



CADABCO LTD

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**GAS STATION
VAPOUR
RECOVERY
UNIT**

About Us

The team of Cadabco Ltd is motivated and experienced one. We have over 15 years of experience in the field of the Hydrocarbon Vapour Recovery Systems for different fields and applications, but mostly in the Petrol Terminals and in gas stations.

Our effort is to provide a scalable and feasible solution bringing economic benefit for the petrochemical industry, thus preserving the ecology and making the working environment greener and cleaner.

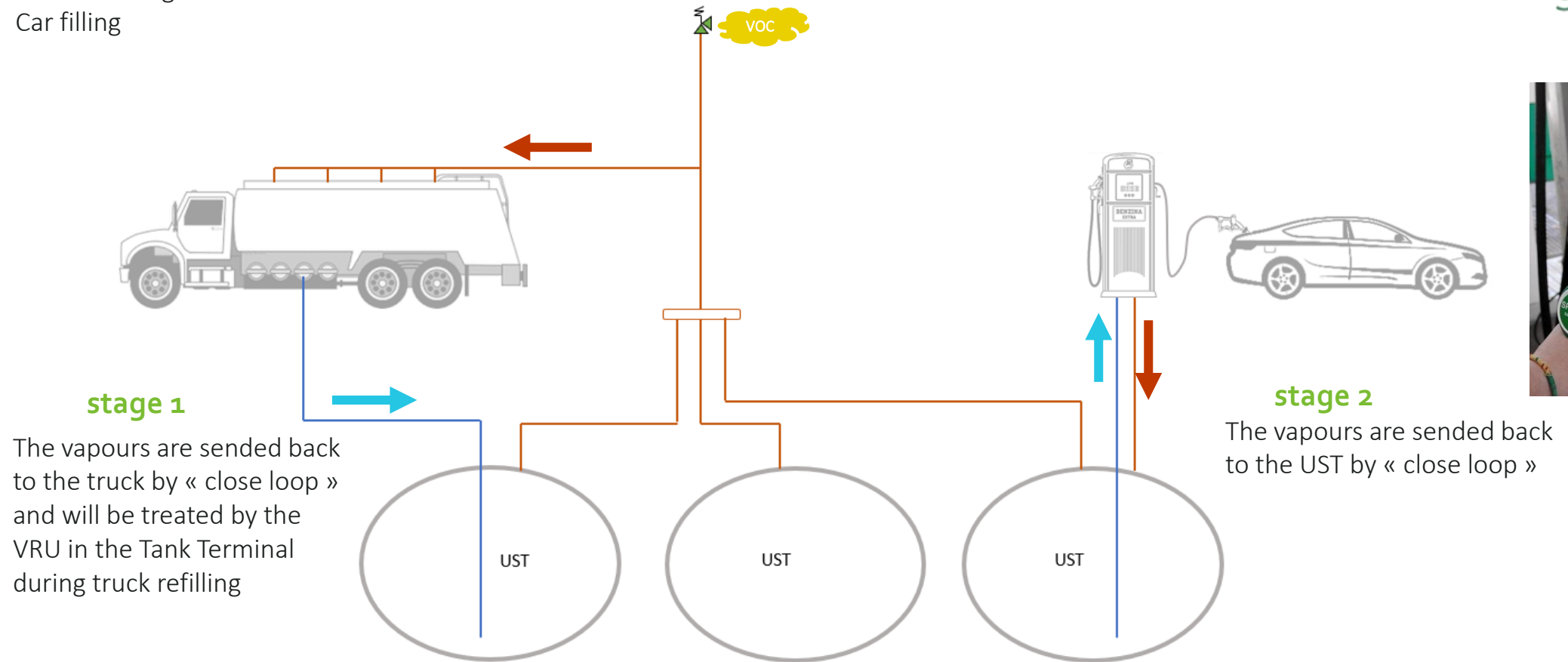
We believe that with the common efforts we can achieve our goals of zero emissions in the atmosphere from the gasoline distribution process.



