

## High stability frequency standards

## Ideal reference for multiple testers

- Rubidium or high stability oven frequency reference standard
- Distribution amplifiers for 5x10 MHz and 1x5 MHz outputs as standard
- Optional 10x10 MHz outputs
- 0.001 ppm aging in 10 years (Rubidium)
- Ideal for telecommunication test systems and calibration laboratories



The Pendulum Frequency References; model 6689 with a Rubidium clock and model 6688 with a high-stability oven-controlled crystal oscillator, are designed for use in test systems, where a very high stability frequency reference is required and where multiple instruments or testers need to be supplied.

The Frequency References are also suited in calibration laboratories for calibrating various instrumentation, like frequency counters and synthesizers. The 6689 Rubidium Reference can be used as a primary lab reference, ensuring a frequency drift due to aging of less than 0.001 ppm during 10 years.

## Specifications

## Reference outputs

**Standard Model:** 5x10 Mhz, 1x5 Mhz; sine >0,6V rms in 50Ω

**Incl. option 70:** 10x10 Mhz, 1x5 Mhz; sine >0,6V rms in 50Ω

## Frequency stability

Stability	6688 (Oven)	6689 (Rubidium)
Aging/month	$3 \times 10^{-9}$	$5 \times 10^{-11}$
Aging / year; aging /10 years:	$2 \times 10^{-8}$ (1 Jahr)	$1 \times 10^{-9}$ (10 years)
Temperature (0...+50°C)	$2.5 \times 10^{-9}$	$3 \times 10^{-10}$
Short term(Root Allan variance)	$5 \times 10^{-12}$ t=1s	$1 \times 10^{-11}$ t=10s
	$5 \times 10^{-12}$ t=1s	$3 \times 10^{-11}$ t=1s
Warm up ( at +25°C):	10 min to $5 \times 10^{-9}$	5.4 min to lock 11 min bis $4 \times 10^{-10}$

## Environmental

**Temperature:** 0°C...+50°C (operating)  
-40°C...+70°C (storage)

**Safety:** Compliant to EN 61010-1, Cat II, pollution degree 2, CE

**EMI:** Compliant to EN 55011 ISM group , class B and EN 50082-2, CE

## Power consumption (90...264 V,47-63 Hz)

**6688:** <20W at warm-up, <7W continuous operation

**6689:** <70W at warm-up, <30W continuous operation

## Mechanical Data

**BxHxT:** 315x86x395 mm; 4.8 kg (net), 7.8 kg (shipping)

## Built-in options

**Option 70:** 5 extra 10 Mhz outputs

## Ordering information

**6688/011:** Crystal oven standard model; 5x10 MHz and 1x5 MHz outputs

**6688/021:** Crystal oven incl. option 70; 10x10 MHz and 1x5 MHz outputs

**6689/011:** Rubidium standard model; 5x10 MHz and 1x5 MHz outputs

**6689/021:** Rubidium incl. option 70; 10x10 MHz and 1x5 MHz outputs

## Included with Instrument

Operators manual, Calibration certificate

## Optional accessories:

Option 22: 19" rack mount kit

Option 27: Carrying case

Specifications subject to change without notice

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## Pendulum Instruments

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- Experts in time & frequency calibration, measurement and analysis