KMT - Kraus Messtechnik GmbH

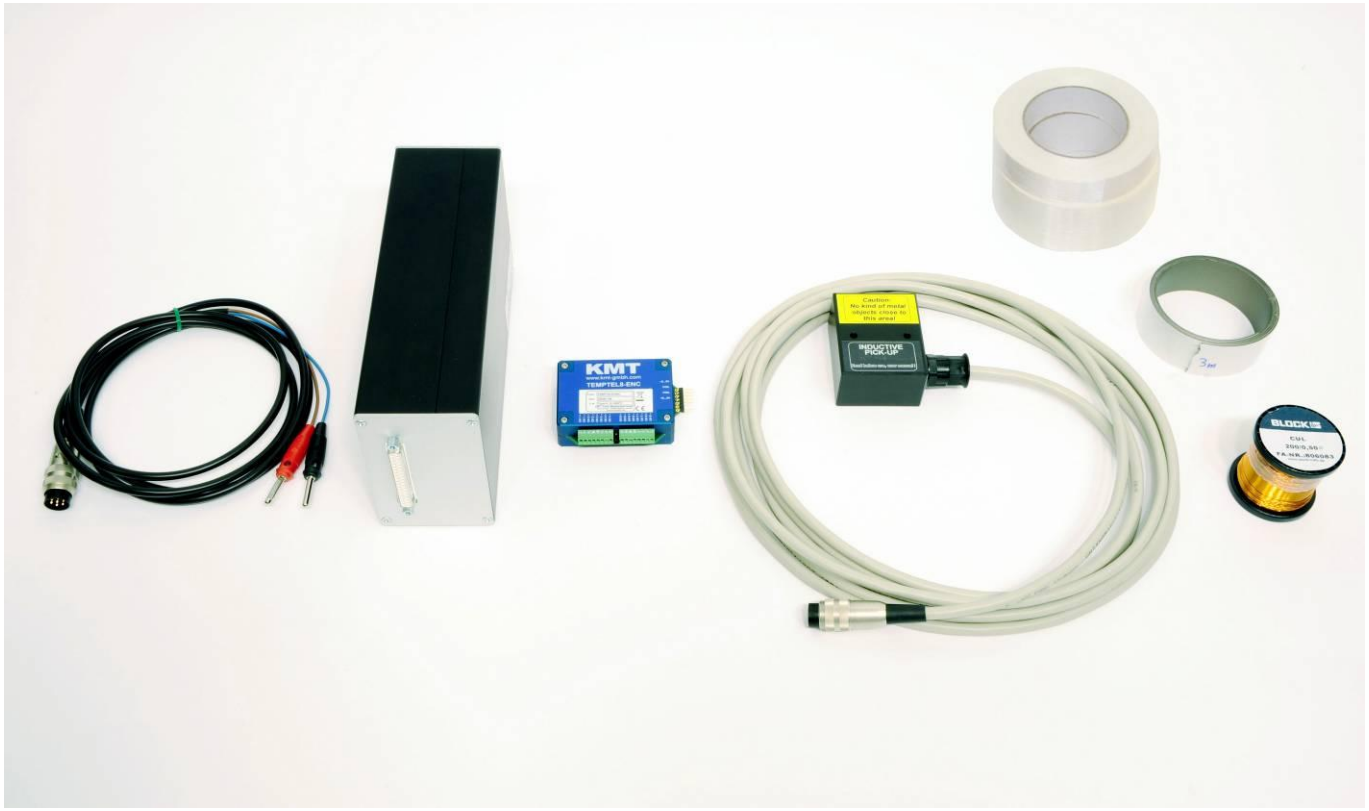
Gewerbering 9, D-83624 Otterfing, Germany, ☎ 08024-48737, Fax. 08024-5532
Home Page: http://www.kmt-telemetry.com, Email: info@kmt-telemetry.com

TEMPTEL 4/8

4/8 channel Telemetry System for Thermocouples K or J

Inductive digital transmission from rotating shafts

User Manual



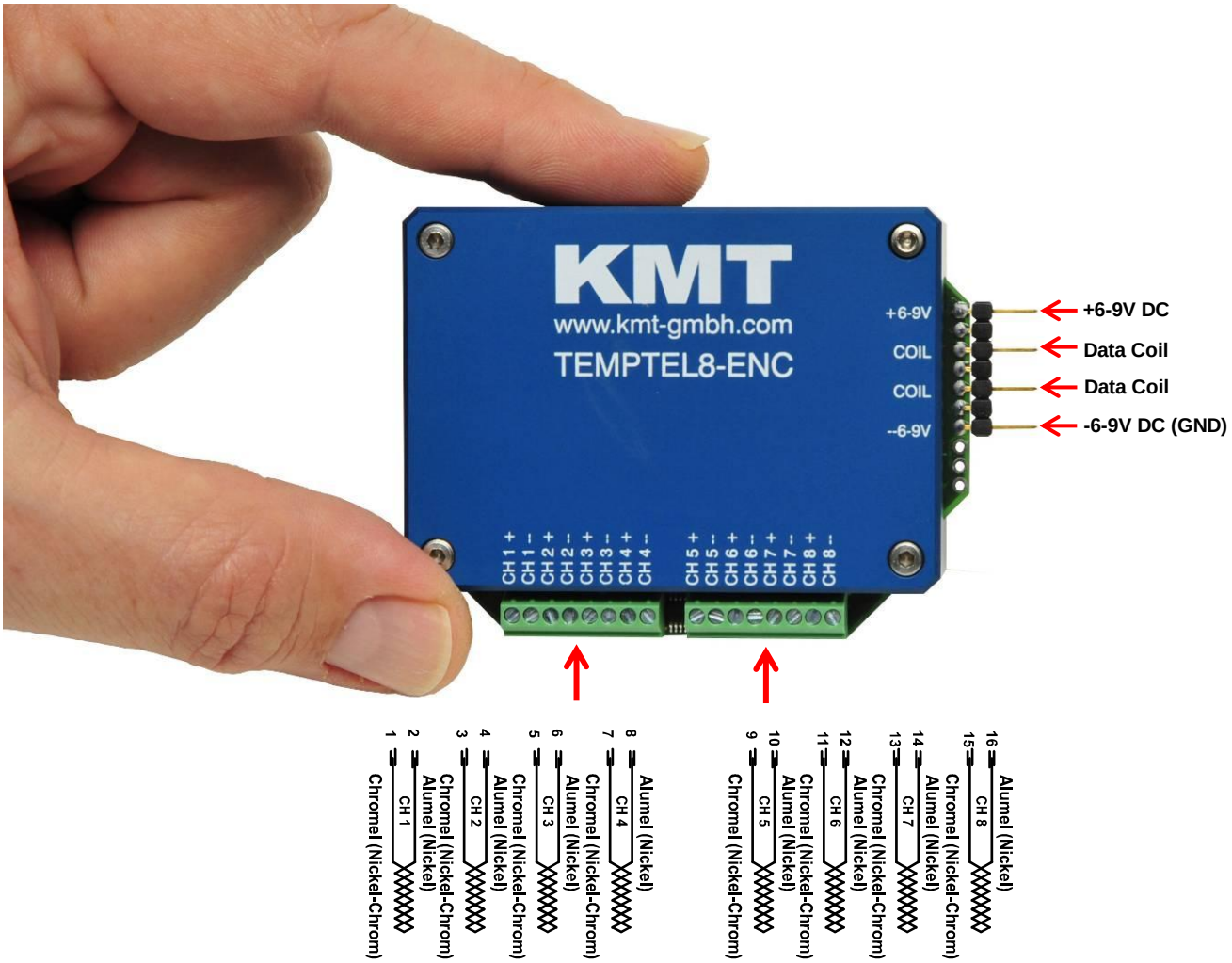
INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

- For thermo couples K or J
- Linearization for K or J
- Galvanic isolated inputs
- Cold junction compensation
- 12 bit ADC resolution
- Signal bandwidth 0-30 Hz
- Different temperature ranges
- Inductive digital transmission
- 4 or 8 channel version
- Analog output +/- 10V
- Current outputs 0-20mA (Opt.)
- Powering of encoder with battery

Safety notes

- The device should only applied by instructed personnel.
- The power head emits strong magnetic radiation at 30-60 kHz to a distance of 300 mm. Therefore persons with cardiac pacemakers should not work with this device!
- Magnetic data storage media should be kept in a distance of at least 3m from the power head to avoid data loss. The same is valid for electromagnetic sensitive parts, devices and systems.
- Do not place the power head in the switched-on state on metallic objects, because this results in eddy currents which could overload the device and strong heat up small objects. Also the probe could be destroyed!
- No metallic objects, other than the disc-type coil, should be located in the air gap of the power head. The same applies to metallic parts within a radius of up to 50 mm in all directions.
- Do not use damaged or faulty cables!
- Never touch in the area between shaft and inductive head, the rotating shaft itself or rotor electronic contacts during operation!
- This is a “Class A” system suitable for operation in a laboratory or industrial environment. The system can cause electromagnetic interferences when used in residential areas or environments. In this case the operator is responsible for establishing protective procedures.

