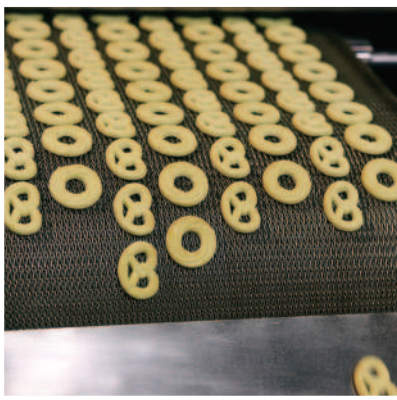
CLK

Airless oil projection system for conveyor roller chain lubrication



SKF ChainLube, CLK oil projection system

The CLK airless oil projection system is the simple, reliable and easy-to-install solution for lubricating the roller chains of industrial conveyors.

The system comprises a central unit with a reservoir, automatic system and volumetric pump for delivering a precise quantity of lubricant through projection nozzles to each point of friction of moving chain links. None of the system components is in mechanical contact with the chain, thereby eliminating any risk of wear and potential build-up of dirt. All components are corrosion-resistant. Nozzles and pipework are suitable for high temperatures (200°C/400°F).

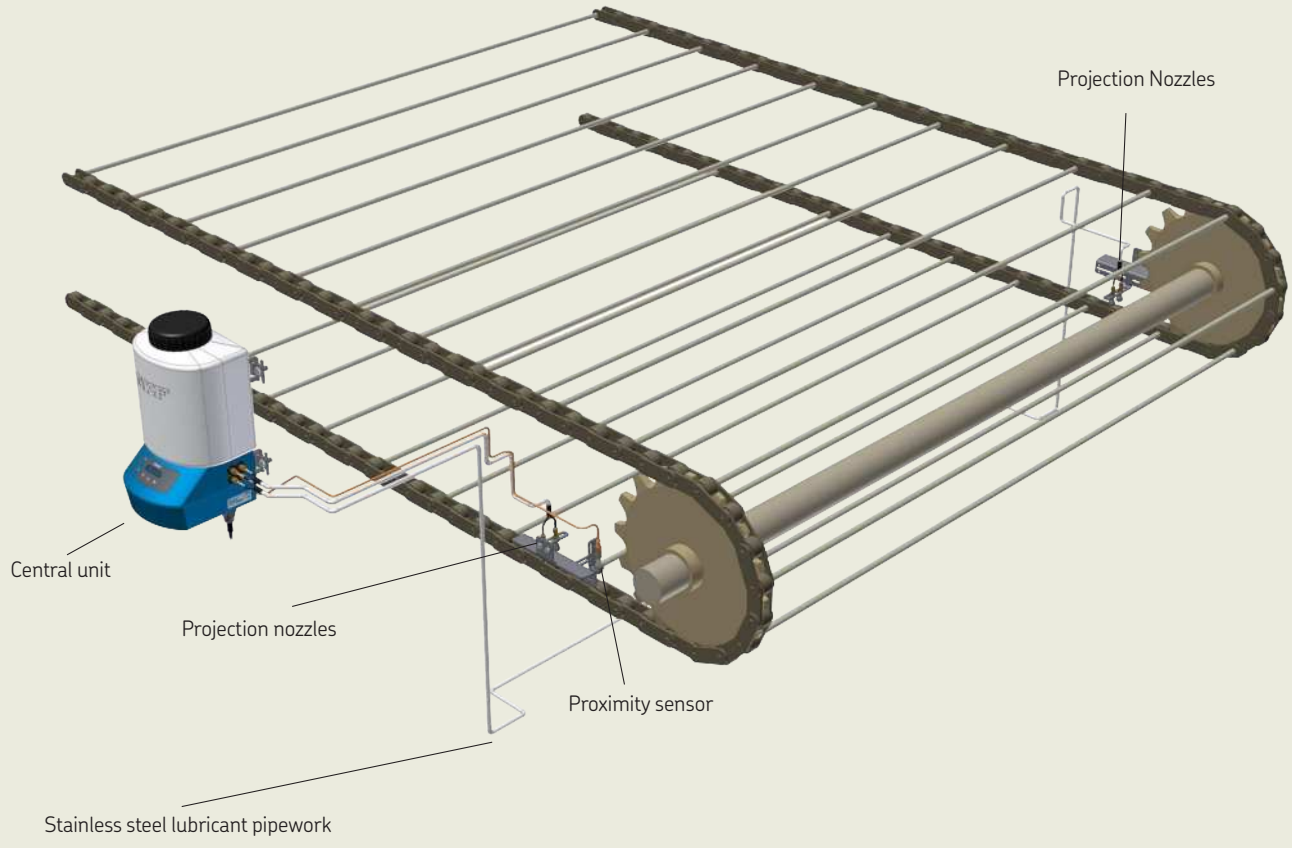
