

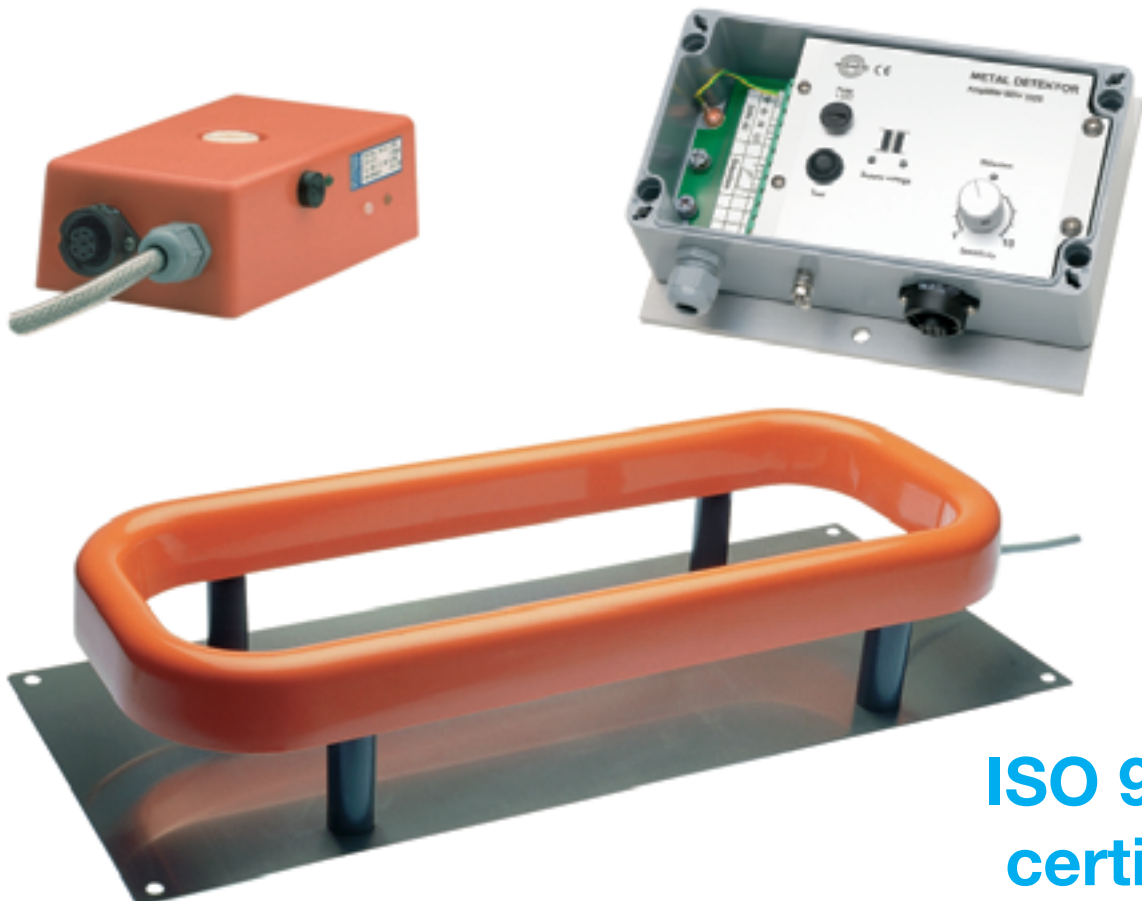
Special-Sensors for Automation



Metal Detectors

System 3000

- for jaw crusher
- for conveyer belt monitoring
- for waste separation

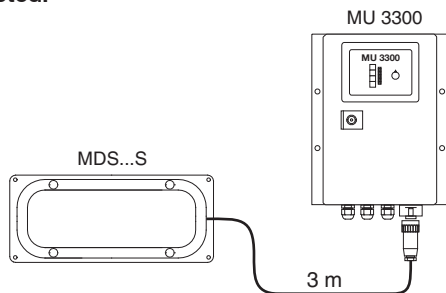


ISO 9001
certified

Technology and use

The metal detector System 3000 is designed to detect medium size and larger pieces of metal. The system has a very effective means of adjusting sensitivity. When used with the MU 3300 amplifier, it will respond at the highest level of sensitivity to medium size parts like nails, washers, or pieces of flatware. When used with the MDV amplifier, it will respond only to larger pieces of metal like teeth from an excavator bucket, tools, or metal paneling. If not discovered, these items could destroy stone-crushing machines, vibratory equipment, or wood-chipping machines. When used in this manner, the metal detector is suitable for protecting machinery, whereby smaller parts will not interrupt operation of the equipment. It detects metal during bulk material transport by means of contactless measurement.

