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Progressive distributor LX-2 / LX-3

Progressive distributor SX-1

Progressive distributor SX-2 / SX-3

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Progressive distributor SXE-3

Progressive distributor SXD

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Progressive distributor SXW-1

Progressive distributor SXW-2

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Accessories progressive distributors

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System description

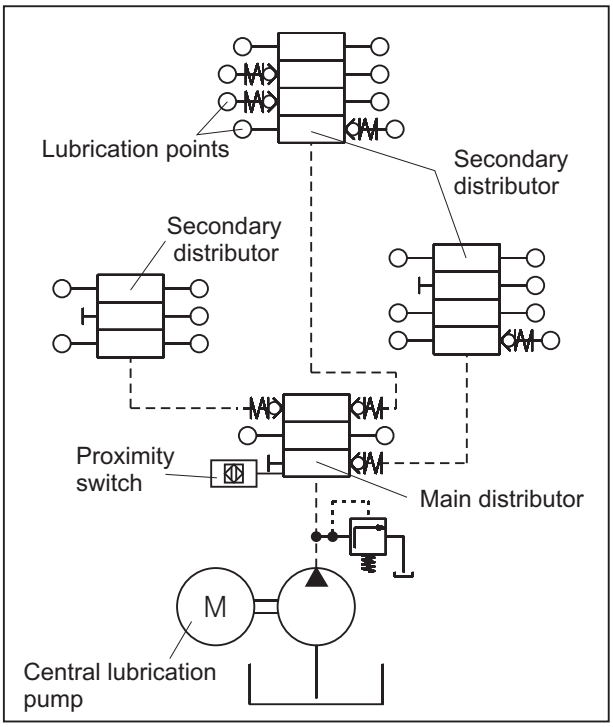
At progressive central lubrication systems is the lubricant progressively distributed to the lubrication points by the main and secondary distributors.

BEKA progressive systems are designed to deliver oil, fluid greases and multi-purpose greases up to NLGI-cl. 2.

The progressive system works with pressures of 10 to 300 bar, depending on the back pressure or the line- and distributor resistance.

Construction

A progressive system mainly consists of a central lubrication pump, the progressive distributors and a control unit.



Applications

The main application fields of progressive systems are presses and synthetic processing machines, printing- and paper processing machines, machine tools, packing machines, textile machines, wood- and metal working machines (non-cutting and cutting) as well as mobile machines.

Advantages

- simple design
- well-arranged construction and easy installation
- easy expansion, alteration or reduction of existing systems possible
- maintenance-free components
- exact metering due to a wide range of types
- economic supply of many lubrication points by one single pump
- simple electronic monitoring of the lubricant volume

Function

Progressive systems distribute the lubricant progressively via a follower piston control.

Because of this follower piston control a progressive system can easily be monitored with a pressure limitation valve. If one of the lubrication points is not lubricated, the follower piston control is stopped. The system blocks and the lubricant comes out of the pressure limitation valve.

The volume flow can additionally be monitored by a proximity switch at the distributor.

A central lubrication pump delivers the lubricant to one or several main distributors. These distributors bring the lubricant in the right quantity to one or several secondary progressive distributors and then to the individual lube points. An electronic control device regulates the break- and lubrication time of the pump.

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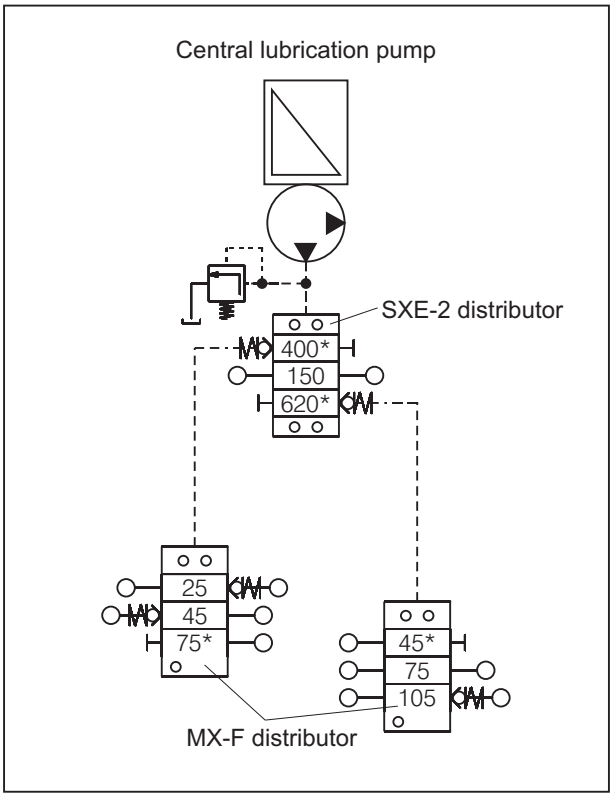
System design

The drive is decisive for the selection of progressive system components.

You can select between manual, hydraulic, pneumatic and electrical actuation.

The choice of the lubrication metering components depends on the size and the number of the bearing points which have to be lubricated.

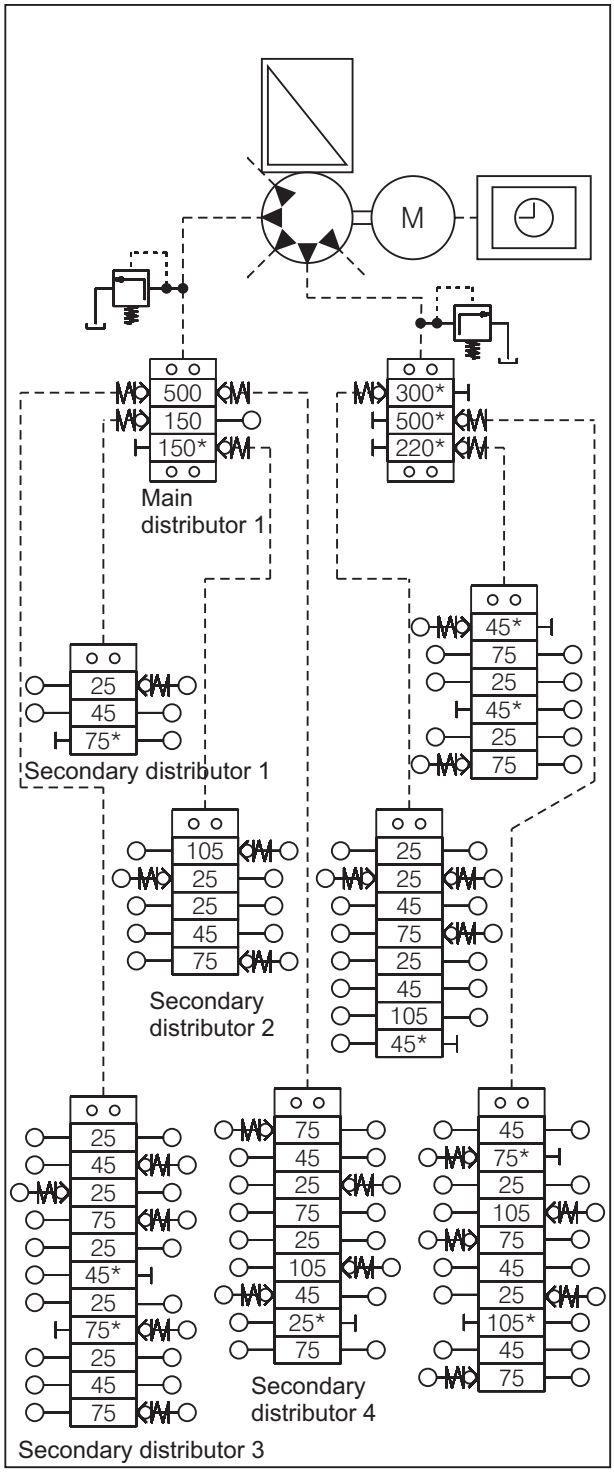
Different models of progressive distributors can be combined in one system. A system consisting of MX-F distributors can have a SXE-2 distributor as a main distributor, for example.



Design and installation of progressive systems

A scheme is created first, corresponding to the number and position of lubrication points and the drive of the pump.

The following example shows a progressive system with an electrically driven pump and integrated control.



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Calculation of the main distributor

The main distributors transport the lubricant to the secondary distributors.

The metering volume of the individual secondary distributors is calculated of the metering volume code numbers. Those are added and related to each other.

See figure on the previous page:

Secondary distributor 1:
(25 + 45 + 75) x 2 = 290

Secondary distributor 2:
(105+25+25+45+75) x 2 = 550

Secondary distributor 3:
(25 + 45 + 25 + 75 + 25 + 45 + 25 + 75 + 25 + 45 + 75) x 2 = 970

Secondary distributor 4:
(75 + 45 + 25 + 75 + 25 + 105 + 45 + 25 + 75) x 2 = 990

The metering volume code numbers have to be multiplied with 2 as the distributor disks deliver on the left and on the right.

Relation Code-no.	Main distributor 1 (e. g. SXE-2)	Relation distributor
290 = 1	app. SXE-2 150	app. 1
550 = 1,9	app. SXE-2 150 x 2 = 300	app. 2
970 = 3,35	app. SXE-2 500	app. 3,33
980 = 3,4	app. SXE-2 500	app. 3,33

The relations does not have to correspond exactly. A tolerance of ± 0,2 is permissible.

Lines

The pump is connected with the main distributors, respectively the main distributors are connected with the secondary distributors by steel pipe, high pressure hose or polyamide pipe.

Use non-return valves in each outlet when higher bearing back-pressures have to be expected

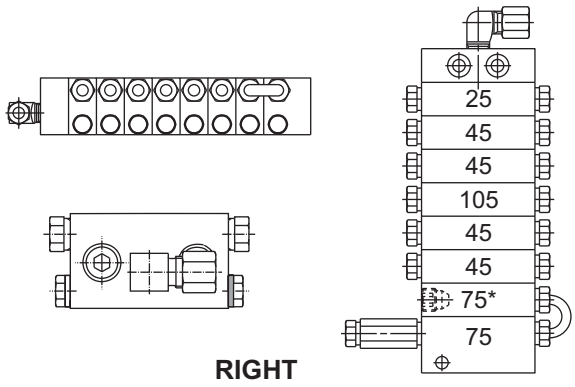
.

They are also necessary for the outlets of those main distributors which supply the secondary distributors.

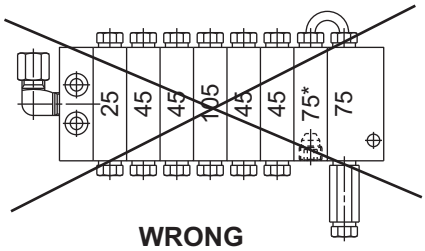
Installation of the distributor

Caution:

Please always install the progressive distributors with the pistons in horizontal position.



RIGHT



WRONG

The surface has to be even and free of anything that could possibly lead to tensions.

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Selection criteria

- Drive (manual, hydraulic, pneumatic, electric)
- Lubricant (oil, fluid grease, grease)
- Metering volume
- Range of pressure, depending on the number and counter-pressure of the lubrication points, distributors and the line system.

Calculation of the pump operation time

The pump operation time is calculated with the metering volume code numbers of the secondary distributors and the pump's metering volume per stroke or per minute (time control).

See figure of a calculation of the main distributor

Secondary distributor 1:
25 + 45 + 75 = 145 x 2 = 290 mm³

Secondary distributor 2:
105 + 25 + 25 + 45 + 75 = 275 x 2 = 550 mm³

Secondary distributor 3:
25 + 45 + 25 + 75 + 25 + 45 + 25 + 75 + 25 + 45 + 75 = 485 x 2 = 970 mm³

Secondary distributor 4:
75 + 45 + 25 + 75 + 25 + 105 + 45 + 25 + 75 = 495 x 2 = 990 mm³

Calculating a lubrication cycle

290 mm³/cycle + 550 mm³/cycle+
970 mm³/cycle + 990 mm³/cycle =
2800 mm³

Calculation of the output rate of the pump

(e.g. FKGM-EP with electrical drive and gear, with pump element PE 120)
Motor revolutions: 1400 r/min
Transmission of the gear: 80:1
(see data sheet)

1400 r/min ÷ 80 = 17,5 r/min

Metering volume of the pump element:
120 mm³/stroke

120 mm³/stroke x 17,5 r/min = 2100mm³/min

Calculation of the pump operation time

2800 mm³ ÷ 2100 mm³/min = 1,3 min
that is: 1 min 18 sec

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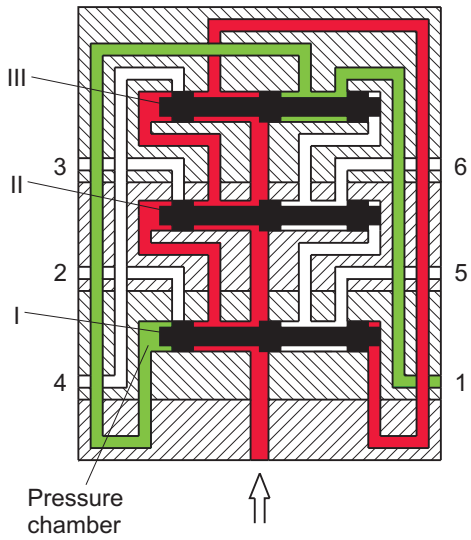
Functional description of distributors in plate construction.

At distributors in disk construction, the lubricant is always supplied to the outlets of the distributor disk, in which the piston moves.

The progressive distributors consist of distributor disks, which are combined to distributor blocks by connecting rods (hexagon socket screws) and disks. O-rings seal the individual elements.

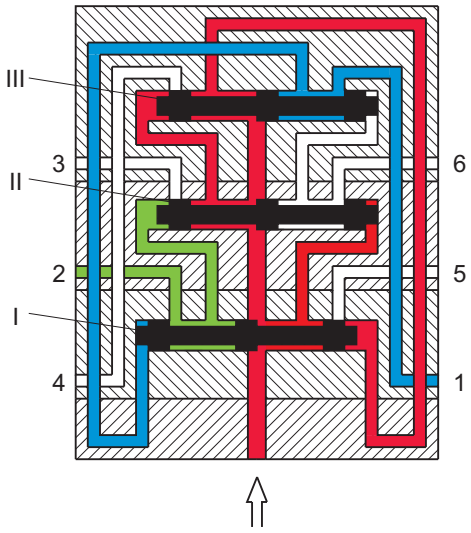
According to the functional description, the following distributors operate: MX-F, SX-1, SX-2, SX-3, UX.

The lubricant flows through all distributor disks to the piston (I) (fig. A). The piston (I) is shifted to the left and the lubricant of the piston's left pressure



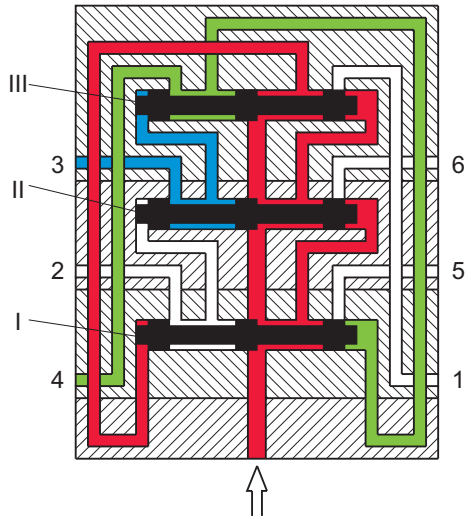
After that, the lubricant is delivered to the outlets 2 and 3 by the progressive movement of the pistons (II and III). Then the lubricant is directed to the left side of the piston (I) (fig. C) and delivered out of the piston's right pressure chamber to outlet 4.

Figure B



The pistons (II and III) are shifted and the lubricant is pushed to the outlets 5 and 6.

Figure C



After the piston III has been moved, the lubricant is directed to the piston's right side again (fig.A) and a new cycle of the progressive piston distributor is effected. This function is repeated as long as lubricant is supplied to the progressive distributor.

= pressure ducts
= already supplied
= following metering stroke

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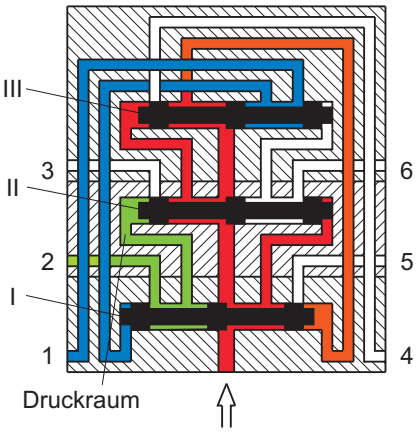
Functional description of distributors in segment construction

At distributors in segment construction, the lubricant is always delivered to those outlets of the distributor disk, in which the piston moves.

The progressive distributors in segment construction consist of metering-, initial-, middle-,and end elements, which are fixed with hexagon socket screws. The disks are combined by connecting rods with washers and nuts. O-rings seal the individual elements.

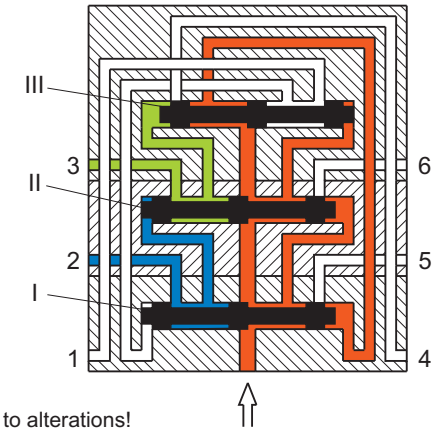
According to the functional description as shown here, the following distributors operate: SXE-2, SXE-3, SXD.

Figure A



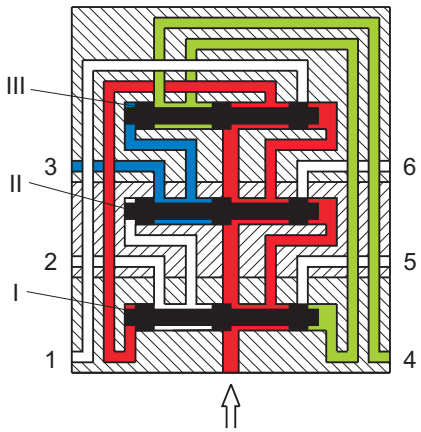
The lubricant flows to the second metering element's piston (II) (fig. A). The piston (II) is moved to the left and the lubricant is pushed out of the piston's left pressure chamber to outlet 2 (fig. B).

Figure B



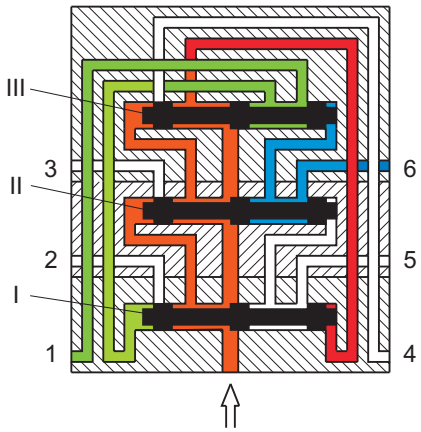
Following, the metering piston (III) is moved progressively and the lubricant is supplied to outlet 3. After the piston (III) has been moved, the lubricant is directed to the left side of the metering piston(I) (fig. C) and delivered out of the metering piston's (I) right pressure chamber to outlet 4.
After that, the metering pistons (II and III) are shifted and the lubricant is pushed to outlet 5 and 6.

Figure C



After the metering piston (III) has been shifted is the lubricant directed to the metering piston's (I) right side (fig. D) and the metering volume of the metering piston's (I) left pressure chamber is directed to outlet 1.

Figure D



A new cycle starts. This is repeated as long as lubricant is supplied to the progressive distributor.

= pressure ducts
= already supplied
= following metering stroke

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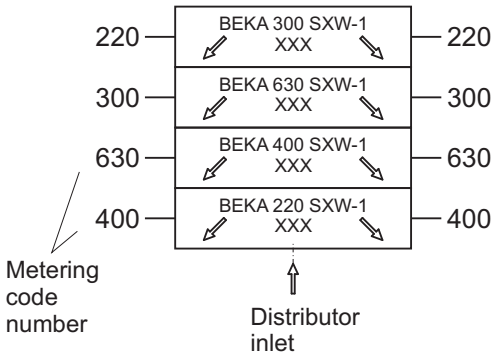
Functional description in sandwich construction

At distributors in sandwich construction, the lubricant always comes out of the previous outlet in the direction of the distributor inlet.



The progressive distributors SXW-1 and SXW-2 in sandwich construction, consists of a connecting plate and several metering elements. The metering elements are connected with the connecting plate by means of hexagon socket screws. The individual elements are sealed by O-rings.

Figure A

The supplied lubricant flows through the connecting through the ring groove of piston III to the left side of piston I and shifts it to the right side. The lubricant of the right pressure chamber of piston I flows to outlet 6.

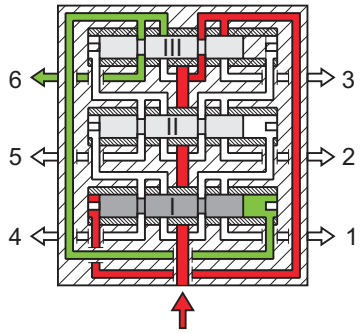


Figure B

After that the way to piston II is free and the lubricant is directed to outlet 1.

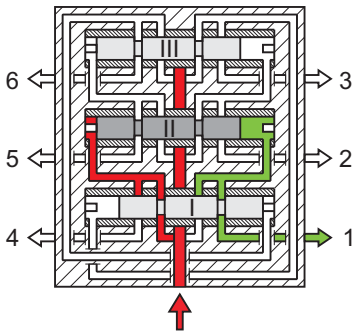


Figure C

Then the way to piston III gets free and lubricant out of the right pressure chamber is directed to outlet 2.

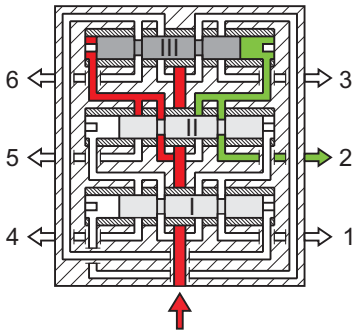


Figure D

After piston III has been moved, the lubricant is led to the piston's right side and shifts it to the left. The lubricant of the left pressure chamber of the piston I is supplied to outlet 3.

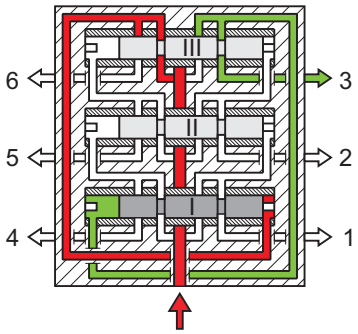


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Figure E
The way to piston II is free and the lubricant of the left pressure chamber is directed to outlet 4.

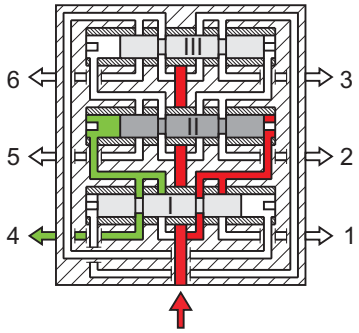
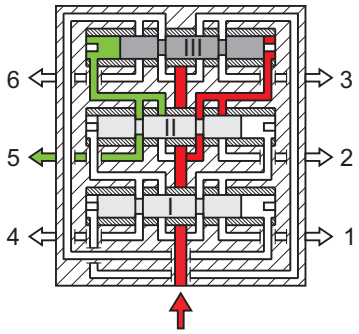


Figure F
Then the way to piston III is free and the lubricant of the left pressure chamber is led to outlet 5.



After piston III has been shifted, the lubricant is led to the distributor's left side again and a new cycle begins. This function of the distributor is repeated as long as the distributor is supplied with lubricant.

= pressure ducts
= current metering stroke

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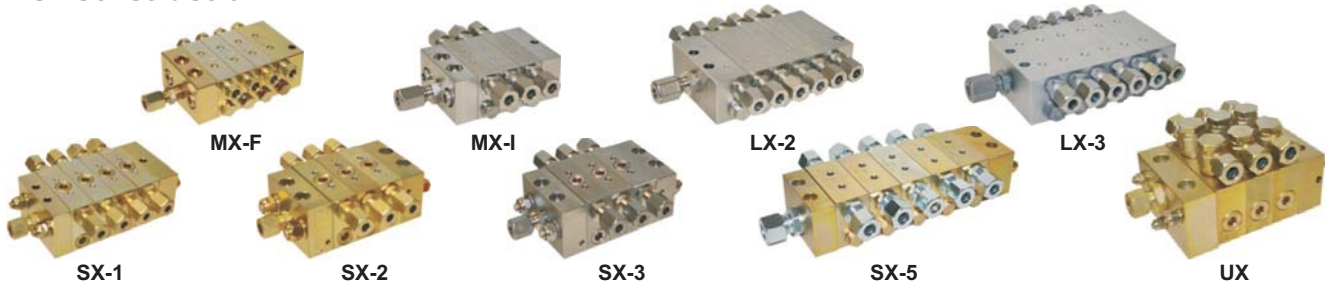
Disk construction



Designation	Type	max. revolutions / min	Pressure max. (bar)	No. of outlets max.	Connection inlet	Connection outlet	Material	Metering volume (mm^3/stroke per outlet)	Metering medium	Features
MX-F	4010	180	300	24	M10x1	M10x1	steel, galvan.	25 - 105	oils and greases up to NLGI-cl. 2	- use in mobile range (on- /off-road vehicles, agricultural a. construction machinery etc.) - special coating for heaviest operating conditions
MX-I	3979	60	300	16	M10x1	M10x1	1.4404	45 - 105		- especially suited for food industry and agressive ambient - very high material quality (1.4404)
LX-2	3972	180	300	20	M10x1	M10x1	steel, ZnNi	200		- Perfect for applications, where VA is not really necessary, high corrosion protection - 100 % compatible dimensions and output rate to similar block distributors
LX-3	3973	60	300	20	M10x1	M10x1	1.4404 1.4401	200		- identical to LX-2 - perfect for beverage- and packing industry - 100 % compatible dimensions and output rate to similar block distributors
SX-1	4000	180	300	20	G 1/8	G 1/8	steel, galvan.	68 - 430		- due to up positioned sealing washers, easy outlet combination without loosen the pipe lines and fittings
SX-2	3989	180	300	20	G 1/8	G 1/8	steel, galvan.	75 - 470		- see SX-1 - increased volume due to compact design
SX-3	4008	60	300	20	G 1/8	G 1/8	1.4301	75 - 470		- the alternative for SX-2, but with V2A (1.4301) - especially suited for food industry and agressive ambient
SX-5	3983	180	300	20	G 3/8	G 1/4	steel, galvan.	75 - 470		- large connection threads - especially suited for minery area
UX	4005	180	250	20	G 1/2	G 3/8	steel, galvan.	1130 - 2000		- outlets are upwards positioned; easily detachable when using swivelling elbow fittings at connected pipe lines

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Segment construction

Sandwich construction





SXE-2 SXE-3 SXD SXW-1 SXW-2

Designation	Type	max. revolutions / min	Presusre max. (bar)	No. of outlets max.	Connection inlet	Connection outlet	Material	Metering volume (mm³/stroke per outlet	Metering medium	Features
SXE-2	4003	180	300	20	G 1/4	G 1/8	steel, galvan.	100 - 760	oils and greases up to NLGI-cl. 2	- designed for the use as main distributor for grease lubrication systems at construction machinery - use of dummy elements, which can be replaced by metering elements if necessary
SXE-3	3985	180	300	20	G 3/8	G 1/4	steel, galvani.	100 - 760		- same characteristics as SXE-2 - suitable for a larger line diameter
SXD	3998	180	200	20	G 3/8	G 3/8	steel, galvani.	100 - 760		- same characteristics as SXE-2 - conn. of outlets show downwards hence, perfect to be installed in a switch cabinet - use of dummy elements, which can be replaced by metering elements if necessary
SXW-1	3977	180	150	20	G 1/4	G 1/4 G 1/8	steel, galvan. (conn. plate in Al)	100 - 760		- metering elements can be changed individual or complete with the intermediate plate - use of dummy elements, which can be replaced by metering elements if necessary - suitable for oil circulation systems
SXW-2	3978	180	150	20	G 1/2	G 3/8	steel, galvan. (conn. plate in Al)	1000 - 3800		- metering elements can be changed individual or complete with the intermediate plate - use of dummy elements, which can be replaced by metering elements if necessary - especially designed for the automotive industry

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Technical description

Progressive distributors MX-F are built in a variable disk construction. Therefore the distributor can be, depending on the number of lubrication points, extended or shortened. Because of the disk construction there is the possibility to join individual distributor disks (middle element, end element) with different metering volumes together to one complete progressive distributor.

The different metering volume per stroke is effected by different piston diameters.

A progressive distributor needs at least three pistons.

Technical data

Operating pressure inlet: max. 300 bar

Temperature range: -30 °C to 80 °C

Metering medium: oil - fluid grease - grease up to NLGI-cl. 2

Revolutions: max. 180 r/min

Material: steel, galvanized

No. of elements:

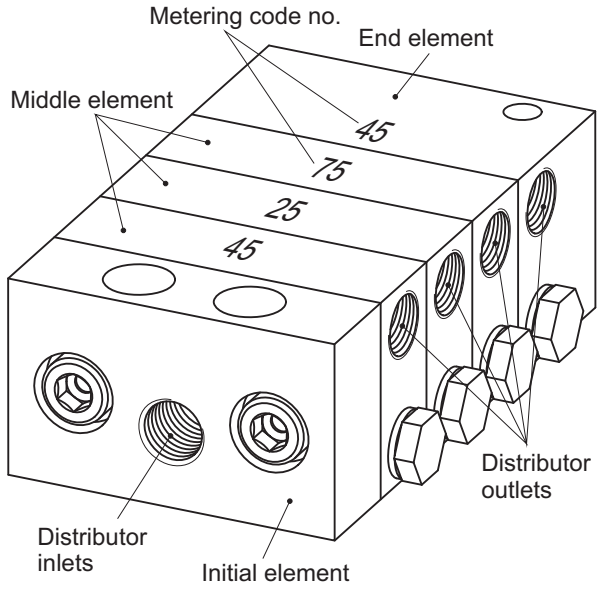
min. 3 piston elements: MX-F 3/6

max. 12 piston elements: MX-F 12/24

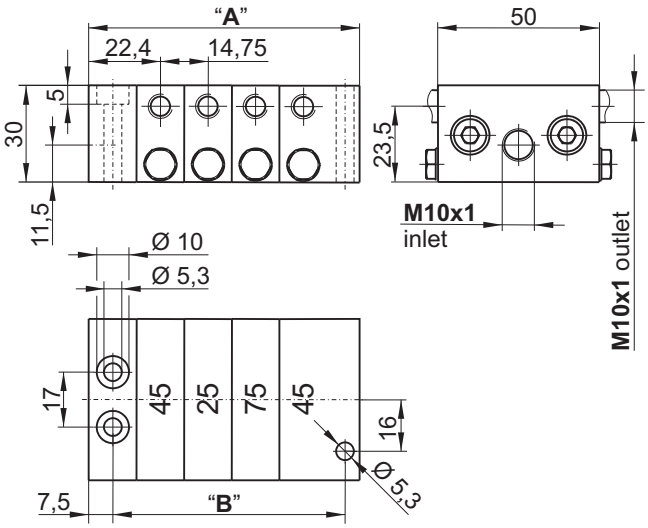
Table metering volume:

Designation piston element	Metering volume (mm³/stroke)		Code no.
	p. outlet	p. element	
MX-F 25	25	50	25
MX-F 45	45	90	45
MX-F 75	75	150	75
MX-F 105	105	210	105

Progressive distributor MX-F with four piston elements (middle element, end element) and eight outlets:



Dimensional drawing



No. of piston elements	No. of outlets (max.)	Dim. "A" (mm)	Dim. "B" (mm)
3	6	69,20	57,2
4	8	83,95	72,0
5	10	98,70	86,7
6	12	113,45	101,5
7	14	128,20	116,2
8	16	142,95	131,0
9	18	157,70	145,7
10	20	172,45	160,5
11	22	187,20	175,2
12	24	201,95	190,0

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Elements

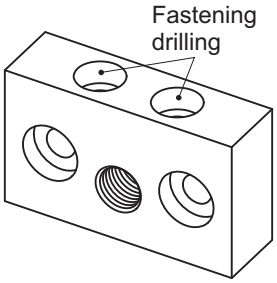
Progressive distributors MX-F have an initial element (without piston), two to eleven middle elements (with piston) and one end element (with piston).

The initial elements have a M10x1 thread connection at the distributor inlet as well as middle and end elements at all distributor outlets.

Initial elements

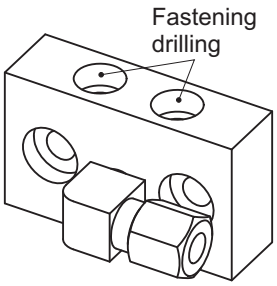
Initial elements can be delivered with and without inlet fitting.

Initial elements without inlet fitting,
Distance of fastening drillings: 17 mm
Diameter of fastening drilling: 5,3 mm
Order-no.: 401094001 (standard)

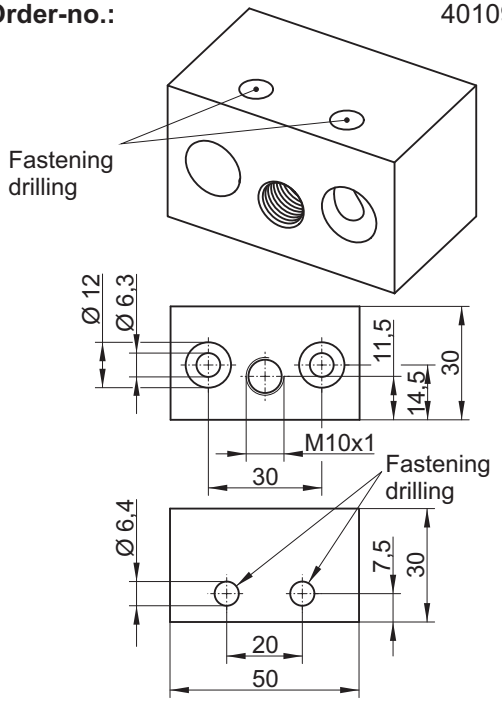


All fittings with a connection thread M10x1 fit into an initial element without inlet fitting.

Inital element with elbow screw fitting WE6 M10x1k,
Distance of fastening drillings: 17 mm
Diameter of fastening drilling: 5,3 mm
Order-no.: 401094002

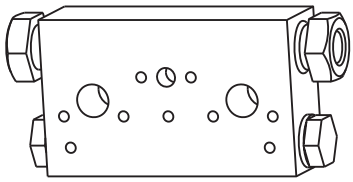


Initial element without inlet fitting,
Distance of fastening drilling: 20 mm
Diameter of fastening drilling: 6,4 mm
Order-no.: 401094001L



Middle elements

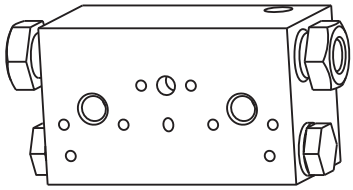
Middle elements are delivered with union screw and olives for pipe Ø 6 mm



Middle element	Order-no.
MX-F 25	401095101
MX-F 45	401095102
MX-F 75	401095103
MX-F 105	401095104

End element

End elements are delivered with union screw and olives for pipe Ø 6 mm



End element	Order-no.
MX-F 25	401096101
MX-F 45	401096102
MX-F 75	401096103
MX-F 105	401096104

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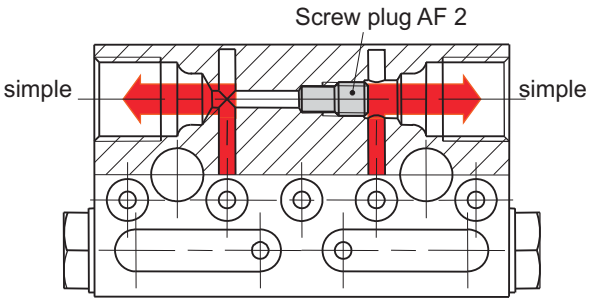
Combination of outlets

For larger lubrication points it could be necessary to combine two or more outlets at the progressive distributor.
The individual disks have two outlets.



Combination of outlets

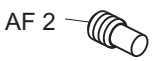
Screw plug for closing outlets at the progressive distributor MX-F

Order-no.: 4010960050000

Separation of outlets

To separate combined outlets again, the sealing screw has to be screwed in again.

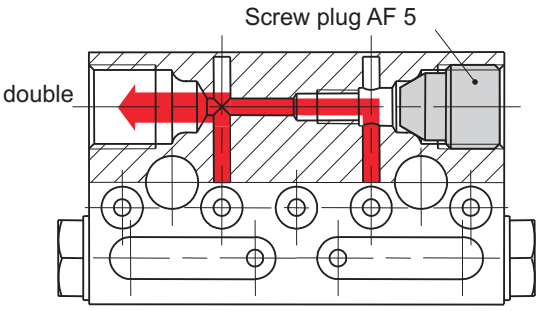
Sealing screw for separating outlets at progressive distributors:



Order-no.: 4010960060000

Combination of outlets at one distributor disk

When two outlets are combined, the two outlets of one disk are connected. To this purpose, the sealing screw, which separates the two sides, is removed and a screw plug is screwed into the side to be closed. The metering volume of the locked side now comes out of the other side, i.e. the metering volume at the open side doubles.
1 outlet per distributor disk



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Combination of outlets at several distributor disks

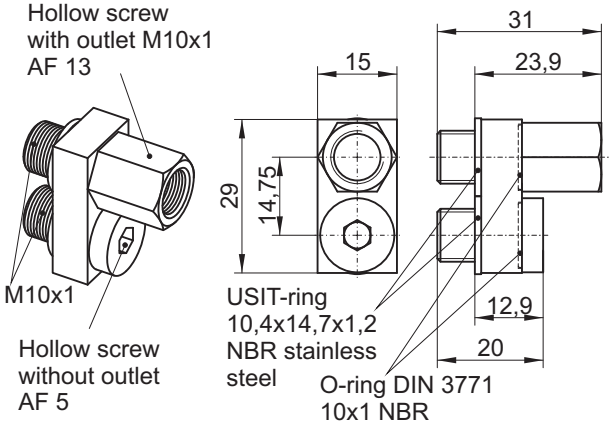
When the total metering volume of the outlets combined in one disk should be insufficient, for very large bearing points or main distributors e.g., there is also the possibility to combine the outlets of several distributor disks.

