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 2 plant inputs are electrically isolated. A line voltage equal to the controller supply voltage should be connected for the logical conditions - **door closed** 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.

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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 4 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 a suitable set of data into the controller 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 display

The temperature display shows the air on temperature. The LCCS controller drives an LED1 display and the LCCP an LED5 display. Pushbuttons on the LED5 display allow certain items of data to be scrolled onto the display.

Control strategy

The air off temperature is controlled to a computed setpoint shown on item 28. 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 air on temperature with the air on temperature setpoint. The computed setpoint is raised or lowered depending on whether the temperature is below or above the setpoint. The computed air off setpoint cannot go more than 4 degrees Celcius below the air on setpoint.

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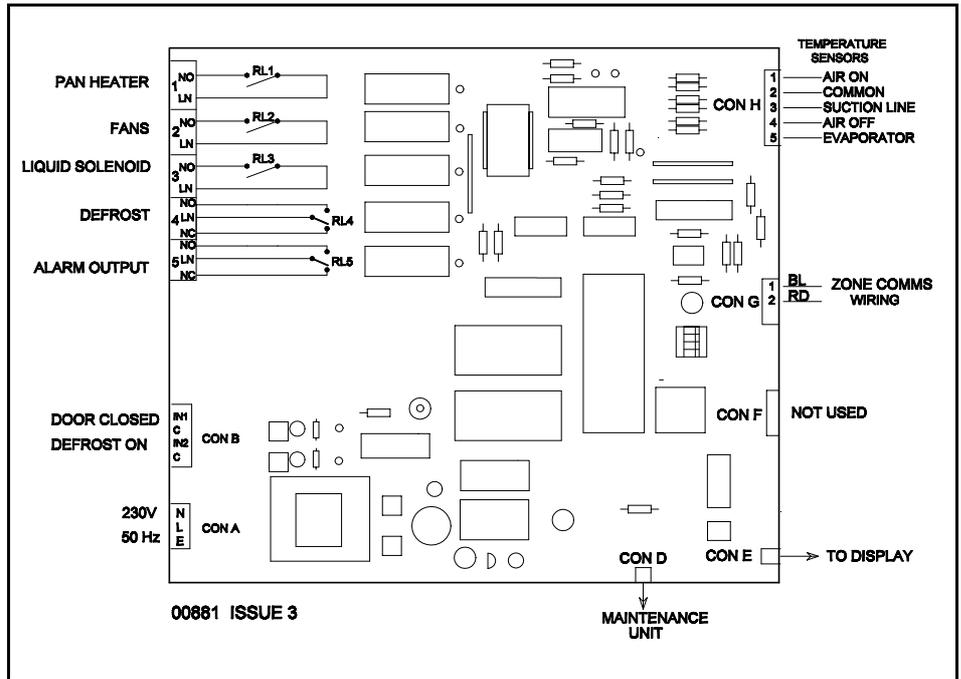
There is a choice of 2 methods of defrost operation, termination or control, using item 76. In termination mode the defrost output relay is energised during defrost recovery and at any time when the termination temperature is exceeded. In control mode the defrost output relay is energised during defrost.

The liquid solenoid is left open during suction initiated defrost and closed during other types of defrost. For network and contact initiated defrost a time delay can be applied (item 49) after defrost before the liquid valve is reopened. During defrost the fans are stopped and the pan heater output is energised. When defrost is detected the display shows "dEF ".

Defrost Recovery

After the defrost is terminated a drain down period, set on item 59, is applied, during which the fans remain off and the pan heater remains energised. The fans are controlled during defrost recovery depending on the evaporator temperature. When the evaporator temperature is low enough the fans start. There is a 5 degree deadband.

During defrost recovery the display shows "dEFr".

Coldstore door functions

When the coldstore door is opened refrigeration is stopped by shutting the liquid solenoid valve and stopping the evaporator fans. If the door remains open for a time longer than the value set on item 64 then refrigeration is restarted.   If the door remains open for a time longer than set on item 33 then an alarm is given.

The time that the door has currently been open and that it has been open in the last 24 hours is also recorded.

Alarms

The air on temperature is monitored continually. The temperature is averaged over the period set on item 47. If the average temperature exceeds the alarm level then an alarm is given which is shown on the display and available, for remote indication, on the JTL alarm system. High temperature alarms are **NOT** cancelled during defrost or defrost recovery. An alarm relay output is available on type LCCP. The relay is de-energised on alarm.

Network shutdown

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

**ADJUSTABLE PARAMETERS**				Bitswitch settings

Item	Function	Range	Units	Bitswitch settings
1	Unit number	0.1 to 899.9		4321
3032	Air on temperature setpoint	-30 to +10	°C	xxCC Frozen food
33	Overtemperature tolerance	0 to +10	°C	xxCO Ice cream
36-39	Door open alarm delay	00:00 to 00:30		xxOC Chillers
45	Probe selections	0=off 1=on		xxOO Produce
47	Suction or comms initiated	0=comms 1=suction		
48	Alarm averaging time	00:30 to 03:00	hr:mn	where
49	Compressor starts/hour	unlimited/10/15/20		C = closed
50	Refrigeration delay after defrost	00:00 to 00:10	hr:mn	O = open
57	Defrost termination temp (evap) Defrost	0 to +30	°C	x = don't care
58	termination time	00:05 to 00:40	hr:mn	
59	Defrost initiation temp (suction)	-5 to +20	°C	closed = dot visible
62	Drain down time	00:00 to 00:20	hr:mn	
64	Network shutdown selection	0=off 1=on		
69	Refrigeration delay after door open	00:00 to 00:30	hr:mn	
76	Number of defrosts expected	0 to 6		
102	Defrost control mode	0=termination 1=control		
	Probe selection	0=Tempkey 1=Elm		

**OTHER USEFUL ITEMS**			

Item	Function	Item	Function
21	Air on temperature	46	Communications defrost command
22	Air off temperature	66	Defrost input state (was item 79)
23	Evaporator temperature	70	Operating mode
24	Suction line temperature	71	Door input state
25	Superheat	72	Pan heater output state
28	Effective air off setpoint	73	Fans output state
34	Time door has been open	74	Defrost output state
35	Time door open in last 24 hours	75	Liquid valve output state
40	Duration of last defrost	77	Forced defrost
41	Time since end of last defrost	78	Inhibit defrost
42	Duration of this defrost	79	Forced refrigeration

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. 01810
Software Variations	Doc No. 00883
Wiring Diagrams	Doc No. LCCP - 01969, LCCS - 00622
Evaporator Manual	Doc No. 01923
Installation Requirements	Doc No. 01662
Outline Details	Doc No. n/a

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