

OTP SYSTEM ENGINEERING & METERING CONCEPTS

Scott Sigette

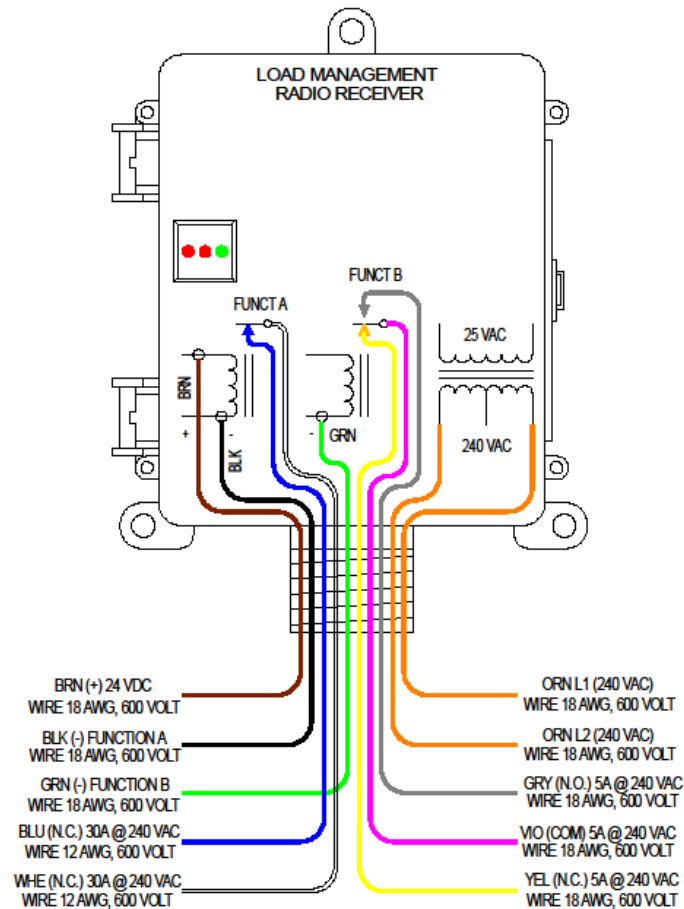
Devils Lake & Rugby Energy Management Rep

LOAD MANAGEMENT CONTROLLER CONNECTIONS

OTP Contractor Workshop

1. LMR Overview
2. Water Heating
3. Residential Demand Control (RDC)
4. Rates with Penalty Demand
5. Cool Savings (Air Conditioning)
6. Fixed Time of Service

OTP LOAD MANAGEMENT RECEIVER (LMR)

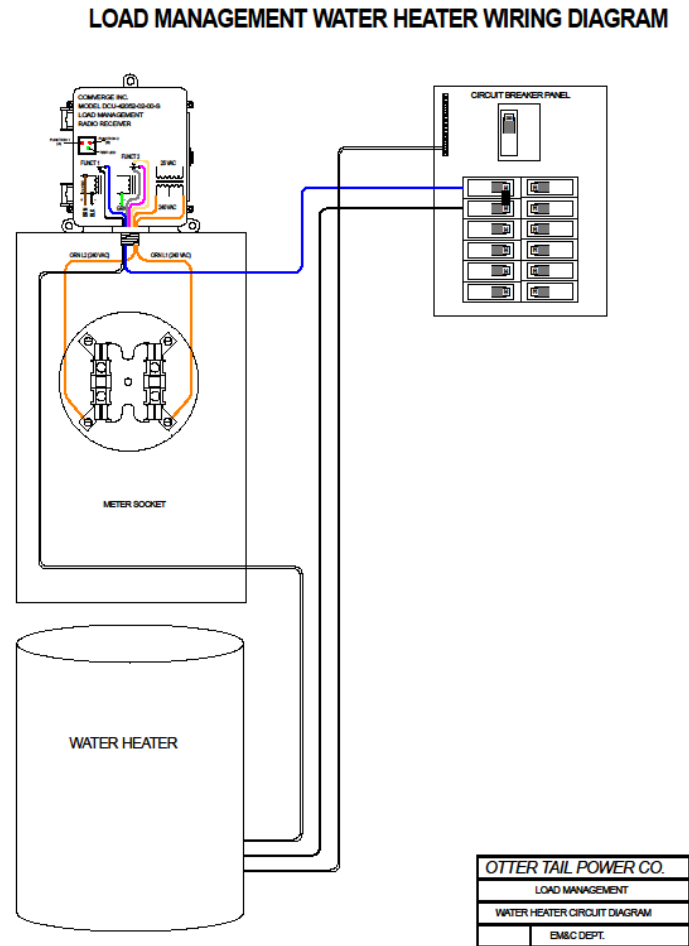


| | |
|--------------------------------|------------------------|
| OTTER TAIL POWER CO. | |
| LOAD MANAGEMENT RADIO RECEIVER | |
| WIRING SPECIFICATION | |
| 8/3/01 | DALE HANSON EM&C DEPT. |

