

Two-Way Coaxial Switches

SPINNER supplies a wide variety of switch types for highly demanding applications. Their RF ratings range from a few watts to several hundred kilowatts, and they are available for sizes from N to 6 1/8" EIA and frequencies up to several GHz.

SPINNER's RF switches consist of different drive types (lifting magnet, impulse solenoid or motor drive) for switching times from 25 ms up to about one second. The two-way switches, which come in 4 1/2" IEC and 6 1/8" EIA, are the fastest RF switches available in the marketplace.

Due to their extremely compact dimensions and exceptional dependability, SPINNER switches are preferred for systems that must be highly reliable. The 2+1 and 4+1 switching units developed by SPINNER are excellently suited for ensuring operation of redundant systems. In 19" rack systems, these compact switching systems have a height of only 1 rack unit yet are able to keep remote stations broadcasting even if a transmitter should fail.

Manual Operation

With manually operated switches, the switch position is selected using a knob. The switch locks at its end positions to reliably maintain them even if it is subjected to vibrations or rotates around a rotor axis

Impulse Solenoid Drive

In switches with an impulse solenoid drive, the rotor torque is generated by a rotating permanent magnet surrounded by a stationary coil. The drive system has two stable switching positions and locks in both end positions (i.e. it is latching). A pulse is therefore sufficient as a control signal (no control voltage is required after switching). In the event of a power failure or system restart, the most recent switch position is retained.

There is also a failsafe switch version that is reset to its initial position by a spring if the power fails.

Lifting Magnet Drive

In this version, electromagnetic force moves a lever from its resting position to its final position. When the current stops, the lever is reset to its resting position by an externally applied force such as a spring. Either the drive is not locked in either position (monostable) or else it is held in place by an auxiliary magnet (bistable).

Motor Drive

Motorized switches are turned by a special gear mechanism developed by SPINNER (see "hypocycloid gear mechanism" below). This drive system rotates by 90° and locks in both end positions.

Hypocycloid Gear Mechanism

The drive and switch base (rotor) are connected by a special gear mechanism developed by SPINNER. This mechanism varies the torque and angular velocity across the switch's rotational range. Initially, the torque is very high while the angular velocity of the switch rotor is very low. Then, as the angle increases the angular velocity steadily increases while the torque decreases. After passing the middle of the range, this is reversed and the angular velocity decreases while the torque increases. The drive mechanically locks in both end positions.

Signaling and Interlock Contacts

Potential-free SPDT contacts (signaling contacts) indicate the current switch position.

The interlock contacts are coupled with RF contacts for interrupting RF power before and during switching. They open before the RF contacts separate and closes after the RF contacts are in their new position.

The maximum switching limits of these contacts are 42.4 VACpk / 60 VDC / 0.5 A. For BN 512663 and BN 512665 the limits are 42.4 VACpk / 50 VDC / 0.1 A.

Two-Way Coaxial Switches

Protection Class

The protection class is IP40 (EN60529), meaning that the switches are only suitable for indoor use. Switches for outdoor installation are also available on request.

Power Ratings

All power ratings apply to room temperature (about 25 °C), normal air pressure (about 1000 hPa), relative humidity of about 50% and an RF-matched state. Specified power ratings are for the highest given frequency and can be transmitted via both switch paths concurrently. If you require operation with pulsed power, please send us detailed data.

Dimensions

All dimensions are in mm.

Note:

The maximum average transmittable power of digital signals (e.g. DAB, DVB-T, ATSC, ISDB-T etc.) is rated by applying an RF proof voltage while taking the crest factor into account. When operating multiple transmitters with analog or digital signals, the sum of their voltages must be considered.

Two-Way Coaxial Switches

2-Way Switches (DPDT)

Part Number	Connectors	Average Input Power			Type of Drive
		100 MHz	230 MHz	860 MHz	
BN 754645	N female	≤ 0.79 kW	≤ 0.79 kW	≤ 0.79 kW	Manual operation
BN 754070	N female	≤ 0.79 kW	≤ 0.79 kW	≤ 0.79 kW	Manual operation
BN 743741	N female	≤ 0.30 kW	≤ 0.30 kW	≤ 0.30 kW	Lifting magnet drive
BN 754067	N female	≤ 0.75 kW	≤ 0.75 kW	≤ 0.75 kW	Impulse solenoid
BN 754030 BN 754098	N female	≤ 0.79 kW	≤ 0.79 kW	≤ 0.79 kW	Impulse solenoid
BN 754066	N female	≤ 0.79 kW	≤ 0.79 kW	≤ 0.79 kW	Impulse solenoid
BN 512690	7-16 female	≤ 5.00 kW	≤ 3.50 kW	≤ 2.00 kW	Impulse solenoid
BN 512697 BN 512698	7/8 " EIA	≤ 8.00 kW	≤ 5.00 kW	≤ 2.50 kW	Motor
BN 640081 BN 640082	1 5/8 " EIA	≤ 20.0 kW	≤ 13.50 kW	≤ 7.00 kW	Motor
BN 941917 BN 941918	3 1/8 " EIA	≤ 73.0 kW	≤ 48.0 kW	≤ 25.0 kW	Motor
BN 941934	4 1/16 " EIA	≤ 100.0 kW	≤ 70.0 kW	≤ 38.0 kW	Motor
BN 941944	4 1/2 " EIA	≤ 100.0 kW	≤ 70.0 kW	≤ 38.0 kW	Motor
BN 941989	6 1/8 " EIA	≤ 170.0 kW	≤ 110.0 kW	≤ 60.0 kW	Motor

2-Way Plug-In Switches (DPDT)

