### Technical Data

<table>
<thead>
<tr>
<th>Application</th>
<th>Heavy fuel or soluble oils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity</td>
<td>32 - 460 cSt</td>
</tr>
<tr>
<td>Coolers</td>
<td>Water / oil coolers</td>
</tr>
<tr>
<td></td>
<td>Plate or shell and tube type</td>
</tr>
<tr>
<td></td>
<td>Air / oil cooler (fan and radiators)</td>
</tr>
<tr>
<td></td>
<td>Water-flow control and / or oil diverter with thermostatic valve</td>
</tr>
<tr>
<td>Pumps</td>
<td>Flow-range 100 cm³/min or 5,000 l/min</td>
</tr>
</tbody>
</table>

### Applications

- Motor and mill bearings (typically) with white metal bearings
- Winder bearings

### Field Services

- OEM installation
- Piping (interconnecting)
- Service
- Repairs
- Breakdowns
- Upgrade
- Retrofits

### Features

- Duplex filters
- Oil coolers
- Full instrumentation
- Duty and standby pumps
- Gear or screw pumps

### General

100 - 630 l tanks (typically)
2 or 3 compartment design tanks
LP: for lube and conditioning (continuous)
HP: for jacking (start-up only)

### Carbon Footprint

Reduced operating by
- High-efficiency motors
- High capacity filters
- Custom-built for every application to ensure efficiency
## Technical Data

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</tr>
<tr>
<td>Pumps</td>
<td>Flow-range 100 cm³/min or 5,000 l/min</td>
</tr>
</tbody>
</table>

## Features

- Emergency run-down oil supply from accumulator banks
- Kidney filtration system (2 µm)
- Water removal facility
- Turbidity sensors
- Analog instrumentation 4 mA to 20 mA or bus
- Gear or screw pumps for positive displacement

## General

- 2,000 - 10,000 / tanks
- 3 compartment design tanks
- LP: overflow conditioning circuit (continuous)
- HP: hydrostatic (continuous)

## Applications

- Large mills (phosphor / bronze bearings)

## Features

- Duplex filters
- Oil coolers
- Full instrumentation
- Duty and standby pumps

## Field Services

- OEM installation
- Piping (interconnecting)
- Service
- Repairs
- Breakdowns
- Upgrade
- Retrofits

## Carbon Footprint

Reduced operating by

- High-efficiency motors
- High capacity filters
- Custom-built for every application to ensure efficiency
Applications

- Gearboxes
- Reducers
- Crushers
- Fan and motor bearings

Technical Data

- Application: Heavy fuel or soluble oils
- Viscosity: 32 - 460 cSt
- Coolers:
  - Water / oil coolers
  - Plate or shell type, tube type
  - Air / oil cooler (fan and radiators)
  - Water-flow control and/or oil diverter with thermostatic valve
- Pumps: Flow-range 100 cm³/min or 5,000 l/min

Features

- Duplex filters
- Oil coolers
- Duty and standby pumps
- Full instrumentation

Field Services

- OEM installation
- Piping (interconnecting)
- Service
- Repairs
- Breakdowns
- Upgrade
- Retrofits

Carbon Footprint

- Reduced operating by
- High-efficiency motors
- High capacity filters
- Custom-built for every application to ensure efficiency

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standard grease and oil lubrication systems

Single-line Lubrication System

Application

Single-line central lubrication systems are used mainly for the lubrication of machinery with the following specification:

- lubrication points: up to 100
- pipe length: up to 30 m
- pump pressure: up to 160 bar

Example of Application

General mechanical engineering, bottle cleaning machinery, calender machines, plate conveyors, presses, tyre moulds, packaging machinery, machine tools, brick manufacturing machinery, etc.

Product Features

- The metered quantity can be adapted to the requirement at the lubrication point by changing the metering screw in each injector segment.
- The system can be extended subsequently by connecting additional injectors, or may be reduced by disconnecting injectors.
- During the intervals between lubricating cycles the pressure in the main line is released so that the lubricant fed into the injectors is supplied to the other side of the plunger for the next lubrication cycle. This also ensures that no lubricant reaches the lubrication points during the interval in an uncontrolled manner.
- The quantity of lubricant delivered to the lubrication points is to a large extent independent of the back pressure.
- Systems with motor-driven pumps can be operated fully automatically with variable intervals between lubrication cycles.
- In comparison with central lubrication systems using oil, grease systems have the following advantages:
  - Grease adheres better to the sliding surfaces and is therefore not so easily forced out of the lubrication gap, even at high bearing pressures.
  - Grease forms a reserve in the lubrication connections and the lubrication pockets.
  - Grease stands up better to heavy and intermittent loads.
  - The grease forced out of the bearing forms a collar of grease which protects the bearing from the ingress of dirt and dust.
standard grease and oil lubrication systems

Dual-line Lubrication System

Application

Centralised lubrication systems with two main feed lines are chiefly used for the lubrication of machines and plant with large numbers of lubrication points:

- lubrication points: up to 1000
- pipe length: up to 150 m
- pump pressure: up to 400 bar

Example of Application

Smelting plant, rolling mills, mining, power stations, cement works, sugar refineries, breweries, construction machinery, etc.

Configuration

The lubrication system consists principally of the pump, one 4/2-way or two 3/2-way change-over valves, the two main feed lines, the divider valves arranged close to the lubrication points, the lines leading to the lubrication points, switchgear at the line end, the pressure gauge unit and the controls. A pressure relief valve is required to protect the pump from over-pressure.

Product Features

- Metering can be adjusted to meet the requirements of the individual lubrication points:
  - by selection of the appropriate divider valve size,
  - by varying the metering setting, and
  - by varying the interval.
- The metered quantity is independent of back pressure.
- The systems can at any time be extended by connection of additional divider valves, or reduced by shutting down divider valves or outlets.
- Special monitoring of critical lubrication points is made possible for each pair of divider valve outlets using limit switches.
- The system can be operated fully automatically with variable intervals.
- Up to over 1,000 lubrication points at a distance of 100 metres can be lubricated, depending on the type of pump and lubricant.
- In all automatic systems, the patented switchgear SG-A, which initiates change-over, that is, the pressure change in the two main feed lines, as a function of the differential pressure at the line end, is used. Depending on temperature, lubricant and line dimensions, the optimum working pressure is adjusted automatically and there are, in comparison to systems where the switchgear is provided on the pump, the following advantages:
  - Pump load is kept to a minimum.
  - Even at low temperature, which causes a slow pressure build-up (pipe friction), delivery of the correct quantity of lubricant is ensured by the switchgear SG-A being installed at the line end.
  - Additional monitoring of the main feed lines by means of the switchgear.
standard grease and oil lubrication systems

Multi-line Lubrication System

**Application**

The multi-line, centralised lubrication system can be used for lubricating individual machines and small groups of machines or appliances. In the multi-line system, the lubricant is delivered by the pump in metered quantities through several outlets. Each lubrication point is connected to the pump by its own line.

- **Lubrication points:** up to 32
- **Pipe length:** 20 to 40 m
- **Pump pressure:** 200 bar

**Example of Application**

Presses, punching presses, cutters, excavators, cranes, lifts, conveyors, machine tools, packing machinery, pumps, blowers, turbines, building construction machinery, rock crushers, briquetting presses, coke crushers, woodworking machinery, etc.

**Mode of Operation**

Each lubrication point has its own line connecting it directly to the pump. The lubrication pump develops the pressure necessary to pump the lubricant and overcome the back pressure and it meters the quantity of lubricant required for each lubrication point. A progressive divider valve can be introduced into any of the lines coming from the pump, thereby increasing the number of points being lubricated.

