

Vacuum Coaxial Relay

Catalog COA-99



A Danaher Company

JENNINGS VACUUM COAXIAL RELAYS

Jennings Technology offers over 55 years of expertise in manufacturing vacuum coaxial relays. These specialized relays are essential in multiple transmitter-antenna matching applications for both military and commercial communication fields.

FEATURES

- Vacuum Dielectric
- High speed switching
- Internal grounding
- Dielectric Strength of 1000 V/mil.
- Compact size
- Auxiliary fittings available

DESCRIPTION

The relay body utilizes OFHC copper material with the inner conductors sealed into the ends of the housing by vacuum-tight ceramic disk insulators. The inner conductors are electrically connected by means of a switch plate slotted for multiple, positive contact.

A metal bellow on the movable contact allows movement within the vacuum chamber and maintains the vacuum-tight seal. Unique design of the inner conductors provides the necessary compensation to maintain a 50-ohm impedance of the line.

The actuating mechanism is a bi-stable device utilizing permanent magnets, which operate as positive, latching devices, and aid in the open-close function of the relay. Further drive power for contact movement in either direction is provided by a balanced spring which also acts to neutralize atmospheric pressure. Small momentary-duty coils are used to transfer the magnetic field of the magnets thereby releasing their latching hold and initiating contact operation.

BENEFITS

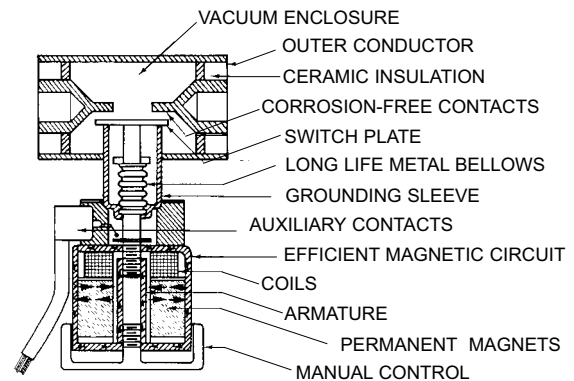
Revolutionary usage of vacuum as a dielectric medium gives Jennings customers many valuable advantages. The absence of oxygen provides a corrosion-free environment preventing oxide formation on the contacts that could increase circuit resistance. The result is a highly reliable, extremely fast switching unit with low and stable contact resistance that is virtually maintenance free, and serves to increase the life of the relay.

These dependable, high-speed switching devices are ruggedly constructed to withstand exposure in harsh conditions, making them highly valuable in military applications.

The Jennings vacuum coaxial relay is also ideal for commercial communication applications because of its low circuit losses and stable contact resistance, allowing for low thermal and RF noise generation. A unique feature built into the coaxial unit is internal grounding. This feature minimizes possible crosstalk, resulting in a high quality signal most favorable for peak performance in HF and UHF radio systems.

High dielectric strength, approximately 1000 volts per million, offered in a Jennings vacuum coaxial relay is higher than any ordinary brand of coaxial relay. Consequently, only a slight contact separation is required to withstand high voltages. Such limited contact movement translates into a condensed and compact construction, permitting the use of a small, simple actuating mechanism, which attributes to faster switch-times. The small relay size made possible by the use of vacuum as a dielectric medium is literally the smallest size possible commensurate with power handling capability and high voltage stand-off rating. Typical operating speeds of between 5 and 50 milliseconds are much faster than that available from conventional coaxial relays.

System flexibility, made possible with auxiliary fittings, is extremely broad and you are encouraged to discuss your applications with Jennings engineers who can make recommendations to assure you of the optimum system at minimum cost.