Transmitting unit TEMPTEL4/8-ENC (Encoder)



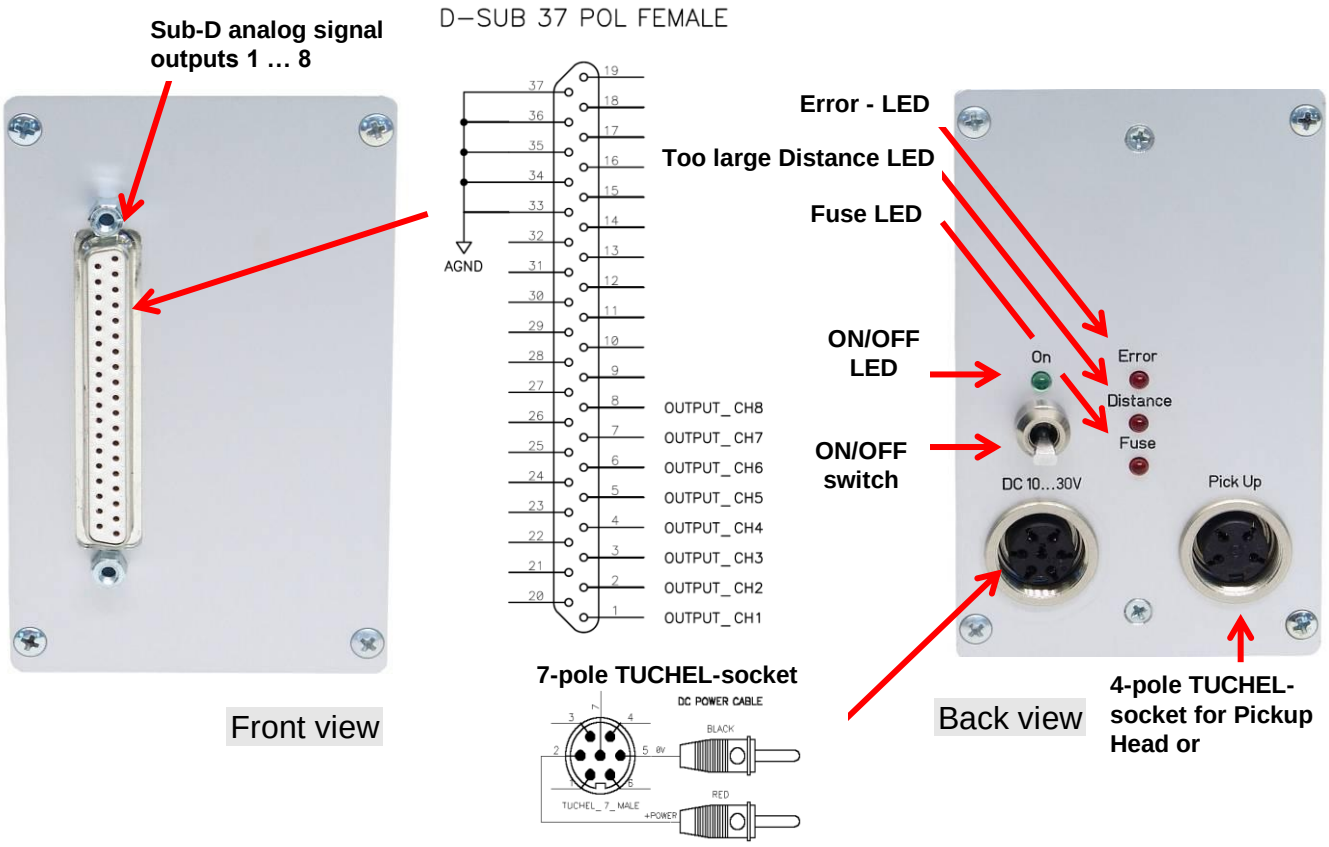
SC Module TH-K (J):

Sensor:	thermo-couple, type K (J) with cold junction compensation **inputs full galvanic isolated!!**
Temperature measuring range type K:	-50°C to +1000°C (standard), or -50°C to +500°C or -50°C to +250°C specify temperature range at order!
Temperature measuring range type J: type *J on request*	-50°C to +750°C or -50°C to +500°C or -50°C to +250°C specify temperature range at order! J on request

System Parameters:

Channels:	4 or 8
Resolution:	12 bit A/D
Line-of-sight distance:	distance 5-50mm at battery power (between coil and Pickup Head)
Powering:	6-9V by battery or optional inductive power supply
Current consumption:	130 mA
Analog signal bandwidth:	4x 0…30Hz or 8x 0…30Hz (scanning rage 312.5Hz/CH)
Dimensions:	70mm x 50 x 22.5mm (housing)
Weight:	110 g without cables
Transmission:	Induktive ,digital PCM Miller Format - FSK
Operating temperature:	- 20 … +70°C
Housing:	Aluminum IP 54
Humidity:	20 ... 80% no condensing
Static acceleration:	1000g in all directions
Shock:	2000g in all directions

Receiving unit TEMPTEL4/8 DEC (Decoder)

