

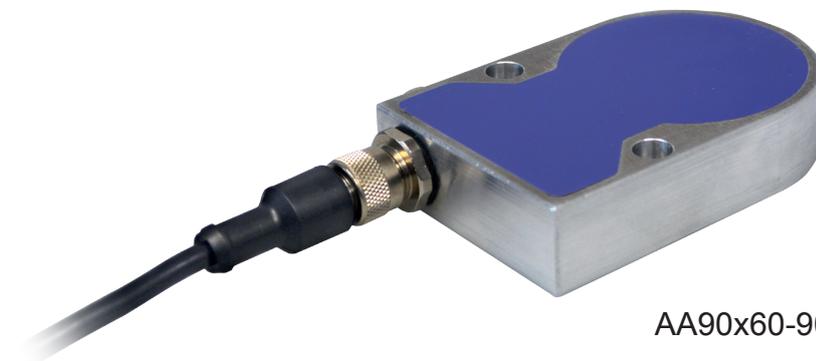
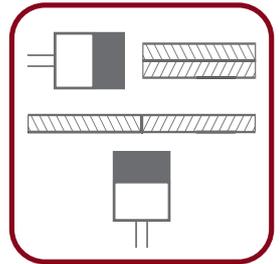
## Eddy Current Sensor Eagle Eye AA

Universal inductive sensor principle for the detection of layers, butt joints and edges in metallic semi-finished products

- Double sheet detection, butt joint detection and wire detection
- For all metals
- Contact free and independent from optical properties
- Applicable for start and stop operation
- Analog output 4...20 mA or 2...10 V
- For connection to the PLC
- Cost effective control unit XA100-S
- Available in different sizes and designed for different fields of applications

### THE ROLAND PLUS

- ▶ Innovative sensor ideas
- ▶ Solutions for the mechanical engineering



AA90x60-902F8S



XA100-S



### The manual contains detailed security instructions

These devices are NOT suitable for personnel safety applications. Never use these products as sensing devices for personnel protection. Their use as a safety device may create an unsafe condition which could lead to injury or death.



With the new eddy current sensor AA-type, Roland Electronic has succeeded to develop an amazing sensor. The sensor, consisting of several coupled bobbins, reminds in the figurative sense the vision of the giant Argus (Eagle) in Greek mythology. If something comes into the inductive „field of view“, then it will not loose the sight of it.

When processing sheets, strips and other semi-finished metallic products, such as stacked sheets or individual segments of coil packages, a secure and reliable detection of sheets, of coil segments or butt joints becomes necessary.

## Application

The Eagle Eye AA is capable to detect especially structural material boundaries in metals. These might be for example air gaps between butt joints or stacked sheets. Even metallic transitions with different types of metals are detected reliably.

In the detection of ferromagnetic materials the sensor indicates a very significant signal which is affected only by the number of material boundaries. Applications solvable only with complex systems become so far possible with this sensor type.

The analog sensor signal output can be processed rapidly with a performant PLC. The universal control unit XA100-S may be used for a simple and quick integration in an existing system. The control unit provides switching signals for norm-, under- and over size limits.

## Function

To proceed a correct measurement, it is a basic condition to adjust the sensor perpendicular to the material transition. When destacking sheets from a cart, the sensor is targeted to the lateral side of the cart (Fig.1). When detecting butt joints, the sensor must be positioned parallel to the material (Fig.2).

The edge of the blank has to pass the sensor in a constant distance  $X$ . When a material transition passes along the sensor, the signal value rises or falls above or under standard value. This signal can be monitorized with a windows comparator, both in start and in stop operation.

Keep in mind that the distance between the sensor and the material must remain constant. In applications that do not apply to this basic condition, Roland Electronic offers other solutions in its product program. The maximum transport velocity of the material depends on the sample rate of the system in usage. According to the application it is required that the PLC is able to sample and to process the sensor signal with 1 KHz.

If that is not possible the control unit XA100 can be used to process switching signals directly..

