

Chronos 2 electronic timers - 17.5 mm

1 changeover relay output

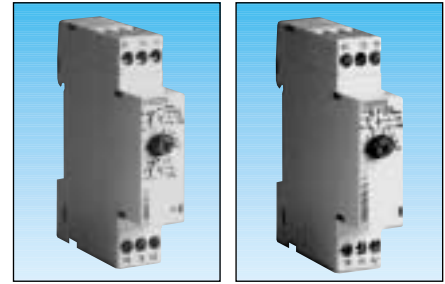
- Multi-function or mono-function
- Multi-range (7 ranges, available options)
- Multi-voltage
- 1 changeover relay output: 8 A - 250 V (10 A UL)
- Screw or spring terminals
- 1 LED status indicators
- Option of connecting an external power supply to the control input
- 3-wire sensor control option

Technical specifications

Timing	
Repetition accuracy (with constant parameters)	± 0.5 % (CEI 1812-1)
Drift	
- Temperature	± 0.05 % / °C
- Voltage	± 0.2 % / V
Display precision according to IEC 1812-1	±10 % / 25 °C
Minimum pulse duration	
- Typically (relay version)	30 ms
- Typically (solid state version)	50 ms
- Typically under load (relay version)	100 ms
Maximum reset time by de-energisation	
- Typically (relay version)	100 ms
- Typically (solid state version)	350 ms
Immunity to breaks in supply voltage: typically	>10 ms
Power supply	
Multi-voltage power supply	depending on version, see page 1/13
Frequency	50/60 Hz
Operating range	85 to 110 % Un (85 to 120 % Un for 12V AC/DC)
Load factor	100 %
Maximum power consumption	0.6 W 24V AC/DC 1.5 W 230V AC 32 VA 230V AC
Output elements relay output	
1 or 2 changeover relays, AgNi (cadmium-free)	2000 VA / 80 W
Rated power	2000 V A / 80W
Maximum breaking current	8 A AC 8 A DC
Minimum breaking current	10 mA / 5 VDC
Voltage breaking capacity	250V AC/VDC
Electrical life	10 ⁵ operations 8 A 250V resistive
Mechanical life	5 x 10 ⁶ operations
Breakdown voltage acc. to IEC 1812-1	2.5 kV / 1min / 1 mA / 50Hz
Impulse voltage acc. to IEC 664-1 IEC 1812-1	5 kV, wave 1.2 / 50 µs
Display	
State displayed by 1 LED	
- Flashing green when on	
Green LED operation indicator	
■■■■■ Pulsing:	
- timer on, no timing in progress (except functions Di-D and Li-L)	
■■■■■ Flashing:	
- timing in progress	
■■■■■ Permanently lit:	
- Relay waiting, no timing in progress	
Input type	
- Volt-free contact	
- 3-wire PNP output control option maximum residual voltage: 0.4 V whatever the timer power supply	

Other information

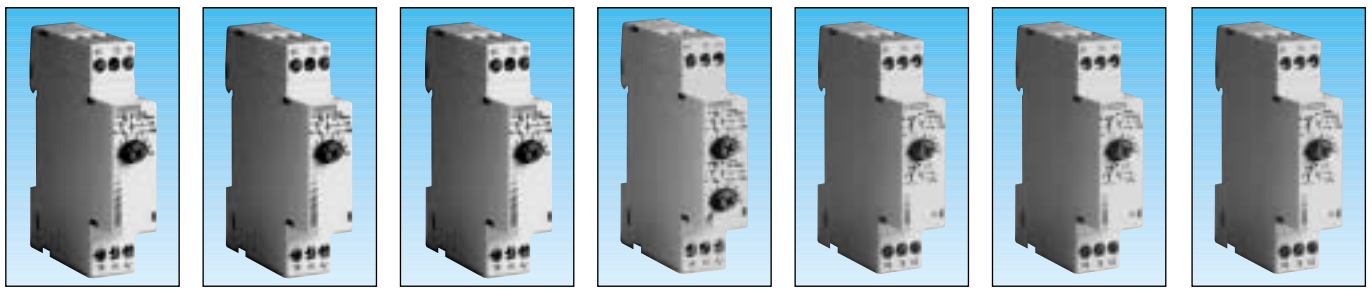
Non stocked, minimum order quantity 100 units.



