

LUBRICATION PUMP **SAO, SAG**

APPLICATION

Lubricating pump sets, SAO for lubricating oils, and SAG for soft-grease, are used as a source of pressurised lubricant, oil or soft-grease, for single-line central lubrication. Lubricating system circuits are equipped with SKIB and SKIG series single-line metering valves with SRK manifolds, or with SKIE, SKIB and SKIC series single-line metering valves assembled directly to the lubricated point.

Lubricating pumps with built-in control timer are usually used for cyclic, regular lubrication of a variety of machines and equipment, e.g. textile, food-making, wood-making, shoe-making, plastic-making, printing, paper-making, wrapping, etc.

SAO and SAG lubricating pumps are available in various execution (see tab.) with lubricant tank volumes of 3 and 6 litres. The tanks are made of plastic. The nominal flow rate is 100 cm³/min. with maximum working pressure of 24 bar. Electric motors are normally 115V AC, 230V AC and 24V DC single phase. For other voltages, consult supplier.

DESCRIPTION

The lubricating pump set includes oil tank and cover. The oil tank is attached to the cover with 6 bolts and sealed with a flat paper gasket. All parts of the lubricating pump set are located on the cover. These are: electric motor, clutch, gear pump, suction strainer, outlet with connecting pipe union, distributor, electric level indicator and the filler with a strainer and a cap. The control timer and the electric motor are located under a plastic casing which is securely attached to the cover of the lubricating set. The casing is made from two parts, from which the upper part is detachable, enabling access to, and adjustment of, the control timer unit. In the lower part of the casing a push button is installed for a manual start of intermediate lubrication and 3 indicators. Individual indicators are: green light - voltage applied, yellow light - set is in operation, red light – low oil level or, if applicable, an alarm of the pressure switch.

OPERATION

After starting the lubricating pump set, the gear pump, driven by the electric motor, delivers lubricant into the distributor. The distributor's working piston is simultaneously moved into its working position. The passage for the delivered lubrication into the lubricating circuit is thus opened and all installed dosing devices make their stroke and deliver doses of oil into the lubricated points. The pressure switch, which is built into the pump, is activated when the pressure in the lubricating circuit reaches the switching pressure value. At that moment the electric motor is switched off by an electric signal and the working piston of the distributor returns to its zero position. With this movement the passage of the lubricant into the lubricating circuit is closed and through the relief valve pressure decrease occurs in the lubricating circuit. After pressure relief in the lubricating circuit, the dosing device pistons return to their starting positions and the lubricating cycle can be repeated. Another purpose of the pressure switch built into the pump is to control the pressure and a signal is given to the control timer, to which it is internally connected. With a lubricating pump set with an external pressure switch located at the end of the of the lubricating circuit, the working cycle is entirely identical. A requirement for this is that the connection of the pressure switch to the control timer is correct. One or several of the above-described working cycles can be in progress during the pump operation period. It is possible to set an operation period and pause period, during which the lubricating pump is put out of operation, on the control timer. The control timer is not equipped with a ROM memory, therefore if the power supply is interrupted, the set pause period will be cleared.

SERVICE AND MAINTENANCE

The SAO and SAG lubricating pump sets are installed in a horizontal position and are attached to the machine or equipment wall. 2 x 6.5 mm diameter anchoring holes are prepared for pump attachment.

After pump installation and connection of the outlet to the piping of the lubricating circuit the oil tank is filled up with the specified lubricant. The outlet is designed for connection to TR 6, outlet for connection to TR 8 or other required diameters must be specified in the order.

For SAO and SAG pumps equipped with the time control it is possible to set operation period and pause period within a wide range. This is set before the pump's connection to the power supply. The setting is made by selection of individual switch combinations on three change-over relays. The operation period in seconds is selected on the relay identified as DS 2. The basic range of pause period values in minutes (3 value series) or in hours (1 value series) is selected on relay DS 3. Selection of the exact pause period, from the range (value series) defined on relay DS 3, is consequently made on relay DS 1. For lubricating circuits with a very long pause period, it is possible to set an automatic mode for intermediate lubrication. In this mode an additional lubricating cycle is made during the pause period, during which the pressure switch and lubricant level in the tank are checked. Automatic intermediate lubrication mode is set by switching over the J 1 bridge. If the pump is equipped with a control timer, internal or external, then it is activated by switching over the J 2 bridge.

