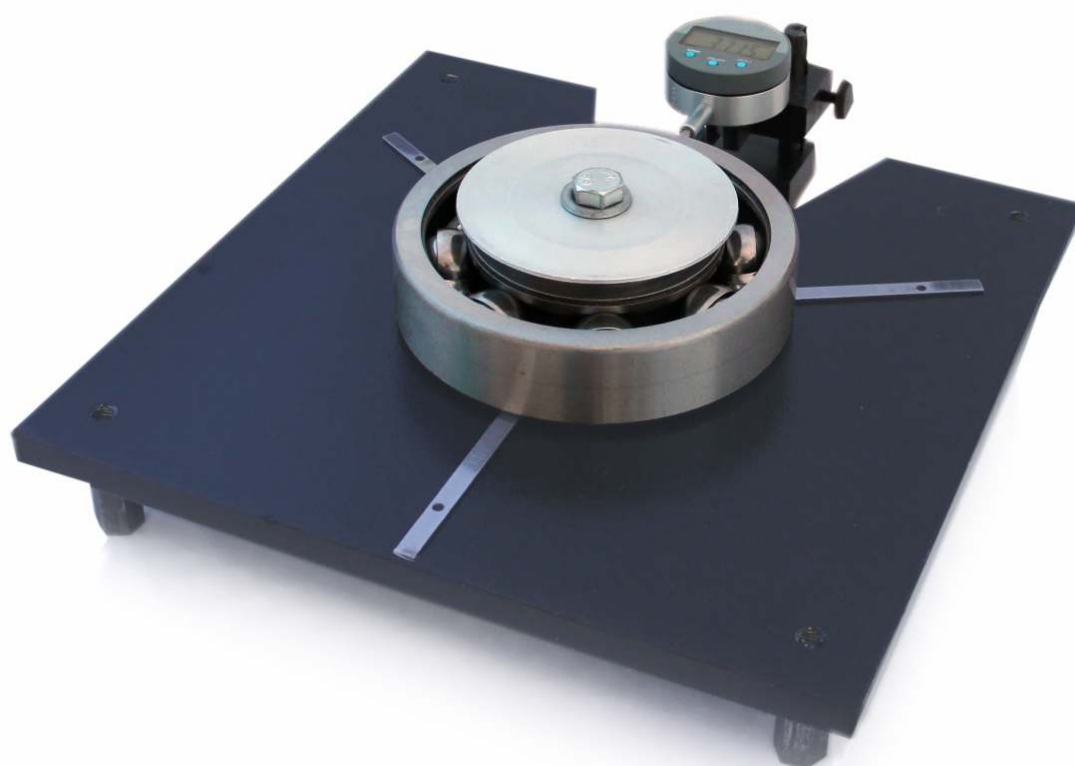


Made in Russia



Device for measurement of the radial clearance of the bearings



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Bearing radial clearance

Radial, or as it is also called “**expansion**” **clearance** is one of the most critical bearing parameters. Radial inner clearance in a bearing is a **distance** to which one of the bearing rings can move towards the other in the radial direction (perpendicular to the rotation axis). A bearing can have a **normal, reduced or increased** radial clearance.

The **less** radial clearance, the **higher** the bearing **rotation accuracy** and its **service life**. At the same time, a large number of rolling elements are working, the shock load from vibration is less. However, bearings with a radial clearance equal to zero are not produced, since there is no space for an oil wedge in such bearings. Without lubrication the bearing quickly overheats, wears out and can be seized up.

In **GOST 520-2002** the following groups are provided — **6, normal, 7,8,9**.

In **ISO** — **C1, C2, CN, CM, C3, C4, C5**.

