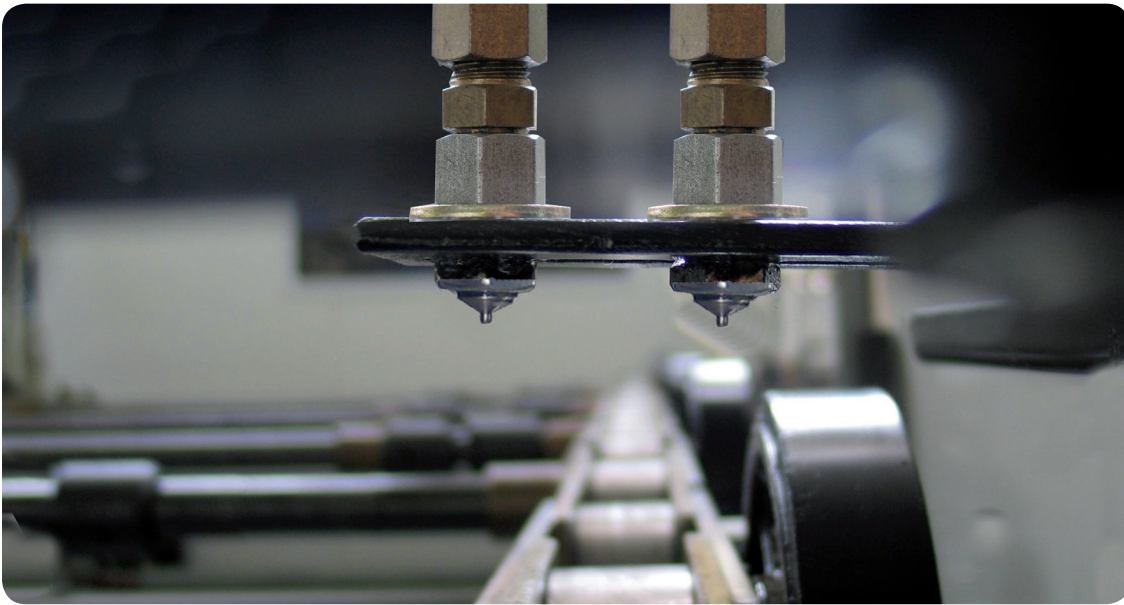


SKF Oil Projection System for Chain Conveyors



Application

Chain conveyors are used in numerous industrial fields. They make it possible to carry heavy loads automatically and continuously.

These conveyors are used in the following industries :

- **Car industry**
Paintshops and drying kilns, transportation of parts, assemblies, power trains and complete vehicles
- **Food & Beverage industry**
Drying kilns, ovens, stoves, sterilization systems, slaughter houses
- **Miscellaneous,**
Escalators, luggage processing in airports, freight consolidation stations, etc

The chains

There are different kinds of conveyor chains to better meet the user's needs. The lubrication points are different depending the type of chain.

- roller chain (→ fig. 1)
- cardan chain (→ fig. 2)
- rivetless chain (→ fig. 3)

Demands on feed and chain conveyors are always very high. They have to withstand heavy loading, continuous operation and harsh operating conditions such as extreme temperature, dust, dirt and water. Chain wear caused by friction between the chain elements and/or corrosion requires regular servicing and repair work to be carried out on the chain – that is if the entire chain does not need to be replaced completely.

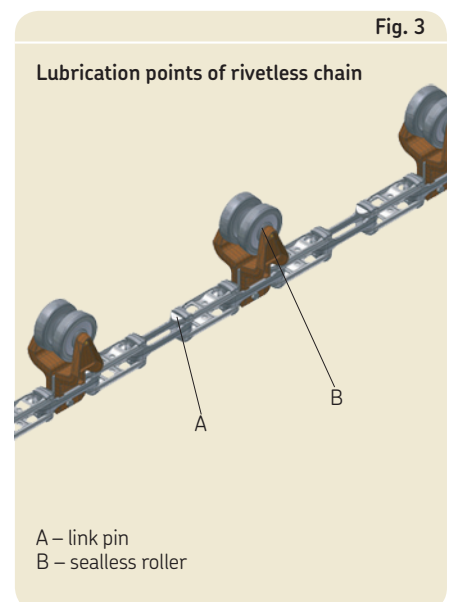
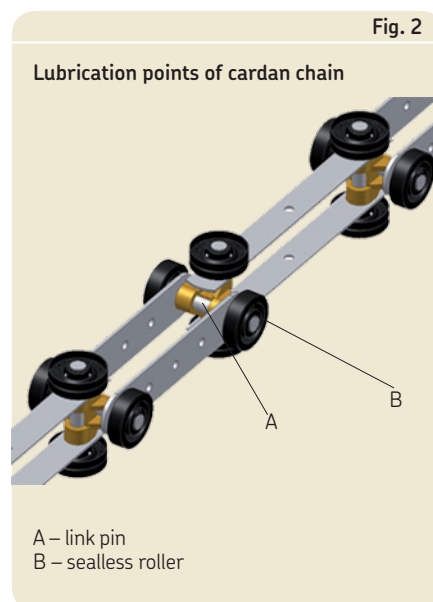
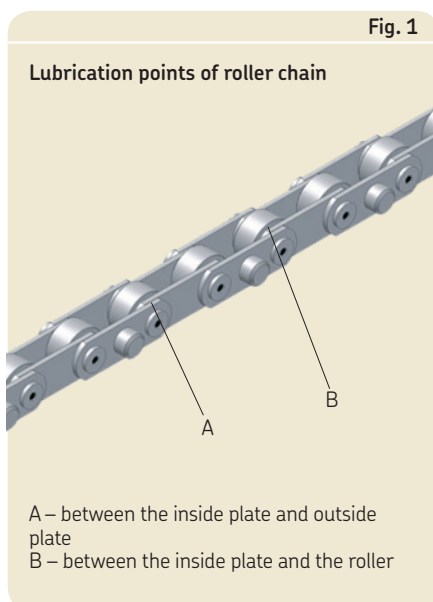
All of this work interrupts the production process. Regular, accurate lubrication of the chain helps to minimize chain wear and thus the need for servicing and repair.

As a specialist in chain lubrication, SKF can offer you custom solutions for your application. SKF has developed a complete range of lubrication systems for oil. The systems can be controlled and monitored using control units or software.

Advantages

- The SKF Oil Projection System prolongs the mechanical service life of the chain and increases its availability.
- Saves energy through reduction of friction
- Better complies with environmental requirements since lubricant usage becomes manageable.
- Improves operator safety by reducing the number of manual maintenance tasks.
- SKF assistance begins with planning and continues right up to the commissioning of the complete system. SKF is available to answer all questions concerning this system.

The lubrication of rollers with nipple is made by grease injection. See the brochure 1-4101-EN "SKF Grease Injection Systems"



The chain lubrication

Friction point

Chains have many friction points (→ **fig. 4**), which need to be lubricated. The example below shows the cross-section view of a roller chain with the different components and friction points. The lubricant flows through the different friction points by capillarity.