The System 3000 consists of an amplifier and an inductive detector coil. The amplifier is equipped with an automatic adjustment regulator that ensures reliable operation even when disturbing metal parts are in close proximity to the detector coil. In addition, the adjustment regulator also ensures that only metal parts that are in motion will be detected.

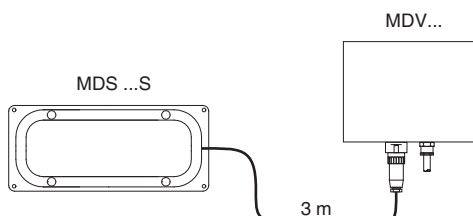


One of the amplifier's tasks is to process the signals emitted by the metal detector coil and convert them into an electronic pulse. The detector coil generates an electromagnetic field. As soon as a piece of metal passes by the coil, it disturbs that field, resulting in a signal that can be evaluated.

The operator adjusts the metal detector's sensitivity on the potentiometer. The coil's sensitivity is dependent on several factors, including: the coil's environment, the electromagnetic characteristics of the material to be detected, and the speed with which the material is transported.

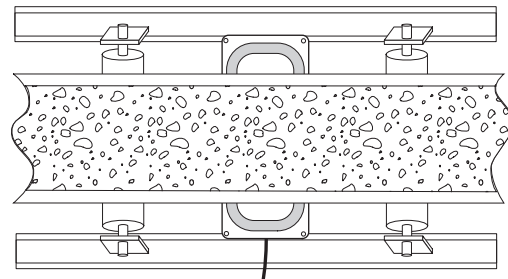
The MU 3300 amplifier has a self-monitoring function. Any error that appears in the system will activate a separate output relay. The unit's electronics are installed in a robust metal housing that has a window for the functional display.

The MDV 3172 and MDV 3220 amplifier are particularly well suited for use in difficult environments like those that involve dirt, temperature fluctuations, or vibration. These models therefore possess only the most critical adjustment and display functions.



The detector coils are mounted with PVC columns on an aluminium baseplate that shields the coils from electromagnetic disturbances coming from the substructure. The baseplate simultaneously provides stability. Whenever the operator must arrange the detector coil in the presence of iron structural elements, he can use the aluminium plate to shield the coil.

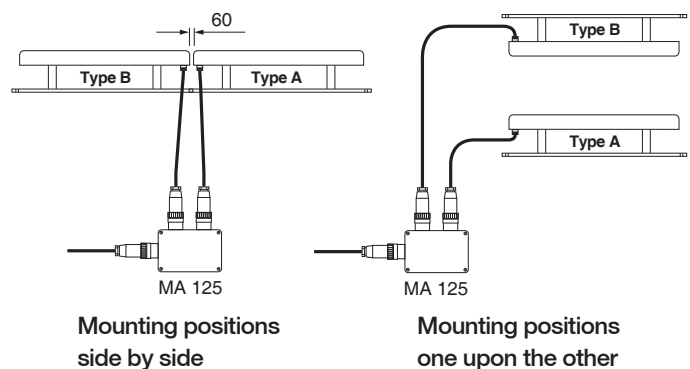
It is preferable to arrange the detector coils underneath the material transport belts in order to minimize the chance of mechanical damage to the coil. The distance to the belt's transport rollers should be at least equal to the width of a coil. In order to most effectively exploit the metal detector's sensitivity, maintain a metal-free area around the detector coil approximately equal to 1.5 to 2 times the coil diameter.



If the coil is installed in a hanging position above the transport belt, always make sure that no structural parts made of iron are too close to the coil and especially that they do not vibrate. If this cannot be avoided, it will be necessary to reduce the sensitivity. This will consequently reduce the detection distance or may have the result that only large pieces of metal will be detected.

The detector coils have a special 3-meter long cable. If the distance between the detector coil and the amplifier is longer than 3 meters, connect these two units with the KS 031 DS... extension cable. The longest permissible distance is 50 meters. In order to ensure that the system will work properly at that distance, we recommend using the EGE special extension cable.

By using connection box MA 125 two detector coils can operate together with one amplifier MDV.../ MU... The maximum cable length between one coil and the connection box MA 125 is 3 m.



