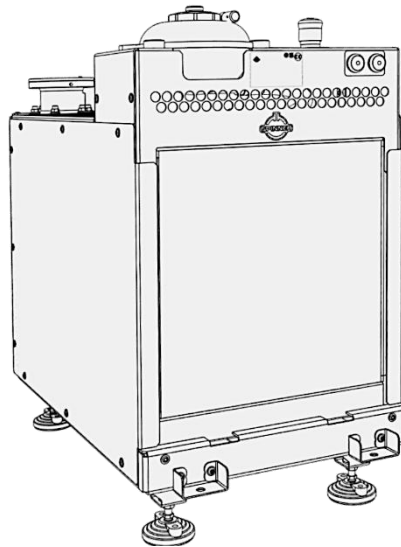




# SPINNER | Service Notice | 10090592

## Visual inspection and functional test

Product Numbers BN 546423xxxxx  
10kW SmartLoads





## SPINNER SmartLoad

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## SPINNER SmartLoad

### 1 General information

#### Background

This Service Notice describes how to inspect visually and test the functionality of 10kW SmartLoads. The checks in this document are to be performed with diverse cycles (annex I).

The filled-out checklist only needs to be sent back to us annually when the functional test (chapter 3) is completed.

#### Actions

Visual inspection, functional test, report results in checklist

#### Affected Parts

All SPINNER SmartLoads with a power rating of 10 kW  
BN 546423xxxxx

#### Qualification of personnel

Qualified technical personnel only

#### 1.1 Overview

This document contains a checklist (chapter 2) and an overview of the hardware (chapter 6). Also, how to set the idle speed (chapter 5) is explained. Please read the instructions carefully before performing the tasks.

In the annex you find the maintenance cycles list, maintenance references and for the functional test of reject loads (chapter 3).

Please follow the tasks in the check list in ascending order, mark or comment your results and e-mail the finished document back to us: [after-sales-service@spinner-group.com](mailto:after-sales-service@spinner-group.com).



**Always find latest updates including training videos and this document on our SmartLoad Service page:**







<https://www.spinner-group.com/en/products/smart-load-service>

Questions? Contact: [after-sales-service@spinner-group.com](mailto:after-sales-service@spinner-group.com)



#### 1.2 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

## SPINNER SmartLoad

Warning! Non-ionised electromagnetic radiation	No access for persons with pacemakers	Use safety shoes	Use safety helmet	Use safety gloves	Observe product documentation

### 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.



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



**WARNING** - Electric shock hazard  
Electric shock can cause severe burns and fatal injuries.  
Utilize appropriate devices and methods to prevent accidental energizing.



**WARNING** - High leakage current  
Connect at least 10 mm<sup>2</sup> PE conductor permanently to separate PE terminal before connecting mains connector.



**WARNING** - Radio Frequency Hazard  
Radio Frequency Power can cause burns, eye injuries and electrical shock.  
Utilize appropriate devices and methods to prevent accidental energizing.



Wear eye protection

**SPINNER SmartLoad**

**2 Check list**

Please use the check list below to conduct the tests and give us feedback about the results. Please send a copy of this list with the subject “SmartLoad Inspection\_Station Name\_BN\_Serial” to SPINNER After Sales Service:

[after-sales-service@spinner-group.com](mailto:after-sales-service@spinner-group.com)

**Registration**

Station call sign*	Transmitter type (e.g., THU 9-40)	SmartLoad P/N*	SmartLoad* Ser.Nr.	Load type** (Reject load / station load)	Date of commissioning**	Note
		BN				

\* This information is mandatory even if you have registered online on our SmartLoad service website. We need it to match your feedback form to the online data.

**How to contact you\*\***

Name	Affiliation	Street / Nr.	City	State	ZIP	Contact e-mail / phone)

**Shipping address\*\***


Name	c/o	Street / Nr.	City	State	ZIP	Local contact (e-mail / phone)


\*\* This information is optional if you have already registered on our SmartLoad service website.

