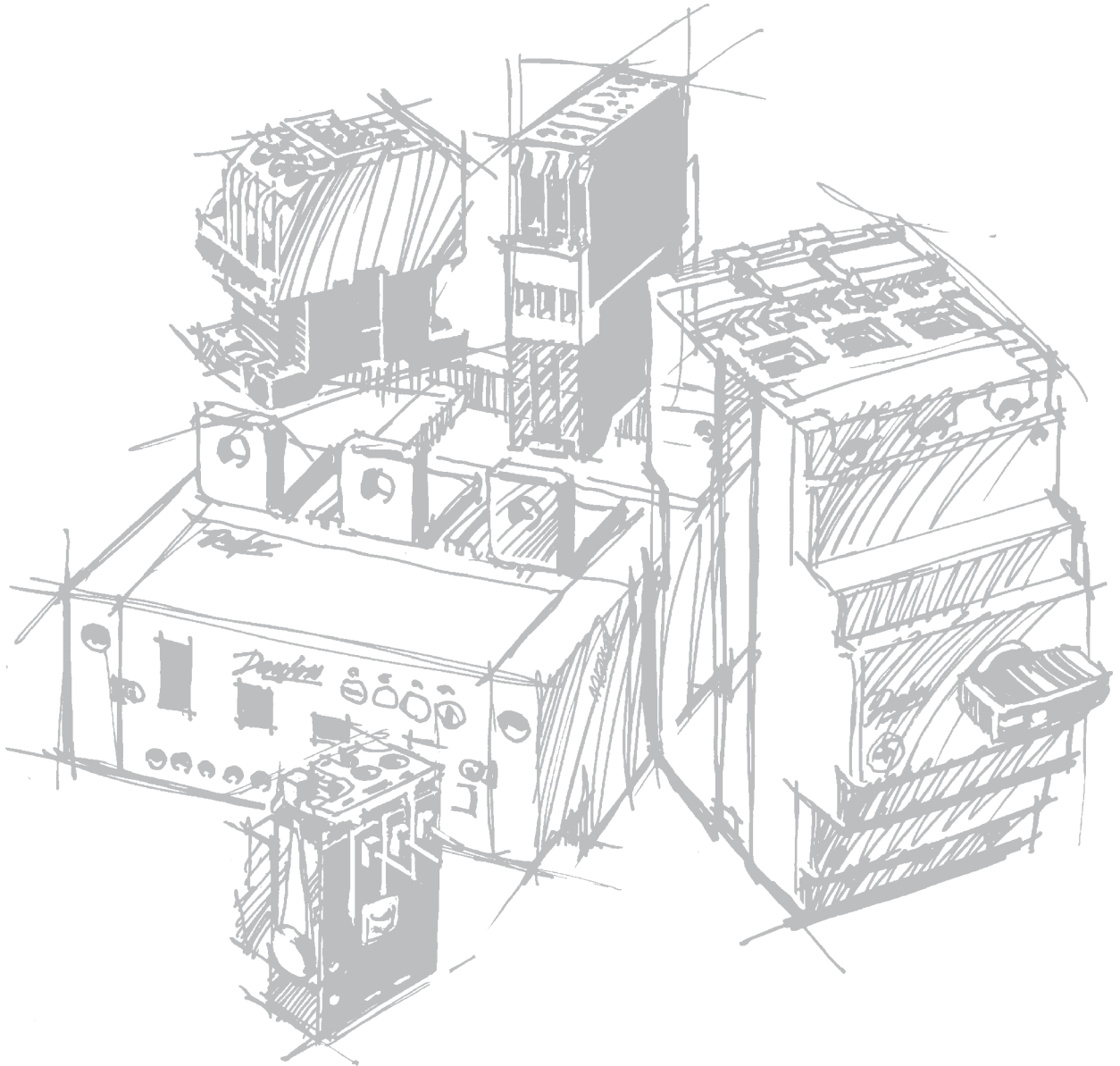




CI-TI™ Contactors and Motor Starters Timers ATI, BTI, MTI

Introduction



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

- Easy time setting
- Electrical noise immunity
- Mechanical shock and vibration resistance
- Time ranges 0.1 s to 30 min for single function Electronic timers and 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 electronic timers featuring:
 - ON delay
 - OFF delay
 - single pulse pause or pause pulse
 - flasher pulse pause or pause pulse
- and
- star-delta start

