

A1800 ALPHA® Meter Installation Instructions

General

This leaflet contains general installation instructions for 4-wire and 3-wire applications of the A1800 ALPHA meters. All meters are factory-calibrated and tested before shipment. For proper installation, accuracy, and maximum life of the meter, use the following installation procedures. For more information about the operation of the meter, see the *A1800 ALPHA Meter Technical Manual* (TIM42-2410).

⚠ 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 precautions are not followed.

Preliminary Inspection

The A1800 ALPHA meter is calibrated and tested at the factory, and it is ready for installation. Follow proper installation and removal procedures for personal safety and protection of the meter.

Before installing and applying power to the A1800 ALPHA meter, a quick inspection of the meter itself is recommended. Check for some of the following items:

- no broken or missing parts
- no missing or broken wiring
- no bent or cracked components
- no evidence of overheating
- check the nameplate to make sure it is appropriate for the service

Physical damage to the outside of the A1800 ALPHA meter could indicate potential electronic damage in the inside of the meter. Do not connect power to a meter that is suspected to have unknown internal damage. Contact your local Elster representative if you suspect your meter may be damaged.

Placing the Meter into Service

See "Wiring Diagrams" on page 7 for illustrations of both internal and connection wiring diagrams.

⚠ WARNING

Circuit-closing devices must be used on current transformer secondaries. Dangerous currents and voltages are present if secondaries are open-circuited. Personal injury, death, or equipment damage can result if circuit-closing devices are not used.

⚠ CAUTION

Make sure to install the correct meter for the service type, maximum current, and capacity required. Always verify that the maximum meter voltage and current ratings are equal to or greater than the maximum service voltage and current. Installing inappropriate meters can damage equipment.

To use the A1800 ALPHA meter effectively and safely, follow this procedure:

1. Make sure that the meter hanger, located on the base of the A1800 ALPHA meter, is in the desired position. Sliding the hanger down to the hidden position 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 it is level. The meter will operate correctly in any position, but failing to mount the meter in a proper vertical position will place the other mounting holes at the wrong place on the mounting panel.

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- Use at least an M6 screw in each of the bottom supporting screws to secure the A1800 ALPHA meter enclosure; the mounting holes are 7.1 mm (0.28 inches) in diameter.

⚠ WARNING

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

- Install the ground connections.

NOTICE

A1800 ALPHA meter terminals are designed for optimum use with copper wiring. For direct connect-rated meters, aluminum wiring can be used but if so, it is extremely important to use proper aluminum wiring practices. Aluminum wiring compound or wiring paste (grease) should be used when attaching the bottom-connected terminals. Tighten the connections, allow them to relax for a few minutes, 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, Elster recommends copper-compatible meter terminals and aluminum wire. Such adapters also can provide for use of larger aluminum conductors that can be otherwise used in the terminals of the A1800 ALPHA meter.

- Ensure that primary or system voltages are either disconnected from a power source or that utility safety practices for handling live circuits are strictly followed.
- If applicable, ensure 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 prior to handling CT connections to the meter.
- Wire the meter using color-coded wire according to locally applicable specifications. The terminal block dimensions on the A1800 ALPHA meter support cable sizes of approximately 5 mm in diameter for transformer rated connections (10 mm in diameter for direct connect).
- After wiring the meter and making any communication and relay connections, assemble the terminal cover and apply power.