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Item	Symptom	Possible Cause	Solution	Check / Notes
<b>2.1 Tank cap</b>  <i>New tank cap with - thread on top and - black valve on the bottom</i>	No pressure relief in reservoir; no drain hose attachable	Old tank cap	Replace with new tank cap  <i>Refer to: Service notice "Replacing the coolant reservoir cap" on the SmartLoad service page</i>	Tank cap current? Is there a thread on top to which a drain hose can be attached?  <input type="checkbox"/> passed <input type="checkbox"/> failed (note)


Item	Symptom	Possible Cause	Solution	Check / Notes
<b>2.2 Pump</b>  <i>Fan and pump are one unit driven by the same motor</i>	Pump button pushed - pump silent / fan standing still	Pump defect	Contact After Sales Service	Pump makes noise and fan rotates if pump button is pressed? <input type="checkbox"/> passed <input type="checkbox"/> failed
		Wiring between VFD FU1 and pump defect		
	Irregular / fluttering pump noise	<i>Approx. every 30 seconds:</i> air in cooling system	Vent cooling system  <i>Refer to manual chapter 9.1</i>	Pump sound is normal? <input type="checkbox"/> passed <input type="checkbox"/> failed (note)
		<i>Periodically:</i> Pressure relief valve activated - Coolant circuit blocked	Contact After Sales Service  <i>Refer to videos "Functional Test" including examples for good/bad noises</i>	
		<i>Continuous:</i> bearings defect / fan scratches at housing	Contact After Sales Service	


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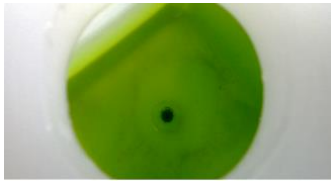


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Item	Symptom	Solution	Check / Notes
<p><b>2.3 Idle Speed</b></p>  <p>VFD indicating idle speed</p>	<p>VFD shows “5.0” when pump button is not pressed</p>	<p>→ Before functional test (chapter 3): leave or reduce to “0.0” → After functional test: Set to “5.0”</p> <p><i>Refer to:</i>            - Video “Set idle speed”            - This document: chapter 4</p>	<p>Idle speed set to “5.0” after functional test?</p> <p><input type="checkbox"/> yes      <input type="checkbox"/> no (note)</p>

<p><b>2.4 Coolant level</b></p>  <p>Good level: Between “MIN” and “MAX”</p>	<p>Level above “MAX” marking</p>	<p>Air in cooling system</p>	<p>Vent if air is present. Drain if overfilled. <i>Refer to product manual chapter 9.1</i></p>	<p>Level not too high? <input type="checkbox"/> passed      <input type="checkbox"/> failed (note)</p>
		<p>Expansion due to high temperature of cooling liquid</p>	<p>Normal behavior. Recheck when coolant &lt; 40°C <i>Refer to product manual chapter 6.2</i></p>	
	<p>Level below “MIN” marking</p>	<p>Evaporation</p>	<p>Normal over a longer time → Refill <i>Refer to product manual chapter 6.2 / 9.3</i></p>	<p>Level not too low? <input type="checkbox"/> passed      <input type="checkbox"/> failed (note)</p>
		<p>Leakage</p>	<p>Localize, rectify, refill, vent <i>Refer to:</i>            - Product manual chapter 6.2 / 9.3            - This document: chapter 2.5 / 2.6</p>	

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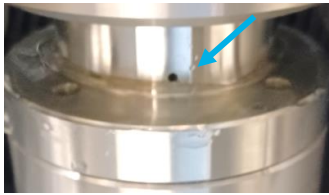
Item	Symptom	Possible Cause	Solution	Check / Notes
<b>2.5 Coolant appearance</b>  <i>Good (green, free of dirt)</i>  <i>Bad (dark, particles)</i>	Coolant not green or yellow, cloudy coolant	Abrased particles in cooling system, glycol break down	Contact After Sales Service Attach foto of coolant	Clear and right color? <input type="checkbox"/> passed <input type="checkbox"/> failed (note)
	Visible particles in coolant	Coarse abrasion		<input type="checkbox"/> passed <input type="checkbox"/> failed (note)
<b>2.6 Leakage - spill</b> 	Coolant spill on floor	Loose hose clamps	Tighten with a torque of 5 Nm	No puddles? <input type="checkbox"/> passed <input type="checkbox"/> failed (note)
		Leaking fitting	Tighten	
		Resistor defect	See chapter 2.7	