The table of compliance of GOST and ISO

GOST	ISO	Description
no	C1	Reduced clearance — less than C2. It is hardly found in the free sale, it is produced by special order
6	C2	The bearing clearance is less than a normal one, rarely found in the free sale
No marks	No marks or CN	A normal clearance. The most widespread.
no	CM	The bearing clearance for electric motors. More than a normal, but less than C3
7	C3	The bearing clearance is more than a normal. The second most common
8	C4	The bearing clearance is more than C3
9	C5	The bearing clearance is more than C4. It is hardly found in the free sale, it is produced by special order

The bearings produced with a radial clearance which comply with a normal group are not marked additionally neither as per GOST, nor as per ISO.

Application of the bearings depending on the clearance groups

With a reduced clearance:

- ▶ the necessity to increase rigidity in the axial and radial directions, for example, in high-speed nodes;
- ▶ according to the operating conditions, increased heating of the outer ring relative to the inner ring is expected.

With a normal clearance:

- ▶ relatively low rotational speeds and loads;
- ▶ outer rings are installed into the body with a clearance;
- ▶ inner rings are installed on a shaft with tension.

A normal group – ensures a satisfactory operation of the bearing assembly under normal, for most cases, fit and temperature conditions.

With an increased clearance:

- ▶ increased heating of the inner ring;
- ▶ the bear operates under high dynamic loads that is why the rings are installed with increased tension;
- ▶ the presence of distortions of the inner rings relative to the outer ones for various reasons.

The use of the bearing with a correct clearance is very important - the machine **service life** directly depends on this. If a high operating temperature occurs in the bearing and it is the intensity of the increase in this temperature that is important, or if the bearing cools sharply, then the metal of the rings and rolling elements can expand or contract at different speeds. This can lead to **increased friction** in the bearing, **oil starvation** and bearing **seizure**. If the bearing operates at a high speed, with high or shock loads, this can also lead to a rapid increase in temperature in the bearing.



Device for measurement of the radial clearance of the bearings

The thermal (radial) clearance of the bearing is the most important parameter that must be controlled. Failure to comply with this parameter can lead to overheating and seizure of the bearing. And this, in its turn, leads to the need to restore the shaft and/or the hole in the housing, or to even more complex and expensive equipment maintenance. Often such situations end with **a stop of the technological process** or even a fire.

Research and Production Enterprise "TIK" has developed an **inexpensive, simple** and **effective device** that allows you to make sure that the radial clearance of the bearing complies with the standard and to protect industrial machines from breakage or fire.



Design of the device with replaceable clamps



Types of sizes of the replaceable clamps

The device contains **a steel base** with **support ribs** on which, with the help of **a replaceable clamp** and **a bolt**, the tested bearing is fixed. The radial clearance is measured using **an indicator** (a clock or digital type) located on **a movable holder**.

During the measurement of the radial clearance, the tip of the indicator is brought to the outer surface of the bearing outer ring. By shifting the outer bearing cage in the direction of the axis of the indicator in the forward and reverse direction, the maximum and minimum readings are determined. The radial clearance is defined as the difference between the maximum and minimum readings of the indicator.

In order to compensate possible non-roundness of bearing outer and inner rings, the procedure is repeated several times in different angular positions.

The radial clearance is measured by method "A" in accordance with **GOST 520-2011**.

Features

- ▶ a set of three replaceable clamps for bearings of various sizes;
- ▶ two highly accurate indicators as an option (clock type or digital);
- ▶ simplicity and convenience in operation;
- ▶ small overall dimensions and weight.

Technical characteristics

Basic parameters

Bearing inner seat diameter, mm	35-150
Bearing outer diameter, mm	55-320
Bearing width, mm	10-106
Indicator division value, mm	0.01 / 0.001

Operation parameters

Range of operating temperatures, °C	20±15
Relative humidity, at 25 °C, %	80

Design parameters

Dimensions, mm	450x330x100
Weight, without a bearing, kg	14

Package content

Device, pcs.	1
Indicator (clock / digital), pcs.	1
Set of clamps for installation of bearings, pcs.	1

Manufacturer's reliability and warranty parameters

Guarantee service life, months	18
Service life, years	10



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