Capillarity

When the lubricant reaches the lubrication point, it penetrates by capillarity through the different components of the chain. A lubricant film is built up between the friction points. The aim of the film is to reduce temperature increase and wear. Furthermore, it offers an additional protection against corrosion and pollution as it prevents any foreign matter such as dust, particles to penetrate between the pieces.

Function

The SKF Oil Projection System for Chain Conveyors, type UC, projects lubricant to the lubrication point, e.g. the friction point, without any direct mechanical contact with the chain.

Oil projection

The SKF Oil Projection System generally has one or several electromagnetic pump(s), one oil reservoir and a control unit. The chain is lubricated while it is running.

To get an optimal lubrication, very small amounts of oil have to be projected at the right moment on the lubrication point of the chain. A proximity switch detects the exact position of the chain, rollers or chain links, thus helping to determine the right time to project the lubricant. When a lubrication point is detected, the control unit triggers a lubrication impulse. At every lubrication impulse, the electromagnetic piston pumps deliver accurate lubricant doses (20 or 40 mm³/impulse) projected to the lubrication points.

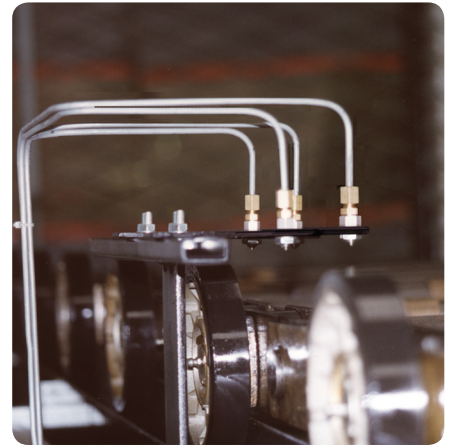
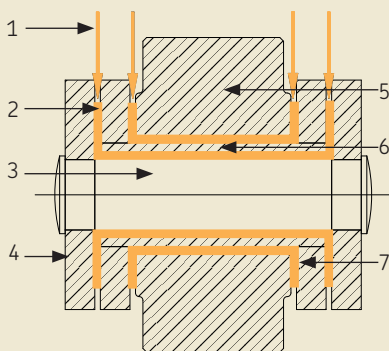


Fig. 4



- 1 lubricant inlet
- 2 lubricant film
- 3 pin
- 4 outside link plate
- 5 roller
- 6 sleeve
- 7 inside link plate

See important product usage information on the back cover.

Oil projection system for the lubrication of floor conveyors

Design

The SKF Oil Projection System type UC-DES is designed for the lubrication of floor conveyors. These conveyors are mostly equipped with roller chains.

The UC-DES lubrication system can, according to the model, lubricate up to eight lubrication points at the same time.

The UC-DES lubrication system comprises the lubrication unit itself and several different kits or accessories depending on the application.

The UC-DES unit

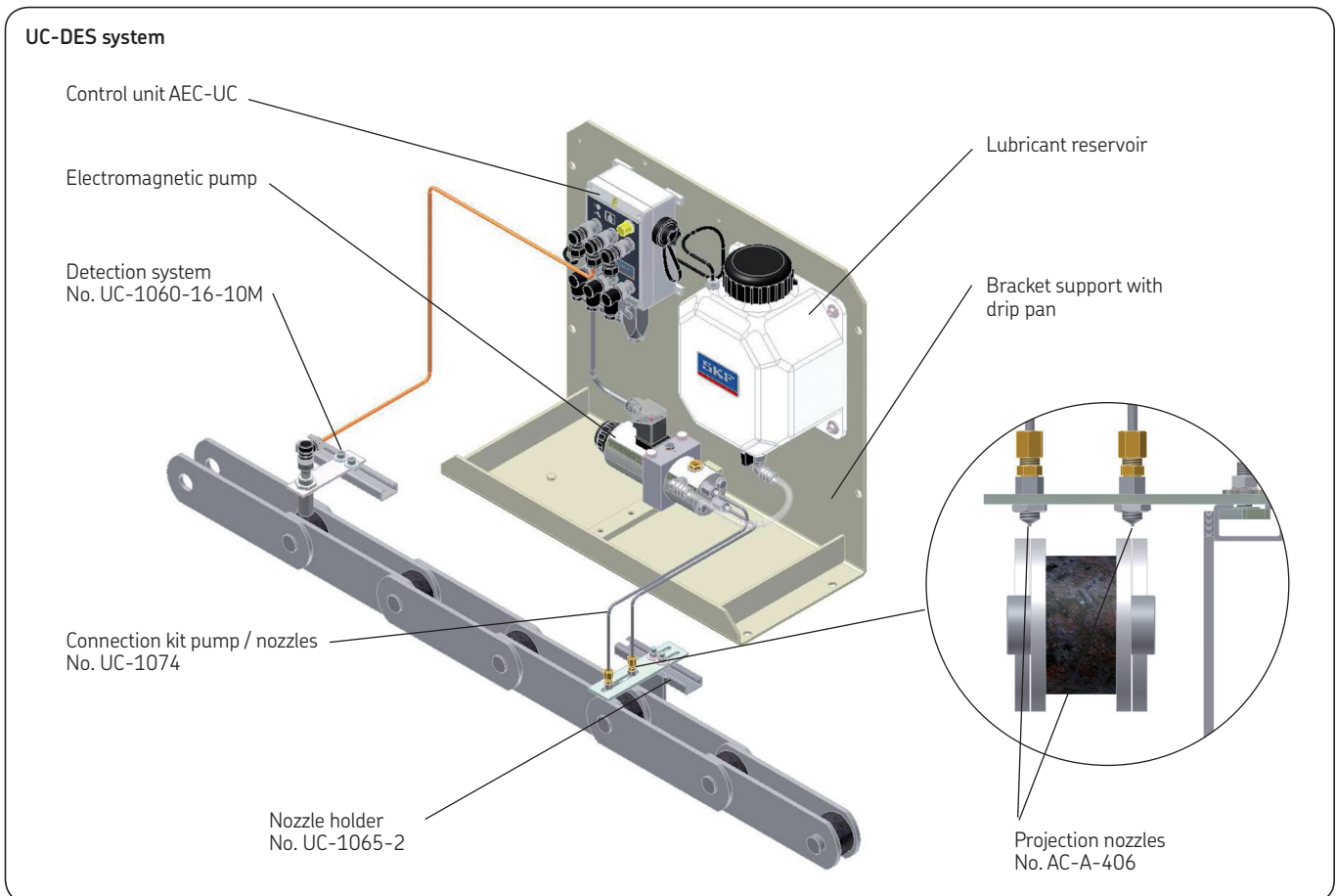
The UC-DES unit is comprised of:

- one or two electromagnetic pump(s) type PE (→ page 8)
- a lubricant reservoir
- a control unit (→ page 9) type AEC-UC to control and monitor the lubrication unit.
- a support plate with a drip pan

