

# METAL SEPARATOR

## P-TRON 03 FM

### DETECTION OF ALL TYPES OF METALS

- FERROUS
- STAINLESS STEEL
- ALUMINUM
- COPPER
- BRASS
- .....

RELIABLE DETECTION OF FREE OR ENCAPSULATED CONTAMINANTS.

Version 04/23

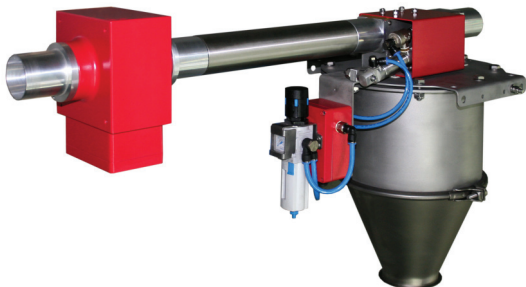
METAL SEPARATOR FOR THE INSTALLATION IN VACUUM TRANSPORT LINES WITH SHORT CONVEYING CYCLES. INCLUDES AN AUTOMATIC EJECTOR WITH BYPASS FUNCTION. DETECTS METAL IN VIRGIN AND REPROCESSED GRANULES OR REGRIND.

### INDUSTRIES

- PLASTIC INDUSTRY
- RECYCLING INDUSTRY
- CHEMICAL INDUSTRY
- ....

### APPLICATION

- MACHINERY PROTECTION



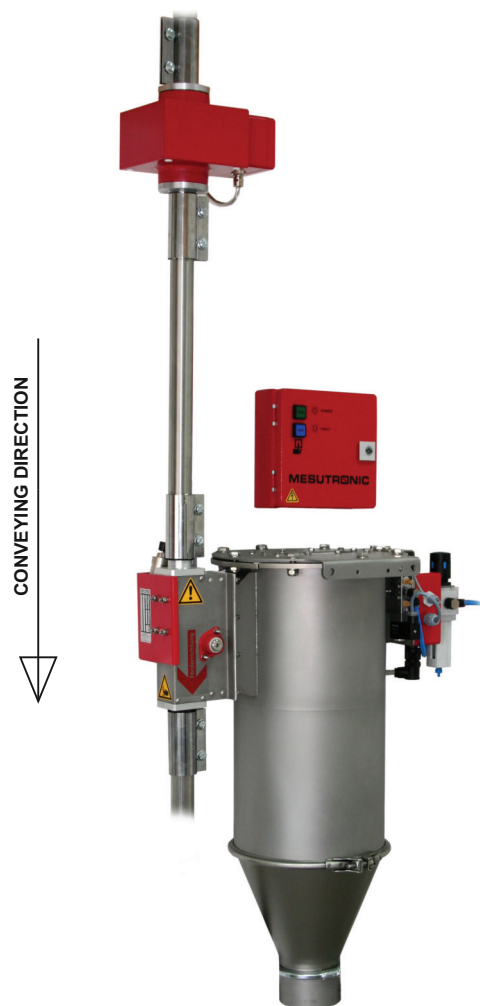
[www.mesutronic.de](http://www.mesutronic.de)

**MESUTRONIC**

*Metal Detection made in Germany*

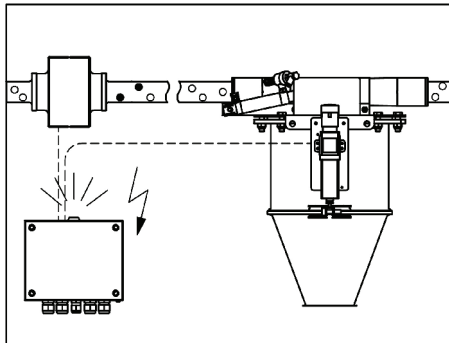
## CONVINCING ARGUMENTS

- SMALL INSTALLATION LENGTH THANKS TO A FAST-REACTING SEPARATING DIVERTER WITH POWERFUL AND PERMANENTLY MAINTENANCE-FREE PNEUMATIC DRIVE.
- UNITS AVAILABLE FOR ALL COMMON NOMINAL PIPE DIAMETERS (38 mm - 120 mm).
- IMMUNE TO INTERFERENCE THANKS TO THE NEW "PCR COMPACT" DETECTOR COIL WITH INTERFERENCE SHIELD AND INTERCHANGEABLE SENSING TUBE.
- SELF MONITORING (OPTIONALLY AVAILABLE) - IN ADDITION TO THE DETECTION UNIT (DETECTOR COIL AND EVALUATION ELECTRONICS), THE OPERATING PRESSURE AND THE REJECT FUNCTION ARE PERMANENTLY MONITORED AS WELL. A TEST BUTTON IS PROVIDED AS STANDARD. MALFUNCTIONS ARE INDICATED!
- DETAILED INFORMATION ON THE EVALUATION ELECTRONICS CAN BE FOUND LATER IN THIS DATA SHEET.
- HIGH TEMPERATURE VERSION FOR PRODUCT TEMPERATURE MAX. +140 °C OR +180 °C AVAILABLE.

