

Version : 1.3.006

Date : 24.03.2000



USER MANUAL

Type: METRON 1.3 C, CO, CR, D, S, SL, SU, V, VT

Dear customer,

To begin with, we would like to thank you for your confidence in our metal detection system.

Prior to switching the system on, please read the user manual completely as this provides you with the expertise necessary for optimum operation and adjustment of the system according to your requirements. In addition, you learn all about the sophisticated options provided by the AMD 01 electronics as well as about the optional extensions.

If, contrary to expectations, you have any problems in operating your system, the TECTRONIX SYSTEMS team and our contractors will be able to assist you at any time.

The TECTRONIX SYSTEMS team is at your disposal from Monday until Friday between 8 a.m. and 5 p.m., tel. (604) 607-6028 or fax (604) 607-6026.

If a demonstration on site is required, we will respond as soon as possible offering national and international services.

Enjoy your TECTRONIX SYSTEMS metal detector,

Yours truly,

TECTRONIX SYSTEMS INC. ®

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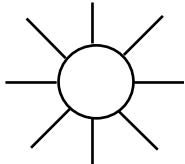
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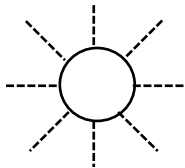
Legend



LED dark



LED lights



LED flashes



Ground



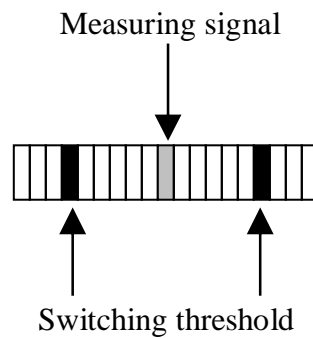
RF-Signal



Cable



Metal detector



Metal ball



Product



Move



Next step



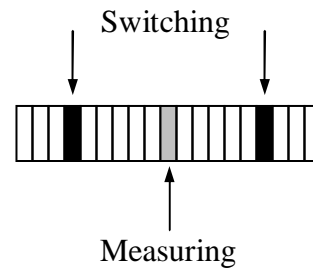
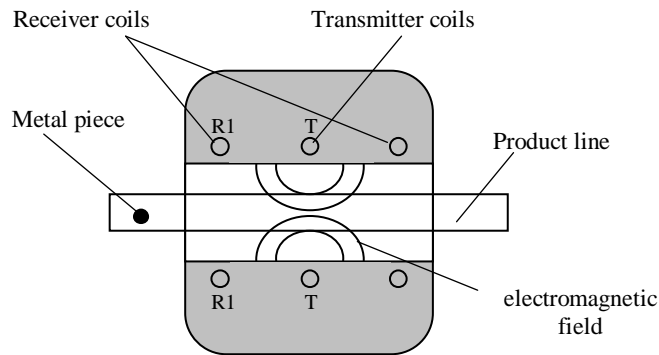
Snap switch position



Don't twist the snap switch position

Principle of Operation

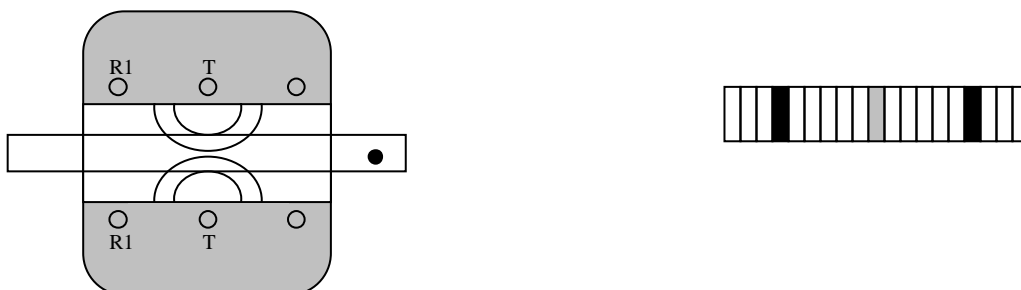
Metal detection



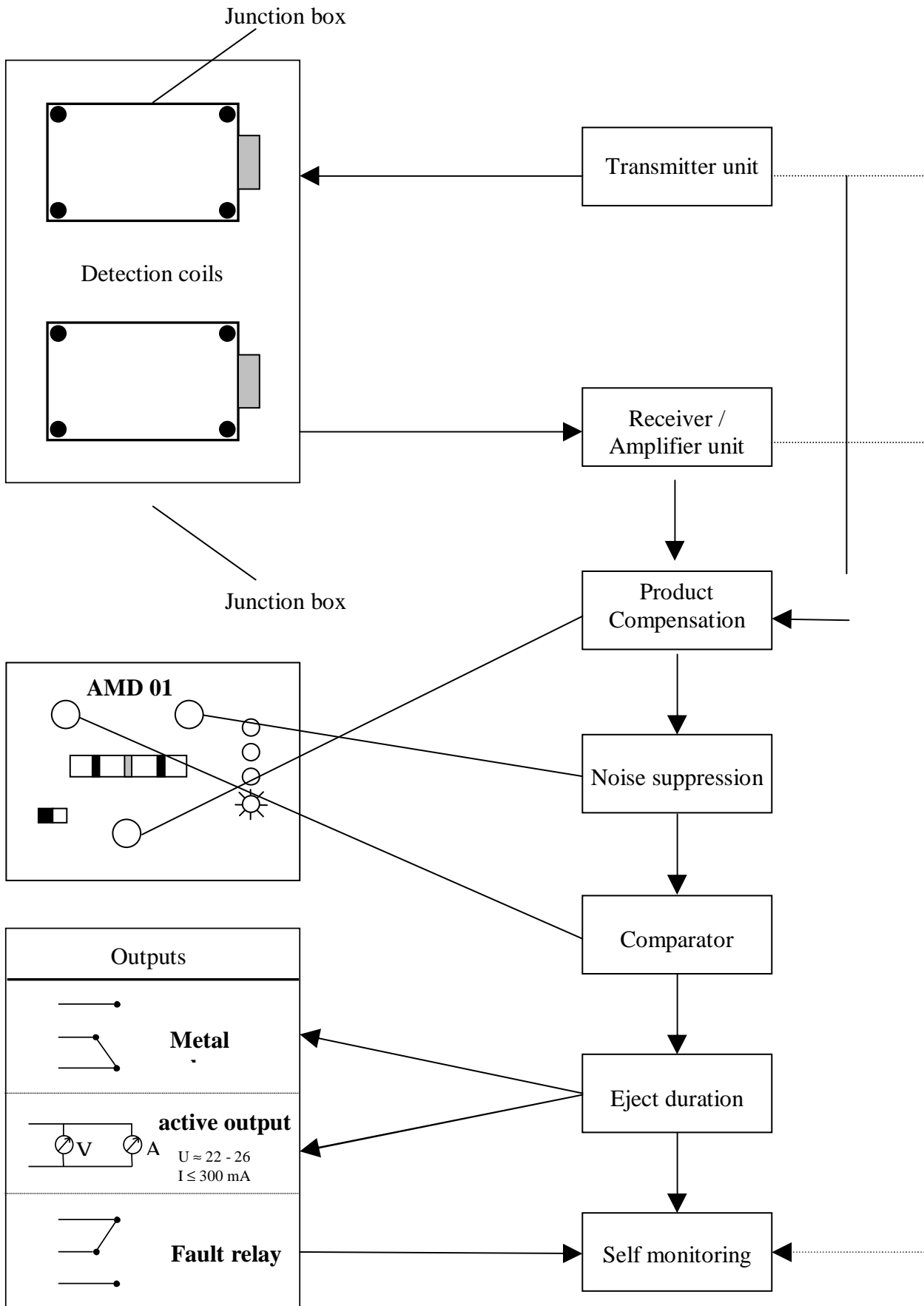
As metal enters the detection field, the measuring signal moves in one direction



As metal leaves the detection field, the measuring signal moves in the opposite direction



Block diagram:



Installation Do's and Don'ts

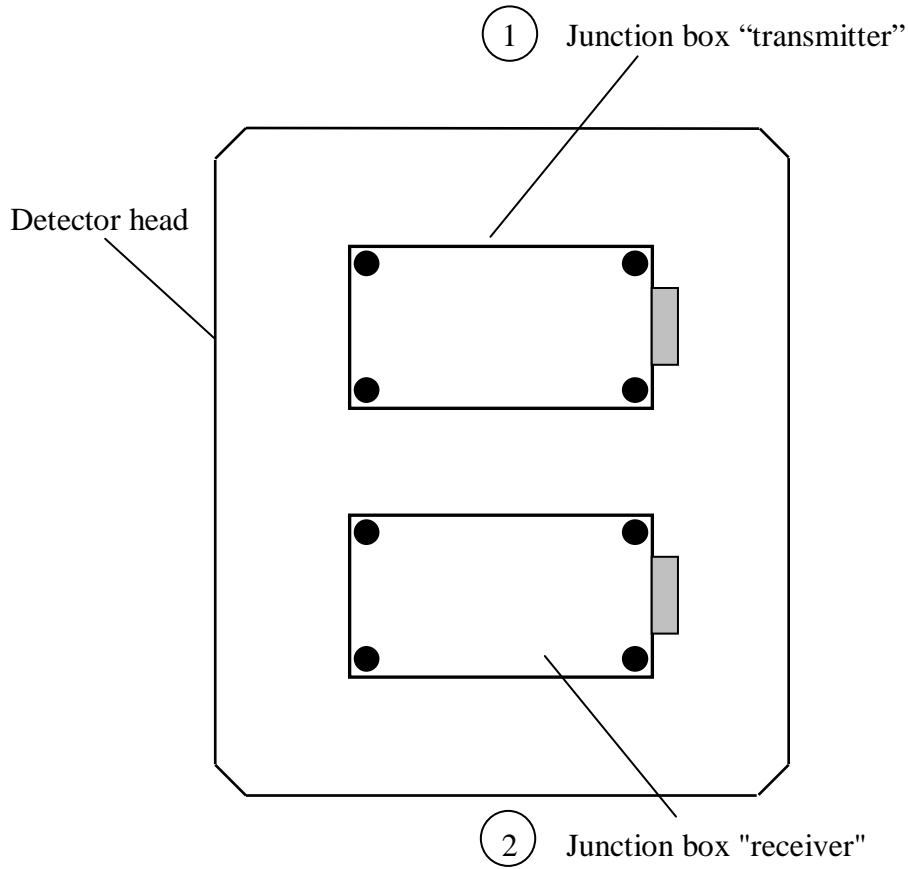
Electrical

- **Do Not cut the connector or the power cables**
These cables are equipped with special double shields and connectors and must not be cut. If you require longer or shorter cables please order them from our parts department. The electrical cables are approximately 10 feet (3m) in length and the connector cables are 26 feet (8m). It is therefore recommended that consideration be given to where the connection boxes are located and that all cables be installed in conduit.
- **Do Not weld in reasonable proximity to the metal detector**
Welding in the vicinity of the metal detector will trigger faults.
- **Run a clean, constant voltage power supply from the main to the control panel**
Voltage fluctuations can cause false tripping therefore a constant voltage transformer is highly recommended.
- **Do Not install the metal detector near MCC's or control panels**
Stray fields can trigger faults.
- **Run the connector cables to the metal detector separately**
Connector cables are part of the metal detector and have to be protected against noise. It is highly recommended to run them in a dedicated conduit. Both cables can be run in the same conduit. The conduit should be metal but, must be grounded. If the conduit is to be connected at the transmit/receive boxes on the coil and/or the control panel, all fittings must be plastic.
- **Do Not install the detection coil inside an electromagnetic field (Strong power supply fluctuations)**
Interferences can trigger faults. For example; where units are installed in close proximity to chipper motors, when under high amperage draw, can cause nuisance or false tripping and this may require the fabrication of a shield.
- **Do Not disconnect the metal detector from the power supply main**
A constant, uninterrupted power supply enables more sensitive adjustments. Powering the unit on and off causes it to recalibrate during which time metal will not be detected.
- **When welding, do not use the control panel mounting surface as a ground**

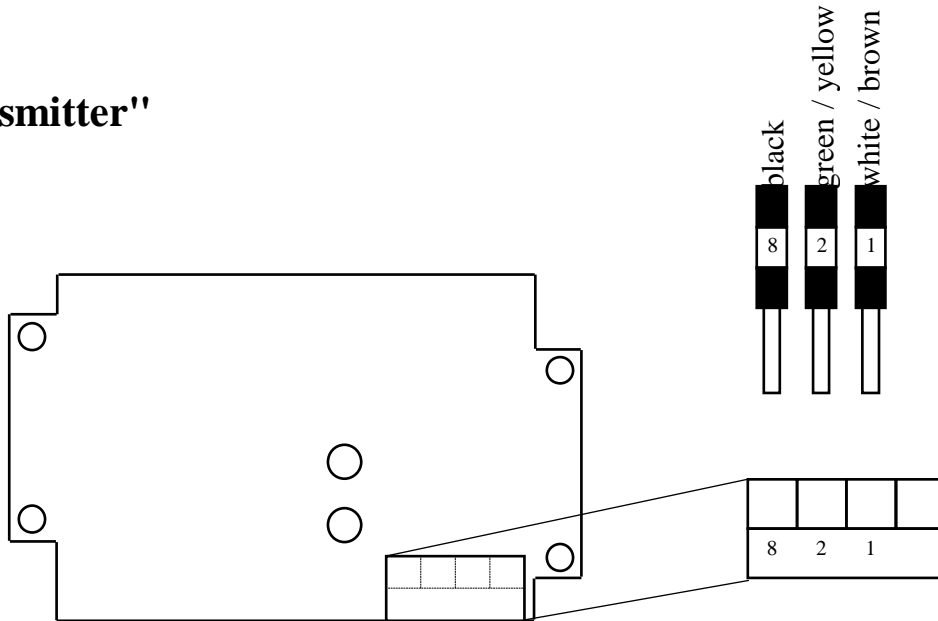
Mechanical

- **Do Not use conductive (Anti-Static) belt material**
Non-conductive belt material is preferred. When splicing belts, use a "Finger over Finger" splice for best results. Ensure all surfaces are clean and free of debris at the splice.
- **Vibration-less installation of the detector coil (except "VT")**
Higher sensitivities can be attained and maintained if the operating conditions are optimal. Ensure the coil is mounted to a structure that is stationary at all times.
- **Eliminate loose metal-to-metal connections near or within the detection field**
Intermittent metal-to-metal contacts from such things as roller axis, loose bolted connections, or broken welds can cause the metal detector to *false trip* especially on the higher sensitivity settings.
- **Vibration-less installation of the Control Panel**
Mount the control panel on a vibration free surface. Vibration can cause premature electronic component failure
- **Avoid cable whiplash.....**
On "VT" Vibratory Conveyor installations, use the supplied cable clamps and tie wraps to secure the cables to the metal detector housing. Doing so will avoid *whiplash* at the transmit/receive box strain relief connections. In addition to this we recommend that you loop the cables as they exit the conduit. These loops will then flex as the conveyor cycles. It is also advisable to follow this procedure on belt conveyor installations.
- **Do Not touch the sensor/coil surface of the detector**
Mechanical contacts may cause detection errors. Keep the sensing surface free of debris.
- **Mount the FLAT PLATE type coils as close as possible to the underside of the vibrating conveyor or belt conveyor**
The closer the coil to the product being conveyed, the greater the sensitivity. Do not allow material to build up on the sensing face so that it touches the conveyor pan. Doing so creates a closed conductive loop and the metal detector will *false trip*.
- **Isolate rollers on belt and driven roll conveyors**
On belt and roller conveyor applications where a roller is less than 24" (610mm) from the centerline of the detector, the roller must be isolated on one side to avoid the possible effect of errant static charges. Use a UHMW shim beneath the bearing and nylon washers or some other non-conductive material beneath the bolt head and nut/flat washer. The bolts should also be sleeved with a non-conductive material. It may be necessary to isolate more than one roller in either direction to achieve the desired results.

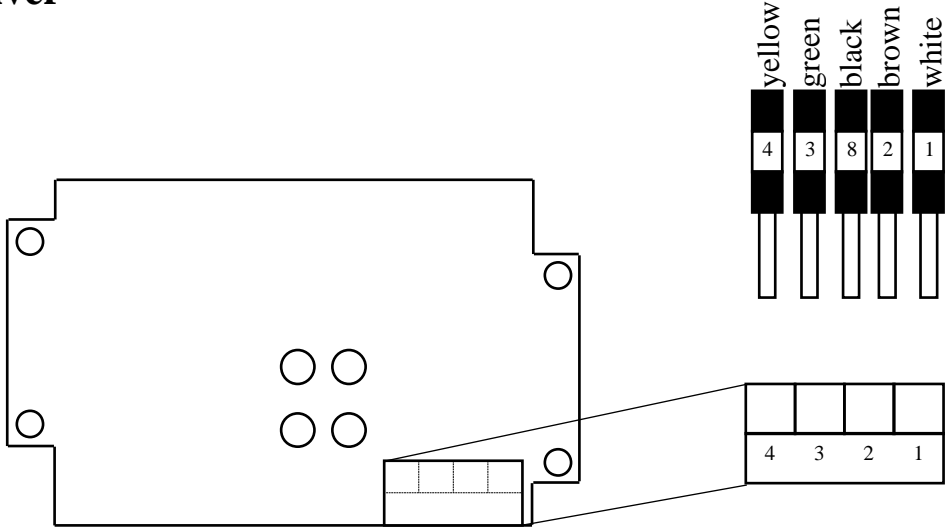
Connections at Detector



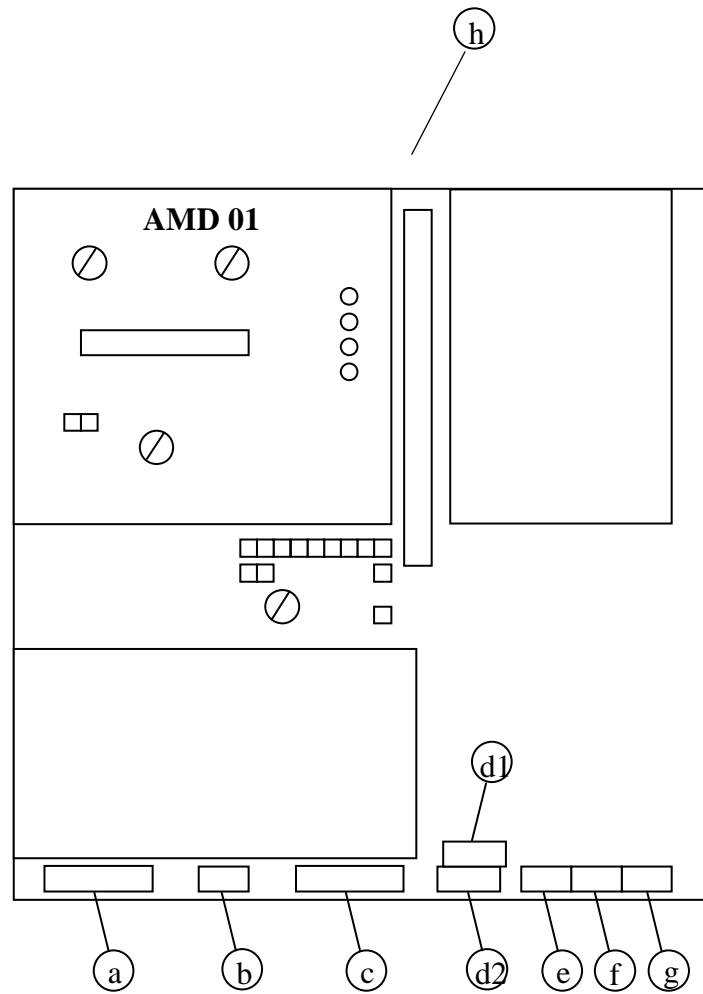
1) "Transmitter"



