



## Introduction

Read this User's Manual thoroughly before using the gage. After reading, retain it close at hand for future reference.

### 1. Safety Precautions

**CAUTION** • Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.

### 2. On Various Types of Notes

**IMPORTANT** • An important note provides information essential to the completion of a task.  
• An important note is a type of precaution, which if neglected could result in a loss of data, decreased accuracy or instrument malfunction/failure.

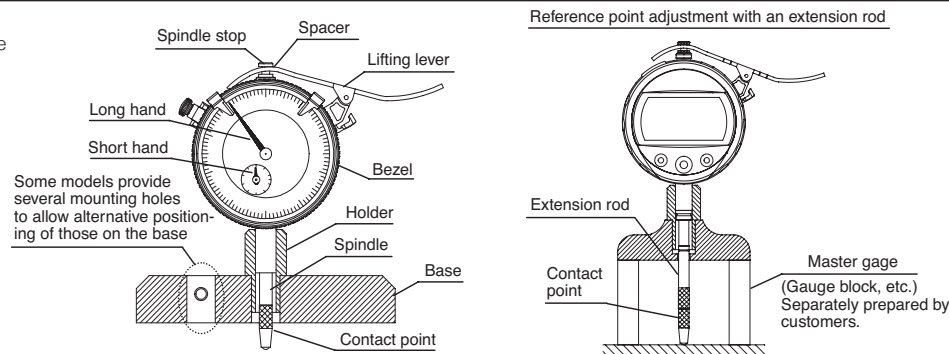
**NOTE** • A note emphasizes or supplements important points of the main text.

### 3. Operating Environment

**IMPORTANT** • Use the gage in an environment with a temperature of 0 to 40°C and a relative humidity of 30 to 70%.  
• Avoid sudden changes in temperature. Condensation may negatively affect the performance of the gage.  
• Use the gage in a place with minimal exposure to dust, oil, and oil mist.  
• Use the gage in a place out of direct sunlight.

### 4. Name of each part

\*The appearance of a gage varies with the model.



### 5. Specifications

Code No.	Measuring Range (Individual Indicator)	Accuracy	Indicator	Graduation	Contact point	Extension Rods	Base Length/Width (Diameter)	Flatness of the Base	Remarks
7210	0 to 10 mm (10 mm)	±15 µm	2902SB for depth gage	0.01 mm	Needle contact point	—	40×16 mm	5 µm	With Lifting Lever
7211	0 to 200 mm (10 mm)								
7212	0 to 210 mm (30 mm)								
7214	0 to 210 mm (30 mm)								
7220	0 to 200 mm (10 mm)	±15 µm	2902SB for depth gage	0.01 mm	Needle contact point	10.20,30,30,100 mm	83.5×16 mm	5 µm	2 mounting positions for indicator With lifting lever
7221	0 to 200 mm (10 mm)								
7222	0 to 10 mm (10 mm)								
7223	0 to 10 mm (10 mm)								
7224	0 to 200 mm (5 mm)								
7231	0 to 200 mm (5 mm)								
547-211	0 to 200 mm (12.7 mm)								
547-212	0 to 200 mm (12.7 mm)								
547-251	0 to 200 mm (12.7 mm)								
547-252	0 to 200 mm (12.7 mm)								
7217S <sup>*</sup>	0 to 8" (2")	±0.002"	2904SB for depth gage	.001"	Sø3 carbide contact point	1.2, 4"	2.5×83 <sup>1)</sup>	.0002"	With Lifting Lever With spare contact point
7218S <sup>*</sup>	0 to 8" (2")								
7237 <sup>**</sup>	0 to 8" (2")								
7238 <sup>**</sup>	0 to 8" (2")								
547-217S	0 to 8" to 200 mm (5/12.7 mm)								
547-218S	0 to 8" to 200 mm (5/12.7 mm)								
547-257S	0 to 8" to 200 mm (5/12.7 mm)								
547-258S	0 to 8" to 200 mm (5/12.7 mm)								
547-211	0 to 200 mm (12.7 mm)								
547-212	0 to 200 mm (12.7 mm)								
547-251	0 to 200 mm (12.7 mm)								
547-252	0 to 200 mm (12.7 mm)								

