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CATALOG

**Jennings®**

Vacuum devices



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**Thomas & Betts is now ABB Installation Products, but our long legacy of quality products and innovation remains the same. From connectors that help wire buildings on Earth to cable ties that help put machines in space, we continue to work every day to make, market, design and sell products that provide a smarter, safer and more reliable flow of electricity, from source to socket.**

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## Vacuum capacitors overview

### Capacitor selection guides

#### Capacitors by type

Capacitor type	Capacity max. (pF)	Test voltage (kV) at 60/50 Hz	Model no. series	Page number
Vacuum variable	30	7.5, 10, 15	CVDD-30	16
	100	7.5, 10, 15	CVDD-100	16
	100	7.5, 10, 15	C/GCS-100	17
	250	3, 5	CVCD-250	17
	250	45, 50, 55	CVHP-250	18
	450	45, 50, 55	CVHP-450	18
	500	3, 5	CSV1-500	19
	500	7.5, 10, 15	CVDD-500	19
	500	7.5, 10, 15	M/CSVF-500	20
	500	5, 8	M/CSV5-500	20
	500	15	PV4-500	21
	650	5	CMV1-650	21
	650	8	CMV3-650	21
	650	45, 50, 55	CVHP-650	22
	650	40, 45, 50	CWV3-650	22
	750	7.5, 10, 15	CVDD-750	23
	900	3, 5, 6	CSV4-900	23
	1000	3	CMV1-1000	24
	1000	3, 5	CSV1-1000	24
	1000	7.5, 10, 15	CVDD-1000	25
	1000	40, 45, 50	CVHP-1000	25
	1000	40, 45, 50	CWV5-1000	26
	1000	3, 5	M/CVCJ-1000	26
	1000	3, 5	M/CSV5-1000	26
	1000	5	PV4-1000	27
	1500	3, 5	CVCD-1500	28
	1500	7.5, 10, 15	CVDP-1500	28
	1600	55, 60	CWV1-1600	29
	1600	30, 35, 40	CWV2-1600	29
	1600	35, 40	CWV3-1600	30
1600	50, 55, 60	CWV4-1600	30	
2000	3, 5	CVCD-2000	27	
2050	40, 45, 50	CWV4-2050	31	
2300	7.5, 10, 15	CVDP-2300	31	
3000	3, 5	CVCD-3000	32	
4000	5	CMV1-4000	32	

Capacitor type	Capacity max. (pF)	Test voltage (kV) at 60/50 Hz	Model no. series	Page number
Vacuum fixed	25	35	CKT-25	8
	50	35	CKT-50	8
	100	35	CKT-100	8
	150	30	CKT-150	8
	200	30	CKT-200	8
	250	30	CKT-250	8
	25	25	CKT1-25	9
	50	25	CKT1-50	9
	100	25	CKT1-100	9
	50	15	CF2-50	10
	80	15	CF2-80	10
	100	15	CF2-100	10
	150	15	CF2-150	10
	180	15	CF2-180	10
	210	15	CF2-210	10
	450	45, 50, 55	CFHP-450	11
	500	20, 25, 30	CFED-500	11
	750	40, 45, 50	CFHP-750	12
	750	10, 15, 20, 25	CFED-750	12
	1000	40, 45, 50	CFHP-1000	12
	1000	10, 15, 20, 25, 30	CFED-1000	13
	1500	7.5, 10, 15	CFDP-1500	13
	1500	25, 30, 35	CFFP-1500	13
2000	7.5, 10, 15	CFDP-2000	14	
2000	25, 30, 35	CFFP-2000	14	

## Vacuum capacitors overview

### Capacitor selection guides

#### Capacitors alpha listing by model number

Model no. series	Page number
C/GCS-100	17
CF2-100	10
CF2-150	10
CF2-180	10
CF2-210	10
CF2-50	10
CF2-80	10
CFDP-1500	13
CFDP-2000	14
CFED-1000	13
CFED-500	11
CFED-750	12
CFFP-1500	13
CFFP-2000	14
CFHP-1000	12
CFHP-450	11
CFHP-750	12
CKT-100	8
CKT-150	8
CKT-200	8
CKT-25	8
CKT-250	8
CKT-50	8
CKT1-100	9
CKT1-25	9
CKT1-50	9
CMV1-1000	24
CMV1-4000	32
CMV1-650	21
CMV3-650	21
CSV1-1000	24

Model no. series	Page number
CSV1-500	19
CSV4-900	23
CVCD-1500	28
CVCD-2000	27
CVCD-250	17
CVCD-3000	32
CVDD-100	16
CVDD-1000	25
CVDD-30	16
CVDD-500	19
CVDD-750	23
CVDP-1500	28
CVDP-2300	31
CVHP-1000	25
CVHP-250	18
CVHP-450	18
CVHP-650	22
CWV1-1600	29
CWV2-1600	29
CWV3-1600	30
CWV3-650	22
CWV4-1600	30
CWV4-2050	31
CWV5-1000	26
M/CSV5-1000	26
M/CSV5-500	20
M/CSVF-500	20
M/CVCJ-1000	26
PV4-1000	27
PV4-500	21

# Vacuum capacitors overview

## Jennings vacuum capacitors

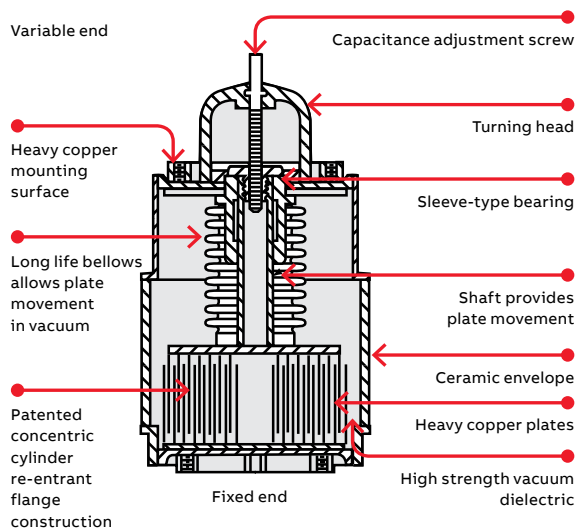
—  
01 Figure 1 – typical  
Jennings variable  
vacuum capacitor

### Features

- High voltage rating – The dielectric strength of the vacuum permits optimized voltage rating for a given size and capacity, in addition to freedom from contamination, humidity and oxidation.
- High current rating – Low losses and rugged copper construction permit the handling of high RF currents with convection cooling only. Some of our designs offer water and air cooling for extraordinary load conditions.
- Wide tuning ranges – High ratio of maximum to minimum capacity makes Jennings vacuum capacitors desirable for wide tuning ranges.
- Low losses – Losses in a vacuum capacitor are so small that for most applications they can be considered as negligible. Construction materials and the vacuum dielectric permit the handling of large RF currents at high RF frequencies that would destroy capacitors with other dielectrics.
- Self-healing – Jennings vacuum capacitors can withstand momentary overloads that would permanently damage other dielectric materials.
- High altitude operation – Vacuum sealing permits the operation of Jennings vacuum capacitors at high altitudes without the degradation that occurs with other types.

### Description and general specification

Figure 1 illustrates the construction of a typical Jennings variable vacuum capacitor. Two sets of



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01

concentric cylinder plates, one adjustable and the other fixed, are enclosed in an evacuated ceramic envelope with OFHC copper seals at both ends. A flexible metal bellows, attached to a sleeve-type bearing, maintains vacuum while allowing capacitance to vary.

The linear sliding motion required to vary capacitance is converted to rotary tuning via an adjustment screw; in many capacitors, direct pull tuning is an alternative.

Internal breakdown voltage is primarily determined by the spacing of the opposing plates and a high vacuum level.

The following are general specifications pertaining to Jennings vacuum capacitors. Current ratings are for normal convection cooling in ambient temperature of 25 °C unless otherwise specified.

- Maximum allowable operating temperature – 125 °C (257 °F) for ceramic capacitor
- Cooling – Natural convection unless otherwise specified
- Mounting position – Any
- Rotation to increase capacity – Counterclockwise

If none of our standard catalog models meet your needs, our engineers will work with you to design a custom solution to meet your specific needs.

### Current/voltage

Maximum operating current for vacuum capacitors is limited by temperature rise and working voltage. At lower frequencies, a capacitor is a current-limiting device as a result of its capacitive reactance. At some frequencies, the internal generation of heat exceeds the device's heat-sinking capabilities, and its current-carrying capacity is limited by thermal considerations. A current vs. frequency chart is provided for each capacitor listed.

Peak voltage is limited by mechanical design of the capacitor. It does not vary with frequency.

Two voltage ratings are provided in our product specifications: AC test voltage and working voltage.

**Temperature**

Jennings Technology vacuum capacitors are rated for a maximum operating temperature of 125 °C (257 °F) with normal convection cooling at an ambient temperature of 25 °C (72 °F).

**Capacitance**

Fixed capacitors with a nominal capacitance above 50pF shall be within  $\pm 5\%$ . Capacitors with a nominal capacitance of 50pF or less shall be within  $\pm 10\%$ , or 0.5pF, whichever is greater. For variable capacitors, the low end will be equal to or less than minimum rating. The capacitance change is substantially uniform with rotation, and there are no capacitance reversals. Capacitance is within  $\pm 10\%$  of the nominal value of the curves shown (capacity vs. turns), in the linear portion of this curve.

**Torque/direct pull**

In variable capacitors, the linear sliding motion of the moving electrode assembly is converted to rotary tuning via a threaded shaft. The torque values given in the tables are the maximum torque needed to reach minimum capacitance when rotated with a standard lead screw; the torque required to tune away from minimum may be less than half this value.

For most variable capacitors, direct pull tuning is an available option to rotary tuning. Maximum required direct pull force values are also given in the tables.

Capacitance range end-stops are built into every variable capacitor. It is recommended that the user install their own external stops to prevent damage from gear-reduction drives.

**Mechanical life**

The mechanical life of variable capacitors is related to length of stroke, speed of operation, bellows material and total number of cycles. Extensive mechanical life tests have been run, operating units for complete cycles from maximum to minimum and back to maximum capacity covering 95% of the full stroke of the movable plates. Capacitors with a large bellows and a short stroke will have the greatest life expectancy under cycling operation. Our most recent variable capacitor models are rated for >2 million cycles, ideal for the semiconductor processing industry.

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**Testing standards****Factory**

All capacitors are tested for dielectric strength on a 100% basis prior to shipment. Upon customer request, certified test reports will be made available.

Dielectric strength is tested using a low current, high potential source at 60 Hz voltage.

Capacitors for applications involving applied DC voltage should be tested on a DC dielectric strength meter for voltage and emission current. Jennings will test capacitors to this measure if specified by the customer.

**User**

Most users will find the 60 Hz dielectric strength test adequate and relatively inexpensive. Jennings does not recommend DC testing being performed by the user because of safety considerations. If DC testing is performed, care should be taken not to exceed 60% of the peak test voltage rating of the capacitor.



# Fixed capacitors

## CKT series

CKT series vacuum fixed capacitors, 25–250 pF

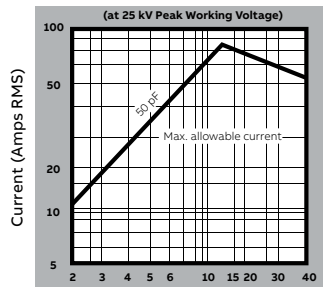
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CKT-25-0035	25	25	35	25	67	6.42	2.32	163	58.9	–	1.54
CKT-50-0035	50	50	35	25	77	6.42	2.32	163	58.9	–	1.54
CKT-100-0035	100	100	35	25	87	6.42	2.32	163	58.9	–	1.54
CKT-150-0030	150	150	30	20	90	6.46	2.66	164	67.5	–	1.98
CKT-200-0030	200	200	30	20	95	6.46	2.66	164	67.5	–	1.98
CKT-250-0030	250	250	30	20	100	6.46	2.66	164	67.5	–	1.98

01 CKT-50-0035  
 CKT-100-0035  
 CKT-200-0030  
 CKT-250-0030



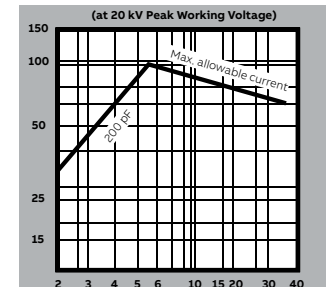
01

Continuous RMS amperes vs frequency

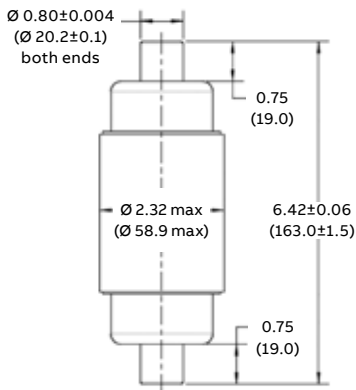


Frequency (MHz)  
 CKT-50-0035

Continuous RMS amperes vs frequency

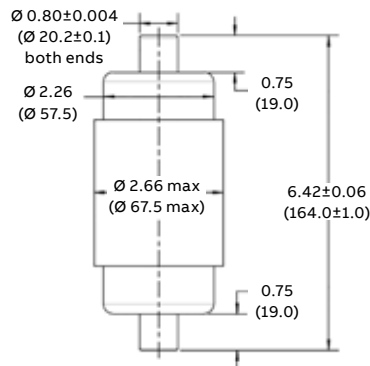


Frequency (MHz)  
 CKT-200-0030



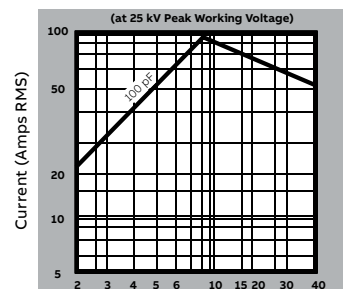
CKT-50-0035  
 CKT-100-0035

Dimensions shown are in inches (mm).



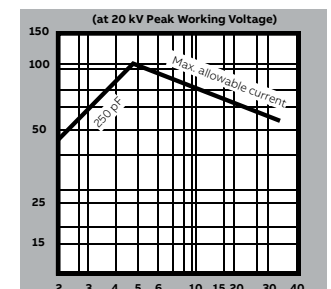
CKT-200-0030  
 CKT-250-0030

Continuous RMS amperes vs frequency



Frequency (MHz)  
 CKT-100-0035

Continuous RMS amperes vs frequency



Frequency (MHz)  
 CKT-250-0030



# Fixed capacitors

## CKT1 series

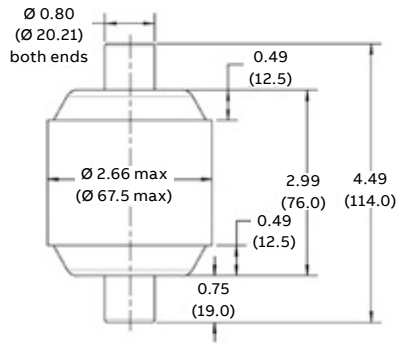
### CKT1 series vacuum fixed capacitors, 25–100 pF

Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CKT1-25-0025	25	25	25	15	58	4.5	2.68	114	67.5	–	1.32
CKT1-50-0025	50	50	25	15	68	4.5	2.66	114	67.5	–	1.32
CKT1-100-0025	100	100	25	15	80	4.5	2.66	114	67.5	–	1.32

01 CKT1-50-0025  
CKT1-100-0025

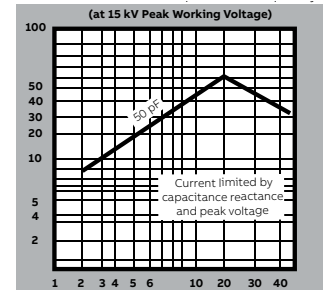


01



Dimensions shown are in inches (mm).

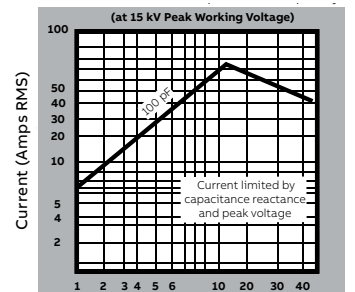
Continuous RMS amperes vs frequency



Frequency (MHz)

CKT1-50-0025

Continuous RMS amperes vs frequency



Frequency (MHz)

CKT1-100-0025

# Fixed capacitors

## CF2 series

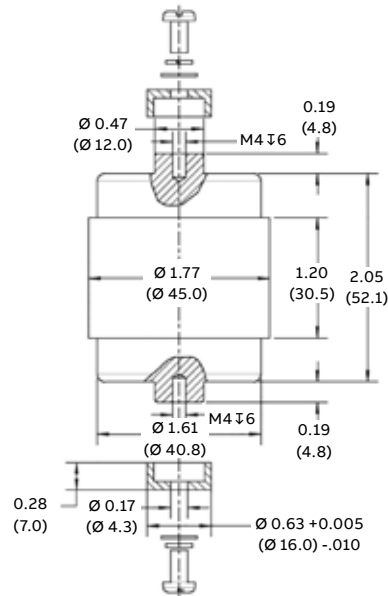
CF2 series compact vacuum fixed capacitors, 50–210 pF

Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions			Torque in.-lbs.	Weight lb.	
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)			Dia. (mm)
CF2-50-0015	50	50	15	9	27	2.44	1.77	62	45	–	0.66
CF2-80-0015	80	80	15	9	76	2.44	1.77	62	45	–	0.66
CF2-100-0015	100	100	15	9	80	2.44	1.77	62	45	–	0.66
CF2-150-0015	150	150	15	9	75	2.44	1.77	62	45	–	0.66
CF2-180-0015	180	180	15	9	90	2.44	1.77	62	45	–	0.66
CF2-210-0015	210	210	15	9	76	2.44	1.77	62	45	–	0.66

- 01 CF2-50-0015
- CF2-80-0015
- CF2-100-0015
- CF2-150-0015
- CF2-180-0015
- CF2-210-0015

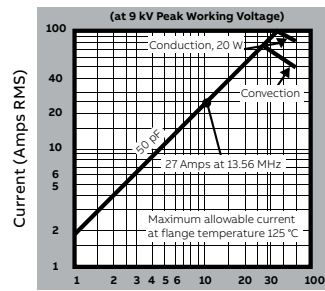


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Dimensions shown are in inches (mm).

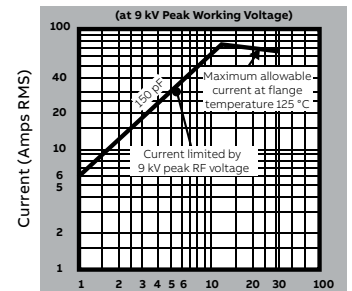
Continuous RMS amperes vs frequency



Frequency (MHz)

CF2-50-0015

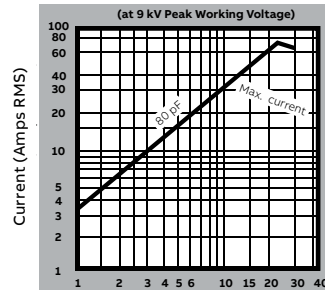
Continuous RMS amperes vs frequency



Frequency (MHz)

CF2-150-0015

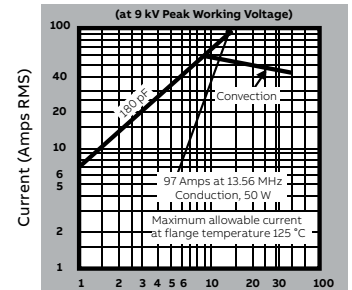
Continuous RMS amperes vs frequency



Frequency (MHz)

CF2-80-0015

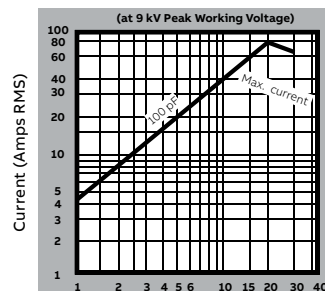
Continuous RMS amperes vs frequency



Frequency (MHz)

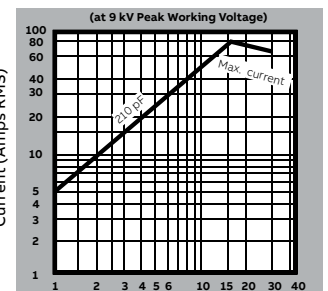
CF2-180-0015

Continuous RMS amperes vs frequency



Frequency (MHz)

CF2-100-0015



Frequency (MHz)

CF2-210-0015

# Fixed capacitors

## CFHP and CFED series

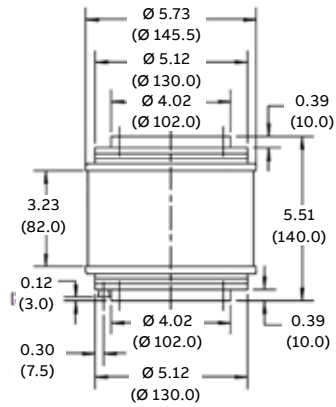
CFHP and CFED series vacuum fixed capacitors, 300–500 pF

Cat. no.	Capacitance (pF)		Voltage peak(kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CFHP-450-45S	450	450	45	27	260	5.51	5.73	140	145.5	-	11
CFHP-450-50S	450	450	50	30	280	5.51	5.73	140	145.5	-	11
CFHP-450-55S	450	450	55	33	300	5.51	5.73	140	145.5	-	11
CFED-500-20S	500	500	20	12	150	3.82	4.76	97	121	-	4
CFED-500-25S	500	500	25	15	160	3.82	4.76	97	121	-	4
CFED-500-30S	500	500	30	18	160	3.82	4.76	97	121	-	4

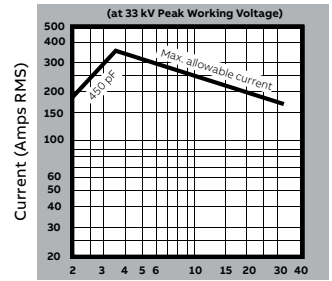
- 01 CFHP-450-45S
- CFHP-450-50S
- CFHP-450-55S
- 02 CFED-500



01



Continuous RMS amperes vs frequency

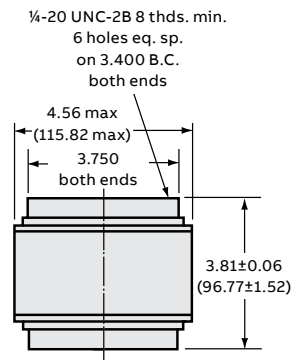


Frequency (MHz)

Mounting: Both ends have tapped holes.

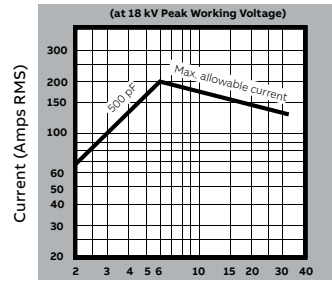


02



Dimensions shown are in inches (mm).

Continuous RMS amperes vs frequency



Frequency (MHz)

Mounting: Both ends have tapped holes.

# Fixed capacitors

## CFHP and CFED series

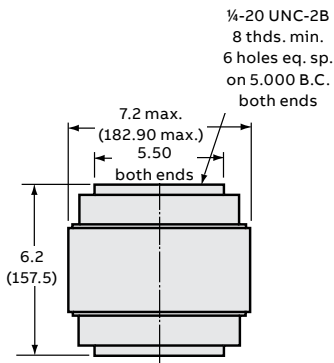
### CFHP and CFED series vacuum fixed capacitors, 750–1000 pF

Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions			Torque in.-lbs.	Weight lb.	
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)			Dia. (mm)
CFHP-750-0040	750	750	40	24	340	6.22	7.2	158	183	–	13.0
CFHP-750-0045	750	750	45	24	340	6.22	7.2	158	183	–	13.0
CFHP-750-0050	750	75	50	30	340	6.22	7.2	158	183	–	13.0
CFED-750-10S	750	750	10	6	145	3.82	4.76	97	121	–	5.06
CFED-750-15S	750	750	15	9	150	3.82	4.76	97	121	–	5.06
CFED-750-20S	750	750	20	9	150	3.82	4.76	97	121	–	5.06
CFED-750-25S	750	750	25	15	225	3.82	4.76	97	121	–	5.06
CFHP-1000-40S	1000	1000	40	24	330	6.22	7.2	158	183	–	19.8
CFHP-1000-45S	1000	1000	45	27	340	6.22	7.2	158	183	–	19.8
CFHP-1000-50S	1000	1000	50	30	350	6.22	7.2	158	183	–	19.8

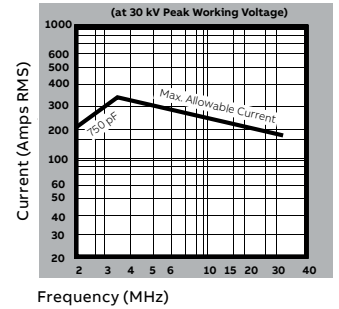
- 01 CFHP-750
- 02 CFED-750
- 03 CFHP-1000-40S
- CFHP-1000-45S
- CFHP-1000-50S



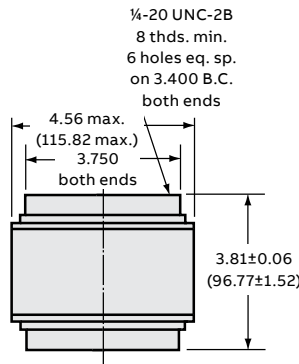
01



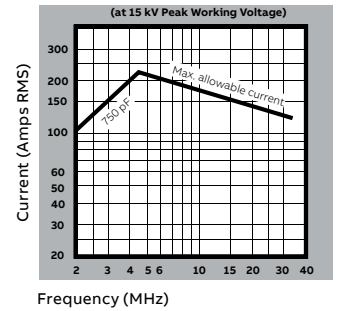
Continuous RMS amperes vs frequency



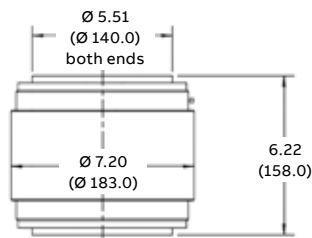
02



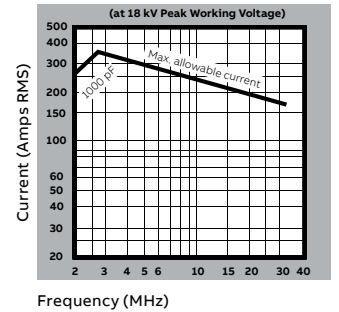
Continuous RMS amperes vs frequency



03



Continuous RMS amperes vs frequency



Dimensions shown are in inches (mm).

