

XR-Q9

Sansui Computerized Full Automatic Direct-Drive Quartz-Servo Turntable with D-O-B Tonearm—0.015% Wow/Flutter and 78dB S/N.



Only hi-fi, everything hi-fi.



This time, we have to admit, we've really outdone ourselves: Here's a turntable that includes some of the most incredible technological improvements ever developed for hi-fi.



Fully Automatic with a "Thinking" Tonearm.

COMPUTER

Computerized Tonearm—A Technological First.

A kind of electronic "brain," assisted by a team of optical sensors, controls the operation of the fully automatic tonearm on the Sansui XR-Q9 turntable with unprecedented accuracy. It monitors the moment-to-moment position of the arm, oversees the functions of the separate motor which lifts and returns the arm when required, and even memorizes action sequences and reacts to threats of damage.

Some people would call this a "computerized" system, and they wouldn't be far wrong. Actually, it makes use of a CPU (Central Processing Unit) which is contained in an LSI (Large-Scale IC). Therefore, its reliability and precision cannot be bettered.



Quick and accurate response without compromise.

Having developed one of the world's most sensitive tonearms (see other pages) for the XR-Q9, Sansui engineers weren't about to compromise that sensitivity by using an ordinary mechanically-linked full-auto system. Thanks to the CPU "brain," the arm remains entirely free during play; when the record ends, or if you touch the START/STOP button at any time, the CPU sends a command to lift the arm and return it to its rest gently and quickly.

Fully protected against all conceivable mishaps.

That's quite a promise—that this system is entirely accident proof. But it's true. The CPU permits the incorporation of a "fail-safe" system which gives total protection to the arm and its motor, its cartridge stylus, and your records.

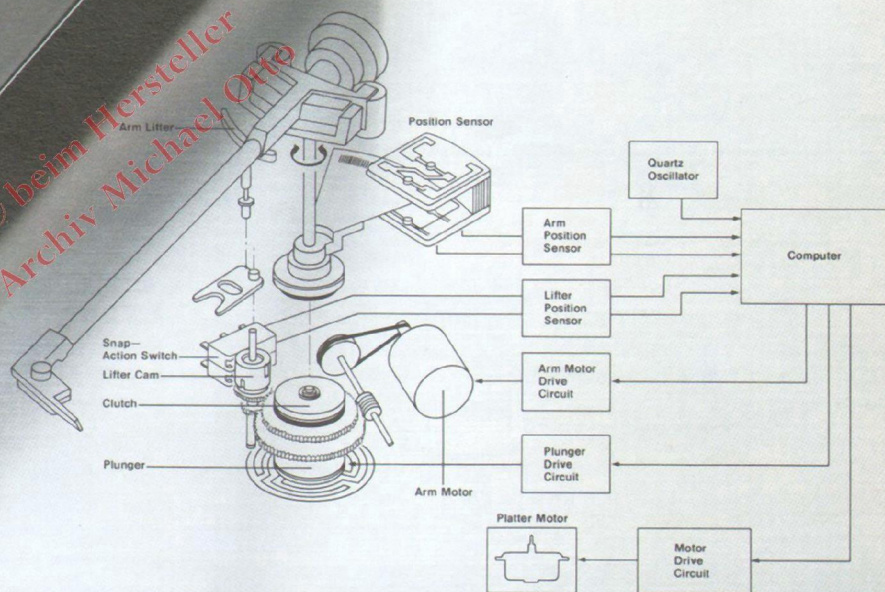


For instance, you forget to unlock the tonearm clip before you touch the START/STOP button, the CPU instantly countermands the start order and shuts off the arm motor before damage can occur.

Light-touch switches make full control easy.

All control switches on the XR-Q9 are short-stroke type requiring only the slightest pressure for positive operation.

