

# Metal detection system Mitus<sup>®</sup>

Reliable inspection in challenging applications



## ! Benefits

- Maximizes safety for food production due to highest detection sensitivity
- MiWave technology tolerates fluctuations in product effects
- High operational comfort, connectivity and design variety
- Durable, robust design

*Mitus<sup>®</sup> with the flexible MiWave modulation is a metal detection system that prevents contamination of tiniest metal particles in a product flow. Mitus<sup>®</sup> analyzes a number of electromagnetic frequencies simultaneously to provide the highest sensitivity and prevent false rejects even with unstable product effects. All Mitus<sup>®</sup> metal detectors thus ensure maximum product safety and output.*

## Maximised product safety, minimised false rejects

- ① Excellent detection capability of ferrous, non-ferrous metals, light metal alloys such as stainless steel and aluminum.
- ① Automatic learn-mode and reduction of product effect.
- ① The basic interface facilitates user input. Numerous connection options, interfaces and designs available.
- ① Robust stainless steel housing and maximum protection for wash-down applications.

# Technical specifications

Metal detection system Mitus® possible configurations		
Equipment	Function	Diagram
Mitus® C (Compact)	Metal detector (rectangular opening) with evaluation electronics and operator terminal	<p>Mitus® C</p> <p>max. 10 m</p>
Mitus® H (Head) Mitus® T (Terminal)	Metal detector (rectangular opening) with evaluation electronics (max. 4x in series) Separate operator terminal	<p>Mitus® T</p> <p>max. 4x Mitus® H</p> <p>max. 30 m</p>
Mitus® S (Small) Mitus® R (Round) Mitus® E (Electronic)	Metal detector (small rectangular opening) Metal detector (round opening) Separate operator terminal with evaluation electronics	<p>Mitus® E</p> <p>Mitus® S</p> <p>max. 30 m</p> <p>Mitus® E</p> <p>Mitus® R</p> <p>max. 10 m</p>
Mitus® S (Small) Mitus® R (Round) Mitus® T (Terminal) Mitus® EI (Electronic Interface)	Metal detector (small rectangular opening) Metal detector (round opening) Separate operator terminal Separate evaluation electronics (max. 4x in series)	<p>Mitus® T</p> <p>max. 4x Mitus® EI</p> <p>max. 4x Mitus® R</p> <p>max. 30 m</p> <p>max. 10 m</p> <p>Mitus® T</p> <p>max. 4x Mitus® EI</p> <p>max. 4x Mitus® S</p> <p>max. 30 m</p> <p>max. 10 m</p>



## Metal detection system Mitus<sup>®</sup> properties and performance limits

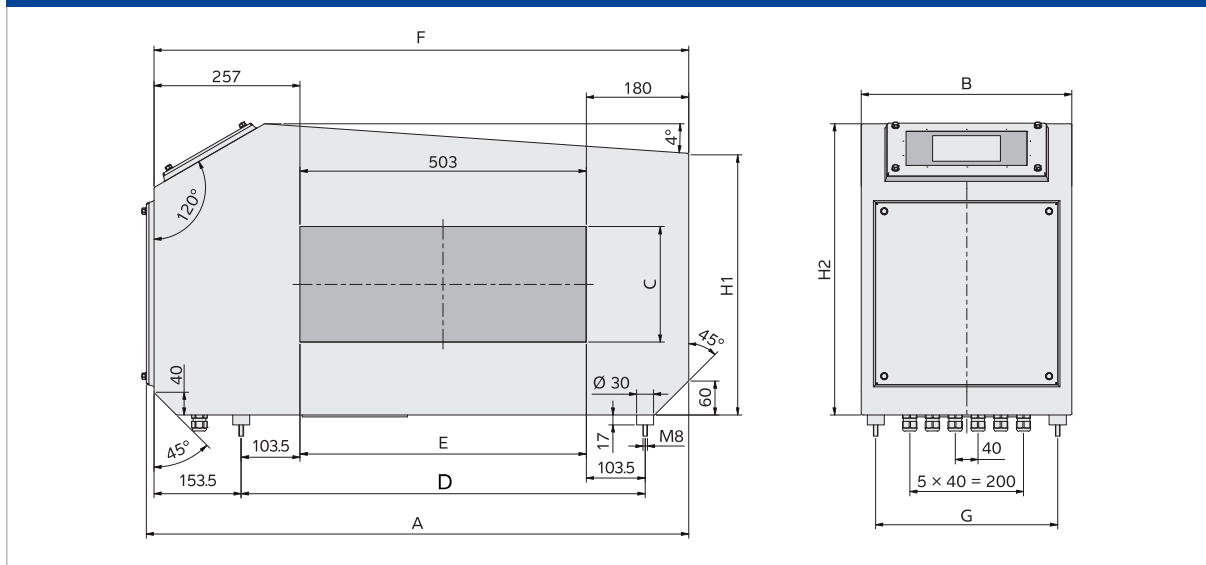
Category	Description
Supply voltage	90 V ... 260 V
Mains frequency	47 Hz ... 63 Hz
Power consumption	45 VA (power supply up to max.120 VA)
Relay outputs	4 relays Relay 1, 3 and 4: freely programmable Relay 2 'Error': fixed assignment
Product speed	2 cm/s ... 20 m/s
Product temperature	-30 °C to +55 °C
Ambient temperature	Operation: -10 °C to +55 °C Storage: -10 °C to +70 °C
Relative air humidity	Operation: < 58% at +55°C Storage: < 30% at +70°C
Housing	1.4301 stainless steel
Protection class	IP65, optional IP69
Weight	See table for dimensions and weights of the relevant equipment
Maximum cable lengths between the equipment	Mitus <sup>®</sup> T to Mitus <sup>®</sup> H: 30 m Mitus <sup>®</sup> E to Mitus <sup>®</sup> R or Mitus <sup>®</sup> S: 10 m Mitus <sup>®</sup> T to Mitus <sup>®</sup> EI: 30 m Mitus <sup>®</sup> EI to Mitus <sup>®</sup> R or Mitus <sup>®</sup> S: 10 m

