Screw pumps KTS

KTS

KNOLL
.It works

available from stock

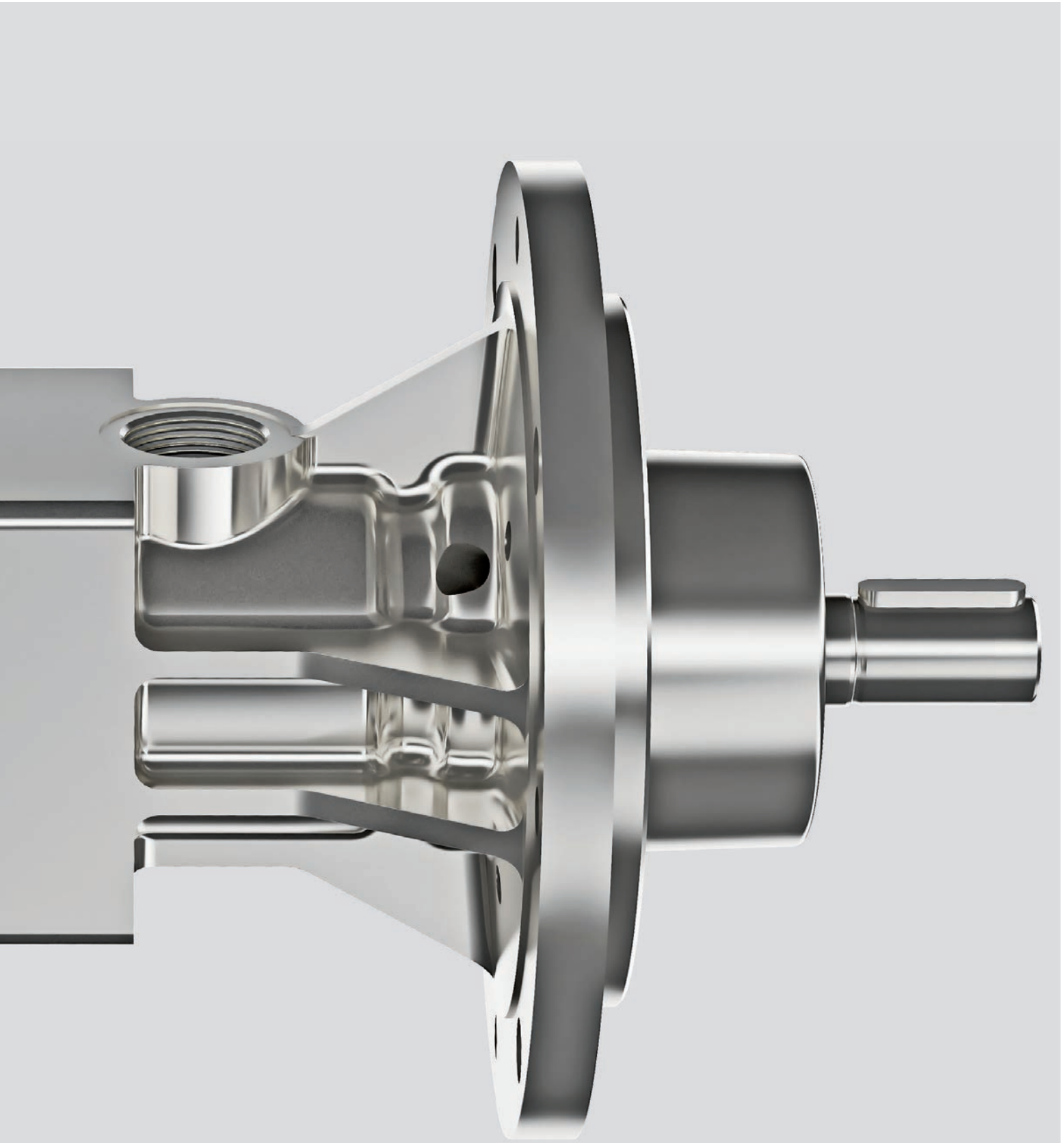
Version 02-2017

Content

KNOLL .It works

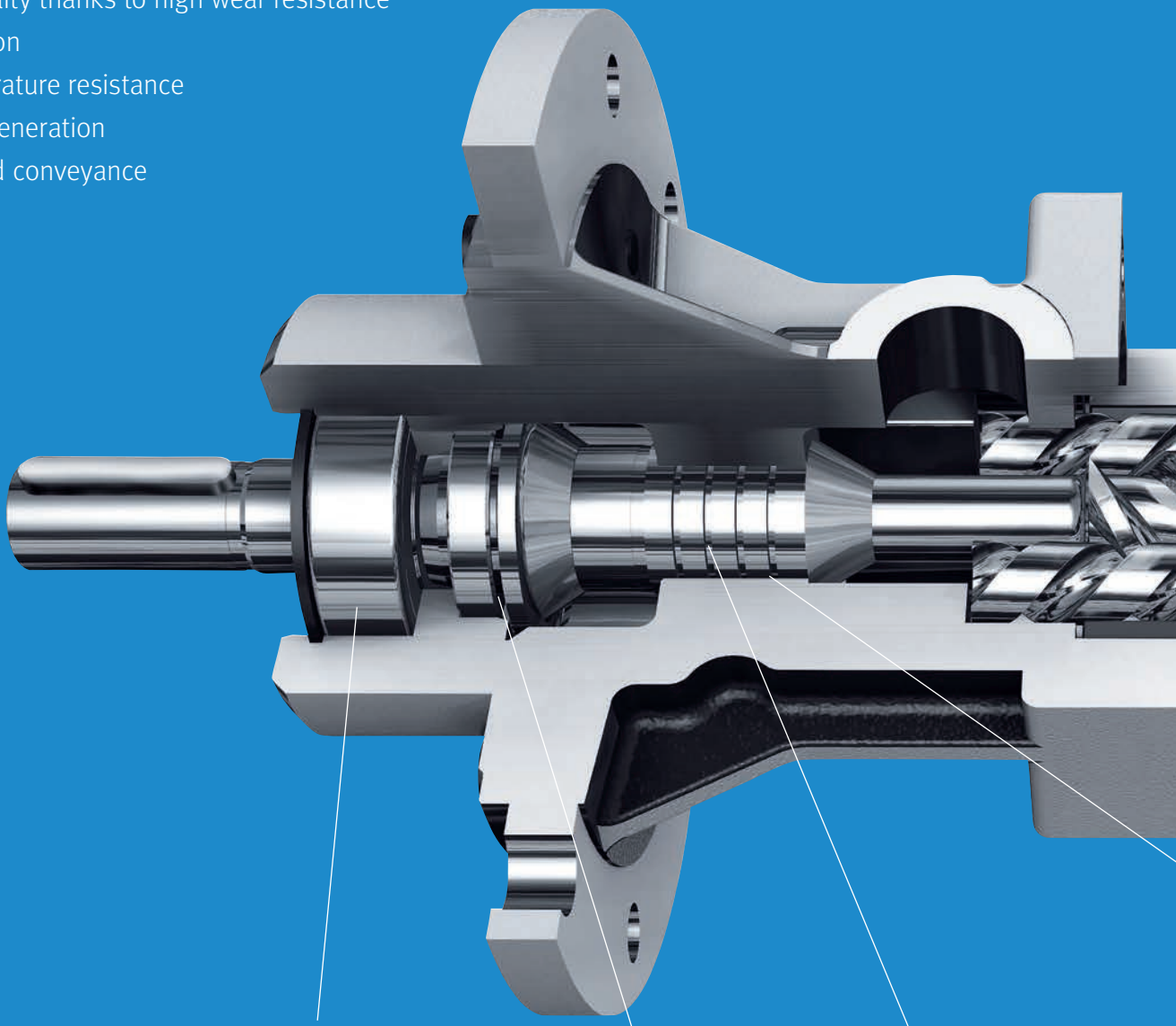
KNOLL is the largest employer in the Upper Swabian city Bad Saulgau with approximately 1,000 employees. Walter Knoll laid the foundation for the company in 1970. The family business supplies manufacturers and users of machine tools with conveyor and filter systems worldwide. All sectors that use machine tools for turning, milling, drilling or grinding apply KNOLL products, especially machine construction, electrotechnology, vehicle assembly, the aerospace industry and the energy sector. Since 1974, the company has grown continuously on its own premises. Its affiliation with and sense of responsibility toward the local region are part of its corporate philosophy. Whether planes, turbine buckets, car rims, knives or cell phones, the list of end products that KNOLL contributes to is highly varied.

KNOLL Maschinenbau ranks among the leading suppliers of systems for conveying and filtering chips and cooling lubricants in the metal machining industry. The screw pump KTS has been a KNOLL success story for over 22 years. It conveys cooling lubricants (oils, emulsions, aqueous solutions) for high-pressure applications on machine tools. A typical example is cooling, lubrication and chip transportation for tools with an internal cooling lubricant supply during drilling and milling. The KTS offers innovative technology, durability and wear resistance. Through cutting-edge production technologies, continuous development and a highly efficient logistics and service network we have established ourselves in this segment.



Advantages

- Long durability thanks to high wear resistance
- Low pulsation
- High temperature resistance
- Low noise generation
- Gentle liquid conveyance



Design features

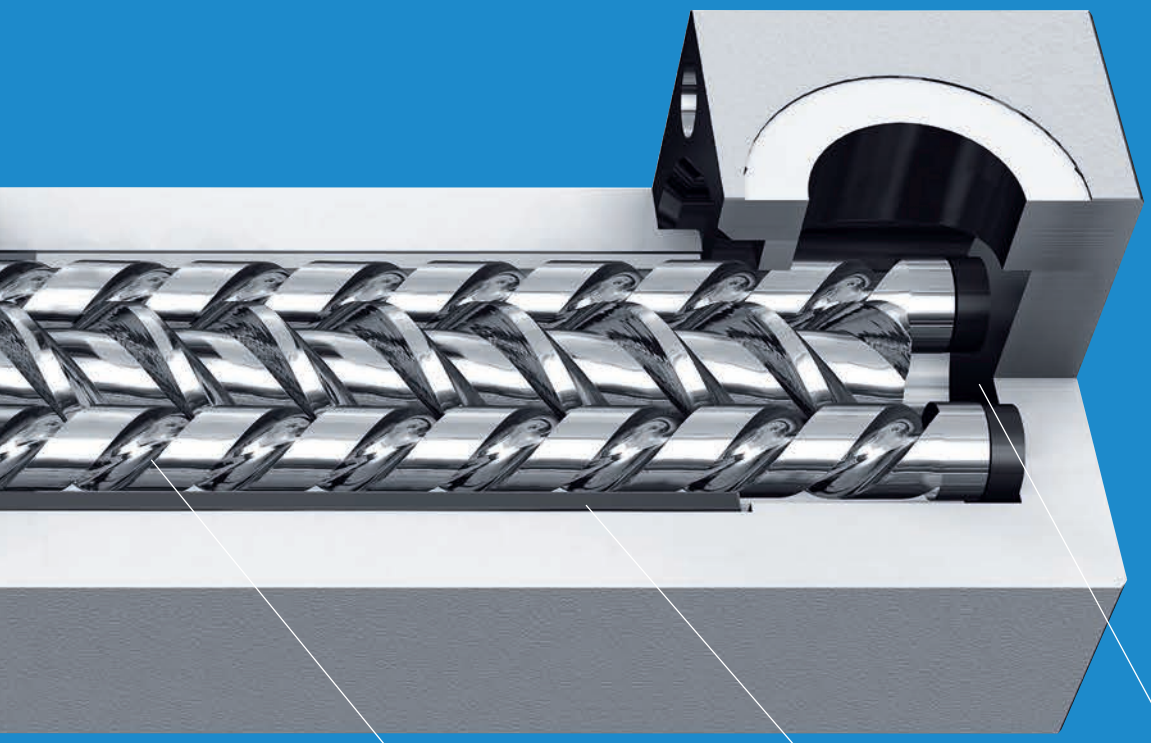
Exterior main bearing for greater durability

Optional axial face seal for dry installation

Labyrinth for effective pressure reduction and high efficiency

Layout

Screw pumps KTS by KNOLL are self-priming displacement pumps suitable for lubricating and little abrasive media. The pump consists of three primary components:
1. Suction housing, 2. Spindle housing with a drive spindle and two concurrently rotating running spindles, 3. Pressure port housing with throttling point, sealed shaft feedthrough and external main bearing. The spindle housing consists of two steel-embedded ceramic shells.

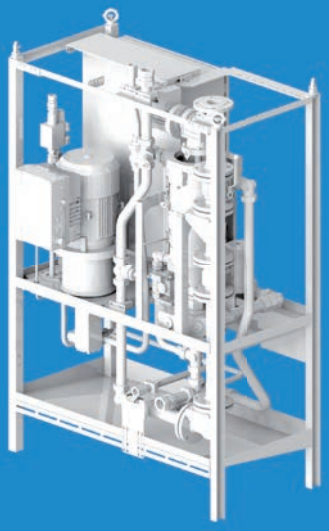


Optional ceramic piston bushing at the throttle gap to minimize wear

Precision manufactured screw spindles from long-lasting specially treated tool steel

Precision manufactured spindle housing made of ceramic, thereby nearly wear-free

Wear resistant axial thrust balance



Type code

KTS 25-50-T-A-G-KB-H

- Configuration
- Type / size
- Spindle pitch
- Model T/TL
- Axial thrust balance
- Mechanical seal G/G4
  G = inlet pressure ≤ 8 bar
  G4 = inlet pressure 8 – 20 bar
- Ceramic piston bushing
- High pressure › 150 bar

Versions

All pumps come in a submersible version for vertical installation (usually in containers) and in a foot version for horizontal dry installation.
KTS pumps can optionally be equipped with PQ-Tronic speed control.

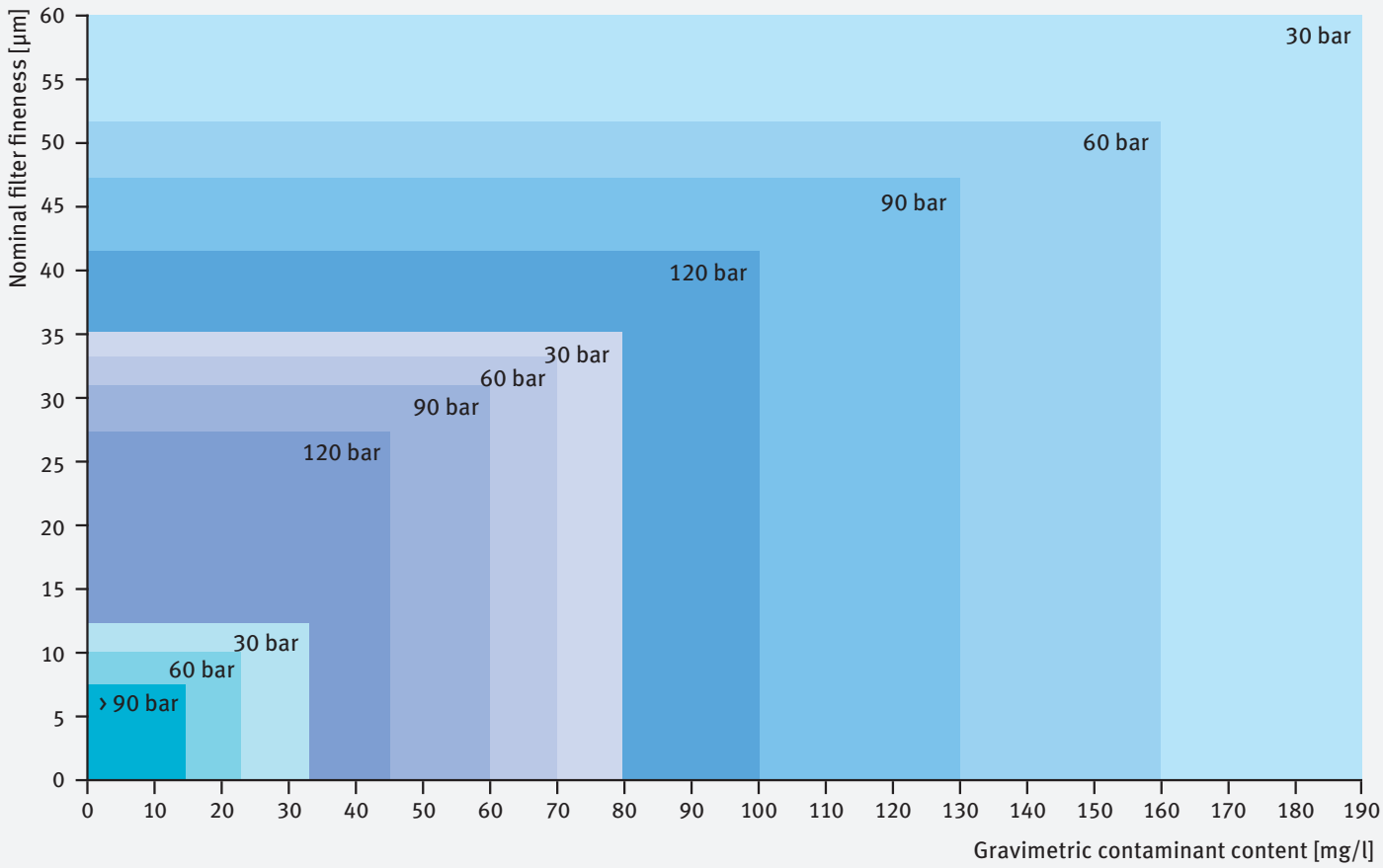
Specifications

Delivery rate:	1 – 900 l/min
Pressure increase:	1 – 200 bar
Inlet pressure:	max. 20 bar
Temperature:	max. 130 °C
Kinematic viscosity:	1 – 2,500 mm^2/s
Air content:	3 – 5 vol. %

Inspection

Precision in accordance with inspection regulations
Q > 100 l/min VDMA 24284, class II, group II
Q ≤ 100 l/min KNOLL instructions

Recommended filter quality



The information refers to the gravimetric contaminant content with a 5 µm cellulose membrane in 100 ml sample.