The power supply for the control timer is made according to the valid regulations for electric equipment. With the SAO 3P2 (SAG 3P2) it is first necessary to make the correct connection of the external pressure switch to the control timer. If the pressure switch is not connected then at the end of the first operation period a pressure alarm is signalled and the pump is automatically put out of operation and blocked. The SAO 3P4 (SAG 3P4) pump is also equipped with a pressure check, i.e. if the lubricating cycle is not finished during the operation period (by a signal from the pressure switch) the pressure alarm is started (flashing red light). With these pump variants, the manual push button for intermediate lubrication can be used at any time during the pause period. One or more lubricating cycles is started with this push button according to the set operation period. Subsequently the automatic clearing of the set pause period is automatically cleared.

It is always necessary to use the push button for intermediate lubrication after refilling the tank due to low lubricant level, where the low level alarm (lighting red indicator) has been lit or in the case of a lubricating cycle repair after a pressure switch alarm (red light reset).

For correct functioning of the lubricating pump the lubricating circuit needs to be perfectly bled, it is further necessary to keep the piping clean, i.e. before pipework assembly to remove burrs and other mechanical impurities.

Except for regular lubrication filling and suction strainer cleaning, approximately twice a year, the pump does not require any other attention or maintenance.

TECHNICAL DATA

Maximum pressure	30 bar	
Working pressure	24 bar - SAO	
	30 bar - SAG	
Relief pressure	cca 1 bar	
Nominal flow rate	100 cm ³ / min.	
Oil tank volume	3, 6 dm ³	
Operation period	5 to 90 s.	
Pause period	1 to 1000 min., 1 to 21 hours	
	2 to 2500 impulse	
Number of outlets	1	
Connecting pipe union	M12x1 mm, for tube outside dia. 6, (8) mm	
Electric Motor	115 V AC, 1,50 A, 50/60 Hz, 110 W	
	230 V AC, 0,75 A, 50/60 Hz, 110 W	
	24 V DC, 1,5 A, 30 W	
Protection	IP 33	
Nomin. voltage of level indicator	oil	250V AC, 150 V DC, 1,5 A
	grease	10-40 V DC, 0,2 A
Lubricant	oil	min. 50 mm ² .s ⁻¹
	grease	NLGI 000, 00
Working environment temperature	0 to 60 °C	
Weight	3,5 kg	

STANDARD VARIANTS AND ELECTRIC WIRING

SAO 3P1, SAO 6P1, SAG 3P1, SAG 6P1

A variant without control timer and without the possibility of end pressure switch connection. The pump is controlled from the machine or equipment control panel. Low level signalling is also connected to the machine control panel.

SAO 3P2, SAO 6P2, SAG 3P2, SAG 6P2

The external pressure switch is attached to the end of the lubricating circuit and can be connected to the control timer, which starts the individual lubricating cycles. The low level signalling is connected to the control timer with the possibility of a remote alarm, e.g. by connecting of an external signalling light.

SAO 3P3, SAO 6P3, SAG 3P3, SAG 6P3

A variant without control timer, pressure switch is built into the pump. Low level signalling is connected to the machine control panel.

SAO 3P4, SAO 6P4, SAG 3P4, SAG 6P4

A variant with control timer on which the operation and pause period is set. An internal pressure switch is built into the lubricating pump and is connected to the control timer. The control timer starts the individual lubricating cycles during the pump operation period. The low level signalling is connected to the control timer with the possibility of a remote alarm, e.g. by connecting an external signalling light.

SAO 3P5, SAO 6P5, SAG 3P5, SAG 6P5

A variant without control timer. The internal pressure switch and push button for the intermediate lubrication is built into the pump. This function enables the starting of lubricating cycles at any time during the pause period. Low level signalling is connected to the machine control panel.

SAO 3P6, SAO 6P6, SAG 3P6, SAG 6P6

A variant without control timer but with a built-in push button for intermediate lubrication without the possibility of end pressure switch connection. The pump is controlled from the machine or equipment control panel. Low level signalling is also connected to the machine control panel.

