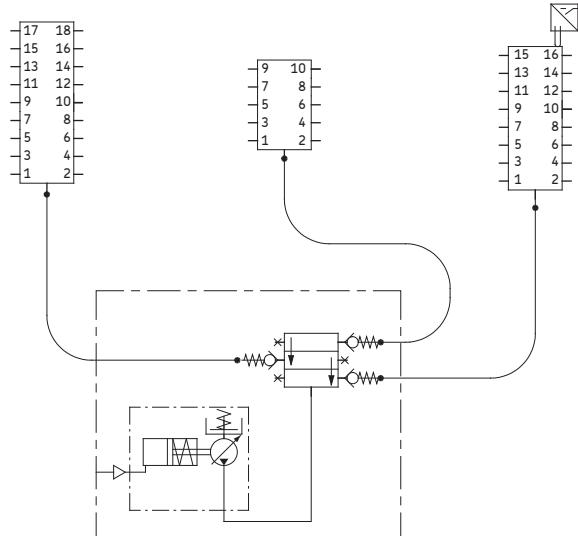


# Control Units

## for Progressive Systems



The control units described in this leaflet are used for time- or pulse-dependent control of central lubrication systems with progressive feeders.

The overview on page 2 shows the available control units for progressive feeder systems together with the scope of their functions.

### Function

The task of the control units is to trigger lubrication after a certain period of time has elapsed. The special feature of the control units described in this chapter is the ability to monitor the distributor pistons' strokes and to run the pump on a clock-cycle basis during the contact time. The pressure is not monitored.

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

#### Overview of available control units for progressive systems

Designation	Brief description
EXZT2A03	Pulse generator/counter with selectable monitoring time, lubricant-level and pump-runtime monitoring (stroke monitoring), adjustable delay time and interval-time extension
EXZT2A06	Pulse generator/counter with selectable monitoring time, lubricant-level and pump-runtime monitoring (stroke monitoring), adjustable delay time, interval-time extension and pulse monitoring
IGZ51-20	Pulse generator/counter with alternative clock-cycle or continuous pump operation, with adjustable number of strokes, selectable interval and monitoring time as well as monitoring of lubricant level and pump runtime
IGZ51-20-S2	Like IGZ51-20, with power-failure memory
IGZ51-20-S7	Like IGZ51-20-S2 with filling-level switch in the form of an NC contact, pump runtime = set monitoring time
IGZ51-20-S8	Pulse generator/counter with alternative clock-cycle or continuous pump operation, prelubrication, IGZ51-20-S8 selectable interval and monitoring time, with monitoring of lubricant level, pump runtime and pulses as well as power-failure memory

*Our control units conform to the generally applicable standards.*

#### The lubrication cycle

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

#### The interval time TP

The interval time is the time between two contact times. The length of the interval can basically be set in two ways, thus resulting in two different modes of operation (BA) for the control units (pulse generator and pulse counter). The mode of operation can be set on the unit by hand.

#### 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.

#### Pulse counter mode

In this mode, the interval time is determined by the machine, which sends pulses to the control unit while it is in operation. The pulses received via the machine contact (MK or MKPV) are counted by the control unit and lubrication triggered after a preset number of pulses. The number of pulses to be counted can be specified by the operator.

#### Pulse monitoring

In the case of units with pulse monitoring (in the pulse counter mode only), not only the machine contact, MK or MKPV, but also a second machine contact (MKUe) is used. Both inputs are alternately queried. If no pulse is received via contact MKUe between two pulses arriving at contact MK/MKPV, a fault signal is emitted.

#### The contact time

After completion of the interval time, the control unit initiates the lubrication routine, i.e. the pump is switched on and the monitoring time started. This sequence is also called the contact time. During the contact time, a proximity switch, called a cycle switch here, counts the strokes of a piston in one of the progressive feeders by detecting its motion. The contact time is ended after a certain number of strokes and the pump's motor switched off.

#### Clock-cycle mode

Since pneumatic pumps are also used in central lubrication systems with progressive feeders, the control units can be set up so that such pumps work on a clock-cycle basis during the contact time.

#### The cycle switch

The cycle switch (ZS) controls the pump running time according to the number of strokes executed by a piston in the progressive feeder. The pump is switched off after a certain number of switching operations take place during the contact time.

