

# Piston Distributors, Metering Units

For single-line total-loss lubrication systems

Group 350



Piston distributors meter out and distribute the oil delivered by an intermittently actuated pump.

The quantities of oil for the individual lube points are determined by exchangeable metering nipples. The metered amount is indicated on the individual nipples. The amount needed to cover the total oil demand can then be further regulated via the lubricating frequency.

Group 321



To meet the required quantities and comply with spatial constraints, it is possible to choose among four distributor groups that differ in terms of their metering ranges and sizes.

The functional principle of the groups is the same, but there are differences in design.

Different distributor groups can be used in one installation.

Group 320



## Please note:

Seal material: NBR.

In general, the operating conditions specified by you for the pump units should also apply to the distributors, with due attention being given to the permissible limit values.

Limit values for the distributors:

Temperature range: 0 to +80 °C

Effective oil viscosity: 5 to 2500 mm<sup>2</sup>/s.

## Single-line total-loss lubrication system with piston distributor for oil

### Function

A pump feeds the lubricant through the main line to the piston distributors. From there it is directed to the lube points in precisely metered quantities. This takes place in a time- or pulse-controlled sequence.

### Planning

1. Determine the type of drive to be used for the oil pump (manual, electric for three-phase current or AC, pneumatic).
2. Select the lubricant. Then determine the pump unit and type of distributors.
3. Determine the number of lube points and define the amount of lubricant required to meet the needs of each point. Ascertain the total amount of lubricant needed per unit of time or clock pulse. Then, determine the dimensions of the lubricant reservoir necessary to hold the required amount of lubricant.

### Choice of distributors

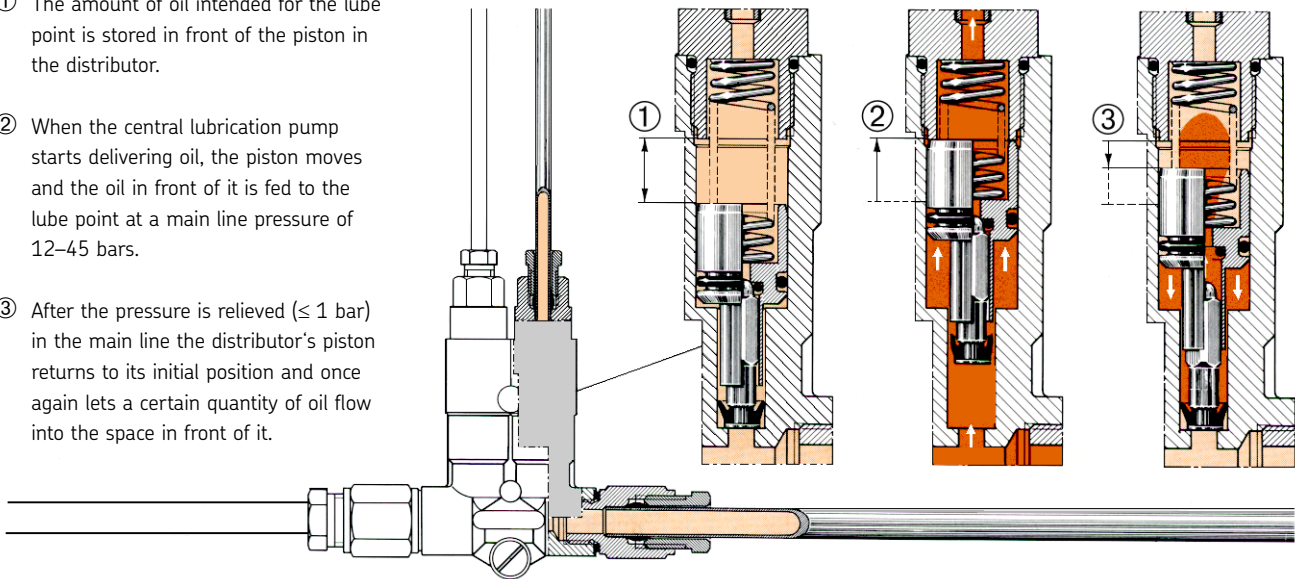
Select the piston distributors on the basis of the metered quantity and spatial constraints.

The ratio of the metered quantities with respect to each other should be the same as the consumption of the individual lube points.

The total amount of lubricant needed by the installation is then regulated by the number of lube cycles per unit of time.

### Function

- ① The amount of oil intended for the lube point is stored in front of the piston in the distributor.
- ② When the central lubrication pump starts delivering oil, the piston moves and the oil in front of it is fed to the lube point at a main line pressure of 12–45 bars.
- ③ After the pressure is relieved ( $\leq 1$  bar) in the main line the distributor's piston returns to its initial position and once again lets a certain quantity of oil flow into the space in front of it.



