



SPINNER I Product Manual

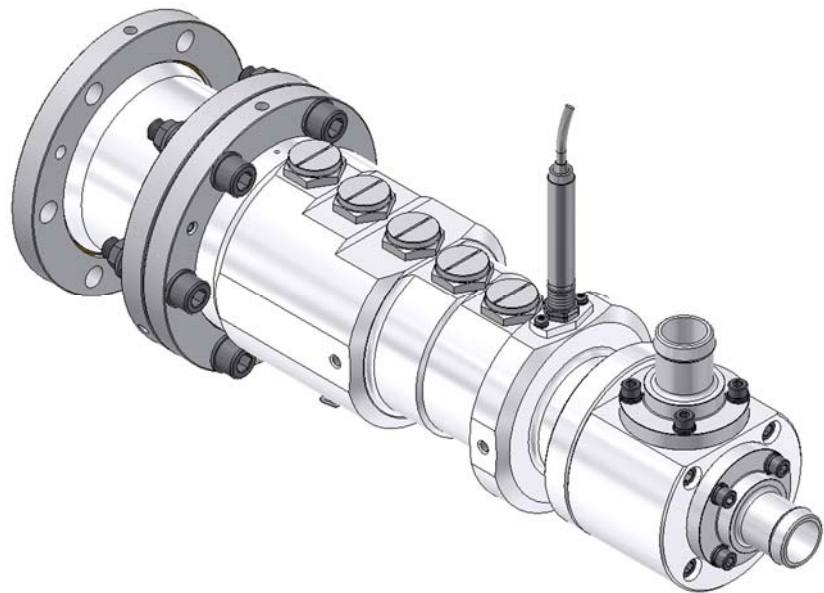
Load

25 kW

RF Interface

3 1/8" EIA

BN 546418



products.spinner-group.com

HIGH FREQUENCY PERFORMANCE WORLDWIDE

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1 Safety

1.1 About this product documentation

The Spinner group makes every effort to keep the safety standard of our products up to date to be able to offer our customers the highest possible degree of safety. Our products are designed and tested in accordance with the relevant safety standards. There is, however, still a danger of personal injury or damage to equipment if this chapter and the safety instructions in this documentation are not complied with. This documentation aims at persons commissioned with the transport, installation, commissioning, operation, maintenance, repairs, demounting and disposal of SPINNER loads. Read this documentation completely and particularly the chapter "Safety", before working with the product. Keep this product documentation available at the site and pass it on to the subsequent users. For all questions regarding the safety you can contact SPINNER at any time.

1.2 Intended use

The intended use of the product is to terminate RF high power coaxial transmission lines. The load BN 546418 is designed to absorb RF power of max. 25 kW in broadcast or industrial indoor applications in operating rooms with restricted access. Access for authorized persons shall be regulated by the operator. Details and other limits are given in the attached data sheet 546418-BE.

The intended use of the product is assumed, if it is used in accordance with the requirements of the applicable product documentation and within its performance limits (see attached data sheet 546418-BE and the following safety instructions). Applicable local or national safety regulations and rules for the prevention of accidents must be observed in all work performed in conjunction with the product.

1.3 Improper use

The improper use of the product involves the use of the product:

- in operating rooms with unrestricted access
- in outdoor applications
- in explosion-prone atmosphere
- with modifications not authorized by SPINNER
- in damaged condition
- for private purposes
- in conditions and environments beyond the limits given in this product documentation

Any other use than described in the chapter intended use and in this product documentation is improper use and therefore inadmissible.

1.4 Qualifications of personnel













Installation, commissioning, operation, maintenance, repairs and demounting of the product require electrical and mechanical specialized knowledge. In order to ensure the safe use, these activities may therefore only be carried out by qualified technical personnel or an instructed person under the direction and supervision of qualified personnel. Qualified personnel are those who, due to professional training, knowledge and experience as well as their understanding of the relevant regulations, are able to assess the work assigned, to recognize possible hazards and to institute appropriate safety measures.

Qualified personnel must have appropriate safety equipment and must be trained in first aid.

The use of the product requires special training and a high level of concentration. It must be ensured that persons who use the product are physically, mentally and emotionally able to comply with the requirements, otherwise injuries or material damage may occur. The employer or operator must choose suitable personnel for use of the product.

1.5 Safety signs and symbols

Safety signs are used on warning labels, stickers, in the product documentation and on the packaging of the product.

					
Warning! General hazard	Warning! Danger of electric shock	Warning! Hot surface	PE terminal	Earth	Warning! High weight
					
Warning! Non-ionised electromagnetic radiation	No access for persons with pacemakers	Use safety shoes	Use safety helmet	Use safety gloves	Observe product documentation

1.6 Signal words for hazard seriousness

Signal words are used on warning labels, stickers, in the product documentation, on specific danger spots and on the packaging of the product. They indicate the hazard seriousness in safety messages.

- DANGER** Indicates a hazardous situation conveying great risk which, if not avoided, will result in death or serious injury.
- WARNING** Indicates a hazardous situation conveying moderate risk which, if not avoided, could result in death or serious injury.
- CAUTION** Indicates a hazardous situation conveying minor risk which, if not avoided, may result in minor or moderate injury.
- NOTICE** Indicates the possibility of faulty operation that can damage the product.

It is essential to make sure that the signal words described here are always used only in connection with the related product documentation and the related product. The use of signal words in connection with unrelated products or documentation can result in misinterpretation and thus contribute to personal injury or material damage.

1.7 Grouped safety messages for SPINNER broadcast products

Entire or multiple phases of product lifecycle

- Unless otherwise specified, these products are not protected against penetration of liquids, gases, steam, etc. Failure to comply could result in electric shock or product damage, which could also lead to serious injury.
- Blocking of constructive openings on the product (ventilation slots, fine leaks etc.) must be prevented, because these are necessary for product operation. Failure to comply could lead to overheating and could result in burns, fire and electric shock.
- Any object that is not designed to be placed in the openings of the housing must not be used for this purpose. Doing so can cause short circuits inside the product and could result in electric shock, fire or injury.
- Depending on the function, certain products such as RF radio equipment can produce an elevated level of electromagnetic radiation. Considering that unborn babies require increased protection, pregnant women must be protected by appropriate measures. Persons with pacemakers may also be exposed to risks from electromagnetic radiation. The employer/operator must evaluate workplaces where there is a special risk of exposure to radiation and, if necessary, take measures to avert the potential danger.
- As with all industrially manufactured goods, the use of substances that induce an allergic reaction (allergens) such as nickel cannot be generally excluded. If you develop an allergic reaction (such as a skin rash, frequent sneezing, red eyes or respiratory difficulties) when using a SPINNER product, consult a physician immediately to determine the cause and to prevent health problems or stress.
- Should a fire occur, the product may release hazardous substances (gases, fluids, etc.) that can cause health problems. Therefore, suitable measures must be taken, e.g. protective masks and protective clothing must be worn.

Transport

- The product may be very heavy. In some cases, the user may require suitable lifting gear and means of transportation to avoid back or other physical injuries.
- Transport the product only in the original packaging. Do not unpack until immediately prior to installation. Failure to comply could result in death or serious injury.

Installation

- Do not place the product on heat-generating devices such as radiators or fan heaters. The ambient temperature must not exceed the maximum temperature specified in the product documentation or in the data sheet. Product overheating could result in burns, fire and electric shock.
- Do not place the product on surfaces, vehicles, cabinets or tables that for reasons of weight or stability are unsuitable for this purpose. Always follow the installation instructions of the manufacturer when installing the product and fastening it to objects or structures (e.g. walls and shelves). An installation that is not carried out as described in the product documentation could result in death or serious injury.
- Mains driven products must be operated only from a TN power distribution system. The operator is responsible for using an appropriate and sufficiently dimensioned AC power line. The AC power line must be externally fused according to the product documentation. Failure to comply could result in fire or electric shock.
- Operation of products with protection class I according to EN 61140 is permitted only with a mains cable with protective earth connection. The protective conductor continuity must be inspected by an electrically skilled person. Failure to comply could result in electric shock.