Very hard particles 1,000 – 10,000 HV
Such as corundum, ceramic, SIC, glass and carbide metals. Corundum upon request

Hard particles 500 – 1,000 HV
Such as hardened steel, cast material with filler metal, aluminum with a high silicon content, abrasive: CBN/diamond

Soft particles ‹ 500 HV
Such as unhardened steel, grey cast iron, non-ferrous metals

KTS selection

Maximum pressure [bar]

	Grinding		Grinding		Turning, Milling, Drilling		Turning, Milling, Drilling	
	Emulsion	Oil	Emulsion	Oil	Emulsion	Oil	Emulsion	Oil
T	–	–	30	60	60	80	80	100
T-KB	–	–	60	90	80	100	100	120
T-A-KB	60	90	90	120	120	120	150	150
T-A-KB-H	Higher pressures upon request							

2,900 rpm
50 Hz
1 mm²/s

Motor:	2-pole
Rotational speed:	2,900 rpm
Frequency:	50 Hz
Delivery rate:	Q [l/min]
Power requirement:	P [kW]
Viscosity:	1 mm²/s, such as emulsion

Higher pressures upon request.

Model	Pressure [bar]:		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
	KTS 20-30	Q	15	14.1	13.3	12.5	11.8	11.1	10.5	9.9	9.4	8.9	8.5	8.1	7.8	7.5	7.3
		P	0.4	0.7	1	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.3	3.6	3.9	4.2	4.5
	KTS 20-40	Q	19.5	18.6	17.8	17	16.3	15.6	15	14.4	13.9	13.4	13	12.6	12.3	12	11.8
		P	0.5	1	1.4	1.9	2.3	2.7	3.2	3.6	4.1	4.5	4.9	5.4	5.8	6.3	6.7
	KTS 20-48	Q	23.1	22.2	21.3	20.5	19.8	19.1	18.4	17.8	17.3	16.8	16.4	16	15.6	15.3	15.1
		P	0.7	1.2	1.7	2.2	2.7	3.2	3.7	4.2	4.7	5.2	5.8	6.3	6.8	7.3	7.8
	KTS 25-38	Q	29.7	28.7	27.7	26.8	25.9	25	24.2	23.4	22.7	22	21.4	20.8	20.2	19.7	19.3
		P	0.7	1.3	1.9	2.5	3.1	3.7	4.3	4.9	5.5	6.1	6.7	7.3	7.9	8.5	9.1
	KTS 25-50	Q	38.5	37.2	36	34.8	33.7	32.6	31.6	30.6	29.7	28.9	28.1	27.4	26.8	26.2	25.7
		P	1	1.7	2.5	3.3	4	4.8	5.6	6.3	7.1	7.9	8.7	9.4	10.2	11	11.7
	KTS 25-60	Q	45.2	43.8	42.3	41	39.8	38.6	37.5	36.4	35.5	34.6	33.8	33.1	32.4	31.8	31.4
		P	1.1	2	3	4	5	5.9	6.9	7.9	8.8	9.8	10.8	11.7	12.7	13.7	14.7
	KTS 32-48	Q	58.5	56.6	54.8	53.1	51.5	49.9	48.5	47.2	45.9	44.8	43.8	42.8	42	41.2	40.6
		P	1.4	2.5	3.7	4.8	6	7.2	8.3	9.5	10.6	11.8	13	14.1	15.3	16.4	17.6
	KTS 32-64	Q	79.4	77.2	75	72.9	70.9	69	67.2	65.5	63.8	62.3	60.8	59.5	58.2	57	55.9
		P	1.9	3.5	5	6.6	8.1	9.7	11.3	12.8	14.4	15.9	17.5	19.1	20.6	22.2	23.7
	KTS 32-76	Q	92.4	90.2	87.9	85.8	83.8	81.8	79.9	78	76.3	74.6	73	71.5	70	68.6	67.4
		P	2.3	4.2	6	7.9	9.7	11.6	13.4	15.3	17.1	19	20.8	22.7	24.5	26.4	28.2
	KTS 40-60	Q	115	112	109	106	103	100	97.6	95.1	92.8	90.5	88.4	86.3			
		P	2.8	4.9	7	9.1	11.2	13.3	15.4	17.5	19.6	21.7	23.8	25.9			
	KTS 40-80	Q	156	152	148	144	141	137	134	131	128	125	122	119			
		P	3.7	6.6	9.6	12.5	15.5	18.4	21.4	24.3	27.3	30.2	33.2	36.1			
	KTS 40-96	Q	187	183	179	175	171	167	164	160	157	154	151	148			
		P	4.4	8.1	11.8	15.5	19.3	23	26.7	30.5	34.2	37.9	41.7	45.4			
	KTS 50-74	Q	228	224	220	217	213	209	206	202	199	195	192	188			
		P	5	9.4	13.8	18.3	22.7	27.1	31.5	35.9	40.4	44.8	49.2	53.6			
	KTS 50-100	Q	311	305	300	294	289	284	279	274	270	266	261	257			
		P	7	13	19	25	31	37	43	49	55	61	67	73			
	KTS 50-120	Q	374	367	360	353	347	341	334	328	323	317	312	306			
		P	8.6	15.7	22.8	29.9	37	44.2	51.3	58.4	65.5	72.6	79.8	86.9			
	KTS 60-90	Q	458	447	436	425	415	405	396	387	378	369					
		P	10	18.3	26.6	34.9	43.2	51.5	59.8	68.1	76.4	84.7					
	KTS 60-120	Q	606	592	579	566	553	541	530	519							
		P	12	22.5	33	43.5	54	64.5	75	85.5							
	KTS 60-130	Q	651	639	627	614	602	590	578	567							
		P	13	24.2	35.4	46.6	57.8	69	80.2	91.5							
	KTS 60-145	Q	735	718	701	686	670	655									
		P	14.7	28.3	41.9	55.5	69.1	82.7									

Motor:	2-pole
Rotational speed:	2,900 rpm
Frequency:	50 Hz
Delivery rate:	Q [l/min]
Power requirement:	P [kW]
Viscosity:	20 mm²/s, such as oil

2,900 rpm
50 Hz
20 mm²/s

Viscosity › 20 mm²/s greater power requirement. Higher pressures upon request.

Model		Pressure [bar]:	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
KTS 20-30	Q		15.3	14.9	14.5	14.1	13.7	13.4	13.1	12.8	12.5	12.3	12.1	11.9	11.7	11.6	11.5
	P		0.4	0.7	1	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.3	3.6	3.9	4.2	4.5
KTS 20-40	Q		20.2	19.7	19.3	18.9	18.6	18.2	17.9	17.6	17.4	17.1	16.9	16.7	16.6	16.4	16.3
	P		0.5	1	1.4	1.9	2.3	2.7	3.2	3.6	4.1	4.5	4.9	5.4	5.8	6.3	6.7
KTS 20-48	Q		24.1	23.6	23.2	22.8	22.4	22.1	21.7	21.4	21.2	20.9	20.7	20.5	20.3	20.2	20.1
	P		0.7	1.2	1.7	2.2	2.7	3.2	3.7	4.2	4.7	5.2	5.8	6.3	6.8	7.3	7.8
KTS 25-38	Q		30.4	29.8	29.3	28.9	28.4	28	27.6	27.2	26.8	26.5	26.2	25.9	25.6	25.4	25.1
	P		0.7	1.3	1.9	2.5	3.1	3.7	4.3	4.9	5.5	6.1	6.7	7.3	7.9	8.5	9.1
KTS 25-50	Q		39.7	39	38.4	37.8	37.2	36.7	36.2	35.7	35.3	34.8	34.5	34.1	33.8	33.5	33.2
	P		1	1.7	2.5	3.3	4	4.8	5.6	6.3	7.1	7.9	8.7	9.4	10.2	11	11.7
KTS 25-60	Q		47.1	46.3	45.6	45	44.3	43.8	43.2	42.7	42.2	41.8	41.4	41	40.7	40.4	40.1
	P		1.1	2	3	4	5	5.9	6.9	7.9	8.8	9.8	10.8	11.7	12.7	13.7	14.7
KTS 32-48	Q		61.3	60.4	59.5	58.6	57.8	57	56.3	55.7	55	54.5	54	53.5	53.1	52.7	52.4
	P		1.4	2.5	3.7	4.8	6	7.2	8.3	9.5	10.6	11.8	13	14.1	15.3	16.4	17.6
KTS 32-64	Q		82.5	81.4	80.3	79.2	78.2	77.3	76.4	75.5	74.7	73.9	73.2	72.5	71.9	71.3	70.7
	P		1.9	3.5	5	6.6	8.1	9.7	11.3	12.8	14.4	15.9	17.5	19.1	20.6	22.2	23.7
KTS 32-76	Q		97	95.9	94.8	93.7	92.7	91.7	90.7	89.8	88.9	88.1	87.3	86.5	85.8	85.1	84.5
	P		2.3	4.2	6	7.9	9.7	11.6	13.4	15.3	17.1	19	20.8	22.7	24.5	26.4	28.2
KTS 40-60	Q		120	118	117	115	114	113	111	110	109	108	107	106			
	P		2.8	4.9	7	9.1	11.2	13.3	15.4	17.5	19.6	21.7	23.8	25.9			
KTS 40-80	Q		161	160	158	156	154	152	151	149	147	146	144	143			
	P		3.7	6.6	9.6	12.5	15.5	18.4	21.4	24.3	27.3	30.2	33.2	36.1			
KTS 40-96	Q		194	192	190	188	186	184	182	180	179	177	176	174			
	P		4.4	8.1	11.8	15.5	19.3	23	26.7	30.5	34.2	37.9	41.7	45.4			
KTS 50-74	Q		235	233	231	229	227	225	224	222	220	218	216	215			
	P		5	9.4	13.8	18.3	22.7	27.1	31.5	35.9	40.4	44.8	49.2	53.6			
KTS 50-100	Q		319	316	313	310	308	305	303	300	298	296	294	292			
	P		7	13	19	25	31	37	43	49	55	61	67	73			
KTS 50-120	Q		383	379	376	372	369	366	363	360	357	354	352	349			
	P		8.6	15.7	22.8	29.9	37	44.2	51.3	58.4	65.5	72.6	79.8	86.9			
KTS 60-90	Q		464	458	453	448	443	438	433	428	424	419					
	P		10	18.3	26.6	34.9	43.2	51.5	59.8	68.1	76.4	84.7					
KTS 60-120	Q		609	601	595	588	582	576	570	565							
	P		12	22.5	33	43.5	54	64.5	75	85.5							
KTS 60-130	Q		655	648	642	636	630	624	618								
	P		13	24.2	35.4	46.6	57.8	69	80.2								
KTS 60-145	Q		746	737	729	721	714	706									
	P		14.7	28.3	41.9	55.5	69.1	82.7									

1,450 rpm
50 Hz
1 mm²/s

Motor:	4-pole
Rotational speed:	1,450 rpm
Frequency:	50 Hz
Delivery rate:	Q [l/min]
Power requirement:	P [kW]
Viscosity:	1 mm²/s, such as emulsion

Higher pressures upon request.

Model		Pressure [bar]:	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
KTS 20-30	Q		7.1	6.3	5.4	4.7	3.9	3.3	2.6	2.1	1.5	1.1					
	P		0.2	0.4	0.5	0.7	0.8	0.9	1.1	1.2	1.4	1.5					
KTS 20-40	Q		9	8.2	7.3	6.6	5.8	5.2	4.5	4	3.4	3					
	P		0.3	0.5	0.7	0.9	1.2	1.4	1.6	1.8	2	2.3					
KTS 20-48	Q		10.5	9.6	8.8	8	7.2	6.6	5.9	5.3	4.8	4.3					
	P		0.3	0.6	0.8	1.1	1.3	1.6	1.9	2.1	2.4	2.6					
KTS 25-38	Q		14.2	13.2	12.2	11.3	10.4	9.5	8.7	7.9	7.2	6.5					
	P		0.4	0.7	1	1.3	1.6	1.9	2.2	2.5	2.8	3.1					
KTS 25-50	Q		18.1	16.8	15.6	14.4	13.3	12.2	11.2	10.2	9.3	8.5					
	P		0.5	0.9	1.2	1.6	2	2.4	2.8	3.2	3.6	3.9					
KTS 25-60	Q		20.8	19.3	17.9	16.5	15.3	14.1	13	12	11	10.1					
	P		0.5	1	1.5	2	2.5	3	3.4	3.9	4.4	4.9					
KTS 32-48	Q		26.4	24.5	22.7	21	19.4	17.9	16.4	15.1	13.9	12.7					
	P		0.7	1.3	1.8	2.4	3	3.6	4.2	4.7	5.3	5.9					
KTS 32-64	Q		36.7	34.4	32.2	30.2	28.2	26.3	24.4	22.7	21.1	19.5					
	P		1	1.7	2.5	3.3	4.1	4.9	5.6	6.4	7.2	8					
KTS 32-76	Q		41.7	39.4	37.2	35	33	31	29.1	27.3	25.5	23.8					
	P		1.2	2.1	3	3.9	4.9	5.8	6.7	7.6	8.6	9.5					
KTS 40-60	Q		52.1	49	46	43	40.2	37.5	35	32.5	30.1	27.9					
	P		1.4	2.5	3.5	4.6	5.6	6.7	7.7	8.8	9.8	10.9					
KTS 40-80	Q		72.4	68.5	64.7	61	57.4	53.9	50.5	47.2	44	41					
	P		1.8	3.3	4.8	6.3	7.7	9.2	10.7	12.2	13.6	15.1					
KTS 40-96	Q		87.3	82.9	78.7	74.6	70.7	66.9	63.3	59.9	56.6	53.5					
	P		2.2	4	5.9	7.8	9.6	11.5	13.4	15.2	17.1	19					
KTS 50-74	Q		107	104	99.8	96	92.3	88.6	85	81.4	77.8	74.3					
	P		2.5	4.7	6.9	9.1	11.3	13.6	15.8	18	20.2	22.4					
KTS 50-100	Q		148	142	137	131	126	121	116	111	107	102					
	P		3.5	6.5	9.5	12.5	15.5	18.5	21.5	24.5	27.5	30.5					
KTS 50-120	Q		178	171	164	158	151	145	139	133	127	121					
	P		4.3	7.8	11.4	15	18.5	22.1	25.6	29.2	32.8	36.3					
KTS 60-90	Q		223	212	201	191	180	171	161	152							
	P		5	9.2	13.3	17.5	21.6	25.8	29.9	34.1							
KTS 60-120	Q		301	287	273	260	248	236	225	214							
	P		6	11.3	16.5	21.8	27	32.3	37.5	42.8							
KTS 60-130	Q		323	310	298	286	273	261	250	238							
	P		6.5	12.1	17.7	23.3	28.9	34.5	40.1	45.7							
KTS 60-145	Q		356	339	323	307	292	277	263	249							
	P		7.4	14.2	21	27.8	34.6	41.4	48.2	55							

Motor:	4-pole
Rotational speed:	1,450 rpm
Frequency:	50 Hz
Delivery rate:	Q [l/min]
Power requirement:	P [kW]
Viscosity:	20 mm²/s, such as oil

1,450 rpm
50 Hz
20 mm²/s

Viscosity › 20 mm²/s greater power requirement. Higher pressures upon request.

