



**Bulletin 700-CF**

- IEC industrial relays
- Mechanically linked contact performance per IEC 60947-5-1
- Gold plated, bifurcated version for low level switching applications
- Master control relay version rated 15 A (AC-15)
- Solid-state and pneumatic timing modules
- 4-...10 Poles

**Certifications**

cULus Listed (File No. E14840, Guide NKCR/NKCR7)  
 CE Marked  
 CCC Certified

**Table of Contents**

Product Selection..... this page  
 Accessories..... 9-150  
 Specifications..... 9-155  
 Approximate Dimensions..... 9-157  
**Standards Compliance**  
 UL 508  
 CSA C22.2 No. 14  
 EN/IEC 60947-1, -5-1

**4-Pole AC Coil Voltage (Ratings for 700-CF Only)**

AC-12		AC-15							Connection Diagrams	Contacts		Standard Contacts Cat. No.	Gold Plated Bifurcated Contacts Cat. No.*	Master Contacts Cat. No.*
<i>I<sub>th</sub></i> [A]		<i>I<sub>th</sub></i> [A]								N.O.	N.C.			
40 °C	60 °C	24/48V	120V	240V	400V	500V	600V	690V						
20	20	10	10	10	6	2.5	1	1		2	2	700-CF220⊗	700-CFB220⊗	<b>700-CFM220⊗</b>
										3	1	<b>700-CF310⊗</b>	700-CFB310⊗	<b>700-CFM310⊗</b>
										4	0	<b>700-CF400⊗</b>	700-CFB400⊗	700-CFM400⊗
										0	4	<b>700-CF040⊗</b>	<b>700-CFB040⊗</b>	—

⊗ **AC Coil Voltage Code**

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 700-CF220⊗** becomes **Cat. No. 700-CF220D** for 120V, 60 Hz

[V]	12	24	32	36	42	48	100	100	110	120	127	200	200	208	240	230	230	240	240	277	347	380	380	400	400	415	440	480	500	550	600
50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	L	—	—	F	—	VA	T	—	—	—	N	—	G	B	—	M	C	—	
60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	H	L	—	—	—	A	T	I	E	—	—	—	N	B	—	—	C	
50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	—	KG	KL	—	—	—	—	KA	—	—	—	—	—	KN	—	KB	—	—	—	

**4-Pole DC Coil Voltage (Ratings for 700-CF Only)**

AC-12		AC-15							Connection Diagrams	Contacts		Standard Contacts Cat. No.	Gold Plated Bifurcated Contacts Cat. No.*	Master Contacts Cat. No.*
<i>I<sub>th</sub></i> [A]		<i>I<sub>th</sub></i> [A]								N.O.	N.C.			
40 °C	60 °C	24/48V	120V	240V	400V	500V	600V	690V						
20	20	10	10	10	6	2.5	1	1		2	2	700-CF220⊗	700-CFB220⊗	<b>700-CFM220⊗</b>
										3	1	<b>700-CF310⊗</b>	700-CFB310⊗	<b>700-CFM310⊗</b>
										4	0	<b>700-CF400⊗</b>	700-CFB400⊗	700-CFM400⊗

\* Ratings for Bulletin 700-CF and 700-CFM are on page 9-155.

⊗ **DC Coil Voltage Code\***

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. example: **Cat. No. 700-CF220⊗** becomes **Cat. No. 700-CF220ZJ** for 24V DC

[V]	9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
Standard	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	ZP	ZS	ZA	ZF	ZT
Standard diode	—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—
Electronic with diode	—	—	EJ	—	—	—	—	—	—	—	—	—	—	—	—

\* When ordering DJ coil with built-in surge suppression, the DJ is not polarity sensitive. Drop out time: 14...20 ms.

6- and 8-Pole Relays



Cat. No. 700-CFZ 1420



Cat. No. 700-CFZ 0530

Control Relays with Overlapping Side-Mounted Contacts

AC-12			AC-15							Left Aux.	Relay Arrangement	Right Aux.	Contacts		Overlapping Side-Mounted Contacts		Cat. No.	
$I_{th}$ [A]		40 °C	60 °C	24/48V	120V	240V	400V	500V	600V				690V	N.O.	N.C.	N.O.		N.C.
Main Relay	20	20	10	10	10	6	2.5	1	1			4	0	1	1	700-CFZ1510⊗		
												3	1	1	1	700-CFZ1420⊗		
Side Contacts	10	10	6	6	5	3	1.6	1	1			2	2	1	1	700-CFZ1330⊗		
												4	0	2	2	700-CFZ2620⊗		
												3	1	2	2	700-CFZ2530⊗		
												2	2	2	2	700-CFZ2440⊗		

Control Relays with Standard Side-Mounted Contacts

AC-12			AC-15							Left Aux.	Relay Arrangement	Right Aux.	Contacts		Standard Side-Mounted Contacts		Cat. No.	
$I_{th}$ [A]		40 °C	60 °C	24/48V	120V	240V	400V	500V	600V				690V	N.O.	N.C.	N.O.		N.C.
Main Relay	20	20	10	10	10	6	2.5	1	1			4	0	1	1	700-CFZ0510⊗		
												3	1	1	1	700-CFZ0420⊗		
												2	2	1	1	700-CFZ0330⊗		
Side Contacts	10	10	6	6	5	3	1.6	1	1			4	0	2	2	700-CFZ0620⊗		
												3	1	2	2	700-CFZ0530⊗		
												2	2	2	2	700-CFZ0440⊗		





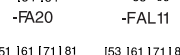
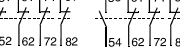

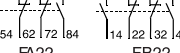
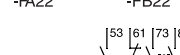
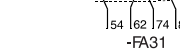
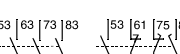
⊗ AC Coil Voltage Code








The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 700-CFZ0510**⊗ becomes **Cat. No. 700-CFZ0510F**.