Timing	0.1s • 100h	0.1s • 100h
Types		
Screw terminals	MUR1	MAR1
Spring terminals	—	—
Part numbers and voltage		
24V _c / 24 • 240V _a	88 826 105	88 826 115
12 V _a / c	—	—
12 • 240 V _a / c	—	—
Functions		
	Multi-function	Bifunction
	A - At - B - C - H - Ht -	A - At
	Di - D - Ac - Bw	
Nominal current		
	8 A	8 A
Timing ranges (7 ranges)		
1s - 10 s - 1 min - 10 min - 1 h - 10 h - 100 h		

General specifications

Conforming to standards	
IEC 1812-1, EN 50081-1/2, EN 50082-1/2, LV directives (73/23/EEC + 93/68/EEC (CE marking) + EMC (89/336/EEC + IEC 669-2-3 (17.5 mm)	
Approvals	
UL - CSA - cUL pending	
Temperatures limits	
- use	-20 °C + 60 °C
- stored	-30 °C + 60 °C
Installation category (acc. to IEC 664-1)	
Voltage surge category	
4 kV / 3	
Creepage distance and clearance acc. to IEC 664-1	
Degree of protection acc. to IEC 529	
- terminal block	IP 20
- casing	IP 40
- front face (except Tk2R1)	IP 50
Vibration resistance acc. to IEC 68-2-6	
f = 10 • 55 Hz	
A = 0.35 mm	
Relative humidity acc. to IEC 68-2-3 without condensation	
93 %	
Electromagnetic compatibility	
- Immunity to electrostatic discharges acc. to IEC 1000-42	
Level III (Air 8 K / Contact 6 KV)	
- Immunity to electrostatic fields acc. to ENV 50140/204 (IEC 1000-4-3)	
Level III 10V/m: 80 MHz to 1 GHz)	
- Immunity to rapid transient bursts acc. to IEC 1000-4-4	
Level III (direct 2kV/ Capacitive coupling clamp 1 KV)	
- Immunity to shock waves on power supply acc. to IEC 1000-4-5	
Level III (common mode 2 KV / residual current mode 1KV)	
- Immunity to radiofrequency in common mode acc. to ENV	
Level III (10V rms: 0.15 MHz to 80 MHz)	
- Immunity to voltage dips and breaks acc. to IEC 1000-4-11	
30 % / 10 ms	
60 % / 100 ms >	
95 % / 5 s	
- Mains-borne and radiated emissions acc. to EN 55022 (EN 55011 Group 1)	
Class B	
Fixing: Symmetrical DIN rail (EN 50022)	
35 mm	
Connection capacity	
- without ferrule	2 x 2.5 mm ²
- with ferrule	2 x 1.5 mm ²
Spring terminals, 2 terminals per connection point	
- flexible wire	1.5 mm ²
- rigid wire	2.5 mm ²
Casing material	
Self-extinguishing	
Weight : 17.5 mm casing	
60 g	



