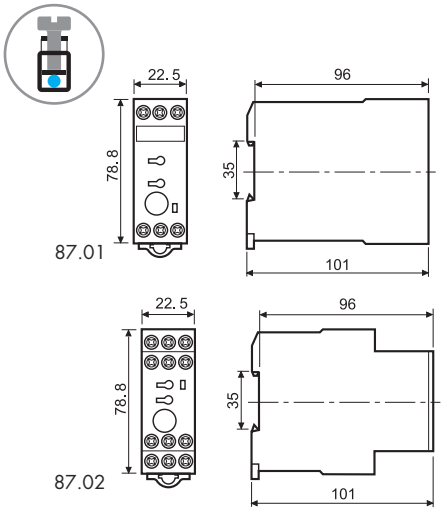
Features

Mono-function and multi-function timer range 22.5 mm wide

87.01 - 1 Pole - Multi-function and multi-voltage
87.02 - 2 Pole - Multi-function and multi-voltage, (timed + instantaneous options)
External time setting potentiometer option

- Wide supply voltage range: (24...240)V AC / (24...48)V DC
- LED indicator
- Time setting from 0.05 seconds to 60 hours
- 35 mm rail (EN 60715) mount

87.01 / 87.02
Screw terminal

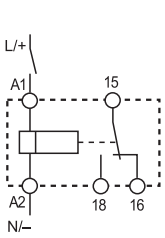


87.01

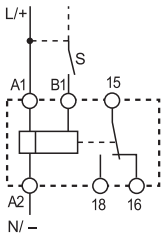


- Multi-function
- 1 pole
- 35 mm rail (EN 60715) mount

AI: On-delay
BE: Off-delay with control signal
CE: On- and off-delay with control signal
DE: Interval with control signal on
DI: Interval
EE a: Interval with control signal off
GI: Pulse delayed
SW: Symmetrical flasher (starting pulse on)



Wiring diagram (without control signal)



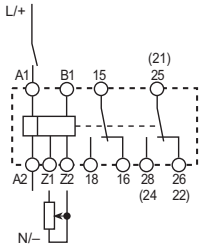
Wiring diagram (with control signal)

87.02

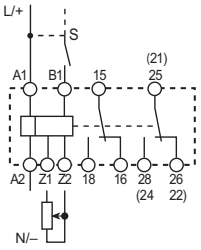


- Multi-function
- Timing can be regulated using ext. Potentiometer
- 2 timed contacts or 1 timed + 1 instantaneous contact
- 35 mm rail (EN 60715) mount

AI: On-delay
BE: Off-delay with control signal
CE: On- and off-delay with control signal
DE: Interval with control signal on
DI: Interval
EE a: Interval with control signal off
GI: Pulse delayed
SW: Symmetrical flasher (starting pulse on)



Wiring diagram (without control signal)



Wiring diagram (with control signal)

Contact specification			
Contact configuration		1 CO (SPDT)	2 CO (DPDT)
Rated current/Maximum peak current	A	8/30	8/30
Rated voltage/Maximum switching voltage	V AC	250/400	250/400
Rated load AC1	VA	2,000	2,000
Rated load AC15 (230 V AC)	VA	400	400
Single phase motor rating (230 V AC)	kW	0.185	0.185
Breaking capacity DC1: 30/110/220 V	A	8/0.5/0.2	8/0.5/0.2
Minimum switching load	mW (V/mA)	300 (10/5)	300 (10/5)
Standard contact material		AgCdO	AgCdO
Supply specification			
Nominal voltage (U_N)	V AC (50/60 Hz)	24...240	24...240
	V DC	24...48	24...48
Rated power AC/DC	VA (50 Hz)/W	5/0.5	5/0.5
Operating range	AC	(0.85...1.1)U_N	(0.85...1.1)U_N
	DC	(0.85...1.2)U_N	(0.85...1.2)U_N
Technical data			
Specified time range		See page 6	See page 6
Repeatability	%	± 0.2	± 0.2
Recovery time	ms	50	50
Minimum control impulse	ms	50	50
Setting accuracy-full range	%	± 5	± 5
Electrical life at rated load in AC1	cycles	$100 \cdot 10^3$	$100 \cdot 10^3$
Ambient temperature range (Contact current)	°C	–20...+70	–20...+60 / –20...+70 (< 5 A)
Protection category		IP 20	IP 20
Approvals (according to type)		CE GL EAC cULus	