Constant distance  $X$  between sensor und material to detect correctly layers, butt joints and edges

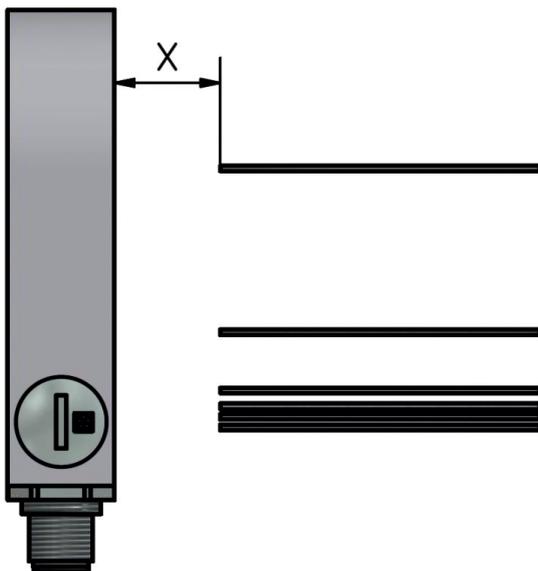


Fig.1 Adjustment of the sensor when destacking sheets from the blank cart

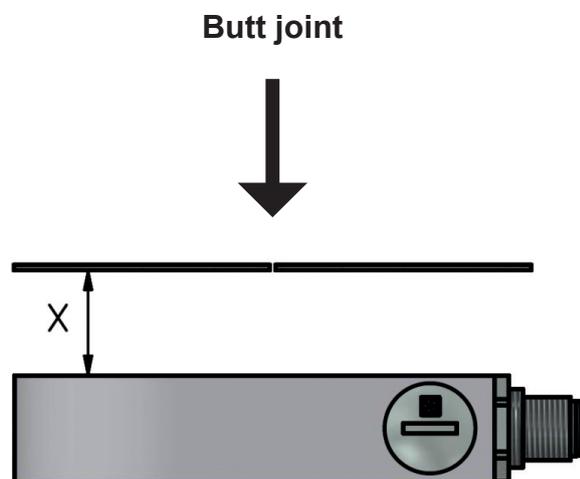
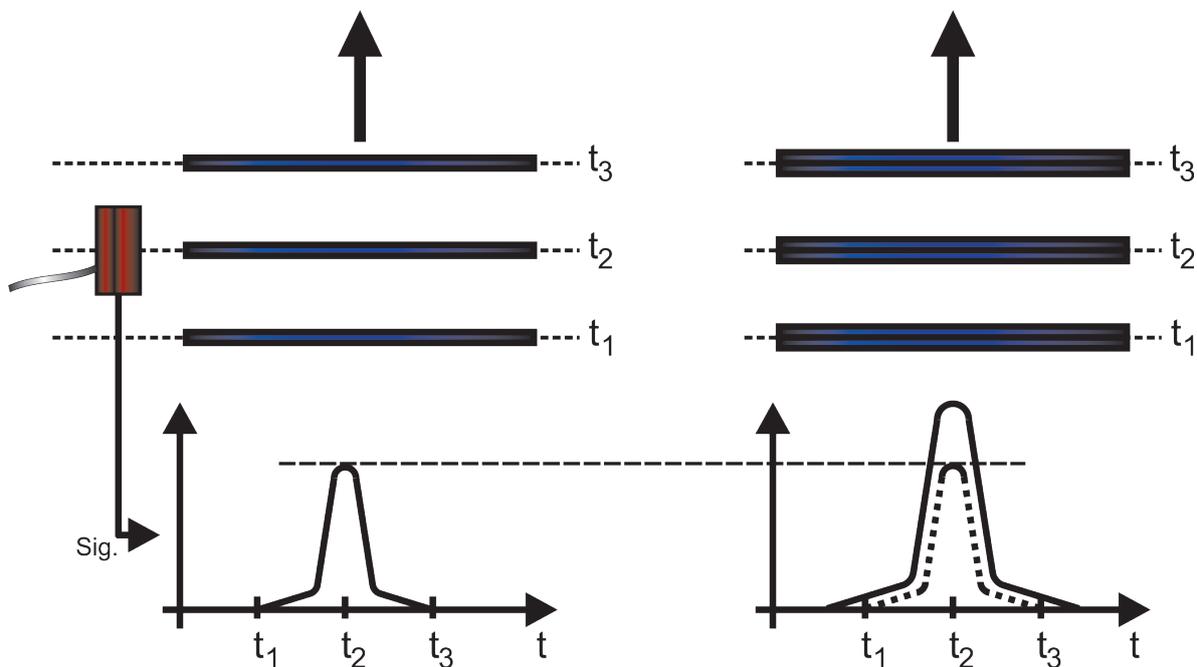