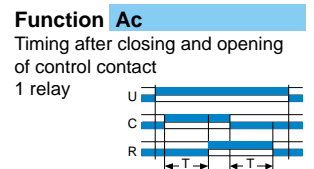
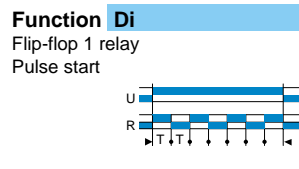
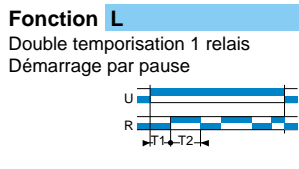
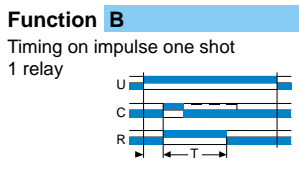
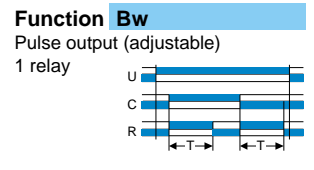
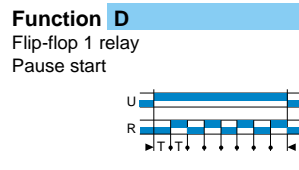
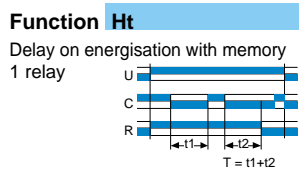
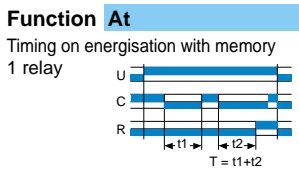
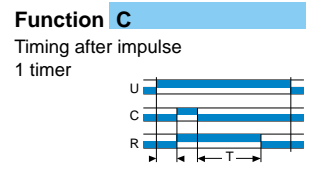
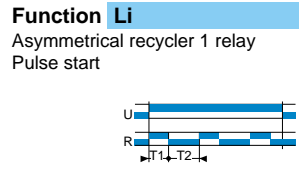
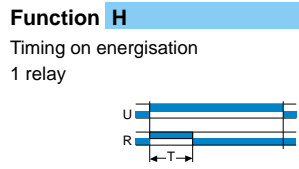
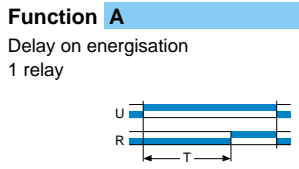
0.1s • 100h	0.1s • 100h	0.1s • 100h	0.1s • 100h	0.1s • 100h	0.1s • 100h	0.1s • 100h
MBR1	MCR1	MHR1	MLR1	MUR4	MUR3	MXR1
—	—	—	—	—	MURc3	—
88 826 125	88 826 135	88 826 145	88 826 155	—	—	88 826 185
—	—	—	—	88 826 100	88 826 103	88 826 503
Mono-function B	Mono-function C	Bifunction H - Ht	Bifunction Li - L	Multi-function A - At - B - C - H - Ht - Di - D - Ac - Bw	Multi-function A - At - B - C - H - Ht - Di - D - Ac - Bw	
8 A	8 A	8 A	8 A	8 A	8 A	8 A

1

2

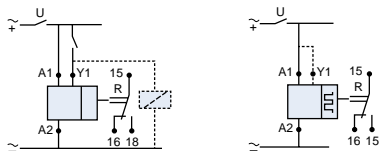


Function diagrams

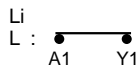


MXR1 functions see page 1/10, 1/11

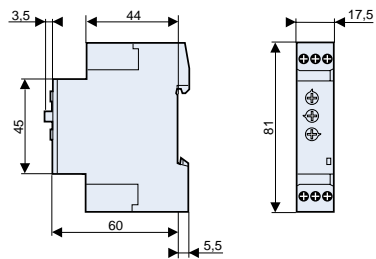
Connections



Functions :
A - At / H - Ht / B / C
Di - D / Ac / BW /
Ad - Ah - N - O - P
Pt - TL - Tt - W



Dimensions



To order, specify:

Standard products

1 Type

2 Part number

Example: Chronos 2 Timers MUR1 88 826 105

Chronos 2 electronic timers - 17.5 mm

Solid state output

- Multi-function or mono-function
- Multi-range (7 ranges, available options)
- Multi-voltage
- Solid state output: 0.7 A - 250 V (0.5 A UL)
- Screw or spring terminals
- 1 LED status indicators

Technical specifications

Timing

Repetition accuracy (with constant parameters) $\pm 0.5\%$
(CEI 1812-1)