The number of cycle-switch edges, which corresponds to the number of piston strokes, can be set with some of the units. The respective parameter is abbreviated with NH (number of strokes).

#### Monitoring time

The monitoring time (TU) is a period of time that can be set by the operator to limit the pump running time. If the monitoring time elapses without the expected switching operations of the cycle switch being detected, the pump is stopped at the end of the monitoring time and a fault signal emitted.

#### Pump runtime limitation

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

#### Monitoring of lubricant level

The level of the lubricant reservoir is monitored with the help of a level switch (WS). This switch can be either an NC or NO contact, which has to be taken into account when selecting a control unit.

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

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.

#### Power-failure memory (EEPROM)

The power-failure memory stores important data if the power for the control unit is interrupted, i.e. data such as 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.

See important product usage information on the back cover.

### Prelubrication

Prelubrication is usually started when the system is powered up. The prelubrication routine is, in principle, the same as that of a normal contact time. But fault signal relay d2 remains de-energized and the fault LED lights up.

This function is not available with every unit in this series.

### Intermediate lubrication

Intermediate lubrication is triggered by pressing the  button. It proceeds in the same way as normal contact time.

### Interval time extension

With some units, input I3 can be used in the pulse-generator mode to stop and enable the interval routine. Energization of the input stops the interval routine, de-energization enables it again.

### Installation

Install the control unit in the switchgear cubicle used for a central lubrication system.

Please also pay attention to the information contained in the shipment of your type of unit.

### 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 and the status of the inputs and outputs is shown on the display.

**The power must be switched on and off quickly.**

The warm-up time of the unit after it is powered up will depend on the type of unit.

#### Contact time (lubrication routine)

During the contact time relay, d1 is energized, so the pump's motor is on. At the same time, the monitoring time is started. Relay d1 is de-energized after the last switching edge from the cycle switch and the monitoring time stopped. An interval then begins.

### Interval time

The value set for the interval time is read at the beginning of the interval time, and the interval routine is started. In the further sequence of operations, the contact time and interval alternate with each other in constant order.

### Relay d2 in normal operation

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

### Intermediate lubrication

Intermediate lubrication can be triggered by briefly pressing the  button during the interval. The 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 and the mode of operation

A change in parameters like, for instance, the interval time, takes effect when the next interval begins. A change in the mode of operation does not take effect until the unit has been switched off and then on.

### Operation with power-failure memory

When the unit is operated with a power-failure memory, important operating data like, for example, the remaining interval time or an error message is stored if the power is interrupted. The routine the unit begins with after it is switched on again will depend on the time the failure occurs and on the type of unit.

### Cycle switch fault

If the preselected monitoring time comes to an end due to a lack of switching signals from cycle switch ZS, the sequence of functions is stopped. Relays d1 and d2 are de-energized. The fault LED lights up and the symbol for the ZS input flashes on the display.

### Fault displays

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

### Low lubricant level

The lubricant level input WS is constantly monitored when the power is on. If a low level is detected for more than one second, the sequence of functions is stopped and relay d2 de-energized. At the same time, the fault LED lights up and the symbol for the WS input flashes on the display.

The error message cannot be cleared when the reservoir is empty. When input WS is reenergized, the error message is retained until the  button is pressed to confirm elimination of the fault.

### No MK pulses

In the case of units with pulse monitoring (in the pulse counter mode only), the machine contacts MK and/or MKPV and MKUe are mutually queried. If no pulse is received at contact MKUe between two pulses at contact MK/MKPV, a fault signal is emitted and the symbol for input MKUe flashes on the display.

In the opposite case, the symbol for the MK/MKPV input flashes if no pulse arrives at contact MK/MKPV between two pulses at contact MKUe.

### Relay d2 in faulty operation

If a fault occurs, relay d2 is de-energized or it remains de-energized. The functional sequence remains stopped until the fault is remedied and the error message is cleared.

### Clearing an error message

An error message can only be cleared by pressing the  button, which triggers intermediate lubrication, or by turning off the power.

In the case of units with a power-failure memory, the error message can only be cleared by pressing the  button.

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

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

## EXZT2A03

### Modes of operation

The EXZT2A03 control unit can be used as a pulse generator (mode B) or pulse counter (mode D).