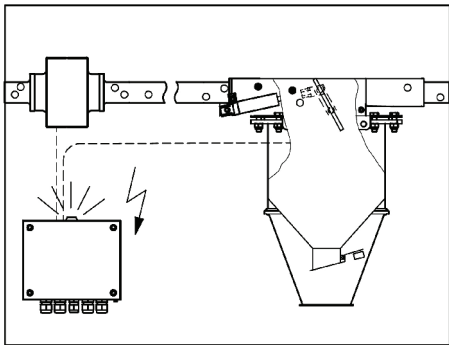


MODELS FOR THE INSTALLATION IN A VERTICAL SUCTION LINE.  
DIRECTION SHOWN: FROM TOP TO BOTTOM, ALTERNATE LAYOUT: FROM BOTTOM TO TOP.

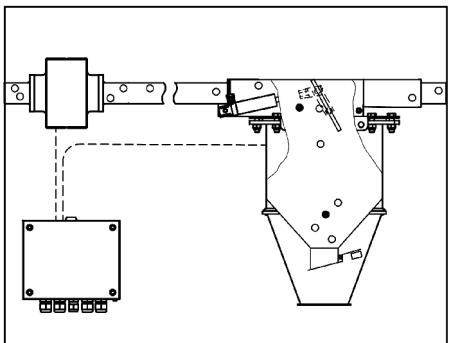
## WORKING PRINCIPLE



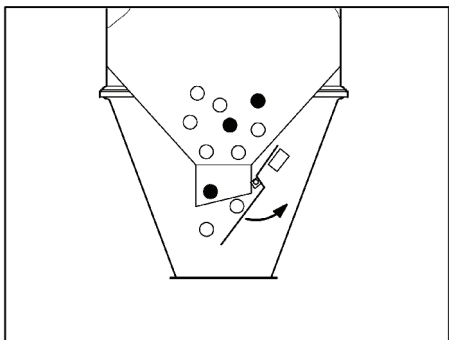
WITH TRANSMITTER AND RECEIVER COILS AN ELECTROMAGNETIC FIELD IS EVALUATED IN THE DETECTOR. IF A METAL PARTICLE ENTERS THE FIELD THE MEASURED SIGNAL IS DEFLECTED IN ONE DIRECTION. WHEN THE METAL PARTICLE LEAVES THE FIELD THE SIGNAL IS DEFLECTED IN THE OPPOSITE DIRECTION. IF THE DETECTION THRESHOLDS ARE EXCEEDED IN BOTH DIRECTIONS A METAL SIGNAL IS CREATED.



IN CASE OF A METAL SIGNAL THE PNEUMATIC CYLINDER OPENS THE EJECT FLAP. THE METAL PARTICLE IS REDIRECTED INTO THE EJECT MATERIAL BIN.



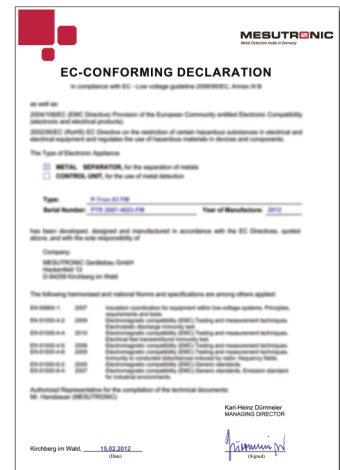
THE METAL PARTICLE IS REDIRECTED INTO THE EJECT BIN TOGETHER WITH A SMALL AMOUNT OF CONVEYED MATERIAL. BECAUSE THE EJECT MATERIAL BIN IS SEALED DURING THE CONVEYING PHASE THE AIR STREAM DOES NOT BREAK DOWN. AFTER THE EJECT DURATION PERIOD THE FLAP IS CLOSED AGAIN AUTOMATICALLY.



DURING A CONVEYING PAUSE THE EJECT MATERIAL BIN IS EMPTIED. AS SOON AS THE CONVEYING STARTS AGAIN THE PENDULUM FLAP IS SEALED THROUGH THE VACUUM CREATED IN THE EJECT MATERIAL BIN.

## STANDARD SCOPE OF DELIVERY

- METAL SEPARATOR CONSISTING OF:
  - DETECTOR COIL
  - EVALUATION ELECTRONICS (WITH OPERATING DISPLAY AND TEST BUTTON)
  - SEPARATING DIVERTER
  - CONNECTION AND INTERCONNECTING CABLE
  
- OPERATING INSTRUCTIONS INCL. INSTALLATION INSTRUCTIONS, ELECTRICAL CONNECTION DIAGRAM AND SPARE PARTS LIST IN VARIOUS LANGUAGES.
  
