Progressive Feeders

1-0107-1-US

for progressive grease and oil systems

Group: **VPB**
Metering rate [ccm]: **0.2**

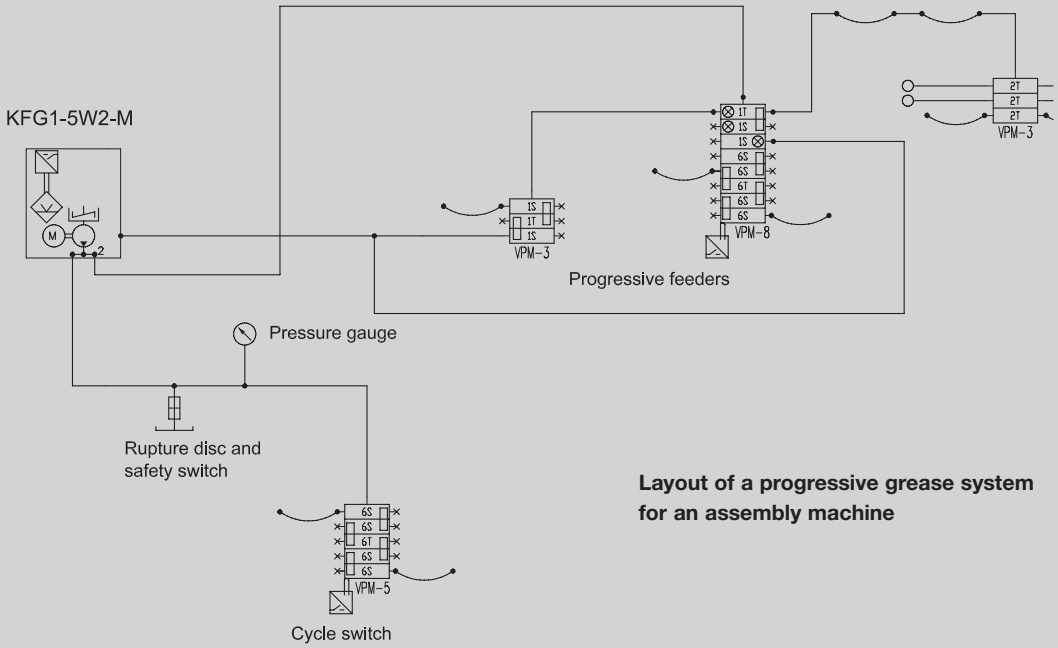
VPK **VP**
0.05 - 0.6 **0.1 - 1.2**

SPVS
0.16 - 0.32

PSG2 **PSG3**
0.06 - 0.84 **0.8-3.2**

Features of progressive systems

- Universally applicable in respect to mode of operation (continuous/intermittent) and lubricants.
- Central monitoring of functioning of all feeder points possible with little effort or expense.
- Max. number of cycles: 200/min (this is used to calculate the maximum possible amount of oil per outlet port in the case of circulating systems).
- Exact apportionment of the lubricant, even when back pressure is encountered at the lube points, thanks to fitted pistons.
- Max. number of lube points roughly 100; several hundred in the case of ring-line systems with in-line metering pumps.
- Possible pressures: 30 - 200 bars in circulating-oil systems
  300 bars in grease systems.



Layout of a progressive grease system for an assembly machine

Quality Management
DIN EN ISO 9001: 2000

Environmental Management
DIN EN ISO 14001

The principle

A progressive system essentially consists of a pump, feeders and a control system.

The amount of lubricant delivered by the pump is fed to the lube points by the individual progressive feeders in keeping with their number of pistons and metering rates.

Function

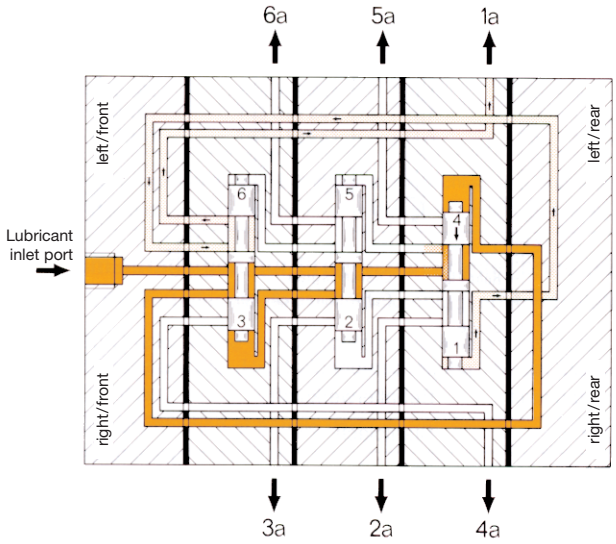
The task of the progressive feeder is to feed pressurized lubricant (grease or oil) to the connected lube points one after another in specified fractional amounts.

The lubricant is dispensed as long as it is fed to the progressive feeder under pressure. The fractional amounts are produced by the motion of the pistons. Two lubricant outlet ports are assigned to each piston at both end positions of the piston's path.

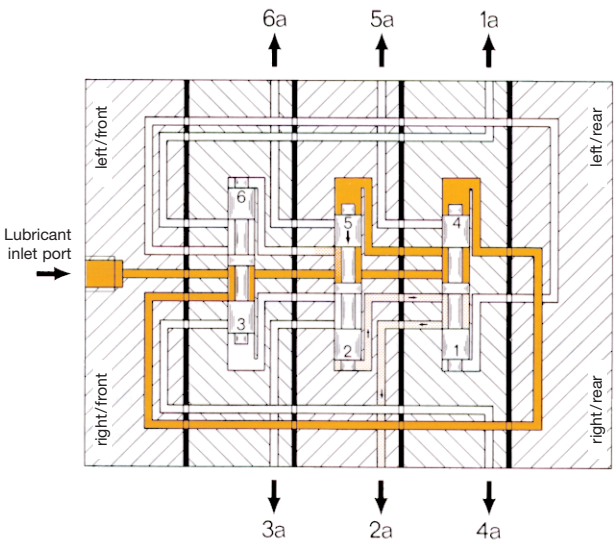
The number of pistons inside a feeder can vary. When lubricant is delivered under pressure, the pistons in a feeder move to their end position one after another. As a result of the piston's motion, the lubricant stored in front of the piston is displaced and fed to the downstream outlet port in a fractional amount.

A piston can begin traveling only after the upstream piston has returned to its end position. If all the pistons are in the left or right end position, defined further travel of the pistons is assured by
interconnecting bores inside the feeder. Once all the pistons have moved to the left or right end position, all the connected lube points have been supplied with the specified amount of lubricant.

The partial amounts of two outlet ports are determined by the diameter and travel of the piston. The required fractional amount is chosen when the feeder is configured. Later changes in the fractional amounts can only be made by converting the feeder.



Piston side **4** is pressurized by the pump, piston side **1** has delivered to outlet port **1a**. Due to the motion of the piston **1/4** the connection between the main line and piston side **5** has been opened.



Piston side **5** is pressurized and piston side **2** discharges via outlet port **2a**. Piston side **6** is the next to be pressurized – etc.

