

## Loading metering skids LPG 050/080

Certified and standardized solutions for custody transfer applications

### Your benefits at a glance

- Loading metering skid (LPG) unit with MID approval (Measuring Instruments Directive) guarantees custody transfer standard
- Easy installation and commissioning thanks to a completely engineered and assembled skid
- Fully compatible and upgradeable with the Endress+Hauser terminal management solution
- Lowest billing losses because of highest Coriolis accuracy
- Lowest maintenance cost based on wear-free measurement
- Lowest recalibration cost as a result of long-term stability of Coriolis meters
- Lower pressure loss than PD (positive displacement) meters



# LPG truck loading process

Liquefied petroleum gas (LPG) is becoming more and more common as an alternative hydrocarbon fuel especially for its lower carbon emissions, higher transport flexibility and higher calorific value.

LPG is however not an easy product to handle, especially because of its relatively high vapor pressure and the related tendency to gasify easily, thus generating bi-phase product which could affect the performance of custody transfer metering systems.

LPG is normally traded in mass and so custody transfer certified metering skids based on mass flow meters are the best option. Endress+Hauser (thanks to its world-renowned Promass mass flow meter and application experience) is acknowledged as being the best partner for engineering and installation.

Dynamic fluid pressure control is included in Endress+Hauser standard LPG custody transfer metering solutions in order to prevent vaporization.

The pressure control loop is implemented in the batching flow computer. It triggers the set-stop valve to increase back pressure in order to maintain the fluid by constantly monitoring its vapor pressure.

## Vapor recovery option

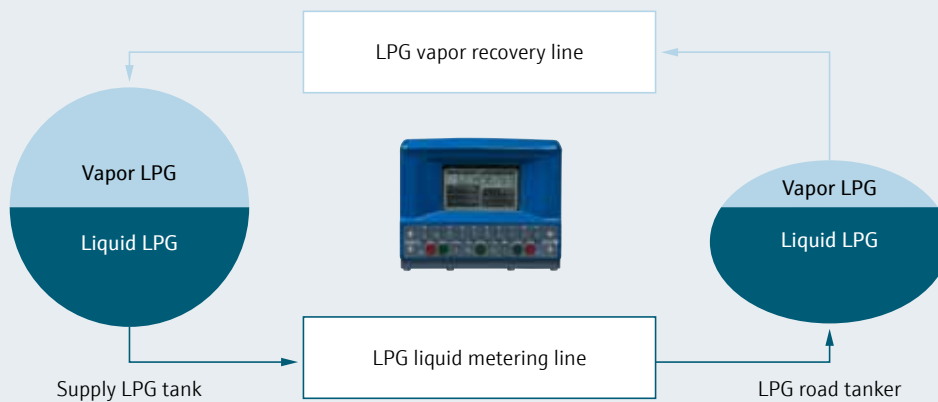
Imagine a LPG road tanker that is mostly empty, but still has some remaining LPG in the tank; the empty space is therefore filled with LPG vapor under pressure of the LPG gas at the tank's temperature.

Clearly, to make space in the tanker for the new liquid that is being tanked, some vapor must be removed.

Significant additional energy is required to re-liquefy LPG gas back into LPG liquid and normally it is not practical to convert this in the road tanker. The vapor is therefore returned to the original storage tanks where re-liquefaction can take place with suitable specialist equipment.

It is proven that if the mass of the vapor returned is not measured and subtracted from the input, there may be up to 3 to 4% error on the reported total liquid LPG loaded. Endress+Hauser LPG loading systems are provided in a modular concept that allow easy integration of a vapor recovery metering line which is equipped with an additional Promass Coriolis meter (usually 1"nb) and the related valves. The LPG net liquid calculation is made directly in the batching flow computer which integrates the mass input from the two meters.

## Vapor recovery process during LPG truck loading



**Truck loading metering skid (LPG) specification**

Model	Application	Line Size	Custody transfer flow rate according to PTB approval	Max. flow @ DP 0.5 bar*	Fast offloading version
LPG050	Small Truck Loading	2"	60...1000 kg/min	280 kg/min	not applicable
LPG080	Large Truck Loading	3"	150...3000 kg/min	700 kg/min	not applicable

\*Note: Maximum flow rate has been calculated in order to maintain the LPG velocity in the piping at lower than 4 m/sec.



## General specifications

<b>Liquids</b>	For LPG (GPL)
<b>Versions</b>	Only horizontal configuration available
<b>Pressure rating</b>	ANSI Cl. 300, DIN PN40 upon request
<b>Material</b>	Carbon steel, others on request
<b>Ex concept</b>	ATEX Ex d, armored cabled
<b>Custody transfer</b>	MID Directive 2004/22/EC MI-005, Class 0.5
<b>Equipment</b>	Promass mass flow meter, batching flow computer, temperature sensor, pressure sensor, digital start-stop valve, Y-strainer, isolation valves, frame and piping, Ex d junction box
<b>Optional</b>	Prover connections, air eliminator, card reader, overflow prevention sensor, grounding unit, a properly sized vapor recovery line can be connected to each loading metering skid above and will be controlled by the batching flow computer.



Interested in more information? Please contact your local Endress+Hauser partner:

[www.endress.com/locations](http://www.endress.com/locations).

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