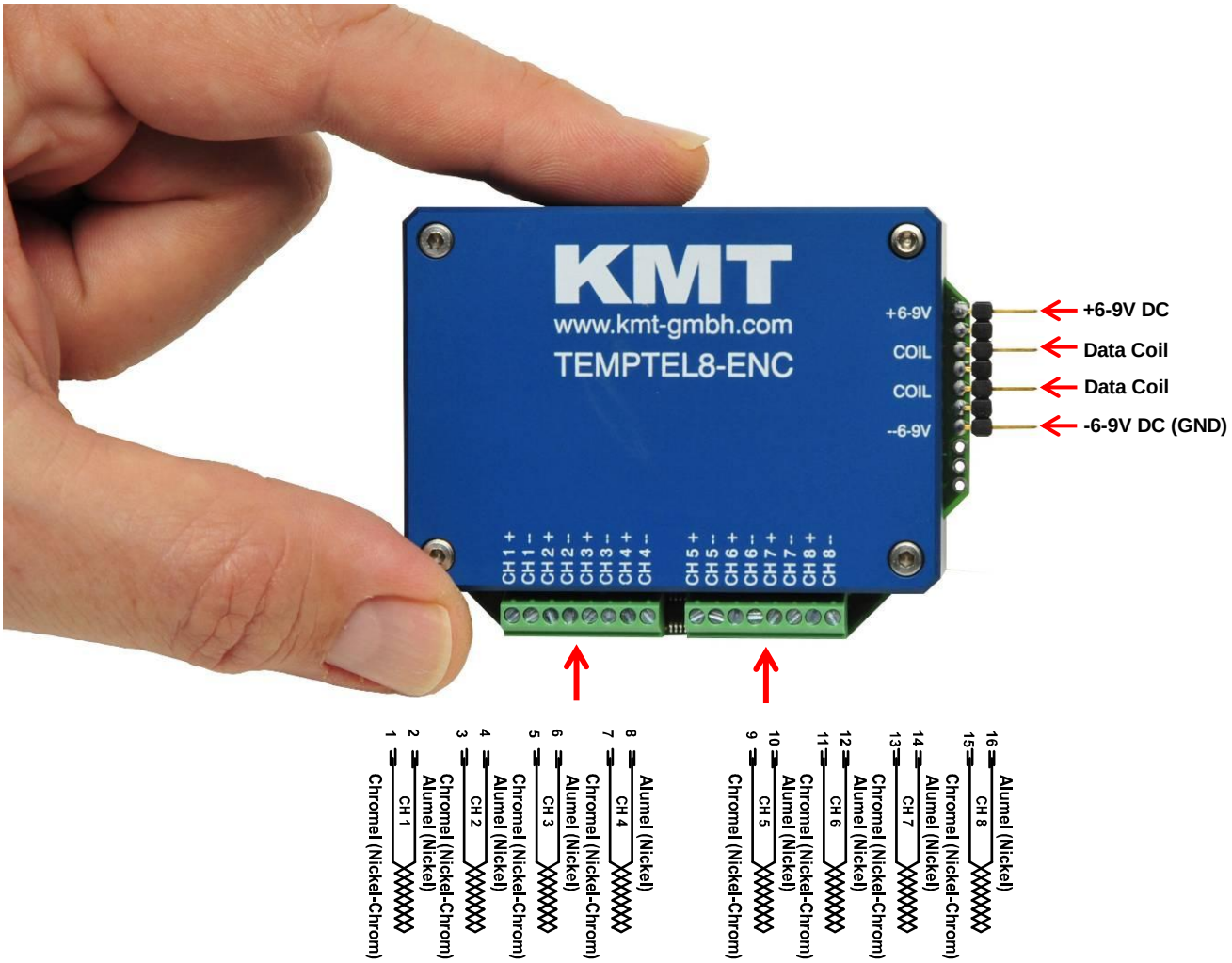


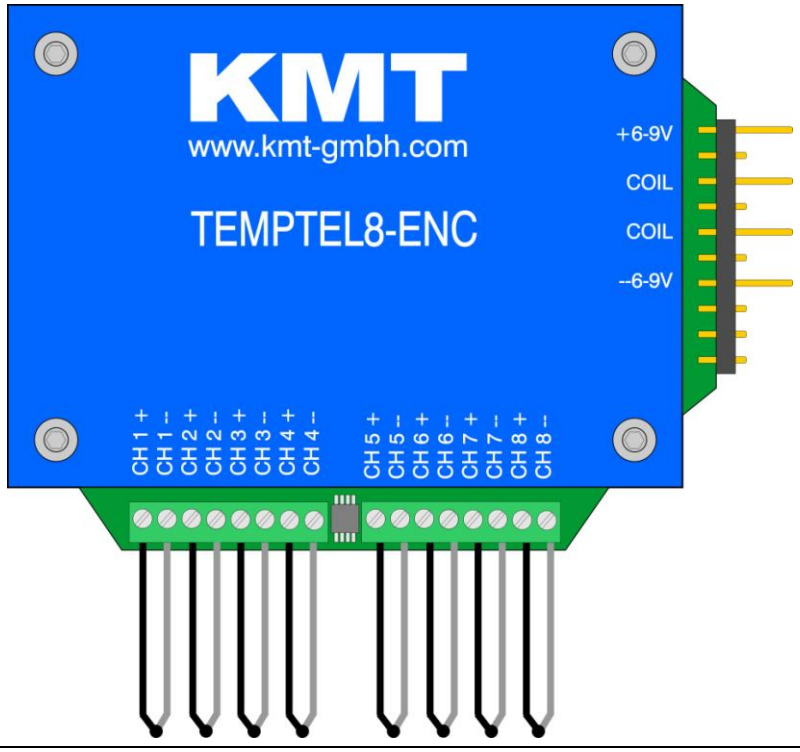
System Parameters:

Channel:	4 or 8 analog outputs via 37-pole sub-D +/-10V (linearised) (optional current output 0-20mA via 25-pole sub-D)
Receiving:	inductive PCM Telemetry
Resolution:	12 bit D/A converter, with smoothing filter
Dynamic:	72dB
Power supply input:	10-30 VDC
Current consumption:	300mA at 10V, 100mA at 30V
Analog signal bandwidth:	4 x 0 … 30Hz or 8 x 0 … 30Hz
Dimensions:	205 x 105 x 65mm
Weight:	1.00 kg without cables and antenna
Overall system accuracy between encoder input and decoder output:	+/-0.5% without sensor influences
<u>Environmental</u>	
Operating:	-20 … +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g Mil Standard 810C, Curve C
Static acceleration:	10g in all directions
Shock:	100g in all directions

TEMPTEL-Pickup
Pickup head receive inductive data from coil
Distance between the transmitter coil and the pickup is 5-100mm
PCM output to TEMPTEL4/8-DEC via 5pol. Tuchel plug incl. 5m cable.
(Cable length standard 5m, optional 20m)
Operating temperature: - 10 to +80 °C
Dimensions: 45x60x25mm (without cable)
Weight: 400 grams (with 5m cable!)
Housing: splash-water resistant IP65 (except connector).

TEMPTEL4/8-ENC - pin connection Th K-ISO IND-data transmission





Output table of Th K-ISO

Temperature measuring range type K: -50°C to +250°C			
Temperature [°C]	Output [V]		
-50	-2.00		
0	0.00		
50	2.00		
100	4.00		
150	6.00		
200	8.00		
250	10.00		

Temperature measuring range type K: -50°C to +500°C			
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-1.00	250	5.00
0	0.00	300	6.00
50	1.00	350	7.00
100	2.00	400	8.00
150	3.00	450	9.00
200	4.00	500	10.00

Temperature measuring range type K: -50°C to +1000°C							
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-0.50	250	2.50	550	5.50	850	8.50
0	0.00	300	3.00	600	6.00	900	9.00
50	0.50	350	3.50	650	6.50	950	9.50
100	1.00	400	4.00	700	7.00	1000	10.00
150	1.50	450	4.50	750	7.50		
200	2.00	500	5.00	800	8.00		