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SPINNER SmartLoad

Item	Symptom	Possible Cause	Solution	Check / Notes
<p><b>2.7 Leakage - resistor</b></p>  <p><i>White stains on aluminum parts</i></p>  <p><i>Brownish residues near vent hole</i></p>	<p>Moisture or residues of dried coolant visible at resistor elements vent hole or any other parts</p>	<p>Resistor element defect</p>	<p>Contact After Sales Service</p>	<p>No stains or residues?  <input type="checkbox"/> passed    <input type="checkbox"/> failed (note)</p>
<p><b>2.8 Performance cooling system</b></p> <p>! Perform "Functional Test" (chapter 3)</p>	<p>VFD frequency too high / overheat</p>	<p>Clogging, defect resistor element</p>	<p>Contact After Sales Service</p>	<p>Max frequency 30Hz?  <input type="checkbox"/> passed    <input type="checkbox"/> failed (note)</p> <p>Max observed frequency:          _____ Hz</p>

For 2.5 to 2.8 also refer to the videos "Functional Test for Reject Loads" or "Functional Test for Station / Test Loads".

For optimum support send back filled out checklist (pages 5-9)

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## SPINNER SmartLoad

### 3 Functional / performance test

This procedure makes sure the SmartLoad works normal by testing it with approx. 2kW of RF power. "Normal" means, that the resistor element gets cooled down with a maximum frequency 30Hz.

Also refer to the explaining videos "Functional Test for Reject Loads" or "Functional Test for Station / Test Loads" on our SmartLoad Service Page: <https://www.spinner-group.com/en/products/smart-load-service>

#### 3.1 Test procedure for REJECT loads

To add the right amount of RF power some amplifiers must get switched off - depending on your transmitter model. Repeat the procedure for each reject load element. The site may stay on air.

##### 3.1.1 Preparation

- Open the SmartLoad housing on the right side and remove the plate in front of the frequency inverter.
- Make sure idle speed is at "0.0" (chapter 4)
- Go to "Appendix III: Switching tables for functional test of 10kW reject loads" and get the table for your model.
- Make yourself familiar with the amps that need to be switched off, as this must be done rather quickly (e.g. mark them). Otherwise, the test result may not be conclusive.
- To make sure the resistor temperature is low enough, push the pump button for 30 s. Upon release the pump should go off or into idle power -> ready for testing

##### 3.1.2 Executing the test

- Begin the test by switching off the amplifiers as indicated in the respective switching table to feed a power of approx. 2kW to 2.5kW to the reject load. Immediately go to the frequency inverter and observe the output frequency.
  - Frequency VFD at or below 30Hz:
    - Test passed
  - Frequency of VFD above 30Hz:
    - Test failed, immediately switch all amps back on. Contact After Sales Service
- Switch all amps back on
- **Set idle speed back to "5.0"** (chapter 4)
- Note result in chapter 2.8 and send the finished check list to After Sales Service
- Reattach the covers

#### 3.2 Test procedure for STATION / TEST loads

For this test the site needs to go off air. The load will also be tested with approx. 2kW of RF power, which needs to be set directly at the transmitter.

##### 3.2.1 Preparation

- Open the SmartLoad housing on the right side and remove the plate in front of the frequency inverter
- Make sure idle speed is at "0.0" (chapter 4)
- Set transmitter control to local, note current output power and switch off the RF output. Decrease the RF output power in the setting to 0 and reroute the RF output from the antenna to the SmartLoad
- Set output power of transmitter to approx. 2kW and switch the transmitter off again
- To make sure the resistor temperature is low enough, push the pump button for 30s. Upon release the pump should go off → ready for testing

## SPINNER SmartLoad

### 3.2.2 Executing the test

- Switch the transmitter on and immediately go to the frequency inverter and observe the output frequency.
  - Frequency VFD at or below 30Hz:
    - Test passed
  - Frequency of VFD above 30Hz:
    - Test failed, immediately switch all amps back on. Contact After Sales Service
- **Set idle speed back to “5.0”** (chapter 4)
- Note result in chapter 2.8 and send the finished check list to After Sales Service
- Restore initial transmitter / antenna output settings
- Reattach covers

## 4 Idle Speed

SmartLoads with internal heat exchanger benefit from the pump being on idle speed. However it needs to be at “0.0” during the functional test in chapter 3 of this document.

