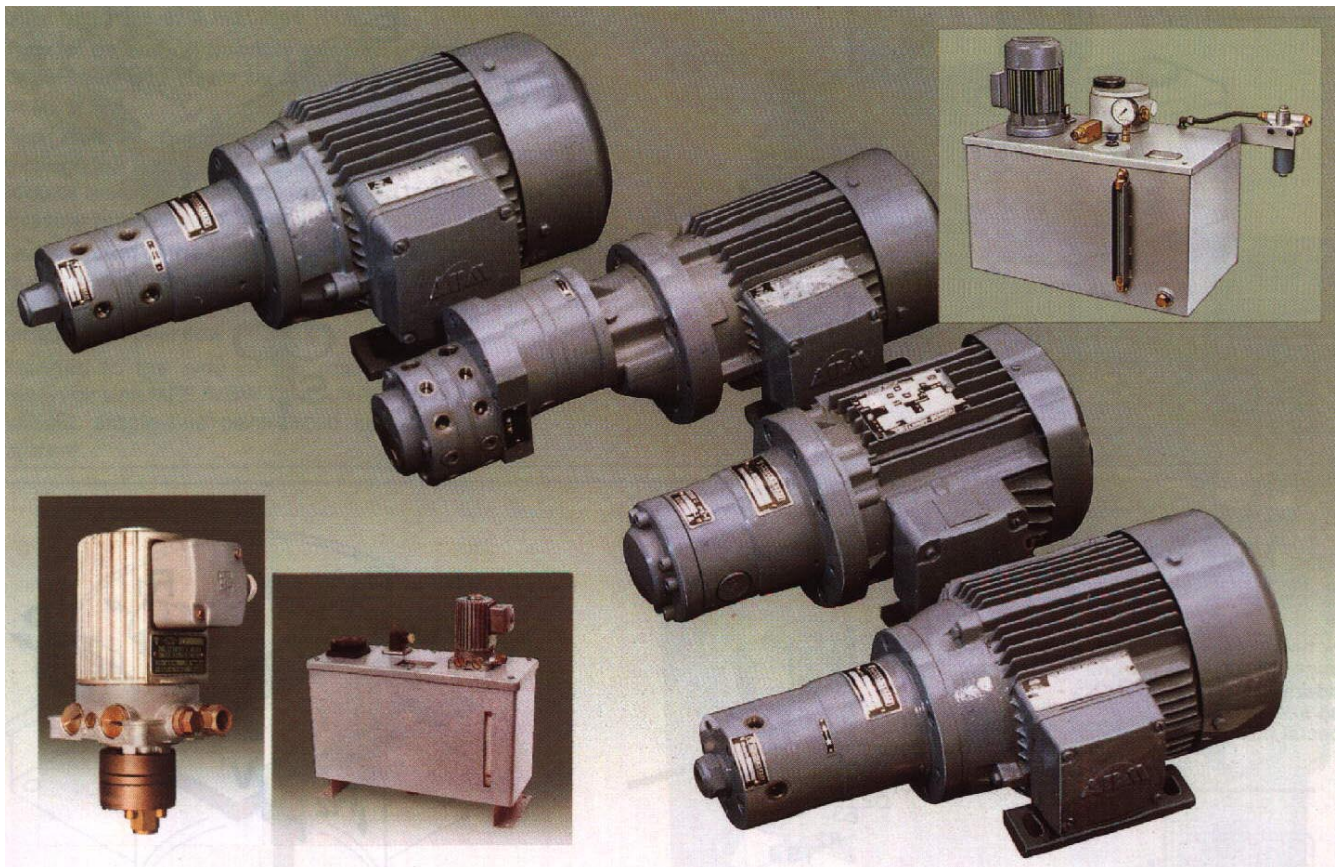


Single- and Multi-Circuit Pumps

for Circulating and Hydrostatic Lubrication
as Gear, Gerotor, and Vane Pump Units, Reservoir Units



The pump units specified in this leaflet are lubricant delivery pumps without pressure relief facilities and are designed for continuous operation in circulating and hydrostatic lubrication systems.

As far as pressure and viscosity ranges stated in the tables permit, these pump units may also be utilized for hydraulic tasks.

The pump units are driven by three-phase motors designed for a rated current consumption of 230/400 V acc. to DIN IEC 38.

State special voltages, if required, when ordering.

Pumps with one to twenty lubrication circuits are available.

- **Multi-circuit pumps** ensure delivery of uniform quantities against varying resistances to the individual feed lines and lubrication points.
- Smooth running and good suction capacity are the characteristic features of the **internal gear (Gerotor) pumps**.

The stated delivery outputs refer to oils with a viscosity of 140 mm²/s with a back pressure $p = 5$ bars.

The permissible pressure and the quantity delivered vary with the viscosity. It is important to conform to the recommended viscosity!

When using oils of different viscosity (spindle oils and highly viscous oils) please ask for further information. Please note that even standard oils may become extremely thin-bodied or highly viscous due to change in temperature (see viscosity / temperature diagram in leaflet No. 9100).

VOGEL[®]

Vogel Lubrication, Inc.

1008 Jefferson Avenue
Newport News, Va 23607
Phone (757) 380-8585 • Fax (757) 380-0709
email: vogel@vogel-lube.com

Single-circuit flange-mounted units with integral cast valve chambers (mini-units)

Type M For mounting separately from oil reservoir

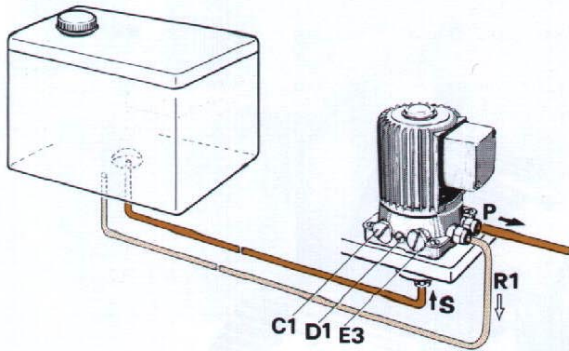


fig. 1

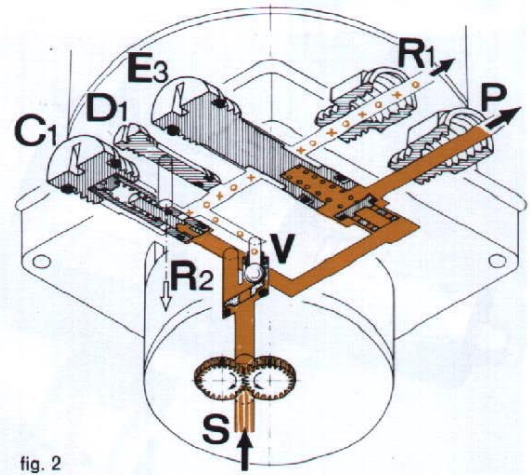


fig. 2

Type MF For flange-mounting into oil reservoir

For horizontal flange-mounting of the unit **underneath the oil level** use a sealed special pump.

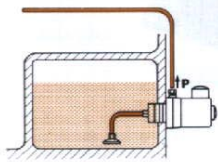


fig. 3

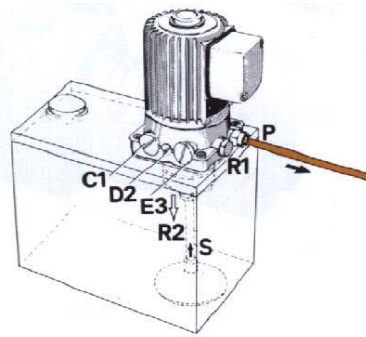


fig. 4

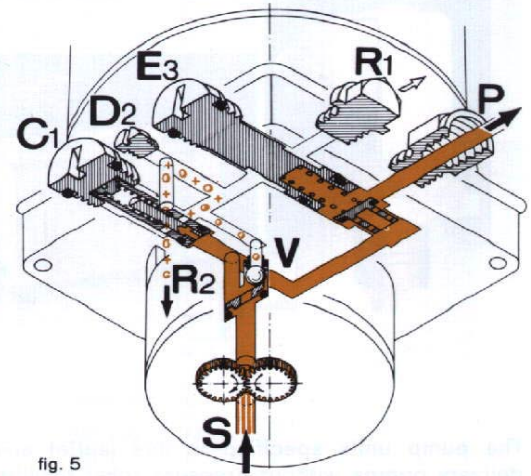
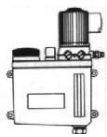


fig. 5



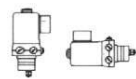
For units type MF complete with reservoir (2.7, 6, and 15 l) see pages C 37, C 38

For the units FLM 12-3 and FLMF 12-3, the feed pump is -contrary to the above illustrations - a **vane pump**.

With the exception of V, the valve function is the same as described on page C 25.



Mounting positions



Type of enclosure IP 54, DIN 40 050

Principle of operation of a vane pump: Unchanging direction of delivery with changing direction of rotation.

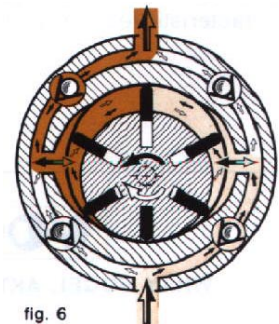


fig. 6

Explanation of the hydraulic function

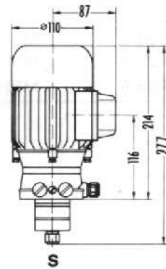
Both types (M and MF) have the same hydraulic function

Oil is sucked in at **S** and flows at pressure through the pressure duct in direction **P**. The oil pressure closes valve **V** and opens valve **E3** against spring tension. If air is entrained (due to low oil level in the reservoir), valve **V** remains open and bleeds the air resp. the air-intermixed oil into the return duct (see circle (o) marking flow in direction R1 resp. R2). Valve **C1** allows the excess pressure oil to flow into the return duct (see cross (+) marking).

