6.6.4   Technical data

Table 6- 9   Technical specifications for RF360T

Memory size	8 KB
Memory organization	Blocks of 8 bits/byte-by-byte
Memory configuration	
• Serial number (UID)	• 4 bytes (fixed code)
• Application memory	• 8189 bytes r/w
• OTP [1] memory	• 20 bytes
Storage technology	FRAM / EEPROM
MTBF (Mean Time Between Failures) in years	1200
Write cycles, at +40 °C	Virtually unlimited ($>10^{10}$)
Read cycles	Virtually unlimited ($>10^{10}$)
Data transmission time	With RS422 reader: With IQ-Sense reader:
• Read	Approx. 0.13 ms/byte Approx. 20 ms/byte
• Write	approx. 0.13 ms/byte approx. 25 ms/byte
Data retention	> 10 years
Read/write distance	Dependent on the reader used [see Chapter Field data of RF300 transponders (Page 41)]
Multitag capability	max. 4 transponders
Recommended spacing from metal	≥ 20 mm; e.g. using spacer 6GT2190-0AA00 in conjunction with fixing pocket 6GT2190-0AB00
Power supply	Inductive, without battery
Degree of protection to EN 60529 Shock to EN 60721-3-7 Vibration to EN 60721-3-7 Torsion and bending load	IP67 50 g 20 g Not permitted permanently
Enclosure dimensions Color Material Fixing	85.8 x 54.8 x 2.5 mm (L x W x H) Anthracite Epoxy resin 2 screws (M3) or with fixing pocket 6GT2190-0AB00
Ambient temperature	
• Operation	-25°C to +75°C
• Transport and storage	-40°C to +85°C
Weight	Approx. 25 g

[1]   OTP: One Time Programmable

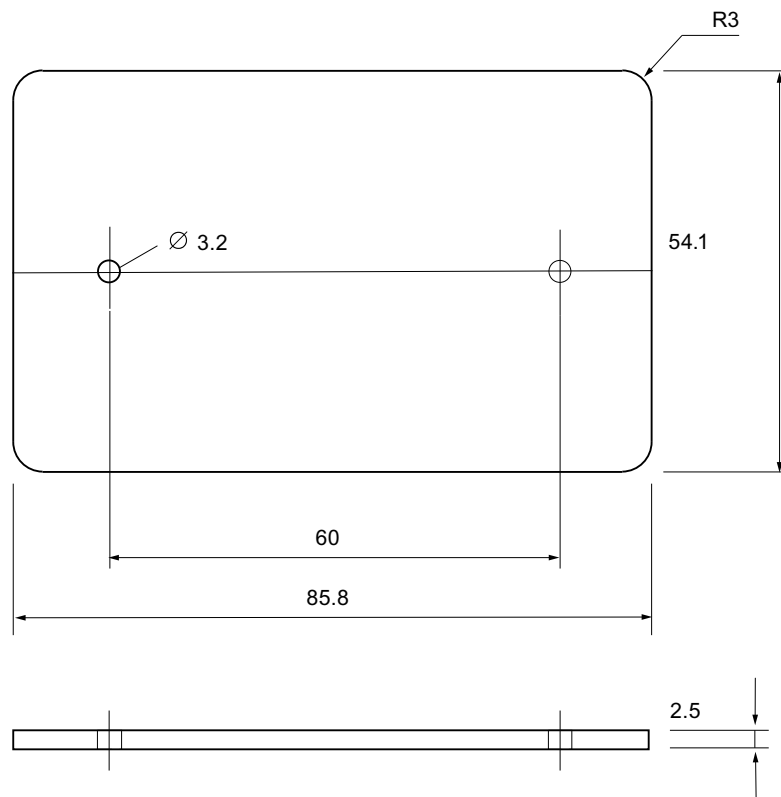## 6.6.5 Dimension drawing

Figure 6-14   RF360T dimension drawing

Dimensions in mm

6.7 SIMATIC RF370T

6.7.1 Features

The SIMATIC RF370T transponder is a passive (i.e. battery-free) data carrier in a square type of construction.

RF370T	Characteristics	
	Field of application	Identification tasks on assembly lines in harsh industrial environments, suitable for larger ranges, e.g. automotive industry
	Memory	Read-only area: 4 byte UID read/write memory: 32/64 KB OTP [1]) memory: 20 bytes

RF370T	Characteristics	
	Read/write range	Refer to SectionField data of RF300 transponders (Page 41)
	Assembly	Direct assembly on metal or flush-mounting is possible (with two M5 screws)
	Degree of protection	IP68 IPx9K
	High resistance	to mineral oils, lubricants and cleaning agents

[1] OTP: One Time Programmable

6.7.2 Ordering data

Table 6- 10   Ordering data RF370T

RF370T	Order number
• IP68 • Memory size: **32 KB FRAM** • Operating temperature: -25 to +85 °C • Dimensions: 75 x 75 x 40 (L x W x H, in mm)	6GT2800-5BE00
• IP68 • Memory size: **64 KB FRAM** • Operating temperature: -25 to +85 °C • Dimensions: 75 x 75 x 40 (L x W x H, in mm)	6GT2800-6BE00

6.7.3 Mounting on metal

Direct mounting of the RF370T on metal is permitted.

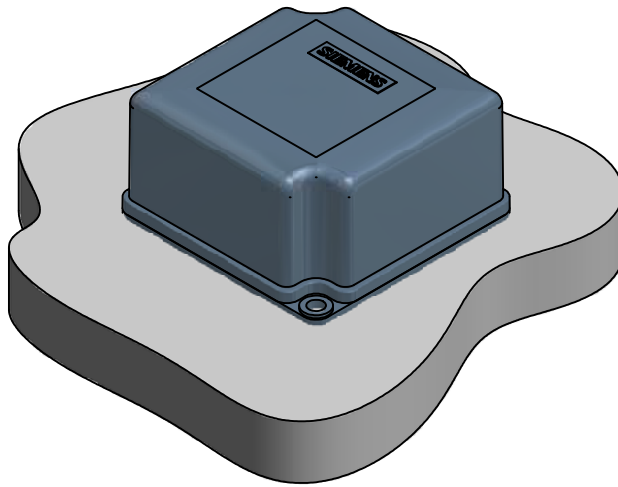## Mounting of RF370T on metal

Figure 6-15   Mounting of RF370T on metal

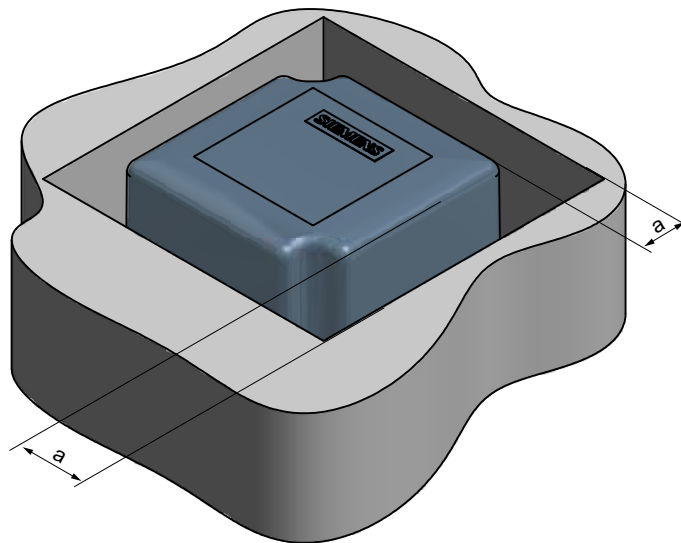## Flush-mounting of RF370T in metal:

Figure 6-16   RF370T flush-mounted in metal

The standard value for a is ≥ 20 mm. At lower values, the field data change significantly, resulting in a reduction in the range.

6.7.4 Mounting instructions

It is essential that you observe the instructions in the Section Installation guidelines (Page 62).

Properties	Description
Type of installation	Screw fixing (two M5 screws)
Tightening torque	< 1.2 Nm (at room temperature)

6.7.5 Technical data for RF370T with 32 KB FRAM

Table 6- 11   Technical specifications for RF370T with 32 KB FRAM/64 KB FRAM

Memory size	32 KB/64 KB		
Memory organization	Blocks of 8 bits/byte-by-byte		
Memory configuration	Serial number	4 bytes (fixed code)	
	Application memory	32765 bytes r/w (32 KB)	
		65276 bytes r/w (64 KB)	
	OTP [1] memory	20 bytes	
Storage technology	FRAM / EEPROM		
MTBF (Mean Time Between Failures) in years	1200		
Write cycles, at +40 °C	Virtually unlimited (>10^{10})		
Read cycles	Virtually unlimited (>10^{10})		
Data transmission time	Read		Approx. 0.13 ms/byte
	Write		Approx. 0.13 ms/byte
Data retention in years	> 10		
Read/write distance	Dependent on the reader used [see Chapter Field data of RF300 transponders (Page 41)]		
Multitag capability	max. 4 transponders		
Recommended spacing from metal	can be directly mounted on metal		
Power supply	Inductive, without battery		
Degree of protection to EN 60529	IPx9K		
Shock resistant to EN 60721-3-7	50 g		
Vibration resistant to EN 60721-3-7	20 g		
Torsion and bending load	Not permissible continuously		
Enclosure dimensions	75 x 75 x 40 mm (L x W x H)		
Color	Anthracite		
Material	PA12		
Fixing	Two M5 screws		
Ambient temperature	Operation		-25 °C to +85 °C
	Transport and storage		-40°C to +85°C

Weight	Approx. 200 g

[1] OTP: One Time Programmable; single write

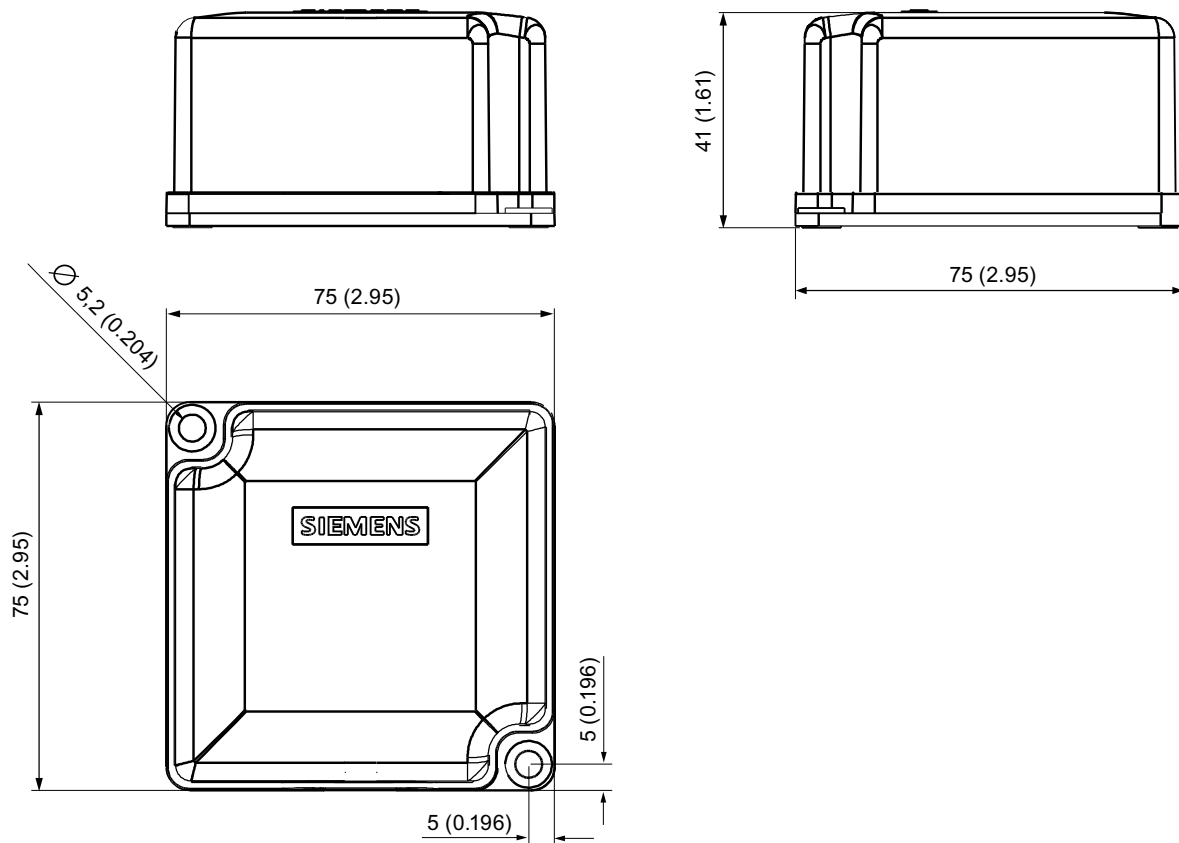## 6.7.6   Dimensional drawing

Figure 6-17   RF370T dimension drawing

Dimensions in mm (inches in brackets)

6.8 SIMATIC RF380T

6.8.1 Features

The SIMATIC RF380T transponder is an extremely rugged and heat-resistant round data carrier suitable e.g. for applications in the automotive industry.