You will also find an explaining video on the SmartLoad Service page:

“Step 4: Set Idle speed of 10kW SmartLoads”



Open the cover of “FU1”. You will have to either

Push the jog wheel,

0.0

turn the jog wheel,

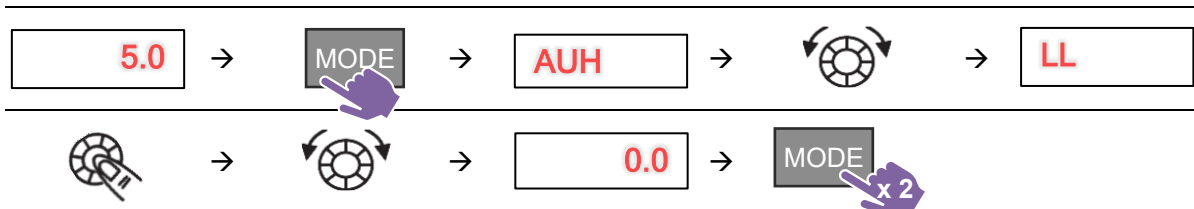


push the “MODE” button or check the value in the display.

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### 4.1 Idle speed set before functional test

In case idle speed is already set, the display of the frequency inverter shows the value “5.0”. You need to set it to “0.0” before performing the functional test



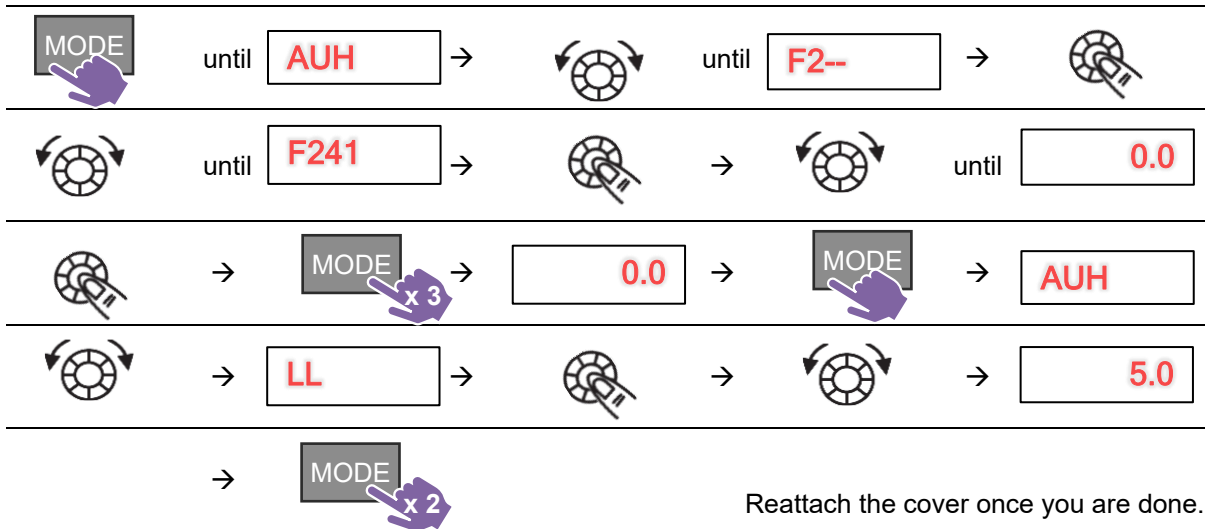
*After the functional test:* Set Idle speed back to “5.0” in the same way.

## SPINNER SmartLoad

### 4.2 No idle speed set before functional test

After performing the functional test, an idle speed should be set for 10kW SmartLoads.

Open the cover of the frequency inverter “FU1” and perform the following steps:



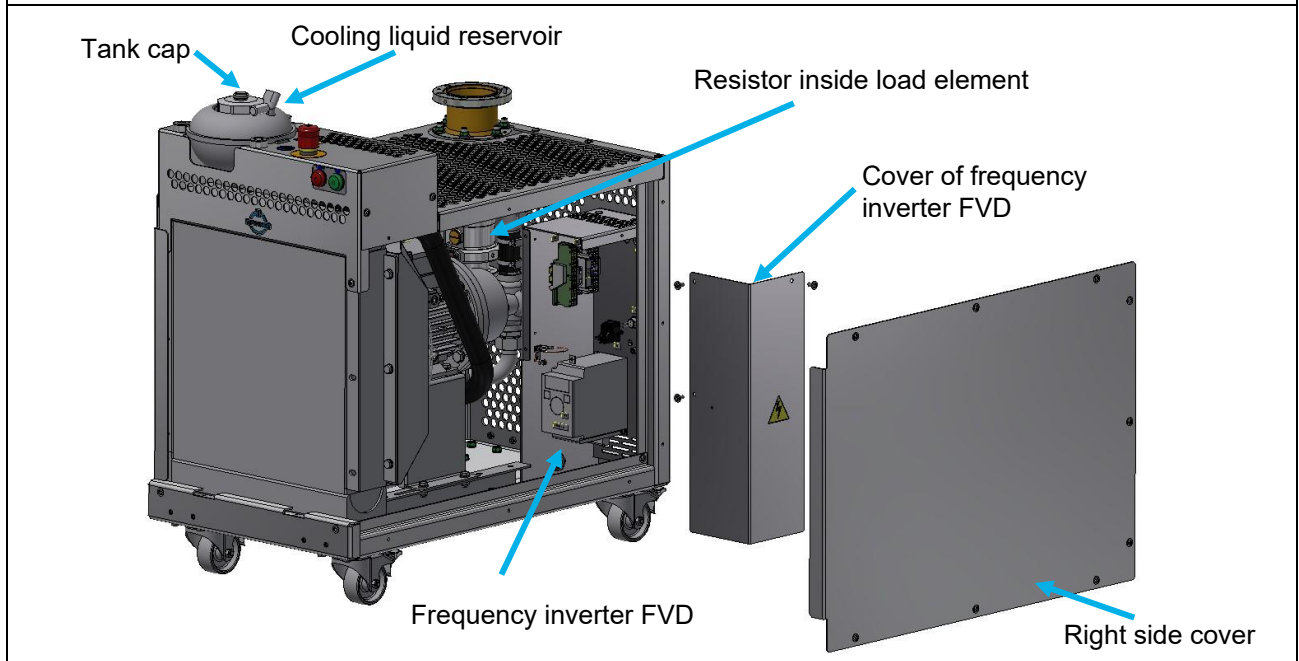
## SPINNER SmartLoad

### 5 Overview of SmartLoad hardware

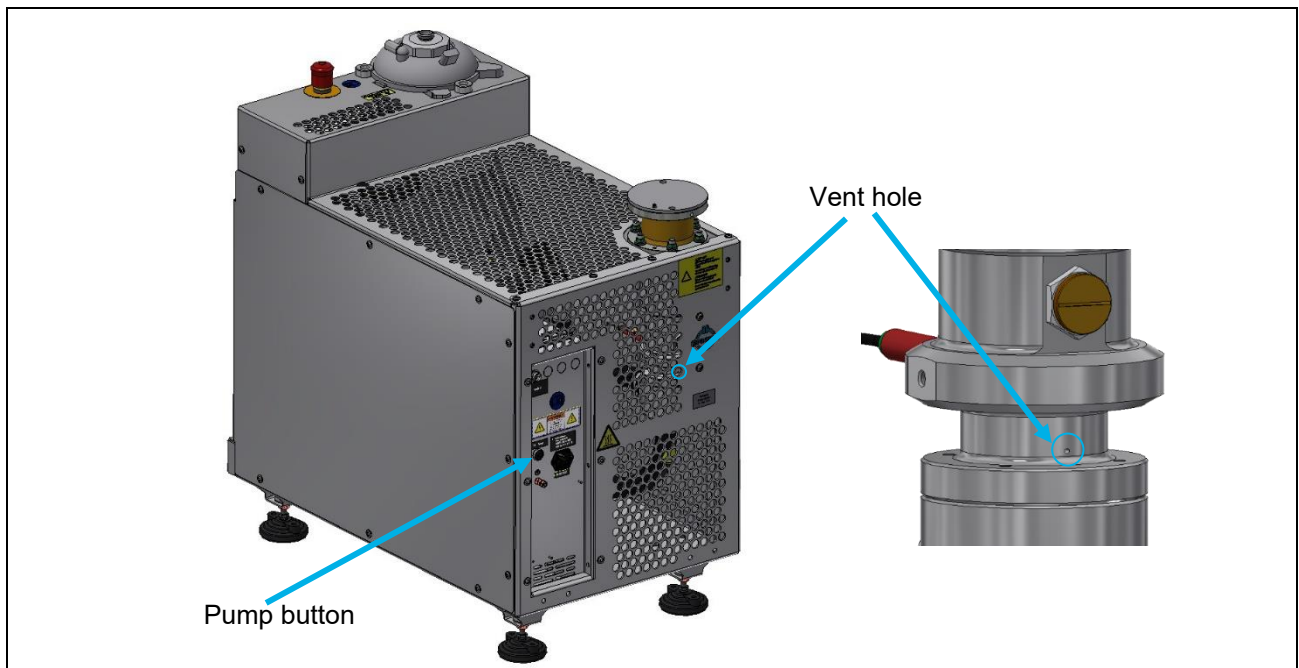
#### 10kW SmartLoad with internal heat exchanger (int. HEX)

