ENGINEERING TOMORROW

Data sheet

Electronic time relays
ATI, BTI, SDT and MTI

With their robust design and many built-in functions, electronic timers ATI, BTI, SDT and MTI are ideal for OEMs and panel builders.

Features

- Easy time setting
- Electrical noise immunity
- Mechanical shock and vibration resistance
- Time ranges 0.1 s to 30 min for single function
  Time ranges 0.05 s to 300 h for multi function
  Electronic timers
- Compact standard dimensions
- DIN rail or adaptor mounting
- Single function electronic timers featuring:
  - ON delay
  - OFF delay or
  - star-delta start
- Multi function timer with 10 timing functions
- Function selector

- = ON delay
- = OFF delay
- = pulse with ON delay
- = pulse with OFF delay
- = flasher relay with pause start
- = flasher relay with pulse start
- = star-delta starters with pulse function
- = ON-delay and OFF-delay, symmetrical
- = Pulse former
- = ON/OFF-Function

- Output relay R2 (On LED = yellow)
- Output relay R1 (On LED = yellow)
- U/T supply voltage (established LED = green)
- "Inst" switch (changes output relay R2 to instantaneous relay).

Approvals

CE
EAC
cULus
LLC CDC TYSK

Ordering

ON-delay electronic timers

Type	Time range	Voltage range	Contact function	Code no.
ATI	0.1 – 10 s	220 – 240 V AC, 50 – 60 Hz	1 changeover	047H3092
		24 V AC, 50 – 60 Hz		
		24 V DC		
	0.3 – 30 s	220 – 240 V AC, 50 – 60 Hz		047H3104
		24 V AC, 50 – 60 Hz		
		24 V DC		
	3 – 300 s	220 – 240 V AC, 50 – 60 Hz		047H3093
		24 V AC, 50 – 60 Hz		
		24 V DC		
	0.3 – 30 min.	220 – 240 V AC, 50 – 60 Hz		047H3105
		24 V AC, 50 – 60 Hz		
		24 V DC		

OFF-delay electronic timers

Type	Time range	Voltage range	Contact function	Code no.
BTI	3 – 300 s	24 V AC, 50 – 60 Hz	1 changeover	047H3095
		24 V DC		
	0.3 – 30 s	220 – 240 V AC, 50 – 60 Hz		047H3107
	3 – 300 s	220 – 240 V AC, 50 – 60 Hz		047H3099

Star-delta electronic timers

Type	Time range	Voltage range	Contact function	Code no.
SDT	0.3 – 30 s	110 – 130 V AC, 50 – 60 Hz	1 changeover	047H3110
		220 – 240 V AC, 50 – 60 Hz		047H3111
		24 V AC, 50 – 60 Hz		
		24 V DC		
		380 – 415 V AC, 50 – 60 Hz		047H3112

Multi function electronic timers

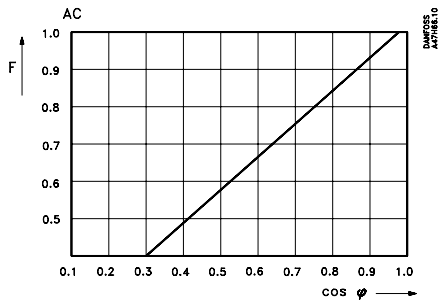
Type	Time range	Voltage range	Contact fuction	Code no.
MTI	0.05 s – 300 h	24 – 240 V AC, 50 – 60 Hz	2 changeover	047H3077
		24 – 48 V DC		

