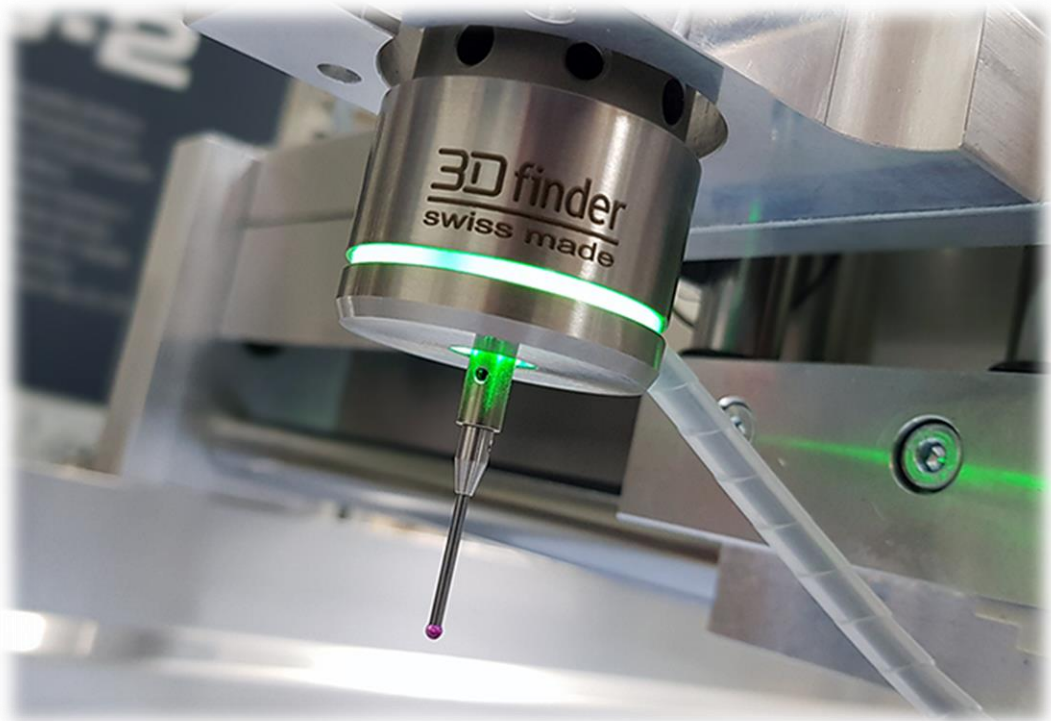


Translation



Data sheet 3D Finder Edge finder and center finder

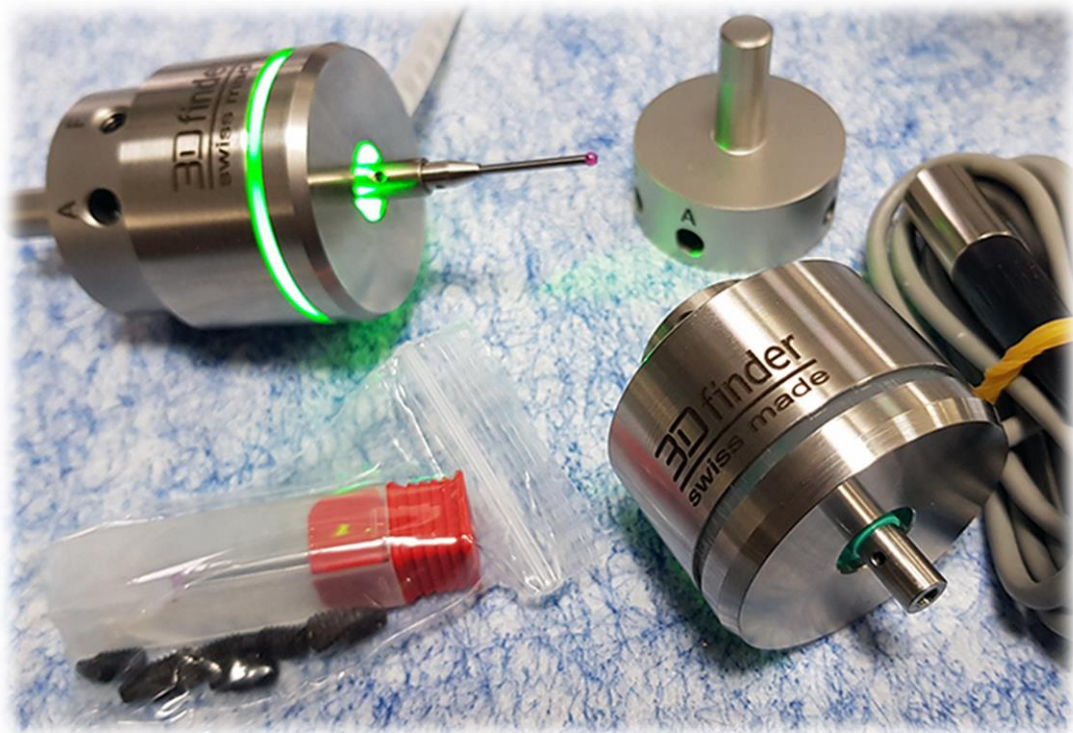
<https://www.cnc-step.com/>



Stand: 25.04.2019



Edge finder and center finder



Short description

The 3D finder can be used to locate a workpiece edge or the center of a hole.

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1 Purpose

The 3D finder probe is used to measure workpiece geometries such as edges, holes, grooves, lands, angles and corners.

This probe was developed for high measurement precision and high repeatability.



In order to achieve high measuring precision, a probe must be mechanically calibrated so that the axis of the probe matches perfectly with the spindle axis of your machine.

Cheap probes from the hobby area do not offer the possibility to align the axis of the probe. Without such a calibration function, the measurement results are very inaccurate and thus often unusable.

Measuring probes with alignment are found in the industrial sector, but these are priced in the far 4-digit range.

