



September 2007

## Process Control Principles

### Historical September



12th September 2003

Country music's 'Man in Black', Johnny Cash dies in Nashville, Tennessee. He was 71 years old



21st September 1998

U.S. TV Networks broadcast President Bill Clinton's testimony explaining his involvement with Whitehouse intern Monica Lewinsky



24th September 1988

Ben Johnson scorchs to the 100m title at the Seoul Olympics in a World record 9.79 seconds. 2 days later he was stripped of his title

### What is an Actuator?

In most control loops the controller itself does not alter the output level to the process directly but uses its output to activate an 'actuator' or control device.

The most simple actuator is a power contactor. If the controller closes its contact, the power contactor is activated and electrical energy is fed to the process.

This is ideal for slow processes that do not require frequent switching.

### Thyristor Power Regulators

Faster control loops use continuous analog outputs. Binary switching mechanisms such as contactors or solid state relays are not able to provide the necessary stability.



### Shimaden PAC 16 Single Phase Regulators

Thyristor power regulators operate in two modes; *phase cut* and *zero voltage switching*.

### Phase Cut Control

In this case the Thyristor switches a portion of every half wave through to the load. The size of the portion determines the output (0-100%)



50% Output with Phase Cut Switching



### Shimaden SR90: Excellent Actuator Controllers

### Zero Voltage Switching Control

The Thyristor is turned on and off at a point close to OV. This method of control creates very little noise in comparison to 'phase cut'.

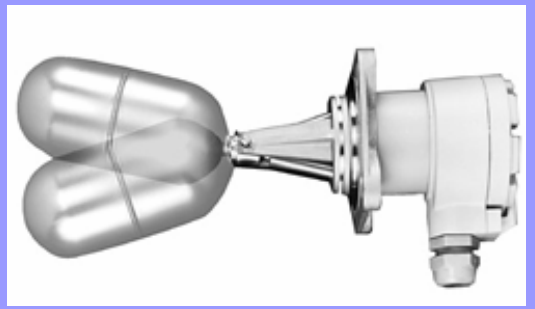


50% Output with Zero Voltage Switching

Zero voltage switching control can also be set to a 'burst-firing' mode. In this guise a pre set number of supply voltage cycles can be switched through the load and between cycles the voltage is shut off.

The switching time for such control is so short that it is considered to be continuous.

Nivelco manufacture some well priced level switches for a variety of applications. Probably the most popular is the NIVOMAG MKA-210 units (below) used extensively in the Bitumen and Petroleum Industries. These switches provide great reliability and easy operation. NIVOMAG MKA's are Lloyd (GL) certified units



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For almost 25 years Intech Instruments have been operating throughout New Zealand, servicing a variety of industries. Our product range is made up of both our own high quality manufactured products plus a range of first class imported items.

Our core business is concerned with supervisory, monitoring and control – utilising hardware and software facilities to provide a host of solutions for end users.

Based in Christchurch, where we have both a sales and service operation, Intech Instruments also have offices in Auckland and Hawkes Bay.

With a combination of industrial experiences and technical skills, Intech are able to provide customers with the best possible solutions for a variety of applications.

**Using Slip Rings? Read On.**

**Mercotac** rotating connectors use a unique design principle unlike the sliding, brush contact of a slip ring. The connection is made through a pool of liquid metal molecularly bonded to the contact, which provides a low-resistance stable connection. During rotation the fluid maintains the electrical connection between the contacts without any wear. Get connected, use **Mercotac**.

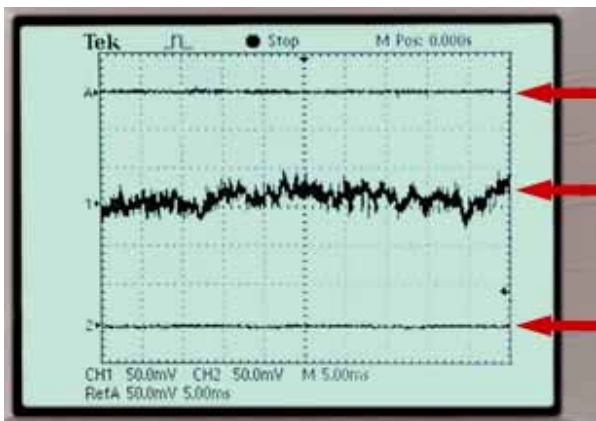
- Increased reliability
- Extremely low electrical noise
- LESS than 1 milliohm resistance
- Sealed ball bearing construction
- Durable, compact and low cost
- Long life



**Model 430 & 1250 Rotary Connectors**



*Intech products are used throughout the wine industry.*



Input Signal from the power supply

Signal after passing through a silver / graphite slip ring - very noisy.

The same signal after passing through a Model 430 - Near Zero Noise



*Intech: Found Worldwide.*

**Trumeter Counters /Timers**



7922/7932 Electronic Counter

Intech hold stocks of Trumeter products for counting, timing and hour meter uses.

Trumeter products have proven to be superbly reliable, user friendly and above all very economic.



7511/HV Self Powered Counter