## Piston Distributors, Metering Units

See important product usage information on the back cover.

### Laying an installation

When installing a centralized lubrication system, lay the main lines and distributors in such a way that any air in the system can escape on its own via the lube points.

To do so, mount the distributors at appropriate places and, **at the end of the installation**, in such a way that the connections to the lube points **face upward**. (see fig. 1)

The main lines from the pump to the distributors must, if possible, be laid with a **rising gradient**.

If lines have to be routed to distributors at lower locations, proceed in accordance with fig. 2.

Check the mainline resistance values, especially in regard to the relief routine, when very large systems and ones with a large number of branches are involved or when highly viscous oils are used.

Each distributor port may be connected to **only one** lube point! (see fig. 3)

Do not connect the secondary line (connection: distributor – lube point) to the lube point until bubble-free oil emerges at its end after repeated actuation of the pump. It might be necessary to fill long secondary lines with oil first.

If a secondary line is blocked or broken, that will have no effect on the remaining lube points in the system.

Fig. 1

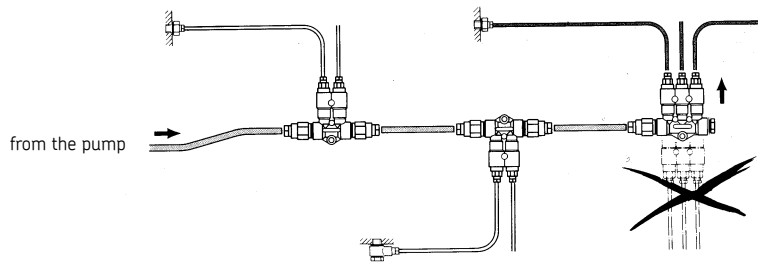


Fig. 2

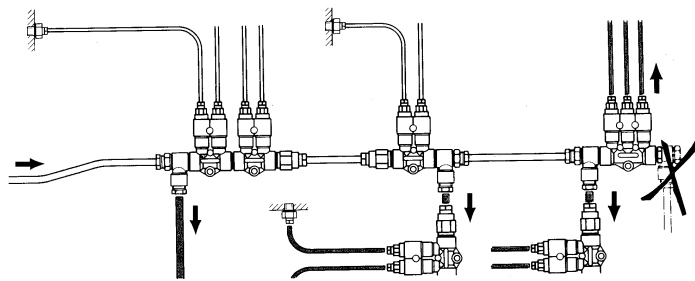
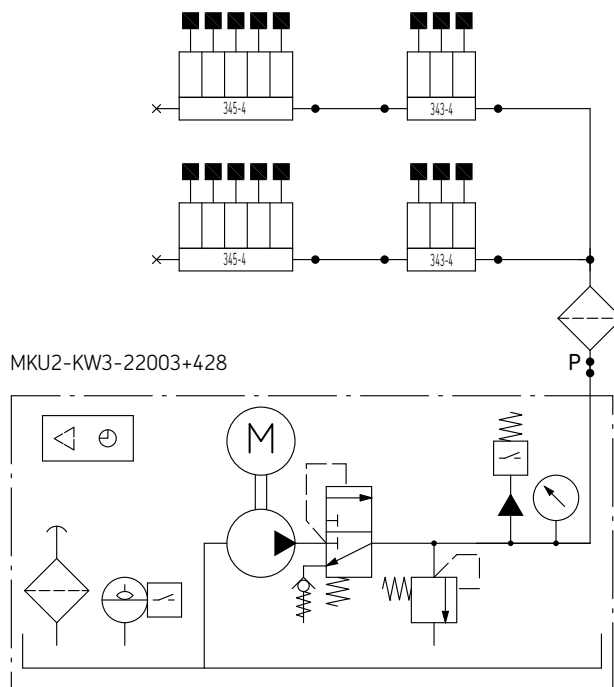


