EN Installation and operating instructions

KNX energy meter Comfort

(with direct connection)
2173 00
(with transformer connection)
2175 00

KNX **GIRA**

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Safety notes

Installation and mounting of electrical devices may only be carried out by qualified electricians.
Serious injury, fire, or material damage are possible in case of improper mounting.
Read these instructions thoroughly and observe them.
Danger of electric shock. Isolate before working on the device and load. Take account of all circuit breakers supplying dangerous voltage to the device or load.
Comply with guidelines and standards valid for SELV circuits for installation and cable routing.
These instructions are part of the product and must remain with the end customer.

Function

System information

This device is a product of the KNX system and complies with the KNX guidelines. Detailed specialist knowledge gained in KNX training courses is assumed for understanding.
Functionality of the device is dependent upon software. Detailed information about software versions, specific ranges of functions, and the software itself can be found in the manufacturer's product database. KNX-certified software is used for the planning, installation and start-up of the device.
The up-to-date product database and technical descriptions are available on our website.

Product features

2173 00 and 2175 00

- Offset bi-directional meter for active and reactive energy
- Front bi-directional D0 interface for communication
- Four switch outputs which can be used individually (Opto Power MOSFET)
- Rate changeover (2 or 4 rates)
- Threshold values for monitoring the various power values can be parameterised on the device or via ETS
- Accuracy class B
- Data backup via EEPROM
- Can be used in private households and industrial operations
- For mounting on a top-hat rail TH35
- Maintenance-free

2173 00

- Direct measurement (75 A)

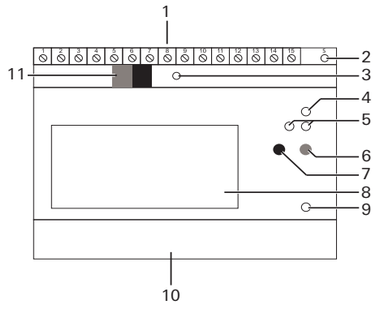
2175 00

- Transformer measurement (1 and 5 A)
- Transformer factor can be parameterised on the device
- Requires current transformer in accordance with the accuracy class
- Requires 6 A fuses

Scope of supply

- 1x KNX energy meter Comfort
- 1x bus connection terminal
- 1x installation and operating instructions

Device description



1 Connection terminals top
2 Button (yellow): Service
3 Programming button and LED (green)
4 LED: Active energy (10 imp/Wh)
5 D0 interface
6 Button (red): Confirm/sub-item
7 Button (blue): Select/menu item
8 Display
9 LED: Reactive energy (10 imp/varh)
10 Connection terminals bottom (behind cover plate)
11 KNX connection

Mounting the device

DANGER

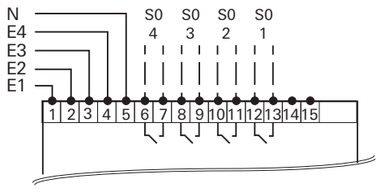
Touching live parts can result in serious material damage or injuries, e.g. due to fire or an electric shock.

Isolate before working on the device and cover up live parts in the vicinity.

In case of non-observance, there is a risk of personal liability for material damage and injury!

1. Switch the mains voltage off.
2. Place the device on the top-hat rail.
3. Wire the device according to the application.

Top connection terminals (2173 00 and 2175 00)



Terminal	Assignment
1 / 2	Synchronisation signal for measurement period
3 / 4	Rate changeover (AC 230 V)
5	Rate changeover (N)
6 / 7	Switch output 1
8 / 9	Switch output 2
10 / 13	Switch output 3
12 / 13	Switch output 4
14 / 15	Reserve

Switch outputs

The 4 switch outputs can be used as follows:

- as an electronic KNX switch output (configuration via ETS)
- as an S0 pulse output in accordance with EN 62053-21(configuration using device buttons)
- as a switching threshold (configuration via ETS / device buttons)

The 4 switch outputs are factory preassigned as follows:

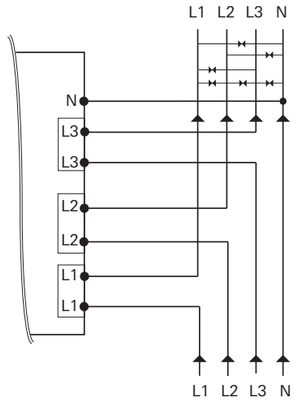
S0 1: Active energy incoming (kWh)
S0 2: Reactive energy incoming (kvarh)
S0 3: Active energy supply (kWh)
S0 4: Reactive energy supply (kvarh)

Meassuring accurancy

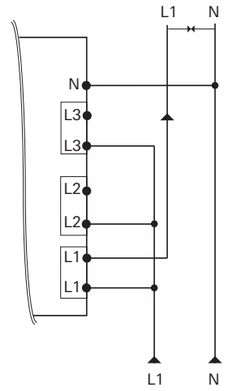
Observe the following:

In "single-phase", "2-phase", or "3-phase without a neutral conductor (N)" connections, the measuring accuracy no longer complies with accuracy class B.

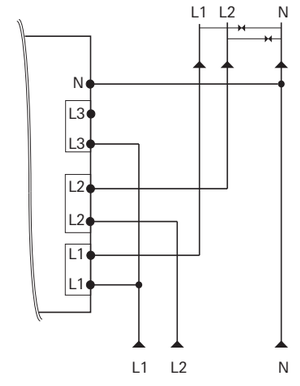
Lower connection terminals (2173 00)



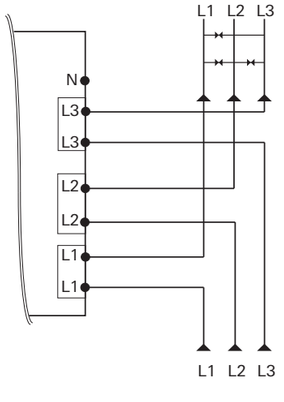
Alternative connection: single-phase



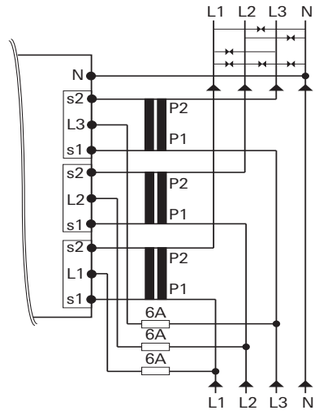
Alternative connection: 2-phase



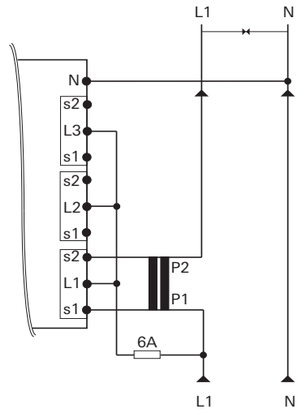
Alternative connection: 3-phase without N



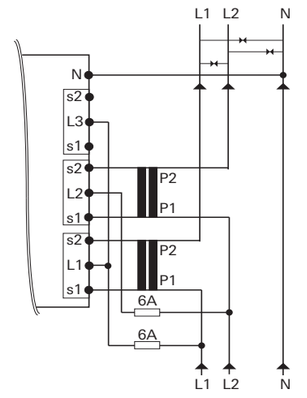
Lower connection terminals (2175 00)



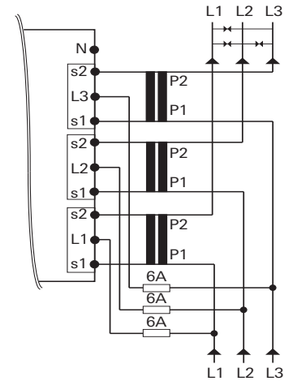
Alternative connection: single-phase



Alternative connection: 2-phase



Alternative connection: 3-phase without N



Switch on mains voltage. Following an initialisation phase of several seconds, first the **[Test display]** appears in the display and then the **[Language selection]**.

4. Select the user language (German or English) with the blue button. After approx. 5 s the selected language is automatically applied, and the standard view **[Active energy]** appears.
5. Switch on bus voltage.