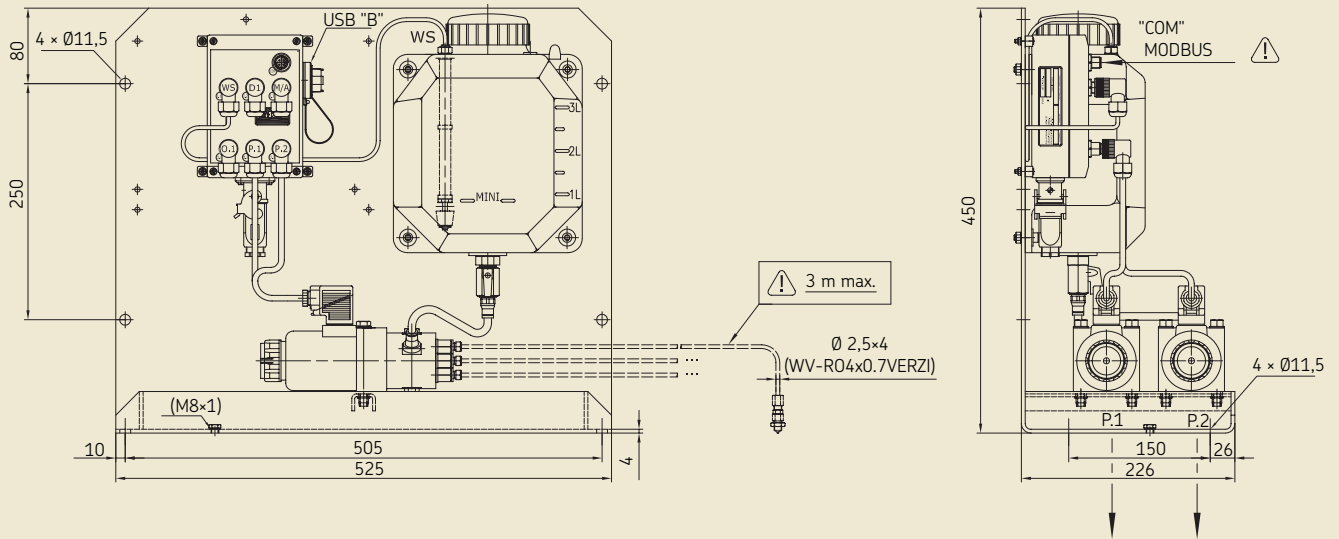
Kits and accessories

Several kits and accessories can be added to the UC-DES unit to complete the lubrication system. More information on the kits and accessories is contained on pages 10 to 14.

- Projection nozzles (No. AC-A-406)
- Fixation kit for projection nozzles (No. UC-1065-2)
- Kit for the connection between the nozzles and the electromagnetic pump outlets (No. UC-1074)
- Kit for the detection of the lubrication points (No. UC-1060-16-10M)
- Kit to attach the unit to a wall or floor (No. UC-1073-1 or UC-1010-150-01).
- Protection kit to protect the lubrication lines against shocks (No. UC-1076)



UC-DES



Technical data

UC-DES

Number of pumps	1 or 2
Outputs	2, 3 or 4 per pump
Flow rate	20 or 40 mm ³ /per stroke and outlet
Lubricant	mineral or synthetic oils, no additives,
Viscosity	< 1 000 mm ² /s
Operating temperature	0 to 60 °C
Working frequency	≤ 2 strokes/s
Reservoir capacity	3,3 l
Level monitoring	min. level switch

UC-DES unit order information

Order No.*	Pump(s)	Pump P.1 Outputs	Volume	Pump P.2 Outputs	Volume
UC-DES-0515	1	2	20	–	–
UC-DES-0516	1	2	40	–	–
UC-DES-0517	1	3	20	–	–
UC-DES-0518	1	3	40	–	–
UC-DES-0519	1	4	20	–	–
UC-DES-0520	1	4	40	–	–
UC-DES-0521	2	2	20	2	20
UC-DES-0522	2	2	40	2	40
UC-DES-0523	2	3	20	3	20
UC-DES-0524	2	3	40	3	40
UC-DES-0525	2	4	20	4	20
UC-DES-0526	2	4	40	4	40
UC-DES-0527	2	2	20	4	20
UC-DES-0528	2	2	40	4	40

* Please indicate the voltage key when ordering:
+428 for 230 V AC, 50/60 Hz, +429 for 115 V AC, 50/60 Hz, +924 for 24 V DC

Oil projection system for the lubrication of overhead conveyors

The SKF Oil Projection System type UC-DEA is designed for the lubrication of overhead conveyors. These conveyors are mostly equipped with rivetless chains.

The lubrication system is fitted on a rail section corresponding to the conveyor. It has been designed to meet the needs of conveyors equipped with rivetless chains of the following dimensions: 2", 3", 4" or 6".

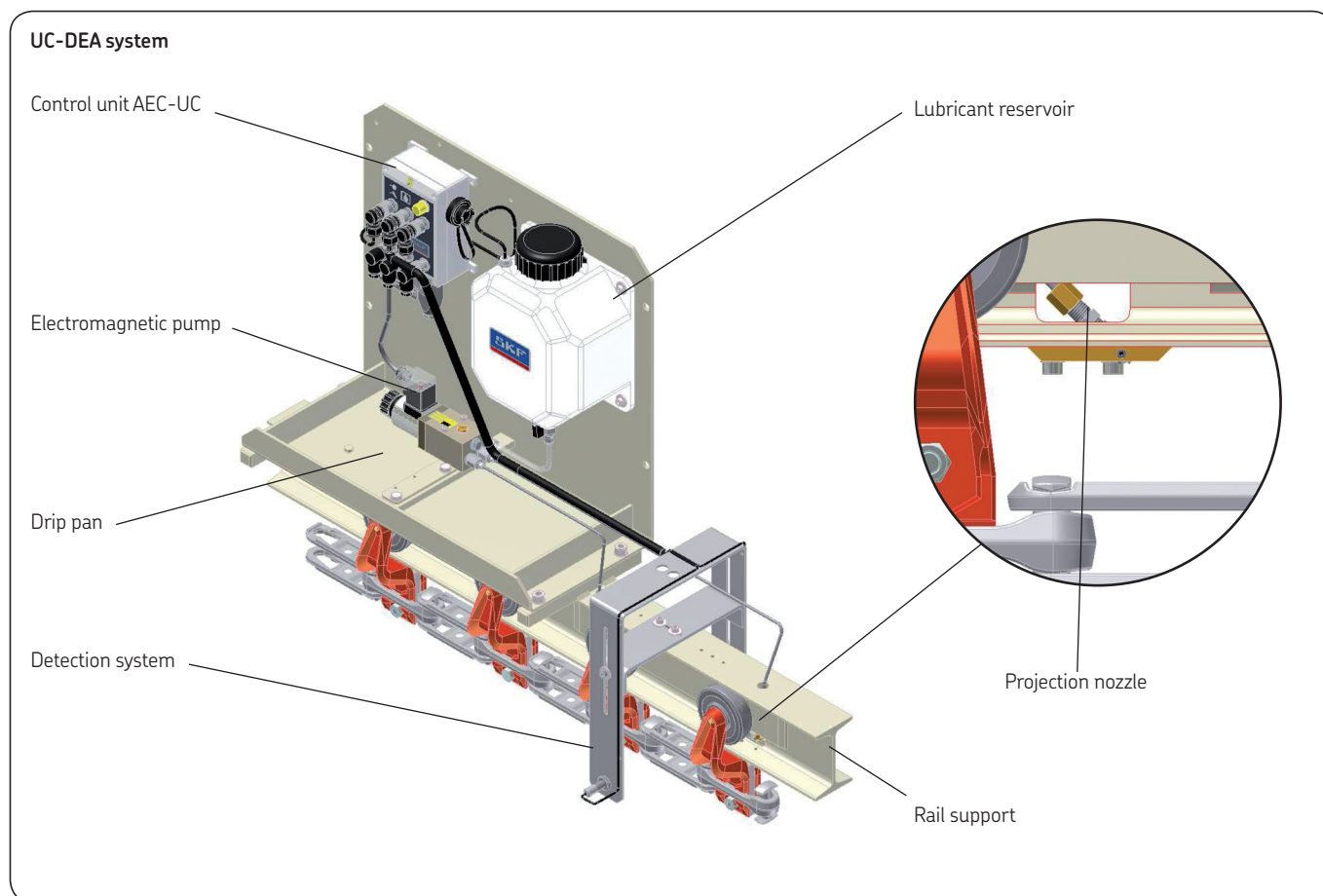
The system has an electromagnetic pump with two outlets and can project oil on two lubrication points at the same time.