The metering volume of all combined outlets is calculated of their metering volume code number.

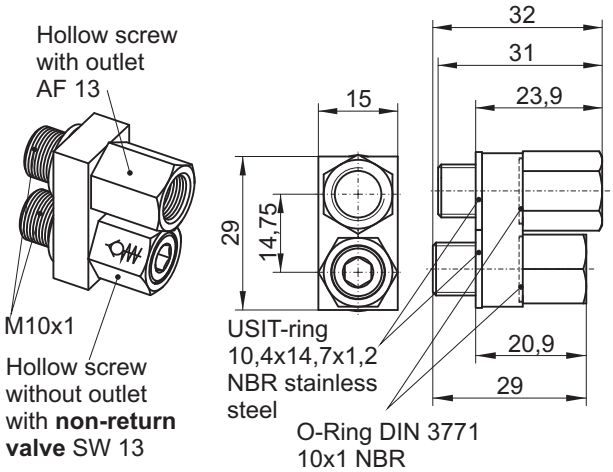
Distributor bridge with outlet

With the help of distributor bridges with outlet two, three or four outlets can be connected at different adjacent distributor disks.

Order-no., complete: 4010 9600 10012



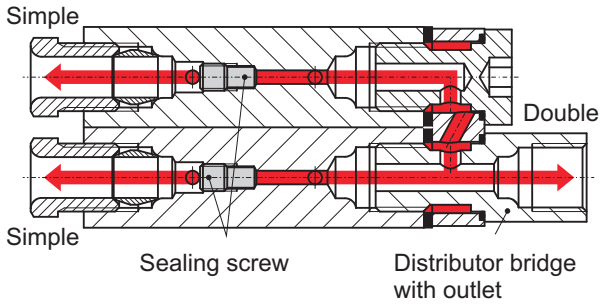
Distributor bridge with outlet with non-return valve , order-no. total: 4010960010018



Two outlets combined at two different distributor disks

When only two outlets at different, adjacent distributor disks are combined, the sealing screw must not be removed from none of the two distributor disks.

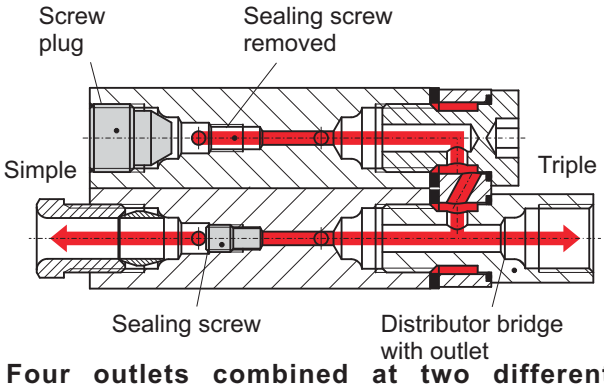
Both outlets' metering volume then comes out of the distributor bridge's outlet.



Three outlets combined at two different distributor disks

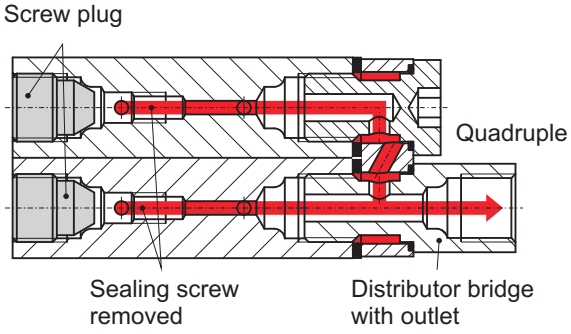
When three outlets shall be combined, the sealing screw has to be removed from one of the concerned distributor disks. The outlet opposite the distributor bridge of the distributor disk at which that sealing screw has been removed, must be locked with a screw plug.

All three outlets' metering volume then comes out of the outlet of the distributor bridge.



Four outlets combined at two different distributor disks

When four outlets should be combined, the sealing screws have to be removed in both distributor disks and a screw plug has to be screwed into each of the two outlets opposite to the distributor bridge. All four outlets' metering volume then comes out of the distributor bridge's outlet.



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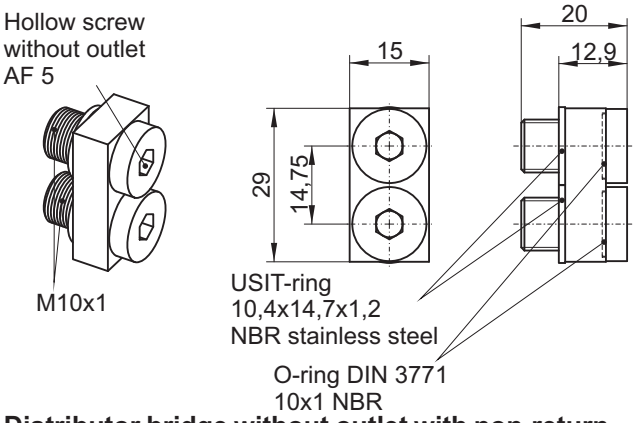
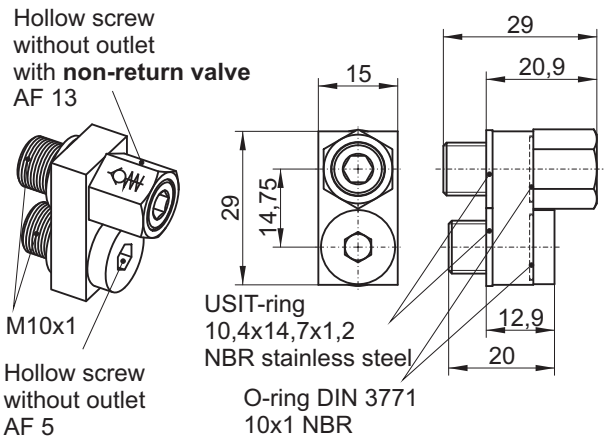
Distributor bridges without outlet and pipe bridge

Distributor bridges without outlet have the same function as pipe bridges. With their help, three or four outlets at different, adjacent distributor disks can be combined.

Distributor bridge without outlet,
Order-no., total: 4010 9600 10013



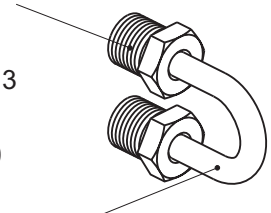
Distributor bridge without outlet with non-return valve,
Order-no., total: 4010 9600 10016



When MX-F 3/2 is used where three outlets are combined, a distributor bridge without outlet with integrated non-return valve has to be used.

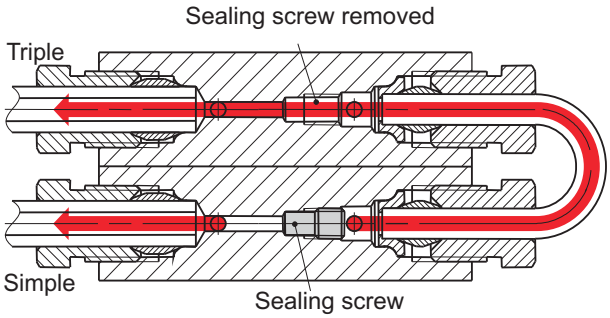
Pipe bridge
order-no. total: 4010960010011

Consisting of:
Union screw ÜS4 M10x1
Order-no.: 0802000312
Olive DKR 4
Order-no.: 09038620013
Reduction Ø6 to Ø4
Order-no.: 0802000310
Pipe bridge
Order-no.: F0409/14-00 001



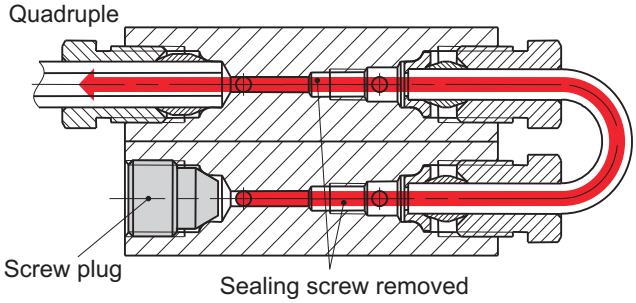
Three outlets combined at two different distributor disks

When outlets are combined with a pipe bridge (standard) or with a distributor bridge without outlet, at least three outlets are always concerned, as the metering volume has to be directed through one of the disks of the progressive distributor. The sealing screw always has to be removed in one of the two combined distributor disks.



Four outlets combined at two different distributor disks

Also four outlets can be combined with a pipe bridge (standard) or a distributor bridge without outlet. To this purpose, the sealing screws have to be removed from both distributor disks and one of the two outlets opposite to the pipe bridge have to be closed with a screw plug.
Pipe bridges can also be ordered in component parts (see drawing on the left).



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Elements with proximity switch

For monitoring the system or for the use of stroke controls for counting the piston strokes can MX-F proximity switches be attached to the progressive distributor.

Proximity switches can be delivered premounted to middle- and end elements MX-F 75, MX-F 105. The intstallation position of the proximity switch is on the right side as standard. Installation on the left side has to be indicated separately.

Middle or end elements with proximity switch have to be indicated when the order is placed, a later attachment of a proximity switch to an existing middle- or end element is only possible by replacing the concerned distributor disk.

The proximity switch is delivered without cable, it has to be ordered separately (see “Accessory Progressive Distributor”).

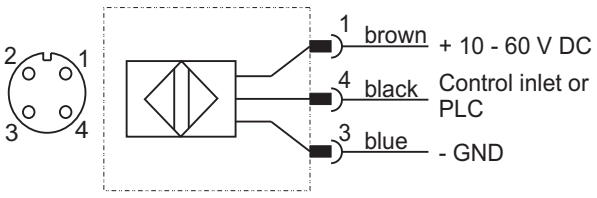
As the terminal housing of the proximity switch sticks out at the distributor (see dimension drawing on the right), a mounting plate (see drawing) has to be put under distributors which are not attached with a welding plate or a mounting angle.

Middle- and end elements with proximity switches always have to be equipped with non-return valves at the distributor outlets to ensure a perfect function of these elements.

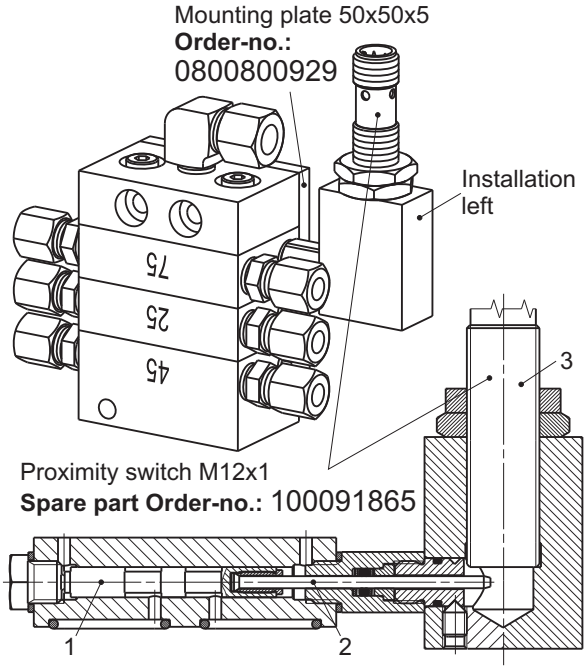
Technical data of the proximity switch:

Connection:	M12x1 pluggable
Connection method:	PNP NO
Load capacity:	200 mA
Possible voltage:	10-60 V DC
Per. ambient temperature:	-40 °C to 85 °C
Function indicator:	LED yellow
Housing material:	stainless steel
Protection class:	IP 67 / IP 69K

Terminal diagram:



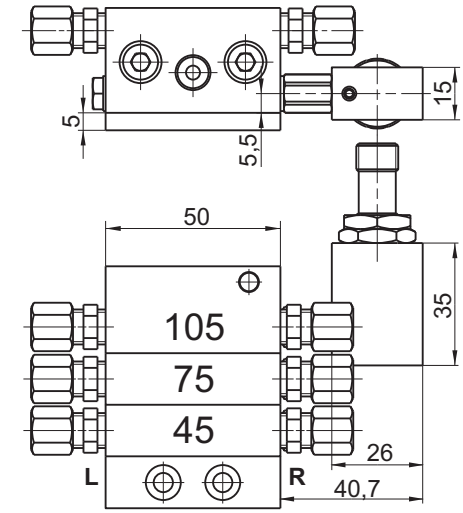
Progressive distributor with installed proximity switch:



Functional description:

A pin (2) is fixed at the piston (1) of middle- or end element. It approaches the proximity switch (3) with each piston stroke and initiates a signal. This signal can be evaluated differently, depending on control type and application case.

Installation dimensions



L = left
R = right

Piston element with PS	Order-no.
Middle element MX-F 75	401095123022*
Middle element MX-F 105	401095124022*
End element MX-F 75	401096123022*
End element MX-F 105	401096124022*

** Please indicate the installation position of the proximity switch: right (standard) or left*

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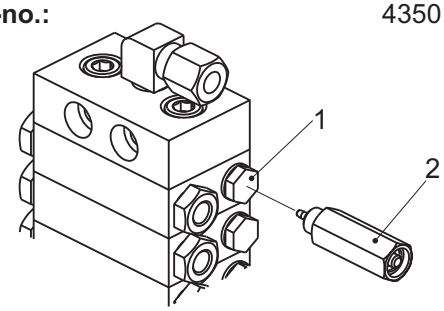
Visual stroke control

Elements of the progressive distributor MX-F can also be equipped with a visual stroke control. This function testing element does not provide read or print out data. However, the visual stroke control can any time be retrofitted to the distributor. For this purpose, the piston screw plug (1) is removed and the visual stroke control (2) is screwed in. This is only possible at middle- and end elements MX-F 75 and MX-F 105.

The max. permissible operating pressure for the outlet with visual stroke control is 50 bar.

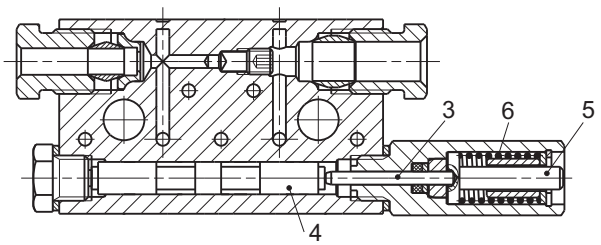
Order-no.: 4350 00 105



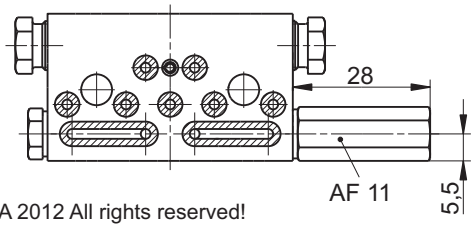
Note: **Please pay attention to utmost cleanness, when the attachment is made.**

Functional description:

The stamp (3) is shifted outwards (in the shown example to the right) when the piston (4) is actuated, the control pin (5) becomes visible. The spring (6) pushes the control pin and the stamp back into their original position, when the piston is moved to the other side (see “Functional description in disk construction”).

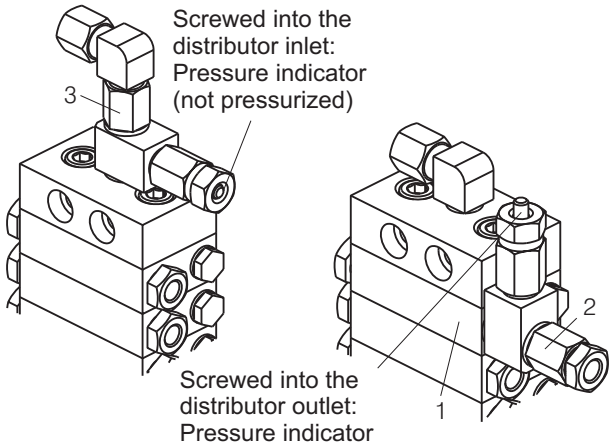


Installation dimensions



Pressure indicator

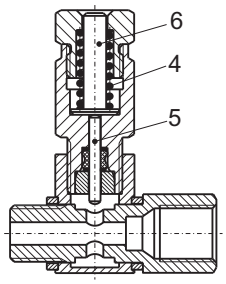
The outlets or the distributor inlet of the MX-F can be equipped with a pressure indicator, i.e. too high pressure is indicated visually. This element does not provide read or print out data. The pressure indicator can be retrofitted any time, as it has only to be screwed into the distributor outlets between the middle- or end element (1) and the retaining screw (2) or into the distributor inlet between the threaded connection (3) and the initial element of the progressive distributor.



Note: Pay attention to utmost cleanness when the attachment is carried out!

Functional description:

Higher pressure means the pin (5) is pressurized and the bolt (6) is lifted visibly. When pressure is relieved, the spring (4) pushes the bolt (6) and the pin (5) back into their normal position.



See order numbers and installation dimensions under “Accessory progressive distributor”.

Should the distributor’s function be ensured even with a closed distributor outlet, the distributor can be provided with a so-called **blockade control.** See “Accessory progressive distributor”.

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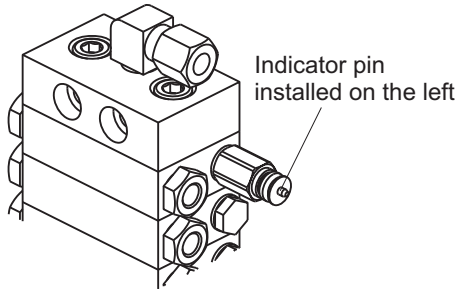
Elements with indicator pin

The progressive distributors MX-F can also be equipped with an indicator pin.

The indicator pin cannot be attached later. Retrofitting an indicator pin is only possible by replacing a distributor disk.

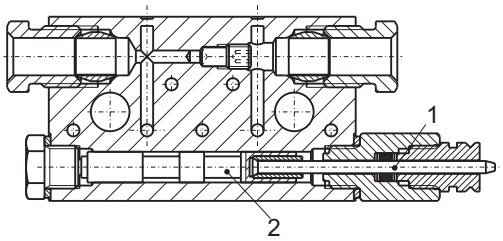
The installation of an indicator pin is also only possible in middle elements as well as in end elements MX-F 75 and MX-F 105 and has to be indicated when the order is placed.

The indicator pin is attached on the right as a standard. An installation on the left has to be indicated separately.

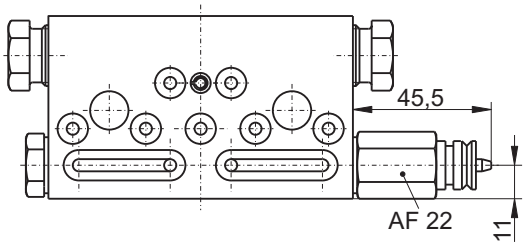


Functional description:

At the indicator pin, the stamp (1) is directly connected to the progressive distributor's piston (2). With each stroke, the stamp (1) is either compulsory pushed out or drawn back.



Installation dimensions

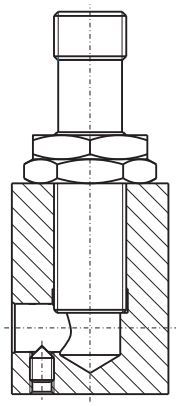


Piston element with indicator pin	Outlet pipe-Ø (mm)	Order-no.
Middle element MX-F 75	6	401095153*
Middle element MX-F 105	6	401095154*
End element MX-F 75	6	401096153*
End element MX-F 105	6	401096154*

** Please indicate the installation position of the indicator pin: on the right (standard) or on the left.*

For the indicator pin it is possible to retrofit a proximity switch, if necessary.

Order-no. of the proximity switch for a later



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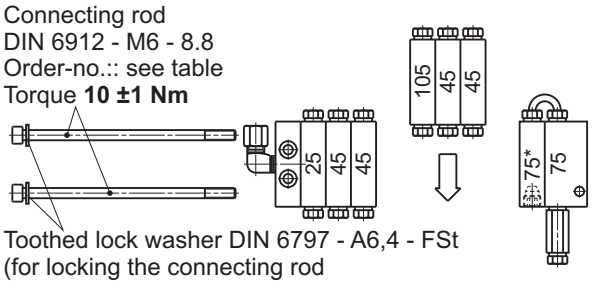
Extension or shortening of distributors

The MX-F distributors can any time be adapted to the application conditions because of their disk construction. If new lubrication points should be added or some become unnecessary, the distributor can be extended or shortened by mounting additional distributor disks or removing unnecessary ones.

Description:

- Remove the connecting rods (1), which keep the distributor together
- Separate the distributor at the desired point
- Add new distributor disks or remove the unnecessary ones
- Screw the distributor together again with the corresponding connecting rods and one tooth lock washer each (see table)

MX-F 5/7 distributor to which three additional distributor disks should be attached:



Caution: Please pay attention to utmost cleannes .

Table order-no. for connecting rod (each 1 pcs):

Distributor	Conn. rod	Order-no.
MX-F 3/6	M6 x 50	090691201913
MX-F 4/8	M6 x 65	090691202213
MX-F 5/10	M6 x 80	090691202413
MX-F 6/12	M6 x 95	090691202613
MX-F 7/14	M6 x 110	090691202813
MX-F 8/16	M6 x 125	090091204823
MX-F 9/18	M6 x 140	090091205023
MX-F 10/20	M6 x 155	090091205123
MX-F 11/22	M6 x 170	090091211223
MX-F 12/24	M6 x 185	090091212223

Note: A MX-F distributor always has to consist of at least 3 piston elements and 12 as a maximum.

Should one of the O-rings, which are used for sealing the distributor between the individual elements be damaged and does not seal anymore, a set of seals can be ordered, containing all O-rings installed into the MX-F distributor.

Set of seals for initial elements:
Order-no.: 4010960030002

Set of seals for middle elements:
Order-no.: 4010960030001

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Order key

Distributor inlet

The MX-F distributor can be delivered with or without fittings. If the inlet fitting shall already be installed in the distributor, indicate this by means of fitting type, pipe diameter and the series when order (see table).

Inlet	Designation
M10x1	without fitting
GE06LL	male stud coupling, pipe-Ø 6 or Ø 8, series LL
GE08LL	
WE06LL	elbow-screw fitting, pipe-Ø 6 or Ø 8, series LL
WE08LL	
WS06LL	elbow-screw fitting, pipe-Ø 6 or Ø 8, series LL
WS08LL	

When no indication concerning the fittings is made, the delivery is without fittings as standard!

Distributor outlet

The distributor outlet can be delivered with union screws, plug-in connections and two types of non-return valves (see table).

Outlet	Designation
M10x1	without fitting
ÜS04	union screw, pipe-Ø 4 or pipe-Ø 6
ÜS06	
GS04	plug-in connection, pipe-Ø 4 or pipe-Ø 6
GS06	
RVA	non-return valve, internal thread M10x1 (**without** olive and union screw)
RVA04	non-return valve, for pipe-Ø 4 or pipe-Ø 6 (**with** olive and union screw)
RVA06	
RVB06	non-return valve, for pipe-Ø 6 (**with** cutting ring and union nut)
RVS06	non-return valve with plug connection, for pipe -Ø 6

When the name of the fitting is missing, retaining screws Ø 6, or, for the installation of a proximity switch, non-return valves with cutting rings Ø 6 are delivered.

Metering volume

The metering code numbers **25** to **105** (see table “Technical description”) of the metering elements have to be indicated on each side of the distributor inlet in the order, in which the lubricant comes out and they have to be separated by a **slash** (/). For distributor bridges, a **plus** (+) has to be indicated instead of the slash.

For combined outlets, the metering code numbers accumulate (see “Combination of outlets”).

Screw plugs and outlets which are closed with distributor bridges are marked with a **line** (---). The sealing screw, which has to be removed, is marked with a **star** (*) in the drawing (see “Combination of outlets”).

Non-return valves in the distributor bridges are marked with **RV** behind the metering code number at the according outlet in the order key.

Proximity switch

Distributor elements to which a proximity switch should be attached, have to be marked with NS (proximity switch) after the number for the metering volume. Proximity switches can be attached to MX-F distributors on the right (standard) or on the left side. After the designation NS, the type of proximity switch

NS	Designation
NS A	NS M8x1 with 6 m cable, not plugable
NS 08	NS M8x1 plugable
NS 12	NS M12x1 plugable (standard)

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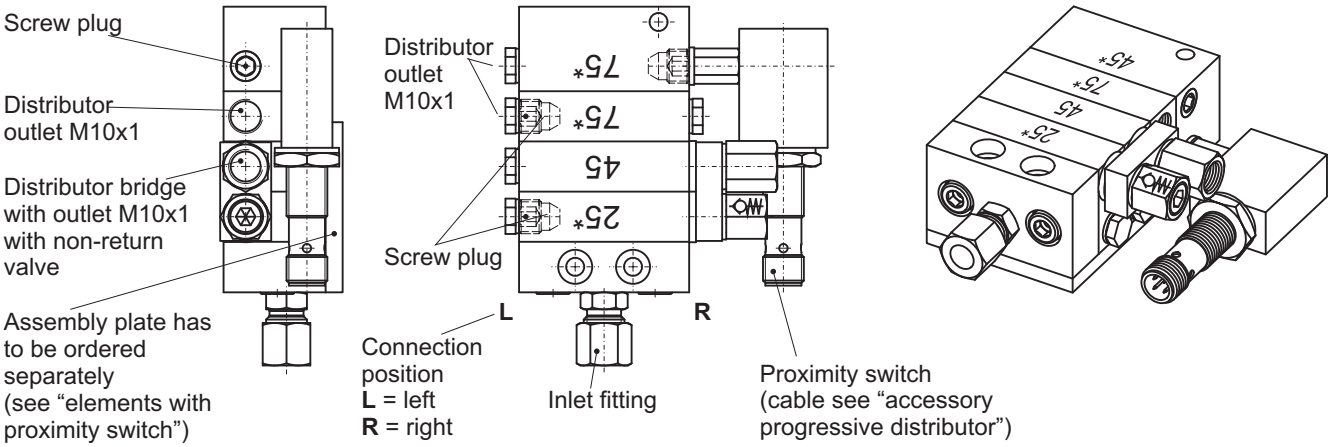
Order example



* = Sealing screw removed!

Type	MX-F 04 / 04 - GE08LL / M10x1	R	--- RV + 95 / 150 / --- NS
No. of piston elements		L	--- / 45 / --- /150
No. of outlets			
Inlet fitting			
Outlet fitting			
Connection positions			
Metering code numbers at outlets			

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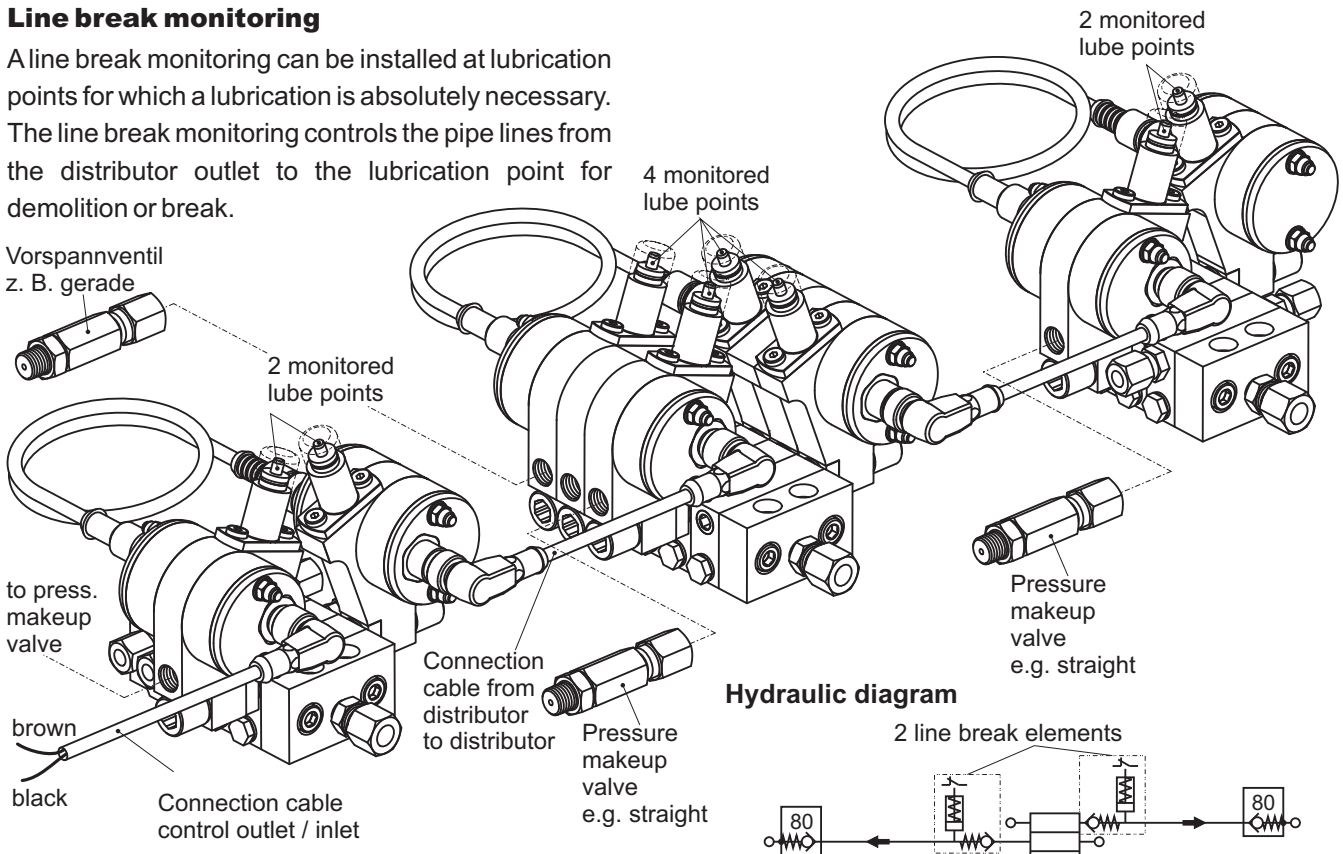
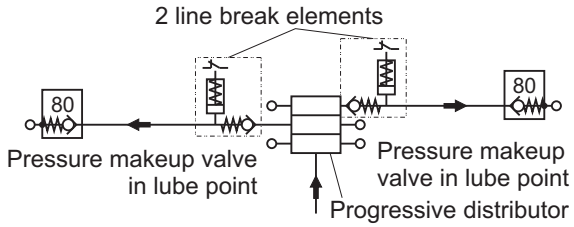
Line break monitoring

A line break monitoring can be installed at lubrication points for which a lubrication is absolutely necessary. The line break monitoring controls the pipe lines from the distributor outlet to the lubrication point for demolition or break.



Hydraulic diagram



Function

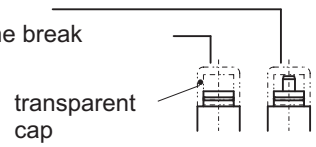
A line break element with pressure indication is screwed at the lube point of the distributor outlet that has to be monitored. The element is screwed together with flanges and plates (see next page) by means of cylinder screws and hexagon socket screws.

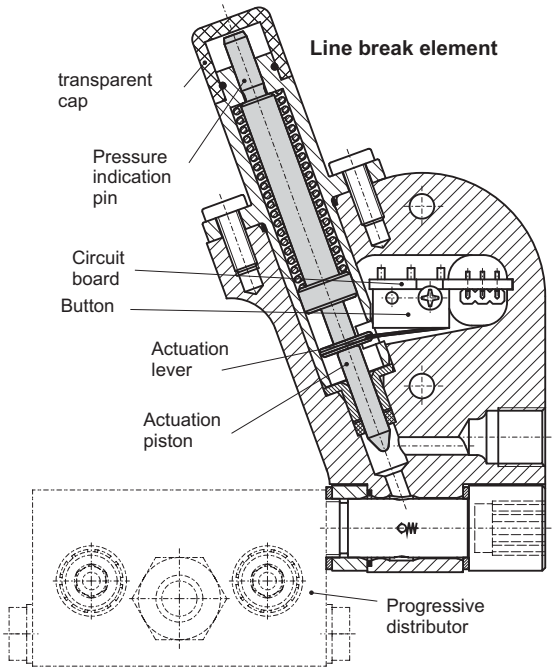
A pressure makeup valve with non-return valve with an opening pressure of 75 bar is screwed directly into the lube point. With this pressure, that always exists within the line, the actuation piston presses a button via the actuation lever in the element. Hence the electrical circuit is closed and the pin of the pressure indication is visible.

If pressure is reduced due to line break, the pin of the pressure indication becomes invisible and the electrical circuit is interrupted.

Attention: To ensure a reliable function, the value of the pressure loss in the connecting line between distributor outlet and preload valve may even under unfavourable conditions (e.g. deep temperature) not be higher than the operating pressure of the line rupture element (approx. 30 bar).

Pressure indicator
pin is visible = OK
pin is invisible = line break





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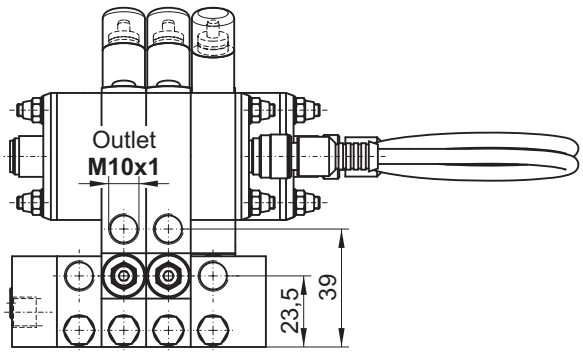
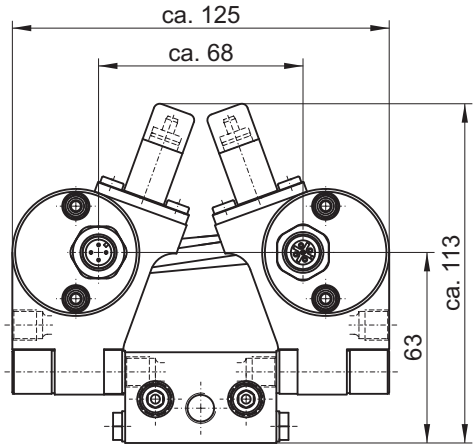
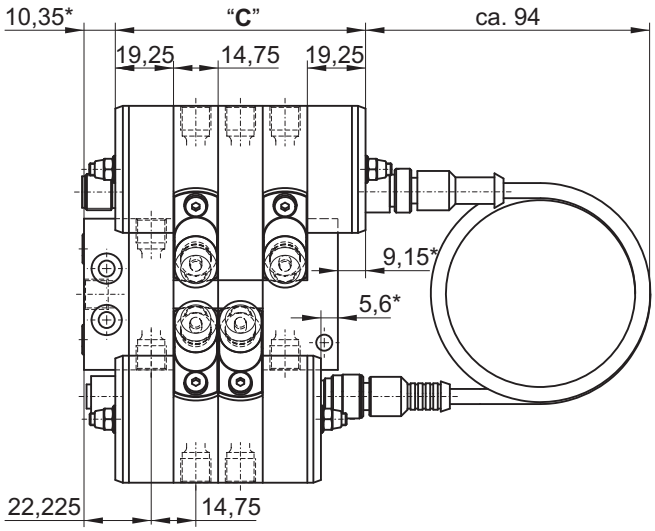
Dimensional drawing of line break monitoring:







No. of line break elements or intermediate plates	Dim. "C" (mm)
1	53,25
2	68,00
3	82,75
4	97,50
5	112,25
6	127,00
7	141,75
8	156,50
9	171,25
10	185,50
11	200,25
12	215,00

* Dimensions depends at which distributor outlet the first or the last line break element is installed.