• Function selector

- AV = ON delay
- RV = OFF delay
- EW = pulse with ON delay
- AW = pulse with OFF delay
- BI = flasher relay with pulse start
- BP = flasher relay with pause start
- YDAV = star-delta starters with ON delay
- YDEW = star-delta starters with pulse function
- output relay R2 (On LED = red)
 - output relay R1 (On LED = red)
 - U/T supply voltage (established LED = green)
 - „Inst“ switch (changes output relay R2 to instantaneous relay).

Ordering

ON-delay electronic timers

Time range	Voltage range	Contact function	Code no.	Type
0.1-10 s	110-130 V a.c., 50-60 Hz	1 changeover	047H3090	ATI
3-300 s	110-130 V a.c., 50-60 Hz	1 changeover	047H3091	
0.1-10 s	220-240 V a.c., 50-60 Hz	1 changeover	047H3092	
	24 V a.c., 50-60 Hz			
	24 V d.c.			
0.3-30 s	220-240 V a.c., 50-60 Hz	1 changeover	047H3104	
	24 V a.c., 50-60 Hz			
	24 V d.c.			
3-300 s	220-240 V a.c., 50-60 Hz	1 changeover	047H3093	
	24 V a.c., 50-60 Hz			
	24 V d.c.			
0.3-30 min	220-240 V a.c., 50-60 Hz	1 changeover	047H3105	
	24 V a.c., 50-60 Hz			
	24 V d.c.			

Ordering (continued)

OFF-delay electronic timers

Time range	Voltage range	Contact function	Code no.	Type
0.1-10 s	24 V a.c., 50-60 Hz	1 changeover	047H3094	BTI
	24 V d.c.			
0.3-30 s	24 V a.c., 50-60 Hz	1 changeover	047H3106	
	24 V d.c.			
3-300 s	24 V a.c., 50-60 Hz	1 changeover	047H3095	
	24 V d.c.			
0.1-10 s	110-130 V a.c., 50-60 Hz	1 changeover	047H3096	
3-300 s	110-130 V a.c., 50-60 Hz	1 changeover	047H3097	
0.1-10 s	220-240 V a.c., 50-60 Hz	1 changeover	047H3098	
0.3-30 s	220-240 V a.c., 50-60 Hz	1 changeover	047H3107	
3-300 s	220-240 V a.c., 50-60 Hz	1 changeover	047H3099	

Star-delta electronic timers for SDU 12-25

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

Multi function electronic timers

Multi-function electronic timers				
Time range	Voltage range	Contact function	Code no.	Type
0.05 s-300 h	24-240 V a.c., 50-60 Hz	2 changeover	047H3075	MTI
	24-240 V d.c.			
	24 V a.c., 50-60 Hz	1 changeover	047H3076	
	24 V d.c.			
	42-48 V a.c., 50-60 Hz			
	42-48 V d.c.			
	110-240 V a.c., 50-60 Hz			



Adaptor

Accessories for electronic timers

Description	Comments	Code no.
Adapter	Mounting base with DIN rail for screw fixing of electronic timers	047H3120

