

# WDA Motion Alignment Sensor

BETTER BY DESIGN

## WDA Motion Alignment Sensor High Power Extended Range Magnetic Proximity Sensor

### APPLICATION

Non-contacting extended range magnetic proximity sensor, not affected by dust or material build up, used to detect a moving ferrous target up to 3 inches away from the sensor.

### METHOD OF OPERATION

The WDA sensor can be used on bucket elevators to measure belt speed and alignment by sensing either the metal elevator buckets, or the ferrous bolts attached to plastic buckets. A more specialized use for the WDA switch is as a broken/slack chain detector on drag chain conveyors, or as a non-contact speed switch for screw conveyors.

The sensor is used in conjunction with a PLC or with 4B's Watchdog™ Elite or A400 Elite control units. Two output signals are provided: one signal is a pulse output, representing each bucket detected: the second signal is a continuous output when moving buckets are detected.

### FEATURES

- ▶ Detects Moving Steel Ferrous Targets
- ▶ Adjustable Sensing Range of 1 to 3 Inches
- ▶ Not Affected by Material Build Up
- ▶ Stainless Steel Construction
- ▶ LED Pulse Indication
- ▶ High Temperature Version Available

### PART NUMBERS/ACCESSORIES

- ▶ WDA3V34C      WDA Standard Sensor
- ▶ HTAS1V34      WDA High Temperature Sensor
- ▶ WDAMB          Nylon Mount (Included with WDA3V34C)
- ▶ SR2V5-1        Speed Relay
- ▶ WDC4V46C      Watchdog Super Elite Monitoring System
- ▶ A4004V46C      A400 Elite Monitoring System



WDA Sensor  
(WDA3V34C)



ATEX and IECEx Versions Available

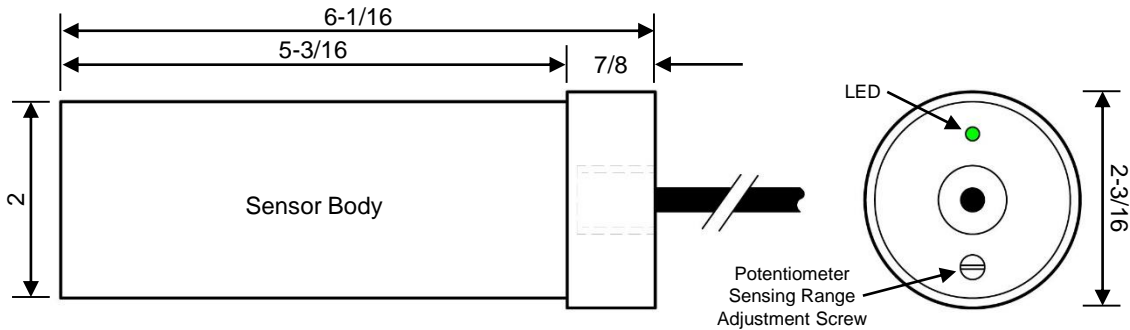


High Temperature WDA Sensor  
& Remote Electronics Box  
(HTAS1V34)

# WDA Motion Alignment Sensor

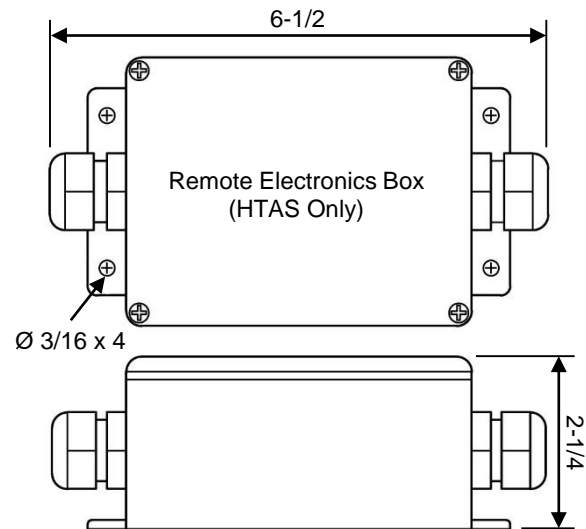
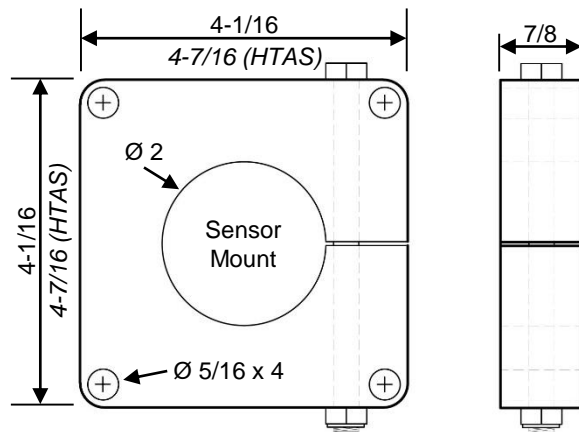
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## DIMENSIONS



ALL DIMENSIONS  
IN INCHES

NOTE – For the HTAS, the LED & potentiometer are located within the remote electronics box.