SIMATIC RF380T transponder	Characteristics	
	Field of application	Identification tasks in applications (e.g. automotive industry) with cyclic **high temperature stress** > 85 °C and < 220 °C Typical applications: • Primer coat, electrolytic dip area, cataphoresis with the associated drying furnaces • Top coat area with drying furnaces • Washing areas at temperatures > 85°C • Other applications with higher temperatures
	Memory	• Read-only area (4 bytes UID) • Read/write memory (32 KB) • OTP [1] memory (20 bytes)
	Read/write range	Refer to SectionField data of RF300 transponders (Page 41)
	Assembly	• Direct assembly on metal or flush-mounting is possible. • The transponder can be secured using a special holder (see installation guidelines, section on RF380T). The tag size is designed such that it can be secured on a skid or also directly on a body.
	Degree of protection	IP 68
	High resistance	to mineral oils, lubricants and cleaning agents

[1] OTP: One Time Programmable

6.8.2 Ordering data

RF380T	Order number
• IP68 • Memory size 32 KB FRAM (read/write) and 4 byte EEPROM • Operating temperature -25 … +200 °C (cyclic) • Dimensions: 114 x 83 (ØxH in mm)	6GT2800-5DA00

Accessories for RF380T	Order number
Holder (short version)	6GT2090-0QA00
Holder (long version)	6GT2090-0QA00-0AX3

Accessories for RF380T	Order number
Covering hood	6GT2090-0QB00
Universal holder	6GT2590-0QA00

6.8.3 Installation guidelines for RF380T

It is essential that you observe the instructions in the Section Installation guidelines (Page 62).

The following section only deals with features specific to the SIMATIC RF380T.

6.8.3.1 Mounting instructions

NOTICE
Only use tag with original holder
You are strongly recommended to only use the tag with the original holder specified. Only this holder guarantees that the data memory observes the listed values for shock, vibration and temperature. A protective cover is recommendable for applications in paint shops.

Data memory holder

Short version (6GT2 090-0QA00)	Long version (6GT2090-0QA00-0AX3)
Material: V2A sheet-steel with thickness 2.5 mm BI 2.5 DIN 59382 1.4541	

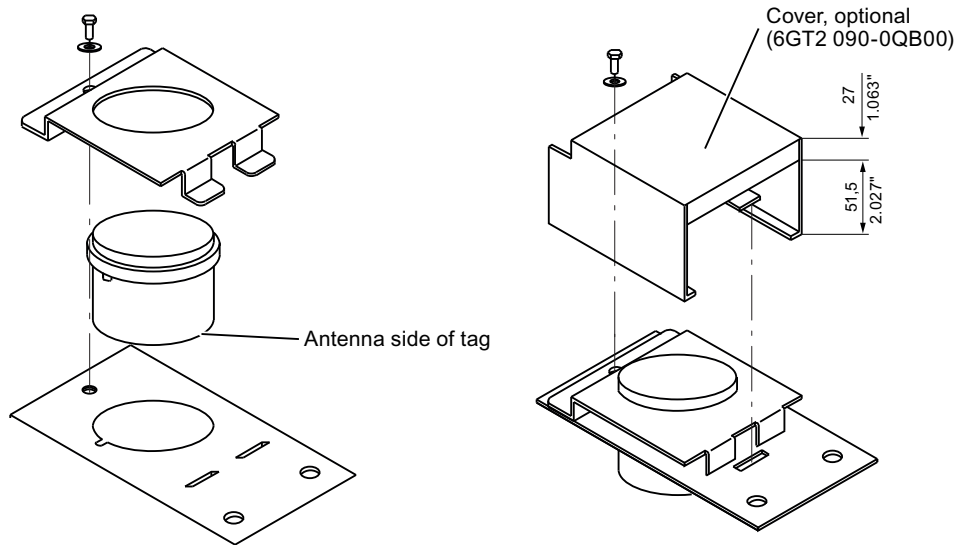## Assembly of data memory with holder

Figure 6-18   Assembly of tag with holder

Scope of supply

The holder is provided with all mounting parts and a mounting diagram. Mounting screws for securing the holder are not included. The mounting screws are of diameter M 10. The minimum length is 25 mm. The optional cover can be used for the long and short versions of the holder.
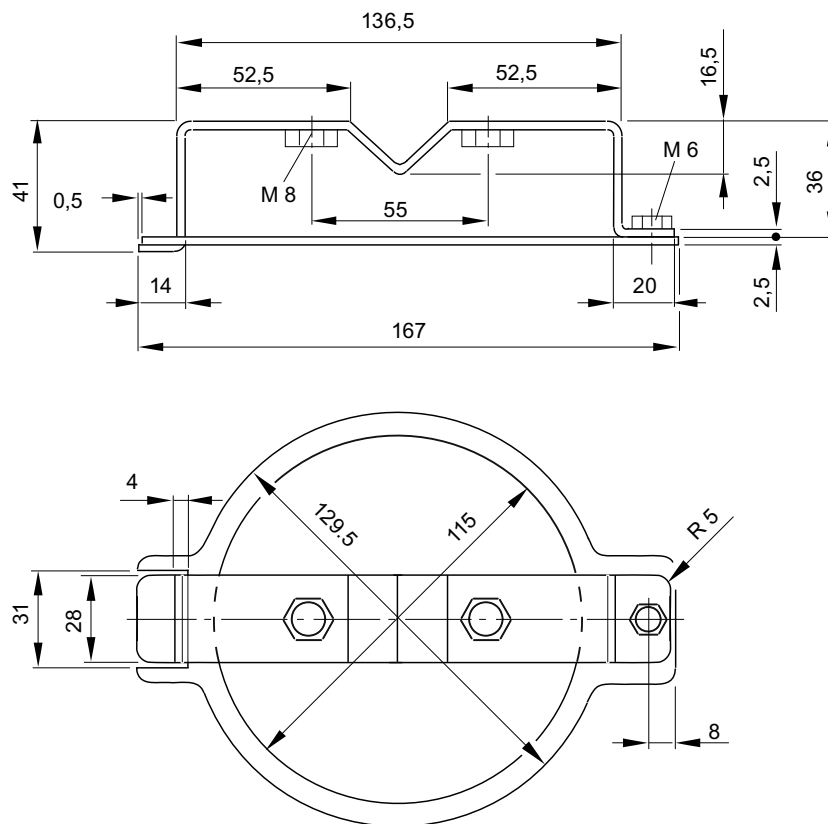
Universal holder

Figure 6-19   Universal holder 6GT2590-0QA00

6.8.3.2   Metal-free area

Direct mounting of the RF380T on metal is permitted.
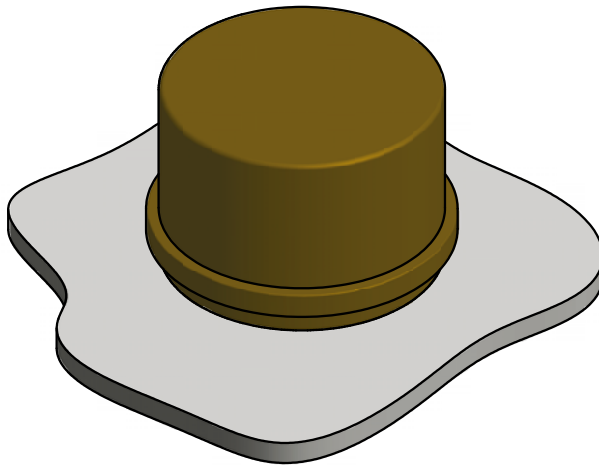
Mounting of RF380T on metal

Figure 6-20   Mounting of RF380T on metal

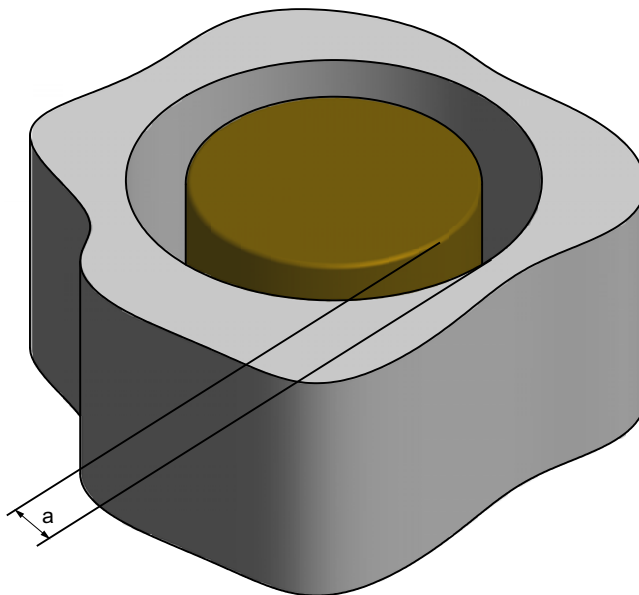## Flush-mounting of RF380T in metal:

Figure 6-21   RF380T flush-mounted in metal

The standard value for a is ≥ 40 mm. At lower values, the field data change significantly, resulting in a reduction in the range.

6.8.4 Configuring instructions

6.8.4.1 Temperature dependence of the transmission window

The guidelines in Section "Planning the RF300 system" apply to configuration of heat-resistant data memories, with the exception of the limit distance and field length at temperatures above 85 °C.

Calculation of transmission window with heat-resistant data memories

The factor 0.8 is required for calculating the transmission window, and takes into account production tolerances and temperature influences of to 85 °C.

An additional correction factor C must be included in the calculation at temperatures > 85 °C (up to 110 °C):

$$t_{v[T<85\ °C]} = \frac{L \cdot 0,8}{V_{MDS}}$$

$$S_{g[T>85\ °C]} = S_g \cdot C \qquad L_{[T>85\ °C]} = L \cdot C$$

$$t_{v[T>85\ °C]} = \frac{L \cdot C \cdot 0,8}{V_{MDS}} \frac{[m]}{[m/s]}$$

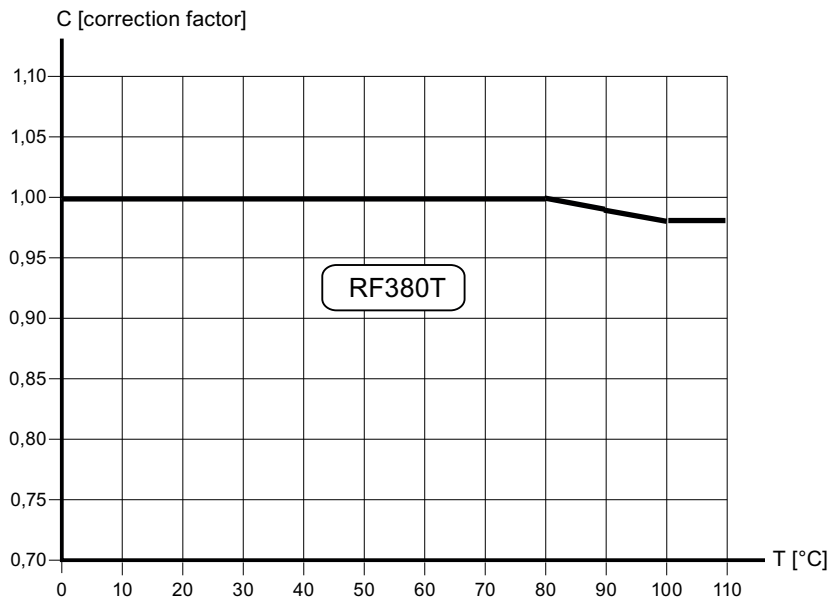|	
L	Field length
S_g	Limit distance tag - reader
V_{Tag}	Tag speed
C	Correction factor at temperatures > 85 °C (cf. following picture with correction factor C depending on temperature)
t_v	Tag dwell time

Figure 6-22   Correction factor C depending on temperature

The following diagram shows the reduction in the limit distance and field length at increased processing temperatures (internal temperature of tag):
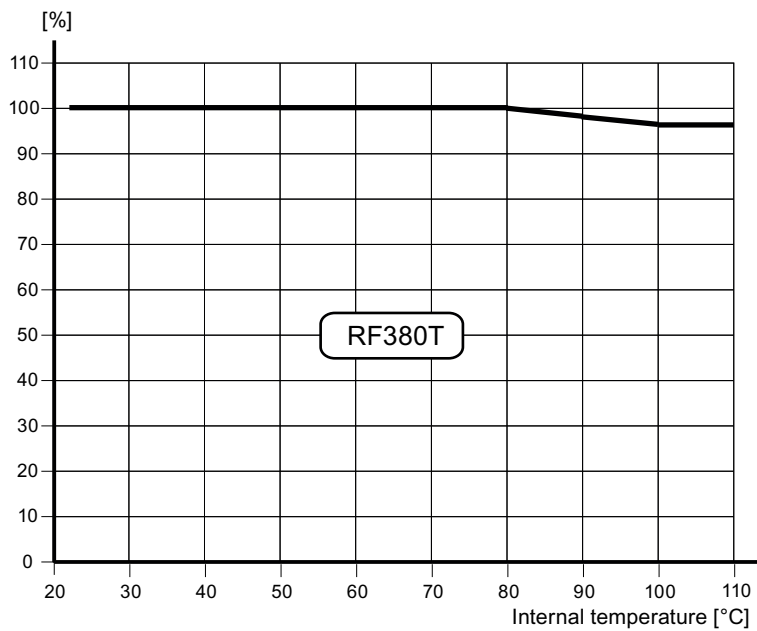

Figure 6-23   Reduction in field length and limit distance

The reduction in the field data at higher temperatures is due to the increased current consumption of the electronics.

