IGZ51-20-S2

Operating Modes

The controller IG51-20-S2 can operate in the following operating modes:

A pulse transmitter with contiuous pump operation during the contact time
B pulse transmitter with intermittent pump operation
C pulse counter with contiuous pump operation during the contact time
D pulse counter with intermittent pump operation

Scope of Functions

The controller IGZ51-20-S2 features the functions listed below. The default and the adjustable parameters are listed in table 2 - 29.

- adjustable pause time
- adjustable monitoring time
- pump run time limit (stroke monitoring)
- adjustable stroke number
- level monitoring (normally open contact)
- power supply failure memory
- pause time extension

Table 2 - 29. Parameters of IGZ51-20-S2

Designation	Abbreviation	Default setting	Unit	Adjustment range	Unit
operating mode	BA	A		A (pulse transmitter with continuous pump operation) B (pulse transmitter with intermittent pump operation) C (pulse counter with continuous pump operation) D (pulse counter with intermittent pump operation)	
pause time	TP	10	minutes	01 E 00 - 99 E 04 (BA A, B) 01 E 00 - 99 E 04 (BA C, D)	minutes pulses
monitoring time	TU	60	seconds	01 E 00 - 99 E 03	seconds
stroke number	NH	3		01 E 00 - 30 E 00	

Input functions

The standard settings for the input functions are listed in table 2 - 30. The input functions can be altered as described in section “Adjusting the input functions” in chapter “Operation” of the general section of this manual.

Installation, First Operation

Install the device in the control cabinet of a VOGEL central lubrication system as described in chapter operation (general part of this manual). Observe the connection diagram (figure 2 - 23). After installing the unit, trigger an intermediate lubrication by pressing the ⊙ button.

Table 2 - 30. Input functions of IGZ51-20

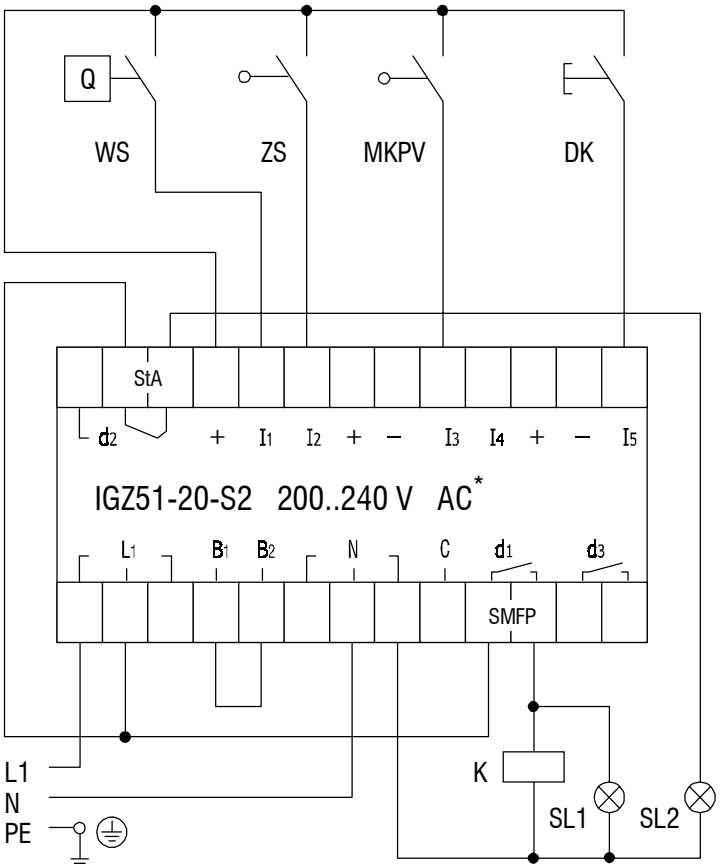
Input	Setting	Meaning
I1	S	normally open contact
I2	S	normally open contact
I3	S	normally open contact
I4	-	not used
I5	S	normally open contact

Operation with Power Supply Failure Memory

When power fails, the power supply failure memory saves the remaining pause time and/or existing failure messages. Table 2 - 31 shows which time parameter is the first in the control sequence upon return of power.

Table 2 - 31. Start upon Power Failure

Situation at time of power failure	Procedure upon power-up
During monitoring time	pause time
During pause time	pause continues after reading of the remaining pause time from the power supply failure memory
During failure message	failure message remains saved



*For connection to a 20..24 V AC supply please note fig. 1 - 3 on page 1 - 6.

Figure 2 - 23. Connection Diagram for IGZ51-20-S2

L1/N	operating voltage
B1/B2	jumper terminals for operating voltage (here shown: 200..240 V)
WS	level monitoring switch (here shown: reservoir filled)
ZS	cycle switch (stroke monitoring)
MKPV	machine contact/ pause time extension
DK	push-button 1. intermediate lubrication 2. delete failure
+	+24 V DC output
-	0 V DC output
d1	operating contact for lubricant supply pump (SMFP)
d2	change-over contact, command line resting contact: failure (StA) operating contact: operation OK
SL1	signal lamp for „PUMP ON"
SL2	signal lamp for „FAILURE"
K	pump motor contactor

IGZ51-20(-S2) Pulse Diagrams

(Time axis not true to dimensions, stroke preset = 3)

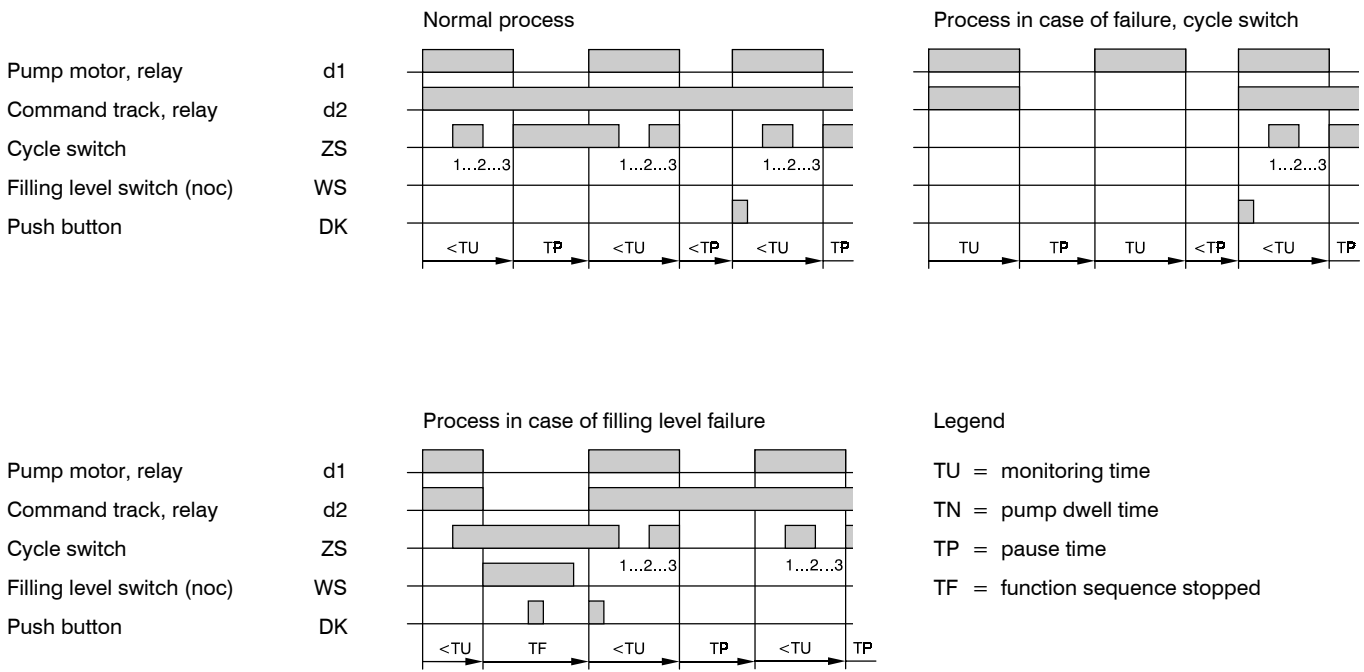


Figure 2 - 24. Pulse Diagram for IGZ51-20-S2

IGZ51-20-S7

Operating Modes

The controller IG51-20-S7 can be operated in the following operating modes:

A pulse transmitter with contiuous pump operation during the contact time
B pulse transmitter with intermittent pump operation
C pulse counter with contiuous pump operation during the contact time
D pulse counter with intermittent pump operation

Scope of Functions

The controller IGZ51-20-S7 features the functions listed below. The default and the adjustable parameters are listed in table 2 - 32.

- adjustable pause time
- adjustable monitoring time
- adjustable minimum stroke number
- level monitoring (normally closed contact)
- power supply failure memory

On the controller IGZ51-20-S7 the pump run time is not controlled by the stroke number, but directly by the monitoring time. Therefore: pump run time = monitoring time.
During the monitoring time the adjusted minimum stroke number is monitored.

Table 2 - 32. Parameters of IGZ51-20-S7

Designation	Abbreviation	Default setting	Unit	Adjustment range	Unit
operating mode	BA	A		A (pulse transmitter with continuous pump operation) B (pulse transmitter with intermittent pump operation) C (pulse counter with continuous pump operation) D (pulse counter with intermittent pump operation)	
pause time	TP	10	minutes	01 E 00 - 99 E 04 (BA A, B) 01 E 00 - 99 E 04 (BA C, D)	minutes pulses
monitoring time	TU	60	seconds	01 E 00 - 99 E 03	seconds
minimum stroke number	NH	3		01 E 00 - 30 E 00	

Input functions

The standard settings for the input functions are listed in table 2 - 33. The input functions can be altered as described in section “Adjusting the input functions” in chapter “Operation” of the general section of this manual.