Model		Pressure [bar]:	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
KTS 20-30	Q		7.5	7.1	6.6	6.3	5.9	5.6	5.2	5	4.7	4.5					
	P		0.2	0.4	0.5	0.7	0.8	0.9	1.1	1.2	1.4	1.5					
KTS 20-40	Q		9.7	9.3	8.9	8.5	8.1	7.8	7.5	7.2	6.9	6.7					
	P		0.3	0.5	0.7	0.9	1.2	1.4	1.6	1.8	2	2.3					
KTS 20-48	Q		11.5	11.1	10.7	10.3	9.9	9.5	9.2	8.9	8.6	8.4					
	P		0.3	0.6	0.8	1.1	1.3	1.6	1.9	2.1	2.4	2.6					
KTS 25-38	Q		14.9	14.3	13.8	13.4	12.9	12.5	12.1	11.7	11.3	11					
	P		0.4	0.7	1	1.3	1.6	1.9	2.2	2.5	2.8	3.1					
KTS 25-50	Q		19.3	18.6	18	17.4	16.8	16.3	15.8	15.3	14.9	14.5					
	P		0.5	0.9	1.2	1.6	2	2.4	2.8	3.2	3.6	3.9					
KTS 25-60	Q		22.6	21.9	21.2	20.5	19.9	19.3	18.7	18.2	17.7	17.3					
	P		0.5	1	1.5	2	2.5	3	3.4	3.9	4.4	4.9					
KTS 32-48	Q		29.2	28.3	27.4	26.5	25.7	25	24.3	23.6	23	22.4					
	P		0.7	1.3	1.8	2.4	3	3.6	4.2	4.7	5.3	5.9					
KTS 32-64	Q		39.7	38.6	37.5	36.5	35.5	34.5	33.6	32.7	31.9	31.2					
	P		1	1.7	2.5	3.3	4.1	4.9	5.6	6.4	7.2	8					
KTS 32-76	Q		46.2	45.1	44	42.9	41.9	40.9	39.9	39	38.1	37.3					
	P		1.2	2.1	3	3.9	4.9	5.8	6.7	7.6	8.6	9.5					
KTS 40-60	Q		57.4	55.8	54.3	52.8	51.4	50.1	48.8	47.6	46.4	45.3					
	P		1.4	2.5	3.5	4.6	5.6	6.7	7.7	8.8	9.8	10.9					
KTS 40-80	Q		78	76	74.1	72.2	70.4	68.7	67	65.4	63.8	62.3					
	P		1.8	3.3	4.8	6.3	7.7	9.2	10.7	12.2	13.6	15.1					
KTS 40-96	Q		93.7	91.6	89.5	87.4	85.5	83.6	81.8	80.1	78.4	76.9					
	P		2.2	4	5.9	7.8	9.6	11.5	13.4	15.2	17.1	19					
KTS 50-74	Q		114	112	110	108	107	105	103	101	99.3	97.5					
	P		2.5	4.7	6.9	9.1	11.3	13.6	15.8	18	20.2	22.4					
KTS 50-100	Q		156	153	150	147	145	142	140	137	135	133					
	P		3.5	6.5	9.5	12.5	15.5	18.5	21.5	24.5	27.5	30.5					
KTS 50-120	Q		187	184	180	177	173	170	167	164	161	159					
	P		4.3	7.8	11.4	15	18.5	22.1	25.6	29.2	32.8	36.3					
KTS 60-90	Q		229	223	218	213	208	203	198	193							
	P		5	9.2	13.3	17.5	21.6	25.8	29.9	34.1							
KTS 60-120	Q		303	296	289	283	277	271	265	260							
	P		6	11.3	16.5	21.8	27	32.3	37.5	42.8							
KTS 60-130	Q		326	320	313	307	301	295	289	283							
	P		6.5	12.1	17.7	23.3	28.9	34.5	40.1	45.7							
KTS 60-145	Q		367	359	351	343	335	328	321	314							
	P		7.4	14.2	21	27.8	34.6	41.4	48.2	55							

3,500 rpm
60 Hz
1 mm²/s

Motor:	2-pole
Rotational speed:	3,500 rpm
Frequency:	60 Hz
Delivery rate:	Q [l/min]
Power requirement:	P [kW]
Viscosity:	1 mm²/s, such as emulsion

Higher pressures upon request.

Model		Pressure [bar]:	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
KTS 20-30	Q		18.2	17.3	16.5	15.7	15	14.3	13.7	13.1	12.6	12.1	11.7	11.3	11	10.7	10.5
	P		0.5	0.9	1.2	1.6	1.9	2.3	2.6	3	3.3	3.7	4	4.4	4.7	5.1	5.4
KTS 20-40	Q		23.8	22.9	22.1	21.3	20.6	19.9	19.3	18.7	18.2	17.7	17.3	16.9	16.6	16.3	16.1
	P		0.7	1.2	1.7	2.2	2.8	3.3	3.8	4.4	4.9	5.4	6	6.5	7	7.6	8.1
KTS 20-48	Q		28.2	27.3	26.5	25.7	25	24.3	23.6	23	22.5	22	21.5	21.1	20.8	20.5	20.3
	P		0.8	1.4	2	2.6	3.2	3.9	4.5	5.1	5.7	6.3	6.9	7.6	8.2	8.8	9.4
KTS 25-38	Q		36.1	35.1	34.1	33.2	32.3	31.4	30.6	29.8	29.1	28.4	27.8	27.2	26.6	26.1	25.7
	P		0.8	1.6	2.3	3	3.7	4.5	5.2	5.9	6.6	7.4	8.1	8.8	9.5	10.3	11
KTS 25-50	Q		47	45.7	44.4	43.2	42.1	41	40	39.1	38.2	37.3	36.6	35.9	35.2	34.6	34.1
	P		1.1	2.1	3	3.9	4.9	5.8	6.7	7.7	8.6	9.5	10.4	11.4	12.3	13.2	14.2
KTS 25-60	Q		55.4	53.9	52.5	51.1	49.9	48.7	47.6	46.6	45.6	44.7	43.9	43.2	42.5	42	41.5
	P		1.3	2.5	3.6	4.8	6	7.1	8.3	9.5	10.7	11.8	13	14.2	15.3	16.5	17.7
KTS 32-48	Q		71.8	69.9	68.1	66.3	64.7	63.2	61.8	60.4	59.2	58.1	57	56.1	55.2	54.5	53.8
	P		1.6	3	4.4	5.8	7.2	8.6	10	11.4	12.8	14.2	15.6	17	18.4	19.8	21.2
KTS 32-64	Q		97.1	94.9	92.7	90.6	88.6	86.7	84.9	83.2	81.5	80	78.5	77.2	75.9	74.7	73.6
	P		2.3	4.2	6.1	7.9	9.8	11.7	13.6	15.5	17.4	19.2	21.1	23	24.9	26.8	28.7
KTS 32-76	Q		113	111	109	107	105	103	101	99	97.3	95.6	94	92.5	91	89.7	88.4
	P		2.8	5	7.2	9.5	11.7	13.9	16.2	18.4	20.6	22.9	25.1	27.3	29.6	31.8	34
KTS 40-60	Q		141	138	135	132	129	126	124	121	119	116	114	112			
	P		3.4	6	8.5	11	13.6	16.1	18.6	21.2	23.7	26.2	28.8	31.3			
KTS 40-80	Q		191	187	183	179	175	172	169	165	162	159	156	153			
	P		4.4	8	11.5	15.1	18.7	22.2	25.8	29.3	32.9	36.5	40	43.6			
KTS 40-96	Q		229	225	220	216	212	209	205	202	198	195	192	189			
	P		5.3	9.8	14.3	18.8	23.3	27.8	32.3	36.8	41.3	45.8	50.3	54.8			
KTS 50-74	Q		278	274	270	267	263	259	256	252	248	245	241	238			
	P		6	11.4	16.7	22	27.4	32.7	38	43.4	48.7	54	59.4	64.7			
KTS 50-100	Q		379	373	367	362	357	352	347	342	337	333	329	325			
	P		8.4	15.7	22.9	30.2	37.4	44.7	51.9	59.1	66.4	73.6	80.9	88.1			
KTS 50-120	Q		455	448	441	434	428	422	415	409	404	398					
	P		10.3	18.9	27.5	36.1	44.7	53.3	61.9	70.5	79.1	87.7					
KTS 60-90	Q		555	544	533	523	512	503	493	484							
	P		12.1	22.1	32.1	42.1	52.1	62.2	72.2	82.2							
KTS 60-120	Q		733	719	705	692	679	668									
	P		14.5	27.2	39.8	52.5	65.2	77.8									
KTS 60-130	Q		788	775	763	751	738	726									
	P		15.7	29.2	42.7	56.2	69.8	83.3									
KTS 60-145	Q		891	874	858	842	827										
	P		17.7	34.2	50.6	67	83.4										

The KTS 60-130 and KTS 60-145 must be operated at an inlet pressure of at least 1.5 bar with an RPM of 3,500.

Motor:	2-pole
Rotational speed:	3,500 rpm
Frequency:	60 Hz
Delivery rate:	Q [l/min]
Power requirement:	P [kW]
Viscosity:	20 mm²/s, such as oil

3,500 rpm
60 Hz
20 mm²/s

Viscosity › 20 mm²/s greater power requirement. Higher pressures upon request.

Model		Pressure [bar]:	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
KTS 20-30	Q		18.6	18.1	17.7	17.3	17	16.6	16.3	16	15.8	15.5	15.3	15.1	15	14.8	14.7
	P		0.5	0.9	1.2	1.6	1.9	2.3	2.6	3	3.3	3.7	4	4.4	4.7	5.1	5.4
KTS 20-40	Q		24.5	24.1	23.6	23.3	22.9	22.6	22.2	22	21.7	21.5	21.2	21.1	20.9	20.8	20.6
	P		0.7	1.2	1.7	2.2	2.8	3.3	3.8	4.4	4.9	5.4	6	6.5	7	7.6	8.1
KTS 20-48	Q		29.2	28.8	28.4	28	27.6	27.3	26.9	26.6	26.4	26.1	25.9	25.7	25.5	25.4	25.3
	P		0.8	1.4	2	2.6	3.2	3.9	4.5	5.1	5.7	6.3	6.9	7.6	8.2	8.8	9.4
KTS 25-38	Q		36.8	36.3	35.8	35.3	34.8	34.4	34	33.6	33.3	32.9	32.6	32.3	32	31.8	31.5
	P		0.8	1.6	2.3	3	3.7	4.5	5.2	5.9	6.6	7.4	8.1	8.8	9.5	10.3	11
KTS 25-50	Q		48.1	47.4	46.8	46.2	45.7	45.1	44.6	44.1	43.7	43.3	42.9	42.5	42.2	41.9	41.7
	P		1.1	2.1	3	3.9	4.9	5.8	6.7	7.7	8.6	9.5	10.4	11.4	12.3	13.2	14.2
KTS 25-60	Q		57.2	56.5	55.8	55.1	54.5	53.9	53.3	52.8	52.3	51.9	51.5	51.1	50.8	50.5	50.3
	P		1.3	2.5	3.6	4.8	6	7.1	8.3	9.5	10.7	11.8	13	14.2	15.3	16.5	17.7
KTS 32-48	Q		74.6	73.6	72.7	71.9	71.1	70.3	69.6	68.9	68.3	67.7	67.2	66.8	66.3	66	65.6
	P		1.6	3	4.4	5.8	7.2	8.6	10	11.4	12.8	14.2	15.6	17	18.4	19.8	21.2
KTS 32-64	Q		100	99	98	96.9	95.9	95	94.1	93.2	92.4	91.6	90.9	90.2	89.6	89	88.4
	P		2.3	4.2	6.1	7.9	9.8	11.7	13.6	15.5	17.4	19.2	21.1	23	24.9	26.8	28.7
KTS 32-76	Q		118	117	116	115	114	113	112	111	110	109	108	108	107	106	105
	P		2.8	5	7.2	9.5	11.7	13.9	16.2	18.4	20.6	22.9	25.1	27.3	29.6	31.8	34
KTS 40-60	Q		146	144	143	141	140	139	137	136	135	134	133	132			
	P		3.4	6	8.5	11	13.6	16.1	18.6	21.2	23.7	26.2	28.8	31.3			
KTS 40-80	Q		196	194	192	190	189	187	185	183	182	180	179	177			
	P		4.4	8	11.5	15.1	18.7	22.2	25.8	29.3	32.9	36.5	40	43.6			
KTS 40-96	Q		235	233	231	229	227	225	223	222	220	219	217	216			
	P		5.3	9.8	14.3	18.8	23.3	27.8	32.3	36.8	41.3	45.8	50.3	54.8			
KTS 50-74	Q		285	283	281	279	277	275	274	272	270	268	266	265			
	P		6	11.4	16.7	22	27.4	32.7	38	43.4	48.7	54	59.4	64.7			
KTS 50-100	Q		386	383	381	378	375	373	370	368	366	363	361	359			
	P		8.4	15.7	22.9	30.2	37.4	44.7	51.9	59.1	66.4	73.6	80.9	88.1			
KTS 50-120	Q		464	460	457	453	450	447	444	441	438	435					
	P		10.3	18.9	27.5	36.1	44.7	53.3	61.9	70.5	79.1	87.7					
KTS 60-90	Q		561	555	550	545	540	535	530	525							
	P		12.1	22.1	32.1	42.1	52.1	62.2	72.2	82.2							
KTS 60-120	Q		735	728	721	715	708	702									
	P		14.5	27.2	39.8	52.5	65.2	77.8									
KTS 60-130	Q		791	784	778	772	766	760									
	P		15.7	29.2	42.7	56.2	69.8	83.3									
KTS 60-145	Q		902	894	886	878	870										
	P		17.7	34.2	50.6	67	83.4										

The KTS 60-130 and KTS 60-145 must be operated at an inlet pressure of at least 1.5 bar With an RPM of 3,500.

1,750 rpm
60 Hz
1 mm²/s

Motor:	4-pole
Rotational speed:	1,750 rpm
Frequency:	60 Hz
Delivery rate:	Q [l/min]
Power requirement:	P [kW]
Viscosity:	1 mm²/s, such as emulsion

Higher pressures upon request.

Model		Pressure [bar]:	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
KTS 20-30	Q		8.8	7.9	7.1	6.3	5.6	4.9	4.3	3.7	3.2	2.7					
	P		0.3	0.4	0.6	0.8	1	1.1	1.3	1.5	1.7	1.8					
KTS 20-40	Q		11.2	10.3	9.5	8.7	8	7.3	6.7	6.1	5.6	5.1					
	P		0.3	0.6	0.9	1.1	1.4	1.7	1.9	2.2	2.5	2.7					
KTS 20-48	Q		13.1	12.2	11.4	10.6	9.8	9.1	8.5	7.9	7.4	6.9					
	P		0.4	0.7	1	1.3	1.6	1.9	2.2	2.5	2.9	3.2					
KTS 25-38	Q		17.4	16.4	15.4	14.5	13.6	12.7	11.9	11.1	10.4	9.7					
	P		0.4	0.8	1.1	1.5	1.9	2.2	2.6	3	3.3	3.7					
KTS 25-50	Q		22.4	21	19.8	18.6	17.5	16.4	15.4	14.4	13.6	12.7					
	P		0.6	1	1.5	2	2.4	2.9	3.4	3.8	4.3	4.8					
KTS 25-60	Q		25.8	24.3	22.9	21.6	20.3	19.2	18.1	17	16.1	15.2					
	P		0.6	1.2	1.8	2.4	3	3.6	4.2	4.7	5.3	5.9					
KTS 32-48	Q		33.1	31.2	29.3	27.6	26	24.5	23.1	21.7	20.5	19.4					
	P		0.8	1.5	2.2	2.9	3.6	4.3	5	5.7	6.4	7.1					
KTS 32-64	Q		45.5	43.3	41.1	39	37	35.1	33.3	31.6	29.9	28.4					
	P		1.1	2.1	3	4	4.9	5.9	6.8	7.7	8.7	9.6					
KTS 32-76	Q		52.2	49.9	47.7	45.5	43.5	41.5	39.6	37.8	36	34.3					
	P		1.4	2.5	3.6	4.7	5.9	7	8.1	9.2	10.3	11.4					
KTS 40-60	Q		65.1	61.9	58.9	56	53.2	50.5	47.9	45.4	43.1	40.8					
	P		1.7	3	4.2	5.5	6.8	8.1	9.3	10.6	11.9	13.1					
KTS 40-80	Q		89.7	85.8	82	78.2	74.6	71.1	67.8	64.5	61.3	58.3					
	P		2.2	4	5.8	7.5	9.3	11.1	12.9	14.7	16.5	18.2					
KTS 40-96	Q		108	104	99.4	95.3	91.4	87.7	84.1	80.6	77.3	74.2					
	P		2.6	4.9	7.1	9.4	11.6	13.9	16.1	18.4	20.6	22.9					
KTS 50-74	Q		132	129	125	121	117	114	110	106	103	99.3					
	P		3	5.7	8.4	11	13.7	16.4	19	21.7	24.4	27					
KTS 50-100	Q		182	176	170	165	160	155	150	145	141	136					
	P		4.2	7.8	11.5	15.1	18.7	22.3	25.9	29.6	33.2	36.8					
KTS 50-120	Q		219	212	205	198	192	185	179	173	167	162					
	P		5.2	9.5	13.8	18	22.3	26.6	30.9	35.2	39.5	43.8					
KTS 60-90	Q		271	260	250	239	229	219	210	200							
	P		6	11	16.1	21.1	26.1	31.1	36.1	41.1							
KTS 60-120	Q		364	350	336	323	311	299	288	277							
	P		7.2	13.6	19.9	26.3	32.6	38.9	45.3	51.6							
KTS 60-130	Q		391	378	366	354	342	329	318	306							
	P		7.8	14.6	21.4	28.1	34.9	41.6	48.4	55.2							
KTS 60-145	Q		435	418	401	385	370	355	341	327							
	P		8.9	17.1	25.3	33.5	41.7	49.9	58.1	66.3							

Motor:	4-pole
Rotational speed:	1,750 rpm
Frequency:	60 Hz
Delivery rate:	Q [l/min]
Power requirement:	P [kW]
Viscosity:	20 mm²/s, such as oil

1,750 rpm
60 Hz
20 mm²/s

Viscosity › 20 mm²/s greater power requirement. Higher pressures upon request.

