

# SKF Dry Lubrication Systems for conveyors



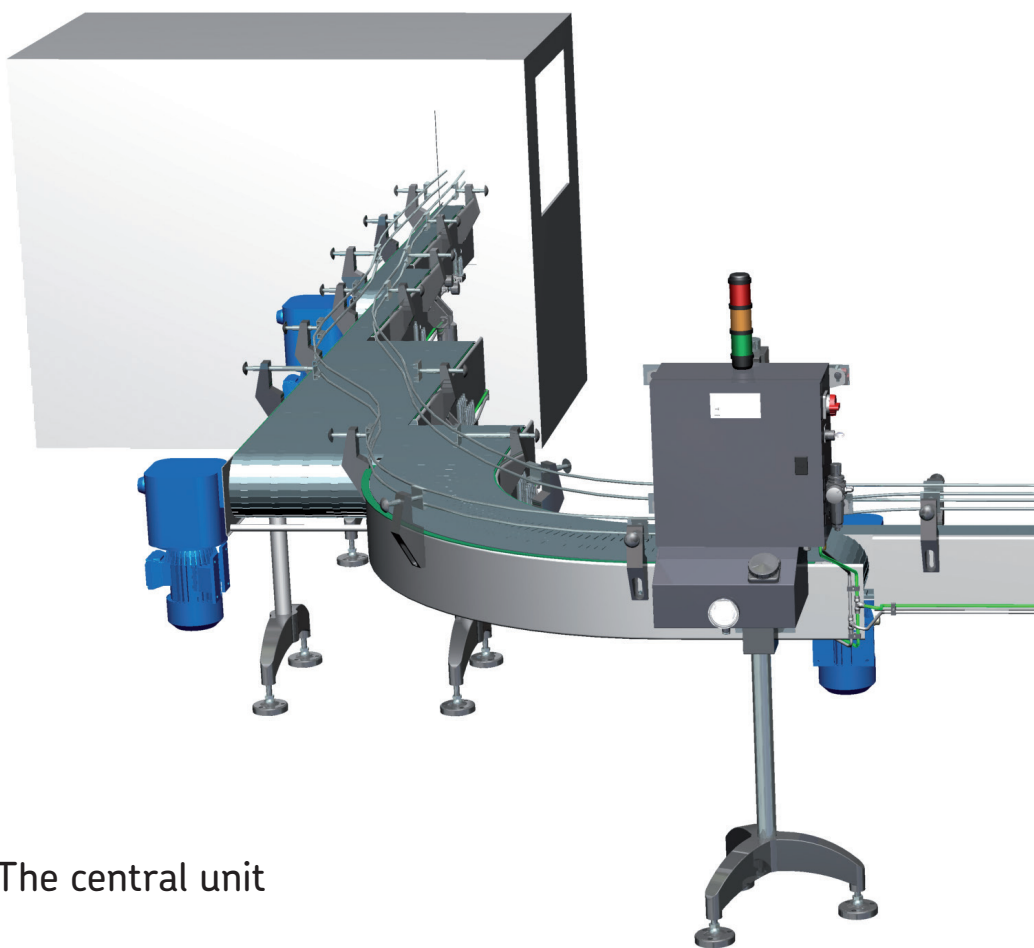
- Autonomous system for up to 200 lubrication points
- Lubrication of the conveyor chain surfaces and guides
- Intermittent lubrication controlled and monitored by an integrated control unit
- PTFE-based dry film lubricant, no water or soluble lubricants

## SKF Dry Lubrication Systems for conveyors

The SKF Dry Lubrication Systems, using a special lubricant, have been developed to lubricate conveyor chain surfaces, as well as chain guides, for the transport of products in bottling and packaging unit.

The association of this special lubricant and the SKF Dry Lubrication System replace the classic wet lubrication systems. This lubricant, suitable for the food and beverage industry, leaves a dry film on the chain surfaces and guides for a better sliding quality.

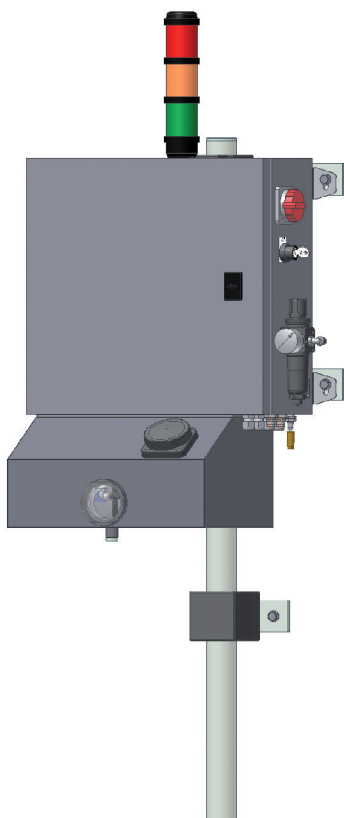
The aim of the SKF Dry Lubrication Systems is to deliver automatically and precisely the right quantity at the right friction point (chain surface or guides) from a central unit, which can feed up to 200 lubrication points in accordance with the production process.

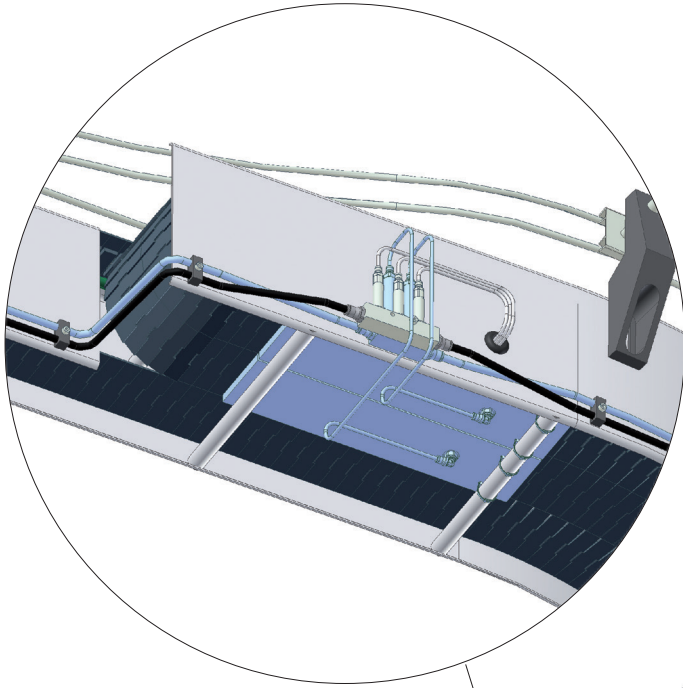


### The central unit

The central unit supplies the lubricant to the volumetric distributors via the primary circuits.

