

<b>Specification</b>	<b>AXRB9000</b>	Rev.: 3	Date: 2018-07-24
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**Oscillator type: High Stability Low Noise Rubidium Frequency Reference in 19" rack (2 HU) with up to 3 outputs**

### Features:

- Very High Long-term Frequency Stability  $2 \cdot 10^{-10}$  per year available
- Short-term Stability (ADEV) Option with  $1 \cdot 10^{-12}$  @  $\tau = 100$  sec available
- Low Phase Noise 10.000 MHz Output
- Ultra-Low Noise Option available
- Up to 3 isolated outputs for frequency distribution
- Slim 19" rack with 2 HU
- Cascadable with Frequency Distribution Units AXDA9000

### Models:

Item	(D)OCXO	(D)OCXO with integrated Distribution amplifiers	GPS-disciplined OCXO	Rubidium
<b>Model</b>	AXIOM9000	AXDO9000	AXGPS9000	<b>AXRB9000</b>
<b>Features</b>	DOCXO option Ultra-low noise Very high stability Can be combined with AXDA9000 up to 48 outputs	Stability as AXIOM9000 plus low noise high isolation frequency distribution amplifier with 4 to 16 outputs	Low noise Stability $10^{-11}$ Distribution option	Excellent long-term stability Distribution option
<b>Performance</b>	See separate data sheet			See specification

Parameter	min.	typ.	max.	Unit	Condition
<b>Nominal output frequency</b>	10.000			MHz	
<b>Frequency stability</b>	<b>STD</b>	<b>MS</b>	<b>HS</b>	Option 1 (max.)	
vs. operating temperature range	±0.5	±0.5	±0.1	ppb	steady state
Long term (aging) per month	±0.05	±0.05	±0.03	ppb	after 3 months operation
Long term (aging) 1 <sup>st</sup> year	±0.5	±0.5	±0.2	ppb	after 3 months operation
Long term (aging) over 10 years	±1.3	±1.3	±1	ppb	after 3 months operation
<b>Frequency adjustment range</b>					
Mechanical Frequency Control	±1.5			ppb	By trimmer access (Note 3)
<b>RF output</b>					
RF output ports	1 Rubidium direct output 3 splitted outputs				See block diagram and enclosure drawing
Signal waveform	Sine wave				
Load $R_L$	50			Ω	±5%
Output level per port	+12 +7	+14 +9		dBm dBm	Rubidium direct output Splitted outputs
Isolation between splitted ports	30	40		dB	
Harmonics			-40	dBc	
Spurious			-80	dBc	
Phase noise	See table 1				Option 2
Short-term stability (ADEV)	<b>STD</b>	<b>MS</b>	<b>HS</b>	Option 1 (max.)	
	8·10 <sup>-11</sup>	3·10 <sup>-11</sup>	1·10 <sup>-11</sup>		@ τ = 1 sec
	3·10 <sup>-11</sup>	1·10 <sup>-11</sup>	3·10 <sup>-12</sup>		@ τ = 10 sec
	8·10 <sup>-12</sup>	3·10 <sup>-12</sup>	1·10 <sup>-12</sup>		@ τ = 100 sec
Warm-up time @ +25°C (Note 2)			15	min	< ±0.5 ppb
Retrace			±0.05	ppb	1 h after 24 hrs OFF
<b>Monitor logic voltage</b>	5			V	COMM interface
<b>AC Supply voltage <math>V_s</math></b>	100	230	240	V	IEC 60320-1 / C14
<b>AC Supply input frequency</b>	50		60	Hz	
<b>Power consumption</b>			50	W	
<b>Operating temperature range</b>	0		+50	°C	
<b>Enclosure (see drawing) (WxDxH)</b>	483x250x88			mm	Color "black"
<b>Drawing number</b>	AXZ10.01097.02				
<b>RF Connectors</b>	BNC female				@ Rear plate
<b>Communication Connector</b>	9-Pin D-Sub male with jack posts				@ Rear plate
<b>Weight</b>			8	kg	

**Notes:**

1. Terminology and test conditions are according to IEC60679-1 and MIL-PRF-55310, unless otherwise stated
2. Warm-up indicator at front plate. Indicator ON when Rubidium locked.
3. Trimmer accessible at front plate. Adjustment range sufficient for 10 years operation.

