Strip Thickness Gauge
for
Narrow Strip and Profile

VBK 563/1

Operating- & Service Instructions
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Subject to change without prior notice

Please order spares referring to the part number and drawing number of the enclosed documentation drawings
Safety Precautions, read carefully!

This manual has to be handed to the machine operator, and one copy must be permanently available to operator and service personnel.

Nobody is allowed to work on or with the gauge, before he has read and understood this manual. Feel free to call the Vollmer company in case of any questions (phone +49 2334 507 0).

Warning, Crushing Hazard! Hands or fingers which are put into the vertical guide behind the gauge or into the slidebase below the gauge, might get caught and heavily injured if the gauge head moves up/down or is traversed.

The gauge might get hot. Therefore check the temperature before trying to handle the gauge head.

The strip processing machine must not be started up until a written statement was made that the entire machine (into which the gauge is installed) is in accordance with the regulations of the EG-Maschinenrichtlinie 89/392/EWG. The manufacturer hereby points out, that this includes the installation of an appropriate protection device. The protection device has to be made in such a way that the operator can pull the gauge on the strip and push it off the strip during the rolling process without facing any hazard by the running or by the possibly breaking strip.

Intended use of this product

This gauge may be used only as a fix mounted component of a strip processing machine for the measurement of cold strip. It must be firmly installed in its intended position and electrically, electronically, hydraulically and pneumatically connected as intended by the Vollmer company. Any alteration might cause severe damage.
Design and Function

The new VBK 563 is designed to measure the thickness of narrow strip and profile on mills or on inspection lines. The gauge measures the passing material continuously in its measurement mouth which has a depth of 50 mm. In order to ease the reading, the following sections of this manual will not continue referring to strip and profile, but only to strip.

The strip first passes the C-shaped thickness measurement frame with two thickness feelers measuring the running strip simultaneously from the top and from the bottom. This can be done by single measurement or by sum measurement:

- **Single measurement** means to measure strip thickness between a movable LVDT transducer and a micrometer fine adjustment feeler. It puts out fine results on slow running strip.

- **Sum measurement** is used to measure fast running strip with high quality surface. Two electronic transducers measure the strip from both sides. As only a small amount of mass has to be moved instead of the entire C-frame, the two transducer tips are able to follow the surface even of vibrating strip.

Both measurement methods provide results of high accuracy, but they require different ways of gauge adjustment.

Due to strip thickness changes, the transducer tips are pushed apart or come closer. The transducer tips are crowned and polished diamonds, which do not leave any marks on the strip.

At its rear side each transducer has got a differential transformer. The movable core of this transformer is connected to the measurement tip which is sliding on the strip surface. In this way any movement of the measurement tip is measured inductively.

All changes within both transducers are passed to a VMF measurement amplifier, where they are added (sum measurement). The amplifier indicates a measurement result as deviation from zero, i.e. the difference to the preset nominal size.

There are two ways to adjust the gauge to nominal size: Either the upper transducer is adjusted within a micrometer thread or the measurement value is electronically converted. In both cases the measurement amplifier will indicate 0 when the measured strip thickness matches the nominal thickness.

The gauge head can be across the strip in a slide base shifted. This allows to measure strip of different width. After the rolling started, the gauge can easily be pulled on strip.

The gauge is suspended vertically movable in its vertical guide which holds it in the correct passline height. Guide rollers hold it always parallel to the strip surface.
VBK 562/1E gauge: The thickness measurement transducer is measuring from the bottom side and the fine adjustment is touching the top side of the strip (principle of single measurement). As an optional addition for VBK gauges, a second measurement frame for strip width measurement can be fitted.

Amplifier measurement data can be used as signal for controlling and for quality control documentation according to ISO 9000. It is available on two analog voltage outputs. Some VMF amplifiers do additionally provide digital data outputs.
System

The VBK 563 gauge is always installed with a VMF measurement amplifier. This measurement amplifier indicates the difference between measured strip thickness and selected nominal size.

Nominal size setting

If the required material thickness - e.g. 500 µm - is entered as nominal size and if the measurement is 501 µm, the amplifier will indicate +1 µm.

So it is possible to stay within the highest sensitivity range of the indicator no matter of the material thickness. In this range the full deflection of the indicator covers a range of +/-10 microns.

Nominal size can be set in two ways:

- **mechanically** (single measurement plus fine adjustment):
  The fine adjustment is set to the selected nominal size on its micrometer thread. The size is indicated by a digital turns counter.