Some systems can be equipped with a second electromagnetic pump to lubricate the driven chain of the conveyor with oiling brushes. The kit No. UC-1075 (→ page 15) is comprised oiling brushes and holders.

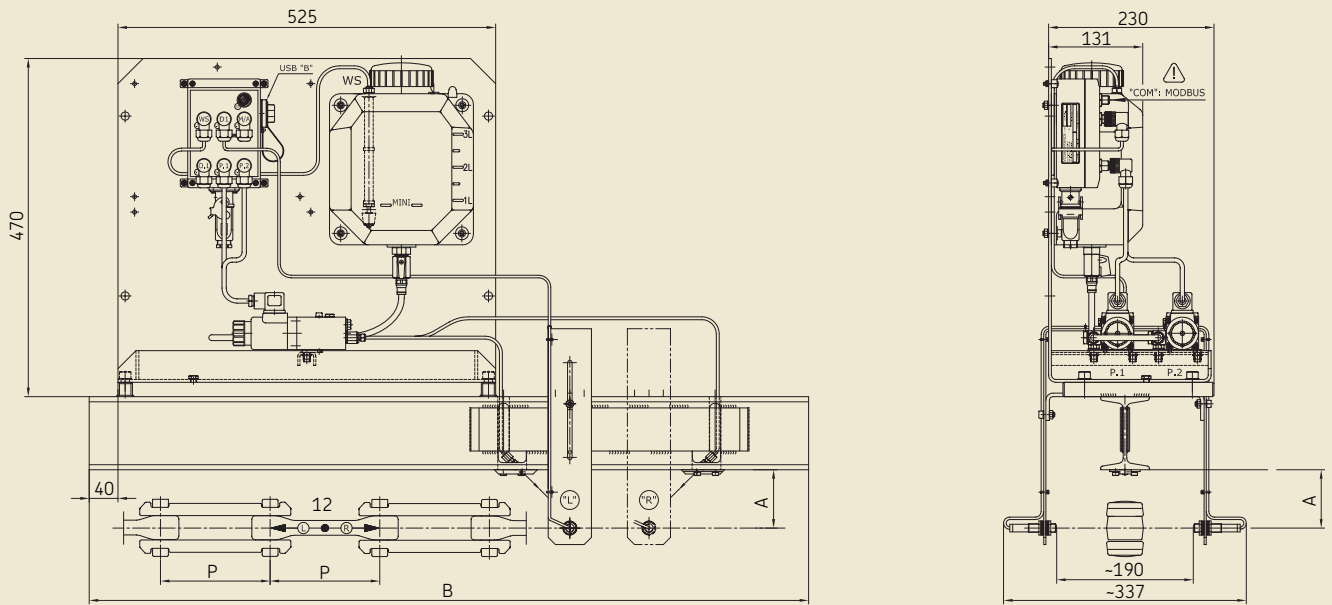
Design

The lubrication system UC-DEA is a complete system with the following components:

- one or two electromagnetic pumps (→ page 8) with two outlets each, flow rate from 20 to 40 mm³ per impulse.
- two projection nozzles fitted on a rail section suited to the size of the chain.
- a lubricant reservoir of 3,3 l.
- a detection system (photoelectric cells).
- a control unit to control and monitor the lubrication system and the detection system (→ page 9).
- a rail section corresponding to the conveyor.



UC-DEA



Technical data

UC-DEA

Number of pumps	1 or 2
Outputs	2 per pump
Flow rate	20 or 40 mm ³ /per stroke and outlet
Lubricant	mineral or synthetic oils, no additives,
Viscosity	< 1 000 mm ² /s
Operating temperature	0 to 60 °C
Working frequency	≤ 2 strokes/s
Reservoir capacity	3,3 l
Level monitoring	min. level switch

UC-DEA unit order information

Order No.*	Rail	Rivetless chain P	Size A	B	Number of pumps	Volume [mm ³]
UC-DEA-0202	IPE 80 (80 × 46)	2"	59	1 000	1	20
UC-DEA-0203	IPE 80 (80 × 46)	2"	59	1 000	2	20
UC-DEA-0204	I.A.S 3" (76,2 × 59,2)	3"	64	1 000	1	20
UC-DEA-0205	I.A.S 3" (76,2 × 59,2)	3"	64	1 000	2	20
UC-DEA-0206	I.A.S 4" (101,6 × 67,5)	4"	81	1 000	1	20
UC-DEA-0207	I.A.S 4" (101,6 × 67,5)	4"	81	1 000	2	20
UC-DEA-0208	I.A.S 6" (152,4 × 84,6)	6"	101,6	1 100	1	40
UC-DEA-0209	I.A.S 6" (152,4 × 84,6)	6"	101,6	1 100	2	40
UC-DEA-0210	I.A.S 4" (101,6 × 67,5)	6"	87	1 000	1	40
UC-DEA-0211	I.A.S 4" (101,6 × 67,5)	6"	87	1 000	2	40

* Please indicate the voltage key when ordering:
+428 for 230 V AC, 50/60 Hz, +429 for 115 V AC, 50/60 Hz, +924 for 24 V DC

Electromagnetic pump

The electromagnetic pump is the core component of the SKF Oil Projection System. It can project precisely 20 to 40 mm³ of lubricant per outlet and impulse to the lubrication point.

Design

The electromagnetic pump consists of a housing, a rotatable (−90°, 0°, +90°) mounting flange, an electric connector and an electromagnet that acts on the plunger. The plunger moves the pumping pistons with the help of a barrel centered in the pump's housing. A return spring pulls each piston back into its initial position. The pump can have 2, 3 or 4 outlets according to the model. Each outlet port is equipped with a check valve.

Oil is fed directly from the gravity reservoir into the intake chamber. The pump is vented by an opening.

Power is supplied to the pump via a swiveling connector – the signal light illuminates when the power is on. DC or AC current supply. Alternating current can be rectified with a diode bridge.