After powering on the turntable, select speed and record size, place your record on the platter and touch the START/STOP button; the CPU "brain" orders the arm up and over the opening track, then lets it fall slowly to the beginning groove. When the record ends, the optical sensor for lead-out informs the "brain" which immediately orders the arm's return. The turntable is then shut off automatically, *unless* you have also pushed the REPEAT button, in which case the lead-in, play and return process will continue until you order it to stop, again with a light touch on the START/STOP button.



The independent tonearm motor "remembers" the first note.

As we have mentioned, there is a second motor in the Sansui XR-Q9, independent from the direct-drive platter motor, used exclusively to lift, cue, and return the tonearm. Its computerized operation is controlled electronically, but it employs a mechanical damping system to ensure that the stylus is lowered to the very beginning of the lead-in groove every time when you cue a record.

Up-Front Up/Down Control: Manual "cue" at any time.

Arm lifting is cued from a separate button on the front-row control panel. The lifter mechanism is ideally damped for steady up/down operation; stylus returns to same groove gently and swiftly when you push the button a second time. Naturally, all action is monitored and controlled by the "brain" circuitry.

The Sansui XR-Q9: You'd Never Think A Turntable Could Have a Dual Magnetic Detection System & "Thinking" D-O-B Technology

Platter speed CANNOT vary under any conceivable load change since we use Quartz-Servo and Dual Magnetic Detection System.

QUARTZ

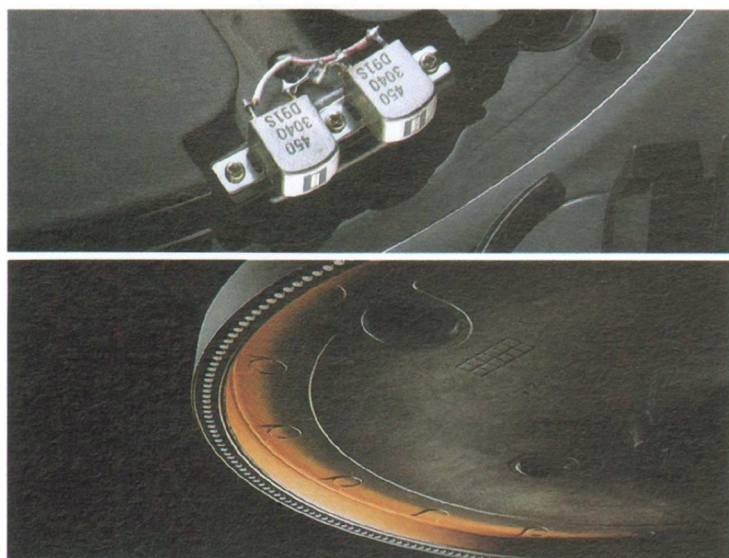
Speed deviation instantly detected by 960 magnetic pulses—five times better than others.

Quartz is not, despite the hi-fi ads, a magic cure-all in itself. A quartz crystal can only provide an accurate reference signal; it cannot directly read or detect the speed of the platter. For speed detection, the XR-Q9 uses an elaborate system—Magnetic Detection System—in which as many as 960 pulses per platter rotation are generated, sent to the servo's PLL (Phase-Locked Loop), compared with the quartz reference, and used in the ultimate speed-up or speed-down correction to the motor.

Those pulses are generated from 960 magnetic poles set in a pattern around the inside rim of the platter itself: as the platter turns, a magnetic detection unit—quite like a tape head on a tape deck—"reads" the pulses; if too many (or too few) pulses are detected, speed control is ordered as earlier explained. This system is five times more accurate than the average since five times as many pulses are generated per rotation: a movement of the platter through as little as one millimeter (equal to a mere 0.375 degrees of arc) is enough to provide a pulse reading to the detection system.

A second Speed Detection Head for over/undershoot control.

