

Kamstrup 162

kWh meter 5(105)A with and without breaker

Measurement in 4 quadrants

Load profile in up to 4 quadrants

DLMS/COSEM compliant

Measurement in up to 8 tariffs

Voltage quality measurement

Safe data logging of consumption

Safe data logging of events

Immune to magnetic influence

Tamper detection

Real-time clock (RTC)

EN62056-21 Mode A



Type approved according to:

Active positive energy

EN 50470-1 (MID)

EN 50470-3 (MID)

Active negative energy and reactive energy

IEC 62052-11

IEC 62053-21

IEC 62053-23

Application

Kamstrup 162 is a direct connected electricity meter for registration of electric energy. The meter is full electronic without movable parts. Thus, shock and impact during transportation and mounting do not affect energy registration.

Furthermore, measurements are correct, no matter the physical mounting direction.

The shunt measuring principle gives good linearity, a considerable dynamic range, and ensures that the meter is not influenced by magnetism.

The easily readable display scrolls automatically between readings, or readings can be changed manually by the consumer activating a push button. The required display readings as well as their order are configurable.

In addition to being read from the display, data can be collected via the optical output or from the module area by means of a suitable communication module. The unique module area permits external changing of tariffs, pulse input and output, and configuration as well as connection of AMR and AMM modules.

Kamstrup 162J has DLMS/COSEM as standard. DLMS/COSEM is an open standardized protocol, which can be accessed by both the optical eye as well as a suitable communication module placed in the module area.

This ensure that Kamstrup 162J is interchangeable with DLMS/COSEM compliant meter types from other producers.

From the factory, the meter can be configured to measure both imported and exported energy. The energy registration is saved in the integral data logger, which ensures good data history with its depth of 36.

As standard, all 162J meter types offer real time load profile generation for all 4 quadrants. The load profile provides detailed information about consumed or produced energy.

Kamstrup 162J offers smart disconnect functionality as well as prepayment as standard. Smart disconnect allows control of the internal relays based on exceeding a current/power limit.

The prepayment functionality uses a countdown register to control the internal breakers.

The meter is configurable and can be supplied from the factory with required functions. A minimum of handling during installation is thus secured.



Kamstrup

Kamstrup A/S
Industrivej 28, Stilling
DK-8660 Skanderborg
TEL: +45 89 93 10 00
FAX: +45 89 93 10 01
info@kamstrup.com
www.kamstrup.com

Functions

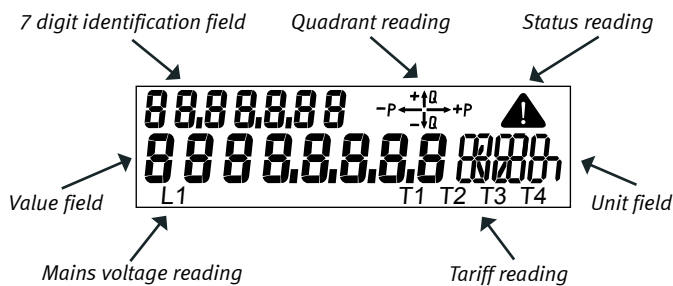
Meter types with and without breakers

| | |
|-------------------------------|---------------------------------------|
| Meter types without breakers: | 162B, 162C, 162Jx3, 162Jx6, 162Jx7 |
| Meter types with breakers: | 162D, 162E, 162JxC, 162JxD, 162JxG |

Display

The display is a liquid crystal display that makes it possible to read out the meter's registers. Available registers depend on the configuration.

The display configuration is constructed as 2 independent display lists: One for automatic shift function and one for manual shift function. The display is constructed of segments as shown in the figure.



Value field

This field is used for displaying register values.

7 digit identification field

OBIS code identification of the value in the value field.

Quadrant reading

The actual active quadrant is indicated.

Status reading

Indication of critical internal errors and magnetic influence.

Unit field

This field is used for displaying the units of registers in the value field.

Tariff reading

Displays the active tariff if tariffs is chosen.

