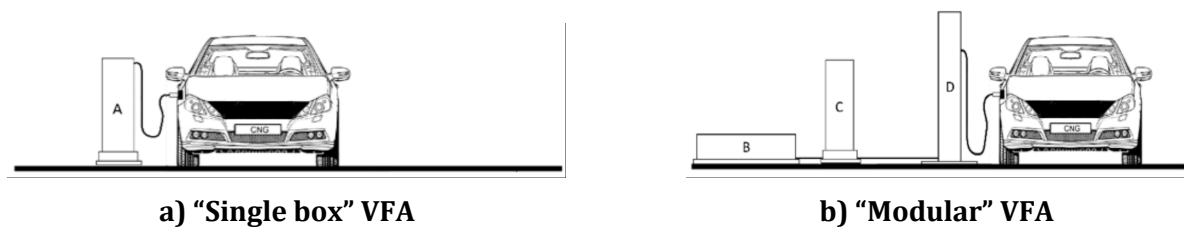


Protection from ignition in explosive atmospheres shall be by the use of protection systems defined in the EN IEC 60079-0.

6 General principles of design

6.1 General construction

The possible variants of VFA design are shown in Figure 1.



Key

- | | | | |
|---|----------------------------|---|----------------------------|
| A | body of a "single box" VFA | C | module 2 of a "modular VFA |
| B | module 1 of a "modular VFA | D | module 3 of a "modular VFA |

Figure 1 — General design of VFA

The VFA shall be equipped with a:

- a) fuel delivery system;
- b) fuelling pressure discharge system;
- c) locking system;
- d) compressor and/or gas containment system
- e) a pressure, temperature compensation system as per 6.4.6.

The VFA can also be equipped with a dryer;

The VFA shall be certified by examiner as a unit. VFAs are subject to the European legislation for pressure equipment.

6.2 General requirements

The following requirements apply in the VFA design:

- 1) The pressure vessels of the VFA shall comply with EN 13445-3.
- 2) The piping of the VFA shall comply with EN 13480-3.
- 3) The number of connections and other possible points of leakage or release of gas to the atmosphere in the installation and equipment shall be minimized.
- 4) The generation of the possibility of a confined explosive atmosphere shall be avoided.
- 5) Fire and explosion risk prevention shall take into account foreseeable malfunctions and misuse.
- 6) The mounting of equipment shall be suitable for local conditions.

- 7) Barriers or other mechanisms to protect the VFA from collision damage shall be provided, if the VFA is exposed to the risk of vehicle collision.
- 8) The VFA shall shut down safely in the event of a loss of power.
- 9) The VFA shall have means of ensuring that oil carryover from the compressor, dust, water and other contaminants in the gas stream meet the requirements of EN 16723-2.
- 10) The specific climatic conditions of the site location and expected minimum and maximum temperatures during operation shall be taken into account.
- 11) Means ensuring a maximum temperature compensated fuelling pressure of 200 bar at 15°C shall be provided.

All VFA components, piping and fittings shall be manufactured, marked and assembled in a manner suitable for their intended use, applying the principles of sound engineering practice, to be suitable for the full range of pressures, temperatures, weather conditions and loadings which can occur under normal and fault conditions.

6.3 Materials

All materials shall be:

- a) suitable for their intended application;
- b) resistant to the rated temperature extremes, corrosion, moisture, natural gas or biomethane and aging.

The manufacturer of the VFA shall ensure that all materials used for the construction of the components conform to their specifications. The manufacturer of the VFA shall document the compliance with the material specifications by using materials which either comply with harmonized standards or are covered by European approval of pressure equipment materials.

6.4 Internal systems and components of VFA

6.4.1 Fuel delivery system

6.4.1.1 General

The fuel delivery system is intended to provide NGV fuelling up to a maximum temperature compensated fuelling pressure 200 bar at 15°C. The fuel delivery system shall contain a fuelling hose with fuelling nozzle and break-away device.

6.4.1.2 Fuelling hose

The following requirements apply to a fuelling hose:

- 1) The fuelling hose shall be designed and manufactured for CNG service. The fuelling hose shall be permanently marked accordingly.
- 2) The fuelling hose shall be suitable for use at a temperature range of –40 °C to 65 °C.
- 3) The MAWP shall be permanently marked on the fuelling hose by the manufacturer.
- 4) The fuelling hose shall be subject to the proper testing. Testing shall be done in accordance with applicable regulations.