

# Hydraulic pumps and hydraulic power packs type Z (gear pumps)

Operating pressure  $p_{\max}$  = 210 bar  
Delivery flow  $Q_{\max}$  = 135 lpm (1450 rpm)  
Geom. displacement  $V_g \max$  = 87.8 cm<sup>3</sup>/rev.

Additional pumps and hydraulic power packs

- Radial piston pumps type R D 6010 ++
- Dual stage pumps type RZ D 6910 ++
- Compact hydraulic power packs type MP D 7200 ++
- Compact hydraulic power packs type HK D 7600 ++
- Compact hydraulic power packs type HC D 7900 ++

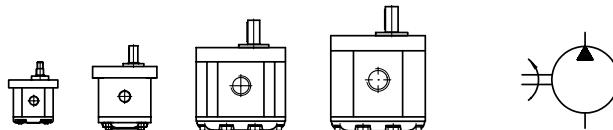
## 1. General information

Hydraulic pumps apply the displacement principle for converting mechanical into hydrostatic energy (DIN ISO 1219-1). The pumps described in this pamphlet are constant delivery pumps, available with or without accessory individually or as power packs.

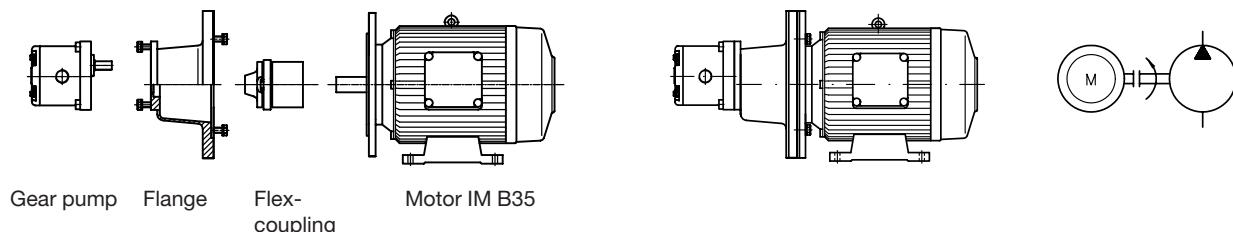
These pumps serve generally to supply compressed fluid to hydraulic consumers in hydraulic systems. The maximum permissible drive power is 22 kW, depending on size.

The following versions are available:

- **Hydraulic pumps** (individual pumps), see sect. 2.1

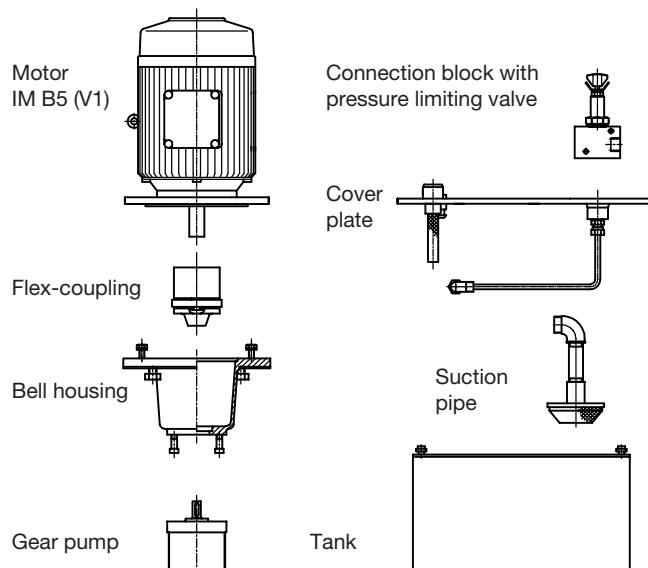


- **Pumps complete with motor** to be mounted outside a tank, see sect. 2.2

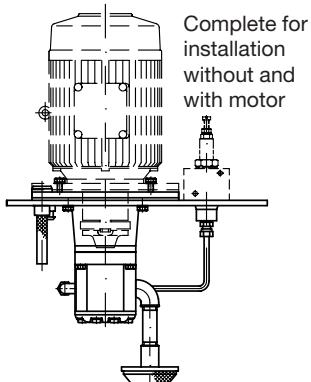


- **Hydraulic power pack**, see sect. 2.3

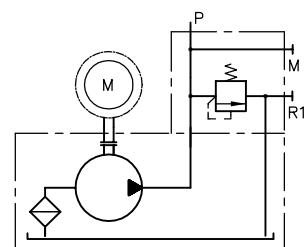
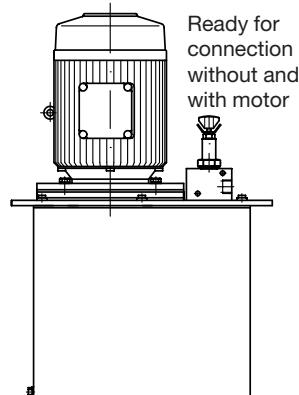
for installation in tanks



Cover plate version



Version with tank



## 2. Available versions, main data

Order examples:

**Z 16**

Individual pump (see sect. 2.1)

**Z 16 - W 5,5**

Pump complete with motor (see sect. 2.2)

**Z 16/B 20 - V 5,5 - A/110** 3 ~ 400 V 50 Hz

Hydraulic power pack (see sect. 2.3)

Attention: Pay attention to the direction of rotation (see sect. 3)!

### 2.1 Individual pumps

Table 1: Basic pump

Size	Coding	V <sub>g</sub> geometric displacement (cm <sup>3</sup> /rev)	Delivery flow Q <sub>max</sub> (l/min)	Pressure p <sub>perm</sub> (bar) <sup>1)</sup>	Power rating (industrial standard motor) kW		Mass (kg)
					min.	max.	
05	<b>Z 0,5</b>	0.36	0.5	140	0.25	0.25	0.4
	<b>Z 1,0</b>	0.72	1.0	140	0.25	0.55	0.4
	<b>Z 1,8</b>	1.3	1.9	140	0.25	0.55	0.45
1	<b>Z 2,0</b>	1.5	2.2	200	0.25	1.1	1.5
	<b>Z 2,7</b>	2.0	2.9	200	0.25	1.5	1.5
	<b>Z 3,5</b>	2.5	3.6	200	0.25	1.5	1.5
	<b>Z 4,5</b>	3.1	4.5	200	0.25	2.2	1.5
	<b>Z 5,2</b>	4.0	5.8	190	0.25	2.2	1.6
	<b>Z 6,9</b>	4.9	7.1	190	0.25	3	1.7
	<b>Z 8,8</b>	6.2	9.0	180	0.25	4	1.7
	<b>Z 9,8</b>	6.5	9.4	180	0.25	4	1.7
	<b>Z 11,3</b>	7.9	11.5	140	0.55	4	1.8
	<b>Z 14,4</b>	9.9	14.4	110	0.55	4	1.9
2	<b>Z 6,5</b>	4.5	6.5	210	0.25	3	2.4
	<b>Z 9,0</b>	6.0	8.7	210	0.25	4	2.4
	<b>Z 12,3</b>	8.5	12.3	210	0.55	5.5	2.4
	<b>Z 16</b>	11	16.0	210	0.55	7.5	2.4
	<b>Z 21</b>	14.5	21.0	200	0.75	9	2.8
	<b>Z 24</b>	17.0	24.7	200	0.75	9	2.8
	<b>Z 28</b>	19.5	28.2	170	1.1	9	2.8
3	<b>Z 37</b>	26.0	37.6	130	1.1	9	3.1
	<b>Z 45</b>	30.2	43.8	200	1.5	18.5	6.2
	<b>Z 59</b>	41.8	60.6	170	2.2	22	7.2
	<b>Z 75</b>	50.4	73.1	170	3	22	7.2
	<b>Z 87</b>	61.0	88.4	145	4	22	7.6
	<b>Z 110</b>	72	104.4	120	4	22	8.0
	<b>Z 135</b>	87.8	127.3	100	5.5	22	8.2

1) The specified pressure rating applies to permanent operation. Perm. peak pressure rating is about 1.3 x p<sub>perm</sub>. (<10% ED).

### 2.2 Pump completes with motor to the mounting outside of a tank

Order examples:

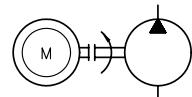
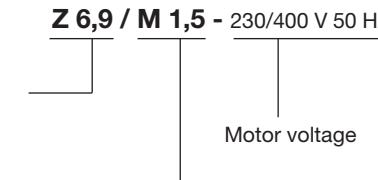
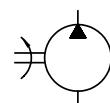
**Z 28 / W 4****Z 6,9 / M 1,5 - 230/400 V 50 Hz**Basic pump acc. to table 1,  
sect. 2.1Pump complete with motor,  
ready for connection

Table 2: Selection table

<b>W</b>	Pump ready for installation for connection of a customer furnished industrial standard motor design IM B35						
<b>M</b>	Pump ready for installation complete with industrial standard motor design IM B35						
Power rating (kW) <sup>2)</sup>	0,25 0,37	0,55 0,75	1,1 1,5	2,2 3 4	5,5 7,5 (9) <sup>3)</sup>	11 15	18,5 22
Available as combination with size (see sect. 2.1)	1	●	●	●			
	2	●	●	●	●		
	3				●	●	●

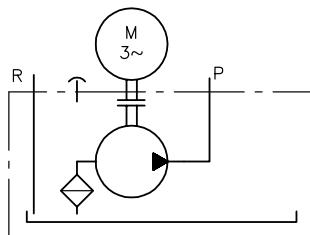
Pump ready for installation  
for connection of a customer  
furnished industrial standard

2) Calculation of the power demand, see sect. 3

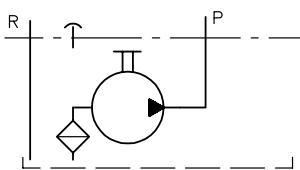
3) Power ratings of motors are not standardized. Motor dimensions usually comply with industrial standard 132M

## 2.3 Hydraulic power packs

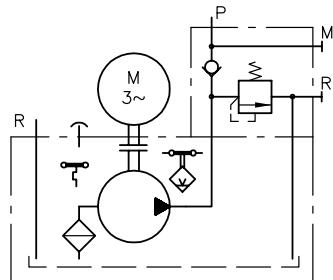
Symbols for the order examples given in sect. 2.3.1 and 2.3.2



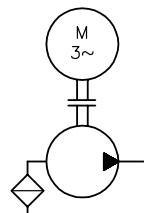
Version with tank like  
example 2 in sect. 2.3.1



Cover plate version like  
example 3 in sect. 2.3.1



Tank and cover plate ver-  
sions with pressure limiting  
valve  
Example 2 in sect. 2.3.1 and  
2.3.2



Motor/pump combi-  
nations for installation  
in customer furnished  
tanks.  
Example 1 in sect. 2.3.1

### 2.3.1 Tank and cover plate version

For listing of the usually utilized bell housings, flex-couplings, and suction pipes, see sect. 5 ++

Order examples 1:

**Z 16 - V 3 - 230/400 V 50 Hz**

Order examples 2:

**Z 6,9 / B 6 DT - V 1,5 - E/110 - 230/400 V 50 Hz**

Order examples 3:

**Z 28 / D 40 - Z 5,5**

Basic pump acc. to table 1  
see sect. 2.1



Connection blocks (optional),  
see sect. 2.3.2

Table 3 a: Tank, cover plate and drive

Optional equipment, table 3 b

		<b>Z ..</b>	Power pack ready for connection of a customer furnished industrial standard motor design IM V1 (IM B5)									
		<b>V ..</b>	Power pack complete with industrial standard motor design IM V1									
Version with tank	Cover plate version	Avail. as comb. with pump	Power rating (kW) <sup>1)</sup>								Mass (weight) (kg) <sup>3)</sup>	Filling volume <sup>4)</sup> approx. (l)
			0.25 0.37	0.55 0.75	1,1 1,5	2.2 3 4	5.5 7.5 (9) <sup>2)</sup>	11 15	18.5 22			
<b>B 6</b>	7.0 6.5	<b>D 6</b>	Z 2,0 ... Z 11,3 Z 6,5 ... Z 16	● ●	● ●	● ●					6.7 7.7	8.2 ... 8.8
<b>B 13</b>	13 12	<b>D 20</b>	Z 2,0 ... Z 11,3 Z 6,5 ... Z 16	● ●	● ●	● ●	● ●				10.9 11.9	18 ... 18.5
<b>B 20</b>	21.5 21	<b>D 20</b>	Z 2,0 ... Z 11,3 Z 6,5 ... Z 16	● ●	● ●	● ●	● ●				12.3 13.3	24 ... 24.5
<b>B 30 a.</b> <b>B 40</b>	32 a. 46.5 31 a. 45	<b>D 40</b>	Z 2,0 ... Z 14,4 Z 6,5 ... Z 28	● ●	● ●	● ●	● ●				16.5 (18.5) 17.5 (19.5)	34.5 ... 36 48 ... 50
<b>B 50</b>	75 70	<b>D 50</b> <b>DZ 50</b>	Z 6,5 ... Z 28 Z 45 ... Z 59				● ●	● ●	● ●		32 33	92
<b>B 75</b>	96 88	<b>D 50</b> <b>DZ 50</b>	Z 6,5 ... Z 37 Z 45 ... Z 59				● ●	● ●	● ●		34.5 35.5	88 ... 111
<b>B 100</b>	119 108	<b>D 100</b> <b>D 100</b> <b>DZ 100</b>	Z 6,5 ... Z 37 Z 45 ... Z 59 Z 75 ... Z 135				● ● ●	● ● ●	● ● ●	● ● ●	54 55 55.5	150 ... 152
<b>B 160</b>	165 148	<b>D 100</b> <b>D 100</b> <b>DZ 100</b>	Z 6,5 ... Z 37 Z 45 ... Z 59 Z 75 ... Z 135				● ● ●	● ● ●	● ● ●	● ● ●	60.5 61.5 62	190 ... 192
<b>B 250</b>	240	<b>D 250</b> <b>DZ 250</b>	Z 45 ... Z 59 Z 75 ... Z 135				● ●	● ●	● ●	● ●	106 107	310 ... 334
<b>B 400</b>	400	<b>D 250</b> <b>DZ 250</b>	Z 45 ... Z 59 Z 75 ... Z 135				● ●	● ●	● ●	● ●	130 131	475 ... 487

Table 3 b: Optional equipment (For additional versions and order examples, see sect. 4.3.7)

Coding	Version	Symbol
<b>K</b>	Fluid level gauge	
<b>T</b>	Temperature switch	-○- θ
<b>D</b>	Float switch	-○- V

<sup>1)</sup> For calculation of the power demand, see sect. 3

<sup>2)</sup> Power ratings of motors are not standardized. Motor dimensions usually comply with industrial standard 132M

<sup>3)</sup> Mass without electric motor (see sect. 5.1) and without optionally directly mounted connection block (see sect. 2.3.2)

<sup>4)</sup> Filling volume slightly varies dep. on pump size and power rating (size of the utilized bell housing). The specified filling volumes are to be regarded only as a guide line.

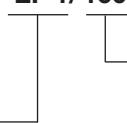
### 2.3.2 Connection blocks

The connection blocks are mounted directly on the cover plate of the power pack. A pressure limiting valve is always integrated whereas return filters are an option. It is possible to go on with directly mounted valve banks.

**Attention:** This is not available with cover plates coding DZ 50, DZ 100, and DZ 250. The pressure limiting valve has to be installed externally with these cover plates.

Order example 1: Z 28 / B 75 - V 7,5 - **A / 130** - 3 ~ 400 V 50 Hz

Order example 2: Z 6,9 / B 20 - V 2,2 - **EF 1/160** - 3 ~ 230/400 V 50 Hz



Pressure setting.

Take care that the perm. pressure of the respective pump is not exceeded!

Table 4: Connection blocks

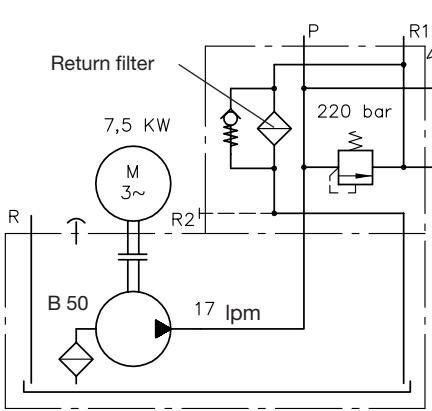
Suited for tank or cover plate versions	Max. pressure setting $p_{max}$ (bar)	Version				Return filter cartridge (MANN micro-Top) Filter material is soaked paper	Mass (weight) approx. (kg)	
		Tool adjustable	Manually adjustable	Tool adjustable	Manually adjustable			
B 6 ... B 40 D 6 ... D 40	315 (corr. to pump and drive power)	A / ...	B / ...	E / ...	F / ...	---	---	1.2
		AF 0/..	BF 0/..	EF 0/..	FF 0/..	W 77/2	7	637
		AF 1/...	BF 1/...	EF 1/...	FF 1/...	HAWE 6905 117F1	15	1230
		AF 2/...	BF 2/...	EF 2/...	FF 2/...	HAWE 6905 117F2	21	1900
		AF 3/...	BF 3/...	EF 3/...	FF 3/...	HAWE 6905 117F3	32	3190
		A/...	B/...	X		---	---	2
		AF 4/...	BF 4/...	X		WD 940/2	32	3190
		AF 5/...	BF 5/...	X		WD 962	52	5110
B 50 ... B 400 D 50 ... D 250		X				12 µm nom. 50% / 30 µm abs.		

### Utilized pressure limiting valves and avail. pressure range

Tank, cover plate	Connection block	Pressure limiting valve	Pressure range (bar)	Tank, cover plate	Connection block	Pressure limiting valve	Pressure range (bar)
B 6 ... B 40 D 6 ... D 40	A/..., B/..., E/..., F/..	MVE 5 C (R) MVE 5 E (R) MVE 5 F (R)	160 ... 315 80 ... 160 (0) ... 80	B 50 ... B 75 D 50	A/.., B/..	SVP 6 C (R) SVP 6 E (R) SVP 6 F (R)	160 ... 315 80 ... 160 (0) ... 80
	AF 0(1,2,3)/.. to FF 0(1,2,3)/..	MVF 5 C (R) MVF 5 E (R) MVF 5 F (R)	160 ... 315 80 ... 160 (0) ... 80			SVP(R) 30 A SVP(R) 34 B SVP(R) 34 D	200 ... 300 150 ... 200 (0) ... 150
					A/.., B/..	SVP(R) 34 D	see D 7722
					AF 4(5)/..., BF 4(5)/..	MVF 6 C (R) MVF 6 E (R) MVF 6 F (R)	160 ... 315 80 ... 160 (0) ... 80
				B 50 ... B 400 D 50 ... D 250		see D 7000 E/1	

### Directional valve banks to be mounted directly

Symbol acc. to example  
Z 16/B50 V7,5 - AF 5/220

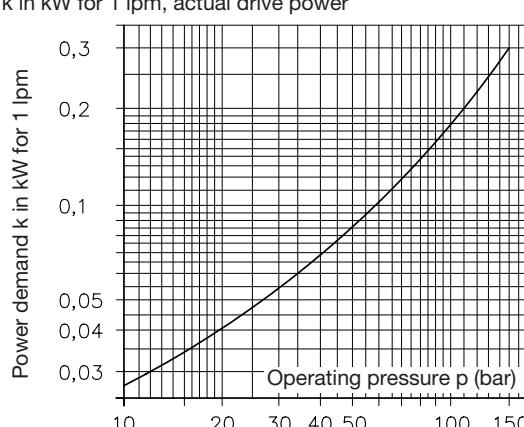


A/.., AF 0(1, 2, 3) /.. (B 6 ... B 40)	SKP(H) 06 and 16	acc. to D 7230
B/.., BF 0(1, 2, 3) /..	BWN(H) 1C	acc. to D 7470 B/1
E/.., EF 0(1, 2, 3) /..	BWH 2(3) C	acc. to D 7470 B/1
F/.., FF 0(1, 2, 3) /..	VB 01(11, 21) C	acc. to D 7302
A/.., B/.. (B 50 ... B 75)	SKP(H) 27 and 37	acc. to D 7230
AF4(5)/.., BF4(5) (B 50 ... B 400)	SWR 1D	acc. to D 7450
A/.. (B 100 ... B 400)	BWH 2(3) D	acc. to D 7470 B/1
B/..	VB 11(21, 31) D	acc. to D 7302
A/.. (B 100 ... B 400)	SKP(H) 28 and 38	acc. to D 7230
B/..	VB 31E	acc. to D 7302

Two mounting screws and two tapped plugs (if P and R are not used otherwise) have to be ordered additionally, when it is intended to directly mount directional valve banks

Connection block, complete	AF 0 (1,2,3) /.. to FF 0 (1,2,3) /.. (dwg. 4000 640)	AF 4(5) /.. and BF 4(5) /.. (dwg. 6330 100 a..d)	
Skt.-head screw conf. ISO 4762	M 8x35-8.8-A2K	M 10x50-8.8-A2K	M 12x60-8.8-A2K
Tapped plug (BSPP)	G 1/2 acc. to dwg. 943 008	G 1/2 acc. to dwg. 943 008	G 3/4 acc. to dwg. 1980 010