Mains voltage reading

Indicates whether mains is above cut-off by either flashing or being permanently on for each individual phase. When flashing, voltage is above cut-off, but current is below cut-off.

The automatic shift function (scoll) changes between the selected readings in the required order every 10 secs. Historical data cannot be selected in the automatic shift function. Up to 16 readings can be selected.

Operation of the manual shift function is activated by pushing and releasing the push button. The order is optional, however it is not possible to opt out the legal readings. Up to 40 readings can be selected.

The meter automatically returns from manual shift function to automatic scroll function two min. after the last activation of the push button.

Energy measurement

The meter has shunt as measuring system for current and resistance division for voltage measurement.

Like voltage drop, energy consumption is calculated as an expression of the current compared to the phase voltage and time.

The energy registration is communicated to the meter's legal processor via the meter's internal bus system.

After correction the energy is summed in the main energy register.

Permanent memory

Measured and calculated data is safely stored in the memory (EEPROM). Data is stored by every change in energy register values.

Furthermore, the below mentioned values are stored at the end of a debiting period.

| |
|--|
| Active energy A+ |
| Active energy A- |
| Reactive energy R+ |
| Reactive energy R- |
| Active energy A+ Tariff (T1-T4) |
| Reactive energy R+ Tariff (T1-T4) |
| Peak power P _{max} Tariff 1 |
| Peak power P _{max} Tariff 1 Hour |
| Peak power P _{max} Tariff 1 Date |
| Peak power P _{max} Tariff 2 |
| Peak power P _{max} Tariff 2 Hour |
| Peak power P _{max} Tariff 2 Date |
| Peak power P _{max} |
| Peak power P _{max} Date |
| Peak power P _{max} Hour |
| Accumulated peak power P _{max acc.} |
| Date |
| Hour |
| Hour counter |
| Number of debiting periods |
| Power threshold counter |
| Pulse input |

Optical reading

An optical infrared sender and receiver is placed to the left on the front of the electricity meter.

This optical reading can be used to read data or to configure e.g. display set-up and pulse figure.

By using METERTOOL for kWh meter, the meter's 2-display readings can be configured. Furthermore, the integration period, target date for debiting logger and debiting logging interval can be changed.

Finally, the pulse input on the meter can be scaled, and tariffs can be changed.

It is not possible to change the meter's legal data without breaking the verification seal.

Functions

Plug-in modules

If needed, Kamstrup 162 can be extended by a plug-in module without subsequent reverification.

The module area communicates with the electricity meter's microprocessor via an internal data bus from the module area.

This provides innumerable functional possibilities such as extra pulse output, tariff modules, power supply modules and data communication via GSM/GPRS, PLC, TCP/IP, radio or other medias.

Kamstrup 162 with radio

This meter type has built-in radio communication on the electricity meter's main circuit board.

This is to optimise the product and eliminates the need for mounting the radio module subsequently.

When the meter's module area is used with another type of communication, the integrated radio communication will be deactivated.

Kamstrup 162 with breaker

This meter type has built-in disconnect function.

This means that is possible to disconnect the mains output from the electricity meter.

The disconnection can be done locally by using the meter's push button, automatically by either the smart disconnect or prepayment function, by METERTOOL for kWh meter or remotely by a connected reading system.

The disconnection must **NOT** be used as a safety switch.

The meter can be re-connected via the same media as it has been disconnected.

Load profile

Load profile is configurable to 5, 15, 30 or 60 minutes following the integration period.

The number of profiles generated follows the selected energy type of the meter.

Logging depth in days:

| Minutes | 5 | 15 | 30 | 60 |
|-------------|----|-----|-----|-----|
| A+ | 37 | 110 | 225 | 450 |
| A+/A- | 26 | 80 | 160 | 320 |
| A+/A-/R+/R- | 17 | 50 | 100 | 200 |

Approved measuring data

The meter is type approved according to the Measurement Instrument Directive (MID) for active positive energy and according to national requirements for other energy sizes where required.

