UNIVERSAL - R

1. INDEX

2. GENERAL WARNING

- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.
- Check the application limits before proceeding.

2.1 SAFETY PRECAUTIONS

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation
- **Warning :** Disconnect all electrical connections before any kind of maintenance.
- The instrument must not be opened.
- Fit the probe where it is not accessible by the End User.
- In case of failure or faulty operation send the instrument back to the distributor with a detailed description of the fault.
- Do not exceed the maximum current that can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, electrical loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- In case of applications in industrial environments, the use of mains filters (our mod. DIXL930) in parallel with inductive loads could be useful.

3. GENERAL DESCRIPTION

Model **Universal-R** is a 32x74 mm format microprocessor based controller suitable for applications on high, medium or low temperature refrigeration units. It is provided with three relay outputs to control compressor, defrost - which can be either electrical or hot gas - and evaporator fans. It can work with PTC or NTC probes. Where defrost is being terminated by time, it can operate with just one thermostat probe or where defrost is being terminated by temperature, it has an input for a second (evaporator) probe.

The **Universal-R** is equipped with an internal alarm buzzer, a flashing visual alarm as well as a 4th relay (volt free) for remote alarm output.
Each instrument is fully configurable through special parameters that can be easily programmed through the keypad.

FOR QUICK REFERENCE & TYPICAL WIRING DIAGRAMS SEE PAGES 2, 3 & 4

4. SERVICE REPLACEMENT - MODELS AND PROBE INFORMATION

The Dixell Universal-R can directly replace all the following controllers for their most typical applications as well as many others not listed. It is compatible with the existing sensors from most other leading brands. If the existing sensors are incompatible or possibly faulty, they can be replaced by the two new PTC sensors which come supplied with the Universal-R.
(When ever practical, replacement of the sensors is always recommended as good practise.)

Controllers that use PTC sensors *

- Please note that some Every controllers may be using NTC sensors

LAE	SAE	Eliwell EWPC	Intek
MTR11/T1RDS	RT31-0000	EWPC901	RK31
MTR11/T1RES	RT31-1000	EWPC902	RK32
SDU11/T1RES	RC31	EWPC961	RK33
SDU11/T1REBS	RC31-1000	EWPC970	TK31
MCDU11/T1RDS	RC31-0100	EWPC971	DK31 (PTC)
MCDU11/T1RDS/1	RC32-0000	EWPC974	
MCDU11/T1RDS/2	RC33	EWPC977A	
MCDU11/T1RDS/3	DC31 (PTC)	EWTC101	
CDC112/T1R2S			
CDC112/T1R3S			
CDC112/T1RBS			

Teddington	Every	Dixell
EK-R31	EC3-120	XR110C
EK-R32	EC3-130	XR120C
EK-R33	EC3-131	XR130C
	EC3-110	XR140C
	EC3-111	XR150C
	EC3-180	XR160C
	EC3-181	XR170C
	EC3-185	

Controllers that use NTC probes.

Carel		Eliwell EWPX	
IR32S	CR32T	EWPX161	EWPX174
IR32Y	CR32X	EWPX161AR	EWPX174AR
IR32C	CR32S	EWPX170	EWPX177A
	CR32Y	EWPX171	EWPX185

Probe type identification :

The two main types of probes used in refrigeration are the PTC and the NTC.
PTC = Positive Temperature Coefficient. The probe resistance increases as the temperature rises.
NTC =Negative Temperature Coefficient. The probe resistance decreases as the temperature rises

Measure the probe's resistance using a suitable meter. Warm the probe (using your hand will normally suffice). If the resistance increases, you have a PTC probe, if it decrease then it's an NTC

You can further check which probes you have by comparing them to this chart. Resistances are approximate and small variations can be compensated for, by using the Universal-R's probe off set parameters. Ot (thermostat probe off set) & OE (Evaporator probe off set)

Sensor resistances at degrees C	- 30 c	- 20 c	- 10 c	0 c	+ 10 c	+ 20 c
PTC – Ohms	617	677	740	807	877	951
NTC – Ohms x 1000	115	70	42	27	18	12

