hp TECHNIK

QUALITY FROM BADEN-WÜRTTEMBERG

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MAIN CATALOG

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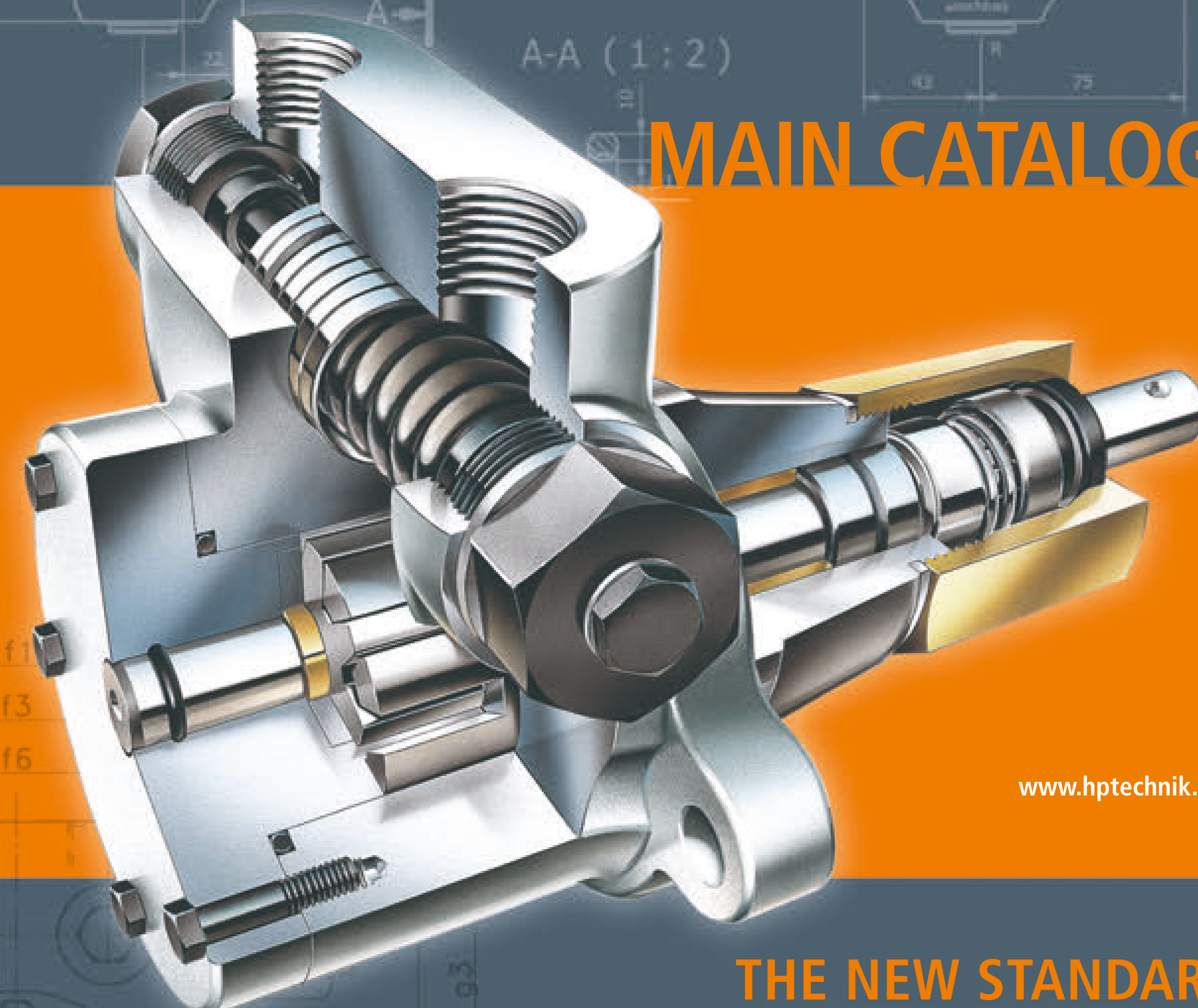
hp TECHNIK

Qualität aus Baden-Württemberg

MAIN CATALOGUE



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THE NEW STANDARD FOR BURNER PUMPS

hp-Industrial pump program 1.0

hp-Internal gear pumps to 40 bar

An internal gear rotor drives an eccentrically-supported, externally toothed gear. The rotor and gear are sealed with a fixed crescent. Internal gear pumps have been in use for more than 40 years and are used in many areas of industry because of their favourable design and technological construction:

hp-Internal gear pumps are produced in 6 series:

Oil burning systems

As oil burner pumps, closed circular pipe and transfer pumps for

- All heating oils defined by DIN 51603 Part 1, 3, 4, 5 and 6
- Marine fuels DMA, DMZ, DMB to ISO 8217
- FAME to DIN EN 14214 (FAME = Fatty Acid Methyl Ester)
- Rapeseed oil to DIN 51605
- Other self-lubricating fuels are possible. Please feel free to ask.
- Diesel fuel EN 590

Machine construction

As hydraulic pumps in hydraulic control units, as lubricating pumps for lubricating oils and greases, as cooling water pumps for water-oil emulsions.

Mineral oil industry

As feed pumps for oils, grease, tar and bitumen

Ship-building

As lubricating oil pumps and booster pumps for lubricating, diesel, heavy oils and oil burning systems on ships.

Material:

Pump casings are made of hydraulic cast iron GJL 250 / GJS 400;
Rotor made of ETG;
Pinion made of 16 Mn Cr 5;

Axial face shaft seal:

Standard: SIC / Carbon / Viton

For use of pumps with abrasive media, the manufacturer provides for the use of axial face shaft seals in the material arrangements SIC / SIC / Viton.

Advantages:

Self-priming, self-lubricating, practically non-pulsating, quiet-running, practically maintenance-free, pressure-proof and vacuum-tight shaft seals

Discharge range: 45 to 6700 l/h
Operating pressure: 0 - 40 bar
Temperatures: up to 150°C (higher temperatures on request)

Model key for hp-Internal gear pumps to 40 bar 1.0

For determining order specifications

Series				Discharge l/h at 0 bar				- Direction of rotation - Nozzle port (only PON) viewed from shaft	Pressure stages bar	Speed of rotation	Medium	Special design and accessories (add code letters sequentially)
				1400 RPM		2800 RPM						
B	VB	VBR	NVBR	P	45	P	90					
B	VB	VBR	NVBR	M	80	M	160					
B	VB	VBR	NVBR	G	120	G	240				**0** = fuel oil EL	
B	VB	VBR	NVBR	F	160	F	320		**0** = 0.5 - 1.5		MGO / MDO	
BG	VBG	VBGR	NVBGR	PP	150	PP	300	**D** = right,				
BG	VBG	VBGR	NVBGR	PZ	200	PZ	400	clockwise		**9** = 980 RPM		**H1** = electrical heating,
BG	VBG	VBGR	NVBGR	P	300	P	600					installed
BG	VBG	VBGR	NVBGR	MZ	–	MZ	850					
BG	VBG	VBGR	NVBGR	M	450	M	900		**1** = 1 - 4	**1** = 1400 RPM		without thermostat, Δ t max = 70 K.
BG	VBG	VBGR	NVBGR	GZ	–	GZ	1100	**I** = left,				
BG	VBG	VBGR	NVBGR	G	600	G	1200	counter-				
								clockwise				**BH1** = bore hole for H1
BH	VBH	VBHR	NVBHR	P	1000	–	–					
BH	VBH	VBHR	NVBHR	M	1500	–	–					
BH	VBH	VBHR	NVBHR	G	2000	–	–		**2** = 2 - 9		**5** = HFO	
												Sc = quick-closing valve
BHG	VBHG	VBHGR	–	P	3000	–	–					
BHG	VBHG	VBHGR	–	PZ	3700	–	–					
BHG	VBHG	VBHGR	–	M	4500	–	–					
BHG	VBHG	VBHGR	–	G	6000	–	–					
BHG	VBHG	VBHGR	–	F	6700	–	–		**3** = 6 - 25			**H2** = electrical heating
												(for UHE)
UHE-A2	–	–	–	PZ	200	PZ	400					
UHE-A3	–	–	–	P	300	P	600					
UHE-A4	–	–	–	M	450	M	900					
UHE-A5	–	–	–	GZ	550	GZ	1100					
									4 = 15 - 40			
PON	–	–	–	–	–	3	90	**R** = nozzle port right		**2** = 2800 RPM		**H3** = electrical heating
PON	–	–	–	–	–	4	160					**(for PON)**
PON	–	–	–	–	–	6	240	**L** = nozzle port left				
PON	–	–	–	–	–	7	320					

Example for ordering: hp-Internal gear pump, VB series, with discharge 450 l/h at 1400 RPM, heating oil EL, counterclockwise direction of rotation, pressure range 4, 15 to 40 bar. Model designation: **VBGM - I - 4 - 10**

max. permitted suction pressure on suction port A of the pump –0.6 bar. Warning, gas separation occurs at just –0.4 bar.

Pump coversion table

Suntec – hp-TECHNIK

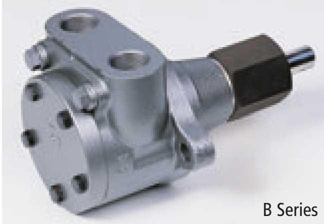
Suntec		hp-TECHNIK		Suntec		hp-TECHNIK
		PON3-D				PON3-I
E4/J4	==>	PON4-D		E4/J4	==>	PON4-I
E6/J6	==>	PON6-D		E6/J6	==>	PON6-I
E7/J7	==>	PON7-D		E7/J7	==>	PON7-I
TA 2 A	==>	UHE-A2-PZ-D		TA 2 C	==>	UHE-A2-PZ-I
TA 3 A	==>	UHE-A3-P-D		TA 3 C	==>	UHE-A3-P-I
TA 4 A	==>	UHE-A4-M-D		TA 4 C	==>	UHE-A4-M-I
TA 5 A	==>	UHE-A5-GZ-D		TA 5 C	==>	UHE-A5-GZ-I

Series B, without overflow valve 1.1

Technical selection chart; scale drawings

Direction of rotation I = indirect – counterclockwise
D = direct – clockwise

The direction of rotation can only be changed in the factory.
Therefore, specify the desired direction of rotation as viewed from the pump shaft as per dimension sheet when ordering.



B Series

hp-Internal gear pumps to 40 bar (direction of rotation I = indirect – counterclockwise)

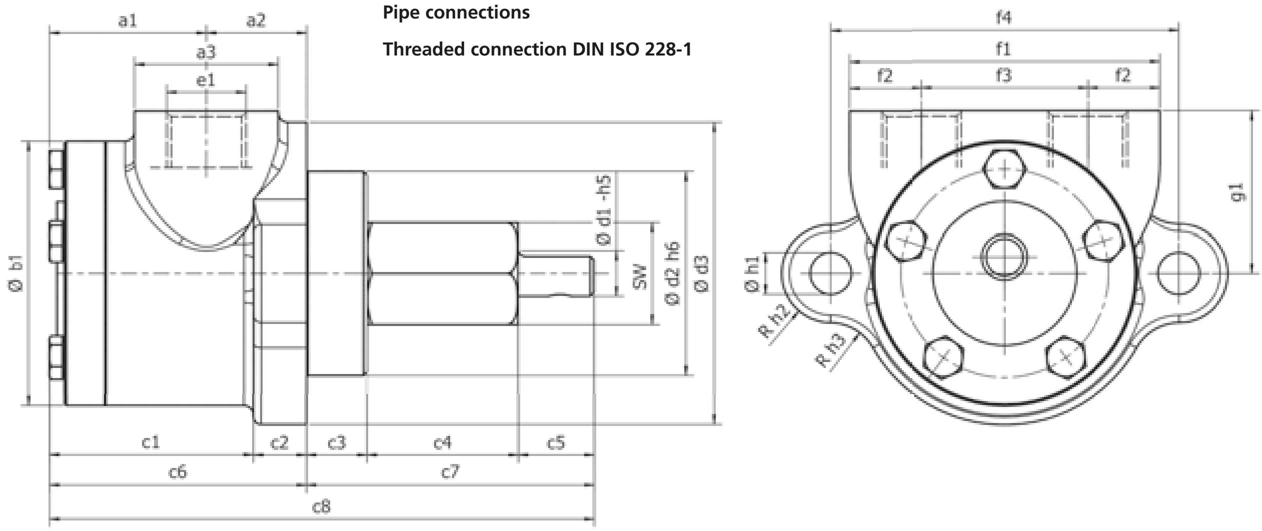
hp-Internal gear pump Series B Sizes:	Viscosity: 6 $mm^2 sec^{-1}$ at 20°C — n = 1400 RPM Discharge l/h				n = 2800 RPM Discharge l/h				Gear rotor size Ø	Shaft Ø	Threaded connection* pipe thread DIN ISO 228	Manometer connection* pipe thread DIN ISO 228	max. permitted pump speed (RPM) at I/D	Net weight (kg) at I/D
	at 9 bar	at 30 bar	at 40 bar	Item No. I	at 9 bar	at 30 bar	at 40 bar	Item No. I						
BP	45	30	20	011/0002	90	60	50	013/0002	25	12	3/8"	–	3500	1.8
BM	80	60	50	011/0003	160	130	120	013/0003	25	12	3/8"	–	3500	1.8
BG	120	100	80	011/0004	240	200	190	013/0004	25	12	3/8"	–	3500	1.8
BF	160	140	120	011/0005	320	270	260	013/0005	25	12	3/8"	–	3500	1.8
BG PP	150	100	80	011/0052	300	240	210	013/0052	38	12	1/2"	–	3500	2.6
BG PZ	200	160	140	011/0053	400	310	280	013/0053	38	12	1/2"	–	3500	2.6
BG P	300	240	200	011/0019	600	520	480	013/0019	38	12	1/2"	–	3500	2.6
BG MZ	–	–	–	–	850	750	700	013/0068	38	12	1/2"	–	3500	2.6
BG M	450	390	360	011/0020	900	850	730	013/0020	38	12	1/2"	–	3500	2.6
BG GZ	–	–	–	–	1100	1000	870	013/0054	38	12	1/2"	–	3500	2.6
BG G	600	540	480	011/0021	1200	1080	960	013/0031	38	12	1/2"	–	2800	2.6
BH P	1000	700	600	011/0031	–	–	–	–	56	18	3/4"	1/4"	1700	6.4
BH M	1500	1200	1000	011/0032	–	–	–	–	56	18	3/4"	1/4"	1700	6.4
BH G	2000	1700	1400	011/0033	–	–	–	–	56	18	3/4"	1/4"	1700	6.4
BHG P	3000	2200	2000	011/0043	–	–	–	–	75	22	1 1/2"	–	1700	14.9
BHG PZ	3700	3000	2700	011/0080	–	–	–	–	75	22	1 1/2"	–	1700	14.9
BHG M	4500	3600	3200	011/0044	–	–	–	–	75	22	1 1/2"	–	1700	14.9
BHG G	6000	4800	–	011/0045	–	–	–	–	75	22	1 1/2"	–	1700	14.9
BHG F	6700	5800	–	011/0081	–	–	–	–	75	22	1 1/2"	–	1700	14.9

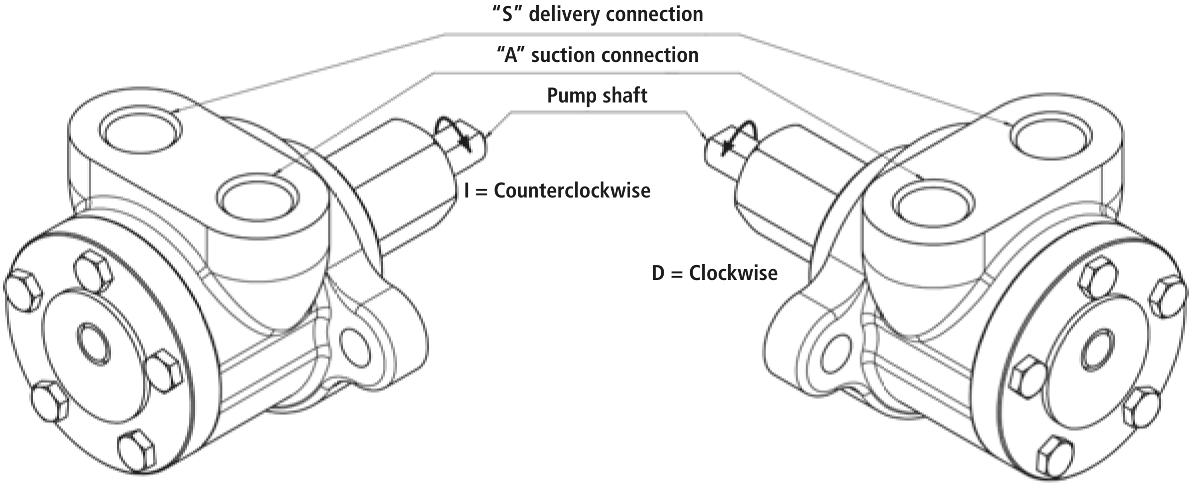
hp-Internal gear pumps to 40 bar (direction of rotation D = direct – clockwise)

hp-Internal gear pump Series B Sizes:	Viscosity: 6 $mm^2 sec^{-1}$ at 20°C — n = 1400 RPM Discharge l/h				n = 2800 RPM Discharge l/h				Gear rotor size Ø	Shaft Ø	Threaded connection* pipe thread DIN ISO 228	Manometer connection* pipe thread DIN ISO 228	Heating power H1 in Watt 230 V, 50 Hz	Breakaway torque of the pump (Nm)
	at 9 bar	at 30 bar	at 40 bar	Item No. D	at 9 bar	at 30 bar	at 40 bar	Item No. D						
BP	45	30	20	012/0002	90	60	50	014/0002	25	12	3/8"	–	100	1.2
BM	80	60	50	012/0003	160	130	120	014/0003	25	12	3/8"	–	100	1.2
BG	120	100	80	012/0004	240	200	190	014/0004	25	12	3/8"	–	100	1.2
BF	160	140	120	012/0005	320	270	260	014/0005	25	12	3/8"	–	100	1.2
BG PP	150	100	80	012/0052	300	240	210	014/0052	38	12	1/2"	–	100	1.6
BG PZ	200	160	140	012/0053	400	310	280	014/0053	38	12	1/2"	–	100	1.6
BG P	300	240	200	012/0019	600	520	480	014/0019	38	12	1/2"	–	100	1.6
BG-MZ	–	–	–	–	850	750	700	014/0068	38	12	1/2"	–	100	1.6
BG M	450	390	360	012/0020	900	850	730	014/0020	38	12	1/2"	–	100	1.6
BG GZ	–	–	–	–	1100	1000	870	014/0054	38	12	1/2"	–	100	1.6
BG G	600	540	480	012/0021	1200	1080	960	014/0031	38	12	1/2"	–	100	1.6
BH P	1000	700	600	012/0031	–	–	–	–	56	18	3/4"	1/4"	160	3.2
BH M	1500	1200	1000	012/0032	–	–	–	–	56	18	3/4"	1/4"	160	3.2
BH G	2000	1700	1400	012/0033	–	–	–	–	56	18	3/4"	1/4"	160	3.2
BHG P	3000	2200	2000	012/0043	–	–	–	–	75	22	1 1/2"	–	280	4.6
BHG PZ	3700	3000	2700	012/0080	–	–	–	–	75	22	1 1/2"	–	280	4
BHG M	4500	3600	3200	012/0044	–	–	–	–	75	22	1 1/2"	–	280	4.6
BHG G	6000	4800	–	012/0045	–	–	–	–	75	22	1 1/2"	–	280	4.6
BHG F	6700	5800	–	012/0081	–	–	–	–	75	22	1 1/2"	–	280	4.6

* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.

Scale drawings for Series B 1.1





Gear rotor size Ø	Discharge l/h 1400 RPM	2800 RPM	a1	a2	a3	b1	c1	c2	c3	c4	c5	c6	c7	c8	d1
25	45 - 160	90 - 320	35.5	20	33	51	41.5	14	16	40	20	55.5	76	131.5	12
38	150 - 600	300 - 1200	43	26.5	38	70	55.5	14	16	40	20	69.5	76	145.5	12
56	1000 - 2000	–	48.5	38	45	96	71.5	15	18	79	27	86.5	124	210.5	18
75	3000 - 6700	–	64.5	83	70	115	129.5	18	25	65	37	147.5	127	274.5	22

Gear rotor size Ø	Discharge l/h 1400 RPM	2800 RPM	sw	e	d2	d3	e1	f1	f2	f3	f4	g1	h1	h2	h3
25	45 - 160	90 - 320	27	31.2	54	80	G 3/8"	71	16.5	38	92	43	11	13	13
38	150 - 600	300 - 1200	27	31.2	54	80	G 1/2"	82	19	44	92	43	11	13	13
56	1000 - 2000	–	46	53.1	60	100	G 3/4"	112	22.5	67	120	65	13	13	25
75	3000 - 6700	–	55	63.5	80	120	G 1 1/2"	170	35	100	150	90	14.5	15	–

For gear rotor size 56 vacuum and manometer connection G 1/4" on the front.

Series VB, with integrated overflow valve 1.2

Technical selection chart; scale drawings

Direction of rotation **I** = indirect – counterclockwise
D = direct – clockwise

The direction of rotation can only be changed in the factory.
Therefore, specify the desired direction of rotation as viewed from the pump shaft as per dimension sheet when ordering.

VB series

hp-Internal gear pumps to 40 bar (direction of rotation I = indirect – counterclockwise)

hp-Internal gear pump Series VB Sizes:	Viscosity: 6 mm² sec^{-1} at 20°C n = 1400 RPM Discharge l/h				n = 2800 RPM Discharge l/h				Gear rotor size Ø	Shaft Ø	Threaded connection* pipe thread DIN ISO 228	Manometer connection* pipe thread DIN ISO 228	max. permitted pump speed (RPM) at I/D	Net weight (kg) at I/D
	at 9 bar	at 30 bar	at 40 bar	Item No. I	at 9 bar	at 30 bar	at 40 bar	Item No. I						
VB P	45	30	20	011/0007	90	60	50	013/0007	25	12	3/8"	1/4"	3500	2.5
VB M	80	60	50	011/0008	160	130	120	013/0008	25	12	3/8"	1/4"	3500	2.5
VB G	120	100	80	011/0009	240	200	190	013/0009	25	12	3/8"	1/4"	3500	2.5
VB F	160	140	120	011/0010	320	270	260	013/0010	25	12	3/8"	1/4"	3500	2.5
VBG PP	150	100	80	011/0055	300	240	210	013/0030	38	12	1/2"	1/4"	3500	3.3
VBG PZ	200	160	140	011/0056	400	310	280	013/0056	38	12	1/2"	1/4"	3500	3.3
VBG P	300	240	200	011/0022	600	520	480	013/0021	38	12	1/2"	1/4"	3500	3.3
VBG MZ	–	–	–	–	850	750	700	013/0070	38	12	1/2"	1/4"	3500	3.3
VBG M	450	390	360	011/0023	900	850	730	013/0022	38	12	1/2"	1/4"	3500	3.3
VBG GZ	–	–	–	–	1100	1000	870	013/0065	38	12	1/2"	1/4"	3500	3.3
VBG G	600	540	480	011/0024	1200	1080	960	013/0032	38	12	1/2"	1/4"	2800	3.3
VBH P	1000	700	600	011/0034	–	–	–	–	56	18	3/4"	1/4"	1700	7.3
VBH M	1500	1200	1000	011/0035	–	–	–	–	56	18	3/4"	1/4"	1700	7.3
VBH G	2000	1700	1400	011/0036	–	–	–	–	56	18	3/4"	1/4"	1700	7.3
VBHG P	3000	2200	2000	011/0046	–	–	–	–	75	22	1"	1/4"	1700	18.6
VBHG PZ	3700	3000	2700	011/0085	–	–	–	–	75	22	1"	1/4"	1700	18.6
VBHG M	4500	3600	3200	011/0047	–	–	–	–	75	22	1"	1/4"	1700	18.6
VBHG G	6000	4800	–	011/0048	–	–	–	–	75	22	1"	1/4"	1700	18.6
VBHG F	6700	5800	–	011/0086	–	–	–	–	75	22	1" 1)	1/4"	1700	18.6

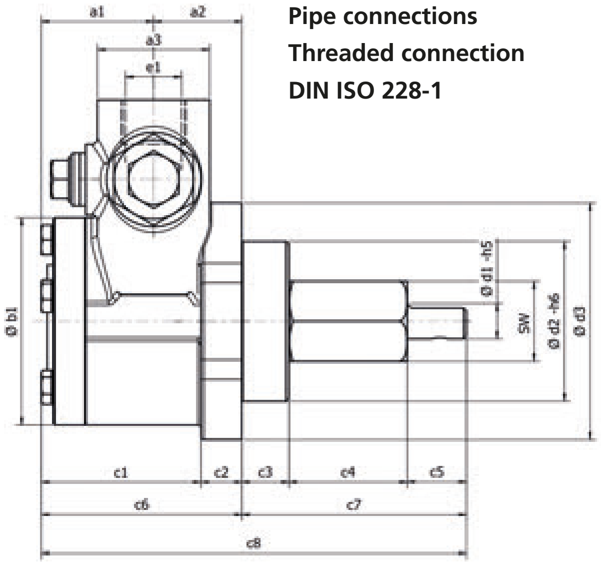
hp-Internal gear pumps to 40 bar (direction of rotation D = direct – clockwise)

hp-Internal gear pump Series VB Sizes:	Viscosity: 6 mm² sec^{-1} at 20°C n = 1400 RPM Discharge l/h				n = 2800 RPM Discharge l/h				Gear rotor size Ø	Shaft Ø	Threaded connection* pipe thread DIN ISO 228	Manometer connection* pipe thread DIN ISO 228	Heating power H1 in Watt 230 V, 50 Hz	Breakaway torque of the pump (Nm)
	at 9 bar	at 30 bar	at 40 bar	Item No. D	at 9 bar	at 30 bar	at 40 bar	Item No. D						
VB P	45	30	20	012/0007	90	60	50	014/0007	25	12	3/8"	1/4"	100	1.2
VB M	80	60	50	012/0008	160	130	120	014/0008	25	12	3/8"	1/4"	100	1.2
VB G	120	100	80	012/0009	240	200	190	014/0009	25	12	3/8"	1/4"	100	1.2
VB F	160	140	120	012/0010	320	270	260	014/0010	25	12	3/8"	1/4"	100	1.2
VBG PP	150	100	80	012/0055	300	240	210	014/0030	38	12	1/2"	1/4"	100	1.6
VBG PZ	200	160	140	012/0056	400	310	280	014/0056	38	12	1/2"	1/4"	100	1.6
VBG P	300	240	200	012/0022	600	520	480	014/0021	38	12	1/2"	1/4"	100	1.6
VBG MZ	–	–	–	–	850	750	700	014/0070	38	12	1/2"	1/4"	100	1.6
VBG M	450	390	360	012/0023	900	850	730	014/0022	38	12	1/2"	1/4"	100	1.6
VBG GZ	–	–	–	–	1100	1000	870	014/0065	38	12	1/2"	1/4"	100	1.6
VBG G	600	540	480	012/0024	1200	1080	960	014/0032	38	12	1/2"	1/4"	100	1.6
VBH P	1000	700	600	012/0034	–	–	–	–	56	18	3/4"	1/4"	160	3.2
VBH M	1500	1200	1000	012/0035	–	–	–	–	56	18	3/4"	1/4"	160	3.2
VBH G	2000	1700	1400	012/0036	–	–	–	–	56	18	3/4"	1/4"	160	3.2
VBHG P	3000	2200	2000	012/0046	–	–	–	–	75	22	1"	1/4"	280	4.6
VBHG PZ	3700	3000	2700	012/0085	–	–	–	–	75	22	1"	1/4"	280	4.6
VBHG M	4500	3600	3200	012/0047	–	–	–	–	75	22	1"	1/4"	280	4.6
VBHG G	6000	4800	–	012/0048	–	–	–	–	75	22	1"	1/4"	280	4.6
VBHG F	6700	5800	–	012/0086	–	–	–	–	75	22	1" 1)	1/4"	280	4.6

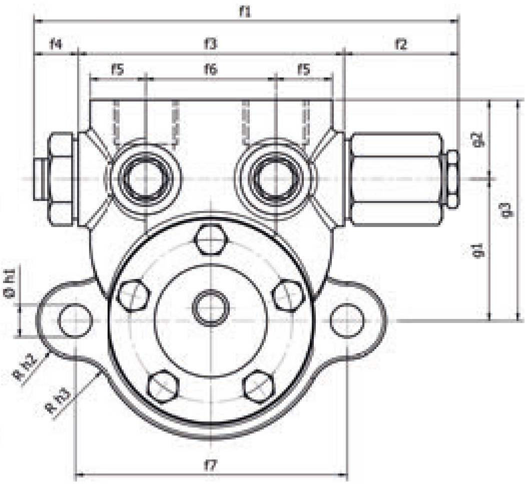
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.

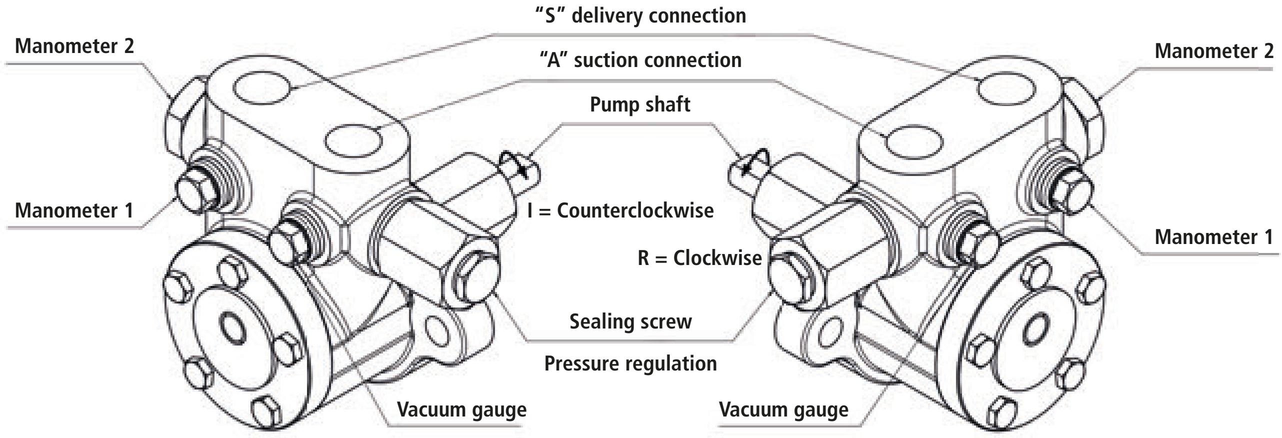
1) Suction connection at the side is 1 1/2", see VBR dimension sheet page 11.

Scale drawings for Series VB 1.2



Pipe connections
Threaded connection
DIN ISO 228-1





Manometer 1 – Connections G 1/4"

Gear rotor size Ø	Discharge l/h 1400 RPM	Discharge l/h 2800 RPM	a1	a2	a3	b1	c1	c2	c3	c4	c5	c6	c7
25	45 - 160	90 - 320	35.5	20	33	51	41.5	14	16	40	20	55.5	76
38	150 - 600	300 - 1200	39.5	30	38	70	55.5	14	16	40	20	69.5	76
56	1000 - 2000	–	48.5	38	45	96	71.5	15	18	79	27	86.5	124
75	3000 - 6700	–	62.5	85	70	115	129.5	18	25	65	37	147.5	127

Gear rotor size Ø	Discharge l/h 1400 RPM	Discharge l/h 2800 RPM	c8	d1	sw	e	d2	d3	e1	f1	f2	f3	f4
25	45 - 160	90 - 320	131.5	12	27	31.2	54	80	G 3/8"	144	38.5	90	15
38	150 - 600	300 - 1200	145.5	12	27	31.2	54	80	G 1/2"	144	38.5	90	15
56	1000 - 2000	–	210.5	18	46	53.1	60	100	G 3/4"	167.5	35	118	15
75	3000 - 6700	–	274.5	22	55	63.5	80	120	G 1"	200	28	150	21.5

Gear rotor size Ø	Discharge l/h 1400 RPM	Discharge l/h 2800 RPM	f5	f6	f7	f8	g1	g2	g3	h1	h2	h3	
25	45 - 160	90 - 320	26	38	92	140	40	27	67	11	13	13	–
38	150 - 600	300 - 1200	23	44	92	140	48	27	75	11	13	13	–
56	1000 - 2000	–	25.5	67	120	171	55	35	90	13	13	25	–
75	3000 - 6700	–	35	80	150	218	80	40	120	14.5	15	–	–

Series VBR, with integrated overflow valve and bypass 1.3

Technical selection chart; scale drawings


VBR series

Direction of rotation **I** = indirect – counterclockwise
D = direct – clockwise

The direction of rotation can only be changed in the factory.
Therefore, specify the desired direction of rotation as viewed from the pump shaft as per dimension sheet when ordering.

hp-Internal gear pumps to 40 bar (direction of rotation I = indirect – counterclockwise)

hp-Internal gear pump Series VBR Sizes:	Viscosity: $6\ mm^2\ sec^{-1}$ at 20°C, n = 1400 RPM Discharge l/h: at 9 bar	at 30 bar	at 40 bar	Item No. I	n = 2800 RPM Discharge l/h: at 9 bar	at 30 bar	at 40 bar	Item No. I	Gear rotor size Ø	Shaft Ø	Threaded connection* pipe thread DIN ISO 228	Manometer connection* pipe thread DIN ISO 228	max. permitted pump speed (RPM) at I/D	Net weight (kg) at I/D
VBR P	45	30	20	011/0011	90	60	50	013/0011	25	12	3/8"	–	3500	2.9
VBR M	80	60	50	011/0012	160	130	120	013/0012	25	12	3/8"	–	3500	2.9
VBR G	120	100	80	011/0013	240	200	190	013/0013	25	12	3/8"	–	3500	2.9
VBR F	160	140	120	011/0014	320	270	260	013/0014	25	12	3/8"	–	3500	2.9
VBGR PP	150	100	80	011/0065	300	240	210	013/0040	38	12	1/2"	–	3500	3.7
VBGR PZ	200	160	140	011/0062	400	310	280	013/0041	38	12	1/2"	–	3500	3.7
VBGR P	300	240	200	011/0025	600	520	480	013/0023	38	12	1/2"	–	3500	3.7
VBGR MZ	–	–	–	–	850	750	700	013/0072	38	12	1/2"	–	3500	3.7
VBGR M	450	390	360	011/0026	900	850	730	013/0024	38	12	1/2"	–	3500	3.7
VBGR GZ	–	–	–	–	1100	1000	870	013/0042	38	12	1/2"	–	3500	3.7
VBGR G	600	540	480	011/0027	1200	1080	960	013/0043	38	12	1/2"	–	2800	3.7
VBHR P	1000	700	600	011/0037	–	–	–	–	56	18	3/4"	–	1700	8.4
VBHR M	1500	1200	1000	011/0038	–	–	–	–	56	18	3/4"	–	1700	8.4
VBHR G	2000	1700	1400	011/0039	–	–	–	–	56	18	3/4"	–	1700	8.4
VBHGR P	3000	2200	2000	011/0049	–	–	–	–	75	22	1" 1)	1/4"	1700	18.6
VBHGR PZ	3700	3000	2700	011/0090	–	–	–	–	75	22	1" 1)	1/4"	1700	18.6
VBHGR M	4500	3600	3200	011/0050	–	–	–	–	75	22	1" 1)	1/4"	1700	18.6
VBHGR G	6000	4800	–	011/0051	–	–	–	–	75	22	1" 1)	1/4"	1700	18.6
VBHGR F	6700	5800	–	011/0091	–	–	–	–	75	22	1" 1)	1/4"	1700	18.6

hp-Internal gear pumps to 40 bar (direction of rotation D = direct – clockwise)

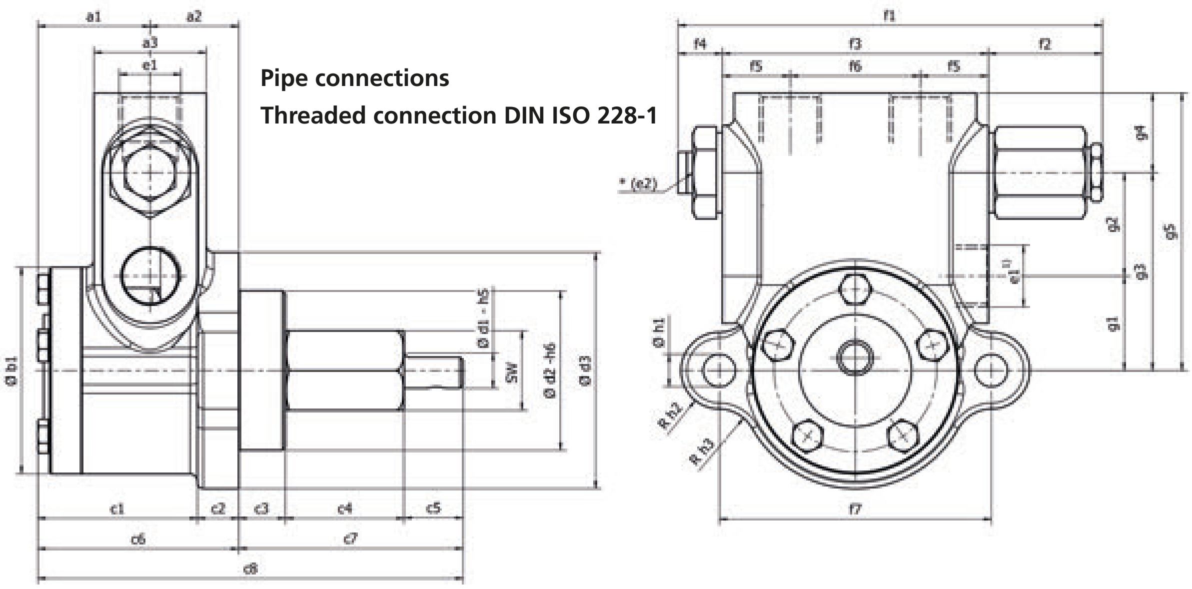
hp-Internal gear pump Series VBR Sizes:	Viscosity: $6\ mm^2\ sec^{-1}$ at 20°C, n = 1400 RPM Discharge l/h: at 9 bar	at 30 bar	at 40 bar	Item No. D	n = 2800 RPM Discharge l/h: at 9 bar	at 30 bar	at 40 bar	Item No. D	Gear rotor size Ø	Shaft Ø	Threaded connection* pipe thread DIN ISO 228	Manometer connection* pipe thread DIN ISO 228	Heating power H1 in Watt 230 V, 50 Hz	Breakaway torque of the pump (Nm)
VBR P	45	30	20	012/0011	90	60	50	014/0011	25	12	3/8"	–	100	1.2
VBR M	80	60	50	012/0012	160	130	120	014/0012	25	12	3/8"	–	100	1.2
VBR G	120	100	80	012/0013	240	200	190	014/0013	25	12	3/8"	–	100	1.2
VBR F	160	140	120	012/0014	320	270	260	014/0014	25	12	3/8"	–	100	1.2
VBGR PP	150	100	80	012/0065	300	240	210	014/0040	38	12	1/2"	–	100	1.6
VBGR PZ	200	160	140	012/0062	400	310	280	014/0041	38	12	1/2"	–	100	1.6
VBGR P	300	240	200	012/0025	600	520	480	014/0023	38	12	1/2"	–	100	1.6
VBGR MZ	–	–	–	–	850	750	700	014/0072	38	12	1/2"	–	100	1.6
VBGR M	450	390	360	012/0026	900	850	730	014/0024	38	12	1/2"	–	100	1.6
VBGR GZ	–	–	–	–	1100	1000	870	014/0042	38	12	1/2"	–	100	1.6
VBGR G	600	540	480	012/0027	1200	1080	960	014/0043	38	12	1/2"	–	100	1.6
VBHR P	1000	700	600	012/0037	–	–	–	–	56	18	3/4"	1/4"	160	3.2
VBHR M	1500	1200	1000	012/0038	–	–	–	–	56	18	3/4"	1/4"	160	3.2
VBHR G	2000	1700	1400	012/0039	–	–	–	–	56	18	3/4"	1/4"	160	3.2
VBHGR P	3000	2200	2000	012/0049	–	–	–	–	75	22	1" 1)	1/4"	280	4.6
VBHGR PZ	3700	3000	2700	012/0090	–	–	–	–	75	22	1" 1)	1/4"	280	4.6
VBHGR M	4500	3600	3200	012/0050	–	–	–	–	75	22	1" 1)	1/4"	280	4.6
VBHGR G	6000	4800	–	012/0051	–	–	–	–	75	22	1" 1)	1/4"	280	4.6
VBHGR F	6700	5800	–	012/0091	–	–	–	–	75	22	1" 1)	1/4"	280	4.6

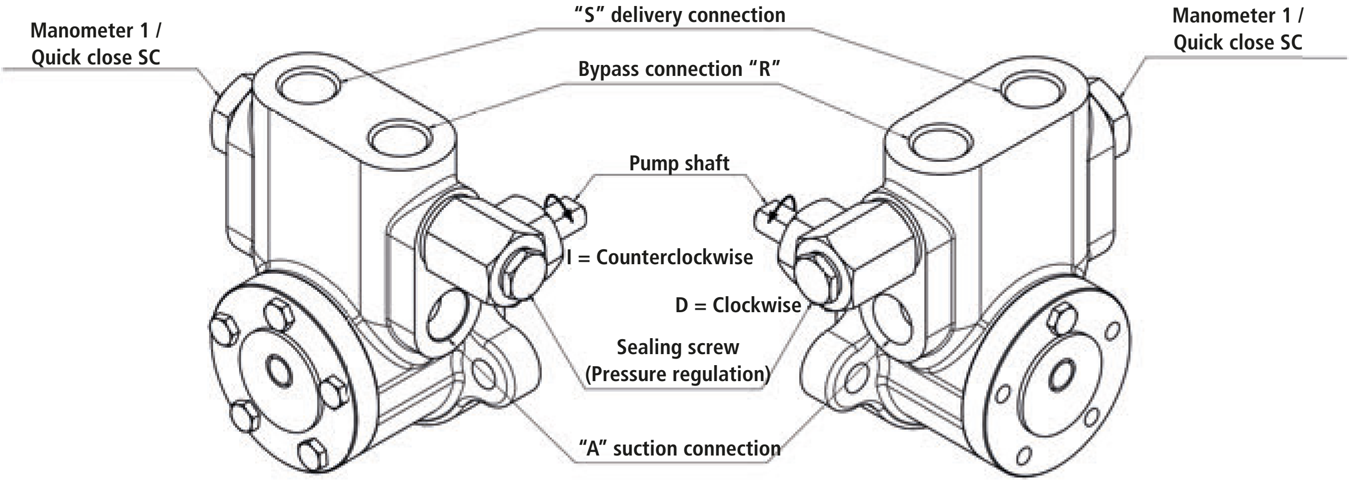
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.

Scale Drawings for Series VBR 1.3

Pipe connections

Threaded connection DIN ISO 228-1





Gear rotor size Ø	Discharge l/h 1400 RPM	2800 RPM	a1	a2	a3	b1	c1	c2	c3	c4	c5	c6	c7	c8
25	45 - 160	90 - 320	35.5	20	33	51	41.5	14	16	40	20	55.5	76	131.5
38	150 - 600	300 - 1200	39.5	30	38	70	55.5	14	16	40	20	69.5	76	145.5
56	1000 - 2000	–	48.5	38	45	96	71.5	15	18	79	27	86.5	124	210.5
75	3000 - 6700	–	62.5	85	70	115	129.5	18	25	65	37	147.5	127	274.5

Gear rotor size Ø	Discharge l/h 1400 RPM	2800 RPM	d1	sw	e	d2	d3	e1	*e2	f1	f2	f3	f4	f5
25	45 - 160	90 - 320	12	27	31.2	54	80	G 3/8"	G 3/8"	144	38.5	90	15	26
38	150 - 600	300 - 1200	12	27	31.2	54	80	G 1/2"	G 3/8"	144	38.5	90	15	23
56	1000 - 2000	–	18	46	53	60	100	G 3/4"	G 3/8"	167.5	35	118	15	25.5
75	3000 - 6700	–	22	55	63.5	80	120	G 1" 1)	G 3/8"	200	28	150	21.5	35

Gear rotor size Ø	Discharge l/h 1400 RPM	2800 RPM	f6	f7	f8	f9	g1	g2	g3	g4	g5	h1	h2	h3
25	45 - 160	90 - 320	38	92	140	18	30	33	63	27	90	11	13	13
38	150 - 600	300 - 1200	44	92	140	18	32	35	67	27	94	11	13	13
56	1000 - 2000	–	67	120	171	26.5	38	42	80	35	115	13	13	25
75	3000 - 6700	–	80	150	218	32	18	62	80	40	120	14.5	15	–

VBGHR model with G 1/4" manometer connection on the front

1) For pinion size 75 = 3000 to 6700 l/h the side suction connection is G 1 1/2".

Pumps and Valves
Motor pump groups
Units for single-pipe installation
Feed pumps and Pressure aggregates
Oil burner pressure aggregates
Filters
Pump controls
Accessories and Spare parts
Nozzles
Special units and Application
General

Series NV, with integrated overflow valve and bypass 1.4

Technical selection chart; scale drawings

Direction of rotation **I** = indirect – counterclockwise
D = direct – clockwise

The direction of rotation can only be changed in the factory.
Therefore, specify the desired direction of rotation as viewed from the pump shaft as per dimension sheet when ordering.


NV series

hp-Internal gear pumps to 40 bar (direction of rotation I = indirect – counterclockwise)

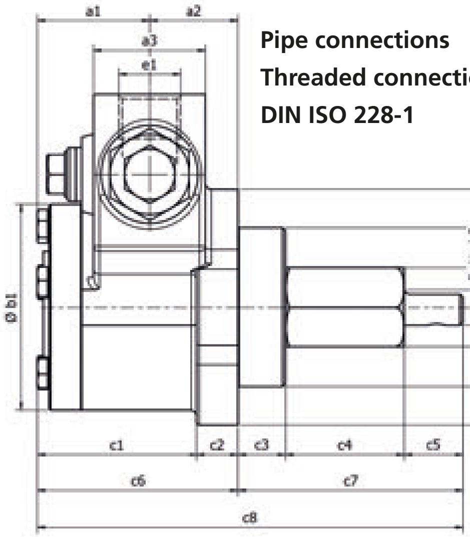
hp-Internal gear pump	Viscosity: 6 mm² sec^{-1} at 20°C, n = 1400 RPM Discharge l/h				n = 2800 RPM Discharge l/h				Gear rotor	Shaft	Threaded connection*	Manometer connection*	max. permitted pump speed	Net weight (kg)
Series NV Sizes:	at 9 bar	at 30 bar	at 40 bar	Item No. I	at 9 bar	at 30 bar	at 40 bar	Item No. I	size Ø	Ø	pipe thread DIN ISO 228	pipe thread DIN ISO 228	(RPM) at I/D	at I/D
NVBR P	45	30	20	011/0015	90	60	50	013/0015	25	12	3/8"	1/4"	3500	2.8
NVBR M	80	60	50	011/0016	160	130	120	013/0016	25	12	3/8"	1/4"	3500	2.8
NVBR G	120	100	80	011/0017	240	200	190	013/0017	25	12	3/8"	1/4"	3500	2.8
NVBR F	160	140	120	011/0018	320	270	260	013/0018	25	12	3/8"	1/4"	3500	2.8
NVBGR PP	150	100	80	011/0075	300	240	210	013/0025	38	12	1/2"	1/4"	3500	3.8
NVBGR PZ	200	160	140	011/0076	400	310	280	013/0028	38	12	1/2"	1/4"	3500	3.8
NVBGR P	300	240	200	011/0028	600	520	480	013/0026	38	12	1/2"	1/4"	3500	3.8
NVBGR MZ	–	–	–	–	850	750	700	013/0074	38	12	1/2"	1/4"	3500	3.8
NVBGR M	450	390	360	011/0029	900	850	730	013/0027	38	12	1/2"	1/4"	3500	3.8
NVBGR GZ	–	–	–	–	1100	1000	870	013/0029	38	12	1/2"	1/4"	3500	3.8
NVBGR G	600	540	480	011/0030	1200	1080	960	013/0034	38	12	1/2"	1/4"	1700	3.8
NVBHR P	1000	700	600	011/0040	–	–	–	–	56	18	3/4"	1/4"	1700	8.6
NVBHR M	1500	1200	1000	011/0041	–	–	–	–	56	18	3/4"	1/4"	1700	8.6
NVBHR G	2000	1700	1400	011/0042	–	–	–	–	56	18	3/4"	1/4"	1700	8.6

hp-Internal gear pumps to 40 bar (direction of rotation D = direct – clockwise)

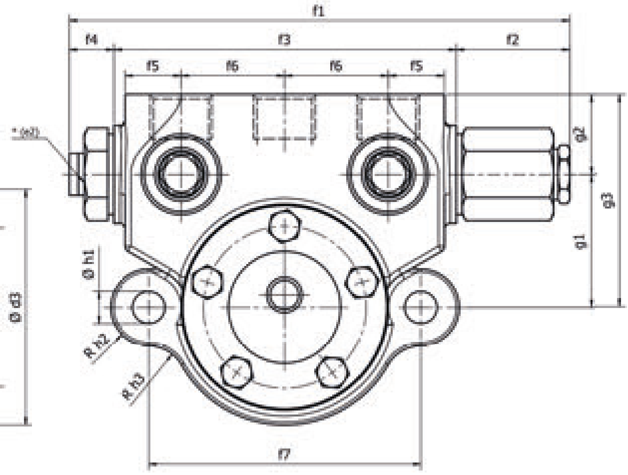
hp-Internal gear pump	Viscosity: 6 mm² sec^{-1} at 20°C, n = 1400 RPM Discharge l/h				n = 2800 RPM Discharge l/h				Gear rotor	Shaft	Threaded connection*	Manometer connection*	Heating power H1 in Watt	Breakaway torque of the pump
Series NV Sizes:	at 9 bar	at 30 bar	at 40 bar	Item No. D	at 9 bar	at 30 bar	at 40 bar	Item No. D	size Ø	Ø	pipe thread DIN ISO 228	pipe thread DIN ISO 228	230 V, 50 Hz	(Nm)
NVBR P	45	30	20	012/0015	90	60	50	014/0015	25	12	3/8"	1/4"	100	1.2
NVBR M	80	60	50	012/0016	160	130	120	014/0016	25	12	3/8"	1/4"	100	1.2
NVBR G	120	100	80	012/0017	240	200	190	014/0017	25	12	3/8"	1/4"	100	1.2
NVBR F	160	140	120	012/0018	320	270	260	014/0018	25	12	3/8"	1/4"	100	1.2
NVBGR PP	150	100	80	012/0075	300	240	210	014/0025	38	12	1/2"	1/4"	100	1.6
NVBGR PZ	200	160	140	012/0076	400	310	280	014/0028	38	12	1/2"	1/4"	100	1.6
NVBGR P	300	240	200	012/0028	600	520	480	014/0026	38	12	1/2"	1/4"	100	1.6
NVBGR MZ	–	–	–	–	850	750	700	014/0074	38	12	1/2"	1/4"	100	1.6
NVBGR M	450	390	360	012/0029	900	850	730	014/0027	38	12	1/2"	1/4"	100	1.6
NVBGR GZ	–	–	–	–	1100	1000	870	014/0029	38	12	1/2"	1/4"	100	1.6
NVBGR G	600	540	480	012/0030	1200	1080	960	014/0034	38	12	1/2"	1/4"	100	1.6
NVBHR P	1000	700	600	012/0040	–	–	–	–	56	18	3/4"	1/4"	160	3.2
NVBHR M	1500	1200	1000	012/0041	–	–	–	–	56	18	3/4"	1/4"	160	3.2
NVBHR G	2000	1700	1400	012/0042	–	–	–	–	56	18	3/4"	1/4"	160	3.2

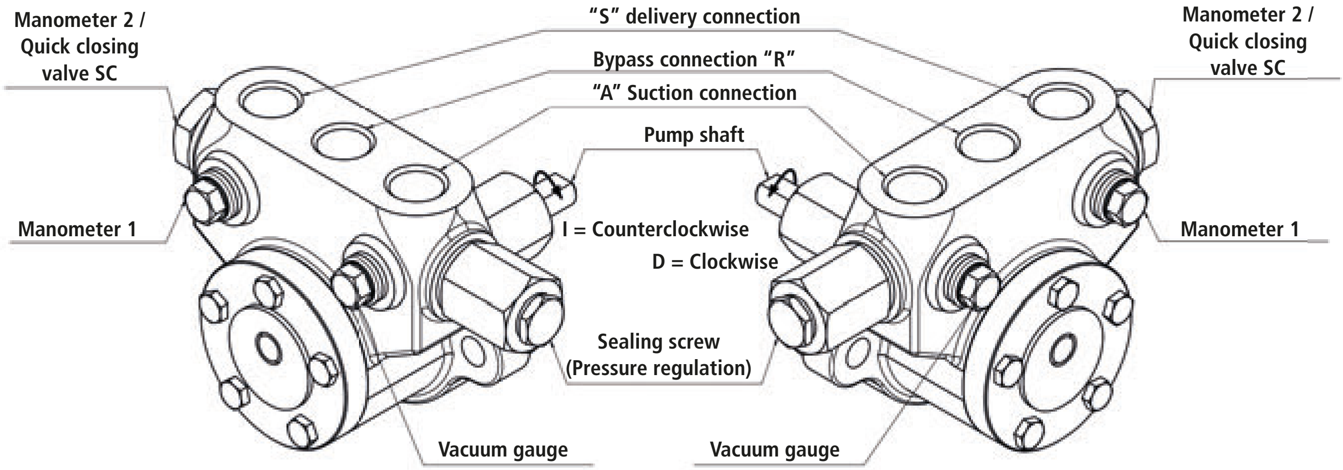
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements.
The pump or device connection gives no indication of the relevant size of the pipe.

Scale drawings for Series NV 1.4



Pipe connections
Threaded connection
DIN ISO 228-1





Gear rotor size Ø	Discharge l/h 1400 RPM	2800 RPM	a1	a2	a3	b1	c1	c2	c3	c4	c5	c6	c7
25	45 - 160	90 - 320	35.5	20	33	51	41.5	14	16	40	20	55.5	76
38	150 - 600	300 - 1200	39.5	30	38	70	55.5	14	16	40	20	69.5	76
56	1000 - 2000	–	48.5	38	45	96	71.5	15	18	79	27	86.5	124

Gear rotor size Ø	Discharge l/h 1400 RPM	2800 RPM	c8	d1	sw/e	d2	d3	e1	*e2	f1	f2	f3	f4
25	45 - 160	90 - 320	131.5	12	27/31.2	54	80	G 3/8"	G 3/8"	169	38.5	116	15
38	150 - 600	300 - 1200	145.5	12	27/31.2	54	80	G 1/2"	G 3/8"	169	38.5	116	15
56	1000 - 2000	–	210.5	18	46/53.1	60	100	G 3/4"	G 3/8"	200	35	150	15

Gear rotor size Ø	Discharge l/h 1400 RPM	2800 RPM	f5	f6	f7	f8	f9	g1	g2	g3	h1	h2	h3
25	45 - 160	90 - 320	25.5	32.5	92	166	18	40	27	67	11	13	13
38	150 - 600	300 - 1200	23	35	92	166	18	45	27	72	11	13	13
56	1000 - 2000	–	25	50	120	203	26.5	65	40	105	13	13	25

With G 1/4" manometer connection on the front

Series UHE, with integrated overflow valve and bypass 1.5

Technical selection chart; scale drawings

Direction of rotation **I** = indirect – counterclockwise
D = direct – clockwise

The direction of rotation can only be changed in the factory.
Therefore, specify the desired direction of rotation as viewed from the pump shaft as per dimension sheet when ordering.
Standard design of the pump for two-pipe installation, design for one-pipe installation on request.