- **electronically** (sum measurement) with two transducers and FS 3/4):
  there is no mechanical transducer adjustment, but the measurement value is electronically compensated for the nominal value by the setting of a thumb wheel switch, so that the selected nominal size is indicated as zero.

This adjustment is limited to 2-3 mm, depending on the transducer type. It can be combined with an adjustable transducer or a fine adjustment, i.e. the upper transducer is mechanically adjusted to one nominal size, and from that position it can be adjusted electronically to different nominal size settings.
Measurement amplifier VMF 311 with electronic classifier 2S (top) and nominal size selector FS4 (bottom).

The measurement amplifier continuously indicates the difference between nominal and actual strip thickness and width. There are two separate amplifiers, one for thickness and one for the width indication. By the measurement range selector MB one can select the resolution of the analogue indicator. Full deflection can indicate from 1000 microns (.030") down to 10 microns (.0003"). The zero potentiometer NP allows to eliminate small deviations of the gauge zero.

Tolerance limits can be set by the two-digit switches DK of the electronic classifier. Coloured control lamps indicate whether the measurement value is in, over or below tolerance. Such classifiers are optional equipment, their operation is described in a separate manual.

The (optional) nominal size selector FS4 shows the selected nominal size in microns (or steps of 0.0001", depending on the FS4 type).

The amplifier VMF 2000 includes all components described above. It puts out the measurement data with statistic evaluation ready for quality control documentation according to ISO 9000. Its internal automatic adjustment provides the best possible measurement accuracy at any time.

The VMF 2000 amplifier is capable of processing transducer signals of overall 4 mm measurement stroke (instead of 2 mm like the VMF 3/11 and 3/22 types). Those transducers and VMF 2000 amplifiers can be used to upgrade nearly all Vollmer gauges.
Types

According to individual requirements of our customers, Vollmer gauges are produced in many different types. The gauge card at the beginning of the documentation shows the type of your gauge. The following list is a general overview about the most common items:

e.g.: **VBK 563/1E/FS4-Dek/Su/K/A0/DAV/3**

Meaning of the abbreviations:

**VBK 563/1 E:**
Electronic strip thickness gauge, measurement depth up to 50 mm from the strip edge.

Single track thickness gauges are identified as VBK 563/1, and width gauges are named VBK 563/2, combined thickness and width gauges are named VBK 563/12.

**Su:**
Measurement by 2 transducers in sum; accurate measurement values even in case of strip vibration.

**FS3/FS4:**
Remote selection of nominal size by a thumb wheel with 3 or 4 decades.

**K:**
Air cooling of the diamond measurement tips; against short-term drift, if the measurement tips are heated by the strip.

**A0:**
Electronic adjustment system, which works when the gauge is in its rear limit position. The amplifier adjusts itself to zero. A0 is mostly started by pressing a key, or it is done automatically when the gauge is in its rear limit stop position.

**DAV:**
The diamond measurement tips of the two transducers are pneumatically pulled apart when the gauge is traversed in order not to damage them at the strip edge. For measurement of wavy strip the measurement pressure can be pneumatically increased to prevent the measurement tips from leaving the surface.

**3:**
The gauge’s slidebase has a stroke of 300 mm.
Measurement head adjustment

Installation

When the gauge is installed into an inspection line, installation height and levelling of the gauge are derived from the inspection table. If the gauge was removed from its position, take care to reinstall the slidebase angular to the passline.

In rolling mills the gauge should be installed as described in the following sketch:

If possible, the gauge should be positioned between the roll gap (mill = W) and the deflector roll U. Base and the bracket K are so high that they lie under the strip by the "passline height" H (see data drawing in the documentation). Here the stroke of the vertical guiding is able to follow the expected range of strip movement.

Additional conditions are:
- base parallel to roll axes in the mill
- slidebase rectangular to the strip
- gauge must be able to traverse towards the roll middle
**Levelling**

If the strip does not run horizontally, the gauge head can be turned: Loosen clamp screw X at the rear of the gauge. Lift the gauge at the front, adjust it to the strip passline angle and clamp it again.

![Diagram of gauge head adjustment](image)

**Passline height**

The upper limit stop of the vertical guide should be set to a position where the lower guide rollers touch the strip edge with the upper third of their slope. Loosen lock nut Y below nut Z, and use nut Z to adjust the gauge head to an appropriate height. Finally tighten lock nut Y.

This sketch shows a guide roller with a collar as it is used on gauges with thickness and width measurement frames. Gauges which are measuring thickness only have guide rollers without collar.

