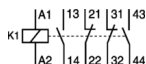
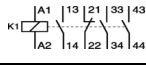
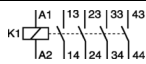


700-EF Control Relay

- IEC industrial relays
- Electronic coils
- Mechanically linked contact performance per IEC 60947-5-1
- Wide control voltage range
- Built-in surge protection
- Add-on auxiliary contact blocks - front or side mount



4-Pole AC Coil Voltage

AC-12	AC-15						Connection Diagrams	Contacts		Standard Contacts ⁽¹⁾
<i>I</i> _{th} [A]	<i>I</i> _e [A]									
≤ 40 °C	24/48V	120V	240V	400V	500V	690V		N.O.	N.C.	
16	6	6	4	3	2	2		2	2	700-EF220⊗
								3	1	700-EF310⊗
								4	0	700-EF400⊗

(1) All catalog numbers are factory stocked.

⊗ Voltage Codes.

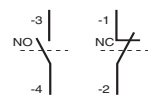
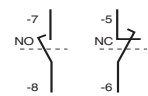
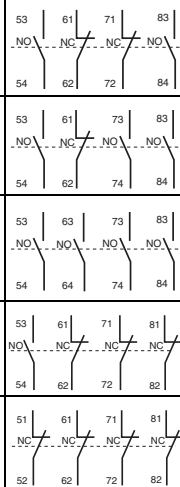
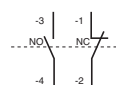
The catalog number listed is incomplete. Select a coil voltage from the table below to complete the catalog number. Example 700-EF220KJ.

Voltage ⁽¹⁾	12...20V DC	24V DC	24...60V AC 20...60V DC	48...130V AC/DC	100...250V AC/DC	250...500V AC/DC
Standard AC/DC	—	—	KJ	KY	KD	KN
Low Consumption AC/DC	EQ	—	EJ	—	—	—
Low Consumption/Faster Drop-out DC	—	QJ	—	—	—	—

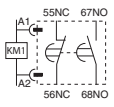
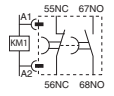
(1) AC Voltages are a 50/60 Hz.

Accessories

Auxiliary Contact Blocks with Standard Auxiliary Contacts

	Description			Connection Diagrams	For Use With	Cat. No.
		N.O.	N.C.			
	Auxiliary Contact Blocks for Front Mounting 1-pole - Quick and easy mounting without tools - Screw connection terminals - Switching down to 12V, 3mA - Mirror contact performance to the main relay poles - L= Late break N.C./early make N.O.	1	0		700-EF220⊗ 700-EF310⊗	100-EFA10
		0	1			100-EFA01
		1L	0		700-EF220⊗ 700-EF310⊗	100-EFAL10
		0	1L			100-EFAL01
	Auxiliary Contact Blocks for Front Mounting 4-pole - Quick and easy mounting without tools - Screw connection terminals - Switching down to 12V 3mA - Mirror contact performance to the main relay poles	2	2		700-EF220⊗	100-EFA22
		3	1			100-EFA31
		4	0			100-EFA40
		1	3			100-EFA13
		0	4			100-EFA04
	Auxiliary Contact Blocks for Side Mounting 2-pole - Two-way numbering for right or left mounting on the relay - With or without sequence terminal designations - Quick and easy mounting without tools - Screw connecting terminals - Switching down to 12V, 3mA - Mirror contact performance to the main relay poles	1	1		700-EF220⊗ 700-EF310⊗	100-ESA11

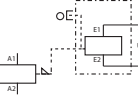
Electronic Timers

	Description				Connection Diagrams	For Use With	Cat. No.
			N.O.	N.C.			
	Electronic Timing Module—ON-Delay - Delay of the relay solenoid - The relay is energized at the end of the delay time	ON-Delay 0.1...1 s 1...10 s 10...100 s	1	1		700-EF220⊗ 700-EF310⊗	100-ETA
	Electronic Timing Module—OFF-Delay - Delay of the relay solenoid - After interruption of the control signal, the relay is de-energized at the end of the delay time	OFF-Delay 0.1...1 s 1...10 s 10...100 s	1	1		700-EF220⊗ 700-EF310⊗	100-ETB

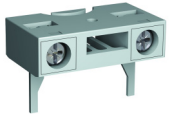
DC Interface Module

	Description	For Use With	Pkg. Qty.	Cat. No.
	DC Interface - Receives 24V DC signals from PLCs or other low output power sources and switches AC control power to operate the coils of the relay. - Coil voltage: 24...250V AC 50/60 Hz - Rated control circuit voltage U_c: 24VDC	700-EF	1	100-EJE
			10	100-EJEM

Mechanical Latch

	Description	Rated Voltage [V]		Connection Diagram	For Use With	Cat. No.
		V AC, 50/60 Hz	V DC			
	Mechanical Latch - Ensures contactor or relay is switched on even if there is a voltage failure - Opening controlled either electrically by AC or DC impulse or manually by button - Front mounting	24...60	24...60		700-EF	100-EFL11EJ
		48...130	48...130			100-EFL11EY
		100...250	100...250			100-EFL11ED
		250...500	250...500			100-EFL11EN

Additional Coil Terminal Block

	Description	For Use With	Pkg. Qty.	Cat. No.
	Additional Coil Terminal Block Allows bottom access to the coil terminals in addition to top access	700-EF	10	100-ECT

Functional Markers

	Description	For Use With	Pkg. Qty.	Cat. No.
	Functional Markers 256 markers (16 per card) printable on HTP500 thermal transfer printer and AMS 500 marking table 7 x 20 mm (0.276 x 0.787 in.)	700-EF	16	100-EFMS

Auxiliary Contacts

700-EF

Cat. No. 700...	Max 2 Pole Side Aux.	Max 1 Pole Front Aux.	Max 4 Pole Front Aux.	Timer	Mechanical Latch
EF310	1 (L)	2	—	1	1
EF220	1 (L) 1 (R)	4	1	1	1
EF400	—	—	—	—	—

	Location of welded N.O. contacts	State of N.C. Contacts if N.O. contact welds		
		Main	Front aux.	Side aux.
	Main	Open	Open	Open ⁽²⁾
Mechanically Linked Contacts ⁽¹⁾	Front aux.	Open	Open	—

(1) Side mounted auxiliary contacts provide “mirror contact” performance with main poles only.

(2) Defined in IEC 60947-5-1 annex L. Mechanically linked is a relationship between contacts of opposite types (i.e., N.O. and N.C.).

Contacts

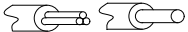
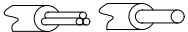
			700-EF	100-EF	100-ESA
Switching of AC Loads					
Rated Insulation voltage U_i			690V	690V	690V
Rated operational voltage U_e			690V	690V	690V
Rated impulse withstand voltage U_{imp}			6kV	6kV	6kV
AC-12 I_{th}	at 40 °C	[A]	16	16	16
	at 60 °C	[A]	—	—	—
AC-15 at rated voltage of	24V	[A]	6	6	6
	42/48V	[A]	6	6	6
	120V	[A]	6	6	6
	230V	[A]	4	4	4
	240V	[A]	4	4	4
	400V	[A]	3	3	3
	415V	[A]	3	3	3
	500V	[A]	2	2	2
	690V	[A]	2	2	2
Switching of DC Loads					
DC-13 switching electromagnets at	24V DC	[A]	6	6	6
	48V DC	[A]	2.8	2.8	2.8
	110V DC	[A]	0.55	0.55	0.55
	220V DC	[A]	0.27	0.27	0.27
	440V DC	[A]	0.13	0.13	0.13
Fuse gG					
Load Carrying Capacity per UL/CSA					
Rated voltage	AC	[V]	600	600	600
Continuous rating	40 °C	[A]	10	10	10
Switching capacity	AC		A 600	A 600	A 600
Rated voltage	DC	[V]	600	600	600
Continuous rating	40 °C	[A]	2.5	2.5	2.5
Switching capacity	DC		Q 600	Q 600	Q 600