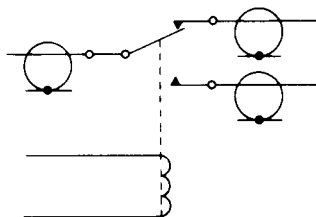
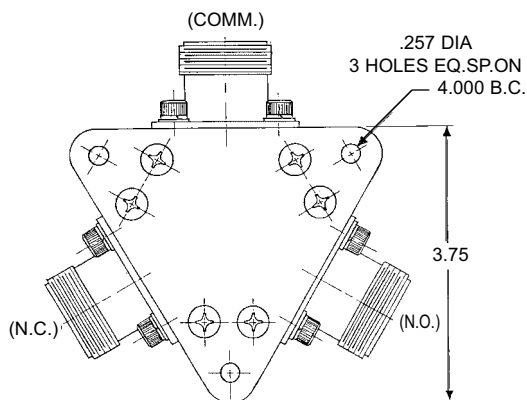
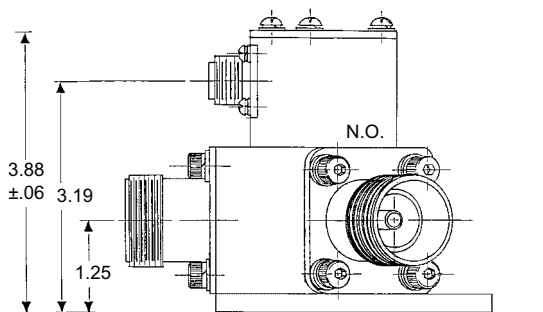
The construction of a typical Jennings Vacuum Coaxial Relay for rigid lines



SPDT Vacuum Coaxial Relay RC43E6050H440

FEATURES:

- General Transmitter/Receiver Switch
- 5 kW CW @ 30 MHz
- SPDT
- 10 kW CW power available (see Options)



RC43 Specifications

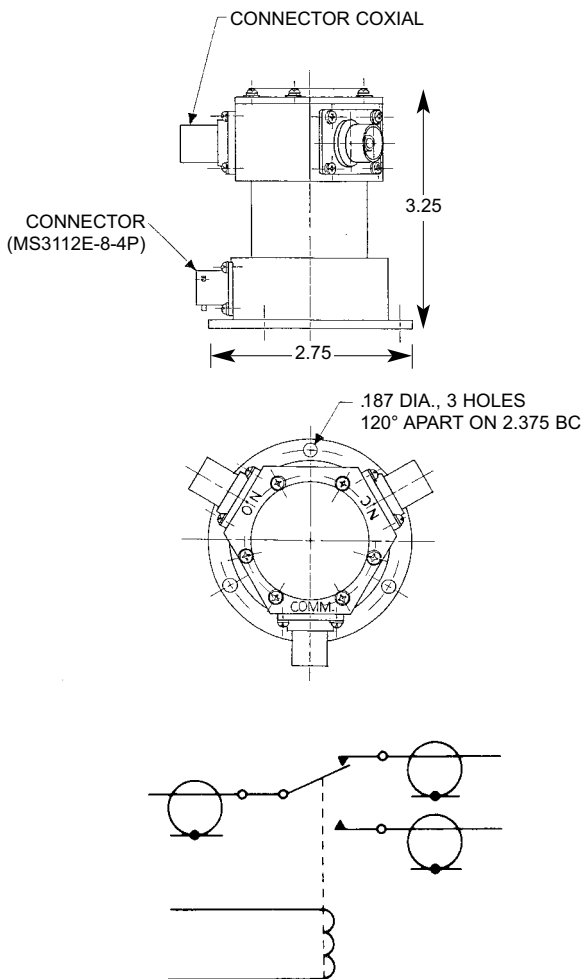
Model Number	RC43E6050H440
Power Rating (See Coaxial Switch Power Ratings graph)	5 kW CW at 30 MHz
Frequency Range	0-500 MHz
Characteristic Impedance	55 Ω
VSWR	1.1:1 max.
Isolation	> 30dB at 300 MHz
Insertion Loss	0.1 dB max.
Coil Resistance	265 Ω ± 10%
Actuator Coil Connection	MS receptacle
Contact Configuration	SPST
Connector Type	LC
Actuation	Non-latching continuous duty coil
Actuating Voltage	26.5 Vdc
Position Indicators	None
Operate Time	25 milliseecs. max.
Weight	3 lbs. 4 oz.
Options	<ul style="list-style-type: none"> • 115 Vdc coil • 10 kW CW power @ 30 MHz w/ screwlock connectors: IEC, DIN, VG or CECC