- EU DECLARATION OF CONFORMITY



## OPTIONS

- OPTICAL AND ACOUSTICAL SIGNAL UNITS
  - BEACON
  - BUZZER
  - BEACON WITH SIREN
  
- METAL EVENT COUNTER
  
- EXTENDED SELF MONITORING
  - AIR PRESSURE
  - DIVERTER FUNCTION

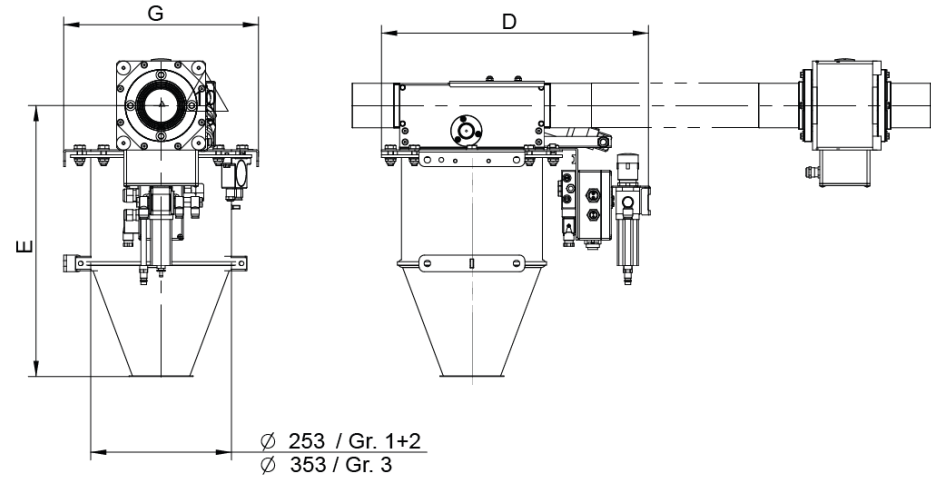
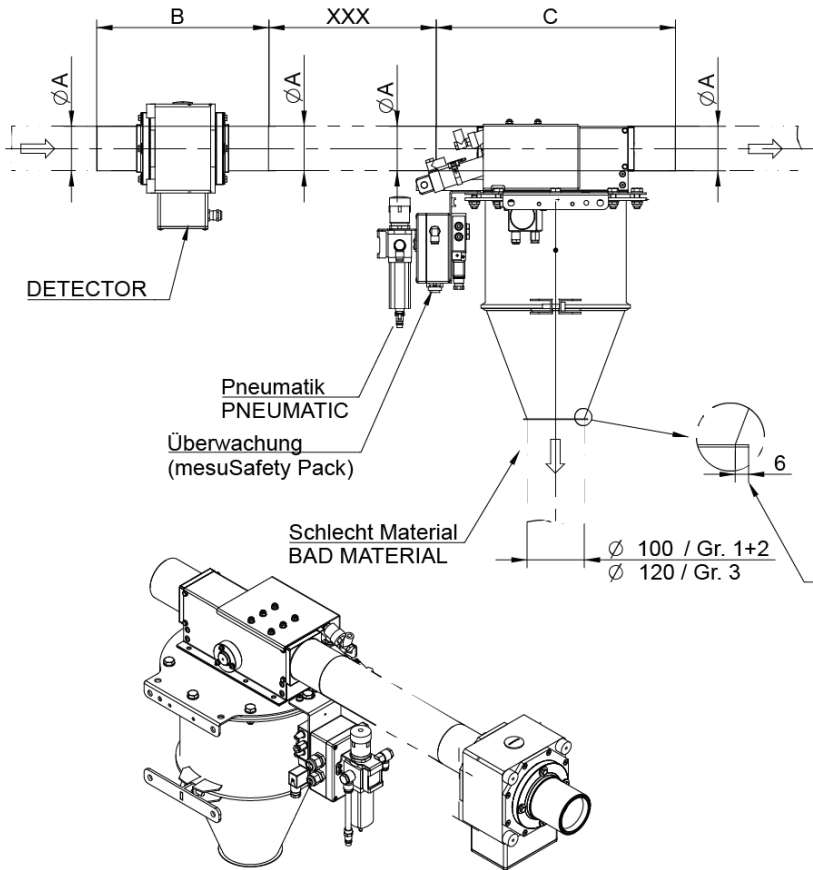
## SPECIAL VERSIONS

- Special device connections E.g. flange or clamp connection
- High temperature version For product temperature max. +140 °C or +180 °C
- Wear resistant version For abrasive products (e.g. plastics with glass fibre content)
- Special voltage
- Special colour Colour according to customer specification