Mounting: Both ends have tapped holes.

# Fixed capacitors

CFED, CFDP and CFFP series

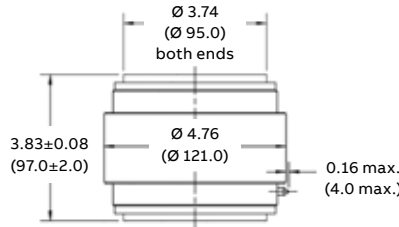
CFED, CFDP and CFFP series vacuum fixed capacitors, 1000–1500 pF

Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CFED-1000-10S	1000	1000	10	6	150	3.82	4.76	97	121	–	7.04
CFED-1000-15S	1000	1000	15	9	155	3.82	4.76	97	121	–	7.04
CFED-1000-20S	1000	1000	20	12	160	3.82	4.76	97	121	–	7.04
CFED-1000-25S	1000	1000	25	15	180	3.82	4.76	97	121	–	7.04
CFED-1000-30S	1000	1000	30	18	180	3.82	4.76	97	121	–	7.04
CFDP-1500-7.5S	1500	1500	7.5	4.5	150	3.31	5.61	84	142.5	–	8.8
CFDP-1500-10S	1500	1500	10	6	170	3.31	5.61	84	142.5	–	8.8
CFDP-1500-15S	1500	1500	15	9	190	3.31	5.61	84	142.5	–	8.8
CFFP-1500-25S	1500	1500	25	15	310	5.83	8.19	148	208	–	22
CFFP-1500-30S	1500	1500	30	18	330	5.83	8.19	148	208	–	22
CFFP-1500-35S	1500	1500	35	21	350	5.83	8.19	148	208	–	22

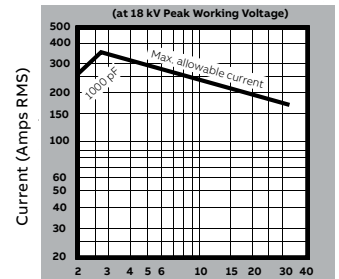
- 01 CFED-1000-10S
- 01 CFED-1000-15S
- 01 CFED-1000-20S
- 01 CFED-1000-25S
- 01 CFED-1000-30S
- 02 CFDP-1500
- 03 CFFP-1500



01



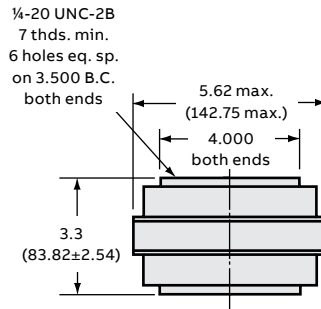
Continuous RMS amperes vs frequency



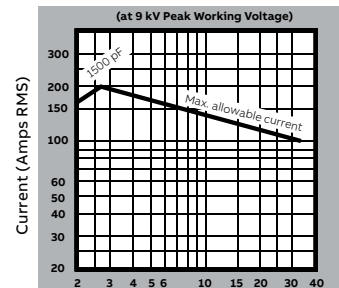
Frequency (MHz)



02



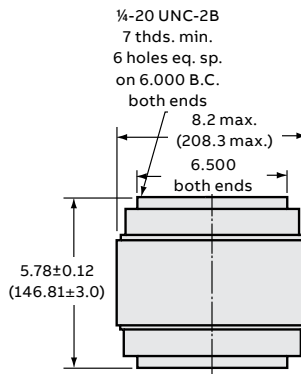
Continuous RMS amperes vs frequency



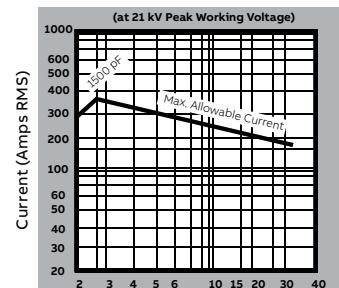
Frequency (MHz)



03



Continuous RMS amperes vs frequency



Frequency (MHz)

Dimensions shown are in inches (mm).

Mounting: Both ends have tapped holes.

## Fixed capacitors

### CFDP and CFFP series

#### CFDP and CFFP series vacuum fixed capacitors, 2000 pF

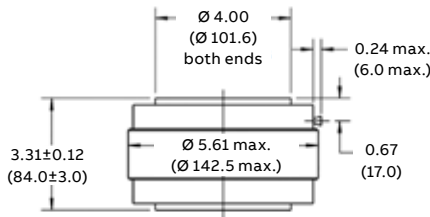
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CFDP-2000-7.5S	2000	2000	7.5	4.5	160	3.31	5.61	84	142.5	-	9.9
CFDP-2000-10S	2000	2000	10	6	180	3.31	5.61	84	142.5	-	9.9
CFDP-2000-15S	2000	2000	15	9	200	3.31	5.61	84	142.5	-	9.9
CFFP-2000-25S	2000	2000	25	15	350	5.83	8.19	148	208	-	23.32
CFFP-2000-30S	2000	2000	30	18	390	5.83	8.19	148	208	-	23.32
CFFP-2000-35S	2000	2000	35	21	390	5.83	8.19	148	208	-	23.32

01 CFDP-2000-7.5S  
CFDP-2000-10S  
CFDP-2000-15S

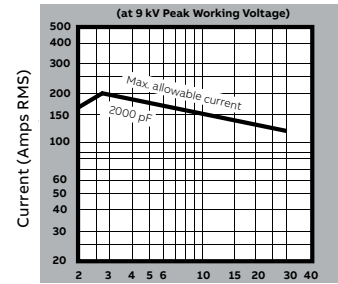
02 CFFP-2000-25S  
CFFP-2000-30S  
CFFP-2000-35S



01



Continuous RMS amperes vs frequency

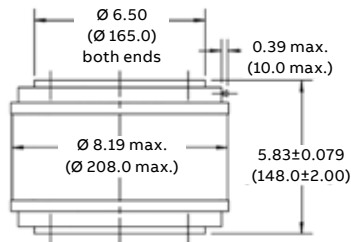


Frequency (MHz)

Mounting: Both ends have tapped holes. CFDM version has additional M6 hole pattern.

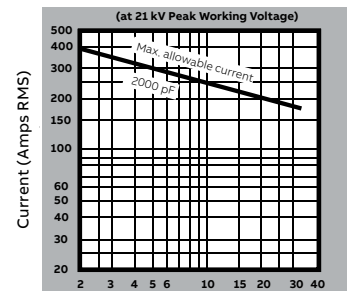


02



Dimensions shown are in inches (mm).

Continuous RMS amperes vs frequency



Frequency (MHz)

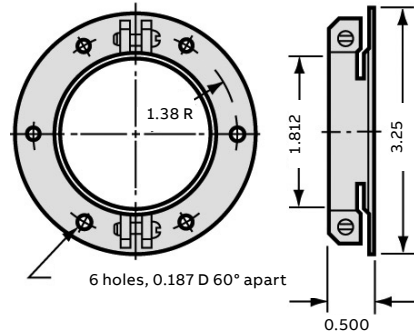
Mounting: Both ends have tapped holes.

## Capacitor accessories

### Flanges

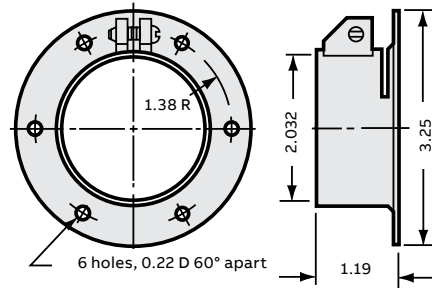
#### FM1C flange mount

Mat. 0.062 copper/silver



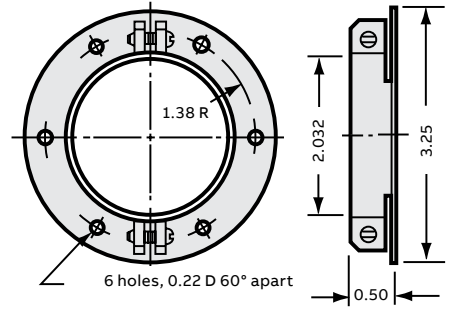
#### FM2D flange mount

Mat. 0.062 copper/silver



#### FM2S flange mount

Mat. 0.062 copper/silver



Dimensions shown are in inches.

# Variable capacitors

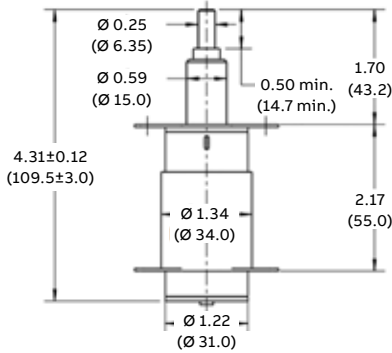
## CVDD series

CVDD series vacuum variable capacitors, 30–100 pF

Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CVDD-30-0007	30	3	7.5	4.5	18	4.31	2.31	109.5	54	1.5	0.44
CVDD-30-0010	30	3	10	6	30	4.31	2.31	109.5	54	1.5	0.44
CVDD-30-0015	30	3	15	9	30	4.31	2.31	109.5	54	1.5	0.44
CVDD-100-7.5S	100	10	7.5	4.5	55	6.36	2.44	168	61.96	1.2	1.98
CVDD-100-10S	100	10	10	6	60	6.36	2.44	168	61.96	1.2	1.98
CVDD-100-15S	100	10	15	9	77	6.36	2.44	168	61.96	1.2	1.98

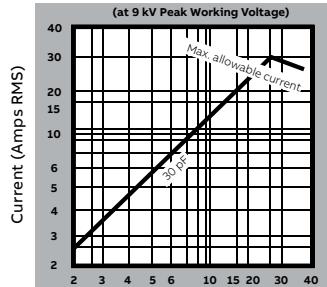
01 CVDD-30-0007  
CVDD-30-0010  
CVDD-30-0015

02 CVDD-100-7.5S  
CVDD-100-10S  
CVDD-100-15S



01

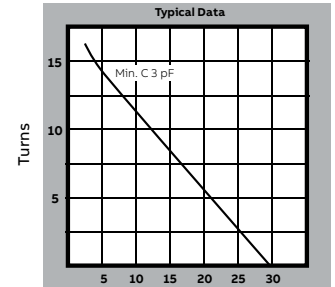
Continuous RMS amperes vs frequency



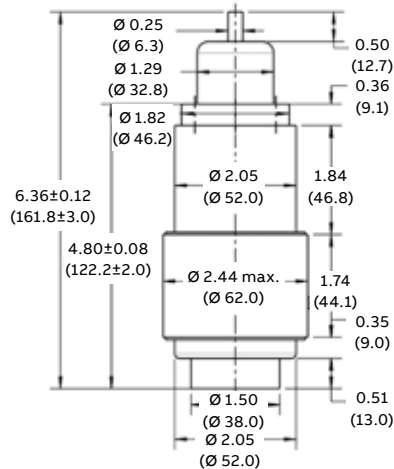
Frequency (MHz)

Mounting: Flanges both ends.

Capacity vs turns

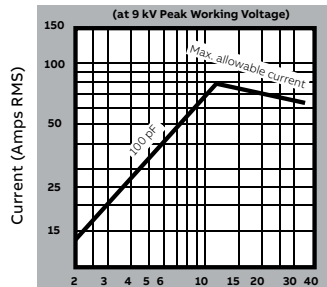


Capacitance (pF)



02

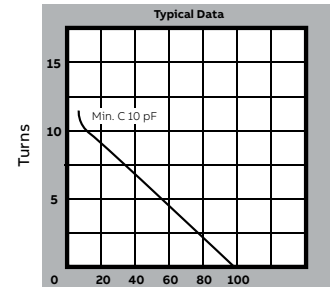
Continuous RMS amperes vs frequency



Frequency (MHz)

Mounting: Variable end tapped holes.

Capacity vs turns



Capacitance (pF)

Mounting: Variable end tapped holes.

Dimensions shown are in inches (mm).



# Variable capacitors

## C/GCS and CVCD series

### C/GCS and CVCD series vacuum variable capacitors, 100–250 pF

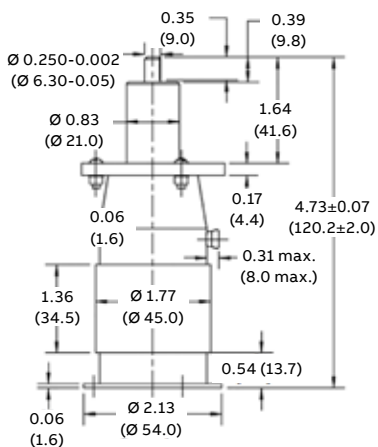
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
C/GCS-100-7.5S	100	5	7.5	4.5	40	4.73	2.13	120.2	54	0.75	0.88
C/GCS-100-10S	100	5	10	6	40	4.73	2.13	120.2	54	0.75	0.88
C/GCS-100-15S	100	5	15	9	45	4.73	2.13	120.2	54	0.75	0.88
CVCD-250-3S	250	5	3	1.8	50	6	2.44	152.4	61.98	2.6	1.98
CVCD-250-5S	250	5	5	3.5	50	6	2.44	152.4	61.98	2.6	1.98

01 C/GCS-100-7.5S  
C/GCS-100-10S  
C/GCS-100-15S

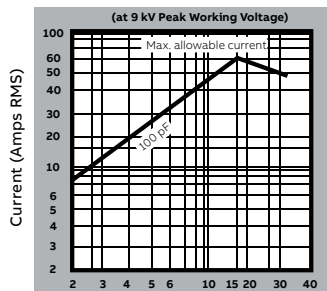
02 CVCD-250-3S  
CVCD-250-5S



01

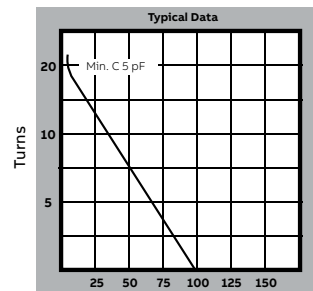


Continuous RMS amperes vs frequency



Frequency (MHz)  
Mounting: Both ends have tapped holes.

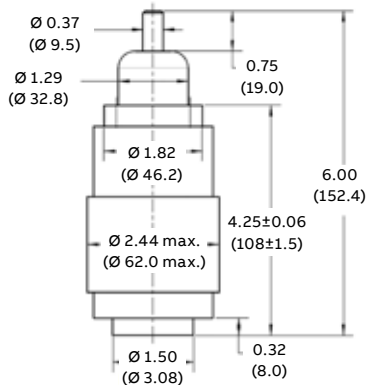
Capacity vs turns



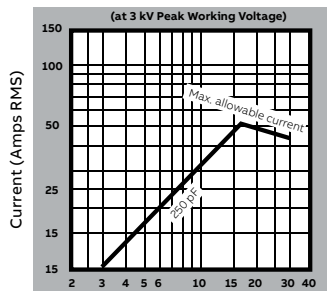
Capacitance (pF)



02

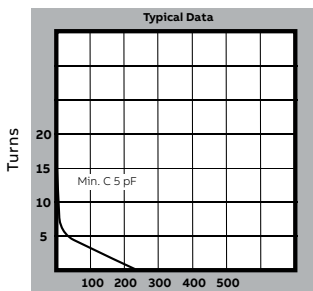


Continuous RMS amperes vs frequency



Frequency (MHz)  
Mounting: Variable end tapped holes.

Capacity vs turns



Capacitance (pF)

Dimensions shown are in inches (mm).

# Variable capacitors

## CVHP series

### CVHP series vacuum variable capacitors, 250–450 pF

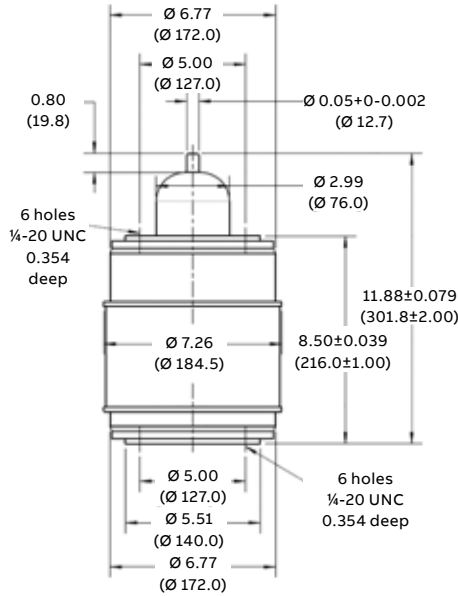
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CVHP-250-45S	250	10	45	27	190	11.88	7.26	302	185	12.9	26.4
CVHP-250-50S	250	10	50	30	200	11.88	7.26	302	185	12.9	26.4
CVHP-250-55S	250	10	55	33	210	11.88	7.26	302	185	12.9	26.4
CVHP-450-45S	450	25	45	27	200	11.88	7.28	302	185	13.2	24.5
CVHP-450-50S	450	25	50	30	210	11.88	7.28	302	185	13.2	24.5
CVHP-450-55S	450	25	55	33	220	11.88	7.28	302	185	13.2	24.5

01 CVHP-250-45S  
CVHP-250-50S  
CVHP-250-55S

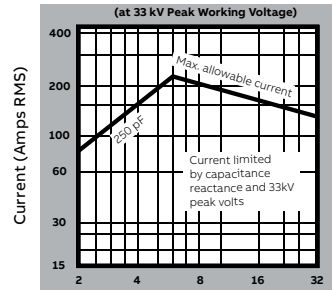
02 CVHP-450-45S  
CVHP-450-50S  
CVHP-450-55S



01

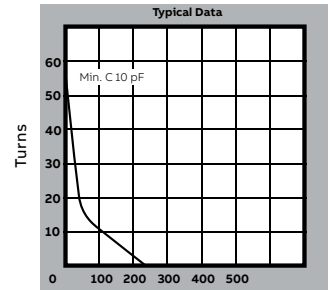


Continuous RMS amperes vs frequency



Frequency (MHz)  
Mounting: Both ends have tapped holes.

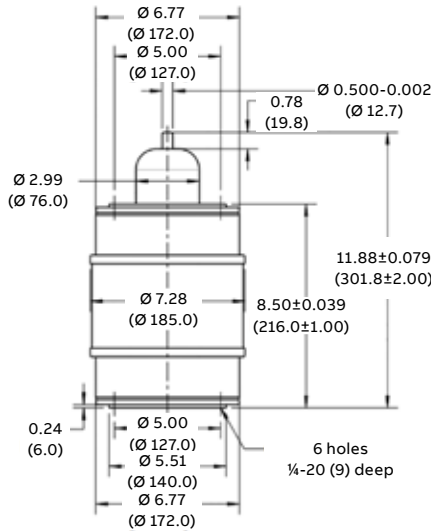
Capacity vs turns



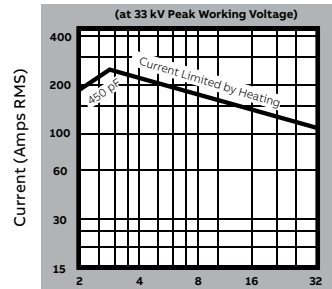
Typical Data



02

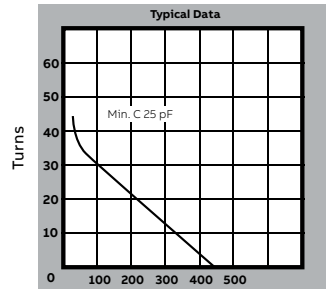


Continuous RMS amperes vs frequency



Frequency (MHz)  
Mounting: Both ends have tapped holes.

Capacity vs turns



Typical Data

Dimensions shown are in inches (mm).

# Variable capacitors

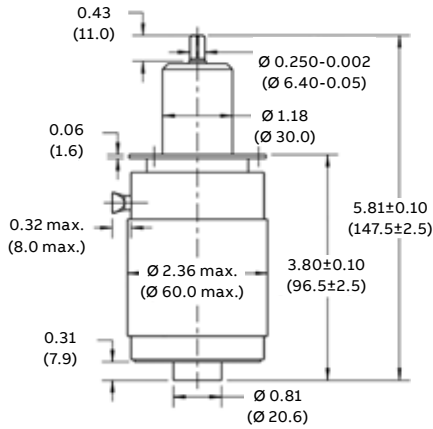
## CSV1 and CVDD series

CSV1 and CVDD series vacuum variable capacitors, 500 pF

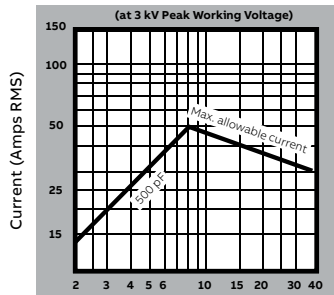
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CSV1-500-0003	500	5	3	1.8	40	5.75	2.35	147.5	60	2	1.76
CSV1-500-0005	500	5	5	3	45	5.81	2.36	147.5	60	2	1.76
CVDD-500-7.5S	500	20	7.5	4.5	80	7.51	3.39	190.7	86	1.8	3.96
CVDD-500-10S	500	20	10	6	90	7.51	3.39	190.7	86	1.8	3.96
CVDD-500-15S	500	20	15	9	95	7.51	3.39	190.7	86	1.8	3.96

01 CSV1-500-0003  
CSV1-500-0005

02 CVDD-500-7.5S  
CVDD-500-10S  
CVDD-500-15S

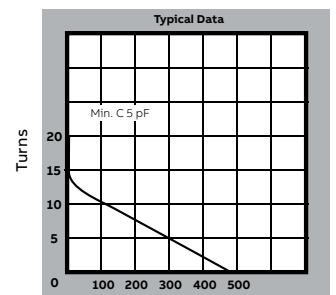


Continuous RMS amperes vs frequency

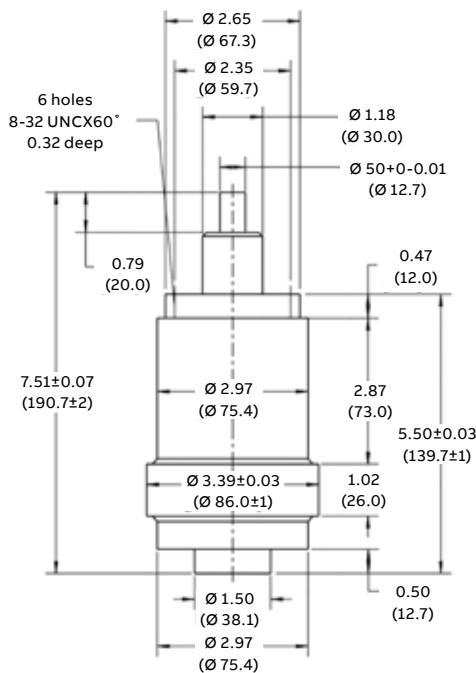


Mounting: Variable end has flange soldered on.

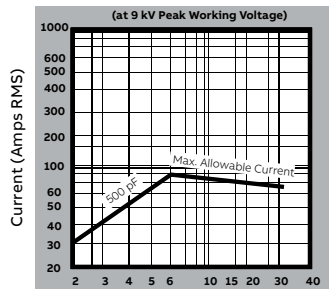
Capacity vs turns



01

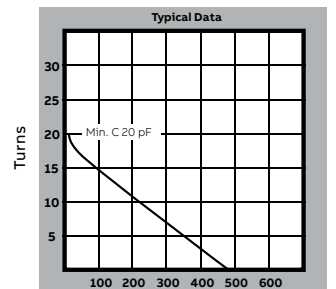


Continuous RMS amperes vs frequency



Mounting: Tapped holes on variable end.

Capacity vs turns



02

Dimensions shown are in inches (mm).

# Variable capacitors

## M/CSVF and M/CSV5 series

### M/CSVF and M/CSV5 series vacuum variable capacitors, 500 pF

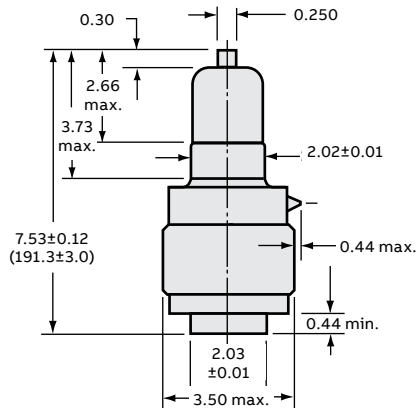
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
M/CSVF-500-0007	500	12	7	4.2	100	7.53	3.39	191.3	86	2.3	3.3
M/CSVF-500-0010	500	12	10	6	100	7.53	3.39	191.3	86	2.3	3.3
M/CSVF-500-0015	500	12	15	9	100	7.53	3.39	191.3	86	2.3	3.3
M/CSV5-500-0005	500	50	5	3	47	5.18	2.17	131.6	55	1.8	1.1
M/CSV5-500-0008	500	50	8	4.8	47	5.18	2.17	131.6	55	1.8	1.1

01 M/CSVF-500

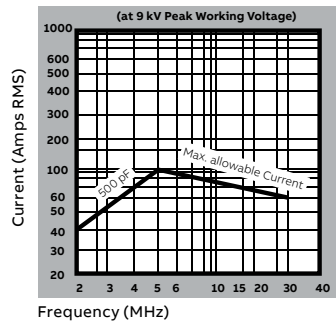
02 M/CSV5-500



01

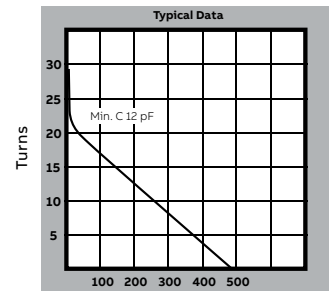


Continuous RMS amperes vs frequency



Frequency (MHz)  
Mounting: Use flange  
FM2S on fixed end.