The properties and performance limits stated here apply for all Mitus<sup>®</sup> series equipment.

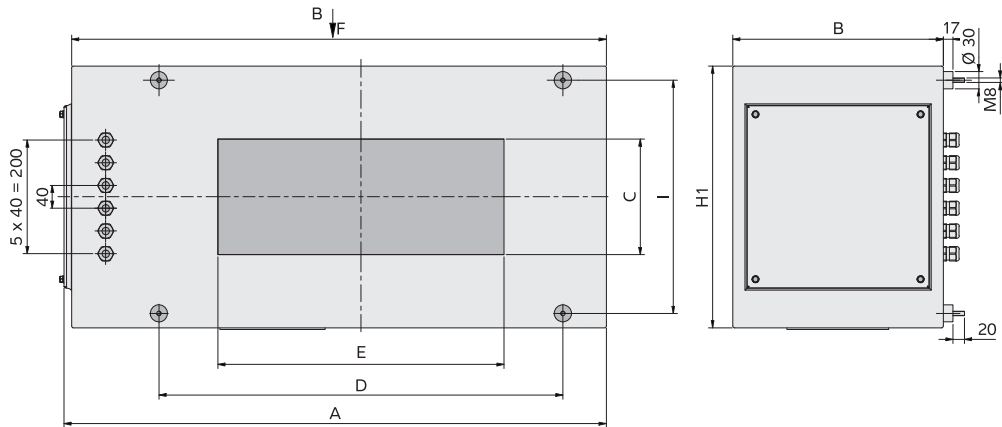
## Technical drawings

### Metal detector with rectangular aperture

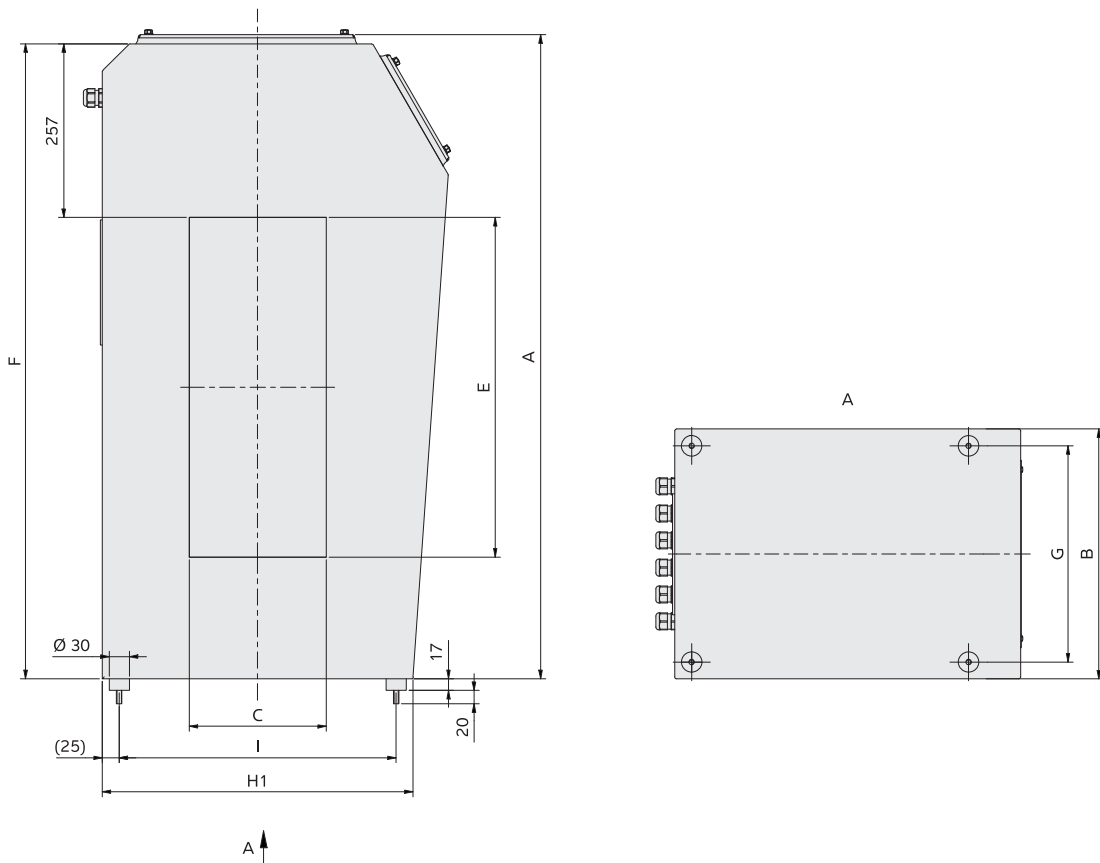
#### Metal detection system Mitus<sup>®</sup> C / H horizontal opening