Accurate start-up speed is a very hard thing to guarantee in any turntable. The Sansui-perfected second-head system in the XR-Q9 may soon become the industry standard, for it does guarantee an end to overshoot and undershoot. And here's how:



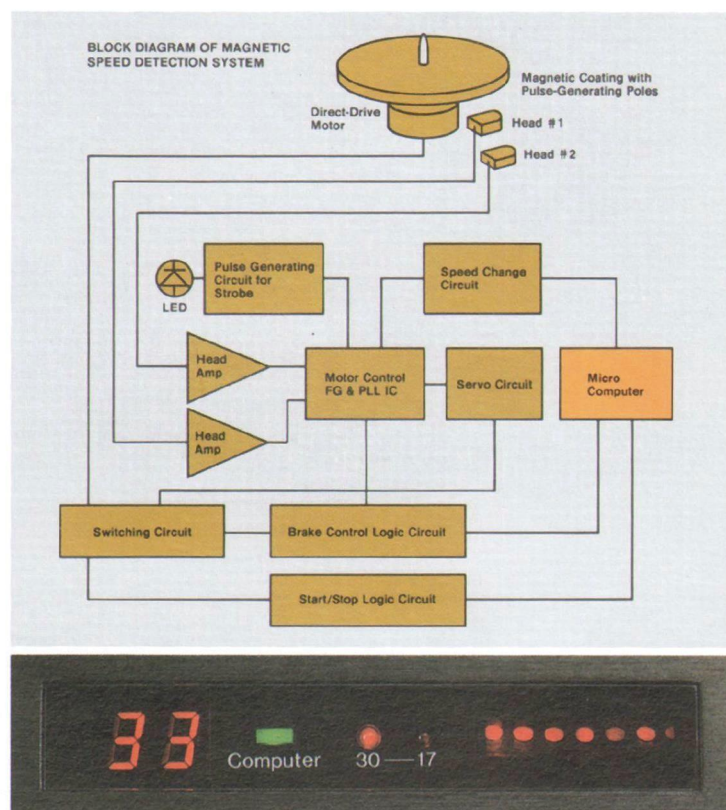
As the platter receives the order to start spinning, the second magnetic-reading head is cued to watch for any wobbling of the magnetic pulse readout; a phase comparison between the two heads is made, and that, too, is added to the servo loop via an op amp to be compared against the rock-steady quartz time-base frequency. This second head is particularly quick to spot overshoot and undershoot *before* the platter reaches rated speed. It also is used in speed-down control when you reduce platter speed from 45 to 33½ rpm.

Purely Electronic QUARTZ-SERVO in IC: Responsive, reliable, smooth.

Not only does our new servo system—Quartz Servo—assure accurate platter rotation (with speed deviation never more than 0.002%) against drastic changes in temperature, humidity or loads; it also quickly and smoothly changes the speed of the platter, or stops it, thanks to the op amp that generates either positive or negative torque in the motor, as occasion demands.

DC Motor is 20-pole/30-slot type with Saturable-Core design.

Sansui's best motor is one that has benefited from our many years of experience in building precision high fidelity equipment; the electrical details include a saturable-core construction with a 20-pole/30-slot design to eliminate "cogging." Operation is extremely quiet because the entire drive unit is dynamically balanced. The high inertia (315kg/cm²) of the heavy, large (35cm in diameter) platter assures very low wow and flutter of 0.015%. With the Quartz-Servo and Dual detection systems described above, this drive system will never permit platter speed variations to spoil your musical pleasure.



Be So Smart – Quartz Servo, Tonearm.



**High density BMC
CABINET—Resonance
and vibration are shut
out for good.**

Our engineers note that the new polyester composite-mixed glassfiber material they use for the XR-Q9 cabinet—the material they call “BMC” (Bulk Molding Compound)—is about two and a half times as dense as ordinary cabinet materials. They say it’s also at least three times more resistant to resonance in the audible frequencies, having a high Young’s Modulus and twice-higher “Q” or resonance frequency. It is, in short, the ideal cabinet material—permitting no “howling” and no shakes, rattles or rolls to hurt your music. Good looking, too, requiring no additional “cosmetic” finishing.

