



BOWERS METROLOGY

XT Analogue Internal Micrometer
Operating Instructions

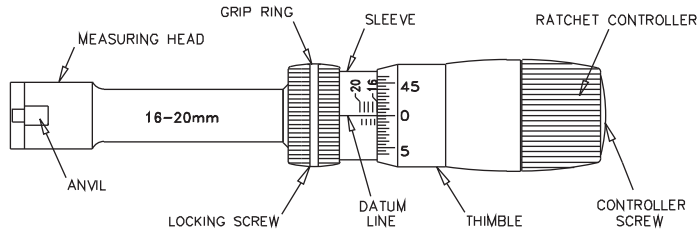
XT Micromètres d'intérieur
Notice d'Utilisation

XT Mechanische
Innenmessschrauben
Bedienungsanleitung

Istruzioni d'uso Micrometri per
Interni Analogici Serie *XT*

Micrometros de Interiores
Analogicos Bowers *XT* A
Manual de instrucciones

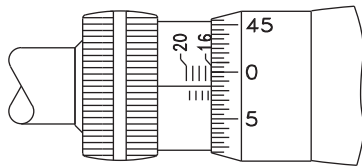
NOMENCLATURE & SETTING INSTRUCTIONS (METRIC)



HOW TO READ...

All metric micrometers are graduated in 0.005mm divisions. The sleeve has a datum line, and the thimble is graduated as illustrated below. The sleeve is graduated in 0.5mm divisions and one complete revolution of the thimble is equal to 0.5mm. To read the instrument, read the size on the sleeve to obtain the nearest half millimetre and to obtain hundredths and microns read the number on the thimble which lines up with the datum line on the sleeve.

An example is illustrated below.



In the illustration above the micrometer reading would be 16.015mm.

EXTENSIONS: When extensions are used for deep hole measurement it will be necessary to reset the instrument as per the resetting instructions below.

RESETTING PROCEDURE...

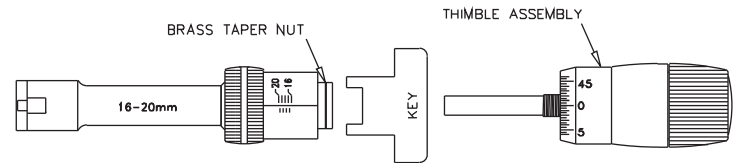
Should the gauge start to lose accuracy due to wear etc., it may be reset as follows :-

- 1) Insert the instrument into the setting ring gauge and set at the correct tightness using the ratchet controller.
- 2) Lock the spindle with the locking screw located through the hole in the grip-ring.
- 3) Loosen the ratchet controller by inserting the allen-key provided into the screw located in the end of the controller and unlock the screw.
- 4) The thimble will now be free and can be rotated and set to the size on the setting ring.
- 5) Re-tighten the controller screw and slacken off the spindle locking screw. The micrometer is now reset.
- 6) Recheck the gauge in the setting ring. Gauge reading should be the same as the setting ring calibrated value.

A KEY IS PROVIDED TO MAKE ADJUSTMENTS OF THE MICROMETER NUT IN THE EVENT OF WEAR.

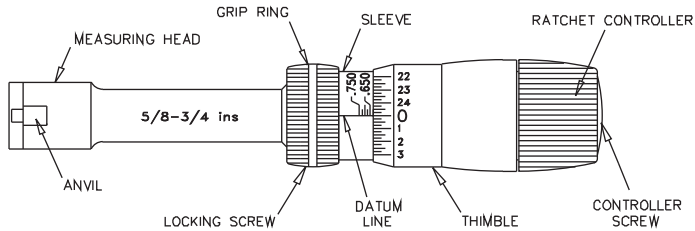
PROCEDURE:-

- 1) Remove the thimble and spindle assembly from the micrometer by completely winding the thimble off the sleeve.
- 2) Locate the key in the slots of the brass nut.
- 3) Make adjustments in very small increments. A clockwise rotation of the brass nut will close the nut to compensate for wear.
- 4) Replace the thimble assembly and recalibrate the gauge as per resetting procedure above.



IMPORTANT NOTE : The anvils have a fixed amount of travel. DO NOT remove anvils from the measuring head.

