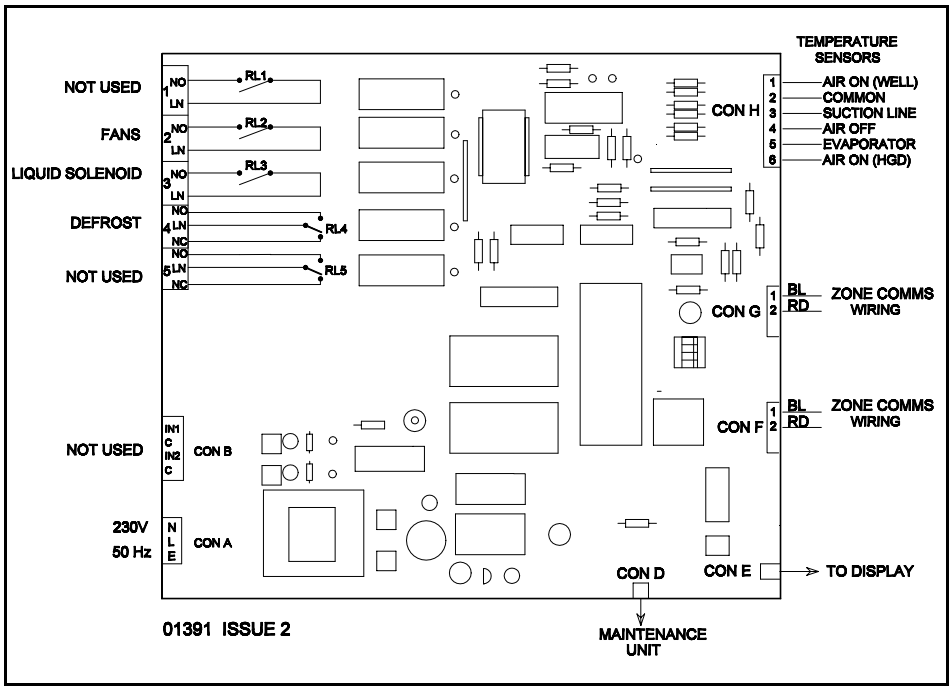


**Electrical installation requirements**
Care should be taken to separate the power and signal cables to prevent electrical interference and possible damage due to inadvertent connection.

The power outputs are fitted with suppressors to protect against electrical interference when switching off solenoid valves or contactors. It is therefore essential to observe the output polarity. The line voltage should be connected to the terminals marked **LN** and the switched loads to **NO** or **NC**.

**CE Conformance**
This unit conforms with the relevant EU standards when installed according to the JTL Installation Requirements for this product.

**Use of Maintenance unit**
The controller can be checked and the operation adjusted using a JTL portable maintenance unit which plugs into the controller. Each item of information has an item number. The more important items are listed in the tables overleaf. Examples:

To read item 21 press: ITEM 2 1 ENTER

To set item 30 to -20.0 press:

ITEM 3 0 ENTER SET – 2 0 0 ENTER

To correct errors press: CANCEL

To select next or previous items press: + and –

**Initial commissioning and bitswitch settings**
The controller has 2 sets of data built in to its program for use during commissioning. These can be accessed by setting the bitswitches as shown in the table overleaf and then setting item 9 to 1. This loads into the controller a suitable set of data for the selected type of case. Adjustments should then be made as necessary. The range over which the settings can be adjusted is also defined by the bitswitch setting.

If a JTL communications network is connected to the controller then the unit number should be set on item 1.

**Temperature displays**
The temperatures displayed are computed from the 2 air on and the air off temperatures. Factors are used to proportion the air off and air on temperatures for each case.

**Control strategy**
The LCAL controller is specifically designed to control the Linde ATR combined half glass door and well case with a single evaporator. The air off temperature is controlled to a computed setpoint shown on item 118. If the temperature falls below this setpoint the liquid valve is closed. There is a deadband of ± 0.2 C.

The computed air off temperature setpoint is calculated by comparing the 2 displayed temperatures with the cabinet temperature setpoints. The computed setpoint is raised or lowered depending on whether the cabinet temperature, on the worst of the 2 cabinets, is below or above the cabinet temperature setpoint.