**Floating sub-base—the key to our double
construction (pat. pend.) design—adds
extra dBs of howling margin.**

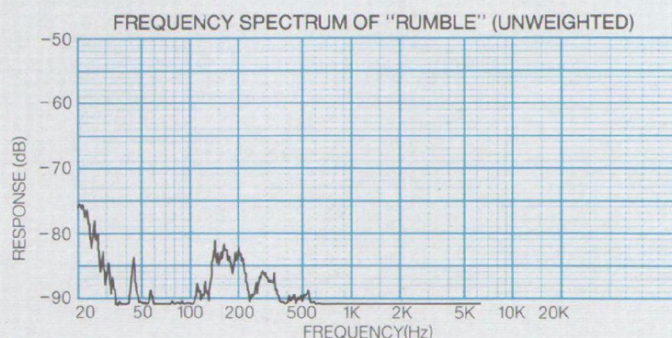
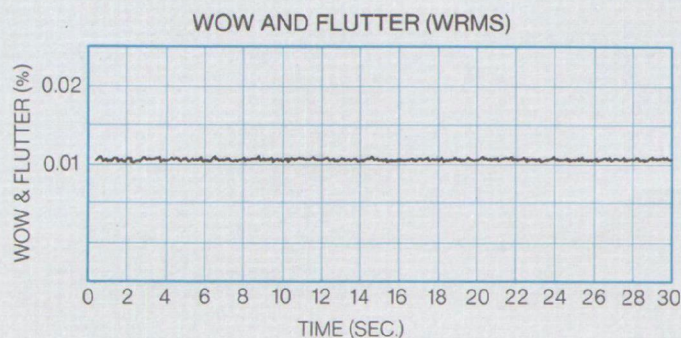
We have applied for patents on this unusually effective turntable base design. It “floats” a sub-base unit, containing the *motor* and *tonearm* mounts, within the BMC cabinet in a “dynamically decoupled” way to prevent mutual vibration. The sub-base, itself diecast of zinc, is thick (3mm) and heavy; it rests on three separate springs and is held from the cabinet by rubber/spring insulators.

How effective is this design? Try it yourself: give the XR-Q9 a whack or two in any direction. You’ll find that even a relatively violent shock will not budge the tonearm.

Floor-borne
and air-borne vibra-
tions, too, are shut out
so that you enjoy extra decibels
of “howling margin” at all times.

**Up-Front Controls: Operate them
even with the dust cover closed.**

Sansui was among the first stereo equipment makers to adopt this functional design, placing all the essential turntable controls up front where they are accessible even with the dust cover closed. The controls include: SPEED SELECT, RECORD SIZE SELECT, REPEAT, UP/DOWN and START/STOP switches (all buttons). Bright LED indicators are provided for the selected speed and record size and to indicate the status of operation of the built-in computerized control system on this first-class turntable from Sansui, where it’s *all* hi-fi.



