

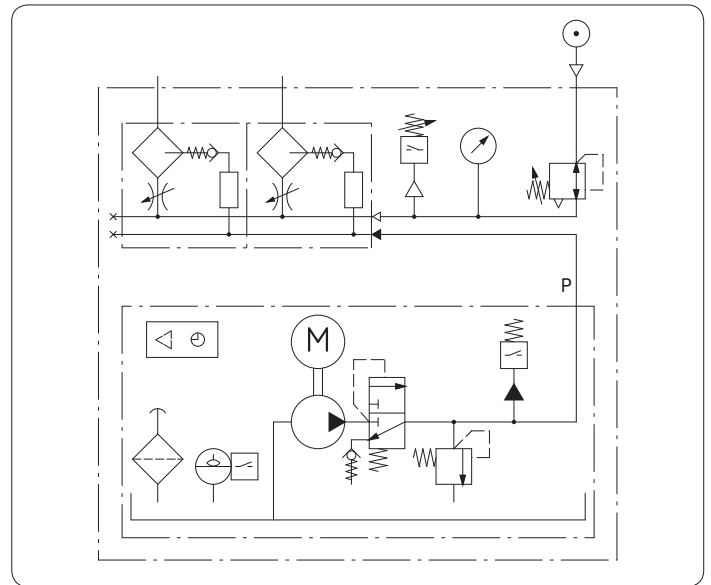
Control Units

for Oil+Air Lubrication



The control units described in this leaflet are used for time- or pulse-dependent control of oil+air systems.

The overview shows the available control units for oil+air systems together with the scope of their functions.



Function

The task of the units is to trigger lubrication after a certain period of time has elapsed. The unique feature of the control units described in this chapter is, however, their prelubrication function, which has been adapted to the special requirements of oil+air lubrication systems.

The functions that come with this series of units will be explained below. The extent to which these functions are implemented will depend on the type of unit.

Overview – Control units for oil+air systems

Designation	Brief description
IG54-20	Pulse generator with prelubrication, adjustable interval time and power-failure memory
IG54-20-S1	Pulse generator with freely selectable number of prelubrication cycles, interval time, delay time and power-failure memory
IG54-20-S3	Like the IG54-20-S1, lubricant level switch configured as NC type
IG54-20-S4	Like the IG54-20-S3, with additional relay output for compressed-air valve

Our units comply with the generally applicable standards.

With all the units in this group, the user can opt for a level switch with NC or NO contacts.

The lubrication cycle

A lubrication cycle consists of the contact time (lubrication routine) and the interval time (TP).

Prelubrication

Prelubrication is a contact time initiated right after the unit is powered up. If a fault occurs during prelubrication, an error message is emitted.

The prelubrication cycle

With some units, a prelubrication cycle is triggered every time the unit is powered up. During the prelubrication cycle, the pump motor is switched on and a number of contact times are executed with short breaks. The number of contact times can, depending on the type of unit, be preset or selected by the operator. An interval time is started at the end of the prelubrication cycle.

In the case of some units operated with a power-failure memory, it is possible to suppress the tripping of a prelubrication cycle when the unit is powered by setting the number of prelubrication cycles (VZ) to 0.

During the prelubrication cycle, faults are only signaled by the flashing of the symbol for the respective input on the display and by interruption of the functional sequence.

The interval time

The interval time is the time between two contact times.

See important product usage information on the back cover.

Pulse generator mode

In this mode, the length of the interval is determined by the unit itself in as much as the unit starts a contact time at the intervals specified by the operator.

The contact time

After completion of the interval time, the control unit initiates the lubrication routine, which is also called the contact time. The contact time consists of the pressure build-up time and the pump delay time (TN).

Monitoring of oil pressure build-up

In the course of the contact time, the pump motor is started to begin with, which builds up the pressure required in the lubricant lines for lubrication. This procedure is monitored by a pressure switch (DS). The respective pressure has to build up within a certain period of time (< monitoring time) or otherwise the pump will switch off and a fault signal will be emitted.

Monitoring time TU

The monitoring time is a time window for the pressure build-up by the pump. If the necessary pressure is reached within the monitoring time, the latter is terminated. The pump delay time is then started. As a rule, the monitoring time is fixed and cannot be changed by the operator.