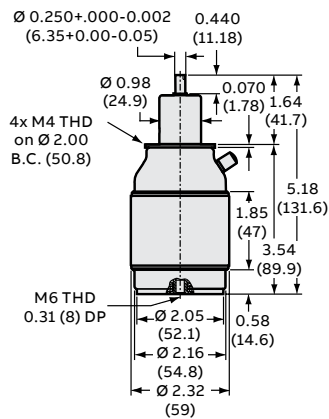
Capacity vs turns



Capacity (pF)  
Mounting: Use flange  
FM2S on fixed end.

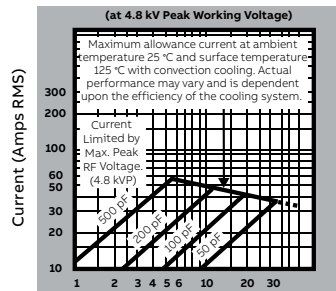


02



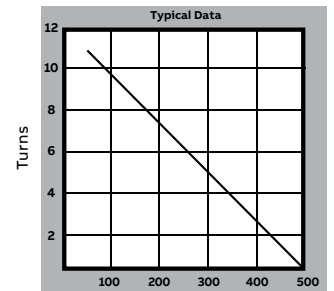
Dimensions shown are in inches (mm).

Continuous RMS amperes vs frequency



Frequency (MHz)  
Mounting: Both ends  
have tapped holes.

Capacity vs turns



Capacity (pF)  
Mounting: Both ends  
have tapped holes.

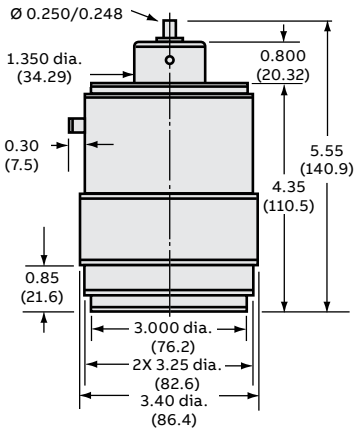
# Variable capacitors

## PV4, CMV1 and CMV3 series

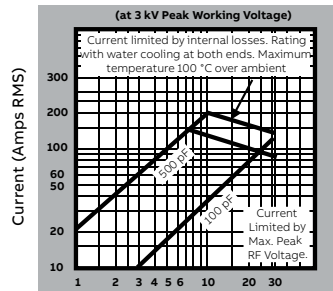
### PV4, CMV1 AND CMV3 series vacuum variable capacitors, 500–650 pF

Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
PV4-500-15S	500	40	15	9	110	5.55	3.4	141	86	2.0625	3.3
CMV1-650-0005	650	8	5	3	35	5.24	1.81	133	46	1.1	0.88
CMV3-650-0008	650	10	8	4.8	40	4.5	1.76	114.3	44.7	1.1	0.88

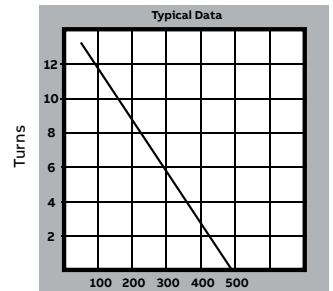
- 01 PV4-500
- 02 CMV1-650
- 03 CMV3-650-0008



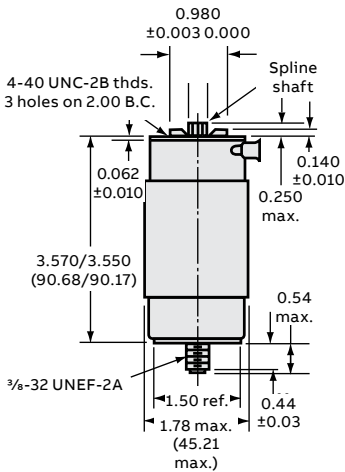
Continuous RMS amperes vs frequency



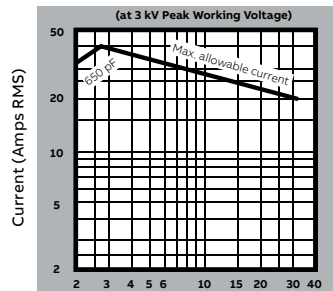
Capacity vs turns



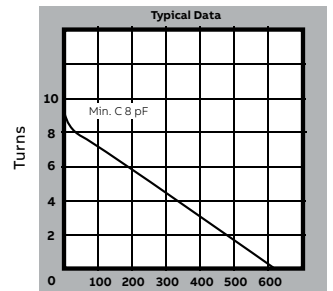
- 01



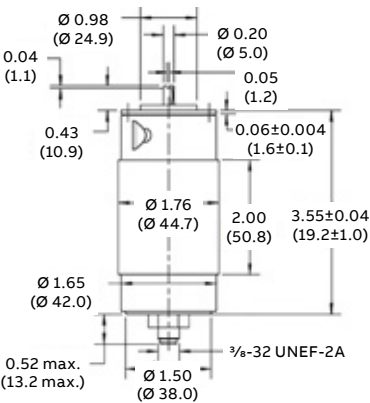
Continuous RMS amperes vs frequency



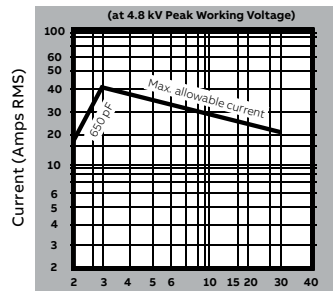
Capacity vs turns



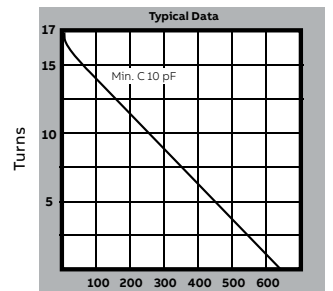
- 02



Continuous RMS amperes vs frequency



Capacity vs turns



- 03

Dimensions shown are in inches (mm).

Mounting: Both ends have tapped holes.

Mounting: Both ends have tapped holes.

Frequency (MHz)

Mounting: Both ends have tapped holes.  
6X M5 thread on 2.350 B.C.  
6X M4 thread on 2.350 B.C.  
Both ends.  
Water cooling disk available: FMWPV, 1 each end.  
Conservative limit with unit in dead airspace.  
Maximum temperature 100 °C over ambient.

Frequency (MHz)

Mounting: Fixed end threaded stud. Variable end tapped holes.

Frequency (MHz)

Mounting: Both ends have tapped holes.

## Variable capacitors

### CVHP and CWV3 series

CVHP and CWV3 series vacuum variable capacitors, 650 pF

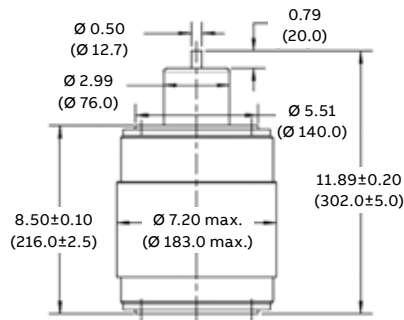
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions			Torque in.-lbs.	Weight lb.	
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)			Dia. (mm)
CVHP-650-45S	650	30	45	27	220	11.89	7.28	302	185	13	24.2
CVHP-650-50S	650	30	50	30	230	11.89	7.28	302	185	13	24.2
CVHP-650-55S	650	30	55	33	240	11.89	7.28	302	185	13	24.2
CWV3-650-0140	650	30	40	24	760	16.5	7.28	420	185	17	26.4
CWV3-650-0145	650	30	45	27	780	16.5	7.28	420	185	17	26.4
CWV3-650-0150	650	30	50	30	800	16.5	7.28	420	185	17	26.4

01 CVHP-650-45S  
CVHP-650-50S  
CVHP-650-55S

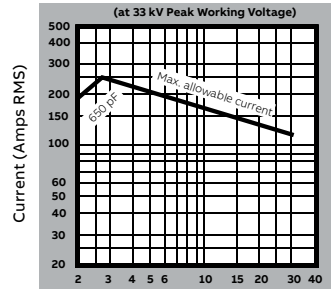
02 CWV3-650-0140  
CWV3-650-0145  
CWV3-650-0150



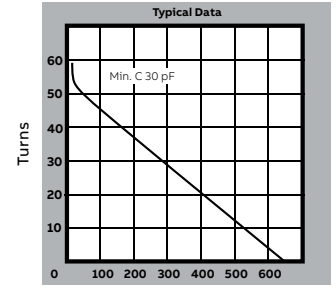
01



Continuous RMS amperes vs frequency



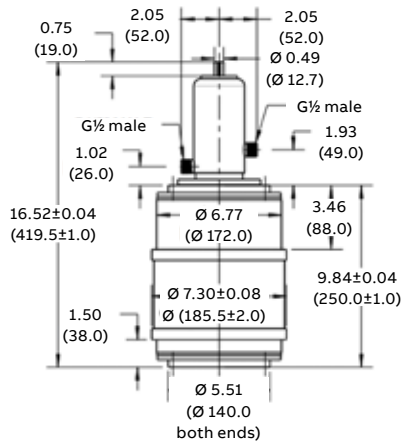
Capacity vs turns



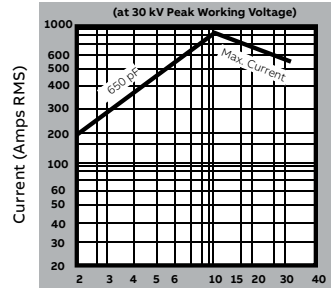
Mounting: Both ends have tapped holes.



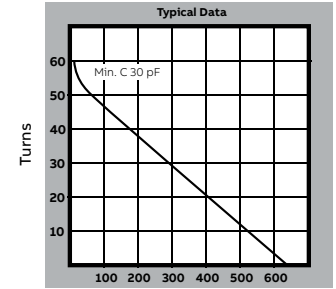
02



Continuous RMS amperes vs frequency



Capacity vs turns



Mounting: Both ends have tapped holes.

Dimensions shown are in inches (mm).

# Variable capacitors

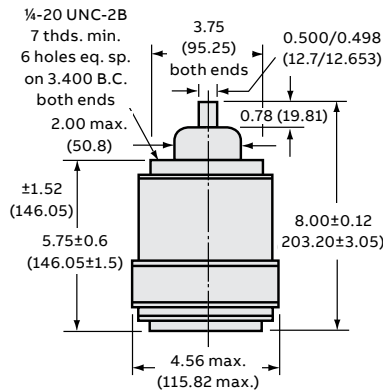
## CVDD and CSV4 series

CVDD and CSV4 series vacuum variable capacitors, 750–900 pF

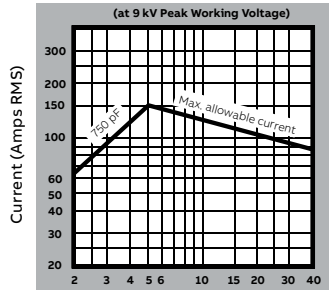
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CVDD-750-7.5S	750	25	7.5	4.5	130	7.99	4.53	203	115	4.2	6.6
CVDD-750-10S	750	25	10	6	140	7.99	4.53	203	115	4.2	6.6
CVDD-750-15S	750	25	15	9	150	7.99	4.53	203	115	4.2	6.6
CSV4-900-0103	900	500	3	1.8	40	6.24	2.17	159.2	55	25	1.32
CSV4-900-0106	900	500	5	3	40	6.27	2.17	159.2	55	1.5	1.32
CSV4-900-0206	900	10	6	3.6	45	6.27	2.17	159.2	55	1.5	1.32

01 CVDD-750

02 CSV4-900-0103  
CSV4-900-0106  
CSV4-900-0206

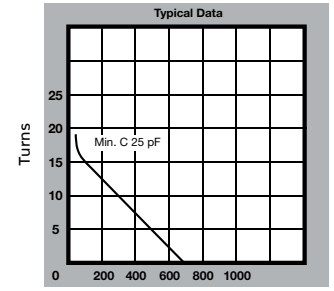


Continuous RMS amperes vs frequency

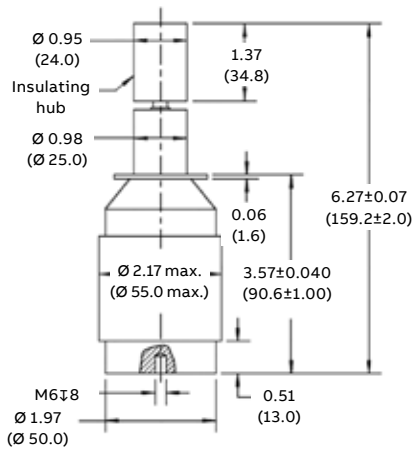


Mounting: Both ends have tapped holes.

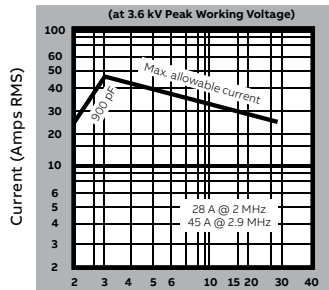
Capacity vs turns



01

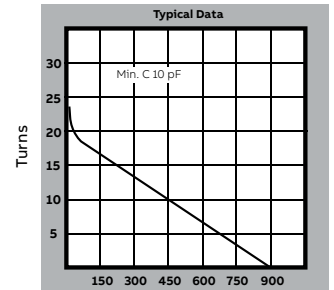


Continuous RMS amperes vs frequency



Mounting: Both ends have tapped holes.

Capacity vs turns



02

Dimensions shown are in inches (mm).

# Variable capacitors

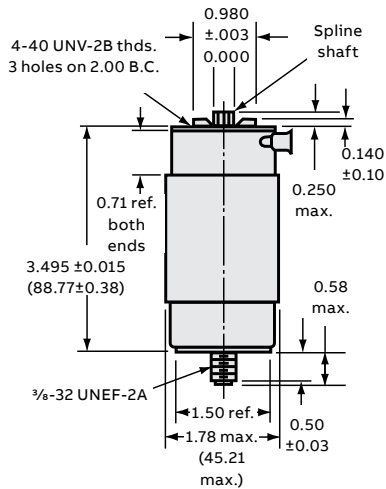
## CMV1 and CSV1 series

CMV1 and CSV1 series vacuum variable capacitors, 1000 pF

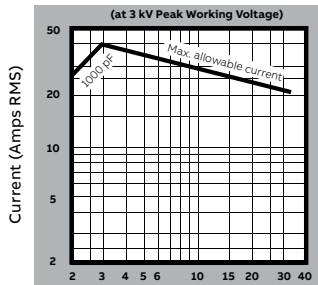
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions		Torque in.-lbs.	Weight lb.		
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)			Length (mm)	Dia. (mm)
CMV1-1000-0003	1000	8	3	1.8	25	3.495	1.78	88.9	45.21	18	0.88
CSV1-1000-0003	1000	10	3	1.8	65	5	3.12	127	79.2	2.5	1.32
CSV1-1000-0005	1000	10	5	3	70	5	3.12	127	79.2	2.5	1.32

01 CMV1-1000

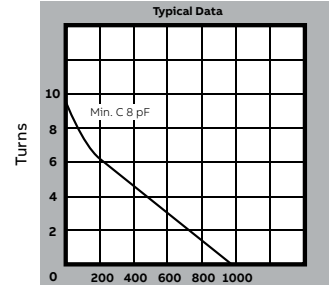
02 CSV1-1000-0003  
CSV1-1000-0005



Continuous RMS amperes vs frequency

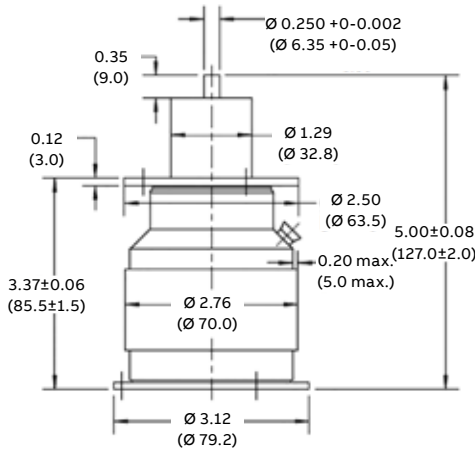


Capacity vs turns

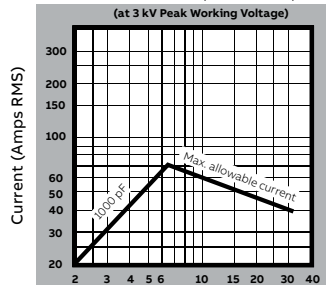


Mounting: Fixed end threaded stud. Variable end tapped holes.

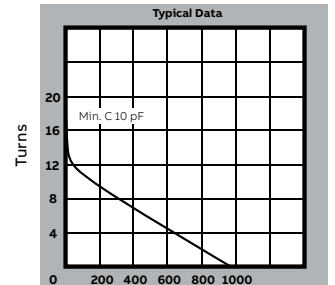
01



Continuous RMS amperes vs frequency



Capacity vs turns



Mounting: Both ends have flanges soldered on.

02

Dimensions shown are in inches (mm).



# Variable capacitors

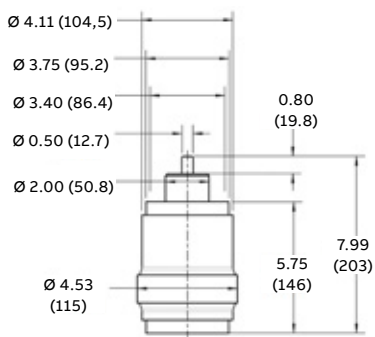
## CVDD and CVHP series

CVDD and CVHP series vacuum variable capacitors, 1000 pF

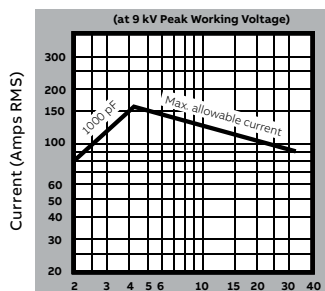
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CVDD-1000-7.5S	1000	25	7.5	4.5	130	7.99	4.53	203	115	1.6	6.6
CVDD-1000-10S	1000	25	10	6	140	7.99	4.53	203	115	1.6	6.6
CVDD-1000-15S	1000	25	15	9	150	7.99	4.53	203	115	1.6	6.6
CVHP-1000-40S	1000	60	40	24	230	14.57	8.19	370	210	11.7	29.92
CVHP-1000-45S	1000	60	45	27	240	14.57	8.19	370	210	11.7	29.92
CVHP-1000-50S	1000	60	50	30	250	14.57	8.19	370	210	11.7	29.92

01 CVDD-1000-7.5S  
CVDD-1000-10S  
CVDD-1000-15S

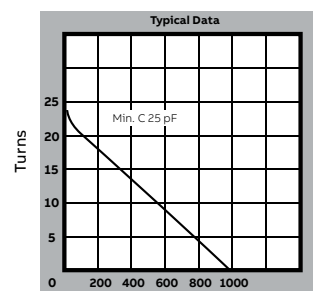
02 CVHP-1000-40S  
CVHP-1000-45S  
CVHP-1000-50S



Continuous RMS amperes vs frequency

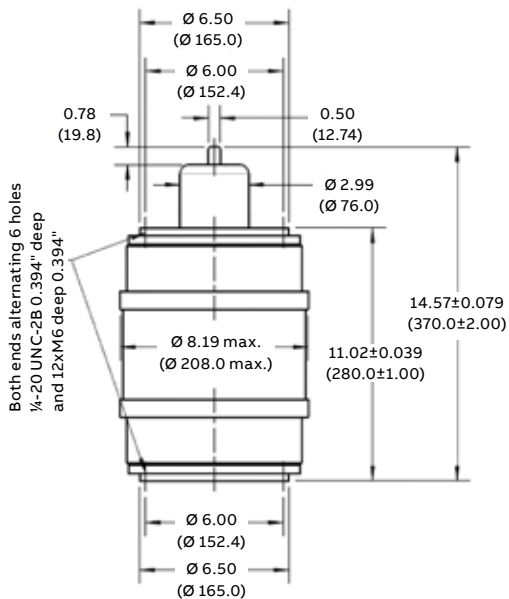


Capacity vs turns

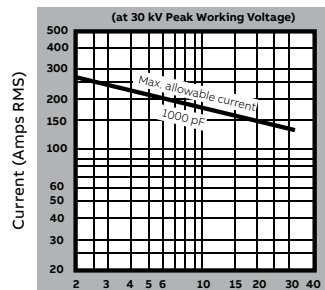


Frequency (MHz)  
Mounting: Both ends have tapped holes.

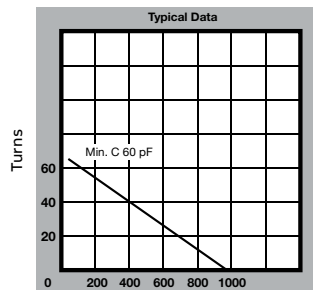
01



Continuous RMS amperes vs frequency



Capacity vs turns



Frequency (MHz)  
Mounting: Both ends have tapped holes.

02

Dimensions shown are in inches (mm).

# Variable capacitors

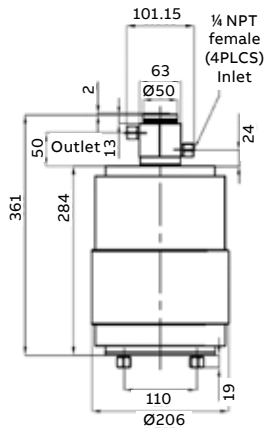
## CWV5, M/CVCJ and M/CSV5 series

### CWV5, M/CVCJ and M/CSV5 series vacuum variable capacitors, 1000 pF

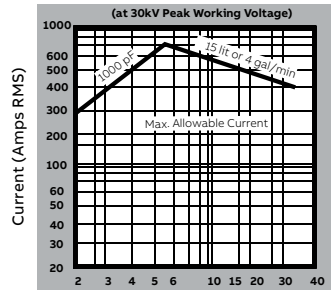
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CWV5-1000-0040	1000	100	40	24	700	18.03	8.54	458	217	13.3	46.2
CWV5-1000-0045	1000	100	45	27	700	18.03	8.54	458	217	13.3	46.2
CWV5-1000-0050	1000	100	50	30	700	18.03	8.54	458	217	13.3	46.2
M/CVCJ-1000-3S	1000	7	3	1.8	70	7.29	2.76	185.1	70	2.6	2.86
M/CVCJ-1000-5S	1000	7	5	3	70	7.29	2.76	185.1	70	2.6	2.86
M/CSV5-1000-0003	1000	100	3	1.8	89	5.17	2.17	131.6	55	1.8	1.32
M/CSV5-1000-0005	1000	100	5	3	89	5.17	2.17	131.6	55	1.8	1.32

01 CWV5-1000-0040  
CWV5-1000-0045  
CWV5-1000-0050

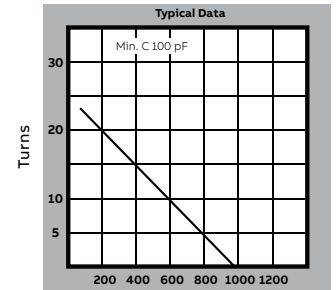
02 M/CVCJ-1000  
03 M/CSV5-1000



Continuous RMS amperes vs frequency

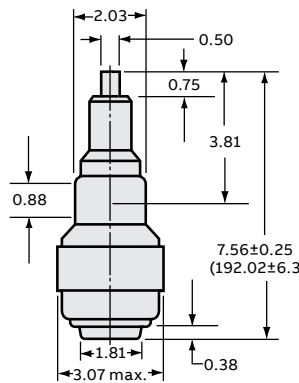


Capacity vs turns

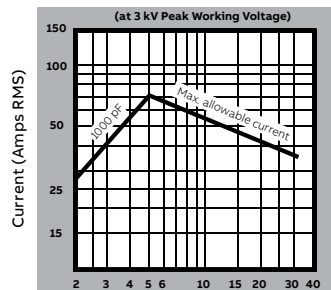


Mounting: Both ends have tapped holes.

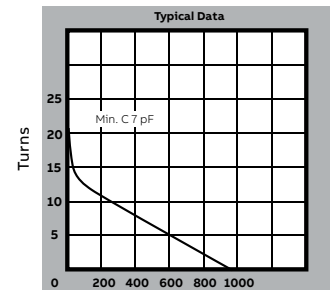
01



Continuous RMS amperes vs frequency

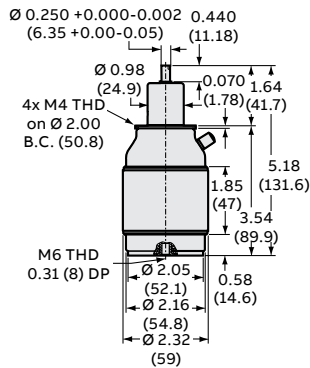


Capacity vs turns

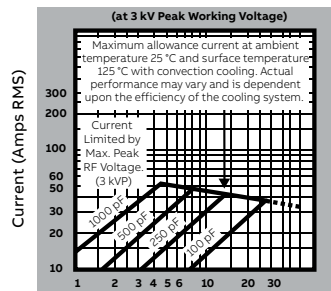


Mounting: Use flange FM1C on fixed end.

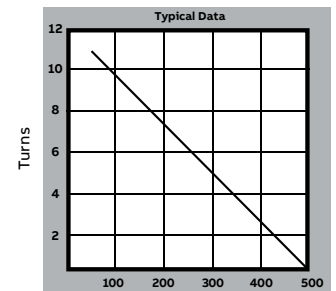
02



Continuous RMS amperes vs frequency



Capacity vs turns



Mounting: Both ends have tapped holes.

03

Dimensions shown are in inches (mm).