Technical data

2173 00 and 2175 00

Power supply:	via KNX bus
Rated voltage:	3x 230/400 V (± 20%)
Frequency:	50 - 60 Hz
Power consumption:	< 10 W
Internal consumption:	< 0.6 W/phase
Accuracy class:	B (±1%) for active energy in accordance with EN 50470-1
KNX	
Medium:	TP
Start-up mode:	S mode (ETS)
Rated voltage:	DC 21 ... 32 V SELV
Connection type:	bus connection terminal
Inputs	
Input voltage:	AC 230 V
External fuse:	6 A per phase
Consumption measurement:	class B (±1%) for active energy in accordance with EN 50470-1-3
D0 interface:	fulfils EN 62056-21
Outputs	
Quantity:	4
Type:	Opto Power MOSFET, AC/DC 5 ... 400 V, max. 90 mA
Ambient temperature	
Device:	-25 ... +55 °C
KNX-BCU:	-5 ... +45 °C
Protection type:	IP 20
Dimensions:	5 HP
Fulfils:	IEC 62056-21 to -23 IEC 62056-42 -46 -53

2173 00

Measurement range:	75 A
Starting current:	< 9 mA
Terminals top:	up to 2.5 mm^2, 0.5 Nm
Terminals bottom:	0.5 ... 35 mm^2, 1.6 Nm

2175 00

Measurement range:	1 A/5 A
Starting current:	< 1 mA
External fuse:	6 A per phase
Terminals top:	up to 2.5 mm^2, 0.4 Nm
Terminals bottom:	0.5 ... 6 mm^2, 1.6 Nm

Starting up the device

Start-up

Inspect the following prior to start-up:
- Rotating field direction
- Electricity/phase (negative energy direction)
- Sequence of the phase (L1, L2, L3)
- Transformer ratio
- Terminals

1. Press the programming button:
   The programming LED lights up.
2. Load the physical address and application from the ETS into the device:
   The programming LED goes out.

The application has been loaded successfully, and the device is ready for operation.

Rate assignment

The rate is changed over using AC 230 V at the corresponding terminal.

2 rates	E4
T1	0
T2	1

4 rates	E4	E3
T1	0	0
T2	1	0
T3	0	1
T4	1	1

0 = De-energized / 1 = Voltage

Start of the measurement period

Independent of the setting configured in the ETS, the measurement period can be triggered via an AC 230 V control signal and shown in the display.

	E1	E2
Normal operation	1	0
Start of the measurement period	0	1

0 = De-energized / 1 = Voltage

For safety reasons, a current change must be performed at both inputs.

Behaviour in case of failure

Behaviour in case of failure or loss of mains voltage

The status object moves to 0 and is sent via the bus. Accordingly, all meter readings are set to 0 and sent.
The current values such as power, voltage, electricity, and power factor
are no longer sent. To prevent data loss, all relevant data are saved in a non-volatile EEPROM. The measured values can still be read off at the device.

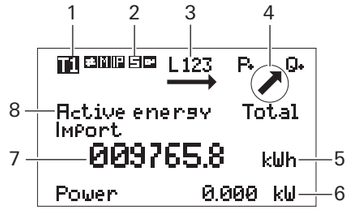
Behaviour in case of connected mains voltage and failure of the bus voltage

No more data can be sent or received via the bus. Otherwise the device functions properly.

Behaviour when the bus voltage has been restored for connected mains voltage

The status object moves to 1 and is sent via the bus. All meter readings and the current values such as power, voltage, electricity, and power factor are sent again.

