



## High Precision Clockwork Time Relays

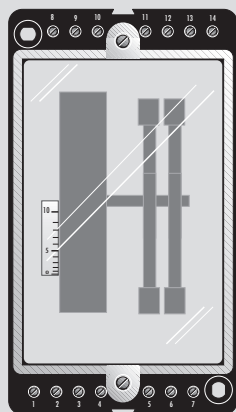
### MZU 13-S, MZU 23-S for single voltage

**Function:** ON-delay (AV)

**1 time range**

**Contact equipment:** MZU 13-S = 2 timed and 1 instantaneous changeover  
MZU 23-S = 2 timed and 1 instantaneous changeover

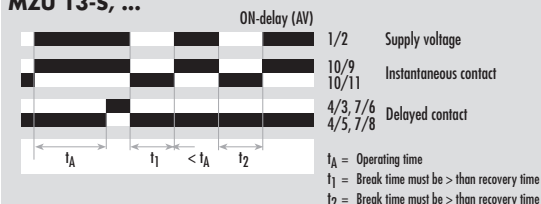
### MZU 13-S, ...



### Function Diagram

FD 0040

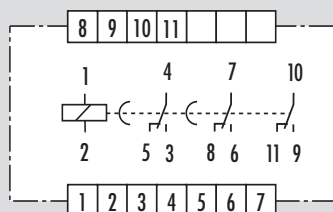
#### MZU 13-S, ...



### Connection Diagram

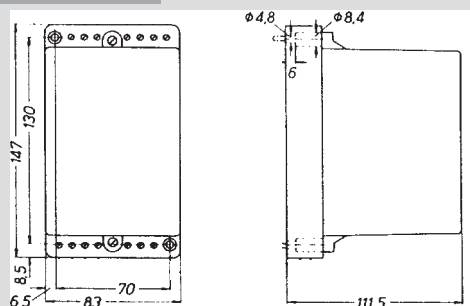
KS 5004/2

#### MZU 13-S, ...



### Dimensions

M 2-1



### General

AV (see page M 5/3).

The time relays are equipped with high precision clockwork mechanism and reliable starting is ensured by the use of a patented special industrial design.

The timing error of the clockwork time relay of only  $\pm 2\%$ , related to the full scale value is not affected by voltage fluctuations.

Infinitely variable time setting within a range is carried out with the aid of a setting scale. It is necessary to remove the protection cover though.

### Function

Upon energization, the solenoid actuates the instantaneous contact and the timing period starts.

When the preset time has elapsed, a toothed segment in the clockwork is released to snap the timed contacts into action.

Upon de-energization, the solenoid, clockwork mechanism and all contacts go into their off-position.

If a voltage interruption occurs during the timing period, the solenoid, the instantaneous contact and clockwork mechanism go back into their off-position.

### Note

- ▶ The clockwork mechanism may not be re-lubricated.
- ▶ In order to insure the functional reliability and the timing precision, the clockwork time relays should be overhauled after about 5 years, regardless of the switching frequency. They should also be regularly checked for good pickup action.

### Product Description

The high precision clockwork time relays MZU 13-S and MZU 23-S are single range items, available in the following time ranges:

#### Time Range

1 to 10 s
6 to 60 s
18 to 180 s

Type	Standard voltage	Special voltage	Price Code
MZU 13-S 10 s	24 V AC	42 V AC	<b>M 5/11.1</b>
MZU 13-S 60 s	110 V AC	50 to 60 Hz	
	220 V AC		
	240 V AC	50 to 60 Hz	
MZU 13-S 180 s	24 V AC	42 V AC	<b>M 5/11.2</b>
	110 V AC	50 to 60 Hz	
	220 V AC		
	240 V AC	50 to 60 Hz	
MZU 23-S 10 s	24 V DC	48 V AC	<b>M 5/11.3</b>
MZU 23-S 60 s	110 V DC	60 V DC	
	220 V DC		
MZU 23-S 180 s	24 V DC	48 V AC	<b>M 5/11.4</b>
	110 V DC	60 V DC	
	220 V DC		





# Electromechanical High Precision Time Relays

## TECHNICAL DATA

**FUNCTION** according to DIN VDE 0435 Part 110:04.89

Point 3.13

Function display  
Function diagram

### POWER SUPPLY

Rated voltage  $U_N$  V AC  
Rated voltage  $U_N$  V DC  
Rated consumption: motor at 50 Hz and  $U_N$  (AC) VA  
Rated consumption: motor at 50 Hz and  $U_N$  (AC) W  
Rated consumption: coil at 50 Hz and  $U_N$  (AC) VA  
Rated consumption: coil at 50 Hz and  $U_N$  (AC) W  
Rated consumption DC W  
Rated frequency Hz  
Operating voltage range

