Purpose.

The **Tool Setter** sensor is used to determine tool height and diameter. CNC milling machine generates coordinates when the tool touchs the Tool SetterTSm measurement pad and uses them to calculate the height and diameter of the tool. The device can be used with various CNC systems: LinuxCNC, Mach3, embedded systems on industrial machines, etc.

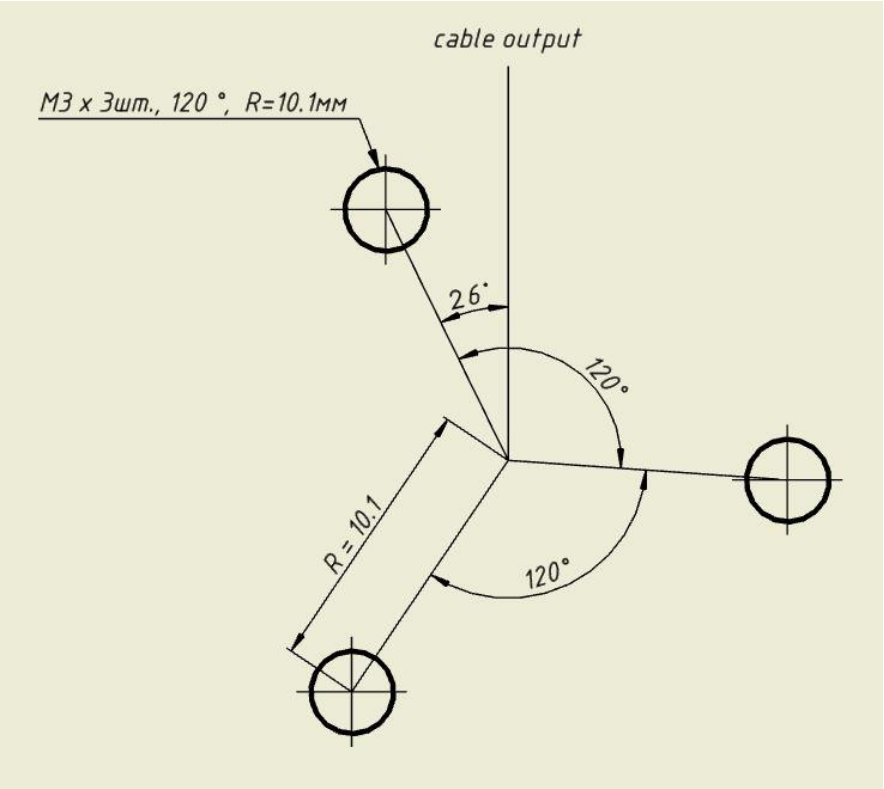
Specifications.

Unidirectional repeatability	< 0.003 mm
Search directions	±X, ±Y, -Z
Permitted deviation of the measuring pad in XYZ directions	±4mm
Contact force	min 0.5N max 2N
Diameter and overall height	D=28.8mm, H=40mm
Diameter and height of the ceramic pad	D=10mm, h=2.5mm
Power supply for TSm v.1.0	+5v
Power supply for TSm v.1.1	+5v...+12v
Power supply for TSm v.1.2 and higher	+5v...+24v
Current consumption	<4mA
Dust protection	Yes
Splash protection	Yes
Adjustability	Yes

Installation.

Placement Vesr TSm is recommended to be chosen so that the entire surface of the ceramic platform of the device is in the working area of the machine, with an indent from the boundaries = the maximum diameter of the tool being measured + 2mm.

The device is fixed to the machine body with three M3 screws. Three threaded holes are prefabricated in the machine body:



Adjustment.

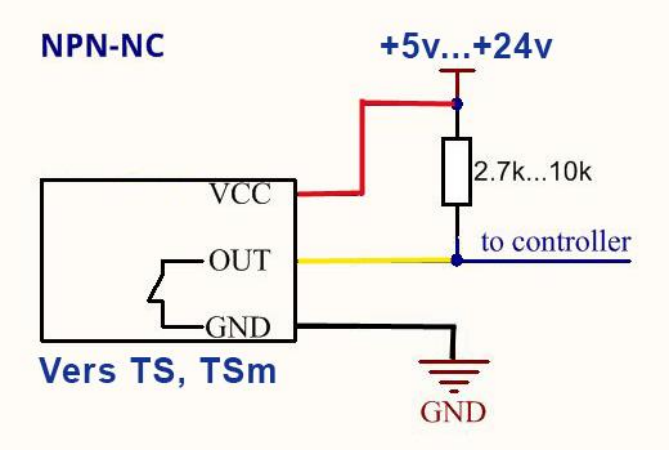
Before starting the measurement, it is necessary to adjust the device. As a result of the adjustment, the surface of the measuring platform should become parallel to the XY plane.

The indicator should be sensitive to a weak effect of 0.3-0.5N (for example, most lever indicators have this property).

For adjustment, three points are selected at the measuring pad (shown with red crosses) approximately at the edge of the site in the direction of the adjustment holes. The indicator is set in the spindle (you will need to moving the spindle in XY coordinates), the stylus of the indicator is located to measure the deviations in height. The results of the indicator must have to the same values in these three selected points. For adjustment, a 2mm hex key is used from the kit, both screwing in and loosening of the adjustment screws located inside the holes, closed with elastic bands. The key is recommended to hold for a short lever, so as not to develop excessive force when screwing.

Connection.

Be careful!
1. ReTool Settering the polarity when power will damage the sensor.
2. Tool Setter TSm is an NPN-NC sensor, i.e. output normally closed **to ground**. Connection to controllers with PNP inputs, i.e. designed for short-circuited **to power** PNP sensors , it is possible only with the help of special npn-to-pnp converter, otherwise, both the sensor and the controller may be damaged.
The connection scheme for normally-closed npn sensors is applied, the color of the wires inside the cable corresponds to the colors of the connections in the scheme. (Caution! The supply voltage in the diagram is shown for currently available sensors in Tool Setterion v.1.2 and higher, for restrictions for previous Tool Setterions, see the "Specifications" section).


NPN-NC
+5v...+24v
2.7k...10k
VCC
OUT
GND
to controller
Vers TS, TSm
GND