Gas Station emissions

As a first step we have to understand where are the sources of emissions in a gas station

1. UST (underground storage tank) filling
2. UST breathing
3. Car filling

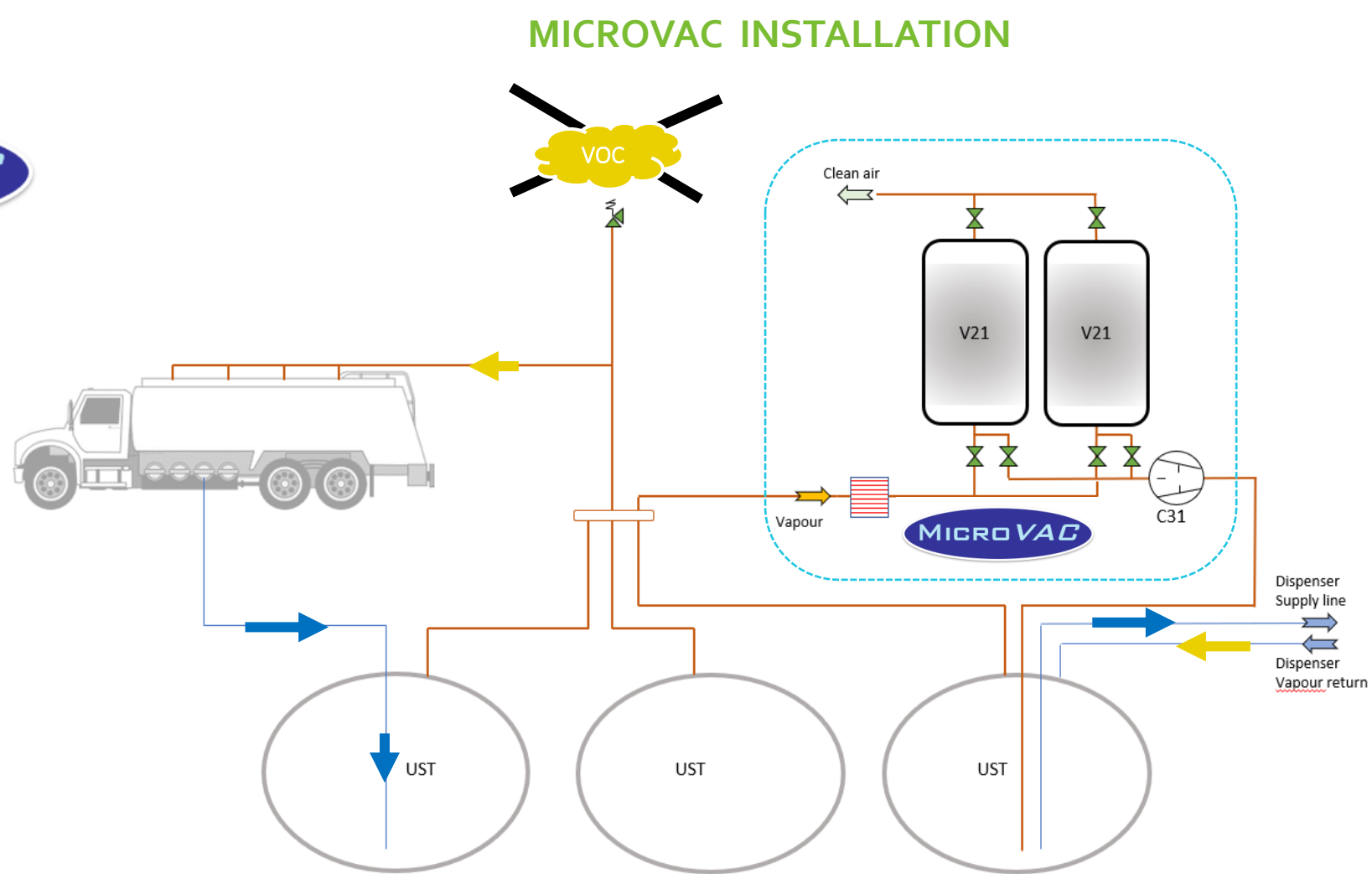


By installing stage 1 & stage 2 the major VOC emissions are recovered, but there are still some emissions due to tank breathing and stage 2 efficiency

PROCESS



MICROVAC INSTALLATION



The MICROVAC will treat all the vapour occurring during the liquid transfer in the gas station and the UST breathing

The efficiency of the unit is greater than 99%

The MICROVAC also gives the possibility to increase the efficiency of the Stage 2 by increasing the return vapour flowrate from the dispenser. The existing vapours are directly treated by the MICROVAC

PROCESS

The MICROVAC consists of two (2) activated carbon filters V21 and V22. One inlet detonation arrestor will isolate the MICROVAC from the storage facility.