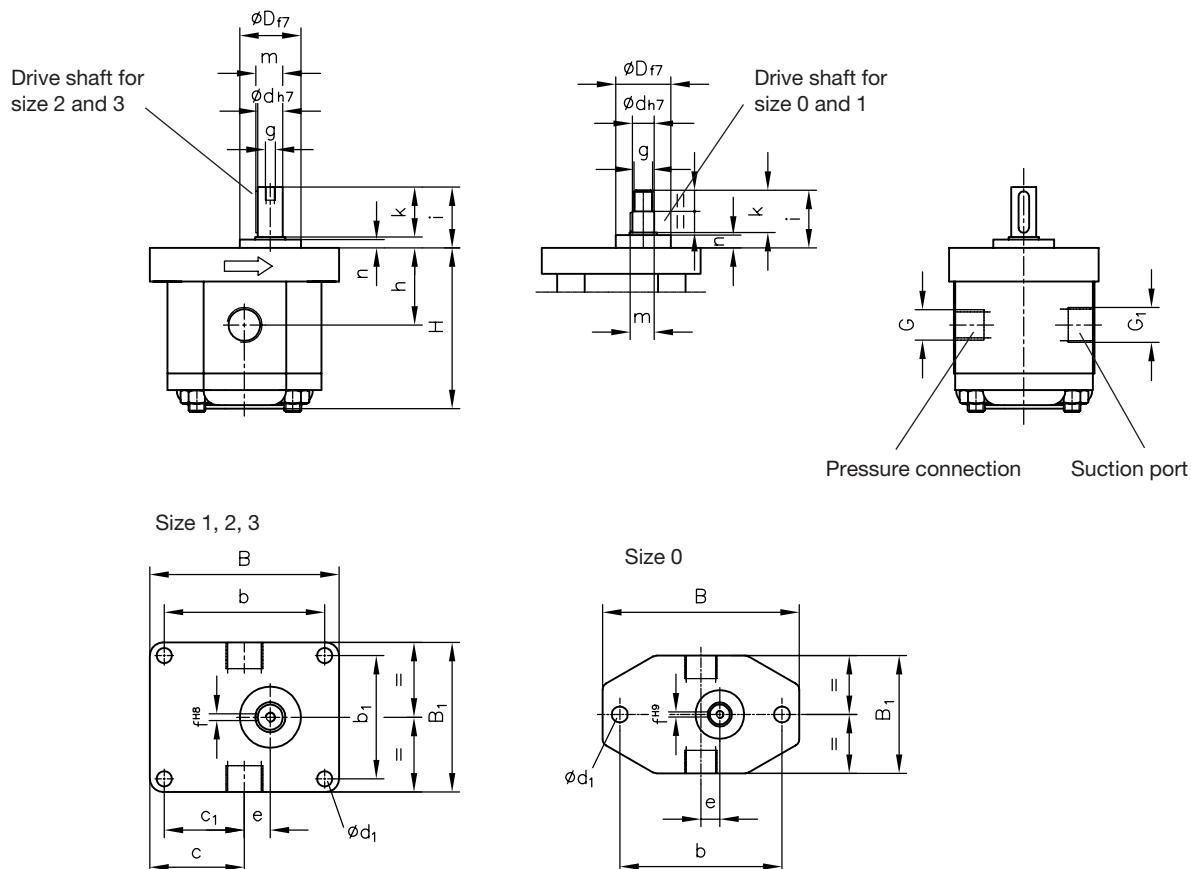
### 3. Further parameters

Design and nomenclature	Play compensated gear pump, constant delivery pump																							
Fastening	Hydraulic pump: Facial Pump complete with motor: At the motor brackets Hydraulic power pack: At the cover plate or at brackets at tank (dep. on size)																							
Pipe connection	Pipe thread ISO 228/1 (BSPP), see dimensional drawings in sect. 4.1																							
Drive	via electric motor																							
Direction of rotation	Counter clockwise when facing the pump shaft (for conversion of the rotation direction, see Z 6820 900)																							
Engine speed range	Z 0,5 ... Z 1,8 Z 2,0 ... Z 6,9 Z 8,8 ... Z 14,4	650 ... 3500 rpm 650 ... 3500 rpm 650 ... 3000 rpm	Z 6,5 ... Z 24 Z 28 ... Z 37 Z 45 ... Z 59 Z 75 Z 87 ... Z 135	650 ... 3500 rpm 650 ... 3000 rpm 650 ... 3000 rpm 650 ... 2500 rpm 650 ... 2000 rpm																				
Installed position	Hydraulic pump: Any Pump complete with motor: Horizontal Hydraulic power pack: Only with vertically up motor - design IM B5 (V1)																							
Operating pressure	Depending on delivery flow, see sect. 2.1																							
Surface	Cover plate and tank	B 6 (D6) ... B 40 (D 40) B 50 (D 50) ... B 400 (D250)	zinc galvanized coated with grey primer																					
Hydraulic fluid	Hydraulic oil acc. to DIN 51524 table 1 to 3, 10 ... 68 mm <sup>2</sup> /s at 40°C (ISO VG 10 to 68 conf. DIN 51 519) Viscosity range: min. approx. 10; max. approx. 800 mm <sup>2</sup> /s Optimal operation range: approx. 10...500 mm <sup>2</sup> /s Also suitable are biologically degradable pressure fluids type HEPG (Polyalkylenglycole) and HEES (synth. ester) at operation temperatures up to approx. +70°C.																							
Temperature	Ambient: approx. -40...+80°C; Fluid: -25...+80°C; Pay attention to the viscosity range! Start temperature down to -40°C are allowable (Pay attention to the viscosity range during start!), as long as the operation temperature during subsequent running is at least 20 (Kelvin) higher. Biologically degradable pressure fluids: Pay attention to manufacturer's information. With regard to the compatibility with sealing materials do not exceed +70°C.																							
Delivery flow	See delivery flow coding in sect. 2.1																							
Guideline depending on speed	Abbreviations: V <sub>g</sub> in cm <sup>3</sup> /rev      Delivery flow (acc. to table 1) n in rpm      Speed $\eta_{vol}$ ≈ 0,88 ... 0,92 volumetric efficiency																							
$Q_{pu} = V_g \cdot n \cdot \eta_{vol} \cdot 10^{-3}$ lpm	<b>Attention:</b> The efficiency is strongly depends on - operating pressure - speed																							
Power demand	Abbreviations: P <sub>kW</sub> = Required power at the pump drive shaft in kW p <sub>bar</sub> = Exploited pressure in bar (consumer pressure + back pressure) Q <sub>lpm</sub> = Delivery flow in lpm, at 1450 rpm (≈ flow coding in sect. 2.1) at other speed Q <sub>lpm</sub> = $\frac{V_g \cdot n \cdot \eta_T}{1000}$ $\eta_T$ = Total efficiency, average ≈ 0,8																							
Power demand	$P_{req\ kW} = k_{kW} \cdot Q_{lpm}$																							
	k in kW for 1 lpm, actual drive power																							
Running noise (guideline)	 <p>The graph plots Power demand k in kW for 1 lpm against Operating pressure p (bar). The x-axis ranges from 10 to 150 bar, and the y-axis ranges from 0,03 to 0,3 kW. A straight line starts at approximately (10, 0,03) and ends at approximately (150, 0,3).</p>																							
	There is no significant noise level difference between pumps complete with motor acc. to sect. 2.2 and hydraulic power packs acc. to sect. 2.3																							
	<table border="1"> <thead> <tr> <th>Size</th> <th>05</th> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>pressure less</td> <td>55 ... 60</td> <td>55 ... 63</td> <td>60 ... 66</td> <td>63 ... 70</td> </tr> <tr> <td>dB(A)</td> <td>63 ... 66</td> <td>66 ... 72</td> <td>72 ... 74</td> <td>73 ... 76</td> </tr> <tr> <td>p<sub>max</sub></td> <td>65 ... 68</td> <td>70 ... 75</td> <td>73 ... 76</td> <td>75 ... 78</td> </tr> </tbody> </table>				Size	05	1	2	3	pressure less	55 ... 60	55 ... 63	60 ... 66	63 ... 70	dB(A)	63 ... 66	66 ... 72	72 ... 74	73 ... 76	p <sub>max</sub>	65 ... 68	70 ... 75	73 ... 76	75 ... 78
Size	05	1	2	3																				
pressure less	55 ... 60	55 ... 63	60 ... 66	63 ... 70																				
dB(A)	63 ... 66	66 ... 72	72 ... 74	73 ... 76																				
p <sub>max</sub>	65 ... 68	70 ... 75	73 ... 76	75 ... 78																				

## 4. Dimensions

All dimensions in mm, subject to change without notice!

### 4.1 Hydraulic pumps



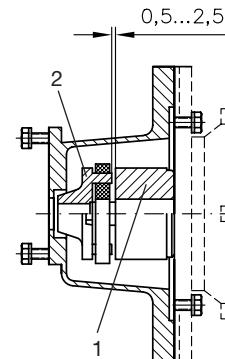
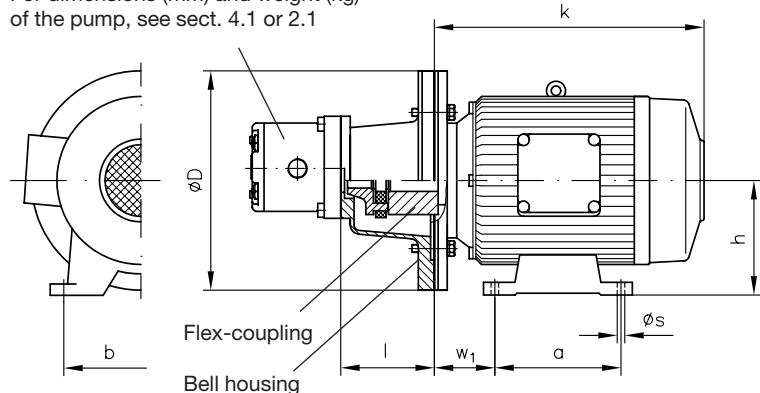
\*) (BSPP)

Size	Type	B	B <sub>1</sub>	b	b <sub>1</sub>	c	c <sub>1</sub>	$\phi D$	$\phi d$	$\phi d_1$	e	f	G	G <sub>1</sub>	g	H	h	i	k	m	n
05	Z 0,5	80	48	66	--	--	--	22	7	6.5	7.7	2	M10x1	M10x1	M 6	59.5	28	21	16	6.8	4
	Z 1,0															59.5	28				
	Z 1,8															64.5	30				
1	Z 2,0	89	72	73	56	44.5	37.5	30	12	7	11.3	3	G 3/8 *)	G 3/8 *)	M 10x1	67.3	32.4	31.5	23	13.2	7
	Z 2,7															68.9	33.2				
	Z 3,5															70.5	34				
	Z 4,5															72.5	35				
	Z 5,2															75.3	36.5				
	Z 6,9															78.5	38				
	Z 8,8															82.5	40				
	Z 9,8															82.5	40				
	Z 11,3															88	42.8				
	Z 14,4															94.5	46				
2	Z 6,5	113	89	96	71.5	56.5	48	36.5	15	9.2	15.5	4	G 1/2 *)	G 3/4 *)	M 6	93	36.5	30	16.2	5	
	Z 9															96	46				
	Z 12,3															100.7	48.2				
	Z 16															105.2	50.4				
	Z 21															111.6	53.6	36.5	30	16.2	5
	Z 24															116.1	55.9				
	Z 28															120	58				
	Z 37															132	64.3				
3	Z 45	150	120	128	98.4	75	64	50.8	20	10.8	21.7	5	G 3/4 *)	G 1 *)	M 8	137	67.5	46	40	21.6	5
	Z 59															145	71.5				
	Z 75															151	74.5				
	Z 87															159	78				
	Z 110															167	82				
	Z 135															178	87.5				

## 4.2 Pump completes with motor

**Dimensions** All dimensions in mm, subject to change without notice!

For dimensions (mm) and weight (kg) of the pump, see sect. 4.1 or 2.1



When the motor is mounted care has to be taken that there is a play of 0.5 to 2.5 mm between the flex-coupling sections mounted on the pump (2) and on the motor (1) to prevent any axial thrust on the bearings.

Drive power (kW)	Bell housing ext. -Ø D (mm)	Bell housing l (mm) when combined with size			Outline dimensions Industrial standard motor <sup>2)</sup>					
		1	2	3	h	a	b	Øs	w1	k <sup>2)</sup>
0.25 a. 0.37	160	94	103.5	--	71	90	112	7	45	190 ... 210
0.55 a. 0.75	200	99	108.5	--	80	125	9	50	50	215 ... 230
1.1 1.5	200	99	108.5	--	90	100 125	140	9(10)	56	240 ... 250 265 ... 270
2.2 3	250	--	107.5	150	100	140	160	12	63	280 ... 320
4	250	--	107.5	150	112	140	190	12	70	315 ... 320
5.5 7.5 and 9	300	--	144.5	150	132	140 178	216	12	89	330 ... 360 390 ... 400
11 15	350	--	--	178	160	210 254	254	14	108	500 ... 520 500 ... 550
18.5 22	350	--	--	178	180	241 254	279	14(15)	121	500 ... 550 550 ... 580

Mass (weight) approx. kg  
(guideline - dep. on the make of the motor)

Drive power (kW)	Bell housing and flex-coupling when combined with size	Motor 1)		
		1	2	3
0.25 a. 0.37	3.1	3.7	--	6 ... 7.3
0.55 a. 0.75	3.1	3.7	--	9 ... 10
1.1 1.5	3.0 3.0	3.5 3.5	--	12 ... 14 15
2.2 3	--	3.6 3.6	5.5 5.5	20 ... 21 23 ... 24
4	--	3.6	5.5	28 ... 35
5.5 7.5 and 9	--	6.3 6.3	6.5 6.5	45 ... 58 60 ... 80
11 15	--	--	8.5 8.5	80 ... 110 100 ... 145
18.5 22	--	--	8.5 8.5	115 ... 170 140 ... 185

<sup>1)</sup> Reference values for two makes. See the manufacturer's specifications.

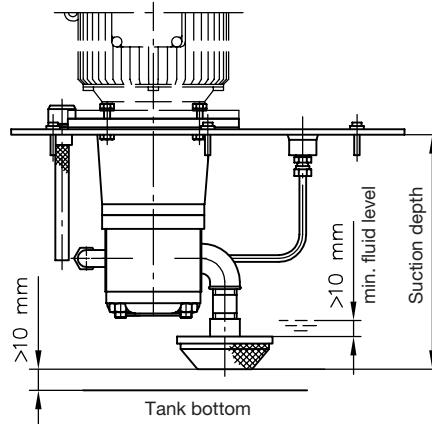
<sup>2)</sup> Not standardized, rough guideline for two makes. See the manufacturer's specifications.

### 4.3 Hydraulic power packs

The following illustrations supply all main outline dimensions to determine the spatial requirements at the place where these power packs are intended for use.

The suction depth with cover plate versions depends on the selected pump combination and suction parts. It is most important with cover plate versions that the intake strainer of the pump is located minimum 10 mm above the tank bottom.

