KÄLLSTRÖM
E N G I N E E R I N G

Acid Filler SF4-8D (fixed filling heads)

SF4-8D fills VRLA batteries according to the vacuum principle with a preselected mass or volume per cell. The machine consists of a stand with a 2000 mm belt conveyor, a measuring unit, filling unit lifting and a lifting table.
A tank equipped with a pump, valves and level control is placed at the bottom of the stand.

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

Fixed filling head

Principle of operation:

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

The filling unit consists of two filling stations, each with a fixed filling head.
Six expansion vessels are firmly anchored to the base of each filling head. To ensure a quick change over time, each type of battery has its own set of filling heads that are easy to change.
Six optical sensors per filling head ensure that the whole measured mass enters each cell.
Each filling station is also fitted with one vacuum pump.

Since the lifting table raises the conveyor belt and the batteries towards the fixed filling heads there are no hoses on the machine, which minimizes acid drips and improved the filling accuracy.

In automatic mode two 12V batteries are fed into the filling stations. When the batteries are in place the lifting table is raised until the filling nozzles form a tight seal on the vent plug holes. The vacuum pumps empty the air out of the batteries and the expansion vessels. When the vacuum in the recipe has been achieved, the valve between the measuring unit and the filling unit is opened and the measured electrolyte 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. The optical sensors in the filling heads control that the whole mass/volume has entered the batteries. If this has not happened, a new vacuum cycle is started.

During the filling cycle acid for the next two batteries are measured into the volume vessels. When all the sensors have switched off, the lifting table is lowered and the batteries are transported out and two new batteries enter the filling position.

The fixed filling heads are special made for each battery type and are easy to exchange.
No adjustment of nozzles is necessary.
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
- Fixed filling heads
- 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	± 3g mass (Coriolis)
	± 0.5% (Electromagnetic) for volumes > 250 ml
Dimensions	2800x1450x2900 mm
(LxWxH)	(79x58x106")
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	∅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)