Explanation of the constructional differences

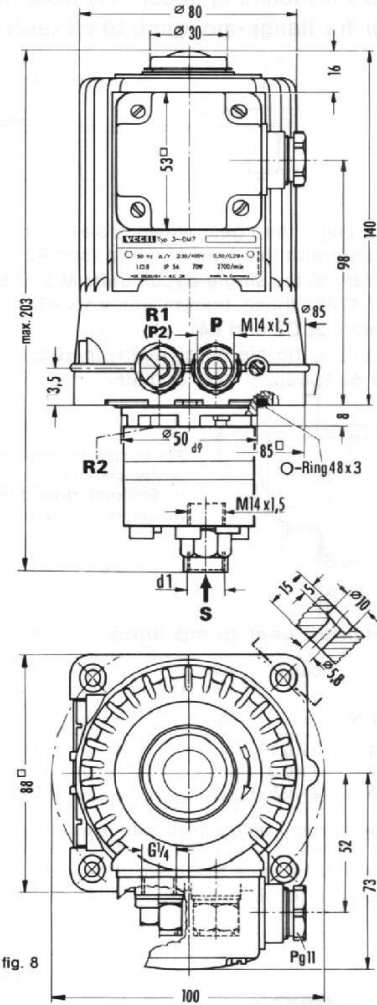
In type **M** the long screw plug **D1** blocks the port **R2** of the return duct. The return oil from the valves **V** and **C1** flows via **R1** through a lube into the separate oil reservoir (see fig. 1 and 2).

In type **MF**, the short screw plug **D2** – contrary to **D1** in type **M** – does not block the port **R2** and a screw plug seals the external port **R1**. Port **R2** of the return duct discharges directly into the reservoir without any connection facilities (see fig. 4 and 5).



* deviating motor dimensions for unit **MF 5/S12**
Type of enclosure IP 54

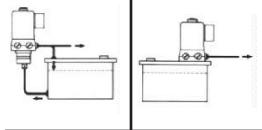
- S** = suction port
- P** = pressure port
- (P2)** = 2nd pressure port for two-circuit units (see page C 26)
- R1** = oil return (type **M**)
- R2** = oil return (type **MF**)
- Ports tapped for solderless tube connection



Single-circuit gear pump units

Vane pump units

For separately mounted oil reservoir	For flange-mounting into oil reservoir	Output ¹⁾	Max. back pressure	Permissible operating viscosity range mm ² /s (cSt)	Suction head (with open pressure pipeline)	Three-phase motor ³⁾	Capacitors (Steinmetz-circuit) for frequency	Suction port S		
Order No.	Order No.	l/min	bars	from to	mm	rated output W	speed min ⁻¹	consumption at 50/60 Hz	for frequency	thread d1
M 1	MF 1	0.1	27	20 2000		30	1345	0.39/0.23 A	20 µF 5 µF	
M 2	MF 2	0.2	27	20 2000		70	2700	0.50/0.29 A	30 µF 8 µF	M14 x 1.5
M 2/S 127	MF 2/S 127	0.2	70	140 2000	500	70	2700	0.50/0.29 A	30 µF 8 µF	for 8mm diam. tube
M 5	MF 5	0.5	27	20 1000		70	2700	0.50/0.29 A	30 µF 8 µF	
	* MF 5/s 12	0.5	60	140 2000		120	2600	0.68/0.39 A	50 µF 12 µF	
FLM 12-3	FLMF 12-3	1.2	6	20 850	3000	70	2700	0.50/0.29 A	30 µF 8 µF	M16 x 1.5 for 10 mm diam. tube



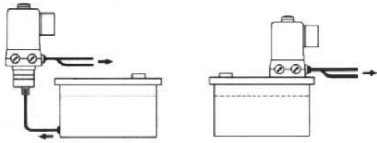
- ¹⁾ Output based on an operating viscosity of 140 mm²/s (cSt) at a back pressure p = 5 bars.
- ²⁾ The actual back pressure is equivalent to the actual value of the built-in pressure regulating valve. If the units are operated with single phase a.c. supply, only 60% of the quoted pressure are permissible, i.e. a pressure regulating valve with an actual value of 16 bars is to be fitted to the system.

Appropriate capacitors for a frequency of 50 and 60 Hz are:

- for 230 V - 5 µF - order No. 179 340 026
 - for 230 V - 8 µF - order No. 179 340 007
 - for 230 V - 12 µF - order No. 179 340 050
 - for 115 V - 20 µF - order No. 179 340 027
 - for 115 V - 30 µF - order No. 179 340 008
- These particulars do not apply to type MF 5/S12.

³⁾ See also leaflet 1210: "Multirange voltage motors."

Units for mounting separately from oil reservoir or for flange-mounting to oil reservoir



By adding a third wheel, a second delivery circuit is available with this type of pump (see P2)

Contrary to the **single-circuit units M** and **MF** described on page C 25, these pumps are valveless (compare differences at C2 and E4).

By omitting the internal oil return, there is no structural difference as specified in **M** and **MF**.

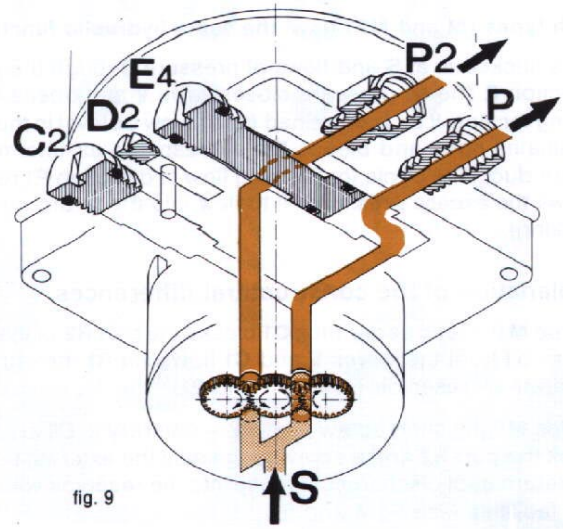
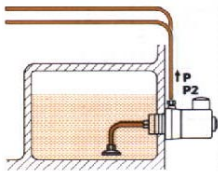


fig. 9



For horizontal flanging of the unit in a position underneath the oil level a sealed special pump is to be used.

Two-circuit gear pump units

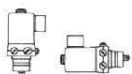
Order No.	Output l/min	Max. back pressure bars	Permissible operating viscosity range		Suction head (with open pressure pipeline) mm	Three-phase motor			Suction port S thread d1 (see fig. 8, page C 25)
			mm ² /s (cSt) from	to		output W	speed min ⁻¹	rated current consumption at 50 Hz 230/400 V	
M 201	2 x 0.1	12		1000		30	1345	0.39/0.23 A	M14 x 1.5 for 8 mm diam. tube
M 202	2 x 0.2	12	20	1500	500	70	2700	0.50/0.29 A	M14 x 1.5 for 8 mm diam. tube
M 205	2 x 0.5	12		500		70	2700	0.50/0.29 A	M16 x 1.5 for 10 mm diam. tube



S = suction port
P a. P2 = pressure ports

For dimensions see fig. 8, page C 25.

Mounting positions



Type of enclosure IP 54, DIN 40 050

Layout of a circulating lubrication system with two-circuit gear pump unit

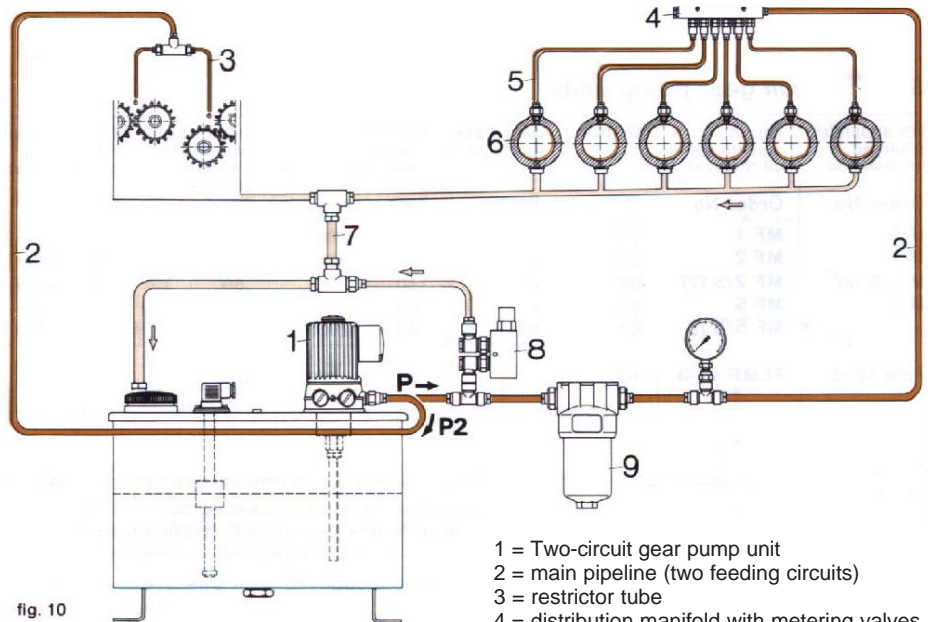
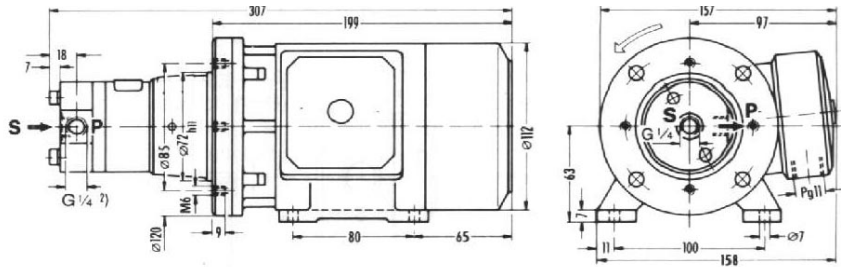


fig. 10

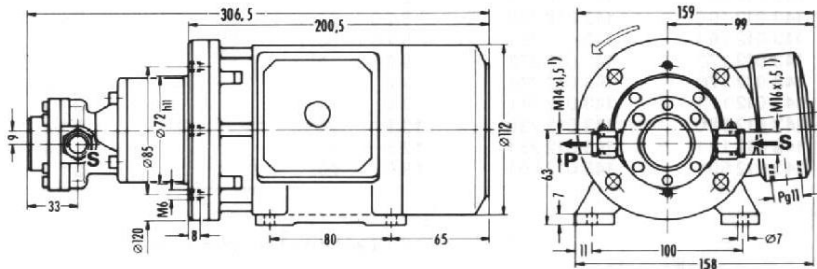
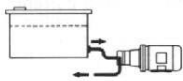
- 1 = Two-circuit gear pump unit
- 2 = main pipeline (two feeding circuits)
- 3 = restrictor tube
- 4 = distribution manifold with metering valves
- 5 = lubrication line
- 6 = lubrication point
- 7 = return line
- 8 = safety valve
- 9 = microfilter

