

# MEDICAL DEVICE ASSEMBLY



## **Life Sciences Applications**







#### Dispense type: jetting

- Ø Fluid type: UV-cure adhesive
- **Specifications:** dispensing weight:  $1.7 \text{ mg} \pm 2\%$ Ω 8 valve configuration

#### Plastic Bonding for Insulin Pen Housing

- Dispense type: jetting
- Ø Fluid type:

Ø

Specifications: convert to modular valve improve stroke loss reduce cleaning time improve control range

UV-cure adhesive

#### **Medical Test Strip/Cassette**

#### **Medical Test Strip**

- Dispense type: jetting
- Fluid type: medical reagent
- Specifications: 10 20 nl / cavity 100 dots / second (100 Hz)

#### **Medical Test Strip**

Ð	Dispense type:	jetting
Ð	Fluid type:	medical reagent viscosity < 100 centipoise
Ø	Specifications:	dispensing volume: 0.1 - 1.0 µl material waste: < 5 µl

#### **Ultrasonic Instrument**

#### Ultrasonic Instrument

- Dispense type: jetting
- Fluid type: 2-component epoxy Ø
- Specifications: line width < 800 µm dispensing volume: ± 2% multi-axis requirement

### **Device Assembly**

- Dispense type: jetting
- Fluid type: acrylic
- Specifications: 210 µm line\*
- \*Capability ≤ 180 µm



#### **Cardiac Management Device**

#### **Cardiac Management Device**

- Dispense type: potting/encapsulation
- Fluid type: 2-component silicone
- Specifications: static & dynamic mixing Ø +/- 1% volumetric accuracy

#### **Circuit Board**

- Dispense type: needle dispensing
- Fluid type:
- solder paste, silver epoxy
- Specifications: dot diameter: 250 300 μm 20 µm diameter accuracy

#### **Electronics Assembly**

#### **Electronics Assembly**

- Dispense type: jetting or needle dispensing
- Fluid type: silver epoxy, solder paste and other materials
- Specifications: dot diameter 120 500 µm; 80 120 dots/sec. Ω

## **Precision Dispensing Systems**



#### **SJet Valve**

- Itighly precise non-contact jetting up to 2,000 Hz regulated
- Adjustable closing force
- S Closed loop opening stroke control within ±2 μm
- Sealing-seat position and closure point detection
- Modular design facilitates easy assembly and reconfiguration of parts
- Dispenses variety of fluids from low to high viscosity

#### **Hot Melt System**

- Special tank for hot melt fluids with a capacity up to 300 ml (10 oz)
- Equipped with three heating zones for optimal fluid processing
- Fully modular and compatible with various other marco components: pressure regulator, different valve seats, nozzles, etc.
- All parts which are in contact with the fluid can be removed, cleaned, or replaced individually





#### Applications

- Bonding: UV-cure adhesive, silicone & PUR hot melt adhesives
- Circuit Board Assembly: solder paste, silver epoxy, flux, underfill epoxy, conformal coatings, encapsulants
- Medical Reagent Dispensing

#### Advantages

- > High-precision nano- & picoliter dispensing
- Regulated valve stroke control for dispensing repeatability within ±1% of target
- Customizable valve opening and closing profiles
- Real-time process monitoring and controls
- Bubble and void free dispensing

## MultiJet & PCR Dispensing Head



Example of a custom configuration of MultiJet with eight SJet valves

#### MultiJet System

- Multiple jet valves for high throughput production
- Integration into existing production systems
- Multiple valves controlled by one HMI controller
- Dispensing with two to ten valves, individually adjusted and controlled
- Syringe mounting modules available in different sizes or bulk feed



#### **PCR Dispensing Head**

- Allows for the smallest quantities dispensed directly out of a PCR tube
- Works with specialized SJet valve seat for fast, precise, and consistent dispensing
- Allows for easy cleaning of all parts and complete replaceability of all parts subject to regular wear

## **Fluid Supply**

#### **Degassing Tanks**

- Vacuum and supply line pumps for degassing fluids for bubble-free supply of material to valves
- Dead space minimized to reduce material waste to < 0.5 %
- Full control of fluid level, vacuum level, etc. via HMI or external Modbus protocol
- Nitrogen compatibility
- Optimal cleaning parameters: 15 30 min. for cleaning and change over between materials
- O Choose between various sizes from 3 to 25 liters



25-liter degassing tank



#### **2C MixingHead**

- Can be used in two modes: Direct deposit from mixing head and continuous, on demand material supply to precision MultiJet valves
- O Controlled time between fluid mix and use
- Dynamic or static mixing configurations
- Two mechanical pumps for constant pressure and fluid delivery without contact with compressed air
- Programmable and adjustable mixing ratio ranges
- Simple replacement of wetted parts

#### **PushMembrane**

- Creates consistent pressure close to the dispensing valve independent of any pressure fluctuation in the factory compressed air supply system. This results in precise and stable dispensing accuracy and repeatability
- The 2-chamber principle is air-tight, sealed from contact with factory compressed air, keeping previously degassed material clean and bubble-free
- A continuous and stable fluid supply and flow rate can be achieved using marco software and tank supply systems
- Real-time monitoring and measurement of the dispensed fluid and refill amount for process control and tracking



## Medical Device Assembly



#### **Fluid Management**

Depending on your application, marco engineers will design the best fitting solution and provide a system that best suits your dispensing needs.

#### Example of an assembly:



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