

A1000 ALPHA® and A1200 ALPHA® Meter Installation Instructions

For A1000 ALPHA Type R, A1000 ALPHA Type C,
and A1200 ALPHA Meters

General

This leaflet contains general installation instructions for 4-wire and 3-wire applications of the A1000 ALPHA and A1200 ALPHA polyphase meters. All meters are factory-calibrated and tested before shipment. For proper installation, accuracy, and maximum life of the meters, use the following installation procedures. For more information about the operation of the meter, see the appropriate technical manual:

- *A1000 ALPHA Meter Technical Manual* (TM42-2390D or later)
- *A1200 ALPHA Meter Technical Manual* (TM42-2398A or later)

||| **▲ DANGER** |||

Dangerous voltages with high current capabilities are present

Use authorized utility procedures to install and service metering equipment. Equipment damage, personal injury, or death can result if safety procedures are not followed.

Installation

▲ **CAUTION**

Make sure the meter being installed matches the service type, system voltages, and maximum load current. Installing a mismatched meter can result in severe damage to the meter or the service installation.

A1000 ALPHA and A1200 ALPHA meters are not intended for use with phase-shifting transformers. The meter voltage inputs have a common internal to the meter, which can result in equipment damage if used with phase-shifting transformers.

To ensure proper operation of the meter, consider the following items before installation:

- 1 Plan the meter installation. Make sure the service type, voltage, and load current are compatible with the meter ratings before installing the meter.
- 2 The meter is mounted to a vertical surface using three mounting screws. Use sufficiently large screws so that the meter will be securely mounted. When mounting, consider the force that will be exerted by the service connecting wires.
 - ◆ One screw engages the meter hanger (1 or 2 in Figure 1) at the top of the meter.
 - ◆ The two bottom supporting screws are positioned on both sides of the meter terminal block (7 in Figure 1).
- 3 Set the mounting height of the meter so that the LCD (3 in Figure 1) is at (or slightly above) average eye level. This is the optimal viewing position for the LCD.

To install the meter

- 1 Make sure that the meter hanger (1 in Figure 1) is in the desired position. Sliding the hanger down to the hidden position (2 in Figure 1) will hide the top supporting screw.
- 2 Use at least an M6 screw for the top supporting position and hang the meter on it, making sure that the meter is vertical. Moisture resistance and LCD visibility are best when the meter is vertical.
- 3 Use at least an M6 screw in each of the bottom supporting screw positions (7 in Figure 1) to secure the A1200 ALPHA meter; the bottom supporting screw slots are 6.0mm wide.

⚠ WARNING

Before wiring the meter into the power circuit, use authorized utility procedures to install proper ground connections on all appropriate VT and CT secondary circuits. Also, be certain that CTs on energized lines are securely short-circuited either with Elster Electricity circuit-closing test switches or with properly installed conductors. Dangerous voltages can be present. Equipment damage, personal injury, or death can result from improperly grounded metering transformer circuits.

- 4 Install the system ground connections.
- 5 Make sure that primary or system voltages are either disconnected or that utility safety practices for handling live circuits are strictly followed.
- 6 Make sure that any current transformers are de-energized with no high-voltage primary voltage connected to their primaries and no primary current circulating through them. If primary current and voltage are present in the current transformers, it is extremely important to verify that safety shorting connections are in place on all secondary winding connections before handling CT connections to the meter.

NOTICE

CT-connected A1200 ALPHA meters are designed for use with copper wiring only. Direct connected A1000 ALPHA and A1200 ALPHA meters may be used with copper or aluminum wiring. When using aluminum wiring, it is extremely important to use proper aluminum wiring practices. Aluminum wiring compound or paste (grease) should be used when attaching the bottom-connected terminals. Tighten the connections, allow them to relax for a few minutes, and then tighten them again. This will minimize the cold-flow effects of aluminum cable. Failure to observe correct practices for installing aluminum wiring could lead to overheating of the terminals, equipment failures, or damaging fires. Where possible, it is recommended to use special wiring adapters which are designed to make the conversion from copper-compatible meter terminals and aluminum wire. Such adapters also can provide for use of larger aluminum conductors that can otherwise be used in the terminals of the A1200 ALPHA meter.

