



POSITION MONITORING FOR ROTARY VALVES

ACCUTRAK

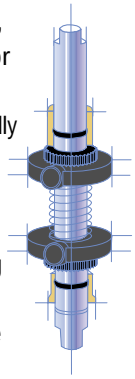
AccuTrak Rotary Valve Position Monitors

- **AccuTrak** Design Features
- **Beacon** Visual Position Monitor
- **Series 1000** General Purpose
- **Series 1200** General Purpose
- **Series 2000** General Purpose / Explosionproof
- **Series 2200** General Purpose / Explosionproof
- **Series 360** Explosionproof
- **Series 3000** Explosionproof
- **Series 4000** Explosionproof
- **Series 5000** Intrinsically Safe
- **Series 7000** All Classes & Groups
- **Series 8000** Multiple Conduit Entry Options
- **Series 9000** All Classes & Groups
- **Position Transmitters**
- **Digital Position Transmitter**
- **EPIC Non-Contact Position Transmitter**

Design Features

Designed around a unique self-locking, spring-loaded TouchSet™ cam mechanism attached to a stainless steel shaft and housed in an NEMA rated aluminum, stainless steel or engineered resin enclosure, the AccuTrak® utilizes bushings at both ends to assure concentric turning of the cams.

For digital signaling to lights, motors, micro processors, or peripheral equipment, two position sensors are standardly housed within the enclosure. The requirement for tools to adjust cam settings is unnecessary. The self-locking TouchSet cam mechanism allows for a quick and simple hand operation in the setting of both sensors. Additionally, the AccuTrak is specifically designed for ease of wiring by the incorporation of abundant working space and a direct wire-feed terminal block. All that is necessary to make the unit operational is the bringing in of electrical leads to a single juncture.



BEACON™ High Visibility Position Monitor

For isolated redundancy of valve position monitoring, the AccuTrak Dual Display Monitor is standardly equipped with a Beacon™ high visibility or Three-Way Flow Path Monitor. Either display can be seen clearly up to 150 feet. In a glance, start-up and operating personnel can instantly determine the position of all monitored valves.

User Design Flexibility

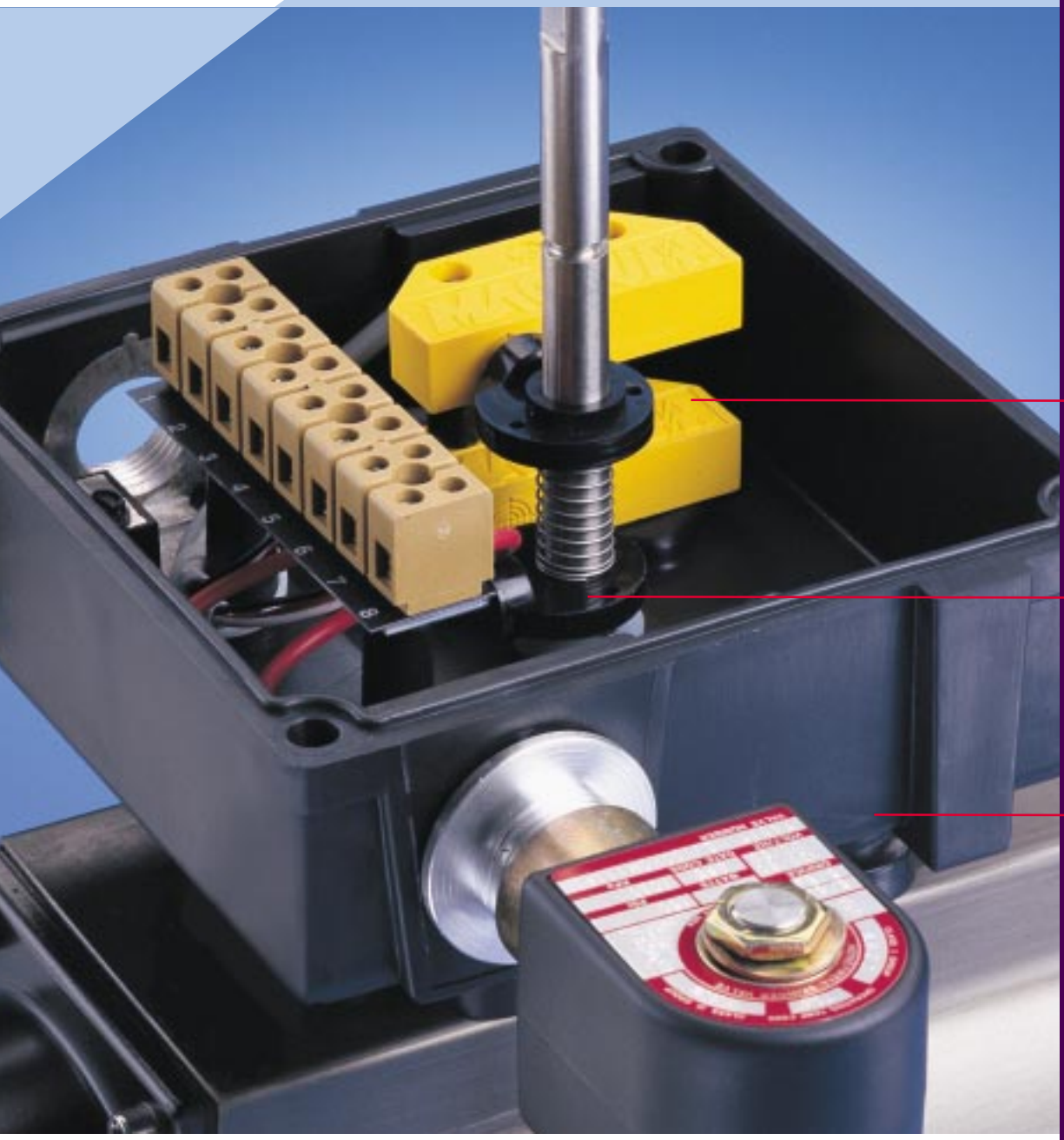
The Dual Display monitor allows the user the flexibility to design a valve monitoring system around processing requirements as the need for additional information is required. The full range AccuTrak offers design and operating personnel the following distinct advantages.

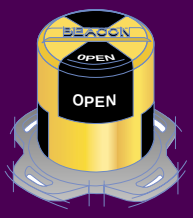
- **Sensors for positive end position monitoring of valve travel.**
- **Local mechanical display of valve position.**
- **0-100% monitoring of full valve travel.**

EACH COMPONENT INCORPORATED INTO THE DESIGN REFLECTS BASIC PRINCIPLES OF SOUND ENGINEERING

- **Beacon® Visual Position Monitors**
- **TouchSet™ Cams**
- **Position Sensors**
- **Prewired Terminal Blocks**
- **Integrated Solenoid Valves**
- **Full Range Monitoring**

Factory Mutual System Approved





Visual Display
Valve performance is mechanically confirmed by high visibility local position monitors.

Position Sensors
Position sensors available in mechanical, proximity and solid state configurations.

TouchSet Cams
Instantaneous hand setting of limit switches requires approximately 5 seconds

Enclosures
High-impact aluminum, engineered resin, or stainless steel enclosures compatible with any environment.

ACCUTRAK®

Position Monitor

Enclosures

Specifically Engineered To Meet All Areas and Groups

The Westlock Series of valve position monitors is available in a wide range of aluminum, engineered resin, and stainless steel enclosures meeting the specific standards set by international approval agencies.

General Purpose

Aluminum:
Area Classification: NEMA 4, 4X
Coating: Double Polyurethane
Conduit Entries: Up to three 1/2" NPT
Terminal Block: Up to 12 contacts

Engineered Resin
Area Classification: NEMA 4, 4X
Material: Engineered Resin
Conduit Entries: Two 1/2" NPT
Terminal Block: Up to 12 contacts
Cover: Zytel or clear copolyester

Explosionproof

Aluminum:
Area Classification:
NEMA 4, 4X, 7, 9
Class I, Groups C & D
Class II, Groups E, F, & G
Division 1 and 2
Coating: Double Polyurethane
Conduit Entries: Up to four 3/4" NPT
Terminal Block: Up to 16 contacts

Explosionproof

Aluminum:
Area Classification:
NEMA 4, 4X, 7, 9
Class I, Groups A, B, C, & D
Class II, Groups E, F, & G
Division 1 and 2
Coating: Double Polyurethane
Conduit Entries: Up to three 3/4" NPT
Terminal Block: Up to 12 contacts

Stainless Steel:
Area Classification: NEMA 4, 4X, 7, 9
Class I, Groups A, B, C, & D
Class II, Groups E, F, & G
Division 1 and 2
Conduit Entries: Up to three 3/4" NPT
Terminal Block: Up to 12 contacts

Nonincendive

Aluminum:
Area Classification: NEMA 4, 4X
Class I, Groups A, B, C, & D
Class II, Groups F & G
Division 2
Coating: Double Polyurethane
Conduit Entries: Up to four 3/4" NPT
Terminal Block: Up to 16 contacts

Engineered Resin:
Area Classification: NEMA 4, 4X
Class I, Groups A, B, C & D
Class II, Groups F & G
Division 2
Material: Engineered Resin
Conduit Entries: Up to three 3/4" NPT
Terminal Block: Up to 16 contacts

Intrinsically Safe

Aluminum:
Area Classification: NEMA 4, 4x
Class I, Groups A, B, C, & D
Class II, Groups E, F & G
Division 1 and 2
Coating: Double Polyurethane
Conduit Entries: Up to four 3/4" NPT
Terminal Block: Up to 16 contacts

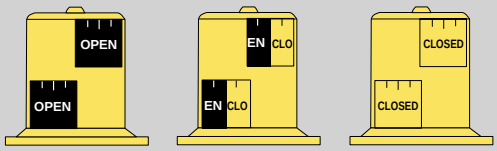
Engineered Resin:
Area Classification: NEMA 4, 4x
Class I, Groups A, B, C, & D
Class II, Groups E, F, & G
Division 1 and 2
Material: Engineered Resin
Conduit Entries: Up to three 3/4" NPT
Terminal Block: Up to 16 contacts

Beacon™

Visual Position Monitor

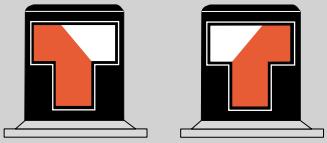
Impact and Corrosion Resistant Visual Position Monitors

POSITION MONITORS



VALVE IN OPEN POSITION | VALVE IN 50% OPEN POSITION | VALVE IN CLOSED POSITION

3-WAY FLOW PATH MONITOR



VALVE IN POSITION A | VALVE IN POSITION B

For Actuated Valves, Gear Operators, Dampers and Three-way Control Assemblies

The high visibility Beacon™ position monitor is designed to increase safety and efficiency in the industrial process plant. Start-up engineers and operating personnel may now determine at a glance the exact position of automated and gear operated valves. Operating problems, caused by actuators having no means of position identification or conventional low-profile indicators seen only when operating engineers are virtually on top of the valve, are easily remedied with the Beacon™.

Beacon Principle of Operation

The Beacon is a totally enclosed monitoring instrument devoid of any external moving parts. When the control valve is in a closed position, operating personnel view a highly visible yellow cylinder. As the valve opens and becomes fully operational, the yellow cylinder is transformed into a sharp-edged yellow and black checker pattern designed for maximum visual impact and easily recognizable at distances of 150 feet.

Features

- **Manufactured from high impact strength, corrosion resistant, clear Ektar® copolyester.**
- **Increases safety for plant personnel.**
- **Offers instant visual recognition of valve position from all vantage points up to 150 feet.**
- **360° color coding for maximum visual impact.**
- **Totally enclosed instrument devoid of any external moving parts.**

PHYSICAL PROPERTIES

Tensile Strength @ Break psi	6,400
Izod Impact Strength, notched @ 73°F, ft-lb/in	>16
UV Resistance	Yes
Clarity	Yes
Heat Deflection Temperature-HDT@ 264 psi,°F	151
UL Flammability Rating	94HB

CHEMICAL RESISTANCE @ 23° C

REAGENT	OBSERVATION
10% Sodium Hydroxide	No visible effect
Chlorox Bleach, 5% Solution	No visible effect
Salt Water	No visible effect
20% Sulfuric Acid	No visible effect
Gasoline, Regular	No visible effect
Hydraulic Fluid	No visible effect
50/50 Water/Ethanol	No visible effect
Ethanol	No visible effect
Methanol	No visible effect
Benzyl Alcohol	No visible effect

Beacon™

Flow Path Monitor

Multiport Flow Path Monitor

The Multiport Flow Path Monitor is a unique and invaluable accessory for any three-way control assembly. Whether gear-operated or automatically controlled, valve flow path and position are immediately recognizable and accurately monitored. Guesswork is eliminated and process system information is safely, economically, and reliably supplied to operating and start-up personnel.

Principle of Operation

The Beacon Flow Path Monitor mounts directly to the valve operator. It is dimensionally equal to the Beacon, having the same operating temperature limits. The outer cylinder is comprised of a graphic flanged tee arrangement, offering a clear view of the inner cylinder. The inner cylinder designates the flow path by a highly visible red pattern. This pattern will appear to viewing personnel through the clear outer tee.

Features

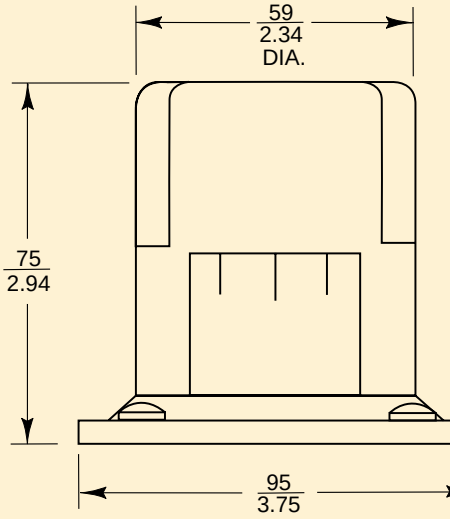
- **Provides a concrete measure of valve performance.**
- **Monitors valve position while visually displaying flow path.**
- **Eliminates guesswork and reduces costs at system start-up.**
- **Offers positive mechanical monitoring of multiport control valves.**

ORDERING GUIDE

BEACON™	3-WAY BEACON™
STANDARD (Black & Yellow) **BY**	90° Rotation **B1**
ANSI YELLOW (Inherently Hazardous) **AY**	90° Rotation **B3**
ANSI GREEN (Liquid-Low Hazard) **AG**	90° Rotation **B5**
ANSI BLUE (Gas-Low Hazard) **AB**	180° Rotation **B7**
ANSI RED (Fire Quenching) **AR**	180° Rotation **B9**

Note: When ordering, please specify actuator make and model number.

