

# ANEMOMETER

*THIS FIRST CLASS ADVANCED*



ORDER - N°	ELECTRICAL OUTPUT	ELECTRICAL SUPPLY	HEATING SUPPLY	MODEL IN EOL MANAGER
4.3351.00.000	R: 100 $\Omega$	3.3...48 VDC 130 $\mu$ A typ.	24 V AC/DC 25 W	<b>THIES FC Advanced</b>
4.3351.10.000	R: 100 $\Omega$	3.3...48 VDC 130 $\mu$ A typ.	No heating	

## APPLICATION

The wind transmitter is designed for the acquisition of the horizontal component of the wind speed in the field of meteorology and environmental measuring technology, evaluation of location and measurement of capacity characteristics of wind power systems.

Special characters are defined and optimised, dynamic behaviour also at high turbulence intensity, minimal over-speeding and a low starting values. The measuring value is available as digital signal at the output. It can be transmitted to display instruments, recording instruments, data loggers as well as to process control systems. For winter operation the instrument is optional equipped with an electronically regulated heating, which guarantees a smooth running of the ball bearings and prevents the shaft and slot from icing-up.

## CONSTRUCTION AND MODE OF OPERATION

A low-inertia cup star with 3 cups, made of carbon-fibre-reinforced plastic, is set into rotation by the wind. The rotation is scanned opto-electronically and is converted into a square wave signal. The frequency of this signal is proportional to the number of rotations. Depending on the supply voltage, the output signal ranges between maximal output voltage and ground or a potential (life-zero), lifted by approx. 1.2 V. The supply of the electronics can be done by DC-voltage of 3.3 V up to 48 V at a very low current consumption. An AC (or DC) voltage of 24 V is intended for the separate supply of the optional heating. In all probability, the heating guarantees a trouble-free function of the Anemometer Thies First Class Advanced even under extreme meteorological icing-conditions.

The outer parts of the instrument are made of corrosion-resistant anodised aluminium. Highly effective labyrinth gaskets and O-rings protect the sensitive parts inside the instrument against humidity and dust. The instrument is mounted onto a mast tube; the electrical plug-connection is located in the transmitter shaft.