**Product Features**

- In many cases it is possible to control the pump from the machine to be lubricated, which eliminates the need for a separate control system.
- With most types of pumps, the lubrication quantity can be adjusted at the pump for each lubrication point.
- Continuous operation of the pump with very small quantities of lubricant.
standard grease and oil lubrication systems

Progressive Lubrication System

Application

Centralised lubrication systems with progressive divider valves primarily serve the lubrication of machinery. The systems are suitable for grease and oil.

- lubrication points: up to 100
- pipe length: up to 100 m
- pump pressure: up to 250 bar

Example of Application

Machine tools, packing machinery, presses, punching presses, cutters, woodworking machinery, etc.

Mode of Operation

Progressive divider valves distribute the lubricant to the lubrication points connected to their outlets, in small metered quantities progressively in a given sequence. When the last lubrication point has been supplied, the process of lubrication automatically starts again at the first lubrication point. If lubrication is interrupted at any point, because the pump is switched off or the delivery line is blocked, it continues from the same point when the system is restarted.

Product Features

- Low investment costs, since only one main feed line, a simple pump and divider valves are required.
- A number of lubricant groups with progressive divider valves can be connected to a single pump if isolating valves are used, and they can then be connected to the system or isolated individually.
- Simple monitoring of operation by means of a movement indicator on the divider valve, or remote monitoring.
- Divider valves are compact in design.

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**Application**

Air operated refill pumps are used to refill the grease reservoirs on electric pumps which serve large centralised lubrication systems.

**Example of Application**

- In steelworks on milling stands, continuous casting machines, etc.
- On stackers / reclaimers
- Grinding mills on mines

**Mode of Operation**

When the low level sensor on the grease reservoir is activated, the PLC will energise the 2/2 way solenoid valve and allows compressed air to operate the pneumatic drum pump which transfers grease from the drum to the pump reservoir via a strainer. The low level sensor will de-activate once grease enters the reservoir, but the PLC maintains the grease flow until the reservoir is full, as monitored by the level sensor.

Optionally, a lifting ram can be supplied to lift the pump out of the drum pneumatically. This is used to replace an empty grease drum with a new one. It is a clean process as the drum pump cannot get dirty.

**Product Features**

An automatic refill system is recommended where large amounts of grease are used in a short time or where lubrication systems are unattended, like on weekends.
Gear Wheel Lubrication System NV-K

Application

This system has been developed to put a film of lubricant onto the gear teeth.

The lubricating wheel of the NV-K unit is in mesh with the drive pinion and transfers a metered quantity of lubricant through its outlet ports which are spaced across the gear teeth.

A DELIMON pump supplies the grease to the NV-K unit.

The system is designed to have a run and a pause cycle, therefore the amount of lubricant being transferred onto the gear can be regulated.
standard grease and oil lubrication systems

Spray Lubrication System

Application

The spray lubrication system is used where lubricating greases, lubricating oils or even adhesive lubricants need to be applied in an even, metered and selective manner due to user-specific and function-related requirements.

The spray lubrication system allows reductions of up to 50% in the quantities consumed, which is very beneficial in terms of the disposal of old lubricant and the reduction of the associated costs. Spray lubrication systems are used on heavy gearing applications such as grinding mills, rotary kilns, cement mills, coal mines and mixing drums, etc.

Product Features

- Metering and apportioning of the lubricant volume to the spray points is carried out by progressive divider valves.
- The compressed air used for the actuation of the pump is the same as that used for spraying if a pneumatic pump is used.
- The use of mixing segments allows for the dispensing of a metered quantity of lubricant to the friction points over an adjustable period of time. In the case of gear spray lubrication systems, the lubricant, once delivered, is further spread onto the greatest possible number of teeth by means of the gears.
- With the help of the limit switch, which is attached to the progressive divider valve, the delivery of grease and the correct mode of working of the divider valve are monitored simultaneously.
- The pressure switches monitor the minimum air pressure required for spraying as well as the unhindered flow of the spray mixture out of the nozzles.
special lubrication systems

Chain Lubrication Unit WS-E

The central lubrication system WS-E is used for automatic and metered lubrication of chains, joints, rollers, hinges, etc. This system is also suitable for application with oil wetting of internal parts (engine crankshaft).

Application

The chain lubrication system WS-E is used for automatic and metered lubrication of chains, joints, rollers, hinges, etc. This system is also suitable for application with oil wetting of internal parts (engine crankshaft).

Product Features

- Chain lubrication with oil
- Pump with a delivery rate of 1.2 l/min
- Surface: light grey RAL 7004

Design

The chain lubrication system WS-E consists of:
1. Electrical switching device
2. Optoelectronic proximity switch*
3. Reflector (not required with inductive proximity switch)
4. Gear pump with integral solenoid valve and throttle
5. Pipe 6 x 0.7
6. Spray nozzle
7. Metering element ZE-E
8. Manifold VZ-E

* The optoelectronic proximity switch with reflector may be replaced by an inductive proximity switch.

Function

After switching on the system, the chain lubrication system starts and circulates oil without pressure via the opened solenoid valve.

As soon as an impulse is initiated via the proximity switch (optoelectronic or inductive) by the chain, the solenoid valve closes and the oil is directed to the metering elements. The metering elements release the stored lubricant quantity with speed to the friction points via spray nozzles (in the form of a directed drop). When the chain leaves the switching range of the proximity switch, the solenoid valve opens, the pressure in the main line decreases and oil is stored in the ZE-E meeting element, ready for the next lubrication cycle.

The above sequence continues automatically.

As the metering element receives lubricant, the precharge of lubricant from the previous cycle is discharged via the spray nozzle as a directed drop of lubricant, and is delivered to a predefined point on the chain at high speed. Once pressure to the metering element is relieved, the precharge of lubricant in the metering element moves into the discharge chamber, ready for the next charge cycle.
special lubrication systems

Micro Fog Oiler ON-L

Application

Micro Fog Oiler for lubricating bearings.

Only a small fraction of the oil quantity passing through the sight dome (approximately 5% according to grade and temperature) enters the air line as micro fog. Suitable for use in systems with predominantly high-efficiency reclassifiers installed downstream, but also suitable in conjunction with standard reclassifiers.

Both reclassifier types, however, cannot be combined in the same system due to their differing operating pressure ratings.

Product Features

- Venturi nozzle
- Adjustable discharge volume
- Allows for the movement of lubricant over long distances in branched pipe networks
- Lubricant: lubricating oils without solid additives
- Oil viscosities ISO VG 7 to DIN 51519
- Surface: signal grey RAL 7004

Function

The compressed air flowing through the venturi nozzle sets up a pressure difference between the reservoir and the sight glass. Oil is thereby forced through a system of pipes and channels to the Venturi nozzle where it is atomised into an oil mist. The flow of oil mist passes through the hollow screw at high velocity; in the process, 95% of the oil falls back into the reservoir. Only the very fine droplets which are transportable over long distances, reach the outlet of the oiler.

Oilers that are capable of delivering oil at a constant low flow rate, independent of the level of oil in the reservoir, have an air-driven oil pump installed in the oil receiver. For setting the correct operating conditions, all the units have a supplementary air screw, by means of which the oil mist pressure can be varied without varying the rate of delivery of the oiler.

The oilers have an additional adjustment spindle for charging the rate of oil delivery, which are marked accordingly.

Micro Fog System

Application

A micro fog lubricator uses a venturi to create an airborne mist of extremely fine oil particles in compressed air. The low weight of the oil particles enables them to be carried in the air stream over considerable distances.

Reclassifier nozzles at the lubrication points condense the oil-mist into larger oil droplets, suitable for lubrication.