- All externally connected circuits for controlling, alerting and signalling have to be fed from SELV sources acc. to DIN EN 60950-1 only. The current in these circuits has to be externally limited by means of fuses to values indicated in the product documentation. Failure to comply could result in fire and electric shock.
- Dangerous voltage must not reach the product over the outer conductor/waveguide. Failure to comply could result in electric shock.
- If the product is equipped with a ground terminal connection (equipotential connection), the ground terminal must be connected sufficiently dimensioned to earth. Failure to comply could result in electric shock.

Commissioning / Operation

- Products in operation may be hot. Touching them could result in burns.
- Before applying RF-power to the product, ensure proper connection and matching (load, line, etc.) of all RF-connectors. Ensure sufficient mechanical rigidity of the RF-connections. Failure to comply could result in serious injuries by non-ionised electromagnetic radiation.
- Operation of the product with a damaged cable is not permitted. All cables must be checked on a regular basis to ensure that they are in proper operating condition. By taking appropriate safety measures and carefully laying the power cable, ensure that the cable cannot be damaged and that no one can be hurt or suffer an electric shock by e.g. tripping over the cable.
- Front panels, lids and covers must not be removed during operation. Otherwise, live components can be accessible. This could result in electric shock, fire and serious injury.
- If the product is subjected to pressure, the locally and nationally applicable guidelines for pressure vessels must be applied. Failure to comply could result in death or serious injury.

Cleaning

- Prior to cleaning, turn off all feeding transmitters and disconnect them from the power supply. Use a soft, lint-free, dry cloth for cleaning. Do not use chemical cleaners. Perform cleaning only after cooling-down. Failure to comply could result in electric shock and burns.

Repair

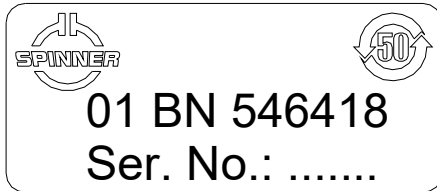
- Troubleshooting and repairs should only be carried out by qualified technical personnel or an instructed person under the direction and supervision of qualified personnel (see chapter 1.4 "Qualifications of personnel"). Observe the section safety messages and in particular chapter 1 "Safety" of this product manual. Failure to comply could result in death or serious injury.
- Do not modify the product and use only spare parts tested and approved by SPINNER. Failure to comply could result in death or serious injury.

Disposal

- The operator is responsible for disposing of the product according to national waste disposal regulations. Improper disassembly or disposal may be hazardous.
- If hazardous substances or operation materials are used for operation of the product, which must be periodically disposed of (e.g. coolant), these materials must be treated in accordance with the safety instructions of the hazardous substance or operating material manufacturer and the national waste disposal regulations. Also observe the relevant safety instructions in this product documentation. Failure to comply could result in serious injury and environmental damage.

2 Product identification

The SPINNER load BN 546418 has a type plate containing the following information for product identification:



3 Function

3.1 General

The load consisting of a cylindrical ceramic substrate coated with special resistive material absorbs the RF power and converts it into heat. According to the requirements given in the attached data sheet 546418-BE, a pressurised or non-pressurised cooling system with coolant pump for transferring the heat from the load via a heat exchanger to the surrounding area must be provided by the operator.

3.2 Coolant

For protection against corrosion and freezing, a suitable coolant consisting of distilled water, ethylene glycol and a corrosion inhibitor must be used. The recommended coolants are SPINNER BN A74423 and BN A75272, refer to chapter 12 and attached data sheet 546418-BE.



Observe the material data sheet of the coolant when filling up, emptying or deaerating the cooling system or disposing of the coolant.