6.8.4.2 Temperature response in cyclic operation

At ambient temperatures (T_u) up to 110 °C, cyclic operation is not necessary, i.e. up to this temperature, the transponder can be in constant operation.

Note

Calculation of the temperature curves

Calculation of the temperature curves or of a temperature profile can be carried out on request by Siemens AG. Exact knowledge of the internal temperature facilitates configuration for time-critical applications.

You can also carry out the calculation with the aid of the "SIMATIC RF Temperature Calculator" on the "RFID Systems Software & Documentation" CD [see Accessories (Page 257)].

Ambient temperatures > 110 °C

NOTICE
Cancellation of warranty
The internal temperature of the data memory must not exceed the critical threshold of 110 °C. Each heating phase must be followed by a cooling phase. No warranty claims will otherwise be accepted.

Some limit cycles are listed in the table below:

Table 6- 12   Limit cycles of data memory temperature

T_u (heating up)	Heating up	T_u (cooling down)	Cooling down
220 °C	0.5 h	25 °C	> 2 h
200 °C	1 h	25 °C	> 2 h
190 °C	1 h	25 °C	> 1 h 45 min
180 °C	2 h	25 °C	> 5 h
170 °C	2 h	25 °C	> 4 h

The internal temperature of the tag follows an exponential function with which the internal temperature and the operability of the tag can be calculated in advance. This is particularly relevant to temperature-critical applications or those with a complex temperature profile.

Ambient temperatures > 220°C

NOTICE
Cancellation of warranty
The data memory must not be exposed to ambient temperatures > 220 °C. No warranty claims will otherwise be accepted.
However, the mechanical stability is retained up to 230 °C!

Example of a cyclic sequence

Table 6- 13   Typical temperature profile of an application in the paint shop

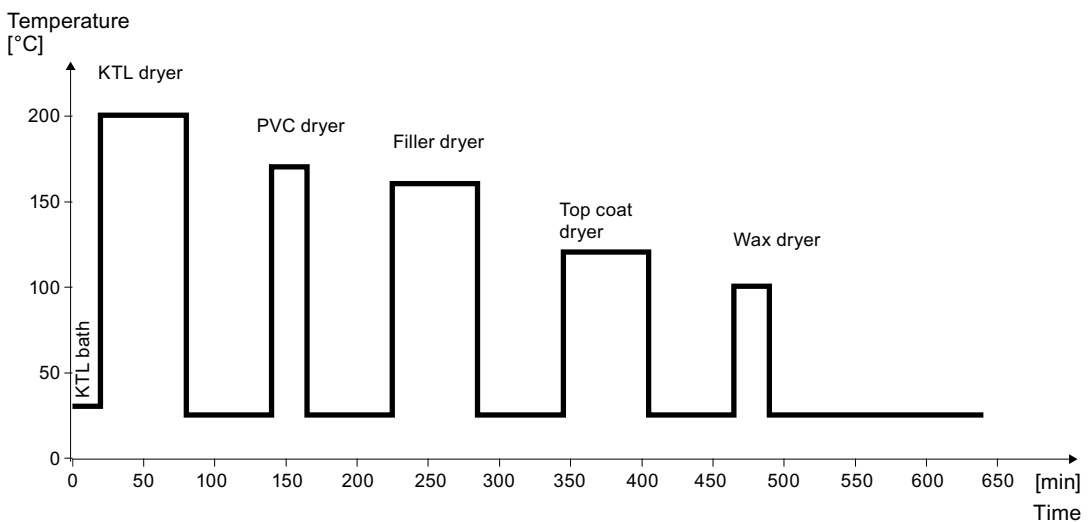| Start of tag at initial point	Duration (min)	Ambient temperature (°C)
Electrolytic dip	20	30
Electrolytic dip dryer	60	200
Transport	60	25
PVC dryer	25	170
Transport	60	25
Filler dryer	60	160
Transport	60	25
Top coat dryer	60	120
Transport	60	25
Wax dryer	25	100
Transport	150	25

Figure 6-24   Graphic trend of temperature profile from above table

The simulation results in the following:

Following a simulation time of 36.5 hours, a total of 3 cycles were carried out, and an internal temperature of 90 degrees Celsius was reached.
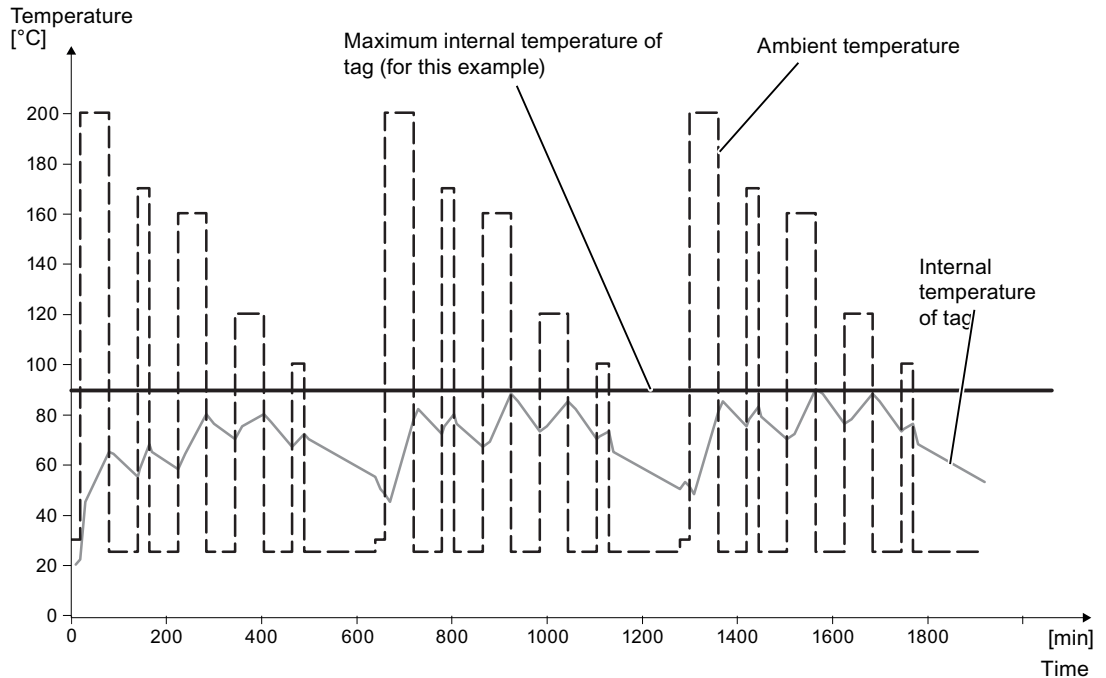
Figure 6-25   Complete temperature response due to simulation

6.8.5   Use of the transponder in the Ex protection area

The TÜV SÜD Automotive GmbH as approved test center as well as the TÜV SÜD Product Service GmbH as certification center, identification number 0123, as per Article 9 of the Directive of the European Council of 23 March 1994 (94/9/EC), has confirmed the compliance with the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in hazardous areas as per Annex II of the Directive. The essential health and safety requirements are satisfied in accordance with the following standards:

Document	Title
EN 60079-0: 2006	Electrical equipment for hazardous gas atmospheres - Part 0: General requirements
EN 60079-15: 2005	Electrical equipment for hazardous gas atmospheres - Part 15: Design, testing and identification of electrical equipment with type of protection "n"
DIN VDE 0848-5: 2001 (in parts)	Safety in electrical, magnetic and electromagnetic fields - Part 5: Explosion protection
ZLS SK 107.1	Central office of the states for safety; test components

Identification

The identification of the electrical equipment as an enclosed unit is:

⟨Ex⟩ II 3G Ex nC IIB T5

-25°C to +70°C

U_m = 30 V DC

The equipment is assigned the following references:

XXXYYYZZZ	[= serial number, is assigned during production]
TPS 09 ATEX 1 459 X	[= certificate number]

"No use of the equipment in the vicinity of processes generating high charges"

6.8.6 Use of the transponder in hazardous areas for gases

Temperature class delineation for gases

The temperature class of the transponder for hazardous areas depends on the ambient temperature range:

Ambient temperature range	Temperature class
-25 °C to +70 °C	T5

⚠ **WARNING**

Ignitions of gas-air mixtures

When using the RF380T transponder, check to ensure that the temperature class is observed in respect of the requirements of the area of application

Non-compliance with the permitted temperature ranges while using the transponder can lead to ignitions of gas-air mixtures.

⚠ **WARNING**

Ignitions of gas-air mixtures

The maximum transmitting power of the transmitter used to operate the transponder must not exceed 2 W.

Non-compliance with the permissible transmitting power can lead to ignitions of gas-air mixtures.

6.8.7 Installation and operating conditions for the hazardous area

a) Use of the equipment in the vicinity of processes generating high charges is not allowed.

b) The equipment must be mechanically protected when installed.

6.8.8 Technical specifications

Table 6- 14   RF380T with 32 KB FRAM

Memory size	32KB	
Memory organization	Blocks of 8 bits/byte-by-byte	
Memory configuration	Serial number	4 bytes (fixed code)
	Application memory	32765 bytes r/w
	OTP [1] memory	20 bytes
Storage technology	FRAM / EEPROM	
MTBF (Mean Time Between Failures) in years	1177	
Write cycles, at +40 °C	Virtually unlimited (>10^{10})	
Read cycles	Virtually unlimited (>10^{10})	
Data transmission time	Read	Approx. 0.13 ms/byte
	Write	Approx. 0.13 ms/byte
Data retention	> 10 years	
Read/write distance	Dependent on the reader used [see Chapter Field data of RF300 transponders (Page 41)]	
Multitag capability	max. 4 transponders	
Recommended spacing from metal	can be directly mounted on metal	
Power supply	Inductive, without battery	
Degree of protection to EN 60529	IP68	
Shock resistant[2] to EN 60721-3-7	50 g	
Vibration[2] to EN 60721-3-7	5 g	
Direction-dependent	No	
Torsion and bending load	Not permissible continuously	
Enclosure dimensions	(diam. x H in mm) 114 x 83	
Color	Brown	
Material	PPS	
Fixing	Holder to be ordered separately	
Ambient temperature	During operation, continuously	-25 °C to +110°C
	During cyclic operation	-25 °C to +220°C
	Transport and storage	-40°C to +110°C
Weight	Approx. 900 g	

[1]   OTP: One Time Programmable

[2]   Applies only in connection with original bracket
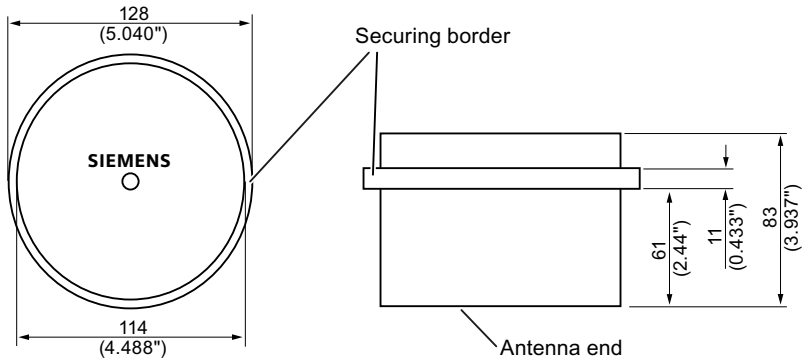
6.8.9 Dimensional drawing

Figure 6-26   Dimension drawing RF380T

Dimensions in mm (inches in brackets)

ISO transponder

7

ISO 15693-compatible transponders, such as the MDS Dxxx from the MOBY D range of products, represent a cost-effective alternative to RF300 tags. The performance that can be achieved with this (data rate, memory size), however, is considerably less than with RF300 tags (see Chapter Communication between communication module, reader and transponder (Page 37)).

