COPY OF THE ORIGINAL

INSTRUCTION MANUAL

Inductive coupler system

F100-ETH

Date: 2026-07
Version: 4
Language: English

SMW AUTOBLOK

Content

INSTRUCTION MANUAL
Inductive coupler system F100-ETH

Validity:

0E011420 0E012320/2	Inductive coupler F100-ETH Base	28.07.2023	V1	EN
0E011421 0E012323/5	Inductive coupler F100-ETH Remote	28.07.2023	V1	EN

Thank you for purchasing your F100-ETH inductive coupler system.

This **instruction manual** contains the installation, the functional description and the operation of the **„F100-ETH“**.

SMW-AUTOBLOK reserves the right to make **changes without notice**.

This **instruction manual is a part of the „F100-ETH“** and must be passed to the new owner in case of sale.

This **instruction manual may not be** -in whole or in part- **copied** without our written agreement.

Please read the instruction manual carefully before installation and use and always follow the regulations.

Please note especially the sections which are marked with the following signs:

- **Danger of injury or danger to life if instructions are not followed.**
- **Danger of damage to the sensor, the machine or the components.**

General safety instructions


General warning sign!


General precept sign!


Caution: Hot surface!


No access for persons with pacemakers


Danger to the environment!


Follow the instructions!

1. **Intended use**
   The device is designed to transmit energy and signals without contact. The system must not be used in applications where the safety of persons depends on the device function.

   Liability claims against the manufacturer expire in the event of damage caused by:
   • unauthorized tampering
   • use not in accordance with the intended purpose
   • use, installation, handling contrary to the regulations of these operating instructions.

2. **Authorized personnel**
   Installation and commissioning are only permitted by trained specialist operators.

3. **Visual inspection**
   Please check the product for visible damage prior to use!

4. **Duties of the operator**
   The operator must ensure that the locally applicable national and international safety regulations are observed. The unit may only be operated with an approved power supply.

5. **Operating faults**
   In case of defective and unrecoverable device malfunctions, put the device out of operation and secure it against unauthorized use.

6. **Caution: Hot surface!**
   Danger of burns from hot surfaces!
   The active surface heats up even under normal operating conditions.
   Keep hands and objects away from the active surface.
   Avoid contact of metallic objects on the active surface.
   Fire hazard!

7. **Protection against electromagnetic fields during operation and assembly**
   The permissible values according to VDE 0848 Part 3-1 are observed from a distance of > 3 mm. Persons with physical aids (e.g. pacemakers) may be exposed to health hazards due to the magnetic fields emitted by the coupler system. The minimum distance for this group of persons is > 5 mm. The operator must ensure that this minimum distance is also maintained during operation by taking suitable measures.

8. **Certification**
   With the CE mark we confirm that our products comply with the requirements of the EC Directives 2004/108/EC (EMC) and the EMC Act.
   In an accredited EMC laboratory, proof was provided that the products meet the EMC requirements of the basic technical standards:
   • EN 61000-6-4 (emitted interference) and
   • EN 61000-6-2 (immunity to interference)


In case of doubts or questions please ask SMW-AUTOBLOK or one of our authorized offices.


Before the start up, the operating instructions must be read carefully.

F100 Ethernet

Axial coupler

Inductive Coupling System

■ **Contact free transmission of energy and signals**

Application/customer benefits

- Contact free transmission of energy and signals between moving / rotating and stationary components
- Application examples: Robotic (END OF ARM TOOLING), Automation, Mechanical engineering
- Substitution of slip ring / connector
- Dynamic Pairing
- Wear and maintenance free
- Protective functions: temperature monitoring, foreign object detection, reverse polarity protection
- Multi-level LED with good visibility

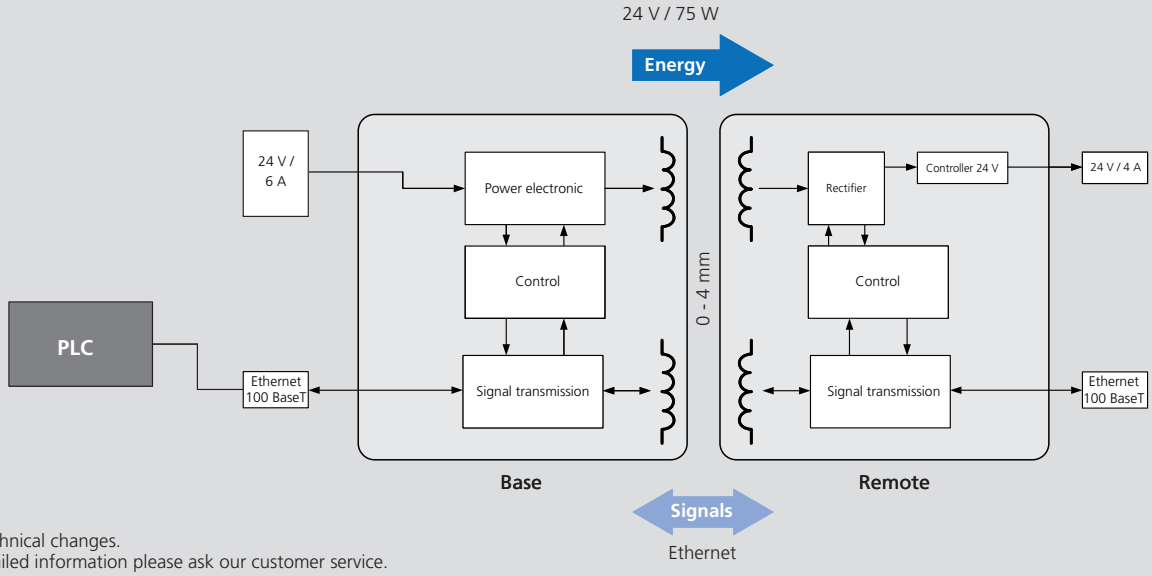
Technical features

- Diameter 100 mm / Through hole 50 mm
- Operating voltage 24 V / max 6 A
- Transmission distance 0 - 4 mm
- Transmission of energy 24 V / 75 W
- Transmission of signals Ethernet 100 Base-T
- Transmission bandwidth: < 5 MBit/s
- Connections: M12 Ethernet (D-coded) / M12 Power (L-coded)
- Protection class: IP67

Standard equipment

Inductive coupler base or remote

Block diagram



Subject to technical changes.
For more detailed information please ask our customer service.

Inductive coupling system F100 Ethernet		
Type	**Base**	**Remote**
Id. No.	**0E011420**	**0E011421**
Operating temperature (housing surface)	-20 °C ... +60 °C	
Storage temperature	-20 °C ... +60 °C	
Transmission distance	0 mm ... 4 mm	
Operating voltage	24 V ± 10%	-
Current consumption (Base)	6 A	-
Output voltage	-	24 V ± 5%
Output power	-	75 W
Signal transmission Ethernet (bidirectional)	Ethernet 100 Base-T	
LED	2 LEDs 2-color	
Overload protection / short circuit protection	✓	✓
Residual ripple	-	< 50 mV
Reverse polarity protection	✓	-
Ready delay	< 1s	

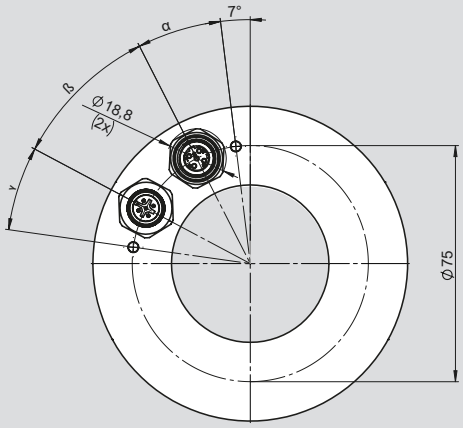
Inductive Coupling System

■ Stationary unit - Base
■ Mobile unit - Remote

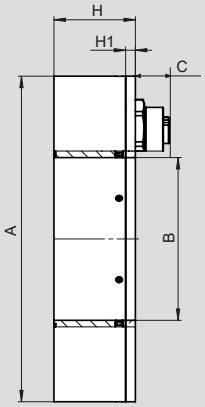
F100 Ethernet

Axial coupler

Base / Remote:



Base / Remote:



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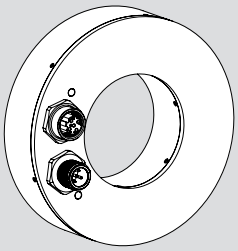
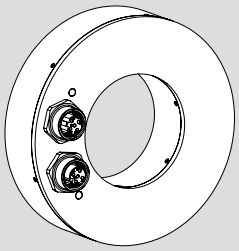


Remote:



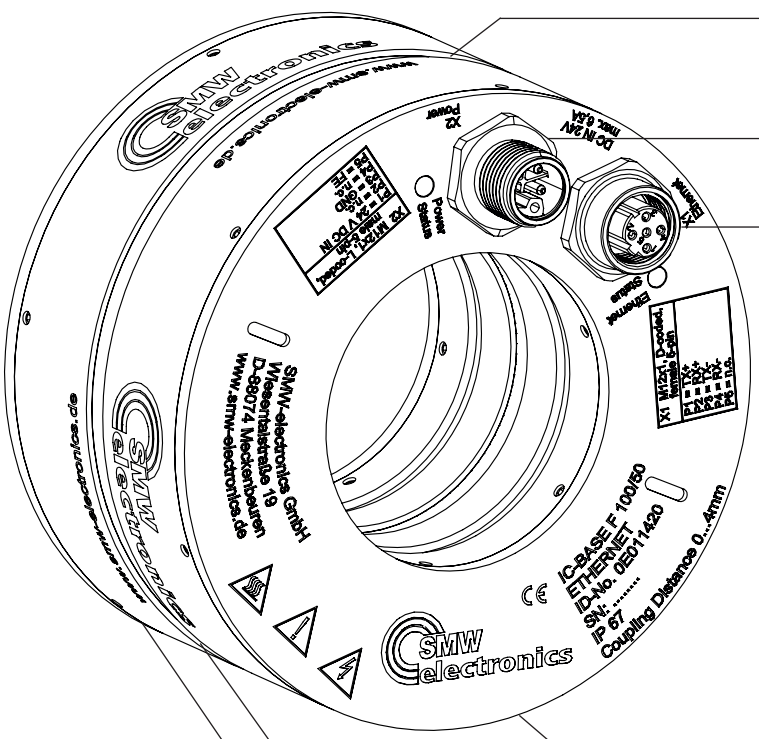
Subject to technical changes.
For more detailed information please ask our customer service.

Inductive coupling system F100 Ethernet			
Type		**Base**	**Remote**
Id. No.		**0E011420**	**0E011421**
A	mm	100	
B	mm	50	
C	mm	13	10
H	mm	25	
H1	mm	3	
α	degree	27	
ß	degree	35	
γ	degree	20	
Housing material		Al, GFK	
Protection class		IP67	
Weight	kg	0.45	0.45

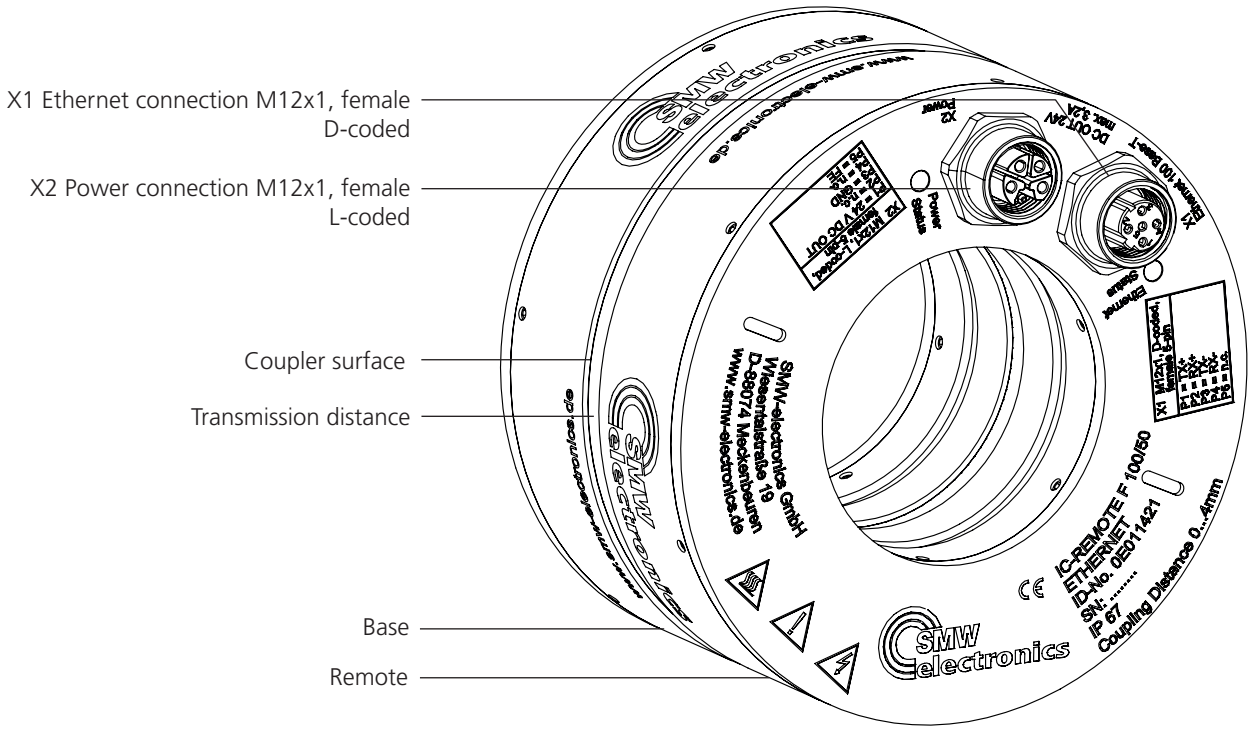
Function Base	
LED Power	
Color	Green / red
Function	Off » Unit not supplied with voltage (or undervoltage)
	On (green) » Voltage ok and mobile unit has been detected
	1 Hz green 25 / 75% » Voltage ok but no mobile unit detected
	1 Hz red / green » Incompatible mobile unit detected
	2 Hz red » Foreign element detected
	5 Hz red » Internal error
LED Signal transmission Ethernet	
Color	Yellow / red
Function	Off » No mobile unit detected
	On / yellow » Signal transmission ready
	1 Hz yellow » Data packets are being transmitted
	3 Hz yellow » 50% of the transmission bandwidth used (10 s)
	8 Hz red » Data packets were discarded (in the last 10 s)
	On / red » Error in data transmission (internal error)

Function Remote	
LED Power	
Color	Green / red
Function	Off » Unit not paired
	On (green) » Unit paired, voltage output ok
	Flashes 2 Hz red » Paired but short circuit
	Flashes 5 Hz red » Internal error
LED Signal transmission Ethernet	
Color	Yellow / red
Function	Off » No mobile unit detected
	On / yellow » Signal transmission ready
	1 Hz yellow » Data packets are being transmitted
	3 Hz yellow » 50% of the transmission bandwidth used (10 s) 8 Hz red » Data packets were discarded (in the last 10 s)
	On / red » Error in data transmission (internal error)

View Base



View Remote



Description of function

Description

The F100-ETH inductive coupling system is used to operate electronic components of automation technology such as fieldbus gateways, sensors or actuators on mobile, dynamically variable or rotating units in machine and plant parts.

A contactless signal transmission takes place between a stationary unit (base) and a mobile unit (remote).

In addition to signal transmission, electrical energy is also transmitted without contact to the mobile unit (remote) for the power supply of sensors or actuators.

The F100-ETH inductive coupling system is designed for high power, allowing the operation of a wide range of suitable actuators such as magnetic valves, servo motors or linear drives.

The F100-ETH inductive coupling system consists of a stationary unit (base) and a mobile unit (remote). Both units are to be mounted axially facing each other at a distance of 0 to 4 mm on the coupling surface.

An integrated coil system ensures the transmission of the energy and the signals on a contactless inductive principle.
The transmission is independent of whether there is a rotating movement of the mobile unit or not.
In addition, the system has a temperature protection function and is protected according to IP 67.

The system is designed as a plug and play solution, so that integration into the customer's system is possible with minimal effort. All important interfaces are designed to be detachable, so that replacement during maintenance and service is possible without delay.
The stationary and mobile units are compatible and interchangeable (dynamic pairing).

The electrical and mechanical interfaces for the individual function units are described in the following chapters.

Start-up

Notice!
Use base coupler 0E011420 (or 0E012320/2) only with remote coupler 0E011421 (or 0E012323/5).

The start-up can only occur after the entire transmission chain of base and remote has been comletely set up. The installation of the components must always be performed in a (electrical) power-free state.

A correct coupling between Base and Remote is indicated by the Data Valid signal.

Electrical connection of the F100-ETH

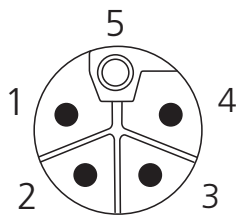
General

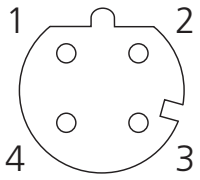
Damage to the electronics possible!
A faulty connection can cause damage to the internal electronics.
- Observe the PIN assignment of the connection terminals
- Ensure all components are properly earthed.

There is a risk of electric shock if the power supply is connected incorrectly!
The following applies:

- The electrical connection must be carried out by a qualified electrician.
- Take suitable protective action to secure the danger zone.
- Connect the power supply to the control unit only after leaving the danger zone.

Pin assignment F100-ETH Base

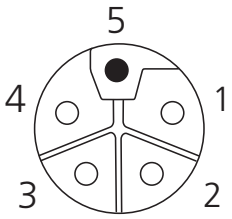


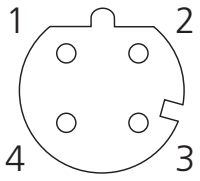


Power interface X2 - M12x1 - 5 Pin L-coded male		
Pin	**Signal**	**Pin assignment**
1	DC 24 Vin	Supply voltage
2	n.c.	-
3	GND	Ground
4	n.c.	-
5	FE	Functional earth

Ethernet interface X1 - M12x1 - 4 Pin D-coded female		
Pin	**Signal**	**Pin assignment**
1	Tx+	Transmit data +
2	Rx+	Receive data +
3	Tx-	Transmit data -
4	Rx-	Receive data -

Pin assignment F100-ETH Remote





Power interface X2 - M12x1 - 5 Pin L-coded female		
Pin	**Signal**	**Pin assignment**
1	DC 24 Vin	Output voltage
2	n.c.	-
3	GND	Ground
4	n.c.	-
5	FE	Functional earth

Ethernet interface X1 - M12x1 - 4 in D-coded female		
Pin	**Signal**	**Pin assignment**
1	Tx+	Transmit data +
2	Rx+	Receive data +
3	Tx-	Transmit data -
4	Rx-	Receive data -

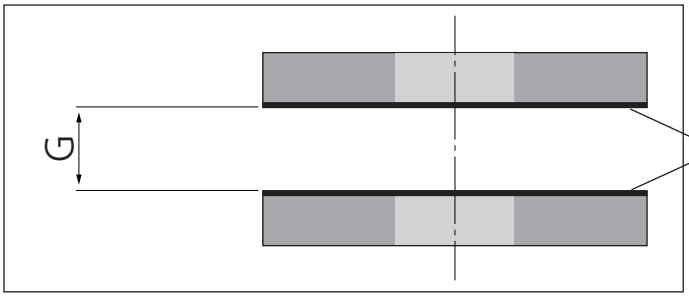
Notes

Integration

The base and remote units of the contactless transmission are integrated by mounting them in axial alignment in compliance with the installation specifications. The assembly must be performed in a (electrical) power-free state. The following sections describe valid installation instructions that must be strictly followed for correct operation.

We recommend to use the coupler with a coupling distance of 1-2 mm.

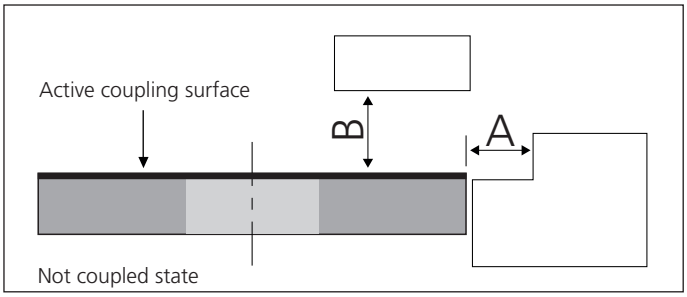
Distance to each other



Distance G ≤ 4 mm

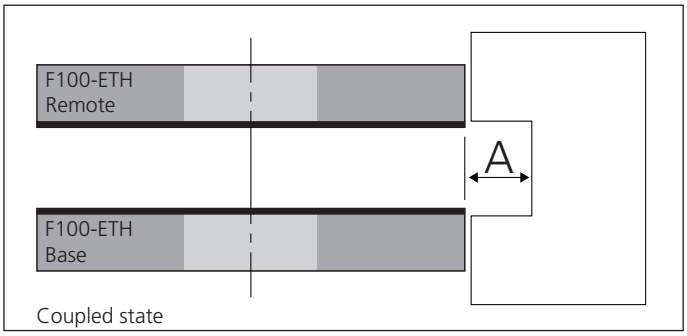
Installation in metall

Attention!
Metal objects in the area near the active coupling surfaces can heat up strongly due to the magnetic field generated by the coupler. Therefore, the specified minimum distances must be strictly followed when installing in metal.



Distance A > 1 mm

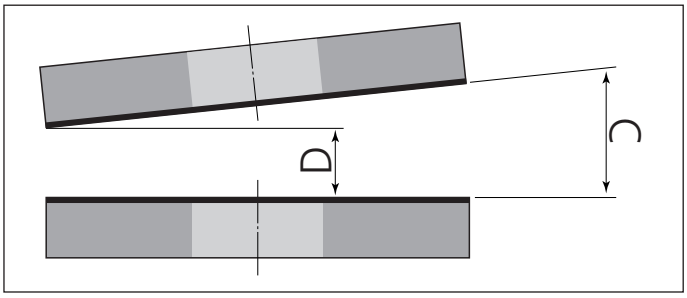
Distance B > 30 mm



Distance A > 1 mm

Permissible angle offset

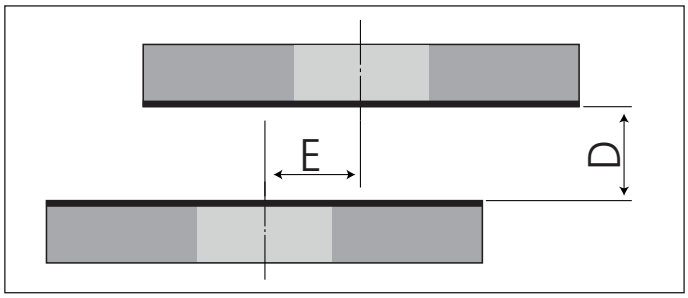
The permissible angle offset allows function in special mounting positions.



Distance D	Angle °
0 mm	< 3°
2 mm	< 2°

Permissible side offset

The maximum side offset between base and remote unit is ±1 mm.



Side offset E < 1 mm at D = 2 mm

Notice!
The factors like enviroment temperature, distance, angle offset and side offset can affect the amount of energy transfer. The coupler works optimal centric at D = 1 to 2 mm.

Notice!
No liability in case of damage to the coupling surfaces caused by the use of the product, for example as a result of insufficient cleanliness. If the coupling surfaces are subject to contamination during operation, suitable action (blowing air and / or flushing) must be performed.

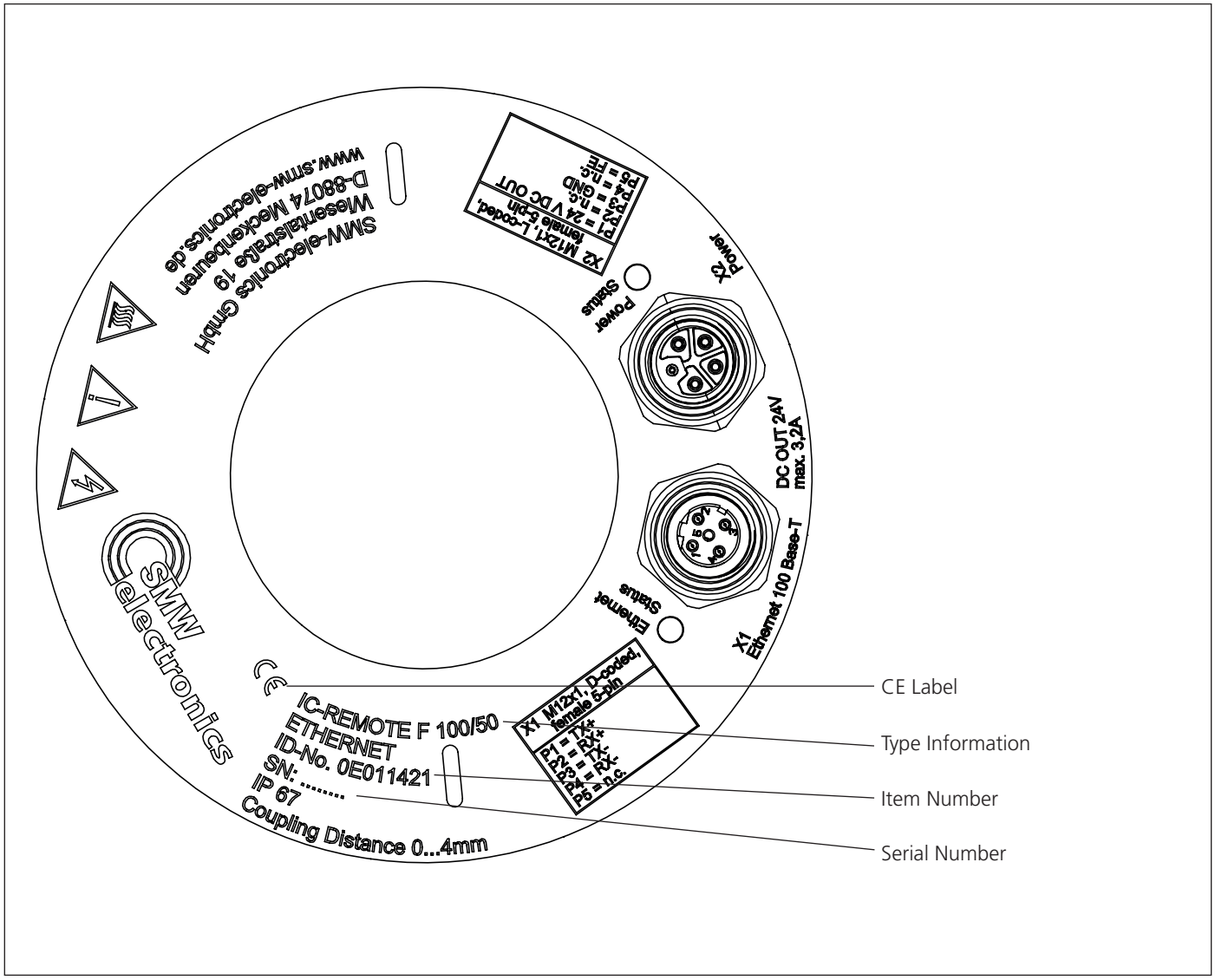
Notice!
It is recommended to turn off the base unit when the remote unit is not present in order to prevent possible damage caused by foreign objects (e.g. metal objects).

Notice!
To ensure that the specified values are permanently reached, the housing of the coupling system must be mounted in a metallic environment so that the heat can be conducted away. The maximum housing temperature is T=60°C.

Notes

Typeplate and contact

If you have any questions about the product or if you wish to place order, please specify the type and item number on the typeplate of the inductive coupling system.



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12 month warranty

Product: Inductive coupler system F100-ETH

SMW-electronics guaranties the proper function of the product, if use and storage are in accordance with the technical instructions of this manual.

In case the product does not perform properly, a repair or exchange is done, after inspecting the circumstances.

In case of a production error the product is repaired free of charge within the warranty period.

The warranty period will be 12 months starting from the date of delivery.

In order to claim warranty, the sensor must be returned in the original packaging.

The return shipment must be accompanied by a detailed trouble description.

Otherwise the manufacturer reserves the right to void any warranty claims.

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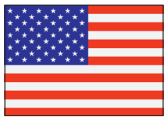

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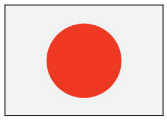

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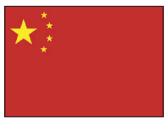

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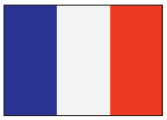

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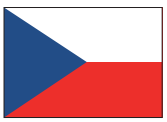

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