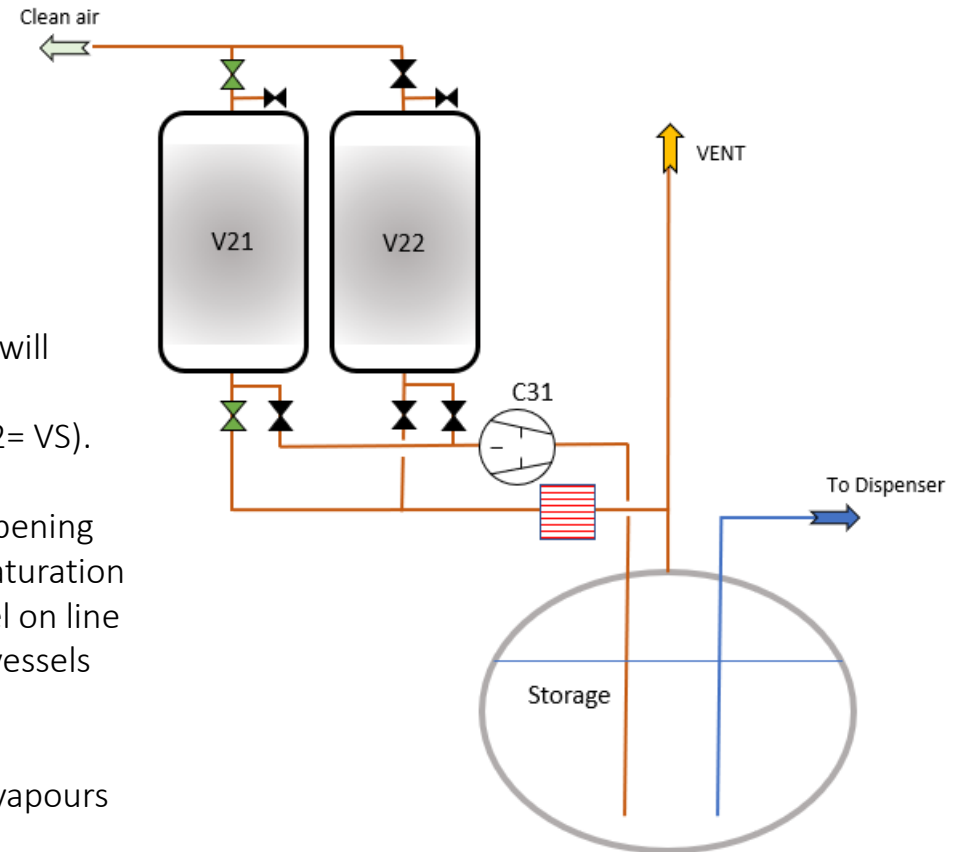
V21 and V22 are filled with 50 l of carbon each and are used to recover the vapours during the adsorption process.
One Rotary vane Vacuum pump C31 is used to regenerate the active carbon beds.

The standard process is based on the pressure in the UST.

In standby mode all the valves are closed. For each vessel V21 and V22 we will considering two status: Saturated or Clean called VS and VC.
Initially we are considering V21 clean and V22 saturated (V21= VC and V22= VS).

When the pressure in the UST reach the High set point (PSH101), we are opening the clean vessel VC by opening Inlet and outlet valve and we starting the saturation of VC. If the pressure is reaching the Low set point we are closing the vessel on line until next high pressure. When VC is saturated, we are switching the ttwo vessels and we are starting a regeneration cycle.

During regeneration the second vessel will be in stand by ready to receive vapours depending on the pressure in the UST



PROCESS

STEP BY STEP ADSORPTION VC

In stand by mode VC vessel is ready to take vapours depending on the pressure in the VST

The saturation status will be given based on adsorption time T1

PSLH 101 > Open Pressure setting

Opening of VC (for example UY222 and UY221)

Start T1

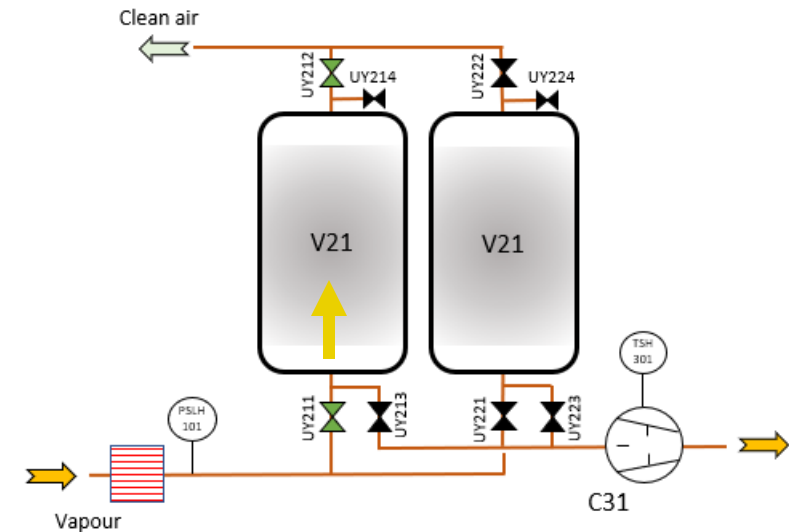
PSH 101 < Close Pressure setting

Closing VS (for example UY211 and UY212)