Single-circuit foot-flanged and flange-mounted units, valveless Circulating lubrication



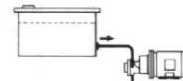
Single-circuit gear pump units (suitable as priming pump)

Foot-flanged units	Flange-mounted units	Output	Max. back pressure	Permissible viscosity range	Suction head (with open pressure pipeline)	Three-phase motor rated
Order No.	Order No.	l/min	bars	mm ² /s (cSt) from to	mm	output speed consumption at
for separately mounted oil reservoir	for flange-mounting to oil reservoir					rated rated current
ZM 12-21	ZM 12-31	1.2	30	20 2000	500	output speed consumption at
						W min ⁻¹ 50 Hz 400 V
						180 11350 0.63 A



Single-circuit gear pump units (suitable as priming pump)

Foot-flanged units	Flange-mounted units	Output	Max. back pressure	Permissible viscosity range	Suction head (with open pressure pipeline)	Three-phase motor rated
Order No.	Order No.	l/min	bars	mm ² /s (cSt) from to	mm	output speed consumption at
for separately mounted oil reservoir	for flange-mounting to oil reservoir					rated rated current
ZM 25-2	ZM 25-3	2.5	20	20 2000	1000	output speed consumption at
						W min ⁻¹ 50 Hz 400 V
						180 11350 0.63 A



S = suction port
P = pressure port

Type of enclosure IP 54, DIN 40 050
Units without foot flange have same dimensions

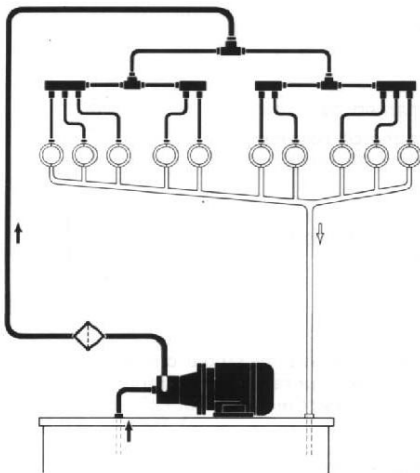
When using special pressure relief and pressure regulating valves, the **single-circuit pump units** specified here may also be used for **intermittent operation of distributor systems**, if the units specially designed for this purpose, specified in leaflet 1202, do not meet the quantity requirements.

- Ports tapped for solderless tube connection; M14 x 1.5 for 8 mm diam. tube, M16 x 1.5 for 10 mm diam. tube
 - For selection of screw unions for port-tube connections see page C 42.
- Please pay attention to special notes** on page C 28.

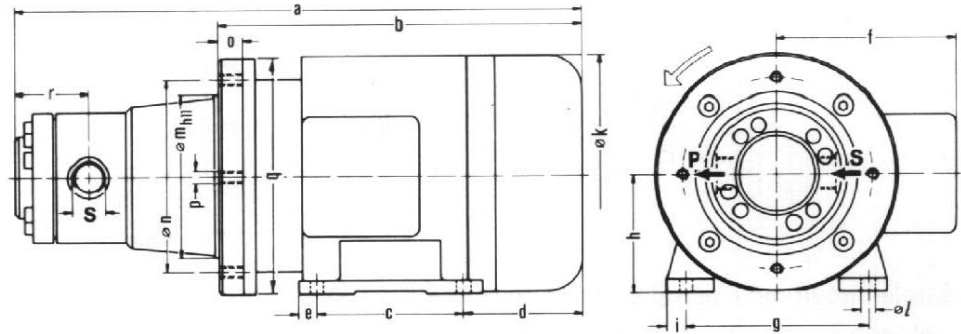
Single-circuit gear pump units for higher pressure

Order No.	Output l/min	Max. pressure bars	Speed min ⁻¹	Rated current consumption W
124 012 211	0.75	100	1400	180
124 012 210	1	150	1400	370
125 012 212	1.7	150	1400	750

Please inquire for appropriate information.

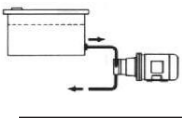


Single-circuit foot-flanged and flange-mounted units, valveless Circulating lubrication



Single-circuit Gerotor pump units (suitable as priming pump)

Serial No.	Foot-flanged units	Flange-mounted units	Output l/min	Max. back pressure bars	Permissible operating viscosity range mm ² /s (cSt) from to	Suction and pressure port S P	Suction head (with open pressure pipeline) mm	Packed cable gland	Three-phase motor		
	for separately mounted oil reservoir	for flange-mounting to oil reservoir							rated output W	rated speed min ⁻¹	rated current consumption at 50 Hz 400 V
1	143 012 131	143 012 231	0.85	30		G 1/4		Pg 11	180	1300	0.63 A
2	143 012 141	143 012 241	1.7	30		G 1/4		pg 11	370	2810	0.94 A
3	143 012 150 ¹⁾	143 012 250 ¹⁾	2.5	20		G 3/8		Pg 11	180	1300	0.63 A
4	143 012 151 ¹⁾	143 012 251 ¹⁾	2.5	50		G 3/8		Pg 11	370	1390	1.1 A
5	143 012 100	143 012 200	5.25	20		G 1/2		Pg 11	370	1390	1.1 A
6	143 012 161	143 012 261	5.25	50	20 1000	G 1/2	1000	Pg 16	750	1390	2.0 A
7	143 012 172	143 012 272	9.0	12		G 1/2		Pg 11	370	1390	1.1 A
8	143 012 170	143 012 270	9.0	20		G 1/2		Pg 16	550	1390	1.55 A
9	143 012 171	143 012 271	9.0	50		G 1/2		Pg 16	1100	1390	2.65 A
10	143 012 180	143 012 280	12.5	20		G 3/4		Pg 16	750	1390	2.0 A
11	143 012 181	143 012 281	12.5	50		G 3/4		Pg 16	1500	1390	3.5 A
12	143 012 501	143 012 601	19.0	20		G 1		Pg 16	1500	1390	3.5 A



¹⁾ Direction of rotation contrary to illustration.

Serial No.	Dimensions (mm)																
	a	b	c	d	e	f	g	h	i	k	l	m	n	o	p	q	r
1	289	200.5	80	65	10	99	100	63	11	112	M6	72	85	14	M6	120	36.5
2	316	219	90	72	9	112	112	71	12.5	140	M6	95	115	12	M8	140	36.5
3	304	199	80	65	10	97	100	63	11	112	M6	85	100	14	M6	120	45
4	334	224	90	72	9	109	112	71	11	140	M6	95	115	17	M8	140	45
5	341	224	90	72	9	109	112	71	11	140	M6	95	115	17	M8	140	50.5
6	376	249	100	82	13	123	125	80	13	162	M8	110	130	17	M8	160	50.5
7	349	224	90	72	9	109	112	71	11	140	M6	95	115	17	M8	140	57
8	384	249	100	82	13	123	125	80	13	162	M8	110	130	17	M8	160	57
9	396.5	252.5	100	79.5	15	136	140	90	15	186	M8	110	130	17	M8	160	57
10	400	249	100	82	13	123	125	80	13	162	M8	110	130	17	M8	160	71
11	437.5	277.5	125	79.5	15	136	140	90	15	186	M8	110	130	17	M8	160	84
12	453.5	277.5	125	79.5	15	150	140	90	15	196	M8	110	130	17	M8	160	84

S = pressure port
P = pressure port

Type of enclosure IP 54, DIN 40 050
Units without foot flange have same dimensions

Special notes!

- Pay attention to direction of rotation, marked by arrow.
- When units are flanged horizontally to the oil reservoirs, make sure that the pump is not below oil level (intermediate flange is not sealed).

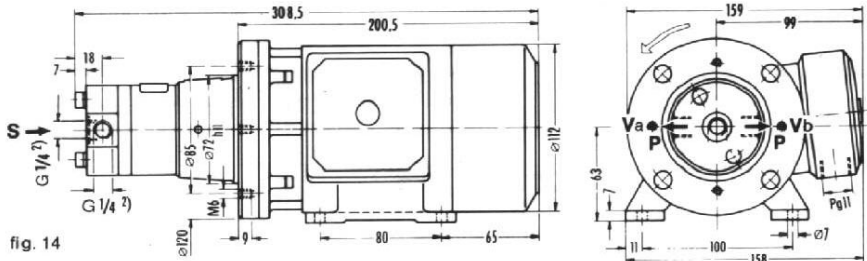
If the unit is mounted separately from the oil reservoir, the suction side for the pump (S) may be connected to a higher-mounted oil reservoir (max. 2000 mm).

When using special pressure relief and safety valves, the single-circuit pump units specified here may also be used for intermittent operation of distributor systems, if the units specially designed for this purpose, specified in leaflet 1202, do not meet the quantity requirements.

For selection of screw unions for port-tube connections see page C 42.