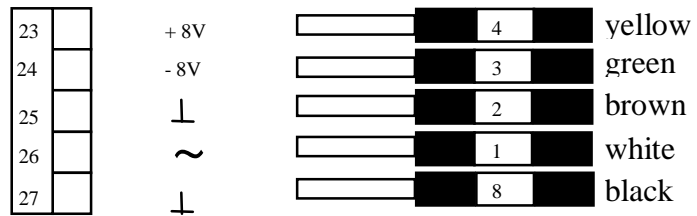
2) "Receiver"



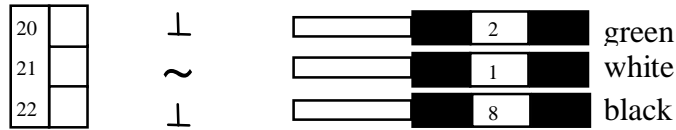
Connections at Control Panel



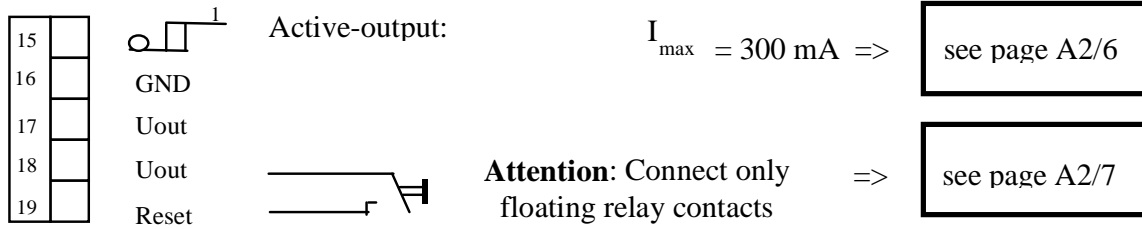
a) Receiver



b) Transmitter



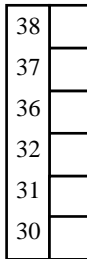
c) Active-output / Reset



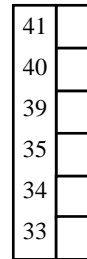
The voltage at the active output and Uout is not controlled. It changes for a loadpower of 0 – 300 mA between 26 V and 22 V (supply voltage at 230 V / 115 V).

d) Option plug

d1)

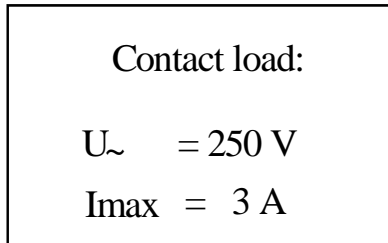


d2)

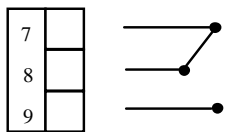


e) Self Monitoring Relay

Output "Self Monitoring Relay" may be used for factory-installed accessories such as a warning light or horn (reference D2).

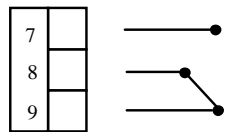


- Power supply removed



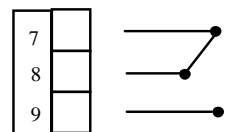
Contacts 8 - 7 are closed

- Normal



Contacts 8 - 9 are closed

- Internal failure

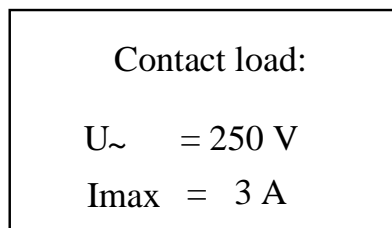


Contacts 8 - 7 are closed

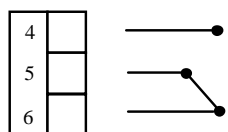
After a failure is corrected, the system must be reset manually. Push the **RESET** button on the control panel door and restart the system (manual reset, connection 18 and 19).

f) Detection Relay

The "Detection Relay" may be factory assigned to other functions such as a warning light or horn.(ref. D2).

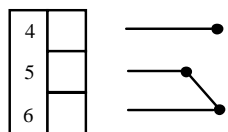


- Power removed



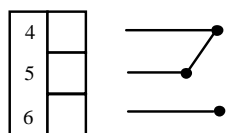
Contacts 5 – 6 are closed

- Normal operation



Contacts 5 – 6 are closed

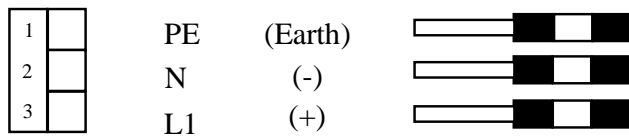
- Metal detected



Contacts 4 – 5 are closed

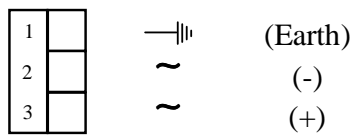
When metal is detected, the system must be reset manually. Push the **RESET** button on the control panel door and restart the system. (Manual reset, connections 18 and 19) or automatically (ref. B6).

g) Power Supply



Variable : 85 to 264 V AC
 50 to 400 Hz
 or : 100 to 375 V DC
 Fuse: 2 A passive

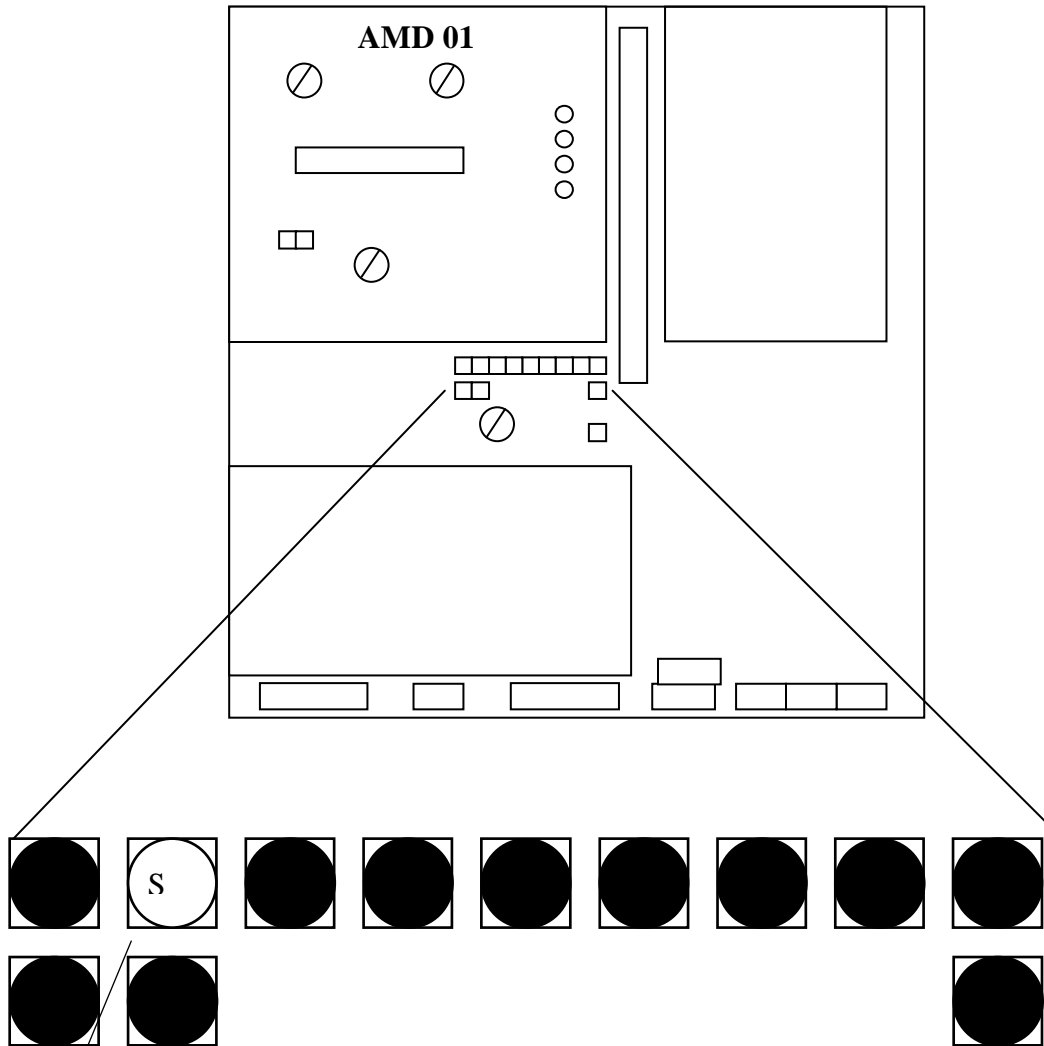
*****Special Version - Low Voltage



Variable : 15 to 54 V AC
 50 to 60 Hz
 or : 20 to 75 V DC
 Fuse: 2 A passive

h) Plug socket for option circuit board

Active Output Operation



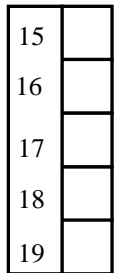
When metal is detected, the "Active Output" switches from 0 to 1 automatically. The signal remains in this mode at "metal free" in case of a power interruption. If you connect an external warning device such as a horn or light, move the switch to this position (factory default setting).



When metal is detected, the "Active Output" switches from 1 to 0 automatically. The signal remains in this mode at "metal reject" in case of a power interruption. If you connect an external warning device such as a light and want to have the light illuminated at all times, only shutting off when metal is detected, move the switch to this position.

Connecting the Reset Contact

Standard:

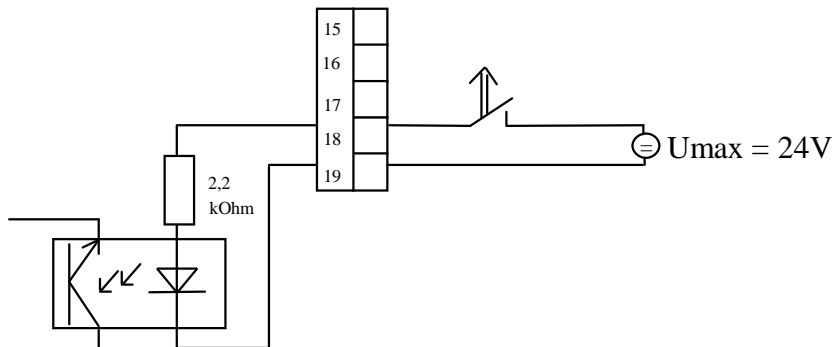


The metal detection signal can be reset remotely by connecting connection 18 with 19. If an additional contact for resetting is required, another contact can be added in parallel.

Attention: maximum length of cable is 5 m (16.40 feet) !!!

Special version for large distances between reset-keys and control cabinet

Easy changes of the electronics enable the user to decouple the reset-input (electrically isolated).



Do not hesitate to ask for modification instructions.

Power Supply

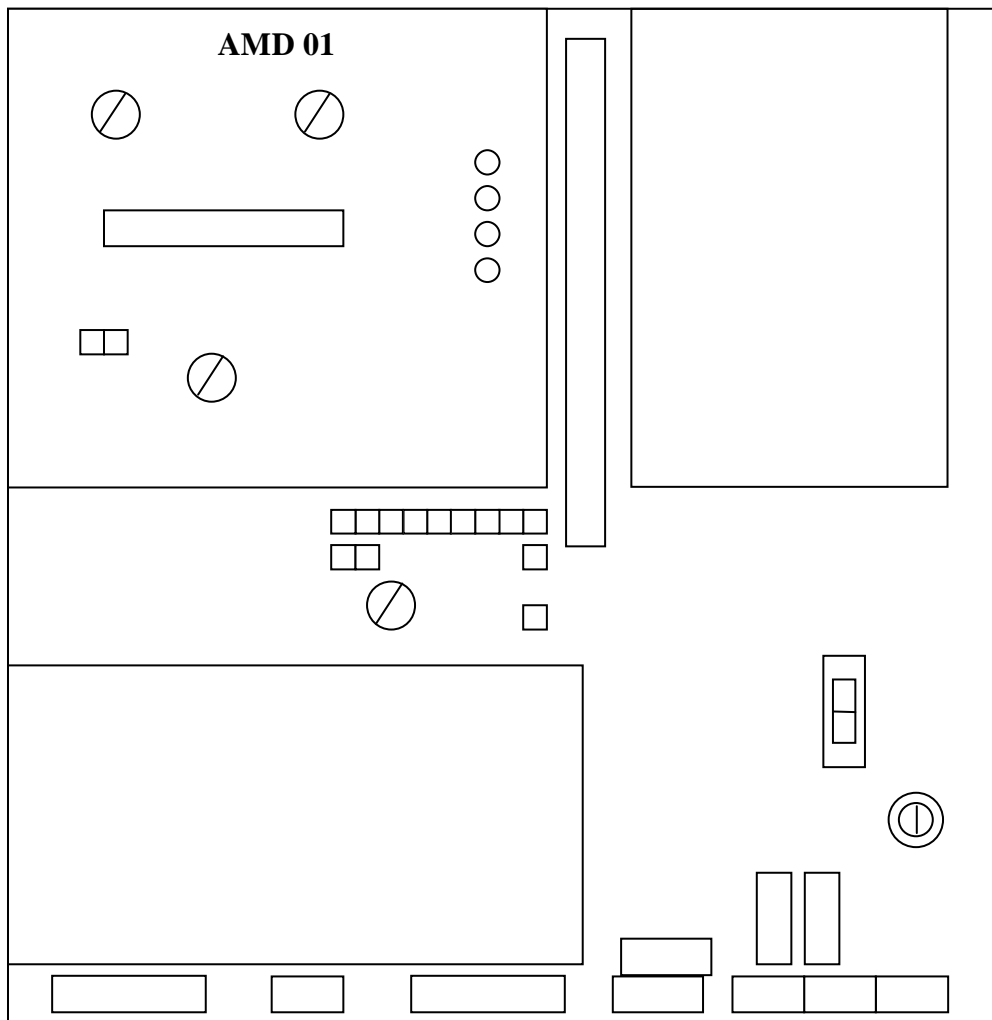
Special version :

Variable : 85 to 264 V AC ;
50 to 400 Hz
or 100 to 375 V DC

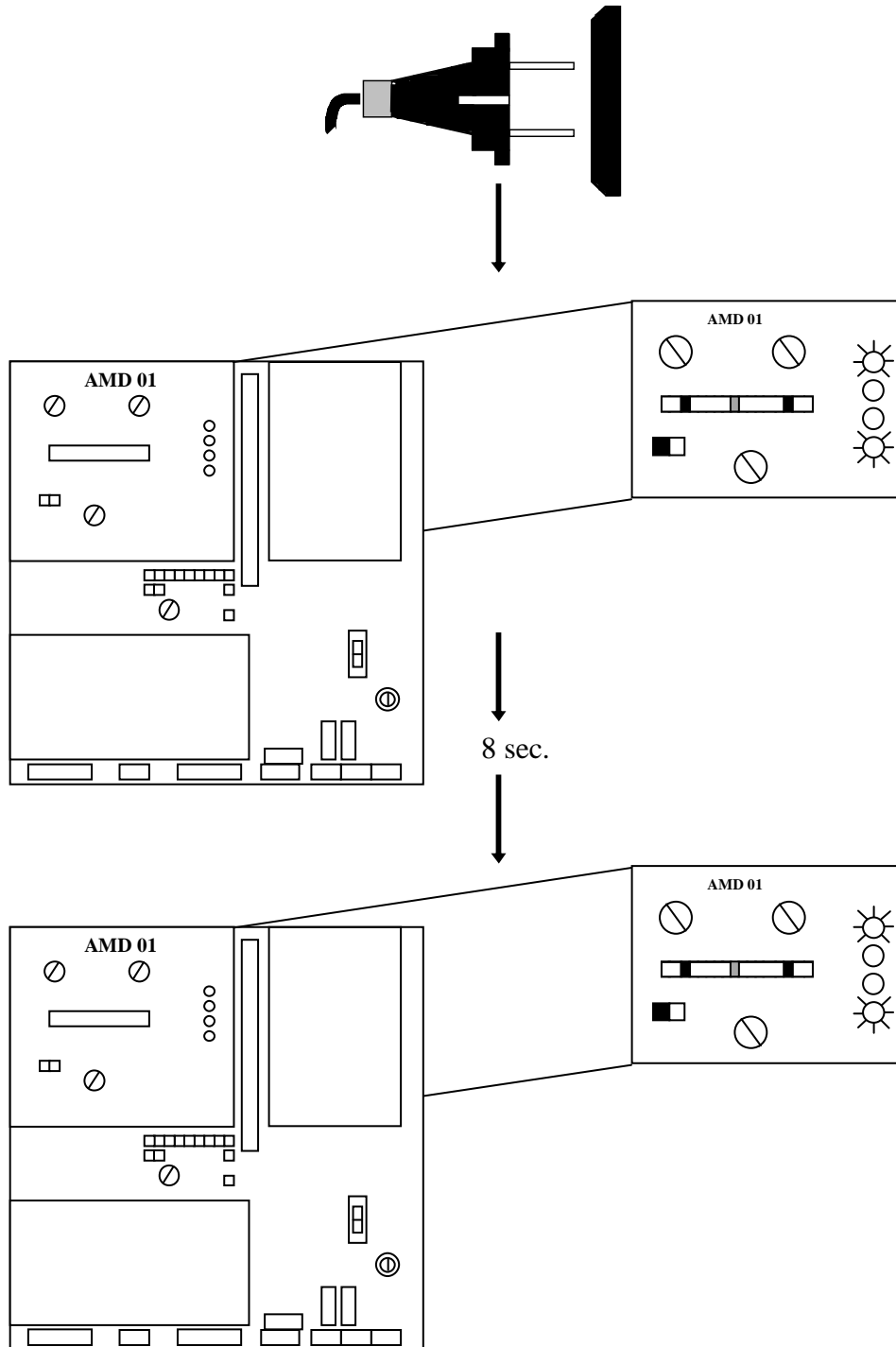
Variable : 15 to 54 V AC
50 to 60 Hz
or 20 to 75 V DC

Fuse : 2 A passive

Fuse : 2 A passive



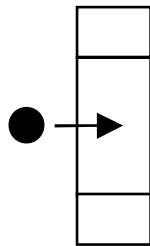
B) Normal Operating Mode



When applying power to the unit, it takes approximately **8 seconds** to complete all self-diagnostics. With belt conveyor applications, this may take longer.

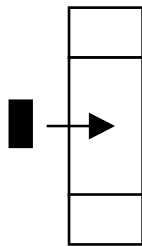
Adjustment Symbols

If requested, we will supply the suitable test kits for your metal detector.



