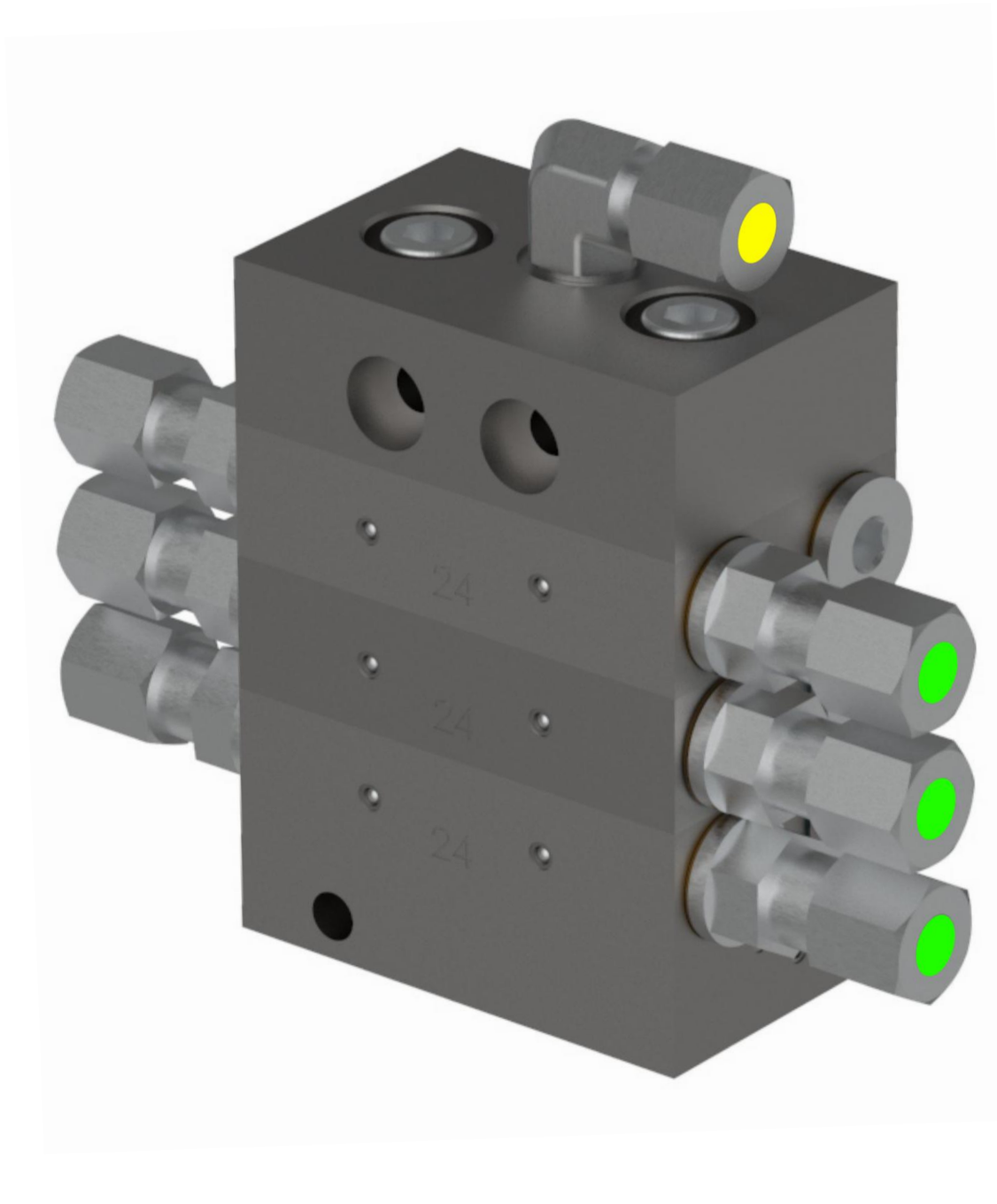
PRODUCT MANUAL

Progressive Lubrication Divider

JPQ1
JPQ1_FKM



AUTOL

Index

Legal disclosure

Manufacturer

Zhengzhou Autol Technology CO.,LTD.,
Add: Hehuan Rd, 96, Zhengzhou High-Tech Zone, China
E-Mail: info@autol.net
Website: www.autolgroup.com

Training courses

In order to provide a maximum of safety and economic viability, Autol Technology carries out detailed training courses. It is recommended that the training courses are attended. For more information, please contact Autol Technology.

Copyright

Warranty and extent of warranty

Inappropriate intervention will rule out your warranty claim!

Warranty regarding operational safety, reliability and performance of the lubricating divider is only accepted by the manufacturer under the following conditions:

- Assembly, connection, setting, maintenance and repair are carried out by authorized and specialized staff.
- The limits stipulated in the technical data must never be exceeded.
- Only original components or components approved by the manufacturer may be used for repair and maintenance work.

All guarantees and warranties expire for damages to central lubrication systems that are caused by operation with improper lubricants (e.g., piston wear, piston jamming, plugins, embrittled sealings).

Autol Technology does not assume liability on damages caused by lubricants, even if these lubricants have been tested and released by laboratory tests, as damages caused by lubricants (e.g., by expired or improper stored lubricants, batch variations etc.) can not be retraced to their root cause in retrospect.

Service address

Hehuan Rd, 96, Zhengzhou High-Tech Zone, China
Tel.: +86 400 6836 862

Disclaimer

The manufacturer shall not be held responsible for damages caused by:

- Non appropriate use faulty assembly, operation, setting, maintenance, repair or accidents
- Use of inappropriate lubricants
- Improper or late response to malfunctions
- Unauthorized modifications of the product
- Intent or negligence
- Use of non-original Autol Technology spare parts
- Faulty planning or layout of the centralized lubrication system

Liability for loss or damage resulting from the use of our products is limited to the maximum purchase price. Liability for consequential damages of whatever kind is excluded.

Safety instructions

General information

Any safety-related faults must be eliminated without delay.

Below, please find fundamental instructions to be complied with, regarding assembly, operation and maintenance. The mechanical and the competent specialists / staff of the operating company must read the Operating Instructions on all accounts prior to starting assembly and commissioning. Moreover, the Operating Instructions must permanently be available on site.

Not only the safety instructions included under this item, but also the specific safety instructions appearing in other parts of this manual must be complied with.

General risk information

All system components have been designed with operational safety and accident prevention in mind, in accordance with the applicable regulations for the design of technical work equipment.

It should be noted, however, that the use of these systems may present certain risks to the user of third parties, as well as to the technical equipment itself. Therefore, it is of the utmost importance that the system is only used for its intended purpose and in compliance with the relevant safety regulations and operating instructions

Explanation of symbols

Safety instructions which, if not complied with, may endanger persons, are marked specifically with the general hazard symbol:

This heading is used if inaccurate compliance or non-compliance with the Operating Instructions or specified work procedures etc. may result in damage

Points out Special Information

Delivery, Returns and Storage

Delivery

After receipt of the shipment, check the shipment for damage and completeness according to the shipping documents. Immediately report any transport damages to the forwarding agent. Keep the packaging material until any discrepancies are resolved. During in-house transport ensure safe handling.

Returns

Clean all parts and pack them properly (i.e., following the regulations of the recipient country) before returning them. Protect the product against mechanical influences such as impacts. There are no restrictions for land, sea or air transport.

Storage

Autol Technology products are subject to the following storage conditions:

dry, dust- and vibration-free in closed premises
no corrosive, aggressive materials at the place of storage (e. g. UV rays, ozone)
protected against pests and animals (insects, rodents, etc.)
possibly in the original product packaging
shielded from nearby sources of heat and coldness
in case of high temperature fluctuations or high humidity take adequate measures (e. g. heater) to prevent the formation of condensation water

Storage conditions for parts filled with lubricant

The conditions mentioned in the following will have to be adhered to when storing products filled with lubricant,

Storage period of up to 6 months

The filled products can be used without having to take further measures.

Step for Storage period from 6 to 18 months

Remove all connection lines and closure screws
Connect the pump which has been filled with new lubrication grease suitable for the application purpose to the divider
Let the pump run until new lubricant leaks from the divider
Remove leaked lubricant
Reinstall closure screws and connection lines

Commissioning

Connect the pump properly to the designated connections. Check the device for functionality and the presence of safety features.

Ensure that all warning labels are present, undamaged, and clearly visible. If this not the case, they must be replaced immediately.

Deviating from Intended Use is strictly Prohibited

Please adhere to the technical specifications provided in the manual and do not exceed the specified limits.

Improper use is strictly prohibited. Only use lubricants intended for this purpose. Make sure to use the product exclusively within its designated area of use.

Accompanying Documents

In addition to this manual, the following documents must be considered by the respective target audience:

1) Operational instructions and release regulations

If applicable:

2) Safety data sheet for the lubricant used
3) Project documentation
4) Supplementary information regarding special configurations of the pump. These can be found in the specific system documentation.
5) Instructions for additional components for the assembly of the central lubrication system.

Lubricant

The system has been designed for commercially available multi-purpose greases of NLGI class 2 for operation in summer and winter.

- Use greases with high-pressure additives (EP greases).
- Only use greases of the same saponification type.
- Lubricants containing solid contents must not be used (lubricants like graphite or MoS2 on request).
- Observe the vehicle manufacturer’s specifications, when you select the lubricant.

Hazards to environment cause by lubricants

The lubricants which are recommended by the manufacturer of your vehicle, system or machine correspond in their composition to the common safety regulations. Mineral oils and greases are generally hazardous to ground water and their storage, processing and transport requires special precautions.

Inadmissible methods of operation

Operational security of the plant is only guaranteed if it is operated in accordance with the operating instructions. The limit values stated in the technical data must not be exceeded under any circumstances.

Transport and storage of the divider

The dividers of the series JPQ1 are packed commercially, according to the regulations of the recipient country and to the wish of the customer. There are no limitations with respect to land, air or sea transport. Store in a dry place at a temperature of -5° C to +35° C.

Overview

The progressive piston dividers are divider devices with a hydraulic sequence control, the pistons of which are regulated by the supplied lubricant in a way that the lubricant inevitably and successively escapes at the individual outlets. In the case of malfunction during the flow of lubricant, e.g. plugging of lubricating line or lubricating points, the divider will block up.

The divider sensor are used for the monitoring of the distributors. In the case of manually operated pumps a virtually insurmountable counter pressure occurs during the blockage. In the case of automatic pumps such as, the electrical pump ALP81 or ALPB the lubricant escapes at the safety valve.

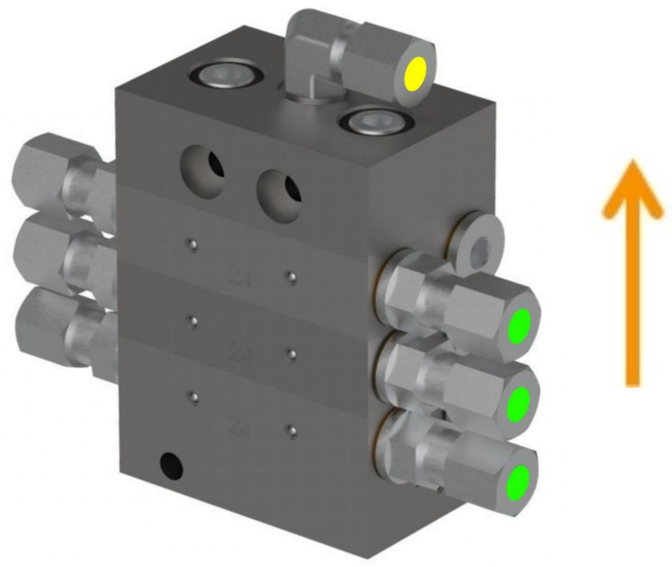
The progressive JPQ1 dividers are manufactured in a variable chip-type structure, which offers the advantage that the divider can be extended or shortened at random according to the amount of lubrication points. Due to this chip-type structure, there is also the possibility of constructing an overall progressive divider from individual distributor disks with different outputs per piston stroke.

The difference in output per piston stroke is created by different piston diameters. To get the correct functioning of a progressive divider a minimum of three pistons, i.e., a minimum of three output elements is a must.