DIMENSIONS (mm/inches)



Engineered Resin Enclosure with Beacon Visual Position Monitor

AccuTrak® 1000

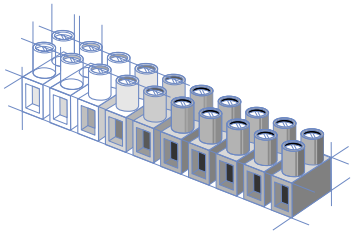
General Purpose

Designed to Survive in Corrosive Environments

High performance polyamide resins, such as Zytel®, offer a viable alternative to metal enclosures for applications where caustic washdowns, chloride atmospheres and saltwater environments are a daily occurrence. The "Supertough" AccuTrak Series 1000 combines chemical resistance with high-impact strength and immunity to weathering. Unaffected by electrolytic corrosion and high concentrates of alkalies, the Series 1000 is remarkably resistant to attack from bacteria and fungi; a feature especially important in food and beverage processing plants

Advanced Composite NEMA 4, 4x Enclosure

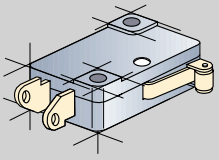
Available in solid Engineered Resin or with clear copolyester covers, the Series 1000 combines strength with corrosion resistance. Each unit carries a UL flammability rating of 94-HB.



Prewired Terminal Block

Prewired terminal blocks are numbered and color-coded. Generous working space for wiring.

Standard Sensor Options

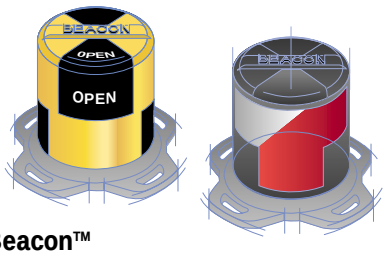


Micro-Switch V3 (Mechanical)

Approvals: UL, CSA

Electrical Version	SPDT Form C
Electrical Characteristics	15 amps/125/250 VAC
	10 amps/24 VDC
	.5 amps/125 VDC
	.25 amps/250 VDC

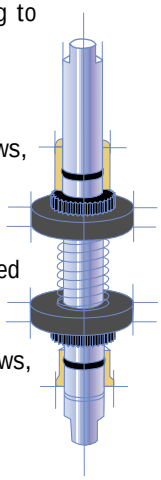
AccuTrak® 1000



Beacon™

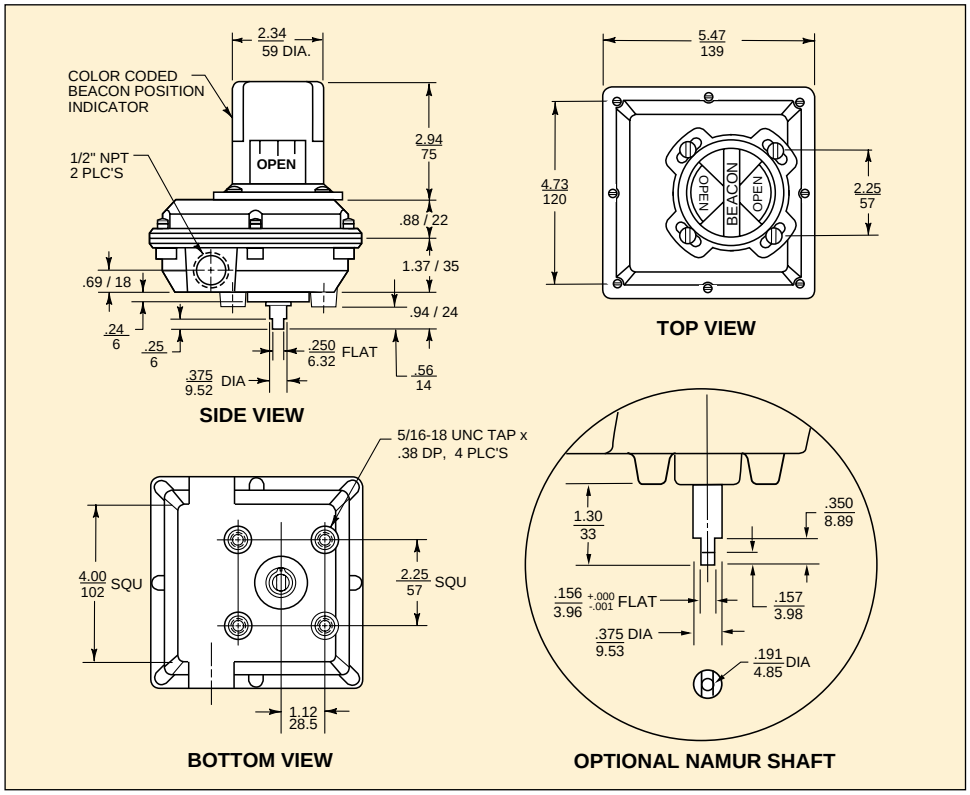
An impact and corrosion resistant valve position monitor capable of displaying exact valve position from any quadrant at distances of up to 150 feet. Start-up and operating personnel avoid being placed in physically awkward or dangerous situations while attempting to ascertain valve position.

TouchSet™ Cams



Cams, secured by set screws, continually lose calibration due to vibration inherent in all pipelines. Self-locking Touchset™ cams are fastened to a splined shaft and can be set by hand in seconds. Since there are no set screws, the cams will never slip out of adjustment.

DIMENSIONS (inches / mm)



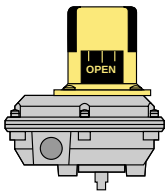
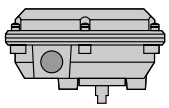
ENCLOSURE	
Conduit Entries	2 - 1/2"NPT
Terminal Strip	8 point standard 12 points optional

MATERIALS OF CONSTRUCTION	
Housing	Engineered Resin
Cover	Engineered Resin (Optional Clear Copolyester)
Shaft	Stainless Steel
Fasteners	Stainless Steel
Beacon Monitor	Copolyester

AREA CLASSIFICATIONS
NEMA 4, 4x

APPROVALS / CERTIFICATION
CSA (Canadian Standards Association)

ORDERING GUIDE

ENCLOSURE	BEACON™	3-WAY BEACON™
1040 2 SPDT mechanical switches NEMA 4, 4x 	**STANDARD** (Black & Yellow) **BY**	90° Rotation **B1**
	ANSI YELLOW (Inherently Hazardous) **AY**	90° Rotation **B3**
	ANSI GREEN (Liquid-Low Hazard) **AG**	90° Rotation **B5**
	ANSI BLUE (Gas-Low Hazard) **AB**	180° Rotation **B7**
	ANSI RED (Fire Quenching) **AR**	180° Rotation **B9**
1065 2 SPDT mechanical switches NEMA 4, 4x  No output shaft (cannot accept beacon)		

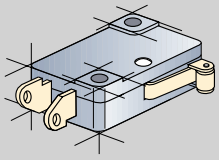
Compact Engineered Resin Enclosure

AccuTrak 1200

General Purpose

The AccuTrak 1200 Series is an extremely compact corrosion resistant valve position monitor having the capability to house two mechanical V3 switches. The new Series 1200 provides the process control industry with a highly engineered, cost-effective means for monitoring the position of rotary valves. An FM and CSA approved NEMA 4, 4X engineered resin enclosure assures both strength and corrosion resistance. TouchSet cam mechanisms allow for instantaneous and secure adjustment of position switch actuation. Two 1/2" NPT conduit entrances with two extra terminal points are standard features allowing for electrical integration of solenoid valves.

Standard Sensor Options

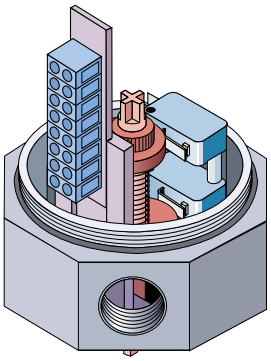


Micro-Switch V3 (Mechanical)

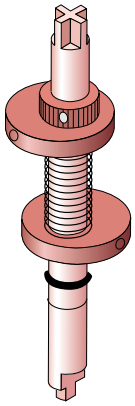
Approvals: UL, CSA

Electrical Version	SPDT Form C
Electrical Characteristics	15 amps/125/250 VAC
	10 amps/24 VDC
	.5 amps/125 VDC
	.25 amps/250 VDC

AccuTrak® 1200

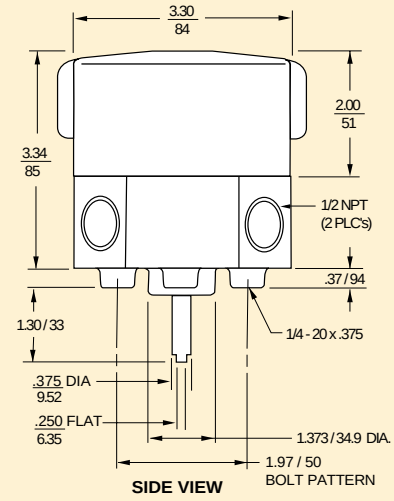


An easy access slide-out terminal block having an extra two points for solenoid valve integration provides for simplicity of wiring and economy of space.

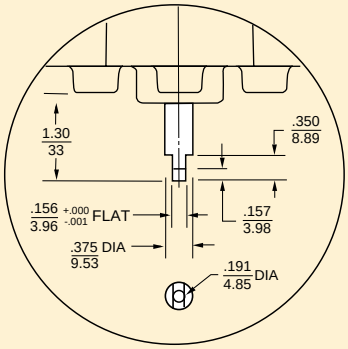


Self-locking TouchSet™ cams are securely fastened to a splined shaft and can be quickly and accurately adjusted by hand in seconds.

DIMENSIONS (inches / mm)



SIDE VIEW

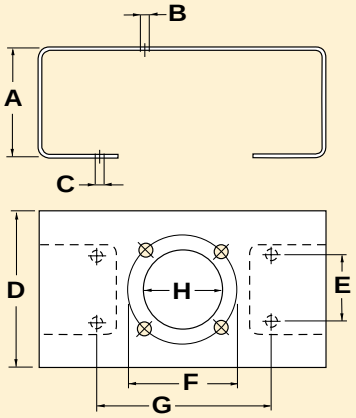


STANDARD NAMUR SHAFT

NAMUR MOUNTING BRACKETS

(dimensions in mm)

Dim.	Size 1	Size 2	Size 3	Size 4
A	45	55	55	75
B	6.5	6.5	6.5	6.5
C	5.5	5.5	5.5	5.5
D	54	54	54	54
E	30	30	30	30
F	50	50	50	50
G	80	80	130	130
H	35	35	35	35



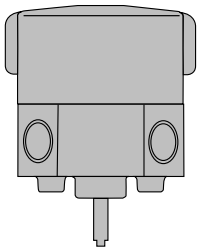
AREA CLASSIFICATIONS
NEMA 4, 4x

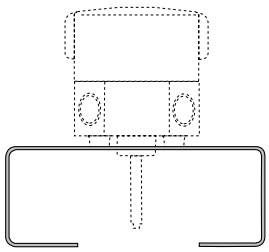
ENCLOSURE	
Conduit Entries	2 - 1/2" NPT
Terminal Strip	8 points

MATERIALS OF CONSTRUCTION	
Housing	ABS 633
Cover	ABS 633 (Optional Clear Copolyester)
Shaft	Delrin
Fasteners	Stainless Steel

ORDERING GUIDE

ENCLOSURE	NAMUR BRACKETS
1200 With 2 Micro Switch V3 Mechanical Switches NEMA 4, 4x	SIZE **1** **2** **3** **4**





AccuTrak® 2000

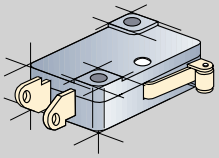
General Purpose/Explosionproof

Dual Display Monitor with Beacon® and TouchSet® Cams

High Visibility Position Monitoring

The AccuTrak 2000 is designed to enable the process engineer to add as much feedback from a control valve as the situation requires. The NEMA 4, 4x, 7, 9 rated aluminum enclosure is equipped with two mechanical switches and a Beacon high visibility monitor for instant recognition of valve position up to distances of 150 feet. A unique self-locking, spring-loaded TouchSet cam mechanism allows for instantaneous hand setting of limit switches requiring only five seconds each. A pre-wired numbered and color coded terminal block provides ease and convenience of wiring. Optional analog transmitters provide full range monitoring of valve position throughout a 0-100% range. Point to point limit switch signalling combined with continuous on-site visual monitoring and optional analog output are all available in one compact UL/CSA enclosure.

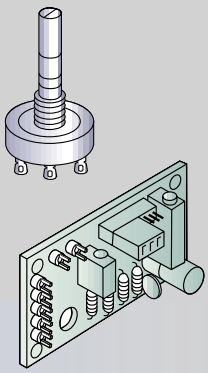
Standard Sensor Options



Micro-Switch V3

SPDT (V3)			DPDT (Licon)	
AMPS	VAC	VDC	AMPS	VAC
15	125		10	125
15	250		10	250
10		24		
.50		125		
.25		250		

0-100% Position Transmission



Resistive Output Signal

Standard Output Signal	1000 ohms
Power Rating at 70°C	1 watt
Elements	Conductive Plastic
Rotational Life (no load)	100,000 cycles

Current Output Signal

Standard Output Signal	4-20 mA DC, 2 wire
Power Requirements	5-38 VDC
Max. Load Resistance at 24 VDC	950 ohms
Operating Temperature	-24°C to 85°C

AREA CLASSIFICATIONS

NEMA 4, 4x, 7, 9
Class I, Groups C, D
Class II, Groups E, F, G,
Divisions 1 & 2

ENCLOSURE

Conduit Entries	NEMA 4: (1) 1/2" NPT NEMA 4, 4x, 7, 9: (2) 3/4"NPT
Terminal Strip	8 contacts standard 16 contacts available

MATERIALS OF CONSTRUCTION

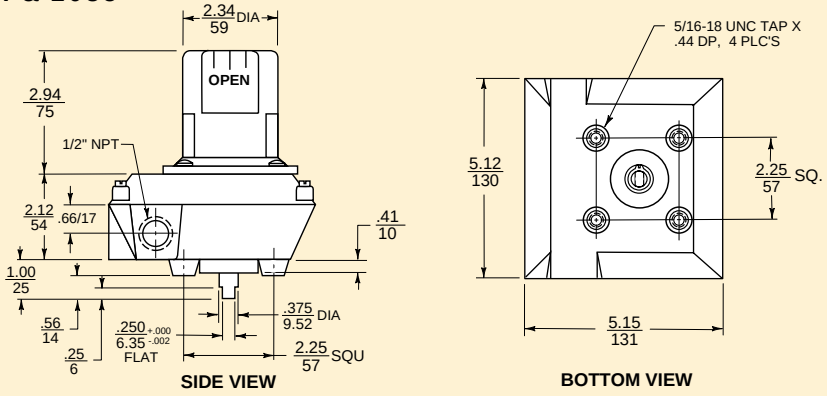
Housing	Die Cast Aluminum
Cover	Die Cast Aluminum
Coating	Polyurethane
Shaft	Stainless Steel
Fasteners	Stainless Steel
Beacon	Copolyester