Benefits

- Reduces maintenance costs compared to manual lubrication (lubricant consumption and labour)
- Eliminates manual lubrication and associated risks for staff
- Improves productivity by eliminating unscheduled downtimes
- Lengthens service life as a result of reduced chain wear
- Reduces energy consumption through decreased friction
- Improves operator safety
- Increases cleanliness owing to a reduction in excess lubricant

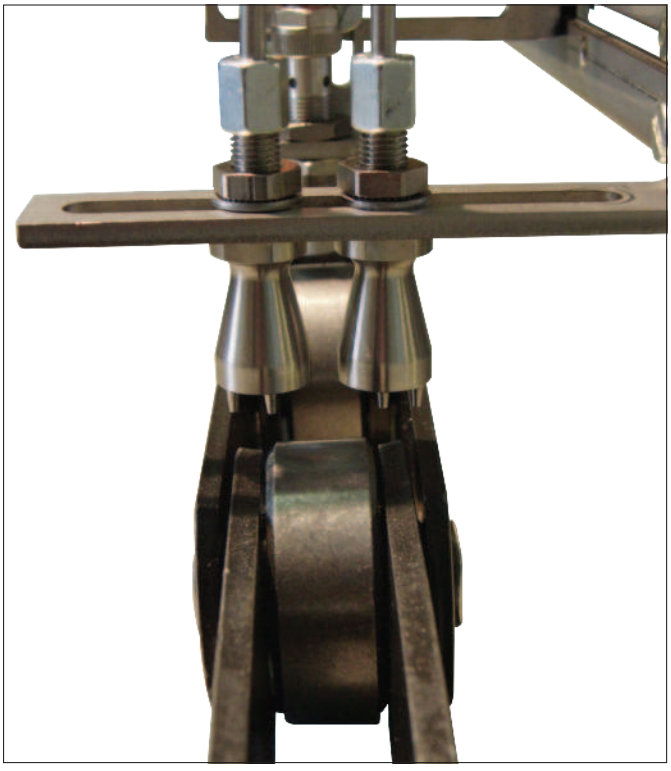
Areas of application

- Industrial bakery oven chains or similar
- Conveyors for grading, cleaning, cooking and pasteurising fruit and vegetables
- Oven/dryer chains in all types of industries (food processing, construction materials, wood, etc.)
- Handling conveyors
- Floor conveyor chains in the automotive industry