Part Number	Connectors	Average Input Power			Type of Drive
		100 MHz	230 MHz	860 MHz	
BN 553064 BN 553065	1 5/8" USL-D	≤ 20.0 kW	≤ 13.5 kW	≤ 7.0 kW	Motor
BN 553364 BN 553365	29 - 68 USL-D	≤ 41.0 kW	≤ 21.0 kW	≤ 14.0 kW	Motor
BN 553664 BN 553665	43 - 98 USL-D	≤ 82.0 kW	≤ 42.0 kW	≤ 28.0 kW	Motor

2-Way Switches DPDT Low Intermodulation

Part Number	Connectors	Average Input Power			Type of Drive
		100 MHz	230 MHz	860 MHz	
BN 754081	N female	N/A	N/A	≤ 0.79 kW	Impulse solenoid
BN 754082	N female	N/A	N/A	≤ 0.79 kW	Impulse solenoid

2-Way Switches with 3 RF Planes

Part Number	Connectors	Average Input Power			Type of Drive
		100 MHz	230 MHz	860 MHz	
BN 659038	N female	≤ 0.79 kW	≤ 0.79 kW	≤ 0.79 kW	Impulse solenoid
BN 512716	N female	≤ 0.79 kW	≤ 0.79 kW	≤ 0.79 kW	Impulse solenoid

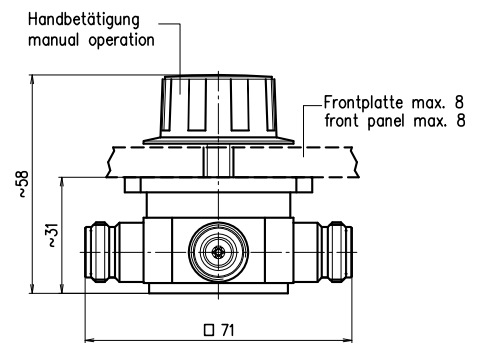
N+1 Switching Units

Part Number	Connectors	Average Input Power			Type of Drive
		100 MHz	230 MHz	860 MHz	
BN 512663 BN 512665	N female	≤ 280 W	≤ 200 W	≤ 130 W	Lifting magnet drive

Two-Way Switch DPDT with N Connectors, Manual Operation

- Optical position indicator

Part Number	BN 754645	
Connectors	N female	
Frequency range	0 - 5 GHz	
Proof voltage	≤ 3.0 kV	
Average power ¹	0 - 1 GHz	≤ 0.79 kW
	1 - 2 GHz	≤ 0.56 kW
	2 - 3 GHz	≤ 0.45 kW
	3 - 5 GHz	≤ 0.35 kW
VSWR	0 - 1 GHz	≤ 1.03
	1 - 2 GHz	≤ 1.13
	2 - 3 GHz	≤ 1.13
	3 - 5 GHz	≤ 1.22
Isolation	0 - 1 GHz	≥ 75 dB
	1 - 2 GHz	≥ 60 dB
	2 - 3 GHz	≥ 60 dB
	3 - 5 GHz	≥ 50 dB
Insertion loss	0 - 1 GHz	≤ 0.04 dB
	1 - 2 GHz	≤ 0.04 dB
	2 - 3 GHz	≤ 0.06 dB
	3 - 5 GHz	≤ 0.06 dB
Mechanical life (cycles)	≥ 500,000	
Ambient temperature	-10 °C ≤ θ ≤ +45 °C	
Weight	≈ 0.35 kg	

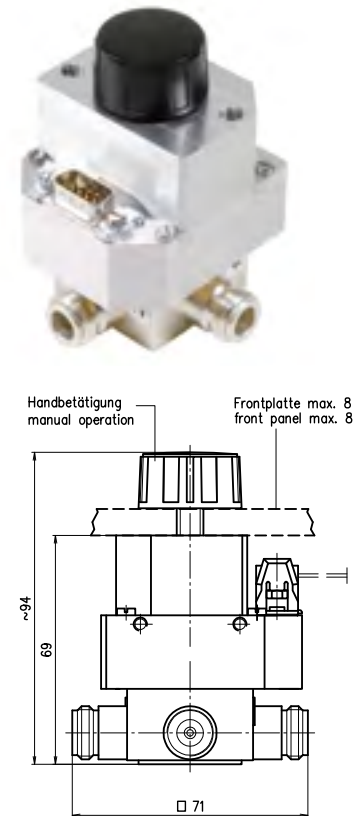


¹ For limitations see "Environmental Conditions for Broadcast Products".

Two-Way Switch DPDT with N Connectors, Manual Operation

- Optical position indicator
- End position signal contacts

Part Number	BN 754070	
Connectors	N female	
Frequency range	0 - 5 GHz	
Proof voltage	≤ 3.0 kV	
Average power ¹	0 - 1 GHz	≤ 0.79 kW
	1 - 2 GHz	≤ 0.56 kW
	2 - 3 GHz	≤ 0.45 kW
	3 - 5 GHz	≤ 0.35 kW
VSWR	0 - 1 GHz	≤ 1.03
	1 - 2 GHz	≤ 1.13
	2 - 3 GHz	≤ 1.13
	3 - 5 GHz	≤ 1.22
Isolation	0 - 1 GHz	≥ 75 dB
	1 - 2 GHz	≥ 60 dB
	2 - 3 GHz	≥ 60 dB
	3 - 5 GHz	≥ 50 dB
Insertion loss	0 - 1 GHz	≤ 0.04 dB
	1 - 2 GHz	≤ 0.04 dB
	2 - 3 GHz	≤ 0.06 dB
	3 - 5 GHz	≤ 0.06 dB
Mechanical life (cycles)	≥ 500,000	
Ambient temperature	-10 °C ≤ θ ≤ +45 °C	
Weight	≈ 0.50 kg	

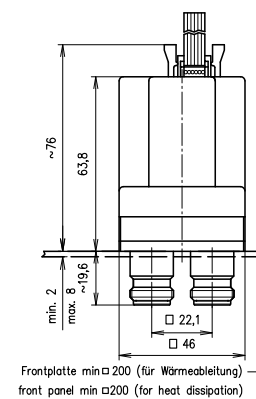


¹ For limitations see "Environmental Conditions for Broadcast Products".