This symbol means:

Convey the metal through the detection field

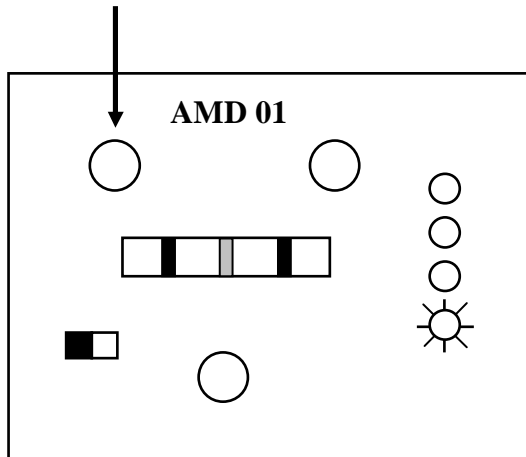


This symbol means:

Convey your product through the detection field

Adjusting the Sensitivity

- General

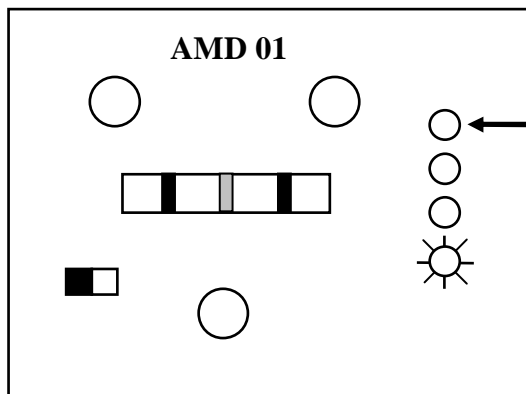


By turning the upper left potentiometer, the sensitivity can be adjusted:

Minimum sensitivity = **Position 0**

Maximum sensitivity = **Position 10**

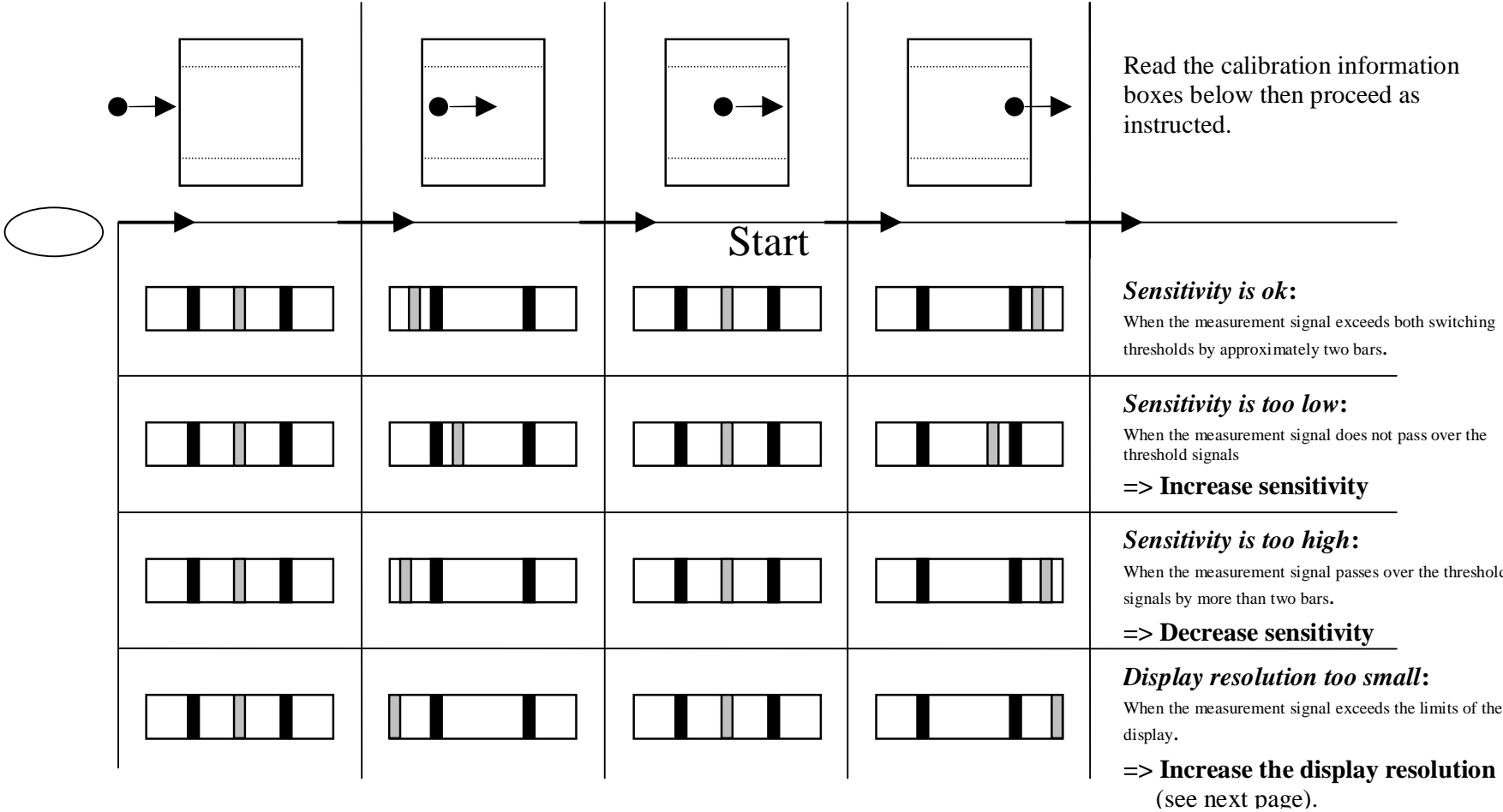
As explained previously in **O1/1** (Principle of Operation), metal will only be detected after the measuring signal passes over both switching thresholds.



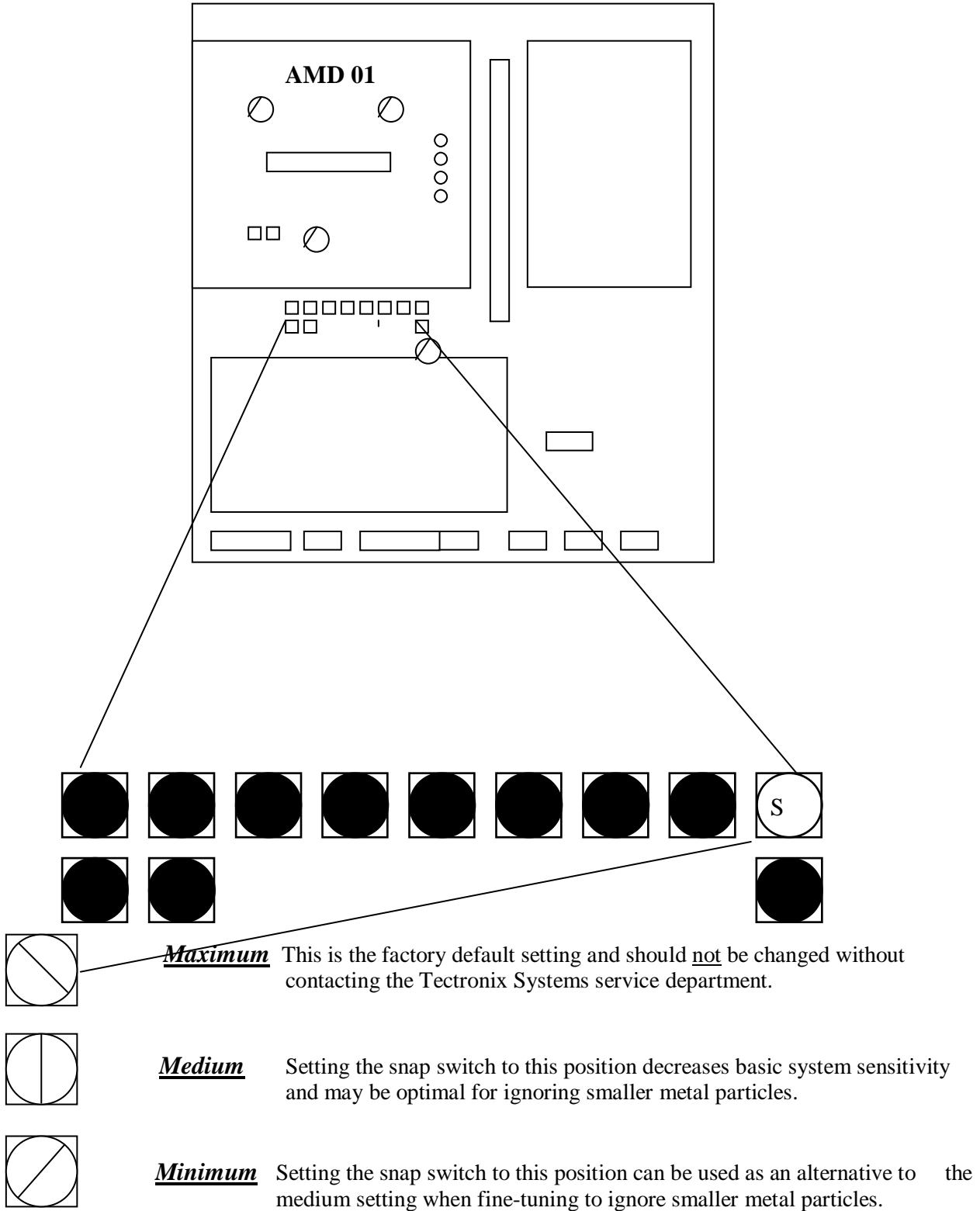
When metal is detected, the upper right LED will illuminate. It will stay lit until a reset signal is given to the electronics.

Along with the LED, relay 4/5/6, as well as the solenoid output 15/16 are activated simultaneously. Further instructions as to the activation time and reset procedures are explained in chapters B4 and B6.

- Calibrating the Sensitivity



- Sensitivity range Adjustment (Display resolution)

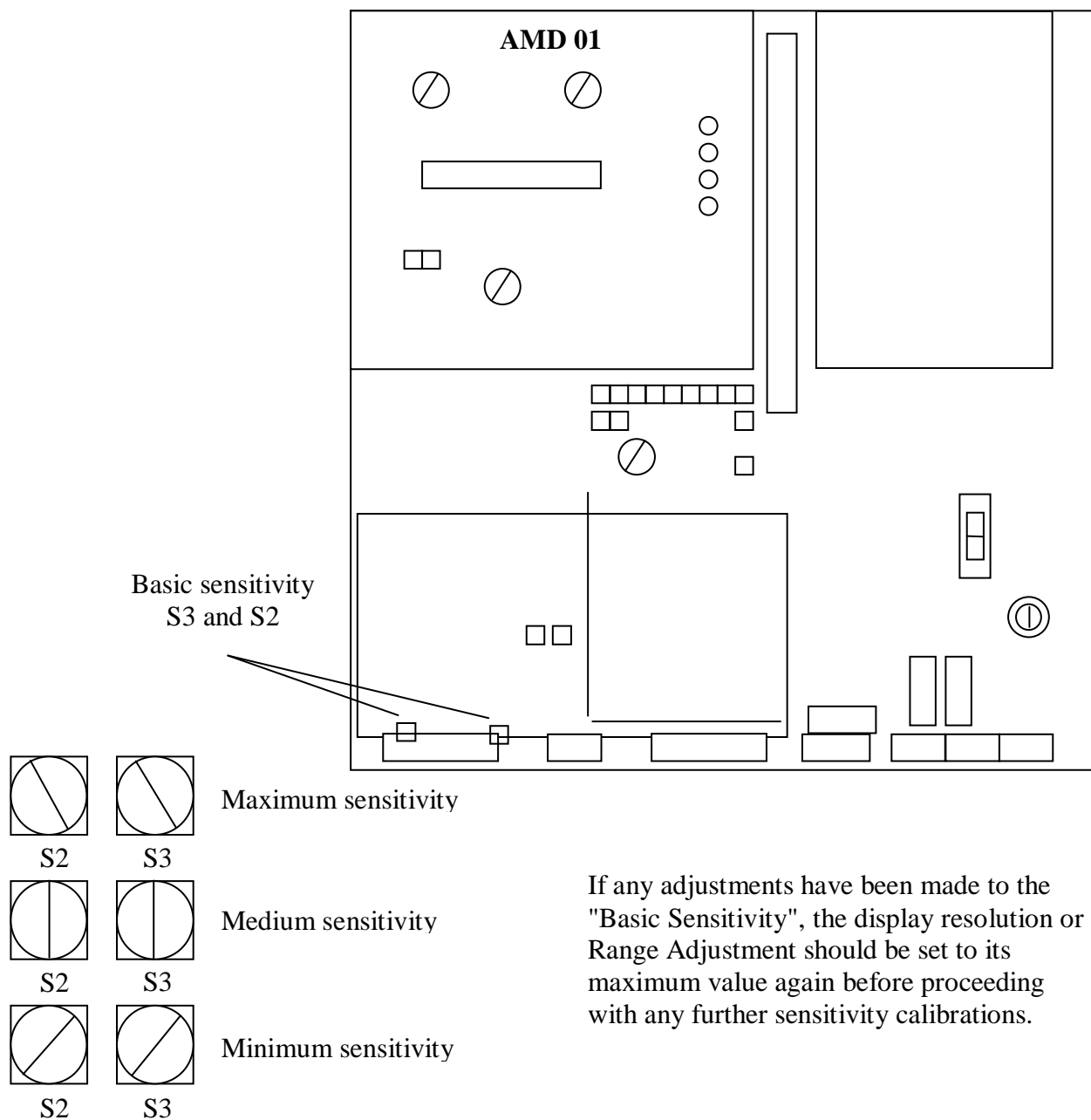


The snap switch position should be selected so that the sensitivity can be adjusted according to the calibration procedure. If the minimum resolution/sensitivity cannot be achieved, the "Basic Sensitivity" may have to be adjusted (see following page for further instructions).

- Basic Sensitivity

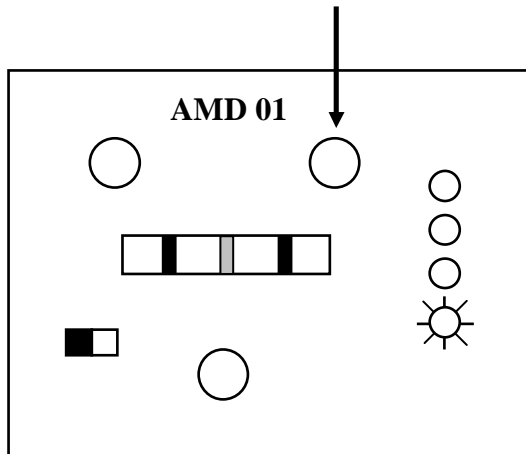
Adjusting the "Basic Sensitivity" settings should not be undertaken unless all attempts to calibrate the system sensitivity using the potentiometer and Snap Switch 21 prove unsuccessful. Doing so can severely impede the systems ability to sense metal. We highly recommend contacting the Tectronix Systems service department before commencing any of these adjustments.

To adjust basic sensitivity, begin by moving the lid to the housing. To do so, straighten the tabs used to secure the lid.



Reject Duration/Noise Suppression

The potentiometer (located at the top right) has several different functions dependent upon the application.



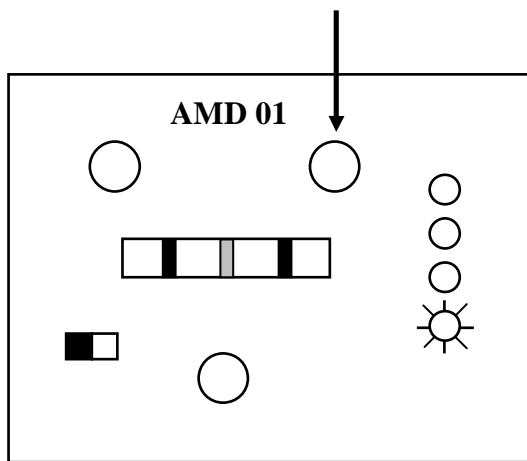
- Freefall and air conveying applications use the automatic reset programs after each metal detection. In this case, the potentiometer is used to adjust the duration of the metal elimination process (comp. B4/1). Due to the high speed it is impossible to use the Noise Suppression function.
- The detection electronics are manually reset on all conveying applications (chapter B4/4). In this case the potentiometer adjusts the noise suppression. The system can also operate in "automatic mode" (chapter B6).

Both functions are described on the following pages.

Adjusting the Reject Duration

- General:

All outputs for the AMD 01 electronics are immediately reset after detection. If the detector is working in the automatic mode, the duration between detecting and the reset signal is adjustable. In the following explanation, the reject time duration will be called "Eject Duration".



For adjusting the eject duration the potentiometer at the right top should be used.

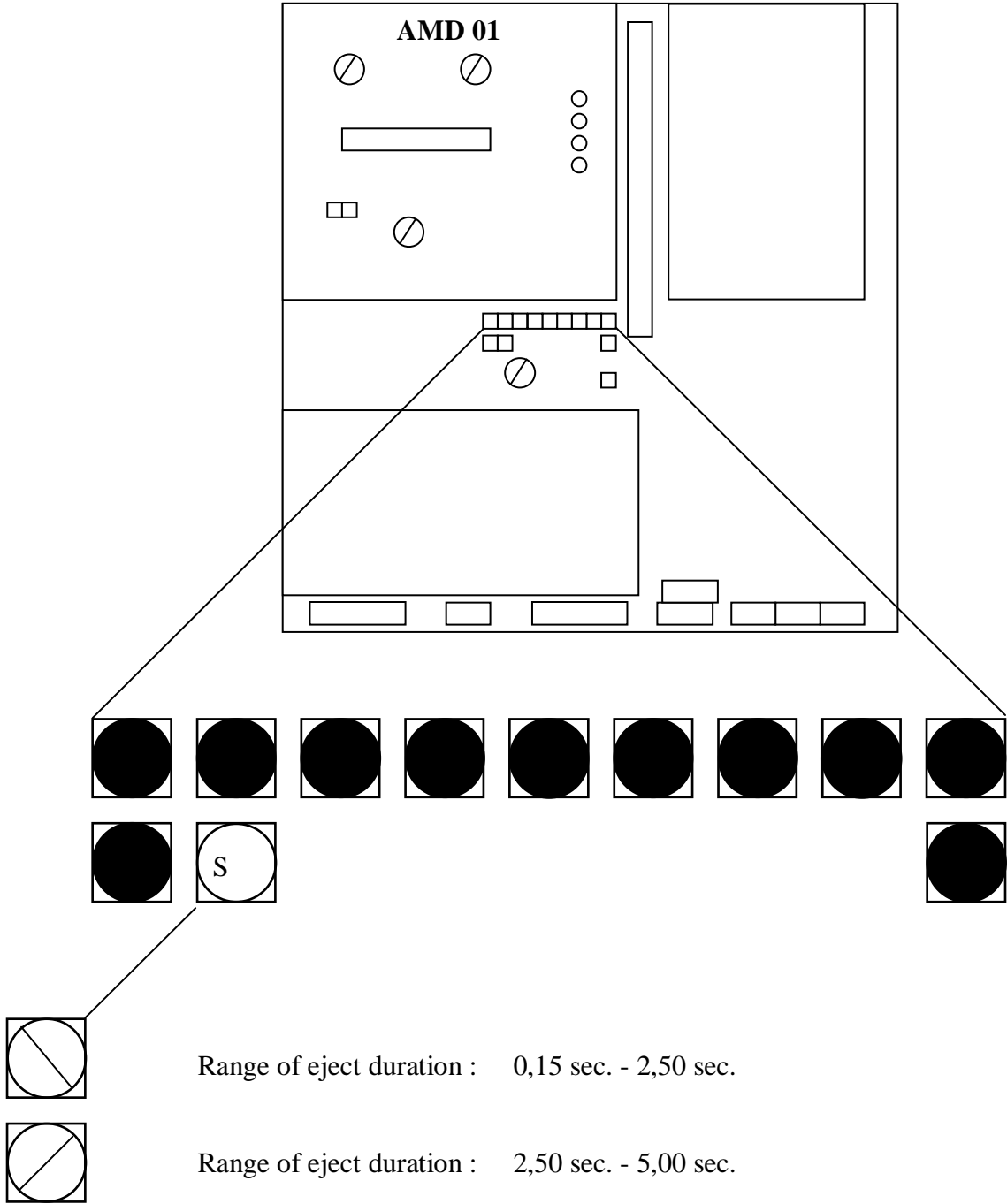
short eject duration = Adjustment 0

long eject duration = Adjustment 10

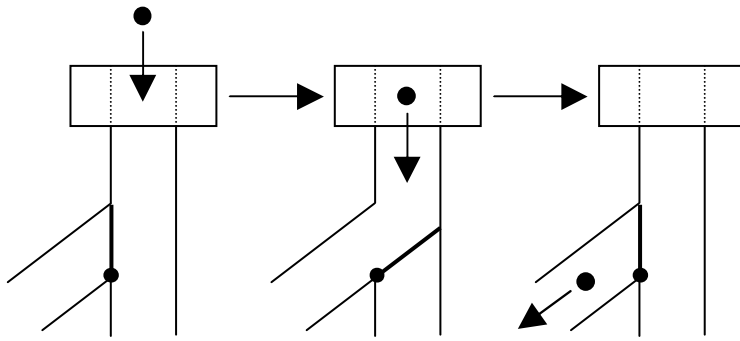
The duration is dependent on the time range (described at page B4/2).