The pump can be operated by hand at any time or when there is a power failure.

Electromagnetic pumps PE and PEP

An electromagnetic pump PE can deliver lubricant to a projection nozzle at a maximal distance* of 7 m. It meets the particular needs of UC-DES systems.

An electromagnetic pump PEP can deliver lubricant to a projection nozzle at a maximal distance* of 1 m. It meets the particular needs of UC-DEA systems.

* The maximal distance depends on the operating conditions and the lubricant.

Electromagnetic pump PE



Electromagnetic pump PEP



Technical data

Electromagnetic pumps	PE	PEP
Delivery pressure	< 100 bars	< 80 bars
Inlet pressure	0,01 < P < 0,5 bar	0,01 < P < 0,5 bar
Flow rate	20 to 40 mm ³ /stroke	20 to 40 mm ³ /stroke
Service temperature	−20 to +60 °C	−20 to +60 °C
Working frequency	≤ 2 strokes/s	≤ 2 strokes/s
Mechanical life	20 × 10 ⁶ operating cycles max.	20 × 10 ⁶ operating cycles max.
Lubricant	mineral or synthetic oils, no additives	mineral or synthetic oils, no additives
Effective viscosity	< 1 000 mm ² /s	< 1 000 mm ² /s
Seals	fluorocarbon (FPM)	fluorocarbon (FPM)
Lubricant inlet	G 1/4 NFE 03-005, depth max. 8 mm	G 1/8 NFE 03-004
Lubricant outlet	M 8×1 according to NFR 954-03	M 8×1 according to NFR 954-03
Bleeding opening	G 1/4, plug H15	M6 plug H9
Electric		
Direct current	24 V DC	24 V DC
or alternative current	115 V – 50/60 Hz or 230 V – 50/60 Hz	115 V – 50/60 Hz or 230 V – 50/60 Hz
Intensity max.	4,5 A/24 V DC 1 A/115 V 0,5 A/230 V	4,8 A / 24 VDC 1,3 A/115 V 0,6 A/230 V
Duty cycle	0,1 ≤ T ≤ 0,2 s	0,1 ≤ T ≤ 0,2 s
Duty ratio	40%	40%
Electromagnet, power	105 W	125 W
according to 93/68/EWG CE / 73/23/EWG low voltage		
Type of enclosure (screwed connector)	IP 65	IP 65
Connector	according to DIN 43 650	according to DIN 43 650

Control unit AEC-UC

The AEC-UC control unit has been especially designed for the SKF Oil Projection System. Its main function is to trigger a lubrication impulse at a regular time interval.

Function

When the chain is running, the proximity or photoelectric switch, located on the chain, detects a lubrication point further down the chain and then at each detection, it sends a signal to the control unit.

If the system is in lubrication phase, the control unit triggers a lubrication impulse at every signal (or an impulse rhythm set by the user). The number of lubrication impulses is set in accordance with the customer's needs.

When the system is paused, no lubrication impulse is triggered. The user set the length of the pause bases on time or number of pulses. If number of pulses, the control unit counts the pulses sent by the proximity switch. When the set number of pulses is reached, the pause phase is over and a new lubrication phase starts.

The control unit AEC-UC can manage two different lubrication circuits. It is also possible to monitor the lubricant level in the reservoir.

Programming software for AEC unit

The user sets the different parameters of the control unit AEC directly on the computer. This software also allows the user to follow the evolution of the different lubrication cycles in real time. And, it also receives information on events occurring during the lubrication cycle.

The software and the connection cable (A/B USB cable) are delivered with the control unit.

Control unit AEC-UC



Technical data

Control unit AEC-UC

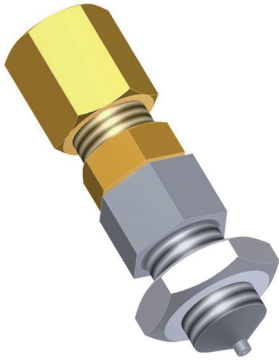
Power supply	115 V AC, 50/60 Hz 230 V AC, 50/60 Hz 24 V DC
Consumption	5.5 A for 115 and 230 V AC 1 W for 24 V DC
Inputs	3
Current [I]	15 mA
Voltage [U]	24 V DC
Outputs	3
Relay output	1
Current [I]	4 A max.
Voltage [U]	250 V AC max.
Static outputs	2
115 V AC	I max. 2 A, U max. 250 V AC
230 V AC	I max. 2 A, U max. 250 V AC
Protection	IP65
Service temperature	0 to 60
Housing material	ABS
Colour	light grey, RAL 7035
Weight	875 g
Connectors (delivered with the control unit)	
Power supply connector	square 24, female
Input connector	screw connector M12×1, round, female
Output connector	screw connector M12×1, round, male
Connectors (not delivered with the control unit)	
Communication connector	screw connector M12×1, round, female

Projection nozzle

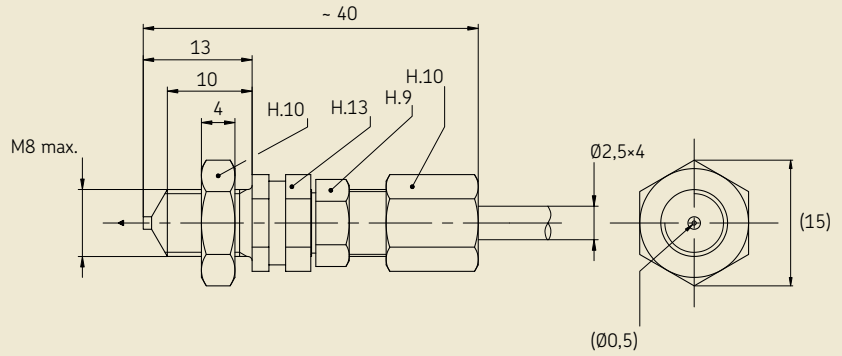
The nozzle is meant to project oil without air. It has a metal housing, fluorocarbon (FPM) seals and is equipped with a check valve.

No. AC-A-406

Nozzle AC-A-406



AC-A-406



Technical data

Nozzle AC-A-406

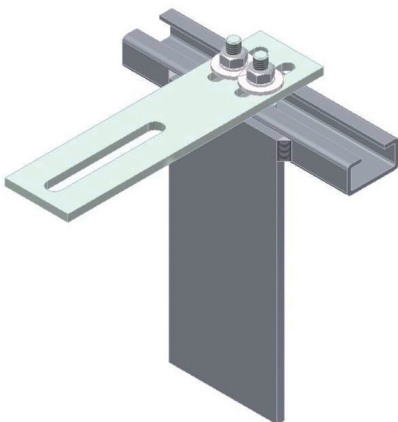
Flow rate	20 to 40 mm ³ /stroke
Lubricant	mineral or synthetic oils, no additives,
Oil viscosity	100 mm ² /s at 40 °C
Operating temperature	10 to 220 °C