In the development of our 3D-finder special attention has been paid to a low price without a loss in precision, repeatability and reliability.

The 3D-finder is not only a simple switch, but also includes electronics to ensure a stable and reliable switching behavior.



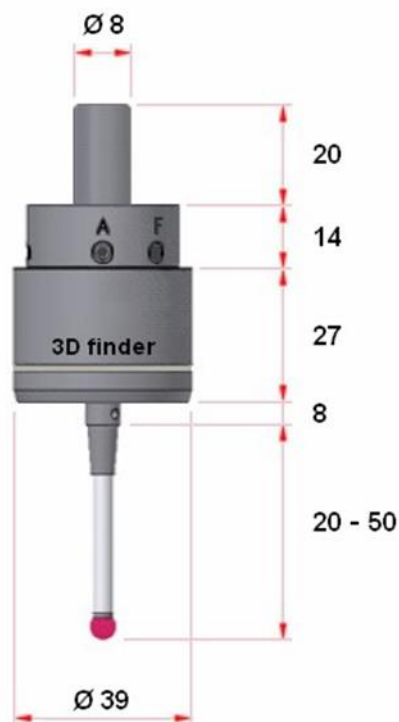
2 Technical data

Sense directions:	$\pm X$; $\pm Y$; $-Z$
Max. probe deflection:	$XY = 12^\circ$; $Z = 5\text{mm}$
Probing force:	$XY = 0,5 - 1\text{N}$; $Z = 2,5\text{N}$
repeatability: (unidirectional)	$1\ \mu\text{m}$ with 30mm probe and max. 200 mm/min measuring speed
Output:	electronic high-speed switch as opener
Switching current:	max. 30 mA
Control display:	LED with switching point display
Operating voltage:	12 – 24V DC
Cable length:	1 Meter (without plug)
Housing:	Stainless steel
Holder:	with alignment function and 8mm cylindrical shank
Probe:	probe with 2mm ruby ball (included)
Dimensions (without holder):	(D) 40mm, (H) 27mm

Assignment

Cable 4-wire:	brown = +12 bis 24VDC blue = 0V (GND) green, white = switch
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2.1 Dimensions

