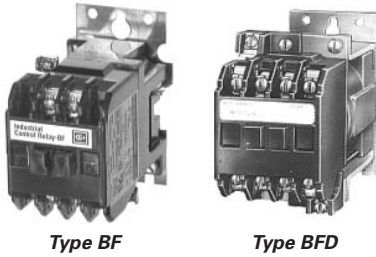


BF/BFD Series — Fixed Contact Industrial Control



Product Description

Type BF is AC operated, 300V maximum, and the BFD is DC operated, 250V. Fixed contact relays are available in any combination of NO and NC from two to twelve poles. BF and BFD relays have captive clamp terminals fully accessible from the front, a molded coil with low operating temperature and silver alloy contacts suitable for low voltage circuits.

Standards and Certifications

- UL recognized, UL File No. E19223 (AC relays only)
- CSA certified, File No. LR39402-6, LR28548-10, 11 (AC and DC relays)

Technical Data and Specifications

Table 49-113. Specifications

BF Relay Electrical Ratings — NEMA A300							
Volts	Maximum Current			Maximum VA			
	Cont.	Make	Break	Make	Break		
120	10	60	6	7200	720		
240	10	30	3	7200	720		
Horsepower Ratings (UL Recognized)				DC Rating — NEMA P300			
Phase	AC Volts		Volts	Maximum Current			Max. Make or Break VA
	115	230		Cont.	Make	Break	
1	1/6	1/2	125	5.0	1.1	1.1	138
3	—	1	250	5.0	0.55	0.55	138
Resistive Rating				Coil Power Requirements			
125V DC: 3A 250V DC: 1.5A				AC: 72 VA open, 22 VA closed DC: 12 watts (nominal), 250V max.			

Options

Table 49-114. Options

Description	Code Letter or	Catalog Number	Price U.S. \$
FASTON Push-On Terminals Insert letter F after relay type designation in listed Catalog Number. Example: BFF20F or BFDFF20S	F	—	
Overlapping Contacts NO contact closes before corresponding NC contact opens — supplied as NO/NC set(s). Insert letter A after relay type designation in listed Catalog Number. Example: BFA22F or BFDFAF22S	A	—	
NEMA 1 Enclosure for Relay Types BF, AR — all poles BFD — 4 – 8 poles ARD — 4 – 6 poles	—	4977D40G04 4977D40G04 4977D40G04	

Product Selection

When Ordering Specify

- Catalog Number of Basic Relay.
- If a coil voltage other than listed is required, select the Suffix Code from the Coil Voltage Table and substitute it for the last letter in the Catalog Number. Example: BF80V for a 110/60 AC coil.

Table 49-115. Complete Relay

Number of Poles	Type of Contact		BF 300V AC Basic Relays 120/60, 110/50 AC Coil		BFD 250V DC Basic Relays 120 DC Coil	
	NO (Form A)	NC (Form B)	Catalog Number	Price U.S. \$	Catalog Number	Price U.S. \$
2	2	0	BF20F		BFD20S	
	1	1	BF11F		BFD11S	
	0	2	BF02F		BFD02S	
3	3	0	BF30F		BFD30S	
	2	1	BF21F		BFD21S ①	
	1	2	BF12F		BFD12S	
	0	3	BF03F		BFD03S	
4	4	0	BF40F		BFD40S	
	3	1	BF31F		BFD31S	
	2	2	BF22F		BFD22S	
	1	3	BF13F		BFD13S	
	0	4	BF04F		BFD04S	
6	6	0	BF60F		BFD60S	
	5	1	BF51F		BFD51S	
	4	2	BF42F		BFD42S	
	3	3	BF33F		BFD33S	
	2	4	BF24F		BFD24S	
	0	6	BF06F		BFD06S	
8	8	0	BF80F		BFD80S	
	7	1	BF71F		BFD71S	
	6	2	BF62F		BFD62S	
	5	3	BF53F		BFD53S	
	4	4	BF44F		BFD44S	
	0	8	BF08F		BFD08S	
10	10	0	BF100F		BFD100S	
	8	2	BF82F		BFD82S ①	
	7	3	BF73F ①		BFD73S	
	6	4	BF64F		BFD64S	
	5	5	BF55F		BFD55S ①	
	4	6	BF46F		BFD46S	
	2	8	BF28F		BFD28S	
12	12	0	BF120F		BFD120S	
	8	4	BF84F		BFD84S	
	7	5	BF75F		BFD75S	
	6	6	BF66F		BFD66S	
	5	7	BF57F		BFD57S	
	4	8	BF48F		BFD48S	

① Consult Customer Support Center for availability.

Note: Relays listed above with equal number of NO and NC contact poles are specially priced — 1NO and 1NC pole are supplied at no additional charge.