Nozzle holder

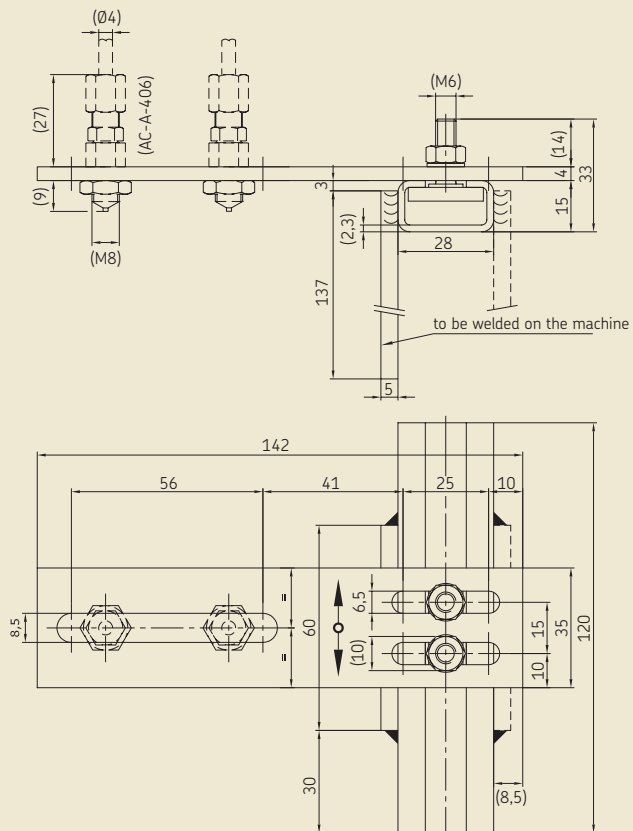
The holder has one or two nozzles positioned above the chain and can be adjusted precisely towards the lubrication points.

No. UC-1065-2

Nozzle holder UC-1065-2



UC-1065-2



Connection kit

The kit connects the electromagnetic pump outlets to the projection nozzles with galvanized steel tubes.

It is possible to connect up to four pump outlets with this kit.

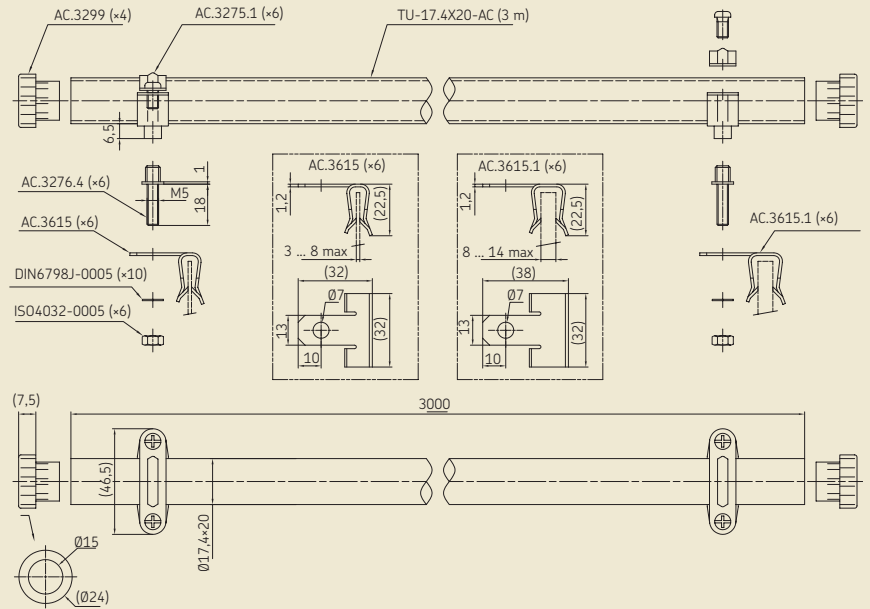
No. **UC-1074**

Protection kit

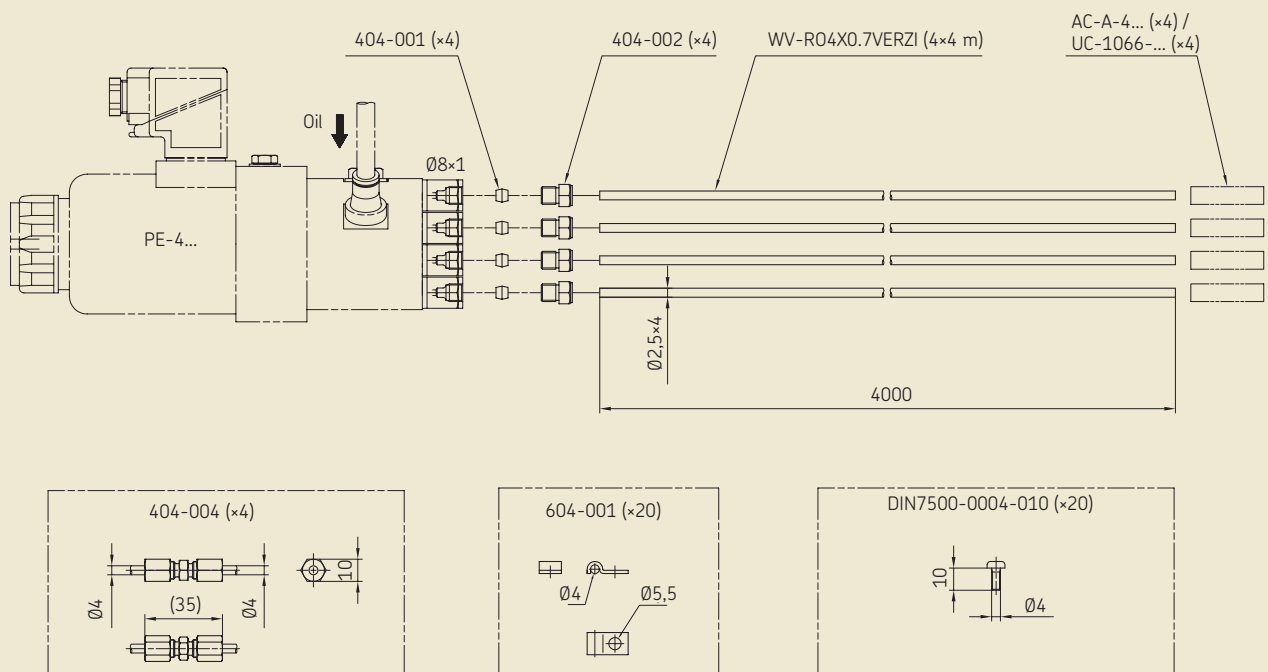
This kit protects the lubrication lines between the pump and the nozzles. It also protects the tubes against accidental shocks that could diminish the performance of the lubrication system (bendings, leakages, etc).

No. **UC-1076**

UC-1076



UC-1074



Fixing kit

This kit can be used to attach the lubrication unit to a wall or floor.