- Itron (Comverge)
- Aging technology
- Stand alone infrastructure
- Radio Frequency Technology
- Ad hoc control
- Multiple control options

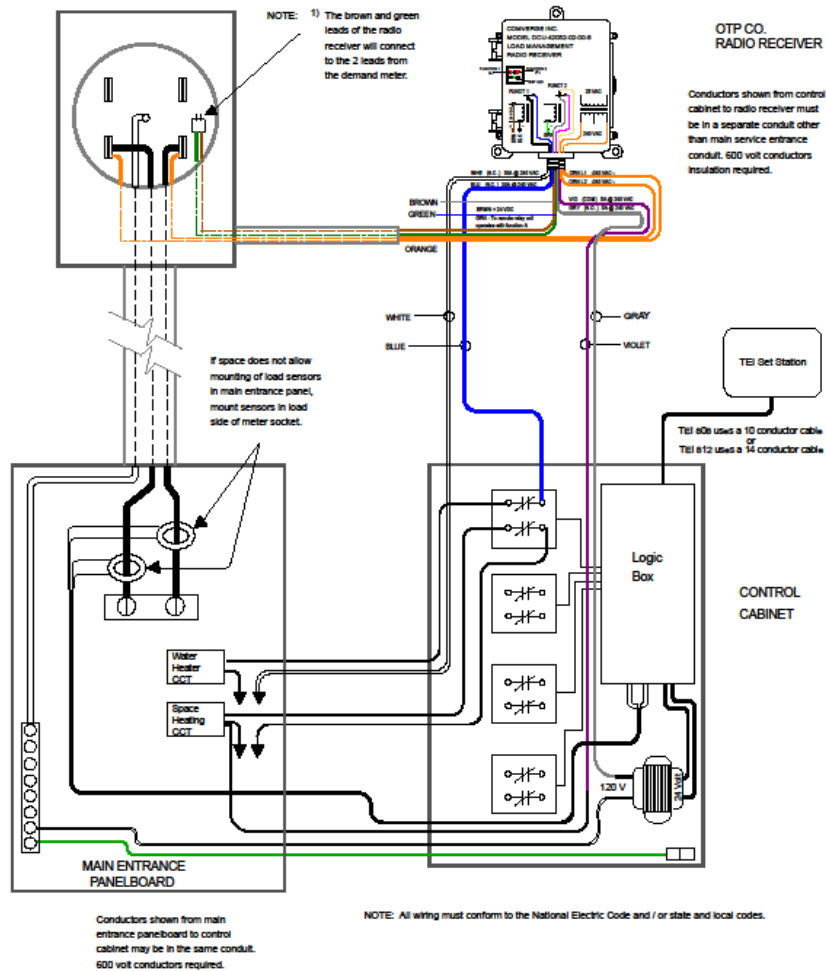
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WATER HEATING



- Breaking the 240V line voltage
 - Properly size conductor
 - Out to meter socket
 - Connections in meter socket by OTP only
 - OTP to install LMR and make all connections in the meter socket
 - Contractors responsible for all customer connections
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RESIDENTIAL DEMAND CONTROL (RDC)