Attention: Dimensions of distributor MX-F see description MX-F dimensional drawing

Technical data

Operating pressure inlet:	max. 300 bar
Operating voltage:	10 - 55 V DC
Contact capacity:	50 mA DC
Connection:	round plug connection M12, Pin 1 = +Ub Pin 4 = outlet (closing contact), Contact opens at fault

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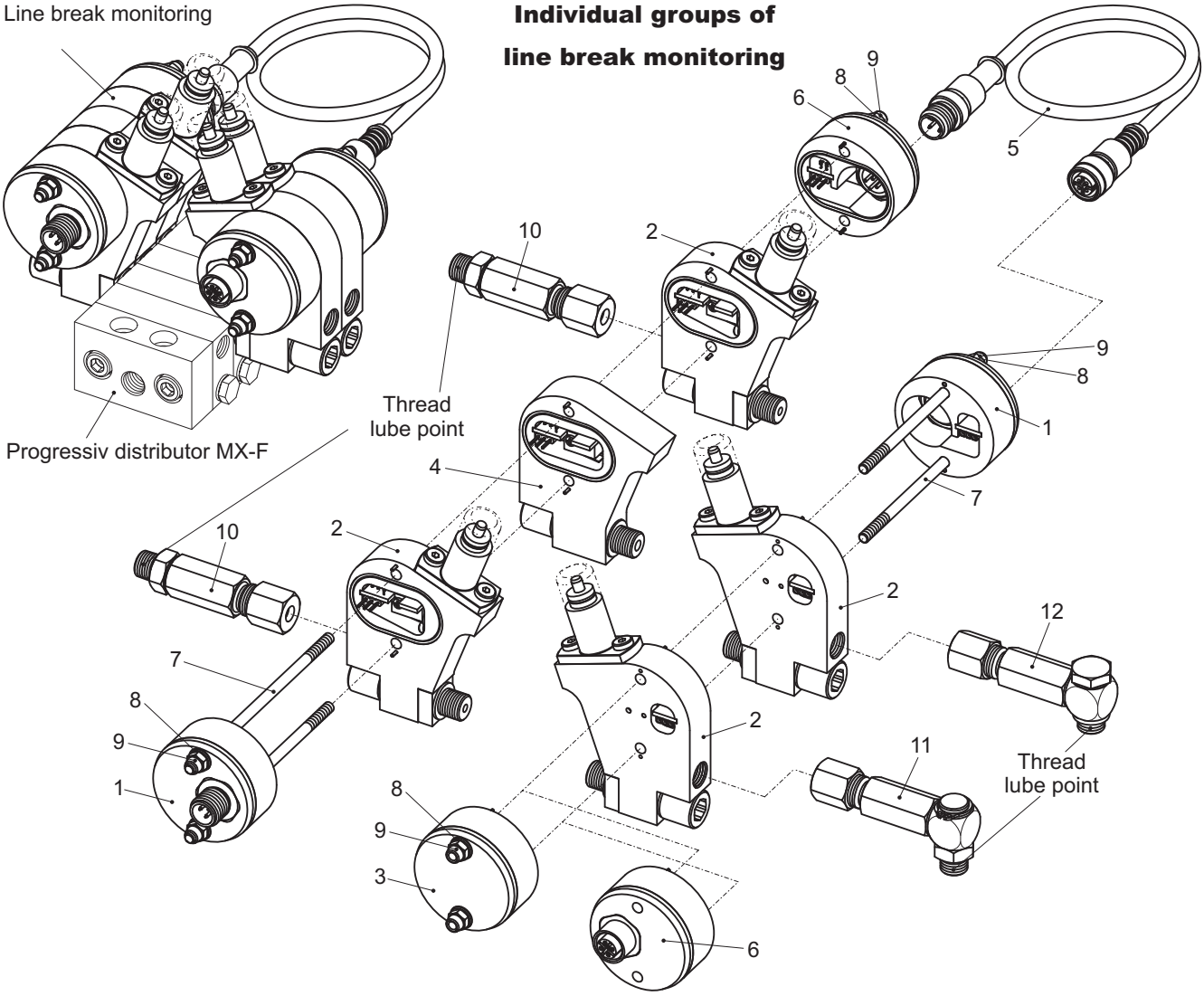

Table of order numbers of individual components of line break monitoring for **MX-F** (see figure above):

Position	Designation	Order-no.
1	Inlet flange, plug M12x1	437501010100
2	Line break element	437502010100
3	Final plate	4375060100
4	Intermediate plate	4375040100
5	Connection cable	1000913864
6	Outlet flange, bush M12x1	437503010100
7	Connecting rod	see table
8	Washer DIN 125-B4,3	0900125006132
9	Nut, self locking DIN 986-M4	09i0704006131
10	Press. makeup valve straight	see table
11	Press. makeup valve swivelling	see table
12	Press. makeup valve angled	see table

Order number table for connecting rod (Pos. 7) for **MX-F** (1 pcs):

Number of line break elements or intermediate plates	Connect. rod	Order-no.
1	M4 x 70	F4375/21-01 001
2	M4 x 85	F4375/21-01 002
3	M4 x 100	F4375/21-01 003
4	M4 x 115	F4375/21-01 004
5	M4 x 130	F4375/21-01 005
6	M4 x 144,5	F4375/21-01 006
7	M4 x 159	F4375/21-01 007
8	M4 x 174	F4375/21-01 008
9	M4 x 188,5	F4375/21-01 009
10	M4 x 203,5	F4375/21-01 010
11	M4 x 218	F4375/21-01 011
12	M4 x 233	F4375/21-01 012

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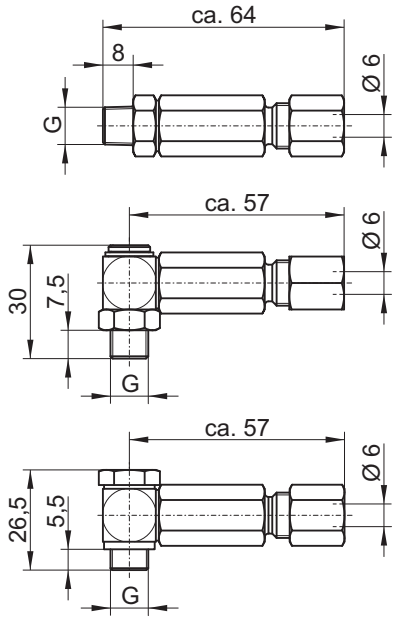
Order number table for pressure makeup valve, opening pressure 75 bar:

Press. makeup valve	Thread G	Order-no.
straight (Pos. 10*)	M8x1k	43750706A111
	M10x1k	43750706A211
swivelling makeup valve (Pos. 11*)	M8x1k	43750706B111
	M10x1k	43750706B211
	M10x1k (lang)	43750706B311
	R 1/8"k	43750706B411
	R 1/4"k	43750706B511
	1/8-27NPT	43750706B611
elbow makeup valve (Pos. 12*)	M8x1	43750706C111
	M10x1	43750706C211
	G 1/8	43750706C311

* see individual compontents of line break monitoring



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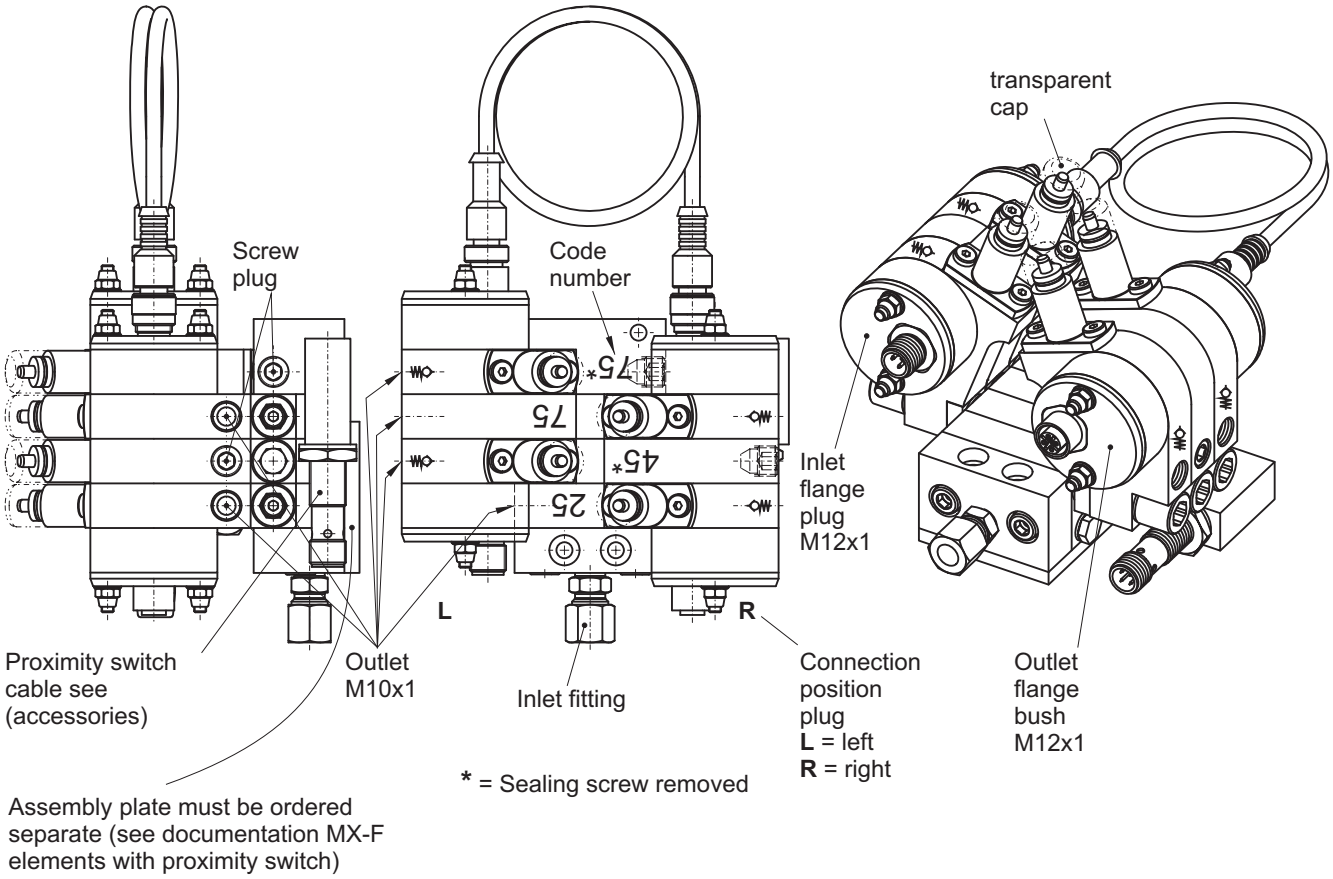
Line break monitoring

Order example of line break monitoring with progressive distributor MX-F

Distributor outlets to which a line break monitoring should be installed have to be marked with **LB** after the metering code number.



Type	MX-F 04 / 06 - GE08LL / M10x1	
No. of piston elements		
No. of outlets		
Inlet fitting		
Outlet fitting		
Connection position		**R** 25 LB / --- / 75 LB / --- NS **L** 25 / 90 LB / 75 /150 LB
Metering code-no. at outlets		

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Technical description

Progressive distributors MX-F are built in a variable disk construction. Therefore the distributor can be, depending on the number of lubrication points, extended or shortened. Due to the disk construction there is the possibility to join individual middle elements (metering elements) with different metering volumes together to one complete progressive distributor.

The different metering volume per stroke is effected by different piston diameters.

A progressive distributor needs at least three pistons i. e. at least three middle elements (metering elements)

Technical data

Operating pressure inlet:	max. 300 bar
Temperature range:	-30 °C to 80 °C
Lubricant:	oil - fluid grease - grease up to NLGI-cl. 2
No. of revolutions:	max. 60 revolutions/min
Material:	V4A (1.4404)
No. of middle elements:	
min. 3 middle elements:	MX-I 3/6
max. 8 middle elements:	MX-I 8/16

Progressive distributor MX-I with four middle elements and eight outlets:

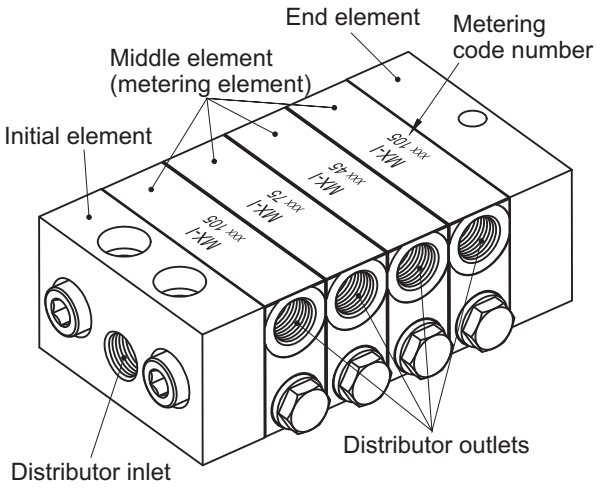
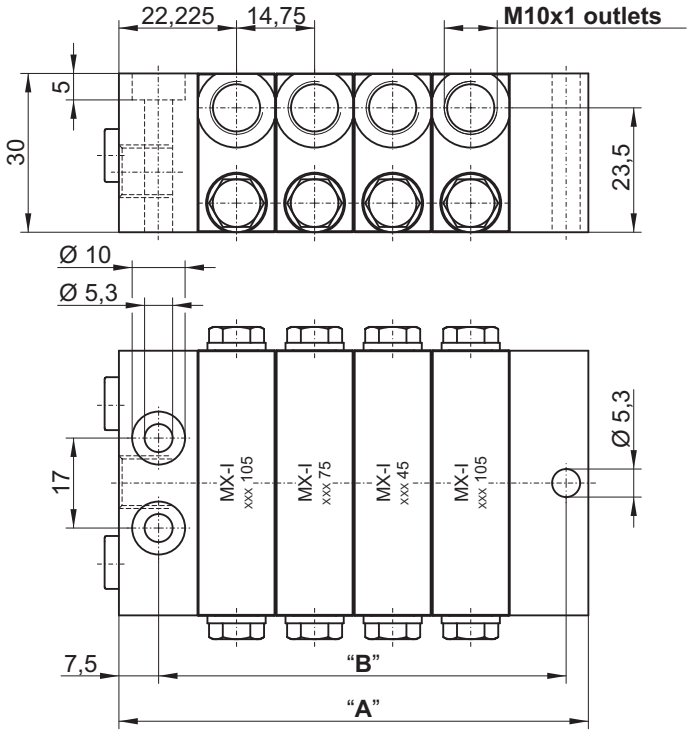
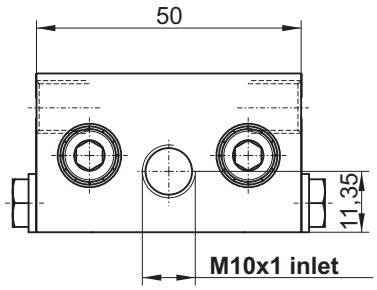


Table of metering volume:

Designation middle element	Metering volume (mm³/stroke)		Code no.
	p. outlet	p. element	
MX-I 45	45	90	45
MX-I 75	75	150	75
MX-I 105	105	210	105





No. of middle element	No. of outlets (max.)	Dim. "A" (mm)	Dim. "B" (mm)
3	6	73,95	62,25
4	8	88,70	77,00
5	10	103,45	91,75
6	12	118,20	106,50
7	14	132,95	121,25
8	16	147,70	136,00

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Elements

Progressive distributors MX-F have an initial element (without piston), three to eight middle elements (with piston) and one end element (with piston).

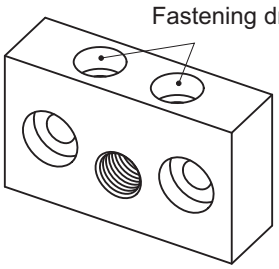
The initial elements have a thread connection M10x1 at the distributor inlet as well as middle elements at all outlets.

Initial element

Initial elements can be delivered with and without inlet fitting.

Initial element without inlet fitting,

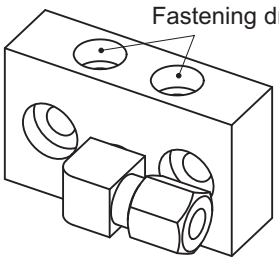
Distance of fastening drilling:	17 mm
Diameter of fastening drilling:	5,3 mm
Material:	V4A (1.4404)
Order-no.:	3979A010 (Standard)



All fittings with a connection thread M10x1 fit into an initial element without inlet fitting.

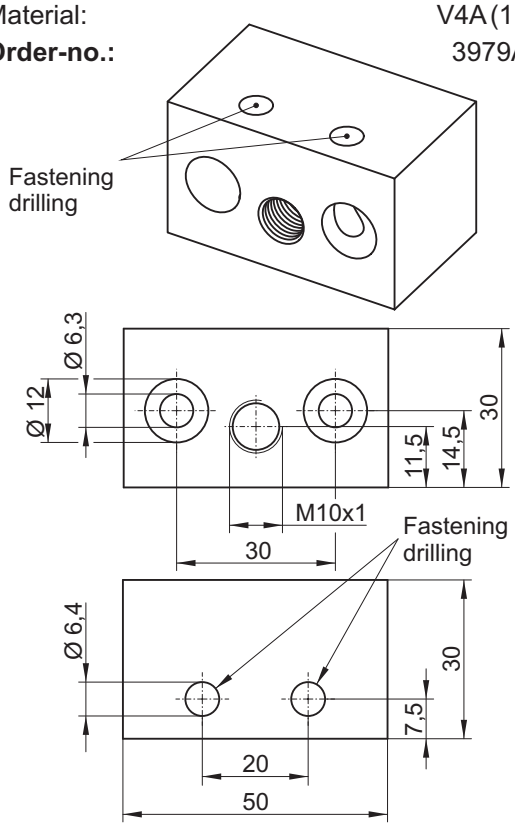
Initial element with elbow screw fitting WE6 M10x1k

Distance of fastening drilling:		17 mm
Diameter of fastening drilling:		5,3 mm
Material	Initial element:	V4A (1.4404)
	WE6 M10x1k:	V4A (1.4571)
Order-no.:		3979A020

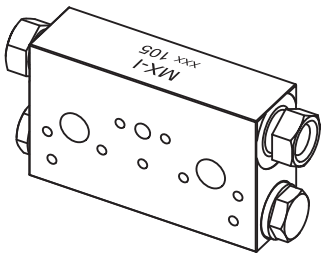


Initial element without inlet fitting

Distance of fastening drilling:	20 mm
Diameter of fastening drilling:	6,4 mm
Material:	V4A (1.4404)
Order-no.:	3979AV010



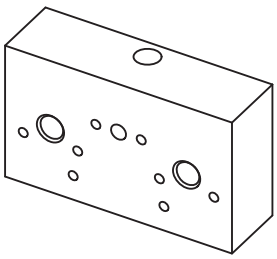
Middle element (metering element).
Middle elements are delivered with union screw and olive for pipe Ø 6 mm



Middle element	Material	Order-no.
MX-I 45	V4A (1.4404)	3979M120
MX-I 75		3979M220
MX-I 105		3979M320

End element

Material:	V4A (1.4404)
Order-no.:	3979E000



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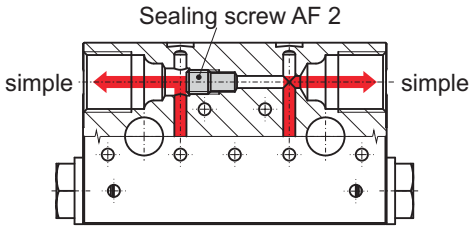
Combination of outlets

For larger lubrication points it could be necessary to combine two or more outlets at the progressive distributor.
The individual disks have two outlets.



Combination of outlets

Sealing screw with O-ring for sealing of outlets:

Order-no. complete:
Screw plug M10x1 with sealing, material V4A (1.4571)
with O-ring: 040301583013

Separation of outlets

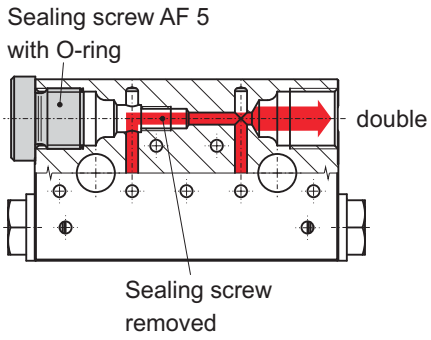
In order to separate combined outlets the sealing screw has to be screwed in again.

Sealing screw for separating outlets at progressive distributors:

Order-no.:
Sealing screw: 0802000455

Combination of outlets at one distributor disk

When two outlets are combined, the two outlets of one middle element are connected. For this purpose, the sealing screw, which separates the two sides, is removed and a screw plug with sealing ring is screwed into the side that has to be closed. The metering volume of the sealed side now comes out of the other side, i.e. the metering volume at the open side doubles.



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Combination of outlets at several middle elements

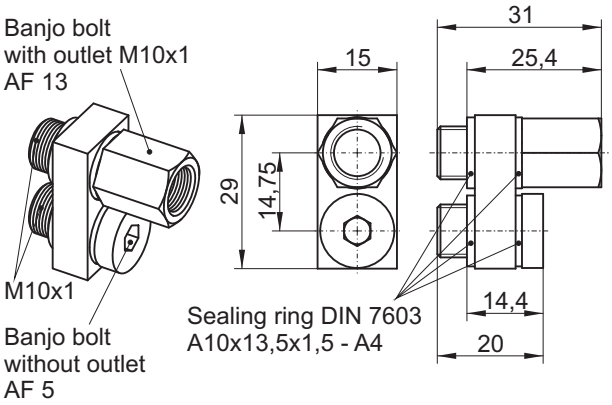
Should the total metering volume of the combined outlets at one middle element be insufficient, at very large bearing points or at main distributors e.g., there is the possibility to combine the outlets of two or more middle elements.

The metering volume is calculated of the metering volume code number of all combined outlets.

Distributor bridge with outlet

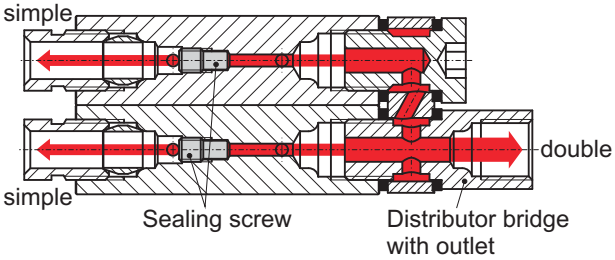
With the help of distributor bridges with outlet two, three or four outlets can be connected at different adjacent distributor disks.

Order-no. complete: 4096960010012
Material: V4A (1.4404)



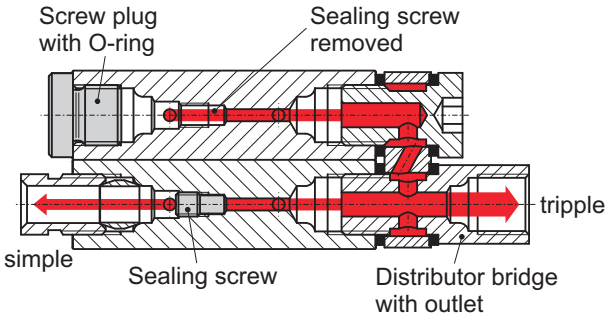
Two outlets combined at two middle elements

If only two outlets at two adjacent middle elements should be combined, the sealing screw of both middle elements must not be removed. The metering volume of both outlets comes out at the distributor bridge's outlet.



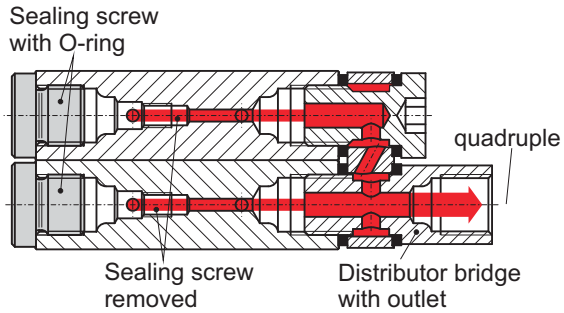
Three outlets combined at two middle elements

To connect three outlets at two adjacent middle elements, the sealing screw of one middle element has to be removed and the outlet opposite the distributor bridge has to be closed with a screw plug and a sealing screw. The metering volume of all three outlets comes out of the outlet at the distributor bridge.



Four outlets combined at two middle elements

When four outlets should be connected at two adjacent middle elements, the sealing screws of both middle elements have to be removed and the outlets opposite the distributor bridge have to be closed with a screw plug and sealing ring.
The metering volumes of the four outlets then come out of the outlet of the distributor bridge.



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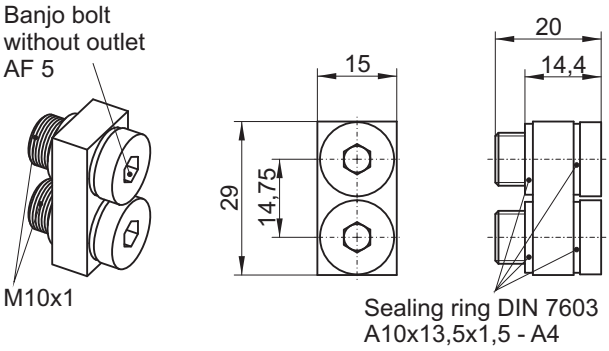
Distributor bridges without outlet

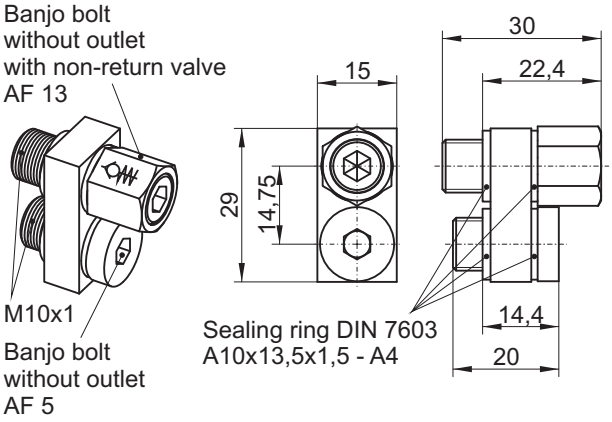
Three or four outlets at different adjacent distributor disks can be combined with the help of distributor bridges without outlets.

Order-no. complete: 4096960010013
Material: V4A (1.4404)



Distributor bridge without outlet, with non-return valve

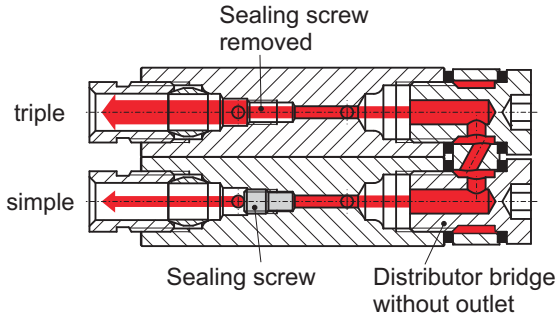
Order-no. complete: 4096960010016
Material: V4A (1.4404)



When using a MX-I 3/2 that combines three outlets, a distributor bridge without outlet but with integrated non-return valve has to be used.

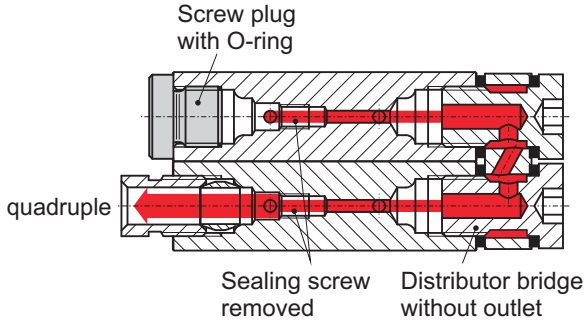
Three outlets combined at two middle elements

At least three outlets are concerned when combining outlets with a distributor bridge without outlet, as the metering volume of one middle element has to be directed through the middle element of a progressive distributor. The sealing screw of one middle element always has to be removed.



Four outlets combined at two middle elements

Four outlets at two adjacent middle elements can be combined by means of a distributor bridge wihout outlet. The sealing screws of both middle elements have to the removed and one outlet opposite the distributor bridge has to be closed with a screw plug and sealing ring.



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Elements with proximity switch

For monitoring the system or for the use of stroke controls for counting the piston strokes MX-I proximity switches can be attached to the progressive distributor.

Proximity switches can be delivered premounted to middle elements MX-I 75, MX-I 105. The installation position of the proximity switch is on the right side as standard. Installation on the left side has to be indicated separately.

Middle elements with proximity switch have to be indicated when the order is placed, a later attachment of a proximity switch to an existing middle element is only possible by replacing the concerned distributor disk.

The proximity switch is delivered without cable, it has to be ordered separately (see “Accessory Progressive Distributor”).

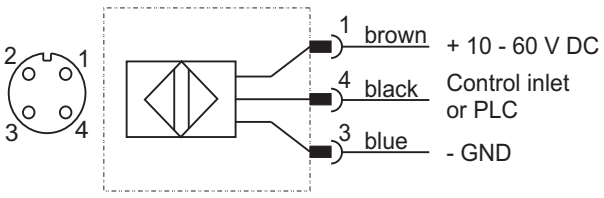
Middle elements with proximity switches always have to be equipped with non-return valves at the distributor outlets to ensure a perfect function of these elements.

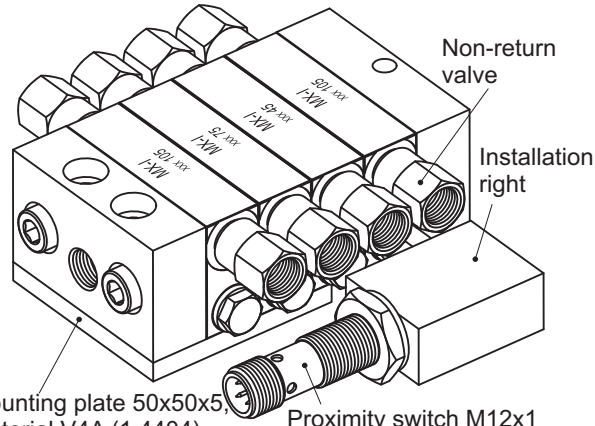
As the terminal housing of the proximity switch jut out at the distributor (see dimensional drawing on the right) a mounting plate (see drawing) has to be put under distributors which are not attached with a welding plate or a mounting angle.

Technical data of proximity switch

Connection:	M12x1 plugable
Connecting type:	PNP NO
Load capacity:	200 mA
Possible voltage:	10 - 60 V DC
Per. ambient temperature:	-40 °C to 85 °C
Function indication:	LED yellow
Housing material:	stainless steel
Protection class:	IP 67 / IP 69K

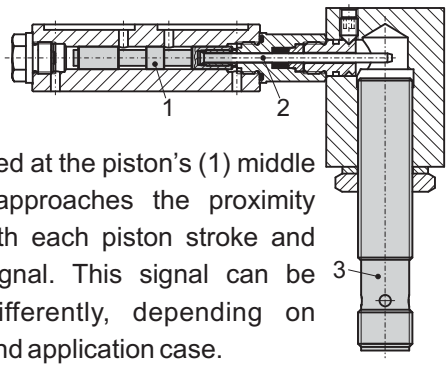
Terminal diagram

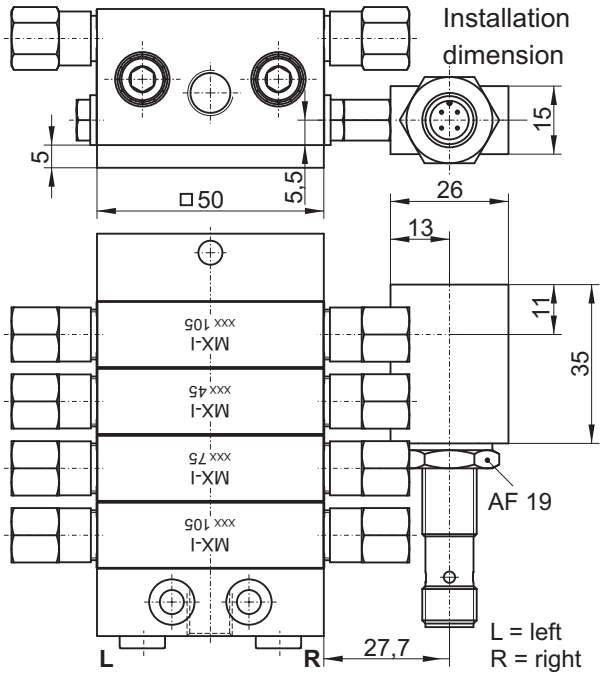




Function description

A pin (2) is fixed at the piston’s (1) middle element. It approaches the proximity switch (3) with each piston stroke and initiates a signal. This signal can be evaluated differently, depending on control type and application case.





Order-no. table for middle elements with proximity switch (=NS) **M12x1**:

Middle element with NS M12x1	Instal.	Order-no.
MX-I 75	right	3979M230N10
	left	3979M230N20
MX-I 105	right	3979M330N10
	left	3979M330N20

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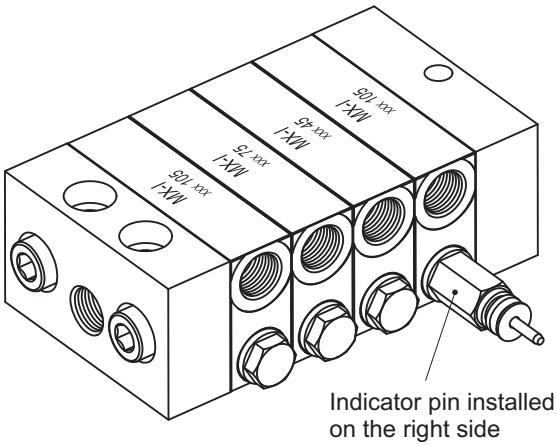
Elements with indicator pin

The progressive distributors MX-I can also be equipped with an indicator pin.

The indicator pin cannot be attached later. Retrofitting an indicator pin is only possible by replacing a distributor disk.

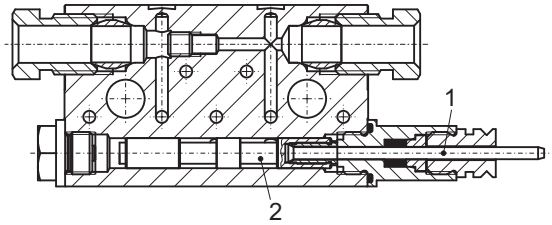
The installation of an indicator pin is also only possible in middle elements MX-I 75 and MX-I 105 and has to be indicated when the order is placed.

The indicator pin is attached on the right as a standard. An installation on the left has to be indicated separately.

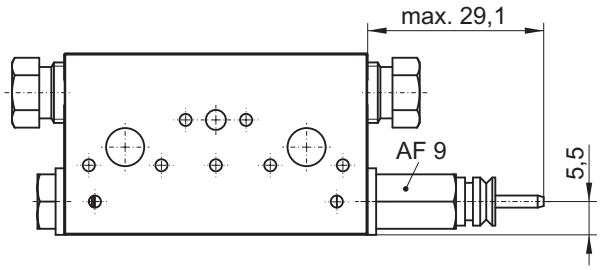


Function description

The stamp (1) is directly connected with the piston of the progressive distributor (2) at the control pin indication. With every stroke, the stamp (1) is



Installation dimensions:

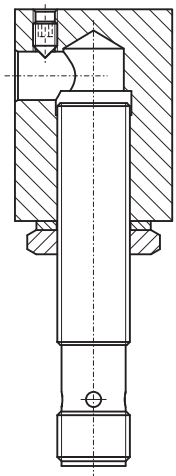


Middle element with indicator pin	Outlet Pipe-Ø	Order-no.
MX-I 75	6 mm	3979M220K1*
MX-I 105	6 mm	3979M320K1*

** Please indicate the installation position of the indicator pin: on the right (standard) or on the left.*

For the indicator pin it is possible to retrofit a proximity switch, if necessary.

Order-no. for proximity switch with terminal housing for retrofit : 3979600010000



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Extension or shortening of distributors

The MX-I distributors can, at any time, be adapted to the application conditions because of their disk construction. If new lubrication points should be added or some become unnecessary, the distributor can be extended or shortened by mounting additional middle elements or removing unnecessary ones.

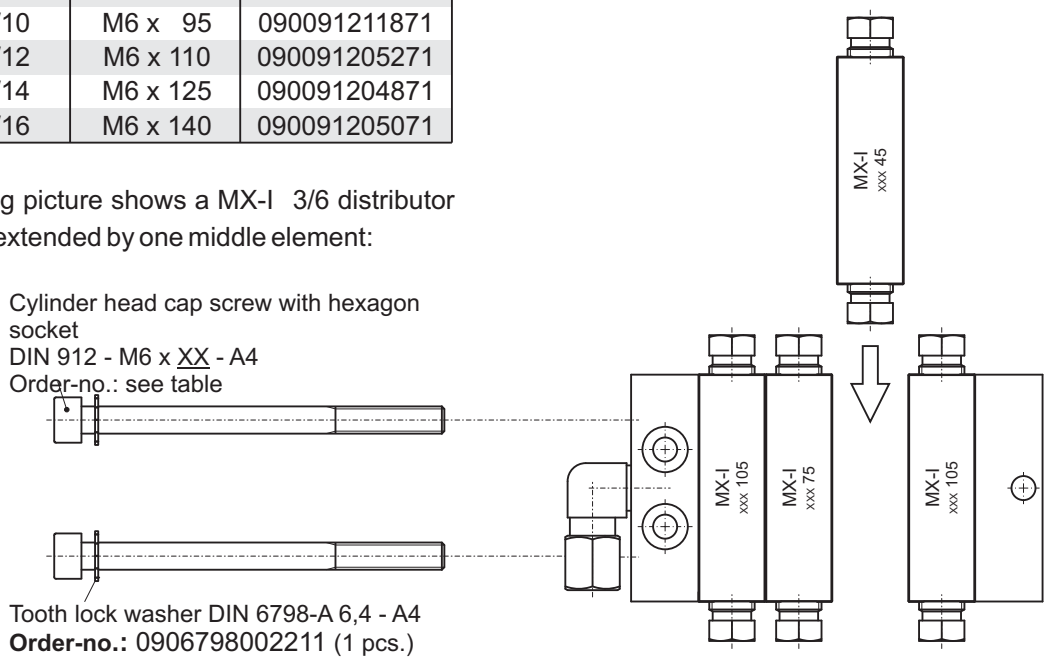
Description:

- Remove the cylinder head cap screws that keep the distributor together
- Separate the distributor at the desired point
- Add new middle elements or remove the unnecessary ones
- Screw the distributor together again with the corresponding cylinder head cap screws and one tooth lock washer each (see table)

Order-no. table for cylinder head cap screw with hexagon socket DIN 912 - A4 (1 piece each):

Distributor size	Cylinder screw	Order-no.
MX-I 3/6	M6 x 65	090091211671
MX-I 4/8	M6 x 80	090091204971
MX-I 5/10	M6 x 95	090091211871
MX-I 6/12	M6 x 110	090091205271
MX-I 7/14	M6 x 125	090091204871
MX-I 8/16	M6 x 140	090091205071

IThe following picture shows a MX-I 3/6 distributor that shall be extended by one middle element:



Caution: Please pay attention to utmost cleanness during this works.