Approval

Type test according to

- Active positive energy
- Reactive energy as well as active negative energy

Norm

EN 50470-1
EN 50470-3

IEC 62052-11
IEC 62053-21
IEC 62053-23

Approval

Terminal according to

- Optical reading according to
- OBIS codes according to

Norm

DIN 43857
DLMS/cosem
and EN62056-21 Mode A
IEC 62056-61

Technical data

| | |
|-------------------------------|---|
| Measuring principle | |
| – Current | Current measurement by current shunt |
| – Voltage | Voltage measurement by voltage divider |
| Nominal voltage Un | 230 V ± 10% |
| Current Ib(I _{max}) | 5(105)A 35 mm ² 10(60)A 10(85)A 5(85)A |
| Class | A B |
| Nominal frequency fn | 50/60 Hz ± 2% |
| Phase displacement | Unlimited |
| Operating temperature | |
| – Without breaker | -40°C - +70°C |
| – With breaker | -40°C - +55°C |
| Storage temperature | -40°C - + 85°C |
| Protective class | IP52 |
| Protection class | II |
| Relative humidity | < 75% year's average at 21°C < 95% less than 30 days/year, at 25°C |

Weight

| 162 without breaker | 162 with breaker |
|---------------------|------------------|
| Approx. 450 g | Approx. 750 g |

| | |
|------------------|---|
| Application area | Indoors or outdoors in suitable meter cabinet |
|------------------|---|

Internal consumption

| Without breaker | |
|-----------------|-------------------------|
| Current circuit | 0.01 VA |
| Voltage circuit | 0.5 VA, 0.2 W per phase |

| With breaker | |
|-----------------|--------------------------|
| Current circuit | 0.01 VA |
| Voltage circuit | 0.7 VA, 0.45 W per phase |

Material

| | |
|---------|--------------------------------|
| – Cover | Transparent polycarbonate |
| – Base | Glass reinforced polycarbonate |

| | |
|--------------|--------------------------------------|
| Data storage | EEPROM > 10 years without voltage |
|--------------|--------------------------------------|

| | |
|---------|--|
| Display | LCD, 7 mm-digit height (Value and unit fields) LCD, 5 mm-digit height (Identification readings) LCD, 3 mm-digit height (voltage and tariff readings) |
|---------|--|

| | |
|----------------|-----------------------------------|
| Meter constant | 1000 imp./kWh, 1000 imp./kvarh |
|----------------|-----------------------------------|

Real-time Clock (RTC)

| | |
|--------------------------|---|
| Accuracy | Typical 5 ppm at 23°C |
| Real-time clock backup | |
| – Supercap life | > 10 years at normal operation |
| Supercap operating hours | A week fully charged |
| S0 pulse diode | 1000 imp./kWh, kvarh Pulse duration 30 ms ±10% |
| Short circuit level | 4500 A ^{2t} |

Connection modules

The meter can be supplied or retrofitted with the following inputs and outputs from main circuit board by connection modules, without reverification.

S0 Supply Sends 24 V via a two wire and pulses, by pulling down the supply at 0 V at each pulse.

Data/pulse Serial RS232 communication, open collector, 300/1200 baud. Maximum load (current)

| Pulse value Imp/kWh, Imp/kvar | Pulse width/Pulse pause | |
|----------------------------------|-------------------------|-----------|
| | 30 msecs. | 80 msecs. |
| 1 | 105A | 105A |
| 10 | 105A | 105A |
| 100 | 105A | 105A |
| 1000 | 86A | 32A |
| 10000 | 8.6A | 3.2A |

| | |
|-----------------|--|
| M-Bus | Remote reading via M-Bus system |
| 2 tariffs | Tariff control via external 230 VAC |
| Current Loop | Tariff control of 2 or 4 tariffs, CS and 230 VAC |
| PLC | Remote reading via power line communication |
| TCP/IP | Remote reading via TCP/IP communication |
| GSM/GPRS | Remote reading via GSM/GPRS communication. Supports SMS reading |
| Radio | Remote reading via radio communication Built-in in CE, Jx4, Jx5, Jx6, Jx7, JxD, JxE, JxF, JxG |
| S0 Pulse module | S0 pulses according to DIN 43864 |