## Metal detection system Mitus® H vertical opening

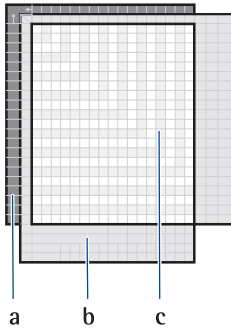


## Metal detection system Mitus® C / H upright opening



The dimensions A to I and the weight can be found in the table of all dimensions and weights.

## Metal detection system Mitus® C / H table of all dimensions and weights



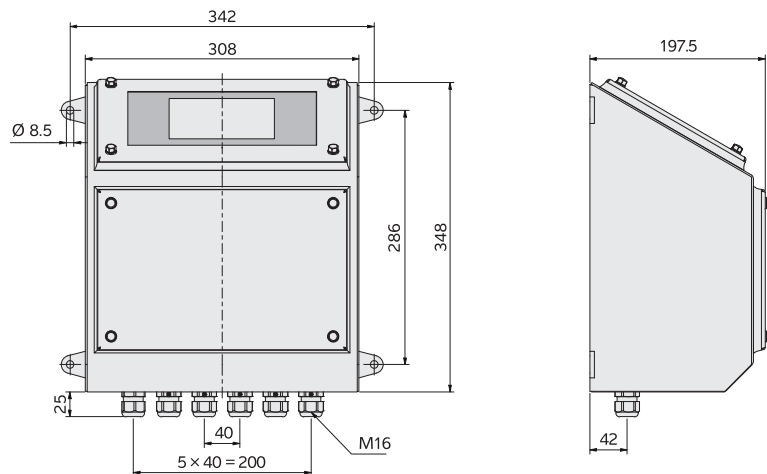
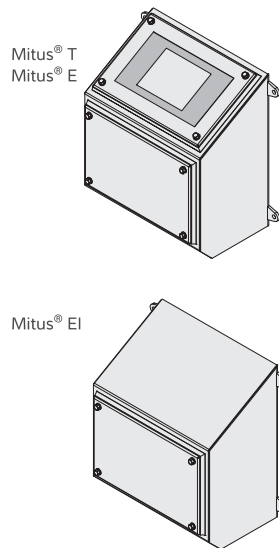
- a Product designation (e.g. Mitus® C 35 x 12.5)
- b Dimensions (A to I, see page 5) in mm
- c Weight in kg

All information excludes any possible installed optional devices, values (b and c) are approximate values.

