

# SUPER TYPE PILLAR FITTING

## INSTRUCTION MANUAL

This instruction manual contains safety information.  
Please read this manual carefully to ensure safe and  
correct use of the product.  
This manual should be kept readily accessible for  
reference.

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# Preface




Thank you very much for purchasing the Super Type Pillar Fitting.  
 This instruction manual describes the structure, specifications, and installation, inspection and maintenance procedures of the product.  
 Please read this manual carefully to ensure safe and efficient use of the product.



## Safety Notices













The following lists safety notices which must be observed to ensure safe and proper use of the product and prevent personal injury and/or property damage.

Because these safety notices contain important information, be sure to read and observe them.

In this manual, safety notices are divided into “Danger”, “Warning” and “Caution” according to the hazard level.

 DANGER	A danger notice with this symbol indicates an imminently hazardous situation which, if avoided, will result in death or serious personal injury.
 WARNING	A warning notice with this symbol indicates a potentially hazardous situation which, if avoided, could result in death or serious personal injury.
 CAUTION	A caution notice with this symbol indicates a potentially hazardous situation which, if avoided, may result in personal injury and/or property damage.

	This symbol indicates prohibition.
	This symbol conveys mandatory action or provides an instruction.

 WARNING	Liquid leakage	<b>Be sure to follow instructions in this manual when installing, retightening, reinstalling the fitting.</b> Poor installation or retightening may cause the liquid to leak or the fitting to uncouple from tubing.	
		<b>Do not retighten the fitting while tubing is in high-temperature or pressurized conditions.</b> Doing so may deform or damage the fitting, resulting in a spout of the liquid. Before retightening the fitting, be sure to lower the temperature to 30 °C (86°F) or less and reduce the pressure to 0 MPaG (0 psiG).	
		<b>The fitting is made of resin. Exercise great care to avoid bending or tensile stress to the fitting when or after tightening it.</b> Doing so may deform or damage the fitting, resulting in liquid leakage.	
		<b>Do not use the fitting beyond the working range specified in this manual.</b> Doing so may cause the liquid to leak or the fitting to uncouple from tubing.	
 CAUTION	Installation work	<b>Never use the Super Type Pillar fitting in combination with other fittings.</b> Doing so may cause the liquid to leak or the fitting to uncouple from tubing.	
		<b>When the liquid temperature is 70 °C (158 °F) or higher, protect the fitting and tubing with a cover or other suitable means.</b> Otherwise, a burn may result.	
		<b>Exercise great care to avoid a burn during the tube flaring process.</b> The tube flaring process involves preheating of tubing.	
		<b>Maintain good ventilation during the tube flaring process.</b> Preheating of tubing could generate toxic gases.	
	Disposal	<b>Do not dispose of the fitting with a liquid residue remaining in it.</b> Be sure to wash a liquid residue inside the fitting and then dispose of the fitting as incombustible waste. Disposal of the fitting without washing a liquid residue may be hazardous.	
<b>Do not incinerate fitting parts.</b> Incineration of fluoro-resin parts will generate toxic smoke.			

- After installing the fitting, keep this manual readily accessible for future reference

# 1 Structure and Specifications of Super Type Pillar Fitting

## 1-1 Structure

- The super type pillar fitting consists of a body, sleeve and union nut.

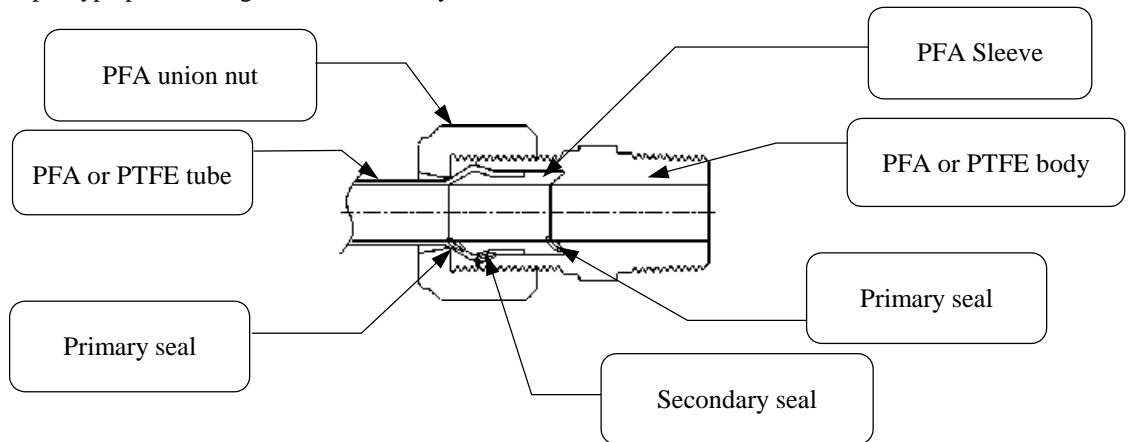


Figure 1. Structure of super type pillar fitting

## 1-2 Specifications

- Applicable tube material : PTFE, PFA,
- Max. working temperature : 200 °C (392 °F)
- Max. working pressure : 0.7 MPaG (101.5 psiG)  
When the liquid temperature is 60°C (140 °F) or higher, the max. working pressure decreases by 0.032 MPaG (4.64 psiG) every 10 °C (18 °F) increase in liquid temperature. See Figure 2 below.
- Permissible ambient temperature : -15 to +60 °C (5 to 140 °F)

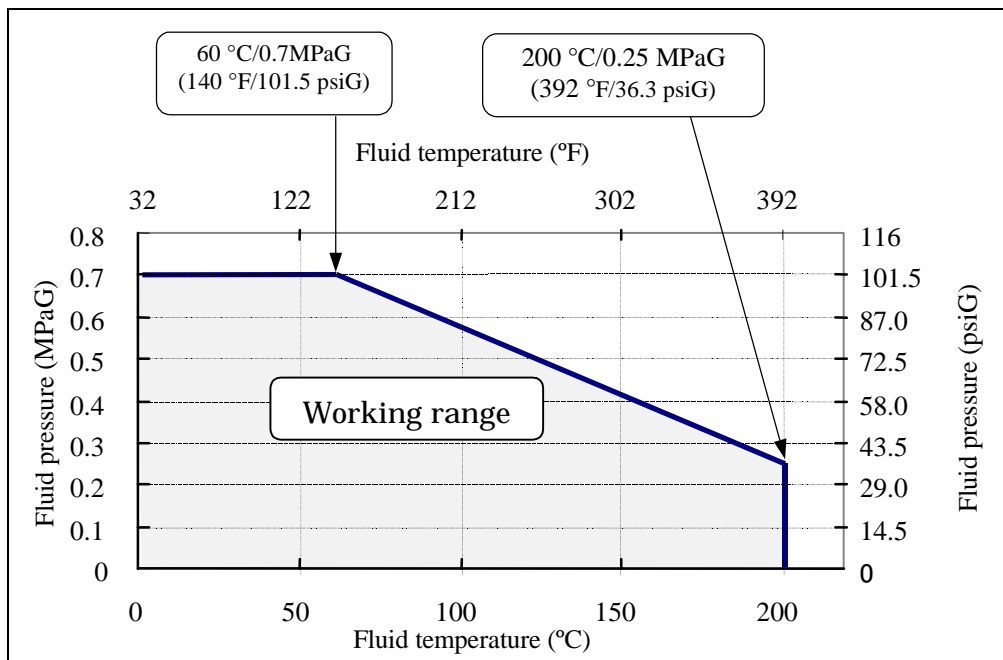


Figure 2. Specifications of super 300 type pillar fitting

## 1-3 Handling precautions

- Use the super type pillar fitting for liquids only.
- When using a solvent to clean the components, dry them well before use or installation.

## 2 Cutting of Tube and Insertion of Sleeve

### 2-1 Cutting a tube

- Cut a tube to the standard cut length according to Table 1 and put the union nut onto the tube.
- When the tube is to be anchored at its both ends (i.e., the fittings installed on the both ends of the tube are to be fixed to a wall or the like), cut the tube to the standard cut length exactly or with a margin of approx. 1% of the length. (Tube length = Standard cut length x 1.01)
- When the tube is used in high temperature conditions, the margin should be approx. 3%. (Tube length = Standard tube length x 1.03)
- If the tube is shorter than the standard cut length, tensile force may be applied to the tube, resulting in leakage of the liquid.
- The standard cut length means the length between bodies (Figure 3) plus the additional length (Table 1). When the tube is anchored at its both ends or used in high temperature conditions, choose the cut length according to the instructions shown above.
- Cutting the tube to a minimum cut length (Table 1) results in the tube arrangement having no gap between the union nuts.