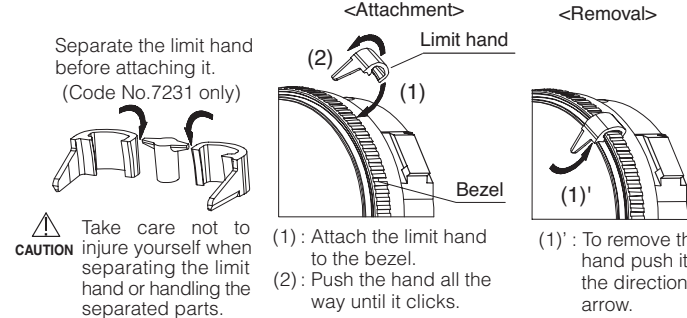
\*1 During normal measurement at 20°C, excluding quantizing error (±1 count).  
\*2 Limit hand is included in No.7217S, No.7218S, No.7237T, No.7238T.

**CAUTION** • Needle contact points are very sharp. Be extremely careful to avoid personal injury when using them.  
• Contact points are easily damaged by impact. Avoid dropping onto, or causing collision with, other objects.

### 6. Notes on Use

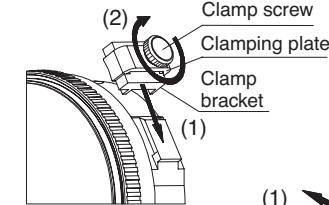
**IMPORTANT** • Read together with the Dial Indicator (or Digimatic Indicator) User's Manual attached.  
• Do not suddenly activate the spindle or apply an excessive horizontal load.  
• Be sure to check the accuracy of gage if it has been dropped or otherwise subjected to shock.  
• Ensure that the spindle and hands operate smoothly. Also check that the digital display is working properly.  
• Ensure that the contact point and screws are not loose.  
• Regularly check and adjust the reference point when using the gage in a place subject to temperature variation.  
• A resin spacer is in the sliding part of a lifting lever. This spacer supports the movement of the lifting lever so that it should not be removed.  
• If the total length of the extension rod exceeds 110mm (4.5"), use the instrument in a vertical position (contact point downward).

### 7. Attaching and Removing Limit Hand (Dial Type Only)



### 8. Attaching Bezel Clamp (Dial type except for 7231, 7237T, 7238T)

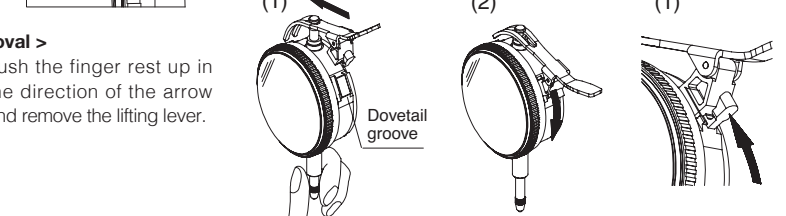
**<Attachment>**  
(1) Insert clamp bracket in the dovetail groove.  
(2) Fix with clamp screw.



**NOTE** Take note that clamp may loosen or fall off under vibration.

### 9. Attaching and Removing the Lifting Lever

**<Attachment>**  
(1) Lift the spindle and fit the forked end of the lifting lever to the spindle stop under the spacer.  
(2) Fit the lifting lever into the dovetail groove and fix in position by pushing down in the direction of the arrow.  
**<Removal>**  
(1) Push the finger rest up in the direction of the arrow and remove the lifting lever.



### 10. Instructions for Use

- If necessary, shift the mounting position of the extension rod and the dial gage.
- Wipe the contact point and the base surface to remove any dust.
- Set the reference point.  
Place the base surface on the flat surface such as a measuring table and slide it several times. (Use a master gage or Gauge blocks, etc. when the extension rod is attached.)
  - Dial type gage ..... Adjust the longer hand so that it points to the zero graduation mark by rotating the bezel.
  - Digital type gage ..... Press the SET button. (This is useful when a master gage is used because the absolute measurement value can be automatically displayed by using the PRESET function. See the Digimatic Indicator User's Manual for details of the PRESET function.)

Apply the base surface on the flat surface (or master gage) several times to check if the reference point has not shifted. If it has, reset and check again. Repeat until the reference point is stable.