The large aluminium knob W is used to set the tension of the suspension springs. The suspension should push the gauge head against the upper limit stop of the vertical guide, but not too hard, so that the strip is not lifted by the gauge head. In that case please do reduce the spring load. It is set correctly, when the gauge head is slightly lowered by the strip when it is forwarded to the measurement position. When measuring very thin strip, the bottom limit stop might be lowered a little, so that the lower guide rollers put less load to the strip. However, the height must not be reduced too far, so that the lower guide rollers are permanently driven by the passing strip.
Measurement frame spring load

If the gauge is measuring with a fine adjustment (single measurement) the strip edge will touch the slope of the (top side) fine adjustment in the forwarding gauge head, and will lift the C-frame for about 1 mm into the levelled (90°) position. By this, the bottom transducer is pushed against the bottom strip side. The more load from the C-frame is resting on the tip of the fine adjustment, the better both measurement tips will follow the strip surface. Limit for that load is the hardness of the strip surface. The load should be reduced when the gauge marks the strip. Also the measuring of very thin strip might require a reduced measurement load. For measurement load reduction loosen the lock nut and tighten the knurled brass plunger screw 50 (turn clockwise).

If the gauge is measuring with two transducers in sum, the C-frame is also held in levelled position by screw 15. It can only move towards the top, as a protection against overloading. A spring loaded plunger screw like the one shown above, but installed at the bottom side of the rotary bearing, pushes the C-frame down against a limit stop, so that it won’t start to swing. This installation does not require readjustment when switching from standard to thin material.

It is recommended not to change the setting of the 90° set screw unless there is a special reason!
Upper guide rollers

The upper guide rollers are adjustable by their eccentric supports. These rollers stabilize the gauge on the strip. If the gauge is measuring in sum, the upper guide rollers should not touch the strip continuously. It is recommended to set the guide rollers apart about 0.5 millimetres wider than the strip thickness.

The upper guide rollers can be lifted or lowered by loosening the knob 46 on either side of the gauge head. Then rotate the support rod of each upper roller until the gap between upper and lower rollers is sufficient. Then tighten the knobs 46.

In case the gauge starts to swing up and down, the operator should reduce the gap between the guide rollers.
Measurement

Zero check

Zero checking should be performed regularly. Set the gauge to nominal size zero and check the VMF indication. It should be zero. Minor deviations can be eliminated by the VMF 3/22 zero potentiometer or by the Master key of the VMF 3/2000.

Then operate the DAV or put a thin piece of material between the transducer tips and take it out again. The indication must return to zero. If not, check the gauge (see section “Trouble shooting”).

Indication check

If the previous test shows a constant zero, check the gauge measurement by a slip gauge or by means of an adjustment plate with integrated slip gauge (optional addition). This test should be made regularly, especially when rolling with tight tolerances.

At first set the nominal size to the thickness of the slip gauge. Then insert the slip gauge between the transducer tips. The indication should be very close to zero (+/- 0,5 µm). If not check the entire gauge adjustment.

Nominal size and tolerance limits

After the zero check, nominal strip thickness is set mechanically (by fine adjustment/or adjustable transducer) and/or electronically by the FS4 thumb wheel switch (optional item).

The tolerance limits can be entered into the electronic classifier 2S or 4S (optional item, see separate instructions) or by then keys of the VMF 3/2000.

Measurement start and end

After the nominal size and the gap between the guide rollers were adjusted, pull the gauge on strip by its handle. The measurement amplifier now indicates the difference between nominal and actual size and (if installed) the classifier indicates whether the measurement value is in or below tolerance, or if it is exceeding the upper limit.

Important note for manually traversed gauges

The gauge must not be operated without a proper protection for the operator (see under Safety Precautions).

Always move the gauge off the strip before the strip tension is switched off! The strip end must never pass through the gauge, as it will cause serious damage.
Continuous check

In between the service intervals, it is recommended to check the gauge regularly:

**Symmetry check:** Adjust nominal size to 0, move both transducer tips up and down, (indication has to be 0 µm +/-0,5). In case of tight tolerances check daily, otherwise weekly (see extra manual).

**Accuracy check with slip gauge:** Set the gauge to the nominal size of the slip gauge, and insert slip gauge between the transducer tips. The indication should be zero. In case of tight tolerances check daily, otherwise weekly.