Pump delay time

The pump delay time is when the pump continues running after the necessary pressure is reached in the lubricant lines. This takes place to reliably supply lubricant to all the lube points in very large central lubrication systems.

Pump runtime limitation

The pump runtime (TL) is basically limited by the monitoring time (TU).

Monitoring of air pressure

The pressure in the compressed air line is monitored with another pressure switch (DS_L). If the pressure drops or if no pressure at all is built up, a fault signal is emitted and the sequence of functions stopped.

Monitoring of lubricant level

The level of lubricant in the reservoir is monitored with the help of a level switch (WS). Switching functions NC or NO contact (level minimum) can be adjustable at the control unit. If the level switch is the NC type, the signal cables leading to the level switch are monitored at the same time for wire breaks.

As soon as the reservoir drops below the minimum level the sequence of functions in the lubrication system is stopped and a fault signal emitted.

Power-failure memory (EEPROM)

If the power for the control unit is interrupted, the power-failure memory stores important data, like the remaining interval time or error messages. That means, depending on the type of unit, that the functional sequence can be continued and no error messages will be lost the next time the unit is powered up.

Installation

Install the control unit in the switchgear cubicle for the central lubrication system. Please also pay attention to the information contained in the description of your type of unit shown below.

Operation

Powering up

The unit is powered up by switching on the operating voltage. If the proper voltage is applied, the green power LED lights up.

The power must be switched on and off quickly.

After the unit is powered up, it usually starts its functional sequence with a prelubrication cycle.

Prelubrication

With some units, a prelubrication cycle is triggered when the units are powered up. The pump motor is switched on and fault signal relay d2 is energized. Prelubrication proceeds like normal contact time.

Prelubrication cycle

With some units, a prelubrication cycle is triggered when the units are powered up. The pump motor is switched on and a number of lubrication operations are triggered with a fixed interval time. During this time, relay d2 remains de-energized and the fault LED lights up, but that does not mean a fault is involved.

At the end of the prelubrication cycles, the relay d2 is energized and the fault LED goes out.

Should a fault occur during the prelubrication cycle, relay d2 remains de-energized and the fault LED continues to burn (also see the chapter on fault displays below).

Interval time

After prelubrication or after the prelubrication cycle is completed, relay d1 is de-energized, which in turn switches off the pump's motor. The value set for the interval time is then read and the interval routine started. In the further sequence of operations, the contact time and interval alternate with each other in constant order.


Contact time (lubrication routine)

The contact time is started after the interval time elapses. It is comprised of the time until the pressure builds up and the delay time. When the contact time begins, relay d1 is energized, thus switching on the pump motor. As soon as the requisite pressure is reached in the lubricant lines, the monitoring time is terminated and the pump delay time starts. A new interval begins at the end of the delay time.

Relay d2 in normal operation

When the power is on and there are no malfunctions, relay d2 is always energized, except during the prelubrication cycle.

Intermediate lubrication

Intermediate lubrication can be triggered by briefly pressing the  button during the interval. Intermediate lubrication follows the same routine as that of a normal contact time.

Switching off

The unit is switched off by disconnecting it from the power.

Recovery time

After the unit is switched off, it has to remain off for a certain amount of time before it can be switched on again.

Changing parameters

A change in parameters such as the interval time takes effect when the next interval begins.

Operation with power failure memory

When units are operated with a power failure memory, important operating data such as the remaining interval time or an error message are stored if the power is interrupted.

After a power failure, the unit usually begins with a prelubrication cycle. But if this function was off, the type of start, when the power is restored, will depend on the time the power failure occurred.

Fault displays

In the event of a fault, the fault LED lights up and the symbol for the respective input flashes on the display.

No oil pressure

If no pressure builds up in the main line during the monitoring time, i.e. if pressure switch DS does not respond, the fault LED will light up and the pump's motor will be switched off. At the same time, the symbol for the DS input will flash on the display. Relays d1, d2 and d3 will be or will remain de-energized. At the same time, the sequence of functions will be stopped.