CLK lubrication system



Oil lubrication for roller chain



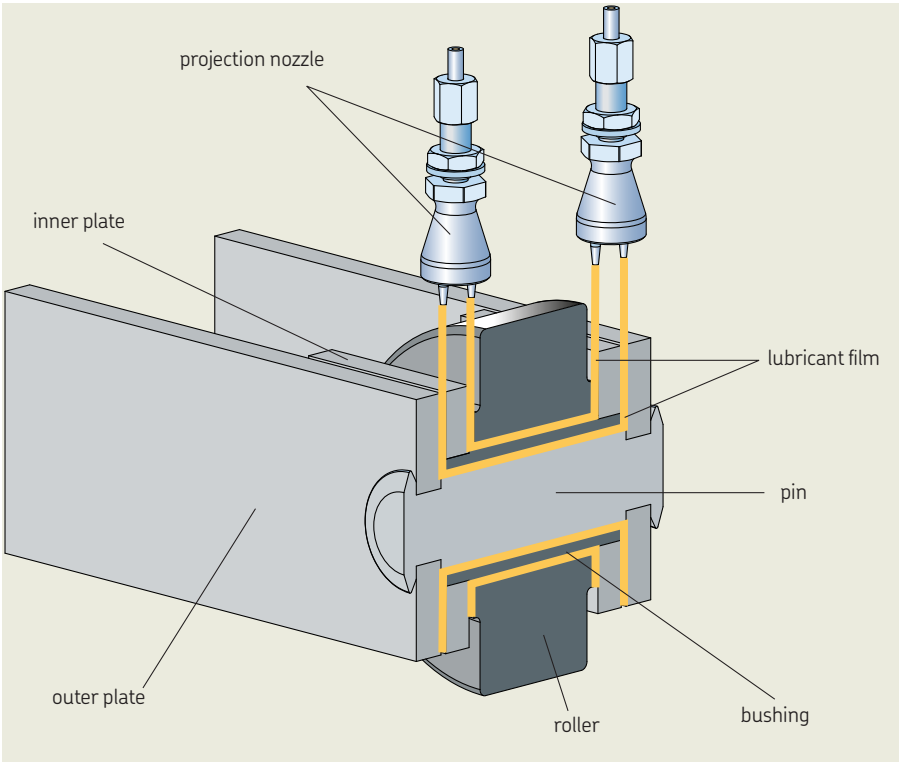
Friction point

The chains present a significant number of friction zones that should be lubricated. The illustration below represents the cross-sectional view of a roller chain with the various parts and friction zones.

The lubricant penetrates between the various elements of the chain by gravity and capillarity. A lubricant film is formed at the friction zones of each element of the chain link. It reduces the temperature rise and thus the wear of parts.

Chain speed
The CLK lubrication system has been designed for lubricating horizontal roller chain conveyors with a chain pitch greater than 25 mm (*1″*). The chain speed should preferably be less than 3 pitches/s. For higher speeds, a "pitch jump" function is integrated into the automation system. Please contact the SKF Service Centre in this case.

Operating temperature
The operating temperature of the lubrication system depends on the lubricant. Contact the lubricant supplier to ensure that the lubricant meets the application temperature requirements.



Central unit

The compact central unit, with protection class IP 65, comprises three main elements:

Oil reservoir

The oil reservoir has a capacity of 7.5 litres. HDPE (high-density polyethylene) transparent plastic makes a visual oil level check possible. In addition, an electrical contact level sends a signal to the integrated control unit (LED and message on the display) once the minimum level has been reached and can also send an external signal to the machine command unit.

Volumetric piston pump

The volumetric piston pump delivers precise quantities of oil and forces them back to the projection nozzles through the 4 mm tubes connected to the outlets. The oil flow is cyclical and synchronised for each outlet with the chain pitch during the lubrication phase.

Control unit

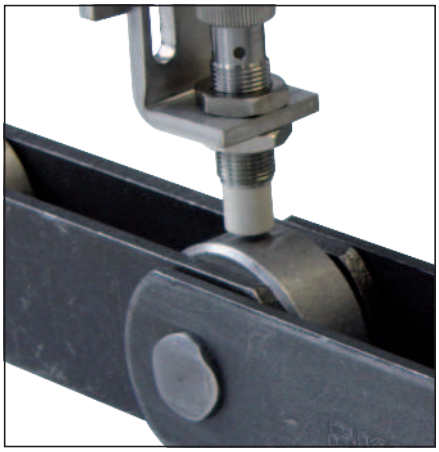
The system works automatically with a succession of lubrication phases and stand-by phases – easily programmable for each application. A 2x16 character front display indicates the status of the system and displays the various parameters. The user can change the lubrication parameters and access the various messages by means of four buttons.

Single or double projection nozzles

The CLK oil lubrication system uses single or double nozzles to project the lubricant onto the lubrication points. The selection of nozzle depends, among other things, on the spacing between the lubrication points.