# Variable capacitors

## PV4 and CVCD series

### PV4 and CVCD series vacuum variable capacitors, 1000–2000 pF

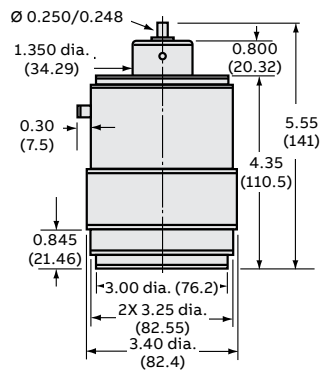
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
PV4-1000-05	1000	80	5	3	180	5.55	3.4	141	86	2.0625	3.3
CVCD-2000-3S	2000	20	3	1.8	63	7.1	3.39	180	86	2.6	3.52
CVCD-2000-5S	2000	20	5	3	63	7.1	3.39	180	86	2.6	3.52

01 PV4-1000

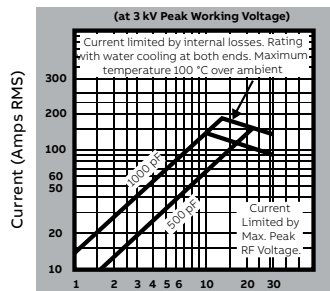
02 CVCD-2000-3S  
CVCD-2000-5S



01

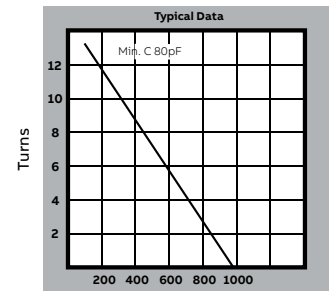


Continuous RMS amperes vs frequency



Frequency (MHz)  
Mounting: Both ends have tapped holes.

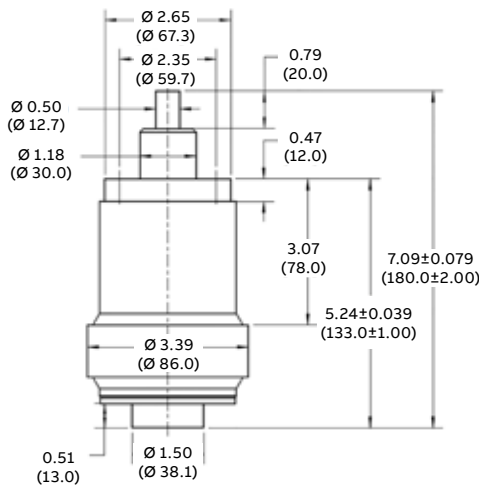
Capacity vs turns



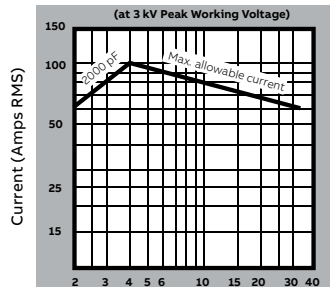
Capacitance (pF)



02

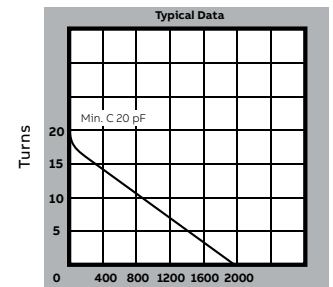


Continuous RMS amperes vs frequency



Frequency (MHz)  
Mounting: Variable end tapped holes.

Capacity vs turns



Capacitance (pF)

Dimensions shown are in inches (mm).

# Variable capacitors

## CVCD and CVDP series

CVCD and CVDP series vacuum variable capacitors, 1500 pF

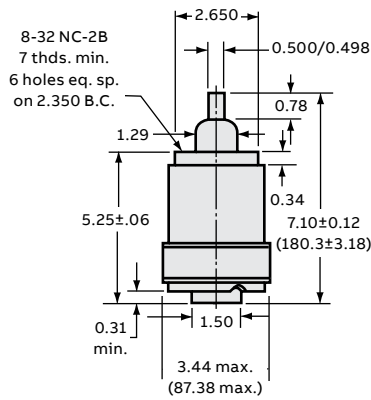
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions		Torque in.-lbs.	Weight lb.		
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)			Length (mm)	Dia. (mm)
CVCD-1500-3S	1500	10	3	1.8	80	7.1	3.46	180	86	1.8	3.52
CVCD-1500-5S	1500	10	5	3	109	7.1	3.46	180	86	1.8	3.52
CVDP-1500-7.5S	1500	35	7.5	4.5	150	9.84	5.61	250	142.5	6.6	13.2
CVDP-1500-10S	1500	35	10	6	155	9.84	5.61	250	142.5	6.6	13.2
CVDP-1500-15S	1500	35	15	9	108	9.84	5.61	250	142.5	6.6	13.2

01 CVCD-1500

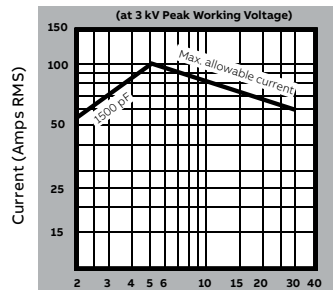
02 CVDP-1500-7.5S  
CVDP-1500-10S  
CVDP-1500-15S



01

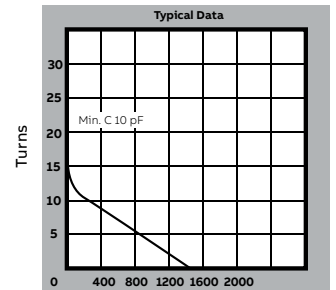


Continuous RMS amperes vs frequency

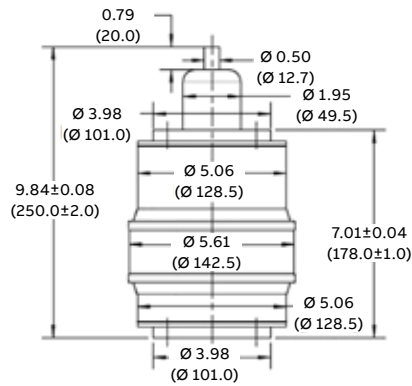


Mounting: Variable end tapped holes.

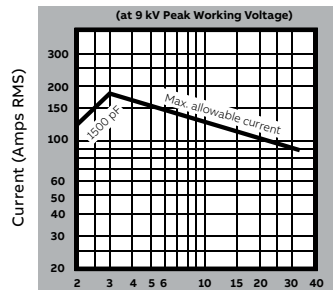
Capacity vs turns



02

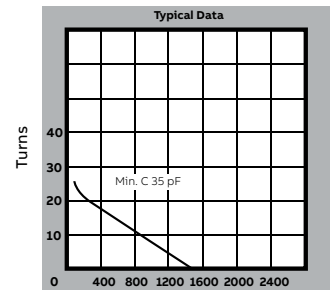


Continuous RMS amperes vs frequency



Mounting: Both ends have tapped holes.

Capacity vs turns



Dimensions shown are in inches (mm).

# Variable capacitors

## CWV1 and CWV2 series

### CWV1 and CWV2 series vacuum variable capacitors, 1600 pF

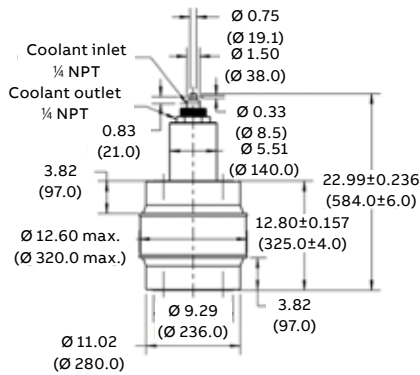
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CWV1-1600-0055	1600	100	55	33	1000	23	12.9	584	330	13	145.2
CWV1-1600-0060	1600	100	60	36	1000	23	12.9	584	330	13	145.2
CWV2-1600-0030	1600	100	30	18	633	25	8.35	635	212	13	53.0
CWV2-1600-0035	1600	100	35	21	633	25	8.35	635	212	13	53.0
CWV2-1600-0040	1600	100	40	24	633	25	8.35	635	212	13	53.0

01 CWV1-1600-0055  
CWV1-1600-0060

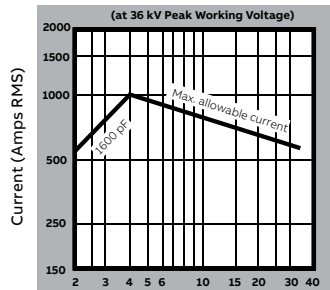
02 CWV2-1600-0030  
CWV2-1600-0035  
CWV2-1600-0040



01

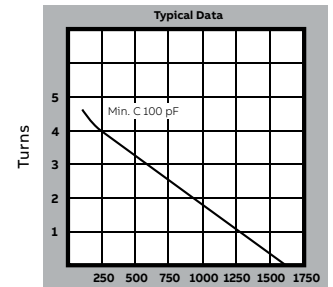


Continuous RMS amperes vs frequency



Mounting: Both ends have tapped holes.

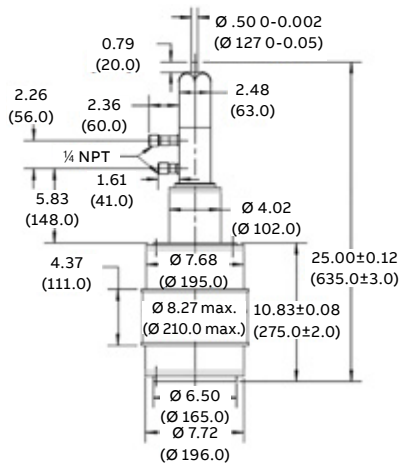
Capacity vs turns



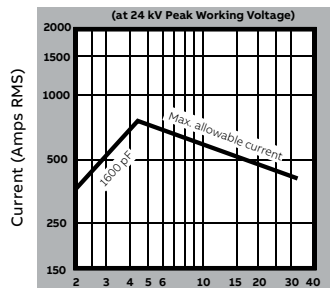
Capacitance (pF)



02

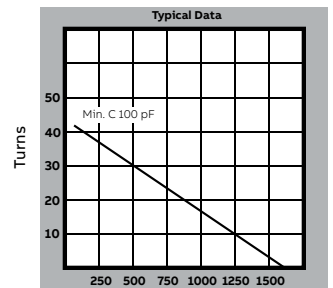


Continuous RMS amperes vs frequency



Mounting: Both ends have tapped holes.

Capacity vs turns



Capacitance (pF)

Dimensions shown are in inches (mm).

# Variable capacitors

## CWV3 and CWV4 series

### CWV3 and CWV4 series vacuum variable capacitors, 1600 pF

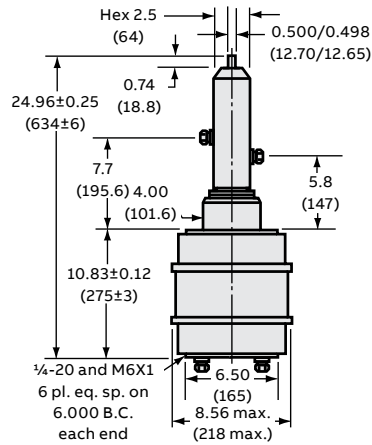
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CWV3-1600-0035	1600	100	35	24	633	25	8.35	635	212	13	123.2
CWV3-1600-0040	1600	100	40	24	633	25	8.35	635	212	13	123.2
CWV4-1600-0050	1600	100	50	30	700	21.5	12.91	546	328	15	123.2
CWV4-1600-0055	1600	100	55	33	700	21.5	12.91	546	328	15	123.2
CWV4-1600-0060	1600	100	60	36	700	21.5	12.91	546	328	15	123.2

01 CWV3-1600

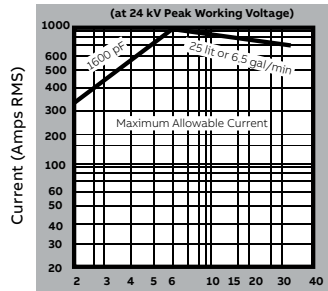
02 CWV4-1600



01

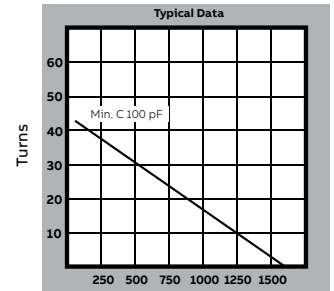


Continuous RMS amperes vs frequency

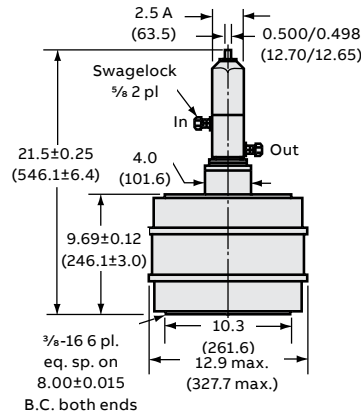


Mounting: Both ends have tapped holes.

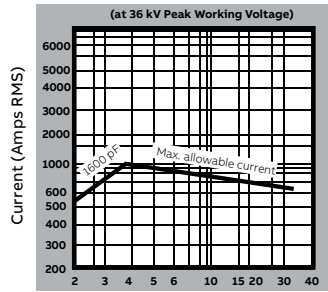
Capacity vs turns



02

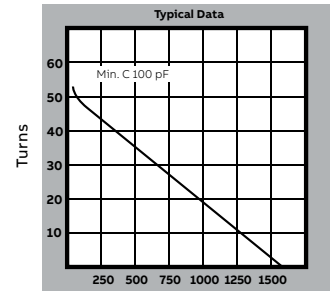


Continuous RMS amperes vs frequency



Mounting: Both ends have tapped holes.

Capacity vs turns



Dimensions shown are in inches (mm).

# Variable capacitors

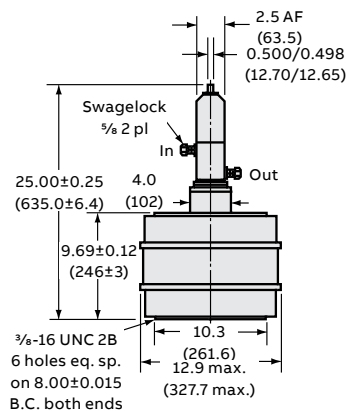
## CWV4 and CVDP series

### CWV4 and CVDP series vacuum variable capacitors, 2050–2300 pF

Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions				Torque in.-lbs.	Weight lb.
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)	Length (mm)	Dia. (mm)		
CWV4-2050-0040	2050	100	40	24	940	24	12.9	610	330	18	132
CWV4-2050-0045	2050	100	45	27	960	24	12.9	610	330	18	132
CWV4-2050-0050	2050	100	50	30	1000	24	12.9	610	330	18	132
CVDP-2300-7.5S	2300	50	7.5	4.5	160	9.84	5.69	250	144.5	6	12.1
CVDP-2300-10S	2300	50	10	60	180	9.84	5.69	250	144.5	6	12.1
CVDP-2300-15S	2300	50	15	9	200	9.84	5.69	250	144.5	6	12.1

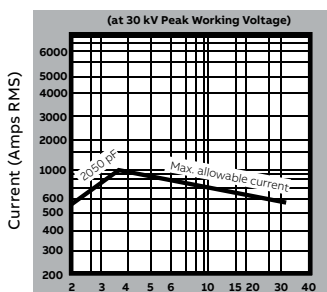
01 CWV4-2050

02 CVDP-2300-7.5S  
CVDP-2300-10S  
CVDP-2300-15S



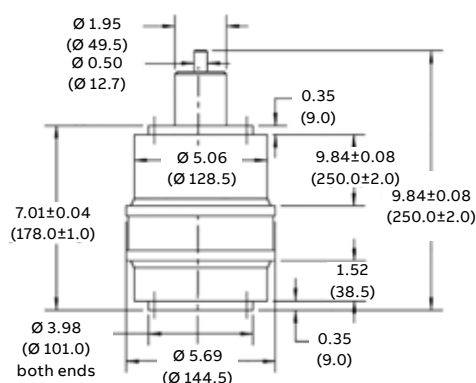
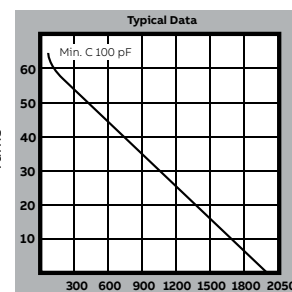
01

Continuous RMS amperes vs frequency



Mounting: Both ends have tapped holes.

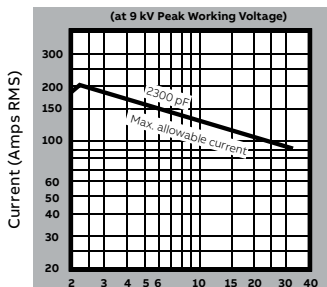
Capacity vs turns



02

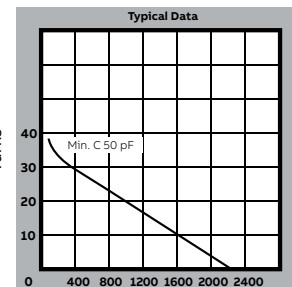
Dimensions shown are in inches (mm).

Continuous RMS amperes vs frequency



Mounting: Both ends have tapped holes.

Capacity vs turns



# Variable capacitors

## CVCD and CMV1 series

CVCD and CMV1 series vacuum variable capacitors, 3000–4000 pF

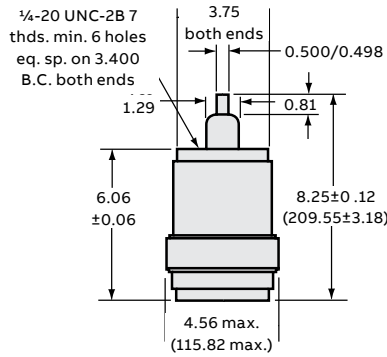
Cat. no.	Capacitance (pF)		Voltage peak (kV)		Current (amps)	Nominal dimensions		Torque in.-lbs.	Weight lb.		
	Max.	Min.	Test	Working		Length (in.)	Dia. (in.)			Length (mm)	Dia. (mm)
CVCD-3000-3S	3000	50	3	1.8	100	8.19	4.53	208	115	1.6	6.6
CVCD-3000-5S	3000	50	5	3	100	8.19	4.53	208	115	1.6	6.6
CMV1-4000-0005	4000	25	5	3	45	5.5	3.39	139.7	86	1.875	4.4

01 CVCD-3000

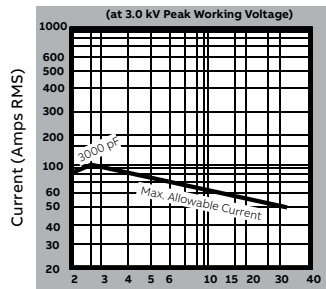
02 CMV1-4000



01

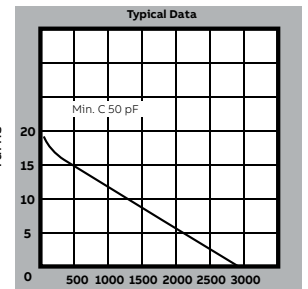


Continuous RMS amperes vs frequency

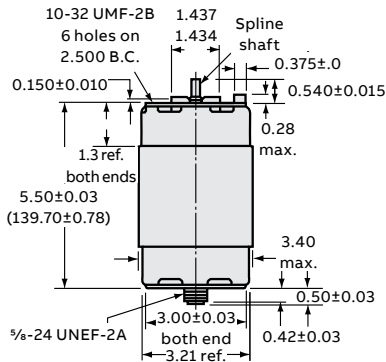


Mounting: Both ends have tapped holes.

Capacity vs turns

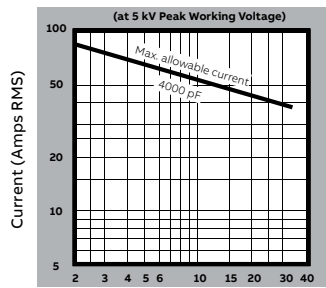


02



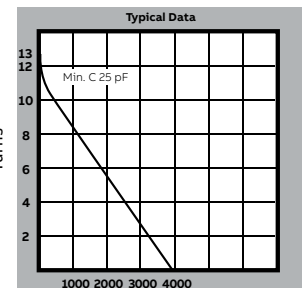
Dimensions shown are in inches (mm).

Continuous RMS amperes vs frequency



Mounting: Fixed end threaded stud. Variable end tapped hole.

Capacity vs turns





## Vacuum and gas-filled relays overview

### Relay selection guides

#### Relays by type

Relay type	Test voltage (kV peak at 60 Hz)	Max. cont. current (amps RMS)	Model no.	Page number
SPST vacuum	4	12	RF41-26SA	39
	4	12	RF42-26SA	39
	6	12	RF44-26SA	40
	9	12	RF43-26SA	40
	8	12	RF5A-26SA	41
	8	12	RF6A-26SA	41
	6	35	RF47-26SA	41
	6	30	RF72-26SA	42
	6	30	RF72-N1105A	42
	6	30	RF72-N1107A	42
	6	30	RF80-26SA	42
	6	10	RF88-26SA	42
	12	12	RF50-26SA	43
	12	12	RF51-26SA	43
	12	30	RF73-26SA	43
	15	15	RF52-26SA	43
	15	12	RF53-26SA	43
16	15	RF69-26SA	44	
30	110	RJ8A-26SA	44	
SPDT vacuum	4	8	RF1E-26SA	45
	4	12	RF60-26SA	45
	4	10	RF61-26SA	45
	5	18	RJ1A-26SA	46
	5	3	RJ1H-26SA	46
	6	18	RJ1C-26SA	46
	6	18	RJ1D-15SA	46
	9	10	RF62-26SA	47
	9	10	RF63-26SA	47
	15	50	RJ2B-26SA	48
	15	30	RJ6B-26SA	48
	15	30	RJ6B-26D3136A	48
	18	30	RJ4C-26SA	49
	20	75	RF10B-26SA	49
30	10	RJ5B-26SA	50	
SPDT gas	50	10	RGH5-26SA	50

## Vacuum and gas-filled relays overview

### Relay selection guides

#### Relays alpha listing by model number

Model no.	Page number	Model no.	Page number
RF10B-26SA	49	RF72-26SA	42
RF1E-26SA	45	RF72-N1105A	42
RF41-26SA	39	RF72-N1107A	42
RF42-26SA	39	RF73-26SA	43
RF43-26SA	40	RF80-26SA	42
RF44-26SA	40	RF88-26SA	42
RF47-26SA	41	RGH5-26SA	50
RF50-26SA	43	RJ1A-26SA	46
RF51-26SA	43	RJ1C-26SA	46
RF52-26SA	43	RJ1D-15SA	46
RF53-26SA	43	RJ1H-26SA	46
RF5A-26SA	41	RJ2B-26SA	48
RF60-26SA	45	RJ4C-26SA	49
RF61-26SA	45	RJ5B-26SA	50
RF62-26SA	47	RJ6B-26D3136A	49
RF63-26SA	47	RJ6B-26SA	49
RF69-26SA	44	RJ8A-26SA	44
RF6A-26SA	41		



# Vacuum and gas-filled relays overview

## Introduction

—  
01 Figure 1

### Jennings high-voltage vacuum relays

Jennings vacuum relays are widely used in airborne, mobile and marine communications equipment. Typical applications include antenna coupling, tap changing on radio frequency (RF) coils, transmit/receive switching to an antenna, switching in pulse-forming networks and heavy-duty power supplies. Our relays are noted for fast operating speeds and the ability to withstand high voltages and carry heavy currents (at frequencies up to 75 MHz), while maintaining low and stable contact resistance.

Vacuum relays are available in SPST normally open (N/O) and normally closed (N/C) models, as well as SPDT configurations. Latching relays are available in some models.

### Vacuum as a dielectric

Vacuum is the ideal dielectric for high voltage relay switching. It has extremely high voltage breakdown characteristics, a fast recovery rate (up to 10 kV per millisecond) and it provides an absolutely inert and non-reactive environment for switching contacts. Since there is no oxygen in a vacuum, contacts remain oxidation free. The high dielectric strength of the vacuum permits close contact spacing, on the order of 1000 V per mil. The small movement required to operate a vacuum relay permits the use of small, low mass actuators, allowing high operating speeds. Use of refractory metal contacts provides exceptional interrupting ability and ensures long contact life.

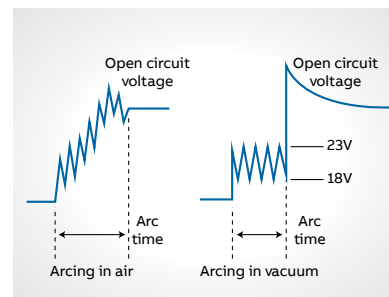
If a load is switched, an arc will form. At the point where the contacts are getting very close and the current density is getting higher and higher, a breakdown occurs. This arc will have a very low voltage of 18–23 V and be quite stable in comparison to an arc in air, which is another advantage of vacuum (Figure 1). The vacuum relay constant arc voltage acts as a current limiter and, when considered in combination with the inherent short arc time, offers a technology that generally wears less than other types of relays, providing stable performance over the life of the relay.

### Pressurized gas as a dielectric (at Jennings, a mixture containing primarily SF-6)

Pure high-pressure gas enables relays to attain high dielectric strength and avoid oxidation. This dielectric is ideal for the high in-rush capacitive make and capacitive discharge loads. Typical applications include electrostatic discharge (ESD) test equipment, cable test equipment and heart defibrillators. Gas-filled relays also provide low, stable leakage current in applications sensitive to current fluctuations, especially across open contact sets over long periods of time.

Gas-filled relays, however, should not be used when it is necessary to break a current. As the contacts open, the gas is ionizing and an arc is formed and sustained for much longer than in vacuum.

The contact resistance of Jennings' gas-filled relays is typically measured at 28 V and will be higher and not as stable as in a vacuum relay.



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## Vacuum and gas-filled relays overview

### Typical applications

#### RF applications

Jennings vacuum relays play a vital role when high power and low RF losses are required.

- Vapor deposition for semiconductor wafer processing
- Transmitter/receiver switches
- Pulse forming networks
- Ion implant
- MRI power supplies
- Radar systems
- Security screening systems
- TWT power supplies
- Radio antenna tuning matching circuits

#### Test equipment and instrumentation

Jennings gas-filled relays are well suited for high in-rush and stable leakage current applications, and Jennings vacuum relays are the ideal solution for low leakage and high carry current applications.

- ESD pulse forming equipment
- HiPot testing
- Cable testing
- Motor winding testing
- Mega-ohm testing
- High power lasers
- Power supply testing
- Mass spectrometry
- High-voltage power supplies
- Transformer test equipment
- Ballast test equipment

#### Specialized applications

Jennings vacuum and gas-filled relays are excellent for:

- Airport lighting systems
- Geosciences down-hole data acquisition
- Scientific instrumentation
- Under-sea power distribution
- Sinusoidal heart defibrillators

#### Custom applications

Because Jennings relays and contactors are sealed to support a vacuum, they can also be filled with special gases for custom applications. They can be re-packaged, tailored or tested to specific requirements.

