

**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**.

The plant inputs are electrically isolated. A line voltage should be connected for the logical conditions **lighting override** and **defrost on**. The terminals marked **C** should be connected to the supply voltage neutral.

**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.

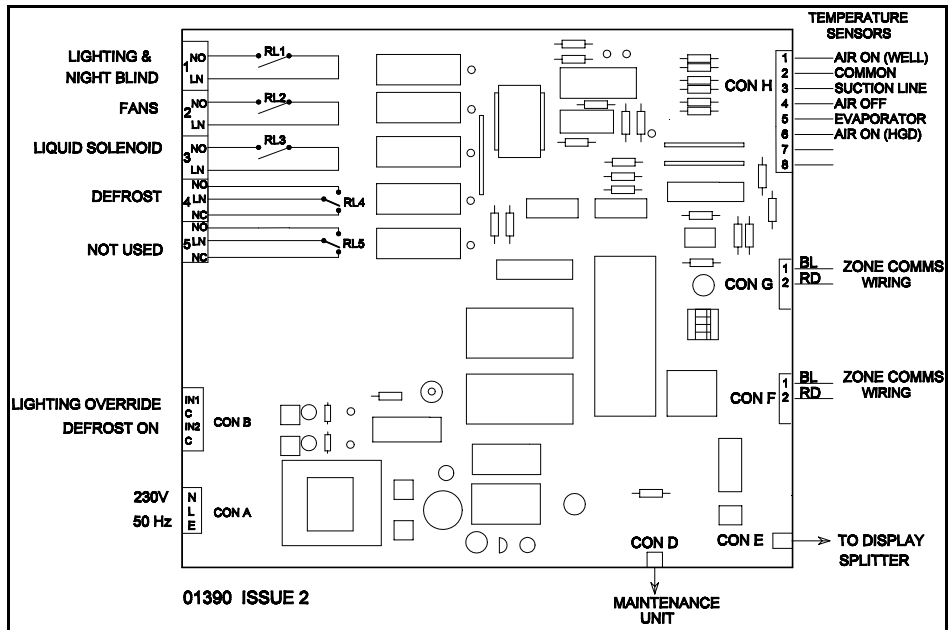
**Control strategy**

The LCNL 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  $\pm 0.2$  °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 3 ways. These can be by deduction from the suction temperature, by command on the JTL



communications network, or by contact input.

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".

**Lighting and Night Blind Control**

The cabinet lights and night blinds can be sequenced on and off by command from the JTL network. An override switch input facility is provided which raises the blinds and turns the lights on.

**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.

**Network shutdown**

When this feature is enabled (item 62), if a shutdown command is received from the JTL communications network both inputs are turned off and all alarms cancelled.

ADJUSTABLE PARAMETERS				Bitswitch settings
Item	Function	Range	Units	
1	Unit number	0.1 to 899.9		4321 xxx C Frozen food xxx0 Ice cream  where  C = closed O = open x = don't care  closed = dot visible
30	Cabinet temperature setpoint	-30 to -18	°C	
31	Air off temperature setpoint	-35 to -20	°C	
32	Overtemperature tolerance	0 to +20	°C	
33	Cabinet temperature factor (well)	20 to 80		
34	Cabinet temperature factor (HGD)	20 to 100		
35	Termination temperature selection	0=Air Off 1=Evap		
45	Suction or network initiated	0=network 1=suction		
47	Alarm averaging time	00:30 to 03:00	hr:mn	
48	Compressor starts/hour	unlimited /10/15/20		
49	Refrigeration delay after defrost	00:00 to 00:10	hr:mn	
50	Defrost termination temp (air off)	0 to +20	°C	
57	Defrost termination time	00:05 to 00:50	hr:mn	
58	Defrost initiation temp (suction)	-5 to +20	°C	
62	Network shutdown selection	0=off 1=on		
69	Number of defrosts expected	0 to 6		
76	Defrost control mode	0=termination 1=control		
105-109	Probe selections	0=off 1=on		
140	Lighting control selection	0=off 1=on		
148	Lighting contractor selection	0=n.o 1=n.c		

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)	79	Forced refrigeration
40	Duration of last defrost	118	Effective air off setpoint
41	Time since end of last defrost	141	Communications lighting command
42	Duration of this defrost	142	Lighting override input state
46	Communications defrost command	143	Lighting output state
70	Operating mode	144	Force lights on
71	Defrost input state	145	Force lights off

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



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

#### Applicable Documentation

Item Numbers	Doc No. 01371
Software Variations	Doc No. 01372
Wiring Diagrams	Doc No. 01369, 01740
Evaporator Manual	Doc No. 01923
Installation Requirements	Doc No. 01662
Outline Details	Doc No. n/a