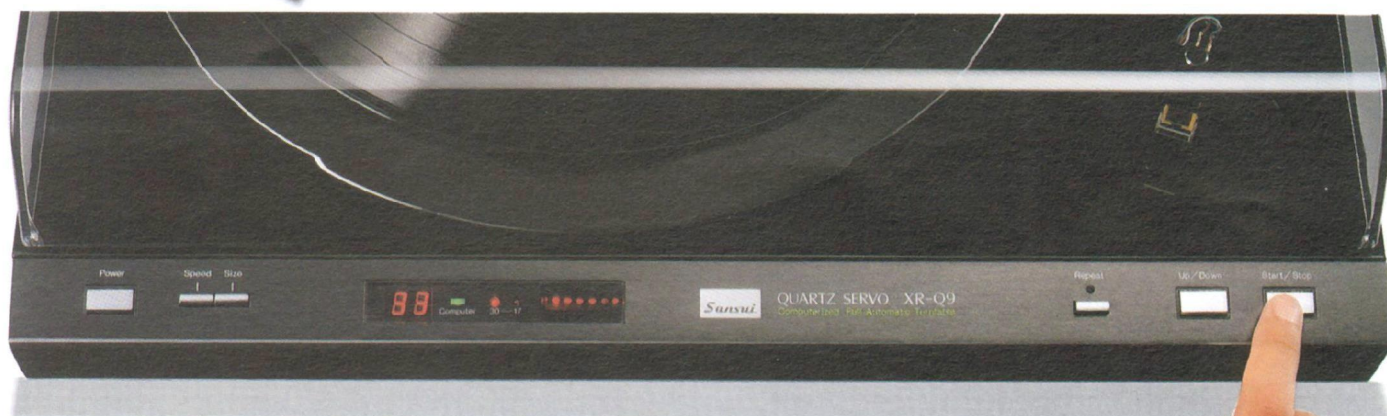


**Tonearm
mistracking CANNOT occur
under normal record-play
circumstances, nor can "howling"
spoil musical performance.**

D-O-B

**D-O-B Tonearm: A novel theory put
to practical use for purer sound.**

After many long years of experimentation and experience, Sansui has developed what just may be the world's most accurate tonearm. In our patent-pending "Dynaoptimum-Balanced" arm the dynamic fulcrum is placed precisely on the point or node of vibration. Because of this (as explained below), the arm exhibits very high stability and its counterweight, headshell and support components show almost none of the microscopic wobbling vibrations which, in other arms, cause still more mutual resonance and pass it on to the stylus. In short, our D-O-B suffers none of the compound resonance irregularities which prevent accurate tracking and give rise to frequency modulation to "muddy" musical reproduction.



Dynamically Ideal Design: The stylus is effectively "decoupled" from the arm.

In theory, it should be possible to create a tonearm balancing system which frees the stylus to trace the undulations in the record groove without *any* adverse inhibitions imposed by the arm. How Sansui achieved this theoretical ideal in practical terms is explained as follows:

Suppose the tonearm were a ruler, with its mass distributed uniformly throughout. Place the ruler on a flat surface, grasp it at one end (*a* in Fig. 1) and wiggle it back and forth rapidly; you should find that point *d* is "stationary." That point is called the node of movement and, if the ruler is indeed of uniform mass, the node will be exactly one-third of the way along the length of the ruler from its far end. Note that no point beyond *d* (*e*, etc.) is stationary but instead moves in proportion to its distance from *d*.

Now move your fingers to point *d* and wiggle the ruler back and forth. As seen in Fig. 2, point *a* is now the "stationary" point. In theory then, point *d* should be the point of *dynamic balance* for the ideal tonearm, assuming that the stylus

is located at point *a*. In practice, however, conventional *statically balanced* tonearms are supported with a fulcrum positioned anywhere between points *b* and *d*, in other words, at or near point *e* in Fig. 1. And as you saw earlier, point *e* moves proportionately to point *a*; if a support's fulcrum is fixed at or near that point, the free movement of the stylus at point *a* is naturally inhibited.

In the Sansui D-O-B arm we have concentrated the static mass at the tail end (around point *b*) and placed the fulcrum itself, as mentioned earlier, smack on point *d*, the node of vibration, to achieve dynamically-optimum balancing—no mean feat of engineering, we can assure you. The stylus, now "decoupled" from the arm's fulcrum, is now entirely free to trace the record groove.