Group	VPB	VPK	VP	SPVS	PSG2	PSG3
Lateral outlet ports	●	●	●	●	●	●
Alternative outlet ports on top	–	–	●	–	●	●
Threaded inlet port	M 10x1 (VPB**M**) or G 1/8 (VPB**G**)	M 10x1 (VPK**M**) or G 1/8 (VPK**G**)	M 14x1,5 (VP**M**) or G 1/4 (VP**G**)	M 12x1 or G 1/8	G 1/4	G 3/8
Threaded outlet port	M 10x1 (VPB**M**) or G 1/8 (VPB**G**)	M 10x1 (VPK**M**) or G 1/8 (VPK**G**)	M 10x1 (VP**M**) or G 1/8 (VP**G**)	M 12x1 or G 1/8	G 1/4	G 1/4
Check valves, integrated	–	–	●	–	●	●
External link (crossporting) possible	●	●	●	–	●	●
Cycle indicator	VPB.-ZY	VPK.-ZY	VP.-ZY	●	●	●
Cycle switch 2-wire version 3-wire version	 177-300-096 177-300-097	 177-300-092 177-300-095	 177-300-091 177-300-094	 ● –	 177-300-091 177-300-094	 – ●
Overpressure indicator	–	–	VP.-UE..	–	VPG-UE..	VPG-UE..
Actuating pressure [bars] min. max.	5 400	5 250	10 250	 100	 200	 200
Number of cycles	200	200	200		200	200
Volume per cycle and outlet [ccm]	0.2	0.05 - 0.6	0.1 - 1.2	0.16 - 0.32	0.06 - 0.84	0.8 - 3.2

Please note
The delivery rate depends on the system and application.
In certain circumstances it can drop to roughly 2/3 of the indicated value.
This has to be taken into account when planning a system.

Apportioning of quantities

Progressive feeders divide up a quantity of lubricant delivered by a pump and feed it to a number of outlet ports in ratios determined by the feeder.

The different amounts discharged in a feeder are achieved by using different piston diameters (but not with VPB feeders) or by combining two or more outlet ports.

The indicated quantities of lubricant result from the piston diameter and the maximum travel of the piston. Depending on the system's configuration, these delivery rates can differ by as much as minus 40 %.

In the case of master-feeder/secondary-feeder systems check valves have to be installed in the outlets on the master feeder if they are not already a constituent part of the feeder.

Sectional feeders comprising groups **VPK, VP and PSG** come with sections for two ports (**T** = Twin) or for one port (**S** = Single). In the case of S-sections the two outlet ports opposite each other are connected internally.

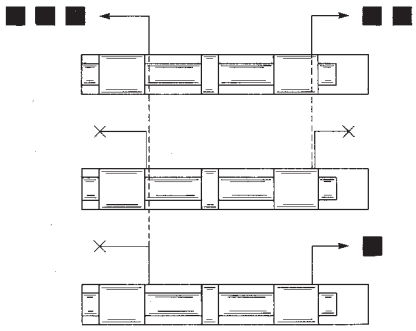
When block feeders comprising Group **VPB** are involved, it is possible to arrive at a single version later on by removing a dummy screw.

Moreover, adjacent outlet ports can also be combined by crossporting bars.

In the case of **VPK** feeders, on the other hand, two adjacent outlet ports can still be combined internally after the feeder has been installed.

Group VPK

Internal link (crossporting) of outlet ports on each side.



Three piston displacements of one side combined with two displacements of the other side to form one respective outlet port.

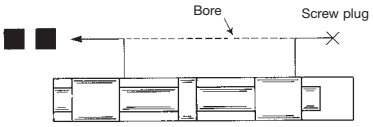
Group VP and VPB

T (**T**win) = two outlet ports

Example: (VP feeders)

2T = 0.2 ccm per outlet
3T = 0.3 ccm per outlet
6T = 0.6 ccm per outlet

S (**S**ingle) = one outlet port

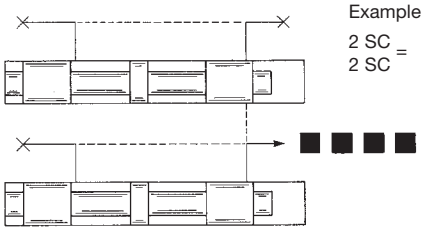


Example :

2S = 0.4 ccm per cycle from one outlet
3S = 0.6 ccm per cycle from one outlet
6S = 1.2 ccm per cycle from one outlet

C (**C**rossporting)

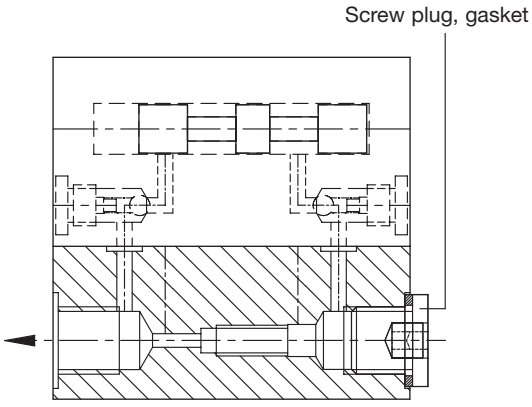
Combing four piston displacements of two sections to form one outlet port.



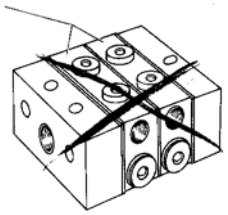
Example :

2 SC
2 SC = 0.8 ccm per cycle from one outlet

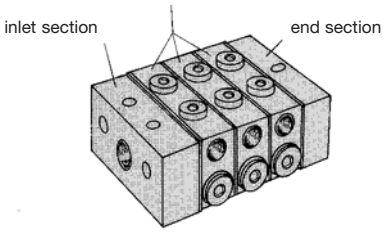
Group PSG



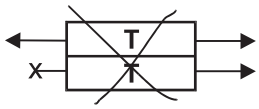
Wrong!
2 feeder sections won't work!



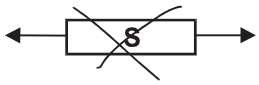
Right!
At least 3 feeder sections!



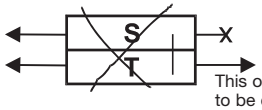
Second outlet port must **not be closed on T**-sections.



S-section can supply only **one outlet port exactly**!

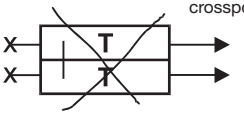


Plug and outlet side can be interchanged with each other.



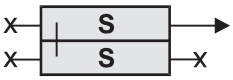
This outlet port has to be closed since crossporting is involved!

When two T-sections are connected by crossporting, one outlet must be **open** on the crossporting side!



Two external crossporting bars (1 **T**-, 1 **S**-section)

One external crossporting bar (2 **S**-sections)

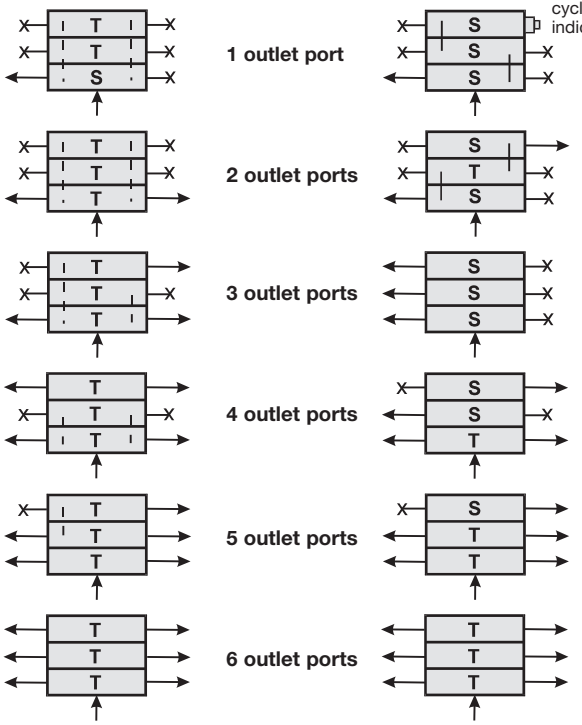


If you want to combine 2 sections (4 outlets) to form **one** outlet port, you can do it **this way** ..... but it's better **this way**!

Example of possible variations for 1 to 6 lube points on one 3-section feeder

Group VPK

Groups VP, VPB, PSG

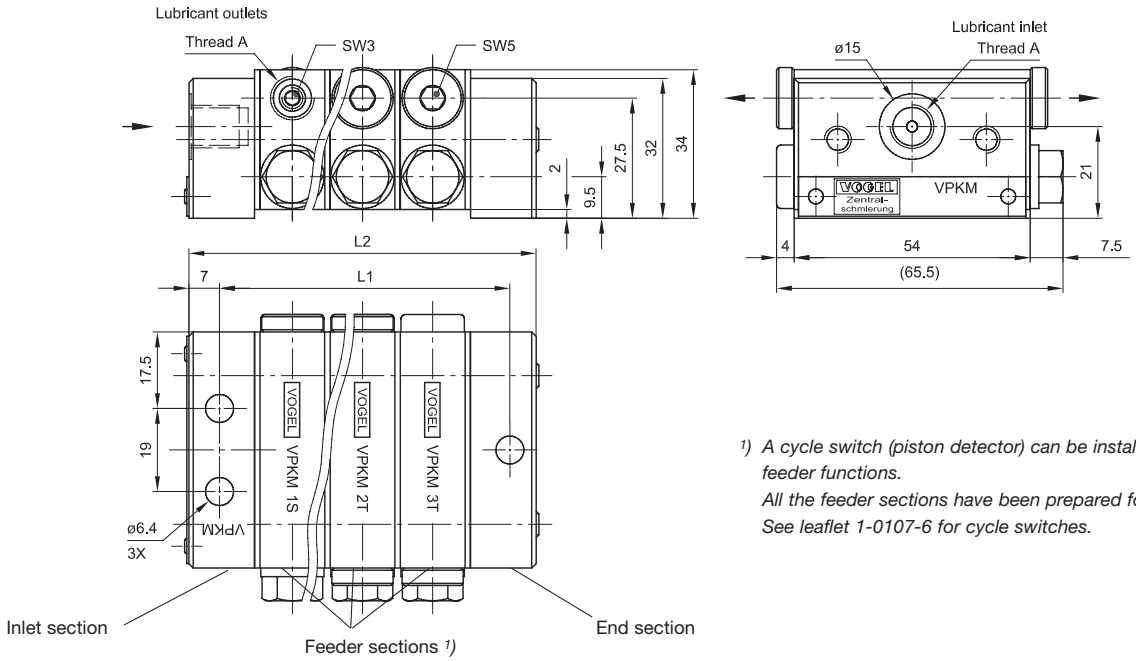


Group VPK

- **Without alternative outlet ports, in contrast to Groups VP and PSG, but with possibility to combine adjacent outlet ports internally.**

Actuating pressure: min. 5 bars / max. 250 bars

Max. permissible degree of oil contamination
to ISO 4406: class 17/14
to NAS 1638: NAS 8
Recommendation: filter with minimum retention rate of $\beta_{10} \geq 75$



1) *A cycle switch (piston detector) can be installed to monitor feeder functions.*
All the feeder sections have been prepared for cycle switches.
See leaflet 1-0107-6 for cycle switches.

With **metric** thread **Order No.**	A	With **Whitworth** pipe threads **Order No.**	A	Number of feeder sections	Number of poss. outlets	Dimensions [mm] l1 2)	l2
VPKM-3		**VPKG-3**		3	6	66.5	79.5
VPKM-4		**VPKG-4**		4	8	82.5	95.5
VPKM-5		**VPKG-5**		5	10	98.5	111.5
VPKM-6	M10x1	**VPKG-6**	G 1/8	6	12	114.5	127.5
VPKM-7		**VPKG-7**		7	14	130.5	143.5
VPKM-8		**VPKG-8**		8	16	146.5	159.5
VPKM-9		**VPKG-9**		9	18	162.5	175.5

The order No. has to be supplemented with the designation of the feeder sections, the sequence starting with the inlet section.

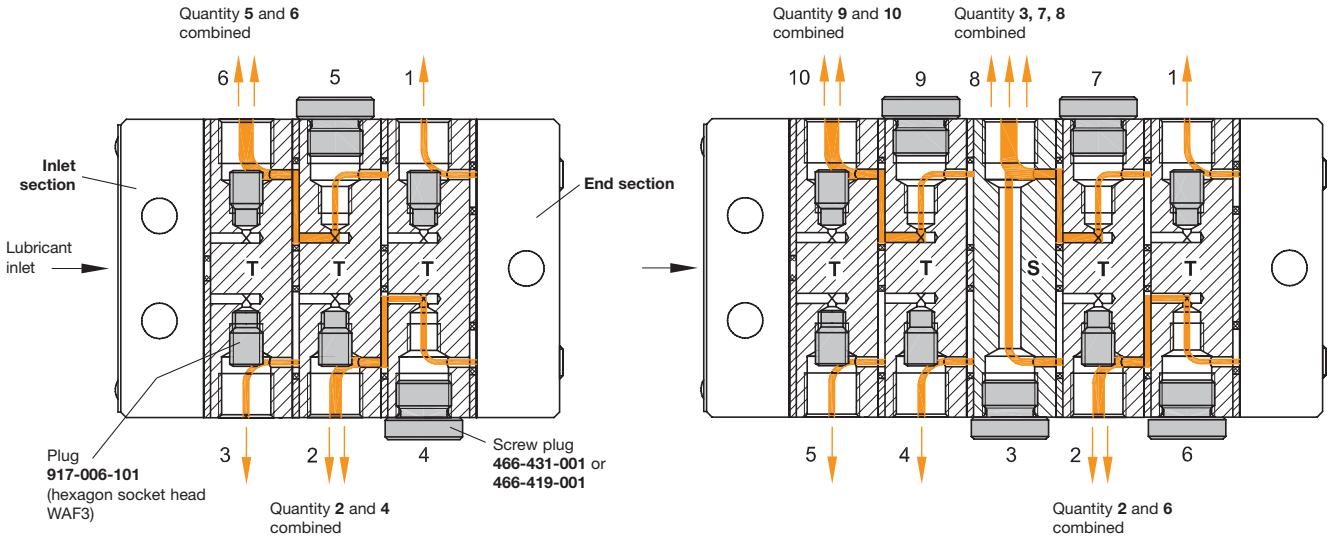
Order examples for the illustrated feeder:
VPKM-3-1S-2T-3T (with metric thread)
VPKG-3-1S-2T-3T (with Whitworth pipe thread)

2) *The spacing of the holes used to fasten the feeders can deviate from the indicated dimensions due to individual tolerances of the sections. It is therefore advisable to bore the fastening holes on the installation surface.*

Apportionment of quantities

Quantity per cycle and outlet [ccm]	Number of outlets	**Designation of sections**
0.05	2	**05T**
0.1	2	**1T**
0.2	2	**2T**
0.3	2	**3T**
0.1	1	**05S**
0.2	1	**1S**
0.4	1	**2S**
0.6	1	**3S**

Examples of how several adjacent outlet ports can be combined



Two adjacent outlet ports are combined in the direction leading from the end section to the inlet section, and, namely, by first screwing the respective 917-006-101 plug out of the outlet port closest to the end section and closing the outlet bore with a screw plug [1]). The quantity of both outlet ports then emerges from the adjacent outlet port in the direction of the inlet section. **Please note: the feeder section downstream of the inlet section must not be closed!**

NB!