Connections

Main terminals

Elevating connections

| Size | For use with connector type: | | |
|--------------------------------------|------------------------------|----------------------|--------------------------|
| | Multi core | 7-core | Massive/cable end-sleeve |
| Brass terminal 35 mm ² | ≥ 10 mm ² | ≥ 10 mm ² | ≥ 2.5 mm ² |
| Steel terminal 35 mm ² | ≥ 6 mm ² | ≥ 6 mm ² | ≥ 1.5 mm ² |
| Steel terminal 25mm ² | ≥ 6 mm ² | ≥ 6 mm ² | ≥ 1.5 mm ² |

Screws PZ 2 and straight slot
Torque 2.5 – 3 Nm

Voltage outputs

| | |
|--------|---|
| Size | 0.25 – 1.5 mm ² , 5 mm Cable terminal forks |
| Screws | TORX Tx 10 Torque 1Nm |

Ordering details

| | 686- | X ₁ | X ₂ | X ₃ | X ₄ | X ₅ | X ₆ | X ₇ | X ₈ X ₉ X ₁₀ |
|--|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---|
| X₁ Phases | | | | | | | | | |
| 1x230 V | | 1 | | | | | | | |
| X₂ Current | | | | | | | | | |
| 0.25-5(65)A | | | 4 | | | | | | |
| 0.5-10(60)A | | | 6 | | | | | | |
| 0.5-10(85)A | | | 7 | | | | | | |
| 0.25-5(85)A | | | 8 | | | | | | |
| X₃ Class | | | | | | | | | |
| Class A | | | | A | | | | | |
| Class B | | | | B | | | | | |
| X₄ Generation | | | | | | | | | |
| DLMS and load profile | | | | | J | | | | |
| X₅ Energy type | | | | | | | | | |
| A+ | | | | | | 1 | | | |
| A+/A- | | | | | | 2 | | | |
| A+/R+ | | | | | | 3 | | | |
| A+/A-/R+/R- | | | | | | 4 | | | |
| X₆ HW option | | | | | | | | | |
| RTC (Supercap) | | | | | | | 3 | | |
| RF S incl. RTC | | | | | | | 6 | | |
| RF K incl. RTC | | | | | | | 7 | | |
| Breaker, battery, supercap | | | | | | | | B | |
| Breaker, supercap | | | | | | | | C | |
| Breaker, RF Seneca, supercap, battery | | | | | | | | D | |
| Breaker, RF Kamstrup, supercap, battery | | | | | | | | E | |
| Breaker, RF Seneca, supercap | | | | | | | | F | |
| Breaker, RF Kamstrup, supercap | | | | | | | | G | |
| X₇ Tariff configurable | | | | | | | | | |
| No tariff | | | | | | | | | 1 |
| 2-tariff | | | | | | | | | 2 |
| Configurable | | | | | | | | | 3 |
| 4-tariff | | | | | | | | | 4 |
| X₈X₉X₁₀ Country code | | | | | | | | | |
| E | | | | | | | | | 031 |
| LIT | | | | | | | | | 049 |
| GB | | | | | | | | | 050 |
| CH-I | | | | | | | | | 059 |
| EST | | | | | | | | | 061 |
| PL | | | | | | | | | 064 |
| CH-F | | | | | | | | | 065 |
| NL | | | | | | | | | 080 |
| FIN | | | | | | | | | 084 |

Configuration 1 (A-B-CCC-DD-E)

- A** Decimals displayed (locked)
- B** LED configuration (locked)
- CCC** Module
- DD** Input/output configuration
- E** Integration period