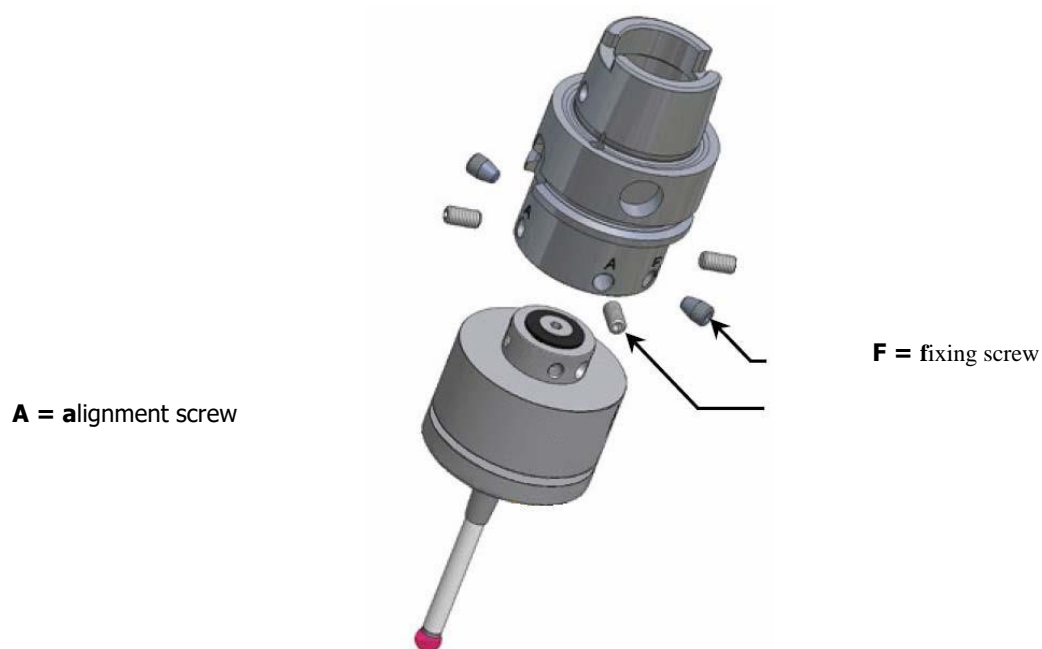




3 Assemble / disassemble tool holder

Push the tool holder onto the probe and align the threads "F" with the cone holes on the probe.

- Screw in both fastening screws "F" and tighten slightly.
- Screw in all 4 alignment screws "A" and tighten slightly
- Align the probe to the spindle center (see chapter "Aligning and calibrating the probe").

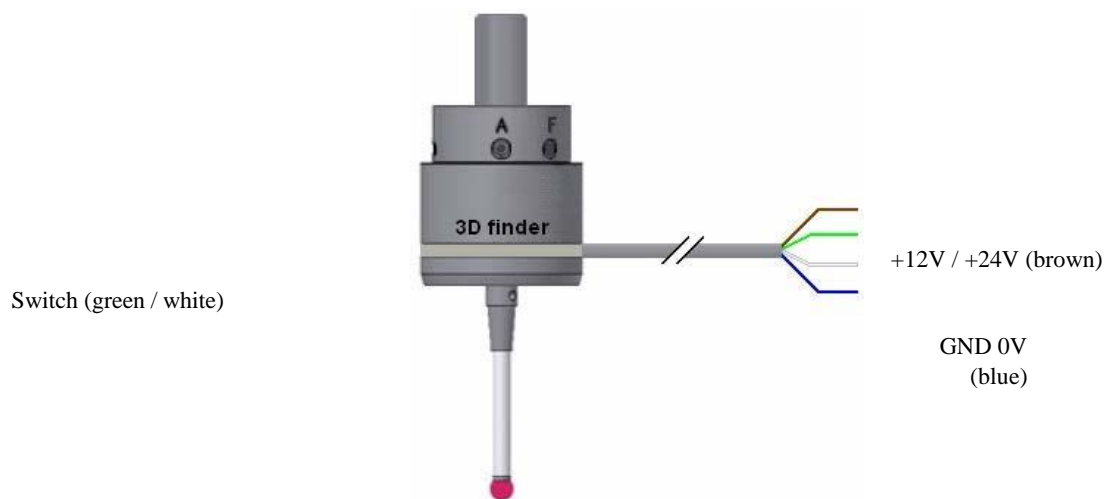


4 Connect the 3D-finder to the CNC controller

- The **3D-finder** can be operated with 12V or 24V DC.
- The switching outputs can be connected to the CNC controller like a normal switch, regardless of whether it has an NPN or PNP input.
- By default, the switch output operates as normally closed contact, a version as normally open contact is available on request