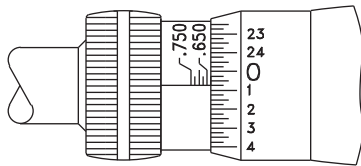
NOMENCLATURE & SETTING INSTRUCTIONS (Inch)



HOW TO READ...

All inch micrometers are graduated in 0.00025" divisions. The sleeve has a datum line, and the thimble is graduated as illustrated below. The sleeve is graduated in 0.025" divisions and one complete revolution of the thimble is equal to 0.025". To read the instrument, read the size on the sleeve to obtain the tenths and hundredths and to obtain thous and tenths of thous read the number on the thimble which lines up with the datum line on the sleeve.

An example is illustrated below.



In the illustration above the micrometer reading would be 0.62575"

EXTENSIONS: When extensions are used for deep hole measurement it will be necessary to reset the instrument as per the resetting instructions below.

RESETTING PROCEDURE...

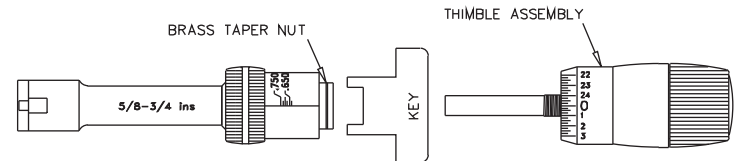
Should the gauge start to lose accuracy due to wear etc., it may be reset as follows :-

- 1) Insert the instrument into the setting ring gauge and set at the correct tightness using the ratchet controller.
- 2) Lock the spindle with the locking screw located through the hole in the grip-ring.
- 3) Loosen the ratchet controller by inserting the allen-key provided into the screw located in the end of the controller and unlock the screw.
- 4) The thimble will now be free and can be rotated and set to the size on the setting ring.
- 5) Re-tighten the controller screw and slacken off the spindle locking screw. The micrometer is now reset.
- 6) Recheck the gauge in the setting ring. Gauge reading should be the same as the setting ring calibrated value.

A KEY IS PROVIDED TO MAKE ADJUSTMENTS OF THE MICROMETER NUT IN THE EVENT OF WEAR.

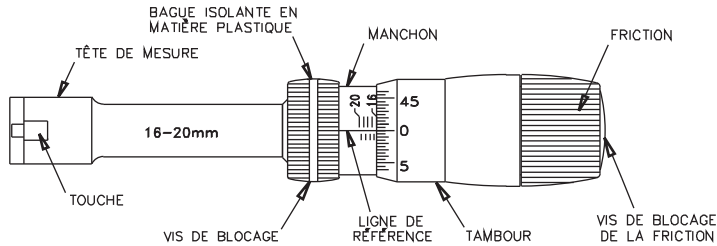
PROCEDURE:-

- 1) Remove the thimble and spindle assembly from the micrometer by completely winding the thimble off the sleeve.
- 2) Locate the key in the slots of the brass nut.
- 3) Make adjustments in very small increments. A clockwise rotation of the brass nut will close the nut to compensate for wear.
- 4) Replace the thimble assembly and recalibrate the gauge as per resetting procedure above.



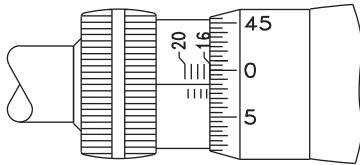
IMPORTANT NOTE : The anvils have a fixed amount of travel. **DO NOT** remove anvils from the measuring head.

NOMENCLATURE ET NOTICE D'UTILISATION POUR MICROMÈTRES D'INTÉRIEUR



LECTURE...

Tous les micromètres en unité métrique ont une résolution de 0.005mm. Un tour du tambour correspond à 0.5 mm. La lecture des centièmes et demi-centièmes s'effectue sur le tambour à l'aide de la ligne de référence placée sur le corps. La lecture des millimètres et demi-millimètres s'effectue sur le corps. Voir dessin ci-dessous.



Sur le dessin la lecture est: 16.015mm

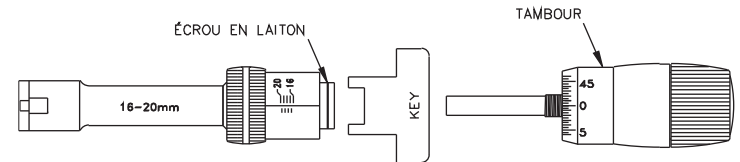
RALLONGE: Il est important de réétalonner le micromètre lorsque l'on utilise une ou plusieurs rallonges pour la mesure de trous de grande profondeur.