Model		Pressure [bar]:	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
KTS 20-30	Q		9.1	8.7	8.3	7.9	7.5	7.2	6.9	6.6	6.3	6.1					
	P		0.3	0.4	0.6	0.8	1	1.1	1.3	1.5	1.7	1.8					
KTS 20-40	Q		11.9	11.5	11	10.7	10.3	10	9.6	9.4	9.1	8.9					
	P		0.3	0.6	0.9	1.1	1.4	1.7	1.9	2.2	2.5	2.7					
KTS 20-48	Q		14.1	13.7	13.3	12.9	12.5	12.1	11.8	11.5	11.2	11					
	P		0.4	0.7	1	1.3	1.6	1.9	2.2	2.5	2.9	3.2					
KTS 25-38	Q		18.1	17.6	17.1	16.6	16.1	15.7	15.3	14.9	14.5	14.2					
	P		0.4	0.8	1.1	1.5	1.9	2.2	2.6	3	3.3	3.7					
KTS 25-50	Q		23.5	22.8	22.2	21.6	21	20.5	20	19.5	19.1	18.7					
	P		0.6	1	1.5	2	2.4	2.9	3.4	3.8	4.3	4.8					
KTS 25-60	Q		27.7	26.9	26.2	25.6	24.9	24.3	23.8	23.3	22.8	22.4					
	P		0.6	1.2	1.8	2.4	3	3.6	4.2	4.7	5.3	5.9					
KTS 32-48	Q		35.9	34.9	34	33.2	32.4	31.6	30.9	30.2	29.6	29					
	P		0.8	1.5	2.2	2.9	3.6	4.3	5	5.7	6.4	7.1					
KTS 32-64	Q		48.6	47.4	46.4	45.3	44.3	43.4	42.5	41.6	40.8	40					
	P		1.1	2.1	3	4	4.9	5.9	6.8	7.7	8.7	9.6					
KTS 32-76	Q		56.7	55.6	54.5	53.4	52.4	51.4	50.4	49.5	48.6	47.8					
	P		1.4	2.5	3.6	4.7	5.9	7	8.1	9.2	10.3	11.4					
KTS 40-60	Q		70.3	68.8	67.3	65.8	64.4	63.1	61.8	60.5	59.3	58.2					
	P		1.7	3	4.2	5.5	6.8	8.1	9.3	10.6	11.9	13.1					
KTS 40-80	Q		95.3	93.3	91.4	89.5	87.7	86	84.3	82.6	81.1	79.5					
	P		2.2	4	5.8	7.5	9.3	11.1	12.9	14.7	16.5	18.2					
KTS 40-96	Q		114	112	110	108	106	104	103	101	99.2	97.6					
	P		2.6	4.9	7.1	9.4	11.6	13.9	16.1	18.4	20.6	22.9					
KTS 50-74	Q		139	137	135	133	131	130	128	126	124	122					
	P		3	5.7	8.4	11	13.7	16.4	19	21.7	24.4	27					
KTS 50-100	Q		189	186	184	181	178	176	173	171	169	167					
	P		4.2	7.8	11.5	15.1	18.7	22.3	25.9	29.6	33.2	36.8					
KTS 50-120	Q		228	224	221	217	214	211	208	205	202	199					
	P		5.2	9.5	13.8	18	22.3	26.6	30.9	35.2	39.5	43.8					
KTS 60-90	Q		277	272	267	261	256	251	247	242							
	P		6	11	16.1	21.1	26.1	31.1	36.1	41.1							
KTS 60-120	Q		366	359	352	346	340	334	328	323							
	P		7.2	13.6	19.9	26.3	32.6	38.9	45.3	51.6							
KTS 60-130	Q		394	388	381	375	369	363	357	351							
	P		7.8	14.6	21.4	28.1	34.9	41.6	48.4	55.2							
KTS 60-145	Q		446	437	429	421	413	406	399	392							
	P		8.9	17.1	25.3	33.5	41.7	49.9	58.1	66.3							

Speed control with PQ-Tronic

Function

The KNOLL PQ-Tronic allows to specify desired pressures within a range of 0 – 150. With this system, pump performance is regulated automatically. By changing the drive motor from 10 Hz – 75 Hz, the rotational speed of the pump unit changes (500 – 4500 rpm) and therefore the performance characteristics change as well. A pressure sensor together with an electronic PI control ensures the specified pressure (target value) independent of the amount used.

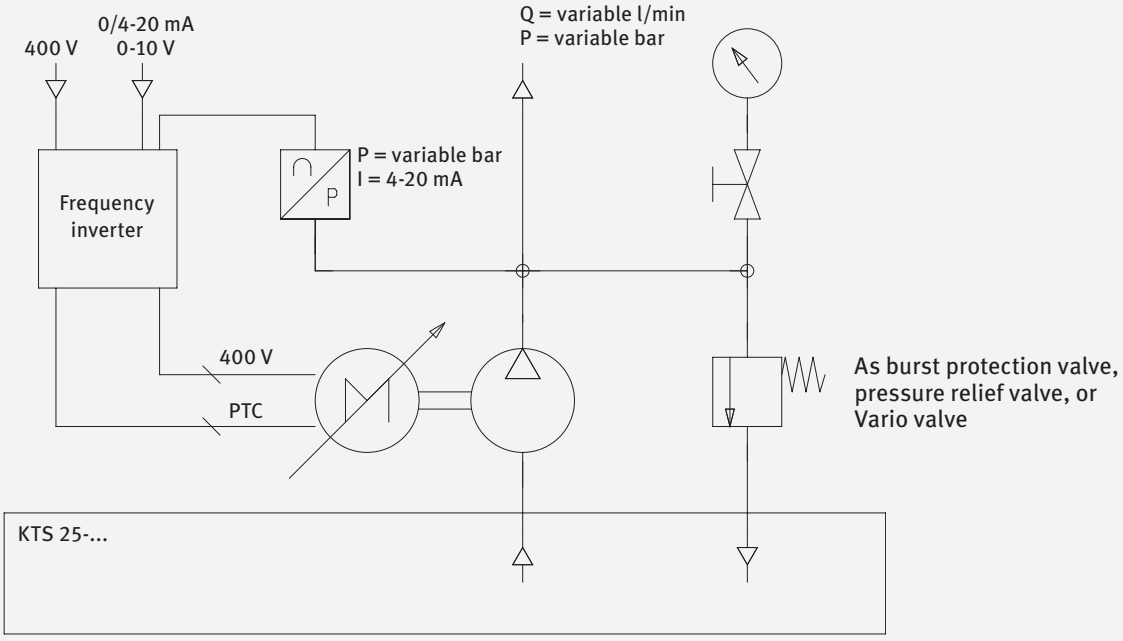
Use

- Machine tools, machining centers and their tools with an internal coolant supply.

Advantages

- Any desired preset pressure with the M-function
- Energy savings of 50 – 70 % and hence quicker amortization
- Low pulsation conveyance
- Smooth starts and stops
- No power peaks during startup
- Speed adjustment to reduce noise
- Less wear and maintenance
- Long service life with parameters optimized to the process
- Reduced heat input to the medium by adapting the performance, thus enabling a smaller cooler
- Minimum quantities with Vario valve at very low speed
- Vario valve as a safety valve with an offset for operating pressure

Schematic



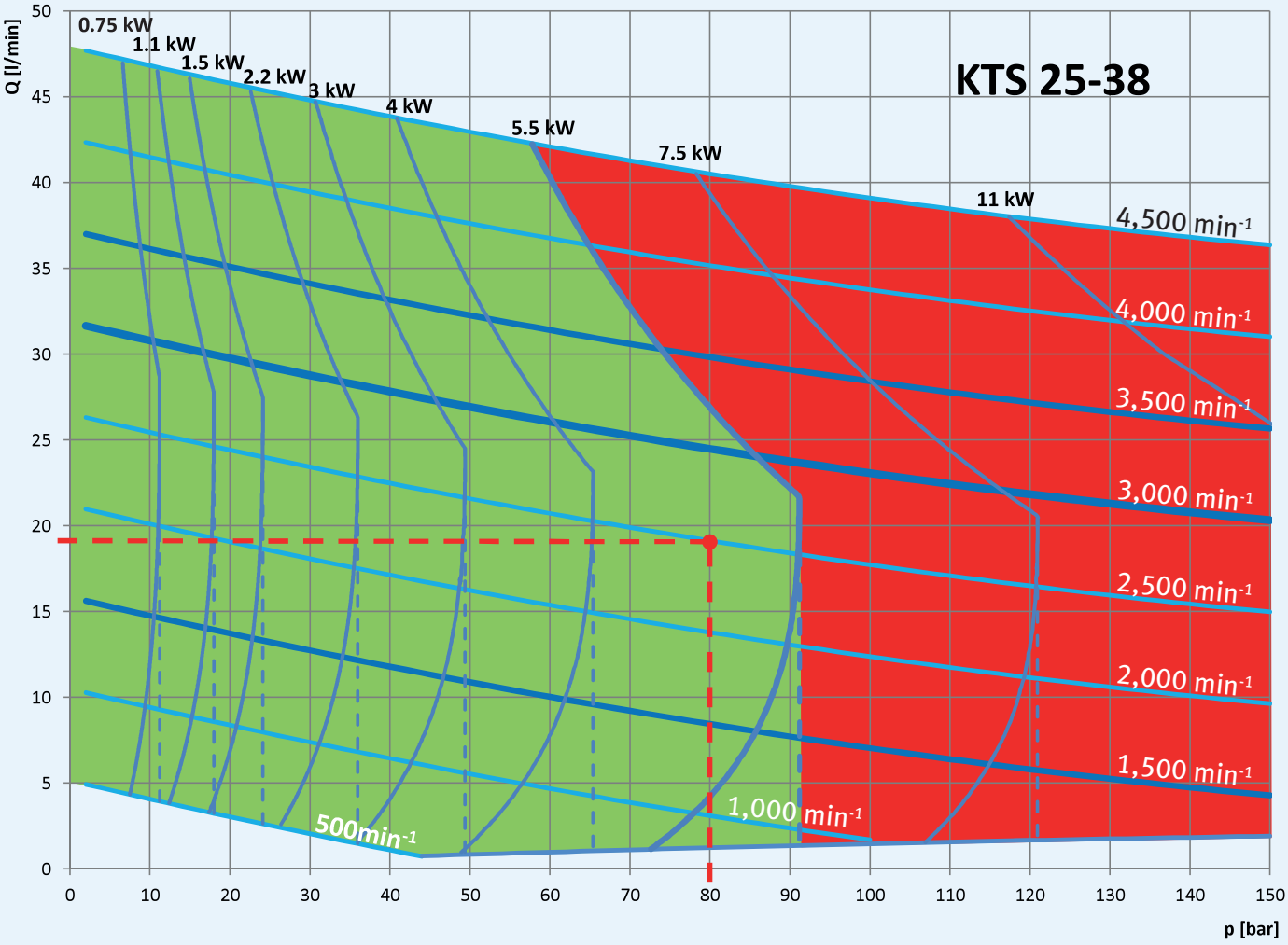
Example layout

Customer requirements

Medium:	Emulsion
Viscosity:	1 mm²/s
Max. pressure increase:	80 bar
Delivery rate:	19 l/min

Speed control with PQ-Tronic

Layout



Results for three-phase motor

Power:	5.5 kW
Rotational speed:	2,500 rpm
Number of pole pairs:	2
Option:	PTC resistor

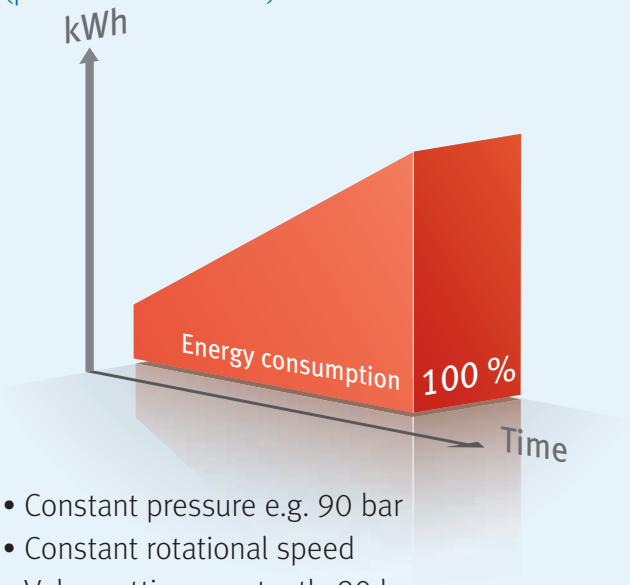
Benefits

Within the diagram, every operating point to the left of the motor characteristic (green area) is possible in terms of delivery rate and pressure. The motor performance characteristic results from the available torque at a specific pressure. For several operating points, the pump size is optimized with regard to the drive power.

Comparison of pressure regulation

Energy savings for the processing of a gearbox housing calculated from the energy required to supply cooling lubricant.

Constant and unregulated pressure (pressure relief valve)

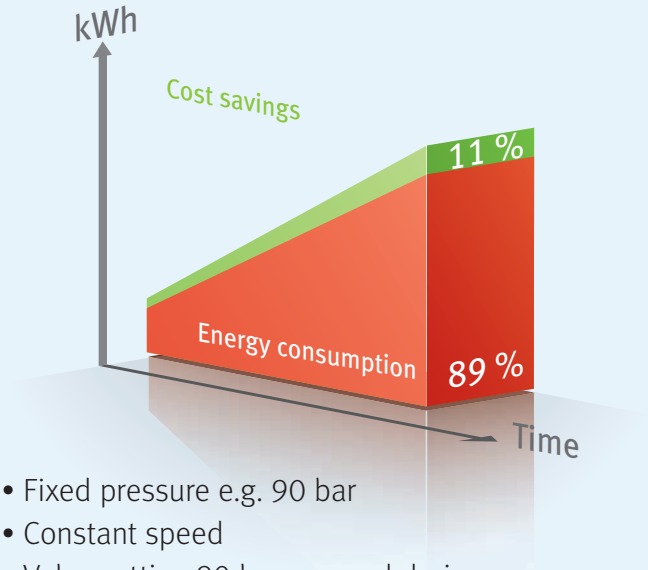


- Constant pressure e.g. 90 bar
- Constant rotational speed
- Valve setting constantly 90 bar

Conclusion

Greatest energy consumption, lowest purchase costs

Constant pressure and pressure-minimized discharge

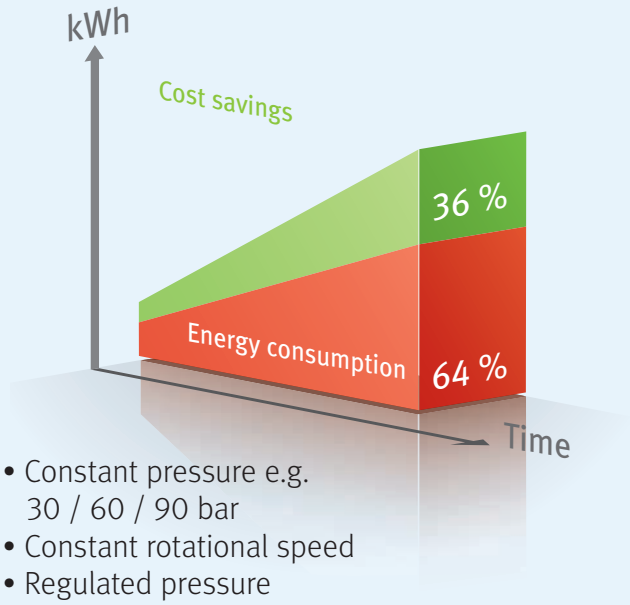


- Fixed pressure e.g. 90 bar
- Constant speed
- Valve setting 90 bar, opened during pauses

Conclusion

Low energy savings, low purchase costs

Variable pressure and pressure-minimized discharge

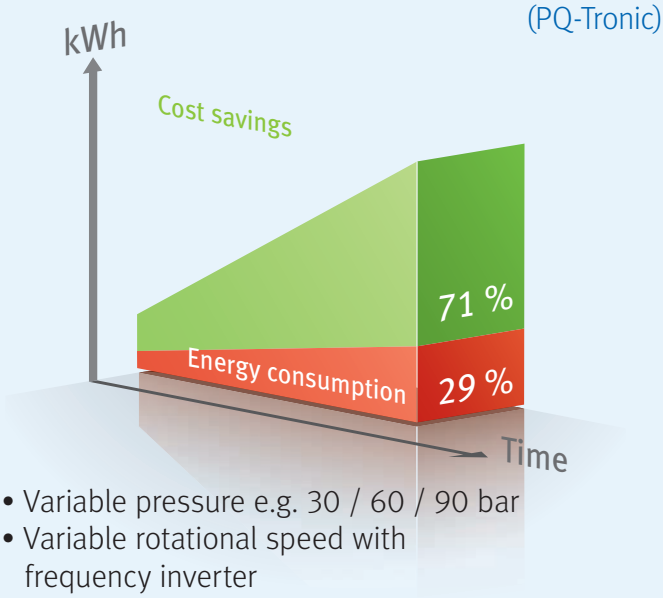


- Constant pressure e.g. 30 / 60 / 90 bar
- Constant rotational speed
- Regulated pressure

Conclusion

Average energy savings, average purchase costs, short amortization time

Variable pressure with rotational speed adaptation (PQ-Tronic)



- Variable pressure e.g. 30 / 60 / 90 bar
- Variable rotational speed with frequency inverter

Conclusion

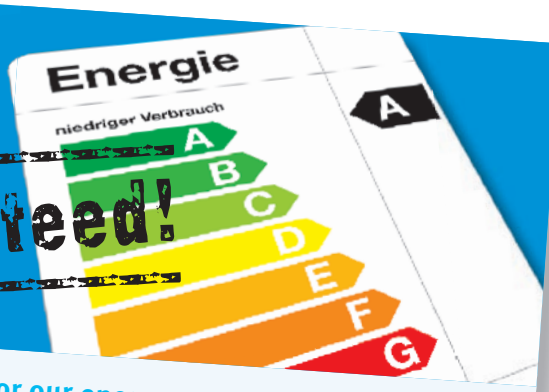
Highest energy savings, highest purchase costs, shortest amortization time

ENERGYNOW

KNOLL .It works

We determine your possible energy savings on-site

Guaranteed!



So far, not many customers opted for our energy saving PQ-Tronic control technology because the determination of the possible savings was too complex.

NOW the measuring process is fast and simple

KNOLL E-PASS

1. We can determine your energy-saving potential on site with a brief measurement, followed by a computer calculation. Afterwards, you receive your energy protocol.
2. Additionaly, we provide you with an on-site cost/benefit appraisal, including your amortization analysis.
3. You then decide whether to go for a PQ-Tronic upgrade.

If you wish to obtain more detailed information, please contact us.