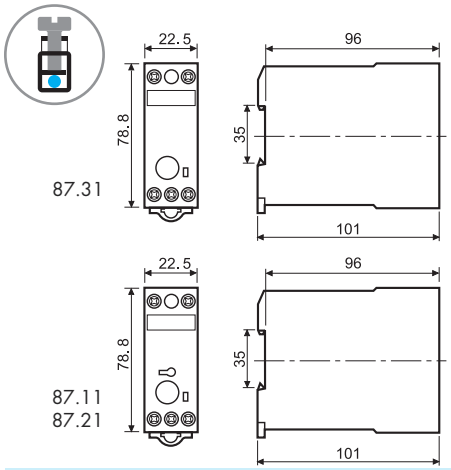
Features

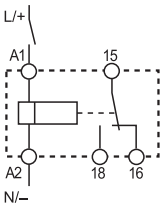
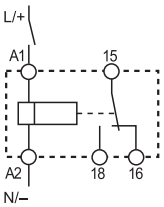
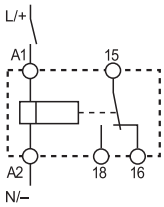
Mono-function and multi-function timer range 22.5 mm wide

87.11 - On-delay, multi-voltage
87.21 - Interval, multi-voltage
87.31 - Symmetrical flasher (starting pulse on), multi-voltage

- 1 Pole output contact
- Wide supply voltage range: (24...240)V AC / (24...48)V DC
- LED indicator
- Time setting: Types 87.11/21 - 0.05 seconds to 60 hours Type 87.31 - 0.5 seconds to 10 seconds
- 35 mm rail (EN 60715) mount

87.11 / 87.21 /87.31
Screw terminal



	87.11	87.21	87.31
			
	• Mono-function • 35 mm rail (EN 60715) mount	• Mono-function • 35 mm rail (EN 60715) mount	• Mono-function • 35 mm rail (EN 60715) mount
	AI: On-delay	**DI:** Interval	**SW:** Symmetrical flasher (starting pulse on)
			
	Wiring diagram (without control signal)	Wiring diagram (without control signal)	Wiring diagram (without control signal)
Contact specification			
Contact configuration	1 CO (SPDT)	1 CO (SPDT)	1 CO (SPDT)
Rated current/Maximum peak current A	8/30	8/30	8/30
Rated voltage/Maximum switching voltage V AC	250/400	250/400	250/400
Rated load AC1 VA	2,000	2,000	2,000
Rated load AC15 (230 V AC) VA	400	400	400
Single phase motor rating (230 V AC) kW	0.185	0.185	0.185
Breaking capacity DC1: 30/110/220 V A	8/0.5/0.2	8/0.5/0.2	8/0.5/0.2
Minimum switching load mW (V/mA)	300 (10/5)	300 (10/5)	300 (10/5)
Standard contact material	AgCdO	AgCdO	AgCdO
Supply specification			
Nominal voltage (U_N) V AC (50/60 Hz)	24...240	24...240	24...240
V DC	24...48	24...48	24...48
Rated power AC/DC VA (50 Hz)/W	5/0.5	5/0.5	5/0.5
Operating range AC	(0.85...1.1)U_N	(0.85...1.1)U_N	(0.85...1.1)U_N
DC	(0.85...1.2)U_N	(0.85...1.2)U_N	(0.85...1.2)U_N
Technical data			
Specified time range	See page 6	See page 6	See page 6
Repeatability %	± 0.2	± 0.2	± 0.2
Recovery time ms	50	50	50
Minimum control impulse ms	—	—	—
Setting accuracy-full range %	± 5	± 5	± 5
Electrical life at rated load in AC1 cycles	100 · 10^3	100 · 10^3	100 · 10^3
Ambient temperature range °C	–20...+70	–20...+70	–20...+70
Protection category	IP 20	IP 20	IP 20
Approvals (according to type)	CE GL EAC cULus		