Drift

- Temperature $\pm 0.05\% / ^\circ\text{C}$
- Voltage $\pm 0.2\% / \text{V}$

Display precision according to IEC 1812-1 $\pm 10\% / 25^\circ\text{C}$

Minimum pulse duration

- Typically (relay version) 30 ms
- Typically (solid state version) 50 ms
- Typically under load (relay version) 100 ms

Maximum reset time by de-energisation

- Typically (relay version) 100 ms
- Typically (solid state version) 350 ms

Immunity to breaks in supply voltage: typically $>10\text{ ms}$

Power supply

Multi-voltage power supply depending on version, see page 1/15

Frequency 50/60 Hz

Operating range 85 to 110 % U_n
(85 to 120 % U_n for 12V AC/DC)

Load factor 100 %

Maximum power consumption 0.6 W 24V AC/DC
1.5 W 230V AC
32 VA 230V AC

Output elements: Solid state output

Rated power 0.7 A AC/DC
20 $^\circ\text{C}$ (0.5A UL)

Derating 5 mA / $^\circ\text{C}$

Maximum admissible current $20\text{ A} \leq 10\text{ ms}$

Minimum breaking current 10 mA

Off-state leakage $< 5\text{ mA}$

Voltage breaking capacity 250V AC/VDC

Maximum voltage drop at terminals 3 fils 4V - 2 fils 8V

Electrical life 10^8 operations

Mechanical life 10^8 operations

Breakdown voltage acc. to IEC 664, IEC 255-5 2.5 kV to 1 mA / 1 min.

Display

State displayed by 1 LED

- Flashing green when on

Green LED operation indicator

■■■■■ Pulsing:

- timer on, no timing in progress
(except functions Di-D and Li-L)

■■■■■ Flashing:

- timing in progress

■■■■■ Permanently lit:

- Relay waiting, no timing in progress

Input type

- Volt-free contact

- 3-wire PNP output control option maximum residual voltage: 0.4 V whatever the timer power supply 0.4 V

Other information

Non stocked, minimum order quantity 100 units.

Timing

Types

Part numbers and voltage

24 • 240 V \sim 50 • 60 Hz

24 • 240 V \sim \approx 50 • Hz

Functions

Nominal current

Timing ranges (7 ranges)

1s - 10 s - 1 min - 10 min - 1 h - 10 h - 100 h

General specifications

Conforming to standards

IEC 1812-1, EN 50081-1/2, EN 50082-1/2, LV directives (73/23/EEC + 93/68/EEC (CE marking) + EMC (89/336/EEC + IEC 669-2-3 (17.5 mm)

Approvals

UL - CSA - cUL pending

Temperatures limits

- use

-20 $^\circ\text{C}$ + 60 $^\circ\text{C}$

- stored

-30 $^\circ\text{C}$ + 60 $^\circ\text{C}$

Installation category (acc. to IEC 664-1)

Voltage surge category

Creepage distance and clearance acc. to IEC 664-1

4 kV / 3

Degree of protection acc. to IEC 529

- terminal block

IP 20

- casing

IP 40

- front face (except Tk2R1)

IP 50

Vibration resistance acc. to IEC 68-2-6

f = 10 • 55 Hz
A = 0.35 mm

Relative humidity acc. to IEC 68-2-3

without condensation

93 %

Electromagnetic compatibility

- Immunity to electrostatic discharges acc. to IEC 1000-42

Level III
(Air 8 K /
Contact 6 KV)

- Immunity to electrostatic fields acc. to ENV 50140/204 (IEC 1000-4-3)

Level III 10V/m:
80 MHz to 1 GHz)

- Immunity to rapid transient bursts acc. to IEC 1000-4-4

Level III (direct 2kV/
Capacitive coupling
clamp 1 KV)

- Immunity to shock waves on power supply acc. to IEC 1000-4-5

Level III (common
mode 2 KV / residual
current mode 1KV)

- Immunity to radiofrequency in common mode acc. to ENV

Level III (10V rms:
0.15 MHz to 80 MHz)

- Immunity to voltage dips and breaks acc. to IEC 1000-4-11

30 % / 10 ms
60 % / 100 ms >
95 % / 5 s

- Mains-borne and radiated emissions acc. to EN 55022 (EN 55011 Group 1)