Stop T1

When T1 is reaching the T1 time setting we are switching the VC/VS status and we are resetting T1

The vapours are now sented to the other vessel and we are starting regeneration of VS vessel



PROCESS

STEP BY STEP REGENERATION VS

After saturation of the vessel we are starting a regeneration process

Closing of VS (for example UY211 and UY221)

Start Vacuum pump C31 for preheating

Open vacuum valve of VS (for example UY213)

After T2 open purge valve of VS (for example UY214)

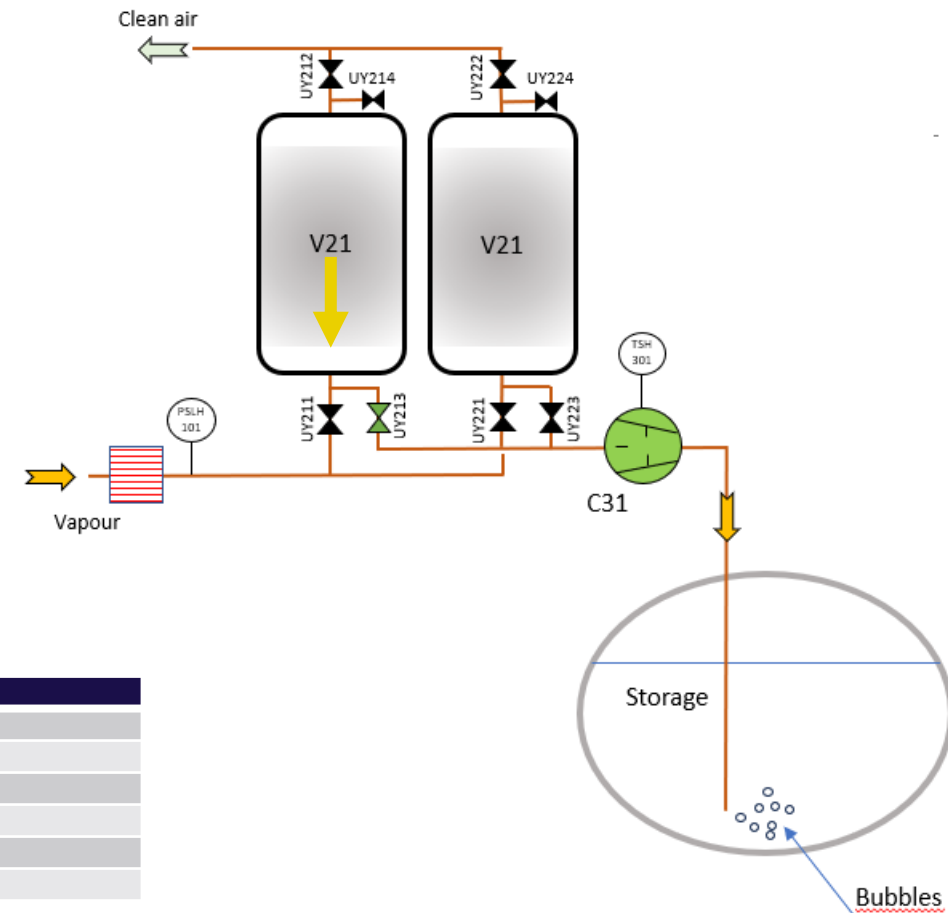
After T3 close vacuum valve of VS (for example UY213)

After T4 stop Vacuum pump C31(initial vacuum break + Pump drying)

Open outlet valve of VS (final vacuum break)

