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## DIGITAL CONTROLLER OPERATION

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**This manual is specific to the operation and diagnostic guides of Dixell and Full Gauge digital controllers used in Glastender self-contained back bar coolers.**



Dixell



Full Gauge

# DIXELL DIGITAL CONTROLLER OPERATION & DIAGNOSTIC GUIDE

The operating temperature range is preset at the factory according to the table below and can be adjusted up or down within the limits shown.

**To see the set point** - push and immediately release the SET button. The set point will be displayed.

**To return to normal visualization** - Push and immediately release the SET button or wait five seconds.

**To change the set point** - push and hold the SET button for more than two seconds. When the ° F display begins flashing, push the up arrow or down arrow buttons to adjust the set point to the desired value.

**To save the new set point and return to the temperature display mode** - push and release the SET button or wait ten seconds.

|                                  | Factory Settings |                  | Range of Adjustment |                   |
|----------------------------------|------------------|------------------|---------------------|-------------------|
|                                  | Set Point        | Operating Range† | Minimum Set Point   | Maximum Set Point |
| <b>Standard Cooler Setting</b>   | 34° F            | 34° F to 39° F   | 33° F               | 65° F             |
| <b>Two Zone Cooler Settings*</b> |                  |                  |                     |                   |
| <b>B = Beer</b>                  | 34° F            | 34° F to 39° F   | 33° F               | 65° F             |
| <b>W = White Wine</b>            | 50° F            | 50° F to 55° F   | 33° F               | 65° F             |
| <b>R = Red Wine</b>              | 60° F            | 60° F to 65° F   | 33° F               | 65° F             |

† Adjusting the factory set point will also adjust the operating range by the same amount

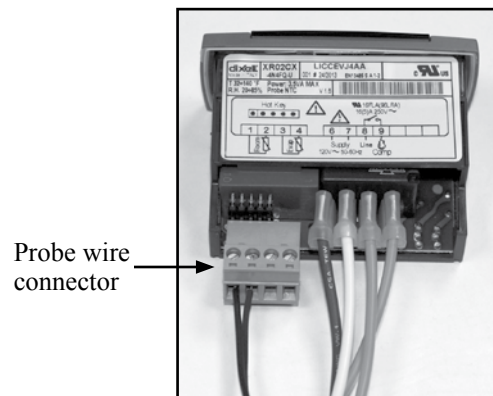
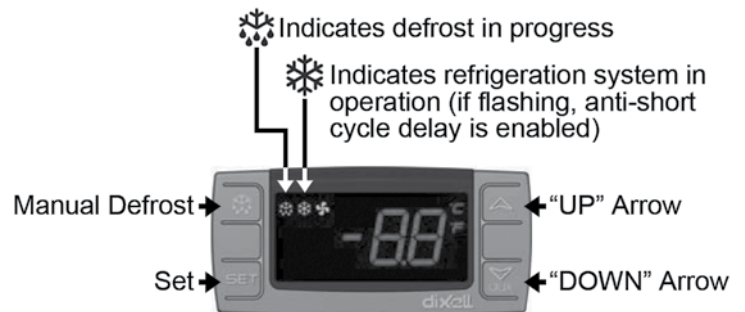
\* To determine a Two Zone Cooler refrigeration configuration, refer to the 2 digits immediately preceding the first hyphen of the model number found on the cooler data tag. These 2 digits will always be BW (Beer/White Wine), BR (Beer/Red Wine), or WR (White Wine/Red Wine). Example: MODEL: BB60**BR**-L1-XS(LR).

The refrigerator is programmed to automatically defrost four times daily for approximately twenty minutes. During defrost, the fan inside the cooler will remain on and the refrigeration system will turn off. To initiate defrost manually, push and hold the DEFROST button for more than two seconds.

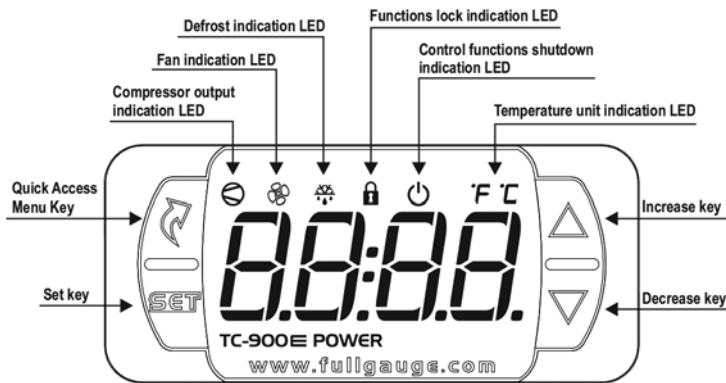
The thermostat controller does not have an “OFF” function. To turn refrigerator off, the unit must be unplugged or power to the electrical branch circuit has to be turned off via a circuit breaker or switch.