### Scope of functions

The EXZT2A03 comes with the following functions:

- adjustable interval time
- adjustable monitoring time
- adjustable pump delay time
- pump runtime limitation by stroke monitoring
- adjustable number of strokes
- lubricant level monitoring (NO contact)
- interval time extension

The table below shows the adjustable and preset parameters.

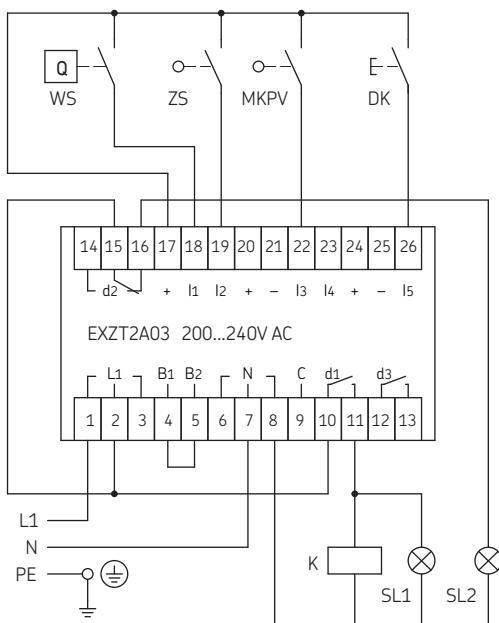
### Operation

The EXZT2A03 is supplied without a power-failure memory. When the unit is switched off, operating data such as the remaining interval time or error messages are lost. As a result, the unit always begins with a contact time after it is switched on again.

#### Adjustable and preset parameters

Designation	Abbreviation	Presetting	Units	Setting range	Units
Mode of operation	BA	B		B (Pulse generator) D (Pulse counter)	
Interval time	TP	10	seconds	01 E 00 - 99 E 04 (mode B) 01 E 00 - 99 E 04 (mode D)	seconds pulses
Monitoring time	TU	60	seconds	01 E 00 - 99 E 04	seconds
Delay time	TN	15	seconds	01 E 00 - 25 E 00	seconds
Number of strokes	NH	3		1-25	

#### Wiring diagram



- L1/N** = operating voltage  
**B1/B2** = jumper terminals for voltage range (illustration: 200...240 V)  
**C** = potential-free terminal  
**WS** = lubricant level switch (illustration: reservoir full)  
**ZS** = cycle switch (stroke monitoring)  
**MKPV** = machine contact / interval time extension  
**DK** = pushbutton  
 1. intermediate lubrication  
 2. clear fault  
**+** = +24 V DC output  
**-** = 0 V DC output  
**d1** = load contact for lubricant pump  
**d2** = changeover contact, command link  
 break contact: fault display  
 make contact: operation OK  
**SL1** = indicator light for "PUMP ON"  
**SL2** = indicator light for "FAULT"  
**K** = pump motor contactor

# IGZ51-20

## Modes of operation

The IGZ51-20 control unit can be used in the following modes of operation:

- A Pulse generator with continuous operation of the pump during the contact time
- B Pulse generator with clock-cycle pump operation
- C Pulse counter with continuous operation of the pump during the contact time
- D Pulse counter with clock-cycle pump operation

## Scope of functions

The IGZ51-20 comes with the following functions:

- adjustable interval time
- adjustable monitoring time
- adjustable number of strokes
- pump runtime limitation by stroke monitoring
- lubricant level monitoring (NO contact)

The table below shows the adjustable and preset parameters.

## Operation

The IGZ51-20 is supplied without a power failure memory. When the unit is switched off, operating data such as the remaining interval time or error messages are lost. As a result, the unit always begins with a new interval time after it is switched on again.

### Adjustable and preset parameters

Designation	Abbreviation	Presetting	Units	Setting range	Units
Mode of operation	BA	A		A (Pulse generator with continuous operation of the pump during the contact time) B (Pulse generator with clock-cycle pump operation) C (Pulse counter with continuous operation of the pump during the contact time) D (Pulse counter with clock-cycle pump operation)	
Interval time	TP	10	minutes	01 E 00 - 99 E 04 (modes A, B) 01 E 00 - 99 E 04 (modes C, D)	minutes pulses
Monitoring time	TU	60	seconds	01 E 00 - 99 E 03	seconds
Number of strokes	NH	3		1-30	

## IGZ51-20-S2

### Modes of operation

The IGZ51-20-S2 control unit can be used in the following modes of operation:

- A Pulse generator with continuous operation of the pump during the contact time
- B Pulse generator with clock-cycle pump operation
- C Pulse counter with continuous operation of the pump during the contact time
- D Pulse counter with clock-cycle pump operation

### Scope of functions

The IGZ51-20-S2 comes with the following functions:

- adjustable interval time
- adjustable monitoring time
- adjustable number of strokes
- pump runtime limitation (stroke monitoring)
- lubricant level monitoring (NO contact)
- power-failure memory

The table below shows the adjustable and preset parameters.