SPDT Vacuum Coaxial Relay RC41E6000D440

FEATURES:

- General Transmitter/Receiver Switch
- 3 kW CW @ 30 MHz
- SPDT
- High shock & vibration resistance
- 26.5 VDC Operation



RC41 Specifications

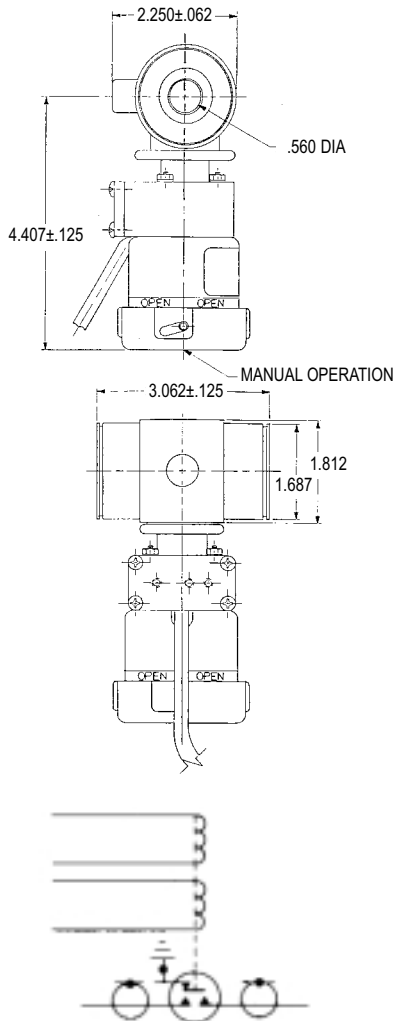
Model Number	RC41E6000D440
Power Rating <small>(See Coaxial Switch Power Ratings graph)</small>	3 kW CW at 30 MHz
Frequency Range	0-500 MHz 0-500 MHz
Characteristic Impedance	55 Ω
VSWR	1.1:1 max.
Isolation	> 30dB at 300 MHz
Insertion Loss	0.1 dB max.
Coil Resistance	265 Ω ± 10%
Actuator Coil Connection	MS receptacle
Contact Configuration	SPDT
Connector Type	C
Actuation	Non-latching continuous duty coil
Actuating Voltage	26.5 Vdc
Position Indicators	None
Operate Time	25 millisecs. max.
Weight	14.5 oz.
Options - contact sales for model numbers	<ul style="list-style-type: none"> • UHF, N, SC, HN connectors • 115 Vdc coil



SPDT Vacuum Coaxial Relay RC5A5101A24B

FEATURES:

- 1-5/8" Line Size
- 25kW CW @ 30 MHz
- SPST
- Manual override for emergency switching
- Auxiliary contacts for status indication and interlocking of transmitters in matrix operations
- Supported by coax lines-mount in any position



RC5 Specifications

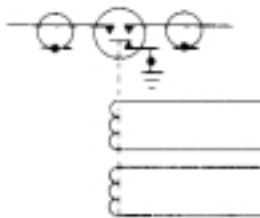
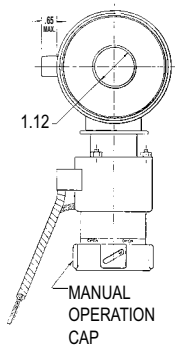
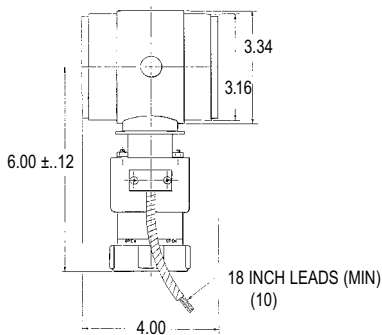
Model Number	RC5A5101A24B
Power Rating (See Coaxial Switch Power Ratings graph)	25 kW @ 30 MHz
Frequency Range	0 to 100 MHz
Characteristic Impedance	50 Ω
VSWR	1.02:1 max. to 30 MHz 1.05:1 max. to 60 MHz
Isolation	> 70dB isolation @ 30 MHz
Insertion Loss	0.02 dB max.
Coil Resistance	Opening: $19.9 \Omega \pm 10\%$ Closing: $18.7 \Omega \pm 10\%$
Actuator Coil Connection	18" Leads
Contact Configuration	SPST
Input Output Line Size	1 5/8"
Actuation	Electromagnetic latching actuator
Actuating Voltage	26.5 Vdc
Position Indicators	DPDT Aux. Contacts & Visual Indicator
Operate Time	15-30 millisecs. max.
Weight	1 lb. 13 oz.