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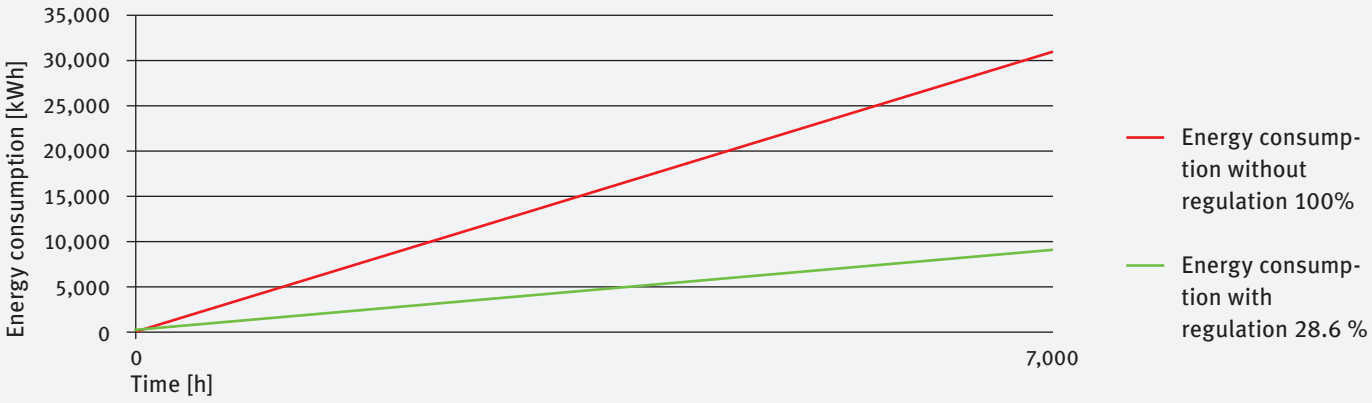
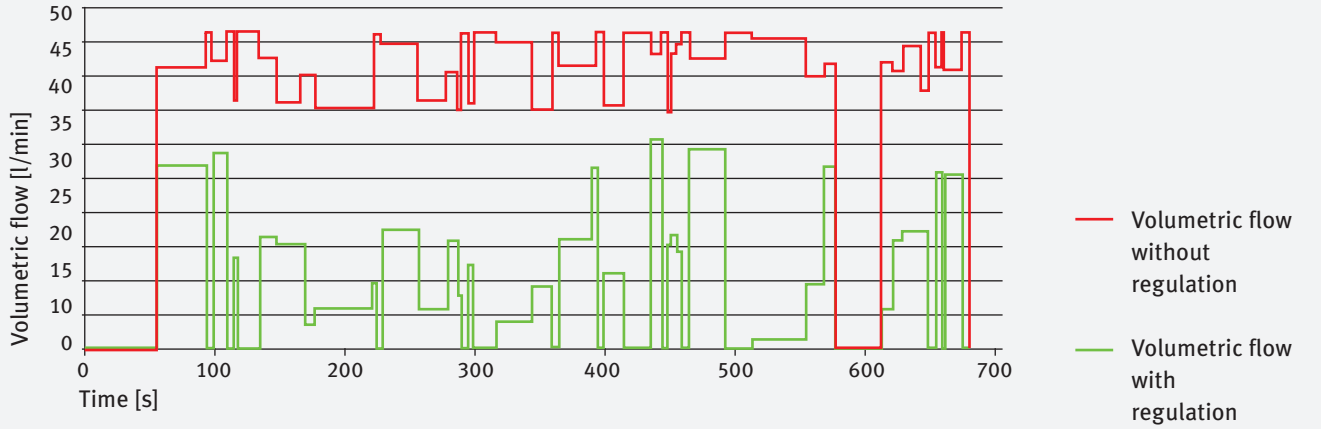
KNOLL Maschinenbau GmbH
Schwarzachstraße 20
DE-88348 Bad Saulgau
www.knoll-mb.de

KNOLL E-PASS
Measurement results

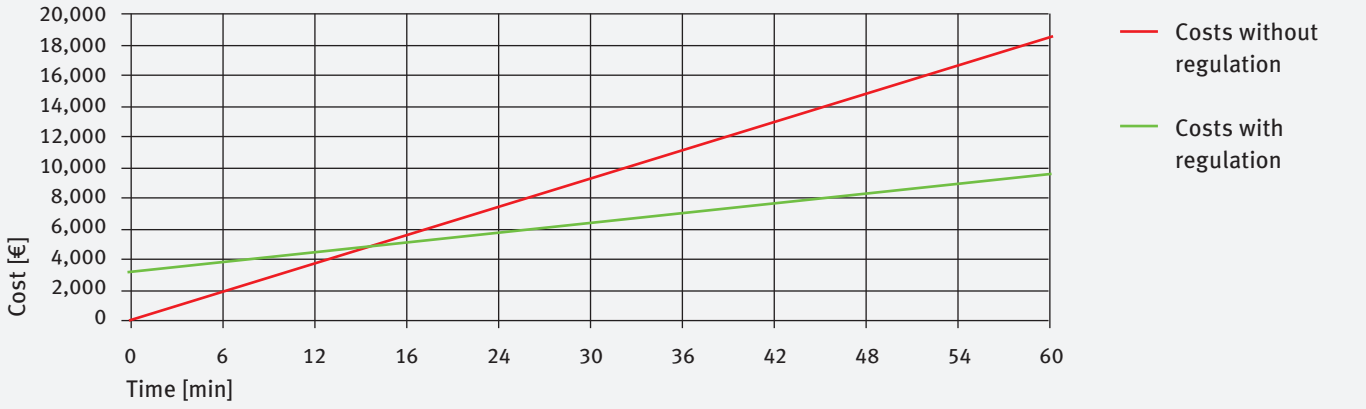
Energy consumption (pump and cooler)



Cooling lubricant volumetric flow



Amortization (7,000 operating hours per year)



KNOLL E-PASS user report

Environmental protection is a priority for one of the world's most important system suppliers of transmission technology for passenger cars and light trucks. One of our goals is to make automobiles more environmentally friendly through the use of our products. Another goal is to minimize the ecological foot- print from production. All of the processes are continuously monitored and optimized in terms of costeffectiveness,energy and resource efficiency, and environmental compatibility.

The KNOLL E-PASS provided the customer with an analysis of the current situation and a calculation of possible savings including amortization. The evaluations are provided both graphically and tabularly. The customer added the KNOLL PQ-Tronic frequency control system to the original high-pressure pump with pressure relief valve.

KNOLL was responsible for connecting the frequency control system to an existing machine tool including the electrical and control system as well as ensuring the necessary safety appraisals.

Result: the reference plant confirmed the theoretically determined values. The amortization of the investment was less than two years.

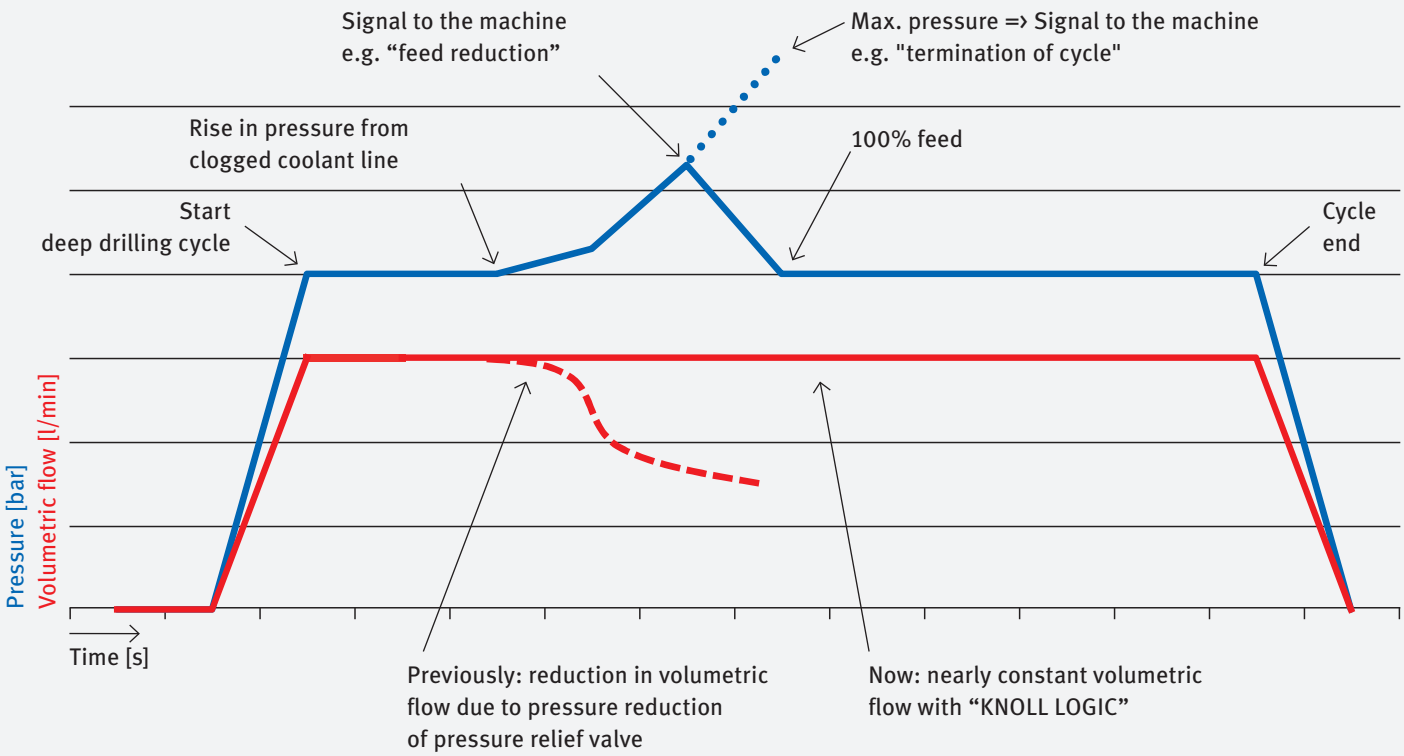
Process monitoring with PQ-Tronic

The KTS system for deep drilling using the PQ-Tronic

KNOLL uses the data from the frequency inverter to identify predictive signs of tool breakage. Relevant signals are forwarded to the CNC control so that the operator or machine can intervene in the process early enough.

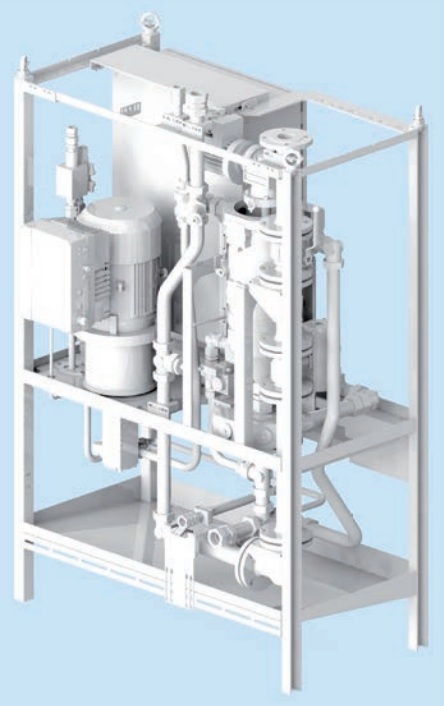
Customer benefits

- Increased feed
- Greater process reliability
- Lower reject rate
- Reduced tool costs
- Early identification of tool wear
- Greater system availability
- Energy savings
- Increased productivity

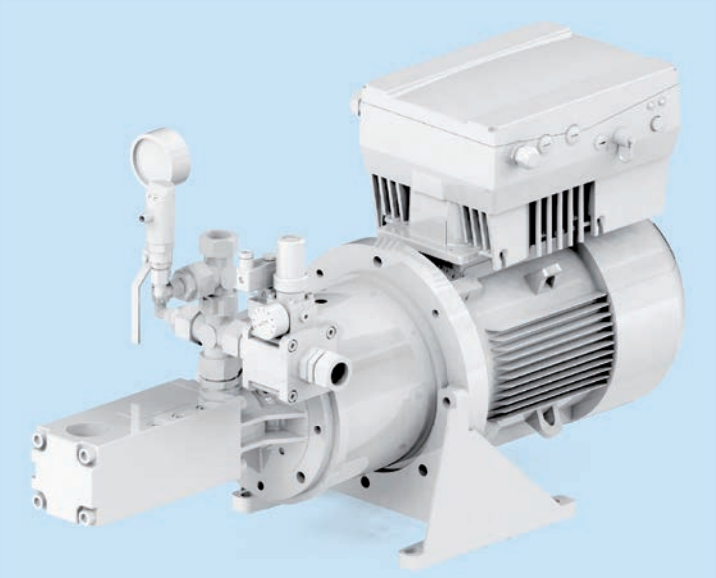


PQ-Tronic
Application examples

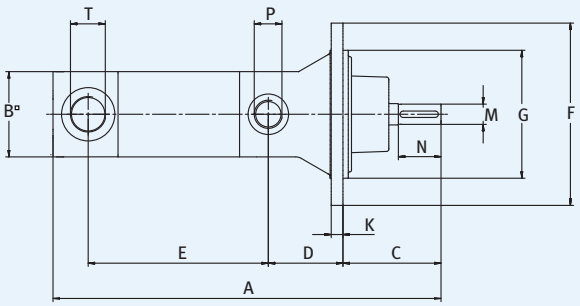
Pressure booster with frequency-controlled screw pump set up in dry installation

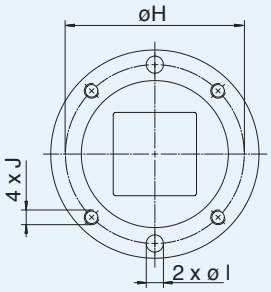


Dry installed frequency-controlled screw pump

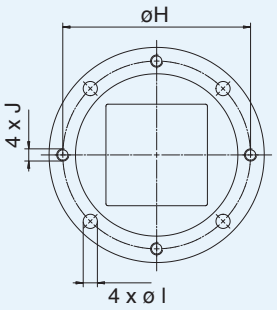


Pump body





KTS 20/25



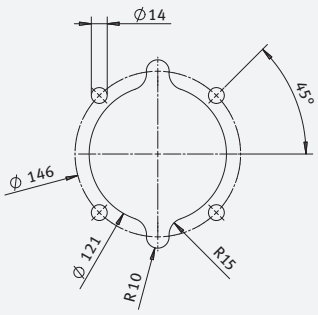
KTS 32/40/50/60

No guarantee of weight and dimensions

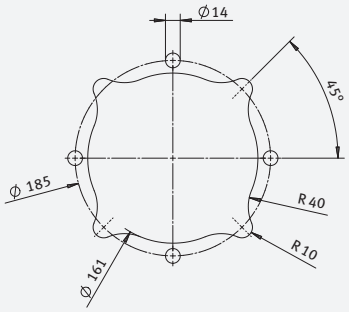
Pump installation size, KTS	Main dimensions [mm]											Pressure connection	Suction connection	Shaft end [mm]		Weight [kg]
	A	B	C	D	E	F	G	H	I	J	K	P	T	M	N	
20 ...	355	80	92	70	144	171	120	146	14	M 12	11	G 1/2"	G 1"	19	40	12
25 ...	380	80	92	70	169	171	120	146	14	M 12	11	G 3/4"	G 1"	19	40	13
32 ...	454	100	100	82	213	212	155	185	14	M 12	14	G 1"	G 1 1/2"	24	40	32
40 ...	525	120	105	84	272	212	155	185	14	M 12	15	G 1 1/2"	G 2"	28	45	40
50 ...	620	140	119	97	329	240	170	205	18	M 16	17	G 1 1/2"	G 2"	32	55	65
60 ...	751	176	143	102	408	350	250	300	22	M 20	19	SAE 2"	SAE 3"	48	65	126

