Antennas

6

6.1 Features

For the RF350R and RF350M readers, you can use the following plug-in antennas:

Antenna	Product photo	Limit distance S_g [1]	Dimensions
ANT 1		Up to 140 mm	75 x 75 x 20 mm (L x W x H)
ANT 3		Up to 50 mm	50 x 75 x 10 mm (L x W x H)

Antenna	Product photo	Limit distance S_g [1]	Dimensions
ANT 3S		Up to 5 mm	50 × 28 × 10 mm (L x W x H)
ANT 8 [2]		Up to 4 mm	M8 x 1.0 x 39 mm (∅ x thread x L)
ANT 12		Up to 16 mm	M12 x 1.0 x 40 mm (∅ x thread x L)
ANT 18		Up to 35 mm	M18 x 1.0 x 55 mm (Ø x thread x L)
ANT 30		Up to 55 mm	M30 x 1.5 x 61 mm (Ø x thread x L)

[1] Depending on the transponder used

[2] only released with RF350M und RF350R - second generation

Note

Use of the antennas in hazardous areas

The antennas ANT 1, ANT 12, ANT 18 and ANT 30 are approved for use in hazardous locations. For more information, refer to the section "Use of the reader in hazardous areas (Page 149)".

ANT 1

The ANT 1 is an antenna in the mid performance range and can be used to the customer's advantage in production and assembly lines due to its manageable housing shape. The antenna dimensions make it possible to read/write large quantities of data dynamically from/to the transponder during operation. The antenna cable can be connected at the reader end.

ANT 3

The ANT 3 is designed for use in small assembly lines. The extremely compact design of the antenna allows extremely accurate positioning. The antenna cable can be connected at the reader end.

ANT 3S

The ANT 3S is designed for use in small assembly lines. The extremely compact design of the antenna allows extremely accurate positioning even with small transponders. The antenna cable can be connected at the reader end.

ANT 8

The ANT 8 is primarily envisaged for tool identification applications. The extremely small design of the antenna allows extremely accurate positioning. The antenna cable can be connected at the reader end and screwed to the antenna.

The antenna ANT 8 has currently only been tested and released for use in conjunction with the mobile reader RF350M and the reader RF350R - second generation.

ANT 12

The ANT 12 is primarily envisaged for tool identification applications. The very small size of the antenna means that highly exact positioning is possible using the plastic nuts included in the scope of delivery. The antenna cable can be connected at the reader end.

ANT 18

The ANT 18 is designed for use in small assembly lines. Due to its small, compact construction, the antenna can be easily positioned for any application using two plastic nuts (included in the package). The antenna cable can be connected at the reader end.

ANT 30

The ANT 30 is designed for use in small assembly lines. In comparison to ANT 18, the maximum write/read distance is approximately 60 % larger. Due to its compact construction, the antenna can be easily positioned for any application using two plastic nuts (included in the package). The antenna cable can be connected at the reader end.

6.2 Ordering data

Table 6- 1 Ordering data for antennas

		Article number
ANT 1	incl. integrated antenna cable 3 m	6GT2398-1CB00
ANT 3	without antenna connecting cable	6GT2398-1CD30-0AX0
	incl. plug-in antenna cable 3 m	6GT2398-1CD40-0AX0
ANT 3S	without antenna connecting cable	6GT2398-1CD50-0AX0
	incl. plug-in antenna cable 3 m	6GT2398-1CD60-0AX0
ANT 8	without antenna connecting cable	6GT2398-1CF00
	incl. plug-in antenna cable 3 m	6GT2398-1CF10
ANT 12	incl. plug-in antenna cable 3 m	6GT2398-1CC00
ANT 18	incl. plug-in antenna cable 3 m	6GT2398-1CA00
ANT 30	incl. plug-in antenna cable 3 m	6GT2398-1CD00

Table 6- 2 Antenna accessories ordering data

		Article number
Antenna connecting cable	3 m	6GT2398-0AH30

6.3 Ensuring reliable data exchange

The "center point" of the transponder must be situated within the transmission window.

6.4 Metal-free area

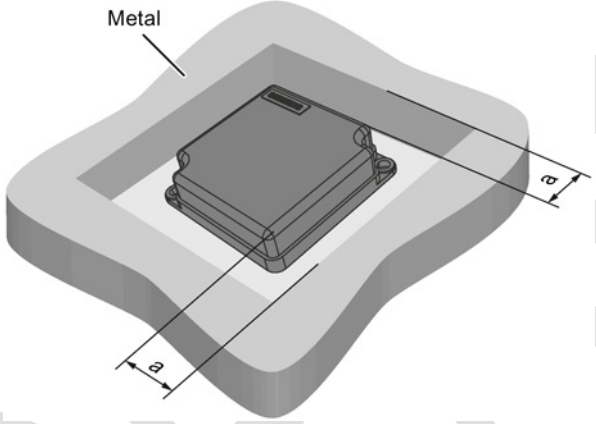
The antennas ANT 1, ANT 8, ANT 12, ANT 18 and ANT 30 can be flush-mounted in metal. Please allow for a possible reduction in the field data values. During installation, maintain the minimum distances (a and b) on/flush with the metal.

Note

Reduction of range if the metal-free space is not maintained

At values lower than a and b, the field data changes significantly, resulting in a reduction in the limit distance and operating distance. Therefore, during installation, maintain the minimum distances (a and b) on/flush with the metal.

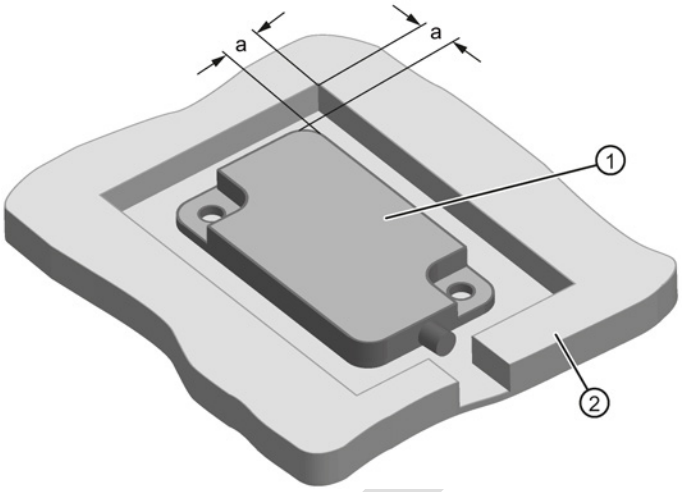
Metal-free space for flush-mounted installation of ANT 1



a = 40 mm

Figure 6-1 ANT 1 flush-mounted in metal

Metal-free space for flush-mounted installation of ANT 3 and ANT 3S



① ANT 3
② Metal
a = 10 mm

Figure 6-2 ANT 3 and ANT 3S flush-mounted in metal

Flush-mounting of ANT 8

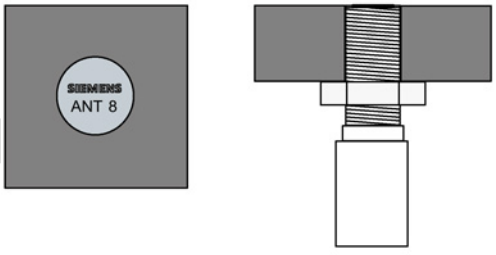


Figure 6-3 ANT 8 flush-mounted in metal

The ANT 8 can be flush-mounted in metal.

Flush-mounting of ANT 12

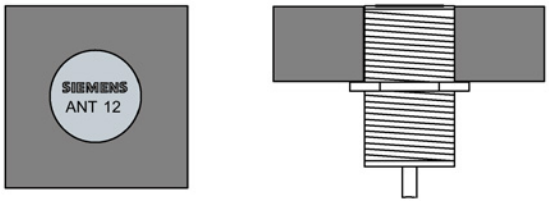
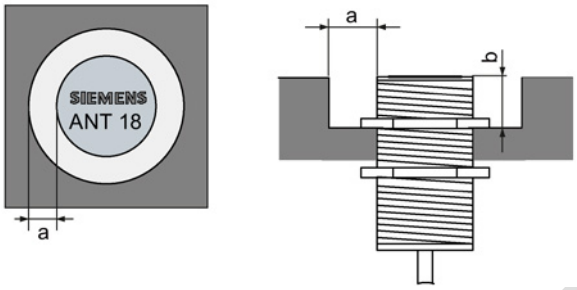


Figure 6-4 ANT 12 flush-mounted in metal

The ANT 12 can be flush-mounted in metal.

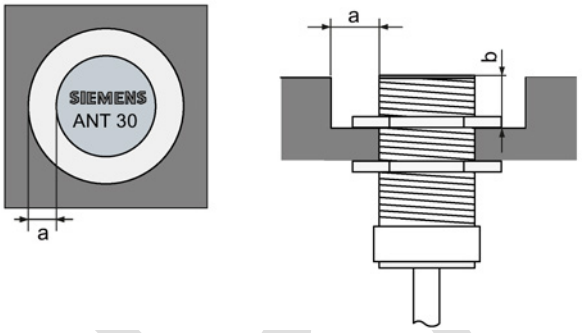
Metal-free space for flush-mounted installation of ANT 18



a = 10 mm
b = 10 mm

Figure 6-5 ANT 18 flush-mounted in metal

Metal-free space for flush-mounted installation of ANT 30

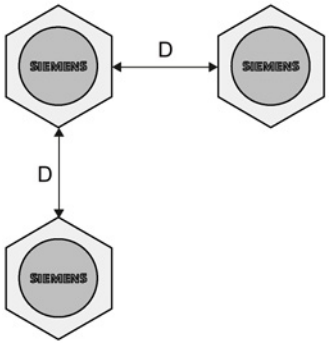


a = 20 mm
b = 20 mm

Figure 6-6 ANT 30 flush-mounted in metal

6.5 Minimum distance between antennas

Table 6- 3 Minimum distance between antennas

Diagram (example)	Minimum distance [mm]	
	**Antennas next to each other**	
	ANT 1	D ≥ 100 mm
	ANT 3	D ≥ 80 mm
	ANT 3S	D ≥ 20 mm
	ANT 8	D ≥ 50 mm
	ANT 12	D ≥ 70 mm
	ANT 18	D ≥ 100 mm
	ANT 30	D ≥ 100 mm
	**Antennas face to face**	
	ANT 1	D ≥ 500 mm
	ANT 3	D ≥ 100 mm
	ANT 3S	D ≥ 50 mm
	ANT 8	D ≥ 50 mm
	ANT 12	D ≥ 100 mm
	ANT 18	D ≥ 100 mm
	ANT 30	D ≥ 200 mm

The reader electronics can be mounted directly alongside each other.

6.6 Technical specifications

Table 6- 4 Technical specifications of the antennas ANT 1, ANT 3 , ANT 3S and ANT 8

	ANT 1	ANT 3	ANT 3S	ANT 8
Max. write/read distance antenna ↔ transponder (S_g)	140 mm	50 mm	5 mm	4 mm
Housing dimensions	75 x 75 x 20 mm (L x W x H)	50 x 28 x 10 mm (L x W x H)	50 x 28 x 10 mm (L x W x H)	M8 x 1.0 x 39 mm (Ø x thread x L)
Color	Anthracite	Black	Black	silver-metallic
Material	Plastic PA 12	Plastic PA6-V0	Plastic PA6-V0	Stainless steel
Plug connection	M8, 4-pin; (pins on antenna side)	M8, 4-pin; socket on antenna side	M8, 4-pin; socket on antenna side	M8, 4-pin; (pins on antenna side)
Degree of protection to EN 60529	IP67			IP67 (front)
Shock-resistant acc. to EN 60721-3-7, Class 7M2 Vibration-resistant to EN 60721-3-7, Class 7M2	50 g [1] 20 g (3 to 50 Hz) [1]			
Attachment of the antenna	2 x M5 screws	2 x M4 screws	2 x M4 screws	2x stainless steel nuts M8 x 1.0 mm
Ambient temperature • During operation • During transportation and storage	 • -25 °C ... +70 °C • -40 °C ... +85 °C			
Weight, approx. • without antenna cable • with antenna cable (3.0 m)	 • -- • 225 g	 • 35 g • 160 g	 • 35 g • 160 g	 • 10 g • 140 g

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

Table 6- 5 Technical specifications of the antennas ANT 12, ANT 18 and ANT 30

	ANT 12	ANT 18	ANT 30
Max. write/read distance antenna ↔ transponder (S_g)	16 mm	35 mm	55 mm
Housing dimensions	M12 x 1.0 x 40 mm (Ø x thread x L)	M18 x 1.0 x 55 mm (Ø x thread x L)	M30 x 1.5 x 61 mm (Ø x thread x L)
Color	Pale turquoise		
Material	Plastic Crastin		
Plug connection	M8, 4-pin; (pins on antenna side)		
Degree of protection to EN 60529	IP67 (front)		
Shock-resistant acc. to EN 60721-3-7, Class 7M2 Vibration-resistant to EN 60721-3-7, Class 7M2	50 g [1)] 20 g (3 to 50 Hz) [1)]		
Attachment of the antenna	2 plastic nuts M12 x 1.0 mm	2 plastic nuts M18 x 1.0 mm	2 plastic nuts M30 x 1.5 mm
Ambient temperature • During operation • During transportation and storage	 • -25 °C to +70 °C • -40 °C to +85 °C		
Approx. weight • without antenna cable • with antenna cable (3.0 m)	 • -- • 145 g	 • -- • 130 g	 • -- • 180 g

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

6.7 Dimensional drawings

The cable length is 3 m. All dimensions are in mm.

ANT 1

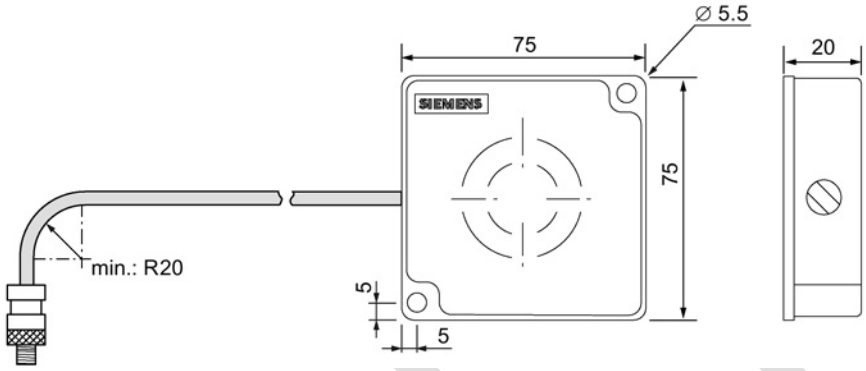


Figure 6-7 Dimension drawing for ANT 1

ANT 3 / ANT 3S

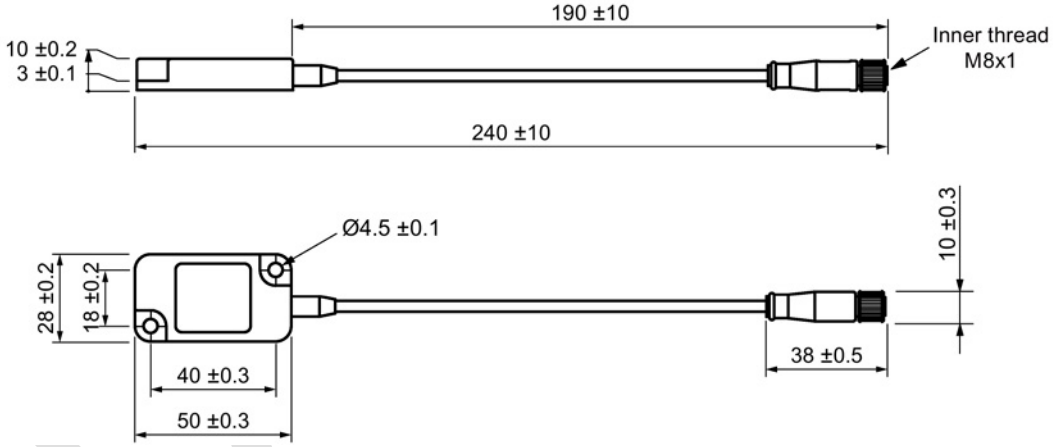


Figure 6-8 Dimension drawing ANT 3 7 ANT 3S

ANT 8

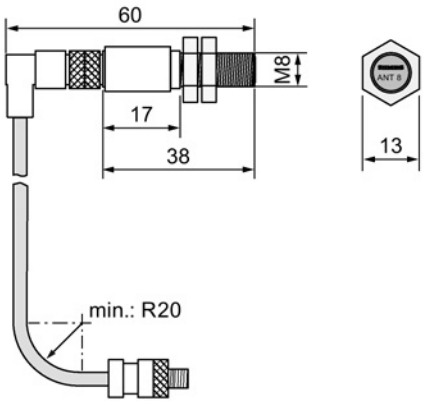


Figure 6-9 Dimension drawing for ANT 8

ANT 12

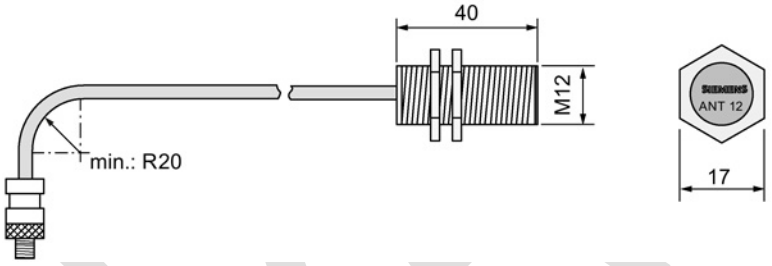


Figure 6-10 Dimension drawing for ANT 12

ANT 18

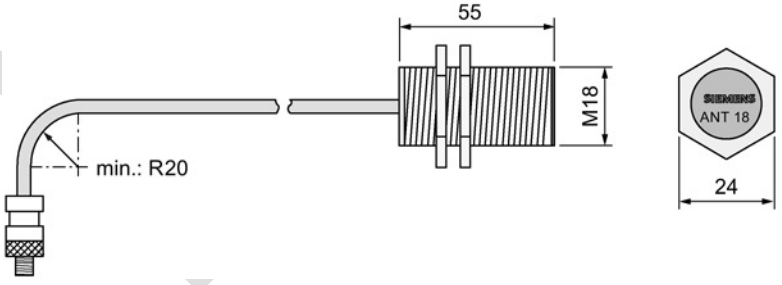


Figure 6-11 Dimension drawing for ANT 18

ANT 30

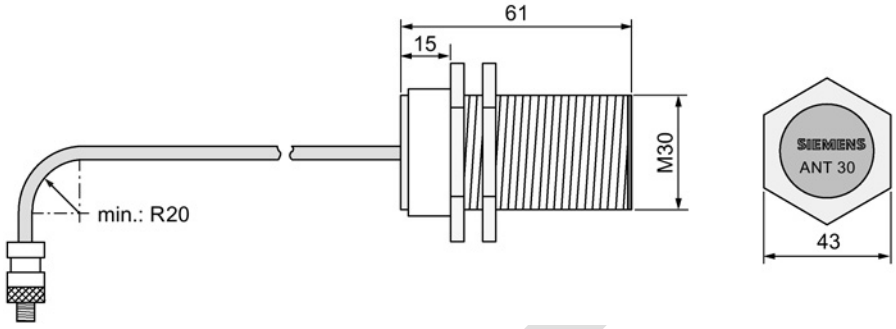


Figure 6-12 Dimension drawing for ANT 30

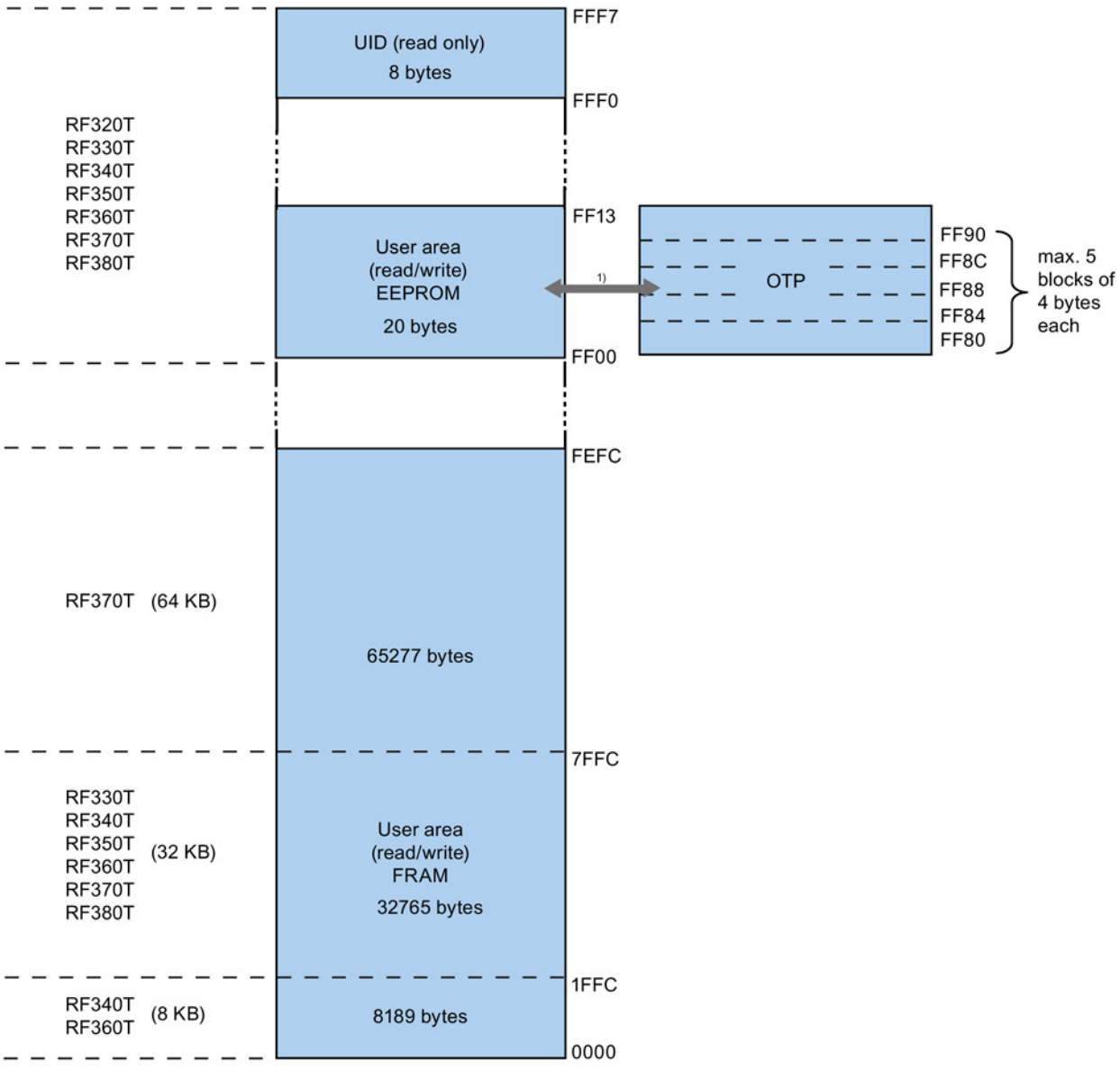
RF300 transponder

7

Features of the RF300 transponders

The RF300 transponders (RF3xxT) stand out particularly for their extremely fast data exchange with the RF300 readers (RF3xxR). With the exception of the RF320T transponder, all of the RF300 transponders have 8 to 64 KB of FRAM memory, which has an almost unlimited capacity for reading and writing.

7.1 Memory configuration of the RF300 transponders



1) Physically identical memory When the OTP area is used, the corresponding user area (FF00-FF13) can no longer be modified (read only).

Figure 7-1 Memory configuration of the RF300 transponders

EEPROM area

The memory configuration of an RF300 transponder always comprises an EEPROM that has 20 bytes for user data (read/write) and a 4-byte unique serial number (UID, read only). For reasons of standardization, the UID is transferred as an 8 byte value through a read command to address FFF0 with a length of 8. The unused 4 high bytes are filled with zeros.

Note

Write speed

The EEPROM user memory (address FF00-FF13, or FF80-FF90) requires significantly more time for writing (approx. 11 ms/byte) than the high-speed FRAM memory. For time-critical applications with write functions, it is advisable to use FRAM transponders (e.g. RF330T, RF340T, RF350T, RF360T, RF370T, RF380T).

FRAM area

Depending on the tag type, high-speed FRAM memory is available. (8 KB, 32 KB, 64 KB). This area does not exist for the RF320T.

In the case of RF3xxT transponders with FRAM memory, the data carrier initialization command (INIT) is only effective on this memory area but not on the EEPROM area (FF00-FF13).

OTP area

The EEPROM memory area (address FF00-FF13) can also be used as a so-called "OTP" memory (One Time Programmable). The 5 block addresses FF80, FF84, FF88, FF8C and FF90 are used for this purpose. A write command to this block address with a valid length (4, 8, 12, 16, 20 depending on the block address) protects the written data from subsequent overwriting.

Note

Seamless use of the OTP area

When the OTP area is used, it must be ensured that the blocks are used starting from Block 0 consecutively.

Examples:

- 3 blocks (with write command), Block 0, 1, 2 (FF80, length = 12): valid
- 2 blocks (consecutive), Block 0 (FF80, length =4), Block 1 (FF84, length = 4): valid
- 2 blocks (consecutive), Block 0 (FF80, length =4), Block 2 (FF88, length = 4): Invalid
- 1 Block, Block 4 (FF90, length = 4): Invalid

Note

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.

7.2 SIMATIC RF320T

7.2.1 Features

RF320T	Characteristics	
	Area of application	Identification tasks on small assembly lines in harsh industrial environments
	Memory size	20 bytes of EEPROM user memory
	Write/read range	See section Field data of RF300 transponders (Page 49)
	Mounting on metal	Yes, with spacer
	Degree of protection	IP67/IPx9K

7.2.2 Ordering data

Table 7- 1 Ordering data RF320T

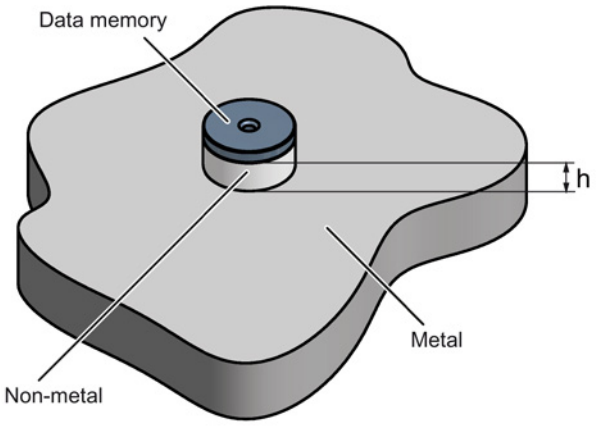
	Article number
RF320T	6GT2800-1CA00

Table 7- 2 Ordering data for RF320T accessories

	Article number
Spacer	6GT2690-0AK00

7.2.3 Mounting on metal

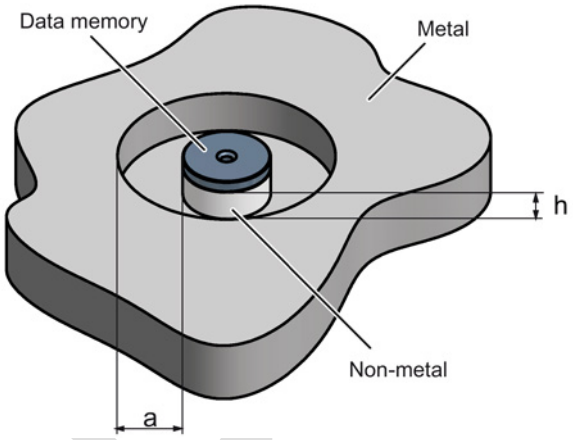
Mounting on metal



h ≥ 15 mm

Figure 7-2 Mounting the MDS D124/D324/D424/D524/E624 and RF320T on metal with spacer

Flush-mounting



h ≥ 15 mm
a ≥ 25 mm

Figure 7-3 Flush-mounting of the MDS D124/D324/D424/D524/E624 and RF320T in metal with spacer

Note

Going below the distances

If the distances (a and 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.

7.2.4 Technical data

Table 7- 3 Technical specifications for RF320T

	6GT2800-1CA00
Product type designation	SIMATIC RF320T
Memory	
Memory organization	Byte-oriented, write protection possible in 4-byte blocks
Memory configuration	
• UID	• 4 bytes EEPROM
• User memory	• 20 bytes EEPROM
• OPT memory	• 20 bytes EEPROM
Read cycles (at < 40 °C)	> 10^{14}
Write cycles (at < 40 °C)	> 10^{5}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of RF300 transponders (Page 49)"
MTBF (Mean Time Between Failures)	1800 years
Mechanical specifications	
Housing	
• Material	• Epoxy resin
• Color	• Black
Recommended distance to metal	≥ 20 mm
Power supply	Inductive, without battery

	6GT2800-1CA00
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +125 °C
• During transportation and storage	• -40 to +140 °C
Degree of protection to EN 60529	• IP67 • IPx9K
Shock-resistant to EN 60721-3-7, Class 7 M3	100 g [1]
Vibration-resistant to EN 60721-3-7, Class 7 M3	20 g [1]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	27 x 4 mm
Weight	5 g
Type of mounting	• 1 x M3 screw [2] ≤ 1.0 Nm • Glued

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

[2]) To prevent it loosening during operation, secure the screw with screw locking varnish.

7.2.5 Dimension drawing

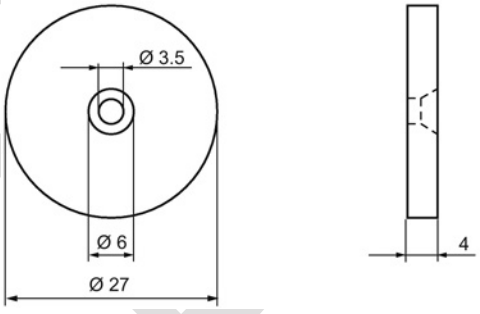


Figure 7-4 RF320T dimension drawing

Dimensions in mm

7.3 SIMATIC RF330T

7.3.1 Features

Table 7- 4

RF330T	Characteristics	
	Area of application	In production automation for identification of metallic workpiece holders, workpieces or containers.
	Memory size	32 KB EEPROM user memory
	Write/read range	See section "Field data of RF300 transponders (Page 49)"
	Mounting on metal	Yes flush mounted on/in metal
	Degree of protection	IP68/IPx9K

7.3.2 Ordering data

Table 7- 5 Ordering data RF330T

	Article number
RF330T	6GT2800-5BA00

Table 7- 6 Ordering data for RF330T accessories

	Article number
Fixing hood RF330T / MDS D423	6GT2690-0EA00

7.3.3 Mounting on/in metal

Direct mounting of the RF330T on metal is permitted.

Mounting of the RF330T on metal

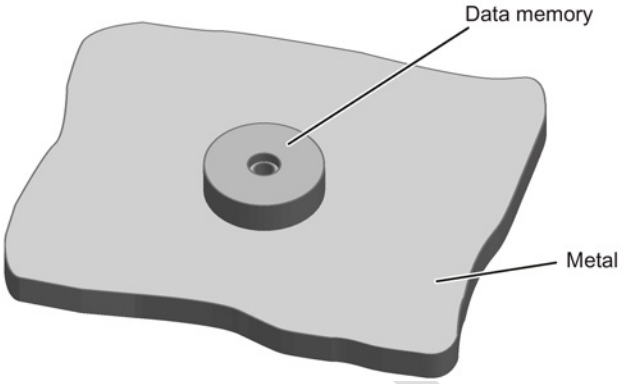
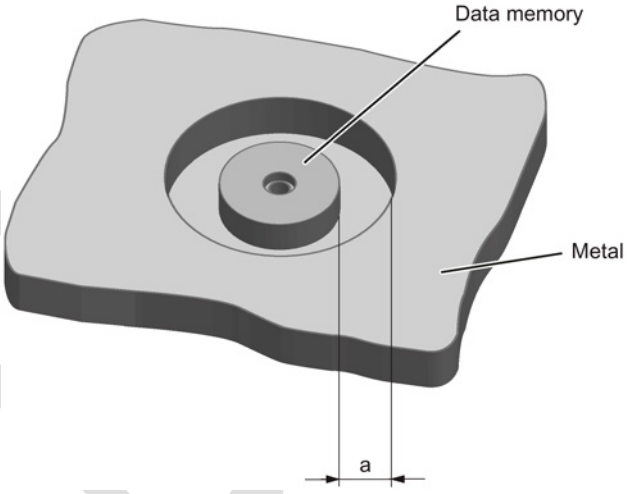


Figure 7-5 Mounting of the RF330T on metal

Flush-mounting of RF330T in metal



a ≥ 10 mm

Figure 7-6 Mounting of the RF330T in metal with 10 mm clearance

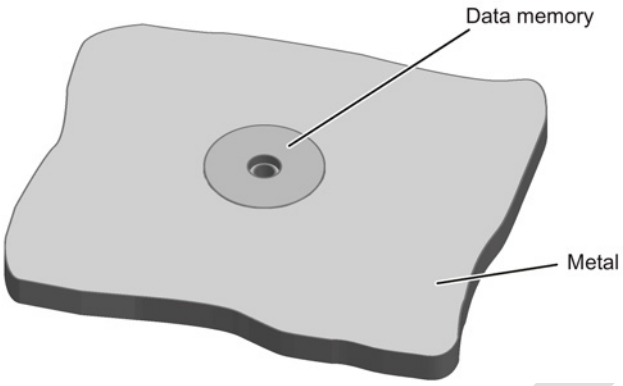


Figure 7-7 Mounting of the RF330T in metal without clearance

Note

Reduction of the write/read range

Note that when the device is flush-mounted in metal without a surrounding clearance ≥ 10 mm, the write/read range is significantly reduced.

7.3.4 Technical specifications

Table 7- 7 RF330T technical specifications

	6GT2800-5BA00
Product type designation	SIMATIC RF330T
Memory	
Memory organization	in bytes
Memory configuration	
• UID	• 4 bytes EEPROM
• User memory	• 8 KB FRAM
• OPT memory	• 20 bytes EEPROM
Read cycles (at < 40 °C)	> 10^{14}
Write cycles (at < 40 °C)	> 10^{14}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of RF300 transponders (Page 49)"
MTBF (Mean Time Between Failures)	1200 years

	6GT2800-5BA00
Mechanical specifications	
Housing	
• Material	• Plastic PPS
• Color	• Black
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C
Degree of protection to EN 60529	• IP68 2 hours, 2 m, 20 °C • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Pressure resistance	• Low pressure resistant vacuum dryer: up to 20 mbar • high pressure resistant (see degree of protection IPx9K)
Shock-resistant to EN 60721-3-7, Class 7 M3	50 g [1)]
Vibration-resistant to EN 60721-3-7, Class 7 M3	20 g [1)]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	30 x 8 mm
Weight	10 g
Type of mounting	1 x M4 screw [2)] ≤ 1.5 Nm

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

2) To prevent it loosening during operation, secure the screw with screw locking varnish.

7.3.5 Dimension drawing

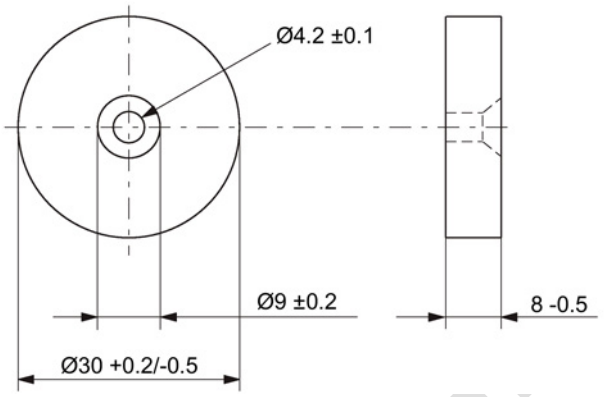


Figure 7-8 RF330T dimension drawing

Dimensions in mm

7.4 SIMATIC RF340T

7.4.1 Features

Table 7- 8

RF340T	Characteristics	
	Area of application	Identification tasks on small assembly lines in harsh industrial environments
	Memory size	• 8 KB FRAM user memory • 32 KB FRAM user memory
	Write/read range	See section Field data of RF300 transponders (Page 49)
	Mounting on metal	Yes
	Degree of protection	IP68/IPx9K

7.4.2 Ordering data

Table 7- 9 Ordering data RF340T

	Article number
RF340T 8 KB FRAM user memory	6GT2800-4BB00
RF340T 32 KB FRAM user memory	6GT2800-5BB00

7.4.3 Mounting on metal

Direct mounting of the RF340T on metal is permitted.

Mounting of RF340T on metal

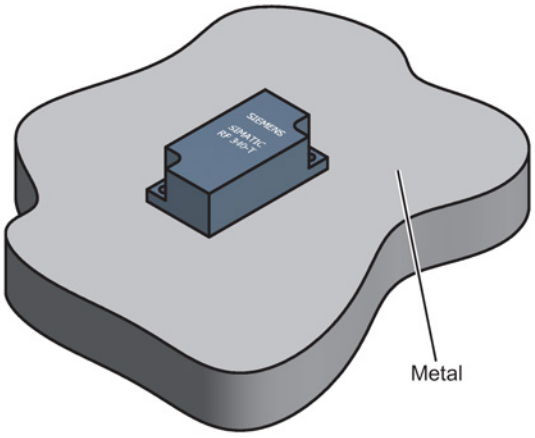


Figure 7-9 Mounting of RF340T on metal

Flush-mounting of RF340T in metal:

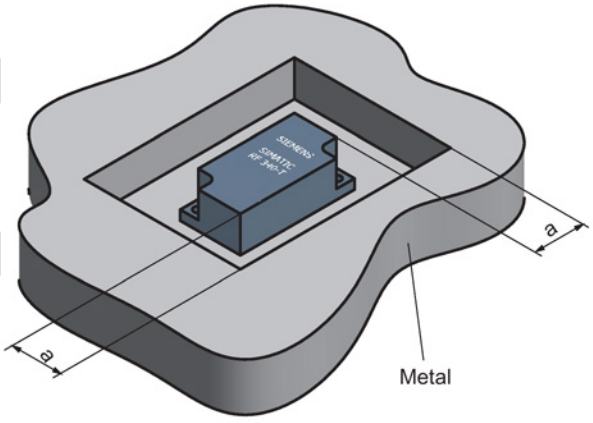


Figure 7-10 Flush-mounting of RF340T in metal

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

7.4.4 Technical specifications

Table 7- 10 Technical specifications for RF340T

	6GT2800-4BB00
Product type designation	SIMATIC RF340T
Memory	
Memory organization	in bytes
Memory configuration	
• UID	• 4 bytes EEPROM
• User memory	• 8 KB FRAM
• OPT memory	• 20 bytes EEPROM
Read cycles (at < 40 °C)	> 10^{10}
Write cycles (at < 40 °C)	> 10^{10}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of RF300 transponders (Page 49)"
MTBF (Mean Time Between Failures)	1200 years
Mechanical specifications	
Housing	
• Material	• Plastic PA 12
• Color	• Anthracite
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +85 °C
Degree of protection to EN 60529	• IP68 • IPx9K
Shock-resistant to EN 60721-3-7, Class 7 M3	50 g [1)]
Vibration-resistant to EN 60721-3-7, Class 7 M3	20 g [1)]
Torsion and bending load	Not permitted

	6GT2800-4BB00
Design, dimensions and weight	
Dimensions (L x W x H)	48 x 25 x 15 mm
Weight	25 g
Type of mounting	2 x M3 screws ≤ 1.0 Nm

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

7.4.5 Dimension drawing

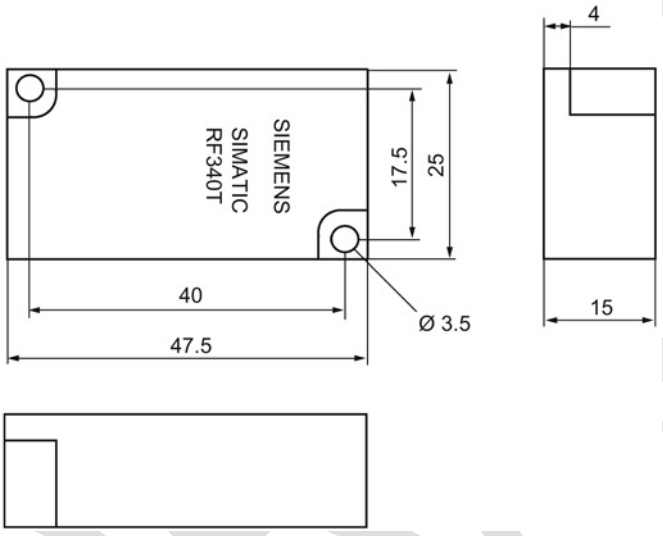


Figure 7-11 RF340T dimension drawing

Dimensions in mm

7.5 SIMATIC RF350T

7.5.1 Features

RF350T	Characteristics	
	Area of application	Identification tasks on small assembly lines in harsh industrial environments
	Memory size	32 KB FRAM user memory
	Write/read range	See section Field data of RF300 transponders (Page 49)
	Mounting on metal	Yes
	Degree of protection	IP68

7.5.2 Ordering data

Table 7- 11 Ordering data RF350T

	Article number
• IP68 • Memory size: 32 KB FRAM (read/write) and 4 bytes EEPROM (read only) • Operating temperature: -25 °C to +85 °C • Dimensions: 50 x 50 x 20 (L x W x H, in mm) • incl. securing frame	6GT2800-5BD00

7.5.3 Mounting on metal

Direct mounting of the RF350T on metal is permitted.

Mounting of RF350T on metal

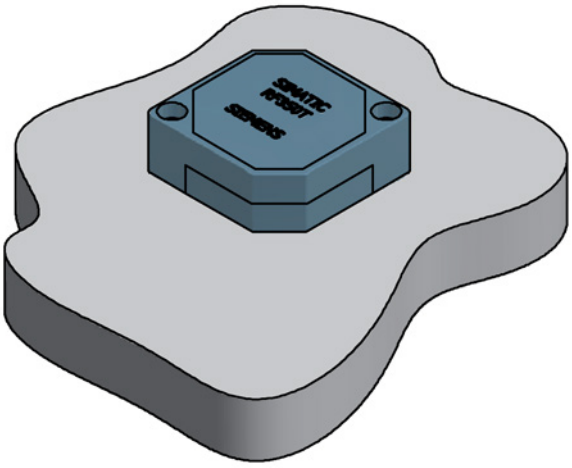


Figure 7-12 Mounting of RF350T on metal

Flush-mounting of RF350T in metal:

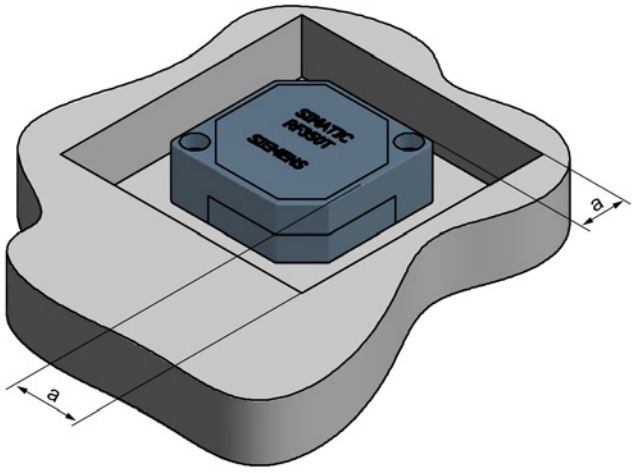


Figure 7-13 RF350T flush-mounted in metal

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

7.5.4 Mounting options

Mounting with fixing frame

The RF350T transponder can be mounted as shown with the fixing frame:

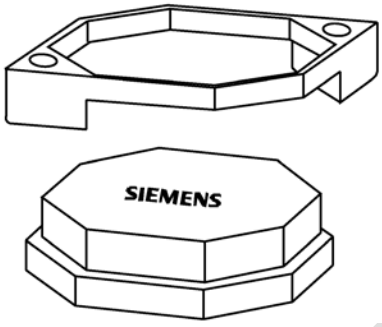


Figure 7-14 Installation diagram

Dimensions of the fixing frame

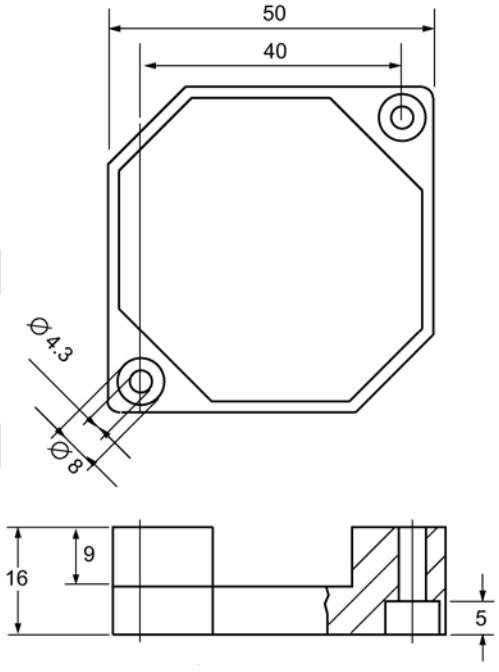


Figure 7-15 RF350T fixing frame

7.5.5 Technical data

Table 7- 12 Technical specifications for RF350T

	6GT2800-5BD00
Product type designation	SIMATIC RF350T
Memory	
Memory organization	in bytes
Memory configuration	
• UID	• 4 bytes EEPROM
• User memory	• 32 KB FRAM
• OPT memory	• 20 bytes EEPROM
Read cycles (at < 40 °C)	> 10^{10}
Write cycles (at < 40 °C)	> 10^{10}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of RF300 transponders (Page 49)"
MTBF (Mean Time Between Failures)	1200 years
Mechanical specifications	
Housing	
• Material	• Plastic PA 12
• Color	• Anthracite
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +85 °C
Degree of protection to EN 60529	IP68
Shock-resistant to EN 60721-3-7, Class 7 M3	50 g [1)]
Vibration-resistant to EN 60721-3-7, Class 7 M3	20 g [1)]
Torsion and bending load	Not permitted

	6GT2800-5BD00
Design, dimensions and weight	
Dimensions (L x W x H)	50 x 50 x 20 mm
Weight	25 g
Type of mounting	2 x M4 screws ≤ 1.5 Nm

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

7.5.6 Dimension drawing

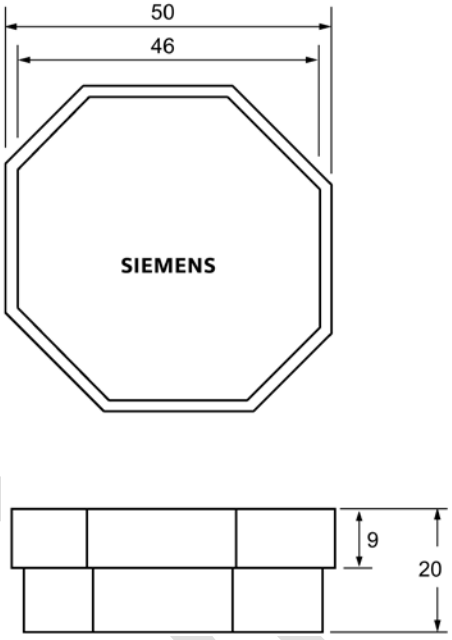


Figure 7-16 RF350T dimension drawing

Dimensions in mm

7.6 SIMATIC RF360T

7.6.1 Features

RF360T	Characteristics	
	Area of application	Identification tasks on small assembly lines in harsh industrial environments
	Memory size	• 8 KB FRAM user memory • 32 KB FRAM user memory
	Write/read range	see section Field data of RF300 transponders (Page 49)
	Mounting on metal	Yes, with spacer
	Degree of protection	IP67

7.6.2 Ordering data

Table 7- 13 Ordering data RF360T

	Article number
RF360T 8 KB FRAM user memory	6GT2800-4AC00
RF360T 32 KB FRAM user memory	6GT2800-5AC00

Table 7- 14 Ordering data for RF360T accessories

	Article number
Spacer (in conjunction with fixing pocket 6GT2190-0AB00)	6GT2190-0AA00
Fixing pocket (in conjunction with spacer 6GT2190-0AA00)	6GT2190-0AB00

7.6.3 Mounting on metal

Direct mounting of the RF360T on metal is not allowed. A distance ≥ 20 mm is recommended. This can be achieved using the spacer 6GT2190-0AA00 in combination with the fixing pocket 6GT2190-0AB00.

Mounting of RF360T on metal

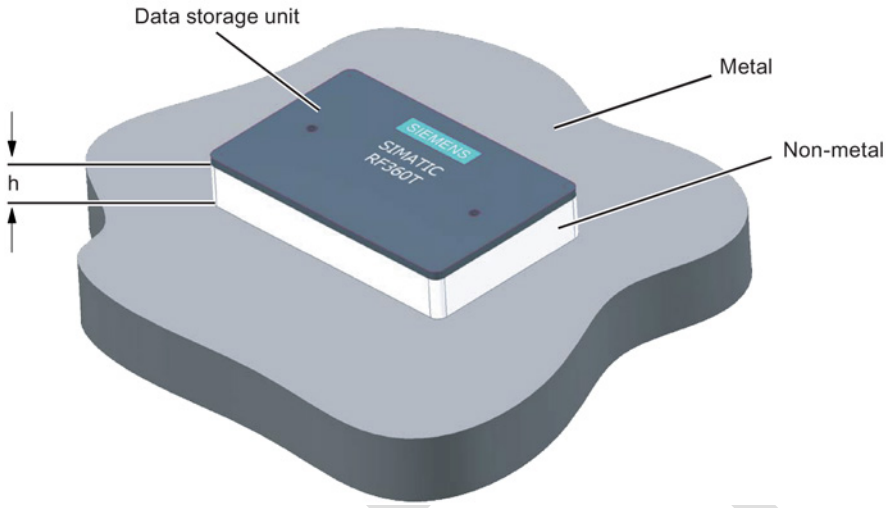


Figure 7-17 Mounting of RF360T with spacer

The standard value for h is ≥ 20 mm.

Flush-mounting of RF360T in metal:

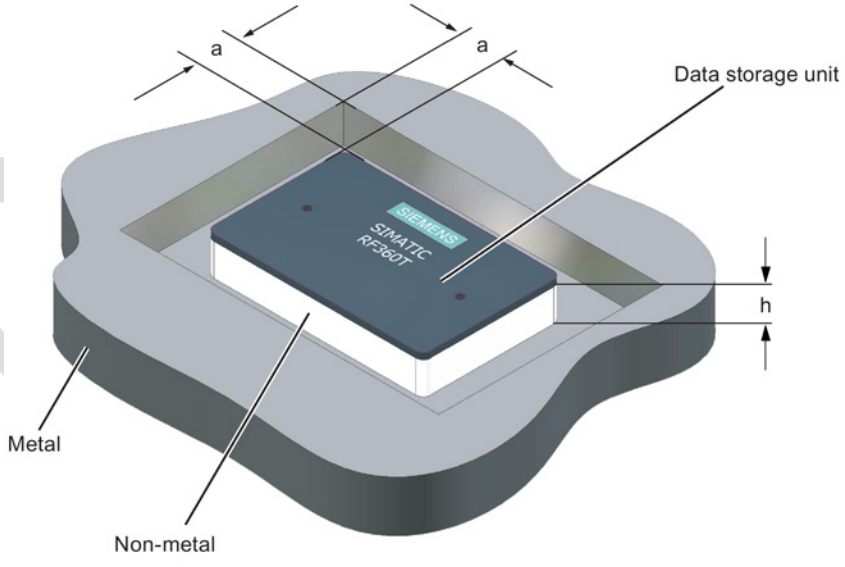


Figure 7-18 Flush-mounting of RF360T with spacer

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

Dimensions of spacer and fixing pocket for RF360T

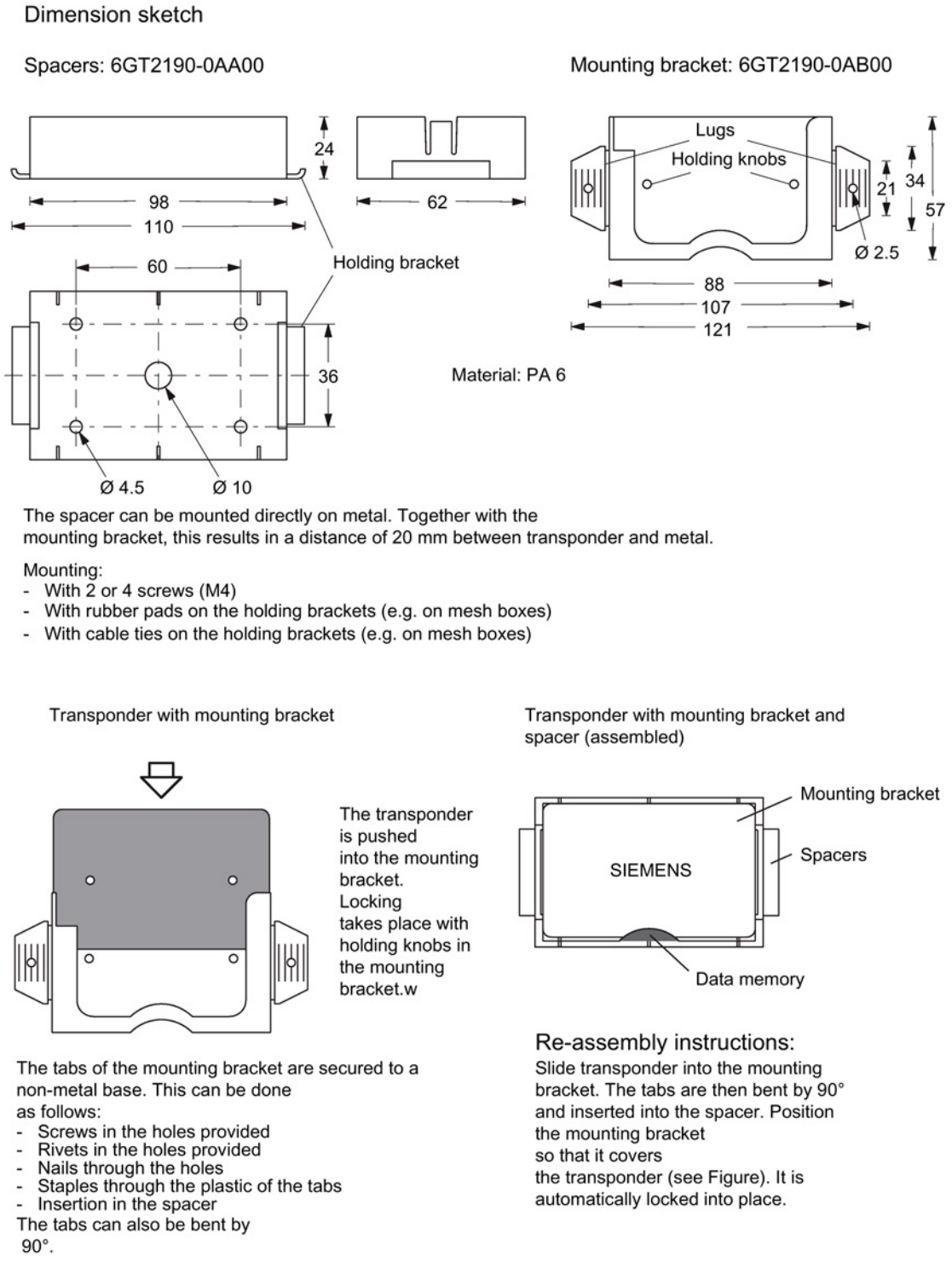


Figure 7-19 Dimensions of spacer and fixing pocket for RF360T

7.6.4 Technical data

Table 7- 15 Technical specifications for RF360T

	6GT2800-4AC00 6GT2800-5AC00
Product type designation	SIMATIC RF360T
Memory	
Memory organization	in bytes
Memory configuration	
• UID	• 4 bytes EEPROM
• User memory	• 8 KB FRAM
• OPT memory	• 20 bytes EEPROM
Read cycles (at < 40 °C)	> 10^{10}
Write cycles (at < 40 °C)	> 10^{10}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of RF300 transponders (Page 49)"
MTBF (Mean Time Between Failures)	1200 years
Mechanical specifications	
Housing	
• Material	• Epoxy resin
• Color	• Anthracite
Recommended distance to metal	≥ 20 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +75 °C
• During transportation and storage	• -40 to +85 °C
Degree of protection to EN 60529	IP67
Shock-resistant to EN 60721-3-7, Class 7 M3	50 g
Vibration-resistant to EN 60721-3-7, Class 7 M3	20 g
Torsion and bending load	Not permitted

	6GT2800-4AC00 6GT2800-5AC00
Design, dimensions and weight	
Dimensions (L x W x H)	86 x 55 x 2.5 mm
Weight	25 g
Type of mounting	• 2 x M3 screws ≤ 1.0 Nm • Fixing pocket (6GT2190-0AB00)

7.6.5 Dimension drawing

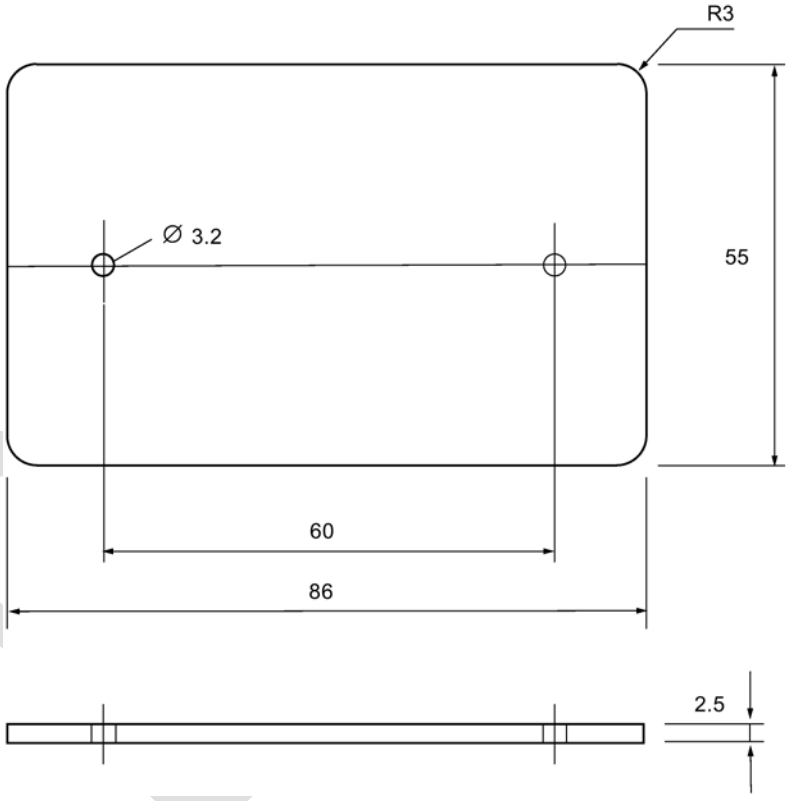


Figure 7-20 RF360T dimension drawing

Dimensions in mm

7.7 SIMATIC RF370T

7.7.1 Features

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

RF370T	Characteristics	
	Area of application	Identification tasks on assembly lines in harsh industrial environments, due to high resistance to oils, lubricants and cleaning agents, and suitable for larger ranges, e.g. automotive industry
	Memory size	• 32 KB FRAM user memory • 64 KB FRAM user memory
	Write/read range	see section Field data of RF300 transponders (Page 49)
	Mounting on metal	Yes
	Degree of protection	IP68/IPx9K

7.7.2 Ordering data

Table 7- 16 Ordering data RF370T

	Article number
RF370T 32 KB FRAM user memory	6GT2800-5BE00
RF370T 76 KB FRAM user memory	6GT2800-6BE00

7.7.3 Mounting on metal

Direct mounting of the RF370T on metal is permitted.

Mounting of RF370T on metal

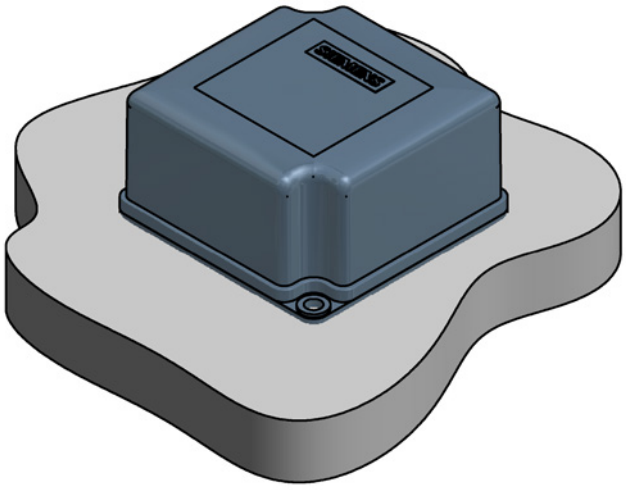


Figure 7-21 Mounting of RF370T on metal

Flush-mounting of RF370T in metal:

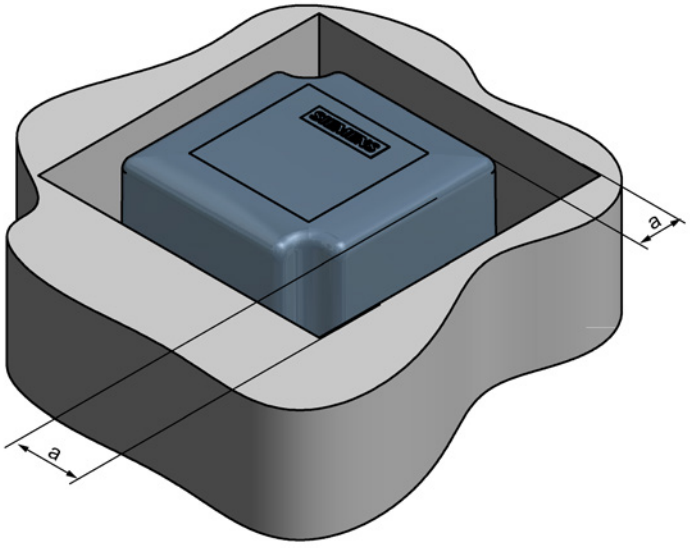


Figure 7-22 RF370T flush-mounted in metal

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

7.7.4 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)

7.7.5 Technical specifications

Table 7- 17 Technical specifications RF370T

	6GT2800-5BE00 6GT2800-6BE00
Product type designation	SIMATIC RF370T
Memory	
Memory organization	in bytes
Memory configuration	
• UID	• 4 bytes EEPROM
• User memory	• 32 or 64 KB FRAM
• OPT memory	• 20 bytes EEPROM
Read cycles (at < 40 °C)	> 10^{10}
Write cycles (at < 40 °C)	> 10^{10}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of RF300 transponders (Page 49)"
MTBF (Mean Time Between Failures)	1200 years
Mechanical specifications	
Housing	
• Material	• Plastic PA 12
• Color	• Anthracite
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery

	6GT2800-5BE00 6GT2800-6BE00
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +85 °C
Degree of protection to EN 60529	IPx9K
Shock-resistant to EN 60721-3-7, Class 7 M3	50 g [1]
Vibration-resistant to EN 60721-3-7, Class 7 M3	20 g [1]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (L x W x H)	75 x 75 x 41 mm
Weight	200 g
Type of mounting	2 x M5 screws ≤ 1.5 Nm

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

7.7.6 Dimensional drawing

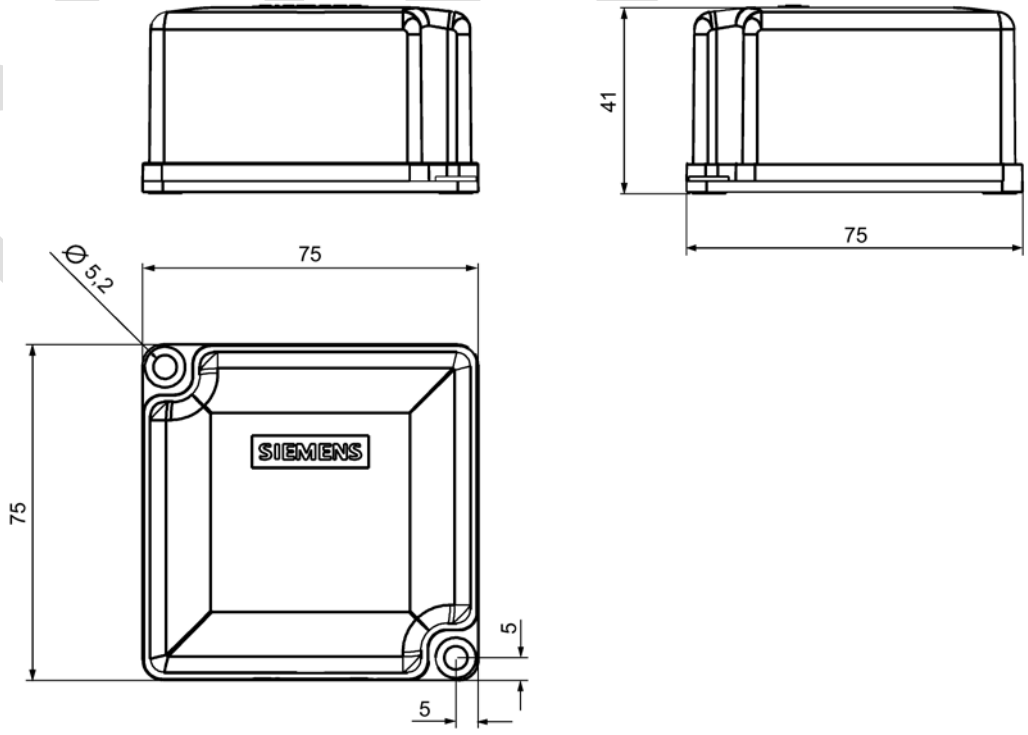


Figure 7-23 RF370T dimension drawing

Dimensions in mm

7.8 SIMATIC RF380T

7.8.1 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	
	Area of application	Identification tasks in applications (e.g. automotive industry) with cyclic high temperature stress > 85 °C and < 220 °C Highly resistant to mineral oils, lubricants and cleaning agents 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 size	32 KB FRAM user memory
	Write/read range	see section "Field data of RF300 transponders (Page 49)"
	Mounting on metal	Yes, flush-mounted in metal
	Degree of protection	IP68

7.8.2 Ordering data

Table 7- 18 Ordering data RF380T

	Article number
RF380T User memory 32 KB FRAM (read/write) and 4 bytes EEPROM	6GT2800-5DA00

Table 7- 19 Ordering data for RF380T

	Article number
Holder (short version)	6GT2090-0QA00
Holder (long version)	6GT2090-0QA00-0AX3
Shrouding cover	6GT2090-0QB00
Universal holder	6GT2590-0QA00

7.8.3 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.

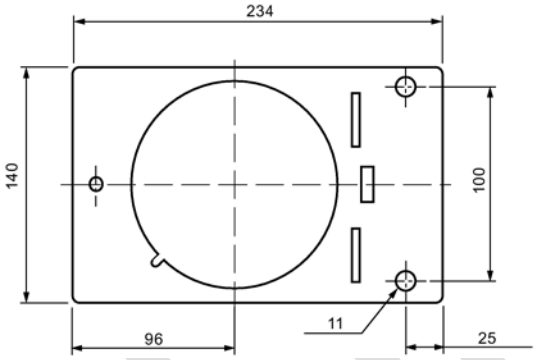
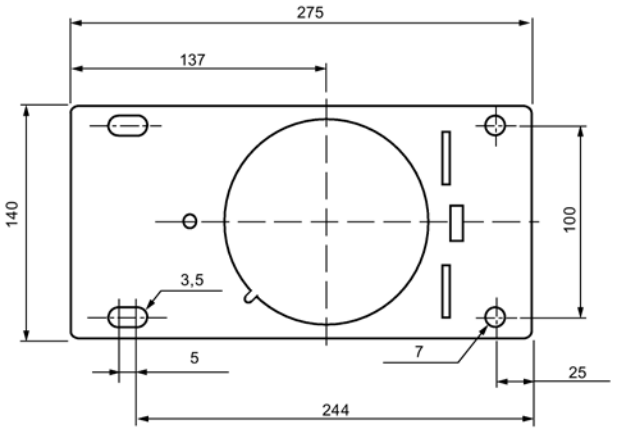
7.8.3.1 Mounting instructions

Note

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

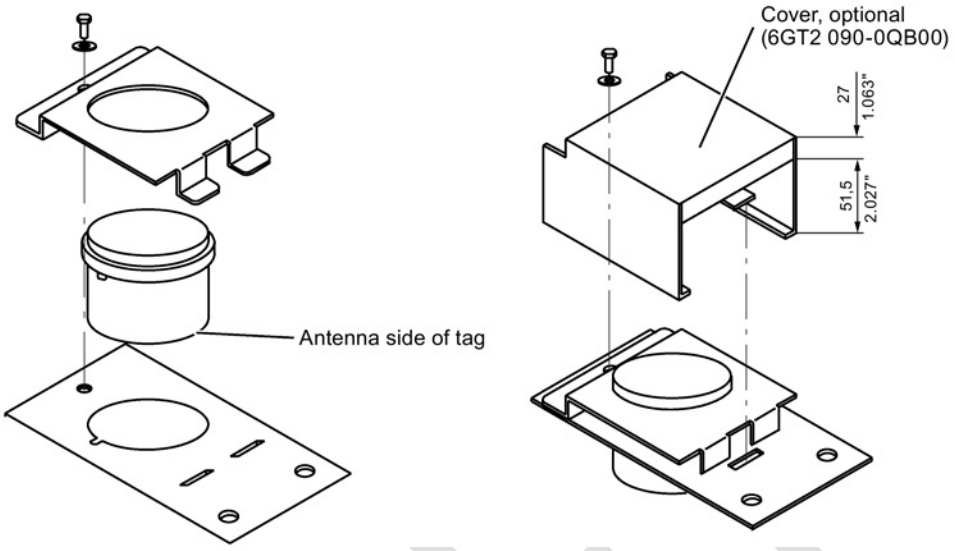


Figure 7-24 Assembly of tag with holder

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

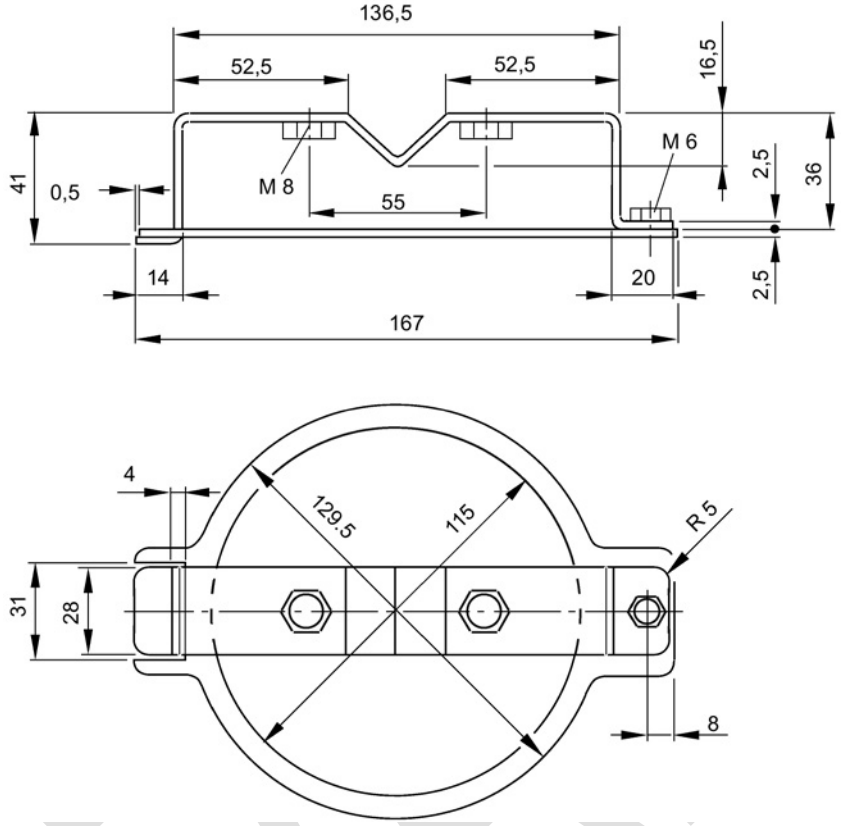


Figure 7-25 Universal holder 6GT2590-0QA00

7.8.3.2 Metal-free area

Direct mounting of the RF380T on metal is permitted.

Mounting of RF380T on metal

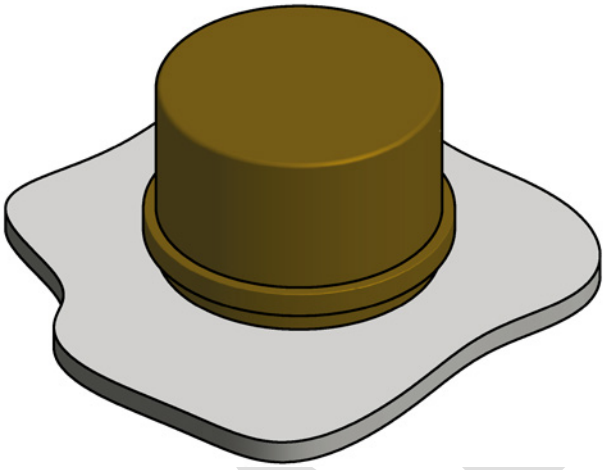


Figure 7-26 Mounting of RF380T on metal

Flush-mounting of RF380T in metal:

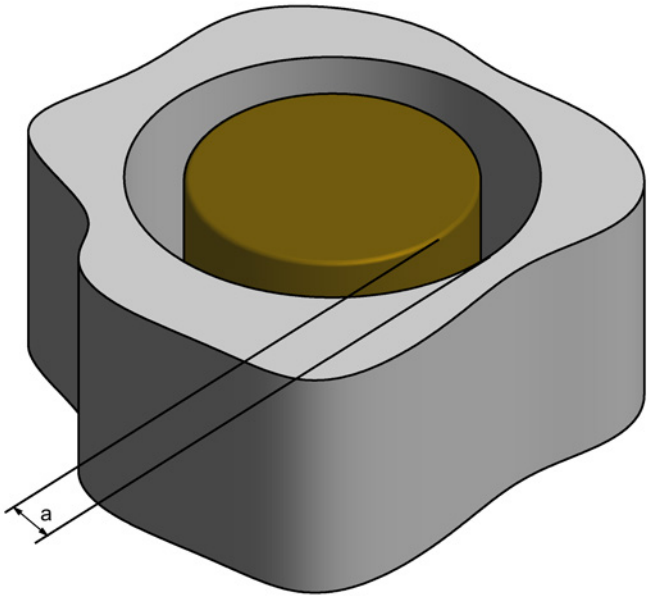


Figure 7-27 RF380T flush-mounted in metal

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

7.8.4 Configuring instructions

7.8.4.1 Temperature dependence of the transmission window

The guidelines in the 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. At temperatures above 85 °C, the length of the transmission window is reduced by up to 10%.

7.8.4.2 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 "Ident Systems Software & Documentation" DVD (refer to the section "DVD "Ident Systems Software & Documentation" (Page 416)").

Ambient temperatures > 110 °C

Note

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 7- 20 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

Note

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 7- 21 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

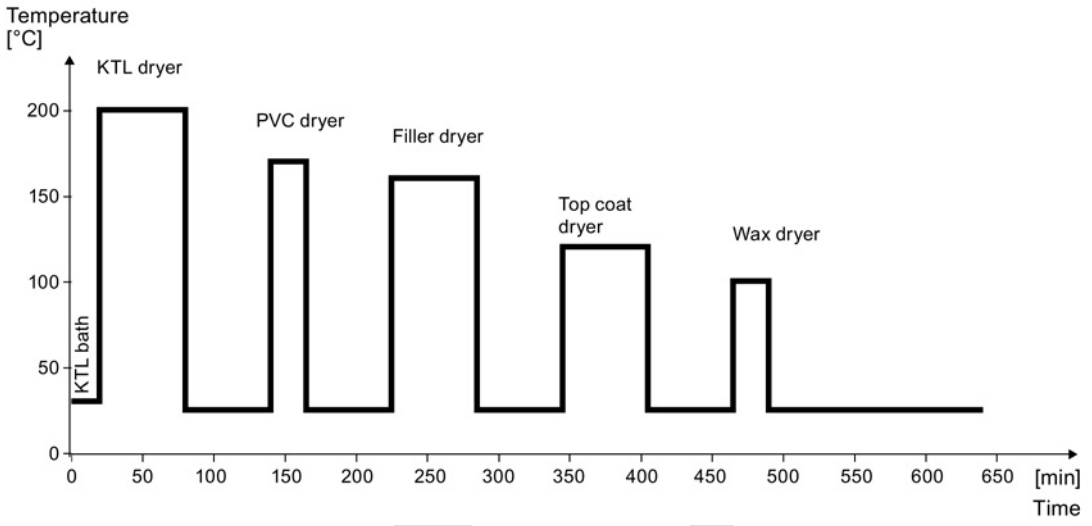


Figure 7-28 Graphic trend of temperature profile from above table

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.

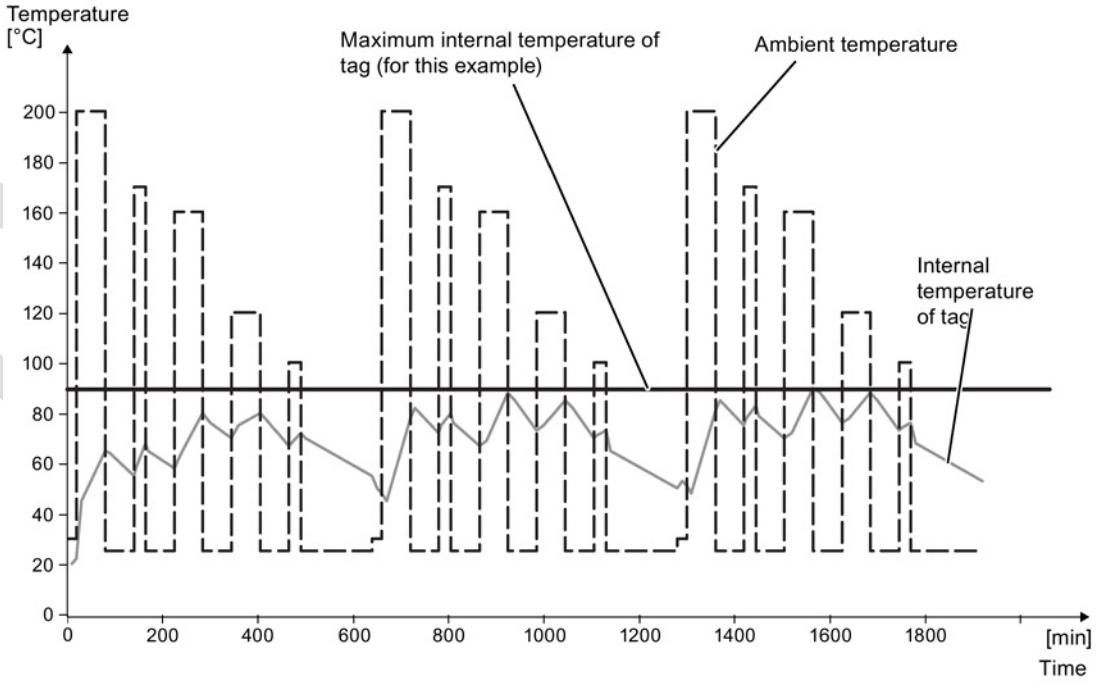


Figure 7-29 Complete temperature response due to simulation

7.8.5 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:

Table 7- 22 Approvals

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

Table 7- 23 The identification of the electrical equipment as an encapsulated unit

	II 3G Ex nC IIB T5
-25°C to +70°C	
Um=30Vdc	

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"

7.8.5.1 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 that the temperature class is kept to in conjunction with the requirements of the area of application.
  If the temperature ranges are exceeded during use of the transponder, gas-air mixtures may be ignited.
- The maximum transmit power of the transmitter used to operate the transponder must not exceed 2 W.
  If the transmit power id not kept to, gas-air mixtures may ignite.

7.8.5.2 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.

7.8.6 Cleaning the mobile data memory

Note

Do not clean the transponder with mechanical tools, sand-blasting or pressure hose. These cleaning methods result in damage to the transponder.

Clean the transponder only with the chemical cleansing agents listed in Chapter Chemical resistance of the transponders (Page 90).

7.8.7 Technical specifications

Table 7- 24 RF380T technical specifications

	6GT2800-5DA00
Product type designation	SIMATIC RF380T
Memory	
Memory organization	in bytes
Memory configuration	
• UID	• 4 bytes EEPROM
• User memory	• 32 KB FRAM
• OPT memory	• 20 bytes EEPROM

	6GT2800-5DA00
Read cycles (at < 40 °C)	> 10^{10}
Write cycles (at < 40 °C)	> 10^{10}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of RF300 transponders (Page 49)"
MTBF (Mean Time Between Failures)	1177 years

Mechanical specifications	
Housing	
• Material	• PPS
• Color	• Anthracite
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery

Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +110 °C
	• -25 … +220 °C: cyclic operation possible
• During transportation and storage	• -40 to +110 °C
Degree of protection to EN 60529	IP68
Shock-resistant to EN 60721-3-7, Class 7 M3	50 g [1)2)]
Vibration-resistant to EN 60721-3-7, Class 7 M3	5 g [2)]
Torsion and bending load	Not permitted

Design, dimensions and weight	
Dimensions (Ø x H)	114 x 83 mm
Weight	900 g
Type of mounting	Holder (must be ordered separately)

1) Applies only in conjunction with the original support

2) The values for shock and vibration are maximum values and must not be applied continuously.

7.8.8 Dimensional drawing

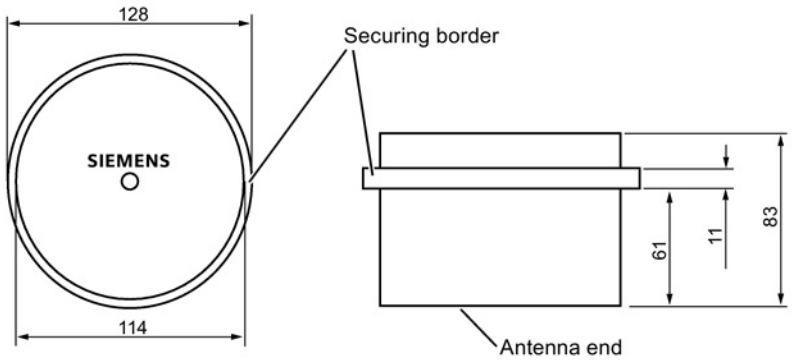


Figure 7-30 Dimension drawing RF380T

Dimensions in mm

ISO transponder

8

Features of the ISO transponders

The transponders (MDS D) that are compatible with ISO 15693 represent a cost-effective alternative to RF300 transponders. The performance that can be achieved with this (transmission speed, memory size), however, is considerably less than with RF300 transponders.

You will find more information on transmission speeds in the section "Communication between communications module, reader and transponder (Page 47)".

8.1 Memory configuration of ISO the transponders

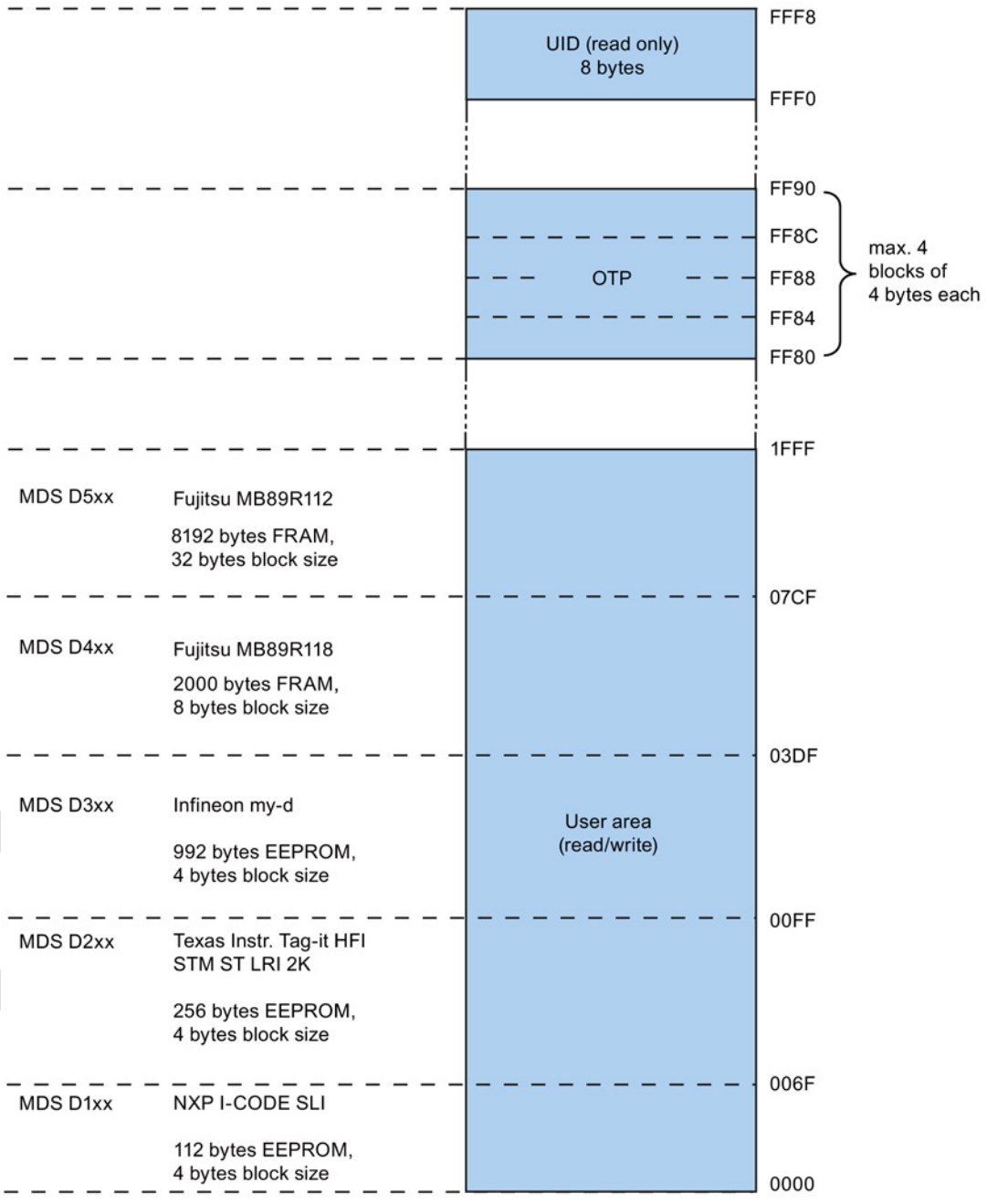


Figure 8-1 Memory configuration of ISO the transponders

Memory areas

Depending on the manufacturer of the transponder chip, the memory configuration of an ISO transponder consists of varying sizes of user memory.

The typical sizes are 112 bytes, 256 bytes, 992 bytes EEPROM or 2000 bytes FRAM. Each ISO transponder chip has an 8-byte long 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). Note that the corresponding addresses for the user data are therefore 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 bytes depending on the block address) protects the written data from subsequent overwriting.

Note

Exception Fujitsu chip (MDS D4xx and MDS D522)

The Fujitsu chip MB89R118 (MDS D4xx) has 8-byte blocks, which means that only 2 block addresses have to be addressed: FF80 and FF88 with the length 8 and 16 bytes).

The Fujitsu chip MB89R112 (MDS D5xx) has 32 byte blocks and can therefore not be addressed in the OTP area.

Note

Restriction to the use of the OTP

Observe the following restrictions when using OTP:

- The OTP write/lock command can only be sent in static operation.
- The OTP write/lock command can not be sent as a chained command.

The Fujitsu chip MB89R112 (MDS D5xx) has 32 byte blocks and can therefore not be addressed in the OTP area.

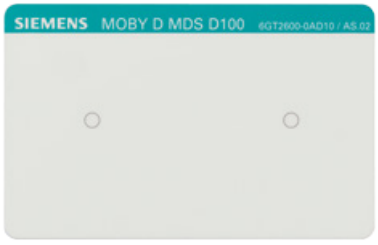
Note

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.

8.2 MDS D100

8.2.1 Characteristics

MDS D100	Characteristics	
	Area of application	From simple identification such as electronic barcode replacement/supplementation, through warehouse and distribution logistics, right up to product identification.
	Memory size	112 bytes of EEPROM user memory
	Write/read range	See section Field data of ISO transponders (MDS D) (Page 52).
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP68

8.2.2 Ordering data

Table 8- 1 Ordering data for MDS D100

	Article number
MDS D100	6GT2600-0AD10

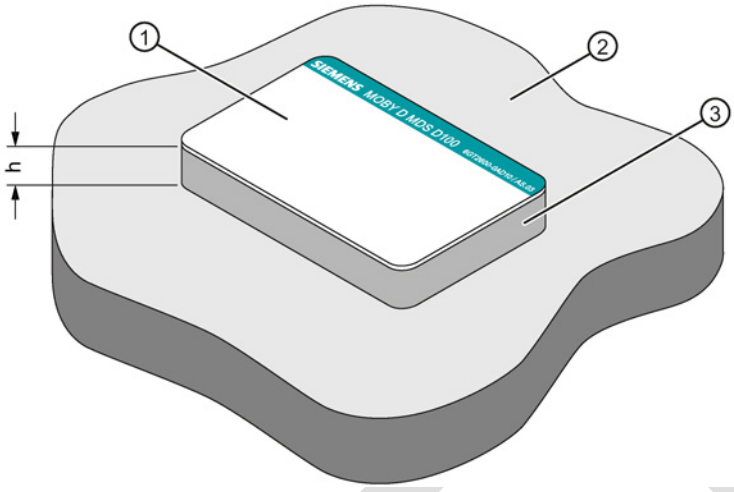
Table 8- 2 Ordering data for MDS D100 accessory

	Article number
Spacer (in conjunction with fixing pocket 6GT2190-0AB00)	6GT2190-0AA00
Fixing pocket (in conjunction with spacer 6GT2190-0AA00)	6GT2190-0AB00
Fixing pocket (not suitable for fixing directly onto metal)	6GT2390-0AA00

8.2.3 Metal-free area

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.

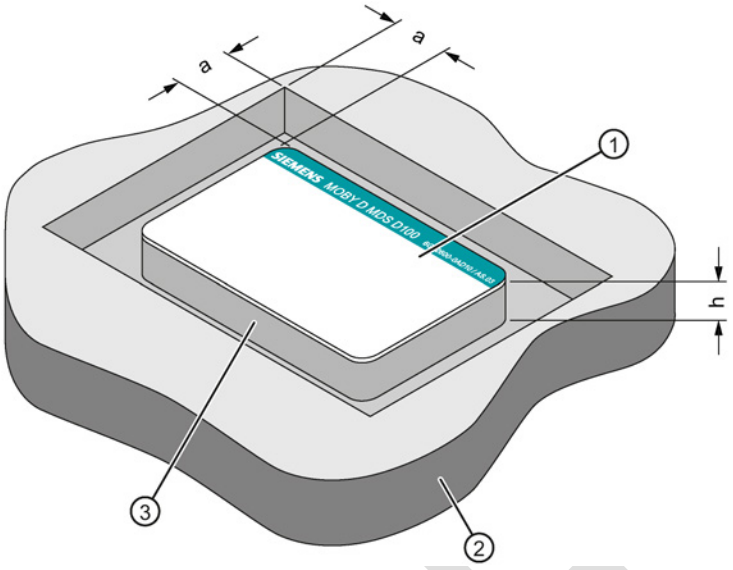
Mounting on metal



h ≥ 20 mm
① Data memory
② Metal
③ Non-metal

Figure 8-2 Mounting of the MDS D100 on metal with spacer

Flush-mounting



a ≥ 20 mm
h ≥ 20 mm
① Data memory
② Metal
③ Non-metal

Figure 8-3 Flush-mounting of MDS D100 in metal with spacer

Note

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

8.2.4 Technical data

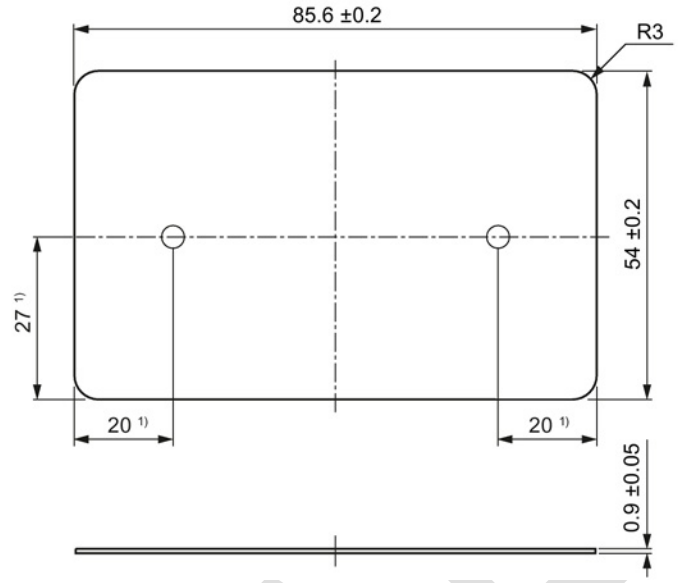
Table 8- 3 Technical specifications for MDS D100

	6GT2600-0AD10
Product type designation	SIMATIC MDS D100
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 112 bytes EEPROM
• OPT memory	• 16 bytes (EEPROM)

	6GT2600-0AD10
Read cycles (at < 40 °C)	> 10^{14}
Write cycles (at < 40 °C)	> 10^{6}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• PC
• Color	• White/petrol
Recommended distance to metal	≥ 20 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +80 °C
• During transportation and storage	• -25 to +80 °C
Degree of protection to EN 60529	• IP68
Shock-resistant to EN 60721-3-7 class 7M3	ISO 10373 / ISO 7810 [1]
Vibration-resistant to EN 60721-3-7, class 7M3	ISO 10373 / ISO 7810 [1]
Torsion and bending load	ISO 10373/ISO 7816-1
Design, dimensions and weight	
Dimensions (L x W x H)	85.6 x 54 x 0.9 mm
Weight	5 g
Type of mounting	• Fixing pocket • Glued

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

8.2.5 Dimension drawing



Dimensions in mm

1) Dimensions for mounting holes

Figure 8-4 MDS D100 dimension drawing

8.3 MDS D117

8.3.1 Features

MDS D117	Characteristics	
	Area of application	Very compact data carrier that can be cemented into objects where precise positioning is necessary; e.g. tool identification, workpiece holders etc..
	Memory size	112 bytes of EEPROM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)."
	Mounting in metal	Yes, flush-mounted in metal
	ISO standard	ISO 15693
	Degree of protection	IP68/IPx9K

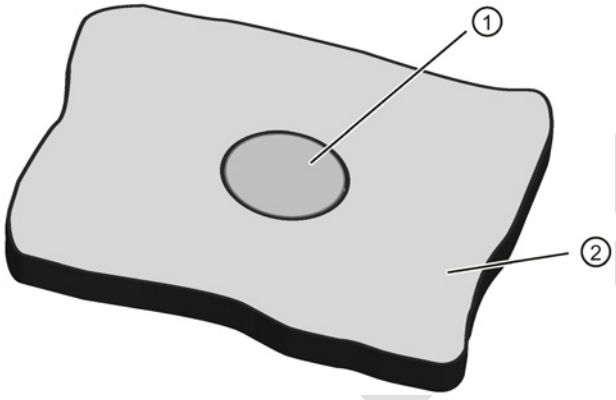
8.3.2 Ordering data

Table 8- 4 Ordering data for MDS D117

	Article number
MDS D117 Pack of 10	6GT2600-0AG00

8.3.3 Mounting in metal

Flush-mounted in metal



① Transponder
② Metal

8.3.4 Technical specifications

Table 8- 5 Technical specifications for MDS D117

	6GT2600-0AG00
Product type designation	SIMATIC MDS D117
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 112 bytes EEPROM
• OPT memory	• 16 bytes (EEPROM)
Read cycles (at < 40 °C)	> 10^{14}
Write cycles (at < 40 °C)	> 10^{6}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years

	6GT2600-0AG00
Mechanical specifications	
Housing	
• Material	• PPS
• Color	• Black
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +125 °C
Degree of protection to EN 60529	IP68 2 hours, 2 bar, +20 °C
Shock-resistant to EN 60721-3-7 class 7M3	100 g [1]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	4 x 5.2 mm
Weight	1 g
Type of mounting	• Fixing pocket • Glued

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

8.3.5 Dimension drawing

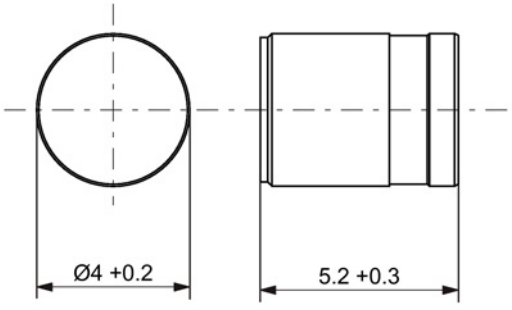


Figure 8-5 Dimensions in mm

8.4 MDS D124

8.4.1 Characteristics

MDS D124	Characteristics	
	Area of application	Application areas in production automation (e.g. small paintshops up to +180 °C)
	Memory size	112 bytes of EEPROM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)".
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP68/IPx9K

8.4.2 Ordering data

Table 8- 6 Ordering data for MDS D124

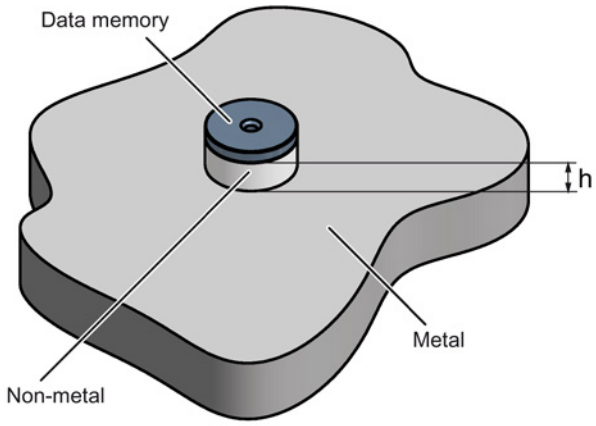
	Article number
MDS D124	6GT2600-0AC10

Table 8- 7 Ordering data for MDS D124 accessories

	Article number
Spacer	6GT2690-0AK00

8.4.3 Mounting on metal

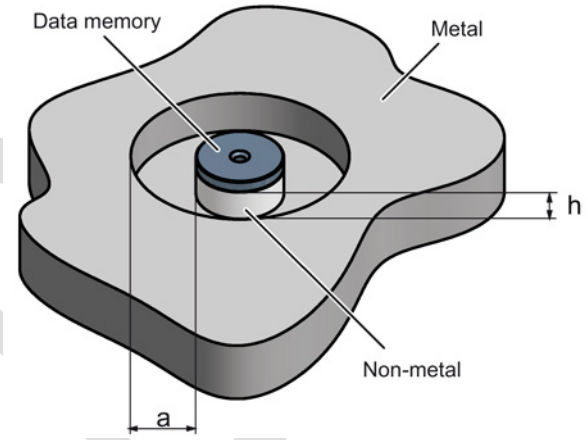
Mounting on metal



h ≥ 15 mm

Figure 8-6 Mounting the MDS D124/D324/D424/D524/E624 and RF320T on metal with spacer

Flush-mounting



h ≥ 15 mm

a ≥ 25 mm

Figure 8-7 Flush-mounting of the MDS D124/D324/D424/D524/E624 and RF320T in metal with spacer

Note

Going below the distances

If the distances (a and 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.

8.4.4 Technical specifications

Table 8- 8 Technical specifications for MDS D124

	6GT2600-0AC10
Product type designation	SIMATIC MDS D124
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 112 bytes EEPROM
• OPT memory	• 16 bytes (EEPROM)
Read cycles (at < 40 °C)	> 10^{14}
Write cycles (at < 40 °C)	> 10^{6}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• PPS
• Color	• Black
Recommended distance to metal	≥ 15 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +180 °C
	• from +125 °C: 20% reduction in the limit distance
	• from +140 °C: No processing possible

	6GT2600-0AC10
	• at +180 °C: Tested up to 5000 hours or 3000 cycles
• During transportation and storage	• -40 to +125 °C
Degree of protection to EN 60529	• IP68 2 hours, 2 bar, +20 °C • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to EN 60721-3-7 class 7M3	100 g [1]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	4 x 5.2 mm
Weight	5 g
Type of mounting	• 1 x M3 screw [2] ≤ 1 Nm • Glued • With spacer

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

[2]) To prevent it loosening during operation, secure the screw with screw locking varnish.

8.4.5 Use of the MDS D124 in hazardous area

The mobile data memory MDS D124, device group II, category 1G or 1D may be installed and operated in zones 0, 1 and 2 or in the zones 20, 21 and 22.

The following requirements of the 94/9/EC directive are met:

- EN 60079-0:2009
- EN 60079-11:2007
- EN 61241-11:2006
- EN 60079-26:2007

When used in hazardous areas, the MDS D124 must not be operated with field strengths > 5 A / m to avoid impermissible heating. This is not the case with readers from the SIMATIC RF range (MOBY D, RF200 and RF300).

Identification

II 1 G Ex ia IIC T3 to T6 Ga

or

II 1 D Ex ia IIIC T80 °C to T180 °C Da

TÜV 12 ATEX 084413 X

The temperature class or the maximum surface temperature depends on the maximum ambient temperature. The relationship between temperature class (gas) or maximum surface temperature (dust) can be found in the following table.

Table 8- 9 Ambient temperature

Ambient temperature range	Temperature class	Max. surface temperature
-25 ... +150 ℃	T3	T180
-25 ... +100 ℃	T4	T130
-25 ... +65 ℃	T5	T95
-25 ... +50 ℃	T6	T80

Note

Safety markings for hazardous areas

Since there is not enough space on the MDS D124 for the safety mark, this is supplied as a label with the device.

This must be affixed immediately next to the MDS D124 so that the label clearly relates to the device.

⚠ WARNING

Gefahr durch elektrostatische Entladungen

Potential electrostatic charging hazard

Danger potentiel de charges électrostatiques

Note

Installation and operating conditions for hazardous areas:

- Use of the device in the vicinity of processes generating high charges is not allowed.
- The device must be installed so that it is mechanically protected.
- For applications requiring devices of category 1, the device must be mounted on a grounded, conductive base.
- It must only be cleaned with a damp cloth.
- The device is suitable for use in atmospheres containing dust, however not for full immersion in dust.

8.4.6 Dimension drawing

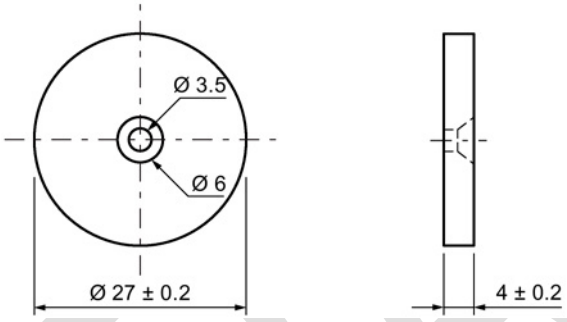


Figure 8-8 Dimension drawing of MDS D124

All dimensions in mm

8.5 MDS D126

8.5.1 Characteristics

MDS D126	Characteristics	
	Area of application	Compact and rugged ISO transponder; suitable for identification of transport units in production-related logistics; can also be deployed in harsh conditions
	Memory size	112 bytes of EEPROM user memory
	Write/read range	See section Field data of ISO transponders (MDS D) (Page 52)
	Mounting on metal	Yes, with spacer
	ISO standard	ISO-15693
	Degree of protection	IP68

8.5.2 Ordering data

Table 8- 10 Ordering data for MDS D126

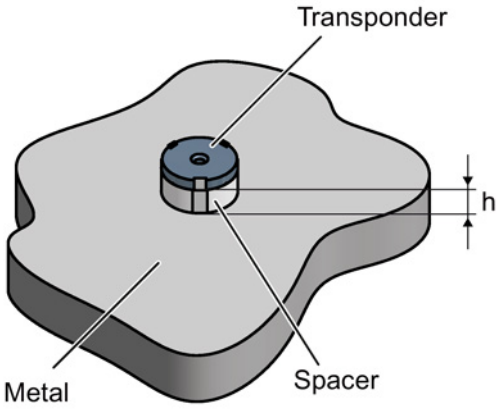
	Article number
MDS D126	6GT2600-0AE00

Table 8- 11 Ordering data for MDS D126 accessories

	Article number
Spacer	6GT2690-0AL00

8.5.3 Mounting on metal

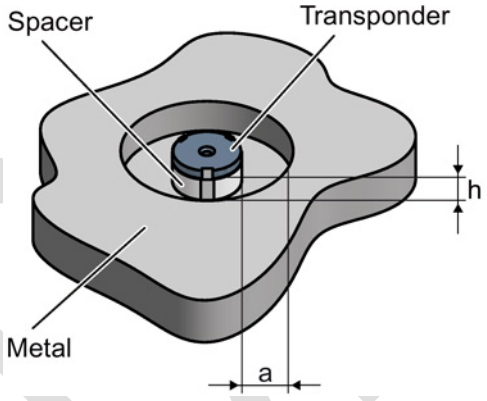
Mounting on metal



h ≥ 25 mm

Figure 8-9 Mounting the MDS D126 / D426 / D526 on metal with spacer

Flush-mounted in metal



h ≥ 25 mm

a ≥ 50 mm

Figure 8-10 Flush installation of the MDS D126 / D426 / D526 in metal with spacer

8.5.4 Technical specifications

Table 8- 12 Technical specifications for the MDS D126

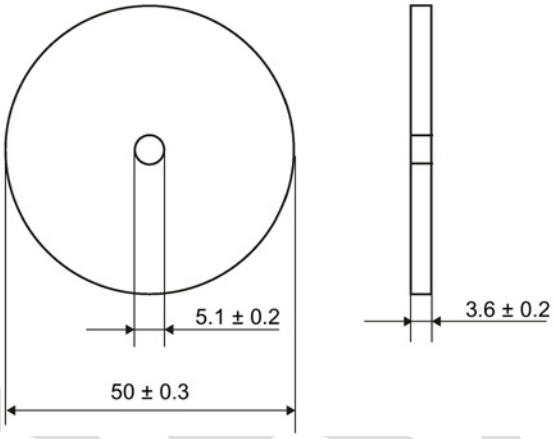
	6GT2600-0AE00
Product type designation	SIMATIC MDS D126
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 112 bytes EEPROM
• OPT memory	• 16 bytes (EEPROM)
Read cycles (at < 40 °C)	> 10^{14}
Write cycles (at < 40 °C)	> 10^{6}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• PA6.6 GF
• Color	• Black
Recommended distance to metal	≥ 25 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C
Degree of protection to EN 60529	IP68 2 hours, 2 bar, +20 °C
Shock-resistant to EN 60721-3-7 class 7M3	50 g [1)]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1)]
Torsion and bending load	Not permitted

	6GT2600-0AE00
Design, dimensions and weight	
Dimensions (Ø x H)	50 x 3.6 mm
Weight	13 g
Type of mounting	• 1 x M4 screw [2)] ≤ 1 Nm • Glued

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

[2]) To prevent it loosening during operation, secure the screw with screw locking varnish.

8.5.5 Dimension drawing



Dimensions in mm

Figure 8-11 Dimension drawing of MDS D126

8.6 MDS D127

8.6.1 Features

MDS D127	Characteristics	
	Area of application	Very compact data carrier that can be screwed into areas where precise positioning is necessary; e.g. tool identification, workpiece holders etc.
	Memory size	112 bytes of EEPROM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)"
	Mounting on metal	Yes, flush-mounted in metal
	ISO standard	ISO 15693
	Degree of protection	IP68/IPx9K

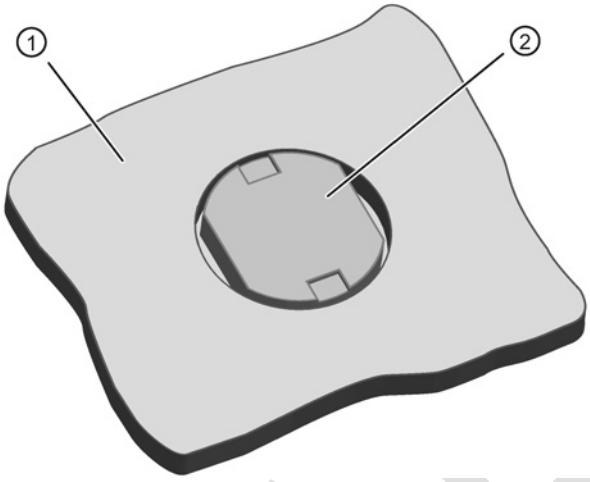
8.6.2 Ordering data

Table 8- 13 Ordering data for MDS D127

	Article number
MDS D127 Pack of 10 (A screw-in aid is supplied with each pack)	6GT2600-0AF00

8.6.3 Mounting in metal

Flush-mounted in metal



① Metal
② Transponders

Note

Damage to the transponder due to improper mounting

To screw the MDS D127 into a suitable thread, use the supplied screw-in tool. This avoids damage to the MDS D127.

Figure 8-12 Screw-in aid for mounting the MDS D127

8.6.4 Technical specifications

Table 8- 14 Technical specifications for MDS D127

	6GT2600-0AF00
Product type designation	SIMATIC MDS D127
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 112 bytes EEPROM
• OPT memory	• 16 bytes (EEPROM)
Read cycles (at < 40 °C)	> 10^{14}
Write cycles (at < 40 °C)	> 10^{6}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• PA6
• Color	• Black
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +100 °C
• During transportation and storage	• -40 to +125 °C
Degree of protection to EN 60529	• IP68 2 hours, 2 bar, +20 °C • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to EN 60721-3-7 class 7M3	100 g [1)]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1)]
Torsion and bending load	Not permitted

	6GT2600-0AF00
Design, dimensions and weight	
Dimensions (Ø x H)	M6 x 5.8 mm
Weight	1 g
Type of mounting	• Glued • 1 x M3 screw

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

8.6.5 Dimension drawing

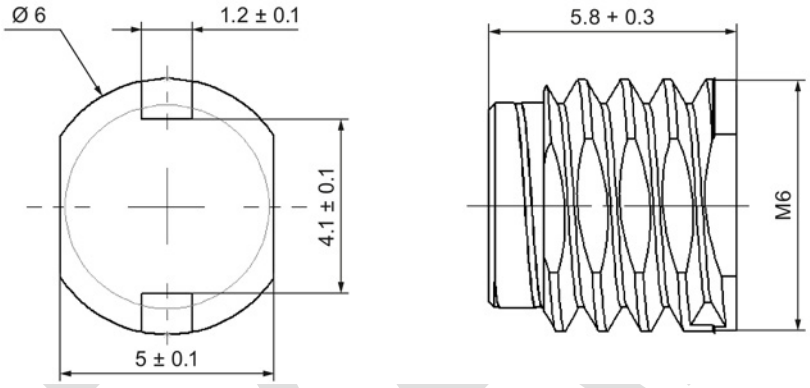


Figure 8-13 Dimensions in mm

8.7 MDS D139

8.7.1 Characteristics

MDS D139	Characteristics	
	Area of application	Applications in production logistics and in assembly lines subject to high temperatures (up to +220 °C) Typical application areas: • Paintshops and their preparatory treatments) • 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 size	112 bytes of EEPROM user memory
	Write/read range	See section Field data of ISO transponders (MDS D) (Page 52).
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP68/IPx9K

Note

Compatibility with SIMATIC RF300 depending on the article number

The transponder MDS D139 with article number 6GT2600-0AA10 is compatible with the SIMATIC RF300 system. The transponder MDS D139 with article number 6GT2600-0AA00 is not compatible.

8.7.2 Ordering data

Table 8- 15 Ordering data for MDS D139

	Article number
MDS D139	6GT2600-0AA10

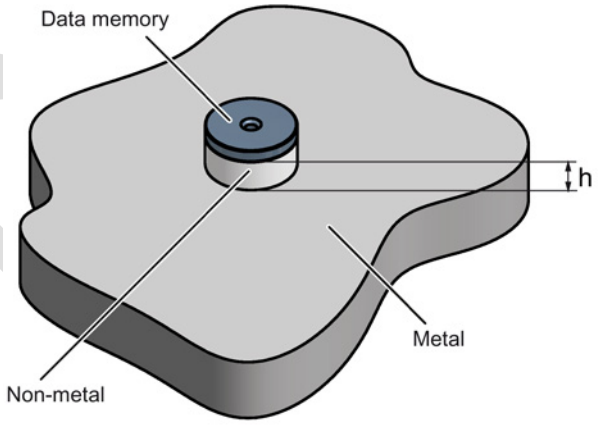
Table 8- 16 Ordering data for MDS D139 accessory

	Article number
Spacer	6GT2690-0AA00
Quick change holder (Ø x H): 22 x 60 mm	6GT2690-0AH00
Quick change holder (Ø x H): 22 x 47 mm	6GT2690-0AH10

8.7.3 Mounting on metal

Direct mounting of the MDS D139/D339 on metal is not allowed. A distance of ≥ 30 mm is recommended. This can be achieved using spacers (see "Ordering data (Page 423)").

Mounting on metal

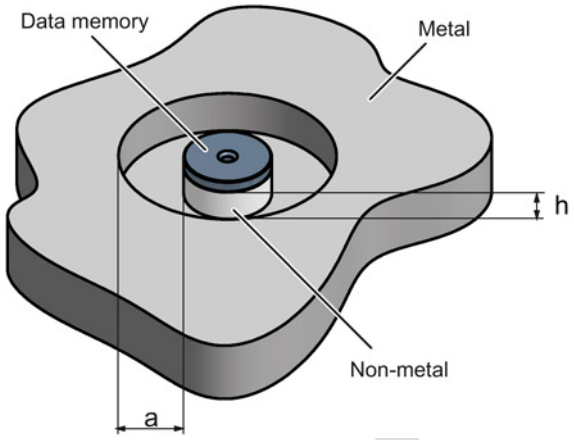


h ≥ 30 mm

Figure 8-14 Mounting the MDS D139/D339 on metal with spacer

Flush-mounting

It is possible to mount the MDS D139/D339 in metal. With large antennas, for example ANT D5, this leads to a reduction of ranges.



h ≥ 30 mm

a ≥ 100 mm

Figure 8-15 Flush-mounting of the MDS D139/D339 in metal with spacer

Note

Going below the distances

If the distances (a and 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.

8.7.4 Cleaning the mobile data memory

Note

Do not clean the transponder with mechanical tools, sand-blasting or pressure hose. These cleaning methods result in damage to the transponder.

Clean the transponder only with the chemical cleansing agents listed in Chapter Chemical resistance of the transponders (Page 90).

8.7.5 Technical specifications

Table 8- 17 Technical specifications for MDS D139

	6GT2600-0AA10
Product type designation	SIMATIC MDS D139
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 112 bytes EEPROM
• OPT memory	• 16 bytes (EEPROM)
Read cycles (at < 40 °C)	> 10^{14}
Write cycles (at < 40 °C)	> 10^{6}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• PPS
• Color	• Black
Recommended distance to metal	≥ 30 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +220 °C
	• from +125 °C: 20% reduction in the limit distance
	• from +140 °C: No processing possible
	• at +200 °C: Tested up to 5000 hours or 6000 cycles
	• at +220 °C: Tested up to 2000 hours or 2000 cycles
• During transportation and storage	• -40 to +100 °C

	6GT2600-0AA10
Degree of protection to EN 60529	• IP68 2 hours, 2 bar, +20 °C • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to EN 60721-3-7 class 7M3	50 g [1)]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1)]
Torsion and bending load	Not permitted

Design, dimensions and weight	
Dimensions (Ø x H)	85 x 15 mm
Weight	50 g
Type of mounting	1 x M5 screw [2)] 1.5 Nm

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

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

8.7.6 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 94/9/EC directive are met:

- EN 60079-0:2006
- EN 60079-15:2005
- EN 61241-0:2006
- EN 61241-1:2004

Identification

II 3 G Ex nA II T2

II 3 D Ex tD A22 IP68 T 220°C

KEMA 09 ATEX 0133 X

Ta: -25 ... +220°C

⚠ WARNING
Gefahr durch elektrostatische Entladungen
Potential electrostatic charging hazard
Danger potentiel de charges électrostatiques

Note

Installations- und Betriebsbedingungen für den Ex-Schutzbereich:

a) Der Einsatz des Gerätes in der Nähe von stark ladungserzeugenden Prozessen ist untersagt.

b) Das Gerät ist mechanisch geschützt zu montieren.

c) Die Montage muss auf einem geerdeten, leitenden Untergrund erfolgen.

d) Die Reinigung darf nur mit feuchtem Tuch erfolgen.

Installation and operating conditions for hazardous areas:

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.

c) Installation must be performed on a grounded and conductive mounting surface.

d) Cleaning only with a wet cloth

Conditions d'installation et de mise en oeuvre pour la zone de protection Ex :

a) L'utilisation de l'appareil près de processus générant de fortes charges est interdite.

b) L'appareil doit être monté de manière à être protégé mécaniquement.

c) Le montage doit être effectué sur un socle conducteur mis à la terre.

d) Nettoyage uniquement avec un chiffon humide

8.7.7 Dimension drawings

Dimensional drawing of MDS D139

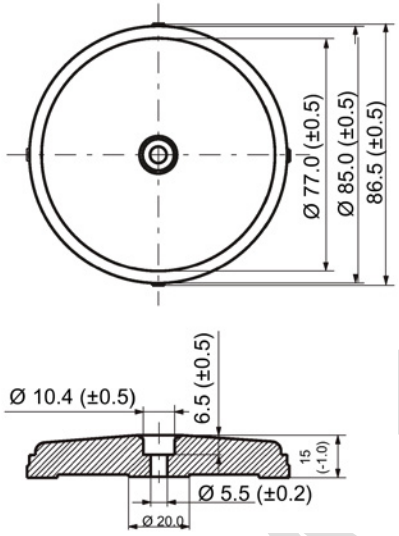


Figure 8-16 Dimensional drawing of MDS D139

Dimensions in mm

8.8 MDS D160

8.8.1 Characteristics

MDS D160	Characteristics	
	Area of application	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. Typical applications are, for example: • Rented work clothing • Hotel laundry • Surgical textiles • Hospital clothing • Dirt collection mats • Clothing for nursing homes/hostels
	Memory size	112 bytes of EEPROM user memory
	Write/read range	See section Field data of ISO transponders (MDS D) (Page 52).
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP68/IPx9K

8.8.2 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.

8.8.3 Ordering data

Table 8- 18 Ordering data for MDS D160

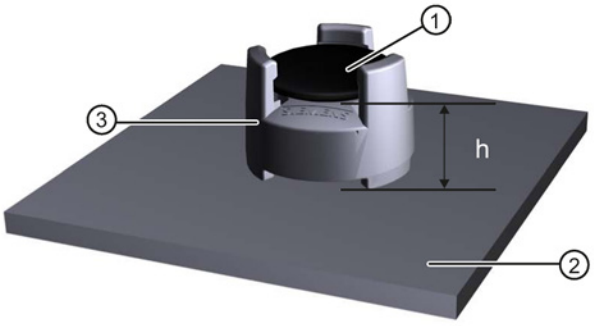
	Article number
MDS D160	6GT2600-0AB10

Table 8- 19 Ordering data for MDS D160 accessories

	Article number
Spacer	6GT2690-0AG00

8.8.4 Mounting on metal

Mounting on metal



① Transponder
② Metal carrier
③ Spacer
h ≥ 10 mm

Figure 8-17 Mounting the MDS D160 on metal with spacer

Note

Going below the minimum distance (h)

If the minimum distance (h) is 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!

8.8.5 Technical specifications

Table 8- 20 Technical specifications for the MDS D160

	6GT2600-0AB10
Product type designation	SIMATIC MDS D160
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 112 bytes EEPROM
• OPT memory	• 16 bytes (EEPROM)
Read cycles (at < 40 °C)	> 10^{14}
Write cycles (at < 40 °C)	> 10^{6}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• PPS
• Color	• beige
Recommended distance to metal	≥ 10 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• In operation, during write/read access	• -25 … +85 °C
• In operation, outside write/read access	• -40 … +175 °C
	• from +125 °C: for 1000 hours, 20% reduction of the limit distance
	• from +140 °C: No processing possible
	• at +175 °C: 100 washing cycles tested
	• at +220 °C: Tested once for up to 30 seconds
• During transportation and storage	• -25 to +100 °C

	6GT2600-0AB10
Mechanical strength	
• Isostatic pressure	• 300 bar for 5 min
• Axial pressure	• 1000 N for 10 s
• Radial pressure	• 1000 N for 10 s
Resistance to chemicals	All chemicals normally used in the washing process
MDS lifespan	At least 100 wash cycles
Degree of protection	• IP68 24 hours, 2 bar, +20 °C • IPx9K
Shock-resistant to IEC 68-2-27	40 g [1)] 18 ms; 6 axes; 2000 repetitions/h
Vibration-resistant to IEC 68-2-6	10 g [1)] 10 to 2000 Hz; 3 axes; 2.5 h
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	16 x 3 mm
Weight	1.2 g
Type of mounting	• Patched • Sewn in • Glued

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

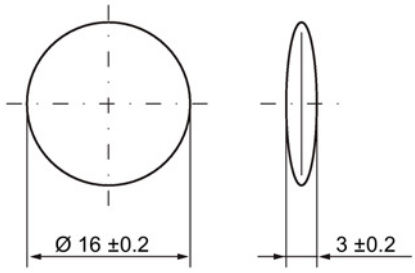
Note

Regeneration time between washing cycles

The regeneration time for the MDS D160 between washing cycles must be at least 24 hours.

8.8.6 Dimension drawings

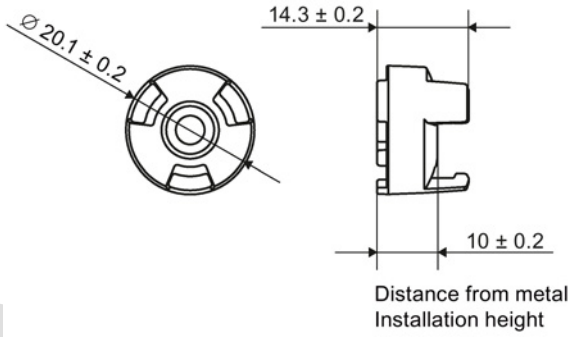
Dimensional drawing of MDS D160



Dimensions in mm

Figure 8-18 Dimensional drawing of MDS D160

Dimensional drawing of spacer



Dimensions in mm

Figure 8-19 Dimensional drawing of spacer

8.9 MDS D165

8.9.1 Features

MDS D165 (special version)	Characteristics	
	Area of application	The design of the transponder (self-adhesive label) permits a variety of designs, guaranteeing optimum dimensioning for the widest variety of applications. From simple identification such as electronic barcode replacement/supplementation, through warehouse and distribution logistics, right up to product identification.
	Memory size	112 bytes of EEPROM user memory
	Write/read range	See section Field data of ISO transponders (MDS D) (Page 52).
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP65

8.9.2 Ordering data

Table 8- 21 Ordering data for MDS D165

	Article number
MDS D165 (special version ISO-CARD)	6GT2600-1AB00-0AX0

Type of delivery

Minimum order quantity: 1250 units (5 rolls with 250 units each)

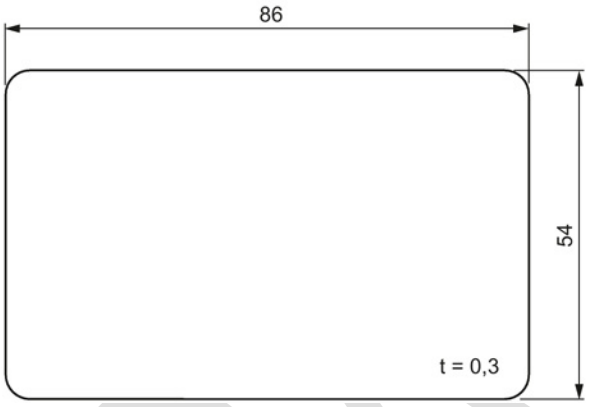
8.9.3 Technical data

Table 8- 22 Technical specifications for MDS D165

			6GT2600-1AB00-0AX0
Product type designation	SIMATIC MDS D165		
Memory			
Memory configuration			
• UID	• 8 bytes		
• User memory	• 112 bytes EEPROM		
• OPT memory	• 16 bytes (EEPROM)		
Read cycles (at < 40 °C)	> 10^{14}		
Write cycles (at < 40 °C)	> 10^{6}		
Data retention time (at < 40 °C)	> 10 years		
Write/read distance (S_g)	Depending on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"		
MTBF (Mean Time Between Failures)	228 years		
Mechanical specifications			
Housing			
• Material	• Top	• PET plastic (label material)	
	• Inlay	• PET plastic (carrier material)	
	• Antenna	• Aluminum	
	• Bottom	• Double-sided transfer adhesive on silicon paper	
• Color	• White		
Recommended distance to metal	≥ 25 mm		
Power supply	Inductive, without battery		
Permitted ambient conditions			
Ambient temperature			
• In operation, during write/read access	• -5 to +85 °C		
• In operation, outside write/read access	• -25 to +85 °C		
• During transportation and storage	• +15 to +30 °C Can be stored for 2 years, determined by the durability of the adhesive.		
Degree of protection	IP65		

	6GT2600-1AB00-0AX0
Design, dimensions and weight	
Dimensions (L x W x H)	86 x 54 x 0.3 mm
Weight	1 g
Type of mounting	Glued with self-adhesive label

8.9.4 Dimension drawing



Dimensions in mm

Figure 8-20 Dimension drawing of MDS D165

8.10 MDS D200

8.10.1 Features

MDS D200	Characteristics	
	Area of application	From simple identification such as electronic barcode replacement/supplementation, through warehouse and distribution logistics, right up to product identification.
	Memory size	256 bytes of EEPROM user memory
	Write/read range	See section Field data of ISO transponders (MDS D) (Page 52).
	Mounting on metal	Yes, with spacer
	ISO standard	15693 with Tag-it HFI technology
	Degree of protection	IP67

8.10.2 Ordering data

Table 8- 23 Ordering data for MDS D200

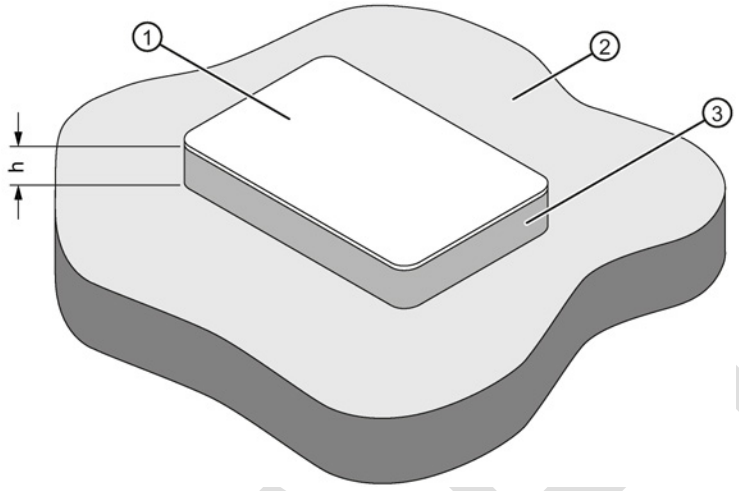
	Article number
MDS D200 (special version ISO-CARD)	6GT2600-1AD00-0AX0

Table 8- 24 Ordering data for MDS D200 accessories

	Article number
Spacer (in conjunction with fixing pocket 6GT2190-0AB00)	6GT2190-0AA00
Fixing pocket (in conjunction with spacer 6GT2190-0AA00)	6GT2190-0AB00
Fixing pocket (not suitable for fixing directly onto metal)	6GT2390-0AA00

8.10.3 Mounting on metal

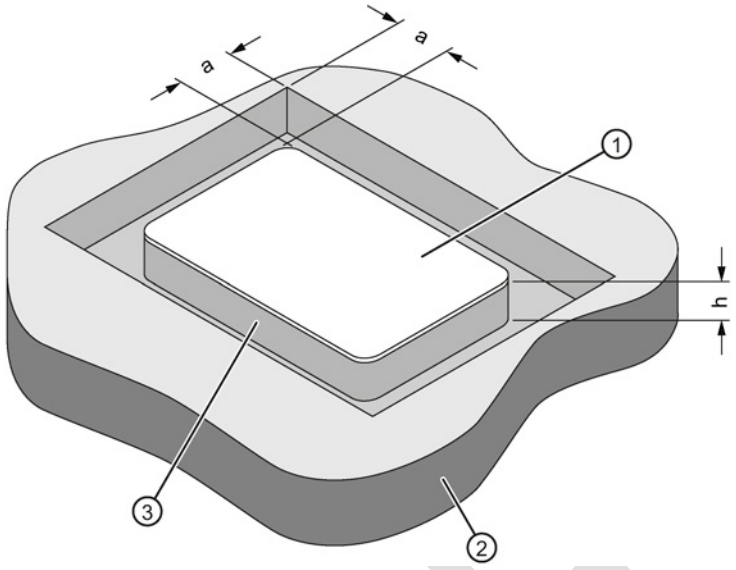
Mounting on metal



h ≥ 20 mm
① Data memory
② Metal
③ Non-metal

Figure 8-21 Mounting of the MDS D200 on metal with spacer

Flush-mounting



a ≥ 20 mm
h ≥ 20 mm
① Data memory
② Metal
③ Non-metal

Figure 8-22 Flush-mounting of MDS D200 in metal with spacer

Note

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

8.10.4 Technical data

Table 8- 25 Technical specifications for MDS D200

	6GT2600-1AD00-0AX0
Product type designation	SIMATIC MDS D200
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 256 bytes EEPROM
• OTP memory	• 16 bytes (EEPROM)

	6GT2600-1AD00-0AX0
Read cycles (at < 25 °C)	> 10^{14}
Write cycles (at < 25 °C)	> 10^{6}
Data retention time (at < 25 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years

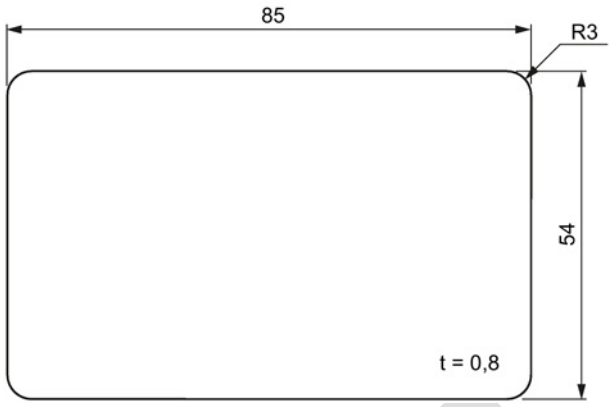
Mechanical specifications	
Housing	
• Material	• PET
• Color	• White
Recommended distance to metal	≥ 20 mm
Power supply	Inductive, without battery

Permitted ambient conditions	
Ambient temperature	
• During operation	• -20 to +60 °C
• During transportation and storage	• -20 to +60 °C
Degree of protection to EN 60529	IP67
Shock-resistant to EN 60721-3-7 class 7M3	ISO 10373 / ISO 7810 [1]
Vibration-resistant to EN 60721-3-7, class 7M3	ISO 10373 / ISO 7810 [1]
Torsion and bending load	ISO 10373/ISO 7816-1

Design, dimensions and weight	
Dimensions (L x W x H)	85 x 54 x 0.8 mm
Weight	5 g
Type of mounting	• Fixing pocket • Glued

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

8.10.5 Dimension drawing



Dimensions in mm

Figure 8-23 Dimension drawing of MDS D200

8.11 MDS D261

8.11.1 Features

MDS D261	Characteristics	
	Area of application	The design of the transponder (self-adhesive label) permits a variety of designs, guaranteeing optimum dimensioning for the widest variety of applications. From simple identification such as electronic barcode replacement/supplementation, through warehouse and distribution logistics, right up to product identification.
	Memory size	256 bytes of EEPROM user memory
	Write/read range	See section Field data of ISO transponders (MDS D) (Page 52).
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP65

8.11.2 Ordering data

Table 8- 26 Ordering data for MDS D261

	Article number
MDS D261	6GT2600-1AA00-0AX0

Type of delivery

Minimum order quantity: 1250 units (5 rolls with 250 units each)

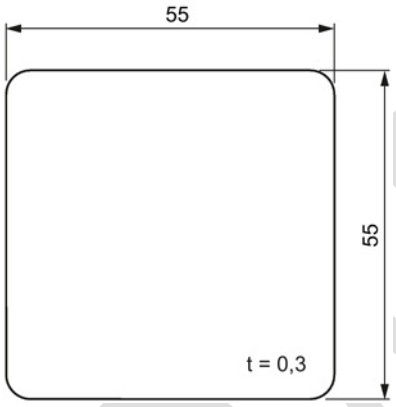
8.11.3 Technical data

Table 8- 27 Technical specifications of MDS D261

		6GT2600-1AA01-0AX0
Product type designation	SIMATIC MDS D261	
Memory		
Memory configuration		
• UID	• 8 bytes	
• User memory	• 256 bytes EEPROM	
• OTP memory	• 16 bytes (EEPROM)	
Read cycles (at < 40 °C)	> 10^{14}	
Write cycles (at < 40 °C)	> 10^{6}	
Data retention time (at < 40 °C)	> 10 years	
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"	
MTBF (Mean Time Between Failures)	228 years	
Mechanical specifications		
Housing		
• Material	• Top	• PET plastic (label material)
	• Inlay	• PET plastic (carrier material)
	• Antenna	• Aluminum
	• Bottom	• Double-sided transfer adhesive on silicon paper
• Color	• White	
Recommended distance to metal	≥ 25 mm	
Power supply	Inductive, without battery	
Permitted ambient conditions		
Ambient temperature		
• In operation, during write/read access	• -5 to +85 °C	
• In operation, outside write/read access	• -25 to +85 °C	
• During transportation and storage	• +15 to +30 °C Can be stored for 2 years, determined by the durability of the adhesive	
Degree of protection	IP65	

	6GT2600-1AA01-0AX0
Design, dimensions and weight	
Dimensions (L x W x H)	55 x 55 x 0.3 mm
Weight	1 g
Type of mounting	Glued with self-adhesive label

8.11.4 Dimension drawing



Dimensions in mm

Figure 8-24 Dimension drawing of MDS D261

8.12 MDS D324

8.12.1 Characteristics

MDS D324	Characteristics	
	Area of application	Production and distribution logistics and product identification Can also be used in harsh environments under extreme environmental conditions (e.g. with higher temperature load).
	Memory size	992 bytes of EEPROM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)."
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP67; IPx9K

8.12.2 Ordering data

Table 8- 28 Ordering data MDS D324

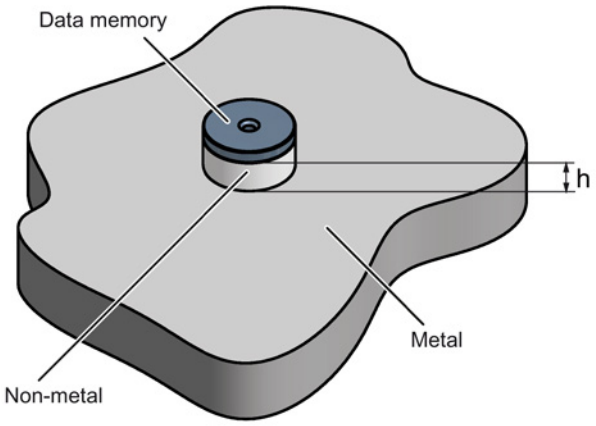
	Article number
MDS D324	6GT2600-3AC00

Table 8- 29 Ordering data MDS D324 accessories

	Article number
Spacer	6GT2690-0AK00

8.12.3 Mounting on metal

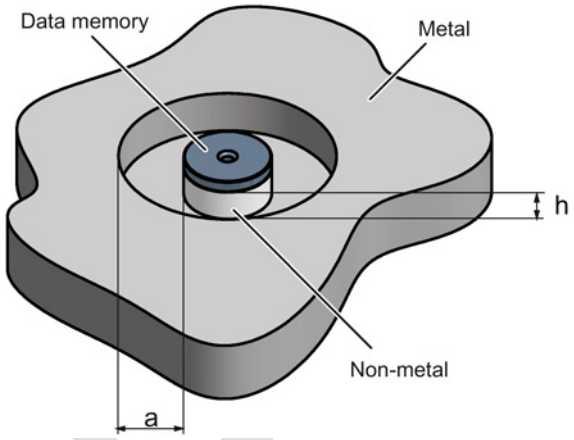
Mounting on metal



h ≥ 15 mm

Figure 8-25 Mounting the MDS D124/D324/D424/D524/E624 and RF320T on metal with spacer

Flush-mounting



h ≥ 15 mm
a ≥ 25 mm

Figure 8-26 Flush-mounting of the MDS D124/D324/D424/D524/E624 and RF320T in metal with spacer

Note

Going below the distances

If the distances (a and 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.

8.12.4 Technical specifications

Table 8- 30 Technical specifications of MDS D324

	6GT2600-3AC00
Product type designation	SIMATIC MDS D324
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 992 bytes EEPROM
• OPT memory	• 16 bytes (EEPROM)
Read cycles (at < 40 °C)	> 10^{14}
Write cycles (at < 40 °C)	> 10^{6}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• Epoxy resin
• Color	• Black
Recommended distance to metal	≥ 15 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +125 °C
• During transportation and storage	• -40 to +140 °C

	6GT2600-3AC00
Degree of protection to EN 60529	• IP67 • IPx9K
Shock-resistant to EN 60721-3-7 class 7M3	100 g [1]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1]
Torsion and bending load	Not permitted

Design, dimensions and weight	
Dimensions (Ø x H)	27 x 4 mm
Weight	5 g
Type of mounting	• 1 x M3 screw [2] ≤ 1 Nm • Glued

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

2) To prevent it loosening during operation, secure the screw with screw locking varnish.

8.12.5 Dimension drawing

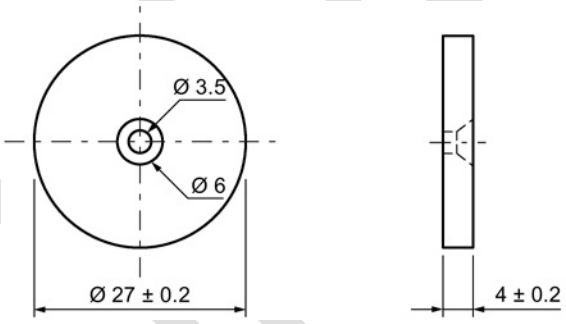


Figure 8-27 Dimension drawing of MDS D324

All dimensions in mm

8.13 MDS D339

8.13.1 Characteristics

MDS D339	Characteristics	
	Area of application	Applications in production automation with high temperature demands (up to +220 °C) Typical application areas: • Paintshops and their preparatory treatments • 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 size	992 bytes of EEPROM user memory
	Write/read range	See section Field data of ISO transponders (MDS D) (Page 52).
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP68/IPx9K

8.13.2 Ordering data

Table 8- 31 Ordering data for MDS D339

	Article number
MDS D339	6GT2600-3AA10

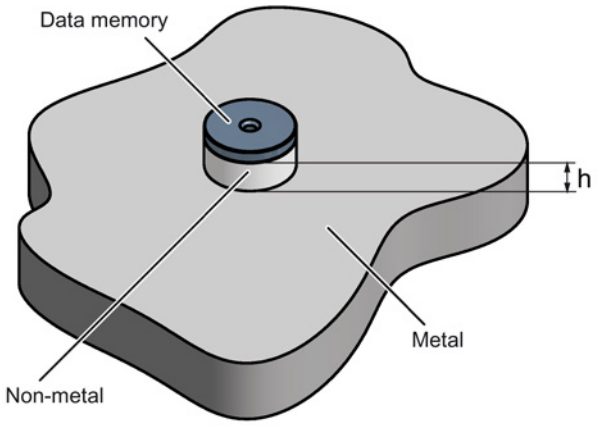
Table 8- 32 Ordering data for MDS D339 accessories

	Article number
Spacer	6GT2690-0AA00
Quick change holder (Ø x H): 22 x 60 mm	6GT2690-0AH00
Quick change holder (Ø x H): 22 x 47 mm	6GT2690-0AH10

8.13.3 Mounting on metal

Direct mounting of the MDS D139/D339 on metal is not allowed. A distance of ≥ 30 mm is recommended. This can be achieved using spacers (see "Ordering data (Page 303)").

Mounting on metal

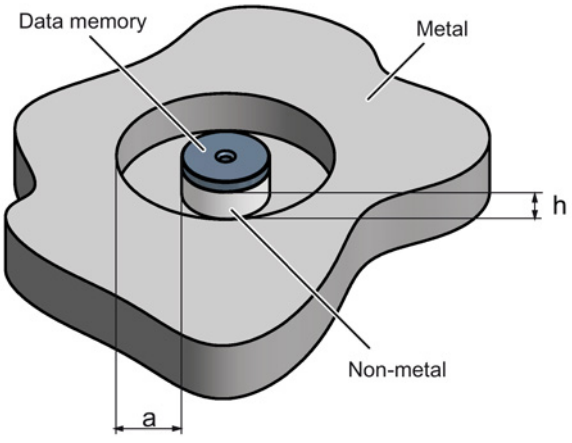


h ≥ 30 mm

Figure 8-28 Mounting the MDS D139/D339 on metal with spacer

Flush-mounting

It is possible to mount the MDS D139/D339 in metal. With large antennas, for example ANT D5, this leads to a reduction of ranges.



h ≥ 30 mm

a ≥ 100 mm

Figure 8-29 Flush-mounting of the MDS D139/D339 in metal with spacer

Note

Going below the distances

If the distances (a and 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.

8.13.4 Cleaning the mobile data memory

Note

Do not clean the transponder with mechanical tools, sand-blasting or pressure hose. These cleaning methods result in damage to the transponder.

Clean the transponder only with the cleaning agents listed in the section "Chemical resistance of the MDS".

8.13.5 Technical specifications

Table 8- 33 Technical specifications of MDS D339

	6GT2600-3AA10
Product type designation	SIMATIC MDS D339
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 992 bytes EEPROM
• OPT memory	• 16 bytes (EEPROM)
Read cycles (at < 40 °C)	> 10^{14}
Write cycles (at < 40 °C)	> 10^{6}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years

	6GT2600-3AA10
Mechanical specifications	
Housing	
• Material	• PPS
• Color	• Black
Recommended distance to metal	≥ 30 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +220 ℃
	• from +125 ℃: 20% reduction in the limit distance
	• from +140 ℃: No processing possible
	• at +200 ℃: Tested up to 5000 hours or 6000 cycles
	• at +220 ℃: Tested up to 2000 hours or 2000 cycles
• During transportation and storage	• -40 to +100 ℃
Degree of protection to EN 60529	• IP68 2 hours, 2 bar, +20 °C • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to EN 60721-3-7 class 7M3	50 g [1)]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1)]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	85 x 15 mm
Weight	50 g
Type of mounting	1 x M5 screw [2)] 1.5 Nm

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

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

8.13.6 Use of the MDS D339 in hazardous areas

The MDS D339 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 94/9/EC directive are met:

- EN 60079-0:2006
- EN 60079-15:2005
- EN 61241-0:2006
- EN 61241-1:2004

Identification

II 3 G Ex nA II T6

Ii 3 D Ex tD A22 IP68 T 210°C

KEMA 09 ATEX 0133 X

WARNING
Gefahr durch elektrostatische Entladungen Potential electrostatic charging hazard Danger potentiel de charges électrostatiques

Note

Installations- und Betriebsbedingungen für den Ex-Schutzbereich:

a) Der Einsatz des Gerätes in der Nähe von stark ladungserzeugenden Prozessen ist untersagt.

b) Das Gerät ist mechanisch geschützt zu montieren.

c) Die Montage muss auf einem geerdeten, leitenden Untergrund erfolgen.

d) Die Reinigung darf nur mit feuchtem Tuch erfolgen.

Installation and operating conditions for hazardous areas:

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.

c) Installation must be performed on a grounded and conductive mounting surface.

d) Cleaning only with a wet cloth

Conditions d'installation et de mise en oeuvre pour la zone de protection Ex :

a) L'utilisation de l'appareil près de processus générant de fortes charges est interdite.

b) L'appareil doit être monté de manière à être protégé mécaniquement.

c) Le montage doit être effectué sur un socle conducteur mis à la terre.

d) Nettoyage uniquement avec un chiffon humide

8.13.7 Dimensional drawing

MDS D339

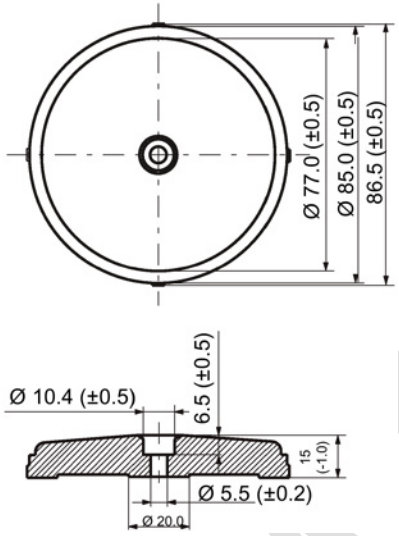


Figure 8-30 Dimension drawing of the MDS D339

Dimensions in mm

8.14 MDS D400

8.14.1 Features

MDS D400	Characteristics	
	Area of application	Simple identification such as electronic barcode replacement/supplements, from warehouse and distribution logistics right through to product identification.
	Memory size	2000 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)"
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP67

8.14.2 Ordering data

Table 8- 34 Ordering data of MDS D400

	Article number
MDS D400	6GT2600-4AD00

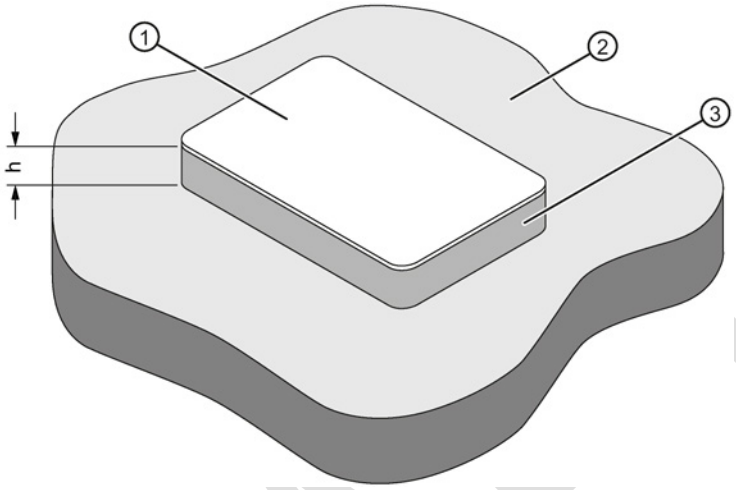
Table 8- 35 Ordering data of MDS D400 accessories

	Article number
Spacer (in conjunction with fixing pocket 6GT2190-0AB00)	6GT2190-0AA00
Fixing pocket (in conjunction with spacer 6GT2190-0AA00)	6GT2190-0AB00
Fixing pocket (not suitable for fixing directly onto metal)	6GT2390-0AA00

8.14.3 Mounting on metal

Mounting on metal

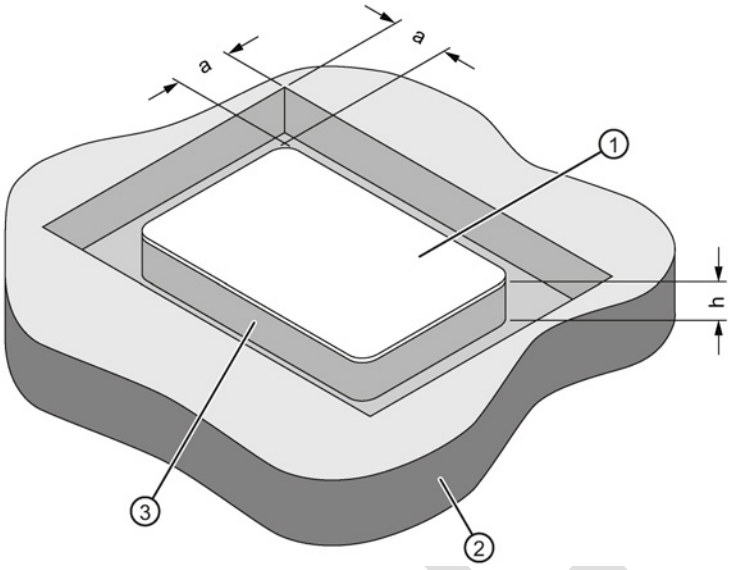
It is possible to mount the MDS D400 on metal.



h ≥ 20 mm
① Transponder
② Metal
③ Non-metal

Figure 8-31 Mounting of the MDS D400 on metal with spacer

Flush-mounted in metal



a ≥ 20 mm
h ≥ 20 mm
① Transponder
② Metal
③ Non-metal

Figure 8-32 Flush-mounting of MDS D400 in metal with spacer

Note

If the minimum guide values (h) are not observed, this will result in a reduction of the field data.

8.14.4 Technical specifications

Table 8- 36 Technical specifications for MDS D400

	6GT2600-1AD00-0AX0
Product type designation	SIMATIC MDS D400
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 256 bytes FRAM
• OPT memory	• 16 bytes FRAM

	6GT2600-1AD00-0AX0
Read cycles (at < 25 °C)	> 10^{12}
Write cycles (at < 25 °C)	> 10^{12}
Data retention time (at < 25 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• PVC
• Color	• White
Recommended distance to metal	≥ 20 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -20 to +60 °C
• During transportation and storage	• -20 to +60 °C
Degree of protection to EN 60529	IP67
Vibration-resistant to EN 60721-3-7, class 7M3	ISO 10373 / ISO 7810 [1]
Torsion and bending load	ISO 10373/ISO 7816-1
Design, dimensions and weight	
Dimensions (L x W x H)	85 x 54 x 0.8 mm
Weight	5 g
Type of mounting	• Fixing lug • Glued

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

8.14.5 Dimension drawing

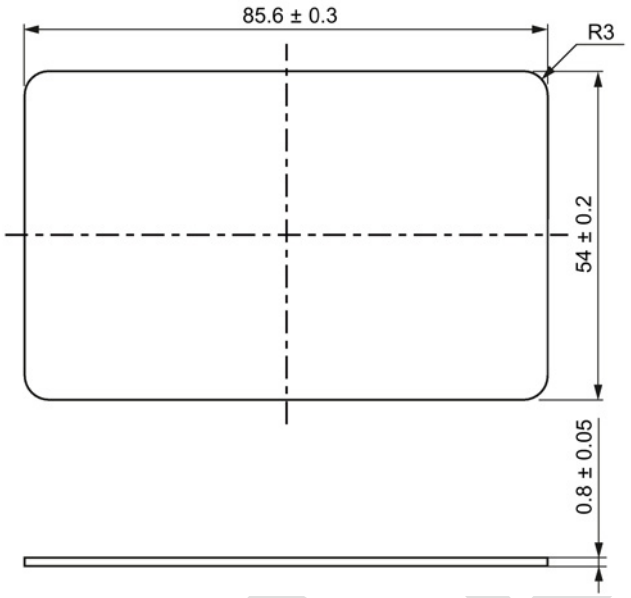


Figure 8-33 Dimensional drawing MDS D400 (dimensions in mm)

8.15 MDS D421

8.15.1 Characteristics

MDS D421	Characteristics	
	Area 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. The rugged housing of the MDS D421 means that it can also be used in a harsh industrial environment without problems.
	Memory size	2000 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)"
	Mounting on metal	Yes, flush-mounted in metal
	ISO standard	ISO 15693
	Degree of protection	IP67/IPx9K

8.15.2 Ordering data

Table 8- 37 Ordering data of MDS D421

	Article number
MDS D421	6GT2600-4AE00

8.15.3 Mounting on metal

Mounting on metal

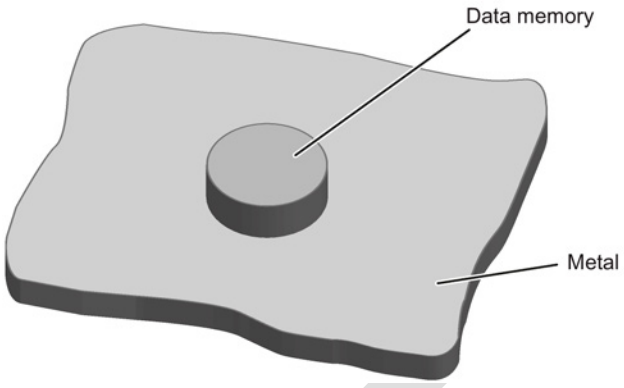


Figure 8-34 Mounting of MDS D421/D521/E623 on metal

Flush-mounting

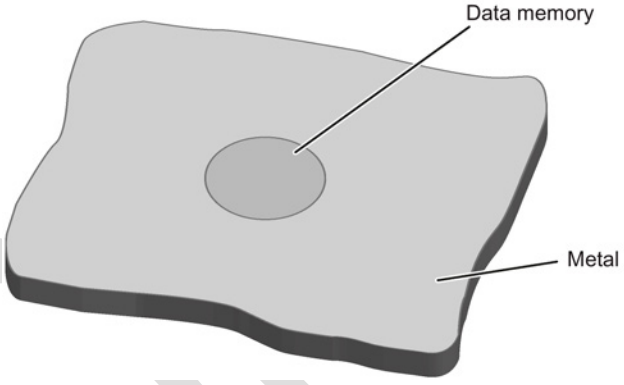


Figure 8-35 Mounting of MDS D421/D521/E623 in metal

Flush-mounting of the MDS in metal with tools

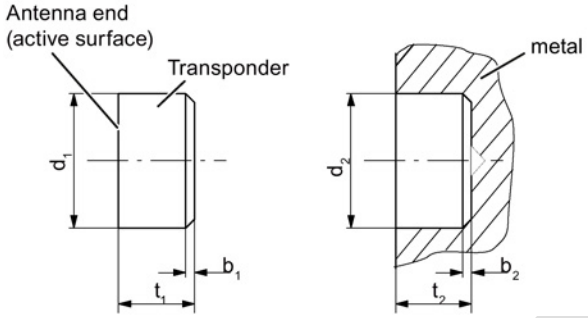


Figure 8-36 Flush-mounting of MDS D421/D521/E623 in metal with tools

b_1	0.5 x 45°	b_2	0.3 x 45° or R0.3
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)

All dimensions in mm

Note

Installation instruction

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 transponder using your fingers; with antenna side to the outside (see figure above)
- Remove residues of adhesive
- Allow to cure according to the manufacturer's instructions
- Flush-mounting of the transponder in metal with tools

Installation examples

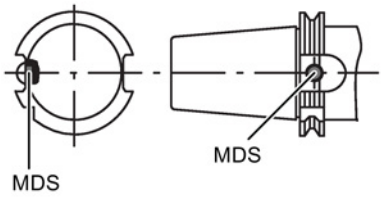


Figure 8-37 Installation example of MDS D421/D521/E623 in a steep cone

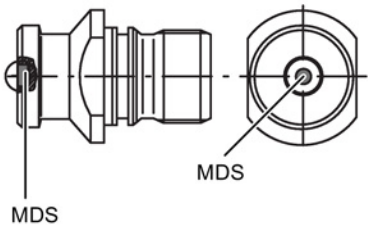


Figure 8-38 Installation example of MDS D421/D521/E623 in a stud bolt

8.15.4 Technical specifications

Table 8- 38 Technical specifications for the MDS D421

	6GT2600-4AE00
Product type designation	SIMATIC MDS D421
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 2000 bytes FRAM
• OPT memory	• 16 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years

	6GT2600-4AE00
Mechanical specifications	
Housing	
• Material	• Epoxy resin
• Color	• Black
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C
Degree of protection to EN 60529	• IP67 • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to EN 60721-3-7 class 7M3	100 g [1]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	10 x 4.5 mm
Weight	Approx. 1 g
Type of mounting	Glued[2]

[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.

8.15.5 Dimension drawing

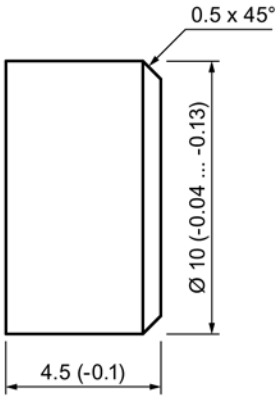


Figure 8-39 Dimension drawing of MDS D421

All dimensions in mm

8.16 MDS D422

8.16.1 Characteristics

MDS D422	Characteristics	
	Area of application	Identification of metallic workpiece holders, workpieces or containers
	Memory size	2000 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52).
	Mounting on metal	Yes
	ISO standard	ISO 15693
	Degree of protection	IP68

8.16.2 Ordering data

Table 8- 39 Ordering data of MDS D422

	Article number
MDS D422 A screw-in aid is included in the scope of supply per packaging unit	6GT2600-4AF00

8.16.3 Mounting in metal

Flush-mounting

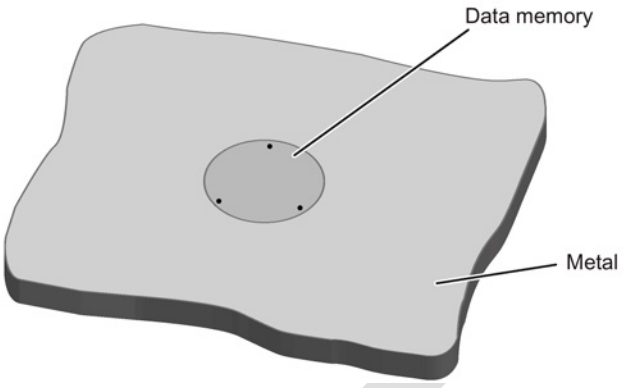


Figure 8-40 Mounting of MDS D422 in metal

Mounting information for screws

You can screw the transponder into a pre-drilled threaded hole using the screw-in aid.

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 D422 using your fingers; with antenna to the outside
- Remove residues of adhesive
- Allow to cure according to the manufacturer's instructions
- Flush-mounting of MDS D422 in metal with tools

8.16.4 Technical specifications

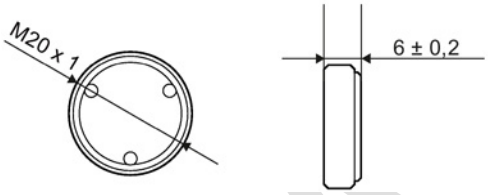
Table 8- 40 Technical specifications for the MDS D422

	6GT2600-4AF00
Product type designation	SIMATIC MDS D422
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 2000 bytes FRAM
• OPT memory	• 16 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	285 years
Mechanical specifications	
Housing	
• Material	• Plastic PA 6.6 GF; brass nickel plated
• Color	• Black/silver
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C
Degree of protection to EN 60529	• IP68 2 hours, 2 bar, +20 °C
Shock-resistant to EN 60721-3-7 class 7M3	50 g [1)]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1)]
Torsion and bending load	Not permitted

	6GT2600-4AF00
Design, dimensions and weight	
Dimensions (Ø x H)	20 x 6 mm
Weight	13 g
Type of mounting	• Glued • 1 x transponder thread M20 ≤ 1 Nm

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

8.16.5 Dimension drawing



Dimensions in mm

Figure 8-41 Dimensional drawing of MDS D422

8.17 MDS D423

8.17.1 Characteristics

MDS D423	Characteristics	
	Area of application	Identification of metallic workpiece holders, workpieces or containers, production automation
	Memory size	2000 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)"
	Mounting on metal	Yes, flush-mounted in metal
	ISO standard	ISO 15693
	Degree of protection	IP68/IPx9K

8.17.2 Ordering data

Table 8- 41 Ordering data of MDS D423

	Article number
MDS D423	6GT2600-4AA00

Table 8- 42 Ordering data of MDS D423 accessories

	Article number
Fixing hood RF330T / MDS D423	6GT2690-0EA00

8.17.3 Mounting on metal

Mounting on metal

Direct mounting of the MDS D423 on metal is possible.

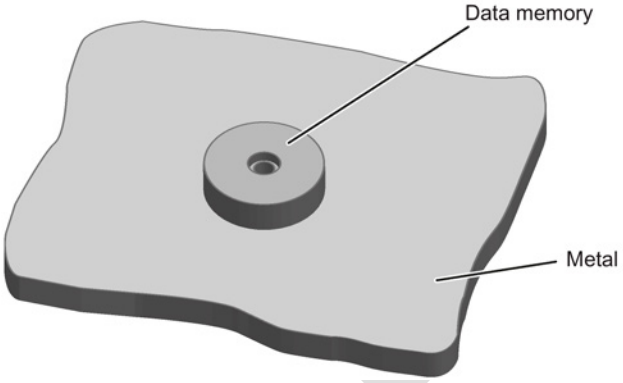
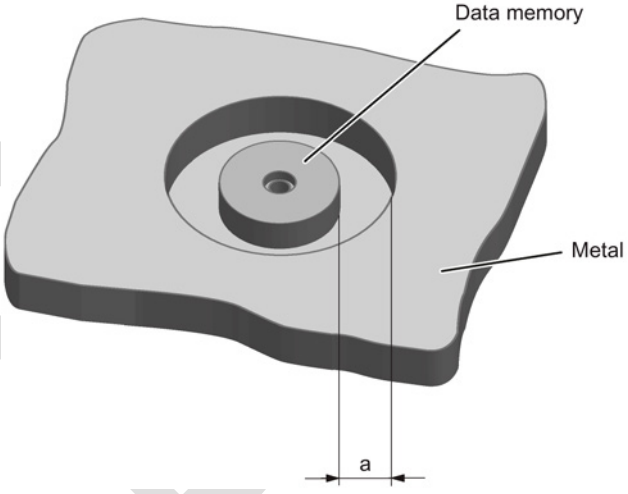


Figure 8-42 Mounting the MDS D423 on metal

Flush-mounted in metal

It is possible to mount the MDS D423 in metal.



a ≥ 10 mm

Figure 8-43 Flush-mounting of the MDS D423 in metal with 10 mm clearance

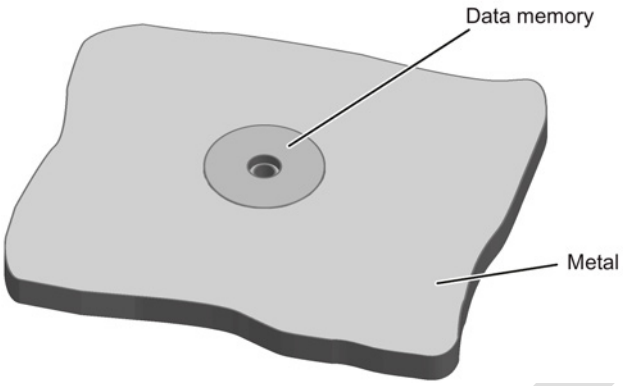


Figure 8-44 Flush-mounting of the MDS D423 in metal without clearance

Note

Reduction of the write/read range

Note that when the device is flush-mounted in metal without a surrounding clearance ≥ 10 mm, the write/read range is significantly reduced.

8.17.4 Technical specifications

Table 8- 43 Technical specifications of MDS D423

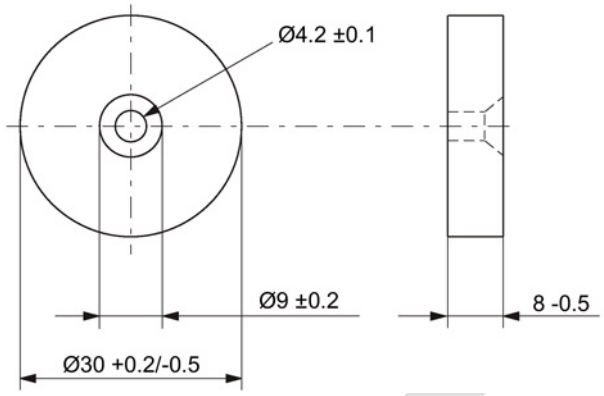
	6GT2600-4AA00
Product type designation	SIMATIC MDS D423
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 2000 bytes FRAM
• OPT memory	• 16 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years

	6GT2600-4AA00
Mechanical specifications	
Housing	
• Material	• Plastic PPS
• Color	• Black
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 ℃
• During transportation and storage	• -40 to +100 ℃
Degree of protection to EN 60529	• IP68 2 hours, 2 bar, +20 °C • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to EN 60721-3-7 class 7M3	50 g [1]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1]
Pressure resistance	• Low pressure resistant vacuum dryer: up to 20 mbar • High pressure resistant (see degree of protection IPx9K)
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	30 x 8 mm
Weight	15 g
Type of mounting	1 x M4 screw [2] ≤ 1 Nm

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

[2]) To prevent it loosening during operation, secure the screw with screw locking varnish.

8.17.5 Dimensional drawing



Dimensions in mm

Figure 8-45 Dimension drawing for MDS D423

8.18 MDS D424

8.18.1 Characteristics

MDS D424	Characteristics	
	Area of application	Production and distribution logistics as well as in assembly and production lines, can also be used in a harsh industrial environment without problem
	Memory size	2000 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)."
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP67; IPx9K

8.18.2 Ordering data

Table 8- 44 Ordering data of MDS D424

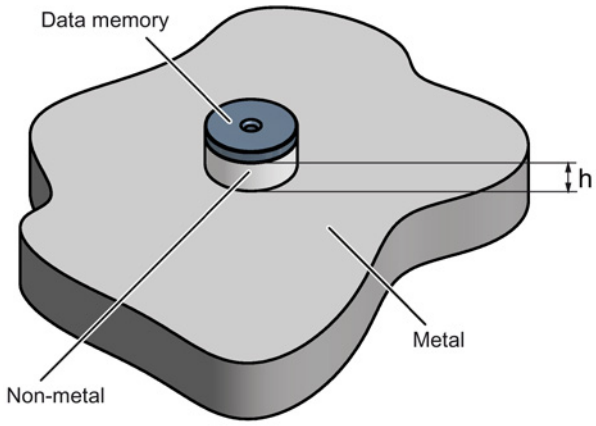
	Article number
MDS D424	6GT2600-4AC00

Table 8- 45 Ordering data of MDS D424 accessories

	Article number
Spacer	6GT2690-0AK00

8.18.3 Mounting on metal

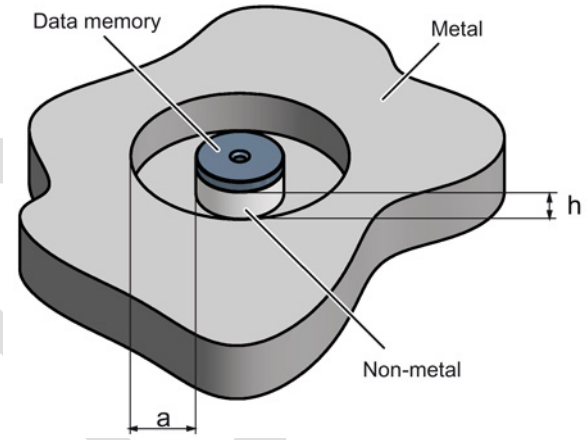
Mounting on metal



h ≥ 15 mm

Figure 8-46 Mounting the MDS D124/D324/D424/D524/E624 and RF320T on metal with spacer

Flush-mounting



h ≥ 15 mm

a ≥ 25 mm

Figure 8-47 Flush-mounting of the MDS D124/D324/D424/D524/E624 and RF320T in metal with spacer

Note

Going below the distances

If the distances (a and 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.

8.18.4 Technical specifications

Table 8- 46 Technical specifications for the MDS D424

	6GT2600-4AC00
Product type designation	SIMATIC MDS D424
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 2000 bytes FRAM
• OPT memory	• 16 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• Epoxy resin
• Color	• Black
Recommended distance to metal	≥ 15 mm
Power supply	Inductive, without battery

	6GT2600-4AC00
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C
Degree of protection to EN 60529	• IP67 • IPx9K
Shock-resistant to EN 60721-3-7 class 7M3	100 g [1]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	27 x 4 mm
Weight	5 g
Type of mounting	• Glued • 1 x M3 screw [2] ≤ 1 Nm

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

[2]) To prevent it loosening during operation, secure the screw with screw locking varnish.

8.18.5 Dimension drawing

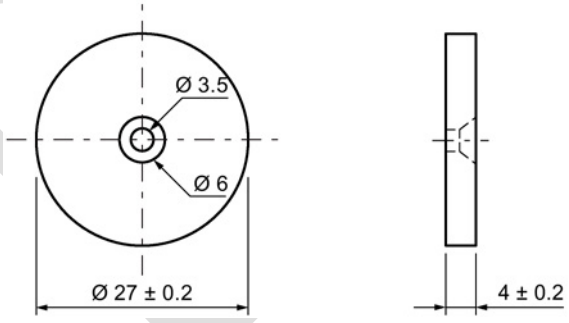


Figure 8-48 Dimension drawing of MDS D424

All dimensions in mm

8.19 MDS D425

8.19.1 Characteristics

MDS D425	Characteristics	
	Area of application	Compact and rugged ISO transponder; suitable for screw mounting Use in assembly and production lines in the powertrain sector; ideal for mounting on motors, gearboxes, and workpiece holders Rugged packaging of the MDS D425; can therefore also be used under extreme environmental conditions without problem
	Memory size	2000 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)".
	Mounting on metal	Yes
	ISO standard	ISO 15693
	Degree of protection	IP68/IPx9K

8.19.2 Ordering data

Table 8- 47 Ordering data of MDS D425

	Article number
MDS D425	6GT2600-4AG00

8.19.3 Application example

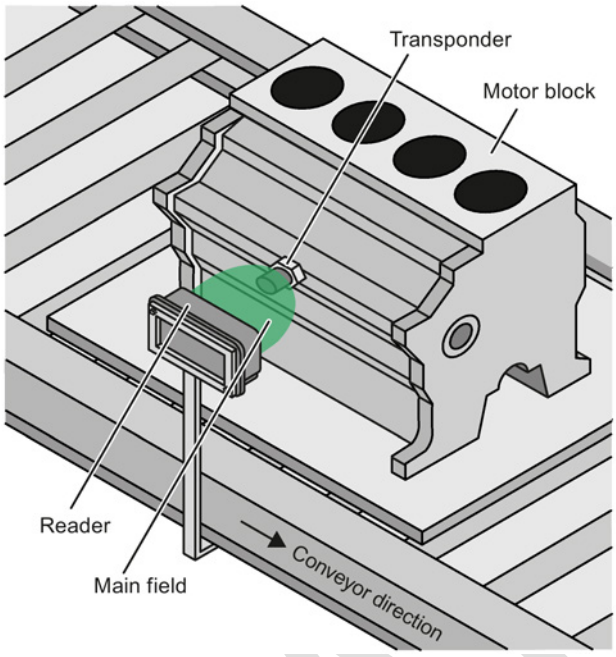


Figure 8-49 Application example

8.19.4 Technical specifications

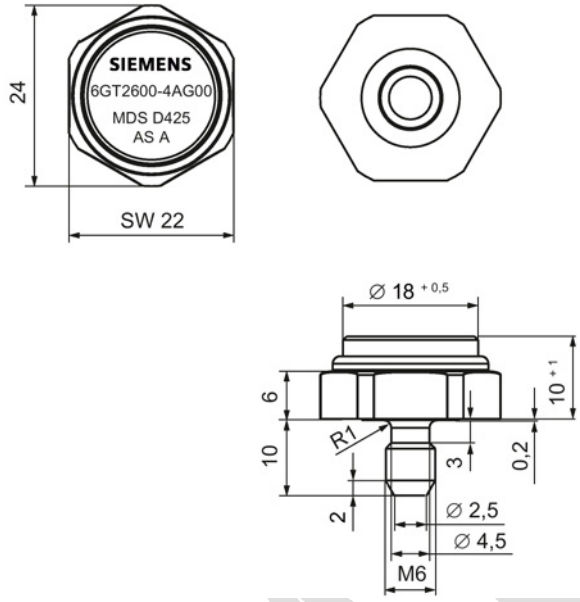
Table 8- 48 Technical specifications for the MDS D425

	6GT2600-4AG00
Product type designation	SIMATIC MDS D425
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 2000 bytes FRAM
• OPT memory	• 16 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years

	6GT2600-4AG00
Mechanical specifications	
Housing	
• Material	• Plastic PA 6.6 GF
• Color	• Black
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 ℃
• During transportation and storage	• -40 to +125 ℃
Degree of protection to EN 60529	• IP68 2 hours, 2 bar, +20 °C • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to IEC 68-2-27	50 g [1)]
Vibration-resistant to IEC 68-2-6	20 g [1)]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	24 x 10 mm (without set screw)
Weight	35 g
Type of mounting	1x transponder set screw M6 SW 22; ≤ 6 Nm

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

8.19.5 Dimension drawing



Dimensions in mm

Figure 8-50 Dimension drawing of MDS D425

8.20 MDS D426

8.20.1 Characteristics

MDS D426	Characteristics	
	Area of application	Compact and rugged ISO transponder; suitable for identification of transport units in production-related logistics; can also be deployed in harsh conditions
	Memory size	2000 bytes of FRAM user memory
	Write/read range	See section Field data of ISO transponders (MDS D) (Page 52)
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP68

8.20.2 Ordering data

Table 8- 49 Ordering data of MDS D426

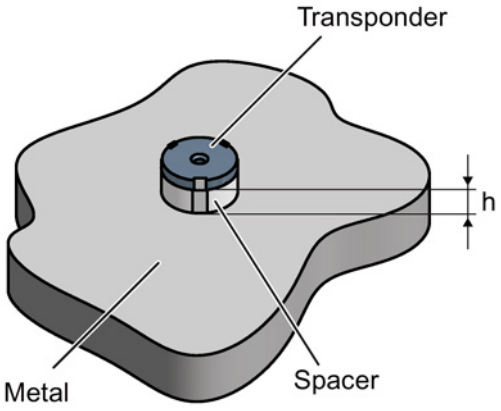
	Article number
MDS D426	6GT2600-4AH00

Table 8- 50 Ordering data of MDS D426 accessories

	Article number
Spacer	6GT2690-0AL00

8.20.3 Mounting on metal

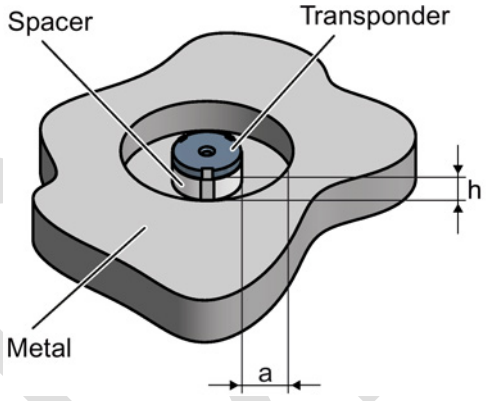
Mounting on metal



h ≥ 25 mm

Figure 8-51 Mounting the MDS D126 / D426 / D526 on metal with spacer

Flush-mounted in metal



h ≥ 25 mm

a ≥ 50 mm

Figure 8-52 Flush installation of the MDS D126 / D426 / D526 in metal with spacer

8.20.4 Technical specifications

Table 8- 51 Technical specifications for the MDS D426

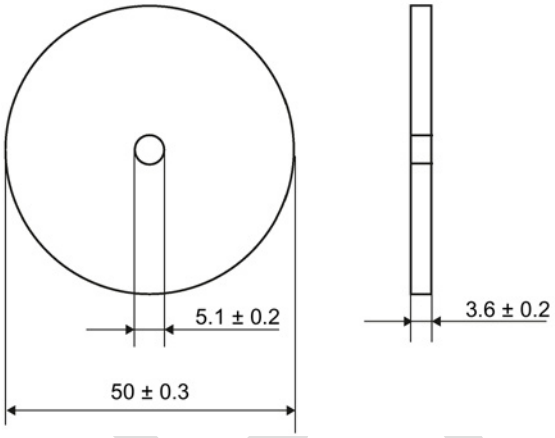
	6GT2600-4AH00
Product type designation	SIMATIC MDS D426
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 2000 bytes FRAM
• OPT memory	• 16 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• Plastic PA 6.6 GF
• Color	• Black
Recommended distance to metal	≥ 25 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C
Degree of protection to EN 60529	IP68 2 hours, 2 bar, +20 °C
Shock-resistant to IEC 68-2-27	50 g [1)]
Vibration-resistant to IEC 68-2-6	20 g [1)]
Torsion and bending load	Not permitted

	6GT2600-4AH00
Design, dimensions and weight	
Dimensions (Ø x H)	50 x 3.6 mm
Weight	13 g
Type of mounting	1 x M4 screw [2] ≤ 1 Nm

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

[2]) To prevent it loosening during operation, secure the screw with screw locking varnish.

8.20.5 Dimension drawing



Dimensions in mm

Figure 8-53 Dimension drawing of MDS D426

8.21 MDS D428

8.21.1 Characteristics

MDS D428	Characteristics	
	Area of application	Compact and rugged ISO transponder; suitable for screw mounting. Use in assembly and production lines in the powertrain sector. The rugged housing of the MDS D428 means that it can also be used in extreme environmental conditions without problems.
	Memory size	2000 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)"
	Mounting on metal	Yes
	ISO standard	ISO 15693
	Degree of protection	IP68/IPx9K

8.21.2 Ordering data

Table 8- 52 Ordering data of MDS D428

	Article number
MDS D428	6GT2600-4AK00-0AX0

8.21.3 Application example

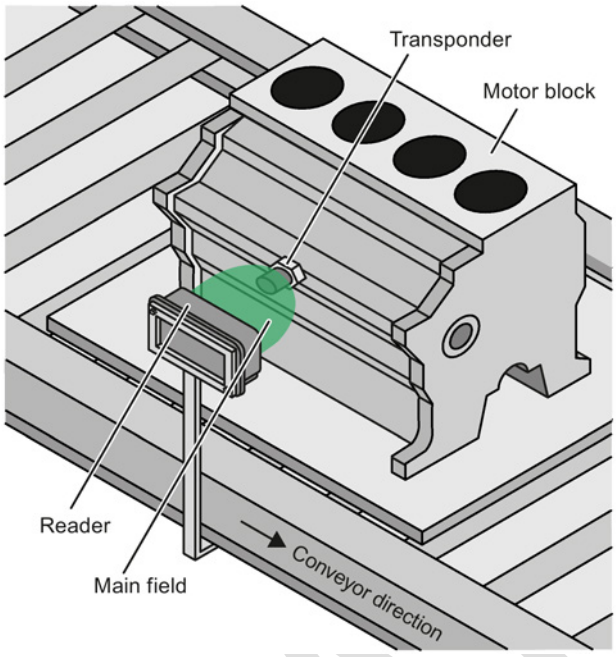


Figure 8-54 Application example

8.21.4 Technical specifications

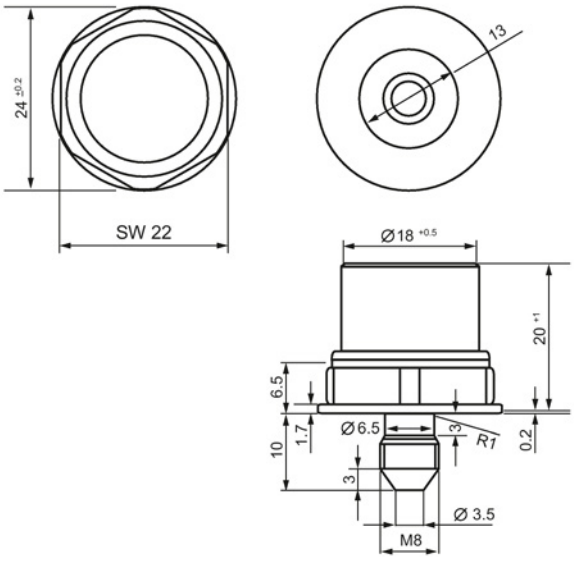
Table 8- 53 Technical specifications for the MDS D428

	6GT2600-4AK00
Product type designation	SIMATIC MDS D428
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 2000 bytes FRAM
• OPT memory	• 16 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years

	6GT2600-4AK00
Mechanical specifications	
Housing	
• Material	• Plastic PA 6.6 GF
• Color	• Black
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 ℃
• During transportation and storage	• -40 to +125 ℃
Degree of protection to EN 60529	• IP68 2 hours, 2 bar, +20 °C • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to IEC 68-2-27	50 g [1)]
Vibration-resistant to IEC 68-2-6	20 g [1)]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	24 x 20 mm (without set screw)
Weight	35 g
Type of mounting	1x transponder set screw M8 SW 22; ≤ 8 Nm

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

8.21.5 Dimension drawing



Dimensions in mm

Figure 8-55 Dimension drawing of MDS D428

8.22 MDS D460

8.22.1 Characteristics

MDS D460	Characteristics	
	Area of application	Identification in small assembly lines; can also be used in a harsh industrial environment
	Memory size	2000 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52).
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP67/IPx9K

8.22.2 Ordering data

Table 8- 54 Ordering data of MDS D460

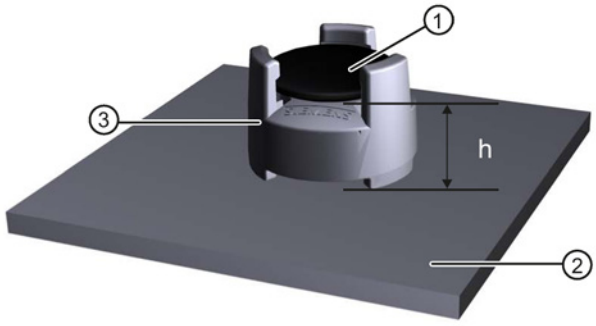
	Article number
MDS D460	6GT2600-4AB00

Table 8- 55 Ordering data of MDS D460 accessories

	Article number
Spacer	6GT2690-0AG00

8.22.3 Mounting on metal

Mounting option on metal with spacer



① Transponder
② Metal
③ Spacer
h ≥ 10 mm

Figure 8-56 Mounting 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!

8.22.4 Technical specifications

Table 8- 56 Technical specifications for MDS D460

	6GT2600-4AB00
Product type designation	SIMATIC MDS D460
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 2000 bytes FRAM
• OPT memory	• 16 bytes FRAM

	6GT2600-4AB00
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years

Mechanical specifications	
Housing	
• Material	• Epoxy resin
• Color	• Black
Recommended distance to metal	≥ 10 mm
Power supply	Inductive, without battery

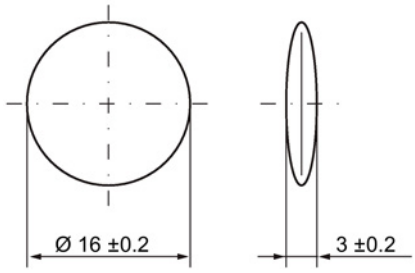
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C
Degree of protection to EN 60529	• IP67 • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to IEC 68-2-27	50 g [1]
Vibration-resistant to IEC 68-2-6	20 g [1]
Torsion and bending load	Not permitted

Design, dimensions and weight	
Dimensions (Ø x H)	16 x 3 mm
Weight	3 g
Type of mounting	• Glued • With spacer

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

8.22.5 Dimension drawings

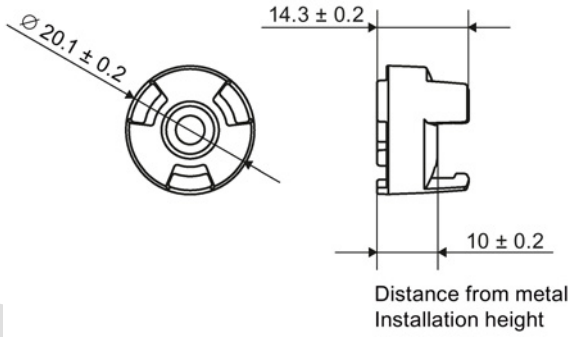
Dimensional drawing of MDS D460



Dimensions in mm

Figure 8-57 Dimensional drawing of MDS D460

Dimensional drawing of spacer



Dimensions in mm

Figure 8-58 Dimensional drawing of spacer

8.23 MDS D521

8.23.1 Characteristics

MDS D521	Characteristics	
	Area of application	The MDS D521 is designed for tool coding according to DIN 69873. It can be used wherever small data carriers and exact positioning are required, e.g. tool identification, workpiece holders. The rugged housing of the MDS D521 means that it can also be used in a harsh industrial environment without problems.
	Memory size	8192 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)"
	Mounting on metal	Yes, flush-mounted in metal
	ISO standard	ISO 15693
	Degree of protection	IP67/IPx9K

8.23.2 Ordering data

Table 8- 57 Ordering data for MDS D521

	Article number
MDS D521	6GT2600-5AE00

8.23.3 Mounting on metal

Mounting on metal

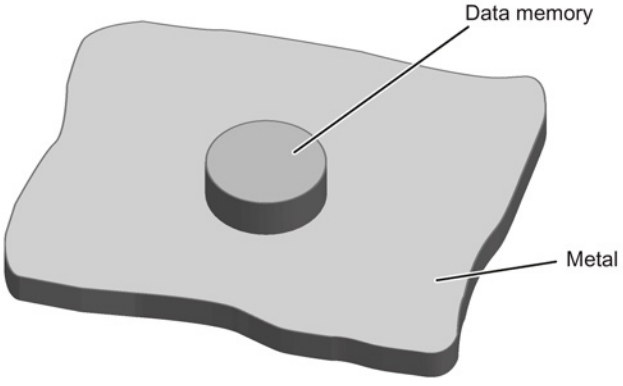


Figure 8-59 Mounting of MDS D421/D521/E623 on metal

Flush-mounting

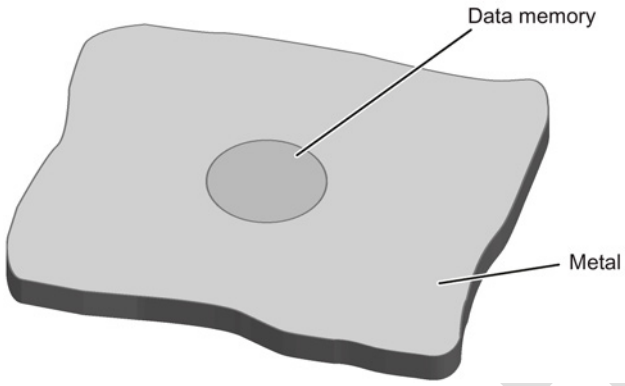


Figure 8-60 Mounting of MDS D421/D521/E623 in metal

Flush-mounting of the MDS in metal with tools

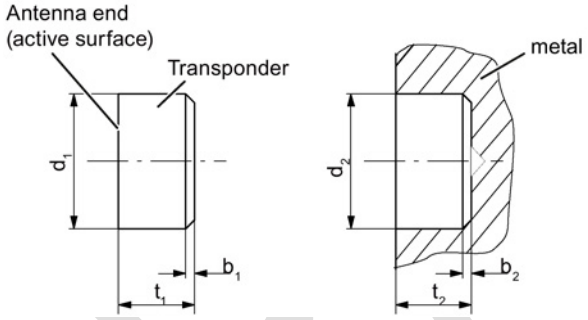


Figure 8-61 Flush-mounting of MDS D421/D521/E623 in metal with tools

b_1	0.5 x 45°	b_2	0.3 x 45° or R0.3
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)

All dimensions in mm

Note

Installation instruction

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 transponder using your fingers; with antenna side to the outside (see figure above)
- Remove residues of adhesive
- Allow to cure according to the manufacturer's instructions
- Flush-mounting of the transponder in metal with tools

Installation examples

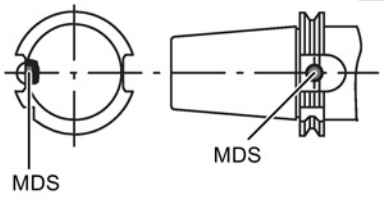


Figure 8-62 Installation example of MDS D421/D521/E623 in a steep cone

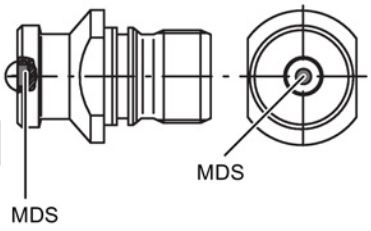


Figure 8-63 Installation example of MDS D421/D521/E623 in a stud bolt

8.23.4 Technical specifications

Table 8- 58 Technical specifications for MDS D521

	6GT2600-5AE00
Product type designation	SIMATIC MDS D521
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 8192 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• Epoxy resin
• Color	• Black
Recommended distance to metal	> 25 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C
Degree of protection to EN 60529	• IP67 • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to EN 60721-3-7 class 7M3	100 g [1)]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1)]
Torsion and bending load	Not permitted

	6GT2600-5AE00
Design, dimensions and weight	
Dimensions (Ø x H)	10 x 4.5 mm
Weight	4 g
Type of mounting	Glued[2)]

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.

8.23.5 Dimension drawing

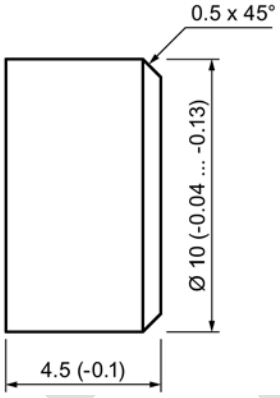


Figure 8-64 Dimension drawing of MDS D521

All dimensions in mm

8.24 MDS D522

8.24.1 Characteristics

MDS D522	Characteristics	
	Area of application	Identification of metallic workpiece holders, workpieces or containers
	Memory size	8192 bytes of FRAM user memory
	Write/read range	See "Field data of ISO transponders (MDS D) (Page 52)."
	Mounting in metal	Yes
	ISO standard	ISO 15693
	Degree of protection	IP68

8.24.2 Ordering data

Table 8- 59 Ordering data for MDS D522

	Article number
MDS D522 Units in a package: 10 units A mounting aid is included in the scope of supply per packaging unit.	6GT2600-5AF00

8.24.3 Mounting in metal

Flush-mounting

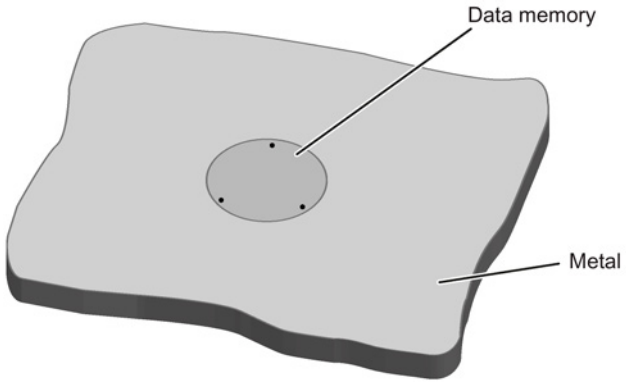


Figure 8-65 Mounting of MDS D522 in metal

Mounting information for screws

You can screw the transponder into a pre-drilled threaded hole using the screw-in aid.

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 D522 using your fingers; with antenna to the outside
- Remove residues of adhesive
- Allow to cure according to the manufacturer's instructions
- Flush-mounting of MDS D522 in metal with tools

8.24.4 Technical specifications

Table 8- 60 Technical specifications for MDS D522

	6GT2600-5AF00
Product type designation	SIMATIC MDS D522
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 8192 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	285 years
Mechanical specifications	
Housing	
• Material	• Plastic PA 6.6 GF; brass nickel plated
• Color	• Black/silver
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery

	6GT2600-5AF00
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C
Degree of protection to EN 60529	• IP68 2 hours, 2 bar, +20 °C
Shock-resistant to EN 60721-3-7 class 7M3	50 g [1]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	20 x 6 mm
Weight	13 g
Type of mounting	• Glued • 1 x transponder thread M20 ≤ 1 Nm

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

8.24.5 Dimension drawing

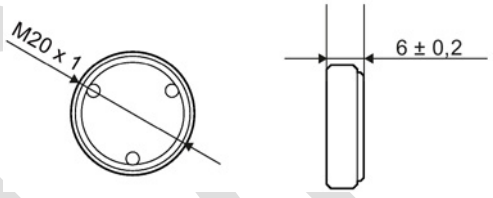


Figure 8-66 Dimensional drawing of MDS D522

All dimensions in mm

8.25 MDS D522 special variant

8.25.1 Characteristics

MDS D522 special version	Characteristics	
	Area of application	Identification of metallic workpiece holders or workpieces
	Memory size	8192 bytes of FRAM user memory
	Write/read range	See "Field data of ISO transponders (MDS D) (Page 52)."
	Mounting in metal	Yes
	ISO standard	ISO 15693
	Degree of protection	IP68

8.25.2 Ordering data

Table 8- 61 MDS D522 special version

	Article number
MDS D522 special version Units in a package: 10 units A mounting aid is included in the scope of supply per packaging unit.	6GT2600-5AF00-0AX0

8.25.3 Mounting in metal

Flush-mounting

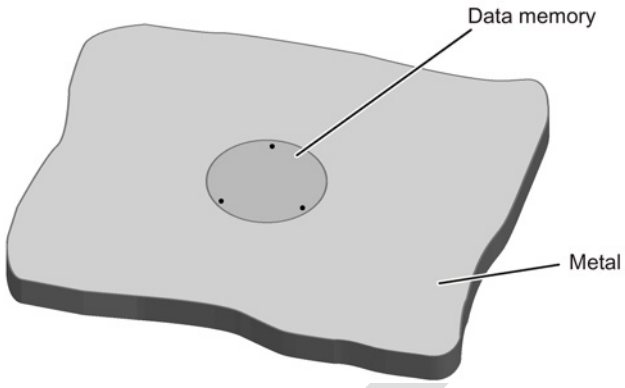


Figure 8-67 Flush installation of the MDS D522 special version in metal without clearance

8.25.4 Installation instructions

The transponder MDS D522 special version is designed to be mounted once.

Note the following instructions when mounting the MDS D522 in a workpiece to avoid damaging the transponder:

- Prepare the workpiece according to the following drawing.
- Using the accompanying mounting aid, press the transponder with uniform and evenly distributed pressure into the drilled hole until the transponder locks in place. Make sure that the transponder does not become tilted.

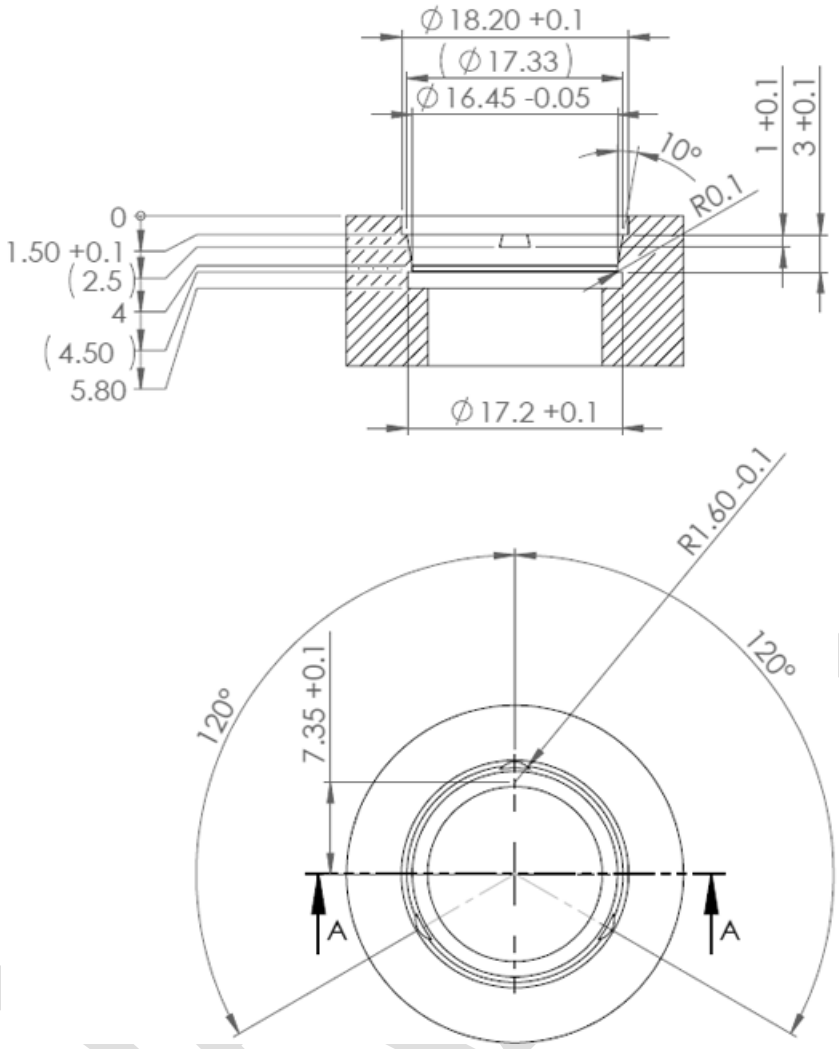


Figure 8-68 Dimension drawing: Workpiece drill hole for mounting the MDS D522 special version

8.25.5 Technical specifications

Table 8- 62 Technical data of MDS D522 special version

	6GT2600-5AF00-0AX0
Product type designation	SIMATIC MDS D522 special version
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 8192 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• Plastic PA 6.6 GF
• Color	• Black
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C
Degree of protection to EN 60529	IP68 2 hours, 2 bar, +20 °C
Shock-resistant to EN 60721-3-7 class 7M3	50 g [1]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	18 (+0.1) × 5.2 mm
Weight	Approx. 1.2 g
Type of mounting	Clipping in once (with accompanying tool)

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

8.25.6 Dimensional drawing

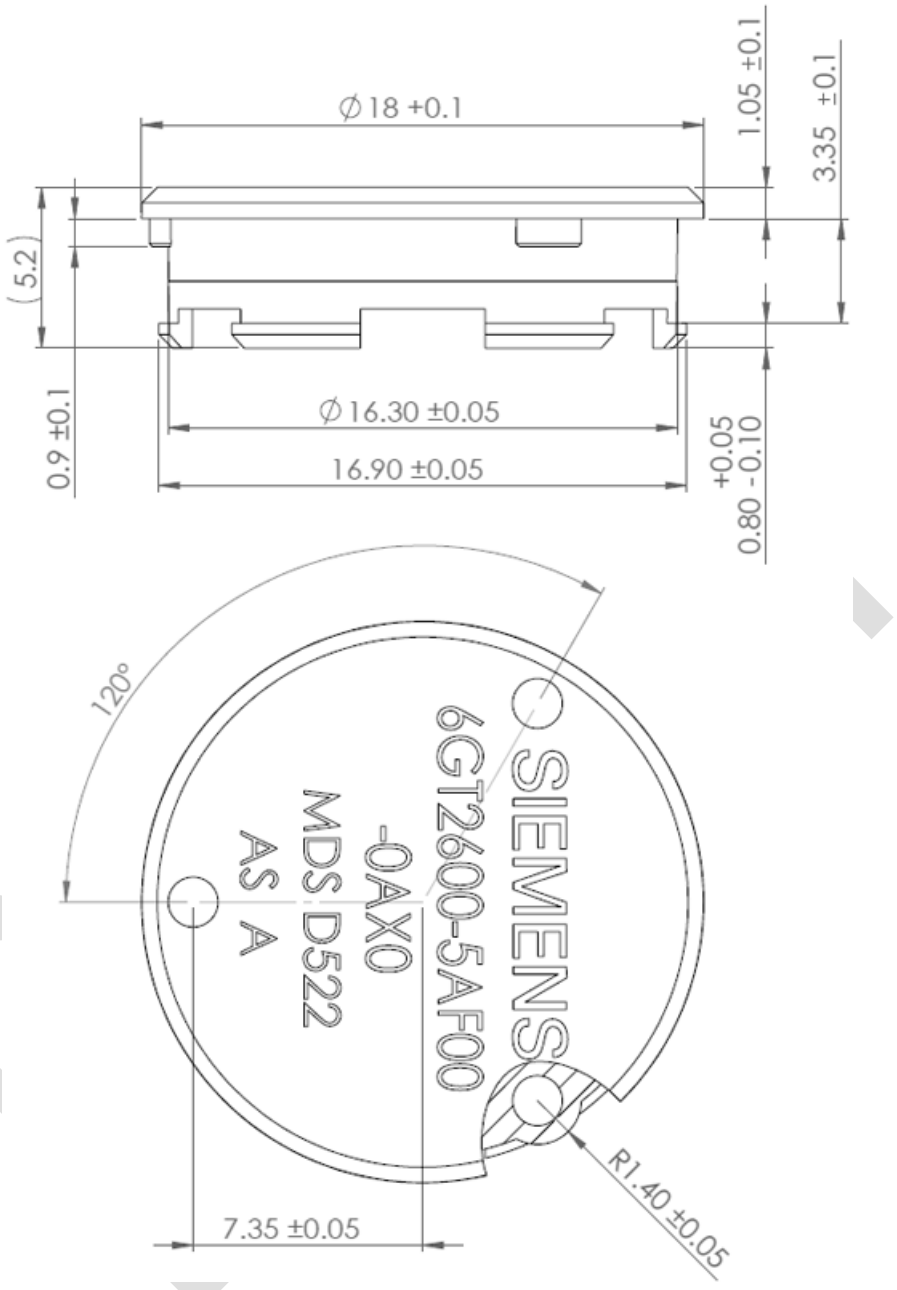


Figure 8-69 Dimension drawing MDS D522 special version

All dimensions in mm

8.26 MDS D524

8.26.1 Characteristics

MDS D524	Characteristics	
	Area of application	Production and distribution logistics as well as in assembly and production lines, can also be used in a harsh industrial environment without problem
	Memory size	8192 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)."
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP67; IPx9K

8.26.2 Ordering data

Table 8- 63 Ordering data for MDS D524

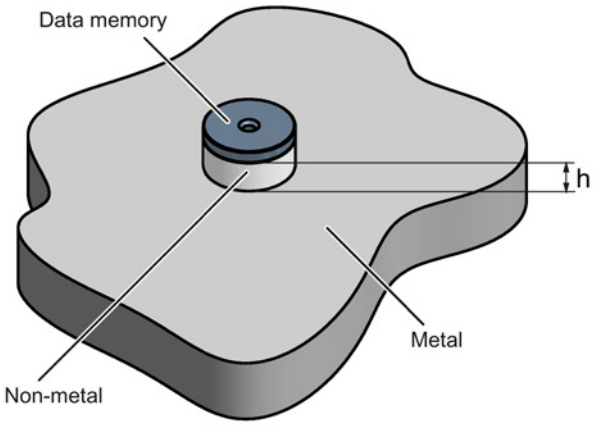
	Article number
MDS D524	6GT2600-5AC00

Table 8- 64 Ordering data of MDS D524 accessories

	Article number
Spacer	6GT2690-0AK00

8.26.3 Mounting on metal

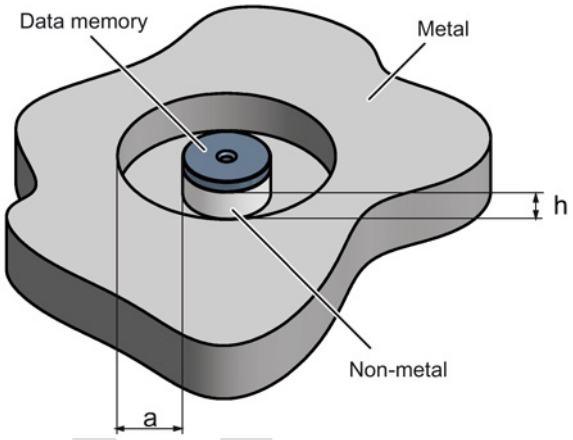
Mounting on metal



h ≥ 15 mm

Figure 8-70 Mounting the MDS D124/D324/D424/D524/E624 and RF320T on metal with spacer

Flush-mounting



h ≥ 15 mm

a ≥ 25 mm

Figure 8-71 Flush-mounting of the MDS D124/D324/D424/D524/E624 and RF320T in metal with spacer

Note

Going below the distances

If the distances (a and 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.

8.26.4 Technical specifications

Table 8- 65 Technical specifications for MDS D524

	6GT2600-5AC00
Product type designation	SIMATIC MDS D524
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 8192 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• Epoxy resin
• Color	• Black
Recommended distance to metal	≥ 25 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C

	6GT2600-5AC00
Degree of protection to EN 60529	• IP67 • IPx9K
Shock-resistant to EN 60721-3-7 class 7M3	100 g [1]
Vibration-resistant to EN 60721-3-7, class 7M3	20 g [1]
Torsion and bending load	Not permitted

Design, dimensions and weight	
Dimensions (Ø x H)	27 x 4 mm
Weight	5 g
Type of mounting	• Glued • 1 x M3 screw [2] ≤ 1 Nm

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

[2]) To prevent it loosening during operation, secure the screw with screw locking varnish.

8.26.5 Dimension drawing

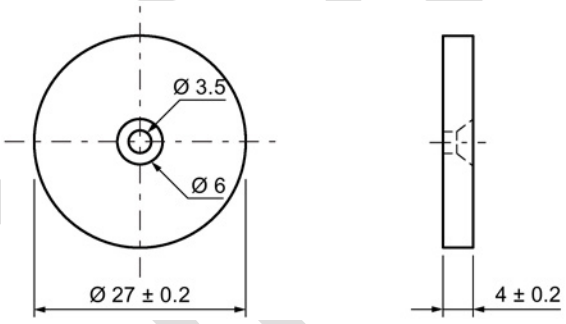


Figure 8-72 Dimensional drawing of MDS D524

All dimensions in mm

8.27 MDS D525

8.27.1 Characteristics

MDS D525	Characteristics	
	Area of application	Compact and rugged ISO transponder; suitable for screw mounting Use in assembly and production lines in the powertrain sector; ideal for mounting on motors, gearboxes, and work-piece holders Rugged packaging of the MDS D525; can therefore also be used under extreme environmental conditions without prob-lems
	Memory size	8192 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)".
	Mounting on metal	Yes
	ISO standard	ISO 15693
	Degree of protection	IP68/IPx9K

8.27.2 Ordering data

Table 8- 66 Ordering data for MDS D525

	Article number
MDS D525	6GT2600-5AG00

8.27.3 Application example

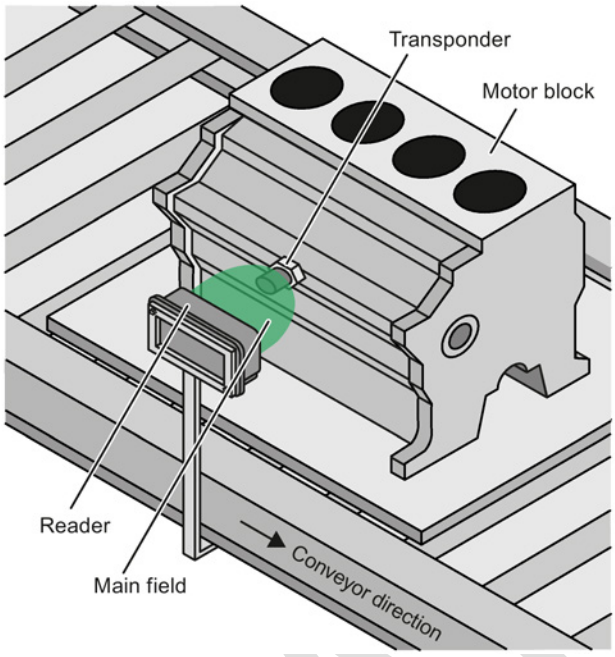


Figure 8-73 Application example

8.27.4 Technical specifications

Table 8- 67 Technical specifications for MDS D525

	6GT2600-5AG00
Product type designation	SIMATIC MDS D525
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 8192 bytes FRAM
• OPT memory	• 16 bytes FRAM
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years

	6GT2600-5AG00
Mechanical specifications	
Housing	
• Material	• Plastic PA 6.6 GF
• Color	• Black
Recommended distance to metal	> 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 ℃
• During transportation and storage	• -40 to +125 ℃
Degree of protection to EN 60529	• IP68 2 hours, 2 bar, +20 °C • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to IEC 68-2-27	50 g [1]
Vibration-resistant to IEC 68-2-6	20 g [1]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	24 x 10 mm (without set screw)
Weight	35 g
Type of mounting	1x transponder set screw M6 SW 22; ≤ 6 Nm

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

8.27.5 Dimension drawing

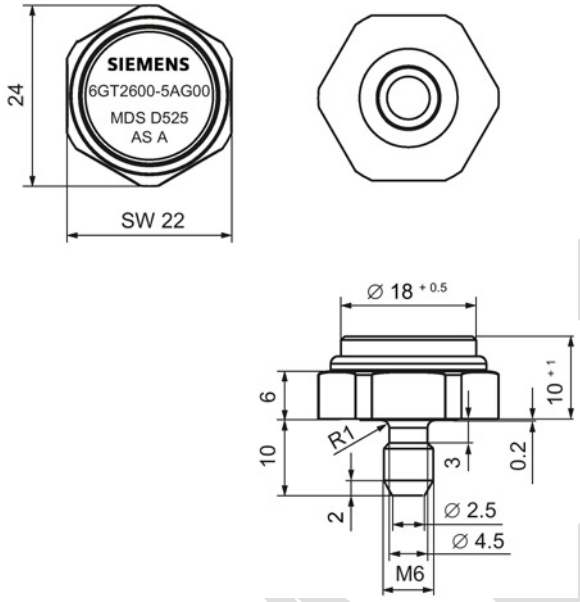


Figure 8-74 Dimensional drawing of MDS D525

All dimensions in mm

8.28 MDS D526

8.28.1 Characteristics

MDS D526	Characteristics	
	Area of application	Compact and rugged ISO transponder; suitable for identification of transport units in production-related logistics; can also be deployed in harsh conditions
	Memory size	8192 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)."
	Mounting on metal	Yes, with spacer
	ISO standard	ISO 15693
	Degree of protection	IP68

8.28.2 Ordering data

Table 8- 68 Ordering data for MDS D526

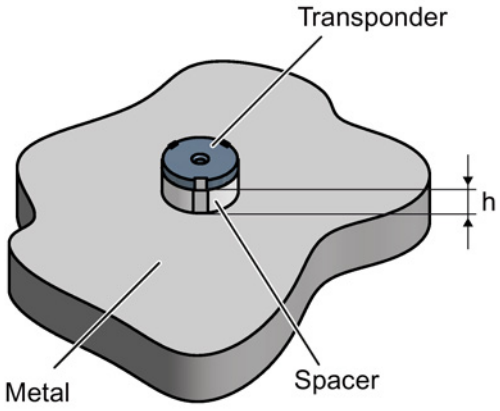
	Article number
MDS D526	6GT2600-5AH00

Table 8- 69 Ordering data for MDS D526 accessories

	Article number
Spacer	6GT2690-0AL00

8.28.3 Mounting on metal

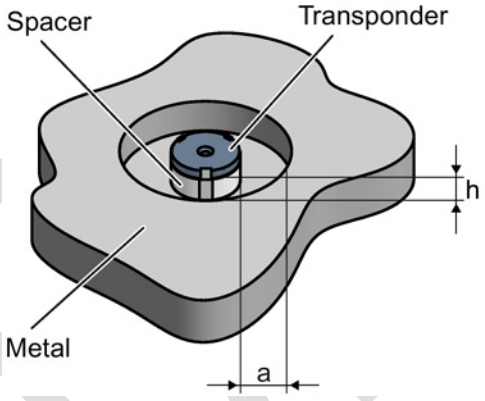
Mounting on metal



h ≥ 25 mm

Figure 8-75 Mounting the MDS D126 / D426 / D526 on metal with spacer

Flush-mounted in metal



h ≥ 25 mm

a ≥ 50 mm

Figure 8-76 Flush installation of the MDS D126 / D426 / D526 in metal with spacer

8.28.4 Technical specifications

Table 8- 70 Technical specifications for MDS D526

	6GT2600-5AH00
Product type designation	SIMATIC MDS D526
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 8192 bytes FRAM
• OTP	• ???
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years
Mechanical specifications	
Housing	
• Material	• Plastic PA 6.6 GF
• Color	• Black
Recommended distance to metal	≥ 25 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +100 °C
Degree of protection to EN 60529	IP68 2 hours, 2 bar, +20 °C
Shock-resistant to IEC 68-2-27	50 g [1)]
Vibration-resistant to IEC 68-2-6	20 g [1)]
Torsion and bending load	Not permitted

	6GT2600-5AH00
Design, dimensions and weight	
Dimensions (Ø x H)	50 x 3.6 mm
Weight	13 g
Type of mounting	1 x M4 screw 2) ≤ 1 Nm

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

2) To prevent it loosening during operation, secure the screw with screw locking varnish.

8.28.5 Dimension drawing

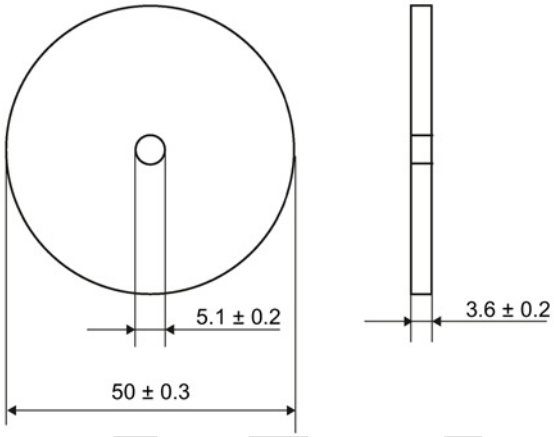


Figure 8-77 Dimensional drawing of MDS D526

All dimensions in mm

8.29 MDS D528

8.29.1 Characteristics

MDS D528	Characteristics	
	Area of application	Compact and rugged ISO transponder; suitable for screw mounting Use in assembly and production lines in the powertrain sector The rugged housing of the MDS D528 means that it can also be used in extreme environmental conditions without problems.
	Memory size	8192 bytes of FRAM user memory
	Write/read range	See section "Field data of ISO transponders (MDS D) (Page 52)"
	Mounting on metal	Yes
	ISO standard	ISO 15693
	Degree of protection	IP68/IPx9K

8.29.2 Ordering data

Table 8- 71 Ordering data for MDS D528

	Article number
MDS D528	6GT2600-5AK00

8.29.3 Application example

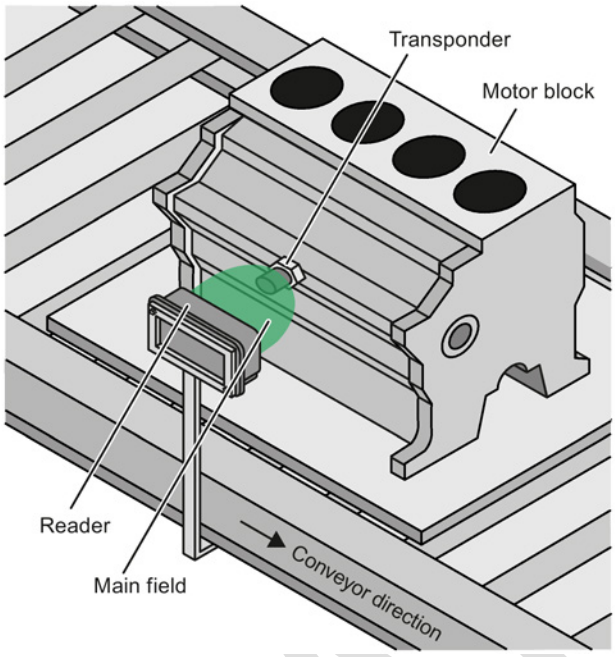


Figure 8-78 Application example

8.29.4 Technical specifications

Table 8- 72 Technical specifications for MDS D528

	6GT2600-5AK00
Product type designation	SIMATIC MDS D528
Memory	
Memory configuration	
• UID	• 8 bytes
• User memory	• 8192 bytes FRAM
• OTP	• ???
Read cycles (at < 40 °C)	> 10^{12}
Write cycles (at < 40 °C)	> 10^{12}
Data retention time (at < 40 °C)	> 10 years
Write/read distance (S_g)	Dependent on the reader used, see section "Field data of ISO transponders (MDS D) (Page 52)"
MTBF (Mean Time Between Failures)	228 years

	6GT2600-5AK00
Mechanical specifications	
Housing	
• Material	• Plastic PA 6.6 GF
• Color	• Black
Recommended distance to metal	≥ 0 mm
Power supply	Inductive, without battery
Permitted ambient conditions	
Ambient temperature	
• During operation	• -25 to +85 °C
• During transportation and storage	• -40 to +125 °C
Degree of protection to EN 60529	• IP68 2 hours, 2 bar, +20 °C • IPx9K steam jet: 150 mm; 10 to 15 l/min; 100 bar; 75 °C
Shock-resistant to IEC 68-2-27	50 g [1)]
Vibration-resistant to IEC 68-2-6	20 g [1)]
Torsion and bending load	Not permitted
Design, dimensions and weight	
Dimensions (Ø x H)	24 x 20 mm (without set screw)
Weight	35 g
Type of mounting	1x transponder set screw M8 SW 22; ≤ 8 Nm

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

8.29.5 Dimension drawing

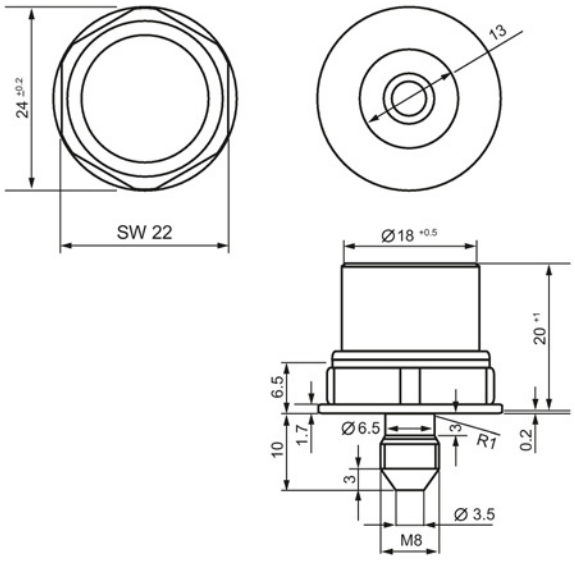


Figure 8-79 Dimensional drawing of MDS D528

All dimensions in mm

System integration

9

The communication modules (interface modules) are links between the RFID components (reader and transponder) and the higher-level controllers (e.g. SIMATIC S7), or PCs or computers.

9.1 Introduction

The readers are connected to the controller via the following interface or communications modules:

- ASM 456
- ASM 475
- SIMATIC RF120C
- SIMATIC RF160C
- SIMATIC RF170C
- SIMATIC RF180C
- SIMATIC RF182C
- RFID 181EIP

Function blocks, interface modules/communication modules and readers

Function blocks are used for integration into the SIMATIC. You will find information on the following blocks on the Internet in "Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/14971)".

- Ident profile and Ident blocks, standard function for RFID systems

  The Ident library linked into the TIA Portal as of STEP 7 Basic / Professional V14 SP 1
- RFID standard profile; standard functions for RFID systems
- FB 45 for MOBY U, MOBY D, RF200, RF300
- FB 55
- RF160C communications module with FC 44

Interface modules/communication modules and function blocks

The following table shows the most important characteristics of the interface modules/communications modules.

Table 9- 1 Overview of interface modules/communication modules

ASM/ communications module	Interfaces to the application (PLC)	Interfaces to the reader	Reader connections	Dimensions (W x H x D)	Temperature range	Degree of protection
ASM 456	PROFIBUS DP-V1	2 x 8-pin connector socket, M12	2 (parallel)	60 x 210 x 54 or 79 mm	0 ℃ to +55 ℃	IP67
ASM 475	S7-300 (central), ET200M (PROFIBUS)	Via screw terminals in front connector	2	40 x 125 x 120 mm	0 ℃ to +60 ℃	IP20
SIMATIC RF120C	S7-1200 (central)	9-pin D-sub socket	1	30 x 100 x 75 mm	0 ℃ to +55 ℃	IP20
SIMATIC RF160C	PROFIBUS DP / DP-V0	2 x 8-pin connector socket, M12	2 (parallel)	60 x 210 x 30 mm	0 ℃ to +55 ℃	IP67
SIMATIC RF170C	PROFIBUS DP-V1 PROFINET IO	2 x 8-pin connector socket, M12	2 (parallel)	90 x 130 x 60 mm	-25 °C to +55 °C	IP67
SIMATIC RF180C	PROFINET IO	2 x 8-pin connector socket, M12	2 (parallel)	60 x 210 x 54 mm	0 °C to +60° C	IP67
SIMATIC RF182C	TCP/IP	2 x 8-pin connector socket, M12	2 (parallel)	60 x 210 x 30 mm	0 ℃ to +60 ℃	IP67
RFID 181EIP	Ethernet IP	2 x 8-pin connector socket, M12	2 (parallel)	60 x 210 x 54 mm	0 °C to +60° C	IP67

The following table shows the program blocks compatible with the interface modules/communications modules.

Table 9- 2 Compatible program blocks

ASM/ communications module	Compatible program blocks in conjunction with ...		
	S7-300 / S7-400 and STEP 7 Classic V5.5	S7-300 / S7-400 and STEP 7 Basic/Professional	S7-1200 / S7-1500 and STEP 7 Basic/Professional
ASM 456	FB 45 FB 55 Standard profile V1.19 Ident profile	FB 45 FB 55 Ident profile	Ident profile Ident blocks PIB_1200_UID_001KB PIB_1200_UID_032KB
ASM 475	FB 45 FB 55	FB 45 FB 55	--
SIMATIC RF120C	--	--	Ident profile Ident blocks PIB_1200_UID_001KB PIB_1200_UID_032KB
SIMATIC RF160C	FC 44 Application blocks for RF160C	FC 44 Application blocks for RF160C	Application blocks for RF160C
SIMATIC RF170C	FB 45 FB 55	FB 45 FB 55	--
SIMATIC RF180C	FB 45 FB 55 Standard profile V1.19 Ident profile	FB 45 FB 55 Ident profile	Ident profile Ident blocks PIB_1200_UID_001KB PIB_1200_UID_032KB

9.2 ASM 456

Configured with ASM 456

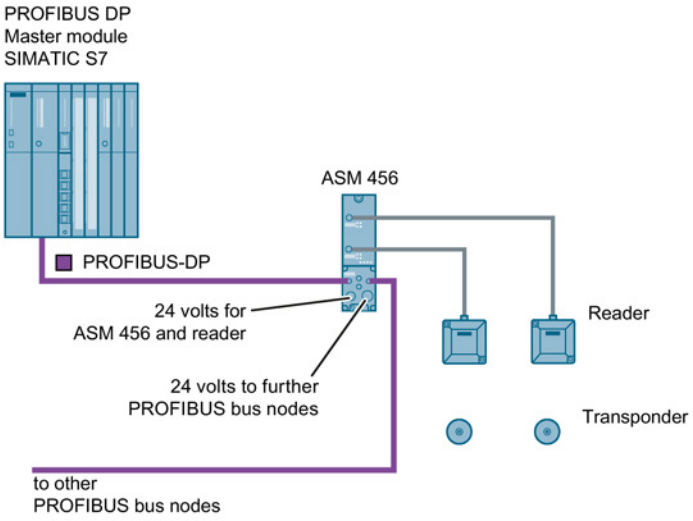


Figure 9-1 Configuration of ASM 456

For more detailed information, please refer to ASM 456 Operating Instructions (https://support.industry.siemens.com/cs/ww/en/view/32629442).

9.3 ASM 475

9.3.1 Features

Area of application

The ASM 475 interface module acting as the link between all RF300 systems and SIMATIC S7-300 performs the functions of a communication module. It can be operated centrally in the S7-300 or decentrally in an ET200M.

As many as eight ASM 475 interface modules can be plugged into one SIMATIC S7-300 rack and operated. In a configuration with several racks (max. four), the ASM 475 can be plugged into and operated on any rack. This means that as many as 32 ASMs can be operated in the maximum configuration of a SIMATIC S7-300. The ASM can also be operated in the ET 200M distributed I/O on PROFIBUS. Operation in an S7-400 environment is therefore problem-free. Up to 7 ASMs can be operated on each ET 200M.

Error messages and operating statuses are indicated by LEDs.
Since there is electrical isolation between the read/write device and the SIMATIC S7-300 bus, a configuration that is immune to interference is possible.

Figure 9-2 Interface module ASM 475

The ASM 475 with the article number 6GT2002-0GA10 is a module that can be set in the parameters. The basic functions of the module are then already specified when the module is configured in HW Config (e.g. standard addressing).

The data in the MDS is accessed direct by means of physical addresses using the ASM 475. Operation in a SIMATIC S7 is controlled by the function block FB 45.

ASM 475 and FB 45 form a unit that is used for reading the data of the MDS simply and at optimal speed.

9.3.2 Ordering data

Table 9- 3 Ordering data for ASM 475

	Article number
ASM 475 interface module for SIMATIC S7 2 x RF3xxR reader with RS-422 can be connected in parallel, without front connector	6GT2002-0GA10

Table 9- 4 Ordering data for ASM 475 accessories

	Article number
Front connector (1 x per ASM)	6ES7392-1AJ00-0AA0
Connecting cable ASM 475 ↔ RF3xxR	
Plug-in cable, pre-assembled, length: 2 m (standard length)	6GT2891-0EH20
Plug-in cable, pre-assembled, length: 5 m	6GT2891-0EH50
Terminal element (1 x per reader cable)	6ES7390-5BA00-0AA0
Shield connecting element	6ES7390-5AA00-0AA0

The plug-in cables 6GT2891-4Fxx can be used as extension cables.

9.3.3 Indicators

Bezel and indicator elements

The figure below illustrates the bezel of the ASM 475 and the inside of the front door complete with the associated connection diagram. The read/write devices must be connected to the ASM in accordance with the connection diagram.

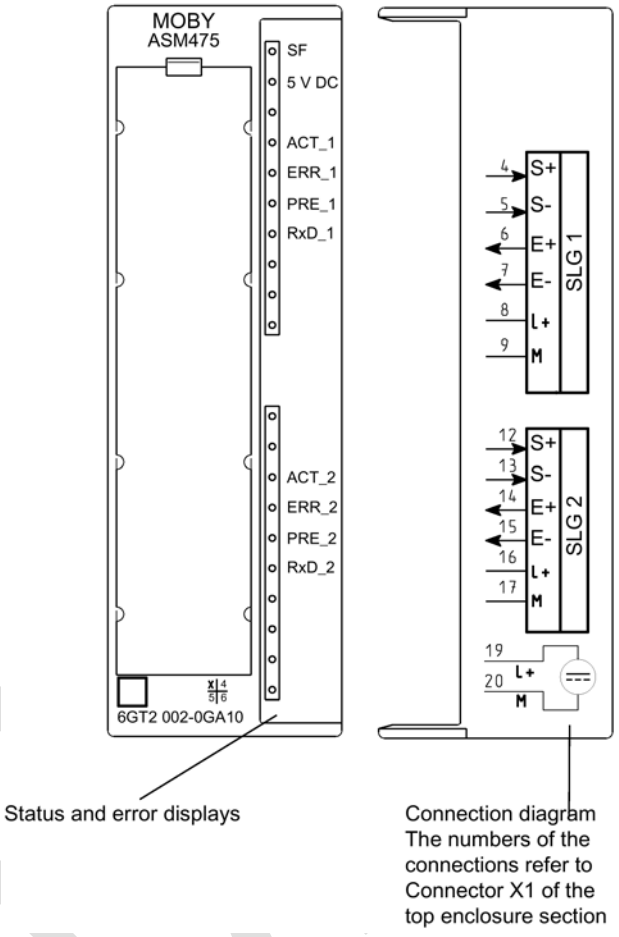


Figure 9-3 Bezel and inside of the front door of the ASM 475

Display elements on the ASM

Table 9- 5 Function of the LEDs on the ASM 475

Light emitting diode	Meaning
SF	System fault (hardware error on ASM)
DC 5V	24 V are connected to ASM and the 5 V voltage on ASM is OK.
ACT_1, ACT_2	The corresponding reader is active in processing a user command.
ERR_1, ERR_2	A flashing pattern indicates the last error to occur. This display can be reset using the parameter Option 1.
PRE_1, PRE_2	Indicates the presence of a transponder.
RxD_1, RxD_2	Indicates live communication with the reader. In the event of a fault on the reader, this display may also be lit.

On the ASM 475, further operating states are indicated with the LEDs PRE, ERR and SF:

Table 9- 6 Operating status display on ASM 475 via LEDs

SF	PRE_1	ERR_1	PRE_2	ERR_2	Meaning
ON	OFF/ON	ON (perm.)	OFF/ON	ON (perm.)	Hardware is defective (RAM, Flash, etc.)
ON	OFF	ON	OFF	OFF	Charger is defective (can only be repaired in the factory).
OFF	2 Hz	OFF	2 Hz	OFF	Firmware loading is active or no firmware detected • Firmware download • ASM must not be switched off
OFF	2 Hz	2 Hz	2 Hz	2 Hz	Firmware loading terminated with errors • Restart required • Load firmware again • Check update files
Any value	5 Hz	5 Hz	5 Hz	5 Hz	Operating system error • Switch ASM off/on
OFF	OFF	1 flash every 2 s	OFF	1 flash every 2 s	ASM has booted and is waiting for a RESET (init_run) from the user.

9.3.4 Configuration

Centralized configuration with SIMATIC S7-300

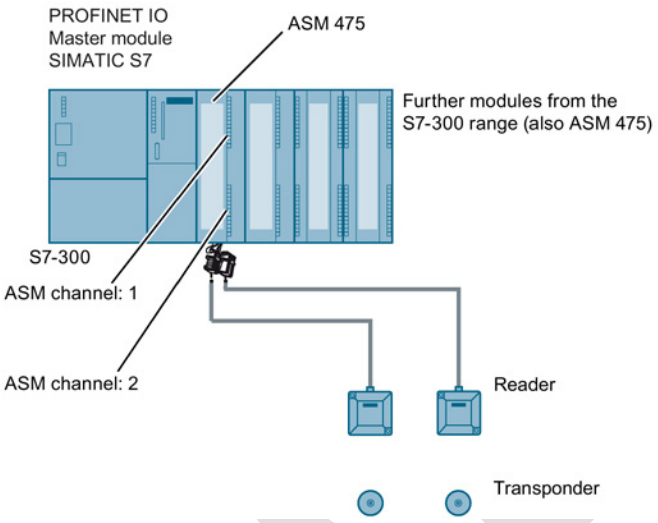


Figure 9-4 Configuration of ASM 475 central

Distributed configuration with ET200M

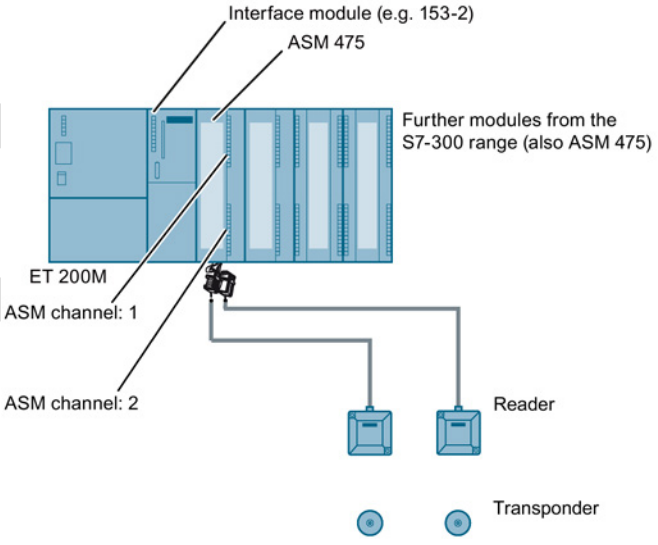


Figure 9-5 Configuration of ASM 475 distributed

Reader connection system

You will find more information on the reader connector technology in the section "Reader RF3xxR (RS422) with ASM 475 (Page 419)".

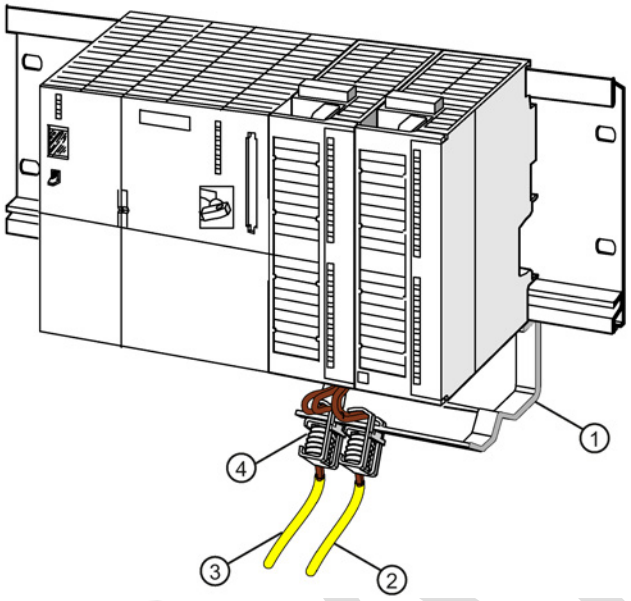
Cable installation

Signal	Pin on M12 connect-or	Cable	Labeling
24 VDC	1	white	1 Reader 2 8 -16
TX -	2	brown	1 Reader 2 7-15
GND	3	Green	1 Reader 2 9-17
TX +	4	Yellow	1 Reader 2 6-14
RX +	5	Gray	1 Reader 2 4-12
RX -	6	Pink	1 Reader 2 5-13
Shield	8 +	-	

Cable assignment for connection of an RF300 reader to ASM 475

9.3.5 Shield connection

When the reader is connected to the ASM 475, the cable shield must be connected to a shield terminal. Shield terminals and holding clips are standard components of the product spectrum of S7-300.



① Holding bracket
② Cable to 2nd reader
③ Cable to 1st reader
④ Shield terminal

Figure 9-6 Shield terminal ASM 475

9.3.6 Technical data

Table 9- 7 Technical specifications for ASM 475

	6GT2002-0GA10
Product type designation	ASM 475 communications module
Interfaces	
Design of the interface point-to-point link	RS-422
Number of connectable readers	2
Electrical connector design	
• Backplane bus	• S7-300 backplane bus
• PROFIBUS interface	• (according to the head module)
• Industrial Ethernet interface	• (according to the head module)
• Supply voltage	• Screw-type or spring-loaded terminals
Design of the interface to the reader for communication	Screw-type or spring-loaded terminals
Mechanical specifications	
Housing	
• Material	• Noryl
• Color	• Anthracite
Supply voltage, current consumption, power loss	
Supply voltage	24 VDC
Typical current consumption	
• Without connected devices	• 0.1 A
• Including connected devices	• 1.0 A
Power dissipation of the module, typ.	2 Watts
Current consumption from I/O bus, max.	80 mA
Electrical isolation between S7-300 and RF300	Yes
Fuse 24 V for the reader	Yes, electronic

	6GT2002-0GA10
Permitted ambient conditions	
Ambient temperature	
• During operation (horizontal installation)	0 ... +60 °C
• During operation (vertical installation)	0 ... +40 °C
• During transportation and storage	-40 ... +70 °C
Degree of protection	IP20
Shock-resistant to IEC 61131-2	150 m/s^2
Vibration-resistant to IEC 61131-2	10 m/s^2
Design, dimensions and weight	
Dimensions (L x W x H)	120 x 40 x 125 mm
Weight	0.2 kg
Type of mounting	S7-300 rack
Cable length for RS-422 interface, maximum	1000 m
Product properties, functions, components general	
LED display design	• 4 LEDs per reader connector • 2 LEDs for device status
Product function transponder file handler addressable	Yes
Protocol supported S7 communication	Yes
Product functions management, configuration, engineering	
Type of parameter assignment	Object manager, GSD
Type of programming	FB 45, FB 55, FC 56 (FC 45/55 with restricted functionality)
Type of computer-based communication	2 words cyclic, 238 bytes acyclic
Transponder addressing	Direct access via addresses
Commands	Initialize transponder, read data from transponder, write data to transponder
Standards, specifications, approvals	
Proof of suitability	CE, FCC, UL/CSA

9.4 RF120C

Configuration with RF120C

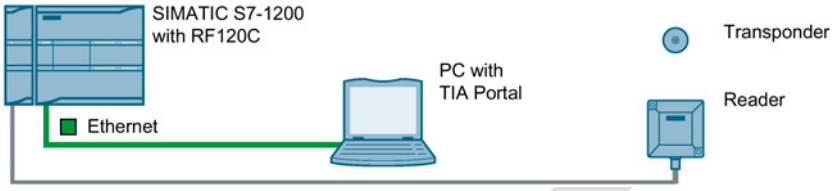


Figure 9-7 Configuration RF120C

For more detailed information, refer to the section " RF120C communications module (https://support.industry.siemens.com/cs/ww/en/view/77485950)".

9.5 RF160C

Configuration with RF160C

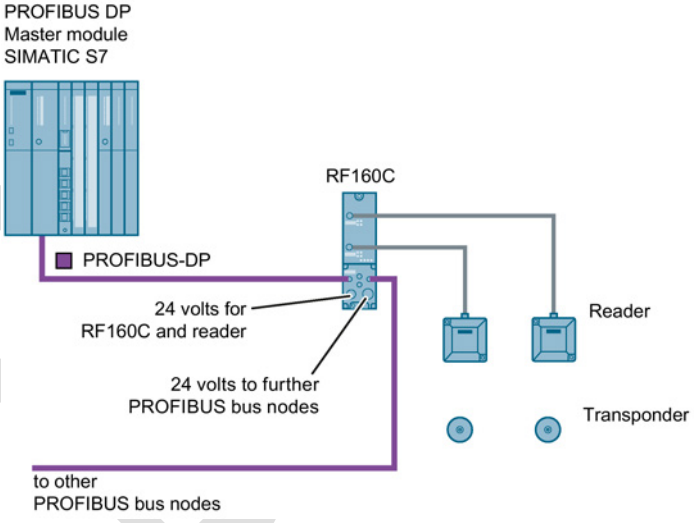


Figure 9-8 Configuration RF160C

For more detailed information, refer to Operating Instructions RF160C (https://support.industry.siemens.com/cs/ww/en/view/42788808).

9.6 RF170C

Configuration with RF170C

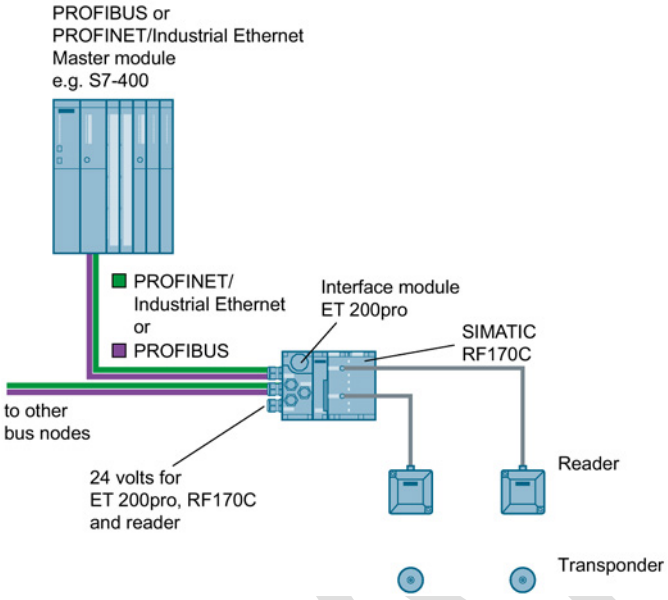


Figure 9-9 Configuration RF170C

For more detailed information, please refer to SIMATIC RF170C Operating Instructions (https://support.industry.siemens.com/cs/ww/en/view/32622825).

9.7 RF180C

Configured with RF180C

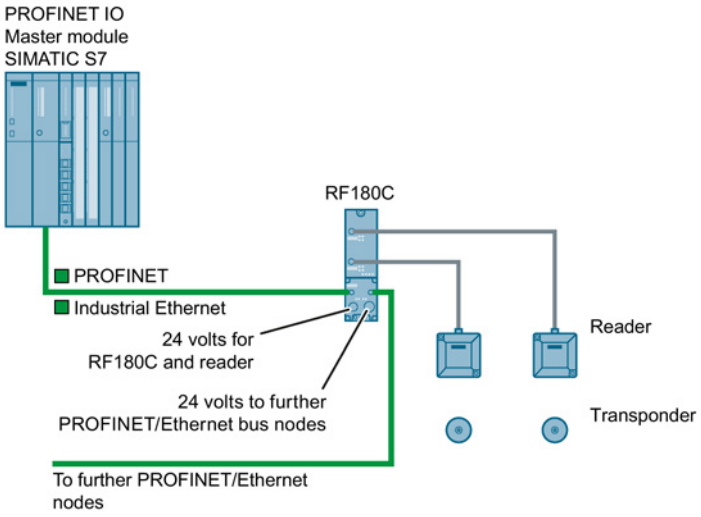


Figure 9-10 Configuration of RF180C

For more detailed information, refer to SIMATIC RF180C Operating Instructions (https://support.industry.siemens.com/cs/ww/en/view/30012157).

9.8 RF182C

Configuration with RF182C

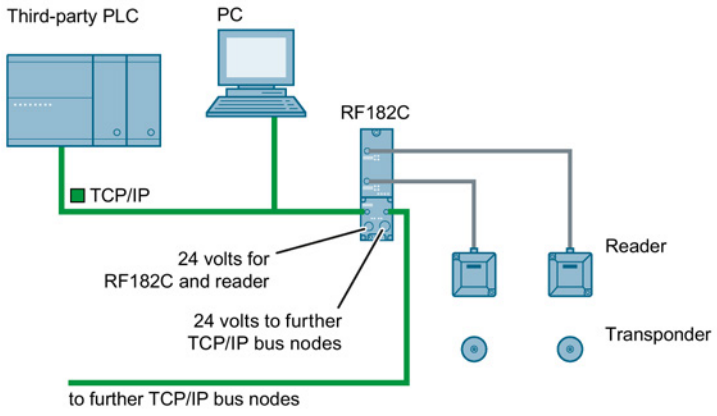


Figure 9-11 Configuration with RF182C

For more detailed information, refer to SIMATIC RF182C Operating Instructions (https://support.industry.siemens.com/cs/ww/en/view/38507897).

System diagnostics

10

10.1 Error codes

Error codes of the RF300 readers

Note

Validity of the error codes

The following error codes apply only to RF300 readers with an RS-422 interface (except for Scanmode).

You can identify the error code in different ways:

- Directly on the reader/interface module by counting the flashing pattern of the red error LED
- In the Ident profile with the output variable "Status"
- with FB 45 / FB 55 variable "error_MOBY".

Table 10- 1 Error codes of the readers

Flashing of the red LED operating display on the reader	Error code (hexa-decimal)	Description
00	00	No error
02	01	Presence error; possible causes: • The active command was not carried out completely • The transponder left the antenna field while the command was being processed • Communication problem between reader and transponder
05	05	Parameter assignment error, possible causes: • Unknown command • Incorrect parameter • Function not allowed
06	06	Air interface faulty
11	0B	The MDS E transponder could not be successfully authenticated.
12	0C	The transponder memory cannot be written, possible causes: • Hardware fault (memory faulty) • Memory write-protected (corresponding OTP area has already been written)
13	0D	Error in the specified memory address (access attempted to non-existent or non-accessible memory areas).
19	13	Buffer overflow: Insufficient buffer available in the reader for saving the command
20	14	Major system fault (hardware fault)
21	15	Parameter assignment error: bad parameter in RESET command
24	18	Command was sent to a reader that has not yet been initialized
25	19	Previous command is still active
28	1C	Antenna is not identified Possible causes: • Antenna is not connected. • Antenna cable is defective.
30	1E	Incorrect number of characters in frame
31	1F	Running command cancelled by "RESET" command

10.2 Diagnostics functions - STEP 7 Classic

10.2.1 Overview

Extended diagnostic functions with SIMATIC RF300

With SIMATIC RF300, extended diagnostics functions are available which simplify commissioning and maintenance.

This diagnostics data is accessed using the SIMATIC function blocks via the SLG Status and MDS Status commands. These two commands can each be called in various modes (subcommands) for which corresponding data structures (UDTs) are defined.

Table 10- 2 In RF300 mode

Command	Mode (subcommand)	Meaning
SLG-STATUS	01	Hardware and firmware configuration, parameterization status
	06	Communication error counter, current command status
MDS-STATUS	01	Serial number of the transponder (UID), memory configuration. EEPROM write-protection status
	02	Serial number of the transponder (UID), HF field strength value, communication error counter, presence counter (duration)

Overview of the diagnostic functions

Table 10- 3 In ISO mode

Command	Mode (subcommand)	Meaning
SLG-STATUS	01	Hardware and firmware configuration, parameterization status
MDS-STATUS	03	Serial number of the transponder (UID), recognized transponder type number in the field (number = tag - type, see reset parameter "ftim"), memory configuration, write protect status (OTP), size and number of blocks in the user memory

10.2.2 Reader diagnostics with SLG STATUS

The SLG STATUS command can be used to scan the status and diagnostics data of the reader.

SLG STATUS (mode 01), corresponds to UDT 110

Name	Type	Possible Hex values	Comment
hardware	char	(31 … 38)	Type of hardware
hardware_version	word		HW version
		0 ... FF	= Version (high byte): Unused
		0 ... FF	= Version (low byte)
loader_version	word		Version of loader
		0 ... FF	= Version (high byte)
		0 ... FF	= Version (low byte)
firmware	char	0 ... FF	Type of firmware
firmware_version	word		Firmware version
		0 ... FF	= Version (high byte)
		0 ... FF	= Version (low byte)
driver	char		Type of driver
		31	3964R
driver_version	word		Version of driver
		0 ... FF	= Version (high byte)
		0 ... FF	= Version (low byte)
interface	byte		Interface type
		01	= RS422
		02	= RS232 (only RF380R)
baud	byte		Transmission speed
		01	= 19.2 Kbaud
		03	= 57.6 Kbaud
		05	= 115,2 Kbaud
distance_limiting_SLG	byte	This variable is only provided for the RF380R. Users are therefore able to check the output power actually set. An incorrect value in the parameter "distance_limiting" of the RESET message frame results in the default setting "05".	
			Transmit power
		02	0.5 W
		03	0.75 W
		04	1.0
		05	1.25 W (default)
		06	1.5 W
		07	1.75 W
		08	2.0 W

Name	Type	Possible Hex values	Comment
multitag_SLG	byte		Number of transponders (Multi/Pulk) that can be processed in the antenna field
		01	= Single tag mode
field_ON_time_SLG	byte	00	= RF300 transponder
		01	= ISO transponder (non-specific)
		03	= ISO transponder (Infineon, MDS D300)
		04	= ISO transponder (Fujitsu, MDS D400)
		05	= ISO transponder (NXP, MDS D100)
		06	= ISO transponder (Texas Instruments, MDS D200)
		07	= ISO transponder (ST, LRI2K)
		08	= ISO transponder (Fujitsu, MDS D500)
		0E	= ISO (setting with "scanning_time" and "fcon")
		10	= RF300 transponder
		20	= MDS E transponder
		31	= General Mode
		FF	= Setting with "scanning_time" and "fcon"
status_ant	byte		Status of the antenna
		01	= Antenna On
		02	= Antenna Off
MDS_control	byte		Presence mode
		00	= Operation without presence message
		01	= Operation with presence message
		04	= Operation with presence message (antenna is off. The antenna is turned on only when a Read or Write command is sent.)

SLG STATUS (mode 06), corresponds to UDT 280

Name	Type	Possible Hex values	Comment
FZP	byte	0 ... FF	= Error counter, passive (errors during idle time)
ABZ			= Abort counter
CFZ			= Code error counter
SFZ			= Signature error counter
CRCFZ			= CRC error counter
BSTAT			= Current command status
ASMFZ			= Interface problems to host (ASM/PC) parity, BCC, frame error

Note

Counter values are deleted.

All counter values are deleted after reading out (= execute "SLG STATUS" command).

Explanations:

- "FZP": counts interference pulses when communication with a transponder is not taking place (e.g. electromagnetic interference caused by contactors, motors, etc.). Counter values can, however, also be generated when a transponder is located at the edge of the field even when there is no external interference.
- "ABZ", "CFZ", "SFZ" and "CRCFZ" are counters for protocol errors which may occur during reader-transponder communication. This can be caused by unsuitable reader/transponder positioning (e.g. transponder on field boundary, several transponders in the antenna field) or external EMC interference.

To ensure clear diagnosis of the quality of communication, it is recommended that an SLG STATUS command (mode 06) is executed following receipt of the presence command to reset the error counter.

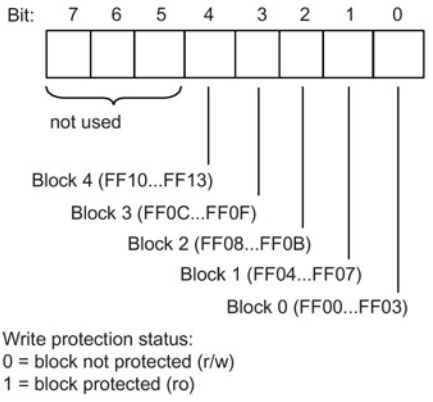
The protocol error counters are not mutually independent. If a code error (CFZ) occurs, this will cause a signature (SFZ) or CRC- (CRCFZ) error.

- "BSTAT" is the status for the most recently executed command. A value other than 0 means that the previous command was repeated by the reader due to faults (see above).
- "ASMFZ" signals line-conducted communication interference between the communications module and the reader. Faults of this type can be caused by contact problems on the connector or the cable connection.

10.2.3 Transponder diagnostics with MDS STATUS

The MDS STATUS command can be used to scan the status and diagnostics data of the transponder that is located within the antenna field.

MDS STATUS (mode 1), corresponds to UDT 260 (only for RF300 transponders)

Name	Type	Possible Hex values	Comment
UID	array[1…8] byte	000000005555555 ... 00000000FFFFFFFF	Unique identifier = b0-31: 4 byte TAG ID, b32-63: 0
MDS_type	byte	01 02 03 04	Transponder memory configuration = Transponder without FRAM = Transponder with FRAM 8 KB = Transponder with FRAM 32 KB = Transponder with FRAM 64 KB
Lock_state	byte	0 ... FF	EEPROM write protection status  Write protection status: 0 = block not protected (r/w) 1 = block protected (ro)

MDS STATUS (mode 02), corresponds to UDT 270, only for RF300 transponders

Name	Type	Possible Hex values	Comment
UID	array[1…8] byte	0000000055555555 ... 00000000FFFFFFFF	Unique identifier = b0-31: 4 byte TAG ID, b32-63: 0
LFD	byte	0 ... FF	= Value for field strength determined in the transponder
FZP	byte	0 ... FF	= Error counter (passive) → errors during idle time
FZA	byte	0 ... FF	= Error counter (active)
ANWZ	byte	0 ... FF	= Presence counter

Note

Counter values are deleted.

All counter values are deleted when the transponder exits the antenna field or when the antenna is switched off.

Explanations:

- "LFD" is a measured value for the field strength that is determined in the transponder. The lower the value, the higher the field strength.
- "FZP" counts interference pulses when communication with a transponder is not taking place (e.g. electromagnetic interference caused by contactors, motors, etc.). Counter values can also be generated when a transponder is located at the edge of the field even when there is no external interference.
- "FZA" counts errors that can occur during reader-to-transponder communication. This can be caused by unsuitable reader/transponder positioning (e.g. transponder on field boundary, several data carriers in the field) or external electromagnetic interference.
- "ANWZ" is the value for the time that the transponder remains in the field before the MDS STATUS command (mode 02) is executed. A time step is 10 ms. The maximum time that can be recorded is therefore 2.5 s.

MDS STATUS (mode 03), corresponds to UDT 230

Name	Type	Possible Values	Comment
UID	array[1…8] byte	0000000000000000 ... FFFFFFFFFFFFFFFF	Unique identifier =8 byte UID, MSB first
MDS_type	byte		Transponder type (vendor, identification)
		00	= ISO transponder (non-specific)
		03	= ISO transponder (Infineon, MDS D300)
		04	= ISO transponder (Fujitsu, MDS D400)
		05	= ISO transponder (Philips, MDS D100)
		06	= ISO transponder (Texas Instruments, MDS D200)
		07	= ISO transponder (ST, LRI2K)
		08	= ISO transponder (Fujitsu, MDS D500)
		11	= RF300 transponder (0 kB)
		12	= RF300 transponder (8 kB)
		13	= RF300 transponder (32 kB)
		14	= RF300 transponder (64 kB)
		15	= RF300 transponder (128 kB)
		16	= RF300 transponder (256 kB)
		21	= ISO transponder (NXP, 1 kB, MDS E)
		22	= ISO transponder (Infineon, 1 kB, MDS E)
		23	= ISO transponder (NXP, 4 kB)

Name	Type	Possible Values	Comment
	binary	0 ... 255	Vendor-specific value
IC_version	byte	0 ... FF	Chip version
size	byte	0 ... FF	Memory size in bytes Depending on transponder type, e.g. my-d: 992 bytes
lock_state	byte	0 ... FF	Lock state, OTP information: One bit is used per block (4 x 4 bytes or 2 x 8 bytes) (bit = 1: block is locked) Example: 01 = Block 1 of address FF80 ... FF83 is locked or 03 = Block 1 and 2 of address FF80 ... FF87 are locked, e.g. for the Philips SL2 ICS20 (MDS D124, D160 or D100). This chip provides a usable memory with 112 bytes EEPROM from address 0000 - 006F (total OTP area "0060 ... 006F"). In this memory, the locked area corresponds to the addresses 0060 ... 0063 or 0060 ... 0067
block_size	byte	0 ... FF	Block size of the transponder Depending on transponder type, e.g. my-d: 4 bytes
nr_of_blocks	byte	0 ... FF	Number of blocks Depending on transponder type, e.g. my-d: 248 bytes

10.3 Diagnostics functions STEP 7 Basic / Professional

Extensive diagnostics functions for the SIMATIC RF300 readers with STEP 7 Basic / Professional are being planned. With the aid of the Ident profile and the Ident blocks, you can make different diagnostics queries.