Fig.2 Parallel adjustment of the sensor in detection of butt joints

## Technical data

	AA90x60-453F2S	AA90x60-902F8S	AA150x100-902F8S
Ferrous material, single sheet thickness:	0.2 ... 4 mm	0.4 ... 8 mm	0.4 ... 8 mm
Distance X (Distance variation < +/- 0.5 mm):	0.5 mm	7 mm	9 mm
Stainless steel, aluminum, copper:	After application test		
Time period for the analog signal, full scale:	< 20 ms		
Supply voltage:	20 ... 28 VDC		
Supply current:	< 50 mA		
Output voltage:	0/2 ... 10 V		
Output voltage load:	100 K $\Omega$ (min. 10 K $\Omega$ )		
Output current:	0/4 ... 20 mA		
Output current load:	50 $\Omega$ (min. 0 $\Omega$ / max. 300 $\Omega$ )		
Temperature range:	+ 15°C ... +45°C (Operation) - 20°C ... + 70°C (Storage)		
Sensor weight:	250 g (0.55 lbs)	250 g (0.55 lbs)	500 g (1.10 lbs)
Conformity:	CE		

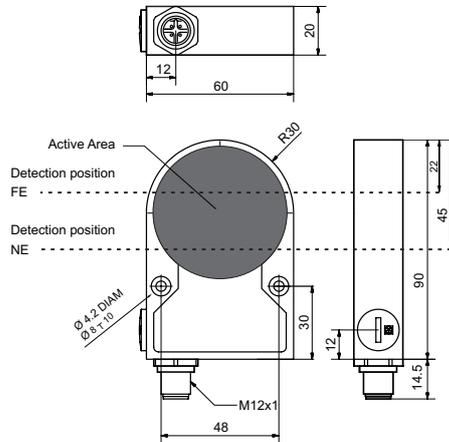
## Sensor signal in dependence on time (or position) and number of sheet layers



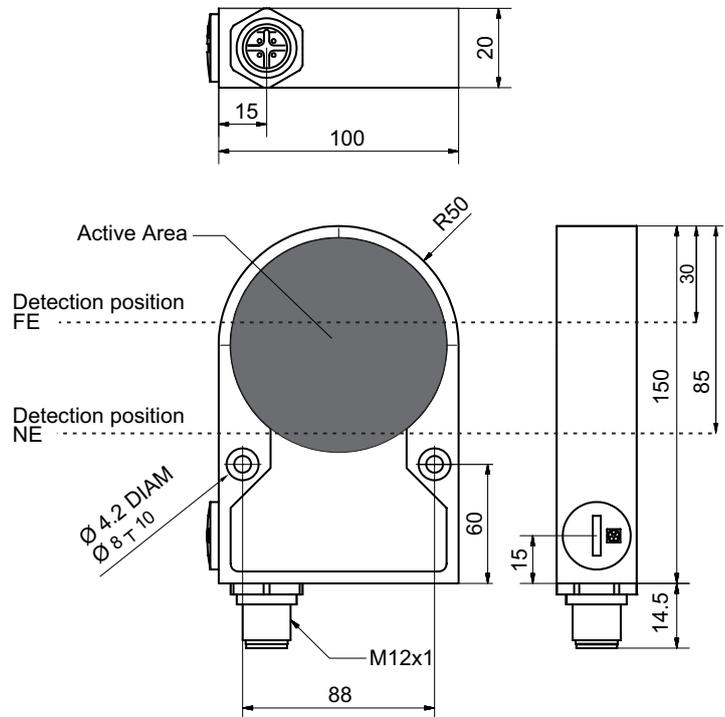
- **Static Measurement:** In this case the sheet is moved at a constant distance X always into the same position t in front of the sensor. In this position the sensor signals are analyzed. After this evaluation the sheet can be removed.
- **Dynamic measurement:** For instance when de-stacking. In this case the sheet passes the sensor at a constant distance X. The analysis and evaluation of the sensor signals have to be made during the movement.
- The highest signal amplitude is reached in the detection position t2. The positions for FE metals and NE metals are not identical. Their positions are marked in the technical drawings of the sensors.