ÉTALONNAGE

- 1) Insérer le micromètre dans la bague étalon jusqu'à ce que le micromètre soit immobilisé dans la bague..
- 2) Serrer avec la clé hexagonale la vis située au niveau de la bague isolante en plastique.
- 3) Deserrer d'un tour avec cette même clé la vis située au centre de la friction.
- 4) Le tambour peut être tourné pour la remise à la valeur indiquée sur la bague étalon.
- 5) Rebloquer la vis de la friction.
- 6) Desserrer la vis située au niveau de la bague isolante en plastique.
- 7) Le micromètre est maintenant réétalonné.
- 8) Vérifier l'étalonnage du micromètre dans la bague étalon.

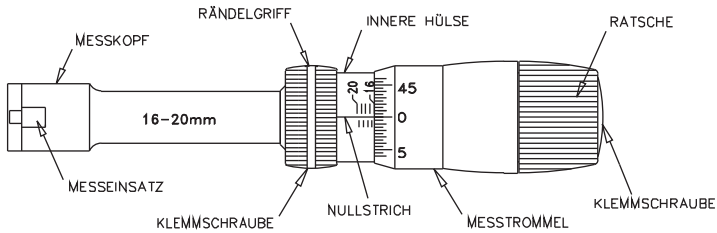
UNE CLÉ SPÉCIALE EST PRÉVUE POUR PERMETTRE DE RATTRAPER LE JEU DE LA VIS MICROMÉTRIQUE (consécutif à une longue utilisation):

- 1) Enlever complètement le tambour
- 2) Introduire la clé spéciale dans les rainures de l'écrou en laiton.
- 3) Serrer légèrement et vérifier que le micromètre n'a plus de jeu. Renouveler l'opération jusqu'à ce que le jeu de la vis micrométrique soit rattrapé.
- 4) Remonter le tambour et réétalonner le micromètre.



IMPORTANT : Les têtes de mesure sont équipées avec des touches fixes. Ne pas démonter les touches

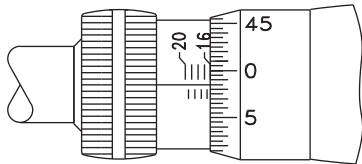
BEDIENUNGSANLEITUNG ZUR MECHANISCHEN INNENMEßSCHRAUBE



Alle Innenmeßschrauben haben einen Skalenwert von 0.005 mm. Die innere Hülse ist mit einem waagerechten Nullstrich sowie mit den 0.5mm Teilstrichen und die Messtrommel mit den Teilstrichen der Feinteilung, wie unten angezeigt, beschriftet. Eine Umdrehung der Messtrommel entspricht einer Messbereichsänderung von 0.5 mm.

Ablesung der Messwerte

Der waagerechte Nullstrich (0.5 mm) kommt zur Deckung mit einem Teilstrich der Feinteilung der Messtrommel: siehe nachstehendes Beispiel:



In diesem Beispiel beträgt der Messwert 16.015 mm

VERLÄNGERUNGEN: Wenn Verlängerungen zur Messung von tiefen Bohrungen eingesetzt werden, muß eine Neueinstellung (wie unten beschrieben) durchgeführt werden.

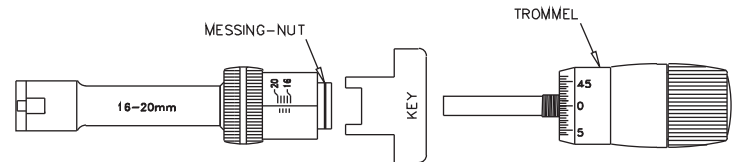
NEUEINSTELLUNG

Sollte die Ablesung aufgrund häufigen Gebrauchs etc. ungenau werden, kann diese wie folgt neu eingestellt werden :

- 1) Innenmessschraube in den Einstellring stellen und mit der Ratsche einige Rasten durchdrehen.
- 2) Spindel anhand der Innensechskantschraube durch festziehen der Feststellschraube im gerändelten Kunststoffring klemmen.
- 3) Ratsche durch lösen der stirnseitigen Innensechskantschraube lockern.
- 4) Die Messtrommel wird hierdurch gelöst und die Innenmessschraube kann auf das Maß des Einstellringes eingestellt werden.
- 5) Schraube an der Ratsche festdrehen, Feststellschraube der Spindel lösen.
- 6) Einstellung im Einstellring prüfen.