SPDT Vacuum Coaxial Relay RC10C5227A24B

FEATURES:

- 3-1/8" Line Size
- 90kW CW @ 30 MHz
- SPST
- Manual override for emergency switching
- Auxiliary contacts for status indication and interlocking of transmitters in matrix operations
- Supported by coax lines-mount in any position



RC10 Specifications

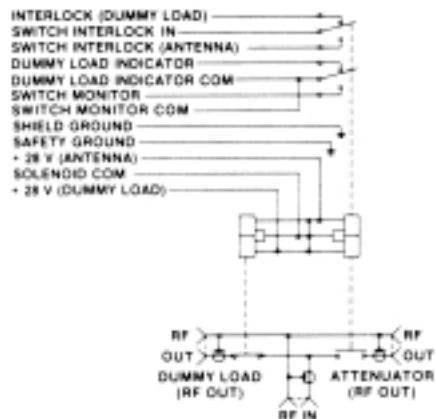
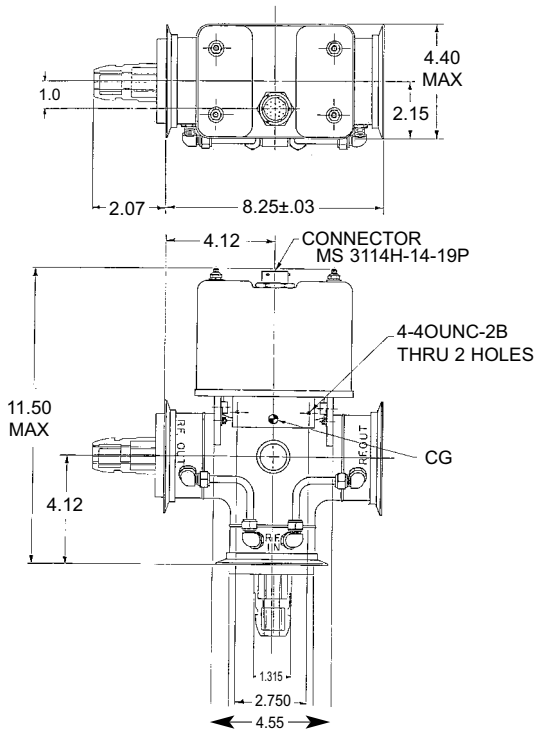
Model Number	RC10C5227A24B
Power Rating <small>(See Coaxial Switch Power Ratings graph)</small>	90kW CW @ 30 MHz
Frequency Range	0 to 100 MHz
Characteristic Impedance	50 Ω
VSWR	1.02:1 max to 30 MHz 1.05:1 max to 60 MHz
Isolation	> 65dB isolation @ 30 MHz
Insertion Loss	0.02 dB max.
Coil Resistance	Opening 20.3 Ω ± 10% Closing: 18.7 Ω ± 10%
Actuator Coil Connection	18" Leads
Contact Configuration	SPST
Input Output Line Size	3 1/8"
Actuation	Electromagnetic latching actuator
Actuating Voltage	26.5 Vdc
Position Indicators	DPDT Aux. Contacts & Visual Indicator
Operate Time	15-30 millisecs. max.
Weight	3 lb. 12 oz.



SPDT Vacuum Coaxial Relay RC265552G24F

FEATURES:

- Switch Assembly
- Power (peak) 2.0 MW @ 400 MHz
- Frequency range 0-600 MHz
- Designed for airborne applications



RC26 Specifications

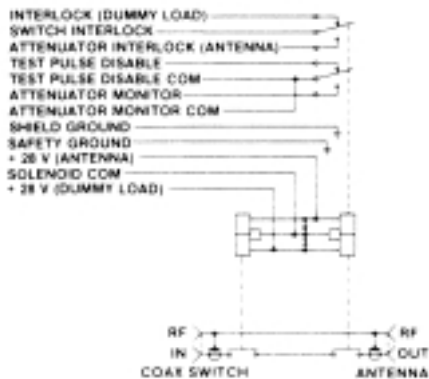
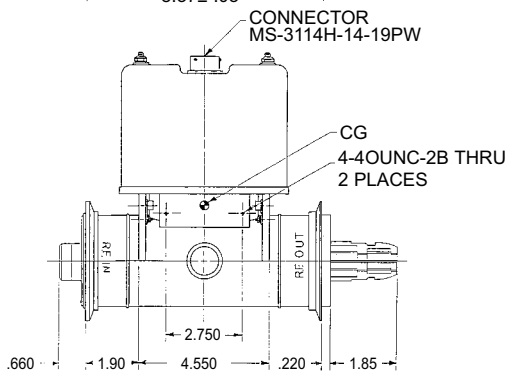
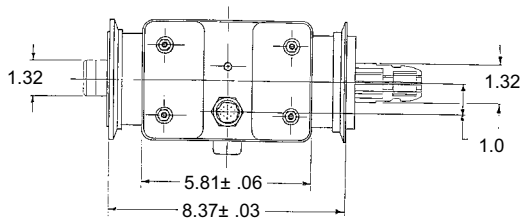
Model Number	RC265552G24F
Power Rating (See Coaxial Switch Power Ratings graph)	90kW CW @ 30 MHz 2MW peak special order
Frequency Range	0 to 600 MHz
Characteristic Impedance	50 Ω
VSWR	1.1:1 max. to 400 MHz
Isolation	> 60dB isolation @ 30 MHz
Insertion Loss	0.01 dB max.
Operating Altitude	35,000 ft. max.
Coil Voltage	26 ± 10%
Coil Current	5 amps max. per coil
Coil Resistance	19 Ω
Coil Current Duration	2 seconds max. 22 milliseconds min.
Auxiliary Switch Rating	5 amps resistive
Ambient Temperature Range	-55 degrees C to +85 degrees C
Max Operating Temperature	+71 degrees C
Pressurization	45 PSIA Dry Air
Normal Operating Pressure	31 ± 1.5 PSIA Dry Nitrogen
Weight	14 lbs.



SPDT Vacuum Coaxial Relay RC275576G24F

FEATURES:

- Attenuator
- 5 kW CW @ 30 MHz
- SPDT
- 10 kW CW power available (see Options)



RC27 Specifications

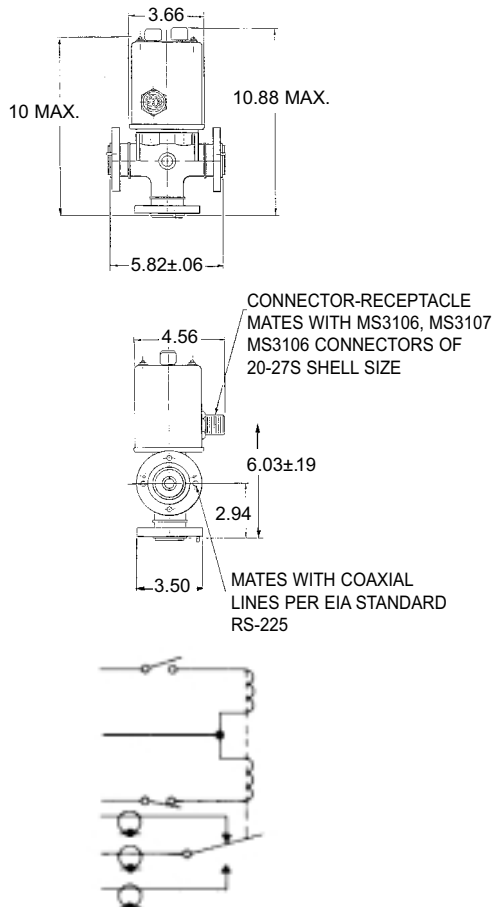
Model Number	RC275576G24F
Power Rating (See Coaxial Switch Power Ratings graph)	90kW CW @ 30 MHz 2MW peak special order
Frequency Range	0 to 600 MHz
Characteristic Impedance	50 Ω
VSWR	1.1:1 max. to 400 MHz
Isolation	> 60dB isolation @ 30 MHz
Insertion Loss	0.01 dB max.
Operating Altitude	35,000 ft. max.
Coil Voltage	26 ± 10%
Coil Current	5 amps max. per coil
Coil Resistance	19 Ω
Coil Current Duration	2 seconds max 22 milliseconds min.
Auxiliary Switch Rating	5 amps resistive
Ambient Temperature Range	-55 degrees C to +85 degrees C
Max Operating Temperature	+71 degrees C
Pressurization	45 PSIA Dry Air
Normal Operating Pressure	31 ± 1.5 PSIA Dry Nitrogen
Weight	13 lbs.