- 7 Wire the meter using labeled or color-coded wire that complies with local electrical codes or applicable specifications. Examples of wiring diagrams are shown either on the nameplate, under the terminal cover, or in the meter's technical manual. Maximum wire size and required clamp screw torque are shown in the following table:

Meter	Maximum wire size	Screw torque
Direct connected	AWG #1 or 35 mm ²	1.7 N-m or 241 oz-inches
CT-connected	AWG #5 or 16 mm ²	1.2 N-m or 170 oz-inches

⚠ WARNING

Sustained operation at currents near the meter's rated current causes some heating in the main terminal connections. Much of this heat is dissipated through the meter service wiring. The wire connected to the main terminals must be properly rated for the service current and voltage. Conductor size and insulation ratings (voltage and temperature) must be considered.

⚠ CAUTION

Direct connected A1200 ALPHA meters include voltage disconnect and voltage test terminals. On CT-connected A1200 ALPHA meters, the voltage disconnect terminals are not used.

Also, on CT-connected A1200 ALPHA meters, the voltage test terminals are used for internal meter wiring and are not available for testing. Do not loosen or disturb the voltage test terminals on CT-connected meters. Failure to observe this caution can result in equipment malfunction.

- 8 On direct connected meters, check that the three voltage disconnect links (1 in Figure 2) are closed. The meter is shipped from the factory with the voltage disconnect links closed and the screws tightened to 0.18 to 0.24 N-m (25 to 34 oz-inches) torque. The links are closed when the link screws are positioned to the left (when facing the meter as shown in Figure 2).
- 9 Install and seal the wiring cover (9 in Figure 1). Seal at least one of the wiring cover screws (8 in Figure 1).
- 10 Apply power to the meter and load. Verify that the meter is installed correctly by following the "Initial Setup" on page 6.

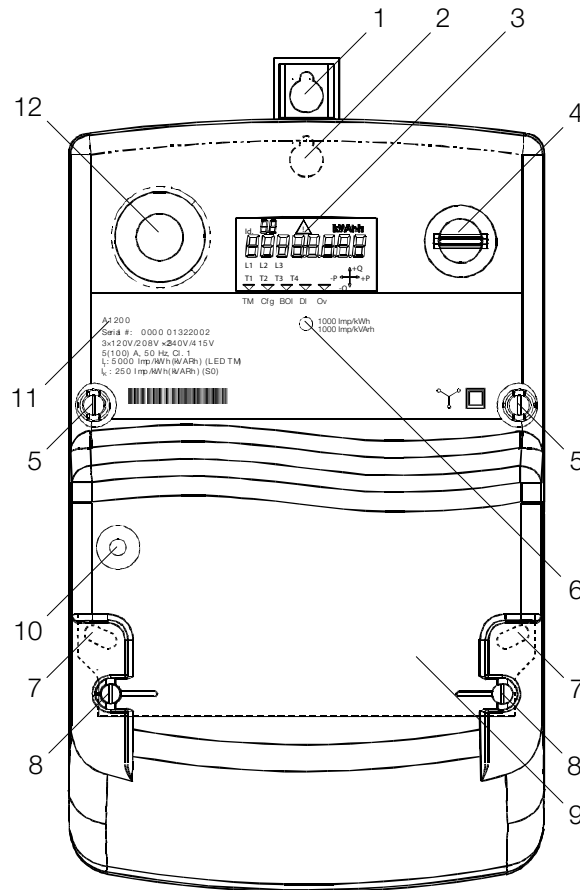


Figure 1. A1200 ALPHA meter (A1000 ALPHA meter is similar)

Callout	Description
1	Meter hanger (shown extended)
2	Meter hanger (hidden)
3	Liquid crystal display (LCD)
4	Push button (A1000 ALPHA Type C and A1200 ALPHA meters only)
5	Meter cover screw (can be sealed)
6	Test light emitting diode (LED)
7	Bottom supporting screws (under wiring cover)
8	Wiring cover screws (can be sealed)
9	Wiring cover (long wiring cover shown)
10	External DC power source connector (optional)
11	Nameplate
12	Optical port