Table 2 - 33. Input functions of IGZ51-20-S7

Input	Setting	Meaning
I1	O	normally closed contact
I2	S	normally open contact
I3	S	normally open contact
I4	-	not used
I5	S	normally open contact

Installation, First Operation

Install the device in the control cabinet of a VOGEL central lubrication system as described in chapter operation (general part of this manual). Observe the connection diagram (figure 2 - 25).

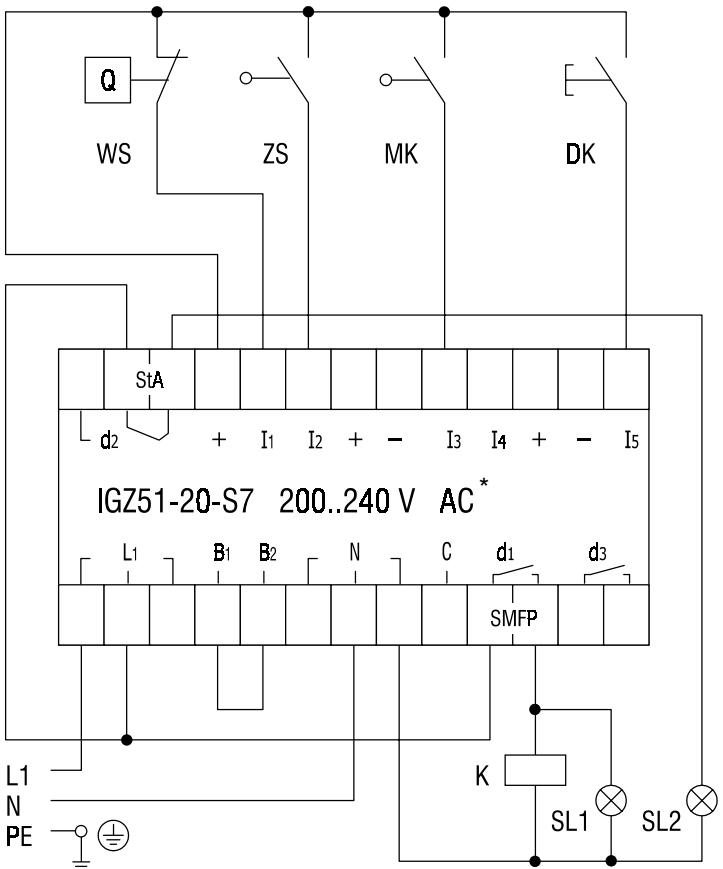
After installing the unit, trigger an intermediate lubrication by pressing the ⦿ button.

Operation with Power Supply Failure Memory

When power fails, the power supply failure memory saves the remaining pause time and/or existing failure messages. Table 2 - 34 shows which time parameter is the first in the control sequence upon return of power.

Table 2 - 34. Start upon Power Failure

Situation at time of power failure	Procedure upon power-up
During monitoring time	pause time
During pause time	pause continues with saved remaining pause time
During failure message	failure message remains saved



*For connection to a 20..24 V AC supply please note fig. 1 - 3 on page 1 - 6.

Figure 2 - 25. Connection Diagram for IGZ51-20-S7

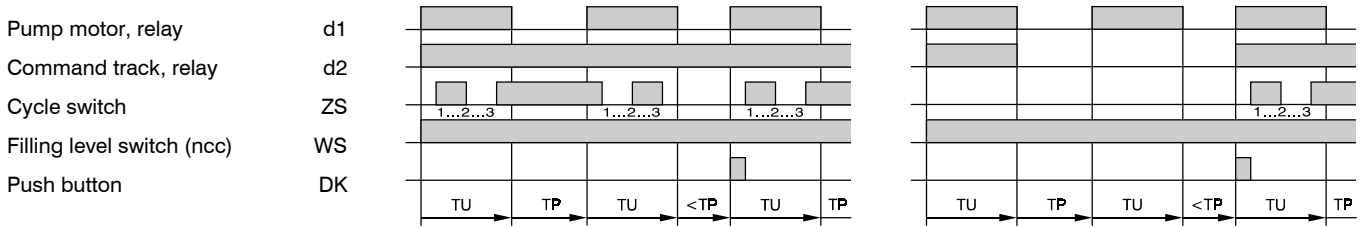
L1/N	operating voltage
B1/B2	jumper terminals for operating voltage (here shown: 200..240 V)
WS	level monitoring switch (here shown: reservoir filled)
ZS	cycle switch (stroke monitoring)
MK	machine contact
DK	push-button 1. intermediate lubrication 2. delete failure
+	+24 V DC output
-	0 V DC output
d1	operating contact for lubricant supply pump (SMFP)
d2	change-over contact, command line resting contact: failure (StA) operating contact: operation OK
SL1	signal lamp for „PUMP ON"
SL2	signal lamp for „FAILURE"
K	pump motor contactor

IGZ51-20-S7 Pulse Diagrams

(Time axis not true to dimensions, stroke preset = 3, monitoring time > 3 strokes))

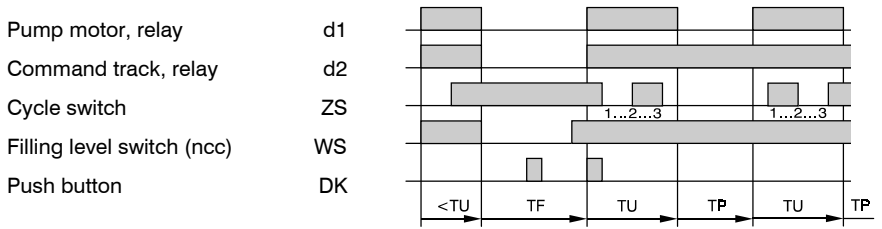
Normal process

Process in case of failure, cycle switch



Process in case of filling level failure

Legend



TU = monitoring time

TN = pump dwell time

TP = pause time

TF = function sequence stopped

Figure 2 - 26. Pulse Diagram for IGZ51-20-S7

IGZ51-20-S8

Operating Modes

The controller IG51-20-S8 can be operated in the following operating modes:

A pulse transmitter with contiuous pump operation during the contact time
B pulse transmitter with intermittent pump operation
C pulse counter with contiuous pump operation during the contact time
D pulse counter with intermittent pump operation

Scope of Functions

The controller IGZ51-20-S8 features the functions listed below. The default and the adjustable parameters are listed in table 2 - 35.

- adjustable pause time
- adjustable monitoring time
- adjustable stroke number
- MK pulse monitoring
- pump run time limit (stroke monitoring)
- level monitoring
- prelubrication
- power supply failure memory

Table 2 - 35. Parameters of IGZ51-20-S8

Designation	Abbreviation	Default setting	Unit	Adjustment range	Unit
operating mode	BA	A		A (pulse transmitter with continuous pump operation) B (pulse transmitter with intermittent pump operation) C (pulse counter with continuous pump operation) D (pulse counter with intermittent pump operation)	
pause time	TP	10	minutes	01 E 00 - 99 E 04 (BA A, B) 01 E 00 - 99 E 04 (BA C, D)	minutes pulses
monitoring time	TU	60	seconds	01 E 00 - 99 E 03	seconds
stroke number	NH	3		01 E 00 - 30 E 00	

Input functions

The standard settings for the input functions are listed in table 2 - 36. The input functions can be altered as described in section “Adjusting the input functions” in chapter “Operation” of the general section of this manual.

Table 2 - 36. Input functions of IGZ51-20-S8

Input	Setting	Meaning
I1	O	normally closed contact
I2	S	normally open contact
I3	S	normally open contact
I4	S	normally open contact
I5	S	normally open contact

Installation

Install the device in the control cabinet of a VOGEL central lubrication system as described in chapter operation (general part of this manual). Observe the connection diagram (figure 2 - 27).

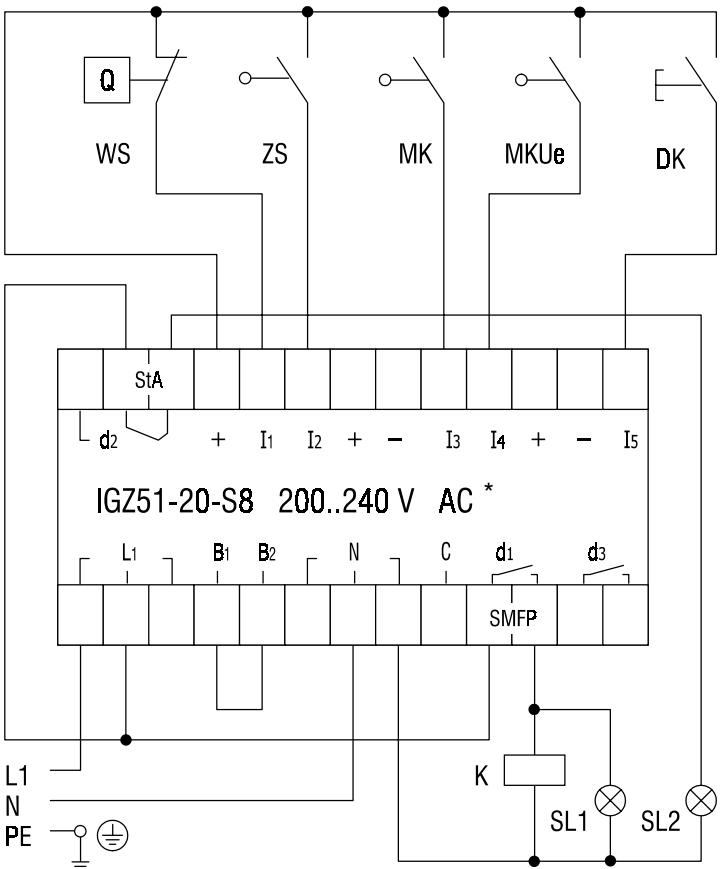
After installation and applying the operating voltage, the device begins its function sequence with prelubrication.

Operation with Power Supply Failure Memory

The IGZ51-20-S8 is supplied with a power supply failure memory, that saves the current failure message if a power failure occurs. Table 2 - 37 shows which time parameter is the first in the control sequence upon return of power.