The distance between the jets of the double projection nozzles can be easily adjusted with an Allen key (between 4.5 mm and 10 mm) for precise projection onto the friction points. The position of the nozzles should always be vertical for top-down projection.

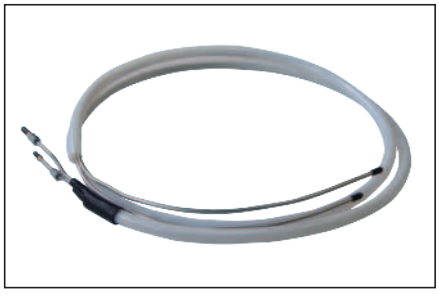
Chain roller sensor



The chain roller sensor – an inductive proximity sensor – sends an electrical signal to the control unit when each roller in the chain is passed. This signal enables the volumetric piston pump to be activated when the system is in the lubrication phase.

The sensor should be located at a maximum distance of 5 mm from the object (roller) to be detected (without any mechanical contact).

Tubing



The measured quantity of lubricant is transported from the central unit to each projection nozzle in stainless steel tubes. Two stainless steel tubes are inserted into a PTFE sheath to facilitate their installation and handling. The tubes are connected to the central unit and to the nozzles by means of crimping ring connectors.

Automatic lubrication

The CLK lubrication system comprises an integrated control unit. This unit, which is easy to use, allows the user to set up their lubrication program according to their needs. The automatic lubrication process can be cyclical, semi-automatic or continuous.

Cyclical lubrication

A lubrication cycle comprises a lubrication phase, during which the lubrication points are lubricated, followed by a stand-by phase. Two parameters should be set: the duration of the lubrication cycle and the number of rollers in the chain that should be lubricated during the lubrication phase. The duration of the stand-by phase depends on the total number of points to be lubricated and the duration of the lubrication cycle.

Semi-automatic lubrication

The user manually triggers the lubrication phase. This phase corresponds to the number of lubrication points set by the user. Once the last lubrication point has been lubricated, the lubrication phase is finished and the system stops. The user should trigger another lubrication phase whenever necessary.

Control unit for SKF CLK chain lubrication system
- *2×16 character display*
- *4 push-buttons*
- *1 failure signal LED*

Continuous lubrication

All lubrication points are continuously lubricated as long as the chain is in operation and the lubrication system is powered.

The control unit also allows the user to monitor the level of lubricant in the reservoir and the proper functioning of the proximity sensor. This last function is only available if the proximity sensor is approved by SKF.

Kit

The CLK lubrication system is provided in the form of a complete kit. The kit comprises all components necessary for installation of the centralized lubrication system, including the central unit, nozzles, proximity sensor and all fittings and accessories.

Oil lubrication system order information

Kit No.	Central unit Flow rate / strokes	Outlets	Nozzle [1] Simple	Double	Proximity sensor [1] Ø	Temperature	Sensing range	Tube [1] Short	Long
CLK-230R-101+XXX [2]	30 mm³	2	2	–	12 mm	-40 to +85 °C	7 mm	1	–
CLK-260R-100+XXX [2]	60 mm³	2	–	2	12 mm	-40 to +85 °C	7 mm	1	–
CLK-260R-101+XXX [2]	60 mm³	2	2	–	12 mm	-40 to +85 °C	7 mm	1	–
CLK-260R-110+XXX [2]	60 mm³	2	–	2	18 mm	-20 to +180 °C	8 mm	1	–
CLK-430R-101+XXX [2]	30 mm³	4	4	–	12 mm	-40 to +85 °C	7 mm	1	1
CLK-430R-121+XXX [2]	30 mm³	4	4	–	8 mm	-40 to +85 °C	4 mm	1	1
CLK-460R-100+XXX [2]	60 mm³	4	–	4	12 mm	-40 to +85 °C	7 mm	1	1
CLK-460R-101+XXX [2]	60 mm³	4	4	–	12 mm	-40 to +85 °C	7 mm	1	1
CLK-460R-110+XXX [2]	60 mm³	4	–	4	18 mm	–20 to +180 °C	8 mm	1	1