It is possible to add a further time gap between metal detection and triggering of the outputs. For this option please reference chapter **D2** "Option".

- Time range

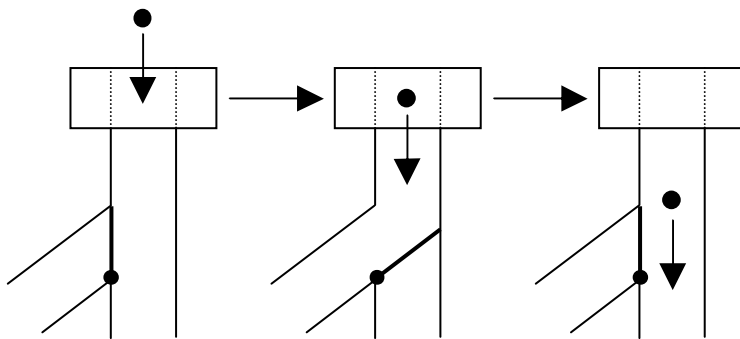


- Potentiometer adjustment for reject duration



Adjustment ok:

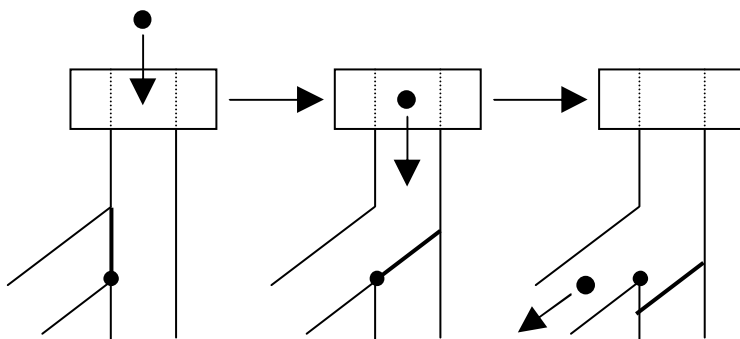
After detecting metal, the automatic rejection system opens. Shortly after the ejection the rejection system closes.



Adjustment too short:

The system closes before the metal contamination is rejected.

=> Increase duration time



Adjustment too long:

The rejection system remains open too long. Too much metal free material is rejected.

=> Shorten duration time.

Some suggestions for adjustments:

If you start with a long enough duration, you can find the optimum duration of rejection. This value can be reduced step by step. After the metal part does not get rejected for the first time, you slightly increase the duration including a small security gap.

Adjusting the Noise Suppression

Important Note

The Noise Suppression has been pre-set for optimal operation and should only be adjusted after consultation with a Tectronix Systems service technician. In the majority of installations, the Noise Suppression does not require adjusting. Arbitrary adjustments can create sensitivity and calibration problems which effect system performance.

Factory Settings

If your system is a "VT" Vibratory Conveyor, the Noise Suppression should be set at **3.5**.

If your system is an "ST" Belt Conveyor, the Noise Suppression should be set according to the belt speed. Although the unit has been set at the factory for your belt speed, should this speed change you can re-set the Noise Suppression per **Appendix D4**.

If your system is the "S" flat plate type metal detector, the Noise Suppression should be set at **3.5**.

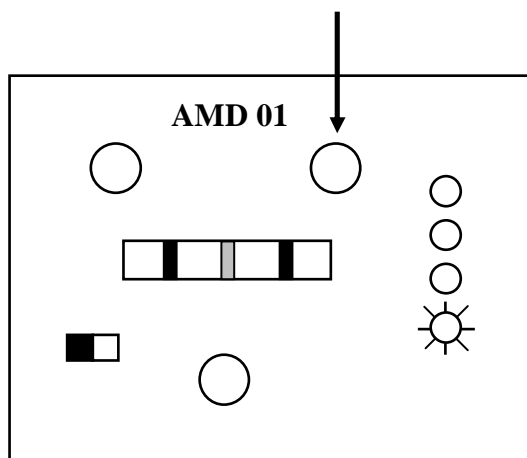
General

Noise Suppression is achieved utilizing an adjustable low pass filter.

Low frequency signals are able to by-pass this low pass filter. High frequency signals are dampened. Metal creates a certain frequency within the detection field.

Low conveying speed =low signal frequencies and a high conveying speed=high signal frequencies.

As long as there is not a visible influence of the measuring signal, the cut-off frequency of the low pass filter can be decreased using the Potentiometer (reference the following page).



You can use the Potentiometer (top right) for adjusting the Noise Suppression.

Low noise suppression means:

High cut-off frequency = Adjustment 0

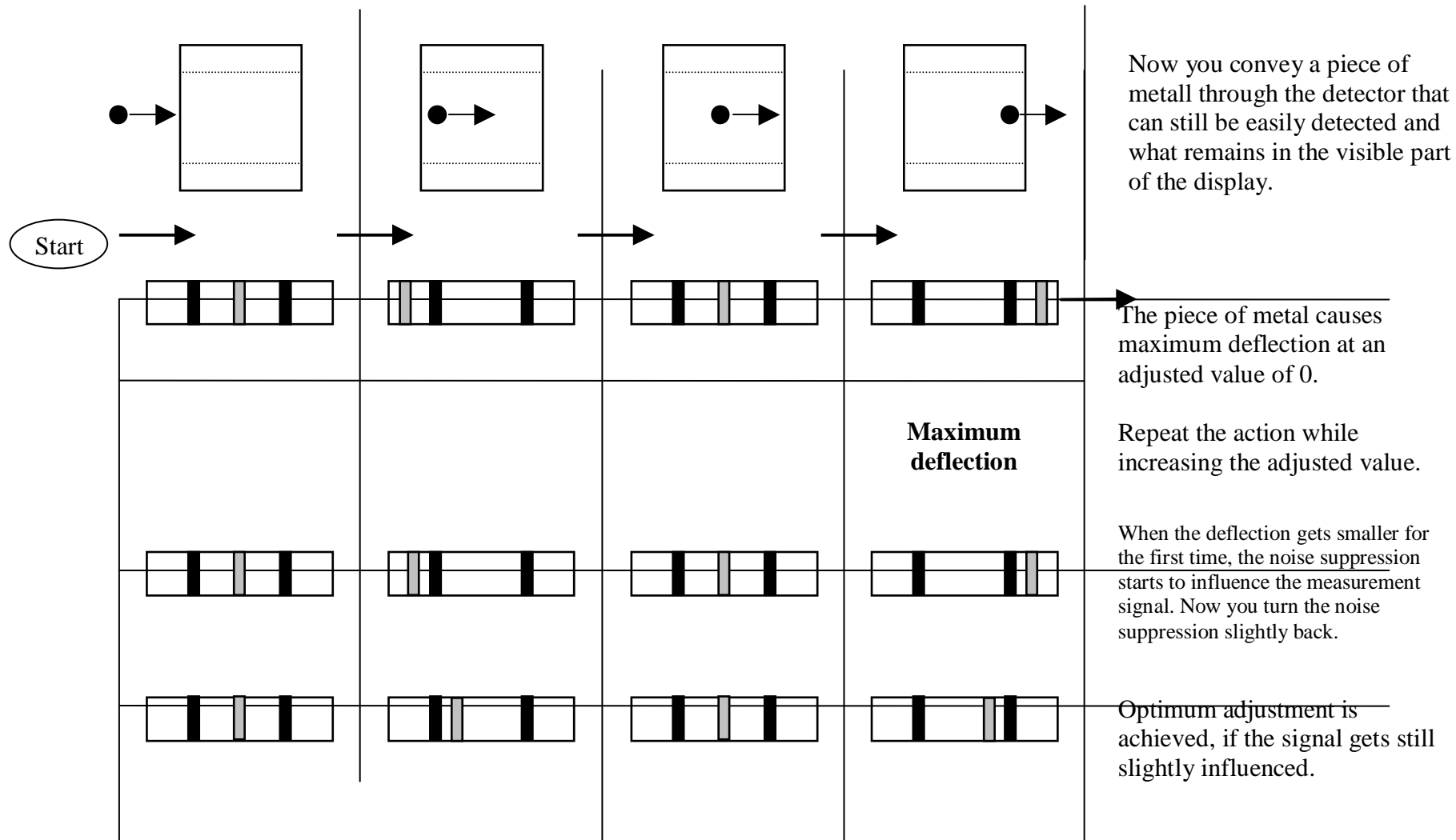
High noise suppression means:

Low cut-off frequency = Adjustment 10

The values as set by the manufacturer should only be changed if the unit cannot perform due to external disturbances and after consulting with a service technician. *Arbitrary adjustments can create sensitivity and calibration problems.*

Potentiometer adjustment for Noise Suppression

At the beginning of the adjustments the noise suppression value has to be set at 0.



ADJUSTING the PRODUCT COMPENSATION

Important Note

The Range and Product Compensation have been pre-set for the type of product you are conveying (wood) and should only be adjusted after consultation with a TecTronix service technician. In the majority of installations, the Range switch and Product Compensation Potentiometer do not require adjusting. Arbitrary adjustments can create sensitivity and calibration problems which effect system performance.

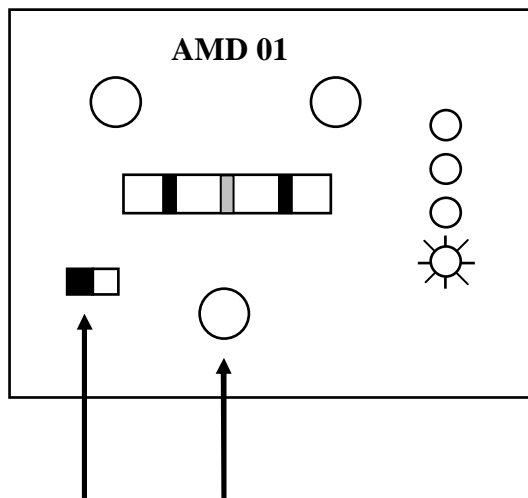
Factory Settings

If your system is a "VT" Vibrating Conveyor or "ST" Belt Conveyor, the Product Range switch should be set at **A** and the Product Compensation potentiometer at **2.5**.

If your system is the "S" flat plate type metal detector, installed beneath a vibrating or belt conveyor, the Product Range switch should be set at **B** and the Product Compensation potentiometer at **4.0**

Range A : Compensation of conductive products (not valid for ferromagnetic material).

Range B : Compensation of non conductive products.



The combination of range and compensation-value represents a specific characteristic value for each material.

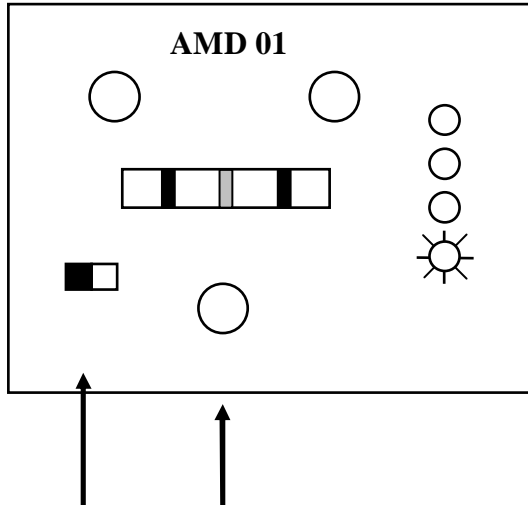
Two manufacturer's adjustments are available. However, the system has been pre-set at the factory for optimum operation with wood and wood by products such as bark.

NOTE:

Changing the Product Compensation will always influence the sensitivity. The values on the data sheet represent the maximum sensitivity without any influences of product or interferences.

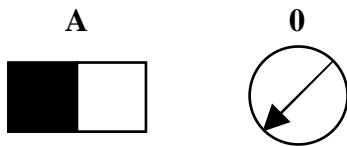
- Process of product compensation

1)



Please note the current compensation Value before commencing any adjustments.

2)



At the beginning of the adjustments turn the channel selection switch to "A" and the product compensation to "0". This position will be called "A0" from now on.

3)

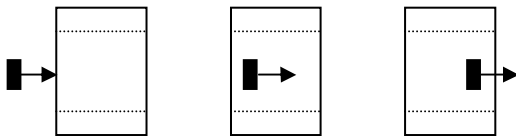
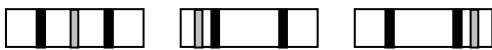
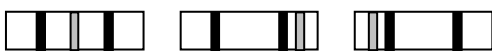


fig. 1a:



or

fig. 1b:



In order to find the optimum compensation value, the deflections will be examined in both directions. If you convey your product through the detector at "A0", a first deflection on the right or left will appear. This information will be compared to further deflections.

4)

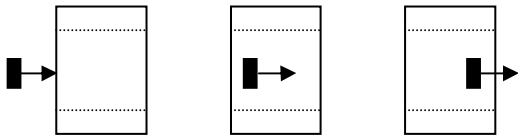
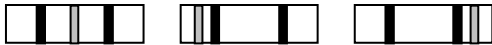
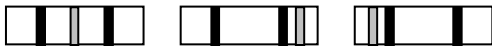


fig. 2a:



or

fig. 2b:

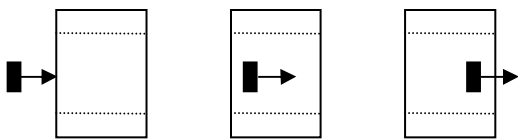


Now turn the product compensation to 10 and convey the product through the detector again.

Choosing the correct RANGE:

- In the direction of deflections 1 and 2 are similar, the product range must be set to **B** (e.g. figure 1a and 2a). Proceed to ITEM 5 for fine-tuning.
- In the direction of deflections 1 and 2 are opposite, the product RANGE must be set to **A** (e.g. figure 1a and 2b). Proceed to ITEM 5 for fine-tuning.

5)



Fine-Tuning/Calibration:

- 5a. Adjust the product compensation back to "0" and increase it slightly, conveying the product again.
- 5b. If the cycle of deflections remains the same, increase the product compensation factor slightly.
- 5c. Repeat procedure 5b. until the deflections begin to move in the opposite direction.
- 5d. Decrease the Product Compensation slightly in small steps and convey the product, noting where the signal stabilizes.

The optimum value for the Product Compensation has been achieved if the deflections are minimal or zero.

- Hints for optimum adjustments

- ⇒ In case a very large product effect appears (large deflections), it might be useful to reduce the indication range (comp. page B3/3) or even the amplification (comp. page B3/4) until the optimum product compensation is found.

- ⇒ With free fall and pneumatic air systems the direction of deflections might be very fast and therefore not visible. In this case you should convey the product manually. You may convey the product inside a closed plastic bag through the detector with free fall applications and pneumatic systems. It is possible to compensate the system with the aid of an oscilloscope at all conveying speeds.

- ⇒ Where the minimum deflection is so big that it is impossible to turn the amplification up again (comp. page B3/4), you should inform your service contact.

- ⇒ With the help of product compensation it is also possible to minimize external disturbances. The adjustments are done according to the same principles as described above, except the external disturbances are evaluated instead of the product now.

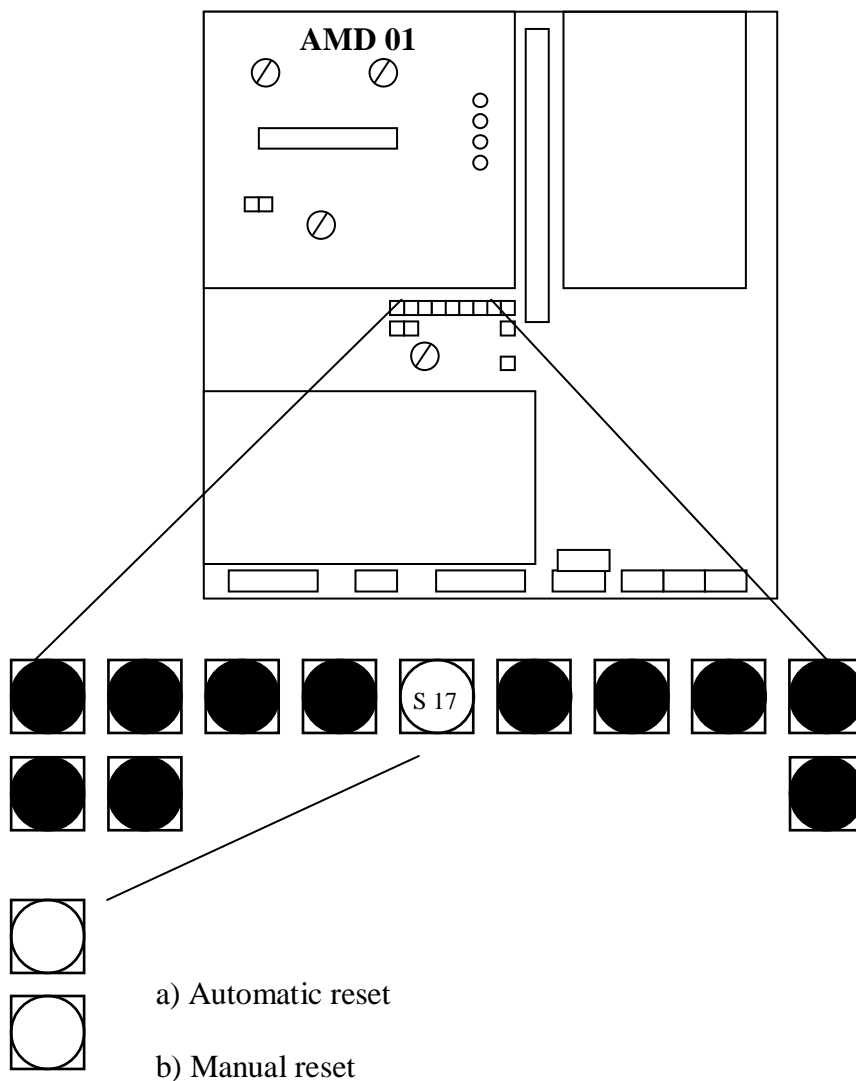
Adjusting the Outputs

- General

Automatic "RESET" is always possible at any conveying speed and in any application.