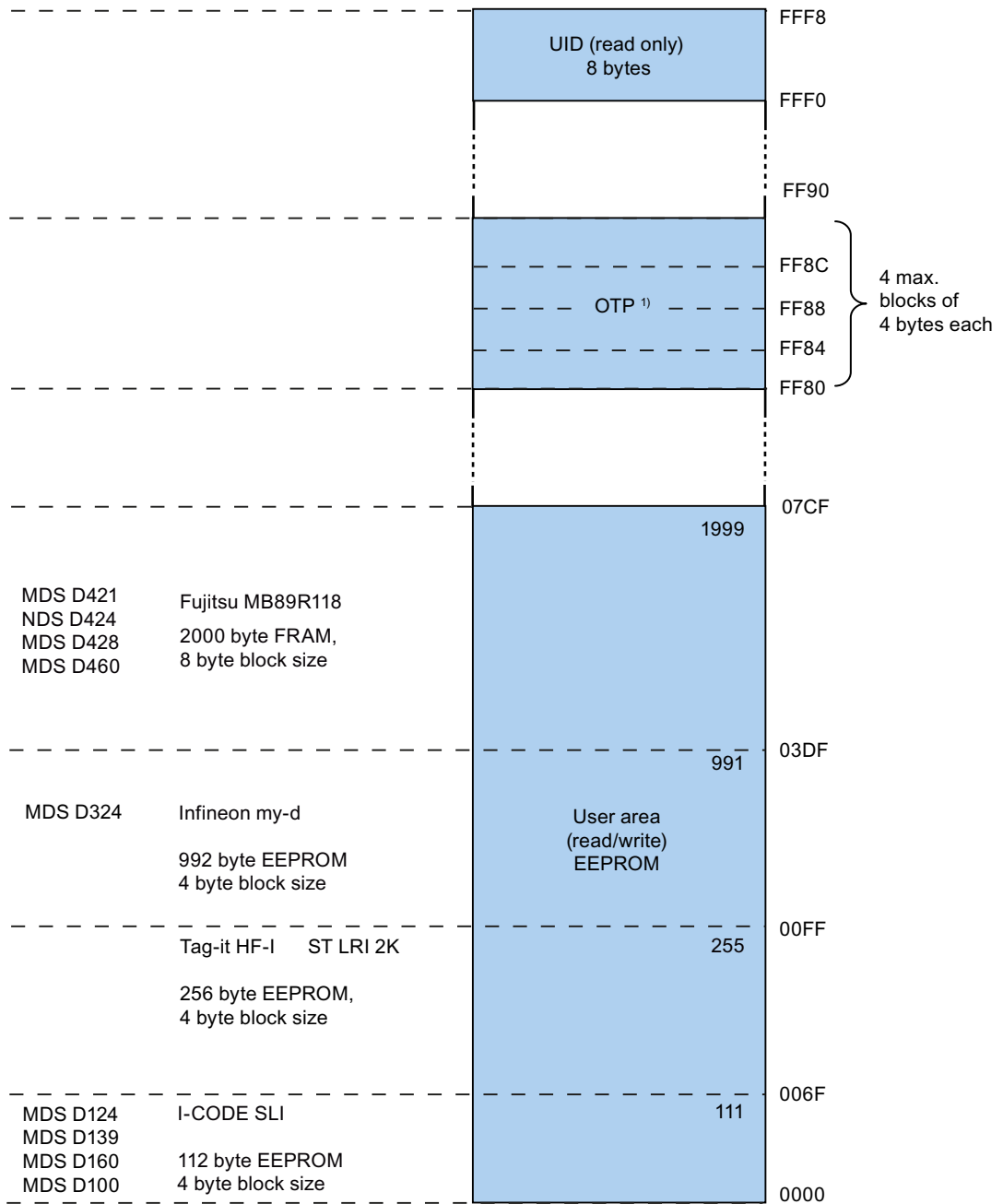Operating with the following ISO tags from MOBY D is described in this manual:

- MDS D100
- MDS D124
- MDS D139
- MDS D160
- MDS D324
- MDS D421
- MDS D424
- MDS D428
- MDS D460

Compatible RF300 readers

ISO tags can currently only be processed using the following readers:

- SIMATIC RF310R (RS422) [6GT2801-1AB10]
- SIMATIC RF340R [6GT2801-2AB10]
- SIMATIC RF350R [6GT2801-4AB10]
- SIMATIC RF380R [6GT2801-3AB10]

7.2 Memory configuration of the ISO tags

	UID (read only) 8 bytes	FFF8
		FFF0
		FF90
		FF8C
	OTP [1]	FF88
		FF84
		FF80
		07CF / 1999

4 max. blocks of 4 bytes each

MDS D421
NDS D424
MDS D428
MDS D460

Fujitsu MB89R118

2000 byte FRAM,
8 byte block size

03DF / 991

MDS D324

Infineon my-d

992 byte EEPROM
4 byte block size

User area
(read/write)
EEPROM

00FF / 255

Tag-it HF-I   ST LRI 2K

256 byte EEPROM,
4 byte block size

006F / 111

MDS D124
MDS D139
MDS D160
MDS D100

I-CODE SLI

112 byte EEPROM
4 byte block size

0000

1) If the OTP area is used, there will be a correspondingly lower amount of user memory available, because the OTP area always occupies the uppermost 16 bytes of the user memory.

Figure 7-1   Memory configuration of ISO tags

Memory areas

Depending on the manufacturer of the transponder chip, the memory configuration of an ISO tag consists of EEPROM memory of varying sizes. Except for transponders that are equipped with a Fuijtsu 2k FRAM, these are equipped with only one FRAM.

The typical sizes are 112 bytes, 256 bytes, 992 bytes or 2000 bytes. Each ISO transponder chip features an 8-byte unique serial number (UID, read only). This UID is transferred as an 8 byte value through a read command to address FFF0 with a length of 8.

OTP area

For the OTP area, a 16-byte address space is always reserved at the end of the memory area. The blocks are divided up depending on the chip (see technical specifications). For the user, this means that the corresponding addresses for the user data are not available to the application when the OTP area is used.

A total of 4 block addresses ("mapped" addresses) are provided:

- FF80
- FF84
- FF88
- FF8C

A write command to this block address with a valid length (4, 8, 12, 16 depending on the block address) protects the written data from subsequent overwriting.

Note

Exception - Fujitsu chip

This chip only has 8-byte blocks, which means that only 2 block addresses have to be addressed: FF80 and FF88 (lengths 8 and 16).

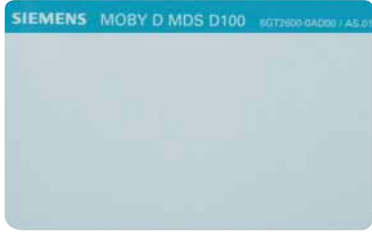| NOTICE |
| --- |
| OTP writing/locking should only be used in static operation. |

NOTICE
Use of the OTP area is not reversible. If you use the OPT area, you cannot undo it, because the OPT area can only be written to once.

7.3 MDS D100

7.3.1 Characteristics

The MDS D100 mobile data memory is a passive, maintenance-free transponder based on the ISO 15693 standard with I-Code technology.

MDS D100	Characteristics	
SIEMENS MOBY D MDS D100 6GT2600-0AD00 / A5.01	Field of application	From simple identification such as electronic barcode replacement/supplementation, through warehouse and distribution logistics, right up to product identification.
	Memory	EEPROM 128 bytes gross 112 bytes net capacity
	Read/write range	See Chapter Field data of ISO transponders (Page 44).
	Mounting on metal	Not possible; recommended distance from metal ≥ 20 mm
	ISO standard	15693 with I-code technology

@ noch zu ergänzen: wo soll das wie hin?Befestigung des MDS D100 (...0AD10) Bohrung / Stanzung max. 3,5 mm, Schraube nach DIN 4017: M3, Kopfdurchmesser max. 6 mm

7.3.2 Ordering data

Table 7- 1   Ordering data for MDS D100

MDS D100	Order number
• Memory size: 112 byte EEPROM • Operating temperature: -25 °C … +80 °C • Dimensions: 85.6 x 54 x 0.9 (L x W x H, in mm) • ISO card • IP68	6GT2600-0AD10

Table 7- 2   Ordering data for MDS D100 accessory

MDS D100 accessory	Order number
Spacers	6GT2190-0AA00
Fixing pocket	6GT2190-0AB00
Fixing pocket (cannot be mounted directly on metal)	6GT2390-0AA00

7.3.3 Mounting on metal

Direct mounting of the MDS D100 on metal is not allowed. A distance of ≥ 20 mm is recommended. This can be achieved using the spacer 6GT2190-0AA00 in combination with the fixing pocket 6GT2190-0AB00.
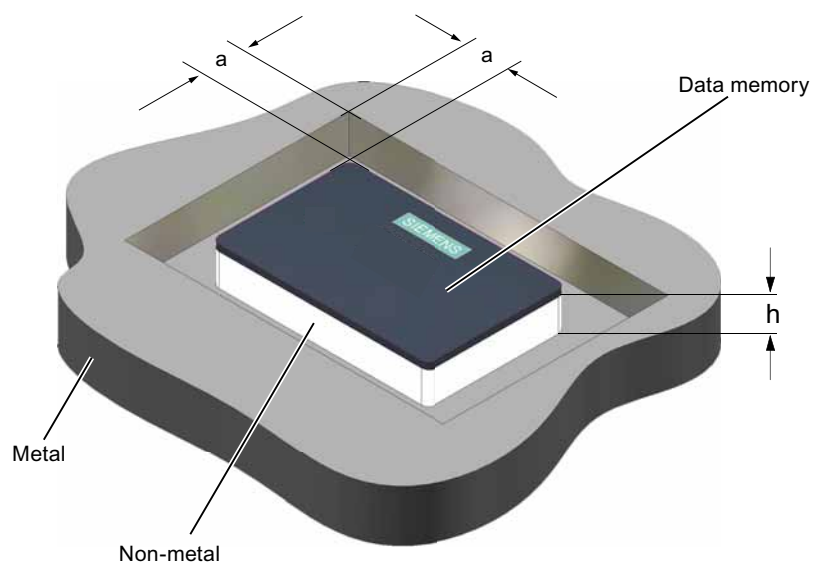
Mounting on metal
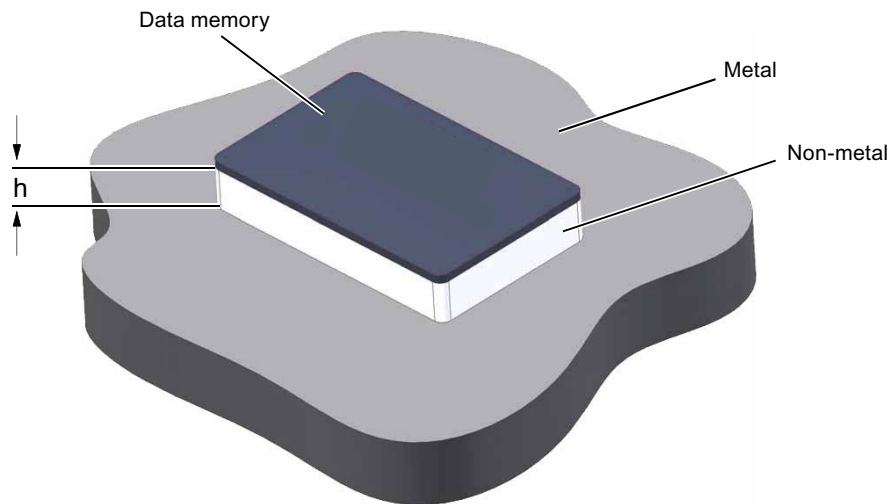
h   ≥ 20 mm

Figure 7-2   Mounting of the MDS D100 on metal with spacer

Flush-mounting

h   ≥ 20 mm
a   ≥ 20 mm

Figure 7-3   Flush-mounting of MDS D100 in metal with spacer

Note

If the minimum guide values (h) are not observed, a reduction of the field data results.

Fixing pocket for MDS D100

The fixing pocket is secured on a non-metallic surface with M4 countersunk head screws in the holes provided.
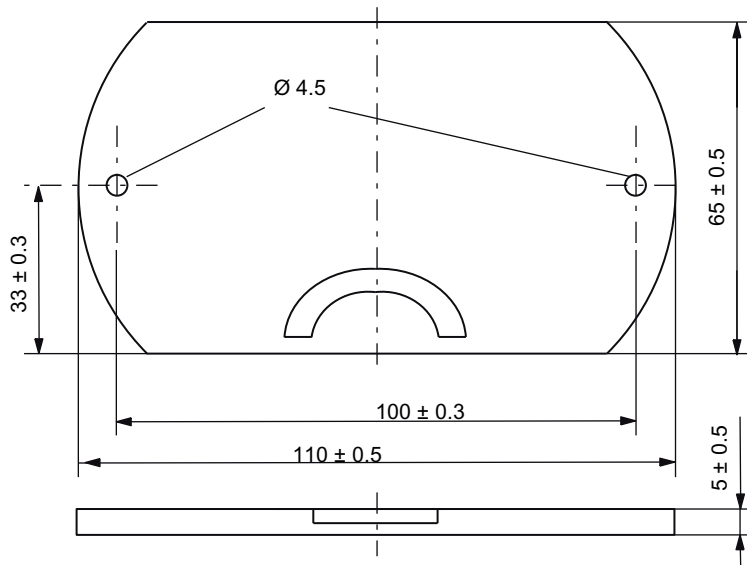
Figure 7-4   Fixing pocket 6GT2390-0AA00 for MDS D100

Note

The fixing pocket shown here with Order No.: 6GT2 390-0AA00 is not suitable for use with the spacer (6GT2 190-0AA00).