APPROVALS / CERTIFICATION

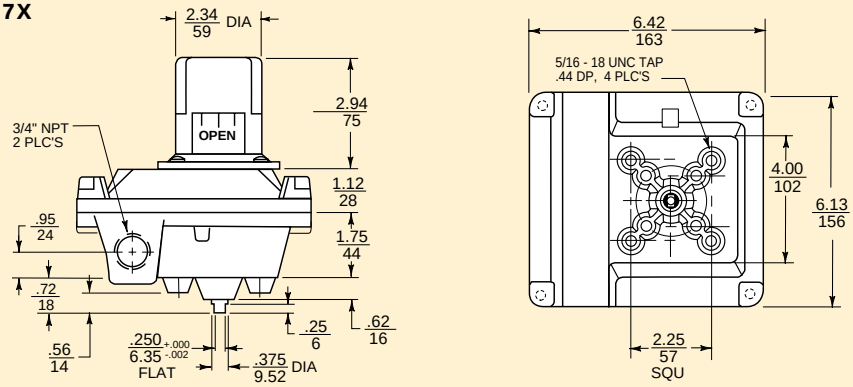
UL (Underwriters Laboratories, Inc.)
CSA (Canadian Standards Association)

DIMENSIONS (inches / mm)

2004 & 2085



2007X



ORDERING GUIDE

ENCLOSURE	BEACON™	3-WAY BEACON™	TRANSMITTERS
2004 2 SPDT Mechanical Switches NEMA 4, 4x	**STANDARD** (Black & Yellow) **BY**	90° Rotation **B1**	1000 ohms **RS** 4-20 mA **CS**
2007X 2 SPDT Mechanical Switches NEMA 4, 4x, 7, 9 Class I, Grps. C & D Class II, Grps. E, F & G Divisions 1 & 2	**ANSI YELLOW** (Inherently Hazardous) **AY**	90° Rotation **B3**	
	ANSI GREEN (Liquid-Low Hazard) **AG**	90° Rotation **B5**	
2085 2 SPDT Mechanical Switches NEMA 4, 4x No output shaft (cannot accept beacon)	**ANSI BLUE** (Gas-Low Hazard) **AB**	180° Rotation **B7**	
	ANSI RED (Fire Quenching) **AR**	180° Rotation **B9**	

Ordering Example: Dual Display Monitor (2 SPDT switches) with standard black and yellow Beacon, 1000 K potentiometer (NEMA-4 enclosure). **2004-BY-RS**

Options Available: 4 SPDT switches (2007X only), 2 DPDT switches, epoxy coatings, anodizing, gold alloy contacts, optional terminal strips, resistive outputs. (Consult Price Sheet)

AccuTrak® 2200

General Purpose/Explosionproof

Hermetically Sealed Proximity Sensors and Transient/Surge Absorption Circuitry

Designed to Survive the Industrial Environment

Valve position monitors in process plants are continually plagued by adverse operating conditions which frequently result in unit malfunction. Moisture causes unwanted paths to form in electrical circuits. Cams, secured by set screws, continually lose calibration. Proximity sensors are subject to harm from voltage and current surges.

The Accutrak 2000 is virtually maintenance free! With hermetically sealed sensors, no set screws for cam adjustment, elevated terminal strip and transient protection, no unit available today is better protected against corrosion and inductive spikes.

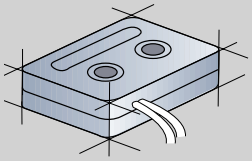
Hermetically Sealed Proximity Sensors

The AccuTrak 2200 employs proximity sensors for feedback of valve performance to micro-computers or PLCs. Sealed against explosive gases, water and corrosive chemicals, these sensors have a low contact resistance of .1 ohms, thereby eliminating "spikes" that may damage sensitive electronic interface equipment.

Transient Suppression

Each monitor is protected against inductive spikes by a circuit board employing plug-in fuses and varisters capable of absorbing transients of up to 2500 amps produced by lightning, switching surges and capacitive discharges.

Standard Sensor Options

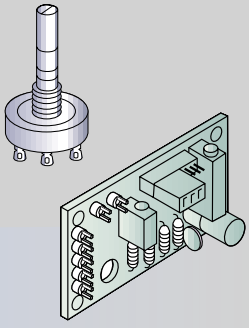


Hermetically Sealed Proximity Sensor

	SPST	SPDT
Contact Resistance (ohms)	.100	.150
Contact Rating* (AC, DC) (Watts)	10	3
Volts (max) (AC, DC)	200	200
Amps (max) (switching)	.5	.25
Amps (max) (carry)	1.2	1.2

* Resistive: Reduce rating to 1/3 for inductive loads.

0-100% Position Transmission



Resistive Output Signal

Standard Output Signal	1000 ohms
Power Rating at 70°C	1 watt
Elements	Conductive Plastic
Rotational Life (no load)	100,000 cycles

Current Output Signal

Standard Output Signal	4-20 mA DC, 2 wire
Power Requirements	5-38 VDC
Max. Load Resistance at 24 VDC	950 ohms
Operating Temperature	-24°C to 85°C

AREA CLASSIFICATIONS

NEMA 4, 4x, 7, 9
Class I, Groups C, D
Class II, Groups E, F, G,
Divisions 1 & 2

ENCLOSURE

Conduit Entries	NEMA 4: (1) 1/2" NPT NEMA 4, 4x, 7, 9: (2) 3/4"NPT
Terminal Strip	8 contacts standard 16 contacts available

MATERIALS OF CONSTRUCTION

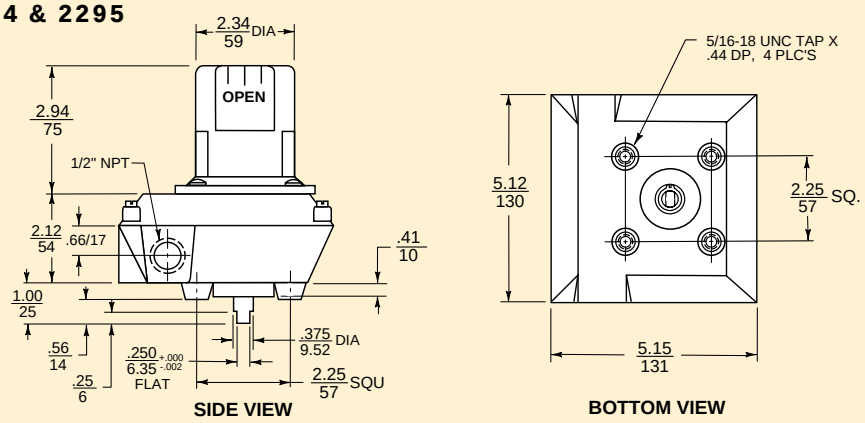
Housing	Die Cast Aluminum
Cover	Die Cast Aluminum
Coating	Polyurethane
Shaft	Stainless Steel
Fasteners	Stainless Steel
Beacon	Copolyester

APPROVALS / CERTIFICATION

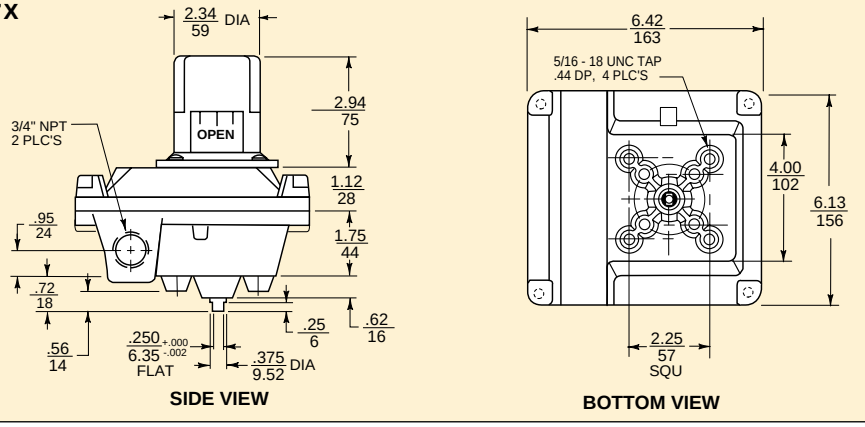
UL (Underwriters Laboratories, Inc.)
CSA (Canadian Standards Association)

DIMENSIONS (inches / mm)

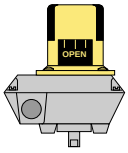
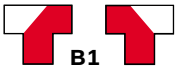
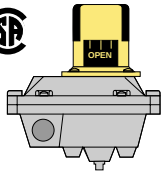
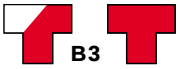
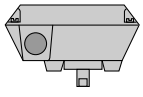
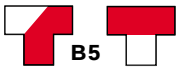
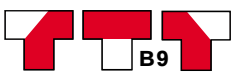
2214 & 2295



2217X



ORDERING GUIDE

ENCLOSURE	BEACON™	3-WAY BEACON™	TRANSMITTERS
2214 Proximity Sensors NEMA 4, 4x 	**STANDARD** (Black & Yellow) **BY** 	90° Rotation **B1** 	1000 ohms **RS**
2217X Proximity Sensors NEMA 4, 4x, 7, 9 Class I, Grps. C & D Class II, Grps. E, F & G Divisions 1 & 2 	**ANSI YELLOW** (Inherently Hazardous) **AY** 	90° Rotation **B3** 	4-20 mA **CS**
2295 Proximity Sensors NEMA 4, 4x  No output shaft (cannot accept beacon)	**ANSI GREEN** (Liquid-Low Hazard) **AG** 	90° Rotation **B5** 	
	ANSI BLUE (Gas-Low Hazard) **AB** 	180° Rotation **B7** 	
	ANSI RED (Fire Quenching) **AR** 	180° Rotation **B9** 	

Ordering Example: Dual Display Monitor (2 SPST sensors) with standard black and yellow Beacon, 1000 K potentiometer. **2214-BY-RS**

Options Available: 4 SPST sensors or 4 SPDT sensors (2217X only), epoxy coatings, anodizing, gold alloy contacts, optional terminal strips, resistive outputs. (Consult Price Sheet)

AccuTrak® 360

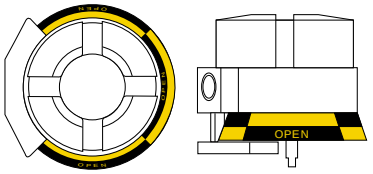
Explosionproof

Specifically engineered to meet all hazardous area classifications and groups.

The Westlock 360 Series is specifically engineered to meet all hazardous area classifications and groups. Certified to UL and Canadian Standards, the unit has the flexibility to satisfy a wide range of diverse requirements.

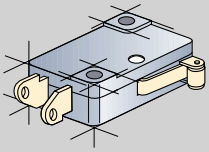
Employing standard Westlock design features, (Beacon® performance monitors, Touch-Set® cams and pre-wired components), the 360 Series is available with a wide range of position sensors and pre-integrated solenoid valves. As an option, it possesses the capability for fugitive emissions monitoring of double-packed or bellows-seal control valves.

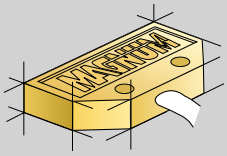
Designed for NEMA 4, 4x, 7, 9 hazardous areas, the 360, in conjunction with high current, hermetically sealed Magnum® sensors, eliminates the costly requirement of installing seal fittings in Division 1, Class I, Groups B, C & D and Division 2, Class I, Groups A, B, C & D. In Division 1, Groups B, C & D the omission of seal fittings is accomplished through the heavy duty construction of the unit's metal enclosure; enabling it to withstand the various pressure piling tests required by UL and Canadian Standards.



Easily viewed from any angle, a high visibility, low profile Beacon® gives local confirmation of valve position.

Standard Sensor Options





Micro-Switch V3

SPDT (V3)			DPDT (Licon)	
AMPS	VAC	VDC	AMPS	VAC
15	125		10	125
15	250		10	250
10		24		
.50		125		
.25		250		

MAGNUM® Proximity Sensors UL, CSA (Hermetically Sealed)

SPDT		
AMPS	VAC	VDC
3	120	
1.5	240	
2		24

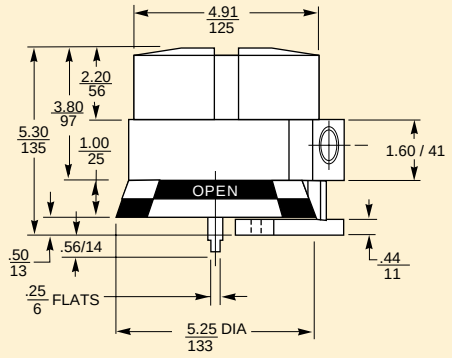
0-100% Position Transmission

Resistive Output Signal	Current Output Signal
Standard Output Signal: 1000 ohms	Standard Output Signal: 4-20 mA DC, 2 wire
Power Rating at 70°C: 1 watt	Power Requirements: 12-38 VDC
Elements: Conductive Plastic	Max. Load Resistance at 24 VDC: 950 ohms
Rotational Life (no load): 100,000 cycles	Operating Temperature: -24°C to 85°C

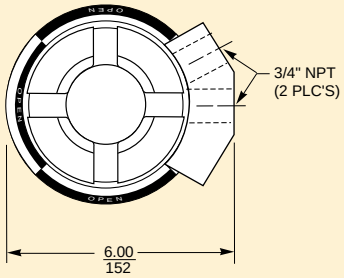
AccuTrak® 360

Engineered as a pre-integrated unit, the capabilities of the 360 include valve position monitoring, solenoid actuator control, and fugitive emissions detection.

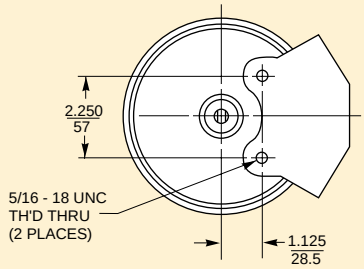
DIMENSIONS (inches / mm)



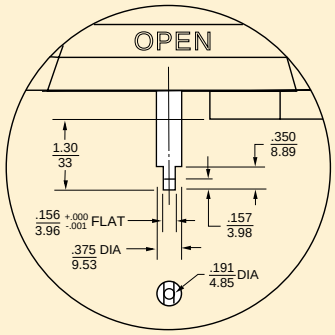
SIDE VIEW



TOP VIEW



BOTTOM VIEW



OPTIONAL NAMUR SHAFT

AREA CLASSIFICATIONS

NEMA 4, 4x, 7, 9
Class I, Groups A, B, C, D
Class II, Groups E, F, G,
Divisions 1 & 2

ENCLOSURE

Conduit Entries	2 - 3/4" NPT
Terminal Points	10 points standard

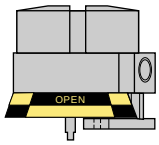
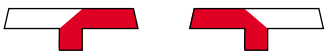
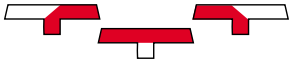
APPROVALS / CERTIFICATION

UL (Underwriters Laboratories, Inc.)
cUL (UL Canadian Certification)

MATERIALS OF CONSTRUCTION

Housing / Cover	Cast Aluminum 316L Stainless Steel
Coating	Polyurethane
Shaft	Stainless Steel
Beacon Monitor	Copolyester

ORDERING GUIDE

ENCLOSURE	BEACON™	3-WAY BEACON™	SENSOR	SOLENOID
 **360** Aluminum **366** 316L Stainless Steel For Eliminator configuration, prefix part number with the letter (E). **Example: E360**	**STANDARD** (Black & Yellow) **BY** 	**90° Rotation B1** 	Mech. (SPDT) **M2** Mech. (DPDT) **M4** MAGNUM (SPDT) **M6** Resistive Output: 1000 ohms **RS** Current Output: 4-20 mA **CS**	To Be Specified By Customer
	ANSI YELLOW (Inherently Hazardous) **AY** 	**90° Rotation B3** 		
	ANSI GREEN (Liquid-Low Hazard) **AG** 	**90° Rotation B5** 		
	ANSI BLUE (Gas-Low Hazard) **AB** 	**180° Rotation B7** 		
	ANSI RED (Fire Quenching) **AR** 	**180° Rotation B9** 		

Eliminator® 3000

Explosionproof

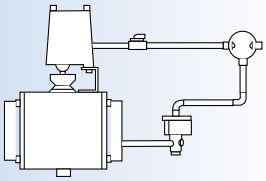
A Cost Efficient Integrated System to Monitor and Regulate Valves in a Single Assembly

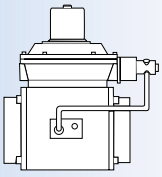
Engineering and plant personnel may now specify an extremely reliable, cost efficient system to monitor and regulate valves in one compact assembly. Westlock Controls design engineers have successfully combined three separate products: a junction box, a limit switch, and a solenoid valve into a single unit — the first of its kind to be listed and recognized as a single assembly by Underwriters Laboratory for hazardous area applications.