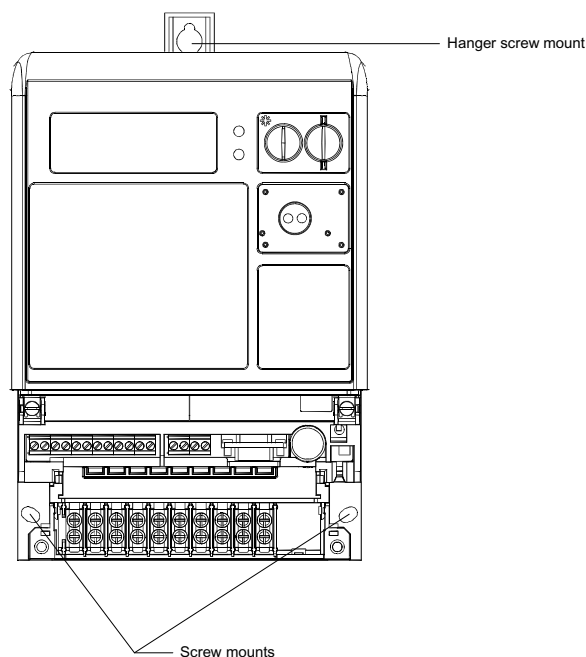
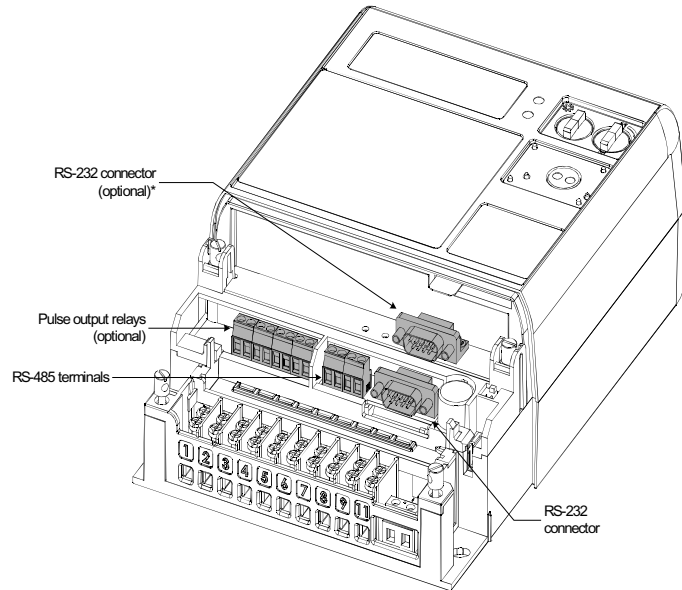
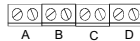


Figure 1. A1800 ALPHA meter mounting screw locations



*Present when optional second communication port is installed

Pulse output relay default values

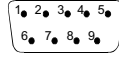


A = Wh del
 B = varh del
 C = Wh rec
 D = varh rec

RS-485 connections

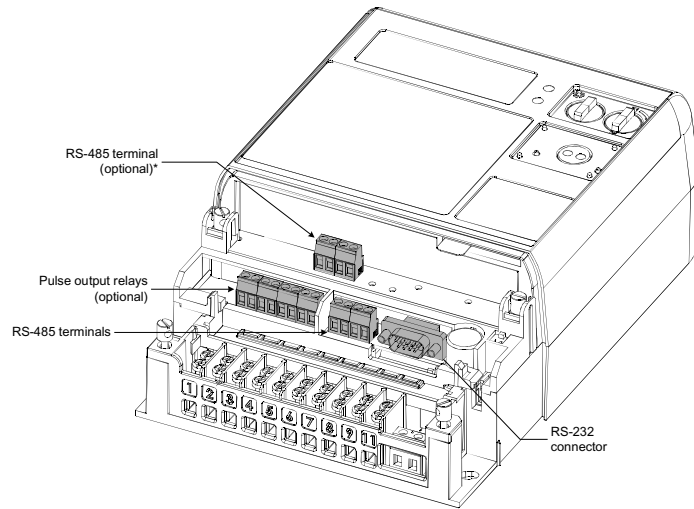


RS-232 connector



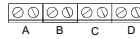
1 = NC 6 = DSR
 2 = Rx 7 = RTS
 3 = Tx 8 = NC
 4 = DTR 9 = NC
 5 = GND

Figure 2. A1800 ALPHA meter with RS-232 as second communication port



*Present when optional second communication port is installed

Pulse output relay default values

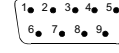


A = Wh del
 B = varh del
 C = Wh rec
 D = varh rec

RS-485 connections



RS-232 connector



1 = NC 6 = DSR
 2 = Rx 7 = RTS
 3 = Tx 8 = NC
 4 = DTR 9 = NC
 5 = GND

Figure 3. A1800 ALPHA meter with RS-485 as second communication port

Installing a TOU Battery

The TOU battery is replaceable without breaking the meter seal. Use only Elster-recommended TOU batteries. See your Elster representative for details.