### Operation with power-failure memory

In the event of a power failure the power failure memory stores the remaining interval time and/or any error messages. The following overview shows which warm-up time the unit starts with after the power is restored.

#### Start after power failure

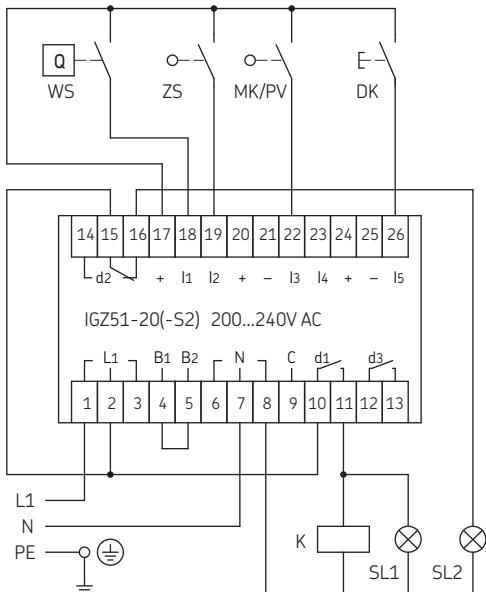
Time of power failure	Procedure after restoration of power
during the monitoring time	interval time
during the interval time	interval continued after remaining interval time is read out of the power-failure memory
while error message pending	error message remains in effect

#### Adjustable and preset parameters

Designation	Abbreviation	Presetting	Units	Setting range	Units
Mode of operation	BA	A		A (Pulse generator with continuous operation of the pump during the contact time) B (Pulse generator with clock-cycle pump operation) C (Pulse counter with continuous operation of the pump during the contact time) D (Pulse counter with clock-cycle pump operation)	
Interval time	TP	10	minutes	01 E 00 - 99 E 04 (modes A, B) 01 E 00 - 99 E 04 (modes C, D)	minutes pulses
Monitoring time	TU	60	seconds	01 E 00 - 99 E 03	seconds
Number of strokes	NH	3		1-30	