Note

When mounting the MDS D100 on metal, it is also possible to use the 6GT2 190-0AB00 fixing pocket, but only in combination with the 6GT2 190-0AA00 spacer.

Fixing pocket with spacer for MDS D100

Dimension sketch

Spacers: 6GT2190-0AA00   Fixing pocket: 6GT2190-0AB00

Material: PA 6
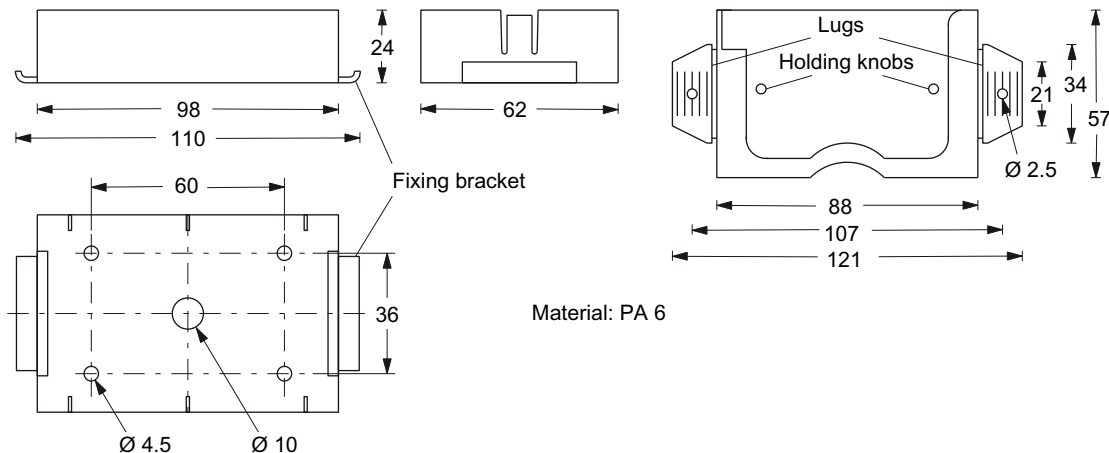
The spacer can be directly mounted on metal. In combination with the
fixing pocket, a non-metal distance of 20 mm results between the transponder and metal.

Mounting:
- With 2 or 4 screws (M4)
- With rubbers on the holding clips (e.g. on mesh boxes)
- With cable ties on the holding clips (e.g. on mesh boxes)

Transponder with fixing pocket
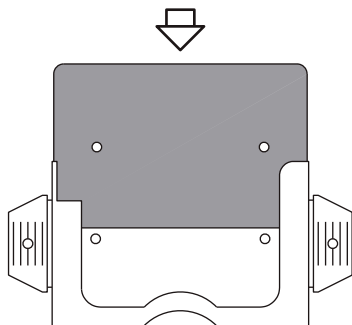
The transponder is inserted into the fixing pocket
.
Locking is carried out using the holding knobs in the fixing pocket.

Transponder with fixing pocket and spacer (connected together)

The fixing pocket is attached to a non-metal base by the ears. This can be achieved with:
- Screws in the holes provided
- Rivets in the holes provided
- Nails through the holes
- Tacks through the plastic of the ears
- Pushing into the spacers
The ears can be moved through up to 90°.
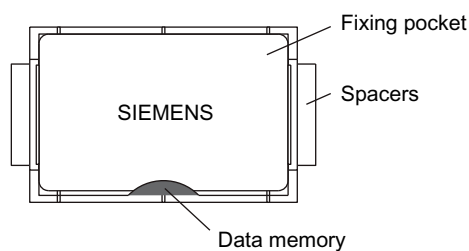
Re-assembly instructions:
The transponder is inserted into the fixing pocket. The ears are moved by 90° and inserted into the spacer. The fixing pocket
must be aligned such that it covers the transponder (see Figure). Locking is automatic.

Figure 7-5   Dimensions of the spacer and fixing pocket 6GT2190-0AB00 for MDS 100

7.3.4 Technical data

Table 7- 3   Technical data for MDS D100

Memory size	128 bytes
Memory configuration • Serial number • Configuration memory • Application memory	 • 8 bytes (fixed code) • 8 bytes • 112 bytes
Storage technology	EEPROM
Memory organization	EEPROM 128 bytes gross 112 bytes net capacity When using the OPT area, 16 bytes of it must be subtracted in 4 byte blocks
Protocol	according to ISO 15693
Data retention (at +40 °C)	10 years
MTBF (at +40 °C)	2×10^6 hours
Read cycles	Unlimited
Write cycles, typical	1 000 000
Write cycles, min.	100 000
Read/write distance (S_g)	See Chapter Field data of ISO transponders (Page 44).
Distance from metal	min. 20 mm (approx. 30% reduction of the field data)
Multitag capability	Yes
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP68
Vibration	ISO 10373/ISO 7810
Torsion and bending load	ISO 10373/ISO 7816-1
Mechanical design • Color • Material • Dimensions (L x W x H) in mm	Laminated plastic card, printable on both sides • White/petrol • PC • 85.6 x 54 x 0.9
Fixing	Adhesive, fixing pocket
Ambient temperature • During operation • Transport and storage	 • -25 °C to +80 °C • -25 °C to +80 °C
Weight, approx.	5 g

7.3.5 Dimension drawing
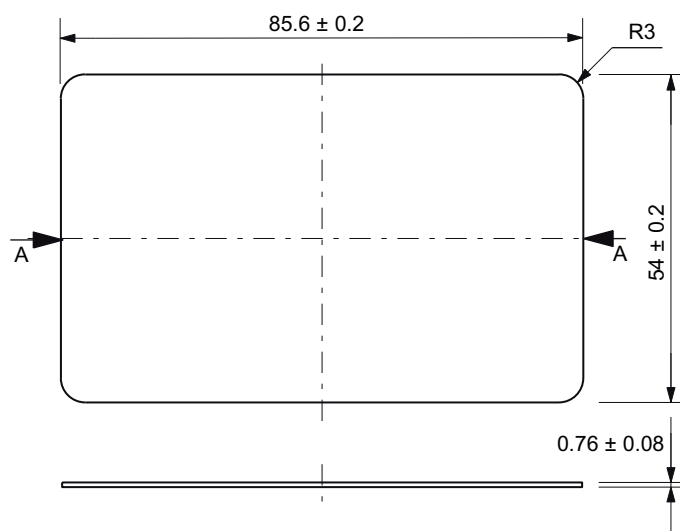
Dimensions in mm

Figure 7-6   MDS D100 dimension drawing

7.4 MDS D124

7.4.1 Characteristics

@ Neuer Kopf - noch nichts geändert! Input fehlt noch The MDS D124 is a passive, maintenance-free transponder based on the ISO 15693 standard with I-Code technology.

This mobile data memory can also be easily used in harsh environments under extreme environmental conditions (e.g. with higher temperature load).

| MDS D124	Characteristics	
	Field of application	Application areas in production and distribution logistics and product identification
	Memory	EEPROM 128 bytes gross 112 bytes net capacity
	Read/write range	See Chapter Field data of ISO transponders (Page 44).
	Mounting on metal	Not possible: Recommended distance from metal ≥ 25 mm
	ISO standard	15693 with I-code technology

7.4.2 Ordering data

Table 7- 4   Ordering data for MDS D124

MDS D124	Order number
• Memory size: 112 byte EEPROM user memory • Operating temperature: -25 °C … +125 °C • Dimensions: Ø = 27 mm x 4 mm • IP67	6GT2600-0AC10

7.4.3 Mounting on metal
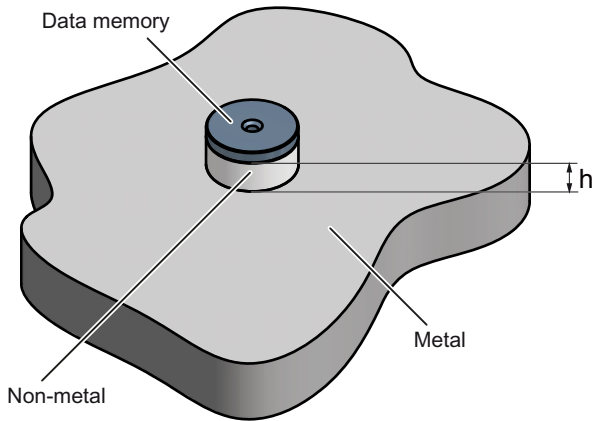
Mounting on metal

h   ≥ 25 mm

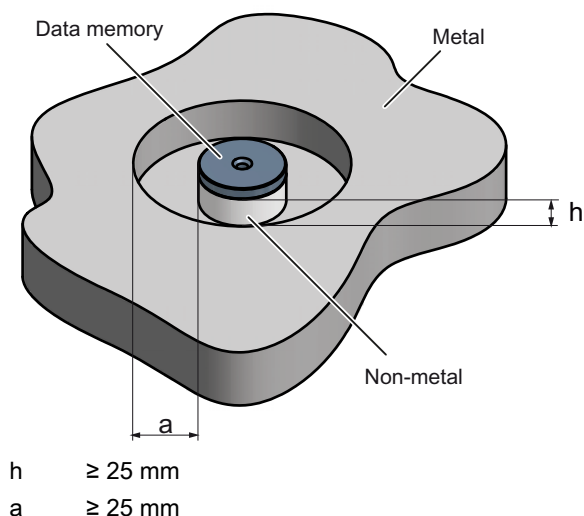Figure 7-7   Mounting of the MDS D124 on metal with spacer

Flush-mounting

h	≥ 25 mm
a	≥ 25 mm

Figure 7-8   Flush-mounting of MDS D124 in metal with spacer

Note

If the minimum guide values (h) are not observed, a reduction of the field data results. It is possible to mount the MDS with metal screws (M3 countersunk head screws). This has no tangible impact on the range.


7.4.4   Technical specifications

Table 7- 5   Technical data for MDS D124

Memory size	128 bytes
Memory configuration • Serial number • Configuration memory • Application memory	 • 8 bytes (fixed code) • 8 bytes • 112 bytes
Storage technology	EEPROM
Memory organization	EEPROM 128 bytes gross 112 bytes net capacity When using the OPT area, 16 bytes of it must be subtracted in 4 byte blocks
Protocol	according to ISO 15693
Data retention (at +40 °C)	10 years
MTBF (at +40 °C)	≥ 1.5 x 10^6 hours

Data transmission rate • Read • Write	• Approx. 3.5 ms/byte • Approx. 9.5 ms/byte
Read cycles	Unlimited
Write cycles, typical	1 000 000
Write cycles, min.	100 000
Read/write distance (S_g)	See Chapter Field data of ISO transponders (Page 44).
Distance from metal	min. 25 mm (approx. 30% reduction of the field data)
Multitag capability	Yes
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP67
Shock according to EN 60721-3-7, Class 7M3 total shock response spectrum, Type II	100 g
Vibration-resistant to EN 60721-3-7, Class 7M3	20 g
Torsion and bending load	Not permissible
Dimensions (D x H) in mm	27 x 4
Color	Black
Material	Epoxy casting resin
Fixing	Adhesive, M3 screw
Tightening torque at +20 °C	≤ 1 Nm (at high temperatures, the expansion coefficients of the materials used must be taken into account)
Ambient temperature • During operation • Transport and storage	• -25 °C to +125 °C • -40 °C to +150 °C
Weight, approx.	5 g

7.4.5 Dimension drawing
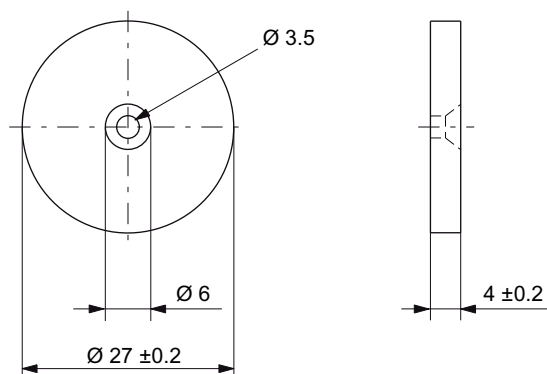
Dimensions in mm

Figure 7-9   Dimension drawing of MDS D124

7.5 MDS D139

7.5.1 Characteristics

The MDS D139 is a passive, maintenance-free transponder based on the ISO standard 15693.