After T5 close outlet valve of VS and stop vacuum pump

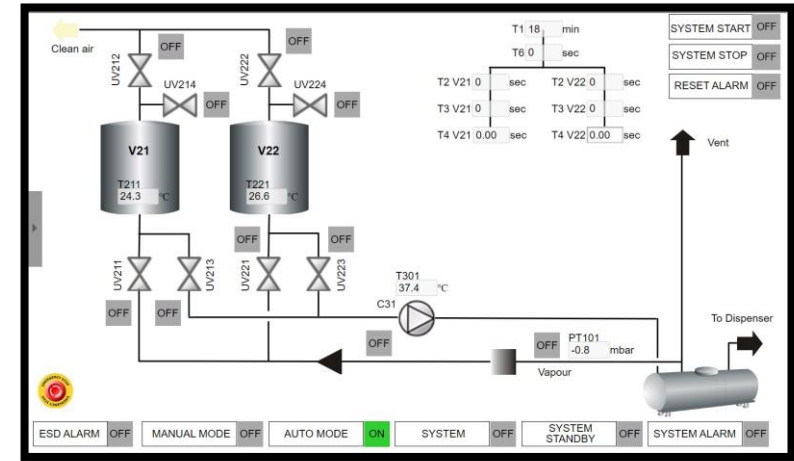
Timer		Description
T1	20 min	Adsorption time
T2	10 min	Regeneration time
T3	5 min	Purge time
T4	1 min	Drying time (inlet to the pump closed and pump running)
T5	30s	Vacuum break
T6	1 min	Pre Heating (inlet to the pump closed and pump running)



PROCESS

The MICROVAC is controlled by a PLC Type LOGO SIEMENS

The PLC has a built-In Web server which enables to operate the system using a connected device (PC, Smart Phone, tablet)



T211 ALARM LEVEL	80.0 °C	T4-V22	60.00 sec	PT101 SWITCH ON	3.0 mbar
T221 ALARM LEVEL	80.0 °C	T5-V22	30.00 sec	PT101 SWITCH OFF	0.5 mbar
C31 FB TIME	10.00 sec	T211-GAIN	1.25	PT101-GAIN	0.63
T1	20 min	T211-OFFSET	-250	PT101-OFFSET	-378
T2-V21	600 sec	T221-GAIN	1.25	WEEKLY RGENERATION COUNT	3
T3-V21	300 sec	T221-OFFSET	-250	ANNUAL RGENERATION COUNT	3
T4-V21	60.00 sec	TT301 ALARM LEVEL	130.0 °C	MANUAL REGENERATION	OFF
T5-V21	30.00 sec	TT301-GAIN	1.88		
T2-V22	600 sec	TT301-OFFSET	-378		
T3-V22	300 sec	Filter Time V21	10.00 sec		
T6	60 sec	Filter Time V22	10.00 sec		





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PROCESS

MINIVAC Parameter



● ● ● APPLICATION

A miniaturized Vapour Recovery Unit to recover hydrocarbon vapours generated by product transfer and evaporation at retail gas stations.

● ● ● PROCESS DESCRIPTION

Based on the Cadabco pressure swing Vapour Recovery Unit process, the **MICROVAC** recovers hydrocarbons by adsorption on activated carbon, regeneration by vacuum and re-absorption in the liquid product.