Fig. 3

### Installation planning, basics: lathe with compact system



## Single-line total-loss lubrication system with piston distributor for oil

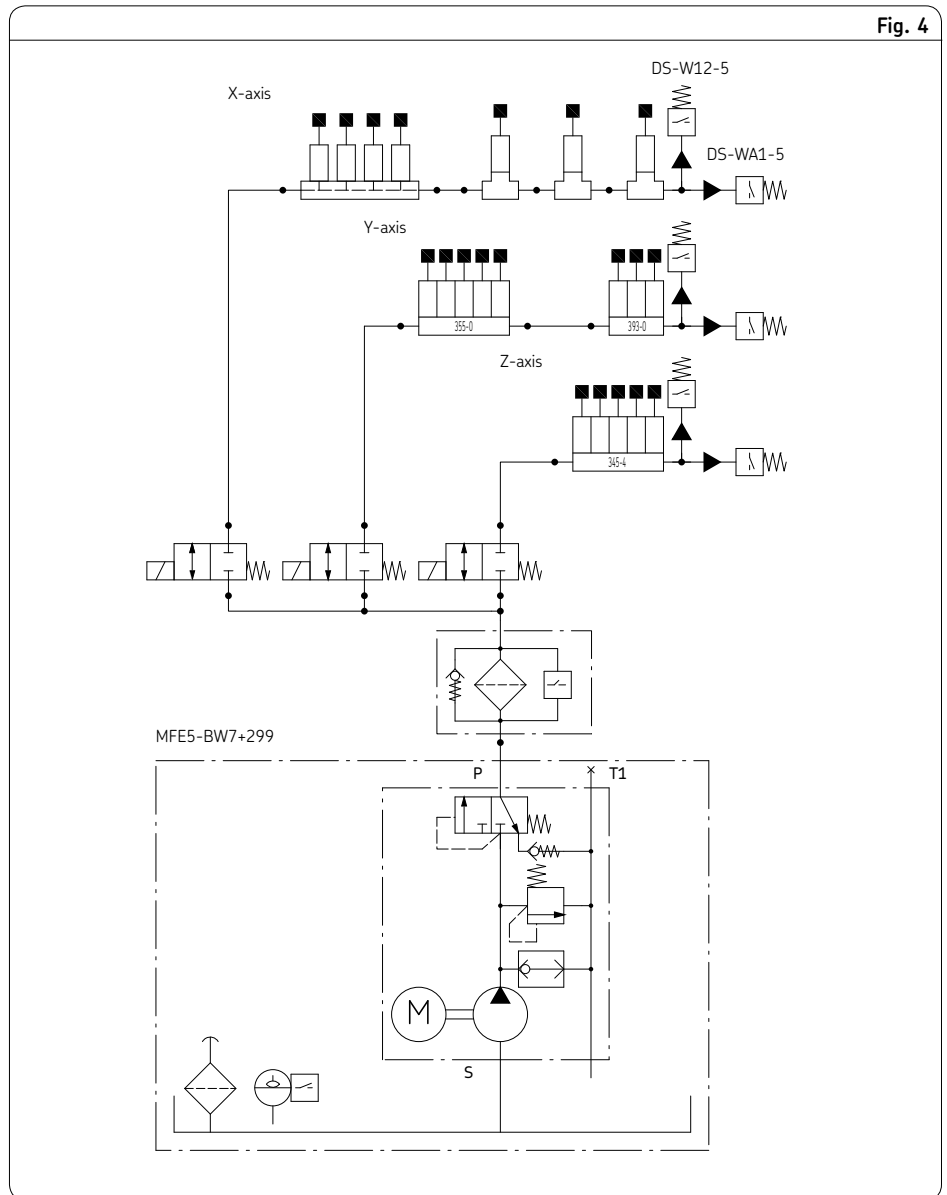
### Practical example: universal milling machine with zoned system

A 2/2-way valve is installed upstream of each respective distributor group so that each axis is supplied with the required lubricant independent of each other.

When an enable signal for the triggering of a lube pulse is emitted in the control system, the pump starts delivering lubricant and the 2/2-way valve of the respective axis opens. The distributors deliver the prestored amount of lubricant to the friction point at the pressure of the pump.

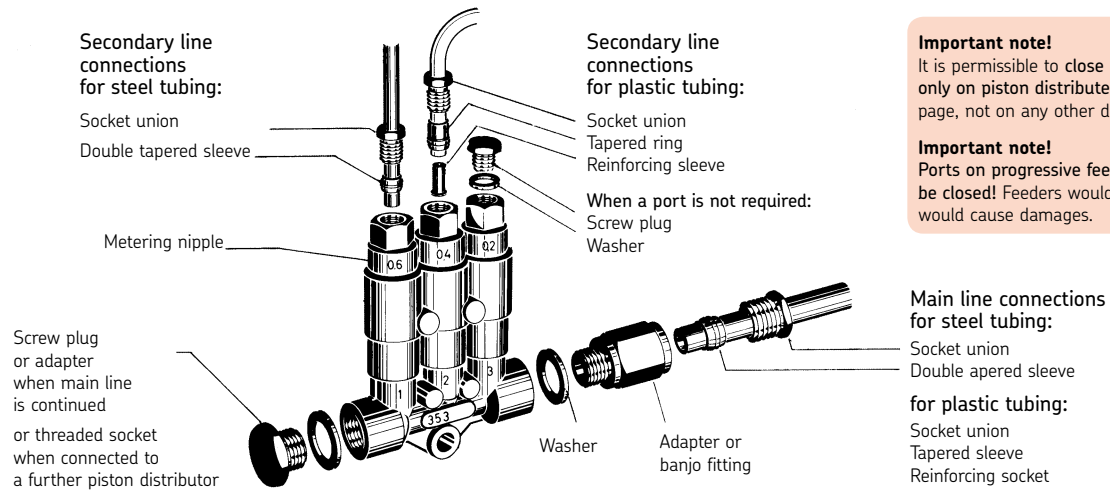
When the rated switching pressure is reached at the maximum-pressure switch, the pump unit is switched off after a pump running time of  $\geq 5$  seconds. The main line is relieved of pressure down to the residual pressure determined by the residual-pressure valve. When a residual pressure of approximately 1 bar is reached, the minimum-pressure switch is actuated. The 2/2-way valve closes as a result of this signal. The lubricant inside the distributors of this group is shifted to the metering chambers and is ready for the new lube cycle. The procedure is repeated for each axis.