The patented high efficiency reclassifier achieves pollution-free lubrication. The use of a pack of small pellets has a multiple reclassifying effect and reduces oil residue in the vented air to one percent.

The system can be designed to supply small and large installations with a constant supply of oil without any moving parts either to convey or to meter the oil.
special lubrication systems

SkyJet Air/Oil Lubrication

Application

Lubrication with oil and compressed air is today widely adopted and accepted within hi-tech engineering applications. For example, in steel and aluminium mills, this method of lubrication is being used on continuous casting plants, cold and hot strip mills and various types of rolling mills. An automated lubrication system ensures operational safety, long service life and low maintenance requirements along with minimal lubricant consumption and is eco-friendly.

Product Features

- Minimal consumption of lubricant through precise, calculated dosing.
- The possibility of different quantities of lubricant at the divider valve outlets.
- Air acts as a transporting and bearing sealing medium.
- The air/oil mixture has excellent adhesion properties, even at the bearing surfaces.
- Improved heat removal.
- Environmentally friendly lubrication.

Function

From the oil tank complete with heater, level switch and flow meter, the oil is pumped via a filter to the oil/air mixing unit. The electric control panel monitors the solenoid valve, filter differential pressure and the oil level in the tank. The oil/air mixing unit has its own electrical panel that controls the oil and air solenoid valves. The oil is now transported in the tube by the air to the master divider.

The master divider can have from 2 to 6 outlets and divides the air/oil flow to the respective slave dividers. The slave dividers, again, can have from 2 to 6 outlets and the air/oil delivered lubricates and cools the bearings of the rollers.
Wheel Flange Lubrication RE

Application

- Wheel flange lubrication helps to reduce noise levels on any type of train wheels.
- Wheel flange lubrication reduces the friction and wear on both the wheel flange and the rail.

Product Features

- Up to 15% saving in driving energy
- Reduction of wheel flange wear by up to 80%
- Cost reduction due to greater reprofiling intervals
- Preservation of environment by noise reduction

Function

The air operated pump delivers a metered quantity of lubricant, and once the 2/2 way solenoid is opened, the compressed air and lubricant is delivered and sprayed onto the wheel flanges via the respective spray nozzles. The process is completely automated and controlled by a programmable control system.
### Technical Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlet</td>
<td>1 to 3</td>
</tr>
<tr>
<td>Output</td>
<td>0.1, 0.15 or 0.2 cm³/stroke or 2.2, 3.3 or 4.4 cm³/min.</td>
</tr>
<tr>
<td>Motor</td>
<td>12 or 24 V DC</td>
</tr>
<tr>
<td>Gear ratio</td>
<td>215:1 (others on request)</td>
</tr>
<tr>
<td>Pressure</td>
<td>Max. 250 bar</td>
</tr>
<tr>
<td>Reservoir</td>
<td>2 / or 4 l</td>
</tr>
<tr>
<td>Level</td>
<td>Transparent reservoir</td>
</tr>
<tr>
<td>Lubricant</td>
<td>Grease NLGI 2</td>
</tr>
<tr>
<td>Temperature</td>
<td>-20°C to +80°C</td>
</tr>
<tr>
<td>Connections</td>
<td>¼ inch BSP</td>
</tr>
</tbody>
</table>

### Application

The electrically operated Autolube-E pump is designed for use in small automatic grease lubrication systems. The pump was developed especially for commercial vehicles. Autolube-E can be used for buses, trucks, semi-trailers, wheel loaders, dumper trucks, steering gears of ships and other special vehicles.

### Function

The system consists of the Autolube-E grease lubrication pump with a maximum of 3 pump elements, feeding progressive divider valves and controlled by a programmable controller.

High-pressure hoses are used between the pump and the divider valves, and high-pressure nylon tubing is used between the divider valve and the lubrication points. lubrication takes place automatically and is activated by a programmable controller.

The various lubrication points on the vehicle require differing quantities of lubricant, a precise metering of lubricant is ensured by the divider valves (delivery 0.1, 0.15 or 0.2 cm³). The amount of grease required for a lubrication cycle (total of lubricant to be supplied by a divider valve) is supplied by the pump in a metered quantity. Changing the lubricant quantity is possible by using different pumping elements with different volume outputs.

### Maintenance

Automatic lubrication systems require little maintenance and need only to be checked during routine maintenance inspections. The pump reservoir can be filled with a standard hand- or air-operated grease pump.
grease lubrication pumps

**Autolube-M**

**Technical Data**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlet</td>
<td>1 to 5</td>
</tr>
<tr>
<td>Output</td>
<td>0.1, 0.15 or 0.2 cm³/stroke or 2.2, 3.3 or 4.4 cm³/min.</td>
</tr>
<tr>
<td>Motor</td>
<td>0.18 kW, 50 Hz, 220, 380, 525 V AC</td>
</tr>
<tr>
<td>Gear ratio</td>
<td>215:1 (others on request)</td>
</tr>
<tr>
<td>Pressure</td>
<td>Max. 250 bar</td>
</tr>
<tr>
<td>Reservoir</td>
<td>2, 4 or 8</td>
</tr>
<tr>
<td>Level</td>
<td>Ultrasonic</td>
</tr>
<tr>
<td>Lubricant</td>
<td>Grease NLGI 2</td>
</tr>
<tr>
<td>Temperature</td>
<td>-20°C to +60°C</td>
</tr>
<tr>
<td>Connections</td>
<td>¼ inch BSP</td>
</tr>
</tbody>
</table>

**Application**

The electrically operated Autolube-M is typically used in the following applications: Machine tools, presses, punching machines, shears, cranes, water pumps, etc.

**Product Features**

- Multi-line pump
- Drive: three-phase AC motor
- Output volume: variable
- Lubricant: oil, grease, liquid grease
- Surface: signal grey RAL 7004

**Function**

**Pump**

The motor drives a reduction gearbox via a coupling. The reduction gearbox drives the eccentric which activates the pumping elements.

The internal stirrer, which is also connected to the shaft from the reduction gearbox, helps to move the lubricant into the suction cavity of the pumping element. As the pump is activated the lubricant is drawn into the pumping element and pumped out to the delivery line going to the divider valve.

**Maintenance**

Automatic lubrication systems require little maintenance and need only to be checked periodically for correct operation. The pump reservoir can be filled with a standard hand or air-operated grease pump.
The BM-B pump is well suited to be used in single-line, dual-line, progressive, and spray lubricating systems. Regardless of the number of lubrication points, the pump can be effectively adapted to meet any requirements. It can also be used for refilling and mobile greasing systems.

### Product Features
- Discharge pressure adjustable up to max. 400 bar
- High reliability due to force control
- Discharge: 2 l/hr and 4 l/hr, depends on driving speed
- Gear motors
- Long service life thanks to the use of wear-resistant high-grade steel
- Compact and rugged design
- Lubricant: oil, grease, liquid grease
- Surface: signal grey RAL 7004

### Function
The pump can be supplied complete with a geared motor. It consists essentially of a housing with pump unit and an integral lubricant reservoir.

The delivery and control plungers of the pump element are driven by eccentric cams to which they are rigidly connected. As a result thereof, they are positively controlled.

An integral pressure relief valve protects the pump if a blockage occurs on the downstream side from the pump outlet. The pump need not be vented.
The BS-B pump is ideally suitable for applications where long main lines are used and a large number of lubrication points are to be reliably served from one central station. The pump is predominantly used in dual-line centralised systems.

