

RoCon[®] Series 6



Electronic Rotational Speed Change Sensor

Introduction

Members of the Schenck Process Group, Stock® are leading providers of feeding, automation and bulk solids handling solutions.

The Schenck Process Group are global market leaders for solutions in measuring and process technologies in industrial weighing, feeding, screening and automation.

Always close to the customer, with an unrivalled global network of operating companies Stock® are your competent global partner for weighing, feeding, screening and automation solutions throughout the process industries.



Our philosophy is based on...

- ◆ Continuous product development
- ◆ Best practice approach to applications
- ◆ Raising industry standards



Capabilities

- ◆ Single machine
- ◆ Multiple machines
- ◆ System solutions
- ◆ Installation & commissioning
- ◆ Plant layout & integration
- ◆ Engineering & contract management
- ◆ Professional customer service approach



Industries

- ◆ Power, Coal, Steel, Cement, Mineral, Chemical, Grain Processing, Brewing/Malting, Flour/Feed, Food, Particle Board, Recycling, Waste Water Treatment

The Schenck Process Group develops, manufactures and markets a full range of solutions, products and turnkey systems on the basis of combining process engineering expertise, reliable components and field-proven technology.

Members of the Schenck Process Group are:

schenckAccuRate  redler 
schenck process group

screenex  stock 
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macprocess  fairfield 
schenck process group

schenckprocess  clydeprocess  pentec 
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How it Operates

A self-contained sensor is employed to sense blades on a target rotor mounted on the driven shaft.

The unit operates on a digital principle, the response time being inversely proportional to speed, i.e the higher the speed the shorter the response time.

Switching occurs when the frequency of the blades passing the sensor corresponds to the threshold frequency. On dropping below the threshold the sensor de-activates.

Standard Units

Allows a machine to 'run up to speed'. If normal running speed is not achieved within 10 seconds the sensor switching current is interrupted.

Pre-set to activate at the min speed of 0.8 rev/min.

Adjustable on site. (On request, units can be supplied to activate at a specified speed.)

DSEAR/ATEX

The RoCon[®] Series 6 complies fully with the Dangerous Substances and Explosive Atmospheres Regulations 2002 and the requirements of Category 2 & 3 Equipment.

It is suitable for use in Zone 21 & 22 conditions.

Typical Applications

Rotation / no rotation detection of a shaft

In the event of machine failure the RoCon[®] provides a control signal to stop and protect the machine. Used within single or multiple machine control systems.

Sequence interlocking at start-up

Ensures each machine in series is running before the preceding machine starts.

Automatic emergency shut down

The emergency stopping of one machine fitted with RoCon[®] is signalled enabling preceding machines to be stopped so preventing a cumulative breakdown.

Unit Housing and Enclosure

The housing is moulded from corrosion resistant glass reinforced polyester resin. Colour Orange.

Enclosure protection is to IP657 to BSEN 60529 - temperature range -25 to +70°C and complies with temperature class T6 to BS 4683 and IEC 79.8.

Special units for hazardous areas

These units can be supplied for use with the client's approved speed monitor to form an 'Intrinsically Safe System'. The RoCon[®] details provided within this leaflet Do Not Apply. Call Redler

RoCon® Series 6 Rotational Control Unit

Sensor Design

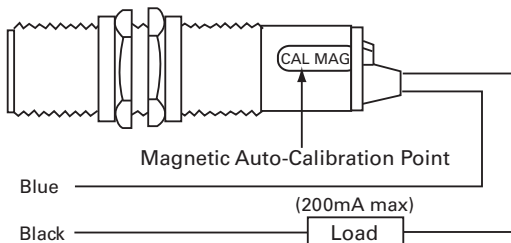
The RoCon® can be wired into the starter circuit of the control system, or used to give an input directly to a PLC. The sensor provides an open circuit when de-energised operating from a 24 to 240V AC/DC 50 Hz supply. For maximum safe operation wiring into the starter circuit is to be preferred as the RoCon® is still functional if manual operation of the system can bypass the PLC control.

