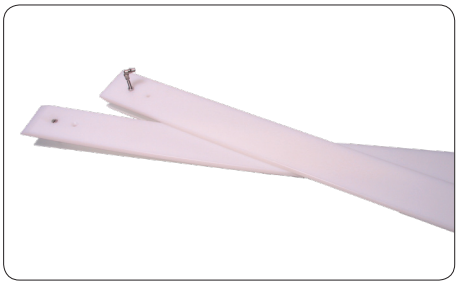
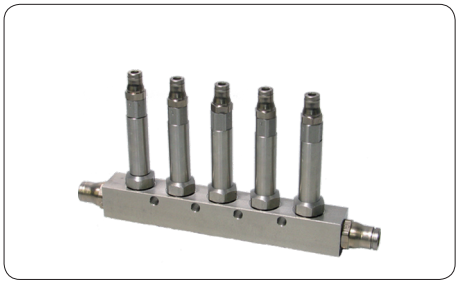
SKF Dry Lubrication Systems for conveyors





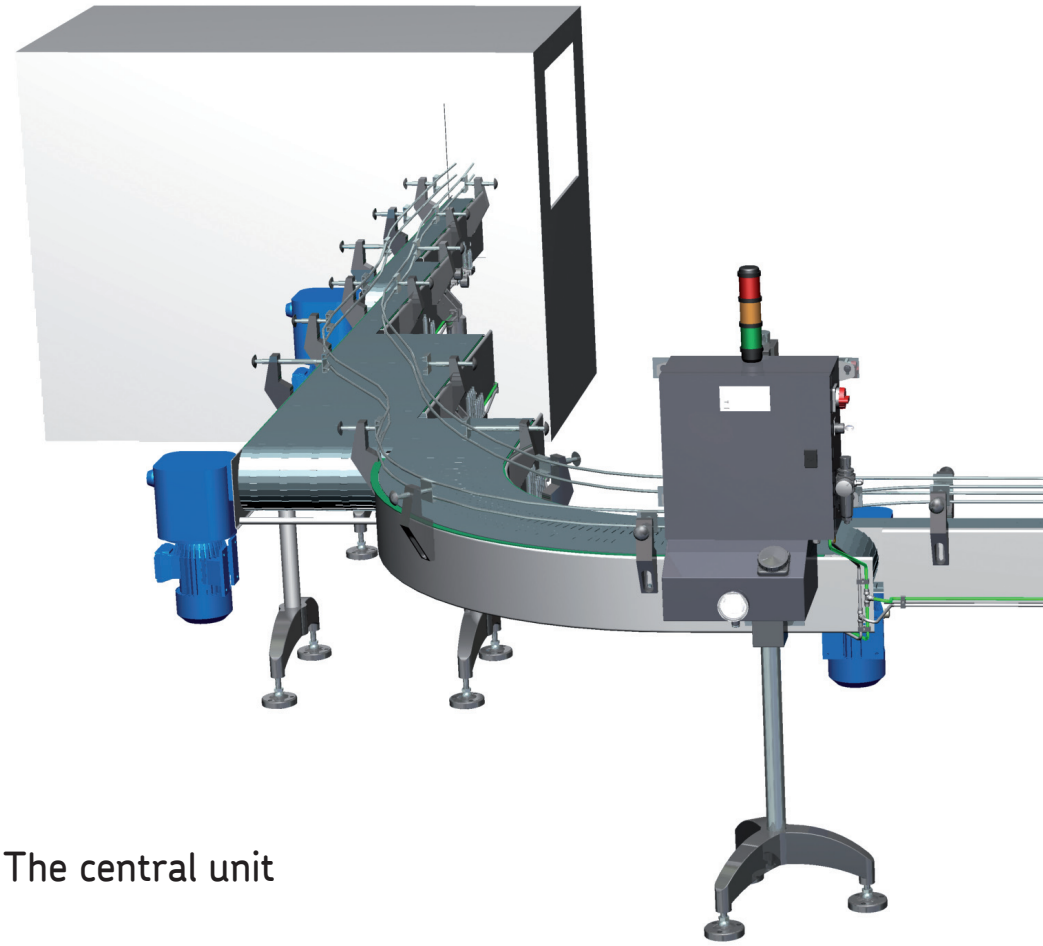
- Autonomous system for up to 200 lubrication points
- Lubrication of the conveyor chain surfaces and guides
- Intermittent lubrication controlled and monitored by an integrated control unit
- PTFE-based dry film lubricant, no water or soluble lubricants

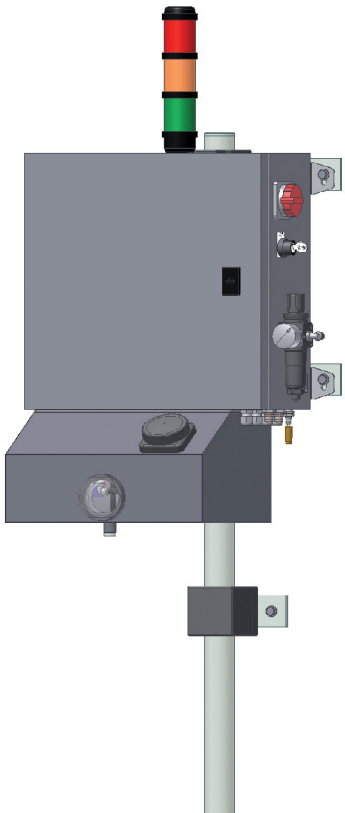
SKF Dry Lubrication Systems for conveyors

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.

