

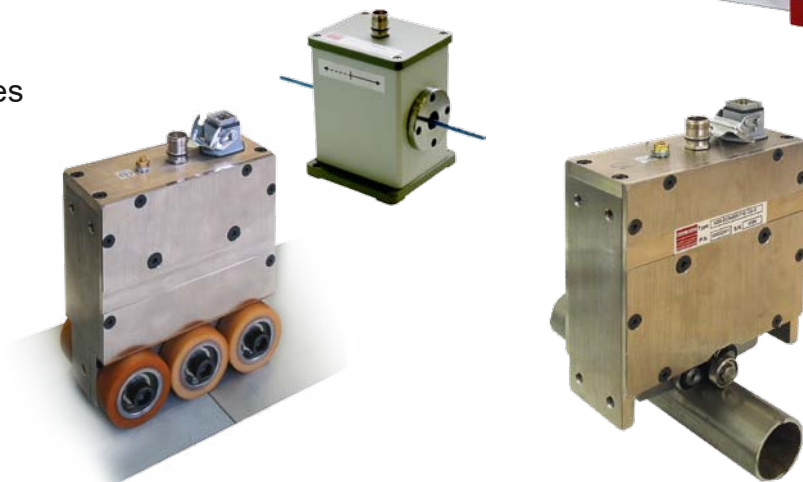
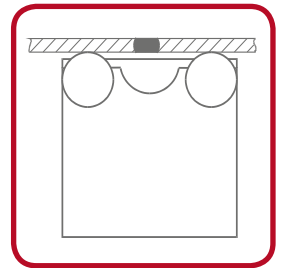
## Weld Seam Detection System SND40

Combination of Leaking Flux  
and Eddy Current for measuring  
ferrous and non-ferrous materials

- Tubes, cans and drums
  - Material diameter 5 - 500 mm (.197" – 19.7")
  - For positioning applications
  - Monitoring of drive and control of detection reliability
- Coils, wires and lines
  - Detection of butt welds and lashes
  - Detection of changes in structure of material
- High inspection speeds
  - For tubes max. 300 rpm (depending on diameter)
  - For coils max. 32 ft/sec
- Sensor signal in recorder-like visualization
- Data backup via USB or Ethernet interface
- Graphical user interface with 10" screen
- Industrial standard interfaces for automation

### THE ROLAND PLUS

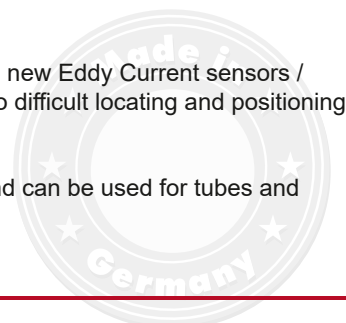
- ▶ Detection of invisible weld seams
- ▶ Two technologies in one unit
- ▶ New wizards for tube setup



The new Weld Seam Detector SND40 combines digital analysis and Eddy Current technology designed for the special requirements of Weld Seam Detection.

The ability to use various sensor types like the tried and proven magnetic Leaking Flux sensors and new Eddy Current sensors / probes make this system a highly flexible Weld Seam Detector. Therefore the SND40 can solve also difficult locating and positioning applications in tube bending machines, hydroforming presses and cut-to-length-lines.

The PC-based units features a menu dialogue with touchscreen, Fieldbus and Ethernet interface and can be used for tubes and coils of all metallic materials



## Description:

For processing of coil material and other “long” products (cables, wires), which become united to larger units (e.g. metal coils with traversal weld seams, cable coils with connectors), automatic detection of weld seams is required.

For processing of tubes, cans and drums, automatic detection of weld seams and positioning of the material is required. In combination with the suitable sensor the SND40 can be used for detecting longitudinal weld seams (e.g. at tubes, cans and drums) as well as traversal weld seams (e.g. at coils, cables and lines), for all metals.

