



Tube assembly

AI/4015-1/UK

aerospace
climate control
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process control
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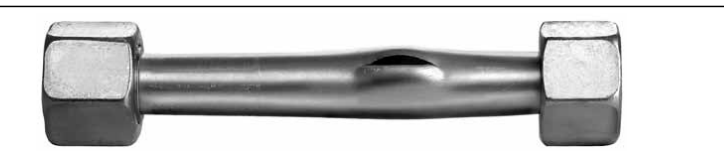
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Assembly



Assembled Parker tube fitting will provide a sealed joint, prevent tube burst. Experience has shown that break-downs, leaks and leaks can be avoided by following these safety instructions. Please review your fitting procedures.

General safety instructions

Correct assembly will reduce the pressure and vibration on a fitting. It can reduce the life cycle time of a fitting and leakage can occur. In extreme cases the fitting can fail due to tube shear or tube crack. When making a tube connection, the unit has to be re-tightened with the same force used during prior assembly. Under tightening can lead to leakage and can reduce the vibration resistance. Over tightening can reduce the possibilities of repeated assembly. In some cases the components can be destroyed. Tube fittings are intended solely for connections for fluid systems.

- Dirt and metal contamination can lead to damage to the system and leaks.
- The operating parameters given (e.g. pressure, temperature, medium compatibility) are to be adhered to.
- Avoid flow rates > 8 m/s. The resulting forces are high and can destroy the tube lines.
- Relevant guidelines (e.g. CE, ISO, BG, TÜV, DIN) are to be observed.
- Weld fittings are manufactured out of weldable materials. No other fittings are suitable for welding.
- EO-NIROMONT and Parflange LUBSS are high-performance lubricants. The use of other lubricants generally leads to an increase in assembly force.
- The tools and lubricants recommended by Parker guarantee safe assembly.
- Components and tooling of different manufacturers are not necessarily compatible. For complete safety, use only Parker components.

Follow the Parker tube recommendations. Non-standard materials or incorrect assembly can lead to incorrect assembly. Use ball bearings, fitting pins or tapered pins, coins or washers instead of the correct Parker blanking plug as blanking parts for the fitting.

The connection and fitting body once assembled, should remain tight. Fitting body is to be used once only for pre-assembly. Tightening of tube fittings which are under pressure can be dangerous. Excessive tension can lead to vibration failure. Tube length and fitting angles are to be adhered to precisely. Fix tube lines with tube clamps.

The tube is not to be clamped to one another but to suitable fixed points. Hoses, cable connections and fitting elements are

- Fittings are to be handled with care.
- Tube lines need to be adapted tension free of the relevant connectors before assembly. An easy turning of the nut is required for the complete thread length. Otherwise leakage can occur. In extreme cases with additional vibrations tube cracks can occur.
- Vibrations have to be clamped by tube clamps. Independent vibrating units need to be separated with hoses. Otherwise tube cracks can occur.

Specific safety instructions for assembly

- During a progressive ring and EO-2 fitting assembly the tube has to bottom up in the stud or in the tool. Without tube bottoming the ring cannot bite sufficiently. Under load the connection can fail due

Assembly of Parker tube fittings always follows the same pattern:



Material combinations

- Use recommended tube material
- Select suitable components according to tube material



Tube preparation

- Cut and deburr thoroughly
- Follow recommendations for minimum straight tube length
- Apply support sleeves when necessary



Machine assembly









- Preferred method
- Most efficient method
- Recommended for large EO progressive ring and EO-2
- Parflange® recommended for 37° flaring

Manual assembly

- Economical for assembly of small quantities
- Suitable for small O.D. tube
- For repair work
- Hand flaring does not provide reliable results
- Stainless steel progressive ring fittings need to be assembled with pre-assembly tools

assembly







Selection of assembly process for bite systems



Workshop machines for industrial assembly					
Process			Product		
Procedure	Equipment	Process/Time*	Economic production qty.	EO progressive ring PSR/DPR	EO-2
Assembly of ECO line		 30 sec.	max. 50 assemblies per day	hydraulic service and on-site installation	ideal for workshop assembly, not ideal for serial production
Assembly of UNI line		 30 sec.	max. 100 assemblies per day	ideal for workshop assembly, not suitable for LL series	ideal for workshop assembly, not suitable for LL series
Assembly of AT PRO line		 10 sec.	min. 100 assemblies per day	ideal for workshop assembly and mass production	ideal for workshop assembly and mass production
Assembly of IM F3 line		 40 sec.	max. 300 assemblies per day	not applicable	not applicable

Workshop machines for industrial assembly					
Process			Product		
Procedure	Equipment	Process/Time*	Economic production qty.	EO progressive ring PSR/DPR	EO-2
Assembly of IM F3 line					

assembly









Selection of assembly process for bite systems



Manual assembly for field repair					
Process			Product		
Dure	Equipment	Process/Time*	Economic production qty.	EO progressive ring PSR/DPR	EO-2
fitting		 60 sec.	max. 10 assemblies per week	field repair only, not for efficient production and tubes larger than 22 mm OD, preferred method for PSR, not for stainless steel	field repair only, not for efficient production and tubes larger than 22 mm OD
assembly		 45 sec.	max. 10 assemblies per week	field repair only, not for efficient production	field repair only, not for efficient production
flange		 120 sec.	max. 10 flarings per week	not applicable	not applicable

Manual assembly for field repair					
Process			Product		
Dure	Equipment	Process/Time*	Economic production qty.	EO progressive ring PSR/DPR	EO-2
assembly M-B		 120 sec.	max. 50 assemblies per day	final assembly in fitting must be 1/2 turn, not for tubes larger than 15 mm OD, not for stainless steel	not applicable

assembly







Selection of assembly process for tube forming systems



Workshop machines for industrial assembly					
Process			Product		
Procedure	Equipment	Process/Time*	EO2-FORM	Triple-Lok®	O-Lok®
Assembly AT ECO line		 30 sec.	not applicable	not applicable	not applicable
Assembly AT UNI line		 30 sec.	not applicable	suitable for workshop assembly, preferred process is Parflange®	not applicable
Assembly AT PRO line		 10 sec.	not applicable	not applicable	not applicable
Forming g IM F3 line		 40 sec.	ideal for workshop assembly and serial production	not applicable	not applicable

Workshop machines for industrial assembly					
Process			Product		
Procedure	Equipment	Process/Time*	EO2-FORM	Triple-Lok®	O-Lok®
Forming FORM machine			ideal for workshop assembly and serial production	not applicable	not applicable

assembly

Selection of assembly process for tube forming systems

Manual assembly for field repair					
Process			Product		
Procedure	Equipment	Process/Time*	EO2-FORM	Triple-Lok®	O-Lok®
Flare fitting		 60 sec.	not possible, use EO-2 for field repair	not possible, use 1015 device or hand flaring tools for field repair	not possible, use braze sleeves or hose lines for field repair
Assembly in a vice		 45 sec.	not possible, use EO-2 for field repair	not possible, use 1015 device or hand flaring tools for field repair	not possible, use braze sleeves or hose lines for field repair
Assembly in a vice		 120 sec.	not applicable	field repair only, not for efficient production, not for stainless steel tubes	not possible, use braze sleeves or hose lines for field repair

Manual assembly for field repair					
Process			Product		
Procedure	Equipment	Process/Time*	EO2-FORM	Triple-Lok®	O-Lok®
Assembly in a vice		 120 sec.	not applicable	not applicable	not applicable

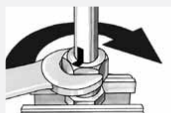
EO assembly instructions for 30° final assembly

Additional assembly

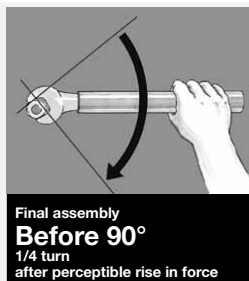
According to DIN 3859 T2
be used optional as usual
machine preset Δ manual preset



Machine presetting:
Machine preset corresponds
to 1/4 turn of nut

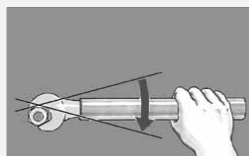


● Manual presetting:
Tighten the nut by 1 1/4 turns



Optimized pre-assembly

Machine preset
Manual preset



assembly

Progressive ring PSR/DPR

Material combinations

- Select suitable EO progressive ring fitting

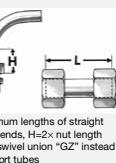
Tube material	EO-Fitting body	assembly instructions
Steel	Steel (LL=D-Ring)	
Stainless Steel	Stainless Steel	Pre-assembly by machine or hardened tool required
Copper	Brass (D-Ring)	Support sleeve E required
Plastic e.g. Polyamide	Steel, Brass, Stainless Steel	Check assembly devices for suitability
Stainless Steel	Steel	Stainless Steel DPR <u>must</u> be used Pre-assembly by machine or hardened tool required

Tube preparation

- Cut and deburr thoroughly
- Do not assemble under tension
- Clamp onto rigid fixtures

Min. length straight tube ends

Series L												
Tube OD	06	08	10	12	15	18	22	28	35	42		
L min	39	39	42	42	45	49	53	53	60	60		
Series S												
Tube OD	06	08	10	12	14	16	20	25	30	38		
L min	44	44	47	47	54	54	59	68	73	82		



Minimum lengths of straight tube ends, H=2x nut length
swivel union "GZ" instead of port tubes

- Cut tube squarely
- max. $\pm 1^\circ$ deviation
- ⚠ Do not use pipe cutters
- EO tube-cutting tool (AV) for manual cutting



- Remove internal and external burrs
- max. chamfer 0.3 mm x 45°
- Recommendation: In-Ex Tube Deburring Tool 226

Support sleeves VH


- Support sleeve VH for thin wall or soft metal tubes (see chart)

Tube insert E

- Support sleeve E for plastic tubes




Progressive ring PSR/DPR



EOMAT PRO

Automatik
L PSR/DPR

123 


123456

AT ECO/UNI and
KARRYMAT:

ment according to pres-
chart on machine (PSR/DPR)


ction of preset pressures for
materials softer than steel
stainless steel required
AT PRO:

atic tool recognition
EOMAT-machines:
k suitability



EOMAT UNI

Ok?




EO-KARRYMAT

100% Pre-assembly with EOMAT/EO-KARRYMAT

- Preferred method
- Most efficient method

⚠ HVMB-device not suitable for 100% assembly of PSR fittings

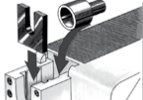
2



Use genuine Parker assembly cone „MOK“


- Control (see checking instructions)
- Clean and lubricate assembly cone and thread regularly
- For EOMAT PRO use assembly cone "MOK...PRO" with transponder chip

3



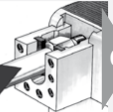
- Insert proper tools
- Clean and lubricate assembly cones regularly
- EO-KARRYMAT: Close valve on handpump
- 2-piece backing plates for 35-L and 42-L

4



- Slide nut and progressive ring as shown onto the end of the tube

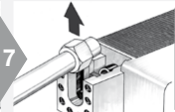
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tube with progressive ring
ut into the die

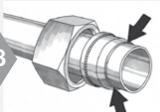
tube-end
into the

7



- Hold tube firmly
- EOMAT: Press and hold start button
- Use support and foot switch for
- After completion of pre-assembly, remove the tube for assembly check
- EO-KARRYMAT:

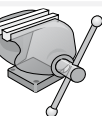
8



⚠ Check to make sure that a visible collar covers the front of the first cutting edge

- It does not matter if the ring can be rotated on the tube and

Progressive ring PSR/DPR




Pre-assembly with hardened tool VOMO

- Reliable method for repair jobs
- Only economic for assembly of small quantities
- ⚠ Stainless steel EO progressive rings must be pre-assembled using a hardened tool (VOMO)
- For tubes over 25 mm, EO-KARRYMAT/EOMAT is recommended




Stainless steel assembly nuts must be lubricated with EO-NIROMONT special performance lubricant for stainless steel fittings

2

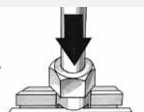


Ok?

3



4



- Control (see checking instructions)
- Cones of pre-assembly bodies must be checked regularly (after 50 pre-assemblies) with cone templates (KONU)
- Clean and lubricate assembly cone and thread regularly


- Use pre-assembly tool VOMO
- Fitting body may be used $\frac{1}{2}$ time only (not for stainless steel)
- Screw on nut until finger-tight

⚠ Press tube-end firmly into the assembly cone




Position the nut on the nut by 1½ turns. Recommended to use spanner extension for sizes over 20 mm

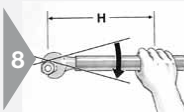
6



7



8



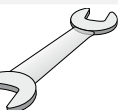
Assembly check:

- Loosen nut
- ⚠ Check to make sure that a visible collar covers the front of the first

- Assemble fitting until wrench-tight (without spanner extension)
- ⚠ Mark position of nut

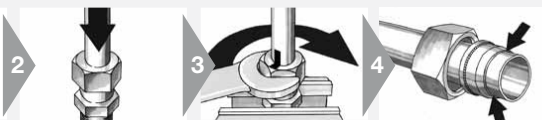
- ⚠ Then tighten fitting firmly by 30° (¼ flat)
- ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)

Progressive ring PSR/DPR



Direct assembly

- Simple procedure for single assemblies of small dimensions
- Not economic for series assembly
- ⚠ Tubes Ø 30, 35, 38 and 42 mm must be pre-assembled in vice
- ⚠ Stainless steel connections have to be assembled using pre-assembly tool (VOMO)
- ⚠ Properly cleaned studs ("BE") have to be assembled with pre-assembly tools



Application of threads will reduce assembly forces and assembly forces on stainless steel fittings be lubricated with CO-NIROMONT special performance lubricant for stainless steel fittings

- Screw on nut until finger-tight
- ⚠ Press tube-end firmly into fitting body



- Mark position of the nut
- Tighten the nut by 1½ turns
- ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)
- Fitting body may be used one time only

Assembly check:

- Loosen nut
- ⚠ Check to make sure that a visible collar covers the front of the first cutting edge
- It does not matter if the ring can be rotated on the tube-end



Repeated assembly

- Each time the tube-end has been disconnected, the fitting must be properly tightened again
- ⚠ EO progressive rings cannot be replaced, once assembled



assembly instructions

assembly-instructions are included in each EO-2 product box.
on EOMAT setting and selection of support sleeves can be found there as well.



Tube preparation

- Cut and deburr thoroughly
- Do not assemble under tension
- Clamp onto rigid fixtures



Tube squarely
at 1° deviation
Do not use pipe cutters
Use pipe-cutting tool (AV)



- Don't deform tube end at cutting or bending
- Marks or scratches can result in leakage
- Thin wall and soft tubes are very sensitive
- Remove internal and external burrs
- max. chamfer 0.3 mm x 45°
- Seal can be damaged by large burrs



Material combinations

- Select suitable FM-type

	Steel tube	Stainless Steel tube	Plastic tube
Steel fitting	FM...CF	FM...SSA	FM...CF+E
Stainless Steel fitting	—	FM...71	FM...71+E



Tube insert E

- Tube insert E for plastic tubes



Support sleeves

Use of support sleeves "VH" with EO-2 fittings

Tube O.D.	0.5	0.75	1	1.5	2	2.5	3	3.5	4
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assembly instructions

assembly-instructions are included in each EO-2 product box.
on EOMAT setting and selection of support sleeves can be found there as well.

Replacement of sealing ring/Repeated assembly

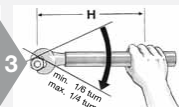
- Sealing ring DOZ can be changed separately



disassembly, sealing ring
pulled of the tube-end
for damage and replace
assembly
on outer rubber parts
not effect performance

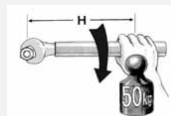


- Assemble fitting until
wrench-tight
(without spanner extension)




- Then tighten fitting firmly by min
 $\frac{1}{4}$ (max $\frac{1}{4}$) turn (1 to $1\frac{1}{2}$ flats)
- Recommended to use spanner
extension for sizes over 20 mm
O.D. (see chart)

Spanner length




Size	Spanner length H [mm]
22-L	400
28-L 20-S	500
35-L 25-S	800
42-L 30-S	1000
38-S	1200


assembly instructions



EOMAT PRO



EOMAT UNI



EO-KARRYMAT

Assembly with EOMAT/EO-KARRYMAT


- Preferred method
- Most efficient method
- HVM-B device is not suitable for EO-2

Automatik

EO-2

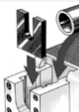
123

Ok?




2

3



4



AT ECO/UNI:

ment according to pres-
on machine
structions shipped with
ct box)

AT PRO:

atic tool recognition

KARRYMAT:

to chart on machine

EOMAT-machines:

k suitability

● Use genuine Parker assembly cone "MOKEO2"

- Check according to MOK checking instructions
- For EOMAT PRO use assembly cone "MOK_PRO" with transponder chip.

Advantages: easy and safe assembly

● Insert proper tools


● 2-piece tube backing plates for 35-L and 42-L

● EO-KARRYMAT: Close valve on handpump


● Place tube with functional nut into the die

● Press tube-end firmly into the assembly cone


● Hold back nut for easy tube insertion




6



7



8



Assembly check:

- Gap between sealing ring and retaining ring must be closed
- A little relaxation

Gap not closed:

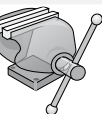
Check all components, tube, machine, tools and pressure setting

▲ Repeat assembly with

Threads of stainless steel fittings must be lubricated

▲ Use EO-NIROMONT special high-performance lubricant for stainless steel fittings

assembly instructions



Assembly in vice

- Reliable method
- Only economic for assembly of small quantities



ds on stainless steel fittings
be lubricated
EO-NIROMONT special
performance lubricant for
ess steel fittings

- Check according to VOMO checking instructions
- Use pre-assembly tool VOMO
- Fitting body may be used ~~at~~ time only and components must stay together

- Push functional nut onto tube-end
- Advantage: Easy tube insertion, particularly large dimensions

- ⚠ Press tube-end firmly into the assembly cone
- Screw on nut until finger-tight



an until sharp increase of
ance
(ox. 1 to 1½ turns)
mmended to use spanner

- Assembly check:
● Gap between sealing ring and retaining ring must be closed
- A little relaxation

- ⚠ Gap not closed:
Repeat assembly with increased torque. Check gap again.

- Assemble fitting until wrench-tight (without spanner extension)

assembly instructions

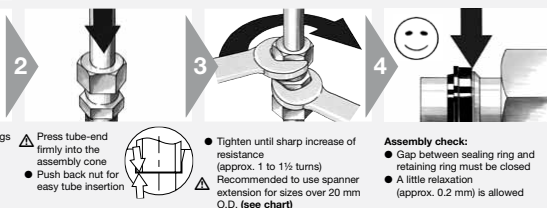


Direct assembly

- Simple procedure for single assemblies of small dimensions
- Not economic for series assemblies
- ⚠ Tubes $\geq 30, 35, 38$ and 42 mm must be pre-assembled in vice



ds on stainless steel fittings
be lubricated
FROMONT is a special
performance lubricant for
ess steel fittings



- ⚠ Press tube-end firmly into the assembly cone
- Push back nut for easy tube insertion

- ⚠ Tighten until sharp increase of resistance (approx. 1 to 1 1/2 turns)
- ⚠ Recommended to use spanner extension for sizes over 20 mm O.D. (see chart)

- Assembly check:
- Gap between sealing ring and retaining ring must be closed
- A little relaxation (approx. 0.2 mm) is allowed



not closed:
k all components includ-
be

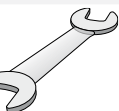
- Assemble fitting until wrench-tight (without spanner extension)

- ⚠ Then tighten fitting firmly by min $\frac{1}{4}$ (max $\frac{1}{2}$) turn (1 to 1 1/2 flats)

Spanner length

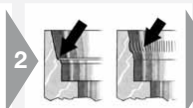
Size	Spanner length H [mm]
22-L	400

Working instructions for EO assembly tools



VOMO tools for manual pre-assembly in vice MOK for use in EO assembly machines

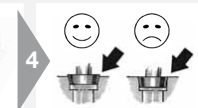
- ⚠ Use of damaged, worn or non-suitable tooling may result in fitting failure or machine damage
- ⚠ Tools must be checked regularly, at least after 50 assemblies
- ⚠ Worn tools must be replaced ⚠ Use only genuine Parker tools
- ⚠ Tools must be kept clean and lubricated



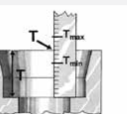
- Visual checks:
Cone must be free of wear, damage or cracks



- Check for deformation of geometry
Special cone template KONU must be used
- ⚠ KONU cone templates are precision measuring devices and must be handled accordingly



- Check contour:
The rear of the template must protrude slightly above the top face of the cone or may be flush



Check insertion depth
Incorrect insertions from the insertion
can cause leakages

FORM assembly instructions



Material combinations

- Select suitable materials
- See catalogue for exact tube specifications

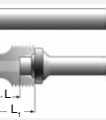
Material selection chart

Tube material	Fitting and nut material	Sealing material
Steel	Steel	Steel/NBR or Steel/FKM
Stainless Steel	Stainless Steel	Stainless/Steel FKM/NBR
Stainless Steel	Steel	Steel/NBR or Steel/FKM

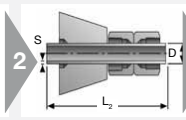


Tube preparation

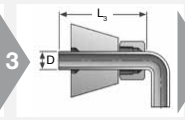
- Cut and deburr thoroughly
- Cut and bend tubes exactly



extra length into account
tube preparation chart)



- Minimum lengths L_1 of straight tubes (see chart)



- Minimum lengths L_1 of straight tube-ends before bend (see chart)



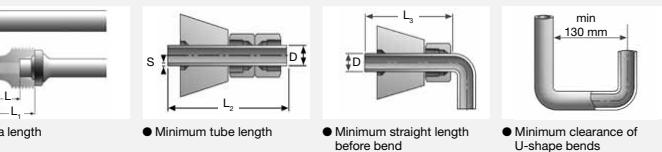
- Cut tube squarely
- max $\pm 1^\circ$ deviation
- ⚠ Do not use pipe cutters
- EO tube-cutting tool (AV)

Four corners and no fillet

assembly

FORM assembly instructions

Preparation chart – Series L



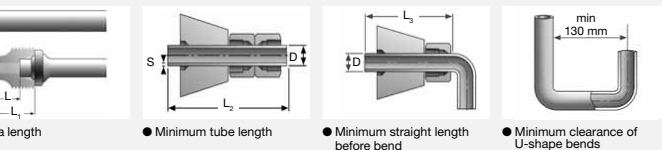
Tube-OD Series	S Wall thickness	L Steel ± 0.5	L Stainless Steel ± 0.5	L ₁ Steel	L ₁ Stainless Steel	L ₂	L ₃
6L	1.0	6.0	6.0	13.0	13.0	90	63
	1.5	6.0	6.0	13.0	13.0		
8L	1.0	5.5	5.5	12.5	12.0	92	65
	1.5	5.5	5.5	12.5	12.5		
	2.0	5.0		12.0	12.5		
10L	1.0	5.5	5.5	12.5	12.5	95	68
	1.5	5.0	6.0	12.0	13.0		
	2.0	5.0	6.0	12.0	13.0		

Tube-OD Series	S Wall thickness	L Steel ± 0.5	L Stainless Steel ± 0.5	L ₁ Steel	L ₁ Stainless Steel	L ₂	L ₃
12L	1.0	4.5	5.0	11.5	12.0	95	70
	1.5	5.5	5.5	12.5	12.5		
	2.0	5.0	5.5	12.0	12.5		
15L	1.5	5.5	7.0	12.5	14.0	102	75
	2.0	5.5	6.5	12.5	13.5		
	2.5	5.5		12.5			
20L	1.5	5.5	7.0	13.0	14.5	110	80
	2.0	5.5	7.0	13.0	14.5		

assembly

FORM assembly instructions

Preparation chart – Series S



Series	S Wall thickness	L Steel ± 0.5	L Stainless Steel ± 0.5	L ₁ Steel	L ₁ Stainless Steel	L ₂	L ₃
6S	1.0	6.0	6.0	13.0	13.0	92	65
	1.5	6.0	6.0	13.0	13.0		
	2.0	5.5		12.5			
8S	1.0	5.5	5.5	12.5	12.5	95	68
	1.5	5.5	5.5	12.5	12.5		
	2.0	5.0		12.0			
10S	1.5	5.0	6.0	12.5	13.5	100	70
	2.0	5.0	6.0	12.5	13.5		

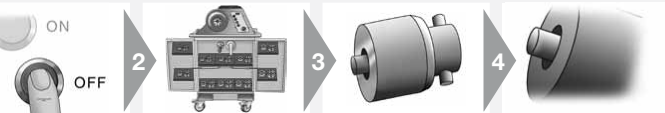
Series	S Wall thickness	L Steel ± 0.5	L Stainless Steel ± 0.5	L ₁ Steel	L ₁ Stainless Steel	L ₂	L ₃
12S	1.5	5.0	6.5	12.5	14.0	100	72
	2.0	5.0	6.0	12.5	13.5		
	1.5	5.0	6.5	13.0	14.5		
16S	2.0	5.5	6.5	13.5	14.5	108	78
	2.5	5.5	6.5	13.5	14.5		
	3.0	5.0	6.0	13.0	14.0		
	2.0	7.0	8.5	17.5	19.0		

FORM assembly instructions



Tube forming with EO2-FORM F3

- Reliable forming method
- Reliable process

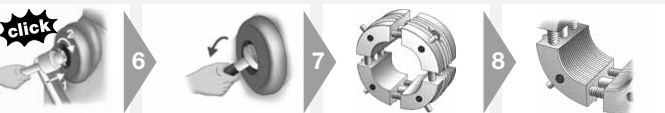


- Open doors to access tools and handling devices
- Tool handling devices are stored in middle on top

- Select suitable forming pin according to tube material, outer diameter and wall thickness

- Check forming pin for dirt, wear and damage

ge tool only when drive
hed off (button OFF)
safety instructions
ot operate machine without
g






- Tilt magneto holder to remove handle

- Select suitable clamping die set according to tube outer diameter
- ⚠ Keep stainless tube clamping dies separate from other tube materials to prevent contact

- Check clamping dies for dirt, wear and damage
- Use wire-brush to remove metal particles from grip surface

magnetic holder to insert
ing pin
clockwise to lock bayonet
e

Assembly

● Insert tube-end with nut into open tool until it firmly touches the stop at the end

⚠ Press tube-end firmly into the tube stop

⚠ Do not turn tube-end anti-clockwise to prevent unlocking forming-pin

● Press and hold start button (♥ START) until tube is clamped

● Instead of start-button (♥ START), footswitch can be used

⚠ Hold tube firmly until clamping dies are closed

● Use support for long tubes

⚠ Do not reach into tool area while machine is working

● Tube can be taken out after the clamping dies are open

● Reset button (RESET) lights up and the machine is ready for the next operation

● Check tools regularly (approx. 50 assemblies) for dirt and wear

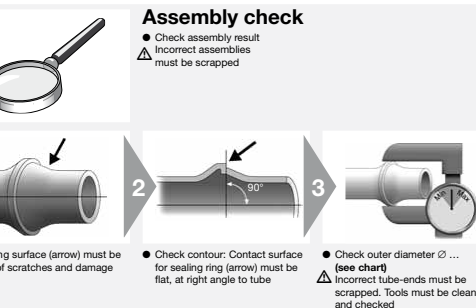
● Remove tools for cleaning

● Clean clamping dies with wire brush

● Clean forming die using compressed air

● Replace worn-out tooling

FORM assembly instructions



Assembly check

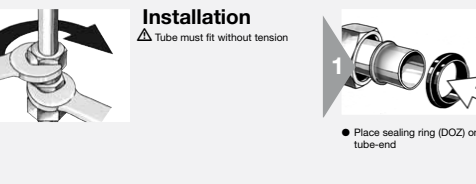
- Check assembly result
- ⚠ Incorrect assemblies must be scrapped

- Check contour: Contact surface for sealing ring (arrow) must be flat, at right angle to tube
- Check outer diameter \varnothing ... (see chart)

⚠ Incorrect tube-ends must be scrapped. Tools must be cleaned and checked

Tube OD check


Tube \varnothing -Series	min \varnothing [mm]	max \varnothing [mm]
6-L/S	8.4	10.3
8-L/S	10.5	12.3
10-L	12.8	14.3
12-L	14.8	16.3
15-L	18.5	20.3
18-L	21.5	24.0
22-L	26.0	27.8
28-L	32.0	33.8
35-L	39.5	42.5
42-L	46.5	49.5
10-S	13.5	15.5
12-S	15.5	17.5
16-S	19.5	21.5
20-S	24.5	27.5
25-S	30.0	34.0
30-S	35.0	39.0
38-S	43.0	47.0



Installation

⚠ Tube must fit without tension

- Place sealing ring (DOZ) onto tube-end



- Threads of stainless steel fittings must be lubricated
- EO-NIPOMONT is a special high-performance lubricant for stainless steel fittings

Maintaining instructions for EO2-FORM tools



Forming pin and clamping dies for EO2-FORM machine

- ⚠ Use of damaged, worn or non-suitable tooling may result in fitting failure and damage of machine
- ⚠ Tools must be checked regularly, at least after 50 assemblies
- ⚠ Worn tools must be replaced
- ⚠ Use only genuine Parker tools
- ⚠ Tools must always be kept clean and lubricated



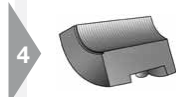
Forming pin for checking
Do not disassemble



- Visual check:
Surface must be free of wear
and damage
- Use air blowgun to remove chips
and dirt



- Clean clamping pin for checking
- Do not disassemble
- Pins must not be loose or
damaged



- Visual check:
Grip surface must be clean and
free of wear
- Use wire-brush to remove metal
particles from grip surface



assembly

fitting



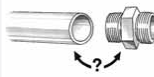
Weld fitting assembly

- EO weld nipple and weld fitting
- ⚠ Use weldable material
- ⚠ Depending on application or project specification, special requirements may apply for: Tube preparation, welding process, operator qualification, inspection of welding connection and surface finish



Tube preparation

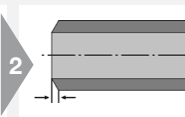
- Cut and deburr thoroughly
- Do not assemble under tension
- Clamp onto rigid fixtures



Material combinations

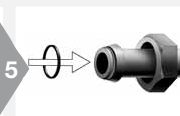
- Select suitable tube material

Fitting material	Tube specification
Steel	Weldable Steel
Stainless Steel	Weldable Stainless Steel



Tube squarely
±1° deviation
of use pipe cutters
tube-cutting tool (AV)
manual cutting

assembly



nut onto tube-end
fitting onto tube-end

- Clean weld
- Calibrate inner diameter

- Assemble O-ring
- Lubricate O-ring for easy

k® assembly instructions



Tube selection

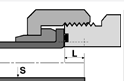
- Select suitable tube material

Steel tube		Stainless Steel tube	
Cold drawn seamless	Welded & redrawn	Cold drawn seamless	
NF A 49330	NF A 49341		
ISO 3304 R	DIN 2393	NF A 49341	
DIN 2391C pt 1	BS 3602/2	DIN 17458 DA/T3	
BS 3602 pt1	SAE J525	ASTM A 269	1.4571 on request
SAE J524			



Tube preparation

- Cut and deburr thoroughly



date tube length before
g
extra length "L"



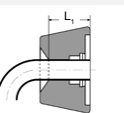
- Minimum length of straight tube-ends (see chart below)



- Cut tube squarely
- max. ±1° deviation
- ⚠ Do not use pipe cutters
- Use tube-cutting tool AV for manual cutting



- Remove internal and external burrs
- max. chamfer 0.3 mm × 45°
- Recommendation: In-Ex Tube Deburring Tool 226
- ⚠ Proper deburring and cleaning of inner diameter essential for sealing surface quality



Metric tube [mm]		Minimum straight length to start to bend L1 [mm]		Extra length – L [mm] for Tube Wall thickness							
Tube Ø	Wall thickness			1	1.5	2	2.5	3	3.5	4	5
6	1.0 – 1.5	40	4.5	5.5							
8	1.0 – 2.0	40	5.0	5.0							
10	1.0 – 2.0	40	2.5	4.0	3.5						
12	1.0 – 3.0	50	3.5	4.5	4.5	4.0	4.0				
14	1.5 – 2.0	50			5.0						
15	1.0 – 2.0	50		4.5	5.0						
16	1.5 – 3.0	50		3.0	3.0	3.0	2.5				
18	1.5 – 2.0	50		6.0	5.5						
20	2.0 – 3.5	50			3.5	4.0	4.0	3.5			
22	1.5 – 2.5	50			6.5	7.0					
25	2.0 – 4.0	50				4.0	4.5		4.0		
28	1.5 – 3.0	50			6.0	7.0					

assembly

O-Lok® assembly instructions



Parlange® 50



Parlange® 1025

O-Lok® machine flanging and assembly

- Preferred method
- Most efficient method
- Parlange® recommended



Use special machines:
Select flaring pin according to tube dimensions.
Use special "SS" pin for stainless steel tube.
Pin must be clean and free of damage and metal residues.
Use flaring pin clean and maintain regularly.

2



- Select flanging dies according to tube dimensions
- Use special "SS" dies for stainless steel tube to avoid contact corrosion
- Grip surface must be clean and free of wear
- Use only genuine Parker tooling for flanging O-Lok®

3



- Load pin into machine
- Ensure lubricating system is filled with EO-NIROMONT (LUBSS)

4



- Place sleeve in lower die half
- Locate upper die half onto lower half

6



Remove the dies in the die housing and close safety cover

- Slide nut onto tube before flanging!
- Open threads towards machine

7



⚠ Press tube firmly into the die against the tube stop

8



- Pull down the handle to clamp the tube in the dies (1025)
- 1040/50 die clamping automatic in cycle

assembly

k® assembly instructions

Checking of flange



- Dimensional check of the flange
- Flare O.D. should not exceed outside sleeve diameter
- Flare O.D. should not be less than smaller diameter of front of sleeve
- When in doubt, measure



Tube O.D.		Ø D	
mm	in.	min. [mm]	max. [mm]
6	1/4"	12.10	12.75
8		14.85	15.75
10	3/8"	14.85	15.75
12	1/2"	18.00	18.90
14		22.20	23.45
15		22.20	23.45
16	5/8"	22.20	23.45
18		26.60	27.85
20	3/4"	26.60	27.85
22		32.95	34.20
25	1"	32.95	34.20
28		39.35	40.55
30		39.35	40.55
32	1 1/4"	39.35	40.55
35		47.25	48.50
38	1 1/2"	47.25	48.50
50	2"	58.90	60.60

Installation in fitting



- Thread nut onto body
- Tighten to full metal contact
- Mark body and nut as quality check
- Tighten to recommended torque level
- Recommended: Tighten with spanner the number of flats indicated α
- 1 flat = 60°

O-Lok® assembly instructions



O-Lok®: Replacement of O-ring

- Parker CORG assembly tool should be used for O-Lok® fitting with captive O-ring groove (O-Lok®)



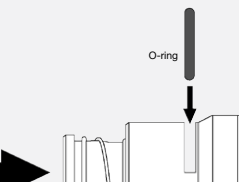
the O-ring into the slot
on the side of the tool



- Position the open end of the tool
over the tube-end of the fitting



- Push the piston of the tool until
the O-ring is released into the
fitting groove



e-Lok® assembly instructions



Tube selection

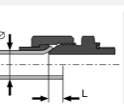
- Select suitable tube material

Steel tube		Stainless steel tube
Cold drawn seamless	Welded & redrawn	Cold drawn seamless
NF A 49330	NF A 49341	
ISO 3304 R	DIN 2393	NF A 49341
DIN 2391 C pt 1	BS 3602/2	DIN 17458 DA/T3
BS 3602 pt1	SAE J525	ASTM A 269
SAE J524		

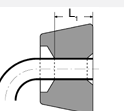
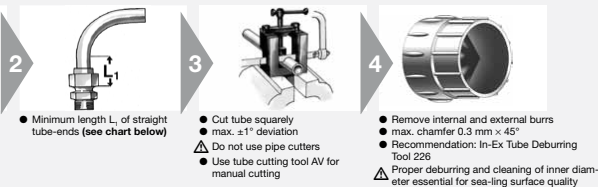


Tube preparation

- Cut and deburr thoroughly



date tube length before
g extra length "L"



Tube preparation chart

Metric tube [mm]		Inch tube [inch]		Extra length	Minimum straight length	Flare Ø
Tube Ø	Wall thickness	Tube Ø	Wall thickness	~ L [mm]	to start to bend L1 [mm]	Ø D [mm]
6	1.0 – 1.5	1/4"	0.020 – 0.065	2.0	40	8.6 – 9.7
8	1.0 – 1.5	5/16"	0.020 – 0.065	2.0	40	10.2 – 11.3
10	1.0 – 1.5	3/8"	0.020 – 0.065	2.0	42	11.7 – 12.7
12	1.0 – 2.0	1/2"	0.028 – 0.083	2.5	43	16.0 – 17.3
14	1.5 – 2.0			2.5	52	19.3 – 20.2
15	1.0 – 2.5			2.5	52	19.3 – 20.2
16	1.5 – 2.5	5/8"	0.035 – 0.095	2.5	52	19.3 – 20.2
18	1.5 – 3.0			3.0	56	23.4 – 24.7

Triple-Lok® assembly instructions

Flaring Parflange®-Process

Proven method
Efficient method
Parker® recommended



Fit flaring pin according to dimensions
Use special "SS" pin for stainless steel tube
Pin must be clean and free of oil and damage
Load tooling into machine
Clean flaring pin and lubricate regularly



- Select flaring dies according to tube dimensions
- Use special "SS" dies for stainless steel tube
- Grip surface must be clean and free of wear
- Use only genuine Parker tooling for flaring Triple-Lok®



Parflange® 50

- Load tooling into machine
- Keep sliding surfaces clean and lubricated
- 50: Close safety cover
- Ensure lubricant system is filled with EO-NIROMONT (LUBSS)



Parflange® 1025

- Slide nut and sleeve as shown onto the tube-end



Push tube firmly into the die until the tube stop
Parflange® 1025:
Release clamping lever
Parflange® 1040/50:



- Hold tube firmly
- Press start button
- ⚠ Keep hands clear off the working area



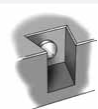
- Parflange® 1025:
Unclamp the dies
- Parflange® 1040/50:
Die unclamping is automatic

Assembly

Triple-Lok® assembly instructions

Flaring with EOMAT/KARRYFLARE

Proven method
Efficient method
Parker® recommended

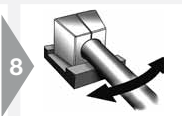


Flaring pin is integrated in die block
Die block must be clean and free of wear and damage
Flaring pin clean
EOMAT/KARRYFLARE: Flaring pin for tube O.D. must be fitted at flat face on top

- Select flaring dies according to tube O.D.
- Grip surface must be clean and free of wear
- Use only genuine Parker tooling for flaring Triple-Lok®
- Keep sliding surfaces clean and lubricated

Slide nut and sleeve as shown onto the tube-end

- Lubricate tube-end inside
- Lubricant EO-NIROMONT recommended



Push tube firmly into the die until the tube stop
EOMAT/KARRYFLARE: Open valve on handpump
EOMAT III/A: Operate handpump

- EOMAT UNI: Adjustment according to pressure on machine
- EOMAT III/A: Adjustment according to pressure on machine

- Hold tube firmly
- EOMAT: Press and hold start button
- KARRYFLARE: Operate handpump

- KARRYFLARE: Open valve on handpump
- Remove tube from machine
- Use die separator to free tube

assembly

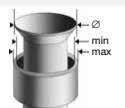
e-Lok® assembly instructions

Checking the flare

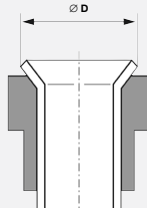


Flare for inspection
Check sealing surface for
burrs, scratches and
g

2

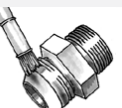


- Dimensional check of the flare
- Flare O.D. should not exceed outside sleeve diameter
- Flare O.D. should not be less than smaller diameter of front of sleeve
- When in doubt, measure



Tube O.D.		∅ D	
mm	inch	Min.	Max.
6	1/4"	8.6	9.7
8	5/16"	10.2	11.3
10	3/8"	11.7	12.7
12	1/2"	16.0	17.3
14		19.3	20.2
15		19.3	20.2
16	5/8"	19.3	20.2
18		23.4	24.7
20	3/4"	23.4	24.7
22	7/8"	26.5	27.8
25	1"	29.7	31.0
28		37.6	38.9
30		37.6	38.9
32	1 1/4"	37.6	38.9
35		43.2	45.3
38	1 1/2"	43.2	45.3
42		52.0	54.8
50	2"	59.2	61.2

Installation



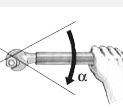
fittings: No lubrication
less steel fittings:
lubrication required
GO-NIRMOINT special

2



- Thread nut onto body
- Tighten to full metal contact (finger tight)
- Mark body and nut as assembly

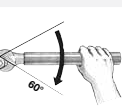
3



- Use spanner extension for larger fittings (28 mm)

Tightening recommendation

4



- 1 flat = 60°

Working instructions for O-Lok®/Triple-Lok® tools



Tools for Parflange® machines

- ⚠ Use of damaged, worn or non-suitable tooling may result in fitting failure and damage of machine
- ⚠ Tools must be checked regularly, at least after 50 assemblies
- ⚠ Worn tools must be replaced
- ⚠ Use only genuine Parker tools
- ⚠ Tools must always be kept clean and lubricated



Pin for checking



- Visual check:
Surface must be free of wear and damage



- Clean die halves for checking
- ⚠ Do not disassemble
- Fixing pins must not be loose or damaged



- Visual check:
Grip surface must be clean and free of wear
- Use wire-brush to remove metal particles from grip surface



Adjustment of Parflange® dies

- Parflange® dies can be adjusted to correct deviations of flare diameter
- ⚠ Re-adjustment of dies will not help if general machine setting is incorrect or components are damaged (worn tube-stop, loose screw connections)



O-ring-Seal assembly instructions



Tube selection

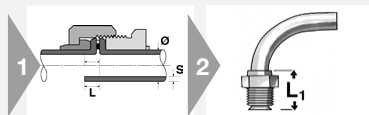
- Select suitable tube material

Steel tube	
Cold drawn seamless	Welded & drawn
NF A 49330	NF A 49341
ISO 3304 R	DIN 2393
DIN 2391C pt 1	BS 3602/2
BS 3602 pt1	SAE J525
SAE J524	



Tube preparation

- Cut and deburr thoroughly



- Calculate tube length before cutting
- Add extra length "L" (see chart below)
- Minimum length of straight tube-ends (see chart below)



- Remove internal and external burrs
- max. chamfer 0.3 mm x 45°
- Recommendation: In-Ex Tube Deburring Tool 226

⚠ Proper deburring and cleaning of inner diameter essential for sealing surface quality

Flange-Seal assembly instructions



Flange-Seal machine 50



Parflange 1025

Flange-Seal machine flanging and assembly

- Preferred method
- Most efficient method
- Parflange® recommended



Flaring machines:
Select flaring pin according to
tube dimensions
standard O-Lok® pins
must be clean and free of
damage and metal parti-

cles.
Flaring pin clean and
inspect regularly



- Select flanging dies according to tube dimensions
- Use special Flange-Seal dies
- Grip surface must be clean and free of wear
- Use only genuine Parker tooling for flanging

⚠ Note limitation on wall thickness for tube-tube connections



- Load pin into machine
- Ensure lubricating system is filled with EO-NIPOMONT (LUBSS)
- 50: Close safety cover



- Place threaded sleeve (LHP) in lower die half
- Locate upper die half onto lower half



Place dies in the die housing



⚠ Press tube firmly into the die against the tube stop



- Pull down the handle to clamp the tube in the dies (1025)
- 50 die clamping automatic in cycle
- Press button to start flanging cycle

Assembly

Flange-Seal assembly instructions



Flange* 1025:
Press the dies
separate tube from machine
die separator to free tube
Flange* 1040/50:
Clamping is automatic



- Clean flange for inspection
- ▲ Check sealing surface for cracks, burrs, scratches and pitting
- Dimensional check of the flare

Tube O.D.		Ø D	
mm	inch	min. [mm]	max. [mm]
6	1/4"	12.10	12.75
8		14.85	15.75
10	3/8"	14.85	15.75
12	1/2"	18.00	18.90
16	5/8"	22.20	23.45
20	3/4"	26.60	27.85



Seal into loose tube nut
Turn to full metal contact
Turn to recommended
Seal level

Tightening recommendation

Metric tube [mm]	Inch tube [inch]	SAE dash size	SAE thread UN/UNF-2A	Assembly torque Nm -0% + 10% Steel
6	1/4"	-4	9/16-18	25
8	5/16"	-6	11/16-16	40
10	3/8"	-6	11/16-16	40
12	1/2"	-8	13/16-16	65
16	5/8"	-10	1-14	80
20	3/4"	-12	1 3/16-12	115

Component guide – Flange-Seal system

Flanges

Con. dash size	Flange-Seal fitting	Seal element	Die tool*	Pin tool
4	LHMP56	4PLS	M4018006XxxxMLHP	B3018006XxxxM
6	LHMP58	6PLS	M4018008XxxxMLHP	B3018008XxxxM
6	LHMP510	6PLS	M4018010XxxxMLHP	B3018010XxxxM
8	LHMP512	8PLS	M4018012XxxxMLHP	B3018012XxxxM
10	LHMP516	10PLS	M4018016XxxxMLHP	B3018016XxxxM
12	LHMP520	12PLS	M4018020XxxxMLHP	B3018020XxxxM

System component guide – Flange-Seal system

Inch tubes

Tube O.D. (inch)	Con. dash size	Flange-Seal fitting	Seal element	Die tool*	Pin tool
1/4"	4	4LHP-S	4PLS	M4004Xxxx180LHP	B4004Xxxx180
3/8"	6	6LHP-S	6PLS	M4006Xxxx180LHP	B4006Xxxx180
1/2"	8	8LHP-S	8PLS	M4008Xxxx180LHP	B4008Xxxx180
5/8"	10	10LHP-S	10PLS	M4010Xxxx180LHP	B4010Xxxx180
3/4"	12	12LHP-S	12PLS	M4012Xxxx180LHP	B4012Xxxx180

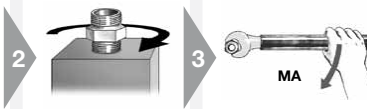
assembly

connections



Assembly of metric straight port connections

- Metric Thread
DIN ISO 6149-2/3
ISO 9974-2/3
DIN 3859-T2



- Screw in until handtight

- Then tighten according to chart

ds of stainless steel fittings
be lubricated
FROMONT is a special
performance lubricant for
ess steel fittings

Assembly torques for zinc plated steel fittings with metric thread in ports made of steel

Tube O.D.	Thread size T mm	Straight male stud fittings with port tapping					Non- return valves	EO Banjo fittings		Adjustable ends		Blanking plugs	
		Form A for sealing washer Nm	Form B with face Nm	Form E with ED sealing Nm	Form F with O-ring sealing Nm	O-ring with sealing and retaining ring	RH/RHZ Form E with ED sealing Nm	WH/TH Nm	SWVE Nm	O-ring and retaining ring Nm	O-ring Nm	VST-ED Form E mit ED sealing Nm Δ	VST-OR Form F with O-ring sealing Nm
6	M 10x1.0	9	18	18	15	18	18	18	18	18	15	12	20
8	M 12x1.5	20	30	25	25	35	25	45	35	35	25	25	35
10	M 14x1.5	35	45	45	35	45	35	55	50	45	35	35	45
12	M 16x1.5	45	65	55	40	55	50	80	60	55	40	50	55
15	M 18x1.5	55	80	70	45	70	70	100	80	70	45	65	70
18	M 22x1.5	65	140	125	60	160	125	140	120	160	60	90	100
22	M 28x1.5	90	190	180	100*	250	145	320	130	180	100	135	
28	M 33x2.0	150	340	310	160	310	210	360		310	160	225	310

assembly

connections



Assembly of BSPP straight port connections

- BSPP Thread G
ISO 1179-1
DIN 3859-T2

ends of stainless steel fittings
be lubricated
BROMONT is a special
performance lubricant for
ess steel fittings

- Screw in until handtight


- Then tighten according to chart

Assembly torques for zinc plated steel fittings with metric thread in ports made of steel

duct ies	Tube O.D.	Thread size T Inch	Straight male stud fittings with port tapping				Non- return valves		EO Banjo fittings		Adjustable ends		Blanking plugs
			Form A for sealing washer Nm	Form B with cutting-face Nm	Form E with ED-sealing Nm	with O-ring sealing and retaining-ring	RHV/RHZ Form E with ED- sealing	WH/TH	SWVE		O-ring and retaining-ring Nm	VST-ED Form E with ED-sealing Nm Δ	
L le-Lok®	6	G 1/8 A	9	18	18	18	18	18	18		18	13	30
	8	G 1/4 A	35	35	35	35	35	45	40		35	30	
	10	G 1/4 A	35	35	35	35	35	45	40		35	30	
	12	G 3/8 A	45	70	70	70	50	70	65		70	60	
	15	G 1/2 A	65	140	90	90	85	120	90		110	80	
	18	G 1/2 A	65	100	90	90	65	120	90		110	80	
	22	G 3/4 A	90	180	180	180	140	230	125		180	140	
	28	G 1 A	150	330	310	310	190	320			310	200	

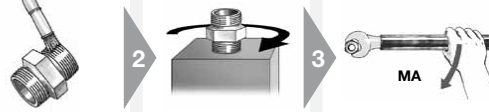
assembly

connections



Assembly of SAE straight port connections

- UN/UNF thread
ISO 11926-2/3



- Screw in until handtight
- Then tighten according to chart

ds of stainless steel fittings
be lubricated
BROMONT is a special
performance lubricant for
ess steel fittings

Assembly torques for zinc plated steel fittings with BSPP thread in ports made of steel

T	Thread size	Series	
	ISO 11296	EO / Triple-Lok® and O-Lok®	
	inch	Assembly torque non-adjustable end Nm	Assembly torque adjustable end Nm
ok®	7/16-20 UN(F)	23	18
	1/2-20 UN(F)	28	28
	9/16-18 UN(F)	34	34
	3/4-16 UN(F)	60	55
	7/8-14 UN(F)	115	80
	1 1/16-12 UN(F)	140	100
	1 5/16-12 UN(F)	210	150
	1 5/8-12 UN(F)	290	290
	1 7/8-12 UN(F)	325	325
	7/16-20 UN(F)	35	20

assembly

connections

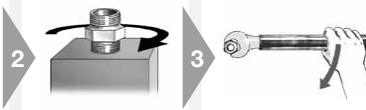


Assembly of tapered thread port connections

- NPT / NPTF thread
ANSI / ASME B 1.20.1 – 1983



ds of stainless steel fittings
be lubricated
FROMONT is a special
performance lubricant for
ess steel fittings



- Apply teffon tape (1.5 layer) to the taper stud end and screw in handtight
- Then tighten according to chart

ing of NPT / NPTF thread

Thread T NPT/F	Assembly TFFT Turns
1/8-27 NPT/F	2.0-3.0
1/4-18 NPT/F	2.0-3.0
3/8-18 NPT/F	2.0-3.0
1/2-14 NPT/F	2.0-3.0
3/4-14 NPT/F	2.0-3.0
1-11.5 NPT/F	1.5-2.5
1 1/4-11.5 NPT/F	1.5-2.5
1 1/2-11.5 NPT/F	1.5-2.5

Assembly

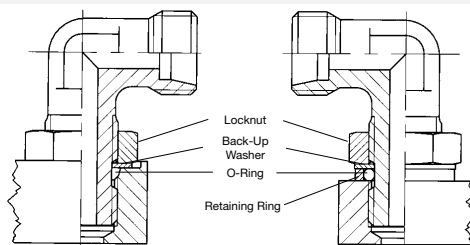
Stable fittings with locknut



Assembly of the orientable joint

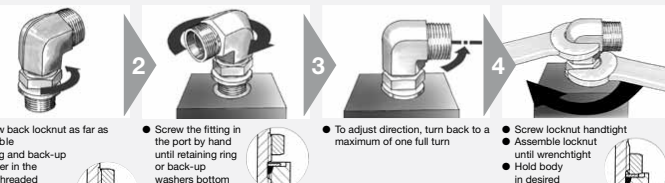
(EO: e.g. WEE, VEE, TEE, LEE - Triple-Lok® / O-Lok®: C4, V4, S4, R4)

⚠ Assembly steps must be done in right order



without Retaining Ring for ISO 6149 or UN/UNF ports

● Fitting *with* Retaining Ring for BSPP or Metric Parallel ports with wide or **SMALL** spot faces



● Screw back locknut as far as possible and back-up washer in the threaded

● Screw the fitting in the port by hand until retaining ring or back-up washers bottom

● To adjust direction, turn back to a maximum of one full turn

● Screw locknut handtight
● Assemble locknut until wrenchtight
● Hold body in desired

Assembly

Swivels



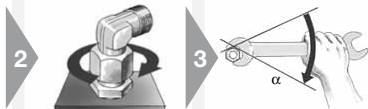
Assembly of EO swivel nut fittings

(e.g. EW, ET, EL, EGE, RED, VKA, SKA)

- Final assembly of swivel nut fittings must be made in appropriate fittings



For stainless steel fittings, the fitting must be lubricated. HYROMONT is a special performance lubricant for stainless steel fittings.



- Screw on nut by hand until handtight

- ⚠ Then tighten fitting firmly by $\frac{1}{4}$ turn (1½ flats)



Final assembly of factory pre-assembled EO-standpipe fittings

(e.g. EVW, EVT, EVL, EVGE, KOR)

- For all fittings delivered pre-assembled from the factory the final assembly is performed in the appropriate fitting body



assembly

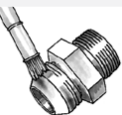
e-Lok® / O-Lok® swivels



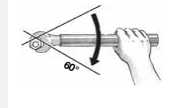
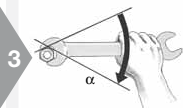
Assembly of Triple-Lok® and O-Lok® swivel nut fittings

e.g.: Triple-Lok®: C6MX, V6MX, R6MX, S6MX, BBMTX
O-Lok®: C6MLO, V6MLO, S6MLO, R6MLO, A0EL6

- Final assembly of swivel nut fittings must be made in appropriate fittings



2



ds of stainless steel fittings
be lubricated
FROMONT is a special
performance lubricant for
ess steel fittings

- Screw on nut by hand until handtight

- Then tighten according to chart

- one flat = 60°

Assembly torques for O-Lok® and Triple-Lok® swivel nut fittings

Size	Metric tube mm	Inch tube inch	Thread UN/UNF	Nm	FFWR
4	6	1/4"	9/16-18	25	1/2
6	8	5/16"	11/16-16	40	1/2
6	10	5/16"	11/16-16	55	1/2
8	12	1/2"	13/16-16	55	1/2
10	14, 15, 16	5/8"	1-14	115	1/2
12	18, 20	3/4"	1 3/16-12	130	1/2
16	22, 25	1"	1 7/16-12	160	1/2

Assembly

Flanges



Assembly of flanges

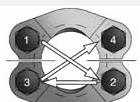
- SAE flange adapters
- SAE 4 bolt flanges
- Gear pump flanges
- CETOP square flanges



2



3



4



Ensure sealing surfaces are free of burrs, nicks, scratches or contamination
Lubricate the O-ring with system oil or compatible lubricant

- Position flange and clamp halves
- Place lock washers on bolts and bolt through clamp halves

- Hand tighten bolts
- Torque bolts in diagonal sequence in small increments to the appropriate torque level listed in chart

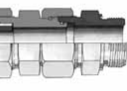
- Tighten bolts according to chart

SI Series (Code 61) Flange recommend screw torque

Screw size	Flange size	Inch screws (J518)	Torque Nm ¹	Metric screws (ISO 6162)	Torque Nm ¹
3	1/2"	5/16-18	24	M8	24
9	3/4"	3/8-16	43	M10	50
15	1"	3/8-16	43	M10	50
12	1 1/4"	7/16-14	70	M10	50
18	1 1/2"	1/2-13	105	M12	92
11	2"	1/2-13	105	M12	92
14	2 1/2"	1/2-13	105	M12	92
16	3"	5/8-11	210	M16	210
19	3 1/2"	5/8-11	210	M16	210
22	4"	5/8-11	210	M16	210

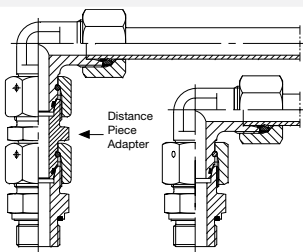
assembly

Replacement of an EO Bite type connection



Distance piece adapter DA

- EO distance piece adapters allow replacement of bite type connections on existing pipework easily or retrofitting using EO-2
- The existing tubes can be re-used



as an extension for stacked assemblies



length L off tube-end
"DA" chapter I)
obsolete nut

- Assemble new EO-2 functional nut or EO PSR/DPR and nut

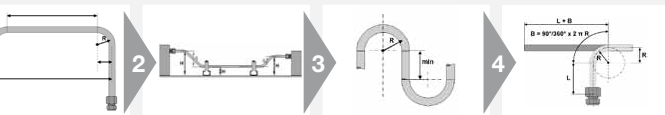
- Thread on
• Then tighten distance piece adapter onto tube-end

assembly

bending

Instructions for hand bend-equipment

on-site piping jobs
or mass production



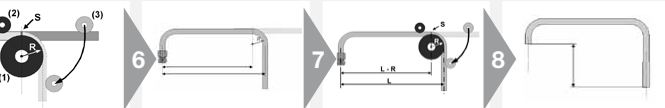
the whole process
high and plan each individ-
step before starting
bend and then cut ends to
length

- Consider steps
- Plan for clamping

- Check bending equipment
specifications for limitations

- Start with first elbow
- Leave tube-end longer if in doubt

for all dimensions like
num straight lengths, extra
for flaring, bending radius,
lengths for bows, etc.



start of bend on tube (S)
at tube between
ing roll (1), clamping roll (2)
pressure roll (3)

- Check bend angle
- Correct angle if necessary
- Gather all dimensions for next
bending operation

- ⚠ Mark start of bend on tube
- Continue bending
- Check and correct each result
before starting next bend

- After the last bend, check tube
for angles and dimensions
- Now cut both tube-ends to cor-
rect length

assembly

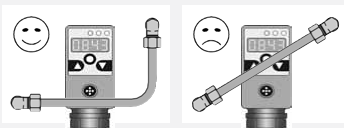
line fabrication guide for leak free systems

Every hydraulic, pneumatic and lubrication system requires some form of tube fabrication and fitting installation for completion. Proper fabrication and installation are essential for the overall efficiency, leak free performance, and general appearance of any system.

After sizing the tube lines and selecting the appropriate style of fitting, consider the following in the design of your system:

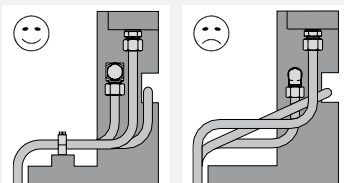
1. Accessibility of joints
2. Proper routing of lines
3. Adequate tube line supports
4. Available fabricating tools

Keep tube lines away from components that require regular maintenance:



Right-angled – parallel – clear

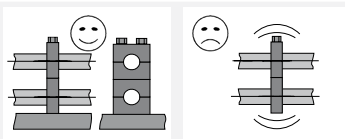
Have a neat appearance and allow for easy trouble-shooting, maintenance and repair:



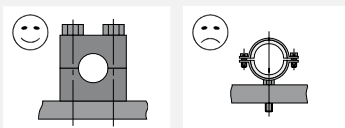
assembly

line fabrication guide for leak free systems

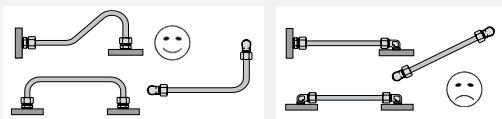
do not use tube lines to support other tubes
 always fix tubes onto a rigid point
 use tube clamps
 do not use cable channels to support tubes



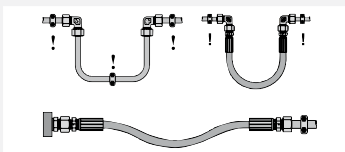
use appropriate tube clamps:



avoid excessive strain on joint:
 a strained joint will eventually leak



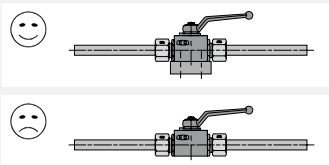
allow for expansion effects



assembly

line fabrication guide for leak free systems

Support against actuating forces:

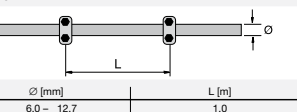


Recommended tools for tube line fabrication:

Cutting:
 Tube cutting tool AV
 Combined tube bending and cutting tool BAV
Cutters:
 Type Kloskut;
 Stainless Steel: Type 635 B-EX,
 218 B-SS Tru-Kut Sawing Vice

Deburring:
 Parker deburring tool no. 226 DEBURR
Bending:
 EO Combined tube bending and cutting tool BAV
 EO Tube bending tool BV 6/18, BV 20/25
 EO Tube bending tool BVP (programmable)

Pipes have to be supported in certain distances:
 Sufficient tube clamps to support weight
 Sufficient tube clamps to protect joints from
 vibration



Vibration has to be eliminated near by the
 connectors:

