Economy Timing Relays

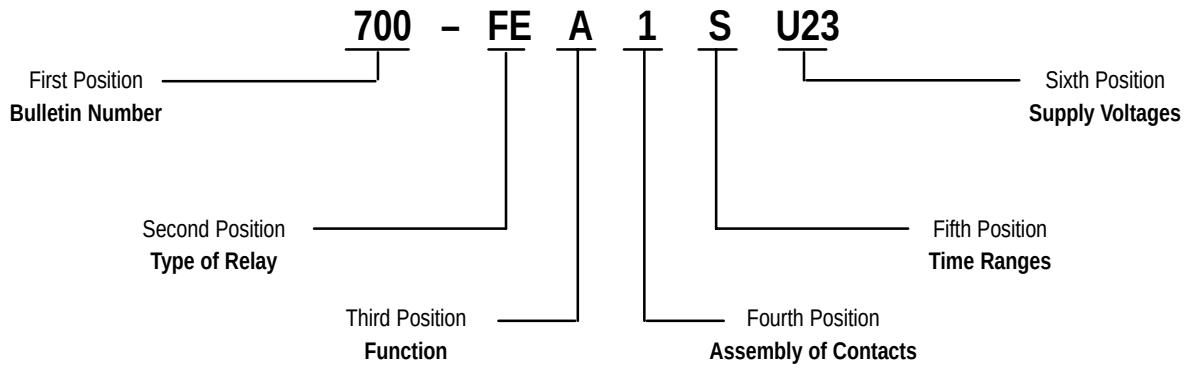
(Catalog Number 700–FE)

Product Data

The Bulletin 700–FE Economy Timing Relays consist of Multi–Function, Single Function, and Special Function designs. These products are offered in a compact, DIN rail mountable package to meet the customers timing needs at an economical price.

- 17.5mm (11/16 inch) Wide
  - 24V AC/DC (1 NO only)
    110–240V AC
  - 24–48V DC (SPDT only)
    24–240V AC
- DIN Rail Mounting
- Finger Safe Terminals
- 1 Normally Open Output Contact
  - Multi–Function (On–Delay, Off–Delay, One Shot, Flasher, with 4 Timing Ranges)
  - Single Function (On–Delay, Off–Delay, One Shot, Flasher, with 4 Timing Ranges)
- Single Pull Double Throw (SPDT) Contact Configuration
  - Multi–Function (On–Delay, Off–Delay, One Shot, Flasher, with 6 Timing Ranges)
  - Single Function (On–Delay, Off– Delay, One Shot, Flasher, Fleeting Off–Delay, Pulse Converter, with 6 Timing Ranges)
  - Special Function (Star–Delta with 4 Timing Ranges)

Catalog Number Explanation



Multi–Function Economy Relays

700-FE	M	1	R	U23
	Function	**Assembly of contacts**	**Time ranges**	**Supply voltages**
	M Multi-function timing relays with a Single-function: A, B, D and F	**1** 1 normally open contact 1 N.O.	**R** 0.5 s... 1 h (4 settings)	**U22** 24V AC/DC❶ 110...240 V 50/60 Hz
		3 1 Changeover contact 1 C/O (SPDT)	**T** 0.05 s...10 h (6 settings)	**U23** 24...48 VDC 24...240 V 50/60 Hz

Single Function Economy Relays

700-FE	A	1	S	U23
	Function	**Assembly of contacts**	**Time ranges**	**Supply voltages**
	A On-delay **B** Off-delay **D** One shot **E** Fleeting off-delay **F** Flasher (repeat cycle starting with pulse) **L** Pulse converter	**Functions A, B, D, F:** **1** normally open contact 1 N.O.	**S** 0.75 s...1 h (4 settings)	**U22** 24V AC/DC❶ 110...240 V 50/60 Hz
		All functions: **3** 1 Changeover contact 1 C/O (SPDT)	**T** 0.05 s...10 h (6 settings)	**U23** 24...48 VDC 24...240 V 50/60 Hz

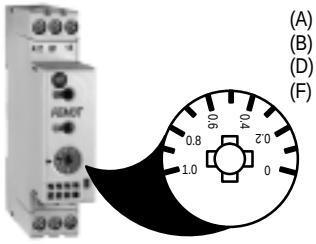
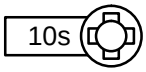
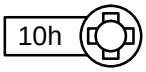
Special Function Economy Relays

700-FE	Y	2	Q	U23
	Function	**Assembly of contacts**	**Time ranges**	**Supply voltages**
	Y Star-delta timing relays	**2** 2 normally open contacts 2 N.O. 1 side common	**Q** 0.15 s...10 min (4 settings)	**U23** 24...48 VDC 24...240 V 50/60 Hz

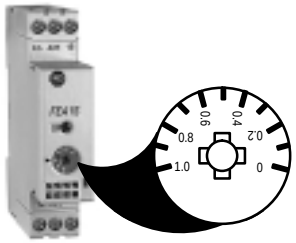
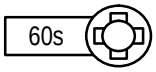
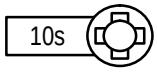
❶ **Voltage is either 24V DC or 24V AC 50/60 Hz.**

Technical Data

700–FEM Multi–Function Economy Relays

Description	1 NO	SPDT
Multi-function timing relays 700-FEM includes 4 selectable functions: (A) - On-delay (B) - Off-delay (D) - One shot / watch dog (F) - Flasher (Repeat Cycle) starting with pulse 	**Multi-time setting ranges 0.5 s...60 m** (10s) 0.5...10 s (60s) 3...60 s (10m) 0.5...10 min (60m) 3...60 m 	**Multi-time setting ranges 0.05 s...10 h** (1s) 0.05...1 s (10s) 0.5...10 s (1m) 0.05...1 min (10m) 0.5...10 min (1h) 0.05...1 h (10h) 0.5...10 h 
Supply voltage	**Cat. No.**	**Cat. No.**
U22 110...240 VAC, 50/60 Hz (A1/A2) 24V AC/DC❶ (A3/A2)	700-FEM1RU22	—
U23 24...48 VDC (A1/A2) 24...240 VAC,50/60 Hz (A1/A2)	—	700-FEM3TU23

700–FE Single Function Economy Relays

Description	1 NO	SPDT
	**Multi-time setting ranges 0.75 s...60 m** (15s) 0.75...15 s (60s) 3...60 s (8m) 0.4...8 m (60m) 3...60 m  **Supply voltage** U22 24V AC/DC❶ (A3/A2) 110...240 VAC, 50/60 Hz (A1/A2)	**Multi-time setting ranges 0.05 s...10 h** (1s) 0.05...1 s (10s) 0.5...10 s (1m) 0.05...1 m (10m) 0.5...10 m (1h) 0.05...1 h (10h) 0.5...10 h  **Supply voltage** U23 24...48 VDC (A1/A2) 24...240 VAC, 50/60 Hz (A1/A2)
Also See 700–FE Timing Charts	**Cat. No.**	**Cat. No.**
(A) On-delay The output contact changes state after the time delay is completed.	700-FEA1SU22	—
	—	700-FEA3TU23
(B) Off-delay Input power must be supplied to terminal (A1/A2) continuously. The output contact changes state when switch "S" is closed. When switch "S" is opened, the time delay begins. After the time delay is completed, the contact returns to shelf state.	700-FEB1SU22	—
	—	700-FEB3TU23
(D) One shot The output contact changes state when the relay is energized. The output contact returns to shelf state when the time delay is completed.	700-FED1SU22	—
	—	700-FED3TU23
(F) Flasher (repeat cycle starting with pulse) The output contact changes state when the power is applied. At the end of the time delay, the output contact returns to shelf state. This cycle continues until the power is removed.	700-FEF1SU22	—
	—	700-FEF3TU23
(E) Fleeting off-delay Input power must be supplied to terminal (A1/A2) continuously. The output contact changes state after closing and opening switch "S". After the time delay is completed, the contact returns to shelf state.	—	700-FEE3TU23
(L) Pulse converter Input power must be supplied to terminal (A1/A2) continuously. When switch "S" is closed, the output contact changes state. When the time delay is complete, the output contact returns to shelf state. The time "t" is not influenced by the duration of the control pulse.	—	700-FEL3TU23

❶ Voltage is either 24V DC or 24V AC 50/60 Hz.