4) Apply the base surface on the workpiece to make the measurement.  
If depth gage has a lifting lever, use the lever to slowly bring the contact point into contact with the workpiece.

Read the gage after ensuring that the indicated value is stable.

**NOTE** • If a master gage is used to set zero, the measured dimension will be the sum of the indicated value and the master gage dimension. (It can not be applied when using the PRESET function.)

### <<Reference>> Tolerance judgment

It is possible to set the depth gage to indicate whether the measured dimension is within tolerance as follows:  
• Dial type gage ..... Set the tolerance by attaching a limit hand to the positions of the upper and lower limit values. Judge whether the workpiece dimensions are within the tolerance range by determining whether the long hand points within the allowable range indicated by the limit hands when the workpiece is measured. Be aware of the value indicated by the short hand to avoid misreading one rotation of the long hand.  
• Digital type gage ..... Set the tolerance by using the tolerance setting function. Judge whether the workpiece dimensions are within the tolerance range via the symbol that is displayed when the workpiece is measured. (See the Digimatic Indicator User's Manual for details of the tolerance setting function.)

### 11. Maintenance and Repairs

**IMPORTANT** • Remove dirt or dust from the sliding surface of the spindle using a dry cloth or a cloth to which a small amount of alcohol has been applied.  
• Remove dirt or dust on the bezel or digital display surface using a soft dry cloth or a cloth to which a neutral detergent has been applied.  
Do not use substances other than a neutral detergent to clean the bezel or digital display surface.  
• Apply an anti-rust oil containing a small amount of anti-rusting agent to the base contact surface before storing the gage.  
• The performance deterioration of this gage differs greatly depending on the usage conditions. Customers are therefore advised to establish in-house standards that take into consideration the actual usage frequency, environment and measurement methods and perform regular maintenance checks on the gage based on these standards.  
• Mitutoyo does not guarantee the performance of this gage if repair or disassembly has been performed by other than Mitutoyo.

# 深度計（指示式 / 數位式）

**簡介**  
使用測量儀前請詳閱本使用手冊。詳閱後將本手冊存放於易取之處。

### 1. 安全注意事項

**注意** • 指示存在安全隱憂，若不加以避免定會導致重大傷亡。

### 2. 各種類型的備註

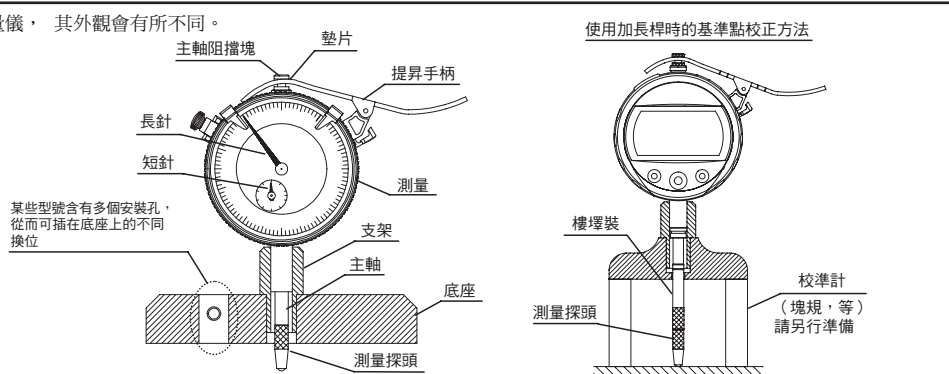
**重要** • 重要備註提供完成各項工作所需資訊。  
**資訊** • 重要備註也是一類注意事項，若忽視定會導致資料遺失、精確度下降或者設備失靈 / 故障。  
**備註** • 強調或補充說明主文字重要性的備註。

### 3. 工作環境

**重要** • 在溫度為 0 至 40°C，相對濕度為 30 至 70% 的環境下使用測量儀。  
**資訊** • 避免突然升降溫度。凝結水珠會對測量儀的效能產生負面影響。  
• 儘量在塵埃、油和油霧含量少的場所使用測量儀。  
• 請勿在陽光直射的地方使用測量儀。