General Specifications - 700-EF Relays

	Cat. No. 700-EF
Rated Insulation Voltage U_i	
IEC	690V
UL; CSA	600V
Rated Impulse Strength U_{imp}	
	6 kV
Rated Voltage U_e	
AC	24, 48, 120, 230, 400, 500, 690V
DC	24, 48, 110, 220, 440V
Short-Circuit Protection gG Fuse 10 A	
Rated Frequency	
	50/60 Hz, DC
Ambient Temperature	
Storage	-60...+80 °C (-76...+176 °F)
Operation at nominal current	-40...+70 °C (-40...+158 °F)
Altitude	
	3000 m
Mechanical Life	
	20 Mil
Electrical Life	
	1.5 Mil (AC-15 240V, 3A)
Type of Protection	
IP2X (IEC 60529 and DIN 40050)	in connected state
Shock Resistance	
	IEC 60068-2: Half sinusoidal shock 11 ms, 25G (in 3 directions)
Vibration Resistance	
	IEC 60068-2: Static >2 G, in normal position no malfunction <5 G
Standards Compliance	
	UL 508, CSA C22.2 No. 14, EN/IEC 60947-1, -5-1, RoHS
Certifications	
	cULus Listed, CE Marked, CCC Certified

Conductors

Cross Sections, Screw Type Terminals

700-EF/ 700S-EF			
Conductor Cross Sections—Main Contacts Terminal Type			(1)
	1 conductor	[mm ²]	0.75...6
	2 conductors	[mm ²]	0.75...6
	1 conductor	[mm ²]	1...6
	2 conductors	[mm ²]	1...6
Recommended torque		[N·m]	1.5
Cross Section per UL/CSA		[AWG]	16...10
Recommended torque		[lb·in]	13
Conductor Cross Sections- Coil and Auxiliary Contact Terminal Type			(1)
	1 conductor	[mm ²]	0.75...2.5
	2 conductors	[mm ²]	0.75...2.5
	1 conductor	[mm ²]	1...2.5
	2 conductors	[mm ²]	1...2.5
Recommended torque		[N·m]	1.2
Cross Section per UL/CSA		[AWG]	18...14
Recommended torque		[lb·in]	11

(1) Pozidriv No. 2 / Blade No. 3 screw.

Coil Data

700-EF/ 700S-EF			
Operating Limits			
50/60Hz	pick-up	[x Us]	0.85...1.1
	dropout	[x Us]	≤ 0.60
DC Control	pick-up	[x Us]	0.80...1.1
	dropout	[x Us]	≤ 0.60
Standard Coil			
24-60V AC, 20-60V DC (KJ)	pick-up	[VA]/[W]	50/50
	hold-in	[VA]/[W]	2.2/2
48...130V AC/DC (KY)	pick-up	[VA]/[W]	50/50
	hold-in	[VA]/[W]	2.2/2
100...250V AC/DC (KD)	pick-up	[VA]/[W]	50/50
	hold-in	[VA]/[W]	2.2/2
250...500V AC/DC (KN)	pick-up	[VA]/[W]	50/50
	hold-in	[VA]/[W]	2.2/2
Operating Times	closing delay	[ms]	40...95
	opening delay	[ms]	11...95
Energy-efficient Coil			
12-20V DC (EQ)	pick-up	[W]	12...16
	hold-in	[W]	1.7
24-60V AC, 20-60V DC (EJ)	pick-up	[VA]/[W]	16/12...16
	hold-in	[VA]/[W]	1.7/1.7
Operating Times	closing delay	[ms]	40...95
	opening delay	[ms]	11...95
High Energy Efficient Coil			
24V DC (QJ)	pick-up	[W]	6
	hold-in	[W]	1.7
Operating Times	closing delay	[ms]	27...53
	opening delay	[ms]	17...29