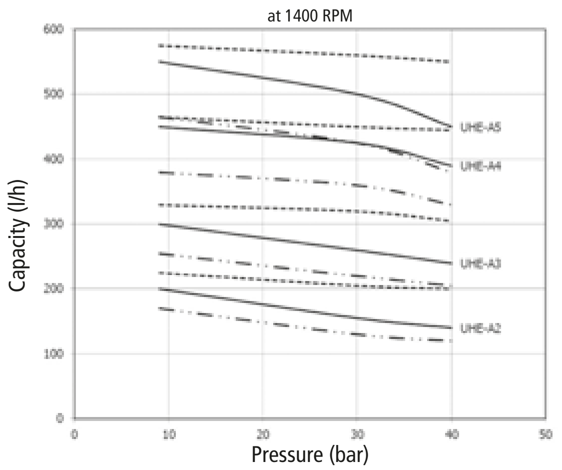
hp-Internal gear pumps to 40 bar (direction of rotation I = indirect – counterclockwise)

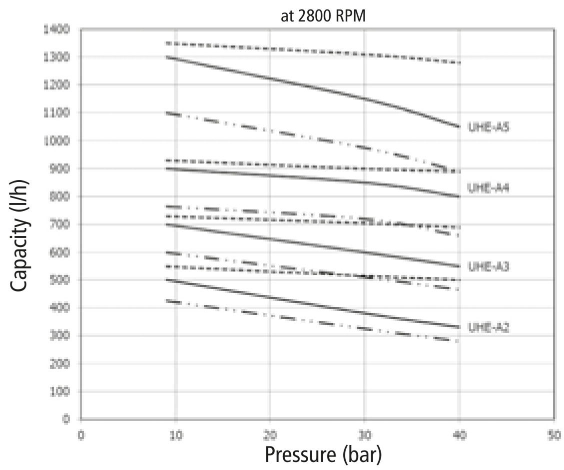
hp-Internal gear pump Series UHE Sizes:	Viscosity: 6 mm² sec⁻¹ at 20°C n = 1400 RPM Discharge l/h at 9 bar	at 30 bar	at 40 bar	Item No. I	n = 2800 RPM Discharge l/h at 9 bar	at 30 bar	at 40 bar	Item No. I	Gear rotor size Ø	Shaft Ø	Threaded connection Suction pressure (S/A/R)	Manometer connection (M1/M2)	max. permitted pump speed (RPM) at I/D	Net weight (kg) at I/D
UHE-A2-PZ	200	155	140	0110542	500	380	330	0130542	38	12	G 1/2"	G 1/4 "	3500	4.4
UHE-A3-P	300	260	240	0110543	700	600	550	0130543	38	12	G 1/2"	G 1/4"	3500	4.6
UHE-A4-M	450	425	390	0110544	900	850	800	0130544	38	12	G 1/2"	G 1/4 "	3500	4.8
UHE-A5-GZ	550	500	450	0110545	1300	1150	1050	0130545	38	12	G 1/2"	G 1/4"	3500	5

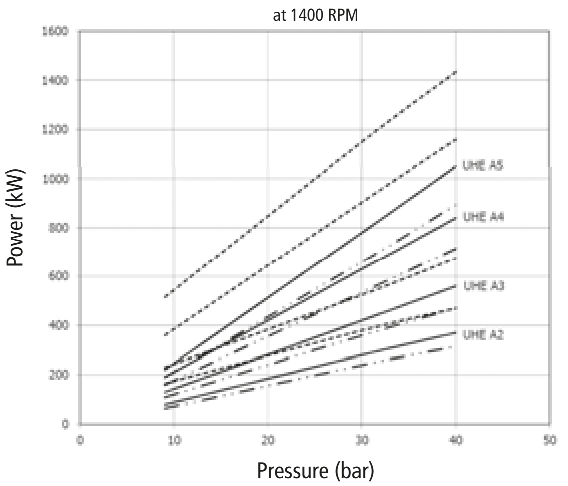
hp-Internal gear pumps to 40 bar (direction of rotation D = direct – clockwise)

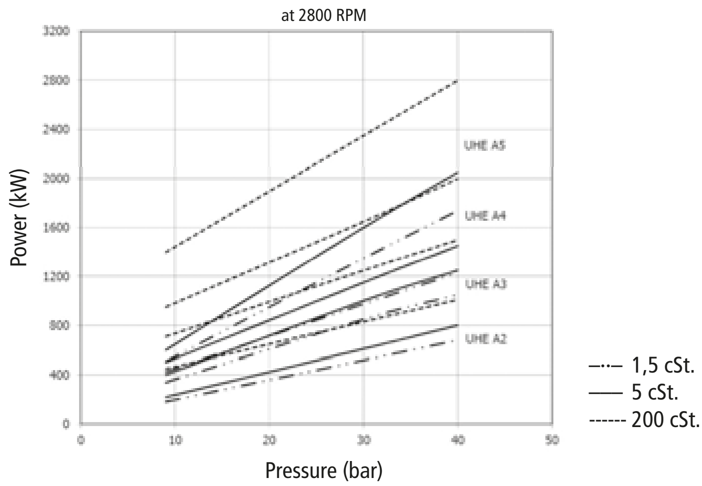
hp-Internal gear pump Series UHE Sizes:	Viscosity: 6 mm² sec⁻¹ at 20°C n = 1400 RPM Discharge l/h at 9 bar	at 30 bar	at 40 bar	Item No. D	n = 2800 RPM Discharge l/h at 9 bar	at 30 bar	at 40 bar	Item No. D	Gear rotor size Ø	Shaft Ø	Threaded connection (Suction, pressure, return) (S/A/R)	Manometer connection (M1/M2)	Heating power H2 in Watt 230 V, 50 Hz	Breakaway torque of the pump (Nm)
UHE-A2-PZ	200	155	140	0120542	500	380	330	0140542	38	12	G 1/2"	G 1/4 "	110	1.6
UHE-A3-P	300	260	240	0120543	700	600	550	0140543	38	12	G 1/2"	G 1/4"	110	1.6
UHE-A4-M	450	425	390	0120544	900	850	800	0140544	38	12	G 1/2"	G 1/4 "	110	1.6
UHE-A5-GZ	550	500	450	0120545	1300	1150	1050	0140545	38	12	G 1/2"	G 1/4"	110	1.6

Curves and power requirement for hp-Pumps Series UHE



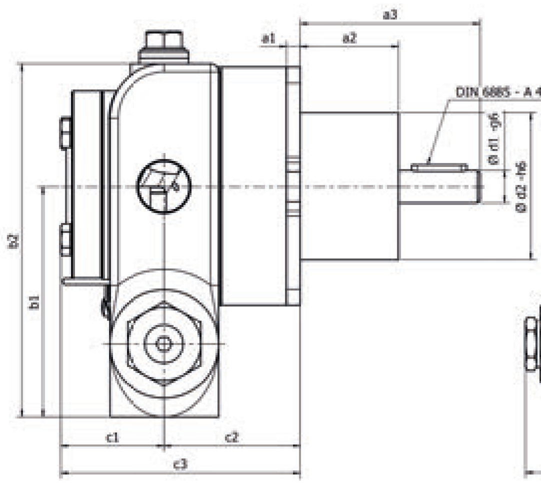


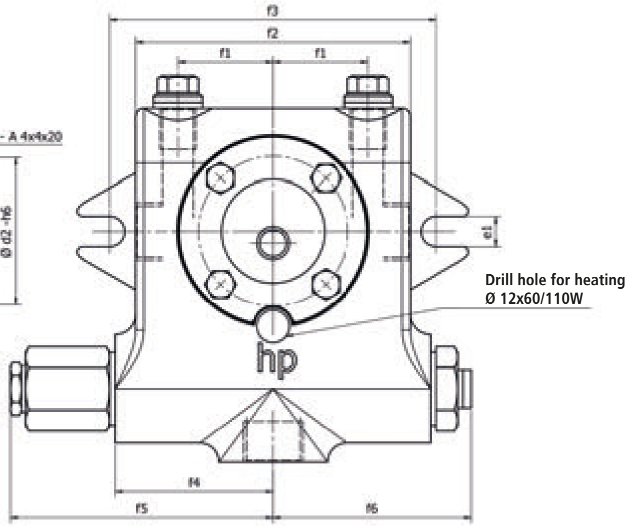


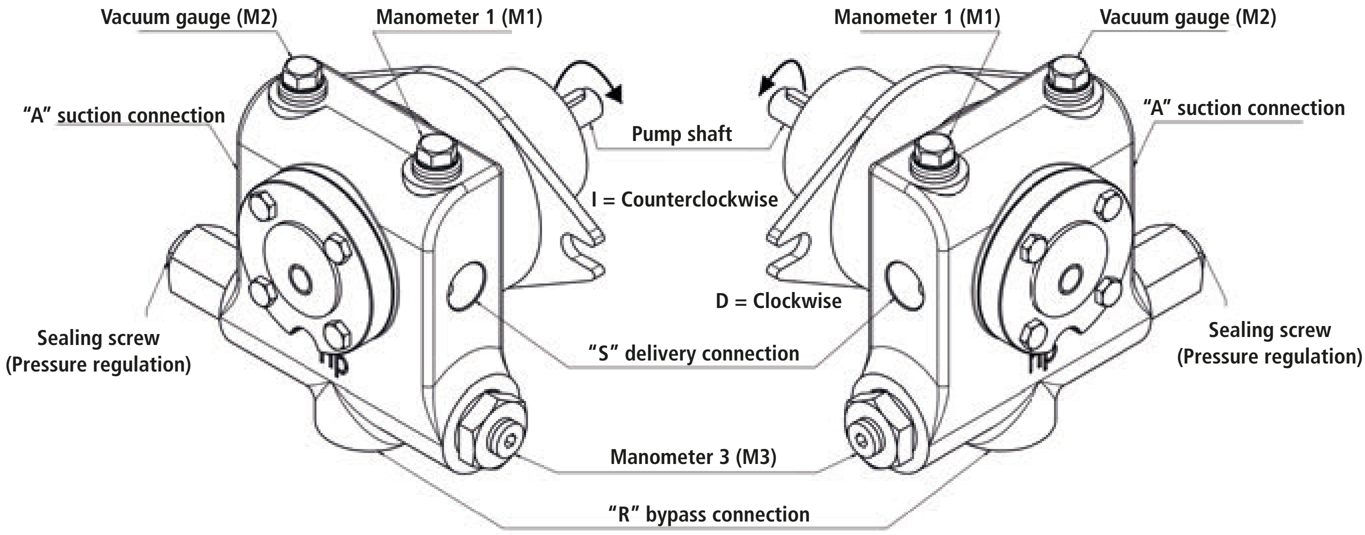


Scale Drawings for Series UHE 1.5

Pipe connections: Threaded connection DIN ISO 228-1







Size	a1	a2	a3	b1	b2	c1	c2	d1	d2	d3
UHE-A2-PZ	5	36	66	85	130	36	50	12	13.5	54
UHE-A3-P	5	36	66	85	130	36	54	12	13.5	54
UHE-A4-M	5	36	66	85	130	36	58	12	13.5	54
UHE-A5-GZ	5	36	66	85	130	36	64	12	13.5	54

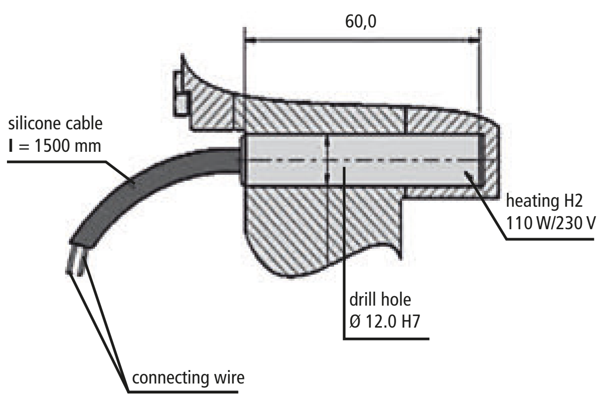
Size	e1	f1	f2	f3	f4	f5	f6	S; A; R	M1/M2	M3
UHE-A2-PZ	11	35	101	125	58	98	72.5	1/2"	G 1/4"	1/8"
UHE-A3-P	11	35	101	125	58	98	72.5	1/2"	G 1/4"	1/8"
UHE-A4-M	11	35	101	125	58	98	72.5	1/2"	G 1/4"	1/8"
UHE-A5-GZ	11	35	101	125	58	98	72.5	1/2"	G 1/4"	1/8"

Accessories for UHE Series

Axial face shaft seal: see page 20 (pinion size Ø 38)

hp-Electric standby and auxiliary heaters for hp-Industrial pumps type H2

For use of the pumps with viscous medium the use of H2 heating is provided by the manufacturer.



Series PON, with integrated overflow valve, bypass and integrated filter 1.6

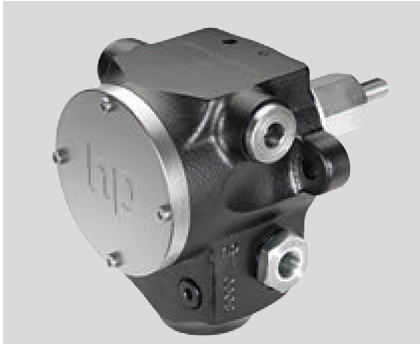
Technical selection chart; scale drawings

Direction of rotation	**I**	= indirect – counterclockwise
	D	= direct – clockwise
Nozzle port	**R**	= on the right hand side
	L	= on the left hand side

The direction of rotation can only be changed in the factory.
Therefore please ensure that you state the desired direction of rotation and the direction of the nozzle port according to the dimension sheet when ordering.

Standard design of the pump for two-pipe installation, conversion to one-pipe operation can be done yourself (see operating and maintenance manual).

All hp-Industrial PON model pumps may be equipped with heating H3 and electrical standby and auxiliary heating without thermostat.



PON series

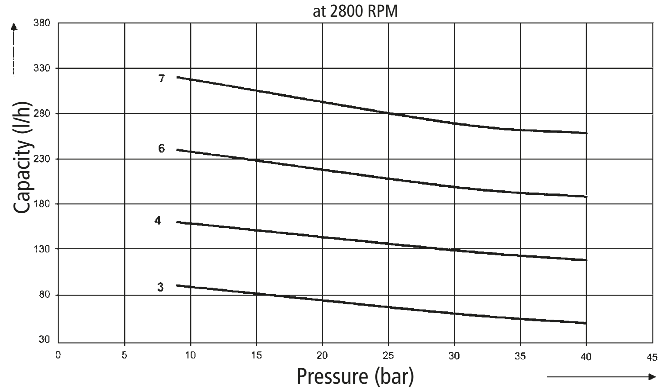
hp-Internal gear pumps of Series PON up to 40 bar

Size	Discharge at 2800 RPM Viscosity 5 cSt			Direction of rotation	Nozzle port	Item No.				max. permitted pump speed (RPM)	Gear rotor size Ø	Breakaway torque (Nm)	Net weight (kg)
	9 bar	30 bar	40 bar			I-L	I-R	D-L	D-R				
PON 3	90	60	50	D = direct - clockwise	R	0130601	0130611	0140601	0140611	3500	25	1.2	5.0
PON 4	160	130	120			0130602	0130612	0140602	0140612	3500	25	1.2	5.0
PON 6	240	200	190	I = indirect - counterclockwise	L	0130603	0130613	0140603	0140613	3500	25	1.2	5.0
PON 7	320	270	260			0130604	0130614	0140604	0140614	3500	25	1.2	5.0

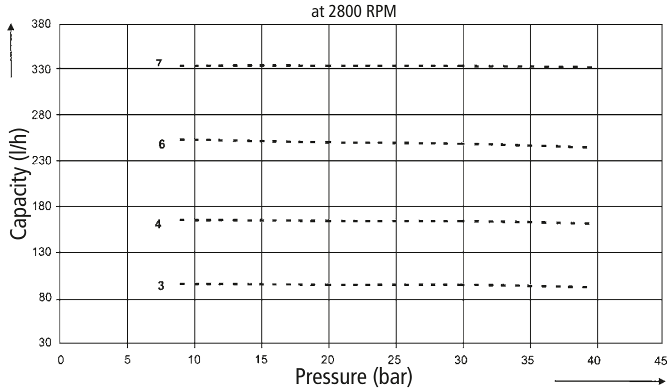
Size	Capacity at 9 bar (l/h)	Threaded connection				Pressure stage (bar)	Speed (RPM)	Medium	Accessories
		Nozzle	Suction side	Bypass	Manometer				
PON 3	90	1/4"	1/2"	1/2"	1/8"	1 = 1 - 4	1 = 1400 RPM	0 = fuel oil EL + L	H3 = heating for PON
PON 4	160	1/4"	1/2"	1/2"	1/8"	2 = 2 - 9		MGO / MDO	E - single-pipe installation
PON 6	240	1/4"	1/2"	1/2"	1/8"	3 = 6 - 25	2 = 2800 RPM	5 = HFO	
PON 7	320	1/4"	1/2"	1/2"	1/8"	4 = 15 - 40			

Curves for Series PON

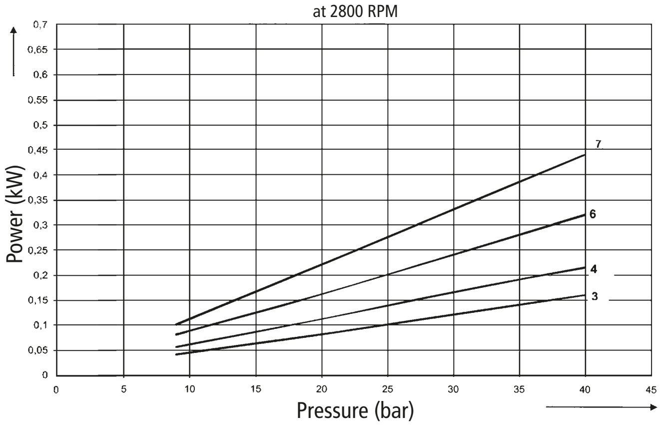
for 5 cSt viscosity
at 2800 RPM



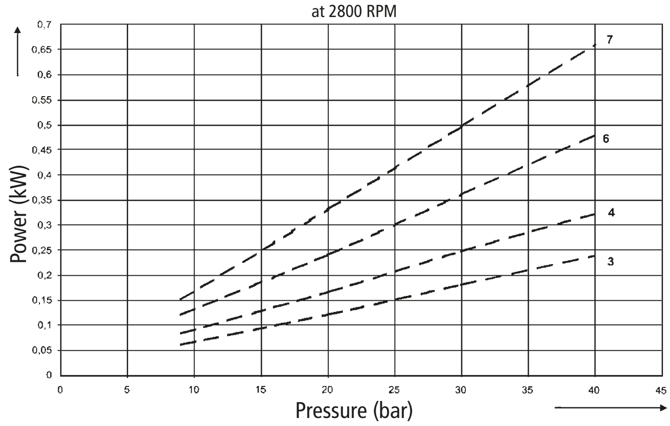
for 200 cSt viscosity
at 2800 RPM



at 2800 RPM

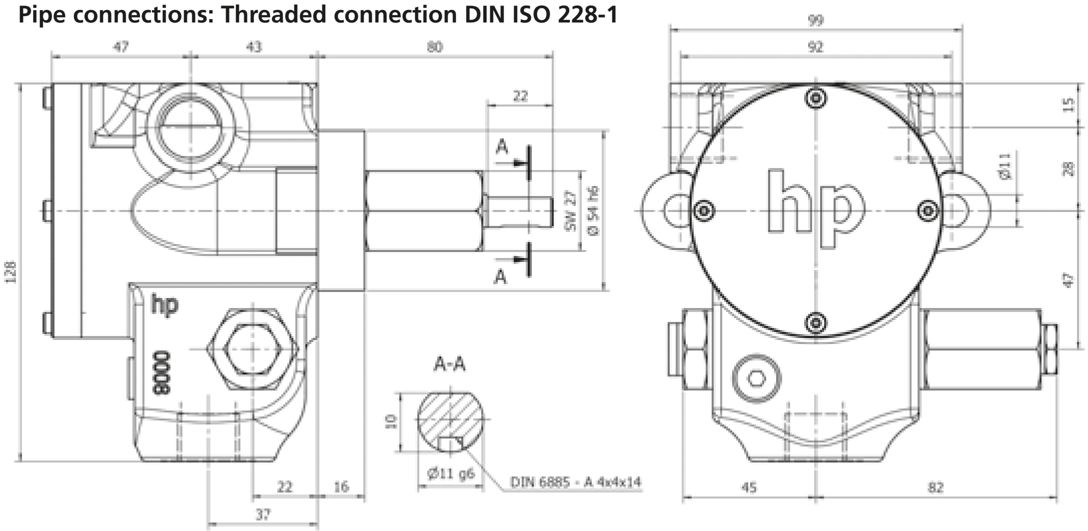


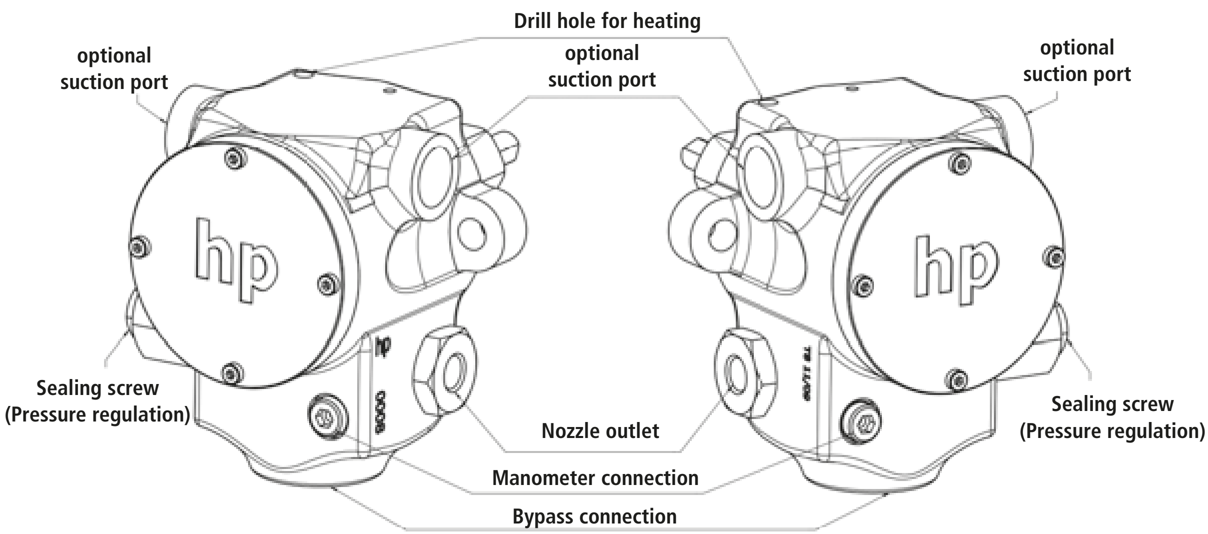
at 2800 RPM



Scale drawings for Series PON 1.6

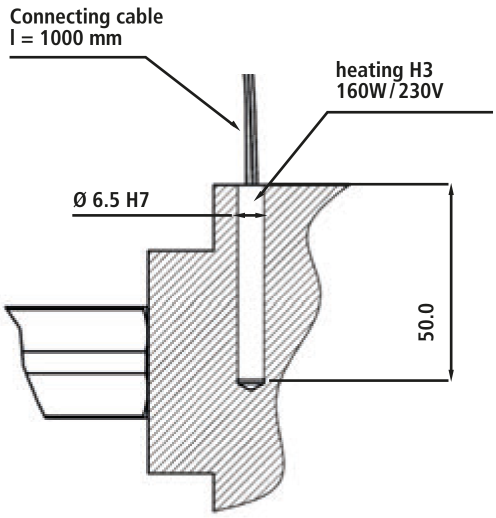
Pipe connections: Threaded connection DIN ISO 228-1





hp-Electric standby and auxiliary heating H3 for PON series hp-Oil burner pumps

For use of pumps with viscous medium, the use of H3 heating is provided by the manufacturer.



Dosing and special pumps 1.7

Derived from the proven hp-Pump program, pumps have been developed for special applications – particularly dosing tasks.

Characteristic of this are:

- different construction sizes (for conveying quantities from 0.01 l/min)
- altered material qualities or pairs and surface treatments
- and shaft seals adapted to the requirements.

A condition of using pumps as dosing pumps is also a medium with self-lubricating properties.

The viscosity is limited to 50 000 mPa s (in special cases to 75 000 mPa s on request).

Technical Data

Medium: various pouring resins, hardeners, polyurethane, epoxy resins, silicones (equipment resistant against the materials uses)
Viscosity: 100 – 50 000 mPa s
Supply pressure: 0 – 5 bar
Operating pressure: max. 30 bar
Direction of rotation: **D** = clockwise and **I** = counterclockwise
Medium temperature: max. 80 °C
Speed range: 100 – 400 RPM

Equipment design

Casing: GG 25
Rotor: ETG 88
Pinion: 16 Mn Cr 5
Shaft seal: Lip seals of various equipment designs

hp-Dosing pumps are manufactured in 3 series, each with differing discharges:

Size: IZP

Size: B

Size: BG

Pumps of the B and BG sizes may be adapted to customer requirements in the area of shaft seal and fastenings.

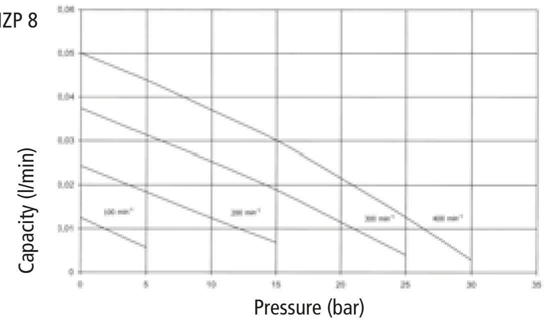
Pump model -I / -D -Do	Threaded connection Suction / Delivery	Item No.	
		I = clockwise	D = counterclockwise
IZP 8-	1/8"	030 0191	030 0185
IZP 15-	1/8"	030 0193	030 0187
IZP 25-	1/8"	030 0195	030 0189
BP-	3/8"	011 0102	011 0110
BM-	3/8"	011 0103	011 0111
BG-	3/8"	011 0104	011 0112
BF-	3/8"	011 0105	011 0113
BG PP-	1/2"	011 0118	011 0128
BG P-	1/2"	011 0119	011 0130
BG M-	1/2"	011 0120	011 0131
BG G-	1/2"	011 0121	011 0132

Dosing and special pumps 1.7

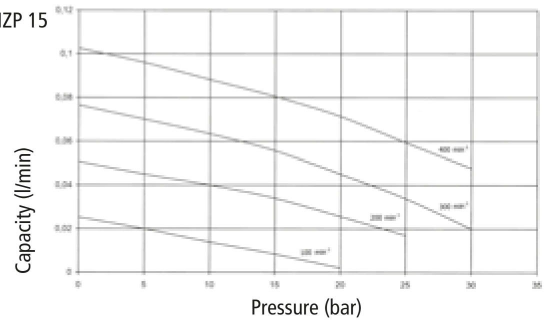
Curves of dosing pumps for speeds 100, 200, 300 and 400 RPM, test medium Mesamoll oil (viscosity 115 mPa s, density 1,055 g/cm³)

Series IZP

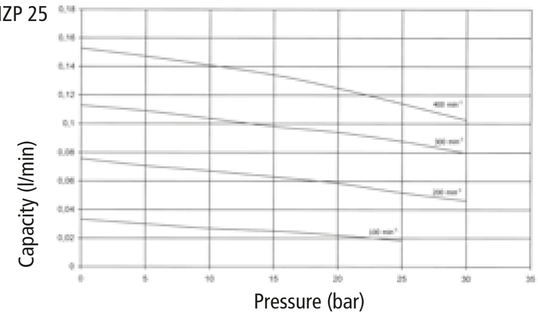
IZP 8



IZP 15

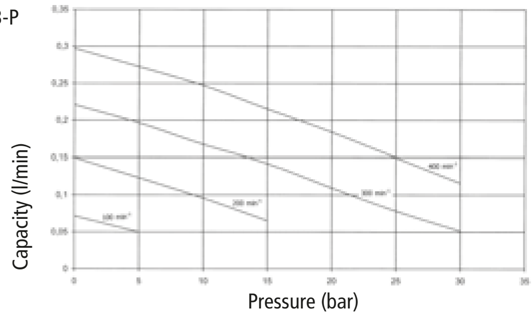


IZP 25

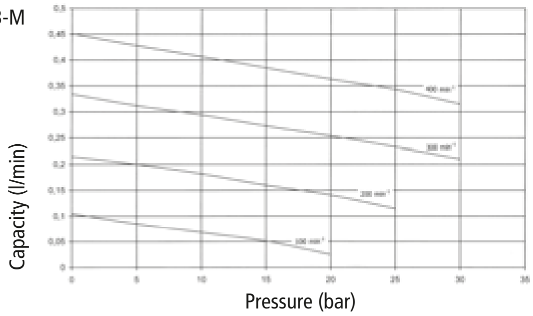


Series B

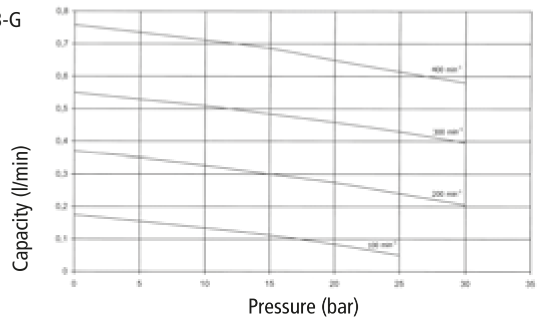
B-P



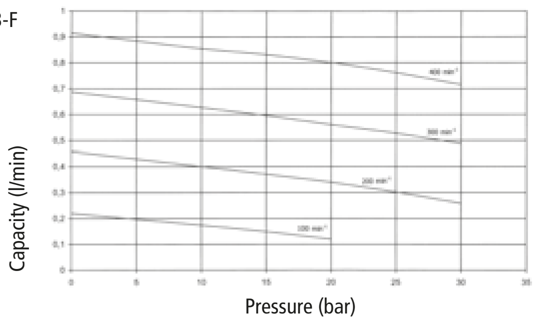
B-M



B-G

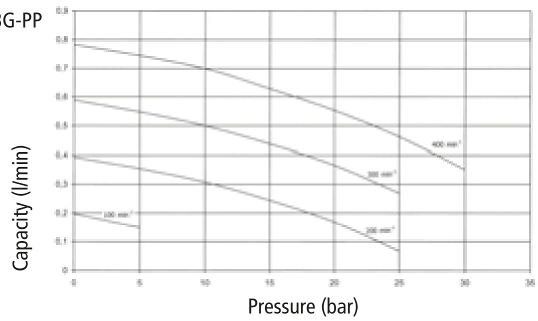


B-F

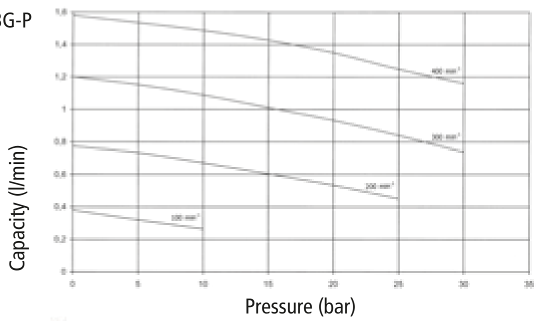


Series BG

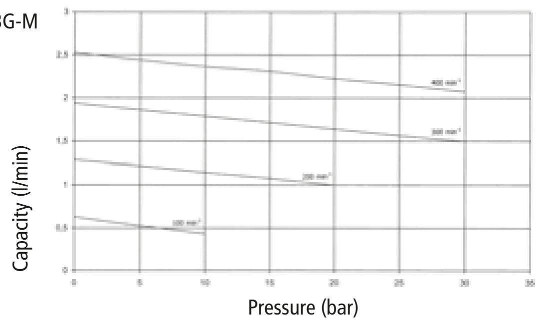
BG-PP



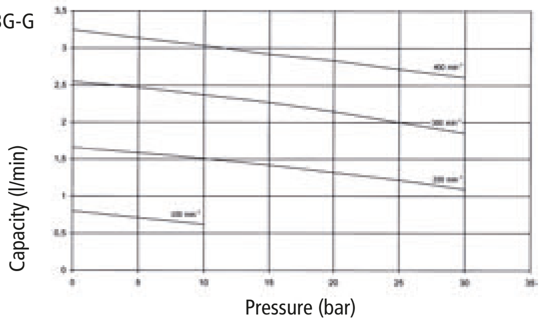
BG-P



BG-M



BG-G

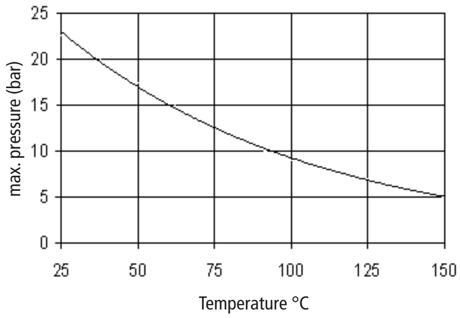


Pumps and Valves
Motor pump groups
Units for single-pipe installation
Feed pumps and Pressure aggregates
Oil burner pressure aggregates
Filters
Pump controls
Accessories and Spare parts
Nozzles
Special units and Application
General

hp-Pump accessories 1.8

All hp-Pumps are equipped with **pressure-tight axial face shaft seals made of viton** which can resist pressures of up to 5 bar. They withstand temperatures up to max. 150 °C. The axial face shaft seals are relieved of pressure on the suction side of the pump. For maximum pressure load of the axial face seal, i.e. of the suction side over temperature, see graph.

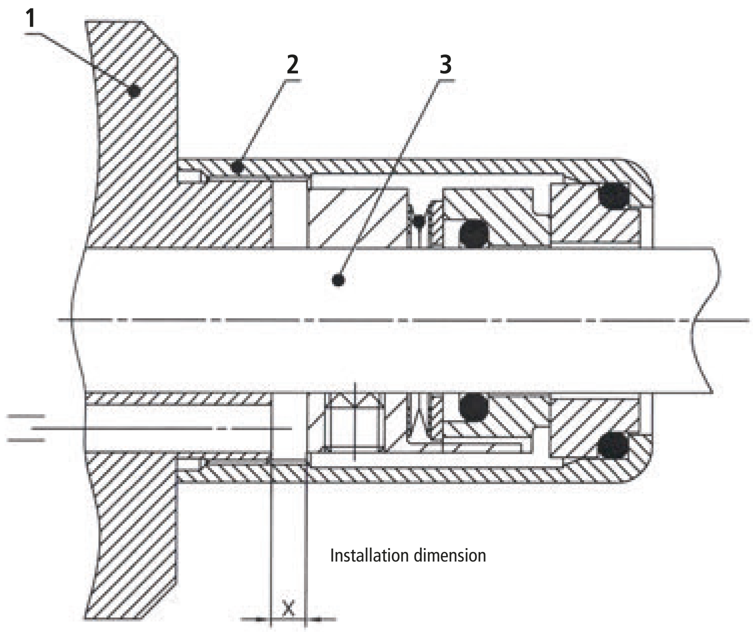
Thermo-elastic high power shaft seal for liquid temperatures of over 150°C on request.



For use of pumps with abrasive media, the manufacturer provides for the use of axial face shaft seals in the material design SIC / SIC / Viton.

Item numbers for axial face shaft seal (max. 150°C)

Gear rotor size Ø	Shaft Ø	Carbon / SIC / Viton spare parts item no.	SIC / SIC / Viton spare parts item no.
25	12	0190015	0190015-S
38	12	0190015	0190015-S
56	18	0190016	0190016-S
75	22	0190017	0190017-S



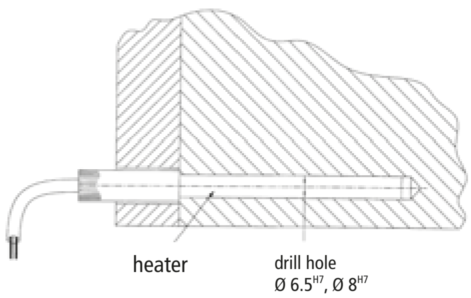
1 = Pump body
2 = Axial face shaft seal (complete)
3 = Pump shaft
x = Installation size

Accessories for use with viscous medium

hp-Electric standby and auxiliary heaters for hp-Industrial pumps type H1; H2: H3;

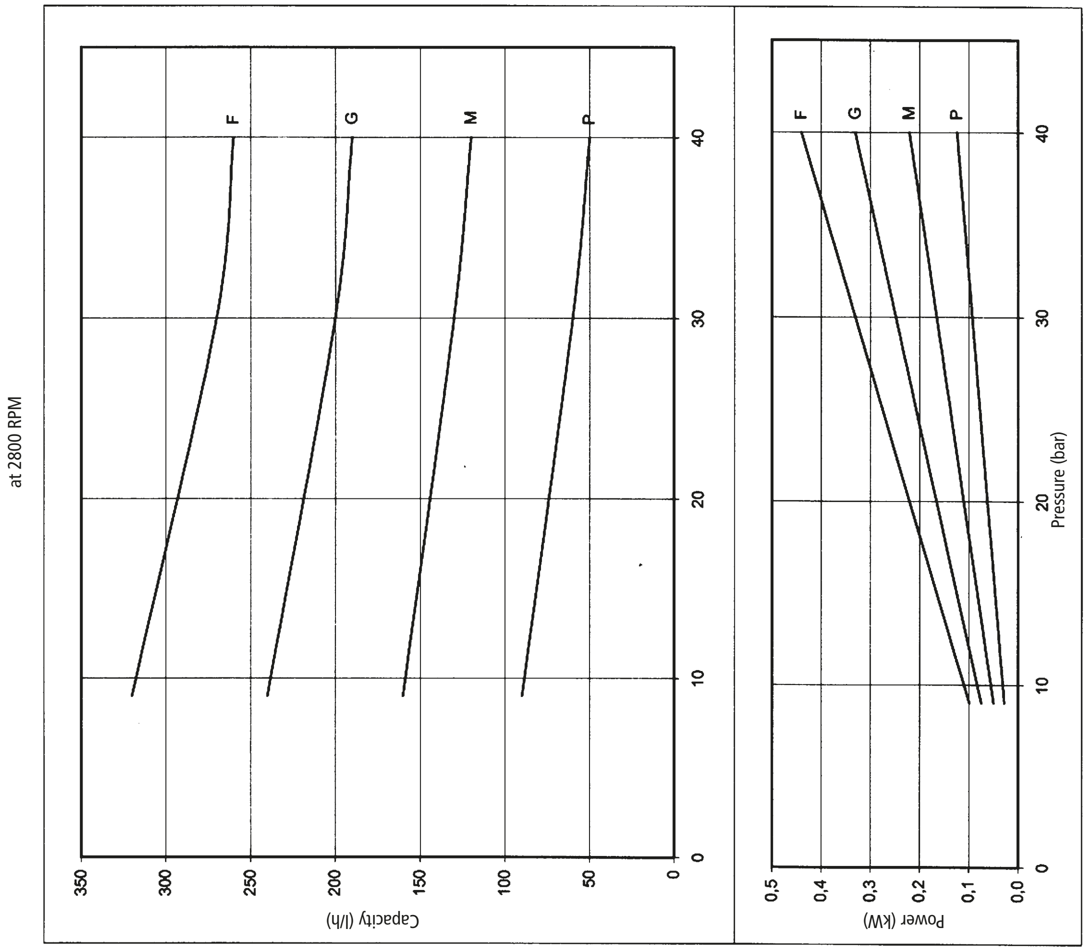
All hp industrial pumps may be equipped with heating and electrical standby and auxiliary heating without thermostat.

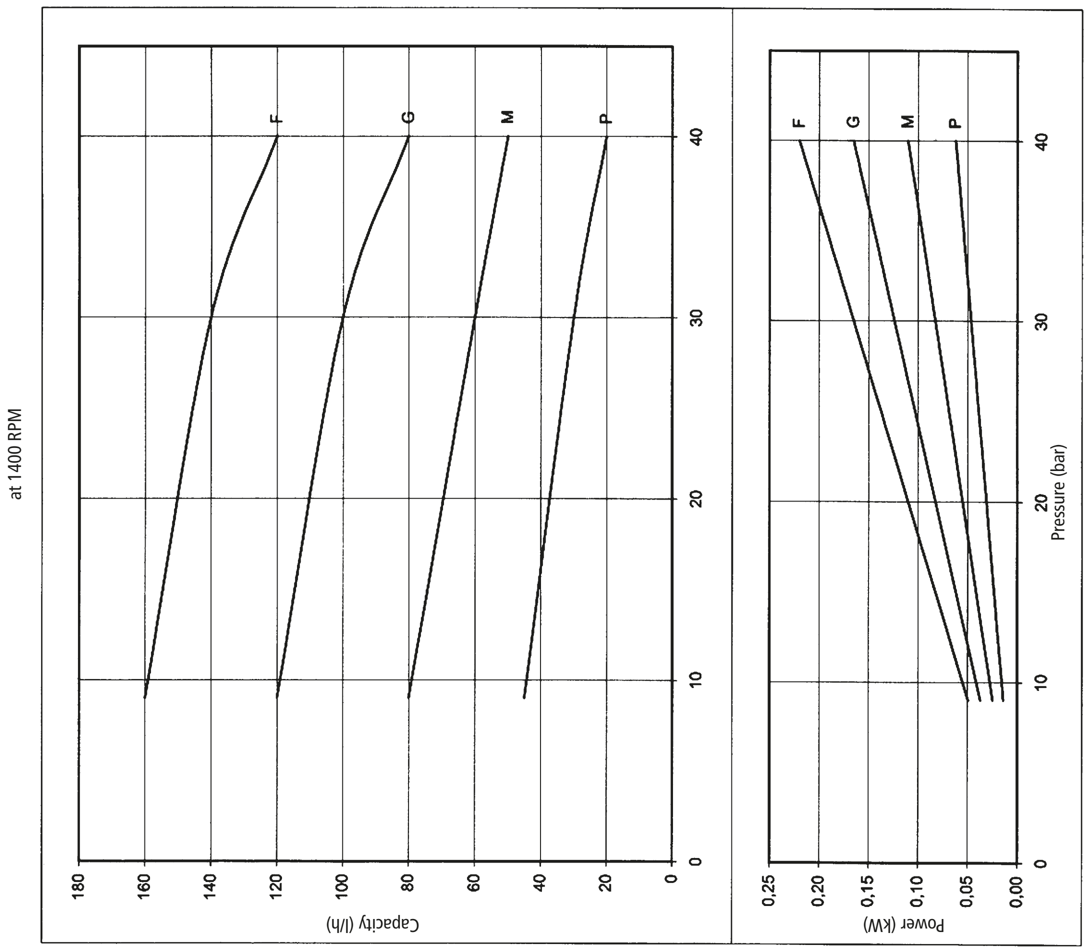
Installed in the factory Item No. H1	Spare parts item no.	Suitable for pump with Gear rotor size Ø / or pump model	Shaft Ø	Heating power H1 in Watt 230 V, 50 Hz	Number of heating units 230 V, 50 Hz other voltages on request
0190051	0190056	25	12	100	1
0190051	0190056	38	12	100	1
0190052	0190057	56	18	160	1
0190053	0190058	75	22	280	1
–	0190062	PON	12	110	1
–	0720525	UHE	12	160	1



Curves for hp-Industrial pumps 1.9

Gear rotor size ø 25; for heating oil L/EL

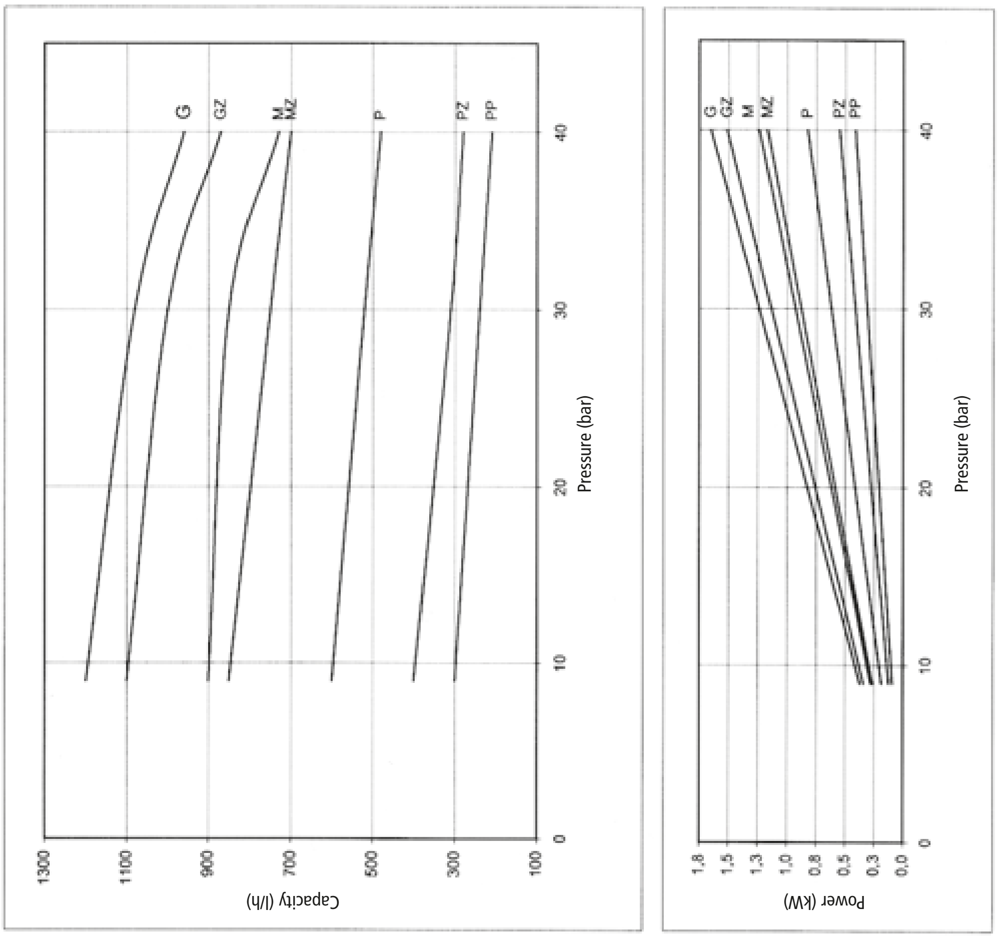




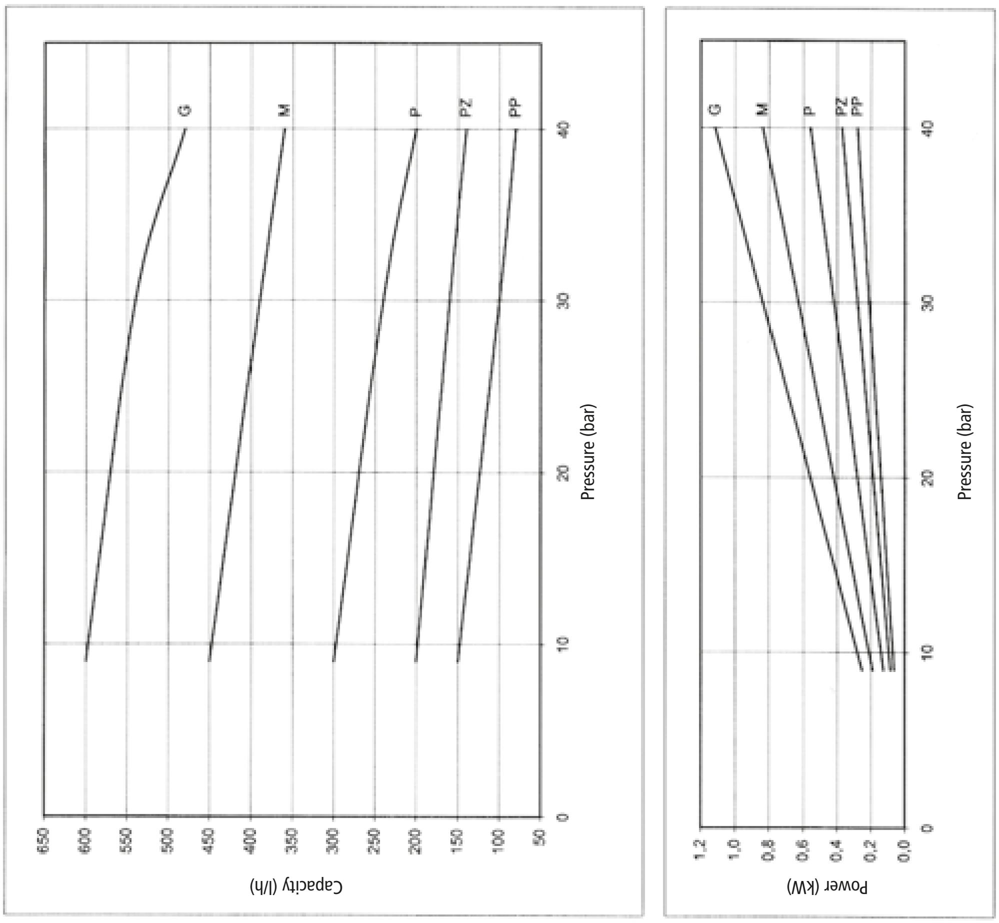
Curves for hp-Industrial pumps 1.9

Gear rotor size ø 38; for heating oil L/EL

at 2800 RPM



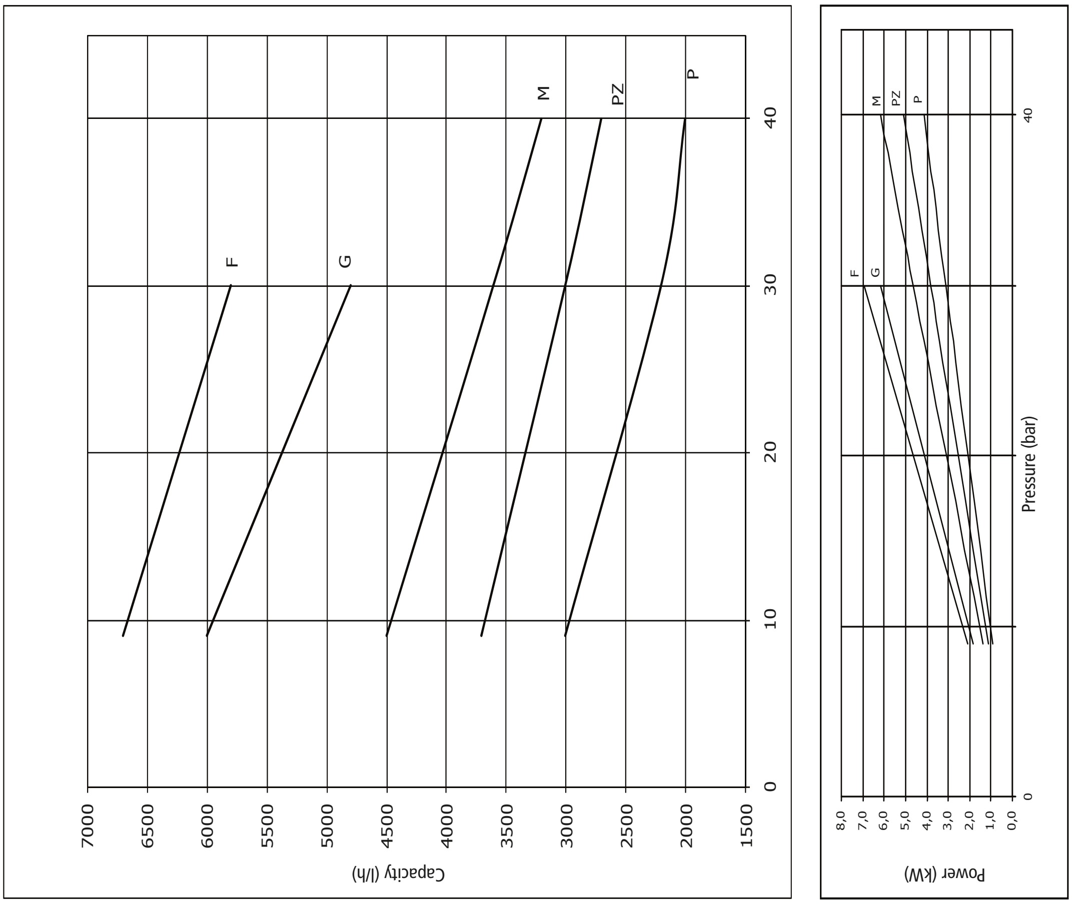
at 1400 RPM



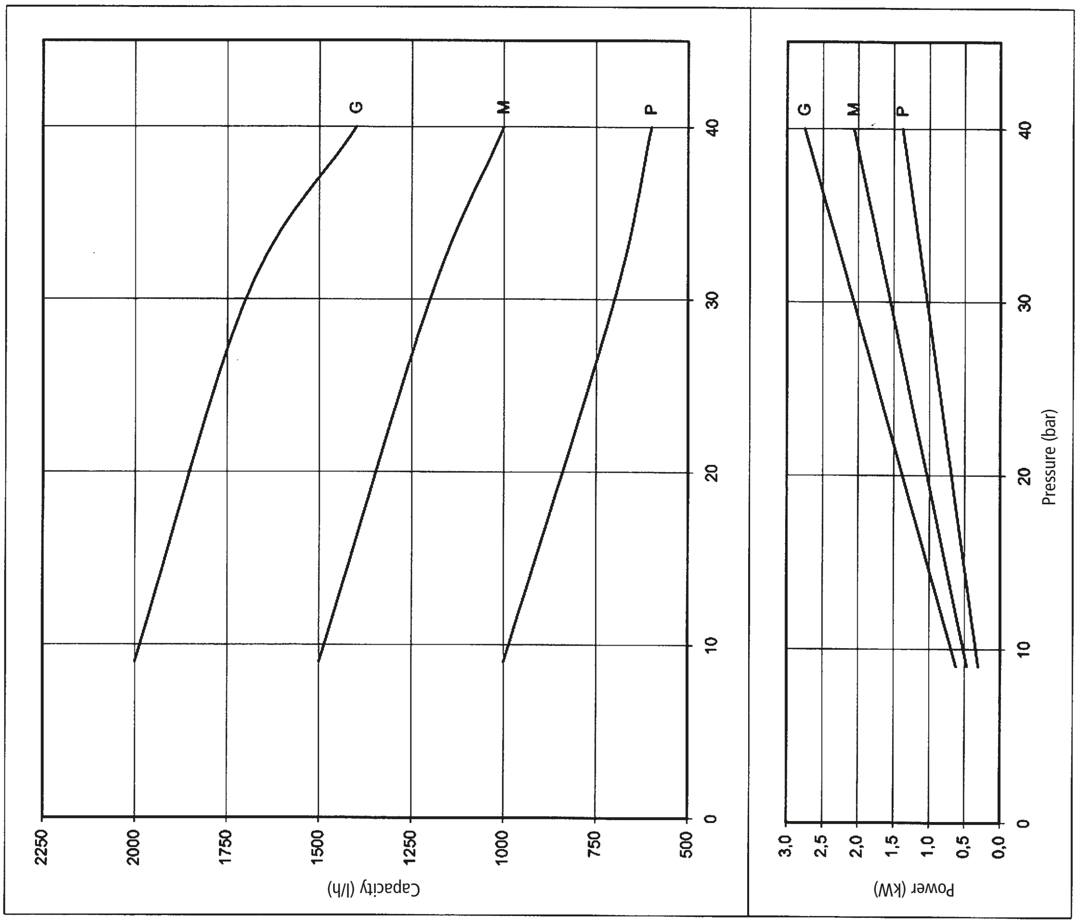
Curves for hp-Industrial pumps 1.9

For heating oil L/EL

Gear rotor size ø 75; at 1400 RPM



Gear rotor size ø 56; at 1400 RPM



Pumps and Valves
Motor pump groups
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Special units and Application
General

hp-Overflow valves 2.0

Overflow valves
with thread connection

Page 25

Overflow valves
with flange connection

Page 26

Overflow valves
in flange connection for SAE flange

Page 28

Page 29

Overflow valves
of Series BV

Pressure-regulating valves
with modulating kit

Page 27

Pressure-regulating valves
of Series B-Pro

Page 30

hp-Overflow valves with thread connection 2.1

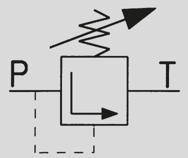
Type of actuation E: with adjustment screw

For lubricating and hydraulic oils and many other self-lubricating non-corrosive fluids. For heating oils EL, L, M, S and ES, coal tar oils, kerosene.

Maximum temperature of fluid medium: 150 °C.

Material: casing of hydraulic cast iron (GGG 40); certificate 3.1 on request; piston, valve tip, spring of hardened steel.

Function: Directly-controlled, spring-loaded overflow valve for maintaining a set operating pressure or a set maximum pressure in a pressure pipe.

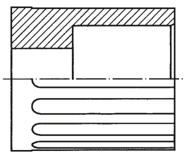


Summary:
hp-Overflow valve,
flow range: . . . . . (l/h)
pressure stage . . . . , adjustable . . . . . (bar)
Type: . . . . .

hp-Overflow valves with thread connection

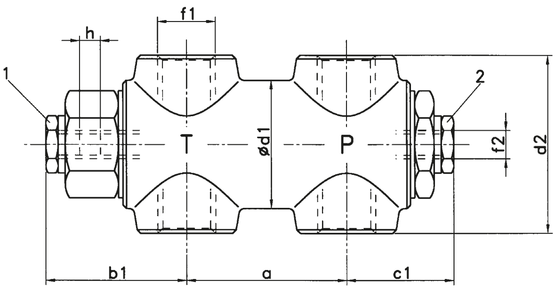
Model	Possible pressure stages for each model	Connection thread [2]	Flow range [3] l/h	Viscosity range cSt	Item No.
B - P - E / _ G 1/4" [1]	0 = 0.5 - 1.5 bar 1 = 1 - 4 bar 2 = 2 - 9 bar 3 = 6 - 25 bar 4 = 15 - 40 bar	G 1/4"	6 - 120	2.8 to 480	0210000
B - P - E / _		G 3/8"	15 - 160	2.8 to 480	0210002
B - G - E / _		G 1/2"	30 - 600	2.8 to 480	0210003
B - GH - E / _ [4]		G 3/4"	100 - 2000	2.8 to 480	0210004
B - GHG - E / _		G 1"	300 - 6000	2.8 to 480	0210005
B - GHG - E / _ G 1 1/4"		G 1 1/4"	500 - 10000	2.8 to 480	0210006

[1] Not pressure stage 0
[2] Pipe thread G…A DIN ISO 228-1
[3] For curve see page 31
[4] Not pressure stage 0, for pressure stage 1: 0.5 - 3.5 bar, all further pressure stages according to table



For very dirty heavy oils, the overflow valves may be fitted or retrofitted with a piston axial nut (heavy oil piston) at an additional cost.

Model	Item No.	Ø for piston and hole
BP	0840750	20/2.5
BG/FDR 15	0840752	20/5.0
BG/FDR 15	0840754	20/7.5
BGH/FDR 20	0840756	30/10
BGHG 1"/FDR 25	0840758	35/15
BGHG 11/4"/FDR 32	0840760	35/25
FDR 50	0840762	50/30



Model with regulating screw
After removing cover screw 1 on the regulating screw, the pressure is increased by turning clockwise with a screwdriver or with an allen key. It is decreased by turning counterclockwise.

Size table

Model	a	b1	c1	d1	d2	f1	max. pipe	NW	f2	Adjustment path h at pressure stage			
										0 + 1	2	3	4
P - 1/4"	55	65	37	36	52	G 1/4"	10 x 1	8	G 1/8"	15	12	8	7
P	55	65	37	36	52	G 3/8"	12 x 1	10	G 1/8"	15	12	8	7
G	55	65	37	36	52	G 1/2"	18 x 1.5	15	G 1/8"	15	12	8	7
GH	63	65	43	50	70	G 3/4"	22 x 1.5	20	G 1/4"	15	10	8	5
GHG	80	62.5	56	56	86	G 1"	28 x 1.5	25	G 1/4"	20	17	9	6
GHG - 1 1/4"	80	62.5	56	56	86	G 1 1/4"	35 x 2	30	G 1/4"	20	17	9	6

For installation, operation and maintenance, follow the operating instructions that come with each piece of equipment.

hp-Overflow valves with flanged connection 2.2

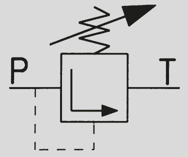
Type of actuation E: with adjustment screw

For lubricating and hydraulic oils and many other self-lubricating non-corrosive fluids. For heating oils EL, L, M, S and ES, coal tar oils, kerosene.