SPDT Vacuum Coaxial Relay RC6A5126F14B

FEATURES:

- 25kW CW @ 30 Mhz
- SPDT
- "T" configuration permits installation in place of EIA 50-ohm standard elbow without modifying coax line
- Suitable for antenna/dummy load switching
- Auxiliary contacts for status indication and Interlocking transmitters in matrix application
- Bi-stable magnetic type actuator assembly maintains Contact position
- Manual override for emergency switching
- Standard EIA flanges



RC6 Specifications

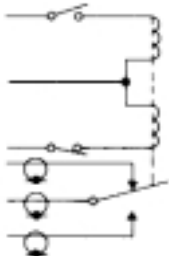
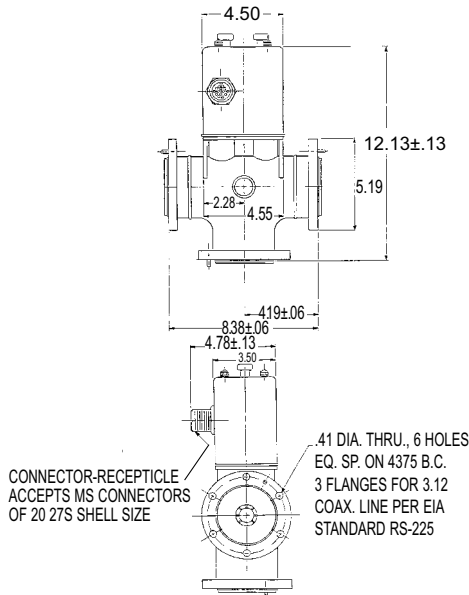
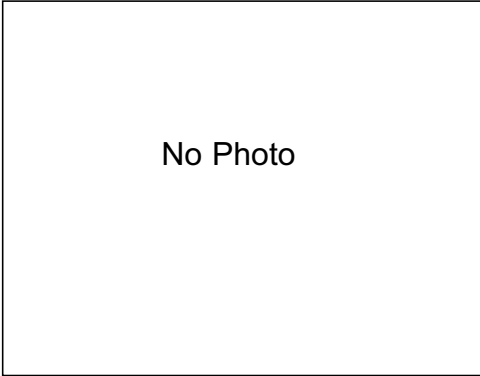
Model Number	RC6A5126F14B
Power Rating (See Coaxial Switch Power Ratings graph)	25 kW @ 30 MHz
Frequency Range	0 to 400 MHz
Characteristic Impedance	50 Ω
VSWR	1.1:1 max. to 150 MHz
Isolation	> 65 dB isolation @ 30 MHz
Insertion Loss	0.01 dB max.
Coil Resistance	15.4 Ω ± 10%
Actuator Coil Connection	MS receptacle
Contact Configuration	SPST
Input Output Line Size	1 5/8"
Actuation	Permanent magnet latching, electrical or manual
Actuating Voltage	26.5 Vdc Auto De-energize
Position Indicators	DPDT Aux. Contacts & Visual Indicator
Operate Time	50 millisecs. max.
Weight	8 lbs.
Options	* Non de-energizing 26.5, 48, 100 Vdc or 115 VAC coils