- Super-low nano amperage leakage
- Screw terminals, long flying leads or special connectors
- Special packaging to replace obsolete relays
- Very low temperature applications
- High-pressure oceanic applications
- Low out-gassing and Hi-Rel testing with traceability and configuration controls for space and satellites

## Vacuum and gas-filled relays overview

Basic functionality – How do Jennings relays work?

—  
01 Figure 2  
—  
02 Figure 3

Jennings manufactures two common relay types:

1. Clapper type relay (Figure 2)
2. Diaphragm relay (Figure 3)

The drawings below show both types and their main features.

A Jennings vacuum relay consists of two main assemblies: the ceramic “switch” assembly, which contains the HV contacts, and the actuator assembly, which holds the actuation coil.

The two types differ in regard to the mechanical actuation. In the diaphragm relay, the actuator is placed outside of the vacuum envelope, whereas in the clapper type relay, the actuator is located inside the vacuum.

The assembly containing the coil is the driving part of the relay and will be connected to the driver circuit. As voltage is applied to the coil, a magnetic field is built up and an electromagnetic force is created. This force is used to move the mechanism and thus the movable contact inside the vacuum envelope. The contact transfers from the N/C to the N/O position or, in an SPST relay, opens your high voltage circuit.



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02

## Vacuum and gas-filled relays overview

### Selection guide



### How to use this table

From the diagrams at the top of the table, choose the contact configuration that meets your requirements. Then choose from the list in that column the relay that meets your voltage and current specifications. Please refer to the product information included in this catalog and look for more detailed information on the selected relay.

Use this table for all continuous current carry applications. For all power switching applications, please contact customer service.

Form A	Form B	Form C	Latching	Latching
SPST-N/O	SPST-N/C	SPDT	SPST	SPDT
RF42-26SA RF6A-26SA RF80-26SA RF51-26SA RF53-26SA RJ8A-26SA	RF41-26SA RF5A-26SA RF88-26SA RF50-26SA RF52-26SA RF69-26SA	RF1E-26SA RJ1H-26SA RJ1C-26SA RJ1D-15SA RF61-26SA RJ1A-26SA RF62-26SA RJ2B-26SA RJ6B-26SA RJ6B-26D3136A RJ4C-26SA RF10B-26SA RJ5B-26SA RGH5-26SA	RF44-26SA RF43-26SA RF47-26SA RF72-26SA RF73-26SA	RF60-26SA RF63-26SA

# Vacuum relays – SPST

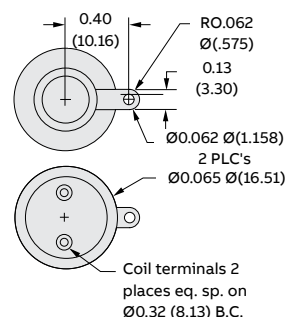
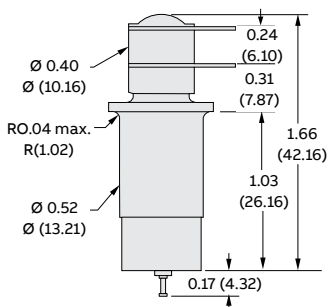
## RF41 and RF42 series

Cat. no	Test voltage (kV peak)		Rated operating voltages (kV)			Continuous current carry (A, RMS)			Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance MΩ	Pull-in voltage at 25 °C V DC	Drop-out voltage at 25 °C V DC	Coil resistance Ω	Shock at 11ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)	
	60 Hz	DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz	16 MHz												32 MHz
RF41-26SA	4	3.6	3.6	3.2	2.5	12	10	7.5	5	10	10	1.6	0.2	16	1–10	290	50	10 at 55–2000 Hz	1	1 (28)
RF42-26SA	4	3.6	3.6	3.2	2.5	12	10	7.5	5	10	10	1.6	0.02	8	1–5	48	50	10 at 55–2000 Hz	1	1 (28)

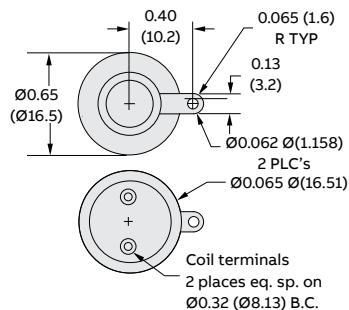
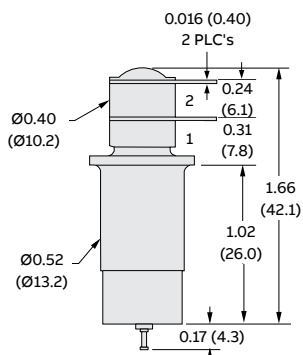
—  
 01 RF41-26SA  
 Form: N/C  
 Flange version available:  
 RF41D-26SA  
 —  
 02 RF42-26SA  
 Form: N/O



01



02



Dimensions shown are in inches (mm).

## Vacuum relays – SPST

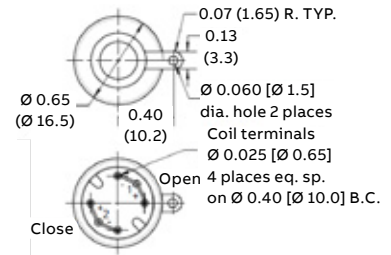
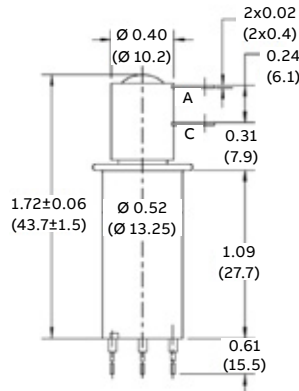
### RF43 and RF44 series

Cat. no	Test voltage (kV peak)		Rated operating voltages (kV)			Continuous current carry (A, RMS)				Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance MΩ	Pull-in voltage at 25 °C V DC	Drop-out voltage at 25 °C V DC	Coil resistance Ω	Shock at 11 ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)
	60 Hz	DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz	16 MHz	32 MHz											
RF44-26SA	6	3.6	3.6	3.2	2.5	12	10	6	5	4	4	1.6	0.012	16	16	80	50	30 at 55–1000 Hz	1	1 (28)
RF43-26SA	9	7	7	6	4	12	10	6	5	10	10	1.6	0.02	16	16	47	50	10 at 55–2000 Hz	1	1 (28)

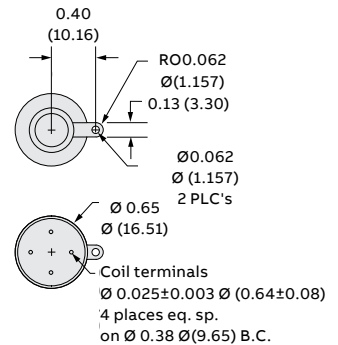
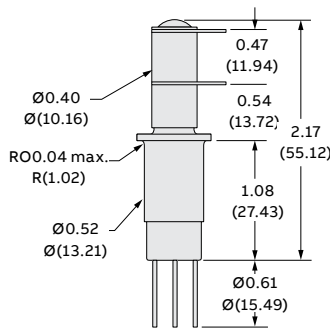
—  
01 RF44-26SA  
Form: Latching  
—  
02 RF43-26SA  
Form: Latching  
Flange version available:  
RF43D-26SA



—  
01



—  
02



Dimensions shown are in inches (mm).

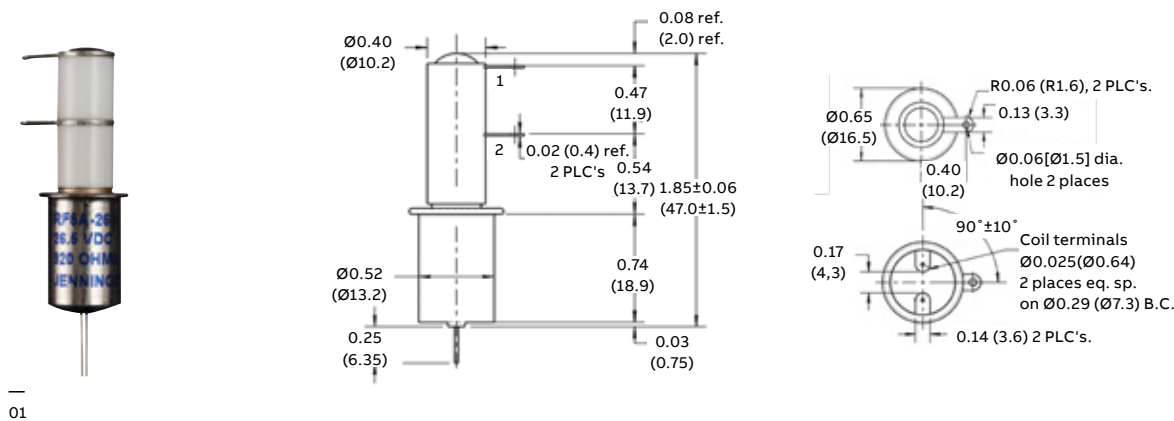


## Vacuum relays – SPST

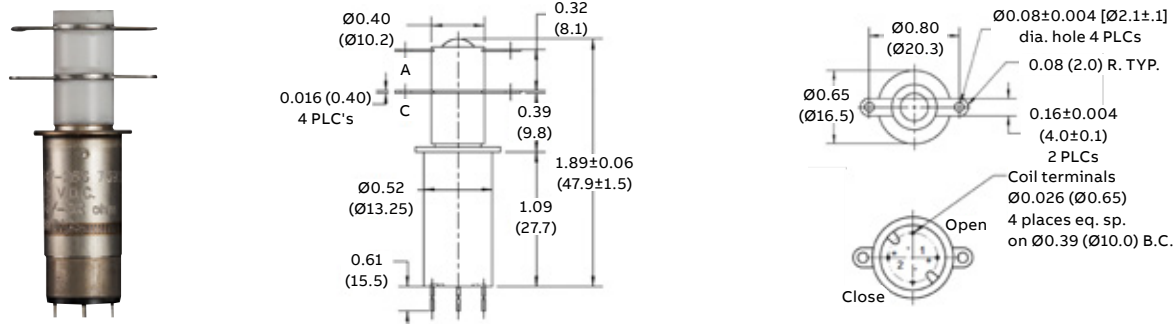
RF5A, RF6A and RF47 series

Cat. no	Test voltage (kV peak)		Rated operating voltages (kV)			Continuous current carry (A, RMS)			Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance M $\Omega$	Pull-in voltage at 25 °C V DC	Drop-out voltage at 25 °C V DC	Coil resistance $\Omega$	Shock at 11 ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)	
	60 Hz	DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz	16 MHz												32 MHz
RF5A-26SA	8	7.5	7.5	7	5	12	10	5	5	8	8	1.6	0.02	16	1–10	920	30	10 at 55–2000 Hz	1	1 (28)
RF6A-26SA	8	7.5	7.5	7	5	12	10	5	2	8	8	1.6	0.02	16	1–10	920	30	10 at 55–2000 Hz	1	1 (28)
RF47-26SA	6	6	5	3.6	2.5	35	21	12	9	4	4	1.6	0.01	16	16	80	50	30 at 55–1000 Hz	1	1 (28)

—  
01 RF5A-26SA  
Form: N/C  
RF6A-26SA  
Form: N/O  
Flange version available:  
RF6AD-26SA  
—  
02 RF47-26SA  
Form: latching  
Flange version available:  
RF47D-26SA



01



02

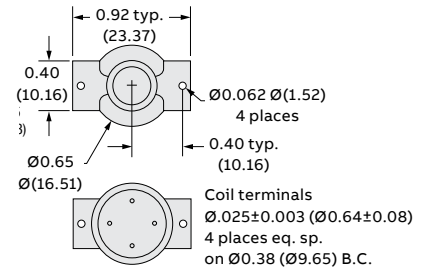
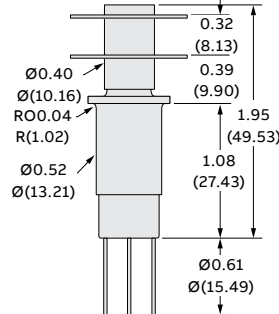
Dimensions shown are in inches (mm).

# Vacuum relays – SPST

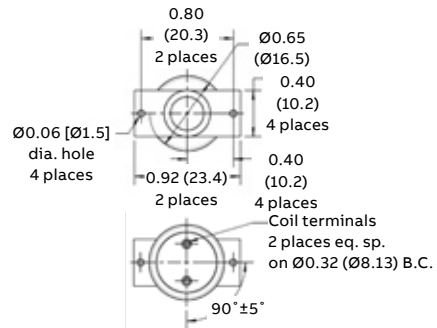
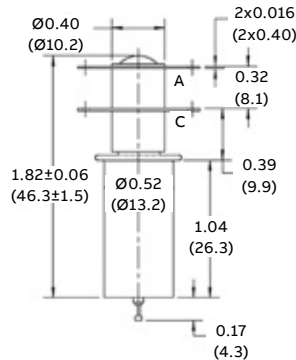
RF72, RF80 and RF88 series

Cat. no	Test voltage (kV peak)		Rated operating voltages (kV)			Continuous current carry (A, RMS)			Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance MΩ	Pull-in voltage at 25 °C V DC	Drop-out voltage at 25 °C V DC	Coil resistance Ω	Shock at 11 ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)	
	60 Hz	DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz	16 MHz												32 MHz
RF72-26SA	6	6	5	3.6	2.5	30	18	11	8	2.5	2.5	1.6	0.02	1–10	16	80	50	30 at 55–1000 Hz	1	1 (28)
RF72-N1105A	6	6	5	3.6	2.5	30	18	11	8	1.5	1.5	1.6	0.008	4–12	6–17	80	50	30 at 55–1000 Hz	1	1 (28)
RF72-N1107A	6	6	5	3.6	2.5	30	18	11	8	2.5	2.5	1.6	0.004	5–16	6–20	80	50	30 at 55–1000 Hz	1	1 (28)
RF80-26SA	6	6	5	3.6	2.5	30	18	11	8	8	3	1.6	0.008	16	1–10	290	30	10 at 55–2000 Hz	1	1 (28)
RF88-26SA	6	6	5	3.6	2.5	10	10	6	5	4	4	1.6	0.02	16	16	80	50	10 at 55–2000 Hz	1	1 (28)

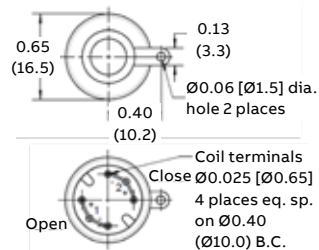
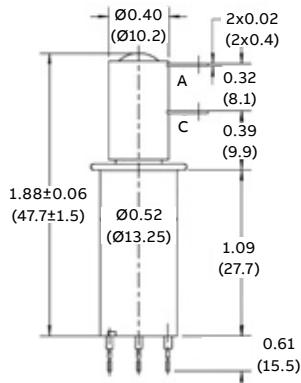
—  
01 RF72-26SA, RF72-N1105A and RF72-N1107A All three models – Form: Latching  
—  
02 RF80-26SA Form: N/O  
—  
03 RF88-26SA Form: N/C



—  
01



—  
02



—  
03

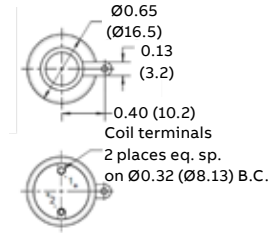
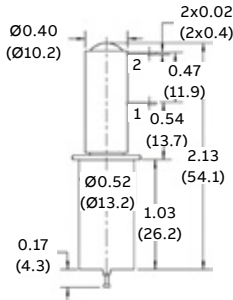
Dimensions shown are in inches (mm).

# Vacuum relays – SPST

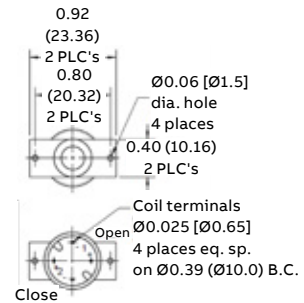
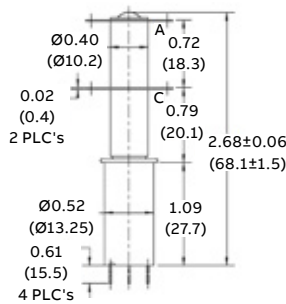
## RF50, RF51, RF52, RF53 and RF73 series

Cat. no	Test voltage (kV peak) 60 Hz	Rated operating voltages (kV)			Continuous current carry (A, RMS)			Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance MΩ	Pull-in voltage at 25 °C V DC	Drop-out voltage at 25 °C V DC	Coil resistance Ω	Shock at 11 ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)		
		DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz												16 MHz	32 MHz
RF50-26SA	12	10	7	6	4	12	10	6	5	15	15	1.5	0.02	16	1–10	290	30	10 at 55– 2000 Hz	0.5	1 (28)
RF51-26SA	12	10	7	6	4	12	10	6	5	15	15	1.5	0.02	16	1.5– 10	290	30	10 at 55– 2000 Hz	1	1 (28)
RF73-26SA	12	10	10	9	7	30	18	11	8	4	4	1.2	0.008	8–13	8–13	47	30	10 at 55– 2000 Hz	1	1 (28)
RF52-26SA	15	12	12	9	7	15	12	6	4	15	15	1.5	0.02	16	1–10	290	30	10 at 55– 2000 Hz	1	1 (28)
RF53-26SA	15	12	12	9	7	12	9.5	5	3	15	15	1.5	0.02	16	1–10	290	30	10 at 55– 2000 Hz	1	1 (28)

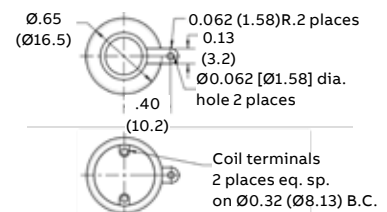
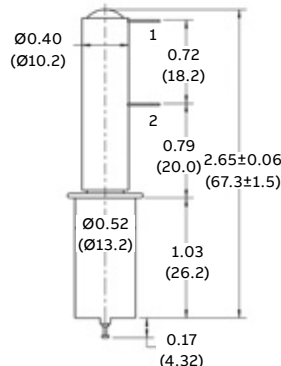
—  
01 RF50-26SA  
Form: N/C  
Flange version available:  
RF50D-26SA  
RF51-26SA  
Form: N/O  
Flange version available:  
RF51D-26SA



—  
02 RF73-26SA  
Form: latching  
Flange version available:  
Yes, please call to order



—  
03 RF52-26SA  
Form: N/C  
Flange version available:  
RF52D-26SA  
RF53-26SA  
Form: N/O



03

Dimensions shown are in inches (mm).

## Vacuum relays – SPST

### RF69 and RJ8A series

Cat. no	Test voltage (kV peak) 60 Hz	Rated operating voltages (kV)			Continuous current carry (A, RMS)			Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance MΩ	Pull-in voltage at 25 °C V DC	Drop-out voltage at 25 °C V DC	Coil resistance Ω	Shock at 11 ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)		
		DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz												16 MHz	32 MHz
RF69-26SA	16	12	-	-	-	15	-	-	15	15	2.5	0.02	16	1-10	290	30	10 at 55- 2000 Hz	1	3 (85)	
RJ8A-26SA	30	28	25	12	10	110	60	40	30	18	8	2.5	0.003	16	1-12	120	30	10 at 55- 450 Hz	2	12 (340)

—  
01 RF69-26SA  
Form: N/C  
Equipped with  
integral flange

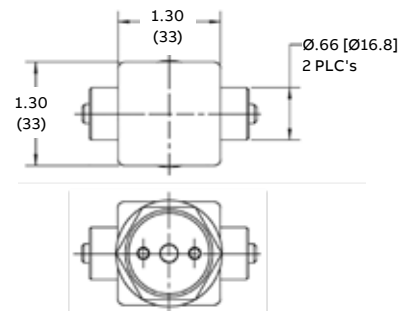
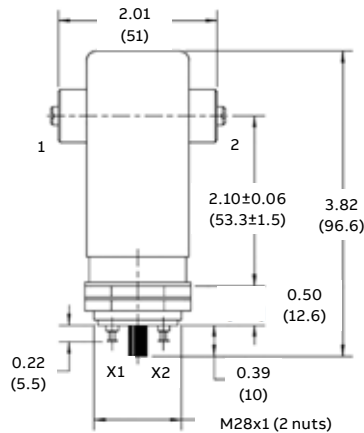
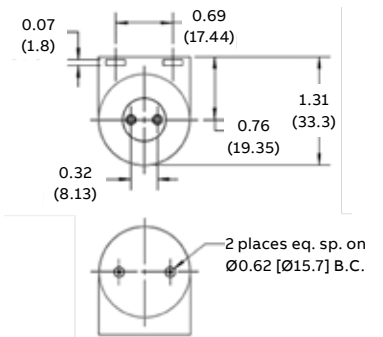
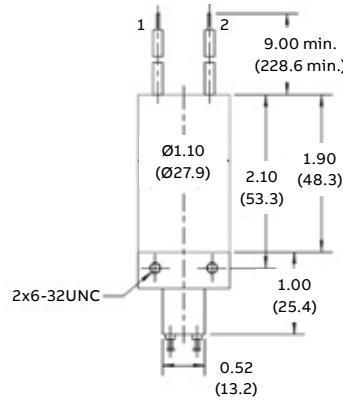


—  
01

—  
02 RJ8A-26SA  
Form: N/O



—  
02



Dimensions shown are in inches (mm).

# Vacuum relays – SPDT

## RF1E, RF60 and RF61 series

Cat. no	Test voltage (kV peak)		Rated operating voltages (kV)			Continuous current carry (A, RMS)			Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance MΩ	Pull-in voltage at 25 °C VDC	Drop-out voltage at 25 °C VDC	Coil resistance Ω	Shock at 11 ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)	
	60 Hz	DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz	16 MHz												32 MHz
RF1E-26SA	4	2	2	2	2	8	6	4	2	10	10	2	0.03	16	1-10	920	30	10 at 55-2000 Hz	1	1 (28)
RF60-26SA	4	3.6	3.6	3.2	2.5	12	10	6	5	10	10	1.6	0.02	5-13	7-16	47	50	10 at 55-1000 Hz	1	1 (28)
RF61-26SA	4	3.6	3.6	3.2	2.5	10	10	6	5	10	10	1.6	0.02	16	1-10	290	50	10 at 55-2000 Hz	0.5	1 (28)

—  
01 RF1E-26SA  
Form: SPDT  
Flange version available: RF1D-26SA

—  
02 RF60-26SA  
Form: latching  
Flange version available: RF60D-26SA

—  
03 RF61-26SA  
Form: SPDT  
Flange version available: RF61D-26SA



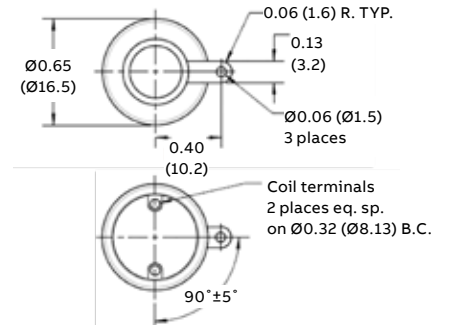
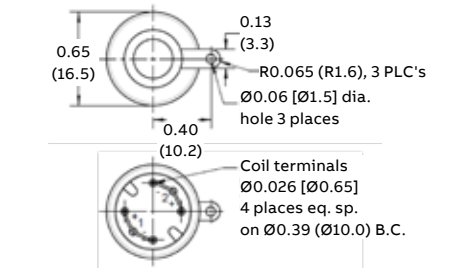
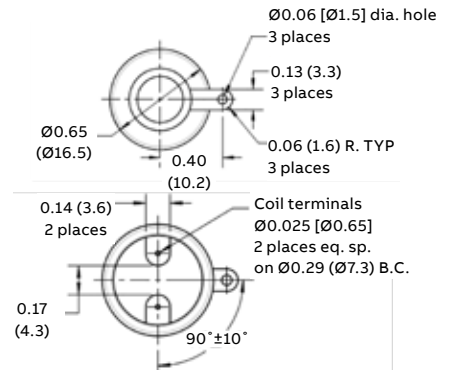
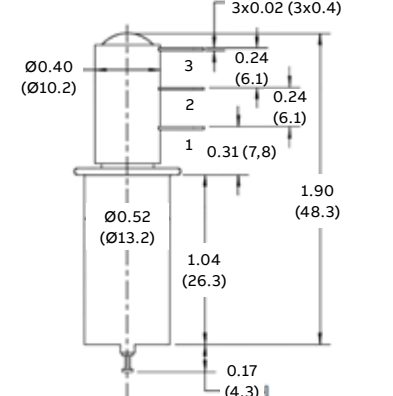
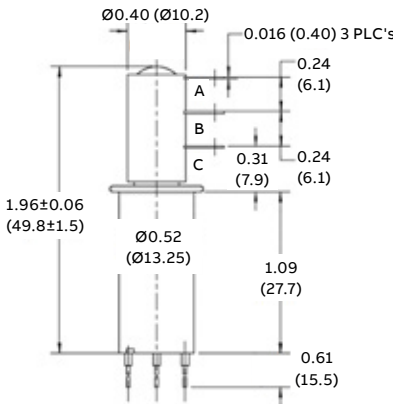
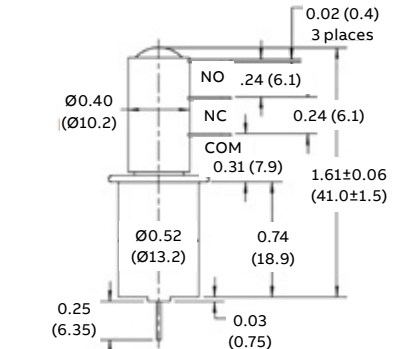
01



02



03



Dimensions shown are in inches (mm).