Technical Data, Continued

700–FEY Special Function Economy Relays

Description	2 NO w/common
	**Multi-time setting ranges 0.15 s...10 m** (3s) 0.15...3 s (10s) 0.5...10 s (1m) 0.05...1 min (10m) 0.5...10 min **Supply voltage** U23 24...48 VDC (A1/A2) 24...240 VAC, 50/60 Hz (A1/A2)
Also See 700–FE Timing Charts	**Cat. No.**
(Y) Star-delta timing relay When power is applied, the output contact 17/18(Y) changes state. After the time setting, the output contact 17/18(Y) returns to shelf state. After the fixed time (50 to 65 ms), the output contact 17/28Δ changes state. The output contact returns to shelf state after the power is removed.	700-FEY2QU23

Specifications

Time characteristics (according to VDE 0435, part 2021)

	1 NO	SPDT
Setting accuracy	± 5% of full scale	
Repeatability	± 1% of setting (typical)	
Tolerance	by voltage: ± 0.01%/%ΔU by temperature: ± 0.25%/°C	by voltage: ± 0.001%/%ΔU by temperature: ± 0.025%/°C
Supply		
Supply voltage	24V AC/DC❶ and 110...240VAC, 50/60 Hz	24...48 VDC and 24...240VAC, 50/60 Hz
Voltage tolerance	–15%/+20% (DC), –15%/+10% (AC)	
Power consumption	0.5 W at 24 VDC, 9 VA at 240 VAC	0.5 W at 24 VDC, 5 VA at 240 VAC
Time energized	100%	
Reset time	250 ms	100 ms
Cable length (supply voltage control)	max. 100 m (30 feet)	max. 250 m (75 feet)
Pulse control (B1)		
Impulse duration	≥ 250 ms	≥ 50 ms (AC), ≥ 30 ms (DC)
Input voltage	supply voltage range	
Input current	1 mA	
Cable length	max. 250 m without parallel load between B1 and A2 max. 50 m with load (< 3 kΩ) between B1 and A2	
Outputs		
Contact type	1 NO contact	1 Form C – SPDT contact
Switching capacity	Power: 1250 VA According to IEC 947-5-1: AC1 – 5A/250 VAC (resistive load) AC14 – 1 A/250 VAC (inductive load) DC13 – 1 A/24 VDC (inductive load)	
	According to UL 508: NEMA D300 – 1A/300VAC	
Short-circuit protection	6 A gL (Fast Blow Fuse)	
Life	mechanical: 20 Mil. of operations electrical operations: 0.4 Mil. at 1 A/250 VAC, resistive 0.4 Mil. at 0.5 A/250 VAC, cos φ = 0.4 0.4 Mil. at 1 A/24 VDC, resistive	
State indicator	1 LED	1 Bi-Color LED (Supply; Relay)