QUICK REFERENCE SECTIONS – PAGES 2, 3 & 4

5. GETTING STARTED – HOW TO SET UP THE UNIVERSAL-R

Most 32 x 74mm refrigeration controllers fall into 1 of 5 types. The Universal-R has a smart parameter (**tC**) which programs it to operate as any of these types using settings 1 to 5

Parameter "tC" Setting	TYPE OF CONTROLLER
1	An on / off refrigeration thermostat - 1 relay & 1 probe
2	A combined thermostat and off cycle defrost timer - 1 relay & 1 probe
3	A combined thermostat with time initiated & time terminated forced defrost - 2 relays & 1 probe
4	A combined thermostat with time initiated & temperature terminated forced defrost - 2 relays & 2 probes
5	A combined thermostat with time initiated & temperature terminated forced defrost + evaporator fan control with delay after defrost - 3 relays & 2 probes

NOW JUST FOLLOW THESE 4 SIMPLE STEPS :-

Identify which type of controller you are replacing.

↓

Change over the wiring in accordance with the appropriate "Typical wiring layout"*****

↓

Check the probe type in use, parameter PbC will allow you to configure the controller for PTC or NTC probes

↓

Program the Universal-R parameters using
Section 7. Parameter Table &
Section 8. Easy Programming Flow Chart

***** Always check the wiring diagram on the controller being replaced. Wiring change over guides covering most popular models of controller, are available on request from your Universal-R supplier. "Typical wiring layouts" are intended for general guidance only

6. EVAPORATOR PROBE

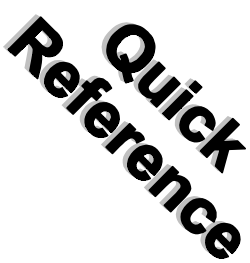
If parameter "tC" is on settings 1, 2 or 3, there is no need to fit an evaporator probe.

7. PARAMETER TABLE and factory default settings

IMPORTANT : **Always** set parameter **"tC"** first. As you move **"tC"** between settings 1 to 5, all non- relevant parameters will become masked out and critical parameters **Idf, MdF, Fdt** & **FnC** will automatically revert to their factory defaults shown below. Once **"tC"** has been set correctly, you can then alter any other parameter if you need to.

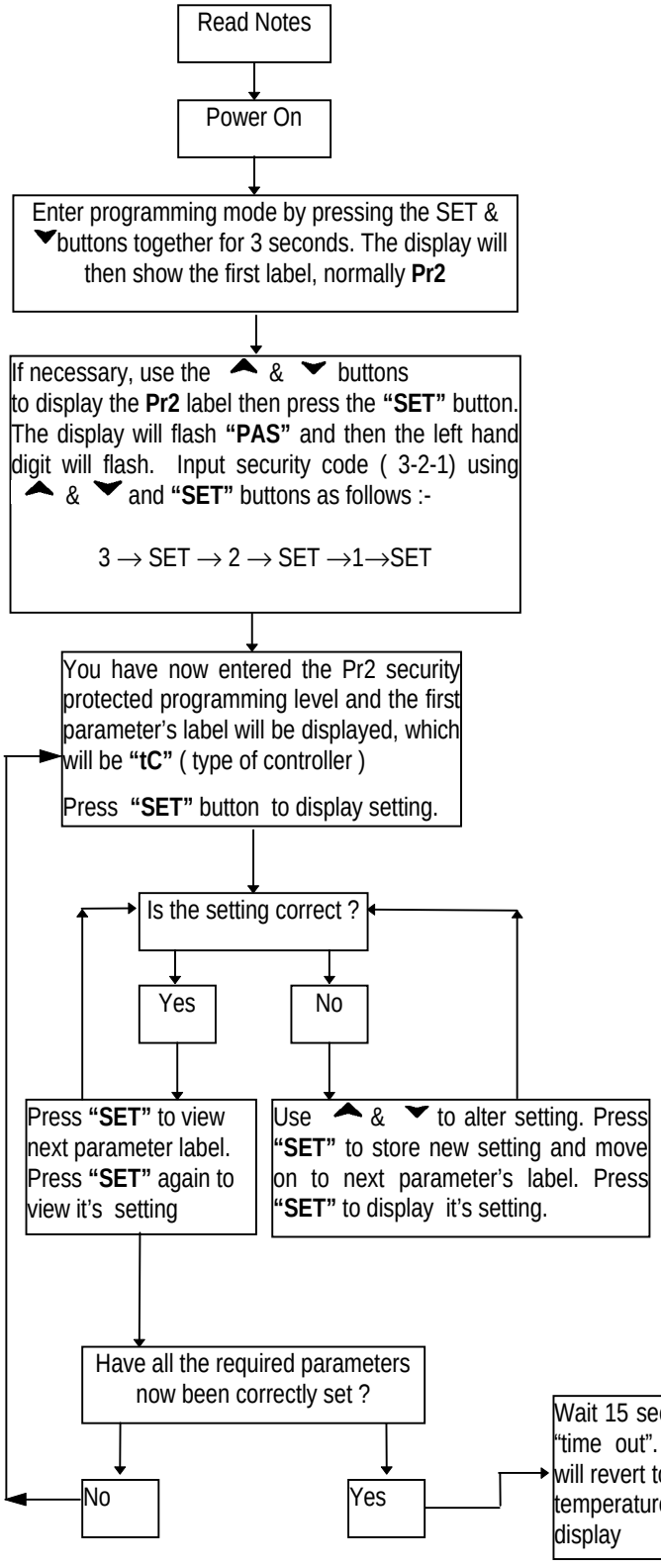
Note : If you alter the setting of parameter rES (decimal point on / off) re-check the settings of all temperature related parameters – Set Point, HY, LS, US, ALU, ALL, dtE, FSt, Ot & OE, as they can be effected.