SPDT Vacuum Coaxial Relay RC21A550014B

FEATURES:

- 90kW CW @ 30MHz
- SPDT
- "T" configuration permits installation in place of EIA 50-ohm standard elbow without modifying coax line
- Suitable for antenna/dummy load switching
- Auxiliary contacts for status indication and Interlocking transmitters in matrix application
- Bi-stable magnetic type actuator assembly maintains Contact position
- Manual override for emergency switching Standard EIA flanges

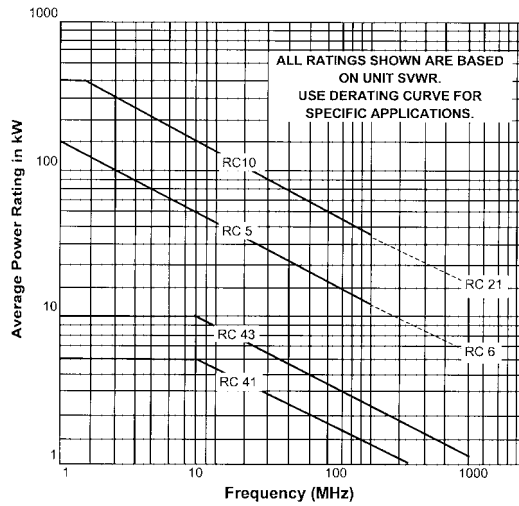


RC21 Specifications

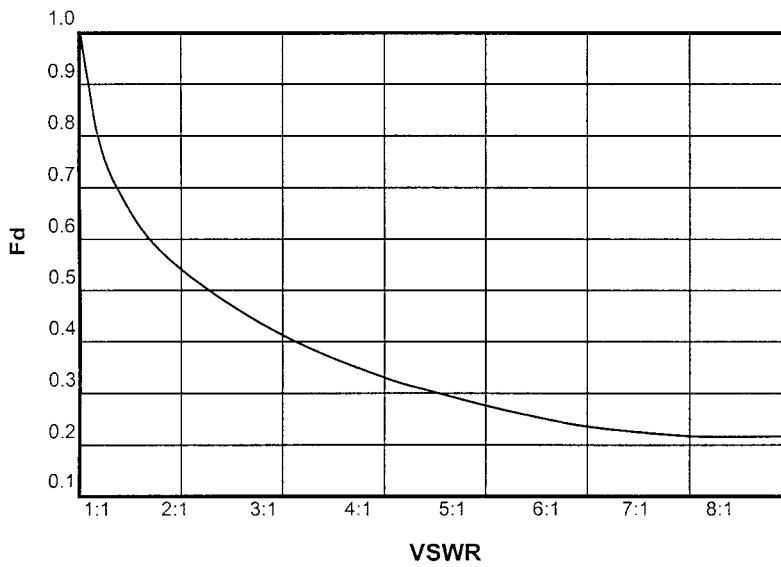
Model Number	RC21A550014B
Power Rating (See Coaxial Switch Power Ratings graph)	90 kW @ CW @ 30 MHz
Frequency Range	0 to 500 MHz
Characteristic Impedance	50 Ω
VSWR	1.1:1 max. to 400 MHz
Isolation	> 60 dB isolation @ 30 MHz
Insertion Loss	0.01 dB max.
Coil Resistance	4.08 Ω ± 10%
Actuator Coil Connection	MS receptacle
Contact Configuration	SPST
Input Output Line Size	3 1/8"
Actuation	Permanent magnet latching, electrical or manual
Actuating Voltage	26.5 Vdc Auto De-energize
Position Indicators	DPDT Aux. Contacts & Visual Indicator
Operate Time	40 millisecons. max.
Weight	14 lbs.
Options	* Non de-energizing 26.5, 48, 100 Vdc or 115 VAC coils

