

# Watchdog Elite

BETTER BY DESIGN

## Watchdog™ Elite Bucket Elevator & Conveyor Hazard Monitor

### APPLICATION

Combined belt alignment, belt speed, continuous bearing temperature, pulley alignment and plug condition monitor for bucket elevators and conveyors.

### METHOD OF OPERATION

The Watchdog Elite system incorporates the latest dual PIC microprocessors and non-volatile (EEPROM) memory chips. An LCD screen displays elevator status messages (available in 4 different languages) and a super-bright LED display shows belt speed. Calibration and set-up parameters are accessed via a password and front panel touch buttons.

### FEATURES

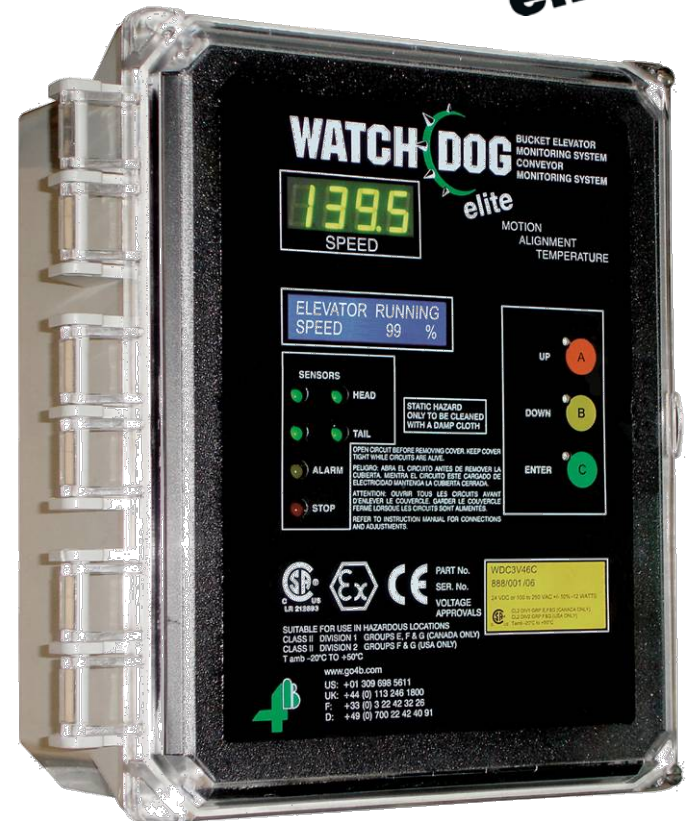
- ▶ Belt Speed Monitoring
- ▶ Belt Alignment Monitoring
- ▶ Bearing Temperature Monitoring
- ▶ Pulley Alignment Monitoring
- ▶ Plug Condition Monitoring
- ▶ Acceleration Monitoring
- ▶ LED Displays
- ▶ RS485 Serial Communication (Standard)
- ▶ PLC Interface (Optional)

### PART NUMBERS/ACCESSORIES

- ▶ WDC3NV46C Watchdog Control Unit
- ▶ TS2V4C Touchswitch - Belt Alignment
- ▶ BS1V4FC Binswitch - Level/Plug
- ▶ ATS7V0FC-FP Autoset Flush Probe - Level/Plug
- ▶ WDA3V34C WDA Motion Alignment Sensor
- ▶ HTAS1V34 WDA Motion Alignment Sensor (High Temp.)
- ▶ P8001V34FC P800 - Proxswitch
- ▶ RSE4VBF Rotech Encoder
- ▶ WDB20V3C NTC Bearing Temperature Sensor
- ▶ WDB70V3C Surface Mount Temperature Sensor
- ▶ ADB20V3C NTC Adjustable Depth Bearing Temp. Sensor - 4 Inch Probe
- ▶ ADB20V3C/D2 NTC Adjustable Depth Bearing Temp. Sensor - 2 Inch Probe
- ▶ ADB20V3C/D8 NTC Adjustable Depth Bearing Temp. Sensor - 8 Inch Probe
- ▶ WDPLCB2V4C PLC Alarm Interface
- ▶ F5004V46C F500 Fieldbus Gateway\*

\* Available Gateways (Must Specify) - Ethernet, DeviceNet, Profibus, Modbus

Detailed specification, wiring diagrams and installation/operating instructions available upon request.