The switching current must not exceed 30mA - Observe the connection regulations of Your CNC controller

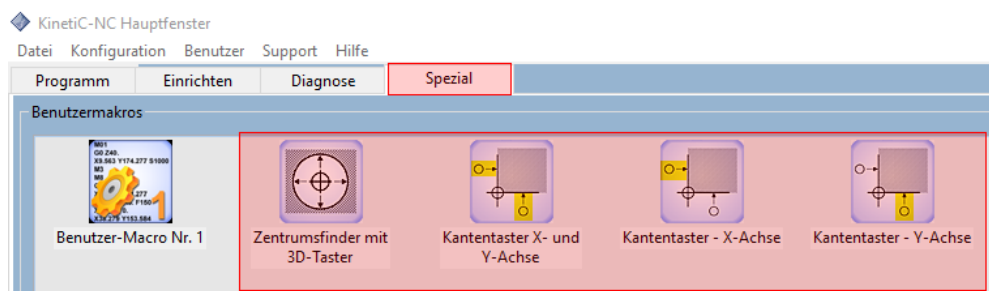
- The switched voltage must not exceed the own supply voltage of the 3D-finder
- The switching outputs can be connected in series with NPN and PNP inductive sensors



4.1 Connecting to the Zero-3 Stepper Motor Controller

For connection to the Zero-3 control of CNC-STEP, there is a ready-made connection set. Thus, the 3D-Finder can be connected directly to the Zero-3 controller and is ready to use.

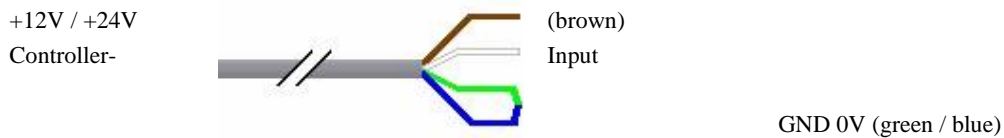
For the software KinetiC-NC some finished measurement macros are included. Further measuring procedures are possible on request.



4.2 Connecting to a controller with PNP input



4.3 Connecting to a controller with NPN input



4.4 Attention: It is important when using as PNP or NPN to comply with this color wiring of the connecting wires!

We recommend switching the controller off before the **3D-finder** is connected. Incorrect connection can damage the **3D-finder**.

4.5 Hot-Plug

If a voltage-free connection can not be realized, then the voltage supply of the **3D-finder** (brown / blue) must be connected in front of the switch contacts (green / white).

For safe hot-plug operation of the **3D-finder** and the other sensors that you use, we recommend using our specially designed **connection box - Sensor hot-plug interface**.

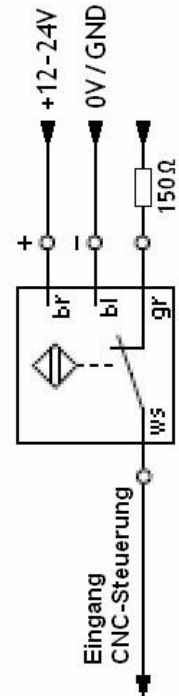
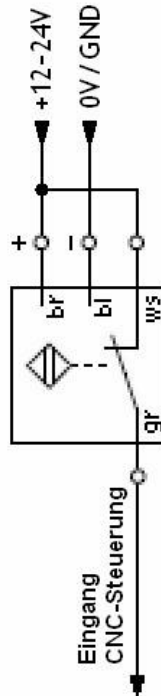
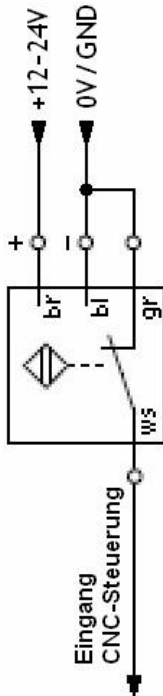
4.6 Connection examples

