Overview of Automated Dispensing Systems

| Item	PROPlus / PRO Series	EV Series	E Series	RV Series	R Series	GV Series
System						
# of axes	3 axes	3 axes	3 axes	4 axes	4 axes	3 axes
Programming method	DispenseMotion software	DispenseMotion software	Teach Pendant TeachMotion software	DispenseMotion software	Teach Pendant TeachMotion software	DispenseMotion software
Vision	CCD smart camera	Pencil camera	N/A	CCD smart camera (fixed or rotating mount)	N/A	**G8V** CCD smart camera **G4V** Pencil camera
OptiSure™ Automated Optical Inspection (AOI)	AOI software (optional) Confocal Laser (optional)	AOI software (optional) Confocal Laser (optional)	N/A	AOI software (optional) Confocal Laser (optional)	N/A	AOI software (optional) Confocal Laser (optional)
Height detection	Laser (included on PROL / PROPlusL)	Mechanical (optional)	Mechanical (optional)	N/A	N/A	Mechanical (optional)
Tip detection	Tip detector (included)	Tip detector (optional)	Tip aligner (optional)	Tip detector or Tip aligner (optional)	Tip aligner (optional)	Tip detector (optional)
Closed loop encoding	Included	N/A	N/A	N/A	N/A	**G4V** (N/A) **G8V** (Included)
Maximum working area (X / Y / Z)	**PRO3 / PRO3Plus** 250 / 250 / 100 mm (10 / 10 / 4") **PRO3L / PRO3PlusL** 250 / 220 / 100 mm (10 / 9 / 4") **PRO4 / PRO4Plus** 350 / 350 / 100 mm (14 / 14 / 4") **PRO4L** 300 / 400 / 100 mm (12 / 16 / 4") **PRO4PlusL** 350 / 320 / 100 mm (14 / 13 / 4")	**E2V** 150 / 200 / 50 mm (6 / 8 / 2") **E3V** 250 / 300 / 100 mm (10 / 12 / 4") **E4V** 350 / 400 / 100 mm (14 / 16 / 4") **E5V** 450 / 500 / 150 mm (18 / 20 / 6") **E6V** 570 / 500 / 150 mm (22 / 20 / 6")	**E2** 200 / 200 / 50 mm (8 / 8 / 2") **E3** 300 / 300 / 100 mm (12 / 12 / 4") **E4** 400 / 400 / 100 mm (16 / 16 / 4") **E5** 500 / 500 / 150 mm (20 / 20 / 6") **E6** 620 / 500 / 150 mm (24 / 20 / 6")	**R3V** 300 / 300 / 150 mm (12 / 12 / 6") **R4V** 400 / 400 / 150 mm (16 / 16 / 6") **R6V** 620 / 500 / 150 mm (24 / 20 / 6") All: ±999°	**R3** 300 / 300 / 150 mm (11.8 / 11.8 / 5.9") **R4** 400 / 400 / 150 mm (15.7 / 15.7 / 5.9") **R6** 620 / 500 / 150 mm (24 / 19.7 / 5.9") All: ±999°	**G4V** 400 / 400 / 100 mm (16 / 16 / 4") **G8V** 800 / 800 / 100 mm (31 / 31 / 4")

Nordson EFD

Glossary

Programming method

There are two methods for creating dispensing programs: EFD's proprietary DispenseMotion™ software or a Teach Pendant using our TeachMotion™ software.

- DispenseMotion software is used on robots with vision systems and includes the DispenseMotion controller, camera, monitor, keyboard, and mouse.

- The Teach Pendant is used on robot models without vision.
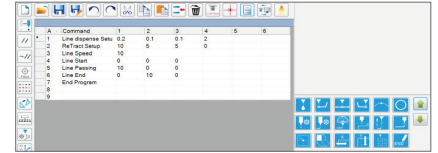

DispenseMotion software
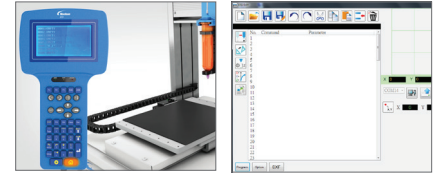
Teach Pendant and TeachMotion software

Vision systems

Robots with vision allow on-screen preview of the dispensing path to make programming easier. Options include a smart vision CCD camera or a simple vision pencil camera. On 3-axis robots, the camera is installed on the Z axis. On 4-axis robots, we offer a fixed-mount camera on the Z axis, or a rotating-mount camera that moves with the R axis.
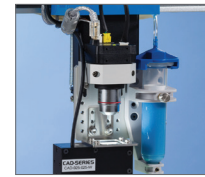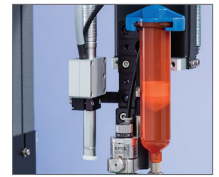

CCD camera   Pencil camera

Height detection

Height detection allows the robot to measure the height of each dispense location on the workpiece. The data (Z clearance) is then used to adjust for height variations from one workpiece to another. We offer two options:

- Laser height detection is most accurate and can determine the height of multiple points on a product in a single sweep.

- Mechanical height detection requires a device that makes contact with the product and determines the height of only one point at a time.
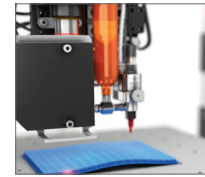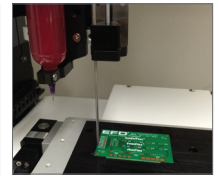
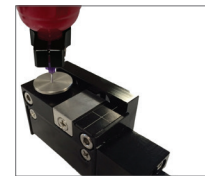Laser height detection   Mechanical height detection
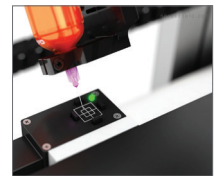
Tip detection

Allows the robot to read the distance between the tip and workpiece after each tip or syringe barrel change-out and maintain deposit consistency. We offer two options:

- The tip detector operates by touching the tip on a sensor pad to detect the height location of the tip (called the gap height), then makes a deposit on the tip detector. The vision system views the deposit to confirm the XY location, and the robot then offsets the program to ensure deposit location accuracy and dispensing gap height.

- The tip aligner uses optical sensors to detect the outside diameter and end of the dispense tip. If there are XY / Z changes from the previous tip, offsets are applied to the program to ensure deposit location accuracy and dispensing gap height.

Tip detector   Tip aligner