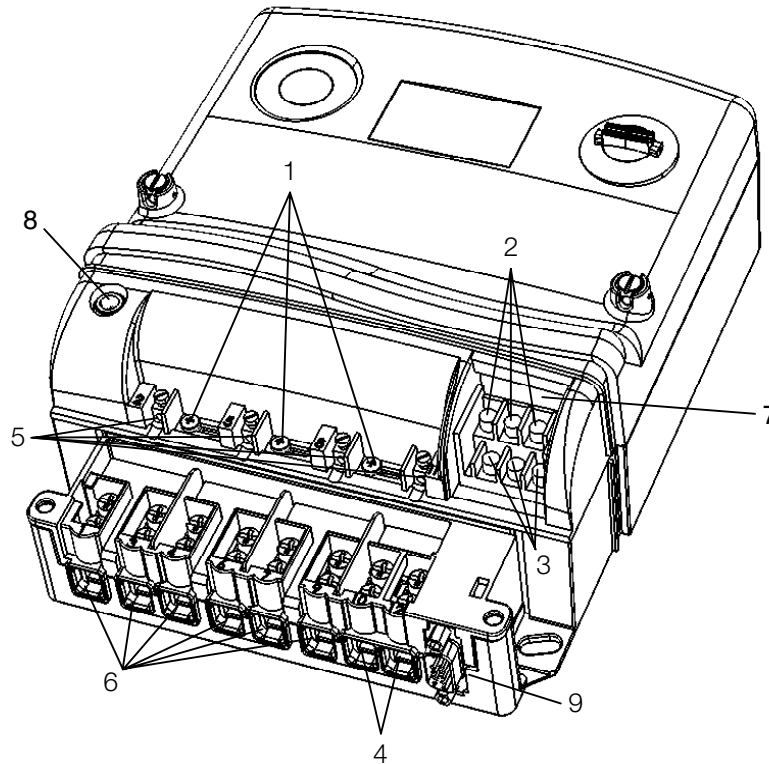


Figure 2. A1000 ALPHA Type C and A1200 ALPHA direct connected meter base assembly

Caption	Description
1	L1 – L3 voltage disconnect links (shown closed)
2	Tariff input terminals
3	SO output terminals
4	Neutral terminals (3–element meters only)
5	Voltage connections for meter testing
6	L1 – L3 main terminals
7	Location of auxiliary terminal block cover (not shown).

Tariff Inputs

The A1200 ALPHA meter can perform tariff control using its internal real-time clock. However, if using the real-time clock is not desired, the A1200 ALPHA meter can receive tariff control information from an external clock or signaling device. A1000 ALPHA meters receive tariff control information only from an external clock or signaling device. Using external signaling, the A1000 ALPHA and A1200 ALPHA meters implement up to 4 tariffs, depending on the meter type and configuration. The operating tariff is selected based on the electrical inputs to the meter tariff inputs. An external timer or communication device controls tariff selection by applying AC control voltages to the optically-isolated tariff inputs. Each input can be separately activated or deactivated. The voltage specification is 100 to 240 VAC \pm 20%.

- Single-tariff meters do not respond to the tariff inputs. Energy is registered to the total registers. The tariff registers are not used.
- Two-tariff meters use input terminal 13.
- Three-tariff and four-tariff meters use input terminal 13 and input terminal 33.
- Terminal 15 is the common terminal for both tariff inputs.
- Terminal numbers for tariff inputs are shown on the meter wiring diagram and on the auxiliary terminal block cover.

S0 Relay Outputs

The A1000 ALPHA and A1200 ALPHA meters include one or two solid-state S0 relay outputs, depending on the meter type and configuration. The S0 relay outputs can be used in the following ways:

- energy quantity pulse outputs
- indication of the beginning of demand interval (BOI)
- indication of the overload condition

As a pulse output, each relay can be separately assigned to one of the meter’s configured energy quantities. The energy quantity assignment, and pulse rate for each output, are configurable using meter support software. The pulse rate should be selected as appropriate for the size of the metered load and capability of the pulse receiver.