**Absolute Maximum Ratings**

Parameter	min.	max.	Unit	Condition
AC Supply Voltage $V_s$	90	260	V	
AC Supply input frequency	47	63	Hz	
AC Supply input current		2	A	Fuse accessible at rear plate
Splitter input level (SPLIT IN)		+20	dBm	
Storage Temperature	-20	+70	°C	

## Ordering Code

Model	Option 1 [Stability]	Option 2 [Phase noise]	Revision	Frequency [MHz]
AXRB9000	STD, MS, HS	Table 1	Rev.3	10.000

**Example: AXRB9000-HS-ULN\_Rev.3 – 10.000 MHz**

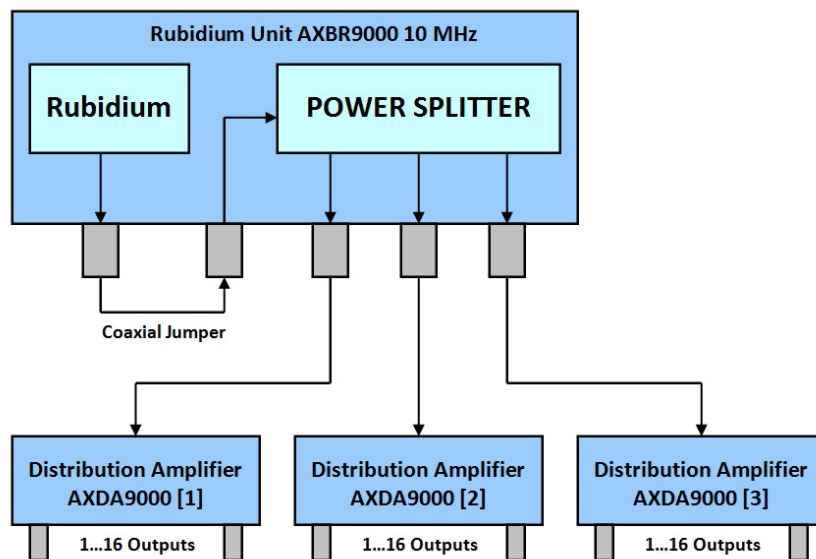
Note: Option 2 = “ULN” only available for Options 1 “MS” and “HS”

## Phase Noise – Option 2:

Offset	10 MHz		Unit
	LN	ULN	
1 Hz	-100	-105	dBc/Hz
10 Hz	-130	-138	dBc/Hz
100 Hz	-145	-155	dBc/Hz
1 kHz	-155	-163	dBc/Hz
≥10 kHz	-155	-170	dBc/Hz