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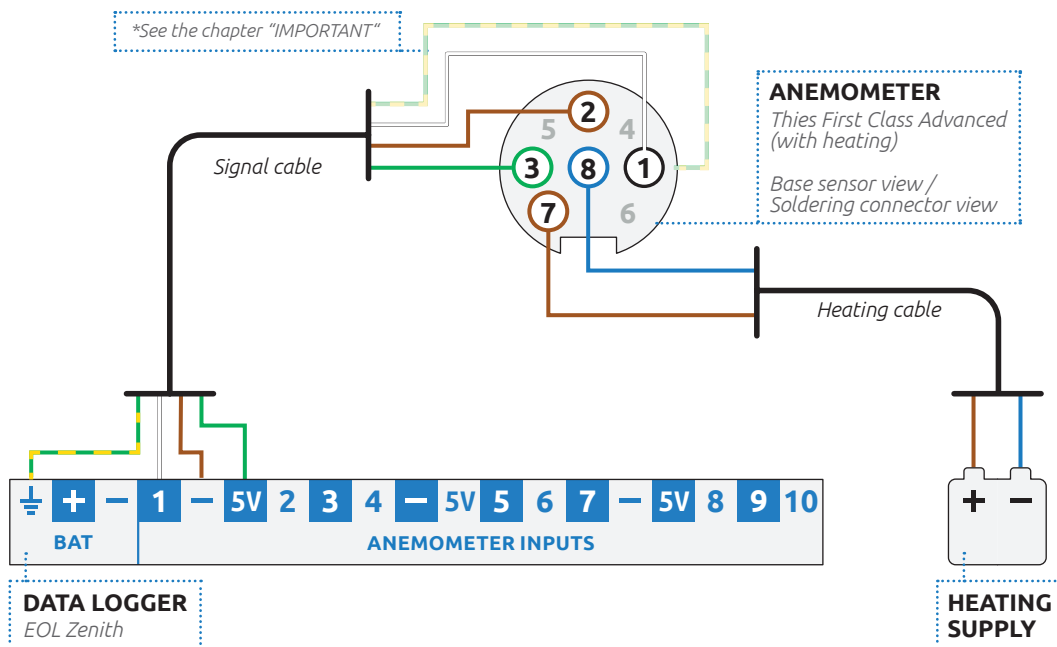
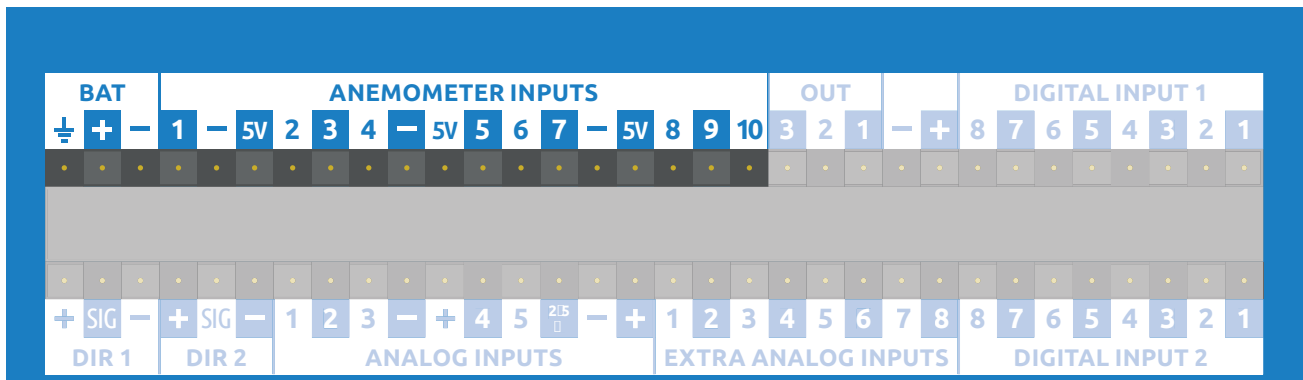
## TECHNICAL DATA

CHARACTERISTIC	DESCRIPTION / VALUE
Measuring range	0.3...75 m/s
Accuracy	0.3...50 m/s <1% of meas. value or < ±0.2 m/s
Survival speed	80 m/s (min. 30 minutes)
Permissible ambient conditions	-50...+80 °C, all occurring situations of relative humidity (incl. dew moistening)
Output signal	Form: rectangle, edge steepness <1 µsec Frequency: 1082 Hz at 50 m/s Amplitude: is at supply voltage, maximum 15 V Push-Pull output resistance: typical 100 Ω ≥10 V, 130 Ω at 5 V, 230 Ω at 3.3 V Constant power limiting on typical 25 mA Open drain output: drain resistance typical 50 Ω, Pull-Up-voltage maximum 30 V Constant power limiting on typical 50 mA Load R≥1 kΩ, C≤200 nF (corresp. to length typical cable <1 km)
Linearity	Correlation factor r between frequency and wind speed y=0.0462*f+0.21 typical r>0.99999 (4...20 m/s)
Starting velocity	<0.3 m/s
Resolution	0.05 m wind run
Distance constant	<3 m (acc. to ASTM D 5096 – 96) 3 m acc. to ISO 17713-1
Turbulent flow	Deviation Δv turbulent compared with stationary horizontal flow 0.5% <Δv <+2% Frequency <2 Hz
Classification	According to IEC 61400-12-1 (2005-12) Class A classification index A 0.9 Class B classification index B 3.0 Class S classification index S 0.5
Wind load	Approx. 100 N at 75 m/s
Heating	Surface temperature of housing neck >0 °C at 20 m/s up to -10 °C air temperature, at 10 m/s up to -20 °C using the THIES icing standard 012002 on the housing neck Heating regulated by temperature sensor
Electrical supply for opto-electronic scanning	Voltage: 3.3...48 VDC (galvanic isolation from housing) Current: 130 µA typ. (150 µA maximum at 3.3...15 V w/o external load) 180 µA typ. (200 µA maximum at 15...48 V w/o external load)
Electrical supply for heating	Voltage: 24 V AC/DC, 54...65 Hz (galvanic isolation from housing) Idling voltage: maximum 30 VAC, maximum 48 VDC Capacity: 25 W
Weight	Approx. 0.5 kg
Protection	IP 55 (DIN 40050)