Class B

Fixing: Symmetrical DIN rail (EN 50022)

35 mm

Connection capacity

- without ferrule

2 x 2.5 mm²

- with ferrule

2 x 1.5 mm²

Spring terminals, 2 terminals per

connection point

- flexible wire

1.5 mm²

- rigid wire

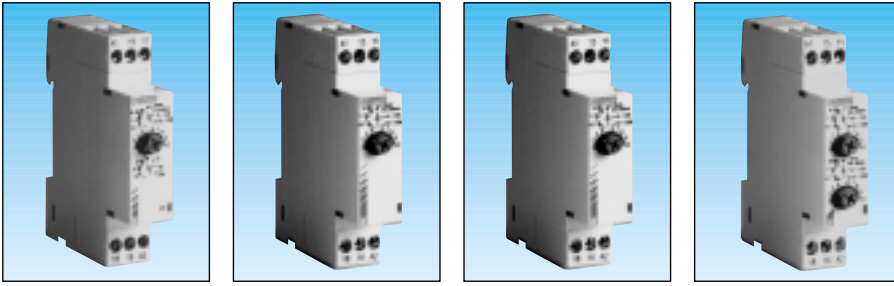
2.5 mm²

Casing material

Self-extinguishing

Weight : 17.5 mm casing

60 g



0.1s • 100h	0.1s • 100h	0.1s • 100h	0.1s • 100h
MUS2	MAS5	MHS2	MLS2
1		2	
88 826 004	—	88 826 044	88 826 054
—	88 826 014	—	—
Multi-function A - At - B - C - H - Ht - Di - D - Ac - Bw	Mono-function A	Mono-function H	Bifunction Li - L
0.7 A	0.7 A	0.7 A	0.7 A

Function diagrams

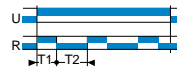
Function A
Delay on energisation
1 relay



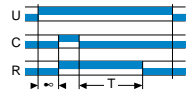
Function H
Timing on energisation
1 relay



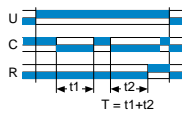
Function Li
Asymmetrical recycler 1 relay
Pulse start



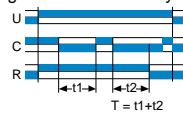
Function C
Timing after impulse
1 timer



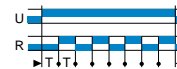
Function At
Timing on energisation with memory
1 relay



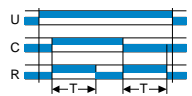
Function Ht
Delay on energisation with memory
1 relay



Function D
Flip-flop 1 relay
Pause start



Function Bw
Pulse output (adjustable)
1 relay



Function B
Timing on impulse one shot
1 relay



Function L
Asymmetrical recycler 1 relay
Pause start



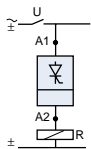
Function Di
Flip-flop 1 relay
Pulse start



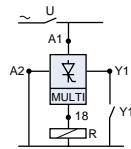
Function Ac
Timing after closing and opening
of control contact
1 relay



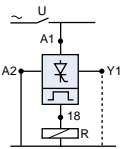
Connections



Functions :
A / H

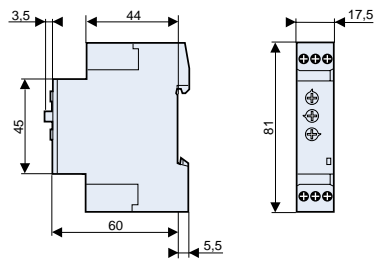


U



Li
L :
A2 Y1

Dimensions



To order, specify:

Standard products

1 Type

2 Part number

Example: Chronos 2 Timers MUS2 88 826 004

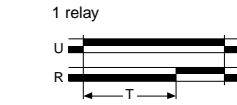
Functions

U : Supply
 R : Output or load relay
 T : Timing
 C (Y1) : Control contact
 : indefinite

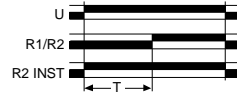
Function A: Delay on energisation

Single timing cycle which begins on energisation.