Note: A MX-I distributor always has to consist of at least 3 middle elements and 8 as a maximum.

Should one of the O-rings, which are used for sealing the distributor between the individual elements be damaged and does not seal anymore, a set of seals can be ordered, containing all O-rings installed into the MX-I distributor.

Set of seals for initial element,
Order-no.: 3979D0001

Set of seals for middle element,
Order-no.: 3979D0002

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Order key

Distributor inlet

The progressive distributor MX-I can be delivered with or without fittings. If the fittings should be delivered already installed into the distributor, then please indicate this with the type of fitting, the pipe diameter and the series.

Inlet	Designation
M10x1	without fitting
GE06L	Male stud coupling, Pipe-Ø 6, series L
WE06L	Elbow screw fitting, Pipe-Ø 6 or Ø 8, series L
WE08L	
WS06L	Elbow swivelling screw fitting, Pipe-Ø 6, series L

The fittings can also be ordered separately (see “accessory progressive distributor” or “fittings and accessory”).

When no indication concerning the fittings is made, the delivery is without fittings as standard!

Distributor outlet

The distributor outlet can be delivered with union screw, non-return valves or without fittings at the outlets.

Outlets	Designation
M10x1	Without fitting
ÜS06	Union screw, pipe-Ø 6
RVA	Non-return valve, internal thread M10x1 (**without** olive and union screw)
RVA06	Non-return valve, pipe-Ø 6 (**with** olive and union screw)
RVB06	Non-return valve, pipe-Ø 6 (**with** cutting ring and union nut) Material: V2A (1.4305)

When the fitting detail is missing, union screws Ø 6, or, for the installation of a proximity switch, non-return valves Ø 6 are delivered as standard.

Metering volume

The metering code numbers **45** to **105** (see table“Technical description”) of the metering elements have to be indicated on each side of the distributor inlet in the order, in which the lubricant comes out and they have to be separated by a **slash** (/). For distributor bridges, a **plus** (+) has to be indicated instead of the slash.

Non-return valves in the distributor bridges are to be indicated with **RV**.

For combined outlets, the metering code numbers accumulate (see “Combination of outlets”).

Screw plugs and outlets which are closed with distributor bridges are marked with a **line** (---). The sealing screw, which has to be removed, is marked with a **star** (*) in the drawing (see “Combination of outlets”).

Proximity switch

Distributor elements to which a proximity switch should be attached, have to be marked with **NS** (proximity switch) after the number for the metering volume. Proximity switches can be attached to MX-I distributors on the right (standard) or on the left side.

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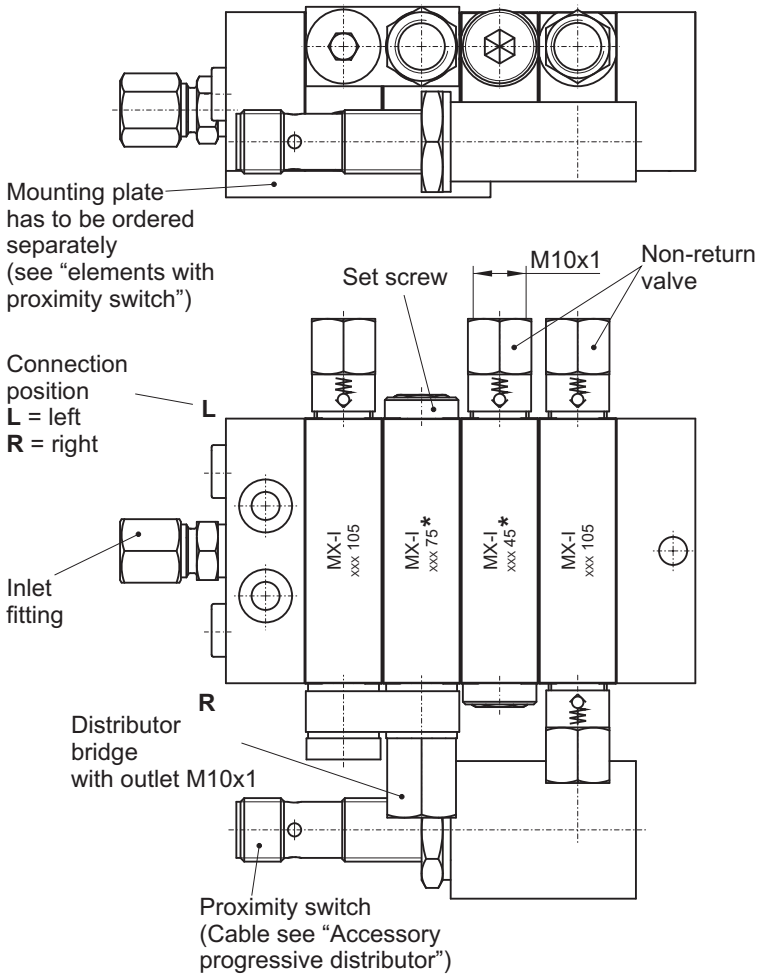
Order example



* = Sealing screw removed!

Type	MX-I	05	/	08	-	GE06L	/	RVA	**R**	---	+ 255	/	---	/ 105 NS
No. of middle elements									**L**	105	/	---	/	90 / 105
No. of outlets														
Inlet fitting														
Outlet fitting														
Position of connections														
Metering code no. at outlets														

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Technical description

The progressive distributor LX-2 and LX-3 are identically constructed, only the material is different (see "technical data").

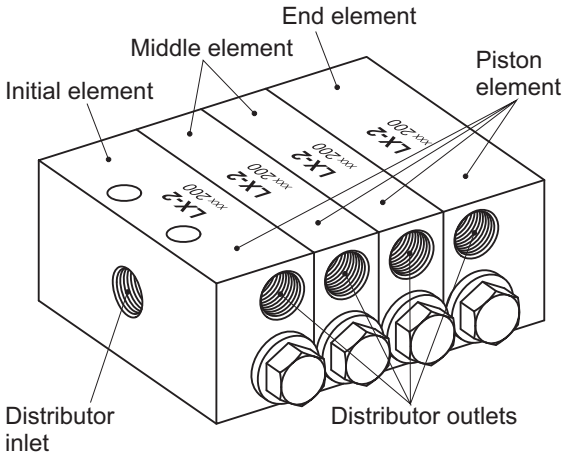
The progressive distributor LX-2 and LX-3 are built in a variable disk construction. Therefore the distributor can be, depending on the number of lubrication points, extended or shortened.

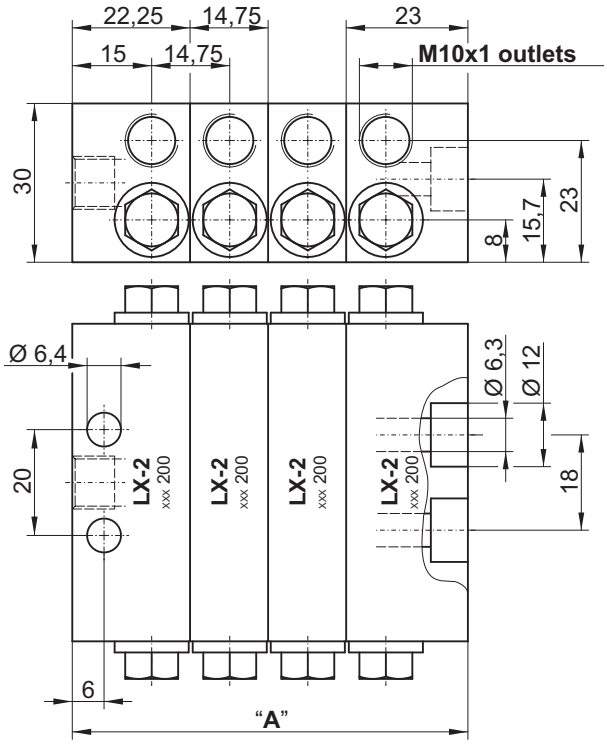
A progressive distributor needs at least three pistons for function, i.e. an initial and end element as well as a middle element for distributor LX-2 and LX-3.

Technical data

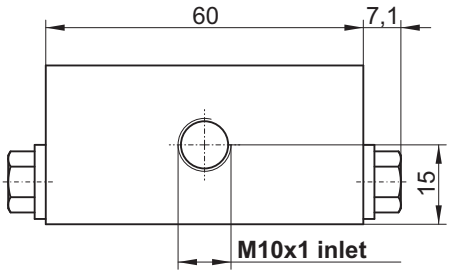
Operating pressure inlet:	max. 300 bar
Temperature range:	-30 °C to 80 °C
Metering medium:	oil - fluid grease - grease up to NLGI-cl. 2
Metering volume:	200 mm³/stroke per outlet
Umlaufzahl:	
LX-2	max. 180 revol./min
LX-3	max. 60 revol./min
Werkstoff:	
LX-2	**steel, zinc-nickel-coating**
LX-3	**V4A (1.4404 / 1.4401)**
Number of piston elements:	
min. 3 piston elements:	LX-2 or LX-3 3/6
max. 10 piston elements:	LX-2 or LX-3 10/20

Progressive distributor LX-2 or LX-3 with four piston elements and eight outlets:





Dimensional drawing of progressive distributor LX-2 or LX-3:



Number of piston elements	Number of outlets (max.)	Dim."A" (mm)
3	6	60,00
4	8	74,75
5	10	89,50
6	12	104,25
7	14	119,00
8	16	133,75
9	18	148,50
10	20	163,25

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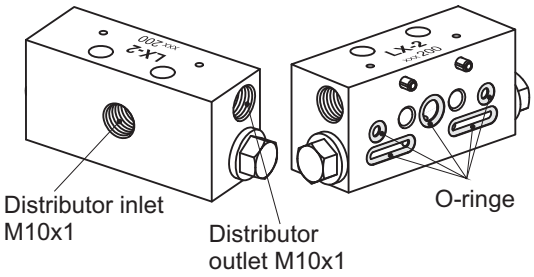
Elements

The progressive distributor LX-2 and LX-3 consists of one initial element, up to eight middle elements and one end element. All elements contain a piston.

The distributor inlet (at initial element) as well as all inlets (at initial-, middle and end element) are designed as threaded connections M10x1.

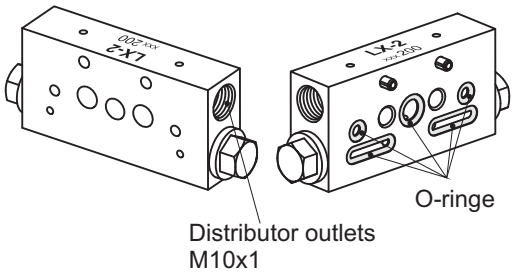
Initial element

for LX-2 order-no.: 3972970000
for LX-3 order-no.: 3973970000



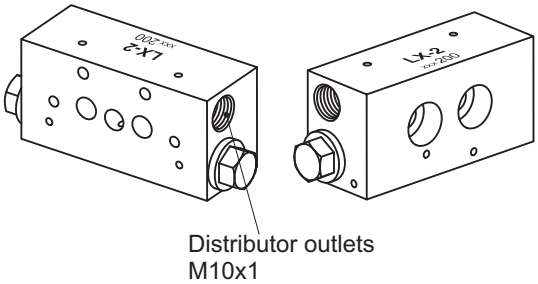
Middle element

for LX-2 order-no.: 3972980000
for LX-3 order-no.: 3973980000



End element

for LX-2 order-no.: 3972990000
for LX-3 order-no.: 3973990000



All pipe fittings with suitable connection threads and nominal pressure can be screwed into the inlet of the initial element as well as into the outlets of all elements (see “accessories progessive distributor” or “fittings and accessories”).

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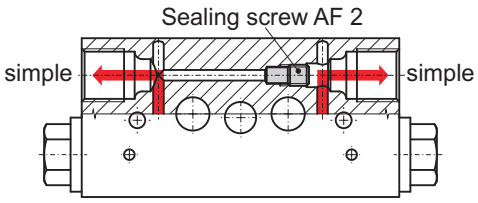
Combination of outlets

For larger lubrication points it could be necessary to combine two or more outlets at the progressive distributor.
The individual disks have two outlets.



Combination of outlets

Screw plug M10x1 for closing outlets:

for LX-2

for LX-3

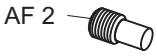
Order number

for LX-2 (ZnNi):	3976960050000
for LX-3 with sealing (1.4571):	040301583013

Separation of outlets

To separate combined outlets again, the sealing screw has to be screwed in again.

Sealing screw for separating outlets at progressive distributors:

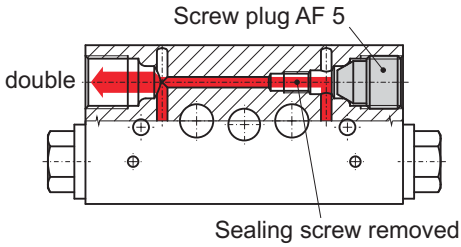


Order number

for LX-2 and LX-3 sealing screw:	0802000455

Combination of outlets at one distributor disk

When two outlets are combined, the two outlets of one disk are connected. To this purpose, the sealing screw, which separates the two sides, is removed and a screw plug is screwed into the side to be closed. The metering volume of the locked side now comes out of the other side, i.e. the metering volume at the open side doubles.
1 outlet per distributor disk



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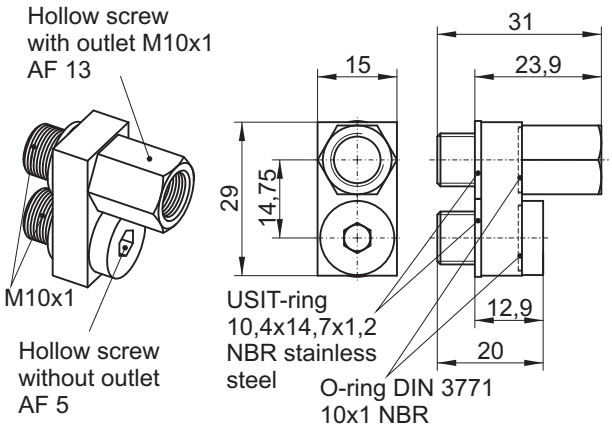
Combination of outlets at several distributor disks

When the total metering volume of the outlets combined in one disk should be insufficient, for very large bearing points or main distributors e.g., there is also the possibility to combine the outlets of several distributor disks.
The metering volume of all combined outlets is calculated of their metering volume code number.

Distributor bridge with outlet

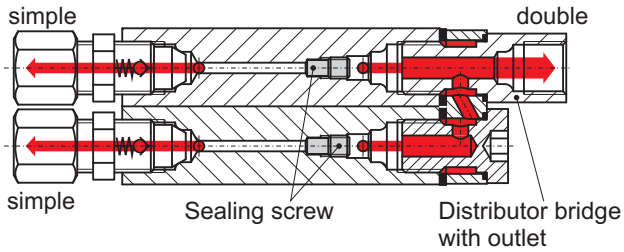
With the help of distributor bridges with outlet two, three or four outlets can be connected at different adjacent distributor disks.

Order number total:
for LX-2 (ZnNi): 3976960010012



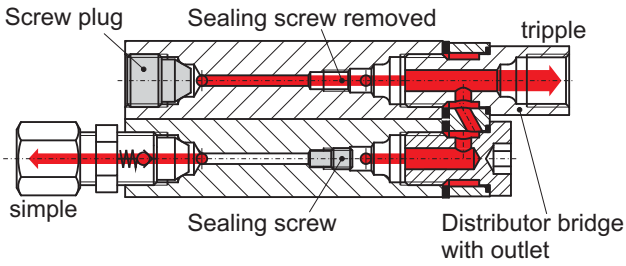
Two outlets combined at two different distributor disks

When only two outlets at different, adjacent distributor disks are combined, the sealing screw must not be removed from none of the two distributor disks.



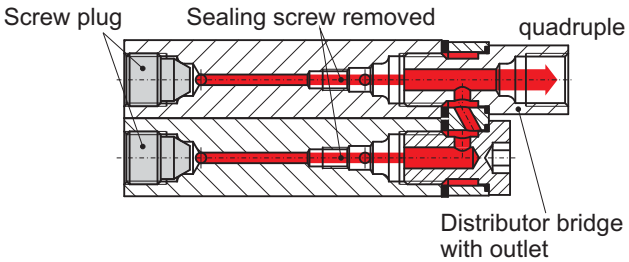
Three outlets combined at two different distributor disks

When three outlets shall be combined, the sealing screw has to be removed from one of the concerned distributor disks. The outlet opposite the distributor bridge of the distributor disk at which that sealing screw has been removed, must be locked with a screw plug.
All three outlets' metering volume then comes out of the outlet of the distributor bridge.



Four outlets combined at two different distributor disks

When four outlets should be combined, the sealing screws have to be removed in both distributor disks and a screw plug has to be screwed into each of the two outlets opposite to the distributor bridge. All four outlets' metering volume then comes out of the distributor bridge's outlet.



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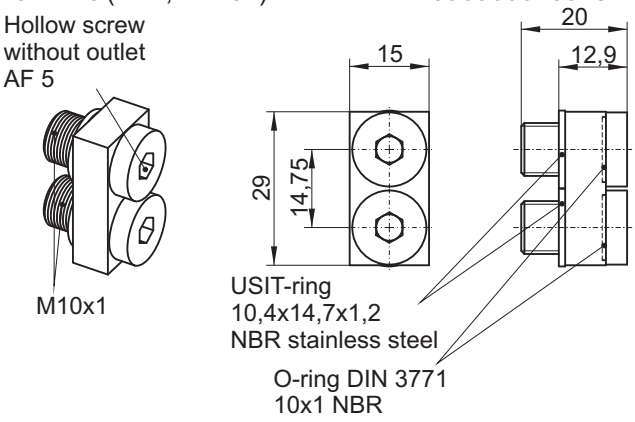
Distributor bridges without outlet and pipe bridge

Distributor bridges without outlet have the same function as pipe bridges. With their help, three or four outlets at different, adjacent distributor disks can be combined.

Order number total:

for LX-2 (ZnNi): 3976960010013

for LX-3 (V4A, 1.4404): 4096960010013

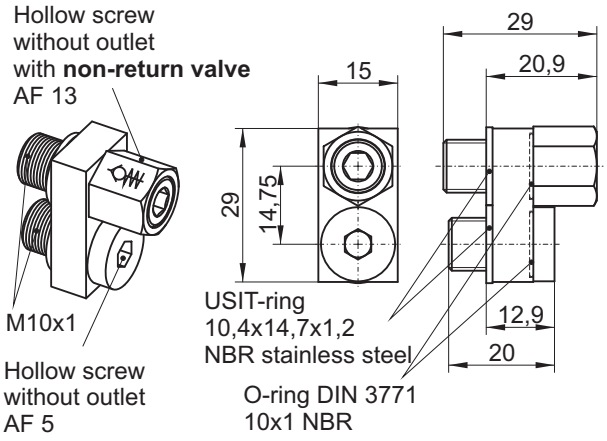


Distributor bridge without outlet, with non-return valve

Order number total:

for LX-2 (ZnNi): 3976960010016

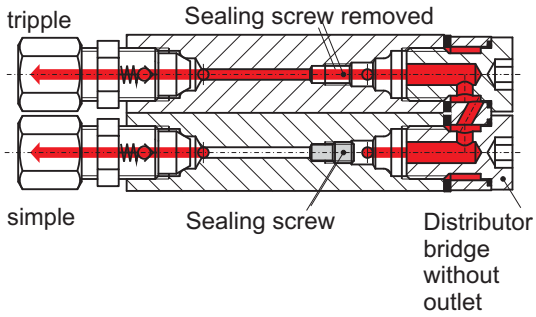
for LX-3 (V4A, 1.4404): 4096960010016



When LX-2 3/2 bzw. LX-3 3/2 are used where three outlets are combined, a distributor bridge without outlet but **with integrated non-return valve** has to be used.

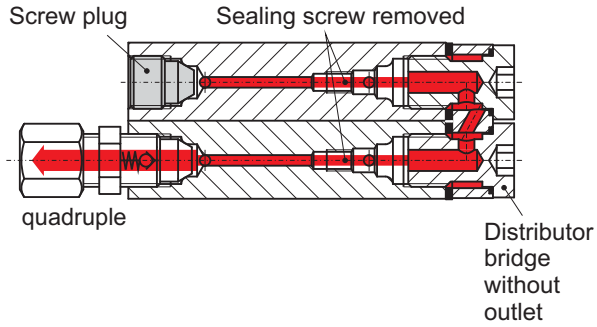
Three outlets combined at two different distributor disks

When outlets are combined with a pipe bridge (standard) or with a distributor bridge without outlet, at least three outlets are always concerned, as the metering volume has to be directed through one of the disks of the progressive distributor. The sealing screw always has to be removed in one of the two combined distributor disks.



Four outlets combined at two different distributor disks

Also four outlets can be combined with a pipe bridge (standard) or a distributor bridge without outlet. To this purpose, the sealing screws have to be removed from both distributor disks and one of the two outlets opposite to the pipe bridge have to be closed with a screw plug.



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Proximity switch

For monitoring the system or when using stroke controls to count the piston strokes, proximity switches can be installed at the progressive distributors LX-2 and LX-3.

Proximity switches can be retrofit at all elements at any time. Remove the screw with O-ring and insert the proximity switch.

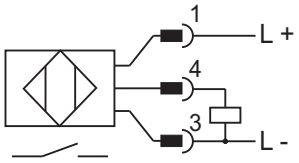
Attention: Take care of utmost cleanness.

The proximity switches are delivered with a cable of 0,3 m and cable and plug M12x1. Depending on the application, bushes with different cable lengths can be connected to the plug, but those bushes must be ordered separate (see accessories progressive distributor).

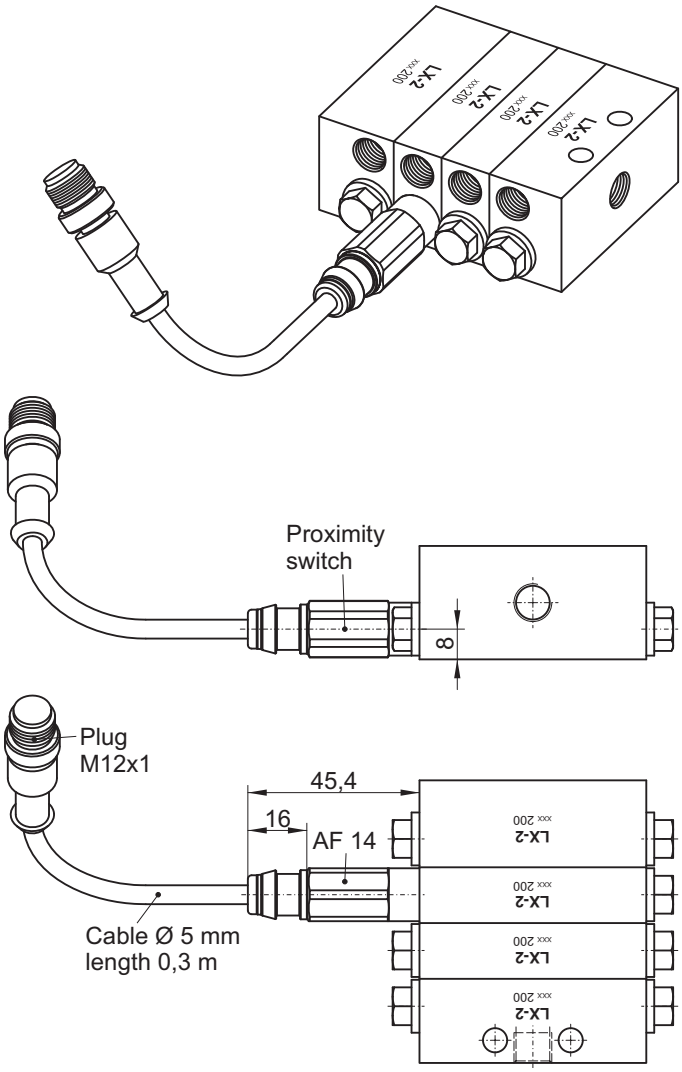
Technical data of proximity switch

Connection:		M12x1 plugable
Switch type:		PNP NO contact
Operating voltage:		10 - 60 V DC
		incl. residual ripple
Current load,	Duration:	100 mA
	Short-term:	100 mA
Current consumption:		< 15 mA
Permitted temperature (ambient):		-25 °C to 70 °C
Function indication:		LED yellow
Protection class:		IP 67
Housing material:		V4A (1.4571)
Threaded connection:		M11x1

Circuit diagram



Progressive distributor LX-2 or LX-3 with proximity switch:



Order number

Proximit switch with 0,3 m cable and plug M12x1
1000912960

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Extension or shortening of distributors

The distributorsLX-2 und LX-3 can any time be adapted to the application conditions because of their disk construction. If new lubrication points should be added or some become unnecessary, the distributor can be extended or shortened by mounting additional distributor disks or removing unnecessary ones.

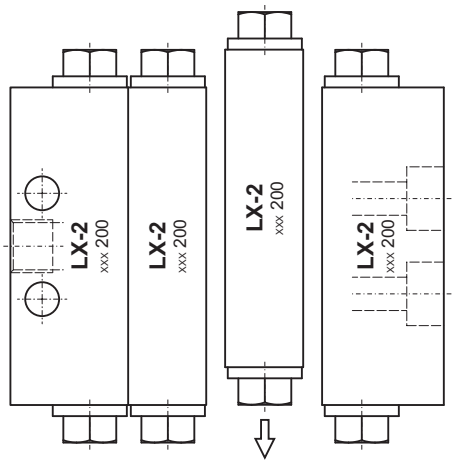
Description:

- Remove the cylinder screws, which keep the distributor together
- Separate the distributor at the desired point
- Add new middle elements or remove the unnecessary ones
- Screw the distributor together again with the corresponding cylinder screws with internal hexagon socket and one tooth lock washer each (see table)

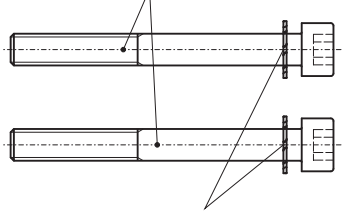
Table for order number for cylinder screws with hexagon socket DIN 912, in A4 (1.4401), (1 pcs):

Distributor size	Cylinder screw	Order-no.
LX-2 / LX-3 3/6	M6 x 40	090091204371
LX-2 / LX-3 4/8	M6 x 55	090091204671
LX-2 / LX-3 5/10	M6 x 70	090091203671
LX-2 / LX-3 6/12	M6 x 85	090091211371
LX-2 / LX-3 7/14	M6 x 100	090091212071
LX-2 / LX-3 8/16	M6 x 115	090091212171
LX-2 / LX-3 9/18	M6 x 130	090091216871
LX-2 / LX-3 10/20	M6 x 145	090091218871

Shown is a LX-2 3/6 or LX-3 3/6 distributor that is enlarged by a middle element:



Cylinder screw with hexagon socket
DIN 912 - M6 - A4 (1.4401)
Order-no.: see table
Torque **10 ± 1 Nm**



Toothed lock washer DIN 6797-A 6,4 - stainless steel
Order-no.: 0906797003311 (1 pcs)

Note: A LX-2 and LX-3 distributor always has to consist of at least 3 piston elements and 10 as a maximum.

Should one of the O-rings, which are used for sealing the distributor between the individual elements be damaged and does not seal anymore, a set of seals can be ordered, containing all O-rings installed into the LX-2 or LX-3 distributors.

Set of seals for initial elements:
Order-no.: 397297D001

Set of seals for middle elements:
Order-no.: 397298D001

Attention: Take care of utmost cleanness.

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Order key

Distributor inlet

The LX-2or LX-3 distributor can be delivered with or without fittings. If the inlet fitting shall already be installed in the distributor, indicate this by means of fitting type, pipe diameter and the series when order (see table).

Inlet	Designation
M10x1	without fitting
GE06L	male stud coupling, pipe-Ø 6, series L
WE06L	elbow screw fitting, pipe-Ø 6, series L
WE08L	**Attention: only possible for LX-3** elbow screw fitting, pipe-Ø 8, series L
WS06L	elbow swivelling screw fitting, pipe-Ø 6, series L

Fittings can also be ordered separate (see accessories progressive distributor or fittings and accessories).

When no indication concerning the fittings is made, the delivery is without fittings as standard!

Distributor outlet

The distributor outlet can be delivered with union screws, plug-in connections and two types of non-return valves.

Outlets	Designation
M10x1	without fitting
ÜS06	union nut, pipe-Ø 6
RVB06	non-return valve, pipe-Ø 6 (**with** cutting ring and union nut)
RVS06	**Attention: only possible for LX-2** non-return valve with **plug-type connection**, for pipe-Ø 6
RVA)	**Attention: only possible for LX-3** non-return valve, internal thread M10x1 (**w/o** olive and union screw)
RVA06	**Attention: only possible for LX-3** non-return valve, pipe-Ø 6 **(with** olive and union screw)

When the description of the fitting is missing, the LX-2 is delivered without fittings and the LX-3 with union screw Ø 6.

Metering volume

The metering code number **200** of the elements have to be indicated on each side of the distributor inlet in the order, in which lubricant comes out and they have to be separated by a **slash** (/). For distributor bridges, a **plus** (+) has to be indicated instead of the slash.

Non-return valves in the distributor bridges are marked with **RV**.

For combined outlets, the metering code numbers accumulate (see “Combination of outlets”).

Screw plugs and outlets which are closed with distributor bridges are marked with a **line** (---). The sealing screw, which has to be removed, is marked with a **star** (*) in the drawing (see “Combination of outlets”).

Proximity switch

Distributor elements to which a proximity switch should be attached, have to be marked with **NS** (proximity switch) after the number for the metering volume.

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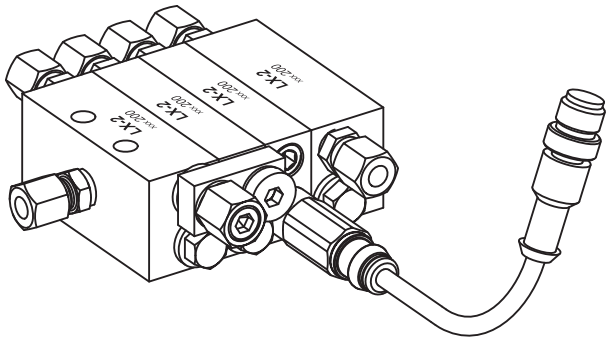
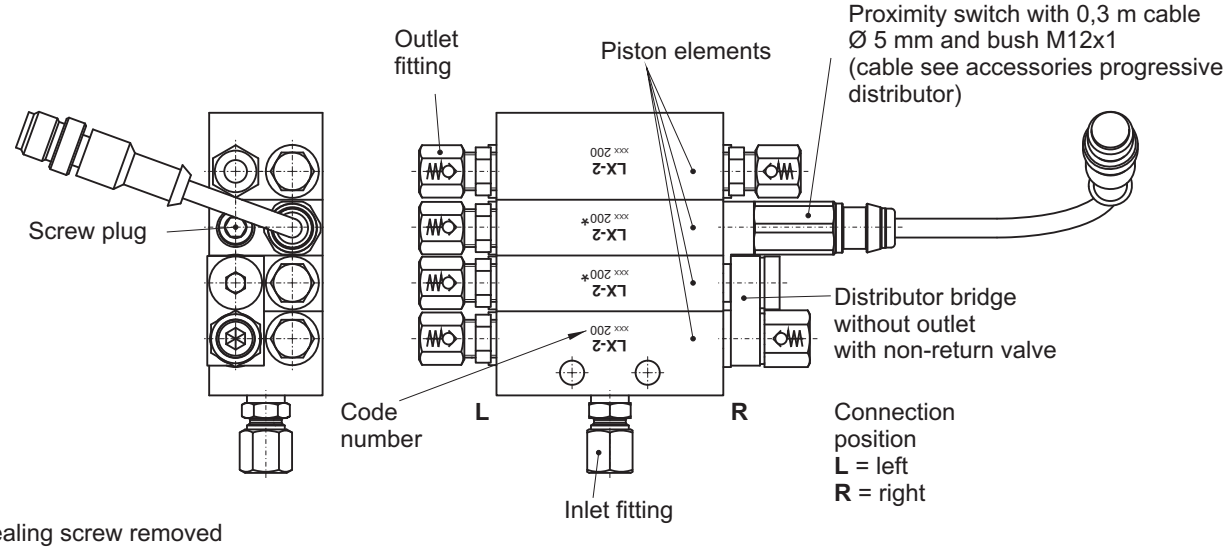
Order example





* = Sealing screw removed

Type	LX-2	04 / 05 -	GE06L / RVB06	**R**	--- RV +	---	/ --- NS / 200			
Number of piston elements				**L**	200	/ 600 /	400	/ 200		
Number of outlets										
Inlet fitting										
Outlet fitting										
Connection position										
Metering code-no. at outlets										

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04-1-14-10 state: 01.12EN

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Technical description

Progressive distributors SX-1 are built in a variable disk construction. Therefore the distributor can be, depending on the number of lubrication points, extended or shortened. Because of the disk construction, there is the possibility to form individual middle elements (metering elements) with different metering volumes to one complete progressive distributor.

The different metering volume per stroke is effected by different piston diameters.

A progressive distributor needs at least three pistons, i.e. at least three middle elements (metering elements).

Technical data

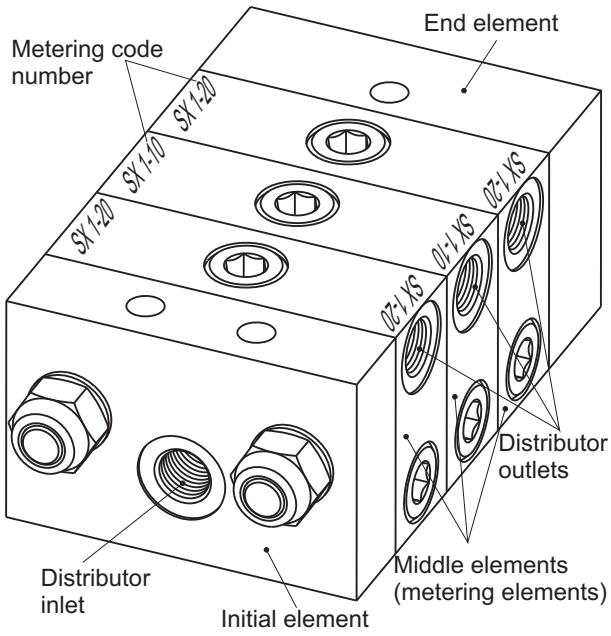
Operating pressure inlet:	max. 300 bar
Temperature range:	-30 °C to 80 °C
Metering medium:	oil - fluid grease - grease up to NLGI-cl. 2
No. of revolutions:	max. 180 r/min
Material:	steel, galvanized

No. of middle elements (metering elements):
min. 3 middle elements: SX-1 3/6
max. 10 middle elements: SX-1 10/20

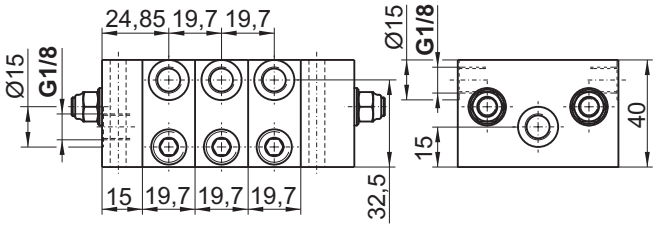
Table metering volume:

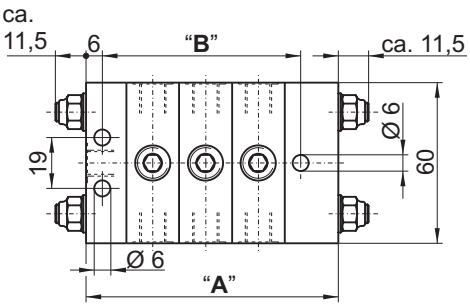
Designation middle element	Metering volume (mm³/stroke)		Code no.
	p. outlet	p. element	
SX-1 05	68	136	05
SX-1 10	105	210	10
SX-1 15	150	300	15
SX-1 20	210	420	20
SX-1 25	275	550	25
SX-1 35	350	700	35
SX-1 45	430	860	45

Progressive distributor SX-1 with three metering elements and six outlets:



Dimensional drawing:





No. of middle elements	No. of outlets (max.)	Dim. "A" (mm)	Dim. "B" (mm)
3	6	94,1	74,1
4	8	113,8	93,8
5	10	133,5	113,5
6	12	153,2	133,2
7	14	172,9	152,9
8	16	192,6	172,6
9	18	212,3	192,3
10	20	232,0	212,0

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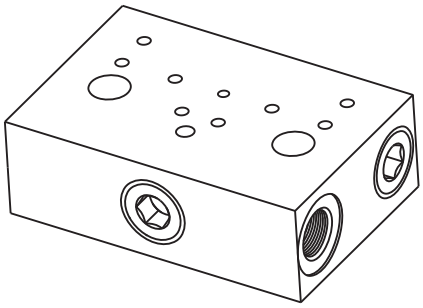
Elements

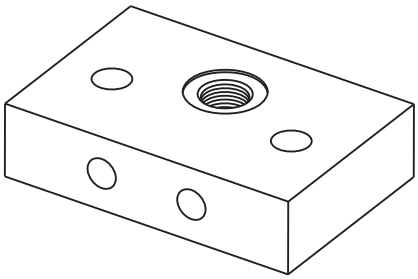
The progressive distributors SX-1 have an initial element (without piston), three to ten middle elements (with piston) and one end element (without piston).