## Vacuum relays – SPDT

RJ1A, RJ1H, RJ1C and RJ1D series

Cat. no	Test voltage (kV peak)		Rated operating voltages (kV)			Continuous current carry (A, RMS)			Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance MΩ	Pull-in voltage at 25 °C V DC	Drop-out voltage at 25 °C V DC	Coil resistance Ω	Shock at 11 ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)
	60 Hz	DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz	16 MHz											
RJ1A-26SA	5	3.5	2.5	2	1.5	18	14	9	7	8	8	2.5	0.01	16	1-10	335	30	10 at 10-2000 Hz	1 1 (28)
RJ1H-26SA	5	2.5	Hot Break	-	-	3	Hot Break	-	-	6	6	2.5	0.03	16	1-10	335	30	10 at 10-2000 Hz	1 1 (28)
RJ1C-26SA	6	6	Hot Break	-	-	18	Hot Break	-	-	6	6	2.5	0.02	16	1-10	335	30	10 at 10-2000 Hz	1 1 (28)
RJ1D-15SA	6	6	Hot Break	-	-	18	Hot Break	-	-	6	6	2.5	0.02	10	0.7-7	80	30	10 at 10-2000 Hz	1 1 (28)

- 01 RJ1A-26SA  
Form: SPDT
- 02 RJ1H-26SA  
Form: SPDT
- 03 RJ1C-26SA  
Form: SPDT
- 04 RJ1D-15SA  
Form: SPDT



01



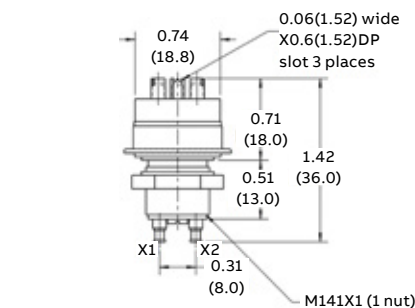
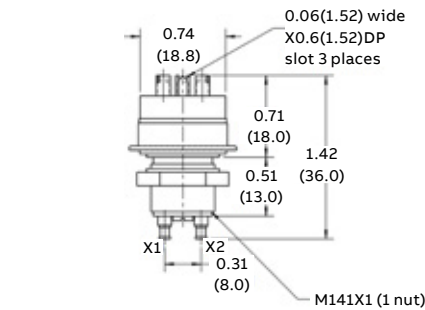
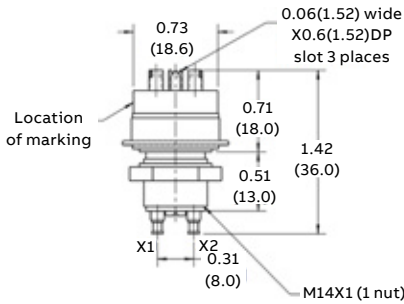
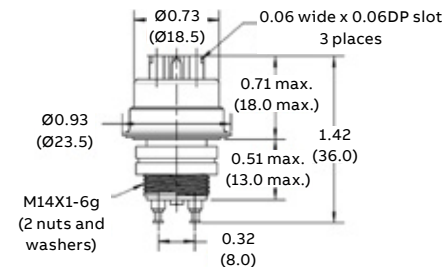
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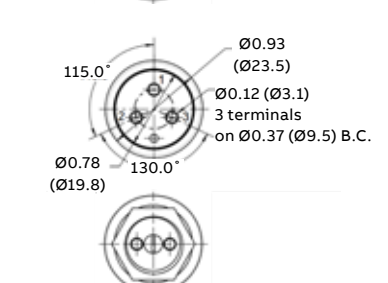
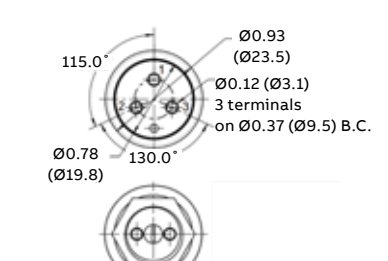
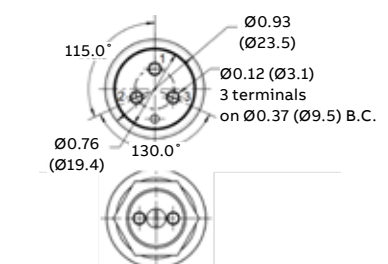
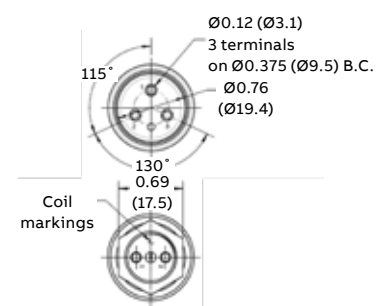
03



04



Dimensions shown are in inches (mm).



# Vacuum relays – SPDT

## RF62 and RF63 series

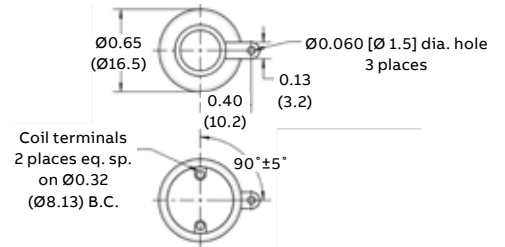
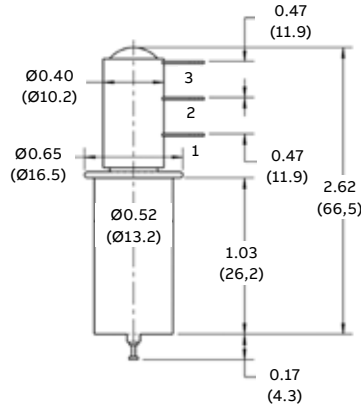
Cat. no	Test voltage (kV peak)		Rated operating voltages (kV)			Continuous current carry (A, RMS)			Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance MΩ	Pull-in voltage at 25 °C V DC	Drop-out voltage at 25 °C V DC	Coil resistance Ω	Shock at 11 ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)	
	60 Hz	DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz	16 MHz												32 MHz
RF62-26SA	9	7	7	6	4	10	10	6	5	10	10	1.6	0.02	16	1-10	290	50	10 at 55-2000 Hz	1	1 (28)
RF63-26SA	9	7	7	6	4	10	10	6	5	10	10	1.6	0.02	16	16	47	50	10 at 55-2000 Hz	1	1 (28)

01 RF62-26SA  
Form: SPDT  
Flange version available:  
RF62D-26SA

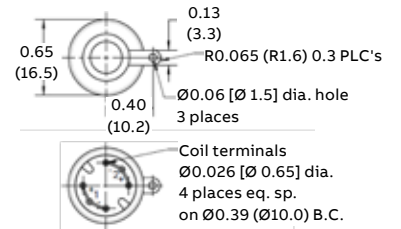
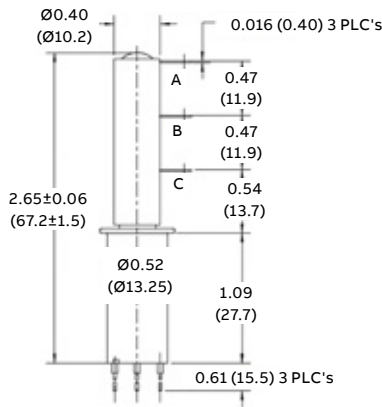
02 RF63-26SA  
Form: latching  
Flange version available:  
RF63D-26SA



01



02



Dimensions shown are in inches (mm).

# Vacuum relays – SPDT

## RJ2B and RJ6B series

Cat. no	Test voltage (kV peak) 60 Hz	Rated operating voltages (kV)			Continuous current carry (A, RMS)			Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance MΩ	Pull-in voltage at 25 °C V DC	Drop-out voltage at 25 °C V DC	Coil resistance Ω	Shock at 11 ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)		
		DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz												16 MHz	32 MHz
RJ2B-26SA	15	12	10	8	6	50	30	17	10	18	9	1	0.012	16	1-10	270	30	10 at 55- 500 Hz	1	3 (85)
RJ6B-26SA	15	12	10	8	6	30	18	10	6	18	9	1	0.025	16	1-10	270	30	10 at 55- 500 Hz	1	3 (85)
RJ6B- 26D3136A	15	12	10	8	6	30	18	10	6	18	9	1.5	0.025	16	1-10	270	30	10 at 55- 500 Hz	1	3 (85)

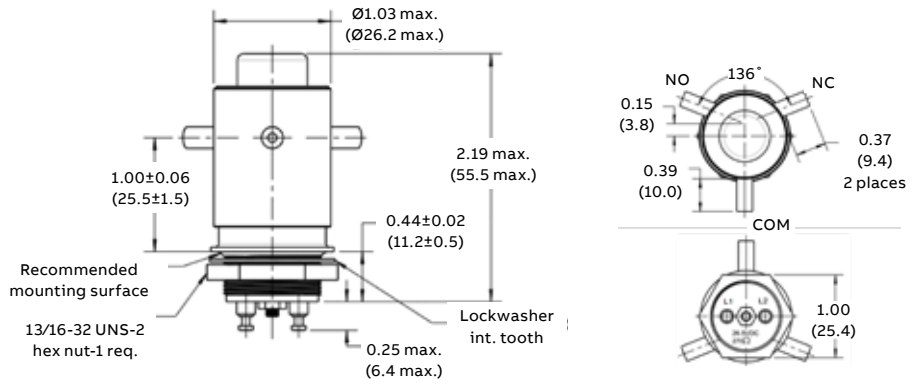
01 RJ2B-26SA  
Form: SPDT  
Flange version  
available: RJ2C-26SA

RJ6B-26SA  
Form: SPDT  
Flange version  
available: RJ6C-26SA

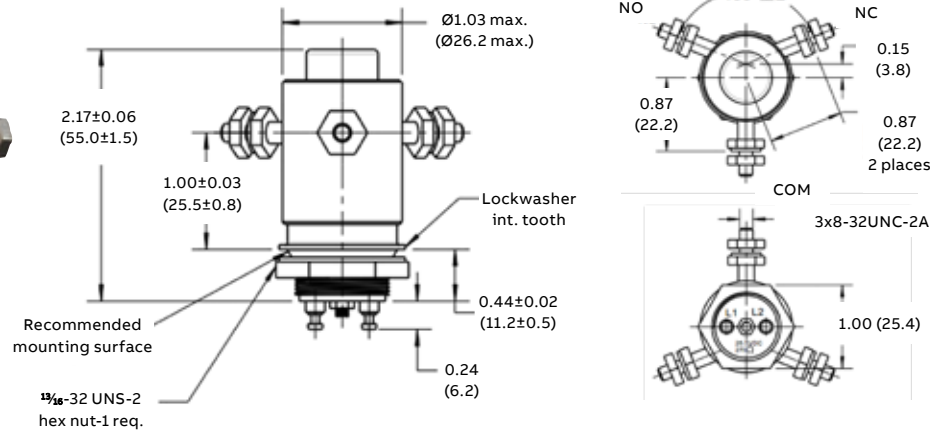
02 RJ6B-26D3136A  
Form: SPDT  
Flange version available:  
RJ6C-26D3136A



01



02



Dimensions shown are in inches (mm).



# Vacuum relays – SPDT

## RJ4C and RF10B series

Cat. no	Test voltage (kV peak)	Rated operating voltages (kV)			Continuous current carry (A, RMS)			Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance MΩ	Pull-in voltage at 25 °C V DC	Drop-out voltage at 25 °C V DC	Coil resistance Ω	Shock at 11 ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)		
	60 Hz	DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz												16 MHz	32 MHz
RJ4C-26SA	18	15	12	10	7	30	18	10	6	18	9	1	0.025	14	1-10	270	30	10 at 55-500 Hz	1	3 (85)
RF10B-26SA	20	15	13	10	8	75	22	15	12	30	10	3.5	0.012	16	1-10	225	30	5 at 55-500 Hz	0.1	1 (28)

—  
01 RJ4C-26SA  
Form: SPDT  
Equipped with  
integral flange

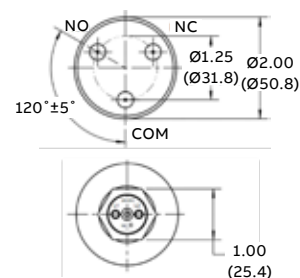
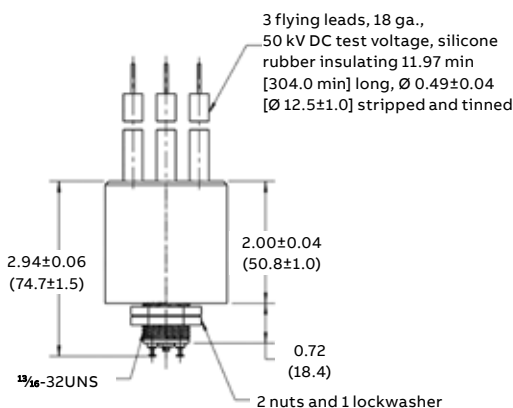
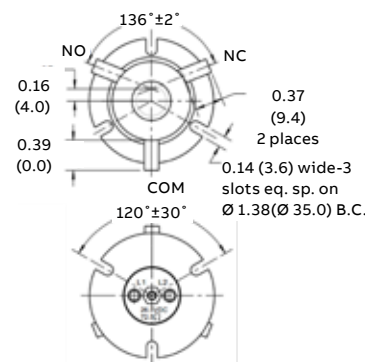
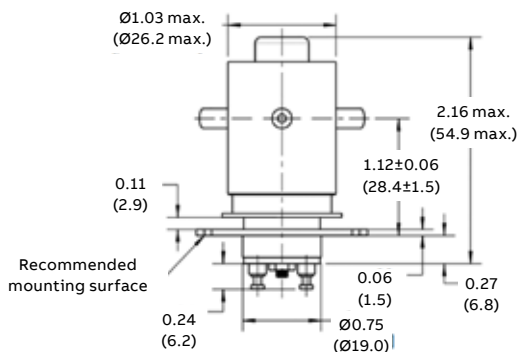


—  
01

—  
02 RF10B-26SA  
Form: SPDT  
Equipped with  
integral flange



—  
02



Dimensions shown are in inches (mm).

## Vacuum relays – SPDT and gas-filled relays

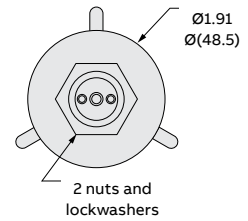
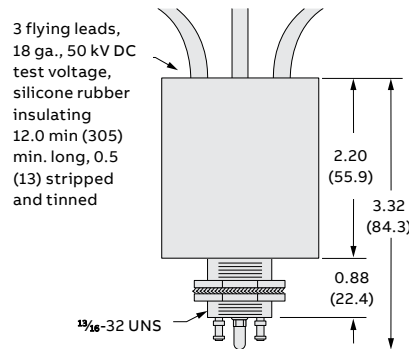
RJ5B (vacuum) and RGH5 (gas-filled) series

Cat. no	Test voltage (kV peak)	Rated operating voltages (kV)			Continuous current carry (A, RMS)			Operate time msec	Release time msec	Contact capacity – open to ground (pF)	Max. contact resistance MΩ	Pull-in voltage at 25 °C V DC	Drop-out voltage at 25 °C V DC	Coil resistance Ω	Shock at 11 ms-½ sine G's	Vibration peak G's	Mechanical life (Million)	Weight oz. (g)		
	60 Hz	DC or 60 Hz	2.5 MHz	16 MHz	32 MHz	DC or 60 Hz	2.5 MHz												16 MHz	32 MHz
RJ5B-26SA	30	25	-	-	-	10	-	-	-	20	15	6	1	18	1-10	167	20	10 at 55-500	1	12 (340)
RGH5-26SA	50	40	-	-	-	10	-	-	-	20	15	6	1	18	1-10	167	20	10 at 55-500	1	12 (340)

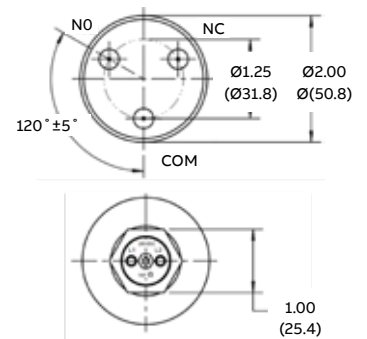
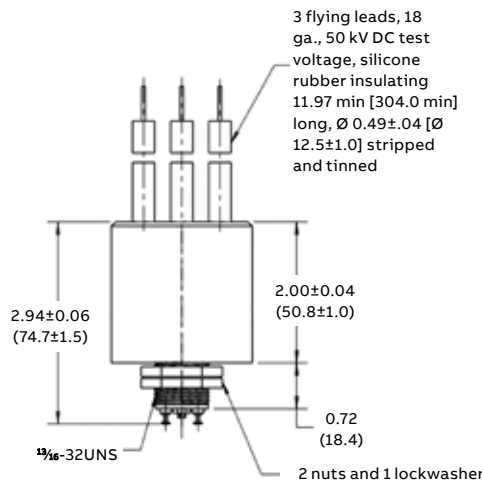
—  
01 RJ5B-26SA  
Form: SPDT  
—  
02 RGH5-26SA  
Form: SPDT



—  
01



—  
02



Dimensions shown are in inches (mm).

# Vacuum interrupters

## Introduction

The first vacuum interrupter used commercially was a Jennings device. It was installed as a line-and-load dropping switch for a 138 kV transmission line in California in 1955. Jennings has continually expanded its portfolio of vacuum products, including a wide range of vacuum interrupters.

Current interruption in a vacuum is recognized as the ideal switching technology in the medium-voltage range, and it's also applied in high-voltage and low-voltage applications. Excellent switching capabilities and compact design make vacuum interrupters the most economical switching device solutions possible.

Jennings interrupter designs handle a wide range of voltage and current interrupt levels, and high quality and highly reliable interrupters are available for the utility and industrial markets.

### Design

Jennings vacuum interrupters feature an evacuated ceramic insulating envelope surrounding two contacts, one fixed and one movable.

The movable contact is operated from the outside through a metallic bellows. Contacts are typically

a copper alloy that is developed for use in AC voltage applications. The end plates are made of stainless steel or copper.

### Features and benefits

- Long life, high reliability – Vacuum interrupters can be expected to last the life of the equipment in which they are installed
- Controlled contact erosion results in virtually maintenance-free operation
- Fast interrupting speed – The interruption mechanism is independent of current magnitude, so interruption can normally be anticipated at the first current zero with no restriking
- Rapid dielectric recovery – The dielectric strength of the contact gap recovers more rapidly than the recovery voltage can rise, eliminating restriking
- High cycle withstand voltages
- Robust, compact design – Vacuum dielectric enables contacts to be arranged close together so circuit interruptions can be designed in a smaller envelope
- Environmentally friendly – Current interruption occurs in a vacuum, so there is no emission of greenhouse or toxic gases
- Atmospheric contact contamination is eliminated – Oxides and corrosion layers cannot form in the vacuum environment
- Noise-free and flash-free – All arcing is confined within the vacuum interrupter body

### Applications

- Load break switches
- Contactors for industrial and motor control (example: Jennings contactors use Jennings vacuum interrupters)
- Capacitor bank switching
- Circuit breakers
- Specialty RF and DC applications

### Markets

- Power distribution
- Power transmission
- Industrial
- Airport
- Steel smelters
- Offshore drilling
- Mining
- Rail



## Vacuum interrupters

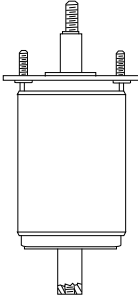



### Product offering and selection guide

#### Product offering


##### Electrical characteristics

Cat. no.	Operating voltage (kV)	1 Minute DWV (kV)	Rated short circuit current (A RMS)	Rated continuous current (A RMS)	Contact force at contact separation (lbs. max.)	Mechanical life (operations)	Body diameter (in.)	Body length (in.)	Total length (in.)	Stroke (contact gap, in.)
RP158	3.6	45	–	300	7.7±20%	2.0 million	2.44	2.81	4.49	0.110
RP133	1.5	30	–	450	9.7±25%	500,000	2.06	2.25	3.275	0.090
RP233	25.0	40	–	3 at 32 MHz	2 lbs. 8 oz.	1.5 million	1.31	4.18	5.68	0.120
RP173	7.2	28	6,000	450	16.5+ 25%	1.0 million	2.40	4.63	6.84	0.190
RP175	7.2	28	6,000	450	16.5+ 25%	1.0 million	3.00	4.75	7.83	0.190

#### Selection guide

	RP175	RP173	RP158	RP133
Contactor and switch application – Commercial				
Operating voltage (kV)	7.2	7.2	3.6	1.5
Rated continuous current (A)	450	450	300	450

\* Capacitive switch rating

	RP233
RF/DC application	
Operating voltage (kV)	40
Rated continuous current (A)	35 at 32 MHz

## Vacuum interrupters

### Applications

#### Industrial applications

The unique advantages of switching in a vacuum make vacuum interrupters useful in industrial applications. Many kinds of test, production or processing equipment have requirements for long contact life without maintenance, for low-cost high-voltage control or for sealed contacts because of difficult environmental requirements. Due to recent advances in vacuum interrupter technology and the availability of new low-cost designs, vacuum interrupters are finding many new uses.

Where voltages are high and fault currents relatively low, a vacuum interrupter switch is an attractive alternative to oil circuit breakers. They are smaller, less expensive to install and maintain, provide half-cycle interruption instead of requiring five cycles or more and eliminate danger of explosion and fire.

Vacuum interrupter switches are useful where dust, high humidity or high altitudes make it difficult to maintain dielectric strength with other types of devices. In airborne equipment, for example, their small size is also an important feature. In environments involving explosive or corrosive atmospheres, they provide an additional safety factor. Even when destroyed by high currents, the arc is still completely contained because not enough gas pressure is developed to destroy the protective envelope.

For dielectric and induction heating equipment and x-ray and irradiation equipment used for processing foods and chemicals, vacuum switches can be used directly in the DC circuits for fast, maintenance-free, push-button disconnect.

#### RF switches

Vacuum interrupter switches have demonstrated superior performance for RF applications, such as:

- Band switching of transmitters
- Switching of filter sections and antenna multicouplers
- Antenna reflector switching
- Tap changing of RF coils in induction and dielectric heating RF generators
- Switching of transmission lines

Most of these applications are in the HF band and involve currents ranging from 20 A to several hundred amperes. At very high currents, switches should be fed symmetrically to avoid uneven current distribution inside the switch. Vacuum interrupter switches, without an actuator, lend themselves to custom-designed tap changing and filter network switching because a number of switches can be driven by cams from a common shaft.



## Vacuum contactors

### Overview

Jennings vacuum contactors offer one of the most reliable means available for remotely controlling electric power

—  
01 Figure 1— Typical Jennings solenoid-operated vacuum contactor

Jennings vacuum contactors provide all the operating advantages of a vacuum interrupter plus the benefits of a matching actuator to meet specific application requirements. These low and medium voltage contactors offer the most reliable means of remotely controlling electric power.

#### Maintenance-free vacuum contactors provide fast arc extinction and rapid recovery of dielectric strength

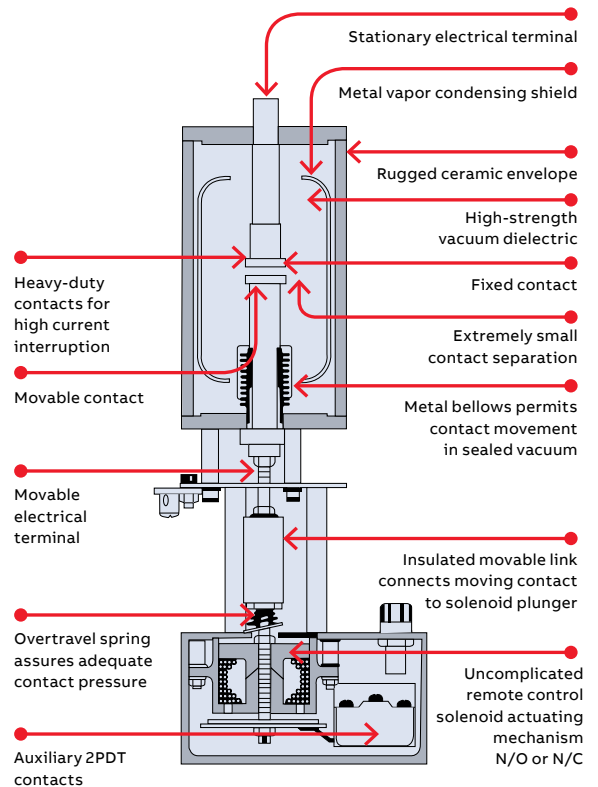
Jennings contactors consist of a vacuum interrupter and an actuator linked together by an insulated actuating rod. Linkage and stand-off posts that isolate the high voltage from ground are made of epoxy glass laminate for DC switching. Heavy-duty connectors are provided for the high voltage connection.

Figure 1 illustrates a solenoid-operated vacuum contactor. Its interrupter consists of an evacuated ceramic insulating envelope in which there are two contacts, one stationary and one movable. The movable contact is operated from the outside through a metallic bellows that provides a vacuum-tight seal.

A vacuum has an extremely high dielectric strength – As high as 1000 V per mil. When the contacts are opened to interrupt current flow, metal vapor is generated by the passage of current through the contacts. The vapor sustains the arc that is created, maintaining it down to or near current zero.

The small arc drawn on the contact opening is quickly extinguished because there are no gases, and there is only a small voltage drop across it. As the arc extinguishes, the metallic vapor rapidly diffuses outward and condenses on the cool surface of the vapor shields. The vapor shields prevent the metallic vapor from depositing on the ceramic insulating surfaces.

Fast arc extinction and rapid recovery of dielectric strength after contact opening are characteristics of vacuum interrupters. A phenomenon with these interrupters is the auto-maintenance of the vacuum. The metallic ions released from the contacts provide a gettering action. Tests have shown that frequent operation of the contacts produces a steady improvement in vacuum level because the released metallic ions actually remove gas molecules from the evacuated space. This ion-pumping action tends to maintain the vacuum near the high initial value.



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01

## Vacuum contactors

### Overview

#### Typical applications

Jennings vacuum power contactors are used for controlling DC and 50/60/400 Hz circuits. Principal use is in high power electrical equipment requiring long contact life without maintenance, low-cost, high voltage control or sealed contacts because of environmental conditions.

