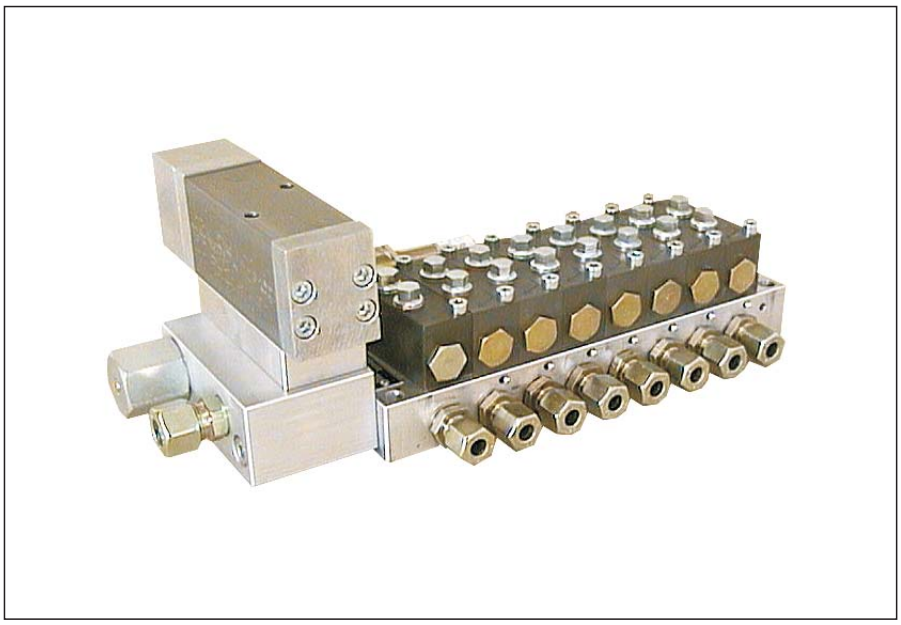
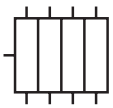
WOERNER
The Experts in Lubrication



Progressive distributor with UNF-thread in element construction

VPI-E



Use:

In progressive mode based central lubrication systems.

The main features of WOERNER progressive distributors are as follows:

- **9 different proportioning volumes** that are selectable according to the lubricant volumes required
- **Accurate proportioning volumes**
- **Extremely long service life** due to refined sliding surfaces
- **Modular system construction**
- **No proportioning decrease at the piston monitored**

Particularities of progressive distributors in element construction:

- Individual proportioning elements as well as dummy elements may **subsequently be replaced** or built-in.[1] (alteration of proportioning volumes or functional controls)
- **Proportioning volumes** can be allocated to the outlets during assembly
- **Clogged lines to lubrication points** can be **localised** without requiring screwed joints to be loosened

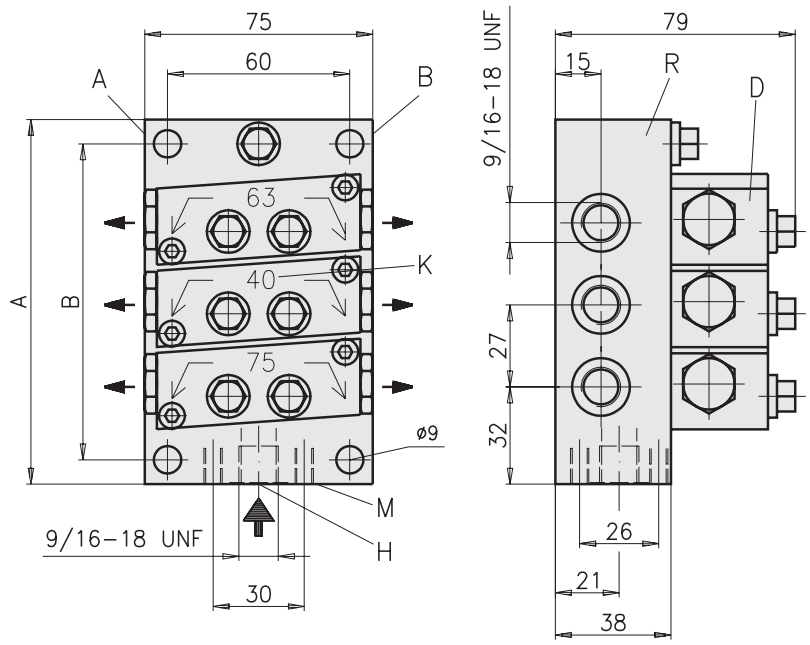
Technical data:

Proportioning volume per cycle:	0,1 ... 0,9 cm³
Lubrication point connections max.:	20
Operating pressure max.:	150 bar
Throughput volume[2] in case of	
Oil max.:	2500 cm³/min
Grease max.:	250 cm³/min
Delivery medium:	
Oil viscosity:	6 cP
Grease:	up to NLGI category 2
Temperature range:	-20 ... +80 °C
Material:	
Connecting plate:	Aluminium
Proportioning elements:	Steel (surface treated)
Gasket:	FPM (Viton)
Fitting position:	usually as needed

Note: In case of heavy vibration or shock load, install the distributor such that piston axes are situated vertically to the main direction of shock impact.

[1] Note: Due to proportioning volume alteration, the allocation volume to all outlets as well as the cycle time may change.

[2] The maximum throughput volume depends on viscosity or penetration of the number of points and proportioning sizes.



A = Assembly side "A" for functional ceck.
B = Assembly side "B" for functional ceck.
D = Proportioning element DPI-C
H = Input line
K = Proportioning volume distinctive number
M = 4x M6 fastening threads for assembly of auxiliary units
R = Connecting plate API-E

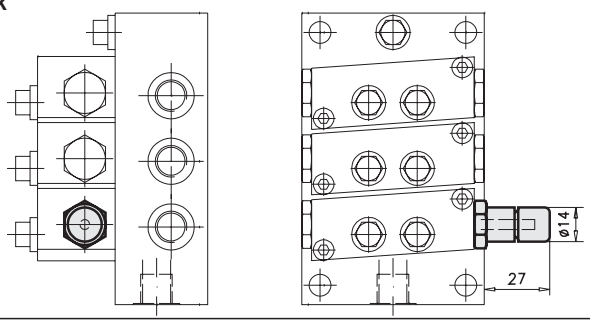
Number of outlets	Length "A"	Length "B"	Weight [kg]
6	120	104	1,9
8	147	131	2,5
10	174	158	3,1
12	201	185	3,7
14	228	212	4,3
16	255	239	4,9
18	282	266	5,6
20	309	293	6,2

- Subject to modifications -

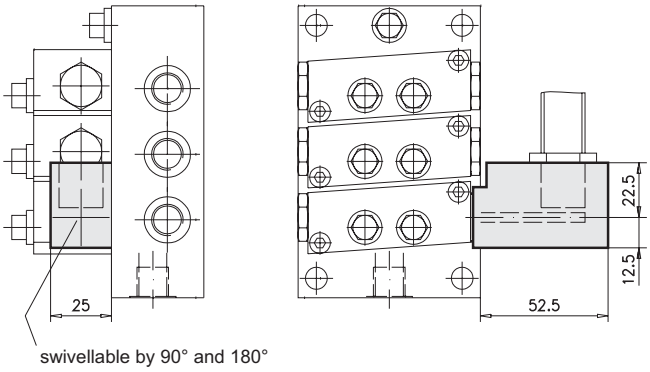
EUGEN WOERNER GmbH & Co. KG
Postfach 1661 D-97866 Wertheim
Am Eichamt 8 D-97877 Wertheim
Tel. +49 (0) 9342 803-0 info@woerner.de
Fax.+49 (0) 9342 803-202 www.woerner.de

Leaflet-No. **0105.10.04 GB**
Supplements No.
Replaces No. 0105.04.04 GB

Visual check



Receptacle for initiator



Functional checks:

Visual check:

In a translucent polyamide casing, a red pin being fixed to the piston shows the piston's movement.