## Function:

The sensor is placed on the material at standstill. Then the material will be continuously transported (for coil material) resp. turned by a tube turn facility (for tubes).

In case of material such as cables and wires the material must be threaded through an encircling coil and will then be continuously transported while measuring.

The measurement procedure will now be initiated by the machine PLC with a start signal. After a certain “settling time”, the measurement is performed.

A seam is detected if the digitally processed and filtered sensor signal exceeds the switching threshold. Then the SND40 sets the “weld seam detected” output.

For measuring tubes, the turn drive is also monitored. Furthermore, the detection reliability can be selected in 5 levels.

## Technical Data:

Supply voltage:	100 - 240 V AC
Power consumption:	< 110 W
Start-up current:	< 15 A / 115 V, < 30 A / 230 V
External fuse protection:	> 3.15 A medium-blow
Class of protection:	IP54 (in industrial enclosure)
Ambient temperature:	0 - 40 °C (32 - 104 °F) during operation
Weight:	approx. 12 kg (26.5 lbs)
Dimensions:	approx. 16.5" × 9.2" × 12" (L × W × H)



## Hardware:

- Embedded PC, operating system Windows CE for user interface
- Real-time computing (ARM7) for detection and positioning
- Potential free inputs / outputs with opto couplers as well as relay contact output
- USB interface at front side, for software update, data backup and print-out
- 10 Mbit Ethernet interface for remote diagnostics / control
- Fieldbus interface (optional) for control and feedback
- Optional usage of mouse and keyboard

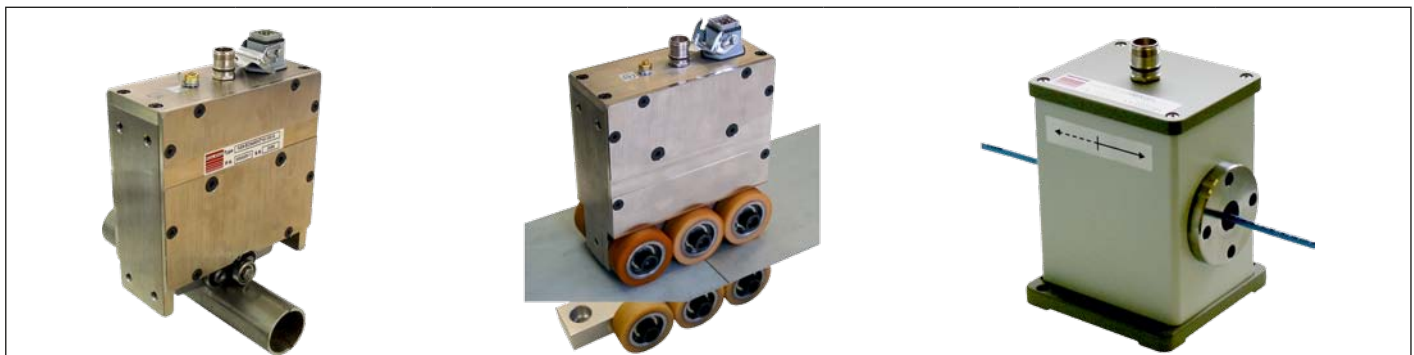
## User Interface:

- **New wizards** for tube setup: System- and program wizard.
- Easy operating and programming of the control unit via a 10" screen
- Large graphical visualization of the sensor signals and the evaluation
- 31 measurement programs can be selected via parallel interface / Fieldbus interface
- Data backup and print-out via USB interface

## Sensors

Sensors for tubes, cans and drums						
Sensor	Function principle	for ...	Tube diameter	Wall thickness	Dimensions	Weight
NS9-EC8×60NT...	Leakage flux / Eddy current	Ferrous / Non-ferrous tubes	10 - 250 mm (.39" —9.9")	up to 3 mm (.12")	79 x 165 x 178 (3.1" x 6.5" x 7")	6.6 kg (14.6 lbs)
NS12-EC8×80NT...			12 - 250 mm (.47" —9.9")	up to 4 mm (.16")	99 x 165 x 205 (3.9" x 6.5" x 8.1")	11 kg (24.3 lbs)
NS24-EC18×185NT...			25 - 500 mm (.99" —19.7")	up to 12.5 mm (.49")	226 x 257 x 367 (8.9" x 10.1" x 14.5")	63 kg (139 lbs)

