

## ELECTRO-PNEUMATIC VALVE

### A new era for bottling has begun

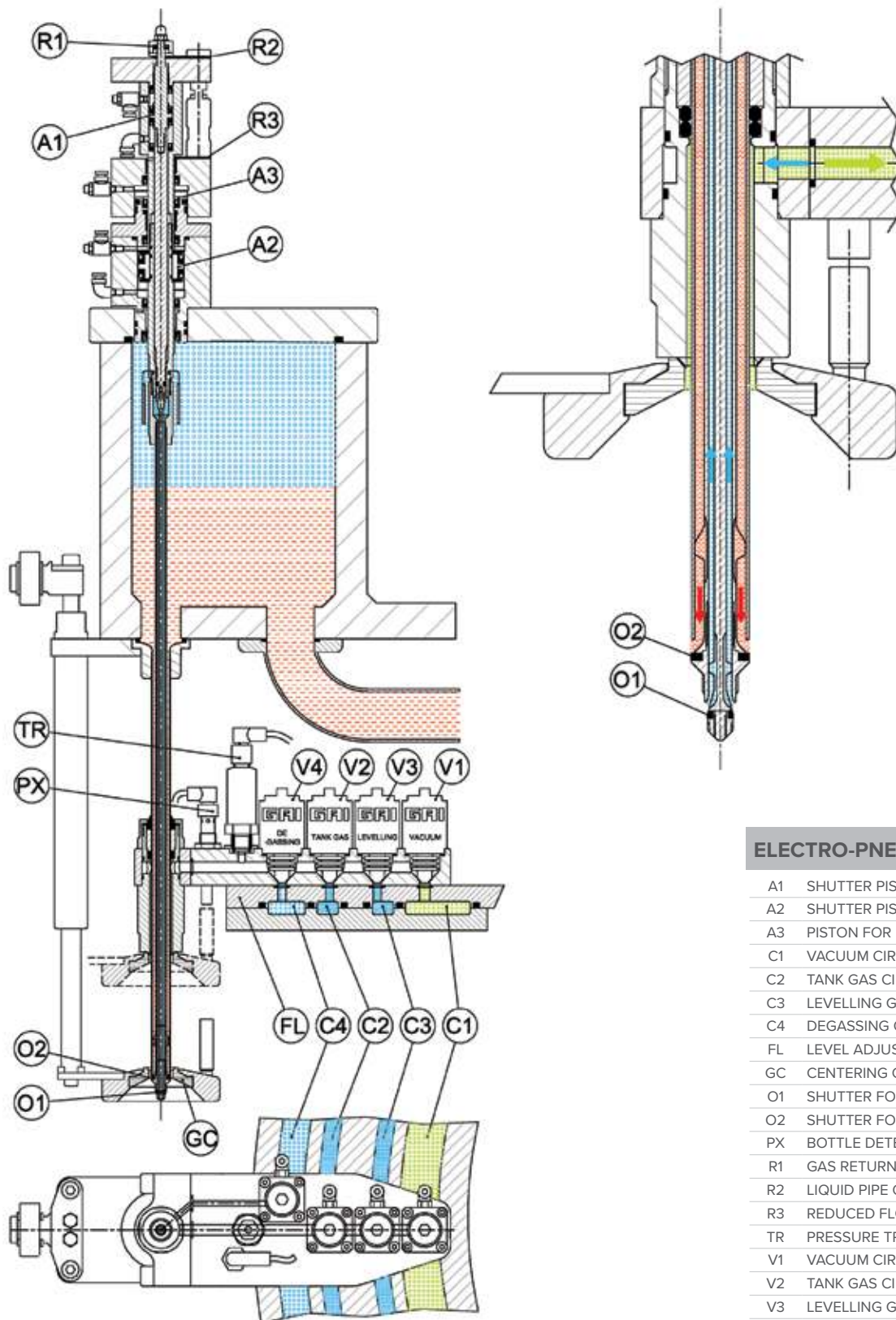
#### Bottling changed by Gai's Patents

Over 100 million bottles produced in the first 2 years from their launch in 2013, steadily growing orders from different markets and sectors, including the most difficult ones. The electro-pneumatic spout or 'UNICA' valve represents a radical upturn that immediately revealed as a great advantage and is now required by an increasing number of new customers.