Contact Rating Table from EN 60947-5-1

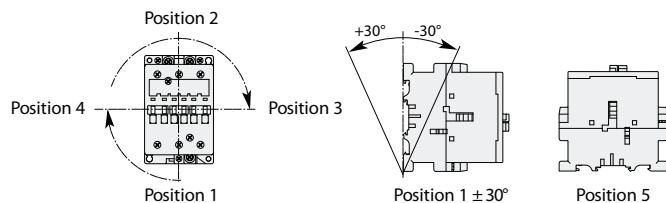
Examples of Contact Rating Designation Based on Utilization Categories										
NEMA Designation (1)	IEC Utilization Category	Conventional Thermal Current I_{the} (A)	Rated Operational Current I_e (A) at Rated Operational Voltage U_e						VA Rating	
AC			120V	240V	380V	480V	500V	600V	Make	Break
A150	AC-15	10	6	—	—	—	—	—	7200	720
A300	AC-15	10	6	3	—	—	—	—	7200	720
A600	AC-15	10	6	3	1.9	1.5	1.4	1.2	7200	720
B150	AC-15	5	3	—	—	—	—	—	3600	360
B300	AC-15	5	3	1.5	—	—	—	—	3600	360
B600	AC-15	5	3	1.5	0.95	0.75	0.72	0.6	3600	360
C150	AC-15	2.5	1.5	—	—	—	—	—	1800	180
C300	AC-15	2.5	1.5	0.75	—	—	—	—	1800	180
C600	AC-15	2.5	1.5	0.75	0.47	0.375	.035	0.3	1800	180
D150	AC-15	1.0	0.6	—	—	—	—	—	432	72
D300	AC-14	1.0	0.6	0.3	—	—	—	—	432	72
E150	AC-14	0.5	0.3	—	—	—	—	—	216	36
DC			125V	250V	440V	500V	600V	—	Make	Break
N150	DC-13	10	2.2	—	—	—	—	—	275	275
N300	DC-13	10	2.2	1.1	—	—	—	—	275	275
N600	DC-13	10	2.2	1.1	0.63	0.55	0.4	—	275	275
P150	DC-13	5	1.1	—	—	—	—	—	138	138
P300	DC-13	5	1.1	0.55	—	—	—	—	138	138
P600	DC-13	5	1.1	0.55	0.31	0.27	0.2	—	138	138
Q150	DC-13	2.5	0.55	—	—	—	—	—	69	69
Q300	DC-13	2.5	0.55	0.27	—	—	—	—	69	69
Q600	DC-13	2.5	0.55	0.27	0.15	0.13	0.1	—	69	69
R150	DC-13	1.0	0.22	—	—	—	—	—	28	28
R300	DC-13	1.0	0.22	0.1	—	—	—	—	28	28

(1) This letter stands for the conventional thermal current and identifies AC or DC: for example, B=5 A AC. The number that follows is the rated insulation voltage.

Approximate Dimensions

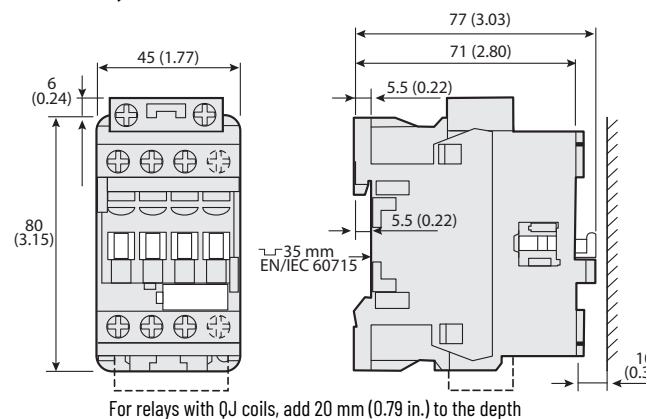
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Mounting Position 700-EF Relays