Table 1

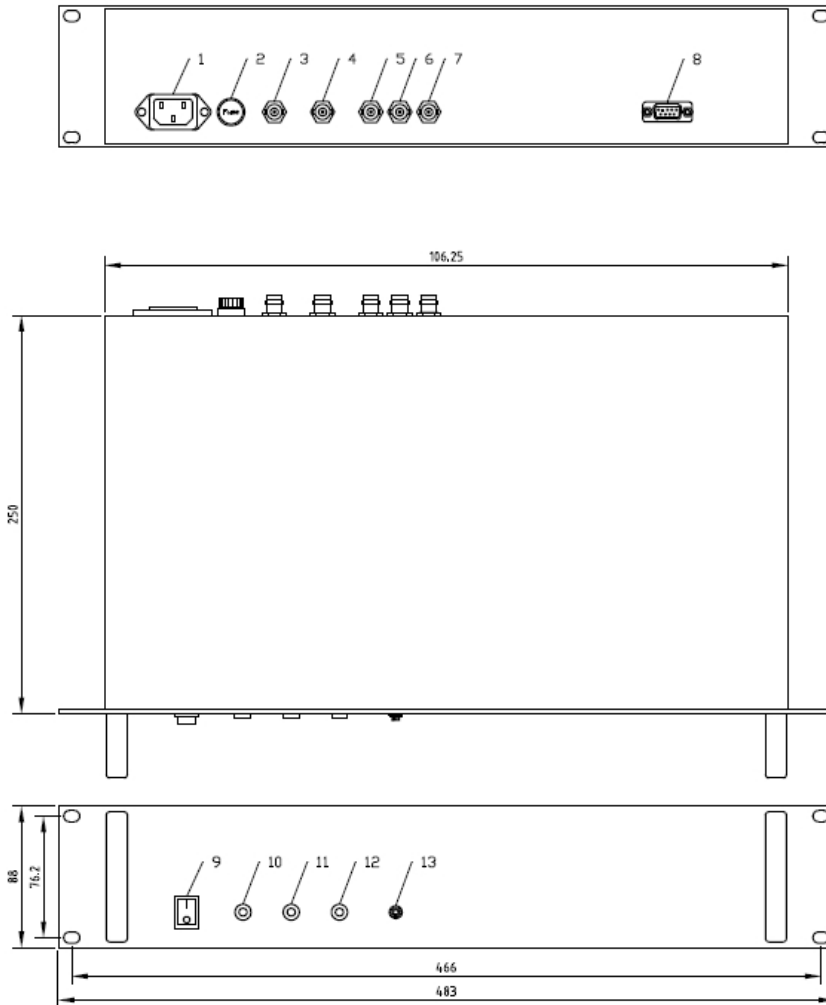
## Extension of AXRB9000 with optional distribution amplifier AXDA9000



## Handling & Testing

Parameter	Procedure / Test condition
Sinusoidal vibration	max. 0.15 mm <10 Hz, 1 g at 10~2000 Hz
Random vibration	max. 0.001 g <sup>2</sup> /Hz, 10~2000 Hz
Mechanical shock	max. 10 g, 6 ms half sine
Handling and Testing	Careful handling. Avoid excessive air flow, vibration and shock during operation.
VDE 0701-0702 Tested	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
RoHS-Compliant	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

## Enclosure drawing

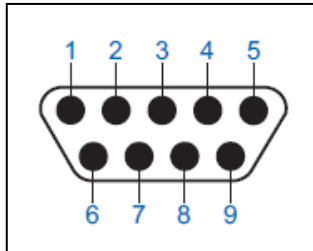


## Connections and operation

#	Panel	Symbol	Function
1	Rear	POWER IN	AC Supply Input (IEC 60320-1 / C14)
2		FUSE	1 A Slow 5x20 mm Fuse
3		RUB OUT	Direct Rubidium output
4		SPLIT IN	Power splitter input
5		OUT 1	Splitted output 1*
6		OUT 2	Splitted output 2*
7		OUT 3	Splitted output 3*
8		COMM	Interface for Monitoring (see pin connections below)
9	Front	POWER SWITCH	Power Switch ON/OFF
10		POWER ON	LED – Power ON Indicator
11		RUB READY	LED – Rubidium Ready Indicator (Locked)
12		OL	LED – Output Level Indicator (ON > +12 dBm)
13		ADJUST	Frequency adjustment potentiometer

\*Unused outputs must be terminated with 50 Ω loads

**Pin connections D-Sub connector**



Front View D-Sub connector

**Pin connections**

#	Symbol	Function	Description
1	N.C.	No Connection	-
2	D.N.C	Do Not Connect	Used in factory
3	D.N.C	Do Not Connect	Used in factory
4	RUB	Rubidium Ready	High = Rubidium Ready (Locked)
5	GND	Ground	-
6	N.C.	No Connection	-
7	OL	Output Level	High = Output level > +12 dBm
8	N.C.	No Connection	-
9	N.C.	No Connection	-

Data sheet is for information purposes only and may be subject to modifications or may be discontinued without notice.

**Revision History**

Rev.	Drawing	Date [dd.mm.yyyy]	Remarks	Author	Checked
1	D0	07.07.2016	First issue	HH	BN
2	D0	18.07.2016	Retrace and PN options added	HH	HH
3	D0	24.07.2018	Major update with Rubidium options	HH	BN