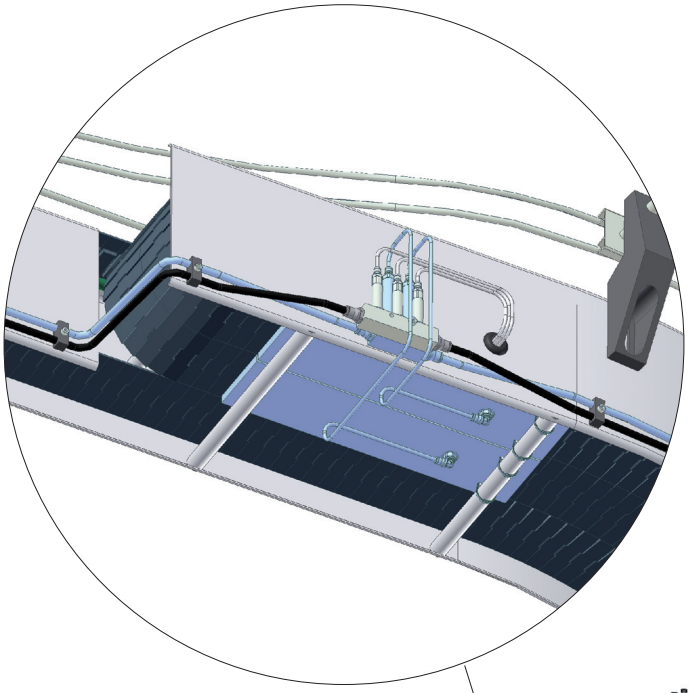




The central unit

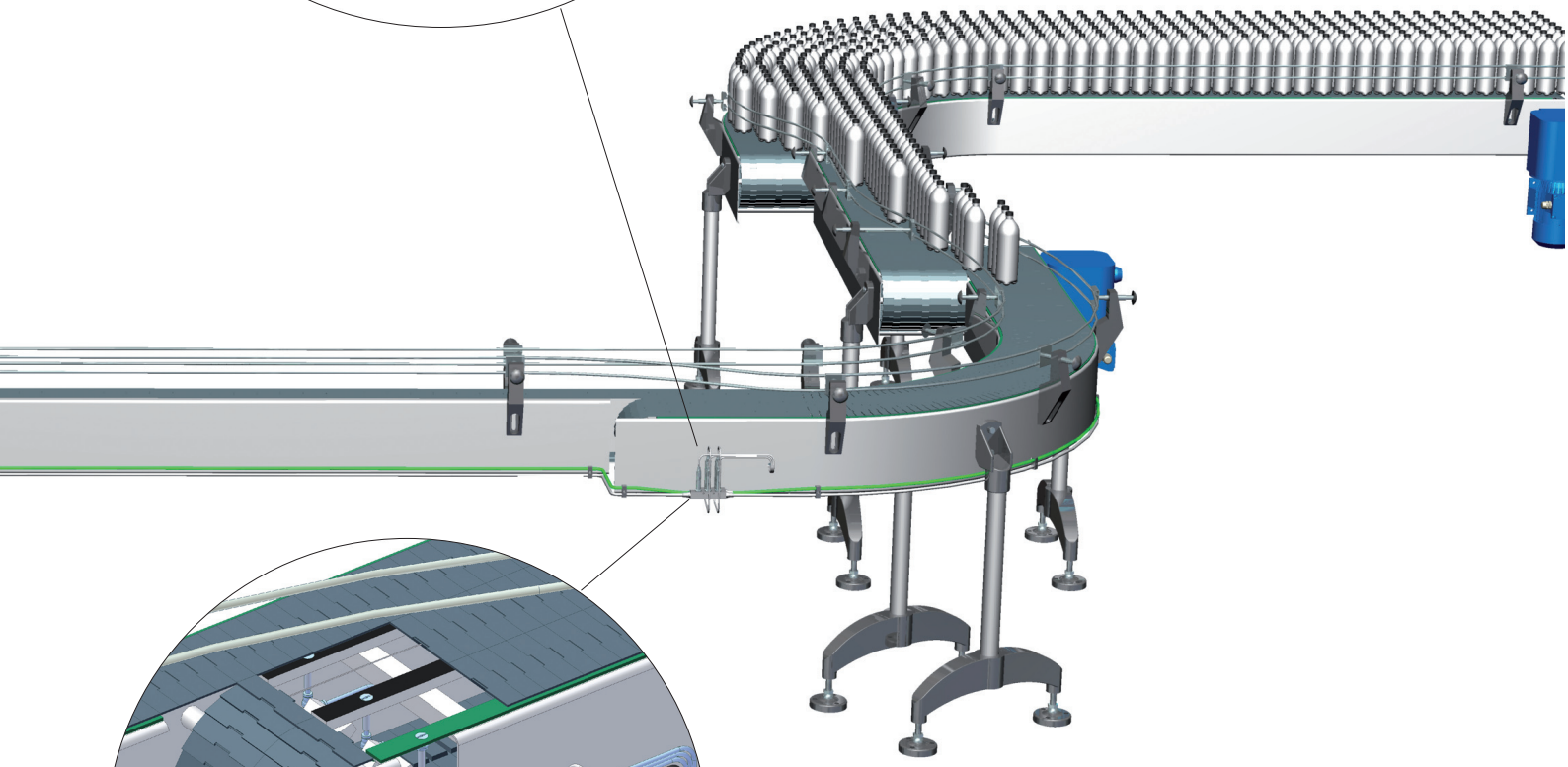
The central unit supplies the lubricant to the volumetric distributors via the primary circuits.

