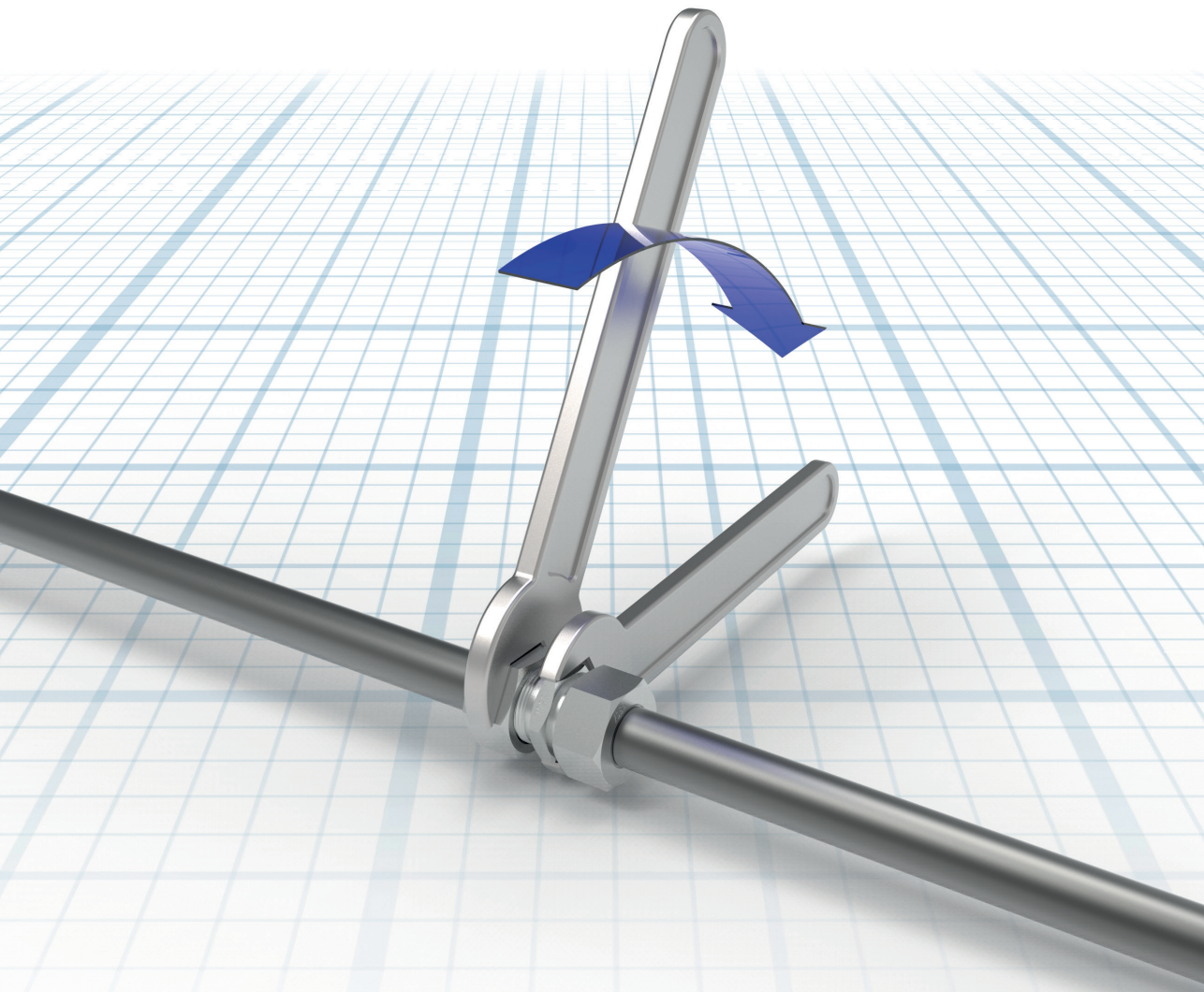


Assembly instructions

For a process reliable and correct pre-assembly and final-assembly



Important notes on VOSS assembly instructions

In order to ensure maximum performance and functional reliability of VOSS products, the respective assembly instructions, operating conditions and tube recommendations have to be adhered to.

We recommend that you use VOSS pre-assembly devices at all times. The use of pre-assembly devices is a strict requirement from tube sizes L18/S16 and larger! It is absolutely essential to follow the operating instructions for the respective pre-assembly device used.

Do not start with assembly until you are absolutely sure that you have understood the operating and assembly instructions for each VOSS pre-assembly device or machine, tool and product. Incorrect handling leads to risks regarding safety and leak-tightness and can result in failure of the entire connection.

It is impossible for the manufacturer to monitor whether the user is adhering to the operating and assembly instructions for individual pre-assembly devices or machines, tools and products, as well as what conditions prevail and what methods are used for installation, operation, application and maintenance of the individual products. Improper workmanship can lead to material damage, which in turn may pose a danger to life and limb. This means that VOSS Fluid GmbH can accept no responsibility or liability for loss, damage or costs incurred due to faulty installation, improper operation or incorrect application and maintenance or from any related issue. Failure to heed this warning will lead to loss of guarantee.

VOSS Fluid GmbH reserves the right to make changes or additions to the information provided without prior notification. Customers can obtain the latest version of the operating and assembly instructions upon request, or from our download area at: www.voss.net

General notes on VOSS assembly instructions

Make sure that all components, including the tubes, are clean before assembly is started and that they remain clean during the entire assembly process. Soiled components may lead to failure of the system.

Before starting assembly, make sure that you have carried out all preparatory work in accordance with the respective instructions.

Specifications concerning permissible steel tubes:

seamless, cold-drawn and normalized precision steel tubes as specified in DIN EN 10305-4, material E235+N, mat. no. 1.0308+N or E355, mat. no. 1.0580. The tubes must be ordered by specifying the outer diameter and the inner diameter.

Specifications concerning permissible stainless steel tubes:

seamless, cold-drawn and solution-annealed, scale-free stainless steel tubes in CFA or CFD delivery condition of dimensions and tolerances according to DIN EN 10305-1 and all other delivery conditions as specified in DIN EN 10216-5, material X6CrNiMoTi17-12-2, mat. no. 1.4571. The tubes must be ordered by specifying the outer diameter and the inner diameter.

The tubes should be prepared with the same thoroughness as pre-assembly and final assembly of the connection. Especially when using long tubes, check the end sections for damage or distortion.

We recommend that pre-assembled tubes which are not to be finally assembled yet should be fitted with protective caps.

Marking a stroke on the union nut and the tube makes it easier to achieve the correct number of turns when tightening the coupling.

Before starting to assemble VOSS components with elastomer seals, always check that:

- the nut and the seal surfaces are clean and undamaged and/or
- the elastomer sealing is clean and undamaged

Determining the tightening torque for screw couplings

The tightening torques specified in the catalogue apply under the following conditions:

- steel fittings with VOSS coat surface coating
- the specified nominal pressure ranges assume that the mating material has a tensile strength of $\geq 600 \text{ N/mm}^2$
- our recommendations on lubrication of the threaded studs are observed

If other values for strength, modulus of elasticity and friction-surface combinations are used, the user has to adapt the tightening torque empirically.

The recommended tightening torques have to be adhered to if the pressure range is to be fully utilized and the appropriate safety level is to be maintained.

The recommended tightening torques for the threads are given in the tables for the respective type of thread.

Explanation of symbols and other notes



Visual inspection



Turn until hand-tight or carry out another manual activity



Use the tool to tighten the coupling according to the instructions



Oil and lubricate at the point marked with an arrow

All dimensions in millimetres [mm]

Assembly instructions for 37° flared adapters

1

Notes

Before starting the assembly work, read and observe the general notes in the up-to-date VOSS catalogue and check that your assembly instructions are up to date.

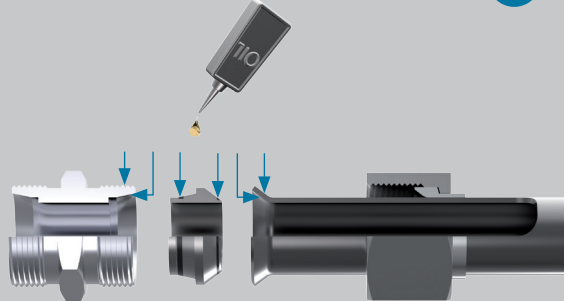



2

Assembly preparation of flared adapters

2.1 Lubricate the O-ring lightly (e.g. using mineral-oil based hydraulic fluid HLP32).

2.2 Preferably, the flare adapter should be pressed into the tube with the aid of a vice (when doing so, protect the threaded parts against damage). However, as an alternative, the flare adapter can be loosely inserted into the coupling stud.

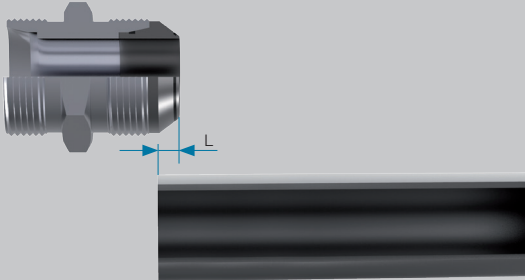


37° flared adapters

3

Tube preparation

3.1 Determine the tube dimensions with the aid of the dimension table (also refer to item 5).

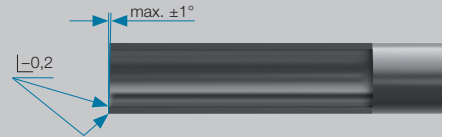


Series	Tube OD [mm]	s [mm]	L [mm]	D min. [mm]	D max. [mm]
L/S	6	1	3.5	9.1	10
		1.5	2.5		
L/S	8	1	4	11.3	12
		1.5	3		
		2	2.5		
L/S	10	1	4.5	13.1	14
		1.5	3.5		
		2	2.5		
L/S	12	1	4.5	15.3	16
		1.5	3.5		
		2	2.5		

Series	Tube OD [mm]	s [mm]	L [mm]	D min. [mm]	D max. [mm]
L	15	1.5	4.5	19.1	20
		2	3.5		
		2.5	2.5		
L	18	1.5	5.5	23.2	24
		2	4.5		
		2.5	4		
L	22	1.5	5.7	26.5	27.5
		2	4.7		
		2.5	3.7		
		3	3.2		
L	28	2	5.7	32.7	33.3
		2.5	4.7		
		3	4.2		
L	35	2	6.5	41.8	42.7
		2.5	6		
		3	5		
		4	3.5		
L	42	2	7	48.8	49.8
		3	6.5		
		4	5		
		5	4		
S	14	1.5	5.5	18.6	19.6
		2	5		
		2.5	4		
		3	3		
S	16	1.5	6.5	20.6	22
		2	5.5		
		2.5	5		
		3	4		
S	20	2	7	25.6	26.8
		2.5	6		
		3	5		
		3.5	4		
S	25	2	7	31.1	33
		2.5	6.5		
		3	5.5		
		4	4		
S	30	2	9	37	38.7
		2.5	8		
		3	7.5		
		4	5.5		
		5	4		
S	38	2.5	10	46	47.2
		3	9.5		
		4	8		
		5	6		
		6	6		
		6	7.5		

37° flared adapters

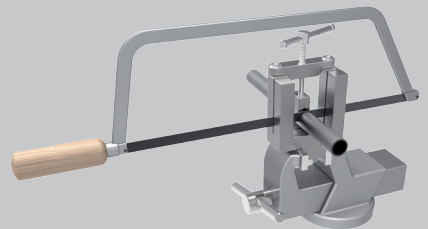
3.2 Cut tubes at right angles. An angle tolerance of $\pm 1^\circ$ is permissible. Do not use a rotary grinder or tube cutter.



3.3 Deburr the inner and outer edges of the tube ends slightly and clean the tubing.

Attention!

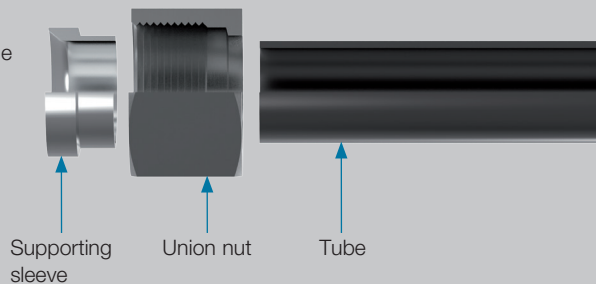
Burrs on the outside and inside tube diameter can impair the flaring process. Tubes which are not cut off squarely and correctly deburred may reduce the service life and leak-tightness of the couplings.



4

Pre-assembly of tube flare

Push the union nut and the supporting sleeve onto the tube. Use the standard pre-assembly devices to flare the tube end.



37° flared adapters

5

Checking the tube flare

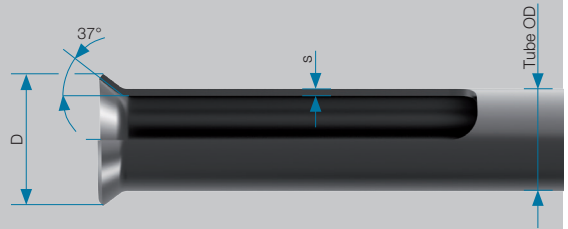
For the connection to fulfill its purpose sustainably, the tube flare must be smooth and free of fissures and scratches.

See the dimension table in item 3 for the respective outer diameter (D_{\min} and D_{\max}) of the flare bell.

Attention!

Failure to keep within the dimension tolerances will impair the connection considerably.

Check the diameter



6

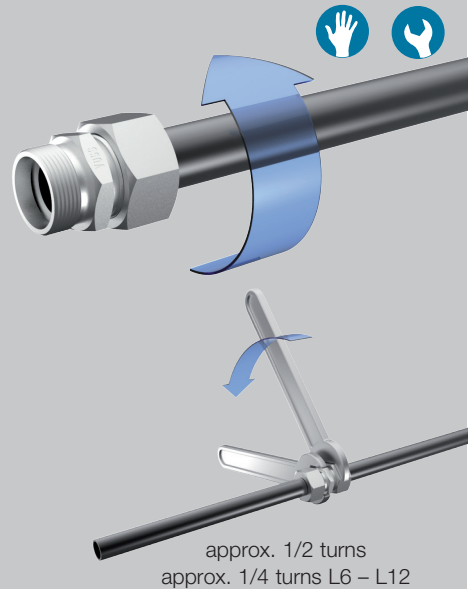
Final assembly

6.1 Turn the union nut until it is hand-tight.

6.2 Final assembly with pressed-in flare adapter:

Use a spanner to tighten up the union nut until a distinctly increased torque is felt.

Continue tightening by approximately **1/2 turns** (for **L6 – L12, only approx. 1/4 turns**).



37° flared adapters

6.3 Final assembly with flare adapter inserted in connecting piece:

Use the union nut and a spanner to press the flare adapter into the connecting piece until it rests against the stop.

6.4 Unscrew the connection and check whether the flare adapter has reached the stop.

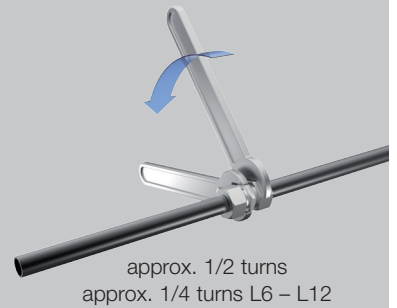
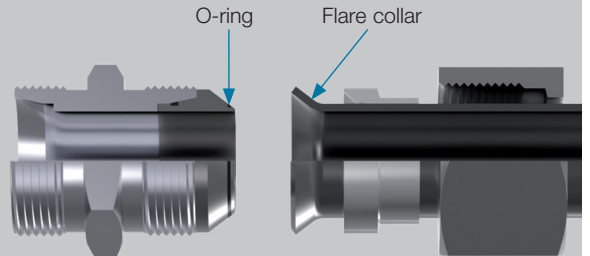
The re-tightening by approximately **1/2 turns** (for **L6 – L12, only approx. 1/4 turns**).

6.5 Turn the union nut until it is hand-tight.

Tighten the union nut with a spanner up to noticeable increase in force.

Then re-tighten by approximately **1/2 turns** (for **L6 – L12, only approx. 1/4 turns**).

Check the O-ring and the flare collar



37° flared adapters

6.6 Final assembly with tightening torque

As an alternative to achieving pre-assembly and final assembly states by distance dependent assembly, the tightening torques can be applied directly. The stated tightening torques are guideline values:

Series	Tube OD [mm]	Tightening torque	
		Steel Nm \pm 5 %	Stainless steel 1.4571 Nm \pm 5 %
L	6	20	30
L	8	40	55
L	10	45	65
L	12	55	110
L	15	70	190
L	18	120	250
L	22	200	400
L	28	300	550
L	35	600	900
L	42	800	900
S	6	30	85
S	8	45	100
S	10	55	130
S	12	80	190
S	14	90	260
S	16	130	330
S	20	250	350
S	25	400	700
S	30	500	900
S	38	800	900

7

Re-assembly of connections

Every time the tube connection is taken apart, the O-ring must be carefully checked for damage and, if necessary, replaced. The tube flaring must also be cleaned and checked (see item 5).

To re-assemble the connection, tighten the union nut as described in item 6.

Check the O-ring and the flare collar