Two-Way Switch DPDT with N Connectors, Failsafe

- Solenoid drive
- Manual operation
- End position signal contacts

Part Number	BN 743741	
Connectors	N female	
Frequency range	0 - 2 GHz	
Proof voltage	≤ 3.0 kV	
Average power ¹	0 - 1 GHz 1 - 2 GHz	≤ 0.30 kW ≤ 0.20 kW
VSWR	0 - 1 GHz 1 - 2 GHz	≤ 1.12 ≤ 1.15
Isolation	0 - 1 GHz 1 - 2 GHz	≥ 70 dB ≥ 65 dB
Insertion loss	0 - 1 GHz 1 - 2 GHz	≤ 0.06 dB ≤ 0.07 dB
Operation voltage	24 V DC ± 10 %	
Control voltage	24 V DC ± 10 %	
Operation current	≤ 0.2 A	
Switching time	≤ 25 ms	
Mechanical life (cycles)	≥ 2,000,000	
Ambient temperature	-10 °C ≤ θ ≤ +45 °C	
Weight	≈ 0.35 kg	



¹ For limitations see "Environmental Conditions for Broadcast Products".

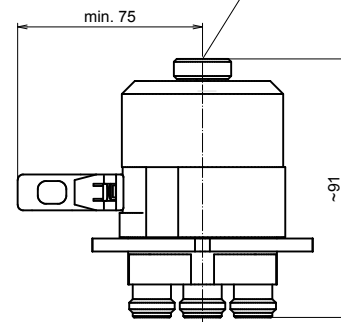
Two-Way Switch DPDT with N Connectors, Latching

- Impulse solenoid drive
- Optical position indicator
- Manual operation
- End position signal contacts

Part Number	BN 754067	
Connectors	N female	
Frequency range	0 - 2 GHz	
Proof voltage	≤ 2.3 kV	
Average power ¹	0 - 1 GHz 1 - 2 GHz	≤ 0.75 kW ≤ 0.50 kW
VSWR	0 - 1 GHz 1 - 2 GHz	≤ 1.04
Isolation	0 - 1 GHz 1 - 2 GHz	≥ 80 dB ≥ 75 dB
Insertion loss	0 - 2 GHz	≤ 0.05 dB
Operation voltage	24 V DC ± 10 %	
Control voltage	24 V DC ± 10 %	
Operation current	≤ 0.8 A	
Switching time	≤ 80 ms	
Mechanical life (cycles)	≥ 250,000	
Ambient temperature	-10 °C ≤ θ ≤ +45 °C	
Weight	≈ 0.45 kg	



Handbetätigung / Positionsanzeige
manual operation / position indication



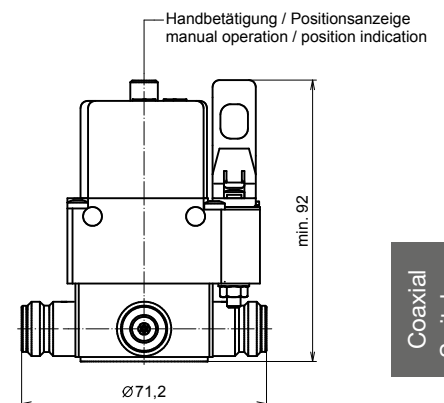
¹ For limitations see "Environmental Conditions for Broadcast Products".

Two-Way Switches DPDT with N Connectors, Latching

- Impulse solenoid drive
- Optical position indicator
- Manual operation
- End position signal contacts

Part Number	BN 754098	BN 754030
Connectors	N female	
Frequency range	0 - 5 GHz	
Proof voltage	≤ 3.0 kV	
Average power ¹	0 - 1 GHz	≤ 0.79 kW
	1 - 2 GHz	≤ 0.56 kW
	2 - 3 GHz	≤ 0.45 kW
	3 - 5 GHz	≤ 0.35 kW
VSWR	0 - 1 GHz	≤ 1.03
	1 - 2 GHz	≤ 1.13
	2 - 3 GHz	≤ 1.13
	3 - 5 GHz	≤ 1.22
Isolation	0 - 1 GHz	≥ 75 dB
	1 - 2 GHz	≥ 60 dB
	2 - 3 GHz	≥ 60 dB
	3 - 5 GHz	≥ 50 dB
Insertion loss	0 - 1 GHz	≤ 0.04 dB
	1 - 2 GHz	≤ 0.04 dB
	2 - 3 GHz	≤ 0.06 dB
	3 - 5 GHz	≤ 0.06 dB
Operating voltage	12 V DC ± 5 %	25 V DC ± 10 %
Control voltage	12 V DC ± 5 %	25 V DC ± 10 %
Operating current	≤ 0.9 A	≤ 0.6 A
Switching time	≤ 40 ms	
Mechanical life (cycles)	≥ 250,000	
Ambient temperature	-10 °C ≤ θ ≤ +45 °C	
Weight	≈ 0.6 kg	

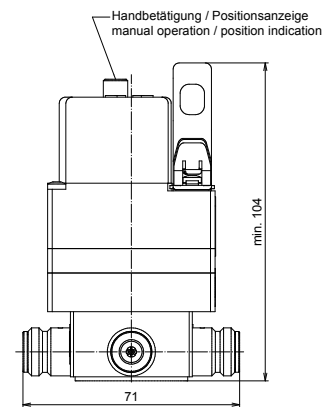
¹ For limitations see "Environmental Conditions for Broadcast Products".



