

Propellant Measurement and Dispensing Machine

Mecelec Design has designed and built a propellant measurement and dispensing machine which is used to draw propellant powder from two feed tubs, accurately measure out a desired weight and then dispense the measured quantity of powder. The machine is primarily made from Atex approved parts and all metal surfaces contacting the media are stainless steel.

The machine is automated to measure the required number of loads of the same weight but safely keep each measured load physically separate from each other to maintain accuracy. This allows the machine to have the next load to be ready to dispense quickly after previous one.

The nature of the propellant required that there should be no direct path from the machine to the operator and so two isolating valves operate in an alternating way to allow the load to pass through but keep machine and operator isolated

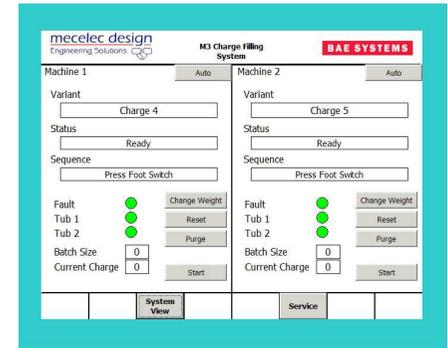


Technical Data	
Accuracy	+/- 0.2g
Air Supply	6 Bar (90 PSI)
Maximum Load Weight	1000g
Electrical Power Supply	3 Phase 400VAC @ 16A
Control System	Siemens S7-300
Control Software	Step 7 V5.5

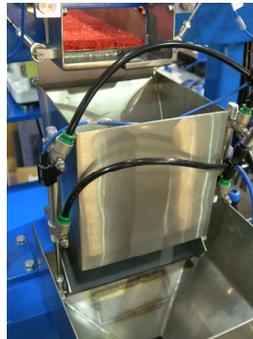


Atex vacuum conveyor with only one moving part and driven entirely by compressed air.

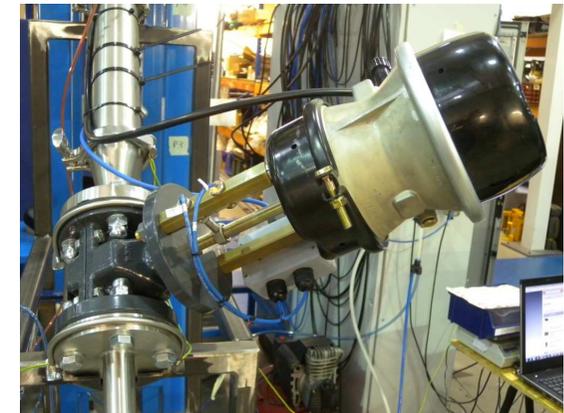
The control system is based around a Siemens S7-300 PLC with operator control provided by an Atex approved 12" touch screen monitor displaying a Labview program. A secondary interface is provided on the control panel in the form of a 10" HMI for maintenance work as this physically is separate from the operator area



Two linear vibratory feeders feed the powder onto the weighing cell. The second feeder operates at a higher speed than the first to spread out the powder and provide an even flow



A precision weight cell keeps track of exactly how much powder is in the measurement hopper as it is fed in. An approach weight signals the feeder to slow down at a predefined weight to slowly feed the last of the load. This allows good fill rates while maintaining final accuracy.



The isolating valves used are Atex rated and are normally closed type valves to ensure safety even in the event of air or power failure