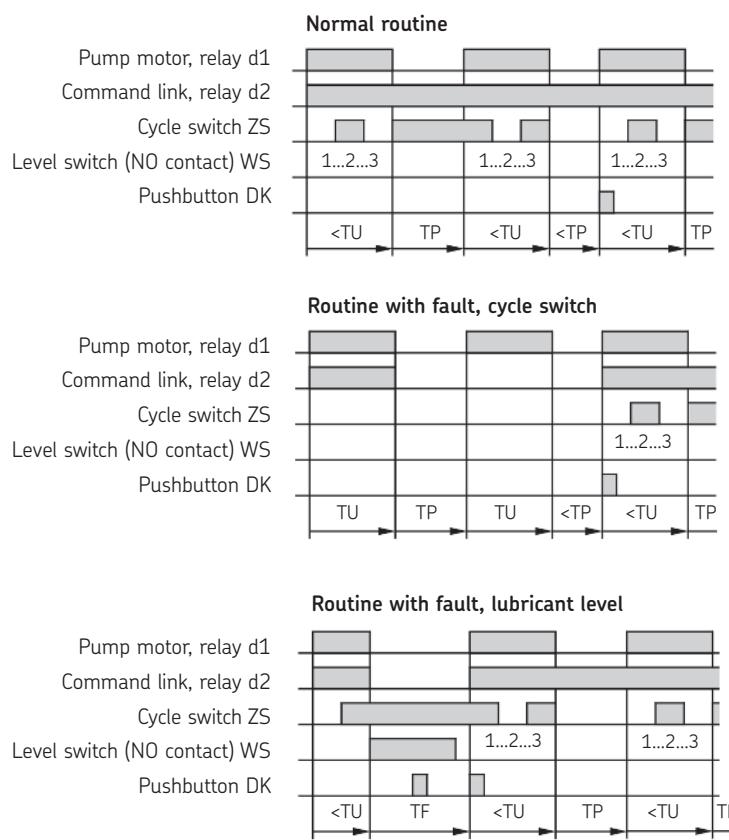
## IGZ51-20 / IGZ51-20-S2

### Wiring diagram



- L1/N** = operating voltage  
**B1/B2** = jumper terminals for voltage range  
 (illustration: 200...240 V)  
**C** = potential-free terminal  
  
**WS** = lubricant level switch (illustration: reservoir full)  
**ZS** = cycle switch (stroke monitoring)  
**MK/PV** = machine contact / interval time extension  
  
**DK** = pushbutton  
 1. intermediate lubrication  
 2. clear fault  
  
**+** = +24 V DC output  
**-** = 0 V DC output  
  
**d1** = load contact for lubricant pump  
**d2** = changeover contact, command link  
 break contact: fault display  
 make contact: operation OK  
  
**SL1** = indicator light for "PUMP ON"  
**SL2** = indicator light for "FAULT"  
**K** = pump motor contactor

### Pulse diagram (time axis not to scale, preset stroke number = 3)



TU = monitoring time  
 TP = interval time  
 TF = functional sequence stopped

# IGZ51-20-S7 / IGZ51-20-S8

## Modes of operation

The IGZ51-20-S7 and IGZ51-20-S8 control unit can be used in the following modes of operation:

- A Pulse generator with continuous operation of the pump during the contact time
- B Pulse generator with clock-cycle pump operation
- C Pulse counter with continuous operation of the pump during the contact time
- D Pulse counter with clock-cycle pump operation

## Scope of functions

The **IGZ51-20-S7** comes with the following functions:

- adjustable interval time
- adjustable monitoring time (= pump running time)
- adjustable minimum number of strokes
- lubricant level monitoring (NC contact)
- power-failure memory

The **IGZ51-20-S8** comes with the following functions:

- adjustable interval time
- adjustable monitoring time
- MK pulse monitoring
- pump runtime limitation (stroke monitoring)
- lubricant level monitoring (NC contact)
- prelubrication
- power-failure memory

The table below shows the adjustable and preset parameters.

## Operation with power-failure memory

In the event of a power failure the power failure memory stores the remaining interval time and/or any error messages. The following overview shows which warm-up time the unit starts with after the power is restored.

### IGZ51-20-S7: Start after power failure

Time of power failure	Procedure after restoration of power
during the monitoring time	interval time
during the interval time	interval continued with stored remaining interval time
while error message pending	error message remains in effect

### IGZ51-20-S8: Start after power failure

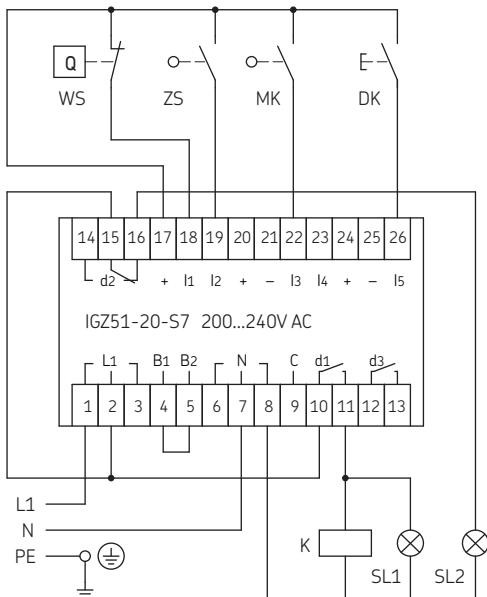
Time of power failure	Procedure after restoration of power
during the monitoring time	prelubrication
during the interval time	prelubrication
while error message pending	error message remains in effect