The Eliminator is a highly reliable valve position monitor and prewired, integrally mounted ASCO® solenoid valve. Compatible with all PC's, the 3000 series is available with mechanical or proximity switches and a broad selection of solenoid valves. The high cost of independent junction boxes, mandatory wiring, seal fittings and field labor is totally eliminated.

COMPARATIVE COST ANALYSIS

MECHANICAL SWITCHES

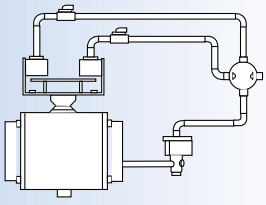


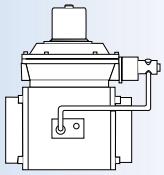


CONVENTIONAL METHOD		ELIMINATOR® 3000	
2 Switches	$150.	2 Switches	Included
Solenoid	100.	Solenoid	Included
Junction Box	50.	Junction Box	Included
Seal Fittings	40.	Seal Fittings	NR*[1]
Wire, Conduit	20.	Wire, Conduit	NR*
Labor	170.	Labor	NR*
TOTAL COST	**$530.**	**TOTAL COST**	**$298.**

*Not Required

PROXIMITY SENSORS



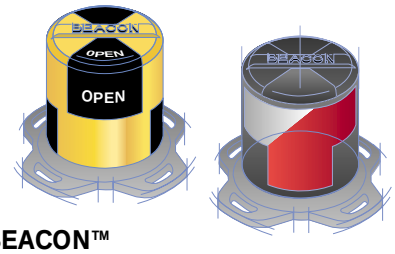


CONVENTIONAL METHOD		ELIMINATOR® 3000	
2 Switches	$358.	2 Sensors	Included
Solenoid	100.	Solenoid	Included
Junction Box	50.	Junction Box	Included
Seal Fittings	80.	Seal Fittings	NR*[1]
Wire, Conduit	30.	Wire, Conduit	NR*
Labor	270.	Labor	NR*
TOTAL COST	**$888.**	**TOTAL COST**	**$364.**

[1] A seal fitting between the Asco solenoid and Eliminator enclosure is not required

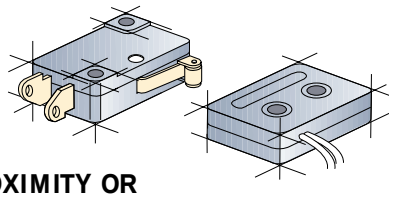
*Not Required

Eliminator® 3000



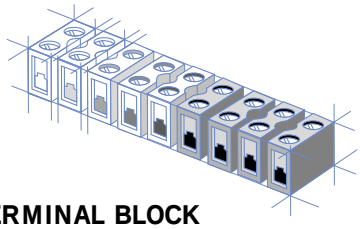
BEACON™

An impact and corrosion resistant valve position monitor capable of displaying exact valve position from any quadrant at distances of up to 150 feet. Start-up and operating personnel avoid being placed in physically awkward or dangerous situations while attempting to ascertain valve position.



PROXIMITY OR MECHANICAL SENSORS

Switch requirements will differ with operating conditions in the industrial environment. Mechanical switches are less expensive and possess the highest current rating. Proximity sensors, encapsulated and hermetically sealed against explosive gases and liquids, provide maximum moisture and corrosion resistance. The reed type proximity sensor eliminates contact bounce while being totally compatible with all computers and PCs.

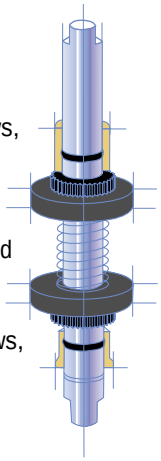


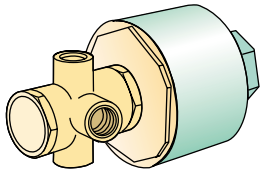
TERMINAL BLOCK

The Eliminator® features an elevated prewired terminal block with two additional points for solenoid valve integration. The enclosure additionally functions as a junction box.

TOUCHSET™ CAMS

Cams, secured by set screws, continually lose calibration due to vibration inherent in all pipelines. Self-locking Touchset™ cams are fastened to a splined shaft and can be set by hand in seconds. Since there are no set screws, the cams will never slip out of adjustment.



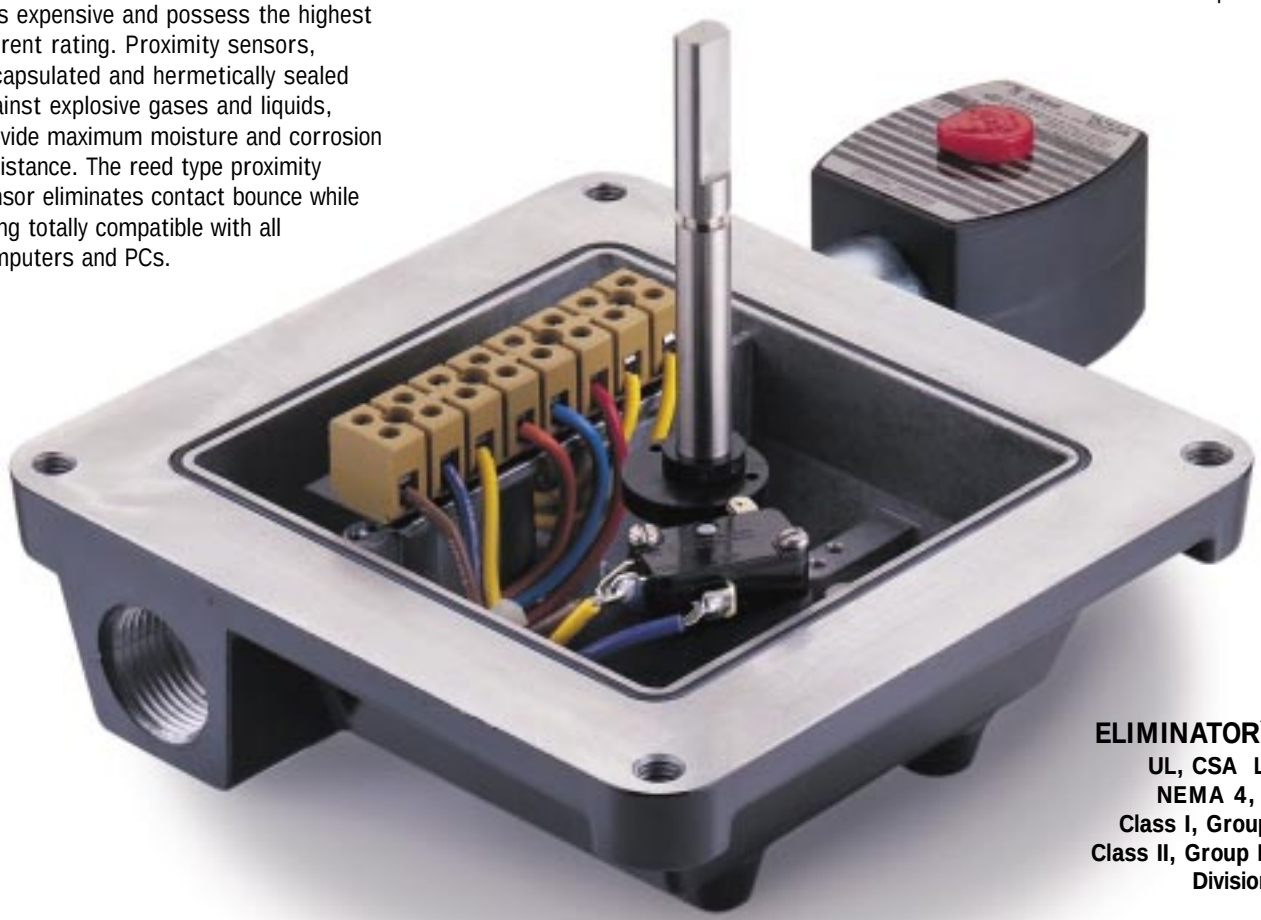


ASCO SOLENOID

Asco is the undisputed choice of the process control industry. Specified by engineers and plant personnel worldwide, the ASCO solenoid valve has proven reliable in millions of industrial applications.

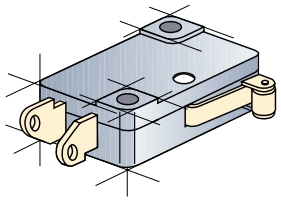
AGENCY LISTING

Underwriters Laboratory has long been recognized for its uncompromising commitment to human safety. Insurance underwriters, government authorities, engineers and plant operators regard the the UL listing and Classification Mark as evidence that the product has satisfied the strictest safety requirements. The Westlock Eliminator has been evaluated and listed by UL and CSA as a single assembly, rather than an arbitrary combination of unrelated components.



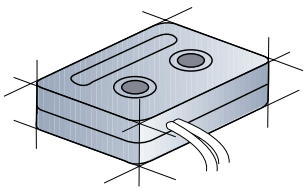
ELIMINATOR™ 3000
UL, CSA Listed for
NEMA 4, 4X, 7, 9
Class I, Groups C & D
Class II, Group E, F & G,
Divisions 1 & 2

Standard Sensor Options



Mechanical Switches
UL, CSA Listed

SPDT (V3)			DPDT (Licon)	
AMPS	VAC	VDC	AMPS	VAC
15	125		10	125
15	250		10	250
10		24		
.50		125		
.25		250		



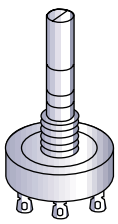
Proximity Sensors UL, CSA

- All switches are PC compatible
- Platinum plated magnetic reed
- Hermetically sealed in glass
- Doubly sealed in silicon housing
- Repeatability: .002 inches
- Switch Life: 100,000,000 cycles

	SPST	SPDT
Actuation Time (milli-seconds)	.5	1.5
Contact Resistance (ohms)	.100	.150
Contact Rating* (AC, DC) (Watts)	10	3
Volts (max) (AC, DC)	200	200
Amps (max) (switching)	.5	.25
Amps (max) (carry)	1.2	1.2
Switch Temp. Rating (°F)	200	200

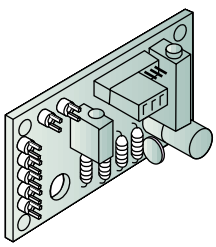
* Resistive: Reduce rating to 1/3 for inductive loads.

0-100% Position Transmission



Resistive Output Signal

Standard Output Signal	1000 ohms
Power Rating at 70°C	1 watt
Elements	Conductive Plastic
Rotational Life (no load)	100,000 cycles



Current Output Signal

Standard Output Signal	4-20 mA DC, 2 wire
Power Requirements	5-38 VDC
Max. Load Resistance at 24 VDC	950 ohms
Operating Temperature	-24°C to 85°C

AREA CLASSIFICATIONS

NEMA 4, 4x, 7, 9
Class I, Groups C, D
Class II, Groups E, F, G,
Divisions 1 & 2

ENCLOSURE

Conduit Entries	1-3/4" NPT, 1-1/2" NPT
Terminal Strip	8 contacts standard 16 contact available

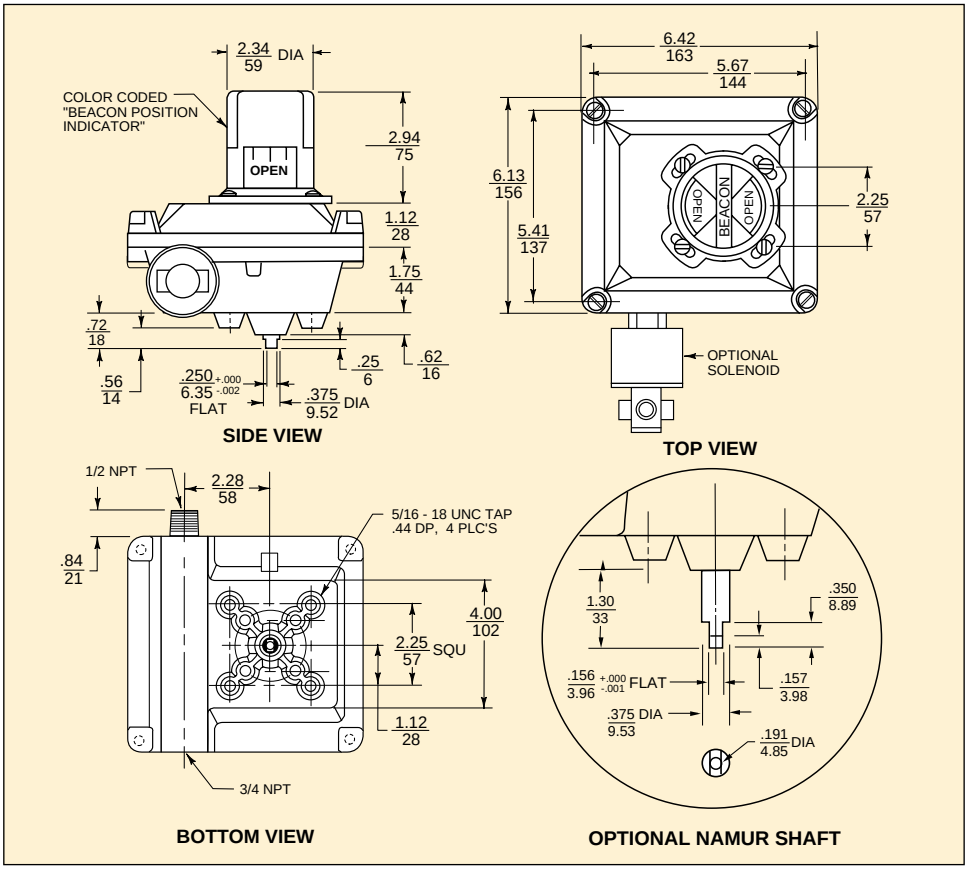
MATERIALS OF CONSTRUCTION

Housing	Die Cast Aluminum
Cover	Die Cast Aluminum
Shaft	Stainless Steel
Fasteners	Stainless Steel
Beacon	Copolyester

