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## Instructions for REFFLEX® crimping fittings for our DN-5.0 mm (3/16") flexible hose system

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### General information

REFFLEX® is the most sophisticated system of thermoplastic (Pa) flexible hose, having excellent mechanical and thermal properties, combined with a very high flexibility. It is suitable for all non-corrosive refrigerants including natural gases and the relevant special oils such as ester-oil and PAG and may be applied between -40 and 115 °C and until 80 bar maximum WPr.

### What makes REFFLEX® to be the system to go for?

The exclusive and well-designed REFFLEX® 5.0 mm crimping fittings provide for a 100% gas tight connection. Its performance is not met by any other system available on the market and REFFLEX® is therefore selected by many well-known and important OEM companies all over the world. Not surprisingly so if you know that this REFFLEX® system combines 5.0-mm (3/16") inside diameter of hose, with 4.0-mm (5/32") inside diameter of the fitting! "Competitive" systems have 4.0-mm ID hose and a poor 2.3 mm fitting only and may not comply with regulations and system requirements for HP-safety equipment and/or oil return purposes.

### How it works

The perfect connection between hose and fitting is achieved in a two-stage action. The unique sizing of both fittings and hose already creates the perfect sealing, just by pushing the fitting into the hose, using the sophisticated "insertion"-tool 200637 (or new 2009 model 200627, check the website for details and/or instructions).



Tool 200637

On top of that, the crimping of the stainless steel sleeve provides for additional safety, along with optimized mechanical strength, after which the connection is ready to use.

The 5.0-mm crimping flared fitting exists of three parts: the body of the fitting, the swivel nut (flare nut) and the crimping sleeve. The REFFLEX® fittings for 6.0-mm compression unions only require a crimping sleeve.



The picture above shows the connection (the crimping sleeve in cross section) with all parts in the correct position, prior to the actual crimping, using one of the sophisticated REFFLEX® crimping tools;

- the hose rests against the stop at the body of the fitting,
- the body of the fitting is introduced into the hose, far enough to match its circular groove with the tip of the crimping sleeve.

The mechanical strength of the connection is achieved by connecting the sleeve with the body of the fitting. Doing so, the sleeve shall provide for protection against damaging the hose when incidentally putting strain on it, caused by possible pulling, twisting or bending of the hose. During the crimping of the sleeve, some of its material shall be introduced into the circular groove, as shown in the previous picture, and make a solid connection with the fitting.

#### Using the “insertion-tool” 200637 for pushing the fitting into the hose, prior to the crimping

**Why do you need to use this tool?** The outside diameter of the tip of the fitting is larger than the size of the hose inside diameter. Consequently, once the fitting has been pushed into the hose, already a very strong bond and great sealing performance between hose and fitting have been achieved. This however can't be easily done by hand, and the tool is taking care of that. This tool shall hold the hose and sleeve and the same time push the fitting into the hose, taking care for alignment and positioning of the fitting, sleeve and hose as described earlier.

The tool, as it comes, is either set for 1/4" and 3/8" SAE flare straight fittings, or for 1/4" elbow fittings, or for 3/8" elbow fittings.

Both vertical clamping jaws shall hold the hose and sleeve tight while the horizontal push rod introduces the fitting into the hose.

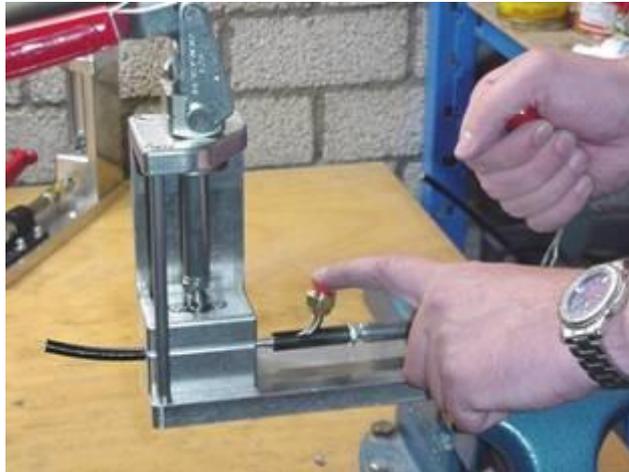
Be sure to take care for the following;

- Slide the sleeve on the hose: the hose has to rest against the internal stop of the sleeve,
- the tip of the fitting, after first sliding the nut on, has been manually introduced over 2-3 mm into the hose. A very little refrigeration grade oil has to be applied to the tip before,
- put the sleeve inside the space for it as provided for in the lower vertical jaw. Now close the jaws,
- now pull the horizontal push-bar until it stops, the fitting now has to be well and perfectly pushed into the hose, the tip of sleeve and groove in fitting must match now,
- the sleeve is now ready for crimping.

**NB:** the brass cone has to be applied for both sizes of **straight** fittings, slotted push rods are available for both elbow fittings. Do not attempt to use the tool 200637 without having pushed the fitting in manually over 2-3 mm first, as described above. This may seriously damage the hose.

## Special procedure for elbows

The stainless steel REFFLEX® elbows have a unique one-piece design, using quality refrigeration grade brass or stainless steel flare nuts. The nut slides across the fitting. This reduces the maximum possible diameter for the slotted push-rod to make contact with on the fitting, and good care must be taken to make full contact between rod and fitting. This can be achieved by slightly pressing the elbow downwards, inside the slot, while applying the mechanism (see picture below).



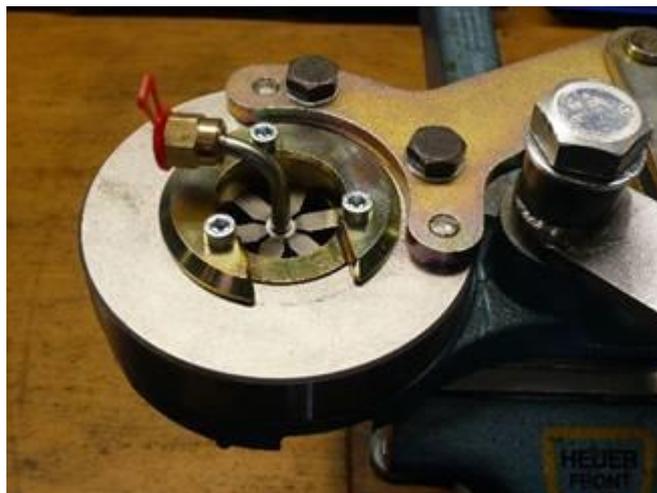
Tip: if you temporarily push a plastic cap into the flare nut, it may stay in place and not hinder you while positioning the elbow.

## How to correctly position the crimping sleeve inside the jaws of the crimping tool

The tip of the sleeve, closest to the flare nut (or to the plain 6.0-mm end suitable for compression fittings) has to be perfectly square with the top end of the jaws. If the sleeve would stick out of the jaws, no sleeve material shall be pressed into the fitting's groove (please see above) and if it is below the jaws, not enough area may be crimped for maximum result.

The top of the sleeve must be square (level) with the top of the crimping dies.

Next picture shows the correct positioning of the crimping sleeve inside the jaws of the tool.



## Crimping procedure (with manual tool 200636)

**First and most important;** before starting to crimp fittings, make absolutely sure that the work bench crimping tool (200636) has been securely fixed inside the jaws of a vice (width of jaws at least 120 mm or 5”).

The work bench, on which the vice has to be very securely fixed, must be connected to any solid structure, such as the nearby wall. If these precautions are not seriously taken care of, the crimping shall inevitably be inadequate as a result. No movement in either vice or work bench should be allowed!

Once the sleeve has been correctly positioned (be sure that the hose does not incidentally slip out of the sleeve!), hold it in place by gently pulling the handle bar of the crimping tool.

Now place both hands closest to the end of the bar. The best result, with least physical effort, may be achieved when you position both feet in a vertical line below the grip of the handle bar, lean backwards, pulling the same time in one single stroke; body weight may assist in reducing the muscular effort.

Always use the full length of the handle bar.

After correctly crimping, a clearly visible impression has been left on the sleeve's surface. Check if sleeve material indeed has been pressed into the fitting's groove.

As the crimping provides for mechanical strength in the first place, the amount may vary within quite some margin without having too much influence on the sealing performance at all.