MDS D139	Characteristics	
	Field of application	Applications in production logistics and in assembly lines subject to high temperatures (up to +220 °C, e.g. Paintshop).
	Memory	112-byte user memory
	Read/write range	See Chapter Field data of ISO transponders (Page 44).
	Mounting on metal	With spacer; recommended distance from metal ≥ 30 mm
	ISO standard	15693
	High degree of protection	IP68/x9K
	Material	Plastic PPS; silicone-free

Note

Compatibility with SIMATIC RF300 depending on MLFB number

Only the MDS D139 with MLFB 6GT2600-0AA10 is compatible with SIMATIC RF300.

7.5.2 Ordering data

Table 7- 6   Ordering data for MDS D139

| MDS D139	Order number
• Memory size: 112-byte user memory • Operating temperature: up to +200 °C/+220 °C • Dimensions: 85 x 15 (Ø x H in mm) • IP68/x9K	6GT2600-0AA10

Table 7- 7   Ordering data for MDS D139 accessory

MDS D139 accessory	Order number
Spacers Diameter x height: 85 mm x 30 mm	6GT2690-0AA00

7.5.3 Mounting on metal

CAUTION
Damage to the MDS due to improper mounting
For mounting with the spacer (6GT2690-0AA00), use a stainless steel M5 screw to avoid damaging the MDS in high temperatures (expansion coefficients). In higher temperatures (> +80 °C), observe the expansion coefficients of all materials in order to prevent damage to the MDS due to fastening.

Mounting on metal
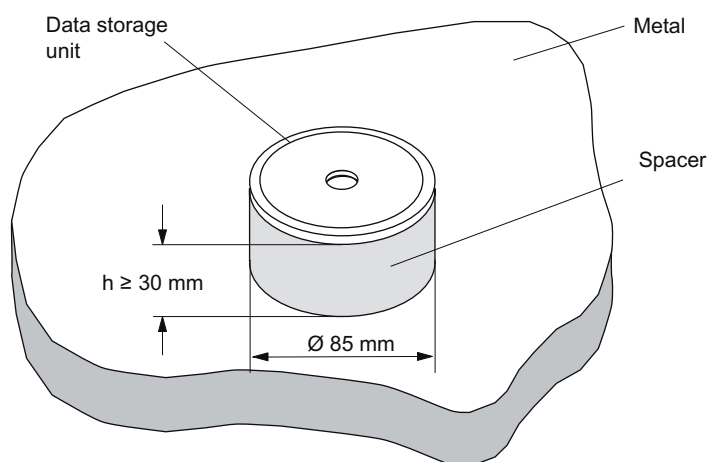
Flush-mounting of the MDS in metal is not permitted!
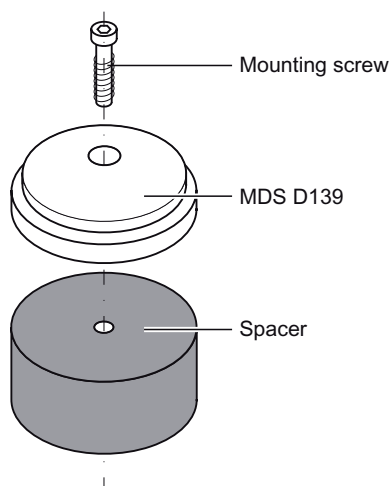
Figure 7-10   Metal-free area for MDS D139

Figure 7-11   MDS D139: Mounting recommended with spacer

Note

If the minimum guide values (h) are not observed, a reduction of the field data results. It is possible to mount the MDS with metal screws (M5). This has no tangible impact on the range. It is recommended that a test is performed in critical applications.

7.5.4 Technical specifications

Table 7- 8   Technical data for MDS D139

Memory size	128 bytes
Memory configuration • Serial number • Configuration memory • Application memory	• 8 bytes (fixed code) • 8 bytes • 112 bytes
Storage technology	EEPROM
Memory organization	See MOBY D System Manual, Chapter 5.1, "Mobile Data Storage Units, Introduction", section "Memory Allocation"
Data retention	10 years
MTBF	2×10^6 hours
Read cycles	Unlimited
Write cycles at +40 °C • minimum • typical	• 100 000 • 1.000.000
Read/write distance (S_g)	See Chapter Field data of ISO transponders (Page 44).
Distance from metal	min. 30 mm (approx. 30% reduction of the field data)
Multitag capability	Yes
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP68/x9K
Shock according to EN 60721-3-7, Class 7M3 Total shock response spectrum, Type II	50 g
Vibration-resistant to EN 60721-3-7, Class 7M3	20 g
Torsion and bending load	Not permissible
Dimensions (D x H) in mm	85 x 15
Color	Black
Material	• Plastic PPS • No silicone
Fixing	1 x M5 screw [1]
Tightening torque	1.5 Nm [2]
Ambient temperature	• During operation	-25 °C to +100 °C	Permanent
		+120 °C to +140 °C	20% reduction in the limit distance
		+200 °C [3]	Tested up to 5000 hours or 3000 cycles
		+220 °C	Tested up to 2000 hours or 1500 cycles

	• Transport and storage	-40 °C to +100 °C
Weight		Approx. 50 g

1) For mounting with the spacer (6GT2690-0AA00), use a stainless steel M5 screw to avoid damaging the MDS in high temperatures (expansion coefficient).

2) In higher temperatures (> +80 °C), observe the expansion coefficient of all materials in order to prevent damage to the MDS due to fastening.

3) Note that no processing is possible at temperatures of +140 °C or higher.

7.5.5 Use of the MDS D139 in hazardous areas

The MDS D139 mobile data memory is classed as a piece of simple, electrical equipment and can be operated in Protection Zone 2, Device Group II, Category 3G.

The following requirements of the Directive 94/9/EC are fulfilled:

II 3 G Ex nA II T2 EN 60079-0 :2006 and EN 60079-15 : 2005

7.5.6 Dimensional drawing
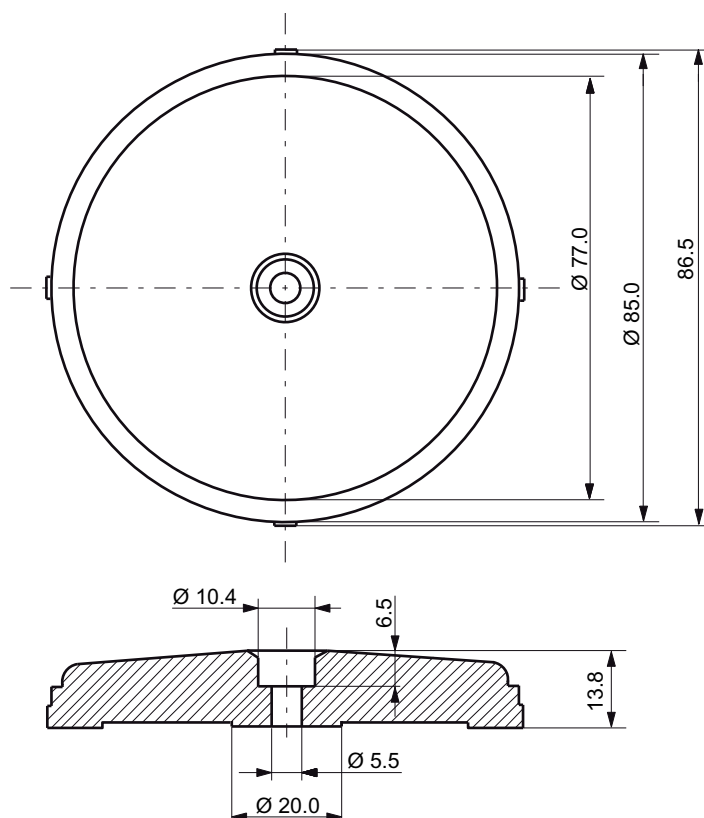
Dimensions in mm

Figure 7-12   Dimensional drawing MDS D139

7.6 MDS D160

7.6.1 Characteristics

This mobile data memory is a passive, maintenance-free laundry tag based on the ISO 15693 standard with I-Code technology for cyclic applications.

MDS D160	Characteristics	
	Field of application	Typical applications are, for example: • Rented work clothing • Hotel laundry • Surgical textiles • Hospital clothing • Dirt collection mats • Clothing for nursing homes/hostels
	Memory	EEPROM 128 bytes gross 112 bytes net capacity
	Read/write range	See Chapter Field data of ISO transponders (Page 44).
	Mounting on metal	Not possible: Recommended distance from metal ≥ 25 mm
	High resistance	Thanks to its rugged packaging, the MDS D160 is a transponder that can be used under extreme environmental conditions. It is washable, heat-resistant and resistant to all chemicals generally used in the laundry process.
	ISO standard	15693 with I-code technology for cyclic applications

7.6.2 Information for RF300 compatibility

Note

Compatibility with SIMATIC RF300 depending on MLFB number

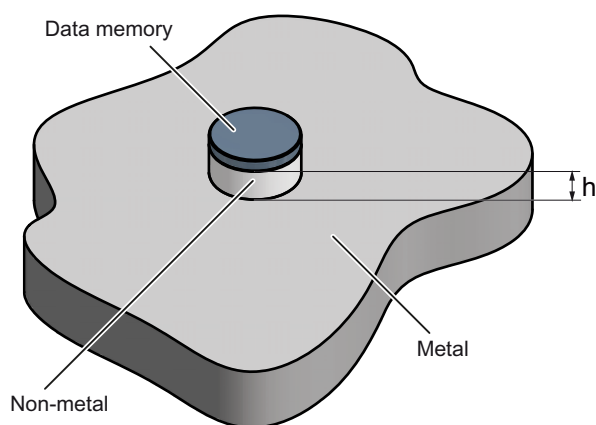Only the MDS D160 with MLFB 6GT2600-0AB10 is compatible with SIMATIC RF300.

7.6.3 Ordering data

Table 7- 9   Ordering data for MDS D160

MDS D160	Order number
• IP68 (24 hours, 2 m, +20 °C) • Memory size: 112 byte user memory • Operating temperature: -25 °C ... +70 °C • Dimensions: 16 x 3 ±0.1 (Ø x H in mm) • Laundry tag for cyclical applications (r/w)	6GT2600-0AB10

7.6.4 Mounting on metal

Mounting on metal

h   ≥ 25 mm

Figure 7-13   Mounting of the MDS D160 on metal with spacer

Note

If the minimum guide values (h) are not observed, a reduction of the field data results.
In critical applications, it is recommended that a test is performed.

Flush-mounting

Flush-mounting of the MDS D160 in metal is not permitted!

7.6.5   Technical specifications

Memory size	128 bytes
Memory configuration • Serial number • Configuration memory • Application memory	 • 8 bytes (fixed code) • 8 bytes • 112 bytes
Storage technology	EEPROM
Memory organization	EEPROM 128 bytes gross 112 bytes net capacity When using the OPT area, 16 bytes of it must be subtracted in 4 byte blocks
Protocol	According to ISO 15693
Data retention (at +55 °C)	10 years
MTBF (at +40 °C)	$2x\ 10^{6}$ hours
Data transmission rate • Read • Write	 • Approx. 3.5 ms/byte • Approx. 9.5 ms/byte
Bulk detection/multitag capability	Yes
Data retention	10 years
Read cycles	Unlimited
Write cycles at + 40 °C, typical	1 000 000
Write cycles, min.	100 000
Read/write distance (S_g)	See Chapter Field data of ISO transponders (Page 44)
Distance from metal	Min. 25 mm (approx. 30% reduction of the field data)
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP68 (24 hours, 2 m, +20 °C)
Shock, tested in accordance with IEC 68-2-27	40 g (18 ms; 6 axes; 2000 repeats/h)
Vibration, tested in accordance with IEC 68-2-6	10 g (10 to 2000 Hz; 3 axes; 2.5 h)
Torsion and bending load	Not permissible
Mechanical strength • Isostatic pressure • Axial pressure • Radial pressure	 • 300 bar for 5 min • 1000 N for 10 s • 1000 N for 10 s
Resistance to chemicals	All chemicals normally used in the washing process
MDS lifespan	At least 100 wash cycles

Mechanical design	Pressed, impact-resistant plastic		
• Color	• Gray		
• Material	• PPA (polyphthalamide)		
• Dimensions (D x H) in mm	• 16 x 3 ±0.1		
MDS fixing	Patch, sew, glue		
Ambient temperature			
	During operation	-25 °C to +70 °C	Permanent
		+120 °C	for 100 hours (20% reduction in the limit distance)
		+175 °C	100 x for 10 minutes
		+220 °C	1 x for 30 seconds
	Transport and storage	-25 °C to +85 °C	
Weight, approx.	1 g		
* No processing possible from +140 °C upwards **@ wo gehört diese Fußnote hin?**			

Note
- Regeneration time for the MDS D160 between wash cycles must be at least 24 hours
- It is recommended that a test is performed in critical applications.