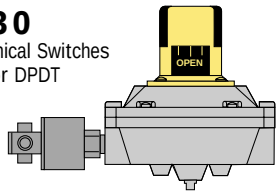
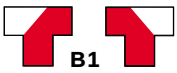
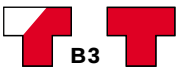
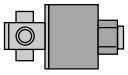
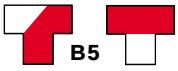
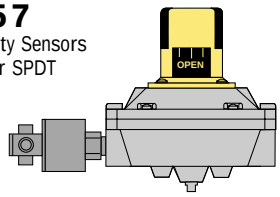
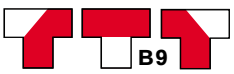
APPROVALS / CERTIFICATION

UL (Underwriters Laboratories, Inc.)
CSA (Canadian Standards Association)

DIMENSIONS (inches / mm)



ORDERING GUIDE

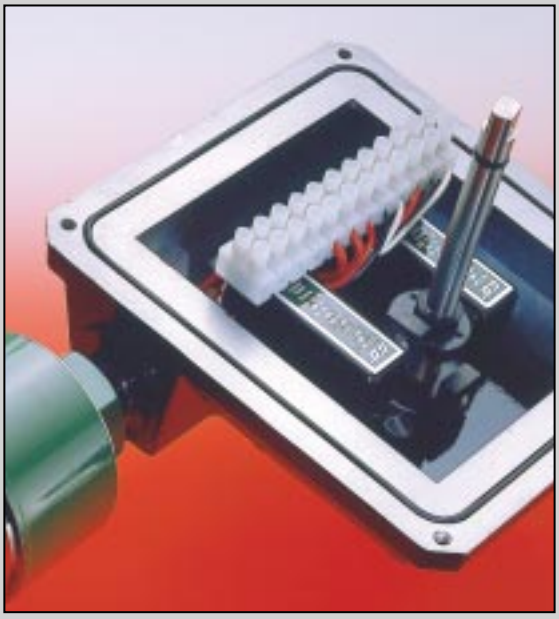
ENCLOSURE	BEACON™	3-WAY BEACON™	TRANSMITTER	SOLENOID
3030 Mechanical Switches SPDT or DPDT 	**STANDARD** (Black & Yellow) **BY** 	90° Rotation **B1** 	1000 ohms **RS**	**ASCO** To Be Specified By Customer
	ANSI YELLOW (Inherently Hazardous) **AY** 	90° Rotation **B3** 	4-20 mA **CS**	
	ANSI GREEN (Liquid-Low Hazard) **AG** 	90° Rotation **B5** 		
3057 Proximity Sensors SPST or SPDT 	**ANSI BLUE** (Gas-Low Hazard) **AB** 	180° Rotation **B7** 		
	ANSI RED (Fire Quenching) **AR** 	180° Rotation **B9** 		

Ordering Example: Eliminator with 2 proximity sensors and standard black and yellow Beacon. 3057-BY with 2 SPDT and Asco 8320A90.

Options Available: The 3000 Series is available with up to six switches and four separate conduit entries. Special coatings, special features of ASCO valves are available upon request.

AccuTrak® 4000

Explosionproof



Hazardous Area Position Monitor with GO® Proximity Switches

Available in both AccuTrak® and Eliminator® configurations, Westlock has combined the engineering and cost-effective features of its standard UL listed and CSA certified products with the high performance, high current-carrying capacity of the GO® proximity switch. This unit offers the process industry all of the design characteristics of the AccuTrak® and Eliminator® (Beacon® position monitor, Touchset® cams, pre-wired terminal strip, pre-wired Asco® solenoid valve) with the proven reliability of the GO® proximity switch.

Available as an extremely dependable, cost-effective system designed to monitor and regulate both rotary and linear-stroke valves, the high cost of independent junction boxes, mandatory wiring, and field labor is totally eliminated. The cost of installing seal fittings between the Asco solenoid and switch enclosure is also eliminated. The series 4000 combines three products: a junction box, GO proximity sensors and an Asco solenoid valve into a single unit for hazardous area applications. All units are UL listed and CSA certified to NEMA 4, 4x, 7 & 9 Class I, Groups C & D, Class II Groups E, F & G Divisions 1 & 2. Besides being housed in the Westlock explosionproof enclosure, the sensors themselves are environmentally sealed and completely self-contained.

All GO® switches have a high contact rating of SPDT, Form C, 2 amps at 240 VAC/4 amps at 120 VAC/50mA at 24 VDC.

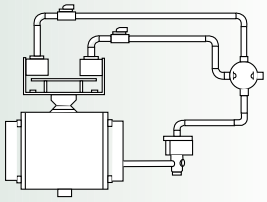
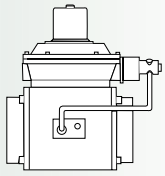
Comparative Cost Analysis

NOTE:
[1]Asco 8320 A90

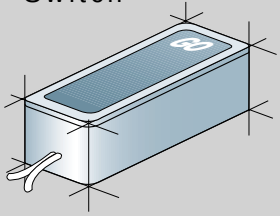
*Not Required

[2]A seal fitting between the ASCO Solenoid and Switch enclosure is not required.

Conduit runs entering the enclosure must have a sealing fitting connected within 18 inches of the enclosure

GO® PROXIMITY SWITCHES			
			
CONVENTIONAL METHOD		**ELIMINATOR® 4000**	
2 Switches w/bracket	$358.	2 Switches	Included
Solenoid[1]	100.	Solenoid	Included
Junction Box	50.	Junction Box	Included
Seal Fittings	80.	Seal Fittings	NR*[2]
Wire, Conduit	30.	Wire, Conduit	NR*
Labor	270.	Labor	NR*
TOTAL COST	**$888.**	**TOTAL COST**	**$570.**

GO® Proximity Switch



Electrical Characteristics

SPDT, Form C

SPDT		
AMPS	**VAC**	**VDC**
4	120	
2	240	
.05 (50 mA)		24

- All GO® switches are environmentally sealed.
- Cables: Potted in with 3-conductor no.18 AWG stranded wire leads, 80°C, 300V, PVC jacket.
- Response Time: 8 milliseconds

AREA CLASSIFICATIONS

NEMA 4, 4x, 7, 9
Class I, Groups C, D
Class II, Groups E, F, G,
Divisions 1 & 2

ENCLOSURE

Conduit Entries	2 - 3/4" NPT
Terminal Strip	12 contacts standard

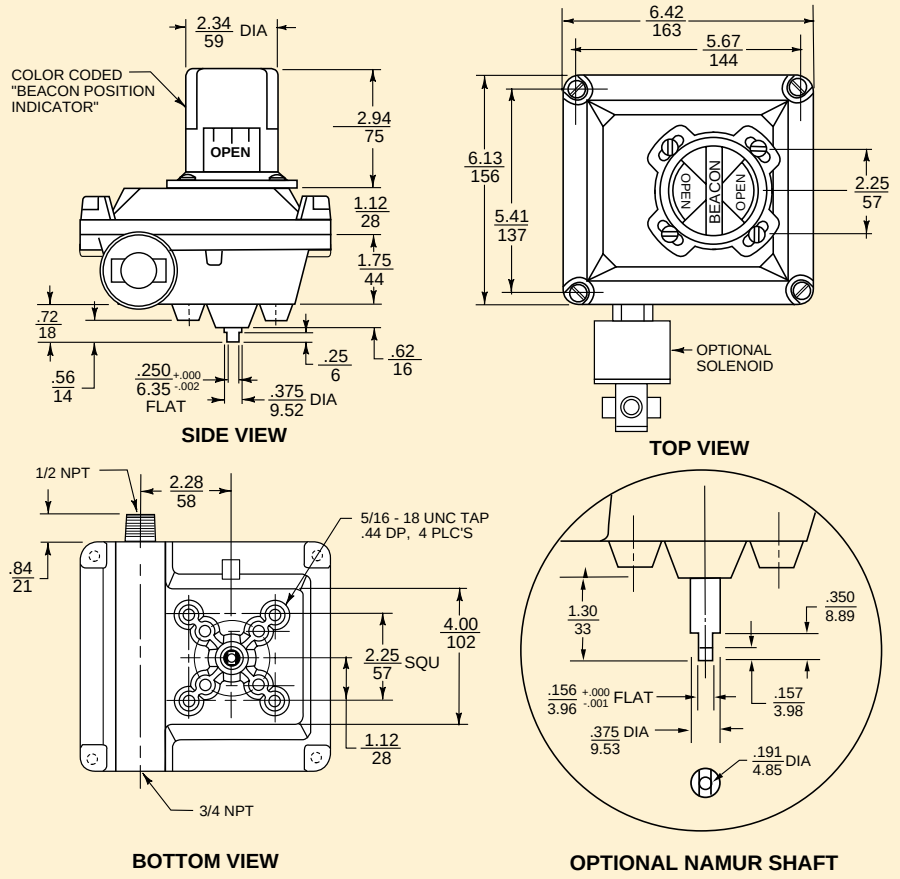
MATERIALS OF CONSTRUCTION

Housing	Die Cast Aluminum
Cover	Die Cast Aluminum
Shaft	Stainless Steel
Fasteners	Stainless Steel
Beacon	Copolyester

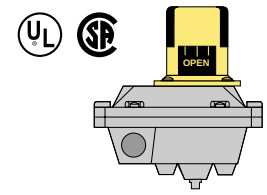
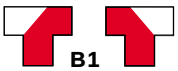
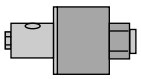
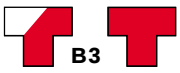
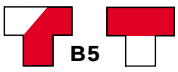
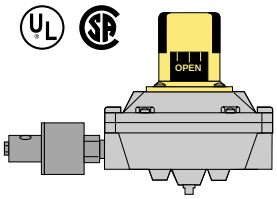
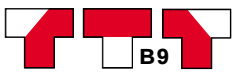
APPROVALS / CERTIFICATION

UL (Underwriters Laboratories, Inc.)
CSA (Canadian Standards Association)

DIMENSIONS (inches / mm)



ORDERING GUIDE

ENCLOSURE	BEACON™	3-WAY BEACON™	SOLENOID
AccuTrak 4040 Aluminum 2-SPDT GO® Switches 	**STANDARD** (Black & Yellow) **BY** 	90° Rotation **B1** 	**ASCO** To Be Specified By Customer 
	ANSI YELLOW (Inherently Hazardous) **AY** 	90° Rotation **B3** 	
	ANSI GREEN (Liquid-Low Hazard) **AG** 	90° Rotation **B5** 	
Eliminator 4080 Aluminum 2-SPDT GO® Switches 	**ANSI BLUE** (Gas-Low Hazard) **AB** 	180° Rotation **B7** 	
	ANSI RED (Fire Quenching) **AR** 	180° Rotation **B9** 	

AccuTrak® 5000

Intrinsically Safe

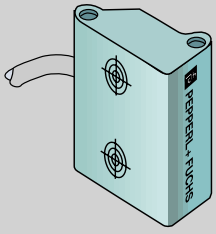
Valve Position Monitor for Intrinsically Safe Applications.*

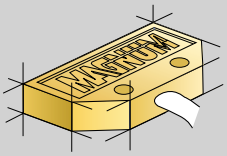
A Universal Standard for Intrinsically Safe Position Monitoring

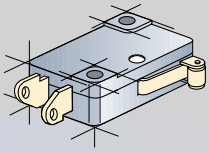
Westlock Controls, through a technical alliance with the world's premier sensor manufacturer, Pepperl+Fuchs, has jointly engineered an Intrinsically Safe position monitor that incorporates into a single unit the primary design features of both companies. By combining field proven components, cost-effective design elements, international approval agency certifications and adherence to NAMUR specifications, Westlock and Pepperl + Fuchs have created an Intrinsically Safe position monitor engineered to become an industry standard.

The new AccuTrak 5000 is a highly corrosion resistant FM/CSA approved valve position monitor having the capability to house a wide range of sensors, including the advanced Kriterium™. The Kriterium dual proximity sensor, a joint design effort between Pepperl+Fuchs and Westlock meets all requirements of the DIN19234 (NAMUR) standard and carries approval certifications from PTB, CENELEC, FM and CSA. In addition, the AccuTrak 5000 is also available with Magnum proximity sensors and mechanical Micro Switches for Intrinsically Safe "simple apparatus" applications.

Standard Sensor Options







*Westlock 5000 Series valve position monitors are FM and CSA approved General Purpose enclosures. For use in Intrinsically Safe applications, the Accutrak 5000 must be used in conjunction with an approved Intrinsically Safe barrier.

P+F Kriterium 2000

Proximity Type (Solid State), Intrinsically Safe, PTB, FM, CSA, CE

Sensing Range	3mm
Electrical Version	D.C. Voltage 2 wire in accordance with DIN19234 (NAMUR)
Hysteresis	Approx 5%
Switching Frequency	1.5 KHz
Nominal Voltage	8 VDC
Input Voltage Range	5-25 VDC
Output/Current Consumption	Cam Trigger Present: ≤1mA Cam Trigger Absent: ≥3mA (15mA max.)
Operating Temp.	-25°C to +100°C

MAGNUM® Proximity Sensors w/ Low Power Contacts

UL, CSA "Simple Apparatus", Hermetically Sealed
SPST or SPDT, Rhodium Contacts

Voltage	24 VDC Nominal
Nominal Contact Resistance	≤ .10 ohm
Operating Current Range	0.5mA to 1A
Power Range	10mW to 25W
Temperature Range	-40°F to +185°F

Micro-Switch V3 w/ Gold Plated Contacts

UL, CSA "Simple Apparatus", SPDT

VDC	Contact Rating
12	100 mA Resistive
24	100 mA Resistive

AccuTrak® 5000

AREA CLASSIFICATIONS

NEMA 4, 4x
Class I, Groups A, B, C, D
Class II, Groups E, F, G,
Divisions 1 & 2

ENCLOSURE

Conduit Entries	2 - 1/2" NPT
Terminal Strip	8 contacts standard 16 contact available

5044 & 5046

MATERIALS OF CONSTRUCTION

Housing/Cover	Engineered Resin
Shaft	Stainless Steel
Screws	Stainless Steel
Beacon	Copolyester

5004

MATERIALS OF CONSTRUCTION

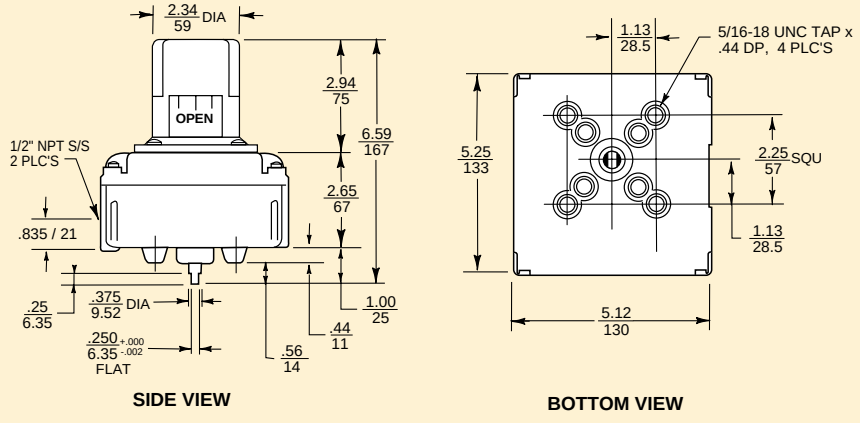
Housing/Cover	Die Cast Aluminum
Shaft	Stainless Steel
Screws	Stainless Steel
Beacon	Copolyester