Technical data:

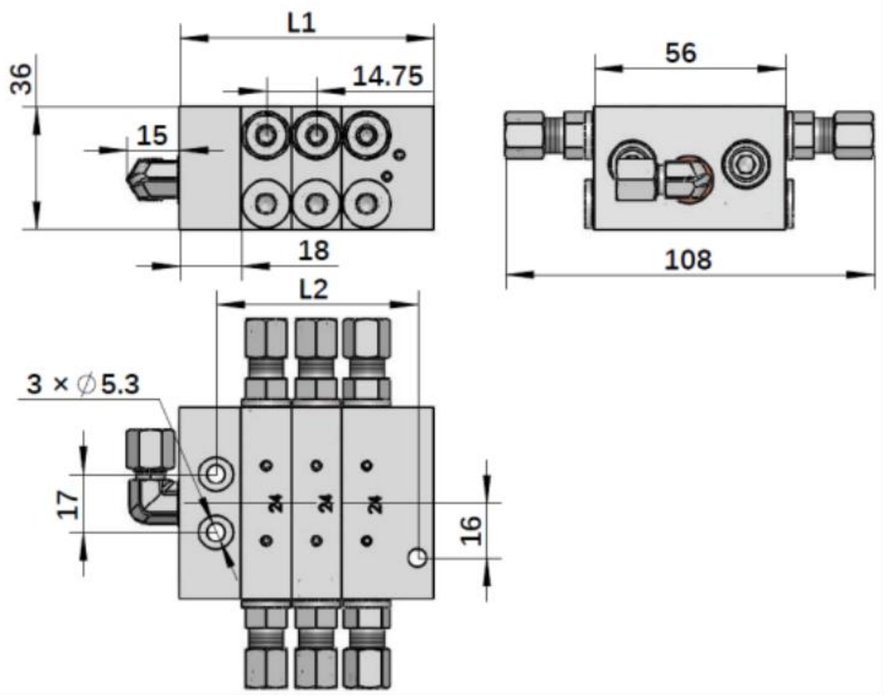
Operating pressure - Inlet: max. 300 bar
Temperature range: -35° C to +70° C
Carrier vehicle: Oil - viscous oil - grease
In- / Outlet Thread: M10x1

Number of elements:
Min.: JPQ1 3/6 (3 output elements)
Max.: JPQ1 12/24 (12 output elements)



Attention： *By installing the dividers, please make sure that the divider can always be mounted vertically like the arrow direction above.*

Element	Delivery Quantity (mm³/Stroke) Per outlet	Per element	Piston Dia. mm
ME 08	80	160	4.0
ME 16	160	320	5.7
ME 24	240	480	7.0
ME 32	320	640	8.0
EE 08	80	160	4.0
EE 16	160	320	5.7
EE 24	240	480	7.0
EE 32	320	640	8.0

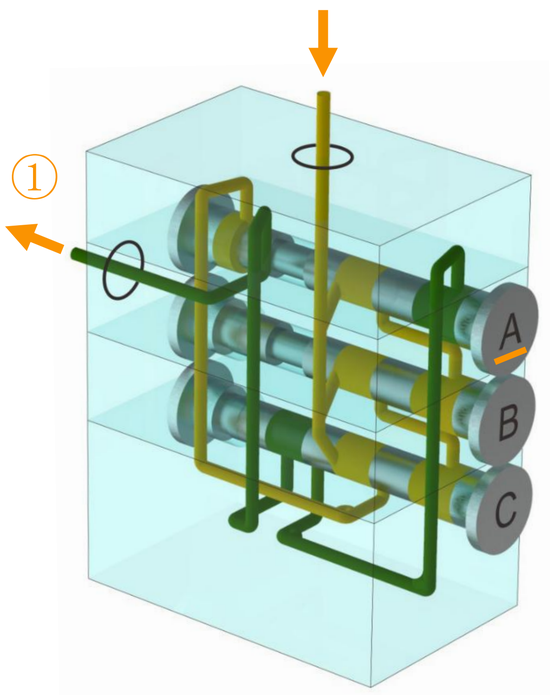


Outlets	6	8	10	12	14	16	18	20	22	24
L1 (mm)	74.5	89.3	104.0	118.8	133.5	148.3	163.5	178.7	193.9	209.1
L2 (mm)	59.0	73.8	88.5	103.3	118.0	132.8	147.6	162.4	177.2	192

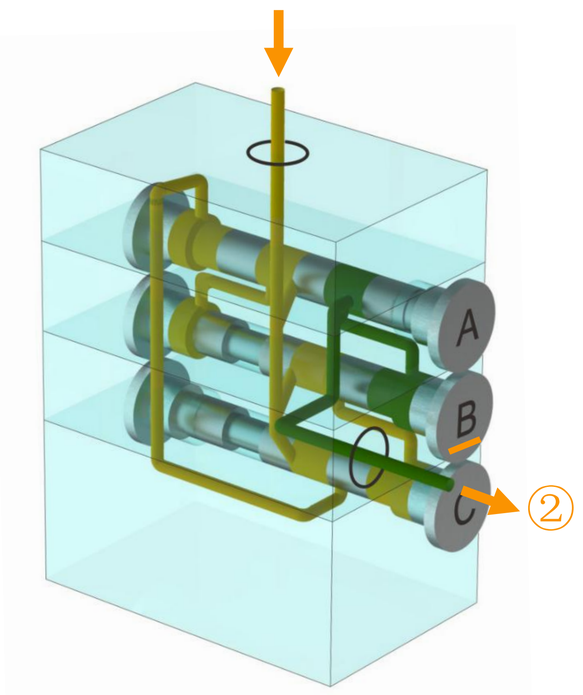
Working Principle

The progressive divider consist of the individual components start element SE (without piston), 2-7 mid element ME and end element EE, all of which are assembled in distributor blocks using tension rods (hexagon socket screws) with lock washers. The individual elements are sealed with O-rings between each other.

The lubricant flows via the inlet of the distributor through all distributor disks to the piston A. The piston (A) is shifted to the left and the lubricant is pressed from the left pressure range of the delivery piston to the outlet ① (*Dia. 9.1*).



Dia. 9.1 Step A

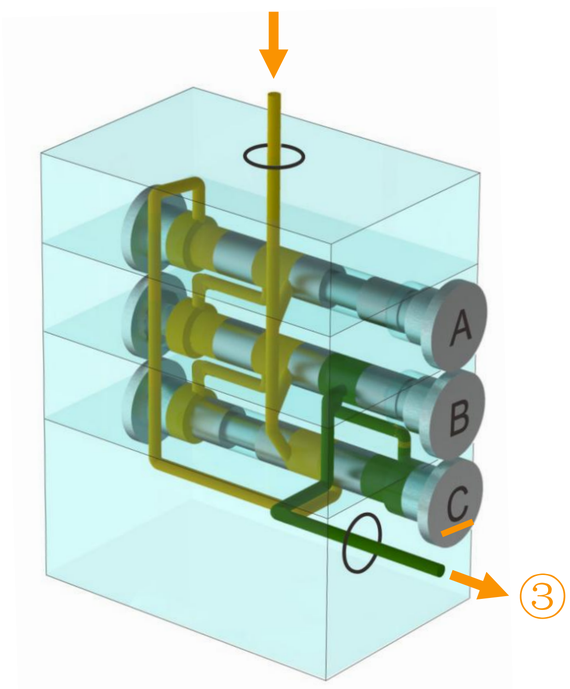


Dia. 9.2 Step B

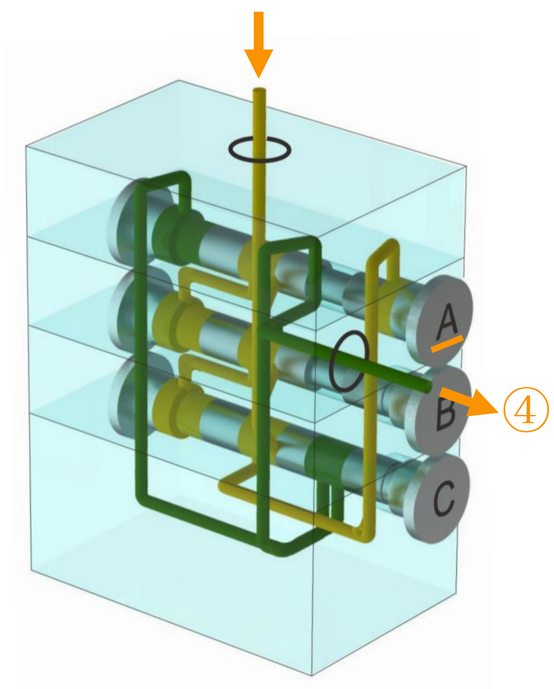
After that, the proportioning pistons B and C are progressively shifted and the lubricant is primed to the outlets ② (*Dia. 9.2*) and ③ (*Dia. 9.3*).

After the piston C has been shifted, the lubricant is directed to the left side of the delivery pi ston A (*Dia. 9.4*) and primed from the right pressure range of the delivery piston to the outlet ④.

Subsequently, the delivery pistons B and C are shifted and lubricant is pressed to the outlets ⑤ (*Dia. 9.5*) and ⑥ (*Dia. 9.6*).

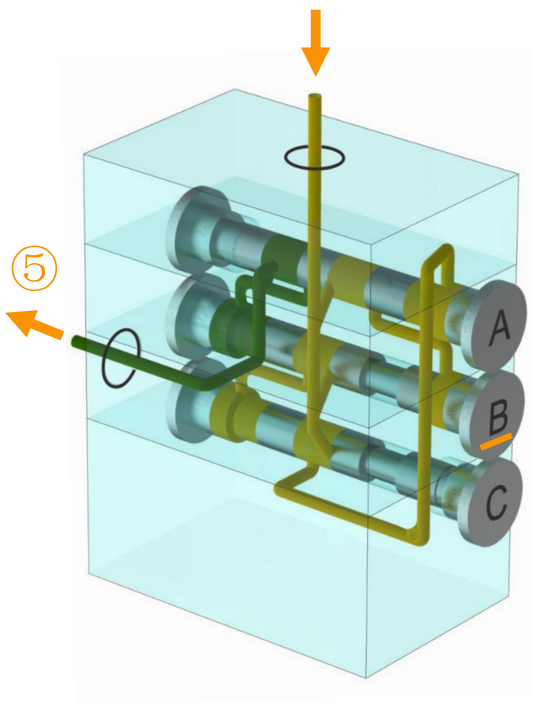


Dia. 9.3 Step C

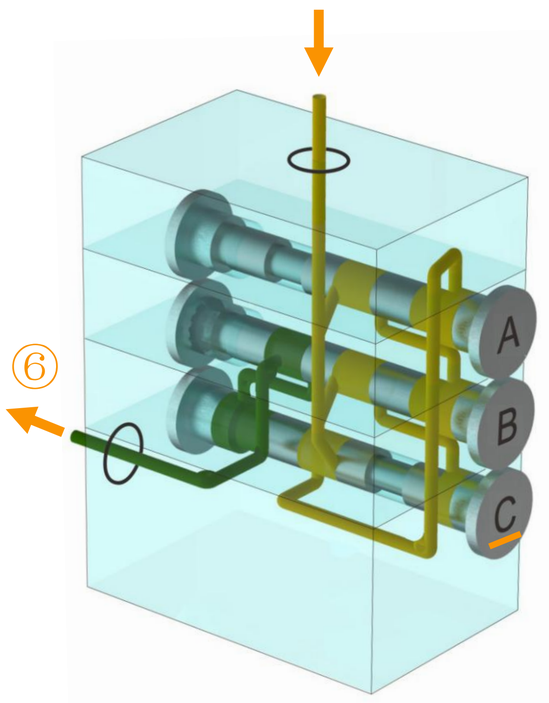


Dia. 9.4 Step D

After the delivery piston has been shifted, the lubricant is once more directed to the right side of the delivery piston (*Dia. 9.1*) and a new cycle of the progressive divider is initiated. The described function is repeated as long as lubricant is fed to the progressive divider.



Dia. 9.5 Step E



Dia. 9.6 Step F

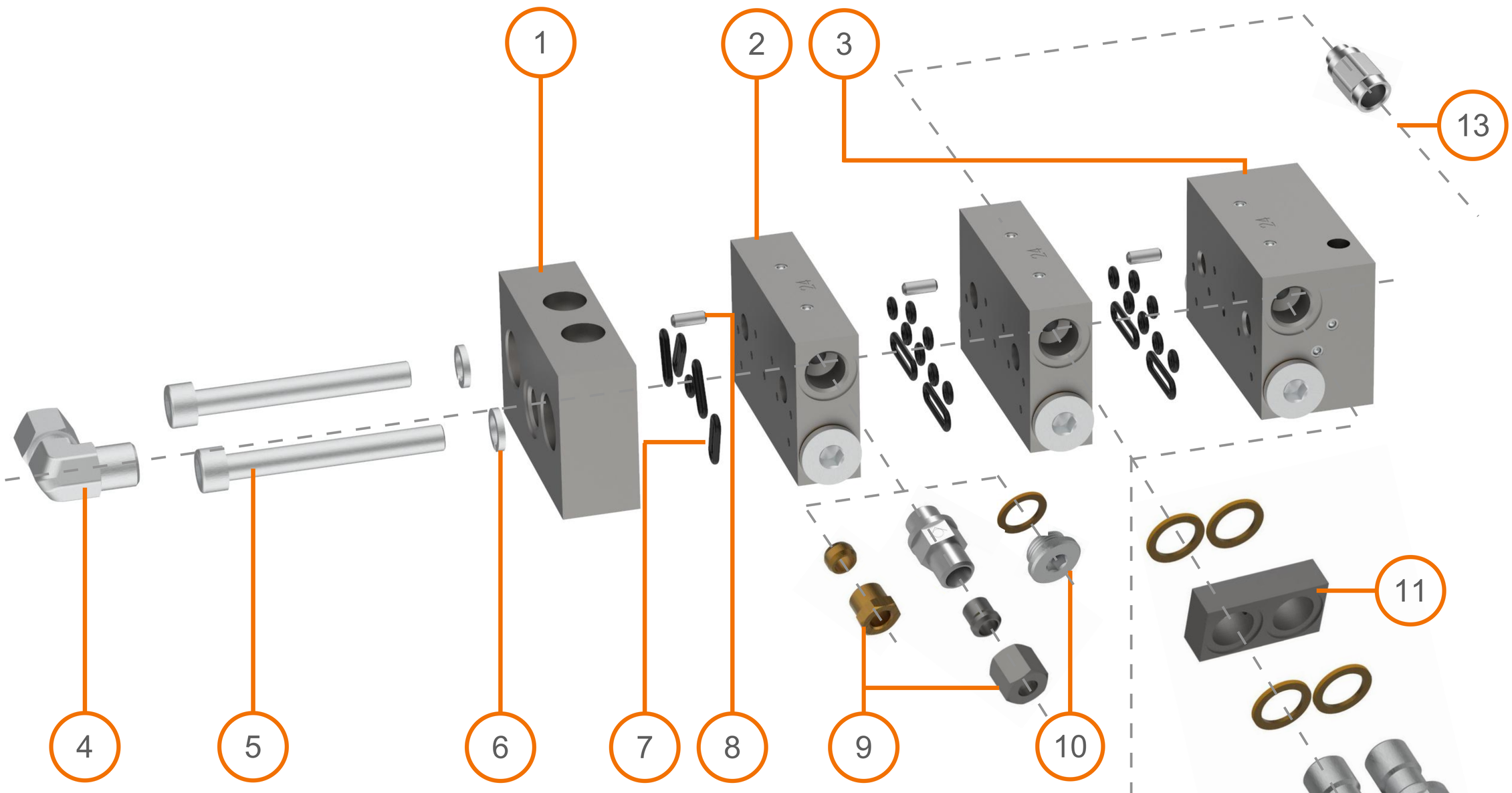
Assembly and Components

The divider is made of a series of at least 4 elements:

1x start element,
2x middle elements,
1x end element.