| | A | B | C | C | C | D | D | E |
|--|---|---|---|---|-----|---|----|---|
| A Decimals in display | | | | | | | | |
| 7.0 | 1 | | | | | | | |
| 6.1 | 2 | | | | | | | |
| B LED configuration | | | | | | | | |
| LED switched off without consumption | | 1 | | | | | | |
| LED switched on without consumption | | 2 | | | | | | |
| CCC Module | | | | | | | | |
| No module, OK | | | | | 000 | | | |
| S0 supply module, SK | | | | | 001 | | | |
| Data/pulse module, RK | | | | | 003 | | | |
| M-Bus module, MK | | | | | 005 | | | |
| Tariff module, 2 tariff, 230 V, WK | | | | | 008 | | | |
| Tariff module, 4 tariff, 230 V, CS, PK | | | | | 018 | | | |
| S0 Pulse module | | | | | 021 | | | |
| PLC module, router, ext. RTC | | | | | 039 | | | |
| IP101i, TCP/IP module | | | | | 040 | | | |
| Radio module, high power | | | | | 043 | | | |
| PLC module, S | | | | | 050 | | | |
| Radio module, router, S | | | | | 052 | | | |
| GSM6i | | | | | 053 | | | |
| GSM6i/RF | | | | | 054 | | | |
| S input/output | | | | | 055 | | | |
| DD Input/output configuration | | | | | | | | |
| Contact Kamstrup | | | | | | | XX | |
| E integration period | | | | | | | | |
| 5 min. | | | | | | | | 1 |
| 15 min. | | | | | | | | 2 |
| 30 min. | | | | | | | | 3 |
| 60 min. | | | | | | | | 4 |

Configuration 2 (FFF-GG-HH-I)

- FFF** Display configuration – **Contact Kamstrup for further information.**
- GG** Target date
- HH** Debiting logging interval
- I** Various

Configuration 2 (FFF-GG-HH-I)

| | G | G | H | H | I |
|-------------------------------------|---|----|---|---|----|
| GG Target date | | | | | |
| External controlled | | 00 | | | |
| 1. | | 01 | | | |
| 2. | | 02 | | | |
| 3. | | 03 | | | |
| 4. | | 04 | | | |
| 5. | | 05 | | | |
| 6. | | 06 | | | |
| 7. | | 07 | | | |
| 8. | | 08 | | | |
| 9. | | 09 | | | |
| 10. | | 10 | | | |
| 11. | | 11 | | | |
| 12. | | 12 | | | |
| 13. | | 13 | | | |
| 14. | | 14 | | | |
| 15. | | 15 | | | |
| 16. | | 16 | | | |
| 17. | | 17 | | | |
| 18. | | 18 | | | |
| 19. | | 19 | | | |
| 20. | | 20 | | | |
| 21. | | 21 | | | |
| 22. | | 22 | | | |
| 23. | | 23 | | | |
| 24. | | 24 | | | |
| 25. | | 25 | | | |
| 26. | | 26 | | | |
| 27. | | 27 | | | |
| 28. | | 28 | | | |
| HH Debiting logging interval | | | | | |
| None (external controlled) | | | | | 00 |
| Monthly | | | | | 01 |
| Every second month, January | | | | | 02 |
| Every second month, February | | | | | 03 |
| Every third month, January | | | | | 04 |
| Every third month, February | | | | | 05 |
| Every third month, March | | | | | 06 |
| Half-yearly, January | | | | | 07 |
| Half-yearly, February | | | | | 08 |
| Half-yearly, March | | | | | 10 |
| Half-yearly, April | | | | | 11 |
| Half-yearly, May | | | | | 12 |
| Half-yearly, June | | | | | 13 |
| Yearly, January | | | | | 14 |
| Yearly, February | | | | | 15 |
| Yearly, March | | | | | 16 |
| Yearly, April | | | | | 17 |
| Yearly, May | | | | | 18 |
| Yearly, June | | | | | 19 |
| Yearly, July | | | | | 20 |
| Yearly, August | | | | | 21 |
| Yearly, September | | | | | 22 |
| Yearly, October | | | | | 23 |
| Yearly, November | | | | | 24 |
| Yearly, December | | | | | 25 |
| I Various | | | | | |
| 30ms, pulses | | | | | 1 |
| 80ms, pulses | | | | | 3 |

Configuration 3 (JJ-K-LL-M-NN)