Attachment of the pump plate and pump body

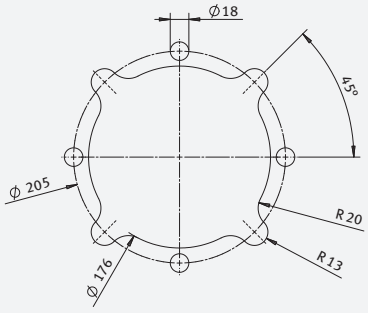
KTS 20/25



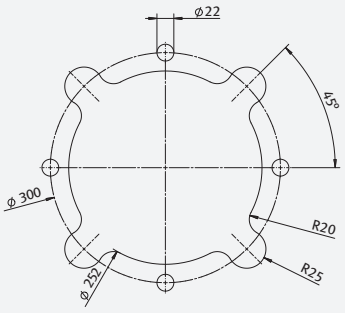
KTS 32/40



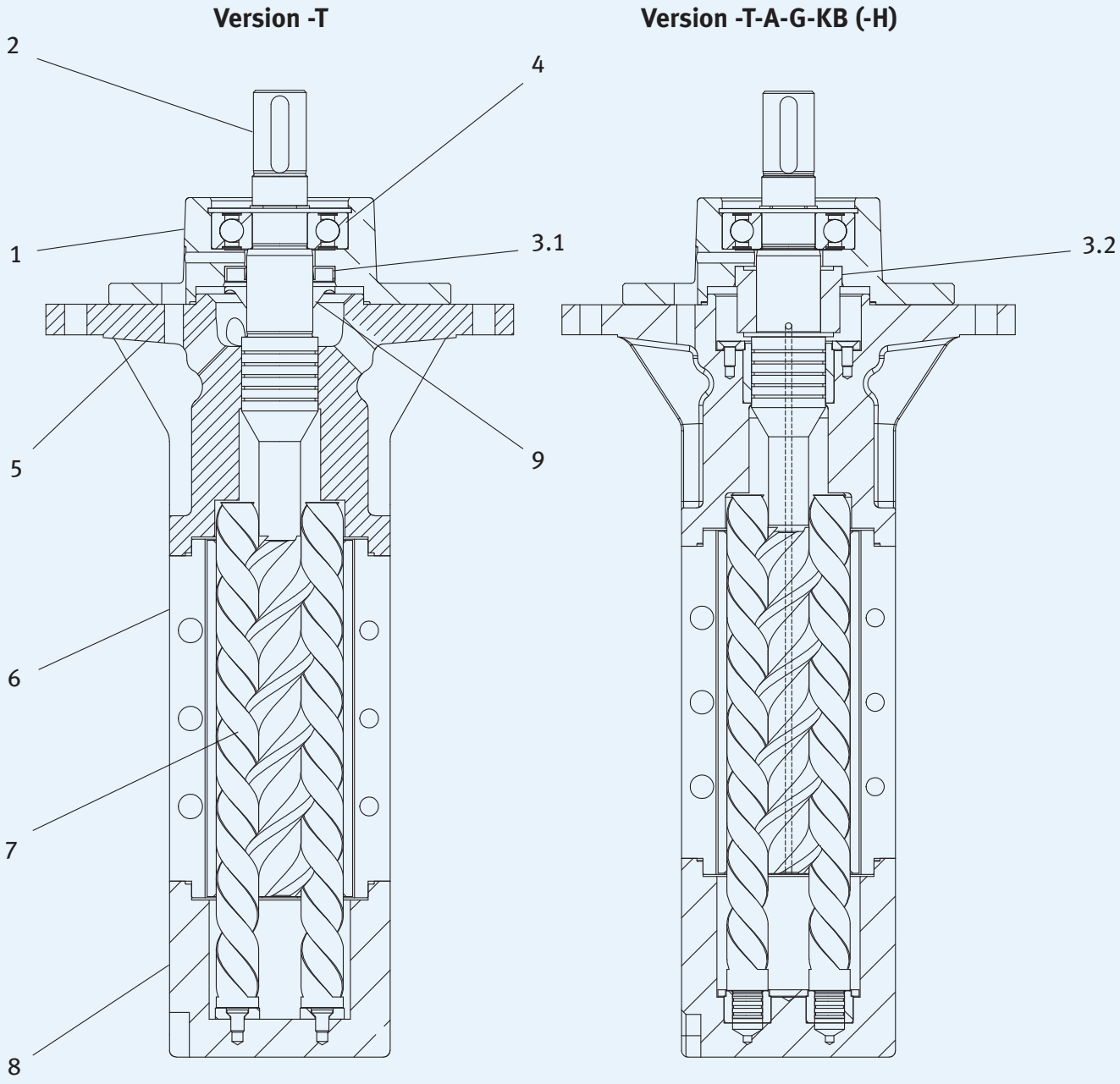
KTS 50



KTS 60



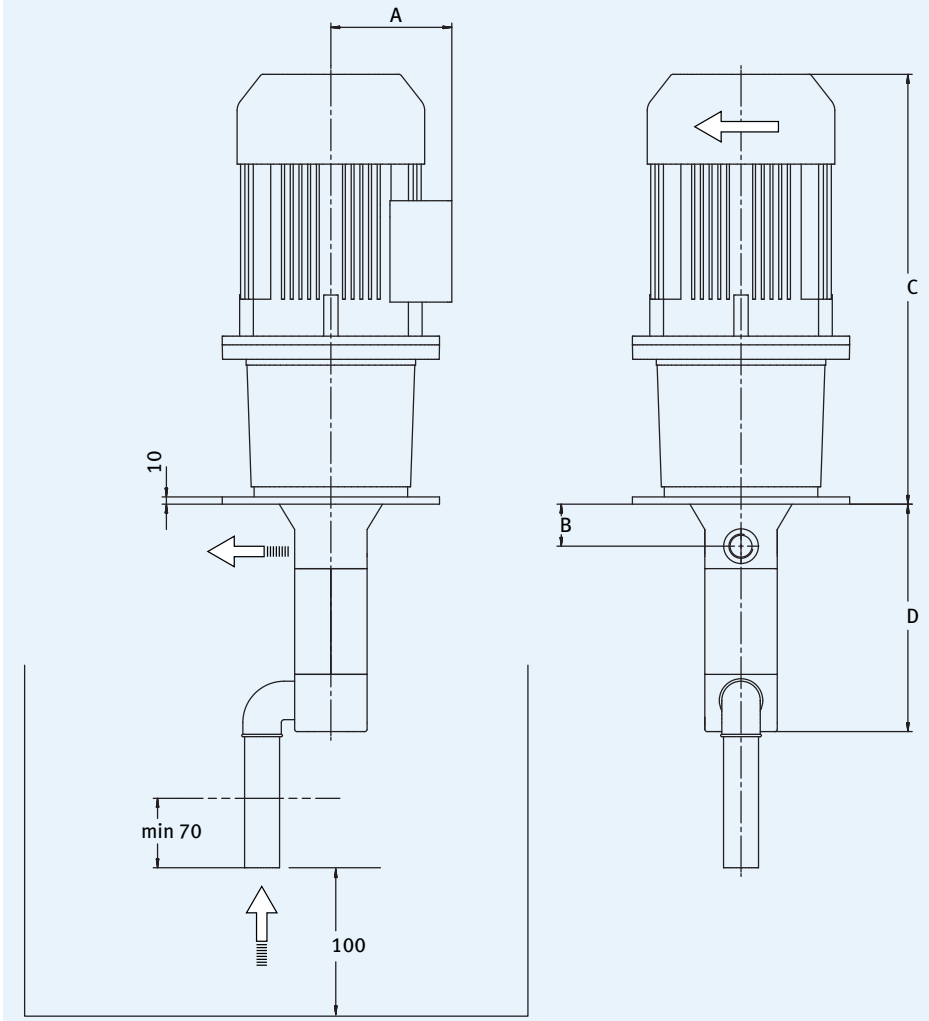
Parts list



Position	Description
1	Bearing cover
2	Drive spindle
3.1	Radial shaft sealing ring (only for version -T)
3.2	Mechanical seal (only for version -T-G)
4	Deep groove ball bearing
5	Pressure port housing

Position	Description
6	Spindle housing
7	Running spindle
8	Suction housing
9	Centrifuge ring

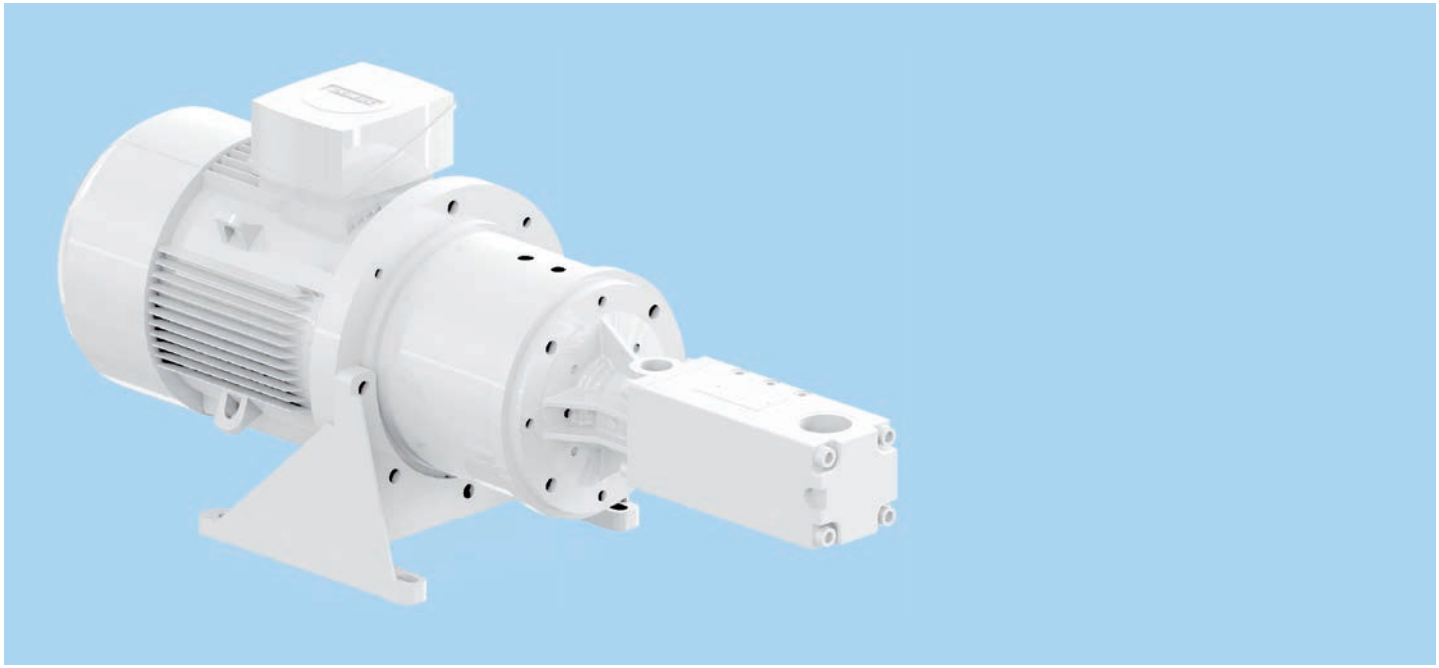
Submersible pumps

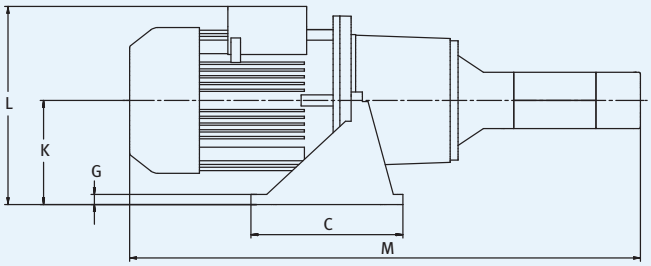


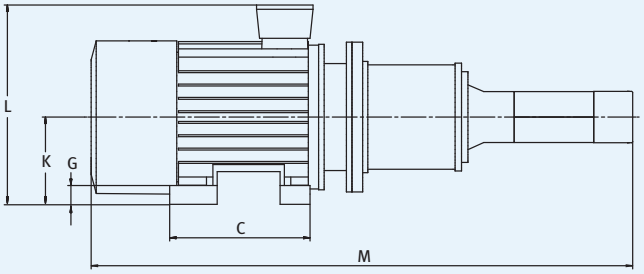
KTS pump	Motor size	Main dimensions [mm]				Weight [kg]	
		A	B	C (IE3)	D	2-pole IE3	4-pole IE3
	80M	120		421		24	27
	80M	120		456		25	-
	90S	128		466		28	29
	90L	128		496		32	32
	100L	135		532		38	42
20	100L	135	49	532	236	-	42
	112M	148		550		49	49
	132S	167		602		60	81
	132S	167		652		74	-
	132M	167		652		-	81
	160M	197		738		94	102
	90S	128		466		29	30
	90L	128		496		33	33
	100L	135		532		39	43
	100L	135		532		-	43
25	112M	148	49	550	261	50	50
	132S	167		602		62	83
	132S	167		652		76	-
	132M	167		652		-	81
	160M	197		743		96	104
	160M	197		743		105	-
	90S	128		511		52	53
	90L	128		541		53	53
	100L	135		571		60	64
	100L	135		571		-	64
	112M	148		554		71	71
	132S	167		605		80	101
32	132S	167	58	655	323	94	-
	132M	167		655		-	101
	160M	197		774		115	123
	160M	197		774		124	-
	160L	197		834		134	140
	180M	262		868		200	205
	200L	300		868		-	257
	200L	300		891		312	327
	112M	148		554		88	109
	132S	167		606		102	-
	132S	167		656		-	109
	132M	167		656		120	128
	160M	197		775		132	-
40	160M	197	59	775	387	142	148
	160L	197		835		208	213
	180M	262		869		-	218
	180L	262		869		273	288
	200L	300		892		298	-
	200L	300		917		-	333
	132S	167		637		113	134
	132S	167		687		127	-
	132M	167		687		-	134
	160M	197		777		145	153
	160M	197		777		154	-
	160L	197		837		167	173
50	180M	262	70	871	468	233	238
	180L	262		871		-	243
	200L	300		894		298	313
	200L	300		919		323	-
	225S	325		960		-	369
	225M	325		1020		405	-
	225M	325		1020		-	410
	160M	197		805		229	237
	160M	197		805		238	-
	160L	197		894		239	245
	180M	262		928		305	310
	180L	262		932		-	315
	200L	300		955		389	404
	200L	300		980		414	-
	225S	325		992		-	433
60	225M	325	73	1052	593	463	-
	225M	325		1052		-	468
	250M	392		1091		572	-
	250M	392		1091		-	582
	280S	555		1164		687	-
	280S	555		1164		-	752
	280M	555		1274		737	-
	280M	555		1274		-	857

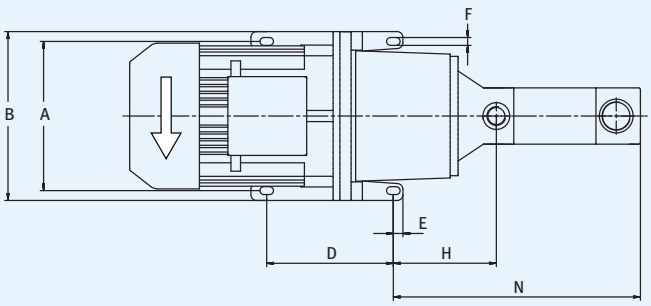
No guarantee of weight and dimensions

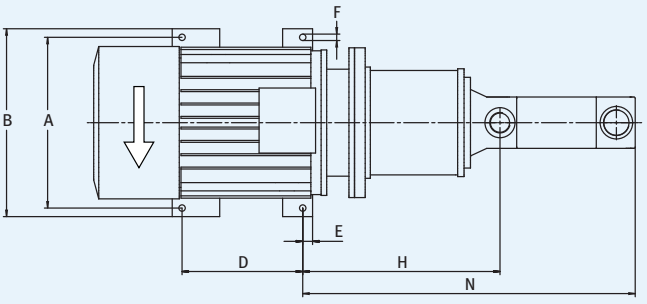
Pumps in foot version











Valid for 80M to 180L size motors, B5 and V1

Valid for 200L to 315S size motors, B35 design

Pumps in foot version

Pump KTS	Motor size	Main dimensions [mm] A	B	C	D	E	F	G	H	K	L	M E3	N	Weight [kg] 2-pole IE3	4-pole IE3
	80M	120	210	90	60	15	11	12	138	112	232	663	331	25	28
	80M	120	210	90	60	15	11	15	138	112	232	698	331	26	-
	90S	128	210	90	60	15	11	12	138	112	240	708	331	29	30
	90L	128	210	90	60	15	11	12	138	112	240	738	331	33	33
20	100L	135	250	230	185	22,5	14	15	167	155	290	774	360	40	44
	100L	135	250	230	185	22,5	14	15	167	155	303	774	360	-	44
	112M	148	250	230	185	22,5	14	15	167	155	303	792	360	51	51
	132S	167	300	270	225	22,5	14	18	171	185	352	844	364	63	84
	132S	167	300	270	225	22,5	14	18	171	185	352	894	364	77	-
	132M	167	350	305	265	20	18	18	183	235	432	993	376	-	89
	160M	197	350	305	265	20	18	18	183	235	432	1052	376	100	108
	90S	128	210	90	60	15	11	12	138	112	240	734	356	30	31
	90L	128	210	90	60	15	11	12	138	112	240	764	356	34	34
	100L	135	250	230	185	22,5	14	15	167	155	290	799	385	41	45
	100L	135	250	230	185	22,5	14	15	167	155	290	799	385	-	45
25	112M	148	250	230	185	22,5	14	15	167	155	303	819	385	52	52
	132S	167	300	270	225	22,5	14	18	171	185	352	869	389	64	85
	132S	167	300	270	225	22,5	14	18	171	185	352	919	289	78	-
	132M	167	350	305	225	22,5	18	18	171	185	352	919	389	-	85
	160M	197	350	305	265	20	18	18	183	235	432	1010	401	101	109
	160M	197	350	305	265	20	18	18	183	235	432	1010	401	110	-
	90S	128	250	90	60	15	14	12	138	155	283	842	451	51	52
	90L	128	250	230	185	22,5	14	15	179	155	283	872	451	55	55
	100L	135	250	230	185	22,5	14	15	179	155	290	900	451	62	66
	100L	135	250	230	185	22,5	14	15	179	155	290	900	451	-	66
	112M	148	250	230	185	22,5	14	15	179	155	303	886	451	73	73
	132S	167	300	270	225	22,5	14	18	183	185	352	935	455	84	105
32	132S	167	300	270	225	22,5	14	18	183	185	352	985	455	98	-
	132M	167	350	305	225	22,5	18	18	183	185	352	985	455	-	105
	160M	197	350	305	265	20	18	18	223	235	432	1104	495	110	118
	160M	197	350	305	265	20	18	18	223	235	432	1104	495	119	-
	160L	197	350	305	265	20	18	18	223	235	432	1204	495	138	144
	180M	262	350	305	265	20	18	18	223	235	497	1241	495	205	210
	200L	300	378	355	305	25	25	25	471	200	500	967	743	-	200
	200L	300	378	355	305	25	25	25	471	200	500	990	743	255	270
	112M	148	250	230	185	22,5	14	15	181	155	303	941	453	90	111
	132S	167	300	270	225	22,5	14	18	185	185	352	1001	457	106	-
	132S	167	300	270	225	22,5	14	18	185	185	352	1051	457	-	113
	132M	167	350	305	225	22,5	18	18	185	185	352	1051	457	124	132
40	160M	197	350	305	265	20	18	18	225	235	432	1170	497	127	-
	160M	197	350	305	265	20	18	18	225	235	432	1170	497	137	143
	160L	197	350	305	265	20	18	18	225	235	432	1270	497	212	217
	180M	262	350	305	265	20	18	18	225	235	497	1307	497	-	223
	180L	262	350	305	265	20	18	18	225	235	497	1307	497	278	293
	200L	300	378	355	305	25	25	25	473	200	500	1337	745	288	-
	200L	300	378	355	305	25	25	25	473	200	500	1362	745	-	323
	132S	167	300	270	225	22,5	14	18	185	185	352	1111	590	117	138
	132S	167	300	270	225	22,5	14	18	185	185	352	1161	590	131	-
	132M	167	350	305	225	22,5	18	18	185	185	352	1161	590	-	138
	160M	197	350	305	265	20	18	18	238	235	432	1251	643	140	148
	160M	197	350	305	265	20	18	18	238	235	432	1251	643	149	-
	160L	197	350	305	265	20	18	18	238	235	432	1351	643	171	177
50	180M	262	350	305	265	20	18	18	238	235	497	1388	643	238	243
	180L	262	350	305	265	20	18	18	238	235	497	1388	643	-	248
	200L	300	378	355	305	25	25	25	486	200	500	1418	891	288	303
	200L	300	378	355	305	25	25	25	486	200	500	1443	891	313	-
	225S	325	436	361	286	37	25	34	531	225	550	1480	936	-	385
	225M	325	436	361	286	37	25	34	531	225	550	1540	936	415	-
	225M	325	490	409	349	30	30	40	560	250	642	1655	965	-	420
	160M	197	350	305	265	20	18	18	166	235	432	1252	672	225	233
	160M	197	350	305	265	20	18	18	166	235	432	1252	672	234	-
	160L	197	350	305	265	20	18	18	166	235	432	1313	672	244	250
	180M	262	350	305	265	20	18	18	166	235	497	1422	672	310	315
	180L	262	350	305	265	20	18	18	166	235	497	1384	672	-	320
	200L	300	378	355	305	25	25	25	508	200	500	1344	1014	374	389
60	200L	300	378	355	305	25	25	25	508	200	500	1366	1014	399	-
	225S	325	436	361	286	25	25	34	553	225	550	1442	1059	-	438
	225M	325	436	361	311	25	25	34	553	225	550	1452	1059	468	-
	225M	325	436	361	311	25	25	34	553	225	550	1452	1059	-	473
	250M	392	490	409	349	30	30	40	585	250	642	1713	1091	577	-
	250M	392	490	409	349	30	30	40	585	250	642	1643	1091	-	612
	280S	555	540	479	368	30	30	40	607	280	835	1788	1113	682	-
	280S	555	540	479	368	30	30	40	607	280	835	1788	1113	-	742
	280M	555	540	479	419	30	30	40	607	280	835	1898	1113	742	-
	280M	555	540	479	419	30	30	40	607	280	835	1898	1113	-	822