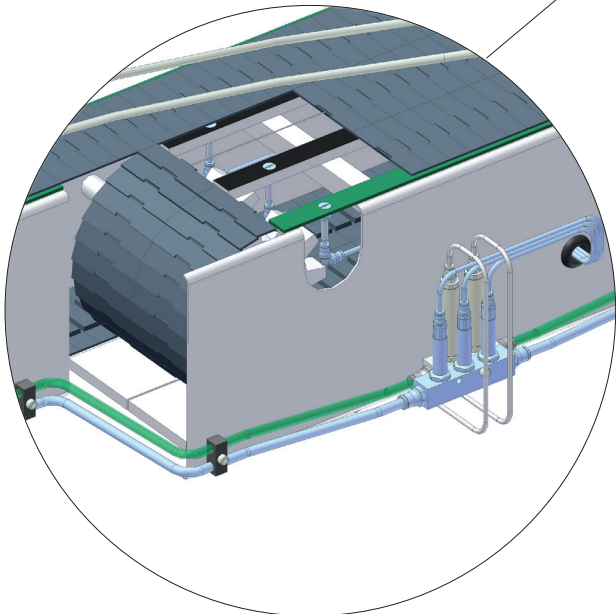
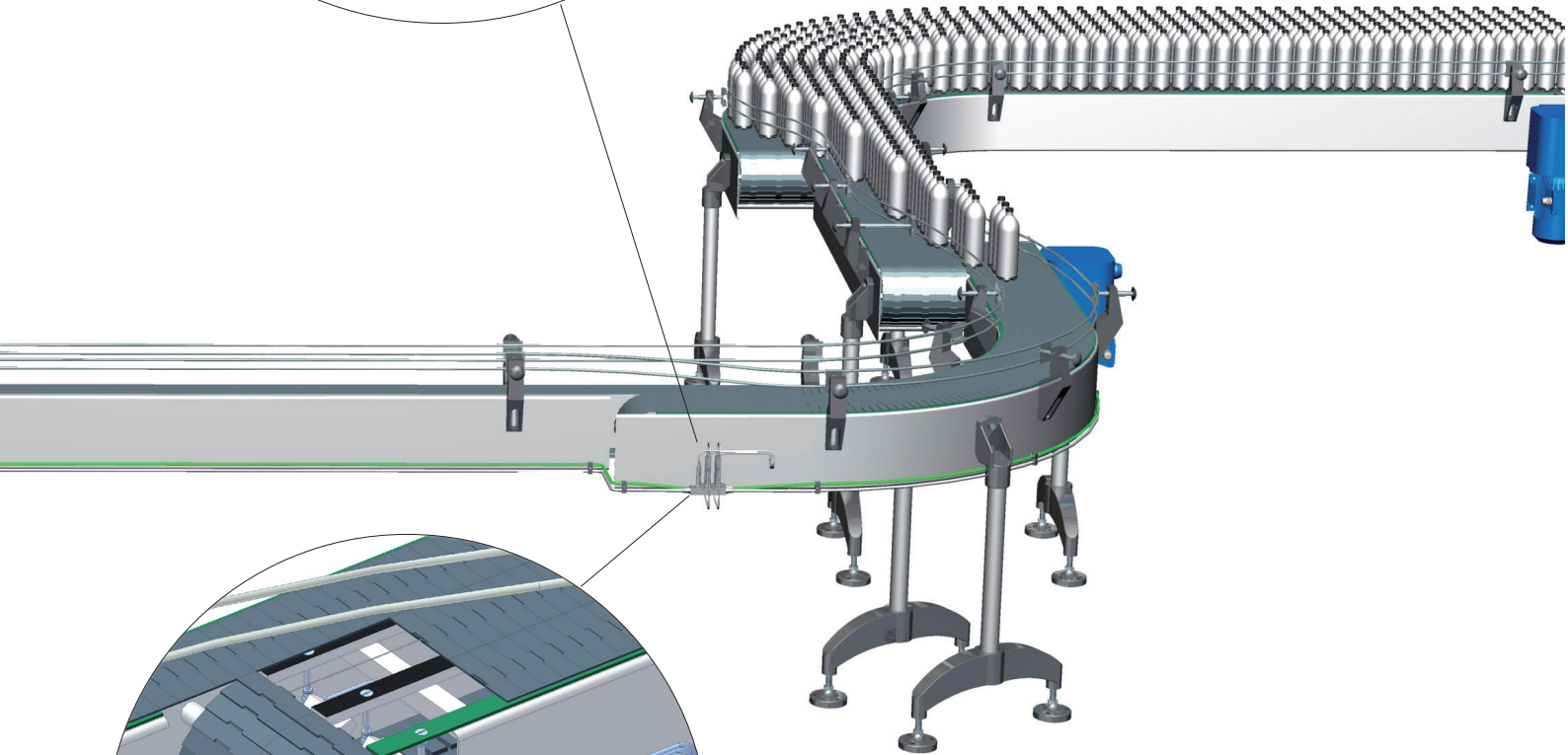
It comprises the pneumatically driven pump unit and the lubricant reservoir. A control unit is integrated in the central unit. It controls and monitors the whole lubrication system.





## The lubrication of the chain surfaces

The piston distributors, with adjustable metered volume, feed the chain surfaces with lubricant. They deliver intermittently a metered volume of lubricant via a secondary line to lubrication plates, which are located under the chain at the end of the return strand. The chain surface sliding on the lubrication plate will be coated with lubricant.



## The lubrication of the chain guides

The preset piston distributors feed the chain guides with lubricant. They deliver intermittently a metered volume of lubricant via a secondary line to lubrication screws, which are inserted into the guide.

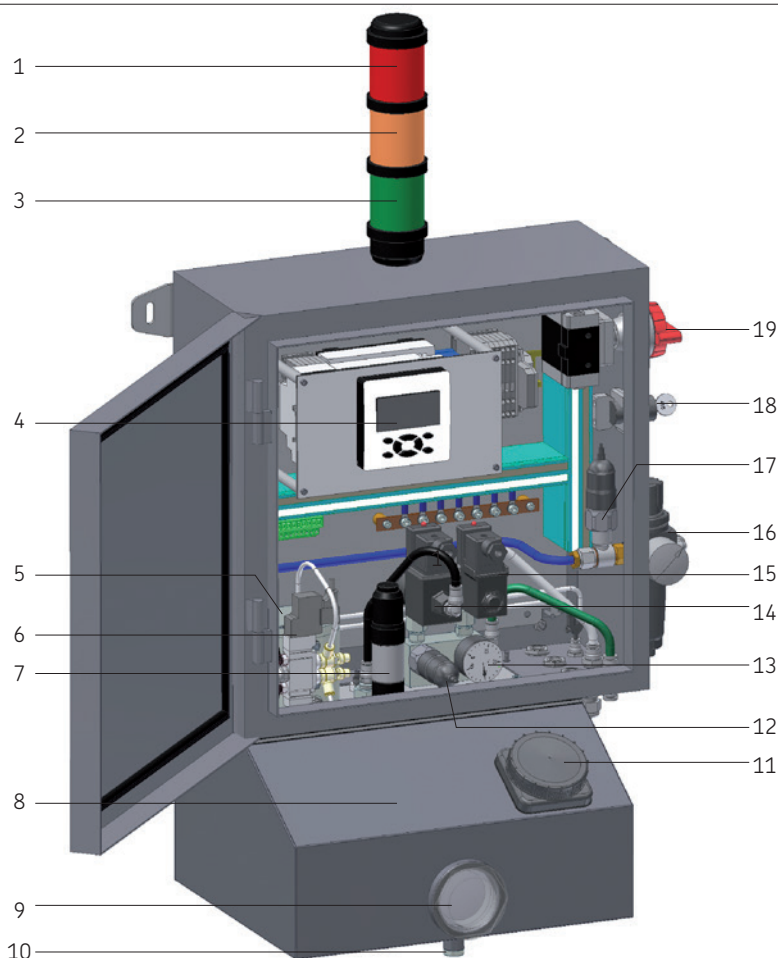
## Central unit

This stainless steel central unit comprises all the components necessary to supply the lubrication circuits

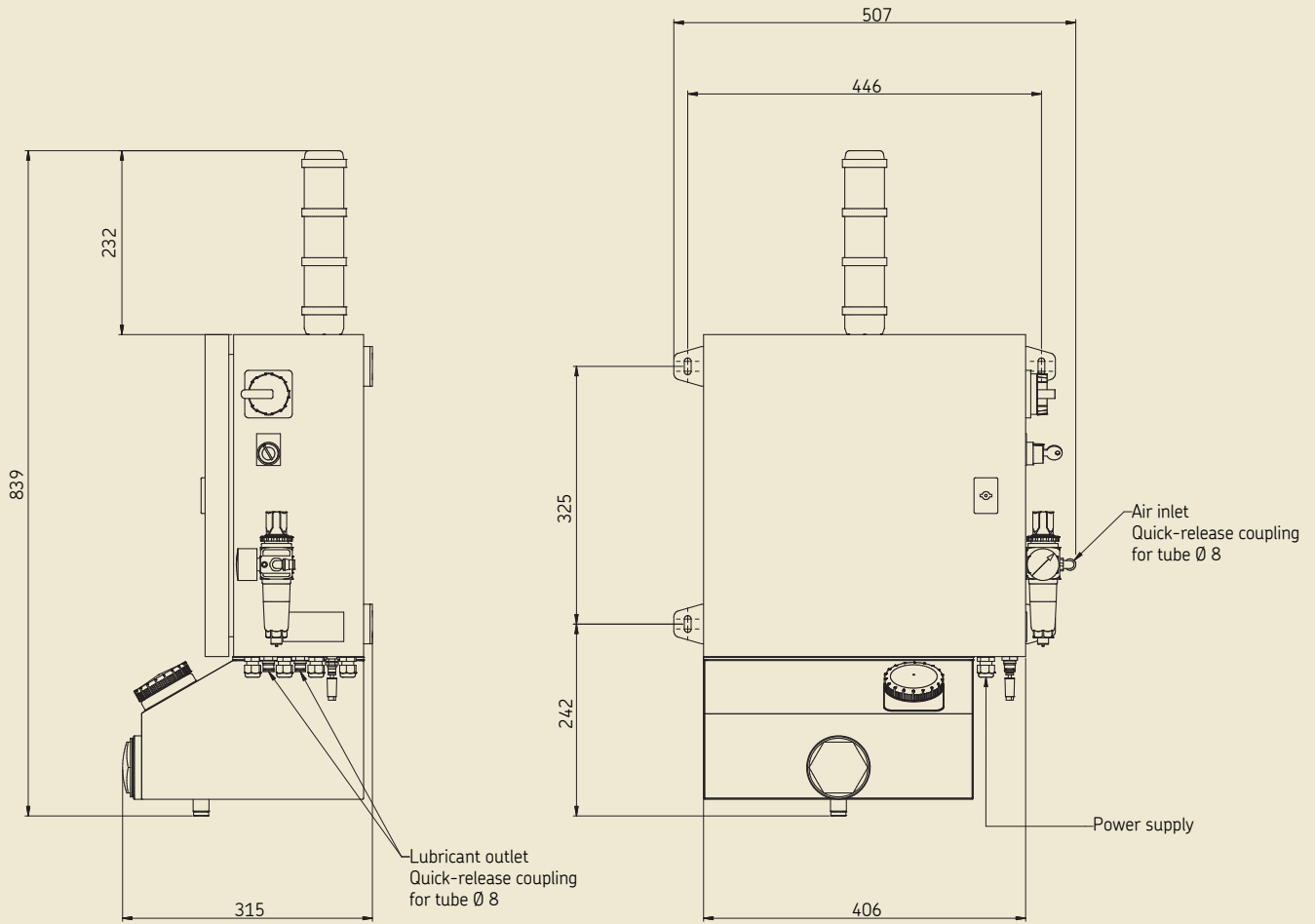
- Pneumatically driven piston pump unit to feed the lubrication lines with lubricant
- Two lubricant outlets (circuit for the lubrication of the chain surfaces and circuit for the lubrication of the chain guides)
- Reservoir with an useful capacity of 10 liters with sight glass to check the lubricant level and agitator
- Regulator-filter and manometer outside the central unit of the pressurized air supply
- Integrated control unit with LCD display and keyboard. This allows the user to program the lubrication parameters on the control unit and to monitor the system.
- Light signal displays the status of the lubrication cycle. The user can get more detailed information from the control unit display.
- Lubricant pressure is monitored at the the pump outlet using a pressure switch and manometer.
- Intermediate lubrication switch to launch an additional lubrication cycle at any time



Central unit LS1200+1ES



- 1 Red signal light, failure
- 2 Orange signal light, warning
- 3 Green signal light, lubrication
- 4 Programmable control unit
- 5 Pneumatically driven piston pump
- 6 Pump control solenoid valve
- 7 Motor of the reservoir agitator
- 8 Lubricant reservoir
- 9 Sight glass
- 10 Reservoir draining plug
- 11 Reservoir filling plug
- 12 Lubricant pressure switch
- 13 Lubricant manometer
- 14 Relief solenoid valve
- 15 Solenoid valve, circuit 2 lubrication
- 16 Air inlet regulator-filter
- 17 Air pressure switch
- 18 Intermediate lubrication switch
- 19 Switch-disconnector



**Technical data**

Number of lubrication points	max. 200
Circuit length	max. 200 m for each circuit
Air inlet pressure	4 to 10 bars
Air inlet pressure set at	5 bars
Air consumption	2 NI/min
Pump flow rate	20cm <sup>3</sup> /stroke
Pump working frequency	1 stroke/5 s
Pump pressure ratio	1:4
SKF Lubricant	LDS 1
Other lubricants	please, consult us
Reservoir capacity	total 13 l, useful 10 l
Service temperature	0 to 50 °C
Operating voltage	88 to 250 V AC
Frequency	47 to 63 Hz
Current max.	1 A
Protection	IP54

**Material of the components**

Cabinet	stainless steel 304
Pump	stainless steel 303, seals FKM
Solenoid valve circuit 2	stainless steel 303, seals FKM
Solenoid valve, relief	stainless steel 316L, seals FKM
Manometer	stainless steel 304L
Lubricant pressure switch	stainless steel 303, seals FKM

**Order information**

**LS central unit**

Order No. .... **LS1200+1ES**

See important product usage information on the back cover.  
See operating instruction 951-130-461.

## Function

A pneumatically driven piston pump supplies lubricant to the lubrication circuits. The pressurized air comes from the user network and is regulated (**R1**) at 5 bars and filtered (**FI**) before entering into the central unit. The pump sucks the lubricant from the reservoir, which is under the central unit. An agitator (**AG**) is regularly actuated to ensure the homogeneity of the lubricant.

At the beginning of the lubrication cycle (the length is adjustable) the control unit launches a lubrication phase. The pneumatic pump (**P**) is actuated via the solenoid valve (**Y2**). It has a working frequency of 1 stroke/5 s for a flow rate of 20 cm<sup>3</sup>/stroke. It delivers lubricant to the first circuit (**C1**), for the lubrication of the

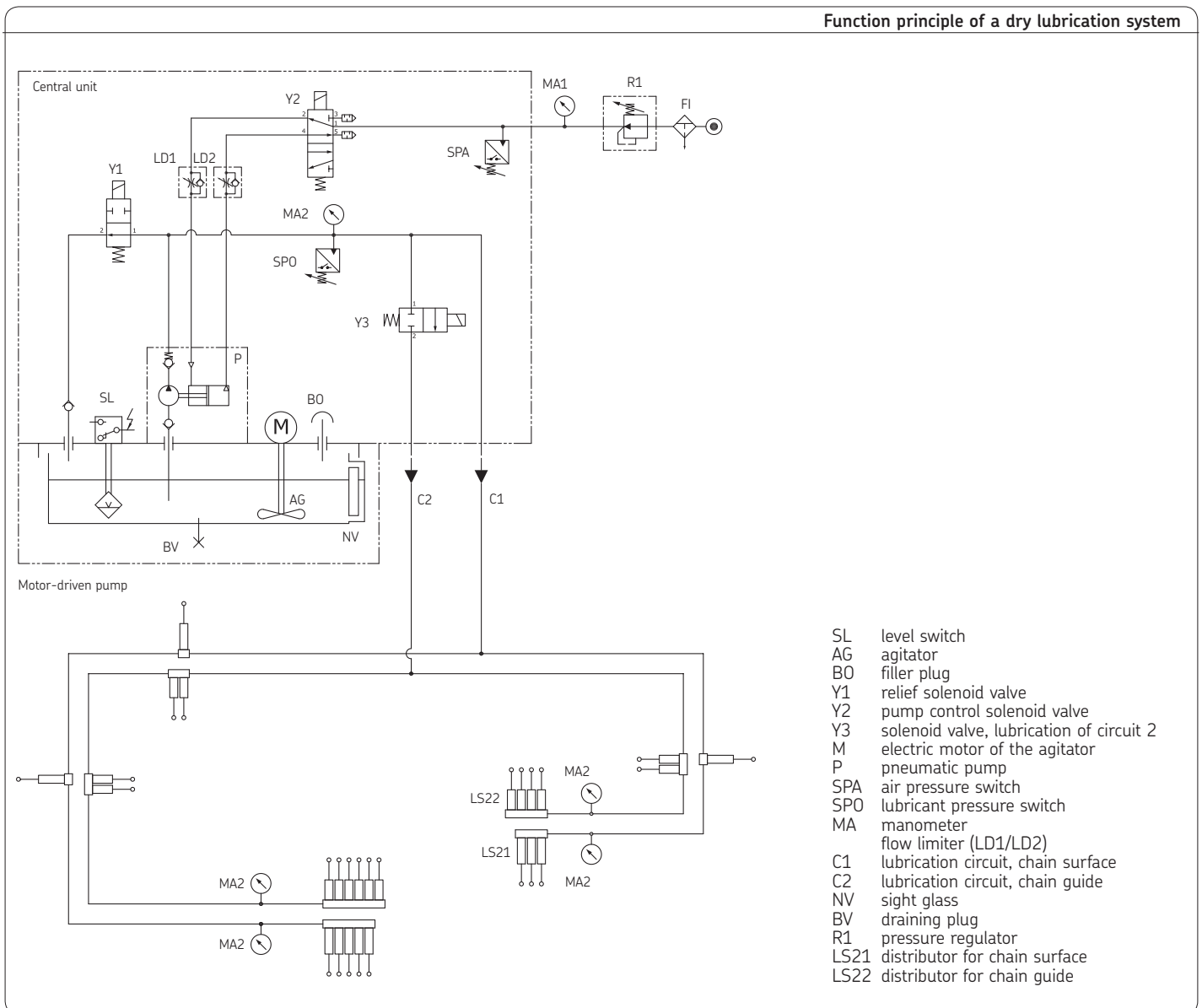
chain surfaces. The relief solenoid valve (**Y1**) is closed to prevent the lubricant to flow back to the reservoir.

When the operating pressure of 12 bars has been reached at the pump outlet, the pressure switch **SPO** is activated. The pump keeps running during a preset time (holding time, set at 60 s) to be sure to reach the optimal lubrication pressure (ca. 20 bars) over the whole circuit. Manometers (**MA2**) are mounted at the end of the circuit, before the last distributors, to check the pressure build-up in each circuit.

When the holding time has elapsed, the pump is switched off. The relief solenoid valve

**Y1** is opened and the pressure in the circuit begins to relieve.

The lubrication of the chain guides is performed with the second circuit (**C2**), which operating frequency depends on the operation of the first circuit. When the first circuit has carried out **n** lubrication cycles (adjustable), the control unit opens a solenoid valve (**Y3**). The pump is now supplying lubricant to both circuits.







### Integrated control unit

The central unit has an integrated control unit. The user can set the lubrication parameters according to his needs.

This control unit is very easy to use. The user can see on the LCD display the evolution of the lubrication cycles and eventually read the warning and failure messages. The control unit has nine keys to adjust and navigate between the parameters.

- Independent control of the lubrication cycles for the lubrication of the chain surfaces and chain guides.
- Real time display of the evolution of the lubrication cycle
- Selection of 1 or 2 lubrication circuits
- Lubricant level monitoring
- Lubricant pressure monitoring
- Four languages available for the standard version (English, French, German and Spanish)
- Password protected parameters

### Lubrication parameters

#### Lubrication cycle time

The lubrication cycle time is the time between two starts of lubrication cycles.

The lubrication cycle comprises:

- The lubrication phase: the pump is running and a metered quantity of lubricant is delivered to every lubrication point.
- The lubrication phase: the pump is not running.

Lubrication cycle time **T<sub>c</sub>**

5 min < **T<sub>c</sub>** < 99 h 59

#### Lubrication frequency

The lubrication circuit 2 is dedicated to the lubrication of the chain guides. Generally the guides don't need to be lubricated as often as the chain surfaces. Therefore the lubrication of circuit 2 can be carried out once every **n** lubrication cycles of circuit 1.

Lubrication frequency of circuit 2 **n**

1 < **n** < 99

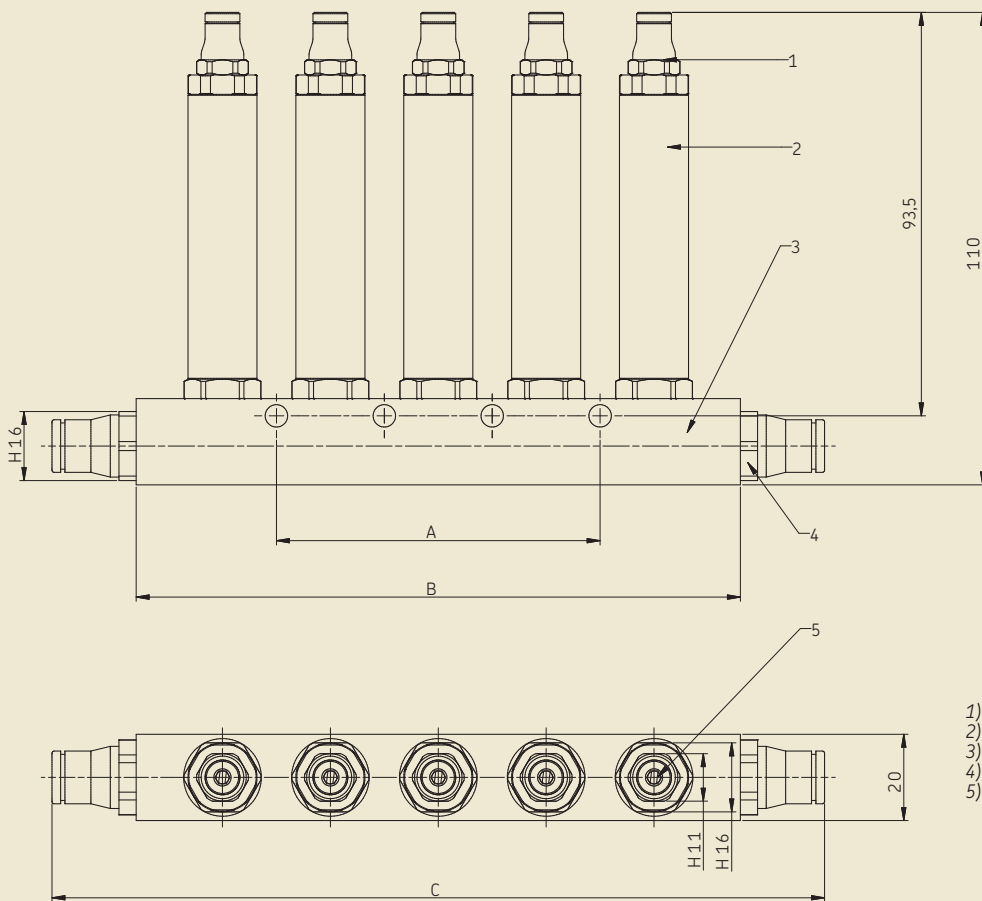
## Distributors LS21..



The volumetric piston distributors LS21.. meter and deliver the lubricant to the **lubrication plate for the conveyor chain surfaces**.

- **Volumetric metered volume adjustable** from 0,025 to 0,5 cm<sup>3</sup> per cycle independently of the viscosity and back-pressures
- Connection with **quick-release connector**
- **Stainless steel** (except the connector for tube Ø 8 and Ø 4)

LS21..



- 1) Quick connector for tube Ø 4
- 2) Adjustable metering unit
- 3) Manifold
- 4) Quick connector for tube Ø 8
- 5) Adjusting screw of the metering unit



**Technical data**

**LS21..**

Number of outlet(s) .....	1 to 5
Metering unit .....	adjustable flow rate 0,025 to 0,5 cm <sup>3</sup> /stroke
Inlet pressure .....	12 to 20 bars
Outlet pressure .....	ca. 12 to 20 bars
Service temperature .....	0 °C to 50 °C
Working frequency .....	≤ 1 stroke/2 s
Lubricant SKF .....	LDS 1
Other lubricants .....	please, consult us
Manifold .....	quick-release connector for tube Ø 8
Metering unit outlet .....	quick-release connector for tube Ø 4

**Material**

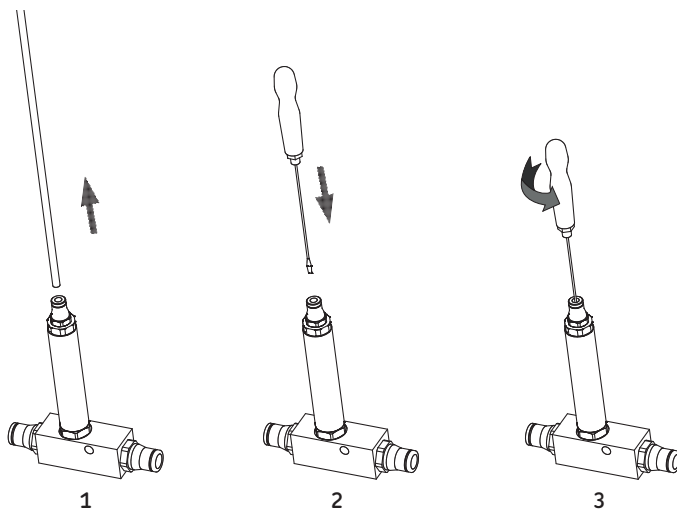
Metering unit .....	stainless steel 303
Manifold .....	stainless steel 303
Connector for tubes Ø 4 and Ø 8 .....	high phosphorus FDA chem. nickel-plated brass

**Order information**

**Adjustable distributor**

Order No.	Outlet(s)	Size A	Size B	Size C
LS2110	1	-	50	89
LS2120	2	-	65	104
LS2130	3	25	90	129
LS2140	4	50	115	154
LS2150	5	75	140	179

**Adjustment of the metering rate of the distributor LS21..**



- Remove the secondary line (1) (quick-release connector)
- Insert the adjustment screwdriver (2) into the metering unit outlet
- Set the metering unit to the minimal flow rate (25 mm<sup>3</sup> per stroke), therefore turn the screwdriver clockwise till stop
- Adjust the flow rate according to your needs turning the screwdriver counter-clockwise (3). A full turn of the screwdriver corresponds to a flow rate of 25 mm<sup>3</sup> per stroke.
- Reconnect the secondary line to the distributor outlet

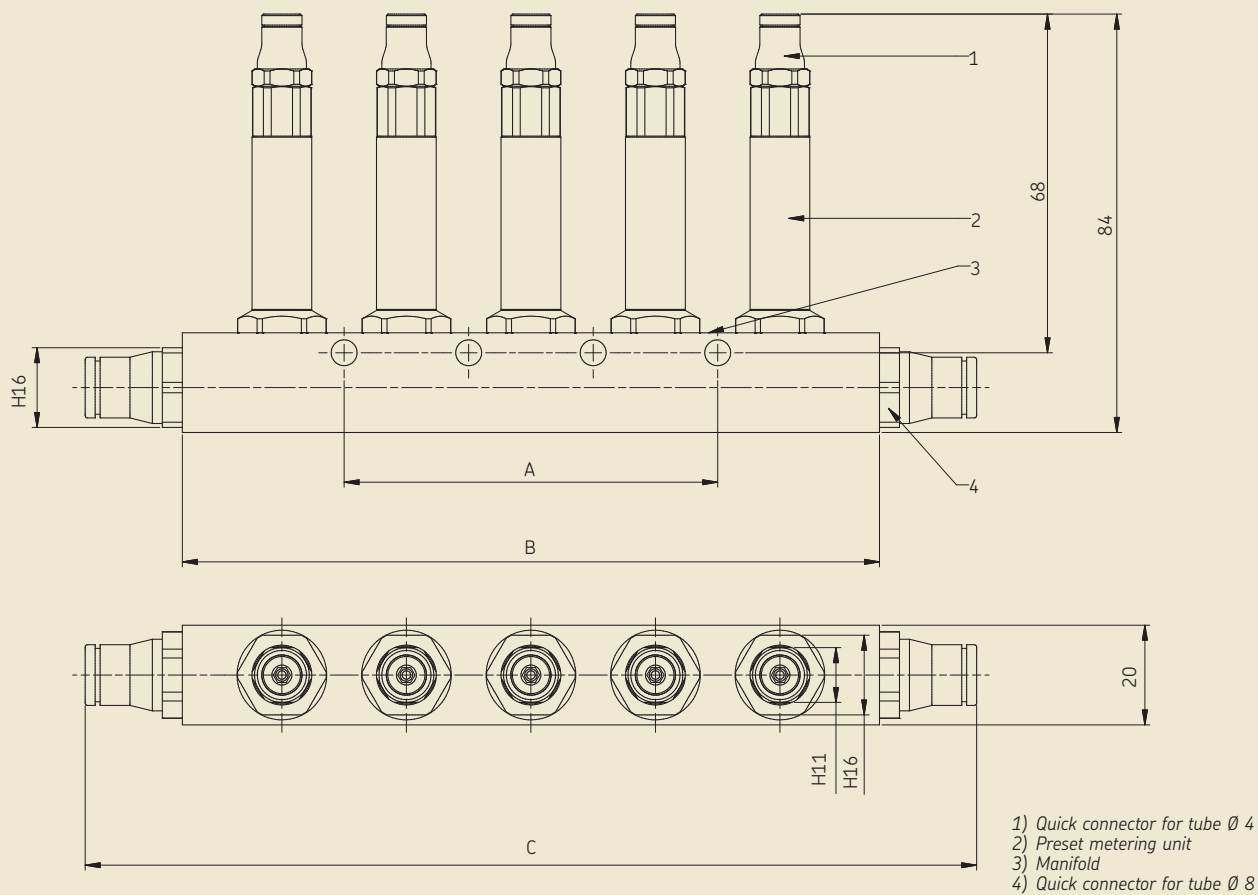
## Distributors LS22..



The volumetric piston distributors LS22.. meter and deliver the lubricant to the **lubrication screw for the conveyor chain guides**.

- **Preset volumetric metered volume** of 0,010 cm<sup>3</sup> per cycle independently of the viscosity and back-pressures
- Connection with **quick-release connector**
- **Stainless steel** (except the connector for tube Ø 8 and Ø 4)

LS22..



**Technical data**

**LS22..**

Number of outlet(s) .....	1 to 5
Metering unit .....	0,010 cm <sup>3</sup> per stroke and outlet
Inlet pressure .....	12 to 20 bars
Outlet pressure .....	ca. 12 to 20 bars
Service temperature .....	0 °C to 50 °C
Working frequency .....	≤ 1 stroke/2 s
Lubricant SKF .....	LDS 1
Other lubricants .....	please, consult us
Manifold .....	quick-release connector for tube Ø 8
Metering unit outlet .....	quick-release connector for tube Ø 4
Material	
Metering unit .....	stainless steel 303
Manifold .....	stainless steel 303
Connector for tubes Ø 4 and Ø 8 .....	high phosphorus FDA chem. nickel-plated brass

**Order information**

**Volumetric distributor LS22..**

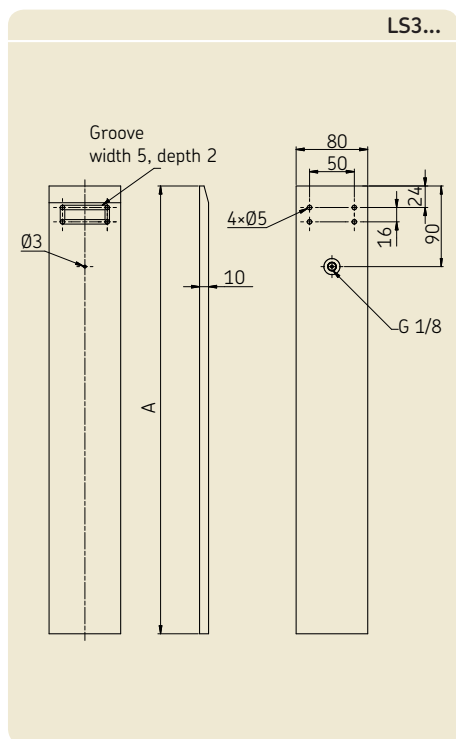
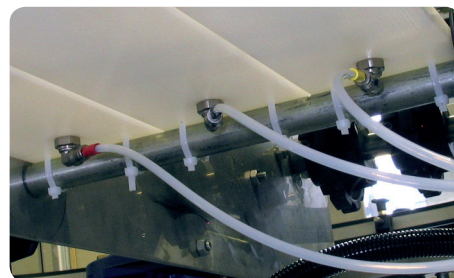
Order No.	Outlet(s)	Size A	Size B	Size C
<b>LS2210</b>	1	-	50	89
<b>LS2220</b>	2	-	65	104
<b>LS2230</b>	3	25	90	129
<b>LS2240</b>	4	50	115	154
<b>LS2250</b>	5	75	140	179

## Lubrication plate

The lubrication plate is designed for the lubrication by coating of the chain surfaces.

The lubrication plate is located under the chain, at the end of the return side. It is fed lubricant by a distributor LS21..., which meters the volume of lubricant. The chain surface sliding on the lubrication plate will be coated with lubricant.

The lubrication plate can either be mounted on a conveyor with rollers or serpentine. It is fastened with plastic collars.



### Order information

#### Lubrication plate, complete

size A = 500 mm, delivered with elbow quick-release connector for tube Ø 4 and clamp collars

Order No. .... **LS3110**

size A = 800 mm, delivered with elbow quick-release connector for tube Ø 4 and clamp collars

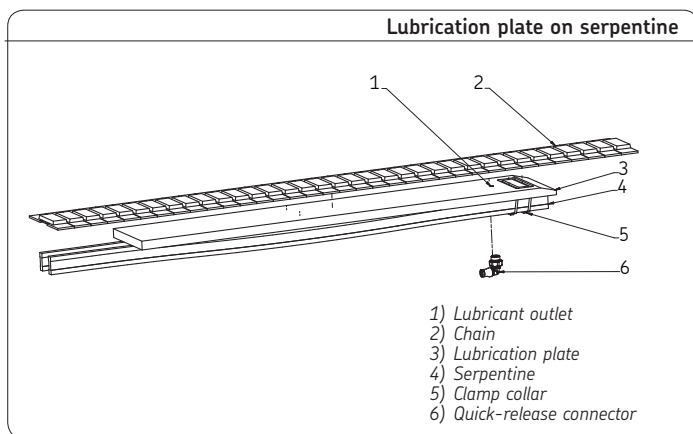
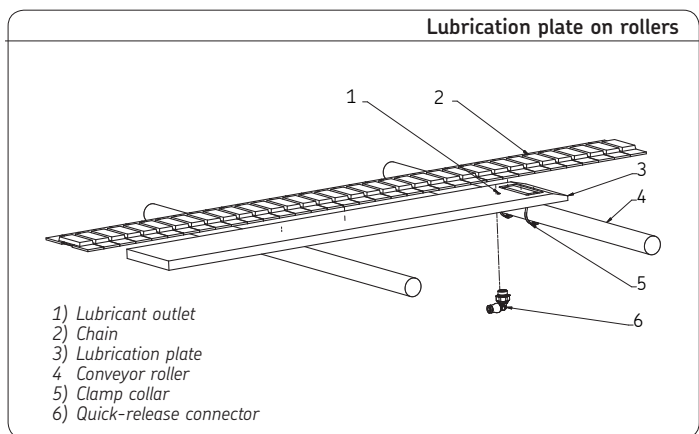
Order No. .... **LS3210**

#### Components

**Lubrication plate** ..... 500 or 800 mm, polyethylene

**Clamp collar** ..... polyamide

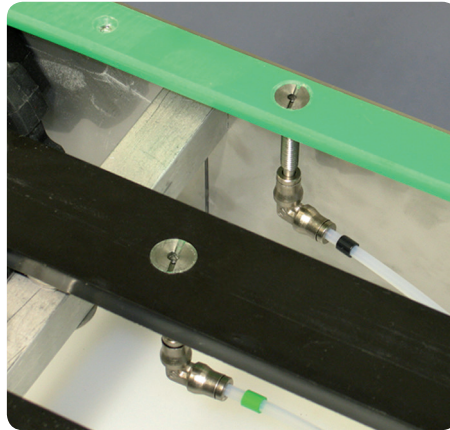
**Quick-release connector** ..... elbow, for tube Ø 4



## LS lubrication screw

The chain guides are lubricated with **lubrication screws**, which are directly inserted at the beginning of the carrying side of the chain. The lubrication screws are fed in lubricant by the distributor LS22... with preset metering rate.

The secondary lines are connected with elbow or straight quick-release connector.