⚠ WARNING

The meter should be de-energized before installing the battery. Dangerous voltages are present; and equipment damage, personal injury, or death can result if safety precautions are not followed. Use authorized procedures to install the battery while power is removed from the meter.

Before installing the battery, the A1800 ALPHA meter must have been energized for at least 1 minute within the preceding 60 minutes. This ensures that the supercapacitor is properly charged and that the battery is not immediately drained upon installation. If this is not done, then the battery may be damaged and the meter may not function correctly. While the meter is powered, verify that the LCD is active and functioning.

To install the battery:

1. If the meter has not been energized for at least 1 minute during the previous 60 minutes, energize the meter for 1 minute. If the meter has been energized for at least 1 minute during the previous 60 minutes, proceed to step 2.
2. De-energize the meter.
3. Remove the terminal cover screws and seals.
4. Remove the terminal cover to expose the battery well.

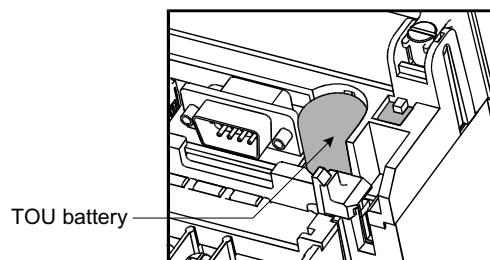


Figure 4. Battery well and connector

5. Slide the battery leads into the connector to the right of the battery well.
6. Place the battery firmly in the battery well.
7. Replace the terminal cover.
8. Energize the meter and verify that the LCD becomes active and functioning properly. Verify that the low battery symbol on the meter LCD is not displayed.
9. Replace the terminal cover screws and seals.
10. Reprogram the meter or clear the errors (as necessary).

Troubleshooting

NOTICE

Not following this procedure can cause the meter to function improperly. In case a battery has been installed correctly and the meter is not functioning properly (for example, display is blank but the meter is powered), use the following procedure.

1. De-energize the meter and let it sit without power for 48 to 72 hours. This provides sufficient time for the supercapacitor to discharge and for the microcontroller to shut down.¹
2. Energize the meter for at least 1 minute. The microcontroller should power up correctly and the supercapacitor will charge. Verify that the LCD becomes active and functioning correctly.
3. De-energize the meter and insert the battery, following the instructions earlier in this section.

¹ If the battery was installed with the polarity reversed, the battery should not be damaged. If the battery was installed without having the meter properly energized, then the battery will lose approximately 8.5 % of its service life each day.

If the meter still does not function properly, then it should be returned to the factory.

Initial Setup

After installing and powering the A1800 ALPHA meter, verify the following:

- The system service voltage test (if enabled) shows the valid service for this installation. The phase rotation, service voltage, and service type should be indicated on the LCD. Other validation information can be obtained using the system instrumentation display quantities.
- All potential indicators (from 1 to 3 depending on the wiring) are present and are not blinking. A blinking indicator means that the phase is missing the required voltage or is below the programmed minimum voltage threshold value.
- The LEDs are blinking and the energy direction indicators on the LCD show the correct energy flow direction.
- Required meter seals are in place.
- Any information (such as registration and location of the meter) has been recorded.

