Vapour Recovery System
for tank trucks to VOC Directive

Alfons Haar

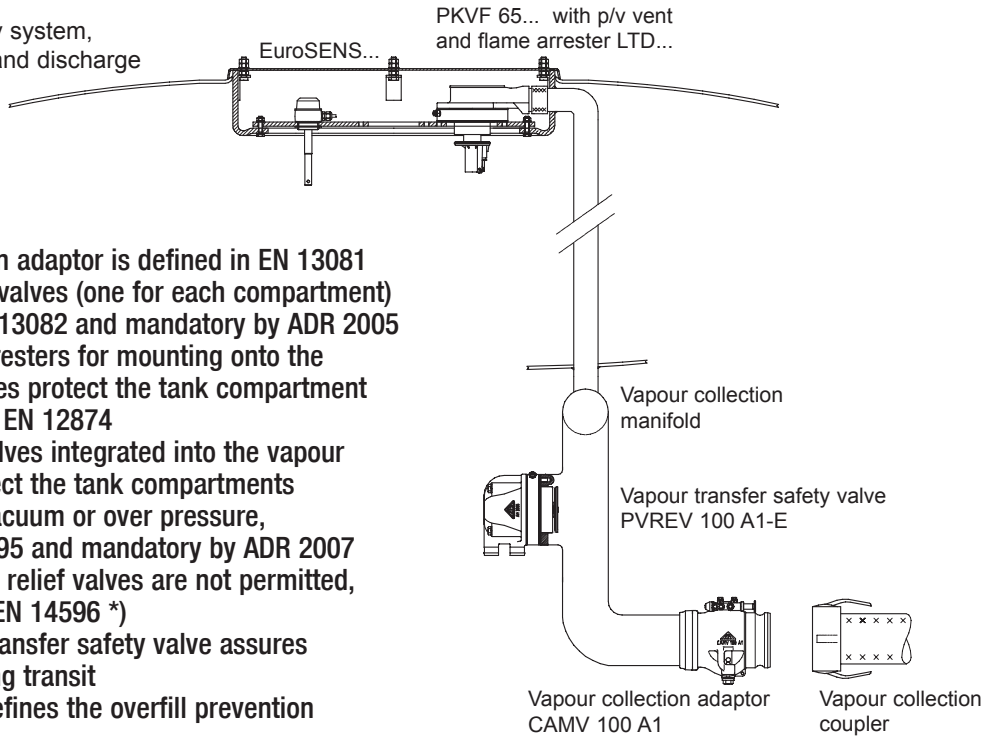
Validity:

The VOC Directive 94/63/EC (VOC - Volatile Organic Compound) governs loading and unloading of gasoline. For practical reasons however, also diesel is handled under the same directive.

Requirements:

With the implementation of the VOC Directive the vapour recovery system must be a closed system to prevent vapour emission during bottom loading and discharge operations.

Diag 1: Vapour recovery system, bottom loading and discharge same side



- The vapour collection adaptor is defined in EN 13081
- The vapour transfer valves (one for each compartment) are approved by EN 13082 and mandatory by ADR 2005
- Detonation/flame arresters for mounting onto the vapour transfer valves protect the tank compartment and are approved to EN 12874
- Pressure/vacuum valves integrated into the vapour transfer valves protect the tank compartments against excessive vacuum or over pressure, approved by EN 14595 and mandatory by ADR 2007
- Emergency pressure relief valves are not permitted, even if designed to EN 14596 *)
- A separate vapour transfer safety valve assures vapour venting during transit
- The VOC Directive defines the overfill prevention system to EN 13922
- The maximum vapour transfer back pressure during bottom loading is to be limited to 55 mbar
- For operational reasons bottom loading with up to 5 loading arms (or the simultaneous bottom loading of all tanker compartments) must be possible without exceeding the max. permissive pressure inside the compartments and without any vapour emission
- For implementation of the requirements defined in the VOC directive the CEN/TR 15120 has been developed

*) As decided by joint meeting, 07./11.03.2005, tank working group INF.27, No. 6

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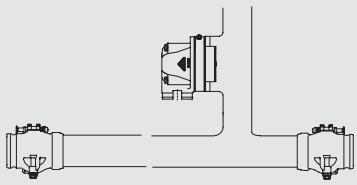
Components and functions:

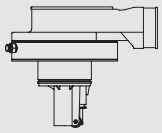
- **Recessed manhole cover type DO 500...** to EN 13317/13314/13094 improves road safety
- **EuroSENS...** to EN 13922
- **Vapour transfer valve with sequence control PKVF 65/1B** to EN 13082 and EN 14595 and direct mounted **detonation/flame arrester LTD 3B** to EN 12874 are connected to the DN 100 vapour collection manifold.
- **The vapour collection adapter CAMV 100 A1** is fitted with an Interlock Valve to assure that the bottom loading permissive signal is only provided with the vapour collection hose connected.
- **The vapour transfer safety valve PVREV 100 A1-E** assures vapour venting during transit, but is pneumatically closed during vapour transfer. A vacuum safety feature protects the tank.
- **If diesel is delivered** without vapour recovery hose connected, the tank is vented to atmosphere through the open vapour transfer safety valve.
- **For bottom loading and delivery of gasoline**, and with connected vapour recovery hose, the vapour transfer safety valve is pneumatically closed. The closed vapour recovery system prevents emission of any vapours.
- If the vacuum in any tank compartment exceeds 15mbar, the vapour transfer safety valve opens automatically.
- The vapour recovery system as described permits safe simultaneous bottom loading with up to 5 loading arms at any depot designed to VOC Directive 94/63/EC.

Diag. 2: Vapour recovery system, bottom loading one side, discharge both sides

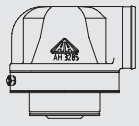


Note: Vapour recovery systems type 1 (CEN/TR15120) which are equipped with separate pressure vacuum vents installed in each compartment and directly venting to atmosphere only permit bottom loading of up to 3 or possibly 4 compartments simultaneously. Higher bottom loading rates and more compartments simulaneous bottom loaded will inevitably emit vapours to the atmosphere and render operation illegal.

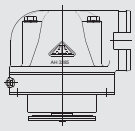
Components of VR-Systems to Euro-Standard



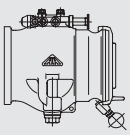
PKVF 65 [2244052] with
LTD 3B [2180904]



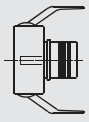
PVRVF 4” A1 [1362581]



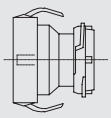
PVREV 100 A1-E [1641995]



CAMV 100 [1649180] with
cap and interlock



Hose connecter
CAMA 100 / 1x 75 A5 [1652121]



Adapter
CAMA 100 / 1x 80 A4 [1652601]
CAMA 100 / 1x 100 A4 [1652610]

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