Amplifier for detector coils

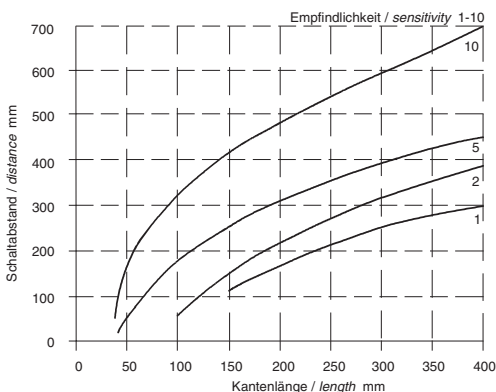
Series MU

- High sensitivity
- Automatic adaption
- Self monitoring function
- Reset function
- 230 / 115 V AC



| | |
|---------------------------------|------------------------------------|
| Design | MU 3300 |
| Dimensions | |
| ID-No. | P81012 |
| Type | MU 3300 |
| Supply voltage [V] | 230 / 115 AC ±10% |
| Current consumption [mA] | <60 |
| Output | Relay / Change over contact |
| Switching voltage [V] | 250 AC / 220 DC |
| Switching current [A] | 4 |
| Switching power [VA] | 1000 / 60 (cos φ = 1) |
| Ambient temperature [°C] | -20...+60 |
| Time delay [s] | typ. 60 |
| EMC class | A |
| Protection [EN 60529] | IP 65 |
| Display | LED-array |
| Housing material | Steel |

Sensitivity diagram (steel cube ST 37)

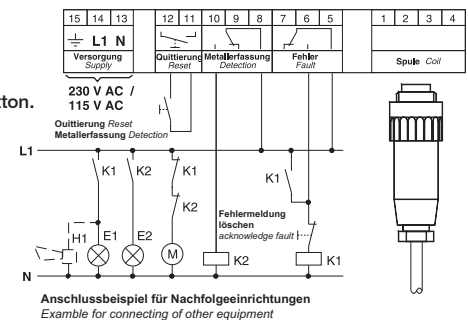


Connections

Relay „Detection“ decays when metal is detected.

Metal detection is acknowledged with reset button.

Relay „Fault“ decays on fault condition.



Anschlussbeispiel für Nachfolgeeinrichtungen
Example for connecting of other equipment

Accessories

see page 8.07

Amplifier for detector coils

Series MDV

Automatic regulation adaption

Waterproof IP 67

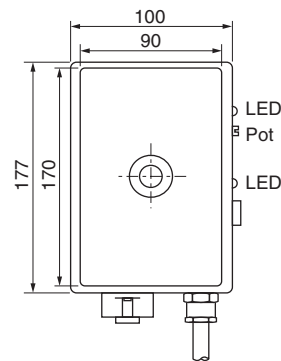
For detector coil with cable plug



Design

MDV 3172

Dimensions

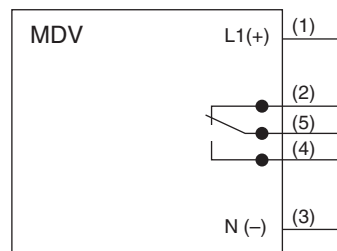


| ID-No. | P81010 | P81017 | P81011 |
|--------------------------|-------------------------------------|-------------------|------------------|
| Type | MDV 3172 WR2 | MDV 3172 WR1 | MDV 3172 GR |
| Supply voltage [V] | 230 AC $\pm 10\%$ | 115 AC $\pm 10\%$ | 24 DC $\pm 10\%$ |
| Current consumption [mA] | <20 | <60 | <100 |
| Output | Relay / Change over contact | | |
| Switching voltage [V] | 250 AC / 220 DC | | |
| Switching current [A] | 1 AC / 2 DC | | |
| Switching power [VA] | 125 VA / 60 W | | |
| Ambient temperature [°C] | -25...+70 | | |
| EMC class | A | | |
| Protection [EN 60529] | IP 67 | | |
| Display | LED | | |
| Housing material | PVC | | |
| Connection | 2 m PVC cable 7x0,5 mm ² | | |

Note:

The amplifier MDV 3172 has a NO-function. During metal detection, the relay is activated and contact 4-5 is closed (2-5 is open).

After switch-on, the contact 5-4 is closed for 2 seconds. This can be used for testing purposes.