[V]	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	208	240	220-230	230	240	240	277	347	380	380-400	400	400-415	440	480	500	550	600
50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	L	—	—	F	—	VA	T	—	—	—	N	—	G	B	—	M	C	—
60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	H	L	—	—	—	A	T	I	E	—	—	—	N	B	—	—	C
50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	KL	—	—	KL	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	



**Auxiliary Contacts**

	Description	N.O.	N.C.	Connection Diagrams	For Use With	Standard Contacts	Bifurcated Contacts
						Cat. No.	Cat. No.
 <b>Auxiliary Contact Blocks for Front Mounting</b> * 2- and 4-pole Quick and easy mounting without tools Electronic-compatible contacts down to 17V, 5 mA Mechanically linked performance between N.O. and N.C. poles and to the main contactor poles (except for L types) Models with equal function with several terminal numbering choices 1L = Late break N.C./early make N.O. Bifurcated version for switching down to 8V, 5 mA	0	2		700-CF	100-FA02	100-FAB02	
	1	1			100-FA11	100-FAB11	
	2	0			100-FA20	100-FAB20	
	1L	1L			100-FAL11	—	
	0	4			100-FA04	100-FAB04	
	1	3			100-FA13	100-FAB13	
	2	2			100-FA22	100-FAB22	
	3	1			100-FA31	100-FAB31	
	4	0			100-FA40	100-FAB40	
	1+1 L	1+1 L			100-FAL22	—	

	Description	N.O.	N.C.	Connection Diagrams	For Use With	Cat. No.
 <b>Auxiliary Contact Blocks for Side Mounting without Sequence Terminal Designations</b> * 1- and 2-pole Two-way numbering for right or left mounting on the contactor Quick and easy mounting without tools Electronic-compatible contacts down to 17V, 10 mA Mirror contact performance to the main contactor poles 1L = Late break N.C./early make N.O.	0	1		700-CF	100-SA01	
	1	0			100-SA10	
	0	2			100-SA02	
	1	1			100-SA11	
	2	0			100-SA20	
	1L	1L			100-SAL11	

\* Control relay and auxiliary contact.  
 † Up to 6 auxiliary contacts may be mounted (a maximum of 4 N.C. contacts and a maximum of 2 N.O. contacts).  
 ‡ Maximum no. of contacts: Refer to the following tables.





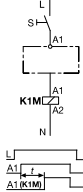

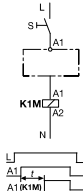
Cat. No. 700...	Max. N.O. Side Aux.	Max. N.C. Side Aux.	Max. N.O. Front + Side Aux.	Max. N.C. Front + Side Aux.	Max. N.O. + N.C. Front + Side Aux.
CF400	2	4	6	4	6
CF310	2	4	6	4*	6
CF220	2	4	6	4*	6
CF040	2	4	4	4*	6

Cat. No. 700...	Max. N.O. Side Aux.	Max. N.C. Side Aux.	Max. N.O. + N.C. Side Aux.	Max. N.O. Front Aux.	Max. N.C. Front Aux.
CF400	2	2	2	4	4
CF310	2	2	2	4	3
CF220	2	2	2	4	2

Cat. No. 700...	Max. N.O. Side Aux.	Max. N.C. Side Aux.	Max. N.O. + N.C. Side Aux.	Max. N.O. Front Aux.	Max. N.C. Front Aux.
CF400	2	2	4	4	2
CF310	2	2	4	4	2
CF220	2	2	4	4	2


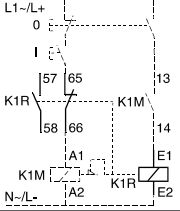
\* Side mounted auxiliary contacts only.  
 † Side or front mounted auxiliary contacts only, not both.


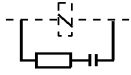
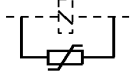
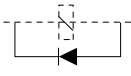
Control Modules

	Description	Connection Diagrams	Reset Time	Repeat Accuracy	Delay	For Use With	Cat. No.
	<b>Pneumatic Timing Modules* ON-Delay</b> Pneumatic timing element contacts switch after the delay time. The contacts on the main control relay continue to operate without delay.		25...90 ms for AC Coils	+/-10%	0.3...30 s	700-CF all*	<b>100-FPTA30</b>
					1.8...180 s		<b>100-FPTA180</b>
	<b>Pneumatic Timing Modules OFF-Delay</b> Pneumatic timing element contacts switch after the delay time. The contacts on the main control relay continue to operate without delay.		47...85 ms for DC coils		0.3...30 s		<b>100-FPTB30</b>
					1.8...180 s		<b>100-FPTB180</b>
	<b>Electronic Timing Modules — On-Delay</b> Delay of the control relay coil assembly. The control relay is energized at the end of the delay time.		100 ms	+/-1%	0.1...3 s	700-CF 110...240V AC 110...250V DC coils	<b>100-ETA3</b>
					1...30 s		<b>100-ETA30</b>
					10...180 s		<b>100-ETA180</b>
					0.1...3 s	700-CF 24...48V DC coils	<b>100-ETAZJ3</b>
1...30 s	<b>100-ETAZJ30</b>						
10...180 s	<b>100-ETAZJ180</b>						
 <b>Cat. No. 100-ETB30</b>	<b>Electronic Timing Modules — Off-Delay</b> Delay of the control relay coil assembly. After interruption of the control signal, the control relay is deenergized at the end of the delay time.		100 ms	+/-1%	0.3...3 s	700-CF 110...240V AC coils	<b>100-ETB3</b>
					1...30 s		<b>100-ETB30</b>
					10...180 s		<b>100-ETB180</b>
					0.3...3 s	700-CF 24V AC coils	<b>100-ETBKJ3</b>
					1...30 s		<b>100-ETBKJ30</b>
					10...180 s		<b>100-ETBKJ180</b>

\* Cannot be used with side-mounted auxiliary contacts on DC coil relays.