Timers ATI, BTI, SDT, MTI

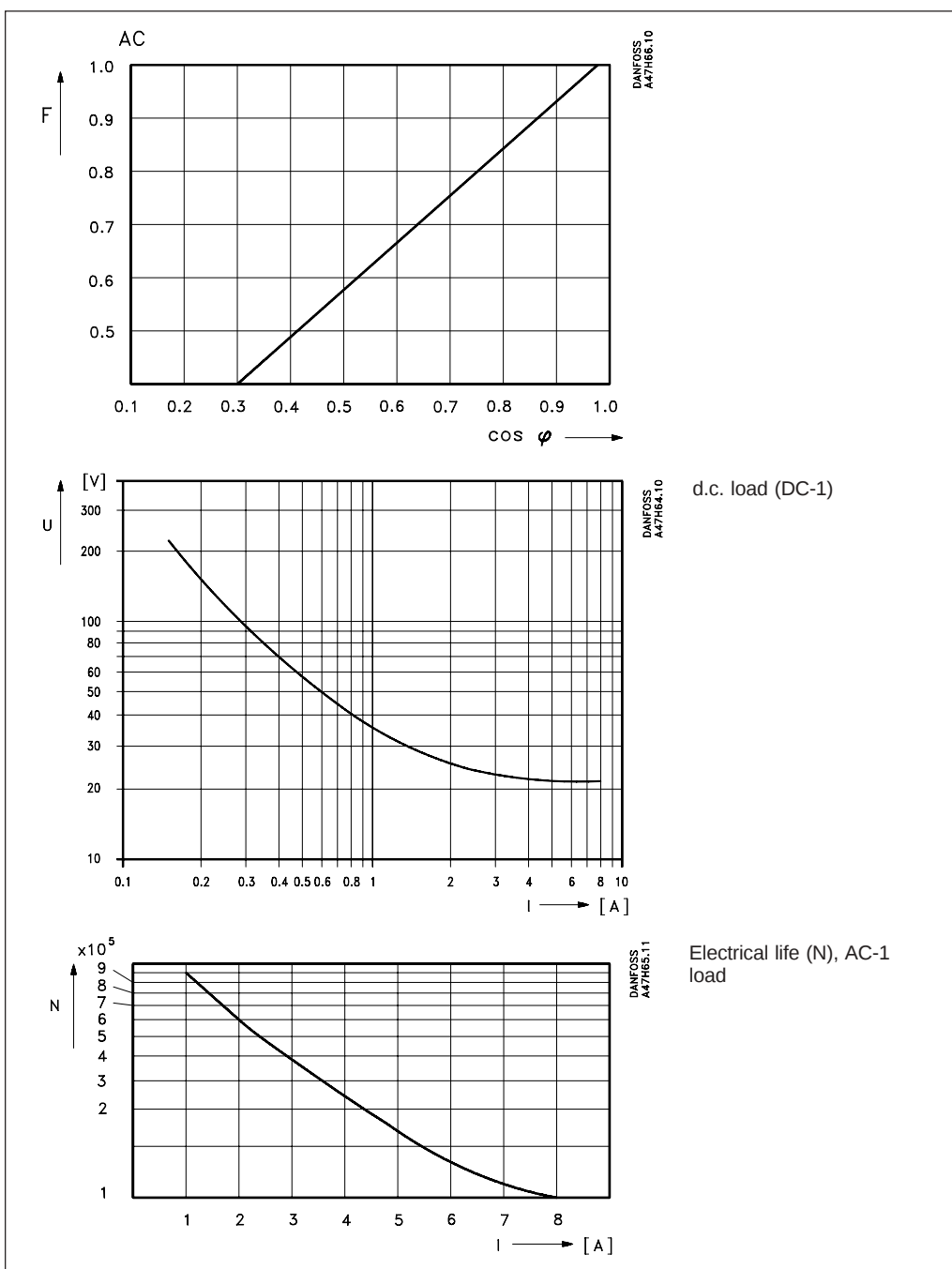
Type designation	ATI	BTI	SDT	MTI	
Output circuit					
Changeover switch	1	1	1	2	1
Max. A on 250 V	4	4	4	4	
AC-15 on 230 V (A)	1.5	1.5	1.5	1.5	
AC-15 on 415 V (A)			0.25		
DC - 12 on 24 V d.c. (A)	4	4	4	4	4
DC - 13 on 24 V d.c. (A)	2	2	2	2	2
Input					
UC 24 V		●			
UC 24-240V				●	
UC 24 V, UC 42-48 V, AC 110-240 V					●
Supply voltage*) UC 24 V, AC 220-240 V	●		●		
AC 110-130 V	●	●	●		
AC 220-240V		●			
AC 380-415 V			●		
Voltage tolerance	-10% to +10%			-15% to +10%	
Frequency	50-60 Hz				
Duty rating	Continuous				
UC 24 V	1.0 VA/W				
AC 110-130 V	6.0 VA				
AC 220-240 V	12.0 VA				
AC 380-415 V		23.0 VA			
UC 42-48 V					Typically 1.8 VA/W
AC 110-240 V					Typically 2.5 VA
UC 24-240 V				Typically 2.5 VA/W	
Time circuit					
Time ranges	0.1-10 s		0.3 -30 s	0.05-1 s 0.15-3 s 0.5-10 s	1. 5-30 s 5-100 s 15-300 s 1.5-30 h
	0.3-30 s				
	3-300 s				
	0.3-30 min				
10 time ranges in each unit	15-300 h				
Reset time (dwell time) <	100 ms		400 ms	50 ms	
Control pulse time >	20 ms				
Y/D changeover time			30 ms		
Repeat accuracy <	1%			0.2%	
Time deviation within voltage tolerance <	0.5%			0.008% / %ΔU	
Time deviation within temperature range	0.1%/ °C			0.07%/ °C	
Ambient temperature operation	-20 °C to +60 °C			-20 °C to +60 °C	
storage	-40 °C to +80 °C			-40 °C to +85 °C	
Control contact Y ₁ -Z ₂ /X ₁ -Z ₂ ¹⁾					
No-load voltage				10 - 50 V d.c.	
Min. current				1-5 mA	
Remote pot.meter connection Z ₁ -Z ₂ ¹⁾ Cable screen Z ₂ to screen				Potentiometer resistance 50 KΩ max. 25 m	
LED indication					
Supply voltage, green	●	●	●		
Supply voltage, green/flashes when time interval expires				●	●
Output relay , red	●	●	●		
Output relay I, red				●	●
Outout relay II, red				●	
Other data					
Installation	DIN rail/screw fixing with adapter				
Enclosure, housing/terminals	IP 50/IP 20				
Installation orientation	Any				
Mechanical life	30 mio. operations				
Electrical life, ohmic load	100 000 operations on 8 A, 230 V a.c.				
Vibration (mechanical)	10 g, 55 Hz/a = ±0.95 mm				
Vibration (operation)	6 g			4 g	
Max. fuse	2 A, gl				
Max. lead cross-section	2 × 1.5 mm ²			2 × 2.5 mm ²	
Test voltage	2.5 kV				
EMC	IEC 801.1 - 4. class III				