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## INSTRUCTIONS

Use the following input channels on the logger to connect this sensor. See highlighted input channels marked here below. The wire colors used in the connection diagram below only applies in case the cable is supplied by Kintech Engineering.  
**For additional wiring & shielding information see the chapter "IMPORTANT" at the end of this dataheet.**

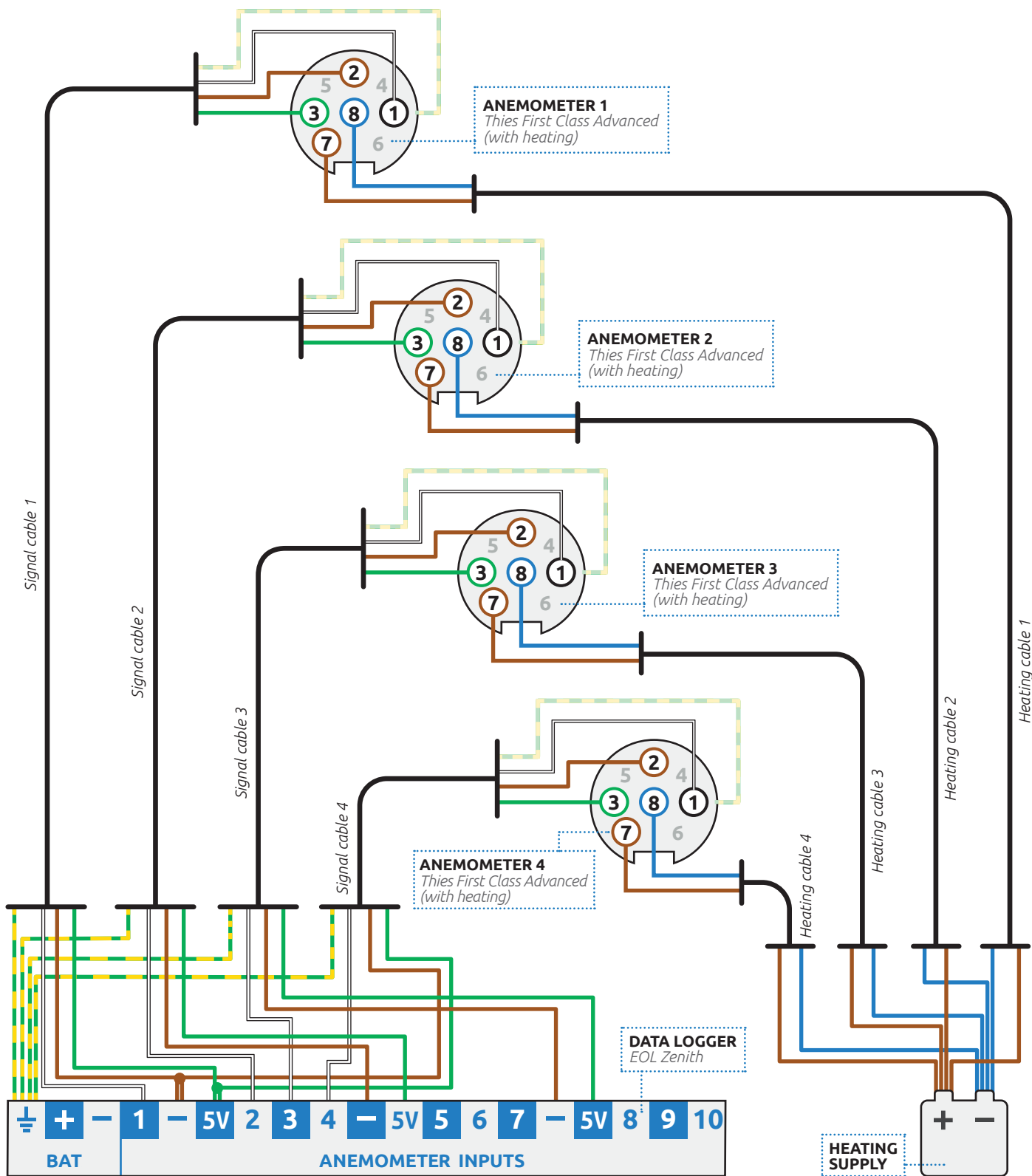


SENSOR PIN DESCRIPTION		DATA LOGGER INPUT CHANNEL		