IDENTIFICATION OF INDIVIDUAL VARIANTS WITH ORDERING CODES

SAO – FOR LUBRICATING OILS

NAME	CODE	TYPE	LUBRICANT	VOLTAGE
SAO 3P1	1008714	Without control timer, without pressure switch	oil	24 V DC
SAO 3P1	1008700	Without control timer, without pressure switch	oil	115 V AC
SAO 3P1	1008701	Without control timer, without pressure switch	oil	230 V AC
SAO 3P2	1808720	With control timer, without pressure switch	oil	24 V DC
SAO 3P2	1008702	With control timer, without pressure switch	oil	115 V AC
SAO 3P2	1008703	With control timer, without pressure switch	oil	230 V AC
SAO 3P3	1008716	Without control timer, with pressure switch	oil	24 V DC
SAO 3P3	1008704	Without control timer, with pressure switch	oil	115 V AC
SAO 3P3	1008705	Without control timer, with pressure switch	oil	230 V AC
SAO 3P4	1808722	With control timer, with pressure switch	oil	24 V DC
SAO 3P4	1008706	With control timer, with pressure switch	oil	115 V AC
SAO 3P4	1008707	With control timer, with pressure switch	oil	230 V AC
SAO 3P5	1008791	Without control timer, with pressure switch and intermediate lubrication	oil	24 V DC
SAO 3P5	1008708	Without control timer, with pressure switch and intermediate lubrication	oil	115 V AC
SAO 3P5	1008709	Without control timer, with pressure switch and intermediate lubrication	oil	230 V AC
SAO 3P6	1808719	Without control timer, with intermediate lubrication	oil	24 V DC
SAO 3P6	1008735	Without control timer, with intermediate lubrication	oil	115 V AC
SAO 3P6	1008736	Without control timer, with intermediate lubrication	oil	230 V AC

NAME	CODE	TYPE	LUBRICANT	VOLTAGE
SAO 6P1	1008757	Without control timer, without pressure switch	oil	24 V DC
SAO 6P1	1008745	Without control timer, without pressure switch	oil	115 V AC
SAO 6P1	1008746	Without control timer, without pressure switch	oil	230 V AC
SAO 6P2	1808724	With control timer, without pressure switch	oil	24 V DC
SAO 6P2	1008747	With control timer, without pressure switch	oil	115 V AC
SAO 6P2	1008748	With control timer, without pressure switch	oil	230 V AC
SAO 6P3	1008759	Without control timer, with pressure switch	oil	24 V DC
SAO 6P3	1008749	Without control timer, with pressure switch	oil	115 V AC
SAO 6P3	1008750	Without control timer, with pressure switch	oil	230 V AC
SAO 6P4	1808726	With control timer, with pressure switch	oil	24 V DC
SAO 6P4	1008751	With control timer, with pressure switch	oil	115 V AC
SAO 6P4	1008752	With control timer, with pressure switch	oil	230 V AC
SAO 6P5	1008769	Without control timer, with pressure switch and intermediate lubrication	oil	24 V DC
SAO 6P5	1008753	Without control timer, with pressure switch and intermediate lubrication	oil	115 V AC
SAO 6P5	1008754	Without control timer, with pressure switch and intermediate lubrication	oil	230 V AC
SAO 6P6	1008794	Without control timer, with intermediate lubrication	oil	24 V DC
SAO 6P6	1008755	Without control timer, with intermediate lubrication	oil	115 V AC
SAO 6P6	1008756	Without control timer, with intermediate lubrication	oil	230 V AC

SAG – FOR SOFT GREASE

NAME	CODE	TYPE	LUBRICANT	VOLTAGE
SAG 3P1	1008715	Without control timer, without pressure switch	grease	24 V DC
SAG 3P1	1008720	Without control timer, without pressure switch	grease	115 V AC
SAG 3P1	1008721	Without control timer, without pressure switch	grease	230 V AC
SAG 3P2	1808721	With control timer, without pressure switch	grease	24 V DC
SAG 3P2	1008722	With control timer, without pressure switch	grease	115 V AC
SAG 3P2	1008723	With control timer, without pressure switch	grease	230 V AC
SAG 3P3	1008717	Without control timer, with pressure switch	grease	24 V DC
SAG 3P3	1008724	Without control timer, with pressure switch	grease	115 V AC
SAG 3P3	1008725	Without control timer, with pressure switch	grease	230 V AC
SAG 3P4	1808723	With control timer, with pressure switch	grease	24 V DC
SAG 3P4	1008726	With control timer, with pressure switch	grease	115 V AC
SAG 3P4	1008727	With control timer, with pressure switch	grease	230 V AC
SAG 3P5	1008792	Without control timer, with pressure switch and intermediate lubrication	grease	24 V DC
SAG 3P5	1008728	Without control timer, with pressure switch and intermediate lubrication	grease	115 V AC
SAG 3P5	1008729	Without control timer, with pressure switch and intermediate lubrication	grease	230 V AC
SAG 3P6	1008799	Without control timer, with intermediate lubrication	grease	24 V DC
SAG 3P6	1008739	Without control timer, with intermediate lubrication	grease	115 V AC
SAG 3P6	1008740	Without control timer, with intermediate lubrication	grease	230 V AC