- **Sparkling and still wine** without compromise.
- **Output increase** up to 30% more for sparkling wines.
- **Level adjustment** from 25 to 100 mm from the top of the mouth, in an automatic and centralized way with no manual intervention. It can be performed even with the machine running.
- **Filling cycle** with total repeatability, possibility to store the correct working sequence. All the stages keep the set duration also when speed is changed. Total control over the filling operation is granted.
- **Optimized sterilization** by opening and washing one circuit at a time, always with the proper pressure and for the necessary time, in a totally automatic way.
- **Automatic dummy bottles** (for machines with 20 or more spouts and manual ones for 12 and 16 spouts). They are always present on the machine and they are automatically and simultaneously inserted, even with time setting, with no manual intervention. They optimize sterilization because they allow to open or close the drain pipe according to the circuit that needs washing.



## EHP



## ELECTRO-PNEUMATIC FILLING VALVE

A1	SHUTTER PISTON FOR GAS RETURN
A2	SHUTTER PISTON FOR LIQUID PIPE
A3	PISTON FOR REDUCED FLOW
C1	VACUUM CIRCUIT
C2	TANK GAS CIRCUIT
C3	LEVELLING GAS CIRCUIT
C4	DEGASSING OUTLET CIRCUIT
FL	LEVEL ADJUSTMENT FLANGE
GC	CENTERING CONE SEAL
O1	SHUTTER FOR GAS RETURN
O2	SHUTTER FOR LIQUID PIPE
PX	BOTTLE DETECTION PROXIMITY
R1	GAS RETURN OPENING ADJUSTMENT
R2	LIQUID PIPE OPENING SETTING
R3	REDUCED FLOW ADJUSTMENT
TR	PRESSURE TRANSDUCER
V1	VACUUM CIRCUIT VALVE
V2	TANK GAS CIRCUIT VALVE
V3	LEVELLING GAS CIRCUIT VALVE
V4	DE-GASSING OUTLET CIRCUIT VALVE

# ELECTRO-PNEUMATIC VALVE

## ADVANTAGES

### 1. Flexible filling

All the operating parameters: vacuum in bottle, working pressure (from 0 to 8 bar) partial opening, filling level and degassing cycle are set on the control panel and can be modified without any manual intervention. Therefore, it will be possible to pass from one type of bottling to another easily. The liquid passage opening can be divided to have a large flow filling followed by a reduced flow. This is an advantageous solution for difficult products because the foam is limited and the level is precise.

### 2. Level adjustment

Automatic and centralized level adjustment with an adjustment range from 25 to 100mm from the rim, even with the machine running. The shape of the valves enables it to reach a specific level with a tolerance of  $\pm 0,5$  mm, due to the levelling operation.

### 3. Structure with double tube with lower closing

The closure of the filling and the gas return tubes enables them to reach precise levels even without using the levelling procedure. However, it is recommended to use the levelling device, as it considerably reduces the product quantity into the gas return tube, which benefits the next bottling operation. To be sure of the gas return for this minimum quantity of product, it is advisable to choose the solution E2 with the gas return in a separate vessel. The closure of the gas return tube has many advantages during the degassing phase with an important increase in productivity of sparkling wines.

### 4. Automatic dummy bottle

Automatic and simultaneous positioning of all dummy bottles, always present on the machine (from 20 filling valves). The GAI dummy bottle is under patent protection and is able to optimize sterilization because it is possible to open or close the discharge according to the specific circuit that needs cleaning.

### 5. Secure sterilizing cycle

Electro-pneumatic valves, together with dummy bottles with discharge circuit, guarantee effective and well defined sterilizing cycles for each filler circuit. The automatic CIP is strongly recommended for time-saving and for sterilization cycle security.

### 6. Operating cycle iteration

The filling cycle, managed with timing phases, guarantee the maximum iteration, making it unaffected to speed variation on the production line. Working phases can be optimized and personalized according to the product to be bottled, improving quality and productivity. Timing is determined in seconds, tenths and hundredths with a repeatability of 1/100 of second.

### 7. Bottle detection

The proximity of each spout guarantees the bottle real presence and enables it to start the filling cycle exactly when the bottle is sealed on the cone.

### 8. Pressure Transducer

The pressure transducer on each spout enables it to constantly control the bottle pressure, in order to check that the filling cycle is carried out correctly and to detect any anomalies or malfunctions.