- JJ** Disconnect setup
- K** Peak power
- LL** GMT
- M** Available
- NN** Unit pulse input

| | J | J | K | L | L | M | N | N |
|----------------------------|---|----|---|---|----|---|---|----|
| JJ Disconnect setup | | | | | | | | |
| None | | 00 | | | | | | |
| K Peak power | | | | | | | | |
| Peak power standard | | | 0 | | | | | |
| Peak power for tariff 1 | | | 1 | | | | | |
| Peak power for tariff 2 | | | 2 | | | | | |
| LL GMT | | | | | | | | |
| 0 London | | | | | 00 | | | |
| 1 DK-D-F-E | | | | | 01 | | | |
| 2 FIN | | | | | 02 | | | |
| 3 | | | | | 03 | | | |
| 4 | | | | | 04 | | | |
| 5 | | | | | 05 | | | |
| 6 | | | | | 06 | | | |
| 7 | | | | | 07 | | | |
| 8 | | | | | 08 | | | |
| 9 | | | | | 09 | | | |
| 10 | | | | | 10 | | | |
| 11 | | | | | 11 | | | |
| 12 | | | | | 12 | | | |
| -11 | | | | | 13 | | | |
| -10 | | | | | 14 | | | |
| -9 | | | | | 15 | | | |
| -8 | | | | | 16 | | | |
| -7 | | | | | 17 | | | |
| -6 | | | | | 18 | | | |
| -5 | | | | | 19 | | | |
| -4 | | | | | 20 | | | |
| -3 | | | | | 21 | | | |
| -2 | | | | | 22 | | | |
| -1 | | | | | 23 | | | |
| M Available | | | | | | | | |
| None | | | | | | 0 | | |
| NN Unit pulse input | | | | | | | | |
| None | | | | | | | | 00 |
| kWh | | | | | | | | 01 |
| m ³ | | | | | | | | 02 |
| L | | | | | | | | 03 |

Configuration 4 (OOO-PPP-QQ)

OOO Tariff control table/Holiday table/Table for summer/normal time plan
PPP Summer/normal time table
QQ Protocol

| | O | O | O | P | P | P | Q | Q |
|-------------------------------------|---|---|-----|---|---|-----|---|----|
| OOO Tariff control table | | | | | | | | |
| None | | | 000 | | | | | |
| Tariff Union Fenosa 070202 | | | 001 | | | | | |
| PPP Summer/normal time table | | | | | | | | |
| None | | | | | | 000 | | |
| QQ Protocol | | | | | | | | |
| None | | | | | | | | 00 |

Configuration 5 (RRR)

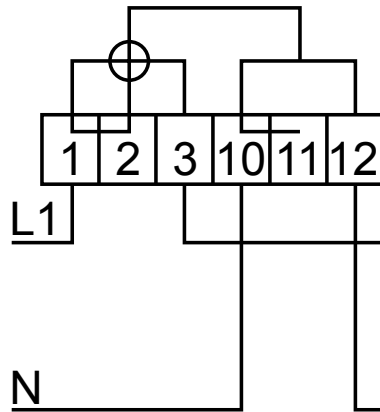
RRR Frequency – transmitting power

| | R | R | R |
|---|---|---|-----|
| RRR Frequency – transmitting power | | | |
| None radio | | | 000 |
| CH 318 RF K | | | 318 |
| EU 319 RF K | | | 319 |

Installation

Connect the meter in accordance with the installation diagram on the meter's verification cover.

1-phase, 2-wire



Security and installation guide lines

The meter shall only be used for measuring electrical energy and shall operate within the specified values only.

The meter must be switched off when working on it. It can be highly dangerous to touch the meter parts when the meter is switched on.

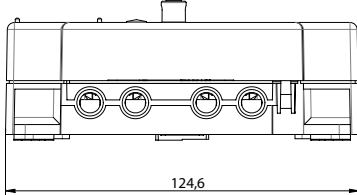
Therefore, the relevant safety fuse must be removed and kept in a place where unauthorised persons cannot insert it.

Current local standards, guidelines, regulations and instructions must be observed. Only authorised personnel are permitted to install electricity meters. Meters for direct connection must be protected against short circuit by a backup fuse in accordance with the maximum current stated on the meter.