Technical data

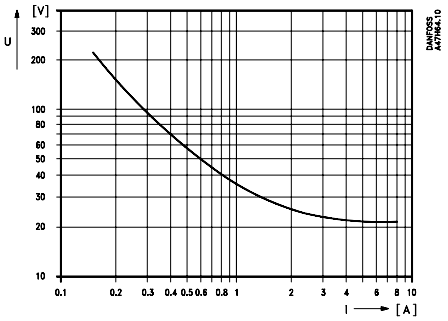
Type designation		ATI	BTI	SDT	MTI
Output circuit					
Changeover switch		1	1	1	2
Max. A on 250 V		4	4	4	4
AC-15 on 230 V (A)		1.5	1.5	1.5	3
AC-15 on 415 V (A)				0.25	
DC-12 on 24 V (A)		4	4	4	4
DC-13 on 24 V (A)		2	2	2	2
Input					
Supply voltage	AC/DC 24 V		•		
	DC 24 – 48 V AC 24 – 240 V				•
	AC/DC 24 V AC 220 – 240 V	•		•	
	AC 110 – 130 V	•		•	
	AC 220 – 240 V		•		
	AC 380 – 415 V			•	
Voltage tolerance		-10% – 10%			-15% – 10%
Frequency		50 – 60 Hz			
Duty rating		Continuous			
Consumption	AC/DC 24 V	1.0 VA / W			
	AC 220 – 240 V	12.0 VA			
	AC 380 – 415 V			23.0 VA	
Time circuit					
Time ranges		0.1 – 10 s		0.3 – 30s	
		0.3 – 30 s		0.15 – 3 s	0.05 – 1 s / 1.5 – 30 s / 1.5 – 30 min.
		3 – 300 s			5 – 100 s / 5 – 100 s / 1.5 – 300 min.
		0.3 – 30 min.			0.5 – 10 s / 15 – 300 s / 1.5 – 30 min.
10 time ranges in each unit		15 – 300 h			
Reset time (dwell time) <		100 ms		400 ms	80 ms
Control pulse time >			20 ms		
Y/D changeover time				30 ms	50 ms
Repeat accuracy <		1%			0.2%
Time deviation within voltage tolerance <		0.5%			0.004% / V
Time deviation within temperature range <		0.1% / °C			0.03% / °C
Ambient temperature	operation	-20 °C – 60 °C			-25 °C – 60 °C
	storage	-40 °C – 80 °C			-40 °C – 85 °C
Control contact Y1 – Z2					
No-load voltage					10 – 40 V DC
Remote pot.meter connection Z_1 Cable screen Z_2 to screen					Potentiometer resistance 50 KΩ 2 x 25 m shielded with 100 pF/m
LED indication					
Supply voltage, green		•	•	•	•
Supply voltage, green/flashes when timg					•
Output relay R1, yellow					•
Outout relay R2, yellow					•
Other data					
Installation		DIN rail			
Enclosure, housing/terminals		IP50 / IP20			
Installation orientation		Any			
Mechanical life		30×10^6			
Electrical life, ohmic load		100,000 operations on 8 A, 230 V AC			100,000 operations on 4 A, 230 V AC
Max. fuse		2 A, gl			6 A, gl
Max. lead cross-section		2×1.5 mm²			2×2.5 mm²
Test voltage		2.5 kV, 50 Hz, 1 s			2.0 kV, 50 Hz, 1 s
EMC Directive		2004 / 108 / EC			

Load graphs, electronic time relays ATI, BTI, SDT, MTI

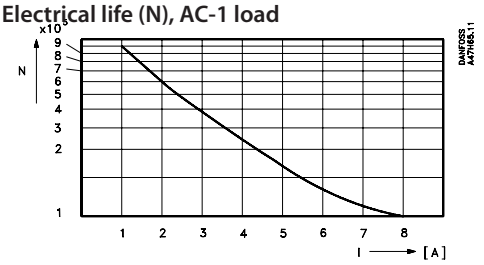
Reduction factor F for inductive load on timers



DC load (DC-1)



Electrical life (N), AC-1 load

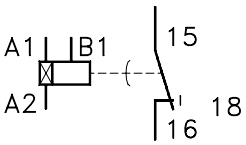


Approvals

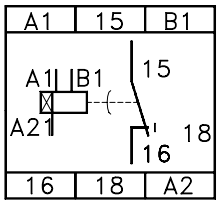
Approval authority / Product type	CE	EAC	cULus LISTED	089
	EN 60947	EAC	UL-listed CANADA USA	LLC CDC TYSK
ATI / BTI / SDT	•	•	•	•
MTI	•	•	•	•

• Approved

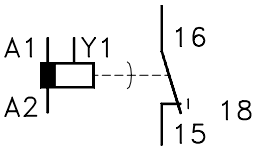
Contact symbols and terminal markings **Electronic timers**