Connection to the sensor is two wire.

Sensor Part Order No. 0048/3048

Approval

Type: M300222B Baseefa03ATEX0674X (C)
 Ex II 1D T100°C Tamb -15 to +50°C IP65 1180



Variations and Optional Extras (a - d)

Without start-up delay

For use with relays, timers and PLC's in automatic control circuits.

Low speed range

Used in conjunction with a ten-bladed sensor target, a selectable speed range of 0.4 to 50 rev/min is available.

Pre-set switching speed units

These units can be supplied to activate at any speed within the range.

- a) Foot mounting bracket (b) Junction box
 c) Shaft connection guard (d) Inspection test certificate

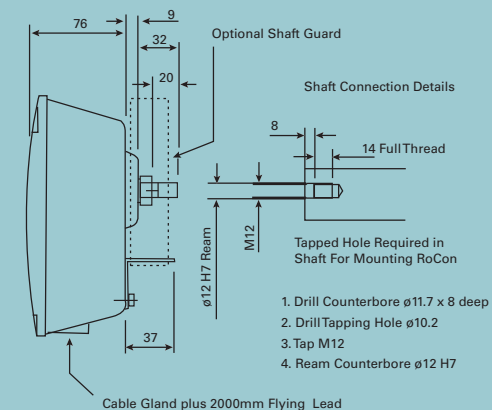
Features and Benefits

- ❖ MULTIVOLTAGE Operation
- ❖ Speed range of 0.4 to 720 rev/min
- ❖ The Security and Protection of both machinery and system in the event of a machine failure.
- ❖ Protection to IP657 BSEN 60529
- ❖ Speed change detection unit Detecting - Mechanical failure, Overspeeding, Underspeeding

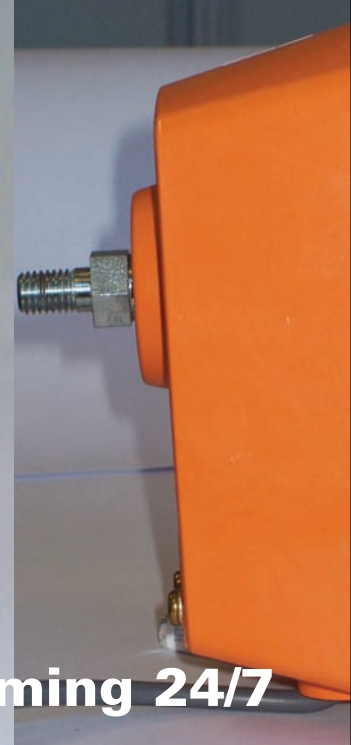
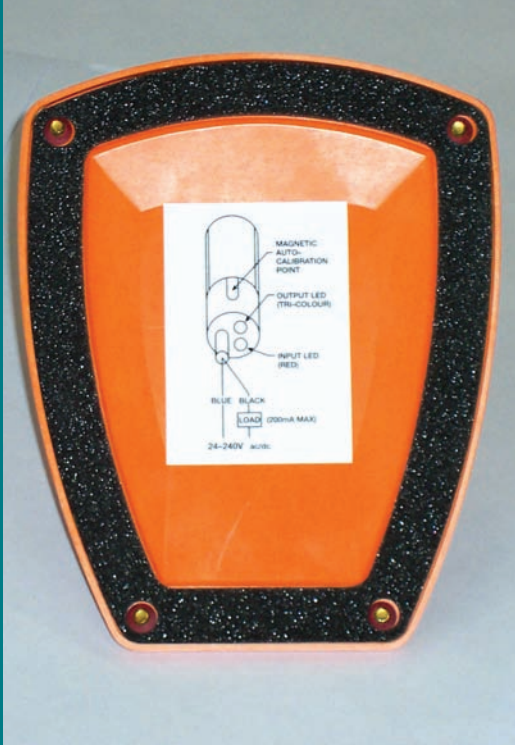