Table 49-116. Coil Voltage Table

BF Coils			BFD Coils	
Volts AC	Hz	Suffix Code	Volts DC	Suffix Code
12	60	H	6	C
24	60	I	12	D
48	60	J	24	L
110	60	V	38	N
110/120	50/60	F	48	M
208	60	K	72	E
220/240	50/60	G	95	B
440	60	C	120	S
			130	U
			240	T

Contact Arrangements

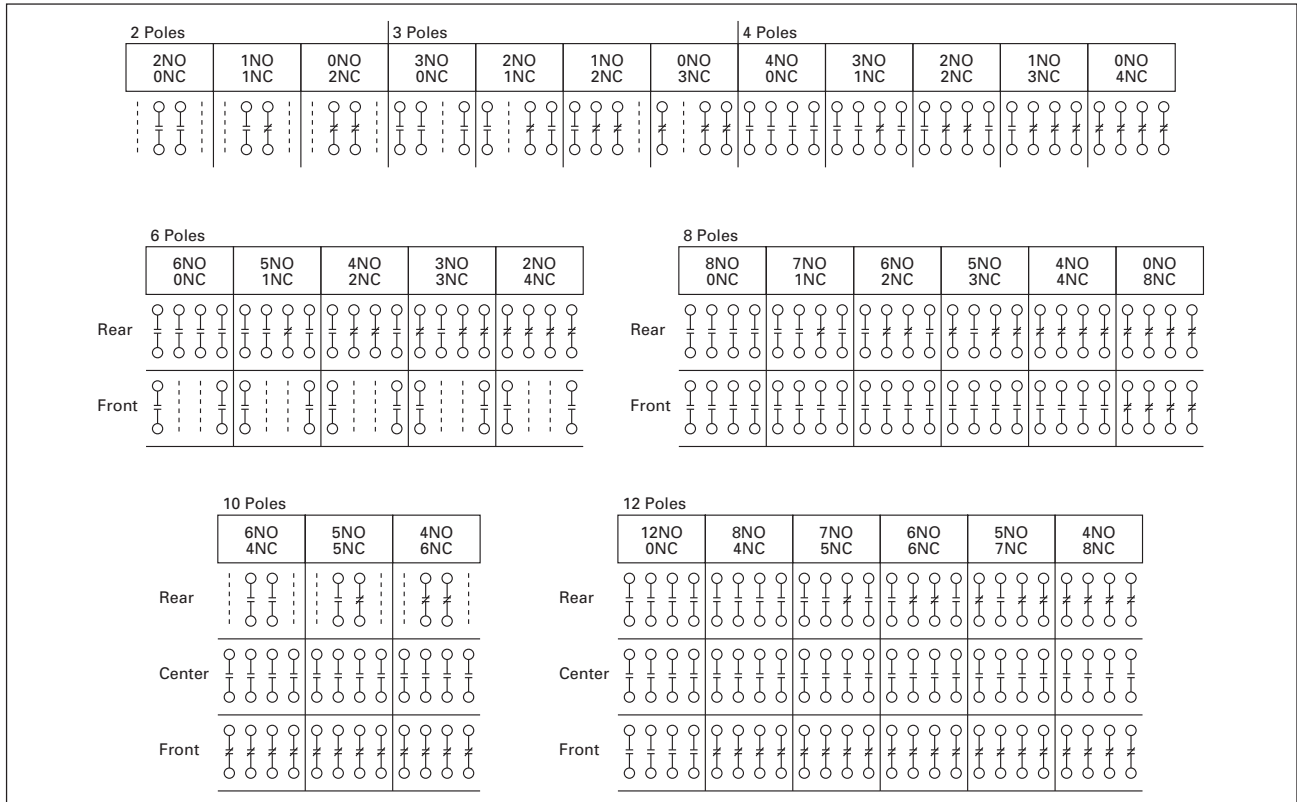


Figure 49-119. Contact Arrangements for BF, BFD Relays

Note: NO = Normally Open NC = Normally Closed

Dimensions

Table 49-117. Dimensions

Number of Poles	Approximate Dimensions in Inches (mm)				
	A BF Only	B BF with Latch	C BF with Timer	D BFD Only	E BFD with Timer
4	3.22 (81.8)	6.22 (158.0)	5.88 (149.4)	4.03 (102.4)	7.06 (179.3)
8	4.19 (106.4)	7.19 (182.6)	6.88 (174.8)	4.97 (126.2)	8.00 (203.2)
12	4.81 (122.2)	7.81 (198.4)	7.50 (190.5)	5.63 (143.0)	8.66 (220.0)