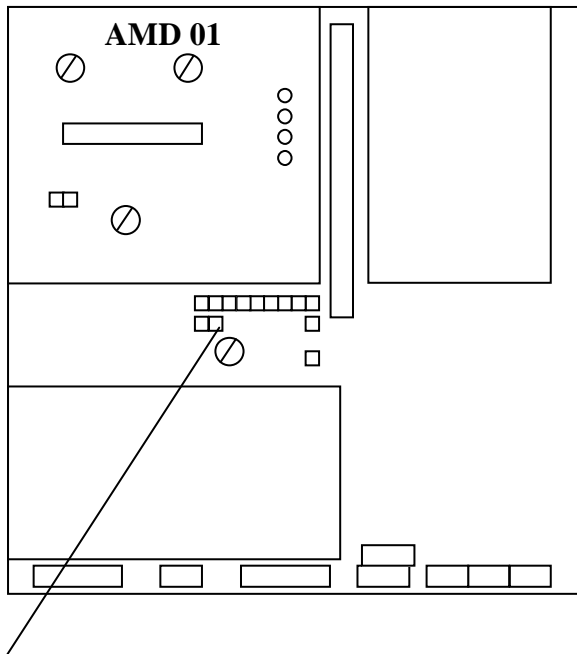
The floating relay, "Contacts 4/5/6" and the active output, Contacts "15/16" are always synchronously controlled. Immediately after metal is detected the outputs are triggered. If a time delay is required please call our service department.

- Adjusting the "RESET"

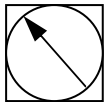


- a) Automatic Reset Mode

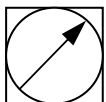
The importance of the duration of rejection is explained on page B4.



Free fall or pneumatic conveying applications usually operate in the automatic reset mode with regard to duration of ejection and can be adjusted with the potentiometer (located at the centre of the electronic panel).



Turning left : The duration of ejection decreases



Turning right : The duration of ejection increases

The adjustment of the range of reject duration is explained on page B4/2.

- b) Manual Reset Mode

If the manual reset mode is selected, the floating relay, contacts "4/5/6" send a signal to stop the conveying system when metal is detected.

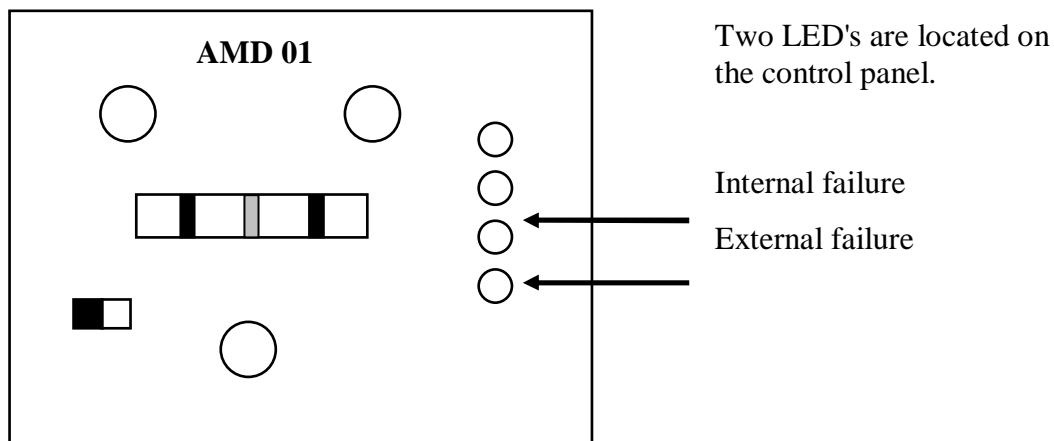
After metal is detected, the reset button, located on the cover of the control panel, must be pressed before restarting the conveyor.

Special applications for the reset are outlined in chapter A2/7 – Connecting the Reset Contact.

Faults and Problems

General Treatment of Failures

The AMD 01 Micro Processor board is self monitoring and constantly performs self tests. The board is self-compensatory for the electronic component aging process however, should a problem occur, one of two LED's on the front panel will provide a visual indication.



Internal Failure:

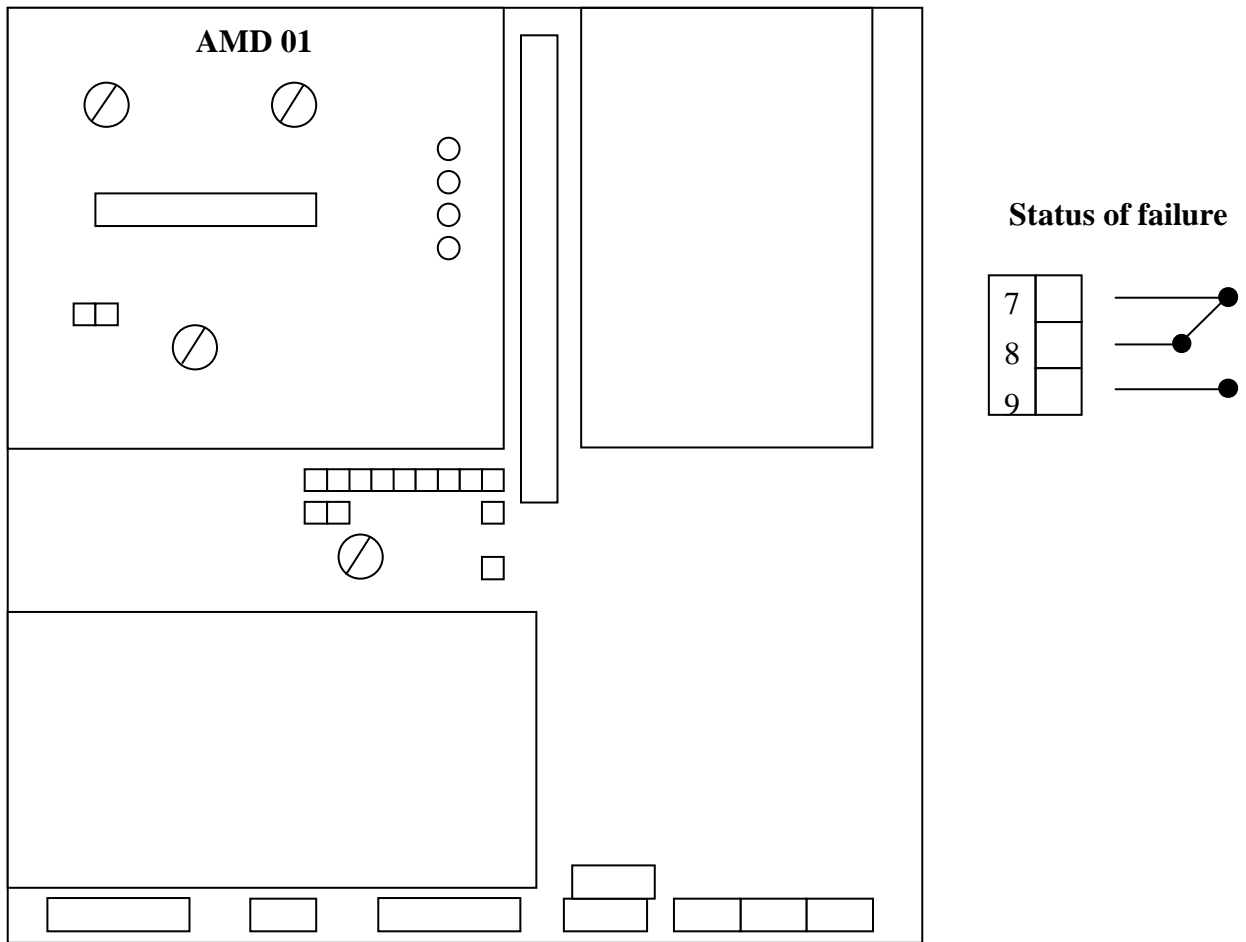
The LED "Internal Failure" indicates a problem with the metal detector. In this case you perform the tests outlined in Section C2.

External Failure:

The LED "External Failure" indicates a problem with an external device such as the optional pneumatic waste gate. Usually the cause of these failures is visually apparent.

In addition to the visible display on the panel, a floating relay exists for checking the operating state.

If a failure is detected, "Failure Relay 7/8/9" switches immediately.



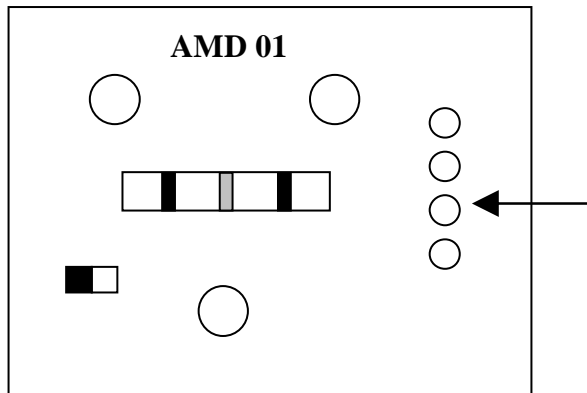
We can now look for the cause or the source of the failure. Pages C2/1, 2/2 and 2/3 outline a series of tests to assist you.

The "Failure Relay" remains switched even after the failure is cleared and must be reset manually and can only be reset once the failure is corrected/cleared.

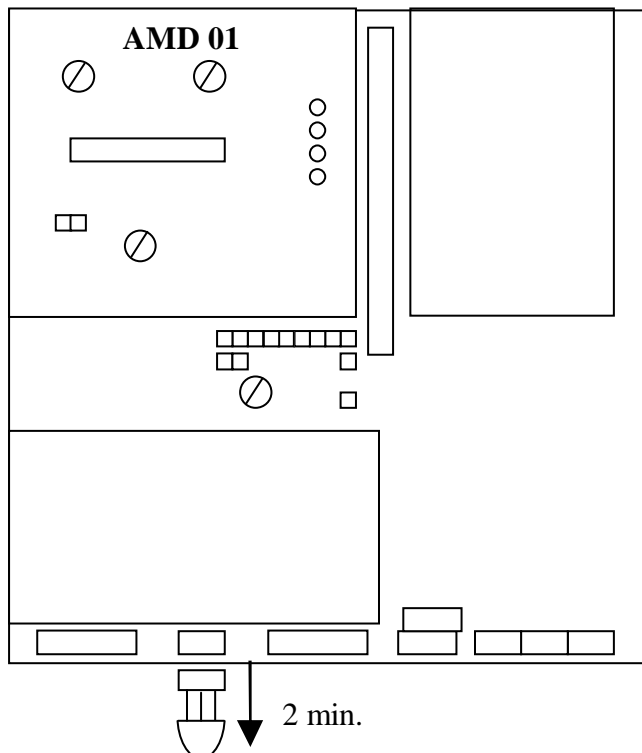
Internal Failure

Failure Analysis:

It is possible to locate the source of the failure. This section of the manual tries to support your finding the source. With the following test procedures you should obtain enough information to complete the checklist of failures. The connecting and disconnecting of the plugs and connectors can be done with the supply voltage connected.



"Internal Failure" permanently lit or flashing LED.



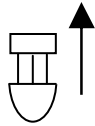
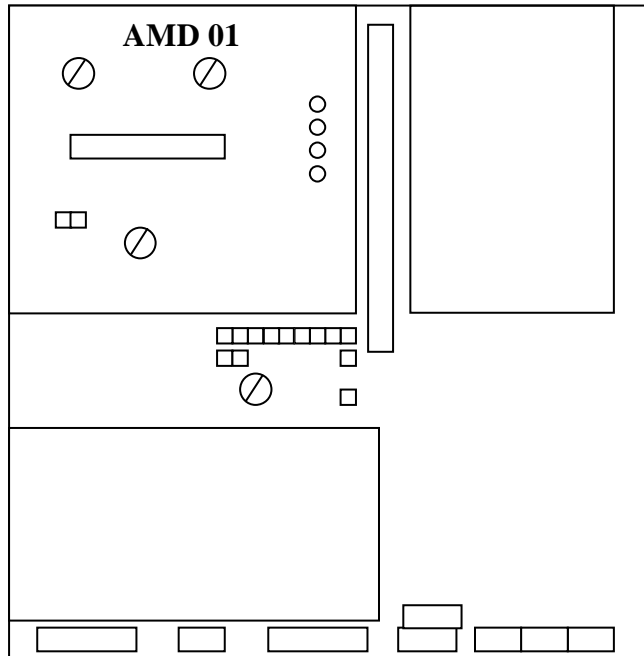
Step 1):

Disconnect the plug "22/21/20" from the electronics and wait two minutes.

Conclusion:

"Internal Failure" LED is flashing
=> go to step 2

"Internal failure" LED is off or on all the time
=> Electronics faulty. Please ask for a replacement board.



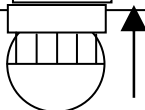
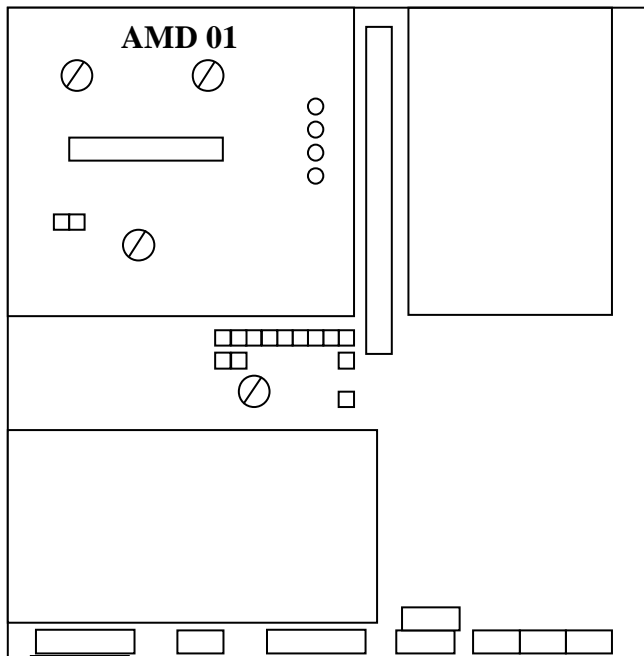
Step 2):

Reconnect the plug "22/21/20".

Conclusion:

"Internal Failure" LED is flashing
=> go to step 3

"Internal Failure" LED is on constantly.
=> Reference Chapter C4 – failure F1,
transmitter overloaded.



Step 3):

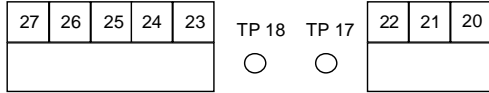
Disconnect the plug "27/26/25/24/23"

Conclusion:

"Internal Failure" LED is flashing
=> go to step 4

"Internal Failure" LED is off or on all the
time

= > Electronics faulty,
Please ask for a replacement board



Step 4):

Bridge the two testpoints 17 and 18. Doing so connects the "Transmitter" directly to the "Receiver", bypassing the coil.

Conclusion:

"Internal Failure" is flashing
=> Reference Chapter C4 – Failure F2,
"Transmitter" non functional

"Internal Failure" is off or on all the time
=> Reference Chapter C4 – Failure F3,
No signal from the "Receiver"

Note:

Step 4) This step is only helpful when diagnosing an "Internal Failure".

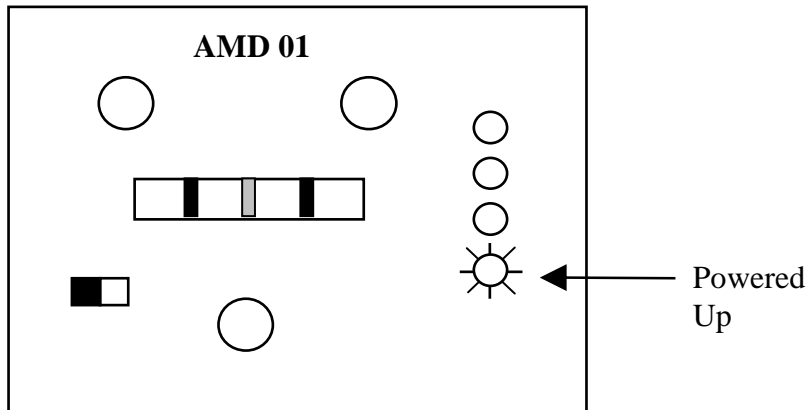
***** Following the two (2) year Warranty period, should a replacement board be required, it is our policy to supply an exchange unit via the fastest means possible. Please provide the unit **Serial Number** when requesting a replacement board.

Since it is our policy to only charge for repairs to your original board, we ask that you provide a Purchase Order number when requesting an exchange unit as well as advising your preferred shipper (UPS/FEDEX/Loomis/Purolator etc). Once we have determined the problems with your board and the cost of repairs, we will contact you so that you can complete your P/O. This usually takes a minimum of 30 days.

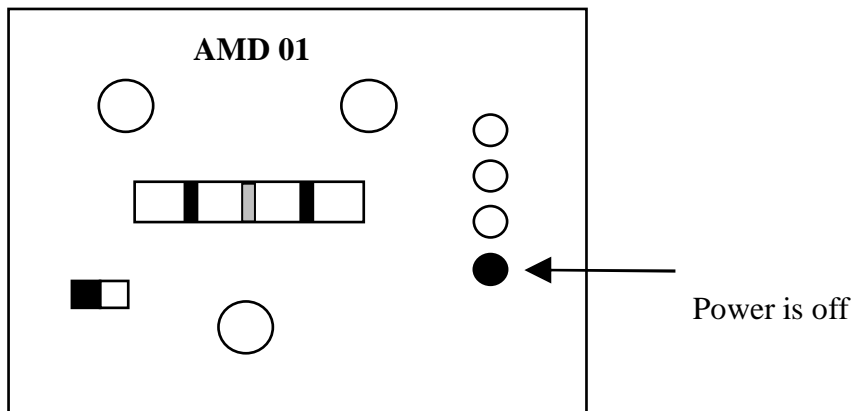
Diagnosing Power Supply Problems

General:

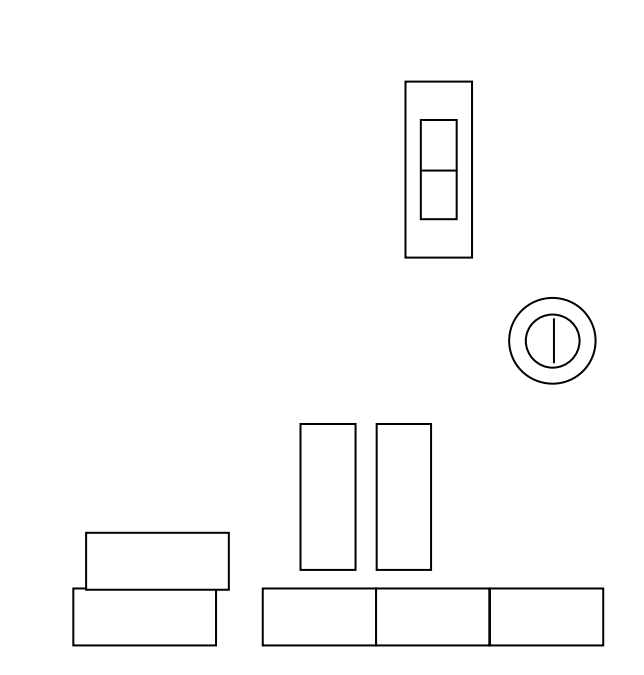
The illuminated LED shows the system is powered up and the system is functioning.