Sensors for coils, cables, wires and lines						
Sensor	Function principle	for ...	Material width	Material thickness	Dimensions	Weight
NS9-EC8×35NT...	Leakage flux / Eddy current	Ferrous / Non-ferrous coils	min. 100 mm	depending on material	102 x 165 x 180 (4" x 6.5" x 7.1")	7.5 kg (16.5 lbs)
EC9-8×35NT...	Eddy current	Non-ferrous coils				6.5 kg (14.3 lbs)
EC...PDN50-500-S	Eddy current encircling coil	Cables, wires	4.5 / 12 / 16 mm Ø, (.18" / .47" / .63") depending on sensor		112 x 123 x 142 (4.4" x 4.9" x 5.6")	1.0 kg (2.2 lbs)
EC...IDN50-500-S						



In addition to the most common sensors listed here, more sensors are available. The suitable sensor must be determined by an investigation of sample material in our application laboratory, in order to guarantee reliable function.

**Leakage flux sensors** and **Eddy current sensors** require a constant distance between the sensor element and the material surface. Since the sensor is placed on the material surface for measurement, a mechanical jacking device (e.g. with pneumatic cylinder) is required.

**Encircling coils** have a tubular detection coil, the material transits through it. The material is to fill the inner passage of the coil as good as possible, but may not touch the coil when transiting. If the material runs unevenly through the sensor and thus strains the inner side of the coil tube, an external protecting device (e.g. with draw stones) is advisable, it is available as accessory.

**Combo sensors** contain a Hall probe and an Eddy Current probe. This enables the sensor to measure ferrous material as well as non-ferrous material.

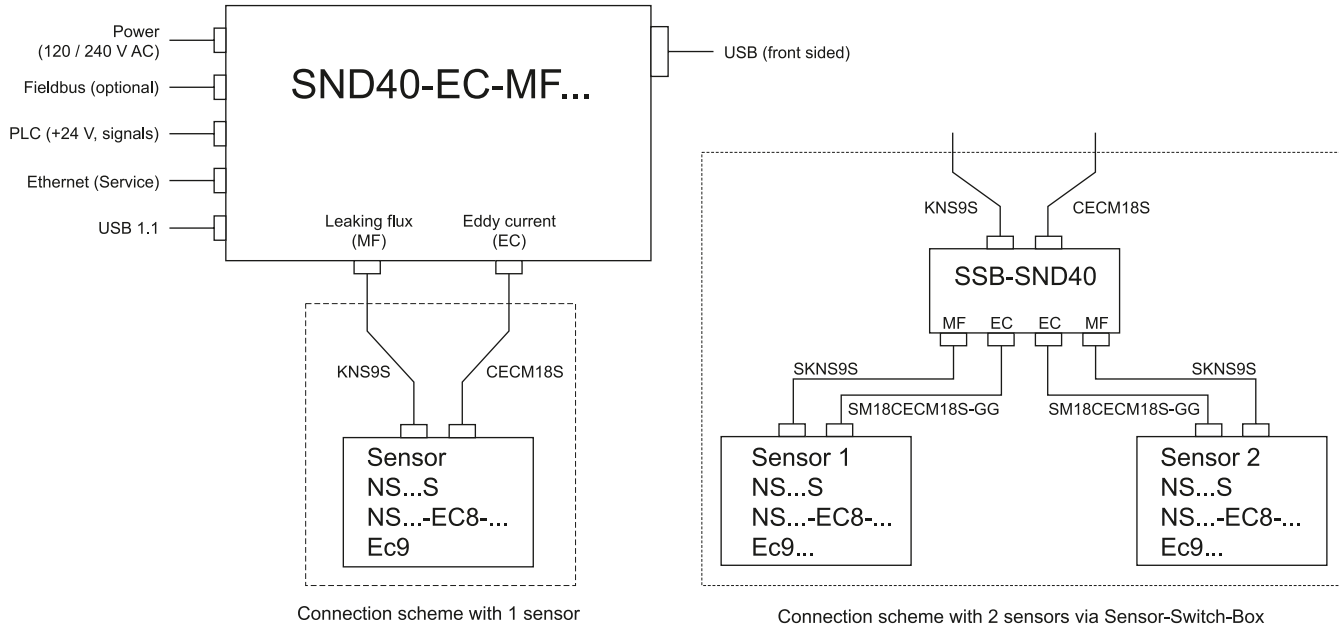
### Measurement Principles:

**Magnetical leaking flux principle:** The magnetic flux of an electro magnet is led into the material, at places with uneven material structure magnetical leakage flux escapes which will be measured and evaluated. This is a solid method for detecting weld seams which appear as deviations in geometry and magnetical conductance. The procedure is suitable only for ferromagnetic material.

**Eddy current principle:** An alternating electromagnetical field is led into the material where it causes Eddy currents. Those induce a voltage in the measuring coil which will be evaluated. This more demanding method enables detection of weld seams which appear as deviations of the magnetical and electrical conductivity as well as geometrical changes. Such geometrical changes (grooves, scratches) can here easier be suppressed. Furthermore, the higher resolution is advantageous when detecting narrow seams.

Giving a sweeping statement about the detectability of weld seams is not possible. Therefore, an investigation of material samples in our application laboratory is always recommended.

# WELD SEAM DETECTION SYSTEM SND40



When using combo sensors, the connections are required according to the connecting scheme.  
 When using leakage flux sensors, the respective cables for Eddy current section are not required.  
 When using Eddy current sensors / probes, the respective cables for leakage flux section are not required.

## Versions of Control Units:

Order information	Description
<b>SND40-EC-IO</b>	Control unit with Eddy current module; control via I/O interface
<b>SND40-EC-PR</b>	Control unit with Eddy current module; control via Profibus interface
<b>SND40-MF-IO</b>	Control unit with leakage flux module; control via I/O interface
<b>SND40-MF-PR</b>	Control unit with leakage flux module; control via Profibus interface
<b>SND40-EC-MF-IO</b>	Control unit with Eddy current and leakage flux module; control via I/O interface
<b>SND40-EC-MF-PR</b>	Control unit with Eddy current and leakage flux module; control via Profibus interface. Other fieldbus variants are available on request.

## Sensor Cables and Accessories:

Order information	Description
<b>KNS9S-G</b>	Sensor cable for connecting the combo and leakage flux sensors with straight cable socket
<b>KNS9S-W</b>	Sensor cable for connecting the combo and leakage flux sensors with angular cable socket
<b>SKNS8S</b>	Sensor cable for connecting the combo and leakage flux sensors to the sensor switchbox, with straight cable socket
<b>CECM18S-G</b>	Sensor cable for connecting the combo and eddy current sensors
<b>SM18CECM18S-GG</b>	Sensor cable for connecting the combo and leakage flux sensors to the sensor switchbox, with straight cable socket
<b>SCB-EC-S</b>	Sensor Connection Box for connecting eddy current probes
<b>SSB-SND40</b>	Sensor Switch Box for connecting 2 sensors
<b>RSB-W</b>	Remote Service Box with WAN connection and WLAN
<b>RSB-M</b>	Remote Service Box with WAN connection and Mobile Network ( In preparation)
<b>22G9015</b>	Industry Network cable (Ethernet) for connecting the RSB with PC, SND40, ECT40 or Company Network. Length: 10m
<b>STUETZSCHUH</b>	Roller block as counter-support

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