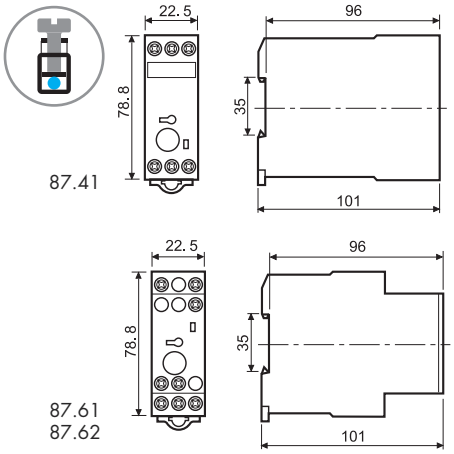
Features

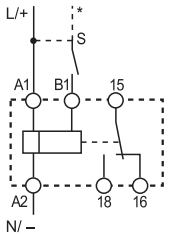
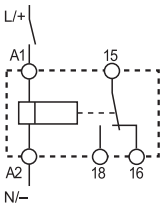
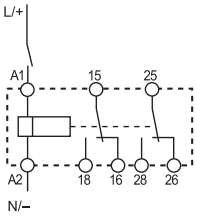
Mono-function and multi-function timer range 22.5 mm wide

87.41 - Off-delay with control signal, multi-voltage, 1 Pole
87.61 - Power off-delay (True off-delay), multi-voltage, 1 Pole
87.62 - Power off-delay (True off-delay), multi-voltage, 2 Pole

- Wide supply voltage range:
  Type 87.41, (24...240)V AC/(24...48)V DC
  Types 87.61/62, (24...240)V AC/DC
- LED indicator
- Time setting range:
  Type 87.41 - 0.05 seconds to 60 hours
  Types 87.61/62 - 0.15 seconds to 10 minutes
- 35 mm rail (EN 60715) mount

87.41 / 87.61 / 87.62
Screw terminal



	87.41	87.61	87.62
			
	• Mono-function • 1 pole • 35 mm rail (EN 60715) mount	• Mono-function • 1 pole • 35 mm rail (EN 60715) mount	• Mono-function • 2 pole • 35 mm rail (EN 60715) mount
	BE: Off-delay with control signal	**BI:** Power off-delay (True off-delay)	**BI:** Power off-delay (True off-delay)
			
	Wiring diagram (with control signal)	Wiring diagram (without control signal)	Wiring diagram (without control signal)

		87.41	87.61	87.62
Contact specification				
Contact configuration		1 CO (SPDT)	1 CO (SPDT)	2 CO (DPDT)
Rated current/Maximum peak current	A	8/30	5/10	5/10
Rated voltage/Maximum switching voltage	V AC	250/400	250/400	250/400
Rated load AC1	VA	2,000	1,250	1,250
Rated load AC15 (230 V AC)	VA	400	250	250
Single phase motor rating (230 V AC)	kW	0.185	0.125	0.125
Breaking capacity DC1: 30/110/220 V	A	8/0.5/0.2	5/0.5/0.2	5/0.5/0.2
Minimum switching load	mW (V/mA)	300 (10/5)	300 (10/5)	300 (10/5)
Standard contact material		AgCdO	AgCdO	AgCdO
Supply specification				
Nominal voltage (U_N)	V AC (50/60 Hz)	24...240	24...240	24...240
	V DC	24...48	24...240	24...240
Rated power AC/DC	VA (50 Hz)/W	5/0.5	1.5/1.5	1.5/1.5
Operating range	AC	(0.85...1.1)U_N	(0.85...1.1)U_N	(0.85...1.1)U_N
	DC	(0.85...1.2)U_N	(0.85...1.2)U_N	(0.85...1.2)U_N
Technical data				
Specified time range		See page 6	See page 6	See page 6
Repeatability	%	± 0.2	± 1	± 1
Recovery time	ms	50	200	200
Minimum control impulse	ms	50	800 ms (A1 - A2)	800 ms (A1 - A2)
Setting accuracy-full range	%	± 5	± 5	± 5
Electrical life at rated load in AC1	cycles	100 · 10^3	100 · 10^3	100 · 10^3
Ambient temperature range	°C	–20...+70	–20...+70	–20...+70
Protection category		IP 20	IP 20	IP 20
Approvals (according to type)		CE GL EAC cULus	CE EAC cULus	