No air pressure

A compressed air fault is involved if pressure switch DS2 is de-energized during the monitoring, pump-delay or interval times or if it is not energized within 5 seconds after the power is applied or after the clearing of an error message. This leads to a fault signal and the sequence of functions is stopped. The symbol for input DS2 flashes on the display.


Low lubricant level

If the level of lubricant in the reservoir drops too far, level switch WS closes or opens, either leading to an interruption of the respective functional sequence. Relays d1, d2 and d3 are de-energized and the fault LED lights up. At the same time, the symbol for the WS input flashes on the display.

Failure of automatic lubricant topping up

In the case of units that automatically top up lubricant, a fault signal is issued if the lubricant drops below the minimum level for an extended period of time. Relay d2 is energized, the fault LED lights up and the symbol for input WS_L flashes on the display. The sequence of functions is stopped.


Relay d2 in faulty operation

If a fault occurs, relay d2 is or will remain de-energized. The sequence of functions is suspended until the fault has been remedied and the error message cleared by pressing the  button.

Fault signal during the prelubrication cycle

If a fault should occur during the prelubrication cycle, the operation will be stopped and the symbol for the respective input will flash on the display. After the error message has been cleared, the unit will continue the prelubrication cycle.

Clearing an error message

An error message is cleared after the fault has been remedied by pressing the  button, which triggers intermediate lubrication.

A level switch error message can only be cleared if enough lubricant has been topped up.

Do not clear an error message until its cause has been remedied.

Operation with power-failure memory – starting procedure after a power failure

Time when power failure occurs	Procedure after restoration of power
During the monitoring time (prior to energized DS1 input)	Contact time
During the pump delay time (after energized DS1 input)	Interval time
During the interval time	Interval continued after remaining interval time is read out of the power-failure memory
When fault pending, by pressure switch DS or DS2	Prelubrication cycle
When fault pending, by level switch WS	Fault signal remains pending

IG54-20

Modes of operation

The IG54-20 control unit can only be used as a pulse generator (mode A).

Scope of functions

The IG54-20 comes with the following functions:

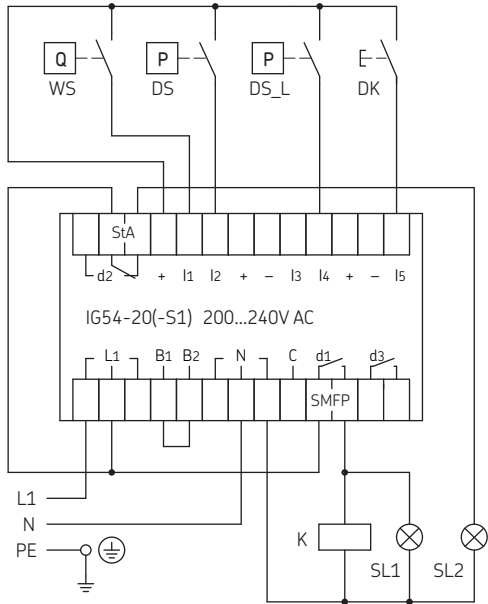
- adjustable interval time
- pump runtime limitation
- oil-pressure monitoring
- air-pressure monitoring
- lubricant level monitoring
- power-failure memory (EEPROM)

The table below shows the preset and adjustable parameters.

Adjustable and preset parameters					
Designation	Abbreviation	Presetting	Units	Setting range	Units
Mode of operation	BA	A		non-adjustable	
Interval time	TP	10	minutes	01 E 00 - 99 E 00	minutes
Monitoring time	TU	60	seconds	non-adjustable	
Delay time	TN	5	seconds	non-adjustable	