## Models BB, ND, LP, FV, MFV, UCR Self Contained Coolers using Dixell digital thermostat controller

The thermostat control probe wire connector may become disconnected when the compressor compartment cover and/or grill are removed. This will result in thermostat P1 code. While the P1 code is flashing the compressor will cycle 5 minutes on and 5 minutes off and may cause icing of the evaporator coil. Service calls to reconnect the probe wiring are not covered by factory warranty.



# FULL GAUGE TC-900E POWER DIGITAL CONTROLLER OPERATION



The operating temperature range is preset at the factory according to the table below and can be adjusted up or down within the limits shown.

## Setting the desired temperature-

To access the setpoints setup menu, press Set for 2 seconds. The message *SP* will appear on the display followed by the normal setpoint set value. Use the Increase key or Decrease key to modify the value and confirm by pressing Set. Immediately, the message *SP-E* appears indicating the setting of the economic setpoint. Again, use the Increase key or Decrease key to modify the value and confirm by pressing Set. Finally, the ---- indication signals the set up completion. The setpoints can also be adjusted individually in the quick access menu.

|                                  | Factory Settings |                  | Range of Adjustment |                   |
|----------------------------------|------------------|------------------|---------------------|-------------------|
|                                  | Set Point        | Operating Range† | Minimum Set Point   | Maximum Set Point |
| <b>Standard Cooler Setting</b>   | 34° F            | 34° F to 39° F   | 33° F               | 65° F             |
| <b>Two Zone Cooler Settings*</b> |                  |                  |                     |                   |
| <b>B = Beer</b>                  | 34° F            | 34° F to 39° F   | 33° F               | 65° F             |
| <b>W = White Wine</b>            | 50° F            | 50° F to 55° F   | 33° F               | 65° F             |
| <b>R = Red Wine</b>              | 60° F            | 60° F to 65° F   | 33° F               | 65° F             |

† Adjusting the factory set point will also adjust the operating range by the same amount

\* To determine a Two Zone Cooler refrigeration configuration, refer to the 5th and 6th characters in the model number found on the cooler data tag. These characters will always be one of the following: BW (Beer/White Wine), BR (Beer/Red Wine), or WR (White Wine/Red Wine). Example: MODEL: BB60**BRL**-XS(LR).

The refrigerator is programmed to automatically defrost four times daily for approximately twenty minutes. During defrost, the fan inside the cooler will remain on and the refrigeration system will turn off. The defrost process can be activated/deactivated manually in the quick access menu through the *dEFr* or pressing the Increase key for 4 seconds. Activation or deactivation will be indicated by the messages *dEFr On* or *dEFr OFF* respectively.

The thermostat controller has an "OFF" function. The shutdown of the control functions allows the controller to operate only as a temperature indicator, keeping the control outputs and alarms off. The use of this feature is enabled or disabled by the shutdown function of the control functions. When enabled, the control functions and alarms are switched off *Ctrl OFF* or on *Ctrl On* in the quick access menu through the *Ctrl* option. When the control functions are off, the message *OFF* is displayed alternating with the temperature and other messages. Also is possible turn on/turn off the control functions by pressing the Increase key for 5 seconds.

## Models BB, ND, LP, PT Self Contained Coolers thermostat controller

The thermostat control probe wire may become disconnected when the compressor compartment cover and/or grill are removed. This will result in thermostat *Err 1* or *Err 3* code. Service calls to reconnect the probe wiring are not covered by factory warranty.

| SIGNALS   |  |
|---|--|
| <span style="border: 1px solid black; padding: 2px;">Err 1</span> | Ambient sensor disconnected or out of range.   |
| <span style="border: 1px solid black; padding: 2px;">Err 3</span> | Sensor 3 disconnected or out of range.   |
| <span style="border: 1px solid black; padding: 2px;">ECO</span>   | Operation with economic setpoint.  |
| <span style="border: 1px solid black; padding: 2px;">AELh</span>  | High ambient temperature alarm (sensor1).  |
| <span style="border: 1px solid black; padding: 2px;">AELo</span>  | Low ambient temperature alarm (sensor1).   |
| <span style="border: 1px solid black; padding: 2px;">AC1</span>   | High temperature in condenser alarm (level 1). If this signal occurs, condenser may need cleaning. |
| <span style="border: 1px solid black; padding: 2px;">AC2</span>   | High temperature in condenser alarm (level 2). If this signal occurs, condenser may need cleaning. |
| <span style="border: 1px solid black; padding: 2px;">AL-CL</span> | Compressor reached the maximum time on without reaching the SP.                                    |
| <span style="border: 1px solid black; padding: 2px;">OFF</span>   | Control routines off.  |
| <span style="border: 1px solid black; padding: 2px;"> </span>     | It indicates that the temperature for end of defrost has not been reached.                         |
| <span style="border: 1px solid black; padding: 2px;">EICAL</span> | Please contact Full Gauge Controls.  |
| <span style="border: 1px solid black; padding: 2px;">PPPP</span>  | Reconfigure the values of the functions.   |

