Minebea intec
The true measure

Metal detector Mitus® Pipeline

Metal detector and separator for products in pipeline applications



Benefits

- Variety of separators available
- Easy installation and operation
- Highest sensitivity with MiWave technology
- Prevents product recalls and facilitates the productivity of your production line
- Also available as Mitus® Pipeline meat

Mitus® Pipeline detects and removes metal contaminants in pumped viscous or liquid products. The system includes our new MiWave technology to reach highest product sensitivity, an intuitive touch displays and optional interfaces for monitoring and control. Different types of separators and various connections and mounting options are available.

Reliable metal detection for products in pipeline applications

- Arc-valve separator **hygienically designed** for easy opening and thorough cleanability.
- Mitus® Pipeline contributes to **contamination-free** product quality. Multiple **interfaces** such as XML over TCP-IP for connectivity and detection statistics with SPC@Enterprise that will improve your lines´ productivity.
- **Mitus® Pipeline meat** is a high pressure system with an easy open separator, specifically designed for meat-like products.
- Product learn mode and individual user levels for maximum **flexibility** and **user experience**.

Technical specifications

Metal detector Mitus® Pipeline

Supply Voltage and Frequency	U_{AC} = 115/230 V (+10 %/ –15 %); 47/63 Hz ± 2 HZ				
Energy Consumption	Ca. 45 VA (without additional load)				
Product / Cleaning temperature	Without air cooling: max 70°C With air cooling: max 120°C				
Ambient temperature	-10°C to +55°C				
Relative air humidity	Operation: <58% up to +55°C Storage: <30% up to +70°C Without condensation				
Frame and housing material	1.4301 stainless steel (AISI 304)				
Search tunnel material	PVC				
Tube materials (depending on pressure and temperature):	Mitus® Pipeline: POM, PVDF or PEEK Mitus® Pipeline meat: POM				
Protection class	IP65 (electronics, search coil and separator)				
Coil variants (Mitus® R)	8,4; 12. Optional with air cooling				
Nominal width (mm)	50, 55 for pipeline meat applications 50, 65, 80, 100 for pipeline applications				
Infeed height	Adjustable via flange clamps on the mounting plate From 430 mm to 1056,5 mm From 600 mm to 1080 mm (meat applications) Inclinations ±6° (meat applications)				
Weight	Approx. 40 kg to 90 kg, depending on nominal width and separator				
Throughput capacity Q (m^3/h)	NW50[1] 3.5	NW55[2] 4.0	NW65 5.0	NW80 5.0	NW100 6.0
Throughput/Product speed v max (m/s)	0.5	0.5	0.4	0.3	0.2
	1) Also available for meat applications 2) Only available for meat applications				
Sound emission	<70 dB(A)				
Additional technical features	- Signal analysis over two channels - Suppression of product effect - Adaptive digital filter - System monitoring - Test mode/function (with flexible rods)				