In the case of special system configurations, e.g. hoses in trailing-cable installations, it is possible for the relief time to be delayed. In this case, it is advisable to use metering units belonging to assembly group 321-403-2. These metering units work at a residual pressure of 3 bars, which means much greater system dependability.



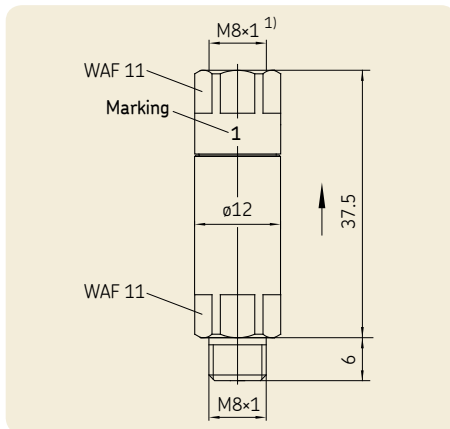
## Piston Distributors, Metering Units

### Example of Group 350 Distributors:



## Piston distributors, Group 320

0.01–0.16 cm<sup>3</sup> (for oil)



Metering units	Washer		
Order No.	Rated metered quantity [cm <sup>3</sup> ]	Marking on metering unit	Order No.
320-401-3	0.01	1	DIN7603-A8x11.5-CU
320-402-3	0.02	2	
320-403-3	0.03	3	
320-406-3	0.06	6	
320-410-3	0.10	10	
320-416-3	0.16	16	

<sup>1)</sup> Ports tapped for solderless tube connection.



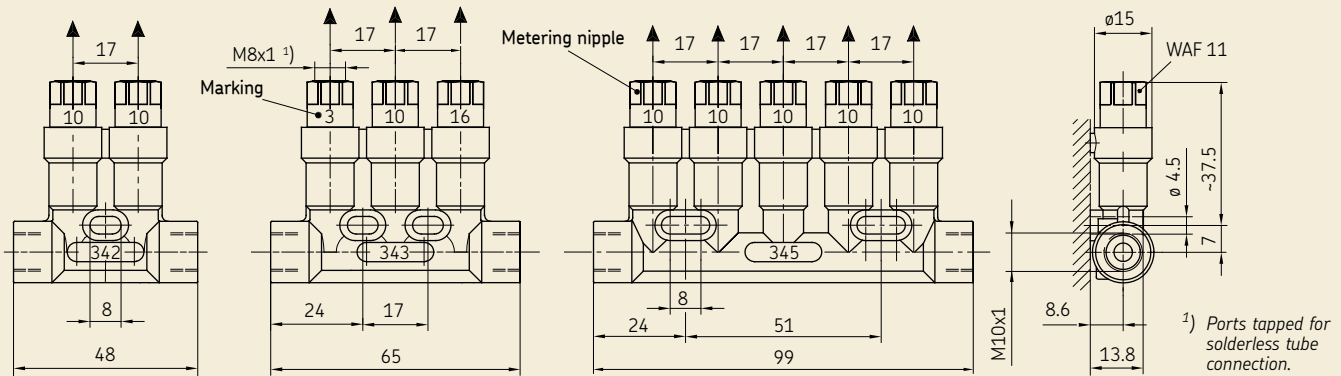
The metering units can only be used together with distributor manifolds or tee pieces (cf. brochure 1-0103-EN, "Fittings and auxiliary equipment").

For metering units for direct connection to lube points, see pages 9 to 11.

# Piston distributors, Group 340

0.01–0.16 cm<sup>3</sup> (for oil)

**Please note:** The piston distributors comprising Groups 340, 350 and 390 are only supplied complete with metering nipples. Possible tubing connection: M8x1 ports tapped for solderless  $\varnothing 4$  tube connection. See brochure 1-5015-DE for piston distributors with quick connector system.