NOTICE

If the meter is not working correctly after it has been installed, then check for improper installation or wiring. If the installation and wiring are correct, then verify these other areas:

- the meter installation matches the meter nameplate
- the correct type of A1800 ALPHA meter is installed in the existing service
- no evidence of mechanical or electrical damage to either the meter or the installation location
- the service voltage falls within the operating range as indicated on the nameplate
- the optical port is free of dirt or other obstructions

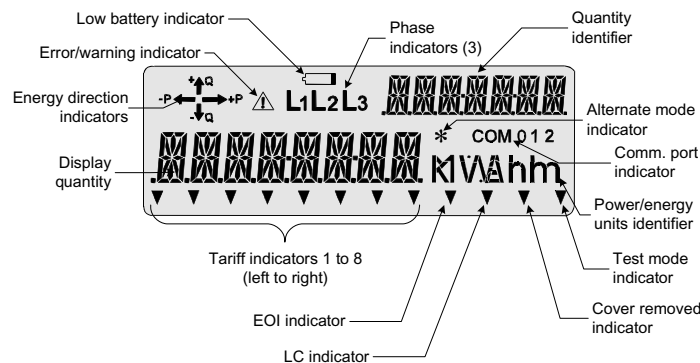


Figure 5. A1800 ALPHA meter LCD

Marking the Utility Information Card

The utility information card can be removed without breaking seals and removing the meter cover screws. Note: the direct connect meter uses a blank card.

To remove the utility information:

1. Remove the terminal cover as described above.
2. Grasp the protruding utility information card tab firmly and pull the card out slowly from under the meter cover.

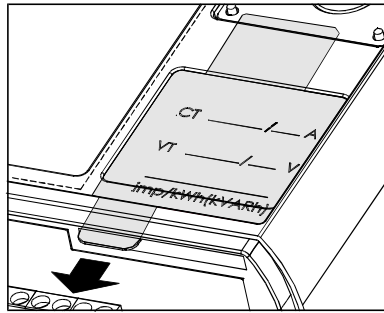


Figure 6. Removing the utility information card

3. Mark the card as needed.

Removing the Meter from Service

Use the appropriate procedure when removing an A1800 ALPHA meter from service.

▲ WARNING

Use authorized utility procedures to remove metering equipment. Dangerous voltages are present, and equipment damage, personal injury, or death can result if safety procedures are not followed.

▲ WARNING

Circuit-closing devices must be used on current transformer secondaries. This applies to CT-connected meters. Dangerous currents and voltages are present if secondaries are open-circuited. Equipment damage, personal injury, or death can result if circuit-closing devices are not used.

If it becomes necessary to remove an A1800 ALPHA meter from service, use the following procedure:

1. Before disconnecting the meter, make sure that the existing meter data has been copied, either manually or electronically using Elster meter support software.
2. Remove the voltage and disconnect the current circuits.
3. Break the seal holding the A1800 ALPHA meter terminal cover in place.
4. Remove the terminal cover screws and take off the terminal cover.
5. Disconnect the wiring.
6. Remove the lower supporting screws.
7. Lift the meter off the top supporting screw.

Removing the Battery

▲ WARNING

The meter should be de-energized before removing the battery. Dangerous voltages are present; and equipment damage, personal injury, or death can result if safety precautions are not followed. Use authorized procedures to remove the battery while power is removed from the meter.

Use the following procedure to remove a battery from an A1800 ALPHA meter:

1. De-energize the meter.
2. Remove the terminal cover to expose the battery well.
3. Firmly grasp the battery and lift it from the well.
4. Disconnect the battery leads from the connector.
5. Replace the terminal cover and ensure the seals are in place.

If the removed battery is still in working condition, it can be stored safely for future use. Non-functioning batteries should be disposed of according to local laws, regulations, or electric utility policies.

Wiring Diagrams

Direct Connected

The A1800 ALPHA meter can be ordered for direct connected service. Refer to the wiring diagram on the nameplate for each meter for specific terminal assignments. All connections are equipped with combination-head screws that accept either a slotted or Phillips screwdriver.