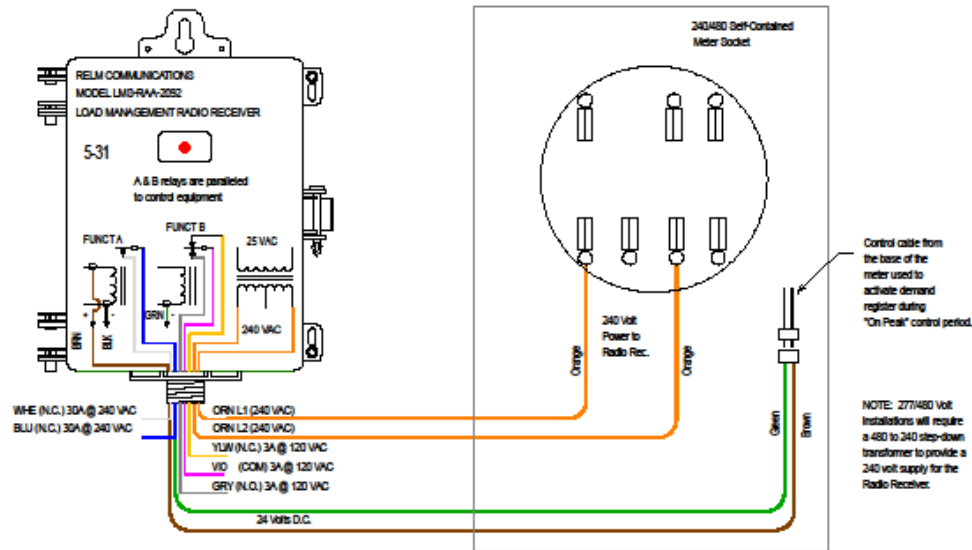
TEI 808/812 & TSP-S2 INSTALLATION

Used to keep TEI set station energized to display data at all times. A contact closure in the OTP Co. Receiver causes demand control operation to begin at the demand level specified by the TEI set station. Shed lights turn on to indicate control is in process.

- Breaking multiple loads
 - Line voltage
 - Low voltage
 - Other relays
 - Control circuits
- OTP
 - Install LMR
 - Install/program meter
 - Make all connections in the meter socket
 - Provide RDC equipment for install
- Contractor Responsibilities
 - Install RDC equipment
 - Make all connections to customer equipment
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RATES WITH PENALTY REGISTERS

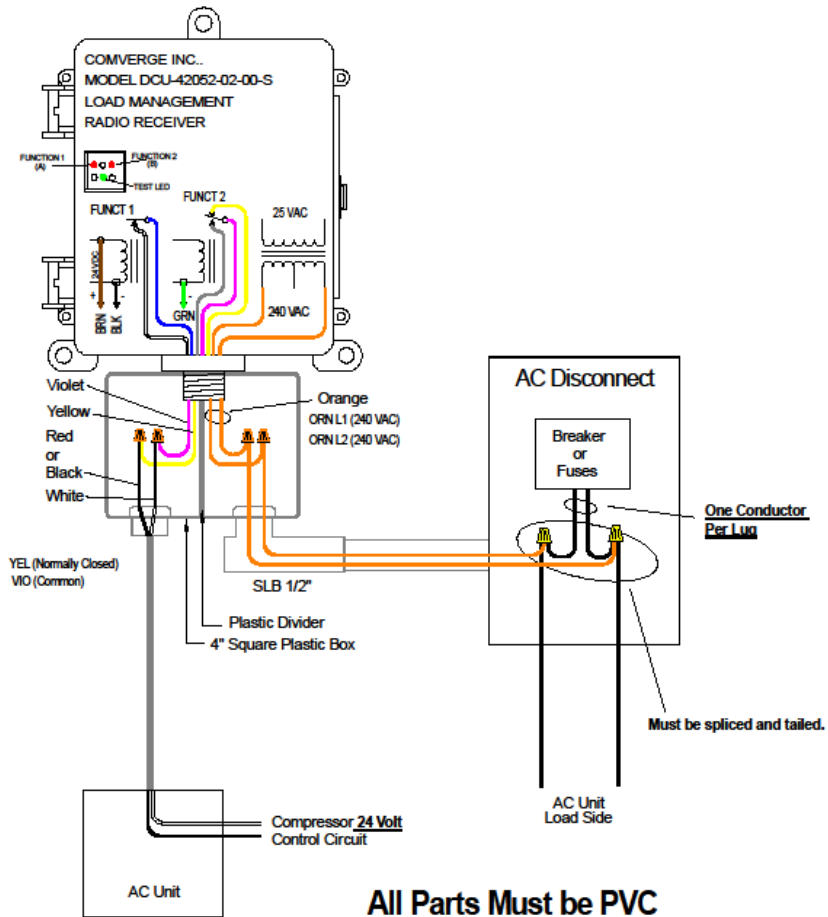
Irrigation - Time of Use



- Penalty register is active only during control
 - LDF, SDF, Irrigation (example shown)
- OTP
 - Install LMR
 - Install & program meter
 - Make connections to equipment in meter socket
- Contractor Responsibilities
 - Provide control wires for customer load in meter socket.
 - Connections to customer equipment
 - Verify customer proper connectivity
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COOL SAVINGS (AIR CONDITIONING)