... x ...	3	4,5	6	7,5	9	12,5	15	17,5	20	22,5	25	27,5	30	35	40	50	60	A	D	F	H2
<b>E</b>	30	45	60	75	90	125	150	175	200	225	250	275	300	350	400	500	600				
<b>7,5</b>	75	22	27	27	32	-	-	-	-	-	-	-	-	-	-	-	-	530	285	515	H1 + 30
<b>12,5</b>	125	27	32	32	38	43	43	-	-	-	-	-	-	-	-	-	-	580	335	565	H1 + 30
<b>17,5</b>	175	38	38	43	43	49	49	54	59	-	-	-	-	-	-	-	-	630	385	615	H1 + 30
<b>22,5</b>	225	38	43	49	49	49	54	59	65	70	76	-	-	-	-	-	-	680	435	665	H1 + 33
<b>25</b>	250	43	49	49	54	54	54	65	70	76	81	86	-	-	-	-	-	705	460	690	H1 + 35
<b>27,5</b>	275	49	49	54	54	54	59	65	70	76	81	86	92	-	-	-	-	730	485	715	H1 + 37
<b>35</b>	350	54	54	59	59	59	65	70	76	81	86	92	97	97	108	-	-	805	560	790	H1 + 42
<b>40</b>	400	59	59	65	65	65	70	76	81	86	92	97	103	103	113	124	-	855	610	840	H1 + 45
<b>50</b>	500	65	70	70	76	76	81	86	92	97	103	108	113	113	124	135	157	955	710	940	H1 + 52
<b>60</b>	600	76	81	81	86	86	92	97	103	108	113	119	124	124	135	146	167	1055	810	1040	H1 + 59
<b>70</b>	700	86	92	92	97	97	103	108	108	113	119	124	130	130	140	151	173	1155	910	1140	H1 + 66
<b>80</b>	800	97	97	103	103	103	108	113	119	124	130	135	140	140	151	162	184	1255	1010	1240	H1 + 73
<b>90</b>	900	103	108	108	113	113	113	119	130	135	140	146	151	151	162	173	194	1355	1110	1340	H1 + 80
<b>115</b>	1150	124	130	130	135	140	140	146	151	157	162	167	173	173	184	194	216	1605	1360	1590	H1 + 98
<b>135</b>	1350	146	151	151	157	157	162	167	173	178	184	189	194	194	205	216	238	1805	1560	1790	H1 + 112
<b>150</b>	1500	162	162	167	167	173	173	178	184	189	194	200	205	205	216	227	248	1955	1710	1940	H1 + 122
<b>170</b>	1700	178	184	184	189	189	194	200	205	211	216	221	227	227	238	248	270	2155	1910	2140	H1 + 136
<b>195</b>	1950	200	205	205	211	216	216	221	227	232	238	243	248	248	259	270	292	2405	2160	2390	H1 + 154
<b>220</b>	2200	227	232	232	238	238	243	248	254	259	265	265	270	270	281	292	313	2655	2410	2640	H1 + 171
<b>250</b>	2500	254	254	259	259	259	265	270	281	286	292	297	302	302	308	319	340	2955	2710	2940	H1 + 192
<b>275</b>	2750	275	281	281	286	286	292	297	302	302	313	319	324	324	335	346	367	3205	2960	3190	H1 + 210
<b>B</b>					320				370	395	420	440	460	520	580						
<b>G</b>					270				320	345	370	390	410	470	530						
<b>H1</b>	435		435	435	385	435	435	460	485	510	535	560	610	660	760	860					
<b>I</b>	270		285	300	335	360	385	410	435	460	485	510	560	610	710	810					

## Terminal and Electronics

### Metal detection system Mitus® T / E / EI dimensions



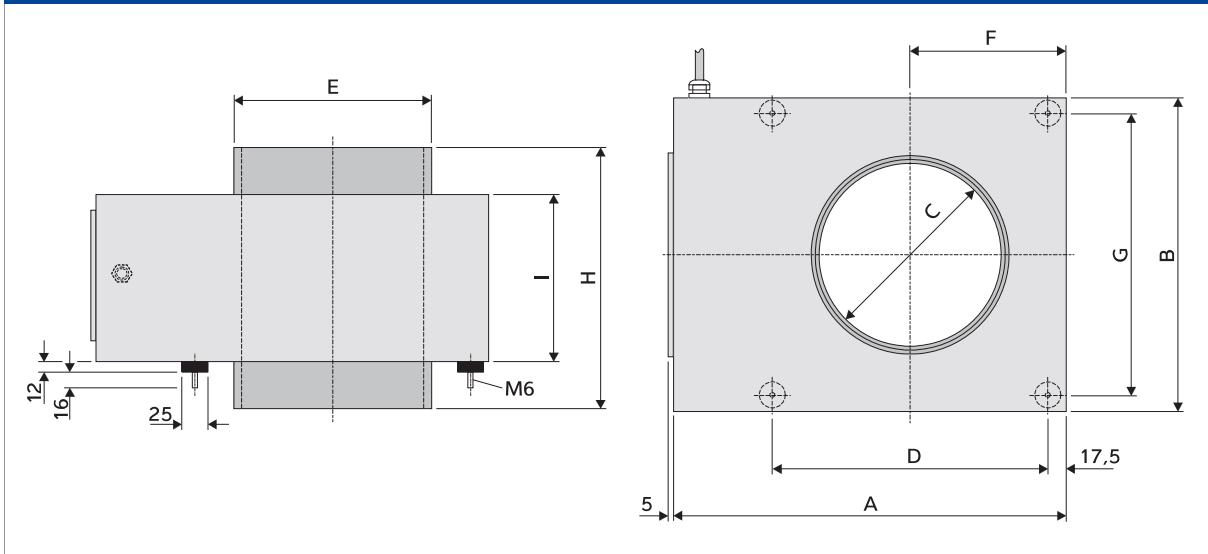
All dimensions in mm

## Metal detection system Mitus® T / E / EI weight

Weight	kg
Mitus® T	Up to 6.5
Mitus® E	Up to 6.5
Mitus® EI	Up to 6.5

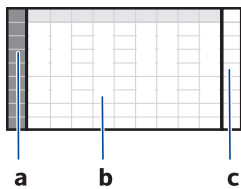
## Metal detector with round aperture

### Metal detection system Mitus® R dimensions and weight



The dimensions A to I and the weight can be found in the table of all dimensions and weights.

