

SPINNER FM Solutions



RF Products & Solutions for FM Sites

HIGH FREQUENCY PERFORMANCE WORLDWIDE
www.spinner-group.com

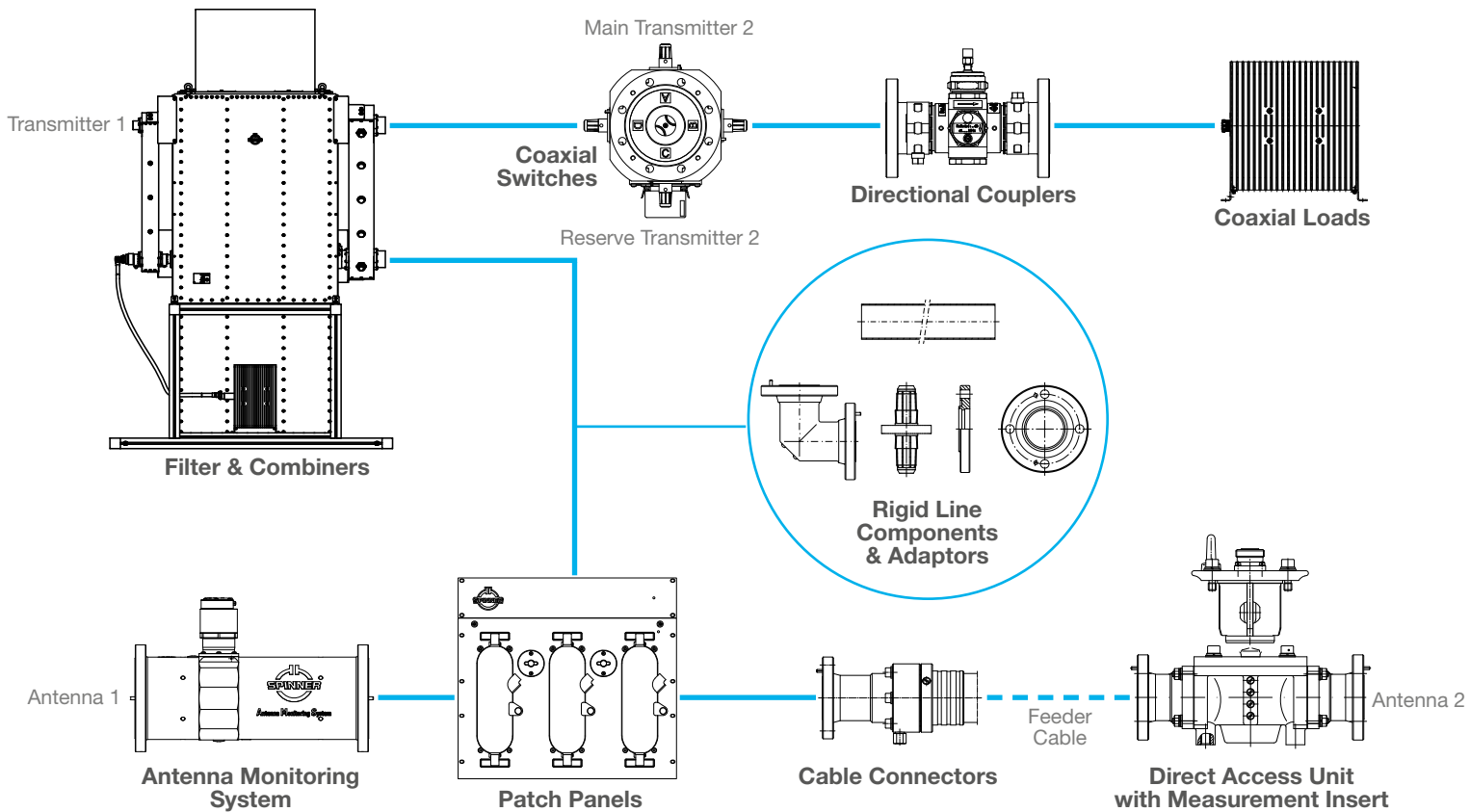


SPINNER FM Solutions

SPINNER supplies a complete range of FM passive components that can be needed between the transmitter and the antenna in a FM Site – naturally all of them with the leading-edge performance we are famous for.