When configured as a BOI indicator, the relay remains closed for the first 1% of the interval time.

The S0 relay outputs are each optically-isolated SPST solid-state relay contacts. The contact ratings are 27 VDC and 27 mA maximum per IEC 62053-31. The common terminal (40) must be connected to the negative side of the external DC control source.

The numbering of the S0 output terminals is listed in the following table:

Output relay function	Terminal number
Overload condition indication	36
BOI indicator	37
+P, IPI	41
-P	42
+Q, IQI	43
-Q	44
Common connection for terminals 36 to 44	40

Battery Installation or Replacement

Multi-tariff A1200 ALPHA meters are typically shipped with the battery installed and connected. If the battery was requested to be shipped disconnected, separately, or as a replacement, see the *A1200 ALPHA Meter Technical Manual* for procedures on installing and removing the battery.

Serial Communication Port

A1200 ALPHA meters may be equipped for remote communication using RS-232 or RS-485. See the A1200 ALPHA meter technical manual for information on how the RS-232 or RS-485 port is configured. The connector wiring is shown on the meter nameplate.

Initial Setup

After installing and powering the A1000 ALPHA or A1200 ALPHA meter, verify the following items:

- All phase indicators are present. Three-element meters should display L1, L2, and L3. Two-element meters should display L1 and L3.
- The appropriate tariff indicator matches the state of the external tariff control device.
- The test LED on the front of the meter pulses. This depends on the magnitude of the load and the energy quantity assigned to the LED.
- The energy direction indicators indicate the correct direction of energy flow. Typically, the → (+P) arrow will be on.

- Check the LCD for any indication of an error.
 - ♦ If the error indicator remains on (not flashing), the meter installation should be checked for wiring errors. Depending on the meter program, the installation test may be performed when the meter is powered up or when alternate mode is entered (or both).
 - ♦ If the error indicator is flashing, there is a meter error. A meter with a flashing error indicator must be removed from service and returned to Elster Electricity for repair or replacement.
- Required meter seals are installed.
- If the tariff control is by real-time clock, check the date and time.
- If the meter is CT-connected, check or set the transformer factor (using meter support software) if this item is included in the display list.
- Record as necessary such information as the meter's identification number, location, and initial readings.

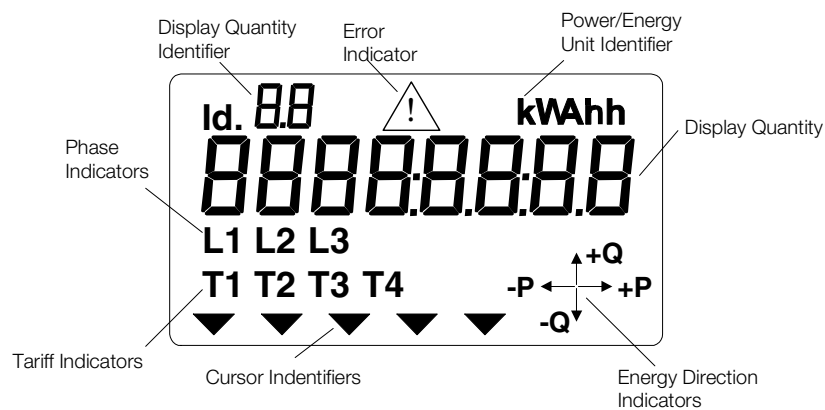


Figure 3. Liquid crystal display

Wiring Diagrams

Direct Connected

The A1000 ALPHA and A1200 ALPHA meters can be ordered for direct connected service. Figure 4 shows an example of a direct connected 3-element wiring diagram. Figure 5 shows an example of a direct connected 2-element diagram. Refer to the wiring diagram on the nameplate of each meter for specific terminal assignments. All connections are equipped with combination-head screws that accept either a slotted or Phillips screwdriver.

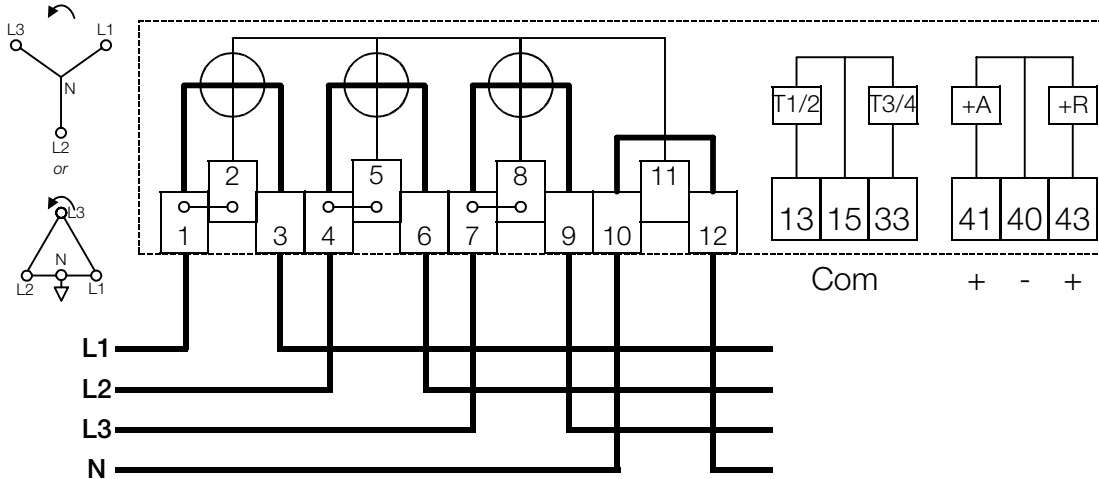


Figure 4. Example of Three-Element, Four-Wire Wye or Four-Wire Delta

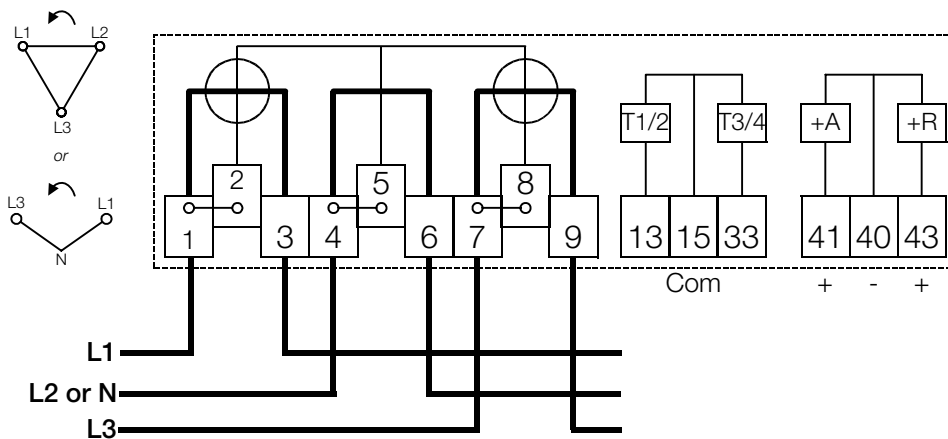


Figure 5. Example of Two-Element, Three-Wire Delta or Three-Wire Network

CT-Connected

The following wiring diagrams only apply to the current transformer connected A1200 ALPHA meter. Figure 6 shows an example of a delta transformer connected two-element wiring diagram. Figure 7 shows an example of wye transformer connected (sequential) three-element wiring diagram. Figure 8 shows an example of wye transformer connected (symmetrical) three-element wiring diagram.

Refer to the wiring diagram on the nameplate of each meter for specific terminal assignments. All connections are equipped with combination-head screws that accept either a slotted or Phillips screwdriver.