Internal gear (Gerotor) pump



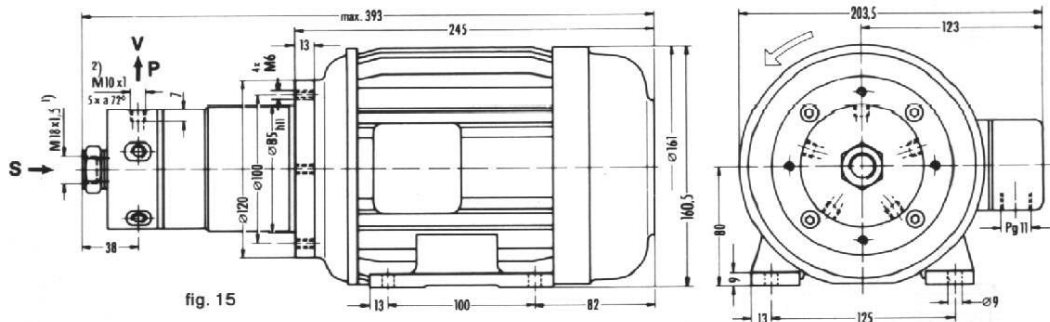
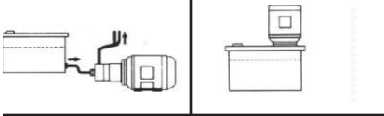


Two-circuit units

Foot-flanged units

Flange-mounted units

for separately mounted oil reservoir	for flange-mounting to oil reservoir	Output at Va	Output at Vb	Max. back pressure	Permissible operating viscosity range mm ² /s (cSt)		Suction head (with open pressure pipeline) mm	Three- phase motor		
Order No.	Order No.	l/min	l/min	bars	from	to		rated output W	speed min ⁻¹	rated current consumption at 50 Hz 400 V
ZM 212-21	ZM 212-31	1.2	1.2	12	20	2000	500	180	1300	0.63 A

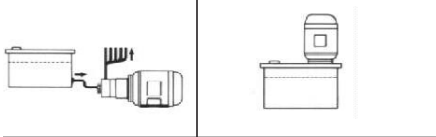


Two-circuit units

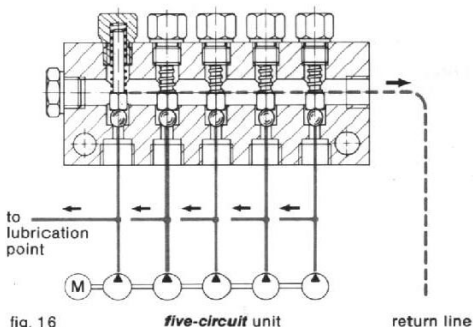
Foot-flanged units

Flange-mounted units

for separately mounted oil reservoir	for flange-mounting to oil reservoir	Output at V	Max. back pressure	Permissible operating viscosity range mm ² /s (cSt)		Suction head (with open pressure pipeline) mm	Three- phase motor		
Order No.	Order No.	l/min	bars	from	to		rated output W	speed min ⁻¹	rated current consumption at 50 Hz 400 V
ZM 502	ZM 502-3	5 x 0.2	20	20	1000	500	250	670	1.22 A
ZM 505	ZM 505-3	5 x 0.45	10	20	500				



If it is necessary to protect the individual pressure lines by safety valves, **distribution manifolds** are available on inquiry,

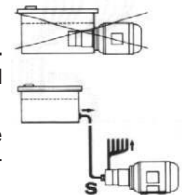


S = pressure port
P = pressure port

Type of enclosure IP 54, DIN 40 050
Units without foot flange have same dimensions

Special notes!

1. Pay attention to direction of rotation, marked by arrow.
2. **When units are flanged horizontally to the oil reservoirs, make sure that the pump is not below oil level** (intermediate flange is not sealed).
If the unit is mounted separately from the oil reservoir, the suction side for the pump (S) may be connected to a higher mounted oil reservoir (max. 2000 mm).
3. **Any delivery ports not required must not be blanked off.** The oil delivered through these ports must be returned to the oil reservoir.



- 1) Ports tapped for solderless tube connection; M18 x 1.5 for 12 mm diam. tube
- 2) For selection of screw unions for port-tube connections see page C 42.

Hydrostatic lubrication

For the hydrostatic bearing the oil pressure appropriate to the bearing capacity is generated outside of the bearing in pumps and the oil is delivered with this pressure to the pressure pockets. From these pockets, the oil escapes through the bearing gaps.

The smaller the output per circuit, the lower the oil viscosity and the greater the pump pressure, the more differ the flow rates of the circuits among one another.

The pressure difference within a multi-circuit pump can be kept very small by the utilization of a **priming pump**, which is of advantage to the uniformity of the flow rate.

The total output of the multi-circuit pump as well as the required pocket pressure per circuit, with consideration of the permissible pressure difference, determine the selection of the priming pump.

With bearings, which are subject to great pressure fluctuations, the priming pressure may be adapted by means of a **proportional pressure valve** to the particular pocket pressure of a characteristic pocket.

One pump delivery circuit per pocket

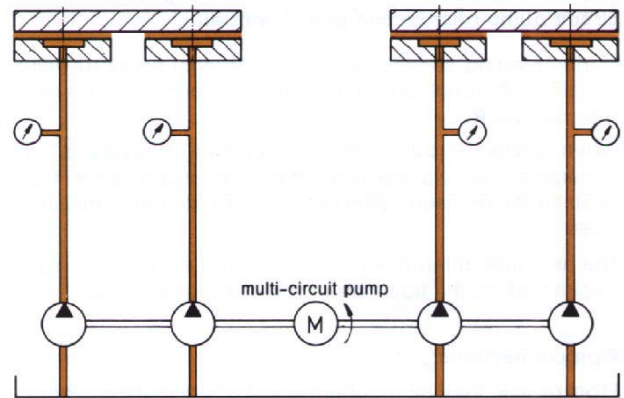


fig. 20

When using a priming pump, a suitable filter may be fitted into the pressure line of the priming pump.

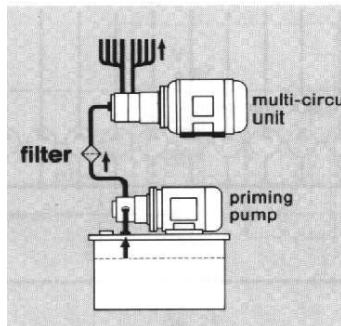


fig. 18

Example of filtering for multi-circuit units with built-in priming pump.

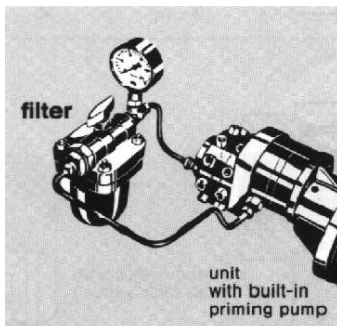


fig. 19

Proportional pressure valve

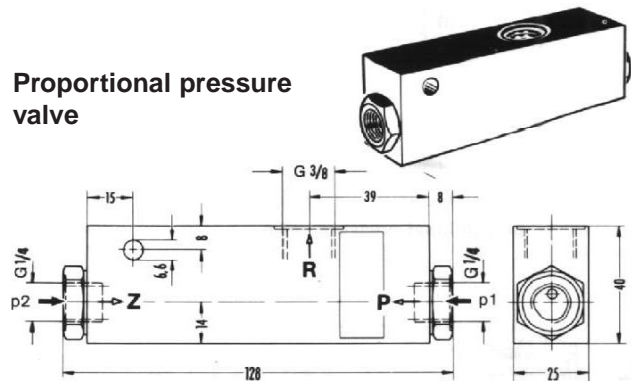


fig. 21

Order No.	Max. pressure at P	Operating temperature range	Rated diam. P - R
161 000 002	100 bars	-20 to + 80° C	5.5 mm diam.

Construction of the proportional pressure valve

Hydrostatic lubrication

Construction of the proportional pressure valve

The priming pump (*single-circuit unit*) supplies the multi-circuit pump (distribution pump) with oil.

During starting conditions, the proportional pressure valve maintains the pressure p_1 at approx. 2.5 bars. Surplus oil is returned via R.

When pressure p_2 rises, the priming pressure p_1 is increased, too, via the proportional pressure valve, thus keeping the pressure difference $p_2 - p_1$ at nearly the same level.

The pressure difference $p_2 - p_1$ shall not exceed 4 - 7 bars, depending on the flow rate of the distribution pump.

Pipe connections:

From p_1 to P, for p_2 (a "characteristic" pressure pocket) to Z and from R to the oil reservoir.