Table 2 - 37. Start upon Power Failure

Situation at time of power failure	Procedure upon power-up
During monitoring time	prelubrication
During pause time	prelubrication
During failure message	failure message remains saved



*For connection to a 20..24 V AC supply please note fig. 1 - 3 on page 1 - 6.

Figure 2 - 27. Connection Diagram for IGZ51-20-S8

L1/N	operating voltage
B1/B2	jumper terminals for operating voltage (here shown: 200..240 V)
WS	level monitoring switch (here shown: reservoir filled)
ZS	cycle switch (stroke monitoring)
MK	machine contact
MKUe	MK pulse monitoring
DK	push-button 1. intermediate lubrication 2. delete failure
+	+24 V DC output
-	0 V DC output
d1	operating contact for lubricant supply pump (SMFP)
d2	change-over contact, command line resting contact: failure display (StA) or prelubrication operating contact: operation OK
SL1	signal lamp for „PUMP ON"
SL2	signal lamp for „FAILURE"
K	pump motor contactor

IGZ51-20-S8 Pulse Diagrams

(Time axis not true to dimensions, stroke preset = 3)

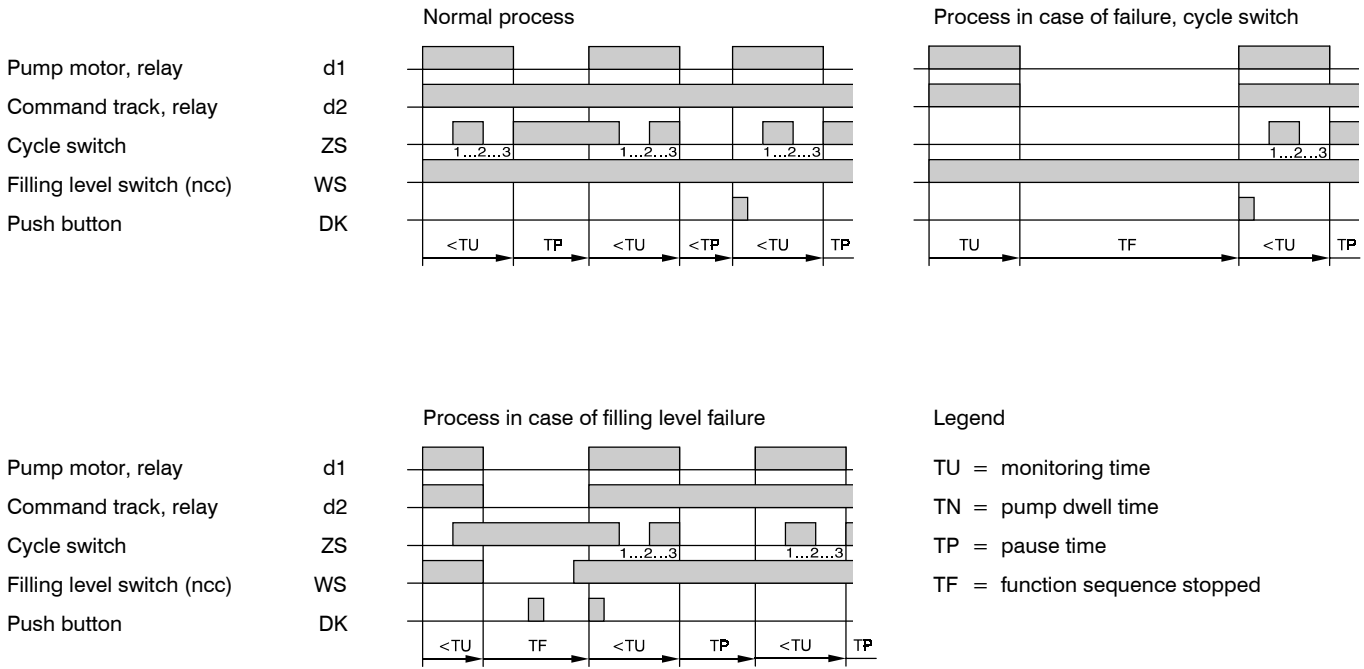


Figure 2 - 28. Pulse Diagram for IGZ51-20-S8

Controllers for Combined Circulation and Piston Feeder Systems

Application

The controllers described in this chapter are used to control combined circulation and distribution lubrication systems with a single pump.

Overview

The device described in table 2 - 38 is used by VOGEL to control combined circulation and distribution lubrication systems.

Table 2 - 38. VOGEL Controller for Combined Circulation and Distribution Lubrication Systems

Designation	Short description
IZ361-30	Pulse counter with adjustable pause time, pressure build-up monitoring in circulation and distributor circuit, pressure build-down monitoring, pulse monitoring and power supply failure memory

Function

The controller is designed to monitor a circulation lubrication system and to control an intermittently operating distribution lubrication system at the same time, while both systems are supplied by the same pump. At defined intervals the controller switches over from the continuously operating circulation lubrication system to the distribution system and monitors the lubrication process.

Lubrication Cycle (Distribution System)
A lubrication cycle of the distribution system is comprised of the contact time and the pause time (TP).

The Pause Time (Distribution System)
The pause time (TP) is the time between two contact times. The length of the pause is determined by the machine to be lubricated which sends pulses to the controller as operation continues. The pulses received at the machine contact MK are counted by the controller, and the contact time is started after a preset number of pulses. The number of pulses to be counted can be set by the user.

Pulse Monitoring
An operating contact (BK) is used for pulse monitoring. When the machine requests lubrication, the operating contact is closed. When the contact BK is closed, a pulse must be received at the MK contact within a certain time, otherwise a failure message is output.

The Contact Time (Distribution System)
After time-out of the pause time, the controller starts the lubrication process. This is referred to as contact time. The contact time is comprised of monitoring time (TU) and pump dwell time (TN). During the contact time, relay d1 is energised and the solenoid valve switching over from circulation lubrication to distribution lubrication is activated.

Pressure Build-Up Monitoring (Distribution System)
During the contact time, the pump builds up the pressure required for lubrication in the distribution circuit. This process is monitored by a pressure switch (DS). As soon as the required pressure is reached, the monitoring time is terminated and the pump dwell time started.

Monitoring Time (Distribution System)
The monitoring time (TU) sets a time window for pressure build-up in the distribution system; monitored by the pressure switch DS. If the required pressure is not reached during the monitoring time (pressure switch DS is not activated), the pump is shut off and a failure message output.

The monitoring time is adjusted permanently and cannot be changed by the user.

Pump Dwell Time (Distribution System)
The pump dwell time (TN) defines a time period following the monitoring time, during which the pump continues to operate for the distribution

circuit, to ensure all lubricating points are supplied with a sufficient amount of lubricant. At the end of the dwell time, relay d1 is de-energised and the system thereby reset to circulation mode. The pump keeps running.

Pressure Build-Up Monitoring (Circulation System)
To monitor the circulation lubrication, a second pressure switch DS2 operating in series with pressure switch DS is employed. DS2 is installed in the circulation circuit and closes e. g. at a pressure of > 1 bar.

Monitoring Time (Circulation System)
The monitoring time for pressure switch DS2 is approx. 2 minutes. It starts at the end of the dwell time and is terminated when the DS2 contact is closed (while the DS contact is open).

Pressure Build-Down Monitoring
If the pressure is not built down after the contact time, that is, if pressure switch DS remains activated or pressure switch DS2 does not close, a failure message is output after a defined time.

Power Supply Failure Memory (EEPROM)
In case the power supply fails, the power supply failure memory saves the most important data of the controller, such as remaining pause time and a failure message.
If power supply is shut of at any time during the function sequence, except during the pause time, the controller will start with a pre-run time and prelubrication as soon as power returns.
If power supply is interrupted during the pause, the number of MK pulses received is saved. After return of power, the controller remains in the pause function, until the further MK pulses required to trigger the next contact time have been received.

Installation

Install the device in the control cabinet of a VOGEL central lubrication system as described in chapter Installation (general part of this manual).

Operation

Switching On
The device is switched on, when the operating voltage is applied. When the operating voltage is present, the green operating voltage LED is on.

Power must be switched on or off instantaneously.

Pre-Run Time
When power is applied, the pre-run time starts. During this time all other functions are locked. The failure message relay d2 is energised.

Prelubrication
After the pre-run time, the controller triggers a prelubrication in the distribution circuit. Prelubrication is performed just like a standard contact time.

Pause Time
At the end of the dwell time, relay d1 is de-energised and the system thereby reset to circulation mode. Then the preset value for the pause time is read and the pause started. Subsequently the controller alternates between distribution lubrication and circulation lubrication at the interval defined by the set pause time.

Contact Time (Distribution System)
The contact time is started after time-out of the pause time. It is comprised of the time required for pressure build-up and the dwell time. At the beginning of the contact time, relay d1 is energised and the system thereby switched over to distribution lubrication. As soon as pressure switch DS is activated, the monitoring time is terminated and the pump dwell time started. At the end of the dwell time, the next pause time begins.

Relay d2 in Normal Operation
When the operating voltage is applied and no failure has occurred, the relay d2 is always energised.

Intermediate Lubrication
Short pressing of the ⧫ button during a pause triggers an intermediate lubrication. Intermediate lubrication is performed just like a standard contact time.

Switching Off
The device is switched off by separating it from the operating power supply.

After switch-off, the device must remain shut off for some time (see reclosing time in the specifications), to allow all internal voltages to be discharged.

Changing Parameters
Change of parameters is described in chapter Operation (in the general part of this operating manual). Parameter changes, such as change of the pause time, will become operative with the beginning of the next pause.

Failure Messages

If a failure occurs, the red failure LED is on and the symbol for the respective input flashes on the display.

Pressure not Built Up in Circulation System
At the beginning of a distribution lubrication process, the monitoring time for pressure switch DS starts. If DS is not activated during this time, relays d1 and d2 are de-energised. The function sequence is stopped and the failure LED lights up. At the same time, the symbol for input DS flashes on the display.