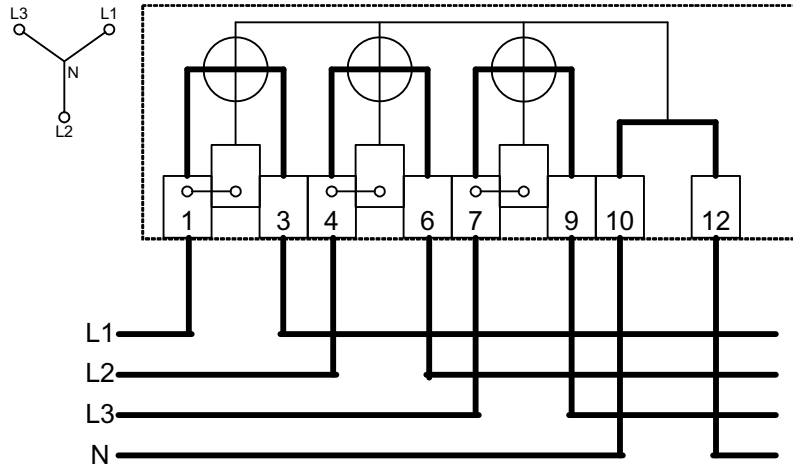


Figure 7. 3-element, 4-wire wye or 4-wire delta

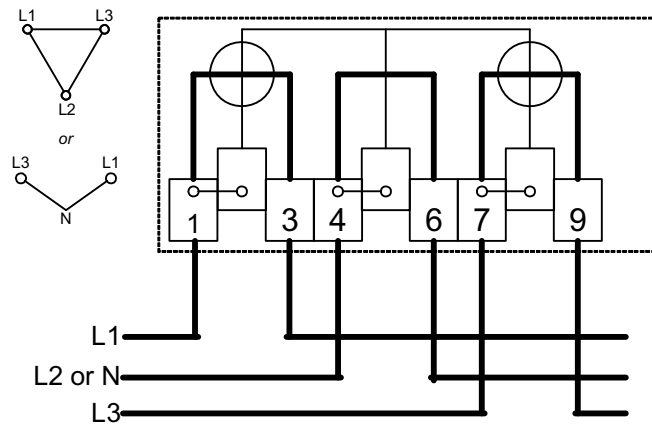


Figure 8. 2-element, 3-wire delta or 3-wire network

CT-connected meters

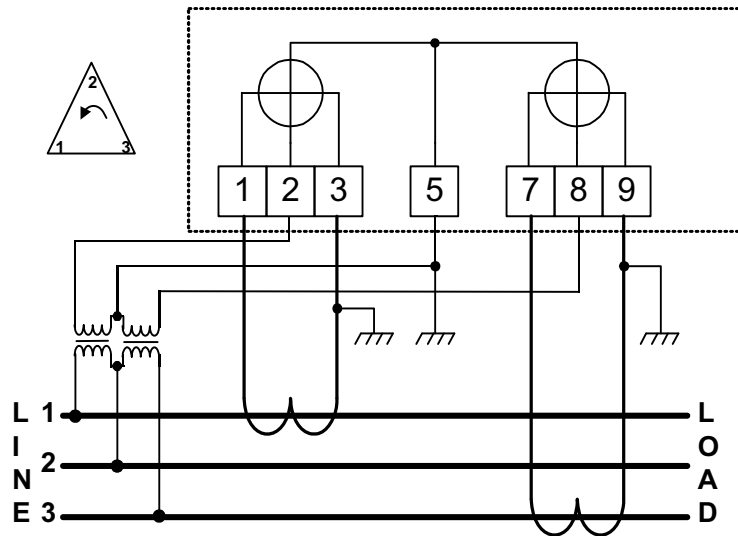


Figure 9. 2-element, 3-wire delta, transformer connected

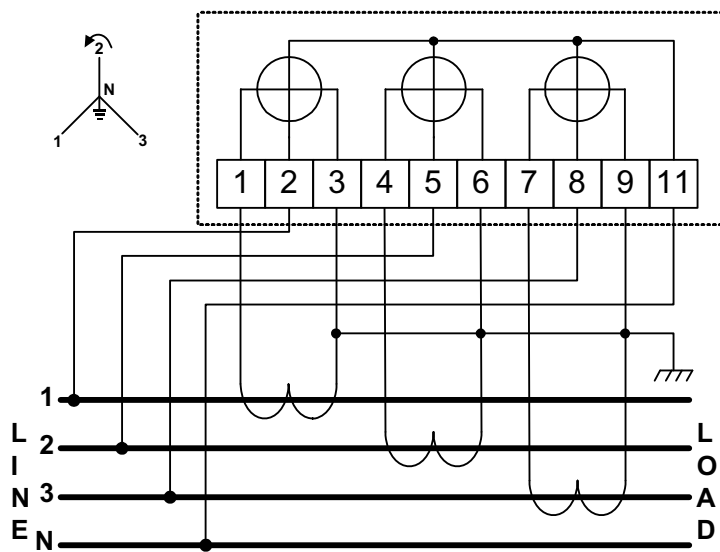