Features

Mono-function and multi-function timer range 22.5 mm wide

87.82 - Star-delta, multi-voltage, star and delta output contacts

87.91 - Multi-function Recycling timer, 1 Pole

- Wide supply range: (24...240)V AC / (24...48)V DC
- LED indicator
- Time setting voltage range: Type 87.82 - 0.05 minute to 1 minute Type 87.91 - 0.05 seconds to 60 hours
- 35 mm rail (EN 60715) mount

87.82



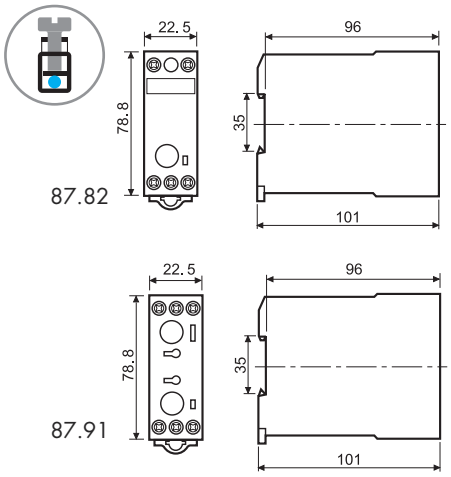
- Mono-function: Star - delta
- 2 pole
- 35 mm rail (EN 60715) mount

87.91

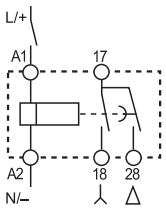


- Multi-function recycling
- 1 pole
- 35 mm rail (EN 60715) mount

87.82 / 87.91
Screw terminal

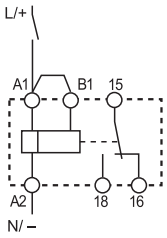


SD: Star-delta

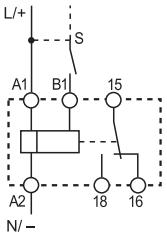


Wiring diagram
(without control signal)

LI: Asymmetrical flasher (starting pulse on)
LE: Asymmetrical flasher (starting pulse on) with control signal
PI: Asymmetrical flasher (starting pulse off)
PE: Asymmetrical flasher (starting pulse off) with control signal



Wiring diagram
(without control signal)



Wiring diagram
(with control signal)

Contact specification			
Contact configuration		2 NO (DPST-NO)	1 CO (SPDT)
Rated current/Maximum peak current	A	8/30	8/30
Rated voltage/Maximum switching voltage	V AC	250/400	250/400
Rated load AC1	VA	2,000	2,000
Rated load AC15 (230 V AC)	VA	400	400
Single phase motor rating (230 V AC)	kW	0.185	0.185
Breaking capacity DC1: 30/110/220 V	A	8/0.5/0.2	8/0.5/0.2
Minimum switching load	mW (V/mA)	300 (10/5)	300 (10/5)
Standard contact material		AgCdO	AgCdO
Supply specification			
Nominal voltage (U_N)	V AC (50/60 Hz)	24...240	24...240
	V DC	24...48	24...48
Rated power AC/DC	VA (50 Hz)/W	5/0.5	5/0.5
Operating range	AC	(0.85...1.1)U_N	(0.85...1.1)U_N
	DC	(0.85...1.2)U_N	(0.85...1.2)U_N
Technical data			
Specified time range		See page 6	See page 6
Repeatability	%	± 0.2	± 0.2
Recovery time	ms	50	50
Minimum control impulse	ms	—	50
Setting accuracy-full range	%	± 5	± 5
Electrical life at rated load in AC1	cycles	$100 \cdot 10^3$	$100 \cdot 10^3$
Ambient temperature range	°C	–20...+70	–20...+70
Protection category		IP 20	IP 20
Approvals (according to type)		CE GL PG cULus	

Ordering information

Example: 87 series multi-function timer 8 A, 1 CO (SPDT) contact, (24…240)V AC (50/60 Hz) and (24…48)V DC supply.