Approvals

Approval authority	CE	A	S	
	EN 60947	CSA Canada	UL-listed USA	Germanischer Lloyd, Germany
Product type				
ATI/BTI/SDT	•	•	•	•
MTI	•	•	•	•

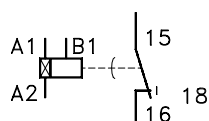
I Approved

Load graphs,
timers ATI, BTI, SDT, MTI

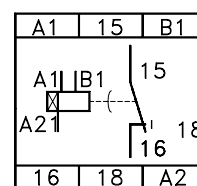


Contact symbols and terminal markings

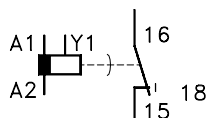
Electronic timers



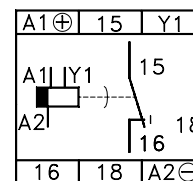
On-delay
ATI



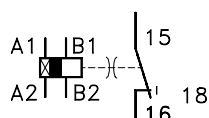
On-delay (Terminal marking)
ATI



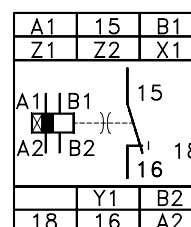
Off-delay
BTI



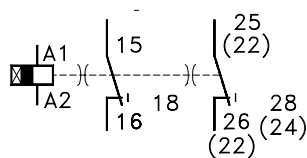
Off-delay (Terminal marking)
BTI



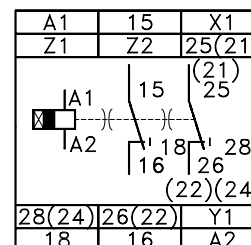
Multi function timer
MTI (with 1 changeover contact)