Two-Way Switches DPDT with N Connectors, Latching

- Impulse solenoid drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- End position signal contacts

Part Number	BN 754066C0001	BN 754066C0002
Connectors	N female	
Frequency range	0 - 5 GHz	
Proof voltage	≤ 3.0 kV	
Average power ¹	0 - 1 GHz	≤ 0.79 kW
	1 - 2 GHz	≤ 0.56 kW
	2 - 3 GHz	≤ 0.45 kW
	3 - 5 GHz	≤ 0.35 kW
VSWR	0 - 1 GHz	≤ 1.03
	1 - 2 GHz	≤ 1.13
	2 - 3 GHz	≤ 1.13
	3 - 5 GHz	≤ 1.22
Isolation	0 - 1 GHz	≥ 75 dB
	1 - 2 GHz	≥ 60 dB
	2 - 3 GHz	≥ 60 dB
	3 - 5 GHz	≥ 50 dB
Insertion loss	0 - 1 GHz	≤ 0.04 dB
	1 - 2 GHz	≤ 0.04 dB
	2 - 3 GHz	≤ 0.06 dB
	3 - 5 GHz	≤ 0.06 dB
Operating voltage	12 V DC ± 10 %	25 V DC ± 12 %
Control voltage	12 V DC ± 10 %	25 V DC ± 12 %
Operating current	≤ 2.0 A	≤ 1.1 A
Switching time	≤ 100 ms	
Mechanical life (cycles)	≥ 500,000	
Ambient temperature	-10 °C ≤ θ ≤ +60 °C	
Weight	≈ 0.8 kg	



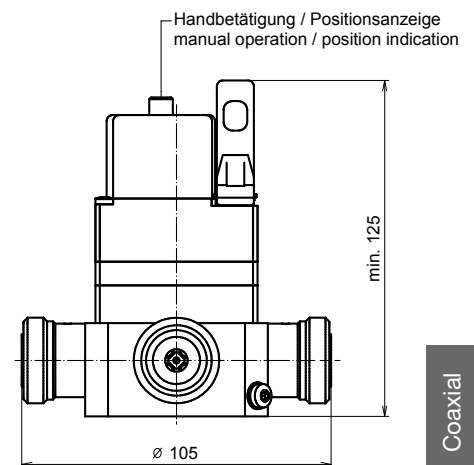
¹ For limitations see "Environmental Conditions for Broadcast Products".

Two-Way Switches DPDT with 7-16 Connectors, Latching

- Impulse solenoid drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- End position signal contacts

Part Number		BN 512690C0001	BN 512690C0002
Connectors		7-16 female	
Frequency range		0 - 5 GHz	
Proof voltage		≤ 4.0 kV	
Average power ¹	100 MHz 230 MHz 860 MHz	≤ 5.0 kW ≤ 3.5 kW ≤ 2.0 kW	
VSWR	100 MHz 230 MHz 860 MHz	≤ 1.02 ≤ 1.02 ≤ 1.04	
Isolation	100 MHz 230 MHz 860 MHz	≥ 80 dB	
Insertion loss		≤ 0.05 dB	
Operating voltage		12 V DC ± 10 %	25 V DC ± 12 %
Control voltage		12 V DC ± 10 %	25 V DC ± 12 %
Operating current		≤ 2.0 A	≤ 1.1 A
Switching time		≤ 100 ms	
Mechanical life (cycles)		≥ 500,000	
Ambient temperature		-10 °C ≤ θ ≤ +60 °C	
Weight		≈ 1.2 kg	

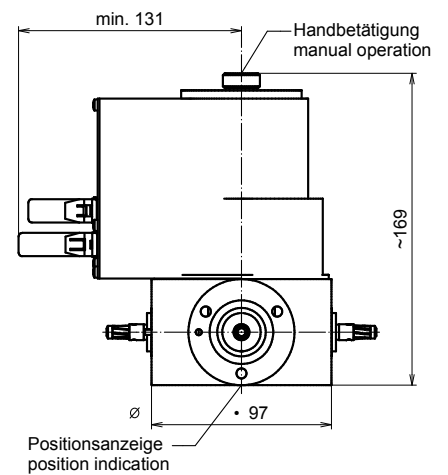
¹ For limitations see "Environmental Conditions for Broadcast Products".



Two-Way Switches DPDT with 7/8" EIA Connectors, Latching

- Motor drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- End position signal contacts

Part Number	BN 512698	BN 512697
Connectors	7/8" EIA	
Frequency range	0 - 3.5 GHz	
Proof voltage	≤ 3.5 kV	
Average power ¹	100 MHz 230 MHz 860 MHz	≤ 7.5 kW ≤ 4.5 kW ≤ 2.4 kW
VSWR	100 MHz 230 MHz 860 MHz	≤ 1.02 ≤ 1.02 ≤ 1.04
Isolation	100 MHz 230 MHz 860 MHz	≥ 80 dB
Insertion loss	≤ 0.03 dB	
Operating voltage	230 V AC ± 10 % 50 - 60 Hz	
Control voltage	8 - 31 V DC	230 V AC ± 10 % 50 - 60 Hz
Operating current	≤ 0.5 A	
Switching time ¹	≤ 120 ms	
Mechanical life (cycles)	≥ 250,000	
Ambient temperature	-10 °C ≤ θ ≤ +60 °C	
Weight	≈ 2.5 kg	

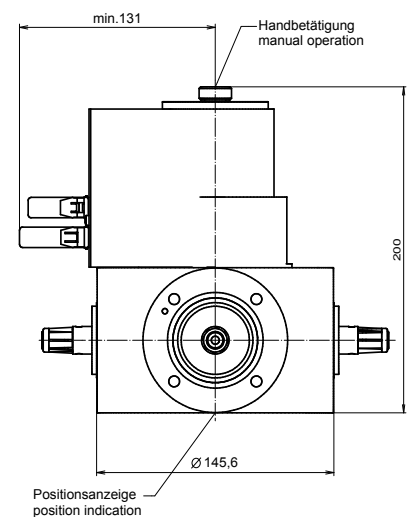


¹ For limitations see "Environmental Conditions for Broadcast Products".