vacuum coaxial relays

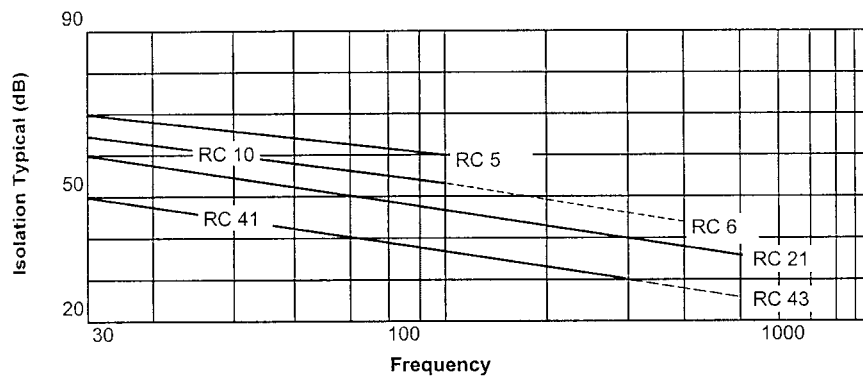
Coaxial Switch Power Ratings



Coaxial Switch Derating for VSWR



Crosstalk



JENNINGS WARRANTY POLICY

A. WARRANTY

Jennings warrants that at the time of shipment, the products manufactured by Jennings and sold hereunder shall be free from defects in material and workmanship and will conform to the specifications furnished by or approved, in writing, by Jennings.

B. WARRANTY ADJUSTMENT

1. If any defect within this warranty appears, Purchaser shall notify Seller immediately.
2. Jennings agrees to repair or furnish a replacement for, but not install, any product which, within one year from the date of shipment by Jennings, shall, upon test and examination by Jennings, prove defective within the above warranty.
3. No product will be accepted for return or replacement without the written authorization of Jennings. Upon such authorization and in accordance with instructions by Jennings, the product will be returned to Jennings, shipping charges prepaid by Purchaser.

C. EXCLUSIONS FROM WARRANTY

1. THE FOREGOING WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER EXPRESSED OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS OR OTHERWISE.
2. Jennings will not be liable for any special incidental or consequential damages or for loss, damages or expense directly or indirectly arising from the use of the products or any inability to use them either separately or in combination with any other equipment or material or from any other cause.
3. The warranty does not extend to any product manufactured by Jennings, which has been subjected to misuse, neglect, accident, improper installation or to use in violation of instructions furnished by Jennings.
4. The warranty does not extend to nor apply to any unit which has been repaired or altered at any place other than at a Jennings factory by persons not expressly approved by Jennings, nor to any unit, the serial number of which has been removed or defaced or changed.
5. This warranty applies to new equipment only and will cover repaired or replaced items only to the extent of the one year from the date of shipment of the original equipment noted above in paragraph B2.

COAXIAL RELAY PATENTS

Coaxial relays made by Jennings are manufactured under one or more of the following issued patents. Other patents are pending.

3021408	3187140	3328547
3145278	3218409	3342966
3171090	3260967	3394324

HOW TO ORDER

To expedite shipment of your order, please supply the following information when ordering:

CATALOG NUMBER
QUANTITY
OPTIONS
SPECIAL REQUIREMENTS

TERMS AND SHIPMENT

Unless otherwise specified on your order, shipment will be made via most economical method. If a specific carrier is specified, shipment will be made at full valuation unless your order instructs differently. In case air shipment and full valuation are desired, please specify whether air express or airfreight. Lacking specification full valuation will be used.

Normally all prices and quotations are F.O.B. San Jose, CA. Terms are Net 30 Days.

Specifications subject to change.

W A R N I N G

HAZARDOUS VOLTAGE CAN SHOCK, BURN OR CAUSE DEATH. DO NOT SERVICE BEFORE DISCONNECTING POWER.

Vacuum coaxial relays may be used to switch radio frequency high voltages. All coaxial lines used to supply power to the relay should be de-energized before being connected or disconnected from the relay to avoid electrical shock.

Contact our Sales and Marketing team for additional information and support,
or for a Jennings representative near you.



JENNINGS

T E C H N O L O G Y

e-mail: sales@jenningstech.com