

VC-LNG

EN ISO 16924:2018



LNG VENT COUPLING INSTALLATION AND OPERATING MANUAL

english

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Please read this manual carefully before installation or operation of the nozzle.

Be sure all instructions are understood. Correct installation, use and maintenance are essential. In case of doubt or question, please contact your service contractor or the manufacturer.

DESCRIPTION

The VC-LNG is a vent coupling designed for the venting of LNG fuel tanks of heavy vehicles with an LNG engine (Liquified Natural Gas) which are equipped with a separate venting interface to EN ISO 16924:2018.

In case of a pressure >10 bar within the vehicle's LNG fuel tank it must be vented first until a pressure of approx. 7 bar is reached. Afterwards LNG can be refuelled. For LNG driven heavy vehicles with a separate venting interface to EN ISO 16924:2018 the VC-LNG vent coupling shall be used.

Special LNG fuel tank systems without this separate venting interface depressurise the fuel tank by other means. In this case the VC-LNG vent coupling shall not be used.

The vent coupling incorporates ease of use and has a 450 psi (31 bar) service pressure rating.

APPROVALS / OPERATING CONDITIONS

The VC-LNG vent coupling is designed and tested to EN ISO 16924:2018. Usable with a low temperature down to -196° C. The flow rate is up to 10 GPM (38 L/min). The maximum working pressure is 3.4 MPa (34 bar).

Each vent coupling is factory tested and labelled with the prescribed marking.

Media compatibility	LNG, LN2, Methane
Nominal flow	10 GPM (38 L/min)
Working pressure (max.)	3.4 MPa (34 bar)
Burst pressure	> 2.5 times of working pressure (max.)
Media temperature (min.)	-196° C
Ambient temperature	-40° C up to +85° C
Connection to fill line	7/8"-14 SAE J512 45° male
Weight	approx. 0,9 kg
Dimension (max.)	Width: 160 mm
	Length: 246 mm

GENERAL INFORMATION / WARNINGS

LNG is a cryogenic liquid fuel that is transported and stored under pressure at temperatures down to -164° C. When LNG is exposed to the atmosphere, its aggregate state changes to gaseous natural gas (visible white vapour). When decoupling the nozzle, minor residual quantities of the LNG, so-called gas release volume, are usually released into the atmosphere. It may also be visible as white vapour.

Cryogenic gases or the handling equipment can cause serious harm to both infrastructure and personnel if safety precautions are not followed.

A small gas release upon uncoupling is normal – but uncontrolled gas release to the atmosphere must be avoided. If you suspect a leakage: stop refuelling immediately, evacuate the area and inform station personnel.



- LNG is extremely flammable:

→ **Open fires, smoking, sources of static electricity and the use of mobile phones or other electric devices is prohibited in the area of gas transfer. Turn off vehicle engine before refuelling / venting.**



- Failure or improper use of this product can cause death, personal injury and property damage.

→ LNG is extremely cold, also when released to the atmosphere.

SAFETY

Caution: Please follow the safety instructions. Disregard can lead to serious injuries or death.

Personal protective equipment ('PPE') is required during the venting process.

The PPE consists of:



Cryogenic Smock



Full Face Shield



Solid Shoes Capable of withstanding Cryogenic Media



Cryogenic Thermal Gloves

- Do not operate vent coupling if there is any visible damage
- Stop venting process immediately if a permanent, uncontrolled release of LNG occurs (see also chapter 'Troubleshooting')
- Read the manual of the LNG vehicle and follow regulations from local authorities
- Keep area clear to avoid accidents

INSTALLATION

Ensure the system is clean of debris, **vented** and **isolated** before any installation or servicing work is carried out.

The VC-LNG is delivered ready for use. This installation must only be done by an authorised service engineer who is trained to ensure compliance with all relevant national regulatory conditions.

The vent coupling is designed for the connection 7/8"-14 SAE J512 45° male and must not be used with any NPT or other thread sealing adapters. The designated connections do not require thread sealants.

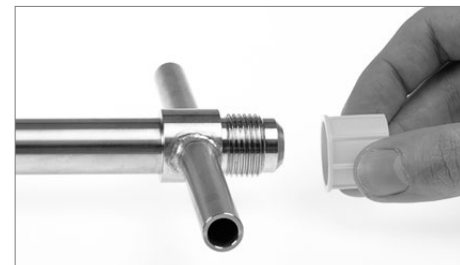
Therefore, **do not use PTFE** sealing tape or liquid seal for any sealing as electrical conductivity may be insufficient and particles of the tape commonly become loose and could clog the vent valve or LNG components at the station.

VC-LNG complies with DIN EN ISO 16924:2018 and must meet its installation requirements.



Needed Tools:

- 1 x Wrench EW M30 (30 mm for Elaflex LNG hose assembly)
- 1 x Wrench (22 mm for Elaflex vent coupling)
- 1 x Foaming agents or spray bottle with snoop or soapy water



Remove cap from vent coupling.



Check sealing surfaces of connections at the vent coupling as well as the hose assembly.