Two-Way Switches DPDT with 1 5/8" EIA Connectors, Latching

- Motor drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- End position signal contacts

Part Number		BN 640082	BN 640081
Connectors		1 5/8" EIA	
Frequency range		0 - 2.0 GHz	
Proof voltage		≤ 5.1 kV	
Average power ¹	100 MHz 230 MHz 860 MHz	≤ 19.0 kW ≤ 12.7 kW ≤ 6.6 kW	
VSWR	100 MHz 230 MHz 860 MHz	≤ 1.03 ≤ 1.03 ≤ 1.05	
Isolation	100 MHz 230 MHz 860 MHz	≥ 80 dB	
Insertion loss		≤ 0.05 dB	
Operating voltage		230 V AC ± 10 % 50 - 60 Hz	
Control voltage		8 - 31 V DC	230 V AC ± 10 % 50 - 60 Hz
Operating current		≤ 0.5 A	
Switching time		≤ 120 ms	
Mechanical life (cycles)		≥ 250,000	
Ambient temperature		-10 °C ≤ ϑ ≤ +60 °C	
Weight		≈ 5.0 kg	



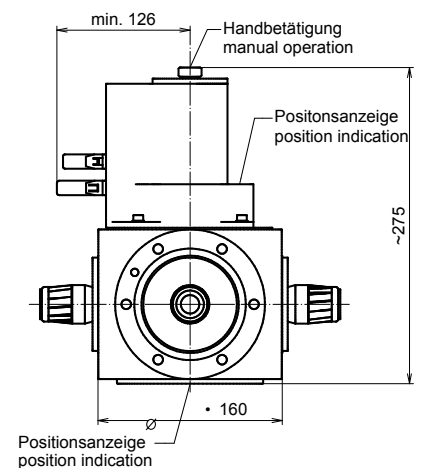
¹ For limitations see "Environmental Conditions for Broadcast Products".

Two-Way Switches DPDT with 3 1/8" EIA Connectors, Latching

- Motor drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- End position signal contacts

Part Number		BN 941918	BN 941917
Connectors		3 1/8" EIA	
Frequency range		0 - 860 MHz	
Proof voltage		≤ 13.3 kV	
Average power ¹	100 MHz 230 MHz 860 MHz	≤ 70 kW ≤ 46 kW ≤ 24 kW	
VSWR	100 MHz 230 MHz 860 MHz	≤ 1.03 ≤ 1.03 ≤ 1.05	
Isolation	100 MHz 230 MHz 860 MHz	≥ 75 dB	
Insertion loss		≤ 0.05 dB	
Operating voltage		230 V AC ± 10 % 50 - 60 Hz	
Control voltage		8 - 31 V DC	230 V AC ± 10 % 50 - 60 Hz
Operating current		≤ 1.0 A	
Switching time		≤ 200 ms	
Mechanical life (cycles)		≥ 250,000	
Ambient temperature		-10 °C ≤ θ ≤ +60 °C	
Weight		≈ 10.5 kg	

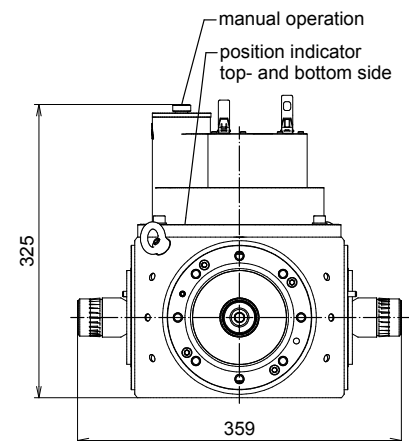
¹ For limitations see "Environmental Conditions for Broadcast Products".



Two-Way Switches DPDT with 4 1/16" EIA Connectors, Latching

- Motor drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- End position signal contacts

Part Number	BN 941934	
Connectors	4 1/16" MYAT flange	
Frequency range	0 - 1.0 GHz	
Proof voltage	≤ 16.0 kV	
Average power ¹	100 MHz	≤ 100 kW
	230 MHz	≤ 70 kW
	700 MHz	≤ 38 kW
VSWR	100 MHz	≤ 1.04
	230 MHz	≤ 1.04
	700 MHz	≤ 1.06
Isolation	100 MHz	≥ 80 dB
	230 MHz	≥ 80 dB
	700 MHz	≥ 70 dB
Insertion loss	≤ 0.03 dB	
Operating voltage	230 V AC ± 10 % 50 - 60 Hz	
Control voltage	8 - 31 V DC	
Operating current	≤ 1.5 A	
Switching time	≤ 1.0 s	
Mechanical life (cycles)	≥ 250,000	
Ambient temperature	-10 °C ≤ θ ≤ +60 °C	
Weight	≈ 26.5 kg	

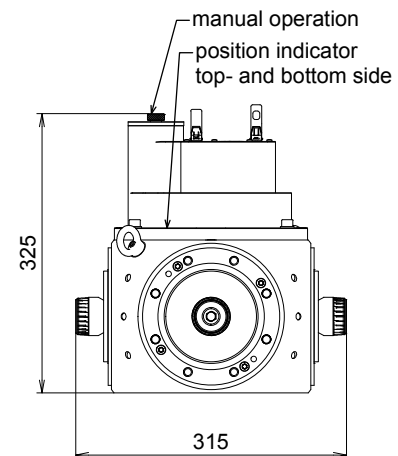


¹ For limitations see "Environmental Conditions for Broadcast Products".