7.6.6   Dimension drawing

Ø 16   3 $^{+0.1}$
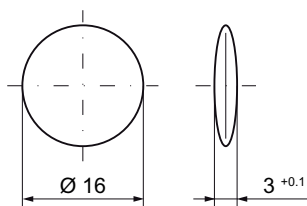
Dimensions in mm

Figure 7-14   Dimension drawing of MDS D160

7.7 MDS D324

7.7.1 Characteristics

The MDS D324 is a passive, maintenance-free transponder based on the ISO standard 15693 with my-d technology.

| MDS D324	Characteristics	
	Field of application	Production and distribution logistics and product identification
	Memory	For the user, the usable application memory amounts to 992 byte.
	Read/write range	See Chapter Field data of ISO transponders (Page 44).
	Mounting on metal	Not possible: Recommended distance from metal ≥ 25 mm
	High resistance	Can also be used in harsh environments under extreme environmental conditions (e.g. with higher temperature load).
	ISO standard	15693 with my-d technology.

7.7.2 Ordering data

Table 7- 10   Ordering data MDS D324

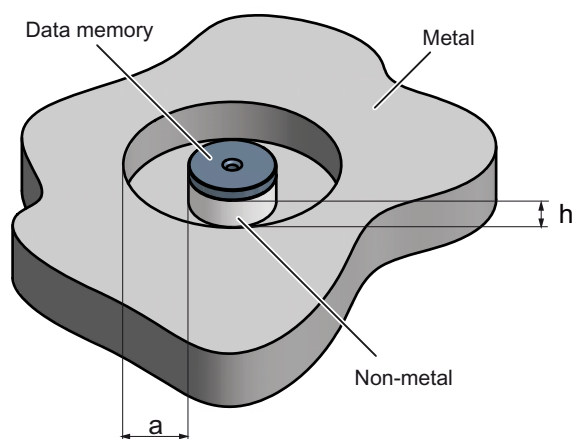| MDS D324	Order number
• IP67 • Memory size: 992 byte EEPROM user memory • Operating temperature: -25 °C...+125 °C • Dimensions: 27 x 4 (Ø x H in mm)	6GT2600-3AC00

7.7.3 Mounting on metal
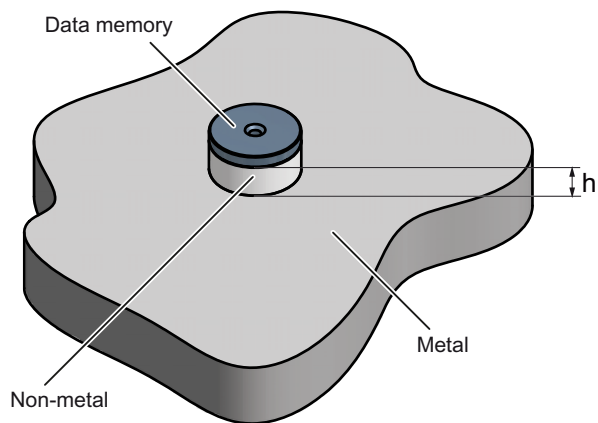
Mounting on metal

h   ≥ 25 mm

Figure 7-15   Mounting of the MDS D324 on metal with spacer

h   ≥ 25 mm

a   ≥ 25 mm

Figure 7-16   Flush-mounting of MDS D324 in metal with spacer

---

Note

If the minimum guide values (h) are not observed, a reduction of the field data results. It is possible to mount the MDS with metal screws (M3 countersunk head screws). This has no tangible impact on the range.


7.7.4 Technical specifications

Table 7- 11   Technical data MDS D324

Memory size	1024 bytes
Memory configuration • Serial number • Configuration memory • Manufacturer data	 • 8 bytes (fixed code) • 1008 bytes • 8 bytes
Storage technology	EEPROM
Memory organization	1024 EEPROM/gross 992 net capacity When using the OPT area, 16 bytes of it must be subtracted in 4 byte blocks
Protocol	according to ISO 15693
Data retention (at +40 °C)	10 years
MTBF (at +40 °C)	$\geq 1.5 \times 10^6$ hours
Data transmission rate • Read • Write	 • Approx. 3.5 ms/byte • Approx. 9.5 ms/byte
Read cycles	Unlimited
Write cycles, typical	1 000 000
Write cycles, min.	100 000
Read/write distance (S_g)	See Chapter Field data of ISO transponders (Page 44)
Distance from metal	Min. 25 mm (approx. 30% reduction of the field data)
Multitag capability	Yes
Anti-collision speed	Approx. 20 transponders/s simultaneously identifiable
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP67
Shock resistant to EN 60721-3-7, Class 7M3 total shock response spectrum, type II	100 g
Vibration-resistant to EN 60721-3-7, Class 7M3	20 g
Torsion and bending load	Not permissible
Dimensions (D x H) in mm	27 x 4
Color	Black
Material	Epoxy casting resin
Fixing	Adhesive, M3 screw
Tightening torque at +20 °C	≤ 1 Nm (at high temperatures, the expansion coefficients of the materials used must be taken into account)

Ambient temperature	
• During operation	• -25 °C to +125 °C
• Transport and storage	• -40 °C to +150 °C
Weight, approx.	5 g

7.7.5 Dimension drawing
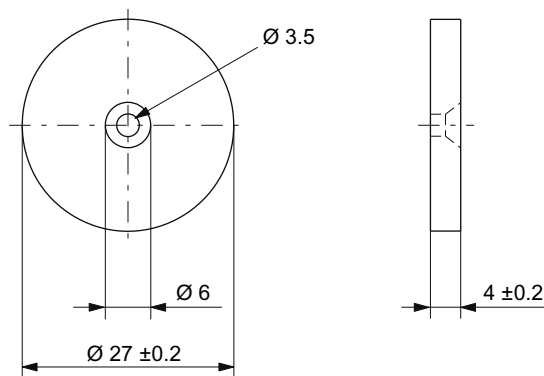
Dimensions in mm

Figure 7-17   Dimension drawing of MDS D324

7.8 MDS D421

7.8.1 Characteristics

MDS D421	Characteristics	
	Field of application	The MDS D421 is designed for tool coding in accordance with DIN 69873.
		It can be used wherever small data carriers and exact positioning are required, e.g. tool identification, workpiece holders
	Memory	FRAM 2048 bytes gross
		2000 bytes net
	Read/write range	See Chapter .
	Mounting	Flush-mounted in and on metal
	High resistance	Rugged packaging of the MDS D421; can therefore also be used in a harsh industrial environment without problem
	Standard	Oriented according to ISO standard 15693

7.8.2   Ordering data

Table 7- 12   Ordering data of MDS D421

MDS D421	Order number
• Memory size: 2000 byte FRAM user memory • Operating temperature: –25 °C to +85 °C • Dimensions: 10 x 4.5 (Ø x H in mm) • IP 67 / x9K	6GT2600-4AE00

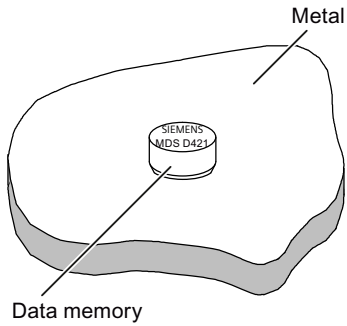## 7.8.3   Mounting on metal

Mounting on metal

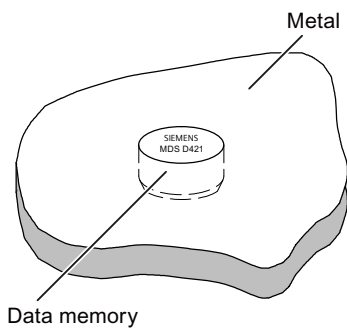Figure 7-18   Mounting of MDS D421 on metal

Flush-mounting

Figure 7-19   Mounting of MDS D421 in metal
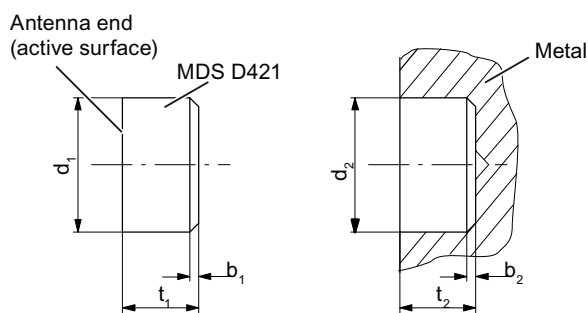
Flush-mounting of MDS D421 in metal with tools

Figure 7-20   Flush-mounting of MDS D421 in metal with tools

b_1	0.5 x 45°	b_2	0.3 x 45° or R 0.3
d_1	10 (-0,04.. -0,13)	d_2	10 (+0,09... 0)
t_1	4,5 (-0... -0,1)	t_2	4,6 (+0,2... 0)

Note

The MDS should not protrude out of the locating hole; it must be flush with the outside contour.

The mounting instructions of the MDS and the conditions associated with the application (e.g. peripheral speed, temperature, and use of coolant) must be observed during the installation.

Mounting information for adhesion

- Drill installation hole
- The adhesive surfaces must be dry, free from dust, oil, stripping agents and other impurities
- Apply adhesive according to the manufacturer's processing instructions
- Press in MDS D421 using your finger; antenna side to the outside (see figure "Flush-mounting of MDS D421 in metal with tools")
- Remove residues of adhesive
- Allow to cure according to the manufacturer's instructions
- Flush-mounting of MDS D421 in metal with tools
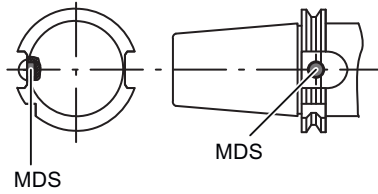
Installation examples

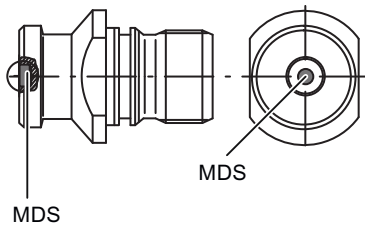Figure 7-21   Installation example of MDS D421 in a steep cone

Figure 7-22   Installation example of MDS D421 in a stud bolt

7.8.4   Technical specifications

|	
Memory size	2048 bytes
Memory configuration • Serial number • Configuration memory • Application memory	 • 8 bytes (fixed code) • 40 bytes • 2000 bytes
Storage technology	FRAM
Memory organization	2048 bytes gross 2000 bytes net
Protocol	ISO 15693
MTBF (at +40 °C)	2.5×10^6 hours
Read cycles	Unlimited
Write cycles at +40 °C	$> 10^{10}$ typ.
Data transmission rate for read and write	Approx. 2 ms/byte
Bulk detection/multitag capability	Yes
Data retention (at +40°C)	10 years
Read/write distance (S_g)	See Chapter
Direction-dependent	No
Power supply	Inductive power transmission (without battery)
[1] Vibration in accordance with IEC 68-2-6	20 g
[1] Shock in accordance with IEC 68-2-27	100 g
Torsion and bending load	Not permissible

MDS fixing	Adhesion [2];
	e.g. Araldit AW2101/HW2951 or 2021;
	UHU-Plus endfest 300

Degree of protection	
• In accordance with EN 60529	• IP 67
• In accordance with DIN 40050 Part 9	• IPx9K [3]

Enclosure	Pressed, impact-resistant plastic
• Color	• Black
• Material	• Epoxy casting resin
• Dimensions (D x H) in mm (dimensions and tolerances in accordance with DIN 69873)	• ⌀ 10 x 4.5 (chamfer underneath 0.5 x 45°)

Ambient temperature	During operation	–25 °C to +85 °C
	Transport and storage	–40 °C to +100 °C

Weight, approx.	4 g

[1] The values for shock and vibration are maximum values and must not be applied continuously.

[2] The manufacturer's processing instructions must be observed.