[1] For more information on sub-assemblies, see technical specifications
[2] The reference should be completed with the code corresponding to the operating voltage of the central unit: 428 for 230 V AC, 50/60 Hz and 429 for 115 V AC, 50/60 Hz

Technical data

Central unit

Flow rate	30 or 60 mm^3 *(0.0018 or 0.0037 cu. in)*/strokes and per outlet
Lubricant	mineral or synthetic oil without solid additives
Viscosity*	20 to 1 000 mm^2/s at operating temperature
Pump pressure	100 Bar *(1450 PSI)* max.
Operating frequency	2.5 Hz max.
Service life	approx. 20×10^6 cycles
Operating temperature	0 to 60 °C *(32 to 140 °F)*
Operating voltage	110/220 V AC; 50/60 Hz
Protection	IP65
Reservoir capacity	7.5 l *(1.54 gal)* (usable capacity)
Level monitoring	min. level switch
Reservoir material	HDPE
Housing material	ABS
Weight	approx. 12 kg *(26.45 lbs)* (full reservoir)
Acoustic emission	≤ 70 dB (A)

The central unit complies with the following principal standards:

IEC 61010-01: 03/2001	Safety standard
IEC 61010-01: 2010	Safety Standard
EN 61000-6-4: 2007/A1: 2011	Electromagnetic compatibility (EMC) – part 6-4: Generic standards – Emission standard for industrial environments
NF EN 60529 (2000)	Degrees of protection provided by enclosures

Sub-assemblies

Nozzles

Type	one- or two-outlet projection nozzle
Projection	vertical, top-down
Volume	30 mm^3 /stroke and outlet
Projection distance	5 to 50 mm *(0.20 to 1.97 in)*
Lubricant	mineral or synthetic oil
Viscosity	7 to 220 mm^2/s at operating temperature
Operating temperature	-25 to +200 °C *(-13 to +392 °F)*
Lubricant inlet	for metal tube Ø 4 mm *(0.16 in)*, max. length 5 m *(16.4 ft)*
Weight	approx. 50 g *(0.11 lbs)*
Material	304 stainless steel, FPM gasket for check valves
Number of nozzles	2
Accessories	holder and fittings

Proximity sensor

Proximity sensor type	3 wires DC PNP
Output function	NO, normally open
Operating voltage	10 to 36 V AC/DC
Brought	5 mm *(0.20 in)*
Protection	IP68
Operating temperature (sensor)	see table on page 4
Cable length	5 m *(16.4 ft)*
Accessories	Support and hardware