### Piston distributors

(available only with metering nipples installed)

Order No.	Number of lube points
342-4..-000	2
343-4..-.00	3
345-4..-...	5

### Metering nipple with O-ring, exchangeable

Rated metered quantity [cm <sup>3</sup> ]	Order key	Marking on the metering nipple	Order No.
0.01	1	1	Metering nipple not exchangeable
0.02	6	2	Metering nipple not exchangeable
0.03	2	3	995-994-103
0.06	3	6	995-994-106
0.10	4	10	995-994-110
0.16	5	16	995-994-116



### To order

The order No. has 9 places.  
The last five numbers of the order No. is the **order key**. It codes the metered quantities of every piston distributor.

### Order example

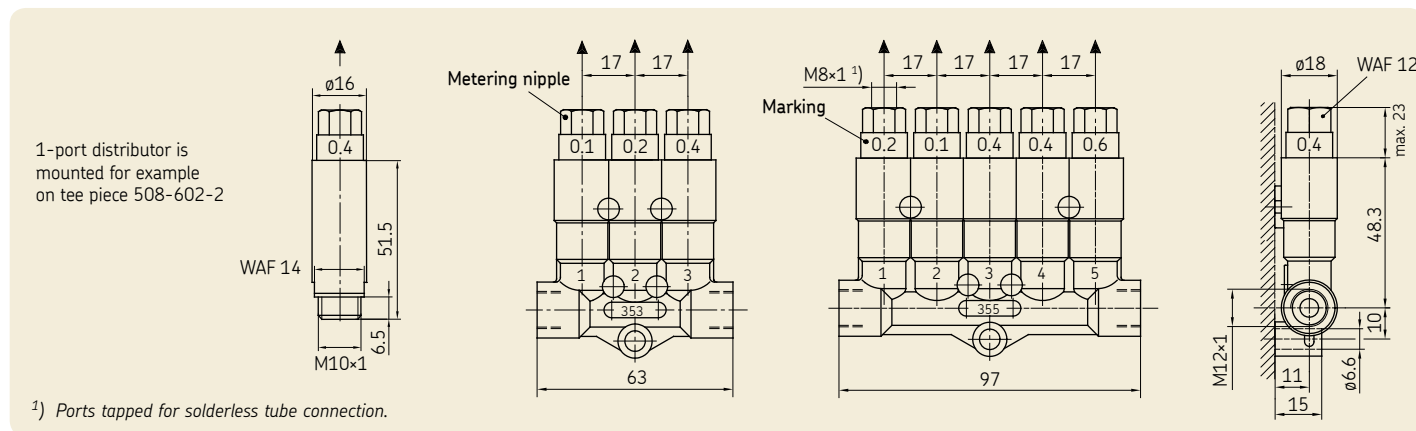
Piston distributor, 5-port type, 345-4 . . . . .  
metered with (from left to right)  
0.03 – 0.10 – 0.10 – 0.16 – 0.06 cm<sup>3</sup>  
**Order key:** 2 – 4 – 4 – 5 – 3

**Order No.:** 345-424-453

Group 340-... distributors are intended for direct connection to a main line with a diameter of 6 mm (double tapered sleeve and socket union).

# Piston distributors, Group 350

0.1 – 0.6 cm<sup>3</sup> (for oil)



**Piston distributors**  
(available only with metering nipples installed)

Order No.	Number of lube points
351-0.0-000	1
352-0..-000	2
353-0..-000	3
355-0..-...	5

**Metering nipple with O-ring, exchangeable**

Rated metered quantity [cm <sup>3</sup> ]	Order key	Marking on the metering nipple	Order No.
0.1	4	0.1	352-010-K
0.2	5	0.2	352-020-K
0.4	6	0.4	352-040-K
0.6	7	0.6	352-060-K



**To order**

The order No. has 9 places.  
The last five numbers of the order No. is the **order key**. It codes the metered quantities of every piston distributor.

**Order example**

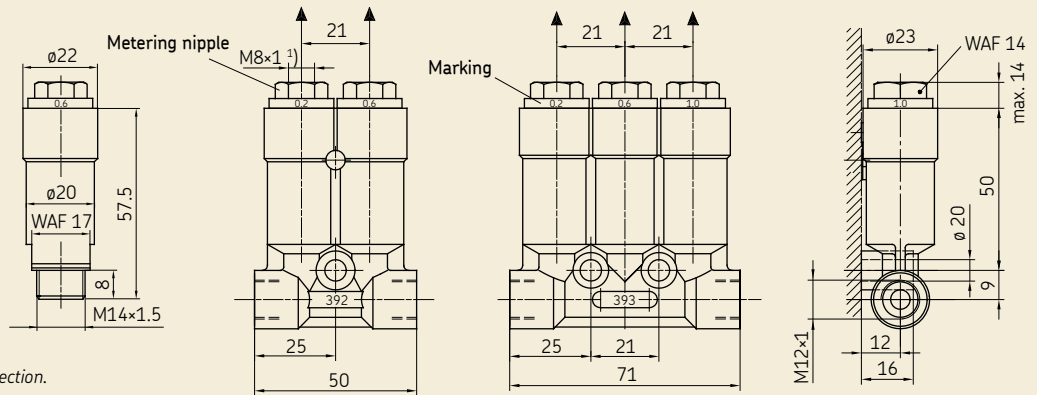
Piston distributor,  
3-port type, 353-0 . . - . 00  
metered with (from left to right)  
0.1 – 0.4 – 0.2 cm<sup>3</sup>  
**Order key: 4 – 6 – 5**