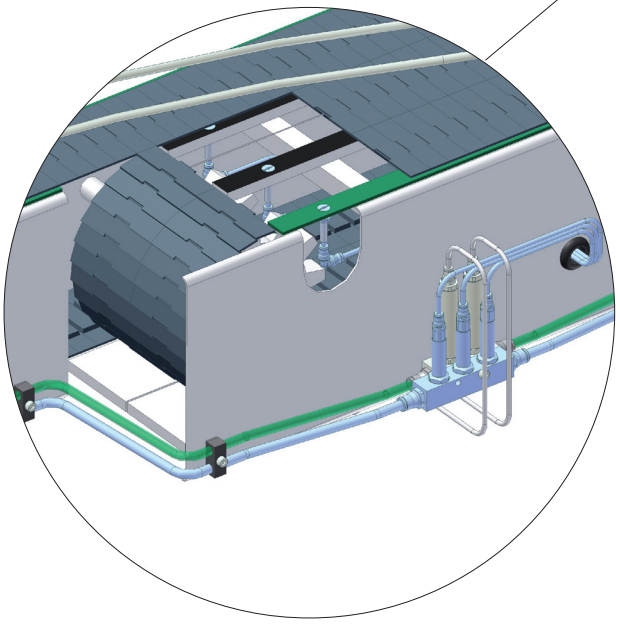
It comprises the pneumatically driven pump unit and the lubricant reservoir. A control unit is integrated in the central unit. It controls and monitors the whole lubrication system.



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

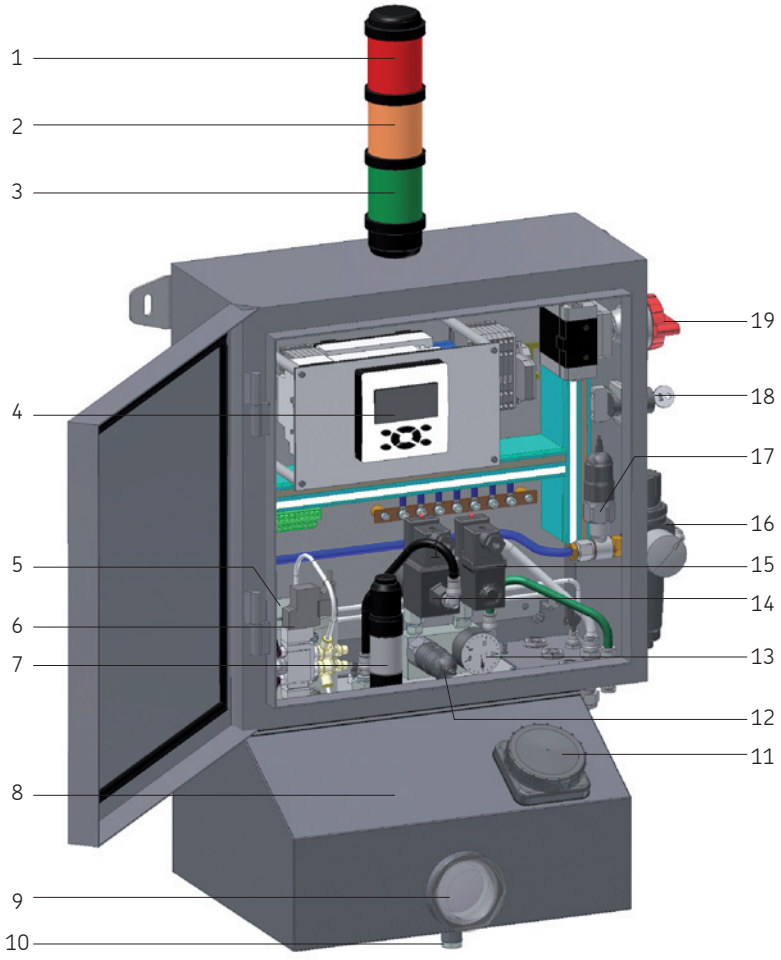
The preset piston distributors feed the chain guides with lubricant. They deliver intermittently a metered volume of lubricant via a secondary line to lubrication screws, which are inserted into the guide.