Maximum temperature of fluid medium: 150 °C.

Material: Casing made of hydraulic cast iron (GGG40)
piston, valve tip, spring of hardened steel.

Function: Directly-controlled, spring-loaded overflow valve for maintaining a set operating pressure or a set maximum pressure in a pressure pipe.

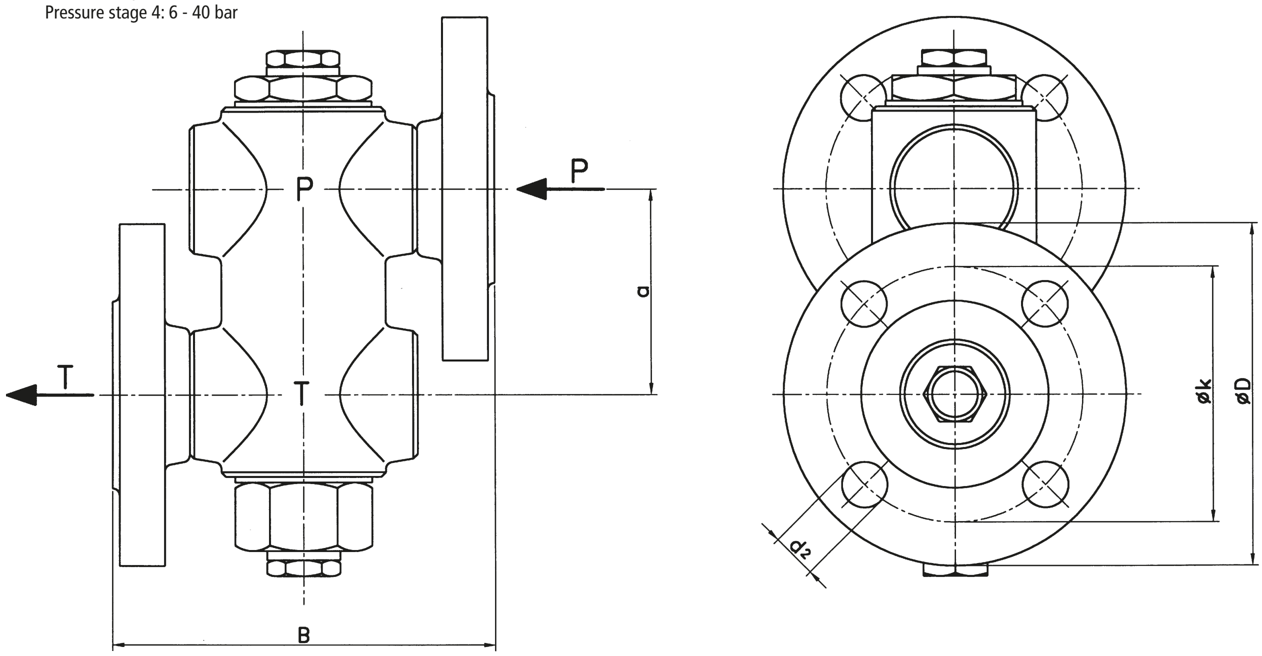


Summary:
hp-Overflow valve,
flow range: . . . . . (l/h)
pressure stage . . . . , adjustable . . . . . (bar)
Type: . . . . .

hp-Overflow valves with flanged connection

Model	Possible pressure stages for each model	Flange DIN2635 PN 40	Flow range [2] l/h	Viscosity range [2] cSt	Item No.
FDR 15 - E -	0 = 0.5 - 1.5 bar	DN 15 [1]	30 - 600	2.8 to 480	0270001
FDR 20 - E - [3]	1 = 1 - 4 bar	DN 20 [1]	100 - 2000	2.8 to 480	0270002
FDR 25 - E -	2 = 2 - 9 bar	DN 25 [1]	300 - 6000	2.8 to 480	0270003
FDR 32 - E -	3 = 6 - 25 bar	DN 32 [1]	500 - 10000	2.8 to 480	0270004
FDR 50 - E - [4]	4 = 15 - 40 bar	DN 50	8000 - 20000	2.8 to 480	0270006

[1] Counterflange with seal + screws must be ordered separately
[2] For curves see page 31
[3] Not pressure stage 0, for pressure stage 1: 0.5 - 3.5 bar, all further pressure stages according to table
[4] Only with: Pressure stage 1: 1 - 4 bar
Pressure stage 2: 2 - 9 bar
Pressure stage 4: 6 - 40 bar



Size table

Model	with hp-Overflow valve	a	b	DIN flange DIN 2635	Ø D	Ø k	Ø d	
FDR 15	B - G = 1/2"	55	92	DN 15	95	65	14	suitable Counter flange from PN 10 - 40 to DIN EN 1092
FDR 20	B - GH = 3/4"	63	118	DN 20	105	75	14	
FDR 25	B - GHG = 1"	80	134	DN 25	115	85	14	
FDR 32	B - GHG = 1 1/4"	80	138	DN 32	140	100	18	
FDR 50		140	205	DN 50	165	125	18	

For installation, operation and maintenance, follow the operating instructions that come with each piece of equipment.

hp-Pressure-regulating valve with modulating kit 2.3

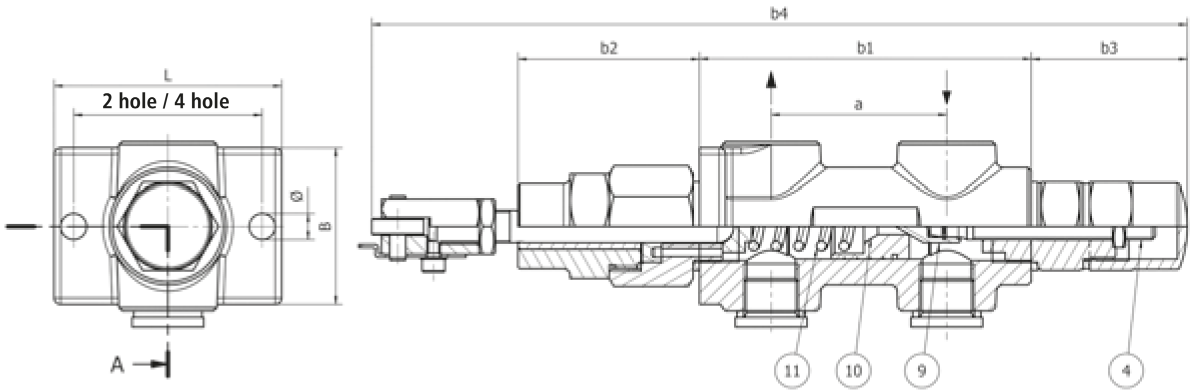
Usage: with modulating kit

With the pressure regulating valve the oil quantity on the bypass of the burner is set, which is required to achieve the relevant nozzle or burner performance.

Maximum temperature of fluid medium: 150 °C.

Material: Casing made of hydraulic cast iron (GGG40)
piston, valve tip, spring of hardened steel.

Model	Possible pressure stages for each model	Connection	Flow range l/h	Viscosity range cSt	Item No.	Weight (kg)
DRV 18 EL	2 = 2 - 18 bar 3 = 6 - 25 bar	G 3/8"	300 -600	2.8 to 480	025 0202	1.5
DRV 19 EL		G 3/4"	1000 -2000	2.8 to 480	025 0206	3
DRV 21 S		G 3/8"	300 -600	2.8 to 480	025 0210	1.5
DRV 22 S		G 3/4"	1000 -2000	2.8 to 480	025 0214	3



Pressure setting:

The return oil flows into the pressure chamber of the pressure regulating valve, situated between the piston (10) and valve cone (9). On the drain side are situated the piston (10) and the spring (11). This spring is compressed more or less by the shaft that is supported in the guide bushing, depending on the burner performance. The greater the pressure on the spring, the greater the pressure in the bypass and therefore the nozzle consumption.

The basic setting is put on the regulating screw 4. Clockwise rotation corresponds to an increase in pressure, counterclockwise to a pressure reduction.
Positions: **4** Regulating screw | **9** Valve cone | **10** Piston | **11** Spring

Size table

Model	a	b1	b2	b3	b4	Flange dimensions				
						L	B	Hole pattern		Ø
DRV 18 EL + 21 S	54	102	56	46	250	70	48	58	2 hole	8
DRV 19 EL + 22 S	63	119	76	46	300	70	70	54 x 54	4 hole	8

For installation, operation and maintenance, follow the operating instructions that come with each piece of equipment.

hp-Overflow valves with flange connection for SAE-flange 2.4

Type of actuation E: with adjustment screw

For lubricating and hydraulic oils and many other self-lubricating non-corrosive fluids. For heating oils EL, L, M, S and ES, kerosene.

Maximum temperature of fluid medium: 150°C

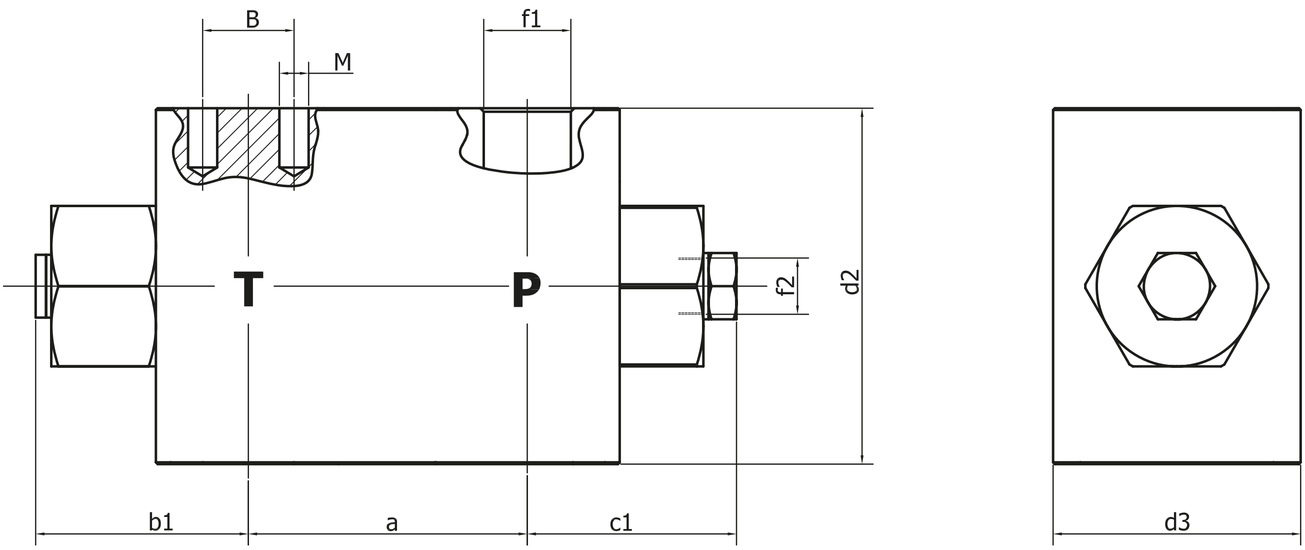
Material: casing (GGG 40); certificate 3.1 on request; piston, valve tip, spring of hardened steel

Function: Directly-controlled, spring-loaded overflow valve for maintaining a set operating pressure or a set maximum pressure in a pressure pipe.

Model	Possible pressure stages for each model	SAE flange connection	Flow range [2] l/h	Viscosity range [2] cSt	Item No.	Weight Kg
B - G - E - SAE 1/2	2 = 2 - 9 bar	G 1/2"	30 - 600	2.8 to 480	027 0210	2.3
B - GH - E - SAE 3/4"	3 = 6 - 25 bar	G 3/4"	100 - 2000	2.8 to 480	027 0220	4.1
B - GHG - E - SAE 3/1"	4 = 15 - 40 bar	G1"	300 - 6000	2.8 to 480	027 0230	6.3

For installation, operation and maintenance, follow the operating instructions that come with each piece of equipment.

[2] For curves see page 31



Model with regulating screw

After removing cover screw on the regulating screw the pressure is increased by turning clockwise with an allen key. It is decreased by turning counterclockwise.

Size table

Model	a	b1	c1	d1	d3	f1	f2	SAE-flange dimensions			
								Size	A	B	M
B - G - E - SAE 1/2	55	51	37	68	54	Ø 13	G1/4"	1/2"	38.1	17.5	M 8
B - GH - E - SAE 3/4"	63	57	43	88	65	Ø 19	G1/4"	3/4"	47.6	22.2	M 10
B - GHG - E - SAE 1"	80	69	68	102	68	Ø 25	G1/4"	1"	52.4	26.2	M 10

hp-Overflow valves of Series BV 2.5

Type of actuation E: with adjustment screw

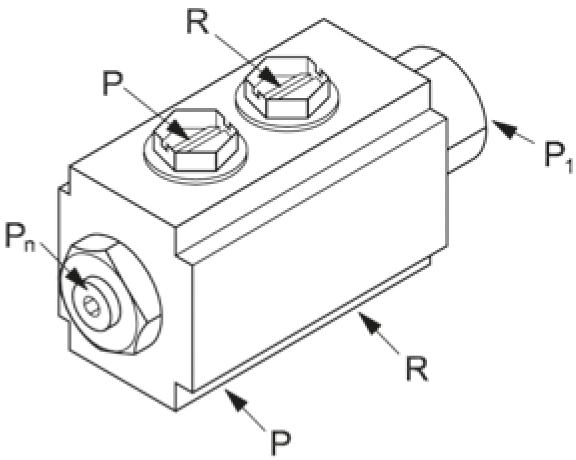
For lubricating and hydraulic oils and many other self-lubricating non-corrosive fluids. For heating oils EL, L, M, S and ES, coal tar oils, kerosene.

Maximum temperature of fluid medium: 150°C

Material: casing (GGG 40); certificate 3.1 on request; piston, valve tip, spring of hardened steel

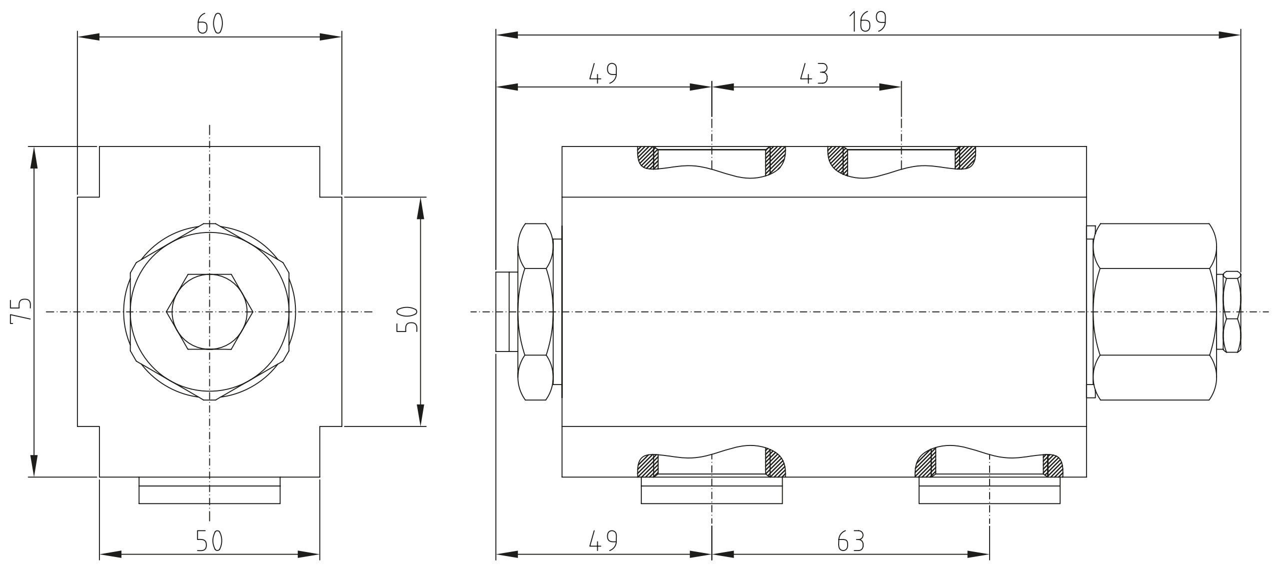
Function: Directly-controlled, spring-loaded overflow valve for maintaining a set operating pressure or a set maximum pressure in a pressure pipe.

BV valve		
Viscosity range	(mm²/s)	1.3 - 700
Flow rate	l/h	300 -2000
Pressure range	bar	2-9 / 6-25 / 15-40
Factory setting	bar	minimum pressure
Weight		3.8 kg
max. oil temperature	°C	150
Ambient temperature	°C	-10 + +90
Storage temperature	°C	-20 + +60



R Bypass connection G 3/4"
P Delivery output G 3/4"
P_n Manometer connection G 1/4"
P_1 Pressure regulation (under cover screw)

Item No.
0250330



Pumps and Valves
Motor pump groups
Units for single-pipe installation
Feed pumps and Pressure aggregates
Oil burner pressure aggregates
Filters
Pump controls
Accessories and Spare parts
Nozzles
Special units and Application
General

hp-Pressure-regulating valve of Series B-PRO 2.6

B-PRO model

B-Pro valves are used to control system pressure and flow. They are available in 4 sizes with capacity up to 2000 l/h. The valves are used in connection with spillback nozzles, where pressure and flow in the spillback determine the nozzle capacity.

Maximum temperature of fluid medium: 150°C

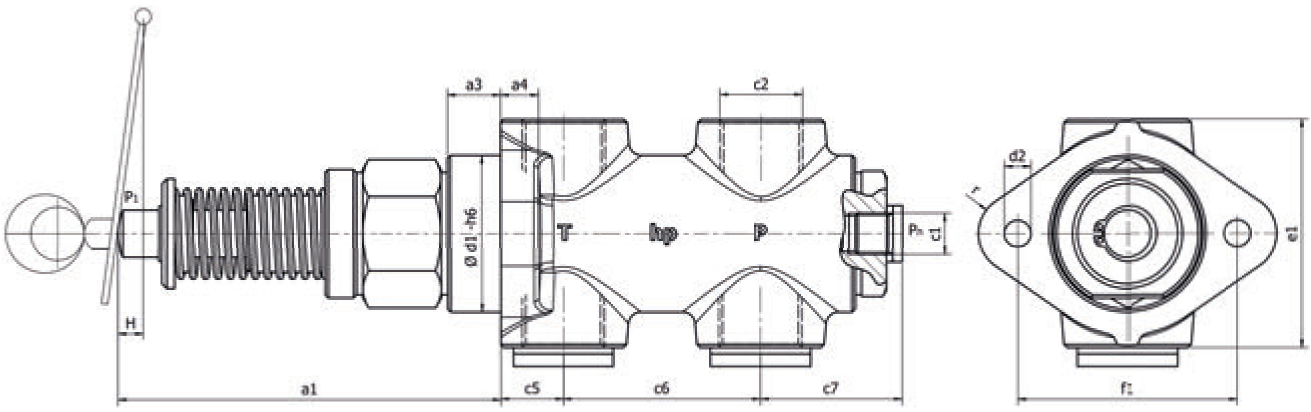
Material: casing (GGG 40); certificate 3.1 on request; piston, stop pin, spring of hardened steel

Usage and characteristics:
· Light and heavy oil
· Oil burner with spillback nozzles

B-PRO	Size		B-PP-PRO		B-P-PRO		B-G-PRO		B-GH-PRO	
Viscosity range (measured in inlet)	cSt. (mm²/s)		1.3 - 700							
Pressure range	bar		Pressure stage 2 (2-22 bar)				Pressure stage 4 (5-45 bar)			
Factory setting	bar		Minimum pressure							
Weight	kg		0.6		1.2		1.2		2.6	
max. oil temperature	°C		150							
Ambient temperature	°C		-10 to +90							
Storage temperature	°C		-20 to +60							
Item No.	Pressure stage 2	Pressure stage 4	0250310	0250312	0250314	0250316	0250318	0250320	0250322	0250324

Flow rate

	Minimum in l/h	Nominal in l/h	Maximum in l/h
B - PP - Pro	20	60	120
B - P - Pro	45	160	300
B - G - Pro	90	300	600
B - GH - Pro	300	1000	2000

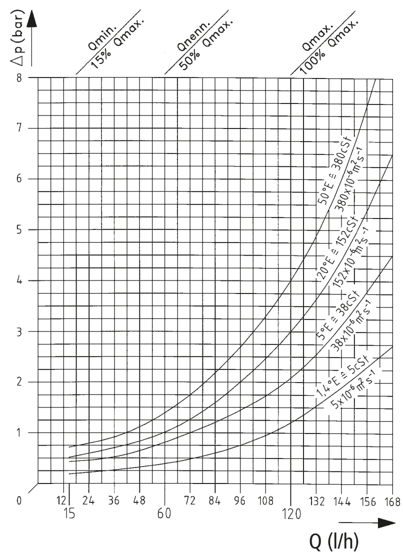


T Return connection to tank
P Pressure outlet
P_n Pressure gauge port
P_1 Pressure and flow setting

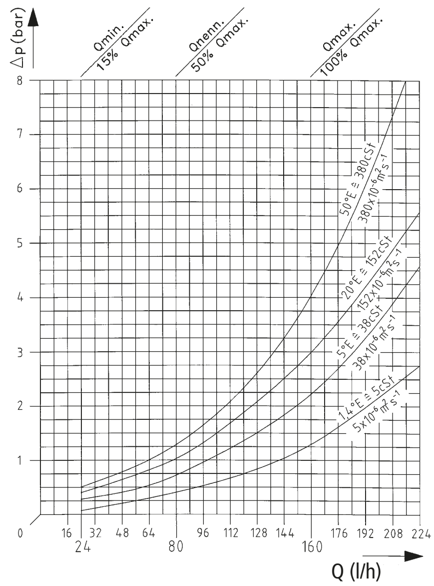
Model	a1	a3	a4	c1	c2	c5	c6	c7	d1	d2	e1	f1	H	r
B-PP-PRO	73	10	8	G1/8"	G1/4"	12	43	34	26	5.5	40	40	6	8
B-P-PRO	90	12	10	G1/8"	G3/8"	15	65	37	32	6.2	55	51	10	8
B-G-PRO	90	12	10	G1/8"	G3/8"	15	65	37	32	6.2	55	51	10	8
B-GH-PRO	121	17	12	G1/8"	G3/4"	20	63	48	50	8.4	70	70	12	12.5

Flow curve ∆ p - Q for hp-Overflow valves 2.7

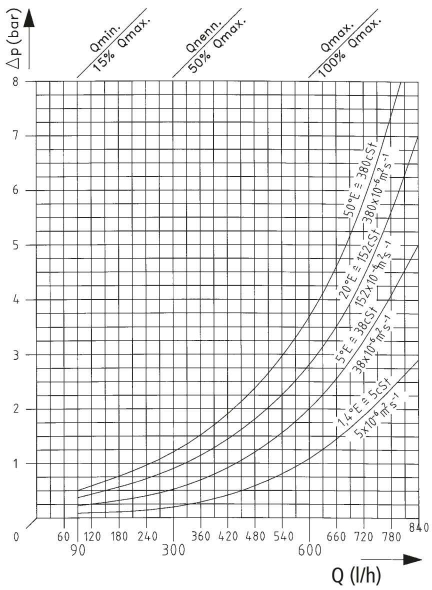
Model B-PP-E and B-P-E 1/4"



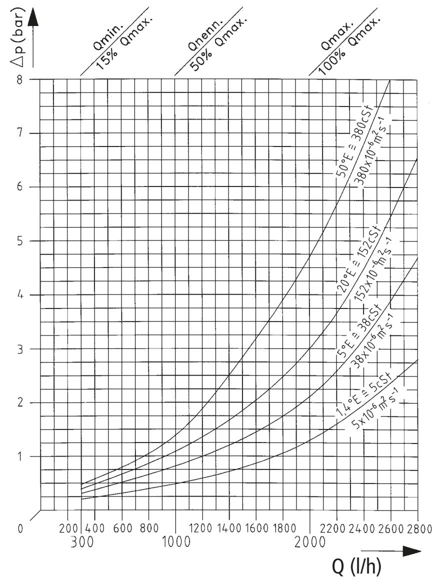
Model B-P-E



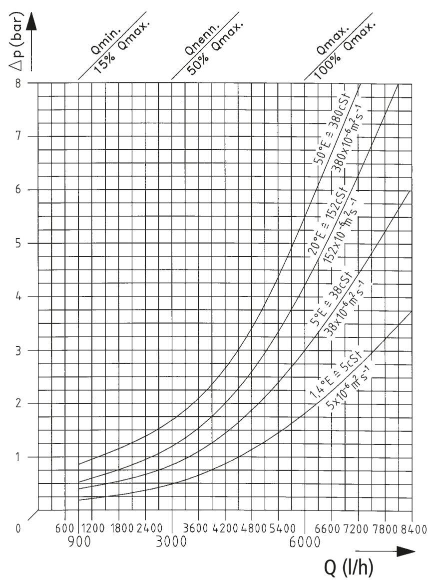
Model B-G-E and FDR 15-E



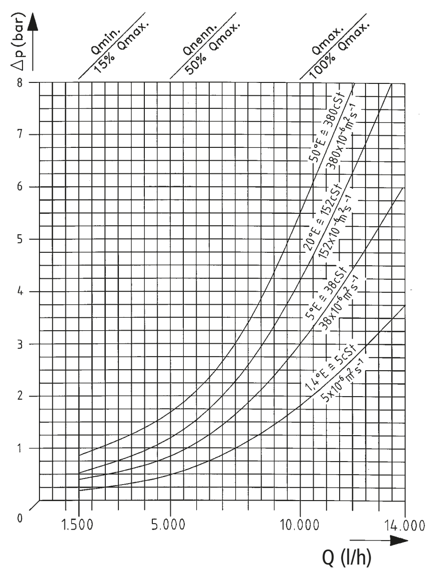
Model B-GH-E and FDR 20-E



Model B-GHG-E and FDR 25-E



Model B-GHG-1 1/4" and FDR 32-E



hp-Motor pump groups; Series SMG and MMG 3.0

Horizontal single units with **hp-Industrial pumps** and axial face shaft seal (SMG) or magnetic coupling (MMG) for loads up to max. 5 bar and max. 150 °C. Easy to operate, maximum operational safety, extremely low-noise, high suction power and long service life.

When used as feed units for fuel oil supply to DIN/EN 12514-1, the max. operating pressure of 6 bar must not be exceeded.

When used: as conveying or feed units, designed for up to 9 bar pressure.
as pressure units, designed for up to 30 bar pressure.
with higher pressures, suitable for up to 40 bar.

> The pump units are fitted with standard rotary current motors B3/B14 or B3/B5, 230 V, 400 V, 50 Hz, 1400 RPM, Protection IP 55, insulation class F. **From 4 kW the motors are executed for 400/690 V, 50 Hz. Y-Δ-cirquit with power supply must be specified with orders.**

> Other voltages and frequencies can be supplied at an additional cost.

> Installation situation: Horizontal, connections upwards

These motor pump units may be equipped with all the pumps of the proven hp-Industrial pump programs.

Model key for determining order specifications for hp-Motor pump groups

E.g.: SMG... – – – –

Type	Direction of rotation[1] viewed from pump shaft	Pressure stage bar	Speed of rotation [1]	Medium	Special design and accessories (add code letters sequentially)
SMG (with axial face seal) e.g.: SMG 1629 MMG (with magnetic coupling) e.g.: MMG 1848	Standard design I = counterclockwise D = clockwise as customer desires	**0** = 0.5 - 1.5 **1** = 1 - 4 **2** = 2 - 9 **3** = 6 - 25 **4** = 15 - 40	9 = 980 RPM 1 = 1400 RPM 2 = 2800 RPM	**0** = heating oil EL MGO / MDO **5** = heavy oil	**H1** = electrical auxiliary heating (heating cartridge) (for heating power/item no: see tab. S 20) **Wa** = fitted on oil pan - for wall mounting (item no.: see Accessories page 46) **LH** = Fitted with oil pan with leakage detection (item no: see Accessories page 83) **S**[2] = equipped with electrical pressure switch for monitoring the pressure line (pipe burst check) **DT** = Pressure transmitter (for description, see page 84)

Max. permitted suction pressure on suction port A of the pump – 0.6 bar.
Warning, gas separation occurs at just – 0.4 bar.

Ordering example: hp-Motor pump groups Series SMG 1568 with hp-Industrial pump type VBHP-I with integrated overflow valve, direction of rotation viewed from pump shaft: I =clockwise, discharge: 700 l/h at 1400 RPM and 30 bar; operating pressure: 25 bar, adjustable from 15 to 30 bar; max. pressure: 30 bar; medium: HFO; viscosity: 6 cSt. at 140 °C; motor. 1.5 kW, 230/400V, 50Hz, protection IP55; accessories: H1 electrical auxiliary heating. **Model key: SMG 1568 - I - 4 - 10 - H1**

For installation, operation and maintenance, follow the operating instructions that come with each piece of equipment.

hp-Motor pump groups; Series SMG-VD

Single pump units with 1400 RPM and 2800 RPM, with integrated overflow valve, integrated filter insert and AC motor.

Designed as a feed unit with p_{max} 9 bar.

Model	Discharge [l/h]	Motor ~230V, 50 Hz		Item No.:	max. suction height [m]	max. pressure [bar]	Dimensions		
		1400 RPM	2800 RPM				Length	Width	Height
SMG-VD-I-2-10	50	0.18 kW	-	0300001	5	6	290	160	165
SMG-VD-I-2-20	100	-	0.18 kW	0300002	5	6	290	160	165

Suction port: G 1/4"
Delivery port: G 1/8"
Oil pan with wall mounting: 400 x 200 - Item no.: 0820501

[1] The direction of rotation of the pumps can only be changed in the factory.
[2] Note: In the place where it is fitted, as a "lower limiter" an electrical pressure monitor must be provided as a pipe break check. This condition is met by selecting the "S" accessory.

hp-Motor pump groups with magnetic drive - MaG-DrivE 3.1

No more damage due to faulty axial face seals.

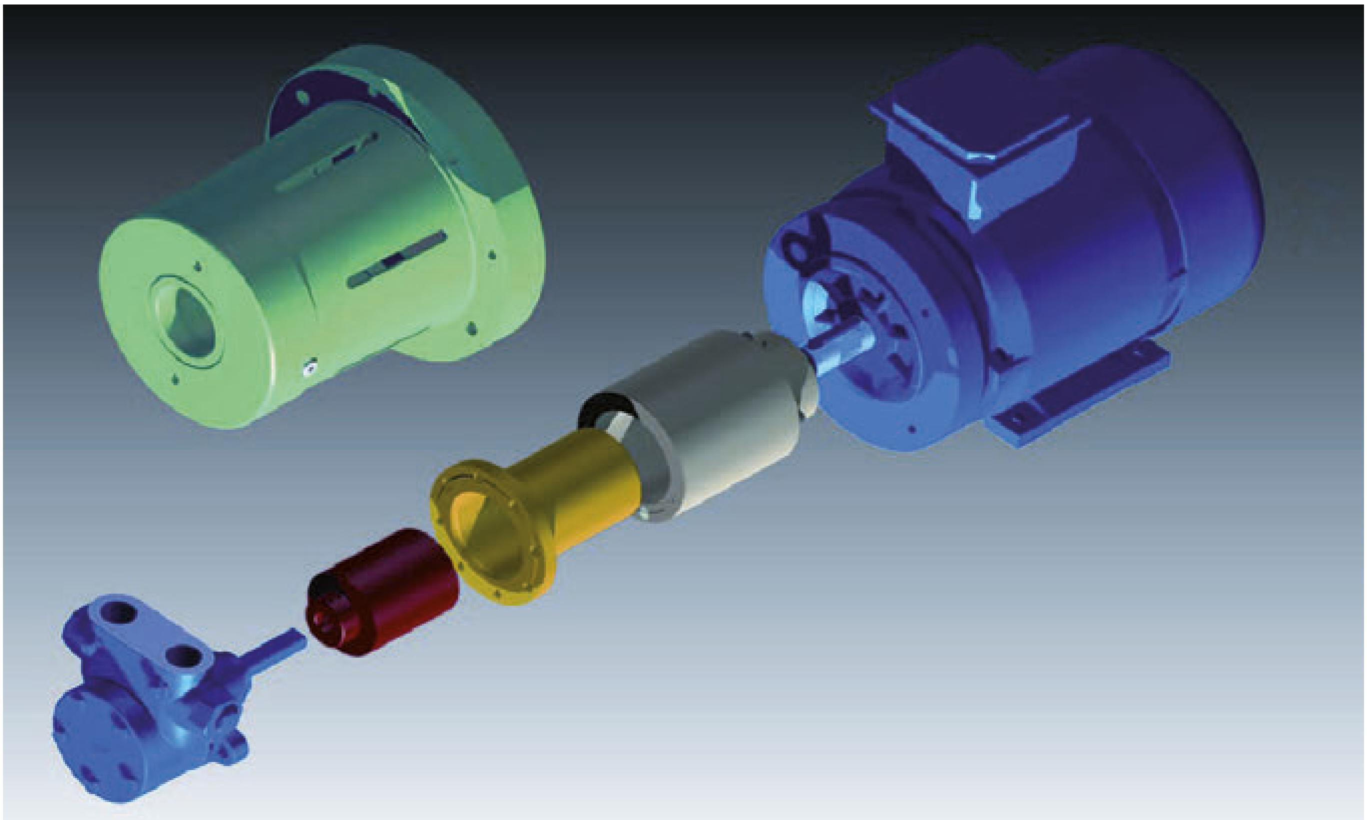
Until now, axial face seals had to be replaced at regular intervals or ahead of schedule due to a fault. The ongoing operating costs were one of the important factors when purchasing a pump. Not any more! The hp-MaG-DrivE is 100% leak-free. Maintenance work or repairs on conventional shaft seals are finally a thing of the past.

The contactless rotational transmission of the magnetic drive provides additional security by destruction-free de-coupling if there is an overload or blockages. As soon as the motor is shut down, the magnetic field is resynchronised, so that the pumps can be restarted.

The use of magnets made of a special samarium cobalt alloy guarantees a stable magnetic field both over a large temperature range and also over a long period.

All the motor pump units of the SMG series can be obtained with our hp-MaG-DrivE and may be equipped in the factory using a conversion set within the shortest possible time. The connection dimensions of the conventional SMG do not change.

As well as all the advantages mentioned, the environmental protection is at the heart of our development work! To protect our environment against damage by our products – for example, caused by the undetected leakage into the environment of damaging media – we will reinforce our efforts with regard to the further development of our hp products.



Conditions of use	
self-lubricating media with a viscosity of 5 – 500 mm²/s	
Discharge	160 - 6,700 l/h
Pressure$_{max.}$	40 bar
Torque$_{max.}$	60 Nm

All hp-Aggregats can be retrofitted with the hp-MaG-DrivE.

hp-Motor pump groups; Series SMG 3.2

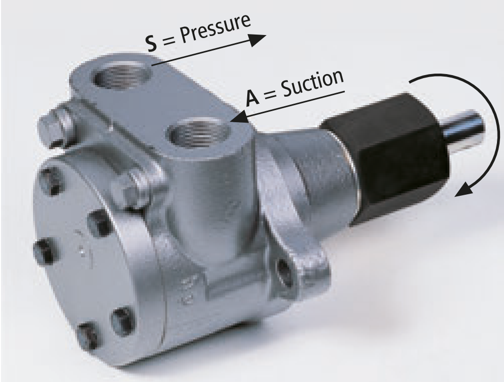
Series B without overflow valve

Single units with 1400 RPM with **hp-Industrial pumps**

Suitable for use with hydraulic oils, lubricating oils, all heating oils, coal tar oils, kerosenes and many other self-lubricating fluids.
The motor powers are applicable for fluids with a viscosity up to 80 cSt.
From 80 to 150 cSt. the motor must be designed for a power stage – construction size – that is larger. At an additional cost, on request.

The pump connections are marked as follows:
A = Suction connection S = Delivery connection

The pumps are designed in the standard version with direction of rotation I = clockwise (viewed from the pump shaft). The position of the pump connections depends on the direction of rotation. (See figure)



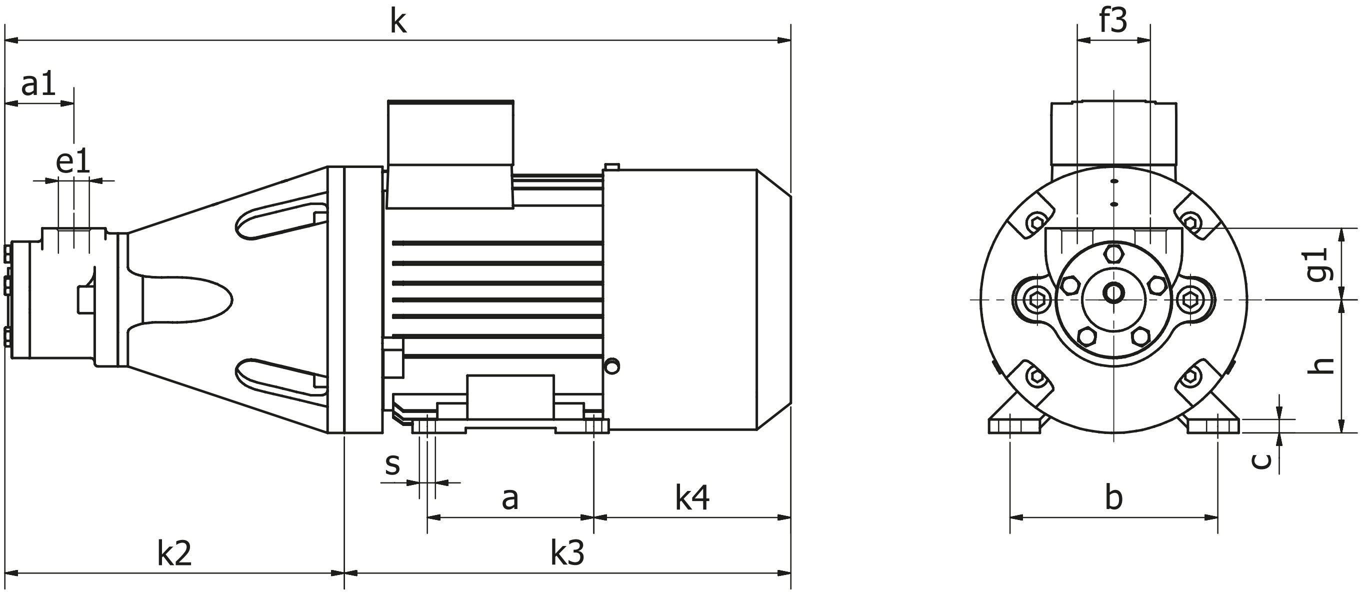
Direction of rotation I = counterclockwise Standard version
For direction of rotation D = clockwise, swap round the oil connection A = suction and S = pressure.
The direction of rotation can only be changed in the factory.

Series size	Pump model	Discharge at 1400 RPM at 0 - 9 bar	Discharge at 1400 RPM at 30 bar	Motor power	Connections[1)]*	H1 heating Watt	Gear rotor / shaft Ø	Item No.	
SMG 1501	BP	45 l/h	–	0.18 kW	G 3/8"	100	25/12	0350001	
SMG 1502	BM	80 l/h	–	0.18 kW	G 3/8"	100	25/12	0350002	
SMG 1503	BG	120 l/h	–	0.18 kW	G 3/8"	100	25/12	0350003	
SMG 1504	BF	160 l/h	–	0.18 kW	G 3/8"	100	25/12	0350004	
SMG 1505	BGP	300 l/h	–	0.18 kW	G 1/2"	100	38/12	0350005	
SMG 1506	BGM	450 l/h	–	0.37 kW	G 1/2"	100	38/12	0350006	for max. pressure
SMG 1507	BGG	600 l/h	–	0.37 kW	G 1/2"	100	38/12	0350007	designed from 9 bar
SMG 1508	BHP	1000 l/h	–	0.75 kW	G 3/4"	160	56/18	0350008	
SMG 1509	BHM	1500 l/h	–	0.75 kW	G 3/4"	160	56/18	0350009	to DIN/EN 12514-1
SMG 1510	BHG	2000 l/h	–	1.1 kW	G 3/4"	160	56/18	0350010	on max. pressure
SMG 1511	BHGP	3000 l/h	–	1.5 kW	G 1 1/2"	280	75/22	0350011	limited from 6 bar
SMG 1511-1	BHGPZ	3700 l/h	–	1.5 kW	G 1 1/2"	250	75/22	0350059	and set
SMG 1512	BHGM	4500 l/h	–	2.2 kW	G 1 1/2"	280	75/22	0350012	
SMG 1513	BHGG	6000 l/h	–	3 kW	G 1 1/2"	280	75/22	0350013	
SMG 1521	BP	45 l/h	30 l/h	0.18 kW	G 3/8"	100	25/12	0350014	
SMG 1522	BM	80 l/h	60 l/h	0.18 kW	G 3/8"	100	25/12	0350015	
SMG 1523	BG	120 l/h	100 l/h	0.18 kW	G 3/8"	100	25/12	0350016	
SMG 1524	BF	160 l/h	140 l/h	0.37 kW	G 3/8"	100	25/12	0350017	
SMG 1525	BGP	300 l/h	240 l/h	0.37 kW	G 1/2"	100	38/12	0350018	
SMG 1526	BGM	450 l/h	390 l/h	0.75 kW	G 1/2"	100	38/12	0350019	
SMG 1527	BGG	600 l/h	520 l/h	0.75 kW	G 1/2"	100	38/12	0350020	p_{max} 30 bar
SMG 1528	BHP	1000 l/h	700 l/h	1.5 kW	G 3/4"	160	56/18	0350021	
SMG 1529	BHM	1500 l/h	1200 l/h	2.2 kW	G 3/4"	160	56/18	0350022	
SMG 1530	BHG	2000 l/h	1700 l/h	3 kW	G 3/4"	160	56/18	0350023	
SMG 1531	BHGP	3000 l/h	2200 l/h	4 kW	G 1 1/2"	280	75/22	0350024	
SMG 1531-1	BHGPZ	3700 l/h	3000 l/h	4 kW	G 1 1/2"	280	75/22	0350060	
SMG 1532	BHGM	4500 l/h	3600 l/h	5.5 kW	G 1 1/2"	280	75/22	0350025	
SMG 1533	BHGG	6000 l/h	4800 l/h	7.5 kW	G 1 1/2"	280	75/22	0350026	

Series size	Pump model	Discharge at 1400 RPM at 0 bar	Discharge at 1400 RPM at 40 bar	Motor power	Connections[1)]*	H1 heating Watt	Gear rotor / shaft Ø	Item No.	
SMG 1902	BM	80 l/h	50 l/h	0.18 kW	G 3/8"	100	25/12	0390001	
SMG 1903	BG	120 l/h	80 l/h	0.37 kW	G 3/8"	100	25/12	0390002	
SMG 1904	BF	160 l/h	120 l/h	0.37 kW	G 3/8"	100	25/12	0390003	
SMG 1905	BGP	300 l/h	200 l/h	0.75 kW	G 1/2"	100	38/12	0390004	
SMG 1906	BGM	450 l/h	360 l/h	1.1 kW	G 1/2"	100	38/12	0390005	
SMG 1907	BGG	600 l/h	480 l/h	1.5 kW	G 1/2"	100	38/12	0390006	for max. pressure
SMG 1908	BHP	1000 l/h	600 l/h	2.2 kW	G 3/4"	160	56/18	0390007	designed from 40 bar
SMG 1909	BHM	1500 l/h	1000 l/h	3 kW	G 3/4"	160	56/18	0390008	
SMG 1910	BHG	2000 l/h	1400 l/h	4 kW	G 3/4"	160	56/18	0390009	
SMG 1911	BHGP	3000 l/h	2000 l/h	5.5 kW	G 1 1/2"	280	75/22	0390010	
SMG 1911-1	BHGPZ	3700 l/h	2700 l/h	5.5 kW	G 1 1/2"	280	75/22	0390012	
SMG 1912	BHGM	4500 l/h	3200 l/h	7.5 kW	G 1 1/2"	280	75/22	0390011	

[1)] Pipe connections pipe thread DIN ISO 228-1
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.

Series B without overflow valve 3.2



Series size	Pump model	Discharge	Motor power	Dimensions												
				regardless of motor										for IE-3		
				a	a1	b	c	e1	f3	g1	h	k2	s	k	k3	k4
SMG 1501	BP	45 l/h	0.18 kW	80	36	100	7	G 3/8"	38	43	63	165	7	345	180	60
SMG 1502	BM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	38	43	63	165	7	345	180	60
SMG 1503	BG	120 l/h	0.18 kW	80	36	100	7	G 3/8"	38	43	63	165	7	345	180	60
SMG 1504	BF	160 l/h	0.18 kW	80	36	100	7	G 3/8"	38	43	63	165	7	345	180	60
SMG 1505	BGP	300 l/h	0.18 kW	80	36	100	7	G 1/2"	44	43	63	179	7	359	180	60
SMG 1506	BGM	450 l/h	0.37 kW	90	43	112	7	G 1/2"	44	43	71	186	7	396	210	82
SMG 1507	BGG	600 l/h	0.37 kW	90	43	112	7	G 1/2"	44	43	71	186	7	396	210	82
SMG 1508	BHP	1000 l/h	0.75 kW	100	49	125	8	G 3/4"	67	65	80	268	9.5	555	287	137
SMG 1509	BHM	1500 l/h	0.75 kW	100	49	125	8	G 3/4"	67	65	80	268	9.5	555	287	137
SMG 1510	BHG	2000 l/h	1.1 kW	100	49	140	10	G 3/4"	67	65	90	278	10	615	337	181
SMG 1511	BHGP	3000 l/h	1.5 kW	125	65	140	10	G 1 1/2"	100	90	90	340	10	677	337	156
SMG 1511-1	BHGPZ	3700 l/h	1.5 kW	125	65	140	10	G 1 1/2"	100	90	90	10	10	677	337	156
SMG 1512	BHGM	4500 l/h	2.2 kW	140	65	160	12	G 1 1/2"	100	90	100	350	12	714	364	160
SMG 1513	BHGG	6000 l/h	3.0 kW	140	65	160	12	G 1 1/2"	100	90	100	350	12	670	320	117
SMG 1521	BP	45 l/h	0.18 kW	80	36	100	7	G 3/8"	38	43	63	165	7	345	180	60
SMG 1522	BM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	38	43	63	165	7	345	180	60
SMG 1523	BG	120 l/h	0.18 kW	80	36	100	7	G 3/8"	38	43	63	165	7	345	180	60
SMG 1524	BF	160 l/h	0.37 kW	90	36	112	7	G 3/8"	38	43	71	172	7	382	210	82
SMG 1525	BGP	300 l/h	0.37 kW	90	43	112	7	G 1/2"	44	43	71	186	7	396	210	82
SMG 1526	BGM	450 l/h	0.75 kW	100	43	125	8	G 1/2"	44	43	80	206	9.5	480	287	137
SMG 1527	BGG	600 l/h	0.75 kW	100	43	125	8	G 1/2"	44	43	80	206	9.5	480	287	137
SMG 1528	BHP	1000 l/h	1.5 kW	125	49	140	10	G 3/4"	67	65	90	278	10	615	337	156
SMG 1529	BHM	1500 l/h	2.2 kW	140	49	160	14	G 3/4"	67	65	100	288	12	652	364	160
SMG 1530	BHG	2000 l/h	3.0 kW	140	49	160	14	G 3/4"	67	65	100	288	12	652	364	160
SMG 1531	BHGP	3000 l/h	4.0 kW	140	65	190	15	G 1 1/2"	100	90	112	350	12	697	347	137
SMG 1531-1	BHGPZ	3700 l/h	4.0 kW	140	65	190	12	G 1 1/2"	100	90	112	350	12	697	347	137
SMG 1532	BHGM	4500 l/h	5.5 kW	140	65	216	17	G 1 1/2"	100	90	132	370	12	790	420	199
SMG 1533	BHGG	6000 l/h	7.5 kW	140	65	216	17	G 1 1/2"	100	90	132	370	12	790	420	199
SMG 1902	BM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	38	43	63	165	7	345	180	60
SMG 1903	BG	120 l/h	0.37 kW	90	36	112	7	G 3/8"	38	43	71	172	7	382	210	82
SMG 1904	BF	160 l/h	0.37 kW	90	36	112	7	G 3/8"	38	43	71	172	7	382	210	82
SMG 1905	BGP	300 l/h	0.75 kW	100	43	125	8	G 1/2"	44	43	80	206	9.5	493	287	137
SMG 1906	BGM	450 l/h	1.1 kW	100	43	140	10	G 1/2"	44	43	90	206	10	543	337	182
SMG 1907	BGG	600 l/h	1.5 kW	125	43	140	10	G 1/2"	44	43	90	206	10	543	337	156
SMG 1908	BHP	1000 l/h	2.2 kW	140	49	160	12	G 3/4"	67	65	100	288	12	652	364	160
SMG 1909	BHM	1500 l/h	3.0 kW	140	49	160	12	G 3/4"	67	65	100	288	12	652	364	160
SMG 1910	BHG	2000 l/h	4.0 kW	140	49	190	12	G 3/4"	67	65	112	288	12	635	347	137
SMG 1911	BHGP	3000 l/h	5.5 kW	140	65	216	15	G 1 1/2"	100	90	132	371	12	790	420	199
SMG 1911-1	BHGPZ	3700 l/h	5.5 kW	140	65	216	15	G 1 1/2"	100	90	132	370	12	790	420	199
SMG 1912	BHGM	4500 l/h	7.5 kW	178	65	216	15	G 1 1/2"	100	90	132	370	12	790	420	153

The dimensional specifications of the electric motors vary according to manufacturer, therefore the dimensions of the motor pump units are not binding.

hp-Motor pump groups; Series SMG 3.3

Series VB with integrated overflow valve

Single units with 1400 RPM with **hp-Industrial pumps**

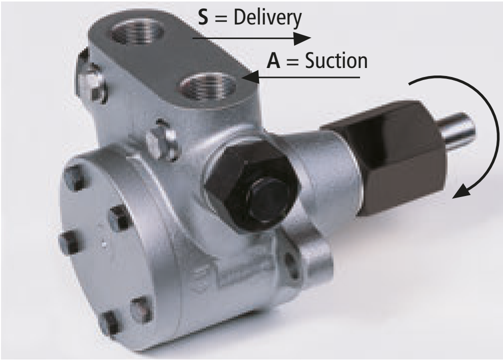
Standard design

Units up to 9 bar: **Pressure stage 2** = 2 to 9 bar. **Limited to 6 bar as per DIN/EN 12514-1**.

Units up to 40 bar: **Pressure stage 4** = 15 to 40 bar

Other pressure stages according to model key on page 32, please specify with order.

Suitable for use with hydraulic oils, lubricating oils, all heating oils, coal tar oils, kerosenes and many other self-lubricating fluids. The motor powers are applicable for fluids with a viscosity up to 80 cSt. From 80 to 150 cSt. the motor must be designed by one power stage – construction size – larger. At an additional cost, on request.



The pump connections are marked as follows:

A = Suction connection **S** = Delivery connection **R** = Bypass connection

The pumps are designed in the standard version with direction of rotation I = counterclockwise (viewed from the pump shaft). The position of the pump connections depends on direction of rotation. (See figure)

Direction of rotation I = counterclockwise Standard version

For direction of rotation D = clockwise, swap round the connections A = suction and S = discharge. The middle connection R = bypass remains unchanged. The direction of rotation can only be changed in the factory.

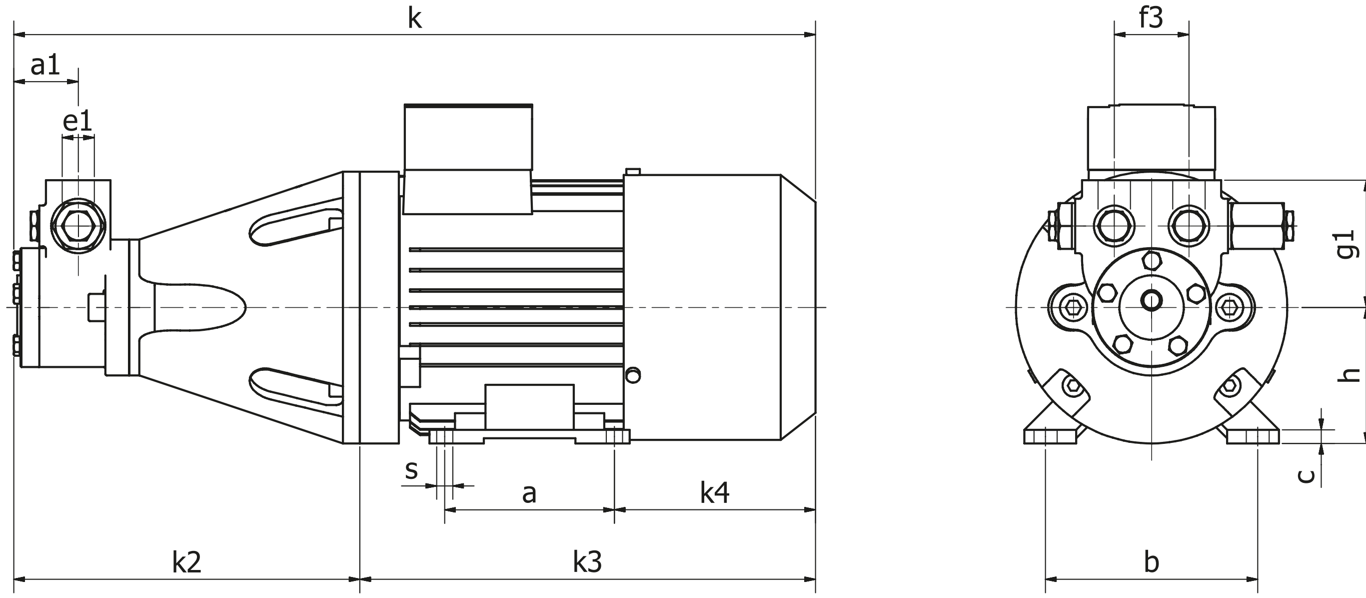
Series size	Pump model	Discharge at 1400 RPM at 0 - 9 bar	Discharge at 1400 RPM at 30 bar	Motor power	Connections[1]*	H1 heating Watt	Gear rotor / shaft Ø	Item No.	
SMG 1541	VBP	45 l/h	–	0.18 kW	G 3/8"	100	25/12	0350027	
SMG 1542	VBM	80 l/h	–	0.18 kW	G 3/8"	100	25/12	0350028	
SMG 1543	VBG	120 l/h	–	0.18 kW	G 3/8"	100	25/12	0350029	
SMG 1544	VBF	160 l/h	–	0.18 kW	G 3/8"	100	25/12	0350030	
SMG 1545	VBGP	300 l/h	–	0.18 kW	G 1/2"	100	38/12	0350031	
SMG 1546	VBGM	450 l/h	–	0.37 kW	G 1/2"	100	38/12	0350032	for max. pressure designed from 9 bar
SMG 1547	VBGG	600 l/h	–	0.37 kW	G 1/2"	100	38/12	0350033	
SMG 1548	VBHP	1000 l/h	–	0.75 kW	G 3/4"	160	56/18	0350034	
SMG 1549	VBHM	1500 l/h	–	0.75 kW	G 3/4"	160	56/18	0350035	to DIN/EN 12514-1 on max. pressure limited from 6 bar and set
SMG 1550	VBHG	2000 l/h	–	1.1 kW	G 3/4"	160	56/18	0350036	
SMG 1551	VBHGP	3000 l/h	–	1.5 kW	G 1"	280	75/22	0350037	
SMG 1551-1	VBHGPZ	3700 l/h	–	1.5 kW	G 1"	280	75/22	0350057	
SMG 1552	VBHGM	4500 l/h	–	2.2 kW	G 1"	280	75/22	0350038	
SMG 1553	VBHGG	6000 l/h	–	3 kW	G 1"	280	75/22	0350039	
SMG 1561	VBP	45 l/h	30 l/h	0.18 kW	G 3/8"	100	25/12	0350040	
SMG 1562	VBM	80 l/h	60 l/h	0.18 kW	G 3/8"	100	25/12	0350041	
SMG 1563	VBG	120 l/h	100 l/h	0.18 kW	G 3/8"	100	25/12	0350042	
SMG 1564	VBF	160 l/h	140 l/h	0.37 kW	G 3/8"	100	25/12	0350043	
SMG 1565	VBGP	300 l/h	240 l/h	0.37 kW	G 1/2"	100	38/12	0350044	
SMG 1566	VBGM	450 l/h	390 l/h	0.75 kW	G 1/2"	100	38/12	0350045	
SMG 1567	VBGG	600 l/h	520 l/h	0.75 kW	G 1/2"	100	38/12	0350046	p_{max} 30 bar
SMG 1568	VBHP	1000 l/h	700 l/h	1.5 kW	G 3/4"	160	56/18	0350047	
SMG 1569	VBHM	1500 l/h	1200 l/h	2.2 kW	G 3/4"	160	56/18	0350048	
SMG 1570	VBHG	2000 l/h	1700 l/h	3 kW	G 3/4"	160	56/18	0350049	
SMG 1571	VBHGP	3000 l/h	2200 l/h	4 kW	G 1"	280	75/22	0350050	
SMG 1571-1	VBHGPZ	3700 l/h	3000 l/h	4 kW	G 1"	280	75/22	0350058	
SMG 1572	VBHGM	4500 l/h	3600 l/h	5.5 kW	G 1"	280	75/22	0350051	
SMG 1573	VBHGG	6000 l/h	4800 l/h	7.5 kW	G 1"	280	75/22	0350052	

Series size	Pump model	Discharge at 1400 RPM at 0 bar	Discharge at 1400 RPM at 40 bar	Motor power	Connections[1]*	H1 heating Watt	Gear rotor / shaft Ø	Item No.	
SMG 1922	VBM	80 l/h	50 l/h	0.18 kW	G 3/8"	100	25/12	0390023	
SMG 1923	VBG	120 l/h	80 l/h	0.37 kW	G 3/8"	100	25/12	0390024	
SMG 1924	VBF	160 l/h	120 l/h	0.37 kW	G 3/8"	100	25/12	0390025	
SMG 1925	VBGP	300 l/h	200 l/h	0.75 kW	G 1/2"	100	38/12	0390026	
SMG 1926	VBGM	450 l/h	360 l/h	1.1 kW	G 1/2"	100	38/12	0390027	
SMG 1927	VBGG	600 l/h	480 l/h	1.5 kW	G 1/2"	100	38/12	0390028	for max. pressure designed from 40 bar
SMG 1928	VBHP	1000 l/h	600 l/h	2,2 kW	G 3/4"	160	56/18	0390029	
SMG 1929	VBHM	1500 l/h	1000 l/h	3 kW	G 3/4"	160	56/18	0390030	
SMG 1930	VBHG	2000 l/h	1400 l/h	4 kW	G 3/4"	160	56/18	0390031	
SMG 1931	VBHGP	3000 l/h	2000 l/h	5.5 kW	G 1"	280	75/22	0390032	
SMG 1931-1	VBHGPZ	3700 l/h	2700 l/h	5.5 kW	G 1"	280	75/22	0390034	
SMG 1932	VBHGM	4500 l/h	3200 l/h	7.5 kW	G 1"	280	75/22	0390033	

[1] Pipe connections pipe thread DIN ISO 228-1

* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.