SPINNER is not only famous for its quality products but also for its customized solutions. Using our 70 years of experience in RF, our highly qualified crew of design engineers are able to offer a complete system with optimized footprints, making life easier for all our SPINNER customers.

Portfolio Overview



Antenna Monitoring System (AMS)

Radio broadcasters worldwide rely on their systems to deliver content to listeners and viewers. But although their infrastructure may be robust, it isn't invulnerable. The insulation of cables and dipole antennas can become brittle and crack from long-term exposure to UV radiation. Feeder cables can be damaged by strong winds, ice or corrosion. Problems can also be caused by improper installation and RF overloads.

Over the long term, these problems can cause the site to go off-air or even lead to fire, thus completely disabling the broadcast system. Operators therefore need a way to reliably detect and pinpoint problems in cables, splitters or antennas at an early stage before they can lead to more serious damage. The SPINNER Antenna Monitoring System (AMS) does all this and more.

The AMS is engineered to detect arcing and water ingress in broadcast transmission systems at an early stage and alert you to problems before major damage can occur. It helps you stay on the air day in and day out.

This SPINNER solution monitors the entire antenna system, including patch panels, feeder cables and dipoles. Recently patented measurement methods detect even the slightest signs of moisture penetration, triggering an alarm both locally on warning lamps and remotely via an SNMP interface. All events are continuously recorded and can be reviewed from anywhere via a user-friendly web interface.

The Antenna Monitoring System consists of two parts: an AMS control unit and AMS detectors (line section or U-link). The AMS detectors respond to possible arcing or water ingress by relaying measurement data to the control unit. It then analyzes the data and triggers alarms via LEDs, SNMP and relay contacts if warranted. A web server is hosted for data logging and configuration.



SPINNER Antenna Monitoring System (AMS)

Line Sections

For installation in any rigid line

Size	1 5/8" EIA	3 1/8" EIA	4 1/2" EIA ¹⁾	6 1/8" EIA	7 3/16"	8 3/16"	9 3/16"
Impedance	50 Ω	50 Ω	50 Ω	50 Ω	75 Ω	75 Ω	50 Ω
Proof voltage	13.5 kV	16 kV	18 kV	22 kV	22 kV	24 kV	24 kV
Average Power	20 kW	67 kW	127 kW	140 kW	202 kW	256 kW	360 kW
VSWR	1.06						

¹⁾ 339 IEC 50-105



U-Links

For connection to SPINNER patch panels

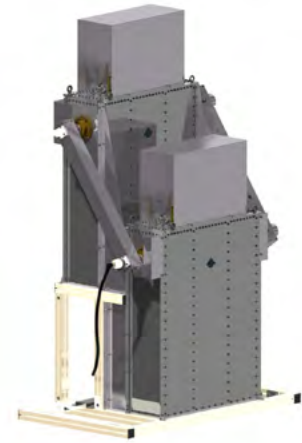
Size	1 5/8"	29.5-68	43-98	52-120
Impedance	50 Ω	50 Ω	50 Ω	50 Ω
Proof voltage	13.5 kV	13.5 kV	8 kV	11 kV
Average Power	20 kW	51 kW	98 kW	140 kW
VSWR	1.06	1.06	1.06	1.06



Combiners

Combiners make it possible to connect multiple transmitters to a single shared output, providing an efficient solution.

All SPINNER combiners have a compact footprint, can be tuned across the entire FM range and feature high RF performance. They are available in two versions: Constant Impedance Balanced (CIB) Combiner and Starpoint Combiner.