Specifications, Continued

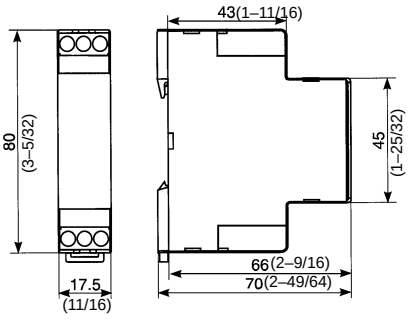
General Specifications

	1 NO	SPDT
Insulation characteristics	2 kVAC/50 Hz test voltage according to VDE 0435 and 4 kV 1.2/50 µs surge voltage according to IEC 947-1 between all inputs and outputs	
EMC/Interference immunity	The following requirements are fulfilled: Surge capacity of the supply voltage according to IEC 1000-4-5: Level 3 (A1–A2) 110...240 VAC according to IEC 1000-4-5: Level 2 (A3–A2) 24 V AC/DC❶ Burst according to IEC 1000-4-4: Level 3 ESD discharge according to IEC 1000-4-2: Level 3	The following requirements are fulfilled: Surge capacity of the supply voltage according to IEC 1000-4-5: Level 3 Burst according to IEC 1000-4-4: Level 3 ESD discharge according to IEC 1000-4-2: Level 3
EMC/Emmission	electromagnetical fields according to EN 55 022: Class B	
Safe isolation	according to VDE 106, Part 101	
Climatic withstand	56 cycles (24 h) at 25...40°C and 95% rel. humidity according to IEC 68-2-30 and IEC 68-2-3	
Vibration resistance	4 g in 3 axis at 10...500 Hz, test FC according to IEC 68-2-6	
Shock resistance	50 g according to IEC 68-2-27	
Protection class IEC 947–1	Enclosure: IP 40 Terminal: IP 20	
Weight	60 g	60 g
Approvals	UL, C-UL, CE Certified	UL, C-UL, Germanischer Lloyd, CE Certified
Ambient temperature	Open: –25°C ... +60°C Enclosed: –25°C ... +45°C Storage: –40°C ... +85°C	
Connections	Screw terminal M3 for Pozidriv No.1, Philips and slotted screws No.2. suitable for power screw-driver. Rated tightening torque 8.8 LB–IN (max. 1.0 Nm) For terminal cross-sections of 1 x 0.5 mm^2 ... 2 x 1.5 mm^2 (solid) or 2 x 1.5 mm^2 (stranded with sleeve), AWG 20...14. Finger protection according to VDE 0106	
Mounting	For surface mounting in any position; snap-on mounting on 35 mm DIN rail or by adapter and 2 screws M4 type	
Disposal	Synthetic materials without dioxin according to EC/EFTA-Notification No. 93/0141/D electrical contacts are AgCdO	

❶ **Voltage is either 24V DC or 24V AC 50/60 Hz.**

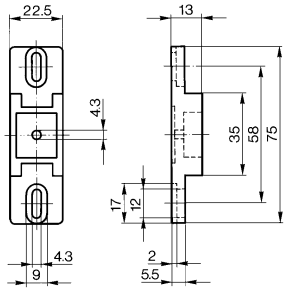
Approximate Dimensions

Dimensions are shown in millimeters (inches).
Dimensions are not intended to be used for manufacturing purposes.



700-FE

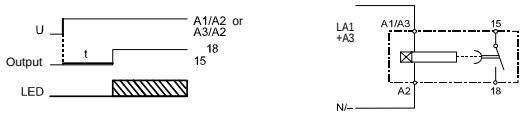
For panel mounting, Use the 199–FSA Panel Mounting Adapter.



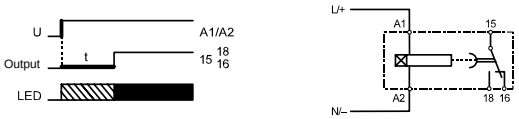
199-FSA

Timing Charts

(A) On-delay

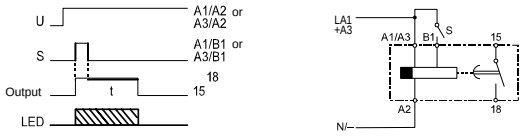


1 N.O. (SPST)

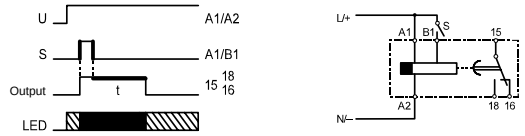


1 C/O (SPDT)

(B) Off-delay

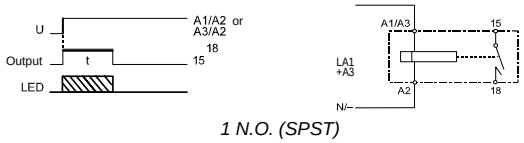


1 N.O. (SPST)

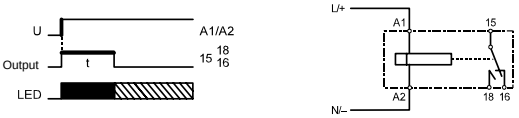


1 C/O (SPDT)

(D) One shot

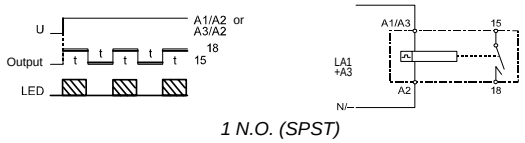


1 N.O. (SPST)

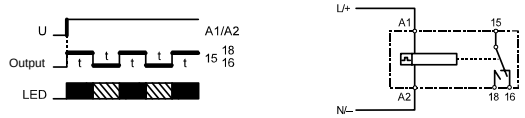


1 C/O (SPDT)

(F) Flasher (repeat cycle starting with pulse)