For additional information, see sect. 5.1



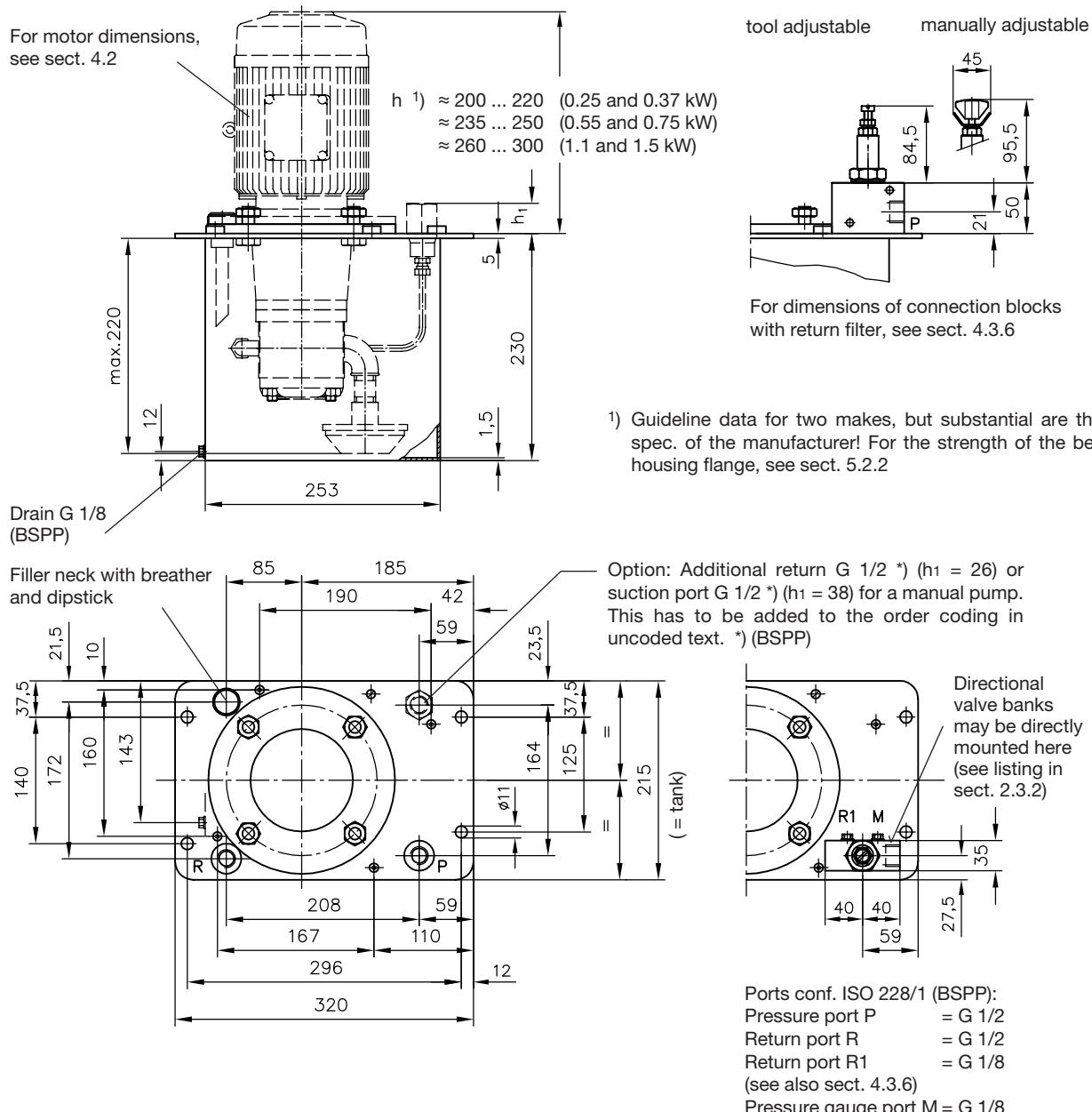
#### 4.3.1 Tank and cover plates type B 6 and D 6

For listing of the utilized bell housings, flex-couplings, and suction parts, see sect. 5.2

All surfaces zinc galvanized (tank and cover plate).

**Note:** Seals and mounting screws ISO 4762-M8x30-8.8-A2K for the tank are scope of delivery with cover plate version type D 6.

##### B 6 and D 6



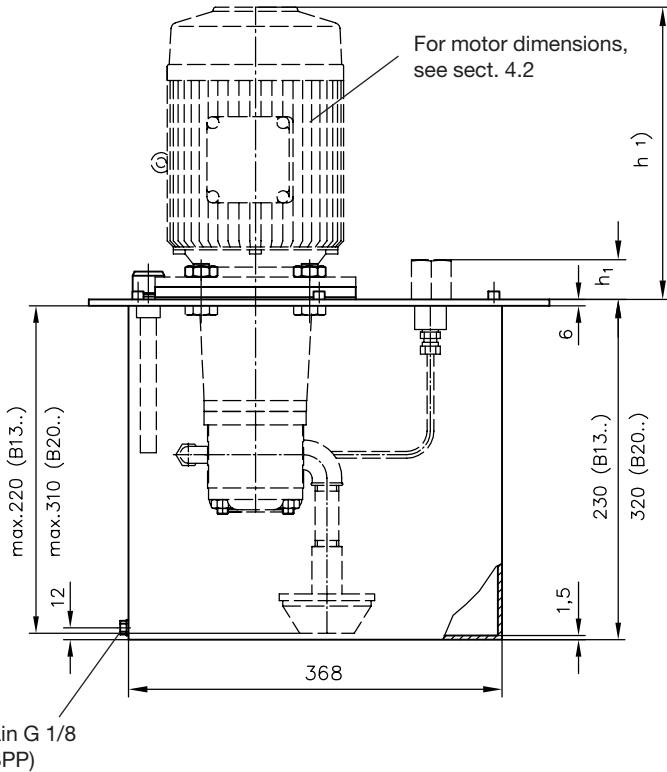
#### 4.3.2 Tank and cover plates type B 13, B 20, and D 20

For listing of the utilized bell housings, flex-couplings, and suction parts, see sect. 5.2

All surfaces zinc galvanized (tank and cover plate).

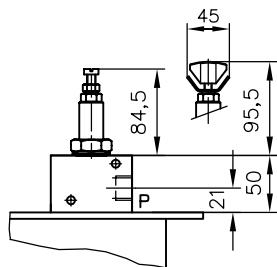
**Note:** Seals and mounting screws ISO 4762-M8x30-8.8-A2K for the tank are scope of delivery with cover plate version type D 20

**B 13 and B 20**  
**D 20**



Version with connection block and pressure limiting valve

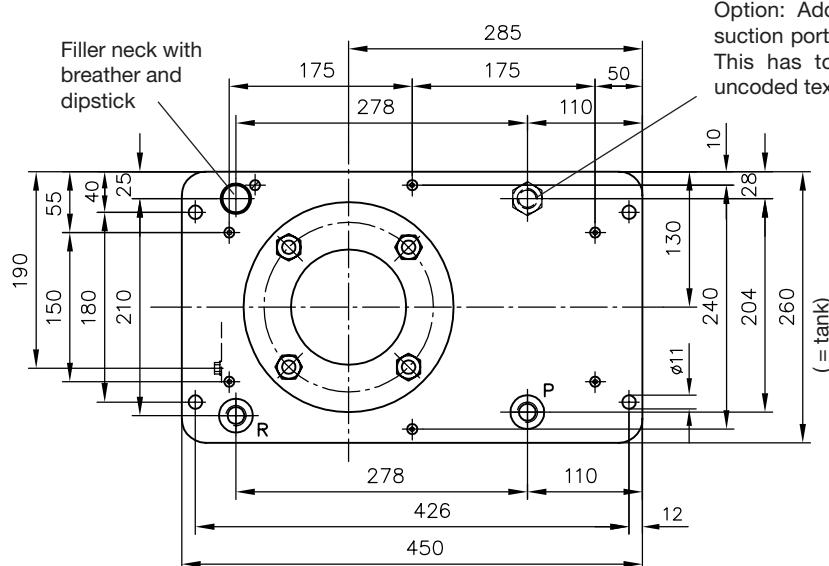
tool adjustable      manually adjustable



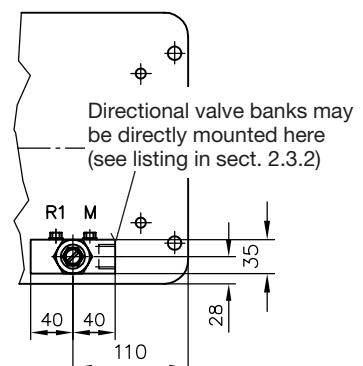
For dimensions of connection blocks with return filter, see sect. 4.3.6

- 1) ≈ 200 ... 220 (0.25 and 0.37 kW)
- ≈ 235 ... 250 (0.55 and 0.75 kW)
- ≈ 260 ... 300 (1.1 and 1.5 kW)
- ≈ 300 ... 340 (2.2 and 3 kW)
- ≈ 330 ... 350 (4 kW)

Guideline data for two makes, but substantial are the spec. of the manufacturer! For the strength of the bell housing flange, see sect. 5.2.2



Option: Additional return G 1/2 \* (h1 = 26) or suction port G 1/2 \* (h1 = 38) for a manual pump. This has to be added to the order coding in uncoded text. \*) (BSPP)



For dimensions of connection blocks with return filter, see sect. 4.3.6

Ports conf. ISO 228/1 (BSPP):

Pressure port P	= G 1/2
Return port R	= G 1/2
Return port R1	= G 1/8
(see also sect. 4.3.6)	
Pressure gauge port M	= G 1/8

### 4.3.3 Tank and cover plates type B 30, B 40, and D 40

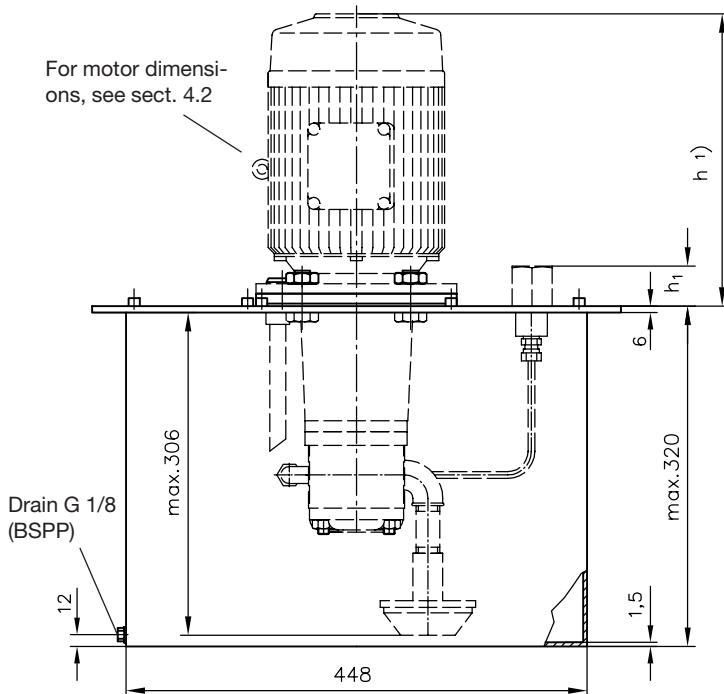
For listing of the utilized bell housings, flex-couplings, and suction parts, see sect. 5.2

All surfaces zinc galvanized (tank and cover plate).