Always start with the largest delivery quantity of the distributor chip behind the start element!

With components e.g., bridge with outlet or blind plug, the divider can be built with multiple configurations to match the grease requests of the greasing points.



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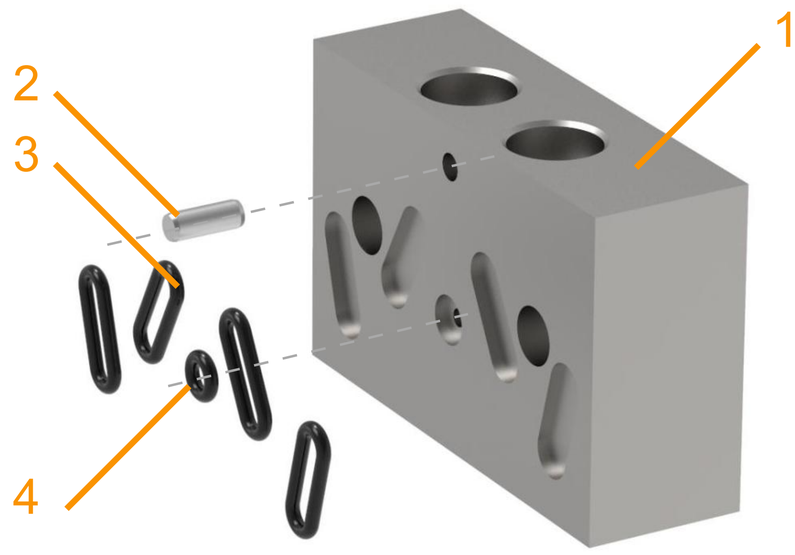
Dia. 10.1 Divider Components

Start Element (SE)

Start element is the element without outlets (*Dia. 11.1*).
Every divider must have a start element.

Description		Part No.
SE		2111000087
Spare Parts	Qty. per Set	
OR M 7.5x1.5mm	4	3021000239
OR S 2.5x1.5mm	1	3024000240
CP	1	3014000096



1- Start Element Body
2- (CP) Connection Pin
3- (OR) O Ring M 7.5x1.5mm
4- (OR) O Ring S 2.5x1.5mm

Dia. 11.1 (SE) Start Element

Inlet Screw Couplings

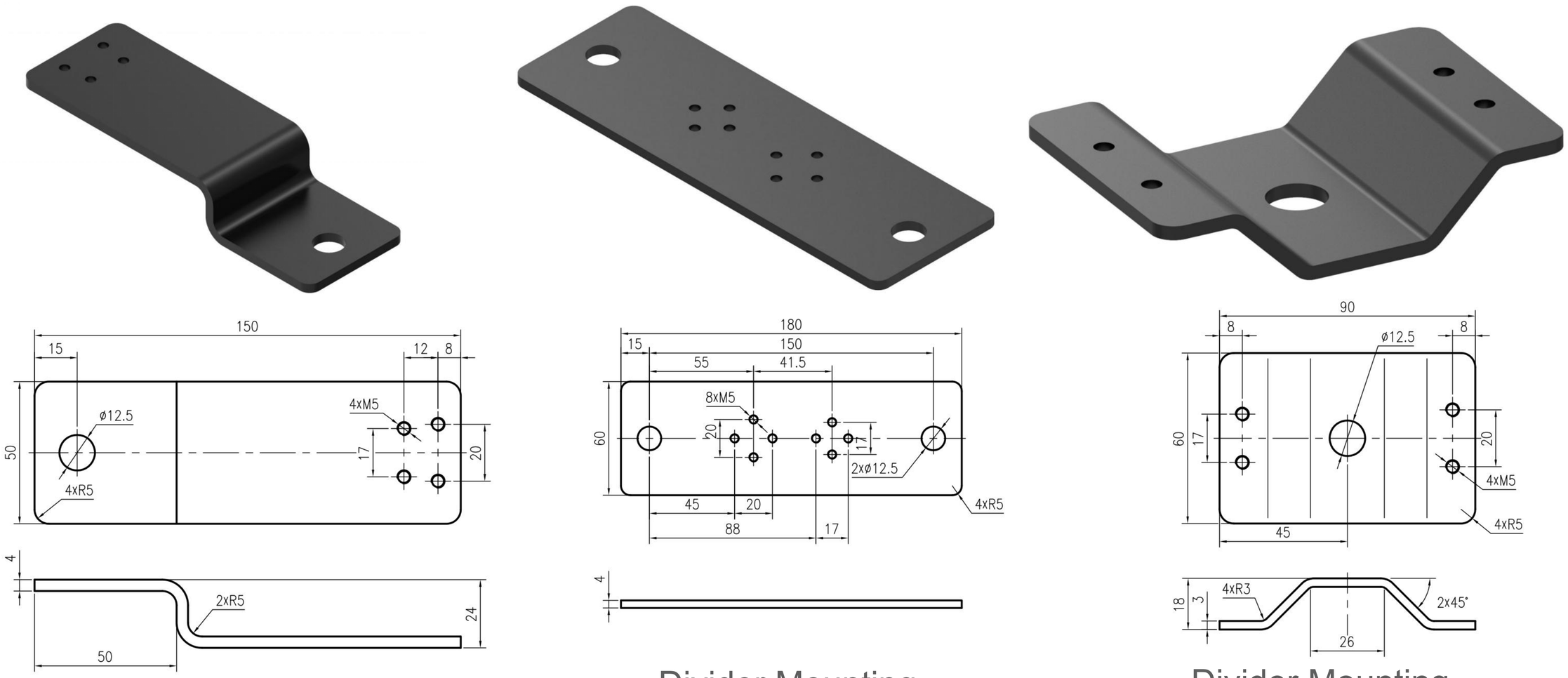
The JPQ1 progressive divider can be used as either a main divider or a secondary divider.

When used as a main divider, the pump and main divider are connected by a high-pressure hose and hose studs with outer diameter 6mm or 8mm. When used as a secondary divider, the main divider and secondary dividers are normally connected by a high-pressure hose and hose studs with outer diameter 6mm.

All screw couplings with M10x1k threads can be directly used for the inlet connection of the JPQ1 divider. All screw couplings with M10x1 threads can be used together with a copper ring (or ED sealed) for the input connection.

Divider Mounting Bracket

For fixing the dividers in palce we offer 3 options of fixing brackets:



Divider Mounting Bracket A
3011001269

Divider Mounting Bracket B
3011001268

Divider Mounting Bracket C
3011001267

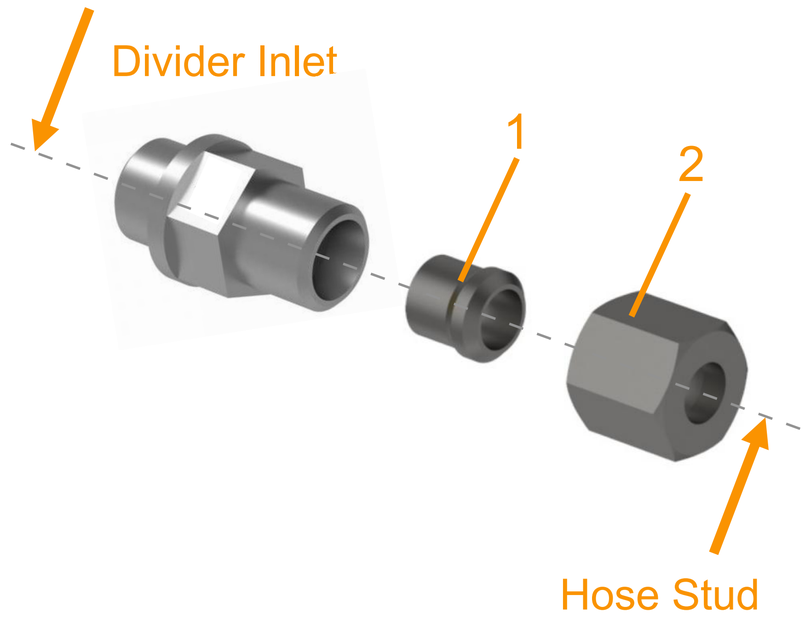
Dia. 11.2 Fixing Brackets

Inlet Screw Couplings

Straight Inlet Screw Couplings (*Dia. 12.1*)

Description		Part No.
GE-ZN M10KD6*		3012002895
GE-ZN M10KD10*		3012002936
GE-ZN M10D6 (ED sealed)		3012002826
GE-ZN M10D10 (ED sealed)		3012003039
Spare Parts 1 – Cutting Ring for Cap Nut		
SR-ZN D6		3014000727
SR-ZN D10		3014000787
Spare Parts 2 – Cap Nut		
U-ZN D6		3014000729
U-ZN D10		3014000704

**** Part with "*" is standard part in our JPQ1 order key.***



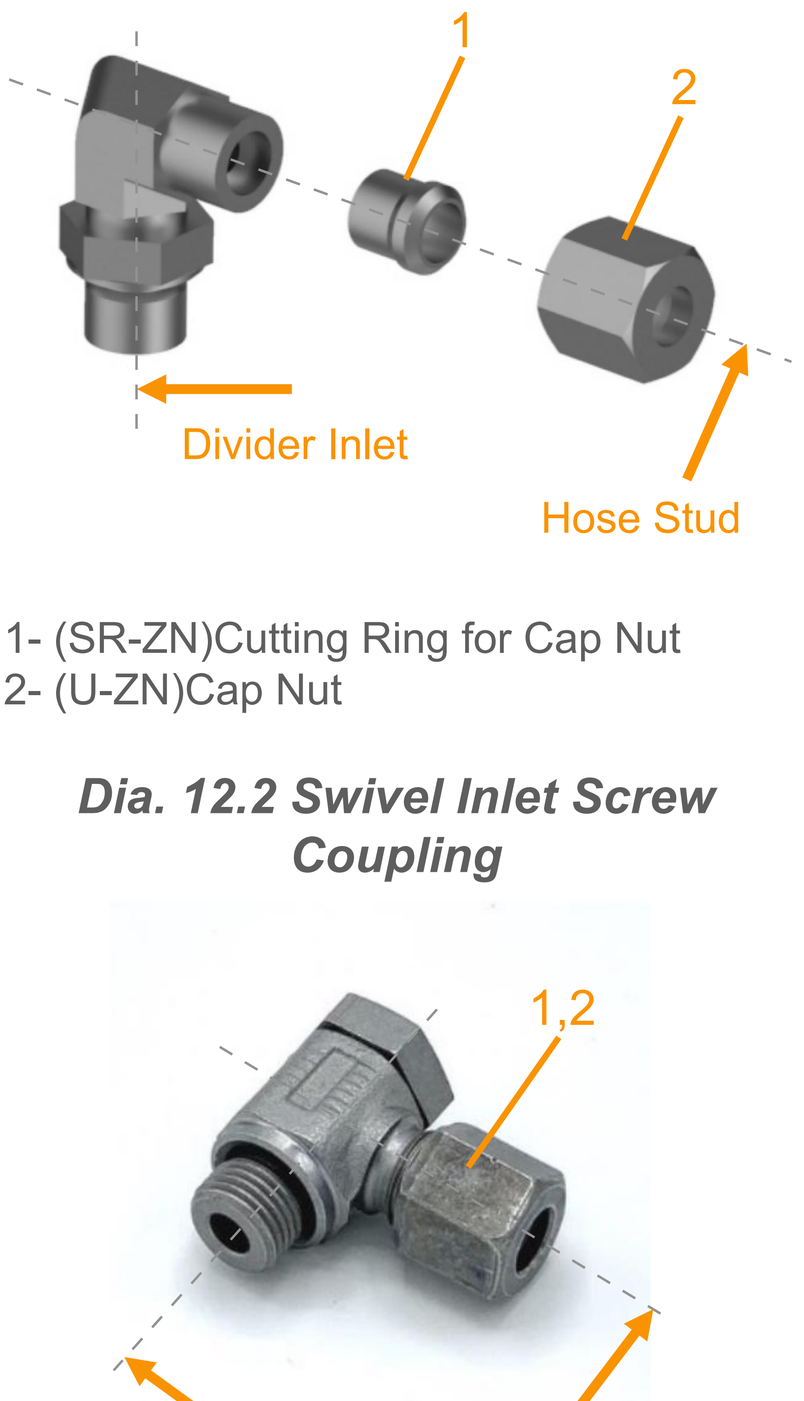
1- (SR-ZN)Cutting Ring for Cap Nut
2- (U-ZN)Cap Nut

Dia. 12.1 Straight Inlet Screw Coupling

Swivel Inlet Screw Couplings (*Dia. 12.2* and *Dia. 12.3*)

Description		Part No.
WSA-ZN M10D6 (ED sealed)		3012002813
WS-ZN M10D6 (ED sealed)		3014000706
WS-ZN M10D10 (ED sealed)		3014000705
Spare Parts 1 – Cutting Ring for Cap Nut		
SR-ZN D6		3014000727
SR-ZN D8		3014000787
Spare Parts 2 – Cap Nut		
U-ZN D6		3014000729
U-ZN D8		3014000704

**** Part with "*" is standard part in our JPQ1 order key.***



1- (SR-ZN)Cutting Ring for Cap Nut
2- (U-ZN)Cap Nut

Dia. 12.2 Swivel Inlet Screw Coupling

1- (SR-ZN)Cutting Ring for Cap Nut
2- (U-ZN)Cap Nut

Dia. 12.3 Swivel Inlet Screw Coupling

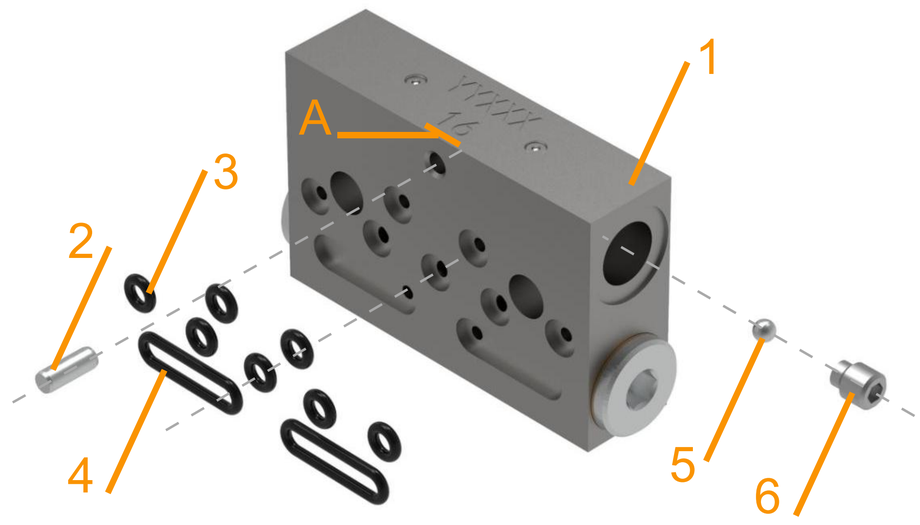
Middle Element (ME)

The middle element of JPQ1 divider has multiple output flow rates.