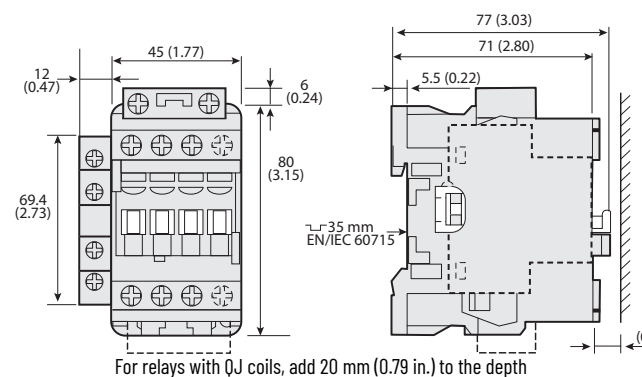


700-EF Relays

700-EF Relays with Standard Coils

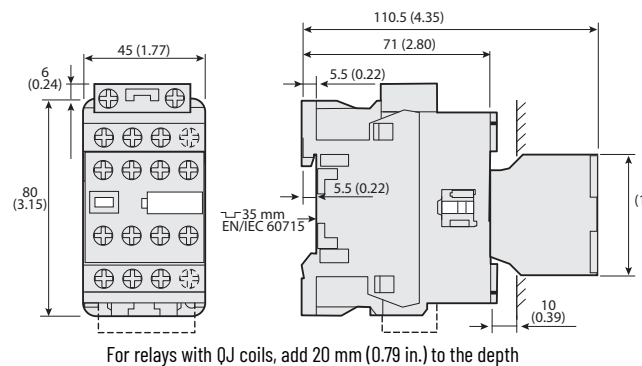
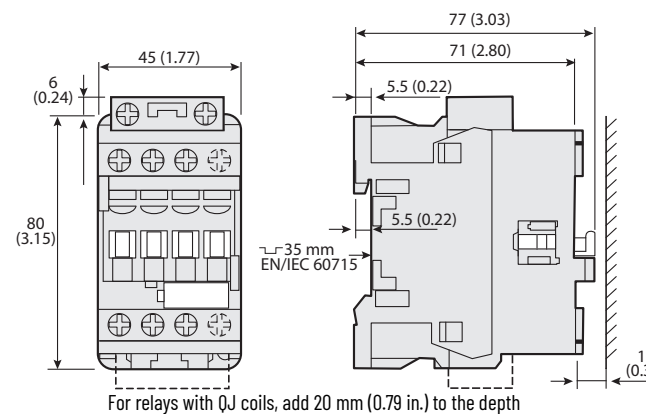


700-EF Relays with Standard Coils and Side-mounted Auxiliary Contact

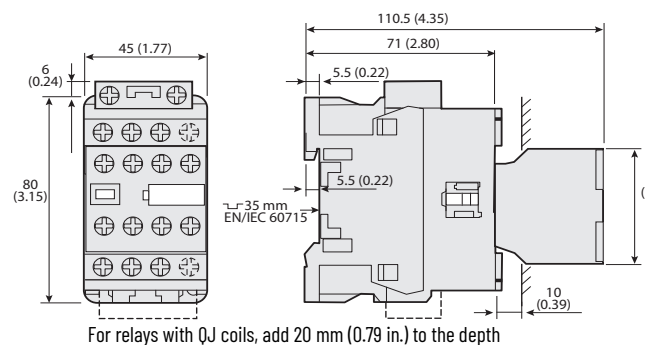


700-EF Relays with Low-consumption Coils and Front-mounted Auxiliary Contact

700-EF Relays with Low-consumption Coils



700-EF Relays with Standard Coils and Front-mounted Auxiliary Contact



700-EF Relays with Low-consumption Coils and Side-mounted Auxiliary Contact