### Product Features

- Discharge pressure adjustable up to max. 400 bar
- High reliability due to force control
- Discharge: 7 l/hr, 14 l/hr and 22 l/hr, depends on driving speed
- Gear motors
- Long service life thanks to the use of wear-resistant high-grade steel
- Compact and rugged design
- Lubricant: grease, liquid grease
- Surface: signal grey RAL 7004

### Function

The pump can be supplied complete with a geared motor. Basically it consists of a body with plunger assembly and reservoir. The rotation is converted inside the pump head into an oscillating movement. The BS-B double acting pump has two pairs of plungers (feed pistons and pilot pistons) which move simultaneously into a common bore.

Whilst one pair of pistons is on the suction stroke in one bore, the other pair forces the lubricant in a second bore into the pressure channel. The pilot pistons are positively-controlled, i.e. they are displaced mechanically with each cycle, thus preventing blocking, which may occur with hydraulically or spring-controlled plungers.

The required feed pressure is adjustable thanks to an integral pressure relief valve. In the event of an over-pressure situation occurring an additional safeguard (burst discs) are incorporated to protect the pump element from damage. The pump need not be bled.
grease lubrication pumps

## Pump FZ Series

<table>
<thead>
<tr>
<th>Technical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Version</strong></td>
</tr>
<tr>
<td><strong>Output</strong></td>
</tr>
<tr>
<td><strong>Outlet</strong></td>
</tr>
<tr>
<td><strong>Motor</strong></td>
</tr>
<tr>
<td><strong>Gear ratio</strong></td>
</tr>
<tr>
<td><strong>Pressure</strong></td>
</tr>
<tr>
<td><strong>Reservoir</strong></td>
</tr>
<tr>
<td><strong>Level (min/max)</strong></td>
</tr>
<tr>
<td><strong>Lubricant</strong></td>
</tr>
<tr>
<td><strong>Connections</strong></td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
</tr>
</tbody>
</table>

## Application

The FZ series type lubricator is a central plunger grease (oil) pump, which operates without valves and springs.

It is intended for use as a multi-line system with up to a maximum of 12 lubrication points. No additional divider valve is required.

The numerous drive ratios that are available i.e. 3:1 to 2880:1 make it a very versatile pump and it can be used from small systems to systems having a large number of lubrication points.

Each outlet can be connected to a progressive divider valve, including a sub-divider valve if necessary, to distribute the lubricant to several lubrication points.

## Product Features

- Numerous drive ratios available
- Pump can run anti-clockwise or clockwise
- Rugged construction results in minimal expenditure on maintenance and repair work
- Explosion protection available
grease lubrication pumps

**Technical Data**

<table>
<thead>
<tr>
<th>Discharge per outlet</th>
<th>1 suction channel</th>
<th>3 suction channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>ratio 6.5 : 1</td>
<td>170 cm³ / hr</td>
<td>500 cm³ / hr</td>
</tr>
<tr>
<td>ratio 34 : 1</td>
<td>30 cm³ / hr</td>
<td>100 cm³ / hr</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outlet</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 pump outlet body</td>
<td>up to 12 outlets</td>
</tr>
<tr>
<td>2 pump outlet body</td>
<td>up to 24 outlets</td>
</tr>
</tbody>
</table>

**Application**

The FW-A pump is of robust construction and is suitable for centralised lubrication systems for heavy machinery operating under severe conditions. The pump has no valves and is therefore extremely reliable.

**Product Features**

- Multi-line pump
- Lubricant: oil grease, liquid grease
- Surface: signal grey RAL 7004

**Function**

The worm which is attached to the drive shaft engages in the worm wheel on the vertically positioned driving bush and turns the grease scraper and screw, which forces grease from the reservoir through the strainer into the gear unit at the bottom.

Two bevel gears with a gear ratio of 1:1, transmit the rotary motion of the driving bush to the control cylinder, which carries the stroke-operating cam disc. For each rotation of the control cylinder, the cam disc fixed to it moves each piston (one for each outlet) up and down three times (suction and delivery stroke).

At each suction stroke, grease is sucked through the suction channel in the control cylinder. At each delivery stroke, the grease is forced out of the cavity, through the delivery channel, into the outlet port. The number of suction strokes per rotation of the cam disc is governed by the number of suction channels in the control cylinder which are open (1 or 3).

Note: The number of suction channels can be changed by removing or fitting grub screws AM 12 x 12 DIN 916.

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OMSA / Industrial Lubrication Equipment / Grease Lubrication Pumps / 4.6 / 0211

uncompromising engineering integrity
The Dynamis pump was designed and developed to serve as a multifunction automatic lubrication pump. Due to its compact size and modular design, the pump can be used in the following versions:

- Version with 1 or 2 outlets
- Version with built-on progressive divider valve
- Version for single-line system c/w electric relief valve
- Version for single-line system c/w hydraulic relief valve
- Version for spray lubrication with free outlet
- Version for spray lubrication with progressive divider valve

Technical Data

<table>
<thead>
<tr>
<th>Dynamis</th>
<th>Technical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlet</td>
<td>1 or 2</td>
</tr>
<tr>
<td>Output</td>
<td>0.84, 1.16, 1.58, 1.98 cc/min</td>
</tr>
<tr>
<td>Motor</td>
<td>24 V DC or 110-240 V AC, 50/60 Hz</td>
</tr>
<tr>
<td>Pressure</td>
<td>160/300 bar</td>
</tr>
<tr>
<td>Reservoir</td>
<td>2 / or 4 /</td>
</tr>
<tr>
<td>Level</td>
<td>Transparent reservoir and minimum level switch</td>
</tr>
<tr>
<td>Lubricant</td>
<td>Grease NLGI 2</td>
</tr>
<tr>
<td>Temperature</td>
<td>-40°C to +75°C</td>
</tr>
<tr>
<td>Connection</td>
<td>¼ inch BSP</td>
</tr>
<tr>
<td>Optional</td>
<td>Electronic control module</td>
</tr>
</tbody>
</table>

Application

The Dynamis pump can be used for single line, progressive and spray lubrication systems. The Dynamis pump can also be installed in the upside down position.
grease lubrication pumps

**Pump TB-D Hand Lever**

**Application**
For lubrication of presses, stamping presses, machine tools, conveyors, etc.

**Product Features**
- Multi-line pump
- Hand lever actuation
- Output volume max. 0.5 cm³/stroke
- Discharge pressure max. 25 bar
- Lubricant: grease
- Surface: signal grey RAL 7004

**Function**
By pulling the hand lever the piston is raised and grease is forced into the inner bore of the piston. During the upward motion of the hand lever the cross bore connects the inside chamber of the piston with the outlet ports one after the other. These ports are not on the same level and the ring groove of the cross port frees the way to the outlet ports consecutively. When returning the hand lever to its original position the piston is lowered and lubricant is sucked into the piston cavity.