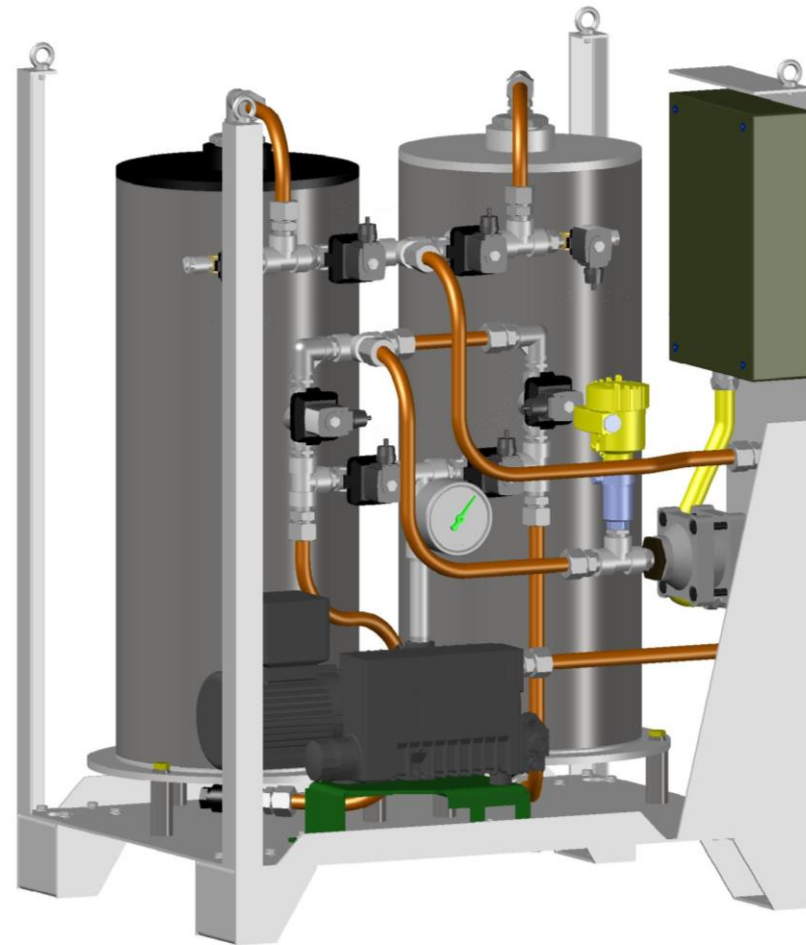
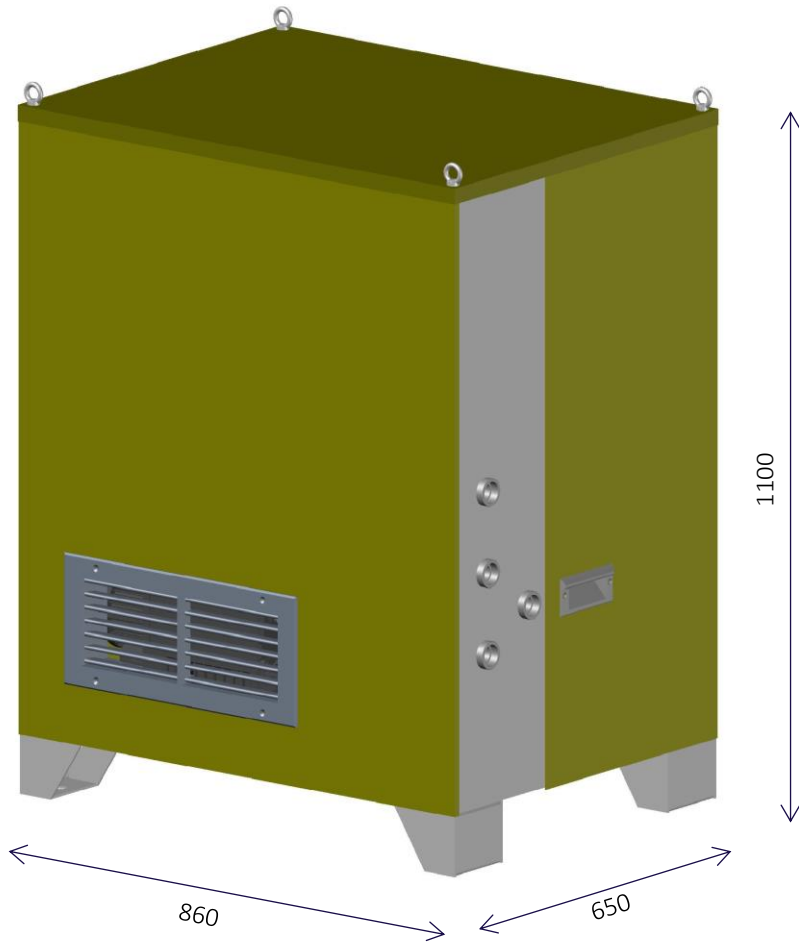
● ● ● EFFICIENCY

The **MINIVAC** will recover up to **99% of the vapours** emitted at the retail gas station storage vents.