**Control Modules, Continued**

	Description	Connection Diagrams	For Use With	Cat. No.
 <b>Cat. No. 100-FL</b>	<b>Mechanical Latch</b> Following relay latching, the relay coil is immediately de-energized (off) by the N.C. auxiliary contact (65-66). Electrical or manual release 1 N.O. + 1 N.C. auxiliary contacts		700-CF with AC coils	<b>100-FL11</b>


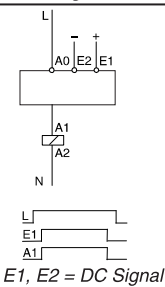
	Description		Connection Diagrams	For Use With	Cat. No.
 <b>Surge Suppressors</b> For limitation of coil switching transients. Plug-in, coil mounted	<b>RC Module</b> AC Operating Mechanism	24...48V 50/60 Hz		700-CF with AC coils	<b>100-FSC48</b>
		110...280V 50/60 Hz			<b>100-FSC280</b>
		380...480V 50/60 Hz			<b>100-FSC480</b>
	<b>Varistor Module</b> AC/DC Operating Mechanism	12...55V AC/ 12...77V DC		700-CF all	<b>100-FSV55</b>
		56...136V AC/ 78...180V DC			<b>100-FSV136</b>
		137...277V AC/ 181...350V DC			<b>100-FSV277</b>
	278...575V AC	<b>100-FSV575</b>			
<b>Diode Module</b> DC Operating Mechanism Dropout Time 70...95 ms	12...250V DC		700-CF with DC coils	<b>100-FSD250</b>	

⊗ **Coil Voltage Code**

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 100-FL11**⊗ becomes **Cat. No. 100-FL11J**.\*

[V]	24	48	100	110	120	230-240	240	277	380-400	400-415	440	480
50 Hz	K	Y	KP	D	—	VA	T	—	N	G	B	—
60 Hz	J	—	—	—	D	—	A	T	—	—	N	B



\* For special voltages, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

	Description (Relays)	Connection Diagrams	For Use With (Relays)	Cat. No.
  <b>Cat. No. 100-JE</b>	<b>DC Interface</b> (electronic) Interface between the DC control signal (PLC) and the AC operating mechanism of the control relay. Control (input) voltage 12V DC 18...30V DC (24V nominal) 48V DC Requires no additional surge suppression on the relay coils	 <i>E1, E2 = DC Signal</i>	700-CF with 110...240V AC coils	<b>100-JE</b>
				<b>100-JE12</b>
				<b>100-JE48</b>

	Cat. No. 100-JE	Cat. No. 100-JE12	Cat. No. 100-JE48		
<b>Electrical</b>					
Input Voltage	24V DC	12V DC	48V DC		
Input Voltage Range	18...30V DC	6...12V DC	35...48V DC		
Output Voltage	110...240V DC	110...240V DC	110...240V DC		
Power Consumption	0.1...0.4 W	0.02...0.12 W	0.2...0.5 W		
Minimum Actuation	5V DC, 2 mA DC	5V DC, 2 mA DC	5V DC, 2 mA DC		
<b>Mechanical</b>					
Finger Protection	IP20	IP20	IP20		
Pickup Time	0...10 ms + pickup time of the contactor	0...10 ms + pickup time of the contactor	0...10 ms + pickup time of the contactor		
Dropout Time	0...10 ms + dropout time of the contactor	0...10 ms + dropout time of the contactor	0...10 ms + dropout time of the contactor		
Max. Cycles Per Second	2*	2*	2*		
Isolation/Breakdown Voltage	In: 50V, Out: 250V	In: 50V, Out: 250V	In: 50V, Out: 250V		
Rated Impulse Withstand Voltage	4 kV	4 kV	4 kV		
<b>Environmental</b>					
Ambient Temperature Range	-25...60 °C	-25...60 °C	-25...60 °C		
Storage Temperature Range	-50...+80 °C	-50...80 °C	-50...80 °C		
Operating Life	100+ million ops	100+ million ops	100+ million ops		
<b>Construction</b>					
Wire Size Range	Flexible wire	1 Wire	0.5...2.5 mm <sup>2</sup>	0.5...2.5 mm <sup>2</sup>	0.5...2.5 mm <sup>2</sup>
		2 Wire	0.75...2.5 mm <sup>2</sup>	0.75...2.5 mm <sup>2</sup>	0.75...2.5 mm <sup>2</sup>
	Solid wire	1 Wire	1.0...2.5 mm <sup>2</sup>	1.0...2.5 mm <sup>2</sup>	1.0...2.5 mm <sup>2</sup>
		2 Wire	1.0...2.5 mm <sup>2</sup>	1.0...2.5 mm <sup>2</sup>	1.0...2.5 mm <sup>2</sup>
	Solid and Stranded		18...14 AWG	18...14 AWG	18...14 AWG
Tightening Torque		1...1.5 N•m/7...15 lb•in	1...1.5 N•m/7...15 lb•in	1...1.5 N•m/7...15 lb•in	
Type of Light		LED	LED	LED	



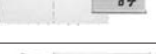

\* To consider the maximum operations/hour of the relays.

**Assembly Components**

	Description	For Use With	Pkg. Quantity*	Cat. No.
 Cat. No. 100-SCCA	<b>Protective Covers</b> Provides protection against unintended manual operation	700-CF all	1	100-SCCA
 Cat. No. 100-SCFA	<b>Protective Covers</b> Provides protection against unintended manual operation For front mounted auxiliary contacts, pneumatic timers and latches	100-FA, -FB, -FC, -FP, -FL;	10	100-SCFA

**Marking Systems**

Uniform labelling materials for contactors, motor startup equipment, relays, and circuit breakers.