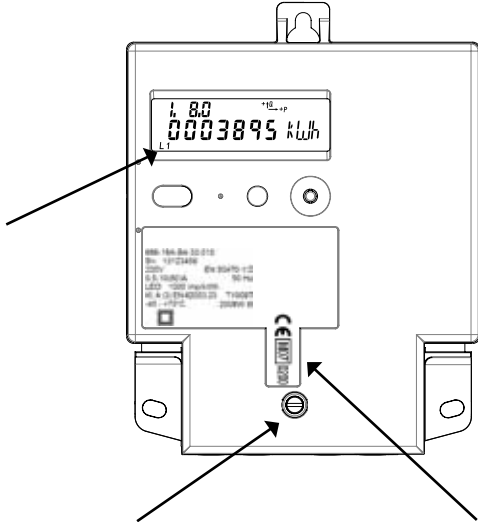
The meter constant LED blinks proportionally to the consumed active energy.

Only authorised personnel must break the sealing.

Sealing



L
Phase connection
– lights up if the meter is connected.

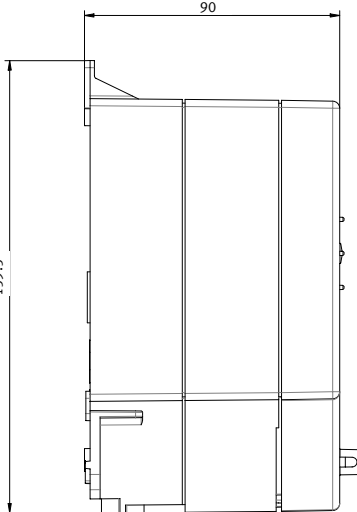
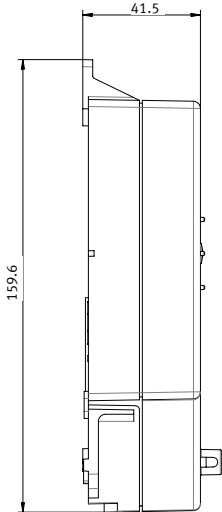


The electricity meter's connection terminal can be sealed in the usual way through the sealing screw and the meter's top cover.

The electricity meter is provided with verification sealing from the factory, which is visible through the top cover.

Kamstrup 162 without breaker

Kamstrup 162 with breaker



Accessories

Modules

| | | |
|---|----|-----------|
| S0 supply module | SK | 68 50 001 |
| Data/pulse module, relay output | RK | 68 50 003 |
| M-Bus module | MK | 68 50 005 |
| Tariff module, 2 tariffs, 230 VAC | WK | 68 50 008 |
| Tariff module, 2 tariffs, 230 VAC, current loop | FK | 68 50 014 |
| Tariff module, 4 tariffs, 230 VAC, current loop | PK | 68 50 018 |
| S0 Pulse module | | 68 50 021 |
| PLC module, router, external RTC | PO | 68 50 039 |
| IP101i, TCP/IP module | IK | 68 50 040 |
| Radio module, router, high power | QR | 68 50 043 |
| PLC S | PP | 68 50 050 |
| S RF router | | 68 50 052 |
| GSM6i | | 68 50 053 |
| GSM6i/RF | | 68 50 054 |
| S input / output | | 68 50 055 |

Software

| | | |
|---|--|-----------|
| Configuration SW, METERTOOL for kWh meter | | 68 99 570 |
|---|--|-----------|

Various

| | | |
|---|--|-----------|
| Long terminal cover 60 mm | | 59 60 150 |
| Optical reading head with 9-pole-t Dsub connector | | 66 99 102 |
| Optical reading head with USB connector | | 66 99 099 |
| DIN rail mounting | | 68 30 007 |
| Extension for the top mounting ring | | 68 30 010 |
| Top fitting, metal bow | | 68 50 101 |
| Contact plugs, 50 pcs. | | 68 50 102 |
| Cable terminals, 50 pcs. | | 68 50 103 |
| Supercap for backup of RTC | | 68 30 012 |
| Lithium battery for backup of RTC | | 68 30 013 |