Air Conditioning Radio Receiver

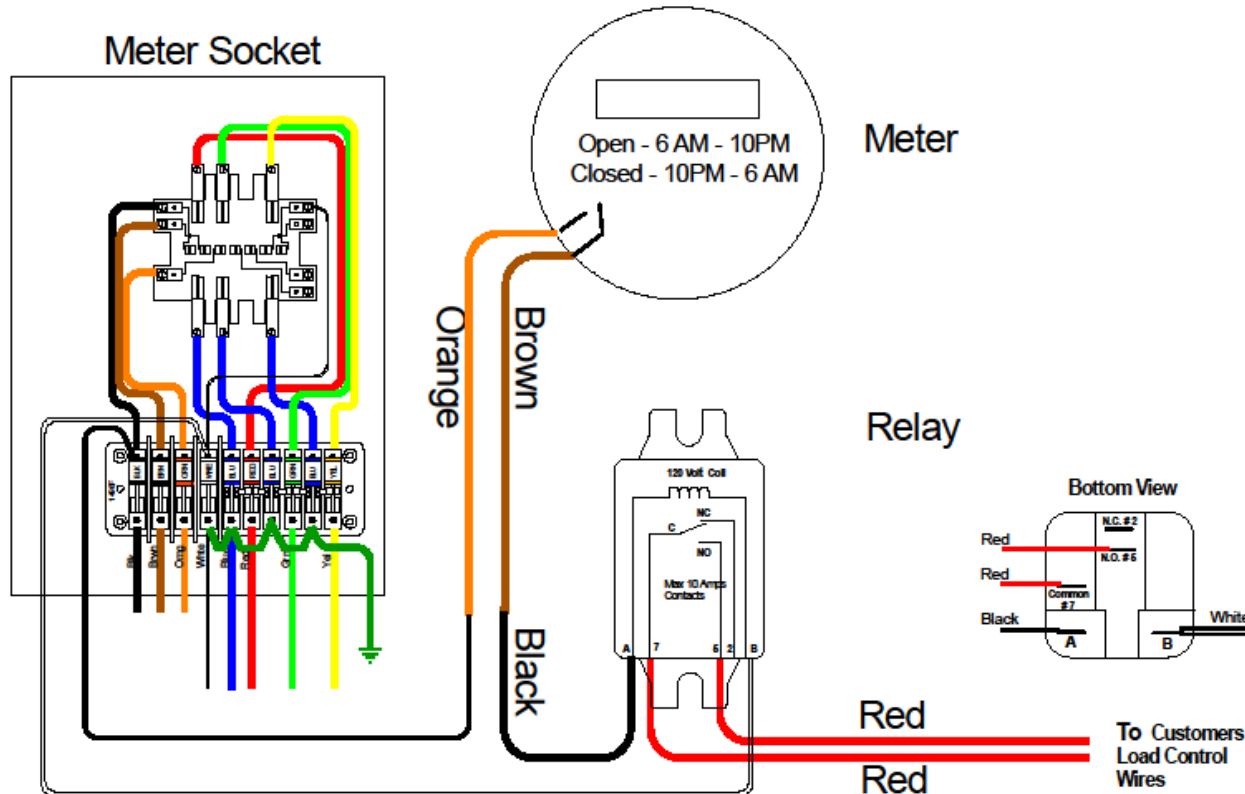


All Parts Must be PVC
(metal screws exempt)
No Ductless AC
No Commercial Buildings

- All connections by the Electrical Contractor
- Breaking the control circuit
- Pulling power from the A/C disconnect
 - Pre-defined list of contractors
 - If interested, ask how to get on the list
- Must also be removed by an Electrical Contractor
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FIXED TIME OF SERVICE (DELIVERY) – NO LMR

Fixed Time of Delivery



Allow operation of customer load only during defined times

OTP Responsibilities:

- Install/program meter
- Install control relay
- Make all connections in the meter socket
- Verify proper operation of OTP equipment

Contractor Responsibilities

- Provide control wires to meter socket
- Make all connections to customer equipment
- Verify customer equipment control

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RDC lease-to-buy program

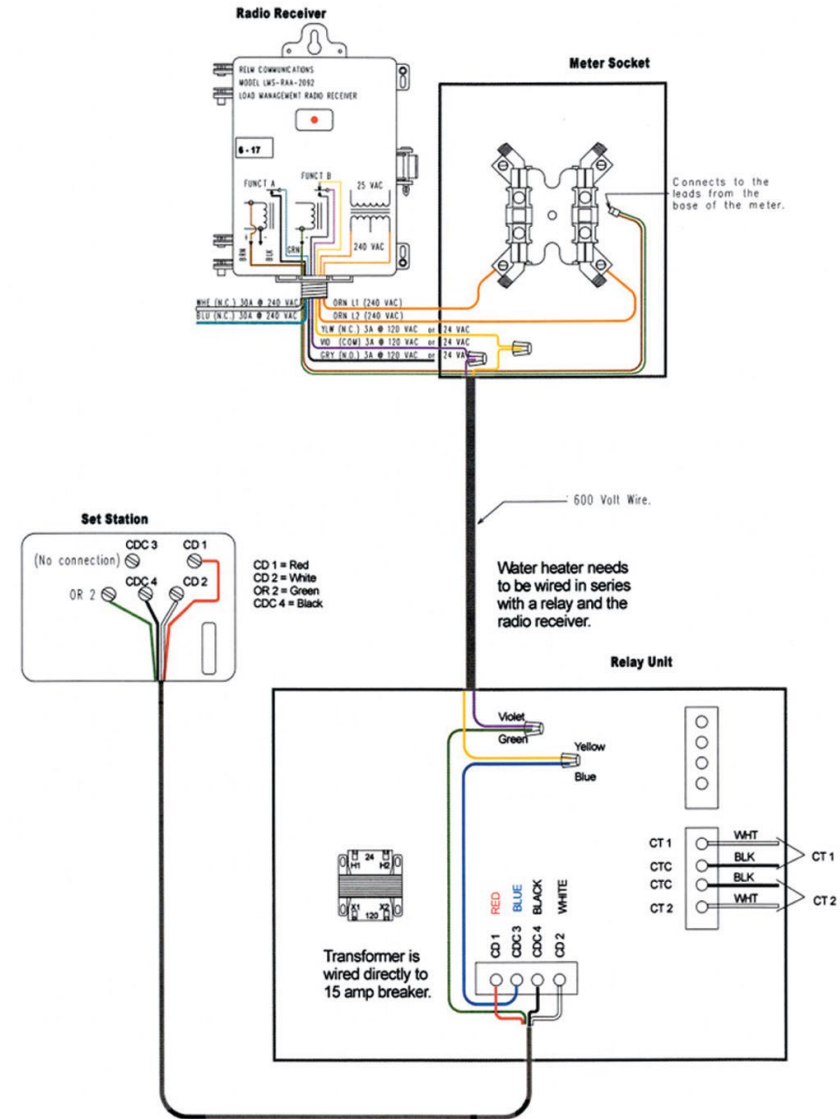
We offer for sale or lease a Brayden 9312 residential demand controller with 8i, 10i, 12i, 14i, or 16i relay options.

This is a full-feature demand controller. Its display allows system monitoring with large LED digits. The audible alarm sounds if the customer exceeds the set demand limit. And it allows the customer to reprogram appliance control order without an electrician.

Purchase price is \$875.

Customers may choose to take advantage of our lease-to-buy program that features 48 monthly payments of \$20 and a final buyout payment of \$1.

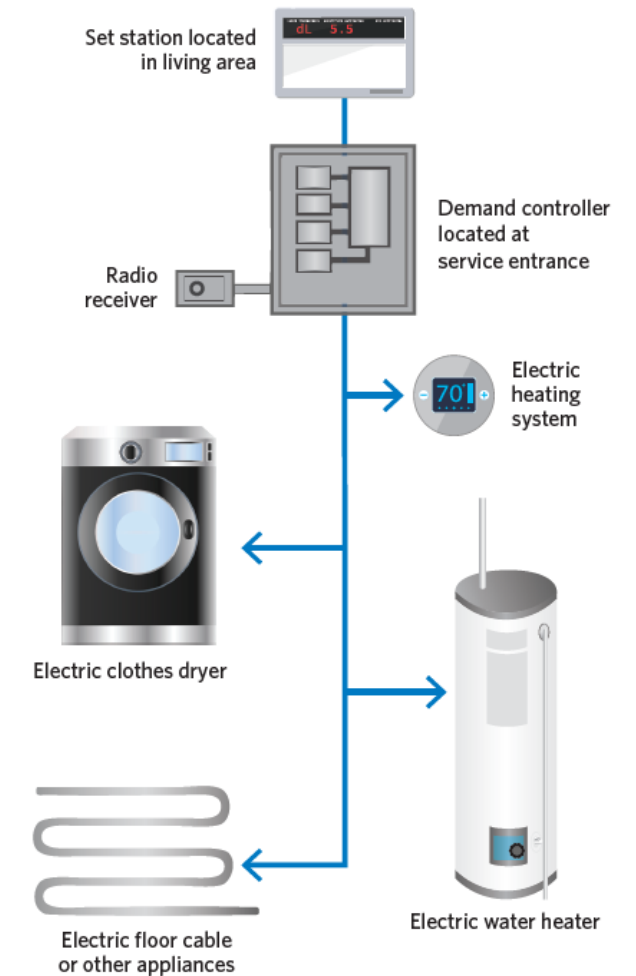
RDC WIRING DIAGRAM



RDC – HOW IT WORKS

- Connected load automatically drops during winter control events to achieve customer's set point.
- If demand still exceeds the customer's set point, the RDC will provide an alarm for manual attention.
- RDC can be controlled up to 14 hours/day (tariff maximum) in emergency.
- Otter Tail provides recovery periods after 5 hours of control.
- Water heating is the only load controlled during the summer season.
- Customers are eligible for the CoolSavings cycled AC program and receive bill credits.