### Metal detection system Mitus® R table of all dimensions and weights



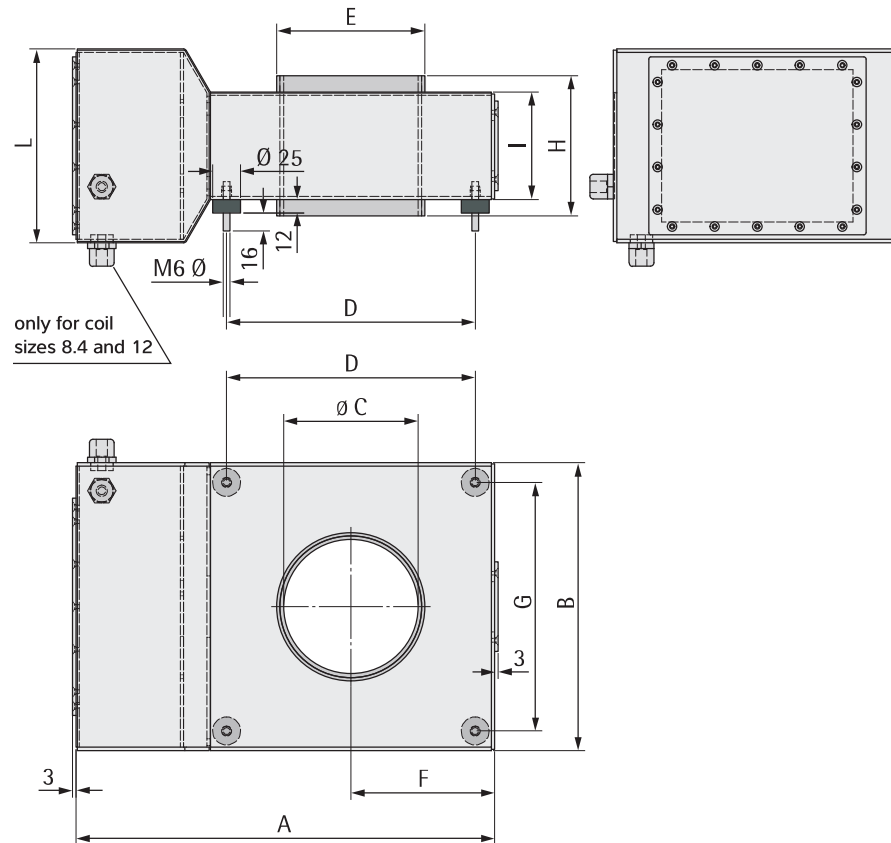
- a Product designation (e.g. Mitus® C 35 × 12.5)
- b Dimensions (A to I, see page 5) in mm
- c Weight in kg
- a Product designation (e.g. Mitus® R 17.2)
- b Dimensions (A to I, see page 9) in mm
- c Weight in kg

...	A	B	C	D	E	F	G	H	I	kg
2.8			28		39.5			210		13.2
5.9	334	195	59	160	70.5	97.5	160	220	160	11.8
8.4			84		97.5			230		10.1
12			120		132.5			240		8.5
17.2	438	300	172	265	187.5	150	265	250	160	18.2
21.6			216		232.5			260		16.1
26.9	568	430	269	395	288	215	395	310	200	30.8
34.1			341		363			320		33

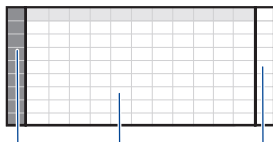
All information excludes any optional devices which may have been installed; values (b and c) are approximate values.