Series VB with integrated overflow valve and bypass 3.3



Series size	Pump model	Discharge	Motor power	Dimensions												
				regardless of motor										for IE-3		
				a	a1	b	c	e1	f3	g1	h	k2	s	k	k3	k4
SMG 1541	VBP	45 l/h	0.18 kW	80	36	100	7	G 3/8"	38	67	63	165	7	345	180	60
SMG 1542	VBM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	38	67	63	165	7	345	180	60
SMG 1543	VBG	120 l/h	0.18 kW	80	36	100	7	G 3/8"	38	67	63	165	7	345	180	60
SMG 1544	VBF	160 l/h	0.18 kW	80	36	100	7	G 3/8"	38	67	63	165	7	345	180	60
SMG 1545	VBGP	300 l/h	0.18 kW	80	40	100	7	G 1/2"	44	75	63	179	7	359	180	60
SMG 1546	VBGM	450 l/h	0.37 kW	90	40	112	7	G 1/2"	44	75	71	186	7	396	210	82
SMG 1547	VBGG	600 l/h	0.37 kW	90	40	112	7	G 1/2"	44	75	71	186	7	396	210	82
SMG 1548	VBHP	1000 l/h	0.75 kW	100	49	125	8	G 3/4"	67	90	80	268	9.5	555	287	137
SMG 1549	VBHM	1500 l/h	0.75 kW	100	49	125	8	G 3/4"	67	90	80	268	9.5	555	287	137
SMG 1550	VBHG	2000 l/h	1.1 kW	100	49	140	10	G 3/4"	67	90	90	278	11	615	337	181
SMG 1551	VGHGP	3000 l/h	1.5 kW	125	63	140	10	G 1"	80	120	90	340	11	677	337	156
SMG 1551-1	VGHGPZ	3000 l/h	1.5 kW	125	63	140	10	G 1"	80	120	90	340	10	677	337	156
SMG 1552	VBHGM	4500 l/h	2.2 kW	140	63	160	12	G 1"	80	120	100	350	13	714	364	160
SMG 1553	VBHGG	6000 l/h	3.0 kW	140	63	160	12	G 1"	80	120	100	350	13	714	364	160
SMG 1561	VBP	45 l/h	0.18 kW	80	36	100	7	G 3/8"	38	67	63	165	7	345	180	60
SMG 1562	VBM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	38	67	63	165	7	345	180	60
SMG 1563	VBG	120 l/h	0.18 kW	80	36	100	7	G 3/8"	38	67	63	165	7	345	180	60
SMG 1564	VBF	160 l/h	0.37 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1565	VBGP	300 l/h	0.37 kW	90	40	112	7	G 1/2"	44	75	71	186	7	396	210	82
SMG 1566	VBGM	450 l/h	0.75 kW	100	40	125	8	G 1/2"	44	75	80	206	9.5	493	287	137
SMG 1567	VBGG	600 l/h	0.75 kW	100	40	125	8	G 1/2"	44	75	80	206	9.5	493	287	137
SMG 1568	VBHP	1000 l/h	1.5 kW	125	49	140	10	G 3/4"	67	90	90	278	10	615	337	156
SMG 1569	VBHM	1500 l/h	2.2 kW	140	49	160	12	G 3/4"	67	80	100	288	12	652	364	160
SMG 1570	VBHG	2000 l/h	3.0 kW	140	49	160	12	G 3/4"	67	90	100	288	12	652	364	160
SMG 1571	VBHGP	3000 l/h	4.0 kW	140	63	190	12	G 1"	80	120	112	350	12	697	347	137
SMG 1571-1	VBHGPZ	3700 l/h	4.0 kW	140	63	190	12	G 1"	80	120	112	350	12	697	347	137
SMG 1572	VBHGM	4500 l/h	5.5 kW	140	63	216	15	G 1"	80	120	132	370	12	790	420	199
SMG 1573	VBHGG	6000 l/h	7.5 kW	178	63	216	15	G 1"	80	120	132	370	12	790	420	153
SMG 1922	VBM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	38	67	63	165	7	345	180	60
SMG 1923	VBG	120 l/h	0.37 kW	90	36	112	7	G 3/8"	38	67	71	372	7	382	210	82
SMG 1924	VBF	160 l/h	0.37 kW	90	36	112	7	G 3/8"	38	67	71	372	7	382	210	82
SMG 1925	VBGP	300 l/h	0.75 kW	100	40	125	8	G 1/2"	44	75	80	206	9.5	493	287	137
SMG 1926	VBGM	450 l/h	1.1 kW	100	40	140	10	G 1/2"	44	75	90	206	10	543	337	181
SMG 1927	VBGG	600 l/h	1.5 kW	125	40	140	10	G 1/2"	44	75	90	206	10	543	337	156
SMG 1928	VBHP	1000 l/h	2.2 kW	140	49	160	12	G 3/4"	67	90	100	288	12	652	364	160
SMG 1929	VBHM	1500 l/h	3.0 kW	140	49	160	12	G 3/4"	67	90	100	288	12	652	364	160
SMG 1930	VBHG	2000 l/h	4.0 kW	140	49	190	12	G 3/4"	67	90	112	288	12	634	347	137
SMG 1931	VBHGP	3000 l/h	5.5 kW	140	63	216	15	G 1"	80	120	132	370	12	790	420	199
SMG 1931-1	VBHGPZ	3700 l/h	5.5 kW	140	63	216	15	G 1"	80	120	132	370	12	790	420	199
SMG 1932	VBHGM	4500 l/h	7.5 kW	178	63	216	15	G 1"	80	120	132	370	12	790	420	153

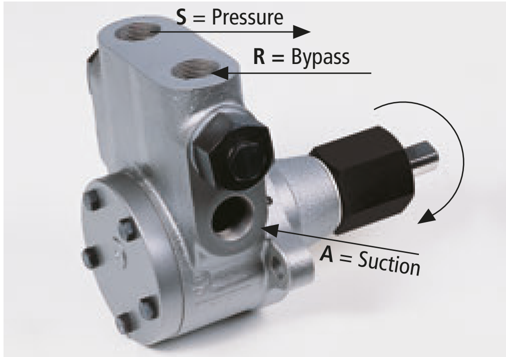
The dimensional specifications of the electric motors vary according to manufacturer, therefore the dimensions of the motor pump units are not binding.

hp-Motor pump groups; Series SMG 3.4

Series VBR with integrated overflow valve and bypass

Single units with 1400 RPM with **hp-Industrial pumps**

Standard design:
Units up to 9 bar: **Pressure stage 2** = 2 to 9 bar.
Limited to 6 bar as per DIN/EN 12514-1.
Units up to 40 bar: **Pressure stage 4** =15 to 40 bar.
Other pressure stages according to model key on page 32, please specify with order.



The pump connections are marked as follows:
A = Suction connection **S** = Delivery connection **R** = Bypass connection

The pumps are designed in the standard version with direction of rotation I = clockwise (viewed from the pump shaft). The position of the pump connections depends on the direction of rotation. (See figure)

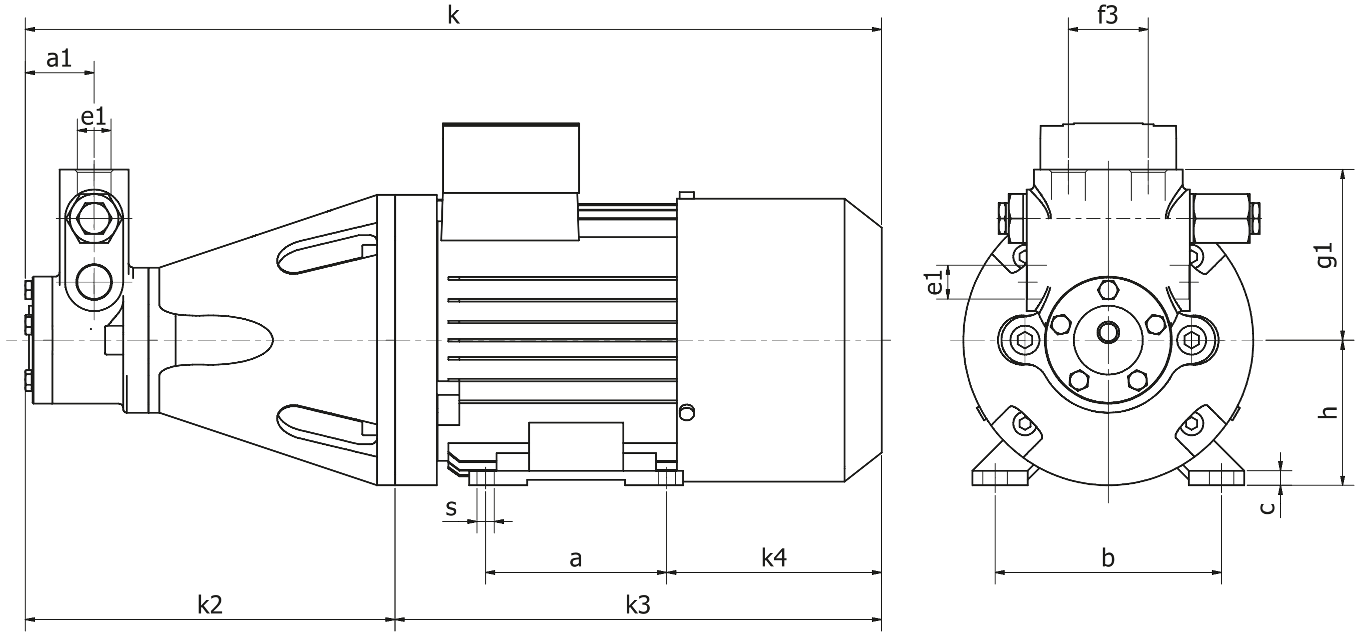
Direction of rotation I = counterclockwise Standard version
For direction of rotation D = clockwise, swap round the oil connections S = Delivery and R = Bypass. Suction port A = Suction is on the other side.

Series size	Pump model	Discharge at 1400 RPM		Motor power	Connections[1]*	H1 heating Watt	Gear rotor / shaft Ø	Item No.	
		at 0 - 9 bar	at 30 bar						
SMG 1601	VBRP	45 l/h	–	0.18 kW	G 3/8"	100	25/12	0360001	
SMG 1602	VBRM	80 l/h	–	0.18 kW	G 3/8"	100	25/12	0360002	
SMG 1603	VBRG	120 l/h	–	0.18 kW	G 3/8"	100	25/12	0360003	
SMG 1604	VBRF	160 l/h	–	0.18 kW	G 3/8"	100	25/12	0360004	
SMG 1605	VBGRP	300 l/h	–	0.18 kW	G 1/2"	100	38/12	0360005	
SMG 1606	VBGRM	450 l/h	–	0.37 kW	G 1/2"	100	38/12	0360006	for max. pressure
SMG 1607	VBGRG	600 l/h	–	0.37 kW	G 1/2"	100	38/12	0360007	designed from 9 bar
SMG 1608	VBHRP	1000 l/h	–	0.75 kW	G 3/4"	160	56/18	0360008	
SMG 1609	VBHRM	1500 l/h	–	0.75 kW	G 3/4"	160	56/18	0360009	to DIN/EN 12514-1
SMG 1610	VBHRG	2000 l/h	–	1.1 kW	G 3/4"	160	56/18	0360010	on max. pressure
SMG 1611	VBHGRP	3000 l/h	–	1.5 kW	G 1" [1]	280	75/22	0360011	limited from 6 bar
SMG 1611-1	VBHGRPZ	3700 l/h	–	1.5 kW	G 1" [1]	280	75/22	0360059	and set
SMG 1612	VBHGRM	4500 l/h	–	2.2 kW	G 1" [1]	280	75/22	0360012	
SMG 1613	VBHGRG	6000 l/h	–	3 kW	G 1" [1]	280	75/22	0360013	
SMG 1621	VBRP	45 l/h	30 l/h	0.18 kW	G 3/8"	100	25/12	0360014	
SMG 1622	VBRM	80 l/h	60 l/h	0.18 kW	G 3/8"	100	25/12	0360015	
SMG 1623	VBRG	120 l/h	100 l/h	0.18 kW	G 3/8"	100	25/12	0360016	
SMG 1624	VBRF	160 l/h	140 l/h	0.37 kW	G 3/8"	100	25/12	0360017	
SMG 1625	VBGRP	300 l/h	240 l/h	0.37 kW	G 1/2"	100	38/12	0360018	
SMG 1626	VBGRM	450 l/h	390 l/h	0.75 kW	G 1/2"	100	38/12	0360019	
SMG 1627	VBGRG	600 l/h	540 l/h	0.75 kW	G 1/2"	100	38/12	0360020	p_{max} 30 bar
SMG 1628	VBHRP	1000 l/h	700 l/h	1.5 kW	G 3/4"	160	56/18	0360021	
SMG 1629	VBHRM	1500 l/h	1200 l/h	2.2 kW	G 3/4"	160	56/18	0360022	
SMG 1630	VBHRG	2000 l/h	1700 l/h	3 kW	G 3/4"	160	56/18	0360023	
SMG 1631	VBHGRP	3000 l/h	2200 l/h	4 kW	G 1" [1]	280	75/22	0360024	
SMG 1631-1	VBHGRPZ	3700 l/h	3000 l/h	4 kW	G 1" [1]	280	75/22	0360060	
SMG 1632	VBHGRM	4500 l/h	3600 l/h	5.5 kW	G 1" [2]	280	75/22	0360025	
SMG 1633	VBHGRG	6000 l/h	4800 l/h	7.5 kW	G 1" [2]	280	75/22	0360026	

Series size	Pump model	Discharge at 1400 RPM		Motor power	Connections[1]*	H1 heating Watt	Gear rotor / shaft Ø	Item No.	
		at 0 bar	at 40 bar						
SMG 1942	VBRM	80 l/h	50 l/h	0.18 kW	G 3/8"	100	25/12	0390045	
SMG 1943	VBRG	120 l/h	80 l/h	0.37 kW	G 3/8"	100	25/12	0390046	
SMG 1944	VBRF	160 l/h	120 l/h	0.37 kW	G 3/8"	100	25/12	0390047	
SMG 1945	VBGRP	300 l/h	200 l/h	0.75 kW	G 1/2"	100	38/12	0390048	
SMG 1946	VBGRM	450 l/h	360 l/h	1.1 kW	G 1/2"	100	38/12	0390049	
SMG 1947	VBGRG	600 l/h	480 l/h	1.5 kW	G 1/2"	100	38/12	0390050	for max. pressure
SMG 1948	VBHRP	1000 l/h	600 l/h	2.2 kW	G 3/4"	160	56/18	0390051	designed from 40 bar
SMG 1949	VBHRM	1500 l/h	1000 l/h	3 kW	G 3/4"	160	56/18	0390052	
SMG 1950	VBHRG	2000 l/h	1400 l/h	4 kW	G 3/4"	160	56/18	0390053	
SMG 1951	VBHGRP	3000 l/h	2000 l/h	5.5 kW	G 1" [2]	280	75/22	0390054	
SMG 1951-1	VBHGRPZ	3700 l/h	2700 l/h	5.5 kW	G 1" [2]	280	75/22	0390056	
SMG 1952	VBHGRM	4500 l/h	3200 l/h	7.5 kW	G 1" [2]	280	75/22	0390055	

[1] Pipe connections pipe thread DIN ISO 228-1
[2] For SMG 1611 - 1613, SMG 1631 - 1633, SMG 1951 - 1952 the side suction port is A = G 1 1/2"
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.

Series VBR with integrated overflow valve and bypass 3.4



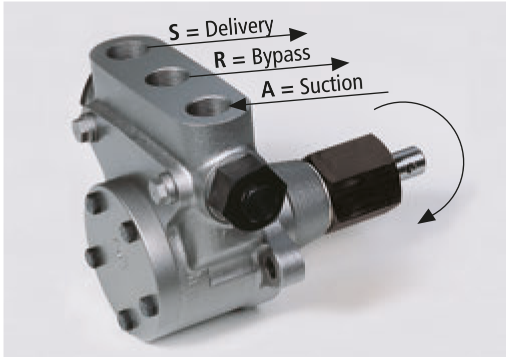
Series size	Pump model	Discharge	Motor power	Dimensions												
				regardless of motor										for IE-3		
				a	a1	b	c	e1	f3	g1	h	k2	s	k	k3	k4
SMG 1601	VBRP	45 l/h	0.18 kW	80	36	100	7	G 3/8"	38	90	63	165	7	345	180	60
SMG 1602	VBRM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	38	90	63	165	7	345	180	60
SMG 1603	VBRG	120 l/h	0.18 kW	80	36	100	7	G 3/8"	38	90	63	165	7	345	180	60
SMG 1604	VBRF	160 l/h	0.18 kW	80	36	100	7	G 3/8"	38	90	63	165	7	345	180	60
SMG 1605	VBGRP	300 l/h	0.18 kW	80	40	100	7	G 1/2"	44	94	63	179	7	359	180	60
SMG 1606	VBGRM	450 l/h	0.37 kW	90	40	112	7	G 1/2"	44	94	71	186	7	396	210	82
SMG 1607	VBGRG	600 l/h	0.37 kW	90	40	112	7	G 1/2"	44	94	71	186	7	396	210	82
SMG 1608	VBHRP	1000 l/h	0.75 kW	100	49	125	8	G 3/4"	67	115	80	268	9.5	555	287	137
SMG 1609	VBHRM	1500 l/h	0.75 kW	100	49	125	8	G 3/4"	67	115	80	268	9.5	555	287	137
SMG 1610	VBHRG	2000 l/h	1.1 kW	100	49	140	10	G 3/4"	67	115	90	278	10	615	337	181
SMG 1611	VBHGRP	3000 l/h	1.5 kW	125	63	140	10	G 1" 1)	80	120	90	340	10	677	337	156
SMG 1611 -1	VBHGRPZ	3700 l/h	1.5 kW	125	63	140	10	G 1" 1)	80	120	90	340	10	677	337	156
SMG 1612	VBHGRM	4500 l/h	2.2 kW	140	63	160	12	G 1" 1)	80	120	100	350	12	714	364	160
SMG 1613	VBHGRG	6000 l/h	3.0 kW	140	63	160	12	G 1" 1)	80	120	100	350	12	714	364	160
SMG 1621	VBRP	45 l/h	0.18 kW	80	36	100	7	G 3/8"	38	90	63	165	7	345	180	60
SMG 1622	VBRM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	38	90	63	165	7	345	180	60
SMG 1623	VBRG	120 l/h	0.18 kW	80	36	100	7	G 3/8"	38	90	63	165	7	345	180	60
SMG 1624	VBRF	160 l/h	0.37 kW	90	36	112	7	G 3/8"	38	90	71	172	7	382	210	82
SMG 1625	VBGRP	300 l/h	0.37 kW	90	40	112	7	G 1/2"	44	94	71	186	7	396	210	82
SMG 1626	VBGRM	450 l/h	0.75 kW	100	40	125	8	G 1/2"	44	94	80	206	9.5	493	287	137
SMG 1627	VBGRG	600 l/h	0.75 kW	100	40	125	8	G 1/2"	44	94	80	206	9.5	493	287	137
SMG 1628	VBHRP	1000 l/h	1.5 kW	125	49	140	10	G 3/4"	67	115	90	278	10	615	337	156
SMG 1629	VBHRM	1500 l/h	2.2 kW	140	49	160	12	G 3/4"	67	115	100	288	12	652	364	160
SMG 1630	VBHRG	2000 l/h	3.0 kW	140	49	160	12	G 3/4"	67	115	100	288	12	652	364	160
SMG 1631	VBHGRP	3000 l/h	4.0 kW	140	63	190	12	G 1" 1)	80	120	112	349	12	697	347	137
SMG 1631 -1	VBHGRPZ	3700 l/h	4.0 kW	140	63	190	12	G 1" 1)	80	120	112	350	12	697	347	137
SMG 1632	VBHGRM	4500 l/h	5.5 kW	140	63	216	15	G 1" 1)	80	120	132	370	12	790	420	199
SMG 1633	VBHGRG	6000 l/h	7.5 kW	178	63	216	15	G 1" 1)	80	120	132	370	12	790	420	153
SMG 1942	VBRM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	38	90	63	165	7	345	180	60
SMG 1943	VBRG	120 l/h	0.37 kW	90	36	112	7	G 3/8"	38	90	71	172	7	382	210	82
SMG 1944	VBRF	160 l/h	0.37 kW	90	36	112	7	G 3/8"	38	90	71	172	7	382	210	82
SMG 1945	VBGRP	300 l/h	0.75 kW	100	40	125	8	G 1/2"	44	94	80	206	9.5	493	287	137
SMG 1946	VBGRM	450 l/h	1.1 kW	100	40	140	10	G 1/2"	44	94	90	206	10	543	337	181
SMG 1947	VBGRG	600 l/h	1.5 kW	125	40	140	10	G 1/2"	44	94	90	206	10	543	337	156
SMG 1948	VBHRP	1000 l/h	2.2 kW	140	49	160	12	G 3/4"	67	115	100	288	12	652	364	160
SMG 1949	VBHRM	1500 l/h	3.0 kW	140	49	160	12	G 3/4"	67	115	100	288	12	652	364	160
SMG 1950	VBHRG	2000 l/h	4.0 kW	140	49	190	12	G 3/4"	67	115	112	288	12	635	347	137
SMG 1951	VBHGRP	3000 l/h	5.5 kW	140	63	216	15	G 1" 1)	80	120	132	370	12	790	420	199
SMG 1951 -1	VBHGRPZ	3700 l/h	5.5 kW	140	63	216	15	G 1" 1)	80	120	132	370	12	790	420	199
SMG 1952	VBHGRM	4500 l/h	7.5 kW	178	63	216	15	G 1" 1)	80	120	132	370	12	790	420	153

The dimensional specifications of the electric motors vary according to manufacturer, therefore the dimensions of the motor pump units are not binding.

hp-Motor pump groups; Series SMG 3.5

Series NV with integrated overflow valve and bypass

Single units with 1400 RPM with **hp-Industrial pumps**



Standard design:
Units up to 9 bar: **Pressure stage 2** = 2 to 9 bar.
Units up to 40 bar: **Pressure stage 4** = 15 to 40 bar
Other pressure stages according to model key on page 32, please specify with order.

Suitable for use with hydraulic oils, lubricating oils, all heating oils, coal tar oils, kerosenes and many other self-lubricating fluids. The motor powers are applicable for fluids with a viscosity up to 80 cSt. From 80 to 150 cSt. the motor must be designed by one power stage – construction size – larger. At an additional cost, on request.

The pump connections are marked as follows:
A = Suction connection **S** = Delivery connection **R** = Bypass connection

The pumps are designed in the standard version with direction of rotation I = counterclockwise (viewed from the pump shaft). The position of the pump connections depends on direction of rotation. (See figure)

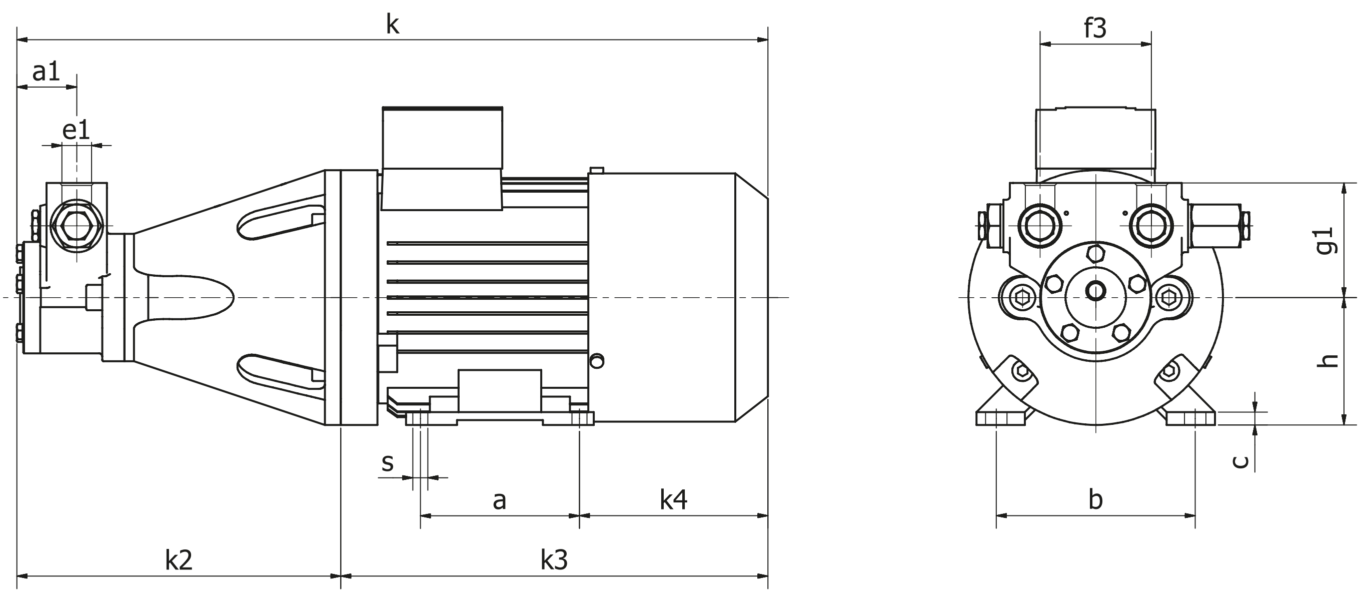
Direction of rotation I = counterclockwise Standard version
For direction of rotation D = clockwise, swap round the connections A = suction and S = discharge. The middle connection R = bypass remains unchanged. The direction of rotation can only be changed in the factory.

Series size	Pump model	Discharge at 1400 RPM		Motor power	Connections[1)]*	H1 heating Watt	Gear rotor / shaft Ø	Item No.	
		at 0 - 9 bar	at 30 bar						
SMG 1701	NVBRP	45 l/h	–	0.18 kW	G 3/8"	100	25/12	0370001	
SMG 1702	NVBRM	80 l/h	–	0.18 kW	G 3/8"	100	25/12	0370002	
SMG 1703	NVBRG	120 l/h	–	0.18 kW	G 3/8"	100	25/12	0370003	
SMG 1704	NVBRF	160 l/h	–	0.18 kW	G 3/8"	100	25/12	0370004	
SMG 1705	NVBGRP	300 l/h	–	0.18 kW	G 1/2"	100	38/12	0370005	for max. pressure
SMG 1706	NVBGRM	450 l/h	–	0.37 kW	G 1/2"	100	38/12	0370006	designed from 9 bar
SMG 1707	NVBGRG	600 l/h	–	0.37 kW	G 1/2"	100	38/12	0370007	
									to DIN/EN 12514-1
SMG 1708	NVBHRP	1000 l/h	–	0.75 kW	G 3/4"	160	56/18	0370008	on max. pressure
SMG 1709	NVBHRM	1500 l/h	–	0.75 kW	G 3/4"	160	56/18	0370009	limited from 6 bar
SMG 1710	NVBHRG	2000 l/h	–	1.1 kW	G 3/4"	160	56/18	0370010	and set
SMG 1721	NVBRP	45 l/h	30 l/h	0.18 kW	G 3/8"	100	25/12	0370011	
SMG 1722	NVBRM	80 l/h	60 l/h	0.18 kW	G 3/8"	100	25/12	0370012	
SMG 1723	NVBRG	120 l/h	100 l/h	0.18 kW	G 3/8"	100	25/12	0370013	
SMG 1724	NVBRF	160 l/h	140 l/h	0.37 kW	G 3/8"	100	25/12	0370014	
SMG 1725	NVBGRP	300 l/h	240 l/h	0.37 kW	G 1/2"	100	38/12	0370015	
SMG 1726	NVBGRM	450 l/h	390 l/h	0.75 kW	G 1/2"	100	38/12	0370016	
SMG 1727	NVBGRG	600 l/h	520 l/h	0.75 kW	G 1/2"	100	38/12	0370017	
									p_{max} 30 bar
SMG 1728	NVBHRP	1000 l/h	700 l/h	1.5 kW	G 3/4"	160	56/18	0370018	
SMG 1729	NVBHRM	1500 l/h	1200 l/h	2.2 kW	G 3/4"	160	56/18	0370019	
SMG 1730	NVBHRG	2000 l/h	1700 l/h	3.0 kW	G 3/4"	160	56/18	0370020	

Series size	Pump model	Discharge at 1400 RPM		Motor power	Connections[1)]*	H1 heating Watt	Gear rotor / shaft Ø	Item No.	
		at 0 bar	at 40 bar						
SMG 1962	NVBRM	80 l/h	50 l/h	0.18 kW	G 3/8"	100	25/12	0390067	
SMG 1963	NVBRG	120 l/h	80 l/h	0.37 kW	G 3/8"	100	25/12	0390068	
SMG 1964	NVBRF	160 l/h	120 l/h	0.37 kW	G 3/8"	100	25/12	0390069	
SMG 1965	NVBGRP	300 l/h	200 l/h	0.75 kW	G 1/2"	100	38/12	0390070	
SMG 1966	NVBGRM	450 l/h	360 l/h	1.1 kW	G 1/2"	100	38/12	0390071	for max. pressure
SMG 1967	NVBGRG	600 l/h	480 l/h	1.5 kW	G 1/2"	100	38/12	0390072	designed from 40 bar
SMG 1968	NVBHRP	1000 l/h	600 l/h	2.2 kW	G 3/4"	160	56/18	0390073	
SMG 1969	NVBHRM	1500 l/h	1000 l/h	3 kW	G 3/4"	160	56/18	0390074	
SMG 1970	NVBHRG	2000 l/h	1400 l/h	4 kW	G 3/4"	160	56/18	0390075	

[1)] Pipe connections pipe thread DIN ISO 228-1
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.

Series NV with integrated overflow valve and bypass 3.5



Series size	Pump model	Discharge	Motor power	Dimensions												
				regardless of motor										for IE-3		
				a	a1	b	c	e1	f3	g1	h	k2	s	k	k3	k4
SMG 1701	NVBRP	45 l/h	0.18 kW	80	36	100	7	G 3/8"	32.5	65	63	165	7	345	180	60
SMG 1702	NVBRM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	32.5	65	63	165	7	345	180	60
SMG 1703	NVBRG	120 l/h	0.18 kW	80	36	100	7	G 3/8"	32.5	65	63	165	7	345	180	60
SMG 1704	NVBRF	160 l/h	0.18 kW	80	36	100	7	G 3/8"	32.5	65	63	165	7	345	180	60
SMG 1705	NVBGRP	300 l/h	0.18 kW	80	40	100	7	G 1/2"	35	70	63	179	7	359	180	60
SMG 1706	NVBGRM	450 l/h	0.37 kW	90	40	112	7	G 1/2"	35	70	71	186	7	396	210	82
SMG 1707	NVBGRG	600 l/h	0.37 kW	90	40	112	7	G 1/2"	35	70	71	186	7	396	210	82
SMG 1708	NVBHRP	1000 l/h	0.75 kW	100	49	125	8	G 3/4"	50	100	80	268	9.5	555	287	137
SMG 1709	NVBHRM	1500 l/h	0.75 kW	100	49	125	8	G 3/4"	50	100	80	268	9.5	555	287	137
SMG 1710	NVBHRG	2000 l/h	1.1 kW	100	49	140	10	G 3/4"	50	100	90	278	10	615	337	181
SMG 1721	NVBRP	45 l/h	0.18 kW	80	36	100	7	G 3/8"	32.5	65	63	165	7	345	180	60
SMG 1722	NVBRM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	32.5	65	63	165	7	345	180	60
SMG 1723	NVBRG	120 l/h	0.18 kW	80	36	100	7	G 3/8"	32.5	65	63	165	7	345	180	60
SMG 1724	NVBRF	160 l/h	0.37 kW	90	36	112	7	G 3/8"	32.5	65	71	172	7	382	210	82
SMG 1725	NVBGRP	300 l/h	0.37 kW	90	40	112	7	G 1/2"	35	70	71	186	7	396	210	82
SMG 1726	NVBGRM	450 l/h	0.75 kW	100	40	125	8	G 1/2"	35	70	80	206	9.5	493	287	137
SMG 1727	NVBGRG	600 l/h	0.75 kW	100	40	125	8	G 1/2"	35	70	80	206	9.5	493	287	137
SMG 1728	NVBHRP	1000 l/h	1.5 kW	125	49	140	10	G 3/4"	50	100	90	278	10	615	337	156
SMG 1729	NVBHRM	1500 l/h	2.2 kW	140	49	160	12	G 3/4"	50	100	100	288	12	652	364	160
SMG 1730	NVBHRG	2000 l/h	3.0 kW	140	49	160	12	G 3/4"	50	100	100	288	12	608	320	117
SMG 1962	NVBRM	80 l/h	0.18 kW	80	36	100	7	G 3/8"	65	67	63	165	7	345	180	60
SMG 1963	NVBRG	120 l/h	0.37kW	90	36	112	7	G 3/8"	65	67	71	172	7	382	210	82
SMG 1964	NVBRF	160 l/h	0.37 kW	90	36	112	7	G 3/8"	65	67	71	172	7	382	210	82
SMG 1965	NVGRP	300 l/h	0.75 kW	100	40	125	8	G 1/2"	70	75	80	206	9.5	493	287	160
SMG 1966	NVBGRM	450 l/h	1.1 kW	100	40	140	10	G 1/2"	70	75	90	206	10	543	337	181
SMG 1967	NVBGRG	600 l/h	1.5 kW	125	40	140	10	G 1/2"	70	75	90	206	10	543	337	156
SMG 1968	NVBHRP	1000 l/h	2.2 kW	140	49	160	12	G 3/4"	100	105	100	288	12	652	364	160
SMG 1969	NVBHRM	1500 l/h	3.0 kW	140	49	160	12	G 3/4"	100	105	100	288	12	652	364	160
SMG 1970	NVBHRG	2000 l/h	4.0 kW	140	49	190	12	G 3/4"	100	105	112	288	12	635	347	137

The dimensional specifications of the electric motors vary according to manufacturer, therefore the dimensions of the motor pump units are not binding.

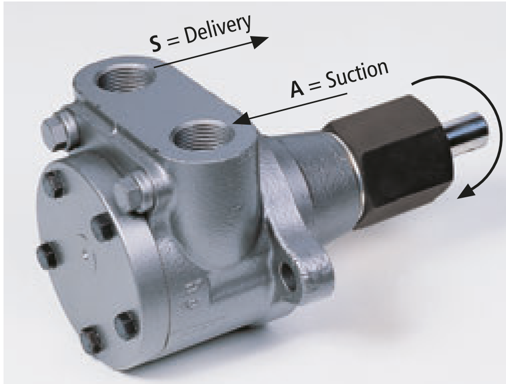
hp-Motor pump groups; Series SMG 3.6

Series B without overflow valve

Single units with 950 RPM with **hp-Industrial pumps**

Suitable for use with hydraulic oils, lubricating oils, all heating oils, coal tar oils, kerosenes and many other self-lubricating fluids.

The motor powers are applicable for fluids with a viscosity up to 400 cSt.
From 400 to 1000 cSt. the motor must be designed
by one power stage – construction size – larger.
At an additional cost, on request.



The pump connections are marked as follows:
A = Suction connection
S = Delivery connection

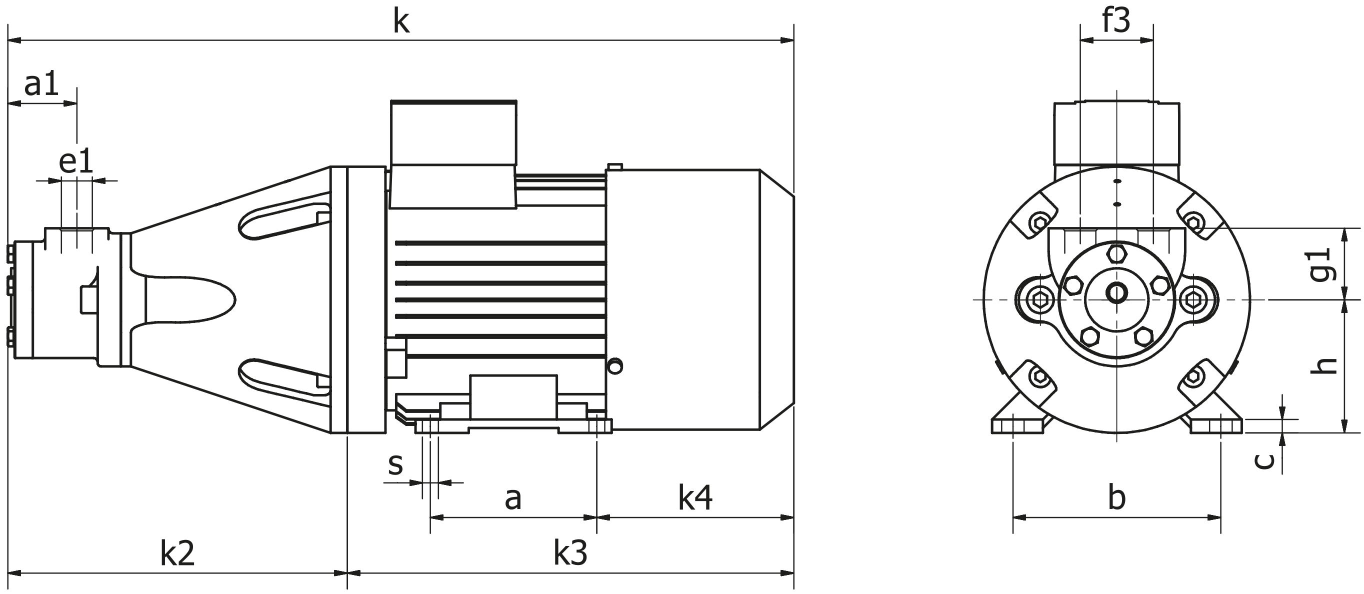
The pumps are designed in the standard version with direction of rotation I = counterclockwise (viewed from the pump shaft). The position of the pump connections depends on the direction of rotation. (See figure)

Direction of rotation I = counterclockwise Standard version
For direction of rotation D = clockwise, swap round the connections A = suction and S = delivery.
The direction of rotation can only be changed in the factory.

Series size	Pump model	Discharge at 950 RPM at 0 - 9 bar	Discharge at 950 RPM at 30 bar	Motor power	Connections[1)]*	H1 heating Watt	Gear rotor / shaft Ø	Item No.	
SMG 1801	BP	30 l/h	–	0.25 kW	G 3/8"	100	25/12	0380001	
SMG 1802	BM	55 l/h	–	0.25 kW	G 3/8"	100	25/12	0380002	
SMG 1803	BG	80 l/h	–	0.25 kW	G 3/8"	100	25/12	0380003	
SMG 1804	BF	105 l/h	–	0.25 kW	G 3/8"	100	25/12	0380004	
SMG 1805	BGP	200 l/h	–	0.25 kW	G 1/2"	100	38/12	0380005	
SMG 1806	BGM	300 l/h	–	0.25 kW	G 1/2"	100	38/12	0380006	
SMG 1807	BGG	400 l/h	–	0.37 kW	G 1/2"	100	38/12	0380007	for max. pressure designed from 9 bar
SMG 1808	BHP	670 l/h	–	0.55 kW	G 3/4"	160	56/18	0380008	
SMG 1809	BHM	1000 l/h	–	0.75 kW	G 3/4"	160	56/18	0380009	
SMG 1810	BHG	1330 l/h	–	1.1 kW	G 3/4"	160	56/18	0380010	
SMG 1811	BHGP	2000 l/h	–	1.5 kW	G 1 1/2"	280	75/22	0380011	
SMG 1811-1	BHGPZ	2400 l/h	–	1.5 kW	G 1 1/2"	280	75/22	0380053	
SMG 1812	BHGM	3000 l/h	–	2.2 kW	G 1 1/2"	280	75/22	0380012	
SMG 1813	BHGG	4000 l/h	–	3.0 kW	G 1 1/2"	280	75/22	0380013	
SMG 1821	BP	30 l/h	20 l/h	0.25 kW	G 3/8"	100	25/12	0380014	
SMG 1822	BM	55 l/h	40 l/h	0.25 kW	G 3/8"	100	25/12	0380015	
SMG 1823	BG	80 l/h	60 l/h	0.25 kW	G 3/8"	100	25/12	0380016	
SMG 1824	BF	105 l/h	90 l/h	0.25 kW	G 3/8"	100	25/12	0380017	
SMG 1825	BGP	200 l/h	160 l/h	0.55 kW	G 1/2"	100	38/12	0380018	
SMG 1826	BGM	300 l/h	260 l/h	0.75 kW	G 1/2"	100	38/12	0380019	
SMG 1827	BGG	400 l/h	360 l/h	1.1 kW	G 1/2"	100	38/12	0380020	
SMG 1828	BHP	670 l/h	470 l/h	1.5 kW	G 3/4"	160	56/18	0380021	p_{max} 30 bar
SMG 1829	BHM	1000 l/h	800 l/h	2.2 kW	G 3/4"	160	56/18	0380022	
SMG 1830	BHG	1330 l/h	1100 l/h	3.0 kW	G 3/4"	160	56/18	0380023	
SMG 1831	BHGP	2000 l/h	1400 l/h	4.0 kW	G 1 1/2"	280	75/22	0380024	
SMG 1831-1	BHGPZ	2400 l/h	2000 l/h	4.0 kW	G 1 1/2"	280	75/22	0380054	
SMG 1832	BHGM	3000 l/h	2400 l/h	5.5 kW	G 1 1/2"	280	75/22	0380025	
SMG 1833	BHGG	4000 l/h	3200 l/h	7.5 kW	G 1 1/2"	280	75/22	0380026	

[1)] Pipe connections pipe thread DIN ISO 228-1
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements.
The pump or device connection gives no indication of the relevant size of the pipe.

Series B without overflow valve 3.6



Series size	Pump model	Discharge	Motor power	Dimensions												
				regardless of motor										for IE-3		
				a	a1	b	c	e1	f3	g1	h	k2	s	k	k3	k4
SMG 1801	BP	30 l/h	0.25 kW	90	36	112	7	G 3/8"	38	43	71	172	7	382	210	82
SMG 1802	BM	55 l/h	0.25 kW	90	36	112	7	G 3/8"	38	43	71	172	7	382	210	82
SMG 1803	BG	80 l/h	0.25 kW	90	36	112	7	G 3/8"	38	43	71	172	7	382	210	82
SMG 1804	BF	105 l/h	0.25 kW	90	36	112	7	G 3/8"	38	43	71	172	7	382	210	82
SMG 1805	BGP	200 l/h	0.25 kW	90	43	112	7	G 1/2"	44	43	71	186	7	396	210	82
SMG 1806	BGM	300 l/h	0.25 kW	90	43	112	7	G 1/2"	44	43	71	186	7	396	210	82
SMG 1807	BGG	400 l/h	0.37 kW	100	43	125	8	G 1/2"	44	43	80	206	9.5	493	287	137
SMG 1808	BHP	670 l/h	0.55 kW	100	49	125	8	G 3/4"	67	65	80	268	9.5	555	287	137
SMG 1809	BHM	1000 l/h	0.75 kW	100	49	140	10	G 3/4"	67	65	90	278	10	615	337	181
SMG 1810	BHG	1330 l/h	1.1 kW	125	49	140	10	G 3/4"	67	65	90	278	10	615	337	156
SMG 1811	BHGP	2000 l/h	1.5 kW	140	65	160	12	G 1"	100	90	100	350	12	714	364	160
SMG 1811 -1	BHGPZ	2400 l/h	1.5 kW	140	65	190	12	G 1"	100	90	112	350	12	697	347	137
SMG 1812	BHGM	3000 l/h	2.2 kW	140	65	190	12	G 1"	100	90	112	350	12	697	347	137
SMG 1813	BHGG	4000 l/h	3.0 kW	140	65	216	15	G 1"	100	90	132	370	12	790	420	190
SMG 1821	BP	30 l/h	0.25 kW	90	36	112	7	G 3/8"	38	43	71	172	7	382	210	82
SMG 1822	BM	55 l/h	0.25 kW	90	36	112	7	G 3/8"	38	43	71	172	7	382	210	82
SMG 1823	BG	80 l/h	0.25 kW	90	36	112	7	G 3/8"	38	43	71	172	7	382	210	82
SMG 1824	BF	105 l/h	0.25 kW	90	36	112	7	G 3/8"	38	43	71	172	7	382	210	82
SMG 1825	BGP	200 l/h	0.55 kW	100	43	125	8	G 1/2"	44	43	80	206	9.5	493	287	137
SMG 1826	BGM	300 l/h	0.75 kW	100	43	140	10	G 1/2"	44	43	90	206	10	543	337	181
SMG 1827	BGG	400 l/h	1.1 kW	125	43	140	10	G 1/2"	44	43	90	206	10	543	337	156
SMG 1828	BHP	670 l/h	1.5 kW	140	49	160	12	G 3/4"	67	65	100	288	12	652	364	160
SMG 1829	BHM	1000 l/h	2.2 kW	140	49	190	12	G 3/4"	67	65	112	288	12	635	347	137
SMG 1830	BHG	1330 l/h	3.0 kW	140	49	216	15	G 3/4"	67	65	132	308	12	728	420	199
SMG 1831	BHGP	2000 l/h	4.0 kW	178	65	216	15	G 1"	100	90	132	370	12	790	420	153
SMG 1831 -1	BHGPZ	2400 l/h	4.0 kW	178	65	216	15	G 1"	100	90	132	370	12	790	420	153
SMG 1832	BHGM	3000 l/h	5.5 kW	178	65	216	15	G 1"	100	90	132	370	12	790	420	153
SMG 1833	BHGG	4000 l/h	7.5 kW	210	65	254	18	G 1"	100	90	160	370	15	864	494	166

The dimensional specifications of the electric motors vary according to manufacturer, therefore the dimensions of the motor pump units are not binding.

hp-Motor pump groups; Series SMG 3.7

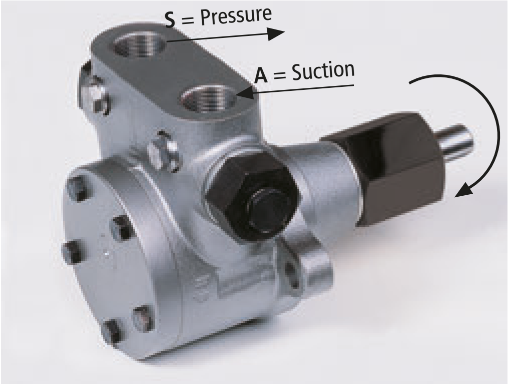
Series VB with integrated overflow valve

Single units with 950 RPM with **hp-Industrial pumps**

Standard design:
Units up to 9 bar: **Pressure stage 2** = 2 to 9 bar.
Units up to 30 bar: **Pressure stage 4** =15 to 40 bar.
Other pressure stages according to model key on page 32, please specify with order.

The pump connections are marked as follows:
A = Suction connection
S = Delivery connection

The pumps are designed in the standard version with direction of rotation I = counterclockwise (viewed from the pump shaft). The position of the pump connections depends on the direction of rotation. (See figure)

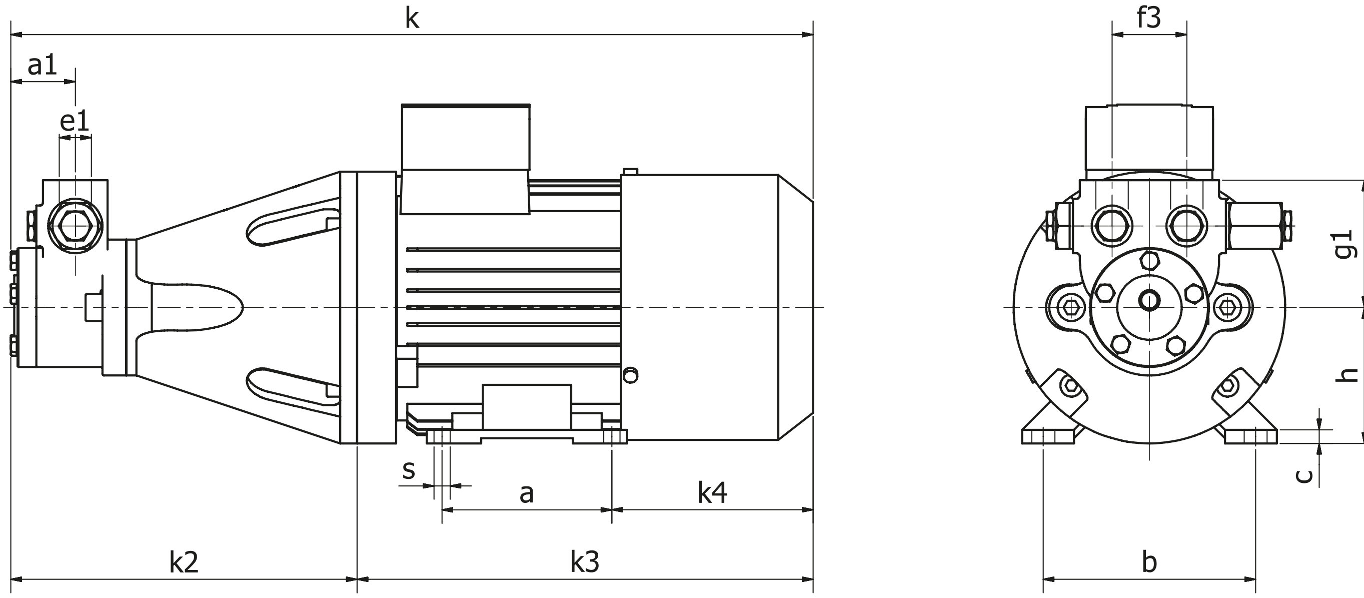


Direction of rotation I = counterclockwise Standard version
For direction of rotation D = clockwise, swap round the connections A = suction and S = delivery. The direction of rotation can only be changed in the factory.

Series size	Pump model	Discharge at 950 RPM at 0 - 9 bar	Discharge at 950 RPM at 30 bar	Motor power	Connections[1)*]	H1 heating Watt	Gear rotor / shaft Ø	Item No.	
SMG 1841	VBP	30 l/h	–	0.25 kW	G 3/8"	100	25/12	0380027	
SMG 1842	VBM	55 l/h	–	0.25 kW	G 3/8"	100	25/12	0380028	
SMG 1843	VBG	80 l/h	–	0.25 kW	G 3/8"	100	25/12	0380029	
SMG 1844	VBF	105 l/h	–	0.25 kW	G 3/8"	100	25/12	0380030	
SMG 1845	VBGP	200 l/h	–	0.25 kW	G 1/2"	100	38/12	0380031	
SMG 1846	VBGM	300 l/h	–	0.25 kW	G 1/2"	100	38/12	0380032	for max. pressure designed from 9 bar
SMG 1847	VBGG	400 l/h	–	0.37 kW	G 1/2"	100	38/12	0380033	
SMG 1848	VBHP	670 l/h	–	0.55 kW	G 3/4"	160	56/18	0380034	
SMG 1849	VBHM	1000 l/h	–	0.75 kW	G 3/4"	160	56/18	0380035	
SMG 1850	VBHG	1330 l/h	–	1.1 kW	G 3/4"	160	56/18	0380036	
SMG 1851	VBHGP	2000 l/h	–	1.5 kW	G 1"	280	75/22	0380037	
SMG 1851-1	VBHGPZ	2400 l/h	–	1.5 kW	G 1"	280	75/22	0380055	
SMG 1852	VBHGM	3000 l/h	–	2.2 kW	G 1"	280	75/22	0380038	
SMG 1853	VBHGG	4000 l/h	–	3 kW	G 1"	280	75/22	0380039	
SMG 1861	VBP	30 l/h	20 l/h	0.25 kW	G 3/8"	100	25/12	0380040	
SMG 1862	VBM	55 l/h	40 l/h	0.25 kW	G 3/8"	100	25/12	0380041	
SMG 1863	VBG	80 l/h	60 l/h	0.25 kW	G 3/8"	100	25/12	0380042	
SMG 1864	VBF	105 l/h	90 l/h	0.25 kW	G 3/8"	100	25/12	0380043	
SMG 1865	VBGP	200 l/h	160 l/h	0.55 kW	G 1/2"	100	38/12	0380044	
SMG 1866	VBGM	300 l/h	260 l/h	0.75 kW	G 1/2"	100	38/12	0380045	
SMG 1867	VBGG	400 l/h	360 l/h	1.1 kW	G 1/2"	100	38/12	0380046	
SMG 1868	VBHP	670 l/h	470 l/h	1.5 kW	G 3/4"	160	56/18	0380047	p_{max} 30 bar
SMG 1869	VBHM	1000 l/h	800 l/h	2.2 kW	G 3/4"	160	56/18	0380048	
SMG 1870	VBHG	1330 l/h	1100 l/h	3 kW	G 3/4"	160	56/18	0380049	
SMG 1871	VBHGP	2000 l/h	1400 l/h	4 kW	G 1"	280	75/22	0380050	
SMG 1871-1	VBHGPZ	2400 l/h	2000 l/h	4 kW	G 1"	280	75/22	0380056	
SMG 1872	VBHGM	3000 l/h	2400 l/h	5.5 kW	G 1"	280	75/22	0380051	
SMG 1873	VBHGG	4000 l/h	3200 l/h	7.5 kW	G 1"	280	75/22	0380052	

[1)] Pipe connections pipe thread DIN ISO 228-1
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.

Series VB with integrated overflow valve 3.7



				Dimensions												
	Pump		Motor	regardless of motor										for IE-3		
Series size	model	Discharge	power	a	a1	b	c	e1	f3	g1	h	k2	s	k	k3	k4
SMG 1841	VBP	30 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1842	VBM	55 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1843	VBG	80 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1844	VBF	105 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1845	VBGP	200 l/h	0.25 kW	90	40	112	7	G 1/2"	44	75	71	186	7	396	210	82
SMG 1846	VBGM	300 l/h	0.25 kW	90	40	112	7	G 1/2"	44	75	71	186	7	396	210	82
SMG 1847	VBGG	400 l/h	0.37 kW	100	40	125	8	G 1/2"	44	75	80	206	9.5	493	287	137
SMG 1848	VBHP	670 l/h	0.55 kW	100	49	125	8	G 3/4"	67	90	80	268	9.5	555	287	137
SMG 1849	VBHM	1000 l/h	0.75 kW	100	49	140	10	G 3/4"	67	90	90	278	10	615	337	181
SMG 1850	VBHG	1330 l/h	1.1 kW	125	49	140	10	G 3/4"	67	90	90	278	10	615	337	156
SMG 1851	VBHGP	2000 l/h	1.5 kW	140	63	160	12	G 1"	80	120	100	350	12	714	364	160
SMG 1851 -1	VBHGPZ	2400 l/h	1.5 kW	140	63	160	12	G 1"	80	120	100	350	12	714	364	160
SMG 1852	VBHGM	3000 l/h	2.2 kW	140	63	190	12	G 1"	80	120	112	350	12	697	347	137
SMG 1853	VBHGG	4000 l/h	3.0 kW	140	63	216	15	G 1"	80	120	132	370	12	790	420	199
SMG 1861	VBP	30 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1862	VBM	55 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1863	VBG	80 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1864	VBF	105 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1865	VBGP	200 l/h	0.55 kW	100	40	125	8	G 1/2"	44	75	80	206	9.5	493	287	137
SMG 1866	VBGM	300 l/h	0.75 kW	100	40	140	10	G 1/2"	44	75	90	206	10	543	337	181
SMG 1867	VBGG	400 l/h	1.1 kW	125	40	140	10	G 1/2"	44	75	90	206	10	543	337	156
SMG 1868	VBHP	670 l/h	1.5 kW	140	49	160	12	G 3/4"	67	90	100	288	12	652	364	160
SMG 1869	VBHM	1000 l/h	2.2 kW	140	49	190	12	G 3/4"	67	90	112	288	12	635	347	137
SMG 1870	VBHG	1330 l/h	3.0 kW	140	49	216	15	G 3/4"	67	90	132	308	12	728	420	199
SMG 1871	VBHGP	2000 l/h	4.0 kW	178	63	216	15	G 1"	80	120	132	370	12	790	420	153
SMG 1871 -1	VBHGPZ	2400 l/h	4.0 kW	178	63	216	15	G 1"	80	120	132	370	12	790	420	153
SMG 1872	VBHGM	3000 l/h	5.5 kW	178	63	216	15	G 1"	80	120	132	370	12	790	420	153
SMG 1873	VBHGG	4000 l/h	7.5 kW	210	63	254	18	G 1"	80	120	160	370	15	864	494	166

The dimensional specifications of the electric motors vary according to manufacturer, therefore the dimensions of the motor pump units are not binding.

hp-Motor pump groups; Series SMG 3.8

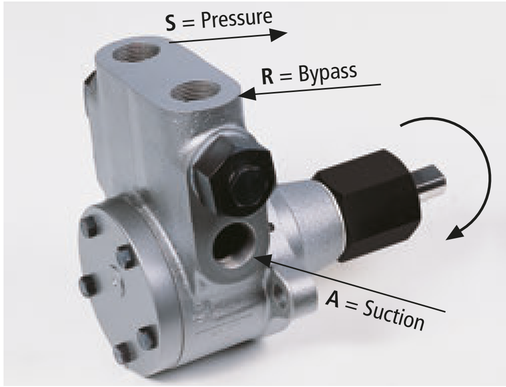
Series VBR with integrated overflow valve and bypass

Single units with 950 RPM with **hp-Industrial pumps**

Standard design:
Units up to 9 bar: **Pressure stage 2** = 2 to 9 bar.
Units up to 30 bar: **Pressure stage 4** =15 to 40 bar.
Other pressure stages according to model key on page 32, please specify with order.