**Note:** Seals and mounting screws ISO 4762-M8x30-8.8-A2K for the tank are scope of delivery with cover plate version type D 40

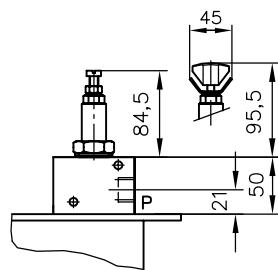
**B 30 and B 40**

**D 40**



Version with connection block and pressure limiting valve

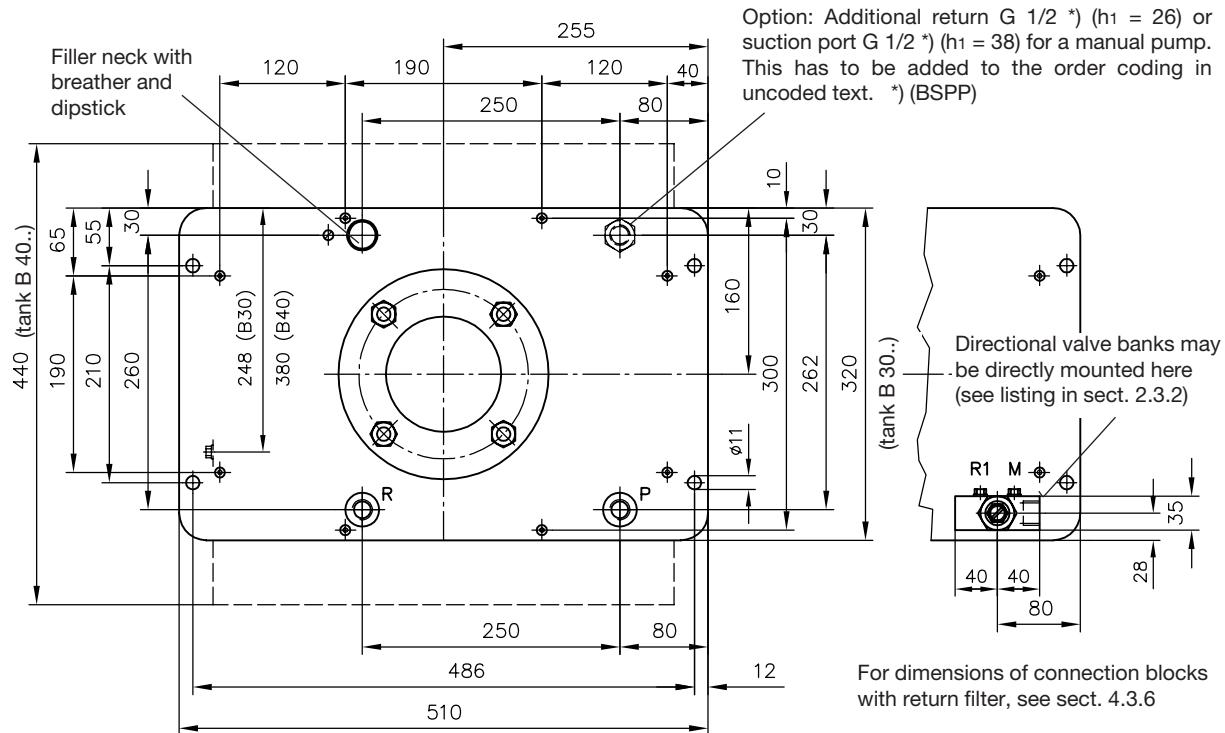
tool adjustable      manually adjustable



For dimensions of connection blocks with return filter, see sect. 4.3.6

- 1) ≈ 200 ... 220 (0.25 and 0.37 kW)
- ≈ 235 ... 250 (0.55 and 0.75 kW)
- ≈ 260 ... 300 (1.1 and 1.5 kW)
- ≈ 300 ... 340 (2.2 and 3 kW)
- ≈ 330 ... 350 (4 kW)

Guideline data for two makes, but substantial are the spec. of the manufacturer! For the strength of the bell housing flange, see sect. 5.2.2



Option: Additional return G 1/2 \* ( $h_1 = 26$ ) or suction port G 1/2 \* ( $h_1 = 38$ ) for a manual pump. This has to be added to the order coding in uncoded text. \*) (BSPP)

For dimensions of connection blocks with return filter, see sect. 4.3.6

Ports conf. ISO 228/1 (BSPP):

Pressure port P	= G 1/2
Return port R	= G 1/2
Return port R1	= G 1/8
(see also sect. 4.3.6)	
Pressure gauge port M	= G 1/8

#### **4.3.4 Tank and cover plates type B 50, B 75 and D 50, DZ 50**

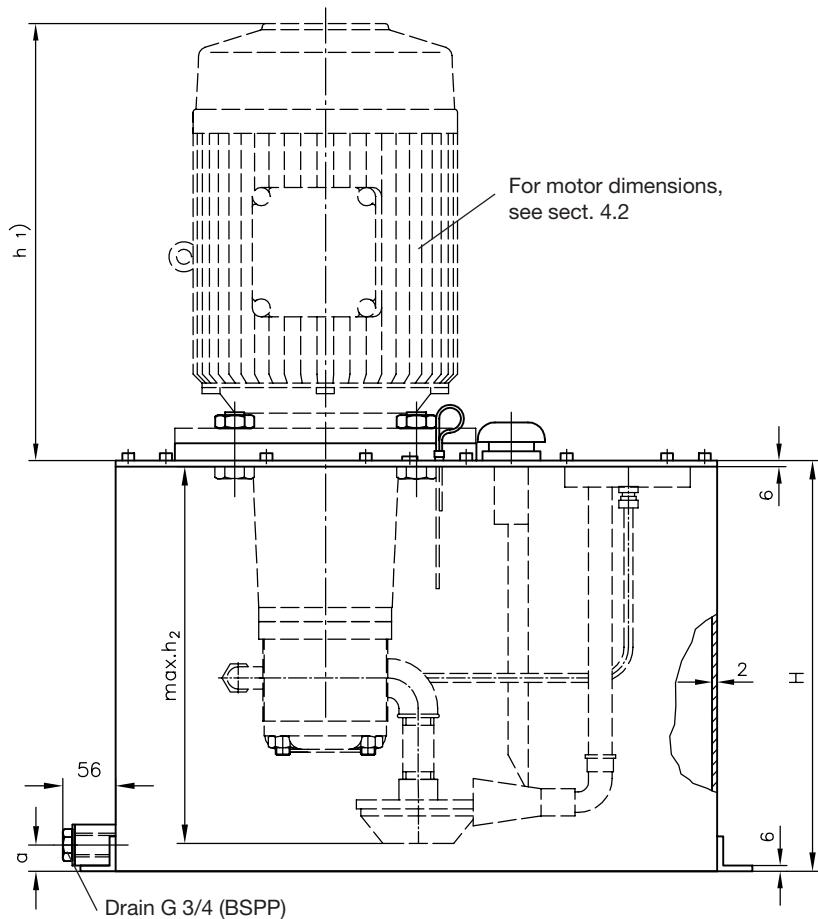
For listing of the utilized bell housings, flex-couplings, and suction parts, see sect. 5.2

All external surfaces (tank and cover plate) coated with grey primer.

**Note:** Seals and mounting screws ISO 4762-M8x30-8.8-A2K for the tank are scope of delivery with cover plate version type D 50

## B 50 and B 75

D 50 and DZ 50

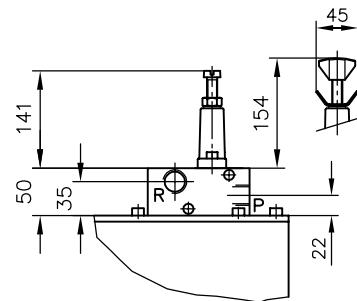


For motor dimensions,  
see sect. 4.2

For dimensions of connection blocks with return filter, see sect. 4.3.6

Version with connection block and pressure limiting valve

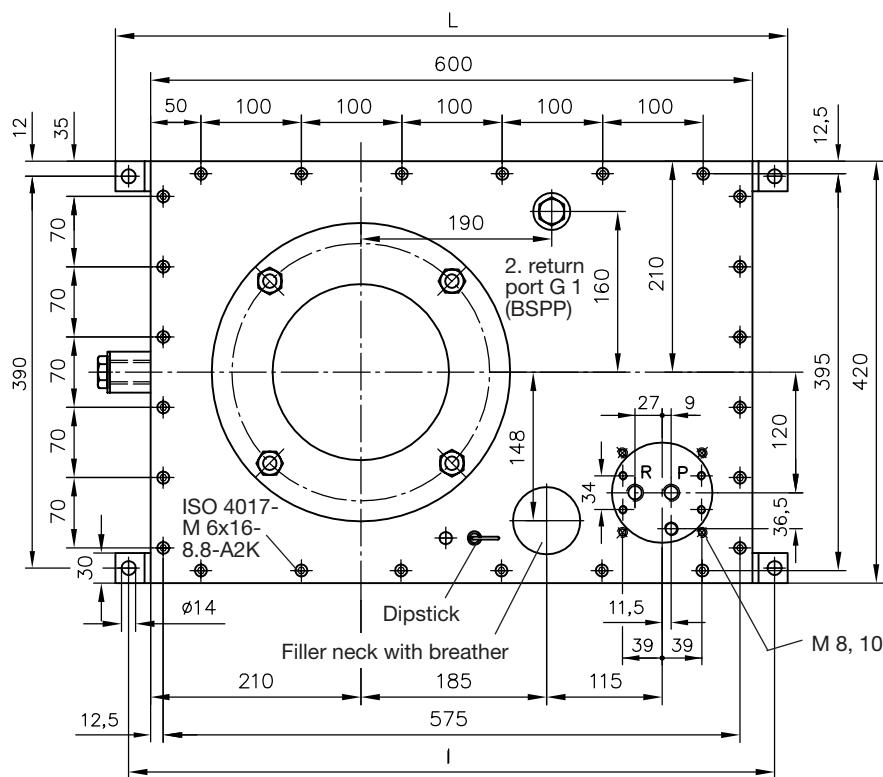
tool adjustable      manually adjustable



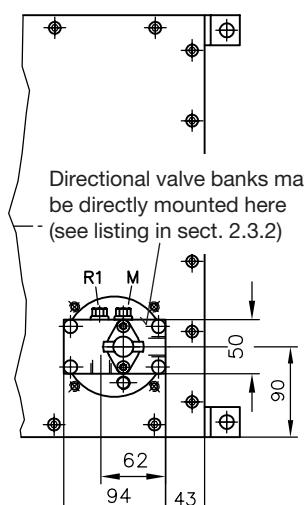
- 1)  $\approx$  200 ... 220 (0.25 and 0.37 kW)  
 $\approx$  235 ... 250 (0.55 and 0.75 kW)  
 $\approx$  260 ... 300 (1.1 and 1.5 kW)  
 $\approx$  300 ... 340 (2.2 and 3 kW)  
 $\approx$  330 ... 350 (4 kW)  
 $\approx$  410 ... 420 (5.5 to 9 kW)  
 $\approx$  520 ... 570 (11 and 15 kW)

Guideline data for two makes, but substantial are the spec. of the manufacturer! For the strength of the bell housing flange, see sect. 5.2.2

Type	H	$h_2$	L	I	a
B 50..	403	370	670	644	27
B 75..	478	450	660	630	26



Directional valve banks may be directly mounted here (see listing in sect. 2.3.2)