No Pressure Built Up in the Circulation System
At the end of the dwell time, the controller switches over to circulation lubrication and the monitoring time for pressure switch DS2 starts. If DS2 is not activated during the monitoring time, relays d1 and d2 are de-energised. The function sequence is stopped and the failure LED lights up. At the same time, the symbol for input DS2 flashes on the display.

Pressure not Built Down
If the pressure is not built down after the contact time, that is, if pressure switch DS remains activated or pressure switch DS2 does not close, a failure message is output after a defined time. The function sequence is stopped and the failure LED lights up. At the same time, the symbol for input DS2 flashes on the display.

Missing MK Pulses
If the BK contact is closed and no pulse is received at the machine contact MK during a defined time, a failure message is output. The failure LED lights up and the symbol for the input MK flashes on the display.

Relay d2 when Operation Fails
When a failure occurs, relay d2 is de-energised and the function sequence is stopped.

Deleting a Failure Message
A failure message can only be deleted by pressing the ⧫ button. This triggers an intermediate lubrication.

Delete a failure message only after resolving the cause of the failure.

IZ361-30

Operating Modes

The controller IZ361-30 can only be used as pulse counter (operating mode C).

Scope of Functions

The IZ361-30 features the functions listed below. The default and the adjustable parameters are listed in table 2 - 39.

- adjustable pause time
- pulse monitoring
- pressure build-up monitoring for distribution lubrication
- pressure build-up monitoring for circulation lubrication
- pressure build-down monitoring
- power supply failure memory (EEPROM)
- pre-run time

Input functions

The standard settings for the input functions are listed in table 2 - 40. The input functions can be altered as described in section “Adjusting the input functions” in chapter “Operation” of the general section of this manual.

Table 2 - 39. Parameters of IZ361-30

Designation	Abbreviation	Default setting	Unit	Adjustment range	Unit
operating mode	BA	C		not adjustable	
pause time	TP	10	pulses	01 E 00 - 99 E 04	pulses
monitoring time	TU	60	seconds	not adjustable	
dwell time	TN	15	seconds	not adjustable	
prelubrication time	TV	60	seconds	not adjustable	

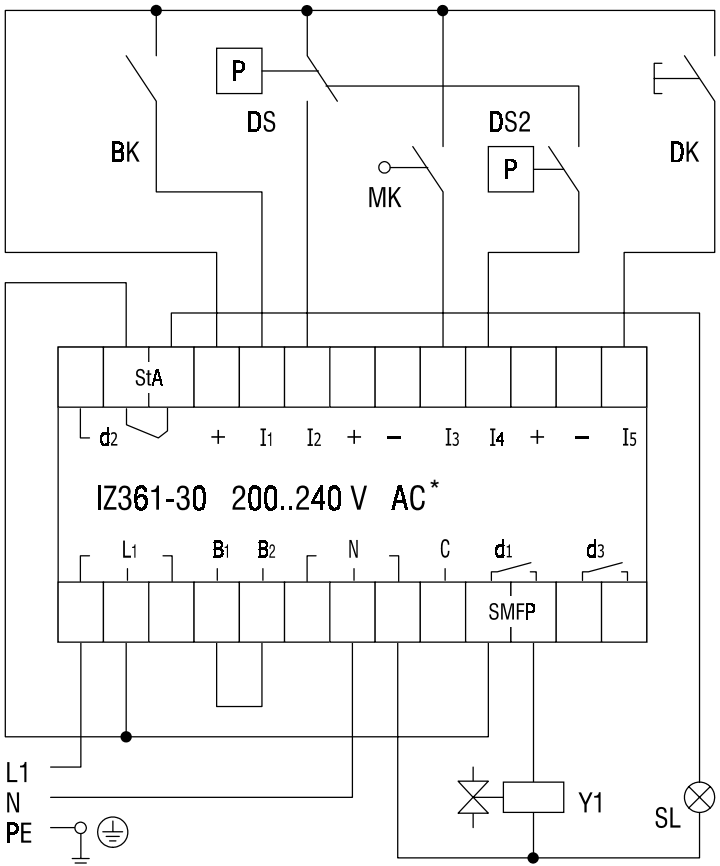
Installation, First Operation

Install the device in the control cabinet of a VOGEL central lubrication system as described in chapter operation (general part of this manual). Observe the connection diagram (figure 2 - 29).

After installation, input of parameters and applying the operating voltage, the device begins its function sequence with pre-run time and prelubrication.

Table 2 - 40. Input functions of IZ361-30

Input	Setting	Meaning
I1	S	normally open contact
I2	S	normally open contact
I3	S	normally open contact
I4	S	normally open contact
I5	S	normally open contact



*For connection to a 20..24 V AC supply please note fig. 1 - 3 on page 1 - 6.

Figure 2 - 29. Connection Diagram for IZ361-30

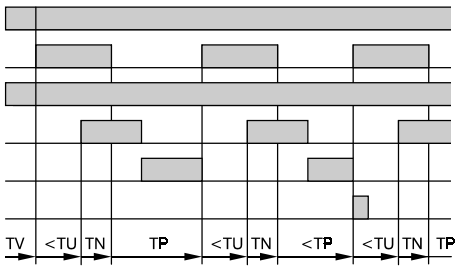
L1/N	operating voltage
B1/B2	jumper terminals for operating voltage (here shown: 200..240 V)
BK	machine operation contact
DS	pressure switch for pressure build-up monitoring for distribution lubrication
DS2	pressure switch for pressure build-up monitoring for circulation lubrication
MK	machine contact
DK	push-button for intermediate lubrication
+	+24 V DC output
-	0 V DC output
d1	operating contact for lubricant supply pump (SMFP)
d2	change-over contact, command line resting contact: failure (StA) operating contact: operation OK
SL	signal lamp for „FAILURE"
Y1	solenoid valve for switch-over between circulation/distribution lubrication

IZ361-30 Pulse Diagrams

(Time axis not true to dimensions)

Normal process

Operating voltage	L1/N
Solenoid valve, relay	d1
Command track, relay	d2
Pressure switch (noc)	DS
Pressure switch (noc)	DS2
Push button	DK



Legend

TV = pre-run time

TU = monitoring time

TN = pump dwell time

TP = pause time

TF = function sequence stopped

Process in case of pressure build-up failure, DS

Operating voltage	L1/N
Solenoid valve, relay	d1
Command track, relay	d2
Pressure switch (noc)	DS
Pressure switch (noc)	DS2
Push button	DK

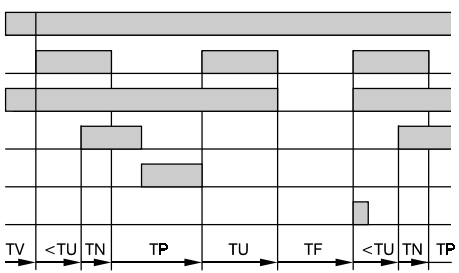


Figure 2 - 30. Pulse Diagram for IZ361-30

Pulse Monitors

Application

The controllers described in this chapter are used to monitor lubrication with volume-flow controlled pulse transmitters.

Overview

Table 2 - 41 lists the available VOGEL pulse monitors and their scope of functions.

Function

These controllers monitor up to three signal sources for adherence to preset limit values. When the limit values are not reached or exceeded, a failure message is output.

Monitoring Time
The monitoring time (TU) is the time period during which a defined number of pulses must be received at the sensor contacts of the controller. If this is not the case, the controller outputs a failure message.

On some devices, the monitoring time can be set by the user. If that is the case, it is important to ensure that at least two pulses can be received at each input during the monitoring time. Further information on this is found in the chapters on the respective device types.

Table 2 - 41. VOGEL Pulse Monitors

Designation	Short description
EWT2A01	Pulse monitor for up to 3 measuring spots
EWT2A01-S1	like EWT2A01 with lubrication pause function, outputs are normally closed (wire breakage protection)
EWT2A04	Pulse monitor with adjustable monitoring time and selectable monitoring of a high and low limit value or two low limit values
EWT2A04-S1	like EWT2A04 with lubrication pause function, outputs are normally closed (wire breakage protection)

Limit Values
The limit value is the number of pulses that must be received at the sensor input (Gbrx) during the monitoring time. On some units there is a high and low limit value. High limit values must not be exceeded, low limit values must be reached.

Lubrication pause
On some devices application of a 24 V signal to input I4 allows to start a lubrication pause.

The lubrication pause is a time period during which lubrication is interrupted. To ensure the controller will not output an error message due to the missing lubrication pulses, the number of pulses incoming at the transmitter contacts is not evaluated during the lubrication pause.

The lubrication pause will last as long as the voltage is applied to input I4.

Installation

Install the device in the control cabinet of a VOGEL central lubrication system as described in chapter Installation (general part of this manual).

To prevent unintended failure messages from being output by unused inputs, we recommend to set the limit value for any unused input to the minimum value and short it to a neighbouring input that is in use.

Operation

Switching On
The device is switched on, when the operating voltage is applied. When the operating voltage is present, the green operating voltage LED is on.

Power must be switched on or off instantaneously.

Monitoring Time
Upon power-up, the controller begins to monitor the transmitter contacts, the monitoring time is started.

During the monitoring time, the unit counts the number of pulses received at each transmitter contact. If the preset limit values are not exceeded, the monitoring time will elapse. Then all counters are reset and a new monitoring time is started.

If a high limit value has been set for a transmitter contact, the monitoring time is terminated as soon as this value is exceeded. A failure message is output and the output relay assigned to the transmitter contact is closed or opened depending on the device type.

If a low limit has been set for a transmitter contact, the monitoring time runs until its end. Then adherence to the limit value is checked immediately, and if it has not been reached, a failure message is output. At the same time, the output relay assigned to the transmitter contact is closed or opened depending on the device type.

Lubrication pause
If a 24 V signal is applied to input I4 on pulse monitors with designation S1, the monitoring of the transmitter contacts is interrupted. As long as the voltage is applied to input I4, the pulses incoming at the transmitter contacts are not evaluated. No error message is output.