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**Transducer position to the strip:** The transducers must stand perpendicular to the strip. Lift (or remove) the upper guide rollers and put the test plate onto the lower guide rollers. Tip it to both sides as well as to the front and to the back (see above, sketch 1 through 4). The display may only deflect to +. If not, check the whole gauge. This check is recommended after a strip breaking or other hard treatment.

For your convenience, the Vollmer company offers a special adjustment plate with an integrated slip gauge, which is individually selected to match the thickness of that strip which is usually rolled on your mill.

**Guide rollers:** Check for easy rotation.

**Passline:** Check the correct height of the gauge to the strip
Strip breaking

The gauge is mounted onto the slidebase with a shear block. This is to prevent the gauge and its suspension from destruction in case of strip breaking. Shear block B is made from cast iron and easy to replace. In case of overload it shears off, so that the gauge and its suspension can move with the broken strip.

Please check the gauge zero after each strip breaking. If it has not changed, measurement can continue immediately.

If the gauge zero has shifted for a minor amount, set the measurement amplifier to zero and check the symmetry. Check a the gauge with a slip gauge, which is integrated into the adjustment plate (addition, available from Vollmer). If these points are all right, measurement can go on.

If the symmetry is disturbed, or if the measurement does not indicate the exact thickness of the sample, check the whole gauge. Take special care of the diamonds, the easy movement of the transducer rams and the alignment of the transducer holes in the C-frame.
Maintenance

The thickness gauge does not need much maintenance. Only the measurement tips with the diamonds and the guide rollers are subject to wear. From time to time the gauge should be cleaned in order to avoid dirt deposits which might block movable parts. At least the following points must be checked regularly, even if measurement results and symmetry are correct.

Guide rollers

- Clearance?
  - The rollers have to move freely. They should have only little axial clearance.
  - Blocking rolls mark the strip.
  - Replace defective rollers

- Deposits on the surface?
  - Some strip materials leave deposits on the rollers. They cannot run smooth on the strip and might mark the strip.
  - replace rollers (rework if possible)

Measurement frame

- Easy movable?
  - The C-frame might get stuck because of major dirt deposits in the gauge mechanics, or if after long time of operation the C-frame bearing is worn.
  - This might cause measurement errors.
  - Clean the gauge, send it to Vollmer for repair if the bearing is defective

Transducer check

- Ram easy movable?
  - The transducer rams must be easy to be pushed in and spring back immediately.

- Measurement tips worn or damaged?
  - If the measurement result of the slip gauge plate is not 0, but the other checks are OK, remove the transducers and check the measurement tips:
    - Diamonds worn?
      - The diamonds should be crowned to achieve accurate measurement results. Worn diamonds with flat spots may cause measurement errors.
      - Replace and possibly get the old diamonds reworked
    - Broken diamonds?
      - Cause incorrect measurement results and mark the strip
      - Replace
    - Measurement tips with broken-out diamonds? (after strip breaking or when the strip end has passed through the gauge)
      - Replace
Micrometer thread damaged?
Worn micrometer threads cause measurement errors. Check: Set the transducer to zero, select a nominal size and insert the correspondent slip gauge. Try with several slip gauges. The indication has to be very close to zero. If not,
☞ send the fine adjustment to Vollmer for repair.

Measurement frame distorted?
Take a 20 mm inspection pin (optional addition, available from Vollmer) to check the alignment of the transducer clamp bores in the C-frame. The pin must slide easily through both bores. If not, do not try to straighten the C-frame by yourself,
☞ send it to Vollmer for possibly repair.
Trouble shooting

If the gauge measures wrong

- Wrong point remeasured?
  Cross profile strip thickness varies in many cases. If the gauge is checked, strip thickness must be measured in the same distance from the edge as the transducers have measured.
  ➡️ check the strip thickness at correct edge distance

- Transducers dirty?
  In a very dirty environment, the rams of two transducers sometimes get too sticky, so that they do not shut completely. If the gauge is then set to zero, the indication of a following measurement is too low. After cleaning the transducer ram should slide easy in its bushing or bearing for a quite long period of time.
  ➡️ increase cleaning frequency

- Transducers clamped too hard?
  If the clamp screws in the C-frame are clamped too hard, they possibly distort the transducer housing which increases the friction in the ram guiding.
  ➡️ loosen the clamp screw and re-tighten them with moderate force

- Oil in the flexible cable protection hose?
  Although the oil does not damage the transducer, it increases the friction of the ram guide bushing or ball bearing. In that case the transducers cannot continuously keep contact to a vibrating strip surface. The measurement then indicates "too thick". Much oil in the protection hose does additionally choke the diamond lifting.
  ➡️ Drain the oil from the hose by opening the drain screw in the white plastic DAV connector (see extra DAV instruction). Clean the transducer and possibly improve the quality of the supplied compressed air.