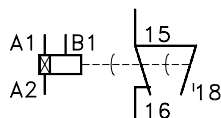
Multi function timer (Terminal marking)
MTI



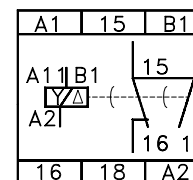
Multi function timer
MTI (with 2 changeover contacts)



Multi function timer (Terminal marking)
MTI



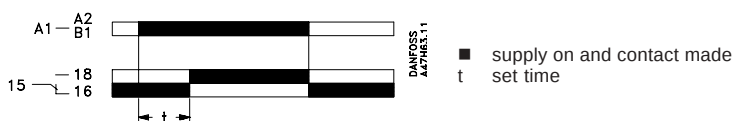
Star-delta timer
SDT



Star-delta timer (Terminal marking)
SDT

Function overview, timers

ATI

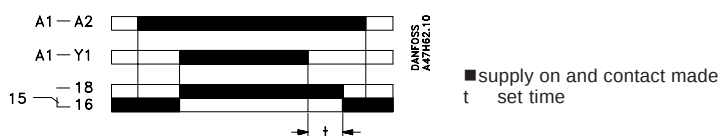


ON delay

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.

BTI

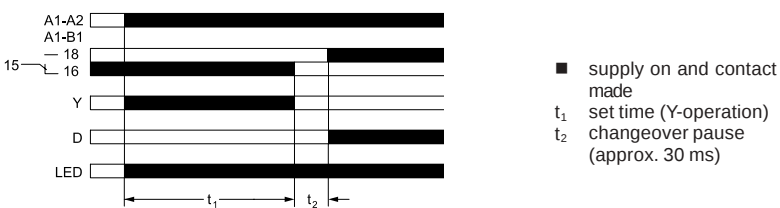


OFF delay

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.

SDT

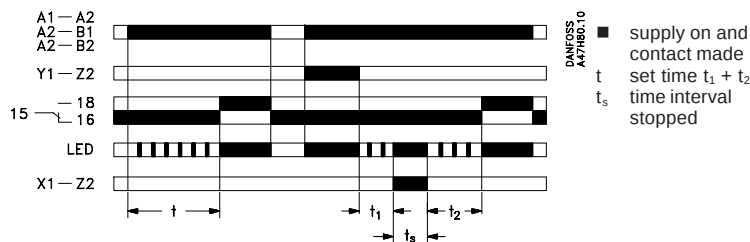


Star-delta relay

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 Δ contactor switch-in. With 24 V supply, terminals A1 and B1 must be used.

MTI multi functions with one switch



AV

ON delay



When voltage is applied to A1/A2*) the set time interval starts. The green LED flashes for the duration of the interval. When the time interval elapses, the output relay is energised and the green LED lights up constantly. The output relay remains energised until supply voltage is cut off. With permanent supply voltage, start and stop of the time interval can also be controlled by making or breaking control contact Y1/Z2. The time interval can be stopped by making control contact X1/Z2. The time elapsed until then is stored and the time interval is stopped. The time interval starts again when control contact X1/Z2 is broken. This function can be repeated any number of times. Note! Control contacts Y1-Z2 and X1-Z2 must be potential-free.

*) On 24 V use terminals A2/B1 and on 48 V terminals A2/B2.

EW

pulse relay with ON delay



When supply voltage is applied to A1/A2*) the output relay is immediately energised and remains energised 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. The time interval can be stopped by making control contact X1/Z2. The time elapsed until then is stored and the time interval is stopped. The time interval starts again when control contact X1/Z2 is broken. This function can be repeated any number of times. Note! Control contacts Y1-Z2 and X1-Z2 must be potential-free.

*) On 24 V use terminals A2/B1 and on 48 V terminals A2/B2.

BI

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 pulse-pause time. The green LED flashes for both pulse and pause, 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. Note! Control contacts Y1-Z2 must be potential-free.

*) On 24 V use terminals A2/B1 and on 48 V terminals A2/B2.

