

# Torque Measurement & Control Products

## Fastener Tightening & Operator Assistance Indicator

Clutch controlled air tools are sufficiently accurate for the many precision fastening applications where torque control is a suitable fastening strategy.

If tools are used correctly and are coupled with a process for tool calibration and audit, this type of tool can easily be the most cost-effective solution. For correctly calibrated clutch tools to be effective, the fastening cycle must run to completion and the clutch must shut off.

The Ingersoll-Rand Fastening Cycle Counter is a simple electronic device which is designed to be used with the **BALD and LD High Performance Screwdrivers & Angle Wrenches**, to provide positive feedback that the fastening cycle or sub-cycle has been completed.

### Benefits of the System

**Process verification.** The system gives feedback that a fastening operation has been completed, and can signal:

- Premature release of the trigger.
- Failure of the clutch to activate.
- Failure of the shut-off mechanism.
- "Double hits" on fasteners already tightened.
- Problems such as damaged or crossed threads.
- Non-completion of all fasteners in a group.

**Low cost.** Where simple feedback is necessary, this method can eliminate the need for expensive transducerised tools.

**Operator involvement** is enabled in the quality process.

**Elimination of non-value-added operations** such as over-checking the joint using break-back spanners, paintmarking, etc.

**Easy installation** in BALD and LD Series tools.

### Features

**Clear LED display** fastening OK/NOK.

**Clear LCD display** cycle count.

**Ease of programming** through the clear display.

**Keyboard** is simple to use and is password-protected.

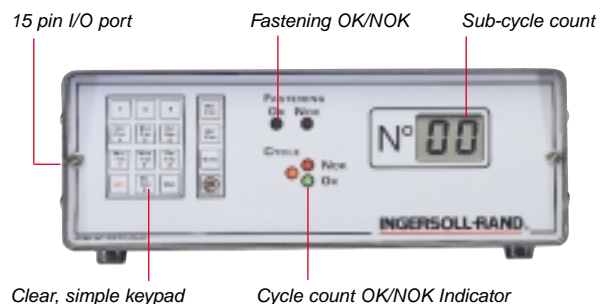
**Fastening fault detection** using programmable minimum and maximum cycle timers.

**Automatic restart** either:

- after a programmed time period
- manually by the operator
- remotely by a PLC, for example.

**Standard 15-pin connector** for communication with external devices. 24 volt supply. Opto-isolated output for: end of cycle, fastening OK, fastening NOK, reset counter, reset fastening.

**Two tone buzzer** for end of fastening and end of cycle, which may be disabled if preferred.



### How it works...

The Cycle Counter is designed to work with the Ingersoll-Rand BALD and LD Series (precision clutch tools), which are fitted with two pneumatic signal tubes running from the tool to the counter. The first signal senses air pressure after the valve inlet. The second senses pressure after the air shut-off.

In the steady state, both signals read "zero".

When the trigger is pulled, air pressure is sensed in both tubes. When the clutch activates and the shut-off valve closes, the pressure after the shut-off valve drops instantly to zero, while the pressure after the inlet valve is still detected. The operator releases the trigger, the clutch re-arms, and both signals are once again at zero.

### Product and Accessories

Model	Description
CYCLE 1	Cycle Counter 1

#### Technical Features

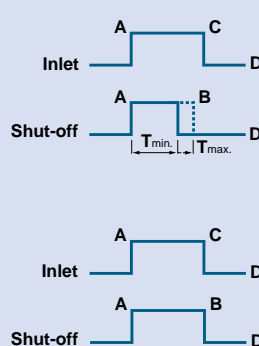
Power..... 220V, 50 / 60 Hz  
 Dimensions..... 255 x 90 x 182 mm  
 Weight..... 2.1 kg

Maximum recommended length for pneumatic tubes: up to 5 m. For lengths greater than 5 m, please ask for advice.

#### Optional Accessories

PLCCAB PLC Cable  
 TUBE-X 2 lengths of tube - X metres (Max. length 6 m)

**Cycle Signatures:** The traces below show the characteristic signal which is sensed by the unit for 1 good and 1 bad cycle.



#### Correct Cycle

At the start of the cycle (point A) air pressure is sensed at the inlet and after the shut-off valve. At point B, the sensor at the shut-off valve detects a drop in air pressure, indicating that the clutch has been activated. At point C, the operator releases the trigger and the inlet pressure falls. By point D, the system is ready to begin a new fastening cycle.

#### Incorrect Cycle

The error shown in this trace is detected by the fact that when the pressure signal at the shut-off valve falls to zero, the inlet pressure is also zero. This indicates that air was shut off to both inlet and shut-off at the same time and that the operator released the trigger before the clutch / shut-off valve activated and therefore ended the cycle prematurely.

Time intervals between A and B can also be set to trap faults, such as crossed threads. From our wide experience of applying the system, we can help you to configure the system to signal these and other faults.