## Adjustable and preset parameters

Designation	Abbreviation	Presetting	Units	Setting range	Units
Mode of operation	BA	A		A (Pulse generator with continuous operation of the pump during the contact time) B (Pulse generator with clock-cycle pump operation) C (Pulse counter with continuous operation of the pump during the contact time) D (Pulse counter with clock-cycle pump operation)	
Interval time IGZ51-20-S7	TP	10	minutes	01 E 00 - 99 E 04 (BA: A, B) 01 E 00 - 99 E 04 (BA: C, D)	minutes pulses
Interval time IGZ51-20-S8 (with MK pulse monitoring)				02 E 00 - 99 E 04 (BA: A, B) 02 E 00 - 99 E 04 (BA: C, D)	minutes pulses
Monitoring time	TU	60	seconds	01 E 00 - 99 E 03	seconds
Number of strokes	NH	3		1-30	

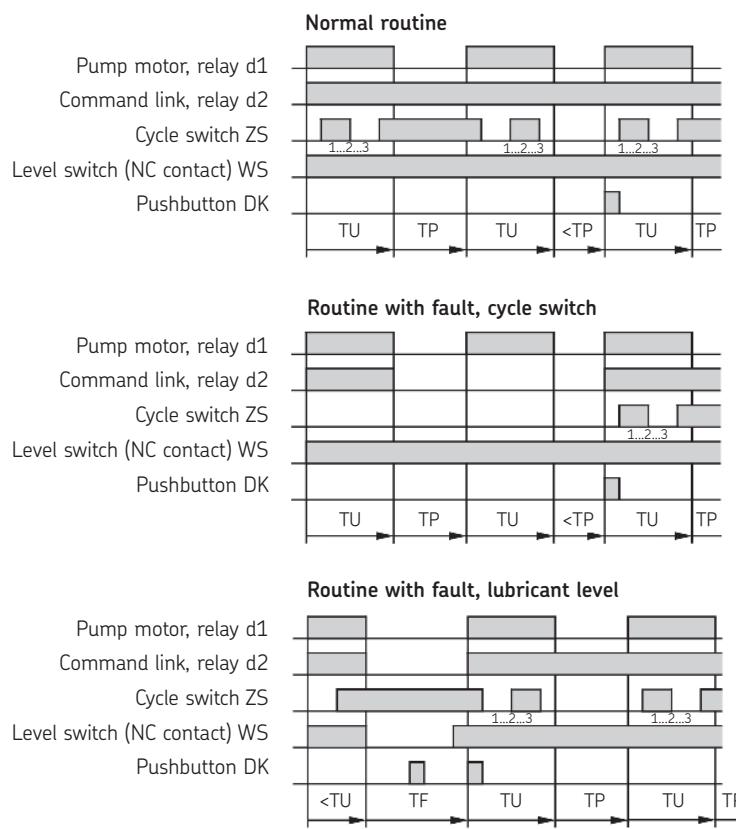
# IGZ51-20-S7

## Wiring diagram



- L1/N = operating voltage
- B1/B2 = jumper terminals for voltage range  
(illustration: 200...240 V)
- C = potential-free terminal
- WS = lubricant level switch (illustration: reservoir full)
- ZS = cycle switch (stroke monitoring)
- MK = machine contact
- DK = Pushbutton
  - 1. intermediate lubrication
  - 2. clear fault
- + = +24 V DC output
- = 0 V DC output
- d1 = load contact for lubricant pump
- d2 = changeover contact, command link  
break contact: fault display  
make contact: operation OK
- SL1 = indicator light for "PUMP ON"
- SL2 = indicator light for "FAULT"
- K = pump motor contactor

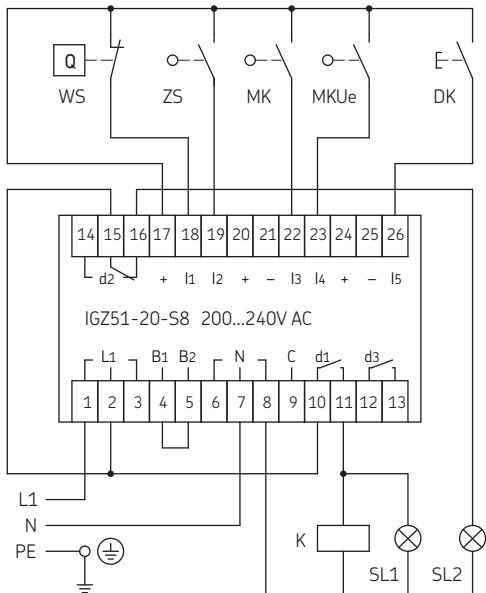
## Pulse diagram (time axis not to scale, preset stroke number = 2, monitoring time >3 strokes)