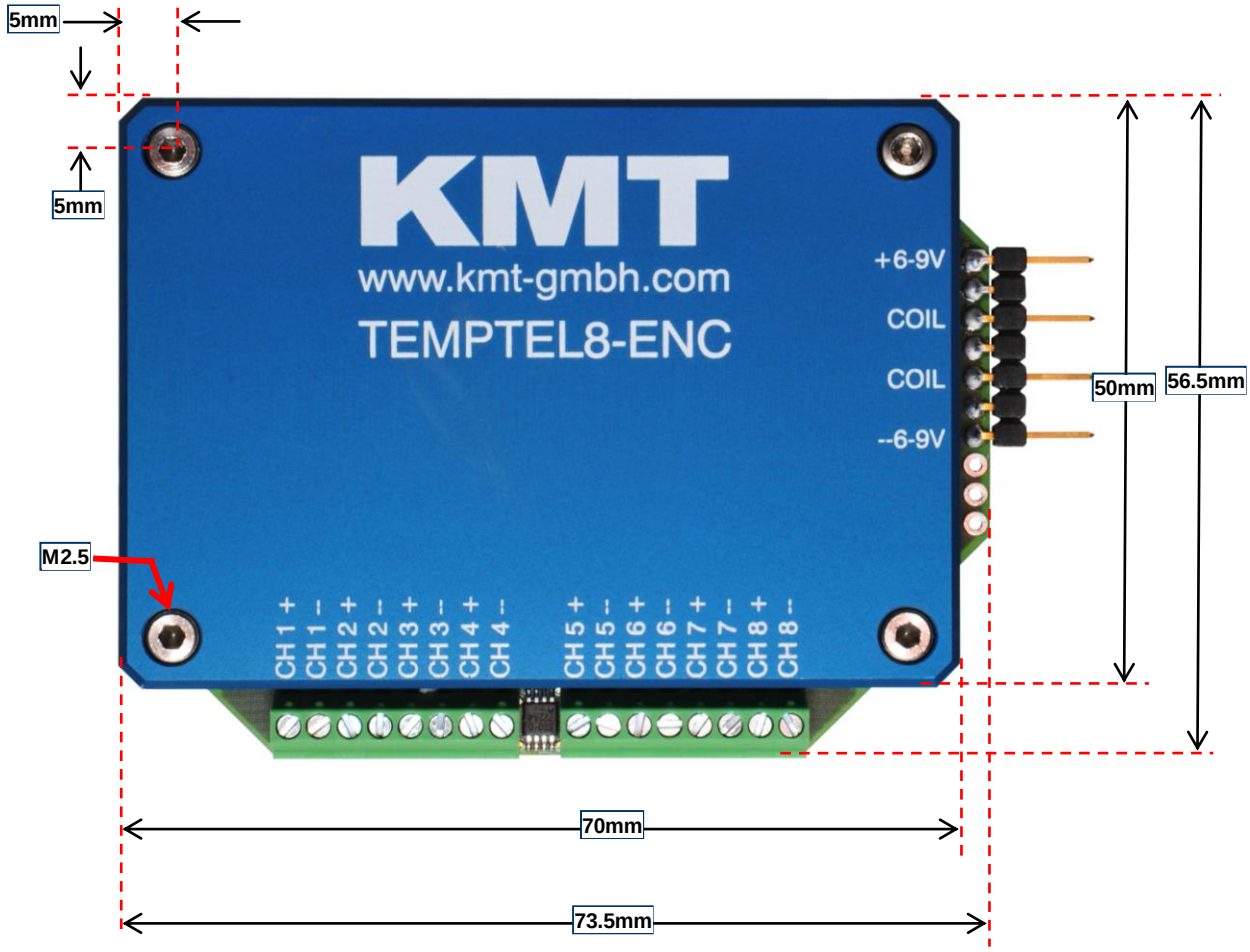
Output table of Th J-ISO

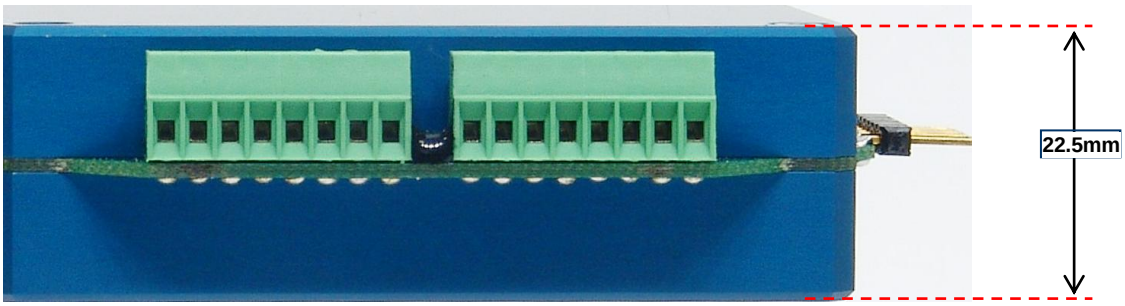
Temperature measuring range type J: -50°C to +250°C			
Temperature [°C]	Output [V]		
-50	-2.00		
0	0.00		
50	2.00		
100	4.00		
150	6.00		
200	8.00		
250	10.00		

Temperature measuring range type J: -50°C to +500°C			
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-1.00	250	5.00
0	0.00	300	6.00
50	1.00	350	7.00
100	2.00	400	8.00
150	3.00	450	9.00
200	4.00	500	10.00

Temperature measuring range type J: -50°C to +750°C			
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-0,67	375	5.00
0	0.00	450	6.00
75	1.00	525	7.00
150	2.00	600	8.00
225	3.00	675	9.00
300	4.00	750	10.00

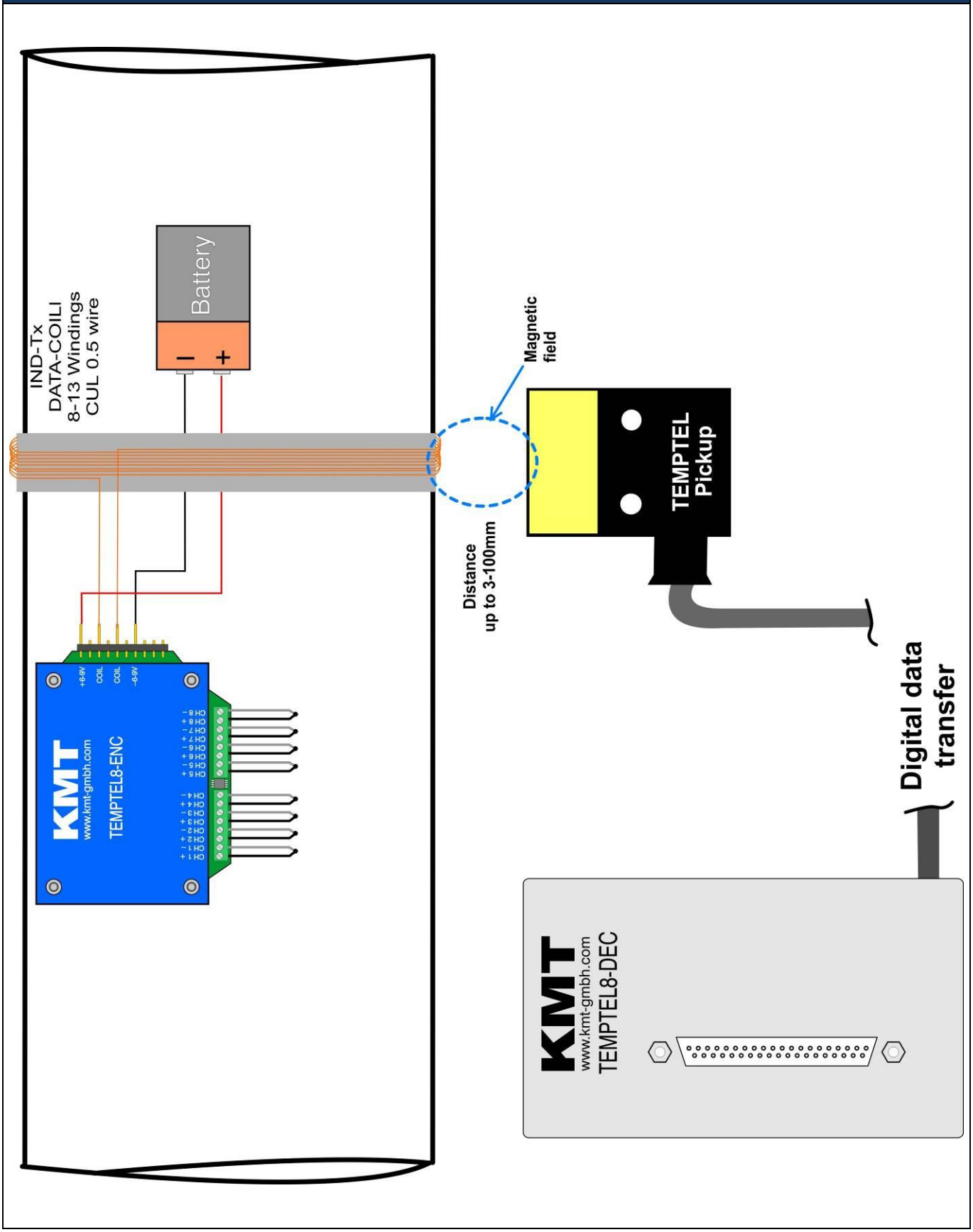
TEMPTEL8-ENC - Dimensions:



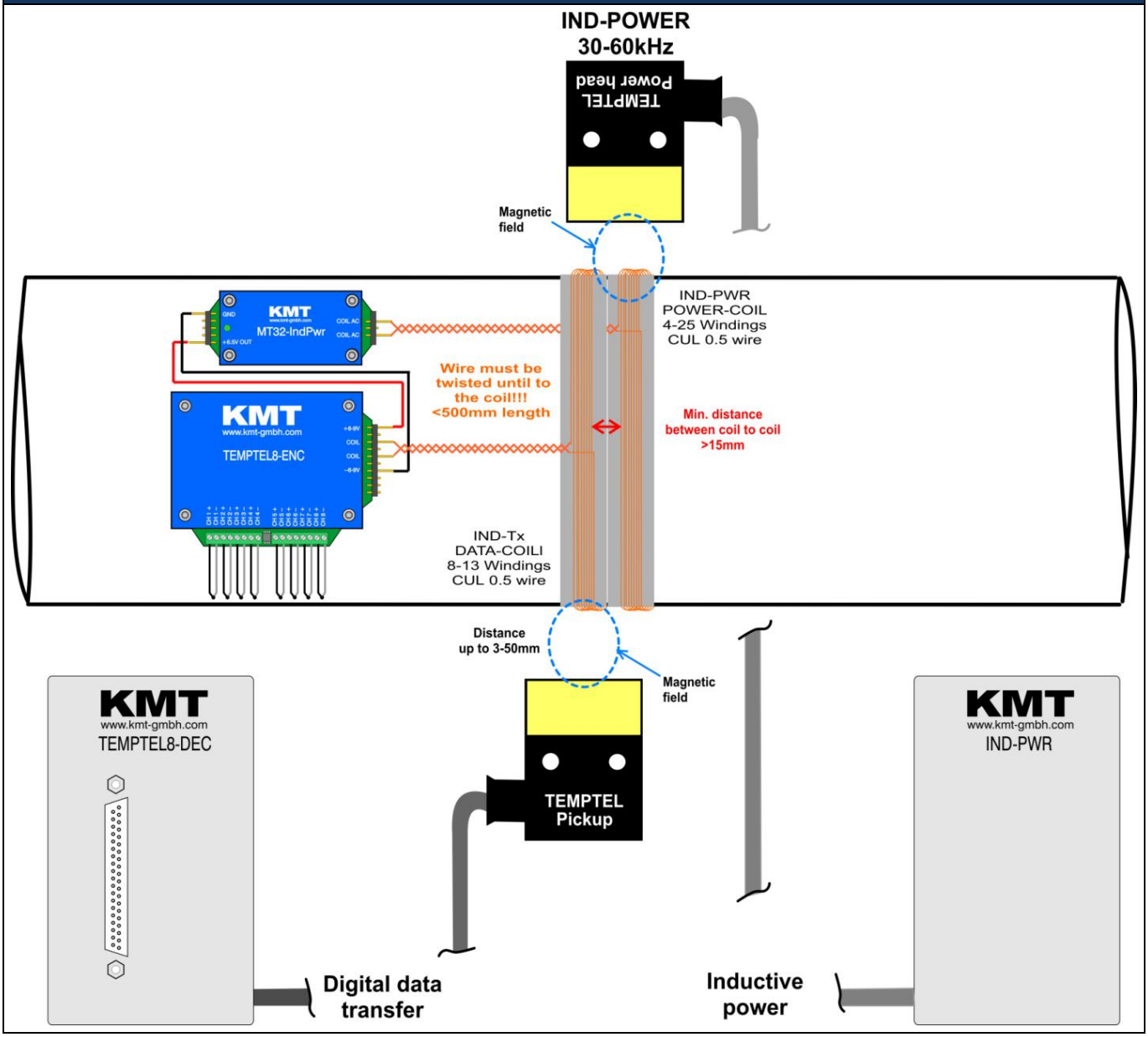


Total weight 110g

Block diagram with battery power

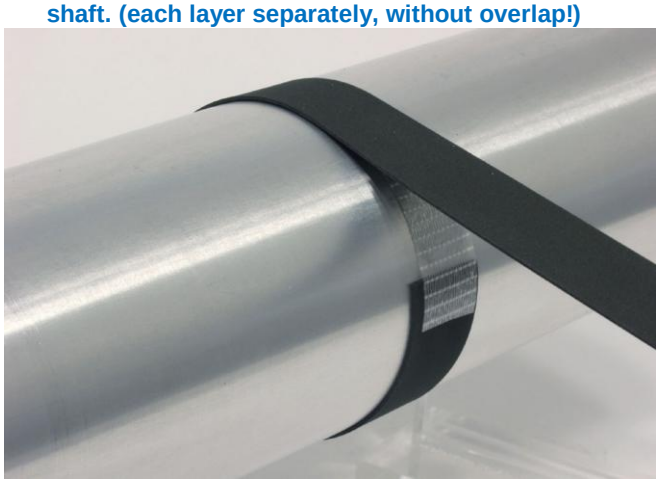


Block diagram with optional inductive power supply



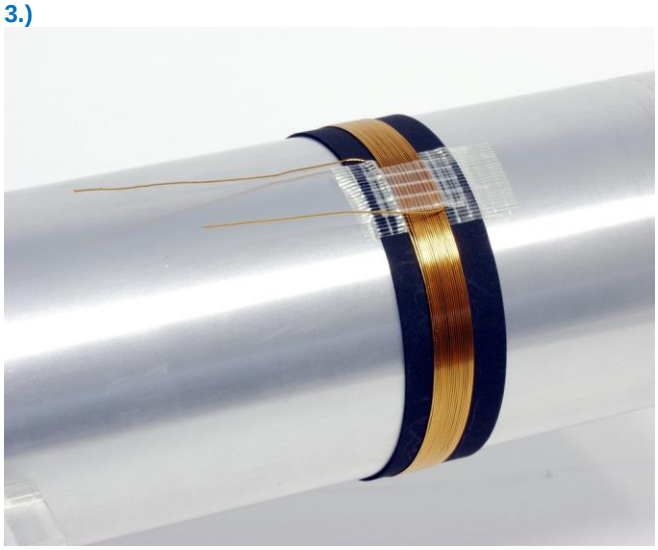
Installation of transmitting coil on a shaft

1.) Mount 2 layers of the special ferrite tape around the shaft. (each layer separately, without overlap!)



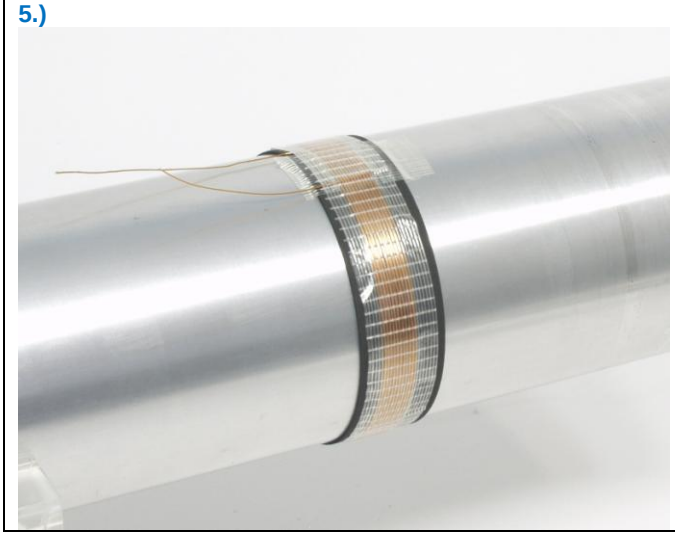
2.) Coil, depends of shaft diameter 8-13 parallel windings of 0.5 CUL wires (see table for help)

3.)



4.) Fix with 3-4 layers of mounting tape around the shaft

5.)

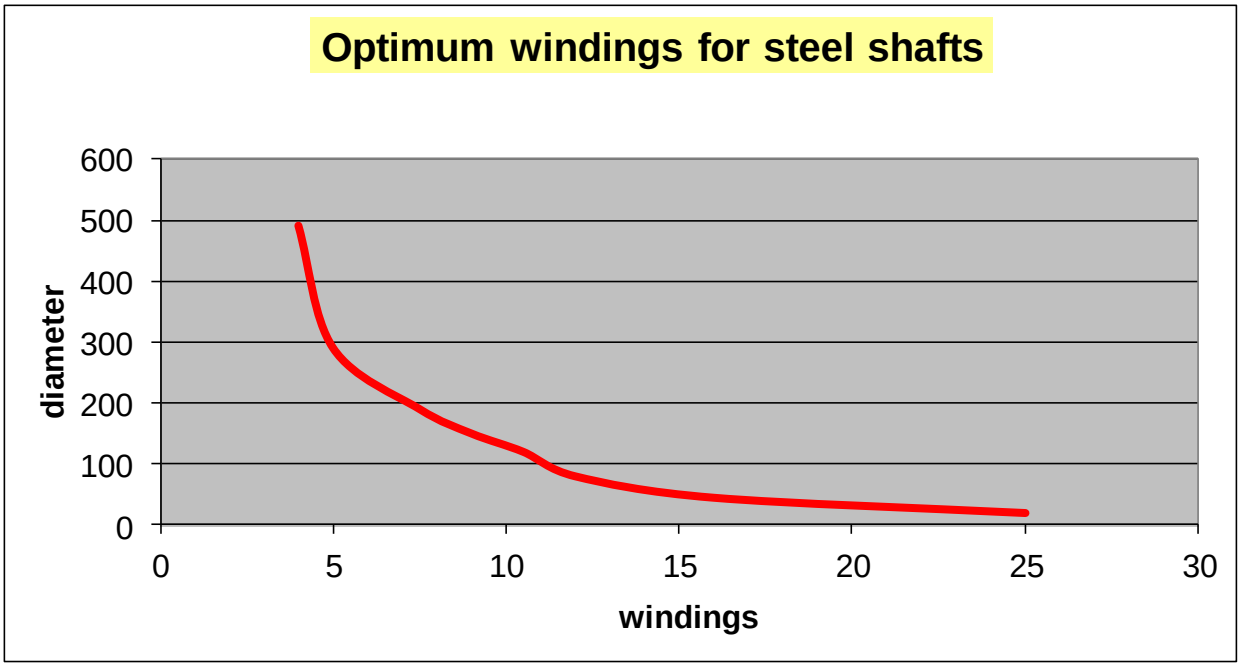


6.)

Find the correct amount of windings

The number of windings depends on several factors. The most important influential factors are the diameter, the materiel of the shaft and the environment around the shaft. The table standing below will help you to find the right number windings for steel shafts. The table below is a help to estimate the number of windings fast. To optimize your results you can try one winding more or less.

Coil, depends of shaft diameter 8-13 parallel windings of 0.5 CUL wire



Diameter (mm)	Windings
490	4
290	5
190	7
150	9
120	10
80	12
45	16
20	25

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Konformitätserklärung

Declaration of Conformity
Declaration de Conformité

Wir We Nous	**KMT - Kraus Messtechnik GmbH**
Anschrift Address Adress	**Gewerbering 9, D-83624 Otterfing, Germany**

erklären in alleiniger Verantwortung, daß das Produkt
declare under our sole responsibility, that the product
declarons sous notre seule responsibilité, que le produit

Bezeichnung	**Messdatenübertragungssystem für Temperatur**
Name	
Nom	

Typ,Modell,Artikel-Nr., Größe	**TEMPTEL8**
Type,Model, Article No.,Taille	
Type, Modèle, Mo.d'Article,Taille	

mit den Anforderungen der Normen und Richtlinien
fulfills the requirements of the standard and regulations of the Directive
satisfait aux exigences des normes et directives

108/2004/EG	**Elektromagnetische Verträglichkeit EMV / EMC**
	DIN EN 61000-6-3 Ausgabe 2002-8 Elektromagnetische Verträglichkeit EMV Teil 6-3 Fachgrundnorm Störaussendung
	DIN EN 61000-6-1 Ausgabe 2002-8 Elektromagnetische Verträglichkeit EMV Teil 6-1 Fachgrundnorm Störfestigkeit

und den angezogenen Prüfberichten übereinstimmt und damit den Bestimmungen entspricht.
and the taken test reports und therefore corresponds to the regulations of the Directive
et les rapports d'essais notifiés et, ainsi, correspond aux règlement de la Directive.

Otterfing, 01.04.2008	**Martin Kraus**  
Ort und Datum der Ausstellung	Name und Unterschrift des Befugten
Place and Date of Issue	Name and Signature of authorized person
Lieu et date d'établissement	Nom et signature de la personne autorisée

Kraus Messtechnik GmbH
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Inductive power supply