These controls allow for the detection of insufficient vacuum, exploded bottles or missing seals on the cone, pressure trends during degassing and the efficiency of every single filling valve.

### 9. Four electro-pneumatic valve structure

Using four electro-pneumatic valves to separately control the following circuits: 1. vacuum, 2. tank gas, 3. levelling and 4. degassing.

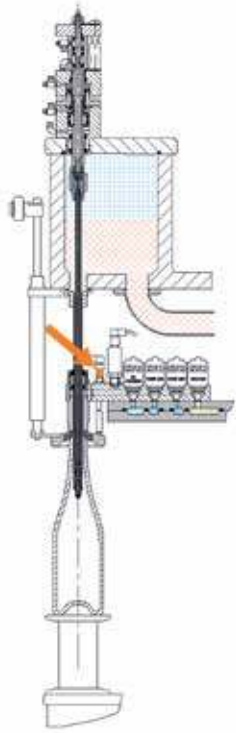
In comparison with the systems with three valves only, the tank gas valve enables pressure compensation in the bottle without using the return gas tube (it avoids sprinkling product residues inside the bottle).

The electro-pneumatic valves and the in-feed pipes placed near the filling spouts minimize the volume in the pipe, thus reducing gas consumption, increasing productivity and ensuring an easy and proper filler sterilization.

### 10. Format saving

The filling cycle can be set through the control panel and it does not require any manual intervention on the filler. Saving cycles and repeating them simplifies and speeds up the format change operation, ensuring more uniformity in the process.

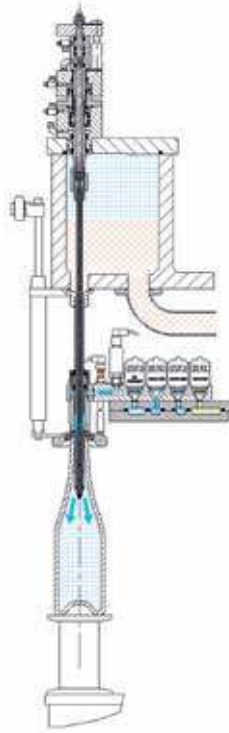
## WINE FILLING



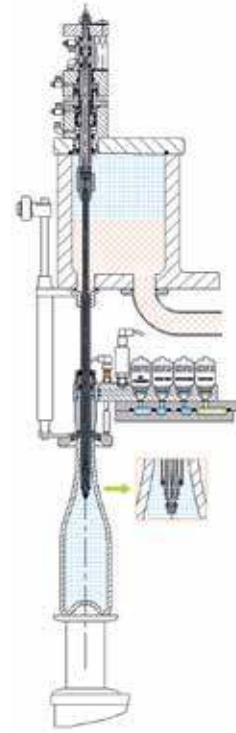
BOTTLE PRESENCE



DEARETION

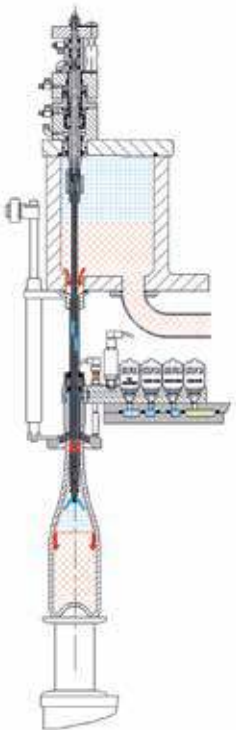


TANK GAS

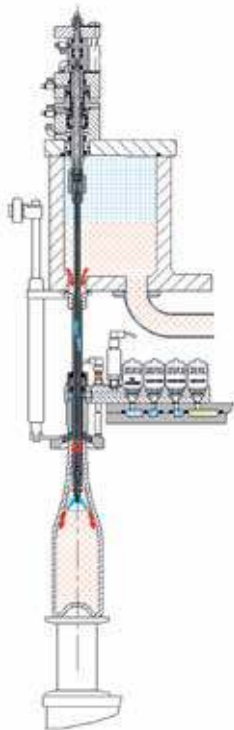
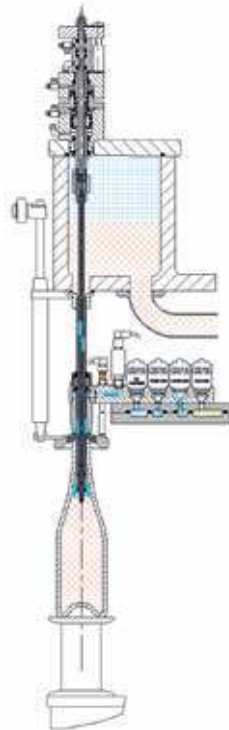