**Order No.:** 353-046-500

## Piston distributors, Group 390

0.2–1.5 cm<sup>3</sup> (for oil)

1-port distributor is mounted for example on tee piece 508-002-2



<sup>1)</sup> Ports tapped for solderless tube connection.

### Piston distributors

(available only with metering nipples installed)

Order No.	Number of lube points
391-0.0-000	1
392-0. .-000	2
393-0. .-.00	3

### Metering nipple with O-ring, exchangeable

Rated metered quantity [cm <sup>3</sup> ]	Order key	Marking on the metering nipple	Order No.
0.2	5	0.2	391-020-K
0.4	6	0.4	391-040-K
0.6	7	0.6	391-060-K
1.0	8	1.0	391-100-K
1.5	9	1.5	391-150-K



### To order

The order No. has 9 places.  
The last five numbers of the order No. is the order key. It codes the metered quantities of every piston distributor.

### Order key

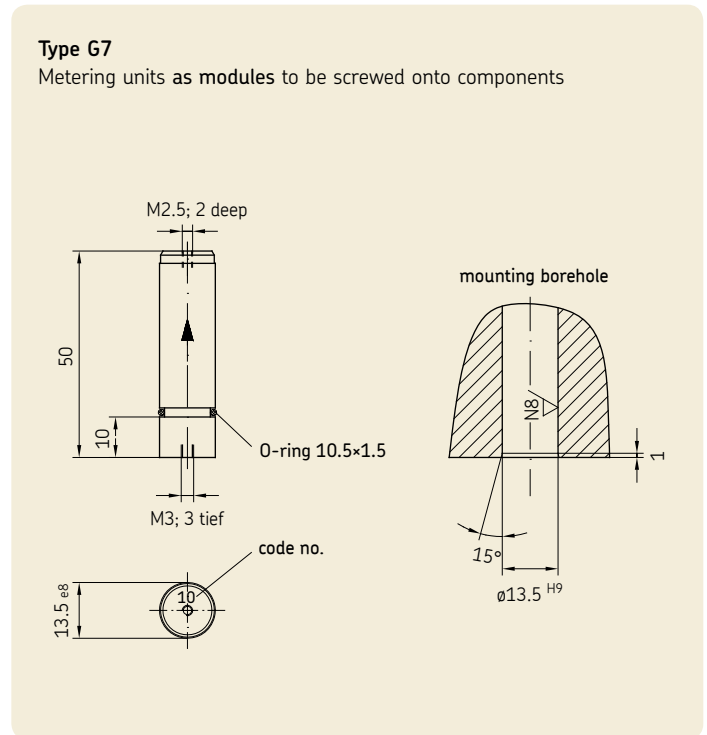
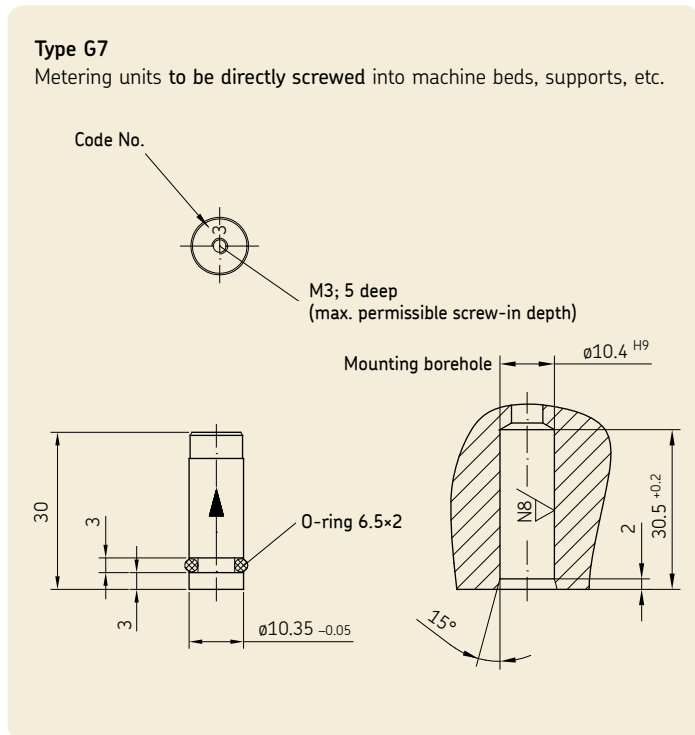
Piston distributor, 3-port type,  
393-0 . . . . 00  
metered with (from left to right)  
1.5 – 1.0 – 0.4 cm<sup>3</sup>  
Order key: 9 – 8 – 6