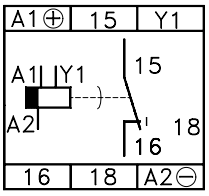
On- delay ATI



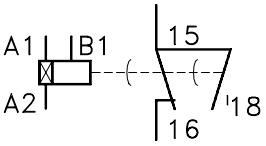
On-delay (terminal marking) ATI



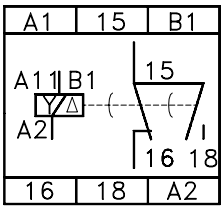
Off-delay - BTI



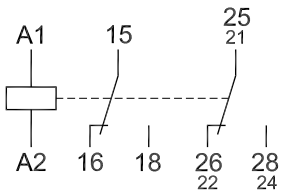
Off-delay (Terminal marking) - BTI



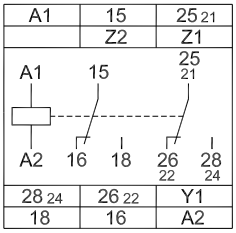
Star-delta timer - SDT



Star-delta timer (Terminal marking)

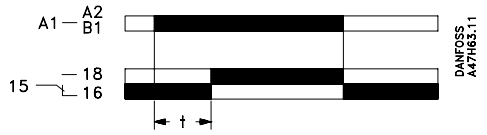


Multi function timer - MTI (with 2 changeover contacts)



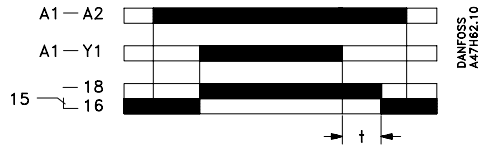
Multi function timer (Terminal marking) - MTI

Function overview, electronic time relays



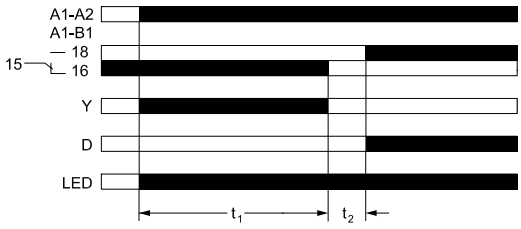
■ supply on and contact made
t set time

ON delay
When voltage is applied to A1/A2 the time interval begins.
When the time interval elapses, the output relay is energised and remains energised until the voltage supply is cut off.
With 24 V supply, terminals A1 and B1 must be used.



■ supply on and contact made
t set time

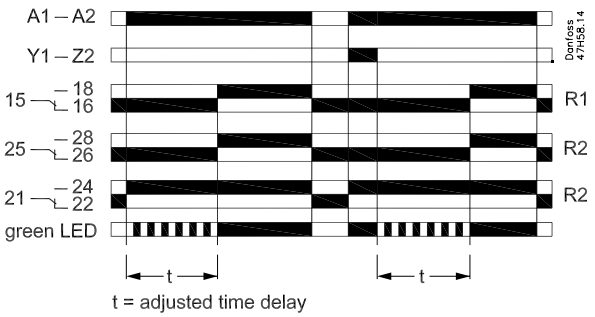
OFF delay
The supply must be connected to A1/A2 and remain established. Time interval start is controlled by a contact on terminal Y1.
When the contact is made, the output relay is energised. When the contact is broken, the time interval starts (control pulse length min. 20 ms).
When the set time interval elapses, the output relay drops back to its dwell position. If the control contact for terminal Y1 makes during the time interval, the interval is stopped. If the contact is broken again, the time interval starts anew.
Note! External load must not be connected so that it is supplied via control contact Y1.



■ supply on and contact made
t1 set time (Y-operation)
t2 changeover pause (approx. 30 ms)

Star-delta relay
When voltage is applied to A1/A2 the time interval starts.
When the time interval elapses, the output relay energises.
The Y-contactor switch-off and after a dwell time of 30 – 35 ms the D contactor switch-in.
With 24 V supply, terminals A1 and B1 must be used.