8 7 . 0 1 . 0 . 2 4 0 . 0 0 0 0

Series

Type
0 = Multi-function
(AI, BE, CE, DI, DE, EE a, GI, SW, ON, OFF)
1 = On-delay (AI)
2 = Interval (DI)
3 = Symmetrical flasher (starting pulse on) (SW)
4 = Off-delay with control signal (BE)
6 = Power off-delay (True off-delay) (BI)
8 = Star-delta (SD)
9 = Asymmetrical flasher (LI, LE, PI, PE)

No. of poles
1 = 1 pole
2 = 2 pole for 87.02/62
2 = 2 NO (DPST-NO) for 87.82

Supply version
0 = AC (50/60 Hz)/DC

Supply voltage
240 = { (24…48)V DC / (24…240)V AC
240 = (24…240)V AC/DC for 87.61 and 87.62

Technical data

Insulation					
Dielectric strength	between input and output circuit	V AC	4,000		
	insulation (1.2/50 µs) between input and output	kV	6		
	between open contacts	V AC	1,000		
	between adjacent contacts	V AC	2,000 (Type 87.02, 87.62)		
EMC specifications					
Type of test			**Reference standard**		
Electrostatic discharge	contact discharge		EN 61000-4-2	8 kV	
	air discharge		EN 61000-4-2	8 kV	
Radio-frequency electromagnetic field (80 ÷ 1000 MHz)			EN 61000-4-3	10 V/m	
Fast transients (burst) (5-50 ns, 5 kHz) on Supply terminals			EN 61000-4-4	6 kV	
Surges (1.2/50 µs) on Supply terminals	common mode		EN 61000-4-5	4 kV	
	differential mode		EN 61000-4-5	4 kV	
Radio-frequency common mode (0.15 ÷ 80 MHz) on Supply terminals			EN 61000-4-6	10 V	
Radiated and conducted emission			EN 55022	class B	
Other data					
Signal control (B1)					
	- current absorption		1 mA		
	- max cable length (capacity of ≤ 10 nF / 100 m)		250 m		
	- when applying a control signal to B1, which is different from the supply voltage at A1/A2		B1 is isolated from A1 and A2 by an opto-coupler, and can therefore be operated at a voltage other than the supply voltage		
Note: when applying a control signal to B1 it is recommended to attach a bypass resistance 56 kOhm/2 W across B1 - A2			If using a control signal of between (24... 48)V DC and a supply voltage of (24...240)V AC; ensure that the signal – is connected to A2 and the + is applied to B1, and that L is applied to B1 and N to A2		
External potentiometer for 87.02			Use a 10 kΩ/ ≥ 0,25 W linear potentiometer. Maximum cable length 10 m. When using an external potentiometer, remove the bridge between Z1 and Z2, and set the timer'spotentiometer to its minimum setting. Consider the voltage potential at the potentiometer to be the same as the timer supply voltage.		
Power lost to the environment			**87.01/02/11/21/31/41/91**	**87.61/62**	**87.82**
	without contact current	W	5	1.5	8
	with rated current	W	15	7	18
Screw torque		Nm	1.2		
Max. wire size			solid cable	stranded cable	
		mm^2	1x4 / 2x2.5	1x4 / 2x1.5	
		AWG	1x12 / 2x14	1x12 / 2x16	