Central unit

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

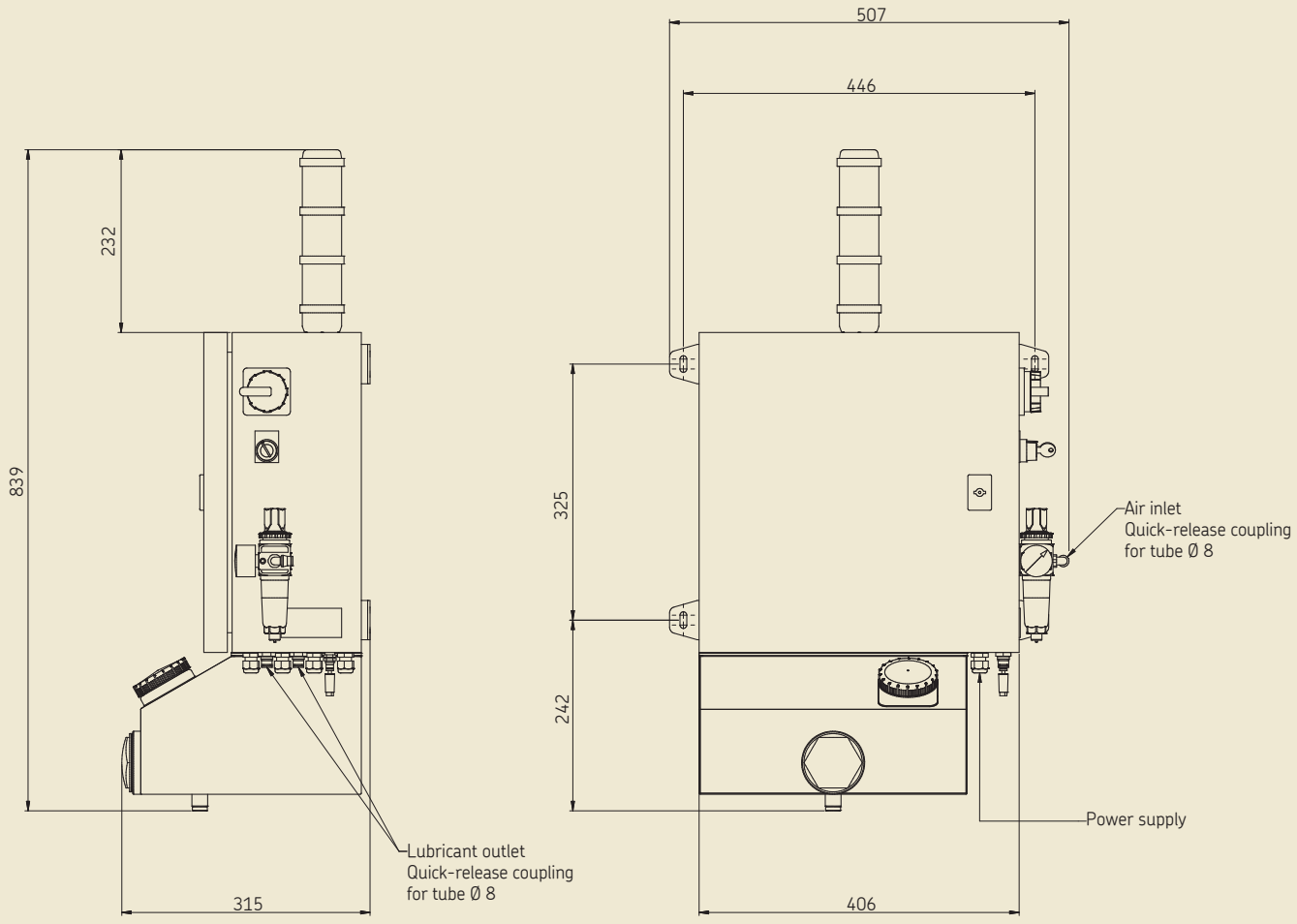
- Pneumatically driven piston pump unit to feed the lubrication lines with lubricant
- Two lubricant outlets (circuit for the lubrication of the chain surfaces and circuit for the lubrication of the chain guides)
- Reservoir with an useful capacity of 10 liters with sight glass to check the lubricant 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

Dry lubrication central unit



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 Nl/min
Pump flow rate	20cm³/stroke
Pump working frequency	1 stroke/5 s
Pump pressure ratio	1:4
SKF Lubricant	LDTS 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.

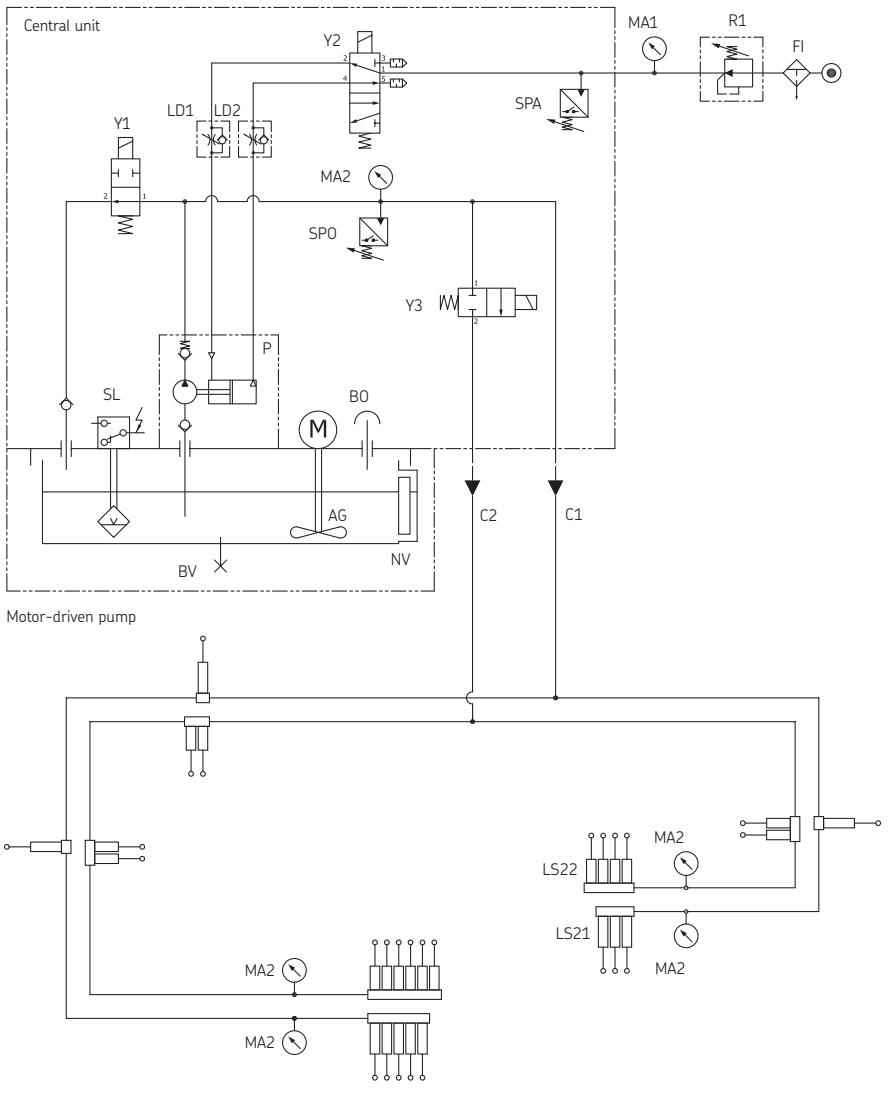
At the beginning of the lubrication cycle (the length is adjustable) the control unit launches a lubrication phase. The pneumatic pump (**P**) is actuated via the solenoid valve (**Y2**). It has a working frequency of 1 stroke/5 s for a flow rate of 20 cm^3/stroke. It delivers lubricant to the first 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 **SP0** 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.