# DIMENSIONS

## P-TRON FM H (HORIZONTAL INSTALLATION)

Förderrichtung  
CONVEYING DIRECTION →



XXX

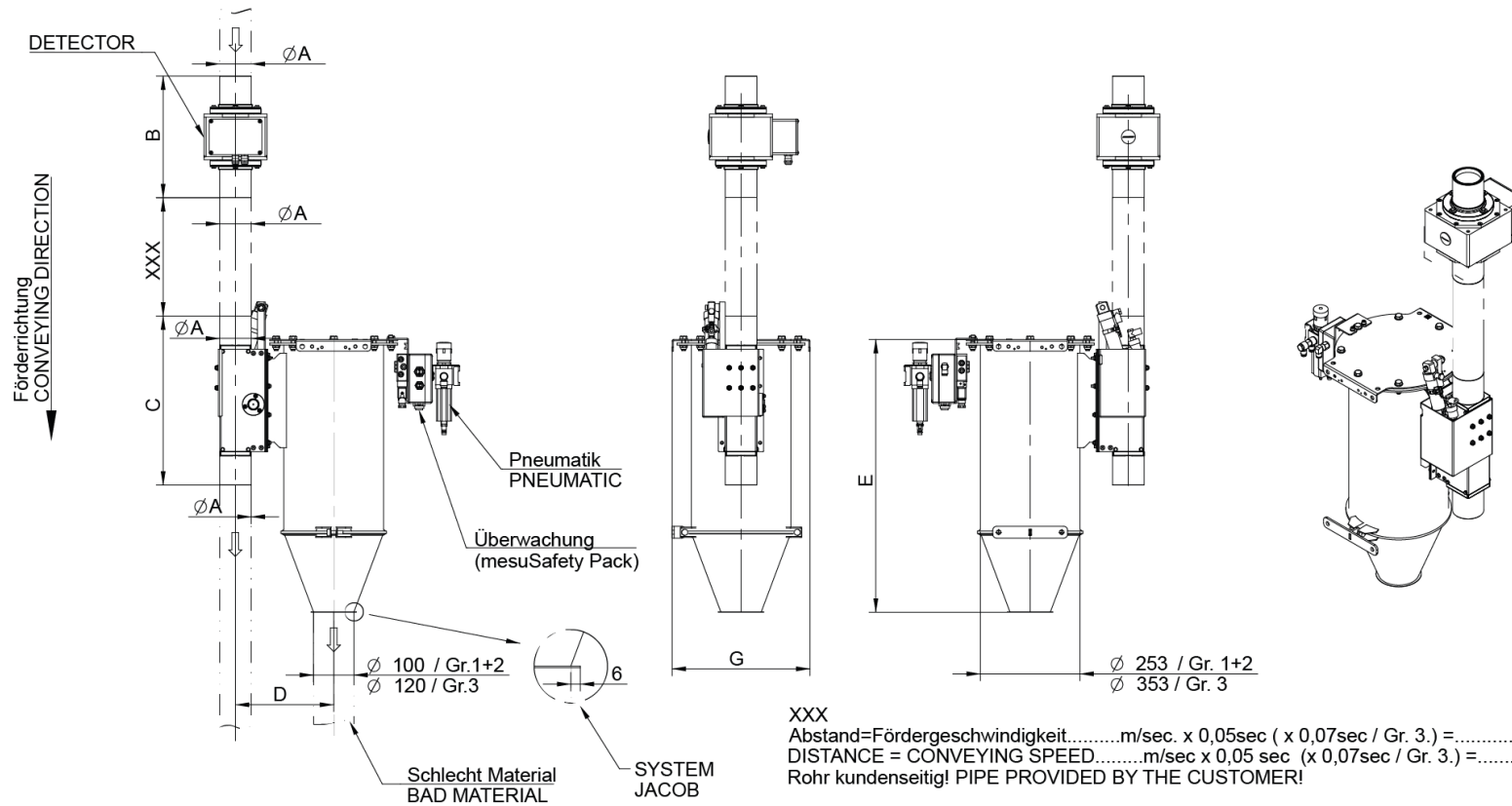
Abstand=Fördergeschwindigkeit.....m/sec. x 0,05sec ( x 0,07sec / Gr. 3.) =.....m  
 DISTANCE = CONVEYING SPEED.....m/sec x 0,05 sec (x 0,07sec / Gr. 3.) =.....m  
 Rohr kundenseitig! PIPE PROVIDED BY THE CUSTOMER!

ALL DIMENSIONS IN MM

	Ø A	B	C	D	E	G
Größe 1 / SIZE 1	38, 45, 50, 55, 60, 65	270	340	482	693	350
Größe 2 / SIZE 2	70, 76, 80	310	430	482	693	350
Größe 3 / SIZE 3	89	420	1067	590	950	470
Größe 3 / SIZE 3	100, 120, System Jacob	276	667	590	950	470

# DIMENSIONS

P-TRON FM V (VERTICAL INSTALLATION FOR MATERIAL MOVEMENT FROM THE TOP TO BOTTOM)