	Description	Pkg. Quantity*	Cat. No.
 #32	<b>Label Sheet</b> 105 self-adhesive paper labels each, 6 x 17 mm	10	100-FMS
 #4	<b>Marking Tag Sheet</b> 160 perforated paper labels each, 6 x 17 mm To be used with a transparent cover	10	100-FMP
	<b>Transparent Cover</b> To be used with marking tag sheets	100	100-FMC
 #1, #23	<b>Marking Tag Adapters</b> To be used with marking tag: System 1492 W	100	100-FMA1 100-FMA2

\* Must be ordered in multiples of package quantities.

**Coils**


	AC Coil Code	AC Voltages			Cat. No. 700-CF	DC Coil Code	DC Voltages	Cat. No. 700-CF
		50Hz	60Hz	50/60Hz				
	Q	—	12V	—	<b>TA006</b>	ZR	9V	<b>TA766</b>
	R	12V	—	—	<b>TA404</b>	ZQ	12V	<b>TA708</b>
	J	—	24V	—	<b>TA013</b>	DJ	24V Diode	<b>TA714M</b>
	K	24V	—	—	<b>TA407</b>	ZJ	24V	<b>TA714</b>
	KJ	—	—	24V	<b>TA855</b>	ZW	36V	<b>TA719</b>
	V	32V	36V	—	<b>TA481</b>	ZY	48V	<b>TA724</b>
	W	36V	—	—	<b>TA410</b>	ZZ	60V	<b>TA774</b>
	X	42V	48V	—	<b>TA482</b>	ZB	64V	<b>TA727</b>
	Y	48V	—	—	<b>TA414</b>	ZG	72V	<b>TA728</b>
	KY	—	—	48V	<b>TA860</b>	ZE	80V	<b>TA729</b>
	KP	100V	100 - 110V	100V	<b>TA861</b>	ZD	110V	<b>TA733</b>
	D	110V	120V	—	<b>TA473</b>	ZP	115V	<b>TA734</b>
	KD	—	—	110V	<b>TA856</b>	ZS	125V	<b>TA737</b>
	P	120V	—	—	<b>TA425</b>	ZA	220V	<b>TA747</b>
	S	127V	—	—	<b>TA428</b>	ZF	230V	<b>TA749</b>
	KG	200V	200 - 220V	200V	<b>TA862</b>	ZT	250V	<b>TA751</b>
	H	—	208V	—	<b>TA049</b>	—	—	—
	L	200 - 220V	208 - 240V	—	<b>TA296</b>	—	—	—
	KL	—	—	200 - 230V	<b>TA864</b>	—	—	—
	A	220V	240V	—	<b>TA474</b>	—	—	—
	F	220 - 230V	260V	—	<b>TA441</b>	—	—	—
	KF	—	—	230V	<b>TA851</b>	—	—	—
	VA	230 - 240V	—	—	<b>TA440</b>	—	—	—
	T	240V	277V	—	<b>TA480</b>	—	—	—
	KA	—	—	240V	<b>TA858</b>	—	—	—
	I	—	347V	—	<b>TA065</b>	—	—	—
	E	—	380V	—	<b>TA067</b>	—	—	—
	N	380 - 400V	440V	—	<b>TA071</b>	—	—	—
	KN	—	—	400V	<b>TA863</b>	—	—	—
	G	400-415V	—	—	<b>TA457</b>	—	—	—
	B	440V	480V	—	<b>TA475</b>	—	—	—
	KB	—	—	440V	<b>TA859</b>	—	—	—
	M	500V	—	—	<b>TA479</b>	—	—	—
	C	550V	600V	—	<b>TA476</b>	—	—	—






General

		Main Relay Cat. Nos. 700-CF, 700S-CF	Front Mounted Standard Auxiliary Contacts	Main Relay Cat. No. 700-CFB, 700S-CFB	Master Relay Cat. No. 700-CFM	Front Mounted Bifurcated Auxiliary Contacts	Side-mounted Auxiliary Contacts
Contact Ratings — NEMA		A600, P600	A600, Q600	A600, Q600	2 x A600, P600	A600, Q600	A600, Q600
Min. Contact Rating		17V, 10 mA	17V, 5 mA	8V, 5 mA	—	5V, 3 mA	17V, 10 mA
Contact Ratings — IEC AC-15 (solenoids, contactors) at rated voltage IEC 60947-5-1	24V	10 A	6 A	3 A	15 A	3 A	6 A
	48V	10 A	6 A	3 A	15 A	3 A	6 A
	120V	10 A	6 A	3 A	15 A	3 A	6 A
	240V	10 A	5 A	3 A	15 A	3 A	5 A
	400V	6 A	3 A	2 A	7.5 A	2 A	3 A
	480V/500V	2.5 A	1.6 A	1.2 A	5 A	1.2 A	1.6 A
	600V	1 A	1 A	0.7 A	2 A	0.7 A	1 A
AC-12 (Control of resistive loads) IEC 60947-5-1	40 °C	<b>I<sub>th</sub></b>	20 A	10 A	10 A	20 A	10 A
		230V	8 kW				
		400V	14 kW				
		690V	24 kW				
	60 °C	<b>I<sub>th</sub></b>	20 A	6 A	6 A	20 A	6 A
		230V	8 kW				
		400V	14 kW				
		690V	24 kW				
DC-12 Switching DC Loads L/R < 1ms, Resistive Loads IEC 60947-5-1	24V	15 A	10 A	6 A	20 A	6 A	6 A
	48V	10 A	9 A	3.2 A	20 A	3.2 A	3.2 A
	110V	6 A	3.5 A	1 A	8 A	1 A	1 A
	220V	1 A	0.7 A	0.5 A	1.5 A	0.5 A	0.5 A
	440V	0.4 A	0.2 A	0.2 A	0.4 A	0.2 A	0.2 A
DC-13 IEC 60947-5-1, Solenoids and contactors	24V	5 A	5 A	2.5 A	5 A	2.5 A	5 A
	48V	3 A	3 A	1.5 A	3 A	1.5 A	3 A
	110V	1.2 A	1.2 A	0.6 A	1.2 A	0.6 A	1.2 A
	220V	0.6 A	0.6 A	0.3 A	0.6 A	0.3 A	0.6 A
	440V	0.3 A	0.15 A	0.15 A	0.3 A	0.15 A	0.15 A

\* Side mounted auxiliary contacts provide “mirror contact” performance with main poles only.