Search coil basic sensitivity

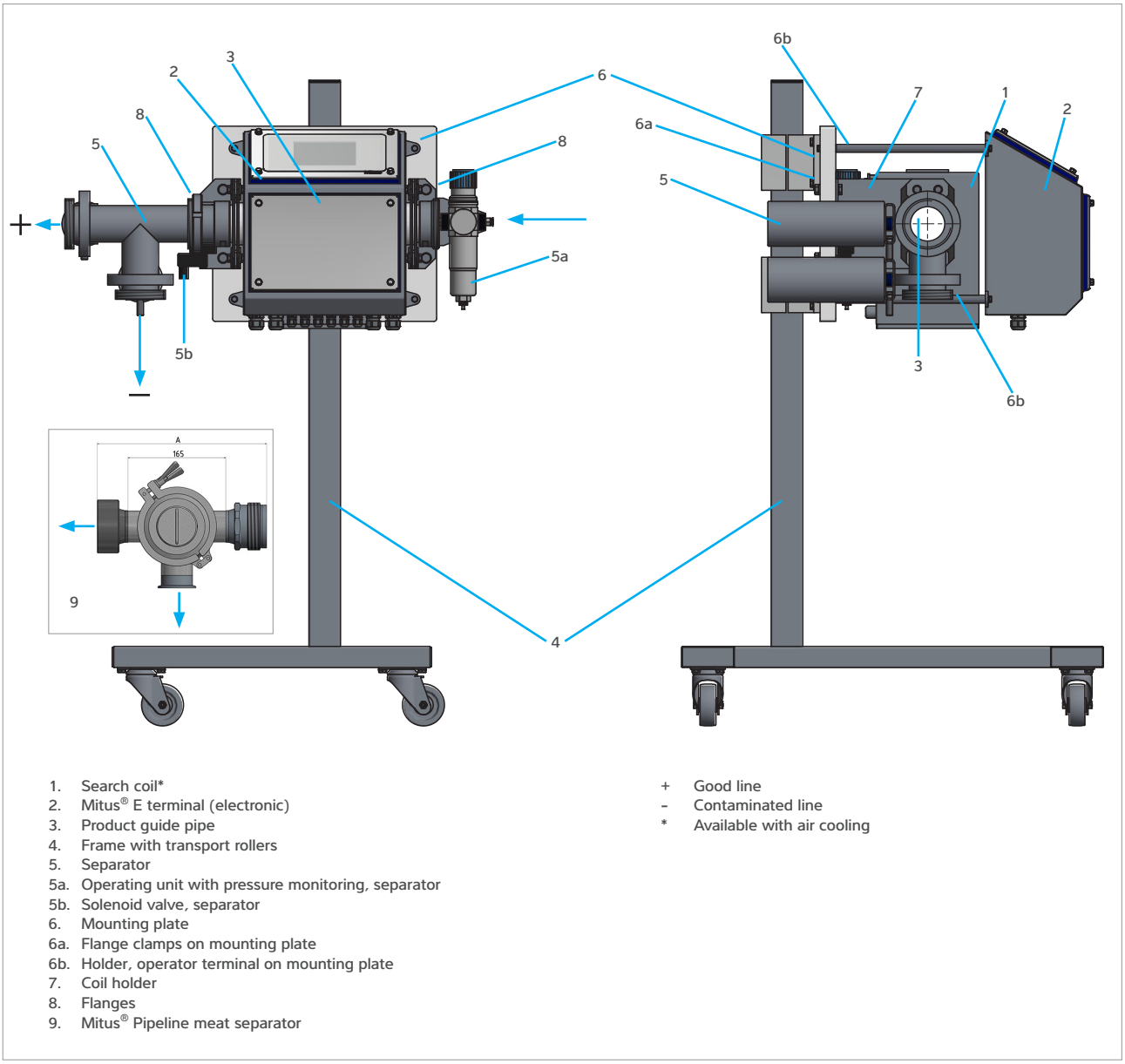
Search coil nominal width	80 (8,4)	100 (12)
Ferrous metals (FE) (mm)	FE 0.19 VA 0.26	FE 0.36 VA 0.50
Stainless steel (VA) (mm)	0.95	1.29

The indicated basic sensitivity is the metal detector´s maximum reachable sensitivity with the exclusion of any environmental interferences. The indicated values are calculated and serve as guide values. An indication of the existing product sensitivity in use is only possible after measurement in our test centre with the final product in the metal detector.

Mitus® Pipeline can detect foreign objects made of ferrous and non-ferrous metals, light alloys and stainless steel.

System configuration

Mitus® Pipeline is designed to meet the high sensitivity and technical requirements of manufacturers processing viscous and liquid food products such as sauces, jams, marmalade, baby food, minced meat, etc. In order to cover a wide range of applications, the product can be configured to suit the most demanding customers' requirements. The following overview shows the modular design of the system with its optional components:



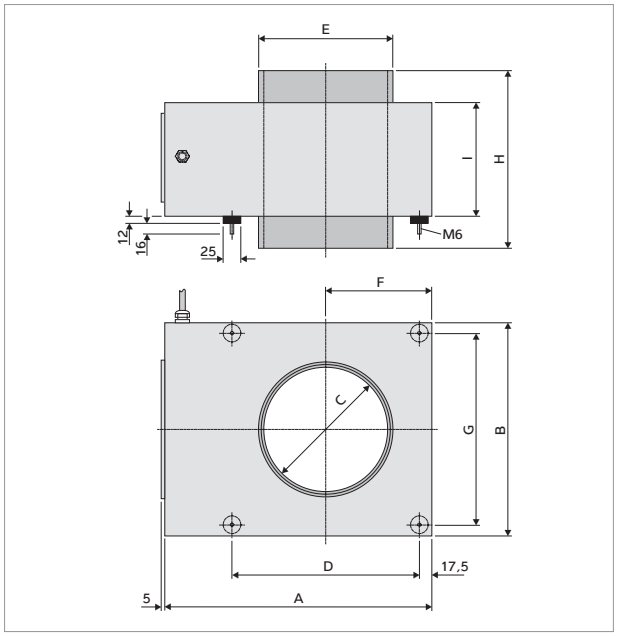
1. Search coil*
2. Mitus® E terminal (electronic)
3. Product guide pipe
4. Frame with transport rollers
5. Separator
5a. Operating unit with pressure monitoring, separator
5b. Solenoid valve, separator
6. Mounting plate
6a. Flange clamps on mounting plate
6b. Holder, operator terminal on mounting plate
7. Coil holder
8. Flanges
9. Mitus® Pipeline meat separator