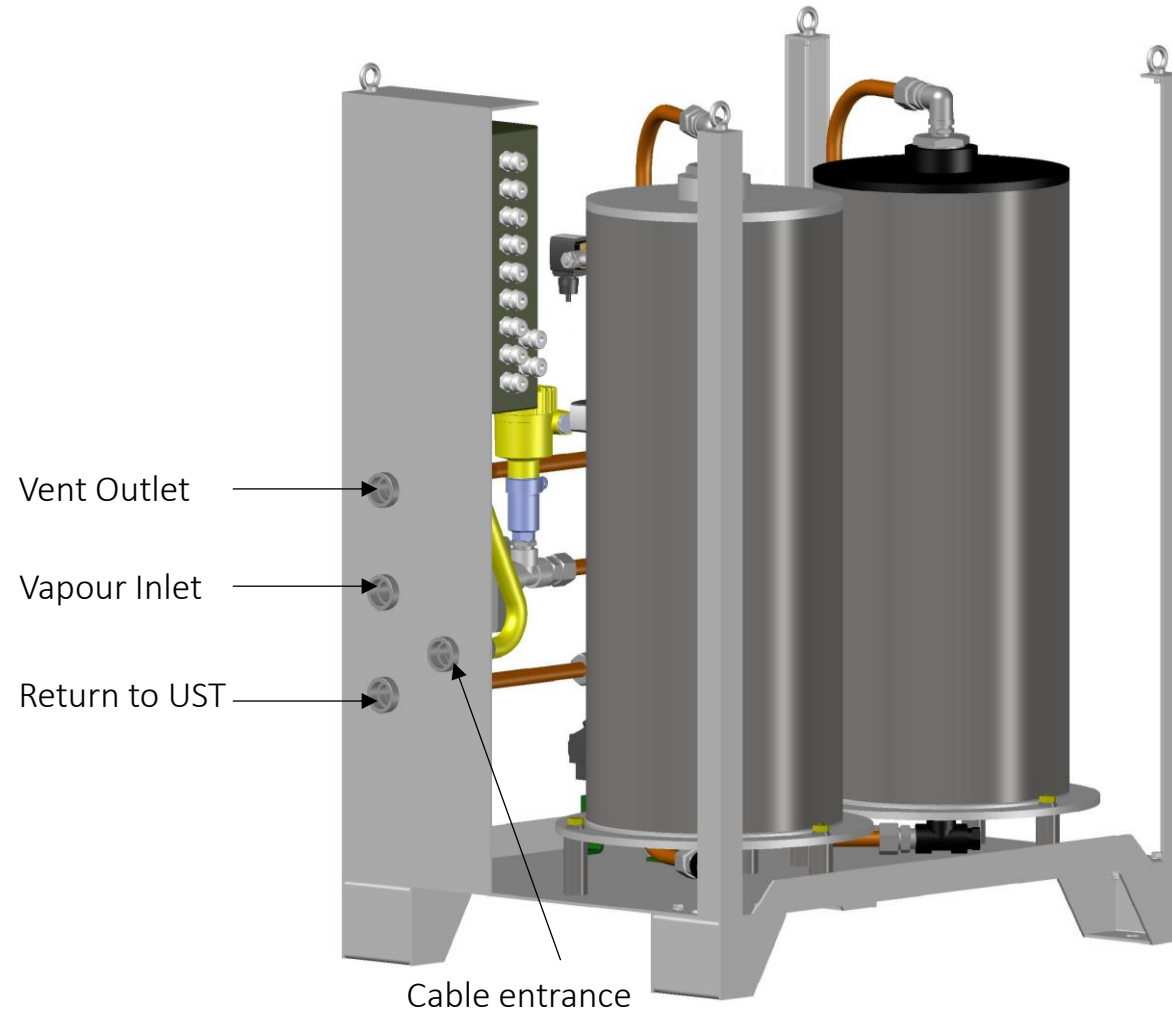
● ● ● MAIN TECHNICAL PARAMETERS

Vapour quantity:	up to 1000 l/h	
Power supply:	Tri 400/240V	0,6Kw
Emission level:	max. 10 g HC/m ³	
ATEX certified installation:	Zone 1 IIB T4	

