

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 **LD**. Terminal 1 should be connected to the supply voltage neutral. The plant inputs are volt free contact inputs **door closed, man trapped**. A closed input is required for the logical conditions.

CE Conformance

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

Inputs

Inputs		
13 14	INPUT 1	MAN TRAPPED
12 14	INPUT 2	DOOR CLOSED
Temperatures (PT1000)		
25, 26	AIR ON TEMP	
23, 24	AIR OFF TEMP	
21, 22	EVAPORATOR	
19, 20	SUCTION LINE	
17, 18	TERMINATION	

Outputs

Outputs			
2 3	OUTPUT 1	(N/O LOAD) (LINE)	PAN HEATER
4 3	OUTPUT 2	(N/O LOAD) (LINE)	FANS
5 6	OUTPUT 3	(N/O LOAD) (LINE)	SUCTION LINE
7 6	OUTPUT 4	(N/O LOAD) (LINE)	DEFROST
8 9	OUTPUT 5	(N/O LOAD) (LINE)	LIQUID SOLENOID

NOTE: Outputs 1 & 2 share a common connection as do outputs 3 & 4.

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:

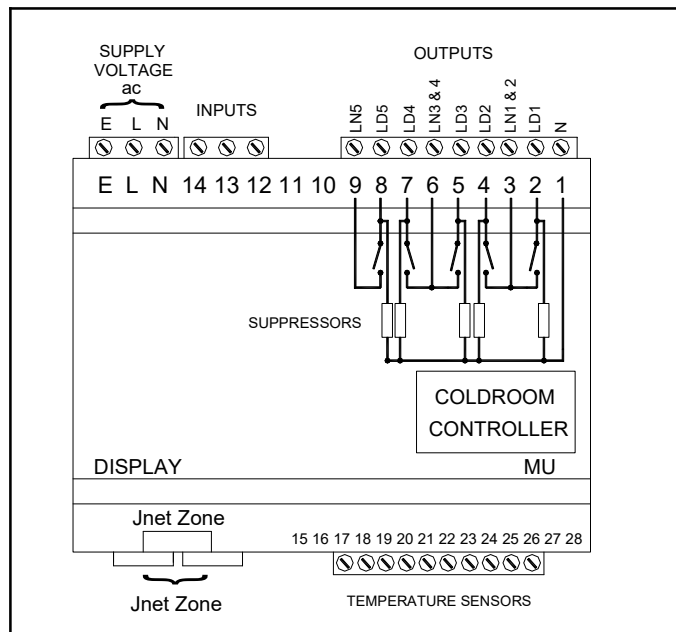
To read item 21 press: **ITEM** **2** **1** **ENTER**

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 virtual bitswitches using item 966 as shown in the table overleaf and then setting item 9 to 1234. 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 virtual bitswitch setting.

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

Coldroom Temperature

The air on temperature is read from the air on sensor. This sensor should not be mounted on the evaporator.

Temperature Display

The temperature displays the coldroom temperature. The temperature can be displayed in Celsius or Fahrenheit as selected by item 122.

The UACA controller drives the LCD10 and LCD14 displays. Various cable lengths are available.

Display	Cable
LCD10	CAB75
LCD14	CAB75

Control Strategy

The controller can control the air on temperature or the air off temperature selected using item 275. The temperature is controlled to the setpoint by controlling a liquid line solenoid valve with a mechanical expansion valve.

When set for air off control the controller uses the computed air off temperature setpoint (item 28) which is calculated by comparing the air on temperature with the coldroom temperature setpoint. The computed setpoint is raised or lowered depending on whether the air on temperature is below or above the temperature setpoint. The computed air off setpoint cannot go more than 4°C below the air on setpoint.

If the control temperature falls below the setpoint the liquid valve is closed. There is a deadband setting on item 140.

In the event of an air on sensor fault the control automatically switches to air off and vice versa.

Defrost Initiation Strategies

The defrost strategy can be initiated in 2 fundamental ways using item 107. Defrost initiation can be by real time clock, by command on the JTL communications network.

When real time defrost is selected items 51-56 set the start of defrost. The schedule can be set for 12 or 24 hour sequence (item 160). Each timed defrost can be programmed for electric or off cycle using items 351-356.

Network initiated defrost can be divided into 3 groups; PREDICT, coordinated and scheduled.

This controller uses the PREDICT 3 method which monitors the TEV operation.