Table 1. Standard cut length of tubes

Millimeter size	Tube size, OD × ID (mm)							
	3×2	4×3	6×4	8×6	10×8	12×10	19×15.8	25×22
Inch size	3.18×2.18	-	6.35×3.95 6.35×4.35	-	9.53×6.33 9.53×7.53	12.7 × 9.5	19×15.8	25.4×22.2
Minimum length between fitting bodies	12	11	14	17	20	21	28	31
Additional length	10	13	18	17	20	25	30	43
Minimum cut length	22	24	32	34	40	46	58	74

**Standard cut length = Length between fitting bodies + Additional length**

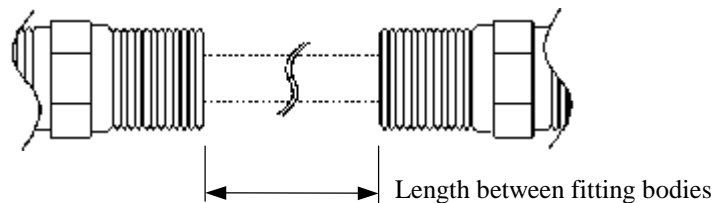


Figure 3. Length between fitting bodies

#### Notes:

- Cutting the tube to a length shorter than the minimum cut length will disable the pillar fittings to be correctly connected to the tube.
- When the tube is to be anchored at its both ends, cut the tube to the standard cut length with a margin of approx. 1% of the length. (Tube length = Standard cut length x 1.01)
- When the tube is used in high temperature conditions, the margin in cut length should be approx. 3%. (Tube length = Standard cut length x 1.03)
- The union nut is direction sensitive (refer to Figure 4). If the union nut is in the incorrect direction, the sleeve of the pillar fitting cannot be engaged in the union nut.

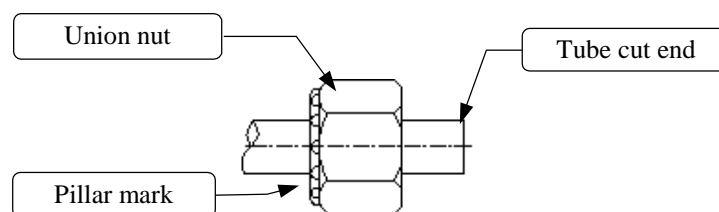


Figure 4. Direction of the union nut on the tube

## 2-2 Inserting the sleeve into the tube

Insert the sleeve of the super type pillar fitting into the tube according to Table 2.  
For details on how to insert the sleeve into the tube using insertion tools, refer to Chapter 4.

Table 2. Insertion methods and applicable tube sizes

Insertion method		Tool type	Tube size OD × ID (mm)	Reference page
Cold insertion	Large size tube	JT-A4	10×8 <sup>Notes</sup> , 12×10, 19×15.8, 25×22, 9.53×6.33, 9.53×7.53, 12.7×9.5, 25.4×22.2	10
	Small size tube	JT-C3	3×2, 4×3, 6×4, 8×6, 3.18×2.18, 6.35×3.95, 6.35×4.35, 9.53×7.53	12
			10×8, 9.53×6.33	15
Cold insertion in tight workspace	Large size tube	JT-SA (ST-SA)	19×15.8, 25×22, 25.4×22.2	18
	Small size tube	JT-SB (ST-SB)	3×2, 4×3, 6×4, 8×6, 10×8, 3.18×2.18, 6.35×3.95, 6.35×4.35, 9.53×6.33, 9.53×7.53, 12.7×9.5	18
Hot insertion		ST-H, ST-FH	All sizes	20

### Notes:

- Insertion tools of types JT-A4, JT-C3, JT-SA and JT-SB are improvements of types JT-A3, JT-C2, ST-SA and ST-SB respectively. The operation procedures of the new tools are basically the same as those of the old ones.
- Type JT-C3 can also be used for cold insertion of 10x8, 9.53x6.33, 9.53x6.53 mm tubes.

## 2-3 Cautions in inserting the sleeve into the tube

- Exercise care to prevent oil from adhering to the tube and sleeve. If oil is adhered to the tube or sleeve, wash it away with a solvent and then dry the tube or sleeve well before insertion.
- Exercise care to avoid entering dust or foreign matters between the tube and sleeve.
- Exercise care to avoid damage to the sleeve when inserting it into the tube.
- Stop inserting the sleeve into the tube when the tube reaches the tube stop of the sleeve. (Figure 5)  
Excessive force may deform the tube.

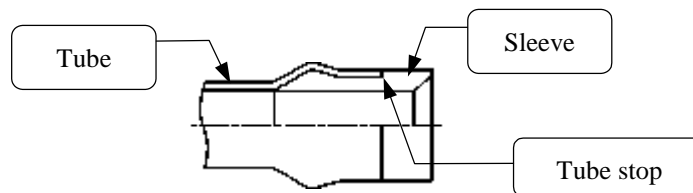


Figure 5

- A gap could remain between the tube and the tube stop of the sleeve when the sleeve is inserted into the tube. In such a case, insert the sleeve into the tube until the gap is smaller than a half of the straight section on the sleeve. (Figure 6)  
The gap to this extent will cause no trouble.

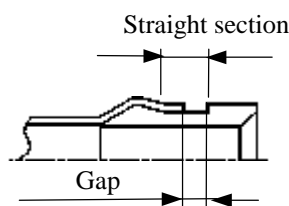


Figure 6

### 3 Tightening

#### 3-1 Cautions in tightening the union nut

- The gap between the union nut and the fitting body serves as a criterion for proper tightening of the union nut.
  - The gap is divided into types A and B depending on the shape of the fittings. Table 3 shows the upper and lower limits of the gap types A and B for each tube size and the gap gauges needed to measure the gap.
- 1) Upper limit: Represents the max. gap needed for the fitting to work well.
  - 2) Lower limit: Represents the min. gap. When the gap is smaller than the lower limit, the fitting (with its union nut and sleeve) needs to be replaced.
  - 3) Type A: Applies to injection-molded fittings of straight type and machined PTFE fittings. (Figure 7)
  - 4) Type B: Applies to injection-molded fittings of elbow and Tee type. (Figure 7)

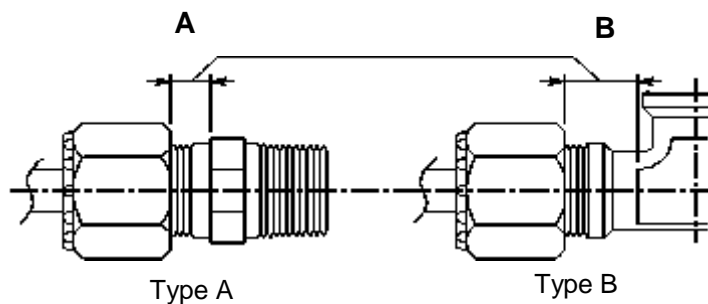


Figure 7. Gaps as criterion for tightness check

Table 3. Limits of gaps

Tube size OD × ID (mm)		Marking on gap gauge	Gap (in mm)			
Millimeter size	Inch size		Type A		Type B	
			Upper limit	Lower limit	Upper limit	Lower limit
3×2	3.18×2.18	3, W1	3.0	2.2	6.4	5.6
4×3	–	4	3.6	2.8	7.0	6.2
6×4	6.35×3.95	6, W2, W2Y	5.6	4.8	9.6	8.8
	6.35×4.35					
8×6	–	8	5.4	4.1	10.7	9.4
10×8	–	10	6.2	5.5	9.8	9.1
–	9.53×6.33	W3	6.8	6.2	10.4	9.8
–	9.53×7.53	W3Y	7.5	6.5	11.1	10.1
12×10	12.7×9.5	12, W4	5.2	3.4	12.2	10.4
19×15.8	19×15.8	19, W6	10.0	8.2	16.3	14.5
25×22	25.4×22.2	25, W6	8.6	5.6	13.6	10.6

**Notes:**

- **To check the gap, use gap gauges (feeler gauges) as shown in Section 3-2.**
- **On the longer thread of the panel mount union, the gap cannot be used as a criterion for tightness.**  
**In this case, tighten the union nut firmly by hand and then tighten it one turn with a wrench.**  
**For a special size tube where the gap cannot be used as a criterion for tightness, tighten the union nut in the same manner.**

### 3-2 Checking the tightness of the union nut

- To check the tightness of the union nut, use gap gauges shown in Table 4.
- Using the gray part of gap gauges permits you to check the gap for upper limit. The red part of gap gauges is for checking the gap for lower limit. Determine whether or not a gap gauge can be inserted in the gap, as shown in Figure 8.