**Pump TB-D Pneumatic**

**Application**
For lubrication of presses, stamping presses, machine tools, conveyors, etc.

**Product Features**
- Multi-line pump
- Pneumatic actuation
- Output volume max. 0.5 cm³/stroke
- Discharge pressure max. 100 bar
- Lubricant: grease
- Surface: signal grey RAL 7004

**Function**
By pressurising the pneumatic cylinder the piston is lifted, thus closing the first suction port. Then the lubricant inside the piston cavity is displaced via a valve seat and ball into the chamber. When the piston moves upwards, the cross bore provided, having an angular groove, reaches the outlet port. These ports are not on the same level so that the lubricant is discharged consecutively in a pre-metered quantity. Relieving the pneumatic cylinder allows the piston to return to its initial position, thus recharging the piston cavity with lubricant. With single-line and progressive systems the total feed volume of the pump is taken from outlet “X”. The “Y” port allows for the relieving of grease pressure when used in a dual-line system. The parameter determining the minimum pulse frequencies is an empirical value dependant upon lubricant, air pressure, number of outlets, and, last but not least, piping cross-sections and length of main feed line.
grease lubrication pumps

TTN Progressive Pump

Technical Data

<table>
<thead>
<tr>
<th>Outlet</th>
<th>1 to 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>8 cc/min</td>
</tr>
<tr>
<td>Motor</td>
<td>12 or 24 V DC</td>
</tr>
<tr>
<td>Pressure</td>
<td>248 bar</td>
</tr>
<tr>
<td>Reservoir</td>
<td>2 /, 4 / or 8 /</td>
</tr>
<tr>
<td>Level</td>
<td>Transparent reservoir and minimum level switch</td>
</tr>
<tr>
<td>Lubricant</td>
<td>Grease NLGI 000 - 2</td>
</tr>
<tr>
<td>Temperature</td>
<td>-25°C to +50°C</td>
</tr>
<tr>
<td>Connection</td>
<td>¼ inch BSP for pump element outlet</td>
</tr>
<tr>
<td>Optional</td>
<td>Hydraulic quick connector for refill</td>
</tr>
<tr>
<td>Optional</td>
<td>Electronic control module</td>
</tr>
</tbody>
</table>

Application

TTN progressive lubricators are ideally suited for off-road mobile machinery such as loaders, excavators, articulated trucks, graders, etc.

Function

Power supplied to an electric motor with gearbox drives an eccentric cam which engages with up to 3 spring loaded piston elements. This action creates a suction and pressure stroke of the piston elements, thereby displacing fixed volumes of lubricant through an outlet check valve. Each piston element comes with an adjustable external relief valve.
The VB-B pump has a single-action plunger operated by a hand lever. The lubricant reservoirs are available in 1, 1.6 or 4 litre versions.

The VB-B pump is designed for use with grease and semifluid greases. The VB-B pump is fitted with an anti-cavitation plate and a level indicator projecting through the reservoir cover.

When the hand lever is in the pressure release position, the delivery outlet is connected to the suction compartment of the pump. The pump can be used as a filling pump, or it can be used for single-line, dual-line or progressive systems. When used for dual-line systems, a 4/2-way valve is available as an accessory, and must be screwed into the delivery connection. In systems, which do not require depressurisation (progressive systems, filling and greasing systems), depressurisation can be prevented by installing a non-return valve in the main delivery line.

**Product Features**

- With follower piston and optical contents indication
- Discharge pressure max. 120 bar
- Lubricant: grease, liquid grease
- Surface: signal grey RAL 7004

**Function**

There are three positions for the hand lever, P, P1 and R. Moving the hand lever from P1 to P pumps the lubricant through the valve to the outlet. When the hand lever is moved in the opposite direction from P to P1, the suction stroke takes place. The lever can be moved on past the notch at position P1 into the position R, in which the pumps delivery and suction compartment are connected to one another.

Within the pump body, the drive shaft operates the cam, which in turn moves the delivery plungers axially. The space in front of the delivery plunger is connected with the pump suction chamber and the delivery outlet via a valve. The indicator unit shows when the maximum delivery pressure has been reached; it operates at the same time as the relief valve, and when the maximum pressure is exceeded it connects the pumps delivery compartment to the reservoir. There is a screw available that can be used to bleed the pump at start-up.
# grease lubrication pumps

<table>
<thead>
<tr>
<th>Pump ZP5000</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ZP5000 pump is used for direct lubrication in multi-line systems (one delivery element per lubrication point) or in large progressive systems.</td>
<td></td>
</tr>
</tbody>
</table>

## Product Features
- Multi-line pump
- Up to 16 lubrication points
- Maintenance-free
- Pressure range up to 160 bar
- Lubricant: oil, grease, liquid grease
- Surface: signal grey RAL 7004

## Function
The pump ZP5000 consists of the following main assembles:
- Pumping unit
- Drive
- Lubricant reservoir

The ZP5000 pump is driven by an electric motor via a reduction gearbox. Internally the output from the reduction gearbox is connected to a worm drive that drives the cam plates that activate the individual pumping elements.

The ZP5000 pump can be supplied with 1 or 2 pumping units installed opposite to each other with a maximum of 8 outlets each. The rate of delivery can be set infinitely from 0 to 0.2 cm³/stroke.

Pumps are delivered with the pumping elements outputs set to maximum.
## Electrical Drum Pump

<table>
<thead>
<tr>
<th>Technical Data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>Threaded</td>
</tr>
<tr>
<td>Size</td>
<td>¼ inch BSP</td>
</tr>
<tr>
<td>Electric motor</td>
<td>0.4 kW</td>
</tr>
<tr>
<td>Protection</td>
<td>IP 55</td>
</tr>
<tr>
<td>Voltage</td>
<td>230 V AC / 50 Hz</td>
</tr>
<tr>
<td>Output pressure</td>
<td>Up to 200 bar</td>
</tr>
<tr>
<td>Delivery</td>
<td>280 cm³/min</td>
</tr>
<tr>
<td>Viscosity</td>
<td>up to NLGI 3</td>
</tr>
<tr>
<td>Container size</td>
<td>5000 MPa</td>
</tr>
<tr>
<td></td>
<td>15 kg to 180 kg</td>
</tr>
</tbody>
</table>

### Application

The electrical drum pump is used as a refill pump for centralised lubrication systems where no compressed air is available.
# grease lubrication pumps

<table>
<thead>
<tr>
<th>Manual Drum Pumps</th>
<th>Technical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portable greasing container</td>
<td></td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td>Threaded</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>¼ inch BSP</td>
</tr>
<tr>
<td><strong>Output pressure</strong></td>
<td>Up to 20 bar</td>
</tr>
<tr>
<td><strong>Delivery, double stroke</strong></td>
<td>20 cm³/min</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>Up to NLGI 3 5000 MPa</td>
</tr>
<tr>
<td><strong>Container size</strong></td>
<td>5 kg to 50 kg</td>
</tr>
</tbody>
</table>

For greasing jobs where no electricity or air available

| Connection | Threaded |
| Size | ¼ inch BSP |
| Output pressure | 300 bar |
| Delivery, double stroke | 2 cm³/min |
| Viscosity | up to NLGI 2 5000 MPa |
| Container size | 14 to 18 kg, portable |

Hose and grease gun included

## Application

Manual grease pumps are used where no electricity or compressed air is available. The drum and pump are normally mounted on a trolley for ease of mobility.
Pneumatic Drum Pumps

Technical Data

<table>
<thead>
<tr>
<th></th>
<th>Threaded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>¼” BSP</td>
</tr>
<tr>
<td>Size</td>
<td></td>
</tr>
<tr>
<td>Air inlet pressure</td>
<td>2 bar to 10 bar (optimal 6 bar)</td>
</tr>
<tr>
<td>Viscosity</td>
<td>NLGI 1 to NLGI 3</td>
</tr>
<tr>
<td>Container size</td>
<td>15 kg to 180 kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure ratio air : grease</th>
<th>5 : 1</th>
<th>10 : 1</th>
<th>20 : 1</th>
<th>60 : 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grease output pressure at 6 bar</td>
<td>27</td>
<td>67</td>
<td>115</td>
<td>335</td>
</tr>
<tr>
<td>Air consumption // min</td>
<td>150</td>
<td>217</td>
<td>150</td>
<td>217</td>
</tr>
<tr>
<td>Delivery rate at pump outlet cm³ / min</td>
<td>1500</td>
<td>1190</td>
<td>890</td>
<td>500</td>
</tr>
</tbody>
</table>

Application

Pneumatic drum pumps are used as refill pumps for grease reservoirs whereby the drum pump is activated automatically by the signal from the low level switch in the grease reservoir. Pneumatic drum pumps are also used on Girth gear spray systems on mills and kilns.
## Oil Lubrication Pumps