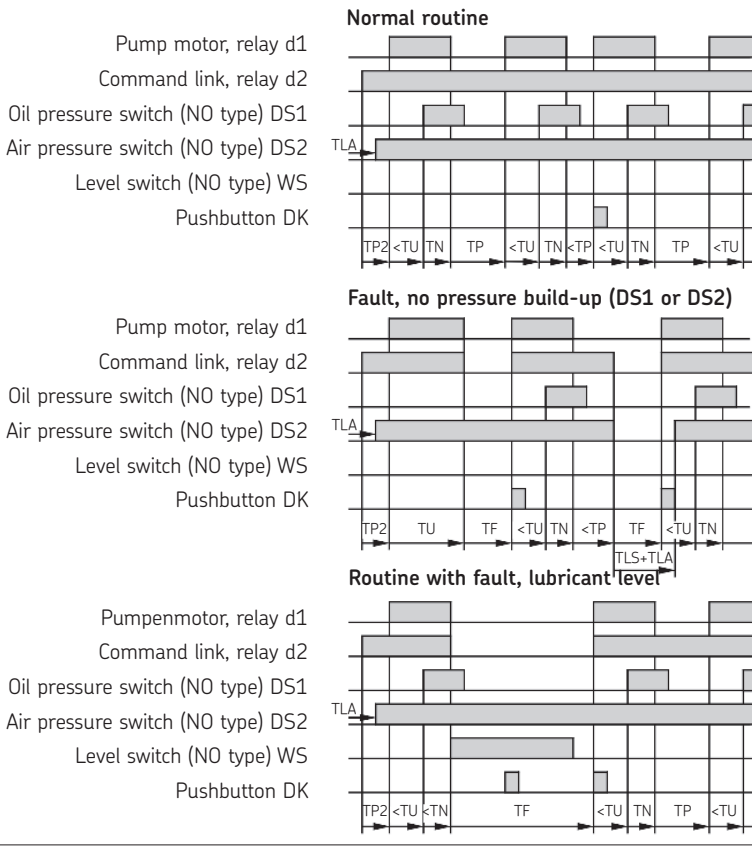
IG54-20 (-S1)

Wiring diagram IG54-20 (-S1) – in the case of the IG54-20-S3 level switch, WS is configured as an NC type



- L1/N = operating voltage
- B1/B2 = jumper terminals for voltage range (illustration: 200..240 V)
- WS = lubricant level switch (illustration: reservoir full)
- DS = pressure switch (monitoring of pressure build-up)
- DS_L = pressure switch (monitoring of air pressure)
- DK = pushbutton
 - 1. intermediate lubrication
 - 2. clear fault
- + = +24 V DC output
- = 0 V DC output
- d1 = load contact for lubricant pump (SMFP)
- d2 = changeover contact, command link
break contact: fault display (StA) or prelubrication cycle
- SL1 = indicator light for "PUMP ON"
- SL2 = indicator light for "FAULT"
- K = pump motor contactor

Pulse diagram (time axis not to scale)



- TP2 = stored remaining interval time
- TU = monitoring time
- TN = pump delay time
- TP = interval time
- TF = functional sequence stopped
- TLS = compressed-air fault
- TLA = compressed-air build-up time

IG54-20-S1, IG54-20-S3, IG54-20-S4

Modes of operation

The IG54-20-S1, IG54-20-S3 and IG54-20-S4 control units can only be used as pulse generators (mode B).

Scope of functions

The IG54-20-S1, IG54-20-S3 and IG54-20-S4 units come with the following functions:

- adjustable interval time
- adjustable number of prelubrication cycles
- adjustable pump delay time
- pump runtime limitation
- oil-pressure monitoring
- air-pressure monitoring
- power failure memory (EEPROM)

Additional functions:

IG54-20-S1

- monitoring of lubricant level (NO type)

IG54-20-S3

- monitoring of lubricant level (NC type)

IG54-20-S4

- monitoring of lubricant level (NC type)
- additional output d3 for compressed-air valve.

The table below shows the preset and adjustable parameters.

Prelubrication cycles (setting "00")

If the "00" setting is preselected as the prelubrication cycle, the unit will run in the memory mode without a prelubrication cycle.

Pump delay time (setting "00")