On the front side of the JPQ1 ME, the **Sign A** as in *Dia. 13.1* shows the flow rate for the single element:
08 = 80 mm^3 per outlet/stroke
16 or 16S = 160 mm^3 per outlet/stroke
24 or 24S = 240 mm^3 per outlet/stroke
32 or 32S = 320 mm^3 per outlet/stroke

The middle elements with **Sign A** 16S, 24S and 32S in *Dia. 13.2* have the possibility to be installed with a divider monitoring sensor (proximity switch) on both sides of the element. The divider monitoring sensor kit and cable must be ordered separately (Page 22)*.

**** More details for divider monitoring sensor please check in the following pages.***



1- Middle Element Body
2- (CP) Connection Pin
3- (OR) O Ring S 2.5x1.5mm
4- (OR) O Ring L11.5x1.5mm
5- Sealing Steel Ball D3
6- Sealing Screw M4

Dia. 13.1 (ME) Middle Element

Description*	Possibility to be installed with a divider monitoring sensor *	With in- and outlets connectors	Part No.
ME 08	No	No	2111000083
ME 16	No	No	2111000084
ME 24	No	No	2111000085
ME 32	No	No	2111000086
ME 16S	Yes	No	2111000219
ME 24S	Yes	No	2111000220
ME 32S	Yes	No	2111000221

**** For all middle elements Part No. in the above table include connecting pin, o rings, internal sealing screw set. For all middle elements with „S“ include a magnet pin for divider monitoring.***

Spare Parts - ME	Qty. per Set	Part No.
CP	1	3014000096
OR S 2.5x1.5mm	7	3024000240
OR L 11.5x1.5mm	2	3024000234
Sealing Screw M4*	1	3014000320
Sealing Steel Ball D3*	1	3014000616

**** The sealing screw and steel ball can only be taken out from the right-side outlet of the elements (Dia. 13.1). For more details of the function of sealing screw set please check page 19-21.***

Dia. 13.2 (ME) Middle Element XXS with Sensor

**** Please notice: ME XXS is without divider monitoring sensor. The divider monitoring sensor need be ordered separately.***

End Element (EE)

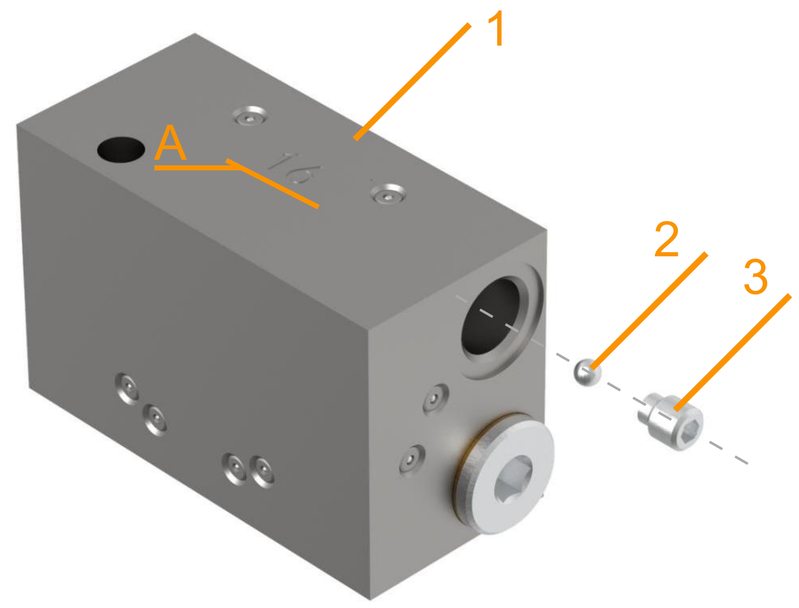
The end element of JPQ1 divider has multiple output flow rates. Every divider must have a end element.

On the front side of the JPQ1 EE, the **Sign A** as in *Dia. 14.1* shows the flow rate for the single element:

08 = 80 mm^3 per outlet/stroke
16 or 16S = 160 mm^3 per outlet/stroke
24 or 24S = 240 mm^3 per outlet/stroke
32 or 32S = 320 mm^3 per outlet/stroke

The end elements with **Sign A** 16S, 24S and 32S in *Dia. 14.2* have the possibility to be installed with a divider monitoring sensor (proximity switch) on both sides of the element. The divider monitoring sensor kit and cable must be ordered separately (Page 22 & 23).

**** More details for divider monitoring sensor, please check in the following pages.***



1- End Element Body
2- Sealing Steel Ball D3
3- Sealing Screw M4

Dia. 14.1 (EE) End Element

Description*	Possibility to be installed with a divider monitoring sensor *	With in- and outlets connectors	Part No.
EE 08	No	No	2111000080
EE 16	No	No	2111000081
EE 24	No	No	2111000082
EE 32	No	No	2111000097
EE 16S	Yes	No	2111000222
EE 24S	Yes	No	2111000223
EE 32S	Yes	No	2111000224

**** For all end elements Part No. in the above table include connecting pin, o rings, internal sealing screw set. For all end elements with „S“ include a magnet pin for divider monitoring.***

Spare Parts - EE	Qty. per Set	Part No.
Sealing Screw M4*	1	3014000320
Sealing Steel Ball D3	1	3014000616

**** The sealing screw and steel ball can only be taken out from the right- side outlet of the elements (Dia. 14.1). For more details of the function of sealing screw set please check page 19-21.***

Dia. 14.2 (EE) End Element XXS

**** Please notice: EE XXS is without divider monitoring sensor. The divider monitoring sensor need be ordered separately.***

Outlet Screw Couplings

The JPQ1 progressive divider can be used as either a main divider or a secondary divider.

From the main divider to the secondary divider, a screw coupling with non return valve is mainly used as the outlet fitting of the main divider for the connection with a high pressure hose and hose stud with outer diameter 6mm. From the secondary divider to the greasing points, a screw coupling without non return valve is mainly used as the outlet fitting of the secondary divider for the connection with a polyamide pipe with diameter 6x1.5mm or steel pipe with a diameter 6x1mm.

For construction machinery application like excavators, wheel loaders, please use non return valves for all divider outlets due to the high back pressure from the greasing points.

All screw couplings (including double cone socket union, non return valve and coupling without non return valve) with M10x1k threads can be directly used for the inlet connection of the JPQ1 divider. All screw couplings with M10x1 threads can be used together with a copper ring (or ED sealed) for the input connection.

Type of Couplings*	Main Divider Outlet with High Pressure Hose with Hose Stud D6mm	Secondary Divider Outlet with High Pressure Hose with Hose Stud D6mm	Secondary Divider Outlet with PA Hose or Steel Pipe D6mm
RDGE	✗	✗	✓
RGE	✓	✓	✗
GE	✗	✓	✗
UDK	✗	✗	✓
PGE	✗	✗	✓

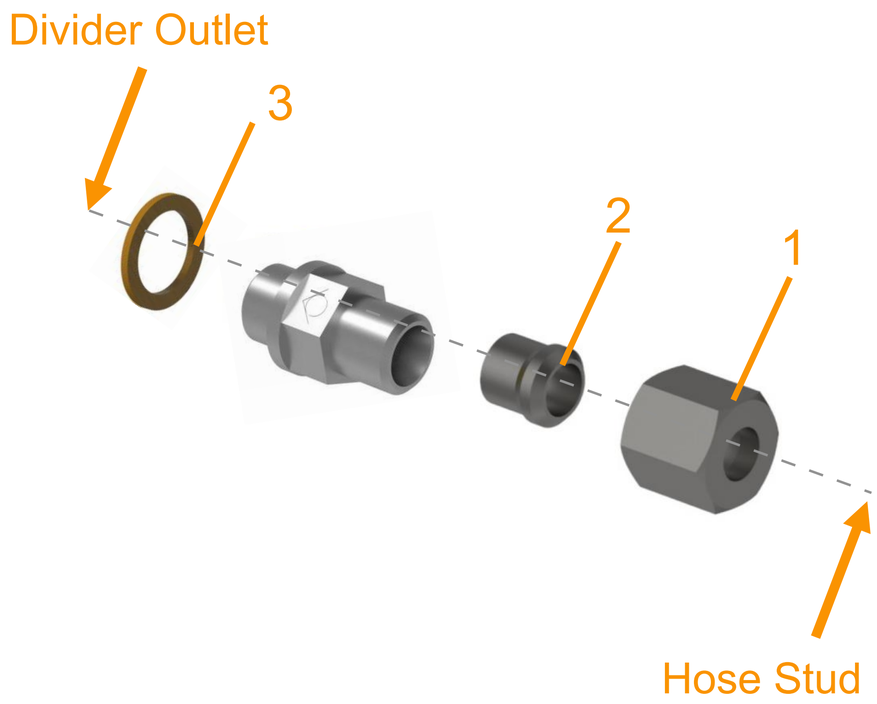
* *RDGE Non Return Valves with Double Cone Drives*
RGE Non-Return Valves
GE Straight Screw Couplings
UDK Socket Unions for Double Cone Drives
PGE Straight Push-in Quick Couplings

Outlet Screw Couplings

RGE (*Dia. 16.1*)

Description		Part No.
RGE-ZN M10D6A **(Dia. 16.1**）		2111000123
Spare Parts 1 – Cutting Ring for Cap Nut		
SR-ZN D6		3014000727
Spare Parts 2 – Cap Nut		
U-ZN D6		3014000729
Spare Parts 3 - Copper Ring		
CR 10-14x1		3012002597

**** Part with "*" is standard part in our JPQ1 order key.***

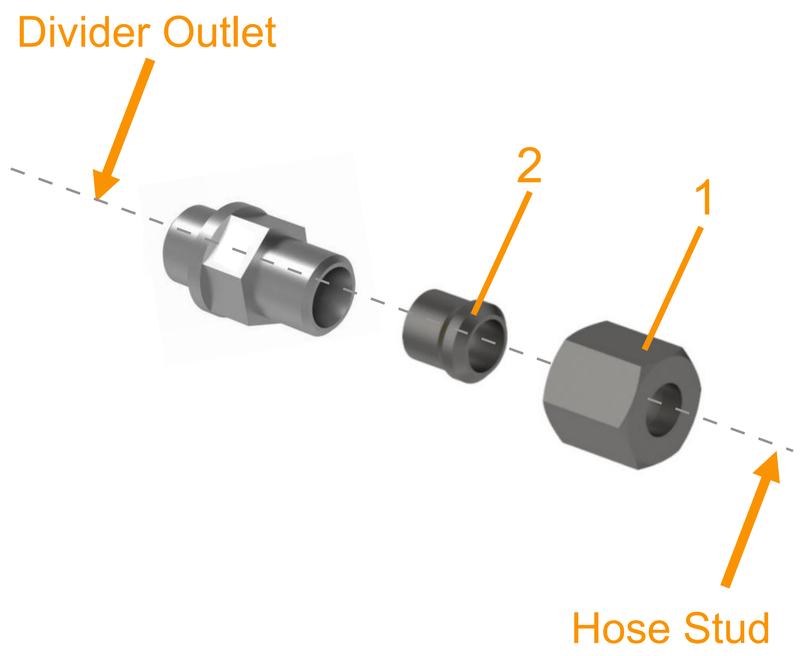


1- (U-ZN) Cap Nut
2- (SR-ZN) Cutting Ring for Cap Nut
3- (CR) Coppering Ring (not incl. in RGE Part No.)