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

\* 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.).

		Cat. No. 700S-CF	Aux. Contact (Front-mounted)
Mechanical Life	[Mil]	15	15
Electrical Life	AC-15 (240V, 3 A) [Mil]	1.5	1.5
Weight	AC Coil [g]	390	—
Terminal Cross-Sections			
Terminal Type			
Terminal Size per IEC 947-1		2 x A4	2 x A4
	Solid/	1 Conductor	[mm <sup>2</sup> ]
	Stranded‡	2 Conductor	[mm <sup>2</sup> ]
Max. Wire Size per UL/CSA		[AWG]	16...10
Tightening Torque		[lb-in]	13.3...22
Tightening Torque		[N-m]	1.5...2.5

‡ For 16 or more strands, end ferrule is required

DC Switching Ratings for 700S-CF Main Poles in Series (Resistive Load at 60 °C)			
	1 pole	2 poles	3 poles
<b>24/48V</b>	25/20 A	25 A	25 A
<b>125V</b>	6 A	25 A	25 A
<b>220V</b>	1.5 A	8 A	25 A
<b>440V</b>	0.4 A	1 A	3 A

**Control Circuit**

			Cat. No. 700-CF
<b>Operating Voltage</b>			
AC 50/60 Hz	Pickup	[x U <sub>s</sub> ]	0.85...1.1
	Dropout	[x U <sub>s</sub> ]	0.3...0.6
DC*	Pickup	[x U <sub>s</sub> ]	0.8...1.1
	Dropout	[x U <sub>s</sub> ]	0.1...0.6
<b>Coil Consumption</b>			
AC 50/60 Hz	Inrush	[VA/W]	70/50
	Seal	[VA/W]	8/2.6
DC	Inrush/Seal	[W]	6.5
<b>Operating Times</b>			
AC 50/60 Hz	Pickup Time	[ms]	15...30
	Dropout Time	[ms]	10...60
DC	Pickup Time	[ms]	40...70
	Dropout Time	[ms]	7...15
<b>Latch Attachment Release, 100-FL</b>			
Coil Consumption	AC	[VA/W]	45 VA/40W
	DC	[W]	25 W
<b>Contact Signal Duration</b>		[min./max]	0.03...15 s
<b>Timing Attachment</b>			
Reset Time, 100-ETA, 100-ETB			
at min. time setting	[ms]		10
at max. time setting	[ms]		70
	Repeat Accuracy		± 10%

\* For 9V DC, code ZR, use operating voltage 0.65...1.3 x U<sub>s</sub>.  
 For 24V DC, code ZJ or DJ, use operating voltage 0.7...1.25 x U<sub>s</sub>.

**Utilization Category Table from EN 947-5-1**

Verification of Making and Breaking Capacities of Switching Elements Under Normal Conditions  
 Corresponding to the Utilization Categories\*

Utilization Category	Normal Condition of Use								
	Make‡			Break‡			Number and Rate of Making and Breaking operations		
	I/I <sub>e</sub>	U/U <sub>e</sub>	cos ψ	I/I <sub>e</sub>	U/U <sub>e</sub>	cos ψ	No. operating cycles§	Operating cycles per minute	ON time [s]➤
AC-12‡	1	1	0.9	1	1	0.9	6050	6	0.05
AC-13‡	2	1	0.65	1	1	0.65	6050	6	0.05
AC-14‡	6	1	0.3	1	1	0.3	6050	6	0.05
AC-15‡	10	1	0.3	1	1	0.3	6050	6	0.05
DC	—	—	T <sub>0.95</sub>	—	—	T <sub>0.95</sub>	—	—	—
DC-12	1	1	1 ms	1	1	1	6050	6	0.05➤
DC-13	1	1	6 x P*	1	1	6 x P*	6050	6	0.05➤
DC-14‡	10	1	15 ms	1	1	15	6050	—	0.05➤

I<sub>e</sub> Rated operational current

U<sub>e</sub> Rated operational voltage I Current to be made or broken

PU<sub>e</sub>I<sub>e</sub> Steady-state power consumption (W)

T<sub>0.95</sub> Time to reach 95% of the steady-state current (ms) U Voltage before make

\* See sub-clause 8.3.3.5.2.

‡ For tolerances on test quantities, see sub-clause 8.3.2.2.

§ The first 50 operating cycles shall be run at U/U<sub>e</sub>=1.1 with the loads set at U<sub>e</sub>.

♣ The value "6 x P" results from an empirical relationship which is found to represent most DC magnetic loads to an upper limit of P = 50 W, e.g., 6 x P= 300 W.

➤ The ON time shall be at least equal to T<sub>0.95</sub>.

‡ Where the break current differs from the make current value, the ON time refers to the make current value after which the current is reduced to the break current value for a suitable period e.g., 0.05 s.