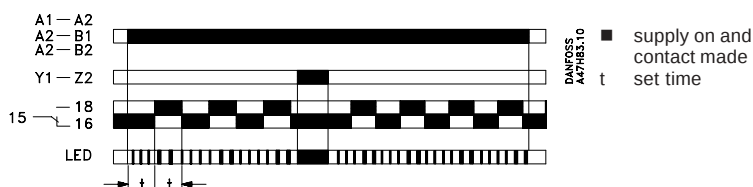
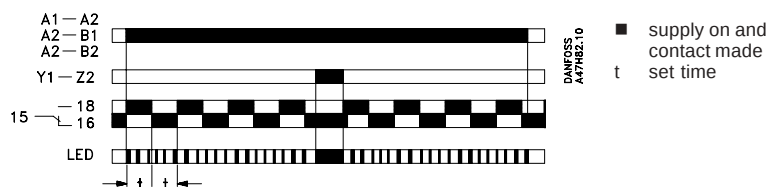
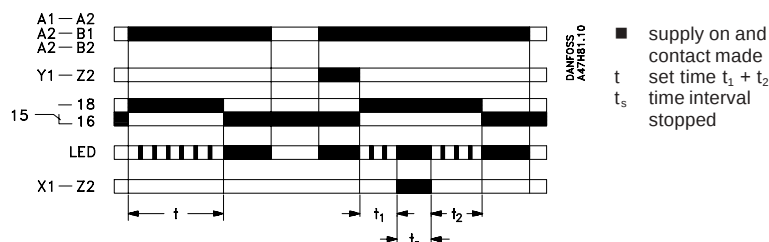
BP

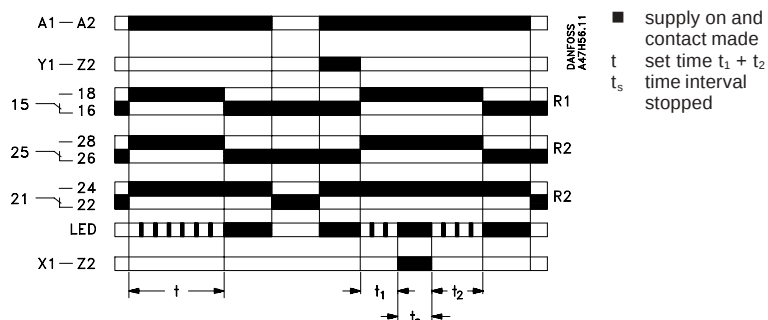
flasher relay with pause begins



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

*) On 24 V use terminals A2/B1 and on 48 V terminals A2/B2.





EW

pulse relay with ON delay



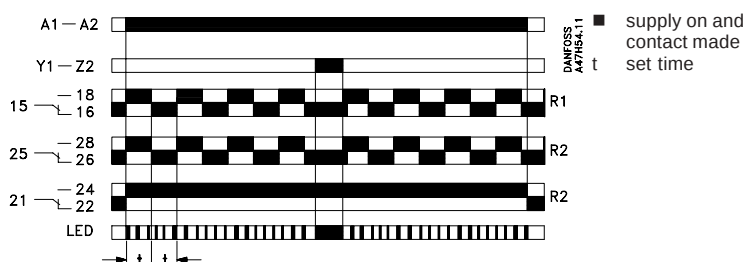
When supply voltage is applied to A1/A2 the output relay is immediately energised and remains activated until the set time interval has elapsed. The green LED flashes for the duration of the interval. When the time interval elapses, the output relay drops back to its dwell position and the green LED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

The time interval can be stopped by making control contact X1/Z2. The time elapsed until then is stored and the time interval is stopped. The time interval starts again when control contact X1/Z2 is broken. This function can be repeated any number of times.

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 and X1-Z2 must be potential-free.