Casing material: Translucent polyamide
Ambient temperature: -10 ... +80 °C

Electrical check with initiator:

Casing for initiator:

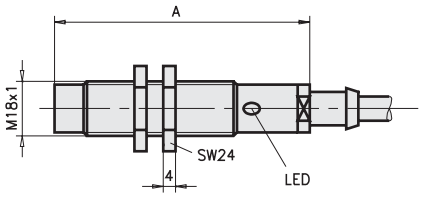
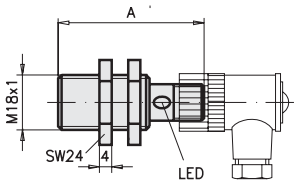
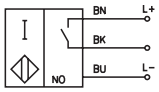
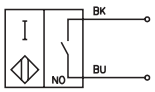
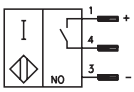
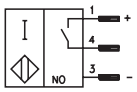
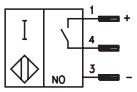
A pin being connected with the piston attenuates an initiator once per cycle.

Version "D":
Casing material: Translucent polyamide (piston movement is visible)
for initiators with a switching distance: ≥8 mm

Version "W":
Casing material: Black polyamide
for initiators with a switching distance: ≥5 mm

Use initiator with M18x1 thread!
(When using other initiators than those depicted below, such initiators must be checked for suitability.)

Choice of initiators:

Designation / Purchase-no.	**Initiator "C" 913.900-03**	**Initiator "F" 913.900-11**	**Initiator "N" 913.900-21**	**Initiator "I" 913.900-14**	**Initiator "2" 979.044-88**
Suits for:	Casing "W" Switching dis. ≥5mm	Casing "D" and "W" Switching dis. ≥8mm	Casing "D" and "W" Switching dis. ≥8mm	Casing "W" Switching dis. ≥5mm	Casing "W" Switching dis. ≥5mm
Dimension drawing:					
Connection diagramm:					
Operating voltage:	10 ... 30 VDC	20 ... 250 VUC	10 ... 30 VDC	10 ... 30 VDC	10 ... 30 VDC
Residual ripple:	≤ 10%		≤ 15%	≤ 15%	≤ 15%
Load current at max.:	250 mA	500 mA	130 mA	200 mA	130 mA
Protection system:	IP67	IP67	IP67	IP67	IP67
Power connection:	Cable 2 m	Cable 3 m	Unit plug (see accessories page 3)		
Length "A":	60 mm	62 mm	45 mm	100 mm	65 mm

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Am Eichamt 8 D-97877 Wertheim
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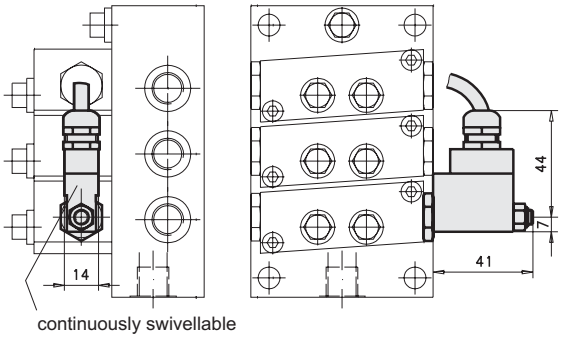
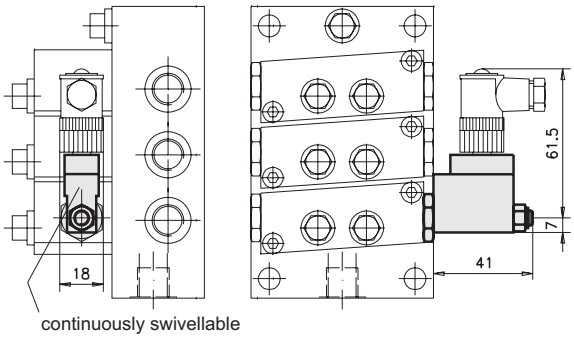
Fax.+49 (0) 9342 803-202 www.woerner.de

Version "RK"



Version "RS"



Electrical check with reed contact

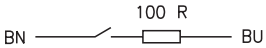
A magnet connected with the piston switches the Reed contact once per cycle.