\+ Good line
\- Contaminated line
* Available with air cooling

The drawing shows an example combination of all the components

Technical drawings

Search coil Mitus® R

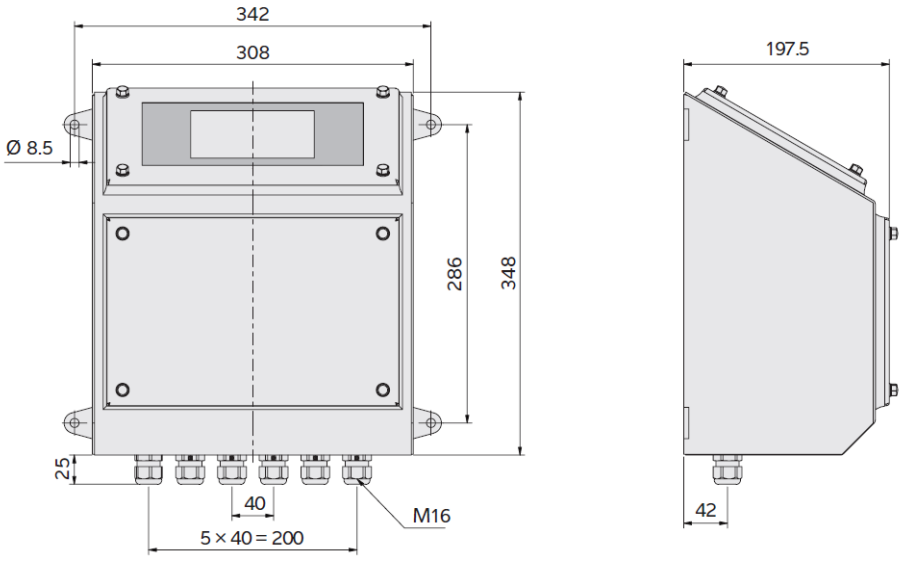


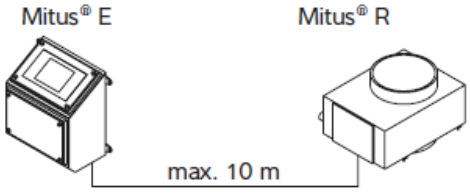
Coil / Pipeline diameter	NW50	NW55	NW65	NW80	NW100
8,4	PM	M	P		
8,4*	P				
12	M	M		P	P
12*	M	M	P	P	

P: Pipeline; M: Meat; *: With air cooling

Coil Dimensions Mitus® R	A	B	C	D	E	F	G	H	I	kg
8,4	289	195	84	160	97.5	97.5	160	230	160	9.2
12	289	195	120	160	132.5	97.5	160	240	160	7.7

Control unit Mitus® E

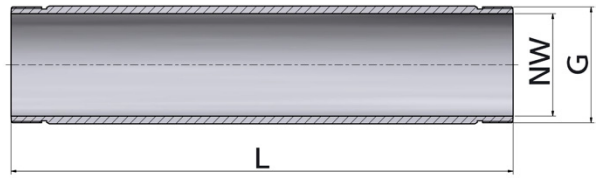




Pipeline options

The pipeline is available in three materials: POM (Polyoxymethylene), PVDF (Polyvinylidene fluoride) or PEEK (Polyether ether ketone), that can be selected depending on the product temperature and system pressure.

For Mitus® Pipeline applications:



NW: Nominal width (mm)
G: Thread (inches)
L: Length of the pipe (mm)

Materials: POM, PVDF, PEEK*				
Temperature (°C)	NW50	NW65	NW80	NW100
0–20	10 bar	10 bar	10 bar	11 bar
21–45	10 bar	10 bar	8 bar	5 bar
46–85	6 bar	6,5 bar	4 bar	4 bar
86–100	5 bar	5 bar	3 bar	3 bar
101–120	2,5 bar	2,5 bar	1,5 bar	1,5 bar