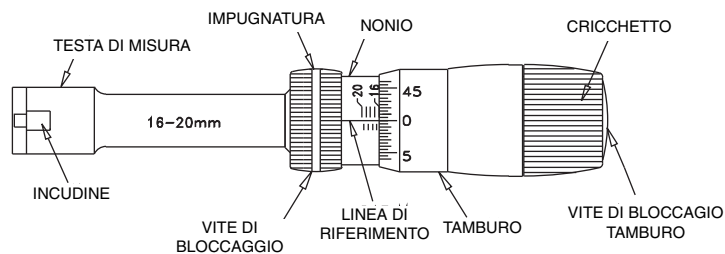
SOLLTE DURCH HÄUFIGEN GEBRAUCH DIE MESSSCHRAUBENSPIDEL SPIEL AUFEZEIGEN, KANN DIES MIT DEM MITGELIEFERTEN SPEZIALSCHLÜSSEL NACHGESTELLT WERDEN:-

- 1) Messtrommel mit Spindel komplett herausrauben.
- 2) Spezialschlüssel in die Messing-Nut stecken.
- 3) Im Uhrzeigersinn vorsichtig drehen (geschlitzte Gewindemutter wird geklemmt).
- 4) Spindel mit Messtrommel wieder einsetzen, eine Neueinstellung durchführen (wie oben beschrieben).



WICHTIG: Die Messköpfe sind mit fixen Messeinsätzen ausgestattet, d.h. die Messeinsätze sind NICHT wechselbar.

NOMENCLATURA E ISTRUZIONI DI TARATURA (micrometri metrici)

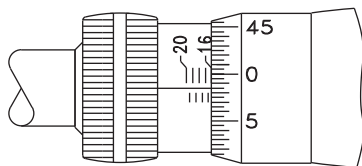


COME LEGGERE....

Tutti i micrometri metrici hanno una divisione del nonio in 0.005 mm.

Il corpo fisso ha una linea di riferimento, ed il tamburo è graduato come indicato nell'illustrazione seguente.

La linea fissa ha graduazioni di 0.5 mm, quindi un giro completo del tamburo corrisponde a 0.5 mm. La lettura del micrometro viene fatta in questo modo: i millimetri ed i decimi vengono letti sulla graduazione della linea fissa, mentre i centesimi ed i micron si leggono sul tamburo



L'illustrazione mostra come esempio una misura di 16.015 mm.

USO DI PROLUNGHE: quando si rende necessario l'utilizzo di prolunghe per misure in fori profondi, è necessario tarare nuovamente lo strumento come descritto in seguito:

TARATURA DEL MICROMETRO....

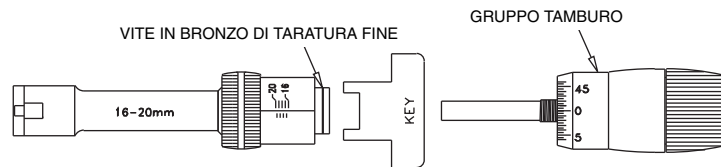
In ogni caso si renda necessario, potere tarare nuovamente lo strumento in questo modo:-

- 1) Inserire il micrometro all'interno dell'anello di taratura e portare a contatto le incudini agendo sul cricchetto.
- 2) Bloccare l'asta interna del micrometro chiudendo il grano posto sul lato del corpo strumento.
- 3) Allentare solamente di poco la vite esagonale posta al centro del cricchetto con l'apposita chiave a brugola.
- 4) Il nonio è ora libero di ruotare ed essere portato al valore corrispondente dell'anello.
- 5) Serrate ora nuovamente la vite in testa e liberate l'asta interna riallentando il grano laterale. Il micrometro è tarato.
- 6) Ricontrollate lo strumento eseguendo una nuova misura nell'anello di taratura, la misura dovrebbe corrispondere.