Please refer to instruction manual for correct installation.  
Information subject to change or correction. Dec 2010

# Watchdog Elite

BETTER BY DESIGN

## Bucket Elevator Application A (Plastic Or Steel Elevator Buckets)

### Belt Misalignment



#### Touchswitch -

Contact type electro-mechanical limit-switch with no moving parts, which detects tracking and misalignment problems.

6

### Plug Condition



#### Binswitch -

Capacitance style sensor that can detect plugged spouts, inlets and outlets.

3

#### Autoset Flush Probe -

Heavy duty capacitance style sensor with automatic material build up compensator that can detect plugged spouts, inlets and outlets.



8

### Bearing & Surface Temperature



#### ADB & WDB Series -

1. Grease through, positive mounting, NTC thermistor with user adjustable trip points. ADB series has adjustable depth probes.

2. Surface mount NTC thermistor designed to bolt onto a bearing or gearbox housing.

1

### Speed Monitoring



#### Proxswitch -

Industry standard inductive sensor for detecting belt slip conditions. Shown on boot shaft with the optional Whirligig target/bracket/guard for easy installation.

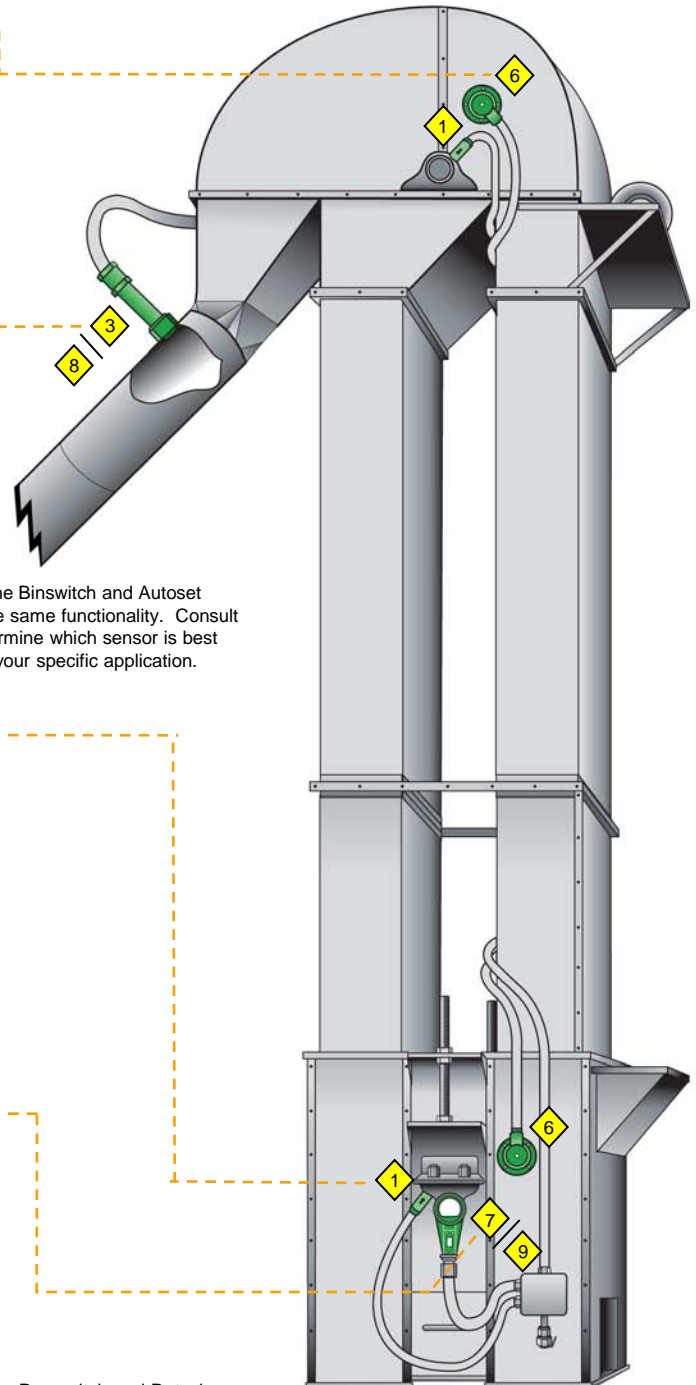
7

#### Rotech Encoder -

Heavy duty option for monitoring underspeed and belt slip conditions. Made from cast aluminum, the Rotech is used in the most severe industrial environments.



9



**NOTE:** The Binswitch and Autoset provide the same functionality. Consult 4B to determine which sensor is best suited for your specific application.

**NOTE:** The Proxswitch and Rotech Encoder provide the same functionality. Consult 4B to determine which sensor is best suited for your specific application.

# Watchdog Elite

BETTER BY DESIGN

## Bucket Elevator Application B (Steel Elevator Buckets)

### Motion (Speed) & Alignment



#### WDA Sensor -

5

Non-contacting extended range sensor used to detect targets which are up to 4 inches from the sensor. High temperature version available (302 F continuous, 356 F max.).

### Plug Condition



#### Binswitch -

3

Capacitance style sensor that can detect plugged spouts, inlets and outlets.

#### Autoset Flush Probe -

Heavy duty capacitance style sensor with automatic material build up compensator that can detect plugged spouts, inlets and outlets.