3.3 Thermal protection

A temperature sensor with alarm output is provided, details and circuit diagrams are given in the attached data sheet 546418-BE. To protect the load from overheating, it is mandatory to integrate the temperature sensor into the interlock loop of the transmitter.

4 Storage

Keep dry and avoid exposure to sudden temperature changes to prevent condensation. Environmental conditions for storage are specified in the attached data sheet 546418-BE. Do not unpack until immediately prior to installation.

NOTICE Do not remove any connector protection cap until immediately prior to installation to avoid formation of dust and scratches on sensitive RF contact surfaces.

5 Transportation



CAUTION

Crushing Hazard

The load is heavy. Crushing or falling may cause injuries.

Do not stand below the load.

To ensure stability, keep the product in the supplied transport packaging until immediately prior to installation.

Do not lift the load at the RF connector.

Safety shoes and hardhat are required.



Environmental conditions for transportation are specified in the attached data sheet 546418-BE.

6 Installation



Before you start, ensure to read and understand the section safety messages and in particular chapter 1 "Safety" of this product manual. Only electrically skilled persons should install SPINNER loads in accordance with the national safety and accident prevention regulations.

Failure to observe could result in death or serious injury.

6.1 Mechanical installation



CAUTION

Crushing Hazard

The load is heavy. Crushing or falling may cause injuries.

Do not stand below the load.

To ensure stability, keep the product in the supplied transport packaging until immediately prior to installation.

Do not lift the load at the RF connector.

Safety shoes and hardhat are required.



WARNING

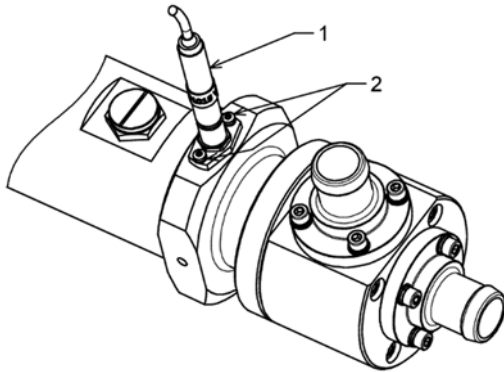
Electric shock hazard

Electric shock can cause severe burns and fatal injuries.

Do not install and operate the load in environmental conditions beyond the specifications given in the attached data sheet 546418-BE. The load is designed for indoor application on operating sites with limited access only.