PREDICT defrost requires that a JTL PREDICT defrost coordinator unit is available on the network. This unit receives requests from the PREDICT controllers and coordinates these requests so that the defrosts are organised ensuring the electrical and refrigeration requirements are met. When the controller requests a defrost the PREDICT coordinator will send out a defrost command at a suitable time. If the backup strategy is invoked the controller reverts to real time schedule.

Coordinated timed defrost requires a defrost coordinator to be present in the network. When coordinated timed request is selected then the controller requests a defrost as defined by the number of defrosts a day as set on item 69. The defrost coordinator coordinates the defrost as required. The backup strategy can be chosen to fall to learned defrost schedule or real time backup.

Backup Defrost Initiation Strategies

For network initiated defrost, 2 defrost backup strategies are included. The strategy choice is made on item 107.

For learned backup the last 24 hours defrost operation is continuously monitored and the defrost schedule is learned. For real time backup the defrost schedule as set up for real time defrost on items 51-56 is used.

If network communication fails, the selected backup strategy is automatically used. The unit reverts to network control whenever the network communications is operational.

The backup strategy is also invoked if the network signals that communications has failed to the defrost scheduler or if there is a fault at the defrost scheduler.

Defrost

The controller will control the defrost and pan heaters. The defrost output relay is energised during the defrost period.

The liquid solenoid is closed during defrost. During defrost the fans can be stopped.

Pump down delay can be applied (item 61) before the defrost/output and heater are energised. During pump down the liquid output is deenergised.

The display shows "dEF "

Defrost Termination

The controller stays in defrost at least until the minimum defrost time, on item 145, is exceeded. If the termination temperature is reached before the minimum defrost time then the defrost heater is cycled.

Defrost Recovery

When the defrost has terminated or time is reached the controller enters defrost recovery.

A time delay can be applied (item 49) after defrost before the liquid valve is reopened.

A drain down time delay can be applied (item 59) after defrost before the liquid valve is reopened.

The display shows "dEF".

Forced Refrigeration and Defrost

The maintenance unit can be used to force controller into a particular mode. This is done using items 77-79. While the maintenance unit is plugged in the controller will remain in the selected mode permanently. Once the maintenance unit is unplugged the controller will revert to normal control after 30 minutes.

When the network initiated defrost strategy is selected, forced defrost

will send a command to the JTL defrost scheduler to initiate a defrost and does not act locally.

Fan Control

The fans can be controlled in various ways.

If item 108 is set to "fans off during defrost" or "fans off during electric defrost" then during defrost recovery the fans can be controlled depending on the evaporator temperature or time delay after defrost.

If item 109 is set to 00:00 when the evaporator temperature is low enough, the fans start. There is a 5 degree deadband. If item 109 is set to a time then the fans are held off until the time delay has occurred.

High Room Temperature Alarms

The room temperature is monitored continually. The temperature error is averaged over the period set on item 47.

If the average room temperature error 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.

If the average room temperature error exceeds half the alarm tolerance a warning alarm is given which is available on the JTL alarm system. If this alarm is present during the last 24 hours for more than the set period a trend alarm is given which is also available on the JTL alarm system.

The temperature tolerance is set on item 32. Setting the tolerance to 0.0°C disables the alarms.

If item 127 is set then high temperature alarms are cancelled during defrost and defrost recovery.

Low Room Temperature Alarms

There is a low room temperature alarm which generates in the same way as the high temperature alarm. The tolerance is set on item 480.

Network Shutdown and Fans Only Mode

This controller supports the JTL Network shutdown and fans only facilities. When these facilities are enabled by item 62. If a shutdown or fans only command is received over the JTL Network, the refrigeration is stopped and alarms are disabled. The high temperature alarm sequence is initialised.

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 door open alarm can be set to be critical using item 126.

Coldroom Isolation

The controller can be isolated for standby operations using item 67. When isolated, all output relays are de-energised and the alarms disabled.

Man Trapped Alarm

A man trapped alarm input is available for alarm indication locally and on the JTL network. The alarm is activated when there is no input.

Load Shedding

The controller has the ability to reduce the electrical load on request by network broadcast. Up to 8 individual broadcast signals can be assigned to the following functions.

- Inhibit defrost,
- Inhibit refrigeration,
- Fans off.

Timer Controlled Shutdown

When used in conjunction with a JTL timer on the network the controller can be put into shutdown mode. Item 238 is used to select the appropriate network timer and item 239 shows the associated network command state.