Switching and protecting transformers used in DC power supplies is one of the most common power frequency applications for contactors. Most transformer switching is done on the primary side for off-on control or to switch out current-limiting resistors or reactors used for reduced-voltage starting of power tubes. It may be necessary to use additional backup fault protection to take care of primary line-side faults. This is sometimes accomplished using a current-limiting fuse or coordinating with a high capacity system breaker already located in the primary side. However, where frequent faults are anticipated, contactors offer a much longer life with no contact maintenance, and they are often less expensive.

#### Advantages of Jennings vacuum contactors

By employing proven Jennings vacuum interrupter technology, Jennings contactors provide reliable, maintenance-free operation in industrial motor controls and other systems using a wide range of currents and voltages. The operation of contacts within a vacuum offers several inherent advantages:

- No required contact maintenance – Contacts are sealed within a very high vacuum and remain clean permanently. There is no contact oxidation or possibility of foreign matter forming on the contacts and leaving contaminating residues.
- Long life – The arc that results as the contact is made or broken is quickly extinguished within a vacuum. The special contact material utilized erodes at an extremely slow rate to provide reliable operation for tens of thousands of operations.
- Environmental safety factor – Vacuum contactors can be used in environments involving corrosive atmospheres because there is no exposed arcing during interruption.
- Compact, reliable operating mechanism – The high dielectric strength of a vacuum minimizes the contact-to-contact gap required to interrupt current. This short contact stroke not only provides high operating speed, but also reduces the size and weight of the operating mechanism used.
- No arc chute replacement – Ordinary air-break contactors require fragile arc chutes to extinguish the arc that forms when the contact is broken. Arc chutes are damaged with use and ultimately require replacement. The manner in which vacuum contactors operate causes the arc to be extinguished rapidly with minimal damage or wear.
- Proven operation – Jennings vacuum interrupters have been supplied for several decades for use in electrical power generation and distribution systems operating at all voltage levels. The long life and reliability of these devices is such that many of the original units are still in operation.
- Low contact resistance – This resistance remains low and stable for the life of the contactor.



## Vacuum contactors

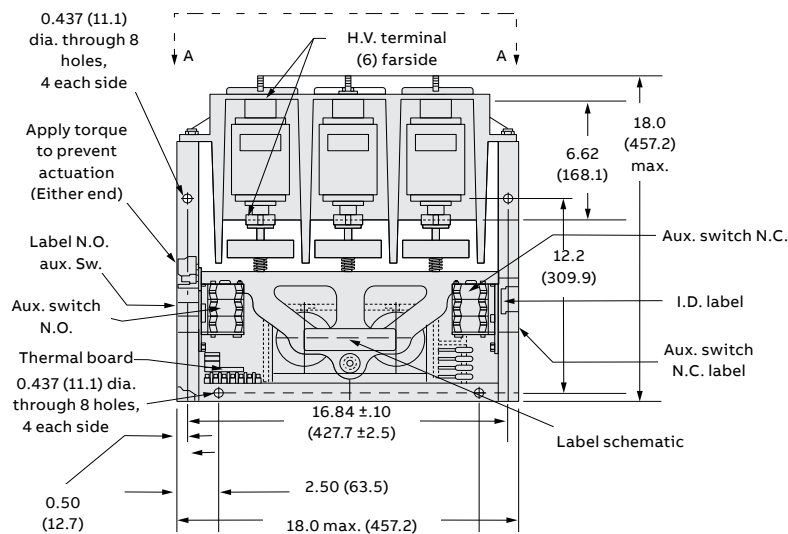
### RP173 three-phase vacuum contactors



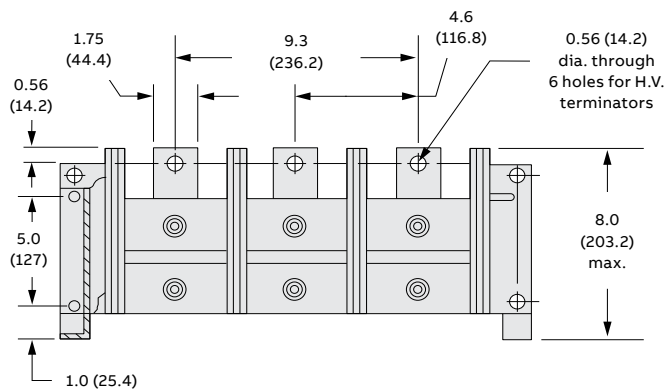
Measuring 18"H x 18"W x 8"D and weighing less than 67 lbs., the Jennings RP173 three-phase vacuum contactor is built tough to work in a variety of heavy-duty applications. Able to withstand the frequent switching required to control furnaces and large motors, this contactor can also be used to switch power transformers and capacitor banks for voltage regulation and power factor correction as a means of reducing operating costs. It is ideal for use in motor controllers that operate production and processing equipment, mining and petroleum equipment, earth movers and conveyors, power shovels and all types of industrial loads. Using a trio of Jennings vacuum interrupters, the three-phase unit provides a short contact-to-contact gap required to interrupt the circuit for highly reliable operation. The contact materials are rated for 7.2 kV, 600 A load life and 6000 A fault current.

#### Features

- Sealed main contacts provide a minimum of 1 million maintenance-free open and close operations
- Reliable operation in harsh temperature extremes ranging from -20 °C to 70 °C
- Versatility for use with heavy-duty motors, power equipment and motor controllers



#### View A-A



Dimensions shown are in inches (mm).



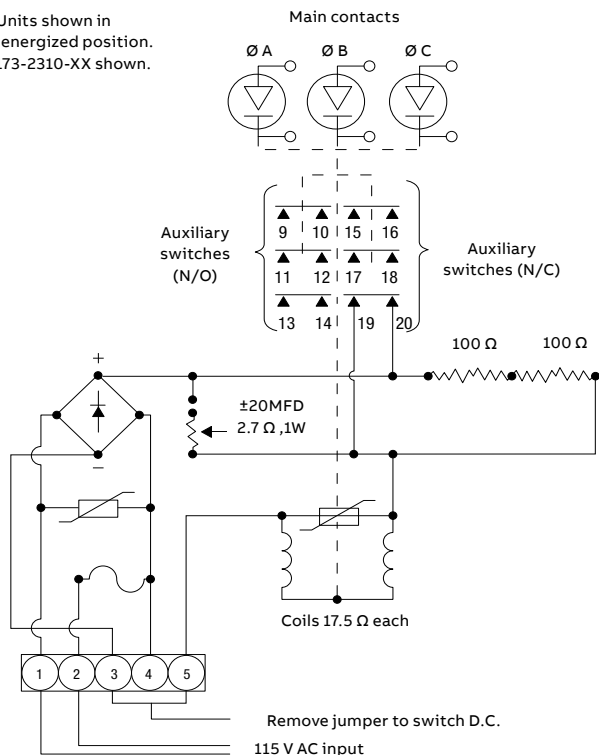
# Vacuum contactors

## RP173 three-phase vacuum contactors



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01 Units shown in de-energized position. RP173-2310-XX shown.



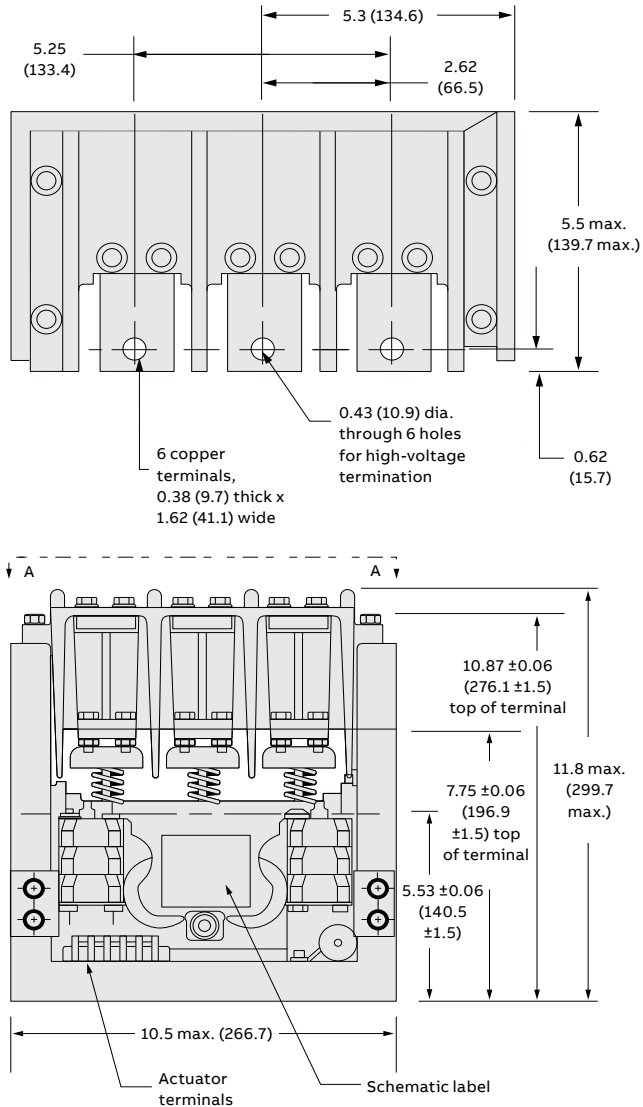
Voltage ratings			
Maximum three-phase line (kV)	1.5, 2.5, 5.0, 7.2		
Dielectrics 50/60/400 Hz, 60-second withstand			
- Line-to-ground (kV RMS)	30		
- Line-to-line (kV RMS)	30		
- Across open contacts (kV RMS)	30		
BIL, 1.2 x 50 µsec impulse			
- Line-to-ground peak (kV)	20		
- Line-to-line peak (kV)	20		
Current rating			
Continuous (amps RMS)	450/600		
Load-switching (amps RMS)	450		
- Capacitors (grounded neutral)	2000 kVAR at 4.16 kV		
- Motors	5000 HP at 7.2 kV		
- Transformers	5000 kVA at 7.2 kV		
Making current (random make)			
- 100 Times at 7.2 kV with 3-second backup (kA RMS)	4.5		
- 10 Times at 7.2 kV with current-limiting fuse (kA)	55 peak		
- 100 Times at 5.0 kV with 3-second backup (kA RMS)	6		
Minimum load life at 600 A RMS	1 million open/close operations		
Interrupt (amps RMS at 5.0 kV)	6000		
Actuator			
Control voltage			
- RP173-2310-XX	115 V AC, 50/60 Hz		
- RP173-2311-XX	or 110 V DC		
230 V AC, 50/60 Hz or 220 V DC			
Control current	3.3 pull-in amps, 0.5 hold-in amp		
Auxiliary contacts configuration	2 N/C, 3 N/O, SPST double break, 10 amps resistive at 600 V AC		
Mechanical			
Weight (lb.)	67 max.		
Release time (msec.) from control switch off to separation of main contacts	100 max.		
Mounting	Operates in any position		
RP173 three-phase vacuum contactors			
Cat. no.	Mounting option	Actuator volts	Line-to-line voltage (RMS)
RP173-2310-00	Standard	115 V AC/110 V DC	7200
RP173-2310-01*	Standard	115 V AC/110 V DC	7200
RP173-2311-00	Standard	230 V AC/220 V DC	7200
RP173-2315-00**	View A-A 180°	115 V AC/110 V DC	7200
RP173-2341-00	Standard	115 V AC/110 or 120 V DC	7200

\* Includes ruggedized frame.  
 \*\* Modified for slower release time.

## Vacuum contactors

### RP133 three-phase vacuum contactors

#### View A-A



Dimensions shown are in inches (mm).

The Jennings RP133 vacuum contactor may be small – only 11.8"H x 10.5"W x 5.5"D – and weigh less than 30 pounds, but it can take on requirements of the most demanding equipment. Using a trio of Jennings vacuum interrupters, the three-phase unit provides a short contact-to-contact gap required to interrupt the circuit for highly reliable operation. The contact materials are rated for 1.5 kV, 450 A load life and 4500 A fault current.

Designed to withstand the frequent switching required to control furnaces and large air conditioning motors, the RP133 is commonly used to protect power transformers and DC power supplies. Use it to switch capacitor banks for voltage regulation and power factor correction as a means of reducing operating costs. Reliable and durable, the RP133 can also be used in motor controllers that operate production and processing equipment, mining and construction equipment, earth movers or carriers, power shovels, rock crushers and conveyors.

#### Features

- Sealed main contacts provide a minimum of 1 million maintenance-free open and close operations
- Reliable operation in harsh temperature extremes ranging from -20 °C to 70 °C
- Versatility for use with heavy-duty motors, power equipment and motor controllers



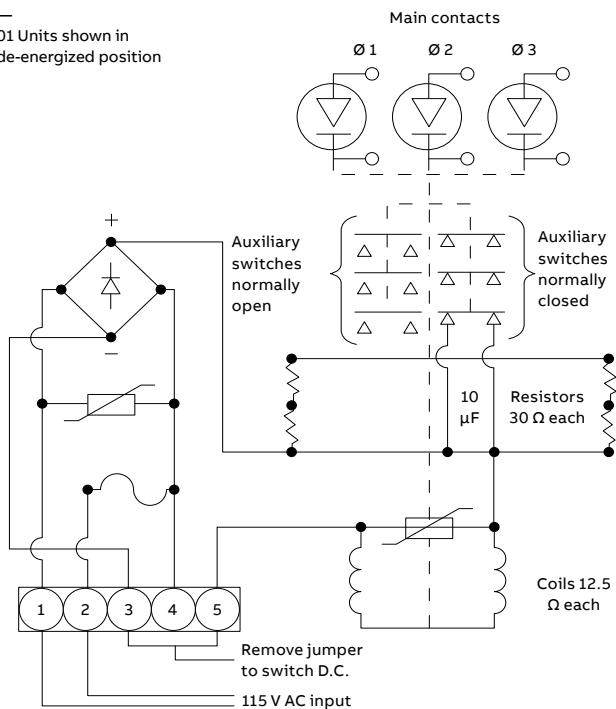
## Vacuum contactors

### RP133 three-phase vacuum contactors



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01 Units shown in de-energized position



Voltage ratings	
Maximum three-phase line (V and kV)	600 and 1.5
Dielectrics 50/60/400 Hz, 60-second withstand	
- Line-to-ground (kV RMS)	6.5
- Line-to-line (kV RMS)	6.5
- Across open contacts (kV RMS)	6.5
BIL, 1.2 x 50 µsec impulse	
- Line-to-ground peak (kV)	20
- Line-to-line peak (kV)	20
- Across open contacts (kV)	20
Current rating	
Continuous (amps RMS)	450
Load-switching (amps RMS)	450
- Capacitors	750 kVAR at 1.5 kV
- Motors	750 HP at 1.1 kV
Making current (random make)	
- 100 times at 1.5 kV with 3-second backup (kA RMS)	4.5
- 10 times at 1.5 kV with current-limiting fuse (kA)	28 peak
- 100 times at 1.5 kV with 3-second backup (kA RMS)	6
Minimum load life at 450 A RMS	1 million open/close operations
Interrupt (amps RMS at 1.5 kV)	4500
Actuator	
Control voltage	115 V AC, 50/60 Hz or 110 V DC
Control current	7.1 pull-in A, 0.9 hold-in A
Auxiliary contacts configuration	2 N/C, 3 N/O, SPST double break, 10 A resistive at 600 V AC
Mechanical	
Weight (lb.)	30 max.
Release time (msec.) from control switch off to separation of main contacts	16 max.
Mounting	Operates in any position

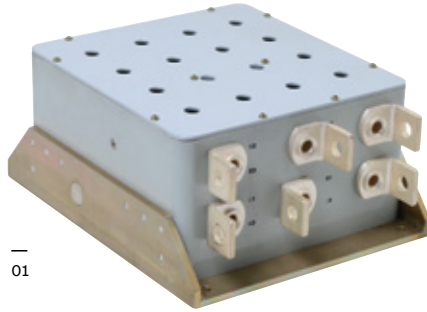
### RP133 three-phase vacuum contactors

Cat. no.	Mounting option	Actuator volts	Line-to-line voltage (RMS)
RP133-2332-00	2332	115 V AC/110 V DC	1500
RP133-2332-01	2332	115 V AC/110 V DC	3300
RP133-2334-00	2334	100 V DC	1500
RP133-2335-00	2335	115 V AC/110 V DC	1500

## Vacuum contactors

### RP151B three-phase vacuum contactors

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01 Mechanically shock-hardened version available as shown



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The Jennings RP151B three-phase vacuum contactor is a compact, normally open, three-phase device for use in equipment that requires a high-speed interrupt. It is useful as an overload interrupter to 2000 A RMS interrupting capacity. Special erosion-resistant contacts provide an operational load life of 250,000 maintenance-free operations at the rated 200 A current.

#### Features

- Erosion-resistant contacts provide a minimum of 250,000 operations for long, maintenance-free life
- 2000 A RMS interrupting capacity – ideal for use in an overload interrupter
- Three-phase, normally open operation provides high-speed interrupt

#### Voltage ratings

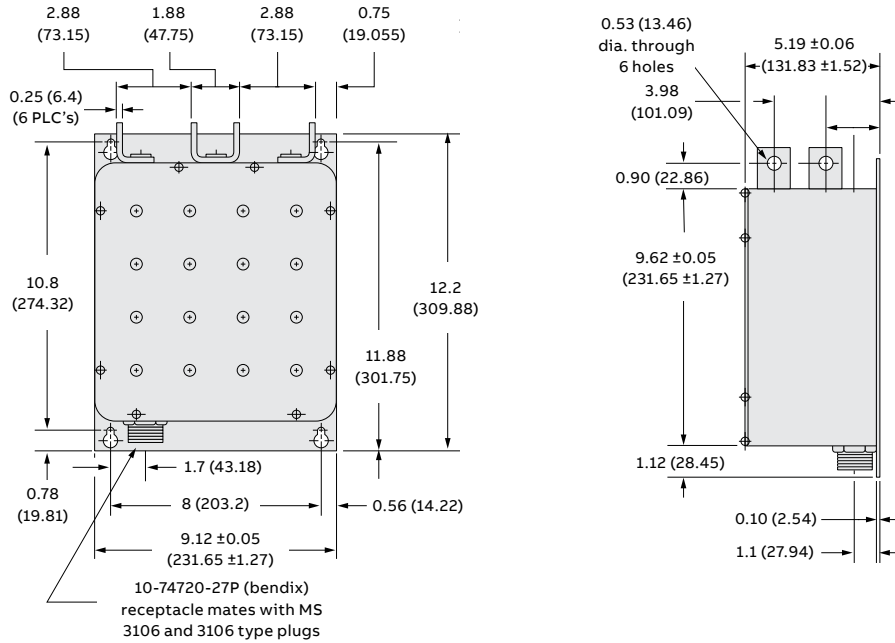
<b>50/60/400 Hz (V)</b>	<b>600</b>
<b>Current rating</b>	
Continuous (amps RMS)	200
Maximum interrupting current (A)	2000
Minimum load life	250,000 operations
Interrupt	Less than 2 cycles
Auxiliary contacts configuration	DPDT, 115/230 V AC, 8 A

#### RP151B three-phase vacuum contactors

Cat. no.	Mounting option	Voltage	Pull-in current (A)	Hold current (A)
RP151B4541X44R20	4541	26.5 V DC	4.0	0.40
RP151B4541X46R20	4541	100 V DC	1.5	0.05
RP151B4541X47R20	4541	115 V AC	1.5	0.05
RP151B4541X4XR20	4541	50 V DC	2.1	0.17

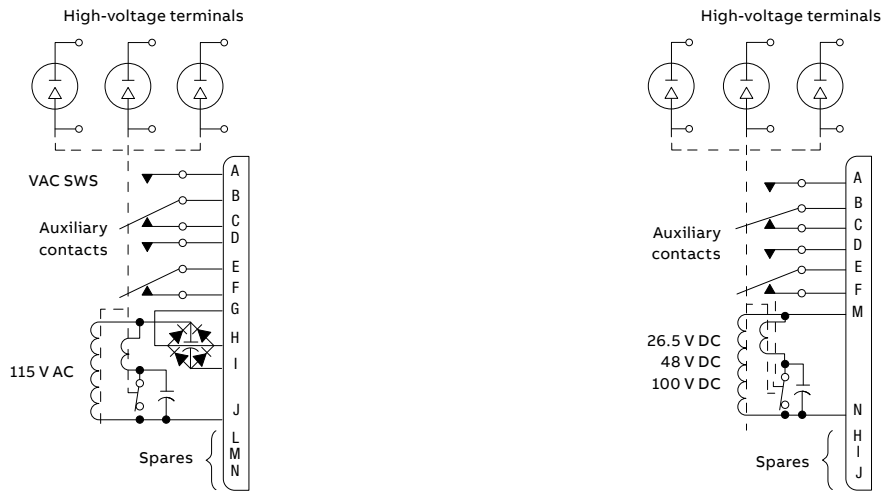
# Vacuum contactors

## RP151B three-phase vacuum contactors



Dimensions shown are in inches (mm).

### Units shown in de-energized position



Dimensions shown are in inches (mm).

# DC contactors

## Overview

Engineered to exceed expectations.

- 01 JEV100-24S-A
- 02 JEV250-24B-A
- 03 JEV400-24S-A
- 04 JEV400-24SC
- 05 JEVB500-24S-A

With the ever increasing acceptance of environment-friendly technology such as renewable energy and electric vehicles, one product is critical to the safety of the electrical circuit: the DC contactor. With the consumer now adapting to this new green technology, quality and reliability are paramount in today's emerging markets where performance needs to be optimal.

Jennings research has once again enhanced the DC contactor by enabling this new technology to aid in lowering the world's carbon footprint. Its innovative and compact design reduces the weight of the device but still allows for very high

mechanical life. Minimizing power consumption creates higher power efficiencies for all controlling circuitry, reducing load consumption. All of this allows the Jennings DC contactor to operate in critical circuits and applications with the highest reliability and performance.

The contactor's rugged design and their total value proposition as a small, lightweight device with high voltage and current ratings allows for endless applications: from cars, trucks and trains using DC power systems to energy-saving devices like solar inverters and DC charge stations.



01



02



03



04



05



## DC contactors

### JEV100 series

01 JEV100-24S-A



01

- 100 Amp current rating
- RoHS compliant
- Hermetically sealed, intrinsically safe, operates in explosive/harsh environments with no oxidation or contamination of coils or contacts during long periods of nonoperation
- Rugged, compact contactor for switching voltages from 50 V DC to 1000+ V DC
- High-efficiency DC coils – Very low 12 and 24 V DC continuous power coils with no EMI emissions or cross-talk on your system control power

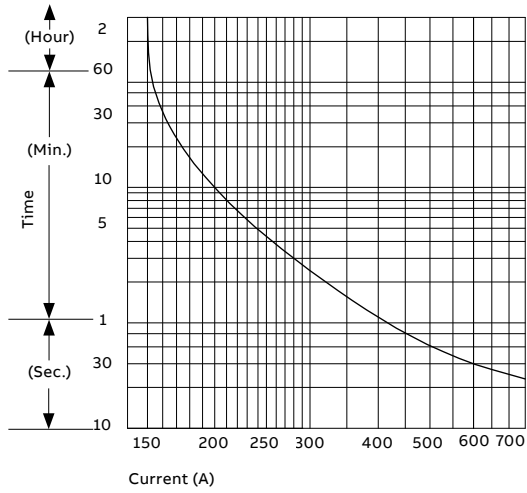
#### JEV100 series specifications

Contact ratings		
Contact arrangement	1 Form A, SPST-NO	
Max. continuous current (A)	150	
Max. switching current (A)	125	
Contact rating switching voltages (V DC)	12–1200	
Max. switching capacity at max. voltage	20 A at 1200 V DC	
General aux. contact current, max.	2 A 30 V DC/3 A 125 V AC	
General aux. contact current, min.	100 mA 8 V DC	
Gold alloy aux. contact current, max.	0.1 A 30 V DC/0.1 A 30 V AC	
Gold alloy aux. contact current, min.	1 mA 5 V DC/1 mA 5 V AC	
Operating time at nominal voltage (msec.)	20	
Release time at nominal voltage (msec.)	5	
Coil ratings		
Nom. voltage (V DC)	12	24
Nominal coil current (mA)	480	245
Coil resistance ( $\Omega$ )	25	110
Pick-up voltage (V) max.	75%	75%
Drop-out voltage (V) min.	10%	10%
Max. voltage (V)	130%	130%
Coil power (W) dissipation	5.6–5.9	5.6–5.9
Expected life		
Mechanical life (min.)	2,000,000 operations	
Electrical life (min.)	10,000 at 450 V DC, 125 A 100,000 at 250 V DC, 125 A	
Other		
Weight	300 g (0.66 lb.)	
Operating and storage temperature	-40 °F ~ 185 °F (-40 °C ~ 85 °C)	
Relative humidity	5–85%	

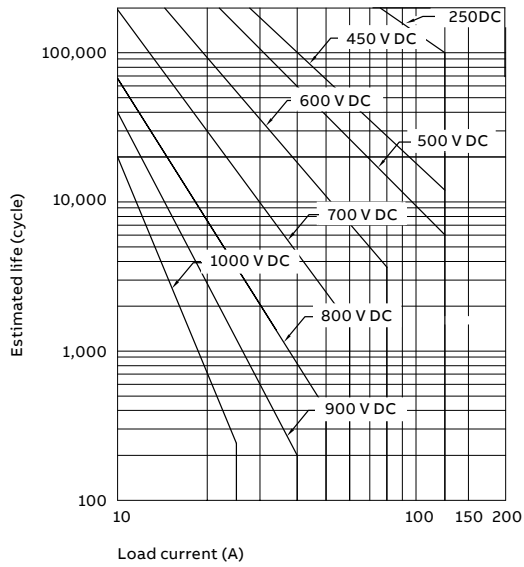
# DC contactors

## JEV100 series

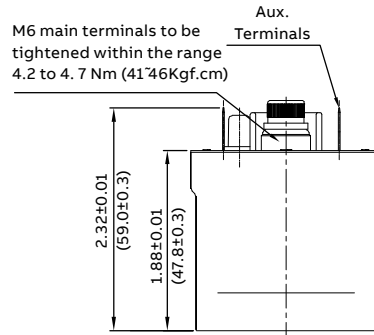
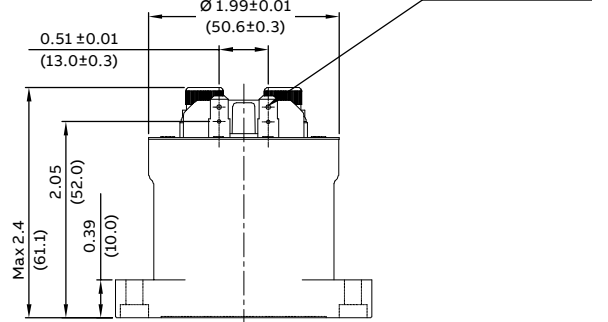
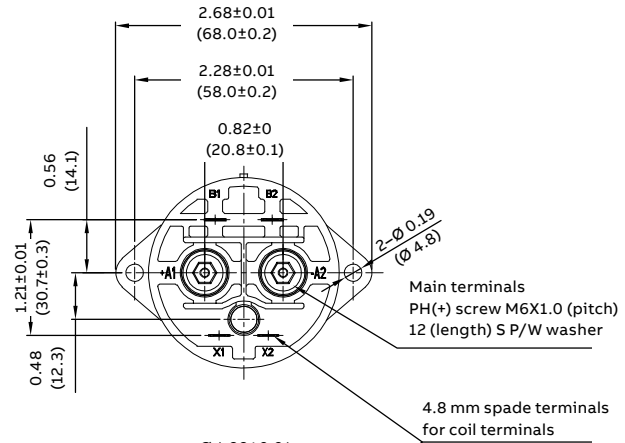
### Continuous carrying 150 A



### Make and break switching rating (resistive load)

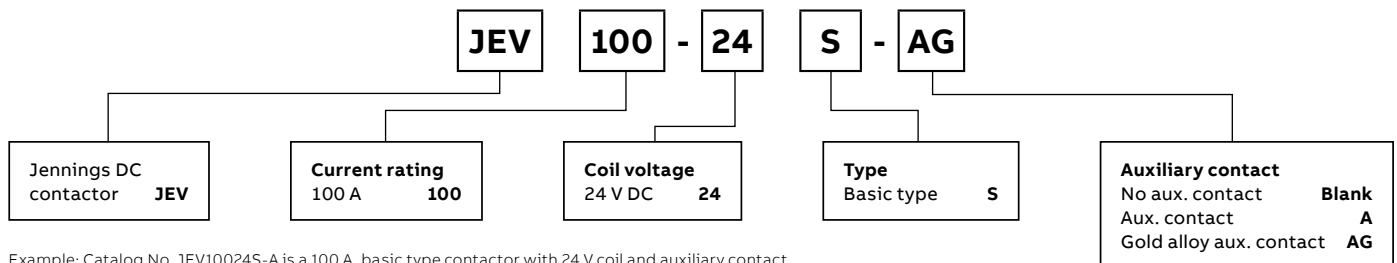


### Illustrations



Dimensions shown are in inches (mm).