**General**

		Cat. No. 700-CF
<b>Rated Insulation Voltage U<sub>i</sub></b>		
IEC		690 V
UL; CSA		600 V
<b>Rated Impulse Strength U<sub>imp</sub></b>		8 kV
High Test Voltage 1 minute (per IEC 60947-4)		2500V
<b>Rated Voltage U<sub>e</sub></b>		
AC		115, 230, 400, 500, 690V
DC		24, 48, 110, 220, 440V
Short-Circuit Protection gG Fuse 10 A		
<b>Rated Frequency</b>		50/60 Hz, DC
<b>Ambient Temperature</b>		
Storage		-55...+80 °C (-67...176 °F)
Operation at nominal current		-25...+60 °C (-13...140 °F)
Conditioned 15% current reduction after AC-1 at > 60 °C		-25...+70 °C (-13...158 °F)
<b>Corrosion Resistance</b>		humid-alternating climate, cyclic, per IEC 68-2-30 and DIN 50 016, 56 cycles
<b>Altitude</b>		2000 m above mean sea level, per IEC 947-4
<b>Type of Protection</b>		
IP2X (IEC 60529 and DIN 40050)		in connected state
Shock Resistance		IEC 68-2: Half sinusoidal shock 11 ms, 30 G (in 3 directions)
Vibration Resistance		IEC 68-2: Static >2 G, in normal position no malfunction <5 G

Contact Rating Table from EN 60947-5-1

Examples of Contact Rating Designation Based on Utilization Categories

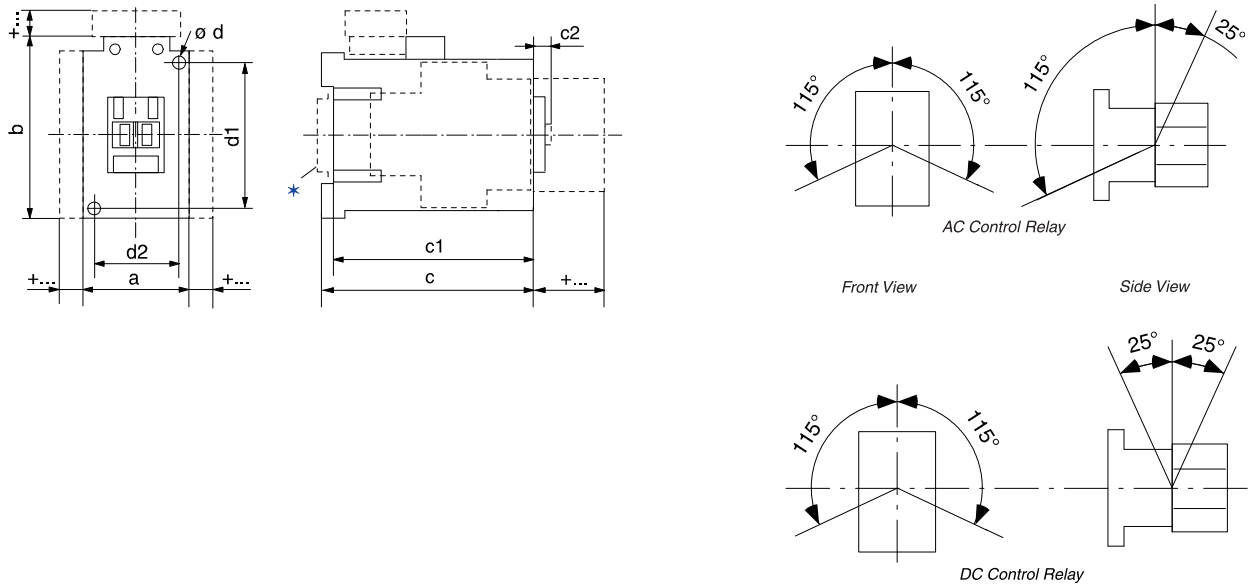
NEMA Designation *	IEC Utilization Category	Conventional Thermal Current $I_{the}$ (A)	Rated Operational Current $I_e$ (A) at Rated Operational Voltage $U_e$						VA Rating	
			120V	240V	380V	480V	500V	600V	Make	Break
AC			120V	240V	380V	480V	500V	600V	Make	Break
A150	AC-15	10	6	—	—	—	—	—	7200	720
A300	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	0.35	0.3	1800	180
D150	AC-14	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	—	—	—
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

\* This letter stands for the conventional thermal current and identifies AC or DC: e.g., B = 5 A AC. The number that follows is the rated insulation voltage.

**Bulletin 700-CF**  
**Industrial Relays**  
**Approximate Dimensions**

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

**Mounting Position**



**AC and DC EJ Control Relays**

Type	a	b	c	c1	c2	Ød	d1	d2
700-CF, CFB	45 (1-25/32)	81 (3-3/16)	80.5 (3-11/64)	75.5 (3-3/32)	6 (1/4)	2 screws 4.5 (3/16)	60 (2-23/64)	35 (1-25/64)

\* May be mounted to 35 mm EN 50 022 DIN Rail.

**DC Control Relays**

Type	a	b	c	c1	c2	Ød	d1	d2
700-CF, CFB	45 (1-25/32)	81 (3-3/16)	106.5 (4-3/16)	101.5 (4)	6 (1/4)	2 screws 4.5 (3/16)	60 (2-23/64)	35 (1-25/64)

**Accessories**

Relay with		AC Control Relay		DC Control Relay	
		mm	(inches)	mm	(inches)
Auxiliary Contact for Front Mounting	2- or 4-pole	c/c1 + 39	(c/c1 + 1 - 37/64)	c/c1 + 39	c/c1 + 1 - 37/64)
Auxiliary Contact for Side Mounting	1- or 2-pole	a + 9	(a + 23/64)	a + 9	(a + 23/64)
Pneumatic Timing Module	—	c/c1 + 58	(c/c1 + 2 - 23/64)	—	—
Solid-state Timing Module	on coil terminal side	b + 24	(b + 15/16)	b + 24	(b + 15/16)
Mechanical Latching	—	c/c1 + 61	(c/c1 + 2 - 31/64)	—	—
Interface	on coil terminal side	b + 9	(b + 23/64)	—	—
Protective Element	on coil terminal side	b + 3	(b + 1/8)	b + 3	(b + 1/8)
Labelling with:	label sheet	+0	(+0)	+0	(+0)
—	marking tag with cover	+0	(+0)	+0	(+0)
—	marking tag carrier for System V4/V5	+5.5	(+7/32)	+5.5	(+7/32)
—	marking tag carrier for System Bull. 1492W	+5.5	(+7/32)	+5.5	(+7/32)



**Description**

Bulletin 700S-CF Safety Control Relays provide mechanically or mirror contact performance, which are required in feedback circuits for safety applications. Bifurcated contacts are ideal for low energy feedback safety circuits where high contact reliability is required.