All elements are delivered without fittings as standard and have a connection thread G1/8 at the distributor inlet (initial element) as well as all distributor outlets (middle elements).



Initial element

Order-no.: 4000 97 0000



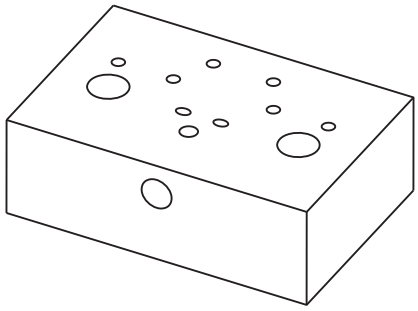
Middle element (metering element)

Middle elements are available with seven different metering volumes. For lubrication points with a higher counter pressure also possible with an integrated non-return valve (=RSV).

Middle element	Integrated RSV	Order-no.
SX-1 05	without	4000981000
	with	4000981000001
SX-1 10	without	4000982000
	with	4000982000001
SX-1 15	without	4000983000
	with	4000983000001
SX-1 20	without	4000984000
	with	4000984000001
SX-1 25	without	4000985000
	with	4000985000001
SX-1 35	without	4000986000
	with	4000986000001
SX-1 45	without	4000987000
	with	4000987000001

End element

Order-no.: 4000990000



All pipe fittings with a suitable connection thread and a suitable nominal pressure can be screwed into the initial element's distributor inlet as well as into the middle elements' distributor outlets (see "Accessory progressive distributor" or "Fittings and accessories")

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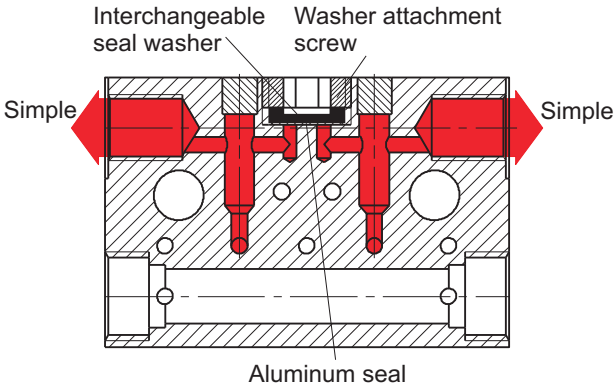
Combination of outlets

In the case of larger lubrication points it could be necessary to combine two or more outlets at the progressive distributor.

The middle elements have two outlets each.



Spare parts:

Screw plug G 1/8:
Order-no.: 090090800313

Sealing ring A10x13,5x1:
Order-no.: 090760303911

Washer attachment screw
Order-no.: 0802000300

Interchangeable seal washer
Order-no.: 0802000295

Aluminum seal
Order-no.: 0800820011

Turning over the interchangeable seal washer when outlets are combined

- Remove the washer attachment screw with a hexagon socket screwdriver A/F 6.
- Remove aluminum seal.
- Turn over the interchangeable seal washer.
- Screw in the attachment screw again.
-

Note: **Please take care of utmost cleanness when working at the distributor.**

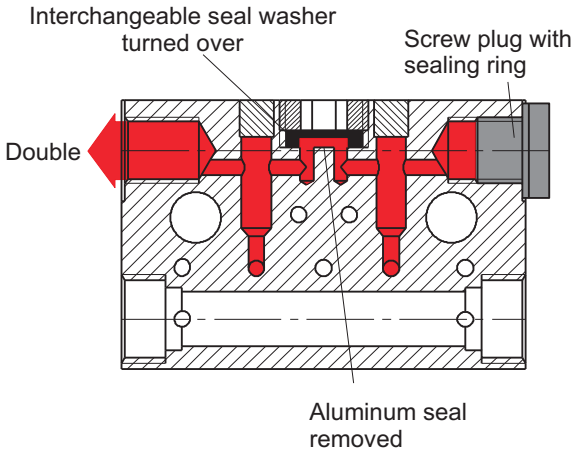
Separating combined outlets again

To separate combined outlets at progressive distributors again, a new aluminum seal has to be laid in, the interchangeable seal washer has to be turned over and the washer attachment screw has to be screwed in again tightly.

Instead of the screw plug, an outlet fitting, respectively a distributor bridge has to be connected.

Combination of two opposite outlets at one middle element

When two opposite outlets at a middle element are combined, the aluminum seal is removed and the interchangeable seal washer, which separates the two outlets, is turned over. One of the two outlets is closed with a screw plug and a sealing ring. The metering volume of the closed side then comes out of the opposite outlet, i.e. the metering volume of the open side doubles.



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Combination of adjacent outlets at several middle elements

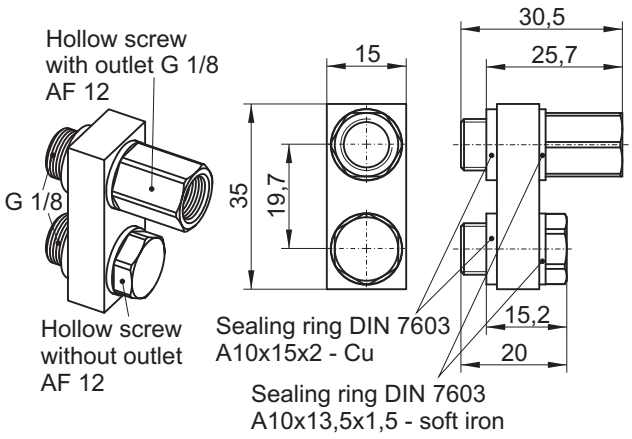
Should the total metering volume of the combined outlets at one middle element be insufficient, at very large bearing points or at main distributors e.g., there is the possibility to combine the outlets of two or more middle elements.

For this purpose, the outlets of two middle elements are on one side connected with a distributor bridge with or without outlet. Depending on the fact, if or in which element the interchangeable seal washer is turned over, two, three or four outlets are connected this way. The closed outlets' metering volume then comes out of one outlet.

The metering volume is calculated of the metering volume code number of all combined outlets.

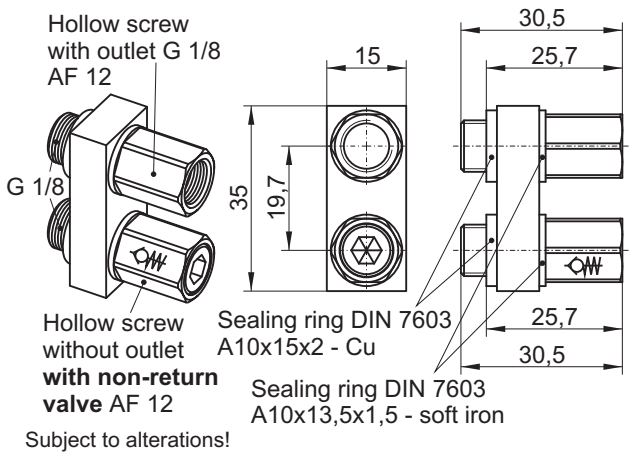
Distributor bridge with outlet

Order-no. total: 4000980010011



Distributor bridge with outlet with non-return valve

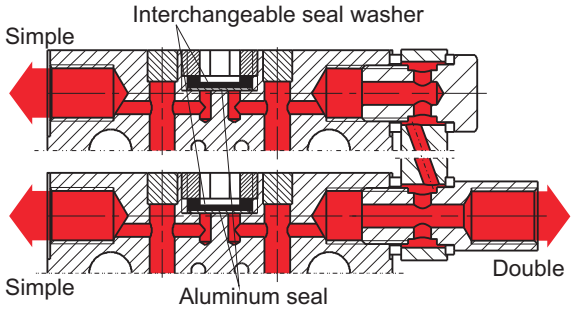
Order-no. total: 4000980010013



For the distributor size SX-1 3/2, at which three outlets shall be combined, a distributor bridge with outlet and with integrated non-return valve is used.

Two adjacent outlets combined at two middle elements

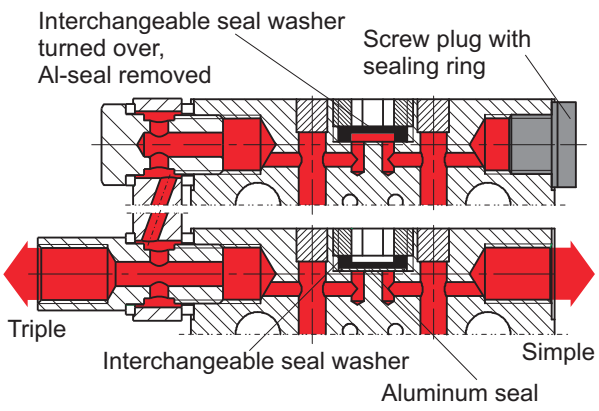
To connect two outlets on one side, at different adjacent middle elements with the help of a distributor bridge with outlet, the interchangeable seal washers of both concerned middle elements are not turned over. The metering volumes of the connected outlets come out of the distributor bridge's outlet.



Three outlets combined at two middle elements

To connect three outlets with a distributor bridge with outlet, the interchangeable seal washer at one of the two concerned middle elements has to be turned over and the aluminum seal has to be removed. This middle element's second outlet has to be closed with a screw plug and a sealing ring.

The metering volumes of both outlets of the middle element at which the interchangeable seal washer has been turned over and the metering volume of the other middle element's outlet now comes out together of the outlet of the distributor bridge.



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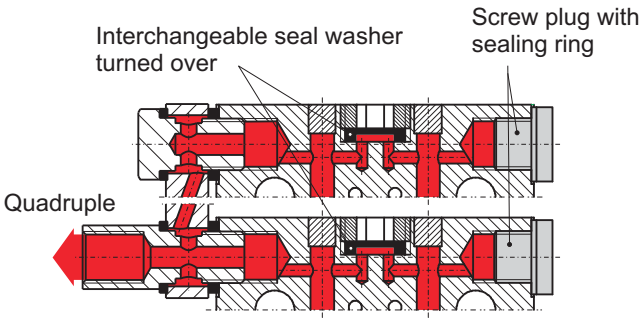
Four outlets combined at two middle elements

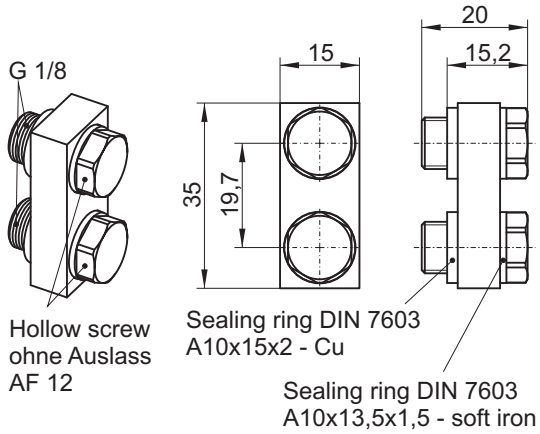
When four outlets should be connected with one distributor bridge with outlet, the two outlets opposite to the distributor bridge each have to be closed with a screw plug with sealing ring. The interchangeable seal washers in both middle elements have to be turned over and the aluminum seal has to be removed.

The metering volumes of the four outlets then come out of the outlet of the distributor bridge.



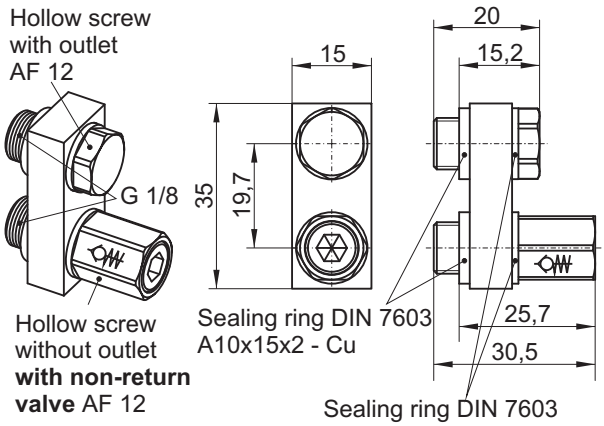
Distributor bridge without outlet

With the help of a distributor bridge without outlet at least three outlets can be connected.



Distributor bridge without outlet with non-return valve

Order-no. total: 4000980010012

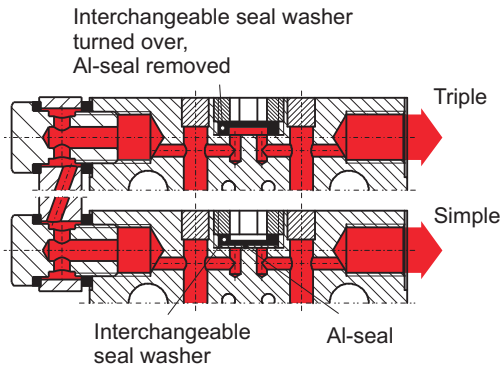


For the distributor size SX-1 3/2, at which three outlets shall be combined, a distributor bridge with outlet and with integrated non-return valve is used.

Three outlets combined at two middle elements

As a middle element must not be closed on both sides without directing the lubricant to another outlet, at least three outlets have to be connected with distributor bridges without outlet. Therefore the interchangeable seal washer in one of the middle elements has to be turned over and the Al-sealing has to be removed.

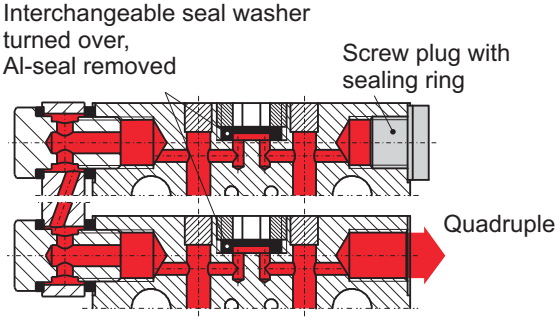
The metering volumes of the three connected outlets then come out of the middle element's open outlet, at which the interchangeable seal washer has been turned over.



Four outlets combined at two middle elements

When four outlets should be combined with one distributor bridge without outlet, the aluminum seals have to be removed at both middle elements and the interchangeable seal washers have to be turned over. The unnecessary outlet opposite to the distributor bridge has to be closed with a screw plug with sealing ring.

All four outlets' metering volumes then come out of the remaining outlet opposite to the distributor bridge.



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Elements with proximity switch

For monitoring the system, for the use of cycle controls or for counting the piston strokes, proximity switches can be attached to the SX-1 distributor for counting the piston strokes.

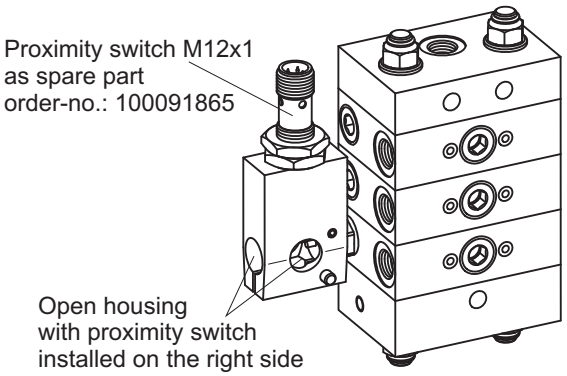
Proximity switches can be delivered preassembled to middle elements SX-1 25,SX-1 35 and SX-1 45. The installation position of the proximity switch is on the right side as a standard. Installation on the left side has to be indicated separately.

Middle elements with proximity switch have to be indicated when the order is placed, as it is not possible to attach them later.

The only possibility of retrofitting a proximity switch to an existing progressive distributor is to replace one middle element.

The proximity switch can be delivered with open or closed housing. A closed housing is used for an impure ambient. However an open housing is installed as standard.

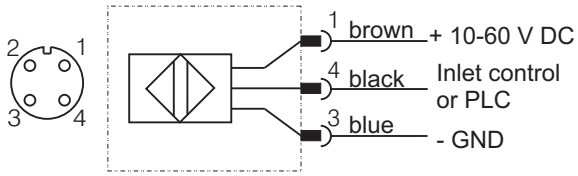
The proximity switch is delivered without cable, it has to be ordered separately (see “Accessory progressive distributor”).



Technical data of the proximity switch:

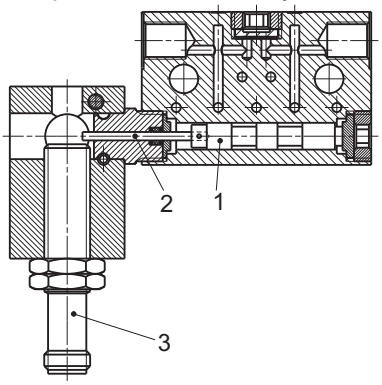
Connection:	M12x1 pluggable
Switching method:	PNP NO
Load capacity:	200 mA
Voltage:	10-60V DC
Per. ambient temperature:	-40 °C to 85 °C
Function indicator:	LED yellow
Housing material:	stainless steel
Protection class:	IP 67 / IP 69K

Terminal diagram:

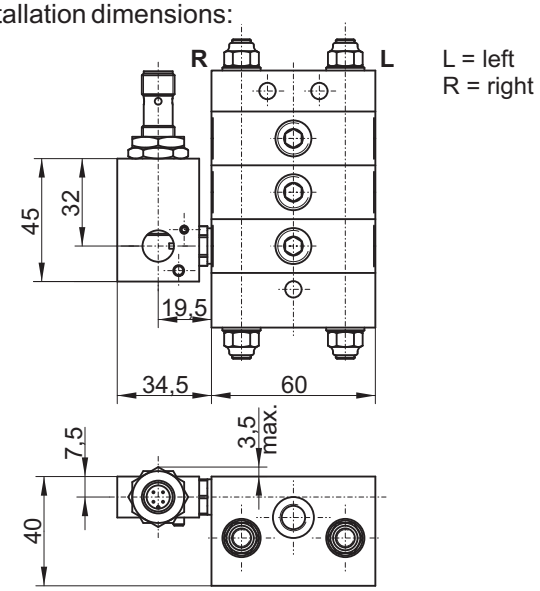


Functional description:

A pin (2) is fixed at the piston of the middle element (1). The pin (2) approaches the proximity switch (3) with each piston stroke and initiates a signal. This signal can be, depending on the type of control or the individual case, processed differently.



Installation dimensions:



Middle element without integrated non-return valve with proximity switch:

Middle element with NS M12x1	Pos.	Order-no.
SX-1 25 NS	right	4000985003
	left	4000985004
SX-1 35 NS	right	4000986003
	left	4000986004
SX-1 45 NS	right	4000987003
	left	4000987004

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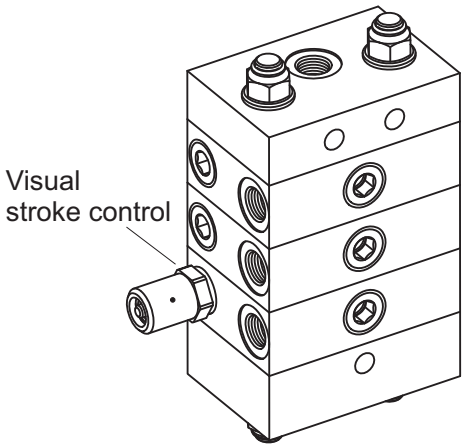
Visual stroke control

The progressive distributors SX-1 can be equipped with a visual stroke control. This function checking part does not provide read or print out data. The visual stroke control can any time be retrofitted. For this purpose the piston screw plug is removed and the visual stroke control is screwed in. This is possible at all middle elements.

The max. permissible operating pressure for an outlet with visual stroke control is 40 bar.

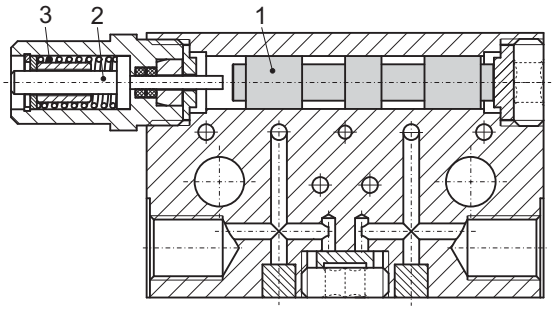
Order-no.: 435000110



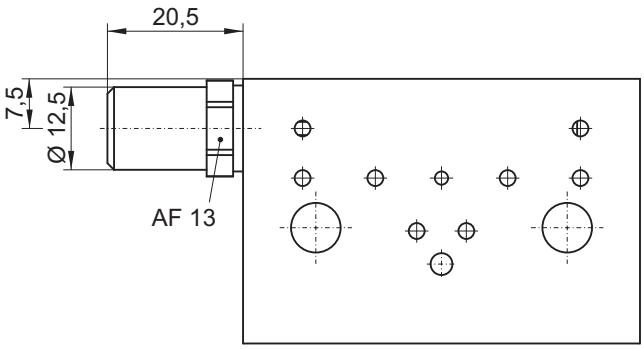
Note: **Please pay attention to utmost cleanness when working at distributors.**

Functional description:

When the piston (1) is actuated, the control pin (2) is shifted outwards (in the shown example to the left) and becomes visible. The control pin is pushed back into its original position by the spring (3) as soon as the piston is moved to the other side (see technical basics “Functional description for disk construction”).



Installation dimensions:



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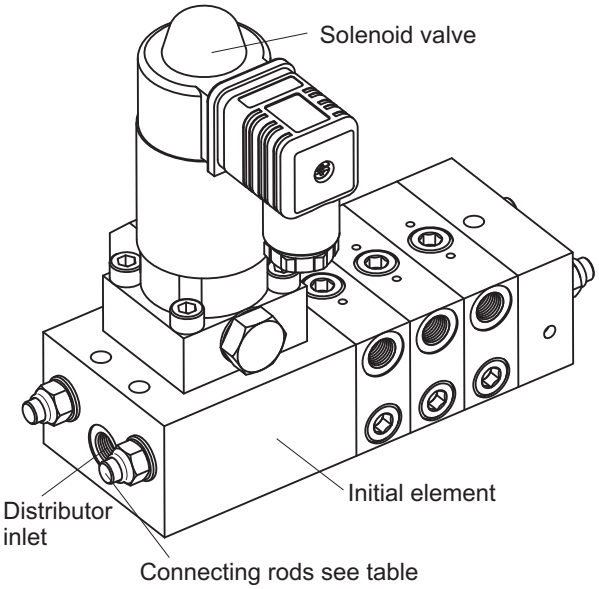
Special accessory solenoid valve

A solenoid valve can be installed at progressive distributor SX-1.

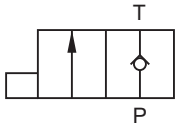
The solenoid valve serves for the time-dependent control of the volume flow.

A lubricant volume flow of 0,5 l/min must not be exceeded.

The holder for the solenoid valve is in the initial element.



Switch symbol (seat valve):



Order-no.:

Initial element 4000970001

Solenoid valve GR 2-1-N24 04100885

24 V DC

Solenoid valve GR 2-1-W110 04101004

110 V AC

Solenoid valve GR 2-1-W220 04101005

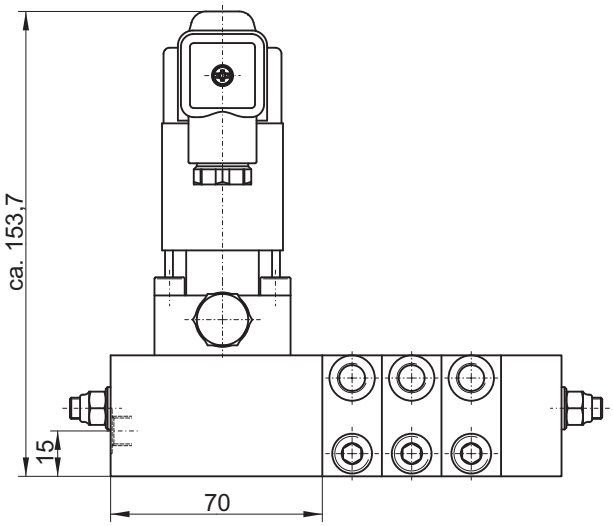
220 V AC

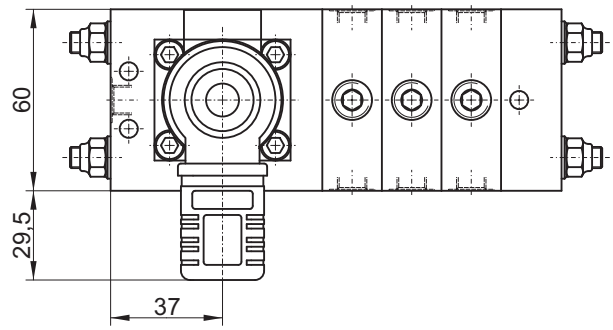
When an initial element with solenoid valve is installed, other connecting rods are required (see table).

Table order no. for connecting rods (1 piece):

Distributor	Conn. rod	Order-no.
SX-1 3/6	M7 x 176	002141016
SX-1 4/8	M7 x 196	002141017
SX-1 5/10	M7 x 216	002141018
SX-1 6/12	M7 x 236	002141019
SX-1 7/14	M7 x 256	002141020
SX-1 8/16	M7 x 276	002141021
SX-1 9/18	M7 x 296	002141022
SX-1 10/20	M7 x 316	002141023

Dimensional drawing:





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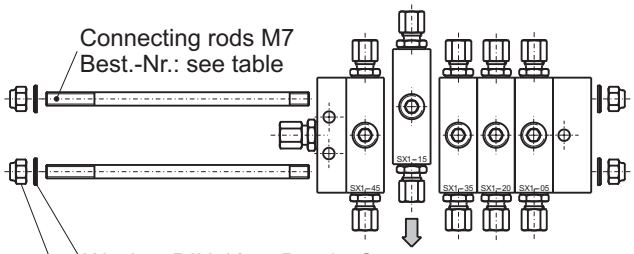
Extension or shortening of distributors

Progressive distributors SX-1 can any time be adapted to the application conditions because of their disk construction. When new lubrication points should be added or some become unnecessary, the distributor can be extended or shortened by the installation or removal of middle elements.

Description:

- screw off the cap nuts of both ends of the connecting rods (1) and take the connecting rods out
- separate the distributor at the desired point
- add the new middle elements or remove the unnecessary ones
- screw the distributor together with the connecting rods and the cap nuts (see table)

SX-1 4/8 distributor to which a distributor disk should be attached:



Washer DIN 125 - B 7,4 - St
Order-no.: 0900125002132 (1 piece)

Protection hexagon nut
DIN 982 - M7- St
Order-no.: 090098200113 (1 piece)

Note: **Please pay attention to utmost cleanness when working at the distributor.**

Table order-no. for connecting rods (1 piece):

Distributor	Conn. rod	Order-no.
SX-1 3/6	M7 x 117	002141013
SX-1 4/8	M7 x 136	002141014
SX-1 5/10	M7 x 156	002141015
SX-1 6/12	M7 x 176	002141016
SX-1 7/14	M7 x 196	002141017
SX-1 8/16	M7 x 216	002141018
SX-1 9/18	M7 x 236	002141019
SX-1 10/20	M7 x 256	002141020

Note: A SX-1 distributor has to consist of at least three middle elements and ten middle elements as a maximum.

Should one of the O-rings which are used for sealing the distributor between the individual elements be damaged and does not seal any more, a set of seals can be ordered. It contains all O-rings that are installed in SX-1 distributors.

Set of seals for middle elements:
Order-no.: 4000 98 D000

Set of seals for initial elements:
Order-no.: 4000 97 D000

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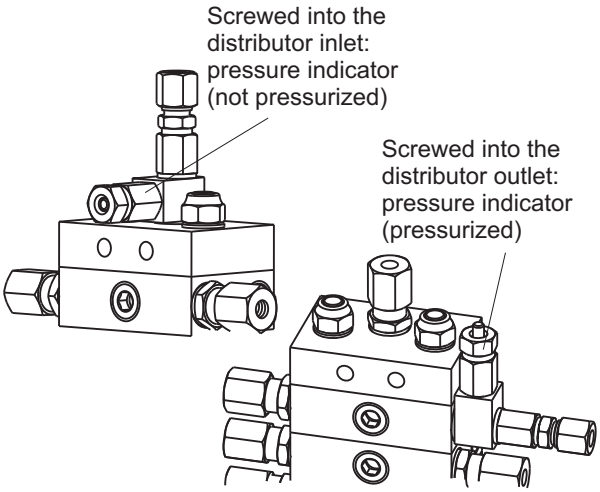
Pressure indicator

The pressure indicator locates closed lubrication lines, respectively blocked progressive distributors.

The pressure indicator can be used in the distributor inlet as well as in the distributor outlets for blockade monitoring of individual lubrication points and series-connected progressive distributors (secondary distributors).

The pressure indication can be retrofitted any time.

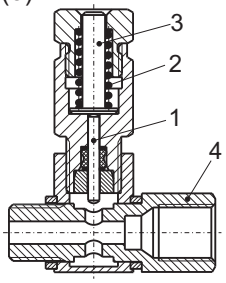


Installation:

The pressure indicator is screwed into a swivelling fitting (4) and then into the distributor. The connection fitting has to be screwed into the swivelling fitting.

Functional description:

When the pressure increases, the pin (1) is pushed out and the indicator pin (3) becomes visible. When the pressure is reduced, the spring (2) pushes back the indicator pin (3).



See order numbers and installation dimensions under “Accessory progressive distributor”.

When the distributor’s function should be ensured even with a closed distributor outlet, the distributor can be provided with a so-called **blockade control**. See “Accessory progressive distributor”.

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Order key

Distributor inlet

The progressive distributor SX-1 can be delivered with or without fittings. When the fittings shall be delivered already installed into the distributor, they have to be marked with the pipe diameter and the series. (see table)

Inlet	Designation
G1/8	without fitting
GE06LL	male stud coupling, pipe-Ø 6 or 8, series L or LL
GE06L	
GE08LL	

The fittings can also be ordered separately (see “Accessories progressive distributor” or “Fittings and accessories”).

When there is no indication concerning the fittings, delivery is without fittings as standard!

Distributor outlet

The fitting type at the distributor outlets has to be indicated with the diameter and the series when the order is placed (see table):

Outlets	Designation
G1/8	without fitting
GE06LL	male stud coupling, pipe-Ø 6 or 8, series L or LL
GE06L	
GE08LL	
RGE06LL	non-return valve, pipe-Ø 6 or 8, series L or LL
RGE06L	
RGE08LL	
RGE08L	

Note:
Without an indication of the series, a male stud coupling, respectively a non-return valve of the series L (cutting ring) is delivered as standard.

The progressive distributor SX-1 with installed solenoid valve as well as metering elements with integrated non-return valve, pressure indicator or visual stroke control have to be indicated separately

Metering volume

The metering code numbers **05** to **45** (see table “Technical description”) of the metering elements have to be indicated for each side of the distributor inlet in the order in which the lubricant comes out and have to be separated by a **slash** (/). For distributor bridges, a **plus** (+) has to be indicated instead of the slash.

The metering code numbers of combined outlets accumulate (see “Combination of outlets”).

Screw plugs and outlets which are closed with distributor bridges are marked with a **line** (---). The interchangeable seal washer that has to be turned over is marked with a **star** (*) in the drawing (see “Combination of outlets”).

Proximity switches

Middle elements to which proximity switches should be attached, have to be marked with NS or NSg after the number for the metering volume. At SX-1 distributors, proximity switches can be installed on the left or on the right side, as desired. However the standard installation position is on the right side.

NS	Designation
NS	NS with open housing (standard)
NSg	NS with closed housing

04-1-20-11 state: 01.12EN

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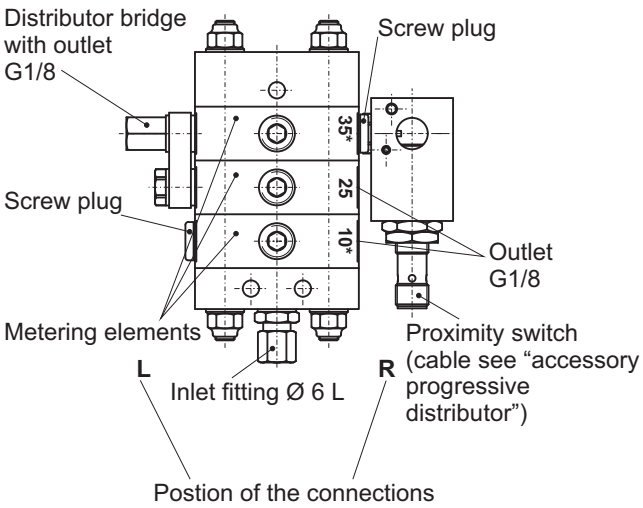
Order example



* = Interchangeable seal washer turned over!

Type	SX-1	03	/	03	-	GE06L	/	G1/8	R	20	/ 25 / --- NS
No. of middle elements									L	---	/ --- + 95
No. of outlets											
Inlet fittings											
Outlet fittings											
Connection position											
Metering code no. at outlets											

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Technical description

Progressive distributors SX-2 and SX-3 are built in a variable disk construction. Therefore the distributors can be, depending on the number of lubrication points, extended or shortened. Because of the disk construction there is the possibility to form individual middle elements (metering elements) with different metering volumes to one complete progressive distributor.

The different metering volume per piston stroke is effected by different piston diameters.

A progressive distributor needs at least three pistons, i.e. at least three middle elements (metering elements).

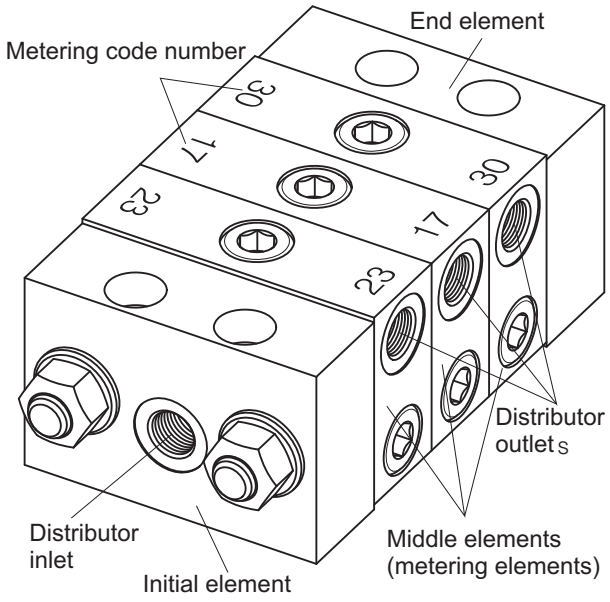
Technical data

Operating pressure-inlet:		max. 300 bar
Temperature range:		-30 °C to 80 °C
Lubricant:		oil- fluid grease - grease up to NLGI-cl. 2
Revol.:	SX-2	max. 180 r/min
	SX-3	max. 60 r/min
Material:	**SX-2**	**steel, galvanized**
	SX-3	**stainless steel**

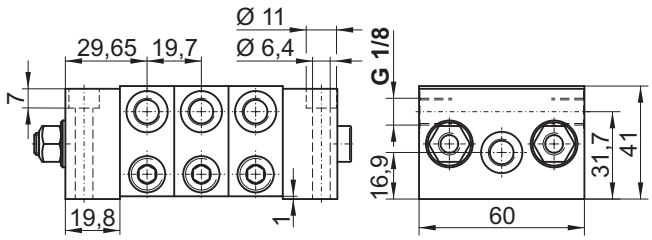
Number of elements:
Min. 3 metering elements: SX-2 or SX-3 3/6
Max. 10 metering elements: SX-2 or SX-3 10/20
(max. up to 12 metering elements possible on enquiry)

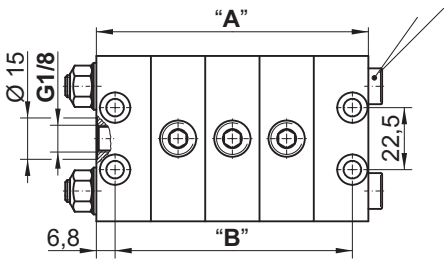
Designation middle element	Metering volume (mm³/stroke)		Code no.
	p. outlet	p. element	
SX-2 (SX-3) 07	75	150	07
SX-2 (SX-3) 11	117	234	11
SX-2 (SX-3) 17	170	340	17
SX-2 (SX-3) 23	230	460	23
SX-2 (SX-3) 30	300	600	30
SX-2 (SX-3) 38	380	760	38
SX-2 (SX-3) 47	470	940	47

Progressive distributor SX-2/SX-3 with three metering elements and six outlets:



Dimension drawing:





SX-2 with fillister head cap screw, or connecting rods SX-3 with connecting rods see " Extension or shortening of distributors" (SX-2/SX-3)

No. of middle elements	No. of outlets (max.)	Dim. "A" (mm)	Dim. "B" (mm)
3	6	98,7	86,1
4	8	118,4	105,8
5	10	138,1	125,5
6	12	157,8	145,2
7	14	177,5	164,9
8	16	197,2	184,6
9	18	216,9	204,3
10	20	236,6	224,0

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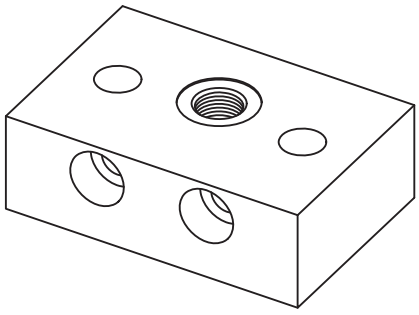
Elements

The progressive distributors SX-2 and SX-3 always consist of one initial element (without piston), three to ten middle elements (with piston) and one end element (without piston).

All elements are delivered without fittings as standard and have a connection thread G 1/8 at the distributor inlet (initial element) as well as at all distributor outlets (middle elements).