8

### Bearing & Surface Temperature

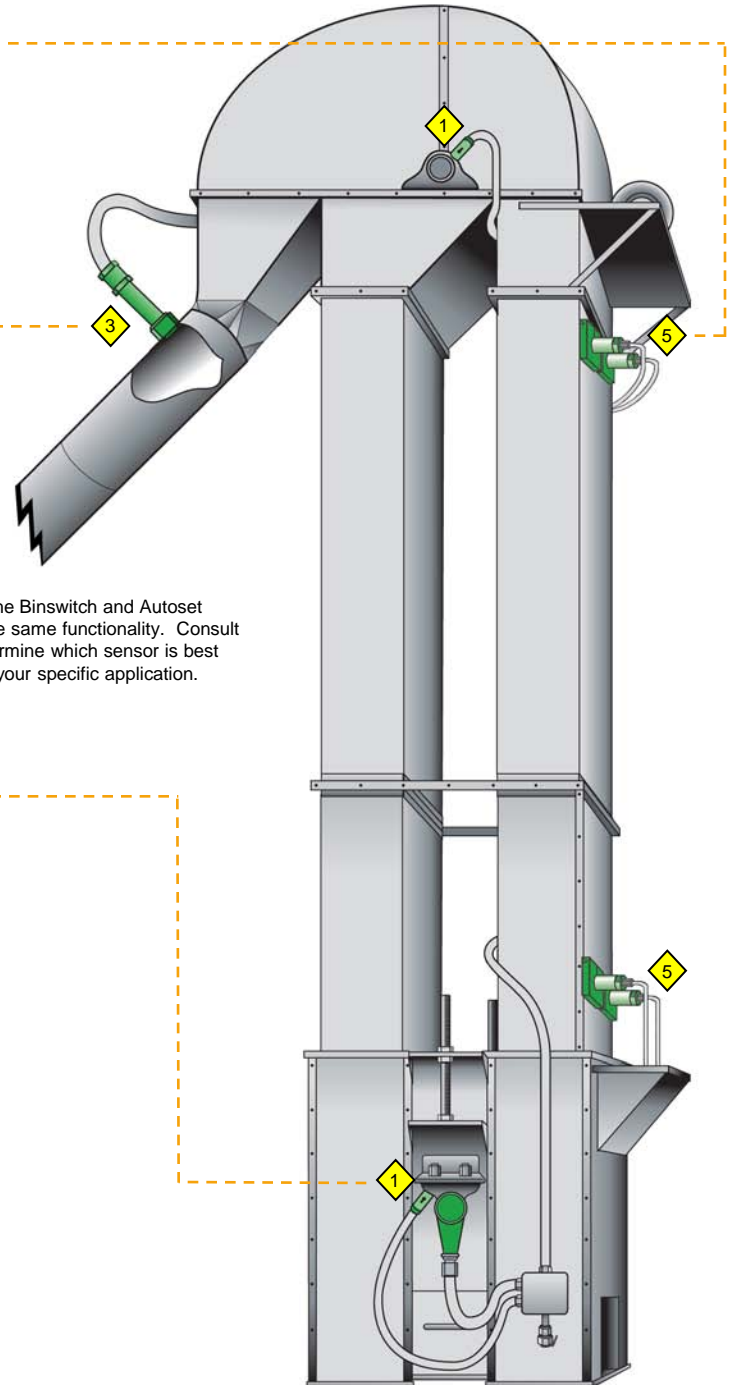


#### ADB & WDB Series -

1

1. Grease through, positive mounting, NTC thermistor with user adjustable trip points. ADB series has adjustable depth probes.