### TIME CIRCUIT

Time setting/Number of time ranges  
Available time ranges s  
Recovery time ms  
Minimum switch-ON time ms  
Release value %  $U_N$   
Permissible parallel load yes  
Internal rectifier yes  
Average of the error related to the full-scale value  $\pm 2$

### OUTPUT CIRCUIT

Contact equipment  
Contact material  
Available modifications  
Switching voltage  $U_n$  V AC/DC  
Maximum continuous current  $I_n$  A  
Application category according to EN 60947-5-1:1991  
Permissible switching frequency switching cycles/h  
Mechanical service life switching cycles  
Response time ms  
Release time ms

### GENERAL DATA

Creepage and clearance distances between circuits according to DIN VDE 0110-1:04.97: rated surge voltage kV  
Over voltage category III  
Contamination level 3 outside, 2 inside  
Design voltage V AC  
Test voltage  $U_{eff}$  50 Hz acc. to DIN VDE 0110-1, Table A.1 kV  
Protection class housing/terminals acc. to DIN VDE 0470 Sec. 1:11.92  
Radiated noise  
Noise immunity

Ambient temperature, working range °C  
Dimensions  
Connection diagram  
Weight kg  
Accessories  
Approvals

### GENERAL TECHNICAL SPECIFICATIONS

## MZU 13-S

High precision clockwork time relay for single voltage  
ON-delay time relay  
FD 0040

**24 42 110 220 240**

–  
–  
ca. 20 pick-up/ca. 4 hold  
ca. 20 pick-up/ca. 4 hold  
50 to 60  
0,8 to 1,1 x  $U_N$

analog/1  
1 to 10  
6 to 60  
–  
 $\leq 120$   
–  
 $\geq 15$   
yes  
yes  
 $\pm 2$

2 timed + 1 instantaneous changeover  
Ag Cd O  
Ag Pd 70/30\*  
400/400  
5  
AC-15  $U_e$  230 V AC,  $I_e$  2 A  
DC-13  $U_e$  24 V DC,  $I_e$  2 A  
500  
 $2 \times 10^6$   
 $\leq 40$   
 $\leq 120$

5  
III  
3 outside, 2 inside  
400  
2,68  
IP 30/IP 20  
EN 50081-1:03.93, -2:03.94  
EN 50082-2:1995

– 10 to + 55  
M 2-1  
KS 5004/2  
1,0  
–  
page i.4

page i.5

\*) Price: upon request

## MZU 13-S

High precision clockwork time relay for single voltage  
ON-delay time relay  
FD 0040

**24 42 110 220 240**

–  
–  
ca. 30 pick-up/ca. 5 hold  
ca. 30 pick-up/ca. 5 hold  
50 to 60  
0,8 to 1,1 x  $U_N$

analog/1  
–  
–  
18 to 180  
 $\leq 70$   
–  
 $\geq 15$   
yes  
yes  
 $\pm 2$

2 timed + 1 instantaneous changeover  
Ag Cd O  
Ag Pd 70/30\*  
400/400  
5  
AC-15  $U_e$  230 V AC,  $I_e$  2 A  
DC-13  $U_e$  24 V DC,  $I_e$  2 A  
500  
 $2 \times 10^6$   
 $\leq 40$   
 $\leq 70$

5  
III  
3 outside, 2 inside  
400  
2,68  
IP 30/IP 20  
EN 50081-1:03.93, -2:03.94  
EN 50082-2:1995

– 10 to + 55  
M 2-1  
KS 5004/2  
1,0  
–  
page i.4

page i.5

\*) Price: upon request



# Electromechanical High Precision Time Relays

## TECHNICAL DATA

**FUNCTION** according to DIN VDE 0435 Part 110:04.89

Point 3.13

Function display  
Function diagram

### POWER SUPPLY

Rated voltage  $U_N$  V AC  
Rated voltage  $U_N$  V DC  
Rated consumption: motor at 50 Hz and  $U_N$  (AC) VA  
Rated consumption: motor at 50 Hz and  $U_N$  (AC) W  
Rated consumption: coil at 50 Hz and  $U_N$  (AC) VA  
Rated consumption: coil at 50 Hz and  $U_N$  (AC) W  
Rated consumption DC W  
Rated frequency Hz  
Operating voltage range