No guarantee of weight and dimensions

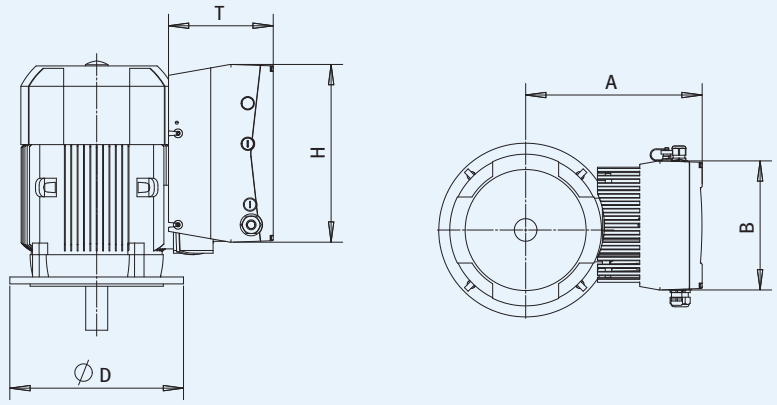
Frequency inverter (FI) 0.75 – 22.0 kW

Advantages

- Compact dimensions by installing the inverter onto the box (piggyback).
- Energy savings by integrating frequency inverter with IE2 achieve efficiency class IE3.
- KNOLL control know-how included.

Recommended motor power [kW]	0.75	1.10	1.50	2.20	3.00	4.00	5.50	7.50	11.00	15.00	18.50	22.00
Line current [A]	1.90	2.60	3.30	4.60	6.20	7.90	10.80	14.80	23.30	28.30	33.30	39.90
Nominal output current [A] at 400 V/8 kHz	2,30	3,10	4,00	5,60	7,50	9,50	13,00	17,80	28,00	34,00	40,00	48,00
Size	A			B			C		D			
Weight including worktop [kg]	3.9			5.0			8.7		21.0			
Protection class	IP 65								IP 55			
Max. overload for 60 sec [%]	150											130
Mains voltage	3 AC 400 V - 15% to 480 V + 10%											
Mains frequency	50 / 60 Hz ± 6%											
EMC acceptance	Compliant according to DIN EN 61800 - 3, class C2											
Certificates and conformance	CE and UL											
Temperature range	- 25°C (without condensation) up to + 50°C (without derating)											
Safety functions	Over/under voltage, I²t limit, short -circuit, motor temperature, inverter temperature, anti-tipper											
Initial frequency range	0 – 400 Hz											
Digital inputs	4											
Fixed frequency	7											
Digital outputs	2											
Analog inputs	2 analog inputs (0 / 2 - 10 V, 0 / 4 - 20 mA)											
Analog outputs	0 - 10 V (-Imax = 10 mA) or 0 - 20 mA (load impedance R = 500 Ω)											
Process control	Freely configurable PID controller											
Relay outputs	2 NO contacts 250 V AC 2 A											
USB- interface	USB for M12 connector (converter RS485 / RS232)											
Manual control unit (optional)	MMI with line											
Bus module (optional)	Profibus DP, CANopen, EtherCAT											
Safe stop	Optional											

Dimensions



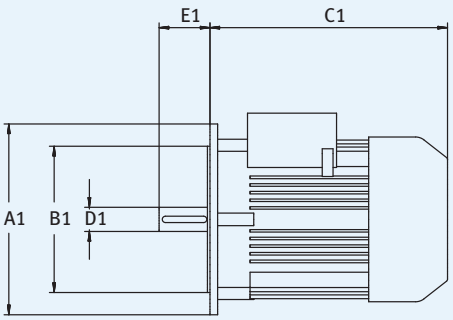
Motor power [kW]	Installation size	Main dimensions [mm] A	B	D	H	T
0.75 - 1.5	A	205	153	200	233	120
2.2	B	230	189	200	270	140
3.0	B	235	189	250	270	140
4,0	B	245	189	250	270	140
5.5 - 7.5	C	310	223	300	307	181
11.0 - 18.5	D	410	294	350	414	232
22.0	D	450	294	350	414	232

Standard multirange motors

Three-phase motor, 2-pole, 4-pole, Thermal class ISO-F, protection class IP 55, IE2

0.75 kW to 5.5 kW		7.5 kW to 90 kW	
230 VΔ / 400 VY	50 Hz	400 VΔ	50 Hz
460 VY	60 Hz	460 VΔ	60 Hz

Other voltages upon request.



Technical data for standard motors IEC/EN 60034

Switch-on frequency: In order to minimize the stress to the pump and motor, the switch-on frequency should not exceed once per minute. For shorter switching operations, the pump should operate continuously and appropriate valves should be used to enable unpressurized discharge of the medium (see pages 36-39).

50Hz 2pole=2,900 rpm			50Hz 4pole=1,450 rpm			60Hz 2pole=3,500 rpm			60Hz 4pole=1,750 rpm			Size	Main dimensions [mm]					Weight [kg]	
Power	Nominal current	Noise level	Power	Nominal current	Noise level	Power	Nominal current	Noise level	Power	Nominal current	Noise level							2-pole	4-pole
[kW]	IE3 [A]	[dB(A)]	[kW]	IE3 [A]	[dB(A)]	[kW]	NPE [A]	[dB(A)]	[kW]	NPE [A]	[dB(A)]		A1	B1	C1 (IE3)	D1	E1	IE3	IE3
0.75	1.56	60	0.75	1.75	53	0.75	1.46	64	0.75	1.53	55	80M	200	130	252	19	40	11	14
1.1	2.25	60	-	-	-	1.1	1.98	64	-	-	-	80M	200	130	287	19	40	12	-
1.5	3	65	1.1	2.4	56	1.5	2.6	69	1.1	2.1	58	90S	200	130	297	24	50	15	16
2.2	4.2	65	1.5	3.15	56	2.2	3.65	69	1.5	2.85	58	90L	200	130	327	24	50	19	19
3	5.6	67	2.2	4.4	60	3	4.9	71	2.2	3.8	62	100L	250	180	371	28	60	26	30
-	-	-	3	5.9	60	-	-	-	3	5.1	62	100L	250	180	371	28	60	-	30
4	7.4	69	4	7.9	58	3.7	6	73	3.7	6.5	62	112M	250	180	354	28	60	34	34
5.5	9.9	68	5.5	10.5	64	5.5	8.6	72	5.5	9.1	68	132S	300	230	385	38	80	43	64
7.5	13.1	68	-	-	-	7.5	11.5	72	-	-	-	132S	300	230	435	38	80	57	-
-	-	-	7.5	14.3	64	-	-	-	7.5	12.4	68	132M	300	230	435	38	80	-	64
11	20	70	11	20.5	65	11	17.2	77	11	18	69	160M	350	250	494	42	110	75	83
15	27	70	-	-	-	15	24	77	-	-	-	160M	350	250	494	42	110	84	-
18.5	32	70	15	28.5	65	18.5	28	77	15	25	69	160L	350	250	554	42	110	94	100
22	38.5	77	18.5	35	66	22	34.5	80	18.5	31	68	180M	350	250	588	48	110	160	165
-	-	-	22	41.5	69	-	-	-	22	37	72	180L	350	250	588	48	110	-	170
30	53	78	30	55	70	30	46.5	81	30	48	72	200L	400	300	611	55	110	225	240
37	65	78	-	-	-	37	57	82	-	-	-	200L	400	300	636	55	110	250	-
-	-	-	37	66	66	-	-	-	37	58	69	225S	450	350	648	60	140	-	285
45	78	76	-	-	-	45	68	77	-	-	-	225M	450	350	708	55	110	315	-
-	-	-	45	80	66	-	-	-	45	70	69	225M	450	350	708	55	110	-	320
55	95	76	-	-	-	55	84	80	-	-	-	250M	550	450	747	60	140	385	-
-	-	-	55	96	66	-	-	-	55	86	69	250M	550	450	747	65	140	-	420
75	128	76	-	-	-	75	112	81	-	-	-	280S	550	450	820	65	140	510	-
-	-	-	75	133	71	-	-	-	75	115	79	280S	550	450	820	65	140	-	570
90	152	76	-	-	-	90	137	81	-	-	-	280M	550	450	930	65	140	590	-
-	-	-	90	157	71	-	-	-	90	141	79	280M	550	450	930	65	140	-	670

Pressure relief valves

Screw pumps are displacement pumps. Because of their design, pressure must be limited in order to maintain a reasonable motor current. In addition to burst protection, pressure relief valves that the preset pressure is maintained. Using dampened valves in screw pumps prevents pressure surges. In case of overpressure, unnecessary material is discharged through the valve.

Selection criteria

The selection of valves depends on the following factors:

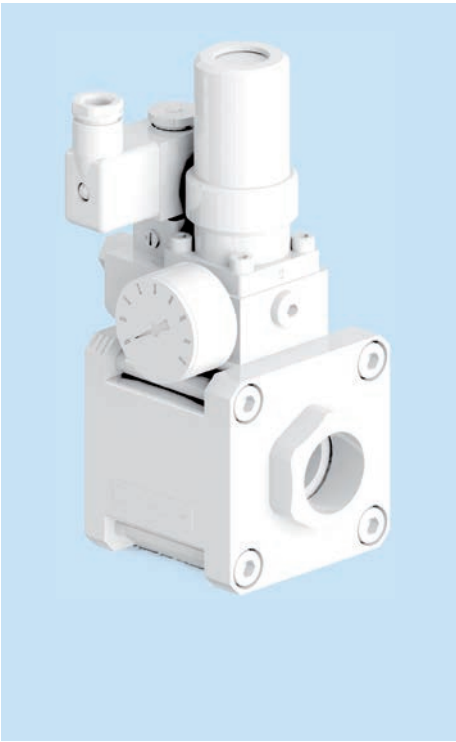
- Pressure
- Delivery rate
- Viscosity
- Adjustability

Advantages

- Robust, insensitive to dirt
- The control part is separated from the cooling lubricant
- Easy change of pressure
- No pressure surges in the piping
- Constant pressure within large area
- Pressure-reducing circulation possible

Controlled pressure relief valves

Pneumatically controlled HPB pressure relief valve (manually adjustable)

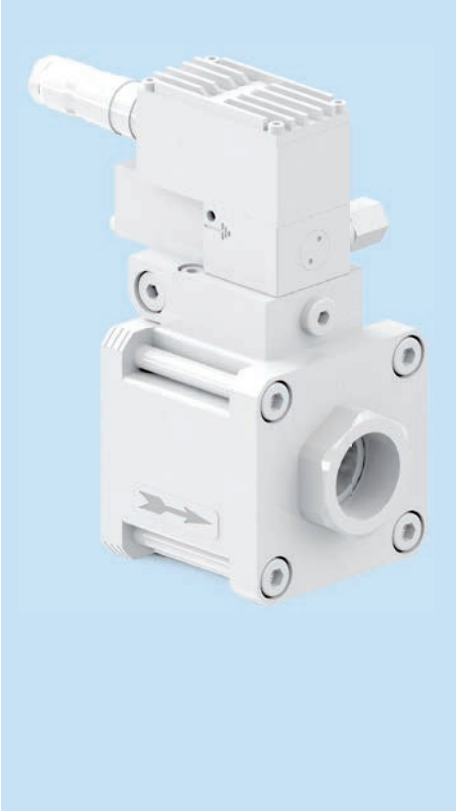


Function

The operating pressure of the valve can be adjusted using a hand-wheel. The pressure-reducing circuit can be controlled electrically. The valve remains open without flow or pressure.

Type	Pressure [bar]	Delivery rate Qmax [l/min]	Connection thread
3-HPB-H-12/160	5 - 160	100	G 1“
3-HPB-H-15	5 - 120	100	G 1“
3-HPB-S-15	5 - 64	100	G 1“
3-HPB-H-32	5 - 120	240	G 1 1/2“
3-HPB-S-32	5 - 64	400	G 1 1/2“
3-HPB-S-50	5 - 64	800	G 1 1/2“

Pneumatically controlled SPB pressure relief valve (electronically controlled)



Function

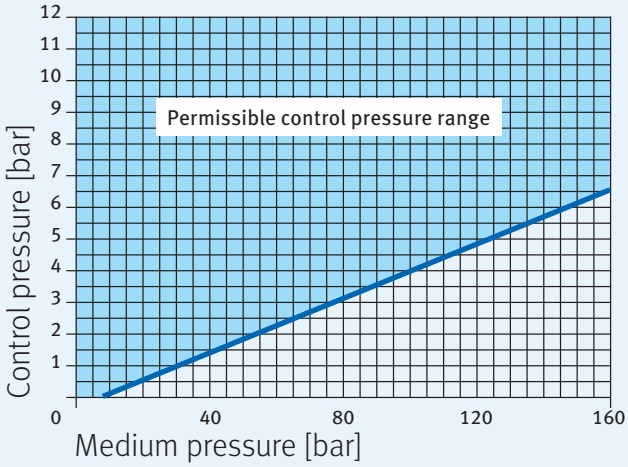
The variable valve allows you to specify desired pressures within a range of 5 – 160 bar. The machine control converts digital signals into analogue values (0 – 10 V) to regulate the pressure. The pneumatic control pressure changes in proportion to the analogue value and regulates the medium pressure. The valve remains open without flow or pressure.

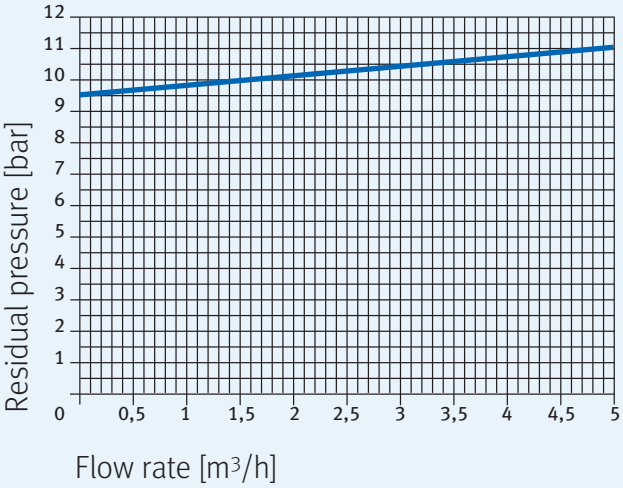
Type	Pressure [bar]	Delivery rate Qmax [l/min]	Connection thread
SPB-H-12/160	5 - 160	100	G 1“
SPB-H-15	5 - 120	100	G 1“
SPB-S-15	5 - 64	100	G 1“
SPB-H-32	5 - 120	240	G 1 1/2“
SPB-S-32	5 - 64	400	G 1 1/2“
SPB-S-50	5 - 64	800	G 1 1/2“

The air connection has to be maintained on a constant value with the help of a pressure regulator. For minimum control pressure, see pages 38-39. Valves for a higher delivery rate and pressure are available upon request.

