



B6 Refrigerant Circuit Joining Technologies

Repair of refrigeration appliances with Lokring series 00

Length: 60 minutes

Theory / demonstration

Agenda B6

☒ Lokring vs Brazing - Advantages

Areas of application – Series 00

Functional principle

Repair possibilities

Technical specifications

Test laboratory

Assembly tools

Accessories

Lokprep

Assembly instructions

Refrigerant circuit commissioning

Lokring vs Brazing

Advantages

- Generally suitable where brazing is not permitted
- No brazers certification required
- Suitable for flammable refrigerants
- Applicable at appliances location with narrow space
- Customer-friendly onsite service with reduced logistics costs
- Clean, fast and reliable
- Assembly possible in high combustion areas, even with heavy foot traffic or during business operations
- Simple assembly without power connection
- No heavy brazing equipment necessary
- No brazing related quality problems



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Areas of application

- Household refrigeration appliances (refrigerators, freezers, wine coolers)
- Ready-to-use refrigeration equipment (refrigeration cabinets, bars, lockers, chillers)
- Refrigeration equipment for catering (sales counter refrigerators, flow-through coolers, portable cooling systems)



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Areas of application – Series 00

☒ Functional principle

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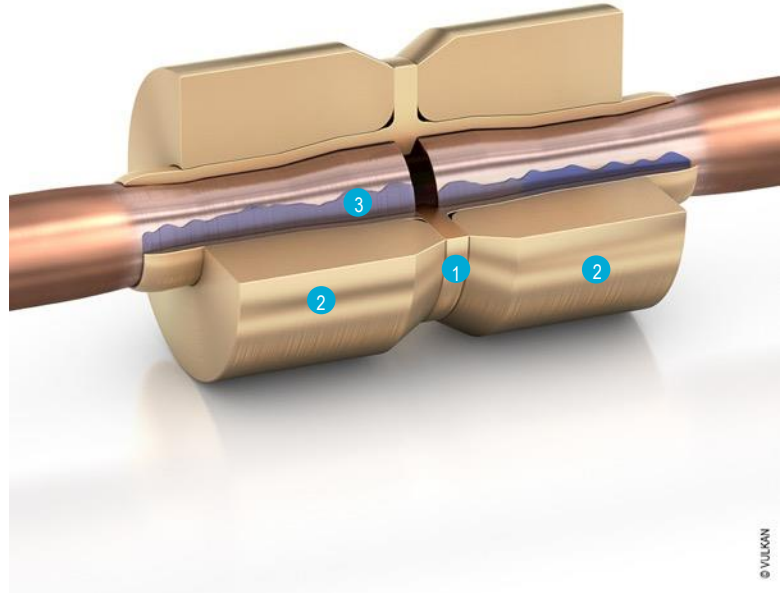
Refrigerant circuit commissioning

Functional principle

Components



- ① Joint
- ② Rings
- ③ Lokprep (anaerobic sealant)

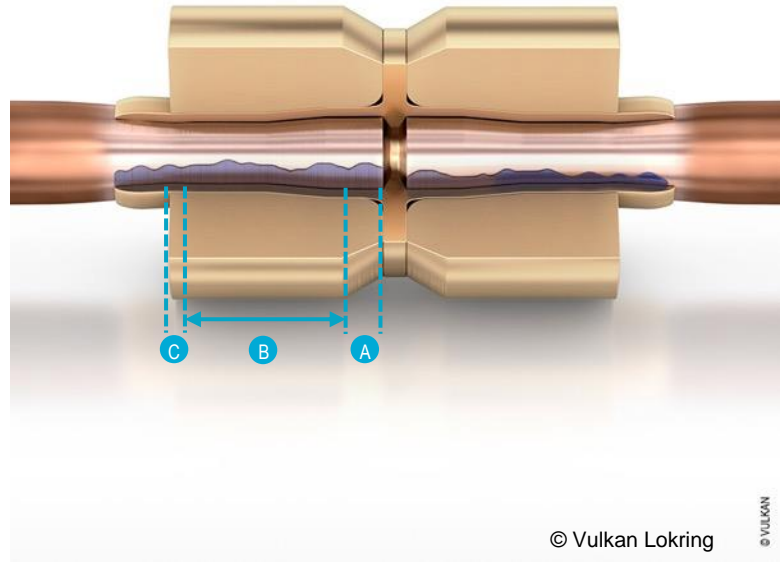


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Functional principle

Areas of the connection

- A Insertion area
- B Stabilisation and sealing area
- C Main sealing area



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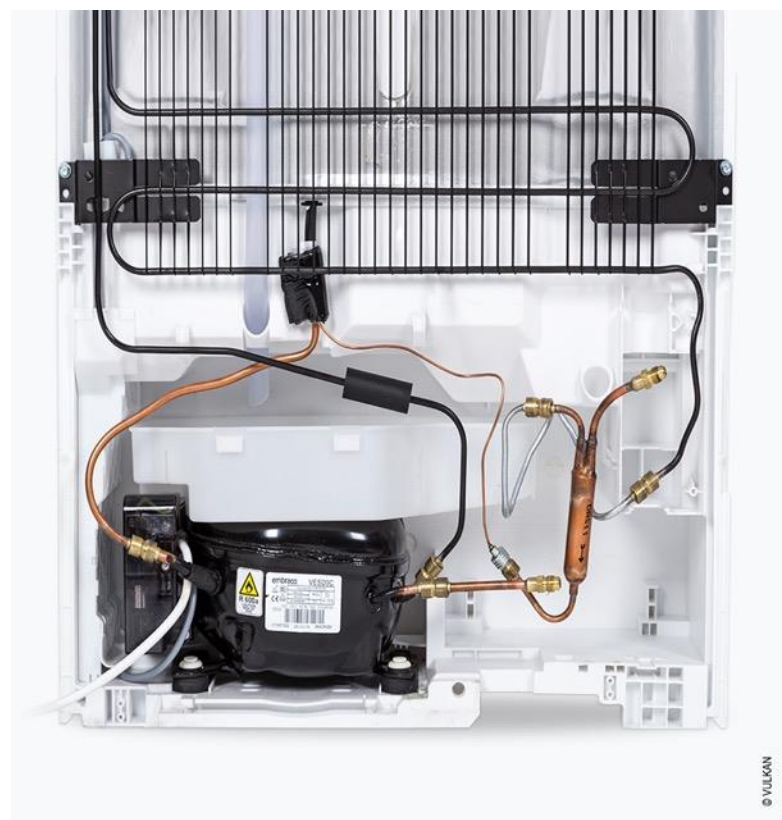
Assembly instructions

Refrigerant circuit commissioning

Repair possibilities

Overview

- Replace a compressor
- Replace a filter-dryer
- Replace a charging tube
- Repair leaky brazed connections

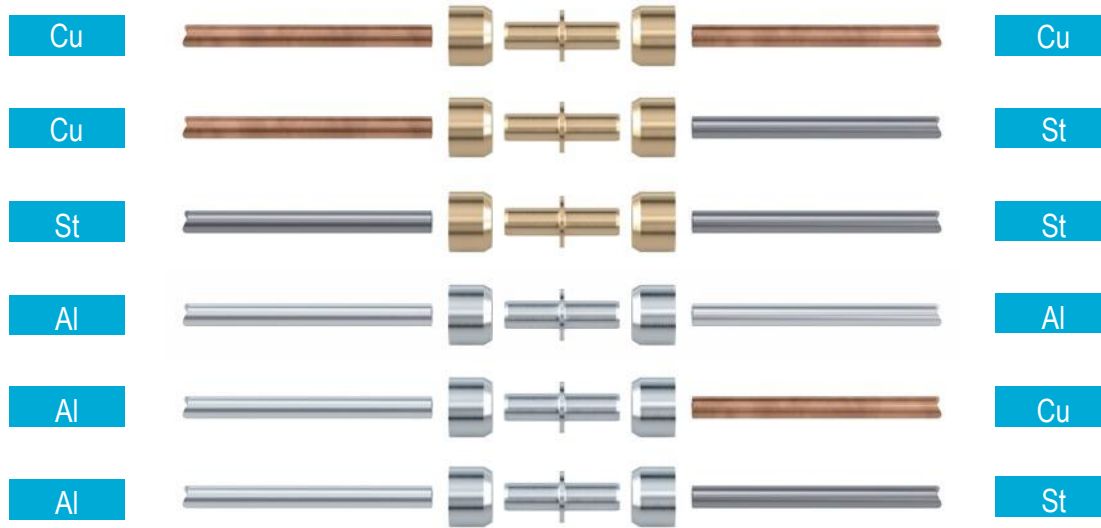


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Repair possibilities

Material combinations



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Repair possibilities

Starter kit

For a perfect start in the world of repairs to plug-in refrigeration equipment.

- Hand assembly tool
- Assembly jaws
- Lokprep
- Sandpaper
- Filter-dryers
- Straight connectors
- Straight reducing connectors



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Repair possibilities

Filter-Dryer section

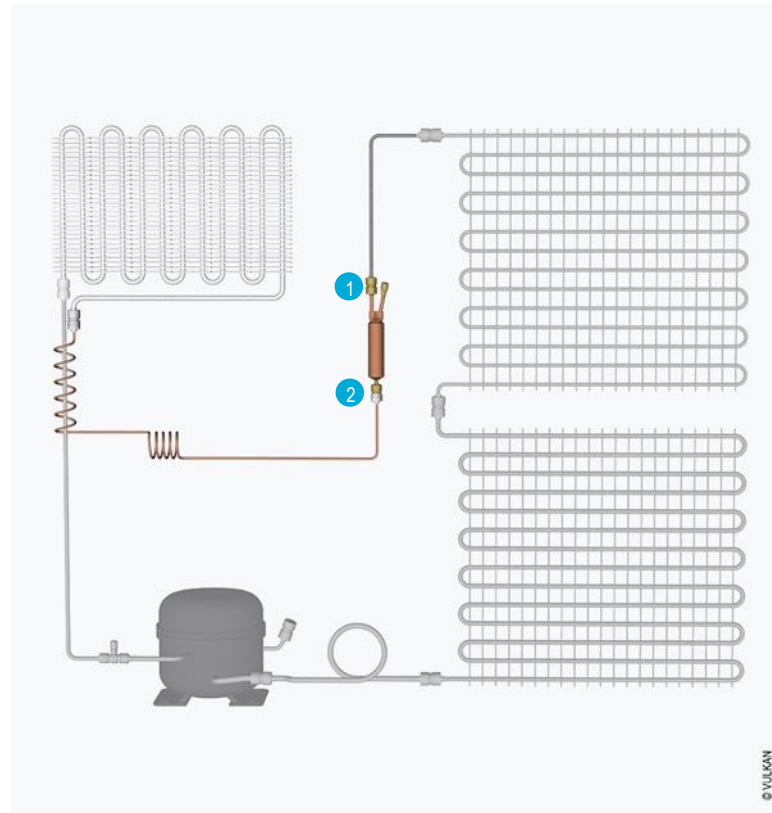
- 1 Liquid line > Dryer



- 2 Dryer > Capillary tube



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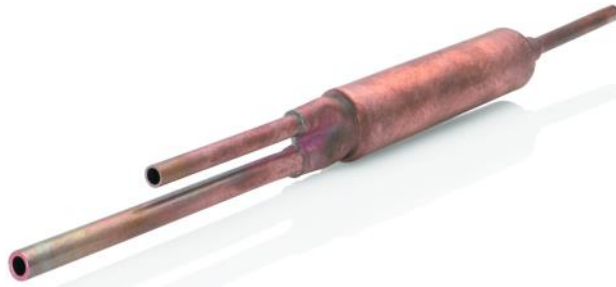
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Repair possibilities

Filter-dryers

- Specially designed for Lokring application.
- For all HC and HFC refrigerants.
- Protects the refrigeration circuit against moisture, acids and dirt particles.
- Desiccant: XH-9



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Repair possibilities

Evaporator section

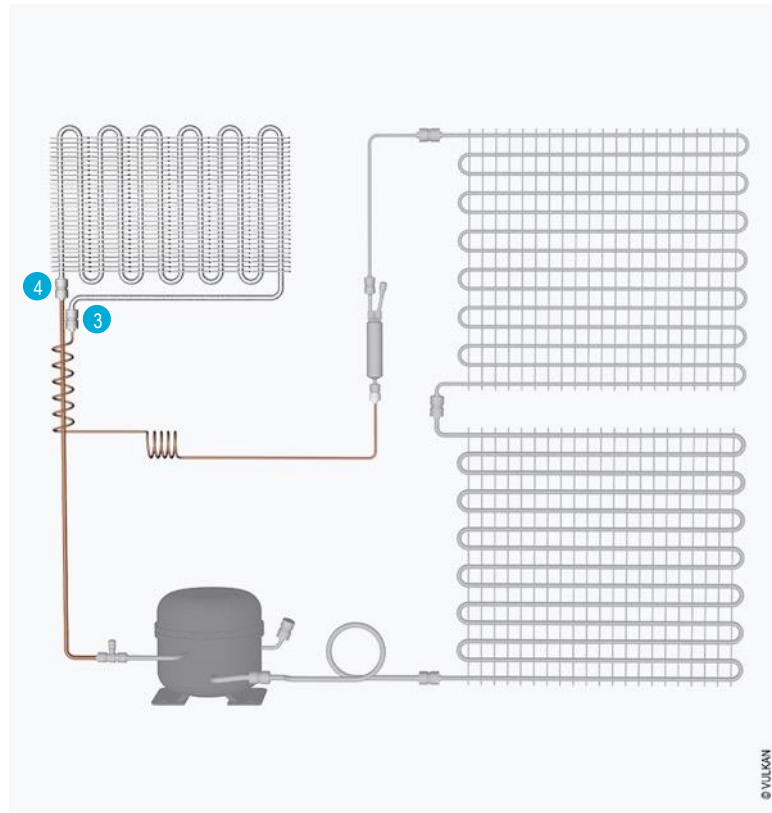
- 3 Capillary tube > Evaporator



- 4 Evaporator > Suction line



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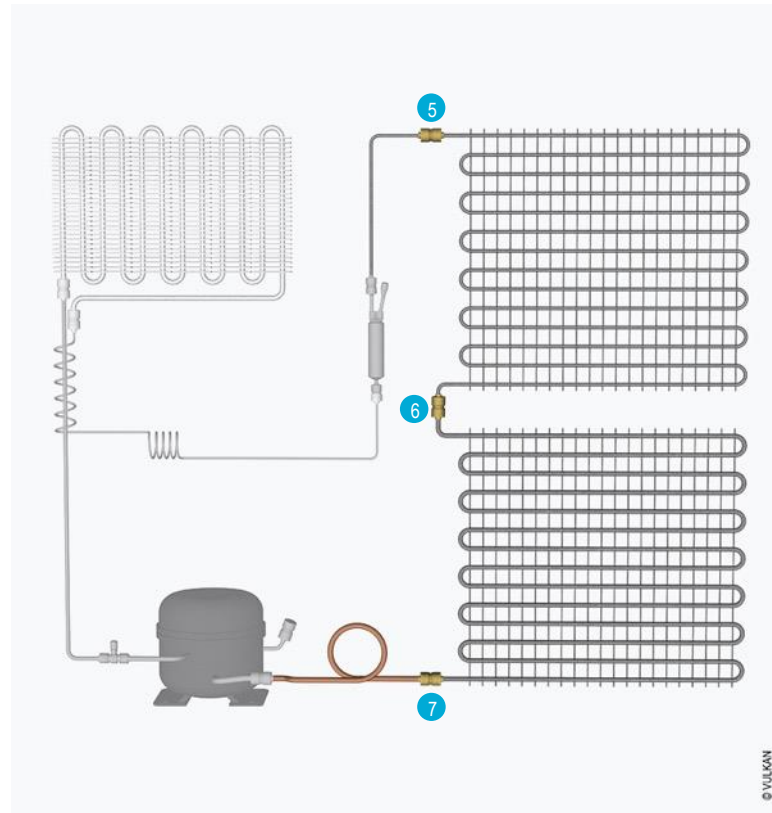
Repair possibilities

Condenser section

- 5 Back plate condenser
 - > Liquid line
- 7 Hot gas line
 - > Side plate condenser



- 6 Side plate condenser
 - > Back plate condenser



Repair possibilities

Compressor section

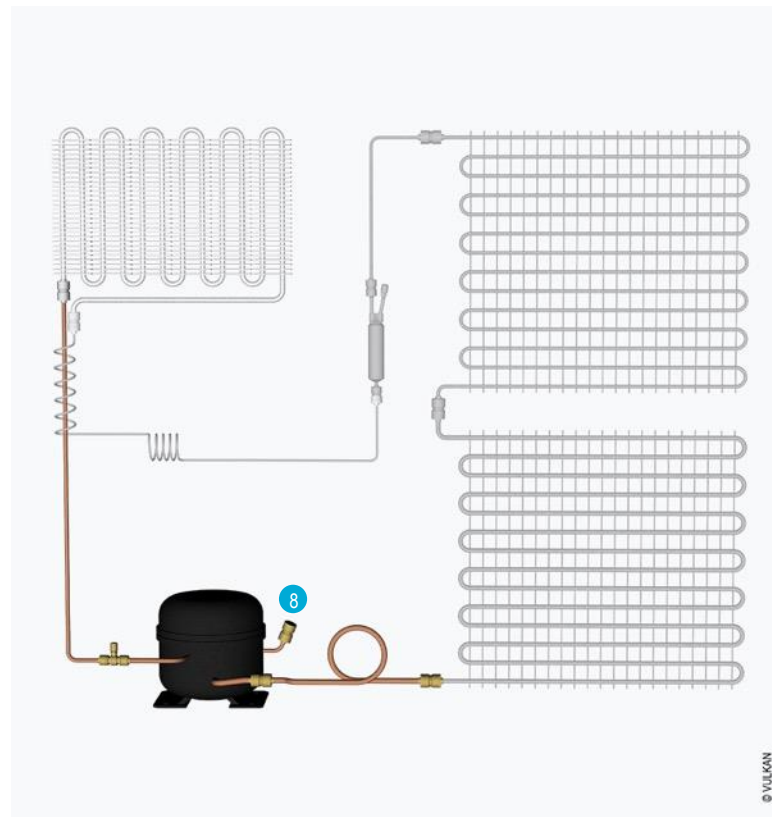
- 8 Charging tube with stopper



- 8 Charging tube with 1/4" schrader valve



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Repair possibilities

Compressor section

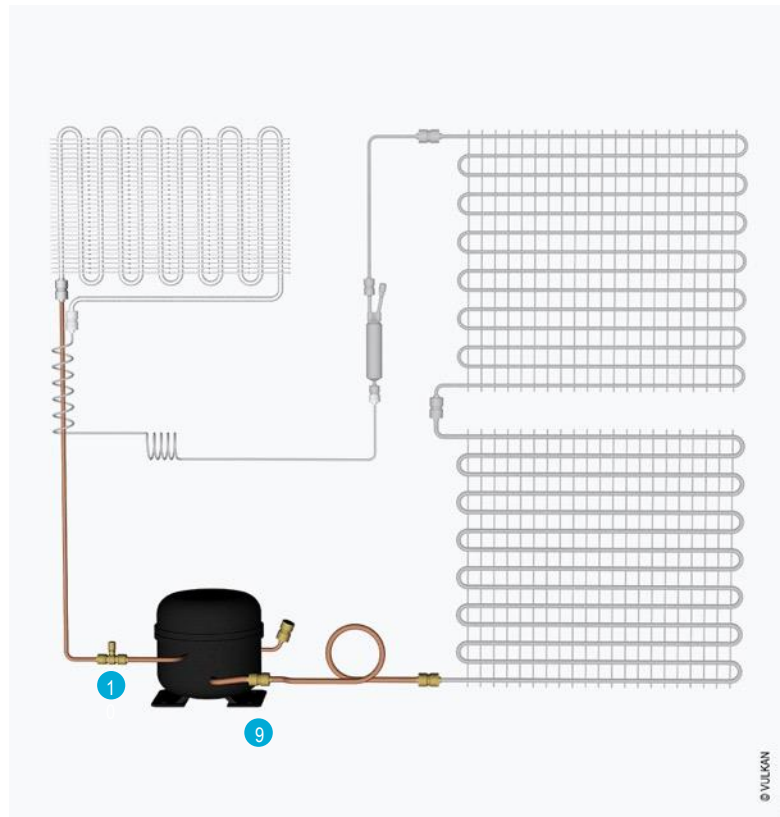
- 9 Compressor > Hot gas line



- 1 Suction line > Compressor



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Lokring connectors type 00



Lokring tube connections are available in material of brass and aluminium and in tube diameter ranges of 1.6 mm to 11 mm (1/16" to 3/8") for brass and 2 to 9 mm (5/64" to 5/16") for aluminium.

Approvals	TÜV UL (File SA12004)
Reference standards	EN 378-2:2016 and EN ISO 14903:2017-12
Max. operating pressure	25 bar (360 psi)
Admissible refrigerants	HFC, HC, not suitable for CO ₂ and NH ₃
Temperature range	-50°C up to 150°C (-58°F up to 302°F)
Minimum tube wall thickness	0.5 mm

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Test laboratory

Pressure test (static)

The Lokring connection is always stronger than the tube.



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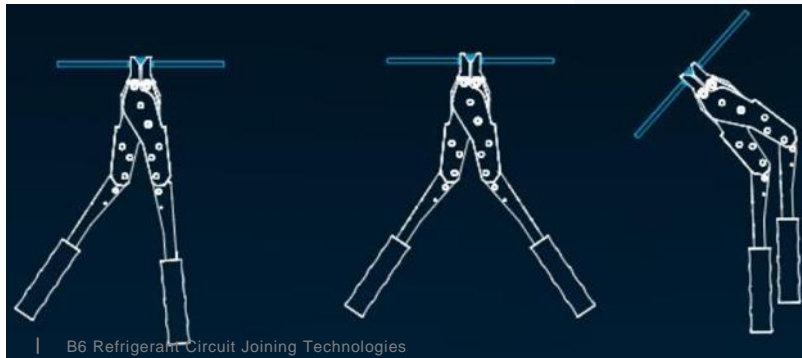
Assembly instructions

Refrigerant circuit commissioning

Assembly tools

Loktool HMRK-V

- Specially developed for the Lokring assembly.
- Patented lever mechanism for assembly with minimum effort.
- Assembly jaws are easy to change for different tube diameters.
- Both handles bend for use in hard-to-reach areas.



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Assembly tools





Assembly jaws

- Suitable for the LOKTOOL HMRK-V and HMRK-L hand assembly tools.
- Suitable for double-sided assembly of LOKRING type 00 connections.
- MB 8 for tube outer- \varnothing 1.6 – 8.5 mm (1/16" – 5/16")
- MB 10 for tube outer- \varnothing 9 – 11 mm (3/8")
- MB 12 for tube outer- \varnothing 12 - 13 mm (1/2")



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Assembly tools

Loktool VME	Loktool NTR-8	Loktool NAV 11	Lokring NAV-E
			
<p>For single-sided pre-assembly of Lokring connector type 00, sizes 3 to 8</p>	<p>For assembling a T-branch. For assembly, the insert is simply inserted into the assembly jaw.</p>	<p>Basic tool for assembling Lokring NAV connections</p>	<p>Assembly insert for NAV 11 assembly tool for assembling Lokring NAV connections, sizes 6 to 9.53</p>

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Accessories

Copper cleaning



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Abrasive mat

- For cleaning tube ends without scratching.
- Suitable for all surfaces.
- Solvent-resistant.
- Dimensions: 158 mm x 224 mm



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Sand paper (abrasion resistant)

- For cleaning tube ends.
- Grain 120
- Dimensions: 230 mm x 280 mm








© ITE Tools

Deburrer

- For removing of burrs
- For all copper and aluminium tubes

Accessories

Tools

Toobe cutting plier	Capillary tube cutter	Piercing plier	Pinch-off plier	Quick copper tube connector
 <p>© Vulkan Lokring</p>				
<p>For cutting aluminium, copper and steel tubes. Wall thicknesses up to 1 mm. Diameter range: 4 to 12.7 mm (5/32" to 1/2") A 120° rotation is sufficient to make the cut.</p>	<p>For clean cutting of capillary tubes. No reduction of inner diameter. Suitable for all capillary tube diameters.</p>	<p>For recovering refrigerant from defective but still pressurised refrigeration circuits. Suitable for copper tubes. For tube outer diameter of 6 mm (1/4"). Hose connection: 1/4" SAE</p>	<p>For pinching off charging tubes. Diameter range: up to 10 mm (3/8")</p>	<p>Quick coupling for straight copper tubes. Quick connection inserts and gaskets.</p>

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☒ Lokprep

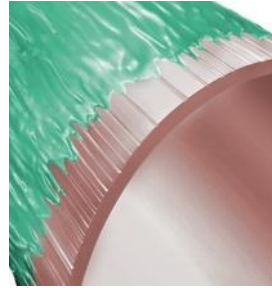
Assembly instructions

Refrigerant circuit commissioning

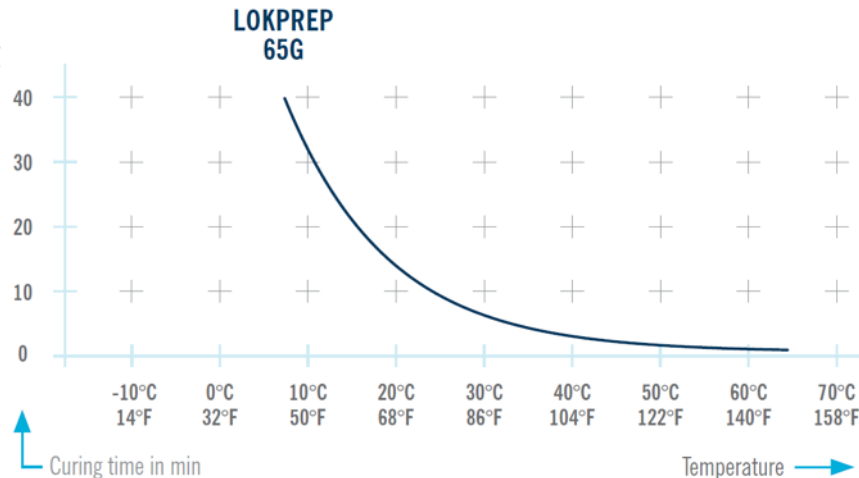
Lokprep

Lokprep G65

- compensates for any unevenness in the tube surface
- hardens under oxygen exclusion and in contact with free metal ions
- stays elastic
- ensures that every Lokring connection is hermetically sealed
- Respect the curing time (min. 10 minutes) of the Lokprep 65G.



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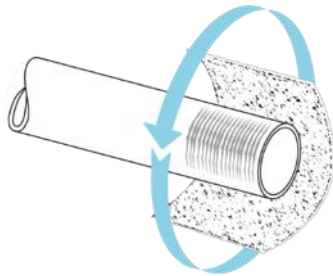
☒ Assembly instructions

Refrigerant circuit commissioning

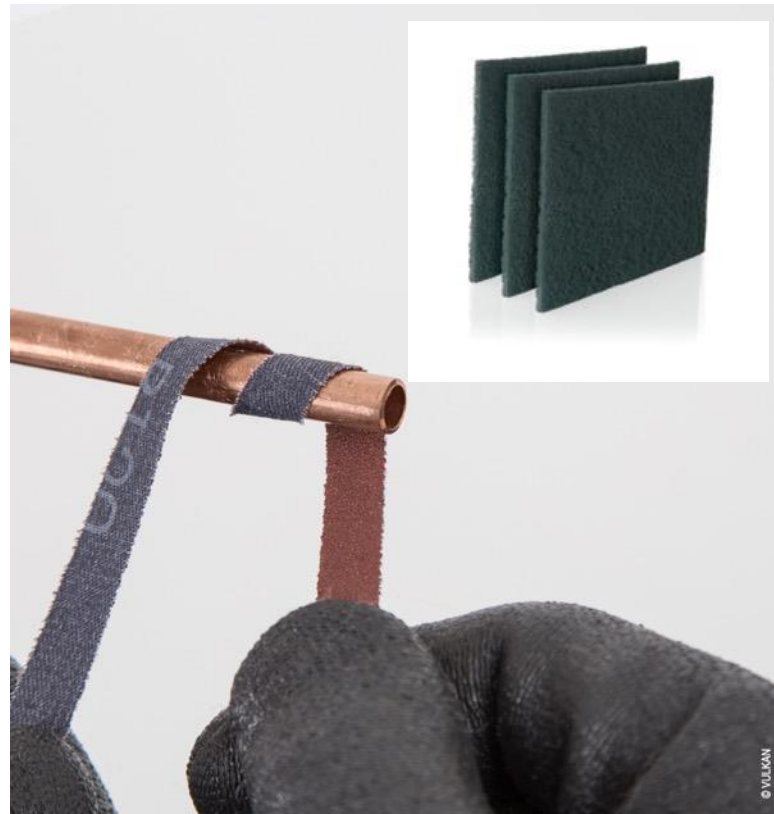
Assembly instructions

Clean up the tube ends

Clean the tube ends in a rotational motion to ensure that they are clean and free from paint or other surface impurities.



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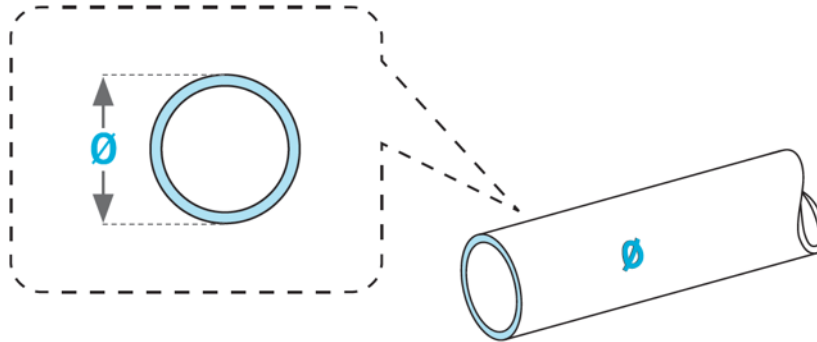
Assembly instructions

Calliper

- Determine the outer tube diameter \varnothing using a digital callipers.
- Select the required connector.



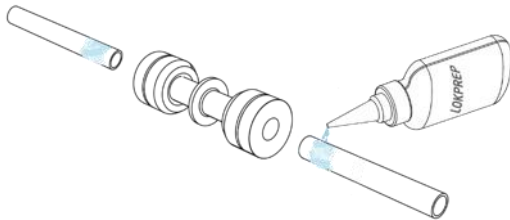
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Assembly instructions

Apply Lokprep

- Apply Lokprep 65G onto the tube ends.
- Curing time of Lokprep starts after it is applied onto the tube.

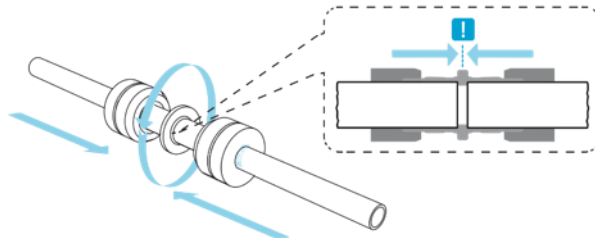


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Assembly instructions

Insert tubes

- Insert both tube ends into the Lokring connector until the tubes reach the inner stop.
- Rotate the Lokring connector through 360° to distribute the Lokprep 65G evenly.
- Respect the correct curing time of the Lokprep 65G.
- **Make the Lokring connection within 20 seconds after applying Lokprep!**

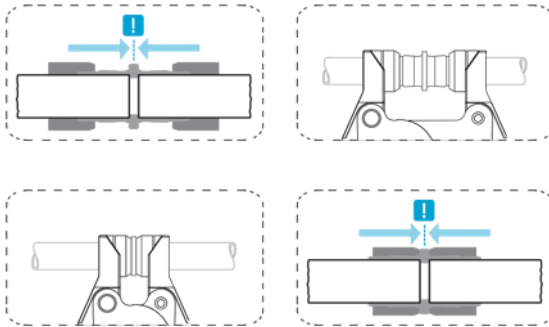


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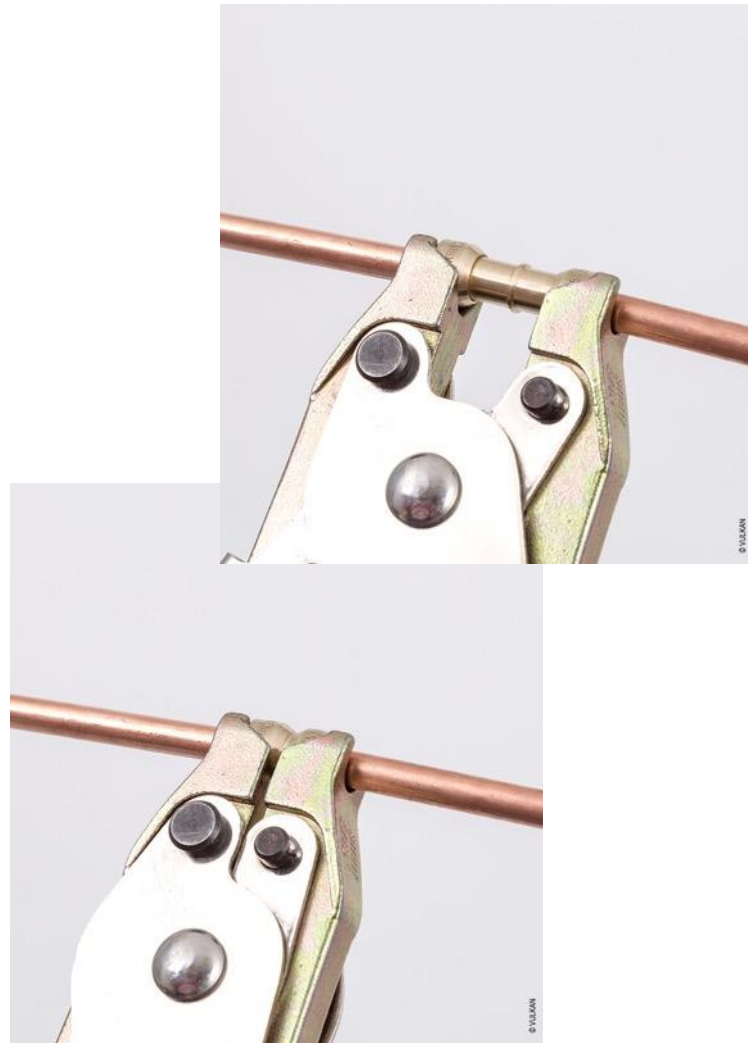
Assembly instructions

Press the rings onto the joint

Press the tube connection until the rings of the Lokring connector are flush to the assembly stop of the Lokring connector.



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Assembly instructions

Complete the connection

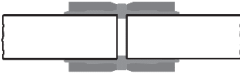



- Respect the curing time (min. 10 minutes) of the LOKPREP 65G.
- The refrigerant circuit is now prepared for:
 - pressure testing
 - evacuation
 - charging with refrigerant
 - operation







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Assembly instructions

Examples as assembly aid

			
<p>Wrong: Rings have not been pressed through to the assembly stop.</p>	<p>Right: Rings have been pressed flush to the assembly stop.</p>	<p>Wrong: The bending point is too close to the joint end.</p>	<p>Right: The tube has to be led straightly out of the joint.</p>

			
<p>Wrong: Assembly jaws are not set in place correctly.</p>	<p>Right: Assembly jaws are set flush correctly.</p>	<p>Wrong: The tube is not pushed in as far as the inner stop.</p>	<p>Right: Push the tube in until you can feel the inner stop.</p>

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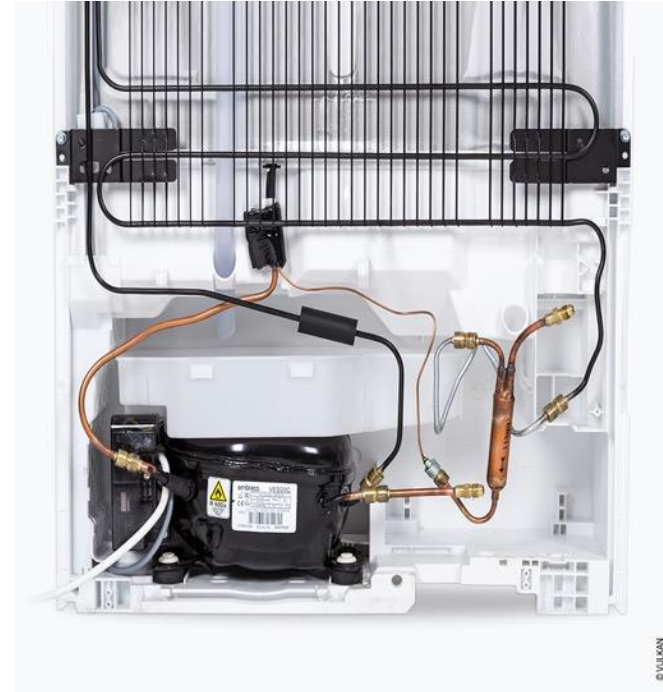
Assembly instructions

 Refrigerant circuit commissioning

Refrigerant circuit commissioning

Execute regular refrigerant circuit servicing activities by applying best servicing practices.

- Functional check of a fridge
- Discharge of the refrigerant (HC venting)
- Recovery of refrigerant
- Repair with Lokring at several connecting points of the refrigerant circuit
- Evacuation
- Charging of refrigerant using a sensitive weighting scale
- Sealing of the refrigerant circuit
- Functional check of the repaired fridge
- Leak detection



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