Switching voltage:	10 ... 36 VUC
Switching current at max.:	25 mA
Switching power at max.:	0,9 VA
Ambient temperature:	-5 ... +80 °C

Version "RK"
with cable:

Material (casing):	PA bzw. 1.4305
System of protection:	IP65
Cable	
Length:	10 m
Cross section:	2x0,75 mm²
Material:	Oelflex

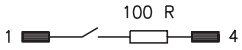
Connection diagramm:



Version "RS"
with unit plug 4-pin (M12):
(for matching cable jack see accessories)

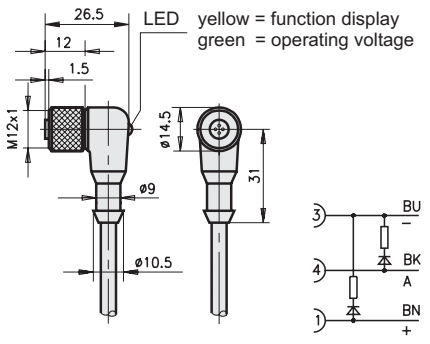
Material (casing): PA bzw. 1.4305

Connection diagramm:

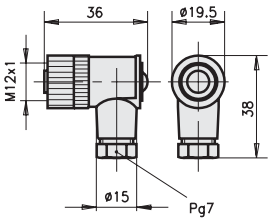


Accessories:
Cable jack for functionality check "RS" and initiator
(state purchase-no., please)

Cable jack with LED and cable



Cable jack with terminal clamps



Cable jack with LED and cable:

Purchase-no.:	**913.404-19**
Operating voltage:	10 ... 30 VDC
Cable	
Cross section:	3x0,34 mm²
Length:	5 m
System of protection:	IP68

Cable jack with terminal clamps:
(without LED)

Purchase-no.:	**913.404-24**
Connection type:	Screws
Connection cross section:	max. 0,75 mm²
Cable diameter:	4 ... 6 mm
System of protection:	IP67