Failure Analysis:



Step 1) Check the power supply



Voltage Range:

variable: 85 to 264 V AC;
50 to 400 Hz
or : 100 to 375 V DC

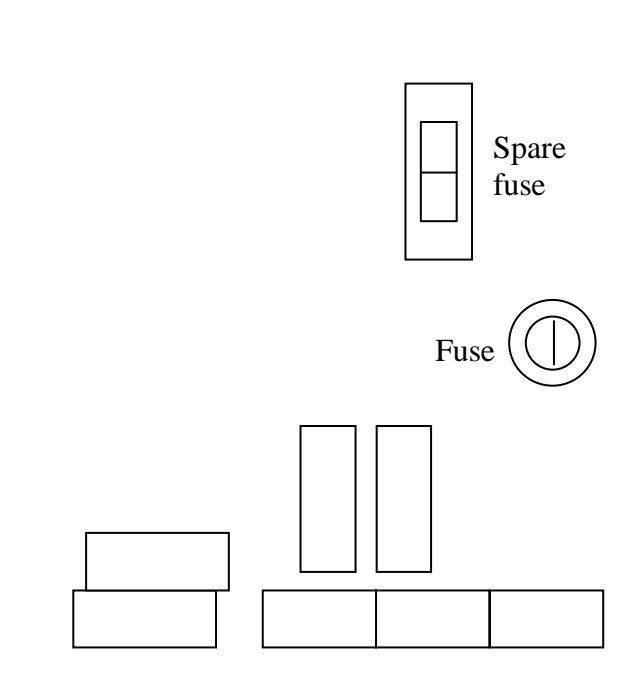
Special Version:

variable: 22 to 75 V AC
50 to 60 Hz
or : 22 to 75 V DC

Decision:

Correct power supply
=> request replacement board

Wrong power supply
=> see 2)



Step 2) Check the fuse

The electronics are protected by a fuse (2 A passive).

Decision:

Fuse is blown
=> Change fuse

Additional possibilities
=> F4 power supply faulty.

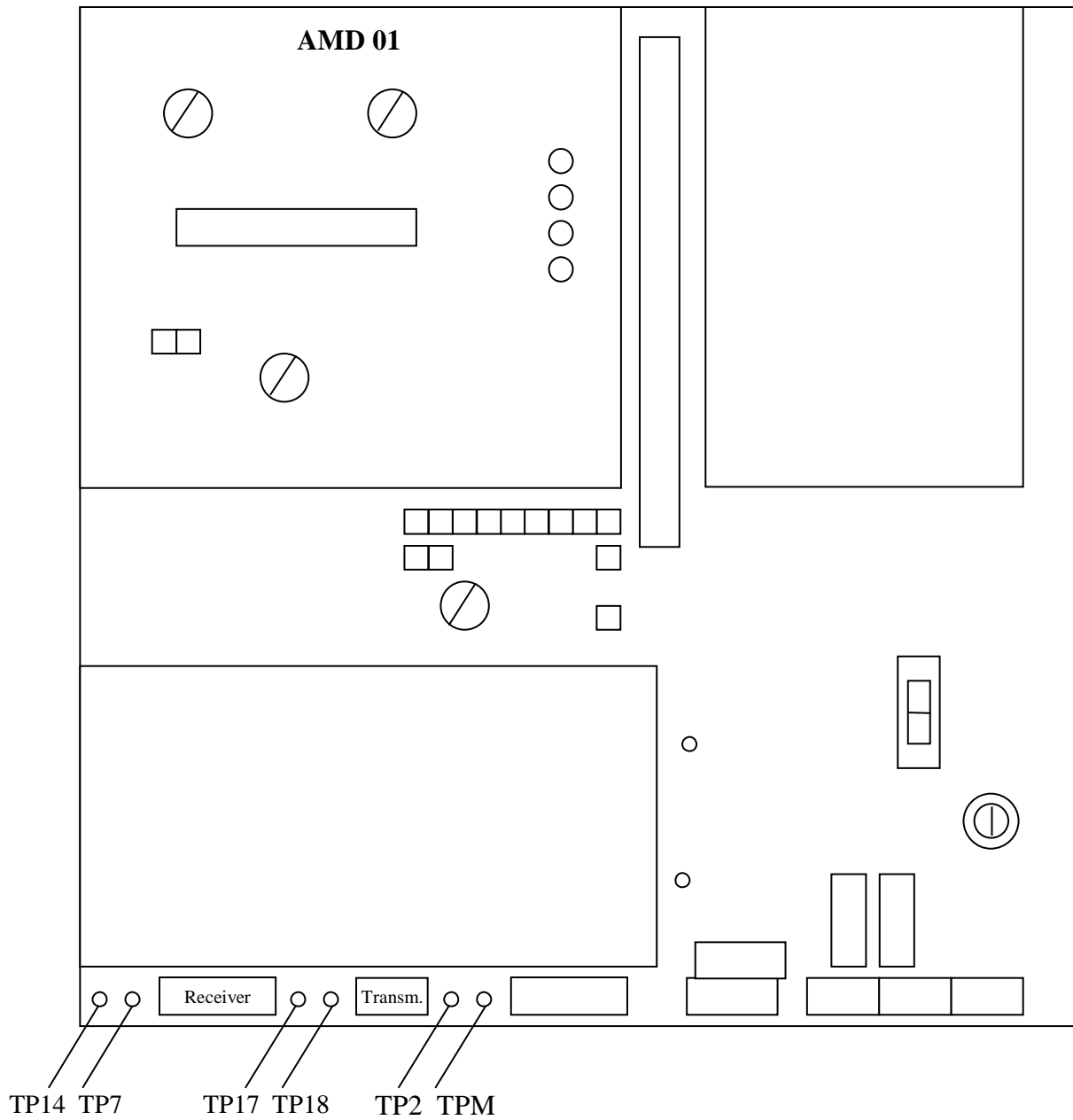
TROUBLE SHOOTING

If you have an "Internal Failure" or "Power Supply" problem, please reference Chapters C2 or C3.

Please call the distributors service department for technical assistance if you are having difficulty diagnosing any problem.

Failure Number	Description of Failure	Possible Problem
F1	"Internal Failure" LED illuminated	Transmitter Overloaded
	<ul style="list-style-type: none"> - Check the "20/21/22" connection at the electronic board (Ref. A2/1) - Check the "Transmitter" connection at the detection device (reference A1) - Are defective parts visible inside the "Transmitter" junction box? 	
F2	"Internal Failure" LED flashes	Transmitter Defective
	<ul style="list-style-type: none"> - Has the junction box been opened and the switch positions changed? <li style="padding-left: 20px;">If so, please ask for the factory set switch positions! 	
F3	"Internal Failure" LED flashes	No Receiver Signal
	<ul style="list-style-type: none"> - Check according to F1! - Check the "23/24/25/26/27" connection at the electronic board (Ref. A2/2) - Check the "Receiver" connection at the detector junction box (Ref. A1)! - Are defective parts visible inside the "Receiver" junction box? 	
F4	LED not illuminated	No Power
	<ul style="list-style-type: none"> - Check the actual voltage at terminals "3/2/1"! <li style="padding-left: 20px;">Please order a replacement board if the voltages are 'ok' but the unit is non-operational! 	

Test Points



If you experience a failure, for example an "Internal Failure", it is possible to check the important signals with an oscilloscope.

The electronics can be examined by connecting at the following test points.

- TPM / TP14 : Test points for the ground clamp of the probe.
- TP2 : **Transmitter signal:**
Sinusoidal voltage with a maximum value of 25 Vpp. The frequency depends on the application, please ask your sales office for the exact frequency value.
- TP7 : **Receiver signal:**
Sinusoidal voltage with the maximum value of 1 Vpp. Voltage values around zero are ideal. For testing the Receiver circuit, move a large piece of metal through the detector.
You will see the changes of the Receiver voltage on the oscilloscope.
- TP8 : **Transmitter load test point:**
DC Voltage: 250 mV up to 950 mV
- TP20 : **Receiver Voltage:**
DC Voltage: 420 mV at maximum
- TP17 / TP18 : Test points 17 and 18 can be used for direct feeding (compare to Chapter C2).
- TP 17 : The Receiver voltage should have the same voltage as measured at TP 17 with an added DC value of 300 mV.

Who, What, How, When, Why

Our qualified staff is available for you at any time and will assist you with eliminating faults and solving problems with the metal-detector.

You can find the department responsible for you on the identification plate. One of them is on the detector head and second one inside the control box. The supplier of the unit can also assist you.

Some dates are indispensable for the further process.

- Serial number of the device

e.g. 050412-CR

This is a six-digit-figure and a two-letter combination. You can find this combination on the identification plate.

- Serial number of the electronics

e.g. 060310-11

This is a six-digit-figure and a two-letter combination. You can find this on the transformer or beside the shroud.

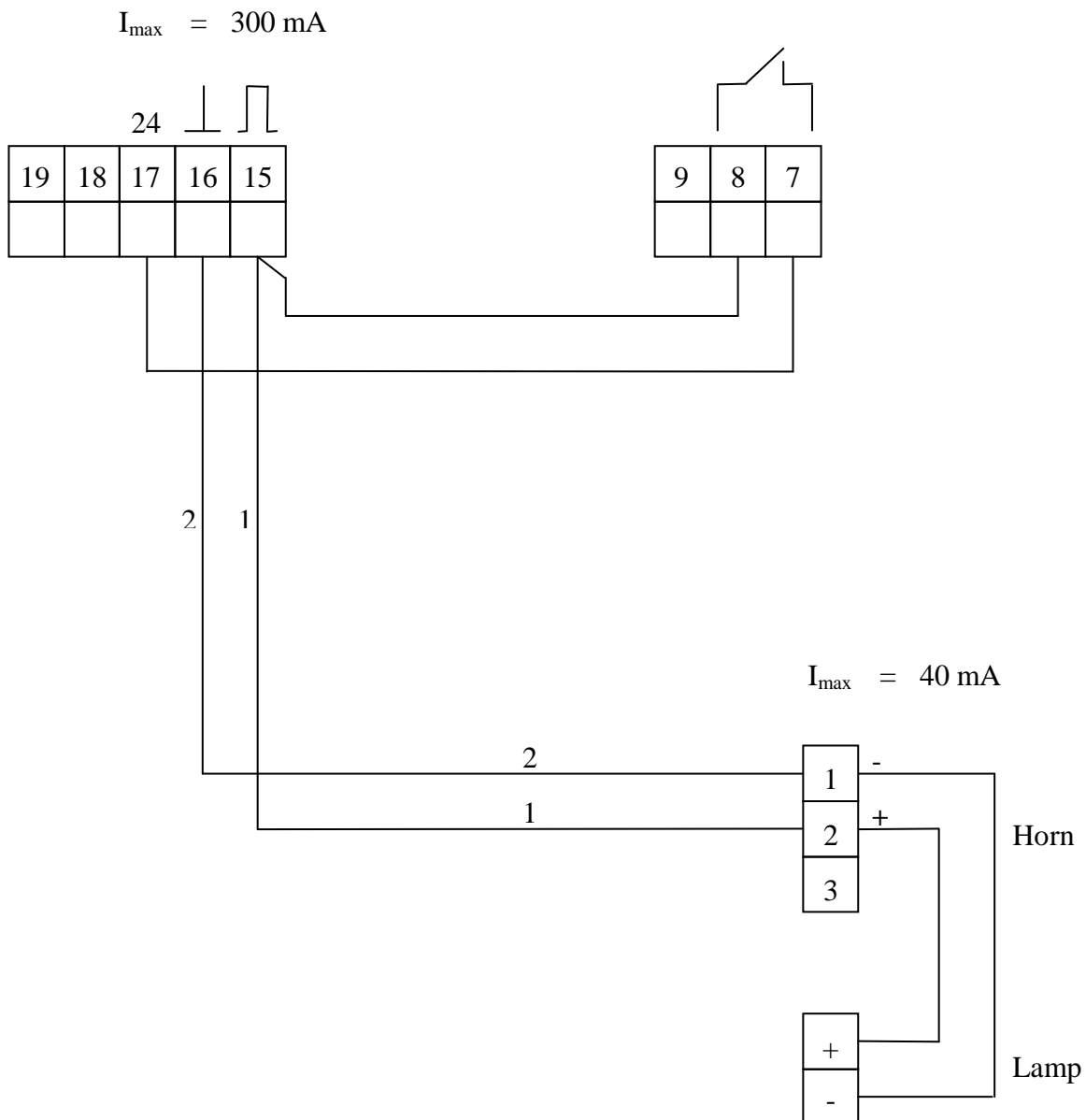
- Acknowledgement numbers of the process.

- Fault description and action taken.

Connecting External Devices

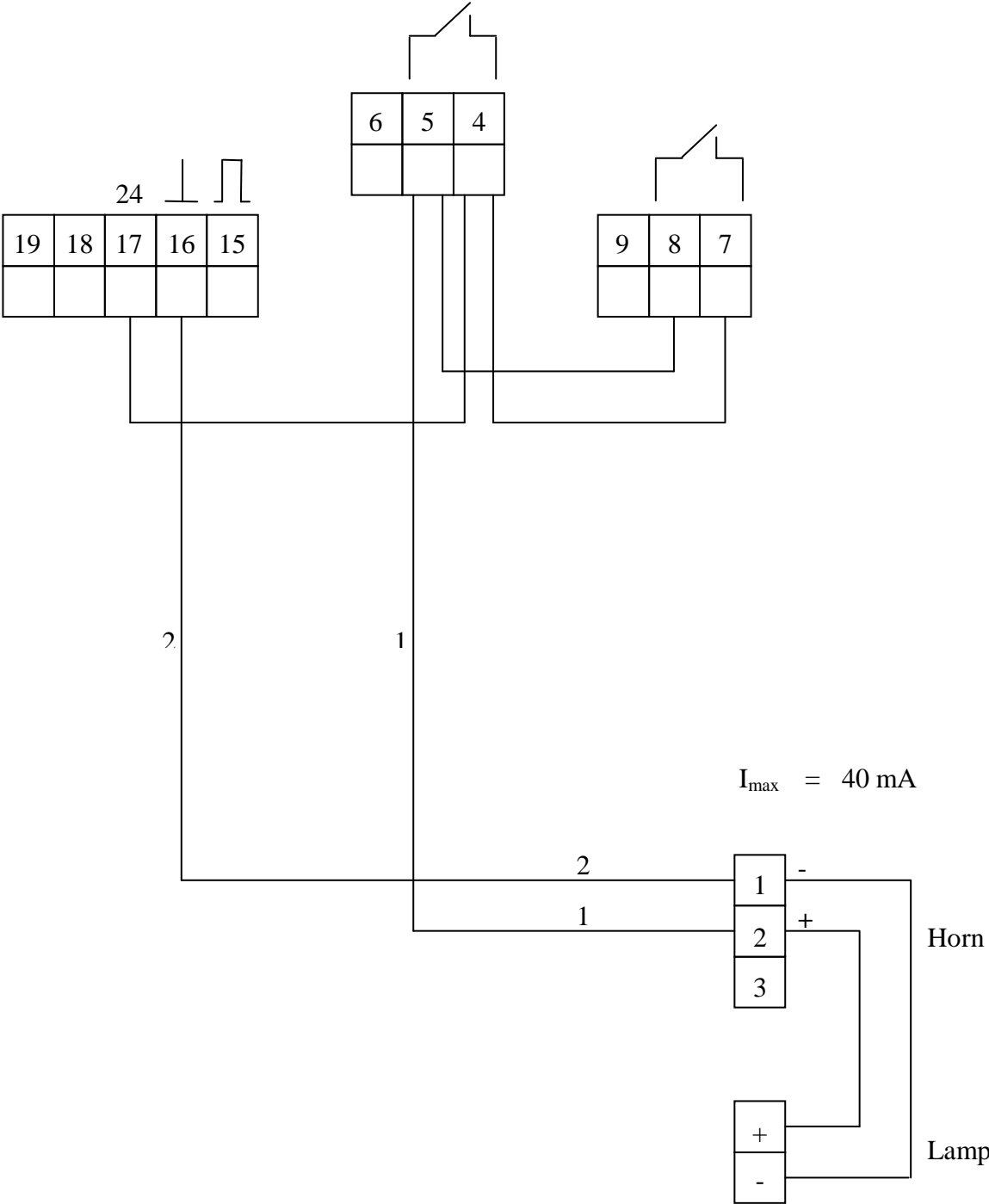
AMD 1.3 / AMD 2.1

- Signal when metal is detected (active output) or fault monitoring is activated (relays)



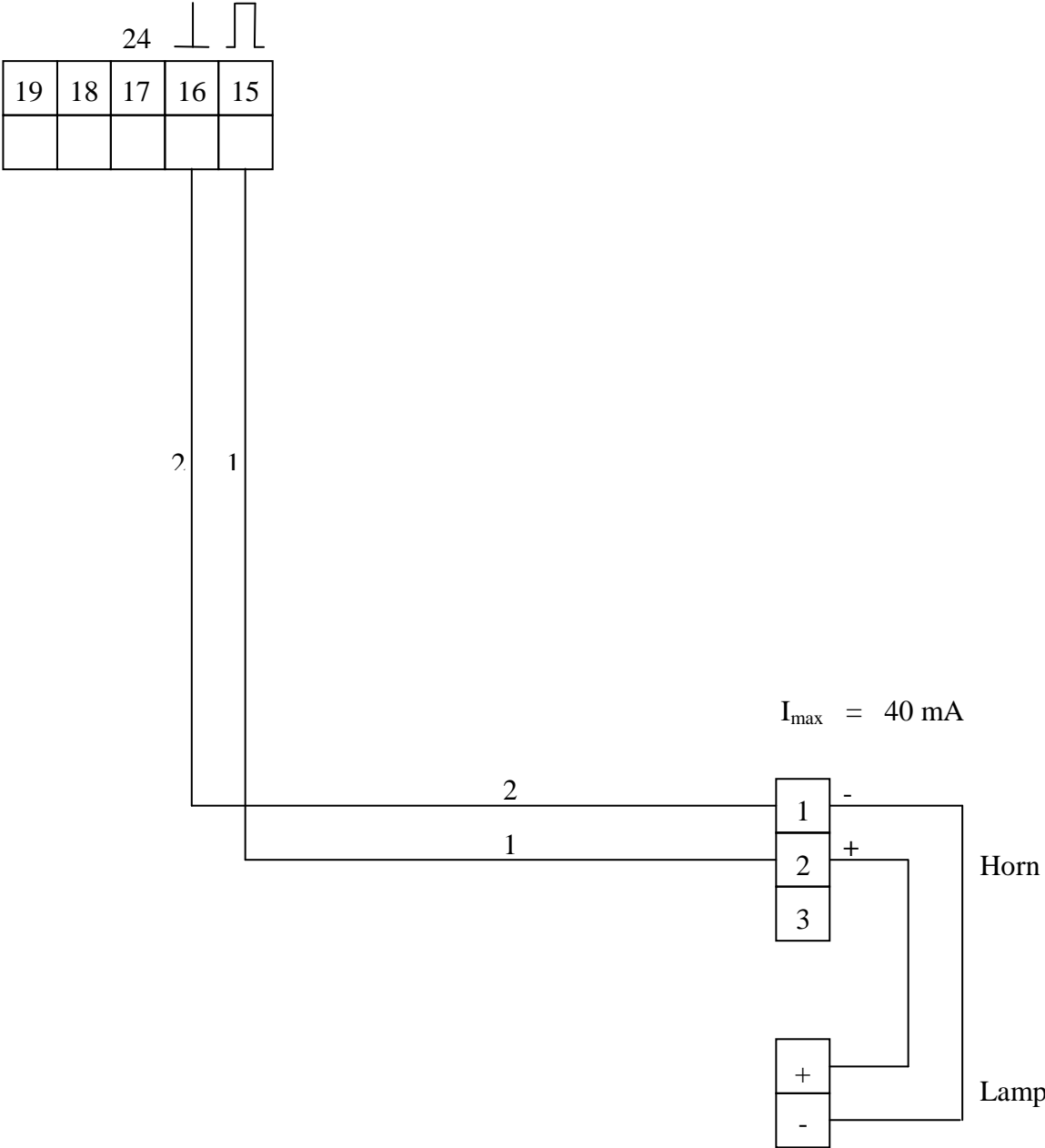
- Signal when metal is detected (relays) or fault monitoring is activated (relays)