Restart
When the external push-button RS is pressed, the monitoring time is terminated and all counters are reset. Then the monitoring time is restarted. Possible failure messages are likewise reset.

A restart is also triggered when the user quits the parameter display after changing parameters.

Switching Off
The device is switched off by separating it from the operating power supply.

After switch-off, the device must remain shut off for some time (see reclosing time in the specifications), to allow all internal voltages to be discharged.

Changing Parameters
Change of parameters is described in chapter Operation (in the general part of this operating manual). A change of parameters becomes operative when the user quits the parameter display and the next monitoring time starts.

Failure Messages

In case of failures, that is, when a low limit is not reached or a high limit value is exceeded, the output relay assigned the respective transmitter is closed.

Insufficient Lubrication
The number of registered pulses falls short of the adjusted low limit.

Excessive Lubrication
The number of registered pulses exceeds the adjusted high limit.

Relays d1 through d3 during a Failure
If a failure occurs, the relay assigned the respective output is closed.

Deleting a Failure Message
A failure message can only be deleted by pressing the external push-button RS.

Delete a failure message only after resolving the cause of the failure.

EWT2A01, EWT2A01-S1

Operating Modes

The controllers EWT2A01 and EWT2A01-S1 can only be used in the operating mode pulse monitoring.

Scope of Functions

The devices feature the functions listed below. The default and the adjustable parameters are listed in table 2 - 42.

EWT2A01
- 3 transmitter contacts
- adjustable limit values for each input
- monitoring time for the input defined on the basis of set limit values
- 3 failure outputs assigned to the 3 pulse inputs as normally open contacts

EWT2A01-S1
like EWT2A01 but:
- lubrication pause function
- failure outputs as normally closed contacts (wire breakage protected)

The adjustable limit values are low limits, that is, the controller monitors the system for insufficient lubrication.

Table 2 - 42. Parameters of EWT2A01 and EWT2A01-S1

Designation	Abbreviation	Default setting	Unit	Adjustment range	Unit
monitoring time	TU	depends on limit values	seconds	not adjustable	
limit value 1	l1	10 E 04	*0.01 pulses/minute	01 E 00 - 25 E 04	*0.01 pulses/minute
limit value 2	l2	10 E 04	*0.01 pulses/minute	01 E 00 - 25 E 04	*0.01 pulses/minute
limit value 3	l3	10 E 04	*0.01 pulses/minute	01 E 00 - 25 E 04	*0.01 pulses/minute

Input functions

The standard settings for the input functions are listed in the tables 2 - 43 and 2 - 44. Except for EWT2A01-S1 the input functions can be altered as outlined in section “Adjusting the input functions” in chapter “Operation” of this general section of the manual.

Table 2 - 43. Input functions of EWT2A01

Input	Setting	Meaning
I1	S	normally open contact
I2	S	normally open contact
I3	S	normally open contact
I4	-	not used
I5	S	normally open contact

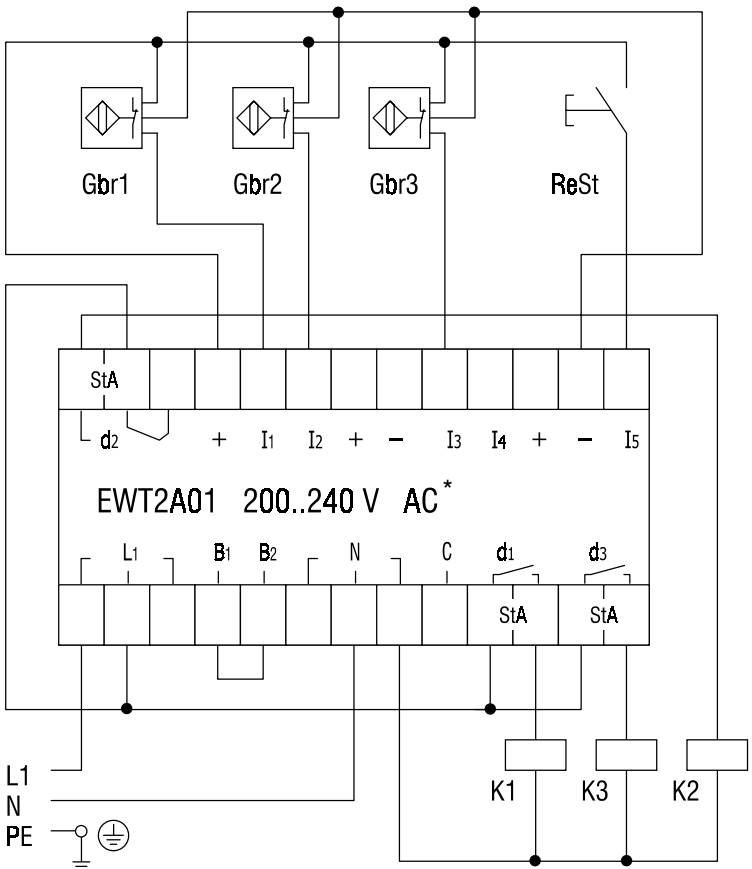
Table 2 - 44. Input functions of EWT2A01-S1

Input	Setting	Meaning
I1	S	normally open contact
I2	S	normally open contact
I3	S	normally open contact
I4	S	normally open contact
I5	S	normally open contact

Installation, First Operation

Install the device in the control cabinet of a VOGEL central lubrication system as described in chapter operation (general part of this manual). Observe the connection diagrams (figure 2 - 31 and 2 - 32).

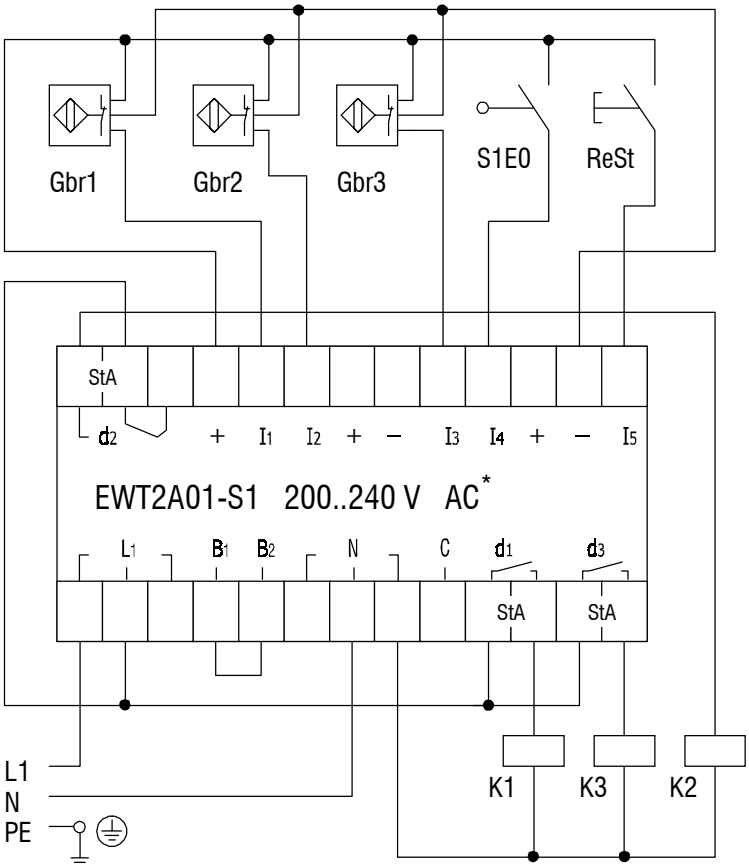
After installation and applying the operating voltage, the device begins its function sequence with the monitoring time.



*For connection to a 20..24 V AC supply please note fig. 1 - 3 on page 1 - 6.

Figure 2 - 31. Connection Diagram for EWT2A01

L1/N	operating voltage
B1/B2	jumper terminals for operating voltage (here shown: 200..240 V)
Gbr1	transmitter contact 1
Gbr2	transmitter contact 2
Gbr3	transmitter contact 3
ReSt	push-button 1. restart 2. delete failure
+	+24 V DC output
-	0 V DC output
d1	operating contact for failure display (StA), assigned Gbr1
d2	operating contact for failure display (StA), assigned Gbr2, change-over contact, resting contact: failure operating contact: operation OK
d1	operating contact for failure display (StA), assigned Gbr3
K1	failure message Gbr1
K2	okay message Gbr2
K3	failure message Gbr3



*For connection to a 20..24 V AC supply please note fig. 1 - 3 on page 1 - 6.

Figure 2 - 32. Connection Diagram for EWT2A01-S1

L1/N	operating voltage
B1/B2	jumper terminals for operating voltage (here shown: 200..240 V)
Gbr1	transmitter contact 1
Gbr2	transmitter contact 2
Gbr3	transmitter contact 3
S1E0	Contact lubrication pause
ReSt	push-button 1. restart 2. delete failure
+	+24 V DC output
-	0 V DC output
d1	operating contact for failure display (StA), assigned Gbr1
d2	operating contact for failure display (StA), assigned Gbr2, change-over contact, resting contact: failure operating contact: operation OK
d1	operating contact for failure display (StA), assigned Gbr3
K1	failure message Gbr1
K2	okay message Gbr2
K3	failure message Gbr3

EWT2A04, EWT2A04-S1

Operating Modes

The controllers EWT2A04 and EWT2A04-S1 can only be used in the operating mode pulse monitoring.

Scope of Functions

The devices feature the functions listed below. The default and the adjustable parameters are listed in table 2 - 45.

EWT2A04
- 2 transmitter contacts
- adjustable limit values for each input
- input of high and low limit values for input I2
- adjustable monitoring time
- 2 failure outputs assigned to the two pulse inputs as normally open contacts

EWT2A04-S1
like EWT2A04 but:
- lubrication pause function
- failure outputs as normally closed contacts (wire breakage protected)

The devices can either monitor the two low limit values for two different transmitters or a high and low limit for a single transmitter. The function is selected by applying or removing power at input I3. When power is applied to input I3, limit value 2 is considered the high limit, that is, input I2 is used to monitor the system for excessive lubrication.