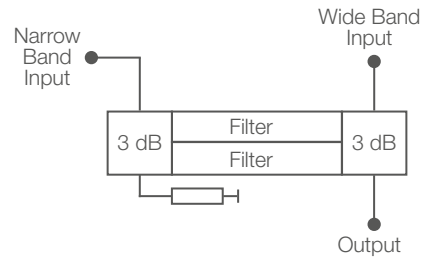


SPINNER Combiner

Constant Impedance Balanced (CIB) Combiner

With an expandable system and high isolation for close channel spacing

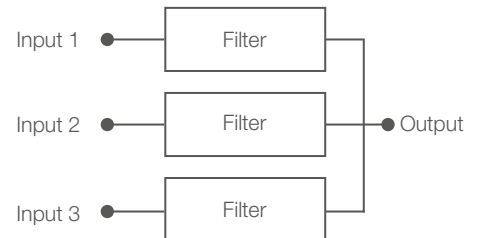
Narrow band input Average power Insertion loss	1 5/8" SMS unflanged 12 kW – 16 kW ¹⁾ 0.4 dB	
Wide band input Average power Insertion loss	1 5/8" SMS unflanged 20 kW 0.2 dB	3 1/8" SMS unflanged 45 kW 0.2 dB
Output Average power Peak voltage	1 5/8" SMS unflanged 20 kW 7 kV	3 1/8" SMS unflanged 45 kW 14 kV
Minimal channel spacing	1 MHz	
Return loss	> 30 dB	
Isolation between inputs	> 36 dB	



Starpoint Combiner

A cost-efficient alternative to CIB combiners

Nr. of Inputs	2	3
Inputs	1 5/8" SMS unflanged	
Average power	6 kW – 8 kW ¹⁾	
Output	1 5/8" SMS unflanged	3 1/8" SMS unflanged
Insertion loss	0.4 dB	0.5 dB
Minimal channel spacing	1.8 MHz	
Return loss	> 26 dB	
Isolation between inputs	> 35 dB	



¹⁾Average power varies according to the tuned bandwidth
All values are typical

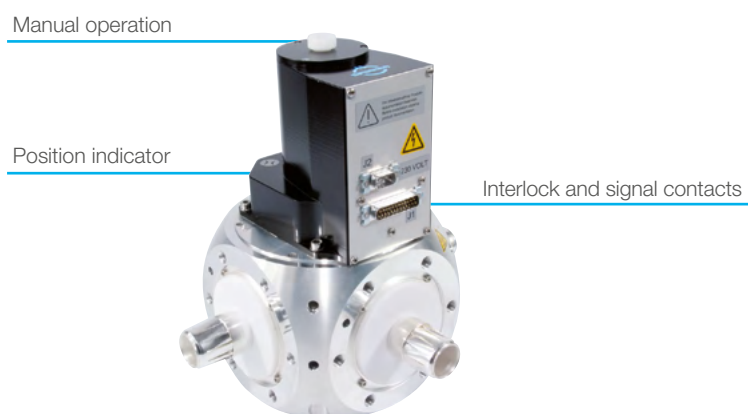
Coaxial Switches

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 coaxial cable sizes from N to 6 1/8" EIA.

SPINNER's RF switches are available with different drive types (impulse solenoid or motor drive) and include a knob for emergency manual operation. A position indicator is also available.

The 2-way Switches are equipped with signal contacts for monitoring and control purposes and with interlock contacts that can be integrated into four potential free safety loops.

Due to their extremely compact dimensions and exceptional dependability, SPINNER switches are preferred for systems that must be highly reliable. They feature the shortest known switching times and highest isolation available in the market.



Connectors	N female	7-16 female	7/8" EIA	1 5/8" EIA	3 1/8" EIA	4 1/2" EIA ¹⁾	6 1/8" EIA
Type of drive	Impulse solenoid			Motor			
Average power	0.79 kW	5 kW	8 kW	20 kW	73 kW	100 kW	170 kW
Proof voltage	3 kV	4 kV	3.5 kV	5.1 kV	13.3 kV	16 kV	18.6 kV
VSWR	1.03	1.02	1.02	1.03	1.03	1.04	1.06
Insertion loss	0.04 dB	0.05 dB	0.03 dB	0.05 dB	0.05 dB	0.03 dB	0.03 dB
Isolation	75 dB	80 dB	80 dB	80 dB	75 dB	80 dB	75 dB
Operating voltage	12 VDC 24 VDC	12 VDC 24 VDC	230 VAC	230 VAC	230 VAC	230 VAC	230 VAC
Control voltage	12 VDC 24 VDC	12 VDC 24 VDC	8-31 VDC 230 VAC	8-31 VDC 230 VAC	8-31 VDC 230 VAC	8-31 VDC	8-31 VDC
Operating current	2.0 A 1.1 A	2.0 A 1.1 A	0.5 A	0.5 A	1.0 A	1.5 A	1.5 A
Switching time	100 ms	100 ms	120 ms	120 ms	200 ms	1 s	1.2 s
Mechanical life (cycles)	500,000	500,000	250,000	250,000	250,000	250,000	250,000

¹⁾ 339 IEC 50-105

Patch Panels

SPINNER supplies patch panels for all sizes (7/16 to 6 1/8"). In addition to our standard patch panels with 3, 4 and 6 ports (half-antenna patch panels with power splitters), we can also provide customized solutions.