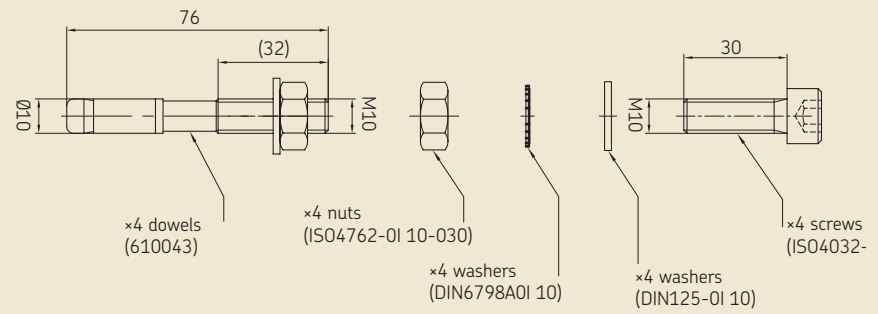
No. UC-1073-1

Fixing kit

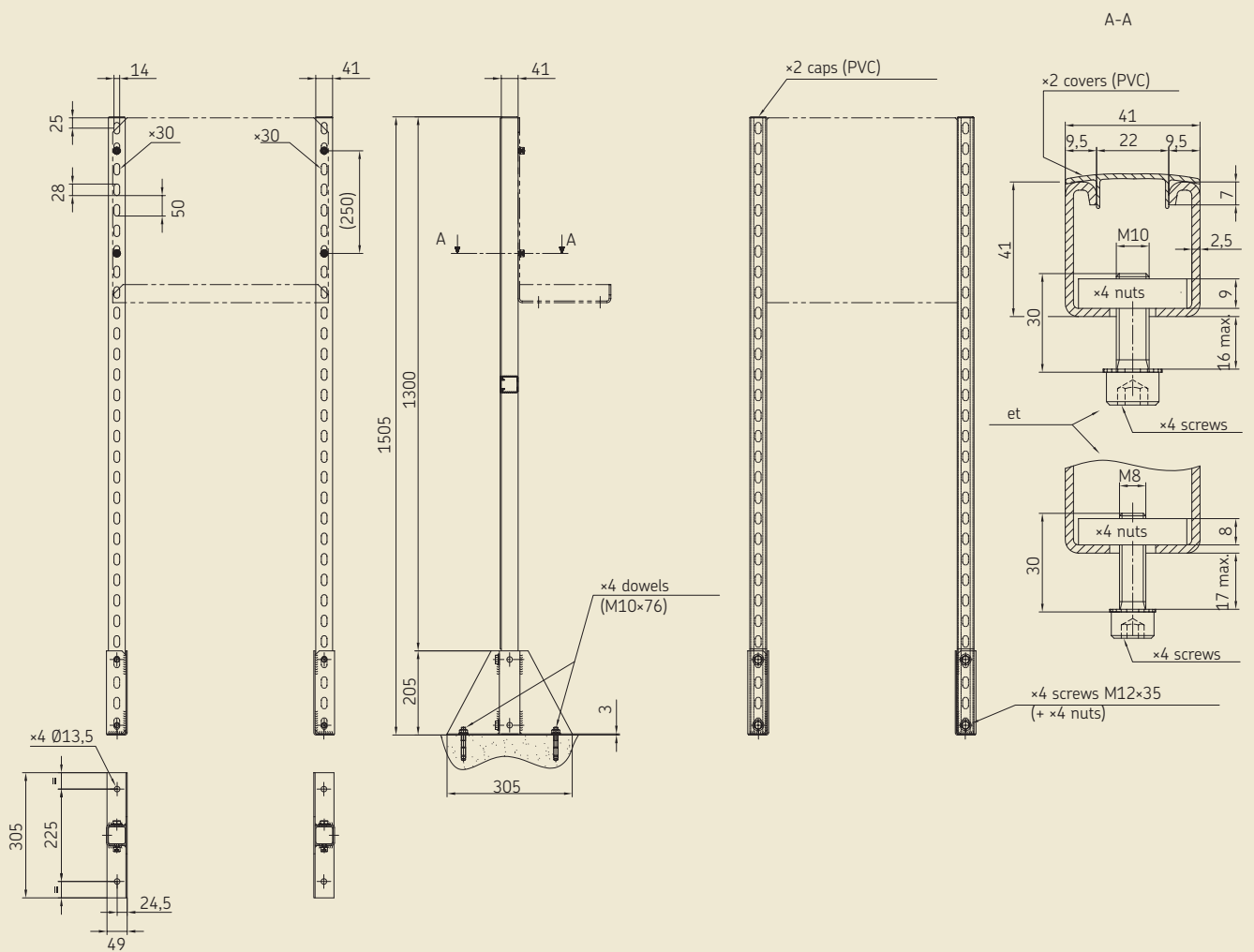
This kit attaches support legs to the unit.

No. UC-1010-150-01

UC-1073-1



UC-1010-150

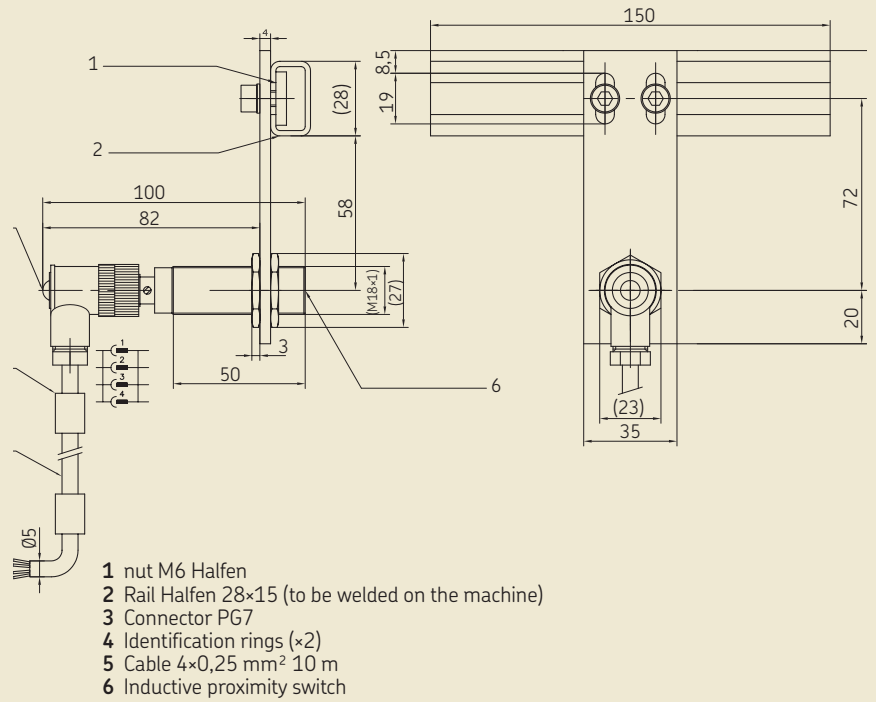


Detection system

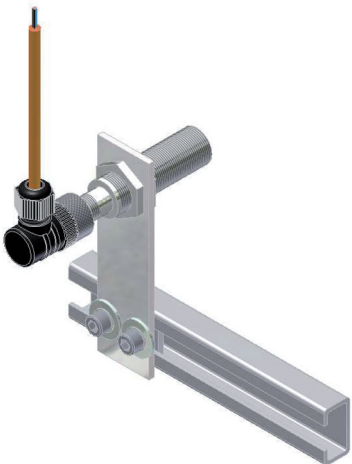
The proximity switch detects a lubrication point further down the chain and then at each detection, it sends a signal to the control unit AEC-UC.

