

# NEARFI PD 2A ETH B - Inductive coupler



1234224

<https://www.phoenixcontact.com/us/products/1234224>

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NearFi base, contactless power and real-time Ethernet coupler, 50 W (US), 100 Mbps, range  $\leq 10$  mm, M12 screw connection, IP65, can be combined with NEARFI PD 2A ETH R. Incompatible with NEARFI 2200 (new)

## Product description

With the robust NEARFI-PD... NearFi couplers, you can transmit power (24 V DC / 2 A) and real-time Ethernet data (100 Mbps, full duplex) without contact across a distance in the centimeter range. Furthermore, the specially developed NearFi technology enables latency-free and protocol-independent Ethernet communication. At the same time, the limited wireless range of just a few centimeters also ensures security and permits parallel applications in the tightest of spaces. You can therefore replace wear-sensitive and maintenance-intensive connections and reduce downtimes in your systems.

## Your advantages

- Contactless - and therefore no wear and no maintenance
- Protocol-independent, latency-free Ethernet real-time communication with 100 Mbps (full duplex)
- High power in a compact housing
- All-round visible diagnostics with light ring on the housing
- High degree of mounting freedom with flexible proximity options
- Plug and Play - as easy as a plug
- Degree of protection IP65

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1234224       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | DN26          |
| Product key                          | DNC691        |
| GTIN                                 | 4063151337919 |
| Weight per piece (including packing) | 598.2 g       |
| Weight per piece (excluding packing) | 550 g         |
| Customs tariff number                | 85176200      |
| Country of origin                    | DE            |

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## Technical data

### Product properties

|                |                                                                        |
|----------------|------------------------------------------------------------------------|
| Product type   | Inductive coupler                                                      |
| Product family | NearFi                                                                 |
| Application    | Ethernet                                                               |
|                | Power                                                                  |
| MTTF           | 115 Years (SN 29500 standard, temperature 25°C, operating cycle 21%)   |
|                | 60 Years (SN 29500 standard, temperature 40°C, operating cycle 34.25%) |
|                | 27 Years (SN 29500 standard, temperature 40°C, operating cycle 100%)   |

### Insulation characteristics

|                      |    |
|----------------------|----|
| Overvoltage category | II |
| Pollution degree     | 2  |

### Electrical properties

|                                                 |        |
|-------------------------------------------------|--------|
| Maximum power dissipation for nominal condition | 4.08 W |
|-------------------------------------------------|--------|

### Supply

|                             |                                                                   |
|-----------------------------|-------------------------------------------------------------------|
| Supply voltage range        | 19 V DC ... 30 V DC                                               |
| Typical current consumption | 170 mA (without remote coupler, at 24 V DC, at 25°C)              |
|                             | 480 mA (with remote coupler, without load, at 24 V DC, at 25°C)   |
| Max. current consumption    | ≤ 3.6 A (with remote coupler, 2 A load, input voltage of 19 V DC) |
| Inrush current              | ≤ 0.8 A (8 ms at 24 V DC, without remote coupler)                 |
|                             | ≤ 4.5 A (6 ms at 24 V DC, with remote coupler, without load)      |
| Protective circuit          | Transient protection, polarity protection                         |

### Input data

#### Digital

|                            |                     |
|----------------------------|---------------------|
| Description of the input   | Digital input       |
| Number of inputs           | 1                   |
| Voltage input signal       | 19 V DC ... 30 V DC |
| Switching level "1" signal | 19 V DC ... 30 V DC |

### Output data

#### Signal

|                       |                |
|-----------------------|----------------|
| Output name           | Digital output |
| Number of outputs     | 1              |
| Voltage output signal | ≤ 24 V DC      |

### Connection data

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## Supply

|                   |                   |
|-------------------|-------------------|
| Connection method | M12 male, A-coded |
|-------------------|-------------------|

## Interfaces

Data: Ethernet interface, 100Base-T(X) in accordance with IEEE 802.3

|                               |                                                                                                          |
|-------------------------------|----------------------------------------------------------------------------------------------------------|
| Transmission speed            | 100 Mbps                                                                                                 |
| Connection method             | M12 female, D-coded                                                                                      |
| Note on the connection method | Auto negotiation and autocrossing, fast startup (FSU, <500 ms)<br>Typical bit error rate $\leq 10^{-12}$ |
| No. of channels               | 1                                                                                                        |
| Transmission length           | 100 m (shielded twisted pair)                                                                            |
| Transmission medium           | Copper                                                                                                   |
| Protocols supported           | Protocol transparent: PROFINET, PROFINET IRT, PROFIsafe, EtherCAT®, Modbus/TCP, Powerlink, TSN, etc.     |

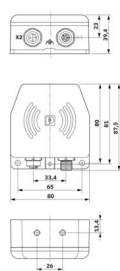
Inductive: Power transmission

|                                        |                                                                |
|----------------------------------------|----------------------------------------------------------------|
| Switch-on time                         | < 450 ms (ETH Full Duplex operating mode)                      |
| Range                                  | min. 0 mm<br>$\leq 10$ mm (at 55°C)<br>$\leq 12$ mm (at 25 °C) |
| Center offset                          | $\pm 5$ mm                                                     |
| Wireless modules that can be connected | 1 (Remote coupler)                                             |
| Frequency range                        | 100 kHz ... 148.5 kHz (Power transmission)                     |
| Test field strength                    | $\sim 1.95 \mu\text{A/m}$ (within 10 m distance)               |

Wireless

|                                        |                                       |
|----------------------------------------|---------------------------------------|
| Wireless modules that can be connected | 1 (Remote coupler)                    |
| Frequency                              | 60 GHz                                |
| Frequency range                        | 57 GHz ... 64 GHz (Data transmission) |
| Transmission power                     | < 10 mW (EIRP)                        |
| Delay time                             | $\leq 1 \mu\text{s}$ (typical)        |

## Dimensions

|                     |                                                                                     |
|---------------------|-------------------------------------------------------------------------------------|
| Dimensional drawing |  |
| Width               | 80 mm                                                                               |
| Height              | 86 mm                                                                               |
| Depth               | 39 mm                                                                               |

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## Material specifications

|                                        |                  |
|----------------------------------------|------------------|
| Color (Housing)                        | black (RAL 9005) |
| Material (Enclosure)                   | PBT              |
|                                        | Die-cast zinc    |
| Flammability rating according to UL 94 | V0               |

## Cable/line

|                  |                                                                                   |
|------------------|-----------------------------------------------------------------------------------|
| Other resistance | Resistant to welding splashes                                                     |
|                  | Resistant to salt spray in accordance with IEC 60068-2-11 (96 h in 5% salt spray) |

## Mechanical tests

|                                                                    |                                                                                                               |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Vibration resistance in accordance with EN 60068-2-6/IEC 60068-2-6 | Vibration (operation): 5 g per spatial direction, 10 Hz ... 150 Hz, amplitude $\pm 0.34$ mm                   |
| Shock in accordance with EN 60068-2-27/IEC 60068-2-27              | Shock (operation): 30 g, 11 ms duration, half-sine shock pulse, three shocks per spatial direction            |
| Continuous shock in accordance with EN 60068-2-27/IEC 60068-2-27   | Continuous shock (operation): 10 g, 16 ms duration, half-sine shock pulse, 1,000 shocks per spatial direction |

## Environmental and real-life conditions

### Ambient conditions

|                                          |                                                   |
|------------------------------------------|---------------------------------------------------|
| Degree of protection                     | IP65 (Manufacturer's declaration)                 |
| Impact strength                          | IK06                                              |
| Ambient temperature (operation)          | -20 °C ... 55 °C (observe derating)               |
| Ambient temperature (storage/transport)  | -40 °C ... 85 °C                                  |
| Altitude                                 | 2000 m                                            |
| Permissible humidity (operation)         | 10 % ... 95 %                                     |
| Permissible humidity (storage/transport) | 10 % ... 95 %                                     |
| Air pressure (operation)                 | 80 kPa ... 108 kPa (up to 2000 m above sea level) |
| Air pressure (storage/transport)         | 66 kPa ... 108 kPa (up to 3500 m above sea level) |

### Test (Salt spray)

|                       |                |
|-----------------------|----------------|
| Test standard         | IEC 60068-2-11 |
| Test duration (Total) | 96 h           |

## Approvals

### CE

|             |              |
|-------------|--------------|
| Certificate | CE-compliant |
|-------------|--------------|

### Wireless approval, Europe

|      |                |
|------|----------------|
| Note | RED 2014/53/EU |
|------|----------------|

### UL, USA

|                |                             |
|----------------|-----------------------------|
| Identification | UL 61010 Recognized         |
|                | UL 61010-2-201, 2nd Edition |

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|             |                         |
|-------------|-------------------------|
|             | UL 61010-1, 3rd Edition |
| Certificate | E238705                 |

## UL, Canada

|                |                                           |
|----------------|-------------------------------------------|
| Identification | cUL 61010 Recognized                      |
|                | CSA C22.2 NO. 61010-2-201:18, 2nd Edition |
|                | CSA C22.2 NO. 61010-1, 3rd Edition        |
| Certificate    | E238705                                   |

## Wireless approval USA, FCC

|             |             |
|-------------|-------------|
| Certificate | YG3PD2AETHB |
|-------------|-------------|

## Wireless approval Japan, MIC

|                |            |
|----------------|------------|
| Identification | 006-001058 |
|----------------|------------|

## KC approval for South Korea

|             |                 |
|-------------|-----------------|
| Certificate | R-R-PCK-1234232 |
|-------------|-----------------|

## CC-Link IE TSN

|                |         |
|----------------|---------|
| Identification | Class A |
|----------------|---------|

## EMC data

|                               |                                           |
|-------------------------------|-------------------------------------------|
| Electromagnetic compatibility | Conformance with EMC Directive 2014/30/EU |
|-------------------------------|-------------------------------------------|

## Electrostatic discharge

|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-2 |
|-----------------------|--------------|

## Electrostatic discharge

|                   |                       |
|-------------------|-----------------------|
| Contact discharge | ± 4 kV (Test Level 2) |
| Discharge in air  | ± 8 kV (Test Level 3) |
| Comments          | Criterion B           |

## Electromagnetic HF field

|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-3 |
|-----------------------|--------------|

## Electromagnetic HF field

|                 |                                 |
|-----------------|---------------------------------|
| Frequency range | 80 MHz ... 1 GHz (Test Level 3) |
| Field intensity | 10 V/m                          |
| Comments        | Criterion A                     |

## Fast transients (burst)

|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-4 |
|-----------------------|--------------|

## Fast transients (burst)

|          |                                      |
|----------|--------------------------------------|
| Input    | ± 2 kV (Test Level 3 - asymmetrical) |
| Output   | ± 2 kV (Test Level 3 - asymmetrical) |
| Signal   | ± 2 kV (Test Level 3 - asymmetrical) |
| Comments | Criterion B                          |

## Surge current load (surge)

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|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-5 |
|-----------------------|--------------|

## Surge current load (surge)

|          |                                       |
|----------|---------------------------------------|
| Input    | ± 0.5 kV (Test Level 1 - symmetrical) |
|          | ± 1 kV (Test Level 2 - asymmetrical)  |
| Output   | ± 1 kV (Test Level 2 - asymmetrical)  |
| Signal   | ± 1 kV (Test Level 2 - asymmetrical)  |
| Comments | Criterion B                           |

## Conducted interference

|                       |              |
|-----------------------|--------------|
| Standards/regulations | EN 61000-4-6 |
|-----------------------|--------------|

## Conducted interference

|                 |                                                   |
|-----------------|---------------------------------------------------|
| Frequency range | 0.15 MHz ... 80 MHz (Test Level 3 - asymmetrical) |
| Comments        | Criterion A                                       |
| Voltage         | 10 V (80% amplitude modulation with 1 kHz)        |

## Emitted interference

|                       |                                  |
|-----------------------|----------------------------------|
| Standards/regulations | EN 55016-2-3                     |
| Comments              | Class A, industrial applications |

## Criteria

|             |                                                                                      |
|-------------|--------------------------------------------------------------------------------------|
| Criterion A | Normal operating behavior within the specified limits.                               |
| Criterion B | Temporary impairment to operational behavior that is corrected by the device itself. |

## Standards and regulations

|                                                                   |                                                                                   |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Free from substances that could impair the application of coating | VDMA 24364:2018-05                                                                |
| Other resistance                                                  | Resistant to welding splashes                                                     |
|                                                                   | Resistant to salt spray in accordance with IEC 60068-2-11 (96 h in 5% salt spray) |
| Standards/regulations                                             | EN 60204-1 (PELV)                                                                 |
| Standard designation                                              | Protective extra-low voltage                                                      |

## Mounting

|                   |                  |
|-------------------|------------------|
| Mounting type     | Panel mounting   |
| Assembly note     | Observe derating |
| Mounting position | any              |

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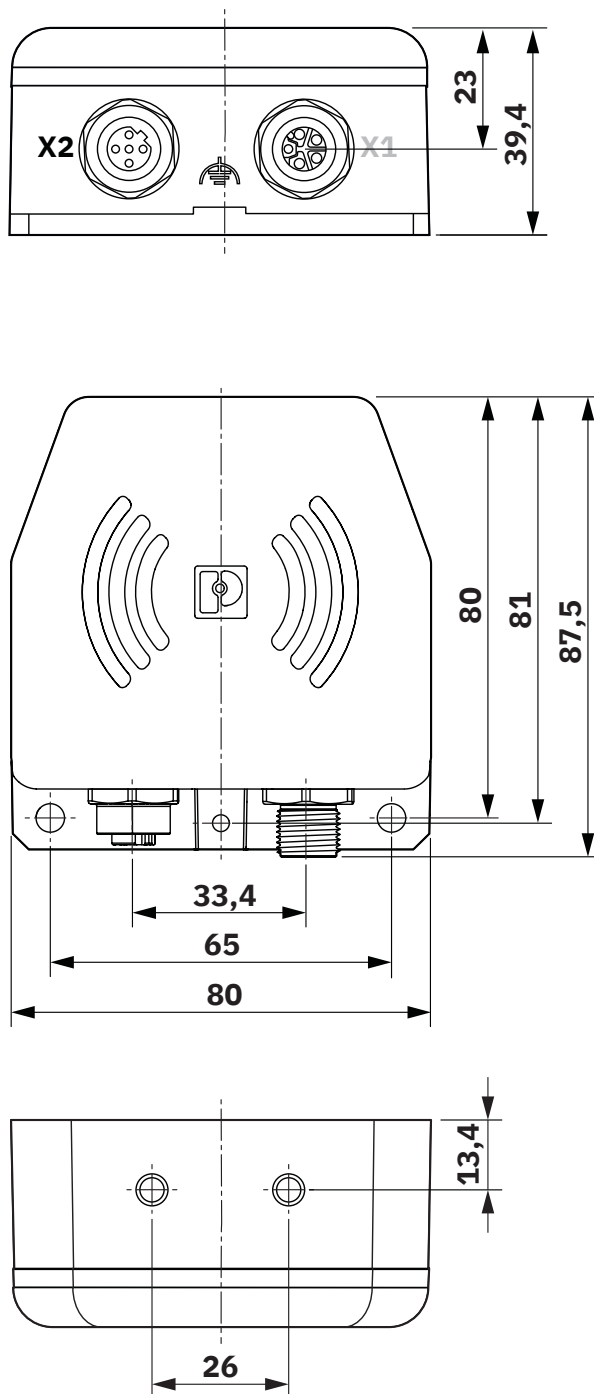
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## Drawings

Dimensional drawing



Dimensional drawing

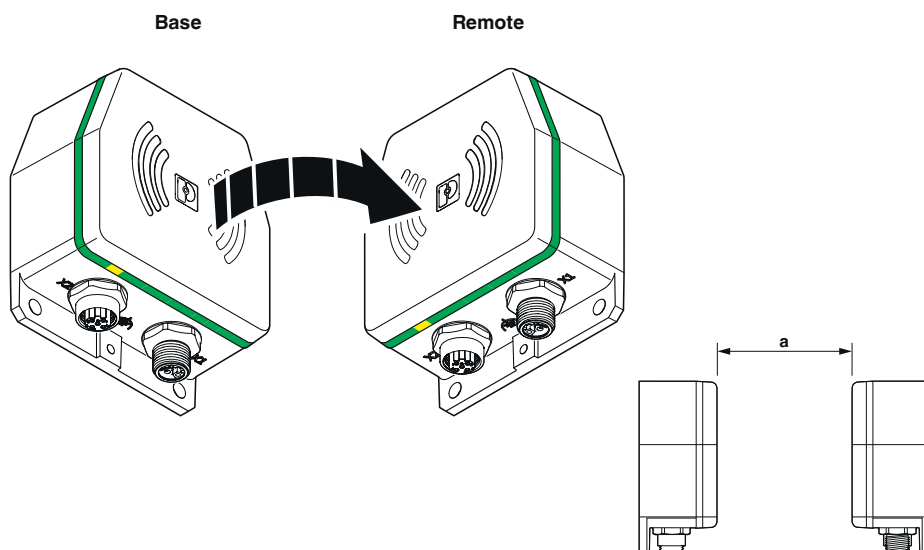
# NEARFI PD 2A ETH B - Inductive coupler

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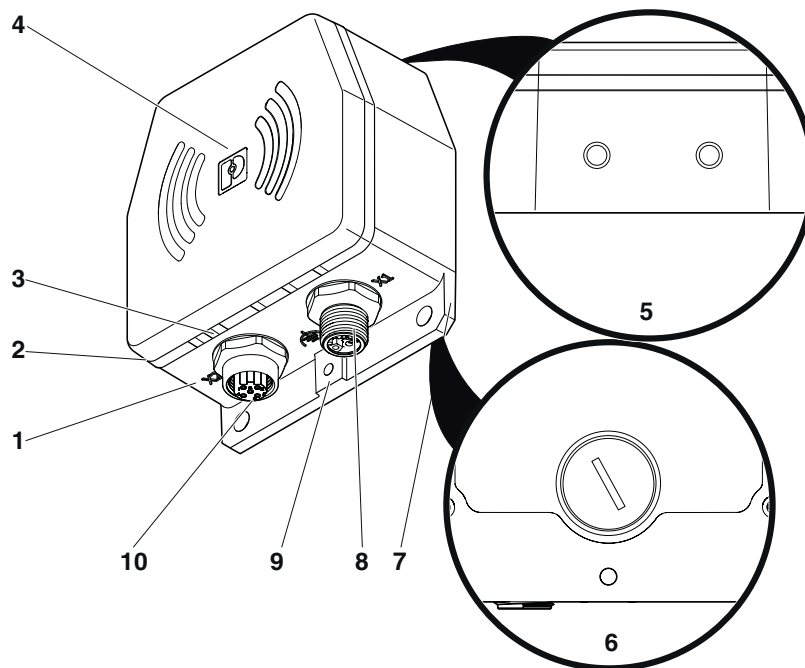


Schematic diagram



## Method of operation

Schematic diagram



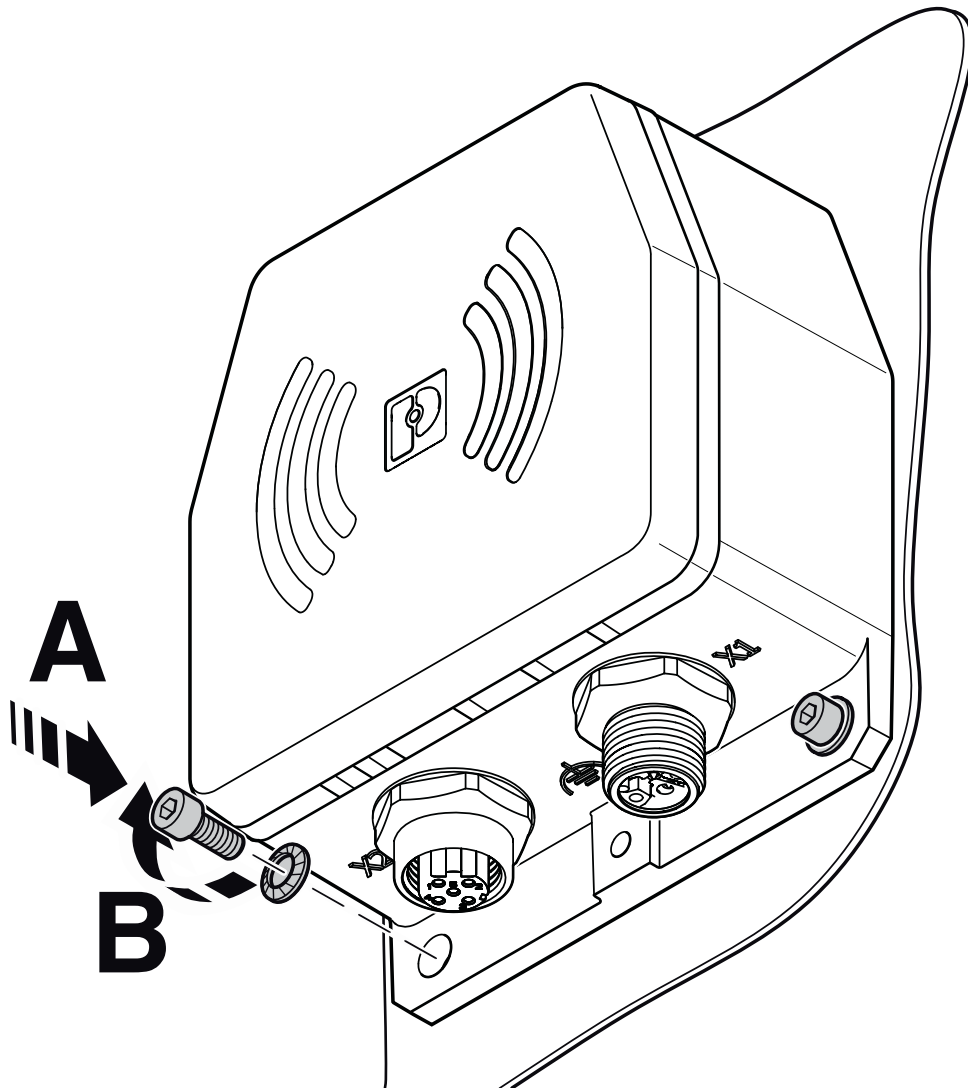
## Function elements

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Schematic diagram



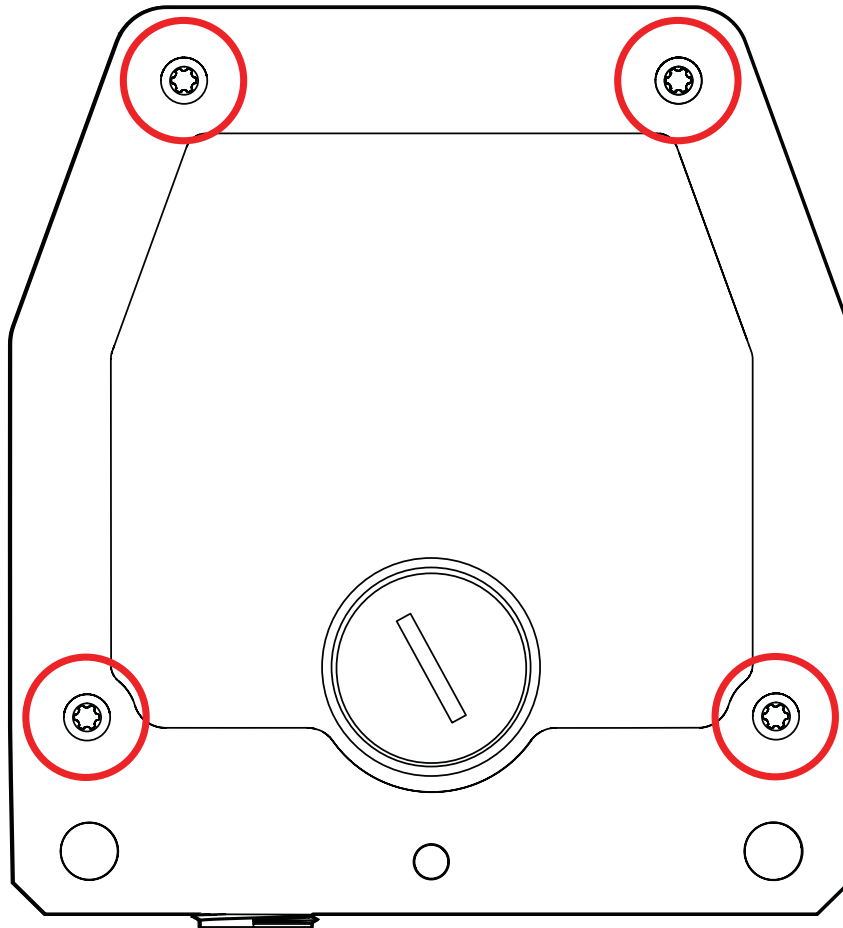
Mounting with two screws

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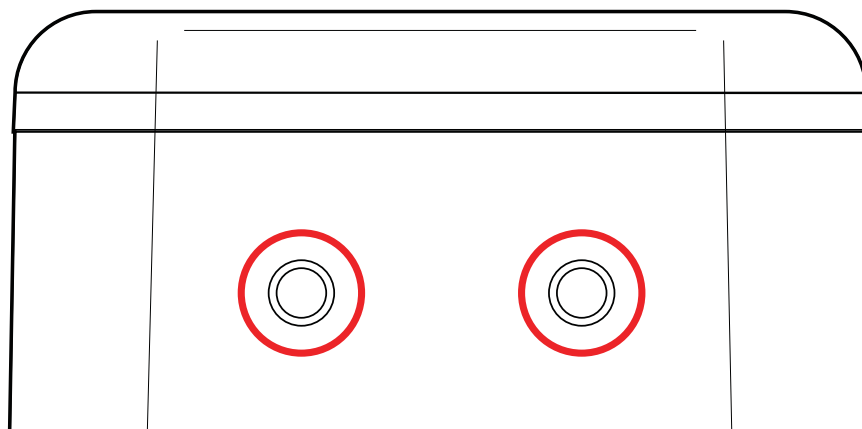
<https://www.phoenixcontact.com/us/products/1234224>

Schematic diagram



Mounting with four screws

Schematic diagram



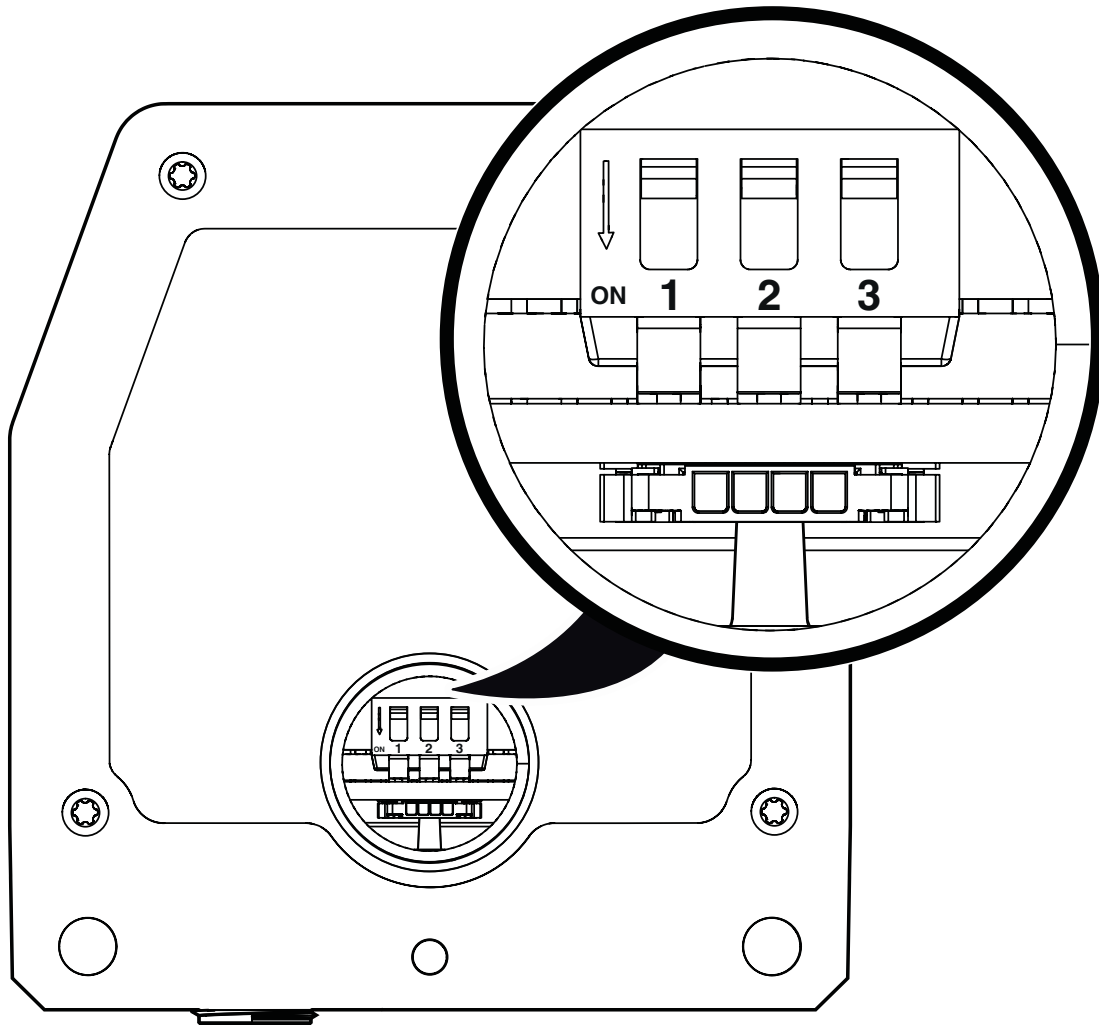
Mounting option

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Schematic diagram



DIP switches

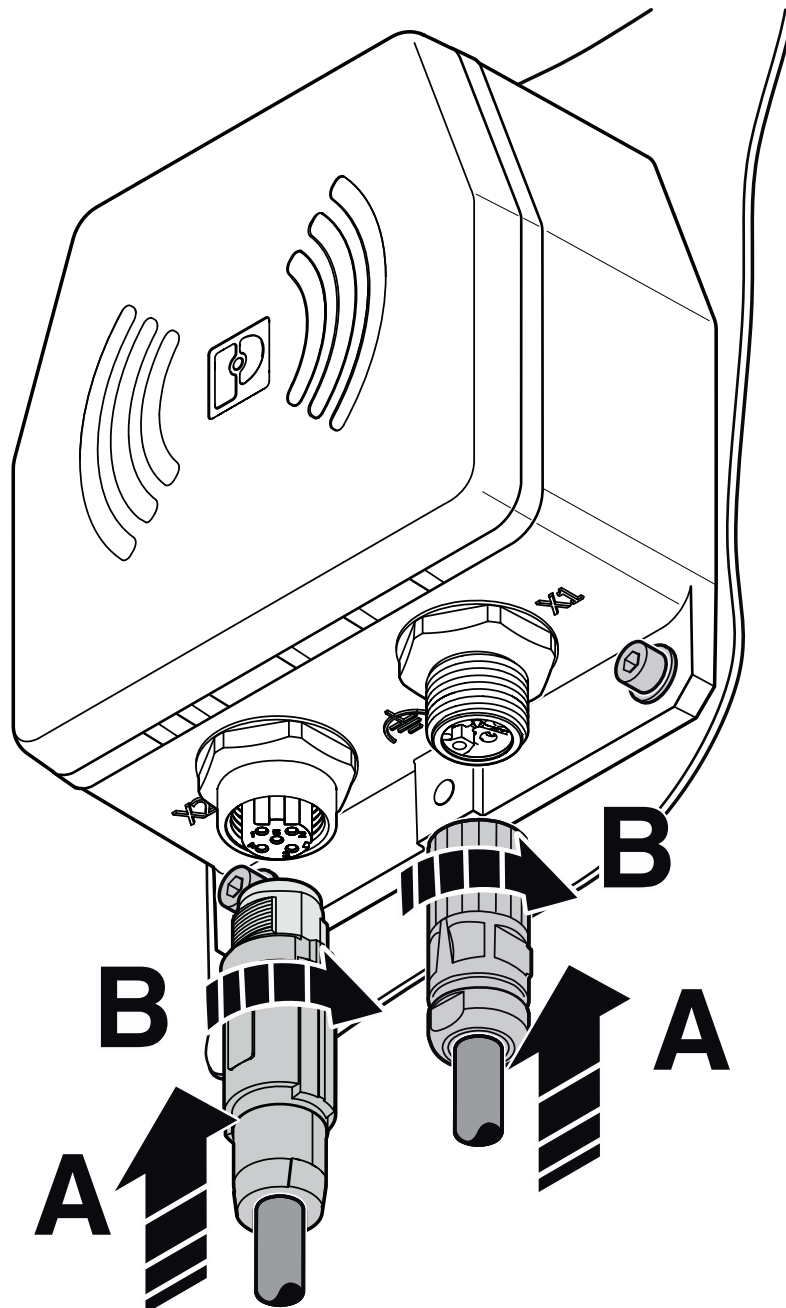
# NEARFI PD 2A ETH B - Inductive coupler

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Schematic diagram



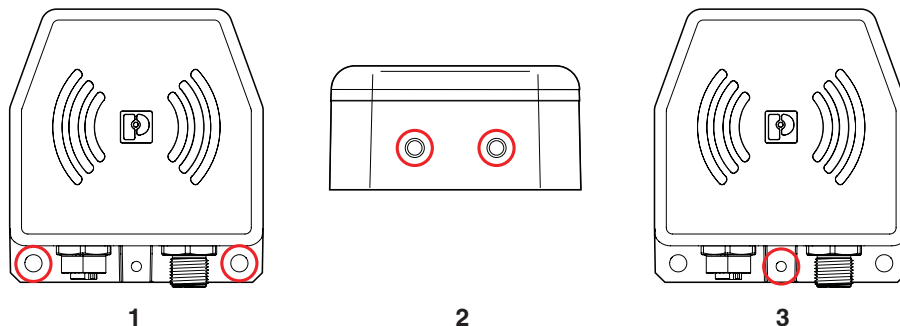
Connecting the cables

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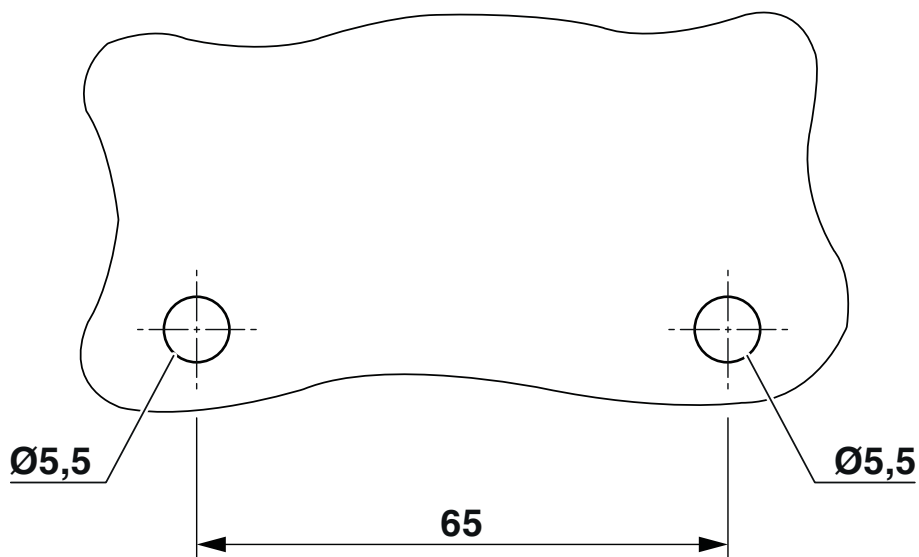
<https://www.phoenixcontact.com/us/products/1234224>