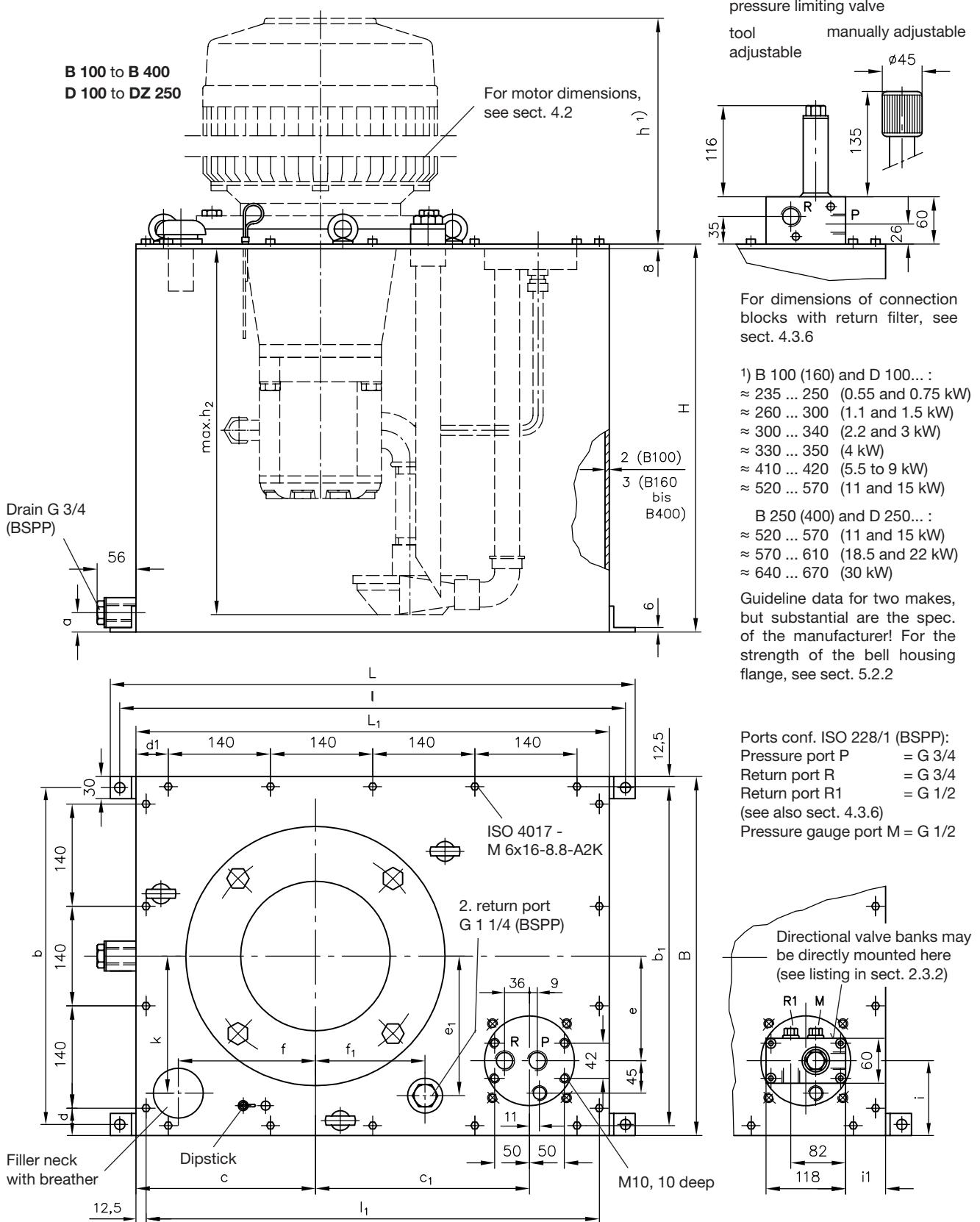
Ports conf. ISO 228/1 (BSPP):  
 Pressure port P = G 1/2  
 Return port R = G 1/2  
 Return port R1 = G 1/8  
 (see also sect. 4.3.6)  
 Pressure gauge port M = G 1/8

#### 4.3.5 Tank and cover plates type B 100 to B 400 or D 100 to DZ 250

For listing of the utilized bell housings, flex-couplings, and suction parts, see sect. 5.2

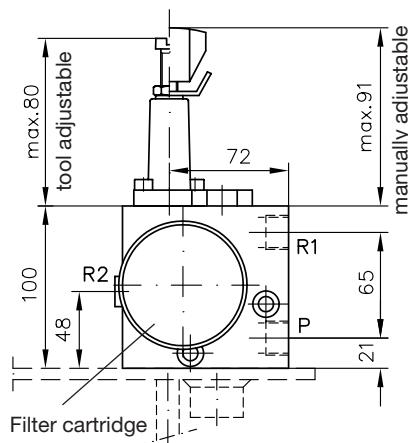
All external surfaces (tank and cover plate) coated with grey primer.

**Note:** Seals and mounting screws ISO 4017 ... -8.8-A2K for the tank are scope of delivery with cover plate version type (D 100 to DZ 250)

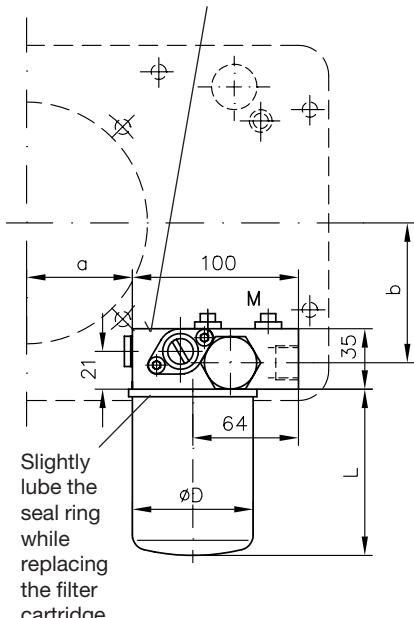


### 4.3.6 Unit dimensions for connection blocks and return filter

Connection blocks AF 0/.. to FF 3/..



Directional valve banks may be directly mounted here (see listing in sect. 2.3.2)

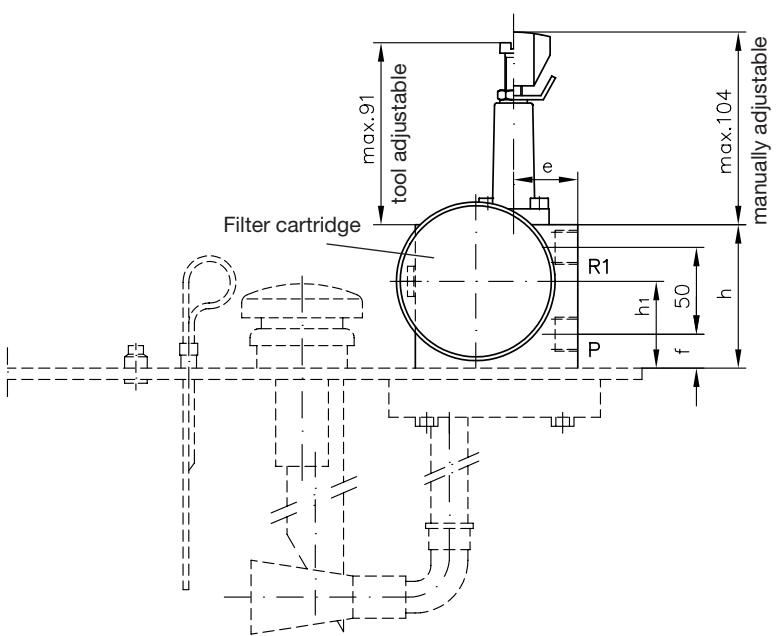


Tank and cover plate size	B 6 D 6	B 13, B 20 D 13, D 20	B 30, B 40 D 30, D 40
a	66	115	115
b	80	102	133

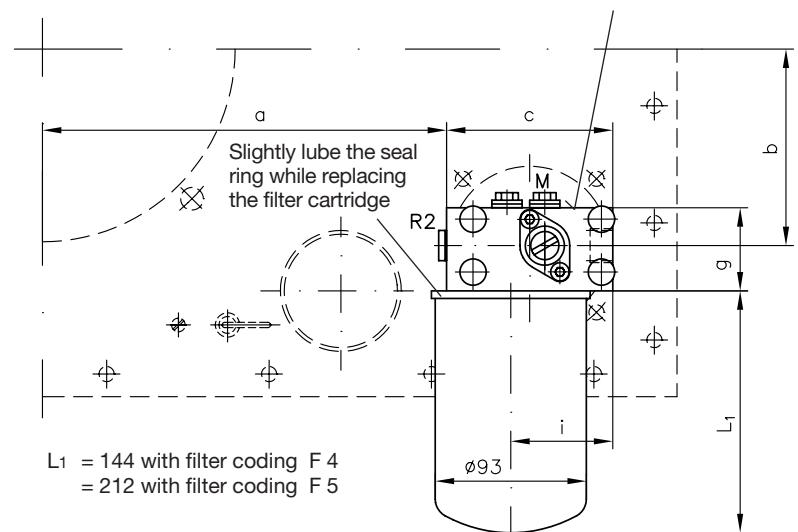
Filter coding	F 0	F 1	F 2	F 3
ØD	78	78	78	93
L	59	93	123	144

Ports conf. ISO 228/1 (BSPP):  
 Pressure port P = G 1/2  
 Return port R = G 1/2  
 Return port R1 = G 1/4  
 Pressure gauge port M = G 1/8

Connection blocks AF 4/.. to BF 5/..



Directional valve banks may be directly mounted here (see listing in sect. 2.3.2)



Tank and cover plate size	Ports ISO 228/1 (BSPP)											
	a	b	c	e	f	g	h	h1	i	P, R1	R2	M
B 50, B 75 D 50	247	120	100	38	22	50	90	54	64	G 1/2	G 1/4	G 1/4
B 100, B 160 D 100	236	154	118	50	26	63	100	56	71	G 3/4	G 1/4	G 1/2
B 250, B 400 D 250	406	165	118	50	26	63	100	56	71	G 3/4	G 1/4	G 1/2

#### 4.3.7 Optional equipment

##### Fluid level gauge

Order example:

Z 5,2 / B6 - K - V 0,55

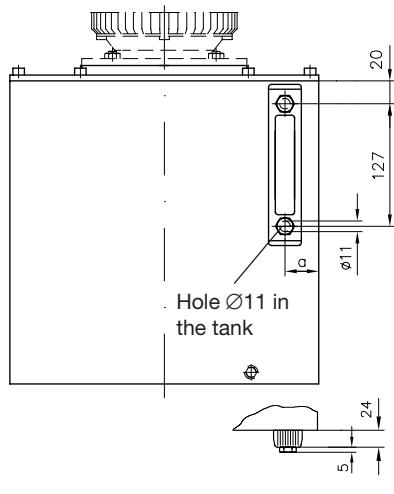
Basic pump acc. to sect.  
2.1 and 2.3

**K** = Standard

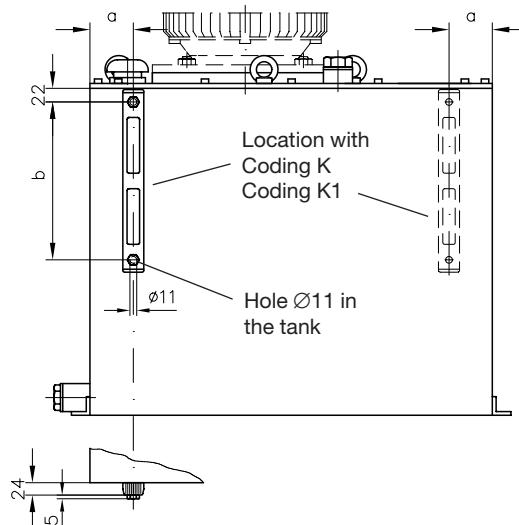
**K1** = Mounted at location 1  
(only with tank B50 to 400)

Tank size:

Type B 6 to B 40



Type B 50 to B 400



For spare part orders:

Fluid level gauge Co. STAUFF  
SNA 2 B/S/0/10 with B 6 to B 75  
SNA 3 B/S/0/10 with B 100 to B 400

Type	B 6	B 13 ... ... B 30	B 40	B 50	B 100	B 250
a	85	95	155	70	70	100
b	---	---	---	127	254	254

##### Temperature and float switches

Order example:

Version with temperature switch

Z 6,9 / B 13      **T 1** - V 0,55 - E/160 - 3 ~ 230/400 V 50 Hz

Version with float switch

Z 16 / B 50      **D** - V 7,5 - A/200 - 3 ~ 400 V 50 Hz

Version with temperature and float switch  
(any combination)

Z 5,2 / B 75      **D 2 T 3** - V 0,75 - A/110 - 3 ~ 230/400 V 50 Hz

Basic pump with tank acc.  
to sect. 2.1 and 2.3

Mounting position (see also dimensional drawings on page 15)

- No coding = Standard  
**1** = Location 1  
**2** = Location 2  
**3** = Location 3

**Table 5:** Optional equipment

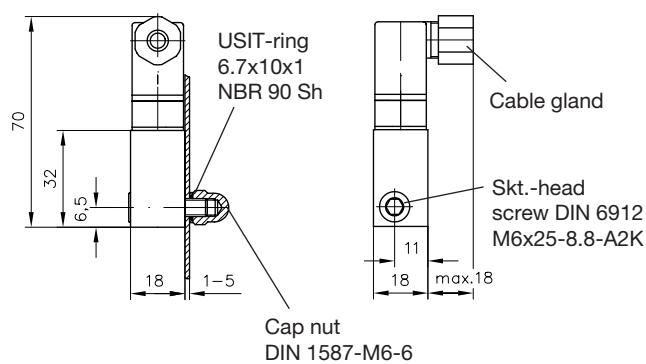
Coding	Qty.	Switch	Parameters
<b>T</b>	1	Temperature switch	Bimetallic switch, Co. MICROTERM T10V 80°C ± 5K U112 P102 L510
<b>D</b>	1	Float switch	Float switch made of PA Float made of NBR Function: NC-contact, when fluid level drops; power rating 230 V DC/AC 0.5 A 30 VA max. perm. temperature 90°C
<b>DD</b>	2		