### Screw Pumps

<table>
<thead>
<tr>
<th>Technical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flow</strong></td>
</tr>
<tr>
<td><strong>Pressure</strong></td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
</tr>
<tr>
<td><strong>Drive</strong></td>
</tr>
</tbody>
</table>

Pressure Relief Valve can be integral to the pump or fitted in-line

<table>
<thead>
<tr>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil circulation systems</td>
</tr>
<tr>
<td>Off-line filtering and cooling</td>
</tr>
<tr>
<td>Lubricating oil transfer</td>
</tr>
</tbody>
</table>

### Gear Pumps

<table>
<thead>
<tr>
<th>Technical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flow</strong></td>
</tr>
<tr>
<td><strong>Pressure</strong></td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
</tr>
<tr>
<td><strong>Drive</strong></td>
</tr>
</tbody>
</table>

Pressure Relief Valve can be integral to the pump or fitted in-line

<table>
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<tr>
<th>Application</th>
</tr>
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<tbody>
<tr>
<td>Oil circulation systems</td>
</tr>
<tr>
<td>Off-line filtering and cooling</td>
</tr>
<tr>
<td>Lubricating oil transfer</td>
</tr>
</tbody>
</table>

### Product Features

- Low noise
- Low pulsation
- Self priming
- Compatible with high viscosity
- Optimal performance - also with air in oil

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Website: www.omsa.co.za
Pressure relief valves (also called safety valves) are fitted downstream from the pump to protect the pump against overpressure. The required relief pressure can be adjusted by a setting screw which in turn holds a spring in the appropriate position.

Pressure relief valves are available in 2 designs:

- mounted directly to the pump
- mounted in-line downstream from the pump

### Technical Data

<table>
<thead>
<tr>
<th>Size: inch</th>
<th>½</th>
<th>¾</th>
<th>1</th>
<th>1½</th>
<th>2</th>
<th>1½</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relief setting: bar</td>
<td>2 - 60</td>
<td>2 - 60</td>
<td>2 - 60</td>
<td>2 - 60</td>
<td>2 - 25</td>
<td>0 - 7</td>
<td>0 - 7</td>
<td>0 - 7</td>
</tr>
<tr>
<td>Flow: l/min</td>
<td>3 - 10</td>
<td>10 - 20</td>
<td>20 - 50</td>
<td>50 - 100</td>
<td>100 - 400</td>
<td>30 - 300</td>
<td>100 - 600</td>
<td>200 - 1200</td>
</tr>
<tr>
<td>Viscosity: cSt</td>
<td>10 - 460</td>
<td>10 - 460</td>
<td>10 - 460</td>
<td>10 - 460</td>
<td>10 - 460</td>
<td>10 - 460</td>
<td>10 - 400</td>
<td>10 - 400</td>
</tr>
<tr>
<td>Temperature: ºC</td>
<td>0 - 100</td>
<td>0 - 100</td>
<td>0 - 100</td>
<td>0 - 100</td>
<td>0 - 100</td>
<td>0 - 100</td>
<td>0 - 100</td>
<td>0 - 100</td>
</tr>
</tbody>
</table>
**1000 Series Divider Valve**

The 1000 Series progressive divider valve distributes and proportions incoming oil or grease to bearing points. A typical divider valve consists of an inlet section, three to nine intermediate valve sections and an end section. One assembly can serve up to a maximum of 18 lubrication points.

Individual divider valve sections have a piston and built-in outlet check valves. Valve sections are offered in three output sizes. The discharge capacity of a valve section is determined by differing piston diameters in each valve section. Valve sections have two outlets located at either end (double outlet blocks) and a predefined volume of grease is delivered from each of the outlets during one valve cycle.

<table>
<thead>
<tr>
<th>Valve size</th>
<th>Metered volume/stroke</th>
<th>Max working pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0ST</td>
<td>0.005 cu in (0.082 cm³)</td>
<td>138 bar</td>
</tr>
<tr>
<td>10T</td>
<td>0.010 cu in (0.164 cm³)</td>
<td>138 bar</td>
</tr>
<tr>
<td>15T</td>
<td>0.015 cu in (0.264 cm³)</td>
<td>138 bar</td>
</tr>
</tbody>
</table>

**3000 Series Divider Valve**

The 3000 Series progressive divider valve distributes and proportions incoming oil or grease to bearing points.

A typical divider valve consists of an inlet section, three to ten intermediate valve sections and an end section. One assembly can serve up to a maximum of 20 lubrication points.

Individual divider valve sections have a piston and built-in outlet check valves. Divider valves are offered in six output sizes. The discharge capacity of a valve section is determined by differing piston diameters in the individual valve sections.

<table>
<thead>
<tr>
<th>Valve size</th>
<th>Metered volume/stroke</th>
<th>Max working pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2ST</td>
<td>0.025 cu in (0.410 cm³)</td>
<td>207 bar</td>
</tr>
<tr>
<td>5ST</td>
<td>0.050 cu in (0.820 cm³)</td>
<td>207 bar</td>
</tr>
<tr>
<td>7ST</td>
<td>0.075 cu in (1.230 cm³)</td>
<td>207 bar</td>
</tr>
<tr>
<td>100T</td>
<td>0.100 cu in (1.639 cm³)</td>
<td>207 bar</td>
</tr>
<tr>
<td>125T</td>
<td>0.125 cu in (2.049 cm³)</td>
<td>207 bar</td>
</tr>
<tr>
<td>150T</td>
<td>0.150 cu in (2.459 cm³)</td>
<td>207 bar</td>
</tr>
</tbody>
</table>

**DD Series Divider Valve**

DD Valves are dual-line divider valves that are hydraulically operated. They will deliver either oil or grease, and each pair of outlets can be adjusted to discharge a predefined volume of grease and are fitted with motion indicators. Each pair of outlets can be converted to a single outlet by the removal of an internal grub screw. For example, a 4-way divider valve can serve from four to eight lubrication points.

DD Valves can be supplied in several basic discharge capacities and are available in 1-, 2-, 3- or 4-way valves.

<table>
<thead>
<tr>
<th>Valve size</th>
<th>Metered volume/stroke</th>
<th>Max working pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td>DD-2X</td>
<td>0.09 cm³</td>
<td>0.59 cm³</td>
</tr>
<tr>
<td>DD-5X</td>
<td>0.18 cm³</td>
<td>4.74 cm³</td>
</tr>
</tbody>
</table>
lubricant divider valves

DDM/SDM Modular Divider Valve

Modular dual-line divider valves are ideal for applications where a varying range of lubricant quantities is needed from a single divider valve. All the moving parts are in the removable upper section. The removable upper section mounts onto a manifold with 2-20 outlets. The DDM/SDM upper valve sections can be replaced individually, therefore it is not necessary to change an entire divider valve in the event of a malfunction.

Features

- Each module can be individually adjusted within its capacity to suit the bearing requirements (adjusts a pair of outlets).
- All moving points are contained in the upper valve section.
- A malfunctioning upper valve section can be changed in minutes, reducing maintenance time and costs.
- Positive hydraulic operation - within design limitations, these valve assemblies can be mounted long distances from the central pumping station.
- Visual indicator showing operation of each upper valve section.
- Body protected by corrosion resistant electroplating.

DM Series Divider Valve

The DM divider valves are hydraulically operated and will deliver either oil or grease, and each pair of outlets can be adjusted to discharge a predefined volume of grease and are fitted with motion indicators. DM divider valves always have one discharge port per pair of outlets located on the bottom of the divider valve.