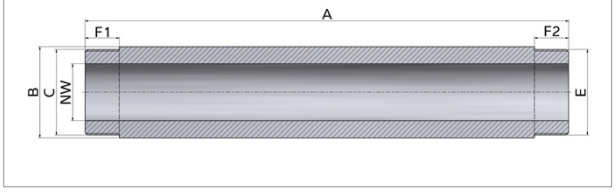
* Depending on P (bar) and T (°C)

Pipe			
NW	Mitus® R	G (inches)	L (mm)
50	8,4	2"	399
50	8,4*	2"	399
65	8,4	2,5"	403
65	12*	2,5"	481
80	12	3"	481
80	12*	3"	481
100	12	4"	491

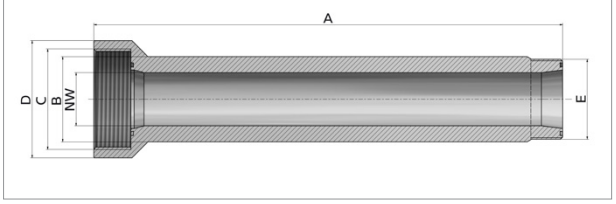
* With air cooling

For Mitus® Pipeline meat applications:

Materials: POM		
Temperature (°C)	NW50	NW55
0–20	50 bar	40 bar
21–45	40 bar	32 bar
46–85	25 bar	20 bar



Meat pipeline for Handtmann flanges							
Flange	NW	Mitus® R	A	B	C	D	E
Handtmann VF Quick-opening	50	8,4 / 12	442	80	M 90x4	110	G 2 1/2"
Handtmann VF, Handtmann VF nipple	55	8,4 / 12	442	80	M 90x4	110	G 2 1/2"



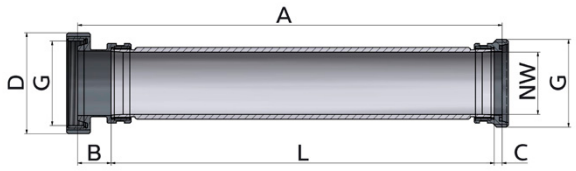
Meat pipeline for other flanges								
Flange	NW	Mitus® R	A	B	C	E	F1	F2
Vemag HP	50	8,4 / 12	425	80	G 21/2"	G 21/2"	30	30
Dairy thread	50	8,4 / 12	425	80	G 2"	G 21/2"	20	30
Tri-clamp	50	8,4 / 12	425	80	G2"	G2"	20	20

Flange options

There are different flanges available depending on the application (non-meat, meat).

Flanges Fe 1.4301 (AISI 304)	
Mitus® Pipeline applications (Separator AMV and ABV)	Mitus® Pipeline meat applications (only ABV separator)
Dairy Thread DIN 11851	Vemag HP
Tri-clamp DIN 32676	Handtmann VF
	Handtmann VF quick-opening
	Handtmann VF nipple
	Dairy thread DIN 11851
	Tri-clamp DIN 32676
	Handtmann ball
	Weld-on end
	Vemag DP

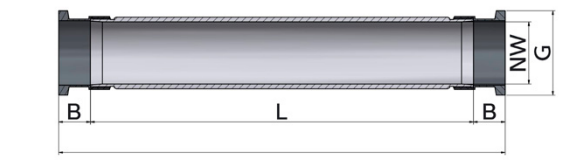
For Mitus® Pipeline applications:



Dairy thread

Pipeline with dairy thread flange							
NW	Mitus® R	A	B	C	D	G	L
50	8,4	442	35	8	92	RD78 x 1/6"	399
50	8,4*	442	35	8	92	RD78 x 1/6"	399
65	8,4	458	43	12	112	RD95 x 1/6"	403
65	12*	536	43	12	112	RD95 x 1/6"	481
80	12	533	42	10	127	RD110 x 1/4"	481
80	12*	533	42	10	127	RD110 x 1/4"	481
100	12	549	46	12	148	RD130 x 1/4"	491

* With air cooling

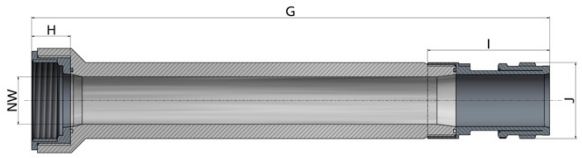


Tri-clamp

Pipeline with Tri-clamp flange					
NW	Mitus® R	A	B	G	L
50	8,4	466	33,5	64	399
50	8,4*	466	33,5	64	399
65	8,4	483	40	91	403
65	12*	561	40	91	481
80	12	561	40	106	481
80	12*	561	40	106	481
100	12	571	40	119	491