TU = monitoring time  
TP = interval time  
TF = functional sequence stopped

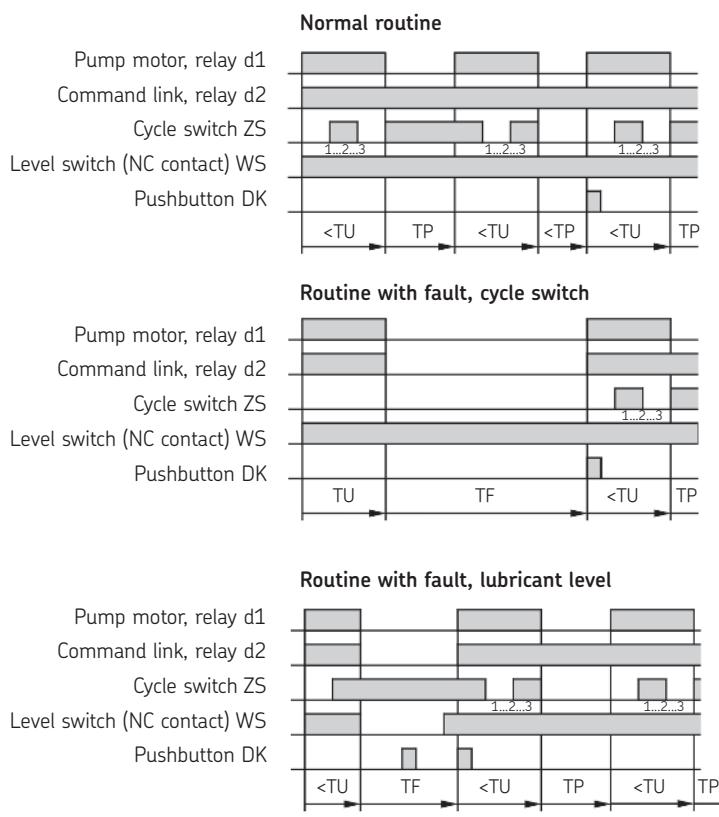
## IGZ51-20-S8

## Wiring diagram

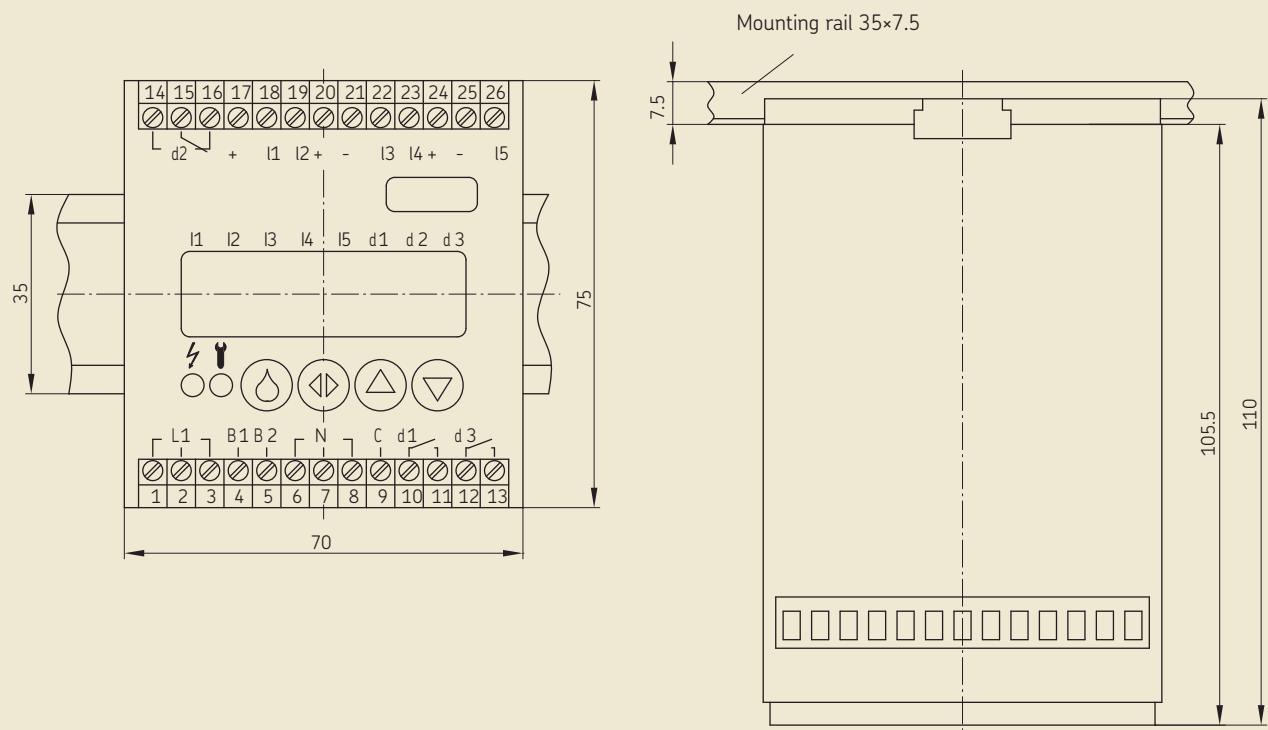


L1/N	= operating voltage
B1/B2	= jumper terminals for voltage range (illustration: 200...240 V)
C	= potential-free terminal
WS	= lubricant level switch (illustration: reservoir full)
ZS	= cycle switch (stroke monitoring)
MK	= machine contact
MKUe	= MK pulse monitoring
DK	= Pushbutton 1. intermediate 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 make contact: operation OK
SL1	= indicator light for "PUMP ON"
SL2	= indicator light for "FAULT"
K	= pump motor contactor

## Pulse diagram (time axis not to scale, preset stroke number = 3)



TU = monitoring time  
TP = interval time  
TF = functional sequence stopped



#### Technical Data Version +471 / +472

Rated input voltage Un		Coincidence factor for the inputs . . . . .	max. 0.8
Version +471 . . . . .	100...120 V AC or 200...240 V AC		
Version +472 . . . . .	20...24 V DC or AC		
Rated value of input voltage		Output voltage for inputs and external loads . . . . .	24 V DC +10% / -15%
Version +471 . . . . .	0.85 Un to 1.1 Un (85...132 V / 170...264 V)		
Version +472 . . . . .	0.85 Un to 1.1 Un (17...26.4)		
Rated frequency		Rated output current ("+" outputs) . . . . .	110 mA
Version +471 . . . . .	50...60 Hz	of that figure for external loads . . . . .	max. 60 mA
Version +472 . . . . .	DC or 50...60 Hz		
