## FEATURES

- Measurement of main electrical magnitudes.
- Suitable for 3-phase 4-wire or single-phase installations (3 lines).
- Power measurement (W or kW) and Energy with 3 registers.
- Currency and CO2 emissions estimation registers.
- KNX system clock synchronization is allowed.
- Up to 6 tariff cost-counters.
- Total data saving on KNX bus failure.
- Integrated KNX BCU.
- Dimensions 67 x 90 x 35mm (2 DIN units).
- DIN rail mounting (EN 50022), through pressure.
- Conformity with the CE directives (CE-mark on the right side).

* Sold separately

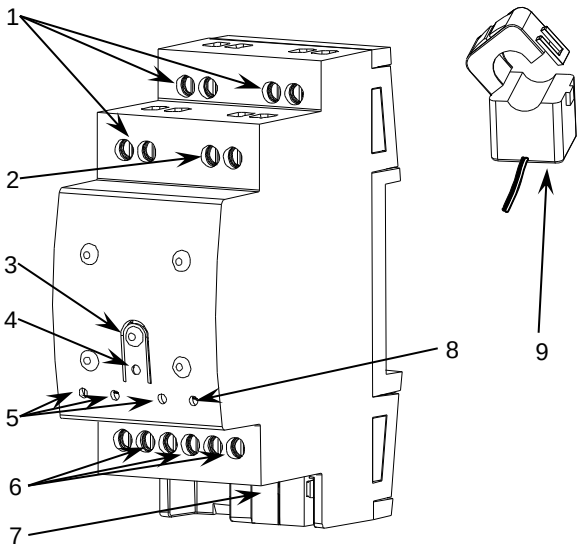



Figure 1: KES Plus

| | | | | |
|---|---|---|---|---|
| 1. Phase/line (voltage) | 2. Neutral (voltage) | 3. Programming button | 4. Programming LED | 5. Phase/line status LED |
| 6. Current transformer connection | 7. KNX connector | 8. Three-phase status LED | 9. Current transformer* | |

Programming button: short press to set programming mode. If this button is held while plugging the device into the KNX bus, it enters the safe mode.

Programming LED: programming mode indicator (red). When the device enters the safe mode, it blinks (red) every half second. During the start-up (reset or after KNX bus failure) and if the device is not in safe mode, it emits a red flash.

## GENERAL SPECIFICATIONS

| CONCEPT | | | DESCRIPTION | |
|---|---|---|---|---|
| Type of device | | | Electric operation control device | |
| KNX supply | Voltage (typical) | | 29VDC SELV | |
| | Voltage range | | 21..31VDC | |
| | Maximum consumption | Voltage | mA | mW |
| | | 29VDC (typical) | 14.25 | 413.25 |
| | | 24VDC[1] | 17.5 | 420 |
| | Connection type | | Typical TP1 bus connector for 0.80mm Ø rigid cable | |
| Voltage measurement range | | | 230V~ / 400V 3~ | |
| Operation temperature | | | 0°C .. +55°C | |
| Storage temperature | | | -20°C .. +55°C | |
| Operation humidity | | | 5 .. 95% | |
| Storage humidity | | | 5 .. 95% | |
| Complementary characteristics | | | Class B | |
| Protection class / Overvoltage category | | | II / III | |
| Operation type | | | Continuous operation | |
| Device action type | | | Type 1 | |
| Electrical stress period | | | Long | |
| Degree of protection / Degree of pollution | | | IP20 / 2 (clean environment) | |
| Installation | | | Independent device to be mounted inside electrical panels with DIN rail (EN 50022). Installation at altitudes over 2000m above mean sea level is not recommended. | |
| Minimum clearances | | | Not required | |
| Response on KNX bus failure | | | Data saving according to parameterization | |
| Response on KNX bus restart | | | Data recovery according to parameterization | |
| Operation indicator | | | The programming LED indicates programming mode (red). Phase and three-phase status LEDs indicate the presence of consumption (yellow blinking) or generation (green blinking). The switch-on time during the blinking is proportional to the power that is flowing. | |
| Weight | | | 101g | |
| PCB CTI index | | | 175V | |
| Housing material | | | PC FR V0 halogen free | |

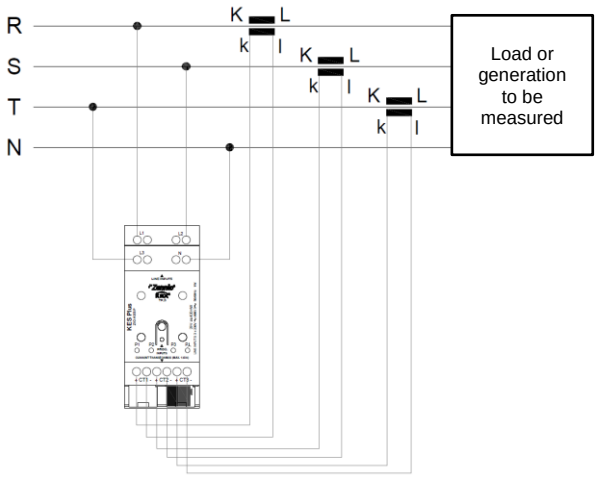
[1] Maximum consumption in the worst case scenario (KNX Fan-In model)