Figure 10. 3-element, 4-wire current transformer, sequential connection

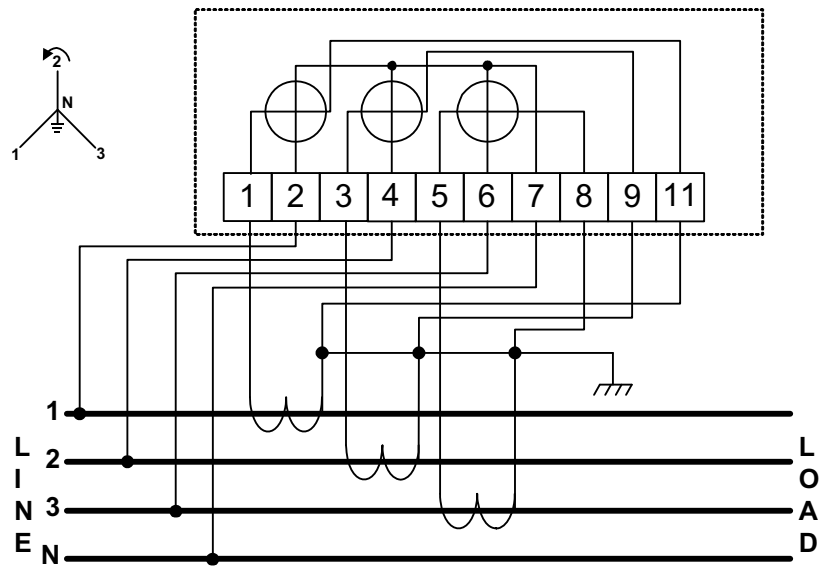


Figure 11. 3-element, 4-wire current transformer, symmetrical connection

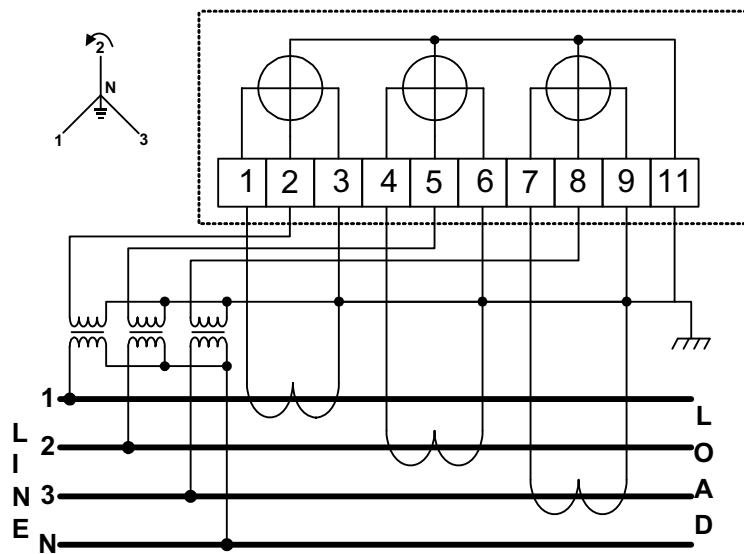


Figure 12. 3-element, 4-wire instrument transformer, sequential connection