Accessories

Central screw M16x1 (Z00105) is part of delivery

Amplifier for detector coils

Series MDV

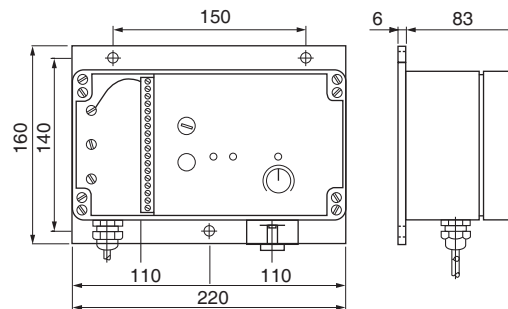
- Automatic regulation adaption
- Waterproof IP 67
- For detector coil with cable plug
- With sensitivity adjustment knob
- Test button



Design

MDV 3220

Dimensions



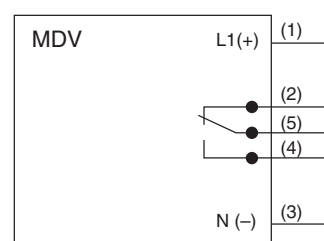
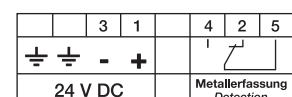
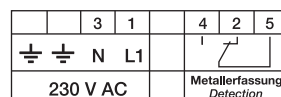
| ID-No. | P81060 | P81061 |
|--------------------------|-----------------------------|------------------|
| Type | MDV 3220 WR2 | MDV 3220 GR |
| Supply voltage [V] | 230 AC $\pm 10\%$ | 24 DC $\pm 10\%$ |
| Current consumption [mA] | <20 | <100 |
| Output | Relay / Change over contact | |
| Switching voltage [V] | 250 AC / 220 DC | |
| Switching current [A] | 1 AC / 2 DC | |
| Switching power [VA] | 125 VA / 60 W | |
| Ambient temperature [°C] | -25...+70 | |
| EMC class | A | |
| Protection [EN 60529] | IP 67 | |
| Display | LED | |
| Cable diameter [mm] | 4...10 | |
| Housing material | Aluminium | |
| Connection | Screw terminals | |

Note:

With the potentiometer it is possible to adjust the sensitivity.

The amplifier MDV 3220 has a NO-function. During metal detection, the relay is activated and contact 4-5 is closed (2-5 is open).

By pushing the test button it is possible to test the complete function of the MDV 3220.

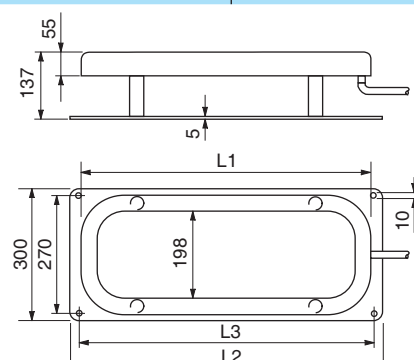


Detector coils

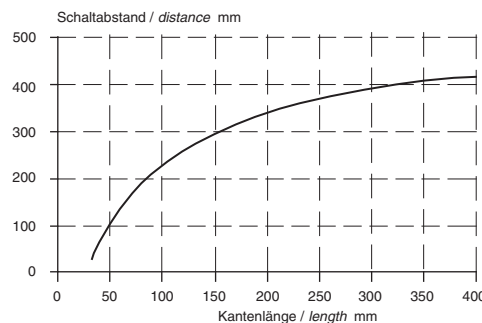
Series MDS

Designed for outdoor use
Rugged construction
Substantially made



| Design | MDS 3065-S | | MDS 3095-S | |
|--------------------------|---|-------------|--------------|-------------|
| Dimensions |  | | | |
| Dimensions L1-L2-L3 [mm] | 650-700-670 | | 950-1000-970 | |
| ID-No. | P81054 | P81055 | P81056 | P81057 |
| Type | MDS 3065-SA | MDS 3065-SB | MDS 3095-SA | MDS 3095-SB |
| Coil type | A | B | A | B |
| Ambient temperature [°C] | -25...+70 | | | |
| Protection [EN 60529] | IP 67 | | | |
| Housing material | PBT / Aluminium plate | | | |
| Connection | 3 m PUR cable with cable plug | | | |

Sensitivity diagram (steel cube ST 37)



Maximum sensitivity for detector coil MDS 3065 with MDV

Note:

When using two detector coils one coil must be coil type A and the other coil type B. The maximum detection width increases up to 1800 mm (see connection box MA 125, page 8.07).