Time scales

Type	Function Code	Function	Time ranges - minimum to maximum span									
			s	s	s	min	min	min	h	h	h	h
			0.05	0.15	0.5	0.05	0.15	0.5	0.05	0.15	0.5	3
			1	3	10	1	3	10	1	3	10	60
87.01	AI	On-delay	•	•	•	•	•	•	•	•	•	•
87.02	BE	Off-delay with control signal	•	•	•	•	•	•	•	•	•	•
	CE	On- and off-delay with control signal	•	•	•	•	•	•	•	•	•	•
	DI	Interval	•	•	•	•	•	•	•	•	•	•
	DE	Interval with control signal on	•	•	•	•	•	•	•	•	•	•
	EE a	Interval with control signal off	•	•	•	•	•	•	•	•	•	•
	GI	Pulse delayed	•	•	•	•	•	•	•	•	•	•
	SW	Symmetrical flasher (starting pulse on)	•	•	•	•	•	•	•	•	•	•
87.11	AI	On-delay	•	•	•	•	•	•	•	•	•	•
87.21	DI	Interval	•	•	•	•	•	•	•	•	•	•
87.31	SW	Symmetrical flasher (starting pulse on)			•							
87.41	BE	Off-delay with control signal	•	•	•	•	•	•	•	•	•	•
87.61 87.62	BI	Power off-delay (True off-delay)		0.15 2.5	•	0.07 1.3		•				
87.82	SD	Star-delta (T_U = ~60 ms)				•						
87.91	LI	Asymmetrical flasher (starting pulse on)	•	•	•	•	•	•	•	•	•	•
	LE	Asymmetrical flasher (starting pulse on) with control signal	•	•	•	•	•	•	•	•	•	•
	PI	Asymmetrical flasher (starting pulse off)	•	•	•	•	•	•	•	•	•	•
	PE	Asymmetrical flasher (starting pulse off) with control signal	•	•	•	•	•	•	•	•	•	•

Functions

U = Supply Voltage

S = Signal switch

C = Output Contact

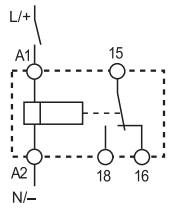
LED** Green	Timing	NO output contact	Contacts Timed Open	Contacts Timed Closed	DIP switch	Contacts Instantaneous* Open	Contacts Instantaneous* Closed
———	None	Open	15 - 18 25 - 28*	15 - 16 25 - 26*	Up	21 - 24*	21 - 22*
▮▮▮▮▮	In progress	Open	15 - 18 25 - 28*	15 - 16 25 - 26*		21 - 22*	21 - 24*
▮▮▮▮▮	In progress	Closed	15 - 16 25 - 26*	15 - 18 25 - 28*		21 - 22*	21 - 24*
▮▮▮▮▮	None	Closed	15 - 16 25 - 26*	15 - 18 25 - 28*	Down	21 - 22*	21 - 24*

* 25-26-28 only for type 87.02 with 2 timed contacts. 21-22-24 only for type 87.02 with 1 instantaneous contact + 1 timed positioning the front DIP switch.

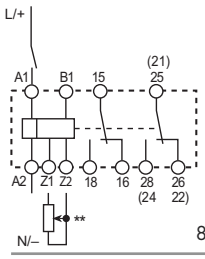
** The LED on types 87.61 and 87.62 is illuminated when supply voltage is supplied to timer.

Wiring diagram

Multi-function
without control signal

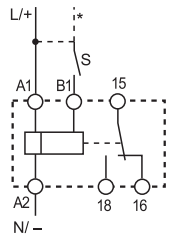


87.01

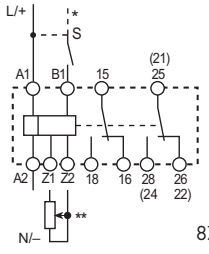


87.02

with control signal



87.01



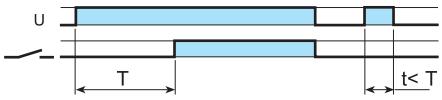
87.02

* A voltage other than the supply voltage can be applied to the command START (B1).
Example:
A1 - A2 = 230 V AC
B1 - A2 = 24 V AC

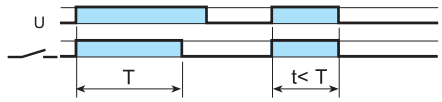
** Type 87.02: regulated using an external potentiometer (10 kΩ - 0.25 W).