### 4. 部件名

\* 不同型號的測量儀，其外觀會有所不同。



### 5. 規格

代號	測量範圍 (單指示器)	精確度	指示器	刻度	測量探頭類型	加長杆	底座長度×寬度 (直徑)	底座的平坦度	說明
7210	0 至 10 mm (10 mm)	±15 µm	深度計用 2902SB	0.01 mm	Sø3 硬質合金球	—	40×16 mm	5 µm	帶提昇手柄
7211	0 至 200 mm (10 mm)								
7212	0 至 210 mm (30 mm)								
7214	0 至 210 mm (30 mm)								
7220	0 至 200 mm (10 mm)	±15 µm	深度計用 2902SB	0.01 mm	Sø3 硬質合金球	10.20,30,30,100 mm	83.5×16 mm	5 µm	指示器的 2 個安裝位置 帶提昇手柄 指示器的 3 個安裝位置 帶提昇手柄
7221	0 至 200 mm (10 mm)								
7222	0 至 10 mm (10 mm)								
7223	0 至 10 mm (10 mm)								
7224	0 至 200 mm (5 mm)								
7231	0 至 200 mm (5 mm)								
547-211	0 至 200 mm (12.7 mm)								
547-212	0 至 200 mm (12.7 mm)								
547-251	0 至 200 mm (12.7 mm)								
547-252	0 至 200 mm (12.7 mm)								
7217S <sup>*</sup>	0 至 8" (2")	±0.002"	深度計用 2904SB	.001"	Sø3 硬質合金球	1.2, 4"	2.5×83 <sup>1)</sup>	.0002"	帶備用測量探頭
7218S <sup>*</sup>	0 至 8" (2")								
7237 <sup>**</sup>	0 至 8" (2")								
7238 <sup>**</sup>	0 至 8" (2")								
547-217S	0 至 8" 至 200 mm (5/12.7 mm)								
547-218S	0 至 8" 至 200 mm (5/12.7 mm)								
547-257S	0 至 8" 至 200 mm (5/12.7 mm)								
547-258S	0 至 8" 至 200 mm (5/12.7 mm)								
547-211	0 至 200 mm (12.7 mm)								
547-212	0 至 200 mm (12.7 mm)								
547-251	0 至 200 mm (12.7 mm)								
547-252	0 至 200 mm (12.7 mm)								

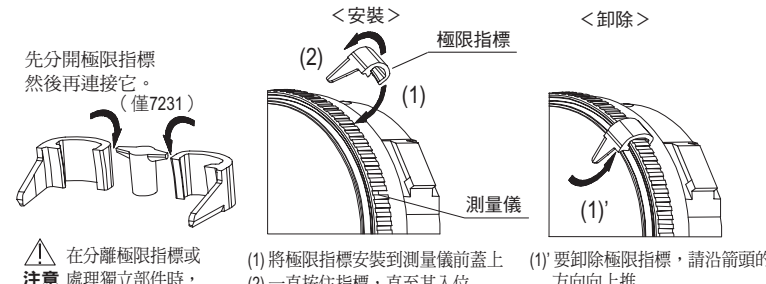
\*1 在 20°C、通常測量時，不包含量子化誤差 (±1 計數)。  
\*2 不對軟線指標—代號 7217S、7218S、7237T、7238T。

**注意** • 針式測量探頭非常鋒利。在使用時要特別小心，以免造成人員傷害。  
• 撞擊容易使測量儀探頭損壞。避免跌落至其他物體上面或者與其他物體碰撞。

### 6. 使用注意事項

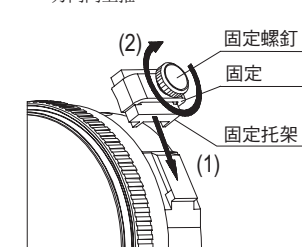
**重要** • 請附隨的指示式 (或數位式) 測量儀的用戶手冊一同閱讀。  
**資訊** • 切勿突然啟動主軸或增加額外的水平負荷。  
• 若測量儀跌落到受到衝擊，請務必檢查其精確度。  
• 確保主軸和探針平穩的運動。同時檢查數位顯示螢幕是否正常工作。  
• 確保測量探頭和螺絲均無鬆動。  
• 在溫度變化的場所使用測量儀時，請定期檢查並調較基準點。  
• 帶提昇手柄的測量儀，其提昇手柄的滑動部分有一個塑膠墊片。此墊片用於輔助提昇手柄的移動，所以不應將其卸除。  
• 延長杆的長度合計在 110mm 以上的情况下，請使用直立姿勢 (測針向下)。