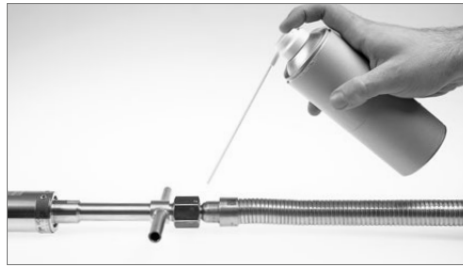
Check if connections correspond in type and size: 7/8"-14 SAE J512 45° male / female



Connect the hose to the vent coupling. Torque to the hose fitting suppliers recommended tightening torque. Elaflex hose assemblies LNG 13: 60 Nm. **Do not use pliers.**

After connecting to the hose assembly, an operational test shall be performed. It is essential to examine that the vent coupling and hose connector are tight under pressure and do not leak – e.g. by external application of foaming agents.

→ **NOTE : Pressurise system gradually while checking for leaks. Do not use pressurised water.**



Always put back the vent coupling into the holder.

→ **ATTENTION: Do not drop. Do not leave on the floor.**



OPERATING INSTRUCTIONS

The fuelling operator must be fully trained in the safe operation of this vent coupling in accordance with local regulation of the local jurisdiction.

Please follow any additional or deviating operating instructions displayed at the dispenser.



Turn off vehicle engine.

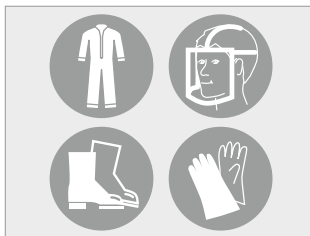
Note:

Before starting the refuelling process, please check if the truck has a separate venting interface. If so, please follow the instructions below.

Additionally, observe the information of the vehicle's manual.

If pressure within the vehicle's tank >10 bar, it needs to be vented.

Trucks with separate venting interface need to be vented with the VC-LNG before the refuelling process.



Always wear your personal protective equipment (see under 'Safety').



Connect the grounding cable from the station to the LNG tank or vehicle.

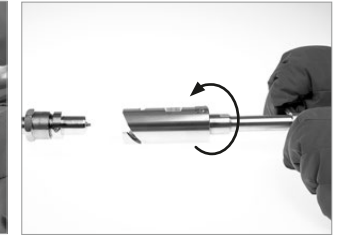


Clean valve seat with compressed air. Moisture, ice and dirt must be completely removed.



Now clean the vent coupling with compressed air. Completely remove moisture, ice and dirt before coupling the vent coupling to the valve seat. Check for visual damage, excessive wear and leakage.

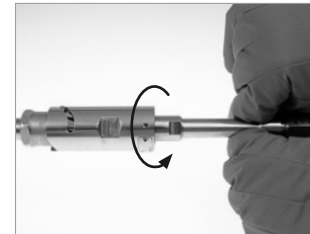
Do not operate when vent coupling or valve seat are damaged.



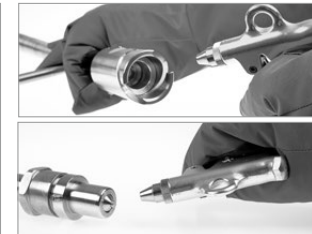
Align vent coupling to the vent valve and couple it with a rotary movement.

Do not tilt the vent coupling and never use force to push vent coupling onto the valve seat.

Wait until pressure in the tank has been released before re-fuelling process can be started.



After releasing the pressure of the tank uncouple the vent coupling with opposite rotary movement.



Use compressed air to clean all coupling parts carefully after the venting process.



Put vent coupling back into dispenser coupling holder. Start refuelling. For operating instructions see manual of nozzle N-LNG.

ADAPTERS

The use of adapters is strictly prohibited.

TROUBLESHOOTING

• Impurities

→ Ice or other contaminants may accumulate in the vent coupling. Condensed water around the valve seat can freeze during the venting process and cause malfunctions. It is therefore essential to thoroughly clean the vent coupling and the valve seat with compressed air before and after venting.

- **If the vent coupling cannot be connected**
 - Check that there are no foreign objects between the vent coupling and the vent valve. **Ensure correct positioning of the vent coupling on the vent valve.** The vent coupling must be aligned straight and coupled onto the vent valve on the vehicle. If you have any doubts or questions, please contact the station personnel.
 - Ensure that the vent coupling is not damaged. Vent couplings in unsuitable condition must not be used. Notify the station personnel or the service contractor.
 - **Never force operation of the vent coupling.** If the coupling process does not work smoothly, disconnect and then re-connect the vent coupling as indicated under 'Operating instructions'. If the problem persists notify the station personnel.
- **Leakage**
 - **If uncontrolled and / or permanent gas release to the atmosphere occurs, immediately stop venting.** Push emergency button of dispenser immediately, leave area and inform station personnel. If area is safe, check tight connection between valve seat and vent coupling as well as seals. If the problem persists notify the station personnel.
- **If the vent coupling cannot be disconnected after venting**
 - Connect vent coupling once again as indicated under chapter 'Operation Instructions'. Then try to disconnect and take off the VC-LNG.
 - Check if ice has accumulated around the vent coupling, remove it with compressed air. Then try to disconnect and take off the vent coupling after venting.
 - Never force operation of the vent coupling. If the uncoupling process does not work smoothly, notify the station personnel.