Initial element

for SX-2 order-no.: 3989 97 0000
for SX-3 order-no.: 4008 97 0000



Middle element (metering element)

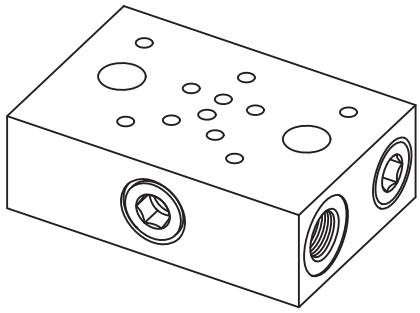
Middle elements can be delivered with seven different metering volumes:

Each middle element has two outlets.

Middle elem. for SX-2	Order-no.
SX-2 07	3989981000
SX-2 11	3989982000
SX-2 17	3989983000
SX-2 23	3989984000
SX-2 30	3989985000
SX-2 38	3989986000
SX-2 47	3989987000

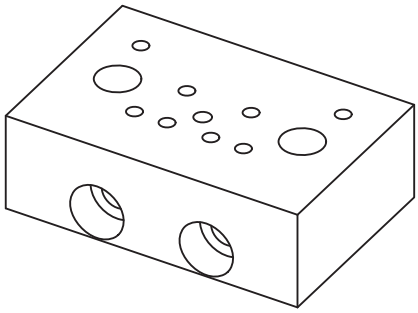
Middle elem. for SX-3*	Order-no.
SX-3 07	4008981000
SX-3 11	4008982000
SX-3 17	4008983000
SX-3 23	4008984000
SX-3 30	4008985000
SX-3 38	4008986000
SX-3 47	4008987000

* Material of middle element SX-3: V2A (1.4301)



End element

for SX-2 order-no.: 3989 99 0000
for SX-3 order-no.: 4008 99 0000



All pipe fittings with a suitable connection thread and a suitable nominal pressure can be screwed into the initial element's distributor inlet as well as middle elements' distributor outlets (see "Accessory progressive distributor", respectively "Fittings and accessories").

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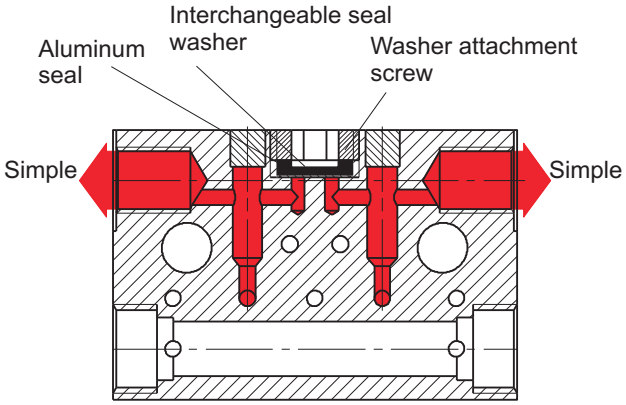
Combination of outlets

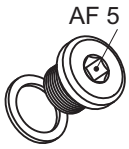
For larger lubrication points it could be necessary to combine two or more outlets at the progressive distributor.

The progressive distributor's individual middle elements have two outlets.



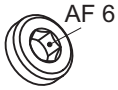
Spare parts:

Screw plug G 1/8 (at the outlet)
SX-2 order-no.: 090090800313
SX-3 order-no.: 090090800341 (1.4571)



Sealing ring A10x13,5x1 (at the outlet)
SX-2 order-no.: 090760303911
SX-3 order-no.: 090760303991 (1.4571)

Washer attachment screw
SX-2 order-no.: 0802000300
SX-3 order-no.: 0802000726 (1.4571)



Interchangeable seal washer
SX-2 order-no.: 0802000291
SX-3 order-no.: 0802000249 (Cu)

Aluminum seal
SX-2/ SX-3 order-no.: 0800820011

Turning over the interchangeable seal washer when outlets are combined

- Remove the washer attachment screw with a hexagon socket screwdriver A/F 6.
- Remove aluminum seal.
- Turn over the interchangeable seal washer.
- Screw the washer attachment screw in again.

Note: Please pay attention to utmost cleanness when working at the distributor.

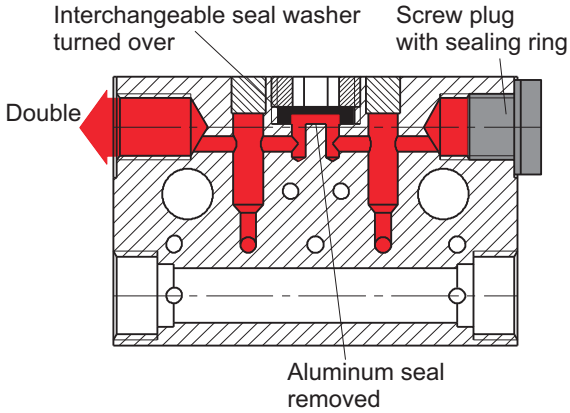
Separating combined outlets again

To separate combined outlets at progressive distributors again, a new aluminum seal has to be laid in, the interchangeable seal washer has to be turned over and the washer attachment screw has to be screwed in again tightly.

Instead of the screw plug, an outlet fitting or a distributor bridge has to be connected.

Combination of two outlets at one middle element

When two opposite outlets are combined at a middle element, the aluminum seal is removed and the interchangeable seal washer, which separates the two outlets, is turned over. One of the two outlets is closed with a screw plug and a sealing ring. The metering volume of the closed side then comes out of the opposite outlet, i.e. the open side's metering volume doubles.



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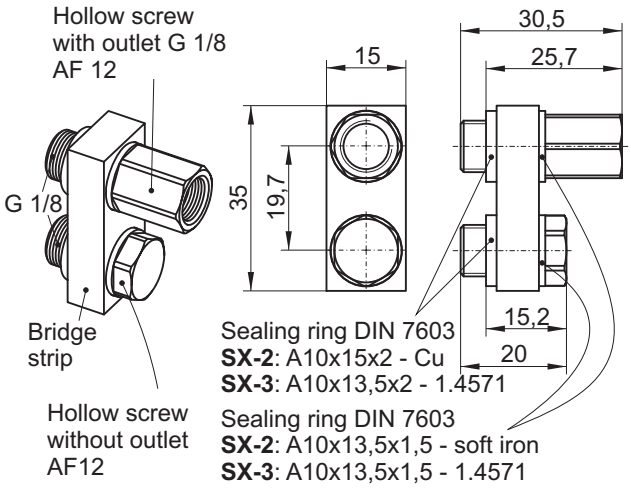
Combination of outlets at several middle elements

Should the total metering volume of the combined outlets at one middle element be insufficient, at very large bearing points or main distributors e.g., there is the possibility to combine the outlets of two or more middle elements.
For this purpose, the outlets of two middle elements are on one side connected with a distributor bridge with or without outlet. Depending on the fact, if or in which element the interchangeable seal washer is turned over, two, three or four outlets are connected this way. The closed outlets' metering volume then comes out of one outlet.
The metering volume is calculated of the metering code numbers of all combined outlets.

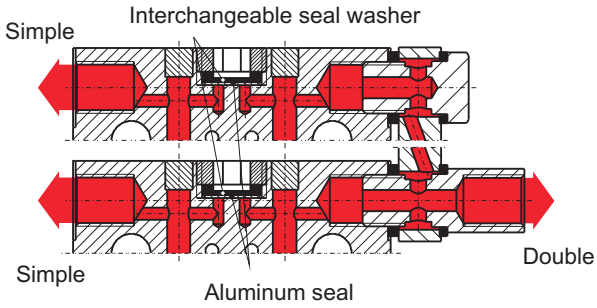
Distributor bridge with outlet



Order-no. total for SX-2: 4000980010011
Order-no. for SX-3 (1.4305): 4008980010011
consisting of:
1 Distributor strip, order-no.: F0408/13-00
1 Hollow screw without outlet,
Order-no.: F0408/15-00
1 Hollow screw with outlet
Order-no.: F0408/14-00
2 sealing rings, order-no. (1 piece) for
SX-2, A10x13,5x1,5-soft iron: 090760305121
SX-3, A10x13,5x1,5-1.4571: 090760305191
2 Sealing rings, order-no. (1 piece) for
SX-2, A10x15x2-Cu: 090760301911
SX-3, A10x13,5x2-1.4571: 090760305291

Two adjacent outlets combined at two middle elements

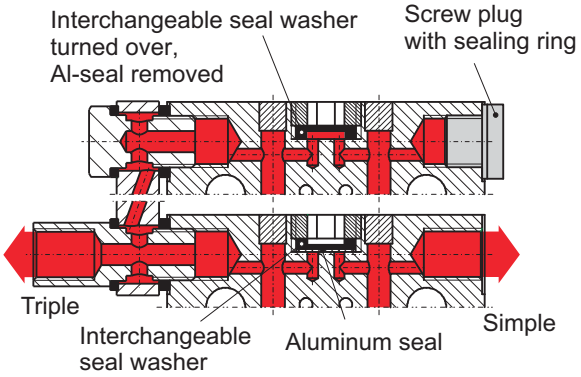
To connect two outlets on one side, at different adjacent middle elements with a distributor bridge with outlet, the interchangeable seal washers of both concerned middle elements are not turned over. The metering volumes of the connected outlets come out of the outlet of the distributor bridge.



Three outlets combined at two middle elements

To connect three outlets with a distributor bridge with outlet, the interchangeable seal washer at one of the concerned middle elements has to be turned over and the aluminum seal has to be removed. The second outlet of this middle element has to be closed with a screw plug and sealing ring.

The metering volumes of both outlets of the middle element at which the interchangeable seal washer has been turned over and the metering volume of the other middle element's outlet now come out of the outlet of the distributor bridge.



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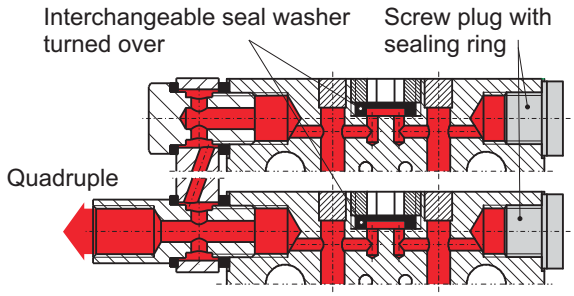
Four outlets combined at two middle elements

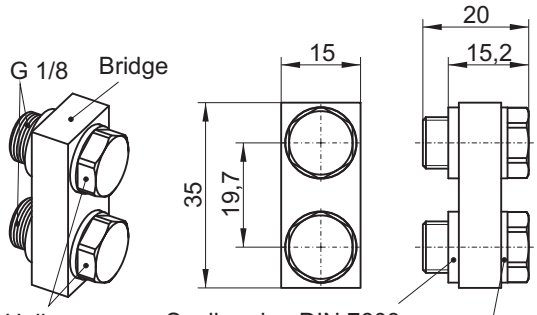
When four outlets should be connected with one distributor bridge with outlet, the two outlets opposite to the distributor bridge each have to be closed with a screw plug with sealing ring. The interchangeable seal washers in both middle elements have to be turned over and the aluminum seal has to be removed.

The metering volumes of the four outlets then come out of the distributor bridge's outlet.



Distributor bridge without outlet

With a distributor bridge without outlet, at least three outlets can be connected.



Sealing ring DIN 7603
SX-2: A10x13,5x1,5 - soft iron
SX-3: A10x13,5x1,5 - 1.4571

Order-no. for SX-2: 4000980010010
Order-no. for SX-3 (1.4305): 4008980010010

consisting of:

1 pcs bridge strip, Order-no.: F0408/13-00

2 pcs hollow screw without outlet
Order-no.: F0408/15-00

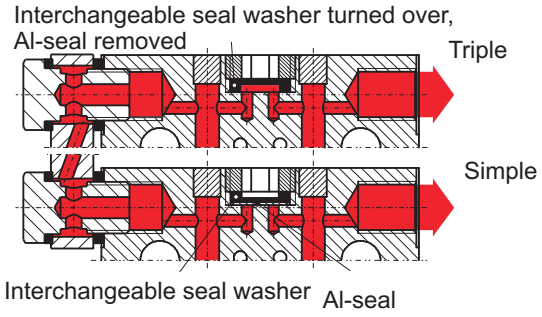
2 pcs sealing ring, order-no. (1 pcs) for
SX-2, A10x13,5x1,5-soft iron: 090760305121
SX-3, A10x13,5x1,5-1.4571: 090760305191

2 pcs sealing ring, order-no. (1 pcs) for
SX-2, A10x15x2-Cu: 090760301911
SX-3, A10x13,5x2-1.4571: 090760305291

Three outlets combined at two middle elements

As a middle element must not be closed on both sides without directing the lubricant to another outlet, at least three outlets have to be connected with distributor bridges without outlet. Therefore the interchangeable seal washer in one of the middle elements has to be turned over and the Al-sealing has to be removed.

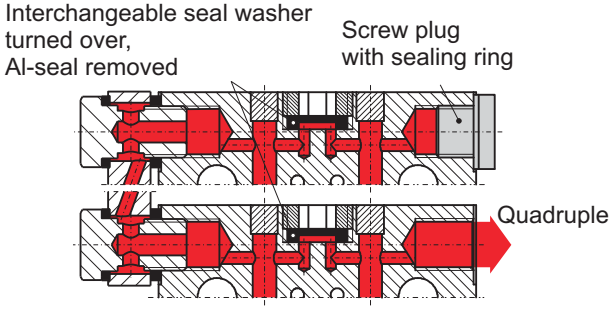
The metering volumes of the three connected outlets then come out of the middle element's open outlet, at which the interchangeable seal washer seal has been turned over.



Four outlets combined at two middle elements

When four outlets should be combined with one distributor bridge without outlet, the aluminum seals have to be removed at both middle elements and the interchangeable seal washers have to be turned over. The unnecessary outlet opposite to the distributor bridge has to be closed with a screw plug with sealing ring.

All four outlets' metering volumes then come out of the remaining outlet opposite to the distributor bridge.



Elements with proximity switch

For monitoring the system, for the use of cycle controls or for counting piston strokes, proximity switches can be attached to the distributors SX-2 and SX-3.

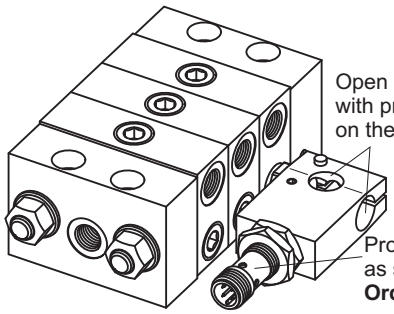
Proximity switches can be delivered preassembled to middle elements SX-2(3) 30, SX-2(3) 38 and SX-2(3) 47. The installation position of the proximity switch is on the right side as a standard. Installation on the left side has to be indicated separately.

Middle elements with proximity switch have to be indicated when the order is placed, as it is not possible to attach them later.

The only possibility of retrofitting a proximity switch to an existing progressive distributor is to replace one middle element.

The proximity switch can be delivered with open or closed housing. A closed housing is used for polluted ambient. However an open housing is installed as standard.

The proximity switch is delivered without cable, it has to be ordered separately (see “Accessory progressive distributor”).

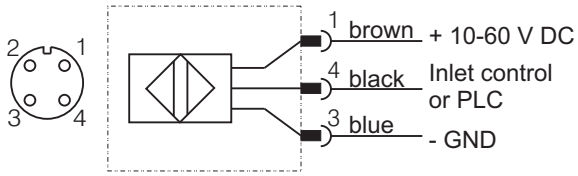


Technical data of the proximity switch:

Connection:	M12x1 pluggable
Switching method:	PNP NO
Load capacity:	200 mA
Voltage:	10-60 V DC
Per. ambient temperature:	-40 °C to 85 °C
Function indicator:	LED yellow
Housing material:	stainless steel
Protection class:	IP 67 / IP 69K

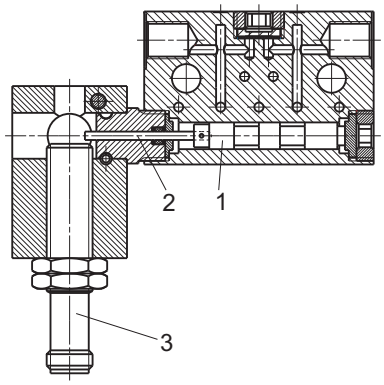
Subject to alterations!

Terminal diagram:

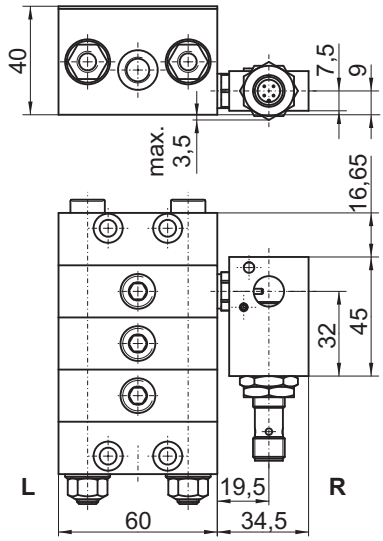


Functional description:

A pin (2) is fixed at the middle element’s piston (1). The pin (2) approaches the proximity switch (3) with each piston stroke and initiates a signal. This signal can be, depending on the type of control or the individual case, evaluated differently.



Installation dimensions:



L = left
R = right

L R

Table order-no. for middle elements with proximity switch (=NS) **M12x1**

Middle element w. NS	Order-no.
SX-2 30 NS	39899850006*
SX-2 38 NS	39899860006*
SX-2 47 NS	39899870006*
SX-3 30 NS	40089850006*
SX-3 38 NS	40089860006*
SX-3 47 NS	40089870006*

** Please indicate the installation position of the proximity switch: right (standard) or left*

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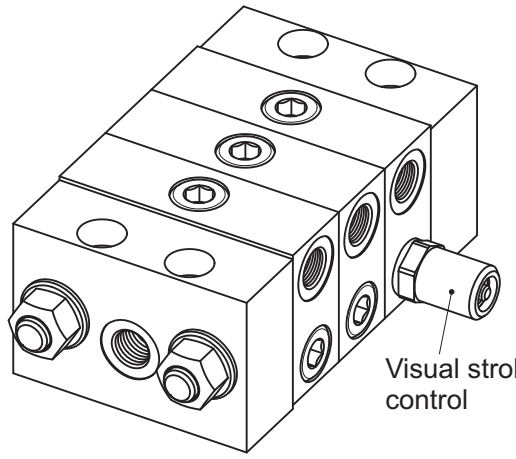
Visual stroke control (only for SX-2)

The progressive distributors SX-2 can be equipped with a visual stroke control. This function checking part does not provide read or print out data. The visual stroke control can any time be retrofitted. For this purpose the piston screw plug is removed and the visual stroke control is screwed in. This is possible at all middle elements.

The max. permissible operating pressure for an outlet with visual stroke control is 40 bar.

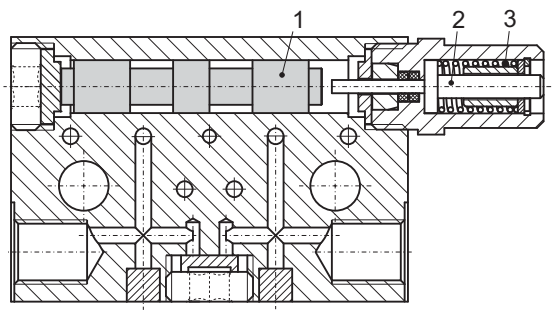
Order-no.: 435000110



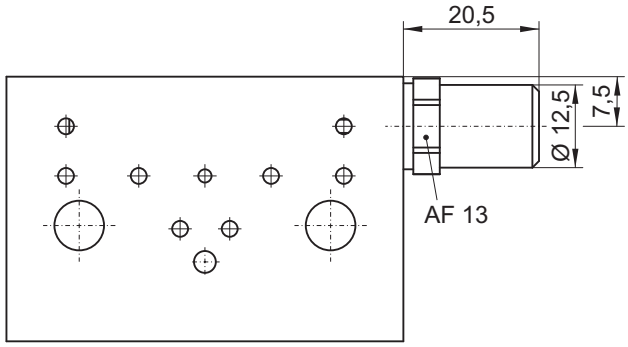
Note: **Please take care of utmost cleanness when working at distributors.**

Functional description:

When the piston (1) is actuated, the control pin (2) is shifted outwards (in the shown example to the right) and becomes visible. The control pin is shifted back into its normal position by the spring (3) as soon as the piston is moved to the other side (see technical basics “Functional description for disk construction”).



Installation dimensions



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Extension or shortening of distributors

Progressive distributors SX-2 and SX-3 can any time be adapted to the application conditions because of their disk construction. When new lubrication points should be added or some become unnecessary, the distributor can be extended or shortened by the installation or removal of middle elements.

Description:

- Screw off the hexagon nuts (2, respectively 6) at the cylinder head cap screws (1), or at the connecting rods and take out the cylinder head cap screw or the connecting rods
- Separate the distributor at the desired point
- Add the new middle elements or remove the unnecessary ones
- Screw the distributor together with the corresponding cylinder head cap screws, respectively the connecting rods and the hexagon nuts (see tables)

Note: **Please pay attention to utmost cleanness when working at distributors.**

Tab. 1 order-no. for cylinder screw with internal hexagon socket DIN 6912 (1 pcs) for **SX-2**:

Distributor	Cylinder scr.	Order-no.
SX-2 3/6	M8 x 110	090691204223
SX-2 4/8	M8 x 130	090691204323

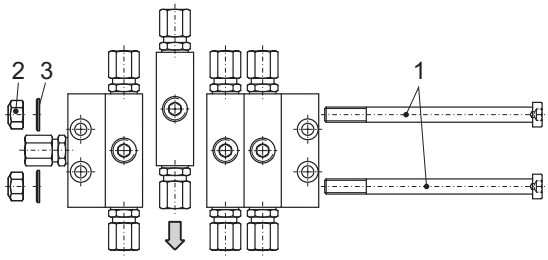
Tab. 2 order-no. for Zugstangen (1 Stück) for **SX-2**:

Distributor	Conn. rod	Order-no.
SX-2 5/10	M8 x 166	0802000552
SX-2 6/12	M8 x 183	0802000553
SX-2 7/14	M8 x 203	0802000554
SX-2 8/16	M8 x 223	0802000555
SX-2 9/18	M8 x 242	0802000556
SX-2 10/20	M8 x 262	0802000557

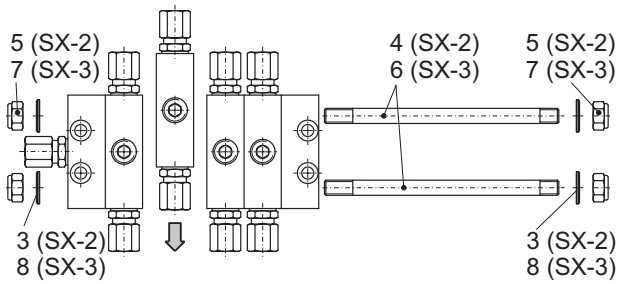
Tab. 3 order-no. for conn. rods (1 pcs) for **SX-3**:

Distributor	Conn. rod	Order-no.
SX-3 3/6	M8 x 124	0802000500
SX-3 4/8	M8 x 144	0802000501
SX-3 5/10	M8 x 166	0802000502
SX-3 6/12	M8 x 183	0802000503
SX-3 7/14	M8 x 203	0802000504
SX-3 8/16	M8 x 223	0802000505
SX-3 9/18	M8 x 242	0802000506
SX-3 10/20	M8 x 262	0802000507

SX-2 distributors, consisting of three or four middle elements (metering elements) are assembled with cylinder head cap screws:



The SX-2 distributors and from five middle elements on also the SX-3 distributors are assembled with connecting rods:



Distributor SX-2:

Pos. 1 Cylinder head cap screw with internal socket DIN 6912-M8-10.9, see order-no. in table 1

Pos. 2 Safety hexagon nut, DIN 980 - M8 - St
Order-no.: 090098000153 (1 piece)

Pos. 3 Washer DIN 125 - B 8,4 - St
Order-no.: 0900125004132 (1 piece)

Pos. 4 Connecting rods M8 - St, see order-no. in table 2

Pos. 5 Hexagon nut, self locking
DIN 982 - M8 - St
Order-no.: 090098200213 (1 piece)

Distributor SX-3:

Pos. 6 Connecting rods M8 - V4A, see order-no. in table 3

Pos. 7 Hexagon nut, self locking
DIN 985 - M8 - V4A
Order-no.: 090098500741 (1 piece)

Pos. 8 Washer DIN 125 - B8,4 - V4A
Order-no.: 0900125004612 (1 piece)

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Note: SX-2 and SX-3 distributors always have to consist of at least three middle elements and up to ten as a maximum.

Should one of the O-rings, which are used for sealing the distributor between the individual elements be damaged and does not seal any more, a set of seals can be ordered containing all O-rings used in SX-2, respectively SX-3 distributors.

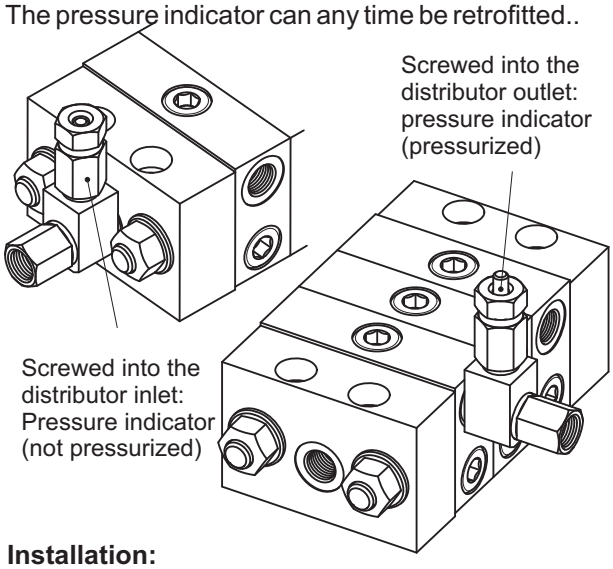
Set of seals for middle elements:
Order-no.: 3989 98 D000

Set of seals for initial elements:
Order-no.: 3989 97 D000

Pressure indicator (only for SX-2)
The pressure indicator locates closed lubrication points, respectively blocked progressive distributors.

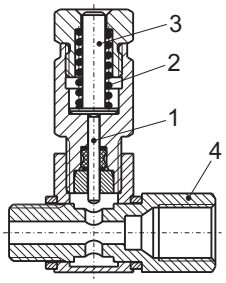
The indicator can be used in the distributor inlet as well as in the distributor outlets for blockade monitoring of individual lubrication points and series-connected progressive distributors (secondary distributors).

The pressure indicator can any time be retrofitted..



Installation:
The pressure indicator is screwed into a swivelling fitting (4) and then into the distributor. The connection fitting has to be screwed into the swivelling fitting.

Functional description:
When pressure increases, the pin (1) is pushed out and the indicator pin (3) becomes visible. When pressure is reduced, the spring (2) pushes back the indicator pin (3).



See order numbers and installation dimensions under “Accessory progressive distributors”.
When the distributor’s function shall be ensured despite the locked distributor outlet, the distributor can be provided with a so-called **blockade control**. See “Accessory progressive

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Order key

Distributor inlet

The progressive distributors SX-2 or SX-3 can be delivered with or without fittings. Should the fittings be delivered already installed into the distributor, they have to be marked with the pipe diameter and the series (see table) :

Inlet	Designation
G1/8	without fitting
GE06LL GE06L GE08LL	male stud coupling, pipe-Ø 6 or 8, series L or LL

Fittings can also be ordered separately (see “Accessory progressive distributors” or “Fittings and accessories”).

When there is no indication concerning the fittings, delivery is without fittings as a standard!

Distributor outlet

The fitting type at the distributor outlets has to be indicated with the diameter and the series , when the order is placed (see table):

Outlet	Designation
G1/8	without fitting
GE06LL GE06L GE08LL	male stud coupling, pipe-Ø 6 or 8, series L or LL
RGE06LL RGE06L RGE08LL RGE08L	Non-return valve pipe-Ø 6 or 8, series L or LL

Note:
Without indication of the series, a straight fitting, respectively a non-return valve of the series L (cutting ring) is delivered.

Metering volume

The metering code numbers **07** to **47** (see table “Technical description”) of the metering elements have to be indicated for each side of the distributor inlet in the order in which the lubricant comes out and have to be separated by a **slash** (/). For distributor bridges, a **plus** (+) has to be indicated instead of the slash.

The metering code numbers of combined outlets accumulate (see “combination of outlets”).

Screw plugs and outlets which are closed with distributor bridges are marked with a **line** (---). The interchangeable seal washer that has to be turned over is marked with a **star** (*) in the drawing (see “Combination of outlets”).

Proximity switch (=NS)

Middle elements to which a proximity switch shall be installed, must be indicated by NS or NSg after the number of the metering volume (see table). Proximity switches can be installed left or right to the SX-2 or SX-3 distributors. The standard assembly is done on the right side.

NS	Designation
NS	NS with open housing (standard)
NSg	NS with closed housing

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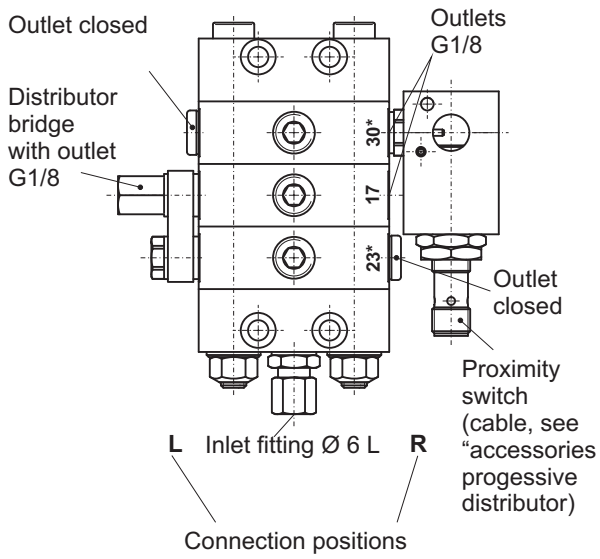
Order example



* = Interchangeable seal washer turned over!

Type	SX-2	03	/	03	-	GE06L	/	G1/8	R	--- / 17 / 60 NS
No. of middle elements									L	--- + 63 / ---
No. of outlets										
Inlet fitting										
Outlet fitting										
Connection position										
Metering code no. at outlets										

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04-1-30-12 state: 01.12EN

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Technical description

Progressive distributors SX-5 are built in a variable disk construction. Therefore the distributors can be, depending on the number of lubrication points, extended or shortened. Because of the disk construction there is the possibility to form individual middle elements (metering elements) with different metering volumes to one complete progressive distributor.

The different metering volume per piston stroke is effected by different piston diameters.

A progressive distributor needs at least three pistons, i.e. at least three middle elements (metering elements).

Technical data

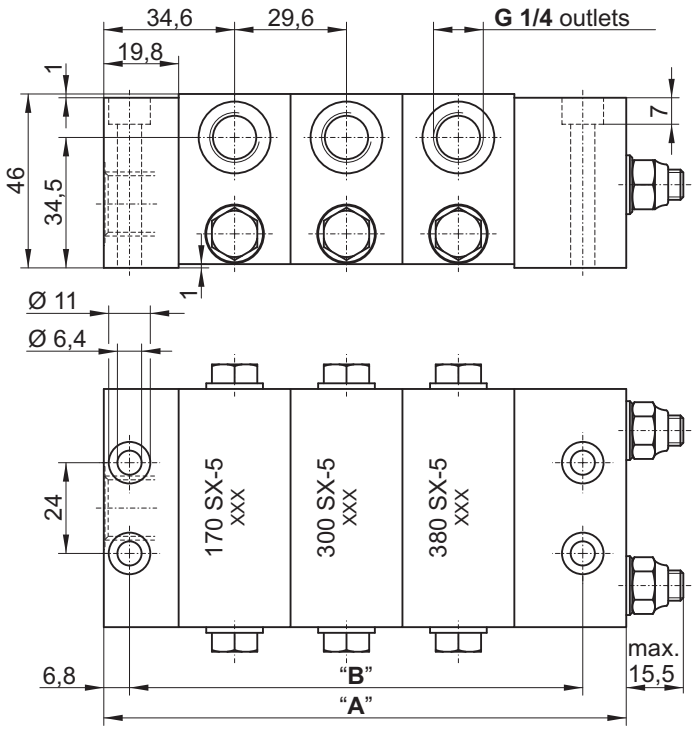
Operating pressure-inlet:	max. 300 bar
Temperature range:	-30 °C to 80 °C
Lubricant:	oil- fluid grease - grease up to NLGI-cl. 2
Revolutions:	max. 180 r/min
Material:	steel, galvanized

No. of middle elements (metering elements):

min. 3 middle elements: SX-5 3/6

max. 10 middle elements: SX-5 10/20

Dimensional drawing:



Progressive distributor SX-5 with three middle elements and six outlets

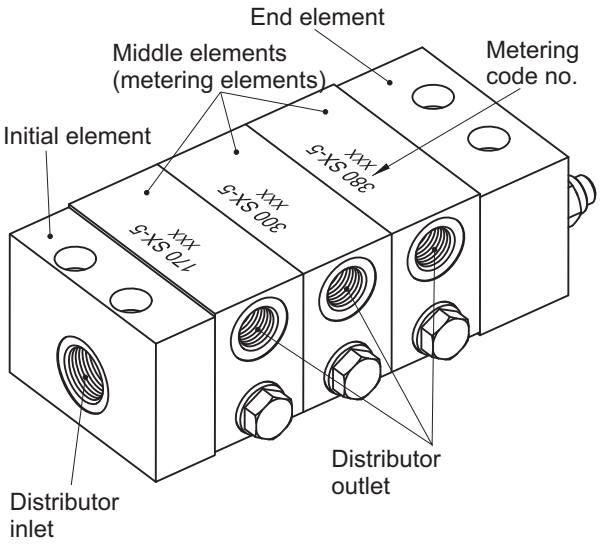
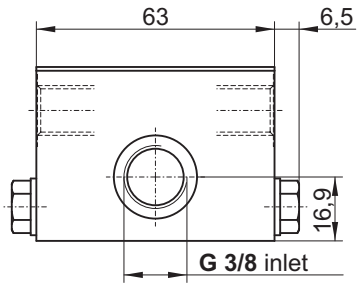


Table metering volume:

Designation middle element	Metering volume (mm³/stroke)		Code no.
	p. outlet	p. element	
075 SX-5	75	150	075
117 SX-5	117	234	117
170 SX-5	170	340	170
230 SX-5	230	460	230
300 SX-5	300	600	300
380 SX-5	380	760	380
470 SX-5	470	940	470



No. of middle elements	No. of outlets (max.)	Dim. "A" (mm)	Dim. "B" (mm)
3	6	138,2	119,9
4	8	167,8	149,5
5	10	197,4	179,1
6	12	227,0	208,7
7	14	256,6	238,3
8	16	286,2	267,9
9	18	315,8	297,5
10	20	345,4	327,1

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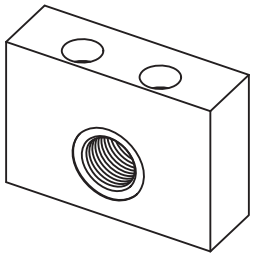
Elements

The progressive distributor SX-5 always consist of one initial element (without piston), three to ten middle elements (with piston) and one end element (without piston).

All elements have a connection thread G 3/8 at the distributor inlet and a connection thread G 1/4 at the distributor outlet

Initial element

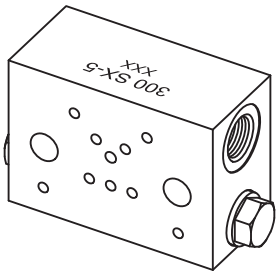
Order-no.: 3983A01



Middle element (metering element)

Middle elements are equipped with integrated non-return valves and are suitable for lubrication points with different counter pressures.

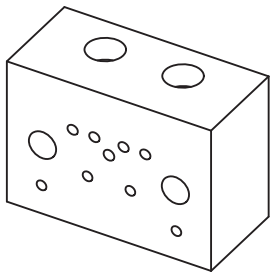
Each middle element has two outlets.



Middle element	Order-no.
075 SX-5	3983M110000
117 SX-5	3983M210000
170 SX-5	3983M310000
230 SX-5	3983M410000
300 SX-5	3983M510000
380 SX-5	3983M610000
470 SX-5	3983M710000

End element

Order-no.: 3983E00



All pipe fittings with a suitable connection thread and a suitable nominal pressure can be screwed into the initial element's distributor inlet as well as middle elements' distributor outlets (see "Accessory progressive distributor", respectively "Fittings and accessories").

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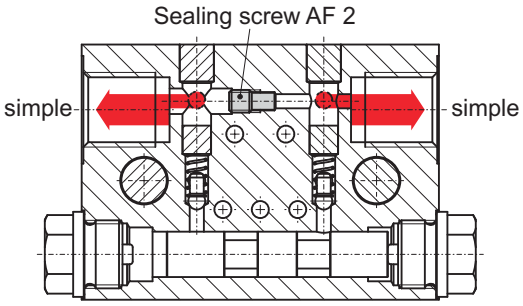
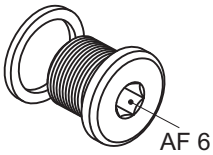
Combination of outlets

For larger lubrication points it could be necessary to combine two or more outlets at the progressive distributor.
The progressive distributor's individual middle elements have two outlets.



Combination of outlets

Screw plug with sealing ring for closing outlets:



Order-no.:

Screw plug G 1/4:	090090800513
Sealing ring A14x18x1,5:	090760300621

Separating outlets

In order to separate the combined outlets again, the sealing screw has to be screwed in again.