The pump connections are marked as follows:
A = Suction connection
S = Delivery connection

The pumps are designed in the standard version with direction of rotation I = counterclockwise (viewed from the pump shaft). The position of the pump connections depends on the direction of rotation. (See figure)

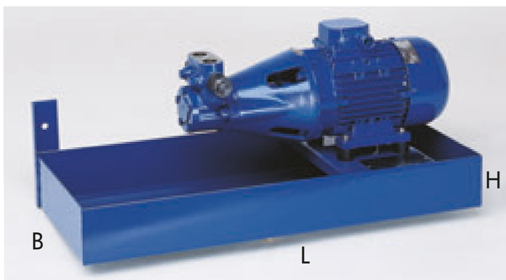


Direction of rotation I = counterclockwise Standard version
With direction of rotation D = clockwise, swap round the oil connections S = delivery and R = bypass. Suction port A = Suction is on the other side.

Series size	Pump model	Discharge at 950 RPM		Motor power	Connections[1)]*	H1 heating Watt	Gear rotor / shaft Ø	Item No.	
		at 0 - 9 bar	at 30 bar						
SMG 1881	VBRP	30 l/h	–	0.25 kW	G 3/8"	100	25/12	0380061	
SMG 1882	VBRM	55 l/h	–	0.25 kW	G 3/8"	100	25/12	0380062	
SMG 1883	VBRG	80 l/h	–	0.25 kW	G 3/8"	100	25/12	0380063	
SMG 1884	VBRF	105 l/h	–	0.25 kW	G 3/8"	100	25/12	0380064	
SMG 1885	VBGRP	200 l/h	–	0.25 kW	G 1/2"	100	38/12	0380065	
SMG 1886	VBGRM	300 l/h	–	0.25 kW	G 1/2"	100	38/12	0380066	for max. pressure designed from 9 bar
SMG 1887	VBGRG	400 l/h	–	0.37 kW	G 1/2"	100	38/12	0380067	
SMG 1888	VBHRP	670 l/h	–	0.55 kW	G 3/4"	160	56/18	0380068	
SMG 1889	VBHRM	1000 l/h	–	0.75 kW	G 3/4"	160	56/18	0380069	
SMG 1890	VBHRG	1330 l/h	–	1.1 kW	G 3/4"	160	56/18	0380070	
SMG 1891	VBHGRP	2000 l/h	–	1.5 kW	G 1" [2)]	280	75/22	0380071	
SMG 1891-1	VBHGRPZ	2400 l/h	–	1.5 kW	G 1" [2)]	280	75/22	0380094	
SMG 1892	VBHGRM	3000 l/h	–	2.2 kW	G 1" [2)]	280	75/22	0380072	
SMG 1893	VBHGRG	4000 l/h	–	3.0 kW	G 1" [2)]	280	75/22	0380073	
SMG 1881-25	VBRP	30 l/h	20 l/h	0.25 kW	G 3/8"	100	25/12	0380074	
SMG 1882-25	VBRM	55 l/h	40 l/h	0.25 kW	G 3/8"	100	25/12	0380075	
SMG 1883-25	VBRG	80 l/h	60 l/h	0.25 kW	G 3/8"	100	25/12	0380076	
SMG 1884-25	VBRF	105 l/h	90 l/h	0.25 kW	G 3/8"	100	25/12	0380077	
SMG 1885-25	VBGRP	200 l/h	160 l/h	0.55 kW	G 1/2"	100	38/12	0380078	
SMG 1886-25	VBGRM	300 l/h	260 l/h	0.75 kW	G 1/2"	100	38/12	0380079	
SMG 1887-25	VBGRG	400 l/h	360 l/h	1.1 kW	G 1/2"	100	38/12	0380080	
SMG 1888-25	VBHRP	670 l/h	470 l/h	1.5 kW	G 3/4"	160	56/18	0380081	p_{max} 30 bar
SMG 1889-25	VBHRM	1000 l/h	800 l/h	2.2 kW	G 3/4"	160	56/18	0380082	
SMG 1890-25	VBHRG	1330 l/h	1100 l/h	3 kW	G 3/4"	160	56/18	0t380083	
SMG 1891-25	VBHGRP	2000 l/h	1400 l/h	4 kW	G 1" [2)]	280	75/22	0380084	
SMG 1891-1-25	VBHGRPZ	2400 l/h	2000 l/h	4 kW	G 1" [2)]	280	75/22	0380095	
SMG 1892-25	VBHGRM	3000 l/h	2400 l/h	5.5 kW	G 1" [2)]	280	75/22	0380085	
SMG 1893-25	VBHGRG	4000 l/h	3200 l/h	7.5 kW	G 1" [2)]	280	75/22	0380086	

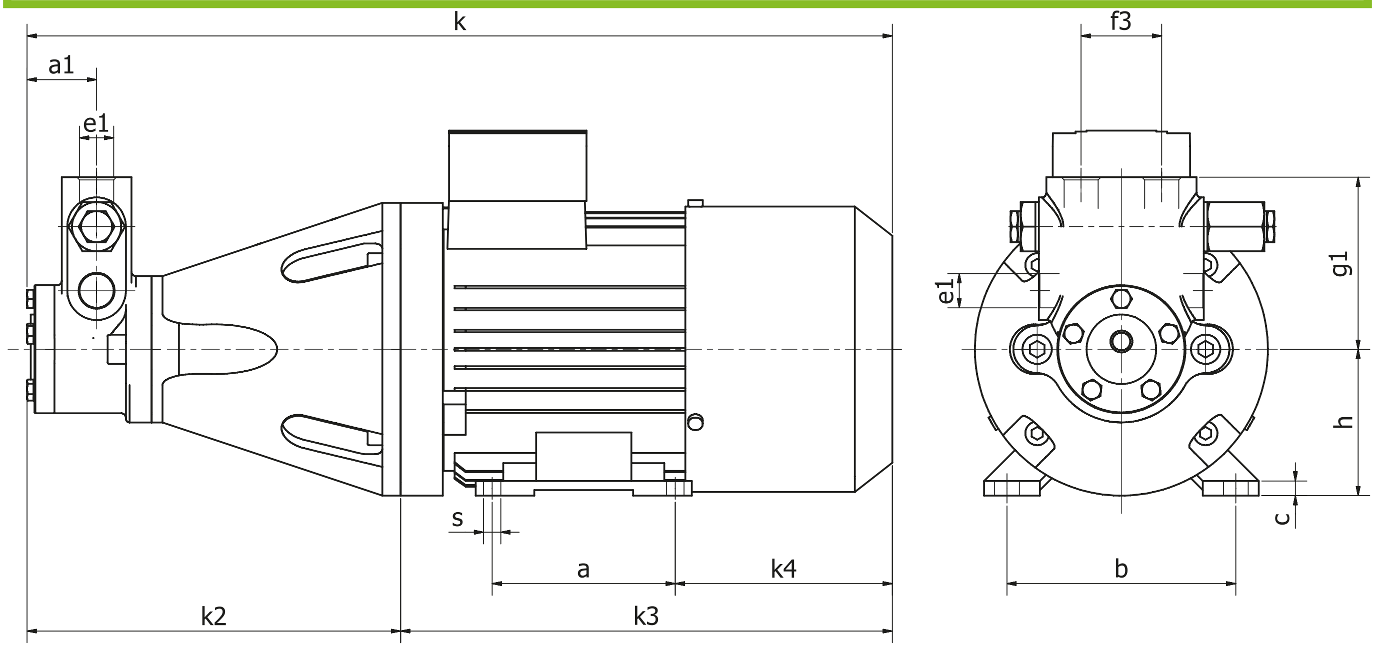
Accessories
"WA" = oil pan with anti-vibration pads for wall mounting
"LH" = leakage detector with WHG and TÜV permit
also for retrofitting already installed units according to the new stipulations.

Gear rotor / shaft Ø	Oil pan dimensions mm			Item No.
	L	B	H	
25/12 + 38/12	600	270	80	0820502
56/18	840	270	80	0820504
75/22	1050	360	80	0820506
Leakage detector Model LMS at 230 V				0720701 -1
Leakage detector Model LMW				0720705 -1



[1)] Pipe connections pipe thread DIN ISO 228-1
[2)] For SMG 1891 - 1893, SMG 1891 - 25 - 1893 - 25 the side suction port is A = G 1 1/2"
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.

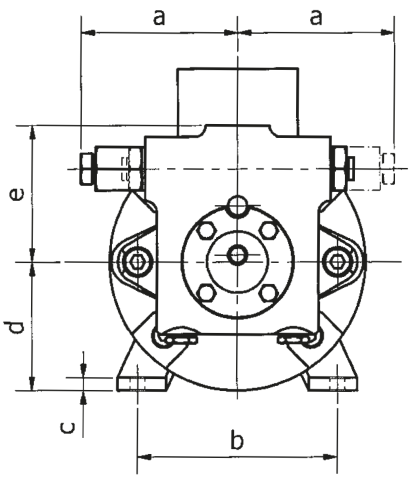
Series VBR with integrated overflow valve and bypass 3.8

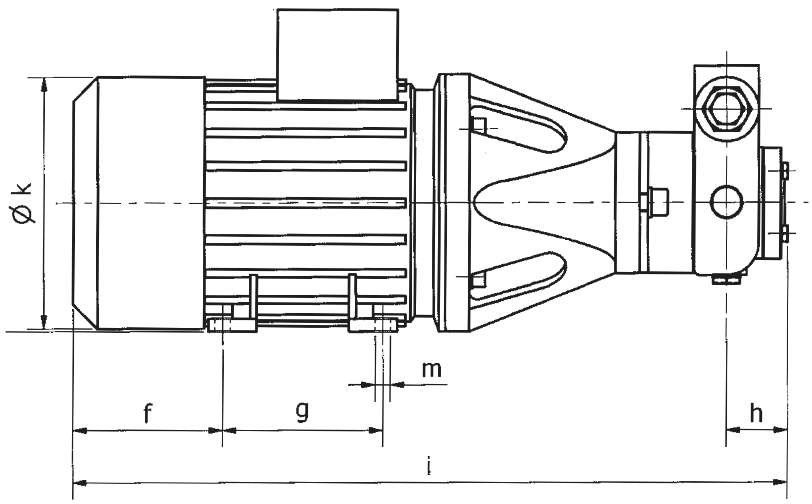


Series size	Pump model	Discharge	Motor power	Dimensions												
				regardless of motor										for IE-3		
				a	a1	b	c	e1	f3	g1	h	k2	s	k	k3	k4
SMG 1881	VBRP	30 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1882	VBRM	55 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1883	VBRG	80 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1884	VBRF	105 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1885	VBGRP	200 l/h	0.25 kW	90	40	112	7	G 1/2"	44	75	71	186	7	396	210	82
SMG 1886	VBGRM	300 l/h	0.25 kW	90	40	112	7	G 1/2"	44	75	71	186	7	396	210	82
SMG 1887	VBGRG	400 l/h	0.37 kW	100	40	125	8	G 1/2"	44	75	80	206	9.5	493	287	137
SMG 1888	VBHRP	670 l/h	0.55 kW	100	49	125	8	G 3/4"	67	90	80	268	9.5	555	287	137
SMG 1889	VBHRM	1000 l/h	0.75 kW	100	49	140	10	G 3/4"	67	90	90	278	10	615	337	181
SMG 1890	VBHRG	1330 l/h	1.1 kW	125	49	140	10	G 3/4"	67	90	90	278	10	615	337	156
SMG 1891	VBHGRP	2000 l/h	1.5 kW	140	63	160	12	G 1" [2)]	80	120	100	350	12	714	364	160
SMG 1891 -1	VBHGRPZ	2400 l/h	1.5 kW	140	63	160	12	G 1" [2)]	80	120	100	350	12	714	364	160
SMG 1892	VBHGRM	3000 l/h	2.2 kW	140	63	190	12	G 1" [2)]	80	120	112	350	12	697	347	137
SMG 1893	VBHGRG	4000 l/h	3.0 kW	140	63	216	15	G 1" [2)]	80	120	132	370	12	790	420	199
SMG 1881-25	VBRP	30 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1882-25	VBRM	55 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1883-25	VBRG	80 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1884-25	VBRF	105 l/h	0.25 kW	90	36	112	7	G 3/8"	38	67	71	172	7	382	210	82
SMG 1885-25	VBGRP	200 l/h	0.55 kW	100	40	125	8	G 1/2"	44	75	80	206	9.5	493	287	137
SMG 1886-25	VBGRM	300 l/h	0.75 kW	100	40	140	10	G 1/2"	44	75	90	206	10	543	337	181
SMG 1887-25	VBGRG	400 l/h	1,1 KW	125	40	140	10	G 1/2"	44	75	90	206	10	543	337	156
SMG 1888-25	VBHRP	670 l/h	1,5 KW	140	49	160	12	G 3/4"	67	90	100	288	12	652	364	160
SMG 1889-25	VBHRM	1000 l/h	2,2 KW	140	49	190	12	G 3/4"	67	90	112	288	12	635	347	137
SMG 1890-25	VBHRG	1330 l/h	3,0 KW	140	49	216	15	G 3/4"	67	90	132	308	12	728	420	199
SMG 1891-25	VBHGRP	2000 l/h	4,0 KW	178	63	216	15	G 1" [2)]	80	120	132	370	12	790	420	153
SMG 1891-1-25	VBHGRPZ	2400 l/h	4,0 KW	178	63	216	15	G 1" [2)]	80	120	132	370	12	790	420	153
SMG 1892-25	VBHGRM	3000 l/h	5.5 KW	178	63	216	15	G 1" [2)]	80	120	132	370	12	790	420	153
SMG 1893-25	VBHGRG	4000 l/h	7.5 KW	210	63	254	18	G 1" [2)]	80	120	160	370	15	864	494	166

The dimensional specifications of the electric motors vary according to manufacturer, therefore the dimensions of the motor pump units are not binding.

hp-Motor pump groups; Series UMG 3.9





		for 1400 RPM															
		Discharge at					Connections										
Series size	Pump model	9 bar	30 bar	40 bar	Motor power	Item No.	(S/A/R)	a	b	c	d	e	f	g	h	i	k	m
UMG 1101	UHE-A2-PZ	200	-	-	0.37 kW / BG 71	03905001	G 1/2"	98	112	7	71	85	82	90	38	410	139	7
UMG 1102	UHE-A3-P	300	-	-	0.37 kW / BG 71	03905005	G 1/2"	98	112	7	71	85	82	90	38	414	139	7
UMG 1103	UHE-A4-M	450	-	-	0.37 kW / BG 71	03905010	G 1/2"	98	112	7	71	85	82	90	38	418	139	7
UMG 1104	UHE-A5-GZ	550	-	-	0.37 kW / BG 71	03905015	G 1/2"	98	112	7	71	85	82	90	38	424	139	7
UMG 1105	UHE-A2-PZ	-	155	-	0.55 kW / BG 80	03905002	G 1/2"	98	125	8	80	85	137	100	38	496	157	9.5
UMG 1106	UHE-A3-P	-	260	-	0.55 kW / BG 80	03905006	G 1/2"	98	125	8	80	85	137	100	38	500	157	9.5
UMG 1107	UHE-A4-M	-	425	-	0.75 kW / BG 80	03905011	G 1/2"	98	125	8	80	85	137	100	38	504	157	9.5
UMG 1108	UHE-A5-GZ	-	500	-	0.75 kW / BG 80	03905016	G 1/2"	98	125	8	80	85	137	100	38	510	157	9.5
UMG 1109	UHE-A2-PZ	-	-	140	0.55 kW / BG 80	03905003	G 1/2"	98	125	8	80	85	137	100	38	496	157	9.5
UMG 1110	UHE-A3-P	-	-	240	0.75 kW / BG 80	03905007	G 1/2"	98	125	8	80	85	137	100	38	500	157	9.5
UMG 1111	UHE-A4-M	-	-	390	1.1 kW / BG 90 S	03905012	G 1/2"	98	140	10	90	85	181	100	38	564	174	10
UMG 1112	UHE-A5-GZ	-	-	450	1.1 kW / BG 90 S	03905017	G 1/2"	98	140	10	90	85	181	100	38	570	174	10

		for 2800 RPM															
		Discharge at					Connections										
Series size	Pump model	9 bar	30 bar	40 bar	Motor power	Item No.	(S/A/R)	a	b	c	d	e	f	g	h	i	k	m
UMG 1201	UHE-A2-PZ	500	-	-	0.37 kW / BG 71	03905201	G 1/2"	98	112	7	71	85	82	90	38	410	139	7
UMG 1202	UHE-A3-P	700	-	-	0.37 kW / BG 71	03905205	G 1/2"	98	112	7	71	85	82	90	38	414	139	7
UMG 1203	UHE-A4-M	900	-	-	0.55 kW / BG 71	03905210	G 1/2"	98	112	7	71	85	82	90	38	418	139	7
UMG 1204	UHE-A5-GZ	1300	-	-	0.55 kW / BG 71	03905215	G 1/2"	98	112	7	71	85	82	90	38	424	139	7
UMG 1205	UHE-A2-PZ	-	380	-	0.75 kW / BG 80	03905202	G 1/2"	98	125	8	80	85	137	100	38	496	157	9.5
UMG 1206	UHE-A3-P	-	600	-	1.1 kW / BG 80	03905206	G 1/2"	98	125	8	80	85	137	100	38	500	157	9.5
UMG 1207	UHE-A4-M	-	850	-	1.5 kW / BG 90 S	03905211	G 1/2"	98	140	10	90	85	181	100	38	564	174	10
UMG 1208	UHE-A5-GZ	-	1150	-	2.2 kW / BG 90 L	03905216	G 1/2"	98	140	10	90	85	156	125	38	570	174	10
UMG 1209	UHE-A2-PZ	-	-	330	1.1 kW / BG 80	03905203	G 1/2"	98	125	8	80	85	137	100	38	496	157	9.5
UMG 1210	UHE-A3-P	-	-	550	1.5 kW / BG 90 S	03905207	G 1/2"	98	140	10	90	85	181	100	38	560	174	10
UMG 1211	UHE-A4-M	-	-	800	2.2 kW / BG 90 L	03905212	G 1/2"	98	140	10	90	85	156	125	38	564	174	10
UMG 1212	UHE-A5-GZ	-	-	1050	2.2 kW / BG 90 L	03905217	G 1/2"	98	140	10	90	85	156	125	38	570	174	10

The dimensional specifications of the electric motors vary according to manufacturer, therefore the dimensions of the motor pump units are not binding.

hp-High-capacity suction aggregates 4.0

Usage and selection of high-capacity suction aggregates

Usage options and powers for hp-Suction units are already extensively known as they have been in use for many years. In the course of product development, however, a few details of the devices have changed, to improve handling and use. With the versions below, the manufacturer may give a few important instructions to the user for the selection of suitable unit.

Suction units are used everywhere pressurised pipelines are not permitted such as:

- Pipework not visible
- Pipework earthed
- Inaccessible pipework
- TÜV requirements

For a precise selection of devices, the following information is compulsory:

1. Burner power in [kW] or [l/h]
2. Number of consumers
3. Geodetic height difference between the lowest point of extraction and the highest point of the suction pipe [m]
4. Extended suction pipe length [m]
5. Number of pipe bends and fittings
6. Arrangement diagram of tank up to burner / flow chart

Below are a few notes which would be helpful for the layout:

a) Permitted flow rates in suction pipes: 0.3 - 0.8 ms^{-1}. The following rule of thumb is useful to determine it: C=Q/A with Q [m^3s^{-1}] and A [m^2]. For the discharge Q, the full discharge of the pump is to be used. Not the discharge according to selection diagram. See also diagram on catalogue page 99.
b) The physically max. possible suction height: approx. 9.0 m / at 10 m pipe length. The anticipated underpressures in the suction pipe are then at $p \geq -0.9$ bar, associated with a considerable development of noise. Within these limits, residential buildings are excluded from the suction units.
c) If the tank is situated higher, lifting equipment securing is to be provided if there is a pipe break. When using solenoid valves, the suction pipe is always to be equipped with the corresponding pressure releases. Mechanical valves are not suitable for the underpressures that may possibly occur.
d) The pipe must be laid frost free, if this is not possible, then use auxiliary heating.
e) Foot valves cannot be used, as the pipe is self-locking, it must be possible to bypass the oil to the tank if there is a pipe break.
f) When setting up in WHG areas, the units are to be equipped with additional overflow safety devices to § 63 of the WHG
g) A device can be preselected using the pump curves on page 53. In this case, the actual discharge power of the suction pump depends on the suction pipe length and the suction height and pipe diameter are shown. The discharge determined should always be high enough to balance out viscosity fluctuations in winter operation.

For your limits you will find suction units by the underpressure arising in the suction pipe which increases proportionally with increasing suction height and pipe length and therefore correspondingly reduces the effective discharge of the pump.
At high underpressures, the fill level of the pumps decrease considerably, and the noise emission increases. Thus the service life of the pumps is reduced accordingly.

Advantages:

- Simple installation (ready to be connected)
- Simple commissioning
- Simple maintenance
- Simple adaptation to various system requirements by programmable control

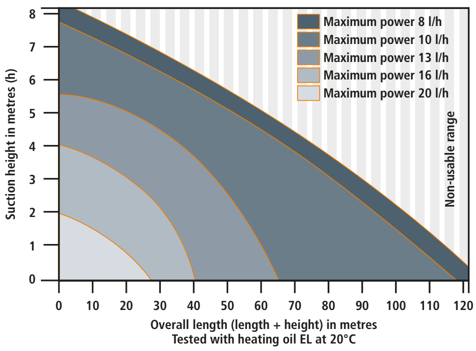
hp-High-capacity suction aggregates 4.1

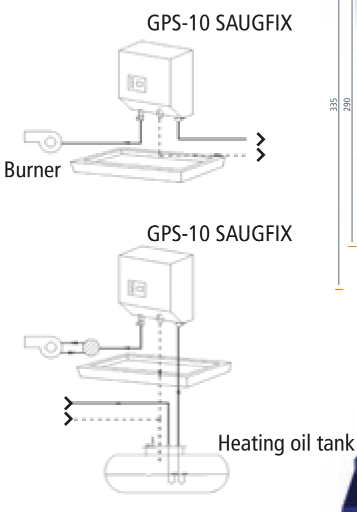
GPS-10 SAUGFIX

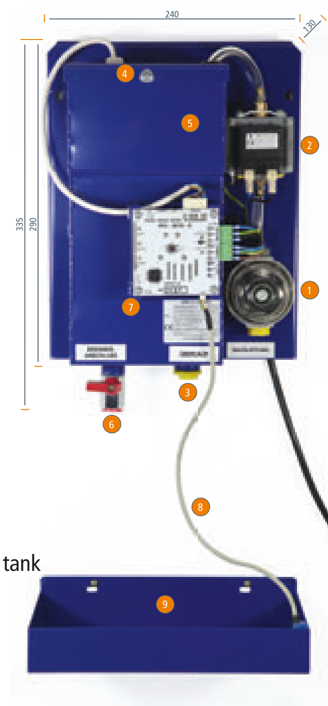
The suction unit of the GPS-10 "Saugfix" series is used to supply oil to consumer with fuel oil EL (kerosene) according to DIN 21514-1. It is a self-controlling high capacity suction unit for single pipe oil supply of burners with safety shut-off

Designed for low extraction quantities, it extends the proven hp-High capacities suction aggregates of the HSPE series.

Delivery complete with oil pan and leakage detector.







Item No.	0450050

Scope of supply

1) Filter 3/8" iG - suction pipe connection
2) Electromagnetic reciprocating plunger pump
3) Connection for spill 1/2" iG
4) Float switch
5) Operating tank (3.5 l)
6) Connection of burner / extraction 3/8" iG
7) Control (Version E)
8) Leakage oil sensor (350 mm length)
9) Oil pan (350 x 200 x 60 mm)

High-capacity single suction aggregates 4.2

hp-Single units HSPE series

Consisting of:

- Operating tank, hp-Internal gear pump
- Control system with operating and fault indicator
- Level sensor with safety shut-off of measurement transducer
- Potential-free fault message
- Secure against dry running and overtemperature shut-down
- Connection for solenoid valve and audible warning signal available
- Filter and nonreturn valve

Self-controlling high capacity suction unit for single pipe oil supply of burners with safety shut-off. **Delivery complete with oil pan and leakage detector.**

HSPE 30 - Standard

HSPE 60

HSPE 700

Model	Discharge l/h	ave. [1] Extraction quantity l/h	Motor power [2] 230 V Alternating current	Motor power [2] 400 V Rotary current	Item No. HSPE	Item No. additional burner connections	max. burner connections	Weight Kg approx.
HSPE 30 - Standard - 6042	80	50	0.18 kW	–	0430002	0430200	2	25
HSPE 60 - 6044	160	120	0.18 kW	–	0430008	0430200	4	38
HSPE 200 - 6045	300	200	0.18 kW	–	0430014	0430201	4	50
HSPE 200 - 6047	600	400	0.18 kW	–	0430024	0430201	4	50
HSPE 700 BHP	1000	700	–	0.75 kW	0430030	0430202	5	145
HSPE 700 BHM	1500	1000	–	0.75 kW	0430038	0430202	5	145
HSPE 700 BHG	2000	1500	–	0.75 kW	0430040	0430202	5	145
HSPE 1500 BHGP	3000	2200	–	1.10 kW	0430048	0430210	5	200
Leakage detector in plug-in casing Type LMS for 230 V (for description see page 83).								
Leakage detector in control system integrated Type LMP for 230/400 V								
From HSPE 30, additional spill protection to VbF or WHG permitted						0720713		
For further dimensions see page 52.								

The HSPE 30 and 60 may be supplied with 4 feet, as desired (see price list).

Maintenance: The HSPE suction units are maintenance-free, only the suction filter is to be cleaned regularly.

All models installed, tested and registered suitable for heating oil EL, to DIN/EN 12514-1 and DIN 4755 part 2.

[1] As the discharge basically depends on the viscosity of the medium, the suction length, the suction resistance, the suction height, the pipe diameter and the temperature, a technical fine-tuning is required in each individual case.

[2] Motor voltages 230 V or 230/400 V, 50 Hz

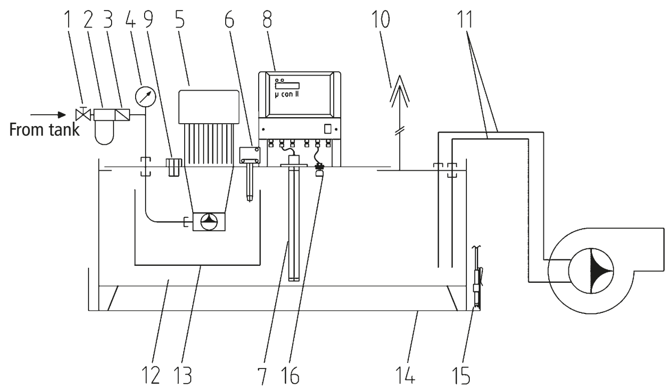
High-capacity double suction aggregates 4.3

hp-Double unit HSPD series

hp-Oil supply for fire places with heating oil EL to DIN/EN 12514-1

Consisting of:
Operating tank with 2 hp-Internal gear pumps, measurement transducer, NIVOCAP capacitive level sensor, filter and nonreturn valve. Protection from dry running and overtemperature shut-off. Double pump control system with automatic replacement and fault switch-over and all required operating and fault displays; potential-free collective fault reporting. Connection for solenoid valve available.
Supplied complete with oil pan and leakage detector.

HSPD 200



Order text:
hp single suction unit
HSPE model: see table
Discharge: L/h
max. burner
overall power: L/h heating oil EL
...... further burner connections

Order text:
hp double pump suction unit
HSPD model: see table
Discharge: L/h
max. burner
overall power: kW / L/h
...... further burner connections

Scope of supply of the suction units:

1 Ball valve
2 Suction filter
3 Nonreturn valve
4 Vacuum gauge
5 hp-Internal gear pump with standard electric motor
6 Temperature monitoring
7 Level measurement
8 hp-Pump control (for description see page 82)
9 Filling port
10 Air discharge port
11 Suction and return pipe of the burner (in the place of installation)
12 Operating tank
13 Oil bath chamber
14 Oil pan
15 Leakage detector
16 Spill protection (standard)

Accessories:

16 Spill protection according VbF with WHG permisson

Model	Discharge l/h	ave. Extraction quantity l/h	Motor power Alternating current	Motor power Rotary current	Item No. HSPD	Item No. additional burner connections	max. burner connections	Weight Kg approx.
HSPD 30 - 6042	80	50	0.18 kW	–	0430104	0430200	4	58
HSPD 60 - 6044	160	120	0.18 kW	–	0430108	0430200	4	60
HSPD 200 - 6045	300	200	0.18 kW	–	0430114	0430201	4	62
HSPD 200 - 6047	600	400	0.18 kW	–	0430124	0430201	4	62
HSPD 700 BHP	1000	700	–	0.75 kW	0430130	0430202	5	185
HSPD 700 BHM	1500	1000	–	0.75 kW	0430138	0430202	5	185
HSPD 700 BHG	2000	1500	–	0.75 kW	0430142	0430202	5	185
HSPD 1500 BHGP	3000	2200	–	1.10 kW	0430148	0430210	5	230
Leakage detector in plug-in casing Type LMS for 230 V (for description see page 83).								
Leakage detector in control system integrated Type LMP for 230/400 V								
From HSPD 30, additional spill protection to VbF or WHG permitted						0720713		

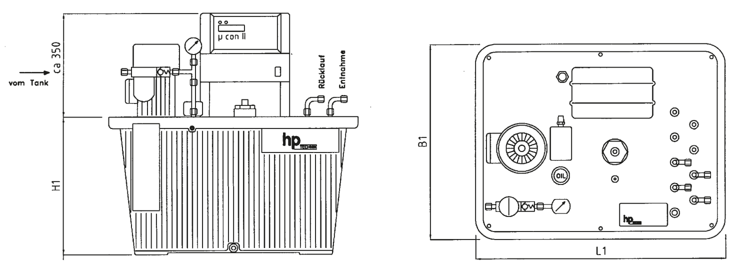
For further dimensions see page 52.

Dimension Table for hp-High capacity suction aggregates 4.3

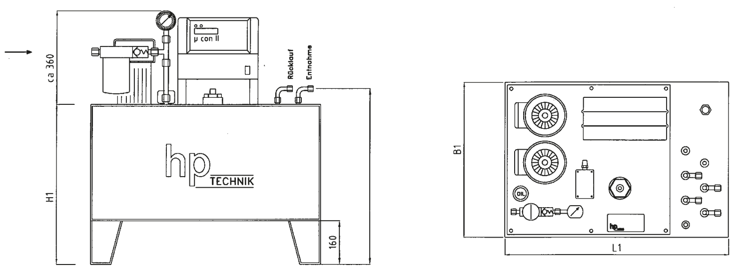
hp-Single units HSPE series / hp-Double units HSPD series

Unit	Model	Pump: Discharge power pump l/h	Pump: Ave. extraction quantity [1] [l/h]	Motor: W-alternating current ~230 V D-rotary current 230/400 V	Connections: Suction port for pipe Ø	Connections: Consumer connection for pipe Ø	Connections: Air discharge port connection	Tank data: Model	Tank data: Capacity (litres)	Tank data: First fill (litres)	Tank data: Length (mm) L1	Tank data: Width (mm) B1	Tank data: Height (mm) H1	Oil pan L x B x H	Electrical equipment: Control system with leakage detector (Model; item no.:)	Electrical equipment: Level measurement	Electrical equipment: Temperature monitoring	Electrical equipment: Spill protection	Electrical equipment: Optional spill protection to WHG	Solenoid valves option: Solenoid valve to DIN/EN (anti-lift valve) 230 V, 50 Hz	Solenoid valves option: Piston solenoid valve (TÜV and DIN tested) [-1 to 16 bar]
HSPE 30 -	6042	80	50	W-0.18 kW	12	12	G ¾"	NG 30	25	4	500	350	310	600 x 400 x 150	µCON I alternating current 0720075-01	NIVOCAP (capacitive level sensor) Item no.: 0710176	Temperature switch KTY81-110 / 50°C Item No.: 0720636	Level switch LS01 BV 14575 Item No.: 0720729	Overflow protection permitted to VbF and 63 WHG "Liquifant FTL-31" Item No.: 0720713 -2	G ⅜" - DN 10 (0820250)	"G ⅜" (0820256)
HSPE 60 -	6044	160	120	W-0.18 kW	15	12	G ¾"	NG 30	25	4	500	350	310	600 x 400 x 150						G ½" - DN 12 (0820342)	MK 10 G ½" (0820257)
HSPE 200 -	6045	300	200	W-0.18 kW	18	15	G 1"	NG 70	63	22	610	470	370	800 x 600 x 150							
HSPE 200 -	6047	600	400	W-0.18 kW	18	15	G 1"	NG 70	63	22	610	470	370	800 x 600 x 150							
HSPE 700 -	BHP	1000	700	D-0.75 kW	28	22	G 1¼"	E 160	160	40	810	570	560	1160 x 745 x 150	µCON I rotary current 0720076-01					G 1" - DN 25 (0820344)	MK 15 G 1" (0820259)
HSPE 700 -	BHM	1500	1000	D-0.75 kW	28	22	G 1¼"	E 160	160	40	810	570	560	1160 x 745 x 150							
HSPE 700 -	BHG	2000	1500	D-0.75 kW	28	22	G 1¼"	E 160	160	40	810	570	560	1160 x 745 x 150							
HSPE 1500 -	BHGP	3000	2200	D-1.1 kW	42	28	G 1½"	E 250	280	40	1010	700	580	1300 x 1100 x 150						G 1¼" - DN 25 (0820345)	MK 20 G 1¼" (0820260)
HSPD 30 -	6042	80	50	W-0.18 kW	12	12	G ¾"	NG 30	25	4	500	350	310	600 x 400 x 150	µCON III alternating current 0710050-11	NIVOCAP (capacitive level sensor) Item no.:0710176	Temperature switch KTY81-110 / 50°C Item No.: 0720636	Level switch LS01 BV 14575 Item No.: 0720729	Overflow protection permitted to VbF and 63 WHG "Liquifant FTL-31" Item No.: 0720713 -2	G ⅜" - DN 10 (0820250)	G ⅜" (0820256)
HSPD 60 -	6044	160	120	W-0.18 kW	15	12	G ¾"	NG 30	25	4	500	350	310	600 x 400 x 150						G ½" - DN 12 (0820342)	MK 10 G ½" (0820257)
HSPD 200 -	6045	300	200	W-0.18 kW	18	15	G 1"	NG 70	63	22	610	470	370	800 x 600 x 150							
HSPD 200 -	6047	600	400	W-0.18 kW	18	15	G 1"	NG 70	63	22	610	470	370	800 x 600 x 150							
HSPD 700 -	BHP	1000	700	D-0.75 kW	28	22	G 1¼"	E 160	160	40	810	570	560	1160 x 745 x 150	µCON III rotary current 0710070-11					G 1" - DN 25 (0820344)	MK 15 G 1" (0820259)
HSPD 700 -	BHM	1500	1000	D-0.75 kW	28	22	G 1¼"	E 160	160	40	810	570	560	1160 x 745 x 150							
HSPD 700 -	BHG	2000	1500	D-0.75 kW	28	22	G 1¼"	E 160	160	40	810	570	560	1160 x 745 x 150							
HSPD 1500 -	BHGP	3000	2200	D-1.1 kW	42	28	G 1½"	E 250	280	40	1010	700	580	1300 x 1100 x 150						G 1¼" - DN 25 (0820345)	MK 20 G 1¼" (0820260)

HSP30-200



HSP700-1500



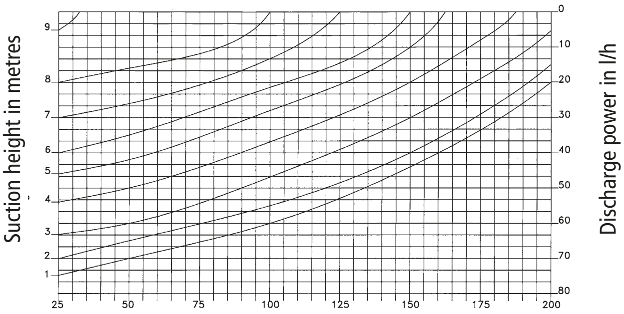
Subject to technical alterations.

[1] max. discharge power in l/h = max. pump suction flow! Measured for heating oil EL
The average extraction quantity in l/h depending suction height, suction length, pipe diameter is produced from the empirically-determined performance tables.

Performance curves for hp-High power suction pump units 4.3

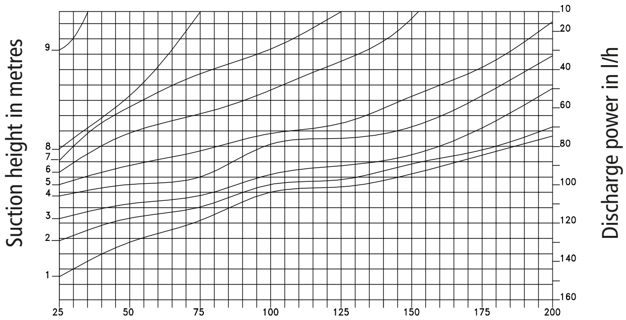
hp-Suction units Series HSP Based on empirical determination with heating oil EL at 20 °C.

HSP 30-6042 Performance Curve



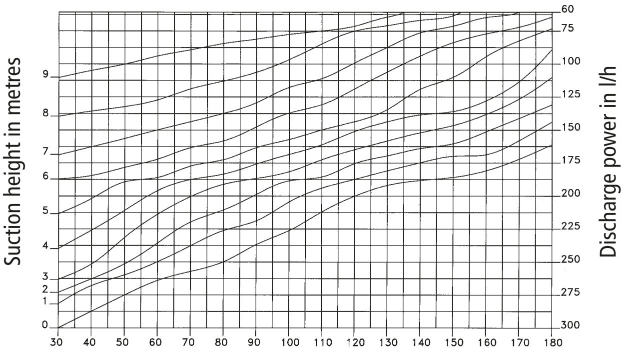
Length of the suction pipe in meters / pipe diameter DN 10

HSP 60-6044 Performance Curve



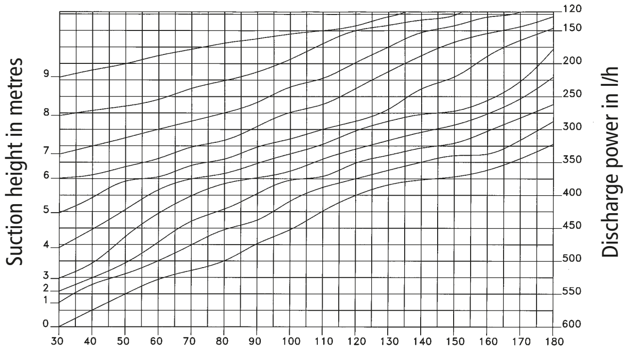
Length of the suction pipe in meters / pipe diameter DN 10

HSP 200-6045 Performance Curve



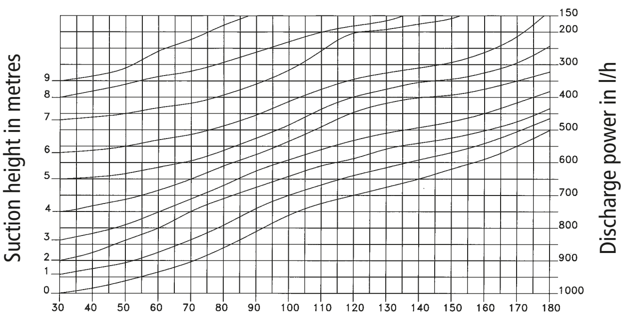
Length of the suction pipe in meters / pipe diameter DN 15

HSP 200-6047 Performance Curve



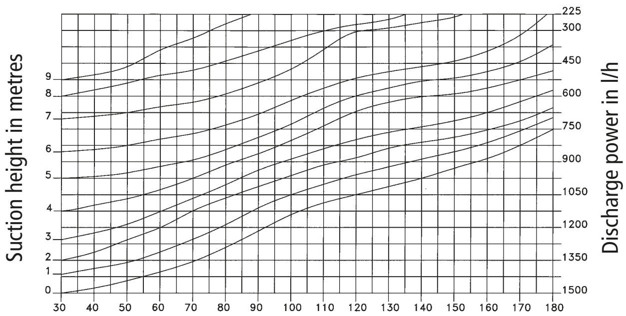
Length of the suction pipe in meters / pipe diameter DN 15

HSP 700-BHP Performance Curve



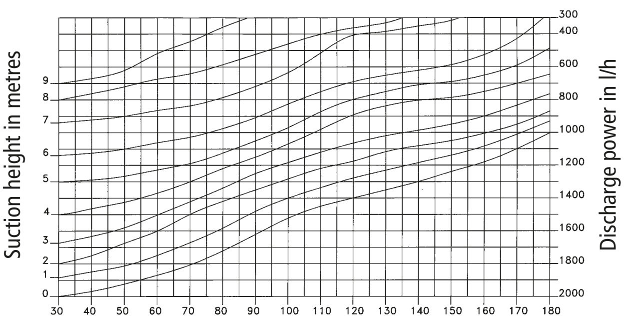
Length of the suction pipe in meters / pipe diameter DN 20

HSP 700-BHM Performance Curve



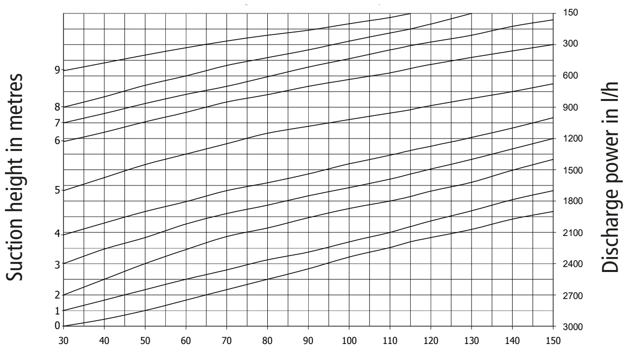
Length of the suction pipe in meters / pipe diameter DN 25

HSP 700-BHG Performance Curve



Length of the suction pipe in meters / pipe diameter DN 25

HSP 1500-BHGP Performance



Length of the suction pipe in meters / pipe diameter DN 32

These performance curves are based on tests with optimum pipe flow and may only be considered as guidelines. Not all usage cases can be derived from them. Copying, duplication or forwarding to third parties requires our written permission.

hp-Single suction and pressure pump aggregates 4.4

hp-Single suction and pressure pump unit Series ESD

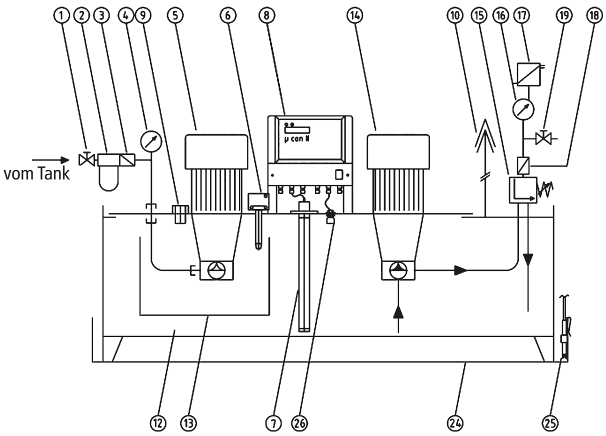
The suction and pressure units are a combination of the proven hp-Pressure units with hp-High capacity suction units to handle more difficult heating oil transfer problems.
The suction units can handle underpressures up to -0.9 bar, which is 9 m geodetic height or even up to 200 m suction pipe length.

With the pressure unit, loads that are further away, with observable pipe flow, can be provided in single and two-pipe operation. The required preliminary pressure (up to max. 6 bar) can be adjusted on the overflow valve on the delivery side. The pressure line monitoring to display pipe break or leakage of oil is done by means of a pressure transmitter.

The pump is controlled through two interconnected pump control systems.
Via the operating menu, each pump can be switched on and off separately. If there are any faults, a total shutdown occurs, correspondingly displayed, and potential-free collective fault message.

As an option, there is the possibility of equipping the control system with potential-free individual contacts to be activated by the central system. The device is shut down when oil leaks by means of an oil leak alarm, fitting in the oil pan.

Baureihe ESD für intermittierenden Betrieb



Scope of supply:

1 Ball valve (in the place of installation)
2 Suction filter
3 Nonreturn valve
4 Vacuum gauge
5 hp-Internal gear pump with standard electric motor
6 Temperature monitoring
7 Level sensor
8 hp-Pump control
9 Filling port
10 Air discharge port
12 Operating tank
13 Oil bath chamber
14 hp-Internal gear pump with standard electric motor
15 hp-Overflow valve
16 Manometer
17 Pressure transmitter
18 Nonreturn valve
19 Ball valve
24 Oil pan
25 Leakage detector
26 Spill protection (standard)

Accessories:
26 Spill protection according to VbF with WHG permission

ESD for pressure-side intermittent or two-pipe operation for heating oil supply diagrams, see page 100/101

	Discharge power [1)] Suction pump		Discharge power [1)] Delivery pump		Tank	Capacity	First filling	Length	Width
Unit model	Model	l/h	Model	l/h	Type	Litres	Litres	L1	B1
ESD 60	6044	160	6043	120	BAK 70	60	5	515	440
ESD 200	6047	600	6045	300	BAK 70	60	5	650	510

Unit model	Pump model	Motor 230 V	Item No.	Suction port (tank)	DN	Delivery connection for pipe Ø	Overflow valve pressure stage 1 1 - 4 bar adjustable	Air discharge port connection	Oil pan L x B x H
ESD 60 -	6044/43	0.18 kW	0490030	G 1/2"	13	12	BP-G 1/2″	G 3/4"	800 x 600 x 150
ESD 200 -	6047/45	0.18 kW	0490052	G 1/2"	15	15	BG-G 1/2″	G 1"	800 x 600 x 150

Other sizes on request
Can also be supplied with accumulator control

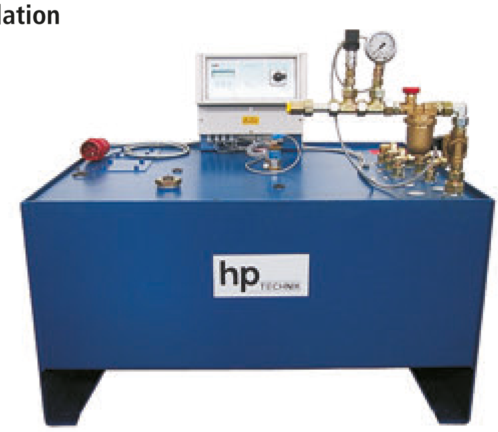
Remark:
The unit types listed contain pump pairings of the suction and pressure pump, based on the many years of experience with our hp suction units and their average extraction[1]).
For the layout for the relevant use case, a precise fine-tuning of the pump pairing (depending on suction height, suction length, pipe cross-section, pipe route on the suction side and the pressure height, pressure pipe length, maximum extraction on the delivery side) must be carried out with the manufacturer.

[1)] max. discharge power in l/h = max. pump suction flow!
The average extraction quantity in l/h depending suction height, suction length, pipe diameter is produced from the empirically-determined performance tables.

hp-Oil day tank 4.5

Oil day tanks for fuel oil El for supplying oil consumers in single pipe installation

designed and tested to DIN EN 12 514 – 1
- Operating tanks of: Al or sheet steel (day fuel tank)
- Level control system (230 V or 400 VAC) with leakage detector
- Level sensor
- Filling port
- Air discharge port
- Consumer connection
- Solenoid valve
- Oil pan
- Spill protection
- Supply line with shut-off, filter and pressure monitor
- Spill protection to § 63 WHG



Applications:

- Oil operating tanks for emergency power diesel units
- Oil operating tanks for block heat and power plants
- Oil operating tanks for burner supply

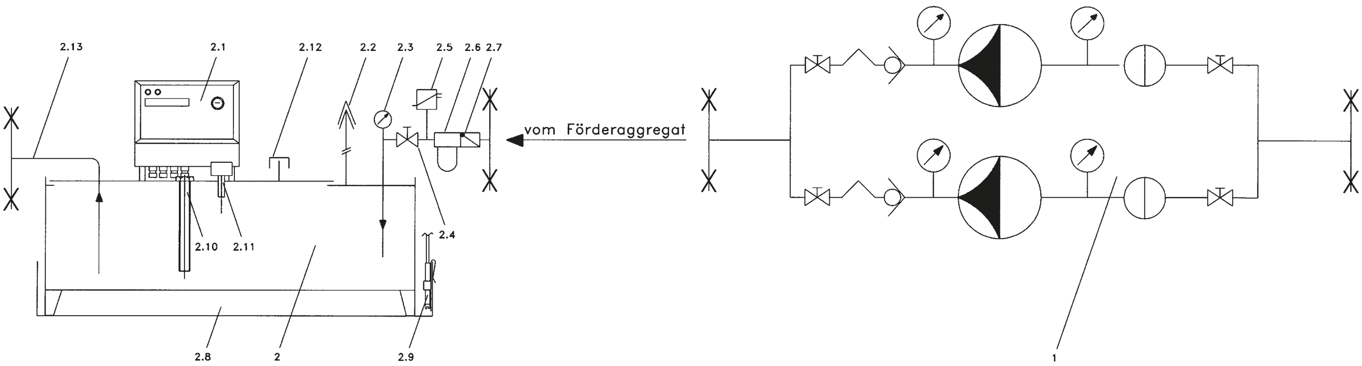
General description:

The oil operating tanks may be filled with an external supply pump. Using a freely programmable µCon III model control system and a relevant capacitive level recording system, the fill levels in the operating tanks are regulated. The gas emissions of the medium when conveying will be carried away by an air discharge port. This ensures a bubble-free supply of the consumption points with fuel. The filling pump(s) can be controlled by the available µCon III control system. However, it is also possible to activate them using a separate pump control system.
An ideal place of installation of the operating tank is in the immediate vicinity of the consumption points.

	Tank		Volume / litres during switching			Tank dimensions			Filling port connection	Oil pan	Item No.
Model	Model	max. capacity	min / In	max / Out	Overfilled / l	Length	Width	Height			
ÖVB 70	NG 70	63	9	55	60	605	465	380	DN 15	800 x 600	0420 500
ÖVB 160	E 160	160	50	130	150	810	640	560	DN 20	1160 x 745	0420 510
ÖVB 250	E 250	280	50	130	150	1010	700	580	DN 25	1300 x 1100	0420 520

Other sizes on request
For air discharge port connection and extraction connections, as for suction unit, see table on

Diagram:



1 Pump unit (single or double)
2 Oil operating tank
2.1 Tank control system
2.2 Air discharge port
2.3 Manometer
2.4 Ball valve
2.5 Pressure switch
2.6 Oil filter
2.7 Nonreturn valve
2.8 Oil pan
2.9 Leakage detector
2.10 Level sensor
2.11 Spill protection
2.12 Bypass connection
2.13 Consumer connection

hp-Small pressure accumulator units 4.6

Series: Ölman®

Single unit to supply small fire places with fuel oil EL in single pipe system to DIN/EN 12514-1

Delivery: Complete with oil pan and electrical oil leakage detector to DIN or TÜV with WHG permit. (§ 63 WHG)

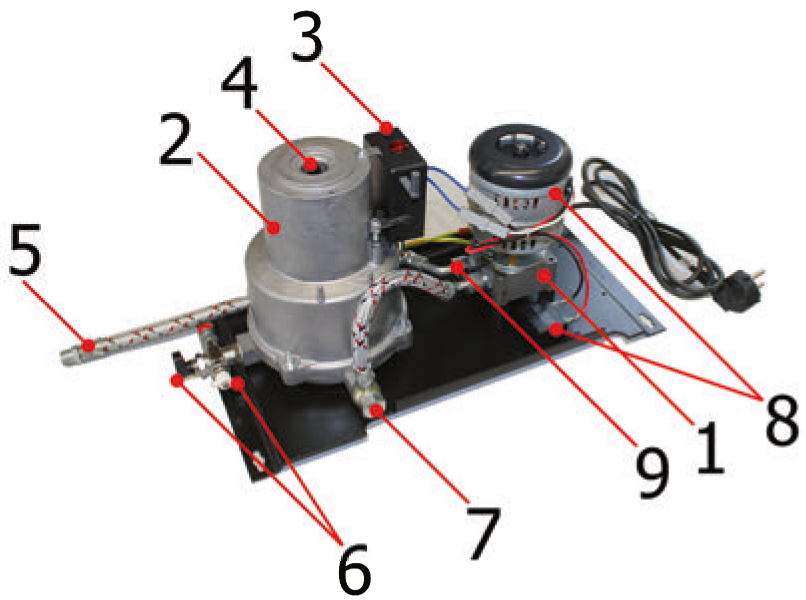
Oil pump: An internal gear pump driven by a robust motor provided with overtemperature protection. The upper safety pressure limit to DIN/EN 12514-1 is achieved by an additional micro limit switch that locks the control system. Only a specialist may unlock it. When doing this, it must by checked why the safety circuit has activated. After removing the lid, unlocking may be initiated (disconnect mains plug). To unlock, the micro limit switch must be pushed together using a pin through the bore hole (3 mm) into its initial position.

Filter: Is located in the suction port, can be unscrewed for cleaning.

Nonreturn valve: Located in the delivery port to the pressure accumulator.

Pressure accumulator: Consisting of an aluminium construction. In this is located the roll membrane made of special rubber with fabric inlay (operating pressure max. 7 bar) with a piston and compression spring to determine the conveying pressure. The indicator rod indicates the relevant fill level of the tank. The safety and operating switches provided with silver contacts are fastened completely with screws onto the pressure accumulator and provided with plug connection.

Maintenance-free pressure accumulator



Scope of supply:

1 Oil pump
2 Pressure accumulator
3 Control system with indicator light/ switch and fault shut-down system
4 Indicator rod
5 Suction port for pipe 8mm ø
6 Crossover valve (with throttle valve) Delivery connection for pipe 8mm ø or ventilation or emptying option
7 Nonreturn valve
8 Motor with capacitor
9 Location of filter

Technical Data:

Capacity:	30 l/h
Pressure height:	16 m
Suction height:	4 m
Operating pressure:	2.5 bar
Suction/delivery pipe:	8 mm pipe Ø
Motor:	220 V; 50 Hz, maintenance free
Fuse type:	DIN 40050 T.1
Length:	400 mm
Width/height:	200 mm
Weight:	6.5 kg

- 2 year manufacturer's guarantee
- Low noise
- Any installation position
- Overtemperature protection

Name	Item No.
Ölman (without accessories)	045 8002
Ölman (complete with oil pan and oil leak detector)	045 8004

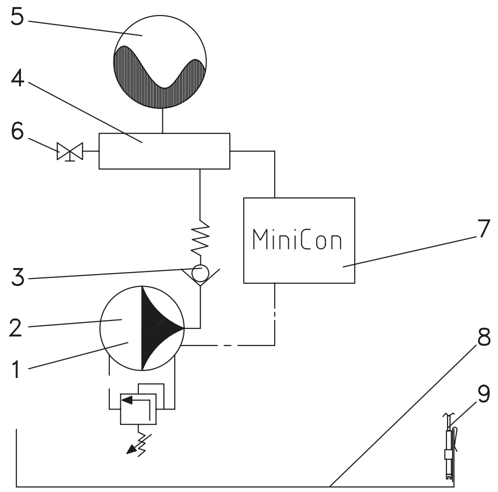
hp-Single pressure accumulator units 4.7

hp-Single unit Series DSK 4.1-K (for wall mounting)

hp-Oil supply for small fire places with fuel oil EL to DIN/EN 12514-1.

All units are constructed, tested, registered and labelled according to this test standard.

Independently controlling oil feed unit for single-pipe installation
- with oil accumulator
- with internal gear pump fitted on mounting plate
- with overflow valve and all the required fittings



Scope of supply:

1 Oil filter in pump
2 Internal gear pump with overflow valve
3 Nonreturn valve
4 Oil distributor
5 Pressure accumulator with heating oil resistant membrane
6 Ball valve for supply line
7 Pressure accumulator control „miniCon"
8 Oil pan
9 Leakage detector for electrical shutdown

Model	Device connections pipe Ø*		Discharge	Continuous extraction max.	Motor 230 V 2800 RPM	Pressure accumulator	Dimensions in mm			Item No.	
	Delivery	Suction	l/h	l/h	kW	Litres	Width	Height	Depth		
DSK 4.1-6044-K	12	12	140	70	0.18	8	410	600	250	0450032	Max. delivery head: 20 m Max suction height: 4 m
Spare parts: Plug-in coupling										0820623	
Accessories: Safety valve (7 bar) 1)										0820379 -7	

1) The safety valve is used to secure the delivery pipe against overpressure, e.g. caused by thermal expansion of the heating oil. (Securing the delivery pipe against overpressure is prescribed by the standard.)

Accessories for DSK 4.1

Suction port with vacuum gauge

Model	Connection	for pipe Ø	Item No.
DSK 4.1-6044	EV GE 12	12	045 0115

* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements! The pump or device connection gives no indication of the relevant size of the pipe.

hp-Double pump feed units 4.8

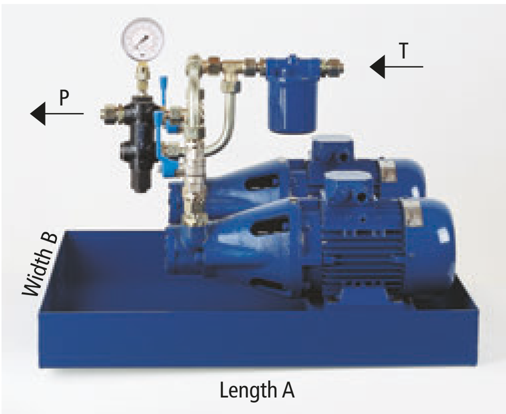
hp-Double pump units Bi-Comfort 2000 Series SMG 2200

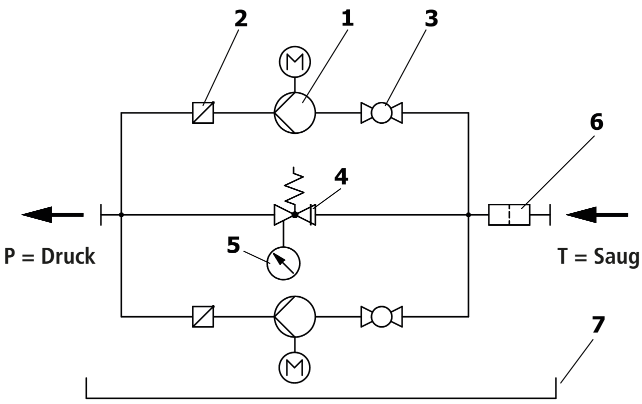
equipped with hp-Industrial pump Series B, with rotary and alternating current motor (1400 RPM).