### Catalog number configurator



Example: Catalog No. JEV10024S-A is a 100 A, basic type contactor with 24 V coil and auxiliary contact.



## DC contactors

### JEV250 series

01 JEV250-24B-A



01

- 250 A current rating
- UL508 listed for the U.S. and Canada
- RoHS compliant
- Hermetically sealed, intrinsically safe, operates in explosive/harsh environments with no oxidation or contamination of coils or contacts during long periods of nonoperation
- Rugged, compact contactor for switching voltages from 50 V DC to 1000+ V DC
- High-efficiency DC coils – Very low 12 and 24 V DC continuous power coils with no EMI emissions or cross-talk on your system control power

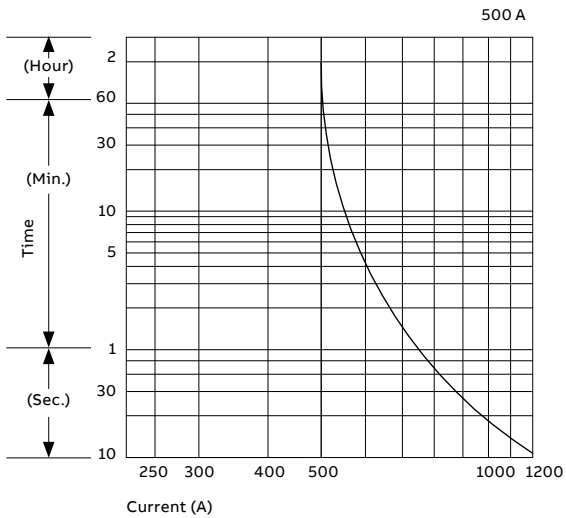
#### JEV250 series specifications

<b>Contact ratings</b>		
Contact arrangement	1 Form A, SPST-NO	
Max. continuous current (A)	500	
Max. switching current (A)	250	
Contact rating switching voltages (V DC)	12–1200	
Max. switching capacity at max. voltage	200 A at 900 V DC	
General aux. contact current, max.	2 A 30 V DC/3 A 125 V AC	
General aux. contact current, min.	100 mA 8 V DC	
Gold alloy aux. contact current, max.	0.1 A 30 V DC/0.1 A 30 V AC	
Gold alloy aux. contact current, min.	1 mA 5 V DC/1 mA 5 V AC	
Operating time at nominal voltage (msec.)	30	
Release time at nominal voltage (msec.)	10	
<b>Coil ratings</b>		
Nom. voltage (V DC)	12	24
Inrush coil current 100ms (max.) (A)	2.4	1.3
Holding coil current (A)	0.29	0.17
Pick-up voltage max. (V DC)	9	18
Drop-out voltage min. (V DC)	6	12
Holding voltage min. (V DC)	7.5	13.5
Max. voltage (V DC)	18	32
<b>Expected life</b>		
Mechanical life (min.)	2,000,000 operations	
Electrical life (min.)	7,000 at 450 V DC, 250 A 3,000 at 750 V DC, 250 A	
<b>Other</b>		
Weight	460 g (0.93 lb.)	
Operating and storage temperature	-40 °F ~ 185 °F (-40 °C ~ 85 °C)	
Relative humidity	5–85%	

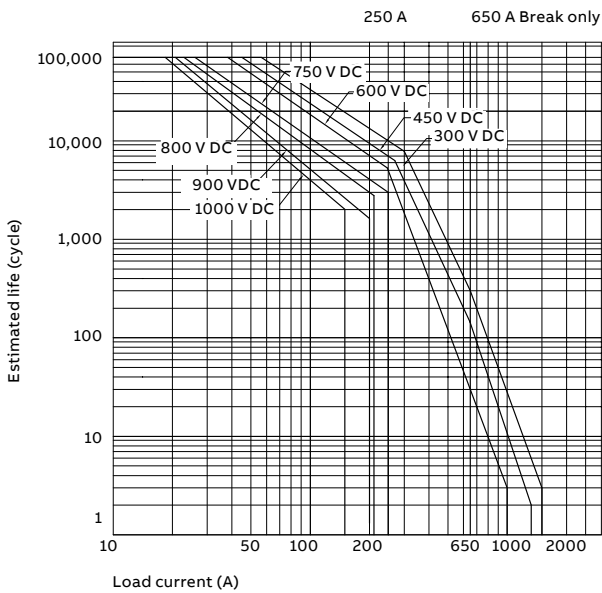
# DC contactors

## JEV250 series

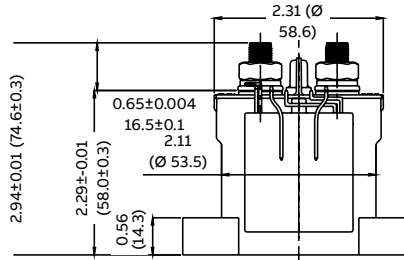
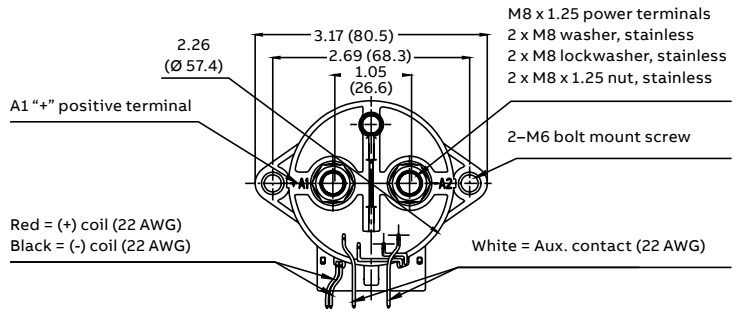
### Continuous carrying



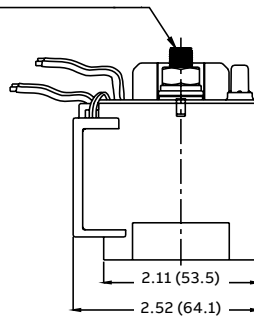
### Make and break switching rating (resistive load)



### Illustrations

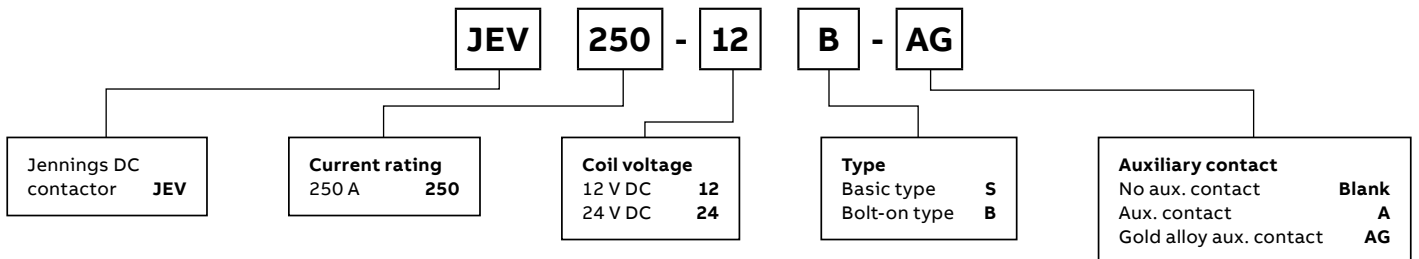


M6 main terminals to be tightened within the range 8.8~11 Nm (80~100kgf.cm)



Dimensions shown are in inches (mm).

### Catalog number configurator



Example: Catalog No. JEV25012B-AG is a 250 A, bolt-on type contactor with 12 V coil and gold alloy auxiliary contact.

## DC contactors

### JEV400 series

—  
01 JEV400-24S-A  
—  
02 JEV400-24SC



- 400 A current rating
- UL508 listed for the U.S. and Canada
- RoHS compliant
- Hermetically sealed, intrinsically safe, operates in explosive/harsh environments with no oxidation or contamination of coils or contacts during long periods of nonoperation
- Rugged, compact contactor for switching voltages from 50 V DC to 1000+ V DC
- High-efficiency DC coils – Very low 12 and 24 V DC continuous power coils with no EMI emissions or cross-talk on your system control power

#### JEV400 series specifications

##### Contact ratings

Contact arrangement	1 Form A, SPST-NO or 1 Form B, SPST-NC
Max. continuous current (A)	500
Max. switching current	400 A at 450 V DC (UL) (NO version only) 80 A at 1200 V DC (UL) 90 A at 1000 V DC (UL) 100 A at 1000 V DC (CE) (NO version only)
Contact rating switching voltages (V DC)	12–1500
Max. switching capacity at max. voltage	200 A at 1000 V DC
General aux. contact current, max.	2 A 30 V DC/3 A 125 V AC
General aux. contact current, min.	100 mA 8 V DC
Gold alloy aux. contact current, max.	0.1 A 30 V DC/0.1 A 30 V AC
Gold alloy aux. contact current, min.	1 mA 5 V DC/1 mA 5 V AC
Operating time at nominal voltage (msec.)	30
Release time at nominal voltage (msec.)	10

##### Coil ratings

Nom. voltage (V)	12-NO	24-NO	12-NC	24-NC
Inrush coil current (A)	1.2	0.6	3.8	2.7
Holding coil current (A)	0.32	0.16	0.3	0.3
Pick-up voltage max. (V DC)	9	18	9	18
Drop-out voltage min. (V DC)	6	12	6	12
Holding voltage min. (V DC)	7.5	13.5	7.5	13.5
Max. voltage (V DC)	18	32	18	32

##### Expected life

Mechanical life (min.)	2,000,000 operations
Electrical life (min.)	3,000 at 450 V DC, 400 A 100,000 at 250 V DC, 400 A 10,000 at 1,000 V DC, 100 A

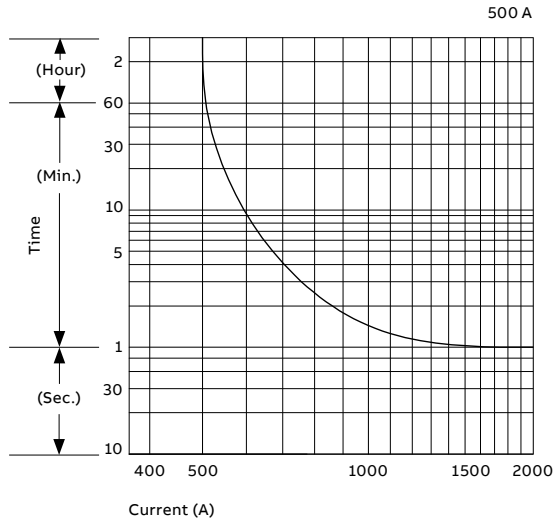
##### Other

Weight	660 g (1.45 lb.)
Operating and storage temperature	-40 °F ~ 185 °F (-40 °C ~ 85 °C)
Relative humidity	5–85%

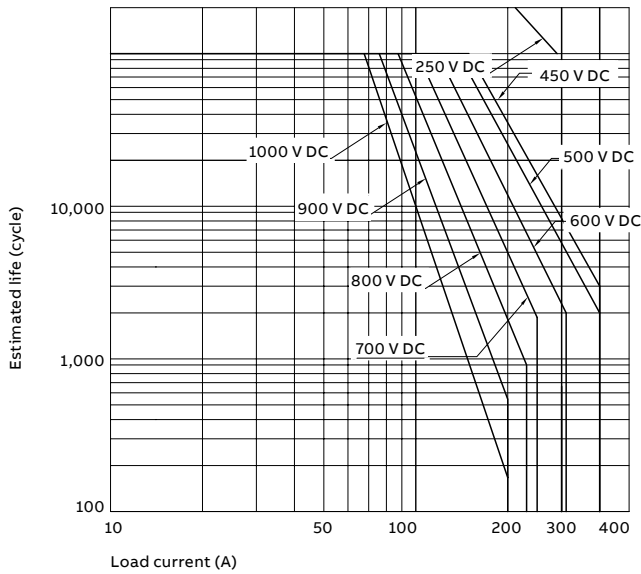
# DC contactors

## JEV400 series

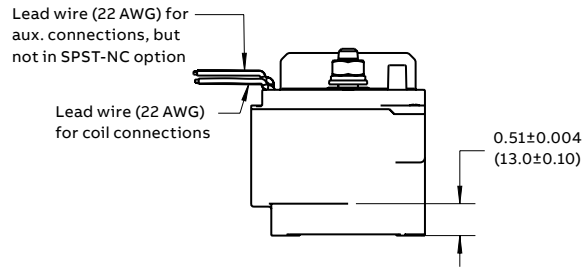
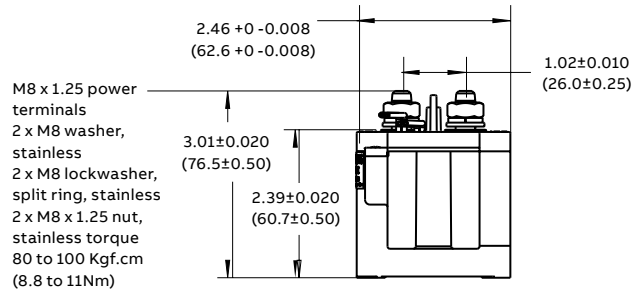
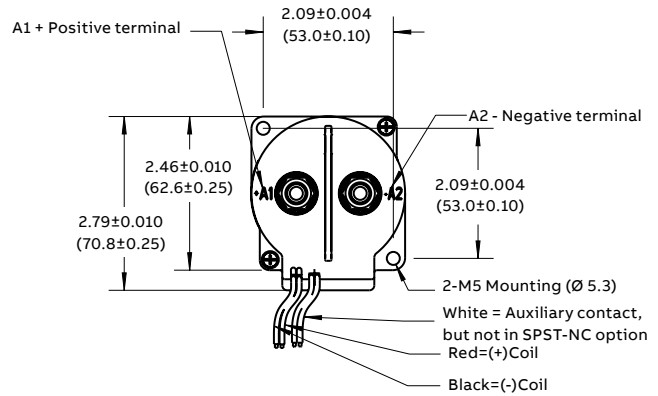
### Continuous carrying



### Make and break switching rating (resistive load)

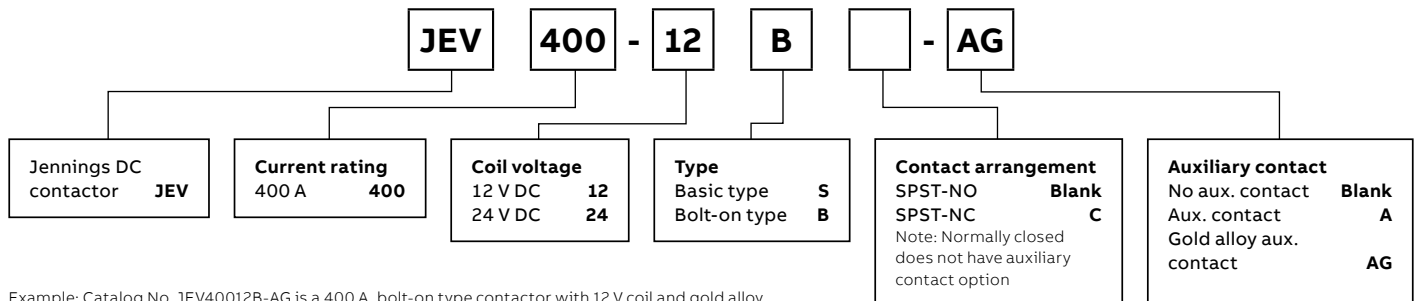


### Illustrations



Dimensions shown are in inches (mm).

### Catalog number configurator



Example: Catalog No. JEV40012B-AG is a 400 A, bolt-on type contactor with 12 V coil and gold alloy auxiliary contact.

## DC contactors

### JEVB500 series

01 JEVB500-24S-A



01

- 500 A current rating
- Bidirectional switching device
- A simple solution for applications that require charging and discharging because it safely cuts off the current flowing through the main contact in the opposite direction
- UL508 listed for the U.S. and Canada
- RoHS compliant
- Hermetically sealed, intrinsically safe, operates in explosive/harsh environments with no oxidation or contamination of coils or contacts during long periods of nonoperation
- Rugged, compact contactor for switching voltages from 50 V DC to 1000+ V DC
- High-efficiency DC coils – Very low 12 and 24 V DC continuous power coils with no EMI emissions or cross-talk on your system control power

#### JEVB500 series specifications

##### Contact ratings

Contact arrangement	1 Form A, SPST-NO	
Max. continuous current (A)	500	
Max. switching current	500 A at 750 V DC (UL) 300 A at 1000 V DC (UL) 100 A at 1500 V DC (UL)	
Contact rating switching voltages	12–1500 V DC/1000 V AC	
Max. switching capacity at max. voltage	300 A at 1500 V DC	
General aux. contact current, max.	2 A 30 V DC/3 A 125 V AC	
General aux. contact current, min.	100 mA 8 V DC	
Gold alloy aux. contact current, max.	0.1 A 30 V DC/0.1 A 30 V AC	
Gold alloy aux. contact current, min.	1 mA 5 V DC/1 mA 5 V AC	
Operating time at nominal voltage (msec.)	40	
Release time at nominal voltage (msec.)	10	

##### Coil ratings

Nom. voltage (V DC)	12	24
Inrush coil current 100 ms (max.) (A)	1.4	1.1
Holding coil current (A)	0.32	0.16
Pick-up voltage max. (V DC)	9	18
Drop-out voltage min. (V DC)	6	12
Holding voltage min. (V DC)	7.5	13.5
Max. voltage (V DC)	18	32

##### Expected life

Mechanical life (min.)	2,000,000 operations	
Electrical life (min.)	1,000 at 750 VDC (+), (-) 500 A 1,000 at 1,000 VDC (+), (-) 300 A 1,000 at 1,500 VDC (+), (-) 100 A	

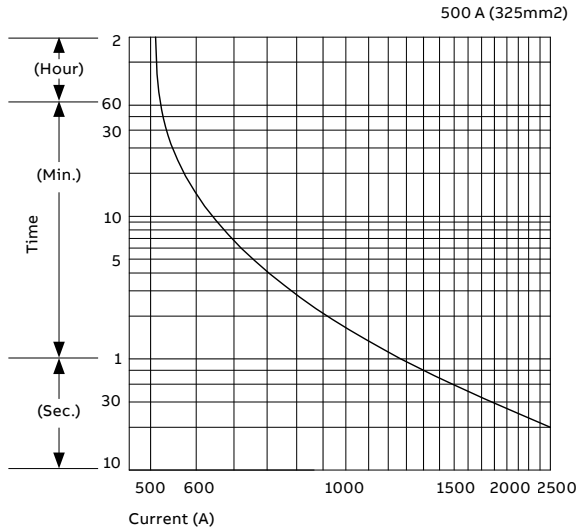
##### Other

Weight	980 g (2.16 lb.)
Operating and storage temperature	-40 °F ~ 185 °F (-40 °C ~ 85 °C)
Relative humidity	5–85%

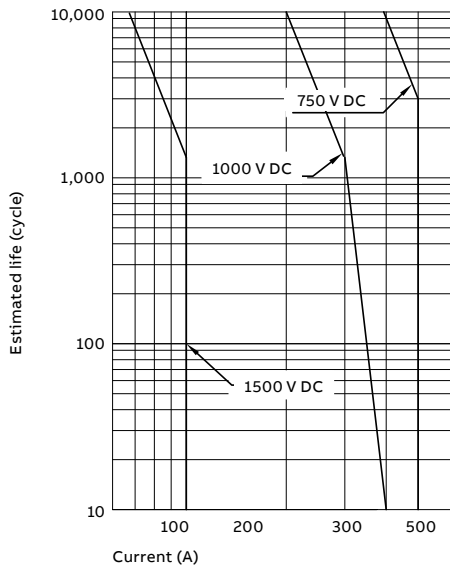
# DC contactors

## JEVB500 series

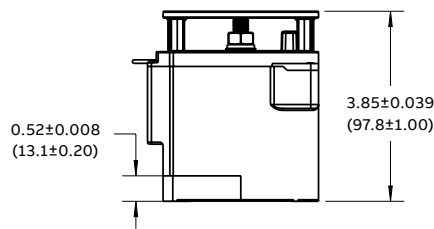
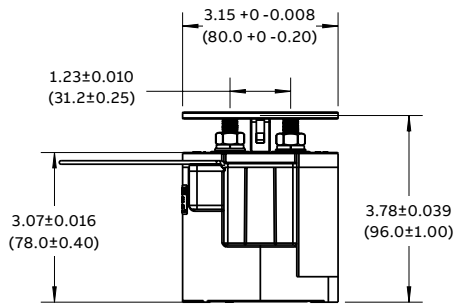
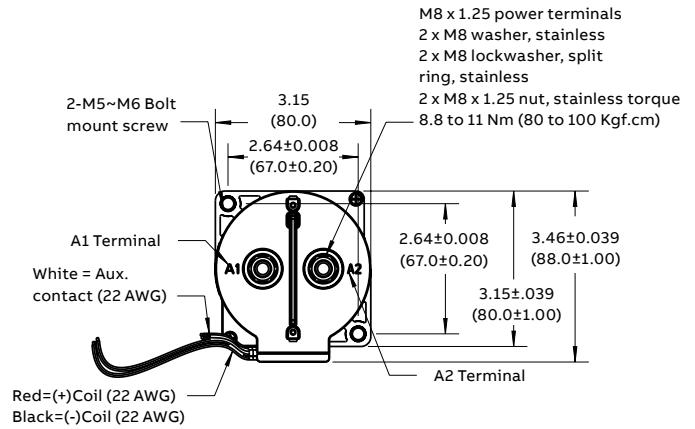
### Continuous carrying



### Make and break switching rating (resistive load)

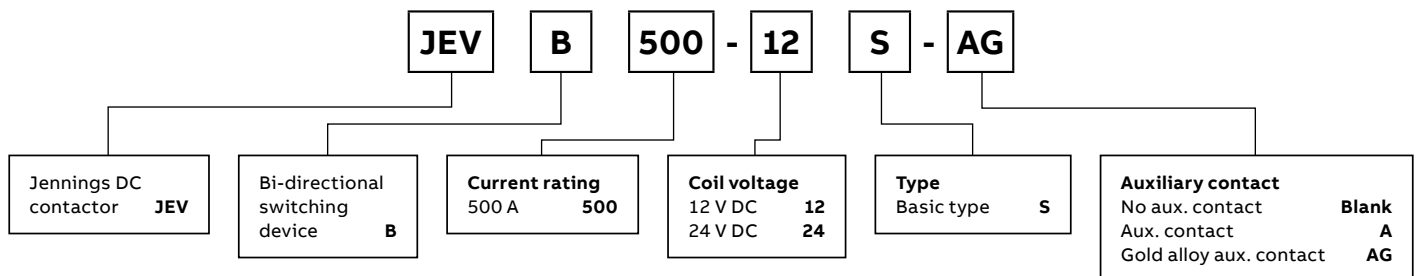


### Illustrations



Dimensions shown are in inches (mm).

### Catalog number configurator



Example: Catalog No. JEVB50012S-AG is a 500 A, basic type contactor with 12 V coil and gold alloy auxiliary contact.









**Additional information**

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**US**

ABB Installation Products  
Electrification Products division  
860 Ridge Lake Blvd.  
Memphis, TN 38120  
+1 901-252-5000

**[tnb.abb.com](http://tnb.abb.com)**