

SUPER 300 TYPE PILLAR FITTING

P SERIES

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.

NIPPON PILLAR PACKING CO., LTD.
PILLAR 日本ピラー工業株式会社

Table of Contents

1	Structure and Specifications of P series Super 300 Type Pillar Fitting	3
1-1	STRUCTURE	3
1-2	SPECIFICATIONS	4
1-3	HANDLING PRECAUTIONS	4
2	Cutting of Tube and Insertion of Sleeve	5
2-1	CUTTING A TUBE	5
2-2	INSERTING THE SLEEVE INTO THE TUBE	6
2-3	CAUTIONS IN INSERTING THE SLEEVE INTO THE TUBE	6
3	Tightening (Nominal tube size: 6 - 25, W2 - W8)	7
3-1	STRUCTURE AND FUNCTION OF GAUGE RING (NOMINAL TUBE SIZE: 6 - 25, W2 - W8)	7
3-2	INITIAL TIGHTENING (NOMINAL TUBE SIZE: 6 - 25, W2 - W8)	7
3-3	INSTALLING THE CAP SLEEVE (NOMINAL TUBE SIZE: 6 - 25, W2 - W8)	8
3-4	REMOVING AND REINSTALLATION (NOMINAL TUBE SIZE: 6 - 25, W2 - W8)	9
3-5	MEASURES AGAINST LIQUID LEAKAGE (NOMINAL TUBE SIZE: 6 - 25, W2 - W8)	9
4	Tightening (Nominal tube size: 3, 4, W1)	10
4-1	CAUTIONS IN TIGHTENING THE UNION NUT (NOMINAL TUBE SIZE: 3, 4, W1)	10
4-2	CHECKING THE TIGHTNESS OF THE UNION NUT (NOMINAL TUBE SIZE: 3, 4, W1)	11
4-3	INITIAL TIGHTENING (NOMINAL TUBE SIZE: 3, 4, W1)	11
4-4	INSTALLING THE CAP SLEEVE (NOMINAL TUBE SIZE: 3, 4, W1)	12
4-5	REMOVING AND REINSTALLATION (NOMINAL TUBE SIZE: 3, 4, W1)	12
4-6	MEASURES AGAINST LIQUID LEAKAGE(NOMINAL TUBE SIZE: 3, 4, W1)	12
5	How to Use Insertion Tools	13
5-1	USING ROOM TEMPERATURE INSERTION TOOL JT-A4 (NOMINAL TUBE SIZE: 10 - 25, W3 - W8)	13
5-2	USING ROOM TEMPERATURE INSERTION TOOL JT-C3 (NOMINAL TUBE SIZE: 6, 8, W2, W2Y, W3Y)	15
5-3	USING ROOM TEMPERATURE INSERTION TOOL JT-C3 (NOMINAL TUBE SIZE: 10, W3)	18
5-4	USING ROOM TEMPERATURE INSERTION TOOL JT-C3 (NOMINAL TUBE SIZE: 3,4, W1)	21
5-5	USING HAND-HELD TYPE ROOM TEMPERATURE INSERTION TOOL JT-SA-KA (NOMINAL TUBE SIZE: 19, 25, W6, W8)	23
5-6	USING HAND-HELD TYPE ROOM TEMPERATURE INSERTION TOOL JT-SA-KA (NOMINAL TUBE SIZE: 6 - 12, W2 - W4)	25
5-7	USING HAND-HELD TYPE ROOM TEMPERATURE INSERTION TOOL JT-SA-KA (NOMINAL TUBE SIZE: 3, 4, W1)	27
5-8	USING HEAT INSERTION TOOLS P-FH AND P-FH-H (NOMINAL TUBE SIZE: 6 - 25, W2 - W8)	29
5-9	USING FLARE INSERTION TOOLS P-FH AND P-SH-H (NOMINAL TUBE SIZE: 3, 4, W1)	31
5-10	OUTER DIMENSIONS OF INSERTION TOOLS	32
6	Disposal Precautions	33
7	Office Locations	33

Preface

Thank you very much for purchasing the P series Super 300 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 not avoided, will result in death or serious personal injury.
 WARNING	A warning notice with this symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious personal injury.
 CAUTION	A caution notice with this symbol indicates a potentially hazardous situation which, if not 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	Be sure to follow instructions in this manual when installing, retightening, reinstalling the fitting. Poor installation or retightening may cause the liquid to leak or the fitting to uncouple from tubing.	
		Do not retighten the fitting while tubing is in high-temperature or pressurized conditions. 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).	
		The fitting is made of resin. Exercise great care to avoid bending or tensile stress to the fitting when or after tightening it. Doing so may deform or damage the fitting, resulting in liquid leakage.	
		Do not use the fitting beyond the working range specified in this manual. Doing so may cause the liquid to leak or the fitting to uncouple from tubing.	
 CAUTION	Installation work	Never use the P series Super 300 Type Pillar fitting in combination with other fittings. Doing so may cause the liquid to leak or the fitting to uncouple from tubing.	
		When the liquid temperature is 70 °C (158 °F) or higher, protect the fitting and tubing with a cover or other suitable means. Otherwise, a burn may result.	
		Exercise great care to avoid a burn during the tube flaring process. The tube flaring process involves preheating of tubing.	
	Disposal	Maintain good ventilation during the tube flaring process. Preheating of tubing could generate toxic gases.	
Do not dispose of the fitting with a liquid residue remaining in it. 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.			
		Do not incinerate fitting parts. 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 P series Super 300 Type Pillar Fitting

1-1 Structure

- The P series Super 300 Type Pillar Fitting consists of a body, sleeve, union nut and gauge ring (see Fig. 1). However, the fittings for the tubes of nominal sizes 3, 4, and W1 are not provided with a gauge ring.

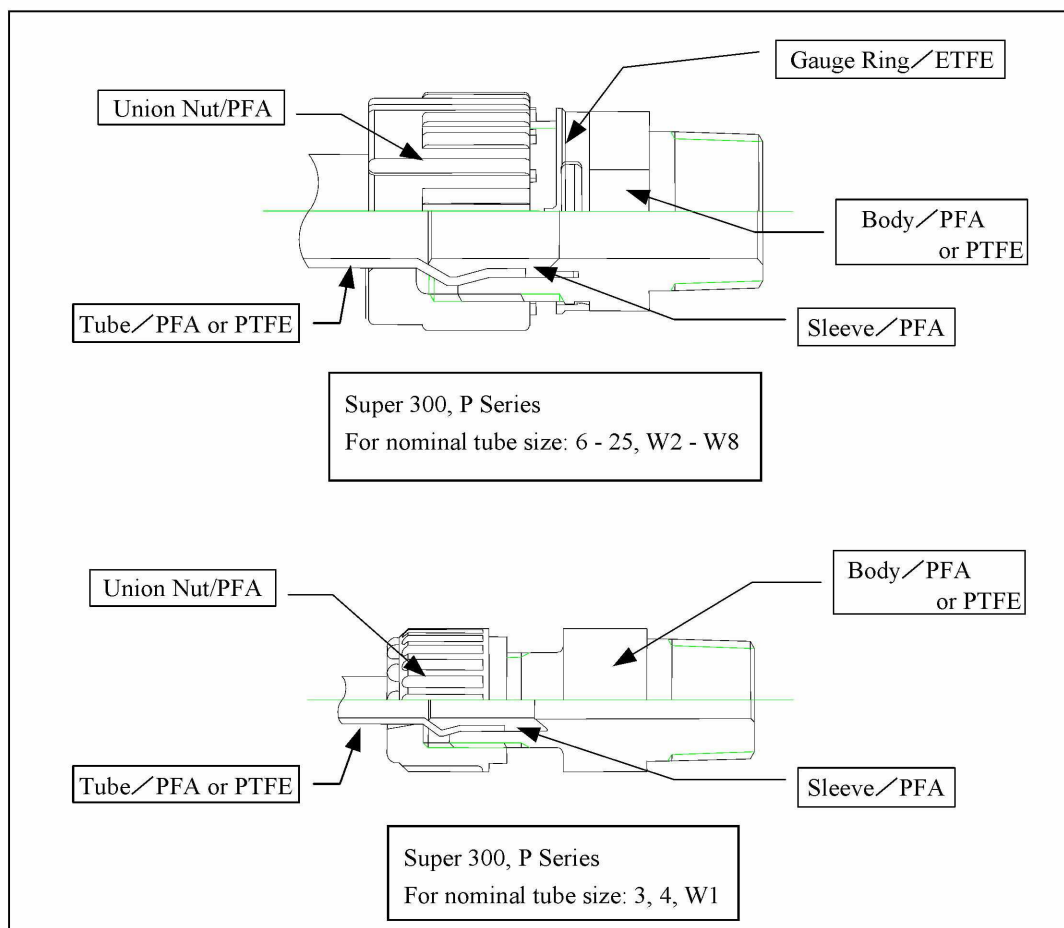


Fig. 1 - Structure of P series Super 300 Type Pillar Fitting

Table 1 - Tube size for Super 300 Type Pillar Fitting P Series

		Nominal size and actual dimensions of tubes for P Series Super 300 Type Pillar Fitting							
Millimeter size	Nominal	3	4	6	8	10	12	19	25
		O.D.×I.D.	3×2	4×3	6×4	8×6	10×8	12×10	19×15.8
Inch size	Nominal	W1		W2		W3	W4	W6	W8
	O.D.×I.D.	3.18×2.18		6.35×3.95		9.53×6.33	12.7×9.5	19×15.8	25.4×22.2
Inch size (Thin wall)	Nominal			W2Y		W3Y			
	O.D.×I.D.			6.35×4.35		9.53×7.53			

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 Fig. 2 below.
- Permissible ambient temperature : -15 to +60 °C (5 to 140 °F)

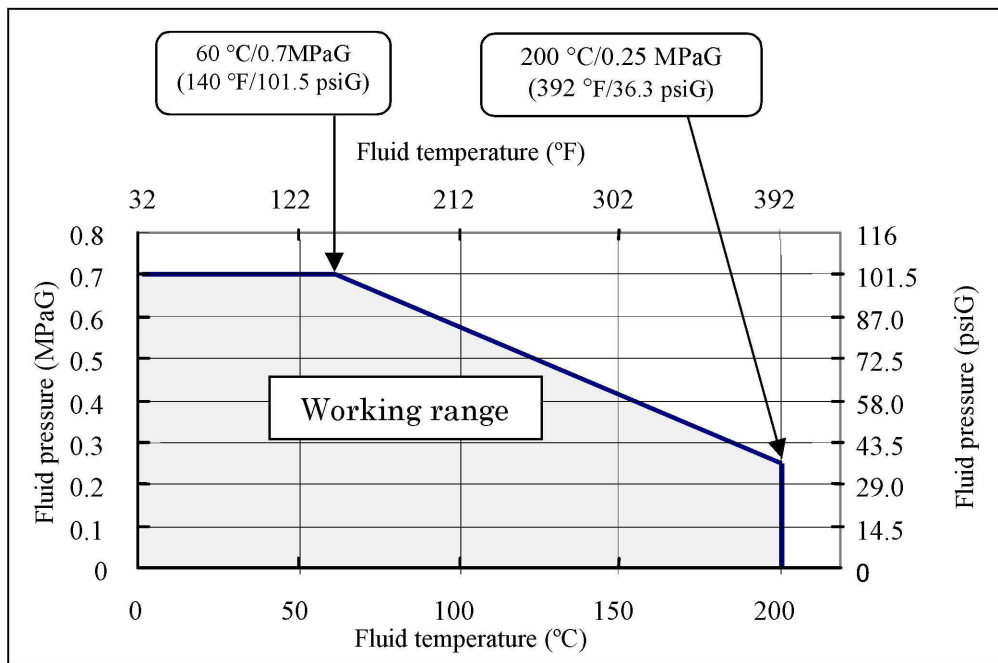


Fig. 2 - Specifications of P Series Super 300 Type Pillar Fitting

1-3 Handling precautions

- Use the Super 300 Type Pillar Fitting for liquids only.
- To cut the tube, insert or tighten the sleeve, use the insertion tool, scrap the fitting carefully read in advance Chapters 2, 3, 4, and 5.
- 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

- Please be carried out according to Fig.3 and Table2 of the tube cutting.

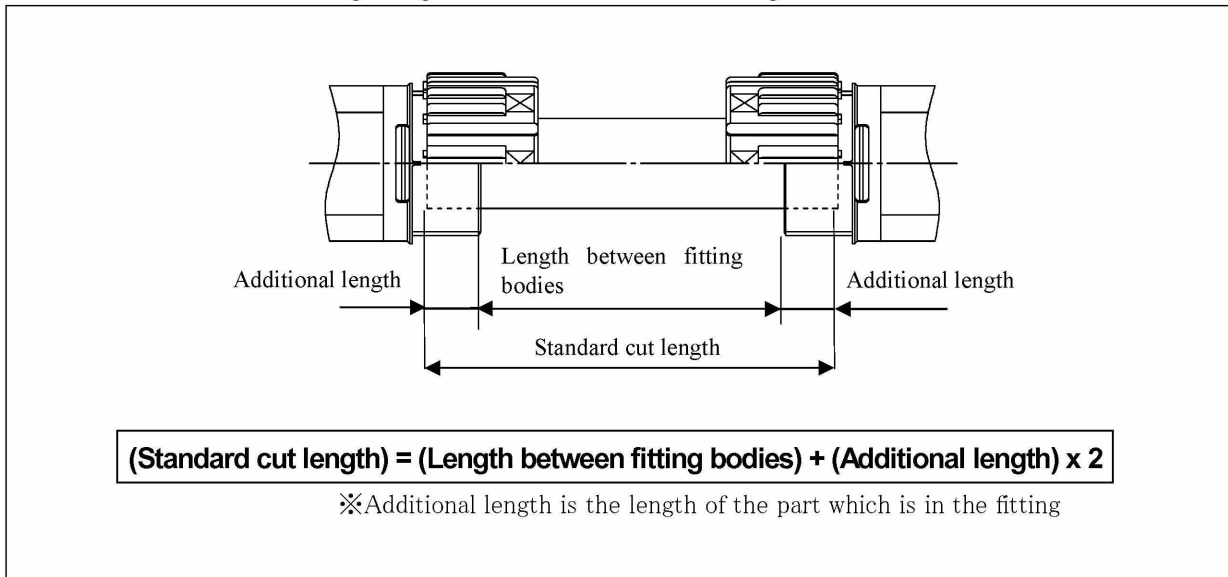


Fig. 3- Standard cut length

Table 2 - Minimum cut length of tubes

Millimeter size	Nominal tube size							
	3	4	6	8	10	12	19	25
Inch size	W1	-	W2,W2Y	-	W3,W3Y	W4	W6	W8
Minimum length between fitting bodies	11	11	18	19	22	27	31	38
Additional length*	5	6.5	8	8.5	10	11.5	15.5	19
Minimum cut length	21	24	34	36	42	50	62	76

*: However, if this value is smaller than the shortest length between bodies shown in Table 2, the sleeve cannot be inserted.

Notes:

- Before inserting, pass the union nut through the tube while taking care of the orientation of the union nut.
- Cutting the tube to a length shorter than the minimum cut length will disable 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)
- If the tube is shorter than the standard cut length, tensile force may be applied to the tube, resulting in leakage of the liquid.
- 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 tube should be cut vertically wherever practical.

2-2 Inserting the sleeve into the tube

- Insert the sleeve of the P series Super 300 Type Pillar Fitting into the tube according to Table 3. For details on how to insert the sleeve into the tube using insertion tools, refer to Chapter 4.

Table 3 - Insertion methods and applicable tube sizes

Insertion method	Tool type	Nominal tube size								Reference page
		3	4	6	8	10	12	19	25	
		W1	-	W2 W2Y	-	W3 W3Y	W4	W6	W8	
Room temperature insertion	JT-A4					●	●	●	●	P-14
	JT-C3	●	●	●	●	●				P-16
Room temperature insertion (Hand-held type tool)	JT-SA-KA	●	●	●	●	●	●	●	●	P-25
Heat insertion	PT-FH			●	●	●	●	●	●	P-31
Flare insertion	PT-H	●	●							P-33

- Insert the sleeve to the tube by either room temperature insertion or flare insertion method.
- Stop inserting the sleeve into the tube when the tube reaches the tube stop of the sleeve (see Fig. 4).
- Excessive force may deform the tube.

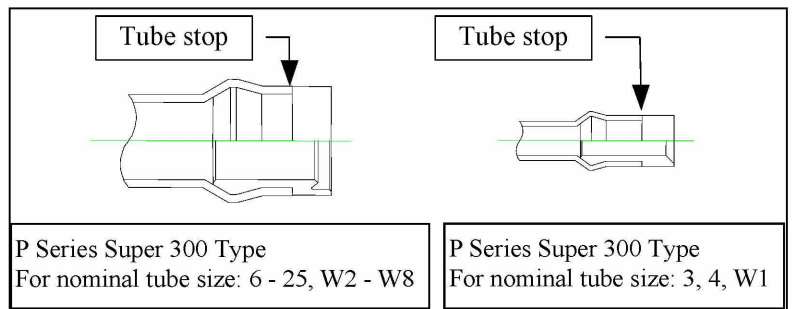


Fig. 4 - Completion of insertion

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.
- A gap could remain between the tube and the tube stop of the sleeve when the sleeve is inserted into the tube.

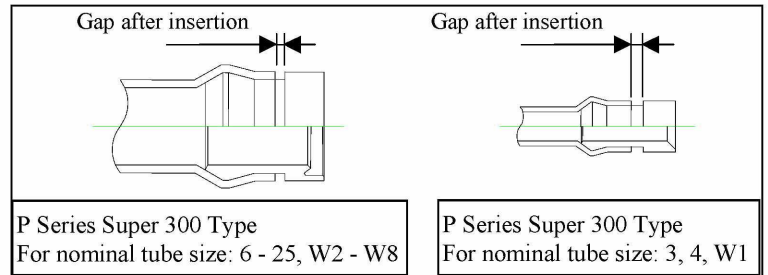


Fig. 5 - Sleeve straight section

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. The gap to this extent will cause no trouble. The recommended gaps are shown in Table 4 (see Fig. 5).

Table 4 - Recommended gap after insertion

Millimeter size	Nominal tube size							
	3	4	6	8	10	12	19	25
Inch size	W1	-	W2, W2Y	-	W3, W3Y	W4	W6	W8
Recommended gap after insertion (mm)	1 or less	1 or less	1.2 or less	1.3 or less	1.5 or less	2.5 or less	2.8 or less	3.5 or less

3 Tightening (Nominal tube size: 6 - 25, W2 - W8)

3-1 Structure and function of gauge ring (Nominal tube size: 6 - 25, W2 - W8)

- The P Series Super 300 Type Pillar Fitting is provided with a gauge ring to facilitate controlling the tightening range and limit, thereby ensuring safe and proper tightening (see Fig. 6).
- At initial tightening, the boss at the end of the union nut makes contact with the blade of the gauge ring, allowing you to find from the feel and looking that the initial tightening has been completed.
- When the tightening limit of the fitting is reached, the base will stop rotating and restrict the rotation of the union nut.

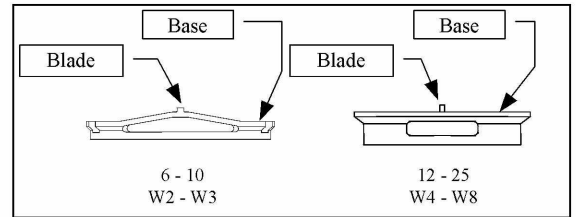


Fig. 6 - Shapes of gauge rings

Note: The gauge ring is only applicable for the tubes of nominal sizes 6 to 25 and W2 to W8. For the tubes of nominal sizes 3, 4, and W1, see Section 4.

3-2 Initial tightening (Nominal tube size: 6 - 25, W2 - W8)

- Insert the tube into which the sleeve has been inserted, into the main unit and then tighten it until the boss on the union nut makes contact with the gauge ring and pulls the blade. Crunching sound should be heard (see Fig. 7).
- The use of the dedicated spanner allows you to more efficiently tighten the union nut (see Fig. 8).

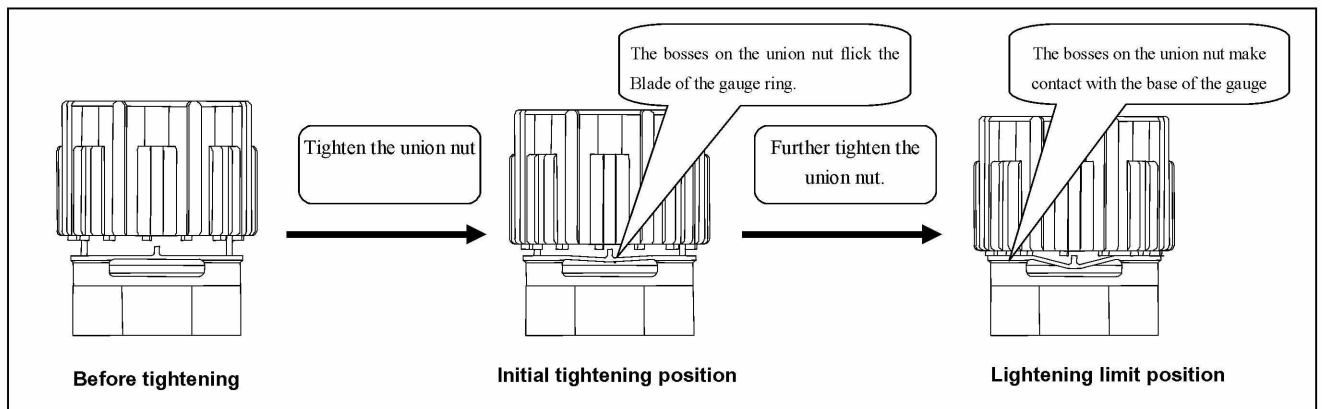


Fig. 7 - Initial tightening

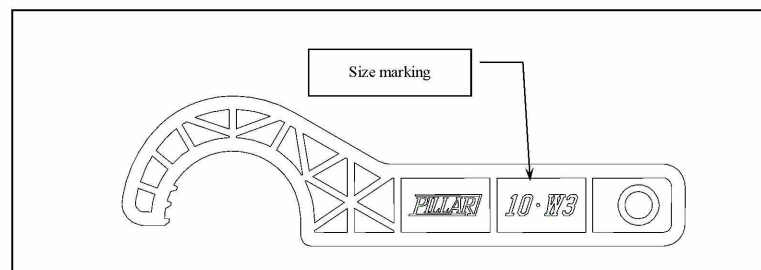


Fig. 8- Spanner for tightening the union nut

Table 5 – Spanner type

	Nominal tube size					
Millimeter size	6	8	10	12	19	25
Inch size	W2, W2Y	-	W3, W3Y	W4	W6	W8
Spanner type	J-SN-6	J-SN-8	J-SN-10	J-SN-12	J-SN-19	J-SN-25
Size marking	6·W2	8	10·W3	12·W4	19·W6	25·W8

Note: On the longer thread of the panel mount union, the gap cannot be used as a criterion for tightness. In this case, measure the clearance between the bossed leading end of the union nut and the half nut to control tightening (see Equation 1, Fig. 9, and Table 6).

$$(*\text{Gap after tightening}) = X - (\text{Thickness of panel})$$

Equation 1 - Dimensions in tightening the panel mount fitting

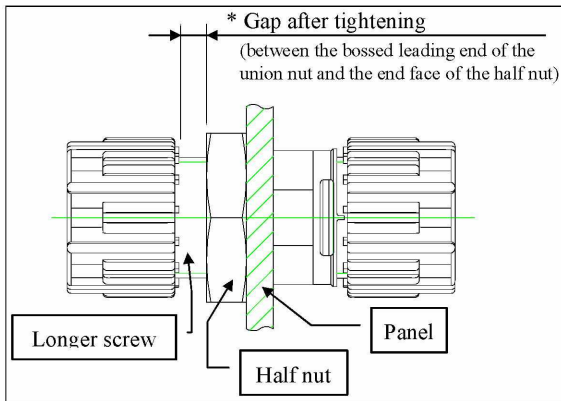


Fig. 9- Standard position to tighten the panel mount fitting

Table 6 - Substituted value "X"

Millimeter size	Inch size	Substituted value (X)	
		Standard tightening (Upper limit)	Limit tightening (Lower limit)
6	W2, W2Y	10.0	9.0
8	-	10.2	8.9
10	W3, W3Y	10.7	9.1
12	W4	12.8	11.2
19	W6	14.5	12.5
25	W8	22.3	20.0

3-3 Installing the cap sleeve (Nominal tube size: 6 - 25, W2 - W8)

- Insert the cap sleeve into the fitting body and tighten the union nut.
- Hand-tighten the union nut and then turn the nut a half turn with a wrench (see Fig.10 and Table 7).

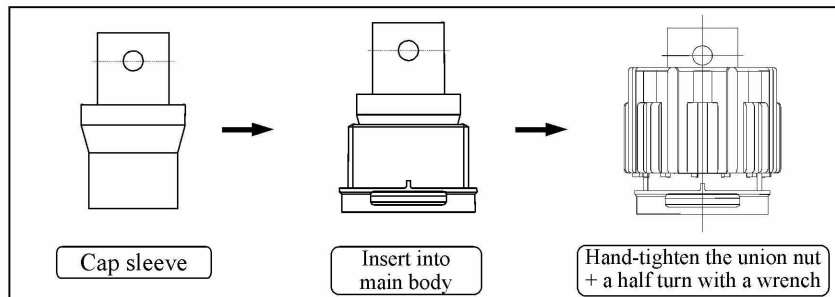


Fig. 10 - Installing the cap sleeve (6 - 25, W2 - W8)

Table 7 - Tightening control for the cap sleeve (6 - 25, W2 - W8)

Cap sleeve Type	Nominal tube size		Tightening control method for cap sleeve
	Millimeter size	Inch size	
P-CS-6A	6	W2, W2Y	Hand-tightening + 1/2 turn
P-CS-8A	8	-	
P-CS-10A	10	W3, W3Y	
P-CS-12A	12	W4	
P-CS-19A	19	W6	
P-CS-25A	25	W8	

Note: When the cap sleeve is tightened, the boss at the end of the union nut will not make contact with the blade of the gauge ring.

3-4 Removing and reinstallation (Nominal tube size: 6 - 25, W2 - W8)

- To remove the installed fitting, loosen the union nut and then separate it from the main body. Manually hold the tube and the main body, circularly move the tube, and then separate the sleeve from the main body.
- When reusing the removed fitting, do not disconnect the sleeve from the tube when removing the fitting.
- To install the removed fitting, insert the sleeve into the main body and then tighten to the last time position. Even if tighten to the last time position, further hand-tighten the unit nut so far as hand tightening is possible.

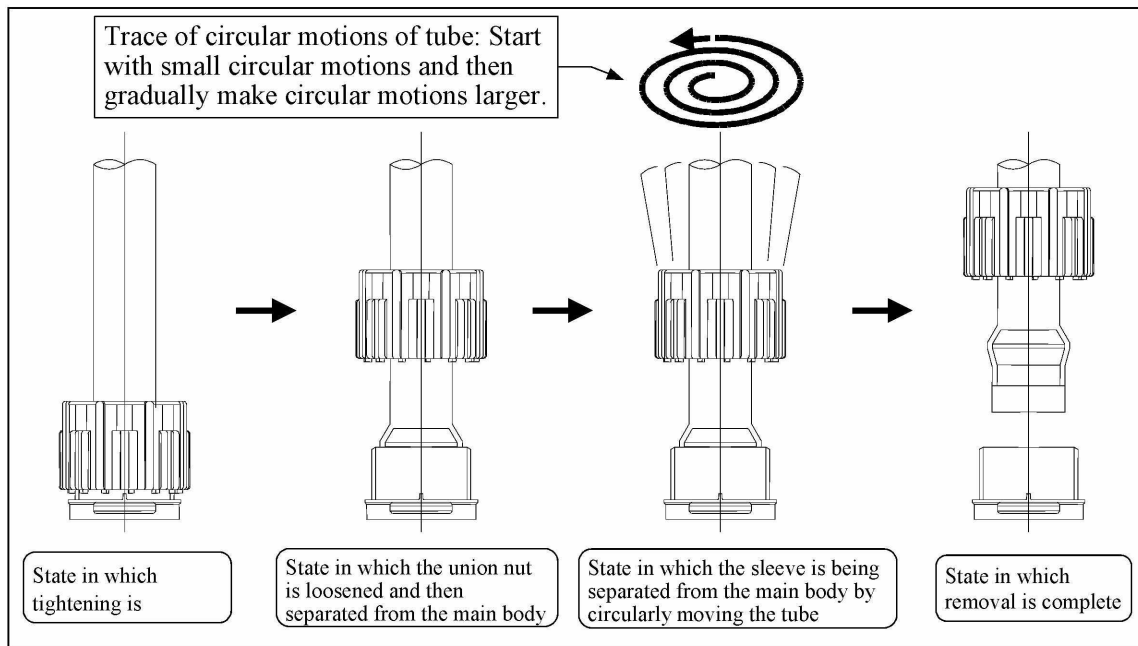


Fig. 11 - How to remove P series Super 300 Type Pillar Fitting (6 - 25, W2 - W8)

Notes:

- **In removing the fitting, circularly move the tube like first drawing small circles and then gradually drawing larger circles (see Fig.11).If you greatly twist the tube to left or right or if you circularly moves the tube like suddenly drawing large circles, then the sleeve may remain on the main body, hindering you from retightening the tube.**
- **In reinstalling, do not damage the removed parts.**
- **Removal and reusing are acceptable up to 10 times. If this number of reusing times is exceeded, replace the fitting. If the tightening limit is reached regardless of the number of reusing times, replace the fitting immediately.**

3-5 Measures against liquid leakage (Nominal tube size: 6 - 25, W2 - W8)

- 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		
 CAUTION	The fitting is made of resin. Exercise great care to avoid bending or tensile stress to the fitting when or after tightening it. Doing so may deform or damage the fitting, causing the liquid to leak or the fitting to uncouple from tubing.	
	Do not retighten the fitting while tubing is in high-temperature or pressurized conditions. 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).	
	Be sure to follow instructions in this manual when installing, retightening, reinstalling the fitting. Poor installation or retightening may cause the liquid to leak or the fitting to uncouple from tubing.	

4 Tightening (Nominal tube size: 3, 4, W1)

4-1 Cautions in tightening the union nut (Nominal tube size: 3, 4, W1)

- The gap between the union nut and the fitting body serves as a criterion for proper tightening of the union nut. (Gap specified for tightening control)
- The gap specified for tightening control has the upper and lower limits. Even if fittings have the same nominal size, they are classified into the A-type and the B-type according to their shapes.

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 (see Fig.12).

4)Type B: Applies to injection-molded fittings of elbow and Tee type (see Fig.12).

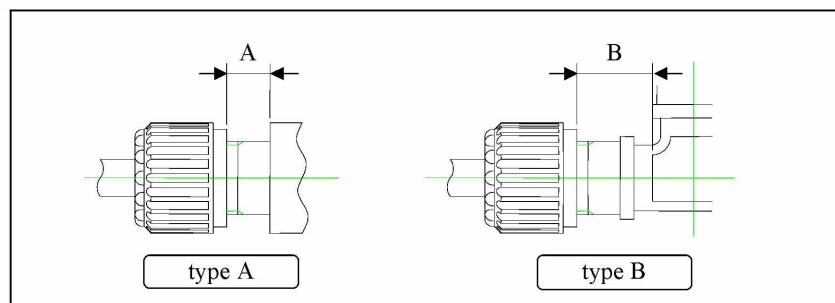


Fig.12 - Gaps as criterion for tightness check (3, 4, W1)

Table 8 - Fittings controlled with the B-type side of the gap gauge

	Fitting shape	
	Elbow	Tee
Fitting only <small>(Note 1)</small>	P-UE-3B P-UE-4B P-RUE 4-3B	P-UT-3B P-UT-4B P-RUT 4-3-4B P-RUT 3-4-3B
Combination of fitting and taper thread <small>(Note 1, 2)</small>	P-ME 3-1B P-ME 3-2B P-ME 4-1B P-ME 4-2B	P-MBT 3-1B P-MBT 3-2B P-MBT 4-1B P-MBT 4-2B

Note 1: This is applicable even if “3” is changed to “W1” in the above table.

Note 2: This is applicable even if “1” or “2” representing the taper thread size is changed to “N1” or “N2”, respectively.

Note: To check the gap, use gap gauges (feeler gauges) as shown in Section 4-2.

4-2 Checking the tightness of the union nut (Nominal tube size: 3, 4, W1)

- To check the tightness of the union nut, use gap gauges shown in Table 9. 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 Fig.13.

Checking the gap for upper limit:

As shown in Fig.13, 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.

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.

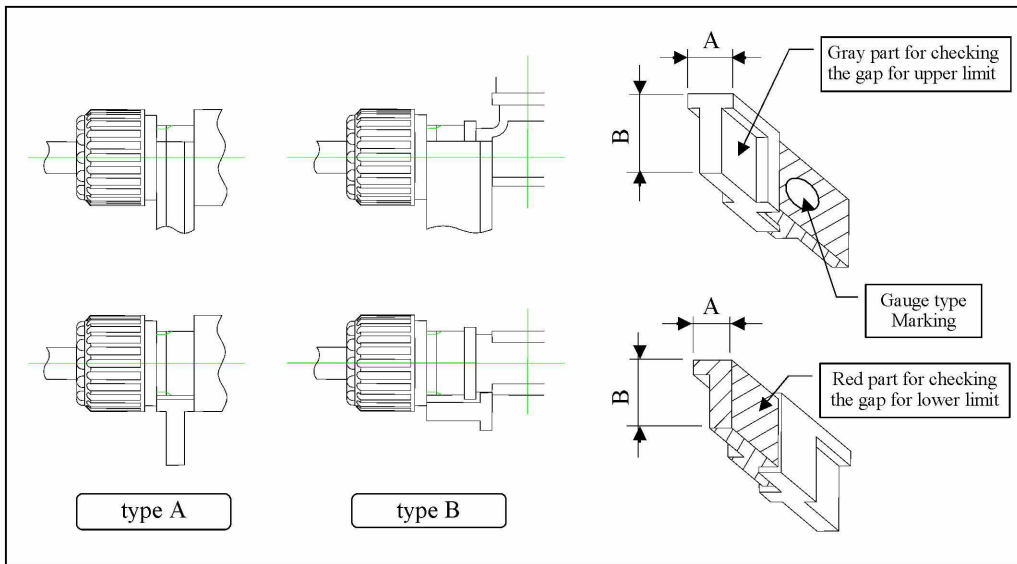


Fig.13 - How to use gap gauge (3, 4, W1)

Table 9 - Gap gauge type (3, 4, W1)

Gap gauge type	Nominal tube size	
	Millimeter size	Inch size
SSG-3(W1)	3	W1
SSG-4	4	-

Note:

Gap gauges are not supplied. They are available from Nippon Pillar Packing.

The gap gages (for nominal tube size: 3, 4, and W1) are the same as those for the Super Type Pillar Fittings.

4-3 Initial tightening (Nominal tube size: 3, 4, W1)

- Insert 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.**
- 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. For a special size tube where the gap cannot be used as a criterion for tightness, tighten the union nut in the same manner.**

4-4 Installing the cap sleeve (Nominal tube size: 3, 4, W1)

- Insert the cap sleeve into the fitting body and hand-tighten the union nut until it no longer turns (see Fig.14 and Table 10).

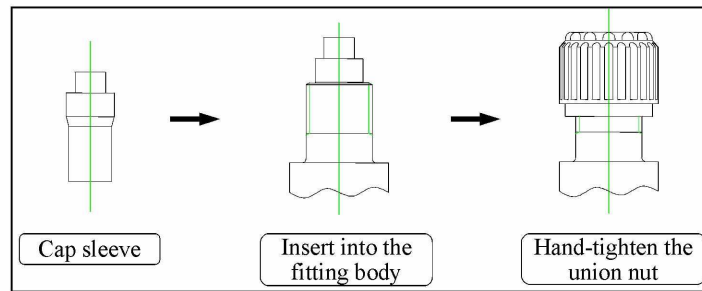


Fig.14 - Installing the cap sleeve (3, 4, W1)

Table 10 – Tightening control method for the cap sleeve (3, 4, W1)

Cap sleeve type	Nominal tube size		Tightening control method for cap sleeve
	Millimeter size	Inch size	
P-CS-3A	3	W1	Hand-tighten the union nut
P-CS-4A	4	-	

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 over tightening, causing damage or leakage.
- Note:
- The cap sleeves P-CS-3A and P-CS-4A are the same as the cap sleeve CS-3A and CS-4A for the Super Type Pillar Fittings.

4-5 Removing and reinstallation (Nominal tube size: 3, 4, W1)

- 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, 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, 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.

4-6 Measures against liquid leakage (Nominal tube size: 3, 4, W1)

- 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		
	The fitting is made of resin. Exercise great care to avoid bending or tensile stress to the fitting when or after tightening it. Doing so may deform or damage the fitting, causing the liquid to leak or the fitting to uncouple from tubing.	
	Do not retighten the fitting while tubing is in high-temperature or pressurized conditions. 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).	
	Be sure to follow instructions in this manual when installing, retightening, reinstalling the fitting. Poor installation or retightening may cause the liquid to leak or the fitting to uncouple from tubing.	

5 How to Use Insertion Tools

5-1 Using room temperature insertion tool JT-A4 (Nominal tube size: 10 - 25, W3 - W8)

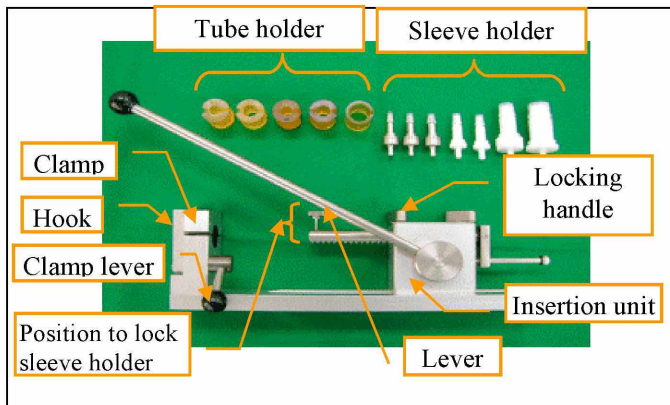


Fig. 15 - Parts designation of JT-A4

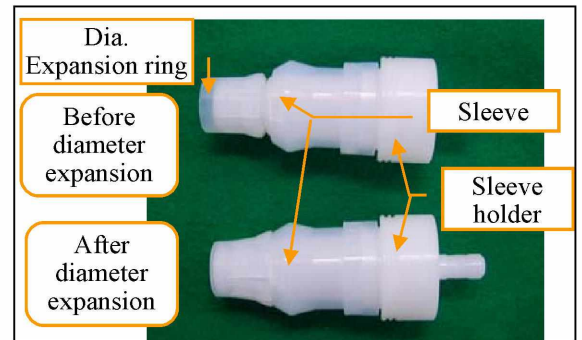


Fig. 16 - Setting the sleeve

1. Setting the sleeve

- Install to insertion tool JT-A4 the sleeve holder and then the sleeve as shown in Fig.16 for the state before the diameter has been expanded.
- After setting the sleeve, push the diameter expansion ring into the sleeve until it clicks in place (see Fig.16 for the state after the diameter has been expanded and Table for applicable parts).

2. Clamping the tube

- Loosen insertion unit locking handle and lock the insertion unit at its shortest locking length (see Fig.17 and Table 11).
- Fit the tube holder onto the tube having the union nut in place.
- Lock the tube with the clamp at the shortest locking length for the tube (see Fig.17 and Table11).

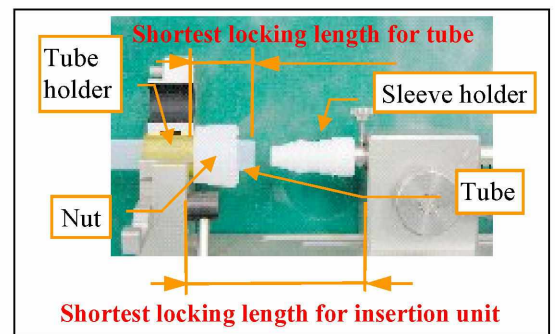


Fig. 17 - Shortest locking length

Table 11 - Shortest locking length (10 - 25, W3 - W8)

Millimeter size	Nominal tube size			
	10	12	19	25
Inch size	W3, W3Y	W4	W6	W8
Shortest length for locking the tube	25	30	35	41
Shortest length for locking the insertion unit	94		110	

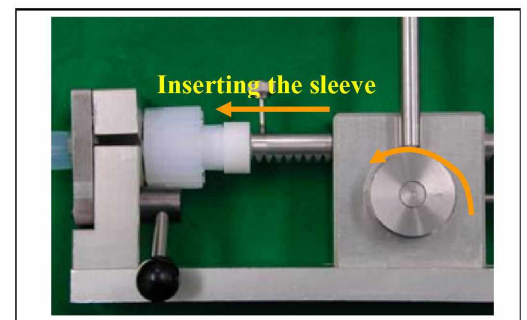


Fig. 18 - Inserting the sleeve

3. Inserting the sleeve into the tube

- Turn the lever counterclockwise to insert the sleeve into the tube (see Fig.18).
- Stop turning the grip when the tube end reaches the tube stop of the sleeve (see page 6).
- Turn the lever clockwise as viewed from you. The sleeve holder will move back and the diameter expansion ring will be unlocked. Now the inserted tube sleeve can be removed from the sleeve holder (see Fig. 19).

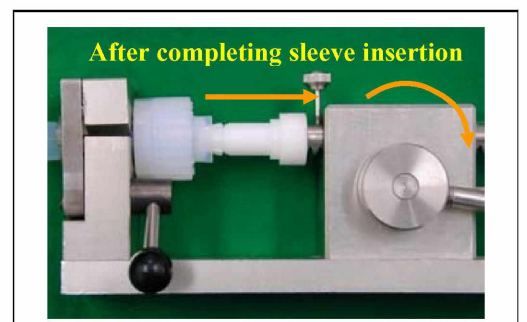


Fig. 19- Completely inserted sleeve

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 steps 1 to 3.
- Open the clamp and remove the tube.
- After inserting the sleeve into one end of the tube, cut the tube using Table 2 for reference before inserting the other end.
- Loosen the insertion unit locking handle, position the insertion unit so as to allow the arrangement shown in Fig.20, and then retighten the locking handle to secure the unit (refer to Table 12 for applicable parts).
- Put the union nuts on the tube, set the inserted sleeve in sleeve holder for short tube, and then fix the sleeve holder to the clamp.
- Insert the other end as described in 1 to 3.

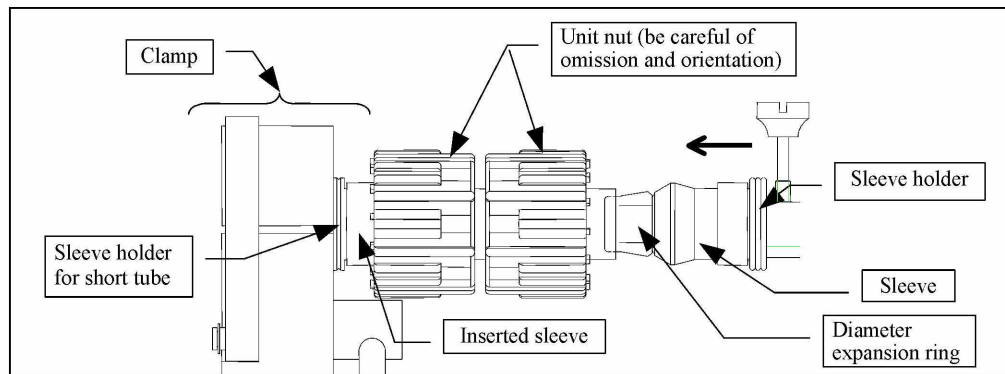


Fig. 20 - Parts arrangement (10 - 25, W3 - W8)

Table 12 - Parts for JT-A4 (10 - 25, W3 - W8)

Millimeter size	Nominal tube size			
	10	12	19 (W6)	25
Sleeve holder	P-SHP-AK10	P-SHP-AK12	P-SHP-AK19(W6)	P-SHP-AK25(W8)
Diameter expansion ring	P-KR-A10	P-KR-A12	P-KR-A19(W6)	P-KR-A25(W8)
Tube holder	J-TH-A10	J-TH-A12	J-TH-A19	Not required
Sleeve holder for short tube	P-SH-A10S2	P-SH-A12S2	P-SH-A19(W6)S2	P-SH-A25(W8)S2

Inch size	Nominal tube size			
	W3	W3Y	W4	W8
Sleeve holder	P-SHP-AKW3	P-SHP-AKW3Y	P-SHP-AKW4	P-SHP-AK25(W8)
Diameter expansion ring	P-KR-AW3	P-KR-AW3Y	P-KR-AW4	P-KR-A25(W8)
Tube holder	J-TH-AW3		J-TH-AW4	Not required
Sleeve holder for short tube	P-SH-AW3S2	P-SH-AW3YS2	P-SH-AW4S2	P-SH-A25S2

Notes:

- The P-SHP-AK** sleeve holder is provided with a diameter expansion ring at its end. If the diameter expansion ring becomes less secured, place an order for the diameter expansion ring only.
- Insertion tool JT-A4 is an improvement of JT-A3.
- The sleeve holder for Super 300 Type Pillar Fitting P Series has dual grooves on its flange (see Fig.21).

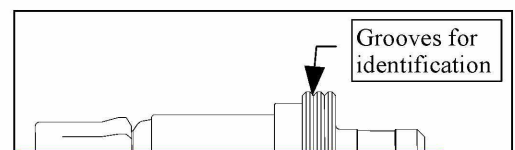


Fig. 21 - Sleeve holder

5-2 Using room temperature insertion tool JT-C3 (Nominal tube size: 6, 8, W2, W2Y, W3Y)

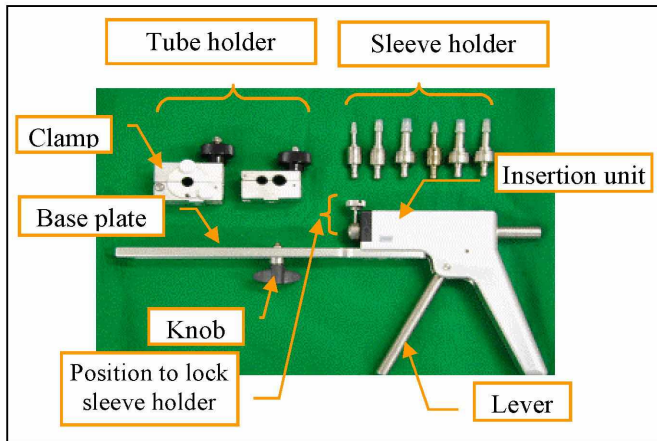


Fig. 22 - Parts designation of JT-C3

1. Setting the sleeve

- Install to insertion tool JT-C3 the sleeve holder and then the sleeve as shown in Fig.23 for the state before the diameter has been expanded.
- After the sleeve has been set, push the diameter expansion ring toward the sleeve until it clicks (see Fig.23 for the state after the diameter has been expanded and Table for the applicable parts).

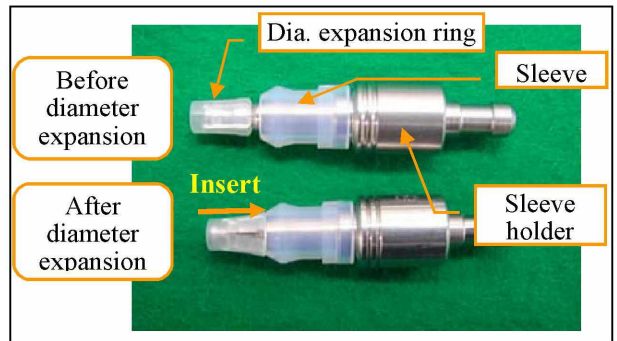


Fig.23 - Setting the sleeve

2. Clamping the tube

- Select a suitable tube holder according to Table 14 and fix it to the JT-C3.
- Loosen the knob located at the bottom of the tube holder and then lock the tube holder at its shortest locking length (see Fig.24 and Table 13).
- Open the clamp and install the tube with union nut passing through it in the tube holder so that the shortest locking length for the tube (see Fig.24 and Table 13).

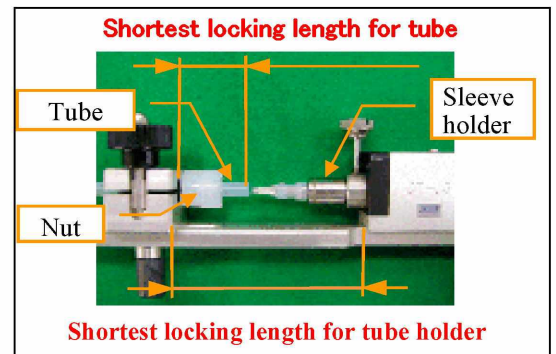


Fig. 24 - Shortest locking length

Table 13 - Shortest locking length (6, 8, W2, W2Y, W3Y)

Millimeter size	Nominal tube size		
	6	8	-
Inch size	W2, W2Y	-	W3Y
Shortest locking length for tube	20	23	25
Shortest locking length for tube holder	68		

3. Inserting the sleeve into the tube

- Grip the lever, and the sleeve will be inserted into the tube (see Fig.25).
- When the tube end reaches the tube stop of the sleeve, release the levers (see page 6).
- When the lever is released, the sleeve holder will move back and the diameter expansion ring will be unlocked. Now the inserted tube sleeve can be removed from the sleeve holder (see Fig.26).

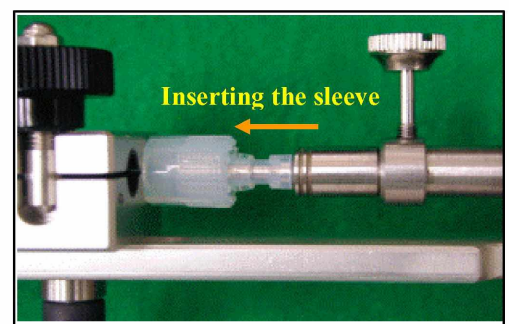


Fig. 25 - Inserting the sleeve

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.

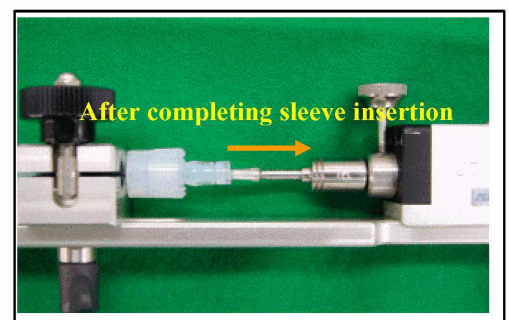


Fig. 26 - Completely inserted sleeve

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 steps 1 to 3.
- Open the clamp and remove the tube.
- After inserting the sleeve into one end of the tube, cut the tube using Table 2 for reference before inserting the other end.
- Loosen the knob located at the bottom of the tube holder, position the tube holder so as to allow the arrangement shown in Fig.27, and then retighten the knob to secure the unit.
- Put the union nuts on the tube, set the inserted sleeve in sleeve holder for short tube, and then fix the sleeve holder to the $\phi 6$ portion of the tube holder (see Fig.27 and refer to Table for applicable parts).
- Insert the other end as described in 1 to 3.

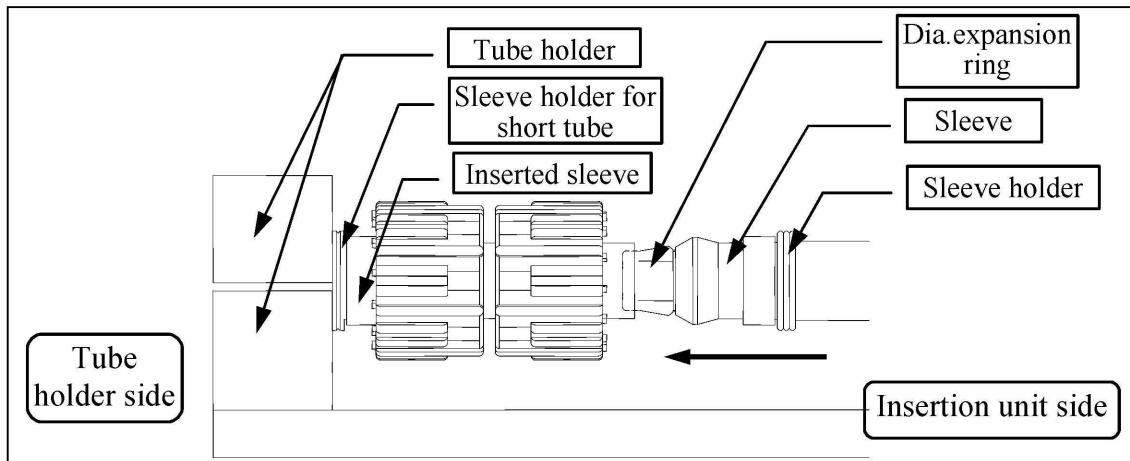


Fig. 27 - Parts arrangement (6, 8, W2, W2Y, W3Y)

Table 14 - Parts for JT-C3 (6, 8, W2, W2Y, W3Y)

	Nominal size of tube				
	6	8	W2	W2Y	W3Y
Sleeve holder	P-SHP-CK6(W2)	P-SHP-CK8	P-SHP-CK6(W2)	P-SHP-CKW2Y	P-SHP-AKW3Y
Dia. Expansion ring	P-KR-C6(W2)	P-KR-C8	P-KR-C6(W2)	P-KR-CW2Y	P-KR-AW3Y
Tube holder	J-TH-C2			J-TH-C3	
Sleeve holder for short tube	P-SH-C6(W2)S2	P-SH-C8S2	P-SH-C6(W2)S2	P-SH-CW2YS2	P-SH-CW3YS2

Notes:

- The P-SHP-CK** sleeve holder is provided with a diameter expansion ring at its end. If the diameter expansion ring becomes less secured, place an order for the diameter expansion ring only.
-
- Insertion tool JT-C3 is an improvement of JT-C2.
- The sleeve holder for Super 300 Type Pillar Fitting P Series has dual grooves on its flange (see Fig.28).

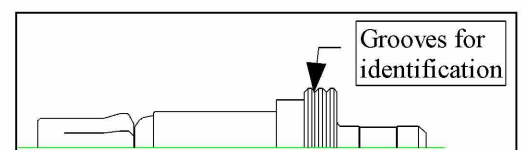


Fig. 28 - Sleeve holder

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-CP (short type) (see Fig.29).
- Remove the clamp by turning the knob located below the clamp.
- Remove the set bolt located below the insertion unit 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-CP (short type).**
- **To use a short pipe, replace the J-BP-CP with the J-BP-C (standard type).**

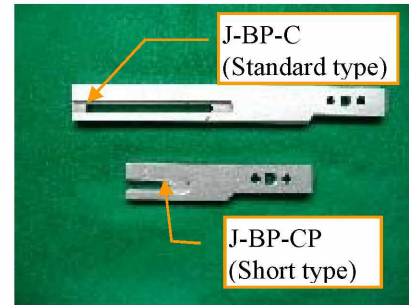


Fig. 29– Names of parts in replacing the base plate

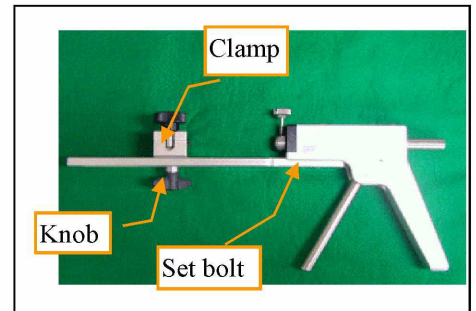


Fig. 30– Names of base plates

5-3 Using room temperature insertion tool JT-C3 (Nominal tube size: 10,W3)

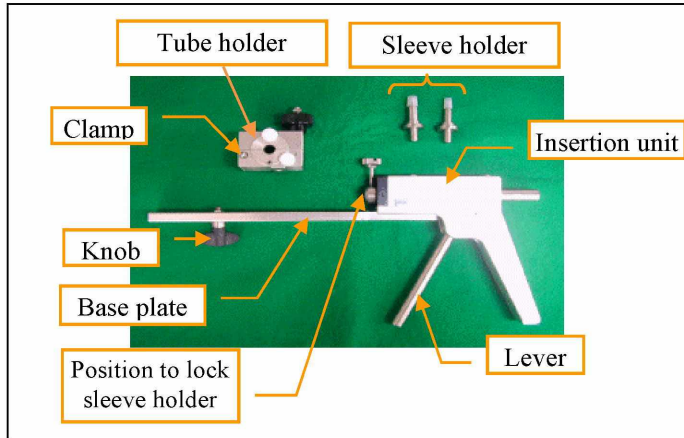


Fig.31 - Parts designation of JT-C3

1. Setting the sleeve

- Install to insertion tool JT-C3 the sleeve holder and then the sleeve as shown in Fig. 32 for the state before the diameter has been expanded.
- After the sleeve has been set, push the diameter expansion ring toward the sleeve until it clicks (see Fig. 32 for the state after the diameter has been expanded and Table 16 for the applicable parts).

2. Clamping the tube

- Select a suitable tube holder according to Table 16 and fix it to the JT-C3.
- Loosen the knob located at the bottom of the tube holder and then lock the tube holder at its shortest locking length.(See Fig.33 and Table 15)
- Open the clamp and install the tube with union nut passing through it in the tube holder so that the shortest locking length for the tube. (see Fig.33 and Table 15)

3. Inserting the sleeve into the tube

- Grip the lever, and the sleeve will be inserted into the tube (Fig. 35).
- When the tube end reaches the tube stop of the sleeve, release the levers (see page 6).
- When the lever is released, the sleeve holder will move back and the diameter expansion ring will be unlocked. Now the inserted tube can be removed from the sleeve holder (see Fig. 36).

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.

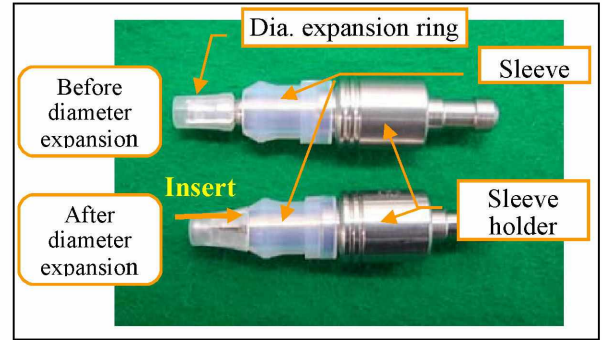


Fig. 32 - Setting the sleeve

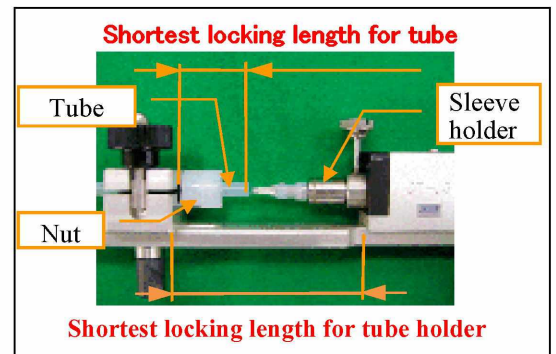


Fig. 33 - Shortest locking length

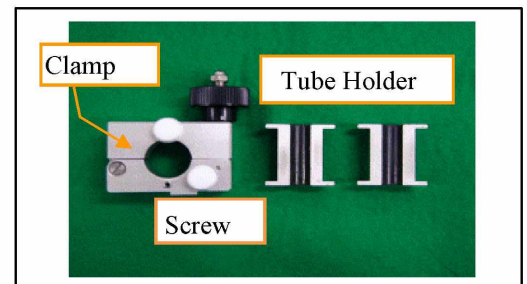


Fig. 34 - Parts designation of J-TH-C

Table 15 - Shortest locking length (10,W3)

	Nominal tube size
Millimeter size	10
Inch size	W3
Shortest locking length for tube	25
Shortest locking length for tube holder	68

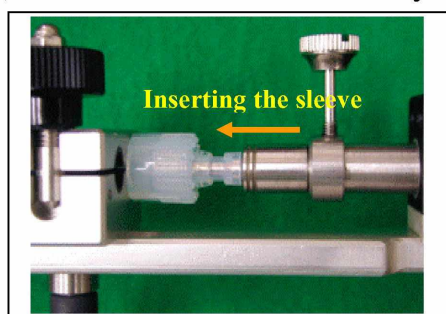


Fig. 35 - Inserting the sleeve

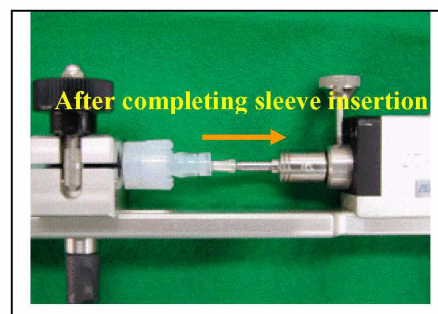


Fig. 36 - Completely inserted sleeve

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 steps 1 to 3.
- Open the clamp and remove the tube.
- After inserting the sleeve into one end of the tube, cut the tube using Table 2 for reference before inserting the other end.
- Loosen the knob located at the bottom of the tube holder, position the tube holder so as to allow the arrangement shown in Fig. 37, and then retighten the knob to secure the unit.
- Put the union nuts on the tube, set the inserted sleeve in sleeve holder for short tube, and then fix the sleeve holder to the $\phi 6$ portion of the tube holder (see Fig. 37 and refer to Table 16 for applicable parts).
- Insert the other end as described in 1 to 3.

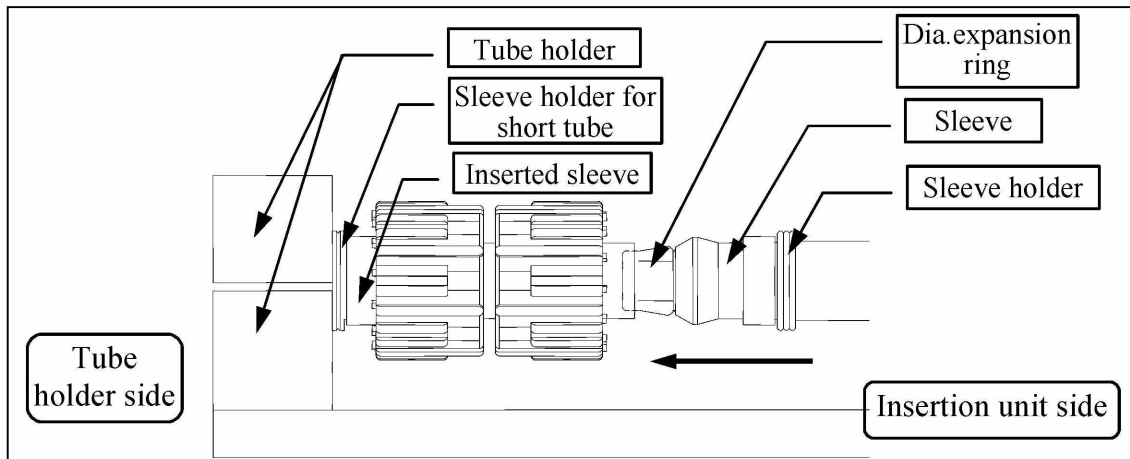


Fig. 37 - Parts arrangement (10,W3)

Table 16 - Parts for JT-C3 (10,W3)

	Nominal size of tube	
	10	W3
Sleeve holder	P-SHP-AK10	P-SHP-AKW3
Dia. Expansion ring	P-KR-A10	P-KR-AW3
Tube holder	J-TH-C	
	J-TH-SB10	J-TH-SBW3
Sleeve holder for short tube	P-SH-C10S2	P-SH-CW3S2

Notes:

- The P-SHP-CK** sleeve holder is provided with a diameter expansion ring at its end. If the diameter expansion ring becomes less secured, place an order for the diameter expansion ring only.
- Insertion tool JT-C3 is an improvement of JT-C2.
- The sleeve holder for Super 300 Type Pillar Fitting P Series has dual grooves on its flange (see Fig. 38).

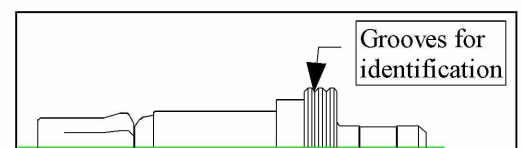


Fig. 38 - Sleeve holder

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-CP (short type) (see Fig.39 and Fig. 40).
- 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-CP (short type).**
- **To use a short pipe, replace the J-BP-CP with the J-BP-C (standard type).**

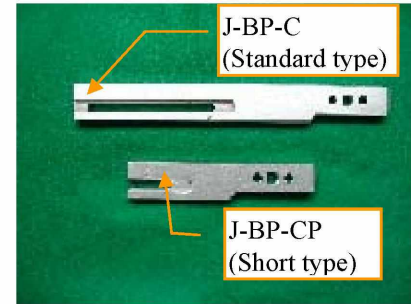


Fig. 39– Names of parts in replacing the base plate

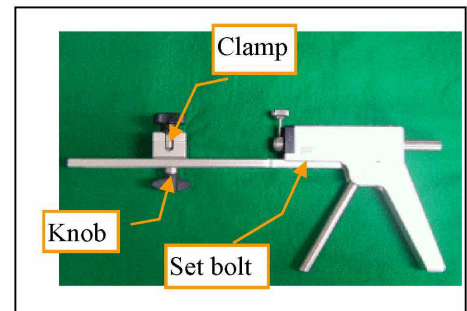


Fig. 40– Names of base plates

5-4 Using room temperature insertion tool JT-C3 (Nominal tube size: 3, 4, W1)

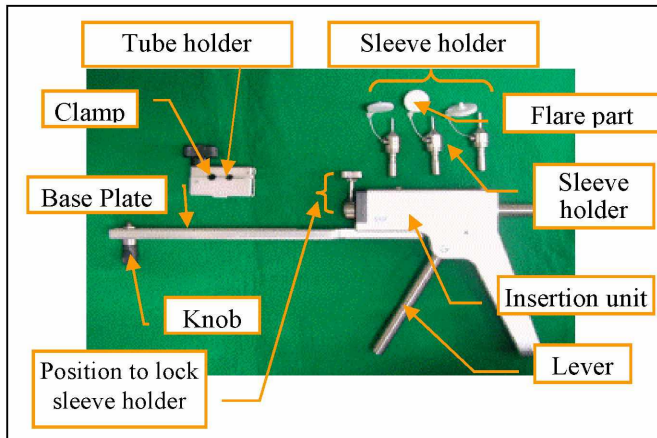


Fig. 41 - Parts designation of JT-C3

1. Setting the sleeve

- Install to insertion tool JT-C3 the sleeve holder and then the sleeve as shown in Fig. 42 for the state before the flare part has been set.
- After fitting the sleeve, lock the flare part at the leading end of the sleeve holder (see Fig. 42 for the state after the flare part has been set and Table 18 for the applicable parts).

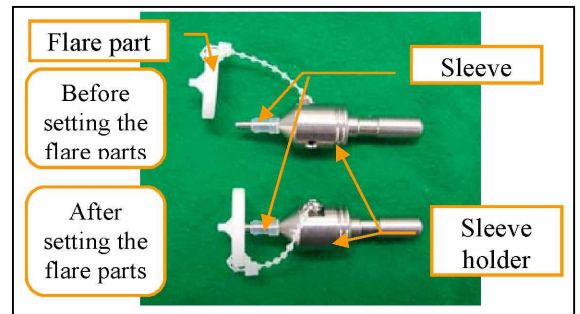


Fig. 42 - Setting the sleeve

2. Clamping the tube

- Select a suitable tube holder according to Table 18 and fix it to the JT-C3.
- Loosen the knob located at the bottom of the tube holder and then lock the tube holder at its shortest locking length. (See Fig.43 and Table 17) Open the clamp and install the tube with union nut passing through it in the tube holder so that the shortest locking length for the tube (see Fig.43 and Table 17).

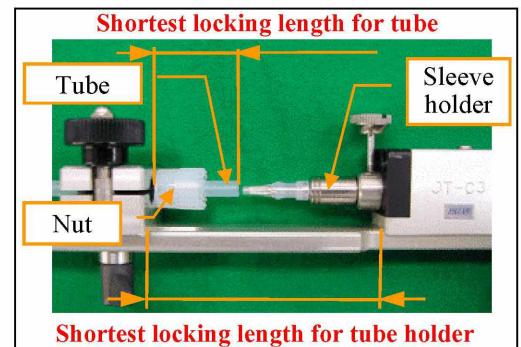


Fig. 43 - Shortest locking length

Table 17 - Shortest locking length (3,4,W1)

Millimeter size	Nominal tube size	
	3	4
Inch size	W1	-
Shortest locking length for tube	12	12
Shortest locking length for tube holder	58	

3. Inserting the sleeve into the tube

- Squeeze the lever to expand the diameter of the tube end with the flare part. Repeat this step several times (see Fig. 44).
- After the diameter has been expanded, remove the flare part.

Notes:

- **If the flare part is moved forward after the diameter has been expanded, the tube may be buckled. Upon the completion of diameter expansion, stop moving forward the flare part.**
- **If the flare part is difficult to remove, turn it. This will allow you to remove the flare part easily.**

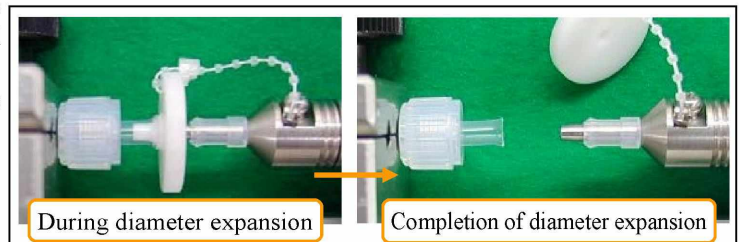


Fig. 44 - Expansion of tube diameter

4. Inserting the sleeve into the tube

- Grip the lever, and the sleeve will be inserted into the tube (see Fig. 45).
- When the tube end reaches the tube stop of the sleeve, release the lever (see page 6).
- When you release the lever, the sleeve holder will move back allowing you to remove the inserted tube sleeve.

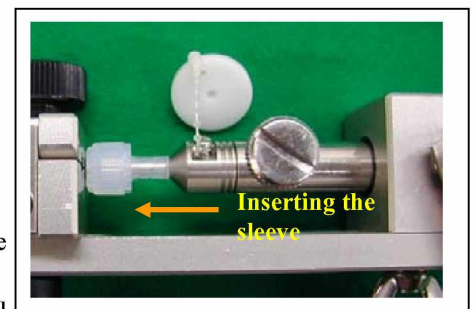


Fig. 45 - Inserting the sleeve

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.

5. 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 steps 1 to 4.
- Open the clamp and remove the tube.
- After inserting the sleeve into one end of the tube, cut the tube using Table 2 for reference before inserting the other end.
- Loosen the knob located at the bottom of the tube holder, position the tube holder so as to allow the arrangement shown in Fig. 46, and then retighten the locking knob to secure the unit.
- Put the union nuts on the tube, set the inserted sleeve in sleeve holder for short tube, and then fix the sleeve holder to the $\phi 6$ portion of the tube holder (see Fig. 46 and refer to Table 18 for applicable parts).
- Insert the other end as described in 1 to 4.

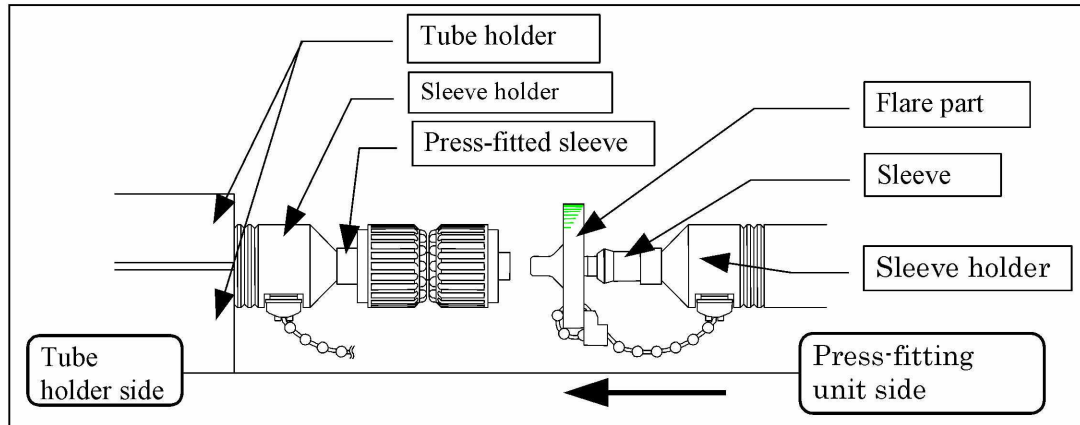


Fig. 46 - Parts arrangement (3, 4, W1)

Table 18 - Parts for JT-C3 (3, 4, W1)

	Nominal tube size		
	3	4	W1
Sleeve holder	P-SH-CK3	P-SH-CK4	P-SH-CKW1
Tube holder	J-TH-C1		

Notes:

- The P-SH-CK** sleeve holder is provided with a flare part ring at its end.
- Insertion tool JT-C3 is an improvement of JT-C2.
- The sleeve holder for Super 300 Type Pillar Fitting P Series has dual grooves on its flange (see Fig. 47).

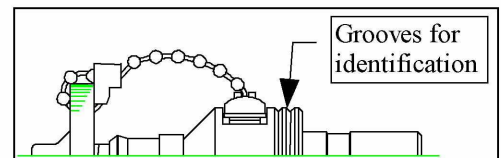


Fig. 47 - Sleeve holder

6. 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-CP (short type) (see Fig.48 and Fig. 49).
- 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-CP (short type).**
- **To use a short pipe, replace the J-BP-CP with the J-BP-C (standard type).**

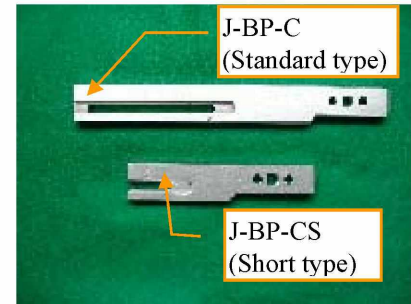


Fig. 48– Names of parts in replacing the base plate

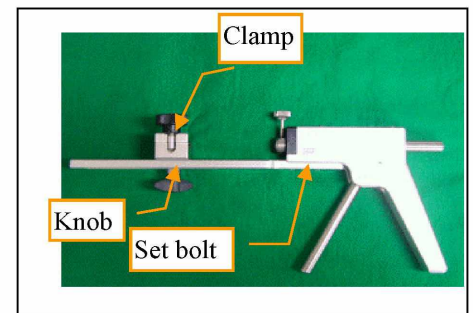


Fig. 49– Names of base plates

5-5 Using hand-held type room temperature insertion tool JT-SA-KA (Nominal tube size: 19, 25, W6, W8)

In the case of use, a part of table19 is necessary according to the tube size other than the JT-SA-KA. Please prepare a part adapting to tube size.

Table 19 - Parts for JT-SA-KA(19(W6),25,W8)

Millimeter size	Nominal tube size	
	19	25
Inch size	W6	W8
Sleeve holder	P-SHP-SAK19(W6)	P-SHP-SAK25(W8)
Tube holder	J-TH-A19	—

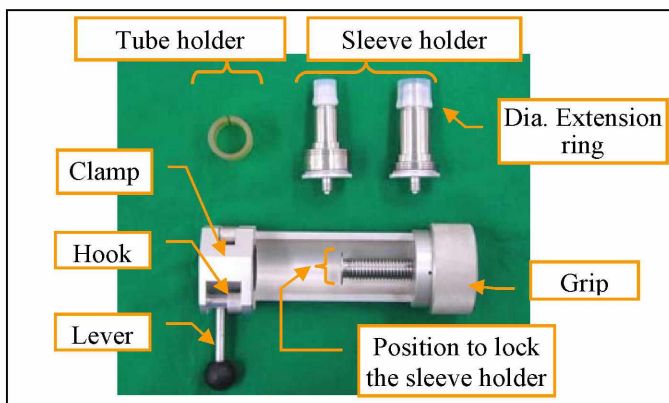


Fig. 50- Parts designation of JT-SA-KA

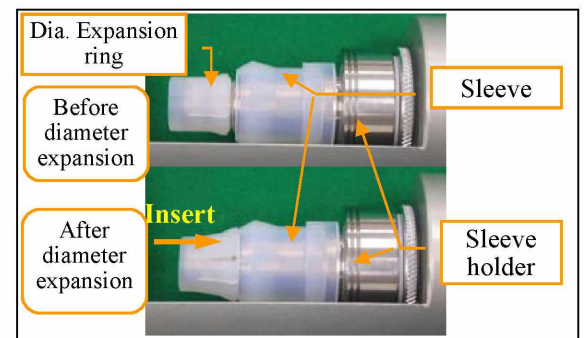


Fig. 51 - Setting the sleeve

1. Setting the sleeve

- Install to insertion tool JT-SA-KA the sleeve holder and then the sleeve as shown in Fig. 51 for the state Before diameter expansion.
- After the sleeve has been set, push the diameter expansion ring toward the sleeve until it clicks (see Fig. 51 for the state After diameter expansion).

2. Clamping the tube

- Fit the tube holder onto the tube having the union nut in place.
- Lock the tube with the clamp at the tube locking length. (see Fig. 52 and Table 20)
- In addition, in the case of 25 or W8 size, the tube holder is unnecessary. Please fix a tube to the clamp directly.

Table 20 - Tube locking length

Millimeter size	Nominal tube size	
	19	25
Inch size	W6	W8
Tube locking length	35	41

3. Inserting the sleeve into the tube

- Turn the grip clockwise to insert the sleeve into the tube (see Fig. 53).
- Stop turning the grip when the tube end reaches the tube stop of the sleeve (see psg 6).
- Turning the grip counterclockwise will move the sleeve holder backward and unlock the diameter expansion ring. Now the inserted tube sleeve can be removed from the sleeve holder (see Fig. 54).

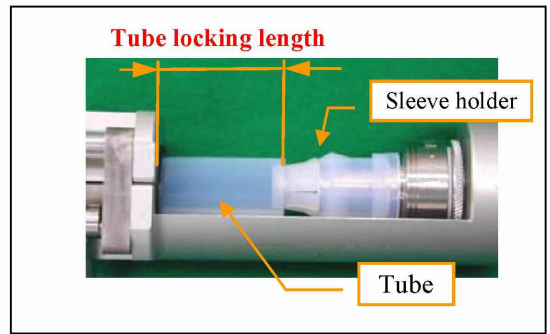


Fig. 52 - Tube locking length

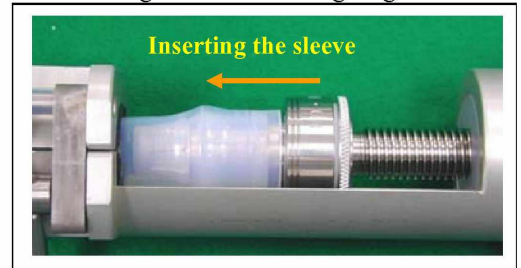


Fig. 53 - Inserting the sleeve

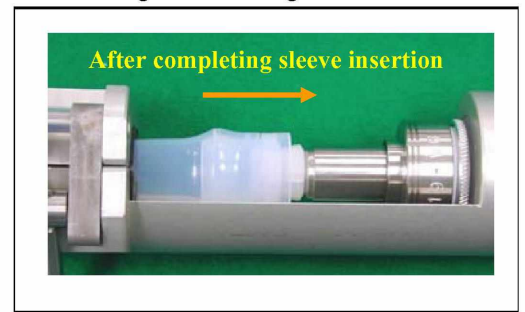


Fig. 54- Completely inserted sleeve

Caution:

- **Stop turning the grip clockwise when the tube end reaches the tube stop of the sleeve. Otherwise, damage to the tube, sleeve and/or sleeve holder may result.**
- **The sleeve holder is provided with a diameter expansion ring at its end. If the diameter expansion ring becomes less secured, replace the diameter expansion ring to the new thing.(Table 21)**

Table 21 – Dia. Expansion ring

Millimeter size	Nominal tube size	
	19	25
Inch size	W6	W8
Sleeve holder	P-SHP-SAK19(W6)	P-SHP-SAK25(W8)
Dia. Expansion ring	P-KR-A19(W6)	P-KR-A25

5-6 Using hand-held type room temperature insertion tool JT-SA-KA (Nominal tube size: 6 - 12, W2 - W4)

- In the case of use, a part of table22 is necessary according to the tube size other than the JT-SA-KA. Please prepare a part adapting to tube size.

Table 22 - Parts for JT-SA-KA (6-12,W2-W4)

Nominal tube size	Millimeter size				Inch size				
	6	8	10	12	W2	W2Y	W3	W3Y	W4
Sleeve holder	P-SHP-SBK6(W2)	P-SHP-SBK8	P-SHP-SBK10	P-SHP-SBK12	P-SHP-SBK6(W2)	P-SHP-SBKW2Y	P-SHP-SBKW3	P-SHP-SBKW3Y	P-SHP-SBKW4
Tube holder	J-TH-SA6-KA	J-TH-SA8-KA	J-TH-A10	J-TH-A12	J-TH-SAW2-KA		J-TH-AW3		J-TH-AW4
Attachment	SA-SB-AT								

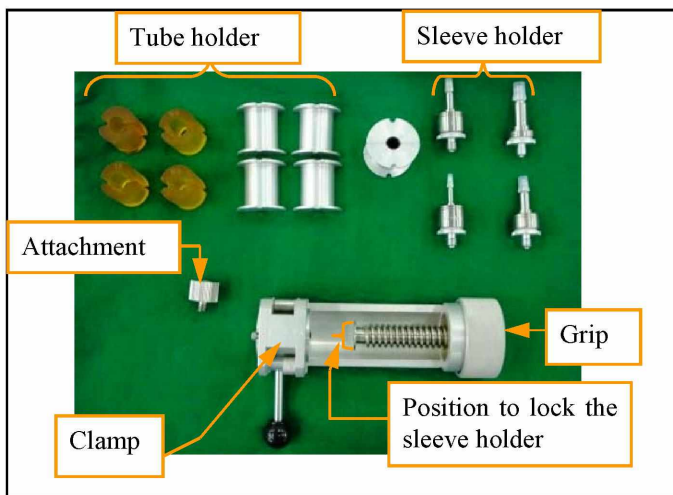


Fig. 55 - Parts designation of JT-SA-KA

1. Setting the sleeve

- Attach the attachment to JT-SA-KA.(Fig.56)
- Then Attach the sleeve holder to the attachment and the sleeve as shown in Fig. 57 for the state Before diameter expansion.
- After the sleeve has been set, push the diameter expansion ring toward the sleeve until it clicks (see Fig. 57 for the state After diameter expansion).

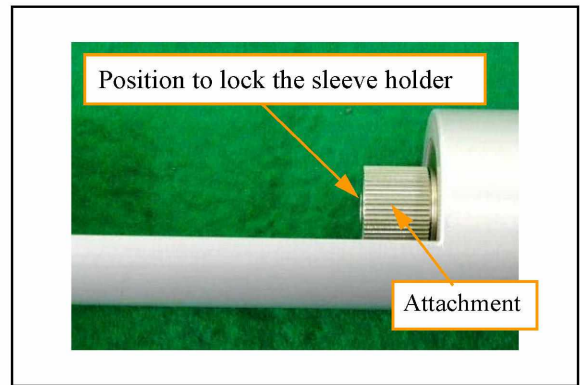


Fig. 56 – Setting the attachment

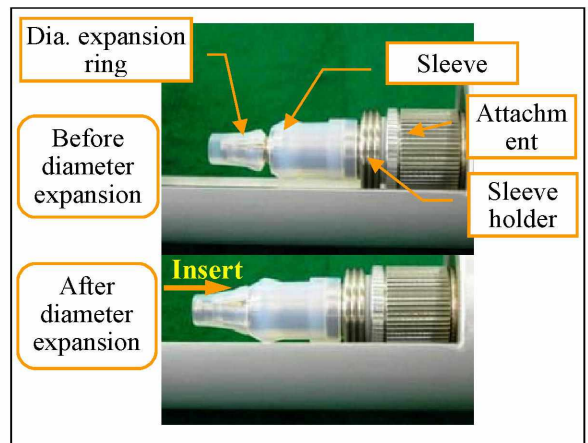


Fig. 57 – Setting the sleeve

2. Clamping the tube

In the case of nominal tube size 6,8,W2,W2Y

- Select a suitable tube holder according to Table 22 and fix it to the JT-SA-KA..
- Open the clamp and install the tube with union nut passing through. Lock the tube with the clamp at the tube locking length (see Fig. 58 and Table 23)

In the case of nominal tube size 12,W3,W3Y,W4

- Fit the tube holder onto the tube having the union nut in place.
- Lock the tube with the clamp at the tube locking length shown in Table 23. (see Fig. 58)

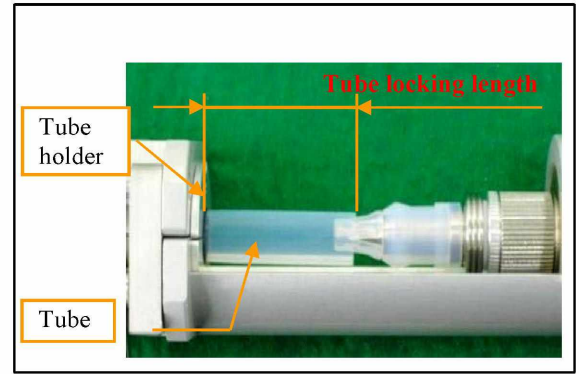


Fig. 58 - Tube locking length

Table 23 - Tube locking length

Millimeter size	Nominal tube size			
	6	8	10	12
Inch size	W2, W2Y	-	W3, W3Y	W4
Tube locking length	20	23	25	30

3. Inserting the sleeve into the tube

- Turn the grip clockwise to insert the sleeve into the tube (see Fig. 59).
- Turning the grip counterclockwise will move the sleeve holder backward and unlock the diameter expansion ring. Now the inserted tube sleeve can be removed from the sleeve holder (Fig. 60).



Fig. 59 – Inserting the sleeve

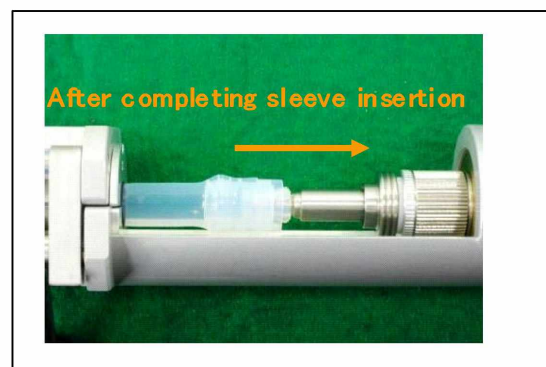


Fig. 60 - Tube locking length

Caution:

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

The sleeve holder is provided with a diameter expansion ring at its end. If the diameter expansion ring becomes less secured, replace the diameter expansion ring to the new thing.(Table 24)

Table 24 – Dia. Expansion ring

Nominal tube size	Millimeter size				Inch size				
	6	8	10	12	W2	W2Y	W3	W3Y	W4
Sleeve holder	P-SHP-SBK6(W2)	P-SHP-SBK8	P-SHP-SBK10	P-SHP-SBK12	P-SHP-SBK6(W2)	P-SHP-SBKW2Y	P-SHP-SBKW3	P-SHP-SBKW3Y	P-SHP-SBKW4
Dia. Expansion ring	P-KR-C6	P-KR-C8	P-KR-C10	P-KR-C12	P-KR-C6	P-KR-CW2Y	P-KR-CW3	P-KR-CW3Y	P-KR-CW4

5-7 Using hand-held type room temperature insertion tool JT-SA-KA (Nominal tube size: 3, 4, W1)

In the case of use, a part of table25 is necessary according to the tube size other than the JT-SA-KA. Please prepare a part adapting to tube size.

Table 25 - Parts for JT-SA-KA (3,4,W1)

Nominal tube size	Millimeter size		Inch size
	3	4	W1
Sleeve holder	P-SH-SBK3	P-SH-SBK4	P-SH-SBKW1
Tube holder	J-TH-SA3-KA	J-TH-SA4-KA	J-TH-SAW1-KA
Attachment	SA-SB-AT		

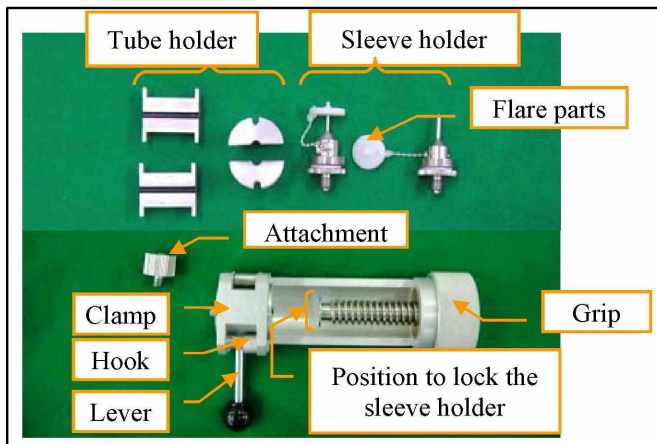


Fig.61 - Parts for JT-SA-KA

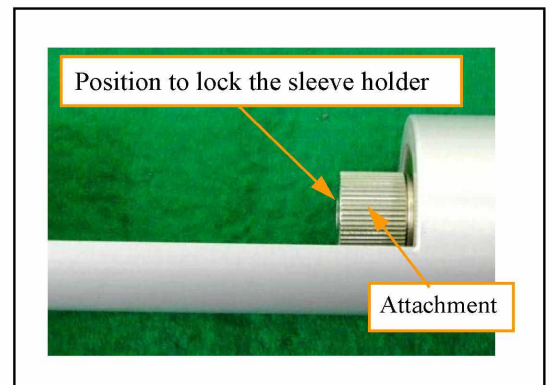
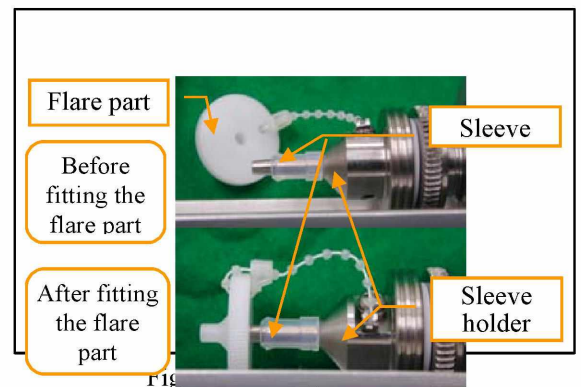


Fig.62 - Setting the attachment



1. Setting the sleeve

- Attach the attachment to JT-SA-KA.(Fig.62)
- Then Attach the sleeve holder to the attachment and the sleeve as shown in Fig. 63 for the state Before fitting the flare part.
- After the sleeve has been set in place, lock the flare part at the end of the sleeve holder (see Fig. 63 for the state after fitting the flare par).

2. Clamping the tube

- Select a suitable tube holder according to Table 25 and fix it to the JT-SA-KA..
- Open the clamp and install the tube with union nut passing through. Lock the tube with the clamp at the tube locking length. (see Fig. 64 and Table 26)

Table 26 - Tube locking length

Millimeter size	Nominal tube size	
	3	4
Inch size	W1	-
Tube locking length	12	12

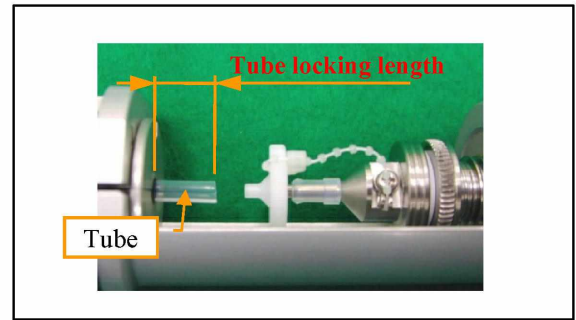


Fig. 64 - Tube locking length

3. Expanding the tube diameter

- Turn the grip clockwise to advance the screw and expand the tube end with the flare part. Repeat this step several times (Fig. 65).
- After the diameter has been expanded, remove the flare part.

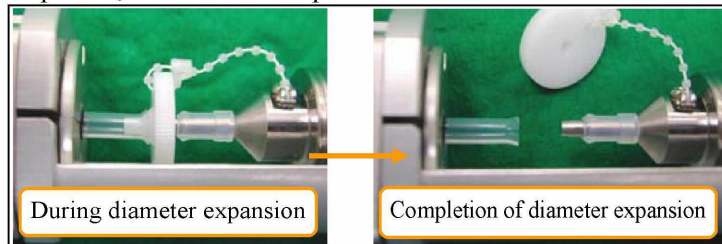


Fig. 65 – Expanding the tube diameter

Notes:

If the flare part is moved forward after the diameter has been expanded, the tube may be buckled. Upon the completion of diameter expansion, stop moving forward the flare part. If the flare part is difficult to remove, turn it. This will allow you to remove the flare part easily.

4. Inserting the sleeve into the tube

- Turn the grip clockwise to insert the sleeve into the tube (see Fig. 66).
- Turning the grip counterclockwise will move the sleeve holder backward.

Caution:

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

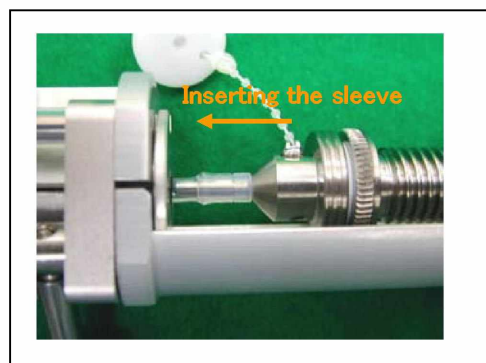


Fig. 66 – Inserting the sleeve

5-8 Using heat insertion tools P-FH and P-FH-H (Nominal tube size: 6 - 25, W2 - W8)

- Devices required for heat insertion include an appropriate base (or grip), sleeve holder, flaring tool and a heat gun. (The sleeve holder and flaring tool for the S-300 have their flanges grooved.)

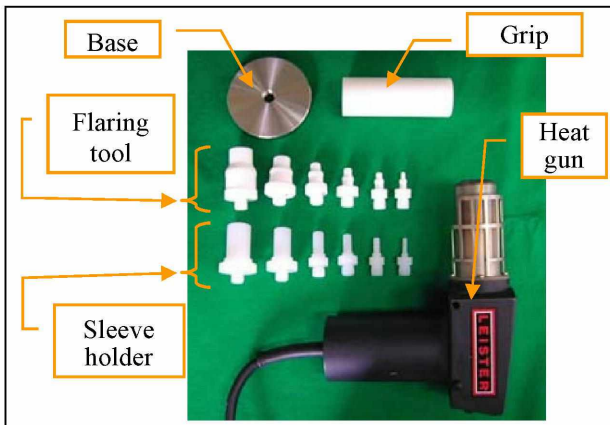


Fig. 67 - Parts used for heating and inserting

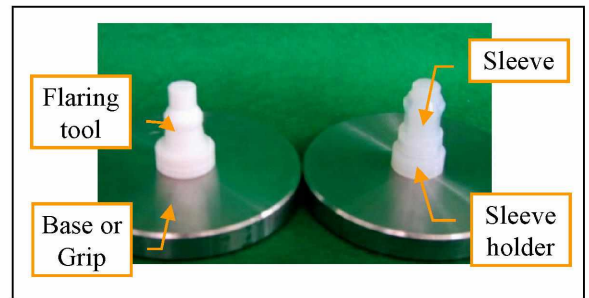


Fig. 68 - Preparation for flaring

1. Preparation

- Set the Flaring tool and the Sleeve holder to Base or Grip (see Fig. 68).

2. 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 (see Fig. 69).

(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.)



Fig. 69- Preheating the tube

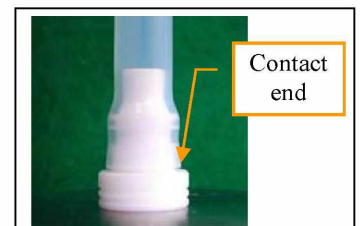


Fig. 70 - Flaring the tube end

3. Flaring the tube end

- Immediately after preheating, insert the heated tube into the flaring tool until it stops at the base as shown in Fig. 70, and hold the tube for approx. 10 seconds to cool it down.

4. Inserting the sleeve into the tube

- Remove the tube from the flaring tool, and insert the tube onto the sleeve as shown in Fig. 71.



Fig. 71 - Inserting the sleeve

5. Heating the tube after insertion

- Remove the tube from the sleeve holder and, using a heat gun, heat the portion marked with an asterisk (*) in Fig. 72, in order to ensure close contact of the tube with the sleeve.

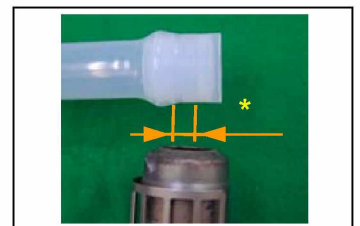

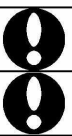


Fig. 72 - Heating the tube after insertion

Table 27 - Parts for heat insertion tool (6 - 25, W2 - W8)

Millimeter size	Nominal tube size					
	6	8	10	12	19	25
Sleeve holder	P-SH-H6(W2)	P-SH-H8	P-SH-H10	P-SH-H12	P-SH-H19(W6)	P-SH-H25(W8)
Flaring tool	P-FH-6	P-FH-8	P-FH-10	P-FH-12	P-FH-19(W6)	P-FH-25(W8)
Base	SB-H					
(Grip)	(SG-H)					
Heat gun	JH-H					

Inch size	Nominal tube size					
	W2	W2Y	W3	W3Y	W4	W8
Sleeve holder	P-SH-H6(W2)	P-SH-HW2Y	P-SH-HW3	P-SH-HW3Y	P-SH-HW4	P-SH-H25(W8)
Flaring tool	P-FH-W2	P-FH-W2Y	P-FH-W3	P-FH-W3Y	P-FH-W4	P-FH-25(W8)
Base	SB-H					
Grip	(SG-H)					
Heat gun	JH-H					

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

5-9 Using flare insertion tools P-FH and P-SH-H (nominal tube size: 3, 4, W1)

- Flaring the tube requires the base (or grip), sleeve holder, flaring tool, and tube holder (the sleeve holder and flare tool for the Super 300 Type Pillar Fitting have their flanges grooved).

Note: No heat gun is used to flare tubes of nominal sizes 3, 4, and W1.

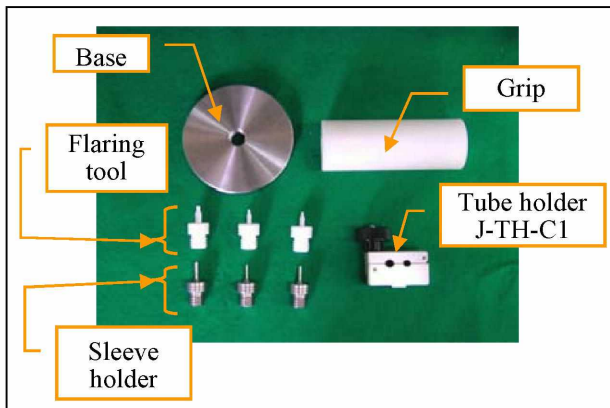


Fig. 73 - Parts used for flaring

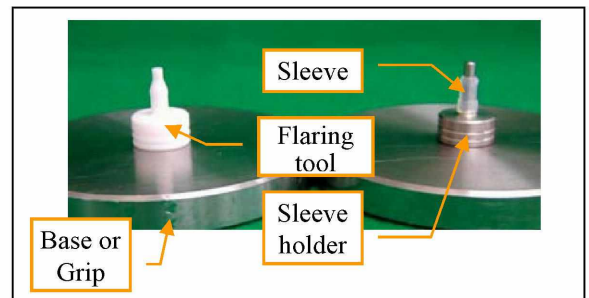


Fig. 74 - Preparation for flaring

1. Preparation

- Set the Flaring tool and the Sleeve holder to Base or Grip (see Fig. 74).

2. Clamping the tube

- Lock the tube to the tube holder referring to the dimension of Table 28 (see Fig. 75).

Table 28 - Locking length (3,4,W1)

	Nominal tube size	
Millimeter size	3	4
Inch size	W1	-
Locking length for tube	12	12

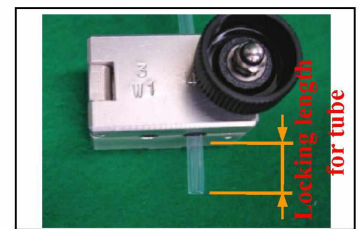


Fig. 75 - Clamping the tube

3. Flaring

the tube end

- Insert the tube into the flaring tool to flare it.
- Inserting the tube several times will complete flaring it (see Fig. 76).

4. Inserting the sleeve into the tube

- Insert the sleeve set onto the sleeve holder into the tube. This completes the insertion of the sleeve (see Fig. 77 and Fig. 78).

Table 29 - Parts for flare insertion tool (3, 4, and W1)

	Nominal tube size		
	3	4	W1
Sleeve holder	P-SH-H3	P-SH-H4	J-SH-HW1
Flaring tool	P-FH-3	P-FH-4	J-FH-W1
Base	SB-H		
(Grip)	(SG-H)		
Tube holder	J-TH-C1		



Fig. 76 - Flaring the tube



Fig. 77 - Inserting the sleeve



Fig. 78 - Completely inserted sleeve

5-10 Outer dimensions of insertion tools

- Fig. 79 to Fig. 83 show the external dimensions of the insertion units.

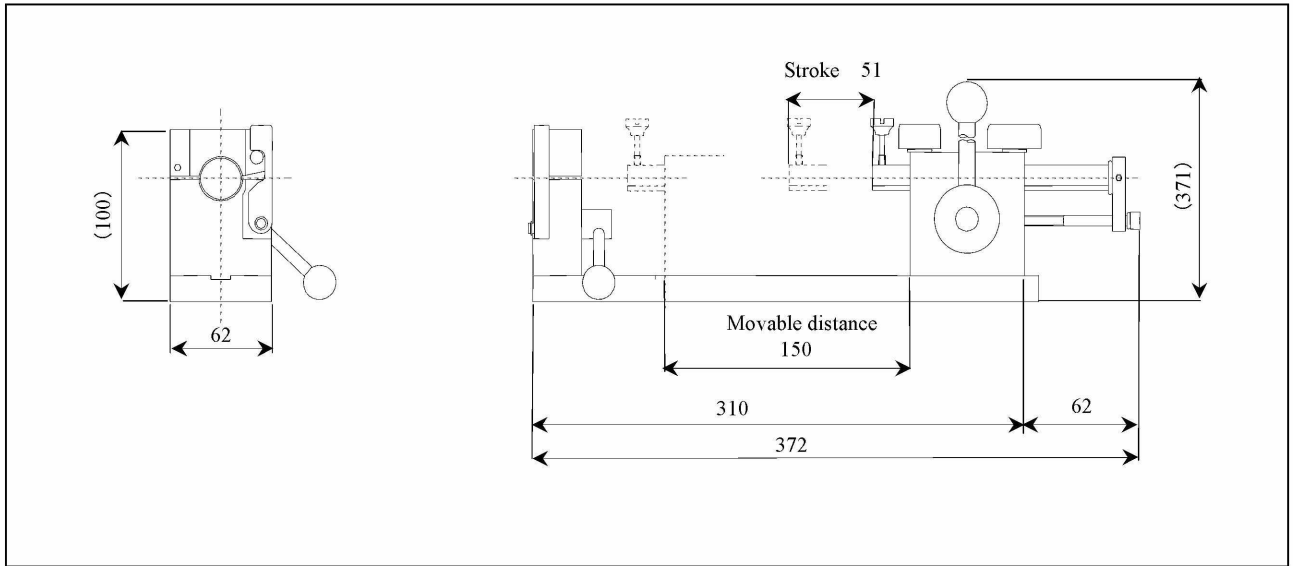


Fig. 79. Outer dimensions of JT-A4

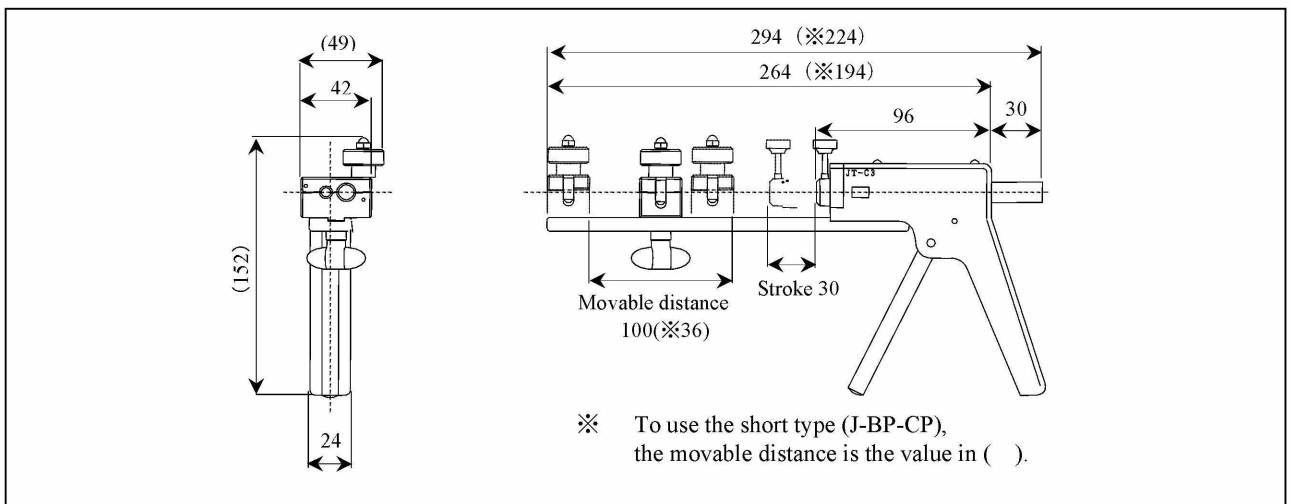


Fig. 80. Outer dimensions of JT-C3

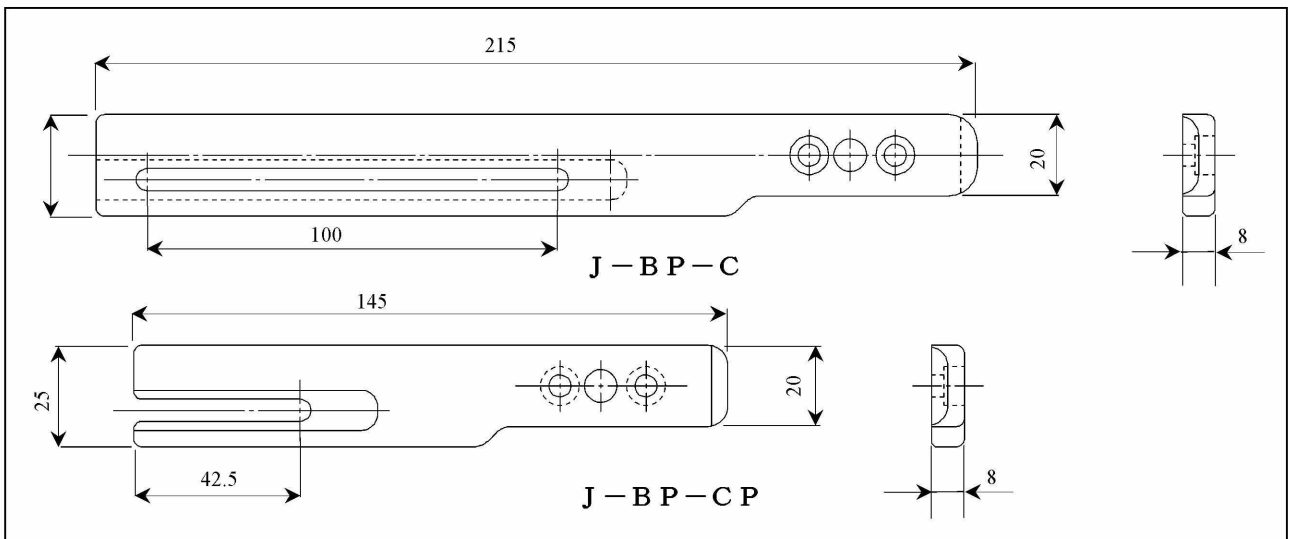


Fig. 81. Outer dimensions of J-BP-C and J-BP-CP

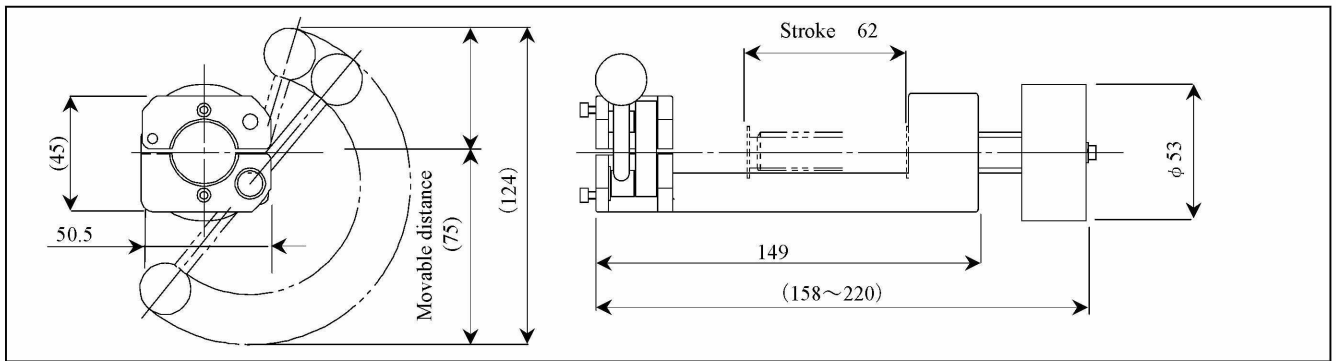


Fig. 82. Outer dimensions of JT-SA-KA

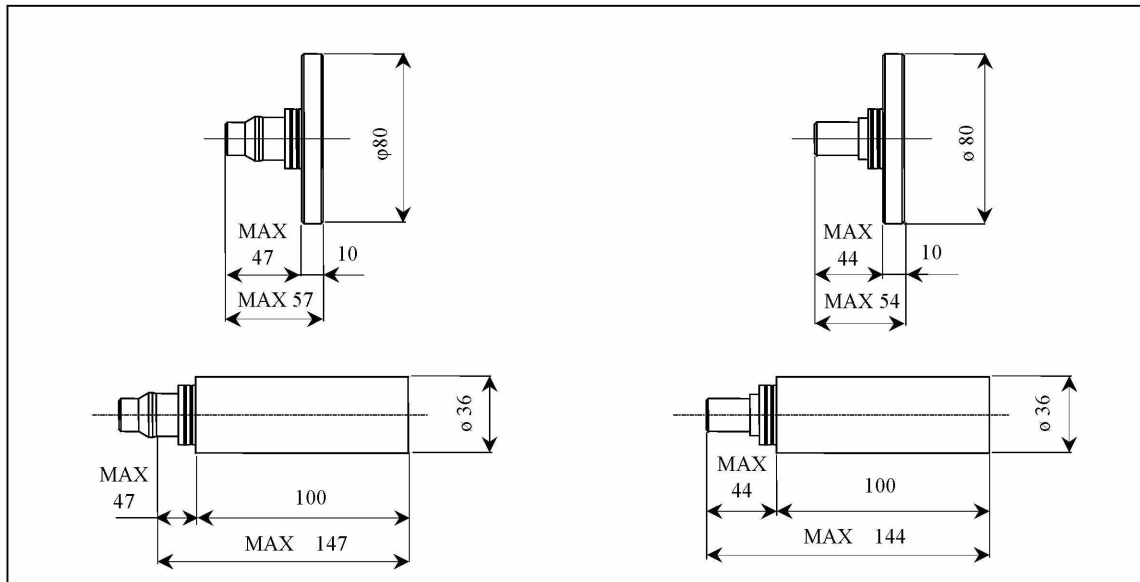





Fig. 83 - Outer dimensions of P-FH and P-SH-H

6 Disposal Precautions

- 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		
 CAUTION	Do not dispose of the fitting with a liquid residue remaining in it. 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.	
	Do not incinerate fitting parts. Incineration of fluoro-resin parts will generate toxic smoke.	

7 Office Locations

- Head Office : 11-48, Nonakaminami 2 chome, Yodogawa-ku, Osaka, 532-0022 Japan
 Tel : 81-6-6305-2821 Fax : 81-6-6302-3300
 E-mail : sales@pillar.co.jp