## Metal detector round aperture with reduced metal-free zone

### Metal detection system Mitus® R RMFZ reduced metal-free zone



### Metal detection system Mitus® R RMFZ table of all dimensions and weights

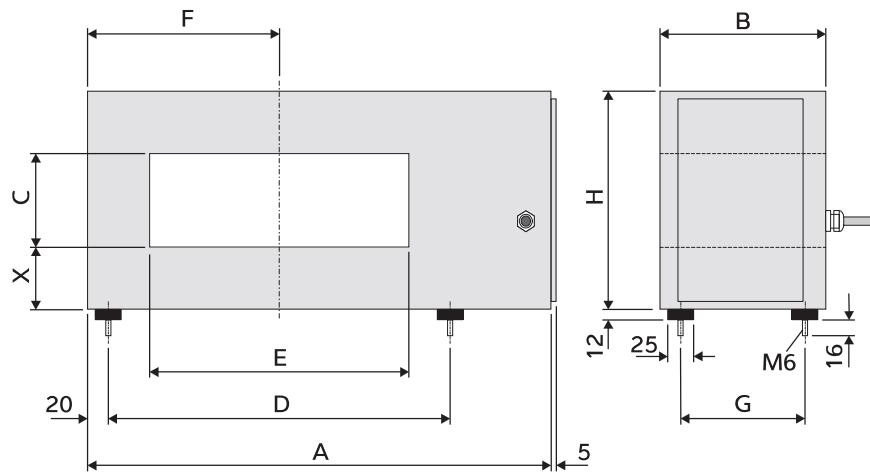


- a Product designation (e.g. Mitus® R 12)
- b Dimensions in mm
- c Weight in kg

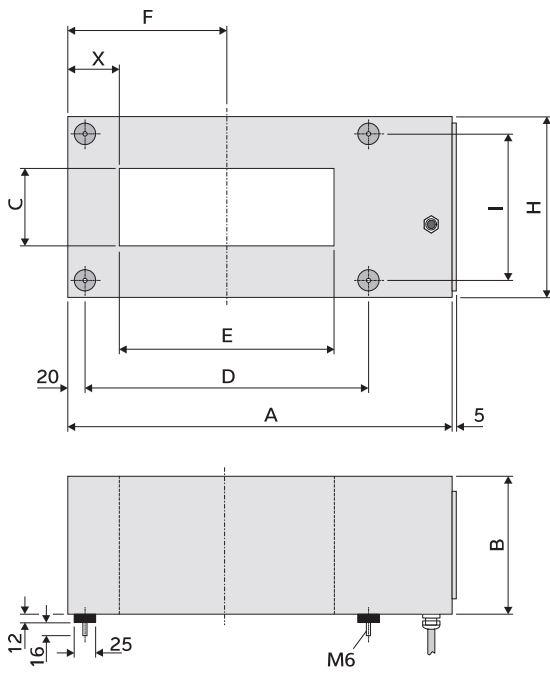
Mitus-R...	A	B	C	D	E	F	G	H	I	J	L	kg
8.4	382	212	84	177	97.5	106	177	88	68	33	173	10.5
12	419	257	120	222	132.5	129	222	125	96	61	173	14.3
17.2	472	322	172	287	187.5	161	287	180	138	103	173	21.5
21.6	518	380	216	345	232.5	190	345	225	173	138	173	27.5
26.9	583	445	269	410	288	223	410	280	215	180	215	39.6
34.1	672	534	341	499	363	267	499	355	273	238	215	60.5

All information excludes any optional devices which may have been installed.  
All dimensions and weights are approximate values.

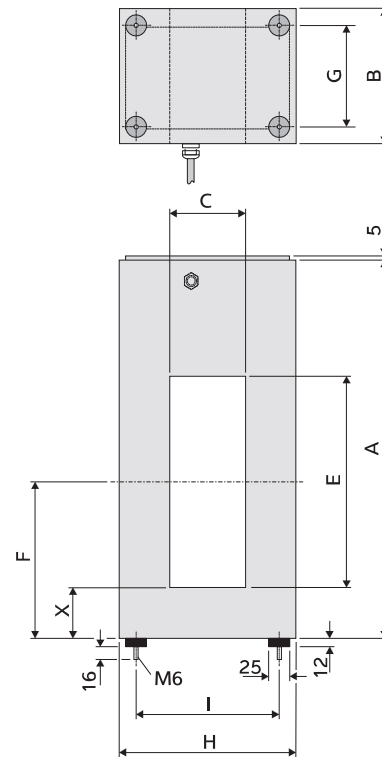
Metal detection system Mitus® S dimensions horizontal opening



