

CD-Player - PULSAR CD 1230 R

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The sparkling new little brother to the [CD 1240 R](#) has everything that its sibling offers apart from the two-way converter, the co-ax output and the dual-transformer mains section. This gives us the chance to mention a few of this family's exemplary qualities:

- [Two Sigma-Delta stereo converters operating in double differential mode for optimum performance in terms of noise, overload and dynamics](#)
- [T + A reverse clock process provides 192 kHz / 24-bit resolution and eliminates jitter, driving the performance of the system close to the physical limits.](#)

As with our other CD players this unit employs a freely programmable signal processor (DSP). DSPs are not limited in the way they can process digital signals, and for this reason such a system ensures better oversampling than would be possible with standard conventional chips. Until now oversampling filters were designed to provide as smooth a frequency response as possible, but their timing characteristics (pre- and post-echo) have been neglected. The problem is long pre- and post-echo effects which can seriously distort the musical signal, especially with transients. A different type of filter is now available which exhibits perfect transient handling: these are known as polynomial filters, and unfortunately they are characterised by a slight treble fall-off at 20 kHz. In the **CD 1230 R** we employ a particular class of these filters which has been developed by T+A: BEZIER polynomial types. These are combined with an IIR filter in a three-stage oversampling process. The result is a filter which produces no pre-echos. The human ear is particularly sensitive to pre-echos for two reasons: on the one hand such an echo can never occur in the natural world, and on the other they are not concealed by the main signal, unlike post-echos. This new filter also boasts a frequency response which is considerably smoother than that of other polynomial filters (e.g. cubic spline types). Such sophisticated filters cannot be purchased ready-made, and that is why a digital signal processor is employed in the **CD 1230 R**. The freely programmable signal processor of the **CD 1230 R** is not tied to a single filter, and this makes it possible for the unit to provide five different filter types offering subtly different sound characteristics - from the classical long FIR filter via short FIR filters to the BEZIER filter. These filters can be selected by means of a button on the front panel of the unit.

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Connection elements

Analog Out

The analogue output of the CD player supplies a fixed-level output signal. It is designed for connection to a pre-amplifier, integrated amplifier or receiver with its own volume control

Digital Out	Optical digital output for connection to an external digital/analogue converter. Optional co-axial digital output.
RC IN	RC input socket for connection to an "R"-series pre-amplifier, integrated amplifier or receiver.
R-Link	Interface for future system expansions

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Standard-filter (long FIR-filter)

The [long FIR-filter](#) is the standard oversampling filter used in digital technology. Advantages: Extremely linear frequency response in the audible range, very high stop band attenuation, linear phase, constant group delay.

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Filter 1 (short FIR-filter)

The [short FIR-filter](#) has similar characteristics to the long **FIR** filter, but very much lower coefficient (160) and consequently considerably lower pre- and post-echoes. Advantages: Extremely linear frequency response in the audible range, high stop band attenuation, linear phase, constant group delay.

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Filter 2 (IIR-filter)

This filter is a classic 8th order [IIR-filter](#). It exhibits absolutely no pre-echo effects, albeit a slight tendency to post-echo. This is also a feature of natural instruments, and in any case the post-echo is usually masked by the normal audible signal. Advantages: No pre-echo at all, no treble loss, very high stop band attenuation.

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Filter 3 (Bezier- / IIR-filter)

This [combination circuit](#) consists of three cascaded filters: a Bezier filter, an IIR filter and a second Bezier filter. It represents a good compromise between transient response and frequency response. Advantages: Virtually no pre-echo, minimal post-echo (in masking range), relatively flat frequency response, no pronounced treble loss.

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Filter 4 (Bezier-filter)

The [Bezier-filter](#) is the ideal filter in terms of transient response, virtually no pre- or post-echo, linear phase, slight treble roll-off at 20 kHz. Advantages: Optimum transient response, linear phase, constant group delay.

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Specifications

<i>Mechanism</i>	Professional, close-tolerance linear disc mechanism with triple-beam LDGU optics, 780 mm semi-conductor laser, 2 mW power
<i>Wow and flutter</i>	Quartz-controlled, not measurable
<i>Mechanical construction</i>	Rigid all-metal case, shielded sub-assemblies, vibration de-coupled
<i>Digital filters</i>	Freely programmable signal processor with four different filter types, 8-times oversampling and 56-bit resolution, FIR short, FIR lang, IIR Bezier, Bezier IIR filters
<i>D/A converter type</i>	Double differential mode. Two 1-bit Sigma-Delta converters with 256-times oversampling
<i>Analogue filter</i>	Phase-linear Bessel filter

3rd order with 60 kHz limit frequency

<i>Frequency response</i>	2 Hz – 20 kHz
<i>Distortion / intermodulation</i>	< 0,002 %
<i>Effective system dynamics</i>	97 dB
<i>Signal: noise ratio (A-weighted)</i>	109 dB
<i>Signal: noise ratio (unweighted)</i>	106 dB
<i>Channel separation 1 kHz / 10 kHz</i>	106 / 100 dB
<i>Digital output</i>	Data format SP-DIF 1 x Opto = 660 nm / -18 dBm
<i>Analogue output</i>	nominal 2,6 V eff, 22 Ohm
<i>Dimensions</i>	7,5 x 44 x 39 cm
<i>Weight</i>	7 kg
<i>Colours</i>	black (9005), alu silber, chrome (non-standard version)
<i>Remote control</i>	Via R system or as non-standard version

We reserve the right to alter technical specifications.