2. Surface mount NTC thermistor designed to bolt onto a bearing or gearbox housing.

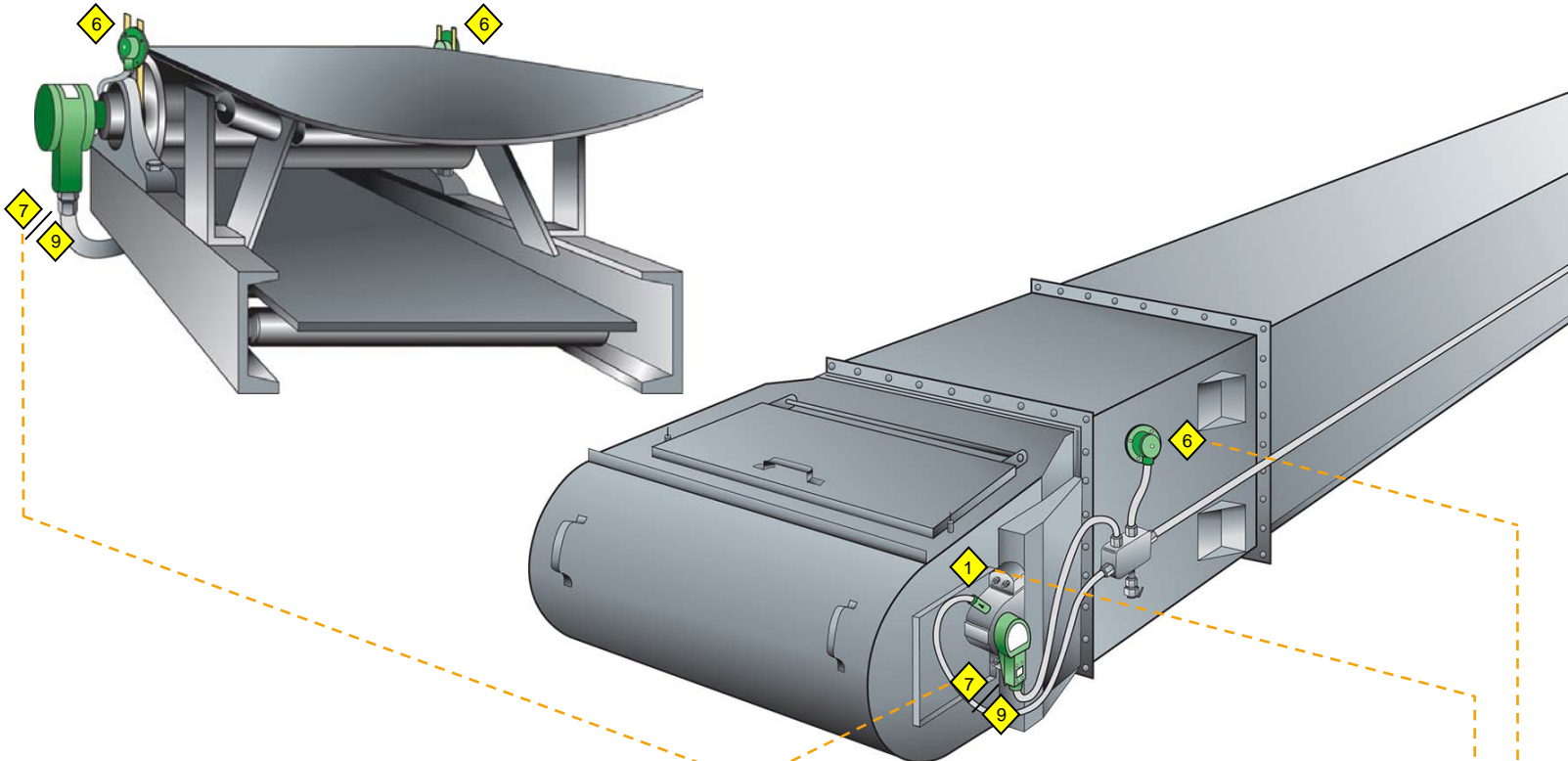


**NOTE:** The Binswitch and Autoset provide the same functionality. Consult 4B to determine which sensor is best suited for your specific application.

# Watchdog Elite

BETTER BY DESIGN

## Standard Conveyor Application (Open & Enclosed)



### Speed Monitoring

#### Rotech Encoder -

Heavy duty option for monitoring underspeed and belt slip conditions. Made from cast aluminum, the Rotech is used in the most severe industrial environments.



9

#### Proxswitch -

Industry standard inductive sensor for detecting belt slip conditions. Shown on boot shaft with the optional Whirligig target/bracket/guard for easy installation.



7

**NOTE:** The Proxswitch and Rotech Encoder provide the same functionality. Consult 4B to determine which sensor is best suited for your specific application.

### Bearing & Surface Temperature

#### ADB & WDB Series -

1. Grease through, positive mounting, NTC thermistor with user adjustable trip points. ADB series has adjustable depth probes.