**Warning: Performance and reliability issues that result from the controller parameters being changed from the factory default settings are not covered under warranty.**

**Controller error codes:**

- P1- Room Probe Failure
  - Check to make sure the probe is connected to the controller
  - Check the probe resistance (see “Checking the probe resistance” below)
- P2- Evaporator Probe Failure
  - This error should only occur on MFV units. Verify that the unit is an MFV model.
  - Check to make sure the probe is connected to the controller
  - Check the probe resistance (see “Checking the probe resistance” below)
- dF- Indicates that the unit is in defrost
  - Normal Scheduled defrosts can last up to 20 minutes at the factory default values
  - If abnormal defrosts are suspected see “Resetting the program to factory default settings” below
- HA- Maximum Temperature Alarm
  - The box temperature has exceeded the 75° maximum for more than 30 minutes
  - See diagnostic flow charts below
- LA- Minimum Temperature Alarm
  - The box temperature has deceeded the 25° minimum (-15° for MFV) for more than 30 minutes
  - See diagnostic flow charts below

**Checking the controller set point:**

- Press the set button once to display the controller set point. Press again to return to the temp display.

**Changing the controller set point:**

- Hold the SET key for 3 seconds, release, and use the arrow keys to change the set point. The set point can be changed from 33° to 65° on coolers and 0° to 28° on MFV's
  - Factory Default set points are as follows: MFV 10°, Beer 34°, White Wine 50°, Red Wine 60°
  - There is a 5° (8° for MFV) differential between cut in and cut out temps. If the controller set point is 35° the range will be 35° to 40°. (MFV controller set point 10°, range will be 10° to 18°)

**Checking the probe resistance:**

- Verify the probe resistance is accurate at the box temperature
  - Use a calibrated thermometer to check the cooler's temperature at the evap inlet where the probe is located
  - Disconnect the probe from the controller
  - Use a calibrated Ohm meter to measure the resistance of the probe at the box temperature
  - The resistance of the probe should match the associated box temperature of the following table

| Temp Deg F | Ohms Resistance | Temp Deg F     | Ohms Resistance | Temp Deg F | Ohms Resistance | Temp Deg F | Ohms Resistance | Temp Deg F | Ohms Resistance |
|------------|-----------------|----------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| -4         | 67770           | 22             | 34852           | 42         | 21596           | 64         | 13246           | 86         | 8313            |
| -2         | 64579           | 23             | 33900           | 44         | 20687           | 66         | 12668           | 88         | 8008            |
| 0          | 61388           | 24             | 33164           | 46         | 19778           | 68         | 12090           | 90         | 7703            |
| 2          | 58197           | 26             | 31693           | 48         | 18869           | 70         | 11626           | 92         | 7398            |
| 5          | 53410           | 28             | 30222           | 50         | 17960           | 72         | 11161           | 94         | 7093            |
| 8          | 49763           | 30             | 28751           | 52         | 17233           | 74         | 10697           | 95         | 6940            |
| 10         | 47332           | 32 (Ice Water) | 27280           | 54         | 16507           | 76         | 10232           | 96         | 6816            |
| 12         | 44901           | 34             | 26118           | 56         | 15780           | 77         | 10000           | 98         | 6569            |
| 14         | 42470           | 36             | 24956           | 58         | 15053           | 78         | 9813            | 100        | 6322            |
| 16         | 40566           | 38             | 23793           | 59         | 14690           | 80         | 9438            | 102        | 6074            |
| 18         | 38661           | 40             | 22631           | 60         | 14401           | 82         | 9063            | 104        | 5827            |

- Fill a cup full of ice water (use a lot of ice), put the probe into the ice bath, stir for 1 minute, then measure the resistance with a calibrated Ohm meter. Make sure to keep the probe in the center of the cup.
  - The probe should have 27,280 Ohms of resistance in the ice bath. Replace the probe if it is not within 2 degrees Ohms range from Table 1 above.