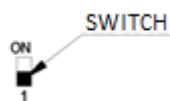
NAME	CODE	TYPE	LUBRICANT	VOLTAGE
SAG 6P1	1008758	Without control timer, without pressure switch	grease	24 V DC
SAG 6P1	1008770	Without control timer, without pressure switch	grease	115 V AC
SAG 6P1	1008771	Without control timer, without pressure switch	grease	230 V AC
SAG 6P2	1808725	With control timer, without pressure switch	grease	24 V DC
SAG 6P2	1008772	With control timer, without pressure switch	grease	115 V AC
SAG 6P2	1008773	With control timer, without pressure switch	grease	230 V AC
SAG 6P3	1008768	Without control timer, with pressure switch	grease	24 V DC
SAG 6P3	1008774	Without control timer, with pressure switch	grease	115 V AC
SAG 6P3	1008775	Without control timer, with pressure switch	grease	230 V AC
SAG 6P4	1808727	With control timer, with pressure switch	grease	24 V DC
SAG 6P4	1008776	With control timer, with pressure switch	grease	115 V AC
SAG 6P4	1008777	With control timer, with pressure switch	grease	230 V AC
SAG 6P5	1008793	Without control timer, with pressure switch and intermediate lubrication	grease	24 V DC
SAG 6P5	1008778	Without control timer, with pressure switch and intermediate lubrication	grease	115 V AC
SAG 6P5	1008779	Without control timer, with pressure switch and intermediate lubrication	grease	230 V AC
SAG 6P6	1008798	Without control timer, with intermediate lubrication	grease	24 V DC
SAG 6P6	1008780	Without control timer, with intermediate lubrication	grease	115 V AC
SAG 6P6	1008781	Without control timer, with intermediate lubrication	grease	230 V AC

Basic variant of lubrication pump SAO, SAG is without gauge. Upon request the code of gauge is 1463000, 0-60bar, G1/8.

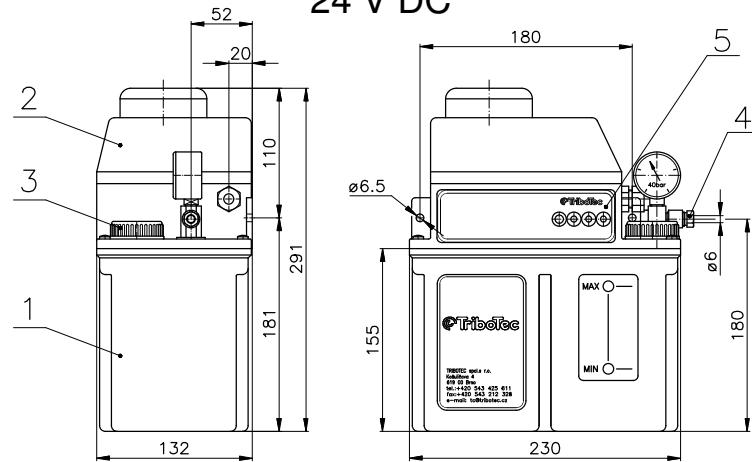
SETTING THE LUBRICATION OPERATION AND PAUSE TIMES

LUBRICATION [seconds]	TIME OF PAUSE				
	[minutes]				
	SWITCH DS 3 	SWITCH DS 3 	SWITCH DS 3 	SWITCH DS 3 	SWITCH DS 3
SWITCH DS2	SWITCH DS 1	SWITCH DS 1	SWITCH DS 1	SWITCH DS 1	SWITCH DS 1
5	1	2,5	5	20	1
10	2	3	10	40	3
15	4	5	15	60	6
20	8	7	20	80	9
30		10	40	160	12
40		20	80	320	15
60		40	160	640	18
90		80	250	1000	21