Long tubes

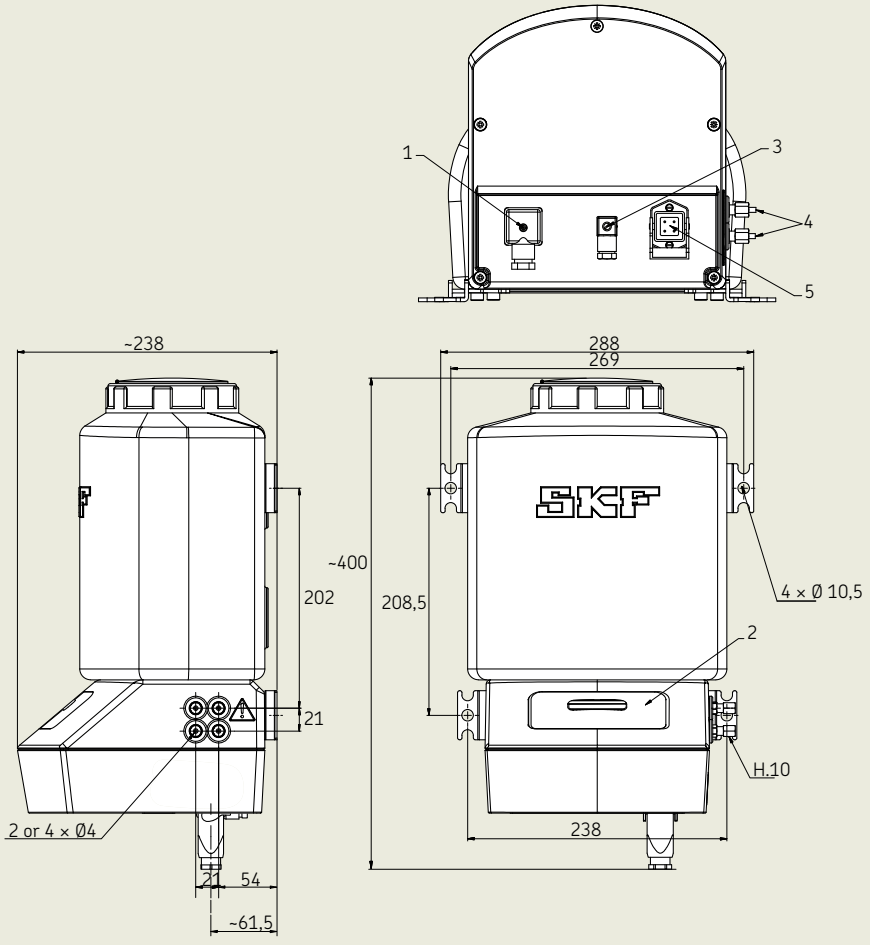
Diameter	4 mm *(0.16 in)* – thin wall
Length	5 m *(16.4 ft)*
Material	316L stainless steel, annealed, in PTFE support sheath
Number of tubes	2

Short tubes

Diameter	4 mm *(0.16 in)* – thin wall
Length	2.5 m *(8.24 ft)*
Material	316L stainless steel, annealed, in PTFE support sheath
Number of tubes	2

*) The minimum and maximum effective viscosities are recommended at operating temperature. It is therefore necessary to take into account any temperature differences between the central unit and the nozzles, for example for "oven" applications.
As the viscosity affects the velocity of the projection, it is necessary to validate the lubricant selected when the system is started under the actual conditions of use (configuration of the installation, ambient temperatures of each component and chain speed).

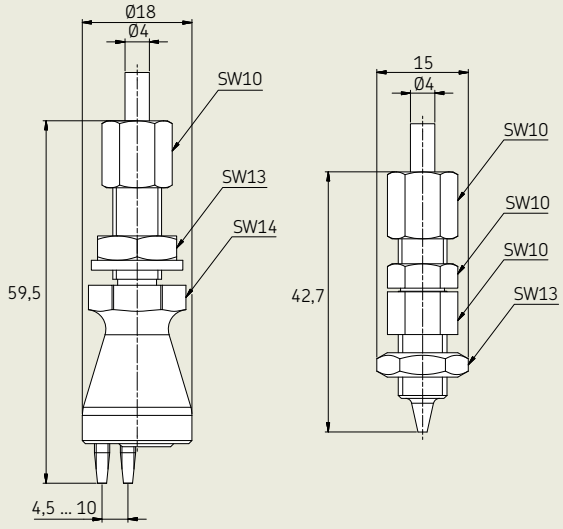
Central unit



1 *Default output connector*
2 *Control panel*
3 *Inductive proximity sensor connector*
4 *Outlets for stainless steel tubing, external diameter 4 mm*
5 *Power supply connector*

Dimensions in mm

Stainless steel projection nozzles

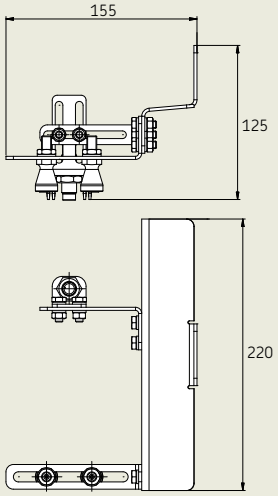


Double nozzle

Single nozzle

Dimensions in mm

Stainless steel holder for nozzles and proximity sensor



Dimensions in mm

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