Assembling instructions for

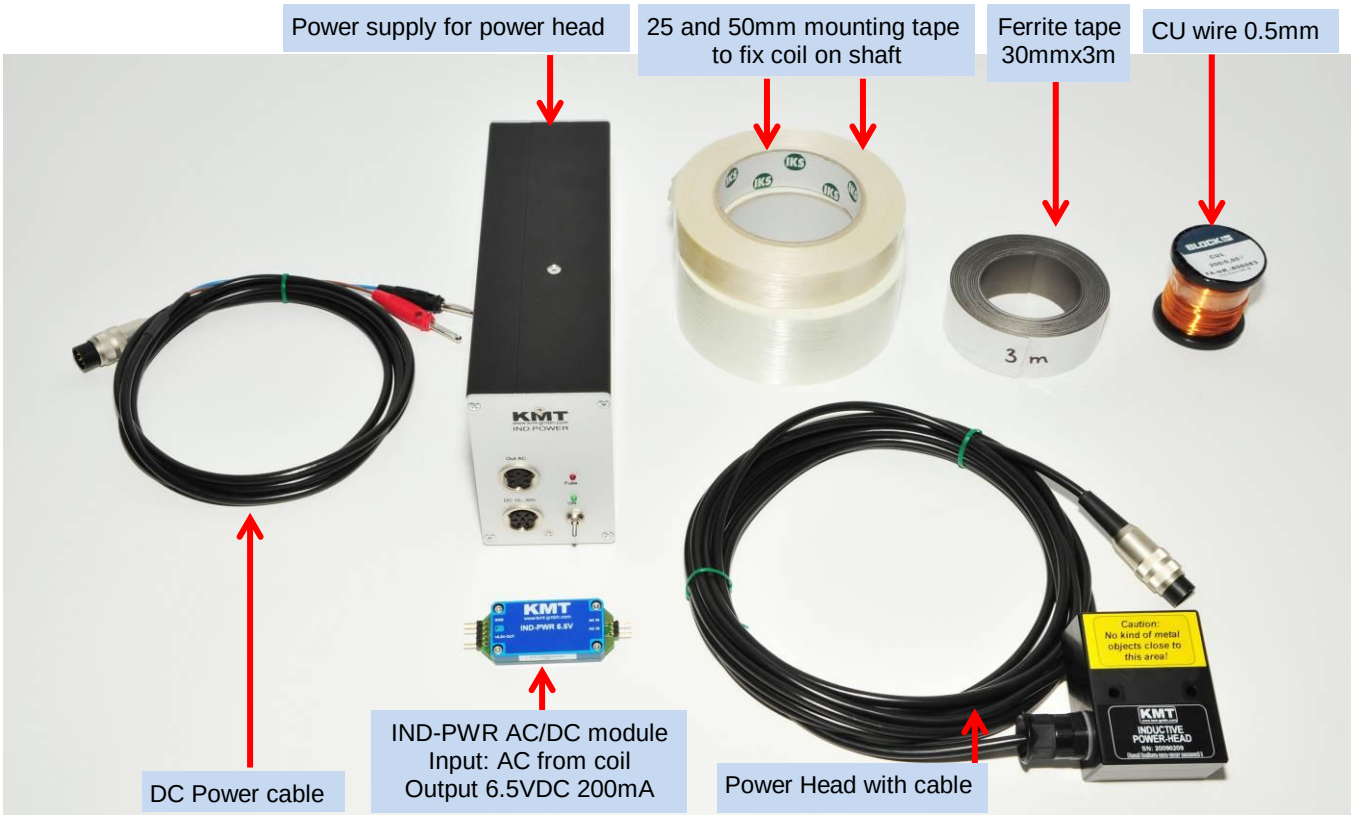
TEMPTEL4/8

Safety notes

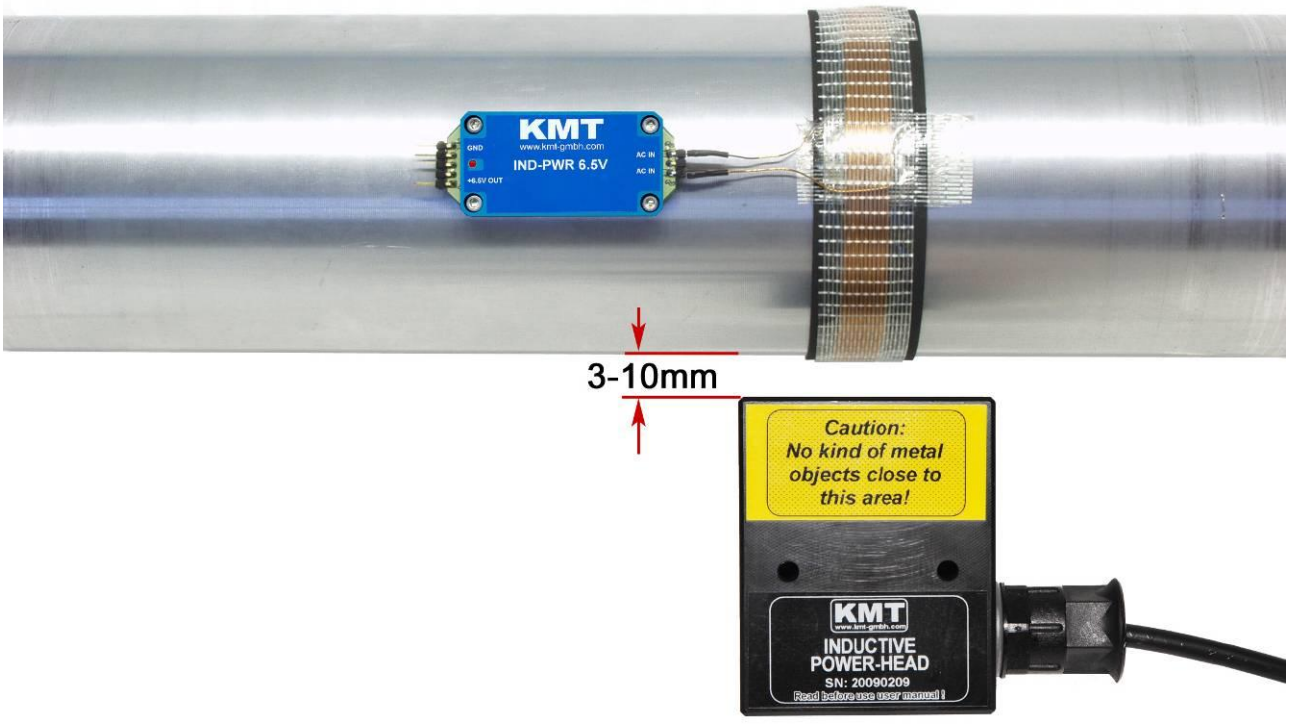
- The device should only applied by instructed personnel.
- The power head emits strong magnetic radiation at 30-60 kHz to a distance of 300 mm. Therefore persons with cardiac pacemakers should not work with this device!
- Magnetic data storage media should be kept in a distance of at least 3m from the power head to avoid data loss. The same is valid for electromagnetic sensitive parts, devices and systems.
- Do not place the power head in the switched-on state on metallic objects, because this results in eddy currents which could overload the device and strong heat up small objects. Also the probe could be destroyed!
- No metallic objects, other than the disc-type coil, should be located in the air gap of the power head. The same applies to metallic parts within a radius of up to 50 mm in all directions.
- Do not use damaged or faulty cables!
- Never touch in the area between shaft and inductive head, the rotating shaft itself or rotor electronic contacts during operation!
- This is a “Class A” system suitable for operation in a laboratory or industrial environment. The system can cause electromagnetic interferences when used in residential areas or environments. In this case the operator is responsible for establishing protective procedures.

Inductive power supply set

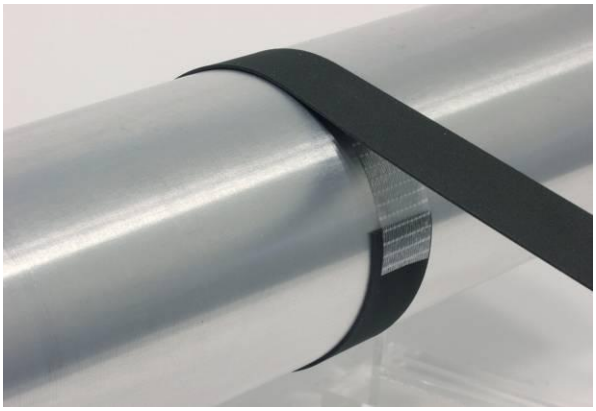
Picture shows standard Inductive Power Supply for diameter up to 300mm



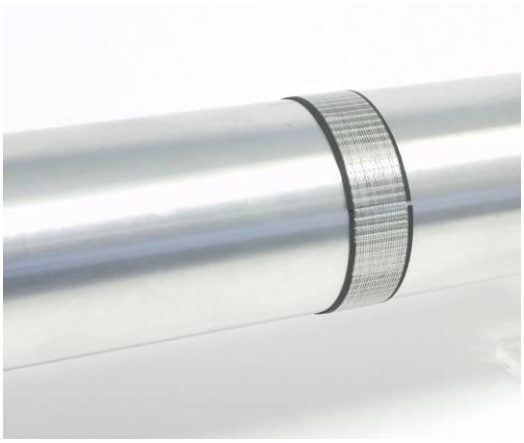
Mounted on shaft

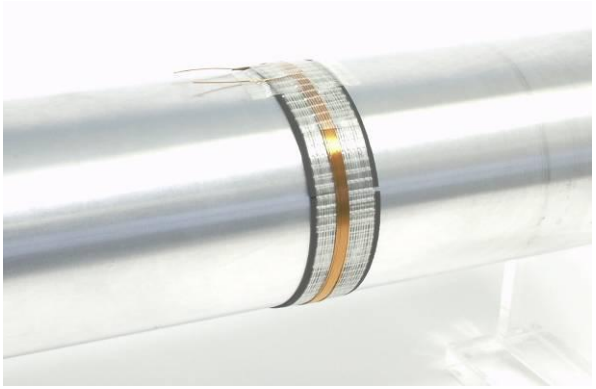


Installation of coil for inductive powering on shaft



Attach for electromagnetic insulation “Ferrite Tape”
- 2 x layers Ferrite-Tape around the shaft
- Fixed with 2 layers mounting tape





Wind the 0.5 mm enameled copper wire around the shaft:

- 4-25 windings for 500-20mm diameter

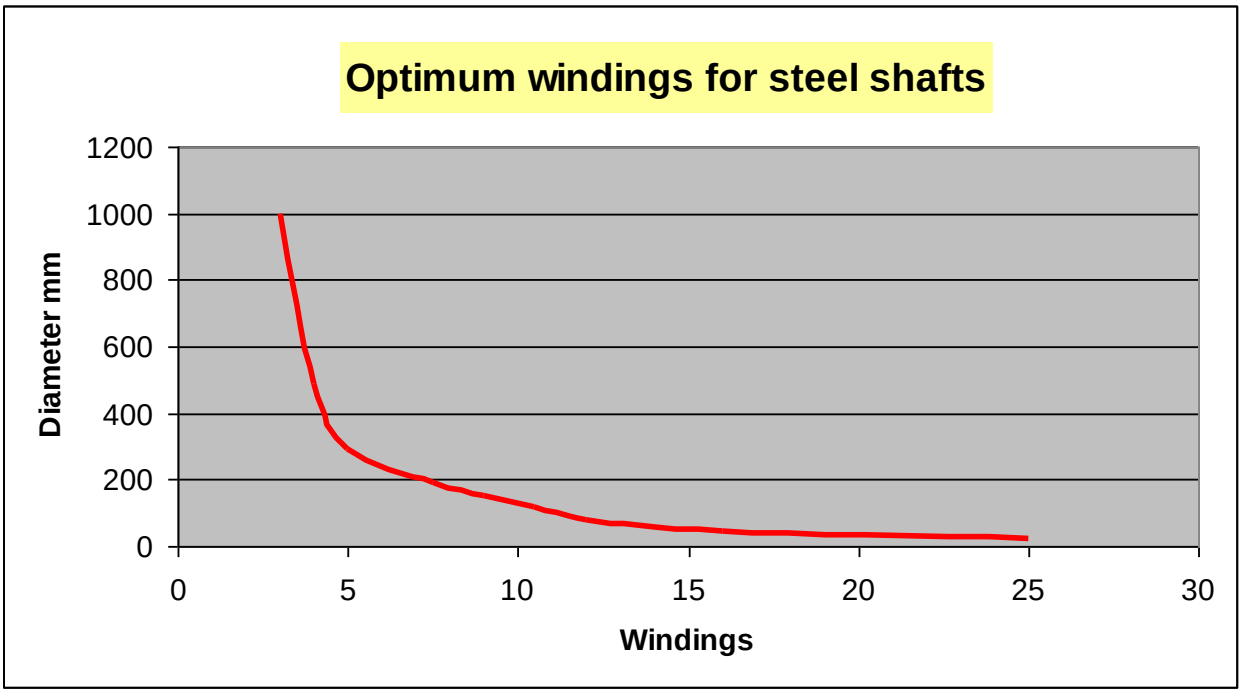
Other diameter on request!