Feed unit constructed, tested, registered and labelled to DIN/EN 12514-1 !

The installed hp-Overflow valve is equipped in the factory with pressure stage 2, i.e. 2 to 9 bar. Pressure stage 1, i.e. 1 to 4 bar, is possible on request.

Please append the number "1" to the model description on the order.





Bi-Comfort scope of supply:

1 Motor pump groups
2 Nonreturn valve
3 Ball valve
4 Overflow valve
5 Manometer
6 Suction filter
7 Oil pan

		for fuel oil EL and L (2.8 to 34 cSt.)								Dimensions		Item No.	
			Electric motor kW		Unit connection*								
					Delivery side		Suction side						
Unit model	Pump model	Discharge l/h	Rotary current	Alternating current	Thread	Pipe	Thread	Pipe	Filter size	Length A	Width B	Rotary current	Alternating current
SMG 2201	BP-I + D	45	0.18	0.18	G 3/8"	12 x 1	G 3/8"	12 x 1	G 3/8"	600	500	0410001	0410021
SMG 2202	BM-I + D	80	0.18	0.18	G 3/8"	12 x 1	G 3/8"	12 x 1	G 3/8"	600	500	0410002	0410022
SMG 2203	BG-I + D	120	0.18	0.18	G 3/8"	12 x 1	G 3/8"	12 x 1	G 3/8"	600	500	0410003	0410023
SMG 2204	BF-I + D	160	0.18	0.18	G 3/8"	12 x 1	G 3/8"	12 x 1	G 3/8"	600	500	0410004	0410024
SMG 2205	BGP-I + D	300	0.18	0.18	G 1/2"	15 x 1	G 1/2"	15 x 1	G 1/2"	600	500	0410005	0410025
SMG 2206	BGM-I + D	450	0.37	0.37	G 1/2"	15 x 1	G 1/2"	15 x 1	G 1/2"	600	500	0410006	0410026
SMG 2207	BGG-I + D	600	0.37	0.37	G 1/2"	15 x 1	G 1/2"	15 x 1	G 1/2"	600	500	0410007	0410027
SMG 2208	BHP-I + D	1000	0.75	–	G 3/4"	22 x 1.5	G 3/4"	22 x 1.5	G 3/4"	800	700	0410008	–
SMG 2209	BHM-I + D	1500	0.75	–	G 3/4"	22 x 1.5	G 3/4"	22 x 1.5	G 3/4"	800	700	0410009	–
SMG 2210	BHG-I + D	2000	1.1	–	G 3/4"	22 x 1.5	G 1 "	28 x 2	G 1 "	800	700	0410010	–
SMG 2211	BHGP-I + D	3000	1.5	–	G 1"	28 x 2	G 1 1/2"	42 x 2	G 1 1/2"	800	700	0410011	–
Designed for p_{max} = **6 bar**													

Model key for determining order specifications

E.g.: SMG 2205 – ○ – ○ – ○ – ○

Series size	Pressure stage bar	Motor	Accessories	Item No.
SMG 2201 to SMG 2211	**1** = 1 – 4 **2** = 2 – 9	W = Alternating current D = Rotary current	**LH** = Oil pan equipped with oil leakage detector	0720705 -1
			S[1)] = with integrated electrical pressure switch for monitoring of the delivery line (pipe burst check)	FF4-0820290 DSF-0820292
			DF = execution with double filter (DN 15)	On request

For installation, operation and maintenance, follow the operating instructions that come with each piece of equipment.

[1)] Note: In the place where it is fitted, as a "lower limiter" an electrical pressure switch must be provided as a pipe break check. This condition is met by selecting the "S" accessory.
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements.
The pump or device connection gives no indication of the relevant size of the pipe.
Note for screw-fitted design: EO pipe screw fitting for steel tube DIN 1630 and 2391, when using Cu pipe, the corresponding EO protective sleeve must be used.

Accessories for burner supply 4.9

Double ball valve combination for installation in tank supply and bypass pipe or as a connection for an air separator on ring pipe system.

Double ball valve combination

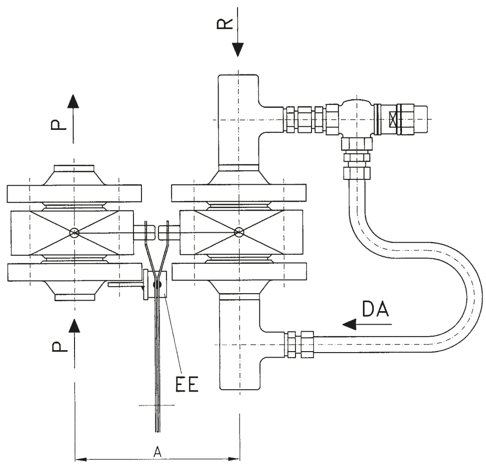
Screw-fitted design
with safety valve, without component testing for pressure release and end position switch

Model	A	Item No.
DK-DA-EE/G 1/2" for pipe 15	126	0830500
DK-DA-EE/G 1/2" for pipe 18	126	0830504
DK-DA-EE/G 3/4" for pipe 22	132	0830508
DK-DA-EE/G 1" for pipe 28	138	0830512

Double ball valve combination

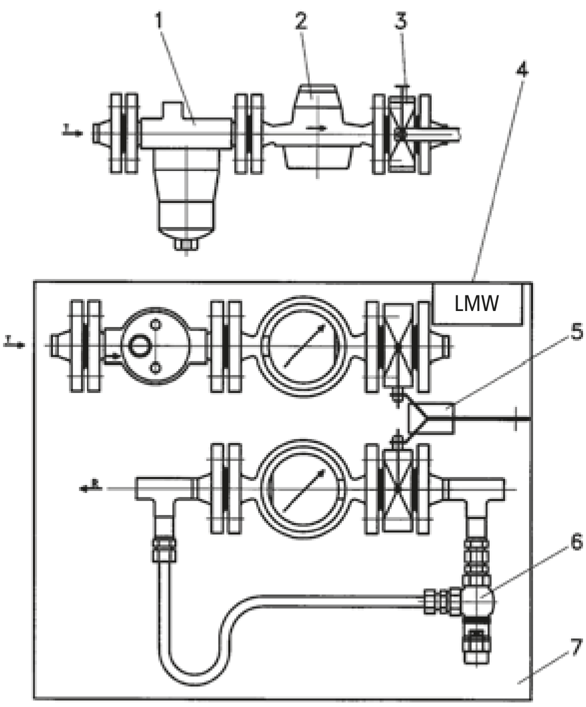
Flanged design with counter-flange, seals and screws
with safety valve, without component testing for pressure release and end position switch

Model	A	Item No.
DK-DA-EE/DN 15 – PN 16	135	0830515
DK-DA-EE/DN 20 – PN 16	140	0830520
DK-DA-EE/DN 25 – PN 16	170	0830525
DK-DA-EE/DN 32 – PN 16	175	0830532
DK-DA-EE/DN 40 – PN 16	205	0830540

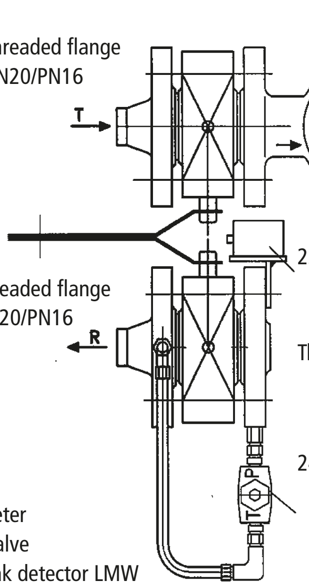


Safety valve not component-tested G 3/8" 0820379
Set to 3 bar and sealed, adjustment possible
alternative at an additional cost
Safety valve with component testing G 1/2" 0820372
set to 3 bar and sealing cap, not adjustable
See page 84.

Figures: Special design on customer request



1 Filter
2 Oil meter
3 Ball valve
4 Oil leak detector LMW
5 End position switch
6 Safety valve
7 Oil pan



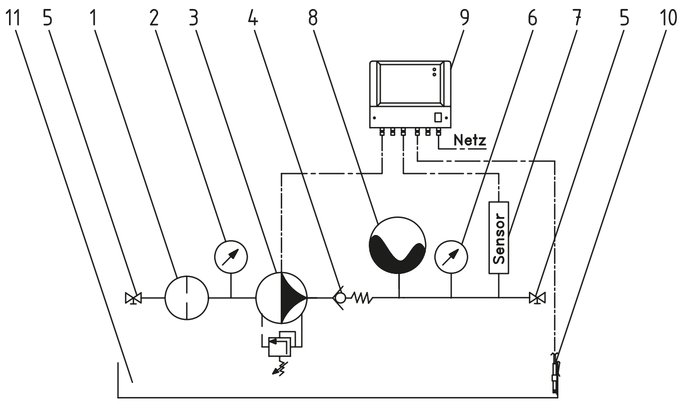
hp-Single pressure accumulator units Series DSK 4.1 — 4.10

hp-Single units with pressure accumulator control system (for wall mounting)

With hp-Internal gear pump fitted horizontally on the oil pan with overflow valve, all the required fittings and pump control system to switch the pump on and off, and recording all relevant operating parameters.

Self-controlling fuel oil feed units with accumulator membrane vessels for single-pipe oil supply to DIN/EN 12514-1 for automatic oil burners.
Feed pump unit constructed, tested, registered and labelled to DIN/EN 12514-1

Supplied complete with oil leakage detector.



Scope of supply:

1 Oil filter
2 Vacuum gauge
3 Internal gear pump with overflow valve
4 Nonreturn valve
5 Ball valve
6 Manometer
7 Sensor
8 Pressure accumulator with fuel oil resistant membrane and ball valve
9 hp-Pump control
10 Leakage detector for electrical shutdown in oil pan
11 Oil pan

Unit model	Device connections pipe -Ø* Delivery	Device connections pipe -Ø* Suction	Discharge l/h	Continuous extraction l/h	Motor capacity at 1400 RPM Rotary current (kW)	Motor capacity at 1400 RPM Alternating current AC (kW)	Pressure accumulator litres	Dimensions mm Width	Dimensions mm Height	Dimensions mm Depth	Item No. Rotary current design	Item No. Alternating current design	
DSK 4.1-1545	15	18	300	240	0.18[2]	0.18	18	650	1000	320	0450004	0450015	max. delivery head: 20 m[1]
DSK 4.1-1547	15	18	600	400	0.37[2]	–	18	650	1000	320	0450006	–	
DSK 4.1-1549	18	28	1500	1000	0.75[2]	–	25	750	1000	420	0450008	–	max. suction under-pressure: -0.4
	Pipe dimension by calculation of the line												

For installation, operation and maintenance, follow the operating instructions that come with each piece of equipment.

Accessories	Item No.
Safety valve (7 bar)	0820379 -7

The safety valve is used to secure the delivery pipe against overpressure, e.g. caused by thermal expansion of the fuel oil.
(Securing the delivery pipe against overpressure is prescribed by the standard.)

[1]) Larger delivery heads on request.
[2]) The motor voltage is 230/400 V at speeds of 1400 RPM
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements.
The pump or device connection gives no indication of the relevant size of the pipe.
Note for screw-fitted design: EO pipe screw fitting for steel tube DIN 1630 and 2391, when using Cu pipe, the corresponding EO protective sleeve must be used.

hp-Double pressure accumulator units Series DSK 2.16 — 4.11

hp-Double units with pressure accumulator control system (for wall mounting)

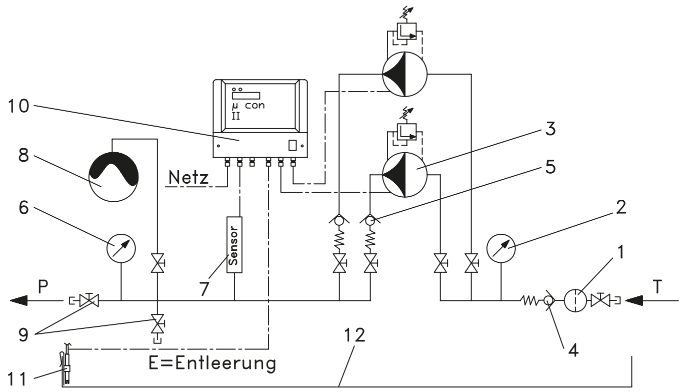
With hp-Internal gear pump fitted horizontally on the oil pan with overflow valve and all the required fittings.

Supplied complete with leakage detector.

Order text:

hp-Double wall-mounted unit with pressure accumulator control system for automatic alternating current and fault changeover.

Continuous extraction: l/h fuel oil EL
Max. discharge height: m
Power type:
Voltage: Volt, 50 Hz
Accessories:
Model: (see table)



Scope of supply:

1 Oil filter
2 Vacuum gauge
3 2 x Internal gear pump with overflow valve
4 Nonreturn valve
5 2 x nonreturn valve
6 Manometer
7 Pressure sensor
8 Pressure accumulator
9 Ball valves
10 hp-Double-pump control system
11 Oil leak detector
12 Oil pan

Unit model	Device connections pipe Ø* Delivery	Device connections pipe Ø* Suction	Discharge l/h	Continuous extraction l/h	Motor capacity at 1400 RPM Rotary current (kW)	Motor capacity at 1400 RPM Alternating current (kW)	Pressure accumulator litres	Dimensions mm Width	Dimensions mm Height	Dimensions mm Depth	Item No. Rotary current design	Item No. Alternating current design	
DSK 2.16-6044	12	12	140	70	–	0.18	8	840	900	320	–	0460044	max. delivery head: 20 m [1] max. suction under pressure: -0.4 bar
DSK 2.16-1545	15	18	300	240	0.18[2]	–	18	840	1000	320	0460008	0460028	
DSK 2.16-1547	15	18	600	400	0.37[2]	–	18	840	1000	320	0460012	–	
DSK 2.16-1549	18	28	1500	1000	0.75[2]	–	25	1300	1000	400	0460016	–	
	Pipe dimension by calculation of the line												

For installation, operation and maintenance, follow the operating instructions that come with each piece of equipment.

Accessories	Item No.
Safety valve (7 bar)	0820379 -7

The Safety valve is used to secure the delivery pipe against overpressure, e.g. caused by thermal expansion of the heating oil.
(Securing the delivery pipe against overpressure is prescribed by the standard.)

[1] Larger delivery heads on request.
[2] The motor voltage is 230/400 V at speeds of 1400 RPM
* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.

Units for air-separation of return fuel Series BA 4.12

Air-separation unit

For single-pipe installation of the burner for supply pressure max. 10 bar, with pressure regulator set to 0.5 bar

Diagram I with adapter for oil meter

with HZ 5 oil meter for max. 50 l/h

with VZO 8 oil meter for max. 135 l/h

Accessories:
Leakage detector type LMW, item no. 072 0705-1

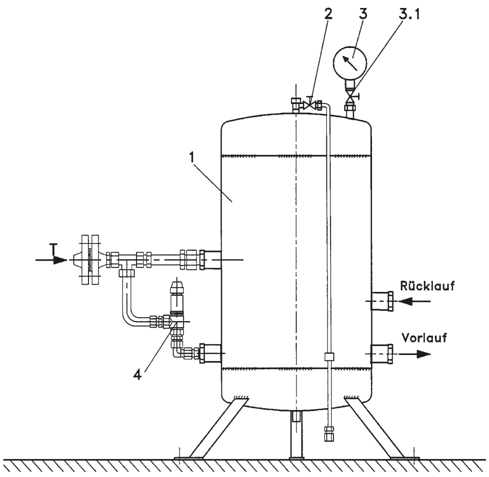
Scope of supply:

- Filter with ball valve and filter cup (brass)
- Adapter for oil meter
- Solenoid valve for burner control system
- Pressure regulator set fixed at secondary pressure 0.5 bar, system pressure max. 10 bar
- Air-separation vessel with ball valve for manometer and
- Automatic air vent for starting up
- Pressure-equalising fitting, for increase in volume due to heating up
- Completely fitted in oil pan for floor or wall fitting, direction of flow may be left or right

Model	Burner throughput	max. bypass	Filter connection	Burner connection	Item No.	Dimensions	Weight Kg	Adapter for oil meter	Max. oil throughput
BA Diagram I	20 – 130 l/h	120 l/h	G 3/8" IG	G 3/8"	082 1204	465 x 105 x 315	5.6	HZ 5 VZO 8	40 l/h 135 l/h
BA Diagram III/2	150 – 400 l/h	360 l/h	G 1/2" IG	G 1/2"	082 1245	625 x 125 x 315	8.3	VZO 15	400 l/h

Air separation vessel

Size	Tank	Height	Connection supply	Burner	Item No.
5 l	DN 125	400	DN 15	G 3/4"	0821210
17 l	DN 200	500	DN 15	G 3/4"	0821220
30 l	DN 250	550	DN 20	G 1"	0821230
70 l	DN 350	700	DN 25	G 1"	0821240



Scope of supply:

1 Vessel
2 Manual air vent
3 Manometer with ball valve
4 Safety valve without component test
Set to 3 bar and sealed, adjustment possible

Options:

10 Pressure switch
11 Solenoid valve
12 Oil meter
13 Filter
14 Pressure regulator
15 Double ball valve
16 Electrical end position switch for item
17 Ball valve in supply line
18 Automatic float air vent
19 Air vent with solenoid valve

Units for air-separation of return fuel Series LBA-A 4.13

hp-Air-separation unit

For single-pipe installation with monoblock burners and systems according to DIN 4755 Bl.2 and TRD 411 or 604.

These fuel oil air-separation units are to be considered as a component of a burner unit and designed for a max. pressure of 5 bar.

Medium: fuel oil EL and L
Internal setting: max. 45 °C

Basic design A for supply pressure

by means of separate feed pump through the ring main present or tank situated higher up.
For single-pipe oil installation of automatic oil fuel with fuel oil EL suitable for systems to DIN 4755 or TRD.

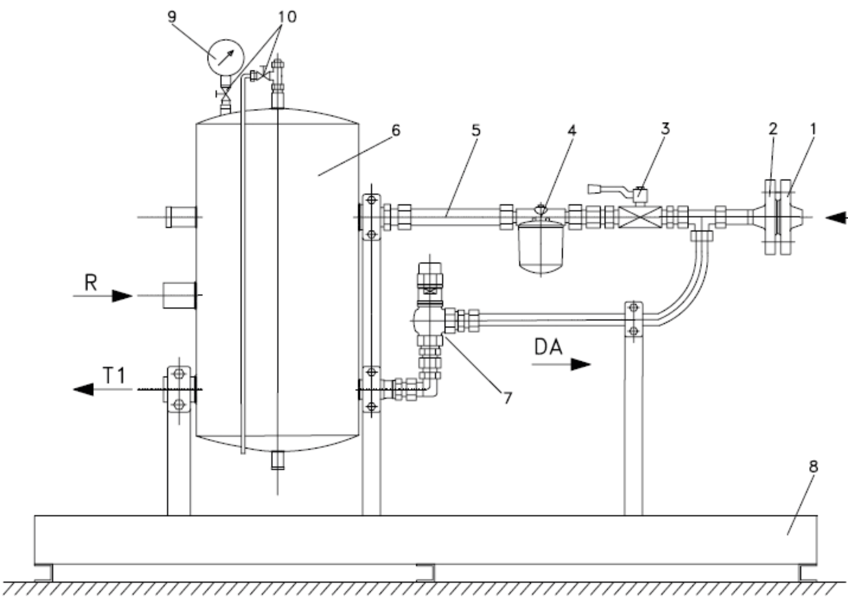
Functional description:
Design according to scheme A (with supply pressure on T connection)

The burner pump shall supply the oil via a ball valve (3), filter (4), adapter for oil meter (or optionally integrate oil meter) (5) and vessel (6) **in the single pipe system, i.e. in T connection, only the fuel oil used by the boiler flows. In T1 and R connections, on the other hand, the full intake flow of the burner pump flows**. The bypass oil R coming from the burner is directed via the vessel back to the burner. The air arising as a result may be vent by manual ventilation (10).

Optionally, automatic vent by a float air vent is also possible.

This unit is designed for supply pressure of 1 - 5 bar.

Other designs (e.g. for suction operation or deviating accessories) may be provided on request.



Scope of supply of burner fittings:

1 Weld neck flange
2 Connection flange PN 16
3 Ball valve PN 16
4 Filter
5 Adapter for oil meter
6 Vessel
7 Overflow valve as safety valve
8 Oil pan with fastening
9 Manometer
10 Ball valve for Manometer and ventilation

Size	Burner flow on T l/h	Burner pump max. l/h	Supply connection T	Burner connection R + T1	Vessel capacity litres	Dimensions	Item No.
LBA 600 A	10 – 200	600	DN 15	G 3/4"	5	1050 x 360	0480060
LBA 1200 A	10 – 400	1200	DN 15	G 3/4"	18	1400 x 500	0480120
LBA 2400 A	30 – 1000	2400	DN 20	G 1"	30	1400 x 500	0480240
LBA 3000 A	75 – 2000	3000	DN 25	G 1"	30	1400 x 500	0480300

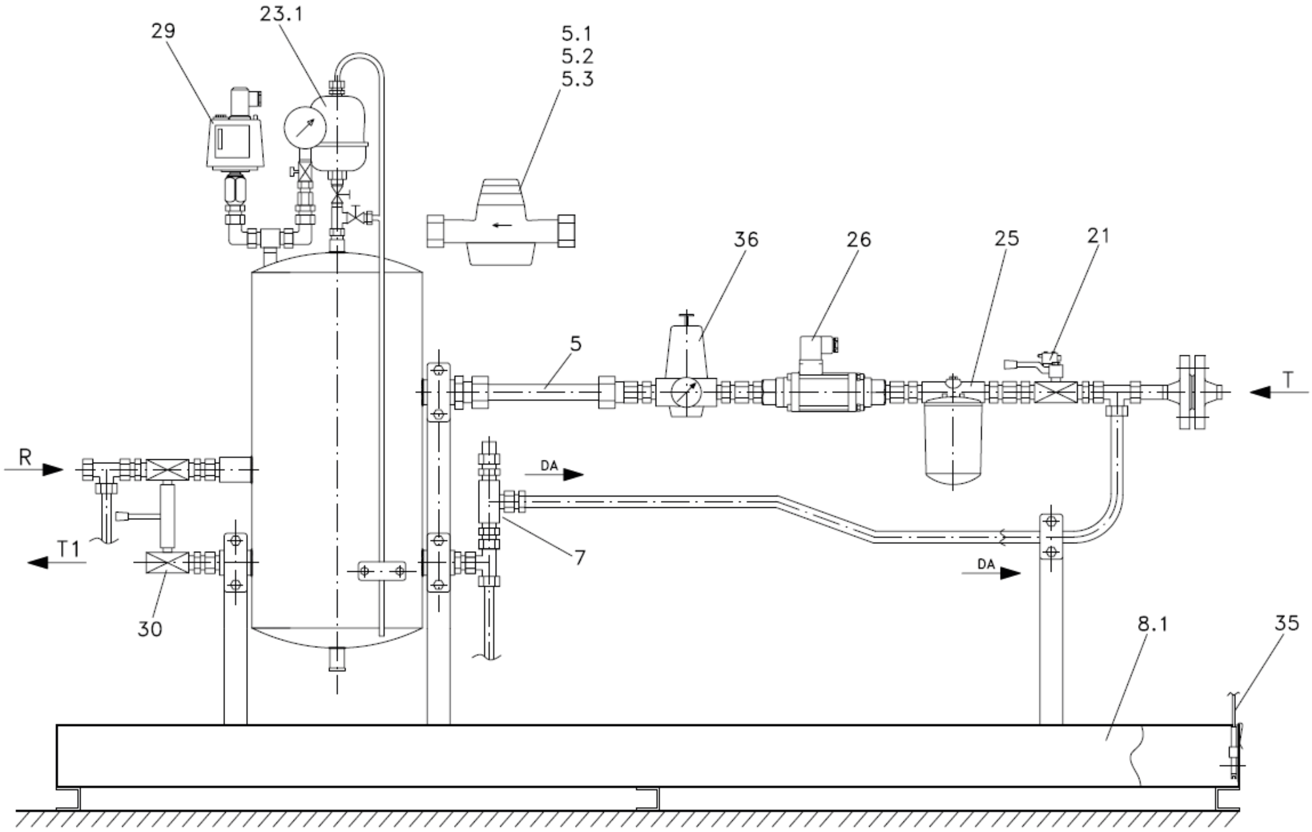
Option for air-separation unit Series LBA-A 4.14

hp-Air-separation unit

for single-pipe installation with monoblock burners and systems according to DIN 4755 Bl.2 and TRD 411 or 604.

These fuel oil air-separation units are to be considered as a component of a burner unit and designed for a max. pressure of 5 bar.

Medium: fuel oil EL and L
Internal setting: max. 45 °C



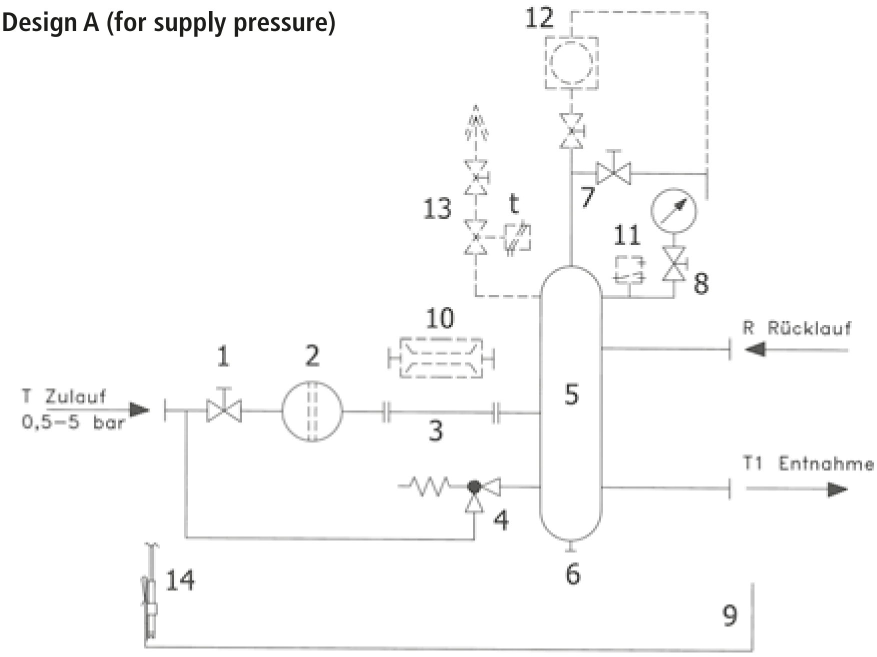
Item	Brief description	Name	LBA 600 Item no.	LBA 1200 Item no.	LBA 2400 Item no.	LBA 3000 Item no.
5.1	HZ	Oil meter VZO 15 to 25 RC	0700312	0700312	0700320	0700326
5.2	RV	Pulse generator RV = 0.1 for VZO 15; Pulse generator RV = 1 for VZO	0700313	0700313	0700321	0700327
5.3	IN	Pulse generator IN = 0.1 for VZO 15; Pulse generator IN = 1 for VZO	0700315	0700315	0700322	0700328
21	EE	End position switch, including bracket, 230 V/50 Hz	0820730	0820730	0820730	0820730
23.1	G/SE	Automatic float air vent for optimum ventilation	0820212	0820212	0820212	0820212
25	EF	Single filter G 3/4" / PN10, 100µ	0820022	0820022	–	–
25	EF	Single filter G 1" / PN6, 100µ	–	–	0842950	0842950
26	M	Piston solenoid valve, G 1/2"– DN 10, DIN & TÜV tested	0820257 M	0820257 M	–	–
26	M	Piston solenoid valve, G 3/4"– DN 15, DIN & TÜV tested	–	–	0820258 M	–
26	M	Piston solenoid valve, G 1"– DN 15, DIN & TÜV tested	–	–	–	0820259 M
29	S	Pressure switch G 1/2", 230 V/50 Hz, adjustment range: 0.5 - 6 bar	0720672 M	0720672 M	0720672 M	0720672 M
30	DK	Double ball valve combination	0821110	0821112	0821112	0821114
35	LH	Leakage detector integrated into oil pan, type LMW (sensor 1.5 m)	0720705 -1	0720705 -1	0720705 -1	0720705 -1
36	DM	Pressure-regulator valve 0.2–2.5 bar	0821185 M	0821186	0821187	0821188
7	DA	Pressure equalisation as safety valve with component test possible at an additional cost, set to 3 bar with sealing cap	0820372	0820372	0820372	0820372

Units for air-separation of return fuel in compact execution Series LBA-K 4.15

For single-pipe installation with automatic oil burners with bypass oil-air separation to DIN EN 12514 and TRD 411 & 604.

Medium: fuel oil L/EL to DIN 51603
Maximum pressure: 5 bar
Maximum temperature: 45 °C

Design A (for supply pressure)



Scope of supply:

1. Ball valve
2. Filter
3. Adapter for oil meter (VZO)
4. Pressure-equalisation device (safety valve)
5. Vessel with:
5.1 Manual ventilation
5.2 Tank drain
6. Manometer with ball valve
7. Oil pan

Accessories/options:

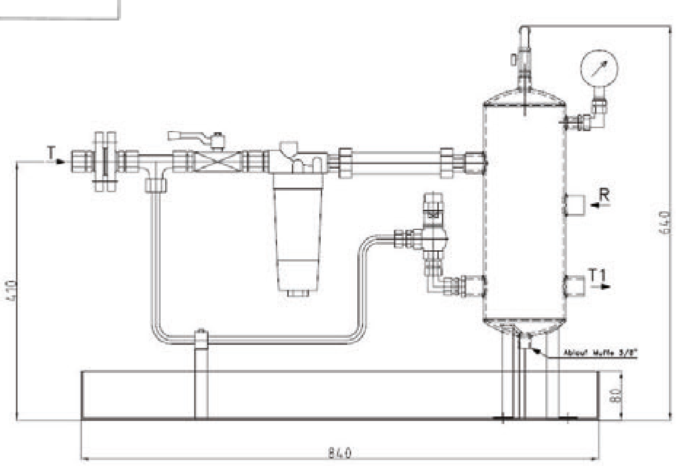
10. Oil meter model VZO
11. Pressure switch (S)
12. Automatic float air vent (G/SE)
13. Time-controlled vessel vent (TE)
14. Leakage detector integrated into oil pan (LH)

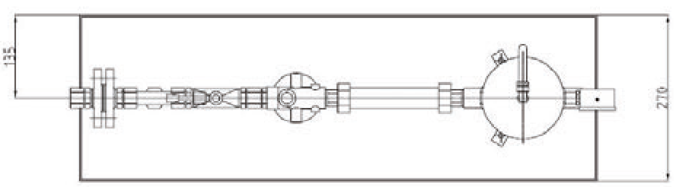
Via the **T** connection the medium is conveyed through the fitting with system pressure (0.5 - 5 bar) via ball valve **1** and filter **2**.

The burner pump extracts the medium from the vessel via **T1** connection and returns the burner bypass quantity via R connection to the vessel.

In the vessel, the air is separated from the medium and is separated off out of the system via manual ventilation **7** (optionally other ventilation options **12** and **13**).

To avoid unpermitted high system pressure, a pressure equalisation device **4** (safety valve) is integrated.





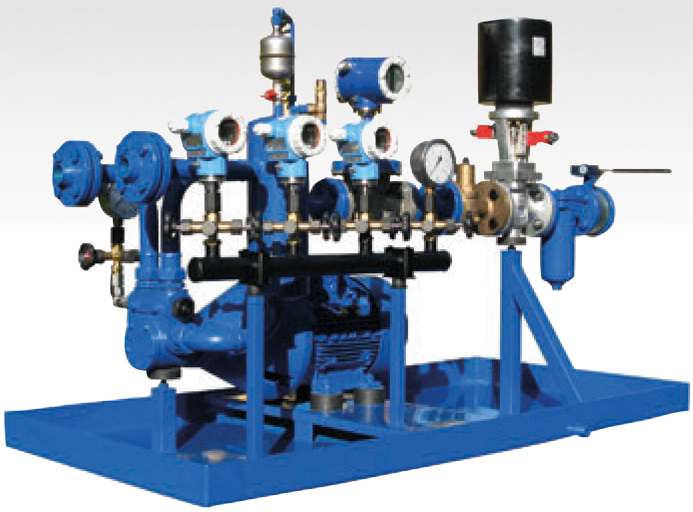
Size	Burner pump max. l/h	Burner extraction (ENT) on T1 (in l/h) Max. ENT without oil meter	Max. ENT with oil meter	Average ENT with oil meter	Supply connection T flanged	screwed	Connection T / R	Dimensions (mm)	adapter for oil meter	Item No.
LBAK 1200	1200	1000	600	400	DN 15	Pipe M 18	G ¾"	840 x 270	VZO 15	0480130
LBAK 2400	2400	2250	1500	1000	DN 20	Pipe M 22	G ¾"	840 x 270	VZO 20	0480250

Overview of units 5.0

Single pump unit as pressure unit for HFO design with bypass connection

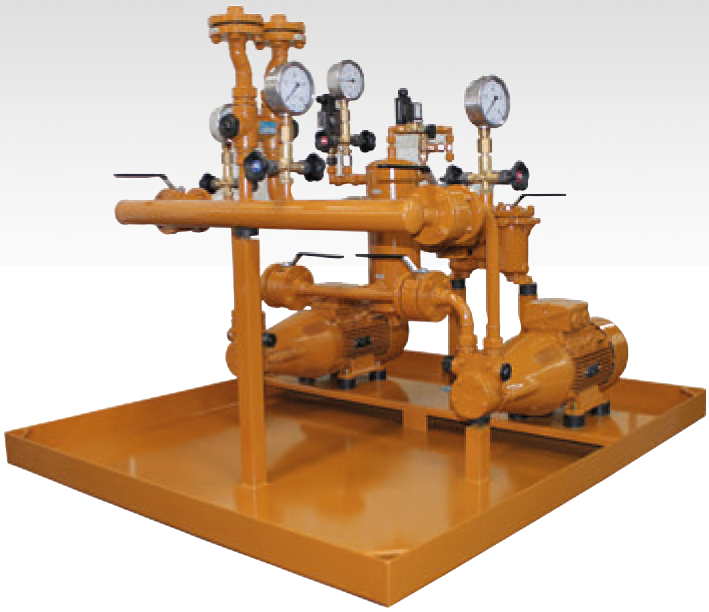
Single pump unit as feed pump unit with water separator unit for offshore applications

Single pump unit fitted as pressure unit on suction aggregate with 1000 litre tank



Single pump unit as pressure unit with integrated air separation of the bypass oil (redundant measurement recording and fittings with end position switches)

Overview of units 5.0



Double pump unit as pressure unit with integrated air separation of the bypass oil

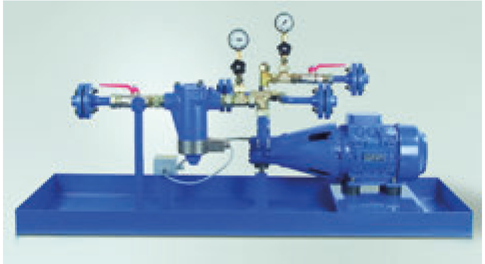
Double pump unit as feed unit with double filter (in NEMA design)

Double pump unit as feed unit with control system (in redundant design)

Quadruple pump unit as feed unit in vertical design, for wall-mounting

hp-Single-pumping unit Series MOG 5.1

hp-Single pumping unit is screwed-on or flanged design as feed or pressure modules for oil supply to TRD 411 or TRD 604 and DIN 4755-2 must be constructed, tested, registered and labelled to test standard DIN EN 12514-1. For fuel oil supply diagram, see page 101.



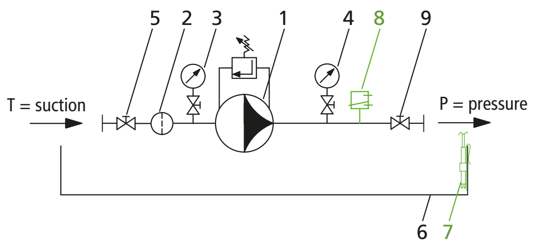
General specifications:

Viscosity range:	Motor capacities of the units are designed for: - Viscosities up to 80 cSt. for units for fuel oil EL, L - Viscosities up to 150 cSt. for units for fuel oil M, S + ES Please ask for any differing conditions.
max. permitted underpressure:	Measured on the vacuum gauge item 3 ≤ -0.6 bar
max. system pressure:	5 bar

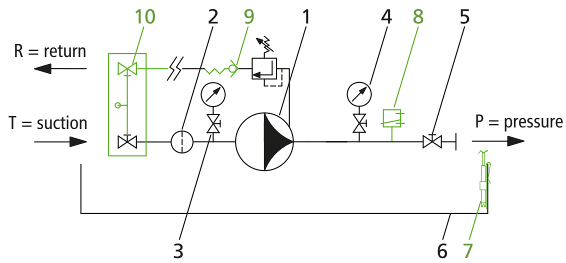
Order text:
hp-Single pumping unit

Series MOG:	see model key
Discharge/pressure:	… l/h, max. pressure in bar
Medium:	…
Operating pressure:	… bar
Motor:	… kW … V, 50/60 Hz
Accessories:	see model key

Scheme I for MOG 50, MOG 51, MOG 53 and MOG 55 series (without bypass line)



Scheme II for MOG 52 and MOG 54 series (with bypass line)



Scope of supply:

1 hp-Motor pump group
2 Single filter
3 Vacuum gauge
4 Pressure gauge
5 Ball valve
6 Oil pan

Optional accessories:

7	Leakage detector LH	
8	Electrical pressure switch or pressure transmitter	S / DT
9	Nonreturn valve (only for Scheme II), not used for selection of accessories 10	RV
10	Double ball valve (only for Scheme II)	DK

Model key for determining order specifications

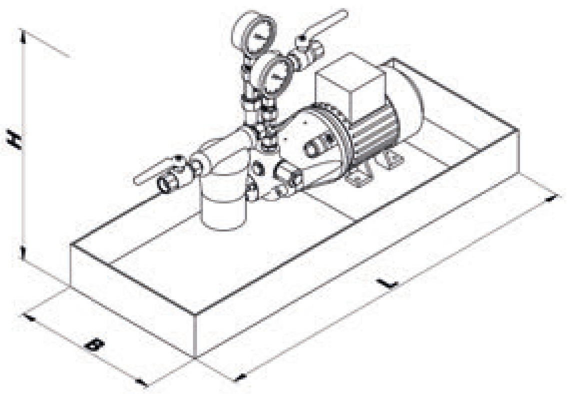
MOG ●● - ● - ● - ●●

Series size	Size		Accessories*
50 = Feed pump aggregate **9 bar and 6 bar**, [1)] fuel oil EL + L, kerosene			**A** = Filter and pump with electrical auxilary heating with connection box
51 = Feed pump aggregate **9 bar**, fuel oil M, S + ES, mineral tar oil			**E1** = With optical filter indicator
			E2 = With optical and electrical filter indicator
52 = Pressure aggregate **30 bar**, fuel oil EL + L + kerosene	Discharge see data tables	FL = flanged design	**LH** = Oil pan equipped with leakage detection
53 = Pressure aggregate **30 bar**, fuel oil M, S, + ES			**RV** = Nonreturn valve, only for scheme II
54 = Pressure aggregate **40 bar**, fuel oil EL + L			**DK** = Double ball valve, only with MOG 52 and MOG 54
55 = Pressure aggregate **40 bar**, fuel oil M, S + ES			**S**[1)] = With electrical pressure switch for monitoring the pressure line (pipe burst check)
Other designs on request			**DT** = Pressure transmitter

Item no. for accessories: For "RV" and "DK" accessories, see data table. For "A" filter + pump with electrical auxiliary heating, see data table. Accessories E1, E2, L and S see page 96.

* List key letters one after the other
[1)] When used as feed pump aggregate for fuel oil supply to DIN 4736, the max. operating pressure of 6 bar must not be exceeded.
Note: In the place where it is fitted, as a "lower limiter" an electrical pressure monitor must be provided as a pipe break check. This condition is met by selecting the "S" accessory.

hp-Single-pumping unit Series MOG 5.2



Feed pump aggregate according to Scheme I without bypass connection for fuel oil EL, L - max. pressure 9 bar

Unit model	Device connections screw-fitted	Device connections flanged	Discharge at 1400 RPM at 0 - 9 bar	used Pump model	used Motor power [kW]	Item No. screw-fitted design	Item No. flanged design	Unit dimensions L x B [mm]	max. pressure [bar]
MOG 5001	Pipe Ø 12	-	45	VB P	0.18	0510101	-	700x270	designed for max. pressure of **9 bar** to DIN EN 12514-1 max. working pressure of **6 bar**.
MOG 5002	Pipe Ø 12	-	80	VB M	0.18	0510102	-	700x270	
MOG 5003	Pipe Ø 12	-	120	VB G	0.18	0510103	-	700x270	
MOG 5004	Pipe Ø 12	-	160	VB F	0.18	0510104	-	700x270	
MOG 5005	Pipe Ø 18	DN 15	300	VBG P	0.18	0510105	0510205	840x270	
MOG 5006	Pipe Ø 18	DN 15	450	VBG M	0.37	0510106	0510206	840x270	
MOG 5007	Pipe Ø 18	DN 15	600	VBG G	0.37	0510107	0510207	840x270	
MOG 5008	Pipe Ø 22	DN 25	1000	VBH P	0.75	0510108	0510208	1050x360	
MOG 5009	Pipe Ø 22	DN 25	1500	VBH M	0.75	0510109	0510209	1050x360	
MOG 5010	Pipe Ø 22	DN 25	2000	VBH G	1.1	0510110	0510210	1050x360	
MOG 5011	-	DN 32	3000	VBHG P	1.5	-	0510211	1400x500	
MOG 5011-1	-	DN 32	3700	VBHG PZ	1.5	-	0510214	1400x500	
MOG 5012	-	DN 32	4500	VBHG M	2.2	-	0510212	1400x500	
MOG 5013	-	DN 40	6000	VBHG G	3.0	-	0510213	1400x500	

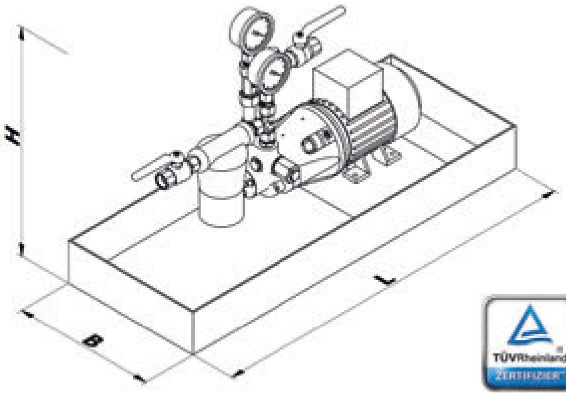
Feed pump aggregate according to Scheme I without bypass connection for fuel oil M, S + ES - max. pressure 9 bar

Unit model	Device connections screw-fitted	Device connections flanged	Discharge at 1400 RPM at 0 - 9 bar	used Pump model	used Motor power [kW]	Item No. screw-fitted design	Item No. flanged design	Unit dimensions L x B [mm]	Stationary and auxiliary heating accessory "A"	max. pressure [bar]
MOG 5101	Pipe Ø 12	-	45	VB P	0.18	0510114	-	700x270	When used for fuel oil S + ES urgently recommended. See page 96	designed for max. pressure of **9 bar**
MOG 5102	Pipe Ø 12	-	80	VB M	0.18	0510115	-	700x270		
MOG 5103	Pipe Ø 12	-	120	VB G	0.18	0510116	-	700x270		
MOG 5104	Pipe Ø 12	-	160	VB F	0.18	0510117	-	700x270		
MOG 5105	Pipe Ø 18	DN 15	300	VBG P	0.18	0510118	0510218	840x270		
MOG 5106	Pipe Ø 18	DN 15	450	VBG M	0.37	0510119	0510219	840x270		
MOG 5107	Pipe Ø 18	DN 15	600	VBG G	0.37	0510120	0510220	840x270		
MOG 5108	Pipe Ø 22	DN 25	1000	VBH P	0.75	0510121	0510221	1050x360		
MOG 5109	Pipe Ø 22	DN 25	1500	VBH M	0.75	0510122	0510222	1050x360		
MOG 5110	Pipe Ø 22	DN 25	2000	VBH G	1.1	0510123	0510223	1050x360		
MOG 5111	-	DN 32	3000	VBHG P	1.5	-	0510224	1400x500		
MOG 5111-1	-	DN 32	3700	VBHG PZ	1.5	-	0510227	1400x500		
MOG 5112	-	DN 32	4500	VBHG M	2.2	-	0510225	1400x500		
MOG 5113	-	DN 40	6000	VBHG G	3.0	-	0510226	1400x500		

*** To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.**

Motors used to IE 3, IP 55, 230/400 V from 4 kW 400/690 V, 50 Hz can also be used in 60 Hz operation – other voltages, frequencies and protection types on request.
Specifications for dimensions are guidelines, we will send the actual setup diagram when the order is placed.
Other designs or accessories (e.g. double filters, solenoid valves etc.) can be planned and provided on request.

hp-Single-pumping unit Series MOG 5.3



Pressure aggregate according to Scheme I without bypass connection for fuel oil M, S + ES - max. pressure 30 bar

Unit model	Device connections*		Discharge at 1400 RPM		used		Item No.:		Unit dimensions L x B [mm]	Stationary and auxiliary heating accessory "A"	max. pressure [bar]
	screw-fitted	flanged	at 0 - 9 bar	at p_{max}	Pump model	Motor power [kW]	screw-fitted design	flanged design			
MOG 5305	Pipe Ø 18	DN 15	300	240	VBG P	0.75	0510130	0510230	840x270		
MOG 5306	Pipe Ø 18	DN 15	450	390	VBG M	1.1	0510131	0510231	840x270		
MOG 5307	Pipe Ø 18	DN 15	600	540	VBG G	1.5	0510132	0510232	840x270		
MOG 5308	Pipe Ø 22	DN 25	1000	700	VBH P	2.2	0510133	0510233	1300x400	Urgently recommended when used for fuel oil S + ES	
MOG 5309	Pipe Ø 22	DN 25	1500	1200	VBH M	3.0	0510134	0510234	1300x400		desiged for max. pressure of 30 bar
MOG 5310	Pipe Ø 22	DN 25	2000	1700	VBH G	4.0	0510135	0510235	1300x400		
MOG 5311	-	DN 32	3000	2200	VBHG P	5.5	-	0510236	1400x500	See page 96	
MOG 5311-1	-	DN 32	3700	3000	VBHG PZ	5.5	-	0510239	1400x500		
MOG 5312	-	DN 32	4500	3600	VBHG M	7.5	-	0510237	1400x500		
MOG 5313	-	DN 40	6000	4800	VBHG G	7.5	-	0510238	1400x500		

Pressure aggregate according to Scheme I without bypass connection for fuel oil M, S + ES - max. pressure 40 bar

Unit model	Device connections*		Discharge at 1400 RPM		used		Item No.:		Unit dimensions L x B [mm]	Stationary and auxiliary heating accessory "A"	max. pressure [bar]
	screw-fitted	flanged	at 0 - 9 bar	at p_{max}	Pump model	Motor power [kW]	screw-fitted design	flanged design			
MOG 5505	Pipe Ø 18	DN 15	300	200	VBG P	0.75	0510140	0510240	840x270		
MOG 5506	Pipe Ø 18	DN 15	450	360	VBG M	1.5	0510141	0510241	840x270		
MOG 5507	Pipe Ø 18	DN 15	600	480	VBG G	2.2	0510142	0510242	840x270		
MOG 5508	Pipe Ø 22	DN 25	1000	600	VBH P	3.0	0510143	0510243	1300x400	When used for fuel oil S + ES urgently recommended.	
MOG 5509	Pipe Ø 22	DN 25	1500	1000	VBH M	4.0	0510144	0510244	1300x400		designed for max. pressure of 40 bar
MOG 5510	Pipe Ø 22	DN 25	2000	1400	VBH G	5.5	0510145	0510245	1300x400		
MOG 5511	-	DN 32	3000	2000	VBHG P	7.5	-	0510246	1400x500	See page 96	
MOG 5511-1	-	DN 32	3700	2700	VBHG PZ	7.5	-	0510248	1400x500		
MOG 5512	-	DN 32	4500	3200	VBHG M	7.5	-	0510247	1400x500		

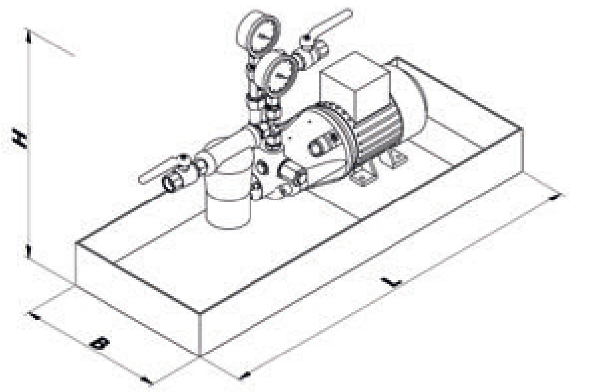
Item no. for accessories

A	=	Filter and pump with electrical auxiliary heating and connection box		
E1	=	with optical filter indicator		0820221
E2	=	with optical and electrical filter indicator		0820222
LH	=	Oil pan fitted with leakage detector, without electrical wiring		0720705 -1
S	=	with attached electrical pressure switch for monitoring pressure line	Model FF4	0820290
		(Pipe break check) without electrical wiring	Model DSB	0820292
DT	=	Pressure transmitter		0720695

*** To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.**

Motors used to IE 3, IP 55, 230/400 V from 4 kW 400/690 V, 50 Hz can also be used in 60 Hz operation – other voltages, frequencies and protection types on request.
Specifications for dimensions are guidelines, we will send the actual setup diagram when the order in placed.
Other designs or accessories (e.g. double filters, solenoid valves etc.) can be planned and provided on request.

hp-Single-pumping unit Series MOG 5.4



Pressure aggregate according to Scheme II with bypass connection for fuel oil EL + L - max. pressure 30 bar

Unit model	Device connections*		Discharge at 1400 RPM		used		Item No.:		Unit dimensions	max. pressure [bar]
	screw-fitted	flanged	at 0 - 9 bar	at p_{max}	Pump model	Motor power [kW]	screw-fitted design	flanged design	L x B [mm]	
MOG 5201	Pipe Ø 12	-	45	30	VBR P	0.18	0510148	-	700x270	designed for max. pressure of **30 bar**
MOG 5202	Pipe Ø 12	-	80	60	VBR M	0.18	0510149	-	700x270	
MOG 5203	Pipe Ø 12	-	120	100	VBR G	0.18	0510150	-	700x270	
MOG 5204	Pipe Ø 12	-	160	140	VBR F	0.37	0510151	-	700x270	
MOG 5205	Pipe Ø 18	DN 15	300	240	VBGR P	0.75	0510152	0510252	1050x360	
MOG 5206	Pipe Ø 18	DN 15	450	390	VBGR M	0.75	0510153	0510253	1050x360	
MOG 5207	Pipe Ø 18	DN 15	600	540	VBGR G	1.1	0510154	0510254	1050x360	
MOG 5208	Pipe Ø 22	DN 25	1000	700	VBHR P	1.5	0510155	0510255	1400x500	
MOG 5209	Pipe Ø 22	DN 25	1500	1200	VBHR M	2.2	0510156	0510256	1400x500	
MOG 5210	Pipe Ø 22	DN 25	2000	1700	VBHR G	3.0	0510157	0510257	1400x500	
MOG 5211	-	DN 32	3000	2200	VBHGR P	4.0	-	0510258	1600x500	
MOG 5211-1	-	DN 32	3700	3000	VBHGR PZ	4.0	-	0510261	1600x500	
MOG 5212	-	DN 32	4500	3600	VBHGR M	5.5	-	0510259	1600x500	
MOG 5213	-	DN 40	6000	4800	VBHGR G	7.5	-	0510260	1600x500	

Pressure aggregate according to Scheme II with bypass connection for fuel oil EL + L - max. pressure 40 bar

Unit model	Device connections*		Discharge at 1400 RPM		used		Item No.:		Unit dimensions	max. pressure [bar]
	screw-fitted	flanged	at 0 - 9 bar	at p_{max}	Pump model	Motor power [kW]	screw-fitted design	flanged design	L x B [mm]	
MOG 5405	Pipe Ø 18	DN 15	300	200	VBGR P	0.75	0510165	0510265	1050x360	designed for max. pressure of **40 bar**
MOG 5406	Pipe Ø 18	DN 15	450	360	VBGR M	1.1	0510166	0510266	1050x360	
MOG 5407	Pipe Ø 18	DN 15	600	480	VBGR G	1.5	0510167	0510267	1050x360	
MOG 5408	Pipe Ø 22	DN 25	1000	600	VBHR P	2.2	0510168	0510268	1400x500	
MOG 5409	Pipe Ø 22	DN 25	1500	1000	VBHR M	3.0	0510169	0510269	1400x500	
MOG 5410	Pipe Ø 22	DN 25	2000	1400	VBHR G	4.0	0510170	0510270	1400x500	
MOG 5411	-	DN 32	3000	2200	VBHGR P	5.5	-	0510271	1600x500	
MOG 5411-1	-	DN 32	3700	2700	VBHGR PZ	5.5	-	0510282	1400x500	
MOG 5412	-	DN 32	4500	3200	VBHGR M	7.5	-	0510272	1600x500	

*** To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.**

Motors used to IE 3, IP 55, 230/400 V from 4 kW 400/690 V, 50 Hz can also be used in 60 Hz operation – other voltages, frequencies and protection types on request.
Specifications for dimensions are guidelines, we will send the actual setup diagram when the order in placed.
Other designs or accessories (e.g. double filters, solenoid valves etc.) can be planned and provided on request.

hp-Compact Twin-pumping unit Series BIKO 5.5

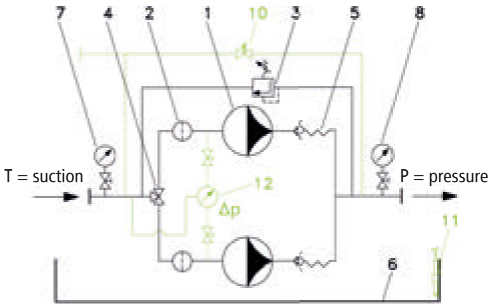
hp-Twin-pumping unit in screwed-on or flanged (SAE flange to DIN ISO 6162) design are used as feed or pressure unit according to TRD 411 or TRD 604 and DIN 4755-2 must be constructed, tested, registered and labelled according to standard DIN EN 12514-1.

The BIKO series is available in 2 designs (L - light oil and S - HFO). It can optionally be used for 1- or 2-pipe system (simple conversion by the user). The selection for use a feed [1] or pressure unit is determined by the selection of pressure stages.

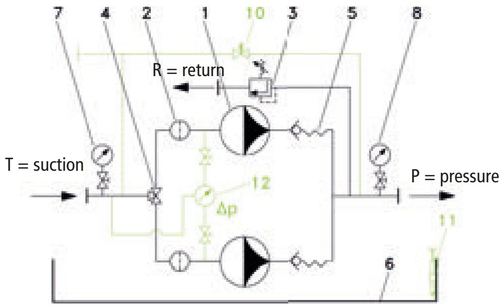
General specifications:

Viscosity range:	Motor capacities of the modules are designed for: - BIKO-L to 80 cSt. - BIKO-S to 150 cSt. Please ask for any differing conditions.
max. permitted underpressure:	Measured on the manometer item 7 ≤ -0.4 bar
max. system pressure:	5 bar
Casing material:	EN-GJS 400

BIKO Scheme 1-pipe-system



BIKO Scheme 2-pipe-system



Scope of supply:

1 hp-Motor pump group
2 Filter
3 Integrated overflow valve
4 Switchover
5 Nonreturn valve
6 Oil pan
7 Vacuum gauge
8 Pressure gauge

Optional accessories:

10 Pressure compensation device [2]
(pressure setting corresponding to selected pressure stage)
11 Leakage detector
12 Filter indicator (opt./ opt.-elec.)

Model key for determining order specifications

BIKO-... – ● / ● – ● – ●●

Series	hp Hydraulics size	hp Motor code	Pressure stage	Accessories
BIKO-L Design for fuel oil EL + L, MDO/MGO **BIKO-S** Design for fuel oil M, S + ES, mineral tar oil	Hydraulics size (see data tables)	Selection suited to pressure needed (see data tables)	2 = 2 - 9 bar 4 = 6 - 40 bar	**LH** Oil pan equipped with leakage detector **DB** Additional pressure compensation device (safety valve set at: Pressure stage 2 = 7 bar; pressure stage 4 = 45 bar) **A** Electrical auxiliary heating **E1** With optical filter indicator **E2** With optical and electrical filter indicator (E1 and E2)

[1] When used as feed unit for fuel oil supply to DIN EN 12514, the maximum operating pressure of 6 bar must not be exceeded.