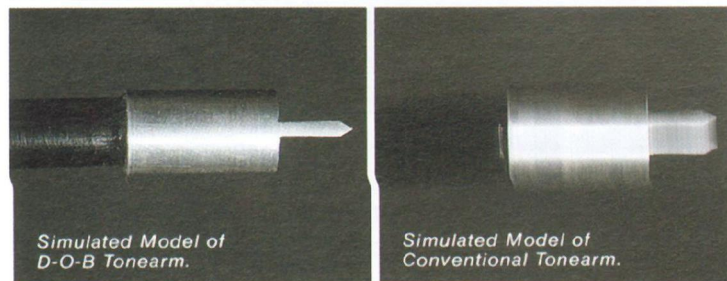
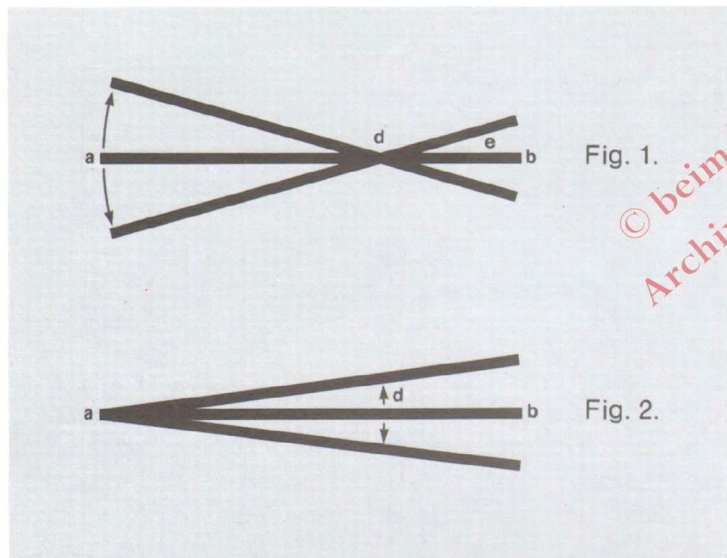
Tonearm tubing is STRAIGHT for still better tracking.

The low-mass (light-weight) straight arm affords very good lateral balance and provides assurance that a uniform tracking force is applied to all points in the tracked groove. Stereo reproduction retains depth and definition.

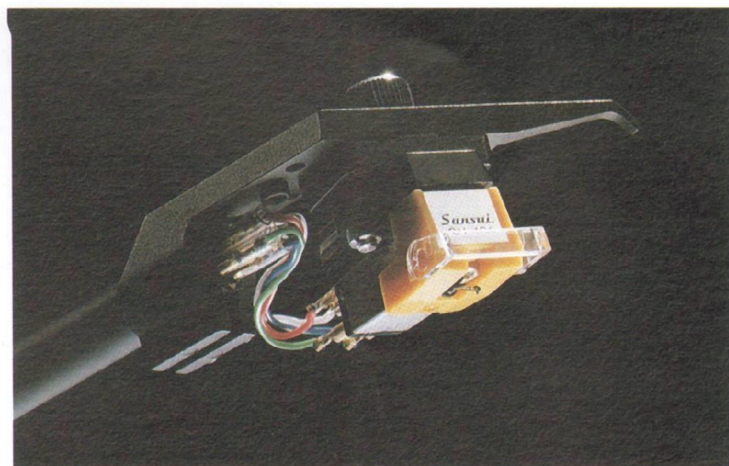
With mass reduced in this design, higher sensitivity is achieved and the arm can track even the most heavily-modulated grooves under a mere 0.5-gram force if required. Our new "Wide-Span Fulcrum" support further enhances these advantages.

And we haven't forgotten...