VIENE FORNITA IN DOTAZIONE ANCHE UNA CHIAVE SPECIALE PER REGISTRARE LA MADREVITE INTERNA IN CASO DI USURA.

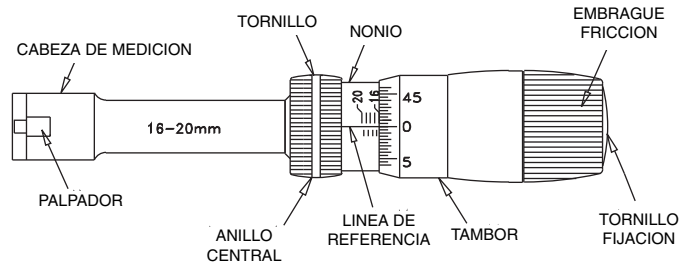
PROCEDURA:-

- 1) Svitare completamente il tamburo dal corpo del micrometro ed estrarlo.
- 2) Posizionare la chiave speciale negli inserti della vite in ottone.
- 3) Eseguire la registrazione con rotazioni minime. Ruotando in senso orario la vite in ottone tenderà a chiudersi, recuperando eventuali giochi.
- 4) Rimontare il tamburo sul corpo strumento ed eseguire una nuova taratura come descritto precedentemente.



NOTA IMPORTANTE: L'escursione delle incudini NON può essere modificata. Le incudini NON possono essere rimosse dalla testa.

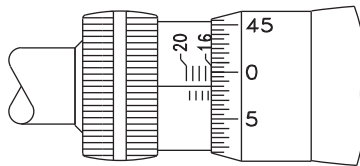
NOMENCLATURA E INSTRUCCIONES DE AJUSTE



LECTURA...

Todos los micrómetros métricos están graduados en divisiones de 0,005 mm. El husillo tiene una línea de referencia y el tambor está graduado como muestra la siguiente figura. El husillo está graduado en divisiones de 0,5 mm y una vuelta completa del tambor equivale a 0,5 mm. Para realizar la lectura, lea el número del husillo para obtener el medio milímetro más próximo y para centésimas y micras lea el dígito del tambor que coincida con la línea de referencia del husillo.

Un ejemplo:



En la figura la lectura del micrómetro es 16,015 mm.

ALARGADERAS: Cuando se empleen alargaderas para medición de agujeros más profundos, es necesario poner a cero el instrumento como indican las siguientes instrucciones.

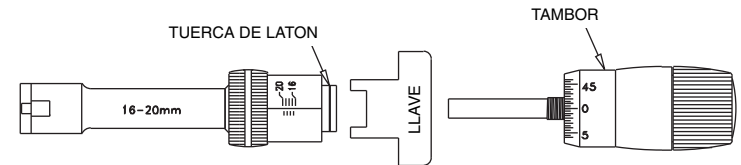
PUESTA A CERO...

Si el micrómetro comienza a perder precisión debido al desgaste, etc ajústelo como sigue:-

- 1) Introduzca el micrómetro en el anillo patrón adecuado y realice una medición usando el embrague de fricción.
- 2) Bloquee el eje con el tornillo situado en el anillo central.
- 3) Afloje el embrague de fricción insertando la llave allen suministrada en el tornillo de la parte trasera del embrague.
- 4) Ahora el tambor gira libre y puede posicionarlo correctamente en la dimensión exacta del anillo patrón.
- 5) Vuelva a apretar el tornillo del embrague de fricción. El micrómetro ya está ajustado.
- 6) Vuelva a comprobar la dimensión del anillo.

UNA LLAVE ESPECIAL SE SUMINISTRA PARA PERMITIR REAJUSTAR EL JUEGO DEL HUSILLO

- 1) Retirar el tambor completamente.
- 2) Introduzca la llave especial en las ranuras de la tuerca de latón.
- 3) Apriete suavemente en pequeños incrementos. Repita la operación hasta que el juego del husillo desaparezca..
- 4) Vuelva a montar el tambor y a calibrar el micrómetro.



NOTA IMPORTANTE: Los micrómetros de interiores BOWERS de la serie XTA llevan palpadores fijos. **NUNCA** intente retirarlos ya que invalidaría el certificado y las mediciones serían erróneas.



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