Function principle of a dry lubrication system



SL	level switch
AG	agitator
B0	filler plug
Y1	relief solenoid valve
Y2	pump control solenoid valve
Y3	solenoid valve, lubrication of circuit 2
M	electric motor of the agitator
P	pneumatic pump
SPA	air pressure switch
SP0	lubricant pressure switch
MA	manometer
	flow limiter (LD1/LD2)
C1	lubrication circuit, chain surface
C2	lubrication circuit, chain guide
NV	sight glass
BV	draining plug
R1	pressure regulator
LS21	distributor for chain surface
LS22	distributor for chain guide

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 **Tc**

5 min < **Tc** < 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**

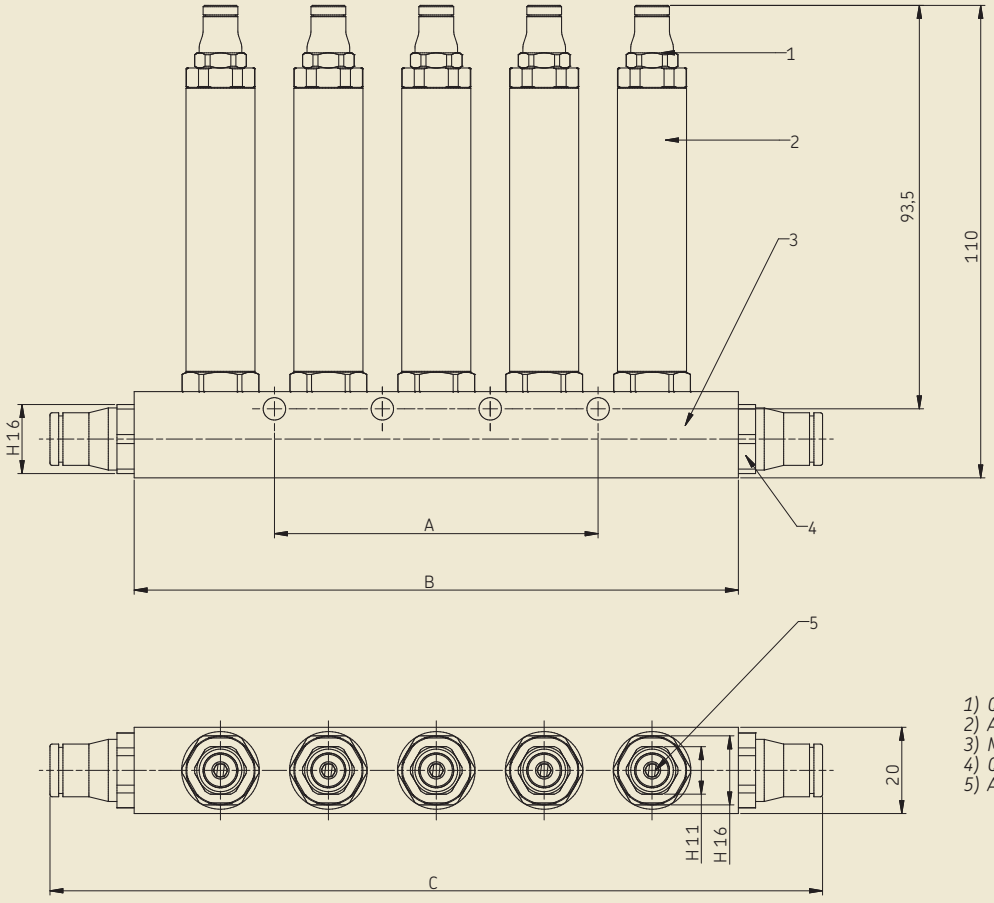
1 < **n** < 99

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^3 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^3/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	LDTS 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

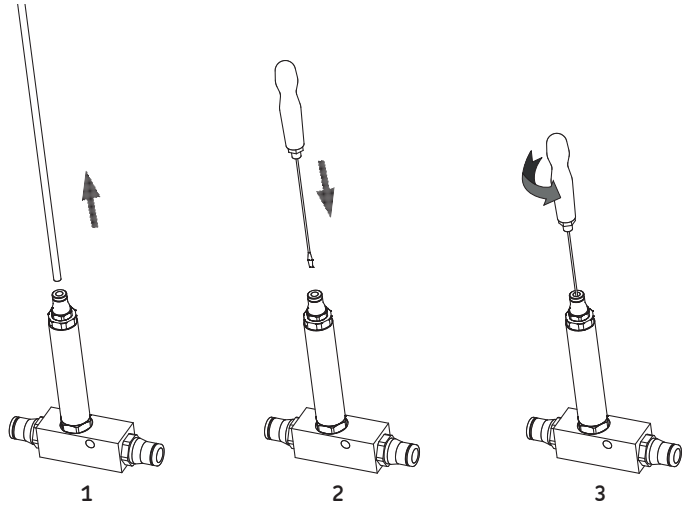
Metering unit	stainless steel 303
Manifold	stainless steel 303
Connector for tubes Ø 4 and Ø 8	high phosphorus FDA chem. nickel-plated brass

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..



