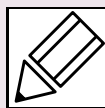


Quick Guide to Precision Measuring Instruments



Linear Scales

Tests for Evaluating Linear Scales

1. Testing within the service temperature range

Confirms that there is no performance abnormality of a unit within the service temperature range and that data output is according to the standard.

2. Temperature cycle (dynamic characteristics) test

Confirms that there is no performance abnormality of a unit during temperature cycling while operating and that data output is according to the standard.

3. Vibration test (Sweep test)

Confirms that there is no performance abnormality of a unit while subject to vibrations of a frequency ranging from 30Hz to 300Hz with a maximum acceleration of $3g_n$.

4. Vibration test (Acceleration test)

Confirms that there is no performance abnormality of a unit subject to vibrations at a specific, non-resonant frequency.

5. Noise test

The noise test conforms to EMC Directive EN61326-1+A1:1998.

6. Package drop test

This test conforms to JISZ0200 (Heavy duty material drop test).

Glossary

■ Absolute System

A measurement mode in which every point measurement is made relative to a fixed origin point.

■ Incremental System

A measurement mode in which every point measurement is made relative to a certain stored reference point.

■ Origin Offset

A function that enables the origin point of a coordinate system to be translated to another point offset from the fixed origin point. For this function to work, a system needs a permanently stored origin point.

■ Restoring the Origin Point

A function that stops each axis of a machine accurately in position specific to the machine while slowing it with the aid of integrated limit switches.

■ Sequence Control

A type of control that sequentially performs control steps according to a prescribed order.

■ Numerical Control

A way of controlling the movements of a machine by encoded commands created and implemented with the aid of a computer (CNC). A sequence of commands typically forms a *part program* that instructs a machine to perform a complete operation on a workpiece.

■ Binary Output

Refers to output of data in binary form (ones and zeros) that represent numbers as integer powers of 2.

■ RS-232C

An interface standard that uses an asynchronous method of serial transmission of data over an unbalanced transmission line for data exchange between transmitters located relatively close to each other. It is a means of communication mainly used for connecting a personal computer with peripherals.

■ Line Driver Output

This output features fast operating speeds of several tens to several hundreds of nanoseconds and a relatively long transmission distance of several hundreds of metres. A differential-voltmeter line driver (RS422A compatible) is used as an I/F to the NC controller in the linear scale system.

■ BCD

A notation of expressing the numerals 0 through 9 for each digit of a decimal number by means of four-bit binary sequence. Data transmission is one-way output by means of TTL or open collector.

■ RS-422

An interface standard that uses serial transmission of bits in differential form over a balanced transmission line. RS-422 is superior in its data transmission characteristics and in its capability of operating with only a single power supply of +5V.

■ Accuracy

The accuracy specification of a scale is given in terms of the maximum error to be expected between the indicated and true positions at any point, within the range of that scale, at a temperature of 20°C. Since there is no international standard defined for scale units, each manufacturer has a specific way of specifying accuracy. The accuracy specifications given in our catalogue have been determined using laser interferometry.

■ Narrow Range Accuracy

Scale gratings on a scale unit normally adopt 20 µm pitch though it varies according to the kind of scale. The narrow range accuracy refers to the accuracy determined by measuring one pitch of each grating at the limit of resolution (1 µm for example).