BI

flasher relay with pulse begins



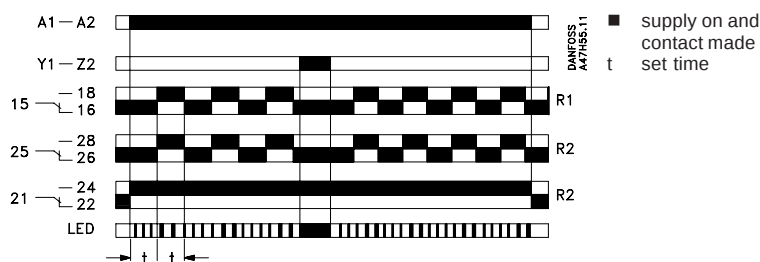
When supply voltage is applied to A1/A2 the time relay flasher function begins, in accordance with the set symmetrical pause-pulse time.

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.



BP

flasher relay with pause begins



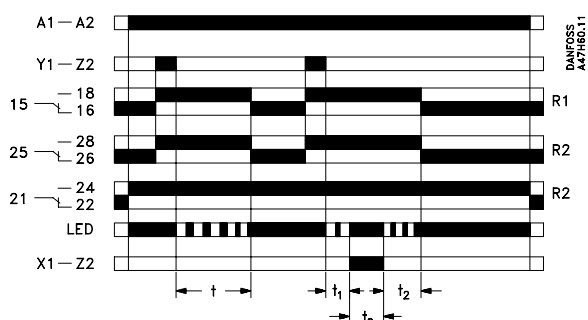
When supply voltage is applied to A1/A2 the time relay flasher function begins, in accordance with the set symmetrical pause-pulse time.

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.



■ supply on and contact made
t set time $t_1 + t_2$
 t_s time interval stopped

RV 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.

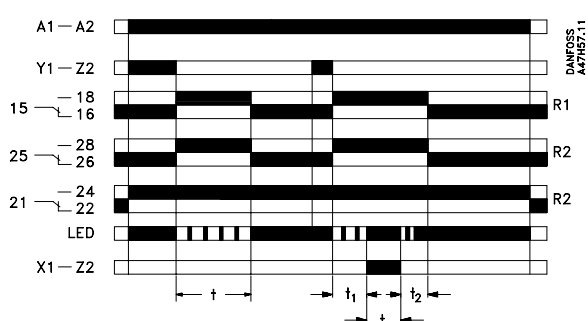
(Note: No foreign voltage permissible).

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.

The time interval can be stopped by making control contact X1/Z2. The time elapsed until then is stored and the time interval is stopped. The time interval starts again when control contact X1/Z2 is broken. This function can be repeated any number of times.

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 and X1-Z2 must be potential-free.



■ supply on and contact made
t set start-up time
 t_s time interval stopped

AW pulse relay with OFF delay

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

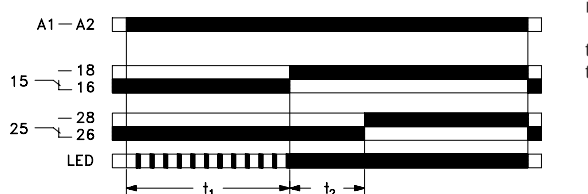
Time interval start is controlled by a contact on Y1/Z2. When the contact is broken, the output relay is activated and the time interval begins. The green LED flashes for the duration of the interval. When the set time interval has elapsed, the output relay drops back to its dwell position and the green LED lights up constantly.

The time interval can be stopped by making control contact X1/Z2.

The time elapsed until then is stored and the time interval is stopped. The time interval starts again when control contact X1/Z2 is broken. This function can be repeated any number of times.

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.

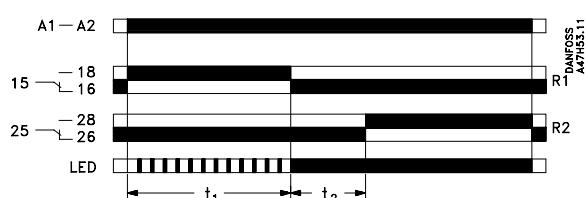
Note! Control contacts Y1-Z2 and X1-Z2 must be potential-free.



■ supply on and contact made
t set start-up time
 t_2 changeover pause (approx. 50 ms)

YDAV star-delta changeover

When supply voltage is applied to A1/A2, the time interval begins. When the interval elapses, output relay R1 is energised immediately, R2 after a further 50 ms. The green LED flashes for the duration of the time interval.