Rated value of frequency		MK input, max. input frequency. . . . .	30 Hz
Version +471 . . . . .	49...61 Hz	Pulse duty factor . . . . .	1:1
Version +472 . . . . .	DC or 49...61 Hz		
Release value of Un. . . . .	max. 10%	Conductor connection (flexible)	
Recovery time . . . . .	1 s	with tubular end sleeves . . . . .	max. 2.5 mm <sup>2</sup> or 2x 0.75 mm <sup>2</sup>
Residual ripple of input voltage		with twin tubular end sleeves . . . . .	max. 2x 1.5 mm <sup>2</sup>
Version +471 . . . . .	not applicable	stripped length . . . . .	8 mm
Version +472 . . . . .	DC: max. 5%		
Max. fusing . . . . .	6.3 A	Type of enclosure (version E) . . . . .	IP 30, IP 20 terminals
Max. switching current . . . . .	5 A AC	Safety class (version E) . . . . .	II
Max. relay switching voltage . . . . .	250 V AC	Rated insulation voltage . . . . .	250 V AC
Overvoltage category to DIN VDE 0110 . . . . .	III	Pollution degree . . . . .	2
Rated voltage of inputs . . . . .	24 V DC	Operating temperature . . . . .	0 to +60 °C
Input impedance . . . . .	2.4 kΩ ±10%	Storage temperature . . . . .	-25 to +70 °C
Input level low . . . . .	0 V...+4 V	Dimensions BxHxT (version E) . . . . .	approx. 70mm×75 mm×110 mm
Input level high . . . . .	+10 V...+26.4 V		

**Order No. 1-1700-2-EN**

Subject to change without notice! (07/2014)

**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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[www.skf.com/lubrication](http://www.skf.com/lubrication)

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