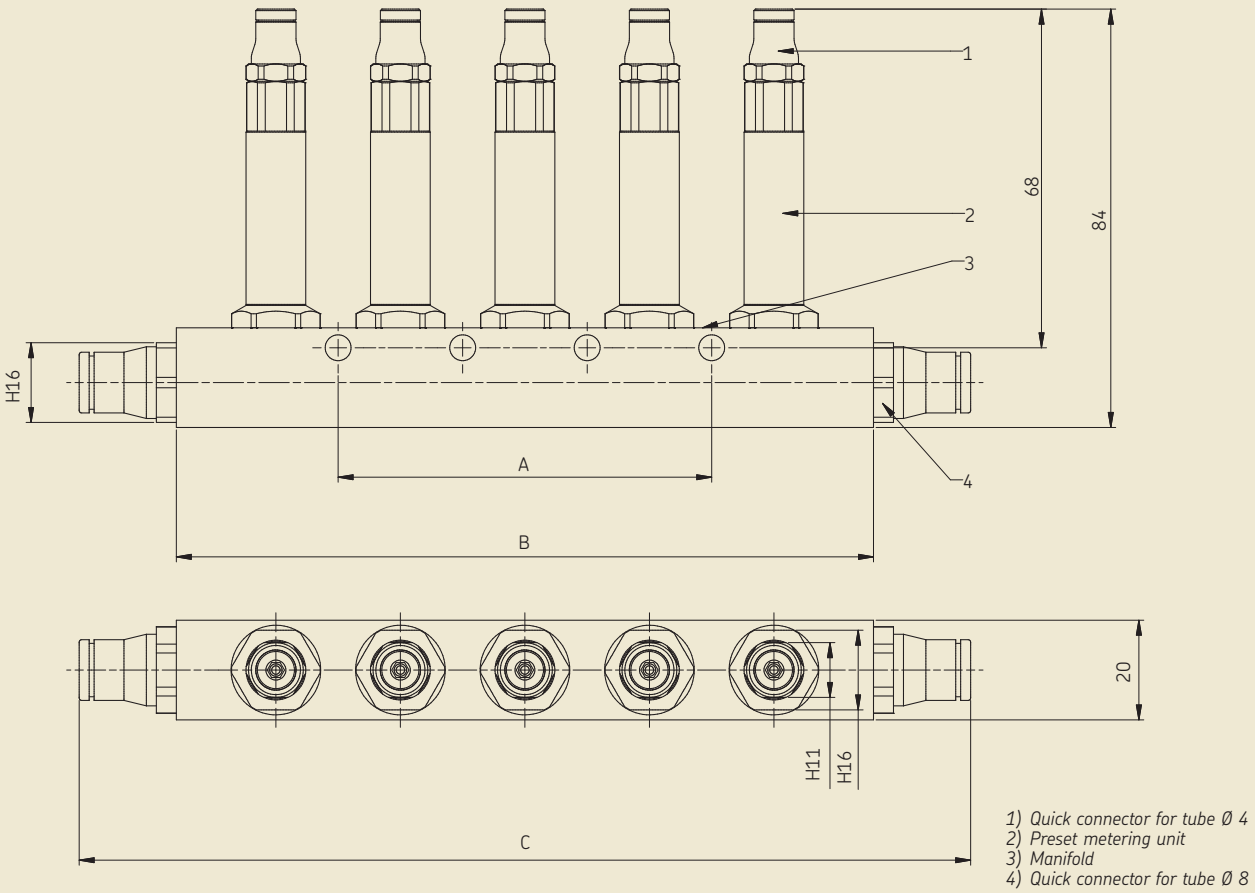
- Remove the secondary line (**1**) (quick-release connector)
- Insert the adjustment screwdriver (**2**) into the metering unit outlet
- Set the metering unit to the minimal flow rate (25 mm^3 per stroke), therefore turn the screwdriver clockwise till stop
- Adjust the flow rate according to your needs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



1) Quick connector for tube Ø 4
2) Preset metering unit
3) Manifold
4) Quick connector for tube Ø 8

Technical data

LS22..

Number of outlet(s)	1 to 5
Metering unit	0,010 cm^3 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	LDTS 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..

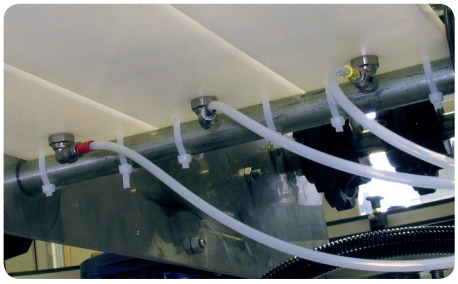
Order No.	Outlet(s)	Size A	Size B	Size C
LS2210	1	-	50	89
LS2220	2	-	65	104
LS2230	3	25	90	129
LS2240	4	50	115	154
LS2250	5	75	140	179

Lubrication plate

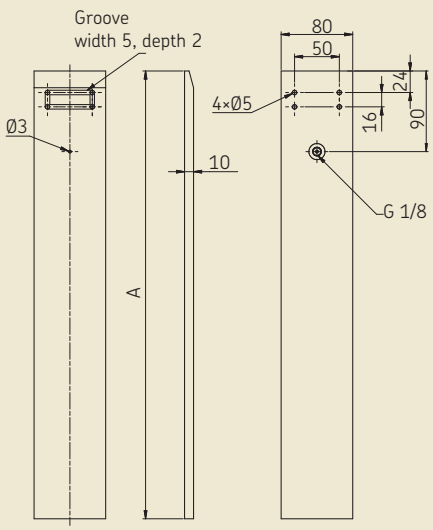
The lubrication plate is designed for the lubrication by coating of the chain surfaces.