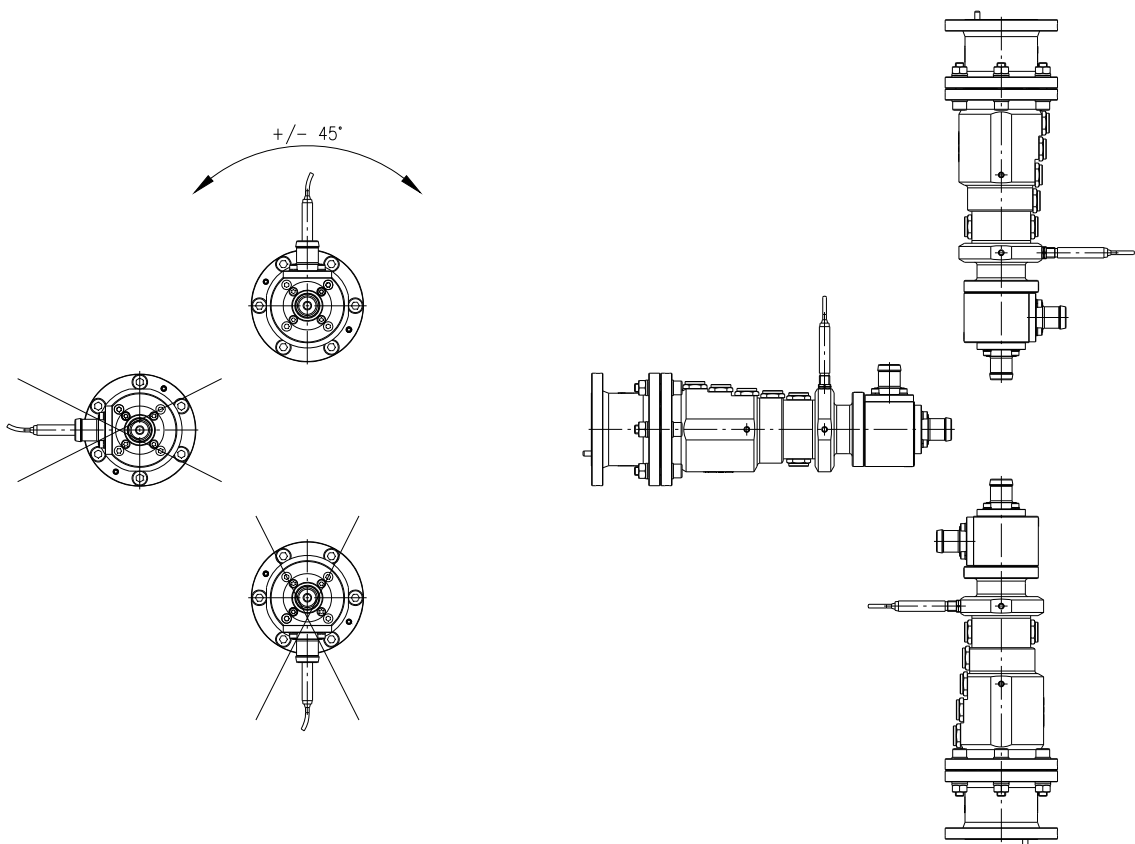


Mount the IR sensor (1) to the load with the supplied two screws and washers (2). We recommend a tightening torque of 0.8 Nm.

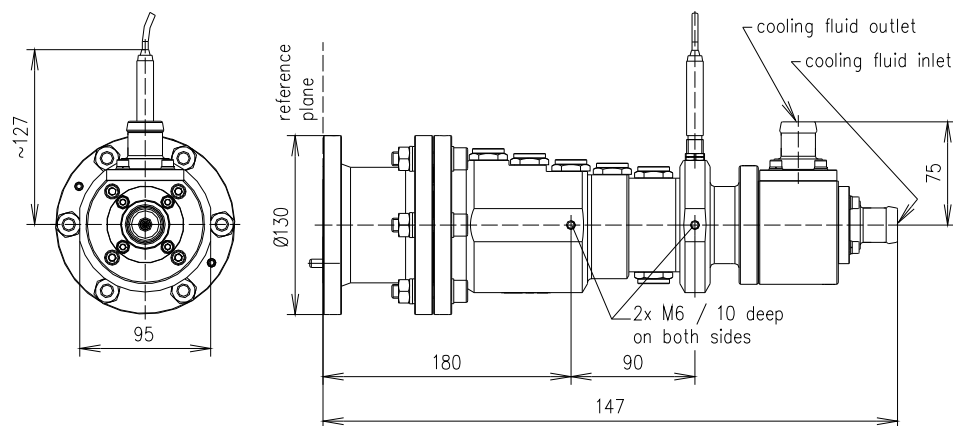


To ensure proper deaeration, use one of the following mounting positions:

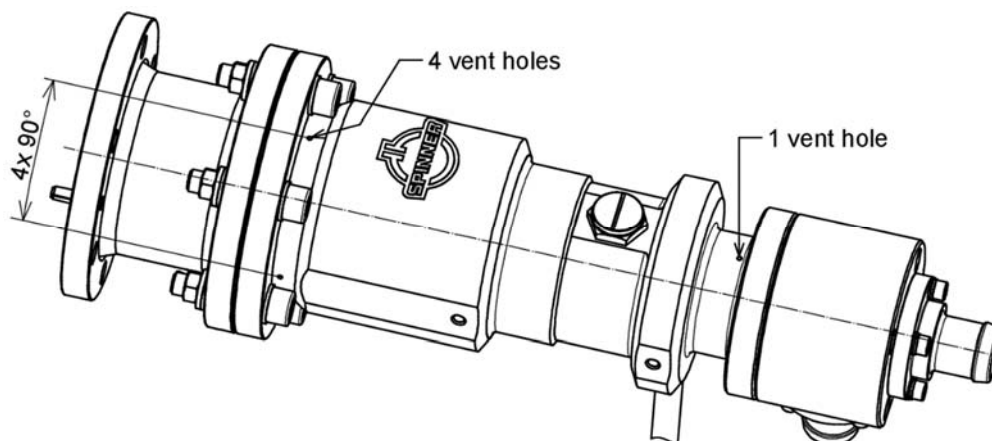
- vertical with RF connector at the top
- vertical with RF connector at the bottom
- horizontal with coolant output connector at the top
- horizontal with coolant output connector within an angle of $\pm 45^\circ$ compared to vertical position



Use at least two of the mounting threads M6 to bolt the load with suitable screws to the assembly support. The quality of the screws and the tightening torque are the responsibility of the user.



Around the circumference of the load housing are several ventilation holes. In the event of a fault with destruction of the resistor element, hot coolant can escape under pressure through these openings. To prevent personal injury, splash protection is required at the vent holes.



6.2 Deaeration of the cooling circuit



Before you start, ensure to read and understand the section safety messages and in particular chapter 1 "Safety" of this product manual. Observe the material data sheet of the coolant. Only qualified personnel may deaerate SPINNER loads in accordance with the national safety and accident prevention regulations. Failure to observe could result in death or serious injury.



WARNING

Radio Frequency Hazard
Radio Frequency Power can cause burns, eye injuries and electrical shock. Before you start ensure to disconnect your entire system from the power supply. Utilize appropriate devices and methods to prevent accidental energizing.



CAUTION

Hot surface

The load heats up during normal operation and may cause burns.

Do not touch the load before cooled-down.

1. Coolant level check:

- Check the coolant level and refill coolant if required according to the instructions of the cooling system supplier.

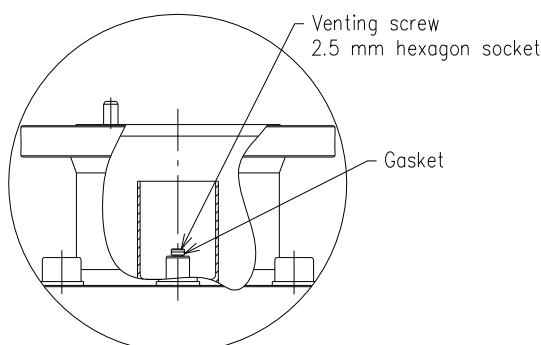
2. Deaeration of complete system except the load:

- Deaerate the system according to the instructions of the cooling system supplier.

3. Deaeration of the load:

This deaeration procedure is only required, if the load is mounted in vertical position with RF connector at the top. It is not required if the load is mounted in horizontal position.

- Remove RF connector, if applicable.
- Open venting screw inside the inner conductor of the 3 1/8 "EIA connector until the gasket is visible and air can escape.



- Close venting screw until stop right after coolant escapes.
- Remove leaked coolant with suitable cloth.
- Reconnect RF connector.

NOTICE

Faultless functioning of the load can only be guaranteed, if the cooling system is deaerated properly. The coolant has to be clear and free of any bubbles.