If no power is applied to input I3, limit value 2 is considered the low limit for input I2, that is, the system is monitored for insufficient lubrication.

Table 2 - 45. Parameters of EWT2A04 and EWT2A04-S1

Designation	Abbreviation	Default setting	Unit	Adjustment range	Unit
monitoring time	TU	60	seconds	06 E 00 – 90 E 03	seconds
limit value 1	I1	10 E 04	*0.01 pulses/minute	01 E 00 - 25 E 04	*0.01 pulses/minute
limit value 2	I2	10 E 04	*0.01 pulses/minute	01 E 00 - 25 E 04	*0.01 pulses/minute

Input functions

The standard settings for the input functions are listed in the tables 2 - 46 and 2 - 47. Except for EWT2A04-S1 the input functions can be altered as outlined in section “Adjusting the input functions” in chapter “Operation” of this general section of the manual.

Installation, First Operation

Install the device in the control cabinet of a VOGEL central lubrication system as described in chapter operation (general part of this manual).

Table 2 - 46. Input functions of EWT2A04

Input	Setting	Meaning
I1	S	normally open contact
I2	S	normally open contact
I3	S	normally open contact
I4	-	not used
I5	S	normally open contact

Table 2 - 47. Input functions of EWT2A04-S1

Input	Setting	Meaning
I1	S	normally open contact
I2	S	normally open contact
I3	S	normally open contact
I4	S	normally open contact
I5	S	normally open contact

Observe the connection diagrams (figure 2 - 33 and 2 - 34).

After installation and applying the operating voltage, the device begins its function sequence with the monitoring time.

Changing Parameters

Setting the Monitoring Time, Input of Limit Values
The monitoring time must be selected long enough to allow at least two pulses to be received at each input during the monitoring time. However, we recommend to adjust a much longer monitoring time, to ensure only substantial deviations are reported as failures, because the occurance of pulses may be rather irregular.

Calculation Example for Oil Lubrication (Monitoring of High and Low Limit Value)
A progressive feeder with n = 8 distribution outlets and an output volume of V_{spec} = 0.13 cm³ per outlet and cycle is supplied with a volume flow of Q = 20 cm³/min. The strokes of the feeder pistons are counted as pulses.

The number of pulses then is:

$$I = \frac{Q}{n \cdot V_{spez}} = \frac{20}{8 \cdot 0{,}13} = 19 \quad \frac{\text{pulses}}{\text{min}}$$

The controller is to report a failure, when the number of piston strokes is exceeded or falls short of the limit value by more than 20 %.

$$I_{min} = I1 = I - (I \cdot 0.2) = 15 \quad \frac{\text{pulses}}{\text{min}}$$

$$I_{max} = I2 = I + (I \cdot 0.2) = 23 \quad \frac{\text{pulses}}{\text{min}}$$

$$TU_{min} = \frac{2}{I_{min}} = \frac{2}{15} = 0{,}133 \quad \text{min}$$

Selected monitoring time TU = 1 (min)
Setting: TU = 60 E 00 (seconds)

Parameter I1 = I_{min} = 15 (pulses/min)
Setting: I1 = 15 E 02 (*0.01 pulses/min)

Parameter I2 = I_{max} = 23 (pulses/min)
Setting: I2 = 23 E 02 (*0.01 pulses/min)

Calculation Example for Grease Lubrication (Monitoring of two Low Limit Values for two Different Transmitters)
A progressive feeder with n = 12 distribution outlets and an output volume of V_{spec} = 0.13 cm³ per outlet and cycle is supplied with a volume flow of Q = 1 cm³/min.

The number of pulses I_A then is:

$$I_A = \frac{Q}{n \cdot V_{spez}} = \frac{1}{12 \cdot 0{,}13} = 0{,}64 \quad \frac{\text{pulses}}{\text{min}}$$

The controller is to report a failure, when the number of piston strokes falls short of the limit value by more than 30 %.

A progressive feeder with n = 6 distribution outlets and an output volume of V_{spec} = 0.13 cm³ per outlet and cycle is supplied with a volume flow of Q = 3 cm³/min. Its pulse frequency I_B is 3.85 pulses/min and the actual number may be max. 40 % lower.
The two low limit values I_{Amin} and I_{Bmin} are calculated as follows:

$$I_{Amin} = I_A - (I_A \cdot 0.30) = 0.45 \quad \frac{\text{pulses}}{\text{min}}$$

$$I_{Bmin} = I_B - (I_B \cdot 0.40) = 2.31 \quad \frac{\text{pulses}}{\text{min}}$$

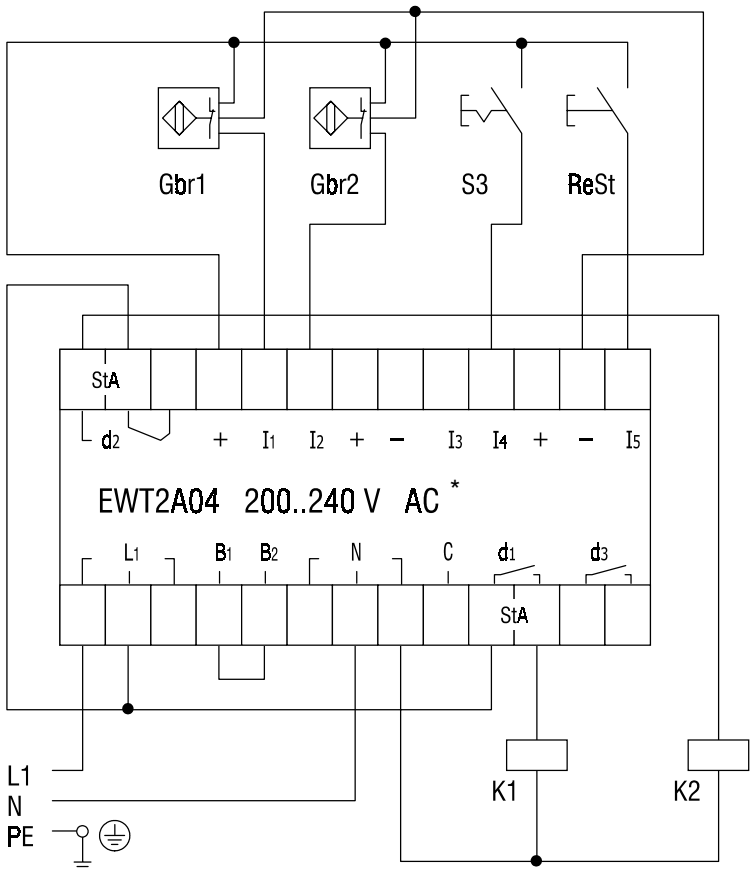
The lower of the two values is used to determine the minimum monitoring time:

$$TU_{min} = \frac{2}{I_{Amin}} = \frac{2}{0{,}45} = 4{,}4 \quad \text{min}$$

Selected monitoring time TU = 60 min
Setting: TU = 36 E 02 (seconds)

Parameter I1 = I_{Amin} = 0.45 (pulses/min)
Setting: I1 = 45 E 00 (*0.01 pulses/min)

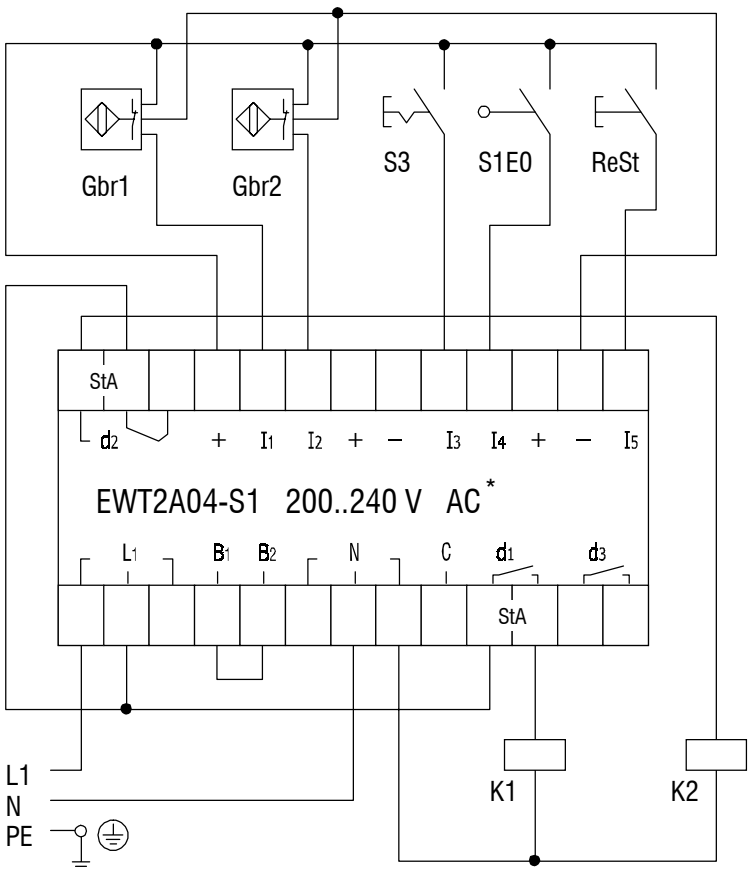
Parameter I2 = I_{Bmin} = 138 pulses
Setting: I2 = 23 E 01 (*0.01 pulses/min)



*For connection to a 20..24 V AC supply please note fig. 1 - 3 on page 1 - 6.

Figure 2 - 33. Connection Diagram for EWT2A04

L1/N	operating voltage
B1/B2	jumper terminals for operating voltage (here shown: 200..240 V)
Gbr1	transmitter contact 1
Gbr2	transmitter contact 2
S3	select contact for excessive/insufficient lubrication opened: insufficient lubrication closed: excessive lubrication
ReSt	push-button 1. restart 2. delete failure
+	+24 V DC output
-	0 V DC output
d1	operating contact for failure display (StA), assigned Gbr1
d2	operating contact for failure display (StA), assigned Gbr2, change-over contact, resting contact: failure operating contact: operation OK
K1	failure message Gbr1
K2	okay message Gbr2



*For connection to a 20..24 V AC supply please note fig. 1 - 3 on page 1 - 6.

