Site Preparation Checklist

CAUTION *Review the guidelines given in the Trio Installation Manual, Precautions and Safety Precautions sections. These guidelines are vital to ensuring both personal safety and proper controller functioning. Trio units must be installed by an authorized electrician.*

1.1 Installation

☐ Install the controller in a separate ventilated control room:

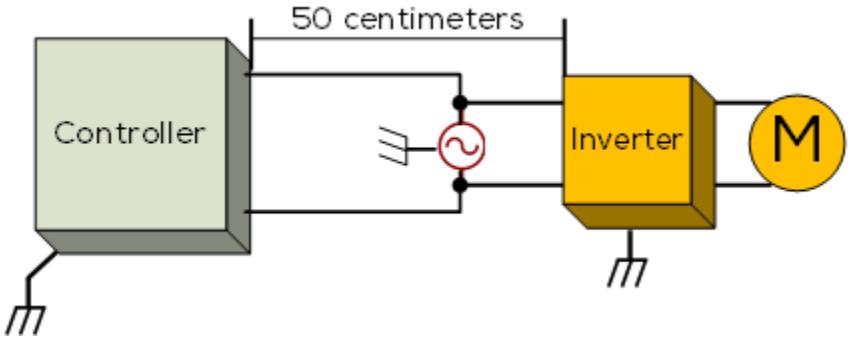
- Whose temperature is within the operating temperature.
- That is protected from the rigorous environments found in the barns/rooms.

☐ Munters strongly recommends that only panel mount (metal) controllers be installed directly in an electrical cabinet. Refer to the Installation Manual.

Note: Not applicable in American installations.

☐ If Trio is installed in an electrical cabinet, ensure that no contactors are in that cabinet. Placing this unit in proximity to contactors results in severe signal interference.

☐ If the electrical panel includes inverters, ensure that the controller is at least 50 centimeters from the inverters



☐ Ensure that low voltage wires can be separated from high voltage wires (at least 20 cm).

☐ Place the controller so that the operators can easily operate the controller and read indicators and displays.

☐ **Rotem Trio 70**: Ensure that the wall can support the Expansion unit's weight!

☐ Any expansion unit should be within 100 meters of the controller (RS-485 connection)

1.2 Temperature/Air Flow

Refer to the Installation Manual for a complete listing of the product specifications.

- [ ] Operating Temperature Range: 0° to +50° C (+32° to +125°F).
- [ ] Storage Temperature Range: -10° to +50° C (+14° to +125°F).
- [ ] Exhaust fans: Panel housing can be equipped with exhaust fans. The fans' capacity depends on local conditions.

  Note: Not applicable in American installations.

1.3 Main Power Supply

- [ ] There must be a stable power supply to the farm. The farm owner is solely responsible. Any break in the power supply can endanger the livestock, flocks, and equipment. A backup generator that cuts in automatically in the event of a power failure can be installed for this purpose.
- [ ] Voltage: 100 – 240 VAC
- [ ] Frequency: 50 Hz/60 Hz
- [ ] Equip Trio Controller with a 10A breaker (minimum).

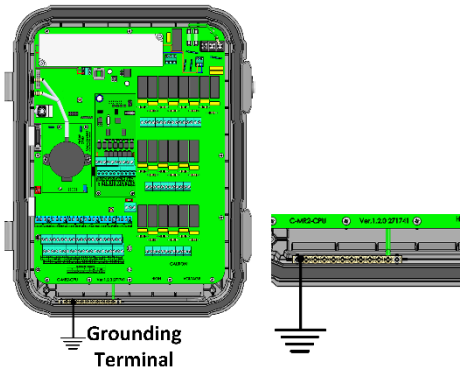
1.4 Battery

- [ ] Munters recommends having several standard 3V (minimum) CR2032 lithium batteries on site.

1.5 Grounding

Refer to the Trio Installation Manual or more details on proper grounding.

☐ Site grounding system resistance value: ≤ 5Ω, one point only.

Grounding terminal must be connected to the inbox grounding terminal.	

1.6 Protection Devices

☐ Munters recommends that each Trio controller be equipped with an RPLP (when the electrical supply is unreliable). The RPLP protects controllers from electrical surges. Refer to the following manuals for more information:

- RPLP 115 Manual (P/N: 110777)
- RPLP 230 Manual (P/N: 110767)

☐ Munters highly recommends installing industry standard lightning rods on all farms.

☐ Munters recommends installing RIT-50 Isolated transformers in areas which suffer from frequent lightning strikes. Refer to the following manual for more information:

- RIT 50 Manual (P/N: 116916)

1.7 Sensors

Refer to the Trio Installation Manual for more details on how to wire input/output devices to the controller.

☐ All signal cables must have a shield wire. This includes sensors, weighing equipment, and bird scales. The shield wire needs to be connected for the entire length of the wire run.

☐ All signal cables must be grounded. This includes sensors, weighing equipment, and bird scales.