NPN circuit PNP circuit Potential-free circuit

Sink / mass / open collector

Source / voltage

Recommended with 150 ohm resistor



- Improper operation or non-compliance with the guidelines will invalidate any warranty claim -



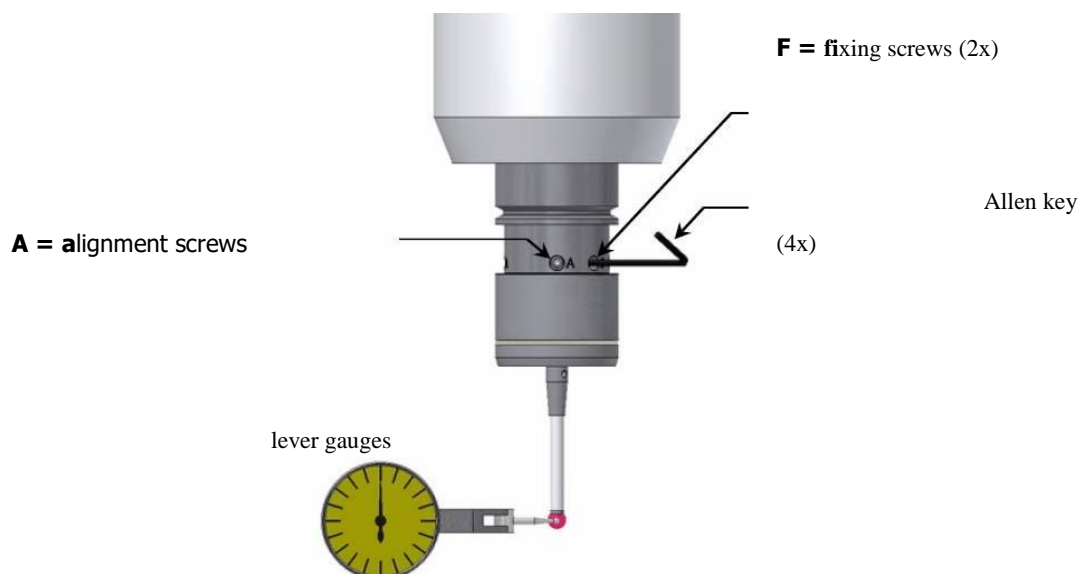
5 Align and calibrate the probe

- To be able to make accurate measurements, the probe must be calibrated. The calibration must be done at:
 - commissioning
 - Probe pin change
 - Change of the probing feed

5.1 alignment to the spindle center

The probe axis normally does not coincide exactly with the spindle axis. The alignment with the spindle center compensates for the offset between the probe axis and the spindle axis. As a result, the probe can be used with high precision from any scanning direction. For alignment with the spindle center, proceed as follows:

- Loosen fixing screws "F" (2x) and tighten again with medium force
- Turn the probe and align it with the alignment screws "A" (4x) to $<20\mu\text{m}$
- Tighten fixing screws "F" (2x) a little more tightly
- Turn the probe and align it with the alignment screws "A" (4x) to $<5\mu\text{m}$
- Tighten fixing screws "F" (2x)
- Tighten alignment screws "A" (4x) against each other
- Check alignment





Note: Mark the position of the probe in the spindle holder (eg with one color point each on the spindle holder and on the probe). For best measurement accuracy, pay attention to the correct alignment of both markings when re-clamping the probe in the spindle.

Marks



This completes alignment with the spindle center.

6 Customer service

For technical information please contact our customer service:

Adresse	CNC-STEP GmbH & Co. KG Siemensstraße 13-15 D-47608 Geldern	
Telefon	+49 (0)2831/91021-50	(Mo. - Fr. 07.00am - 3.15 pm)
Mobil	+49 (0)2831/91021-60 Only in urgent cases (not always available!)	(Mo. - Thu. 3.15pm - 6.00 pm)
Telefax	+49 (0)2831/91021-99	
E-Mail	support@cnc-step.de	
Internet	https://www.cnc-step.com/	

If you have any questions, please contact our customer service via e-mail or telephone. We are happy to help.

Numerous suggestions and information can also be found on our website:

<https://www.cnc-step.com/>