MTI multi functions with two contacts



■ supply on and contact made

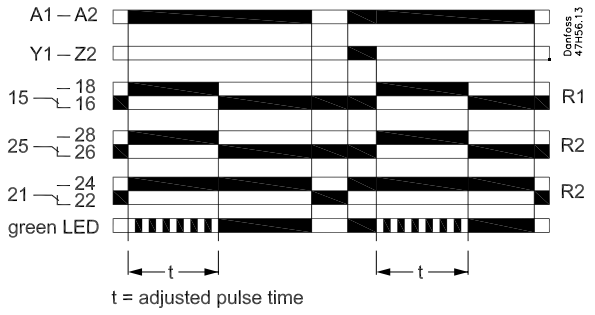
ON delay

When supply voltage is applied to A1/A2, the set time interval begins. The green LED flashes for the duration of the interval. When the interval elapses, the output relay is energised and the green LED lights up constantly. The output relay remains activated until supply voltage is cut off.

With permanent supply voltage, start and stop of the time interval can also be controlled by breaking or making control contact Y1/Z2.

If control input Y1/Z2 closes before the time delay is complete, the time delay is reset and the output relay remains de-energized. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.When the red slide switch is brought to position „Inst." changeover switch R2 is immediately activated when supply voltage is applied and remains activated until the supply is cut off.

Note! Control contacts Y1/Z2 must be potential-free.



■ supply on and contact made

Pulse relay with ON delay

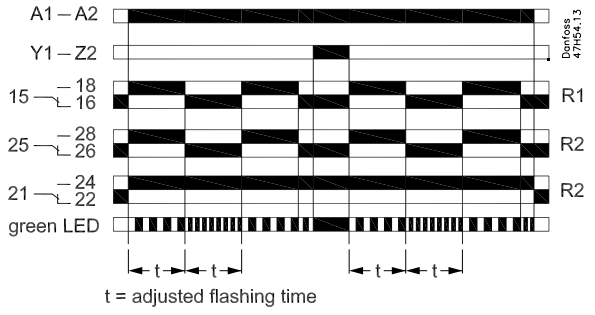
When supply voltage is applied to A1/A2 the output relay is immediately energised and remains activated until the set time interval has elapsed. The green LED flashes for the duration of the interval. When the time interval elapses, the output relay drops back to its dwell position and the green LED lights up constantly.

With permanent supply voltage, start and stop of the time interval can also be controlled by making or breaking control contact Y1/Z2.

If control input Y1/Z2 closes before the time delay is complete, the time delay is reset and the output relay remains de-energized. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

When the red slide switch is brought to position „Inst." changeover switch R2 is immediately activated when supply voltage is applied and remains activated until the supply is cut off.

Note! Control contacts Y1/Z2 must be potential-free.



■ supply on and contact made
t set time

Flasher relay with pulse begins

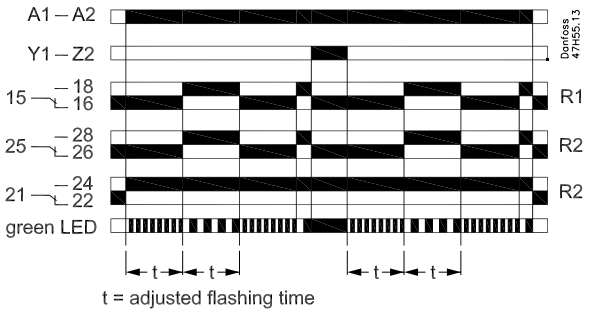
When supply voltage is applied to A1/A2 the time relay flasher function begins, in accordance with the set symmetrical pause-pulse time.

The green LED flashes for both pause and pulse, but with double flash frequency during pauses.

With permanent supply voltage, start and stop of the flash sequence can also be controlled by breaking or making control contact Y1/Z2.

When the red slide switch is brought to position „Inst." changeover switch R2 is immediately activated when supply voltage is applied and remains activated until the supply is cut off.

Note! Control contacts Y1/Z2 must be potential-free.



t = adjusted flashing time

■ supply on and contact made

Flasher relay with pause begins

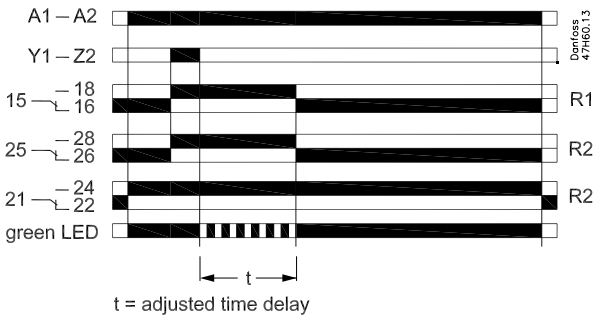
When supply voltage is applied to A1/A2 the time relay flasher function begins, in accordance with the set symmetrical pause-pulse time.