Figure 2 - 34. Connection Diagram for EWT2A04-S1

L1/N	operating voltage
B1/B2	jumper terminals for operating voltage (here shown: 200..240 V)
Gbr1	transmitter contact 1
Gbr2	transmitter contact 2
S3	select contact for excessive/insufficient lubrication opened: insufficient lubrication closed: excessive lubrication
S1E0	Contact lubrication pause
ReSt	push-button 1. restart 2. delete failure
+	+24 V DC output
-	0 V DC output
d1	operating contact for failure display (StA), assigned Gbr1
d2	operating contact for failure display (StA), assigned Gbr2, change-over contact, resting contact: failure operating contact: operation OK
K1	failure message Gbr1
K2	okay message Gbr2

Controllers for Chain Lubrication Systems

Application

The controller described in this chapter is used to control and monitor central lubrication systems for lubrication of conveyor chains.

Overview

The device described in table 2 - 48 is supply by VOGEL to control chain lubrication systems.

Table 2 - 48. VOGEL Controller for Chain Lubrication Systems

Designation	Short description
IZ52-20	Pulse counter with adjustable pause time, adjustable number of lubrication pulses, with pump run time limit, pressure build-up monitoring, MK pulse monitoring and power supply failure memory

Function

The device is designed to control a solenoid valve to supply lubrication systems for chains with the required lubricant amounts. The lubricant supply is controlled at intervals based on the running speed of the chain. An interval time and a pause time can be set; standstill times are considered by monitoring of incoming pulses.

The Lubrication Cycle
A lubrication cycle is comprised of contact time and pause time (TP).

The Pause Time
The pause time (TP) is the time between two contact times. The length of the pause time is determined by the number of pulses sent by the system to be controlled.The pulses received at the machine contact MK are counted by the controller; the pause time is terminated and the contact time started after a preset number of pulses has been received. The number of pulses to be counted can be set by the user.

The Contact Time
After time-out of the pause time, the controller starts the lubrication process. This is referred to as contact time. During the contact time, relay d1 is energised, switching the pump on.

Monitoring Time, Pressure Build-Up Monitoring
The monitoring time (TU) is a time window within the contact time, during which the pressure build-up in the lubricant supply lines is monitored. This is achieved by means of the pressure switch (DS). If the required pressure is not reached during the monitoring time (pressure switch DS is not activated), the pump is shut off and a failure message output.

If the required pressure is reached during the monitoring time, it is terminated and relay d3 is released. At the same time the monitoring time for MK starts.

The monitoring time for pressure build-up is adjusted permanently and cannot be changed by the user.

MK Pulse Monitoring, Pump Run Time Limit
The duration of the contact time and thereby the pump run time is limited by the monitoring time for pressure build-up and the MK monitoring time.

The MK monitoring time starts after successful pressure build-up. If no pulse is received at the MK input within this time, the contact time is terminated and the pump shut off. The contact time continues as soon as the next MK pulse is registered.

If a pulse is received at the MK input during the MK monitoring time, it is terminated and a new MK monitoring time is started.

This allows to register and consider standstill of the chain.

MK Pulse Transmission Ratio Counting of Lubrication Pulses
To control the solenoid valve via relay d3, the controller generates lubrication pulses on the

basis of the MK pulses received at the MK input. Output of a lubrication pulse energises relay d3.

To prevent a lubrication pulse to be issued upon every MK pulse received, the MK pulse transmission ratio allows to determine after how many MK pulses a lubrication pulse is output.

After a certain number of lubrication pulses has been output (parameter NI), the contact time is terminated, the pump is shut off and a new pause time started.

The number of lubrication pulses until the end of the contact time and the MK pulse transmission ratio can be set by the user.

Level Monitoring
The filling level of the lubricant reservoir is monitored by means of a level monitoring switch (WS). This switch is configured as a normally closed contact. This allows simultaneous monitoring of the signal cables to the level monitoring switch, to detect breakage of wires.

As soon as the level in the lubricant reservoir drops below minimum, the function of the lubrication system is stopped and a failure message is output.

Power Supply Failure Memory (EEPROM)
In case the power supply fails, the power supply failure memory saves the most important data of the controller, such as remaining pause time and a failure message. This allows the controller to continue the function sequence and possible failure messages are not lost.

Installation

Install the device in the control cabinet of a VOGEL central lubrication system as described in chapter Installation (general part of this manual).

Operation

Switching On
The device is switched on, when the operating voltage is applied. When the operating voltage is present, the green operating voltage LED is on.

Power must be switched on or off instantaneously.

Contact Time (Lubrication)
Upon power-up, the controller generally begins its function sequence with a contact time (also see subheading Operation with Power Failure Memory). Relay d1 is energised and the pump thereby switched on. At the same time the monitoring time starts.

As soon as pressure switch DS is activated, the monitoring time is terminated and relay d3 released. The pulses received at the input of the machine contact MK are counted and a lubrication pulse is output when the required number of MK pulses is reached. Relay d3 is thereby energised and the solenoid valve opened.

Possibly, the frequency of the pulses incoming at the machine contact MK is higher than the frequency of the output d3. This is indicated by flashing of the symbol for output d3 on the display. In this case the parameter MI (MK pulse ratio) must be set to a suitable value which is higher than 1. Changing of parameters is described in chapter Operation (general section) of this manual.

When the preset number of lubrication pulses is reached, the contact time is terminated and the pump shut off.

Stand Still Times
Stand still of the conveyor chain during the contact time is recognised, since the MK pulses incoming at the MK input are monitored. If no MK pulses are received at the input during the MK monitoring time, the contact time is interrupted. It is resumed as soon as pulses are again registered at the MK input.

Pause Time
At the end of the contact time, the adjusted pause time value is read and the pause then started. Subsequently contact time and pause time alternate.

Relay d2 in Normal Operation
When the operating voltage is applied and no failure has occurred, relay d2 is always energised.

Intermediate Lubrication
Short pressing of the ⦿ button during a pause triggers an intermediate lubrication. Intermediate lubrication is performed just like a standard contact time. Thereafter the device returns to the normal operating cycle.

Switching Off
The device is switched off by separating it from the operating power supply.

After switch-off, the device must remain shut off for some time (see reclosing time in the specifications), to allow all internal voltages to be discharged.

Operation with Power Supply Failure Memory
When power fails, the power supply failure memory saves important data such as the remaining pause time or a current failure message. This allows to resume the function sequence upon return of power. Depending on the situation prevailing at the time of power failure, the controller resumes the function sequence as listed in table 2 - 49.

Changing Parameters
Change of parameters is described in chapter Operation (in the general part of this operating manual). Parameter changes, such as change of the pause time, will become operative with the beginning of the next pause.

Failure Messages

If a failure occurs, the red failure LED is on and the symbol for the respective input flashes on the display.

No Pressure Build-Up
At the beginning of a contact time, the monitoring time for pressure switch DS starts. If DS is not activated during this time, relays d1 and d2 are de-energised. The function sequence is stopped and the failure LED lights up. At the same time, the symbol for input DS flashes on the display.

Low Filling Level
If the filling level in the lubricant reservoir drops too far, the level monitoring switch WS opens, causing an interruption of the current function sequence. Relays d1 and d2 are de-energised and the failure LED lights up. At the same time, the symbol for input DS flashes on the display.

Relay d2 when Operation Fails
When a failure occurs, relay d2 is de-energised and the function sequence is stopped.

Deleting a Failure Message
A failure message can only be deleted by pressing the ⦿ button. This triggers an intermediate lubrication.

Delete a failure message only after resolving the cause of the failure.

Table 2 - 49. Start upon Power Failure

Situation at time of power failure	Procedure upon power-up
During monitoring time	new contact time
After monitoring time	pump is switched on and the contact time continues with the remaining lubrication pulses
During pause time	pause continues with saved remaining pause time
During failure message	failure message remains saved

IZ52-20

Operating Modes

The controller IZ52-20 can only be used as pulse counter (operating mode C).

Scope of Functions

The IZ52-20 features the functions listed below. The default and the adjustable parameters are listed in table 2 - 50.

- adjustable pause time
- adjustable monitoring time
- adjustable number of lubrication pulses
- adjustable pulse monitoring time for MK
- adjustable MK pulse transmission
- pressure build-up monitoring
- MK pulse monitoring
- power supply failure memory (EEPROM)

Input functions

On this device the input function of the level monitoring switch (WS) can be changed. The adjustment is described in section “Adjusting the input functions” in the chapter “Operation” of the general section of this manual.