Suction Pressure Optimisation

When used in conjunction with JTL pack control and suction optimisers this unit is normally included in the suction pressure optimiser algorithm. It can be explicitly excluded by setting item 200 to 1.

Daylight Saving

When connected to a JTL network this controller can operate by displaying daylight saving time for its time and defrost schedule. Daylight saving operation is selected by setting item 18. The connected network controller then adjusts the times automatically during the daylight saving period.

ADJUSTABLE PARAMETERS				UACA
	Item	Function	Range	Units
TEMPS & ALARMS	36-39	Sensor selections	0=off 1=on	K K hr:mn hr:mn
	147	Termination sensor selection	0=off 1=on	
	32	Overtemperature tolerance	0 to +20	
	480	Under temperature tolerance	0 to 40	
	47	Alarm averaging time	00:30 to 03:00	
	481	Temperature warning trend	00:00 to 23:59	
	127	Alarms inhibited during defrost	0=Alarm always 1=inhibit during defrost	
CONTROL	275	Control temperature	0=Air off 1=Air on	°C K
	30	Temperature setpoint	-30 to +25	
	140	Temperature deadband	0.4 to 3.0	
	48	Compressor starts/hour	unlimited /10/15/20	
	67	Isolate coldroom	0=normal 1=isolated	
DEFROST INITIATION	107	Defrost strategy	2=Network (learned backup)3=Time 5=PREDICT 7=Network (real time backup) 8=Coordinated (learned) 9=Coordinated (real time)	hr:mn hr:mn
	69	Number of defrosts expected or required	0 to 6	
	61	Pump down time	00:00 - 00:10	
	51-56	Defrost schedule	00:01 - 23:59	
	351-356	Defrost type for times 51-56	0=Electric 1=Off cycle	
	60	Defrost schedule 12/24 hour clock	0=24hr 1=12hr	
	65	Invert defrost input	0=no 1=yes	
	211	Evaporator group	0=none 1=Lt 2=Ht 3=Satellite	
	210	Electrical supply distribution panel no	0 to 7= panel no	
	213	Electrical supply circuit	0=none 1-31=circuit	
	214	Defrost method	0=brown phase 1=black phase 2=grey phase 3=3 phase 6=off cycle	
	223	Defrost requirement priority	1 to 8	
	225	PREDICT Minimum time between defrosts	2 to 8	
	226	PREDICT Maximum time between defrosts	6 to 72	
	227	PREDICT Sample discard list	0 to 3	
	228	PREDICT volatility setpoint	2 to 12	
DEFROST TERMINATION	144	Defrost termination method	1=Evaporator 2= Air off 3=Termination 4=Time only	hr:mn hr:mn hr:mn hr:mn
	50	Defrost termination temp	0 to +20	
	145	Minimum defrost time	00:00 - 00:30	
	57	Defrost termination time	00:05 to 00:59	
	59	Drain down time	00:00 to 00:10	
	49	Refrigeration delay after defrost	00:00 to 00:10	
FAN CONTROL	108	Fan control	1=run always 2=off during defrost 3=off during electric defrost	hr:mn
	109	Fan delay after defrost	00:00 - 00:10	
LOAD SHEDDING	600	Load shedding	0=off 1=enabled	
	601	inhibit defrost	0=off 1-8 broadcast input	
	602	inhibit refrigeration	0=off 1-8 broadcast input	
	603	Fans off	0=off 1-8 broadcast input	
DOOR FUNCTIONS	128	Select door functions	0=off 1=on	hr:mn hr:mn
	126	Door alarms critical	0=not critical 1=critical	
	33	Door open alarm delay	00:00 to 00:30	
	64	Door open refrigeration delay	00:00 to 00:30	
Jnet FUNCTIONS	1	Unit number	0.1 - 899.7	
	62	Jnet network shutdown selection	0=disabled 1=enabled	
	133	Enable plant to override temp control	0=off 1=on	
	134	Enable plant to cut off refrigeration	0=disabled 1=enabled	
	200	Exclude from suction optimisation	0=include 1=exclude	
	18	Daylight saving operation	0=standard time 1=daylight saving time	
	238	Select network shutdown timer	0=disabled 1-8=timer & number	
DISPLAY	122	Temperature display choice	0=Celsius 1=Fahrenheit	
	199	Display backlight	0=off 1=on 2=off flashes for alarm 3=on flashes for alarm	
VIRTUAL BITSWITCH	966	Bitswitch Selection	0=Frozen Food 1=Ice cream 2=Chiller 3=Off cycle	