Two-Way Switches DPDT with 4 1/2" EIA Connectors, Latching

- Motor drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- End position signal contacts

Part Number	BN 941944	
Connectors	4 1/2" EIA	
Frequency range	0 - 860 MHz	
Proof voltage	≤ 16.0 kV	
Average power ¹	100 MHz 230 MHz 860 MHz	≤ 100 kW ≤ 70 kW ≤ 38 kW
VSWR	100 MHz 230 MHz 860 MHz	≤ 1.04 ≤ 1.04 ≤ 1.06
Isolation	100 MHz 230 MHz 860 MHz	≥ 80 dB ≥ 80 dB ≥ 70 dB
Insertion loss	≤ 0.03 dB	
Operating voltage	230 V AC ± 10 % 50 - 60 Hz	
Control voltage	8 - 31 V DC	
Operating current	≤ 1.5 A	
Switching time	≤ 1.0 s	
Mechanical life (cycles)	≥ 250,000	
Ambient temperature	-10 °C ≤ θ ≤ +60 °C	
Weight	≈ 26.5 kg	



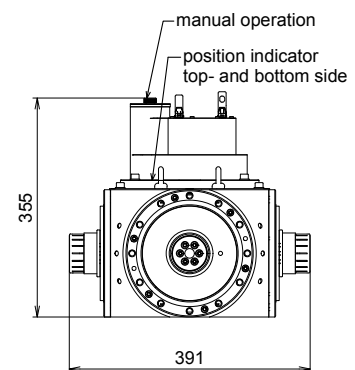
¹ For limitations see "Environmental Conditions for Broadcast Products".

Two-Way Switches DPDT with 6 1/8" EIA Connectors, Latching

- Motor drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- End position signal contacts

Part Number		BN 941989
Connectors		6 1/8" EIA
Frequency range		0 - 800 MHz
Proof voltage		≤ 18.6 kV
Average power ¹		100 MHz ≤ 166 kW 230 MHz ≤ 110 kW 800 MHz ≤ 60 kW
VSWR		100 MHz ≤ 1.06 230 MHz ≤ 1.06 800 MHz ≤ 1.08
Isolation		100 MHz ≥ 75 dB 230 MHz ≥ 75 dB 800 MHz ≥ 70 dB
Insertion loss		≤ 0.03 dB
Operating voltage		230 V AC ± 10 % 50 - 60 Hz
Control voltage		8 - 31 V DC
Operating current		≤ 1.5 A
Switching time		≤ 1.2 s
Mechanical life (cycles)		≥ 250,000
Ambient temperature		-10 °C ≤ θ ≤ +60 °C
Weight		≈ 38.0 kg

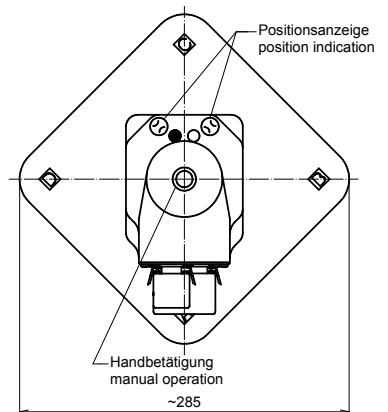
¹ For limitations see "Environmental Conditions for Broadcast Products".



Two-Way Plug-In Switches 1 5/8" USL-D for Patch Panels

- Motor drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- Interlock protection in case of switch removal
- Twist protected on plug-in
- End position signal contacts
- Alternative operation with U-links possible

Part Number		BN 553064	BN 553065
Connectors		1 5/8" USL-D	
Frequency range		0 - 860 MHz	
Proof voltage		≤ 7.0 kV	
Average power ¹	100 MHz 230 MHz 860 MHz	≤ 20.0 kW ≤ 13.5 kW ≤ 7.0 kW	
VSWR	100 MHz 230 MHz 860 MHz	≤ 1.04	
Isolation	100 MHz 230 MHz 860 MHz	≥ 80 dB ≥ 80 dB ≥ 70 dB	
Insertion loss	860 MHz	≤ 0.1 dB	
Operating voltage		230 V AC ± 10 % 50 - 60 Hz	
Control voltage		8 - 31 V DC	230 V AC ± 10 % 50 - 60 Hz
Operating current		≤ 1.0 A	
Switching time		≤ 200 ms	
Mechanical life (cycles)		≥ 250,000	
Ambient temperature		-10 °C ≤ θ ≤ +45 °C	
Weight		≈ 5.0 kg	

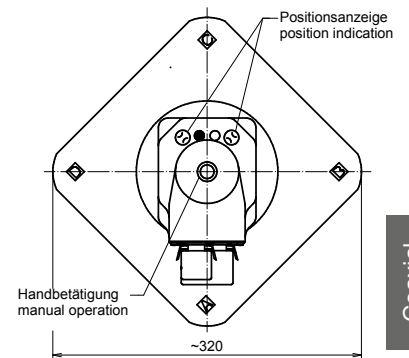


¹ For limitations see "Environmental Conditions for Broadcast Products".

Two-Way Plug-In Switches 29.5-68 USL-D for Patch Panels

- Motor drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- Interlock protection in case of switch removal
- Twist protected on plug-in
- End position signal contacts
- Alternative operation with U-links possible

Part Number		BN 553364	BN 553365
Connectors		29.5-68 USL-D	
Frequency range		0 - 860 MHz	
Proof voltage		≤ 8.1 kV	
Average power ¹	100 MHz 230 MHz 860 MHz	≤ 41 kW ≤ 21 kW ≤ 14 kW	
VSWR	100 MHz 230 MHz 860 MHz	≤ 1.04	
Isolation	100 MHz 230 MHz 860 MHz	≥ 80 dB ≥ 80 dB ≥ 70 dB	
Insertion loss	860 MHz	≤ 0.1 dB	
Operating Voltage		230 V AC ± 10 % 50 - 60 Hz	
Control voltage		8 - 31 V DC	230 V AC ± 10 % 50 - 60 Hz
Operating current		≤ 1.0 A	
Switching time		≤ 200 ms	
Mechanical life (cycles)		≥ 250,000	
Ambient temperature		-10 °C ≤ θ ≤ +45 °C	
Weight		≈ 9.0 kg	