### 7. 安裝和卸除極限指標 (僅指示式)



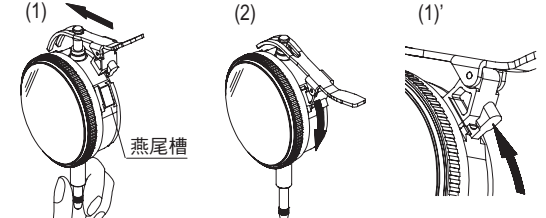
### 8. 安裝測量儀前蓋夾 (僅 7231, 7237T, 7238T 以外的指示式)

**<安裝>**  
(1) 將固定托架插入燕尾槽中。  
(2) 用夾螺絲固定。  
**注意** 在水平使用指示式測量儀時，請注意固定螺絲可能會鬆動並跌落 (因為震動等)。



### 9. 安裝和卸除極限指標

**<安裝>**  
(1) 極起主軸並將提昇手柄開叉的一端裝到墊片下面的主軸阻擋塊上。  
(2) 將提昇手柄裝入燕尾槽中，並朝箭頭方向向下按將其固定到位。  
**<卸除>**  
(1) 用其餘的手指沿箭頭指向上推，然後將提昇手柄卸下。



### 10. 使用說明

- 若有必要，將加長杆和刻度盤的安裝位置對調。
  - 擦拭測量探頭和底面以除去灰塵。
  - 執行基準點設定時，首先將底座置於平坦表面，例如測量臺上，並將其滑動幾次。(在安裝了加長杆時，使用校準計或塊規等)。
    - 指示式測量儀 . . . . . 旋轉測量儀前蓋調針指向零刻線標記。
    - 數位式測量儀 . . . . . 按下 SET 按鈕。(在使用校準計時它很有用，因為可透過使用 PRESET 功能自動顯示絕對測量值。要獲得有關 PRESET 功能的詳情，參閱《數位式測量儀使用手冊》。
  - 將底座 (或校準計) 防盜平面上幾次，檢查基準點是否變化。若變化了，請重新設定並再次檢查。重複以上操作直到基準點穩定為止。
- 將底座置於工件之上進行測量。  
若深度計有提昇手柄，使用手柄慢慢地將測量探頭和工件接觸。  
確保在示值穩定之後讀取測量值。

**備註** • 若使用校準計執行基準點設定，則測量尺寸是示值和校準計尺寸之和。這種情況在使用 PRESET 功能時不適用。

### 《參照》公差判斷

可以設定深度計指示測量的尺寸是否在公差範圍內，如下所示：  
• 指示式測量儀 . . . . . 將極限指標安裝到測量儀前蓋上，標記公差極限的位置。若在測量工件時長針指向極限指標之間，工件尺寸在公差範圍內。應清楚短針的位置，以免讀錯長針的轉數。  
• 數位式測量儀 . . . . . 使用公差設定功能設定公差。若在測量工件時顯示相應的符號，工件尺寸會在公差範圍內。(要獲取有關公差設定功能的詳情，請參閱《數位式測量儀使用手冊》。)

### 11. 維護和維修

**重要** • 使用一塊乾燥的布或加有少量酒精的布擦去主軸滑動表面的灰塵。  
**資訊** • 使用一塊軟布或加有中性的清潔劑的布擦去測量儀前蓋或數位顯示螢幕上的灰塵。  
• 切勿使用非中性的清潔劑清潔測量儀前蓋或數位顯示螢幕的表面。  
• 在存放底座前，請在底座接觸面上塗上少量防銹油。  
• 本測量儀的效能退用情況視使用情況而定。因此建議客戶制定內部標準，考慮實際使用頻率、環境和測量方法，並根據這些標準對測量儀進行定期的維護檢查。  
• 若本測量儀由非 Mitutoyo 員工的其他人員維修或拆卸，Mitutoyo 不擔保本測量儀的效能。