Always make absolutely sure that the 917-006-101 plug has been removed before the screw plug [1]) is screwed in, as otherwise the feeder would be blocked.

In this way it is possible to combine the outlet ports of a whole feeder side, provided there is no S-section between them. The S-section completes the formation of a group; a new group can only be formed again behind the S-section.

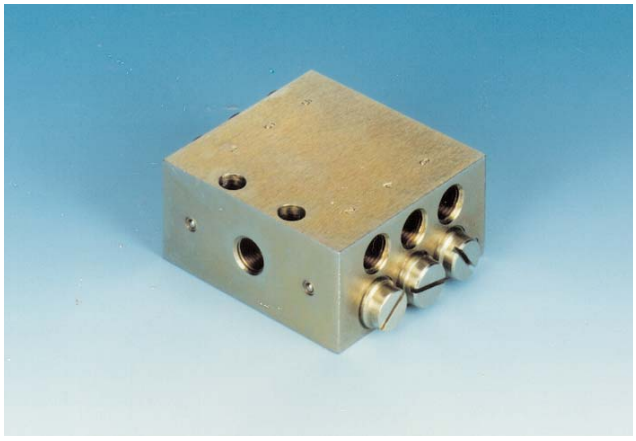
If it later turns out that the quantities of two adjacent outlet ports have to be separated again because, for instance, a lube point has been added, that can be done without further ado. It is only necessary to screw plug 917-006-101 back in again and connect the hitherto closed outlet port to the new lube point.

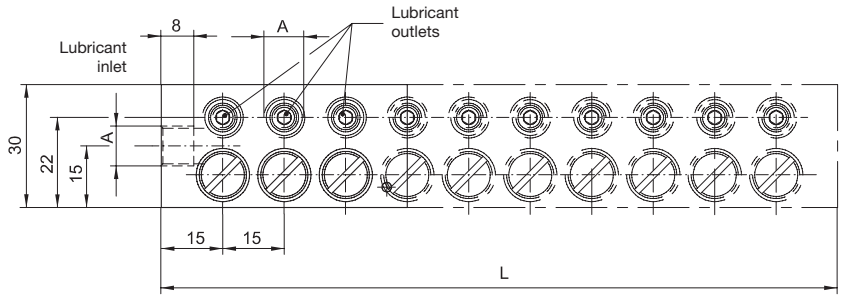
*[1]) **Screw plug** **466-431-001** with VPK**M** feeders,*
***466-419-001** with VPK**G** feeders*

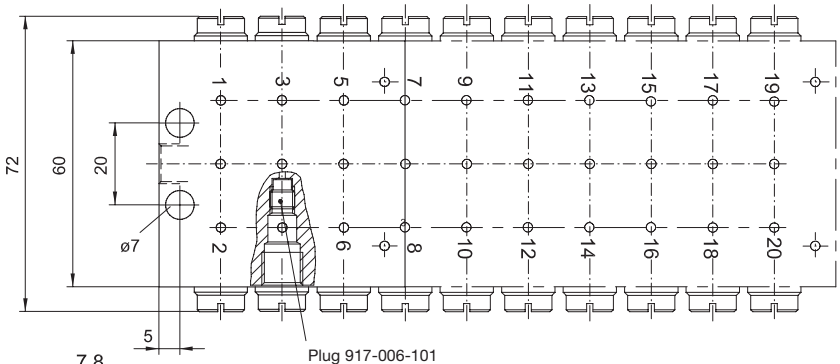
Group VPB

- Modular system, smallest feeder group, primarily for grease-lubricated machines and installations.
- Uniform metering rate: 0.2 ccm
- Possible to connect two opposite outlet ports at a later date by screwing the stopper out of the right-hand outlet bore (outlet bores on top as viewed from lubricant inlet) and closing one of the two outlet ports.
- Combination of two or more adjacent outlet ports by external crossporting bars.
- Without built-in check valves.
- Without alternative outlet ports.

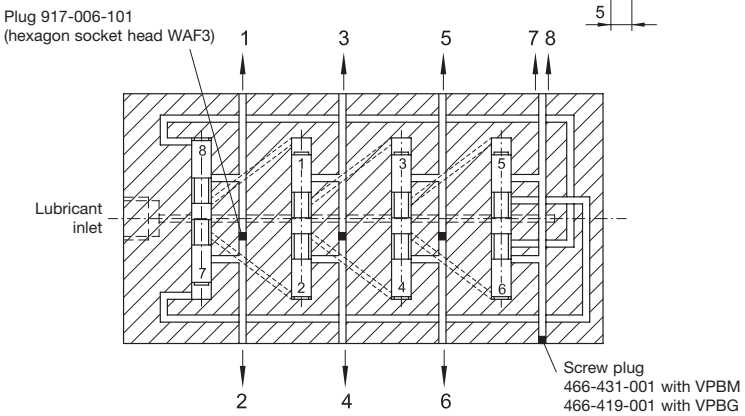
Actuating pressure: min. 5 bars; max. 400 bars







Functional diagram



With **metric** threads **Order No.**	A	With **Whitworth** pipe threads **Order No.**	A	Number of outlet pairs (pistons)	Number of poss. outlets	l [mm]
VPBM-3	M10x1	**VPBG-3**	G 1/8	3	6	60
VPBM-4		**VPBG-4**		4	8	75
VPBM-5		**VPBG-5**		5	10	90
VPBM-6		**VPBG-6**		6	12	105
VPBM-7		**VPBG-7**		7	14	120
VPBM-8		**VPBG-8**		8	16	135
VPBM-9		**VPBG-9**		9	18	150
VPBM-10		**VPBG-10**		10	20	165

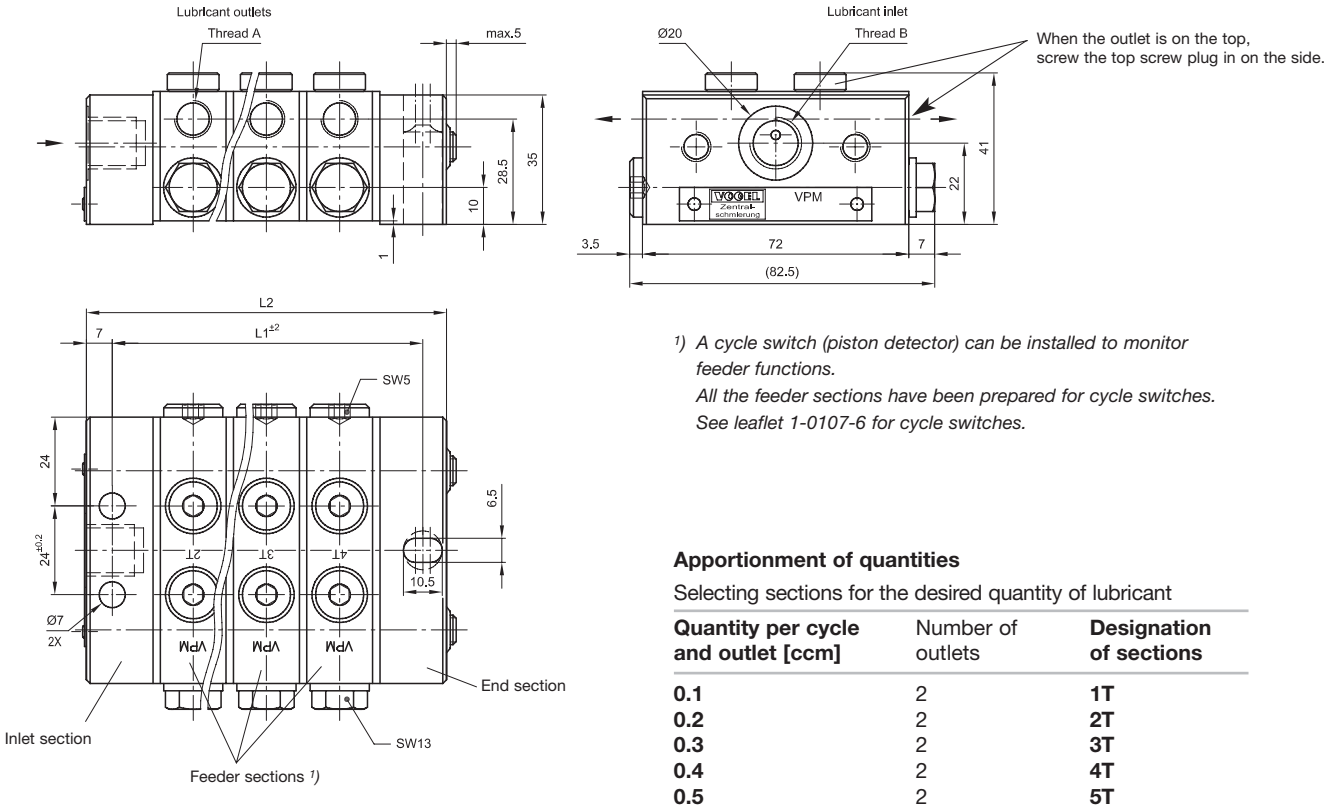
Group VP

- **Each section with a lateral and top outlet port per side.** But only one outlet can be connected at any one time, the second has to be closed by either a screw plug or overpressure indicator. If necessary, crossporting bars can also be connected to the top outlet ports.
- **With built-in check valves,** in order to avoid mutual pressurization of the piston chambers, especially in the case of intermittently operated grease systems.

  If the check valves are not required, they have to be removed by the customer.

Actuating pressure: min. 10 bars / max. 250 bars

Max. permissible degree of oil contamination
to ISO 4406: class 17/14
to NAS 1638: NAS 8
Recommendation: filter with a minimum retention rate of $\beta_{10} \geq 75$



1) A cycle switch (piston detector) can be installed to monitor feeder functions.
All the feeder sections have been prepared for cycle switches.
See leaflet 1-0107-6 for cycle switches.

The order No. has to be supplemented with the designation of the feeder sections, the sequence starting with the inlet section.

Order examples for the illustrated feeder:
VPM-3-2T-3T-4T (with metric thread)
VPG-3-2T-3T-4T (with Whitworth pipe thread)

Apportionment of quantities

Selecting sections for the desired quantity of lubricant

Quantity per cycle and outlet [ccm]	Number of outlets	**Designation of sections**
0.1	2	**1T**
0.2	2	**2T**
0.3	2	**3T**
0.4	2	**4T**
0.5	2	**5T**
0.6	2	**6T**
0.2	1	**1S***
0.4	1	**2S***
0.6	1	**3S***
0.8	1	**4S***
1.0	1	**5S***
1.2	1	**6S***

**) Here the 2 outlet ports of a feeder section are combined.*

With **metric** threads **Order No.**	A	B	With **Whitworth** pipe threads **Order No.**	A	B	Number of feeder sections	Number of poss. outlets	Dimensions [mm] l1	l2
VPM-3			**VPG-3**			3	6	84	98
VPM-4			**VPG-4**			4	8	104	118
VPM-5			**VPG-5**			5	10	124	138
VPM-6	M10x1	M14x1.5	**VPG-6**	G 1/8	G 1/4	6	12	144	158
VPM-7			**VPG-7**			7	14	164	178
VPM-8			**VPG-8**			8	16	184	198
VPM-9			**VPG-9**			9	18	204	218

Group SPVS

These feeders are used for general oil and grease lubrication systems and have the task of apportioning the lubricant in uniform quantities to a number of lube points.
They are used to expand the number of outlet points on a lubrication pump or, in the case of a circulating oil system (gear pump), to divide up the volumetric flow – without influencing the operating pressure – and feed it to the lube points.

Oil and grease of various viscosities and/or penetration can be used. But limits on the flow rate and/or tubing diameters have to be taken into consideration. The grease used should be approved by Willy Vogel AG.

The block feeder is available with 2 or 4 outlet ports, with or with-out stroke control.

The feeders are supplied without inlet and outlet connectors. The threaded holes are closed by plastic stoppers.

Inlet and outlet port connectors as well as fastening parts have to be ordered separately. See page 12 for ordering details.

Technical data

General data

Type	hydraulically controlled block feeders
Number of outlets	2, 4
Mounting position	any
Ambient temperature	–10 to +100 °C

Electrical data

Connection	plug connector
Max. switching voltage	250 V AC / DC
Max. switching current	0.02 A
Max. switching capacity.	5 VA
Load contact	1 NO type
Type of contact	reed contact [1])
Type of enclosure	IP 65 [2])

[1]) For protective relays see DSK 0-050-00 E

[2]) Explosion-proof version only in conjunction with transistor relays

Hydraulic data

Max. operating pressure	100 bars
Lubricant temperature	–10 to +100 °C
Max. perm. differential pressure at any two outlet ports	20 bars with oil 30 bars with grease
Lubricant	mineral oil, synthetic oil grease
Operating viscosity	≥ 12 mm^2/s
Worked penetration	≥ 265 · 0.1 mm
Max. volumetric flow, inlet port	45 ccm/min
Volumes per cycle and outlet	0.32 ccm (SPVS25…) 0.16 ccm (SPVS1…)

How they function

The lubricant delivered by the pump passes through the inlet port into the feeder and flows through the light-colored ducts into the individual outlet chambers.

The piston presses the lubricant out of the respective outlet chamber through the dark-colored ducts to the individual outlet ports.

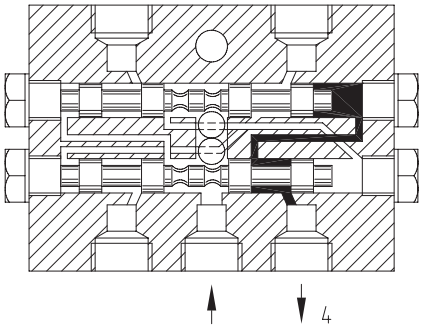


Fig. 1

Figure 1

The lubricant flows to the upper left outlet chamber and shoves the piston to the right. As a result, the lubricant is pressed out of the upper right outlet chamber to outlet port 4, and the balls are displaced in such a way that they block the lower piston.

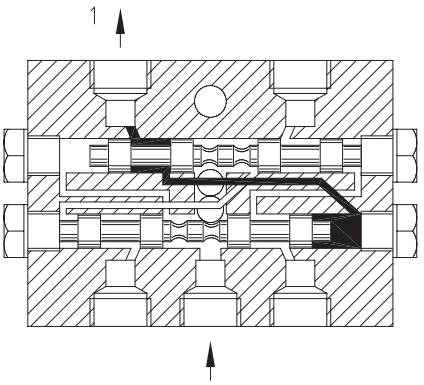


Fig. 2

Figure 2

The lubricant flows to the lower left outlet chamber and shoves the piston to the right. As a result, the lubricant is pressed out of the lower right outlet chamber to outlet port 1, and the balls are displaced in such a way that they block the upper piston.

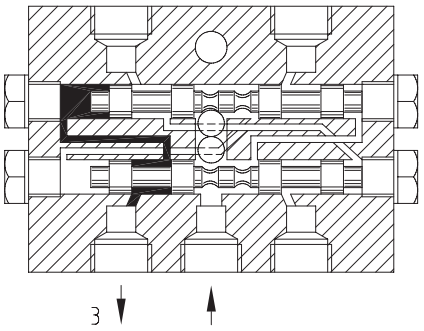


Fig. 3

Figure 3

The lubricant flows to the upper right outlet chamber and shoves the piston to the left. As a result, the lubricant is pressed out of the upper left outlet chamber to outlet port 3, and the balls are displaced in such a way that they block the lower piston.

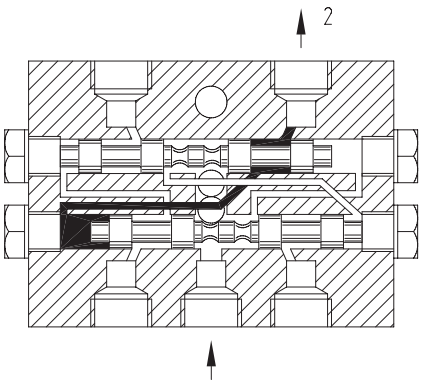


Fig. 4

Figure 4

The lubricant flows to the lower right outlet chamber and shoves the piston to the left. As a result, the lubricant is pressed out of the lower left outlet chamber to outlet port 2, and the balls are displaced in such a way that they block the upper piston (cf. Fig. 5).

This sequence is constantly repeated on a forced basis (progressive).

The advantage of sequential phase control:
If just one single outlet port is closed, the entire feeder is blocked.

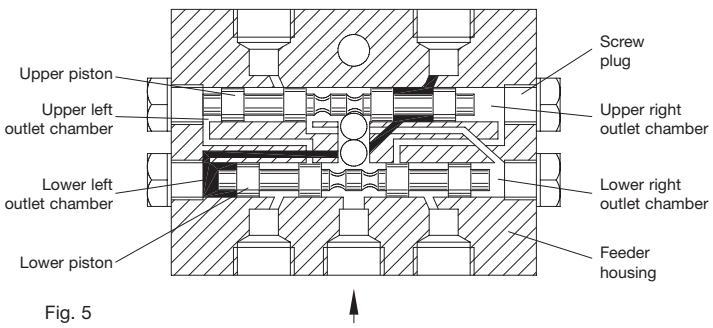


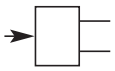
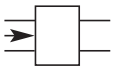
Fig. 5

Figure 5

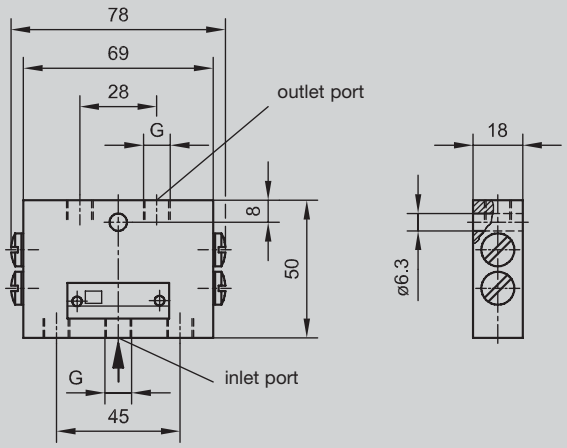
The upper piston is held fast by the two balls until the lower piston has reach its end position on the left. As a result, forced, uniform apportionment of the delivered lubricant is achieved.

Please note: in the case of feeders with two outlet ports, outlet ports 1 and 3 as well as 2 and 4 are internally combined; only outlet ports 1 and 2 are effective.

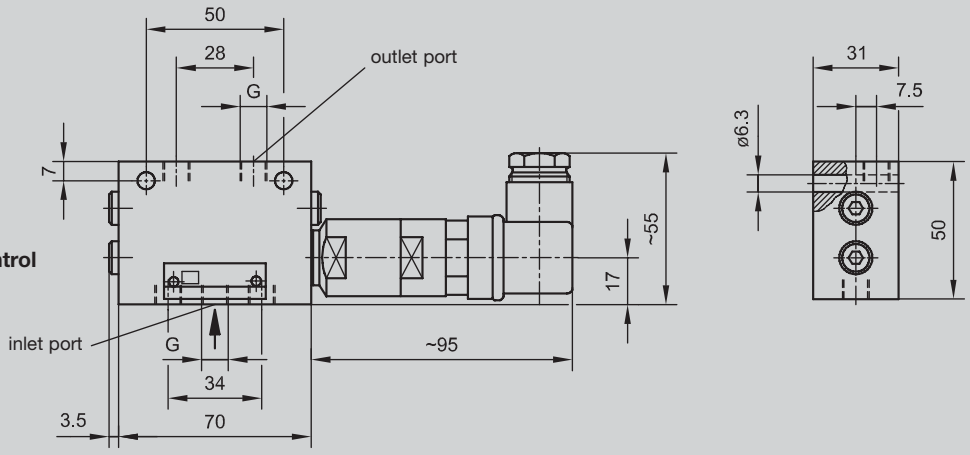
The mode of operation is identical for feeders with 2 or 4 outlet ports.

Number of outlets	Location of outlets	G	Stroke control	Housing material	Weight [kg]	Stock designations	**Order No.**
2		G 1/8	without	St	0.45	SPVS 25-2-ST-G1/8Z	**44-2578-6321**
		M12x1	without	CuZn	0.46	SPVS 25S1Z-2-MS-M12x1	**44-2578-6110**
		G 1/8	electrical	GGC 25		SPVS 25-2-A-G1/8Z	**44-2578-6360**
		G 1/8	optical	GGC 25		SPVS 25-2-B-G1/8Z	**44-2578-6361**
4		G 1/8	without	St	0.45	SPVS 1-4-ST-G1/8Z	**44-2578-6323**
		M12x1	without	CuZn	0.46	SPVS 1S9Z-4-MS-M12x1	**44-2578-6201**
		G 1/8	electrical	GGC 25		SPVS 1-4-A-G1/8Z	**44-2578-6350**
		G 1/8	optical	GGC 25		SPVS 1-4-B-G1/8Z	**44-2578-6351**