If self-service is not possible, please contact a service company specialised and certified in LNG Service Station installations.

MAINTENANCE

The VC-LNG is a mechanical device that may become inoperative due to wear, corrosion and ageing of components. Regular inspections and maintenance are essential for a safe operation.

Daily visual inspections of the vent coupling by trained personnel should be carried out to ensure proper function. It's recommended to clean the vent coupling thoroughly with compressed air regularly in order to remove any debris or contamination.

The vent coupling shall be clean and not show any signs of damage (e. g. dents or sharp edges).

The vent coupling condition shall be thoroughly checked during the annual pump maintenance by competent personnel. Applicable laws, regulations and Codes of Practice have to be followed.

Vent couplings in unfit condition for use must be immediately replaced.

CONDITIONS OF USE

Failure to comply with any warnings, instructions, procedures or any other common sense procedures may result in injury, equipment damage, property damage or poor performance of the equipment.

Elaflex Hiby accepts no liability for direct, indirect, incidental, special, or consequential damages resulting from failure to follow any warnings, instructions and procedures in this manual, or any other common sense procedures generally applicable to equipment of this type. The foregoing limitation extends to damages to person or property caused by the unit or damages resulting from the inability to use the unit including loss of profits, loss of products, loss of power supply, the cost of arranging an alternative power supply, and loss of time, whether incurred by the user or their employees, the installer, the commissioner, a service technician, or any third party.

The manufacturer reserves the right to change the specifications of its products or the information in this manual without necessarily notifying its users.

Variations in installation and operating conditions may affect the unit's performance. Elaflex Hiby has no control over each installation's unique operating environment. Hence, no representations or warranties concerning the performance of the unit under the actual operating conditions prevailing at the installation are made. A technical expert of your choosing should validate all operating parameters for each application.

Elaflex Hiby has made every effort to explain all servicing procedures, warnings, and safety precautions as clearly and completely as possible. However, due to the range of operating environments, it is not possible to anticipate every issue that may arise. This manual is intended to provide general guidance. For specific guidance and technical support, contact your authorized supplier or specialist service contractor.

Only approved original parts shall be used and no unauthorized modifications to the hardware shall be made. The use of non-approved parts or modifications will void all warranties and approvals. The use of non-approved parts or modifications may also constitute a safety hazard.

Information in this manual shall not be deemed a warranty, representation, or guarantee. For warranty provisions applicable to this unit, please refer to the warranty provided by the supplier.

Every effort has been made to ensure the accuracy of this document. However, it may contain technical inaccuracies or typographical errors. Elaflex Hiby assumes no responsibility for and disclaims all liability of such inaccuracies, errors or emissions in this.

WARRANTY

Elaflex Hiby guarantees against defective materials and manufacturing for 18 months from date of supply. If the delivery date cannot be established, the production date applies. The production date is marked on the vent coupling body.

Excluded are vent couplings and parts subjected to wear and tear and damages caused by improper use, for example the use with unsuitable media. Furthermore excluded are indirect damages and costs, such as travelling related to exchange and repair work. We refuse any liability for consequential loss or damage resulting from the use of our vent coupling.



Manufacturer's Declaration

IN ACCORDANCE WITH PED 2014/68/EU AND ATEX 2014/34/EU

*Mann Teknik AB of Strandvägen 16, SE-542 31 Mariestad, Sweden
hereby declares that the product*

LNG vent coupling of type

VC-LNG

is designed and manufactured in accordance with Pressure Equipment Directive 2014/68/EU – Article 4 Chapter 3: Sound Engineering Praxis

and is suitable to be used for the following field test installation:

- Shell LNG fuelling stations

The products above are based on the following standards:

- EN 12516-2:2014 - Industrial valves – Shell design strength - Calculation method for steel valve shells
- EN 12266-1 and 2:2012 - Industrial valves – Testing of valves - Pressure test, test procedures and acceptance criteria - Mandatory and Supplementary requirements
- ISO 12617:2015 – Liquefied natural gas (LNG) refuelling connector – 3.1 MPa connector
- EN ISO 16924:2018 – Natural gas fuelling stations – LNG stations for fuelling vehicles
- EN ISO 80079-36:2016 – Non-electrical equipment for explosive atmospheres - basic method and requirements.
- EN ISO 80079-37:2016 – Non-electrical equipment for explosive atmospheres – Non electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k".

The vent couplings are production tested according to EN 12266 standard to 100%.

Mann Teknik AB is a certified company by Lloyds Register (Notified Body 0525) according to ISO 9001 and PED 2014/68/EU

Signed on behalf of Mann Teknik AB:
19th February 2021

Gerhard Kopplin
Technical Department

(ELECTRONIC DOCUMENT, VALID WITHOUT SIGNATURE)