Switching can be performed by motorized plug-in switches or manually with U-links. All patch panels have an interlock system that briefly switches off the transmitter during the switchover. 4 or 10 isolated interlock contacts are available.

Patch panels can be loosely supplied, wall-mounted or integrated in a 19" or custom rack.

The systems connected to the patch panel can be easily, quickly and precisely measured with test adapters. On request, patch panels can also be equipped with directional couplers.



6-port patch panel with manual switching via U-link and power splitter for half-antenna operation

U-Links

Switching Port	7-16 female	1 5/8" USL-D	29.5 - 68 USL-D	43- 98 USL-D	52-120 USL
Connectors	7-16 female	1 5/8" EIA	3 1/8" EIA	4 1/2" EIA ¹⁾	6 1/8" EIA
Average power	5 kW	20 kW	51 kW	98 kW	132 kW
Proof voltage	2.7 kV	10 kV	13 kV	19 kV	23 kV
Insertion loss	0.1 dB				
VSWR	1.04 (without splitter) 1.06 (with splitter)				

Motorized Plug-In Switches

Switching Port	1 5/8" USL-D	29.5 - 68 USL-D	43- 98 USL-D
Connectors	1 5/8" EIA	3 1/8" EIA	4 1/2" EIA ¹⁾
Average power	20 kW	41 kW	82 kW
Proof voltage	7 kV	8.1 kV	12.5 kV
Insertion loss	0.1 dB		
VSWR	1.04		



Motorized plug-in switch for use in 4-port patch panels

¹⁾ 339 IEC 50-105

Rigid Line Systems

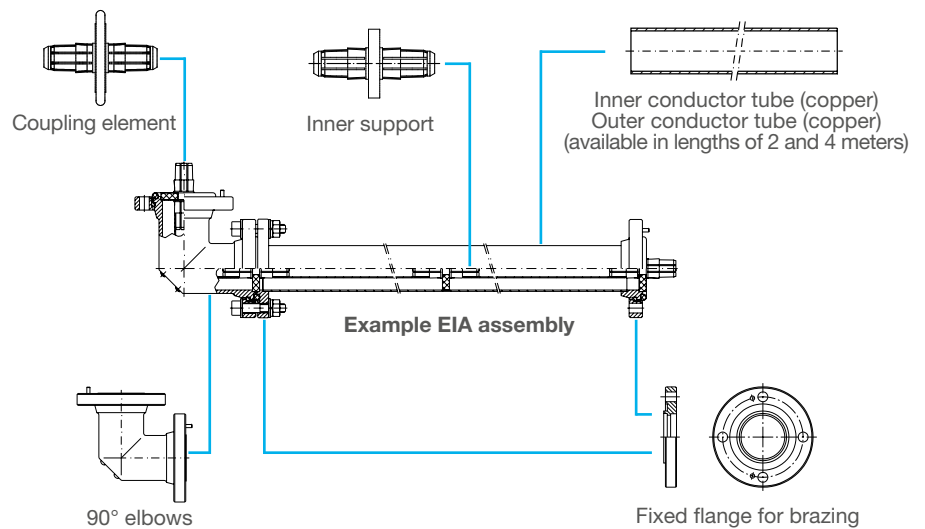
SPINNER supplies two types of rigid line systems: EIA and SMS. All components feature low insertion loss, low VSWR and PTFE insulation.

EIA System

These EIA flange connectors are excellently suited for outdoor installation and pressurized systems.