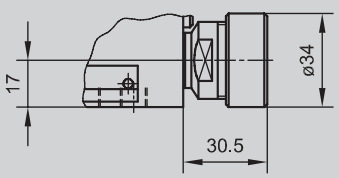
Version without stroke control



Version with electrical stroke control



Version with optical stroke control



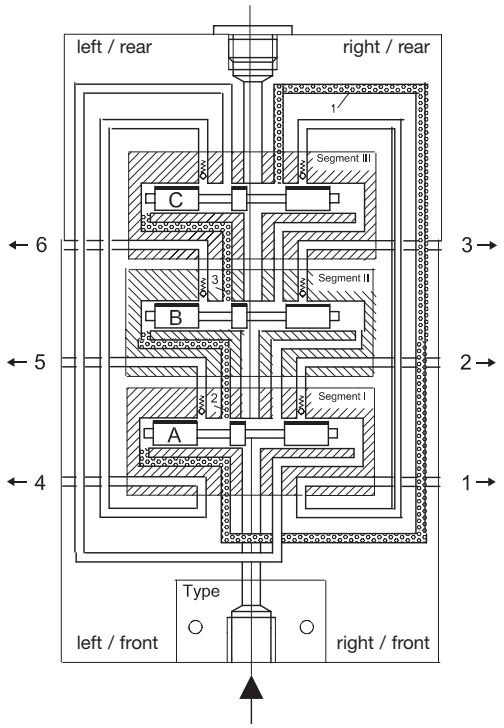
Group PSG

In contrast to sectional feeders, the lubricant outlet ports are located beneath the respective piston in the case of modular feeders, which greatly simplifies this feeder's allocation and use. Moreover, the feeder's inlet port as well as all its outlet ports are accommodated in a baseplate, the length of which is determined by the number of mounted elements, the dummy modules included.
As a result, it is possible – without loosening the screwed tubing connections on the outlet ports – to exchange all the modules independent of each other.

Opposite outlet ports (identical volumetric flow) can be combined internally and adjacent outlet ports externally with the help of bridges over 2 or 3 outlet ports.

The feeders are available with a maximum of 20 outlet ports.

All the modules come with integrated check valves. As a result, high functional reliability, apportioning accuracy as well as self-venting are achieved, especially when different back pressures are involved.



How modular feeders work

If one looks at the sequence of motions beginning at the moment all three pistons (A, B, C) are at their left end stops, it can be seen that the lubricant, and thus the operating pressure, makes its way from the inlet port via the through-duct in the middle to pistons C-right, B-right and A-left; i.e. while pistons C and B keep their position, piston A is shoved to the right. In the process, the volume of lubricant determined by the piston's diameter and travel is pressed into a duct, at the end of which (outlet port 4) the same amount is discharged. Several control ducts were closed or opened with this stroke of piston A. Control duct 2 is now open. The lubricant makes its way through the same to piston B-left and slides the same to the right. The corresponding volume of metered lubricant is pressed into the outlet duct and emerges at outlet port 2. The stroke of piston B has, for its part, now closed or opened control ducts once again. So control duct 3 is now open. The pressure of the lubricant moves piston C to the right, thus shoving the respective metered quantity into the duct to outlet port 3. This displacement of piston C opens, among others, the reversing duct, which again connects the through-duct to piston A-right.

Pistons A, B and C now move to the left again one after another, analogous to the piston motions described.

Remarks on configuring the PSG

The main criterion is the number of strokes. They should be kept as low as possible to likewise keep pressure losses, wear and noise low.

Dummy modules

Dummy and functional modules can be varied at will within the constraints of their size (but at lease 3 functional elements are required per baseplate).

If dummy modules are installed, two lubricant outlet ports in the baseplate must by all means be respectively closed (cf. page 14). If 2 dummy modules are located next to each other or if dummy modules are used as the first or last module, greater pressure losses must be reckoned with.

Combining outlet ports

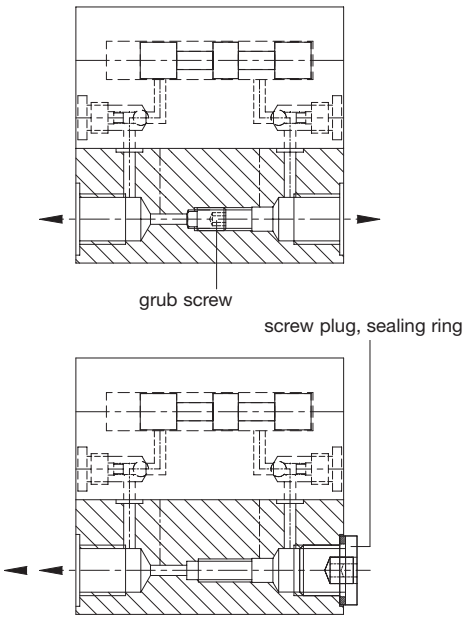
The volumetric flow of an outlet port can be doubled by combining two opposite ports internally (cf. illustration below). For this purpose the grub screw (hexagon socket head WAF 3), as viewed in the direction of the feeder inlet port, has to be screwed out through the right-hand outlet port in the baseplate.

The unneeded outlet port in the baseplate then has to be closed with a sealing ring and screw plug.

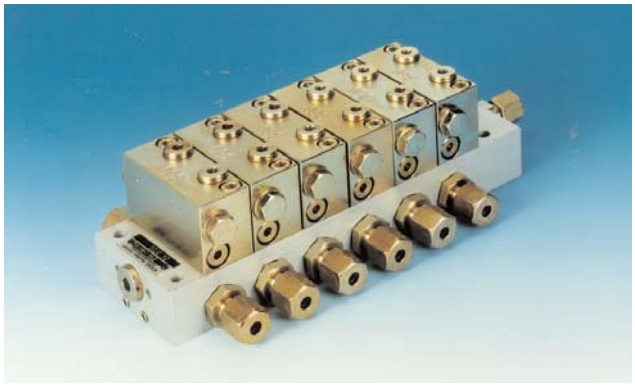
Adjacent outlet ports can be combined by external bridges.
A bridge can optionally combine two or three outlet ports.

To permit combinations involving an internal connection and a bridge, it is possible to use bridges with or without an outlet port (G 1/4).

Please note: do not combine the first module (viewed in the direction of the feeder inlet port).



Modular feeder PSG 2



Number of modules	A [mm]	B [mm]	C [mm]	Weight [kg]
3	131	103	2 x 28 = 56	1.9
4	159	131	3 x 28 = 84	2.4
5	187	159	4 x 28 = 112	3.0
6	215	187	5 x 28 = 140	3.6
7	243	215	6 x 28 = 168	4.1
8	271	243	7 x 28 = 196	4.8
9	299	271	8 x 28 = 224	5.4
10	327	299	9 x 28 = 252	6.0

Technical data

General data

Type	hydraulicaly controlled modular feeder
Mounting position	any [3]
Ambient temperature	–15 to +110 °C
Baseplate, outlet ports	6, 8,10,12,14, 16, 18, 20
Used outlet ports	2 to 20