The output changes state after timing.

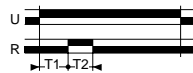


2 relays timed or
 1 relay timed and 1 instantaneous



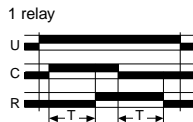
Function Ab: One-shot cycle

The output changes states at the end of the set time T1, for a period T2.
 Both T1 and T2 independently adjustable.

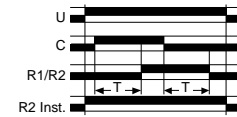


Function Ac: Timing after closing and opening of control contact

After energisation, closure of the control contact causes the timing period T to commence and output relay R (or the load) changes state at the end of this interval. When contact C (Y1) opens, relay R resets after a second timing period T.

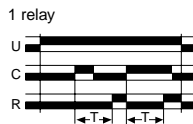


2 relays timed or
 1 relay timed and 1 instantaneous



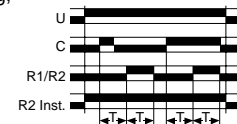
Function Ad: Delay on energisation by switch (not resettable)

After power-up, pressing or holding down the switch starts timing. At the end of timing, the output is energised. The output will be reset the next time the switch is pressed or held down.



Function Ah: Flashing single cycle by switch (not resettable)

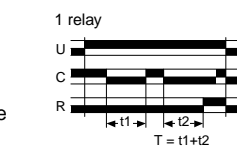
After power-up, pressing or holding down the switch starts timing. At the end of timing, the output is energised. At the end of this second timing, the output falls back to its initial value.



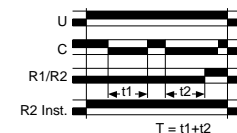
Function At: Timing on energisation with memory

Provides a cumulative time for contact opening.

The output changes states at the end of the set time.



2 relays timed or
 1 relay timed and 1 instantaneous

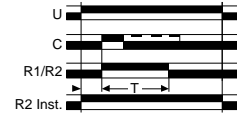
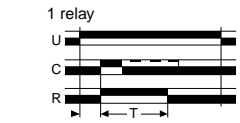


Function B: Timing on impulse one shot On pulse (with constant supply)

After energisation; a pulse (≥ 50 ms) or a maintained control contact will cause the output to change state which reverts to the rest position at the end of timing.

N.B.: this process enables shortening or lengthening of a signal.

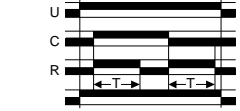
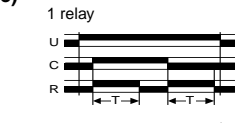
2 relays timed or
 1 relay timed and 1 instantaneous



Function Bw: Pulse output (adjustable)

AOutput relay R (or the load) changes state, and remains in the changed-over state for the timing period, both when control contact C (Y1) closes and when it opens.

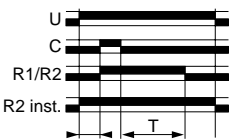
2 relays timed or
 1 relay timed and 1 instantaneous



Function C: Timing after impulse Delay OFF (with constant supply)

After energisation, once the control contact is closed the output state changes. Timing will only begin on the re-opening of this control contact (one shot). Relay R returns to its initial position at the end of the timing period.

2 relays timed or
 1 relay timed and 1 instantaneous

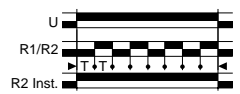


Function D or Di: Flip-flop

Repetitive cycle which switches the output alternately between the rest and operating position for equal time bases. $T1 + T2 = T$ total

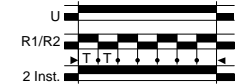
Function D: the cycle begins with the output in rest position. Pause start.

2 relays timed or
 1 relay timed and 1 instantaneous



Function Di: the cycle begins with the output in the operating position. Pulse start.