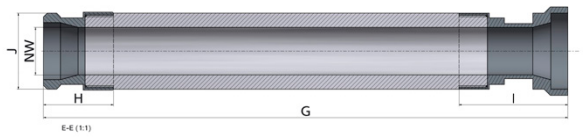
* With air cooling

For Mitus® Pipeline meat applications:



Handtmann VF quick-opening and VF nipple

Meat Pipeline with Handtman VF quick-opening and VF nipple						
Flange	NW	Mitus® R	G	H	I	J
Handtmann VF quick-opening	50	8,4 / 12	548	41	130	110
Handtmann VF, Handtmann VF nipple	55	8,4 / 12	547	41	129	RD80



Vemag HP, Dairy thread and Tri-clamp

Meat Pipeline with other flanges						
Flange	NW	Mitus® R	G	H	I	J
Vemag HP	50	8,4 / 12	554	74	115	RD80
Dairy thread	50	8,4 / 12	552	62	115	G 2 1/2"
Tri-clamp	50	8,4 / 12	492	53,5	53,5	64

Separator options

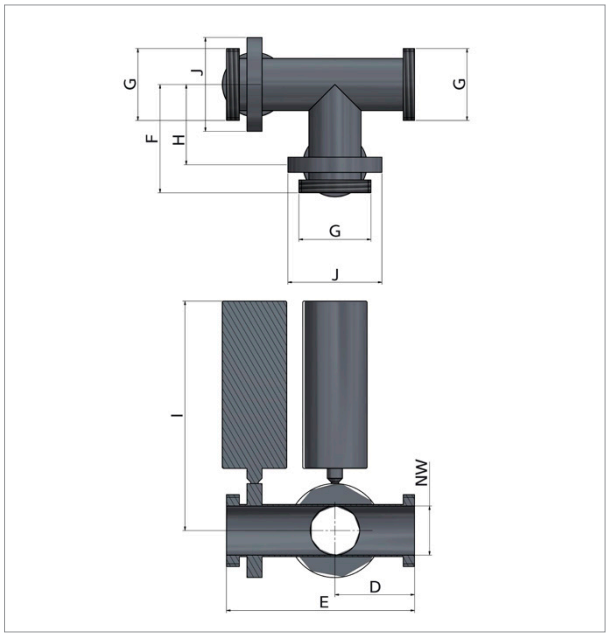
There are two separators available: Multi-way flap valve (AMV) and arc valve (ABV)



Side view of Mitus® Pipeline

Specification	AMV	ABV
Homogeneous liquid and viscous products	•	•
Liquid and viscous mass with soft solids ≤ 2 mm	•	•
Liquid and viscous mass with soft and hard solids ≤ 15 mm	•	•
Liquid and viscous mass with fibrous solids ≤ 15 mm		•
Piggable		•

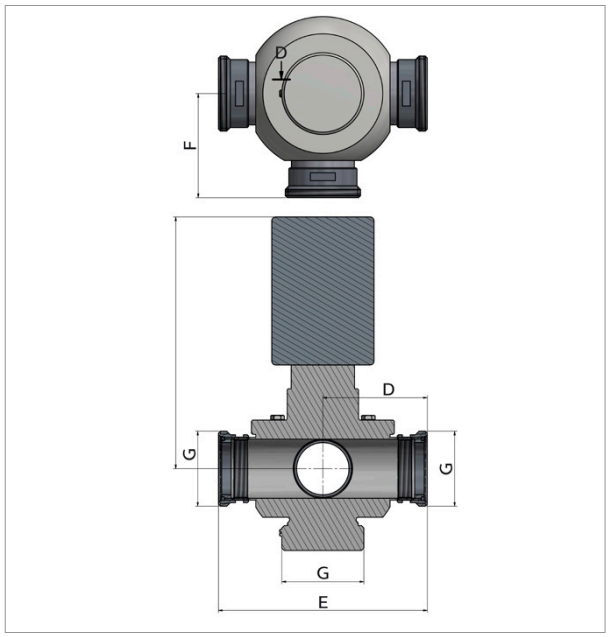
Pipe with dairy thread and multi-way flap valve separator AMV



NW	Mitus® R	D	E	F	G	H	I	J
50	8,4	93	224	131	RD78 x 1/6"	95	241,5	109
50	8,4*	93	224	131	RD78 x 1/6"	95	241,5	109
65	8,4	105	248	143	RD95 x 1/6"	105	249	124
65	12*	105	248	143	RD95 x 1/6"	105	249	124
80	12	115	285	170	RD110 x 1/4"	120	258	142
80	12*	115	285	170	RD110 x 1/4"	120	258	142
100	12	136	320	184	RD130 x 1/4"	132	270	163