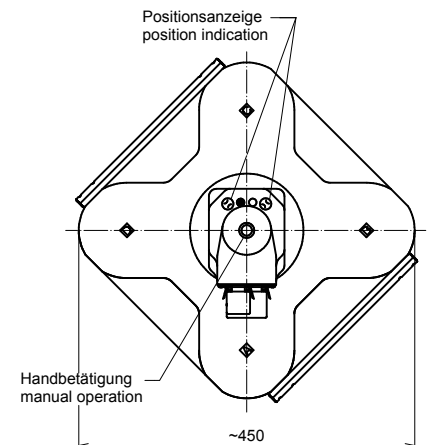


¹ For limitations see "Environmental Conditions for Broadcast Products".

Two-Way Plug-In Switches 43-98 USL-D for Patch Panels

- Motor drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- Interlock protection in case of switch removal
- Twist protected on plug-in
- End position signal contacts
- Alternative operation with U-links possible

Part Number		BN 553664	BN 553665
Connectors		43-98 USL-D	
Frequency range		0 - 860 MHz	
Proof voltage		≤ 14.5 kV	
Average power ¹	100 MHz 230 MHz 860 MHz	≤ 82 kW ≤ 42 kW ≤ 28 kW	
VSWR	100 MHz 230 MHz 860 MHz	≤ 1.04	
Isolation	100 MHz 230 MHz 860 MHz	≥ 80 dB ≥ 80 dB ≥ 60 dB	
Insertion loss		≤ 0.1 dB	
Operating voltage		230 V AC ± 10 % 50 - 60 Hz	
Control voltage		8 - 31 V DC	230 V AC ± 10 % 50 - 60 Hz
Operating current		≤ 1.0 A	
Switching time		≤ 500 ms	
Mechanical life (cycles)		≥ 250,000	
Ambient temperature		-10 °C ≤ θ ≤ +45 °C	
Weight		≈ 22.0 kg	



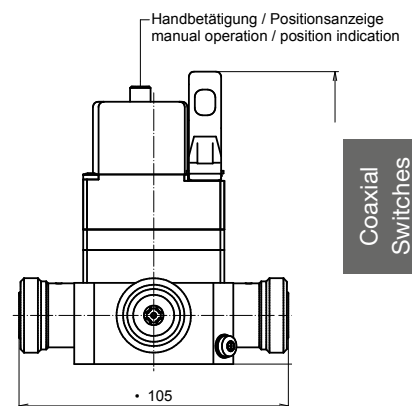
¹ For limitations see "Environmental Conditions for Broadcast Products".

Two-Way Switches DPDT, Low Intermodulation, Latching

- Impulse solenoid drive
- Optical position indicator
- Manual operation
- Advanced interlock contacts
- End position signal contacts

Part Number	BN 754081	BN 754082
Connectors	7-16 female	4.3-10 female
Frequency range	0.69 - 3.80 GHz	
Proof voltage	≤ 1.0 kV	
Average power ¹	0.69 - 3.80 GHz	≤ 300 W
VSWR	0.69 - 3.80 GHz	≤ 1.22
Isolation	0.69 - 2.69 GHz 3.40 - 3.80 GHz	≥ 55 dB ≥ 50 dB
Insertion loss	≤ 0.1 dB	
Intermodulation (IM3) @ 2 x 20 W, max./typ.	-165 dBc / -168 dBc	
Operating voltage	21.6 - 28.0 V DC	
Control voltage	U in low U in high	0 - 4.0 V DC 8.0 - 32.0 V DC
Operating current	≤ 1.1 A	
Switching time	≤ 100 ms	
Mechanical life (cycles)	≥ 500,000	
Ambient temperature	-10 °C ≤ θ ≤ +60 °C	
Weight	≈ 1.8 kg	

¹ For limitations see "Environmental Conditions for Broadcast Products".



Coaxial
Switches

Two-Way Switches with N Connectors, 3 RF Planes, Failsafe

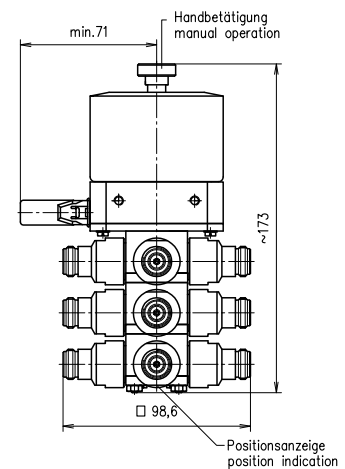
- Motor drive
- Optical position indicator
- Manual operation
- End position signal contacts

Part Number	BN 659038	
Connectors	N female	
Frequency range	0 - 2 GHz	
Proof voltage	≤ 3.0 kV	
Average power ¹	0 - 1 GHz	≤ 0.79 kW
	1 - 2 GHz	≤ 0.56 kW
VSWR	0 - 1 GHz	≤ 1.02
	1 - 2 GHz	≤ 1.06
Isolation	0 - 1 GHz	≥ 90 dB
	1 - 2 GHz	≥ 80 dB
Insertion loss	0 - 2 GHz	≤ 0.05 dB
Operating voltage	24 V DC ± 10 %	
Control voltage	24 V DC ± 10 %	
Operating current / holding current	≤ 2.5 A / 0.3 A	
Switching time	≤ 100 ms	
Mechanical life (cycles)	≥ 100,000	
Ambient temperature	-10 °C ≤ θ ≤ +45 °C	
Weight	≈ 2.7 kg	

¹ For limitations see "Environmental Conditions for Broadcast Products".