The green LED flashes for both pause and pulse, but with double flash frequency during pauses.

With permanent supply voltage, start and stop of the flash sequence can also be controlled by breaking or making control contact Y1/Z2.

When the red slide switch is brought to position „Inst." changeover switch R2 is immediately activated when supply voltage is applied and remains activated until the supply is cut off.

Note! Control contacts Y1/Z2 must be potential-free.



t = adjusted time delay

■ supply on and contact made

OFF delay

The supply voltage must be connected to A1/A2 and remain established. The output relay is energised immediately. Time interval start is controlled by a contact on Y1/Z2.

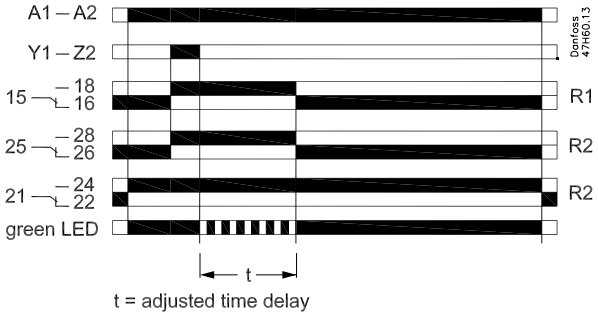
(Note: No foreign voltage permissible).

When the contact is broken, the time interval begins. The green LED flashes for the duration of the interval. When the set time interval has elapsed, the output relay drops back to its dwell position and the green LED lights up constantly.

If control input Y1/Z2 closes before the time delay is complete, the time delay is reset and the output relay remains de-energized. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

When the red slide switch is brought to position „Inst." changeover switch R2 is immediately energised when supply voltage is applied and remains activated until the supply is cut off.

Note! Control contacts Y1/Z2 must be potential-free.



t = adjusted time delay

■ supply on and contact made

Pulse relay with OFF delay

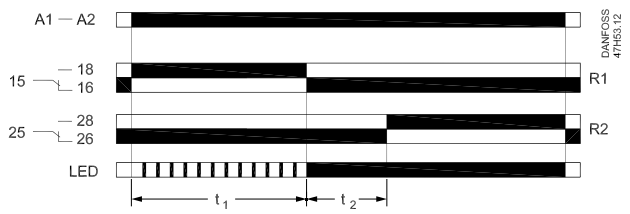
The supply voltage must be connected to A1/A2 and remain established.

Closing control input Y1/Z2 energizes the output relay immediately and starts timing. Operating the control contact switch Y1/Z2 during the time delay has no effect.

The green LED flashes for the duration of the interval. When the selected ON time is complete, the output relay de-energizes and the flashing green LED turns steady. After the ON time is complete, it can be restarted by closing control input Y1/Z2.

When the red slide switch is brought to position „Inst." changeover switch R2 is immediately energized when supply voltage is applied and remains activated until the supply is cut off .

Note! Control contacts Y1/Z2 must be potential-free.

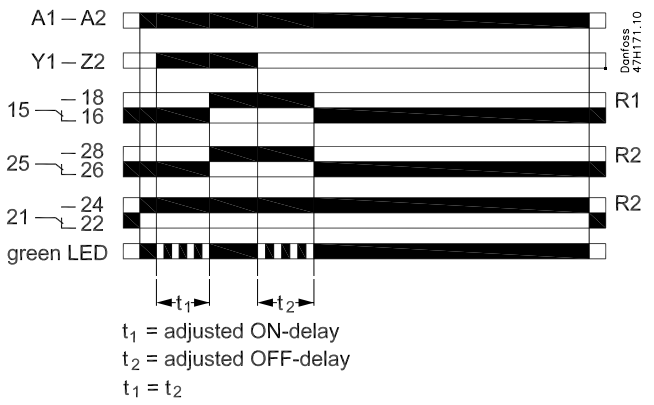


■ supply on and contact made
t set time $t_1 + t_2$
t_2 changeover pause (approx. 50 ms)

Star-delta changeover with pulse function

When supply voltage is applied to A1/A2, output relay R1 is energised immediately. When the set time interval elapses, output relay R1 drops back to its dwell position. After a further 50 ms, output relay R2 is energised and remains cut in as long as the supply is on.

The green LED flashes for the duration of the time interval.



■ supply on and contact made

Symmetrical ON and OFF-delay

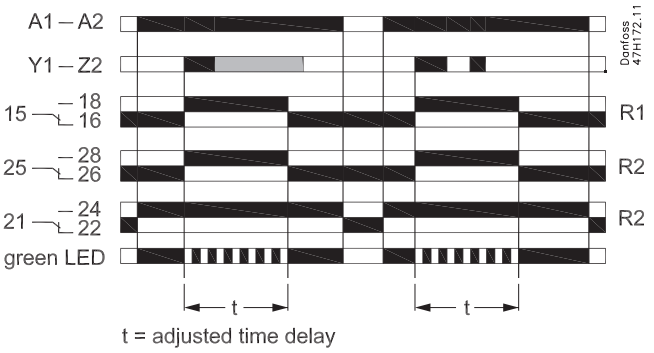
The supply voltage must be connected to A1/A2 and remain established. Time interval start is controlled by a contact on Y1/Z2.

Closing control input Y1/Z2 starts the ON-delay t1. When timing is complete, the output relay energizes. Opening control input Y1/Z2 starts the OFF-delay t2. Both timing functions are displayed by the flashing green LED. When the OFF-delay t2 is complete, the output relay de-energizes.

If control input Y1/Z2 opens before the ON-delay t1 is complete, the time delay is reset and the output relay remains de-energized. If control input Y1/Z2 closes before the OFF-delay t2 is complete, the time delay is reset and the output relay remains energized.

When the red slide switch is brought to position „Inst." changeover switch R2 is immediately energized when supply voltage is applied and remains activated until the supply is cut off .

Note! Control contacts Y1/Z2 must be potential-free.



■ supply on and contact made

Pulse former

The supply voltage must be connected to A1/A2 and remain established.

Closing control input Y1/Z2 energizes the output relay immediately and starts timing. Operating the control contact switch Y1/Z2 during the time delay has no effect.

The green LED flashes for the duration of the interval. When the selected ON time is complete, the output relay de-energizes and the flashing green LED turns steady. After the ON time is complete, it can be restarted by closing control input Y1/Z2.

When the red slide switch is brought to position „Inst." changeover switch R2 is immediately energized when supply voltage is applied and remains activated until the supply is cut off .

Note! Control contacts Y1/Z2 must be potential-free.

■ supply on and contact made

ON/OFF-function

This function is used for test purposes during commissioning and trouble-shooting.

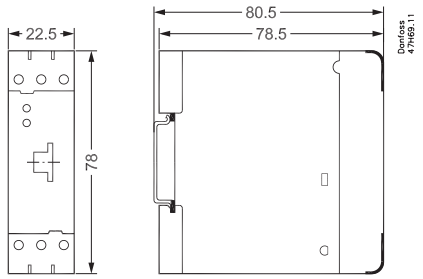
If the selected max. value of the time range is smaller than 300 h (front-face potentiometer "Time sector" not 300 h), applying control supply voltage energizes the output relay immediately and the green LED glows.

Interrupting control supply voltage, de-energizes the output relay. If the selected max. value of the time range is 300 h (front-face potentiometer "Time sector" = 300 h) and control supply voltage is applied, the green LED glows, but the output relay does not energize.

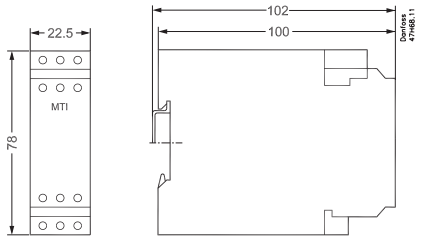
Time settings and operating of the control inputs have no effect on the operation.

Dimensions [mm]

Electronic timers ATI, BTI, SDT



Electronic timers MTI



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