* With air cooling

Pipe with dairy thread and arc valve separator ABV

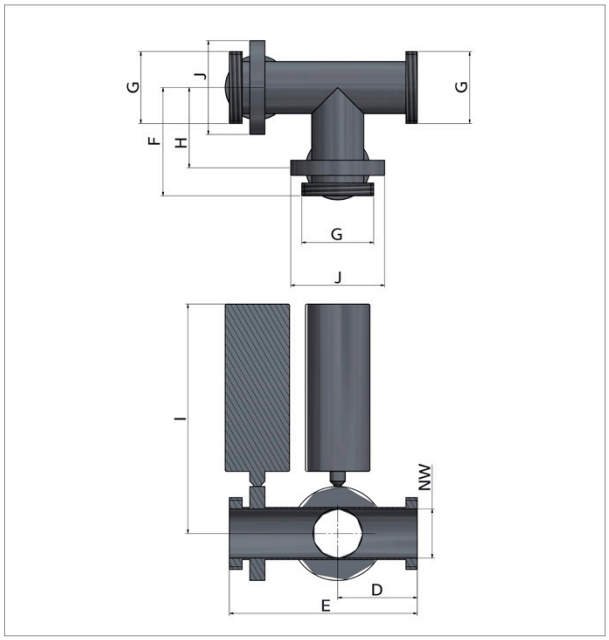


NW	Mitus® R	D	E	F	G	I
50	8,4	89	179	94	RD78 x 1/6"	272,5
50	8,4*	89	179	94	RD78 x 1/6"	272,5
65	8,4	128	259,5	131,8	RD95 x 1/6"	318,5
65	12*	128	259,5	131,8	RD95 x 1/6"	318,5
80	12	123,5	250	131,5	RD110 x 1/4"	348,5
80	12*	123,5	250	131,5	RD110 x 1/4"	348,5
100	12	155,5	311	155,5	RD130 x 1/4"	364

* With air cooling

NW: Nominal width (inner diameter) product guide pipe (mm)
D: Distance from center point of contaminated line to start of separator (mm)
E: Length of separator (mm)
F: Distance from center point of good line until end of contaminated line separator (mm)
G: Outer diameter of flange (inches)
H: Center-to-center distance of operating units (mm)
I: Distance from center point of separator to gage block operating unit (mm)
J: Outer diameter of flange

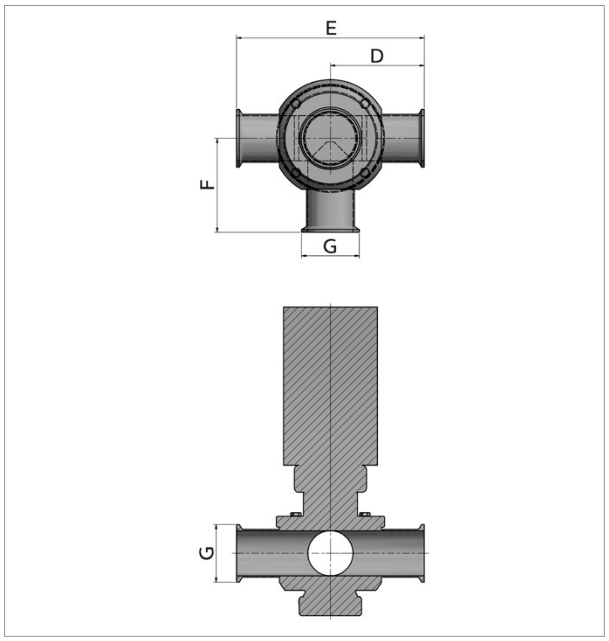
Pipe with tri-clamp flange and separator AMV



NW	Mitus® R	D	E	F	G	H	I	J
50	8,4	93	224	131	64	95	241,5	109
50	8,4*	93	224	131	64	95	241,5	109
65	8,4	105	248	143	91	105	249	124
65	12*	105	248	143	91	105	249	124
80	12	115	285	170	106	120	258	142
80	12*	115	285	170	106	120	258	142
100	12	136	320	184	119	132	270	163

* With air cooling

Pipe with tri-clamp flange and separator ABV



NW	Mitus® R	D	E	F	G
50	8,4	104	208	104	64
50	8,4*	104	208	104	64
65	8,4	138	276	138	91
65	12*	138	276	138	91
80	12	143	286	143	106
80	12*	143	286	143	106
100	12	158	316	158	119

