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Control Technology and Sensors

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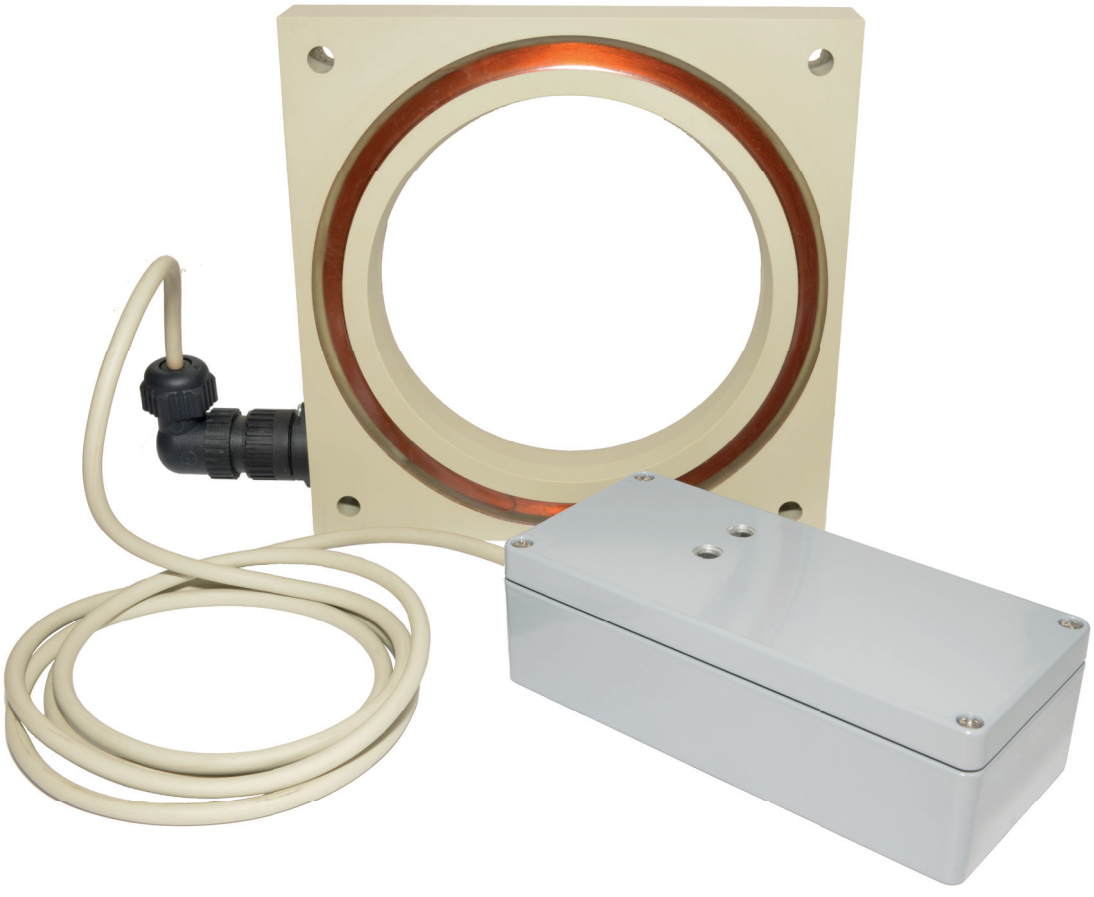

# Control Unit IRV20

## Self-Adjusting Control Unit for Sensing Coil IRT

- Typical application areas: Tube processing machines (Straightening, Pilgering), tube feeding by mandrel bars
- Automatic compensation of environmental metal masses
- Automatic compensation of environmental fields
- Automatic adjustment of the optimum response sensitivity related to the immersion depth of the material in the coil
- Adjustment remains stored after power-off
- High operational reliability under difficult conditions
- Isolated optocoupler switching outputs with high load rating (30V/100mA)
- Isolated optocoupler switching inputs
- Robust metal housing, protection class IP65
- Supply voltage: 24V DC or 24V AC

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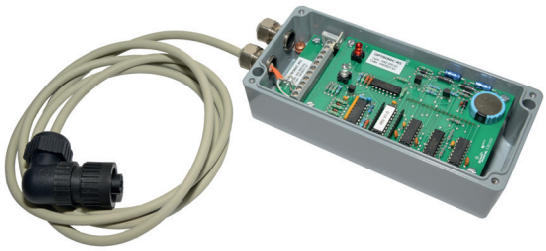
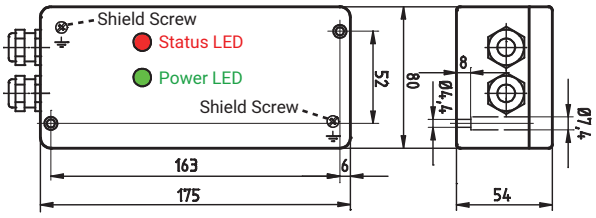
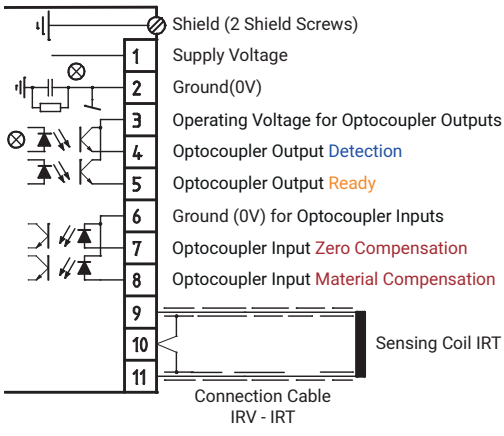