- Gauge zero not constant?
  If the screws, which connect the measurement ram with the guide ram, are not tight, the measurement ram might move against the guide ram. If, for example, DAV was activated or material was placed between the transducers and then removed, the zero point changes. The indication is incorrect even if the symmetry is correct.
  ➡️ Fasten the grub screws in the guide ram (see transducer manual)

- Short-term drift of the gauge zero?
  Can be noticed, if the rolling has been finished and the gauge in its rear position is directly set to zero (without pushing A0). If the display drifts away to + or -, the diamond cooling does not work correctly. Check, whether the small air pipes are not bent. The jet should meet the diamond tip of the transducer.
  ➡️ Readjust the cooling at the pressure valve "cooling" in the pneumatic cabinet (if the indication drifts away to minus -> increase the cooling, if the indication drifts away to plus -> reduce it) Cooling is an optional addition.
Indication too low?
If the transducers in the C-frame are clamped not tight enough, they might be shifted in their bore. Gauge zero is then shifted too.

Indication wrong?
If the fine thread of the upper transducer is defective, the nominal size setting is disturbed (see section Transducer check*).

Indication correct at zero but wrong at other values?
Check the transducer symmetry by moving up and down both transducer tips. If the indication does not stay near zero
☞ readjust the transducer symmetry

Additional check for gauges with decade switch (type FS3/FS4): If a new transducer was installed, the adjustment of the measurement amplifier to the nominal size selector has to be checked by a slip gauge. Set the gauge to 0 and insert 500 or 800 µm slip gauge. Then set the decade switch to 500 (resp. 800) and check, if the gauge measures zero. If not,
☞ adjust the VMF 3/22 to the nominal size selector switch by the X9 sensitivity potentiometer (not necessary for VMF 3/2000 amplifiers)

Indication too high?
Put a test plate onto the lower guide rollers and tip it to both sides as well as forward and backward. The indication should deflect only towards +. If not,
☞ check the complete gauge (measurement tips for wear, C-frame for 90° position and C-frame distortion)

Indication too high?
If the strip breaks or a strip end passes through the gauge, the C-frame is possibly bent. The indication is too high. Check as before and
☞ check the alignment of transducer clamping bores with a 20 mm inspection pin

If the gauge marks the strip?

Diamond with small cracks?
If hit too hard, the diamonds in the transducer measurement tips might get tiny ring-shaped cracks, which are hardly visible. Sometimes such crackles mark the strip
☞ replace the measurement tip

Diamond broken out?
In case of strip breaking the diamonds might break out of the measurement tips.
☞ replace the measurement tip

Roller blocked?
☞ Replace roller. If the roller surface is not damaged, replace only the bearings.
Repairs

Transducer installation

For transducer service or repair (see separate manual) the transducers can easily be removed from their clamping bores in the measurement frame. Take care not to overload the C-frame when undoing the transducer clamp screws. The gauge requires new adjustment and calibration after the transducers were reinstalled.

At first only one transducer is installed and positioned against a Vollmer fine adjustment. It is then used to find the 90° position of the C-frame. After that, the fine adjustment is replaced with the second transducer which is then zeroed by means of the VMF indication. Please do not swap the transducers. Here is the description of the entire procedure:

- Remove or lift the upper guide rollers (by loosening the knobs 46) and put a flat adjustment plate onto the lower guide rollers.
- Insert a fine adjustment into the upper clamping bore of the C-frame and set it in such a way that the measurement frame seems visually to be levelled in the so-called 90° position.
- Now insert the bottom transducer and select the 1000 µm measurement range. If there is a nominal size selector, set it to zero. Push the transducer up into its bore until the amplifier indicates zero and clamp it.

Note

If no fine adjustment is available, use alternatively a square which is put on the gauge and insert a rod of 20 mm diameter into the transducer holes of the measurement frame. Then use set screw 60 to adjust the measurement frame so that the rod is parallel to the perpendicular leg of the square. Put the adjustment plate on the lower guide rollers and insert the bottom transducer after having connected it to the VMF amplifier. Clamp the transducer when it measures zero while the front end of the measurement frame is held down against its bottom limit stop and lock the set screws. Then check the transducer position by tipping the adjustment plate as described below.

