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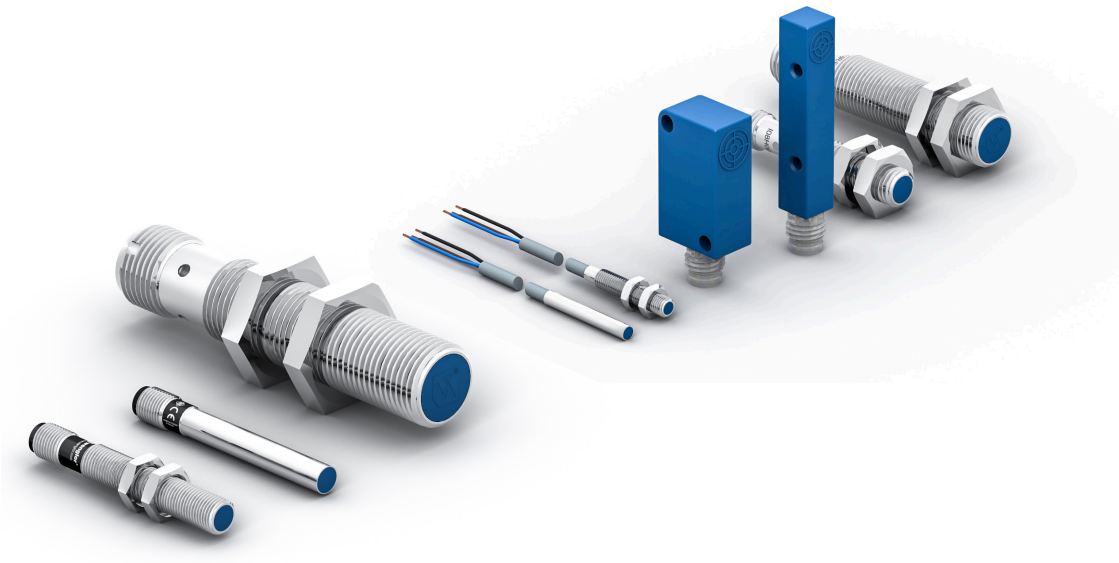
wenglor
the innovative family

Inductive Sensors

with Standard Switching Distance
with Increased Switching Distance



Operating Instructions

Translation of the original operating instructions
Subject to change without notice
Available as PDF file only
Version 1.0.0
Status: 10/21/2021
www.wenglor.com

Table of Contents

1. General

1.1 Information Concerning these Instructions

- These instructions apply to the products:
  - Inductive sensors with standard switching distances (I12Nxxx, I18Nxxx, I30Nxxx, IJ008, IL008)
  - Inductive sensors with increased switching distances (I03Hxxx, I04Hxxx, I08Hxxx, I12Hxxx, I18Hxxx, I30Hxxx, I1AHxxx, I1BHxxx, I1CHxxx, I1DHxxx, I1QHxxx)
- They make it possible to use the product safely and efficiently.
- These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.
- Local accident prevention regulations and national work safety regulations must be complied with as well.
- The product is subject to further technical development, and thus the information contained in these operating instructions may also be subject to change. The current version can be found at www.wenglor.com in the product's separate download area.

NOTE!
The operating instructions must be read carefully before using the product and must be kept on hand for later reference!

1.2 Explanations of Symbols

- Safety precautions and warnings are emphasized by means of symbols and attention-getting words.
- Safe use of the product is only possible if these safety precautions and warnings are adhered to.
- The safety precautions and warnings are laid out in accordance with the following principle:

SIGNAL WORD
Type and source of danger!
Possible consequences in the event that the hazard is disregarded.
- Measures for averting the hazard.

The meanings of the signal words, as well as the scope of the associated hazards, are listed below:

DANGER!
This signal word indicates a hazard with a high degree of risk which, if not avoided, results in death or severe injury.

WARNING!
This signal word indicates a hazard with a medium degree of risk which, if not avoided, may result in death or severe injury.

CAUTION!
This signal word indicates a hazard with a low degree of risk which, if not avoided, may result in minor or moderate injury.

ATTENTION!
This word draws attention to a potentially hazardous situation which, if not avoided, may result in property damage.

NOTE!
A note draws attention to useful tips and suggestions, as well as information regarding efficient, error-free use.

1.3 Limitation of Liability

- The product has been developed in consideration of the current state-of-the-art technology, as well as applicable standards and guidelines. Subject to change without notice. A valid declaration of conformity can be found at www.wenglor.com in the product's separate download area.
- wenglor sensoric elektronische Geräte GmbH (hereinafter referred to as "wenglor") excludes all liability in the event of:
    - Non-compliance with the instructions
    - Use of the product for purposes other than those intended
    - Use by untrained personnel
    - Use of unapproved replacement parts
    - Unapproved modification of products
- These operating instructions do not include any guarantees from wenglor with regard to the described procedures or specific product characteristics.
- wenglor assumes no liability for printing errors or other inaccuracies contained in these operating instructions unless wenglor was verifiably aware of such errors at the point in time at which the operating instructions were prepared.

1.4 Copyrights

- The contents of these instructions are protected by copyright law.
- All rights are reserved by wenglor.
- Commercial reproduction or any other commercial use of the provided content and information, in particular graphics and images, is not permitted without previous written consent from wenglor.

2. For Your Safety

2.1 Use for Intended Purpose

This wenglor product is intended for use in accordance with the following functional principle

Inductive Sensors with Standard Switching Distance
Inductive Sensors with Increased Switching Distance

Inductive sensors are used to detect the position of metallic objects. A coil is located underneath the sensing face of inductive sensors which generates a magnetic field. Approaching metal objects (e.g. steel, aluminum or brass) generate eddy currents within this magnetic field which are measured by the sensor. When the approaching metal object reaches the selected switching distance, the output is switched.

This product can be used in the following industry sectors:

- Special-purpose mechanical engineering
- Heavy mechanical engineering
- Logistics
- Automotive industry
- Food industry
- Packaging industry
- Pharmaceuticals industry
- Clothing industry
- Plastics industry
- Woodworking industry
- Consumer goods industry
- Paper industry
- Electronics industry
- Glass industry
- Steel industry
- Printing industry
- Aviation industry
- Construction industry
- Chemicals industry
- Agriculture industry
- Alternative energies
- Raw materials extraction

2.2 Use for Other than the Intended Purpose

- No safety components in accordance with 2006/42/EC (Machinery Directive).
- The product is not suitable for use in potentially explosive atmospheres.
- The product may be used only with accessories supplied or approved by wenglor, or in combination with approved products. A list of approved accessories and combination products can be found at www.wenglor.com on the product detail page.

DANGER!
Risk of personal injury or property damage in case of use for other than the intended purpose!
Use for other than the intended purpose may lead to hazardous situations.
- Observe instructions regarding use for intended purpose.

2.3 Personnel Qualifications

- Suitable technical training is a prerequisite.
- In-house electronics training is required.
- Trained personnel must have (permanent) access to the operating instructions.

DANGER!
Risk of personal injury or property damage in case of incorrect initial start-up and maintenance!
Personal injury and damage to equipment may occur.
- Adequate training and qualification of personnel

2.4 Modification of Products

DANGER!
Risk of personal injury or property damage if the product is modified.
Personal injury and damage to equipment may occur. Non-observance may result in loss of the CE mark, and the guarantee may be rendered null and void.
- Modification of the product is not permitted.

2.5 General Safety Precautions

NOTE!
- These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.
- In the event of possible changes, the respectively current version of the operating instructions can be found at www.wenglor.com in the product's separate download area.
- Read the operating instructions carefully before using the product.
- Protect sensor against contamination and mechanical influences.

2.6 Approvals and Protection Class

RoHS

- I03Hxxx, I04Hxx:

UK CA

- IJ008, IL008, I08xxxx, I12xxxx, I18xxxx, I30xxxx, I1AHxxx, I1BHxxx, I1CHxxx, I1DHxxx, I1QHxxx:

3. Technical Data

The specific technical data for the respective product can be found on the product detail page at www.wenglor.com.

3.1 Scope of Delivery

- Sensor
- Packaging bag incl. quick start printing
- Nut set (with I04, I08, I12, I18, I30)

4. Transport and Storage

4.1 Transport

Upon receipt of shipment, inspect the goods for damage in transit. In the case of damage, conditionally accept the package and notify the manufacturer of the damage. Then return the device, making reference to damage in transit.

4.2 Storage

The following points must be taken into consideration with regard to storage:

- Do not store the product outdoors.
- Store the product in a dry, dust-free place.
- Protect the product against mechanical impacts.
- Protect the product against exposure to direct sunlight.

ATTENTION!
Risk of property damage in case of improper storage!
The product may be damaged.
- Follow storage instructions.

5. Installation and Electrical Connection

5.1 Installation

- Protect the product from contamination during installation.
- Observe all applicable electrical and mechanical regulations, standards, and safety rules.

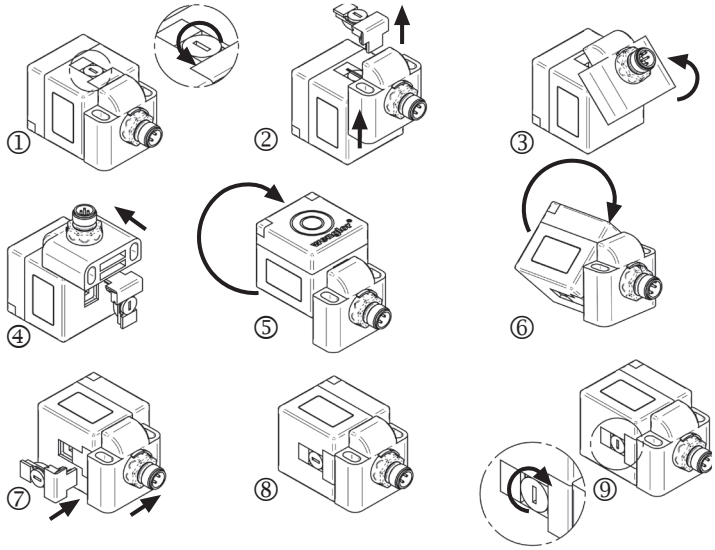
- Protect the product against mechanical influences.
- Make sure that the sensor is mounted in a mechanically secure fashion.
- The sensing face of the sensor may not contact any other machine parts.
- Installation instructions must be observed (see product detail page at www.wenglor.com)
- Specified torque values must be complied with (see product detail page at www.wenglor.com)

ATTENTION!
Risk of property damage in case of improper installation!
The product may be damaged.
- Comply with installation instructions.

CAUTION!
Risk of personal injury or property damage during installation!
Personal injury and damage to the product may occur.
- Ensure a safe installation environment.

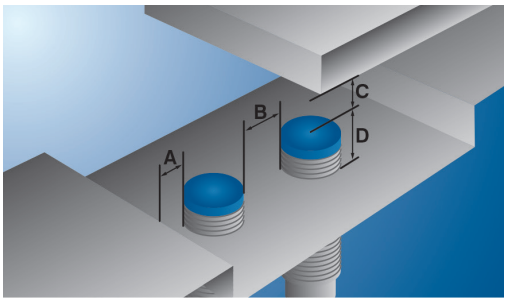
5.2 Installation for Format 40×40 (I1QHxxx)

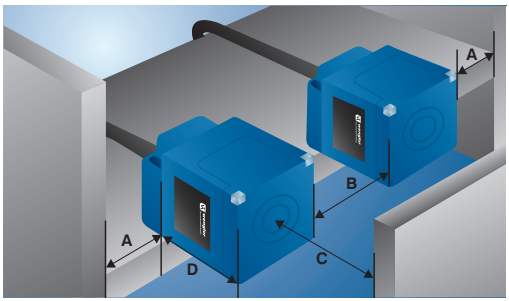
The sensing surface of the sensor can be mounted in 5 different directions.

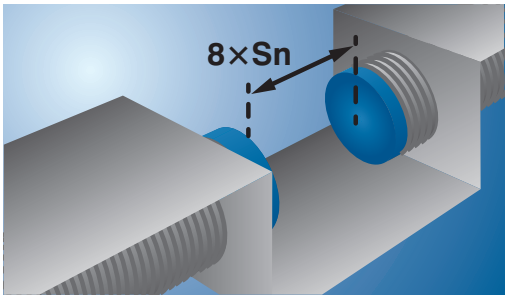


5.3 Installation Instructions

5.3.1 Installation Instructions in Accordance with Standard





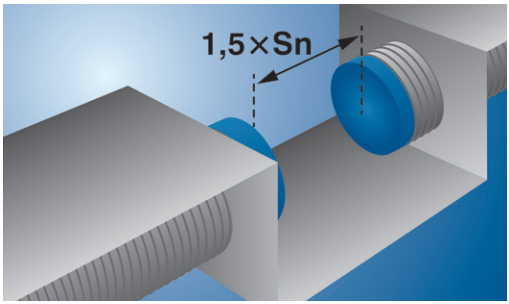


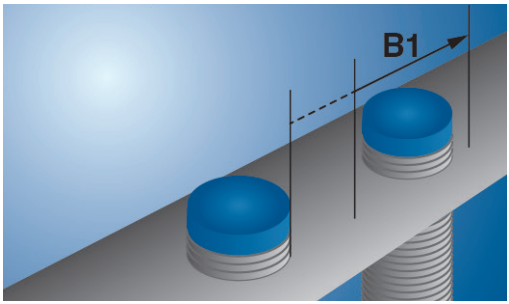
Installation dimension	Description
A	Minimum distance from sensor to damping material (e.g. steel).
B	Minimum distance between two inductive sensors. This clearance applies to installation in air. If the sensors are installed within an attenuating material (e.g. steel), this distance is reduced. Testing in the application is required in order to determine the exact distance.
C	Minimum distance from the sensing face of the inductive sensor to the damping material (e.g. steel). Distance C does not make reference to the object to be detected, but rather to the background. The object to be detected is detected within the switching distance.
D	Minimum dimension by which the sensor (sensing face) must protrude from the damping material (e.g. steel).
8 × Sn	Installation opposite each other Two identical sensors must be mounted at this minimum distance.

5.3.2 Installation instructions for sensors with weproTec

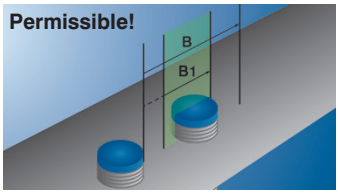
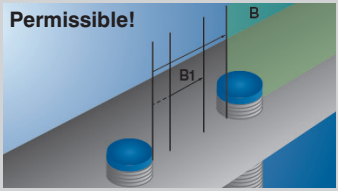
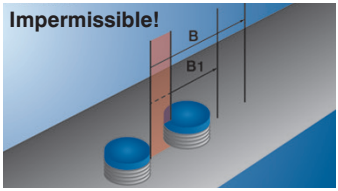
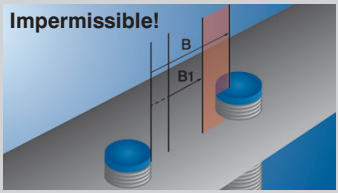
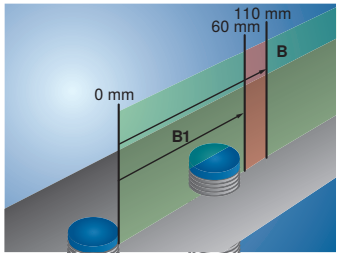
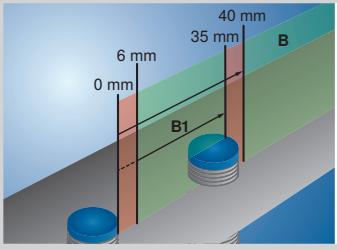
weproTec is the abbreviation for wenglor proximity switch technology, an innovative, patented wenglor technology for inductive sensors.
Inductive sensors with weproTec can be mounted very close to each other (→ installation dimension B1) or opposite one another (1.5 ×Sn). No reciprocal influence occurs among the sensors within the specified zones.
The installation instructions in accordance with the standard (section “5.3.1 Installation Instructions in Accordance with Standard” on page 11) are also valid.

weproTec has the following sensors:
I08xxxx, I12xxxx, I18xxxx, I30xxxx, I1AHxxx, I1BHxxx, I1CHxxx, I1DHxxx, I1QHxxx



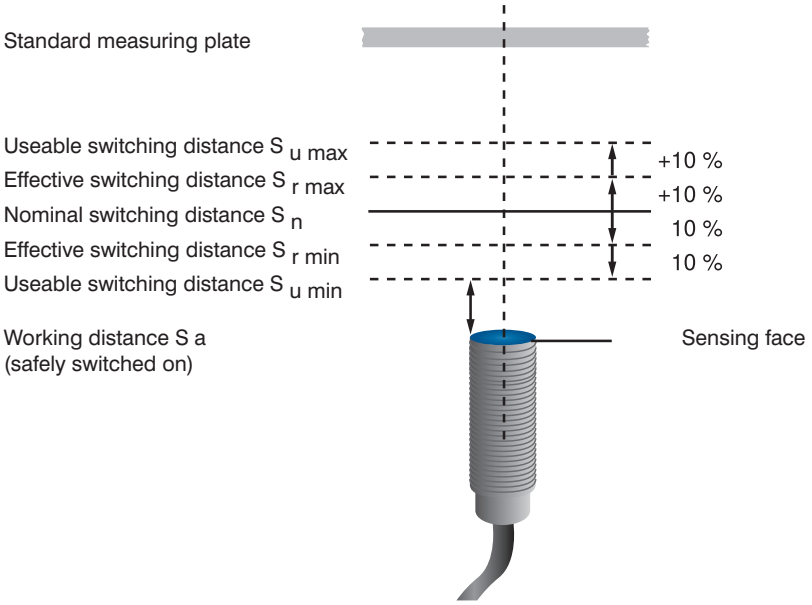


Installation dimension	Description
A	Minimum distance from sensor to damping material (e.g. steel).
B	Minimum distance between two inductive sensors. This clearance applies to installation in air. If the sensors are installed within an attenuating material (e.g. steel), this distance is reduced. Testing in the application is required in order to determine the exact distance.
B1	Additional minimum distance between two inductive sensors. This clearance applies to installation in air. If the sensors are installed within an attenuating material (e.g. steel), this distance is reduced. Testing in the application is required in order to determine the exact distance.
C	Minimum distance from the sensing face of the inductive sensor to the damping material (e.g. steel). Distance C does not make reference to the object to be detected, but rather to the background. The object to be detected is detected within the switching distance.
D	Minimum dimension by which the sensor (sensing face) must protrude from the damping material (e.g. steel).
1.5 × Sn	Installation opposite each other Two identical sensors must be mounted at this minimum distance.

Installation variant	Description
	Two sensors can be mounted next to each other in area B1.
	Two sensors can be mounted next to each other from installation dimension B.
	Two sensors must not be mounted next to each other in front of area B1.
	Two sensors must not be mounted in the area between B1 and B.
	Example: B1 starts at 0 mm Installation B1 in mm: 0…60 • Installation A/B/C/D in mm: x/110/x/x • Non-permissible range: 60…110 mm
	Example: B1 does not start at 0 mm • Installation B1 in mm: 6…35 • Installation A/B/C/D in mm: x/40/x/x

5.4 Switching distance

- The switching distance described in the data sheet is the nominal switching distance Sn according to the standard.
- The switching distance refers to a standard measuring plate (material: steel, thickness: 1 mm, side lengths: 3× Sn or outside diameter sensor).
- The switching distance according to the standard is further differentiated into:
  - Effective switching distance S_r
  - Useable switching distance S_u
  - Working distance S_a



NOTE!

- If the objects in the application are smaller than the standard measuring plate, the switching distance is also reduced.
- The correction factor of the sensor for certain materials also influences the switching distance and must be observed.
- The sensor should be mounted at a working distance Sa or less to the object.

5.5 Electrical Connection

- Wire the sensor according to the connection diagram (for the connection diagram see packaging or product detail page at www.wenglor.com)
- Connect the sensor to 10...30 V DC

DANGER!
Risk of personal injury or property damage due to electric current.
Live parts may cause personal injury or damage to equipment.
- The electric device may be connected by suitably qualified personnel only.

5.6 Diagnosis

5.6.1 LED Indicators

IJ008, IL008, I08Hxxx, I12Nxxx, I12Hxxx, I18Nxxx, I18Hxxx, I30Nxxx, I30Hxxx, I1AHxxx, I1BHxxx, I1CHxxx, I1DHxxx, I1QHxxx

Indicator	Status	Meaning
Switching status indicator	☀	Switching output active
	☀ 5 Hz	Error
	○	Switching output inactive

I03Hxxx, I04Hxxx

Indicator	Status	Meaning
Switching status indicator	☀	Switching output active
	☀ 5 Hz	Warning
	○	Switching output inactive

○ Not lit up

☀ Flashing

☀ Permanently lit up

5.6.2 Troubleshooting

Error	Possible Cause	Elimination
Warning	Adjustment aid for displaying the unsafe range Active at: 0.8 × Sr min < S ≤ Sr min Example Sn = 1 mm, i.e. Sr min = 0.9 mm Adjustment aid active: 0.72…0.9 mm	Reduce the distance between the sensor and the object • Distance must be < 0.8 × Sr min Example Object distance < 0.71 mm
Error	Short circuit	Check the electrical wiring and eliminate the short circuit
	Mechanical damage to the coil	Replace the sensor

Required Action in Case of Fault:

NOTE!

- Shut down the machine.
- Analyze and eliminate the cause of error with the aid of the diagnostics information.
- If the error cannot be eliminated, please contact wenglor's support department
- Do not operate in case of indeterminate malfunctioning.
- The machine must be shut down if the error cannot be definitively explained or properly eliminated.

DANGER!

Risk of personal injury or property damage in case of non-compliance!

The system's safety function is disabled. Personal injury and damage to equipment may occur.

- Required action as specified in case of fault.

6. Maintenance Instructions

NOTE!

- This wenglor sensor is maintenance-free.
- We recommend cleaning the lens and the display, and to check the plug connections at regular intervals.
- Do not clean the sensor with solvents or cleaning agents that could damage the product.
- The product must be protected against contamination during initial start-up.

7. Proper Disposal

wenglor sensoric GmbH does not accept the return of unusable or irreparable products. Respectively valid national waste disposal regulations apply to product disposal.

8. Appendix

8.1 List of Abbreviations

Abbreviation	Meaning
Sr	Effective switching distance
Sn	Nominal switching distance
Su	Useable switching distance
Sa	Working distance

8.2 Index of Changes

Version	Date	Description/Changes
1.0.0	10/21/2021	Initial version of the operating instructions

8.3 EU Declaration of Conformity

The EU declaration of conformity can be found on our website at www.wenglor.com in the product's separate download area.