[3] steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C

7.8.5   Dimension drawing
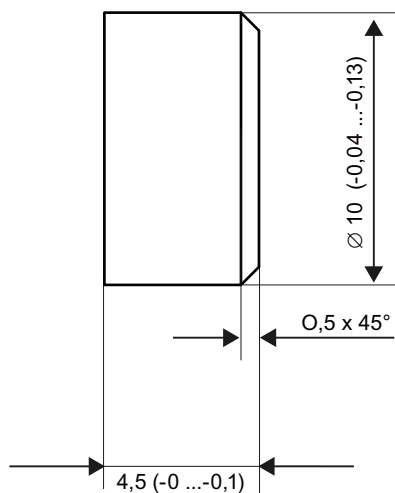
Dimensions in mm

Figure 7-23   Dimension drawing of MDS D421

7.9 MDS D424

7.9.1 Characteristics

| MDS D424	Characteristics	
	Field of application	Production and distribution logistics as well as in assembly and production lines
	Memory	FRAM 2048 bytes gross 2000 bytes net
	Read/write range	See Chapter .
	Mounting on metal	Not possible: Recommended distance from metal ≥ 25 mm
	High resistance	Can also be used in a harsh industrial environment without problem
	Standard	Oriented according to ISO standard 15693

7.9.2 Ordering data

Table 7- 13   Ordering data of MDS D424

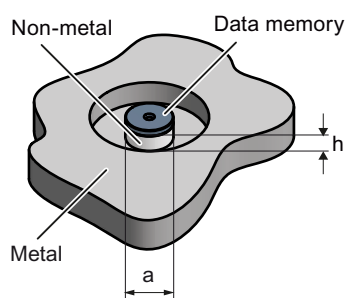| MDS D424	Order number
• Memory size: 992 byte EEPROM user memory • Operating temperature: -25 °C ...+125 °C • Dimensions: 27 x 4 (Ø x H in mm) • IP67	6GT2600-4AC00

7.9.3   Mounting on metal
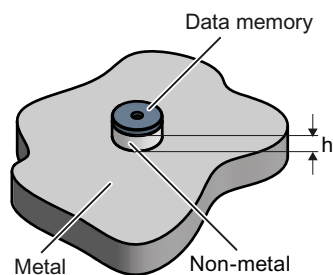
Mounting on metal

h	≥ 25 mm

Figure 7-24   Mounting of the MDS D424 on metal with spacer

Flush-mounting

h	≥ 25 mm
a	≥ 25 mm

Figure 7-25   Flush-mounting of MDS D424 in metal with spacer

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Note

If the minimum guide values (h) are not observed, a reduction of the field data results. It is possible to mount the MDS with metal screws (M3 countersunk head screws). This has no tangible impact on the range.


7.9.4 Technical specifications

Table 7- 14   Technical data of MDS D424

Memory size	2048 bytes
Memory configuration • Serial number • Configuration memory • Manufacturer data	 • 8 bytes (fixed code) • 1008 bytes • 2000 bytes
Storage technology	FRAM
Memory organization	2048 bytes gross 2000 bytes net When using the OPT area, 16 bytes of it must be subtracted in 4 byte blocks
Protocol	SO 15693
Data retention (at +40 °C)	10 years
MTBF (at +40 °C)	$\geq 1.5 \times 10^6$ hours
Data transmission rate for read and write	Approx. 2 ms/byte
Read cycles	Unlimited
Write cycles (at +40 °C)	$> 10^{10}$
Read/write distance (S_g)	See Chapter
Distance from metal	Min. 25 mm (approx. 30% reduction of the field data)
Multitag capability	Yes
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP 67, IP x9K [2]
[1] Shock in accordance with EN 60721-3-7 Class 7M3 Total shock response spectrum, Type II	100 g
[1] Vibration in accordance with EN 60721-3-7 Class 7M3	20 g
Torsion and bending load	Not permissible
Dimensions (D x H) in mm	
Enclosure • Color • Material • Dimensions	 • Black • Epoxy casting resin • 27 x 4
Fixing	M3 screw, adhesive
Tightening torque at +20 °C	≤ 1 Nm

Ambient temperature	
• During operation	• -25 °C to +85 °C
• Transport and storage	• -40 °C to +100 °C
Weight, approx.	5 g

[1] The values for shock and vibration are maximum values and must not be applied continuously.

[2] steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C

7.9.5 Dimension drawing
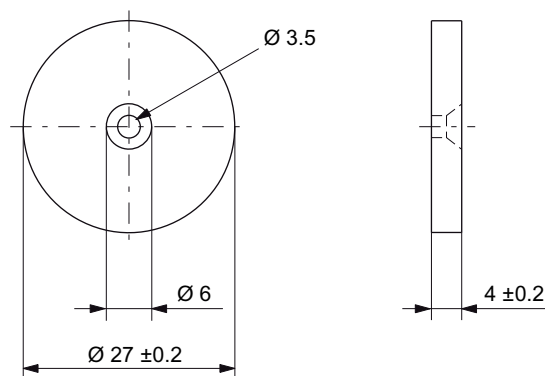
Dimensions in mm

Figure 7-26   Dimension drawing of MDS D424

7.10 MDS D428

7.10.1 Characteristics

MDS D428	Characteristics	
	Field of application	Compact and rugged ISO transponder; suitable for screw mounting Use in assembly and production lines in the powertrain sector
	Memory	FRAM 2048 bytes gross 2000 bytes net
	Read/write range	See Chapter .
	Mounting on metal	Yes
	High resistance	Rugged packaging of the MDS D428; can therefore also be used under extreme environmental conditions without problem
	Standard	Oriented according to ISO-15693

MDS D428	Characteristics

7.10.2   Ordering data

Table 7- 15   Ordering data of MDS D428

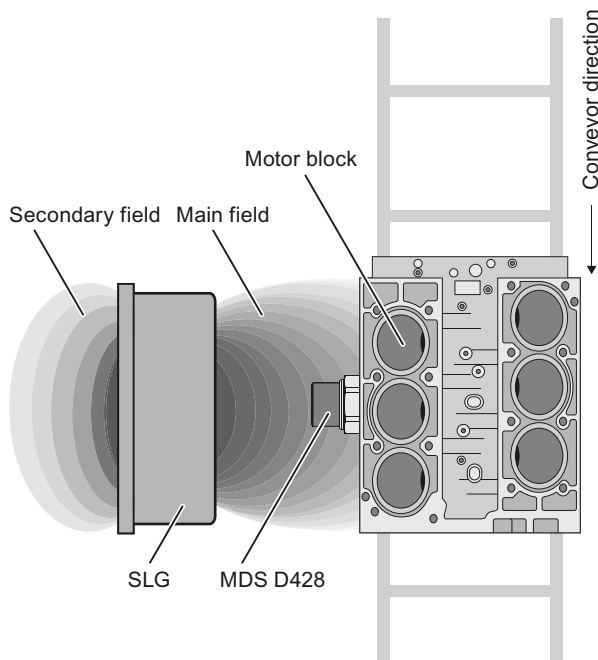| MDS D428	Order number
• Memory size: 2000 byte FRAM user memory • Operating temperature: -25 °C ...+85 °C • Dimensions (D x H): 18 mm x 20 mm (without thread), tolerance 1 mm; M8 thread • IP68; IPx9K	6GT2600-4AK00

7.10.3   Application example of MDS D428

Figure 7-27   Application example

7.10.4   Technical specifications

|	
Memory size	2048 bytes
Memory configuration • Serial number • Configuration memory • Application memory	 • 8 bytes (fixed code) • 40 bytes • 2000 bytes
Storage technology	FRAM
Memory organization	2048 bytes gross 2000 bytes net
Protocol	ISO 15693
Data retention (at +40 °C)	10 years
Data transmission rate for read and write	Approx. 2 ms/byte
Bulk detection/multitag capability	Yes
Read cycles	Unlimited
Write cycles at + 40 °C, typical	> 10^{10}
Read/write distance (S_g)	See Chapter
Distance from metal	Can be mounted on metal
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP68 [1)] IPx9K [2)]
[3)] Shock in accordance with IEC 68-2-27	50 g
[3)] Vibration in accordance with IEC 68-2-6	20 g
Torsion and bending load	Not permissible
Enclosure • Color • Material • Dimensions (D x H)	 • Black • Plastic PA 6.6 GF; thread: Stainless steel • 18 mm x 20 mm (without thread), tolerance 1 mm; M8 thread
MDS fixing	Screws, tightening torque (at room temperature) ≤ 1 Nm
Ambient temperature • During operation • Transport and storage	 • -25 °C to +85 °C • -40 °C to + 125 °C
Weight, approx.	35 g

[1)]   24 hours, 2 m, +20 °C

[2)]   steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C

[3)]   The values for shock and vibration are maximum values and must not be applied continuously.

Note

It is recommended that a test is performed in critical applications.

7.10.5   Dimension drawing
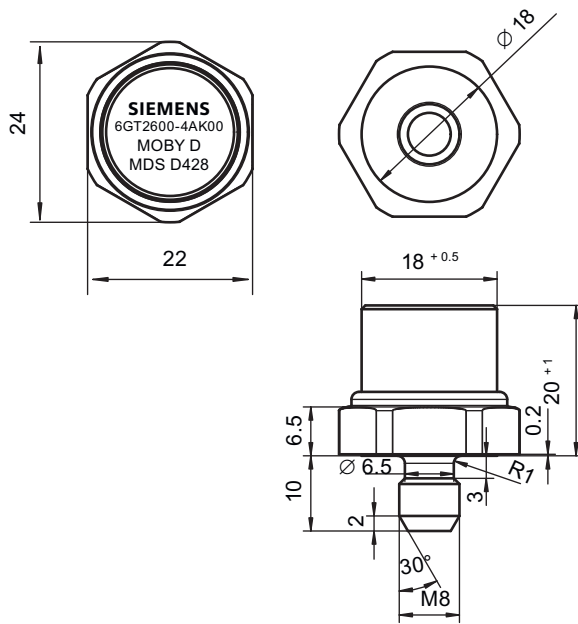
Dimensions in mm

Figure 7-28   Dimension drawing of MDS D428

7.11   MDS D460

7.11.1   Characteristics

MDS D460	Characteristics	
Dummy	Field of application	Identification tasks on small assembly lines in harsh industrial environments
	Memory	FRAM 2048 bytes gross
		2000 bytes net
	Read/write range	See Chapter .
	Mounting on metal	Not possible:
		Recommended distance from metal ≥ 25 mm

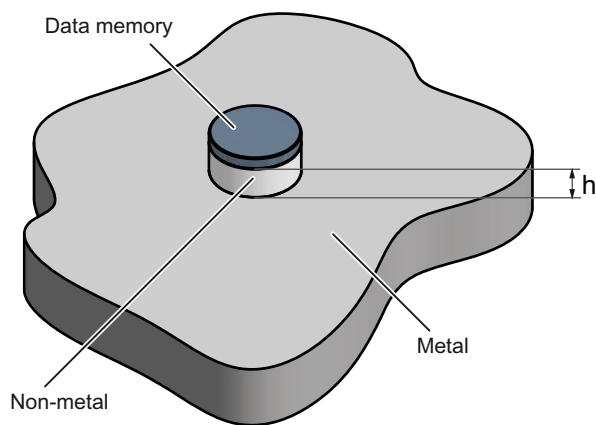| MDS D460	Characteristics	
	High resistance	Can also be used in a harsh industrial environment
	Standard	Oriented according to ISO standard 15693

7.11.2   Ordering data

Table 7- 16   Ordering data of MDS D460

MDS D460	Order number
• Memory size: 2000 byte FRAM user memory • Operating temperature: -25 °C ...+85 °C • Dimensions: 16 x 3 ±0.1 (Ø x H in mm) • IP68	6GT2600-4AB00

7.11.3   Mounting on metal

Mounting on metal

h   ≥ 25 mm

Figure 7-29   Mounting of the MDS D460 on metal with spacer

Note

If the minimum guide values (h) are not observed, a reduction of the field data results.
In critical applications, it is recommended that a test is performed.

Flush-mounting

Flush-mounting of the MDS D460 in metal is not permitted!

7.11.4   Technical specifications

Memory size	2048 bytes
Memory configuration • Serial number • Configuration memory • Application memory	 • 8 bytes (fixed code) • 40 bytes • 2000 bytes
Storage technology	FRAM
Memory organization	2048 bytes gross 2000 bytes net
Protocol	ISO 15693
Data retention (at +40 °C)	10 years
MTBF (at +40 °C)	2×10^6 hours
Data transmission rate for read and write	Approx. 2 ms/byte
Bulk detection/multitag capability	Yes
Read cycles	Unlimited
Write cycles (at +40 °C, typical)	$> 10^{10}$
Read/write distance (S_g)	See Chapter
Distance from metal	min. 25 mm (approx. 30% reduction of the field data)
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP68 [1] IPx9K [2]
[3] Shock in accordance with IEC 68-2-27	50 g
[3] Vibration in accordance with IEC 68-2-6	20 g
Torsion and bending load	Not permissible
Mechanical design • Color • Material • Dimensions (D x H) in mm	 • Black • Epoxy casting resin • 16 x 3 ±0,2
MDS fixing	Adhesion, spacer

Ambient temperature		
	During operation	-25 °C to +85 °C permanent
	Transport and storage	-40 °C to +100 °C

Weight, approx.	3 g

[1] 2 hours, 2 m, +20 °C

[2] steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C

[3] The values for shock and vibration are maximum values and must not be applied continuously.

7.11.5 Dimension drawing
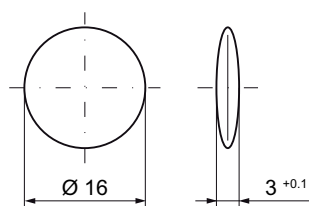
Dimensions in mm

Figure 7-30   Dimension drawing of MDS D460