Display and menu structure

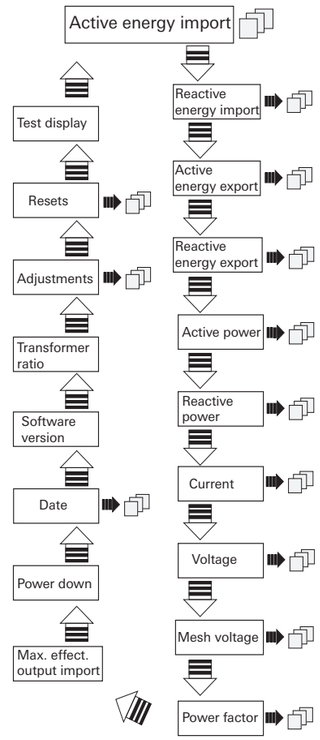


1 Active rate
2 Service mode
3 Rotating field display
4 Energy direction
5 Unit
6 Current power
7 Current meter reading
8 Measured value/menu item

Menu structure

The following actions can be performed manually via the two buttons on the device:
- Blue button: toggling between the menu items/measured values.
- Red button: activation and toggling of the sub-items for each menu item.

Symbol	Name
Blindenergie	Measured value/menu item
	Measured value/sub-menu
	Next menu item
	Activate/next sub-item



Menu items and sub-menus

Menu item	Sub-menu
Active energy import	Total Per phase Per rate
Reactive energy import	Total Per phase Per rate
Active energy export	Total Per rate
Reactive energy export	Total Per rate
Active power	Total Per phase Minimum (total) Minimum per phase Maximum (total) Maximum per phase
Reactive power	Total Per phase
Current	Per phase Minimum (total) Minimum per phase Maximum (total) Maximum per phase
Voltage	Per phase Minimum (total) Minimum per phase Maximum (total) Maximum per phase
Mesh voltage	L1 - L2 L2 - L3 L3 - L1
Power factor	Per phase
Max. effective power import	-
Power down	-
Date	Date (DD.MM.YY) Time (hh:mm:ss)
Software version	-
Transformer ratio	For 2175 00 only
Adjustments	Measurement period S0 pulse valency S0 pulse length Assignment of Outputs 1 to 4 Language
Resets	Min./max. register Max. effective output Power failure
Test display	All possible symbols and numbers are shown

Settings using the service button

The settings made using the service button on the device are ETS-independent.

Setting the date

1. Blue button: tap until **[Date]**.
2. Press the service button briefly.
3. Blue button: change numbers.
4. Red button: swap numbers.
5. Press and hold the service button for 5 s.
   New value is saved.

Setting the time

1. Blue button: tap until **[Date]**.
2. Red button: tap until **[Time]**.
3. Press the service button briefly.
4. Blue button: change numbers.
5. Red button: swap numbers.
6. Press and hold the service button for 5 s.
   New value is saved.

Changing the transformer ratio (for 2175 00 only)

The transformer ratio can be set as follows:
- 5 A current transformer: 5 ... 20000
- 1 A current transformer: 1 ... 4000

1. Blue button: tap until **[Transformer ratio]**.
2. Press the service button briefly.
3. Blue button: change secondary current.
4. Red button: change to primary current.
5. Blue button: change first position.
6. Red button: move to next position.
7. Repeat steps 5 and 6 until all positions have been changed.
8. Press and hold the service button for 5 s.
   New value is saved.

Changing the measurement period

1. Blue button: tap until **[ADJUSTMENTS]**.
2. Red button: tap until **[Measurement period]**.
3. Press the service button briefly.
4. Blue button: change time (1 ... 60 min).
5. Press and hold the service button for 5 s.
   New value is saved.

Changing the S0 pulse

1. Blue button: tap until **[ADJUSTMENTS]**.
2. Red button: tap until **[S0 pulse valency]**.
3. Press the service button briefly.
4. Blue button: shift decimal place (from 0.001 to 10000).
5. Press and hold the service button for 5 s.
   New value is saved.

Changing the S0 pulse length

1. Blue button: tap until **[ADJUSTMENTS]**.
2. Red button: tap until **[S0 pulse length]**.
3. Press the service button briefly.
4. Blue button: change the pulse length (4 ... 250 ms) in 2 ms intervals.
5. Press and hold the service button for 5 s.
   New value is saved.

Configuring the switch output

1. Blue button: tap until **[ADJUSTMENTS]**.
2. Red button: tap until **[Assignment Output X]**.
3. Press the service button briefly.
4. Blue button: select among relay output, S0 pulse output (kWh incoming) and threshold value.
5. Press and hold the service button for 5 s.
   New value is saved.