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 serpentines. It is fastened with plastic collars.



LS3...

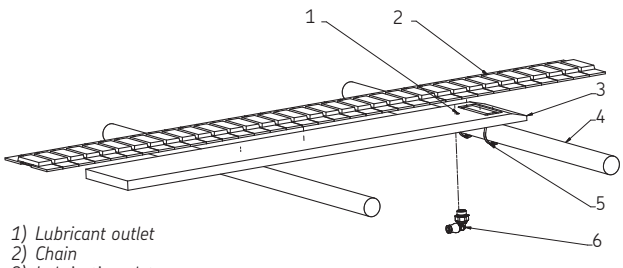


Order information

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**

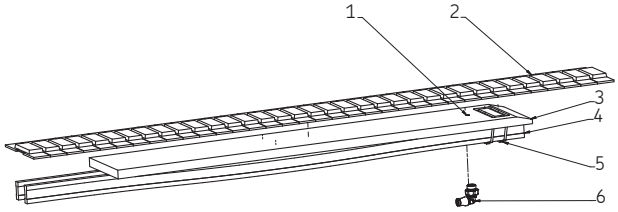
Components
Lubrication plate . . . . . 500 or 800 mm, polyethylene
Clamp collar . . . . . polyamide
Quick-release connector . . . . . elbow, for tube Ø 4

Lubrication plate on rollers



1) Lubricant outlet
2) Chain
3) Lubrication plate
4 Conveyor roller
5) Clamp collar
6) Quick-release connector

Lubrication plate on serpentine

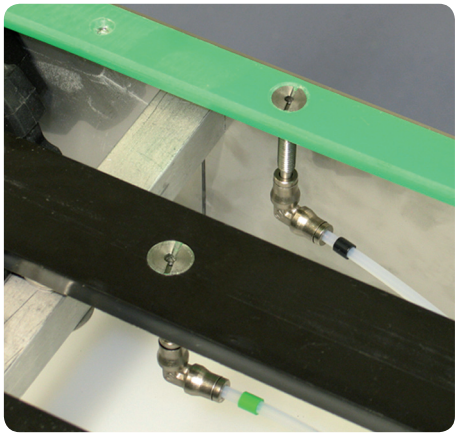


1) Lubricant outlet
2) Chain
3) Lubrication plate
4) Serpentine
5) Clamp collar
6) Quick-release connector

LS lubrication screw

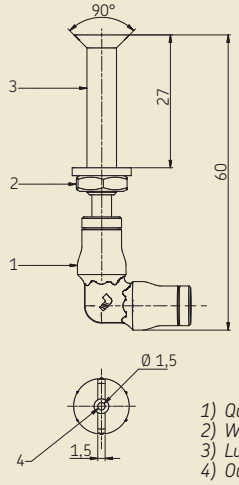
The chain guides are lubricated with **lubrication screws**, which are directly inserted at the beginning of the carrying side of the chain. The lubrication screws are fed in lubricant by the distributor LS22... with preset metering rate.

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

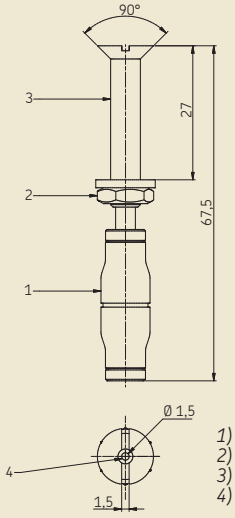
Order information

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

Components

Lubrication screw	M6×50, stainless steel 303
Washer	Ø 6, stainless steel 304
Nut	M6, stainless steel 304
Quick-release connector	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

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

Fittings and Accessories

Fittings and accessories for the distributors

Plug

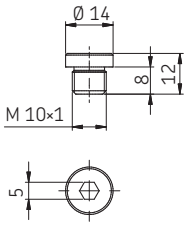
To plug an unused outlet of the distributor manifold (when a metering unit is removed).

Order No. **LS5050**

Plug

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

LS5050



Plug

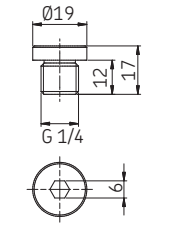
Plug for the distributor manifold, which is at the end of the circuit.

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

LS5051



Union

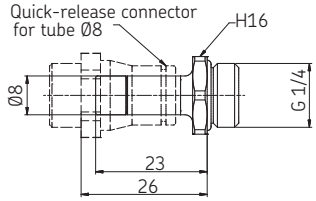
This union makes possible to connect two distributors together. This union is inserted into the quick-release connector of the other manifold.

Order No. **LS5014**

Union

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

LS5014



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

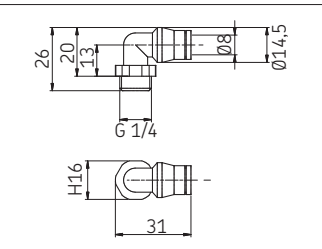
For the connection of a primary line to a distributor. It replaces a straight quick-release connector.

