TECHNICAL DATA

908/909 Frequency References


FLUKE 909 FREQUENCY STANDARD
ON
UNLOCKED
FREQUENCY ADJUST
CAL SEAL
RUBIDIUM ATOMIC CLOCK


TYPE 909
FLUKE
STANDARD CLOCK OUTPUTS
OPTIONAL OUTPUTS

Key features

- Designed for calibration laboratories, ideal for calibrating a wide range of instruments, offering excellent short-term stability for faster frequency calibration.
- Serve as an accurate ""Atomic clock"" reference in automated test systems.
- Fast warm-up time, increasing productivity and efficiency in calibration tasks.
- Cost-effective solution for frequency standards located in multiple departments or buildings, eliminating the need for a costly central reference distribution system.

Product overview: 908/909 Frequency References

Stable frequency references for test systems and calibration labs

The 908 and 909 Frequency Reference Standards are designed for use as accurate reference clocks in automated test systems and as in-house frequency standards.

Because they require only a short warm-up time to reach specified stability, they can also be used as portable frequency standards.

The 909 Frequency Reference includes an ultra-stable Rubidium timebase ("atomic clock"), while the 908 Frequency Reference is built around a high-stability oven-controlled cut crystal oscillator. Both instruments provide five buffered 10 MHz outputs plus one 5 MHz output. Option 70 increases the number of 10 MHz outputs to ten.

Ideal for automated test (ATE) systems

Many production test systems, particularly in the telecommunications industry, require a stable external frequency clock as a reference. Depending on your needs either the 908 or the 909 can supply a stable frequency reference to up to 11 other instruments and testers, making them ideal for use in an ATE system. In addition there is a rack mounting kit available.

908 (Crystal oven)

With its high-stability oven-controlled SC-cut crystal oscillator the 908 offers the lowest purchase cost per output on the market in the 11 output version (option 70 installed).

909 (Rubidium)

The Rubidium version, with its negligible aging drift needs in practice no adjustment during the lifetime of the test system.

In-house frequency standards

Both the 908 and the 909 Frequency References are ideal for use in calibration laboratories where there is a need to calibrate a wide range of instruments, such as frequency counters and synthesizers. Unlike off-air frequency receivers, the 908 and 909 have very-high short-term stability that enables much faster frequency calibration.

Companies that require frequency standards in numerous departments spread over several buildings will find that a local Rubidium standard (909) normally offers a more cost effective solution than a central reference with a costly distribution system.

Made for portability

The 908 and 909 Frequency References are designed for portability. They perform exceptionally well as transportable fast-warm-up frequency references. Traditionally, oven oscillators using AT-cut crystal could not maintain their specification without continuous battery backup during transportation to different sites. This is because AT-cut crystals suffer from significant frequency retrace (frequency offset after a power interruption). They also need a very long warm-up time, 24 hours or more, to arrive at the final frequency value.

The 908's oven oscillator is designed around the more advanced SC-cut crystal oscillator which has virtually no retrace. In just 10 minutes the frequency is within 5x10-9 of the final value, meaning it can be in service faster. Finally, there is no need for battery back up during transportation. The warm-up of the Model Rubidium oscillator is even faster, taking only 10 minutes to reach as close as 4x10-10 from the final frequency.

For protection during transport and storage, there is a carrying case available. The 908 and 909 provide stabile, cost effective solutions for your frequency reference requirements whether in ATE, laboratory or portable applications.

Specifications: 908/909 Frequency References

Reference outputs		
Base model	5x10 MHz, 1x5 MHz: sine >0.6V rms in 50Ω	
With Option 70	10 x 10 MHz, 1 x 5 MHz: sine >0.6V rms in 50Ω	
Frequency Stability		
Aging per month	908 (Oven)	$3x10^{-9}$
	909 (Rubidium)	$5x10^{-11}$
Aging per year (per 10 years)	908 (Oven):	$2x10^{-8}$ (1 year)
	909 (Rubidium)	$1x10^{-9}$ (10 years)
Temperature	(20°C to 26°C)	
	908 (Oven):	$4x10^{-10}$ typ
	909 (Rubidium):	$2x10^{-11}$ typ.

	0°C to +50°C)	
	908 (Oven):	$2.5x10^{-9}$
	909 (Rubidium):	$3x10^{-10}$
Short term (root Allan variance)	908 (Oven):	$5x10^{-12}$, t= 10s
	909 (Rubidium)	$1x10^{-11}$, t=10s
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	908 (Oven):	$5x10^{-12}$, t=1s
	909 (Rubidium)	$3x10^{-11}$, t=1s

Warm up (at +25oC)	908 (Oven):	10 mins. to $5x10^{-9}$
	909 (Rubidium)	5.4 mins. to lock
		11 mins. to $4x10^{-10}$
Environment		
Temperature	0°C to +50°C (operating)	
	-40°C to +70°C (storage)	
Safety	Compliant to EN 61010-1 and CE	
EMI	Compliant to EN 55011 ISM group, class B, EN 50082-2 and CE	
Power Consumption (90-264V, 47-63 Hz)		
908:	<20W at warm up, < 7W continuous operation	
909:	<70W at warm up, <30W continuous operation	
Dimensions and Weight		
Size	315 x 86 x 395 mm	
	(12.4 x 3.4 x 15.5 ins)	
Weight	4.8 kg (net), 7.8 kg (shipping)	
	(10.6 lb (net), 18.2 lb (shipping)	
Calibration		
Calibration Documentation	17025 accredited report of calibration included	

Ordering information

908
Crystal oven; 5 x 10 MHz and 1 x 5 MHz outputs

909
Rubidium; 5 x 10 MHz and 1 x 5 MHz outputs

908-70
Additional 5 x 10 MHz Outputs

909-70
Additional 5 x 10 MHz Outputs

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