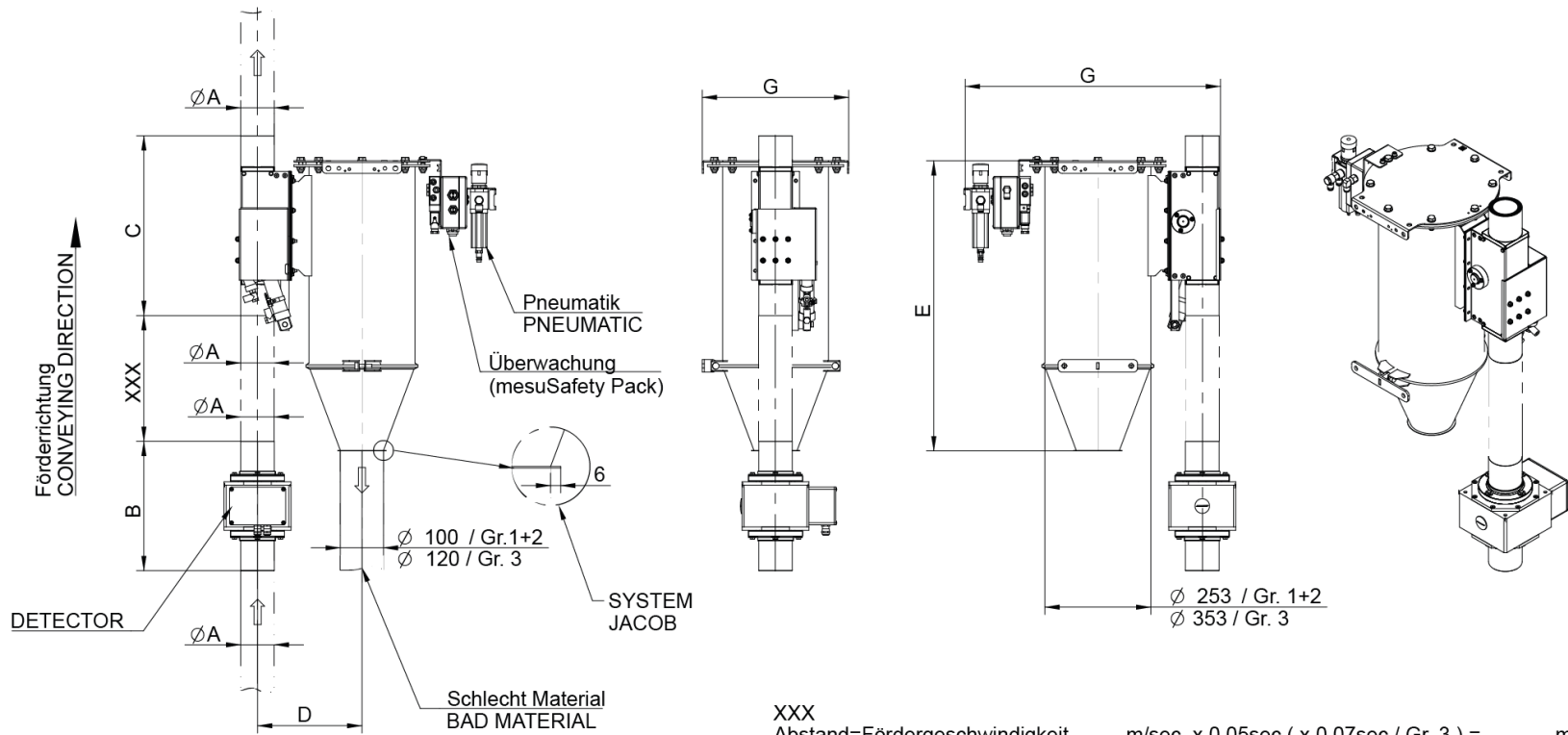


ALL DIMENSIONS IN MM

	$\varnothing A$	B	C	D	E	G
Größe 1 / SIZE 1	38, 45, 50, 55, 60, 65	270	340	246	693	350
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P-TRON FM V (VERTICAL INSTALLATION FOR MATERIAL MOVEMENT FROM THE BOTTOM TO TOP)



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## MATERIALS EMPLOYED

	STANDARD	OPTION ABRASIVE PRODUCTS
<b>COIL HOUSING</b>	ALU	ALU
<b>ELECTRONIC HOUSING</b>	S 235	S 235
<b>BEARING / CYLINDER SUPPORT</b>	GALVANIZED / ALU	STAINLESS STEEL (1.4301 / SS 304)
<b>PRODUCT CONTACTING PARTS</b>		
<b>TRANSITIONS</b>	ALU	STAINLESS STEEL (1.4301 / SS 304)
<b>REJECT GATE</b>	STAINLESS STEEL (1.4301 / SS 304)	STAINLESS STEEL (1.4301 / SS 304)
<b>FLAP SEAL</b>	PUR	PUR
<b>SENSING TUBE</b>	GRP	GRP

## INSTALLATION AND OPERATION INSTRUCTIONS

- THE DISTANCE BETWEEN THE COIL AND AND THE REJECT SYSTEM IS DETERMINED ACCORDING TO THIS RULE OF THUMB:

$$\text{DISTANCE} = \text{CONVEYING SPEED (M/S)} \times \text{REJECT DURATION (S)}$$

EXAMPLE: CONVEYING SPEED = 15 M/S  
REJECT DURATION = 0,05 S FOR UNIT SIZE 1+2 (0,07 S FOR UNIT SIZE 3)

$$\text{DISTANCE} = 15 \text{ M/S} \times 0,05 \text{ S} = 0,75 \text{ M}$$

- INSTALL THE DETECTOR COIL FREE OF VIBRATIONS. THE SUPPORT PROVIDED BY THE CUSTOMER MUST BE ADAPTED TO THE WEIGHT OF THE UNIT.
- DO NOT INSTALL THE METAL SEPARATOR NEAR STRONG ELECTROMAGNETIC INTERFERENCE FIELDS. POTENTIAL INTERFERENCE MAY BE CAUSED BY LARGE ELECTRIC MOTORS, HIGH VOLTAGE LINES, INSUFFICIENT SHIELDED FREQUENCY CONVERTERS AND SUCH.
- KEEP THE METAL SEPARATOR UNDER POWER AT ALL TIMES. THE INITIALIZATION PERIOD AFTER POWER UP IS 15 SECONDS.
- POLL THE FAULT INDICATOR AT (CONNECTION BLOCK (C)).

## SENSITIVITY

MODEL DN IN mm	38-50	55-65	70-80	89	100	120
SENSITIVITY Fe-BALL IN mm	0,6	0,6	0,7	0,8	0,8	0,9

THE SENSITIVITY IS PROPORTIONAL TO THE DIAMETER OF THE APERTURE. THE SMALLER THE APERTURE, THE HIGHER THE SENSITIVITY. THE ABOVE STATED VALUES WERE OBTAINED IN THE CENTRE OF THE APERTURE UNDER SIMULATED PRODUCTION CONDITIONS AND ARE VALID FOR MOST DRY POWDERS AND GRANULATES.

MAXIMUM OBTAINABLE SENSITIVITY VALUES CAN BE ESTABLISHED BY TESTING YOUR PRODUCT SAMPLE IN OUR LABORATORY.

# CONTROL UNIT AMD 03 (VERSION 3.5)

ADVANTAGES THAT WILL CONVINCEN YOU!