Schematic diagram



Options for functional grounding

Drilling plan/solder pad geometry



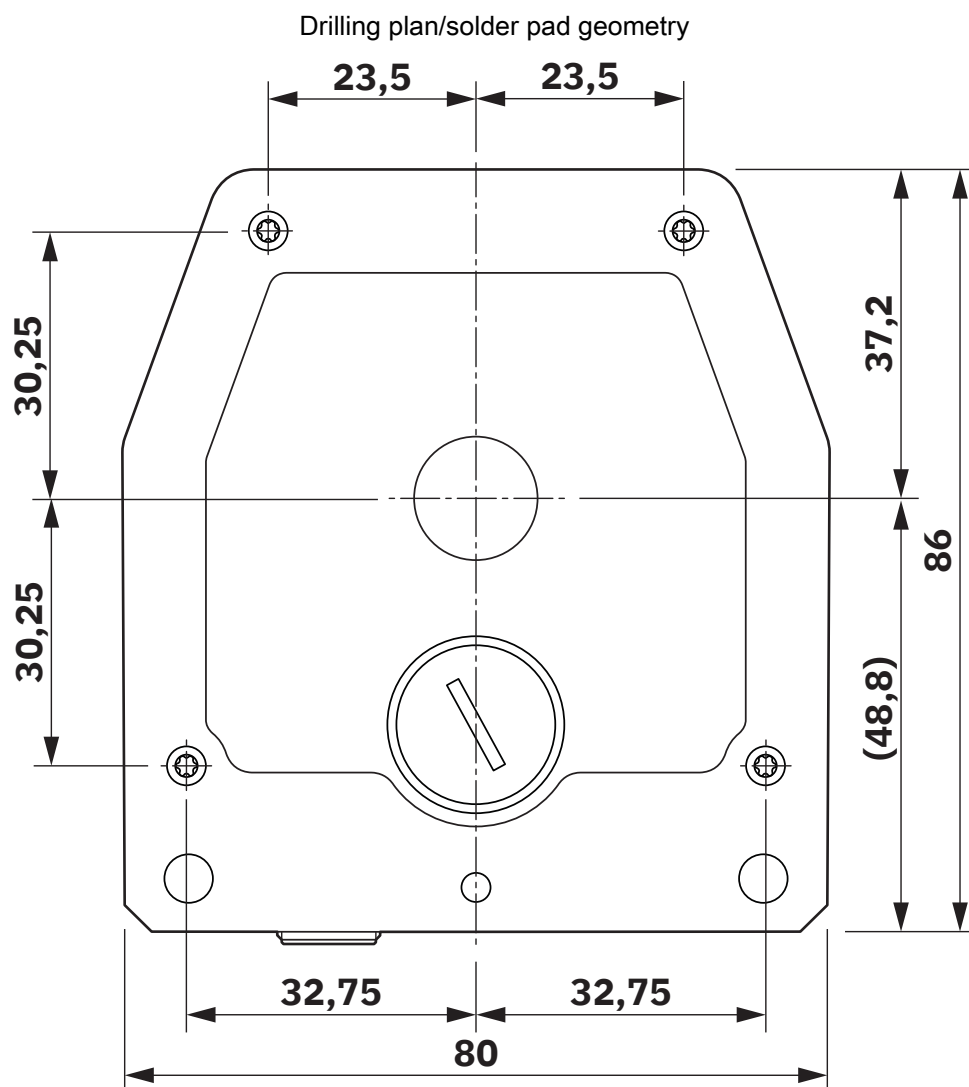
Drilling diagram

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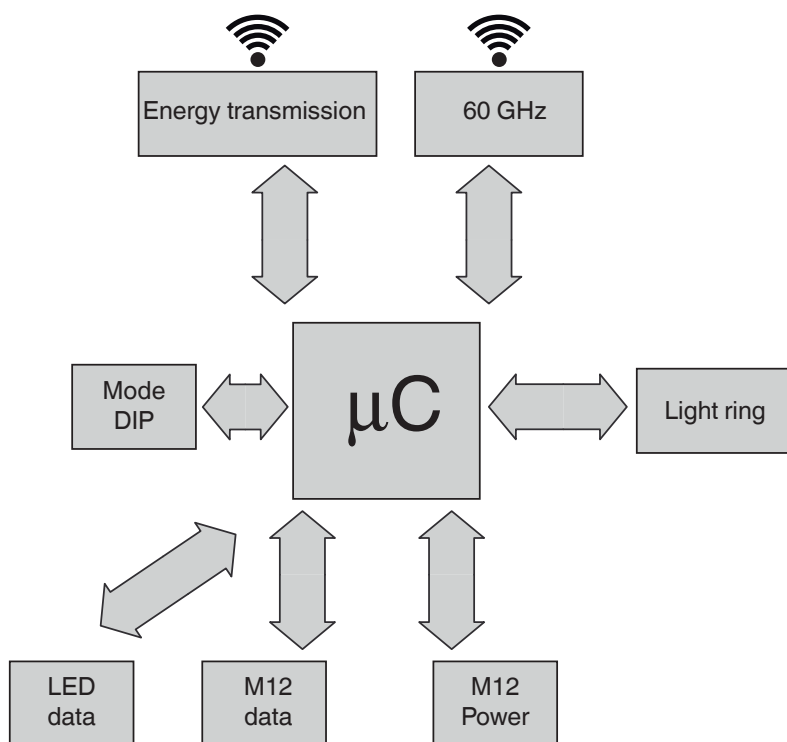
Centering template

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Block diagram



Basic circuit diagram

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## Approvals

 To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1234224>



**MIC**

Approval ID: 006-001058



**cULus Recognized**

Approval ID: E238705



**KC**

Approval ID: R-R-PCK-1234232

**FCC**

Approval ID: YG3PD2AETHB

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27040701 |
| ECLASS-15.0 | 19170417 |

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC002540 |
|----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 39121000 |
|-------------|----------|

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## Environmental product compliance

|                                         |                                                                                                                                                                                                                                   |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EU RoHS                                 |                                                                                                                                                                                                                                   |
| Fulfills EU RoHS substance requirements | Yes                                                                                                                                                                                                                               |
| Exemption                               | 6(c)                                                                                                                                                                                                                              |
| China RoHS                              |                                                                                                                                                                                                                                   |
| Environment friendly use period (EFUP)  | EFUP-50                                                                                                                                                                                                                           |
|                                         | An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required. |
| EU REACH SVHC                           |                                                                                                                                                                                                                                   |
| REACH candidate substance (CAS No.)     | Lead(CAS: 7439-92-1)                                                                                                                                                                                                              |
| SCIP                                    | d92acee4-1886-4061-b33b-27dc6f8a5818                                                                                                                                                                                              |

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