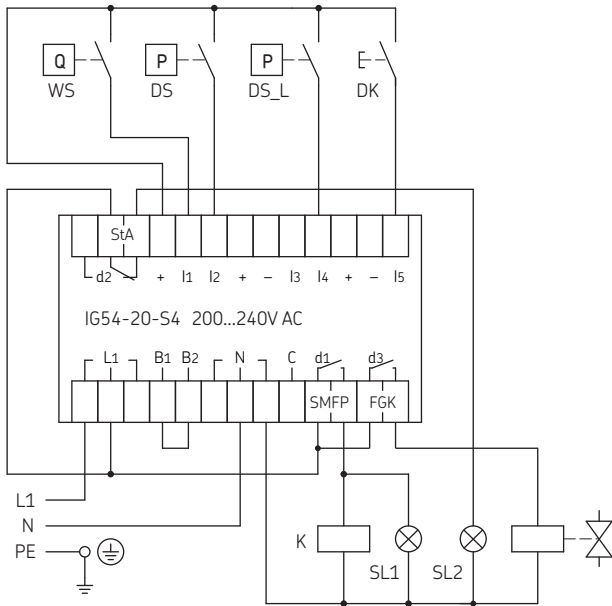
If the value "00" is selected as the pump delay time, the unit will end the lubrication time without delay after the pressure has built up. Relay d1 is de-energized and the pump's motor switched off.

Adjustable and preset parameters

Designation	Abbreviation	Presetting	Units	Setting range	Units
Mode of operation	BA	B		non-adjustable	
Interval time	TP	10	minutes	01 E 00 - 99 E 00	minutes
Monitoring time	TU	60	seconds	non-adjustable	
Delay time	TN	5	seconds	00 E 00 - 99 E 00	seconds
Prelubrication cycles	VZ	10		00 E 00 - 99 E 00	

IG54-20-S4

Wiring diagram

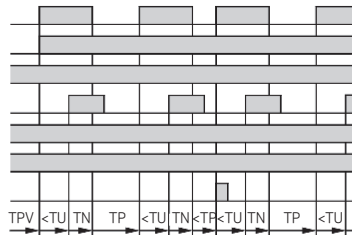


- L1/N = operating voltage
- B1/B2 = jumper terminals for voltage range (illustration: 200...240 V)
- WS = lubricant level switch (illustration: reservoir full)
- DS = pressure switch (monitoring of pressure build-up)
- DS_L = pressure switch (monitoring of air pressure)
- DK = pushbutton
 - 1. intermediate lubrication
 - 2. clear fault
- + = +24 V DC output
- = 0 V DC output
- d1 = load contact for lubricant pump (SMFP)
- d2 = changeover contact, command link
break contact: fault display (StA)
make contact: operation OK
- d3 = enable contact for compressed-air valve (FGK)
- SL1 = indicator light for "PUMP ON"
- SL2 = indicator light for "FAULT"
- K = pump motor contactor
- Y1 = compressed-air valve

Pulse diagram (time axis not to scale; depicted after the prelubrication cycles have finished)

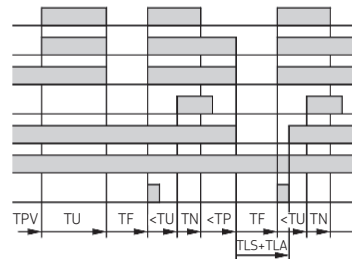
Normal routine

- Pump motor, relay d1
- Command link, relay d2
- Enabling relay d3
- Oil pressure switch (NO type) DS1
- Air pressure switch (NO type) DS2
- Level switch (NO type) WS
- Pushbutton DK



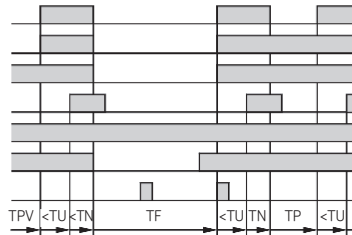
Fault, no pressure build-up (DS1 or DS2)

- Pump motor, relay d1
- Command link, relay d2
- Enabling relay d3
- Oil pressure switch (NO type) DS1
- Air pressure switch (NO type) DS2
- Level switch (NO type) WS
- Pushbutton DK



Routine with fault, lubricant level

- Pump motor, relay d1
- Command link, relay d2
- Enabling relay d3
- Oil pressure switch (NO type) DS1
- Air pressure switch (NO type) DS2
- Level switch (NO type) WS
- Pushbutton DK



- TPV = last interval in prelubrication cycle
- TU = monitoring time
- TN = pump delay time
- TP = interval time
- TF = functional sequence stopped
- TLS = compressed-air fault
- TLA = compressed-air build-up time

Order No. 1-1700-3-EN

Subject to change without notice! (11/2014)

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.

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