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

LS5019



Lubrication lines

Primary lines

Tube 5,5×8, green
Order No. **LS5041***
Tube 5,5×8, 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 2,5×4, 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.

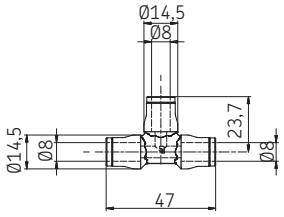
Tee

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

LS5015



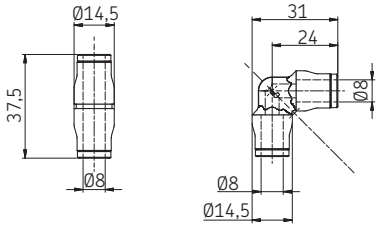
Union

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

LS5017, LS5018



Mounting clips

Mounting of the primary circuits along the conveyor frame.

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

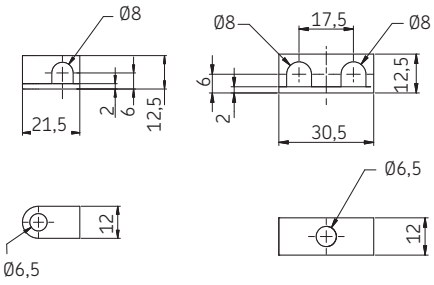
Clip for one circuit
Order No. **LS5093**

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

Mounting clips

Clip
Material . . . . . polypropylene

LS5093, LS5091



Identification rings

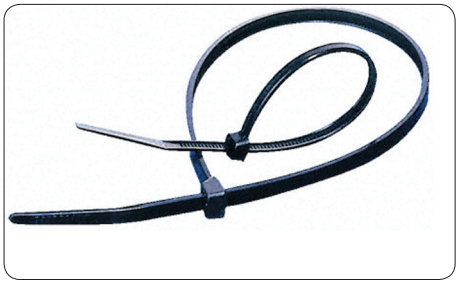
Rings to identify the secondary lines.
Bag: 100 rings 5 colors (orange, red, green, black, yellow)

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

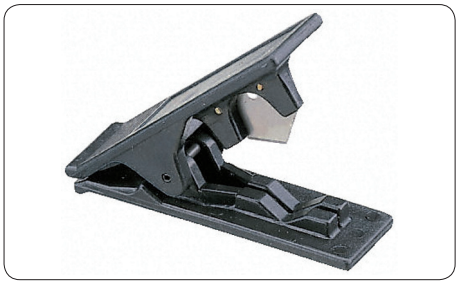
Tube bushing for 1 to 8 tubes

Order No. **LS5092**

Tube cutter

For Rilsan tube Ø 4 to Ø 12

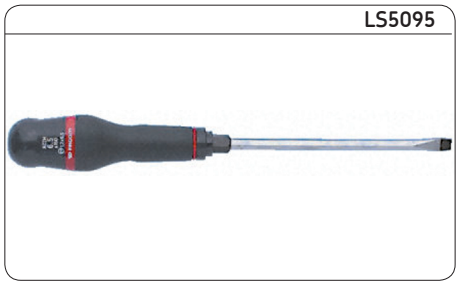
Order No. **LS5096**



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 manometer, 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

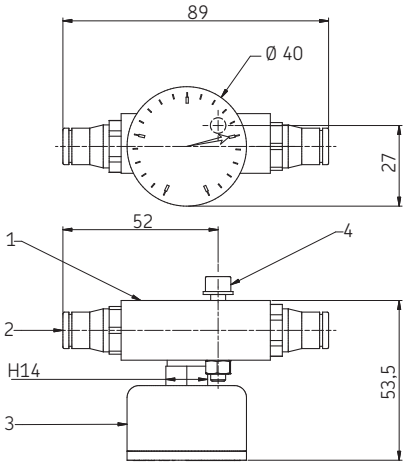
Fixing

Washer Ø 5
Material . . . . . stainless steel 304

Nut M5
Type . . . . . Ø 5
Material . . . . . stainless steel 304

Screw CHC M5×30
Material . . . . . stainless steel 304

LS5210



1) Manifold
2) Quick-release connector
3) Manometer
4) Mounting screw

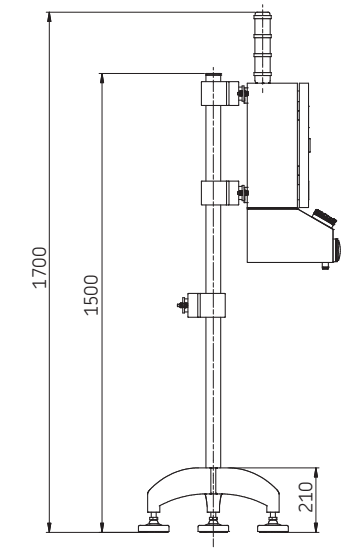
Tripod

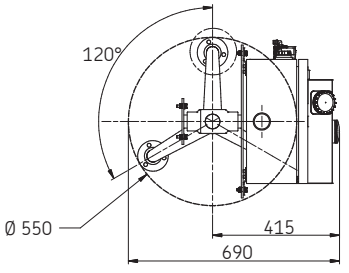
Tripod for the central unit. The central unit is fastened with two mounting flanges. It is possible to fasten the tripod to the conveyor frame with a third bar to ensure the stability.

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

Order No. **LS1090**

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^2/s
Pour point , °C	< 0
Density (20 °C/ 68 °F)	ca. 843 kg/m^3
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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