2 relays timed or
 1 relay timed and 1 instantaneous

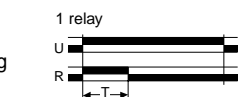


Function H: Timing on energisation Interval timer - one shot

On energisation, the output changes state, remains in that state for the duration of timing and resets at the end of the single cycle.

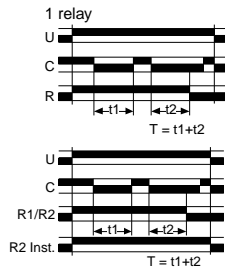
N.B. This is complementary to function A.

2 relays timed or
 1 relay timed and 1 instantaneous



Function Ht : Delay on energisation with memory

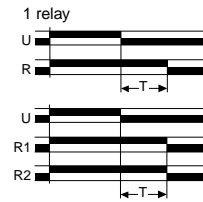
Provides a cumulative time for contact opening. On energisation, the output changes state, remains in that state for the duration of timing and resets at the end of the single cycle.



2 relays timed or
1 relay timed and 1 instantaneous

Function K: Delay on de-energisation - True delay OFF

On energisation, the output changes state. On de-energisation timing commences and the output only returns to the reset condition after timing.



2 relays timed or
1 relay timed and 1 instantaneous

Function L : Cyclic timing - Asymmetrical recycler

Repetitive cycle comprising 2 independent adjustable time bases. Each time base corresponds alternately to a different output state.

N.B. : The cycle starts with the output in the rest position.



2 relays timed or
1 relay timed and 1 instantaneous

Function Li : Cyclic timing - Asymmetrical recycler

Repetitive cycle comprising 2 independent adjustable time bases. Each time base corresponds alternately to a different output state.

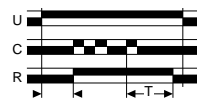
N.B. : The cycle starts with the output in the operating position.



2 relays timed or
1 relay timed and 1 instantaneous

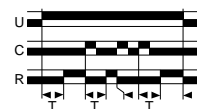
Function N : "Safe-guard"

At the first control pulse the output is energised. To complete the timing the interval between the two control pulses must be greater than the timing set.



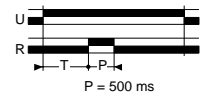
Function O : "Delayed safe-guard".

On energisation, a first timing sequence occurs and the output changes state. With the closing of the control contact, the output resets and the timing starts, with the output being activated after timing. For the timing to be completed, the interval between the closing of two control contacts must be greater than the timing set.



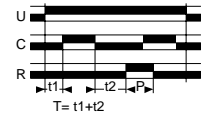
Function P : Delayed fixed-length pulse

Timing begins on energisation. At the end of the timing period output relay R (or the load) changes state for a period of approx. 500 milliseconds.



Function Pt : Impulse counter (delay on)

Calculates the total opening time of a contact. At the end of timing, the output is energised for approximately 500 ms.



Function Q : Star-delta"

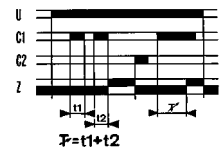
At the end of timing, the output is not energised. It remains "open" (not conducting) and will only change state after the fixed time of T_i has elapsed. Dwell time selectable



Function T : Timing on energisation with memory

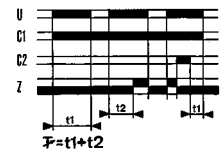
a - energisation by control signal

The timer sums the times for which the control contact is closed (C1). Reset is by the reset signal (C2) only.



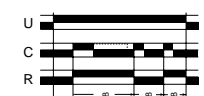
b - energisation by supply voltage

The timer sums the times for which the supply voltage (U) is on. Reset is by the reset signal (C2) only



Function T : Impulse relay

After power-up, pressing or holding down the switch closes the relay. Pressing the switch a second time opens the relay.



Function Tt : Timed impulse relay

After power-up, pressing or holding down the switch closes the relay and starts timing. The relay opens at the end of timing or when the switch is pressed a second time.



Function W : Timing after pulse on control contact

After energisation, if the control contact opens it causes output relay R (or the load) to change state and timing to start. At the end of the timing period, relay R resets to its original state.