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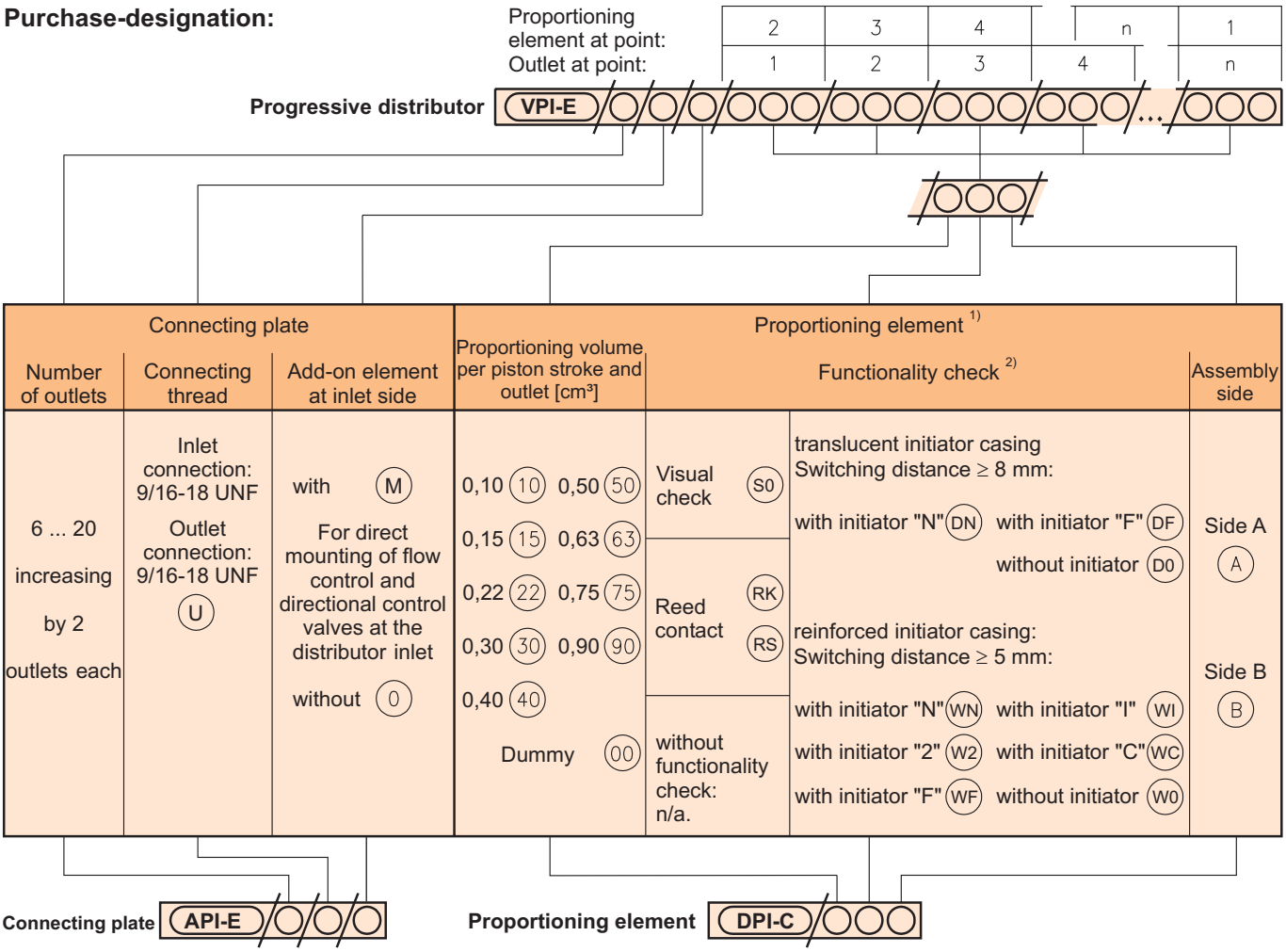
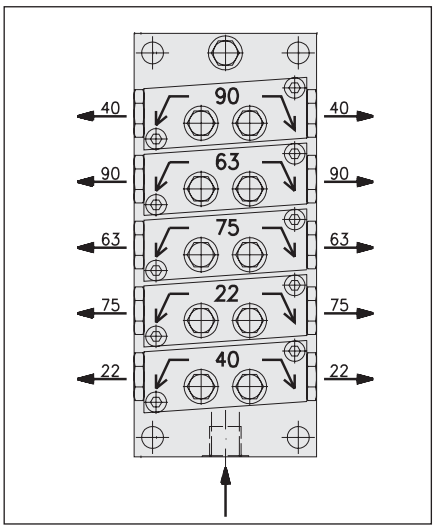
Fax.+49 (0) 9342 803-202 www.woerner.de

Purchase-designation:



Note:
The order in which the proportioning distinctive numbers are stated does not correspond to the order in which the proportioning elements are mounted. The proportioning distinctive numbers are stated as they are assigned to the respective outlets.



Example: VPI-E / 10 / 0 / 22 / 75 / 63 / 90 / 40

The proportioning element having a proportioning volume of 0,22 cm³ is, by means of its distinctive number "22" to be stated in the purchasing number first. It proportiones to the outlets at point 1. It is, however, mounted at point 2.

The proportioning element having a proportioning volume of 0,75 cm³ is, by means of its distinctive number "75" to be stated in the purchasing number second. It proportions to the outlets at point 2. It is, however, mounted at point 3.