Dia. 16.1 (RGE-ZN) Non-Return Valve with Copper Ring

GE (*Dia. 16.2*)

Description		Part No.
GE-ZN M10KD6*		3014000787
GE-ZN M10D6 (ED sealed)		2111000030
Spare Parts – Cap Nut		
SR-ZN D6		3014000727
Spare Parts – Cutting Ring for Cap Nut		
U-ZN D6		3014000729



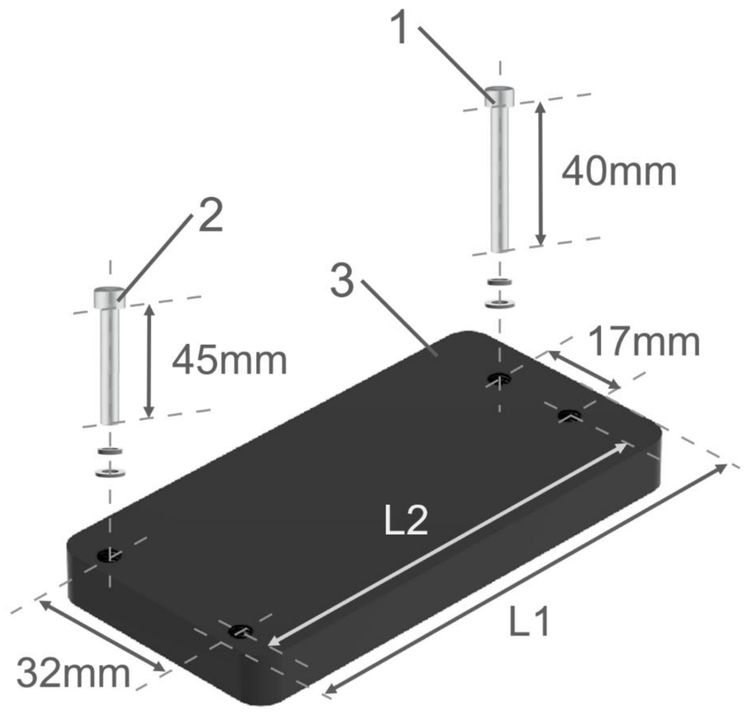
1- (SR-ZN) Cutting Ring for Cap Nut
2- (U-ZN) Cap Nut

Dia. 16.2 (GE-ZN) Straight Screw Coupling

**** Part with "*" is standard part in our JPQ1 order key.***

Divider Mounting Bracket D (welding)

Part No.	Description	Fit for	L1	L2
3011001421	DMB – D6	JPQ Divider 6	75,0	59,0
3011001422	DMB – D8	JPQ Divider 8	90,0	73,8
3011001423	DMB – D10	JPQ Divider 10	104,0	88,5
3012002705	DMB – D12	JPQ Divider 12	119,0	103,3
3012002706	DMB – D14	JPQ Divider 14	136,0	118,0
3011001424	DMB – D16	JPQ Divider 16	149,0	132,8
3012002707	DMB – D18	JPQ Divider 18	164,0	147,5



Material of Bracket: Steel Steel, Light Black

Part No.	Length (mm)	Quantity need	Set - Screw, Spring and Flat Washer
3014000431	40.0	2	On Top
3014000536	45.0	0 or 1	On Bottom

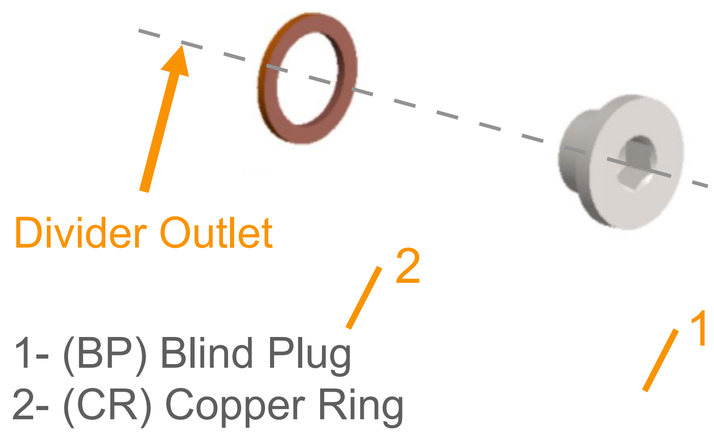
Outlet Blind Plug

The function of the blind plug of the JPQ1 divider outlet is to achieve a double flow rate by direct blinding one of the 2 sides on a same middle or end element.

To achieve this function, before the blinding, the sealing screw and sealing screw ball of the element must be taken out in advance, otherwise the divider will be blocked.

**** More details regarding the working principle please check on page 9.***

Description	Part No.
BP M10x1	3012002598
CR 10-14x1	3012002597



Dia. 17.3 (BP) Blind Plug of Outlet

Bridge with / without Outlet

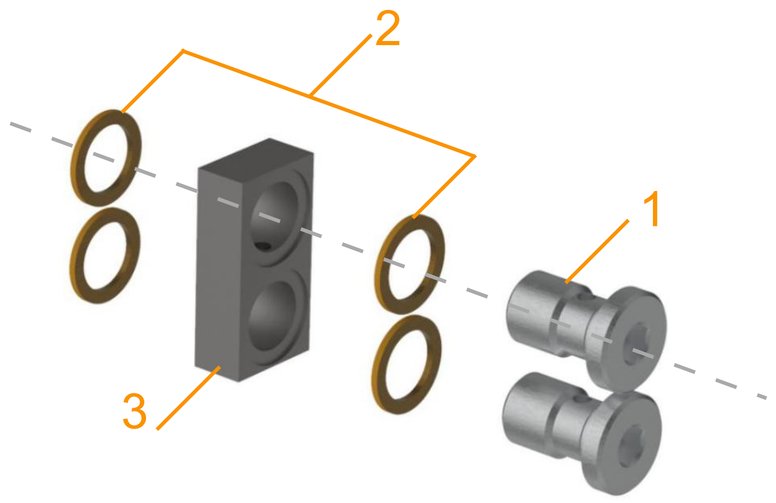
The function of the bridge with or without outlet of the JPQ1 divider is to achieve a combined flow rate by external blinding the outlets on the same side of 2 adjacent elements.

The sealing screw and sealing ball of the element can be taken out or kept depends on the configuration.

**** More details regarding the working principle please check on page 19-21.***

OB-0 Bridge without Outlet (*Dia. 18.1*)

Description		Part No.
OB-0		2111000105
Spare Parts	Qty. per Set	
BBP	2	3012002606
BB	1	3012002605
CR 10-14x1	4	3012002597

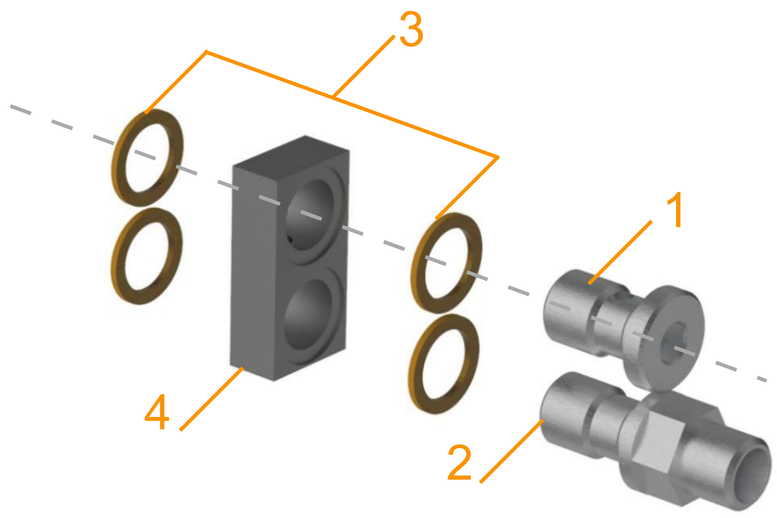


1- (BBP) Bridge Blind Plug
2- (CR) Copper Ring
3- (BB) Bridge Block

Dia. 18.1 (OB-0) Bridge without Outlet

OB-1 Bridge with Outlet and Non-Return Valve (*Dia. 18.2*)

Description		Part No.
OB-1		2111000104
Spare Parts	Qty. per Set	
BBP	1	3012002606
BO*	1	3012002631
BB	1	3012002605
CR 10-14x1	4	3012002597



1- (BBP) Bridge Blind Plug
2- (BO) Bridge Outlet
3- (CR) Copper Ring
4- (BB) Bridge Block

Dia. 18.2 (OB-1) Bridge with Outlet and Non-Return Valve

Extra OB Bridge Kits

Description	Part No.
OB-0, incl. Non-Return Valve	2111000100
OB-1 DC*, incl. Non-Return Valve	2111000101
OB-1 DC, excl. Non-Return Valve	2111000102
OB-1 SC*, excl. Non-Return Valve	2111000103

** DC = double cone, SC = cutting ring.*

Element Combination Principle

In order to meet the volume demand of the different greasing points under various application environment, even if the JPQ1 divider provides 4 different flow rate single element (8/16/24/32), sometimes it is still necessary to combine the outlets of the divider internally or externally to achieve more possibilities of the flow rate combination.

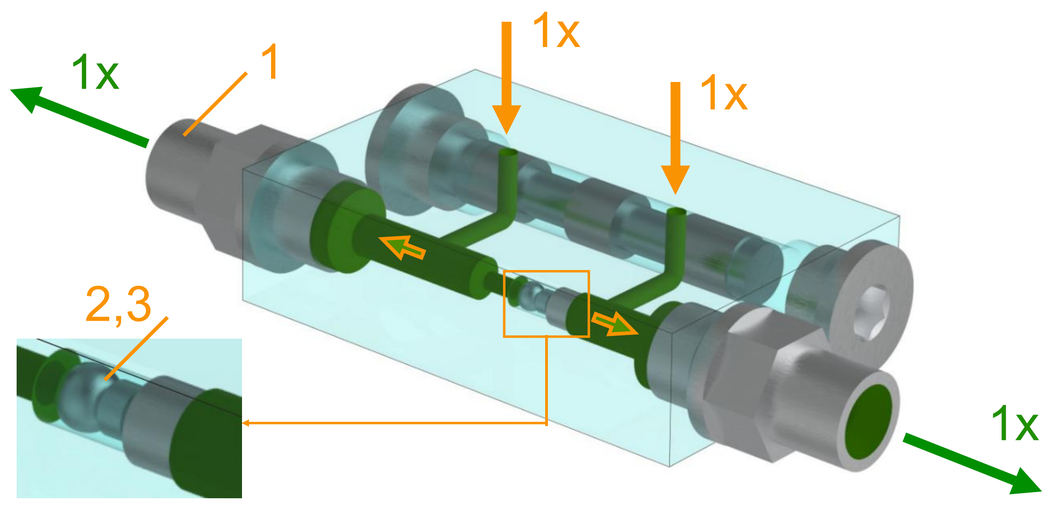
With the help of e.g. element internal bridge* - sealing screw and sealing ball, external bridge* - OB-0 and OB-1, JPQ1 divider can achieve these possibilities.

** Internal Bridge - the divider element bridged left and right*
External Bridge - the divider elements bridged up and down

Single Element without Combination

Dia. 19.1 shows the divider middle element with 2 separate outlets which have the same output flow rates. The grease channel has been separated by a sealing ball and sealing screw.

Description	Part No.
Divider Outlet Screw Coupling	Page 11-12
Sealing Steel Ball D3	3014000616
Sealing Screw M4 SW2	3014000320



1- Divider Outlet Screw Coupling
2- Sealing Steel Ball
3- Sealing Screw

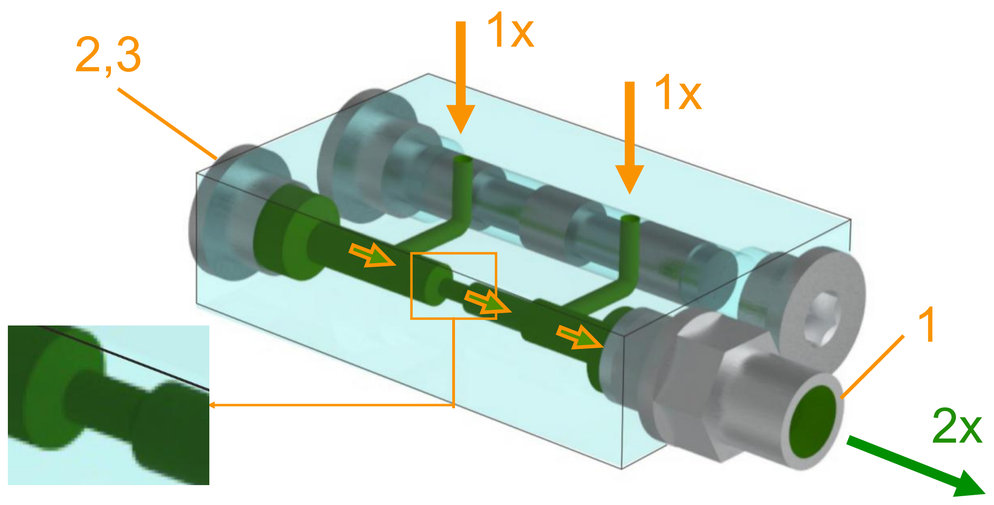
Dia. 19.1 Single Element without Combination

Single Element with Combination

Dia. 19.2 shows the divider middle element with 1 outlet (either on left side or on right side), which the other of the element has been locked by an outlet blind plug and removing the sealing steel ball and sealing screw. The flow rate of the left outlet is doubled.

Attention: In this case, the sealing steel ball and sealing screw must be removed, otherwise the divider blocks!

Description	Part No.
Divider Outlet Screw Coupling	Page 11-12
BP M10x1,5	3012002598
CR 10-14x1	3012002597



1- Divider Outlet Screw Coupling
2- BP - Blind Plug
3- CR - Copper Ring

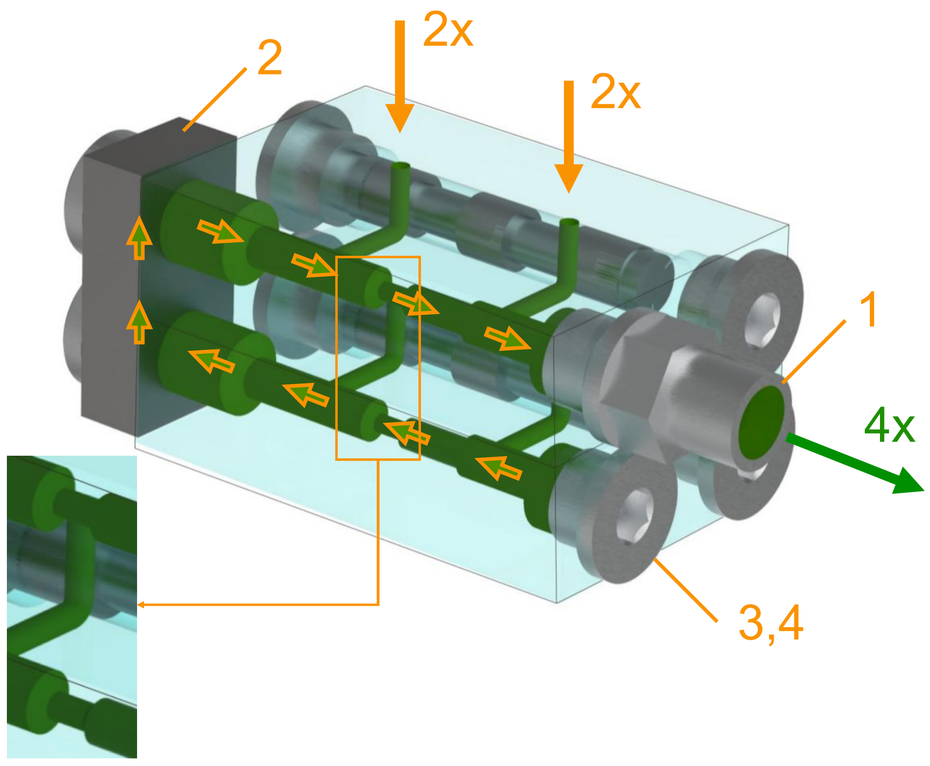
Dia. 19.2 Single Element with Combination

Element Combination Principle

Combination A with OB-0 (1 Outlet)

Dia. 20.1 shows the 2 divider elements are connected by an outlet bridge OB-0 on left side which bridges the outlets up and down. In the mean time, both element's middle sealing screws and steel balls are removed. In this case, all 4 outlets are bridged with each other.