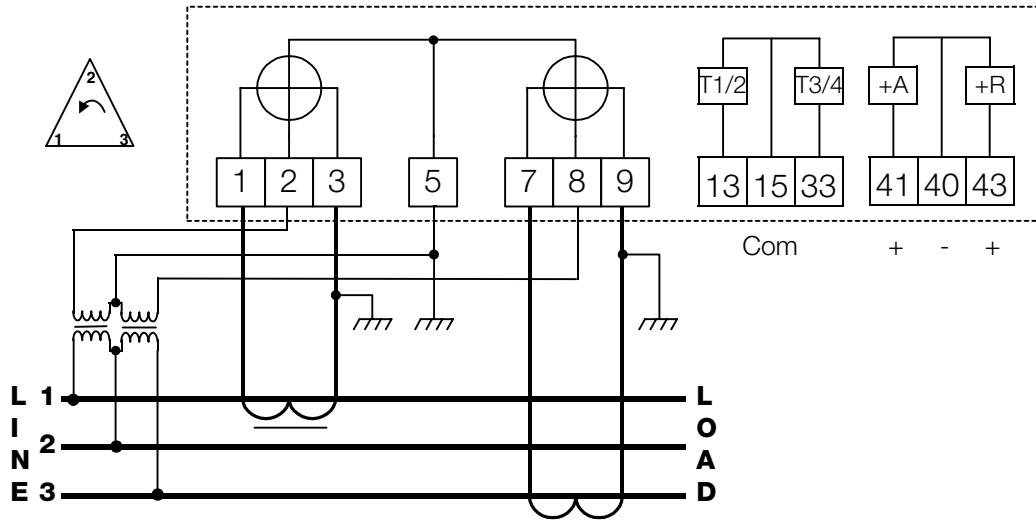


Figure 6. Example of Two-Element, Three-Wire Delta Transformer Connected

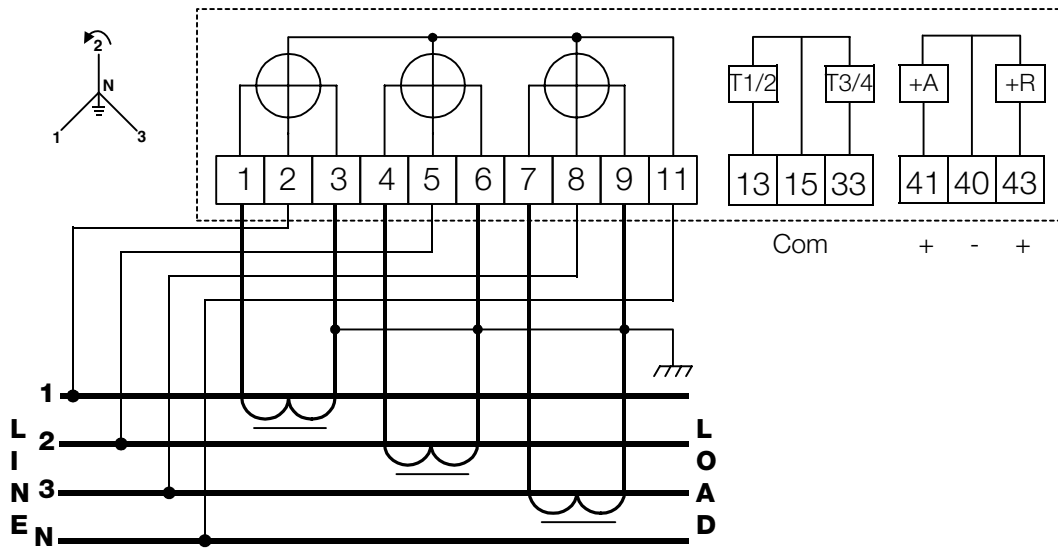


Figure 7. Example of Three-Element, Four-Wire Instrument Transformer, Sequential Connection