The computed air off setpoint cannot go below the value set on item 31.

**Defrost**
The defrost sequence can be initiated in 2 ways. These can be by deduction from the suction temperature, or by command on the JTL communications network.

There is a choice of 2 methods of defrost operation, termination or control, using item 76. In termination mode the defrost output relay is energised during defrost recovery period and at any time when the termination temperature is exceeded. In control mode the defrost output relay is energised during the defrost period.

The liquid solenoid is left open during suction initiated defrost and closed during network and contact initiated defrost. During defrost the fans are stopped and the display shows "dEF "

NOTE No defrost can be detected within 3 hours of the previous defrost.

**Defrost recovery**
When the termination temperature or time is reached the controller enters defrost recovery.

For network and contact initiated defrost a time delay can be applied (item 49) after defrost before the liquid valve is reopened.

During defrost recovery the fans can be controlled depending on the evaporator temperature. When the evaporator temperature is low enough, the fans start. There is a 5 degree deadband.

The display shows "dEFr".

**Alarms**
The cabinet and air off temperatures are monitored continually. The temperatures are averaged over the period set on item 47. If any of the average temperatures exceeds the alarm level then an alarm is given which is shown on the relevant display and available, for remote indication, on the JTL alarm system.

High temperature alarms are cancelled during defrost and defrost recovery.

| ADJUSTABLE PARAMETERS | | | | Bitswitch settings |
|---|---|---|---|---|
| Item | Function | Range | Units | |
| 1 | Unit number | 0.1 to 899.9 | | 4321 |
| 30 | Cabinet temperature setpoint | -30 to -18 | °C | xxxC Frozen food |
| 31 | Air off temperature setpoint | -35 to -20 | °C | xxx0 Ice cream |
| 32 | Overtemperature tolerance | 0 to +20 | °C | |
| 33 | Cabinet temperature factor (well) | 20 to 80 | | |
| 34 | Cabinet temperature factor (HGD) | 20 to 100 | | |
| 45 | Suction or comms initiated | 0=comms 1=suction | | |
| 47 | Alarm averaging time | 00:30 to 03:00 | hr:mn | where |
| 49 | Refrigeration delay after defrost | 00:00 to 00:10 | hr:mn | |
| 50 | Defrost termination temp (air off) | 0 to +20 | °C | C = closed |
| 57 | Defrost termination time | 00:05 to 00:20 | hr:mn | 0 = open |
| 58 | Defrost initiation temp (suction) | -5 to +20 | °C | x = don't care |
| 69 | Number of defrosts expected | 0 to 6 | | |
| 76 | Defrost control mode | 0=termination 1=control | | closed = dot visible |
| 105-109 | Probe selections | 0=off 1=on | | |

| OTHER USEFUL ITEMS | | | |
|---|---|---|---|
| Item | Function | Item | Function |
| 20 | Cabinet temperature | 73 | Fans output state |
| 21 | Air on temperature (well case) | 74 | Defrost output state |
| 22 | Air off temperature | 75 | Liquid valve output state |
| 23 | Evaporator temperature | 77 | Forced defrost |
| 24 | Suction line temperature | 78 | Inhibit defrost |
| 25 | Air on temperature (HGD case) | 118 | Effective air off setpoint |
| 40 | Duration of last defrost | | |
| 41 | Time since end of last defrost | | |
| 42 | Duration of this defrost | | |
| 46 | Communications defrost command | | |
| 70 | Operating mode | | |

Full operating manuals and item number information can be obtained from your supplier or JTL Systems.

CE This unit conforms with the relevant EU standards when fitted in accordance with its installation instructions.

**Applicable Documentation**

| | |
|---|---|
| Item Numbers | Doc No. 00804 |
| Software Variations | Doc No. 00805 |
| Wiring Diagrams | Doc No. 00696, 01369 |
| Evaporator Manual | Doc No. 01923 |
| Installation Requirements | Doc No. 01662 |
| Outline Details | Doc No. n/a |



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