- Now tip the adjustment plate on the lower guide rollers to all four directions, see sketch 1 through 4. The indicator must be deflected at any time exclusively towards the + side. If not, the gauge might measure inaccurate.
If "minus" is indicated when the plate is tilted towards the front, the transducer end of the measurement frame is too low.

Loosen the clamp of the bottom side transducer, pull it back for a little, and turn the fine adjustment to set the indication back to zero.

If "minus" is indicated when the plate is tilted towards the back, the transducer end of the measurement frame is too high.

Loosen the clamp of the bottom side transducer, push it up for a little, and turn the fine adjustment to set the indication back to zero.

If "minus" is indicated when the plate is tilted towards one side (sketches 1+2), either the transducer tips are worn or the C-frame is distorted.

If the indication is deflected to minus, theoretically there might be one transducer with a diamond that is not perfectly centred. This is easy to check by turning the transducer clockwise in 90° steps. Then it is easy to check if the error follows in the same direction when tilting the adjustment plate.

Important note

Please do always use a transducer together with its own extension cable, which was individually adjusted to the transducer measurement characteristics. With another cable the gauge accuracy might be affected.

You must always check the transducers for symmetry and correct position after any manipulation at the gauge (see extra manual).
For sum measurement: Loosen the lock nut and turn the screw by its cap until it touches the limit stop without lifting the C-frame (watch the indicator). Then pull out the adjustment plate and watch the C-frame. It must not drop down.

For single measurement: Loosen the lock nut and turn the screw by its cap until it touches the limit stop without lifting the C-frame (watch the indicator). Then turn it back for about half a turn. Now pull out the adjustment plate and watch the C-frame. The front end must drop down for about 1 mm.

After the C-frame is in its 90° position, re-insert the adjustment plate and loosen the clamp of the bottom transducer. Insert the bottom transducer into its holding and push it up against the test plate until the amplifier indicates the required value. That value depends on the type of the gauge (see gauge card in the documentation) and the application:

We marked the paragraph with the optimum values for your application:

- 2 Transducers with 1 mm stroke (20-MUBE-0/20 MOBE-0) and measurement amplifier VMF 3/11 or 3/22 or 3/2000: clamp lower transducer at +500 µm
- 2 Transducers with 1 mm stroke (two 20-MUBE-0) and measurement amplifier VMF 3/11 or 3/22 or 3/2000: clamp lower transducer at +800 µm. If measuring only strip below 1 mm, clamp the lower transducer at +500 µm
- 2 Transducers with 2 mm stroke (series -90 or -92, 20-MUBE/20 MOBE), and measurement amplifier VMF 3/2000: clamp lower transducer at +1000 µm
- 2 Transducers with 2 mm stroke (series -90 or -92, two 20-MUBE), and measurement amplifier VMF 3/2000: clamp lower transducer at +1500 µm. If measuring only strip below 1 mm, clamp the lower transducer at +500 µm

for single measurement (one transducer and one fine adjustment ) there is no further position adjustment of the transducer required, as the transducer has been already clamped in its final position (measuring 0 at the bottom of the adjustment plate).

Then take off the adjustment plate.

Gauges with sum measurement
- select measurement range 10 µm
- for transducers with micrometer fine adjustment: Before inserting, screw the upper part of the transducer clockwise down to the limit stop, and then turn it back for one full turn.
- connect the second transducer and push it into the upper bore against the lower transducer until the measurement amplifier indicates nearly zero. Minor deviations can be eliminated by the zero point potentiometer (VMF 3/11 or 3/22) or the Master key (VMF 3/2000). Set the transducer scale or counter to zero (only for transducers with micrometer fine adjustment).
Gauges with single measurement
- Before inserting, screw the upper part of the fine adjustment clockwise down to the limit stop, and then turn it back for one full turn.
- Push the fine adjustment into the upper bore against the lower transducer until the measurement amplifier indicates nearly zero. Minor deviations can be eliminated by the zero point potentiometer (VMF 3/1 or 3/22) or the Master key (VMF 3/2000). Set the scale or counter of the fine adjustment to zero.

Then check the gauge with a slip gauge. If the error exceeds 1 µm, check the VMF adjustment to the nominal size selector (only for VMF 3/11 or 3/22), the transducer measurement tips and the transducer symmetry.

Symmetry check. If there was any soldering done on the cable or the transducer coil, check the compensation resistor in the transducer cable connector and the VMF phase and sensitivity adjustment. On gauging systems with transducers of the ../90 or 92 series and VMF 3/2000 amplifiers, parts of these procedures are performed automatically (see separate manual).
Personal Notes: