



## **Peco Controls - Europe Limited**

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### **7 Key Questions for the first time Liquid Nitrogen Doser buyer**

#### **1. What Speed Can I Discrete Dose up to?**

There are two ways of getting liquid nitrogen into a container.

Firstly (and most simply) you have a dispenser over the conveyor which 'continually streams' liquid nitrogen down toward the containers.

Secondly you can 'discrete' dose; this means that each container is given a separate measured dose of liquid into the container opening only. This has a number of benefits over the continuous stream solution.

- No wasted liquid nitrogen by streaming between containers – saves money.
- Excess LN2 can both damage the filler and cause ice build up on the conveyor consequently causing jams.
- Excess LN2 is a health and safety hazard if in accessible areas.
- If cans or bottles stop beneath a continuous stream system it will continue to stream for a time, thereby causing grossly over pressured containers which are liable to explode.

#### **2. Does the system speed compensate?**

Most systems on the market are able cope with varying line speeds to some degree. However, this is often simply to ensure the dose hits the bottle or can at the correct time regardless of speed.

Another important consideration for consistent pressures is varying the quantity of the actual dose dependant on speed. For example if you are running at a crawl speed the time the liquid has to turn to gas is much greater than if you were running full speed. Therefore, to maintain consistent results you need to put in more liquid at lower speed to compensate for this.

#### **3. How do I adjust the amount of nitrogen dosed (container pressure)?**

The ability to quickly change the amount of liquid dosed is important, for example if you change from a small to a large bottle you may need a larger amount of liquid nitrogen to obtain the same resultant pressure and vice versa.

For continual streaming systems (and some discrete systems) this can often be an issue, whereby the only means of changing the amount of liquid dosed and consequently the resultant container pressure is by changing a nozzle. This brings with some further issues which are addressed later.

#### **4. How quickly can I change a nozzle if I need to?**

The maximum and minimum amounts of liquid dosed are dependant on the line speed, container opening and the nozzle size of the unit. The liquid nitrogen actually flows through the nozzle and therefore its size dictates the maximum flow rate in a given time.

On some machines you may need to change nozzles if you change bottle or can sizes or simply require a different pressure. The ability to do this quickly is crucial in minimizing change over times, some systems require you to fully empty the system of LN2 and manually defrost



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the dosing head before being able to remove the nozzle. This is time consuming and can result in long unnecessary downtime.

### **5. How does the system protect against freezing?**

Because liquid nitrogen is very cold, if it comes into contact with water it will freeze it. Beverage fillers are by their very nature wet environments and so freezing up can be a real problem.

The most vulnerable area of any system is the actual dosing point which dispenses into the container as it is here that the liquid nitrogen and surrounding water are in closest proximity. Freezing will inevitably result in containers which are not dosed thereby increasing wastage.

### **6. If my dosing head does freeze how quickly can I get running again?**

Because of the environment it is always possible that a nozzle or dosing head can freeze (albeit rarely if the proper safeguards are in place), if this happens you need to get the unit going again quickly to minimize downtime.

Some systems may require you to completely empty the system and then manually defrost the head and nozzle – this can take hours.

### **7. Can I interface the system to stop production if the unit fails?**

If for whatever reason the system fails to deliver a dose you need to know about it. Installations are more often than not inside guards where the operator may not immediately see a problem. Therefore the ability to interface directly with your line controls to stop production if a problem occurs is an important feature to minimize wasted product.



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### **How do Peco / VBS address these questions?**

#### **1. What Speed Can I Discrete Dose up to?**

Peco can offer two different dosing solutions:

The LCI200 has the ability to discrete dose up to 1800cpm with a single head.

The UltraDoser is aimed at slower speeds and will discrete dose up to 1000cpm. However, we would suggest that anybody running over 800 cpm looked at the LCI2000.

#### **2. Does the system speed compensate?**

We have a speed sensor which we would normally install on the gearing underneath your filler or capper. This provides us with feedback of the actual machine speed.

We then take this speed and automatically adjust when the dose occurs to ensure each container is correctly dosed regardless of speed.

In addition we also have a feature called 'dose duration factor' this allows us to vary the amount of the actual dose dependant on line speed, thereby ensuring consistent results at all speeds.

#### **3. How do I adjust the amount of nitrogen dosed (container pressure)?**

On our touch screen controller we have an increase dose arrow and a decrease dose arrow along side a reading of the current dose time. To increase or decrease the dose (and consequently container pressure) you simply press the arrows.

#### **4. How quickly can I change a nozzle if I need to?**

In under 10 minutes on the LCI2000.

Our unique quick service feature and local isolation valve allow the dosing head to be purged of liquid and warmed with nitrogen gas automatically. Within 10 minutes a nozzle can be removed and replaced and the unit is ready to run.

#### **5. How does the system protect against freezing?**

We have a heater on the dosing head, which as well as providing heat also creates a shield to protect the nozzle area. The liquid passes through a small hole in the heater. To freeze the head or nozzle water would have to pass through this small hole and then travel a further 25mm or so to the nozzle area.

#### **6. If my dosing head does freeze how quickly can I get running again?**

Again, using the unique quick service feature of the LCI2000 the head and nozzle can be automatically thawed and dried with nitrogen gas in about 10 minutes.

#### **7. Can I interface the system to stop production if the unit fails?**

Yes, the system automatically monitors the liquid nitrogen level, feed pressure, speed sensor and dosing cylinder movement and provides volt free signalling for you to use with your PLC.