BN 546423xxxxx

#### Location of key elements



Frontview



Rearview

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## SPINNER SmartLoad

### Appendix I: Maintenance cycles

Just like your transmitter also SmartLoads need regular attention. Repeat the checks as explained in the previous chapters and in the manual according to this schedule, which is also part of the Rohde & Schwarz maintenance list.

#### Weekly:

- Color / pureness of coolant
- Coolant level / pressure
- Leakages
- Residues around vent hole of load elements
- Run up pump for a few seconds

#### Monthly:

- Check heat exchanger for unobstructed airflow (damage, dirt..)

#### Annual:

- Perform functional test (station & reject loads) as described in chapter 3 and send results to Spinner After Sales Service
- Check air filters of electrical cabinet to be clean
- Check glycol concentration to be between 35% and 45% (Manual)

#### Every 4 years:

- Exchange coolant (see video “coolant change” on service page)

### Appendix II: Maintenance references in product manual

Below are references for some maintenance procedures. Descriptions are to be found in the manual corresponding to your SmartLoad. (<https://products.spinner-group.com>; find the “downloads” tap belonging to your products “BNxxxxx” number)

- Heat Exchanger: We recommend checking every 6 weeks to ensure unobstructed air circulation. Remove dust or dirt from the heat exchanger with compressed air or a soft brush. Ch. 8, 9 (int. HEX) Ch. 9, 10 (ext. HEX)
- Front panel fan filter cleaning: Ch. 9.5 (int. HEX), Ch. 10.3 (ext. HEX)
- Deaeration of the cooling circuit: Ch. 9.2 (int. HEX), Ch. 10.2 (ext. HEX)
- Checking glycol concentration and pH-value (Ch. 9.3)
- Correcting the coolant level (Ch. 9.4)

SPINNER SmartLoad

**Appendix III: Switching tables for functional test of 10kW reject loads ATSC (8VSB)**

Table 1: THU9evo (16)			Table 2: THU9evo (20)			Table 3 THU9evo (24)					
Pout C1-2: 12,09 kW			Pout C1-2: 17,46 kW			Pout C1-2: 20,91 kW					
reject load C1-2: 2,50 kW			reject load C1-2: 1,94 kW			reject load C1-2: 2,32 kW					
1,80 kW		12,79 kW	3,88 kW		15,53 kW	4,65 kW		18,59 kW			
cabinet 1		cabinet 2		cabinet 1		cabinet 2		cabinet 1		cabinet 2	
A1	off	0,00 kW	A1	on	1,60 kW	A1	off	0,00 kW	A1	on	1,56 kW
A2	on	1,60 kW	A2	on	1,60 kW	A2	on	1,56 kW	A2	on	1,56 kW
A3	off	0,00 kW	A3	on	1,60 kW	A3	off	0,00 kW	A3	on	1,56 kW
A4	off	0,00 kW	A4	on	1,60 kW	A4	on	1,56 kW	A4	on	1,56 kW
A5	on	1,60 kW	A5	on	1,60 kW	A5	on	1,56 kW	A5	off	0,00 kW
A6	off	0,00 kW	A6	on	1,60 kW	A6	off	0,00 kW	A6	on	1,55 kW
A7	on	1,60 kW	A7	on	1,60 kW	A7	on	1,56 kW	A7	off	0,00 kW
A8	off	0,00 kW	A8	on	1,60 kW	A8	off	0,00 kW	A8	on	1,55 kW
						A9	on	1,56 kW	A9	on	1,55 kW
						A10	off	0,00 kW	A10	on	1,55 kW
									A11	on	1,55 kW
									A12	off	0,00 kW

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