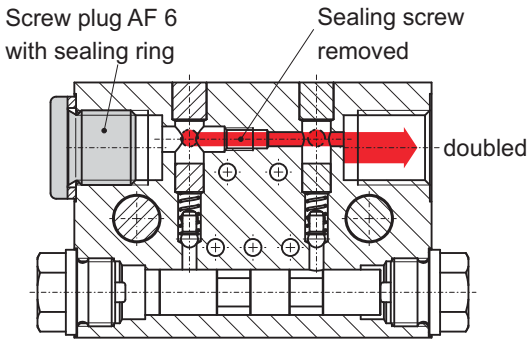
Sealing screw for separating outlets:

Order-no.:

Sealing screw:	0802000455

Combination of outlets at one distributor disk

When two outlets are combined, the two outlets of one middle element are connected. For this purpose, the sealing screw, which separates the two sides, is removed and a screw plug with sealing ring is screwed into the side that has to be closed. The metering volume of the sealed side now comes out of the other side, i.e. the metering volume at the open side doubles.



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Combination of outlets at several middle elements

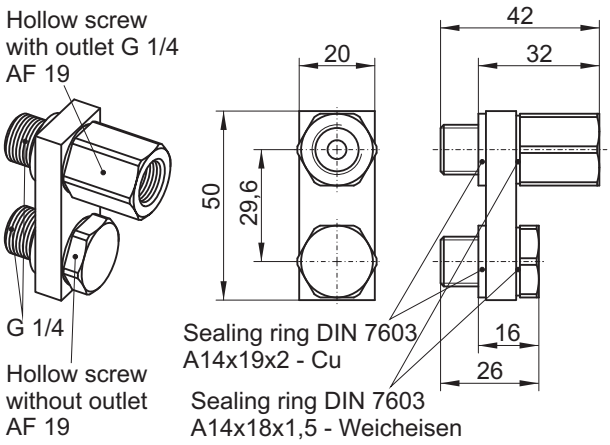
Should the total metering volume of the combined outlets at one middle element be insufficient, at very large bearing points or at main distributors e.g., there is the possibility to combine the outlets of two or more middle elements.

The metering volume is calculated of the metering volume code number of all combined outlets.

Distributor bridge with outlet

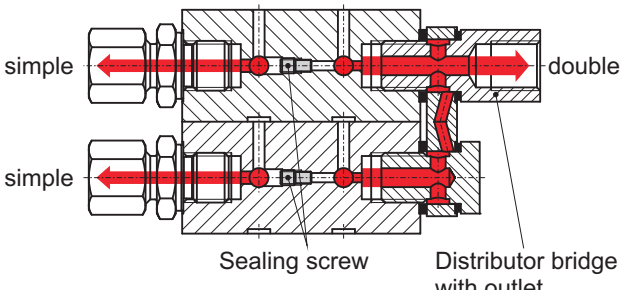
With the help of distributor bridges with outlets, two, three or four outlets at different adjacent middle elements can be combined.

Order-no. total: 3985980010011



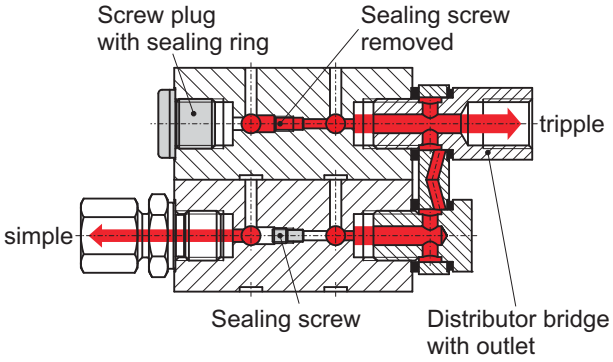
Two outlets combined at two middle elements

If only two outlets at two adjacent middle elements should be combined, the sealing screw of both middle elements must not be removed. The metering volume of both outlets comes out at the distributor bridge's outlet.



Three outlets combined at two middle elements

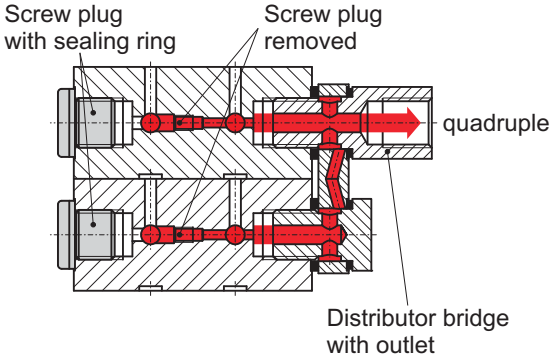
To connect three outlets at two adjacent middle elements, the sealing screw of one middle element has to be removed and the outlet opposite the distributor bridge has to be closed with a screw plug and a sealing screw. The metering volume of all three outlets comes out of the outlet at the distributor bridge.



Four outlets combined at two middle elements

When four outlets should be connected at two adjacent middle elements, the sealing screws of both middle elements have to be removed and the outlets opposite the distributor bridge have to be closed with a screw plug and sealing ring.

The metering volumes of the four outlets then come out of the outlet of the distributor bridge.



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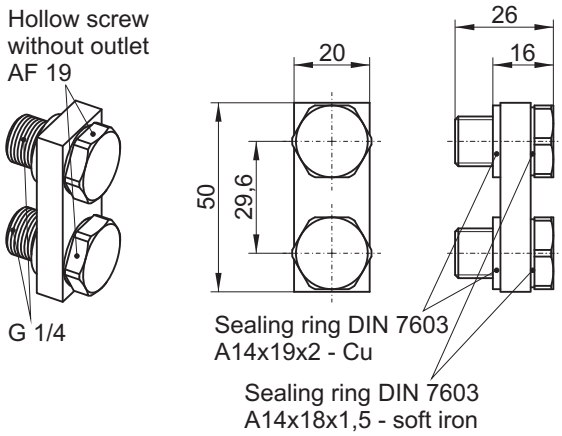
Distributor bridge without outlet

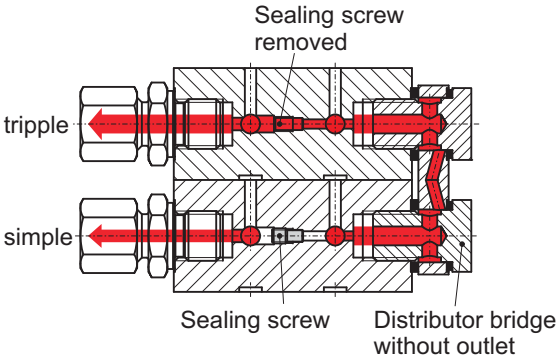
With the help of a distributor bridge without outlet three to four outlets at different adjacent middle elements can be combined.

Order-no. total: 3985980010010



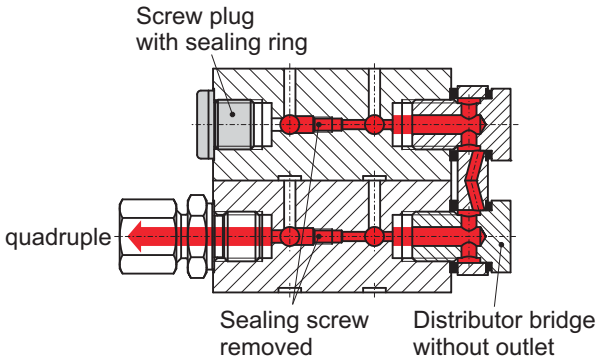
Three outlets combined at two middle elements

At least three outlets are concerned when combining outlets with a distributor bridge without outlet, as the metering volume of one middle element has to be directed through the middle element of a progressive distributor. The sealing screw of one middle element always has to be removed.



Four outlets combined at two middle elements

Four outlets at two adjacent middle elements can be combined by means of a distributor bridge wihout outlet. The sealing screws of both middle elements have to the removed and one outlet opposite the distributor bridge has to be closed with a screw plug and sealing ring.



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Elements with proximity switch

For monitoring the system, for the use of cycle controls or for counting the piston strokes, proximity switches can be attached to the SX-5 distributor.

Proximity switches can be delivered preassembled to middle elements 170 SX-5 to 470 SX-5 . The installation position of the proximity switch is on the right side as a standard. Installation on the left side has to be indicated separately.

Middle elements with proximity switch have to be indicated when the order is placed.

The only possibility of retrofitting a proximity switch to an existing progressive distributor is to replace one middle element.

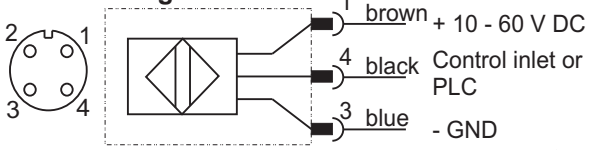
The proximity switch is delivered without cable, it has to be ordered separately (see “Accessory progressive distributor”).

Due to the fact that the nuts of the proximity switch juts out the distributor (see drawing on the right side), an assembly plate has to be put under distributors that are not installed with welding plates or an assembly angle (see drawing).

Technical data of proximity switch

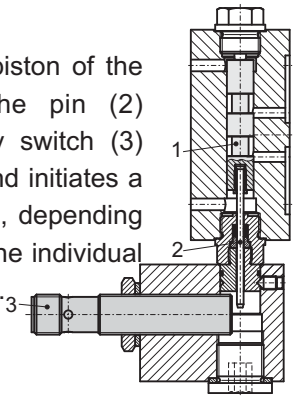
Connection:	M12x1 plugable
Switch type:	PNP NO
Current load:	200 mA
poss. voltage:	10 - 60 V DC
Temperature range:	-40 °C to 85 °C
Funktion indication:	LED yellow
Material:	stainless steel
Protection class:	IP 67 / IP 69K

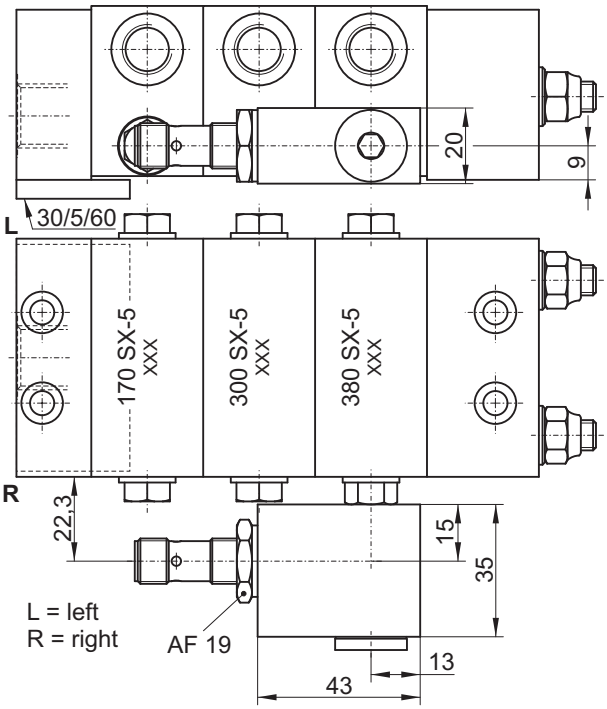
Terminal diagram

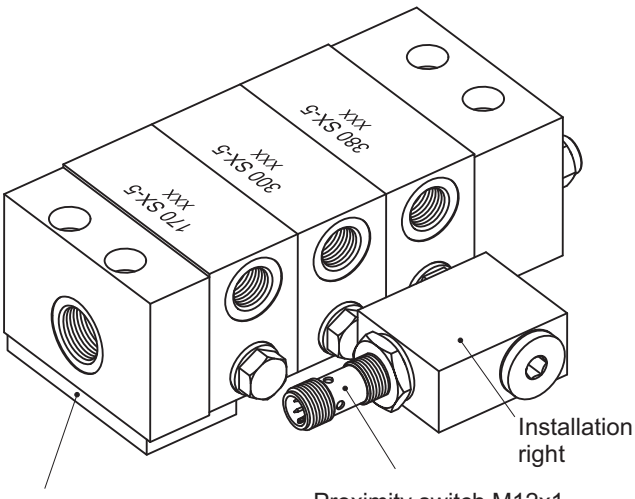


Functional description:

A pin (2) is fixed at the piston of the middle element (1). The pin (2) approaches the proximity switch (3) with each piston stroke and initiates a signal. This signal can be, depending on the type of control or the individual case, processed differently.







Assembly plate 60x30x5
Order-no.: 0800801957

Proximity switch M12x1
Order-no.: 100091865

Table order-no. for middle elements with proximity switch (=NS) **M12x1:**

Middle element with NS M12x1	Position	Order-no.
170 SX-5	right	3983M310N10
	left	3983M310N20
230 SX-5	right	3983M410N10
	left	3983M410N20
300 SX-5	right	3983M510N10
	left	3983M510N20
380 SX-5	right	3983M610N10
	left	3983M610N20
470 SX-5	right	3983M710N10
	left	3983M710N20

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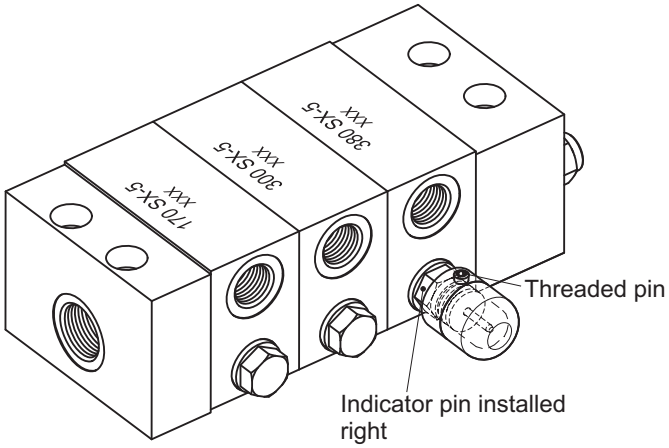
Elements with indicator pin

The progressive distributors SX-5 can be equipped with an indicator pin instead of a proximity switch.

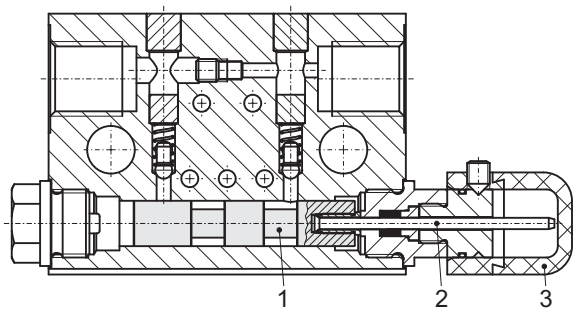
The indicator pin can only be installed at the middle elements 170 SX-5 to 470 SX-5 on the right or left side and must be indicated seperately when order.

The indicator pin can not be retrofitted.
A retrofit is only possible by exchanging the middle element.



Functional description

A pin (2) is fastened at the piston of the middle element (1). This can be seen in the transparent cap (3) at each piston stroke.



The transparente cap (indicator pin cover) of the indicator pin can be ordered separately.

Order-no.: 4003000S003

Installation dimensions

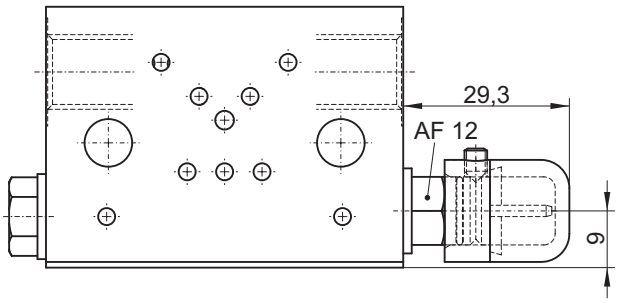
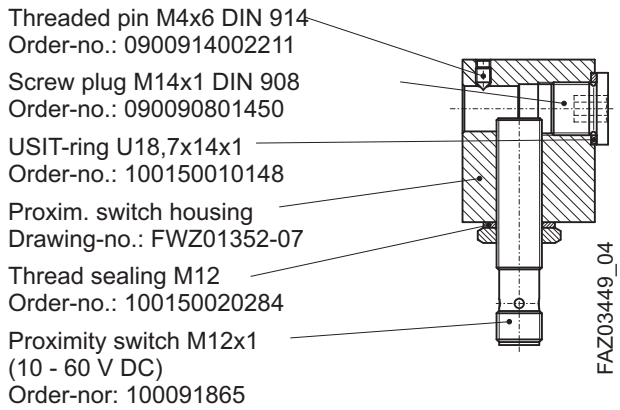


Table order-no for middle element with indicator pin with cover:

Middle elem. with indicator pin	Pos.	Order-no.
170 SX-5	right	3983M310K10
	left	3983M310K20
230 SX-5	right	3983M410K10
	left	3983M410K20
300 SX-5	right	3983M510K10
	left	3983M510K20
380 SX-5	right	3983M610K10
	left	3983M610K20
470 SX-5	right	3983M710K10
	left	3983M710K20

A proximity switch can be retrofit at indicator pin.

Order-no complete: 4003000N002



The proximity switch is adjusted at the assembly.
When retrofit a proximity switch the threaded pin must be screwed out and the cap of the indicator pin must be pulled off. Then the proximity switch is put on and the threaded pin can be screwed in.

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Extension or shortening of distributors

Progressive distributors SX-5 can any time be adapted to the application conditions because of their disk construction. When new lubrication points should be added or some become unnecessary, the distributor can be extended or shortened by the installation or removal of middle elements.

Description:

- screw off the cap nuts of both ends of the connecting rods and take the connecting rods out
- separate the distributor at the desired point
- add the new middle elements or remove the unnecessary ones
- screw the distributor together with the connecting rods and the cap nuts and a washer (see table)

Table order no. for connecting rod (1 piece):

Distributor	Conn. rod	Order-no.
SX-5 3/6	M8 x 147	0802000755
SX-5 4/8	M8 x 177	0802000756
SX-5 5/10	M8 x 206	0802000757
SX-5 6/12	M8 x 236	0802000758
SX-5 7/14	M8 x 265	0802000759
SX-5 8/16	M8 x 295	0802000760
SX-5 9/18	M8 x 325	0802000761
SX-5 10/20	M8 x 354	0802000762

A SX-5 3/6 distributor should be extended by a middle element

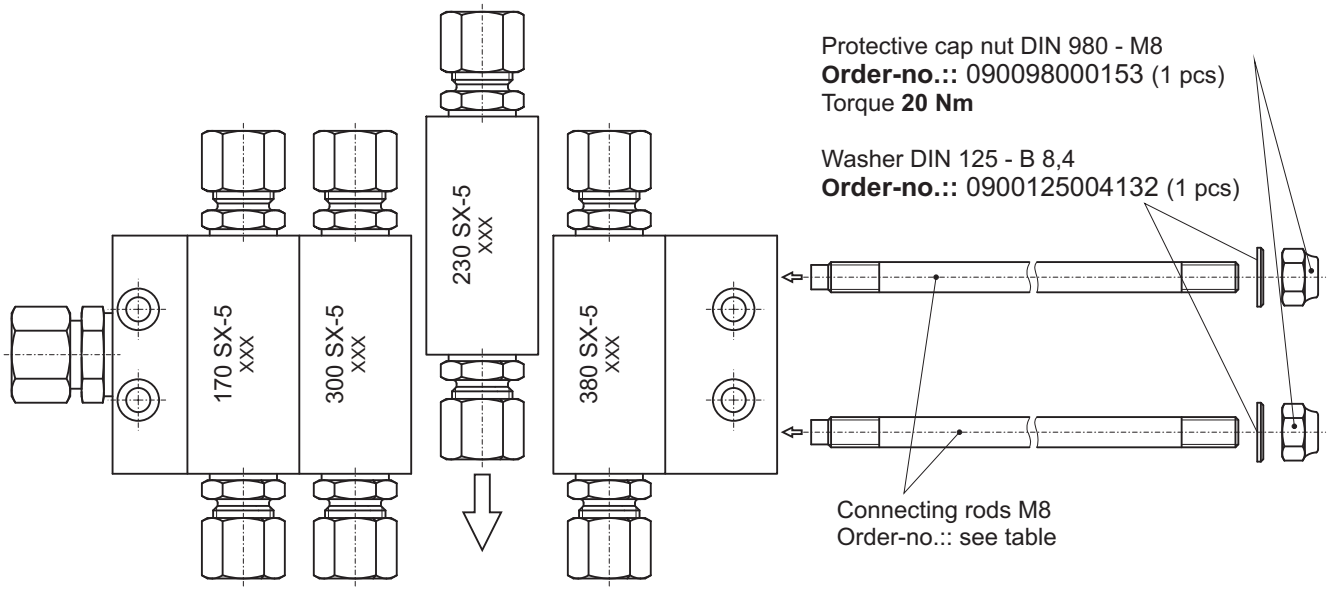
Note: A SX-**5** distributor has to consist of at least three middle elements and ten middle elements (piston elements) as a maximum.

Should one of the O-rings which are used for sealing the distributor between the individual elements be damaged and does not seal any more, a set of seals can be ordered. It contains all O-rings that are installed in SX-5 distributors.

Set of seal for initial element,
Order-no.: 3983D0001

Set of seal for middle element,
Order-no.: 3983D0002

Note: **Please pay attention to utmost cleanness when working at the distributor.**



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Order key

Distributor inlet

The progressive distributor SX-5 can be delivered with or without fittings. If the fittings should be delivered already installed into the distributor, then please indicate this with the type of fitting, the pipe diameter and the series (see table).

Inlet	Designation
G3/8	without fitting
GE06L	male stud coupling, pipe-Ø 6, 8, 10, 12 or 15, series L
GE08L	
GE10L	
GE12L	
GE15L	

The fittings can also be ordered separately (see “accessory progressive distributor” or “fittings and accessory”).

When no indication concerning the fittings is made, the delivery is without fittings as standard!

Distributor outlet

The distributor outlet can be delivered with union screw, non-return valves or without fittings at the outlets (see table).

Outlet	Designation
G1/4	without fitting
GE06L	male stud coupling, pipe-Ø 6, 8, 10 or 12, series L
GE08L	
GE10L	
GE12L	

Metering volume

The metering code numbers **075** to **480** (see table“Technical description”) of the metering elements have to be indicated on each side of the distributor inlet in the order, in which the lubricant comes out and they have to be separated by a **slash** (/). For distributor bridges, a **plus** (+) has to be indicated instead of the slash.

For combined outlets, the metering code numbers accumulate (see “Combination of outlets”).

Screw plugs and outlets which are closed with distributor bridges are marked with a **line** (---). The sealing screw, which has to be removed, is marked with a **star** (*) in the drawing (see “Combination of outlets”).

Proximity switch

Distributor elements to which a proximity switch should be attached, have to be marked with **NS** (proximity switch) after the number for the metering volume. Proximity switches can be attached to SX-5 distributors on the right (standard) or on the left side.

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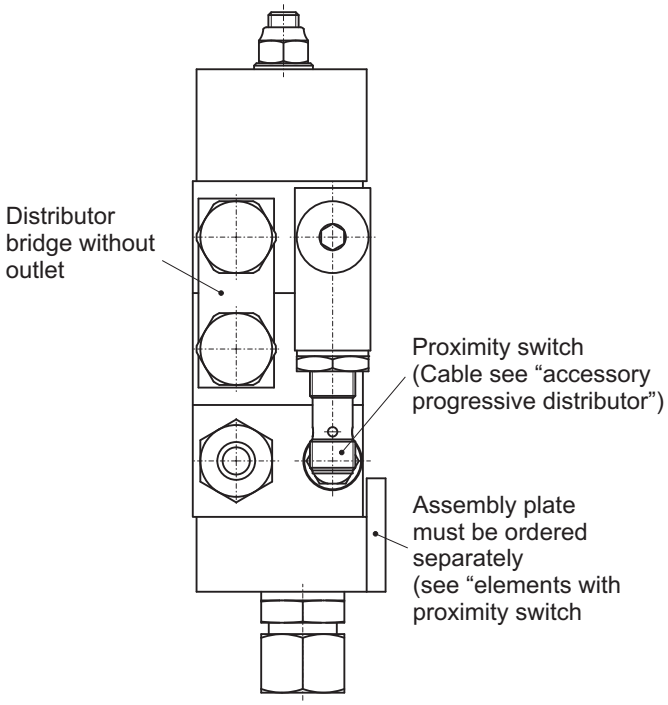
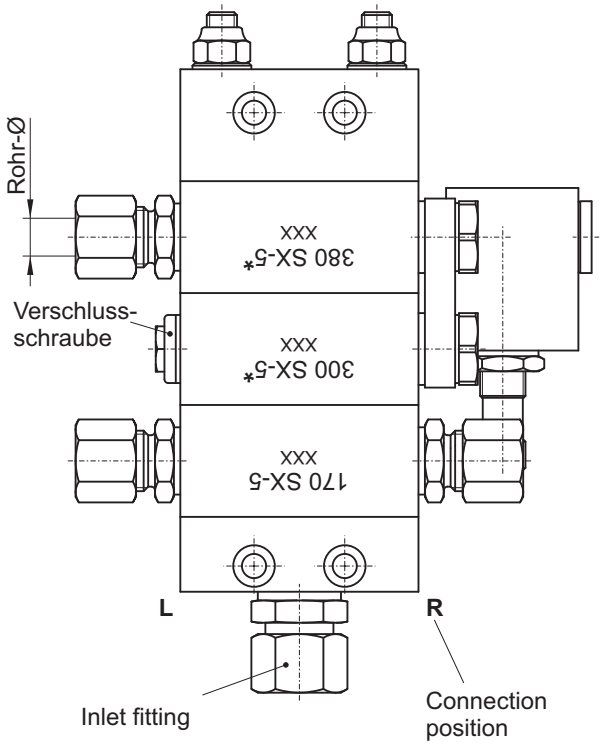
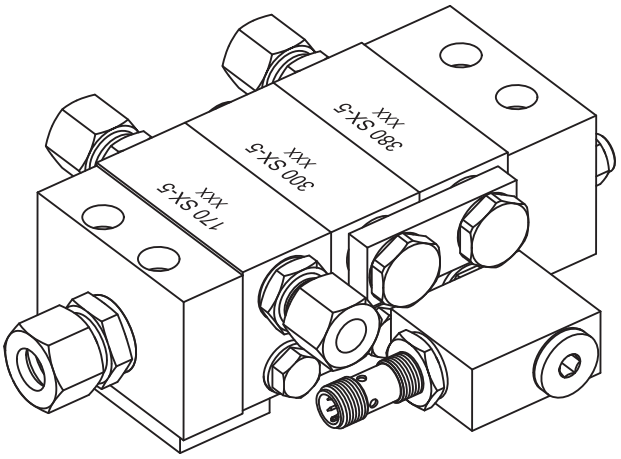
Order example







* = Sealing screw removed!

Type	SX-5 03 / 03 - GE12L / GE10L	**R**	170	/	---	+	---	NS
No. of middle elements		**L**	170	/	---	/	1360	
No. of outlets								
Inlet fitting								
Outlet fitting								
Connection position								
Metering code no. at outlets								

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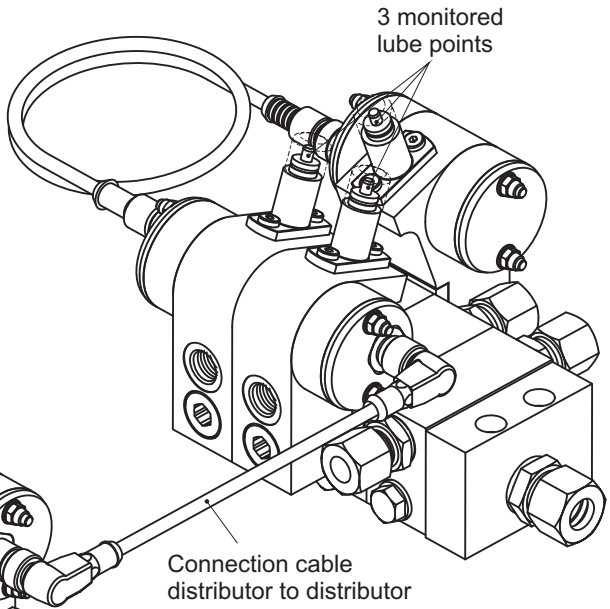
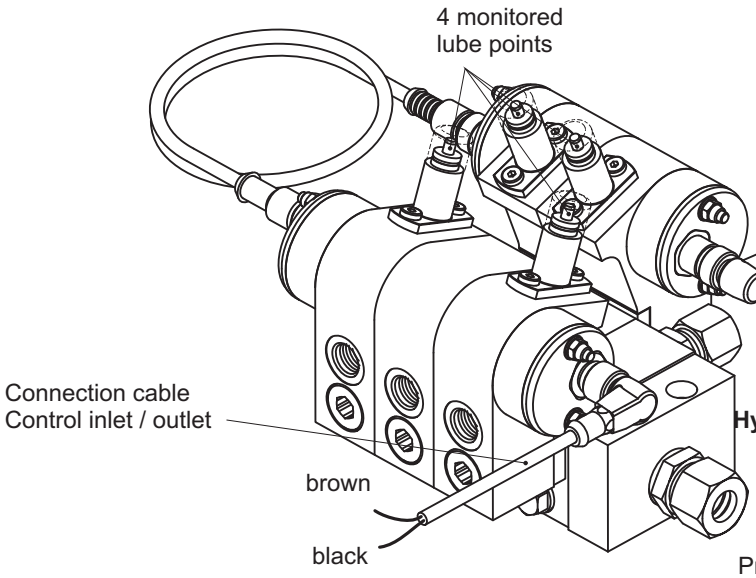
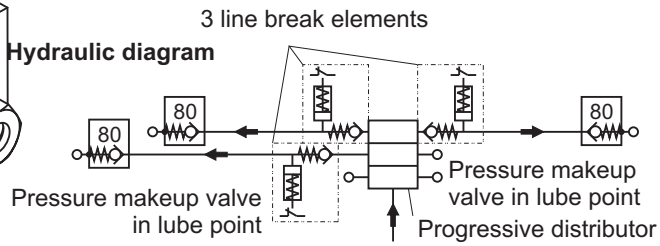
Line break monitoring

A line break monitoring for distributor SX-5 can be installed at lubrication points for which a lubrication is absolutely necessary. The line break monitoring controls the pipe lines from the distributor outlet to the lubrication point for demolition or break.







Function

A line break element with pressure indication is screwed at the lube point of the distributor outlet that has to be monitored. The element is screwed together with flanges and plates (see next page) by means of cylinder screws and hexagon socket screws.

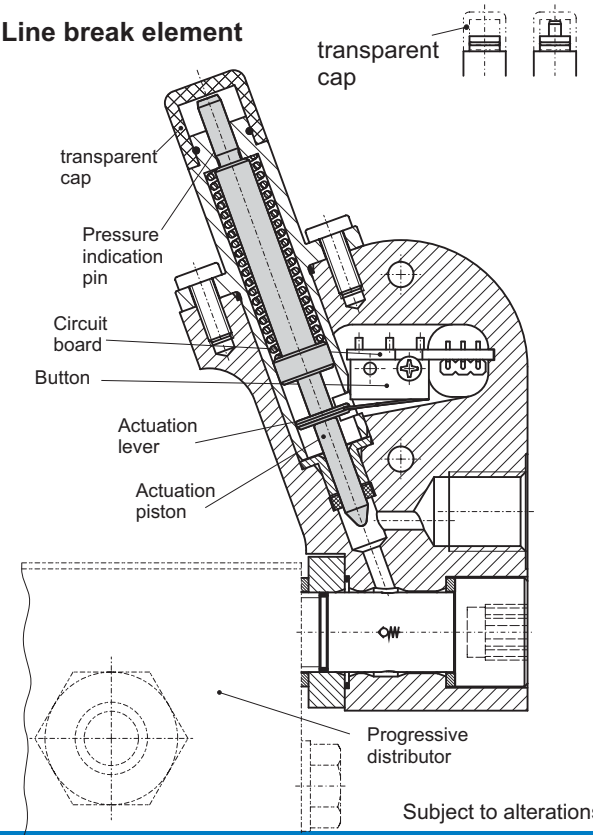
A pressure makeup valve with non-return valve with an opening pressure of 75 bar is screwed directly into the lube point. With this pressure, that always exists within the line, the actuation piston presses a button via the actuation lever in the element. Hence the electrical circuit is closed and the pin of the pressure indication is visible.

If pressure is reduced due to line break, the pin of the pressure indication becomes invisible and the electrical circuit is interrupted.

Attention: To ensure a reliable function, the value of the pressure loss in the connecting line between distributor outlet and preload valve may even under unfavourable conditions (e.g. deep temperature) not be higher than the operating pressure of the line rupture element (approx. 30 bar).

Pressure indicator
pin is visible = OK
pin is invisible = line break

Line break element



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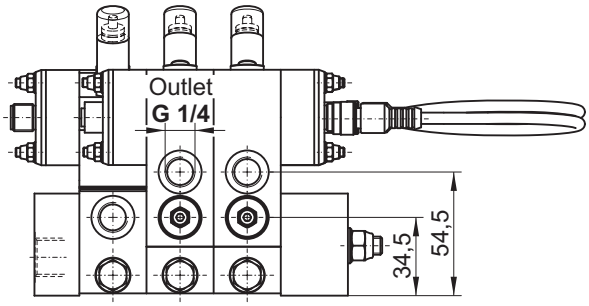
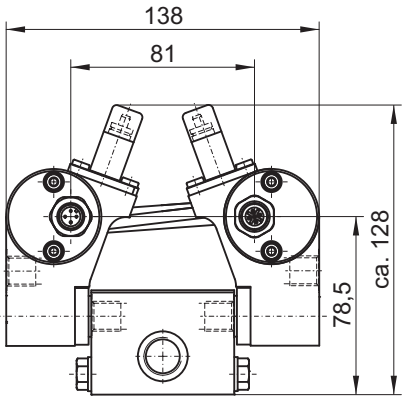
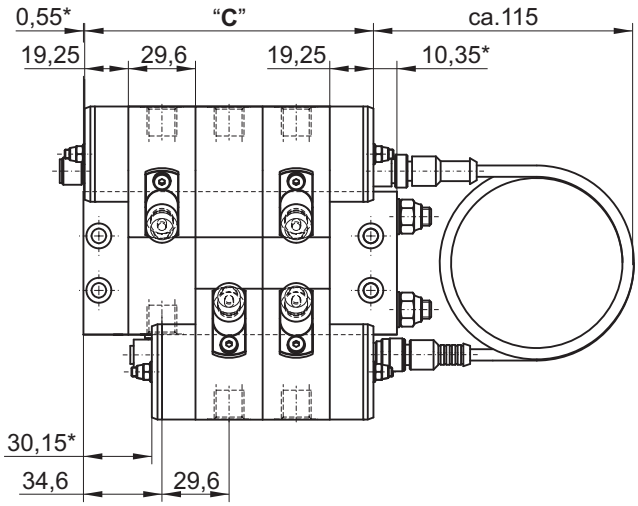
Dimensional drawing of line break monitoring:







Number of line break elements or intermediate plates	Dim. "C" (mm)
1	68,1
2	97,7
3	127,3
4	156,9
5	186,5
6	216,1
7	245,7
8	275,3
9	304,9
10	334,5

* Dimension depends at which outlet the first or the last line break element is installed.