Typical RDC system configuration

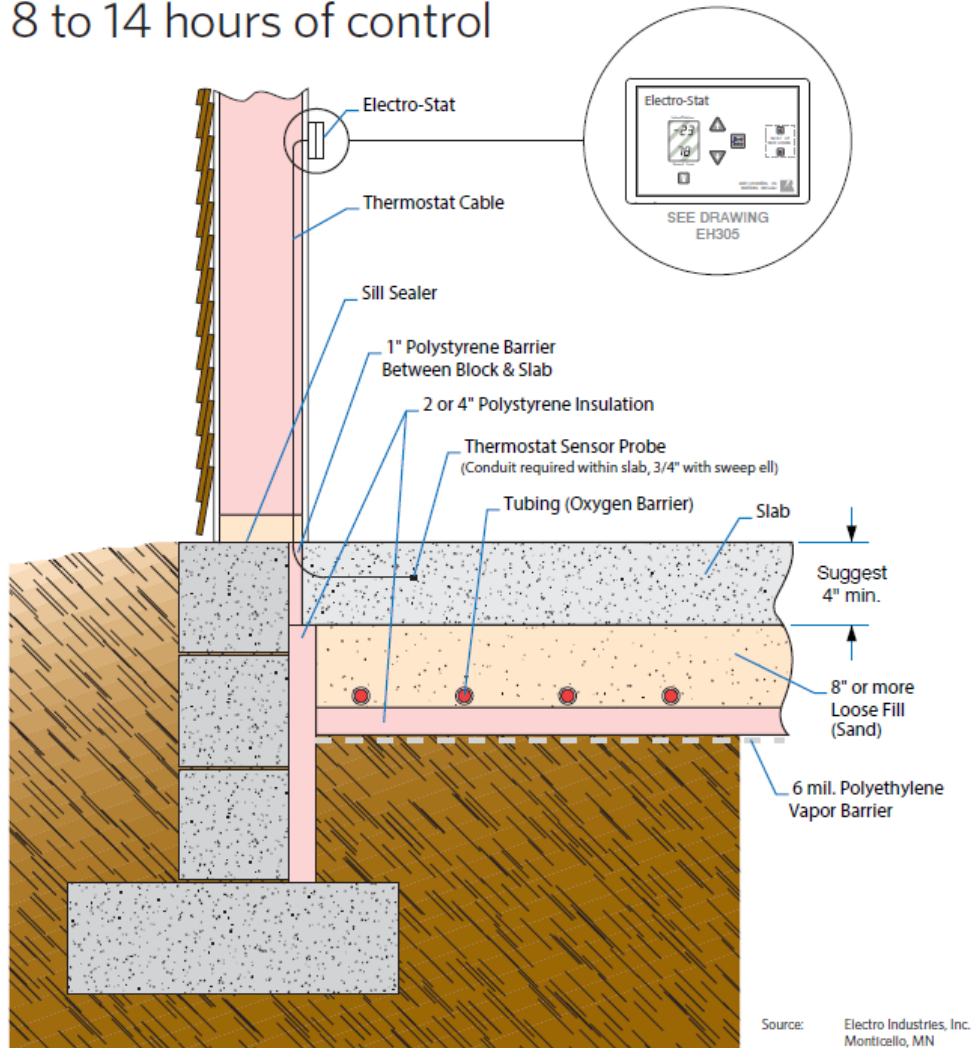


THERMAL STORAGE

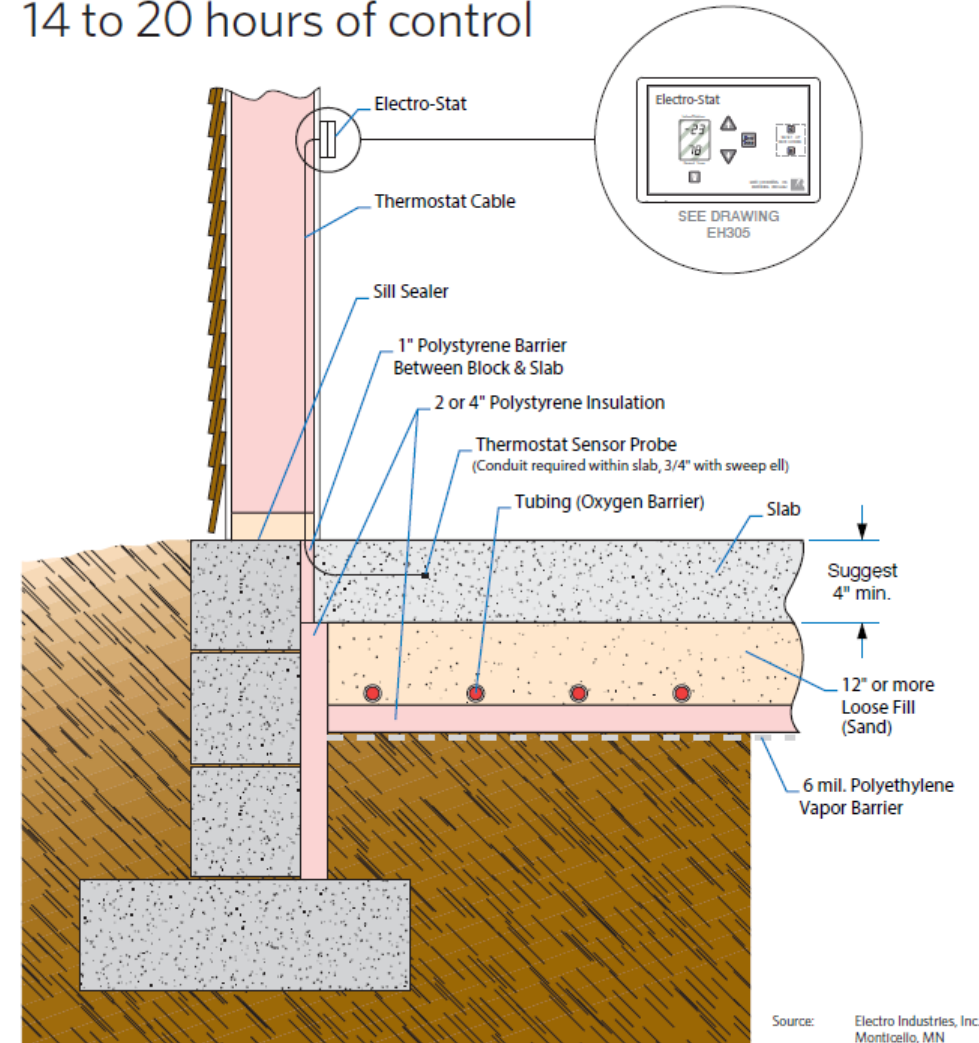


THERMAL STORAGE – PAGE 58-59