APPROVALS / CERTIFICATION

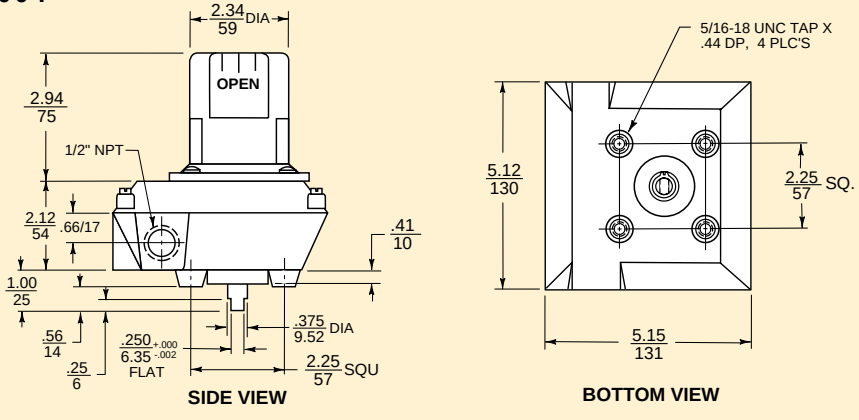
FM (Factory Mutual Research)
CSA (Canadian Standards Association)

DIMENSIONS (inches / mm)

5044 & 5046



5004



ORDERING GUIDE

ENCLOSURE	BEACON™	3-WAY BEACON™	SENSORS	TRANSMITTERS	SOLENOID
5044 Engineered Resin NEMA 4, 4X	**STANDARD** (Black & Yellow) **BY**	90° Rotation **B1**	MAGNUM (SPDT) **M12**	Current Output 4-20 mA **CS**	To Be Specified By Customer
5046 Engineered Resin with Latch cover NEMA 4, 4X	**ANSI YELLOW** (Inherently Hazardous) **AY**	90° Rotation **B3**	KRITERIUM **M11**		
5004 Aluminum NEMA 4, 4X	**ANSI GREEN** (Liquid-Low Hazard) **AG**	90° Rotation **B5**	MAGNUM (SPST) **M10**		
	ANSI BLUE (Gas-Low Hazard) **AB**	180° Rotation **B7**	Mech. (SPST) w/ Gold Plated Contacts **M9**		
	ANSI RED (Fire Quenching) **AR**	180° Rotation **B9**			

For Eliminator configuration on 5000 series enclosures, prefix part numbers with the letter "E"
NOTE: The 5000 series may be ulitized with any I.S certified solenoid valve.

Terminator® 7000

All Classes & Groups

Junction housings (less switches)

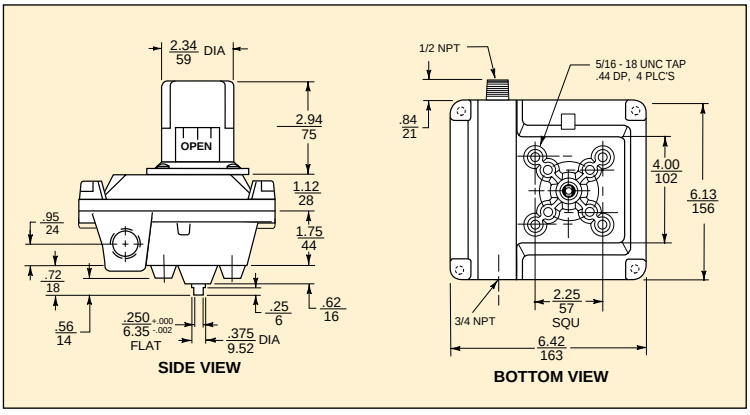
Westlock units are available (less switches) as central termination junctions with NEMA 4 or Explosionproof UL listed housings, having variations of conduit entries, local valve position indication and pre-wired solenoid valves. All electrical connections may be terminated at one point eliminating costly field labor and conduit runs. If at a later date, switches for remote monitoring of valve position are to be added, all that will be necessary is to add a pre-wired switch module which will easily adapt to the existing enclosure.

MATERIALS OF CONSTRUCTION	
Housing	Die Cast Aluminum
Cover	Die Cast Aluminum
Shaft	Stainless Steel
Fasteners	Stainless Steel

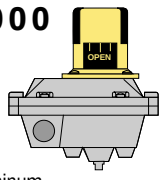
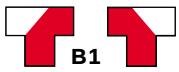
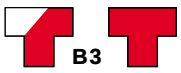
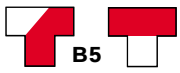
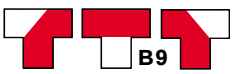
AREA CLASSIFICATIONS

NEMA 4, 4x, 7, 9, Class I, Groups C, D, Class II, Groups E, F, G, Div. 1 & 2

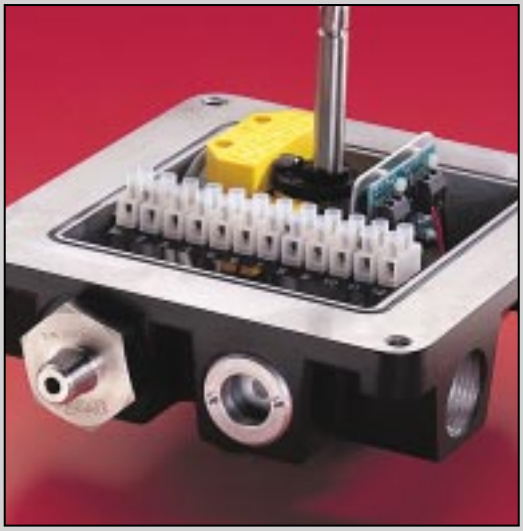
DIMENSIONS (inches / mm)



ORDERING GUIDE

ENCLOSURE	BEACON™	3-WAY BEACON™
7000  Aluminum NEMA 4 4x, 7, 9 Class I, Groups C & D Class II, Groups E, F, G Divisions 1 & 2	**STANDARD** (Black & Yellow) **BY** 	90° Rotation  **B1**
	ANSI YELLOW (Inherently Hazardous) **AY** 	90° Rotation  **B3**
	ANSI GREEN (Liquid-Low Hazard) **AG** 	90° Rotation  **B5**
	ANSI BLUE (Gas-Low Hazard) **AB** 	180° Rotation  **B7**
	ANSI RED (Fire Quenching) **AR** 	180° Rotation  **B9**

Multiple Conduit Entry Enclosures



Multiple Conduit Entry Options

All Classes & Groups

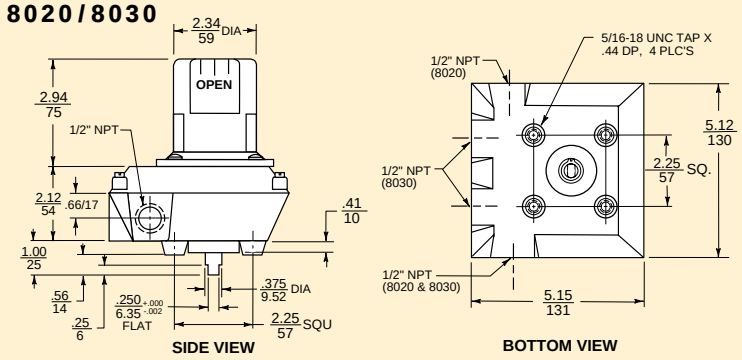
8020 NEMA 4, 4x Enclosure: Two 1/2" NPT entries*
8030 NEMA 4, 4x Enclosure: Three 1/2" NPT entries*
8040 NEMA 4, 4x, 7 & 9 Enclosures: Three 3/4" NPT entries*
8060 NEMA 4, 4x, 7 & 9 Enclosures: Four 3/4" NPT entries*

Specify number of terminal points: up to 16 points available

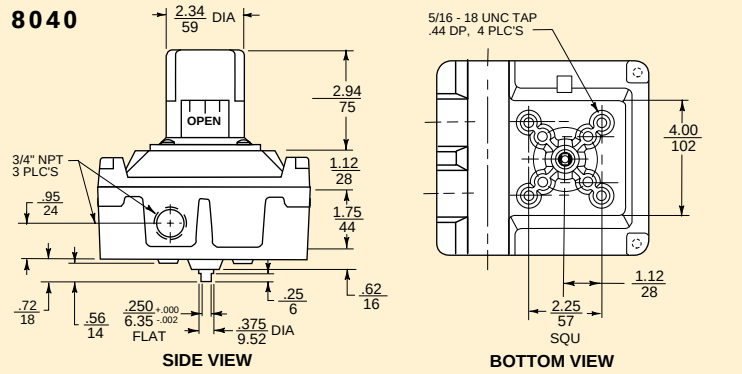
All Explosionproof units meet Class I, Groups C & D, Class II, Groups E, F & G, Division 1 & 2. If proximity switches are utilized, all explosionproof units will additionally meet Groups A & B Division 2 only.

DIMENSIONS (inches / mm)

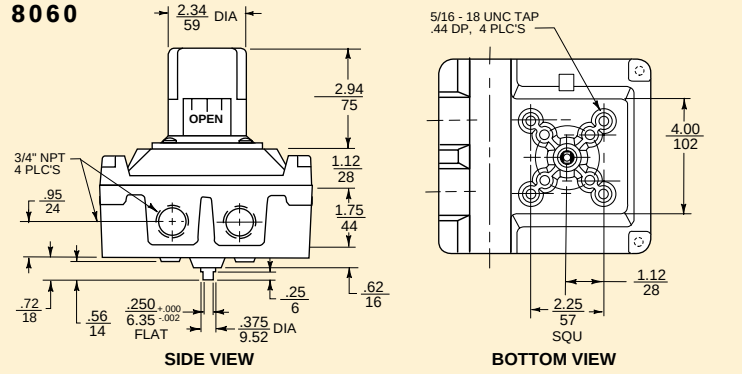
8020/8030



8040



8060



ORDERING GUIDE: Order standard units as required (i.e. 2004, 2007X, 9479 etc.) and request special designation as above for multiple conduit entry enclosures.

*Consult factory for Eliminator configurations and/or alternate conduit entry sizes.

AccuTrak® 9000

All Classes & Groups

MAGNUM®

High-current Hermetically Sealed Proximity Sensors.

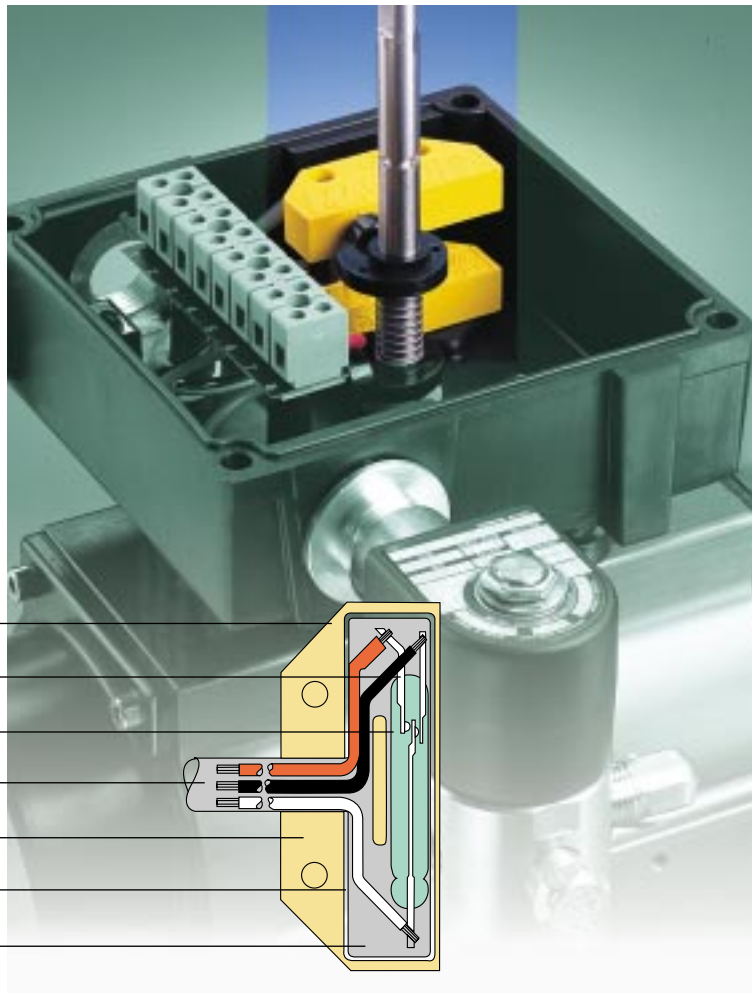
By applying the economic advantages offered by the National Electrical Code, and by utilization of hermetically sealed high-current Magnum sensors, the AccuTrak 9000 merges technology with economy. Cost saving benefits are realized by the consolidation of components and the complete elimination of hazardous location seal fittings, wiring, conduit and their associated labor costs.

Magnum®

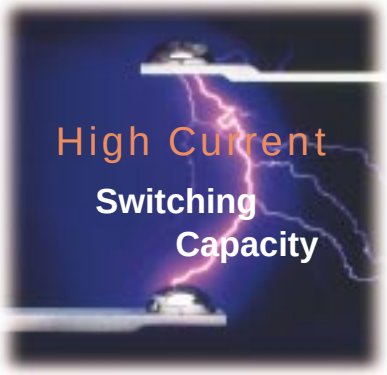
The Magnum proximity sensor was designed in response to our customers needs. The main requirement for any product in a process plant is reliability. That is why the Magnum sensor is warranted to perform as specified for a full five years. This warranty reflects our complete confidence in the capabilities of our product.

Corrosion Resistance

The highly corrosion-resistant tungsten contacts are hermetically sealed in an inert atmosphere to protect them from dust, oxidation or external corrosion. The entire sealed unit is then encapsulated in a plastic coating to cushion the sensor in case of shock or vibration. After encapsulation, the sensor is encased in a flame-retardant high-impact thermoplastic enclosure and then re-encapsulated in a premium grade polymer impervious to moisture, chemicals and solvents.



Technical Specifications



The Magnum sensor was developed specifically for valve monitoring applications. The Form C, SPDT contacts are manufactured from solid hunks of pure tungsten. Since tungsten has the highest melting point of all metals plus excellent electrical conductivity characteristics, the Magnum proximity sensor is capable of handling 3 amps (switching) at 120 VAC and 2 amps (switching) at 24 VDC. The sensor is UL listed and CSA recognized.

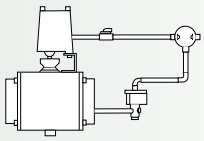
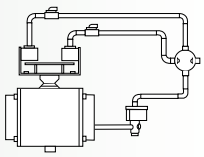
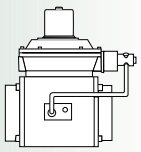
Field Reliability

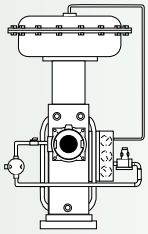
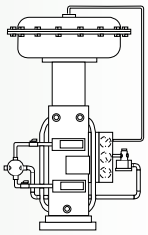
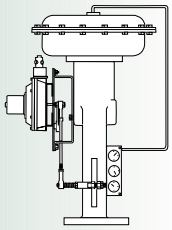
The industrial environment requires products that function reliably and safely. By evaluating customer's needs, conducting field tests to confirm that evaluation and then working with design engineers to provide innovative and cost-effective solutions to those needs, the Magnum proximity sensor was conceived. Borrowing from the technology utilized in every pacemaker in the world, sensors that monitor the flaps on jumbo jets and the high-current switching capability required for large Halogen underwater flashlights, the Magnum sensor was brought into the industrial marketplace.