2. Surface mount NTC thermistor designed to bolt onto a bearing or gearbox housing.



1

### Belt Misalignment

#### Touchswitch -

Contact type electro-mechanical limit-switch with no moving parts, which detects tracking and misalignment problems.



6

# Watchdog Elite

BETTER BY DESIGN

## TECHNICAL SPECIFICATIONS

Watchdog Control Unit - WDC3NV46C	
<b>Power Supply:</b>	110 VAC, 240 VAC or 24 VDC
<b>Power Consumption:</b>	18 VA
<b>Alarm &amp; Stop Relay:</b>	2x Voltage Free Relay Contact (Changeover) Max 10A / 240 VAC
<b>Sensor Inputs:</b>	4 at 24 VDC Digital, 6 at 24 VDC Analog, 1 RS485 Com. Port
<b>Sensor Supply:</b>	24 VDC, 100 mA Available
<b>Speed Range:</b>	20 - 4,000 Pulses/Minute
<b>Construction:</b>	Polycarbonate Enclosure with NEMA Ratings 1, 3, 3S, 4, 4X, and 12
<b>Dimensions:</b>	11" x 10" x 5" (28cm x 25cm x 13cm)
<b>Conduit Entries:</b>	2 at 3/4"
<b>Approval:</b>	CSA Class II, Division 2 - F, G (USA) CSA Class II, Division 1 - E, F, G (Canada)