Order No.: 393-098-600



## Metering units for direct connection to lube points

(for oil)



Metered quantity [cm <sup>3</sup> ]	Code No.	Seal material	Order No.
0.03	3	NBR	321-403G7
0.06	6	NBR	321-406G7
0.10	10	NBR	321-410G7
0.03	3	FPM	321-403G7-S8
0.06	6	FPM	321-406G7-S8
0.10	10	FPM	321-410G7-S8

Metered quantity [cm <sup>3</sup> ]	Code No.	Seal material	Order No.
0.10	10	NBR	351-410G7
0.16	16	NBR	351-416G7
0.20	20	NBR	351-420G7
0.30	30	NBR	351-430G7

Operating pressure: p min. 12 bars  
p max. 45 bars  
perm. residual pressure 3 bars

Operating pressure: p min. 12 bars  
p max. 45 bars  
perm. residual pressure 3 bars

## Metering units for direct connection to lube points

(for oil)

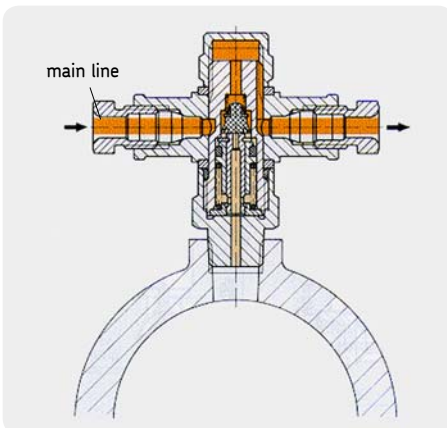
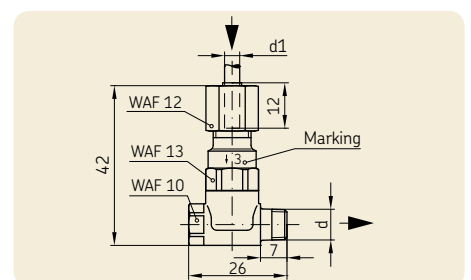
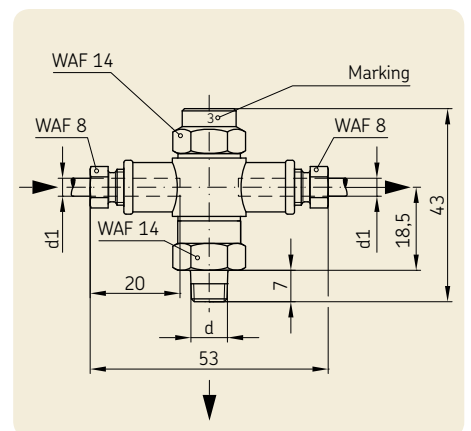
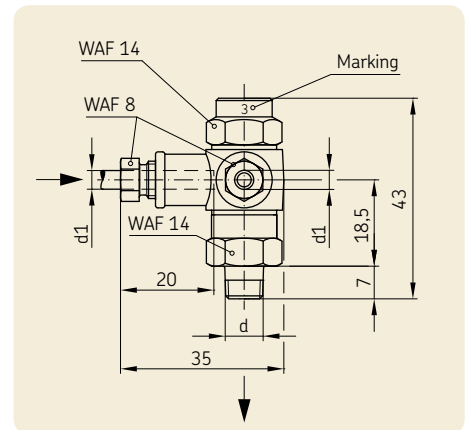
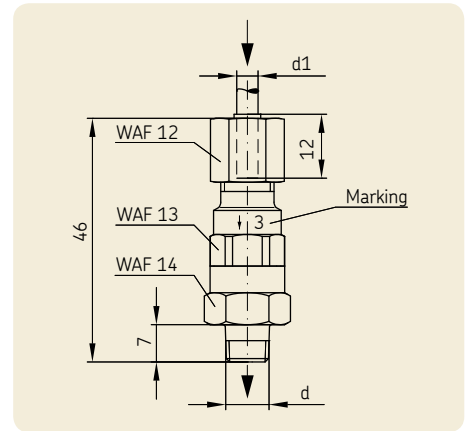
These metering units are used for direct connection to the lube point. Pressure switches can be used in main lines (connection: pump – system distributors) to control the pressure build-up and, if necessary, the pressure reduction. In the secondary lines (connection: distributors – lube point), the pump pressure no longer has a direct effect. Secondary lines have to be turned into main lines before they can be monitored. This is done by screwing metering units of **types G, L, T, W** directly into the lube point's threads.

The metering units are preassembled with union nuts or socket unions and (single) tapered rings, so installation of the tubing (plastic, steel and metal tubing) is simple:

- Insert tube all the way to the stop (types **G** and **W** about 12 mm; types **L** and **T** about 20 mm).
- Tighten union nut or socket union.

To achieve the same advantage of simplified tubing connections on a distributor manifold, it is advisable, for example, to use tapered ring 404-611 for  $\varnothing 4$  tubing and socket union 404-612 instead of the double tapered ring connection.

All four types are supplied complete with tapered ring and socket union (union nut).



## Metering units for direct connection to lube points (for oil)

Metered quantity [cm <sup>3</sup> ]	Code number	Screwed stud end d	Order No.						
			Type G d1 = $\varnothing 4$ d1 = $\varnothing 6$		Type L <sup>1)</sup> d1 = $\varnothing 4$	Type T d1 = $\varnothing 4$ d1 = $\varnothing 6$		Type W d1 = $\varnothing 4$ d1 = $\varnothing 6$	
0,01	1	M 8×1 tap.	321-401G1	321-601G1	321-401L1	321-401T1	–	321-401W1	321-601W1
		M 10×1 tap.	321-401G2	321-601G2	321-401L2	321-401T2	321-601T2	321-401W2	321-601W2
		R 1/8 tap.	321-401G3	321-601G3	321-401L3	321-401T3	321-601T3	321-401W3	321-601W3
0.03	3	M 8×1 tap.	321-403G1	321-603G1	321-403L1	321-403T1	321-603T1	321-403W1	321-603W1
		M 10×1 tap.	321-403G2	321-603G2	321-403L2	321-403T2	321-603T2	321-403W2	321-603W2
		R 1/8 tap.	321-403G3	321-603G3	321-403L3	321-403T3	321-603T3	321-403W3	321-603W3
0.06	6	M 8×1 tap.	321-406G1	321-606G1	321-406L1	321-406T1	–	321-406W1	321-606W1
		M 10×1 tap.	321-406G2	321-606G2	321-406L2	321-406T2	321-606T2	321-406W2	321-606W2
		R 1/8 tap.	321-406G3	321-606G3	321-406L3	321-406T3	321-606T3	321-406W3	321-606W3
0.10	10	M 8×1 tap.	321-410G1	321-610G1	321-410L1	321-410T1	321-610T1	321-410W1	321-610W1
		M 10×1 tap.	321-410G2	321-610G2	321-410L2	321-410T2	321-610T2	321-410W2	321-610W2
		R 1/8 tap.	321-410G3	321-610G3	321-410L3	321-410T3	321-610T3	321-410W3	321-610W3

<sup>1)</sup> Type L, d1 =  $\varnothing 6$  not available

**Type G4**  
Metering units to be directly screwed into machine beds, supports, etc.

<sup>2)</sup> Ports tapped for solderless  $\varnothing 4$  tube connection (main line connection).

**Type G4**  
Metering units as module to be screwed onto components

<sup>3)</sup> With counterbore for  $\varnothing 5 \times 1$  O-rings. O-rings are supplied detached.

Metered quantity [cm <sup>3</sup> ]	Code No.	Order No.
0.03	3	321-403G4
0.06	6	321-406G4
0.10	10	321-410G4

Metered quantity [cm <sup>3</sup> ]	Code No.	Order No.
0.01	1	320-101
0.03	3	320-103
0.06	6	320-106

**Order No. 1-5001-EN**

Subject to change without notice! (07/2009)

**Important product usage information**

All products from SKF may be used only for their intended purpose as described in this brochure and in any instructions. If operating instructions are supplied with the products, they must be read and followed.

Not all lubricants are suitable for use in centralized lubrication systems. SKF does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized system. SKF lubrication systems or their components are not approved for use 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.

Hazardous materials of any kind, especially the materials classified as hazardous by European Community Directive EC 67/548/EEC, Article 2, Par. 2, may only be used to fill SKF centralized lubrication systems and components and delivered and/or distributed with the same after consulting with and receiving written approval from SKF.

**Further brochures**

- 1-5015-EN Piston distributors with quick connector system
- 1-0103-EN Fittings and auxiliary equipment
- 1-0103-1-EN Quick connectors
- 1-9201-EN Transport of Lubricants in Centralized Lubrication Systems

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