WARNING!!
Always switch the power OFF then ON at the end of programming to initiate changes.
If parameter "tC" is set to 4 or 5 without an evaporator probe fitted, a P2 probe alarm will be generated. If you do intend to use settings 4 or 5 fit a probe, if you intend to use settings 1, 2 or 3, you must switch the power OFF then ON again to clear the alarm.



UNIVERSAL R	Label	Adjustment Range	Factory defaults with parameter "tC" 1 - 5				
Type (category) of controller	tC	1 = On / Off Thermostat	**1**				
		2 = Off cycle defrost		**2**			
		3 = Time / time defrost			**3**		
		4 = Time / temp defrost				**4**	
		5 = Time / temp defrost + fan delay					**5**
Probe type	PbC	0 = PTC 1 = NTC	0	0	0	0	0
Differential	HY	0.2 ÷ 30.0 °c	2.0	2.0	2.0	2.0	2.0
Minimum Set Point limit	LS	- 50 °c ÷ Set Point	-30.0	-30.0	-30.0	-30.0	-30.0
Maximum Set Point limit	US	Set Point ÷ 150 °c	20.0	20.0	20.0	20.0	20.0
Anti-short cycle delay	AC	0 ÷ 30 mins.	1	1	1	1	1
Temperature alarm configuration	ALC	0 = Relative to SP 1 = Absolute	1	1	1	1	1
High temperature alarm	ALU	0 ÷ 50 °c (Relative) ALL÷150 °c (Absolute)	50	50	50	50	50
Low temperature alarm	ALL	0 ÷ 50 °c (Relative) - 50 °c ÷ ALU (Absolute)	- 50	- 50	- 50	- 50	- 50
Temperature alarm delay	Ald	0 ÷ 250 mins.	15	15	15	15	15
Delay of temperature alarm at start up	dAO	0 ÷ 720 mins.	90	90	90	90	90
Outputs activation delay at start up	OdS	0 ÷ 250 mins.	0	0	0	0	0
Thermostat override	CCT	0 ÷ 990 mins.		0	0	0	0
Defrost delay after thermostat override	dAF	0 ÷ 250 mins.		2	2	2	2
Interval between defrosts	IdF	1 ÷ 250 hours		4	6	6	6
Delay start of defrost	dSd	0 ÷ 59 mins.		0	0	0	0
(Maximum) duration of defrost	MdF	0 ÷ 250 mins.		15	15	30	30
Defrost termination temperature	dtE	- 50 ÷ 150 °c				8.0	8.0
Display during defrost	dFd	0 = Real temp. 1 = Temp. at defrost start 2 = Set Point 3 = "DEF" label 4 = "DEG" label		3	3	3	3
Defrost display time out	dAd	0 ÷ 250 mins.		10	10	10	10
Defrost type (forced)	tdF	0 = Electrical 1 = Hot Gas			0	0	0
Drain down time	Fdt	0 ÷ 60 mins.			0	0	2
First defrost after power on	dPO	0 = Immediate 1 = After normal interval		1	1	1	1
Evaporator fan operating mode	FnC	0 ÷ 4 (1 = Fan always on apart from during defrost. See section 10 for info. on other settings)					1
Evaporator fan stop temperature	FSt	- 50 ÷ 150 °c					25
Evaporator fan delay after defrost	Fnd	0 ÷ 250 mins.					7
Thermostat probe calibration	Ot	- 12.0 ÷ 12.0 °c	0.0	0.0	0.0	0.0	0.0
Evaporator probe calibration	OE	- 12.0 ÷ 12.0 °c				0.0	0.0
Display Resolution	rES	0 = With decimal point 1 = No decimal point	0	0	0	0	0
Temperature measurement unit (°C/°F)	CF	0 = ° Celsius 1 = ° Fahrenheit	0	0	0	0	0
Compressor ON time with faulty probe	COn	0 ÷ 250 mins.	15	15	15	15	15
Compressor OFF time with faulty probe	COF	0 ÷ 250 mins.	30	30	30	30	30
Alarm muting configuration for buzzer & relay	tbA	0 = Mute buzzer only 1 = Mute buzzer & relay	1	1	1	1	1
Parameter table	Ptb	For factory use only	-	-	-	-	-
Software release number	rEL	Read only	-	-	-	-	-
Evaporator probe temperature	Prd	Read only	-	-	-	-	-