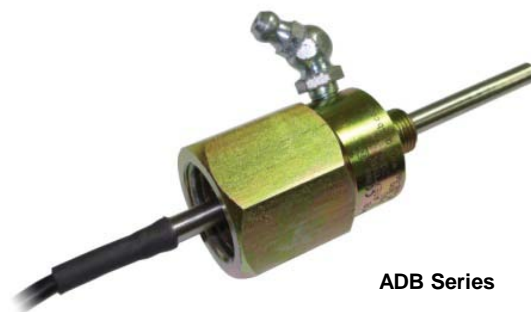
Watchdog Control Unit

1 WDB Series - Bearing Temperature Sensor	
<b>Style:</b>	Grease Through Positive Mounting
<b>Thread Size:</b>	1/8" NPTF
<b>Conduit Entry:</b>	1/2" NPT
<b>Resistance at 77°F:</b>	10,000 Ohms
<b>Resistance at 140°F:</b>	2,487 Ohms
<b>Resistance at 194°F:</b>	916 Ohms
<b>Sensing Voltage:</b>	5 to 24 VDC
<b>Current Draw:</b>	1 mA
<b>Approval:</b>	CSA Class II, Division 1 - E, F, G



WDB Series

1 ADB Series - Bearing Temperature Sensor	
<b>Probe Lengths:</b>	2, 4 and 8 Inches Available
<b>Thread Size:</b>	1/8" NPT
<b>Conduit Entry:</b>	1/2" NPT
<b>Resistance at 77°F:</b>	10,000 Ohms
<b>Resistance at 140°F:</b>	2,487 Ohms
<b>Resistance at 194°F:</b>	916 Ohms
<b>Sensing Voltage:</b>	5 to 24 VDC
<b>Current Draw:</b>	1 ma
<b>Approval:</b>	CSA Class II, Division 1 - E, F, G



ADB Series

# Watchdog Elite

BETTER BY DESIGN

## TECHNICAL SPECIFICATIONS

1 Surface Mount Temperature Sensor - WDB70V3C	
<b>Style:</b>	Surface Mount
<b>Bolt Entry:</b>	5/16" Factory (Can be Drilled to 1/2")
<b>Conduit Entry:</b>	1/2" NPT
<b>Resistance at 77°F:</b>	10,000 Ohms
<b>Resistance at 140°F:</b>	2,487 Ohms
<b>Resistance at 194°F:</b>	916 Ohms
<b>Sensing Voltage:</b>	5 to 24 VDC
<b>Current Draw:</b>	1 mA
<b>Approval:</b>	CSA Class II, Division 1 - E, F, G



Surface Mount

6 Touchswitch (Belt Alignment) - TS2V4C	
<b>Supply Voltage:</b>	24 VDC
<b>Power Consumption:</b>	50 mA
<b>LED Indication:</b>	Power and Relay Energized
<b>Adjustment:</b>	Force Sensitivity Screw (1 to 12 lbs.)
<b>Output:</b>	Voltage Free Relay Contact (Changeover) Max 5A / 250 VAC Non-Inductive
<b>Body Construction:</b>	Pressed Seamless Steel
<b>Face Construction:</b>	Hardened and Annealed Stainless Steel
<b>Conduit Entry:</b>	1/2" NPT
<b>Conductors:</b>	6 at 22 AWG
<b>Dimensions:</b>	3-1/2" Dia x 1-3/4" (89mm Dia x 44.5mm)
<b>Protection:</b>	NEMA 4X, IP65
<b>Approval:</b>	CSA Class II, Division 1 - E, F, G CE and ATEX Available



Touchswitch

7 Proxswitch - P8001V34FC	
<b>Supply Voltage:</b>	24 VDC
<b>Indication:</b>	LED's for Target Detection
<b>Output:</b>	Voltage Free Changeover Relay
<b>Max Input Speed:</b>	5 Hz (300 ppm)
<b>Sensitivity:</b>	Detect Ferrous Object at 1/2" Detect Non-Ferrous Object at 5/16"
<b>Temperature:</b>	5°F to 122°F
<b>Minimal Current:</b>	1 mA
<b>Conduit Entry:</b>	1/2" NPT
<b>Protection:</b>	IP67
<b>Approval:</b>	CSA Class II, Division 1 - E, F, G CE Available