For spare part orders: Temperature switch, part No. 7912 000

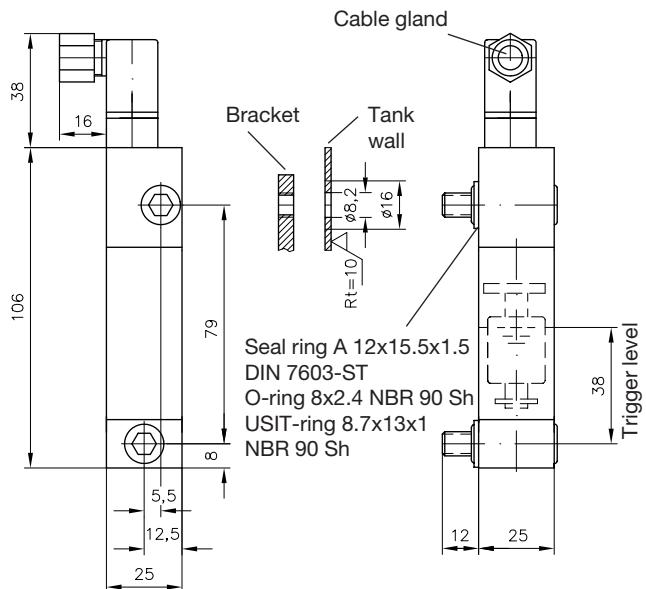
Float switch, part No. 7912 300

**Unit dimensions** All dimensions in mm, subject to change without notice!

#### Temperature switch

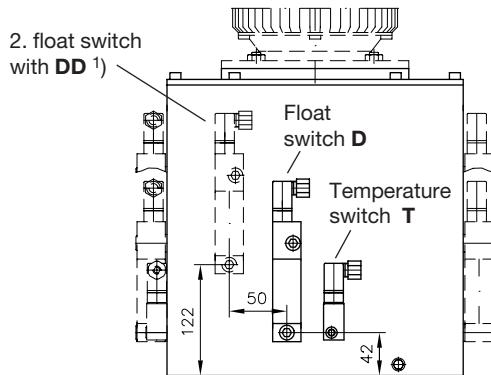


#### Float switch

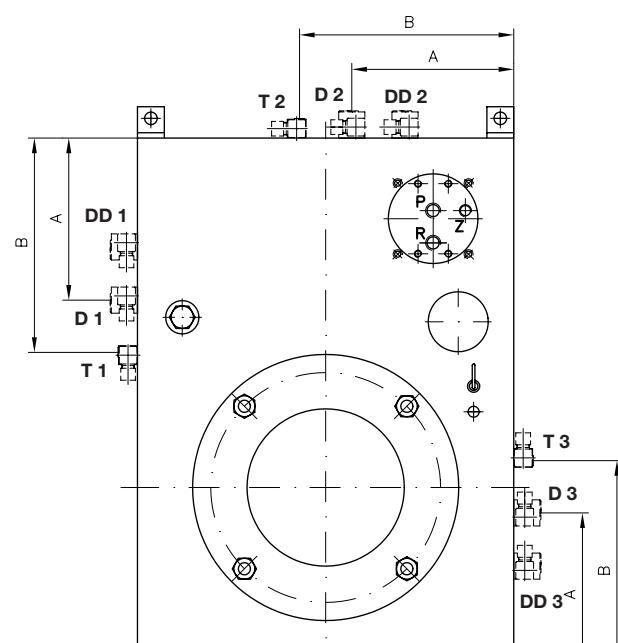
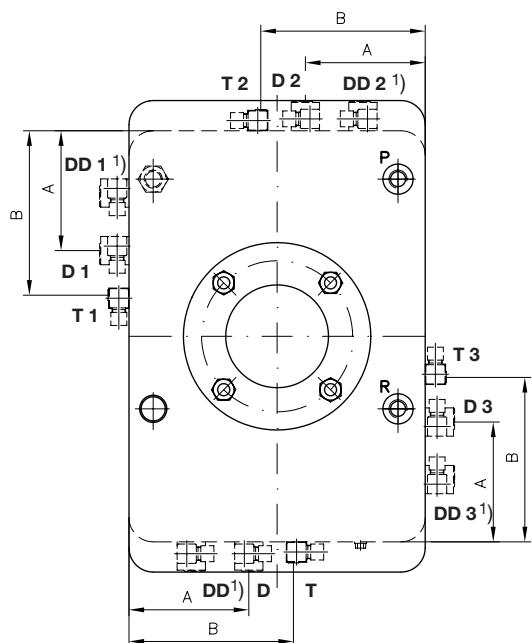
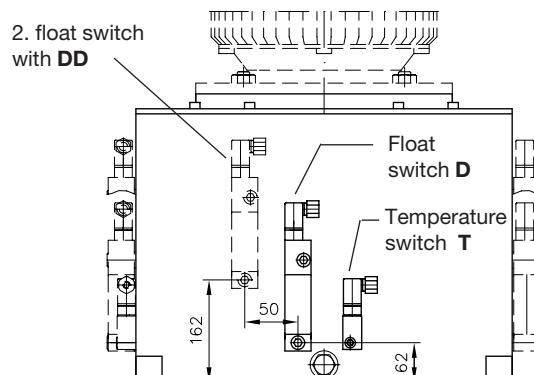


#### Mounting position

With type B6 to 40



With type B 50 ... B 400



	B 6	B 13	B 20	B 30	B 40	B 50	B 75	B 100	B 160	B 250	B 400
A	80	100	100	100	160	160	160	160	160	200	200
B	170	220	220	130	190	260	260	340	340	450	450

<sup>1)</sup> Float switch DD can be mounted only in position 1 (DD 1) or 3 (DD 3) at tanks B 6 and B 13

## 5. Appendix

### 5.1 Fluid level

The tank should be well-filled during start-up but not absolutely full so as to allow the fluid to expand while reaching operation temperature. This is particularly important with customer furnished tanks. The figures for the minimum distance ( $h_3$ ) between cover plate and fluid level (see table below) are to be understood as a guideline. This distance ( $h_3$ ) is roughly halved if the fluid temperature rises by approx. 50 K (Kelvin).

Tank	B 6	B 13	B 20 B 30 B 40	B 50	B 75	B 100	B 160	B 250	B 400
$h_3$ (mm)	10 - 15	15	15	20	20	30	30	40	40
$\Delta h$ (mm)	6	6.5	9.5	12	15	17	21	22	28

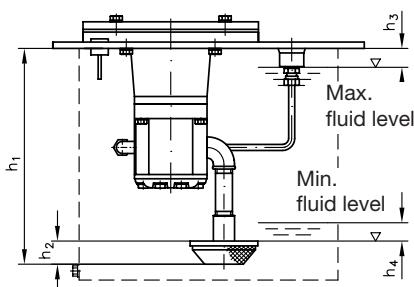
$h_1$  = Suction depth

$h_2$  =  $h$  from sect. 5.2.4

$h_3$  = Fluid level below cover plate, when at MAX

$\Delta h$  = Fluid level increase due to temperature rise by  $\Delta\vartheta = +50$  K

$h_4 \geq 10$  mm safety margin



### 5.2 Accessories for pumps complete with motor and hydraulic power packs

#### 5.2.1 Overview

Cross reference table for bell housings (F.. and L..), flex-couplings (K..), and suction parts (S..) to standard pump/motor/tank-combinations.

#### Motor pumps acc. to sect. 2.2

Drive power (kW) (4-pole)	DIN-size	Utilized accessories for size		
		1	2	3
0.25 and 0.37	71	F 11 K 11	F 21 K 21	
0.55 and 0.75	80	F 12 K 12	F 22 K 22	
1.1 and 1.5	90 S (L)	F 12 K 13	F 22 K 23	
2.2 and 3	100 L		F 23 K 24	F 33 K 33
4	112 M		F 23 K 24	F 33 K 33
5.5 and 7.5 (9)	132 S (M)		F 26 KN 27	F 35 KN 35
11 and 15	160 M (L)			F 37 KN 37
18.5 and 22	180 M (L)			F 37 KN 38

#### Power packs acc. to sect. 2.3

Drive power (kW) (4-pole)	DIN-size	Utilized accessories for size			
		1 Z 2,0 ... Z 11,3	2 Z 6,5 ... Z 12,3	16 Z 16	21 ... 28 Z 21 ... Z 28
Tank and cover plate versions coding B 6, B 13 and D 6, D 20 (B 13)					
0.25 and 0.37	71	L 11 K 11 S 101	L 21 K 21 S 103	L 21 K 21 S 108	L 21 K 21 S 114
0.55 and 0.75	80	L 12 K 12 S 101	L 22 K 22 S 103	L 21 K 22 S 108	L 21 K 22 S 114
1.1 and 1.5	90 S (M)	L 12 K 13 S 101	L 22 K 23 S 103	L 22 K 23 S 108	L 22 K 23 S 114
2.2 and 3 4	100 L 112 M		L 23 K 24 S 103	L 23 K 24 S 108	L 23 K 24 S 114
Tank and cover plate versions coding B 20, B 30, B 40 and D 20 (B 30), D 40					
0.25 and 0.37	71	L 11 K 11 S 102	L 21 K 21 S 104	L 21 K 21 S 109	L 21 K 21 S 109
0.55 and 0.75	80	L 12 K 12 S 102	L 22 K 22 S 104	L 22 K 22 S 109	L 22 K 22 S 109
1.1 and 1.5	90 S (M)	L 12 K 13 S 102	L 22 K 23 S 104	L 22 K 23 S 109	L 22 K 23 S 109
2.2 and 3 4	100 L 112 M		L 23 K 24 S 104	L 23 K 24 S 109	L 23 K 24 S 109

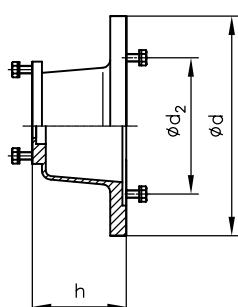
Continuation: **Hydraulic power packs** acc. to sect. 2.3

Drive power (kW) (4-pole)	DIN-size	Utilized accessories for size					3	
		2		Z 6,5 ... Z 12,3	Z 16 ... Z 28	Z 37	Z 45	Z 59 / Z 75
<b>Tank and cover plate versions coding B 50 and D 50, DZ 50</b>								
2.2 and 3 4	100 L 112 M	L 24 K 25 S 105	L 24 K 25 S 110	L 24 K 25 S 115	L 33 K 33 S 109	L 23 K 23 S 118 g		
5.5 and 7.5 (9)	132 S (M)	L 26 KN 27 S 105	L 26 KN 27 S 110	L 26 KN 27 S 115	L 35 KN 35 S 109	L 35 KN 35 S 118 g		
11 and 15	160 M (L)				L 37 KN 37 S 109	L 37 KN 37 S 115 g / S 118 g		
<b>Tank and cover plate versions coding B 75 and D 50, DZ 50</b>								
2.2 and 3 4	100 L 112 M	L 24 K 25 S 106	L 24 K 25 S 111	L 24 K 25 S 116	L 33 K 33 S 110	L 23 K 23 S 119 g		
5.5 and 7.5 (9)	132 S (M)	L 26 KN 27 S 106	L 26 KN 27 S 111	L 26 KN 27 S 116	L 35 KN 35 S 110	L 35 KN 35 S 119 g		
11 and 15	160 M (L)				L 37 KN 37 S 110	L 37 KN 37 S 116 g / S 119 g		
<b>Tank and cover plate versions coding B 100 and D 100 (B 100), DZ 100 (B 100)</b>								
2.2 and 3 4	100 L 112 M	L 25 K 26 S 106	L 25 K 26 S 112	L 25 K 26 S 116				
5.5 and 7.5 (9)	132 S (M)	L 27 KN 28 S 106	L 27 KN 28 S 112	L 27 KN 28 S 116	L 36 KN 36 S 111	L 36 KN 36 S 116 g / S 122	L 36 KN 36 S 126	
11 and 15	160 M (L)				L 38 KN 37 S 110	L 38 KN 37 S 116 g / S 122	L 38 KN 37 S 126	
18.5 and 22	180 M (L)				L 38 KN 37 S 111	L 38 KN 38 S 116 g / S 122	L 38 KN 38 S 126	
<b>Tank and cover plate versions coding B 160 and D 100 (B 160), DZ 100 (B 160)</b>								
2.2 and 3 4	100 L 112 M	L 25 K 26 S 107	L 25 K 26 S 113	L 25 K 26 S 117				
5.5 and 7.5 (9)	132 S (M)	L 27 KN 28 S 107	L 27 KN 28 S 113	L 27 KN 28 S 117	L 36 KN 36 S 111	L 36 KN 36 S 117 g / S 124	L 36 KN 36 S 129	
11 and 15	160 M (L)				L 38 KN 37 S 111	L 38 KN 37 S 117 g / S 124	L 38 KN 37 S 129	
18.5 and 22	180 M (L)				L 38 KN 37 S 111	L 38 KN 38 S 117 g / S 124	L 38 KN 38 S 129	
<b>Tank and cover plate versions coding B 250 and D 250 (B 250), DZ 250 (B 250)</b>								
11 and 15	160 M (L)				L 38 KN 37 S 112	L 38 KN 37 S 120 g / S 123	L 38 KN 37 S 127	
18.5 and 22	180 M (L)				L 38 KN 37 S 112	L 38 KN 38 S 120 g / S 123	L 38 KN 38 S 127	
<b>Tank and cover plate versions coding B 400 and B 250 (B 400), DZ 250 (B 400)</b>								
11 and 15	160 M (L)				L 38 KN 37 S 113	L 38 KN 37 S 121 g / S 125	L 38 KN 37 S 129	
18.5 and 22	180 M (L)				L 38 KN 38 S 113	L 38 KN 38 S 121 g / S 125	L 38 KN 38 S 129	