- DAMPED TONEARM PIPE—Special acoustic absorbent (Pat. Pend.) inside the tonearm ends resonance to assure clearer reproduction.
- SOLID DIE-CAST ALUMINUM HEADSHELL—Low-porosity formation ends resonance in this lightweight precision piece.
- GOLD-PLATED CONNECTORS—Resist corrosion.
- LEVER/WEIGHT ANTI-SKATE—Prevents uneven wear and channel imbalance.
- BALANCE WEIGHT—A special rubber decoupler damps spurious vibration, preventing it from reaching your stylus.
- DIRECT-READOUT TRACKING FORCE—Easy to use dial.
- SMOOTH ARM LIFTER—Works with full-automatic system for smooth, silent, safe operation in this first-class Sansui turntable.
- SANSUI HIGH-RESOLUTION CARTRIDGE—In some areas, the Sansui XR-Q9 comes complete with a high-resolution dual magnet cartridge (Sansui SV-101)



Apply vibrations to a conventional design tonearm, mounted on a base; the arm will then vibrate together with the base. But the D-O-B tonearm, subjected to the same test, does not vibrate at all.



Computerized Tonearm: Basic Operations



AUTOMATIC LEAD-IN

One touch of the START/STOP button and the platter begins to rotate, the lifter descends, the arm moves over to the first selection of the record and play begins.



AUTOMATIC RETURN

At the end of play, the tonearm lifts up and returns to its rest. As it does, the platter stops.



AUTOMATIC REPEAT

Touch the REPEAT button and the record is played and replayed infinitely with the tonearm traveling only between the lead-in groove and the lead-out. Repeat will be defeated when the START/STOP button is touched.



AUTOMATIC CUT/RETURN

Touch the START/STOP button during play and automatic return operation occurs. You can even send the tonearm back home while it's on the way to the lead-in groove of a record.

Specifications

TYPE	Two-speed, computerized fully automatic quartz-servo direct drive turntable
MOTOR	20-pole, 30-slot DC brushless
DRIVE SYSTEM	Direct spindle drive quartz servo controlled
PLATTER	350mm (13 7/8") die-cast aluminum alloy, weighing 1.7kg (3.74lbs.)
PERFORMANCE	
WOW & FLUTTER	less than 0.015%
SIGNAL TO NOISE RATIO	Read out direct at the FG output, better than 78dB (DIN-B)
BUILD-UP TIME AND ARC ANGLE	within 1.8sec. (180°)
PLATTER SPEED DEVIATION	±0.002% (QUARTZ-SERVO)
TEMPERATURE COEFFICIENT	less than 0.00003%/°C (QUARTZ-SERVO)
LOAD CHARACTERISTICS	0% (QUARTZ-SERVO)
PLATTER SPEEDS	33 1/3, 45 rpm
TONEARM	Statically-balanced straight D-O-B tonearm with two point pivot support
LENGTH	245mm (9 1/2") pivot to stylus
OVERHANG	16mm (5/8")
OFFSET ANGLE	22°
MINIMUM TRACKING FORCE SETTING	0.5g (when using cartridge guaranteed to operate at 0.5g stylus pressure)

ACCEPTABLE CARTRIDGE WEIGHT	4 to 10g
CABINETY	Lacquer-like slim-line BMC cabinet with floating sub-plate system, free-stop and hinged curved dust cover.
CARTRIDGE	SV-101
TYPE	Dual Magnet Type
FREQUENCY RESPONSE	10 to 20,000Hz
OUTPUT VOLTAGE	2.5mV per channel (1,000Hz, 35.4mm/sec.)
OPTIMUM LOAD	47k ohms
TRACKING FORCE	2 ±0.5g
STYLUS	0.6 mil diamond spherical (SN-101)
No Sansui cartridge is provided on XR-Q9 models sold in the U.S.A. and Canada. Cartridge supplied along with the turntable varies depending on sales area.	
POWER REQUIREMENTS	100, 120, 220, 240V 50/60Hz
	U.S.A. and Canada models: 120V 60Hz
	European and UK models: 220, 240V 50Hz
	Australian models: 240V 50Hz
POWER CONSUMPTION	less than 25W
DIMENSIONS	483mm (19.1") W
	142mm (5 5/8") H
	420mm (16 5/8") D
WEIGHT	11.6kg (25.5lbs.) Net
	13.6kg (30.0lbs.) Packed

Design and specifications subject to change without notice for improvements.



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