The proportioning element having a proportioning volume of 0,40 cm³ is, by means of its distinctive number "40" to be stated in the purchasing designation last. It proportions to the outlets at the last point. It is, however, mounted at point 1.

[1] Three proportioning elements need to be selected at least.

[2] Functionality checks are possible as from proportioning volume 22 on only.

- Subject to modifications -

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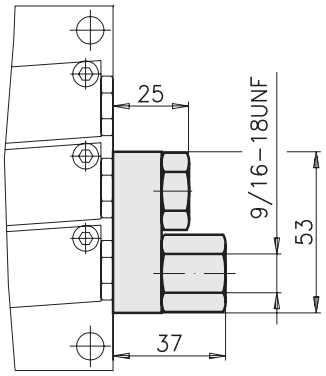
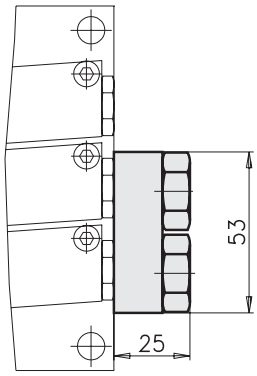
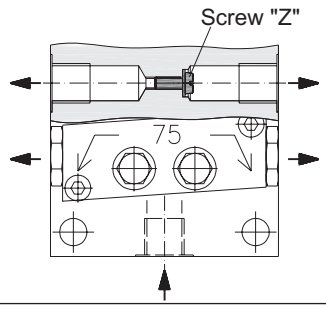
Bridge double with outlet



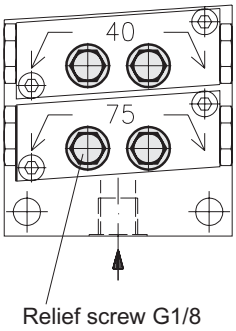
Bridge double without outlet



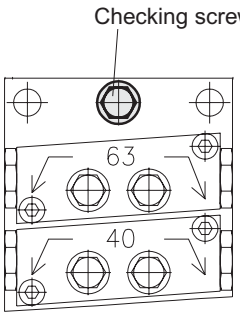
Screw "Z"



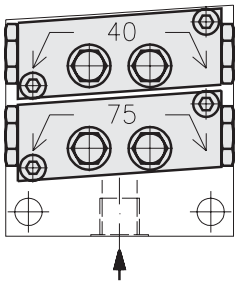
Relief screw



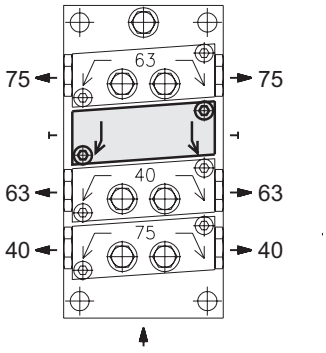
Checking connection



Mounting the proportioning elements



Blind element (proporting volume "00")



Combining of outlets:

Bridges:

Adjacent outlets can be combined by bridges as follows:
- as needed with or without outlet connection
- as needed with or without check valves

Material:

Hollow screw:	Galvanised steel
Bridge body:	Aluminium

Screw "Z":

Opposite outlets can be connected by removing the "Z" screw. When removing that screw, one outlet must be closed.

Relief screw:

The hole towards the relief screw is directly linked with the outlet situated beneath. In case of fault, e.g. due to a clogged lubricant point line, the faulty spot can be localised by opening the relief screw.

Test connection:

The test connection is directly linked with the inlet line. Hence the inlet pressure can be shown or monitored at that point.

Mounting the proportioning elements:

Starting from the distributor inlet side, the proportioning elements are to be mounted downward into the arrow's direction.

Venting the distributor:

Prior to distributor start-up, it must be vented. To this effect, open the checking screw for the inlet line as well as the relief screws for the respective outlets.

Blind element:

For subsequent modification of the number of lubrication points, blind elements can be mounted instead of proportioning elements. Below the blind elements, no volumes are ejected.
Please note:
- Any subsequent modification of the number of lubrication points will change both the proportioning volume to all outlets and cycle time.
- For function-technical reasons, 3 proportioning elements must be mounted at least.