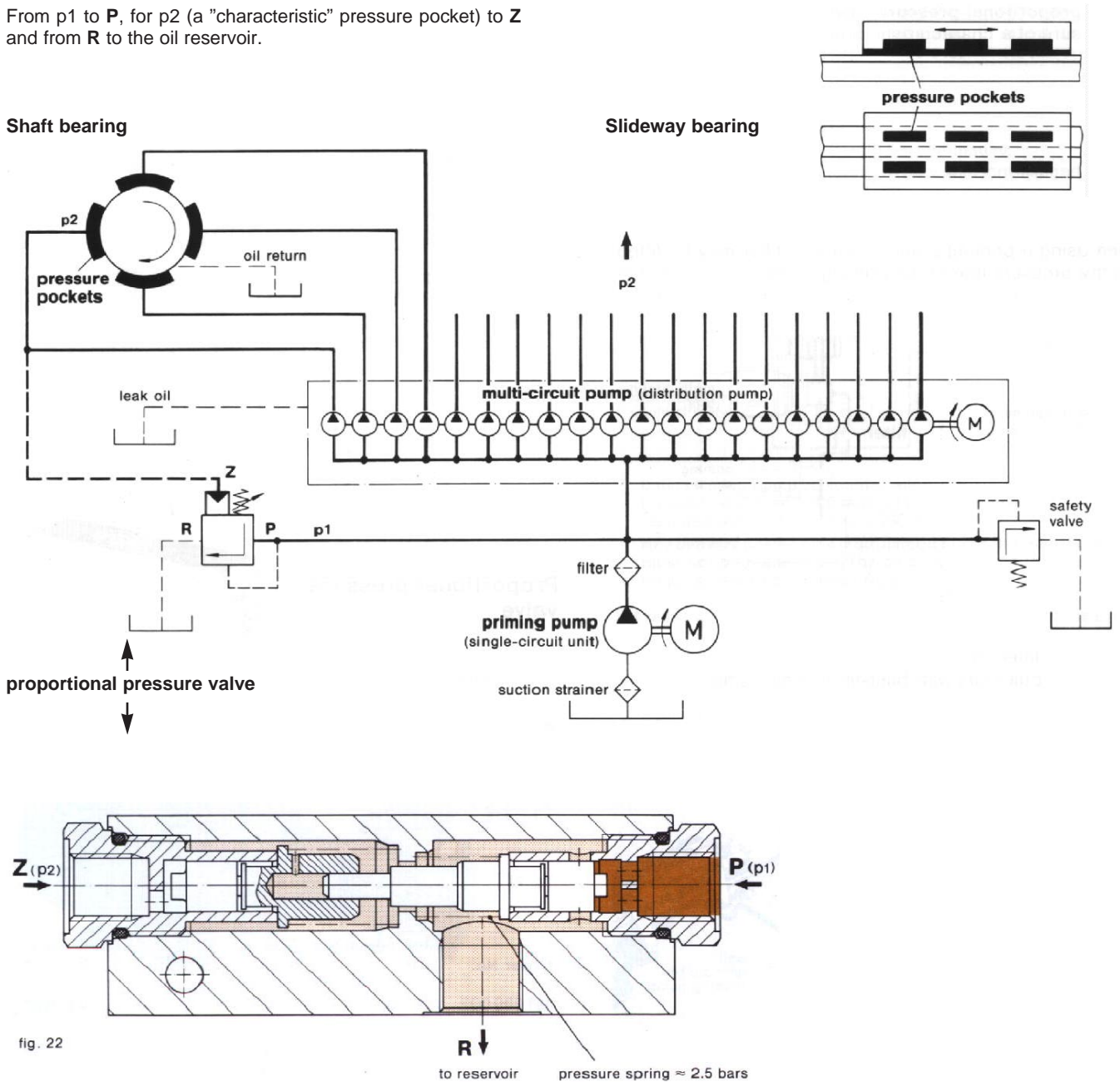
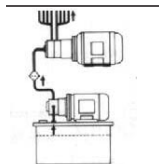
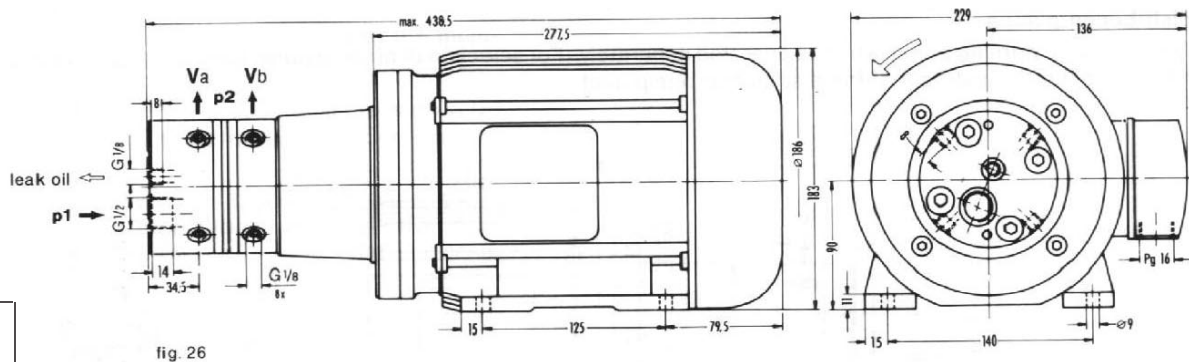


fig. 22

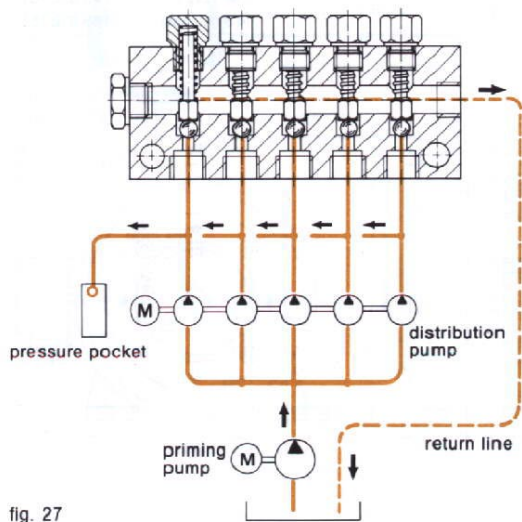
Multi-circuit unit for hydrostatic lubrication →

**Eight-circuit units, max 55 (80) bars,
for operation with separate priming pump**



Order No.	Output at Va Vb		Pump inlet max. p1 bars	Pressure port max. p2 bars	Permissible operating viscosity range mm ² /s (cSt)		Three-phase motor			Single-circuit units suitable as priming pumps ²⁾	
	l/min	l/min			from	to	rated output W	speed min ⁻¹	rated current consumption at 50 Hz 400 V	Order No.	Order No.
ZM 802-2/S2	4 x 0.2	4 x 0.2	50 (75) ¹⁾	p1 ± 5	20	500	550	690	1.83 A	143 012 150	143 012 151
ZM 805-2/S2	4 x 0.45	4 x 0.45								143 012 100	143 012 161

Distribution manifolds for protection of individual lubrication circuits on inquiry.



Type of enclosure IP 54, DIN 40 050

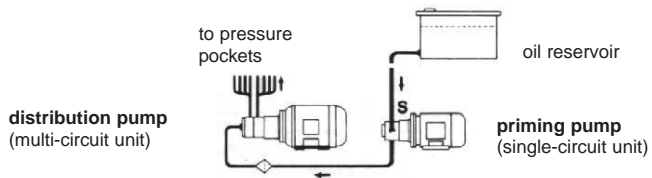
Pay attention to direction of rotation, marked by arrow.

1) Values shown in brackets (): priming pump, on inquiry.

2) The priming pumps shown in the tables are units with foot-flanged motors. For technical data see pages C 27, C 28.

Special notes!

1. Pay attention to direction of rotation, marked by arrow.



2. If the priming pump is mounted separately from the oil reservoir, the suction side of the pump (S) may be connected to a higher mounted oil reservoir (max. 2000 mm).

3. Any delivery ports of the multi-circuit pump (distribution pump) must not be blanked off. The oil delivered through these ports must be returned to the oil reservoir.

For selection of screw unions for port-tube connections see page C42.



Ten-circuit and twenty-circuit units, max 20 bars, with built in priming pump and adjustable pressure regulating valve

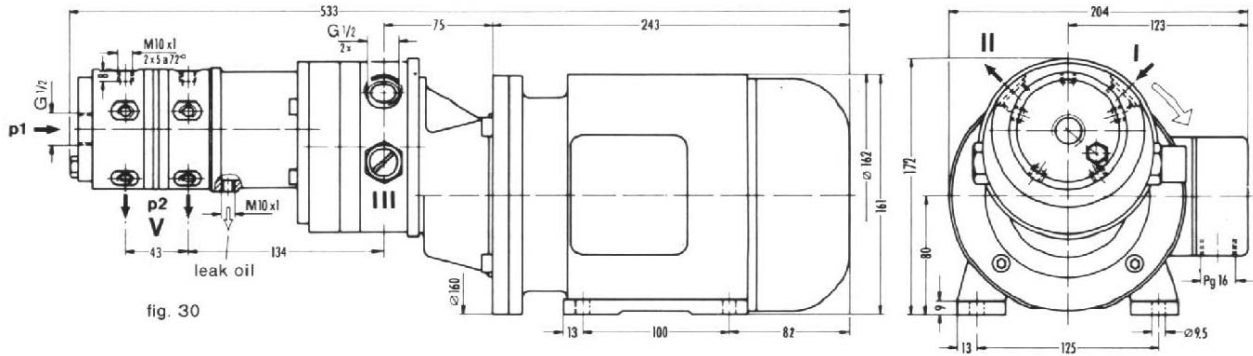


fig. 30

Ten-circuit units

Order No.	Output at V l/min	Pump inlet max. p1 bars	Pressure port max. p2 bars	Permissible operating viscosity range mm ² /s (cSt) from to	Suction head (with open pressure pipeline) mm	Three-phase motor rated output W	speed min ⁻¹	rated current consumption at 50 Hz 400 V
ZM 1035	10 x 0.45	16	20	20 500	500	750	1400	2.0 A

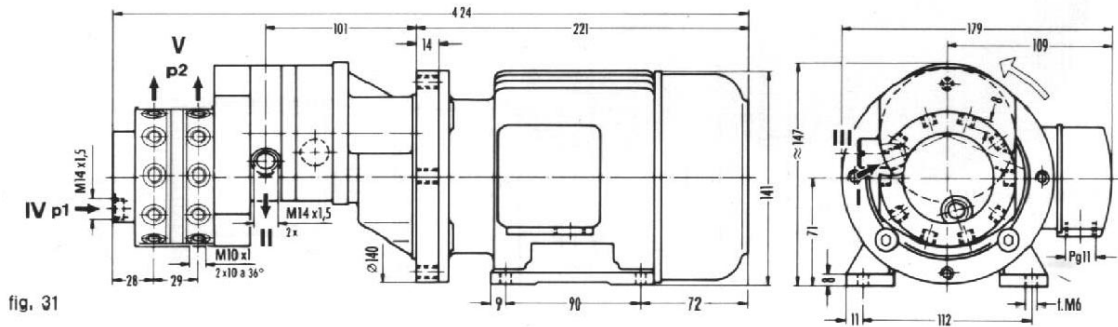
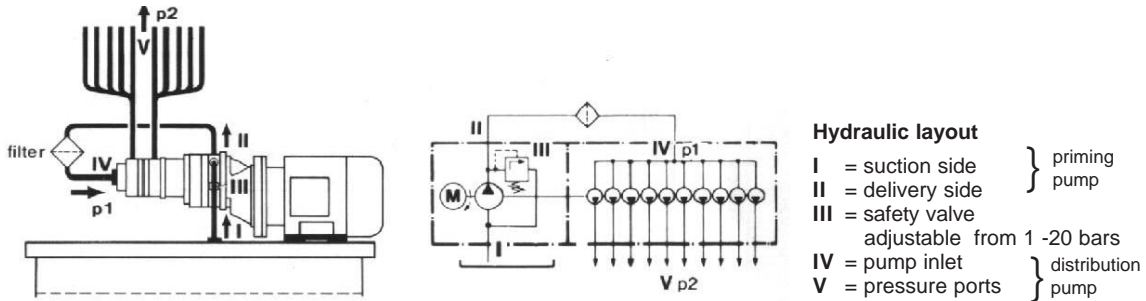
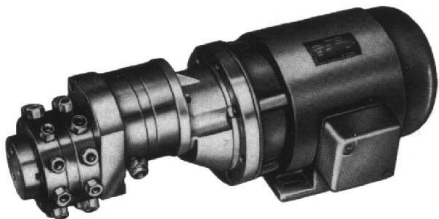


fig. 31

Twenty-circuit units

Order No.	Output at V l/min	Pump inlet max. p1 bars	Pressure port max. p2 bars	Permissible operating viscosity range mm ² /s (cSt) from to	Suction head (with open pressure pipeline) mm	Three-phase motor rated output W	speed min ⁻¹	rated current consumption at 50 Hz 400 V
ZM 2201	20 x 0.025					120	680	0.67 A
ZM 2202	20 x 0.035	18	20	20 500	500	180	915	0.73 A



Type of enclosure IP 54, DIN 40 050

Pay attention to direction of rotation, marked by arrow.