DM divider valves can be supplied in several basic discharge capacities and are available in 1-, 2-, 3- or 4-way valves.

<table>
<thead>
<tr>
<th>Valve size</th>
<th>Metered volume/stroke</th>
<th>Max working pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min cm³</td>
<td>Max cm³</td>
</tr>
<tr>
<td>DM-3X</td>
<td>0.19 cm³</td>
<td>1.18 cm³</td>
</tr>
<tr>
<td>DM-4X</td>
<td>0.59 cm³</td>
<td>2.21 cm³</td>
</tr>
<tr>
<td>DM-5X</td>
<td>1.23 cm³</td>
<td>5.01 cm³</td>
</tr>
<tr>
<td>DM-6X</td>
<td>2.95 cm³</td>
<td>13.11 cm³</td>
</tr>
</tbody>
</table>

DX Series Divider Valve

The DX Valve is available with varying number of outlets for use with any conventional portable type, lubrication gun to serve a limited number of lubrication points where the installation of a complete centralised lubrication system would not be justified. This unit is widely used for the lubrication of materials handling equipment, trucks, presses, machine tools and large or small pieces of equipment with isolated groups of lubrication points.

These systems provide low cost centralised lubrication to small groups of isolated lubrication points, i.e. 4 to 12 lubrication points.

This system offers the following advantages:

- Reduction in the number of grease nipple connections required
- Lubrication from a safe, convenient central point
- Control of quantity of lubricant going to the lubrication points (the amount delivered to each pair of lubrication points is adjustable).

<table>
<thead>
<tr>
<th>Metered volume/stroke</th>
<th>Max working pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.19 - 1.18 cm³</td>
<td>240 bar</td>
</tr>
</tbody>
</table>
lubricant divider valves

FD Series Divider Valve

The FD Series divider valves are designed for use in series progressive oil and grease lubrication systems. They are of two piece, steel construction with viton O-ring seals. FD valves will serve 2, 3, 4 or 6 lubrication points. The 2, 3 and 4 point divider valves require 0.08 cubic inches to complete one full cycle. An FD-6 divider valve requires 0.06 cubic inches to complete one full cycle.

Max working pressure
207 bar

M2500 Series Divider Valve

The M2500 Series divider valves are designed for use in series progressive oil and grease lubrication systems. Modular construction makes these divider valves easy to install, modify and maintain, without removing any tubing.

As the lubricant is pumped into the divider valve, the internal pistons will cycle in a pre-arranged sequence. An indicator pin can be supplied on one of the valve sections to provide visual indication that the divider is cycling. Furthermore, a limit switch can be attached to the indicator pin to provide an electrical feedback that the divider is cycling.

Up to 20 lubrication points can be lubricated from one divider valve assembly. Series progressive systems can consist of a master divider valve assembly, supplying lubricant to several slave divider valve assemblies. This permits the lubrication of a hundred or more lubrication points from one master divider valve assembly with one pumping unit. Upper valve sections have differing piston diameters and can be configured as single outlet or twin outlet, thus making the system capable of servicing lubrication points with large variances of volume requirements.

<table>
<thead>
<tr>
<th>Valve size</th>
<th>Metered volume/stroke</th>
<th>Max working pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twin outlet</td>
<td>Single outlet</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>0.08 cm³</td>
<td>0.16 cm³</td>
</tr>
<tr>
<td>10</td>
<td>0.16 cm³</td>
<td>0.33 cm³</td>
</tr>
<tr>
<td>15</td>
<td>0.25 cm³</td>
<td>0.49 cm³</td>
</tr>
<tr>
<td>20</td>
<td>0.33 cm³</td>
<td>0.66 cm³</td>
</tr>
<tr>
<td>25</td>
<td>0.41 cm³</td>
<td>0.82 cm³</td>
</tr>
<tr>
<td>30</td>
<td>0.49 cm³</td>
<td>0.98 cm³</td>
</tr>
<tr>
<td>35</td>
<td>0.57 cm³</td>
<td>1.15 cm³</td>
</tr>
<tr>
<td>40</td>
<td>0.66 cm³</td>
<td>1.31 cm³</td>
</tr>
</tbody>
</table>
lubricant divider valves

### PVB Series Divider Valve

The PVB series divider valves are applied in small progressive lubrication systems which provide a cost saving and efficient solution for lubrication points with relatively low pressure and small volume requirements. Used for machine tools and processing machinery, presses of every type, plastic and paper processing machines, textile machines, printing and packaging machinery, etc.

### Application

- Progressive divider valve design
- Grease and oil
- Up to 20 outlets with the use of 6mm delivery lines
- Metered volume 0.17 cm³/stroke
- Material: steel
- With built-in outlet check valve
- Max working pressure - 160 bar

### Design and Function

The divider valves are available in sizes ranging from 6 to 20 outlets. Valve sections can be converted from twin outlets to single outlets with use of fittings to alter the internal porting of the valve section.

Lubricant pumped into the divider valve is directed through the valve via internal porting and the pistons in each valve section. The pistons deliver a metered amount of lubricant to each lubrication point. The divider valve can be supplied with an indicator pin to visually check the cycling of the divider valve. A limit switch can also be attached to the indicator pin to monitor the system electrically.
The ZP Series divider valves are used to divide and meter lubricant in total loss centralised lubrication systems (oil, liquid grease and grease) and in oil recirculation systems suitable for small, medium and large machine applications.

**Product Features**

- Progressive divider
- Electronic monitoring possible
- Grease, liquid grease and oil

<table>
<thead>
<tr>
<th>Versions</th>
<th>Metered volume/stroke</th>
<th>Flow volume/min</th>
<th>Working pressure</th>
<th>Outlets</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZP-A</td>
<td>0.1 cm³, 0.2 cm³, 0.3 cm³</td>
<td>min. 0.5 cm³</td>
<td>max. 1000 cm³</td>
<td>max. 160 bar up to 24</td>
</tr>
<tr>
<td>ZP-B</td>
<td>0.5 cm³, 1.5 cm³, 2 cm³</td>
<td>min. 0.5 cm³</td>
<td>max. 1500 / 3000 / 5000 cm³</td>
<td>max. 300 bar up to 24</td>
</tr>
<tr>
<td>ZP-C</td>
<td>0.1 cm³, 0.2 cm³, 0.3 cm³</td>
<td>min. 0.5 cm³</td>
<td>max. 1000 cm³</td>
<td>max. 160 bar up to 24</td>
</tr>
<tr>
<td>ZP-D</td>
<td>0.5 cm³, 1.5 cm³, 2 cm³</td>
<td>min. 0.5 cm³</td>
<td>max. 1500 / 3000 / 5000 cm³</td>
<td>max. 300 bar up to 22</td>
</tr>
</tbody>
</table>

**Function**

The ZP divider valve series consists of several individual segments that are bolted together and sealed against each other.

Depending on the arrangement within the divider valve, the following segment types are available:

- Inlet - or A-segment
- Intermediate - or M-segment
- End - or E-segment

The ZP divider valve series is designed to divide the lubricant volume (oil or grease) received under pressure into metered volumes and to deliver the lubricant to each point with up to a possible 24 outlets. This is achieved due to pistons which are moved by the lubricant being fed under pressure, through the internal porting of the divider valve.

The divider valve will cycle continuously while the lubricant is being fed to the divider valve under pressure.

The divider valves are equipped with outlet check valves which ensure positive displacement of the lubricant to the lubrication point, irrespective of the back pressure at the lubrication point. An indicator pin can be supplied on one of the valve sections for visual indication, or by attaching a limit switch to achieve electrical monitoring of the effective cycling of the divider valve.
The ZV divider valve series is used for dual-line centralised lubrication systems for grease and for oil. The function of the ZV divider valve series is to deliver a metered amount of lubricant to any number of lubrication points, irrespective of the back pressures at the respective lubrication points.