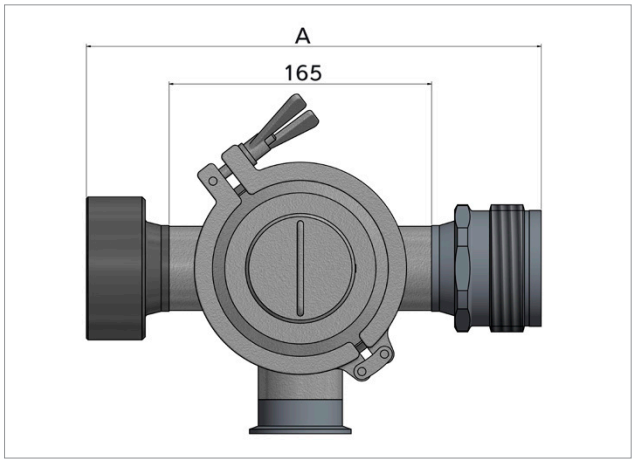
* With air cooling

NW: Nominal width (inner diameter) product guide pipe (mm)
D: Distance from center point of contaminated line to start of separator (mm)
E: Length of separator (mm)
F: Distance from center point of good line until end of contaminated line separator (mm)
G: Outer diameter of flange (mm)
H: Center distance of operating units (mm)
I: Distance from center point of separator to gage block operating unit (mm)
J: Outer diameter of flange (mm)

Mitus® Pipeline meat applications:

For meat applications, the separator used is a 3-way-arc valve separator (ABV) with an easy open function that works at 6 bar.

Separator ABV easy-open



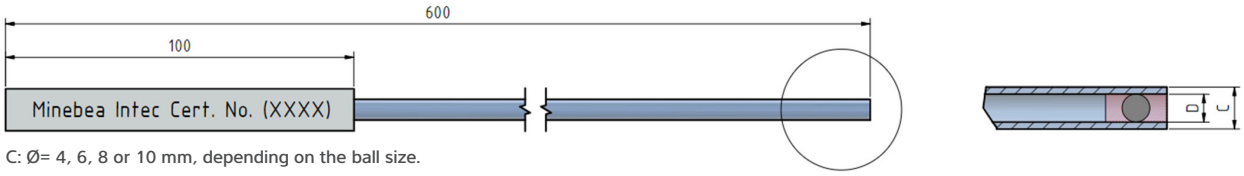
Flange	NW	A
Vemag HP	50	268
Handtman VF quick-opening	50	345
Handtmann VF, Handtmann VF nipple	55	287,5
Dairy pipe thread	50	251
Tri-clamp	50	255
Handtmann ball	50	270

Flexible test rods

The flexible test rods have been specially developed for pipeline applications. The thin tube can fit between the pipe and the coil and allows you to test the metal detector in a way that no test piece insertion into the product stream is needed. The handle is manufactured with PTFE Grade 400 and the flexible stick with semi rigid Nylon. It is tested in accordance to FDA 177.1550 and EC 1935/2004.







C: Ø= 4, 6, 8 or 10 mm, depending on the ball size.

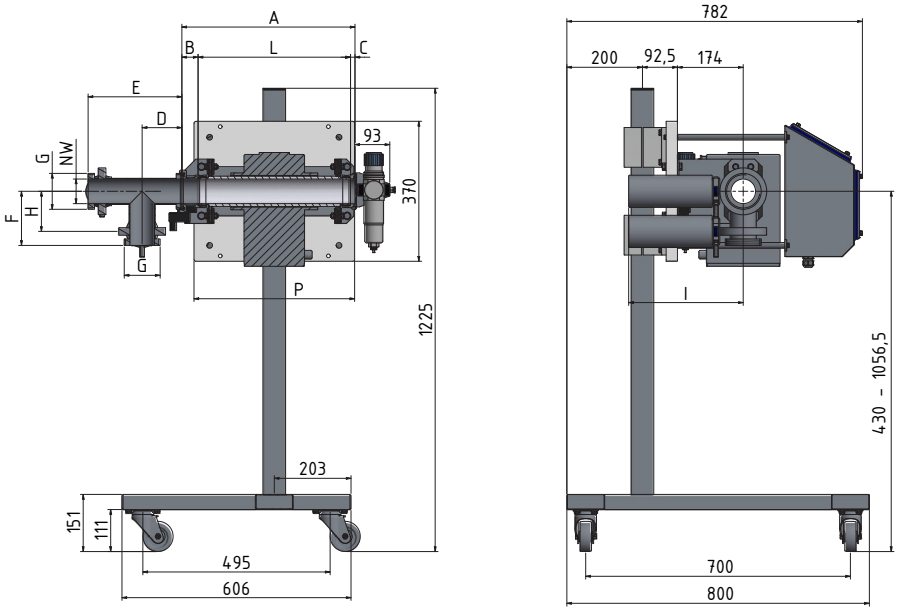
You can use the flexible tests rods in the following configurations:

Mitus® R	NW50	NW55	NW65	NW80	NW100
8,4	•				
8,4*	4, 6 mm				
12	•[1]	•[2]	•	•	
12*	•[2] 4, 6 mm	•[2] 4, 6 mm	•	4, 6, 8 mm	

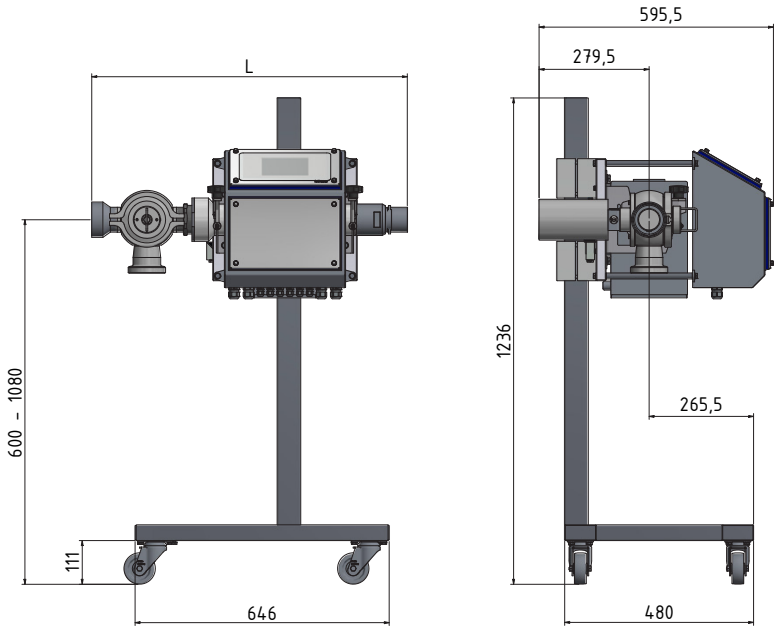
1: also for meat applications; 2: only for meat applications ; * With air cooling

We offer a comprehensive range of certified test pieces in a variety of materials and sizes to ensure an accurate and consistent in-field validation of the basic sensitivity. During the order process, customers can choose to change the type or add ddditional test pieces. All test pieces are made of FDA approved materials.

Mitus® Pipeline



Mitus® Pipeline meat



Flange	NW	Mitus® R	Separator	L
Vemag HP	50	8,4 / 12	ABV easy open	804
Tri-clamp	50	8,4 / 12	ABV easy open	695
Handtmann VF	55	8,4 / 12	ABF easy open	800
Handtmann VF nipple	55	8,4 / 12	ABV easy open	800
Handtmann VF quick-opening	50	8,4 / 12	ABV easy open	801
Dairy thread	50	8,4 / 12	ABV easy open	788
Handtmann ball	50	8,4 / 12	ABV easy open	775

NW: Nominal width (inner diameter) product guide pipe (mm)
A: Installation length (mm)
B, C: Assembly dimension customer-side (mm)
D: Distance from center point of contaminated line to start of separator (mm)
E: Length of separator (mm)
F: Distance from center point of good line until end of contaminated line separator (mm)
G: Outer diameter flange (mm)
I: Distance from center point of separator to gage block operating unit (mm)
L: Length of product guide pipe (mm)

Options

- Air cooling
- Signal lights & signal horns
- Monitoring functions
- Remote product change
- USB printing
- Fingerprint sensor

Interfaces

- RS 232, RS 422
- TCP-IP XML server/client
- Remote control
- Profibus
- SPC@Enterprise
- OPC DA and OPC UA

The products and solutions presented in this data sheet make major contributions in the following sectors:



The technical data given serves as a product description only and should not be understood as guaranteed properties in the legal sense.

Specifications subject to change without notice.
Rev. 10/2023

Minebea Intec Aachen GmbH & Co. KG
Am Gut Wolf 11
52070 Aachen, Germany

Phone +49.241.1827.0

sales.ac@minebea-intec.com
www.minebea-intec.com