Underfloor thermal storage 8 to 14 hours of control



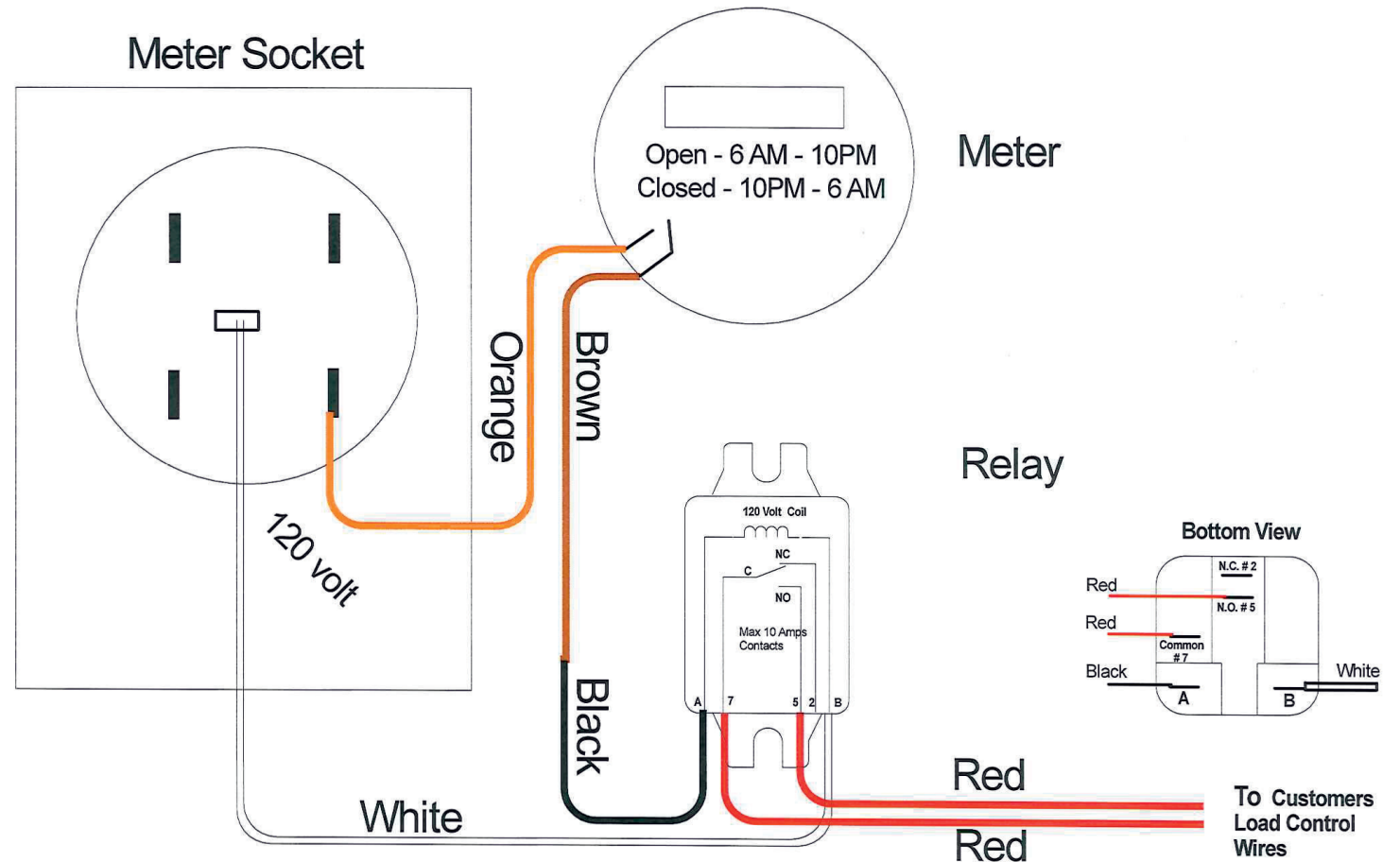
Underfloor thermal storage 14 to 20 hours of control