## 5.2.2 Bell housings

### Bell housing for motor pumps

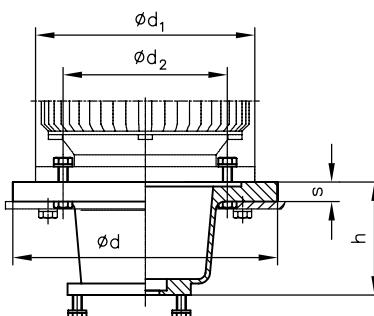
Intended for mounting of pumps at motors with brackets, motor housing design IM B3 / IM B5



Coding 1) Bell housing complete	Suited for pump size	Drive power kW	Main dimensions (mm)			Mass (weight) approx. (kg)
			Ød	Ød2	h	
F 11	1	0.25 and 0.37	200	165	94	1.3
F 12		0.55 ... 1.5		165	99	1.2
F 21	2	0.25 and 0.37	250	165	103.5	1.8
F 22		0.55 ... 1.5		165	108.5	1.7
F 23	3	2.2 ... 4	300	215	107.5	1.8
F 26		5.5 and 7.5		265	144.5	2.9
F 33		2.2 ... 4		215	150	3.1
F 35		5.5 and 7.5		265		
F 37		11 ... 22	350	300	178	4.3

### Bell housing for power packs

Intended for vertical mounting of a pump inside the tank, suited for motors with flange, motor housing design IM V1 (IM B5)



Coding 1) Bell housing complete	Suited for pump size	Utilized as standard for			Main dimensions (mm)				Mass (weight) approx. (kg)	
		Cover plate	Tank	Drive power kW	Ød	Ød1	Ød2	h		
L 11	1	D 6; D 20; D 40	B 6 ... B 40	0.25 a. 0.37	200	160	130	94	13	1.5
L 12				0.55 ... 1.5		200	165	99	18	1.4
L 21		D 6; D 20; D 40	B 6 ... B 40	0.25 a. 0.37	200	160	130	103.5	13	1.9
L 22				0.55 ... 1.5		200	165	108.5	18	1.8
L 23	2	D 20; D 40	B 13 ... B 40	2.2 ... 4	250	215	107.5	13	2.0	
L 24		D 50; DZ 50	B 50; B 75			250	215	139.5	14	3.2
L 25		D 100	B 100; B 160	5.5 and 7.5	300	215	173	16	4.6	
L 26		D 50; DZ 50	B 50; B 75			300	265	144.5	19	3.1
L 27		D 100	B 100; B 160		350	300	265	173	16	4.0
L 33		DZ 50	B 50; B 75	2.2 ... 4		250	215	145	14	3.4
L 35	3	D 100; DZ 100	B 100; B 160	5.5 and 7.5	300	265	150	19	3.3	
L 36						300	265	178	16	4.6
L 37		DZ 50	B 50; B 75	11 ... 22	350	300	265		16	4.7
L 38		D 100; D 250 DZ100; DZ 250	B 100; B 160 B 250; B 400			350	300			4.8

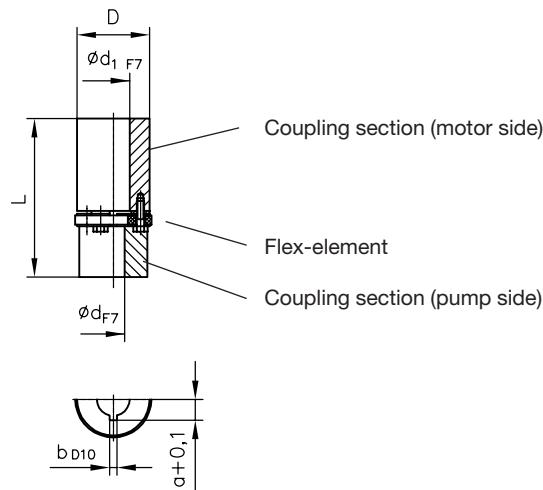
1) These codings contain always bell housing, mounting screws, and flat seal.

### 5.2.3 Flex-couplings

When the motor is mounted care has to be taken that there is a play of 0.5 to 2.5 mm between the coupling sections mounted on the pump and on the motor to prevent any axial thrust on the bearings.

(See also illustration of the installation in sect. 4.3)

Coding 1) Flex-coupling complete	Suited for pump size	Main dimensions (mm) 2)					Utilized as standard for		Order cod- ing of the flex-element	Mass (weight) approx. (kg)	
		L	$\emptyset d$	$\emptyset d_1$	D	a	b	Bell housing	Drive power kW		
K 11	1	85	12	14	76	9.2	5	F 11; L 11	0.25; 0.37	HAWE-No. 6020 084	1.8
K 12		89		19		12.2	6	F 12	0.55; 0.75		1.9
K 13				24		15.1	8	L 12	1.1; 1.5		1.8
K 21	2	97	15	14	28	9.2	5	F 21; L 21	0.25; 0.37	HAWE-No. 6020 084	1.97
K 22				19		12.2	6	F 22	0.55; 0.75		2.0
K 23		101		24		15.1	8	L 22	1.1; 1.5		1.8
K 24						17.1	8	F 23; L 23	2.2		1.8
K 25		133			38	17.1	8	L 24	3		2.4
K 26		167				17.1	8	L 25	4		3.1
KN 27		136	91	22.5	10	F 26; L 26	5.5			3.4	
KN 28		166		22.5	10	L 27	7.5			4.3	
K 33	3	139	20	28	76	17.1	8	F 33; L 33	2.2 ... 4	HAWE-No. 6020 084	2.4
KN 35		142		38	91	22.5	10	F 35; L 35	5.5; 7.5		3.4
KN 36				22.5		10	L 36		5.5; 7.5		4.3
KN 37		172		42	48	24.3	12	F 37 L 37; L 38	11; 15		4.2
KN 38				27.7		14	L 38		18.5; 22		4.2



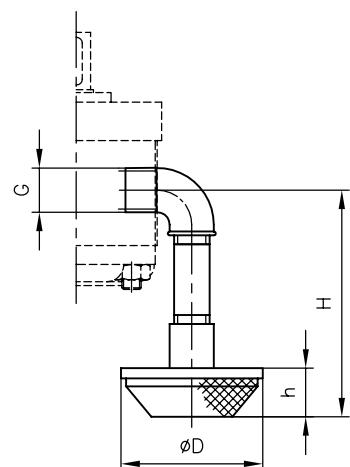
1) This coding contains the complete flex-coupling

2) Key dimensions conf. DIN 6888

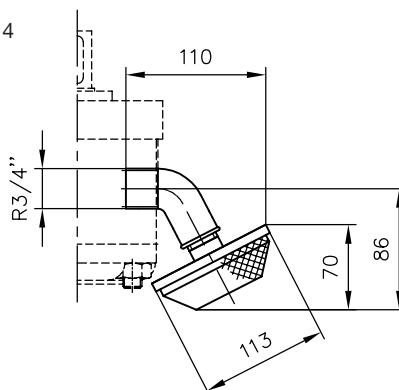
### 5.2.4 Suction parts (Main dimensions see page 20!)

Type S 101 ... 113  
S 115 (g) ... 129

Main dimensions  
see page 20!



Type S 114



Coding Suction parts complete 1)	Suited for pump size				Suited for tank	Main dimensions (mm)				Mass (weight) approx. (kg)				
	1 Z 2,0 ... Z 14,4	2 Z 6,5 ... Z 12,3	2 Z 16	3 Z 21 ... Z 28		3 Z 37	3 Z 45	3 Z 59 / Z 75	3 Z 87 ... Z 135	H	h	ØD	G	
<b>S 101</b>	●								B 6; B 13	95	27	113	R 3/8"	0.3
<b>S 102</b>	●								B 20 ... B 40	185	27	113	R 3/8"	0.4
<b>S 103</b>		●							B 6; B 13	80	27	113	R 1/2"	0.4
<b>S 104</b>		●							B 20 ... B 40	160	27	113	R 1/2"	0.5
<b>S 105</b>		●							B 50	211	30	113	R 1/2"	0.5
<b>S 106</b>		●							B 75; B 100	280	30	113	R 1/2"	0.6
<b>S 107</b>		●							B 160	430	30	113	R 1/2"	0.8
<b>S 108</b>			●						B 6; B 13	80	30	113	R 3/4"	0.3
<b>S 109</b>			●	●					B 20 ... B 40	150	30	113	R 3/4"	0.4
					●				B 50					
<b>S 110</b>			●	●					B 50	197	30	113	R 3/4"	0.5
					●				B 75					
<b>S 111</b>			●	●					B 75	277	30	113	R 3/4"	0.6
					●				B 100; B 160					
<b>S 112</b>			●	●					B 100	307	30	113	R 3/4"	0.7
					●				B 250					
<b>S 113</b>			●	●					B 160	427	30	113	R 3/4"	0.8
					●				B 400					
<b>S 114</b>				●					B 6; B 13	86	70	113	R 3/4"	0.3
<b>S 115</b>					●				B 50	165	30	113	R 1"	0.7
<b>S 115 g</b>						●				185	50	130	R 1"	0.8
<b>S 116</b>					●				B 75; B 100	245	30	113	R 1"	0.8
<b>S 116 g</b>						●				265	50	130	R 1"	0.9
<b>S 117</b>					●				B 160	365	30	113	R 1"	1.1
<b>S 117 g</b>						●				385	50	130	R 1"	1.2
<b>S 118 g</b>						●			B 50	145	50	130	R 1"	0.7
<b>S 119 g</b>						●			B 75	215	50	130	R 1"	0.8
<b>S 120 g</b>						●			B 250	315	50	130	R 1"	1.1
<b>S 121 g</b>						●			B 400	565	50	130	R 1"	1.6
<b>S 122</b>						●			B 100	230	52	163	R 1"	1.1
<b>S 123</b>						●			B 250	260	52	163	R 1"	1.2
<b>S 124</b>						●			B 160	360	52	163	R 1"	1.4
<b>S 125</b>						●			B 400	510	52	163	R 1"	1.7
<b>S 126</b>							●	B 100	173	52	163	R 1 1/4"	1.3	
<b>S 127</b>							●	B 250	203	52	163	R 1 1/4"	1.4	
<b>S 128</b>							●	B 160	303	52	163	R 1 1/4"	1.7	
<b>S 129</b>							●	B 400	463	52	163	R 1 1/4"	2.2	

● Available combinations

1) This coding contains the Suction part i.e. strainer readily assembled with pipe work.