Description	Part No.
Divider Outlet Screw Coupling	Page 15-17
OB-0	2111000105
BP M10x1,5	3012002598
CR 10-14x1	3012002597



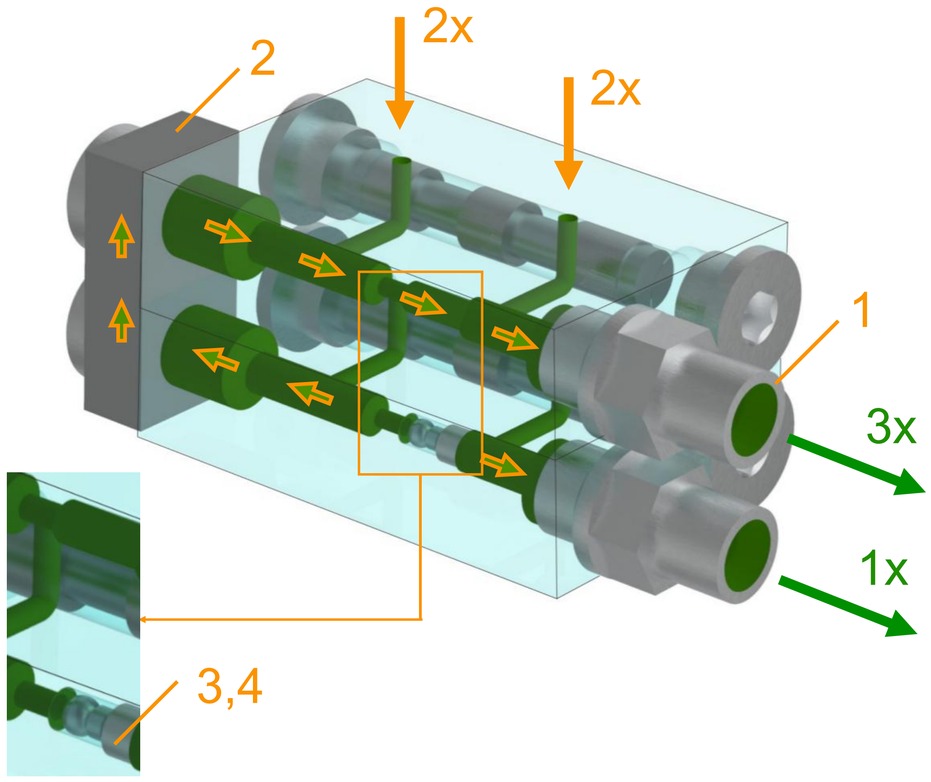
1- Divider Outlet Screw Coupling
2- BO-0 - Bridge without Outlet
3- BP Outlet Blind Plug
4- Copper Ring

Dia. 20.1 2 Divider Elements with OB-0 Combination A

Combination B with OB-0 (2 Outlets)

Dia. 20.2 shows the 2 divider elements are connected by an outlet bridge OB-0 on left side which bridges the outlets up and down. In the mean time, 1 of the 2 elements' middle sealing screw and steel ball is removed. In this case, the grease channel is separated by the sealing screw and steel ball, only 3 outlets are bridged with each other.

Description	Part No.
Divider Outlet Screw Coupling	Page 15-17
OB-0	2111000105
Sealing Screw M4	3014000320
Sealing Steel Ball D3	3014000616



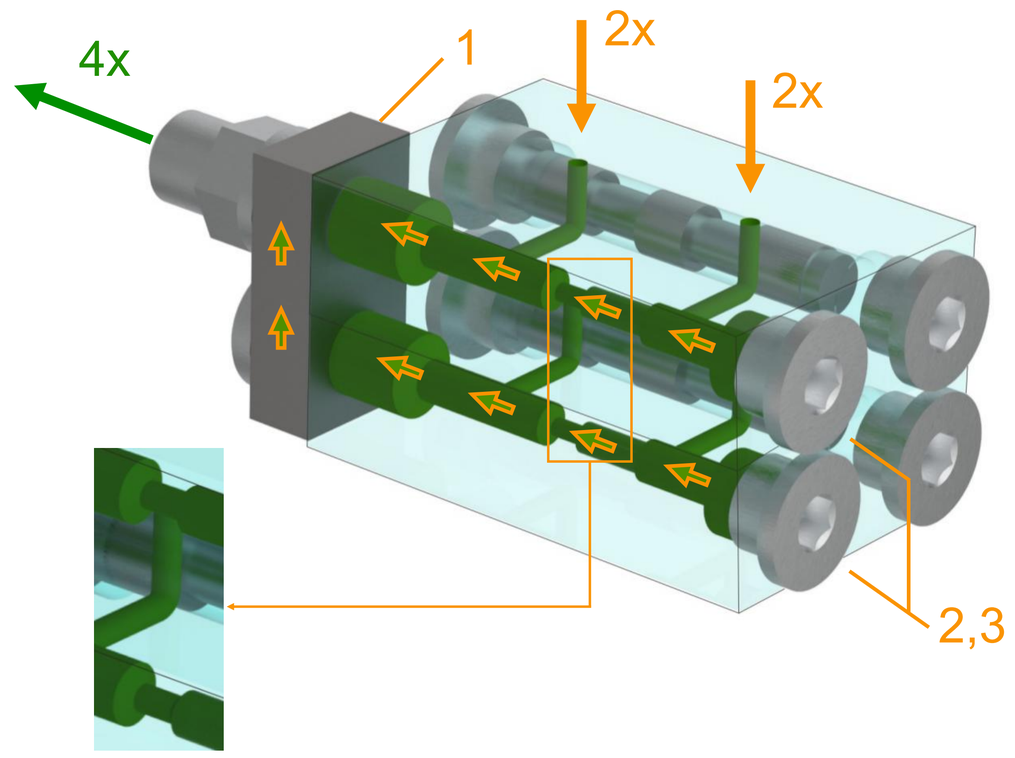
1- Divider Outlet Screw Coupling
2- BO-0 - Bridge without Outlet
3- Sealing Screw
4- Sealing Steel Ball

Dia. 20.2 2 Divider Elements with OB-0 Combination B

Element Combination Principle

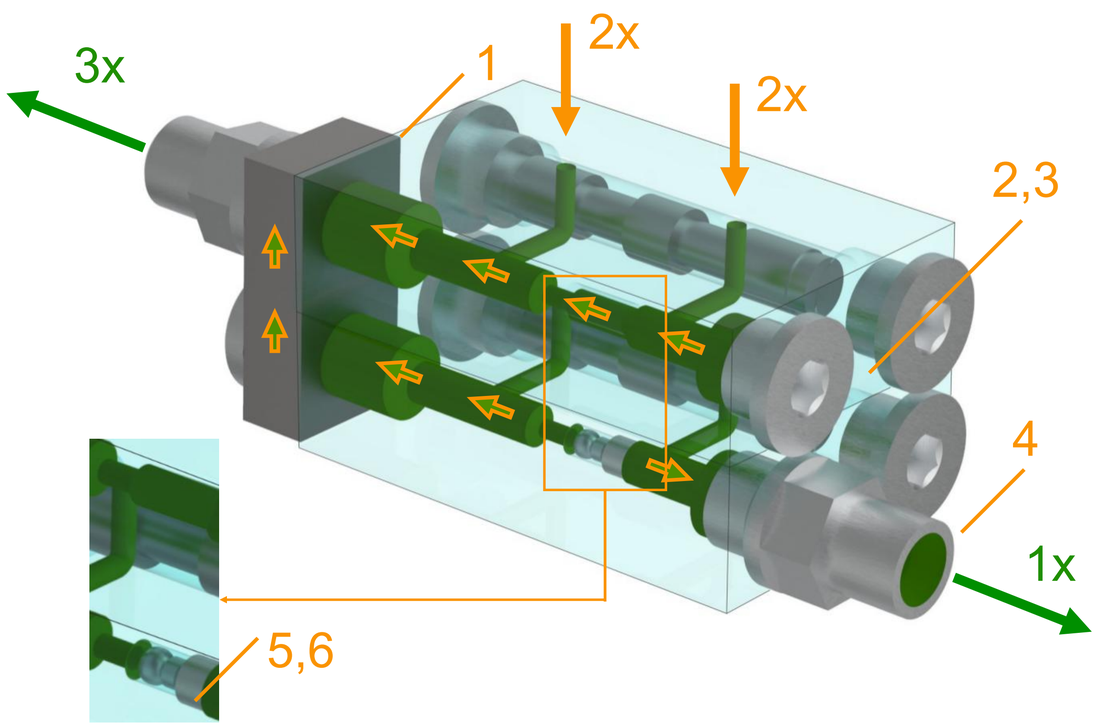
Combination A with OB-1 (1 Outlet)

Dia. 21.1 shows the 2 divider elements are connected by an outlet bridge OB-1 on left side which bridges the outlets up and down. In the mean time, both element's middle sealing screws and steel balls are removed. In this case, all 4 outlets are bridged with each other.



Combination B with OB-1 (2 Outlets)

Dia. 21.2 shows the 2 divider elements are connected by an outlet bridge on left side which bridges the outlets up and down. In the mean time, 1 of the 2 elements' middle sealing screw and steel ball is removed. In this case, the grease channel is separated in 3 ways by the sealing screw and steel ball, only 3 outlets are bridged with each other.

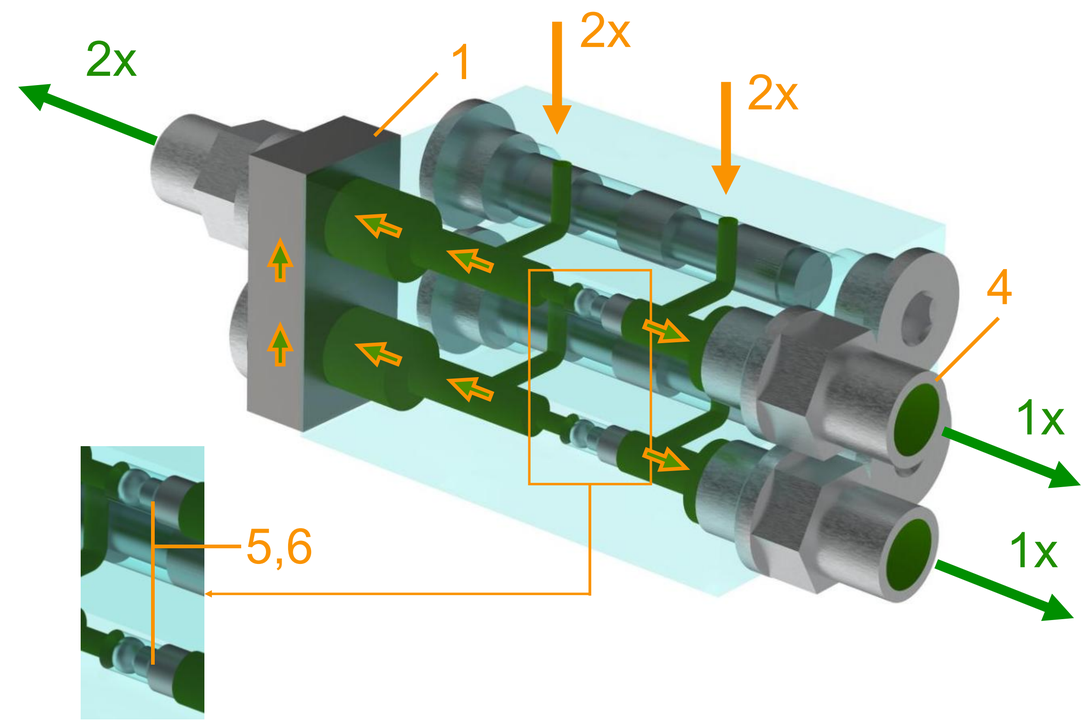


Combination C with OB-1 (3 Outlets)

Dia. 21.3 shows the 2 divider elements are connected by an outlet bridge on left side which bridges the outlets up and down. In the mean time, both elements' middle sealing screws and steel balls keep in position. In this case, the grease channel is separated in 3 ways and only 2 outlets on left side are bridged.

Description	Part No.
Divider Outlet Screw Coupling	Page 15-17
OB-1	2111000104
BP M10x1,5	3012002598
CR 10-14x1	3012002597
Sealing Steel Ball D3	3014000320
Sealing Screw M4	3014000616

Dia. 21.2



Dia. 21.3

1- BO-1 - Bridge with Outlet
2- Outlet Blind Plug
3- Copper Ring
4- Divider Outlet Screw Coupling
5- Sealing Screw
6- Sealing Steel Ball

Divider Monitoring

Divider monitoring sensor kit

Thanks to the Hall effect, the divider monitoring sensor kit is designed to monitor the operation status of the divider with the magnet pin (Dia. 14.1). During the working time of the pump, the sensor checks the movement of the piston and send signal back to pump. Based on different working principles * (time-control or cycle-control) and parameter settings, the pump will discern whether the divider is working properly or not and apprise warning to pump or customized terminal if necessary.