[2] Additional protection against overpressure – optional integration into the suction or return line or directly into the tank.

hp-Compact Twin-pumping unit Series BIKO 5.6

Design for normal fuel

Unit model	hp-Hydraulics size	Design max. pressure 9 bar: Discharge at 1400 RPM at 0- 9 bar	hp-Motor code	Motor power [kW]	hp-Item no.:	Design max. pressure 30 bar: Discharge at 1400 RPM at 30 bar	hp-Motor code	Motor power [kW]	hp-Item no.:	Design max. pressure 40 bar: Discharge at 1400 RPM at 40 bar	hp-Motor code	Motor power [kW]	hp-Item no.:	Aggregate dimension	Device connections*: Suction screw-fitted	Suction flanged	Pressure & Return screw-fitted	Pressure & Return flanged
BIKO-L-	01					30	01	0.18	0525050	-		-	-	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-L-	02	80	01	0.18	0525052	60	01	0.18	0525052	-		-	-	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-L-	03	120	01	0.18	0525054	100	01	0.18	0525054	-		-	-	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-L-	04	160	01	0.18	0525056	140	03	0.37	0525058	-		-	-	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-L-	05	300	01	0.18	0525060	240	05	0.75	0525062	200	05	0.75	0525062	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-L-	06	450	03	0.37	0525064	390	05	0.75	0525066	360	06	1.1	0525068	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-L-	07	600	03	0.37	0525070	540	06	1.1	0525072	480	07	1.5	0525074	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-L-	08	1000	05	0.75	0525076	700	07	1.5	0525078	600	08	2.2	0525080	900 x 800	G 1"	SAE 1"	G ¾"	SAE ¾"
BIKO-L-	09	1500	05	0.75	0525082	1200	08	2.2	0525084	1000	09	3.0	0525086	900 x 800	G 1"	SAE 1"	G ¾"	SAE ¾"
BIKO-L-	10	2000	06	1.1	0525088	1700	09	3.0	0525090	1400	10	4.0	0525092	900 x 800	G 1"	SAE 1"	G ¾"	SAE ¾"
BIKO-L-	11	3000	07	1.5	0525094	2200	10	4.0	0525096	2000	11	5.5	0525098	1100 x 950	G 1½"	SAE ½"	G 1¼"	SAE 1¼"
BIKO-L-	11-1	3700	07	1.5	0525100	3000	10	4.0	0525102	2700	11	5.5	0525104	1100 x 950	G 1½"	SAE ½"	G 1¼"	SAE 1¼"
BIKO-L-	12	4500	08	2.2	0525106	3600	11	5.5	0525108	3200	12	7.5	0525110	1100 x 950	G 1½"	SAE ½"	G 1¼"	SAE 1¼"
BIKO-L-	13	6000	09	3.0	0525112	4800	12	7.5	0525114	-		-	-	1100 x 950	G 1½"	SAE ½"	G 1¼"	SAE 1¼"
BIKO-L-	14	6700	09	3.0	0525116	5800	12	7.5	0525118	-		-	-	1100 x 950	G 1½"	SAE 1½"	G 1¼"	SAE 1¼"

Design for HFO

Unit model	hp-Hydraulics size	Design max. pressure 9 bar: Discharge at 1400 RPM at 0- 9 bar	hp-Motor code	Motor power [kW]	hp-Item no.:	Design max. pressure 30 bar: Discharge at 1400 RPM at 30 bar	hp-Motor code	Motor power [kW]	hp-Item no.:	Design max. pressure 40 bar: Discharge at 1400 RPM at 40 bar	hp-Motor code	Motor power [kW]	hp-Item no.:	Aggregate dimension	Device connections*: Suction screw-fitted	Suction flanged	Pressure & Return screw-fitted	Pressure & Return flanged
BIKO-S-	01	50	01	0.18	0525150	45	01	0.18	0525150	-		-	-	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-S-	02	90	01	0.18	0525152	80	01	0.18	0525152	-		-	-	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-S-	03	130	01	0.18	0525154	125	03	0.37	0525156	-		-	-	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-S-	04	170	01	0.18	0525158	165	03	0.37	0525160	-		-	-	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-S-	05	320	01	0.18	0525162	300	05	0.75	0525164	295	05	0.75	0525164	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-S-	06	475	03	0.37	0525166	450	06	1.1	0525168	435	07	1.5	0525170	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-S-	07	620	03	0.37	0525172	600	07	1.5	0525174	590	08	2.2	0525176	800 x 675	G ¾"	SAE ¾"	G 1½"	SAE ½"
BIKO-S-	08	1100	05	0.75	0525178	950	08	2.2	0525180	900	09	3.0	0525182	900 x 800	G 1"	SAE 1"	G ¾"	SAE ¾"
BIKO-S-	09	1625	05	0.75	0525184	1475	09	3.0	0525186	1425	10	4.0	0525188	900 x 800	G 1"	SAE 1"	G ¾"	SAE ¾"
BIKO-S-	10	2150	06	1.1	0525190	2050	10	4.0	0525192	1975	11	5.5	0525194	900 x 800	G 1"	SAE 1"	G ¾"	SAE ¾"
BIKO-S-	11	3225	07	1.5	0525196	3000	11	5.5	0525198	2900	12	7.5	0525200	1100 x 950	G 1½"	SAE 1½"	G 1¼"	SAE 1¼"
BIKO-S-	11-1	3900	08	2.2	0525202	3700	11	5.5	0525204	3650	12	7.5	0525206	1100 x 950	G 1½"	SAE 1½"	G 1¼"	SAE 1¼"
BIKO-S-	12	4825	08	2.2	0525208	4750	12	7.5	0525210	4725	12	7.5	0525212	1100 x 950	G 1½"	SAE 1½"	G 1¼"	SAE 1¼"
BIKO-S-	13	6100	09	3.0	0525214	5600		-	-	-		-	-	1100 x 950	G 1½"	SAE 1½"	G 1¼"	SAE 1¼"
BIKO-S-	14	6800	09	3.0	0525216	6550		-	-	-		-	-	1100 x 950	G 1½"	SAE 1½"	G 1¼"	SAE 1¼"

The twin-pumping units of the BIKO series are currently under development. Therefore, not all sizes are available.

Please send your request.

Pumps and Valves | Motor pump groups | Units for single-pipe installation | Feed pumps and Pressure aggregates | Oil burner pressure aggregates | Filters | Pump controls | Accessories and Spare parts | Nozzles | Special units and Application | General

hp-Twin-pumping unit Series BIK 5.7

hp-Twin-pumping unit in screwed-on or flanged design as feed or pressure units for oil supply to TRD 411 or TRD 604 and DIN 4755-2 must be constructed, tested, registered and labelled to test standard DIN EN 12514-1. For fuel oil supply diagram, see page 101.

General specifications:

Viscosity range: Motor capacities of the units are designed for:
- Viscosities up to 80 cSt. for units for fuel oil EL, L
- Viscosities up to 150 cSt. for units for fuel oil M, S + ES

Please ask for any differing conditions.

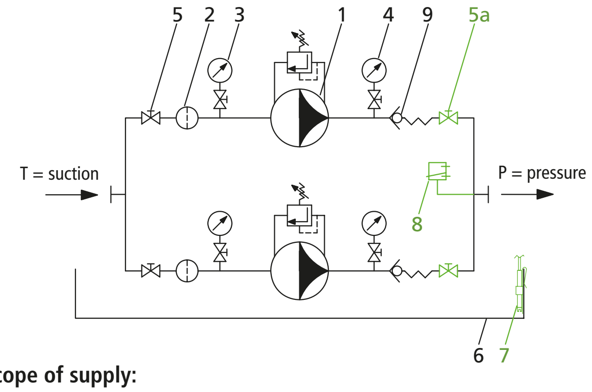
max. permitted underpressure: Measured on the manometer item 3 ≤ -0.6 bar

max. system pressure: 5 bar

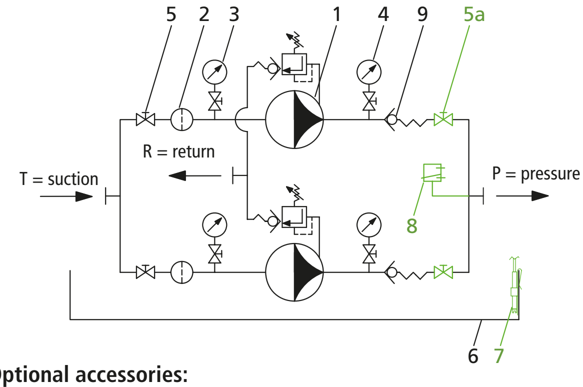
Order text:
hp-Twin-pumping unit

Series BIK:	see model key
Discharge/pressure:	… l/h, max. pressure in bar
Medium:	…
Operating pressure:	… bar
Motor:	… kW … V, 50/60 Hz
Accessories:	see model key

Scheme I for BIK 50, BIK 51 and BIK 55 series (without bypass line)



Scheme III for BIK 52 and BIK 54 series (with bypass line)



Scope of supply:

1 hp-Motor pump group
2 Single filter
3 Vacuum gauge
4 Pressure gauge
5 Ball valve
6 Oil pan
9 Nonreturn valve

Optional accessories:

5a Ball valve pressure side (from 3000 l/h – scope of supply)
7 Leakage detector LH
8 Electrical pressure switch or pressure transmitter S / DT

Model key for determining order specifications

BIK... – ○○ – ○ – ○ – ○○

Series	Size		Accessories*
50 = Feeder unit **9 bar and 6 bar**, [1)] heating oil EL + L, kerosene	Discharge see data tables	FL = flanged design	**A** = Filter and pump with electrical auxiliary heating with connecting box
51 = Feeder unit **9 bar**, heating oil M, S + ES, mineral tar oil			**EF** = with 2 single filters
52 = Pressure unit **30 bar**, heating oil EL + L + kerosene			**DF** = with changeable double filter
54 = Pressure unit **40 bar**, heating oil EL + L			**E1** = with optical filter detection
55 = Pressure unit **40 bar**, heating oil M, S + ES			**E2** = with optical and electrical filter detection (E1 and E2)
Other designs on request			**LH** = Oil pan equipped with oil leakage detection

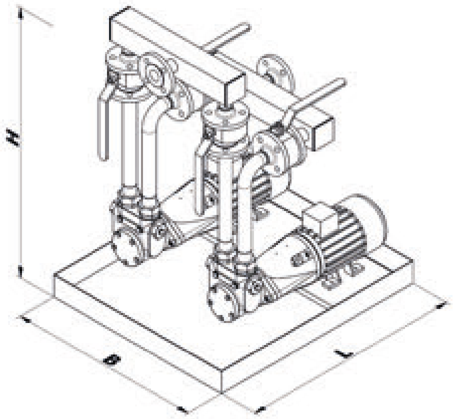
Item no. for accessories: Accessories “A” filter + pump with electrical auxiliary heating, accessories E1, E2, L and S see page 96.

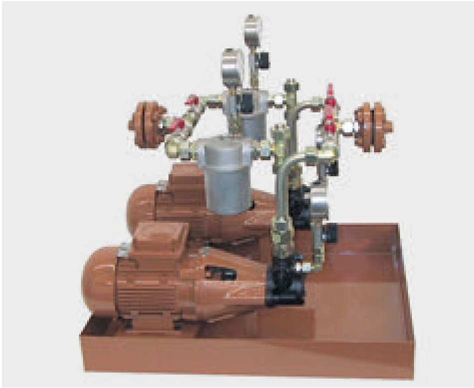
* List key letters one after the other

1) When used as feed pump aggregate for fuel oil supply to DIN 4736, the max. operating pressure of 6 bar must not be exceeded.

Note: In the place where it is fitted, as a “lower limiter” an electrical pressure monitor must be provided as a pipe break check. This condition is met by selecting the “S” accessory.

hp-Twin-pumping unit Series BIK 5.8





Feed pump aggregate according to Scheme I without bypass for fuel oil EL, L - max. pressure 9 bar

Unit model	Device connections* screw-fitted	Device connections* flanged	Discharge at 1400 RPM at 0 - 9 bar	used Pump model	used Motor power [kW]	Item No.: screw-fitted design	Item No.: flanged design	Unit dimensions L x B [mm]	max. pressure [bar]
BIK 5001	Pipe Ø 12	-	45	VB P	0.18	0520046	-	600x500	designed for max. pressure of **9 bar** to DIN EN 12514-1 max. working pressure of **6 bar**.
BIK 5002	Pipe Ø 12	-	80	VB M	0.18	0520047	-	600x500	
BIK 5003	Pipe Ø 12	-	120	VB G	0.18	0520048	-	600x500	
BIK 5004	Pipe Ø 12	-	160	VB F	0.18	0520049	-		
BIK 5005	Pipe Ø 18	DN 15	300	VBG P	0.18	0520050	0520051	600x500	
BIK 5006	Pipe Ø 18	DN 15	450	VBG M	0.37	0520056	0520052	600x500	
BIK 5007	Pipe Ø 18	DN 15	600	VBG G	0.37	0520057	0520053	600x500	
BIK 5008	Pipe Ø 22	DN 25	1000	VBH P	0.75	0520058	0520054	800x700	
BIK 5009	Pipe Ø 22	DN 25	1500	VBH M	0.75	0520059	0520055	800x700	
BIK 5010	Pipe Ø 22	DN 25	2000	VBH G	1.1	0520060	0520064	800x700	
BIK 5011	-	DN 32	3000	VBHG P	1.5	-	0520061	800x700	
BIK 5011-1	-	DN 32	3700	VBHG PZ	1.5	-	0520065	800x700	
BIK 5012	-	DN 32	4500	VBHG M	2.2	-	0520062	800x700	
BIK 5013	-	DN 40	6000	VBHG G	3.0	-	0520063	800x700	

Feed pump aggregate according to Scheme I without bypass for fuel oil M, S + ES - max. pressure 9 bar

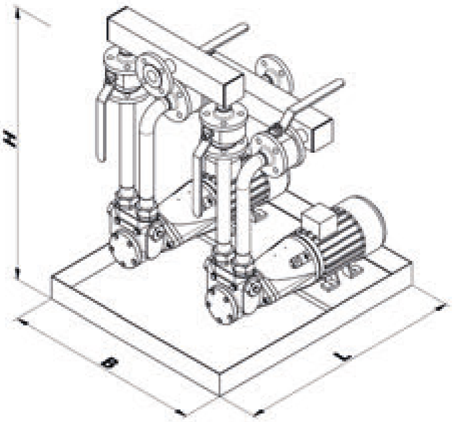
Unit model	Device connections* screw-fitted	Device connections* flanged	Discharge at 1400 RPM at 0 - 9 bar	used Pump model	used Motor power [kW]	Item No.: screw-fitted design	Item No.: flanged design	Unit dimensions L x B [mm]	Stationary and auxiliary heating accessory "A"	max. pressure [bar]
BIK 5101	Pipe Ø 12	-	45	VB P	0.18	0520111	-	600x500	When used for fuel oil S + ES urgently recommended. See page 96	designed for max. pressure of **9 bar**
BIK 5102	Pipe Ø 12	-	80	VB M	0.18	0520112	-	600x500		
BIK 5103	Pipe Ø 12	-	120	VB G	0.18	0520113	-	600x500		
BIK 5104	Pipe Ø 12	-	160	VB F	0.18	0520114	-			
BIK 5105	Pipe Ø 18	DN 15	300	VBG P	0.18	0520115	0520330	600x500		
BIK 5106	Pipe Ø 18	DN 15	450	VBG M	0.37	0520116	0520331	600x500		
BIK 5107	Pipe Ø 18	DN 15	600	VBG G	0.37	0520117	0520332	600x500		
BIK 5108	Pipe Ø 22	DN 25	1000	VBH P	0.75	0520118	0520333	800x700		
BIK 5109	Pipe Ø 22	DN 25	1500	VBH M	0.75	0520119	0520334	800x700		
BIK 5110	Pipe Ø 22	DN 25	2000	VBH G	1.1	0520120	0520335	800x700		
BIK 5111	-	DN 32	3000	VBHG P	1.5	-	0520336	800x700		
BIK 5111-1	-	DN 32	3700	VBHG PZ	1.5	-	0520339	800x700		
BIK 5112	-	DN 32	4500	VBHG M	2.2	-	0520337	800x700		
BIK 5113	-	DN 40	6000	VBHG G	3.0	-	0520338	800x700		

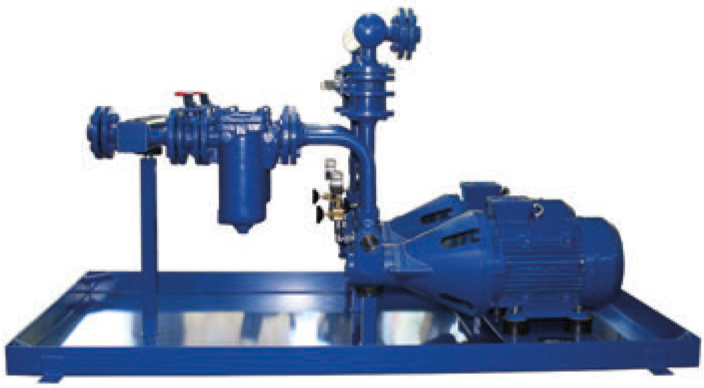
*** To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.**

Motors used to IE 3, IP 55, 230/400 V from 4 kW 400/690 V, 50 Hz can also be used in 60 Hz operation – other voltages, frequencies and protection types on request.
Specifications for dimensions are guidelines, we will send the actual setup diagram when the order in placed.
Other designs or accessories (e.g. double filters, solenoid valves etc.) can be planned and provided on request.

Pumps and Valves
Motor pump groups
Units for single-pipe installation
Feed pumps and Pressure aggregates
Oil burner pressure aggregates
Filters
Pump controls
Accessories and Spare parts
Nozzles
Special units and Application
General

hp-Twin-pumping unit Series BIK 5.9





Pressure aggregate according to Scheme III with bypass connection for fuel oil EL + L - max. pressure 30 bar

Unit model	Device connections*		Discharge at 1400 RPM		used		Item No.:		Unit dimensions	max. pressure [bar]
	screw-fitted	flanged	at 0 - 9 bar	at p_{max}	Pump model	Motor power [kW]	screw-fitted design	flanged design	L x B [mm]	
BIK 5201	Pipe Ø 12	-	45	30	VBR P	0.18	0520141	-	600x500	designed for max. pressure of **30 bar**
BIK 5202	Pipe Ø 12	-	80	60	VBR M	0.18	0520142	-	600x500	
BIK 5203	Pipe Ø 12	-	120	100	VBR G	0.18	0520143	-	600x500	
BIK 5204	Pipe Ø 12	-	160	140	VBR F	0.37	0520144	-	600x500	
BIK 5205	Pipe Ø 18	DN 15	300	240	VBGR P	0.75	0520145	0520390	600x500	
BIK 5206	Pipe Ø 18	DN 15	450	390	VBGR M	0.75	0520146	0520391	600x500	
BIK 5207	Pipe Ø 18	DN 15	600	540	VBGR G	1.1	0520147	0520392	600x500	
BIK 5208	Pipe Ø 22	DN 25	1000	700	VBHR P	1.5	0520148	0520393	800x700	
BIK 5209	Pipe Ø 22	DN 25	1500	1200	VBHR M	2.2	0520149	0520394	800x700	
BIK 5210	Pipe Ø 22	DN 25	2000	1700	VBHR G	3.0	0520150	0520395	800x700	
BIK 5211	-	DN 32	3000	2200	VBHGR P	4.0	-	0520396	1800x1000	
BIK 5211-1	-	DN 32	3700	3000	VBHGR PZ	4.0	-	0520399	1800x1000	
BIK 5212	-	DN 32	4500	3600	VBHGR M	5.5	-	0520397	1800x1000	
BIK 5213	-	DN 40	6000	4800	VBHGR G	7.5	-	0520398	1800x1000	

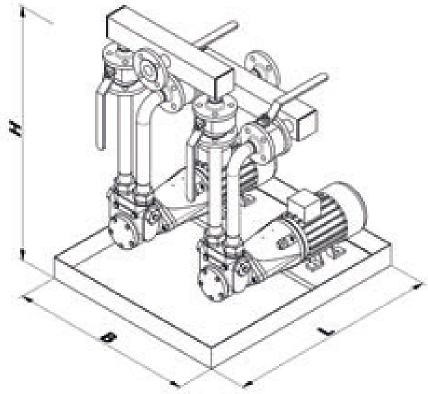
Pressure aggregate according to Scheme III with bypass connection for fuel oil EL + L - max. pressure 40 bar

Unit model	Device connections*		Discharge at 1400 RPM		used		Item No.:		Unit dimensions	max. pressure [bar]
	screw-fitted	flanged	at 0 - 9 bar	at p_{max}	Pump model	Motor power [kW]	screw-fitted design	flanged design	L x B [mm]	
BIK 5405	Pipe Ø 18	DN 15	300	200	VBGR P	0.75	0520154	0520410	600x500	designed for max. pressure of **40 bar**
BIK 5406	Pipe Ø 18	DN 15	450	360	VBGR M	1.1	0520155	0520411	600x500	
BIK 5407	Pipe Ø 18	DN 15	600	480	VBGR G	1.5	0520156	0520412	600x500	
BIK 5408	Pipe Ø 22	DN 25	1000	600	VBHR P	2.2	0520157	0520413	800x700	
BIK 5409	Pipe Ø 22	DN 25	1500	1000	VBHR M	3.0	0520158	0520414	800x700	
BIK 5410	Pipe Ø 22	DN 25	2000	1400	VBHR G	4.0	0520159	0520415	800x700	
BIK 5411	-	DN 32	3000	2200	VBHGR P	5.5	-	0520416	1800x1000	
BIK 5411-1	-	DN 32	3700	2700	VBHGR PZ	5.5	-	0520418	1800x1000	
BIK 5412	-	DN 32	4500	3200	VBHGR M	7.5	-	0520417	1800x1000	

*** To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.**

Motors used to IE 3, IP 55, 230/400 V from 4 kW 400/690 V, 50 Hz can also be used in 60 Hz operation – other voltages, frequencies and protection types on request.
Specifications for dimensions are guidelines, we will send the actual setup diagram when the order in placed.
Other designs or accessories (e.g. double filters, solenoid valves etc.) can be planned and provided on request.

hp-Twin-pumping unit Series BIK 5.10



Pressure aggregate according to Scheme I without bypass for fuel oil M, S + ES - max. pressure 40 bar

Unit model	Device connections* screw-fit-ted	Device connections* flanged	Discharge at 1400 RPM at 0 - 9 bar	Discharge at 1400 RPM at p_{max}	used Pump model	used Motor power [kW]	Item No.: screw-fitted design	Item No.: flanged design	Unit dimensions L x B [mm]	Stationary and auxiliary heating accessory "A"	max. pressure [bar]
BIK 5505	Pipe Ø 18	DN 15	300	200	VBG P	0.75	0520133	0520370	800x700	When used for fuel oil S + ES urgently recommended. See page 96	designed for max. pressure of **40 bar**
BIK 5506	Pipe Ø 18	DN 15	450	360	VBG M	1.5	0520134	0520371	800x700		
BIK 5507	Pipe Ø 18	DN 15	600	480	VBG G	2.2	0520135	0520372	800x700		
BIK 5508	Pipe Ø 22	DN 25	1000	600	VBH P	3.0	0520136	0520373	800x1000		
BIK 5509	Pipe Ø 22	DN 25	1500	1000	VBH M	4.0	0520137	0520374	800x1000		
BIK 5510	Pipe Ø 22	DN 25	2000	1400	VBH G	5.5	0520138	0520375	800x1000		
BIK 5511	-	DN 32	3000	2000	VBHG P	7.5	-	0520376	1800x1000		
BIK 5511-1	-	DN 32	3700	2700	VBHG PZ	7.5	-	0520378	1800x1000		
BIK 5512	-	DN 32	4500	3200	VBHG M	7.5	-	0520377	1800x1000		

Item no. for accessories

A	=	Filter and pump with electrical auxiliary heating and connection box		
E1	=	with optical filter indicator		0820221
E2	=	with optical and electrical filter indicator		0820222
LH	=	Oil pan fitted with oil leakage detection, without electrical wiring		0720705 -1
S	=	with attached electrical pressure switch for monitoring pressure line	Model FF4	0820290
		(Pipe break check) without electrical wiring	Model DSB	0820292
DT	=	Pressure transmitter		0720695
DF	=	with double filter (please ask)		

*** To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements. The pump or device connection gives no indication of the relevant size of the pipe.**

Motors used to IE 3, IP 55, 230/400 V from 4 kW 400/690 V, 50 Hz can also be used in 60 Hz operation – other voltages, frequencies and protection types on request.
Specifications for dimensions are guidelines, we will send the actual setup diagram when the order in placed.
Other designs or accessories (e.g. double filters, solenoid valves etc.) can be planned and provided on request.

hp-Single-pumping unit Series MOG 1900 6.0

Fuel oil pressure unit with integrated bypass oil air separation for single-pipe oil supply for automatic oil burners to TRD 411 or TRD 604 and DIN 4755 sheet 2.

Design "A" for supply pressure to max. 5 bar.

General Specifications:

Medium: Fuel oil EL to DIN 51603
Viscosity: at 20 °C: max. 6 cST
Max. pressure on shaft seal of pump: **max. 5 bar** on vacuum gauge (4)

The pump units are equipped with **standard motors, flange size B3/B14 or B3/B5**, 230/400 V, 50 Hz, 1400 RPM/, IP 55.
Y-Δ-cirquit with power supply must be specified with order. **From 4 kW the motors are executed for 400/690 V, 50 Hz.**
Other voltage and frequencies can be supplied on request.

Scope of supply:

1. Ball valve
2. Filter
4. Vacuum gauge with gauge valve
5. Vessel with manual ventilation
6. hp-Motor pump group consisting of:
   hp-Internal gear pump with integrated overflow valve and bypass connection, pump connector, coupling and standard motor
7. Pressure gauge with gauge valve
11. Double ball valve for P + R
14. Complete assembled on an oil pan

Accessories:
May be selected according to the requirements of the table on page 79.

Functional description: Design according to Scheme A (with supply pressure on T connection)
The pump (6) is supplied with oil via ball valve (1), filter (2), manometer (4), vessel (5) in single-pipe system, i.e. only the oil consumed by the burner flows here.
For manual ventilation, the supply pressure must be at least 1 and max. 5 bar. For automatic float air vent (accessories 17) the supply pressure must be max. 5 bar. A higher supply pressure must be reduced with pressure-regulator (accessories 18). Further accessories are adapters for oil meters (15), oil meter (16), solenoid valve (20), leakage detector (19) and filter indicator (21 + 22).
The pump (6) increases the supply pressure to the operating pressure that can be set on the overflow valve, that the pressure gauge (7) displays and supplies the pressurised oil to the burner via the ball valve (11). Return oil coming from the burner is fed back via the ball valve (11) to the vessel (5) and therefore the pump (6). If there is no oil consumption, the entire oil supplied by the pump is controlled via the overflow valve to the vessel (5) and therefore the inlet side of the pump (6).

Remark:
Accessories "**M**": Lifter effect is excluded by a tank situated higher up in the supply pipe.
Accessories "**L**": Leakage detector, e.g. when the shaft seal of the pump presents a leak.

Unit model	Used pump model	Item No.	Operating pressure p_{max} in bar	Discharge at 1400 RPM at 0 - 9 bar	Discharge at 1400 RPM at p_{max}	Motor power 1) kW	Vessel capacity in litres	Pipe connections* DIN flange including screws + seal DIN 2633 T	DIN 2635 P	DIN 2633 R
MOG 1945 - A	VBGRP	0620101	40	300	200	0.75	5	DN 15	DN 15	DN 15
MOG 1946 - A	VBGRM	0620105	40	450	360	1.1	5	DN 15	DN 15	DN 15
MOG 1947 - A	VBGRG	0620109	40	600	480	1.5	5	DN 15	DN 15	DN 15
MOG 1948 - A	VBHRP	0620113	40	1000	600	2.2	5	DN 20	DN 20	DN 20
MOG 1949 - A	VBHRM	0620117	40	1500	1000	3	5	DN 20	DN 20	DN 20
MOG 1950 - A	VBHRG	0620121	40	2000	1400	4	5	DN 25	DN 25	DN 25
MOG 1951 - FL-A	VBHGRP	0620125	40	3000	2000	5.5	5	DN 32	DN 32	DN 32
MOG 1951-1-FL-A	VBHGRPZ	0620136	40	3700	2700	5.5	5.5	DN 32	DN 32	DN 32
MOG 1952 - FL-A	VBHGRM	0620129	40	4500	3200	7.5	5	DN 40	DN 40	DN 40
MOG 1953 - FL-A	VBHGRG	0620132	30	6000	4800	7.5	5	DN 40	DN 40	DN 40

* To ensure the pump is working properly, the pipes must be scaled according to the principles of fluid dynamics by calculation of line according to the local requirements.
The pump or device connection gives no indication of the relevant size of the pipe.

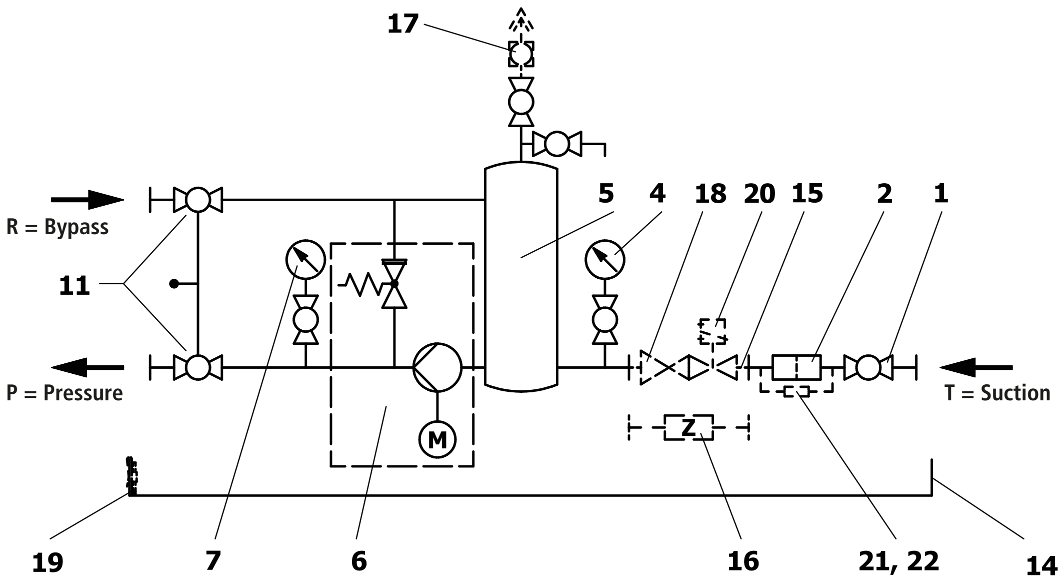
Model key for determining order specifications 6.1

As most units of the MOG 19... series have to be engineered according to the burner power, we recommend fine-tuning with the manufacturer.

Accessories

Item	Label	Explanations	Item No.
15	PZ	Adapter for oil meter	
16	Z	Oil meter	
17	G/SE	Automatic float air vent	0820212
18	DM	Pressure-regulator	Depending on design
19	LH	Leakage detector	0720705 -1
20	M	Solenoid valve	Depending on design
21	E1	Optical filter indicator	0820221
22	E2	Optical and electrical filter indicator	0820222

Diagram



Scope of supply:

1 Ball valve PN 16
2 Filter PN 6
4 Vacuum gauge with gauge valve
5 Vessel with manual ventilation
6 hp-Motor pump group consisting of: hp-Internal gear pump with integrated overflow valve and bypass connection, pump connector, coupling and standard motor
7 Pressure gauge with gauge valve
11 Double ball valve PN 40
14 Oil pan

Accessories:

15 Adapter for oil meter installation
16 Oil meter
17 Automatic float air vent
18 Pressure regulator
19 Leakage detector
20 Solenoid valve
21 Optical filter indicator
22 Optical and electrical filter indicator

Other designs (e.g. for suction operation or accessories) on request.

hp-Single filter 7.0

hp-Single filter Series GS (screw fitting connection)

Material

Filter housing:	EN-GJS-400
Cover:	S235JR
Filter element:	stainless steel

Operational limits

max. pressure:	6 bar
max. temperature:	150°C

Connection	Flow L/h EL/100 µm	Flow L/h S/500 µm	Weight / Kg	Item No.
G 1½''	900		2.6	084 2942
G ¾''	1500		2.6	084 2944
G 1''	2250		5.0	084 2950
G 1½''	4200		6.0	084 2952
G 1½''		950	2.6	084 2943
G ¾''		1600	2.6	084 2945
G 1''		2500	5.0	084 2951
G 1½''		4500	6.0	084 2953

hp-Single filter Series GF (flanged connection)

Material

Filter housing:	EN-GJS-400
Cover:	S235JR
Filter element:	stainless steel

Operational limits

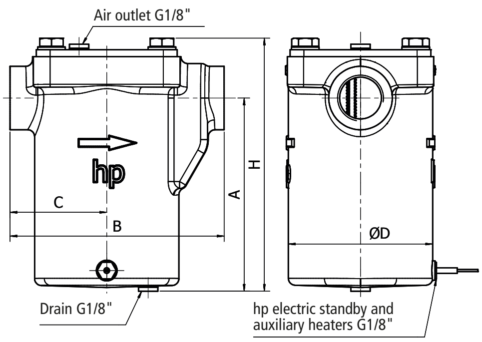
max. pressure:	6 bar
max. temperature:	150°C

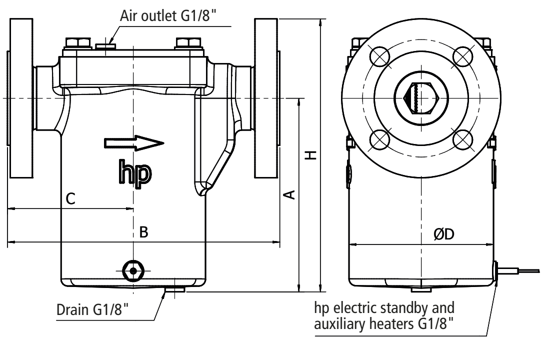
Connection	Flow L/h EL/100 µm	Flow L/h S/500 µm	Weight / Kg	Item No.
DN 20	1500		4.6	084 2948
DN 25	2250		7.5	084 2954
DN 32	3900		10.0	084 2956
DN 40	6800		11.0	084 2958
DN 20		1600	4.6	084 2949
DN 25		2500	7.5	084 2955
DN 32		4200	10.0	084 2957
DN 40		7200	11.0	084 2959

Accessories and spare parts for hp-Single filter

	Size	Fineness	Area cm²	Item No.
Filter element for fuel oil EL + L	G ½'' + G ¾'' + DN20	100 µm	108	082 1029
	G 1'' + DN 25	100 µm	148	082 1031
	G 1½'' + DN 32	100 µm	255	082 1033
	DN 40	100 µm	364	082 1035
Filter element for heavy fuel oil S	G ½'' + G ¾'' + DN20	500 µm	108	082 8030
	G 1'' + DN 25	500 µm	148	082 1032
	G 1½'' + DN 32	500 µm	255	082 1034
	DN 40	500 µm	364	082 1036
O-Ring for cover	G ½'' + G ¾'' + DN20			084 0935
	G 1'' + DN 25			084 0941
	G 1½'' + DN 32 + DN 40			084 0941
Set of springs for filter element	G ½'' + G ¾'' + DN20			082 4403
(3 pieces)	G 1'' + DN 25			082 4401
	G 1½'' + DN 32 + DN 40			082 4402
Electrical heaters	G ½'' + G ¾'' + DN20			072 0523
	G 1'' + DN 25			072 0521
	G 1½'' + DN 32 + DN 40			072 0522

Dimensions for hp-Single filter





Connection	A	B	H	C	ØD
G 1½''	140	105	178	46	73
G ¾''	140	105	178	46	73
G 1''	140	155	185	70	105
G 1½''	210	185	255	80	105

Connection	A	B	H	C	ØD
DN20	140	149	192.5	68	73
DN 25	140	197	197	90	105
DN 32	210	220	280	97.5	105
DN 40	270	230	345	100	105

Filter - Trade program 7.1

Fuel oil filter with shut-off valve

"Standard" connection	Flow l/h	Item No.
Filter connection G 3/8" with plastic filter cup and "SiKu" filter element (50µ)	300	0820020
Filter connection G 1/2" with plastic filter cup and "stainless steel" filter element (100µ)	600	0820021

Spare parts and options		Remark	Item No.
Brass filter cup (PN 16)	for filters with connection G 3/8" and G 1/2"	PN 16	0820009
Plastic replacement filter cup			0820005
O-ring for filter cup			0820003
"Sintered bronze" filter element		50µ	0820010
"SiKu" (50µ) filter element		50µ	0820004
"Stainless steel" (100µ) filter element		100µ	0820024

Standard design		Flow l/h	Item No.
Filter connection G 3/8" with plastic filter cup and "nickel" filter element (100µ)		1500	0820022
Spare parts and options		**Remark**	**Item No.**
"Nickel" filter element (100µ)	for filters with connection G 3/8"	100µ	0820025
O-Ring for filter cover			0820026

Aluminium - Fuel oil filter Series FD

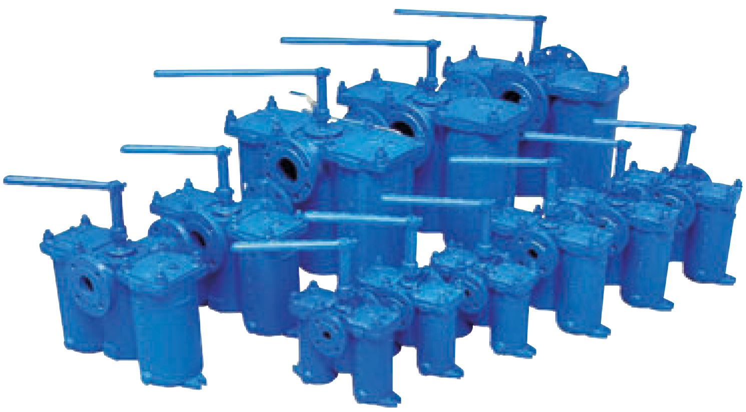
Design	Nominal pressure	Connection	Flow l/h	Item No.
Cover and filter made of die-cast aluminium filter element (100µ)	PN 2	G 3/8"	200	0820027
		G 1/2"	800	0820007
		G 3/4"	1700	0820028
		G 1"	2000	0820029
		G 1 1/4"	7000	08200301
		G 1 1/2"	7000	0820030
	PN 5	G 1/2"	800	0820000 -5
		G 1"	2000	0820029 -5
		G 1 1/2"	7000	0820030 -5

Spare parts	for filters	Item No.
Filter element (100µ)	G 3/8"	0820031
	G 1/2"	0820033
	G 3/4"	0820033
	G 1"	0820035
	G 1 1/4"	0820039
	G 1 1/2"	0820039
Seal set (complete)	G 3/8"	0820032
	G 1/2"	0820037
	G 3/4"	0820034
	G 1"	0820038
	G 1 1/4"	0820036
	G 1 1/2"	0820036

Duplex filter with stopcock change-over

For continuous operation during the cleaning phase hp-TECHNIK provides Duplex filters.

Material:	EN-GJS-500
max. operating pressure:	PN 16
Filter element:	stainless steel
Connection:	DN 15 - DN 80



Pump controls 8.0

Design: - Alternating current

miniCon II

Universal control for pressure accumulator units, main ring units or pressure pipe monitoring.
- (Integrated) stainless steel pressure measurement cell
- Measurement range 0-10 bar
- Display for pressure, timer, status
- Connection for 230V motor up to 0.75 W
- Connection for building control

Dimensions of plastic casing:	W 120 x H 70 x D 40 mm
Voltage:	230 VAC
Power:	up to 0.75 kW

Design	Item No.
Alternating current	0710076

Design: – Alternating current / Rotary current

µCon I

Single pump control for suction, pressure accumulator and main ring units
- Range of application of the level sensor from 0 - 99 cm
- Range of application pressure 0 - 10 bar, 0 - 25 bar
- Display for pressure, timer, status
- Connection for building control or burner requirement
- Connection for oil temperature monitoring
- Connection for spill protection

Alternating current design

Dimensions of plastic casing:	W 230 x H 200 x D 100 mm
Voltage:	230 VAC
Power:	up to 0.75 kW

Rotary current design

Dimensions of plastic casing:	W 240 x H 240 x D 90 mm
Voltage:	400 VAC
Power:	up to 4.0 kW

Control system	Item No.	Design
Suction	0720075 -01	Alternating
Pressure accumulator	0720075 -02	Alternating
Main ring	0720075 -03	Alternating
Suction	0720076 -01	Rotary current
Pressure accumulator	0720076 -02	Rotary current
Main ring	0720076 -03	Rotary current

Design: – Alternating current / Rotary current

µCon III

Double pump control for suction, pressure accumulator and main ring units
- Range of application of the level sensor from 0 - 99 cm
- Range of application pressure 0 - 10 bar, 0 - 25 bar

- Display for pressure, timer, status
- Connection for building control or burner approval
- Connection for oil temperature monitoring
- Connection for spill protection

Alternating current design

Dimensions of plastic casing:	W 240 x H 240 x D 90 mm
Voltage:	230 VAC
Power:	up to 0.75 kW

Rotary current design

Dimensions of plastic casing:	W 370 x H 240 x D 90 mm
Voltage:	400 VAC
Power:	up to 4.0 kW

Control system	Item No.	Design
Suction	0710050 -11	Alternating
Pressure accumulator	0710050 -12	Alternating
Suction-Delivery	0710050 -13	Alternating
Main ring	0710050 -14	Alternating
Split	0710050 -15	Alternating
Suction	0710070 -11	Rotary current
Pressure accumulator	0710070 -12	Rotary current
Suction-Delivery	0710070 -13	Rotary current
Main ring	0710070 -14	Rotary current
Split	0710070 -15	Rotary current

For the applications illustrated in the catalogue, the controls are supplied with our standard software. The programming of different use cases, such as, for example, special switching points, the use of other measurement transducers or other functions are possible, in principle, at hp-TECHNIK. Using clearly-defined task setting hp-TECHNIK would be happy to provide you with a quotation.

Accessories and spare parts 9.1

Fuel oil air air vent Series Flow-Control 3M TÜV tested

Casing of metal, hood of plastic, additional
safety float chamber

max. flow:	70 l/h	max. supply pressure:	0.7 bar
Pump circuit:	140 l/h	Test pressure:	6 bar
Gas/air separation	4 l/h		

Connection	Item No.
3 x G 1/4" i	0820211

Automatic float air vent

Automatic air vent
Automatic float air vent VA (stainless steel)
Suitable for air-separation units with supply pressure

max. supply pressure:	5 bar
Test pressure:	10 bar

Connection	Item No.
G 3/8"	08202141
G 3/8"	0820212

Automatic fuel oil vent with integrated filter

for use in single-pipe systems with bypass delivery.
Casing of metal, transparent vent hood from plastic and
safety float.

Siku element	50 µm

Connection	Nozzle capacity	Item No.
G 3/8"	100 l/h	082 0237

Leakage detector with plug-in casing Series LMS

TÜV tested, according WHG (§ 63)

Voltage:	AC 230 V, IP 20
Display:	Operation green; alarm red
Sensor cable:	1.5 m

Item No.
0720701 -1

Leakage detector wall-mounted Series LMW

TÜV tested, according WHG (§ 63)

Voltage:	AC 230 V, IP 20
Display:	Operation green; alarm red
Length of sensor cable (standard):	1.5 m

Length	Item No.
LMW	0720705 -1
Sensor cable 1.5 m	0720721 -1
Sensor cable 10 m	0720723 -1
Sensor cable 30 m	0720724 -1

Leakage detector Series ÖWWG3

on PTC basis for visual and audible warning
of accumulations of fluid

Consisting of display device with operating and alarm indicator,
and a flexible PTC sensor

Item No.
0720714

Pressure accumulator

Pressure up to 6 bar, oil-resistant membrane
R 3/4" external thread

Capacity	Item No.
1 litre	0820329
8 litres	0820181
18 litres	0820183
25 litres	0820184

Pumps and Valves
Motor pump groups
Units for single-pipe installation
Feed pumps and Pressure aggregates
Oil burner pressure aggregates
Filters
Pump controls
Accessories and Spare parts
Nozzles
Special units and Application
General

Accessories and spare parts 9.1

Safety valve (angle-type) Series 617T

Not component-tested
Set to 3 or 7 bar and sealed, it is possible to adjust after removing the seal.

Connection	Item No.
3 bar G 3/8"	0820379
7 bar G 3/8"	0820379 -7

Safety valve (angle-type) Series 851

TÜV component-tested
fixed setting to 3 bar with sealing cap,
not adjustable

Connection	Item No.
G1/2" and 1"	0820372

miniCon II

Universal control for pressure accumulator units, main ring units or pressure monitoring.

Design	Item No.
Alternating current	0710076

Electrical pressure switch

for monitoring of pressure pipes
230 V, 50 Hz, IP 65
max. operating temperature 70 °C

Model	Adjustment range (bar)	Item No.
FF 4 - 2	0.11 - 2	0820295
FF 4 - 4	0.5 - 4	0820294
FF 4 - 8	0.5 - 8	0820296
FF 4 - 32	2 - 32	0820297

Electrical pressure switch

TÜV-tested for min. or max. pressure monitoring
230 V, 50 Hz, IP 64 to DIN 3398 part 4
Temperature range 0 – 70 °C
Sealing option, to be fitted as desired, even as a retrofit

Model	Adjustment range (bar)	Item No.
DSB 140	0.2 - 2.5	0720670
DSB 143	0.5 - 6	0720672
DSB 146	1 - 10	0720674
DSB 152	6 - 16	0720675
DSB 170	15 - 40	0720676

Pressure transmitter (with plug)

Output 4 - 20 mA
Voltage: 12 – 24 VDC
Connection: G 1/4"

Pressure range	Item No.
0 – 10 bar	0710162
0 – 25 bar	0710125
0 – 40 bar	0710163

Level sensor

Type NIVOCAP capacitive level sensor
Recording range: 10 – 270 mm
Voltage: 12 – 24 VDC
Output 4 - 20 mA
(MODEL EL – 7.5 mA, compatible with 100 mbar pressure sensor)

Other lengths on request.

Connection	Item No.
G 1"	0710176

Accessories and spare parts 9.2

Lucifer valves

All types and models, please feel free to ask.

Solenoid valves ($P_{max.}$: 0 – 10 bar)

normally closed, **directly controlled**
230 V, 50 Hz
For fuel oil EL

Connection	DN	Discharge l/h	Item No.
G 3/8"	15	160	0820241
G 1/2"	15	600	0820242
G 3/4"	15	2000	0820243
G 1"	25	6000	0820244

Solenoid valves ($P_{max.}$: -0.9 – +4 bar)

DIN tested no. 56235/2000
Vacuum-compatible, **directly controlled**
as anti-lifting valve suitable for EL
230 V, 50 Hz
For fuel oil EL

Connection	DN	Discharge l/h	Item No.
G 3/8"	10	–	0820250
G 1/2"	13	–	0820342
G 3/4"	20	–	0820343
G 1"	25	–	0820344
G 1 1/4"	40	–	0820345

Coaxial direct acting valves TÜV and DIN tested

normally closed
suitable for suction operation
and can be used as an
anti-lifting valve 230 V, 50 Hz
for fuel oil EL
P_{max} -1bar to 16 bar

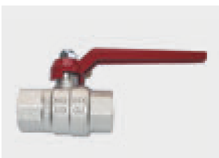
	Connection	DN	Discharge l/h	Item No.
Plug with rectifier	G 3/8"	10	200	0820256
Plug with rectifier	G 1/2"	10	600	0820257
With separate rectifier	G 3/4"	15	1000	0820258
With separate rectifier	G 1"	15	2000	0820259
with separate rectifier without TÜV	G1 1/4"	20	7400	0820260

Pressure-regulator for fuel oil EL

pressure: after regulator adjustable 0.2 – 3.5 bar
with manometer

Admission pressure: up to 10 bar

Connection	Discharge l/h	Item No.
G 1/4"	180	0821185
G 3/8"	480	0820186
G 1/2"	1200	0820187
G 3/4"	1800	0820188
G 1"	2400	0820189



Ball valve

made of brass, casing: nickel-plated, ball chromium plated, Teflon seal, operating temperature -30 ° to +200 °C

	Connection	Discharge l/h	Item No.
PN 40 with full flow	G 3/8"	Ø 12	0820140
	G 1/2"	Ø 15/18	0820141
	G 3/4"	Ø 22	0820142
	G 1"	Ø 28	0820143
PN 25 with full flow	G 1 1/4"	Ø 35	0820135
	G 1 1/2"	Ø 42	0820136
Mini ball valve PN 25 with full flow	G 1/4"	Ø 8	0820117

Gauge valve

Casing brass
with air vent,
with stuffing box

Connection	Item No.
G 1/4"	0820179

Accessories and spare parts 9.3

axial

radial

Liquid filled gauge

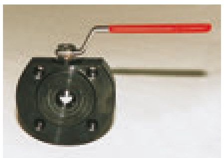
with glycerine filling,
diameter: 63 mm

Connection	Measurement range	Item No.
G 1/4"	radial 0 - 10 bar	0820172
G 1/4"	axial 0 - 10 bar	0820173
G 1/4"	radial 0 - 25 bar	0820204
G 1/4"	axial 0 - 25 bar	0820232
G 1/4"	radial 0 - 40 bar	0820174
G 1/4"	axial 0 - 40 bar	0820175
G 1/4"	radial –1/+5 bar	0820176
G 1/4"	axial –1/+5 bar	0820177
G 1/4"	radial –1/ 0 bar	0820205

Ermeto screw fittings

Various models can be supplied from stock.

please feel free to ask.



Compact ball valve (flanged design)

Casing: steel
Ball: chrome-plated steel
Seal: PTFE
PN 16 – 40

Connection	Item No.	Connection	Item No.
DN 15	0820150	DN 32	0820153
DN 20	0820151	DN 40	0820154
DN 25	0820152	DN 50	0820155

Nonreturn valves 0.5 bar opening pressure

Screw-fitted design

Other models, designs and opening pressures available from stock. Please feel free to ask.

Screw-fitted design - for:	Item No.
Pipe Ø 12	0860318
Pipe Ø 15	0860319
Pipe Ø 18	0860320
Pipe Ø 22	0860321
Pipe Ø 28	0860322

Nonreturn valves 0.5 bar opening pressure

Flanged design

Other models, designs and opening pressures available from stock. Please feel free to ask.

Flanged design - for:	Item No.
DN15/PN40	0861423
DN20/PN40	0861424
DN25/PN40	0861410
DN32/PN40	0861415
DN40/PN40	0861427

Double ball valve

Various designs and sizes.

please feel free to ask.

Welded flange DIN 2633 and DIN 2635

PN 16 and PN 40, material: RST 37-2 to DIN 17100
Temperature to 150 °C, C-shape sealing strip to DIN 2526

Connection	Item No.	Connection	Item No.
DN 15	0820090	DN 32	0820093
DN 20	0820091	DN 40	0820094
DN 25	0820092	DN 50	0820095

Flange seals

oil-resistant
Klingerit, PN 40

Connection	Item No.	Connection	Item No.
DN 15	0820098	DN 32	0820101
DN 20	0820099	DN 40	0820102
DN 25	0820100	DN 50	0820103

Nozzle case for 44 nozzles

Item No.
0980000

Spray nozzles for industry and agriculture

Please ask for our catalogue.

See page 90.

Accessories and spare parts 9.4

Oil meter HZ 3 for central oil supply – oil heaters– Oil meter for perfect consumption control

Installation also for oil central heating systems with single-pipe system
(suction capacity) possible max. -0.3 bar.
Technical Data:
Measurement accuracy ± 1 %
Flow range calibrated 0.18 to 12 l/h
Flow range maximum 30 l/h = 25 kg/h
Heater output 1.65 kW to 275 kW
Connection thread DIN 3852-X-G 1/4" inner

The oil meter HZ 3 can be used as a measuring device for fuel oil EL and diesel fuel. The smallest quantities can be measured with the greatest accuracy, simply read off your oil consumption. The calibrated oil meter (calibration validity 10 years) allows precise consumption calculation and is also robust and durable.
The HZ 3 oil meter can be supplied with an EU-valid calibration on request.

HZ 3 model	Site-tested	Item no. 0700350
HZ 3 model	Calibrated	Item no. 0700351

HZ 5 / HZ 6

HZ 5 DR / HZ 6 DR

Oil meter HZ 5 / HZ 6 for central heating systems, installation in delivery and suction lines possible

HZ 5 DR / HZ 6 DR oil meters with LCD digital display and pulse generator for digital reprocessing

For HZ 5, HZ 6 & HZ 5 DR / HZ 6 DR
- Robust and durable
- Energy efficient and economical to use
- Can be retrofitted into any existing heating system
- Precise monitoring of consumption and supply
- Alarm system for any heating faults
- Make optimum use of oil price fluctuations

For HZ 5 DR / HZ 6 DR
- Precise monitoring of consumption
- High data security
- Consumption can be electrically recycled
- Data can be evaluated statistically
- Economy efficiency calculations can be made

Technical Data:

Measurement accuracy:	± 1 %
Heating oil grades:	EL to DIN 51603
Flow range HZ 5 series:	0.7 to 40 l/h
Flow range HZ 6 series:	1.0 to 60 l/h
Temperature range:	-5 °C – +70 °C
Pulse value:	1 pulse = 0.02 l
Connection thread:	DIN 3852-X-G1 1/8" inner
Nominal pressure:	25 bar
Dimensions:	60 x 60 x 85 mm
Pressure loss:	0.1 to 0.2 bar
Weight:	0.6 kg

HZ 5 model		Item no. 0700352
HZ 5 DR model	LCD display, with pulse generator	Item no. 0700361
HZ 6 model		Item no. 0700362
HZ 6 DR model	LCD display, with pulse generator	Item no. 0700363
Mounting Kit Type	4 mm pipe Ø	Item no. 0700358
Mounting Kit Type	6 mm pipe Ø	Item no. 0700360

Piston oil flow meter

Oil and fuel meter with backlash-free integrated ring piston.
Measurement accuracy independent from viscosity and density of the medium,
+/- 1.0 % of actual value at 1...2 mPa/s

Oil meter model	VZO 4	VZO 8	VZO 15 RC	VZO 20 RC	VZO 25 RC	VZO 40 RC
Thread design in inches	1/8"	1/4"	1/2"	3/4"	1"	2"
Item No.	070 0301	070 0308	070 0312	070 0320	070 0326	070 0332
Screw-fitting pair	070 0300m	070 0308m	070 0312V	070 0320V	070 0327V	070 0332V
Flange design			**VZO 15 FL**	**VZO 20 FL**	**VZO 25 FL**	**VZO 40 FL**
Nominal diameter	4	8	15	20	25	40
Item No.	–	–	070 0316	070 0323	070 0329	070 0336
Max. flow in l/h	80	200	600	1500	3000	9000
Continuous flow in l/h	50	135	400	1000	2000	6000
Min. flow in l/h	1	4	10	30	75	225
Start-up at approx. l/h	0.5	1.6	4	12	30	90
Nominal pressure in bar	25	25	16	16	16	16
Temperature in °C	60	60	130	130	130	130
Special designs on request	–	–	25/40	25/40	25/40	25/40
Design with teletransmitter						
Thread design – Read puls transmitter RV	RE 0.00125 – 0.1	RE 0.00311 / 0.1 / 1	RV 0.1 / 070 0313	RV 1 / 070 0321	RV 1 / 070 0327	RV 1 / 070 0333
Flange Design	070 0302 – 0305	070 0309 – 0311	RV 0.1 / 070 0317	RV 1 / 070 0324	RV 1 / 070 0330	RV 1 / 070 0337
Thread design – Inductive impuls transmitter IN	–	–	IN 0.1 / 070 0315	IN 1 / 070 0322	IN 1 / 070 0328	IN 1 / 070 0335
Flange Design	–	–	IN 0.1 / 070 0319	IN 1 / 070 0325	RV 1 / 070 0331	IN 1 / 070 0339

Other models on request.

Oil burner nozzles 10.0

Monarch Oil Burner Nozzles

With the exception of special usage for fuel oil EL, the nozzles can be used for all oils the viscosity of which does not exceed 5 cst (1.4° E).
The Type HO models (see below) can also be used for oils with a viscosity up to 13 cst (2.1 °E).

Selection

The series comprises 72 discharges from 1.5 l/h to 378.5 l/h (0.40 to 100 US GPH).
The use of fuel oil EL at normal operating temperature may vary the discharge by approx. 1%.
The discharge increases with viscosity.

Operating pressure

The nozzles are tested at an operating pressure of 7 bar with fuel oil EL (see discharge tables on the next page).
The recommended operating pressure for nozzles (for fuel oil EL) is between 6 and 25 bar (please ask for using at higher pressure).
For fluids with a higher viscosity, they can work with an operating pressure of 10 – 14 bar. However, the spray angle decreases drastically (heavily), except if nozzles are used that are specially designed for such applications (see HO nozzle).

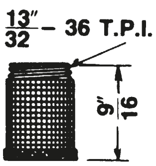
Nozzle with porous bronze filters

These filters, where all nozzles are equipped from 0.40 – 1.00 GPH, achieve very good filtering (filter fineness 25 – 50 microns).
This filter has huge advantages to protect the nozzles with small discharges (under 1.00 GPH). The accumulation of small bronze balls forms a series of obstacles, which results in considerably better filtering than for simple screen filters. Therefore, the sensitive internal parts of the small nozzles are better protected. This filter withstands high temperatures.

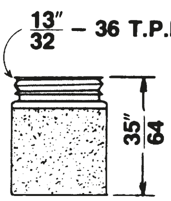
Nozzle with mesh strainers

Nozzles from 1.10 GPH to 9.5 GPH (4.16 – 39.7 l/h) discharge are all equipped with mesh strainers (Monel), mesh width 120. For larger discharges up to 30 GPH (113.5 l/h), this type of filter can also be used, but is then separately supplied as an extra.

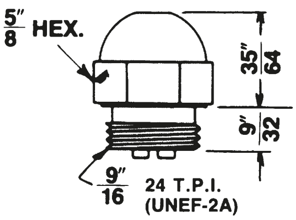
Mesh width 120 or 200



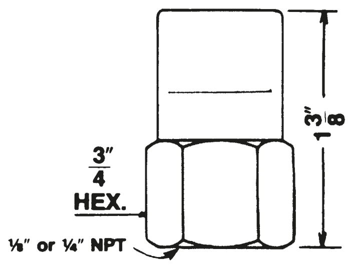
MONEL mesh strainer



Porous bronze filter



Tip (stainless steel)

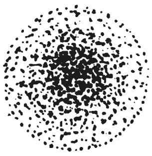


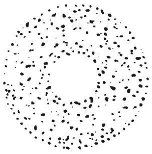
Adaptor (brass)

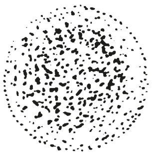
Remark		
13/32" = 10.3 mm	35/64" = 13.9 mm	1/4" = 6.3 mm
9/16" = 14.3 mm	1 3/8" = 34.9 mm	1/8" = 3.2 mm
9/32" = 7.1 mm	3/4" = 19.0 mm	5/8" = 15.9 mm

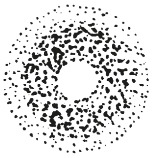
T. P. I.: Number of turns per inch

Spray patterns and flow table 10.1

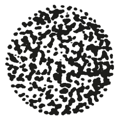

R


NS


AR


PLP


PL


HV

All MONARCH nozzles are stamped with the following characteristics, subject to modification on adoption of CEN standards:
- the flow (in USGPH at l00 PSI = 6.895 bar), (soon, capacity at 10 bar and CEN references);
- spray angle;
- letters to identify the series of spray patterns;
- the, reference MTD-92;
- the, MONARCH trade mark.