**Note!**  
The guides of the chain have to be previously drilled before fitting the lubrication screws.

**LS4100**

1) Quick-release connector  
2) Washer and nut  
3) Lubrication screw  
4) Outlet port

**Order information**

**LS lubrication screw, complete**  
with elbow quick-release connector for tube Ø 4,  
Order No. .... **LS4100**

**Components**

<b>Lubrication screw</b> .....	M6×50, stainless steel 303
<b>Washer</b> .....	Ø 6, stainless steel 304
<b>Nut</b> .....	M6, stainless steel 304
<b>Quick-release connector</b> .....	elbow, for tube Ø 4

**LS4110**

1) Quick-release connector  
2) Washer and nut  
3) Lubrication screw  
4) Outlet port

**Order information**

**LS lubrication screw, complete**  
with straight quick-release connector for tube Ø 4,  
Order No. .... **LS4110**

**Components**

<b>Lubrication screw</b> .....	M6×50, stainless steel 303
<b>Washer</b> .....	Ø 6, stainless steel 304
<b>Nut</b> .....	M6, stainless steel 304
<b>Quick-release connector</b> .....	straight, for tube Ø 4

## Fittings and Accessories

### Fittings and accessories for the distributors

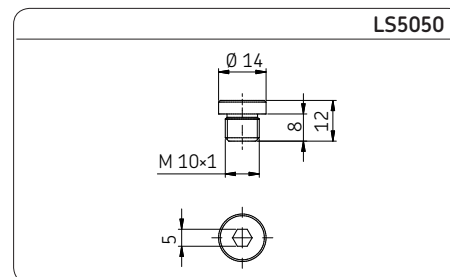
#### Plug

To plug an unused outlet of the distributor manifold (when a metering unit is removed).

Order No. . . . . . **LS5050**

**Plug**

**Connection** . . . . . M10×1  
**Seal** . . . . . NBR  
**Material** . . . . . stainless steel 316 Ti  
**Pressure max.** . . . . . 400 bars  
**Temperature** . . . . . -20 °C to +120 °C



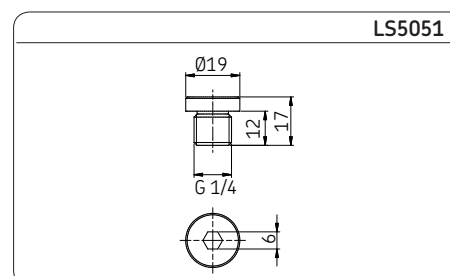
#### Plug

Plug for the distributor manifold, which is at the end of the circuit.

Order No. . . . . . **LS5051**

**Plug**

**Connection** . . . . . G 1/4"  
**Seal** . . . . . NBR  
**Material** . . . . . stainless steel 316 Ti  
**Pressure max.** . . . . . 400 bars  
**Temperature** . . . . . -20 °C to +120 °C



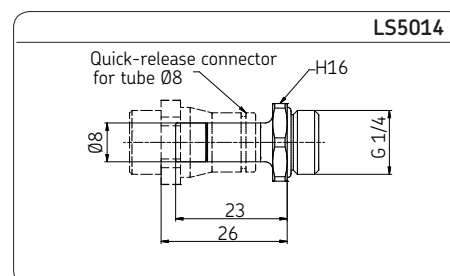
#### Union

This union makes possible to connect two distributors together. This union is inserted into the quick-release connector of the other manifold.

Order No. . . . . . **LS5014**

**Union**

**Material** . . . . . high phosphorus FDA chemical nickel-plated brass  
**Pressure max.** . . . . . 20 bars  
**Temperature** . . . . . -20 °C to +120 °C



#### Mounting kit

For mounting the distributors on the conveyor frame. The kit comprises 25 pieces of: screw, washer and nut.

Screw M5 × 20 . . . . . **LS5102**  
 Screw M5 × 30 . . . . . **LS5100**  
 Screw M5 × 50 . . . . . **LS5101**

**Mounting kit**

**Screw, washer and nut.**  
**Material** . . . . . stainless steel 304

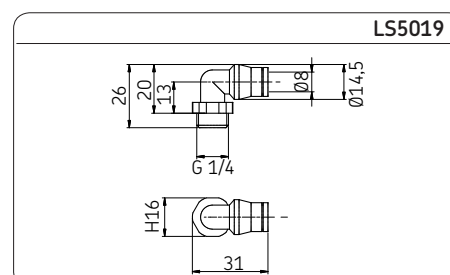
#### Elbow quick-release connector

For the connection of a primary line to a distributor. It replaces a straight quick-release connector.

Order No. . . . . . **LS5019**

**Elbow quick-release connector**

**Connection** . . . . . G 1/4 for tube Ø 8  
**Material** . . . . . high phosphorus FDA chemical nickel-plated brass  
**Pressure max.** . . . . . 20 bars  
**Temperature** . . . . . -20 °C to +120 °C



## Lubrication lines

### Primary lines

Tube 5,5x8, green  
 Order No. . . . . . **LS5041\***  
 Tube 5,5x8, white  
 Order No. . . . . . **LS5042\***

#### Primary line tube

**Material** . . . . . polyamide 12  
**Pressure max.** . . . . 49 bars at 20 °C  
**Temperature** . . . . . -10 °C to +50 °C  
**Color** . . . . . green or black



### Secondary lines

Tube 2,5x4, neutral  
 Order No. . . . . .+++ **LS5040\***

#### Secondary line tube

**Material** . . . . . polyamide 12  
**Pressure max.** . . . . 30 bars at 20 °C  
**Temperature** . . . . . -10 °C to +50 °C  
**Color** . . . . . neutral

#### Note!

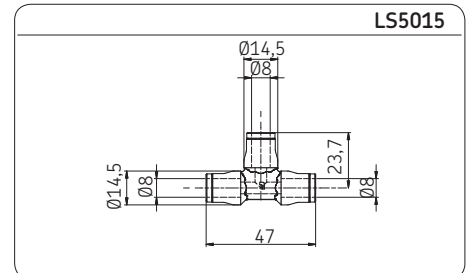
SKF recommends to distinguish the two primary circuits (for distributors LS21.. and LS22..) using two different colors of tube.

### Tee

Quick-release Tee connector for tube Ø 8  
 (primary circuit)  
 Order No. . . . . . **LS5015**

#### Tee

**Material** . . . . . high phosphorus  
 FDA chemical  
 nickel-plated brass  
**Pressure max.** . . . . 20 bars  
**Temperature** . . . . . -20 °C to +120 °C

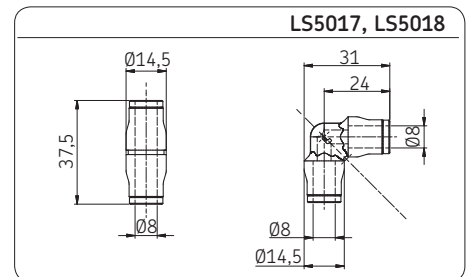


### Union

Union for tube Ø 8 (primary circuit)  
 Order No. . . . . . **LS5017**  
 Elbow union for tube Ø 8,  
 Order No. . . . . . **LS5018**

#### Union

**Connection** . . . . . for tube Ø8  
**Material** . . . . . high phosphorus  
 FDA chemical  
 nickel-plated brass  
**Pressure max.** . . . . 20 bars  
**Temperature** . . . . . -20 °C to +120 °C



### Mounting clips

Mounting of the primary circuits along the conveyor frame.