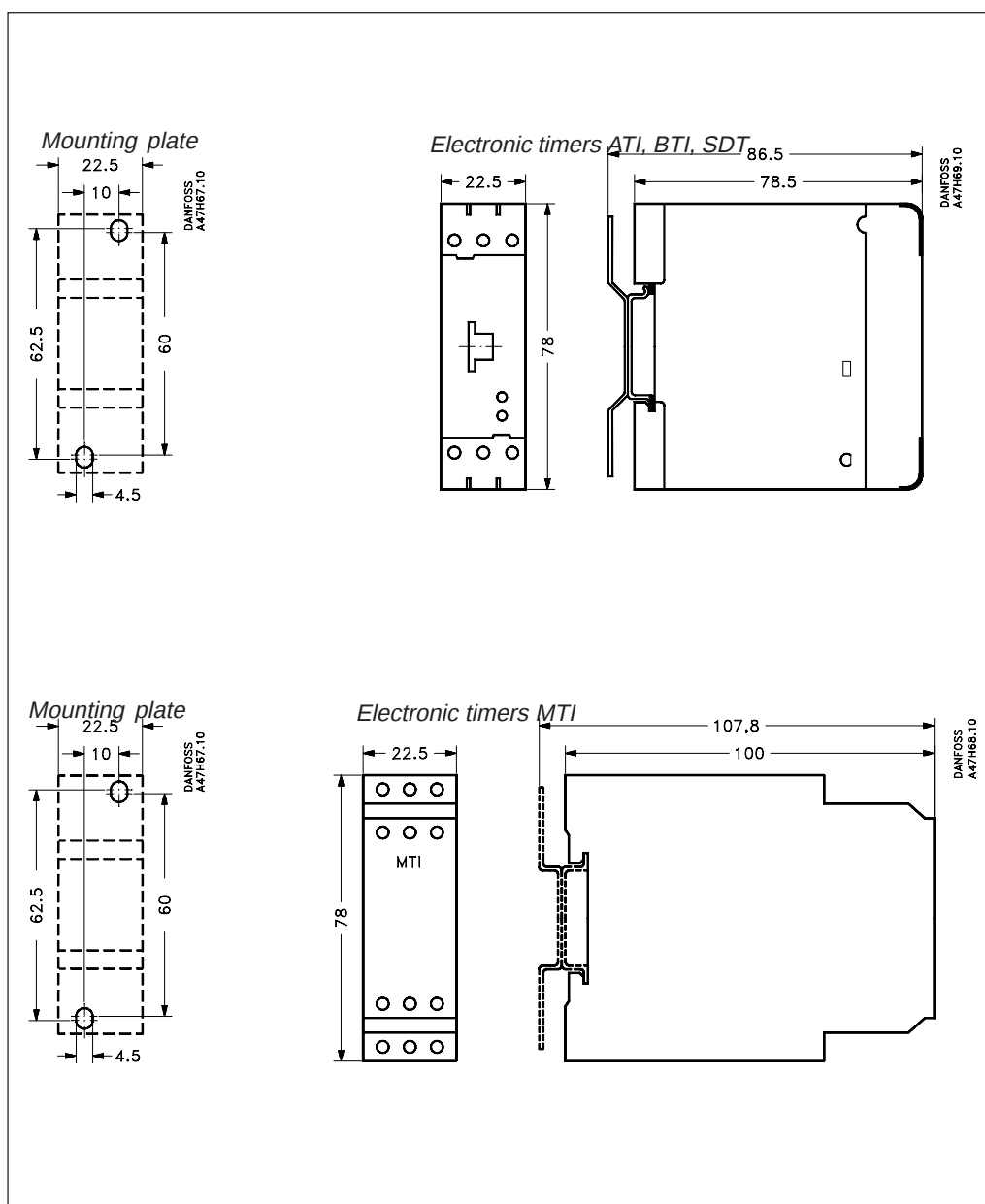
■ supply on and contact made
t set time $t_1 + t_2$
 t_2 changeover pause (approx. 50 ms)

YDEW 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.

Dimensions



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