Sensor Specification

- ❖ **Supply:** 24-240 Volts AC/DC
- ❖ **Fusing:** Supply to be fused at 5A max
- ❖ **Switching Capacity:** 200mA max
- ❖ **Saturation Voltage:** 8 Volts Max. (Output On)
- ❖ **Ambient Temperature:** -15 to +50 °C
- ❖ **Output State:** Normally closed above set speed
Normally open below set speed
- ❖ **Input Pulse Range:** 10-3600 ppm
- ❖ **Maximum Voltage Drop (closed):** 8 Volts
- ❖ **Maximum Leakage Current (open):** 1.6mA
- ❖ **Minimum Switching Current:** 5mA
- ❖ **Hysteresis:** 1% typically
- ❖ **Sensor Enclosure:** ISO threaded 30mm by 1.5 pitch, PET/PEN co-polymer.
- ❖ **Sensor Protection:** IP65 **Relative Humidity:** 90% RH
- ❖ **Red Input LED:** Target sensed
- ❖ **Coloured Output LED:**
- ❖ **Green:** Normal Status
- ❖ **Orange:** Programming not accepted, unit has defaulted back to default setting and requires re- programming.
- ❖ **Red:** Sensor needs re-calibrating, follow recalibration procedure.
- ❖ **Connections:** 2 wire lead. See wiring diagram.



- ❖ Supplied ready to fit
- ❖ Self-contained
- ❖ On-site adjustable speed switching
- ❖ Low cost installation
- ❖ Compatibility with PLC systems



Performing 24/7

**Typical Wiring Diagrams:
Directly Connected into Starter Circuits**

❖ **Standard Units With Time Delay**

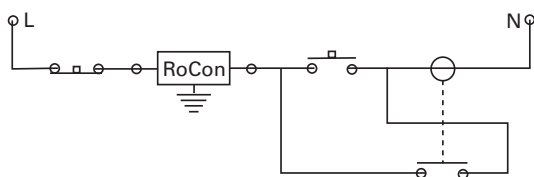
The RoCon® is wired in series with the stop push button and when operated the RoCon® conducts for 10 seconds to allow the machine to run up to speed. After 10 seconds the machine rotation maintains the RoCon® in a conducting state. If the machine's speed drops below the switching speed the RoCon® will cease conducting thus releasing the machine starter.

NOTE: The start up delay is initialised when the sensor is powered up from an open circuit condition.

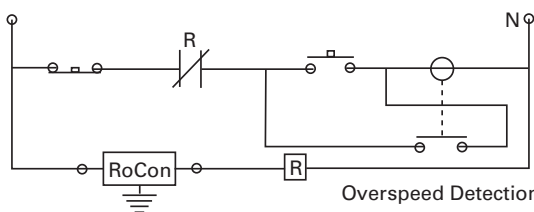
❖ **Units Without Time Delay**

Units are normally used with relays, timers and PLCs in automatic control circuits. Relay connection to the RoCon® will energise when the machine reads the pre-set speed and will release in event of underspeed. RoCon® can also be used to detect overspeed and a typical circuit shown.

WARNING: If the starter coil current is greater than 200mA, an interposing relay **MUST** be used or damage to the sensor will occur



Underspeed Detection



Overspeed Detection

**Typical Wiring Diagrams:
RoCon Units For PLC Applications**

❖ **Start-Up Delay**

Most installations require machines to run up to speed and the standard RoCon® (ref: 045/2080/01) has a 10 second delay to allow for this process. If the delay is to be programmed into the PLC then the version of the RoCon® without an inbuilt delay (ref: 045/2080/11) should be used.

Interfacing with the PLC (and miniature relays)

❖ **AC circuits**

The two wire sensor in the RoCon® is directly applicable to AC input devices and relays provided the 5mA sensor switching current is exceeded and a leakage current of greater than 3mA does not inhibit the OFF state.

When leakage current causes a problem a 'Reactive Load Module' can be provided for wiring in parallel with the load. This unit is a Watt-less device that adds to the total load, but generates almost no heat. It is therefore preferable to ballast resistors and can be used where multiple devices are wired in close proximity.