## TECHNICAL SPECIFICATIONS

### WDA Motion Alignment Sensor

	WDA3V34C	HTAS1V34
<b>Voltage:</b>	12-24 VDC ± 10%	12-24 VDC ± 10%
<b>Supply Current:</b>	65 mA	60 to 130 mA
<b>LED Indicator:</b>	Green (Flashing) - Target Detected Green (Off) - No Target Detected	Green (Flashing) - Target Detected Green (Off) - No Target Detected
<b>Outputs (Max):</b>	100 mA Sink (Pull) 50 mA Source (Push)	100 mA Sink (Pull)
<b>Detection Range (1" Dia. Target):</b>	Adjustable: 1" - 3" (25 mm - 75 mm)	Adjustable: 1" - 3" (25 mm - 75 mm)
<b>Detection Rate:</b>	20 - 2,000 Targets/Minute	200 - 2,000 Targets/Minute
<b>Cable:</b>	6 Conductor - 9 ft. Long	3 Conductor - 12 ft. Long
<b>Conduit Entry:</b>	1/2" NPT	NA
<b>Temperature Rating:</b>	-4°F to +122°F (-20° C to 50° C)	-14°F to +302°F Continuous (-25.5° to 150° C) -14°F to +356°F Maximum (-25.5° to 180° C)
<b>Protection:</b>	IP66	IP66
<b>Approvals:</b>	CSA Class II Div. 1 Groups E, F, & G (USA and Canada) ATEX and IECEX Available	CE - Europe

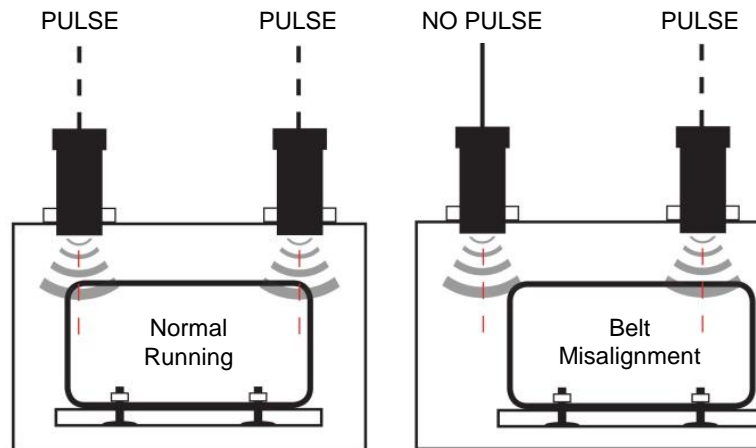
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## BUCKET ELEVATOR MONITORING

For bucket elevator belt alignment monitoring, WDA sensors are designed to work in pairs. 4B recommends that the elevator leg be monitored at both the head and boot sections. The diagrams below outline the typical installation configurations for metal and plastic elevator buckets.

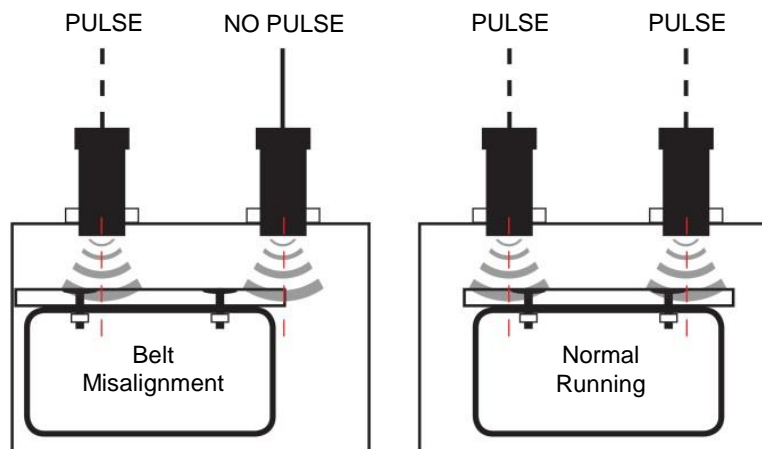
**WARNING** - Make sure that there is no ferrous steel (such as the machine's frame) within the sensing field.



**Ferrous Metal Elevator Bucket Configuration  
Front Mounting - Sensing Buckets**

NOTE - For metal buckets, sensors can also be installed on the side of the elevator leg. 4B recommends that all sensors be placed either on the front or on the side, but not in combinations.

If using stainless steel (non-ferrous) buckets, follow the plastic bucket configuration below to target the ferrous bolts and washers.