Standard setting WS: O (normally closed contact)

Table 2 - 50. Parameters of IZ52-20

Designation	Abbreviation	Default setting	Unit	Adjustment range	Unit
operating mode	BA	C		not adjustable	
pause time	TP	10	pulses	01 E 00 - 99 E 07	pulses
monitoring time	TU	60	seconds	05 E 00 - 12 E 01	seconds
MK pulse monitoring time	TK	120	seconds	01 E 00 - 99 E 01	seconds
MK pulse transmission	MI	1		01 E 00 - 25 E 00	
number of lubrication pulses	NI	10		01 E 00 - 99 E 03	

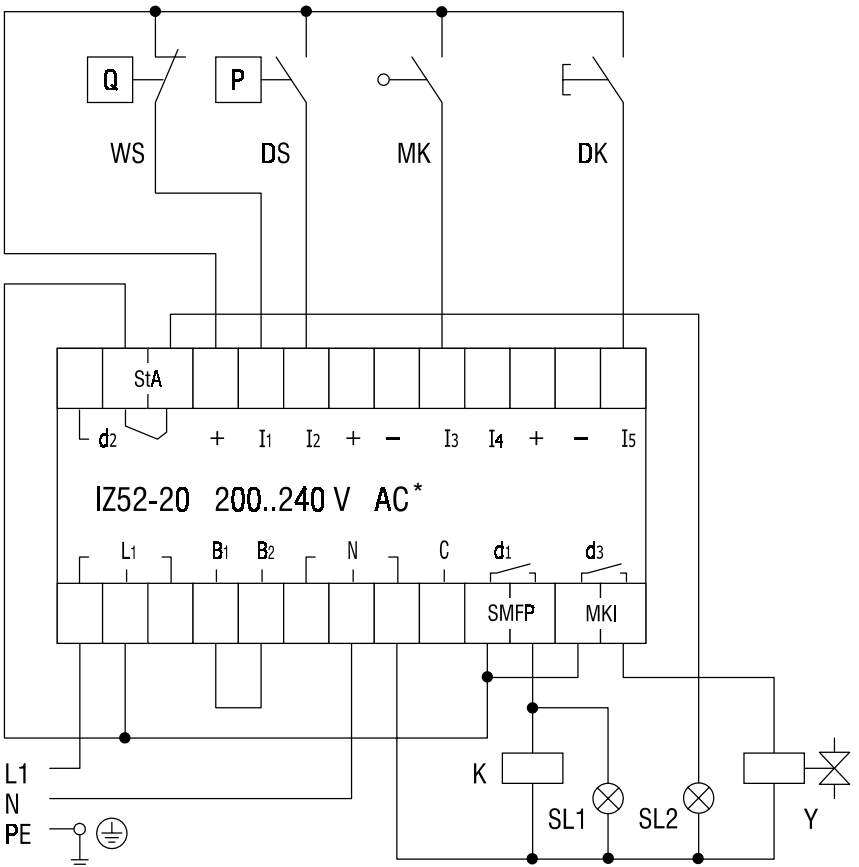
Further information

Cycle time output d3:

- on-time: 0.4 s
- off-time: ≥ 0.4 s
- maximum frequency: 1 Hz

Installation, First Operation

Install the device in the control cabinet of a VOGEL central lubrication system as described in chapter Operation (general part of this manual). Observe the connection diagram (figure 2 - 35).



*For connection to a 20..24 V AC supply please note fig. 1 - 3 on page 1 - 6.

Figure 2 - 35. Connection Diagram for IZ52-20

L1/N	operating voltage
B1/B2	jumper terminals for operating voltage (here shown: 200..240 V)
WS	level monitoring switch (here shown: reservoir filled)
DS	pressure switch pressure build-up monitoring
MK	machine contact
DK	push-button 1. intermediate lubrication 2. delete failure
+	+24 V DC output
-	0 V DC output
d1	operating contact for lubricant supply pump (SMFP)
d2	change-over contact, command line resting contact: failure (StA) operating contact: operation OK
d3	operating contact for solenoid valve or machine contact for pulse-controlled lubrication (MKI)
SL1	signal lamp for „PUMP ON"
SL2	signal lamp for „FAILURE"
Y	solenoid valve for lubricant supply

IZ52-20 Pulse Diagrams

(Time axis not true to dimensions, MK pulse transmission ratio = 2, lubrication pulses = 2)

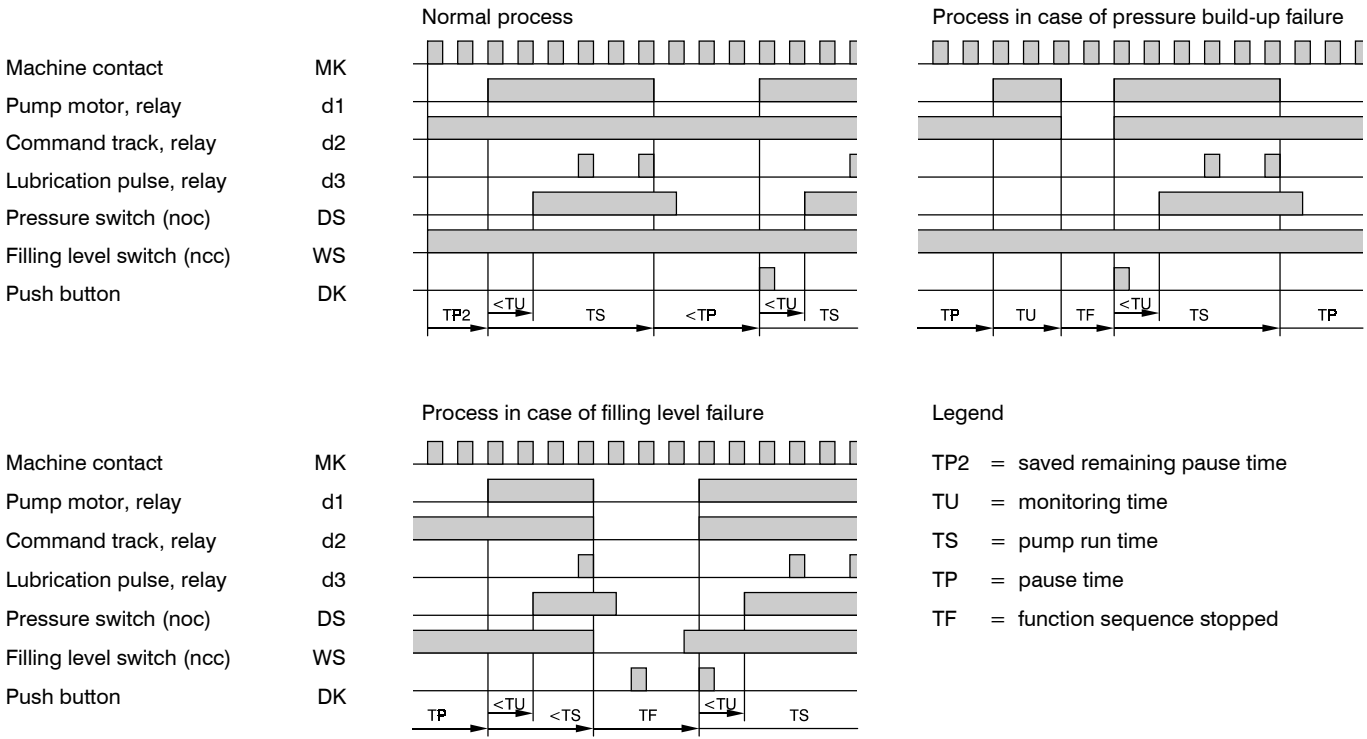


Figure 2 - 36. Pulse Diagram for IZ52-20

EWT
EXZT
IG
IGZ
IZ

Universal Controller for Industrial Lubrication Systems

Part 3: Appendix

Table A - 1. Overview of Available VOGEL Controllers

Former designation	New designation	Application
EWT2A01 voltage	EWT2A01-E	Pulse monitor
EWT2A04 voltage	EWT2A04-E	Pulse monitor
EXZT2A02 voltage	EXZT2A02-E EXZT2A02-I	Single-line systems Piston feeders
EXZT2A03 voltage	EXZT2A03-E EXZT2A03-I	Single-line systems Piston feeders
EXZT2A05 voltage	EXZT2A05-E EXZT2A05-I	Single-line systems Piston feeders
EXZT2A06 voltage	EXZT2A06-E EXZT2A06-I	Progressive feeder systems
EXZT2A07 voltage	EXZT2A07-E EXZT2A07-I	Single-line systems Piston feeders
IG351	IG351-10-E IG351-10-I	Electronic pulse transmitter for central lubrication systems
IG38-3	IG38-30-I IGZ38-30-E IGZ38-30-I	Single-line systems Piston feeders
IG38-3-S1	IGZ38-30-E IGZ38-30-i	Single-line systems Piston feeders
IG54-2	IG54-20-E IG54-20-I	Oil air lubrication
IG54-2-S1	IG54-20-S1-E IG54-20-S1-I	Oil air lubrication
IG54-2-S3	IG54-20-S3-E IG54-20-S3-I	Oil air lubrication
IG54-2-S4	IG54-20-S4-E IG54-20-S4-I	Oil air lubrication
IGZ36-2	IGZ36-20-E IGZ36-20-I	Single-line system Piston feeders
IGZ36-2-S6	IGZ36-20-S6-E IGZ36-20-S6-I	Single-line system Piston feeders
IGZ38-M	IGZ38-M2-E IGZ38-M2-I IGZ38-M3-E IGZ38-M3-I	Oil air lubrication
	IGZ38-M4-E IGZ38-M4-I	Single-line system Piston feeders
IGZ51-2	IGZ51-20-E IGZ51-20-I	Progressive feeders
IGZ51-2-S2	IGZ51-20-S2-E IGZ51-20-S2-I	Progressive feeders

Table A – 1. continued

Former designation	New designation	Application
IGZ51-2-S3	IGZ51-20-S3-E IGZ51-20-S3-I	Single-line systems Piston feeders
IGZ51-2-S7	IGZ51-20-S7-E IGZ51-20-S7-I	Progressive feeders
IGZ51-2-S8	IGZ51-20-S8-E IGZ51-20-S8-I	Progressive feeders
IZ361	IZ361-30-E IZ361-30-I	Circulation and distribution lubrication systems
IZ38-3	IZ38-30-I IGZ38-30-E IGZ38-30-I	Single-line systems Piston feeders
IZ38-3-S1	IGZ38-30-E IGZ38-30-I	Single-line systems Piston feeders
IZ52-2	IZ52-20-E IZ52-20-I	Chain lubrication

Table A - 2. New Voltage Codes

Designation	Description
+471	100..120 V / 200..240 V AC
+472	20..24 V AC / DC

Table A - 3. Comparison of Former and New Voltage Code

Voltage code			
Former	Operating voltage range		New
250	220 V	50/60 Hz	471
410	220 V	50/60 Hz	471
411	110 V	50/60 Hz	471
423	24 V	50/60 Hz	472
426	20 V	50/60 Hz	472
428	230 V	50/60 Hz	471
429	115 V	50/60 Hz	471
447	110 V – 120 V	50/60 Hz	471
924	24 V	DC	472
MAN	220 V – 240 V	50/60 Hz	471