## AUTO BALANCING

DURING POWER UP AS WELL AS DURING STANDARD OPERATION, THE CONTROL UNIT CONTINUOUSLY BALANCES ITSELF. OVER TIME, COILS MAY SHIFT AND SENSITIVE COMPONENTS MAY LOOS TOLERANCE. TEMPERATURE ALSO HAS AN EFFECT ON THE PERFORMANCE AND MUST BE COMPENSATED FOR. THIS SELF BALANCING ROUTINE INSURES THAT THE DETECTOR IS CONTINUOUSLY OPERATING AT MAXIMUM PERFORMANCE.

## PRODUCT EFFECT COMPENSATION

ELECTRICALLY CONDUCTIVE OR HUMID PRODUCTS CAN CAUSE EXTREME LOSS OF SENSIVITY OR EVEN RENDER CONVENTIONAL DETECTORS USELESS. THE EVALUATION ELECTRONIC SYSTEM AMD 03 ELIMINATES THESE PRODUCT EFFECTS ELECTRONICALLY AND GUARANTEES A CONSTANT SENSIVITY.

## SERVICE FRIENDLY

EASY TO DIAGNOSE:  
OPTICAL FAULT INDICATION WITH LED'S  
"DO IT YOURSELF-REPAIRS" ARE EASY. "PLUG AND PLAY" CONNECTORS, A QUARTZ DRIVEN SENDER FREQUENCY AND THE SINGLE MOTHERBOARD CONSTRUCTION GUARANTEE EASE OF REPAIR. ALL AMD 03 MOTHERBOARDS ARE 100% COMPATIBLE!

## TEMPERATURE COMPENSATION

CUTTING EDGE TECHNOLOGY! EVEN EXTREME TEMPERATURE FLUCTUATIONS ARE EFFORTLESS COMPENSATED WITHOUT AFFECTING THE FUNCTIONS OF THE METAL SEPARATOR.

## NOISE SUPPRESSION

BY ADDING DYNAMIC DIGITAL FILTRATION CIRCUITRY, VIBRATIONS WHICH ARE OFTEN TRANSFERRED TO THE DETECTOR CAN NOW BE FILTERED OUT WITHOUT HAVING TO LOWER THE SENSIVITY OF THE SYSTEM.

## SELF MONITORING FEATURES

THE SYSTEM IS FULLY AUTOMATIC AND CONTINUOUSLY MONITORED. MALFUNCTIONS ARE RELIABLY INDICATED. IN ADDITION FAULT S IN THE MAIN COMPONENTS ARE INDICATED THRU LED'S. THE REJECT FLAP REMAINS IN THE REJECT POSITION IN CASE OF A MALFUNCTION, LOSS OF POWER OR AIR PRESSURE UNTIL THE PROBLEM HAS BEEN ELIMINATED.

## QUALITY

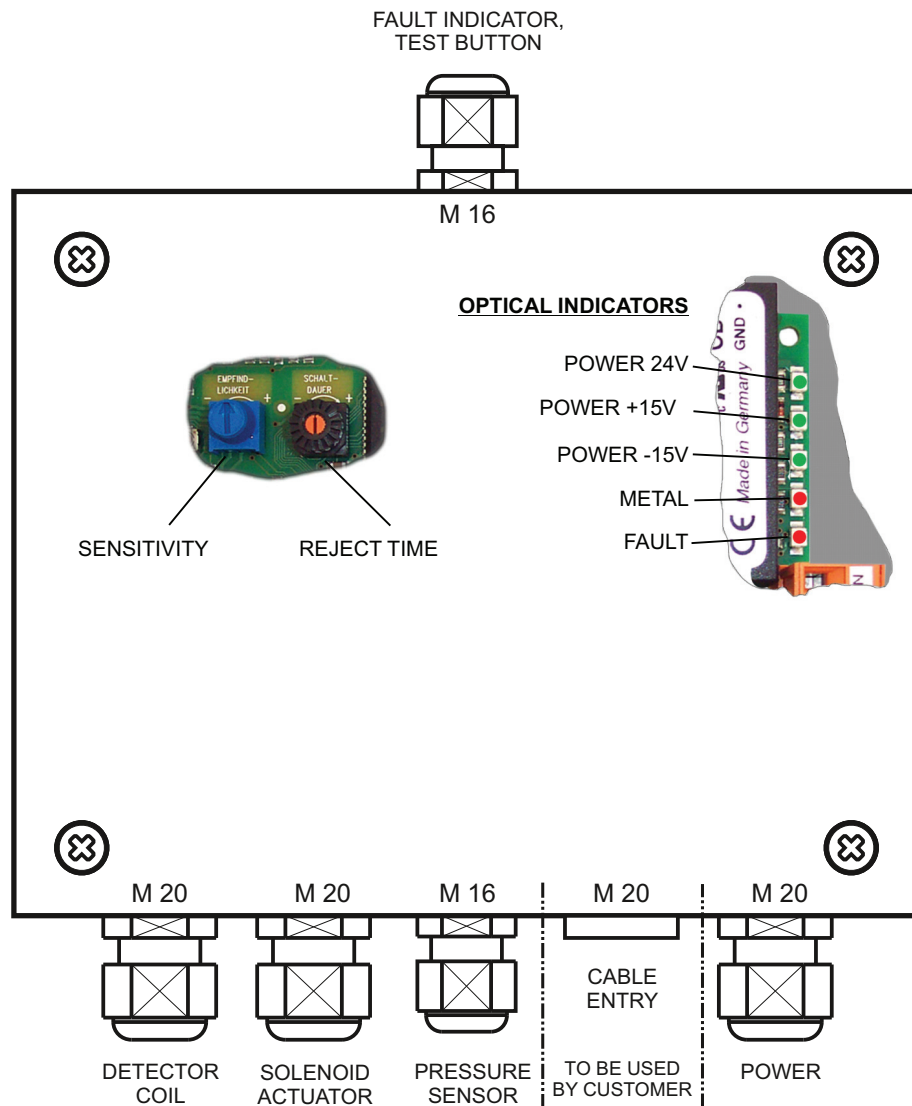
SMD (SURFACE MOUNTED DEVICES) ARE USED IN THE PRODUCTION OF THE CONTROLS. THEY NOT ONLY OFFER A COMPACT DESIGN, BUT ALSO PROVIDE HIGHER QUALITY AND MORE ROBUST PERFORMANCE UNDER HARSH CONDITIONS. ALL MESUTRONIC PRODUCTS CONFORM TO THE CE STANDARDS AND ARE DEVELOPED ACCORDING TO TECHNICAL STANDARDS AND NORMS SUCH AS EN, DIN AND UVV.