GAS SHUTTER OPENING

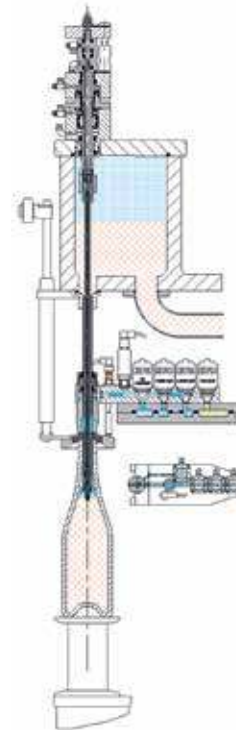
## FUNCTIONAL



BIG FLOW FILLING

REDUCED FLOW  
FILLING

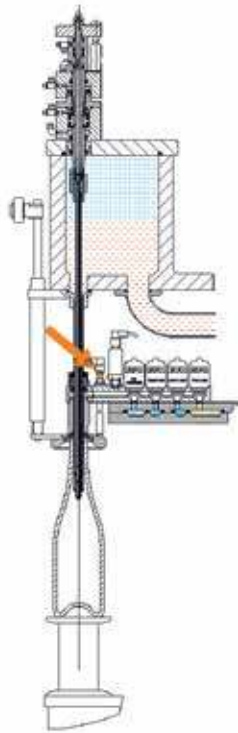
LEVELLING



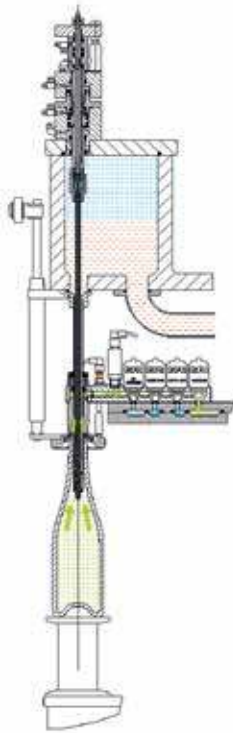
DEGASSING



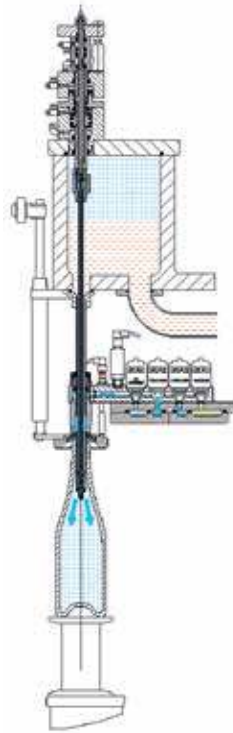
# BEER FILLING



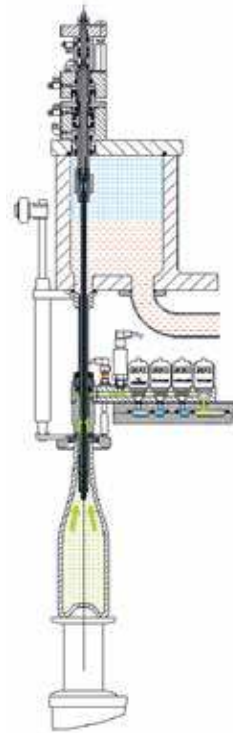
BOTTLE PRESENCE



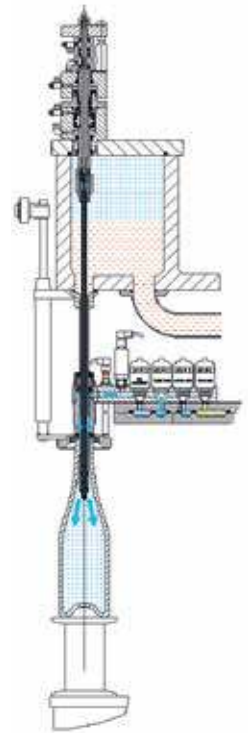
FIRST DEAERATION



TANK GAS

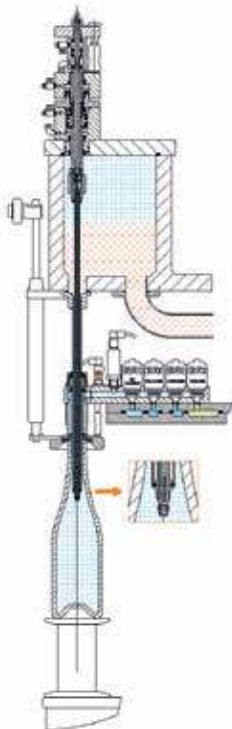


SECOND DEAERATION



PRESSURE COMPENSATION