	1	SIG	Anemometer Inputs	1
	2	GND	Anemometer Inputs	(-)
	3	Us (+)	Anemometer Inputs	5V
	4	<b>Do not connect!</b>		
	5	<b>Do not connect!</b>		
	6	<b>Do not connect!</b>		
	-	Shield	BAT	GND
	7	Heating (+)	Heating Supply	(+)
	8	Heating (-)	Heating Supply	(-)

KINTECH COLOR CODES		
○	White	Signal cable
●	Brown	
●	Green	
●	Yellow - Green	Heating cable
●	Blue	

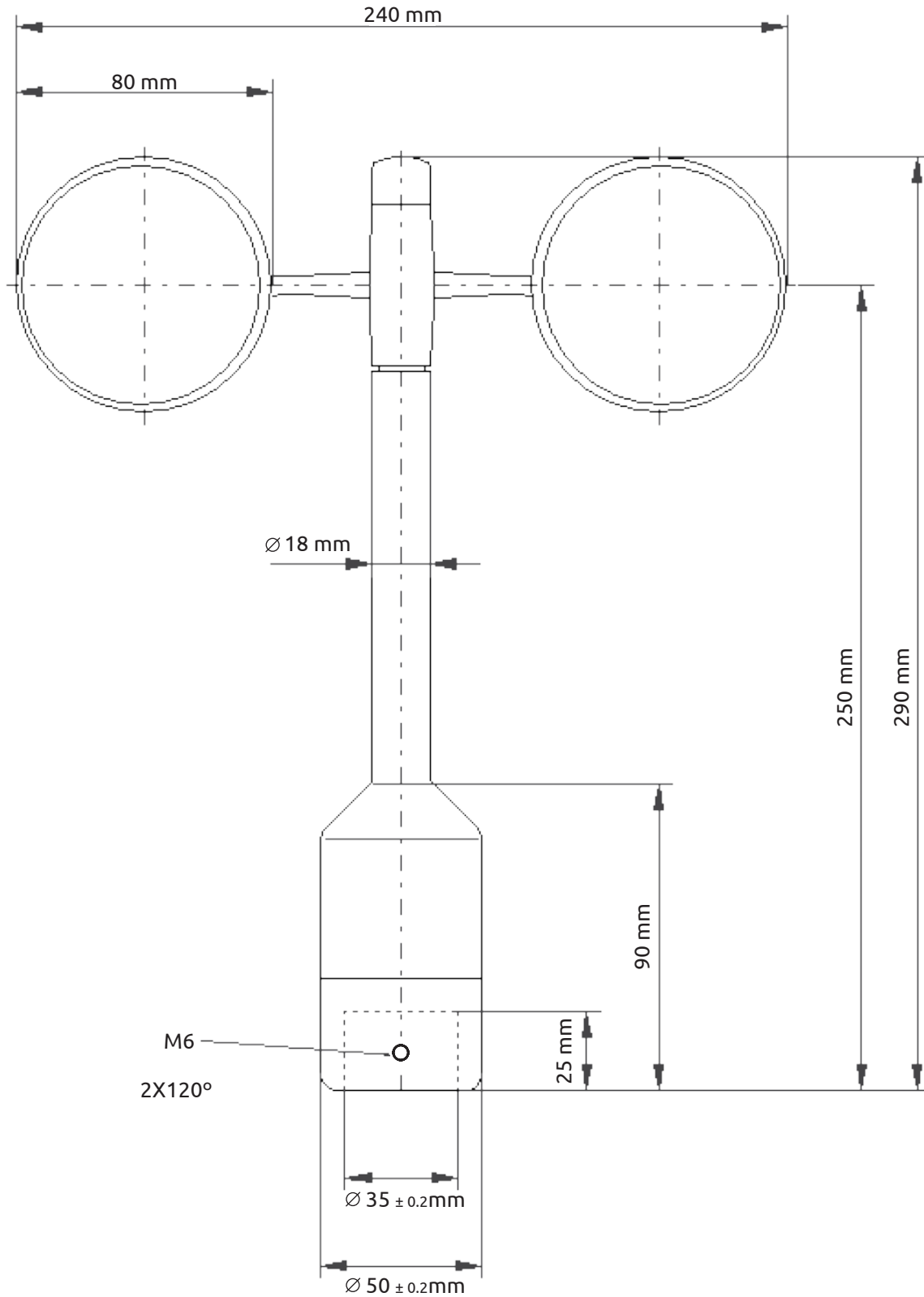
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## HOW TO CONNECT MORE THAN ONE OF THIS SENSOR (EXAMPLE)