$I_{max} = 300 \text{ mA}$

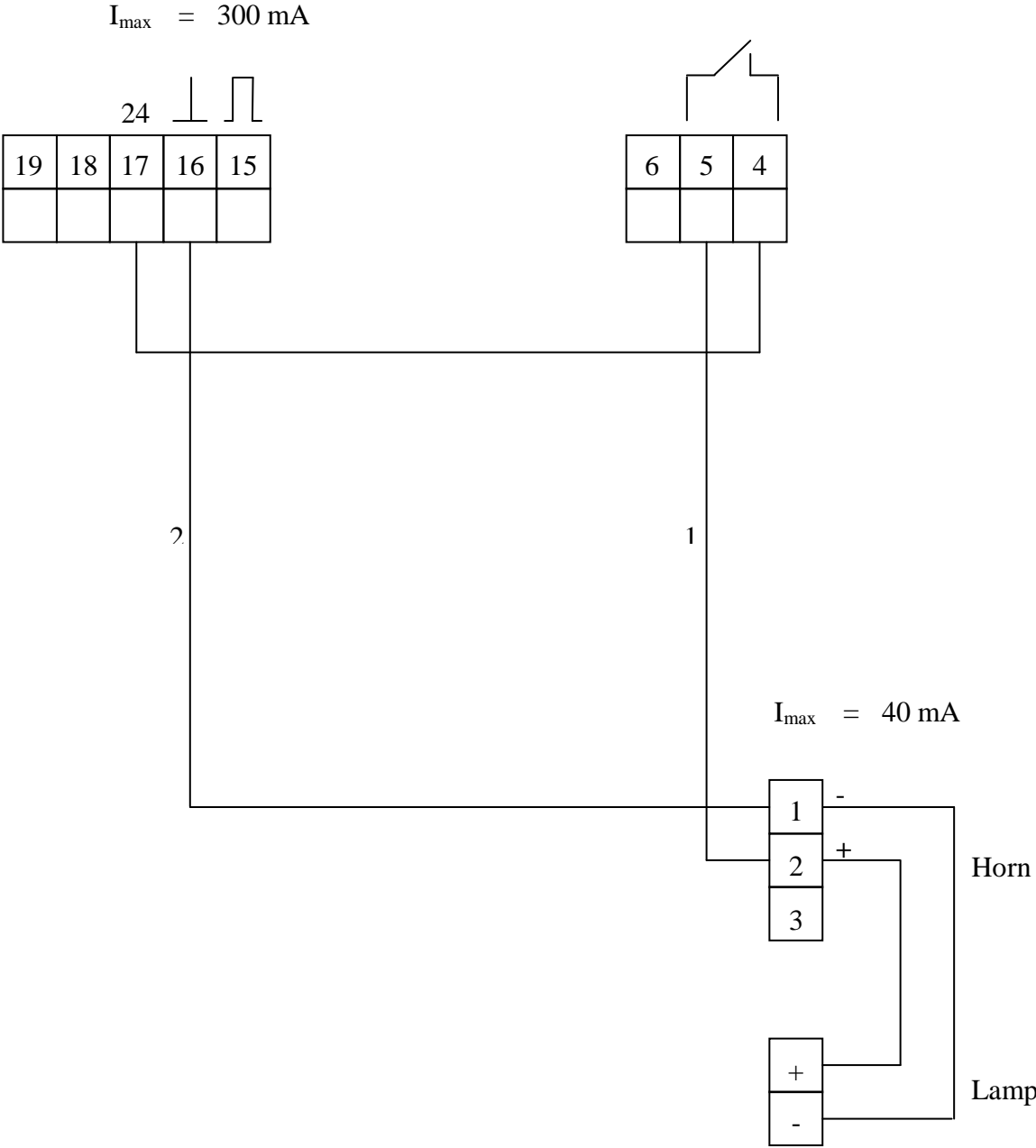


- Signal when metal is detected (active output)

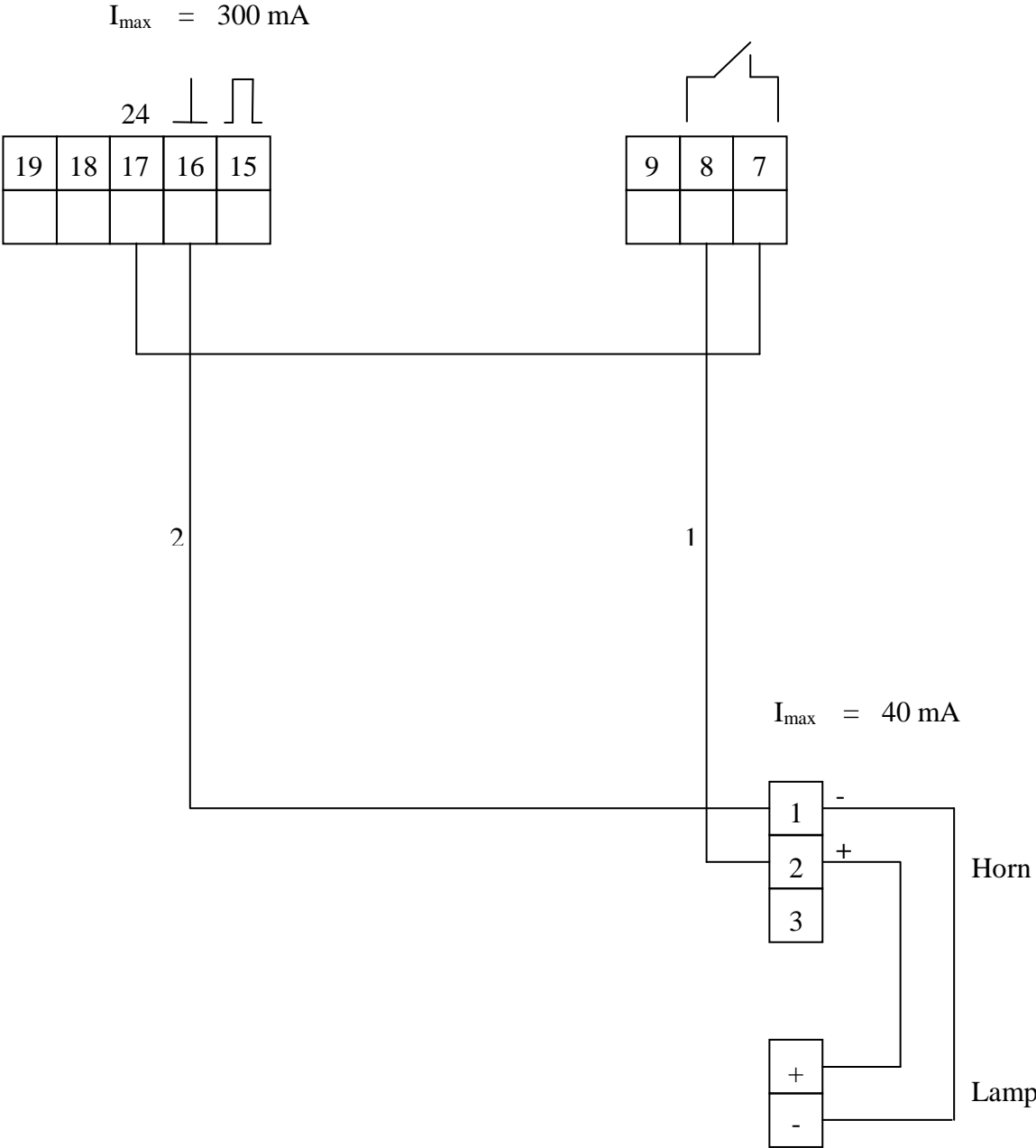
$I_{max} = 300 \text{ mA}$



- Signal when metal is detected (relays)



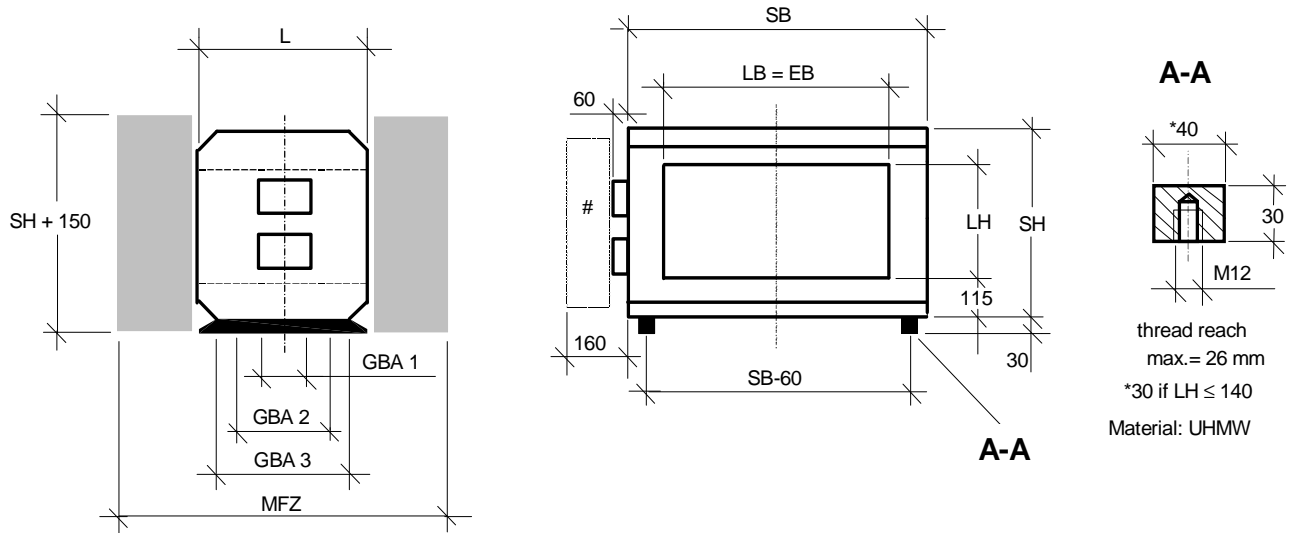
- Signal when fault monitoring is activated (relays)



Dimensions

- Dimensions for Metron 01 C----- D3/1
- Dimensions for Metron 01 CR----- D3/2
- Dimensions for Metron 01 D ----- D3/3
- Dimensions for Metron 01 S----- D3/4

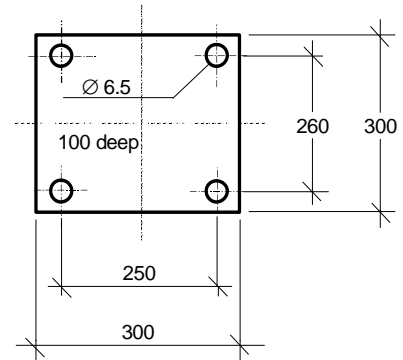
- (Metron 01 C)



MFZ (non moving metal) = $L + LH$ ¹⁾
 MFZ (moving metal) = $L + 2,5 \times LH$ ¹⁾

¹⁾ The metal detector must be centered within the „metal-free-zone“. The calculated values can be used for orientation (minimum values can of course be exceeded!) but must be confirmed by us for the respective project.

ELECTRONICS SWITCH CABINET (hole pattern)

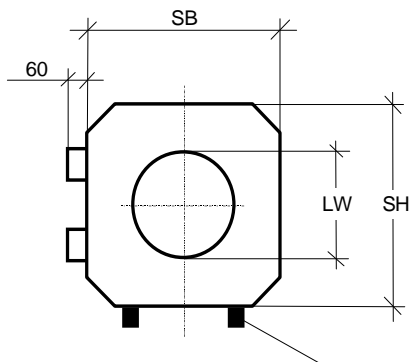
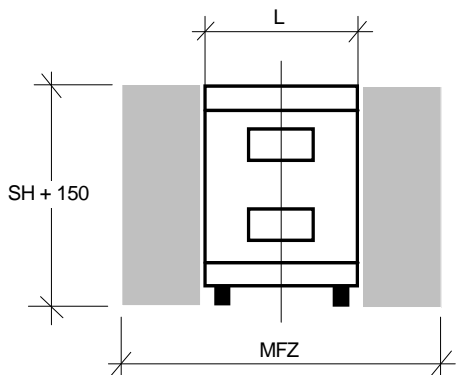


SB (Detector Width) = $LB + 230$
 SH (Detector Height) = $LH + 230$
 EB (Sensitive Breadth)

LH Aperture Height	L Detector Length	GBA 1	GBA 2	GBA 3	A Amount of threaded bore holes per detector (mm)
to 150	250	160			4
to 200	300	210			6
to 250	350	220			6
to 300	400	270			6
to 350	450	320			6
to 400	500	220	370		10
to 450	550	240	420		10
to 500	600	280	470		10
to 600	650	280	520		10
to 700	700	220	410	570	12
to 800	750	220	460	620	12
to 900	800	220	490	670	12
to 1000	850	220	520	720	12
> 1000	900	220	540	770	12

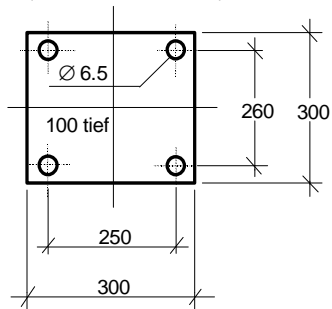
LH to 250 - The Electronics are mounted to a separate bracket

- (Metron 01 CR)



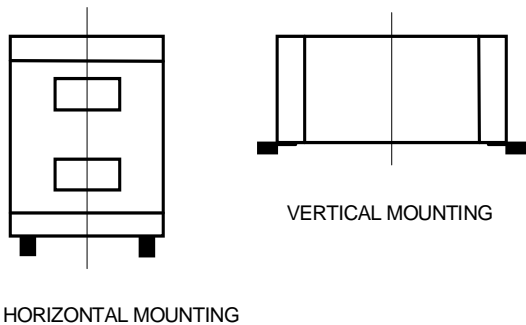
MFZ (non moving Metal) = L + LW ¹⁾
 MFZ (moving Metall) = L + 2 x LW ¹⁾

**CONTROL PANEL
(DRILLING PATTERN)**



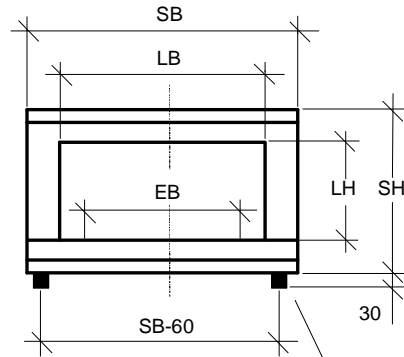
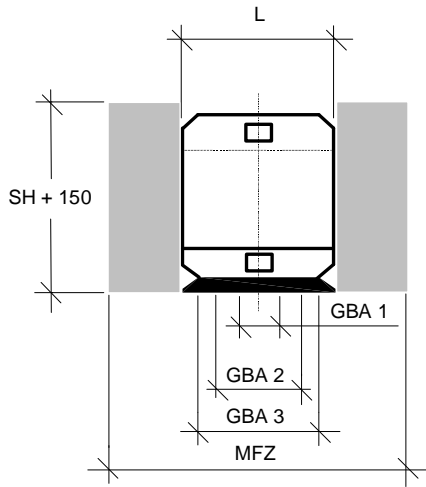
LW = TYPE Clear Width	SB = SH DETECTOR HEIGH= DETECTOR WIDTH	L DETECTOR LENGTH
35	150	125
45	150	125
55	150	125
70	150	125
85	200	150
100	200	150
115	250	150
130	250	150
150	250	200
170	300	200
210	350	250
235	400	300
265	450	300
300	500	350
335	550	400
380	600	450
430	650	500
470	700	500
525	750	600
600	850	700

All Dimensions in mm.

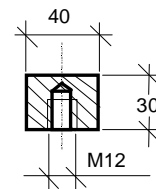
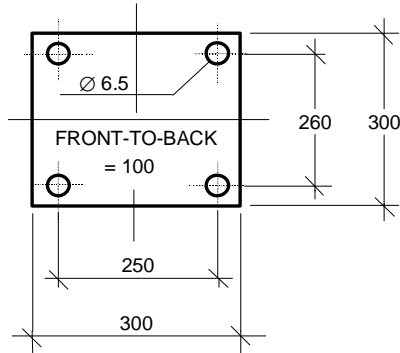


NOTICE:
 THE AMOUNT OF TORQUE ON THE BOLTS
 DEPENDS ON THE SIZE OF THE DETECTOR
 AND THE APPLICATION

- (Metron 01 D)



**CONTROL PANEL
(DRILLING PATTERN)**



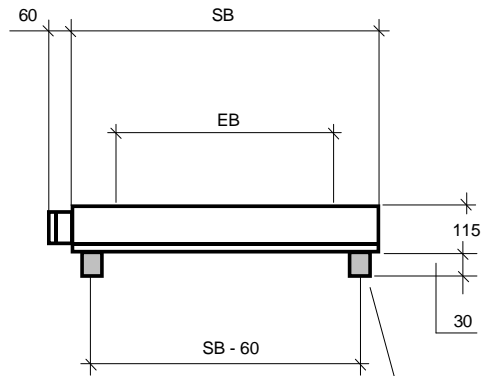
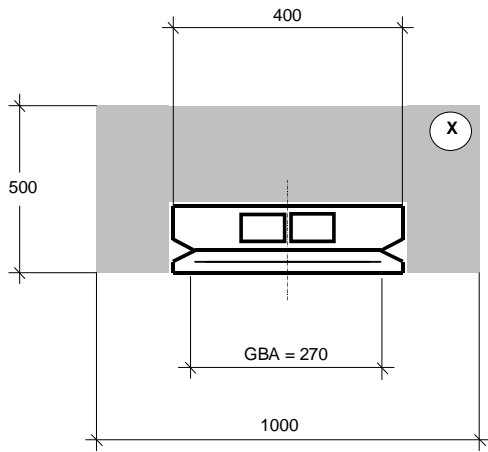
MAX. DEPTH OF
THREAD = 26 MM
MATERIAL: UHMW

SB (DETECTOR WIDTH) = LB + 200 mm
SH (DETECTOR HEIGHT) = LH + 230 mm
EB (SENSING AREA)

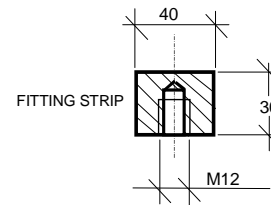
LH APERTURE HEIGHT (mm)	LB APERTURE WIDTH (mm)	L DETECTOR LENGTH (mm)	GBA1	GBA2	GBA3	A NUMBER OF THREADED MOUNTING HOLES IN TOTAL	MFZ METAL FREE ZONE NON-MOVING METAL (mm)
			DISTANCE BETWEEN THREADED BORE HOLES (mm)				
TO 200	EB + 220	400	270			6	1000
TO 300	EB + 220	500	220	370		10	1100
TO 400	EB + 240	600	280	470		10	1300
TO 500	EB + 240	700	220	410	570	12	1400
TO 600	EB + 240	750	220	460	620	12	1500
TO 700	EB + 280	800	220	490	670	12	1600
TO 800	EB + 280	850	220	520	720	12	1700
TO 900	EB + 280	900	220	540	770	12	1800
TO 1000	EB + 280	900	220	540	770	12	1800
> 1000	EB + 300	1000	220	590	870	14	ON INQUIRY

LH < 350mm - REMOTE CONTROL BOX
LH > 350mm - INTEGRAL CONTROL BOX

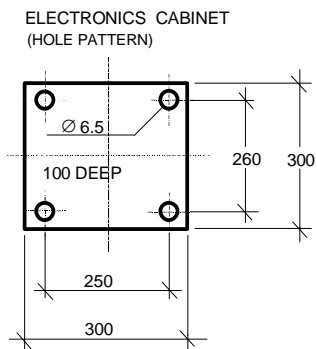
- (Metron 01 S)



(X) MINIMUM METAL FREE ZONE



THREAD REACH
MAX. = 26 mm
MATERIAL : UHMW



GBA = MEANS DISTANCE BETWEEN THREADED BORE HOLES (6 ON EACH DETECTOR)

EB = (SENSING WIDTH) of 200 - 6000 mm

SB = (DETECTOR WIDTH) = EB + 200 mm

"ST" Belt Conveyor 'NOISE SUPPRESSION' Settings

These settings are only to be used for "ST" belt conveyor metal detectors.