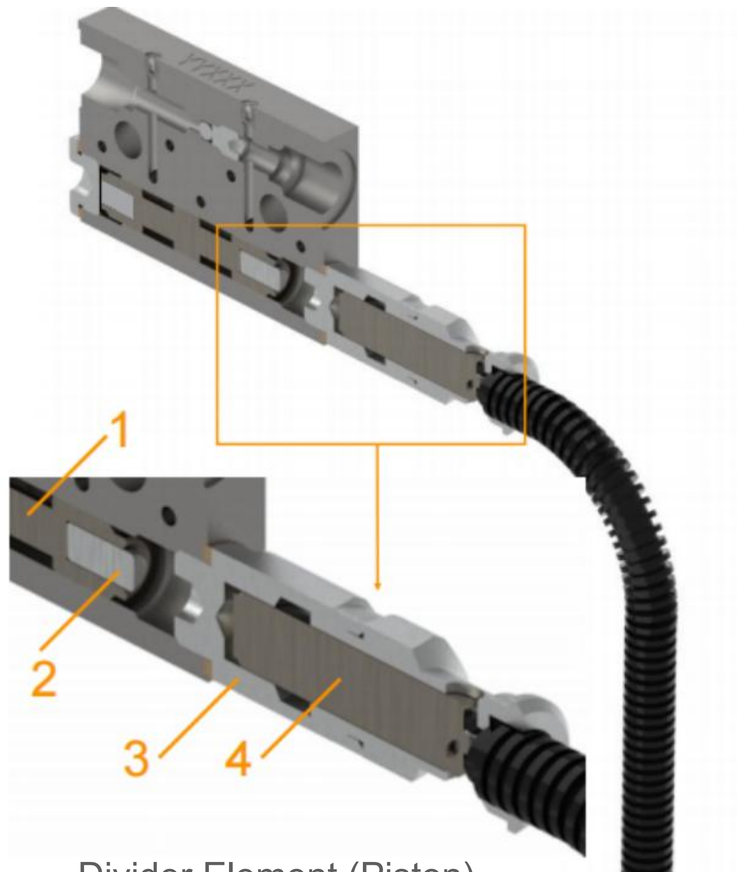
Sensor type:

PNP: sensor signal is (+) positive. Normally open type contact can be used. ***Standard Version for ALPB / ALPB HSC Ver. / ALP81 BYN Ver.***

NPN: Sensor signal is (-) negative. Normally open type contact can be used. ***Only for external controller***

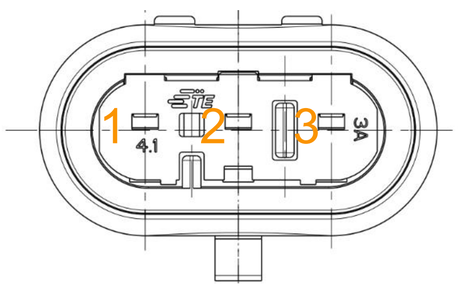
Attention: Only ME 16S/24S/32S and EE 16S/24S/32S are available for a divider monitoring sensor.

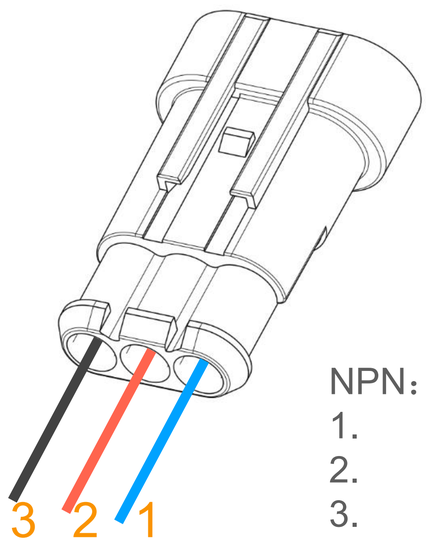
Part No. (Sensor Kit like in Dia. 22.1)*	EU Version	CN Version
NPN:	2020420500*	2111000041
PNP:	2020420510*	2111000042
Technical Data:		
Approval/Conformity:	cULus/CE/WEEE/EAC	
Connection with Divider:	M12x1 plug in	
Connection with Cable:	AMP Super Seal 1.5 SRS. 3P Tab	
Switching Output:	NPN /PNP	
Switching Distance:	>20 mm possible	
Operating Current Ie:	200 mA	
Operating Voltage ub:	10 to 30 V DC	
Temperature Range:	-25 ℃ to +85 ℃	
Function Display:	LED Yellow	LED Red
Housing Material:	Stainless Steel	
Protection Type:	IP 67	



1. Divider Element (Piston)
2. Magnet Pin
3. Sensor Adapter
4. Divider Monitoring Sensor

Dia. 22.1 Divider Element with Monitoring Sensor Kit incl. Part 3. & Part 4.





NPN：
1. 0V DC
2. +10 to 30V DC
3. Signal

Dia. 22.2 Divider Monitoring Sensor Wiring Connection

Dia. 22.3 Divider Monitoring Sensor Adapter JPQ1 M10x1 - M12x1 SW14 L25 (Part No. 3012002954)

**** Attention: For the Part No. of divider monitoring sensor, the sensor connector, and magnet pin are included (Part 2,3 and 4 in Dia. 22.1). The connecting cable between sensor and pump, the divider element are NOT included (Part 1 in Dia. 22.1). More information for cables please check on the next page. Upon request, we provide the technical data from the manufacturer.***

**** Part with "*" is standard part in our JPQ1 order key.***

Divider Monitoring

Connecting cable - divider monitoring sensor

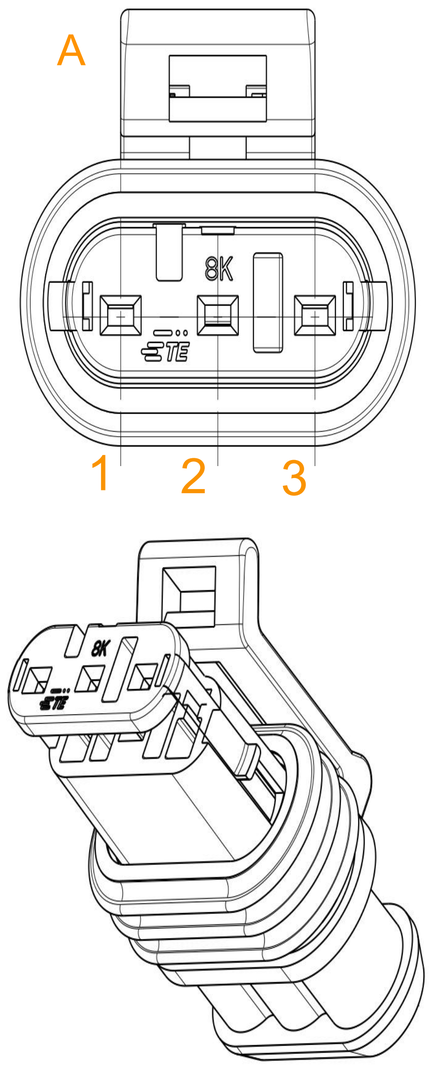
No mater in the part no. for ME XXS and EE XXS* with possibility to install a divider monitoring sensor on page 13 and 14, or the part no. for monitoring sensor kit on page 22, the sensor cable is **NOT** included.

Depends on the various application, the sensor cable need be ordered separately as following description.

**** XX = 16, 24 or 32***

Part No. (Cable):	BD plug	HSC plug
Length 5m:	2210000593	2210000426
Length 7.5m:	2210000592	2210000303
Plug at divider side:	TE - AMP Super Seal 1.5 SRS. 3P plug connector (IEC 529 and ISO 20653)	
Plug at pump side:	RD24 Series 693	Type A EN 175301-803 (DIN 43650) / ISO 4400: Cable socket, self-assembly

**** For more detail regarding the Spec. please contact us.***



Dia. 23.1 Cable Connection at Divider

Dia. 23.2 Cable connection with BD plug

Dia. 23.3 Cable connection with HSC plug

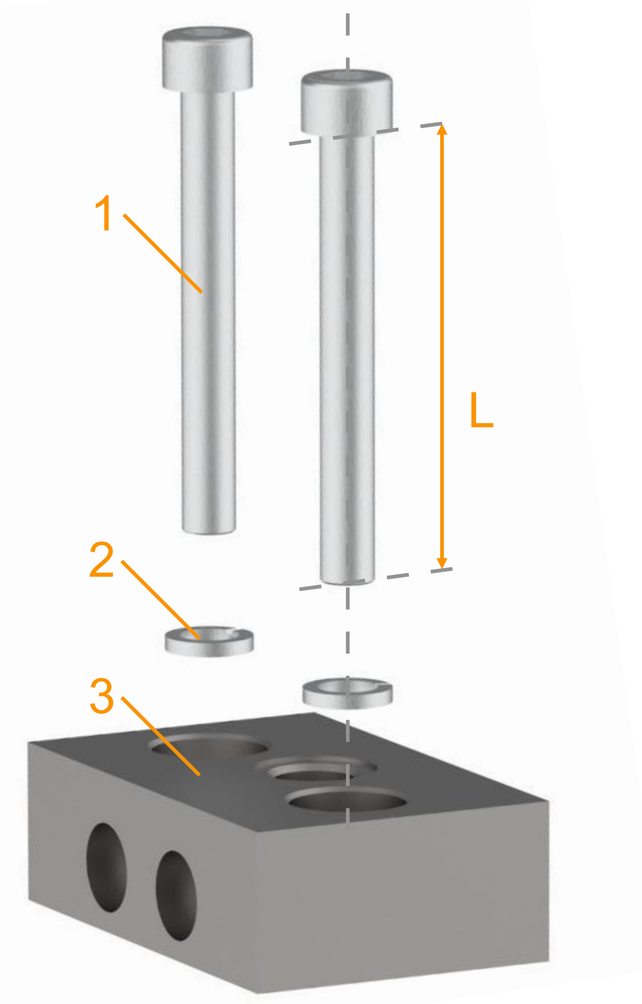
Divider Accessories

Divider tie rods

To mount the elements to a divider, the tie rods and spring washers are needed with a recommended torque value. The standard torque value setting of Autol Technology pre-mounted divider is 12 +/- 1 N/m.

Divider type	Tie rod type (L=50 to 125))	Part no.
JPQ1 - 3/6	Inner hex screw M6 x 50	3014000371
JPQ1 - 4/8	Inner hex screw M6 x 65	3014000372
JPQ1 - 5/10	Inner hex screw M6 x 80	3014000373
JPQ1 - 6/12	Inner hex screw M6 x 95	3014000374
JPQ1 - 7/14	Inner hex screw M6 x 110	3014000351
JPQ1 - 8/16	Inner hex screw M6 x 125	3014000352
JPQ1 - 9/18	Inner hex screw M6 x 140	3014000566
JPQ1 – 10/20	Inner hex screw M6 x 155	3014001525

Part no.: Pos. 2 for spring washer D6: 3040100100



1- Tie rod

2- Spring washer - Part no. 3014000101

3- Start element

Dia. 24.1 Tie rods and spring washers for divider elements connection

Standard package for divider elements *

Description	Package size	Pieces per box	Part no.
SE	340mm x 200 mm x 145mm	60	2111000087
ME 08-N		70	2111000083
ME 16-N		70	2111000084
ME 24-N		70	2111000085
ME 32-N		70	2111000086
EE 08-N		40	2111000080
EE 16-N		40	2111000081
EE 24-N		40	2111000082
EE 32-N		40	2111000097

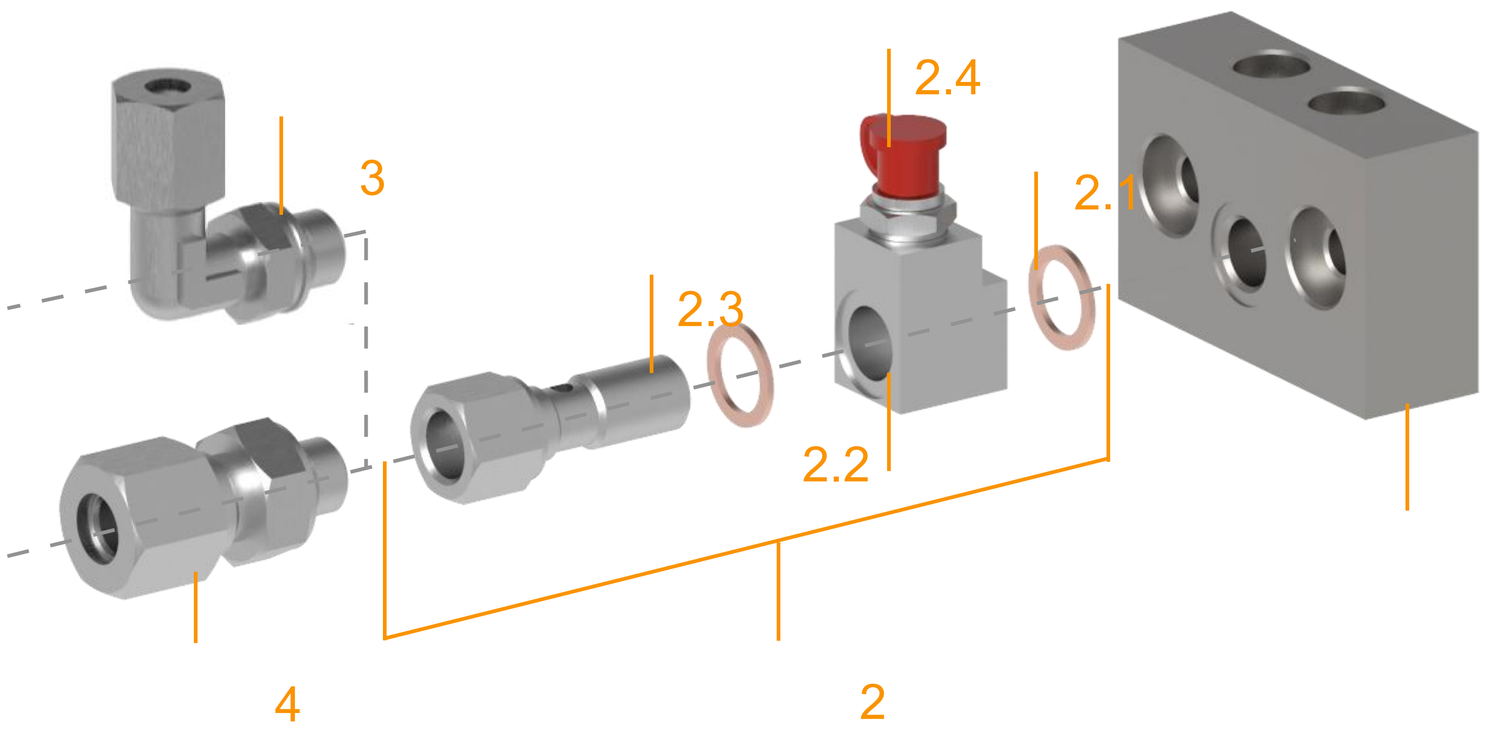
**** Only normal SE, ME and EE divider elements (without in/outlets, sensors or indication pins) can be ordered with a standard package.***

Divider Accessories

Manual emergency lubrication via banjo grease nipple

As an option, a banjo with grease nipple is provided to using a manual or hydraulic pump to refill the grease direct from the start element of the divider when the automatic lubrication pump does not work.