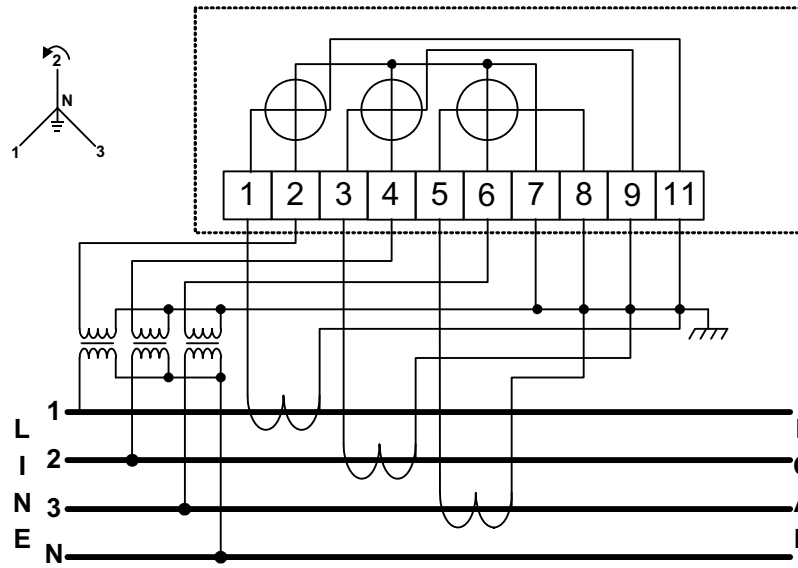


Figure 13. 3-element, 4-wire instrument transformer, symmetrical connection

Mounting dimensions

The A1800 ALPHA meter has the mounting dimensions as shown in the following figures.

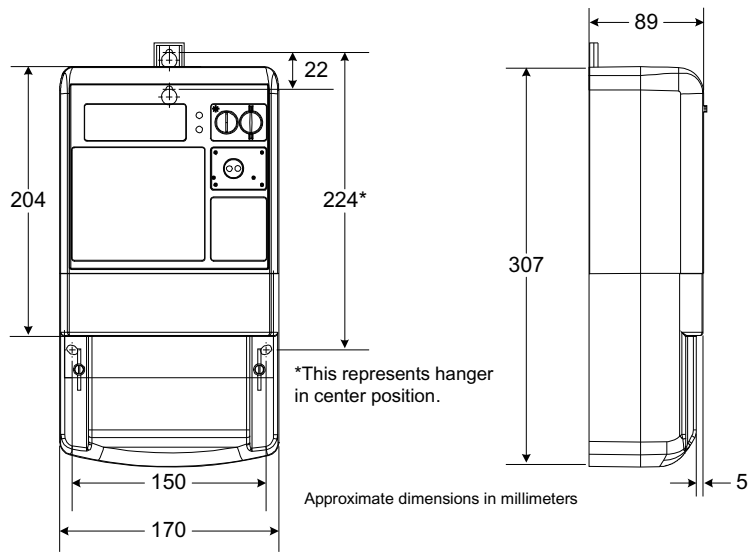


Figure 14. A1800 ALPHA meter, standard terminal cover (in millimeters)