ELECTRIC VEHICLE & FIXED TIME OF DELIVERY WIRING



Fixed Time of Delivery



AMI METER DEPLOYMENT - 2024



- **Why advanced meters benefit you**
- AMI is a technology upgrade that lays the groundwork for us to better meet your needs for reliable service. When combined with the systems we have in place today—and those we've identified for future implementation—you'll have more visibility into your energy use (helping you save energy and money) and we'll be able to respond to outages faster and more precisely.
- Long term, advanced meters help us keep your costs low and will provide insight into new rate options that can help you save money.
- As your energy provider, we're committed to meeting your needs for reliable service and the continuous improvement of our systems. AMI is the next step toward building a stronger electrical system, allowing us to continue delivering safe, reliable, and cost-effective energy for decades.

[Advanced Metering Infrastructure | Otter Tail Power Company \(otpc.com\)](https://www.otpc.com)

AMI METER INSTALLATION

Early 2024 estimated installation dates

| Feb 12 to Feb 23 | | Feb 12 to Feb 16 | | Feb 26 to Mar 8 | | Mar 6 to Mar 22 | | Mar 18 to Apr 5 | | Apr 3 to Apr 19 | |
|------------------|-----------|------------------|------------|-----------------|----------------|-----------------|------------|-----------------|---------------|-----------------|--|
| Amiret | Marshall | Arlington | Albee | Lac qui Parle | Appleton | Alberta | Herman | Barry | Lake City | | |
| Astoria | Milroy | De Smet | Bellingham | Louisburg | Big Stone City | Barrett | Hoffman | Beardsley | Kidder | | |
| Bruce | Minneota | Erwin | Boyd | Madison | Clinton | Chokio | Holloway | Britton | New Effington | | |
| Bushnell | Nunda | Hetland | Brandt | Marietta | Correll | Clontarf | Johnson | Browns Valley | Peever | | |
| Colman | Porter | Lake Norden | Burr | Milan | Corona | Cyrus | Kensington | Claire City | Roslyn | | |
| Dell Rapids | Rutland | Lake Preston | Canby | Montevideo | Marvin | Danvers | Kerkhoven | Eden | Sisseton | | |
| Egan | Taunton | Oldham | Castlewood | Nassau | Milbank | Degraff | Morris | Grenville | Veblen | | |
| Elkton | Toronto | | Clear Lake | Reville | Odessa | Donnelly | Murdock | Hammer | Wheaton | | |
| Estelline | Tracy | | Dawson | Saint Leo | Ortley | Dumont | Norcross | Hillhead | | | |
| Flandreau | Trent | | Dempster | South Shore | Summit | Farwell | Pennock | | | | |
| Ghent | Verdi | | Gary | Stockholm | Twin Brooks | Graceville | Sunberg | | | | |
| Green Valley | Ward | | Hayti | Strandburg | Waubay | Hancock | | | | | |
| Hendricks | Wentworth | | Labolt | | Wilmot | | | | | | |
| Ivanhoe | White | | | | | | | | | | |
| Lake Benton | Wilno | | | | | | | | | | |

Dates may change. We'll update this list as we progress through our service area.



otpc.com/AMI

THANK YOU!