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☐ Sensor cable size:

- United States/Canada: 22 AWG (minimum) twisted (
- ROW: 22 AWG twisted. Refer to Appendix 1.

☐ The cable between controllers and sensors must not have joints.

☐ Keep low voltage wires (sensor cables) separate from high voltage wires.

1.8 Intra-Controller Communication

☐ Refer to Appendix 2: LAN Cable Information for information on setting up communication between Trio units.

☐ Controllers and expansion units must be connected via COM, TX, and RX wiring. Cable type: Twisted pair, shielded.

☐ In situations where there are at least two Trio controllers installed in a daisy chain in two different houses, install a grounding shield cable to one controller only.

1.9 Internet

☐ To ensure remote control and management (including alarm notifications), there must be a stable internet connection at all times. Trio supports LAN, local Wi-Fi, and cell modems (optional). The cell modem provides backup for situations in which LAN-based internet is not available.

1.10 Signature

I confirm that all the above requirements have been met before installing Trio Controller.

Site owner/Manager Name: _____

Signature: _____

2 Appendix 1: Cable Information

Communication Type	Cable Type	Gage
232 Wired Communication	3-wire shielded cable	At least 22 AWG/0.34 mm2
485 Wired Communication	2-wire shielded cable; must be twisted pair (the pair connects to A, B. No Com)	At least 22 AWG/0.34 mm2
485 Isolated Wired Communication	4-wire shielded cable; must be twisted pair (One Pair to A, B./the other pair to Com)	At least 22 AWG/0.34 mm2

- High voltage devices:
  - 110 Volt: wire size 12 or 14 AWG/4 or 2.5 mm2
  - 220 Volt: wire size 16 or 18 AWG/1.5 or 0.75 mm2
- Low voltage deices:

Recommended Maximum Length	Cable Gage and Length	Shield	Number of Wires	Twisted Pair	Type of Connection	Notes
1640 feet (500 meter)	AWG 22 (0.65 mm copper)	Yes	3	No	RS-232	
3280 feet (1000 meter)	AWG 22 (0.65 mm copper)	Yes	2	Yes	RS-485	Do not connect to COM.
3280 feet (1000 meter)	AWG 22 (0.65 mm copper)	Yes	4	Yes	RS-485 Isolated	Do not connect COM to GND
330 feet (100 meter)	AWG 22 (0.65 mm copper)	Yes	4	No	Feed, Silo, Load Cell	
330 feet (100 meter)	AWG 22 (0.65 mm copper)	Yes	4	No	Bird Scale	
330 feet (100 meter)	AWG 18 (1.00 mm copper)	Yes	2	No	Temperature Sensor	

Recommended Maximum Length	Cable Gage and Length	Shield	Number of Wires	Twisted Pair	Type of Connection	Notes
330 feet (100 meter)	AWG 22 (0.65 mm copper)	Yes	4	No	Humidity Sensor	
330 feet (100 meter)	AWG 22 (0.65 mm copper)	Yes	2	No	Wind Speed Sensor	
330 feet (100 meter)	Yes	4	No	Wind Direction Sensor 1000 feet		
(300 meter) AWG 22	AWG 22 (0.65 mm copper)	Yes	2	No	CO2 Sensor	
65 feet (20 meter)	AWG 22(0.65 mm copper)	Yes	2	No	Water Meter	

NOTE The cable sizes listed are the minimum recommended sizes.

3 Appendix 2: LAN Cable Information

3.1 Wire/Optical Ethernet Infrastructure Basics

- Wire Ethernet 1100/1000 BaseT Copper
  - Media – CAT5E or CAT6 Cable with maximum segment length of 100 meters
- Optical Ethernet 1000Base-X Optical
  - 1000Base-SX Media – Short Haul multi-mode optic fiber (MMF) with maximum segment length of 220 meters (62.5/125µm type) or 550 meters (50/125µm type)
  - 1000Base-LX Media – Long Haul single-mode optic fiber (SMF) with maximum segment length of 10000 meters
- Connectivity
  - Connectivity is Point-to-Point using 100/1000 Switches
  - Low latency network
- Equipment
  - Wire Switch serves for Ethernet switching over wire connectivity
    - Could be with preinstalled specific Optic Transceiver (short or long haul)
    - Could be with the SFP port, serving for pluggable SFP Optic Transceiver
  - SFP Transceiver pluggable device serving to transmit data over optic fiber
    - 1000Base-SX SFP serves for multi-mode optic fiber (MMF) of 62.5/125µm type or 50/125µm type
    - 1000Base-LX SFP serves for single-mode optic fiber (SMF)
  - Media Converters server for converting from optics to wire and vice versa. This is used for segments over 100 meters / 330 feet.

3.2 Trio Connectivity: 100/1000Gbps Ethernet Switch

- The switch is wired to the router and modem to access the Internet.
- Switches can be wired to each other by Ethernet cables, each one splitting off to other devices.
- Gigabit switches support 100 and 1,000 Mbps.