**Plastic Elevator Bucket Configuration  
Rear Mounting - Sensing Bolts**

# WDA Motion Alignment Sensor

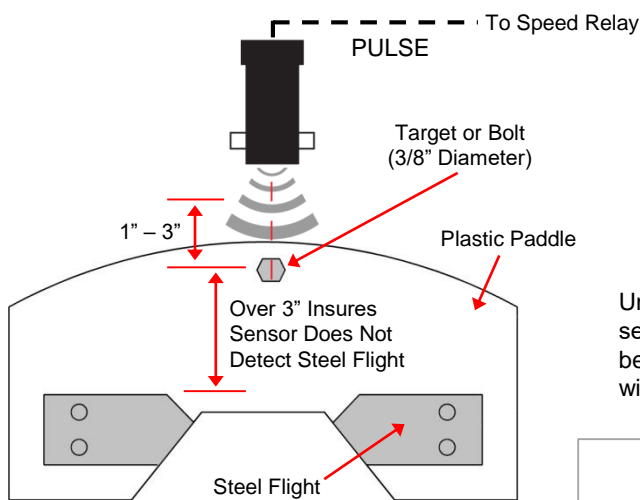
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## SCREW AND DRAG CONVEYOR MONITORING

For speed monitoring on a screw conveyor, mount the WDA sensor by using a stainless steel plate welded to the conveyor housing. Since stainless steel is non-ferrous, the sensor will not be affected as the sensing field can pass through the plate. The sensor should be mounted 1 to 3 inches away from the moving ferrous flight (target), but over 3 inches away from the stationary rotating shaft. This installation is very similar to option 1 for drag conveyors.

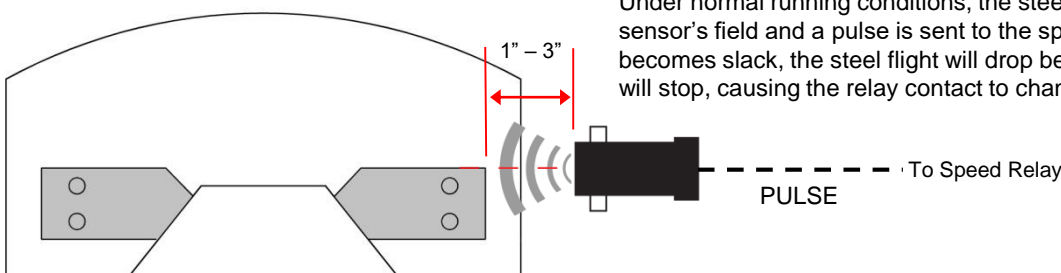
For slack/broken chain detection on drag conveyors, the WDA sensor can be installed using one of the three options below. Either a hole can be cut in the conveyor housing for the sensor, or the mount can be installed on a stainless steel plate welded directly to the conveyor housing without drilling a hole. Since stainless steel is non-ferrous, the sensor will not be affected as the sensing field can pass through the plate.

**WARNING** - Insure that no ferrous steel, such as the machine's frame is within the target sensing field. This can interfere with the sensor detecting the intended target.



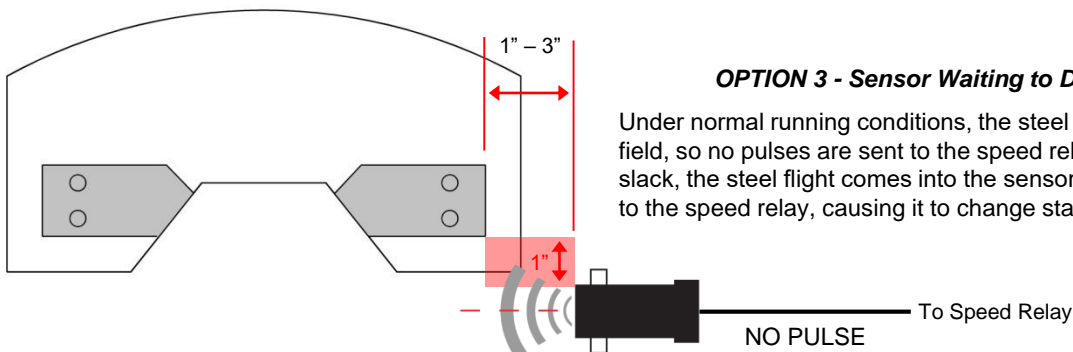
### OPTION 1 - Sensor Detecting Target on Paddle

Under normal running conditions, the target bolt passes through the sensor's field and a pulse is sent to the speed relay. If the chain becomes slack, the target bolt will drop below the field and the pulses will stop, causing the relay contact to change state.



### OPTION 2 - Sensor Detecting Steel Flight

Under normal running conditions, the steel flight passes through the sensor's field and a pulse is sent to the speed relay. If the chain becomes slack, the steel flight will drop below the field and the pulses will stop, causing the relay contact to change state.



### OPTION 3 - Sensor Waiting to Detect Steel Flight

Under normal running conditions, the steel flight is out of the sensor's field, so no pulses are sent to the speed relay. If the chain becomes slack, the steel flight comes into the sensor's field and a pulse is sent to the speed relay, causing it to change state.