Note: “The inductive load of the IND-PWR AC/DC module and the capacitor in the Power Head must be in resonance to get the optimal transmission. The inductive load of the shaft depends of diameters, material and number of windings. ”

To find the optimal transmission try one winding more ore less. The LED on the Inductive Power module will help to find the best configuration. The distance between powerhead and the coil is 3-10mm.

Control the output voltage and move the powerhead in the max distance to the coil.
The minimum Output voltage must be 6,5 V!

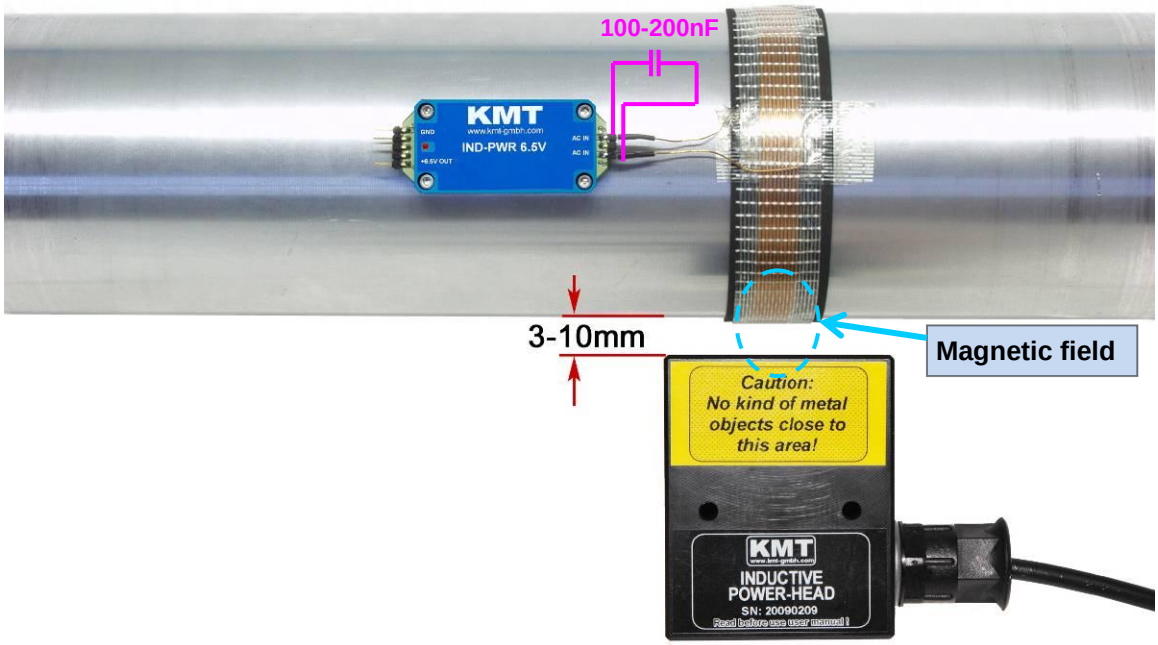
Fix all with 2-3 layers around the coil with mounting tape.

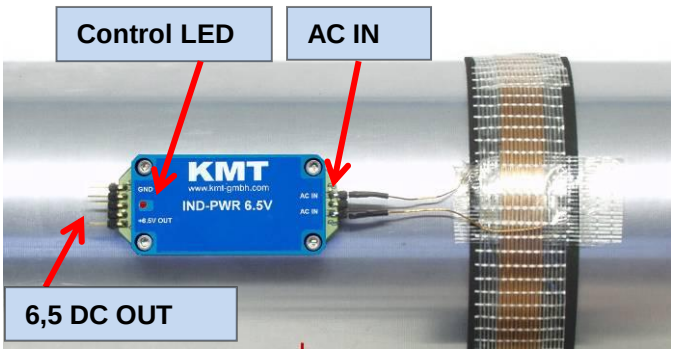


Diameter (mm)	Windings	Fine adjustment capacitor parallel to coil
1000	4-5	100-200nF (Type MKT or MKS 250V)
490	4-5	100-200nF (Type MKT or MKS 250V)
290	5	100-200nF (Type MKT or MKS 250V)
190	7	---
150	9	---
120	10	---
80	12	---
45	16	---
20	25	---

We recommend a capacitor decade e.g

100pF .... 11,111 µF

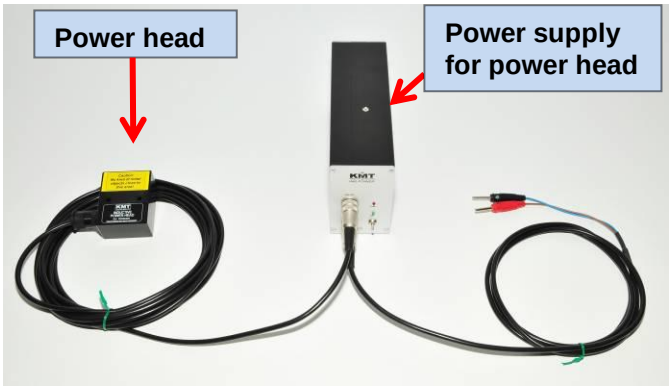




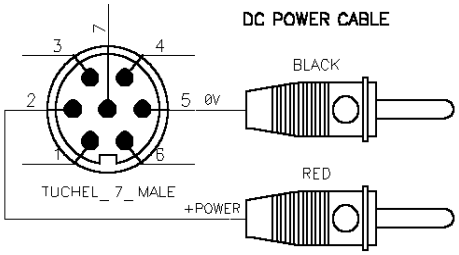
The pins “AC IN” are the AC power input from the coil. On the pins “+6.5” and “GND“ you get a stabilized output voltage of 6.5V DC. The control LED will lights up, as soon as the power head is switched on and at the right position - close enough to the coil on the shaft. The max. load current on the DC output is 100mA. The AC/DC converter will use instead battery pack!

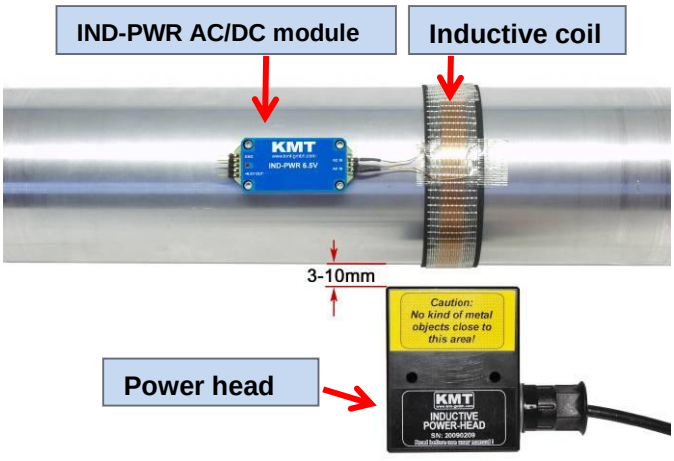
Never use any battery together with the IndPwr!´

Installation of the power head for inductive powering



Connect the power head on the “AC Out” socket of the power box and then the DC power cable on the “DC In 10-30V” socket. The two banana plugs have to be connected to a DC power source with red on +10-30V DC and **black** on **0V**.





You should mount the power head at a fixed location that it’s as free as possible from vibration influences.

The center of the coil should be in the same horizontal position as the center of the power head. The distance is optimal in the range between 3 and 10mm. (depends of shaft and current consumption)

If the red LED of the AC/DC converter lights up, the position of the power head is OK.

Block diagram Temptel8 ENC with inductive power supply