The standard cable length for the connection cable of the detector coil is 3 m. The extension cable type KS031-DS has two plugs, which can be connected at the amplifier and also at the detector coil. The maximum length of the extension cable is 50 m.

Coils MDS 3065-S (P81007) and MDS 3095-S (P81009) are replaced by MDS 3065-SA (P81054) or MDS 3095-SA (P81056) respectively. The technical and mechanical specifications are unchanged.

Accessories

SUPPLY ISOLATION UNIT NTG 251/255, DTG 24

| Type | ID-No. | Design |
|---------|--------|----------|
| NTG 251 | P81030 | 230 V AC |
| NTG 255 | P81032 | 115 V AC |
| DTG 24 | P81053 | 24 V DC |

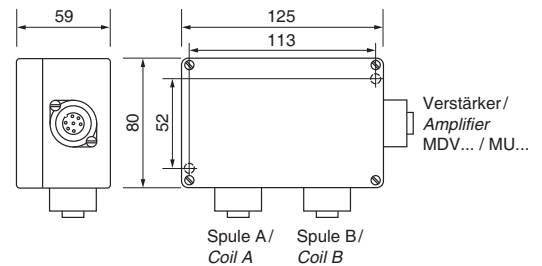
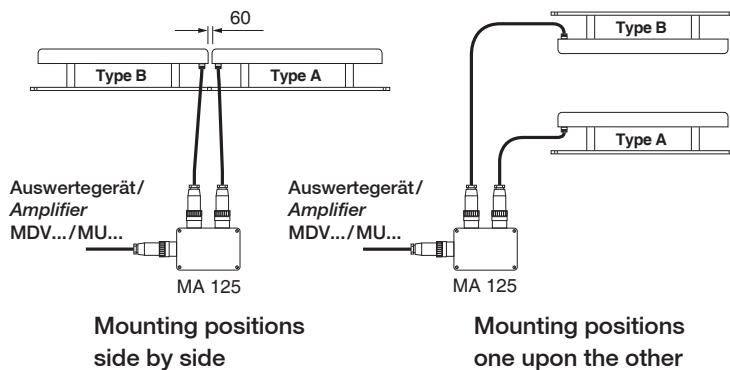
The power supply isolation unit is connected between the power supply and the amplifier MDV... It limits the power supply overvoltage and therefore protects the amplifier against overloading. It is used wherever no overvoltage protection is available, where the power supply takes place via an overhead power transmission network or an unstabilised battery charger, or where high inductive loads, e.g. motors, are directly switched. The power supply isolation unit acts also as an interface filter. The floating changeover output contact is designed to be connected to a power relay. It is not suitable for high loads.



CONNECTION BOX MA 125

| Type | ID-No. | Design |
|--------|--------|----------------|
| MA 125 | P81058 | Connection box |

By using connection box type MA 125 two detector coils can operate together with one amplifier MDV.... The maximum cable length between one coil and the connection box MA 125 is 3 m.



| | |
|---------------------|---------------------|
| Ambient temperature | -25 °C...+70 °C |
| Protection | IP 67 |
| Housing material | Aluminium |
| Connection | C16 plug-connection |
| Mounting size | 52 x 113 mm |

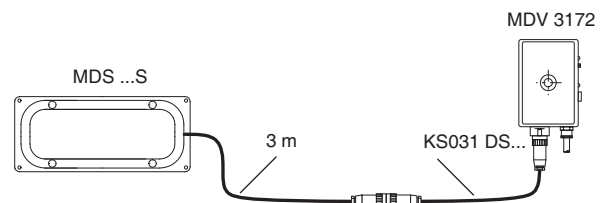
EXTENSION CABLES KS031-DS

| Type | ID-No. | Design |
|------------|--------|------------|
| KS031-DS05 | P81051 | 5 m IP 68 |
| KS031-DS10 | P81052 | 10 m IP 68 |
| KS031-DSXX | S.... | max. 50 m |

XX: Special length up to 50 m with plug connectors.

The KS031-DS... double-end cable connects in particular the detector coil with an extension cable (watertight) that has on its opposite end a plug for connecting to the MDV... or MU... amplifiers.

The KS031 special connection cable is specially designed for use with the Series 3000 of metal detectors. Due to its solid construction and resistant polyurethane sheath, it will not generate any "cable signals" that could initiate an error signal in the amplifier.





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