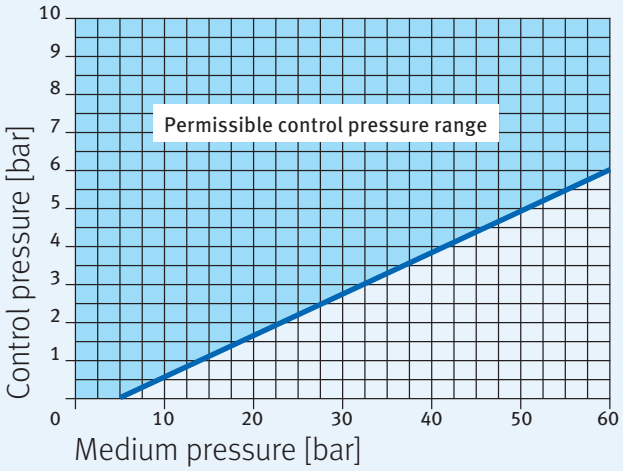
Characteristic curves for pneumatically controlled pressure relief valves

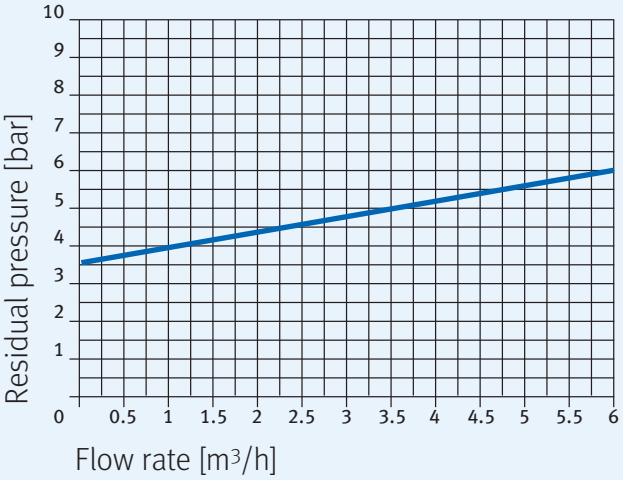
3-HPB-H-12 / SPB-H-12



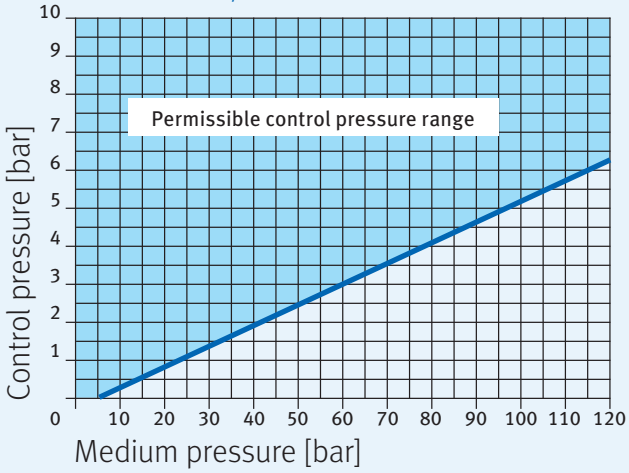


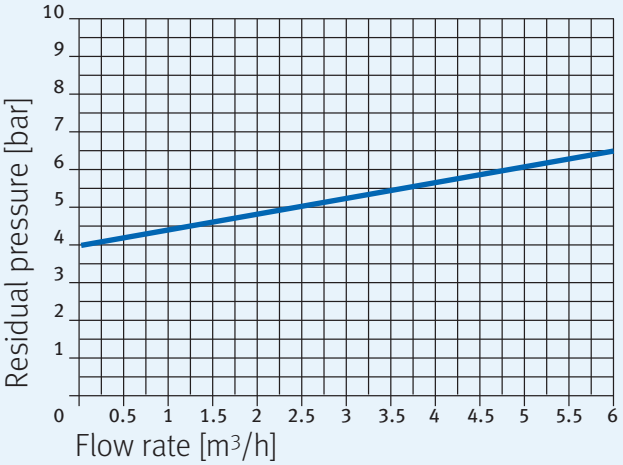
3-HPB-S-15 / SPB-S-15





3-HPB-H-15 / SPB-H-15

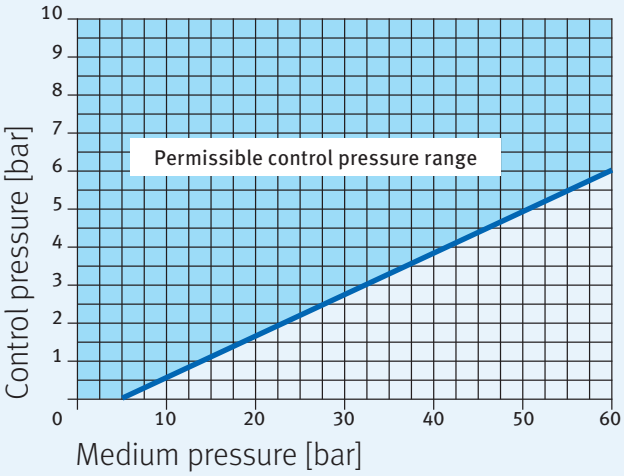


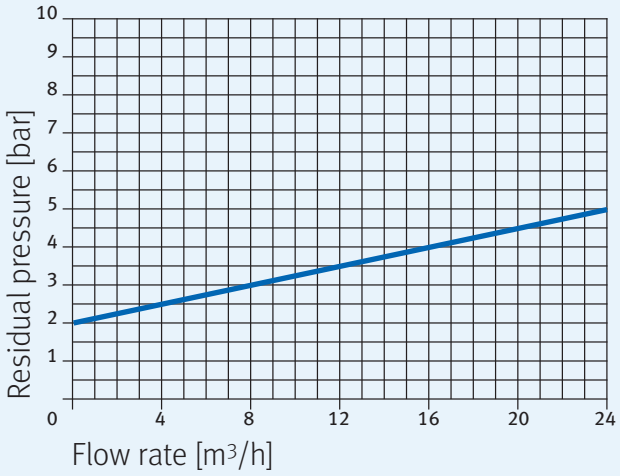


To fully exploit the pressure range, the corresponding control pressure must be available.

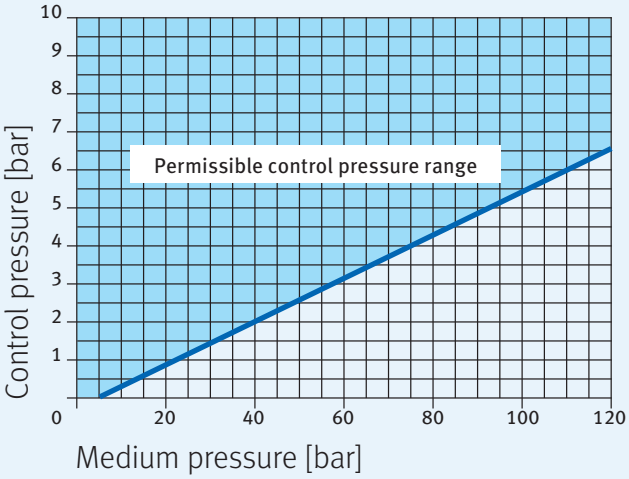
Characteristic curves for pneumatically controlled pressure relief valves

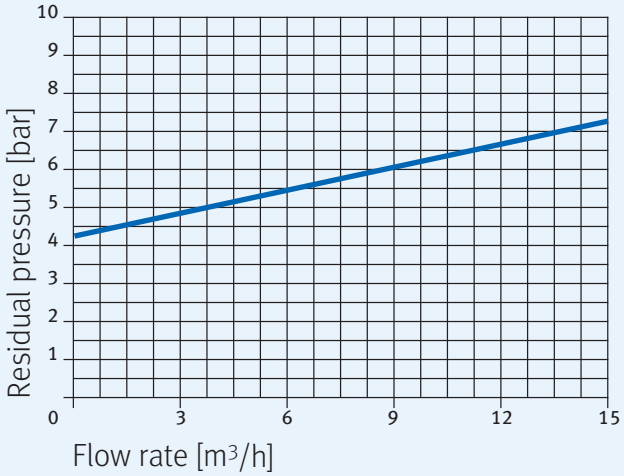
3-HPB-S-32 / SPB-S-32



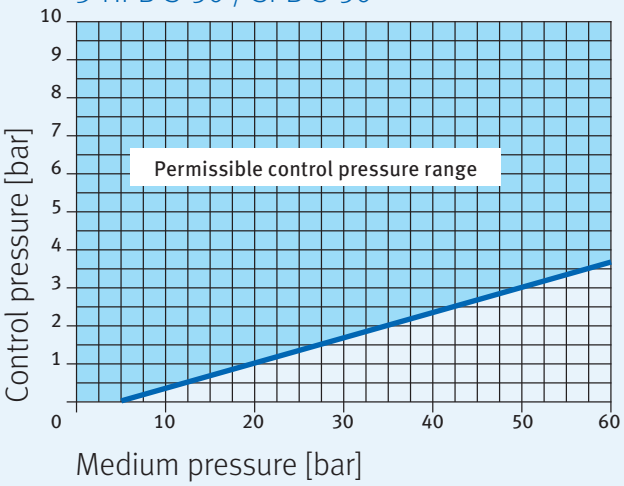


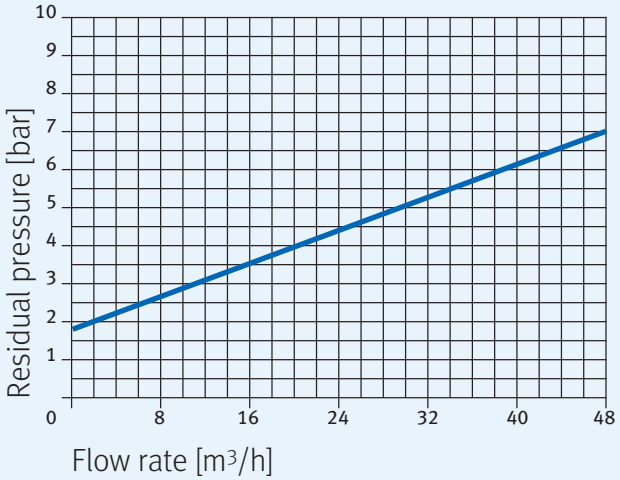
3-HPB-H-32 / SPB-H-32





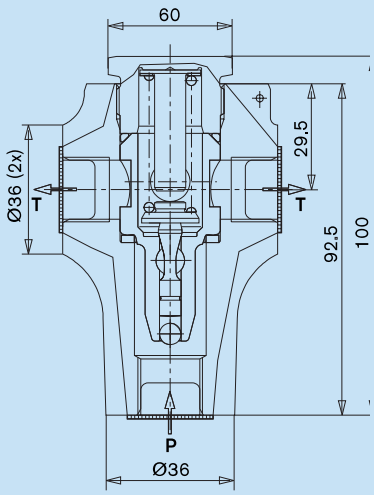
3-HPB-S-50 / SPB-S-50





To fully exploit the pressure range, the corresponding control pressure must be available.

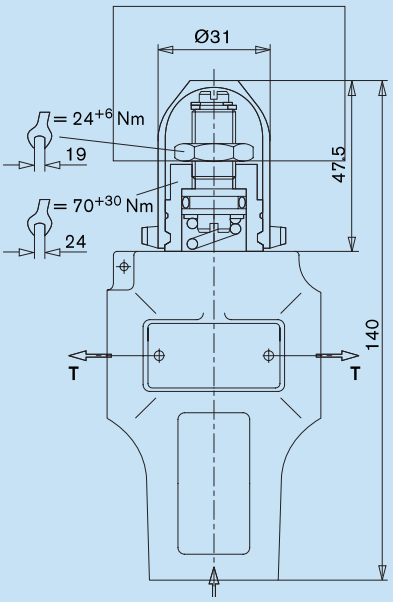
Non-controlled pressure relief valves



Connection threads
M 18 x 1.5

Non-controlled pressure relief valve (fixed setting)

Type		Pressure p [bar]	Delivery rate Qmax [l/min]
DBV	10/25	10	25
DBV	12/30	12	30
DBV	16/35	16	35
DBV	20/40	20	40
DBV	30/50	30	50
DBV	40/57	40	57
DBV	50/65	50	65
DBV	60/75	60	75
DBV	70/80	70	80
DBV	80/85	80	85
DBV	90/90	90	90
DBV	100/95	100	95
DBV	110/100	110	100



Connection threads
M 18 x 1.5

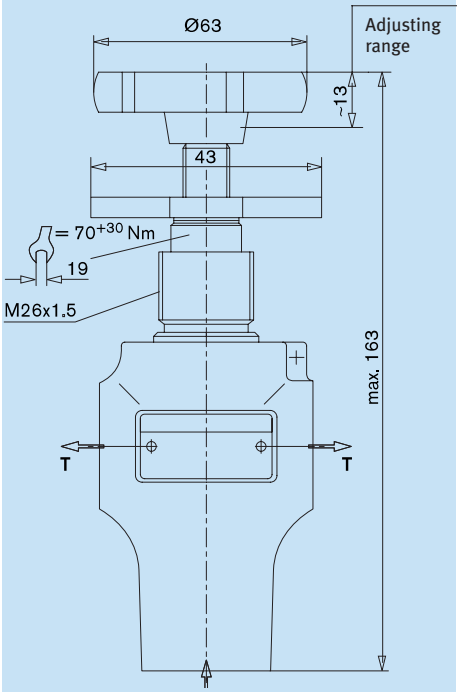
Non-controlled pressure relief valve (adjustable with tool)

Type		Range of application from	to
DBVE	15-50/20-55	15 bar (max 20 l/min)	50 bar (max 55 l/min)
DBVE	40-100/45-85	40 bar (max 45 l/min)	100 bar (max 85 l/min)

Non-controlled pressure relief valves

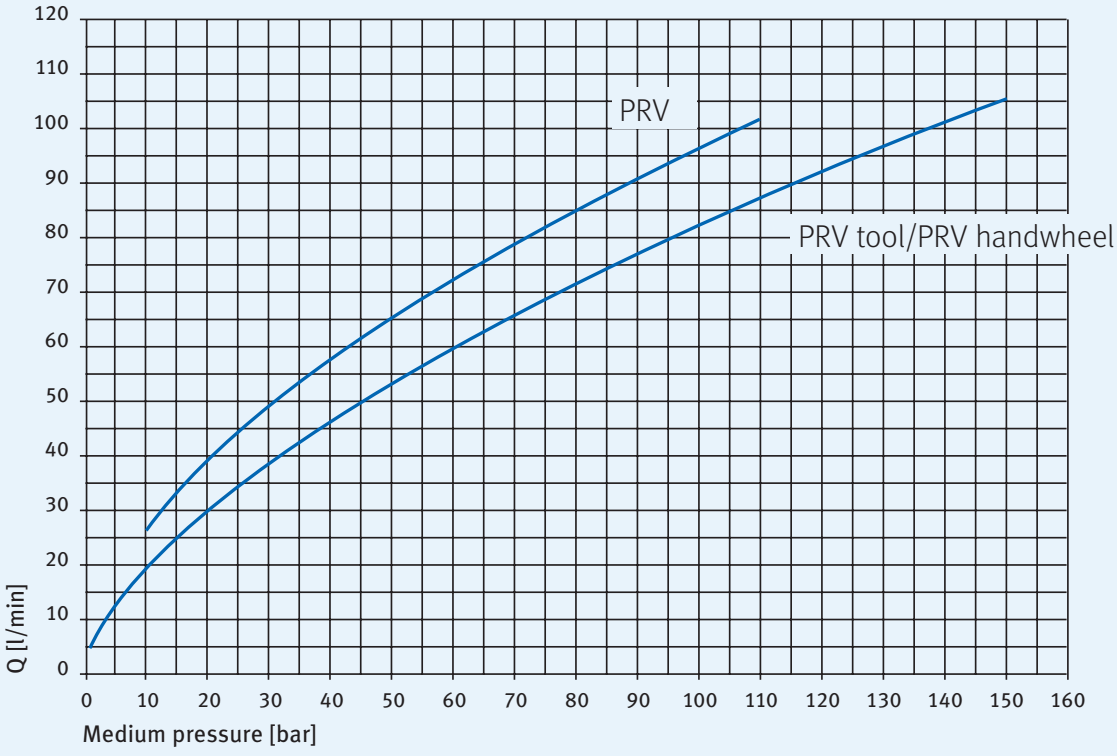
Non-controlled pressure relief valve (adjustable with handwheel)

Type	Range of application	
	from	to
DBVH 1-35/5-45	1 bar (max. 5 l/min)	35 bar (max. 45 l/min)
DBVH 15-80/20-75	15 bar (max. 20 l/min)	80 bar (max. 75 l/min)
DBVH 15-150/20-110	15 bar (max. 20 l/min)	150 bar (max. 110 l/min)



Connection threads
M 18 x 1.5

Characteristic curves



KNOLL Service worldwide

Products by KNOLL are used around the world; service is a main supporting pillar of our success. We offer timely and insightful diagnosis in cases of malfunction and failure. If needed, we will quickly dispatch our service technicians to the operation site. We are committed to offer our customers effective support. Whether on-site or in our pump repair center, the KNOLL repair team conducts a careful analysis for the pumps and quickly repairs them. Our spare parts warehouses have all common parts in stock, ready for urgent shipment on short notice. If necessary, you will receive a KNOLL replacement pump within 24 hours Europe-wide or you directly pick it up at our parent company.

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KTS

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