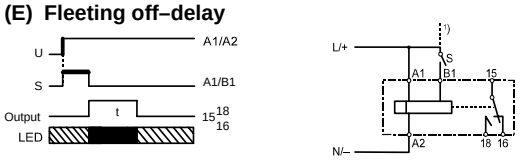


1 N.O. (SPST)



1 C/O (SPDT)

(E) Fleeting off–delay



1 C/O (SPDT)

(L) Pulse converter

1 C/O (SPDT)

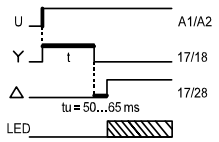
Bi-Color LED: 1 C/O (SPDT) Contact Timers

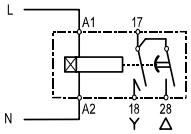
LED U = green:	Supply voltage available
LED Relay = red:	Output is energized

Single Color LED: 1 NO Contact Timers

ON = green:	
OFF = no color	

(Y) Star–Delta





2 NO with Common

Wiring Connections

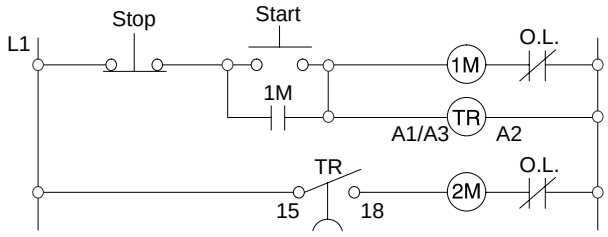
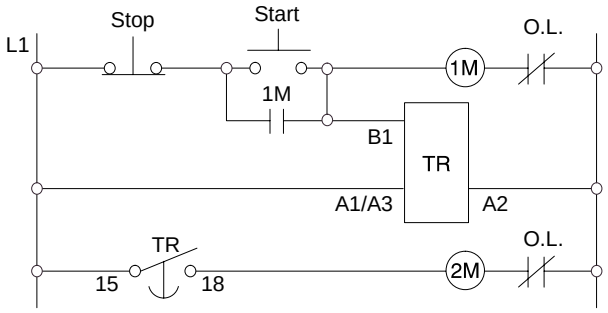
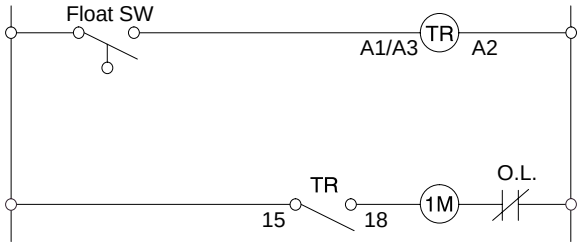
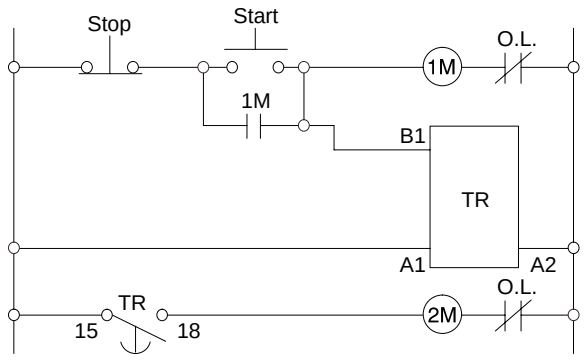
17 Common
18 Y
28 Δ