Metal detection system Mitus® S dimensions vertical opening

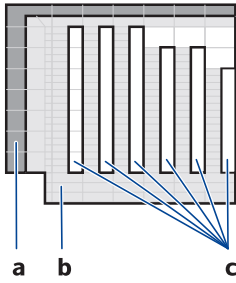


Metal detection system Mitus® S upright structure





# Metal detection system Mitus® S table of all dimensions and weights



... X ...		3		4.5		6		7.5		9		12.5		15		17.5*		20*								
E	C	30		45		60		75		90		125		150		175*		200*								
7.5	75	A	378		363		348		333		11.5															
		D	200	13.8	185	12.65	170	12.65	155*																	
		F	120		112.5		105		97.5*																	
12.5	125	A	428		413		398		383		387		383													
		D	250	15	235	13.8	220	13.8	205	10.35	205	13.8	205	15												
		F	145		137.5		130		123		122.5		122.5													
17.5	175	A	478		463		448		433		433		433		433		453									
		D	300	16.1	285	15	270	15	255	13.8	255	15	255	16.1	255	17.3	275*	23								
		F	170		162.5		155		148		147.5		147.5		147.5		158*									
20	250	A															478		478							
		D															300*	23	300*	25.3						
		F															170*		170*							
22.5	250	A															483		483		483		503		503	
		D															305	16.1	305	18.4	305	18.4	325*	24.15	325*	25.3
		F															173		173		173		183*		183*	
25	250	A	553		538		523		508		508		508		508		528		528							
		D	375	18.4	360	17.3	345	16.1	330	16.1	330	17.3	330	18.4	330	19.6	350*	25.3	350*	26.45						
		F	207.5		200		192.5		185		185		185		185		195*		195*							
27.5	275	A															533		533		533		553		553	
		D															355	18.4	355	19.6	355	20.7	375*	25.3	375*	26.45
		F															198		198		198		208*		208*	
35	350	A	653		638		623		608		608		608		608		628		628							
		D	475	21.9	460	20.7	445	13.8	430	13.8	430	21.9	430	21.9	430	21.9	450*	28.8	450*	29.9						
		F	257.5		250		242.5		235		235		235		235		245*		245*							
37.5	375	A															633		633		633		653		653	
		D															455	20.7	455	21.9	455	23	475*	27.6	475*	31.1
		F															248		248		248		258*		258*	
50	500	A	803		788		773		758		758		758		758		778		778							
		D	625	25.3	610	24.2	595	23	580	17.3	580	24.2	580	25.3	580	26.45	600v	33.4	600*	33.4						
		F	332.5		325		317.5		310		310		310		310		320*		320*							
60	600	A	903		888		873		858		858		858		858		878		878							
		D	725	28.8	710	27.6	695	25.3	680	18.4	680	26.45	680	27.6	680	28.8	700*	36.8	700*	38						
		F	382.5		375		367.5		360		360		360		360		370*		370*							
B		160		160		160		160		160		160		160		190		190								
G		120		120		120		120		120		120		120		150		150								
H		195		195		195		195		210		245		270		315		340								
I		155		155		155		155		170		205		230		275		300								
X		82.5		75		60		60		60		60		60		70		70								

a Product designation (e.g. Mitus® C 35×12.5)

b Dimensions (A, C to F, H, I and X see page 5) in mm

c Weight in kg

All information excludes any optional devices which may have been installed; values (b and c) are approximate values.

\*1 Size available on request

## Metal-free zone

Metal detection disturbances can lead to false rejects errors or a deterioration in sensitivity, therefore it is important to observe the search coil's 'metal-free zone'.

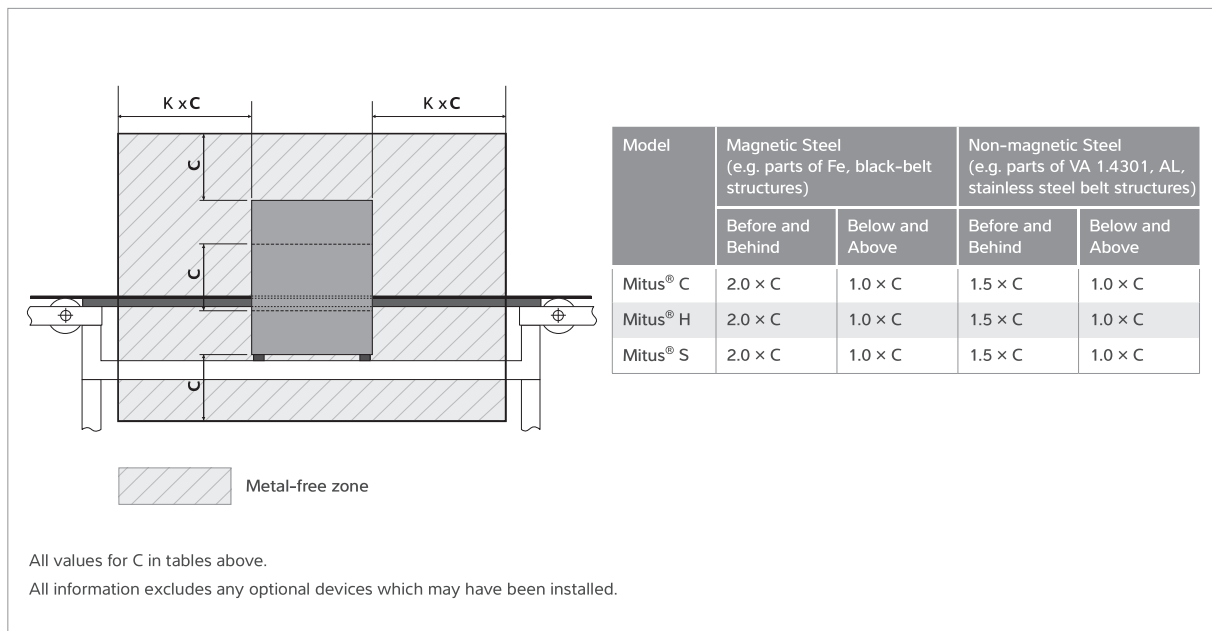
Examples of potential disruptive factors in this zone include:

- Large metal objects such as housing, frames or tables
- Movable metal objects such as oscillating scaffolding or screwed-on freefall pipe fittings
- Cross-connections of the supporting structure forming short circuit coils
- Metal objects worn by employees (e.g. keys, glasses, jewellery, mobile phone)
- Every customer keeps a clip board and their test pieces on top of the coil.