**Product Features**

- Dual-line divider valve (type F with flange plate)
- Grease and oil
- Material: steel

<table>
<thead>
<tr>
<th>Versions</th>
<th>Metered volume/stroke</th>
<th>Outlets</th>
<th>Max. working pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZV-B</td>
<td>0.5 cm³, 1.5 cm³, 3 cm³</td>
<td>up to 8</td>
<td>400 bar</td>
</tr>
<tr>
<td>ZV-C</td>
<td>2.5 cm³ - 15 cm³ (adjustable)</td>
<td>up to 4</td>
<td>400 bar</td>
</tr>
<tr>
<td>ZV-F</td>
<td>1.5 cm³, 3 cm³</td>
<td>up to 8</td>
<td>400 bar</td>
</tr>
</tbody>
</table>

**Design**

The ZV divider valve series is a block type design, and is available with different ranges of volume output. Each divider valve has two threaded holes (¼ inch BSP) on two faces for the connection of the two main lines in and out of the divider valve. The outlet ports (¼ inch BSP) are situated on the other two faces of the divider valve and there can be 2 to 8 outlets, depending on the size of the divider valve being used.

**Function**

The ZV divider valve series has one metering piston and one control piston for each pair of outlets. One main line is pressurised, while the other main line is relieved of pressure. The outlets that are closest to the pressurised main line will deliver lubricant to the lubrication points. As a result, an operating cycle always includes two lubricating strokes.

A dual-line system operates with two main lines. One line is pressurised and one half of the divider valve is cycled, while the other main line is depressurised. An end of line switch senses a pre-set pressure, which is the signal for a change-over to be activated, and the line that was depressurised now becomes the pressurised line and the second half of the divider valve is cycled. The previously pressurised line is now depressurised. The second end of line pressure switch is activated and on activation of the pressure switch the overall system goes into a pause period.
lubricant divider valves

<table>
<thead>
<tr>
<th>ZE-C, ZE-E, ZE-G Divider Valves</th>
<th>Technical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Injector Type</strong></td>
<td>ZE-C</td>
</tr>
<tr>
<td>Application</td>
<td>Single-line system</td>
</tr>
<tr>
<td>Lubricant Oil</td>
<td>460 cSt</td>
</tr>
<tr>
<td>Grease</td>
<td>NLGI 02</td>
</tr>
<tr>
<td>Configuration</td>
<td>1, 2 and 3 Outlets</td>
</tr>
<tr>
<td>Manifold</td>
<td>N/A</td>
</tr>
<tr>
<td>Metered Volume</td>
<td>0,2 / 0,4 / 0,6 ccm</td>
</tr>
<tr>
<td>Material</td>
<td>Alu, Steel, Brass</td>
</tr>
<tr>
<td>Seals</td>
<td>NBR</td>
</tr>
<tr>
<td>Work Pressure</td>
<td>15 - 160 bar</td>
</tr>
<tr>
<td>Relief Pressure</td>
<td>25 bar</td>
</tr>
<tr>
<td>Connection Element</td>
<td>£¼ inch BSP - 6/8/10 tube</td>
</tr>
<tr>
<td>Manifold</td>
<td>£¼ inch BSP - 4/6/8 tube</td>
</tr>
</tbody>
</table>

**Design of ZE-C**

The ZE-C injectors are a compact design and come in 1, 2 or 3 outlet versions. Metering elements with differing output volumes can be selected as required.

**Design of ZE-E**

The ZE-E injectors are designed for single-line systems. A metered volume of lubricant is discharged to the lubrication point after each pressure stroke.

**Design of ZE-G**

The ZE-G injectors are designed for single-line systems. A metered volume of lubricant is discharged to the lubrication point after each pressure stroke.
control valves

### Change-over Valve SA-V

**Application**

The SA-V valve is an electrically operated change-over valve used in dual-line systems. When used in dual-line centralised systems the valve works in conjunction with the SG-A switching device shown below.

**Product Features**

- Function 4/2-way
- Powered with a geared DC motor
- Working pressure max. 400 bar

**Design**

Operation by means of a geared DC motor with high torque ensuring reliable action even under unfavourable operating conditions (e.g. low temperatures or viscous lubricant).

The valve has a short operating time and a short stroke during the change-over action and is therefore not subject to premature wear.

Each of the plunger end positions is electrically monitored by a limit switch.

The motor's overrun and direction of rotation do not affect the limit switch setting or the operation of the change-over. A transformer, rectifier and automatic cut-out are incorporated for connection to an AC 110-127 V or 200-240 V supply.

### Switching Device SG-A

**Application**

The SG-A switching device is used as a differential pressure switch in dual-line centralised lubrication systems. When the differential pressure reaches 50 bar, the switch is activated and the control valve changes over to the second line.

**Product Features**

- Switching pressure differential 50 or 100 bar
- Working pressure 400 bar

**Design**

The SG-A switching device is a hydraulically operated valve mounted on a common base plate with a limit switch to sense when a predefined pressure differential has been reached.

**Function**

In a dual-line lubrication system there are 2 main lines:

- one line under pump pressure and
- the other line relieving back to the grease reservoir.

The function of the electrical SG-A switching device is to reverse the flow of the dual lines by signalling the change-over valve SA-V (shown above) to change over.
## DR4-Way Valve

**Application**
The DR4 is a hydraulically operated directional control valve for use with dual-line centralised lubrication systems.

**Function**
The valve consists of two sections. A flow control portion that directs the flow of lubricant from the pump to one of the supply lines and a pressure control portion that contains the spring loaded piston against which the pump pressure is directed.

The reversing valve change-over pressure is governed by the spring load which can be adjusted to suit the installation. When all the dual-line divider valves in the system have moved in one direction, pressure will build up on a pilot piston which acts against a toggle. When the vertical force of this toggle equates to that of the spring, it will snap over into the opposite position. This directs a pilot flow onto one end of the flow directing piston and relieves its other end to the reservoir, thus moving it over to direct the flow of lubricant to the opposite supply line and relieving the originally pressurised line back to the reservoir.

A limit switch is mounted near to the reversing valve and this switch is actuated by a pin attached to the flow directing piston. When this moves to either make or break the switch, a signal is sent to the system controller to stop the pump and start a pause period.

On the DR4 valve (non-return system), the two pipelines do not return to the reversing valve but the reversal pressure is sufficient for the operation of all the measuring valves. This unit is factory set at 310 bar unless it is previously known that higher pressures are required.

## SA-K Change-over Valve

**Application**
The SA-K is a hydraulic change-over valve to use with dual-line centralised lubrication systems. The design of the 4/2-way valve ensures a permanent flow of the lubricant through the internal passageways, thus avoiding the possibility of the change-over valve becoming inoperative due to the hardening of old lubricant in the internal passageways.

**Product Features**
- Function 4/2-way
- Hydraulically controlled
- Working pressure adjustable up to 250 bar or up to 350 bar
- Motion indicator

**Function**
When one line is pressurised the other line is depressurised. As the pressure builds up in the pressurised line it will reach the pressure at which the change-over valve was set. At this point the valve changes over hydraulically and the previously pressurised line is now relieved and depressurised and the previously depressurised line is pressurised.

The change-over pressure is adjustable up to maximum of 250 and/or 350 bar by means of a pressure relief valve. It is necessary to ensure that the change-over pressure does not exceed the max. delivery pressure of the lubrication pump being used. The respective position of the 4/2-way valve can be monitored by using one limit switch or two electrical switches and enables the pump to be switched off on completion of the lubrication cycle.