Attention: please check the hoses between the banjo and the pump outlet before starting refilling grease from the banjo!



1- Start element
2- Banjo grease nipple
 2.1- (CR) copper ring
 2.2- Banjo block body
 2.3- Extension coupling
 2.4- (GN-SR) Grease nipple
3- Swivel/Elbow inlet screw coupling
4- Straight inlet screw coupling

Dia. 25.1 (BGN) Manual emergency lubrication via banjo grease nipple

Description		Part no.
BJGN M10M10 (incl. parts 2.1, 2.2, 2.3, 2.4 in **Dia. 25.1**)		2180001820
Spare parts 2.1 - copper ring	Qty. per set	
CR 10-14x1	2	3012002597
Spare parts 2.4 – grease nipple		
GN-SR M10	1	3014000990

Order Key JPQ1

JPQ1 - 5 / 8 - 100 - 16-8L0-8*-24-24 - 000

No. of valid elements (ME+EE)	
3 = 2ME+1EE	6 = 5ME+1EE
4 = 3ME+1EE	7 = 6ME+1EE
5 = 4ME+1EE	8 = 7ME+1EE
9 = 8ME+1EE	10 = 9ME+1EE
11 = 10ME+1EE	12 = 11ME+1EE

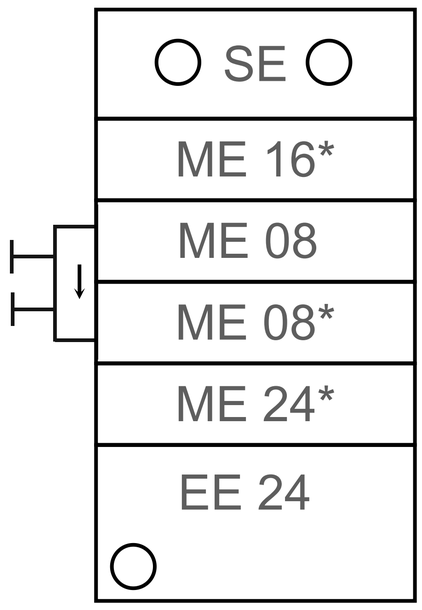
No. of valid outlets
X* = No. of valid outlets

** X <= ((number of middle piece+1)*2)*

Fittings in inlet and outlets							
Outlet \ Inlet	None	Straight D6mm	Straight D8mm	Elbow D6mm	Elbow D8mm	Swivel D6mm	Swivel D8mm
None	100	106	112	118	124	130	136
RDGE	101	107	113	119	125	131	137
RGE	102	108	114	120	126	132	138
GE	103	109	115	121	127	133	139
UDK	104	110	116	122	128	134	140
PGE	105	111	117	123	129	135	141

Type of elements	Middle elements				End elements			
Normal (Without sensor or indication pin)	8	16	24	32	8	16	24	32
With sensor (NPN on side A in Dia. 22.1)	/	16N	24N	32N	/	16N	24N	32N
With sensor (PNP on side A in Dia. 22.1)	/	16P	24P	32P	/	16P	24P	32P
Without sealing ball and screw	XX*				XX*			
Combined element and outlet on left	XX*L				XX*L			
Combined element and outlet on right	XX*R				XX*R			
Bridged with next element with outlets on left	XX*L1 or XXL1				/			
Bridged with next element without outlets on left	XX*L0 or XXL0				/			
Bridged with next element with outlets on right	XX*R1 or XXR1				/			
Bridged with next element without outlets on right	XX*R0 or XXR0				/			

Customized code	
Standard version	000
Customized version	xxx



Dia. 26.1 Divider JPQ1 - 5/8 - 100 - 16 - 8L0 - 8*- 24 - 24

Special version FKM (Viton seals)

The JPQ1 Divider is also available with an FKM seal (Viton) between the start, middle and end elements. The functional description corresponds to the standard version JPQ1 in these instructions.

Technical data:

Operating pressure - Inlet:	max. 300 bar
Temperature range:	-35° C to +70° C
Carrier vehicle:	Oil - viscous oil - grease
In- / Outlet Thread:	M10x1

Number of elements:

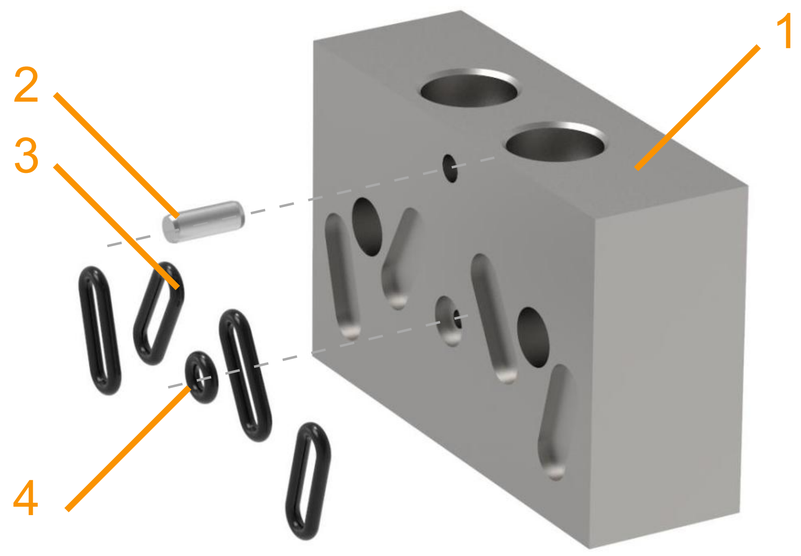
Min.:	JPQ1_FKM 3/6 (3 output elements)
Max.:	JPQ1_FKM 12/24 (12 output elements)

If required, please use the order numbers on the following pages.

Start Element (SE)

Start element is the element without outlets (*Dia. 27.1*).
Every divider must have a start element.

Description		Part No.
JPQ1_FKM-Start element, SE, incl. O-Ring Set & Pin		2111000262
Spare Parts	Qty. per Set	
O-Ring-7,5x1,5-SH80-FKM	4	3024000322
O-Ring-2,5x1,5-SH80-FKM	1	3024000323
Cylinder pin-JPQ1-D3x8-A2	1	3014000096



1- Start Element Body
2- (CP) Connection Pin
3- (OR) O Ring M 7.5x1.5mm
4- (OR) O Ring S 2.5x1.5mm

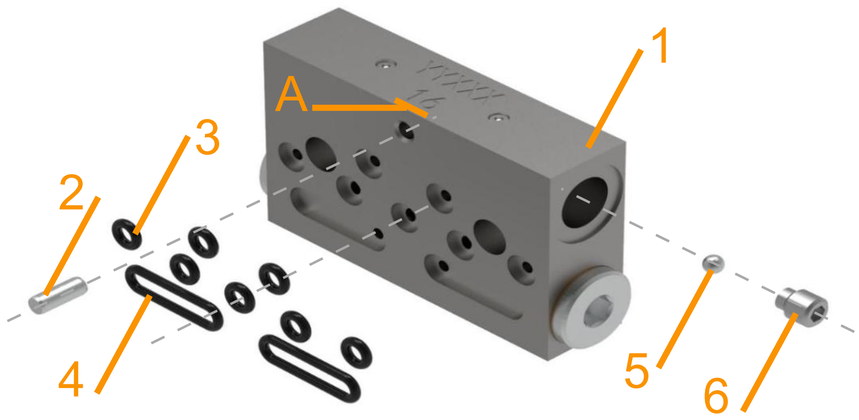
Dia. 27.1 (SE) Start Element

Special version FKM (Viton seals)

Middle Element (ME)

Description*	Possibility to be installed with a divider monitoring sensor *	With in- and outlets connectors	Part no.
ME 08	No	No	2111000263
ME 16	No	No	2111000264
ME 24	No	No	2111000265
ME 32	No	No	2111000266
ME 16S	Yes	No	2111000267
ME 24S	Yes	No	2111000268
ME 32S	Yes	No	2111000269

**** For all middle elements Part No. in the above table include connecting pin, o rings, internal sealing screw set. For all middle elements with „S“ include a magnet pin for divider monitoring.***



1- Middle Element Body
2- (CP) Connection Pin
3- (OR) O Ring S 2.5x1.5mm
4- (OR) O Ring L11.5x1.5mm
5- Sealing Steel Ball D3
6- Sealing Screw M4

Dia. 28.1 (ME) Middle Element

Spare Parts - ME	Qty. per Set	Part no.
Cylinder pin-JPQ1-D3x8-A2	1	3014000096
O-Ring-2,5x1,5-SH80-FKM	7	3024000323
O-Ring-11,5x1,5-SH80-FKM	2	3024000321
Sealing screw for divider outlet separation-M4-ST	1	3014000320
Sealing steel ball for divider outlet separation-D3-ST	1	3014000616

**** The sealing screw and steel ball can only be taken out from the right-side outlet of the elements (Dia. 28.1). For more details of the function of sealing screw set please check page 19-21.***

Packaging units PU of the individual distributor disks in a box

SE	340mm x 200 mm x 145mm	60	2111000087
ME 08-N		70	2111000263
ME 16-N		70	2111000264
ME 24-N		70	2111000265
ME 32-N		70	2111000266

Only divider elements without inlet and outlet fittings and without sensor, can be supplied in a box.

Order Key JPQ1_FKM

JPQ1_FKM - 5 / 6 - 100 - 16-8L0-8*-24-24 - 000

No. of valid elements (ME+EE)	
3 = 2ME+1EE	6 = 5ME+1EE
4 = 3ME+1EE	7 = 6ME+1EE
5 = 4ME+1EE	8 = 7ME+1EE
9 = 8ME+1EE	10 = 9ME+1EE
11 = 10ME+1EE	12 = 11ME+1EE

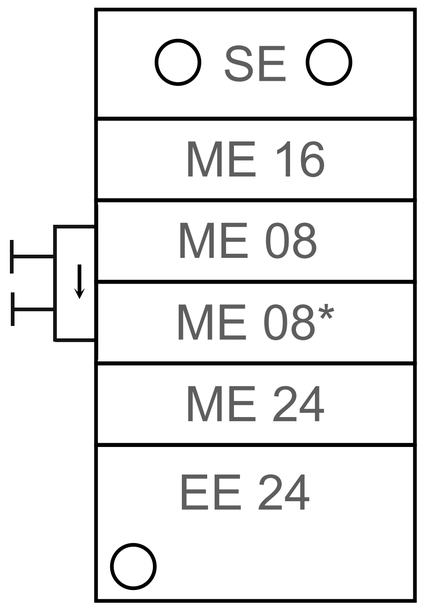
No. of valid outlets
X* = No. of valid outlets

** X <= ((number of middle piece+1)*2)*

Fittings in inlet and outlets							
Inlet / Outlet	None	Straight D6mm	Straight D8mm	Elbow D6mm	Elbow D8mm	Swivel D6mm	Swivel D8mm
None	100	106	112	118	124	130	136
RDGE	101	107	113	119	125	131	137
RGE	102	108	114	120	126	132	138
GE	103	109	115	121	127	133	139
UDK	104	110	116	122	128	134	140
PGE	105	111	117	123	129	135	141

Type of elements	Middle elements				End elements			
Normal (Without sensor or indication pin)	8	16	24	32	8	16	24	32
With sensor (NPN on side A in Dia. 29.1)	/	16N	24N	32N	/	16N	24N	32N
With sensor (PNP on side A in Dia. 29.1)	/	16P	24P	32P	/	16P	24P	32P
Without sealing ball and screw	XX*				XX*			
Combined element and outlet on left	XX*L				XX*L			
Combined element and outlet on right	XX*R				XX*R			
Bridged with next element with outlets on left	XX*L1 or XXL1				/			
Bridged with next element without outlets on left	XX*L0 or XXL0				/			
Bridged with next element with outlets on right	XX*R1 or XXR1				/			
Bridged with next element without outlets on right	XX*R0 or XXR0				/			

Customized code	
Standard version	000
Customized version	xxx



Dia. 29.1 Divider JPQ1_FKM - 5/8 - 100 - 16 - 8L0 - 8*- 24 - 24