

MicroTech[®] Loop Water Controller

Submittal Sheet

Application

The MicroTech Loop Water (LWC) is a microprocessor-based control panel designed to provide sophisticated control and monitoring of the loop water temperatures of a water source heat pump system.

To accommodate a variety of loop water designs, the LWC-16 provides nine configurable outputs and the LWC-24 provides 17 configurable outputs to use for heat rejection, heat addition, and time clock control.

Features of the LWC

Microprocessor Control Board (MCB)

The MCB is required to hold and execute preprogrammed software that is installed and pretested by the manufacturer. The MCB coordinates all communications between the LWC and the controllers that are connected to the network.

Two Communications Ports

The communications ports allow for network communications using RS-485 and for direct communication with a PC using RS-485 or RS-232.

Keypad/Display

The keypad/display offers a local interface with the LWC controller and a remote interface with the unit controllers. All operating conditions, system alarms, control parameters, and schedules are monitored and modified from the keypad/display.

Loop Supply Temperature Sensor

The Loop Supply Temperature determines if heat addition or heat rejection is required.

Outdoor Air Temperature Sensor

The LWC uses the Outdoor Air Temperature Sensor to find the temperature of the outside air.

Lead-lag of Heat Pump Loop and Open Tower Loop

Allows for lead-lag of two pumps based on run hours or by manual lead command.

Heat Rejection/Heat Addition

Two piping arrangements are available for both heat rejection and heat addition.

- Maximum of twelve stages of heat rejection/addition
- Modulating bypass valve and a maximum of ten additional stages of heat rejection/addition.

Occupied/Unoccupied Scheduling

Establishes a time schedule for the heat pump loops pumps and the heat pump units based on time of day for Sunday through Saturday, and holidays.

Emergency Modes

Low temperature – An alarm horn sounds intermittently and a yellow LED flashes on the LWC front panel if the loop supply temperature falls to 52°F (11°C).

High Temperature – An alarm horn sounds intermittently and a yellow LED flashes on the LWC front

panel if the loop supply temperature rises to 105°F (41°C) (adjustable).

Loss of Flow – If the lead pump flow switch is not made or fails to make after 15 seconds, the lag pump activates and an alarm horn sounds intermittently and a yellow LED flashes on the LWC front panel.

Cooling Tower or Boiler Loop – If the lead pump flow switch is not made or fails to make after 15 seconds, the lag pump activates and an alarm horn sounds intermittently and a yellow LED flashes on the LWC front panel.

Pre-cool/Pre-heat Mode

The LWC starts the heat pump loop pump at 2:00 AM (adjustable) and compares the outside air temperature to the heat pump loop temperature. If the outside air is $\pm 5^\circ\text{F}$ (2.8°C), the LWC enters the pre-heat or pre-cool mode.

Password Protection

A separate level of access by the building operator allows the operator to change setpoint settings.

Manual Control - System Simulation

Manual control allows the operator to step through control functions for heat addition and heat rejection stages manually. The manual control functions are as follows.

- Enable/disable loop pump operation
- Enable/disable tower or boiler pump operation
- Enable/disable all stages of heat rejection
- Enable/disable all stages of heat addition
- Enable/disable all time schedules
- Enable/disable alarm horn
- Enable/disable A/C lockout

Heat Pump Control Interface

The LWC interfaces with the Mark IV Water Source Heat Pump Unit Controls to provide the following applications.

Unoccupied Scheduling

The LWC switches the unit controller from occupied to unoccupied, and occupied to unoccupied by assigning one unique time schedule.

Heat Pump Loop “Pump Restart”

The LWC monitors the “P” terminal on the Mark IV boards. If the LWC detects a pump restart command, the heat pump loop pump energizes.

Emergency Shutdown

The LWC monitors the status of the heat pump loop pump and high/low loop temperature conditions. If the loop pump fails or the high/low temperatures exceed pre-defined limits, the LWC places all units into emergency shutdown.

Optional Features for the LWC

PC and Monitoring Software

Monitoring software and a PC provide full dynamic color graphics, trend logging, alarm monitoring, and full loop water controller setpoint changes without the use of a keypad.

MicroTech Modem Kit

The MicroTech Modem Kit provides a 14.4 kb modem and interface cable for 9600 bps remote communication. The modem is powered by the LWC panel.

Remote Alarm Panel

The Remote Alarm Panel provides LEDs and an alarm horn to indicate the status of the network.

Specifications

Housing:	NEMA 1 enclosure
Dimensions:	24” wide X 24” high X 5” deep (610 mm X 610 mm X 123 mm)
Net Weight	50 lb. (22.5 kg)
Environmental	
Temperature:	30°F–100°F (-1°C–38°C) (operating) 0°F–125°F (-18°C–52°C) (non-operating)
Humidity:	10%–90% noncondensing
Communications Cable:	Shielded, paired cable, 300V, 20 AWG stranded, polyethylene, insulated (Belden 8762 or equivalent). 5000 feet maximum distance.