(1) Checking the gap for upper limit:

As shown in Figure 8, try to insert the gray part of the gap gauge in the gap between the fitting body and the union nut to **make sure the gray part cannot be inserted**. If the gray part can be inserted, tighten the union nut until the gauge cannot be inserted in the gap.

(2) Checking the gap for lower limit:

Try to insert the red part of the gap gauge in the same manner to **make sure the red part can be inserted**. If the red part cannot be inserted in the gap, the fitting has already exceeded its service life. Replace the fitting immediately.

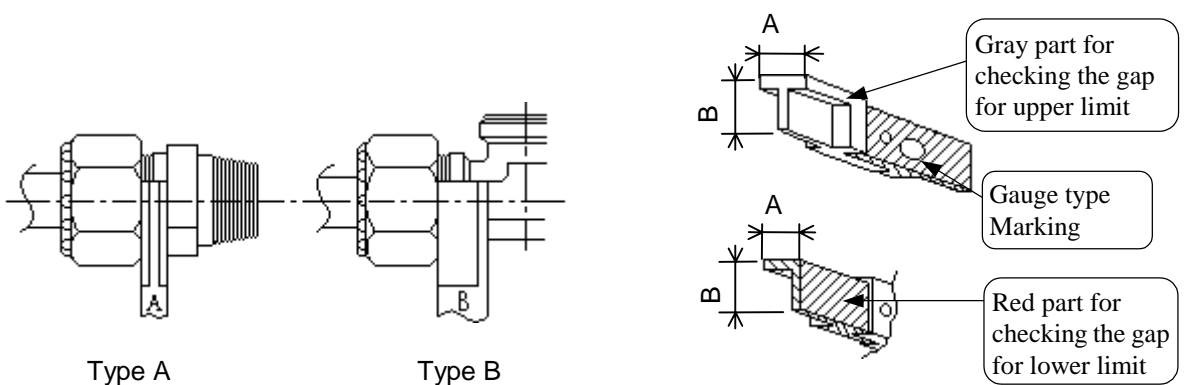


Figure 8. How to use gap gauge

Table 4. Gap gauges and applicable tube sizes

Gage type	Applicable tube (millimeter size)		Applicable tube (inch size)	
	Nominal size	OD x ID	Nominal size	OD x ID
SSG-3 (W1)	3	3 × 2	W1	3.18 × 2.18
SSG-4	4	4 × 3	-	-
SSG-6 (W2)	6	6 × 4	W2	6.35 × 3.95
			W2Y	6.35 × 4.35
SSG-8	8	8 × 6	-	-
SSG-10	10	10 × 8	-	-
SSG-W3	-	-	W3	9.53 × 6.33
SSG-W3Y	-	-	W3Y	9.53 × 7.53
SSG-12 (W4)	12	12 × 10	W4	12.7 × 9.5
SSG-19 (W6)	19	19 × 15.8	(W6)	19 × 15.8
SSG-25 (W8)	25	25 × 22	W8	25.4 × 22.2

**Notes:**

- For description of terms "upper limit", "lower limit", "type A" and "type B", refer to Section 3-1.
- Gap gauges are not supplied. They are available from Nippon Pillar Packing.



### 3-3 Initial tightening

- Fit the tube with the inserted sleeve into the body of the fitting and then **always tighten the union nut until the gap between the union nut and the body becomes smaller than the upper limit.**

**Notes:**

- **It is recommended that you retighten the union nut 24 hours or more after initial tightening. This is because a decrease in tightening torque due to a creep mostly occurs within 24 hours.**  
**If the fitting is exposed to thermal cycles, it is also recommended that you retighten the union nut in a cold state after one thermal cycle is completed.**

### 3-4 Installing the cap sleeve

- Insert the cap sleeve into the fitting body and tighten the union nut.
- When the tube size is 3 × 2, 4 × 3, or 3.18 × 2.18, hand-tighten the union nut (refer to Table 5).
- When the tube size is 6 × 4, 6.35 × 3.95, or 6.35 × 4.35, hand-tighten the union nut and then turn the nut a half turn with a wrench (refer to Table 5).

**Caution:**

- **Be sure to install the cap sleeve according to the above instructions. Using a gap gage when installing the cap sleeve could result in loose installation or overtightening, causing damage or leakage.**

Table 5. Tightening method of the cap sleeve

Cap sleeve type	Tube size		Cap sleeve installation
	OD × ID (mm)		
	Millimeter size	Inch size	
CS-3A	3×2	3.18×2.8	Hand-tighten the union nut.
CS-4A	4×3	—	
CS-6A	6×4	6.35×3.95 6.35×4.35	Hand-tighten the union nuts and then turn the nut a half turn with a wrench.
CS-8A	8×6	—	
CS-10A	10×8	9.53×6.33 9.53×7.53	
CS-12A	12×10	12.7×9.5	
CS-19A	19×15.8	19×15.8	
CS-25A	25×22	25.4×22.2	

### 3-5 Removing and reinstallation





- Loosen the union nut to remove the fitting.
- When removing the fitting and reinstalling it, do not uncouple the sleeve from the tube. Handle the tube and the sleeve as an unit.
- **When reinstall the fitting, tighten the union nut until the gap between the union nut and the fitting body reaches the upper limit specified in Table 3, and furthermore, turn the union nut a half-turn.**
- **The fitting resists ten times of reinstallation. If the gap between the union nut and the fitting body becomes smaller than the lower limit specified in Table 3, however, the fitting needs to be replaced even though it has not yet been reinstalled ten times.**

**Caution:**

- **Do not damage the tube/sleeve and sealing surfaces of the fitting body when reinstalling the fitting. Doing so may result in liquid leakage from the fitting.**

### 3-6 Measures against liquid leakage

- If the union nut needs to be retightened due to liquid leakage from the fitting, lower the temperature of the liquid to 30 °C (86 °F) or less and reduce the pressure to 0 MPaG (0 psiG); then **retighten the union nut by turning it one quarter-turn with a wrench**. After retightening the union nut, check to be sure that the liquid no longer leaks from the fitting.
- Note that, once liquid leakage occurs, the liquid may remain in the nut, resulting in the liquid exuding from the fitting for a while even after retightening the union nut.

Safety Notices		
 <b>CAUTION</b>	<p><b>The fitting is made of resin. Exercise great care to avoid bending or tensile stress to the fitting when or after tightening it.</b>            Doing so may deform or damage the fitting, causing the liquid to leak or the fitting to uncouple from tubing.</p>	
	<p><b>Do not retighten the fitting while tubing is in high-temperature or pressurized conditions.</b>            Doing so may deform or damage the fitting, resulting in a spout of the liquid. Before retightening the fitting, be sure to lower the temperature to 30 °C (86 °F) or less and reduce the pressure to 0 MPaG (0 psiG).</p>	
	<p><b>Be sure to follow instructions in this manual when installing, retightening, reinstalling the fitting.</b>            Poor installation or retightening may cause the liquid to leak or the fitting to uncouple from tubing.</p>	

## 4 How to Use Insertion Tools

### 4-1 Using cold insertion tool JT-A4 (for $\phi$ 10 to 25 mm or 3/8 to 1" tubes)

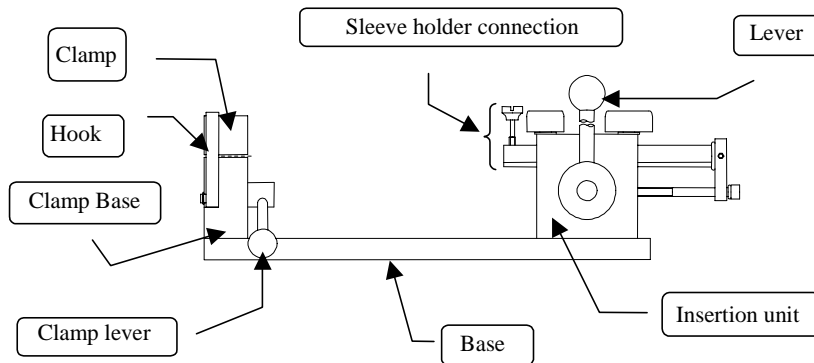


Figure 9. Parts designation of JT-A4

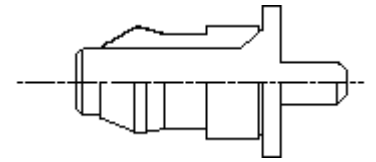


Figure 10. Setting the sleeve

#### 1. Setting the sleeve

- Install to insertion tool JT-A4 the sleeve holder and then the sleeve as shown in Figures 9 and 10. (For applicable sleeve holders, refer to Table 7).

#### 2. Fixing the tube

- Loosen the insertion unit locking handle to make the insertion unit free to move.
- Pull up the clamp lever to open the clamp.
- Install the tube holder in the clamp, set the tube in the tube holder so that the minimum tube length is ensured, and then push down the clamp lever to clamp the tube (Refer to Table 7 for applicable tube holders and Table 6 and Figure 11 for minimum tube length).
- Move the insertion unit forward until the tip of the sleeve holder is just in the tube as shown in Figure 12, and then tighten the locking handle to secure the insertion unit.

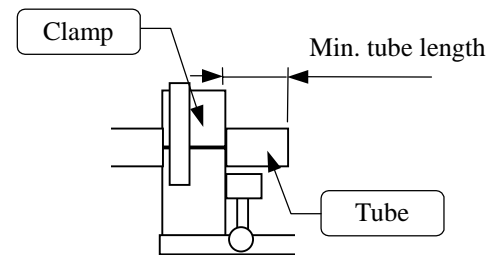


Figure 11. Minimum tube length

Table 6. Minimum tube length

Millimeter size	Tube size, OD × ID (mm)			
	10×8	12×10	19×15.8	25×22
Inch size	9.53×6.33 9.53×7.53	12.7×9.5		25.4×22.2
Minimum tube length	20	23	29	37

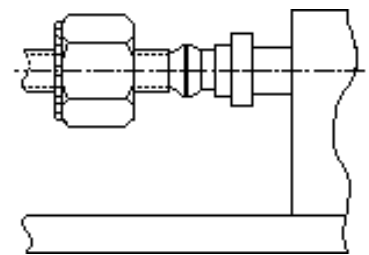


Figure 12. Insertion unit fixing position

#### 3. Inserting the sleeve into the tube

- Turn the lever counterclockwise to insert the sleeve into the tube until the tube end reaches the tube stop of the sleeve (Figure 5).

#### Caution:

- **Stop turning the lever when the tube end reaches the tube stop of the sleeve. Otherwise, damage to the tube, sleeve and/or sleeve holder may result.**

#### 4. How to insert sleeves into a short tube

If the required tube length is too short to insert sleeves into it in the manner described above, proceed as follows.

- Insert the sleeve into one end of the tube as described above. (It is recommended that you insert the sleeve into a tube that is a little longer than required and then cut the tube to the required length).
- Open the clamp and remove the tube.
- Loosen the insertion unit locking handle, position the insertion unit so as to allow the arrangement shown in Figure 13, and then retighten the locking handle to secure the unit.
- Put the union nuts on the tube, set the inserted sleeve in the sleeve holder for short tubes, and then fix the sleeve holder to the clamp.
- Move the sleeve holder forward until the tube end reaches the tube stop of the sleeve.

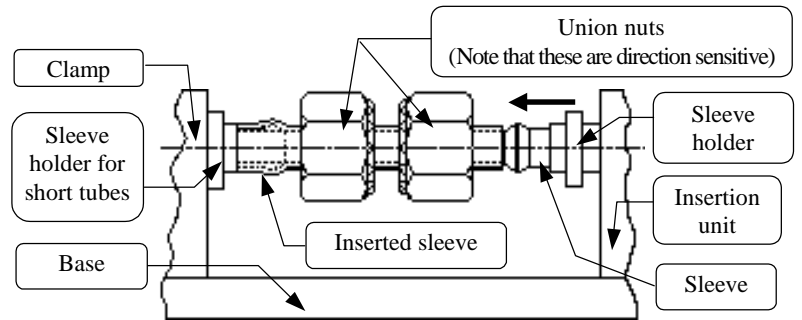


Figure 13. Parts arrangement

Table 7. Tube and sleeve holders for JT-A4

Millimeter size	Tube size, OD × ID (mm)			
	10×8	12×10	19×15.8	25×22
Sleeve holder	SH-A10	SH-A12	SH-A19(W6)	SH-A25(W8)
Tube holder	TH-A10	TH-A12	TH-A19(W6)	Not required
Sleeve holder for short tubes	SH-A10S	SH-A12S	SH-A19(W6)S	SH-A25(W8)S

Inch size	Tube size, OD × ID (mm)			
	9.53×6.33	9.53×7.53	12.7×9.5	25.4×22.2
Sleeve holder	SH-AW3	SH-AW3Y	SH-AW4	SH-A25(W8)
Tube holder	TH-AW3	TH-AW3	TH-AW4	Not required
Sleeve holder for short tubes	SH-AW3S	SH-AW3YS	SH-AW4S	SH-A25(W8)S

#### Notes:

- Insertion tool JT-A4 is an improvement of JT-A3.

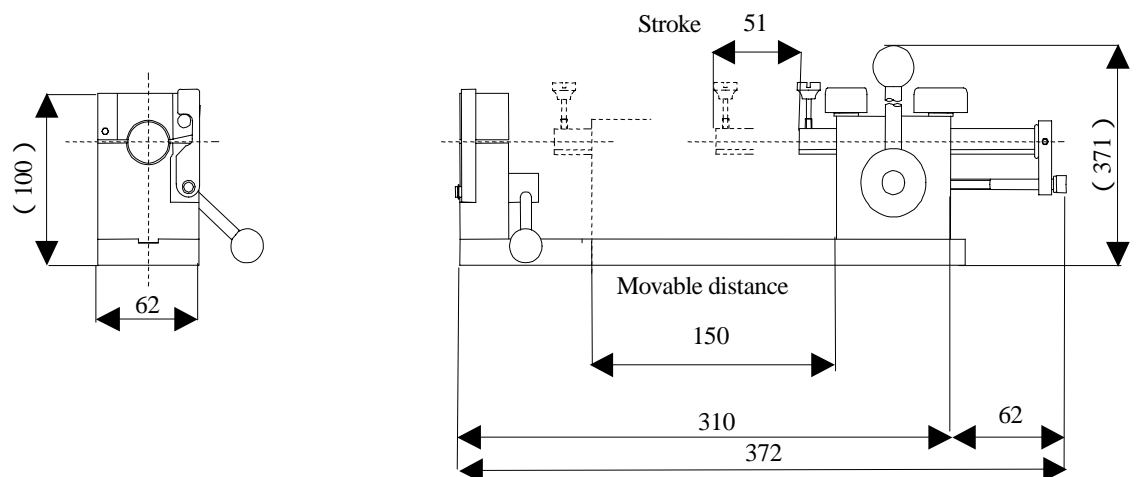


Figure 14. Outer dimensions of JT-A3

## 4-2 Using cold insertion tool JT-C3 (for $\phi$ 3 to 8 mm or 1/8 to 1/4" tubes)

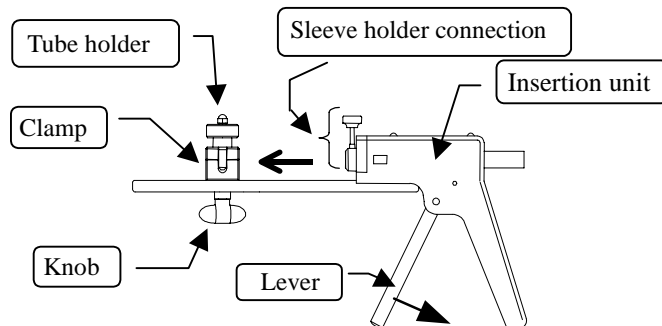


Figure 15. Parts designation of JT-C3

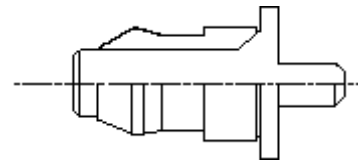


Figure 16. Setting the sleeve

### 1. Setting the sleeve

- Install to insertion tool JT-C3 the sleeve holder and then the sleeve as shown in Figure 15 and Figure 16. (For applicable sleeve holders, refer to Table 9).

### 2. Fixing the tube

- Select a suitable tube holder according to Table 9 and fix it to the base plate using the knob located below the tube holder.
- Loosen the knob located below the tube holder to make the tube holder free to move.
- Open the clamp and install the tube in the tube holder so that the minimum tube length is ensured (Table 8 and Figure 17).
- Fix the tube holder to the base plate as shown in Figure 18.

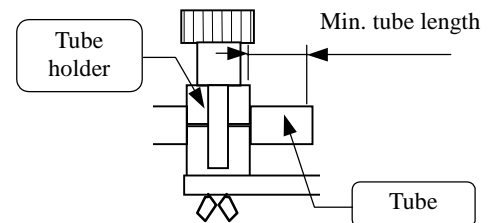


Figure 17. Minimum tube length

Table 8. Minimum tube length

	Tube size, OD $\times$ ID (mm)				
Millimeter size	3 $\times$ 2	4 $\times$ 3	6 $\times$ 4	8 $\times$ 6	–
Inch size	3.18 $\times$ 2.18	–	6.35 $\times$ 3.95 6.35 $\times$ 4.35	–	9.53 $\times$ 7.53
Minimum tube length	11	12	16	17	20

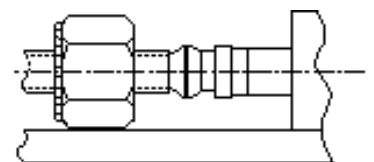


Figure 18. Insertion unit fixing position

### 3. Inserting the sleeve into the tube

- Grip the lever, and the sleeve will be inserted into the tube.
- When the tube end reaches the tube stop of the sleeve, release the levers. (Figure 5).
- Note that excessive force may cause deformation or slippage of the tube.

#### Caution:

- **Releasing the lever when the tube end reaches the tube stop of the sleeve. Otherwise, damage to the tube, sleeve and/or sleeve holder may result.**

#### 4. How to insert sleeves into a short tube

If the required tube length is too short to insert sleeves into it in the manner described above, proceed as follows.

- Insert the sleeve into one end of the tube as described above. (It is recommended that you insert the sleeve into a tube that is a little longer than required and then cut the tube to the required length).
- Open the clamp and remove the tube.
- Loosen the knob located below the tube holder, position the tube holder so as to allow the arrangement shown in Figure 19, and then retighten the knob to secure the tube holder.
- Put the union nuts on the tube, set the inserted sleeve in another sleeve holder, and then fix the sleeve holder to the  $\phi 6$  portion of the tube holder.
- Move the sleeve holder forward until the tube end reaches the tube stop of the sleeve.

#### Notes:

- **When inserting the sleeve into a short tube, you will need one tube holder J-TH-C and two applicable sleeve holders.**

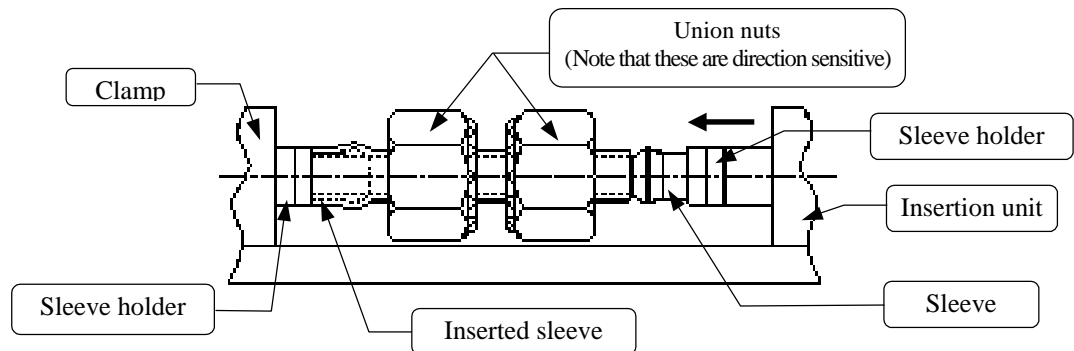


Figure 19. Parts arrangement

Table 9. Tube and sleeve holders for JT-C3 (ST-C)

Millimeter size	Tube size, OD × ID (mm)			
	3×2	4×3	6×4	8×6
Sleeve holder	SH-C3	SH-C4	SH-C6	SH-C8
Tube holder	J-TH-C1	J-TH-C1	J-TH-C2	J-TH-C2

Inch size	Tube size, OD × ID (mm)			
	3.18×2.18	6.35×3.95	6.35×4.35	9.53×7.53
Sleeve holder	SH-CW1	SH-CW2	SH-CW2Y	SH-CW3Y
Tube holder	J-TH-C1	J-TH-C2	J-TH-C3	J-TH-C3

#### Notes:

- **Insertion tool JT-C3 is an improvement of JT-C2.**  
**Tube holders TH-C1 and TH-C” are also upgraded to J-TH-C1 and J-TH-C2 respectively.**  
**JT-C2 and TH-Cx can still be applied for Super Pillar Fittings**

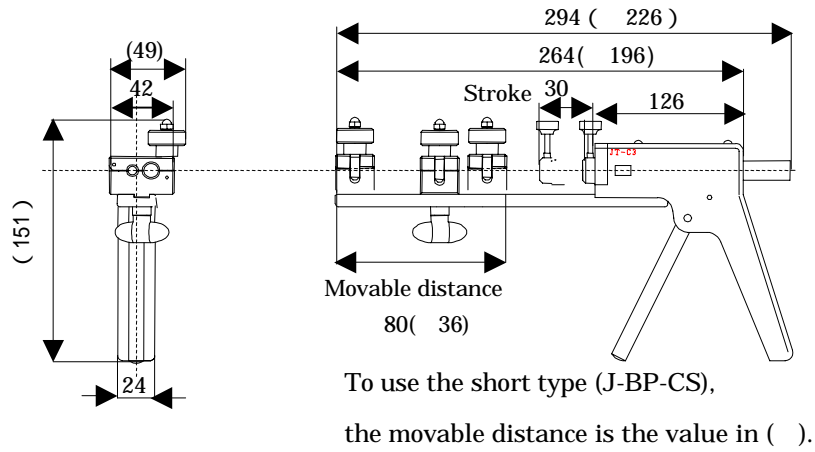


Figure 20. Outer dimensions of JT-C3

### 5. Replacing the base plate

If the base plate for the J-BP-C (standard type) is too long, it may be replaced with the J-BP-CS (short type) (see Fig.21 and Fig. 22).

- Remove the clamp by turning the knob located below the clamp.
- Remove the set bolt located below the insertion unit and then replaced the base plate.
- Put the clamp back in place. Now the procedure has been completed.

#### Caution:

- **No short pipe can be worked with the J-BP-CS (short type).  
To use a short pipe, replace the J-BP-CS with the J-BP-C (standard type).**

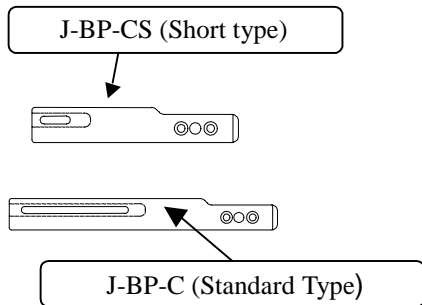


Figure 21 Names of base plates.

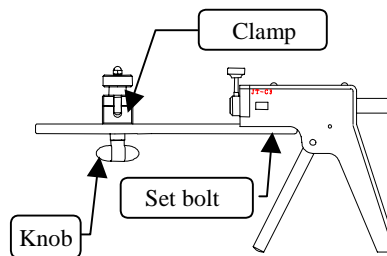


Figure 22 Names of parts in replacing the base plate.

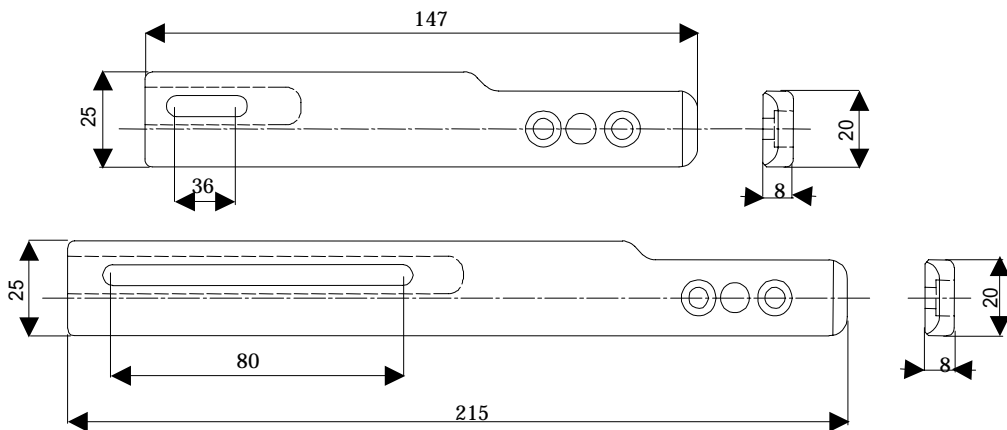


Figure 23 Outer dimensions of J-BP-C and J-BP-CS

### 4-3 Using cold insertion tool JT-C3 (for $\phi 10$ or 3/8" tubes)

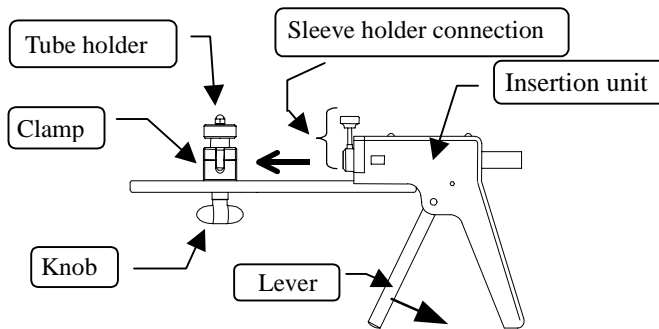


Figure 24. Parts designation of JT-C3

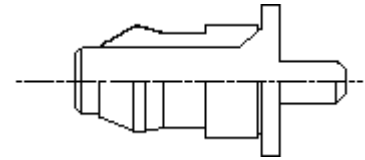


Figure 25. Setting the sleeve

#### 1. Setting the sleeve

- Install to insertion tool JT-C3 the sleeve holder and then the sleeve as shown in Figure 25. (For applicable sleeve holders, refer to Table 11).

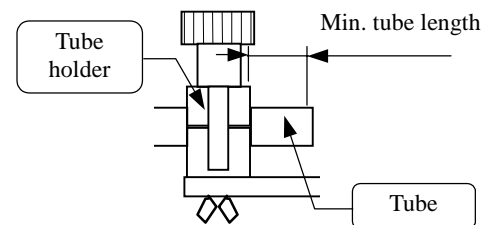


Figure 26. Minimum tube length

#### 2. Clamping the tube

- Install J-TH-SB10 and TH-SBW3 (collectively referred to "tube holder") to J-TH-C (referred to "clamp") and fix them to the JT-C3 using the knob below the tube holder (for the applicable parts, see Table 11).
- Open the clamp and install the tube with union nut passing through it in the tube holder so that the minimum tube length as shown in Table 10 is ensured (see Figure 26)
- Fix the clamp at the position where the end of the sleeve holder moves 1 to 3mm into the inside diameter of the tube. (see Fig.27)

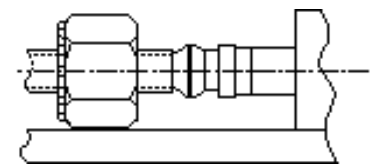


Figure 27. Insertion unit fixing position

Table 10. Minimum tube length

	Tube size, OD × ID (mm)
Millimeter size	10×8
Inch size	9.53×6.33
Minimum tube length	25

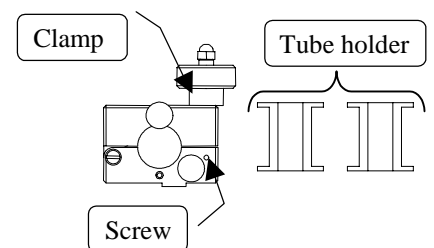


Figure 28. Parts designation of J-TH-C

#### 3. Inserting the sleeve into the tube

- Grip the lever, and the sleeve will be inserted into the tube.
- When the tube end reaches the tube stop of the sleeve, release the levers. (Figure 5).
- Note that excessive force may cause deformation or slippage of the tube.

#### Caution:

- **Releasing the lever when the tube end reaches the tube stop of the sleeve. Otherwise, damage to the tube, sleeve and/or sleeve holder may result.**



#### 4. How to insert sleeves into a short tube

If the required tube length is too short to insert sleeves into it in the manner described above, proceed as follows.

- Insert the sleeve into one end of the tube as described above. (It is recommended that you insert the sleeve into a tube that is a little longer than required and then cut the tube to the required length).
- Open the clamp and remove the tube.
- Loosen the knob located below the tube holder, position the tube holder so as to allow the arrangement shown in Figure 29, and then retighten the knob to secure the tube holder.
- Put the union nuts on the tube, set the inserted sleeve in another sleeve holder, and then fix the sleeve holder to the  $\phi 6$  portion of the tube holder.
- Move the sleeve holder forward until the tube end reaches the tube stop of the sleeve.

#### Notes:

- **When inserting the sleeve into a short tube, you will need one tube holder J-TH-C and two applicable sleeve holders.**

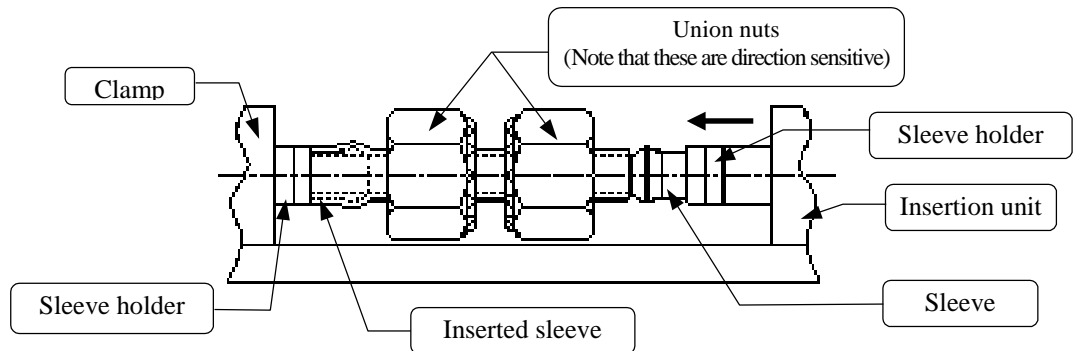


Figure 29. Parts arrangement

Table 11. Parts for JT-C3

	Nominal size of tube	
	10	W3
Sleeve holder	SH-A10	SH-AW3
Tube holder	J-TH-C	
	J-TH-SB10	J-TH-SBW3

#### Notes:

- **Insertion tool JT-C3 is an improvement of JT-C2.**

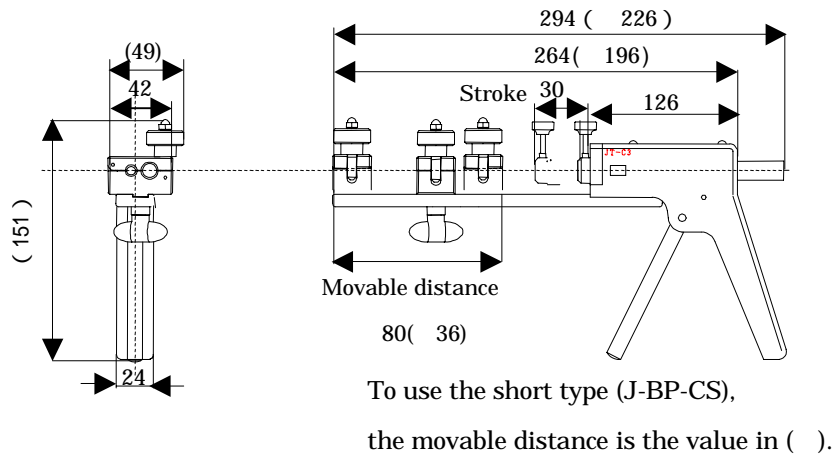


Figure 30. Outer dimensions of JT-C3

### 5. Replacing the base plate

If the base plate for the J-BP-C (standard type) is too long, it may be replaced with the J-BP-CS (short type) (see Fig.31 and Fig. 32).

- Remove the clamp by turning the knob located below the clamp.
- Remove the set bolt located below the tube holder and then replace the base plate.
- Put the clamp back in place. Now the procedure has been completed.

#### Caution:

- **No short pipe can be worked with the J-BP-CS (short type).  
To use a short pipe, replace the J-BP-CS with the J-BP-C (standard type).**

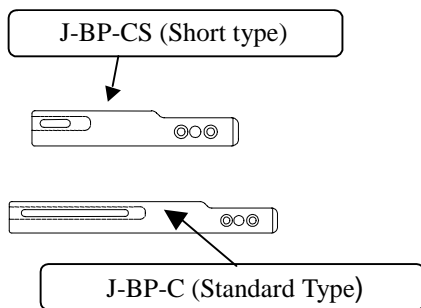


Figure 31 Names of base plates.

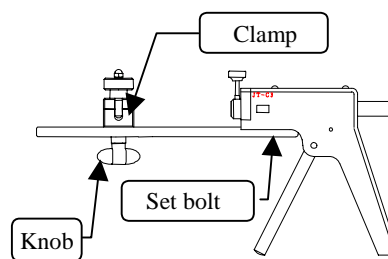


Figure 32 Names of parts in replacing the base plate.

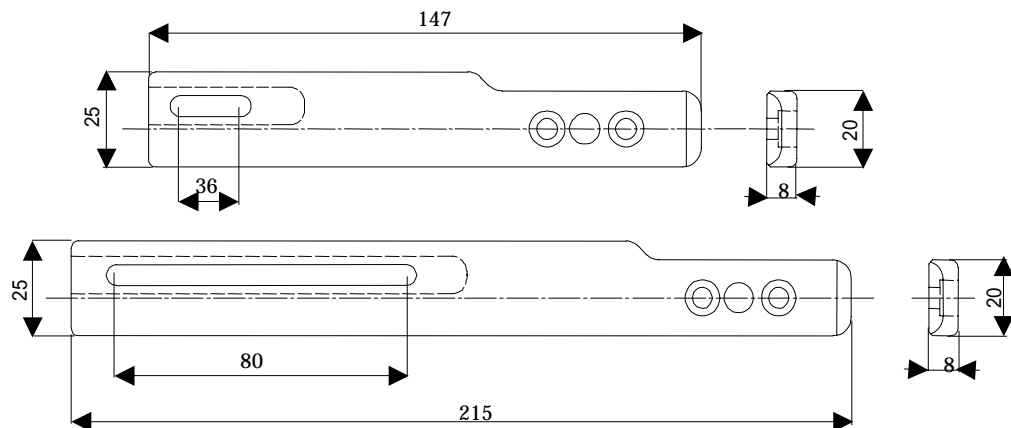


Figure 33 Outer dimensions of J-BP-C and J-BP-CS

#### 4-4 Using insertion tools for tight workspace JT-SA (ST-SA) and JT-SB (ST-SB)

**Insertion tools for tight space are available in two types according to the applicable tube size.**  
(For applicable sleeve holders and tube holders, refer to Table 13.)

Table 12. Applicable tube size for JT-SA and JT-SB

Tool type	Tube size, OD × ID (mm)
JT-SA	19×15.8, 25×22, 25.4×22.2
JT-SB	6×4, 8×6, 10×8, 12×10, 6.35×3.95, 6.35×4.35, 9.53×6.33, 9.53×7.53, 12.7×9.5

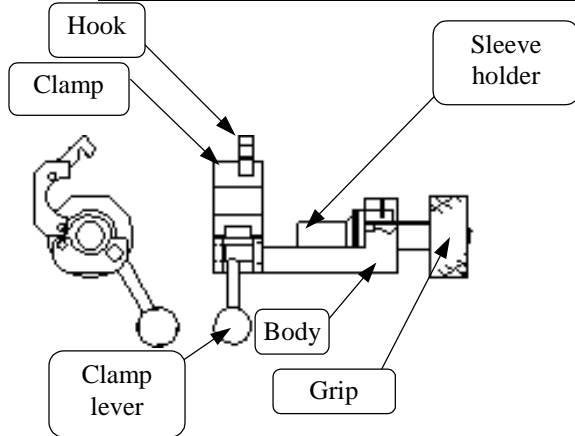


Figure 34. Parts designation of JT-SA

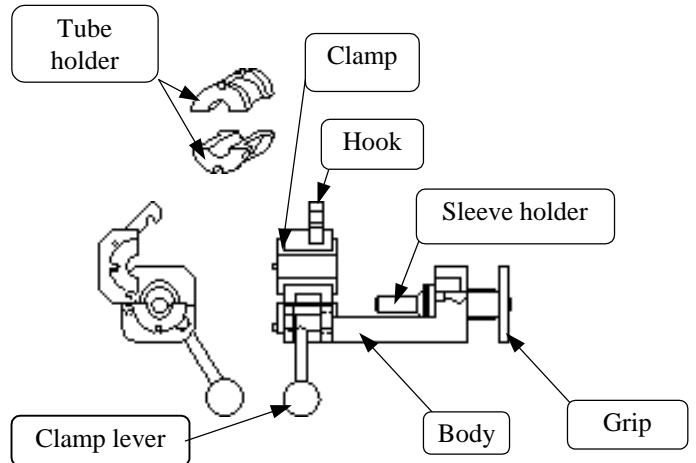


Figure 35. Parts designation of JT-SB

##### 1. Setting the sleeve

- Screw the sleeve holder into the insertion tool connection and install the sleeve in the sleeve holder. (For applicable sleeve holders, refer to Table 13).
- Turn the grip counterclockwise to move the sleeve holder back until it stops.

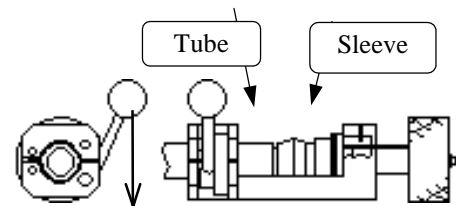


Figure 36. Tube and sleeve setting

##### 2. Setting the tube

- Open the clamp and set an appropriate tube holder. (For applicable tube holders, refer to Table 13.)
- Place the tube in the tube holder. Let a tube end come into contact with the sleeve tip, and engage the hook while the clamp lever is in upper position; then push the clamp lever down to clamp the tube (Figure 36).

##### 3. Inserting the sleeve into the tube

- Turn the grip clockwise to insert the sleeve into the tube.
- Stop turning the grip when the tube end reaches the tube stop of the sleeve.

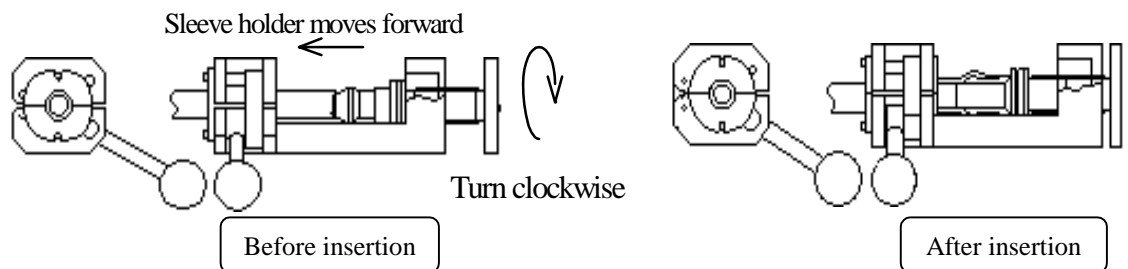


Figure 37. Insertion of sleeve

##### Note:

- **JT-SA (ST-SA) or JT-SB (ST-SB) cannot be used to insert sleeves into a short tube. Use JT-A4 or JT-C3 for sleeve insertion into a short tube.**

Table 13. Sleeve and tube holders for JT-SA (ST-SA) and JT-SB (ST-SB)

Millimeter size	Tube size, OD × ID (mm)							
	3 × 2	4 × 3	6 × 4	8 × 6	10 × 8	12 × 10	19 × 15.8	25 × 22
Body	JT-SB (ST-SB)						JT-SA (ST-SA)	
Sleeve holder	SH-SB3	SH-SB4	SH-SB6	SH-SB8	SH-SB10	SH-SB12	SH-SA19(W6)	SH-SA25(W8)
Tube holder	TH-SB3	TH-SB4	TH-SB6	TH-SB8	TH-SB10	TH-SB12	TH-A19(W6)	Not required

Inch size	Tube size, OD × ID (mm)					
	3.18 × 2.18	6.35 × 3.95	9.53 × 6.33	12.7 × 9.5	19 × 15.8	25.4 × 22.2
Body	JT-SB (ST-SB)				JT-SA (ST-SA)	
Sleeve holder	SH-SBW1	SH-SBW2	SH-SBW3	SH-SBW4	SH-SA19(W6)	SH-SA25(W8)
Tube holder	TH-SBW1	TH-SBW2	TH-SBW3	TH-SBW4	TH-A19(W6)	Not required

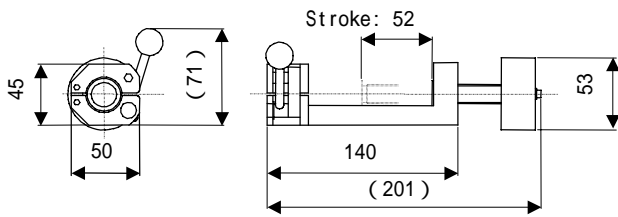


Figure 38. Outer dimensions of JT-SA

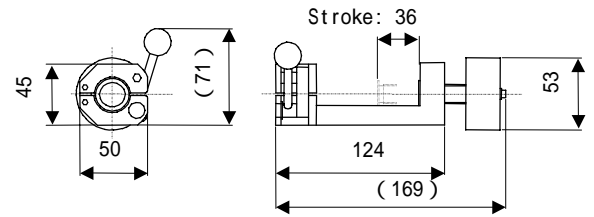


Figure 39. Outer dimensions of ST-SA

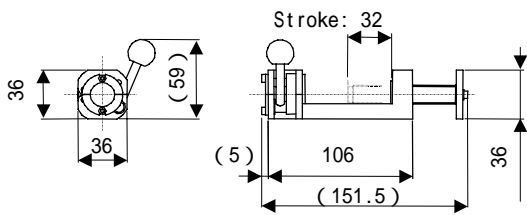


Figure 40. Outer dimensions of JT-SB

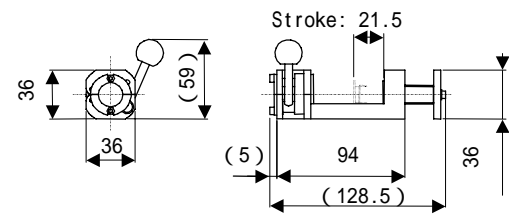


Figure 41. Outer dimensions of ST-SB

## 4-5 Using hot insertion tools ST-FH and ST-H

Devices required for hot insertion include an appropriate flaring tool, sleeve holder and a heat gun.  
(For applicable flaring tools and sleeve holders, refer to Tables 14 and 15).  
Hot insertion tools are available in two types: Base and Grip types.

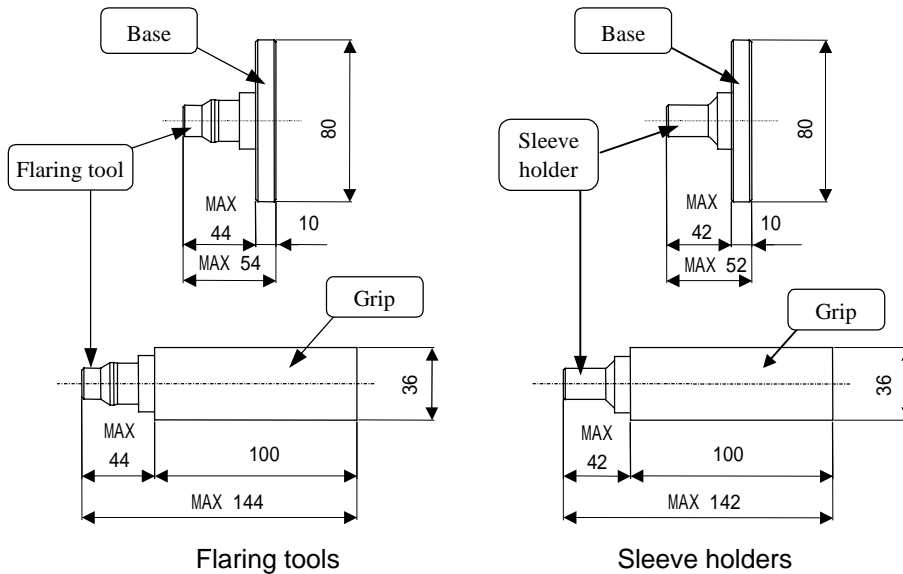


Figure 42. Hot insertion tools

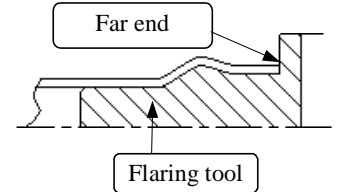


Figure 43. Flaring of the tube end

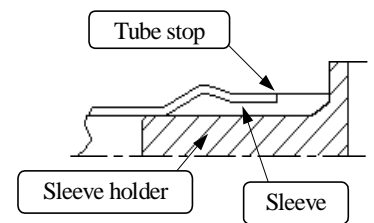


Figure 44. Sleeve insertion

### 1. Preheating the tube

- Using a heat gun, preheat the tube end portion of approx. 15 mm in length as evenly as possible while rotating it.  
(As a guideline, preheat the tube end portion for 10 to 15 seconds when the outlet temperature of hot air is set to approx. 450 °C (842 °F). Pay attention not to melt the tube.)

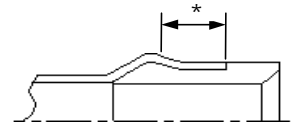


Figure 45. Portion to be heated

### 2. Flaring the tube end

- Immediately after preheating, insert the heated tube into the flaring tool until it stops at the far end as shown in Figure 43, and hold the tube for approx. 10 seconds to cool it down.

### 3. Inserting the sleeve into the tube

- Remove the tube from the flaring tool, and insert the tube onto the sleeve until the tube end reaches the tube stop as shown in Figure 44.

### 4. Heating the tube

- Remove the tube from the sleeve holder and, using a heat gun, heat the portion marked with an asterisk (\*) in Figure 45, in order to ensure close contact of the tube with the sleeve.

### 5. How to insert sleeves into a short tube

If the sleeve is too short to insert it into a short tube in the manner described above, proceed as follows.

- Cut the tube a little longer than required and insert the sleeve into one end of the tube as described above.
- Then cut the tube to the standard cut length and preheat the end portion.
- After preheating the tube, put union nuts onto the tube and then flare the tube.  
Afterwards, insert the sleeve into the tube in the same way as described in Section 3.4.

<b>Safety Notices</b>		
 <b>CAUTION</b>	<b>Exercise great care to avoid a burn during the tube flaring process.</b>	
	The tube flaring process involves preheating of tubing.	
	<b>Maintain good ventilation during the tube flaring process.</b>	
	Preheating of tubing could generate toxic gases.	

Table 14. Base and grip for flaring tool ST-FH

Millimeter size	Tube size, OD × ID (mm)							
	3 × 2	4 × 3	6 × 4	8 × 6	10 × 8	12 × 10	19 × 15.8	25 × 22
Flaring tool	FH-3	FH-4	FH-6	FH-8	FH-10	FH-12	FH-19(W6)	FH-25(W8)
Base	SB-H							
Grip	SG-H							

Inch size	Tube size, OD × ID (mm)							
	3.18 × 2.18	6.35 × 3.95	6.35 × 4.35	9.53 × 6.33	9.53 × 7.53	12.7 × 9.5	19 × 15.8	25.4 × 22.2
Flaring tool	FH-W1	FH-W2	FH-W2Y	FH-W3	FH-W3Y	FH-W4	FH-19(W6)	FH-25(W8)
Base	SB-H							
Grip	SG-H							

Table 15. Base and grip for sleeve holder ST-H

Millimeter size	Tube size, OD × ID (mm)							
	3 × 2	4 × 3	6 × 4	8 × 6	10 × 8	12 × 10	19 × 15.8	25 × 22
Sleeve holder	SH-H3	SH-H4	SH-H6	SH-H8	SH-H10	SH-H12	SH-H19(W6)	SH-H25(W8)
Base	SB-H							
Grip	SG-H							




Inch size	Tube size, OD × ID (mm)							
	3.18 × 2.18	6.35 × 3.95	6.35 × 4.35	9.53 × 6.33	9.53 × 7.53	12.7 × 9.5	19 × 15.8	25.4 × 22.2
Sleeve holder	SH-HW1	SH-HW2	SH-HW2Y	SH-HW3	SH-HW3Y	SH-HW4	SH-H19(W6)	SH-H25(W8)
Base	SB-H							
Grip	SG-H							

## Disposal Precautions

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When disposing of fittings or tubes:

Be sure to wash the remaining liquid inside fittings or tubes and then dispose of them as incombustible waste.

Safety Notices		
 <b>CAUTION</b>	<b>Do not dispose of the fitting with a liquid residue remaining in it.</b> Be sure to wash a liquid residue inside the fitting and then dispose of the fitting as incombustible waste. Disposal of the fitting without washing a liquid residue may be hazardous.	
	<b>Do not incinerate fitting parts.</b> Incineration of fluoro-resin parts will generate toxic smoke.	

## 5 Office Locations

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