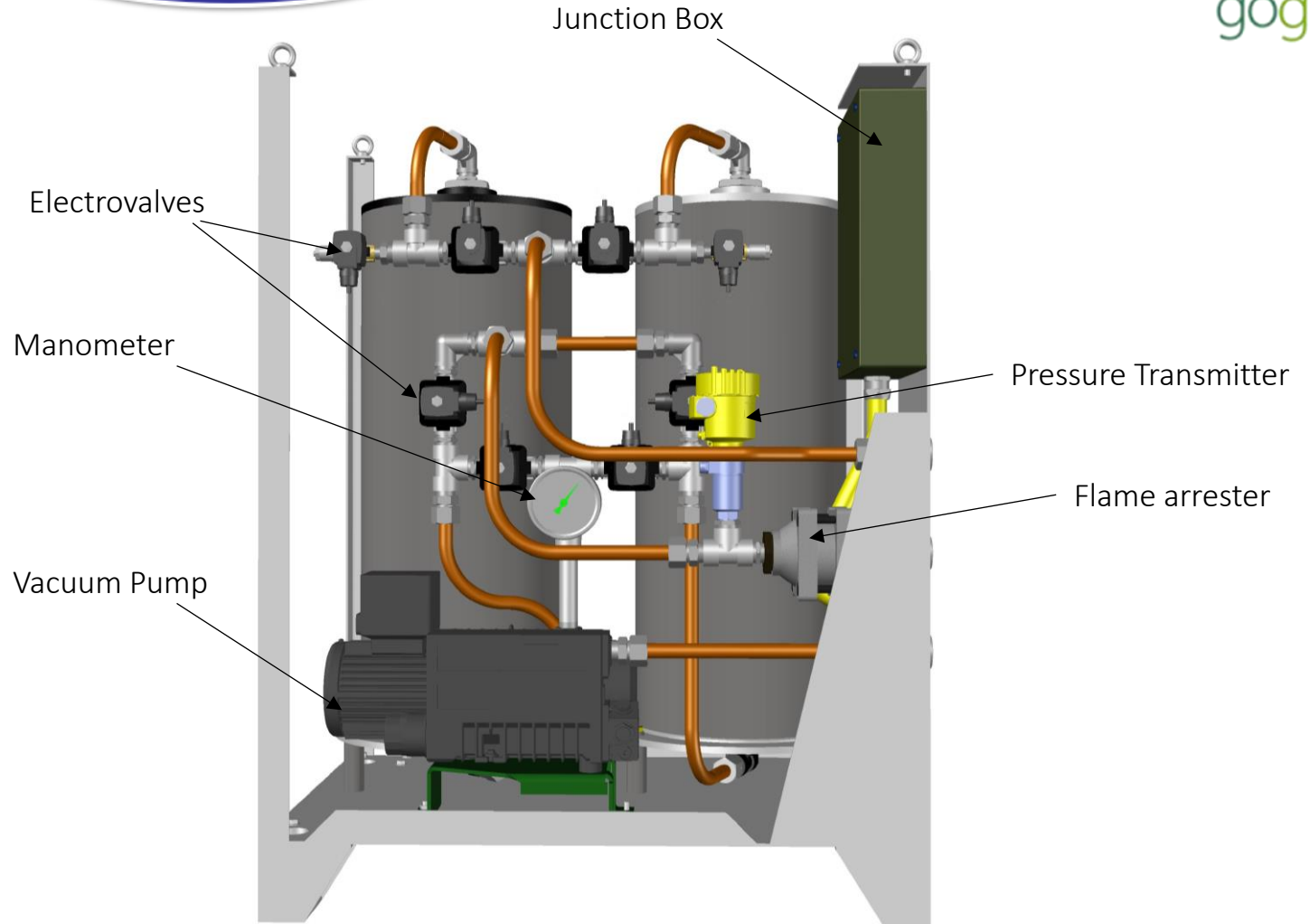
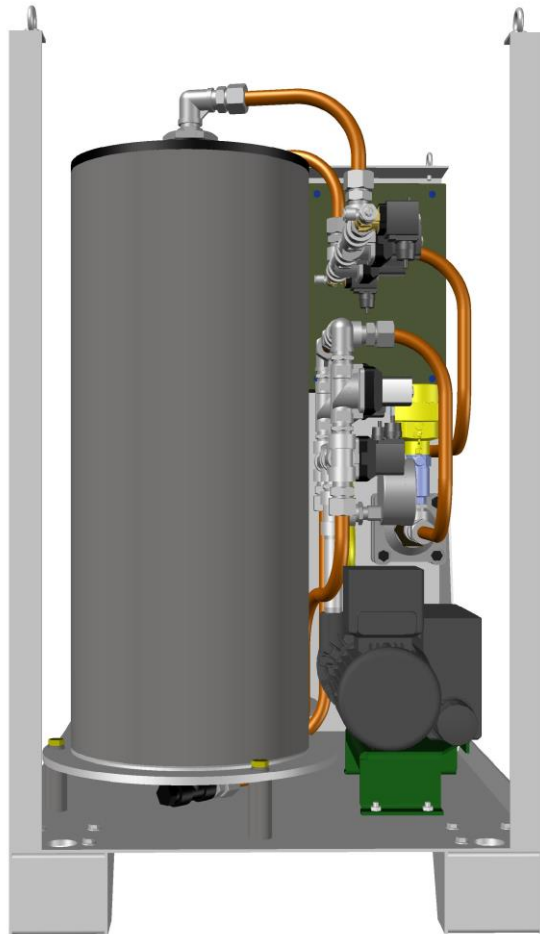
General Arrangement New design



General Arrangement New design



General Arrangement New design



MICRO VAC



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