Attention: Dimension of distributor SX-5 see description of dimensional drawing SX-5

Technical data

Operating pressure inlet:	max. 300 bar
Operating voltage:	10 - 55 V DC
Contact capacity:	50 mA DC
Connection:	Round connector M12, Pin 1 = +Ub Pin 4 = outlet (NO contact), contact opens in case of fault

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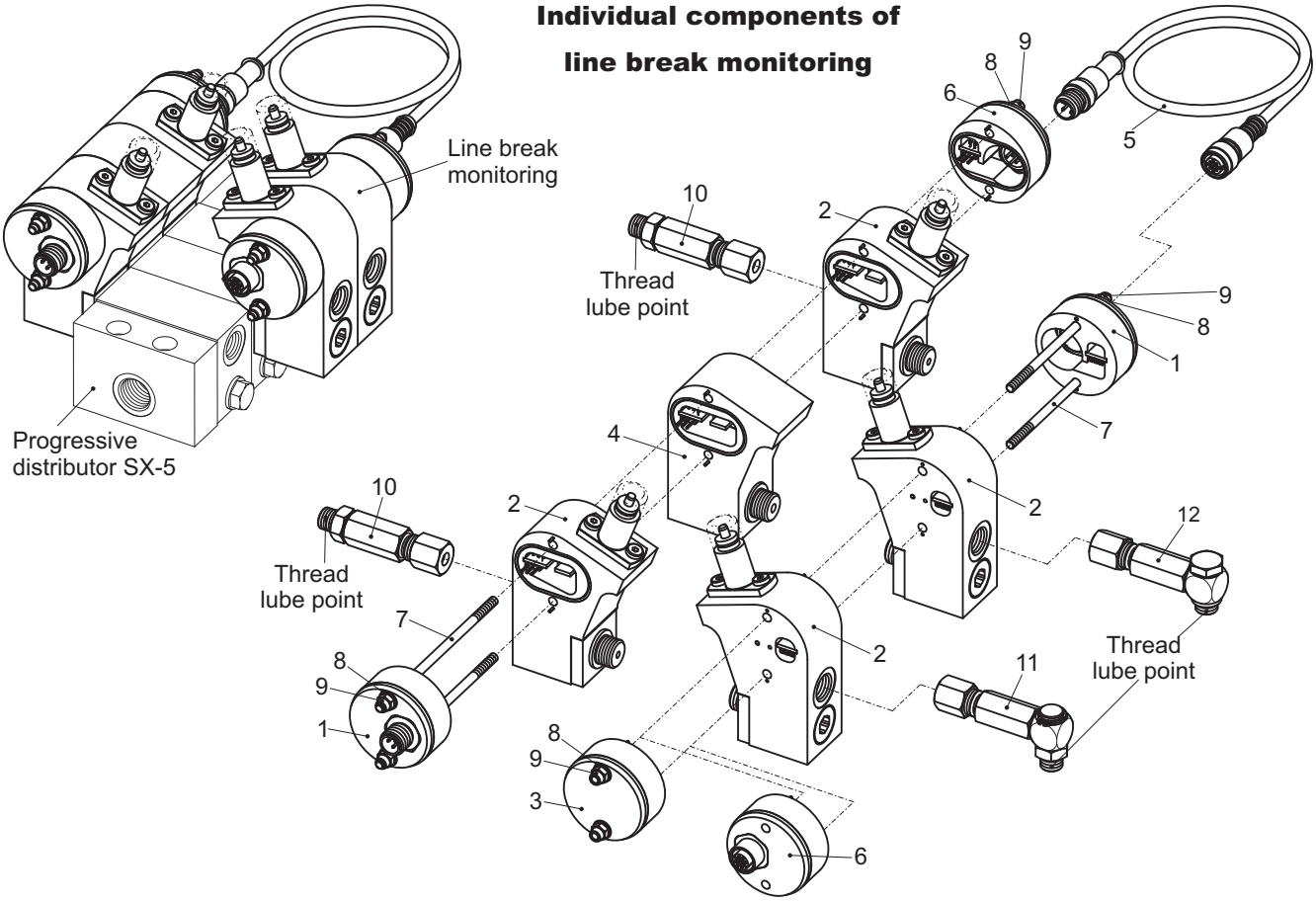

Table of order numbers of individual components of line break monitoring for **SX-5** (see figure above):

Position	Designation	Order-no.
1	Inlet flange, plug M12x1	437501010100
2	Line break element	437502010100
3	Final plate	4375060100
4	Intermediate plate	4375040100
5	Connection cable	1000913864
6	Outlet flange, bush M12x1	437503010100
7	connecting rod	see table
8	Washer DIN 125-B4,3	0900125006132
9	Nut, self locking DIN 986 - M4	09i0704006131
10	Press. makeup valve straight	see table
11	Press. makeup valve swivelling	see table
12	Press. makeup valve angled	see table

Order number table for connecting rod (Pos. 7) for **SX-5** (1 pcs):

Number of line break elements or intermediate plates	Connect. rod	Order-no.
1	M4 x 85	F4375/21-01 002
2	M4 x 115	F4375/21-01 004
3	M4 x 144,5	F4375/21-01 006
4	M4 x 174	F4375/21-01 008
5	M4 x 203,5	F4375/21-01 010
6	M4 x 233	F4375/21-01 012
7	M4 x 263	F4375/21-01 013
8	M4 x 292,5	F4375/21-01 014
9	M4 x 322	F4375/21-01 015
10	M4 x 352	F4375/21-01 016

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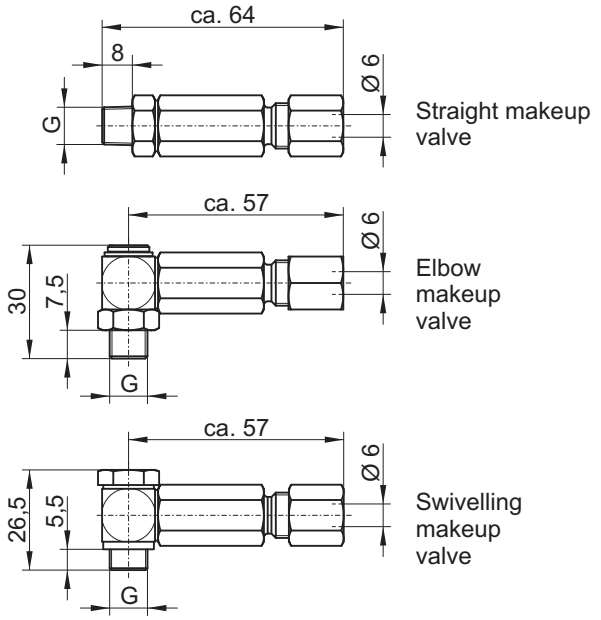
Order number table for pressure makeup valve, opening pressure 75 bar:

Press. makeup valve	Thread G	Order-no.
straight (Pos. 10*)	M8x1k	43750706A111
	M10x1k	43750706A211
swivelling makeup valve (Pos. 11*)	M8x1k	43750706B111
	M10x1k	43750706B211
	M10x1k (lang)	43750706B311
	R 1/8"k	43750706B411
	R 1/4"k	43750706B511
	1/8-27NPT	43750706B611
elbow makeup valve (Pos. 12*)	M8x1	43750706C111
	M10x1	43750706C211
	G 1/8	43750706C311

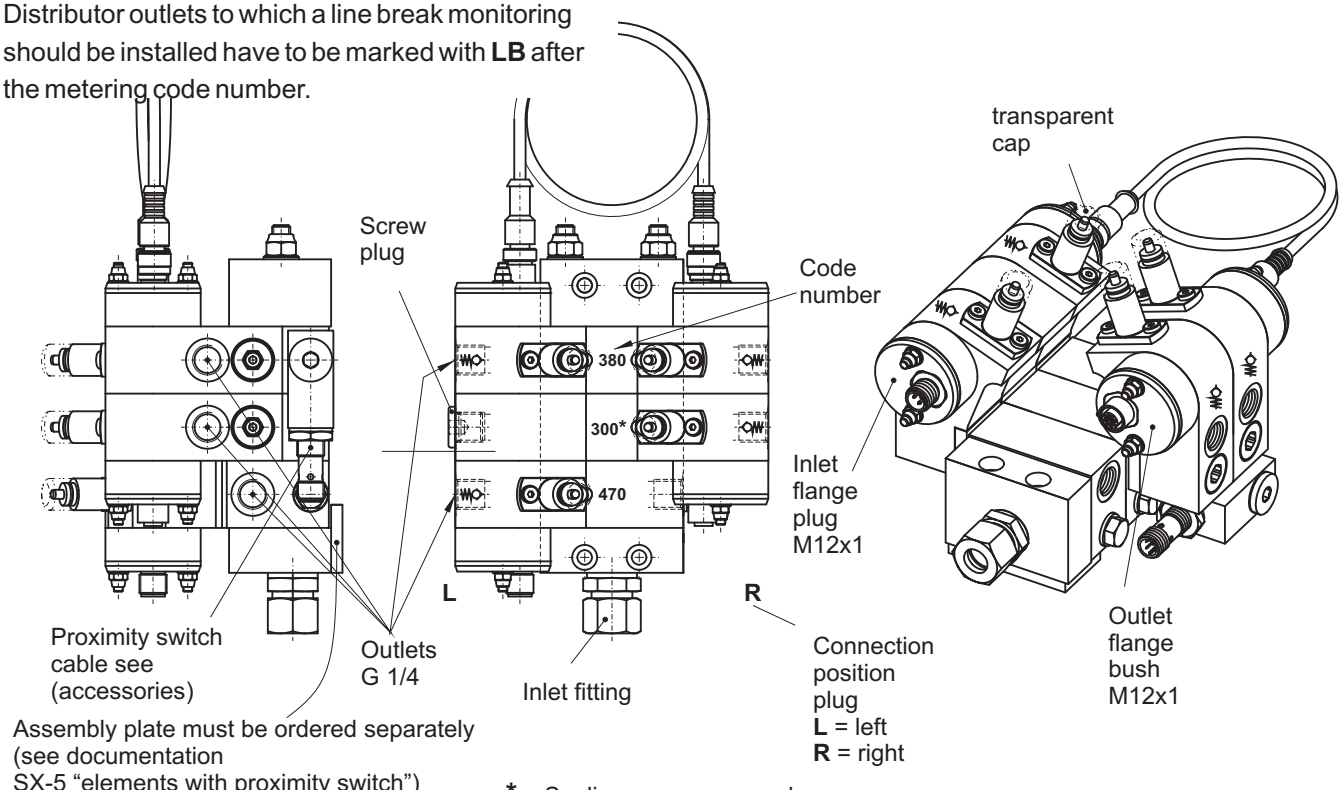
* see individual compontents of line break monitoring



Line break monitoring

Order example of line break monitoring with progressive distributorSX-5

Distributor outlets to which a line break monitoring should be installed have to be marked with **LB** after the metering code number.



Type	SX-5 03 / 05 - GE12L / G1/4	R 470	/ 600 LB / 380 LB NS
No. of piston elements		L 470 LB /	--- / 380 LB
No. of outlets			
Inlet fitting			
Outlet fitting			
Connection position			
Metering code no. at outlets			

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Technical description

Progressive distributors UX are built in a variable disk construction. Therefore the distributor can be, depending on the number of lubrication points, extended or shortened. Because of the disk construction there is the possibility to form individual middle elements (metering elements) with different metering volumes to one complete progressive distributor.

The different metering volume per piston stroke is effected by different piston diameters.

A progressive distributor needs at least three pistons, i.e. at least three middle elements (metering elements).

Technical data

Operating pressure-inlet:	max. 250 bar
Temperature range:	-30 °C to 80 °C
Lubricant:	oil- fluid grease - grease
Revolutions:	max. 180 r/min
Material:	steel, galvanized

No. of middle elements (metering elements):

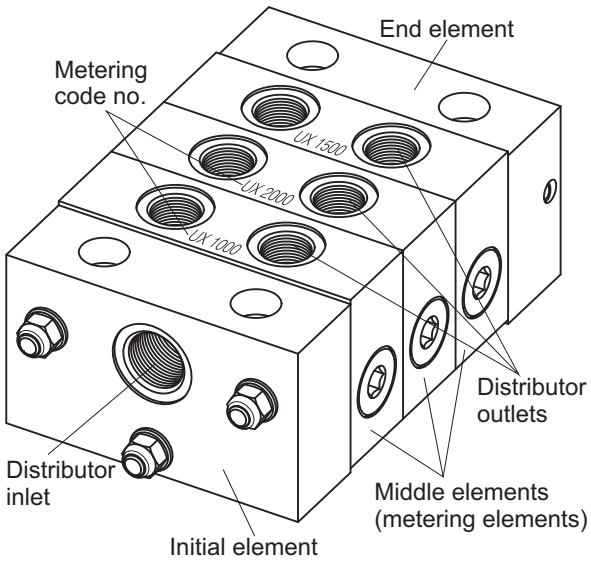
min. 3 middle elements: UX 3/6

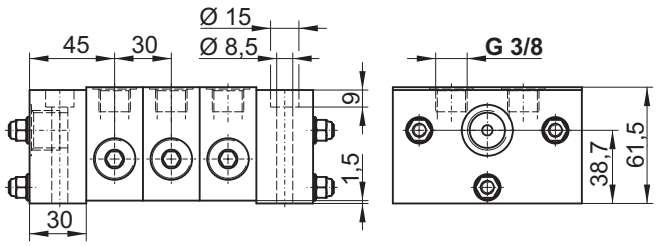
max. 10 middle elements: UX 10/20

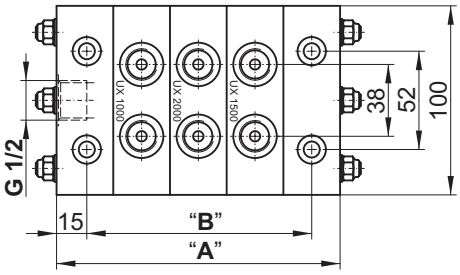
Table metering volume:

Designation middle elem.	Metering volume (mm³/stroke)		Code no.
	p. outlet	p. element	
UX 1000	1130	2260	1000
UX 1500	1540	3080	1500
UX 2000	2000	4000	2000

Progressive distributor UX with three metering elements and six outlets:







No. of middle elements	No. of outlets (max.)	Dim. "A" (mm)	Dim. "B" (mm)
3	6	150	120
4	8	180	150
5	10	210	180
6	12	240	210
7	14	270	240
8	16	300	270
9	18	330	300
10	20	360	330

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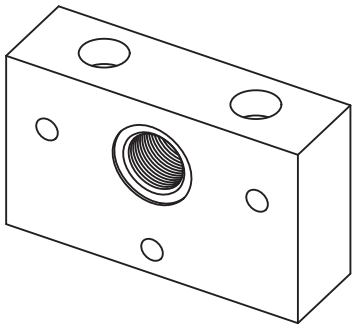
Elements

The progressive distributors UX always consist of one initial element (without piston), three to ten middle elements (with piston) and one end element (without piston).
As standard, all elements are delivered without fittings at the distributor inlet and at the outlet. The connection thread at the distributor inlet (initial element) is G 1/2 and at the distributor outlets (middle elements) G 3/8.

Initial element

Order-no.: 4005 97 0000



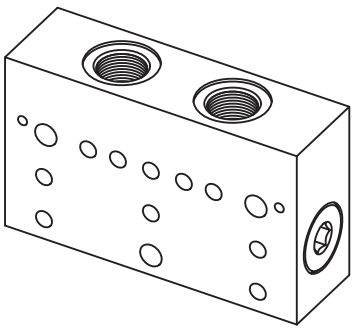
Middle element (metering element)

Middle elements can be delivered with three different metering volumes.

Each middle element has two outlets.

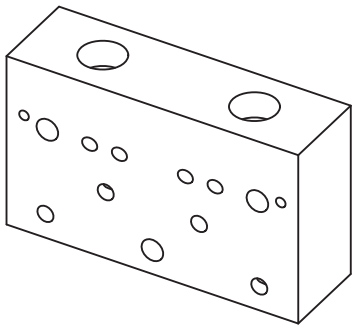
Table of order-no. for middle elements:

Middle element	order-no.
UX 1000	4005981000
UX 1500	4005981500
UX 2000	4005982000



End element

Order-no.: 4005 99 0000



All pipe fittings with a suitable connection thread and a suitable nominal pressure can be screwed into the initial element's distributor inlet as well as the middle elements' distributor outlets (see "Accessory progressive distributor", respectively "Fittings and accessories").

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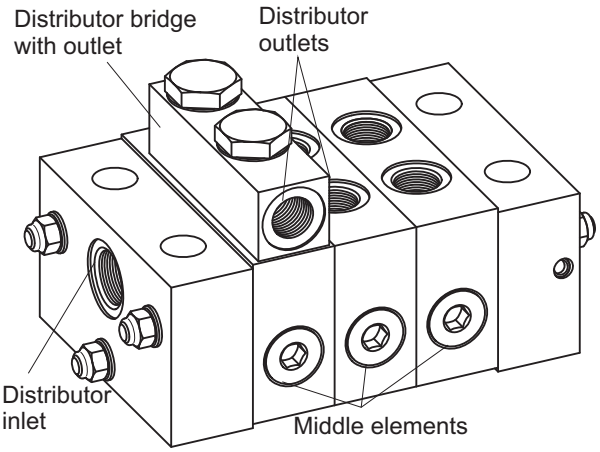
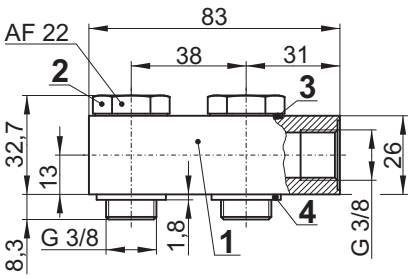
Combination of two outlets at one middle element

For lube points which need more lubricant, it could be necessary to combine two outlets at the progressive distributor.
To this purpose, two outlets of one middle element are connected with a distributor bridge with outlet. The metering volumes of both outlets then come out of the distributor bridge's outlet.



The metering volume is calculated of the combined outlets' metering volume code number.

Distributor bridge with outlet



consisting of:

Pos. 1 1 Bridge strip,
Order-no.: F0414/07-00
Pos. 2 2 Hollow screws without outlet,
Order-no.: 04033331306
Pos. 3 2 Sealing rings A18x24x1,5
Order-no.: 090760301811 (1 piece)
Pos. 4 2 Sealing rings A17x23x2
Order-no.: 090760306611 (1 piece)

Combination of outlets at several middle elements

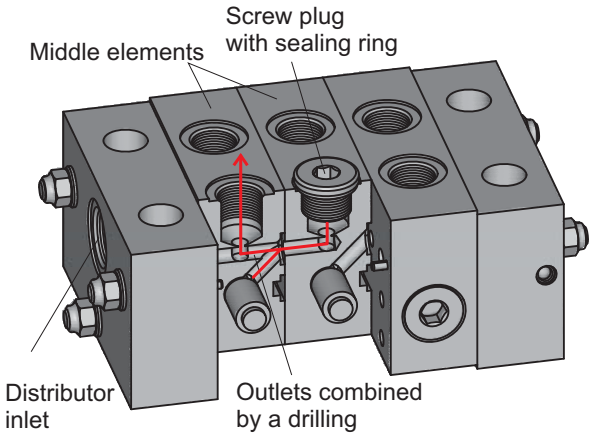
It is not possible to combine the outlets of two neighboring middle elements with a distributor bridge. When necessary, we can drill the outlets in vertical direction. This cannot be changed any more.

Two outlets combined at adjacent middle elements

Of two neighboring middle elements, one outlet each is connected via a connection hole. Only BEKA may drill this hole. One of the two outlets has to be locked with a screw plug and a sealing ring.

For combining the outlets of adjacent middle elements later, the concerned middle element has to be replaced by one with a hole.

The metering volumes of the two connected outlets come out of the open outlet.



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Screw plug and sealing ring for locking outlets

Order-no.:

Screw plug G 3/8:	090090800713
Sealing ring A17x21x1,5:	090760301711

Note: Outlets must not be locked without redirecting the lubricant to another outlet as otherwise the distributor blocks!

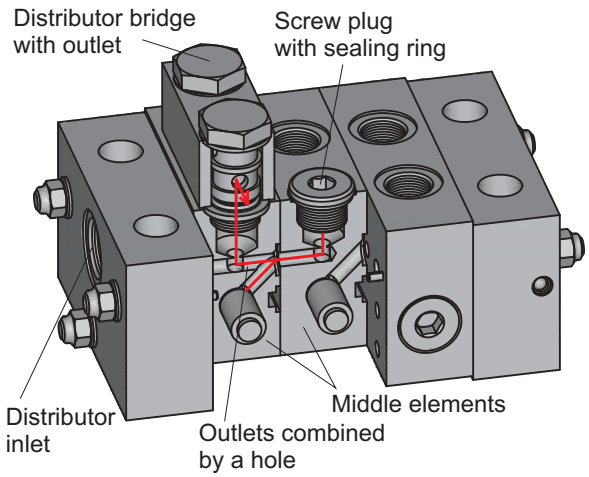
Three outlets combined at adjacent middle elements

Two outlets of a middle element are combined with a distributor bridge with outlet. The adjacent middle element's third outlet is connected with an outlet of the first middle element via a connection hole. Only BEKA may drill the connection hole.

The combined outlet at the adjacent middle element has to be locked by a screw plug and a sealing ring.

For combining the outlets of adjacent middle elements later, the concerned middle element has to be replaced by one with a hole.

The metering volumes of the combined outlets come out of the distributor bridge's outlet.



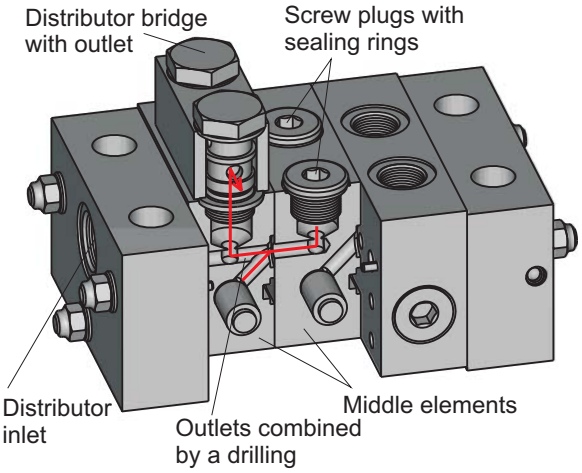
Four outlets combined at adjacent middle elements

Two outlets of a middle element are combined with a distributor bridge with outlet. Both outlets of the neighbored middle element are connected with the outlets of the first middle element via a connection hole.

The combined outlets of the neighbored middle element have to be locked by a screw plug and a sealing ring.

For combining the outlets at neighbored middle elements later, the concerned middle element has to be replaced by one with a hole.

The metering volumes of the four connected outlets come out of the distributor bridge's outlet.



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Elements with proximity switches

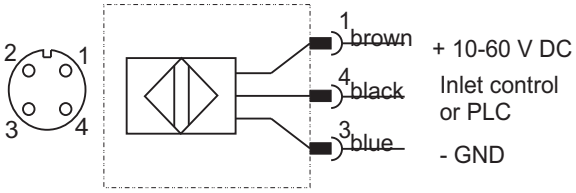
For monitoring the system, for the use of cycle controls or for counting the strokes, proximity switches can be attached to the UX distributor.

Three different types of proximity switches are available (see table). Without further indication, the proximity switch M12x1 is installed on the right side of the last element as standard. An assembly on the left side or of another proximity switch has to be indicated separately.

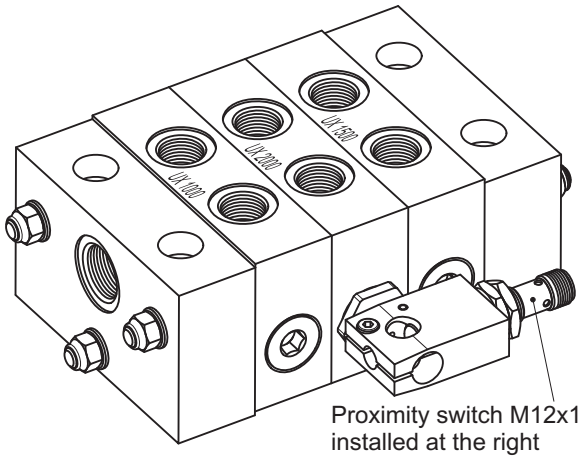
Middle elements with proximity switch have to be indicated when the order is placed, as it is not possible to attach them later.

The only possibility of retrofitting a proximity switch to an existing progressive distributor UX is to replace one middle element.

The proximity switch is delivered without cable, it has to be ordered separately (see “Accessory progressive distributor”).

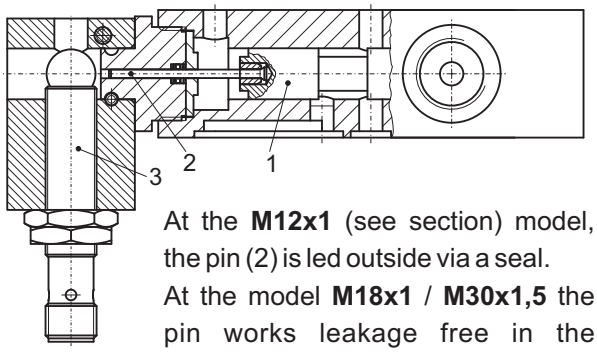


Progressive distributor UX with attached proximity switch:



Functional description:

A pin (2) is fixed at the middle element’s piston (1). This pin approaches the proximity switch (3) with each piston stroke and initiates a signal. This signal can be, depending on the type of control or the individual case, evaluated differently.



At the **M12x1** (see section) model, the pin (2) is led outside via a seal.
At the model **M18x1** / **M30x1,5** the pin works leakage free in the medium.

Table proximity switch:

Size	M12x1 (standard)	M18x1 (special version)	M30x1,5 (special version)
Connection	plugable M12x1		
Switch type	PNP NO		
Current load	200 mA		
Voltage	10 to 60 V DC		
perm. ambient temperature	-40 °C to 85 °C		
Function indication	LED yellow		
Housing material	stainless steel		
Protection class	IP 67 / IP 69K		
Middle elements	UX 1000 to UX 2000		
Order-no. spare part	100091865	1000912586	1000912587

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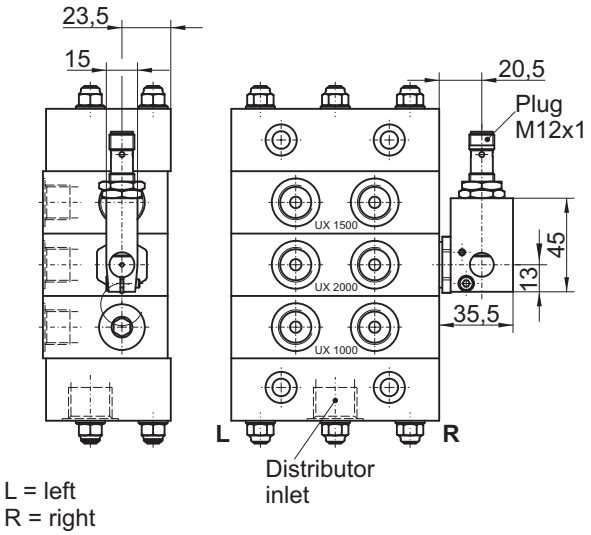
Dimensions for proximity switch **M12x1**:

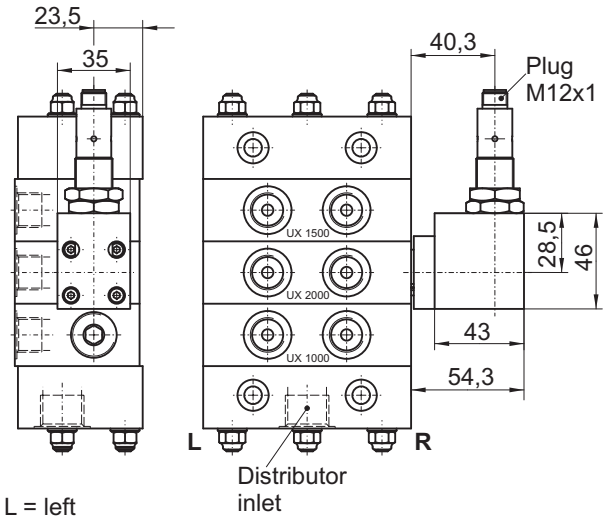


L = left
R = right

Table of order-no. for middle element with proximity switch M12x1 (standard):

Middle element with NS M12x1	Pos.	Order-no.
UX 1000 N12/24 R	right	4005981003
UX 1000 N12/24 L	left	4005981004
UX 1500 N12/24 R	right	4005981503
UX 1500 N12/24 L	left	4005981504
UX 2000 N12/24 R	right	4005982003
UX 2000 N12/24 L	left	4005982004

Installation dimensions for a proximity switch **M18x1**:

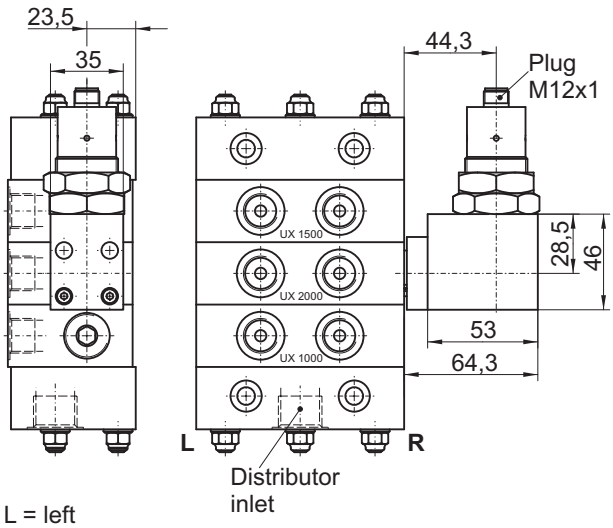


L = left
R = right

Table of order-no. for middle element with proximity switch M18x1 (special model):

Middle element with NS M18x1	Pos.	Order-no.
UX 1000 N18/24 R	right	4005981005
UX 1000 N18/24 L	left	4005981007
UX 1500 N18/24 R	right	4005981505
UX 1500 N18/24 L	left	4005981507
UX 2000 N18/24 R	right	4005982005
UX 2000 N18/24 L	left	4005982007

Installation dimensions for a proximity switch **M30x1,5:**



L = left
R = right

Table of order-no. for a metering element with proximity switch M30x1,5 (special model):

Middle element with NS M30x1,5	Pos.	Order-no.
UX 1000 N30/24 R	right	4005981008
UX 1000 N30/24 L	left	4005981009
UX 1500 N30/24 R	right	4005981508
UX 1500 N30/24 L	left	4005981509
UX 2000 N30/24 R	right	4005982008
UX 2000 N30/24 L	left	4005982009

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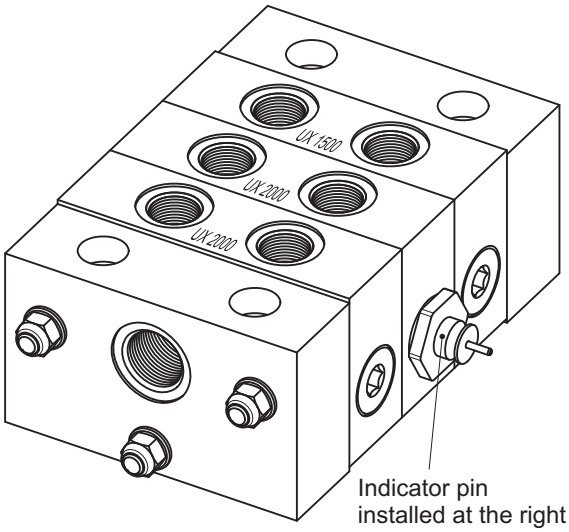
Elements with indicator pin

The progressive distributors UX can also be equipped with an indicator pin.

The indicator pin cannot be attached later. Retrofitting an indicator pin is only possible by replacing a middle element.

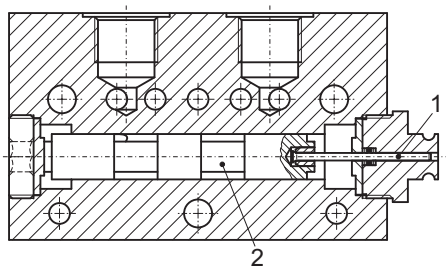
Generally the attachment of an indicator pin is possible at all middle elements and has to be indicated when the order is placed.

The indicator pin is installed on the right side as standard. An assembly on the left side has to be indicated separately.



Functional description:

At the indicator pin, the pin (1) is directly connected to the piston (2) of the progressive distributor. With every stroke, the pin (1) is compulsory pushed out or drawn back.



Dimensions

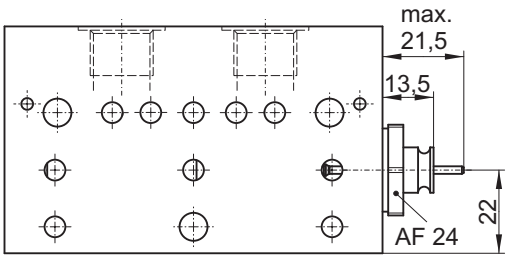


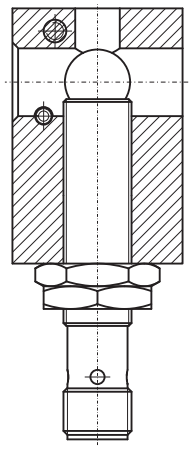
Table of order-no. for a middle element with indicator pin:

Middle element with indicator pin	Order-no.
UX 1000 HS	4005981001*
UX 1500 HS	4005981501*
UX 2000 HS	4005982001*

** Please indicate the installation position of the indicator pin: right (standard) or left*

It is also possible to assemble a proximity switch M12x1 to an indicator pin later.

Order-no. for a proximity switch with housing for a later installation: 4005 96 0001



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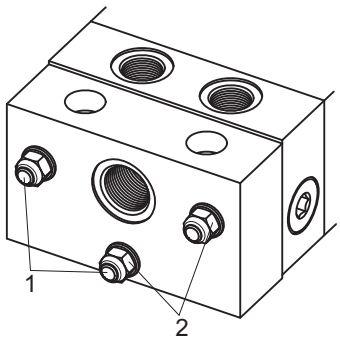
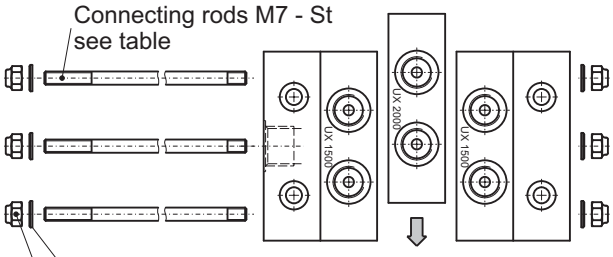
Extension or shortening of distributors

Progressive distributors UX can any time be adapted to the application conditions because of their disk construction. When new lubrication points should be added or some become unnecessary, the distributor can be extended or shortened by the installation or removal of middle elements.

Description:

- Screw off the nuts (2) at both ends of the connecting rods (1) and take out the connecting rods
- Separate the distributor at the desired point
- Add the new middle elements or remove the unnecessary ones
- Screw the distributor together with the corresponding connecting rods and nuts (see table)





Washer DIN 125 - B 7,4 - St
Order-no.: 0900125002132 (1 pcs)

Sicherheits-Sechskantmutter
DIN 982 - M7- St
Order-no.: 090098200113 (1 pcs)

Note: **Please pay attention to utmost cleanness when working at the distributor**

Note: A UX distributor always has to consist of at least 3 middle elements and 10 middle elements as a maximum.

Should one of the O-rings, which are used for sealing the distributor between the individual middle elements, be damaged and does not seal any more, a set of seals can be ordered, containing all O-rings used in an UX distributor.

Set of seals for middle element:
Order-no.: 4005D0002
Set of seals for initial elements:
Order-no.: 4005D0003

Table of connecting rods (1 piece):

Distributor	Conn. rod	Order-no.
UX 3/6	M7 x 172	0802000442
UX 4/8	M7 x 202	0802000443
UX 5/10	M7 x 232	0802000444
UX 6/12	M7 x 262	0802000445
UX 7/14	M7 x 292	0802000446
UX 8/16	M7 x 322	0802000447
UX 9/18	M7 x 352	0802000448
UX 10/20	M7 x 382	0802000449

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Order-key

Distributor inlet

The progressive distributor UX can be delivered with or without fittings. Should the fittings be delivered already installed into the distributor, they have to be marked with the diameter and the series (see table):

Inlet	Designation
G1/2	without fitting
GE08L	male stud coupling pipe-Ø 8, 10, 12 or 15, series L
GE10L	
GE12L	
GE15L	

The fittings can also be ordered separately (see “Accessory progressive distributor” or “Fittings and accessories”).

When there is no indication concerning the fittings, delivery is without fitting as standard!

Distributor outlet

The fitting type at the distributor outlets has to be indicated with the diameter and the series, when the order is placed (see table):

Outlets	Designation
G3/8	without fitting
GE06L	male stud coupling, pipe-Ø 6, 8, 10 or 12, series L
GE08L	
GE10L	
GE12L	
WS12L	elbow swivelling screw fitting, pipe-Ø 10 oder 12, series L or S
WS10S	
RGE06L	non-return valve, pipe-Ø 6, 8, 10 or 12, series L
RGE08L	
RGE10L	
RGE12L	

Note:
Without an indication of the series, a straight fitting, respectively a non-return valve of the series L (cutting ring) are delivered as standard.

Metering volume

The metering code numbers **1000** to **2000** (see table “Technical description”) of the metering elements have to be indicated for each side of the distributor inlet in the direction in which the lubricant comes out and have to be separated with a **slash** (/). The outlets’ union in vertical direction has to be indicated with a **plus** (+) instead of the slash.

The metering code numbers of combined outlets accumulate (see “Combination of outlets”).

Screw plugs and outlets that are closed with distributor bridges are marked with a **line** (--).

Proximity switch

Three different types of proximity switches are available:

NS	Designation
N12/24	proximity switch M12x1 (standard)
N18/24	proximity switch M18x1
N30/24	proximity switch M30x1,5

For other proximity switches, the thread diameter of the proximity switch has to be indicated after the code letter N and then after the slash (/), the proximity switch’s voltage.

The installation position has to be indicated after the metering code number of the metering element, to which the proximity switch shall be attached, with **NS** on the left or on the right side as requested.
R = right
L = left

When no installation position is indicated, the proximity switch is assembled on the right side of the last element as standard.

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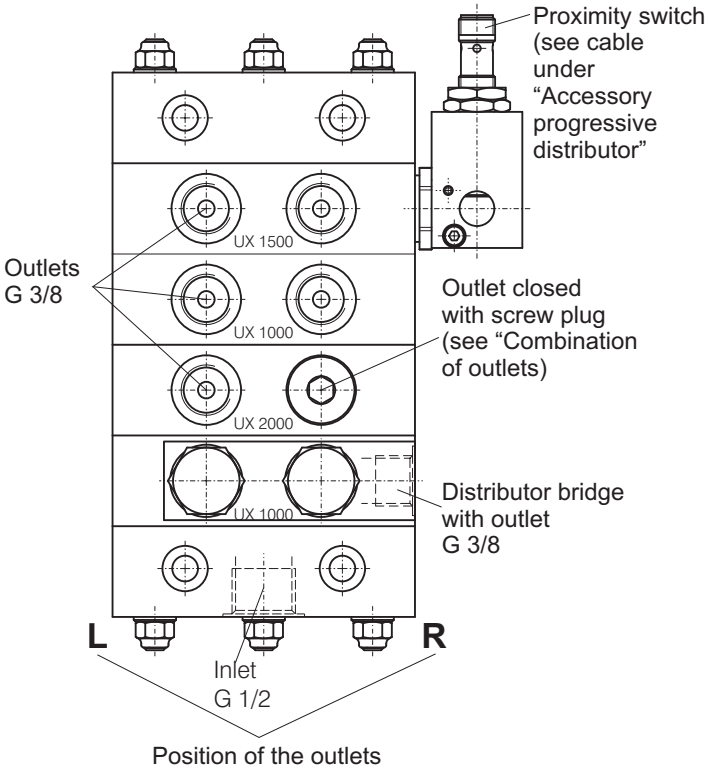
Order example



Type	UX 04 / 06 -	G1/2 / G3/8	N12/24						
No. of middle elements				R	4000 +	---	/ 1000 / 1500	NS	
No. of outlets				L	---	/ 2000 / 1000 / 1500			
Inlet fitting									
Outlet fitting									
Thread diameter of proximity switch									
Voltage									
Connection position									
Metering code no. of outlets									

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