<u>POTENTIOMETER SETTING</u>	<u>MAXIMUM CONVEYING SPEED</u>	
	Meters per Second	Feet per Minute
0	.9	177
1	.8	157
2	.6	118
3	.4	79
4	.3	59
5	.24	47
6	.18	35
7	.16	31
8	.14	28
9	.12	23
10	.10	20

These tabular values are the usual settings for the AMD 01 Electronic Board. If your conveying speed is higher than the stated values, you will have to change the position of Switch 'S18' from the center position (12 o'clock/6 o'clock) to the right (1 o'clock/7 o'clock).

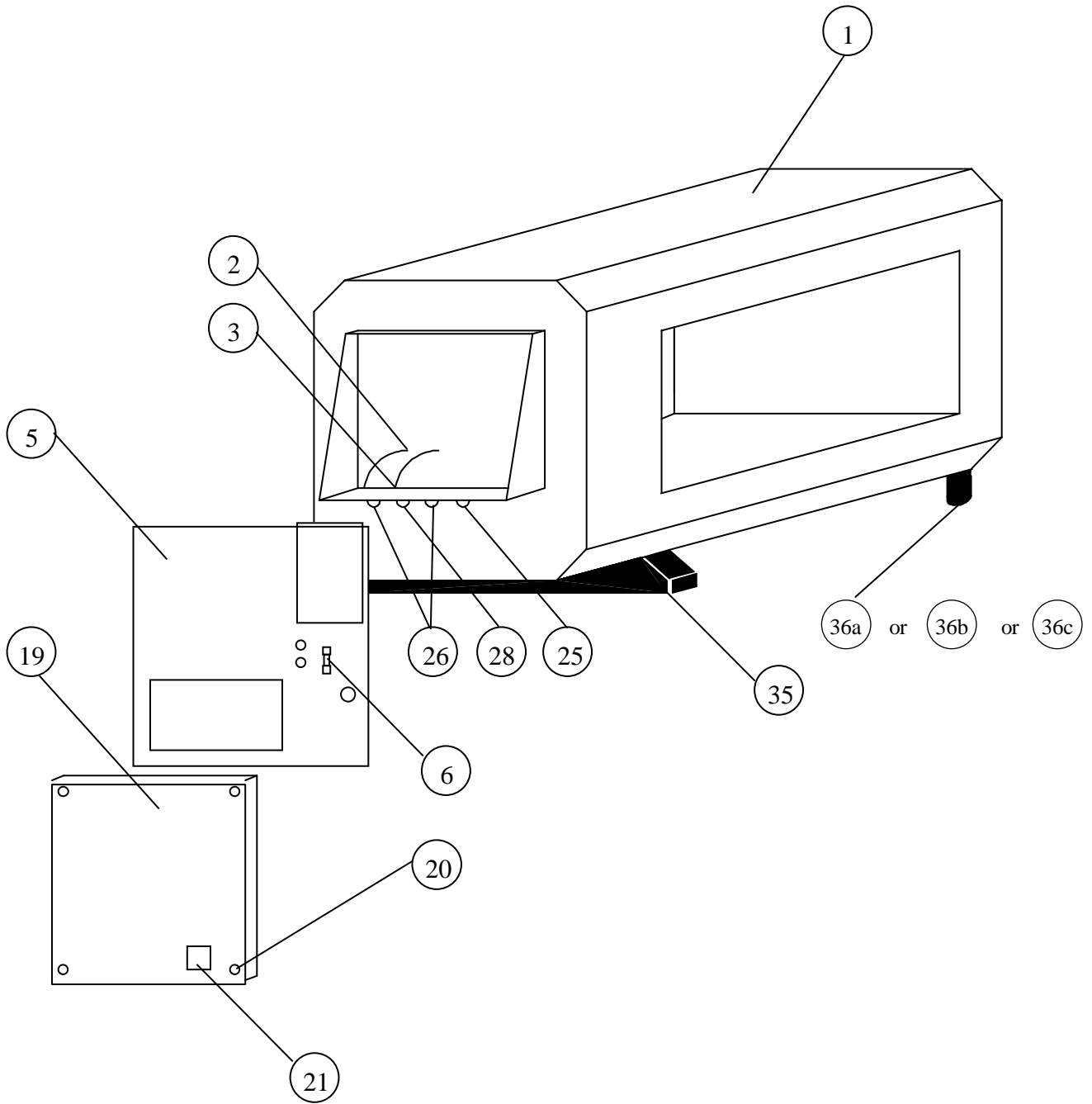
<u>POTENTIOMETER SETTING</u>	<u>MAXIMUM CONVEYING SPEED</u>	
	Meters per Second	Feet per Minute
0	2.0	394
1	1.5	295
2	.75	148

Index of spare part drawings

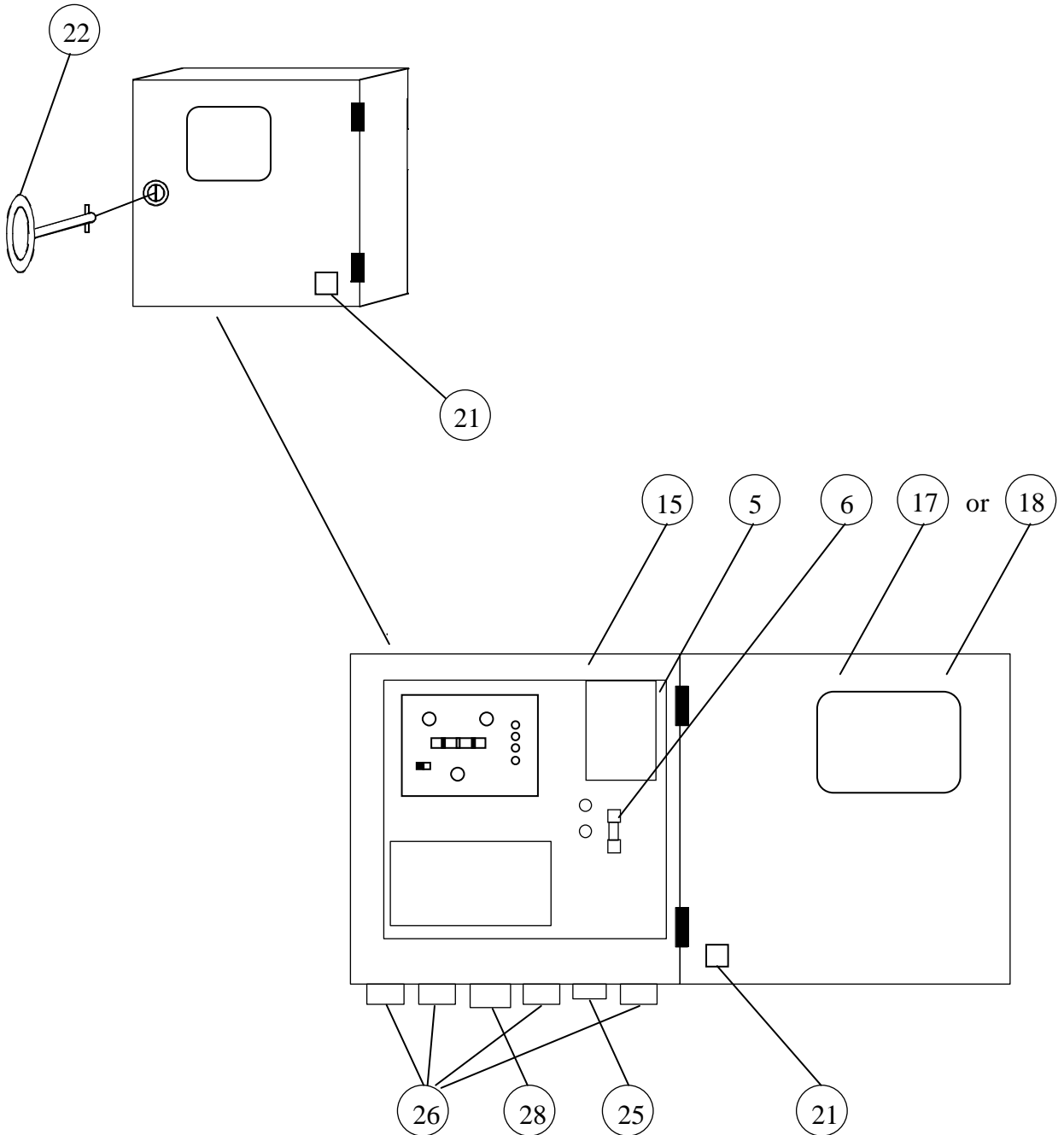
- Spare part drawing C-Coil (**Control unit integral**)----- E1/1
- Spare part drawing (**Control unit remote**) ----- E1/2
- Spare part drawing C-Coil, CR-Coil, CO-Coil (**Control unit remote**)----- E1/3
- Spare part drawing D-Coil (**Control unit remote**) ----- E1/4
- Spare part drawing S-Coil, SU-Coil, V-Coil (**Control unit remote**)----- E1/5
- Spare part drawing VT-Coil (**Control unit remote**)----- E1/6

(Control unit integral)

- C-Coil

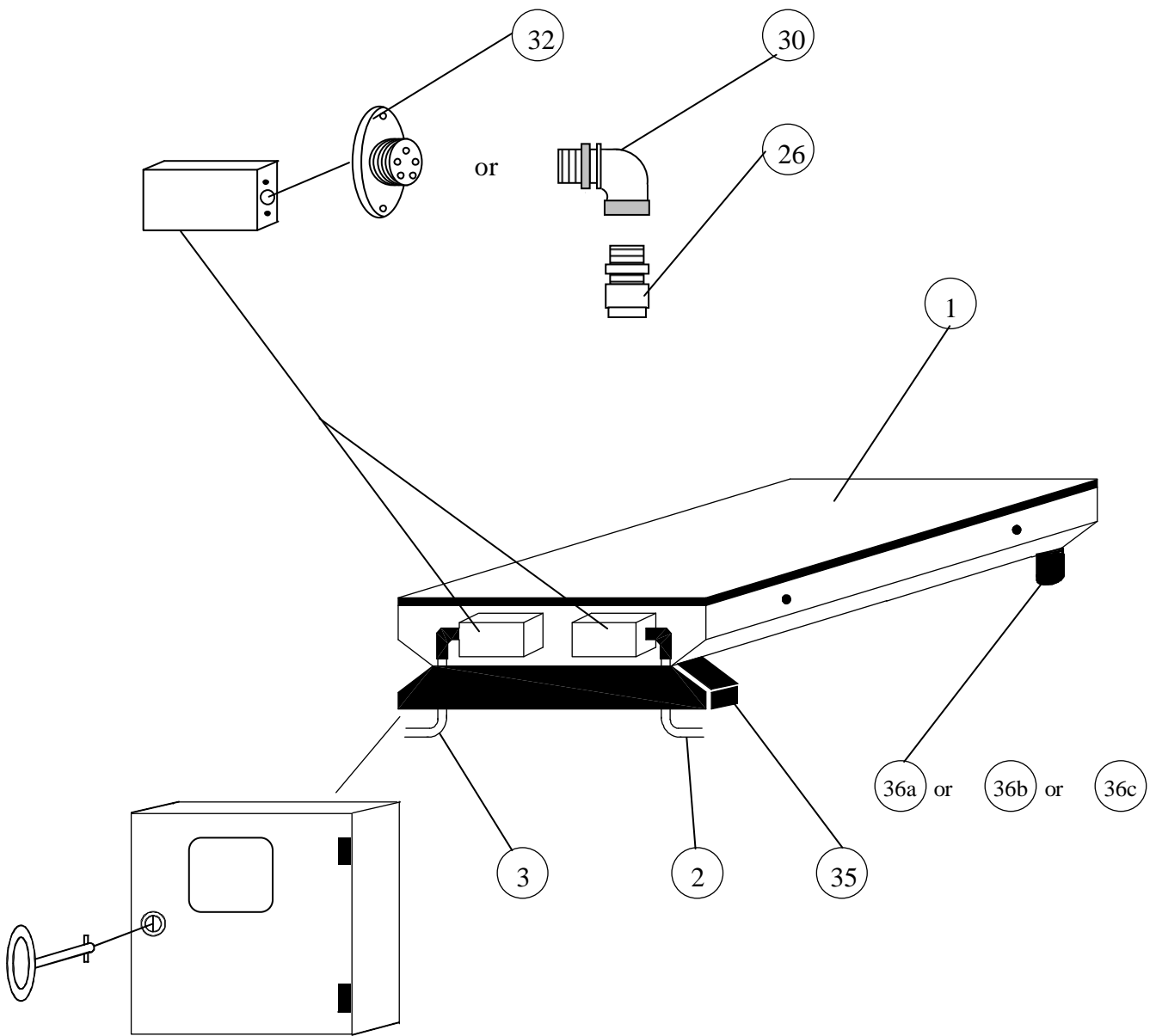


(Control unit remote)



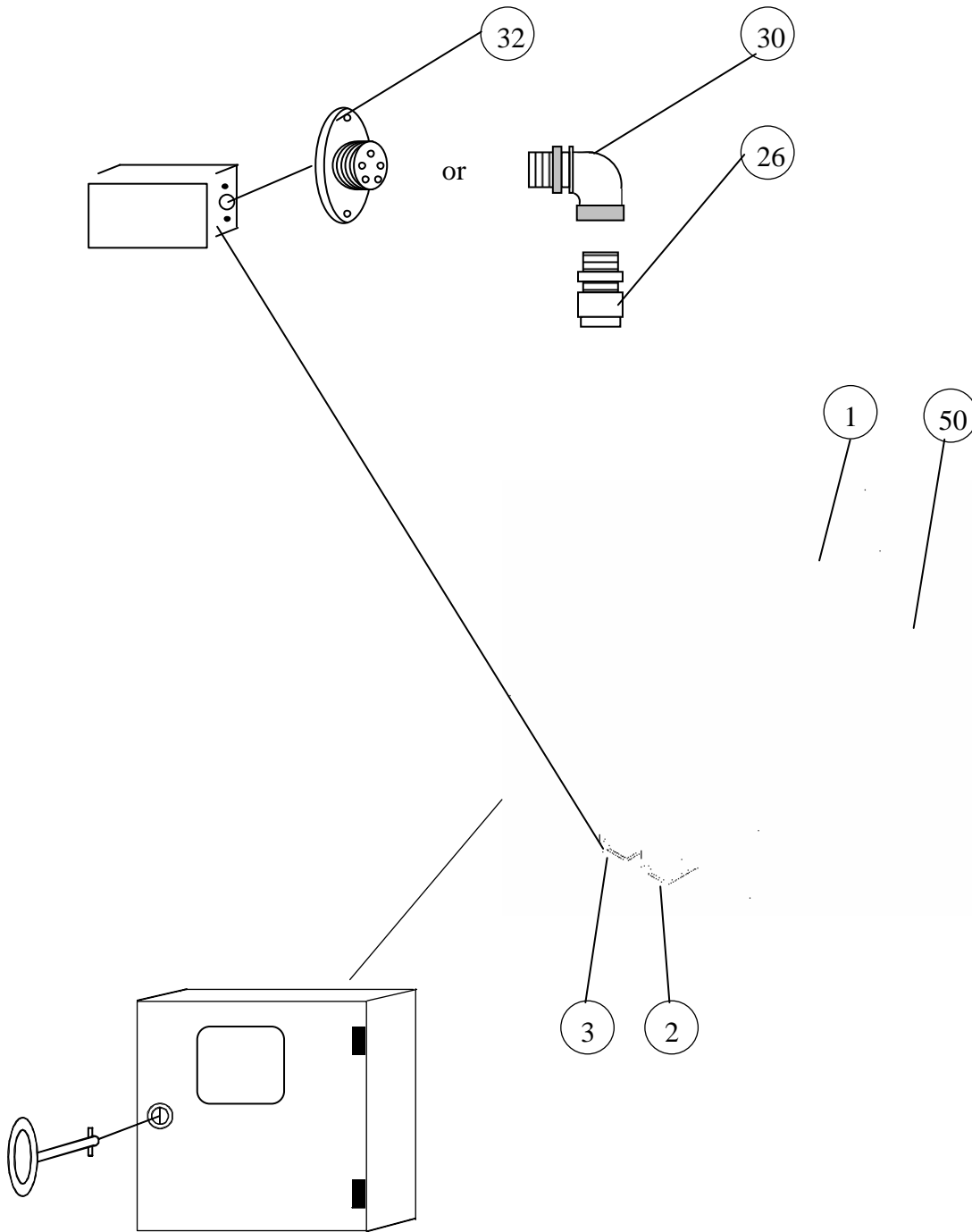
(Control unit remote)

- S-Coil, SU-Coil, V-Coil



(Control unit remote)

- VT-Coil



Item-No.	Description	Part-No.	Note
1	Metal sensor	*	Me
2	Transmitter connecting cable	*	Me
3	Receiving connecting cable	*	Me
4			
5	Electronic evaluation kit	*	Me
6	Spare fuse 2 A	200240	Me
7			
8			
9			
10			
11			
12			
13			
14			
15	Case bottom	*	Me
16			
17	Cover (with window)	*	Me
18	Cover (without window)	*	Me
19	Case lid, design 4	*	Me
20	Screw with sleeve	300198	Me
21	Reset, complete	500024	Me
22	Two-way-key (Form B – 3 mm)	300152	Me
23			
24			
25	Screwed cable gland PG 9	300035	Me
26	Screwed cable gland PG 11	300036	Me

*** When spare parts are requested, please state serial number, acknowledgement number and detector type !!!**

Item-No.	Description	Part-No.	Note
27	Screwed cable gland PG 13,5	300039	Me
28	Screwed cable gland PG 16	300040	Me
29			
30	Threaded elbow joint PG 11	300163	Me
31			
32	Flange socket (7-channel)	200163	Me
33			
34			
35	Detector fixing	*	Me
36 a	Rubber metal Ø 25	300044	Me
36 b	Rubber metal Ø 40	300164	Me
36 c	Rubber metal Ø 50	300208	Me
37			
38			
39			
40	Alan key, 8 mm	300060	Me
41	Screw M 10 x 30	300088	Me
42	Split washer M 10	300102	Me
43	Base disc Ø _i = 11	300114	Me
44	Split washer M 12	300101	Me
45	Screw M 12 x 30	300052	Me
46	Alan key, 10 mm	300059	Me
47	Base disc (PA) Ø _i = 13	300057	Me
48	Ring eye M 12	300058	Me
49	Plug	300041	Me
50	Wearing plate	*	Me

*** When spare parts are requested, please state serial number, acknowledgement number and detector type !!!**