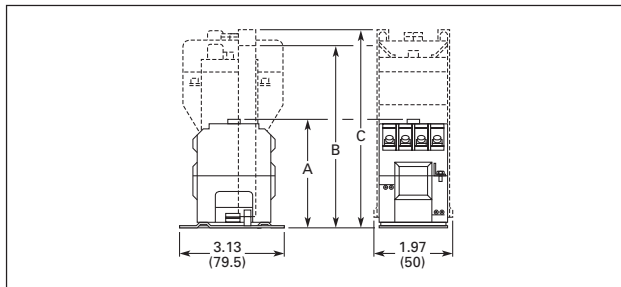


Figure 49-120. BF Relay with Permanent Magnet Latch and Solid-State Timer — Approximate Dimensions in Inches (mm)

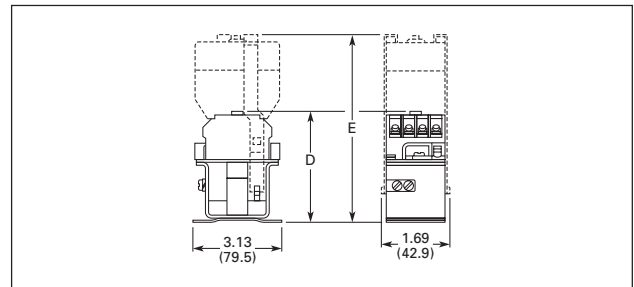
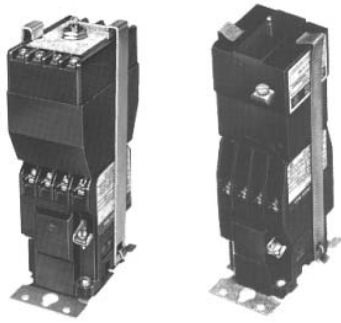


Figure 49-121. BFD Relay with Solid-State Timer — Approximate Dimensions in Inches (mm)

Enclosures

See Page 49-86.



Solid-State Timer, Relay Mounted **Permanent Magnet Latch, Relay Mounted**

Solid-State Timers

- Field-convertible to 48 or 24V DC
- Self-contained units have one NO solid-state contact.

Table 49-118. Solid-State Timers

Voltage	Time Delay Range	Catalog Number ①	Price U.S. \$
ON Delay			
AC	0.1 to 30 Seconds	BST-ON BST-ONB BSTD-ON	
AC	30 to 60 Seconds		
DC	0.1 to 30 Seconds		
OFF Delay			
AC	0.1 to 30 Seconds	BST-OF BST-OFB BSTD-OF	
AC	30 to 60 Seconds		
DC	0.1 to 30 Seconds		

① For panel mount add Suffix F.

Table 49-119. Options

Description	Code Letter	Adder U.S. \$
Panel Mounted Timers Add Suffix Code to Catalog Number	P ②	

② Consult Customer Support Center for availability.

Table 49-120. Permanent Magnet Latch

Coil Volts	Coil Hz	Catalog Number	Price U.S. \$
AC Relays			
24	60	BFMLI ③	
48	60	BFMLJ ③	
110/120	50/60	BFMLF	
220/240	50/60	BFMLG	
DC Relays			
24	—	BFMLL	
48	—	BFMLM	
120	—	BFMLS	
240	—	BFMLT	

③ Consult Customer Support Center for availability.

Application Description

Timers Only

- Minimal time-setting drift with age
- Adjustable timing range
- Increased resolution on short time adjustments
- Operation in adverse environments

Wiring to Relay

- In parallel with coil — one timed and up to 12 instantaneous contacts, or
- In series with coil — up to 12 timed contacts in 1 relay

Permanent Magnet Latch

- Field mountable on Catalog Number BF; factory installed on BFD
- Latch coil continuously rated
- Latch plunger adjustable for optimum performance

Specifications

Timer

- Input
 - 120/110V AC, 50/60 Hz, ±10%
 - 250, 120, 48, 24V DC, ±10%
- Power required: 2 VA maximum
- Contact ratings
 - BST: will switch 120V AC BF relay
 - BSTD: will switch BFD relays
 - 120V DC: 0.1A
 - 48V DC: 0.25A
 - 24V DC: 0.5A
- Repeatability: ±3% of time setting for ±10% change in line voltage, or 15°C change in ambient temperature
- Ambient temperature range: -20° to 70°C
- Duty cycle: 150 operations/minute maximum
- BST and BSTD reset time:
 - ON delay
 - BST: 50 ms maximum
 - BSTD: 100 ms (independent of time setting and duty cycle)
 - OFF delay
 - instantaneous

Permanent Magnet Latch

- Unlatching power requirements
 - Open gap: 24 VA AC
 - Closed gap: 7 VA
 - Burden: 4 watts (AC)