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## SENSOR DIMENSIONS



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## HOW TO CONFIGURE THIS SENSOR IN EOL MANAGER

Open EOL Manager and go to the data logger you are working on. Open the “inputs” tab and select the following type and model:

- ▀ **Section:** Anemometers/Frequency
- ▀ **Type:** Anemometer
- ▀ **Model:** THIES FC Advanced

**Calibration values:** Tick the “Std Cal” to use this sensors standard slope and offset. If you have the Measnet calibration certificate for this sensor insert the slope and offset values from this certificate.

Ignore	Channel	Type	Model	Units	Serial Number	Height	Username	Std Cal	Slope	Offset	Std Dev	Max	Min
<input type="checkbox"/>	ANE1	Anemometer	THIES FC Advanced	m/s		0	Anemo1	<input checked="" type="checkbox"/>	0.045900	0.220000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	ANE2	Anemometer	-----	m/s		0	Anemo2	<input type="checkbox"/>	0.000000	0.000000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## IMPORTANT

- ▀ After configuring the sensor in EOL Manager make sure to upload the configuration file to your EOL Zenith data logger. See the “Quick User Guide” how to upload configuration files to the data logger.
- ▀ All sensor wire shields must be connected to the data logger GND terminal.
- ▀ The data logger should always be connected to a separated ground rod. **Not** to the lightning rod of the tower.
- ▀ The three 5V power supply outputs are completely independent and not associated to any of the signal inputs. The three 5V outputs can therefore be distributed according to needs.
- ▀ To store data such as Std Dev, Max and Min you should tick the corresponding boxes next to each anemometer channel when setting up your site file. Otherwise these parameters will not be stored.

## Connecting recommendation sensor-shield:

Metallic measurement mast, grounded	Drawing of anemometer incl. isolator	The shield should be connected to both the anemometer side and the data logger side  Data logger should always be connected to ground
Metallic measurement mast, grounded	Drawing of anemometer <b>without</b> isolator	The shield should only be connected on the data logger side <b>Not on the sensor</b>  Data logger should always be connected to ground

## Cable recommendation (up to 150 m cable):

Sensor no heating	Signal cable 3x0.5 mm <sup>2</sup>
Sensor with heating	Signal cable 3x0.5 mm <sup>2</sup>
	Heating cable 2x4 mm <sup>2</sup>

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**KINTECH ENGINEERING**

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