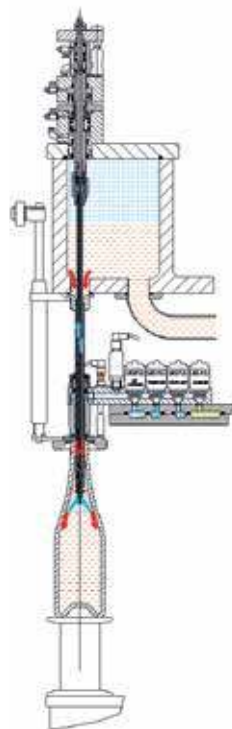
# FUNCTIONAL



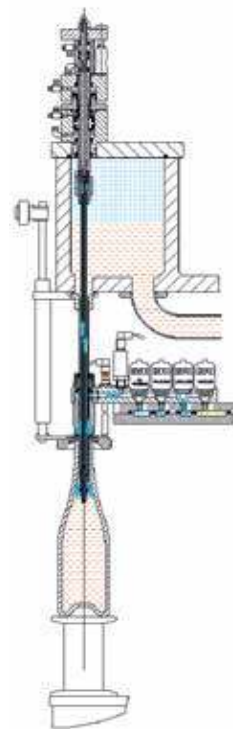
GAS SHUTTER OPENING



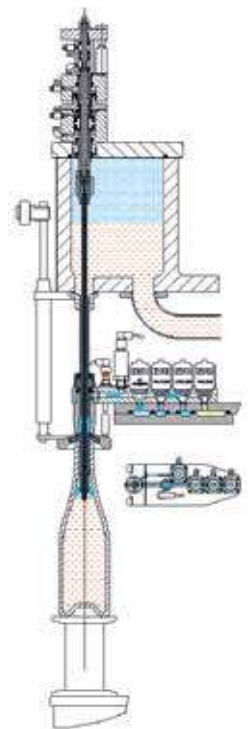
BIG FLOW FILLING



REDUCED FLOW FILLING

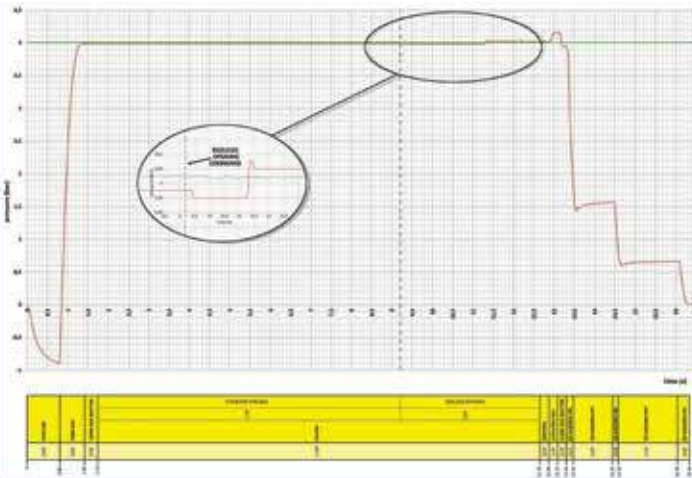


LEVELLING

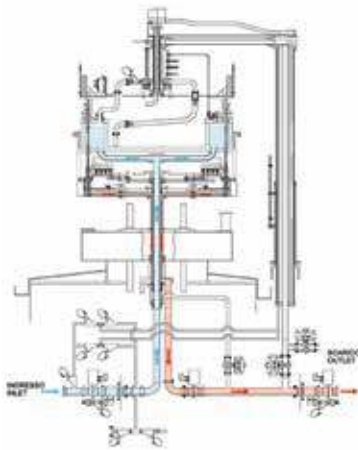


DEGASSING

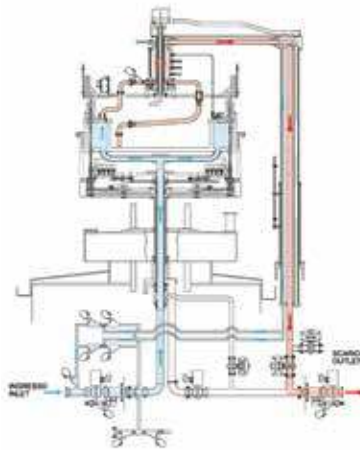
## PRESSURE TREND DURING THE FILLING CYCLE



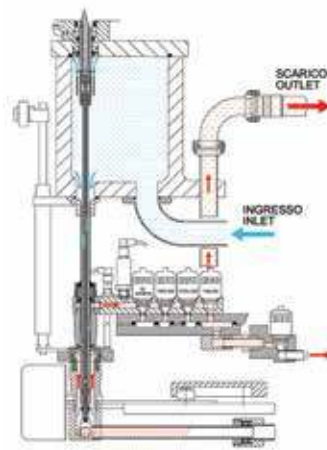
## PRESSURE TREND DURING THE FILLING CYCLE



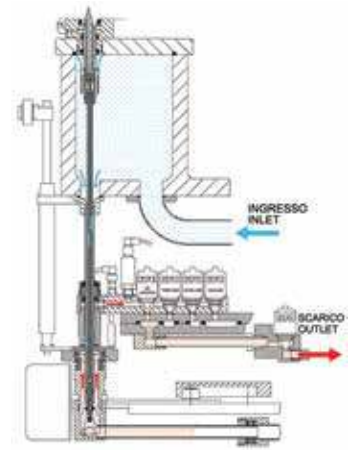