# EDDY CURRENT SENSOR AA

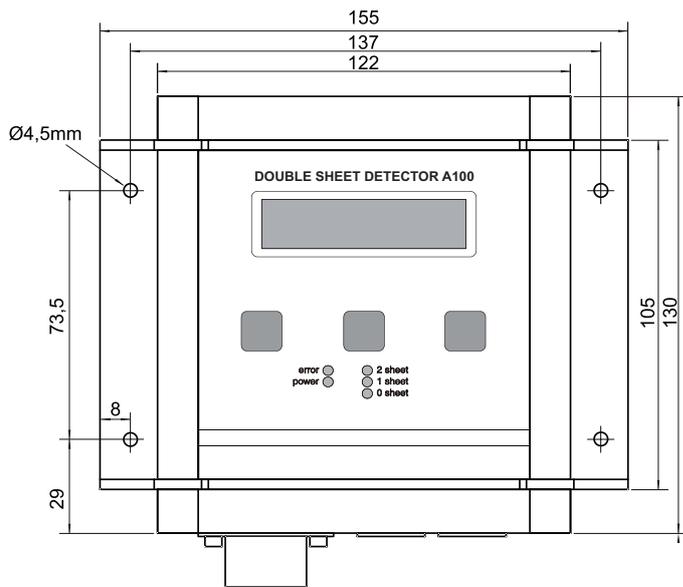
## Sensor AA90x60-xxx-S



## Sensor AA150x100-902F8S



## Control unit XA100-S



## Order Information

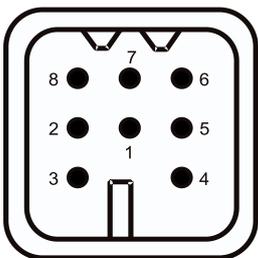
### Control unit

Part name	Comment
<b>XA100-S</b>	Control unit in Aluminum enclosure Supply voltage 20 ... 28 VDC

### Sensors

Part name	Comment
<b>AA90x60-453F2S</b>	Eagle Eye sensor with plug-in connection
<b>AA90x60-902F8S</b>	Eagle Eye sensor with plug-in connection
<b>AA90x60-902F8S</b>	Eagle Eye sensor with plug-in connection

### XA100-S Supply connection



Enclosure HAN 3A, EMI-type metrical 7-pin insert on PE	
Pin 1	+24V DC
Pin 2	GND
Pin 3	Teach-In
Pin 4	2-Sheet
Pin 5	1-Sheet
Pin 6	0-Sheet
Pin 7	+24V DC f. I/O
Pin 8	PE

### Cables

Part name	Comment
<b>SCWFM12S-GG</b>	Sensor cable for connecting the sensor to the control unit XA100-S
<b>CWFM12S-GG</b>	Sensor cable for connecting the sensor to the PLC

Standard length of cable is 5 m, other lengths on request

### Accessories

Part name	Comment
<b>S0003515</b>	Harting connector, complete

Revision 1.5, April 2018 - Subject to technical modification and error