**Checking the controller display temperature accuracy:**

- After verifying the probe resistance to the box temperature, plug the probe into the controller and check the temperature displayed
  - The controller should display the associated temperature of Table 1 above when compared to the resistance measured
    - Note: the probe cannot be plugged into the controller when measuring resistance
- Fill a cup full of ice water (use a lot of ice), put the Ohm verified probe into the ice bath, stir for 1 minute. Make sure to keep the probe in the center of the cup.
  - The controller should display 32°

**Checking the controller compressor relay:**

Does the controller relay open and close at the operating range specified on the data tag?

- If the controller is calling for cooling, the compressor relay (terminals 8 & 9) will have continuity
  - Note: there is a 1 minute anti-short cycle delay programmed into the controller. The snowflake will flash on the display indicating this delay. When the snowflake is solid, the controller is calling for cooling and the relay will be closed.

**Resetting the program to factory default settings:**

- Hold the SET and DOWN ARROW for 3-4 seconds until the display changes and release; the display will either read “rE” or “d2” and the °F symbol will be flashing. Immediately hold the SET and DOWN ARROW for another 7-8 seconds until the display changes to L2, release the buttons and Hy will be displayed; this is the controllers hidden menu where you can set the parameters of the chart below.
  - Note: The SET and DOWN ARROW must be pressed at the same time. If one is accidentally released, the process will need to be restarted.
  - Note: If no keys are pressed, the hidden menu access will time out after 15 seconds and revert to normal operation.
- Use the arrow keys to scroll to the desired set point
  - Press set to access the value
  - Use the arrow keys to change the value
  - Press set again to lock in the value

The chart below represents the factory default settings of MFV, Beer, White and Red Wine controllers  
Set the values to the associated product for the proper control of the unit

| Label      | Description                | MFV  | Beer  | Wht Wine | Red Wine | Label   | Description                        | MFV         | Beer  | Wht Wine | Red Wine |
|------------|----------------------------|------|-------|----------|----------|---------|------------------------------------|-------------|-------|----------|----------|
|            |                            | 0-35 | 34-40 | 50-55    | 60-65    |         |                                    | 0-35        | 34-40 | 50-55    | 60-65    |
| Regulation |                            |      |       |          |          | Defrost |                                    |             |       |          |          |
| Hy         | Differential               | 8    | 5     | 5        | 5        | td      | Defrost type                       | in          |       |          |          |
| LS         | Min Set Point              | 0    | 33    | 33       | 33       | dE      | Defrost Termination Temp           | 75          | 50    | 50       | 50       |
| US         | Max Set Point              | 35   | 65    | 65       | 65       | id      | Interval Between Defrost Cycles    | 4           | 6     | 6        | 6        |
| ot         | First Probe Calibration    | 0    | 0     | 0        | 0        | Md      | Max Length For Defrost             | 20          | 20    | 20       | 20       |
| P2         | Second Probe Presence      | y    | n     | n        | n        | dd      | Start Defrost Delay                | 0           |       |          |          |
| oE         | Second Probe Calibration   | 0    | 0     | 0        | 0        | dF      | Display During Defrost             | dE          | dE    | dE       | dE       |
| od         | Delay At Startup           | 0    | 0     | 0        | 0        | dt      | Drip Time                          | 2           |       |          |          |
| AC         | Anti-short Cycle Delay     | 1    | 1     | 1        | 1        | dP      | Defrost at Power On                | n           |       |          |          |
| Cy         | Comp On Time Faulty Probe  | 5    | 5     | 5        | 5        | Alarms  |                                    |             |       |          |          |
| Cn         | Comp Off Time Faulty Probe | 8    | 5     | 5        | 5        | AU      | Max Temp Alarm                     | 75          | 75    | 75       | 75       |
| Display    |                            |      |       |          |          | AL      | Min Temp Alarm                     | -15         | 25    | 25       | 25       |
| CF         | Units of Measure           | °F   | °F    | °F       | °F       | Ad      | Temp Alarm Delay                   | 30          | 30    | 30       | 30       |
| rE         | Resolution (For °C Only)   | in   | in    | in       | in       | dA      | Exclusion Of Temp Alarm At Startup | 99          | 99    | 99       | 99       |
| Ld         | Default Display            | P1   | P1    | P1       | P1       | Other   |                                    |             |       |          |          |
| dy         | Display Delay              | 0    | 0     | 0        | 0        | tb      | tb                                 |             | y     | y        | y        |
|            |                            |      |       |          |          | d1      | Thermostat Probe Display           | Reads input |       |          |          |
|            |                            |      |       |          |          | d2      | Evap Probe Display                 | Reads input | nP    | nP       | nP       |
|            |                            |      |       |          |          | Pt      | Parameter Code Table               | 1           | 5     | 5        | 5        |
|            |                            |      |       |          |          | rL      | Firmware Release                   | 1.5         | 1.5   | 1.5      | 1.5      |

**Diagnostic flow charts:**