| ELECTRICAL SYSTEM SPECIFICATIONS AND CONNECTIONS | |
|---|---|
| **CONCEPT** | **DESCRIPTION** |
| Number of phases or lines | 3 |
| Voltage measurement range | 230V~ / 400V 3~ |
| Current measurement range | 0.01 – 120A (depending on the current transformer model) |
| Current measurement method | Electromagnetic induction |
| Connection method | Screw terminal block |
| Cable cross-section | 0.5-2.5mm² (IEC) / 26-12AWG (UL) |
| Zennio current transformer (References) [2] | ZN1AC-CST60 (Zennio accessory)<br>ZN1AC-CST120 (Zennio accessory) |
| Transformer ratio (loops number) [2] | Np:Ns=1:3000 |
| Accuracy [3] | 1% |

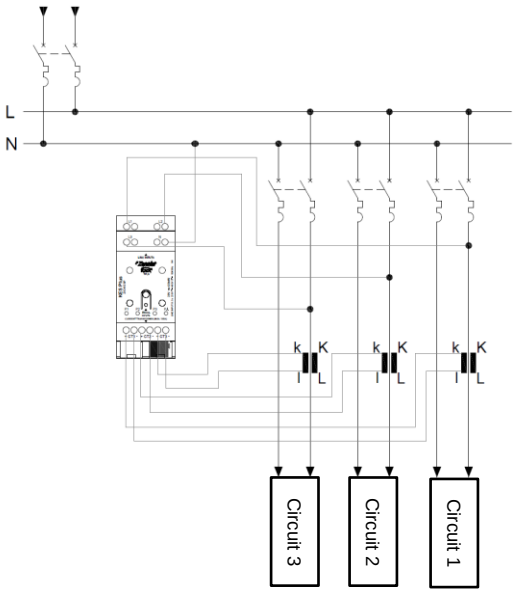
[2] It is not allowed to modify the cable length of the current transformer (Neither cutting nor splicing are allowed)
[3] Accuracy on active power with a power factor between 0.75 and 1 with Zennio current transformer. It is allowed to use other current transformers with the same characteristics that Zennio ones and, also, the complies with IEC 61010-X safety standards.

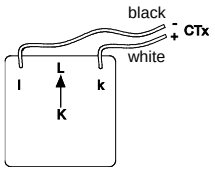
## CONNECTION DIAGRAMS*

### 3-phase 4-wire system




### Single-phase system

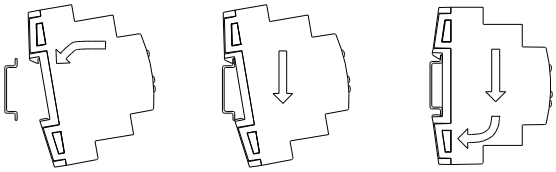


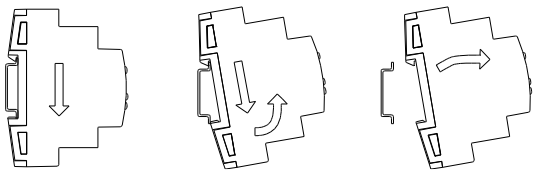

Current transformer detail (bottom part)

*In case of other connection type, please refer the manual.

Attaching KES Plus to DIN rail:



Removing KES Plus from DIN rail:



| SYMBOLS LEGEND | |
|---|---|
| **SYMBOL** | **MEANING** |
| ~ | Alternating current. |
| 3~ | Three-phase current. |
| ⎓ | Direct current. |
| ⧈ | Protection class II |

## SAFETY INSTRUCTIONS

- Installation should only be performed by qualified professionals according to the laws and regulations applicable in each country. Also, if the device is installed in a non-specified for the manufacturer way, the protections of the device may be compromised.
- Do not connect the mains voltage nor any other external voltage to any point of the KNX bus; it would represent a risk for the entire KNX system. The facility must have enough insulation between the mains (or auxiliary) voltage and the KNX bus or the wires of other accessories, in case of being installed.
- The facility must be equipped with a device that ensures the omnipolar sectioning. Installation of a 10A mini-circuit-breaker is recommended. To prevent accidents, it must remain open in case of manipulation of the device. Also, this device must be placed next to the KES Plus and marked as disconnection device of the KES Plus.
- Once the device is installed (in the panel or box), it must not be accessible from outside.
- The device will be cleaned through the use of a dry microfibre cloth for the dust disposal.
- Keep the device away from water (condensation over the device included) and do not cover it with clothes, paper or any other material while in use.
- The WEEE logo means that this device contains electronic parts and it must be properly disposed of by following the instructions at http://zennio.com/weee-regulation.