**Features**

- IEC industrial safety relay
- Mechanically linked contacts as per IEC 60947-5-1
- Third party certification SUVA
- Red cover and mechanically linked contact symbol on front face
- Gold plated, bifurcated version for low level switching applications
- Permanently fixed front mounted auxiliary contact block

**Table of Contents**

Product Selection..... this page  
 Specifications..... 9-161  
 Approximate Dimensions..... 9-162

**Standards Compliance**

EN/IEC 60947-1, -5-1  
 UL 508  
 CSA C22.2 No. 14

**Certifications**

cULus Listed (File No. E14840,  
 Guide NKCR/NKCR7)  
 CE Marked  
 CCC Certified

**Type CF and CFB Safety Control Relays — 8-Pole AC Coil Voltage**

AC-12			AC-15							Contacts		Standard Contacts (Main) Gold-Plated Bifurcated (Front) Cat. No.	Gold-Plated Bifurcated, All Contacts Cat. No.*		
$I_e$ [A]		$I_e$ [A]	$I_e$ [A]							Connection Diagrams					
40 °C	60 °C		24/48V	120V	240V	400V	500V	600V	690V	Main Contacts	Auxiliary Contacts			N.O.	N.C.
Main Contacts	20	20	10	10	10	6	2.5	1	1			4	4	<b>700S-CF440BC</b>	<b>700S-CFB440BC</b>
Adder Deck Contacts	10	6	6	6	5	3	1.6	1	1			5	3	<b>700S-CF530BC</b>	<b>700S-CFB530BC</b>
												6	2	<b>700S-CF620BC</b>	<b>700S-CFB620BC</b>

\* Ratings for Bulletin 700CFB and CFM are on page 9-161

**⊗ AC Coil Voltage Code**

The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **Cat. No. 700S-CF440BC** becomes **Cat. No. 700S-CF440DC** for 120V, 60 Hz.

[V]	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	208	208-240	220-230
50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	L	—	—	F
60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	H	L	—
50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	KL	—	—	KL

[V]	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600
50 Hz	—	VA	T	—	—	—	N	—	G	B	—	M	C	—
60 Hz	—	—	A	T	I	E	—	—	—	N	B	—	—	C
50/60 Hz	KF	—	KA	—	—	—	—	—	KN	—	KB	—	—	—

**Type CF and CFB Safety Control Relays — 8-Pole AC Coil Voltage (Ratings for 700S-CF Only)**

AC-12			AC-15							Connection Diagrams		Contacts		Standard Contacts Cat. No.*	Gold Plated Bifurcated, All Contacts Cat. No.*		
$I_e$ [A]			$I_e$ [A]							Main Contacts		Auxiliary Contacts				No. of N.O. Contacts	No. of N.C. Contacts
40 °C	60 °C		24/48V	120V	240V	400V	500V	600V	690V	No. of N.O. Contacts		No. of N.C. Contacts					
Main Contacts	20	20	10	10	10	6	2.5	1	1		4	4	<b>700S-CF440</b> ⊗C	<b>700S-CFB440</b> ⊗C			
											5	3	<b>700S-CF530</b> ⊗C	<b>700S-CFB530</b> ⊗C			
Adder Deck Contacts	10	6	6	6	5	3	1.6	1	1		6	2	<b>700S-CF620</b> ⊗C	<b>700S-CFB620</b> ⊗C			

\* Ratings for Bulletin 700-CFB and 700-CFM are on page 9-161

⊗ **DC Coil Voltage Code**

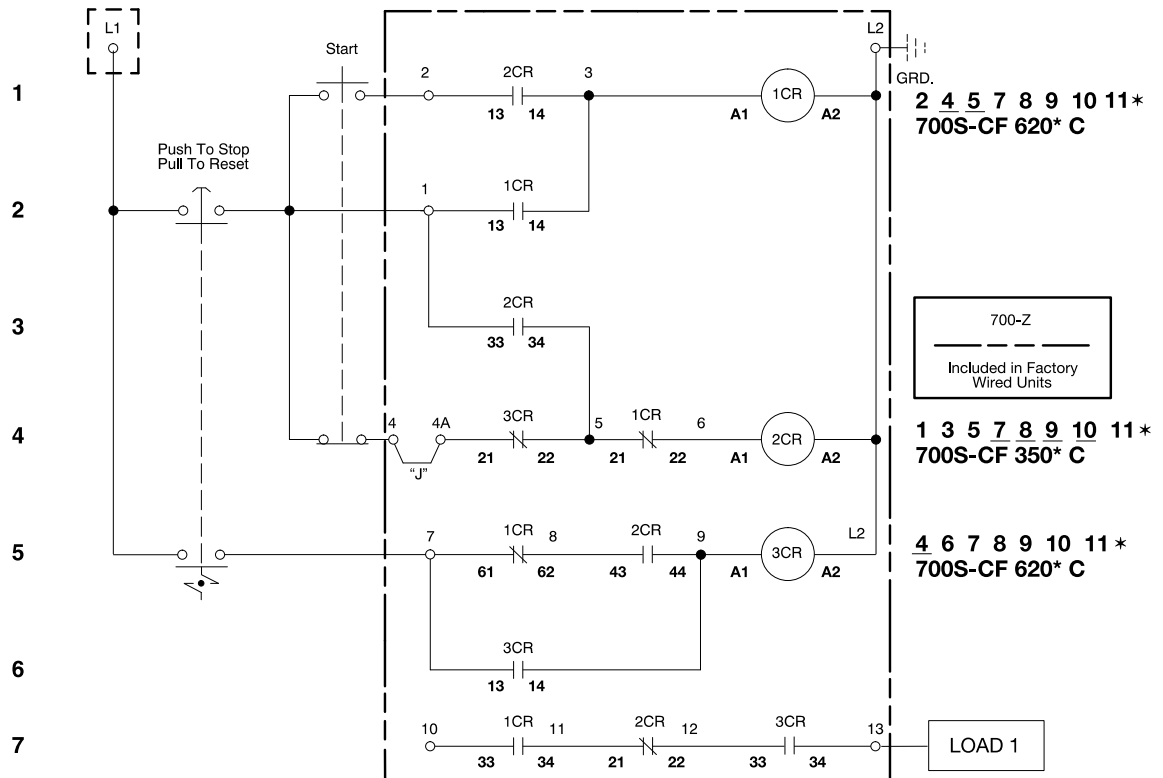
The cat. no. as listed is incomplete. Select a coil voltage code from the table below to complete the cat. no. Example: **700S-CF440**⊗C becomes **Cat. No. 700S-CF440ZJC** for 24V DC.