Each MTD-92 nozzle is individually tested at several different production stages to assure perfect conformity with master nozzles of each series.

The spray patterns (i.e. hollow cone or solid cone) described below refer to the tests carried out with a 60 °C angle at a 75 mm distance from the nozzle orifice. In nozzles of 60 °C spray angle or less, and for low flows in particular, the empty section of a hollow cone becomes smaller. The difference between hollow cone and solid cone practically disappears.

Solid cone "R" series: 0.35 to 3.50 GPH This is the series supplied regularly unless customer specifies otherwise. It is a good all-round nozzle suitable for most burners. Atomization of the oil is not quite as fine as with the "NS" series.

Hollow cons "NS" series: 0.40 to 2.00 GPH This series works best on many burners due to its exceptionally fine atomization. Produces a quiet stable flame. Widely used in 80 °C and 90 °C on flame retention burners.

Special solid cone "AR" series: 0.60 to 3.50 GPH This series has become widely used due to its success in obtaining quiet combustion in some flame retention head burners. Traditionally a "cure-all" replacement nozzle, it now is increasingly specified on original equipment.

Semi-solid cone "PLP" series: 2.25 to 100.00 GPH The standard nozzle for larger capacities. Fine atomization and "solid" spray pattern up to about 3.50 GPH, gradually becoming more and more "hollow" in the larger sizes.

Hollow cone "PL" series: 2.25 to 50.00 GPH This series represents an extension of the "NS" type spray pattern to larger capacity sizes. Spray is not as finely atomized as the "PLP" series, but produces the best results in equipment specifying hollow cone nozzles.

Narrow spray angle "HV" series: 1.65 to 60.00 GPH Used mostly for Semi-Industrial or Scotch Marine applications where narrow spray angle and high spray velocity is essential and some combustion noise is not objectionable.

Heavy oil nozzle "HO" series: 1.25 to 100.00 GPH Designed for use on 70 SSU (approx. 13 centistokes) operating viscosity oil at operating pressures ranging from 200-450 PSIG (13.8 to 31 bar). Write for special data sheet.

	Capacity in l/h at a pressure of (bar):						
Nominal size	1.0	5.2	7.0	8.8	10.4	12.2	14.0
0.40	-	-	1.51	1.70	1.85	2.00	2.12
0.45	-	-	1.70	1.90	2.07	2.24	2.40
0.50	-	-	1.89	2.12	2.30	2.50	2.68
0.55	-	-	2.08	2.33	2.53	2.75	2.94
0.60	-	-	2.27	2.53	2.80	2.99	3.21
0.65	-	-	2.46	2.76	3.03	3.25	3.48
0.75	-	-	2.83	3.18	3.48	3.74	4.01
0.85	-	-	3.18	3.59	3.93	4.27	4.54
1.00	1.43	3.29	3.78	4.24	4.65	4.99	5.33
1.10	1.57	3.59	4.16	4.65	5.07	5.49	5.86
1.20	1.71	3.93	4.54	5.07	5.56	6.02	6.43
1.25	1.79	4.05	4.73	5.26	5.80	6.24	6.70
1.35	1.93	4.43	5.11	5.71	6.24	6.77	7.23
1.50	2.14	4.92	5.67	6.36	6.96	7.49	8.02
1.65	2.35	5.41	6.24	6.69	7.64	8.25	8.85
1.75	2.50	5.70	6.62	7.42	8.10	8.78	9.38
2.00	2.86	6.55	7.57	8.47	9.27	10.00	10.70
2.25	3.21	7.38	8.51	9.53	10.37	11.30	12.00
2.50	3.57	8.17	9.46	10.60	11.58	12.50	13.40
3.00	4.28	9.80	11.35	12.70	13.93	15.00	16.10
3.50	5.0	11.46	13.24	14.80	16.23	17.50	18.70
4.00	5.71	13.10	15.14	16.90	18.50	20.10	21.40
4.50	6.43	14.76	17.03	19.10	20.80	22.50	24.00
5.00	7.14	16.40	18.90	21.20	23.20	25.00	26.70
5.50	7.86	18.00	20.80	23.30	25.50	27.50	29.40
6.00	8.56	19.60	22.70	25.40	27.70	30.00	32.10
6.50	9.30	21.30	24.60	27.50	30.10	32.50	34.80
7.00	10.00	22.90	26.50	29.60	32.50	35.00	37.50
7.50	10.70	24.60	28.40	31.70	34.80	37.50	40.10
8.00	11.40	26.20	30.30	33.80	37.00	40.20	42.80
8.50	11.85	27.80	32.20	36.00	39.50	42.60	45.70
9.00	12.80	29.50	34.00	38.20	41.60	45.00	48.00
9.50	13.60	31.30	36.00	40.10	44.30	47.70	51.10
10.00	14.20	32.80	37.80	42.40	46.40	50.00	53.40
10.50	15.00	34.40	39.70	44.30	48.80	52.60	56.40
11.00	15.70	36.00	41.60	46.60	51.00	55.00	58.80

	Capacity in l/h at a pressure of (bar):						
Nominal size	1.1	5.2	7.0	8.8	10.4	12.2	14.0
11.50	16.40	37.80	43.40	48.60	53.30	57.60	61.50
12.00	17.10	39.60	45.20	50.70	55.60	60.20	64.30
12.50	17.80	41.10	47.20	52.80	57.90	62.60	66.90
13.00	18.60	42.60	49.20	55.00	60.20	65.00	69.60
13.50	19.35	44.10	51.10	57.00	62.60	67.80	72.50
14.00	20.00	45.80	53.00	59.20	65.00	70.00	75.00
14.50	20.70	47.50	54.90	61.30	67.30	72.50	77.60
15.00	21.40	49.20	56.80	63.40	69.60	75.00	80.20
15.50	22.20	50.60	58.66	65.60	71.70	77.80	82.80
16.00	22.80	52.40	60.60	67.60	74.00	80.40	85.60
17.00	23.70	55.00	64.40	72.00	79.00	85.20	91.40
17.50	25.00	57.10	66.20	74.20	81.00	87.80	93.90
18.00	25.60	59.00	68.00	76.40	83.20	90.00	96.00
19.00	27.20	62.60	72.00	80.20	88.60	95.40	102.20
19.50	27.80	64.00	73.90	82.50	90.50	97.60	104.50
20.00	28.40	65.60	75.60	84.80	92.80	100.00	106.80
20.50	29.20	67.20	77.50	86.70	95.20	102.60	109.80
21.00	30.00	68.80	79.40	88.60	97.60	105.20	112.80
21.50	30.70	70.40	81.40	90.90	99.90	107.50	115.00
22.00	31.40	72.00	83.20	93.20	102.00	110.00	117.60
23.00	32.80	75.60	86.80	97.20	106.60	115.20	123.00
24.00	34.30	78.70	90.90	101.40	111.30	120.40	128.70
25.00	35.60	82.20	94.40	105.60	115.80	124.40	133.80
28.00	40.00	91.60	106.00	118.50	129.80	140.00	149.90
29.00	41.40	95.00	109.80	122.60	134.60	145.00	155.20
30.00	42.80	98.40	113.50	127.20	139.30	150.30	160.90
35.00	50.00	114.70	132.50	148.00	162.40	175.20	187.40
40.00	57.20	131.00	151.40	169.20	185.50	200.60	213.80
45.00	64.20	147.60	170.30	191.00	209.00	225.20	241.10
50.00	71.30	163.90	189.20	211.60	232.00	250.20	267.60
55.00	78.90	180.20	208.20	232.80	255.10	275.20	294.10
60.00	86.00	196.80	227.10	253.60	278.20	300.50	318.00
70.00	100.40	229.30	255.00	296.00	324.40	350.10	374.70
80.00	114.70	262.00	302.80	338.40	371.00	401.20	429.60
90.00	129.00	294.80	340.60	382.00	418.20	451.20	482.60
100.00	143.40	327.40	378.50	423.50	464.00	500.80	535.20

Remark

$$\frac{Q_1}{Q_{10}} = \sqrt{\frac{P_1}{P_0}}$$ or

Q_0 = flow l/h or kg/h at 7 bar
P_0 = test pressure for nominal power (generally 7 bar)
P_1 = effective operating pressure
Q_1 = flow intended

The values for the flow table relate to fuel oil EL with an average viscosity of 2.5 – 3 cst (1.18 - 1.22 ° E). 100 PSI = 6.9 bar rounded up to 7 bar. 1 GPH = 3.785 l/h.
The description in the nominal size column is identical to the discharge (GPH) at an operating pressure of 7 bar.

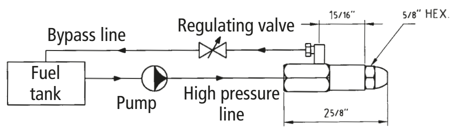
Pumps and Valves
Motor pump groups
Units for single-pipe installation
Feed pumps and Pressure aggregates
Oil burner pressure aggregates
Filters
Pump controls
Accessories and Spare parts
Nozzles
Special units and Application
General

BPS-Bypass nozzle 10.2

The BPS nozzles produce variable orifice flow rates by bypassing fluid from the nozzle swirl chamber. The orifice flow is regulated by controlling the by-pass line pressure.

Nozzle tip and disc are made of high quality, heat-resistant stainless steel, the inner fastening cover and the filter body of nickel-plated brass, the Monel mesh strainer with 120µ mesh width for discharges up to 13.50 Gph and 80 µ mesh width for larger discharges.

The seal between the oil inlet and the bypass connection is guaranteed using a viton O-ring.
The BPS bypass nozzles are tested to a pressure of 7 bar with fuel oil EL, viscosity 2.8 cst.
(1.2 ° E). Maximum operating pressure between 17 and 20 bar and max. viscosity of 13 cst. (2.1 ° E).
The BPS nozzle can be supplied in the following spray angles and capacities:
45 ° from 0.75 Gph – 35.00 Gph
60 ° from 0.75 Gph – 50.00 Gph
80 ° from 1.50 Gph – 35.00 Gph
For discharges above the capacity sizes mentioned above, we refer to the industrial nozzles of model series **C 210, E 179 H and E 180 H** (you will receive the documents on this on request).



HO-Heavy fuel oil nozzle

This is an extension to the burner nozzle usually sold, which is used especially for heavy fuel oils in the upper permitted viscosity ranges of 5 – 9.5 cst, tested at 430 PSI (30 bar).
The HO nozzle can be supplied with the following spray angles and capacities:
45° from 1.75 Gph – 45.00 Gph
60° from 1.75 Gph – 45.00 Gph
80° from 2.25 Gph – 45.00 Gph
For capacities above 45.00 Gph, delivery time on request.
The nozzles mentioned can be obtained with the PL hollow cone spray pattern.

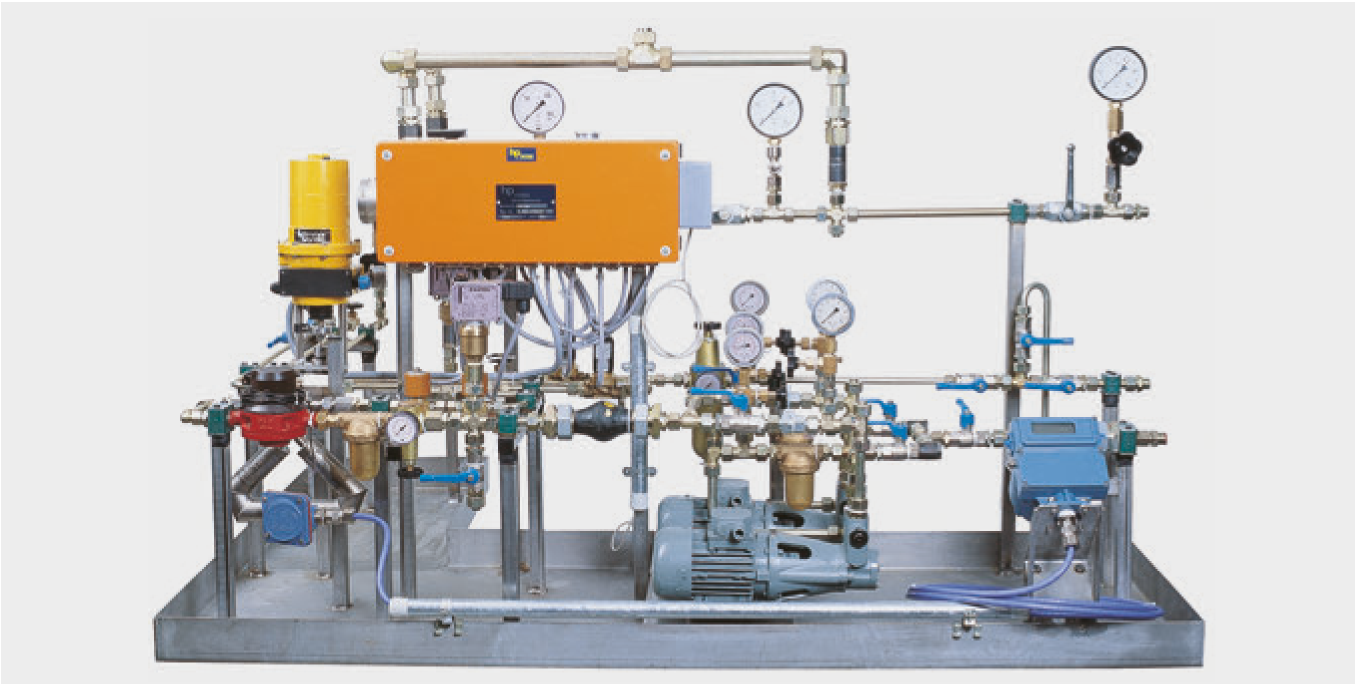
For industry heavy fuel oil nozzles and other applications for chemistry, agriculture etc., please request the relevant catalogue, alternatively you can find the information on our website.

hp-Special units for heating and environmental technology

According to your requirements, we shall plan and construct, connection-ready and tested units for heating technology.

Oil controlled system with ignition gas, for modulating oil burner 11.0

Fitted on joint oil pan for internal set-up
Control ratio: 1 : 10
Option:
- Equipped for ignition and cooling air
- Terminal box for electrical connections
- For open air set-up in heated equipment cabinet

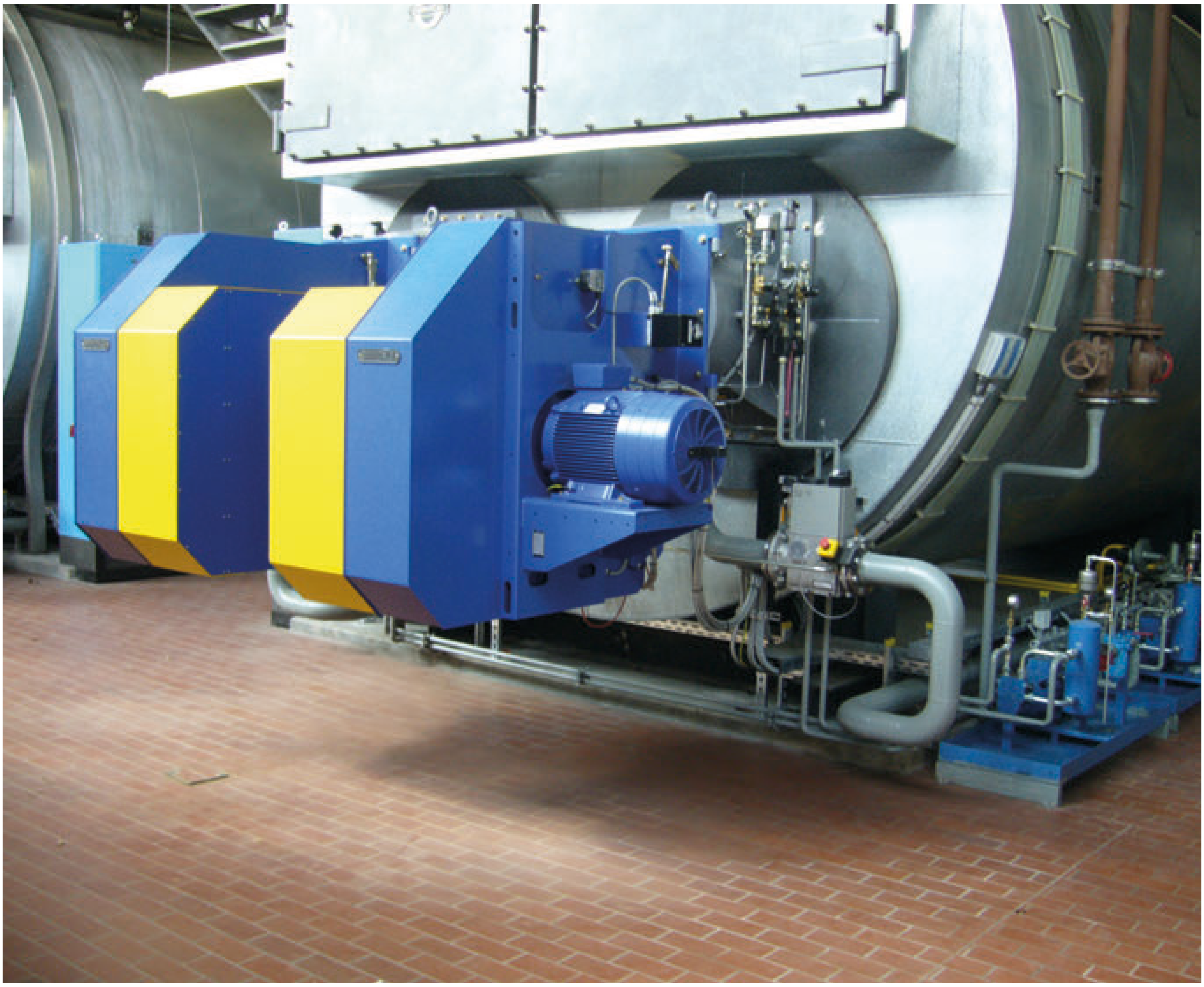


Test facility for pumps

Applications 11.1

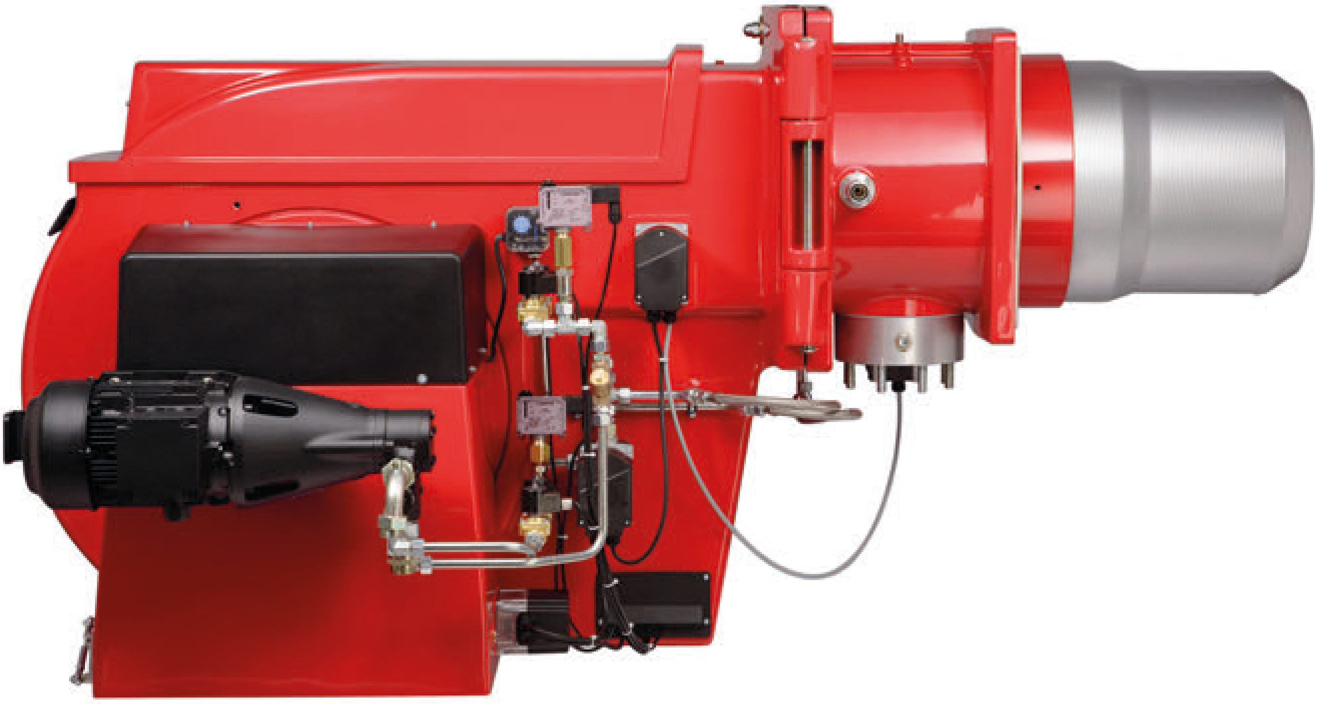
CIB UNIGAS burner with hp-Burner pump UHE

Oilon burner with hp-Burner pump UHE



TEMINOX burner from Saacke with hp-Single-pumping unit Series MOG 1900

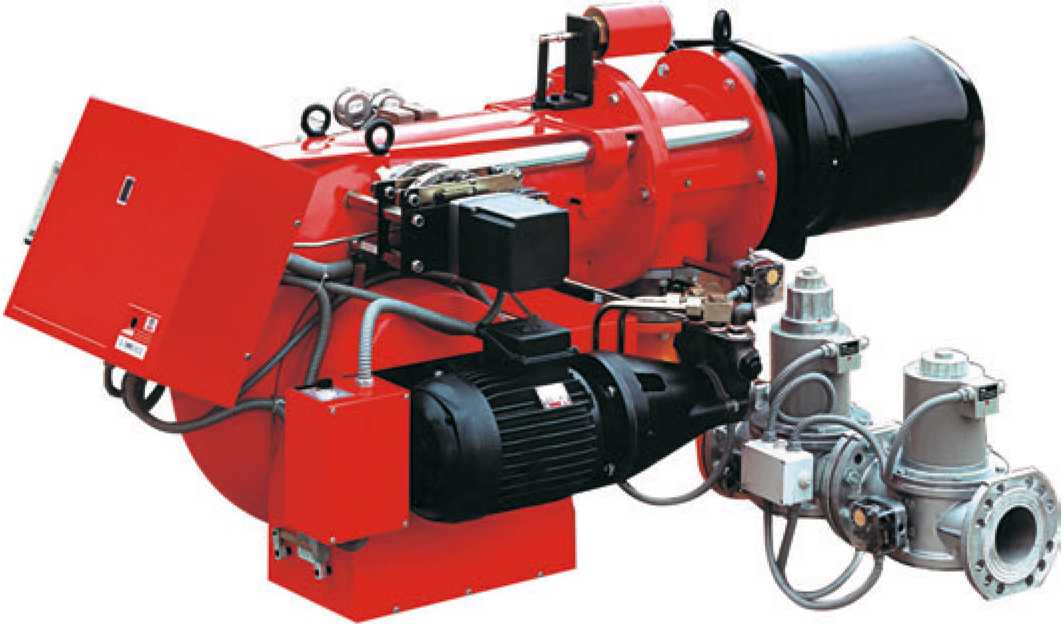
Applications 11.2



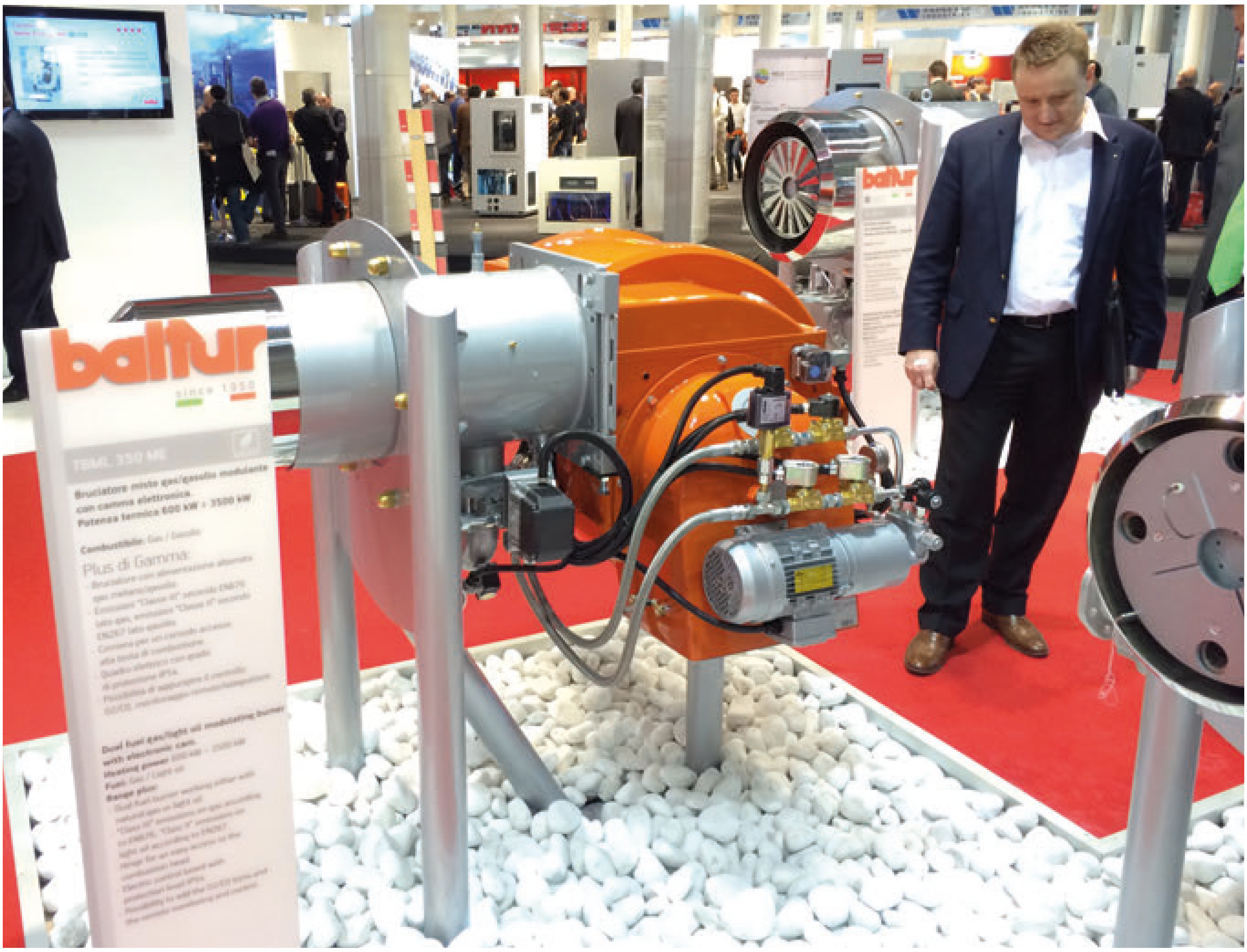
Weishaupt burner, Type RGL 70/1-B 3 LN

Boiler room of a Chinese airport 25MW,
with pressure aggregates from hp-TECHNIK

Applications 11.3



Riello burner with hp-Motor pump group SMG



Baltur burner with hp-Motor pump group SMG

Documents · Certificates · General Instructions 12.0

Documentation

The scope of supply includes documentation (data sheet, manual, circuit diagram) max. in triplicate in the German language.
Any further requirements are billed for at additional cost (price on request). Documentation in a foreign language is billed for at additional cost (price on request).

Test Certificate

All units that leave this factory are subject to a final inspection (leakage and operation test) to DIN-EN ISO 9001.
The results are documented in a test certificat which is generally part of the scope of supply and therefore free of charge.

Acceptance certificate to DIN-EN 10204

Site certificate to	DIN-EN 10204 2.1 Devices (pressure, sealing, function and dimensional check to hp standard)	Price on request
Site certificate to	DIN-EN 10204 2.2	
Marine certification	ABS, GL, LRS, KRS, BV, CCS, DNV, NKK, RINA	

Label

The labels of the devices and packaging are provided on type plates or stickers according to hp-Standard.
Special labels, e.g. on Niro signs, with measurement points are billed for at cost.

Amendment Costs

Additional technical amendments to existing purchase contracts are charged with a reasonable processing fee (depending on manufacturing state and type of amendment).

Viscosity comparison tables and conversions 12.1

Viscosity Table

°Engler [°E]	mm²/s (cSt.)
1	1
2	10
5	40
10	75
20	150
30	230
40	300
50	380
60	460
70	530
80	610
90	680
100	760
150	1150
200	1500
250	1900
300	2300
350	2700
400	3000
450	3400
500	3800

Conversion of dynamic and kinematic viscosity

Formula symbol	Name	Coherent units	Incoherent units	Conversion
η	Dynamic viscosity	Pa s m Pa s	P cP	1 Pa s = 1 kg/s m 1 Pa s = 1 Ns/m 1 mPa s = 10^{-3} Pa s 1 mPa s = 1 cP
ν	Kinematic Viscosity	m²/s mm²/s	St. cSt.	1 St. = 1 cm²/s 1 cSt. = 1 mm²/s $\nu\,[m^2/s] = \frac{\eta\,[Pa\,s]}{\rho\,[kg/m^3]}$

Conversion for Viscosity from 60 mm² s^{-1}

known / unknown	mm^2/s^{-1}	°E	SR 1 (Redwood No1)	SSU (Saybold Universal)
mm²/s	1	7.58	0.247	0.216
°E	0.132	1	0.0326	0.0285
SR1	4.05	30.7	1	0.887
SSU	4.62	35.11	1.14	1

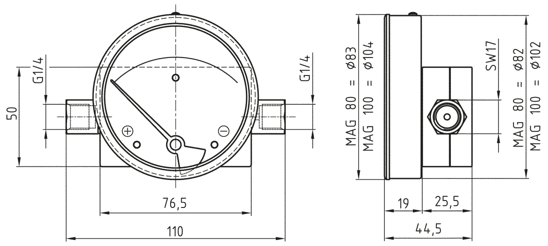
Medium	Temperature t [°C]	Density ρ [kg/m³]	Kinem. viscosity ν [mm²/s]	Calorific value Hu [MJ/kg]	Flash point T [°C]
Heating oils					
Fuel oil “EL”	20	860	≤ 6	≥ 42.0	> 55
Fuel oil “L”	20	1100	≥ 17	≥ 37.7	> 65
Fuel oil “M”	50	1200	≥ 75	≥ 37.7	> 65
Fuel oil “S”	50/100	Manufacturer's specifications	≥ 450/40	≥ 39.8	> 65
Fuel oil “ES”	–	–	–	–	–
Lubricating oils					
SAE 5 W	20/50/100	–	34/11/3.5	–	–
SAE 10 W	20/50/100	–	55/15/4.5	–	–
SAE 15 W	20/50/100	–	137/30/6.5	–	–
SAE 20 W	20/50/100	–	219/43/8.5	–	–
SAE 30	20/50/100	–	345/61/11	–	–
SAE 40	20/50/100	–	550/100/15	–	–
SAE 50	20/50/100	–	865/125/19	–	–

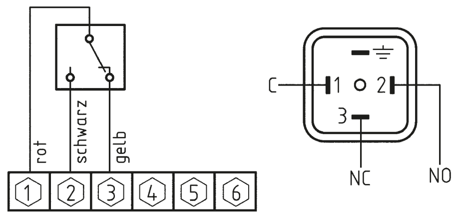
hp Additional equipment for hp-Aggregates 12.2

Accessories "E1" and "E2" - differential pressure indicator
Accessories and filter monitoring for hp-Aggregates
E1 - Optical filter indicator
E2 - Optical and electrical filter indicator

Function:

The pressures have an effect on two pressure chambers separated by a magnetic piston. A pressure difference occurring in these pressure chambers leads to axial deflection of the magnetic piston against a pressure spring and generates the measurement path. This is transferred from the magnetic piston to the pointer by a ring magnet fitted on a pointer boss. The differential pressure is shown directly. Due to the complete mechanical separation of the pressure chamber and display, leaks can be ruled out.





Accessories "A" - electrical stationary and auxiliary heating for filters and pumps

For the use of pumps and units when operating with pre-heated media, which have cooled to a higher viscosity the manufacturer prescribes the use of electrical stationary and auxiliary heating, which can be obtained as accessories.

Electrical connection: ~ 230V, 50Hz

Complete scope of supply Accessories "A":
- Pump heating cartridge
- Filter heating cartridge
- Terminal box (for electrical connections)

Filter size	Filter model	Heating power	Item no. Filter heating	Item no. Complete Accesso-	
G1/2"	GS 1/2"	60 W	0720523	0720650 -1	For double pump units the accessories are to be counted twice
G3/4"	GS 3/4"	60 W	0720523	0720650 -1	
G1"	GS 1"	100 W	0720521	0720651 -1	
G1 1/2"	GS 1 1/2"	140 W	0720522	0720653 -1	
DN 20	GF DN 20	60 W	0720523	0720650 -1	
DN 25	GF DN 25	100 W	0720521	0720651 -1	
DN 32	GF DN 32	140 W	0720522	0720653 -1	
DN 40	GF DN 40	140 W	0720522	0720653 -1	

Accessory "S" - electrical pressure switch for pressure monitoring

Pressure monitors/switches may be optimally installed in all hp-Aggregates. They are used to monitor pressure conditions in the pipelines, for example, to diagnose a pipe break or lack of oil.
To do this, when a set pressure is exceeded or when it falls below this pressure, the drive of a unit is switched off.
The pressure monitoring may, of course, be done also by means of a pressure transmitter. In this case, the name in the accessories changes to "DT".

Leak detection systems 12.3

Leakage detector in plug-in casing Type LMS
TÜV-tested and with general building regulations permit - No. Z65.40-478 (therefore suitable for use to § 63 WHG)

Functional description:
The leakage oil detector consists of a casing with Schuko plug in which the measurement transformer is integrated and a probe. The measurement transformer is supplied with 230V (AC) via the plug. The voltage is transformed to 5V (DC) through the transformer. The probe consists of a sensor (IR transmitter and receiver) that is supplied with the stated voltage,
in which an infrared barrier is built up between the transmitter and receiver. When there is no liquid in the infrared barrier, there is the voltage of 230V (AC) on the measurement transformer output (plug casing). If fluid seeps into the infrared barried when there is a leak, then a signal is sent to the circuit board, which has the effect of interrupting the voltage to the measurement transformer output (socket casing).

Technical Data:

Supply voltage:	AC 230 V / 50 Hz / 100 mA
Ambient temperature:	-10°C to +40 °C
Displays:	LED green (operation), LED red (alarm)
Output:	Relay output max. 230 VAC; max. 5 A; max. 1150 VA
Fuse type:	IP 20 to EN 60529
Protection class:	EN 60730
Dimensions:	120 x 65 x 55 mm
Sensor cable length:	1.5 m

Leakage detector wall-mounted Type LMW
Leakage detector - cirquit board execution Type LMP (for casing installation)
TÜV-tested and with general building regulations permit - No. Z65.40-478 (therefore suitable for use to § 63 WHG)

Functional description:
The LMW heating oil detector consists of a casing in which the measurement transformer is integrated (on a circuit board) and a probe. The electrical power supply of the measurement transformer is produced via the connection for plug-in terminals with 230V (AC).
The LMP design is the version of the LMW without casing, for integration in the available casing. The voltage is transformed to 5V (DC) through the transformer. The probe consists of a sensor (IR transmitter and receiver) that is supplied with the stated voltage, in which an infrared barrier is built up between the transmitter and receiver. When there is no liquid in the infrared barrier, there is a voltage of 230V (AC) on the measurement transformer output (plug casing). If the infrared barrier is penetrated by a leak of fluid, a signal is sent to the circuit board. This signal can be evaluated using a potential-free contact.

Technical Data:

Supply voltage:	AC 230 V / 50 Hz / 100 mA
Ambient temperature:	-10°C to +40 °C
Displays:	LED green (operation), LED red (alarm)
Output:	Relay output max. 230 VAC; max. 5 A; max. 1150 VA
Fuse type:	IP 41 to EN 60529
Protection class:	EN 60730
Dimensions:	140 x 85 x 60 mm
Sensor cable length:	1.5 m (standard); 15 m and 30 m

Spill protection and leakage detector Type FTL31
TÜV-tested and with general building regulations permit - No. Z65.40-532 (therefore suitable for use to § 63 WHG)

Functional description:
The FL31 sensor works according to the vibration damping principle. The mechanical vibration system, consisting of two vibrating rods arranged on a membrane next to each other are subjected to a mechanical vibration with a piezoelectric drive. If the vibrating fork is immersed in a liquid, this vibration is damped. The resulting change of vibration frequency is converted by the integrated measurement transformer into an electrical signal and transformed into a binary switching signal in the same measurement transformer. The sensor provides maximum safety due to permanent self monitoring.

Technical Data:

Supply voltage:	DC-PNP:	10 - 30 V DC, three-wire V / 50 Hz / 100 mA
	AC/DC:	20 - 253 V AC/DC, two-wire
Power consumption:	DC-PNP:	< 975mW
	AC/DC:	< 850mW
Current consumption:	DC-PNP:	< 15 mA
	AC/DC:	< 3.8 mA
Ambient temperature:	-40°C to +70°C	
min. material density	0.7 g/cm³	

Motor data 12.4

Rotary current standard motor

Voltage 230/400 V, 50 Hz, IP 55, ISO Kl.-F
from 4.0 kW voltage 400/690 V
4-pol synchronous rotation speed **1500 RPM**

Item No. IE 3	Motor size	Power (kW)	Type of construction	Flange Ø/ Ø LK	Motor shaft Ø
0820411	63	0.18	B3/B14	120/100	11
0820413	71	0.37	B3/B14	140/115	14
0820415E3	80	0.75	B3/B14	160/130	19
0820416E3	90	1.1	B3/B14	160/130	24
0820417E3	90	1.5	B3/B14	160/130	24
0820418E3	100	2.2	B3/B14	200/165	28
0820419E3	100	3	B3/B14	200/165	28
0820420E3	112	4	B3/B14	200/165	28
0820421E3	132	5.5	B3/B5	300/265	38
0820422E3	132	7.5	B3/B5	300/265	38

Rotary current standard motor

Voltage 230/400 V, 50 Hz, IP 55, ISO Kl.-F
from 4.0 kW 400/690 V
6-pol synchronous rotation speed **1000 RPM**

Item No. IE 3	Motor size	Power (kW)	Type of construction	Flange Ø/ Ø LK	Motor shaft Ø
0820471	71	0.18	B3/B14	140/115	14
0820473	80	0.37	B3/B14	160/130	19
0820475E3	90	0.75	B3/B14	160/130	24
0820476E3	90	1.1	B3/B14	160/130	24
0820477E3	100	1.5	B3/B14	200/165	28
0820478E3	112	2.2	B3/B14	200/165	28
0820479E3	112	3	B3/B14	200/165	28
0820480E3	132	4	B3/B5	300/265	38
0820481E3	132	5.5	B3/B5	300/265	38
0820487E3	160	7.5	B3/B5	SO flange	42

Alternating current standard motor

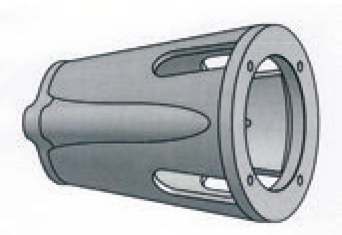
Voltage 230 V, 50 Hz, IP 55, ISO Kl.-F
Synchronous rotation speed **1400 RPM**
with capacitor

Item No.	Size	Power (kW)	Type of construction	Flange	Amp.
0820426	63	0.18	B3/B14	C 120	2
0820428	71	0.37	B3/B14	C 140	3.2
0820429	80	0.55	B3/B14	C 160	4.3

Alternating current standard motor

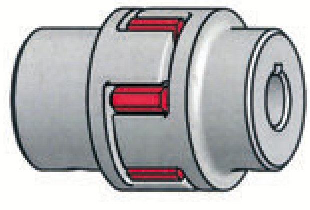
with burner flange
Voltage 230 V, 50 Hz, IP 55, ISO Kl.-F
with capacitor

Item No.	Size	Power (kW)	Type of construction	Burner flange	RPM	Amp.
0820450	E 63 BL 4	0.18	B 3/S	D 32	1400	2
0820454	M 63 A 2	0.18	B 3/S	D 32	2800	2
0820624	Plug-in coupling for IZP pump					
0820623	Plug-in coupling for ITZ pump					



Pump connector

Motor

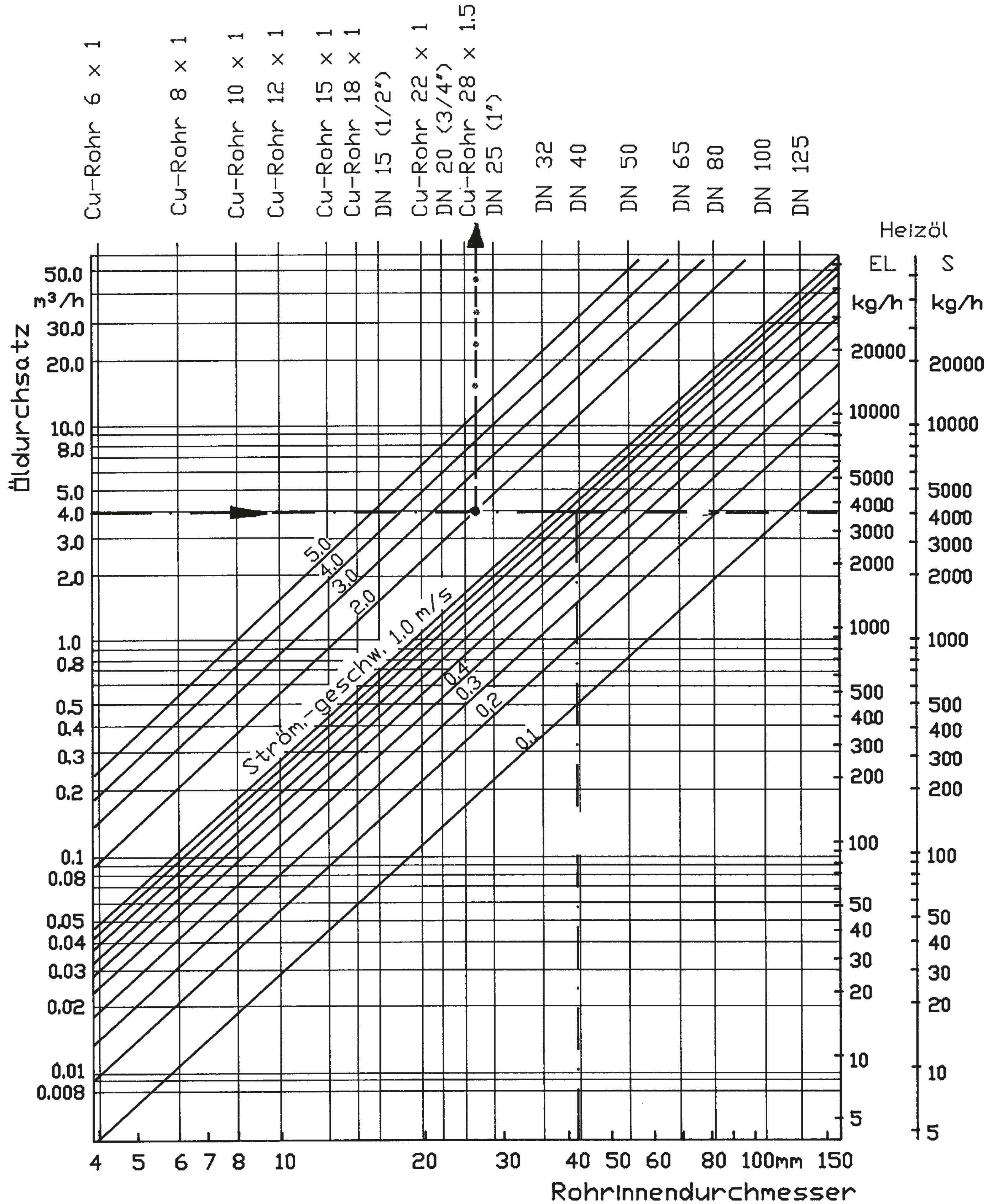


Coupling

Pump gear rotor Ø	Pump centring	Model	Length	Motor size	Flange B 14/Ø	Power (kW)	Item No.	Coupling PS/MS	Item No.
				Motor B3/B14 1400 RPM					
25 + 38 / 12	54	5.050	109	63	120	0.12 – 0.18	0820550	12/11	0820665
	54	5.051	116	71	140	0.25 – 0.37	0820551	12/14	0820666
	54	5.052	136	80	160	0.55 – 0.75	0820552	12/19	0820667
	54	5.052	136	90	160	1.10 – 1.50	0820552	12/24	0820668
56 / 18	60	5.053	182	80	160	0.55 – 0.75	0820553	18/19	0820670
	60	5.054	162	90	160	1.10 – 1.50	0820554	18/24	0820671
	60	5.055	202	100/112	200	2.20 – 4.00	0820555	18/28	0820672
	60	5.056	222	132	300	5.50 – 7.50	0820556	18/38	0820674
75 / 22	80	5.058	193	90	160	1.10 – 1.50	0820558	22/24	0820675
	80	5.059	203	100/112	200	2.20 – 4.00	0820559	22/28	0820676
	80	5.060	223	132	300	5.50 – 7.50	0820560	22/38	0820677
Elastic crown gear for coupling PW 12							0820669		
Elastic crown gear for coupling PW 18							0820673		
Elastic crown gear for coupling PW 22							0820678		

Flow speed in oil pipes 12.5

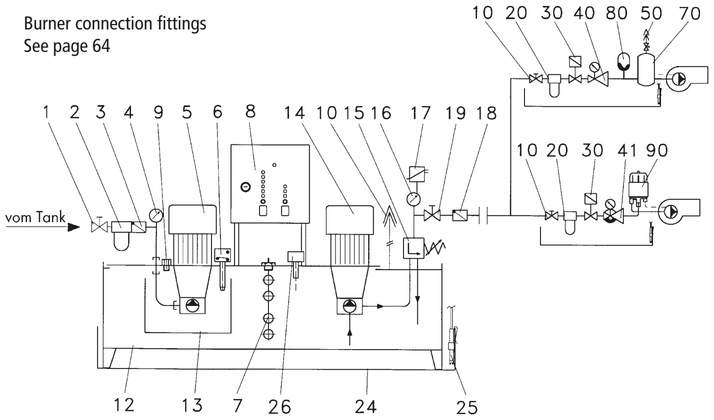
Recommended speeds: in suction pipes: ~ 0.3 - 0.6 m/s
In pressure pipes: ~ 2.0 m/s



Example: Known: Discharge fuel oil EL 4.0 m³/h
Sought: Nominal width
Solution (read off): DN 28 = Cu 28 x 1.5

Heating oil supply schemes 12.6

Single-pipe oil supply of oil burners with independently controlling hp-Single suction and pressure pump aggregates without bypass, aggregates pressure control systems for intermittent operation



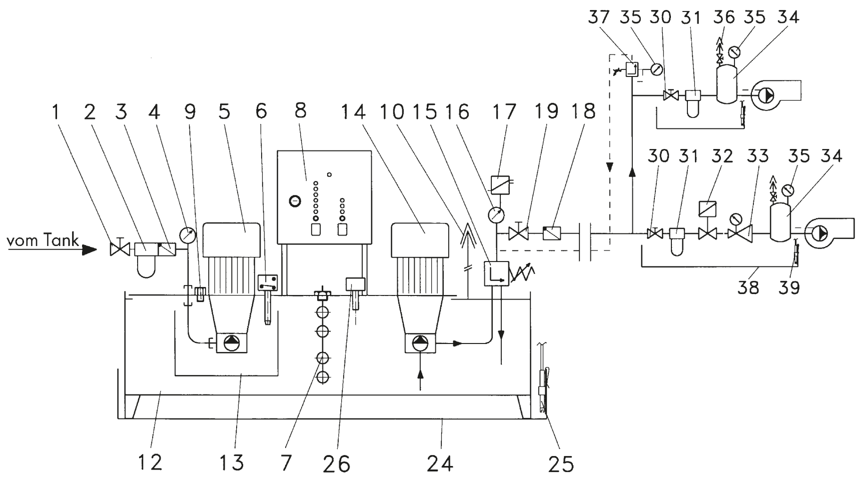
Name:

1 Ball valve (in the place of installation)
2 Filter
3 Nonreturn valve
4 Vacuum gauge
5 hp-Internal gear pump with standard electric motor
6 Thermostatic switch
7 Level sensor
8 hp-Pump control
9 Filling port
10 Air discharge port
12 Operating tank
13 Oil bath chamber
14 hp-Internal gear pump with standard electric motor
15 hp-Overflow valve
16 Pressure gauge
17 min. pressure switch
18 Nonreturn valve
19 Ball valve
20 Oil distributor
21 Working backlash of pressure switch
22 Membrane pressure accumulator
24 Oil pan
25 Leakage detector

Accessories:

26 Additional spill protection to VbF and WHG

Combination:
Single-pipe oil supply with the suction unit part of the suction-pressure pump aggregate and **Two-pipe** oil supply of oil burners in continuous operation with bypass to suction-pressure pump aggregate

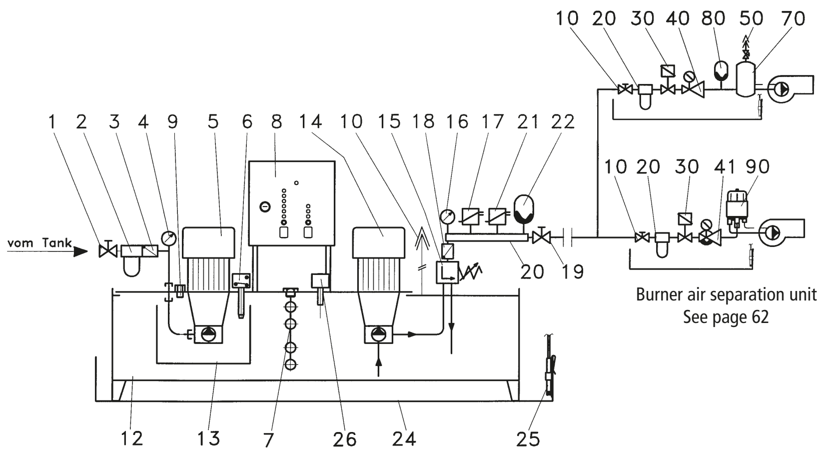


Scope of supply:

30 Ball valve
31 Filter
32 Solenoid valve
33 Pressure regulator
34 Vessel
35 Pressure gauge
36 Automatic air vent
37 hp-Overflow valve
38 Oil pan
39 Leakage detector

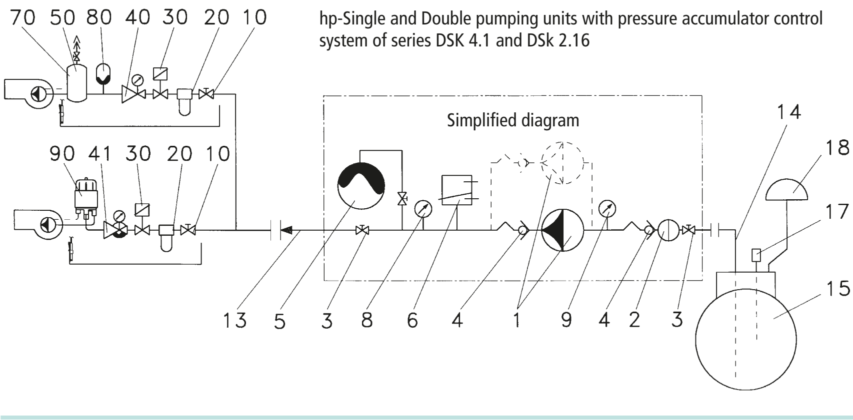
hp-Single suction and pressure pump unit

with self-activating pressure accumulator control system
without bypass to the operating tank



Heating oil supply schemes 12.7

Single-pipe oil supply of oil burners with independently controlling hp feeder units
To DIN/EN 12514 without bypass to the tank



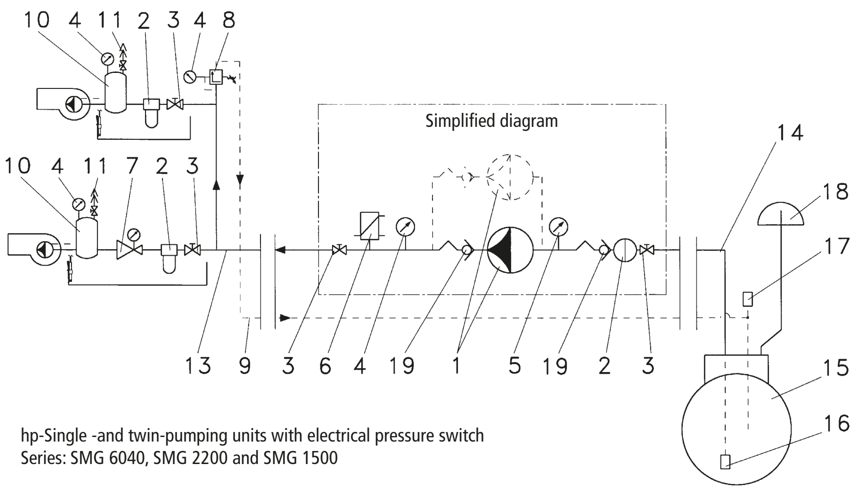
hp-Single and Double pumping units with pressure accumulator control system of series DSK 4.1 and DSk 2.16

Scope of supply:

1 hp-Pump with overflow valve
2 Filter
3 Ball valve
4 Nonreturn valve
5 Membrane pressure accumulator
6 Pressure switch or pressure transmitter
8 Pressure gauge
9 Vacuum gauge
13 Pressure pipe
14 Suction pipe
15 Tank
17 Filling port
18 Air discharge port

Two-pipe oil supply of oil burners with hp-Feed pump aggregate to DIN/EN 12514 and DIN 4755, part 2 without overflow valve (item 8) and bypass to tank (item 9)

For single pipe system, there is no overflow valve (item 8) and bypass line to the tank (item 9)
For single pipe system, the electrical control must be designed for intermittent operation. The single pipe pressure is maintained by the adjustable overflow valve integrated into the pump.



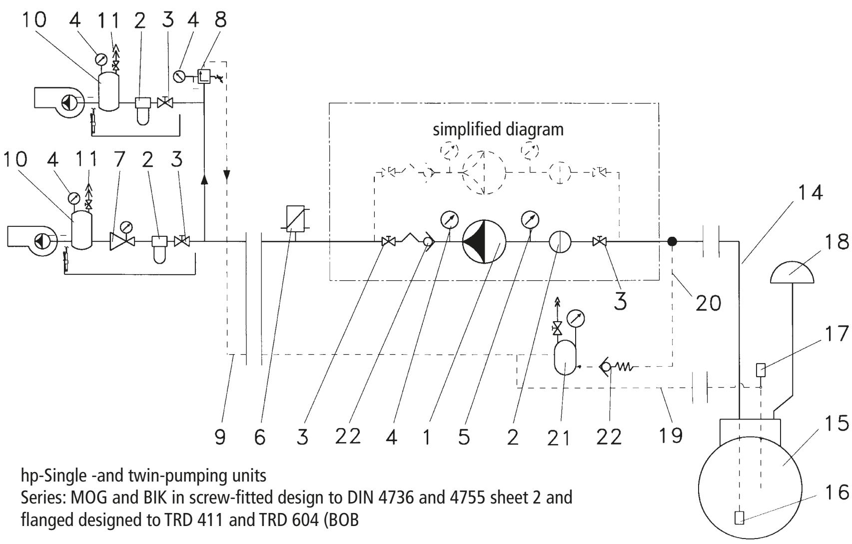
hp-Single -and twin-pumping units with electrical pressure switch
Series: SMG 6040, SMG 2200 and SMG 1500

Scope of supply:

1 hp-Pump with overflow valve
2 Filter
3 Ball valve
4 Pressure gauge
5 Vacuum gauge
6 Pressure switch
7 Pressure-regulator with upstream solenoid valve
8 hp-Overflow valve
9 Bypass lines
10 Vessel
11 Automatic float air vent for single pipe system
13 Pressure pipe
14 Suction pipe
15 Tank
16 Foot valve
17 Filling port
18 Air discharge port
19 Nonreturn valve

Two-pipe oil supply of oil burners with hp-Feed pump aggregate to DIN/EN 12514 and DIN 4755, part 2 without overflow valve (item 8) and bypass to tank (item 9)

For single pipe system, there is no overflow valve (item 8) and bypass line to the tank (item 9)
For single pipe system, the electrical control must be designed for intermittent operation. The single pipe pressure is maintained by the adjustable overflow valve integrated into the pump.



hp-Single -and twin-pumping units
Series: MOG and BIK in screw-fitted design to DIN 4736 and 4755 sheet 2 and flanged designed to TRD 411 and TRD 604 (BOB

Scope of supply:

1 hp-Pump with overflow valve
2 Filter
3 Ball valve
4 Pressure gauge
5 Vacuum gauge
6 Pressure switch at place of installation or "S" accessories
7 Pressure-regulator with upstream Solenoid valve
8 hp-Overflow valve
9 Bypass line
10 Vessel
11 Air vent
12 Pressure pipe
14 Suction pipe
15 Tank
16 Foot valve
17 Filling port
18 Air vent
19 Bypass line to tank only for over-ground bypass line and tank
20 Alternative connection of the bypass line to the suction line for earthing line and earthing tank
In this case there is no Bypass line adapter 19
21 Degassing vessel with ventilation e.g. by automatic float air vent
22 Nonreturn valve, Pre-tension 1 bar