No. UC-1060-16-10M

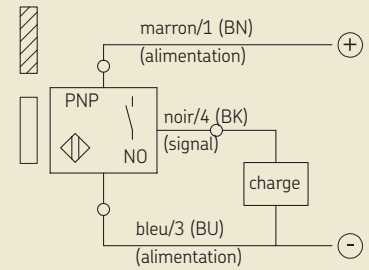
UC-1060-16-10M



Detection system



Proximity switch wiring



Technical data

Detection system UC-1060-16-10M

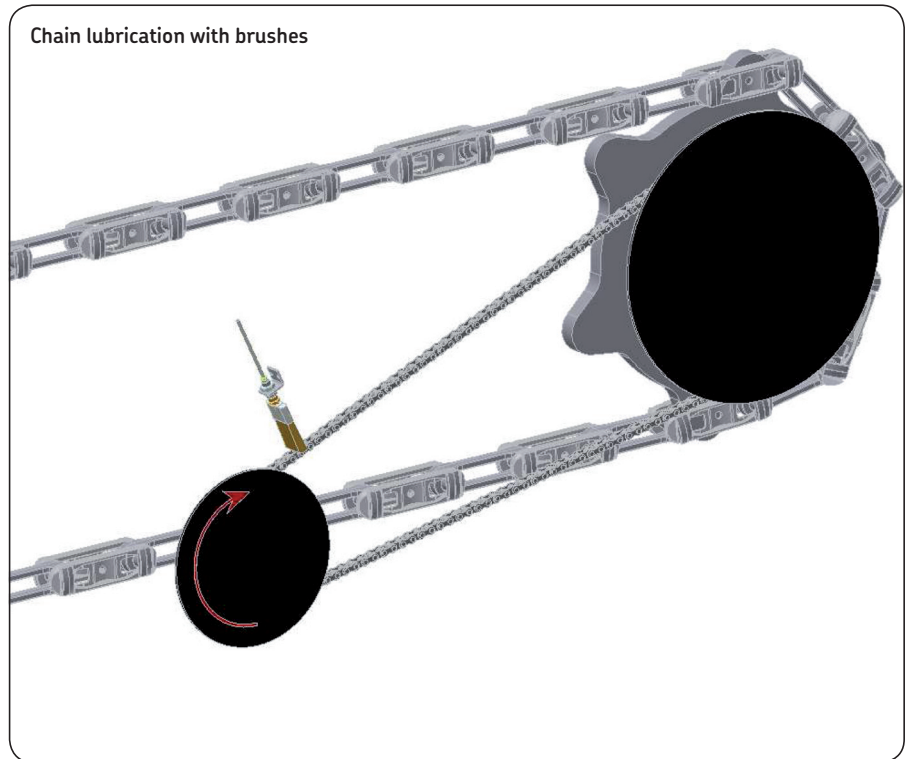
Inductive proximity switch	type 3 leads, PNP
Function	NO
Operating voltage	12 to 48 V DC
Sensing distance	5 mm
Metal housing	IP68
Operating temperature	-25 to +80 °C

Oiling brushes

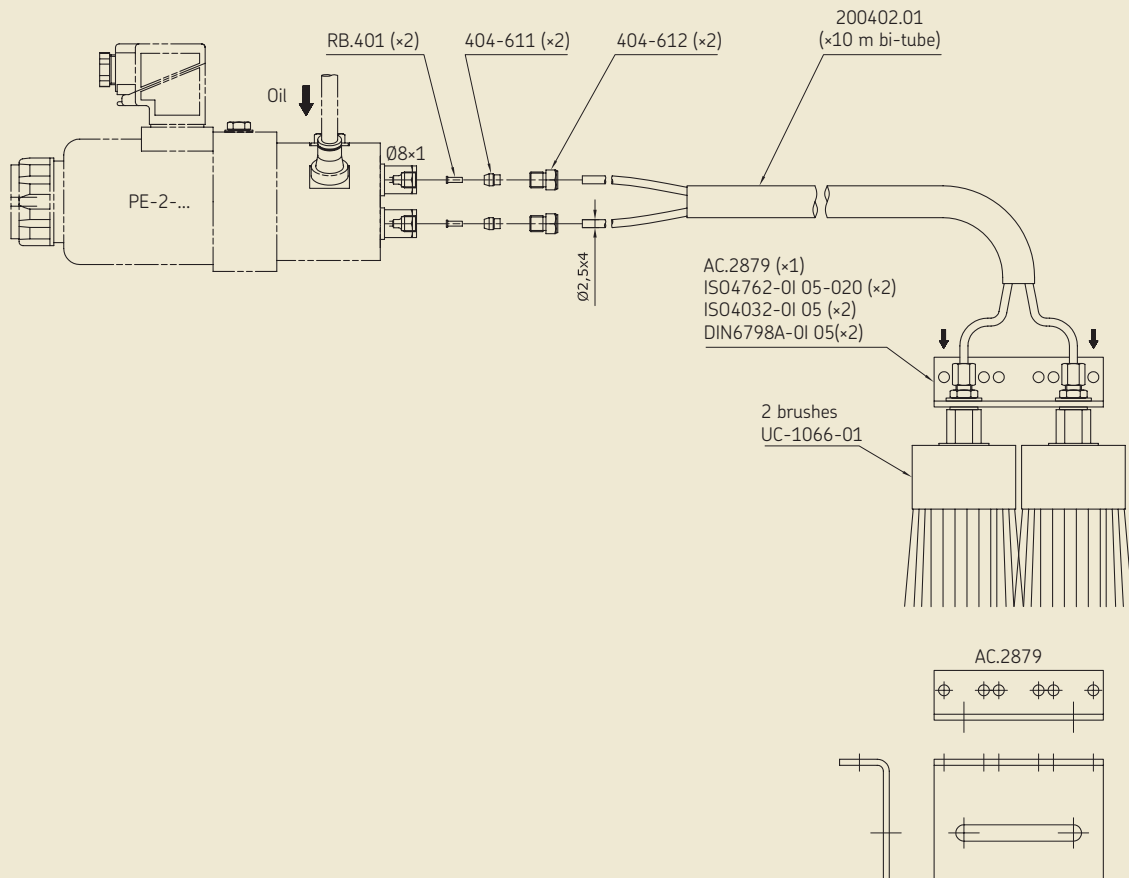
With these lubrication systems, the electromagnetic pumps can also deliver some lubricant to the oiling brushes which apply it directly to the lubrication points.

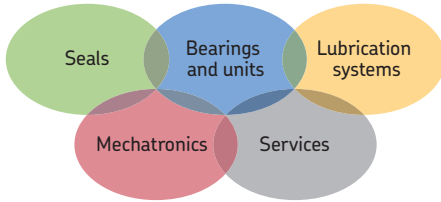
The kit is comprised of two oiling brushes, a holder and all accessories to connect the brushes to the electromagnetic pump. The tube length is 10 m.

No. UC-1075



UC-1075





The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.

This brochure was presented by:

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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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PUB LS/P2 10275 EN · March 2009

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