[V]	9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
Standard	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	ZP	ZS	ZA	ZF	ZT
Standard with diode	—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—
Electronic with diode	—	—	EJ	—	—	—	—	—	—	—	—	—	—	—	—

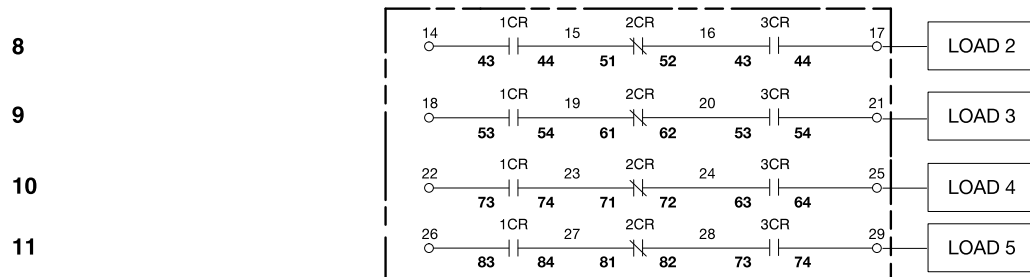
For general Bulletin 700S-CF specifications, refer to page 9-155.

**Basic Circuit**

**(1) Output Circuit (3 Relays, 9 Terminal Blocks)**



**(5) Output Circuit (3 Relays, 17 Terminal Blocks)**



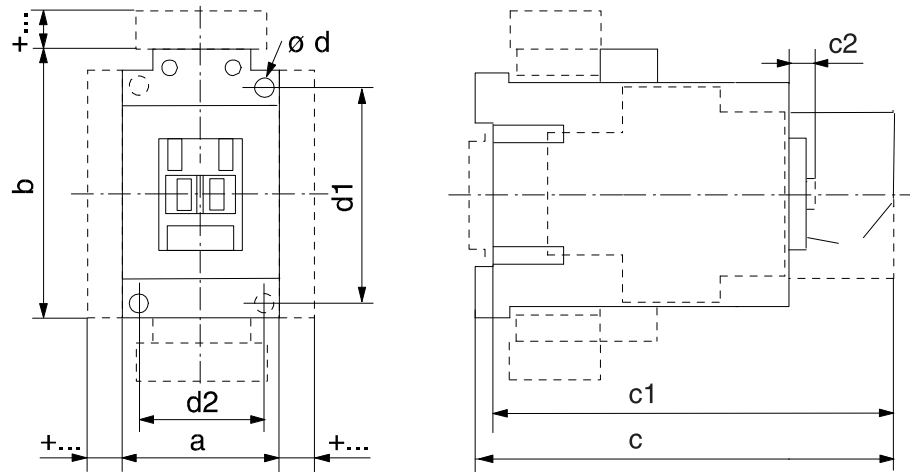
\* Numbers shown are the line numbers where the contacts for this relay appear.  
 Contact your local Rockwell Automation sales office or Allen-Bradley distributor for availability.

**Safety Relay Circuit With 5 Safety Outputs**

- Use for E-stop control. E-stop will work properly if any one fault occurs (a fault could be one welded contact or one undesired open connection such as a loose wire).
- High output switching capability and long contact life.
- Circuit complies with EN 954 categories 1, 2, 3, 4.
- Helps prevent restart of the 5 safety outputs if there is a single fault anywhere in the system.
- Use (3) 700S-CF relays and this diagram to construct the circuit

Bulletin 700S-CF  
**Industrial Relays**  
 Approximate Dimensions

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



**AC and DC EJ Safety Control Relays**

Cat. No.	a	b	c	c1	c2	Ød	d1	d2
700S-CF	45	81	119.5	114.5	6	2 - 4.5	60	35
	(1-25/32)	(3-3/16)	(4-3/4)	(4-43/64)	(1/4)	(2 - 3/16)	(2-23/64)	(1-25/64)

**DC Safety Control Relays**

Cat. No.	a	b	c	c1	c2	Ød	d1	d2
700S-CF	45	81	145.5	140.5	6	2 - 4.5	60	35
	(1-25/32)	(3-3/16)	(5-49/64)	(5-37/64)	(1/4)	(2 - 3/16)	(2-23/64)	(1-25/64)

**Accessories**

Safety Control Relays with	mm	[in.]
Auxiliary contact block for side mounting 1- or 2-pole	a + 9	(a + 23/64)
Electronic Timing Module on coil terminal side	b + 24	(b + 15/16)
Interface Module on coil terminal side	b + 9	(b + 23/64)
Surge Suppressor on coil terminal side	b + 3	(b + 1/8)
Labeling with label sheet	+ 0	(+ 0)
Marking tag sheet with clear cover	+ 0	(+ 0)
Marking tag adapter for System Bul. 1492W	+ 5.5	(+ 7/32)

**9 Mounting Position**