Proxswitch

# Watchdog Elite

BETTER BY DESIGN

## TECHNICAL SPECIFICATIONS

5 WDA Series - Motion Alignment Sensor		
Model:	WDA3V34C	HTAS1V34 (High Temp)
Supply Voltage:	12-24 VDC $\pm$ 10%	12-24 VDC $\pm$ 10%
Supply Current:	65 mA	130 mA
LED Indicator:	Green (Flashing) - Target Detected Green (Off) - No Target Detected	Green (Flashing) - Target Detected Green (Off) - No Target Detected
Outputs (Max):	100 mA Sink (Pull) 50 mA Source (Push)	100 mA Sink (Pull)
Detection Range:	Adjustable 1" - 4" (25mm - 100mm)	Adjustable 1" - 4" (25mm - 100mm)
Detection Rate:	20 - 2000 Targets/Minute	20 - 2000 Targets/Minute
Conduit Entry:	1/2" NPT	1/2" NPT
Temperature Rating:	-14°F to +160°F	-14°F to 302°F Continuous -14°F to 356°F Maximum
Dimensions:	2" Dia x 5-3/4" (50mm Dia x 150mm)	2" Dia x 5-3/4" (50mm Dia x 150mm) - Sensor L 5-1/2" x W 3-1/2" x D 2-1/4" - Interface Box
Protection:	IP66	IP66
Approval:	CSA Class II, Division 1 - E, F, G	CE, ATEX and IECEX Available



WDA Motion Alignment Sensor



WDA High Temperature Sensor with Remote Electronic Box

# Watchdog Elite

BETTER BY DESIGN

## TECHNICAL SPECIFICATIONS

3 Binswitch (Plug Switch) - BS1V4FC	
<b>Supply Voltage:</b>	24 VDC
<b>Power Consumption:</b>	30 mA
<b>Type:</b>	Capacitance Proximity
<b>Operating Temp:</b>	-22°F to +158°F
<b>Sensor Range:</b>	1" (25mm) Typical
<b>Output:</b>	Voltage Free Relay Contact (Changeover) Max 3A / 240 VAC Non-Inductive
<b>Calibration:</b>	Screw Potentiometer
<b>Protection:</b>	IP67 - NEMA 6 and 6P Dust Tight and Water Resistant
<b>Approval:</b>	CSA Class II, Division 1 - E, F, G



Binswitch

8 Autoset Flush Probe (Plug Switch) - ATS7V0FC-FP	
<b>Supply Voltage:</b>	115/230 VAC or 24 VDC
<b>Sensitivity:</b>	0.5 picofarad
<b>Type:</b>	RF Capacitance Proximity
<b>Operating Temp:</b>	-25°F to +160°F
<b>Display:</b>	LED Showing Measured Values
<b>Output:</b>	Voltage Free Relay Contact (Changeover) Max 3A / 240 VAC Non-Inductive
<b>Calibration:</b>	Push Button
<b>Build Up:</b>	Power Shield Automatic Compensation for Material Build Up
<b>Protection:</b>	IP65 - NEMA 4
<b>Approval:</b>	CSA Class II, Division 1 - E, F, G



Autoset Flush Probe

9 Rotech Encoder - RSE4VBF	
<b>Supply Voltage:</b>	10 to 30 VDC
<b>Speed Range:</b>	0.03 - 1500 RPM
<b>Pulse Rate:</b>	4 PPR
<b>Output:</b>	PNP
<b>Body Construction:</b>	Cast Aluminum or Polymer
<b>Weight:</b>	4.5 lbs.
<b>Protection:</b>	IP65
<b>Approval:</b>	FM Approved Class II, Division 1 and Intrinsically Safe Approvals Available



Rotech  
Encoder