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Am Eichamt 8 D-97877 Wertheim
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Fig. 1

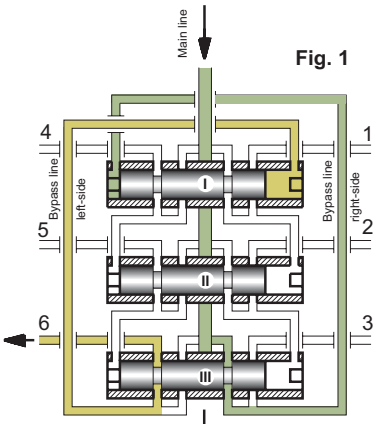


Fig. 2

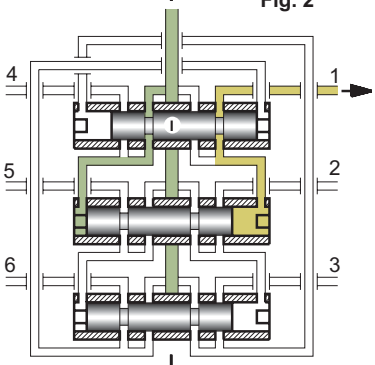


Fig. 3

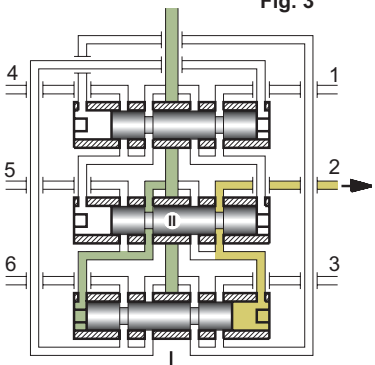
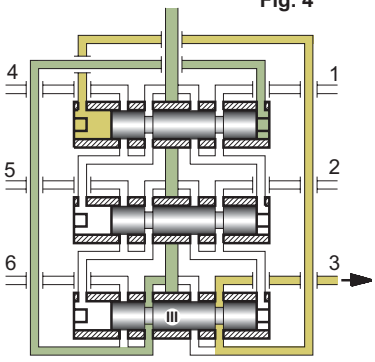


Fig. 4



Functional process fig. 1 ... 4:

The lubricant flows from the main line through the right-side ring groove of piston III as well as the bypass line (right) and to the left side of piston I and moves it into its home position. The lubricant displaced by piston I is ejected via the left bypass line through outlet no. 6.

After shifting of piston I, lubricant flows to the left side of piston II and pushes it into its right-side home position. The displaced lubricant is ejected via outlet no. 1.

After shifting of piston II, lubricant flows to the left side of piston III and pushes it into its right-side home position. The displaced lubricant is ejected via outlet no. 2.

After shifting of piston III, lubricant flows to the right side of piston I and pushes it into its left-side home position. The displaced lubricant is ejected via outlet no. 3. The continuation of that process is evidenced in the scheme depicted.

Monitoring of progressive distributors:

As for instance due to soiling, the flow through a lubricant point line may be prevented. This will cause a piston to get blocked. By virtue of the forced control as depicted in figures 1-4, the other pistons will be stopped as well.
Due to this configuration, the proportioning at all outlets of the distributor can be monitored by means of a sensor at one piston only.

Mounting note:

The pistons are provided with an extremely small fitting clearance. Therefore, the pistons, after the dismantling of a distributor, must never be interchanged.

Formula for calculating the lubricant available per lubrication point:

A progressive distributor allocates the delivered lubricant to the individual lubrication points in forced order. Due to the functional process as described herein, a safe proportioning is ensured.

The lubricant q_i delivered to a lubrication point i can be calculated as follows:

$$q_i = \frac{K_i}{2 * (K_1+K_2+K_3...)} * Q$$

Q = lubricant delivered to the distributor,
K_i = distinctive number of the outlet i

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