RINSING CYCLE  
AFTER BOTTLING



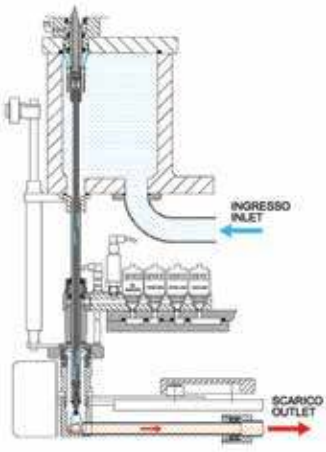
TANK AND COUNTERPRESSURE  
GAS INLET WASHING CYCLE



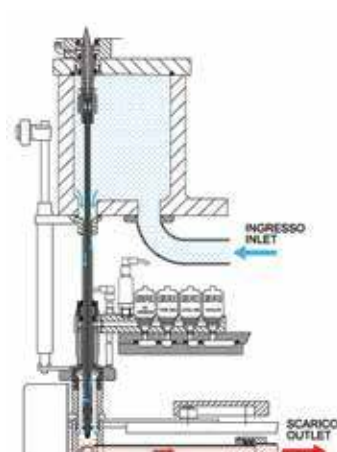
GAS RETURN TUBE  
WASHING CYCLE



FILLING TUBE WASHING  
CYCLE



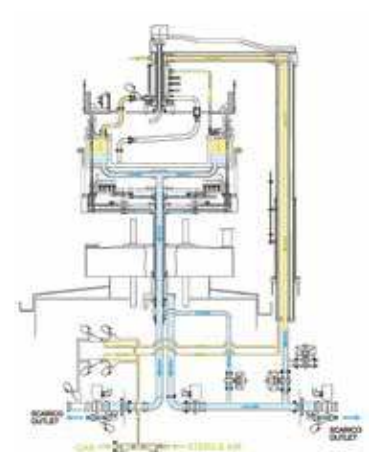
VACUUM CIRCUIT WASHING  
CYCLE



DEGASSING CIRCUIT  
WASHING CYCLE



TANK GAS AND LEVELLING GAS  
CIRCUITS WASHING CYCLE



EMPTYING AND DRAINAGE WITH  
GAS INJECTION (or sterile air)