Single Color LED: 2 N.O. with Common

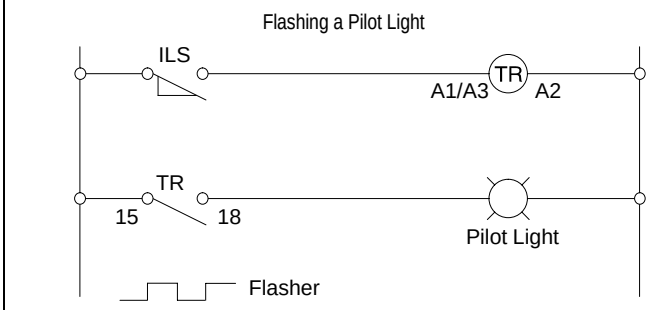
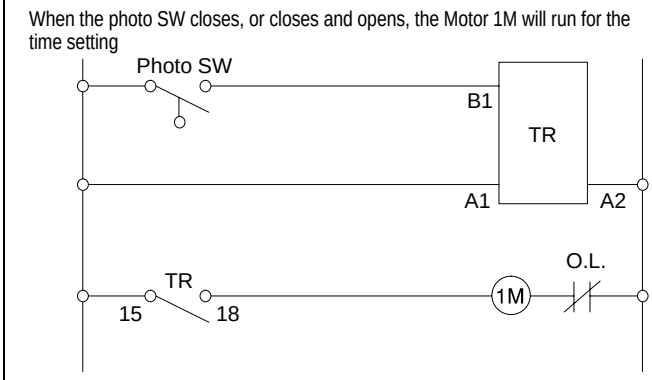
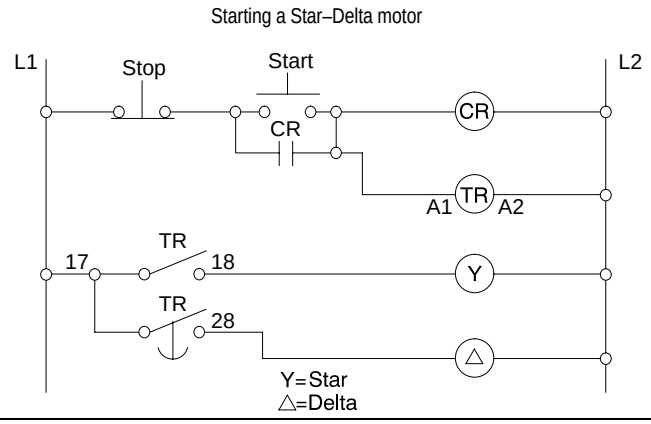
ON = green OFF = no color

NOTE: For the initiate control contact B1, any external power within the supply voltage range can be used. For B1, a different voltage compared to the supply voltage A1/A3–A2 can also be used.
For example: A1–A2 = 230 VAC 50/60 Hz, B1–A2 = 24 VDC, where A2 is the common connection.

Applications

Sequence	Description	Wiring Diagram
On–Delay (A) Motor Starting	Pushing the Start Button energizes both the Starter Coil (1M) and the Timer Coil (TR). The Hold–In Contact (1M) closes to maintain the circuit after the Start Button is released. When the time delay is complete, the contact (TR) closes which energizes coil 2M. Therefor Motor 2M is always started after Motor 1M.	Motor 2M starts after Motor 1M 
Off–Delay (B) Motor Stopping	Pushing the Start Button energizes both 1M and 2M. Pushing the Stop Button de–energizes 1M and the Timer (TR) de–energizes 2M after the time delay. This allows Motor 2M to remain energized for a predetermined time after 1M is stopped	Motor 2M runs for a predetermined time after 1M is stopped 
One Shot (D) Motor On for a Predetermined Time	Each time the Float Switch is closed, Motor 1M will run for the predetermined time that is set on the one shot timer.	Motor 1M always runs for a predetermined time 
Fleeting Off–Delay (E) Motor On for a Predetermined Time After a Stop	Pushing the Start Button and then the Stop Button to energize and de–energize Motor 1M, will cause Motor 2M to be energized for a set time delay.	Turning 1M and Timer TR on and off will cause 2M to run for at least the predetermined time setting on TR 

Applications, Continued

Sequence	Description	Wiring Diagram
Flasher (Repeat Cycle Starting with Pulse) (F) Flashing a Pilot Light	When Limit Switch (1LS) closes, the Timer (TR) will be energized to close and open the contact for the time delay setting, causing the Pilot Light to flash.	
Pulse Converter (L) Pulses Are Turned Into a Set or Predetermined Output	When the Photo Switch closes, the contact TR closes to energize Motor 1M for the predetermined time setting. Time setting is 0.05s to 10h. The timer will not be reset by the opening or pulsing of the photo switch until the time delay is completed.	
Star–Delta (Y) Starting a Star–Delta Motor	Pushing the Start Button energizes the relay CR and the timer TR. Both will hold in through CR. Contact 17–18 will close energizing the Star Contactor (Y), and starting the motor for the predetermined time. Then contact 17–18 will open and 50ms to 65ms later contact 17–28 will close to energize the Delta Contactor (△).	

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