Status LED: Flashes (approx. 2Hz) during Zero or Material Compensation
bright (condition ON) while material is detected
Power LED: bright (condition ON), if the device is supplied and if the
device-internal voltage-converter is working correctly

Connections in Control Unit IRV20
(accessible after removing the housing cover)




Output Detection: Conducting (condition ON): Material detected
Output Ready: Conducting (condition ON): IRV20 adjusted/ready for operation
Input Zero Comp.: Current flowing (condition ON): Start Zero Compensation
Input Mat. Comp.: Current flowing (condition ON): Start Material Compensation

**Self-Adjusting System:**
- Automatic Zero Compensation:
  The influence of surrounding metal masses, static electromagnetic fields, or a mandrel bar in a pipe to be detected is automatically compensated.
- Automatic Material Compensation:
  The optimal response sensitivity related to the immersion depth of the material into the sensing coil is determined automatically.
- Storing the Adjustment after Power-Off:
  Zero compensation and material compensation remain stored without power supply for approx. 2 weeks, assuming that the device was powered-on for more than 2 hours before.

**Performing a Zero Compensation:**
① The material to be detected may be not near the sensing coil IRT
② A pulse at input Zero Compensation triggers the Zero Compensation
③ During the automatic zero compensation, the Status LED flashes, and the outputs Detection and Ready are both OFF
④ Was the Zero Compensation successful?
- YES:
  ⇨ Status LED OFF, output Detection OFF, output Ready ON
- NO (Zero Compensation not possible due to too much surrounding metal masses):
  ⇨ Status LED still flashes, outputs Detection and Ready stay OFF

**Performing a Material Compensation:**
① Insert the material to be detected axially to the middle of the sensing coil IRT
② A pulse at input Material Compensation triggers the material compensation
③ During the automatic Material Compensation, the Status LED flashes, and the outputs Detection and Ready are OFF
④ The IRV20 completes the material comparison automatically
⇨ Output Ready ON
⑤ Was the Material Compensation for the material to detect successful?
(Attention: The material to detect must still be inserted into the sensing coil IRT)
- YES:
  ⇨ Status LED ON, output Detection ON
- NO (the maximum possible response sensitivity is not sufficient):
  ⇨ IRV20 adjusts itself to the maximum possible response sensitivity
  ⇨ Status LED OFF, output Detection OFF

⑥ Remove the material to be detected from the sensing coil IRT
⇨ Output Ready ON, Status LED OFF, output Detection OFF

**Operation:**
① Turn on power
② Power LED OFF?
⇨ IRV20 defective
③ Power LED ON and output Ready OFF?
⇨ IRV20 not adjusted ⇨ Adjust the IRV20 (Zero and Material Compensation)
④ Power LED ON and output Ready ON?
⇨ IRV20 ready for material detection
⑤ No material to detect inserted into the sensing coil IRT?
⇨ Status LED OFF, output Detection OFF
⑥ Material to detect inserted into the sensing coil IRT?
⇨ Status LED ON, output Detection ON

| Parameter | IRV20 |
|---|---|
| Supply Voltage | 24V DC (18V to 30V) or 24V AC (18V to 30V) |
| max. Current Consumption | 100mA (24V DC) / 200mA (24V AC) |
| Optocoupler Outputs: Operating Voltage | 10V to 30V DC |
| Optocoupler Outputs: max. Load per Output | 100mA |
| Optocoupler Outputs: min. Isolation Voltage | 5000$V_{rms}$ |
| Optocoupler Inputs: Operating Voltage | 18V to 30V DC |
| Optocoupler Inputs: Positive Switching Threshold | 15V |
| Optocoupler Inputs: Negative Switching Threshold | 5V |
| Optocoupler Inputs: min. Isolation Voltage | 5000$V_{rms}$ |
| Optocoupler Inputs: max. Current (Operating Voltage 24V DC) | 4mA |
| Optocoupler Inputs: min. Pulse Length to Trigger a Compensation | 2ms |
| Connection Terminals: Max. Conductor Cross-Section | 2.5$mm^2$ |
| Connection Terminals: Optimum Stripping Length | 6mm |
| Length of Connection Cable between IRV und IRT | maximum: 3m, standard: 2m |
| Allowed Ambient Temperature | 0° to +60°C |
| Protection Class | IP65 |

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