Any delivery ports not required must not be blanked off.

The oil delivered through these ports must be returned to the oil reservoir.

For selection screw unions for port-tube connections see page C 42.

Pump units are also available mounted on oil reservoir. Capacities of reservoirs: 2.7; 6; 15; 50; 100; 200; 400 liters.

Pump units complete with reservoir may comprise the following:

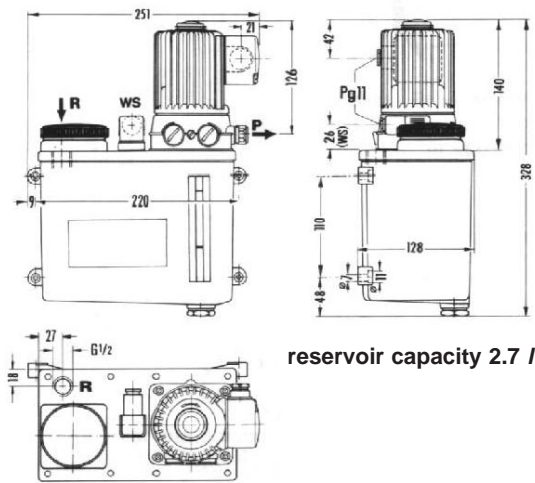
- one or several pump units
- multi-way valves or safety valves
- pressure relief valve (when used for intermittent lubrication)
- filters
- return oil connections (R)
- oil level sight glass
- float switch (WS)
- cooling units
- pressure switch
- thermometer
- flow monitor
- pressure gauge
- pressure gauge protection valve
- pressure gauge selector valve (5 or 10 connections)
- heating elements

Please state your wishes when ordering.

Examples for standard units

The order number is to be completed with the selected *single-* or *two-circuit* unit acc. to pages C 25 and C 26.

Units with metal reservoir



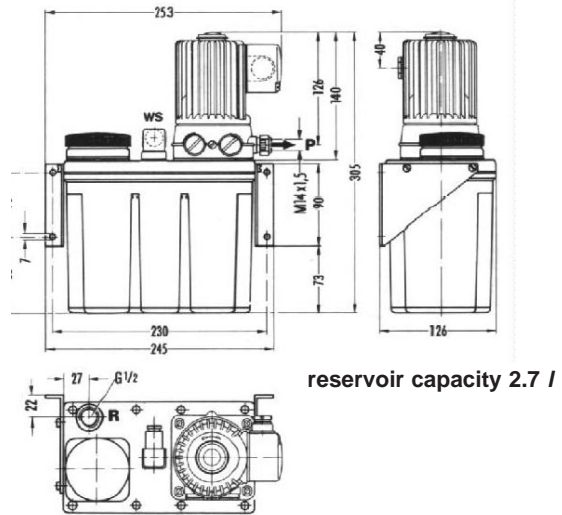
reservoir capacity 2.7 l

fig. 32 No. of the selected unit

Order No. ... /BW .3

Order example: Single-circuit gear pump unit MF 2 with 2.7 l reservoir Order No. MF 2/BW 3

Units with plastic reservoir

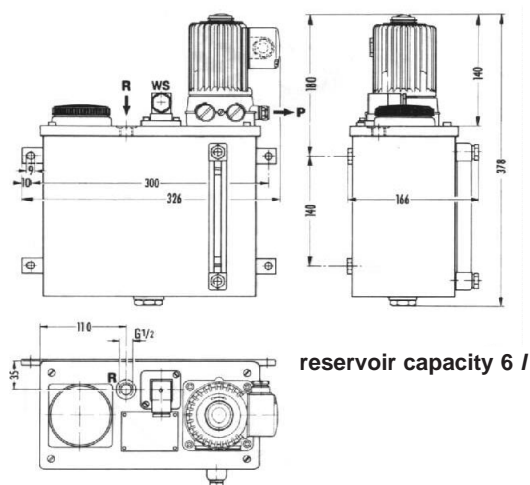


reservoir capacity 2.7 l

fig. 34 No. of the selected unit

Order No. ... /KW 3

Order example: Single-circuit gear pump unit MF 5 with 2.7 l reservoir Order No. MF 5/KW 3

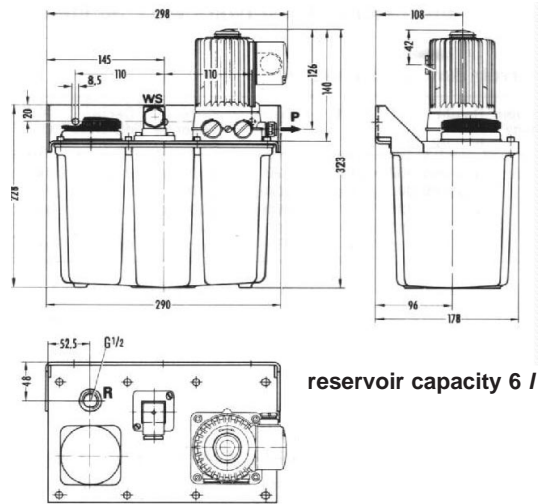


reservoir capacity 6 l

fig. 33 No. of the selected unit

Order No. ... /BW .7

Order example: Single-circuit gear pump unit MF 5 with 6 l reservoir Order No. MF 5/BW 7



reservoir capacity 6 l

fig. 35 No. of the selected unit

Order No. ... /KW 6

Order example: Single-circuit gear pump unit MF 2 with 6 l reservoir Order No. MF 2/KW 6

Example for standard unit

The order number is to be completed with the selected *single-* or *two-circuit* unit acc. to pages C 25 and C 26.

reservoir capacity 15 /

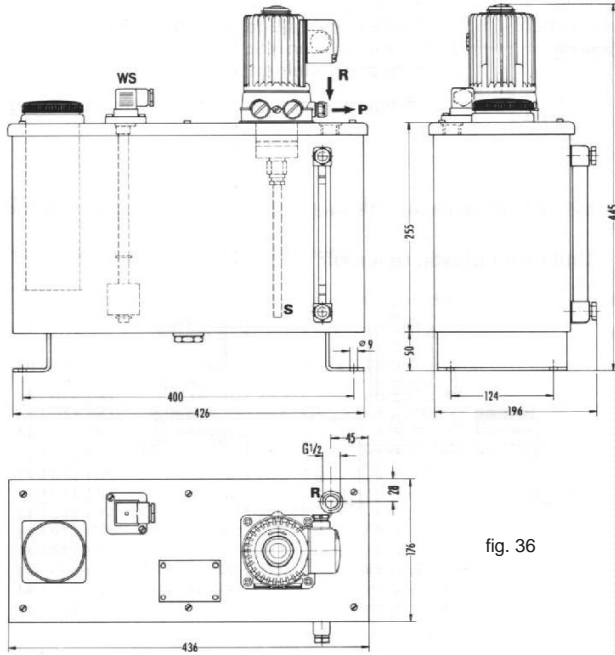


fig. 36

No. of the selected unit

Order No. ... /BW .16

Order example: Two-circuit gear pump unit M 202
with 15l reservoir Order No. M 202/BW 16

Standard dimensions of reservoirs w.e.f. 30 liters.

Reservoir dimensions (in mm)

Reservoir capacity Liters	Height			Width b1	Depth d1	Center distance b2	Center distance d2	Hole distance d2	Hole Ø
	h	h2	h3						
30	375	245	237	510	320	430	240	14	
50	480	310	300	570	350	490	270	14	
100	510	340	326	710	500	630	420	14	
200	650	480	460	880	590	740	460	18	
400	850	650	626	995	711	900	620	18	

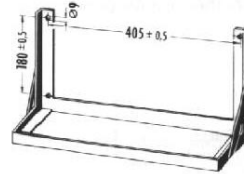
30 and 50 L reservoirs available, also without legs, for wall-mounting.

The complete order number for a "completion according to customer's request" (in accordance with the statements on page C 37) will be laid down when ordering

- ① = oil filler cap
- ② = oil strainer
- ③ = float switch
- ④ = gear or internal gear pump unit
- ⑥ = oil level indication
(oil level, eye, oil level window, oil level gauge)
- ⑦ = oil drain plug

Reservoir and cover: Varnished, hammer finish

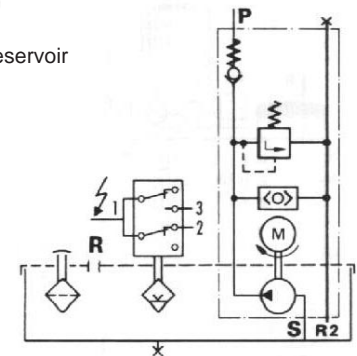
The complete reservoir units are also available according to the regulations of the automobile industry.



support bracket for 15 / reservoir
(for wall mounting)
order No 249 032.10

- P = pressure port
- R = return port
- R2 = return port from safety valve and relief valve
- S = suction pipe
- WS = float switch

depending on order:
WS 32-2: 1 changeover contact
WS 35-2: 1 NO-contact, 1 NC-contact (pre-warning)
Breaking capacity: max. 230 V ~, 0.8 A, 60 VA, 30 W 1)



- 1) When switching inductive consumers, protect contacts by RC elements or install varistors