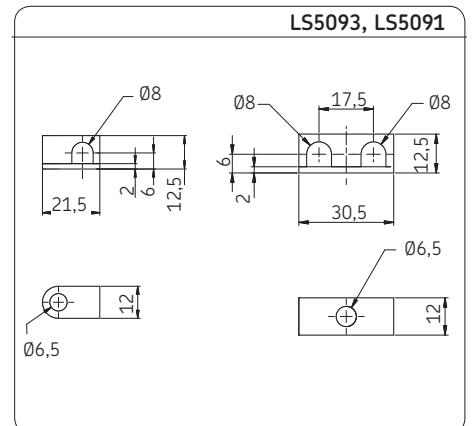
Clip for two circuit  
 Order No. . . . . . **LS5091**

Clip for one circuit  
 Order No. . . . . . **LS5093**

Fixing kit . . . . . see **LS5102**

#### Mounting clips

**Clip**  
**Material** . . . . . polypropylene





**Identification rings**

Rings to identify the secondary lines.  
Bag: 100 rings 5 colors (orange, red, green, black, yellow)

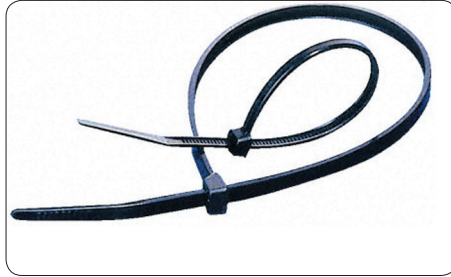
Order No. . . . . . **LS5094**



**Plastic collars**

For primary and secondary lines.  
100 pieces in one bag.

Order No. . . . . . **LS5090**



**Tube bushing**

To let the secondary lines through the conveyor frame

Tube bushing for 1 to 8 tubes

Order No. . . . . . **LS5092**



**Tube cutter**

For Rilsan tube Ø 4 to Ø 12

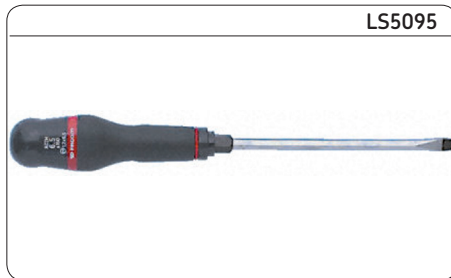
Order No. . . . . . **LS5096**



**Screwdriver**

To adjust the metering rate of the adjustable distributors (LS21..)

Order No. . . . . . **LS5095**



## Manometer

SKF recommends putting a manometer at the end of the primary circuit to check the pressure build-up.

Manometer complete, with manifold, manifold and quick-release couplings for inlet and outlet, fixing screw, nut and washer.

Order No. . . . . . **LS5210**

### Manometer

#### Manometer

**Material** . . . . . stainless steel 304L

**Pressure range** . . . . . 0 to 40 bars  
glycerin bath  
manometer

**Protection** . . . . . IP65

**Temperature** . . . . . 10 °C to 90°C

#### Quick-release connector

**Material** . . . . . high phosphorus  
FDA chemical  
nickel-plated brass

**Pressure max.** . . . . . 20 bars

**Temperature** . . . . . -20 °C to +120 °C

#### Fixing

#### Washer Ø 5

**Material** . . . . . stainless steel 304

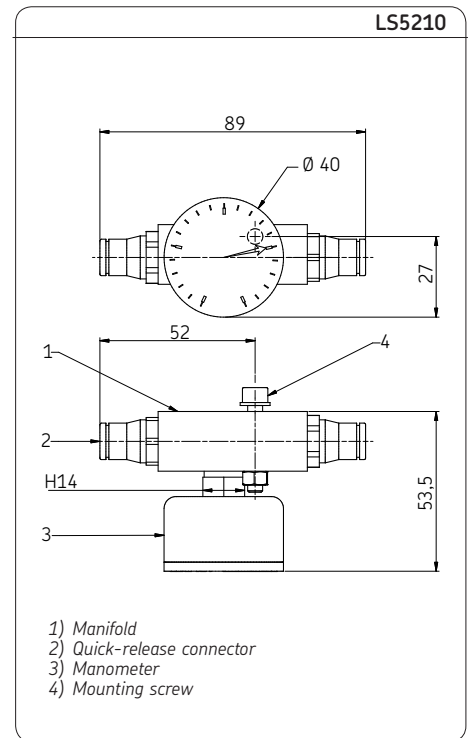
#### Nut M5

**Type** . . . . . Ø 5

**Material** . . . . . stainless steel 304

#### Screw CHC M5×30

**Material** . . . . . stainless steel 304

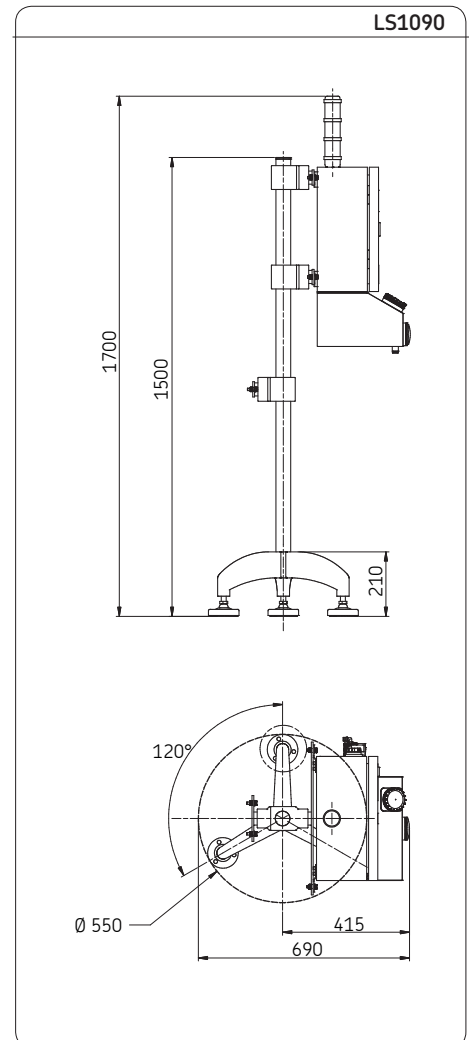


## Tripod

Tripod for the central unit. The central unit is fastened with two mounting flanges. It is possible to fasten the tripod to the conveyor frame with a third bar to ensure the stability.

The tripod is delivered with the mounting bars for the central unit and the conveyor frame.

Order No. . . . . . **LS1090**



# LDTS 1

## SKF Dry Film Lubricant

SKF Dry Film Lubricant LDTS 1 is specially developed for automatic lubrication of flat top chains conveyors in the beverage processing industry. The lubricant consists of synthetic oil and is doped with PTFE as solid lubricant. LDTS 1 is NSF\* H1\*\* certified for use where incidental contact with food cannot be excluded.

- NSF H1 certified
- Recommended for conveyors using plastic chains
- Excellent lubricating properties

### Typical applications:

- Conveyors in bottling lines
- Applications for the following packaging types:
  - Carton packs
  - Cans
  - PET bottles

\* NSF – National Sanitation Foundation

\*\* H1 – Incidental Contact with Food



### Technical data

Designations . . . . .	LDTS 1
Description . . . . .	SKF Dry Film Lubricant
Composition . . . . .	Mineral oils, hydrocarbons, additives, PTFE
Color . . . . .	White
Operating temperature range . . . . .	-5 to +60 °C ( 23 to 140 °F )
Viscosity at 40 °C (104 °F) . . . . .	ca. 11 mm <sup>2</sup> /s
Pour point, °C . . . . .	< 0
Density (20 °C/ 68 °F) . . . . .	ca. 843 kg/m <sup>3</sup>
Flash point of the preparation . . . . .	ca. 100 °C
Flash point after evaporation of the solvent . . . . .	> 170 °C
NSF registration . . . . .	H1 ( registration no: 139739)
Available pack size . . . . .	5 liter can





**Order No.: 1-4120-EN**

Subject to change without notice! (04/2009)

**Important product usage information**

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

Not all lubricants are suitable for use in centralized lubrication systems.

SKF does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized system. SKF lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1013 mbars) by more than 0,5 bar at their maximum permissible temperature.

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

**Further brochures**

1-9201-EN Transport of Lubricants in Centralized Lubrication Systems

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