Safety Information

- ❖ The electric cable must NOT be used to retain the rotation of the unit. The aluminium strap must be secured to the back of the unit with the bolt provided, and locked against a suitably secure structure.
- ❖ Any work on electrical parts may only be undertaken by suitably competent person, observing the relevant electrical safety regulations.

- ❖ The fixing bolt into the shaft MUST be tightly fitted. A standard 19mm A/F spanner should be used to tighten the unit onto the shaft.
- ❖ Unit must be installed in accordance with the design drawings of the plant and the installation drawings included with the unit.
- ❖ Do not apply any external loads to the unit when fitted.
- ❖ Injury may result from opening the unit whilst live or whilst in operation.

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Sensor Adjustment & Recalibration

The sensor start-up delay and speed activation threshold can be adjusted on-site as follows:

- ❖ Start up machine and allow time for it to attain normal running speed.
- ❖ The sensor has two LEDs for information purposes, the input LED is red and flashes every time rotor passes the front face of the sensor. The output LED is tri-colour. Under normal conditions the output LED is green, under fault conditions the LED may be orange or red. See the specification table for fault codes.
- ❖ Whilst the magnet is placed against the target the output LED will flash at one second intervals, as a guide to the time delay. When the magnet is removed, the output LED will again flash at one second intervals, to confirm the start-up delay and at the same time the unit will self-calibrate to 20% under the monitored speed.
- ❖ If zero start-up delay required, allow the machine to reach running speed, then touch the target with the magnet and instantly remove.

Important Safety Information



Caution:

- ❖ **Danger from rotating internal parts**



- ❖ **Danger from electric shock when live.**

These instructions must be read prior to installation of the RoCon[®] unit. Only suitably competent and authorised personnel should attempt to install or maintain this unit.

RoCon control units are an integrated part of the safety concept for the prevention of accidents worked out for our machines and plants.

Shipping / Packing Specification

- ❖ Net weight 1.1kg, gross weight 1.4kg
- ❖ Carton size 210 x 170 x 160mm

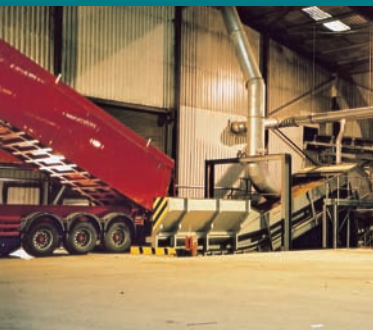


FloMaster®

Circular Bin Discharger

- ❖ Fitted beneath circular silos or bins
- ❖ Positive discharge of difficult materials
- ❖ No bridging or blockage at the silo outlet
- ❖ Compact construction
- ❖ Versatile in material control
- ❖ Single, Two or Three Stage units
- ❖ Totally enclosed
- ❖ Safe/good access for maintenance

Other Redler Technologies



IntraBulk®

Bulk Reception Unit

- ❖ Above ground intake
- ❖ Feed from road vehicle or loader
- ❖ Fast vehicle turn around time
- ❖ Can act as a buffer store
- ❖ Controlled discharge into process
- ❖ Modular heavy duty construction
- ❖ Quick installation & commissioning



FulFiller®

Container Loader System

- ❖ Modular portable unit
- ❖ High speed filling of containers
- ❖ Maximises available storage capacity
- ❖ Meets logistics industry criteria
- ❖ Safe/good access for maintenance



MoveMaster®

Conveyors & Elevators

Where industrial processes require materials to be transported horizontally, vertically or up inclines, Redler® select the appropriate equipment based on a careful analysis of each specific set of conditions within the process.