COMPARATIVE COST ANALYSIS

Merging Technology with Economy

UL/CSA Listed Valve Position Monitors for NEMA 4, 4X, 7, 9; Class 1, Groups C, D, Class II, Groups E, F & G, Div. 1 & 2

ROTARY VALVE	CONVENTIONAL METHOD		WESTLOCK
			
	MECHANICAL SWITCHES	PROXIMITY SWITCHES	MAGNUM® SENSORS
2 switches w/ bracketry	$150	$358	$338
solenoid	$100	$100	$100
junction box	$50	$50	N/R*
seal fittings	$40	$80	N/R*
wire, conduit	$20	$30	N/R*
labor	$170	$270	N/R*
TOTAL COST	**$530**	**$888**	**$438**
TOTAL COST (250 Valves)	**$132,500**	**$222,000**	**$109,500**

LINEAR CONTROL VALVE	CONVENTIONAL METHOD		WESTLOCK
			
	MECHANICAL SWITCHES	PROXIMITY SWITCHES	MAGNUM® SENSORS
2 switches w/ bracketry	$550	$630	$480
solenoid	$100	$100	$100
junction box	$50	$50	N/R*
seal fittings	$40	$80	N/R*
wire, conduit	$20	$30	N/R*
labor	$170	$270	N/R*
TOTAL COST	**$830**	**$1160**	**$580**
TOTAL COST (250 Valves)	**$207,500**	**$290,000**	**$145,000**

*Not Required
Solenoid: Asco 8320A90
Comparative costs were based upon list prices from major manufacturers.

NATIONAL ELECTRICAL CODE (1987):

Article 501-5(a) & (b). Conduit Seals, Class I, Div. 1 & 2

In each conduit run entering an enclosure for switches which may produce arcs, seals shall be placed no more than 18 inches from such enclosures.

Exception: Conduit runs 1 1/2 inches and smaller entering an explosion-proof enclosure for switches need not be sealed if the current-interrupting contacts are enclosed within a chamber hermetically sealed against the entrance of gases or vapors.

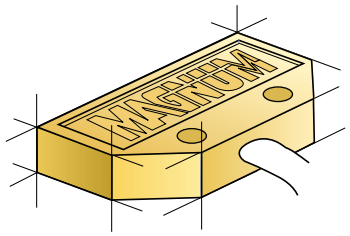
NOTE: Note: For conformance to UL and CSA requirements, all conduit runs in Class I, Division 1 hazardous locations must have a sealing fitting connected within 18 inches of the enclosure.

Technical Specifications

Area Classifications

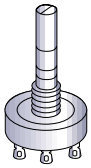
9044 - NEMA 4, 4x
9358 - NEMA 4, 4x
9468 - NEMA 4, 4X Nonincendive **Class I, Groups A, B, C, D** **Class II, Groups F, G, Division 2 only** **FM, CSA**
9479 - NEMA 4, 4X, 7, 9 **Class I, Groups C, D** **Class II, Groups E, F, G, Division 1 & 2** **Class I Groups A, B, Division 2** **FM, UL, CSA**

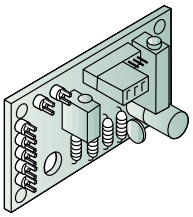
Magnum® XT-90
Hermetically Sealed
Proximity Sensor



Technical Data	
Contact Arrangement	SPDT, Form C (Normally Open)
Contacts	Pure Tungsten
Operating Time	3.0 m Sec.
Initial Contact Resistance	.50 ohms (Max)
Seal	Hermetic
Housing (Flame Retardant)	High Impact Valox®
Approvals	UL, CSA
Temperature Range	-40°F to +185°F
Operational Life	600,000 Cycles (full rated load)
Repeatability	.125 mm.
Warranty	5 Years
Protection Class	IP 67
Electrical Rating	
Contact Arrangement	SPDT Form C (Normally Open) 3 amps/120 VAC, 1.5 amps/240 VAC 2 amps/24 VDC Wire: 3 Conductor 22AWG

0-100% Position Transmission





Resistive Output Signal

Standard Output Signal	1000 ohms
Power Rating at 70°C	1 watt
Elements	Conductive Plastic
Rotational Life (no load)	100,000 cycles

Current Output Signal

Standard Output Signal	4-20 mADC, 2 wire
Power Requirements	12-38 VDC
Max. Load Resistance at 24 VDC	950 ohms
Operating Temperature	-24°C to 85°C

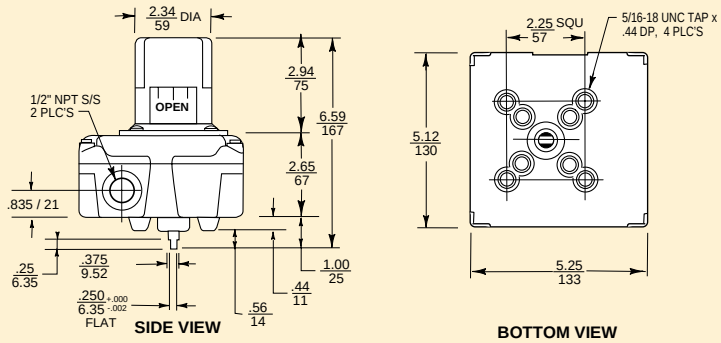
9358 ENCLOSURE	
Enclosure	Zytel® Engineered Resin Clear Cover optional
Conduit Entries	2 - 1/2"
Terminal Strip	8 point standard 12 points optional
9044 ENCLOSURE	
Enclosure	Die Cast Aluminum
Conduit Entries	2 - 1/2", optional 3-1/2"
Terminal Strip	8 point standard 12 points optional
9468 ENCLOSURE	
Enclosure	Zytel® Engineered Resin Clear Cover optional
Conduit Entries	2 - 1/2" optional 3-3/4"
Terminal Strip	8 point standard 16 points optional
Sensors	up to 4
9479 ENCLOSURE	
Enclosure	Die Cast Aluminum
Conduit Entries	2 - 3/4" optional 4-3/4"
Terminal Strip	8 point standard 16 points optional
Sensors	up to 4

DIMENSIONS (inches / mm)

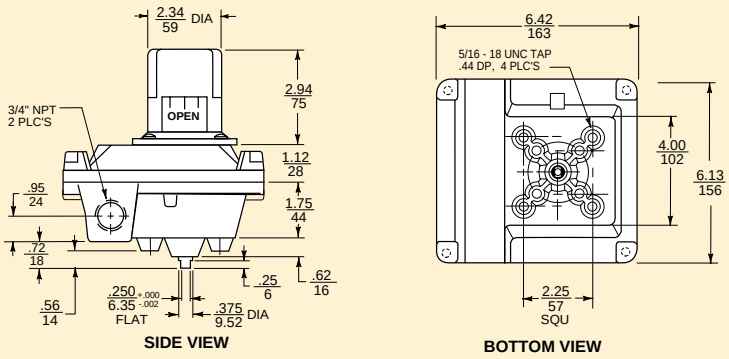
9358 & 9044

For dimensions of 9358 enclosure see page A-13 1000 Series
For dimensions of 9044 enclosure see page A-17 2004 Series

9468

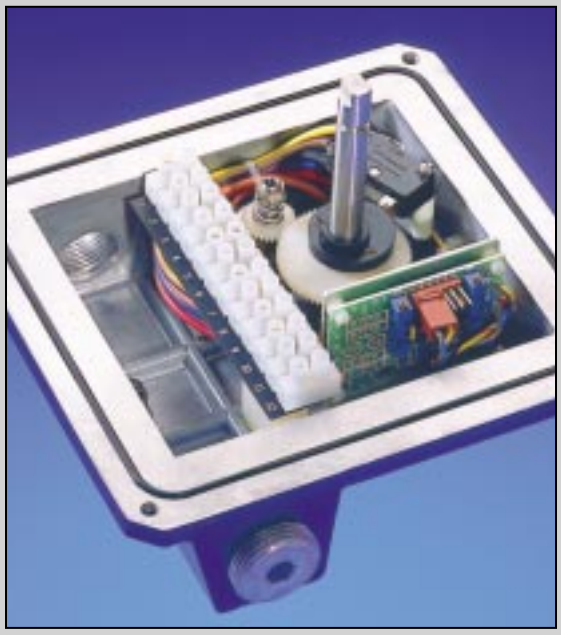


9479



SERIES II (Magnum Sensors)	BEACON™	3-WAY BEACON™	TRANSMITTER	SOLENOID
9358 Engineered Resin NEMA 4, 4X CSA	**STANDARD** (Black & Yellow) **BY**	90° Rotation **B1**	**Resistive Output:** 1000 ohms **RS** (Nema 4, 4x General Purpose) **Current Output:** 4-20 mA **CS** **Spectrum:** 4-20 mA **DT** (9479 only)	To Be Specified By Customer
9044 Aluminum NEMA 4, 4X CSA	**ANSI YELLOW** (Inherently Hazardous) **AY**	90° Rotation **B3**		
9468 Engineered Resin NEMA 4, 4X Haz. Loc. Nonincendive Class I, Groups A, B, C, D Class II, Groups F, G Division 2 Only, FM, CSA	**ANSI GREEN** (Liquid-Low Hazard) **AG**	90° Rotation **B5**		
9479 Aluminum Haz. Loc. NEMA 4, 4X, 7, 9 Class I, Groups C, D Class II, Groups E, F, G Division 1 & 2 Class I, Grps. A, B, Div. 2, FM, UL, CSA	**ANSI BLUE** (Gas-Low Hazard) **AB**	180° Rotation **B7**		
	ANSI RED (Fire Quenching) **AR**	180° Rotation **B9**		

For Eliminator configuration on 9479 and 9468 enclosures, prefix part numbers with the letter (E).
For flat cover (no Beacon) suffix part number with the letter (F). **Example: 9044F**



0-100%
Valve Position Transmitters

AccuTrak® RS & CS
Position Transmitters

Westlock transmitter options combine local visual display with remote electronic signaling for continuous flow device status. Point-to-point limit switch signaling is integrated with on-site visual monitoring and full range analog position transmission in one compact NEMA 4 or explosionproof enclosure.

RS: A 1000 ohm or 10,000 ohm analog resistive output proportional to valve position.

CS: A 4-20 mA analog current output proportional to valve position. The CS current transmitter features the latest technology in solid state transmitter design and operates with one of the lowest operating voltages in the industry (5 VDC) with a maximum load resistance of 1650 ohms at 38 volts DC.

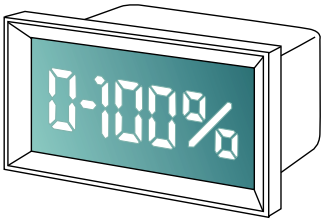
CS Transmitter

RS Transmitter

User Design Flexibility

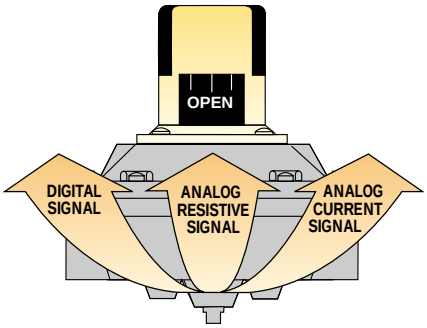
The Westlock Dual Display Monitor allows a user the flexibility to design a valve monitoring system around processing requirements as the need for additional information is required. The Full Range AccuTrak offers design and operating personnel the following distinct advantages.

- 0-100% readout of valve travel is continuously monitored by an analog output signal. By combining an analog current output signal with two limit switches, the AccuTrak now offers complete travel range display, accuracy and speed of response. Additionally, a 1000 ohm resistive analog output, proportional to valve position, can be provided for continuous remote monitoring, trend analysis, or computer interface.
- Limit switches for positive end position monitoring of valve travel.
- Local mechanical display of valve position throughout the full range of travel.



The RS and CS options monitor valves throughout a 0-100% range. At full open or closed, switches will confirm end position limits.

AccuTrak® RS & CS
Position Transmitters



4-20 mA Transmitter

- Precision analog position transmitter.
- Operates with any voltage from 5 to 38 volts DC.
- Polarity Independent.
- Transient protected.
- Easy set up, non-interactive adjustment.
- CW and CCW rotation easily accommodated.
- Accommodates long cable runs and multiple receivers.
- Available with proximity sensors or mechanical switches.

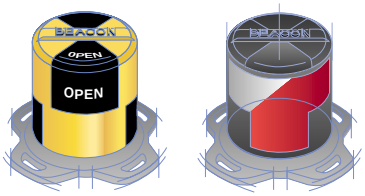
RS POSITION TRANSMITTER (RESISTIVE)

Standard Output Signal	1000 ohms
Power Rating At 70* C	1 watt
Elements	Conductive Plastic
Rotational Life (no load)	100,000 cycles

CS POSITION TRANSMITTER (CURRENT)

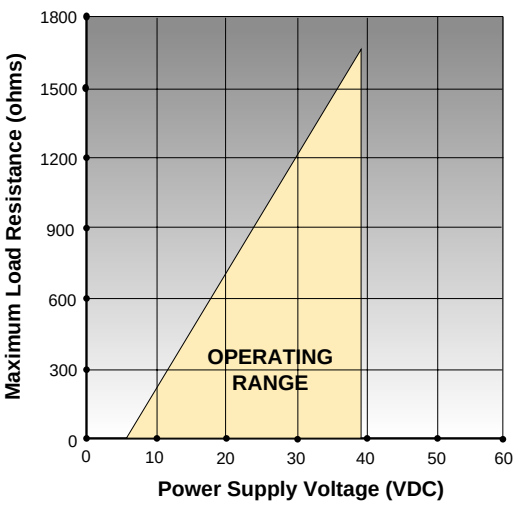
Power Supply Range:	5 volts DC to 38 volts DC
Operating Temperature Range:	-24°C to 85°C
Recommended Power Supply:	24 volts DC
Output Signal Range:	4 to 20 milliamperes DC
Load Impedance:	0 to 950 ohms at 24 volts DC
Output Current Limit:	55 milliamperes DC
Ambient Temperature:	For a 100°C change in ambient temperature. The maximum zero shift is plus or minus .3%, and the maximum span shift is plus or minus .4% of span.
Maximum Rotation:	95°
Minimum Rotation:	45°
Linearity:	Plus or minus 1.0%
Hysteresis:	.55% of full scale
Repeatability:	Plus or minus .3% of full scale
Power Supply:	Output signal changes .018% when the supply voltage is varied between 5 and 38 volts DC.