6.3 Electrical installation



WARNING

Radio Frequency Hazard

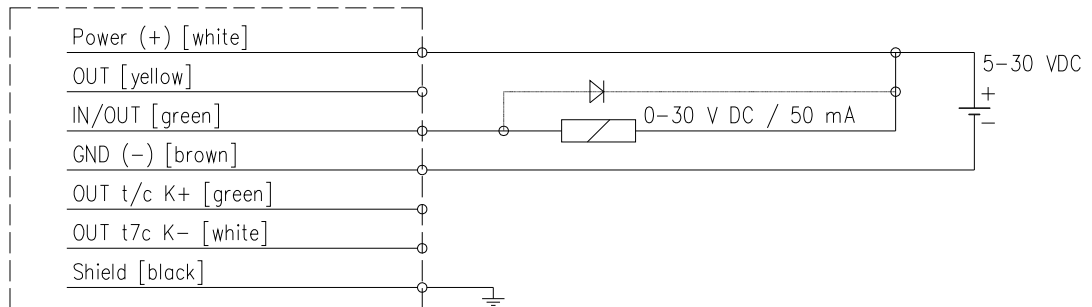
Radio Frequency Power can cause burns, eye injuries and electrical shock.

Before connecting the RF cable, ensure to disconnect your entire system from the power supply. Utilize appropriate devices and methods to prevent accidental energizing.

NOTICE

To avoid overheating caused by RF overload ensure to connect all relevant transmitters to the interlock system of the load prior to commissioning.

- Remove notice label at the venting screw of the RF connector, if applicable.
- Connect RF using connectors according to IEC 339 only.
- Relieve all connections to the load from any bending torque, e.g. caused by heavy cables or assemblies.
- Connect temperature sensor to a 5 to 30 V DC power supply. Connect the alarm output to the interlock loop system. Additional details and circuit diagrams are given in the attached data sheet 546418-BE.



7 Commissioning and normal operation



Before you start, ensure to read and understand the section safety messages and in particular chapter 1 "Safety" of this product manual. Only electrically skilled persons may commission and operate SPINNER loads in accordance with the national safety and accident prevention regulations. Failure to observe could result in death or serious injury.



CAUTION

Hot surface

The load heats up during normal operation and may cause burns. Do not touch the load before cooled-down.

Before applying RF power to the load electrically skilled persons have to ensure:

- proper deaeration of the cooling circuit
- proper connection of RF connector and temperature sensor
- proper functioning of the temperature sensor
- that the cooling circuit is ready for operation

8 Warranty

Do not disassemble the load. The warranty is void, if the load is modified, improperly handled or third party intervention or modification has occurred.

9 Repairs

Repairs may only be executed by the manufacturer.



Do not open the components to avoid possible RF radiation and the risk of serious injury.

10 Demounting



Before you start, ensure to read and understand the section safety messages and in particular chapter 1 "Safety" of this product manual. Only electrically skilled persons may demount SPINNER loads in accordance with the national safety and accident prevention regulations.

Failure to observe could result in death or serious injury.

WARNING

Radio Frequency Hazard



Radio Frequency Power can cause burns, eye injuries and electrical shock. Before you start ensure to disconnect your entire system from the power supply. Utilize appropriate devices and methods to prevent accidental energizing.

CAUTION

Hot surface



The load heats up during normal operation and may cause burns. Do not remove any covers shortly after use of the load. Do not touch the load before cooled-down.



CAUTION

Crushing Hazard



The load is heavy. Crushing or falling may cause injuries. Do not stand below the load. Do not lift the load at the RF connector. Safety shoes and hardhat are required.



11 Disposal

The user is responsible for disposing of the load in accordance with the national waste disposal regulations. Improper disassembly or disposal may be hazardous.

Observe the material data sheet of the coolant.

Please contact SPINNER in advance, before returning the load for disposal.

12 Recommended accessories

Designation	Order-No.
ANTIFROGEN N coolant 39% glycol, 30 litres	BN A74423
STAUBCO® Cool N -40 °C coolant, 25 litres	BN A75272
Hose 20 m, inner diameter 25 mm, wall thickness 6 mm	BN 155855C0001
Hose 1.5 m, inner diameter 25 mm, wall thickness 6 mm	BN 155855C0002
Hose clamp, for hose 25x6	BN 101021

13 Contacts

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14 Attachments

Data sheet 546418-BE