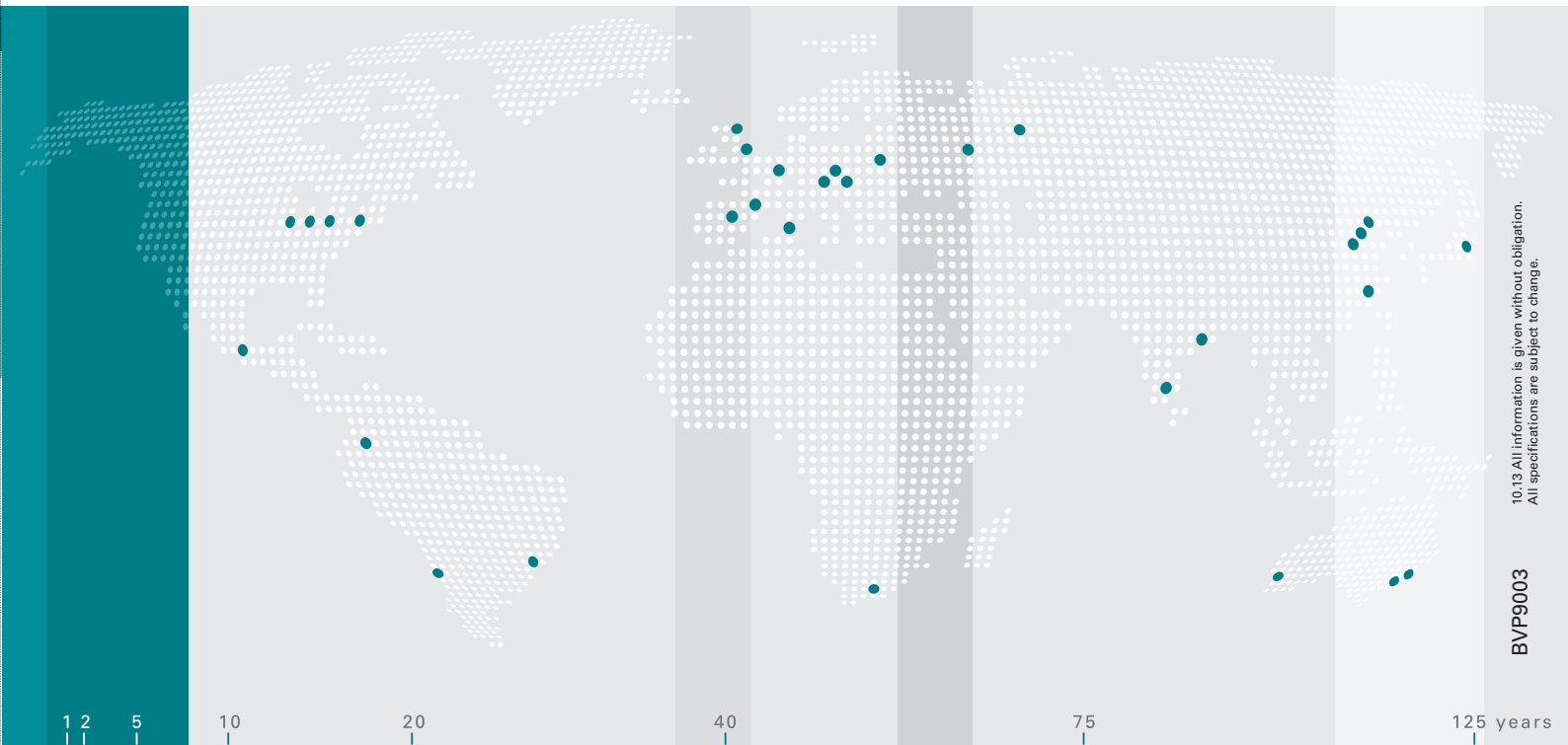
- ❖ Capacities 1-2000 tonnes per hr
- ❖ Worldwide references



PortBulk®

Mobile Reception Hopper

- ❖ Portside applications
- ❖ Grab entry into hopper
- ❖ Integral dust suppression
- ❖ Heavy duty construction
- ❖ Outloading to vehicles
- ❖ Outloading to transfer system



10.13 All information is given without obligation.
All specifications are subject to change.

BVP9003

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