



# SmartWare™ Technology

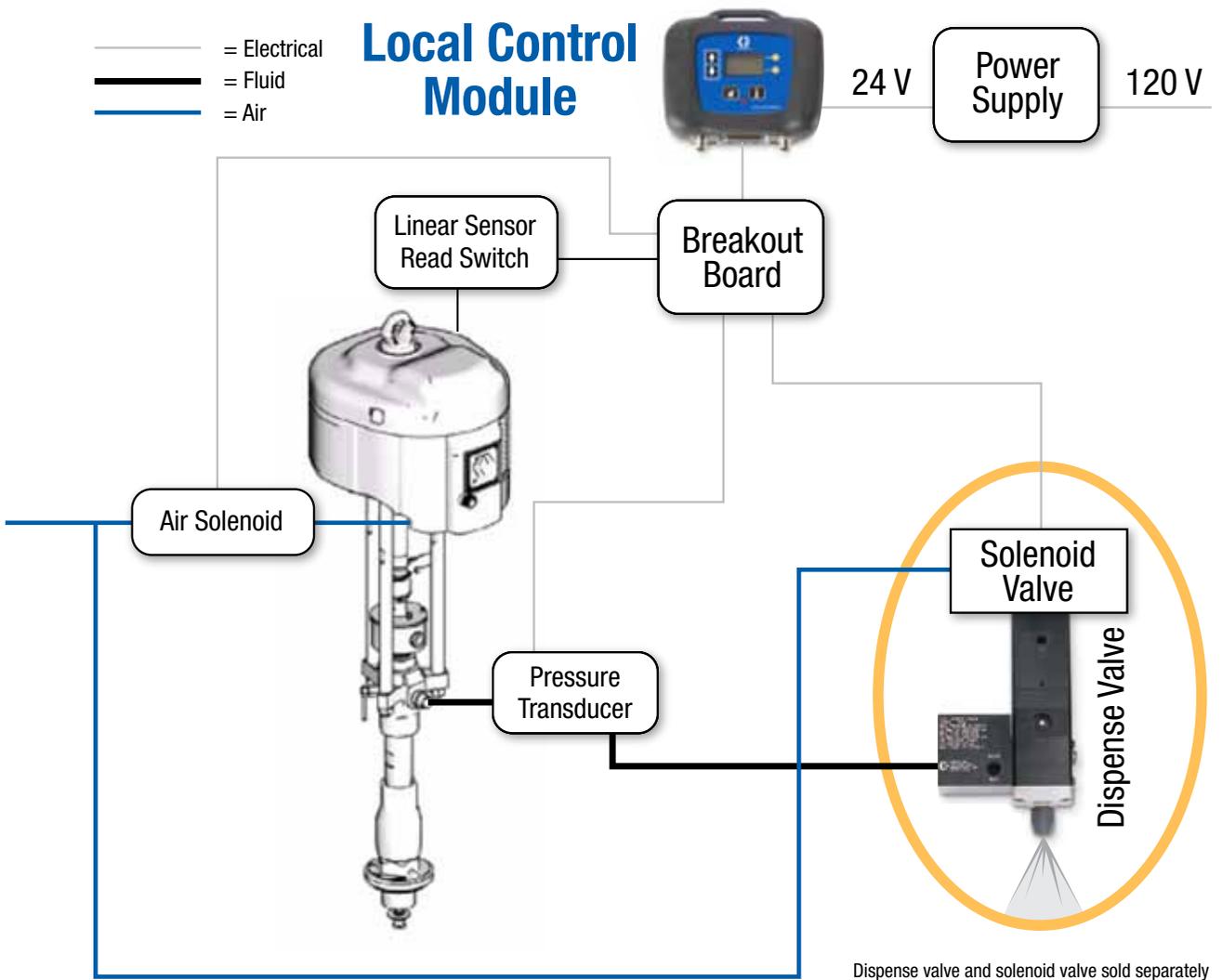
User Guide for SmartWare Shot Dispense Kit



PROVEN QUALITY. LEADING TECHNOLOGY.

# SmartWare Shot Dispense Kit: How it Works

When you add the SmartWare Shot Dispense Kit to your Graco pumping system, you get an accurate, economical way to dose material – saving you time, material and labor costs. It provides accurate dosing without flowmeters or gear meters in the fluid stream. Instead of the typical flow meter, the kit utilizes an internal air motor sensor to track the position of the pump. When the Shot Dispense Kit receives the start signal, the dispense valve opens. Once the desired shot volume has been reached, the Shot Dispense Kit closes the dispense valve.



## Why is it smart?

By precisely measuring pump displacement it can accurately measure volume being dispensed. It is also smart enough to compensate for slight changes in viscosity, pump changeovers, and valve dosing delays. It does this smart compensation continually during operation to maintain accuracy. Major changes in system parameters will require a short period of dispensing to learn and adjust.

## Calibration Procedure

Each pump, system setup, and material combination has potentially unique changeover and overshoot characteristics. Running the calibration routine suggested in your Graco operating manual calibrates your Shot Dispense Kit so it can accurately dispense beginning with the first shot of production. The calibration routine is a simple process that increases accuracy depending on the changeover and overshoot characteristics of your supply system.

### Tips for better accuracy

#### REPEATABLE DISPENSE COMPONENTS – Use

a fast and consistent dispense valve and solenoid combination. Appropriately size the solenoid valve, minimize the length and maximize the diameter of the air tubing between the solenoid and dispense valve, and use high pressure air for the solenoid.

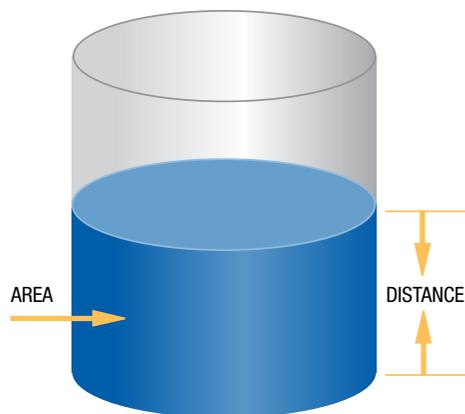
**SLOWER PUMP SPEEDS** – Decreasing the pump speed for any given shot size will reduce overshoot and improve accuracy.

**SYSTEM SETUP** – Use the smallest diameter and shortest outlet hose possible to minimize the fluid between the pump and the dispense point. If pumping higher viscosity fluids with a Graco Dura-Flo™ pump, put a spring loaded ball check at the pump inlet. This will give more consistent pumping through top and bottom changeover.

**MATERIAL** – Compressible materials are harder to dose accurately because of material inconsistency. Any factors that rapidly change material properties will also affect accuracy. Material temperature swings or fast curing materials can affect viscosity and thus affect consistency.

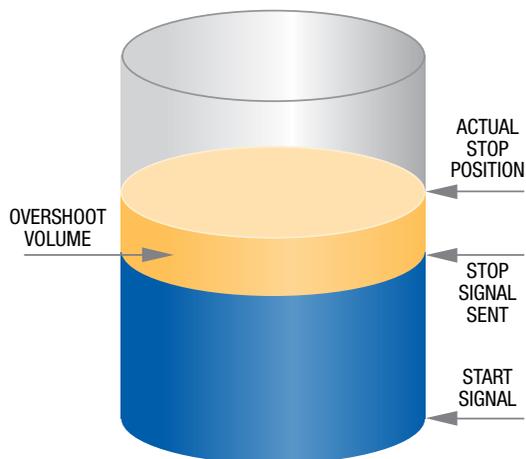
## Theory of Operation

SmartWare Shot Dispense Kits do not use any moving parts in the material path to measure the volume pumped. Instead the kit measures the volume pumped by using the following calculation.



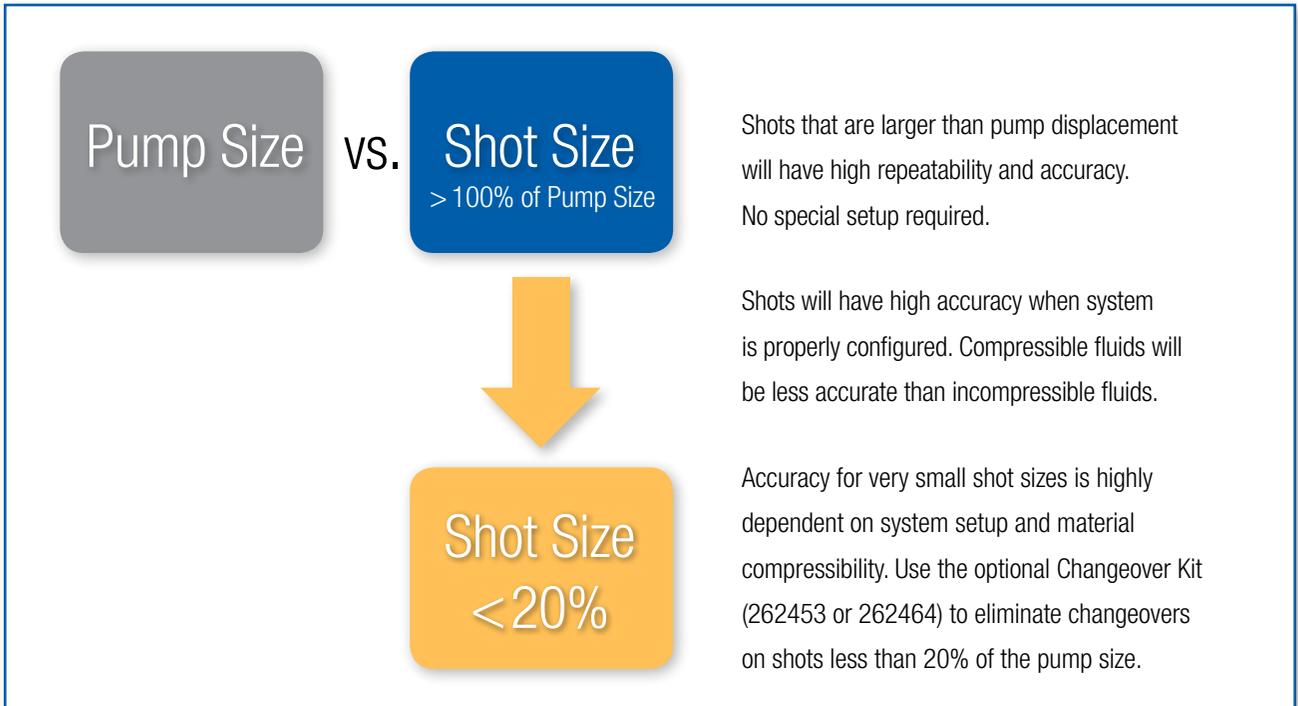
$$\text{VOLUME PUMPED} = \text{AREA} \times \text{DISTANCE}$$

**VOLUME PUMPED** – The kit receives the start signal and the dispense valve opens. Once the correct distance is traveled (desired shot volume), the dispense valve closes and the pump stalls. Cars don't stop the instant you hit the brake, nor does the SmartWare Kit pump stop pumping the instant it gets the stop signal. From the time it takes for the dispense valve to physically close, fluid is still being pumped; this is known as overshoot volume.



**OVERSHOOT VOLUME** – The SmartWare Kit automatically compensates for this overshoot. It does so by taking the overshoot of previous shots into consideration and then sending the stop signal earlier.

# SmartWare Shot Dispense Kit Selection Guide



Use this selection guide to help choose the correct pump size and ratio for your application. Always use the fastest, most consistent dispense valve available, and keep hose length and diameter to a minimum. Use the ranges in this chart to help select your pump size.

### Air Motor Pressure (psi)



### Shot Size / Pump Size



### Pump Speed =

$$\text{Shot Size} / [\text{Shot Time} \times \text{Pump Size}]$$



## Graco Valve Information

Valve P/N	Description	Fluid Inlet Size	Air Inlet Size	Valve Close Times (in milliseconds)
244910	EnDure® Ambient	1/2 in npt	1/8 in	26
288554	Auto Plus™	1/4 in npsm	1/8 in	37
918535	1/4 in Snuff-Back	1/4 in npt	1/8 in	19
918537	1/2 in Ball / Seat	1/2 in npt	1/4 in	97
918539	3/4 in Ball / Seat	3/4 in npt	1/4 in	254
207440	Auto Dispense	3/8 in npt	1/4 in	78

- Solenoid port size should be at least as big as the valve air inlet size
- Valve close times are with oil, 100 psi air, 3000 psi fluid pressure, and a .019 in orifice

See instruction manual 3A0294