Configuring the threshold value

The following measured values can be selected as a threshold value for each output:
- Effective output
- Reactive power
- Apparent power
- Total electricity
- Electricity per phase

The factory setting for the threshold is 5000 kW and the status is set to "inactive". The address time (= time until the contact switches) and the release time (= time which the contact switches after falling below the threshold) can be set between 0 ... 9999 s.

1. Blue button: tap until **[ADJUSTMENTS]**.
2. Red button: tap until **[Threshold value]**.
3. Blue button: select unit.
4. Red button: continue tapping.
5. Blue button: set threshold value.
6. Red button: select next number.
7. Press and hold the service button for 5 s.
   New value is saved.
8. Red button: tap until **[Threshold value time on]**.
9. Press the service button briefly.
10. Blue button: change number.
11. Red button: swap numbers.
12. Press and hold the service button for 5 s. New value is saved.
13. Red button: tap until **[Threshold value time off]**.
14. Press the service button briefly.
15. Blue button: change number.
16. Red button: swap numbers.
17. Press and hold the service button for 5 s. New value is saved.

Change language

1. Blue button: tap until **[ADJUSTMENTS]**.
2. Red button: tap until **[Language]**.
3. Press the service button briefly.
4. Blue button: change language (German -> English).
5. Press and hold the service button for 5 s.
   The new language is saved.

Resets

1. Blue button: tap until **[RESETS]**.
2. Red button: select among min./max. register, max. effective output, and power failures.
3. Press the service button briefly.
4. Blue button: select RESET.
5. Press and hold the service button for 5 s.
   Reset was performed for the selected value.

Service button

After starting up the device, the service button should be sealed to prevent manipulation to the device.

Error messages

In case of an internal error, an error message is shown in the display.

Error code	Meaning
F.F.0(00000000)	No error, meter OK
F.F.0(xxxxxxx0)	Meter calibrated
F.F.0(xxxxxxx1)	Meter not calibrated
F.F.0(xxxxxx8)	Calibration release (meter calibrated, but it can be recalibrated)
F.F.0(xxxxxx9)	Calibration release (meter not yet calibrated, can be calibrated)
F.F.0(xxxxxxF)	Meter newly initialised (default values loaded)
F.F.0(xxxxxx0x)	Meter in normal mode
F.F.0(xxxxxx1x)	Meter in service mode
F.F.0(xxxxx0xx)	Check total Micro FLASH and EEPROM OK
F.F.0(xxxxx1xx)	Check total Micro FLASH error
F.F.0(xxxxx2xx)	Check total EEPROM error
F.F.0(xxxxx3xx)	Check total Micro FLASH and EEPROM error
F.F.0(xxxx0xxx)	Micro RAM and Micro STACK OK
F.F.0(xxxx1xxx)	Check total Micro RAM error
F.F.0(xxxx2xxx)	Micro STACK (Overflow) error
F.F.0(xxxx3xxx)	Check total Micro RAM and Micro STACK error
F.F.0(xxx0xxxx)	Micro OK
F.F.0(xxx1xxxx)	Micro error
F.F.0(xx0xxxxx)	Hardware OK
F.F.0(xx1xxxxx)	Hardware error
F.F.0(x0xxxxxx)	Time basis (real time clock) OK
F.F.0(x1xxxxxx)	Time basis error
F.F.0(0xxxxxxx)	Real time clock set
F.F.0(1xxxxxxx)	Real time clock with default values (date/time)

Exchange meter

DANGER

Touching live parts while exchanging the meter can result in a short circuit or an electric shock causing danger for life and limb.
- De-energize all connected conductors prior to the replacement.
- High voltage can be present at interrupted current transformers. This can be extremely dangerous for people and destroy the current transformer.

In case of non-observance, there is a danger of material damage and injury!

Warranty

The warranty is provided in accordance with statutory requirements via the specialist trade.
Please submit or send faulty devices postage paid together with an error description to your responsible salesperson (specialist trade/installation company/ specialist electrical trade). They will forward the devices to the Gira Service Center.