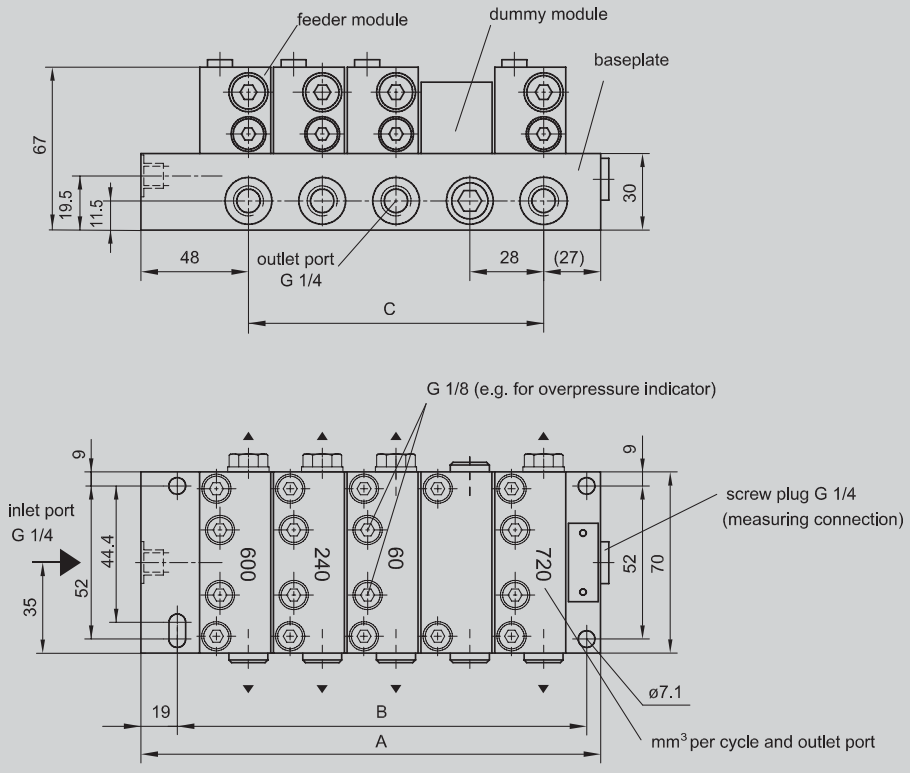
Hydraulic data

Max. operating pressure	200 bars
Volumetric inlet flow	up to 2.5 l/min
Volume per cycle and outlet	0.06; 0.12; 0.24; 0.36; 0.48; 0.60; 0.72; 0.84 ccm
Division ratio	1 : 1 to 1 : 10 [1]
Lubricant temperature	–10 to +100 °C
Pressure difference	5-15 bars [2]
Lubricant	mineral oils, synthetic and ecofriendly oil, grease grease based on mineral oil
Operating viscosity	after ISO VG 15 (≥ 12 mm²/s)
Worked penetration	≥ 265 · 0.1 mm (up to NLGI grade 2)

[1] Up to 1:30 with internal/external combination.

[2] Depending on characteristic volumetric number and viscosity or penetration.

[3] When mounted on moving machinery parts or when strong vibrations are involved (e.g. on presses), the position of the feeder's piston must not be identical with the direction of the machine's motion.



Modular feeder PSG 3

Number of modules	A [mm]	B [mm]	C [mm]	Weight [kg]
3	165	147	2 x 43 = 86	5
4	208	190	3 x 43 = 129	6.6
5	251	233	4 x 43 = 172	8.3
6	294	276	5 x 43 = 215	10
7	337	319	6 x 43 = 258	11.6
8	380	362	7 x 43 = 301	13.3
9	423	405	8 x 43 = 344	15
10	466	448	9 x 43 = 387	16.6

Technical data

General data

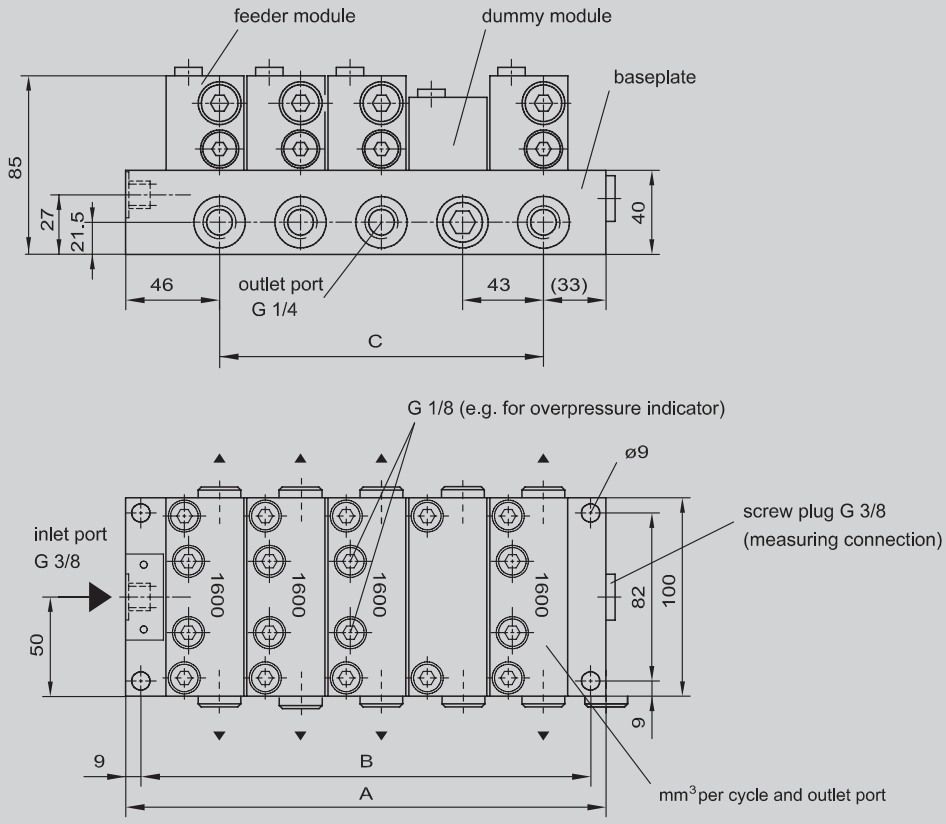
Type	hydraulically controlled modular feeder
Mounting position	any
Ambient temperature	–15 to +110 °C
Baseplate, outlet ports	6, 8, 10, 12, 14, 16, 18, 20
Used outlet ports	2 to 20

Hydraulic data

Max. operating pressure	200 bars
Volumetric inlet flow	up to 6 l/min
Volume per cycle and outlet	0.8; 1.2; 1.6; 2.4; 3.2 ccm
Division ratio	1 : 1 to 1 : 4 [1]
Lubricant temperature	–10 to +100 °C
Pressure difference	5-15 bars [2]
Lubricant	mineral oils, synthetic oils and grease
Operating viscosity	after ISO VG 15 (≥ 12 mm²/s)
Worked penetration	≥ 265 · 0.1 mm (up to NLGI grade 2)

[1] *Up to 1:12 with internal/external combination.*

[2] *Depending on characteristic volumetric number and viscosity or penetration.*



Leaflets

1-0107-2-US Grease Pump Units (Models KFA, KFG, GSJ0)
1-0107-4-US Grease Pump Units (Models PF, PFP, PFH)
1-0107-5-US Piston Pumps (Models PPU, PHU)
1-0107-6-US Accessories for Progressive Systems
DSK 0-003-02-US Modular Feeders PSG 2
DSK 0-003-03-US Modular Feeders PSG 3
DSK 0-002-65-US VPKM/VPKG – VPM/VPG Adaptions
DSK 2-008-00-US Grease-lubricating pump FF
DSK 2-005-00-US Grease-lubricating pump FB

Notice!

All products from VOGEL may be used only for their intended purpose. If operating instructions are supplied together with the products, the provisions and information therein of specific relevance to the equipment must be observed as well.

In particular, we call your attention to the fact that hazardous materials of any kind, especially the materials classified as hazardous by EC Directive 67/548/EEC, Article 2, Par. 2, may only be filled into VOGEL centralized lubrication systems and components and delivered and/or distributed with the same after consultation with and written approval from VOGEL.

All products manufactured by VOGEL are not approved for use in conjunction with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1013 mbars) by more than 0.5 bar at their maximum permissible temperature.

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