## EASY TO OPERATE

EASY TO USE CONTROLS ALONG WITH VISUAL DISPLAYS MAKE THE INSTALLATION AND OPERATION OF THE AMD 03 EFFORTLESS.

## CONTROLS

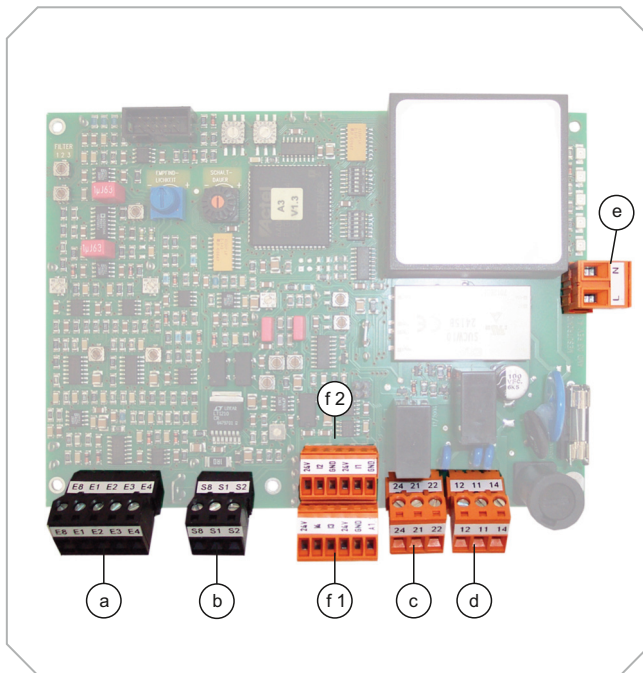


## TECHNICAL DATA

POWER SUPPLY:	100 – 240 V AC, 50/60 HZ
CURRENT CONSUMPTION:	MAX. 0,4 A
FUSE:	315 MA SLOW BLOW, 5 x 20 MM TO DIN
TYPE OF PROTECTION:	IP 54
WORKING TEMPERATURE RANGE:	- 5 °C TO +50 °C
STORAGE TEMPERATURE RANGE:	-10 °C TO +60 °C
PRODUCT TEMPERATURE:	max. +80 °C
REL. HUMIDITY:	0 TO 95 % (WITHOUT CONDENSATION)
MAX. CONVEYING SPEED:	30 M/SEC. - HIGHER SPEEDS ON REQUEST
REJECT DURATION:	0,4 TO 3 SEC., ADJUSTABLE
PAINTED:	RAL 3027 = RASPBERRY RED
AIR SUPPLY:	6 - 10 BAR (AIR PLUG 7,2)
AIR CONSUMPTION:	< 0,2 NORM-LITRES PER REJECT
MAX. BULK MATERIAL SIZE:	Ø 8,0 MM
MIN. BULK MATERIAL SIZE:	Ø 0,5 MM, OPTIONAL: DUST-FREE VERSION
DELIVERY PRESSURE:	MAX. TO 0,5 BAR
POWER CABLE:	APP. 1,6 M CABLE WITH PLUG (TWO POLE AND GROUND PIN) (US-VERSION WITH US-STANDARD PLUG)

OTHER VERSIONS AVAILABLE

## INPUTS AND OUTPUTS

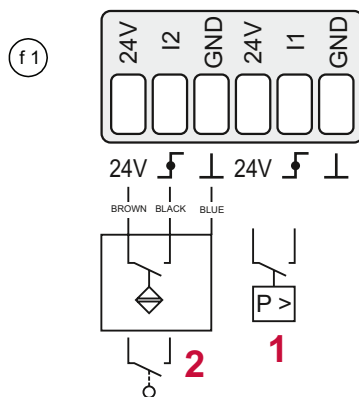


(f1) + (f2) FUNCTION BLOCK + (e) POWER +

(a) RECEIVER + (b) TRANSMITTER ARE USED BY MANUFACTURER.