On-Site Graphic Display



Every AccuTrak is equipped with a Beacon High Visibility Position Monitor. Valve position is recognizable from distances up to 150 feet.

$$\text{Maximum Load Resistance} = \frac{\text{Power Supply Voltage - 5VDC}}{\text{20 mA}}$$



ORDERING GUIDE

Order standard units as required and request Transmitter Option by part number.

RS Resistive Output Signal

CS Current Output Signal

Spectrum® DT

Digital Position Transmitter

Full-Range Position Transmitter with Digital Sensing

Westlock has merged absolute encoder sensing technology with loop-powered analog transmission to create the Spectrum DT™ full-range position monitor. The communication mode continues to be the standard 4-20 mA analog signal while actual sensing is achieved by a true digital sensor.

Key Performance Benefits

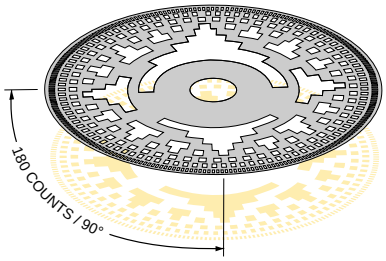
■ Reference accuracy is three times that of traditional potentiometric analog sensors.

■ Shifts due to environmental effects such as temperature are improved by a factor of three or more compared with traditional analog sensors.

■ Greater repeatability and accuracy that digital control systems brought to the control room have now been extended into process measurement in the field.

True Digital Position Sensing

An absolute encoder is a position verification device which provides position information for each shaft location. The digital code is unique to each location. In absolute encoders, there are several concentric tracks, each with an independent light source. As light passes through a slot, a high state called "true 1" is created. When light does not pass, a low state known as "false O" is created. Shaft position is identified by the pattern of 1's and 0's.



Loop-Powered 4-20 mA Transmission

The 4-20 mA analog signal, which has long been a useful method of interfacing sensors to remote computers, is the main standard for data transmission of the Spectrum DT.

The Spectrum DT Position Transmitter derives its operating power from the 4-20mA loop itself, with no need for an external power connection. This is a high-level signal not easily affected by outside noise. In addition to the advantages of standardization, reduced field wiring costs and immunity from most electrical noise, the 4-20 mA transmitter offers these benefits:

■ Any number of signal receivers can be series-connected into the signal circuit without upsetting calibration.

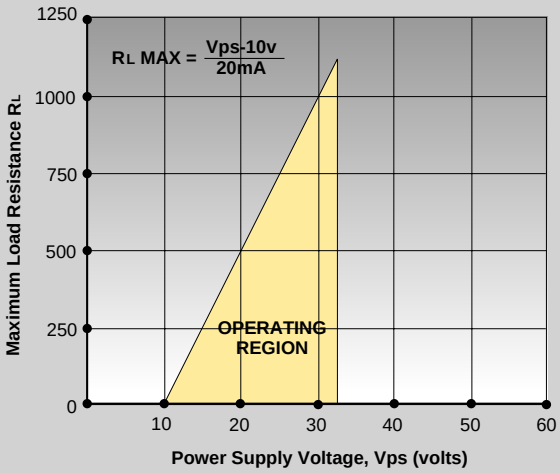
■ Multiple transmitters may share the same power supply.

■ A 4-20mA signal is a "live zero" signal, which distinguishes a process condition (4mA) from an open circuit condition (OmA).

■ No position loss on power down.

■ Operates in electrically noisy environments.

Power Supply Requirements



Spectrum® DT

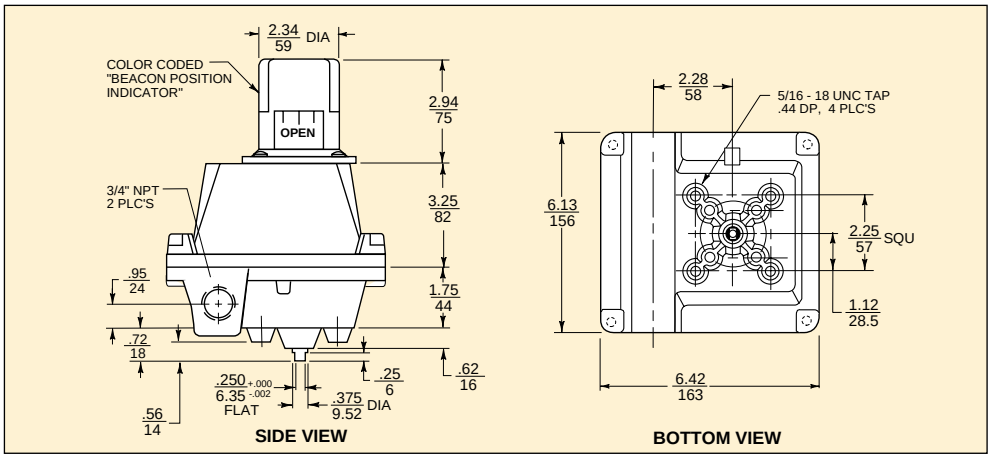
Digital Position Transmitter

Operating Description

The shaft encoder is an 8 bit device, utilizing gray code parallel outputs. Gray to binary conversion takes place before further signal processing. Data corresponding to shaft position is latched, and fed to a high quality digital to analog converter, with timing synchronized to encoder LED excitation. A precision, low drift voltage reference is utilized for the D/A convertor DC source, as it is for the scaling and live zero circuitry which follows. Voltage to current conversion develops the true current sink output characteristic provided by the transmitter. Current sampling and feedback assure that a current which is truly representative of shaft position is generated.

The internal power supply is derived in total from the 4 to 20 mA signal loop. Stored energy from that power supply is delivered to the encoder LEDs for excitation on a pulsed basis for a period of several milliseconds approximately once every 20 milliseconds. In this manner, LED current excitation requirements in excess of 100 mA can readily be met despite the con-straints imposed by 2 wire current loop operation. Operation of the data latch and D/A convertor, as mentioned above, is synchronized to LED excitation.

DIMENSIONS (inches / mm)



TECHNICAL SPECIFICATIONS

Transmitter type:	Angular position, intended primarily for control valve applications, damper applications, and similar uses.
Output:	4 to 20 milliamperes (2 wire), proportional to position. Position range is 90° (reversible) corresponding to nominal output current range.
Operating principle:	Absolute shaft encoder, non-contacting.
Electrical overrange capability:	19° nominal at each° end of 90° span. For travel below range bottom, output current will limit at minimum of approximately 3.2 mA.
Mechanical overrange capability:	Infinite (shaft may be continuously rotated).
End of range wraparound:	Provided 180° away from range midpoint.
Terminal voltage req.	10 to 32 volts DC. Reverse polarity protected.
Temperature range:	-29°C to +82°C. Sunshade available for use when needed.
Temperature effect:	Less than 0.01%°C referred to full scale.
Humidity range:	10% to 90%, non-condensing.
Terminal voltage effect:	Less than 0.1%, from 10 to 32 volts.
Linearity:	Within one encoder count increment.
Output update rate:	Once per second.
Startup stabilization time:	6 seconds, nominal.
Resolution	0.5° 180 counts in 90°

AREA CLASSIFICATIONS

NEMA 4, 4x, 7, 9
Class I, Groups C, D
Class II, Groups E, F, G,
Divisions 1 & 2

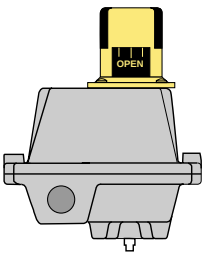
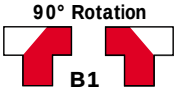
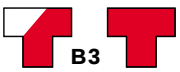
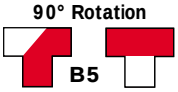
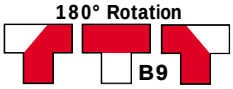
ENCLOSURE

Conduit Entries	2 - 3/4" NPT
Terminal Strip	8 contacts standard 16 contact available

APPROVALS / CERTIFICATION

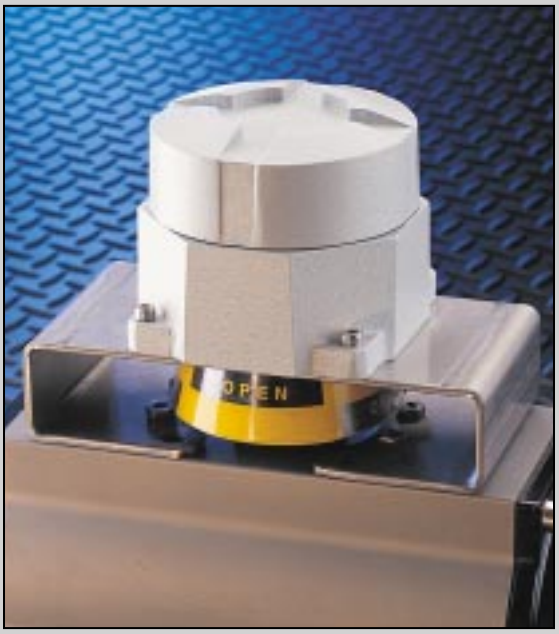
UL (Underwriters Laboratories, Inc.)
CSA (Canadian Standards Association)

ORDERING GUIDE

ENCLOSURE	BEACON™	3-WAY BEACON™	SOLENOID
AccuTrak DT Transmitter 	**STANDARD** (Black & Yellow) **BY** 	90° Rotation  **B1**	To Be Specified By Customer
	ANSI YELLOW (Inherently Hazardous) **AY** 	90° Rotation  **B3**	
	ANSI GREEN (Liquid-Low Hazard) **AG** 	90° Rotation  **B5**	
	ANSI BLUE (Gas-Low Hazard) **AB** 	180° Rotation  **B7**	
	ANSI RED (Fire Quenching) **AR** 	180° Rotation  **B9**	

EPIC® 420R

Non-Contact Position Transmitter



Non-Contact Position Monitoring for Rotary Valves

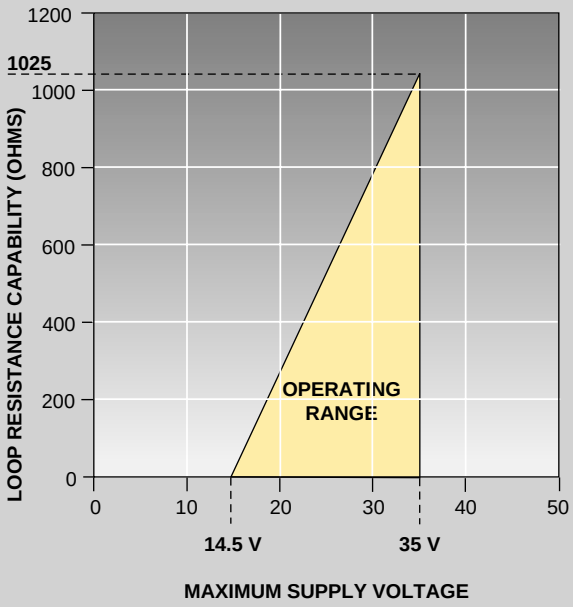
The EPIC® non-contact position transmitter represents a significant departure from previous attempts to reliably measure the position of rotary control valves. As opposed to conventional devices, couplers are not utilized. A magnetic proximity module, attached to the actuator output shaft is the only "moving" part in the transmitter. Sensing is performed totally by non-contacting means, based upon characterization of flux strength as a function of axial position.

A state-of-the-art solid-state sensor is employed whose output is a function of both magnetic flux density and excitation voltage.

Low current operation of the sensor is enabled through the use of new materials, which allows continuous operation rather than discrete sampling. Continuous operation permits high speed updating of the output current making it suitable for use in fast closed loop systems.

The inherent reliability of the transmitter permits use of advanced control strategies, where knowledge of valve position can be used in predictive and other algorithms.

Power Supply Requirements



TECHNICAL SPECIFICATIONS

Conduit Entries	3/4" NPT
Output	4 to 20 mA proportional to angle
Terminal Voltage Req.	7 to 35 volts
Linearity	± 1%
Span Adjustment	60 to 120 degrees
Zero Adjustment	30% of calibration span
Resolution	Infinite
Hysteresis	Negligible
Temperature Range	-20°F to 185°F
Temperature Effect	.03% per °F
Humidity	10% to 90% non-condensing
Voltage Effect	Less than .05%
Reverse Polarity	Protected
Mounting Attitude	Any Position
Startup Stabilization	.5 seconds

EPIC® 420R

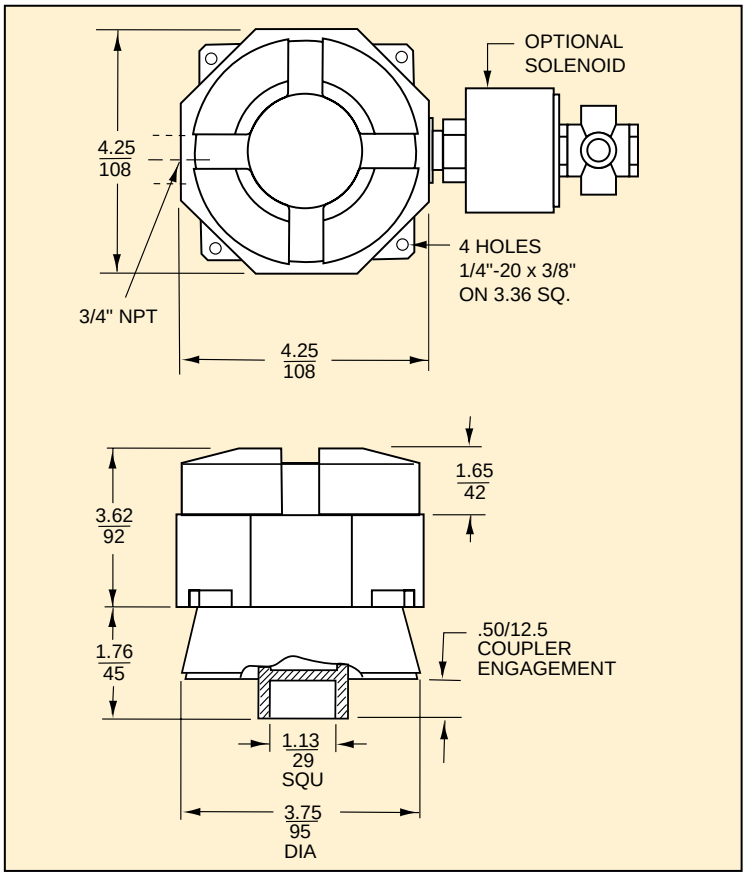
Non-Contact Position Transmitter

AREA CLASSIFICATIONS
NEMA 4, 4x, 7, 9
Class I, Groups B, C, D
Class II, Groups E, F, G, Divisions 1 & 2
Class I, Group A, Division 2

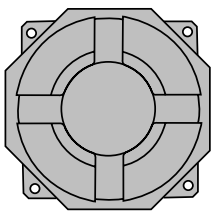
MATERIALS OF CONSTRUCTION	
Housing	Cast Aluminum
Cover	Cast Aluminum

APPROVALS / CERTIFICATION
UL (Underwriters Laboratories, Inc.)
CSA (Canadian Standards Association)

DIMENSIONS (inches / mm)



ORDERING GUIDE

EPIC®	SOLENOID
420R Aluminum: Class I, Groups B, C & D Class II, Groups E, F & G, Divisions 1 & 2 Class I, Group A, Division 2 	To Be Specified By Customer