NB.: remove link between Z1-Z2 and position the Timer potentiometer on "zero".

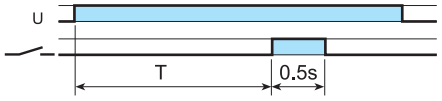
Type
87.01
87.02



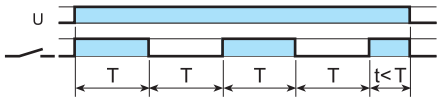
(AI) On-delay.
Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.



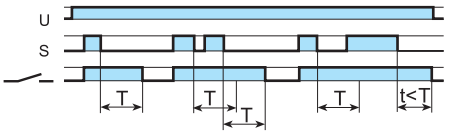
(DI) Interval.
Apply power to timer. Output contacts transfer immediately. After the preset time has elapsed, contacts reset.



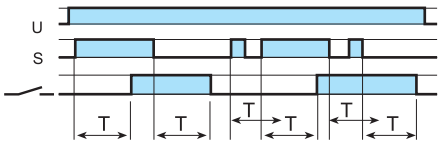
(GI) Pulse delayed.
Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs after a fixed time of 0.5s.



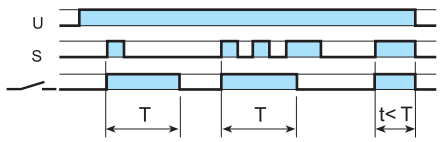
(SW) Symmetrical flasher (starting pulse on).
Apply power to timer. Output contacts transfer immediately and cycle between ON and OFF for as long as power is applied. The ratio is 1:1 (time on = time off).



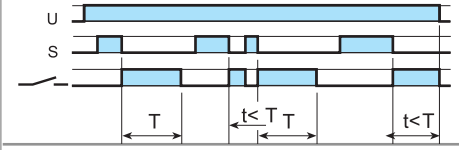
(BE) Off-delay with control signal.
Power is permenently applied to the timer. The output contacts transfer immediately on closure of the Signal Switch (S). Opening the Signal Switch initiates the preset delay, after which time the output contacts reset.



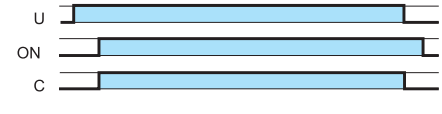
(CE) On- and off-delay with control signal.
Power is permenently applied to the timer.
Closing the Signal Switch (S) initiates the preset delay, after which time the output contacts transfer. Opening the Signal switch initiates the same preset delay, after which time the output contacts reset.



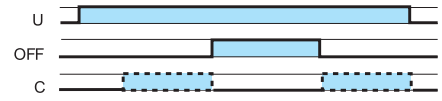
(DE) Interval with control signal on.
Power is permenently applied to the timer.
On momentary or maintained closure of Signal Switch (S), the output contacts transfer, and remain so for the duration of the preset delay, after which they reset.



(EE a) Interval with control signal off.
Power is permenently applied to the timer.
On opening of the Signal Switch (S) the output contacts transfer, and remain so for the duration of the preset delay, after which they reset.



Permanently ON.
Selecting the function ON when power is applied to the relay the first contact transfers immediately and remains in that position.

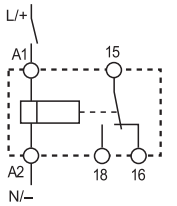


Permanently OFF.
The contact returns to the original position when the OFF function is selected.

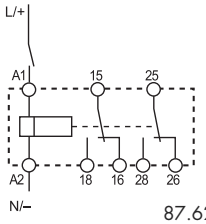
Functions

Wiring diagram

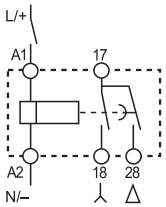
Mono-function
without control signal



87.11
87.21
87.31
87.61

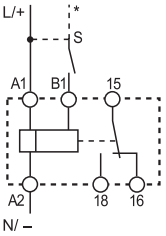


87.62



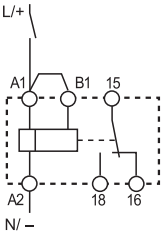
87.82

with control signal (S)