	Average Power	Attenuation dB/100m
7/8" EIA	7.60 kW	1.21
1 5/8" EIA	20.0 kW	0.63
3 1/8" EIA	67.0 kW	0.32
4 1/2" EIA ¹⁾	112.0 kW	0.24
6 1/8" EIA	224.0 kW	0.16

¹⁾ 339 IEC 50-105

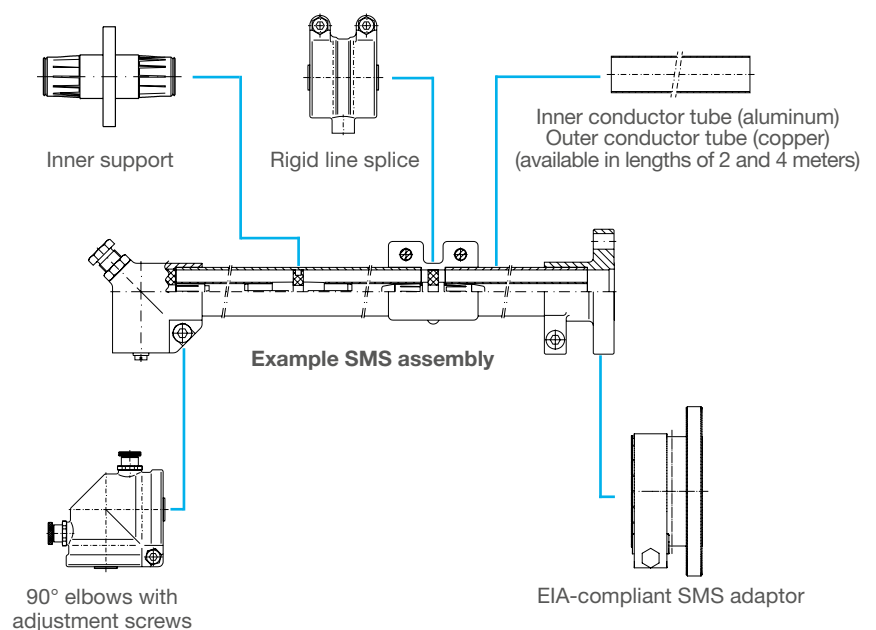


SPINNER SMS (Quick Clamp System)

The SPINNER quick clamp system called "SMS" is based on international rigid line standards including EIA STD RS 225, 339 IEC and DIN EN 122150. The SMS system is available for indoor installation only.

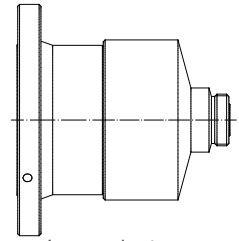
The advantage of the SMS system is that the customer can easily cut the rigid line to length on site, without the need for flaring or brazing. Its parts are connected by coupling elements and secured by clamps. Assembly is therefore very simple, without the need for any special tools.

	Average Power	Attenuation dB/100m
7/8" SMS	7.60 kW	1.21
1 5/8" SMS	19.60 kW	0.75
3 1/8" SMS	63.0 kW	0.37
4 1/2" SMS	106.0 kW	0.28
52-120 SMS	140.0 kW	0.24
6 1/8" SMS	213.0 kW	0.19



Adaptors

SPINNER supplies adaptors with all EIA flanges to 7-16 female with excellent matching ($VSWR \leq 1.02$). All adaptors can be used indoors or outdoors at full power.



Long adaptors

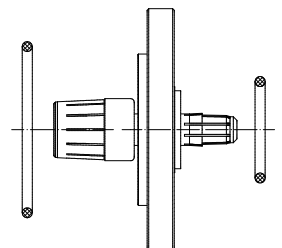
Long Adaptors

	N female	7-16 male	7-16 female	7/8" EIA	13-30 male	13-30 female	1 5/8" EIA	3 1/8" EIA	4 1/2" EIA ¹⁾	52-120 BT	6 1/8" EIA
N female	•	•	•	•			•	•			
N male		•	•								
SMA male	•										
7-16 female			•	•	•		•	•	•		
7-16 male				•							
13-30 female						•	•				
13-30 male					•		•				
7/8" EIA							•				
1 5/8" EIA								•			
3 1/8" EIA									•		•
4 1/2" EIA										•	
4 1/16" Myat									•		
52-120 BT											•
6 1/8" EIA											

Short Adaptors

Short adaptors with integrated coupling elements save space and costs.

	1 5/8" EIA male	3 1/8" EIA male	4 1/2" EIA ¹⁾ male	52-120 BT male	6 1/8" EIA male
7-16 female	•			•	•
7/8" EIA male	•				
1 5/8" EIA male		•			
3 1/8" EIA male			•		•
4 1/2" EIA male					•



Short adaptors

¹⁾ 339 IEC 50-105

Cable Connectors

SPINNER supplies N, 4.3-10, 7-16, 7/8" EIA, 1 5/8" EIA, 3 1/8" EIA, 4 1/2" EIA (339 IEC 50-105) and 6 1/8" EIA connectors for cables made by leading manufacturers. SPINNER connectors comply with international standards and are famous for their outstanding RF performance and reliability.

Connectors for Foam Dielectric Cables

The connectors are sealed by a custom-shaped gasket or injected Plast 2000 to prevent water ingress and corrosion.

	N male	4.3-10 male	7-16 male	7/8" EIA	1 5/8" EIA
SF 1/2"-50	•	•	•	•	
LF 1/2"-50	•	•	•	•	
LF 7/8"-50			•	•	•
LF 1 1/4"-50				•	•
LF 1 5/8"-50				•	•
LF 2 1/4"-50					•



Connectors for Air Dielectric Cables

All connectors have a sealing ring or custom-shaped element between the outer connector and body. The gap between the outer conductor and the connector is additionally sealed with Plast 2000 or a custom-shaped gasket to prevent water ingress and corrosion. All connectors have sealed mating faces and inlets for pressurization.

HELIFLEX Cables

	7-16 male	13-30 male	7/8" EIA	1 5/8" EIA	3 1/8" EIA	4 1/2" EIA ¹⁾	6 1/8" EIA
HCA 38-50	•		•				
HCA 58-50	•		•				
HCA 78-50	•	•	•	•			
HCA 118-50		•		•			
HCA 158-50			•	•			
HCA 295-50					•		
HCA 300-50					•		
HCA 400-50					•		
HCA 495-50						•	
HCA 550-50						•	•
HCA 618-50							•



HELIAX Cables

	N male	N female	7-16 male	7-16 female	7/8" EIA	1 5/8" EIA	3 1/8" EIA	4 1/2" EIA ¹⁾	6 1/8" EIA
HJ5-50	•	•	•	•	•	•			
HJ7-50A				•	•	•			
HJ8-50B							•		
HJ11-50							•	•	•
HJ9HP-50									•
HJ9-50								•	•

¹⁾ 339 IEC 50-105

Measurement Accessories

SPINNER carries a comprehensive range of accessories for facilitating measurement and maintenance work.

Directional Couplers

For measuring forward and reflected power.

For Indoor Use

Main Line		7-16	1 5/8" EIA	3 1/8" EIA	4 1/2" EIA ¹⁾	52-120 BT	6 1/8" EIA
Average power		5.3 kW	20 kW	67 kW	112 kW	170 kW	224 kW
Proof voltage		3 kV	7 kV	14 kV	19 kV	22 kV	28 kV
No. of probes	SMA N	2 -	1, 2, 3 2	2, 3, 4, 5 2	2, 3, 4, 5 2	- 2	- 2
Coupled line		SMA female / N female					
No. of probes	SMA N	51 – 75 dB -	58 – 86 dB 38 – 72 dB	61 – 91 dB 42 – 74 dB	65 – 96 dB 46 – 78 dB	- 48 – 82 dB	- 49.5 – 81 dB
VSWR		1.04					
Directivity		34 – 40 dB					
Insertion loss		0.05 dB					

Direct Access Units

For testing or adjusting antennas without removing the connected feeders, with accurate measurement of VSWR and electrical lengths via galvanic contacts.

For Outdoor Use

Main Connector	1 5/8" EIA	3 1/8" EIA	4 1/2" EIA ¹⁾	6 1/8" EIA
Average power	20 kW	51 kW	67 kW	98 kW
Proof voltage	7 kV	12 kV	14 kV	18 kV
Measuring connector	7-16 female			
VSWR	1.02			

Direct Access Unit (DAU):
for mounting on the feeder cable,
usually on top before the antenna



Measurement Insert:
for insertion in a DAU
for measurement

¹⁾ 339 IEC 50-105

Loads

Loads are needed in many broadcast applications. Typically, they are used as balancing loads for isolated ports or as dummy loads for testing purposes. SPINNER carries a comprehensive range of loads from 1 W up to 25 KW.