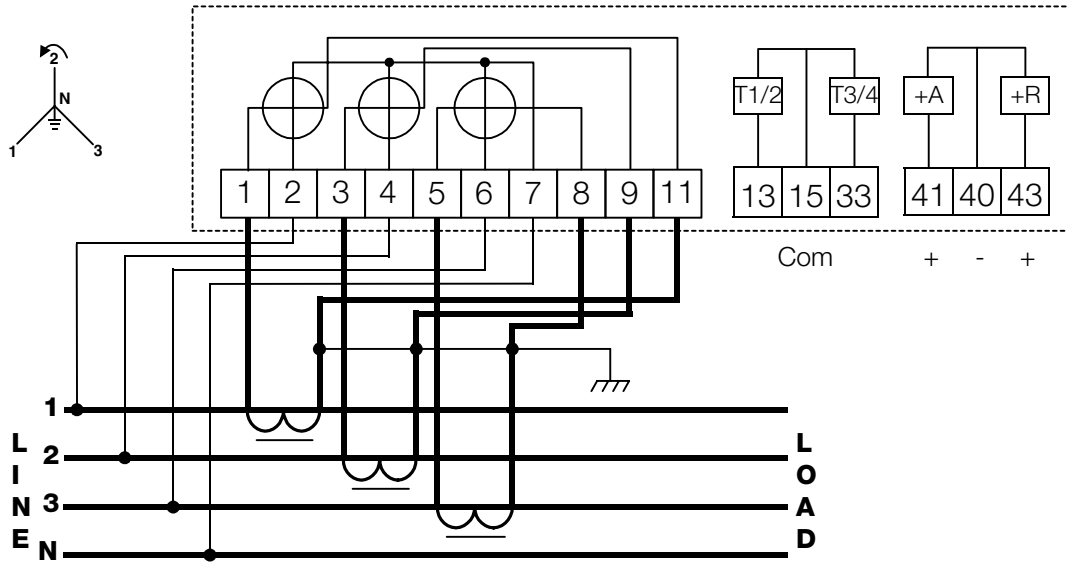


Figure 8. Example of Three-Element, Four-Wire Instrument Transformer, Symmetrical Connection

Mounting Dimensions

The A1000 ALPHA Type R meter, A1000 ALPHA Type C meter, and A1200 ALPHA meter have the same mounting dimensions.

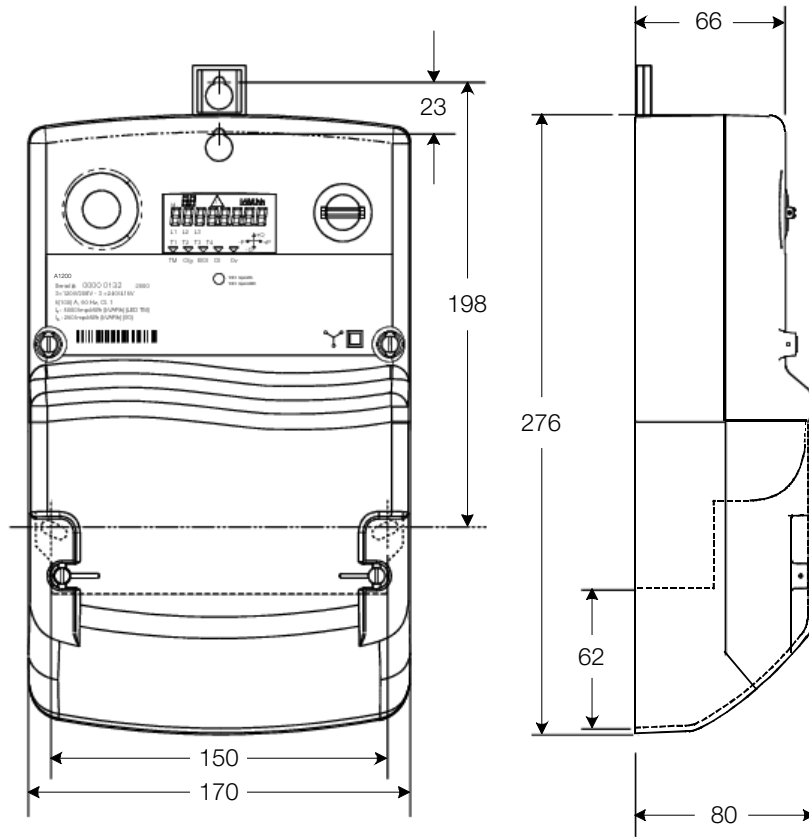


Figure 9. Mounting dimensions (in mm.)

Notes

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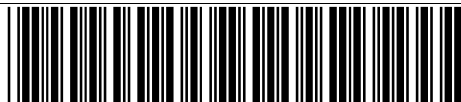
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