OTHER USEFUL ITEMS					
Item	Function	Item	Function	Item	Function
20	TEMPERATURES	40	DEFROST	63	Jnet NETWORK FUNCTIONS
21	Room temperature	41	Duration of last defrost		Network shutdown and fans only command states
22	Air on temperature	224	Time since end of last defrost	203	Associated plant suction line
23	Air off temperature	42	Time since start of last defrost	239	Network timer command state
24	Evaporator temperature	46	Duration of this defrost		MODE INPUTS & OUTPUTS
141	Suction line temperature	77	Communications defrost command	70	Operating mode
482	Termination sensor temperature	78	Forced defrost	71	Door input state
	Accumulated temperature warning time	79	Inhibit defrost	72	Liquid valve output state
	CONTROL	261-272	Forced refrigeration	73	Fans output state
28	Effective air off setpoint	219	Learned defrost schedule	74	Defrost output state
240	Liquid valve open %	221	Defrost arrangement from network	139	Man trapped input state
241	Average liquid valve open %	222	Forced defrost requirement		Door Functions
			Enable forced defrost requirement	34	Time door presently open
				35	Time door has been open in last 24 hours

OUTPUT STATE DIAGRAM FOR JTL CONTROLLER						
MODE OF OPERATION		OUTPUT & FUNCTION				
		RL1	RL2	RL3	RL4	RL5
		PAN HEATER	FANS	SUCTION VALVE	DEFROST	LIQUID SOLENOID
NORMAL REFRIGERATION CYCLE	REFRIGERATION	OFF	ON	ON	OFF	CYCLES ON TEMPERATURE
	PUMP DOWN Adjustable time [61]	OFF	OFF (see note 2)	OFF	OFF	OFF
	DEFROST Time/temp terminated [57]/[50]	ON	OFF (See Note 2)	OFF	CYCLES ON TERMINATION TEMP (See note 3)	OFF
	DRAIN DOWN Adjustable time [59]	ON	OFF (See Note 2)	OFF	OFF	OFF
	LIQUID HOLD OFF Adjustable time [49]	OFF	OFF (See Note 2)	OFF	OFF	OFF
	RECOVERY TIME Time/temp terminated	OFF	TEMPERATURE OR TIME CONTROLLED (See Note 1)	ON	OFF	CYCLES ON TEMPERATURE
	REFRIGERATION	OFF	ON	ON	OFF	CYCLES ON TEMPERATURE
PLANT FAULT		OFF	OFF	ON	OFF	OFF
ISOLATED		OFF	OFF	OFF	OFF	OFF
UNIT SHUTDOWN		OFF	OFF	OFF	OFF	OFF
FANS ONLY SHUTDOWN		OFF	ON	OFF	OFF	OFF
FORCED DEFROST		ON	OFF	OFF	ON	OFF
FORCED REFRIGERATION		OFF	ON	ON	OFF	ON
INHIBIT DEFROST		OFF	ON	ON	OFF	CYCLES ON TEMPERATURE

- NOTE 1: FANS OFF UNTIL TIME SET ON ITEM 109 REACHED.
IF 109 SET TO 00:00 FANS CYCLE ON EVAPORATOR TEMPERATURE
- NOTE 2: FANS CAN BE SET TO RUN DURING DEFROST, DRAIN DOWN AND LIQUID HOLD OFF USING ITEM 108.
- NOTE 3: THE DEFROST HEATER CYCLES ON TERMINATION TEMPERATURE UNTIL THE MINIMUM DEFROST TIME HAS ELAPSED.

Relay Output Rating

2A resistive.

Supply Requirements

230 V ac 48-62 Hz Supply 6 VA maximum inputs 2 mA maximum



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

Applicable Documentation

Item Numbers
Doc No. 04759

Firmware Variations
Doc No. 04760

Connections Diagram
Doc No. 04763

Evaporator Manual
Doc No. 01923

Installation Information
Doc No. 03852

Schematic Diagram
Doc No. 04762

Note

The information contained in this document applies to the current version of the unit supplied with it. Full operating manuals, item number and software variation information can be obtained from your supplier or JTL Systems.

PREDICT® is the patented JTL pattern recognition algorithm for providing defrost on demand for the cabinets on a system.