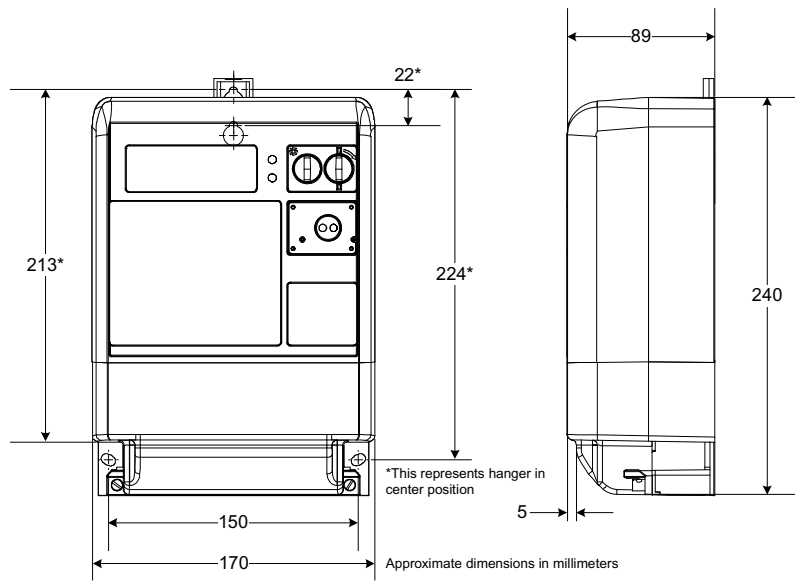
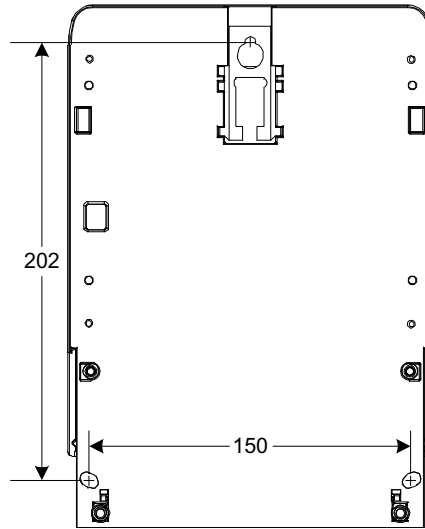
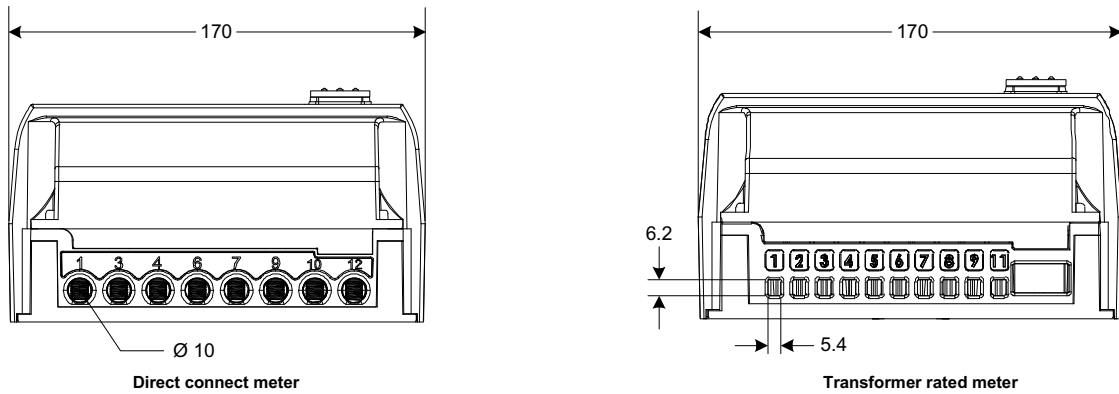


Figure 15. A1800 ALPHA meter, short terminal cover



Approximate dimensions in millimeters.

Figure 16. A1800 ALPHA meter, back of meter



Approximate dimensions in millimeters.

Figure 17. A1800 ALPHA meter, bottom view (direct connect and transformer rated)

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