Acid Filler SF4-8T (movable filling heads)

The SF4-8T is a Triple headed machine that fills VRLA batteries according to the vacuum principle with a pre-selected mass (or volume) per cell.

The machine consists of a stand with one inlet and one outlet belt conveyor, a measuring unit and a filling unit. A tank is placed at the bottom of the stand and is equipped with valves, level control and acid pumps.
A separate vacuum unit with three vacuum pumps is connected to the machine.

All parts that come into direct contact with acid are made of PVC, PP or Hastelloy 267. Stand, cylinders, and cabinets are made of stainless acid-proof steel.

Front view

Principle of operation:

There are two (2) conveyors: one is for transportation of the un-filled batteries into the machine and one is for transportation of the filled batteries out of the machine.

The measuring unit consists of 18 volume vessels, one for each cell, with valves. The volume vessels are connected to three highly accurate mass flow sensors of Coriolis type or electromagnetic volume sensors (6 volume vessels per each sensor).

The filling unit consists of three filling stations, each with a movable filling head. Each filling head has 6 adjustable filling nozzles. Each filling nozzle is equipped with one optical sensor to ensure that whole measured acid volume enters the cell.

Six expansion vessels are connected to each filling head. Each filling station is also fitted with one vacuum pump.

When one battery is filled in one filling station, one un-filled battery is waiting just in front (on the inlet conveyor) of the filling station. When the filling cycle is completed the just filled battery will be pushed onto the outlet conveyor for transportation out of the machine while the un-filled battery will be pushed into the filling station. The un-filled battery will be replaced by a new un-filled battery in the waiting position.

When the unfilled battery is in the filling station the filling head lowers and the filling nozzles form a tight seal on the vent plug holes. The vacuum pump evacuates the air out of the batteries and the expansion vessels. When the pre-set vacuum has been achieved, the valves between the measuring unit and the filling unit are opened and the measured volume is sucked over into the expansion vessels. The venting valves open and the acid is forced down into the batteries. The cycle will continue alternating between opening to atmospheric pressure and creating new vacuum as long as the sensors in the nozzles detect acid.

When all the sensors have switched off (no acid), the filling head rises and the filled battery is pushed out of the filling station and a new un-filled battery is pushed into filling position.

During the filling cycle acid for the next battery will be measured into the volume vessels.

Templates can be made for easy adjustment of the filling nozzles.
The machine can accommodate an optional weighing system and system for gel electrolyte.

FEATURES:

- Filling with a specific acid mass or volume
- Vacuum pulse filling
- High filling accuracy
- Three independent filling stations
- Movable filling heads with adjustable nozzles
- Great flexibility
- Short change over time
- Minimum dripping
- Robust design

OPTIONS:

- Battery Weighing and Reject system
- Acid Density measuring (Coriolis)
- Acid Cooling
- Tank for several acid densities
- Gel mixing and Gel filling
- Filling of batteries with voltage $\neq$ 12V
- Filling of flooded batteries
- Product Identification
- Database

TECHNICAL DATA (STANDARD MACHINE)

Capacity	Depends on battery design
Accuracy	$\pm$ 5g mass (Coriolis)
	$\pm$ 0.75% (Electromagnetic) for volumes > 250 ml
Dimensions	2800x1450x2900 mm
(LxWxH)	(110x58x1114")
Voltage	3x400V-50Hz or 3x480V-60Hz
Power consumption	<2.5kW (at normal use)
Pressure	6 bar
Connections	R½"
Air consumption	<100Nl/min
Acid Tank	1 x 280 litres (1 x 74 gallons)
Acid connection	$\varnothing$32
PLC system	Siemens Siematic S7 or Allen Bradley SLC 5/03
	(other brands/models available on request)
OP	OP7 or Panel View 600
	(other brands/models available on request)