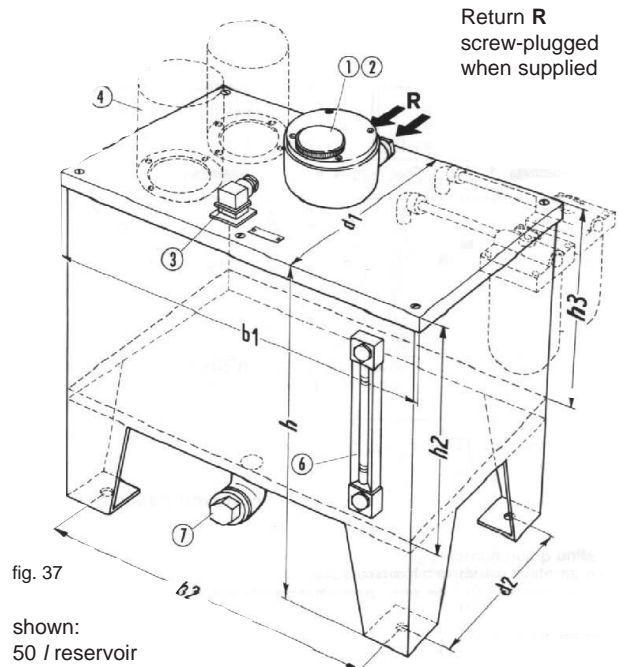


fig. 37

shown:
50 / reservoir

Units complete with reservoir Examples

Unit with reservoir for circulating lubrication

Single-circuit gear pump unit **ZM-12-31** (acc. to page C 27),
 mounted on 15 l reservoir:
Order No. ZM 12/BW 16

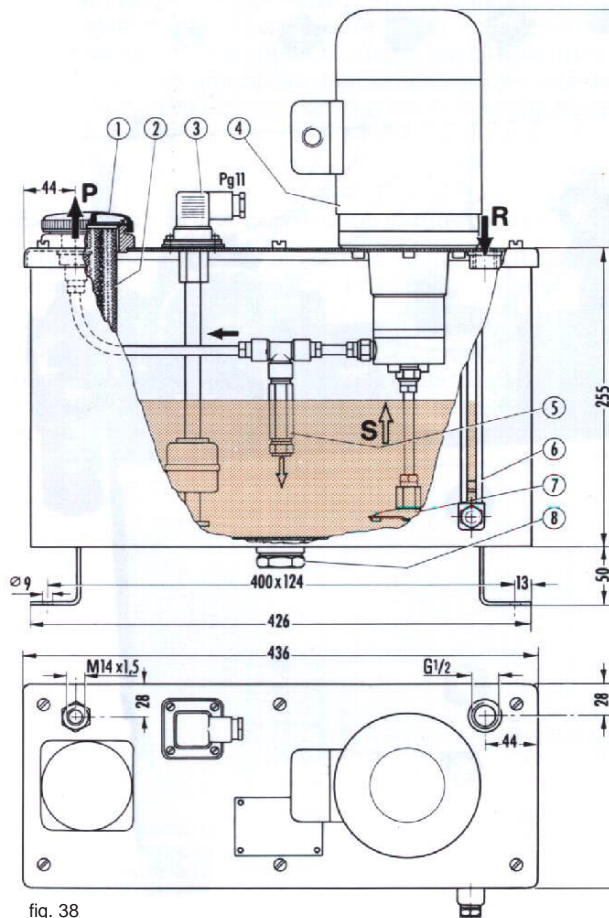
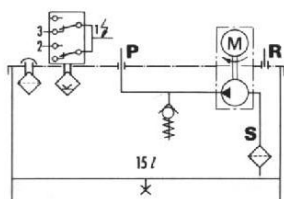


fig. 38

- ① = oil filler cap
- ② = oil strainer
- ③ = float switch WS 35-2
- ④ = gear or Gerotor pump unit
- ⑤ = safety valve
- ⑥ = oil level indicator
- ⑦ = suction strainer
- ⑧ = oil drain plug



S = suction pipe
P = pressure port
R = return line port

The constructions correspond to the regulations of the automobile industry.

Unit with reservoir for pumping off leak oil

Single-circuit gear pump unit **143 012 272**(acc. to page
 C 28), mounted on 15 l reservoir:
Order No. ZR 90/BW 16/S9

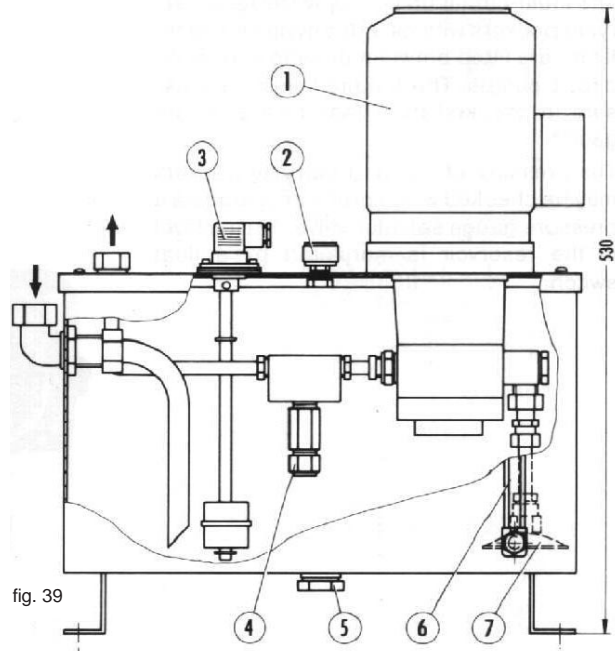


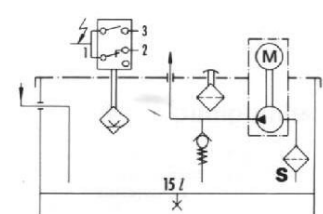
fig. 39

Function of the unit

Collection of leak oil arising and delivery to a central main reservoir.

The built-in float switch WS-33-2 (min./max.) allows automatic draining of the reservoir by means of an external control. The unit is not fitted with a filler socket to avoid topping-up by error.

- ① = Gerotor pump unit
- ② = breathing filter
- ③ = float switch
- ④ = safety valve
- ⑤ = oil drain plug
- ⑥ = oil level indicator
- ⑦ = suction strainer



For **support bracket** for 15 l reservoir (wall-mounting) see page C 38)

Example of a special unit

Specification

The units with 100 l reservoir are designed for the hydrostatic supporting of a revolving table.

The multi-circuit units supply the load-carrying pockets with oil. Edge-type and microfilters are fitted between priming and multi-circuit pumps. The required priming pressure is checked by means of a pressure gauge.

The pressure of the load-carrying pockets may be checked with a pressure gauge via a pressure gauge selector valve. The oil level in the reservoir is monitored by a float switch.

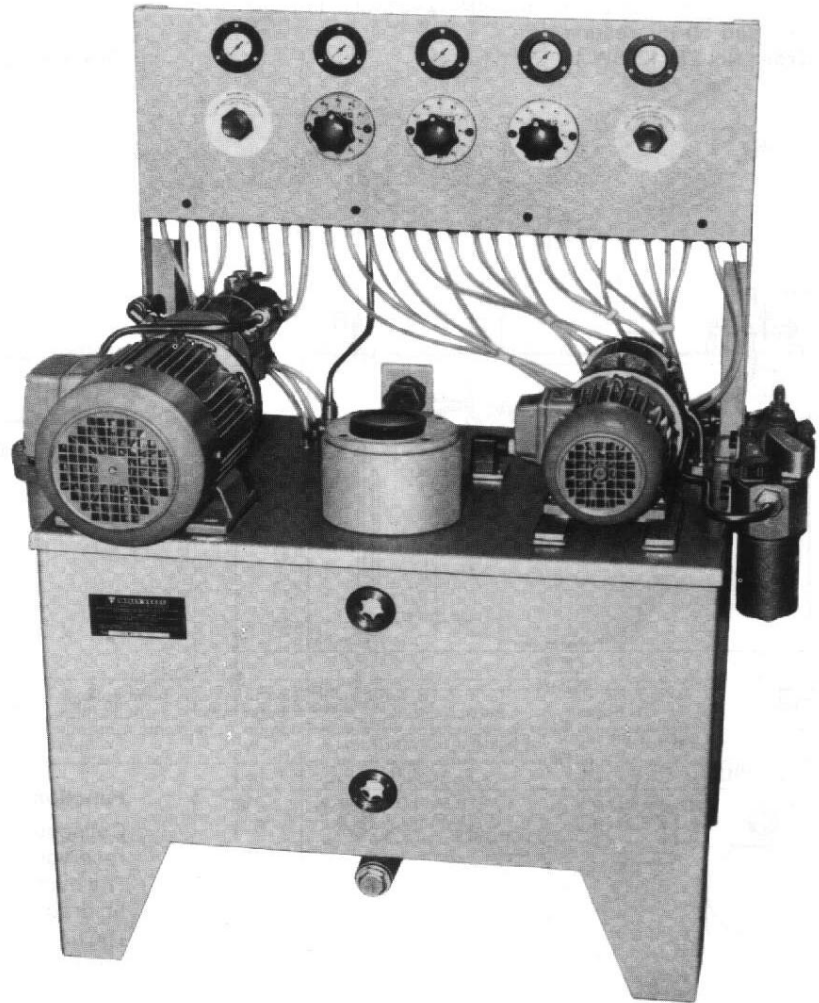


fig. 40

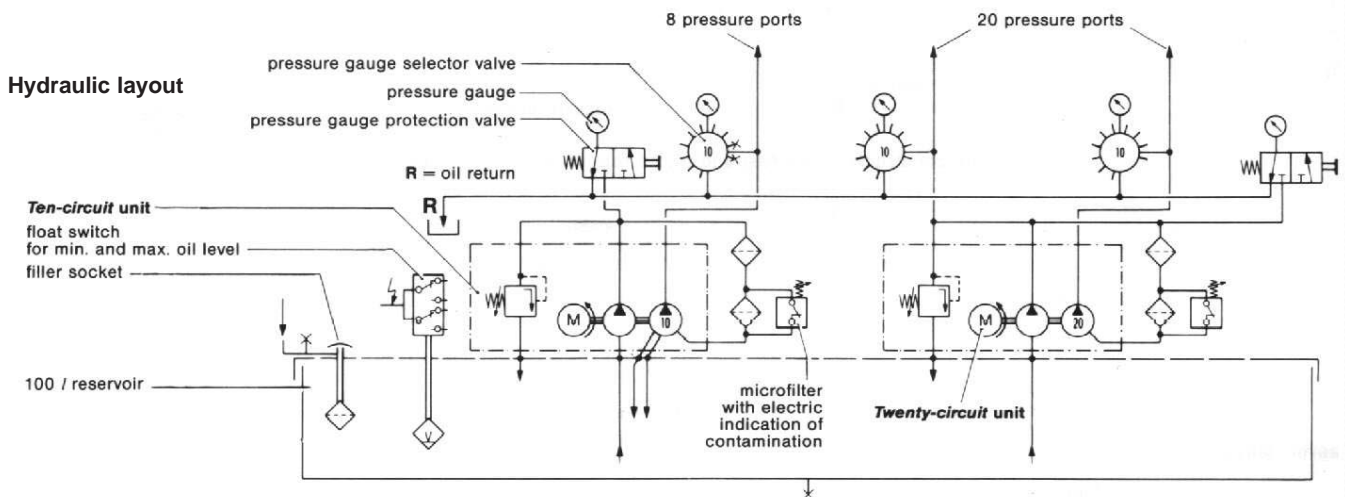


fig. 41

Example of a special unit

Specification

The units complete with 200 l reservoir shown here are designed for four heavy duty bearings of a machine tool.

Type of oil and oil quantity per unit of time have been laid down by the marker of the bearings.

Two Gerotor pump units supply the oil through the filters to the cooling units, which reduce the oil temperature increased by the bearing temperature.

Downstream of the cooling units, the oil flow is evenly distributed by adjustable metering valves. The return oil is monitored by float switches in overflow troughs.

Flanged to the side of the reservoir is a reservoir unit MFE 5/BW 7, which supplies a VOGEL single-line centralized lubrication system.

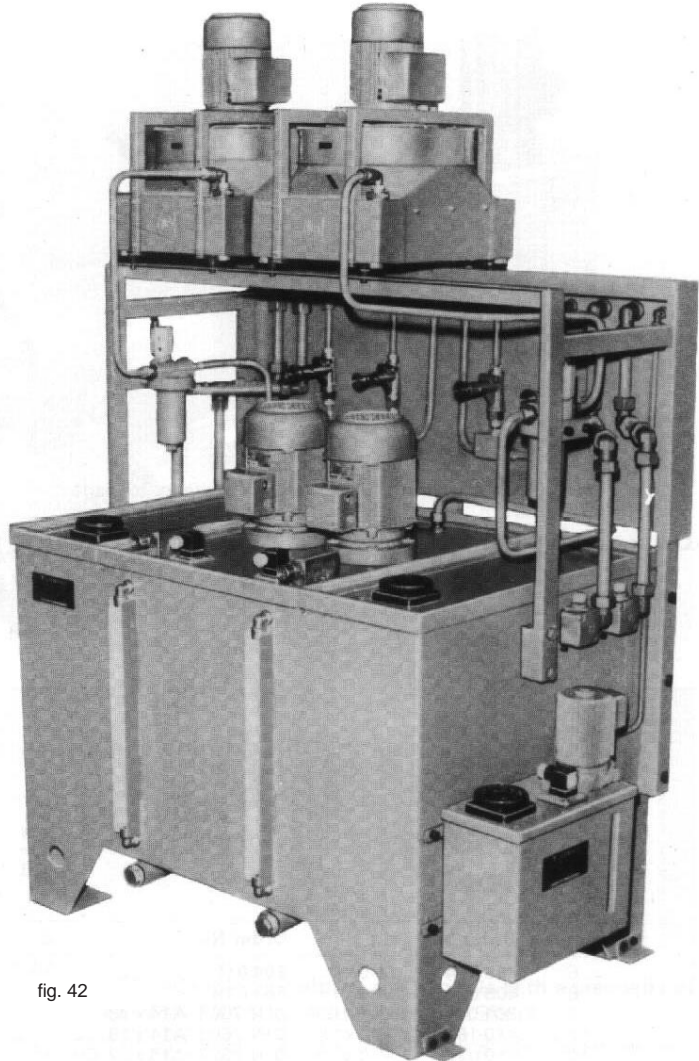


fig. 42

Hydraulic layout

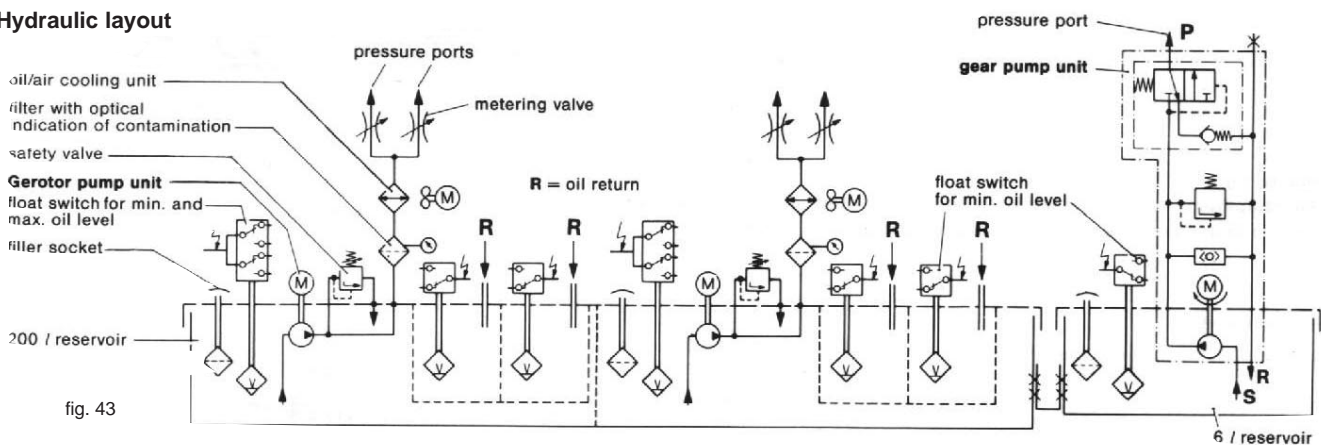


fig. 43

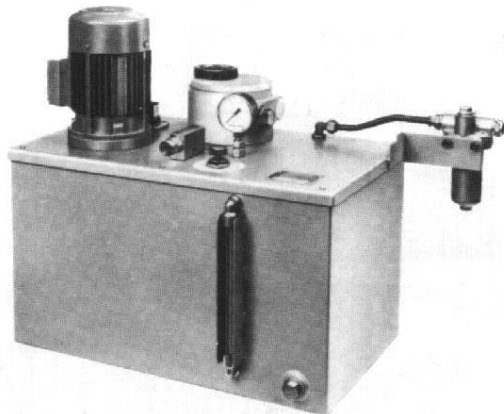


fig. 44

shown:
 Single-circuit Gerotor pump unit **143 012 200** (acc. to page C 28), mounted on 50 l reservoir (without legs).

Order No. **ZR 60 / BW 51 S 21**

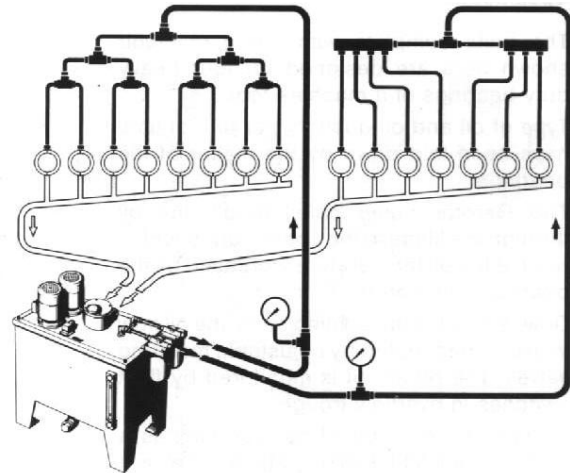


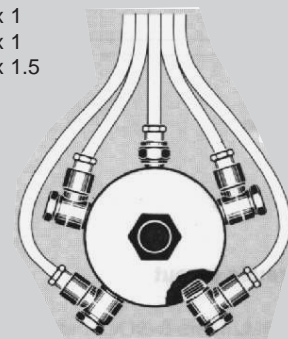
fig. 45

Diagram of a circulating lubrication system with single-circuit units.
 Oil is distributed via restrictor tubes.

Selection of screw unions for port-tube connection



f. diam. tube	Order No.	d	Order No.	d	f. diam. tube	Order No.	d
6	406 004	M10 x 1	504 019	10.2	6	506 140	M10 x 1
8	408 004	M10 x 1	504 019	10.2	8	508 140	M10 x 1
8	301 001	M14 x 1.5	DIN 7603-A14 x 18-Cu	14.2	6	506 142	M12 x 1
10	410 164	M14 x 1.5	DIN 7603-A14 x 18-Cu	14.2	8	508 142	M12 x 1
10	410 018	M18 x 1.5	DIN 7603-A18 x 22 Cu	18.2	8	508 144	M14 x 1.5
6	267 001.17	G1/8	504 019	10.2	6	506 108	G1/8
8	408 154	G1/8	504 019	10.2			
6	406 054	G1/4	508 108	13.3			
8	301 020	G1/4	508 108	13.3			
8	267 001.12	G3/8	DIN 7603-A17 x 21-Cu	17.2			
10	410 171	G1/2	DIN 7603-A21 x 26-Cu	21.1			
12	267 001.15	G1/2	DIN 7603-A21 x 26-Cu	21.2			
12	267 001.16	G3/4	DIN 7603-A27 x 32-Cu	27.3			



Example of tube connection for multi-circuit pumps

Please note:
 All equipment may only be installed and/or mounted by qualified personnel.
 Care is to be taken that safety regulation as valid are observed.

- Leaflet 1200: Gear-, Gerotor- and rotary piston pumps
- Leaflet 5006: Circulating lubrication (metering valves, distribution manifolds, flow control valves, metering valve distributors)
- Leaflet 1201: Gear pump units for centralized lubrication systems with piston distributors
- Leaflet 1203, 1208: Compact units (gear pumps) for centralized lubrication systems with piston distributors
- Leaflet 1702: Float switches
- Leaflet 1700: Control and monitoring units
- Leaflet 1701: Pressure switches
- Leaflet 0103: Fittings and auxiliary equipment (pressure gauges, filters)