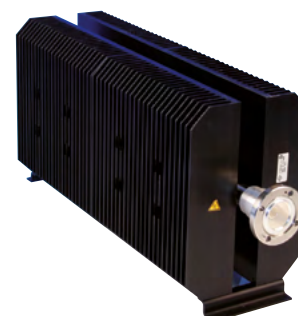


Low Power

	1 W			5 W		10 W		25 W		50 W	100 W		200 W
Connector	SMA male	N male	7-16 male	N male	7-16 male	N male	7-16 male	N male	7-16 male	7-16 male	7-16 female	7-16 male	7-16 female
Proof voltage	50 V			1 kV					1.2 kV				
Cooling	Convection cooling												
VSWR	1.02									1.07	1.06		
Operating position	Any										Cooling fins must be vertical		

Medium Power

	400 W	600 W	1 kW	2 kW	2.5 kW
Connector	7-16 female			1 5/8" EIA	
Proof voltage	1.2 kV		2 kV		2.5 kV
Cooling	Convection cooling				
VSWR	1.06			1.11	
Operating position	Cooling fins must be vertical				



High Power - Smart Loads

Coaxial loads with intelligent control, with pump and fan activated only when needed. Full power from standby, potential-free interlocks with fast self-protection.

	5 kW	10 kW	25 kW
Connector	1 5/8" EIA	3 1/8" EIA	
Proof voltage	2.5 kV	17 kV	
Cooling	Fan	Liquid and van	
Power supply	115 – 230 V, 50 -60 Hz		
VSWR	1.11	1.04	
Operating position	Any	Horizontal	
Optional	-	-	Outdoor cooler





HIGH FREQUENCY PERFORMANCE WORLDWIDE

SPINNER designs and builds cutting-edge radio frequency systems, setting performance and longevity standards for others to follow. The company's track record of innovation dates back to 1946, and many of today's mainstream products are rooted in SPINNER inventions.

Industry leaders continue to count on SPINNER's engineering excellence to drive down their costs of service and ownership with premium-quality, off-the-shelf products and custom solutions. Headquartered in Munich, Germany, the global frontrunner in RF components remains the first choice in simple-yet-smart RF solutions.

www.spinner-group.com

SPINNER GmbH

Headquarters

Erzgiessereistr. 33
80335 Munich

GERMANY

Phone: +49 89 12601-0
Fax: +49 89 12601-1292
info@spinner-group.com

SPINNER Austria GmbH

Triester Str. 190
1230 Vienna

AUSTRIA

Phone: +43 1 66277 51
Fax: +43 1 66277 5115
info-austria@spinner-group.com

SPINNER Electrotécnica S.L.

c/ Perú, 4 – Local nº 15
28230 Las Rozas (Madrid)

SPAIN

Phone: +34 91 6305 842
Fax: +34 91 6305 838
info-iberia@spinner-group.com

OOO SPINNER Elektrotechnik

Kozhevnikeskaja str. 1, bld. 1
Office 420
115114 Moscow

RUSSIA

Phone: + 7 495 6385 321
Fax: + 7 499 2353 358
info-russia@spinner-group.com

SPINNER France S.A.R.L.

24 Rue Albert Priolet
78100 St. Germain en Laye

FRANCE

Phone: +33 1 74 13 85 24
info-france@spinner-group.com

SPINNER ICT Inc.

5126 S. Royal Atlanta Drive
Tucker, GA 30084-3052

USA

Phone: +1 770 2636 326
Fax: +1 770 9343 384
info-atlanta@spinner-group.com

SPINNER Nordic AB

Kråketorpsgatan 20
43153 Mölndal

SWEDEN

Phone: +46 31 7061670
Fax: +46 31 7061679
info-nordic@spinner-group.com

SPINNER Telecommunication

Devices (Shanghai) Co., Ltd.
351 Lian Yang Road
Songjiang Industrial Zone
Shanghai 201613

P.R. CHINA

Phone: +86 21 577 45377
Fax: +86 21 577 40962
info-china@spinner-group.com

SPINNER UK Ltd.

Suite 8 Phoenix House
Golborne Enterprise Park,
High Street
Golborne, Warrington
WA3 3DP

UNITED KINGDOM

Phone: +44 1942 275222
Fax: +44 1942 275221
info-uk@spinner-group.com