### TIME CIRCUIT

Time setting/Number of time ranges  
Available time ranges s  
Recovery time ms  
Minimum switch-ON time ms  
Release value %  $U_N$   
Permissible parallel load yes  
Internal rectifier -  
Average of the error related to the full-scale value  $\pm 2$

### OUTPUT CIRCUIT

Contact equipment  
Contact material  
Available modifications  
Switching voltage  $U_n$  V AC/DC  
Maximum continuous current  $I_n$  A  
Application category according to EN 60947-5-1:1991  
Permissible switching frequency switching cycles/h  
Mechanical service life switching cycles  
Response time ms  
Release time ms

### GENERAL DATA

Creepage and clearance distances between circuits according to DIN VDE 0110-1:04.97: rated surge voltage kV  
Over voltage category III  
Contamination level 3 outside, 2 inside  
Design voltage V AC  
Test voltage  $U_{eff}$  50 Hz acc. to DIN VDE 0110-1, Table A.1 kV  
Protection class housing/terminals acc. to DIN VDE 0470 Sec. 1:11.92  
Radiated noise  
Noise immunity

Ambient temperature, working range °C  
Dimensions M 2-1  
Connection diagram KS 5004/2  
Weight kg  
Accessories -  
Approvals page i.4

### GENERAL TECHNICAL SPECIFICATIONS

## MZU 23-S

High precision clockwork time relay for single voltage  
ON-delay time relay  
-  
FD 0040

	24	48	60	110	220
Rated voltage $U_N$ V AC					
Rated voltage $U_N$ V DC					
Rated consumption: motor at 50 Hz and $U_N$ (AC) VA		-			
Rated consumption: motor at 50 Hz and $U_N$ (AC) W		-			
Rated consumption: coil at 50 Hz and $U_N$ (AC) VA		-			
Rated consumption: coil at 50 Hz and $U_N$ (AC) W		-			
Rated consumption DC W		ca. 15 pick-up/ca. 4 hold			
Rated frequency Hz		-			
Operating voltage range		0,8 to 1,1 x $U_N$			

analog/1  
1 to 10  
6 to 60  
-  
 $\leq 25$   
-  
 $\geq 15$   
yes  
-  
 $\pm 2$

2 timed + instantaneous changeover  
Ag Cd O  
Ag Pd 70/30\*  
400/400  
5  
AC-15  $U_e$  230 V AC,  $I_e$  2 A  
DC-13  $U_e$  24 V DC,  $I_e$  2 A  
500  
 $2 \times 10^6$   
 $\leq 40$   
 $\leq 25$

5  
III  
3 outside, 2 inside  
400  
2,68  
IP 30/IP 20  
EN 50081-1:03.93, -2:03.94  
EN 50082-2:1995

- 10 to + 55  
M 2-1  
KS 5004/2  
1,0  
-  
page i.4

page i.5  
\*) Price: upon request

## MZU 23-S

High precision clockwork time relay for single voltage  
ON-delay time relay  
-  
FD 0040

	24	48	60	110	220
Rated voltage $U_N$ V AC					
Rated voltage $U_N$ V DC					
Rated consumption: motor at 50 Hz and $U_N$ (AC) VA		-			
Rated consumption: motor at 50 Hz and $U_N$ (AC) W		-			
Rated consumption: coil at 50 Hz and $U_N$ (AC) VA		-			
Rated consumption: coil at 50 Hz and $U_N$ (AC) W		-			
Rated consumption DC W		ca. 20 pick-up/ca. 2,5 hold			
Rated frequency Hz		-			
Operating voltage range		0,8 to 1,1 x $U_N$			

analog/1  
-  
-  
18 to 180  
 $\leq 25$   
-  
 $\geq 15$   
yes  
-  
 $\pm 2$

2 timed + 1 instantaneous changeover  
Ag Cd O  
Ag Pd 70/30\*  
400/400  
5  
AC-15  $U_e$  230 V AC,  $I_e$  2 A  
DC-13  $U_e$  24 V DC,  $I_e$  2 A  
500  
 $2 \times 10^6$   
 $\leq 40$   
 $\leq 70$

5  
III  
3 outside, 2 inside  
400  
2,68  
IP 30/IP 20  
EN 50081-1:03.93, -2:03.94  
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- 10 to + 55  
M 2-1  
KS 5004/2  
1,0  
-  
page i.4

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