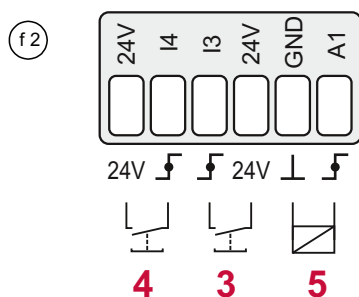
### (f1) + (f2) FUNCTION BLOCK

#### CONNECTING EXAMPLES



#### INPUTS (STANDARD LAYOUT)

- 1 I1 – PRESSURE MONITOR, CONTACTS CLOSED IF PRESSURE OK.
- 2 I2 – INITIATOR (REJECT) FLAP POSITION SENSOR
- 3 I3 – RESET-BUTTON, EXTERNAL TO REST THE FAULT INDICATION (MAX. CABLE LENGTH 5M)
- 4 I4 – TEST-BUTTON, EXTERNAL TO TEST THE FUNCTION OF THE METAL SEPARATOR (MAX. CABLE LENGTH 5M)



#### 24 VDC- OUTPUTS (STANDARD LAYOUT)

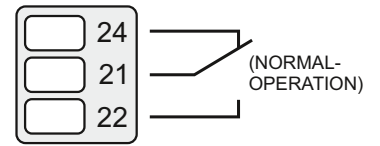
- 5 A1 – ACTIVE OUTPUT SWITCHES WHEN METAL IS DETECTED (OPERATES THE SOLENOID VALVE).

CONNECT ONLY POTENTIAL FREE CONTACTS (NO EXTERNAL SUPPLIED VOLTAGE) ! MAX. (TOTAL) POWER CONSUMPTION  $\leq 100$  MA (FOR ALL CONNECTIONS / (f1) + (f2) )

## INPUTS AND OUTPUTS

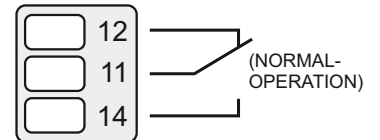
### c RELAY 2 (FAULT)

- FLOATING RELAY CHANGE OVER CONTACT ACTUATED BY SELF MONITORING SYSTEM  
MAX. CONTACT LOAD: 250V/3A



### d RELAY 1 (METAL)

- FLOATING RELAY-CHANGE OVER CONTACT ACTUATED WHEN METAL IS DETECTED  
MAX. CONTACT LOAD: 250 V / 3 A  
PULSE DURATION (AUTO-RESET): 0,14 SEC. TO 19 SEC. (ADJUSTABLE)



### e POWER SUPPLY

- 100 – 240 V AC, 50/60 Hz, CURRENT CONSUMPTION: MAX. 400 MA  
OTHER VERSIONS AVAILABLE





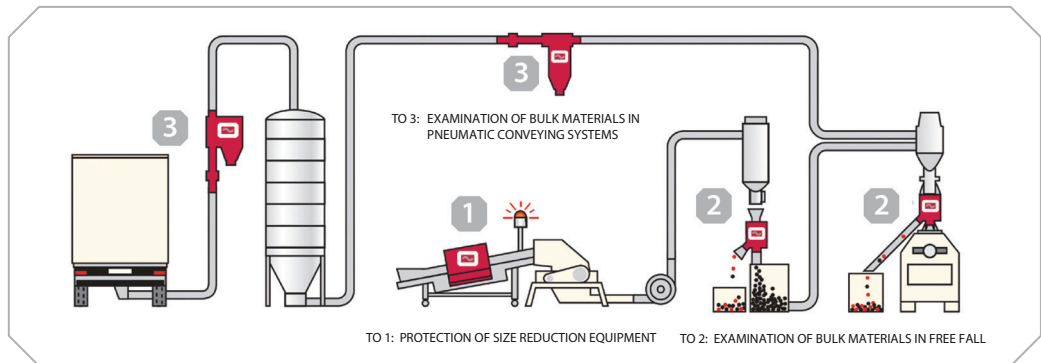


THE MESUTRONIC GERÄTEBAU GMBH IS A GLOBALLY ACTIVE COMPANY IN THE FIELD OF INDUSTRIAL METAL DETECTION TECHNOLOGY WITH HEADQUARTERS IN GERMANY.

A TEAM OF SPECIALISTS FOCUSES FOR DECADES SUCCESSFULLY ON THE DEVELOPMENT, MANUFACTURING AND DISTRIBUTION OF ELECTRONIC METAL DETECTORS AND SEPARATORS FOR ALL INDUSTRIES. DAILY WE TAKE UP THE CHALLENGE TO SOLVE INDIVIDUAL PROBLEMS RELIABLE AND TAILORED TO THE CUSTOMER. WHERE OTHERS SAID "NO" LONG AGO OUR TASK JUST STARTS. TRUE TO THE MOTTO: "NOTHING IS IMPOSSIBLE."

THOUSANDS OF DETECTOR COILS, VARIOUS TRANSMITTERS AND A VARIETY OF EJECTORS AND MECHANICAL COMPONENTS CAN BE COMBINED DEPENDING ON THE TASK AND SERVE AS A BASIS FOR PRACTICAL AND FLEXIBLE SOLUTIONS. THROUGH YEARS OF CLOSE COLLABORATION WITH OUR CUSTOMERS FROM VARIOUS INDUSTRIES, WE HAVE SHAPED OUR EQUIPMENT PROGRAM CONTINUAL WITH THE RESULT THAT ALL MESUTRONIC PRODUCTS ARE NOW LEADING THE WAY IN PERFORMANCE, QUALITY, RELIABILITY AND HANDLING.

IN ADDITION, OUR WORLDWIDE SALES AND SERVICE NETWORK ENSURES THAT ON ALL CONTINENTS OF THE WORLD A PROFESSIONAL COMPETENT CONTACT PERSON IS AVAILABLE FOR YOU.



# MESUTRONIC

*Metal Detection made in Germany*

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