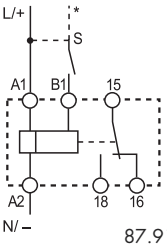
87.41

Asymmetrical recycler
without control signal

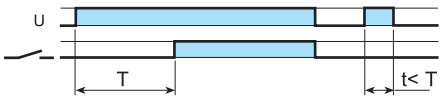
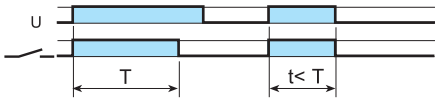
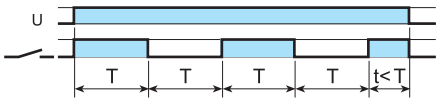
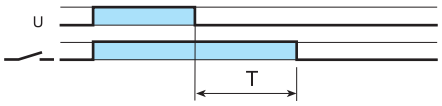
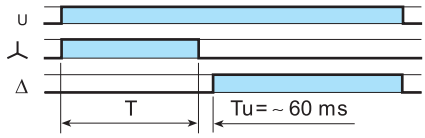
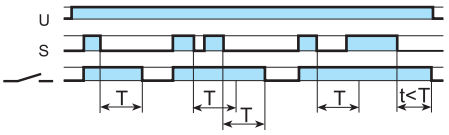
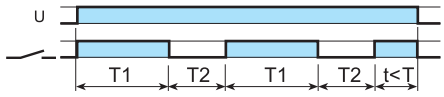
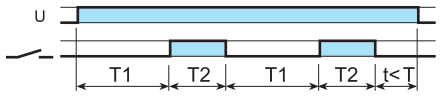
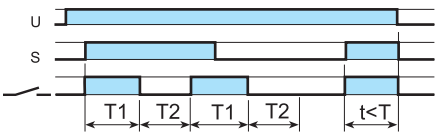


87.91

with control signal (S)



87.91

Type		
87.11		**(AI) On-delay.** Apply power to timer. Output contacts transfer after preset time has elapsed. Reset occurs when power is removed.
87.21		**(DI) Interval.** Apply power to timer. Output contacts transfer immediately. After the preset time has elapsed, contacts reset.
87.31		**(SW) Symmetrical flasher (starting pulse on).** Apply power to timer. Output contacts transfer immediately and cycle between ON and OFF for as long as power is applied. The ratio is 1:1 (time on = time off).
87.61 87.62		**(BI) Power off-delay (True off-delay).** Apply power to timer (minimum 300 ms). Output contacts transfer immediately. Removal of power initiates the preset delay, after which time the output contacts reset.
87.82		**(SD) Star-delta.** Apply power to timer. The star contact (⅄) closes immediately. After preset delay has elapsed the star contact (⅄) resets. After a further fixed time of ~60 ms the delta contact (Δ) closes and remains in that position, until reset on power off.
87.41		**(BE) Off-delay with control signal.** Power is permenently applied to the timer. The output contacts transfer immediately on closure of the Signal Switch (S). Opening the Signal Switch initiates the preset delay, after which time the output contacts reset.
87.91 switch position		**(LI) Asymmetrical flasher (starting pulse on).** Apply power to timer. Output contacts transfer immediately and cycle between ON and OFF for as long as power is applied. The ON and OFF times are independently adjustable.
switch position		**(PI) Asymmetrical flasher (starting pulse off).** Apply power to timer. Output contacts transfer after time T1 has elapsed and cycle between OFF and ON for as long as power is applied. The ON and OFF times are independently adjustable.
switch position		**(LE) Asymmetrical flasher (starting pulse on) with control signal.** Power is permenently applied to the timer. Closing Signal Switch (S) causes the output contacts to transfer immediately and cycle between ON and OFF, until opened.
switch position		**(PE) Asymmetrical flasher (starting pulse off) with control signal.** Power is permenently applied to the timer. Closing the Signal Switch (S) initiates delay T1 after which the output contacts transfer and continue to cycle between OFF and ON, until the Signal Switch is opened.