Follow the guideline below to maintain compliance with the metal-free zone.

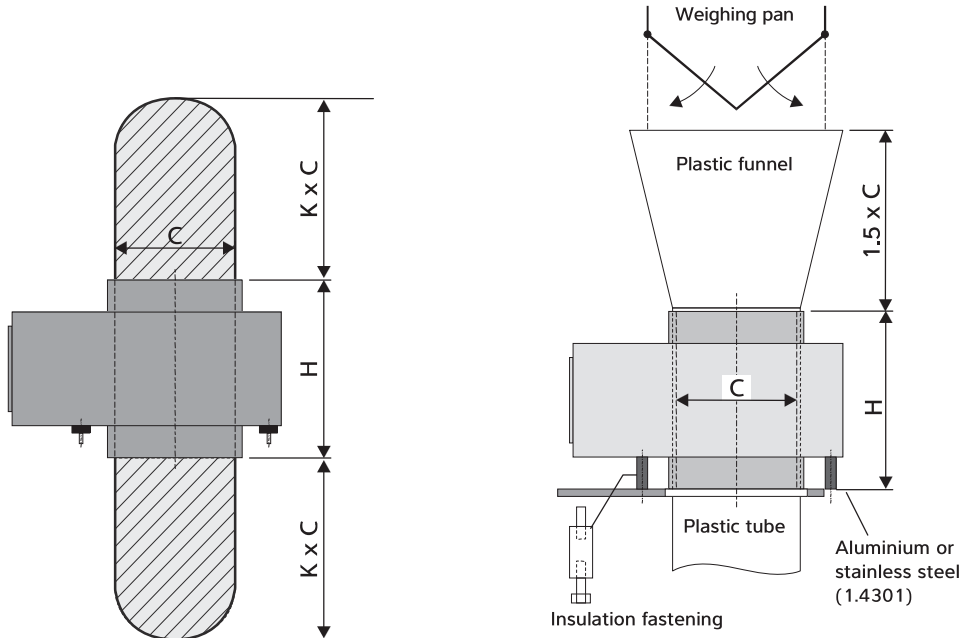
### Metal-free zone for metal detectors with rectangular aperture (Mitus® C / H / S):

The size of the metal-free zone depends on the opening C of the metal detector as well as the type of metal. The following information serves as minimal guide values and can strongly deviate depending on installation location.



**Metal-free zone for metal detectors with round aperture (Mitus® R / RMFZ):**

If moveable elements made of aluminum or stainless steel (VA 1.4301) are operated around the metal detector, the metal-free zone must be maintained above and below the metal detector. The size of the metal-free zone depends on the nominal diameter C of the metal detector as well as the type of metal. The following information serves as minimal guide values and can deviate depending on installation location.



Installation recommendation of Mitus® R in a tubular bag machine

Model	Magnetic Steel (e.g. parts of Fe)		Non-magnetic Steel (e.g. parts of VA 1.4301, AL)	
	Non-moving	Moving	Non-moving	Moving
Mitus® R	$1.2 \times C$	$2.0 \times C$	$0.80 \times C$	$1.5 \times C$
Mitus® RMFZ	$1.0 \times C$	$1.5 \times C$	$0.64 \times C$	$1.2 \times C$

All values for C in tables above.  
All information excludes any optional devices which may have been installed.

## Options

A wide range of options increases your possibilities

- Signal lights and signal horn
- Monitoring functions (e.g. air pressure, reject, product flow)
- Remote product change
- USB printing
- Fingerprint sensor



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 our metal detectors. Within a metal detector package, we provide 2 standard test pieces for a validation of the basic sensitivity. During the order process customers can choose to change the type or add additional test pieces. All test pieces are made of FDA approved materials.

### Metal detection system Mitus® interfaces

- SPC@Enterprise
- RS 232, RS 422
- Profibus
- Remote control
- OPC DA and OPC UA



#### SPC@Enterprise

The pre-packaging and statistical process control software SPC@Enterprise helps you guarantee product quality, food safety and productivity.

The proven software offers configurable interfaces for recording data from a wide variety of machines, equipment and sensors in the processing or packaging line. It transforms this data into information via powerful and comprehensive reporting functions, making it possible to intervene quickly in the production process.

#### OPC DA / UA Option

No matter if you need legacy OPC DA or the cross-platform standard OPC UA, with our OPC option package we generate more value from the inspection data.

We provide you the software to set up an OPC server on your PC and your application can access and use the data for its needs.

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.  
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