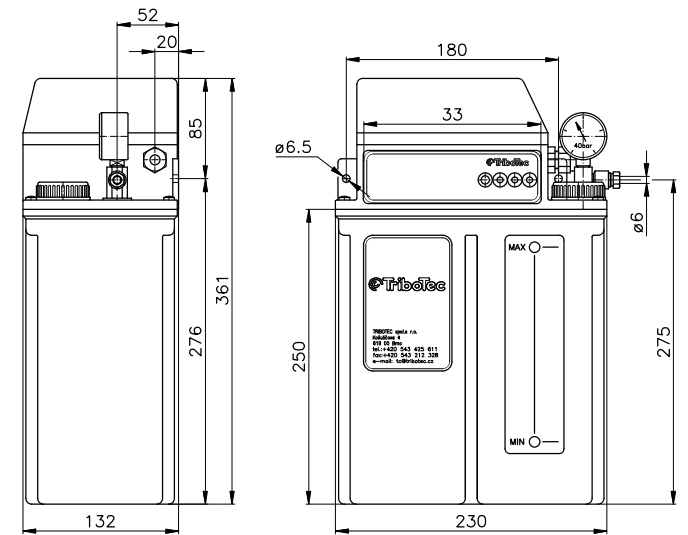
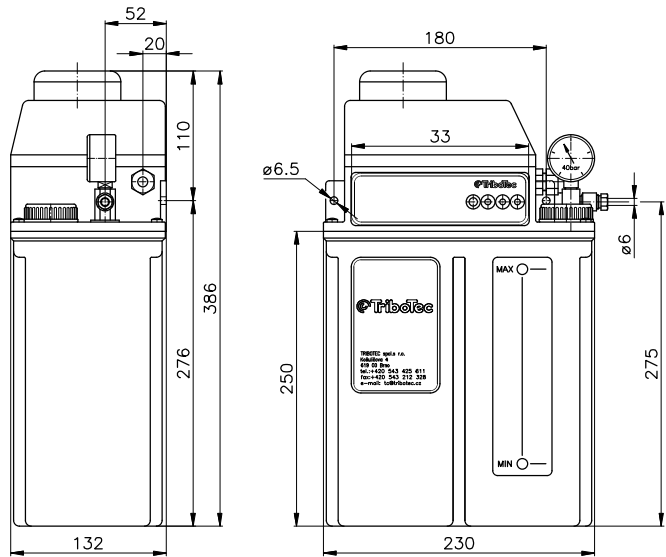
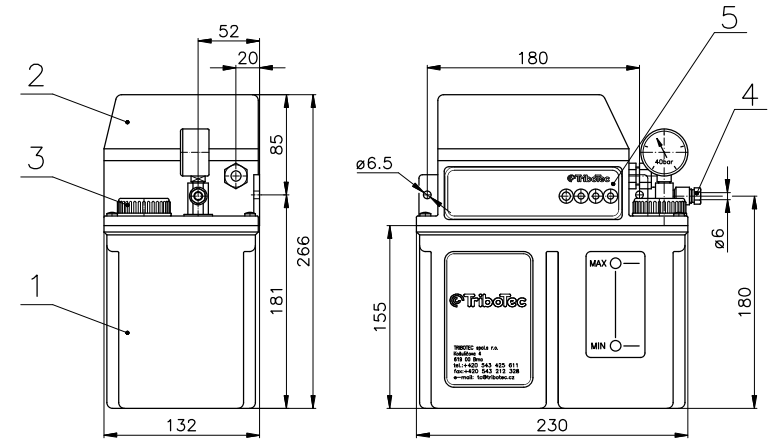
LUBRICATION [seconds]	TIME OF PAUSE				
	[number of impulses]				
	SWITCH DS 3 	SWITCH DS 3 	SWITCH DS 3 	SWITCH DS 3 	SWITCH DS 3
SWITCH DS2	SWITCH DS 1	SWITCH DS 1	SWITCH DS 1	SWITCH DS 1	SWITCH DS 1
5	2	5	10	40	120
10	4	6	20	80	360
15	8	10	30	120	720
20	16	14	40	160	1080
30		20	80	320	1440
40		40	160	640	1800
60		80	320	1280	2160
90		160	500	2000	2520




24 V DC



115 V AC, 230 V AC



Poz.	Název	Name
1	Zásobník maziva	Lubricant tank
2	Víko	Cover
3	Plnicí otvor	Filling hole
4	Vývodní šroubení	Outlet pipe union
5	Ovládací panel	Control panel

Název/Name	MAZACÍ AGREGÁT / LUBRICATION PUMP	 s.r.o. Košuličova 4 Brno www.tribotec.cz +420 543 212 328
Typ/Type	SAO, SAG	
Kód/Code		