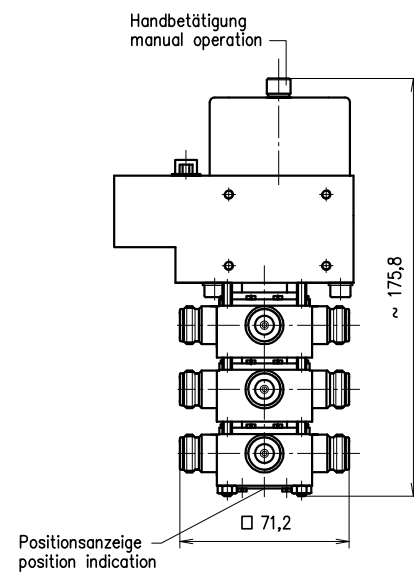
Typical design



Two-Way Switches With N Connectors, 3 RF Planes, Latching

- Motor drive
- Optical position indicator
- Manual operation
- End position signal contacts

Part Number	BN 512716	
Connectors	N female	
Frequency range	0 - 5 GHz	
Proof voltage	≤ 3.0 kV	
Average power ¹	0 - 1 GHz	≤ 0.79 kW
	1 - 2 GHz	≤ 0.56 kW
	2 - 3 GHz	≤ 0.45 kW
	3 - 5 GHz	≤ 0.35 kW
VSWR	0 - 1 GHz	≤ 1.03
	1 - 2 GHz	≤ 1.13
	2 - 3 GHz	≤ 1.13
	3 - 5 GHz	≤ 1.22
Isolation	0 - 1 GHz	≥ 75 dB
	1 - 2 GHz	≥ 60 dB
	2 - 3 GHz	≥ 60 dB
	3 - 5 GHz	≥ 50 dB
Insertion loss	0 - 2 GHz	≤ 0.04 dB
	2 - 5 GHz	≤ 0.06 dB
Operating voltage	26 V DC ± 15 %	
Control voltage	26 V DC ± 15 %	
Operating current	≤ 2.4 A	
Switching time	≤ 100 ms	
Mechanical life (cycles)	≥ 100,000	
Ambient temperature	-10 °C ≤ ϑ ≤ +45 °C	
Weight	≈ 2.0 kg	

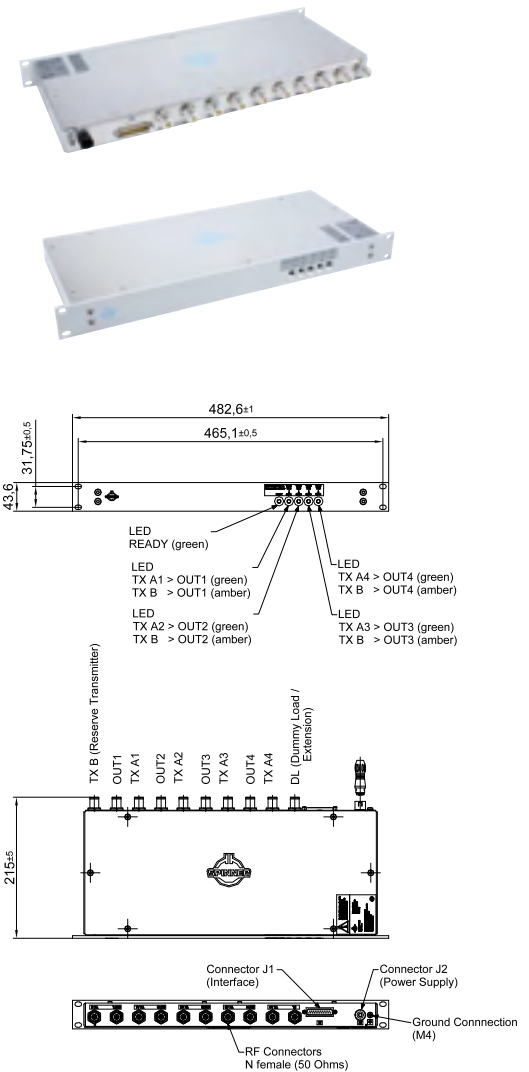


¹ For limitations see "Environmental Conditions for Broadcast Products".

N+1 Switching Units, Latching

- Replaces four 2-way switches
- Ready for operation
- Indication of the switching status at the front plate
- Modular expandable
- 19" drawer, 1 RU
- Easy installation with or without front plate

Part Number		BN 512663 (2+1) BN 512665 (4+1)
Connectors		N female
Frequency range		0 - 1.5 GHz
Proof voltage		≤ 1.0 kV
Average power ¹	0 - 100 MHz 100 - 230 MHz 230 - 860 MHz 860 - 1500 MHz	≤ 280 W ≤ 200 W ≤ 130 W ≤ 75 W
VSWR	0 - 860 MHz 860 - 1500 MHz	≤ 1.06 ² - ≤ 1.12 ³ ≤ 1.20 ² - ≤ 1.22 ³
Isolation	0 - 860 MHz 860 - 1500 MHz	≥ 45 dB ≥ 40 dB
Insertion loss	0 - 860 MHz 860 - 1500 MHz	≤ 0.25 dB ² - ≤ 0.60 dB ³ ≤ 0.35 dB ² - ≤ 0.70 dB ³
Operating voltage		10.8 - 26.4 V DC
Control voltage		8 - 28 V DC
Switching power		20 W
Switching time		≤ 100 ms
Switching characteristic		Bistable (latching)
Mechanical life (cycles)		≥ 100,000
Ambient temperature		-10 °C ≤ θ ≤ +45 °C
Weight		BN 512663 ≈ 3.5 kg BN 512665 ≈ 5.0 kg



BN 512665

¹ For limitations see "Environmental Conditions for Broadcast Products".
² Shortest path
³ Longest path