8. EASY PROGRAMMING FLOW CHART



IMPORTANT :

Whenever the setting of parameter **"tC"** is altered, factory defaults for parameters **Idf, Mdf**, **Fdt & FnC** are restored. For this reason, always set parameter **"tC"** first before attempting to alter any of the other parameters.

If no button is pressed for 15 seconds, the controller will revert to normal temperature display. **Any alteration that has been made will be stored.**

Universal-R uses a programming logic, which prevents parameters conflicting with each other.

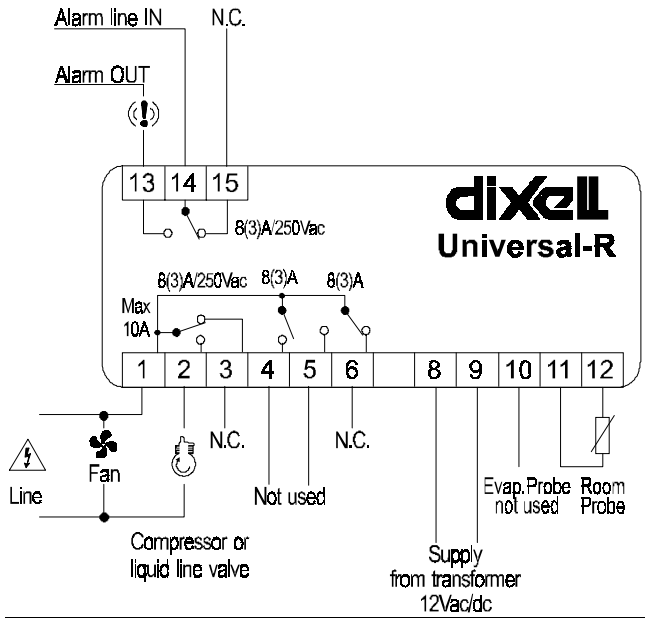
Example :

If the Set Point was set at + 2°c and you tried to lower the Upper Set Point Limit (parameter "**US**"), the minimum setting the controller would allow would be +2°c. Only by lowering the Set Point could you then adjust this parameter further downwards.

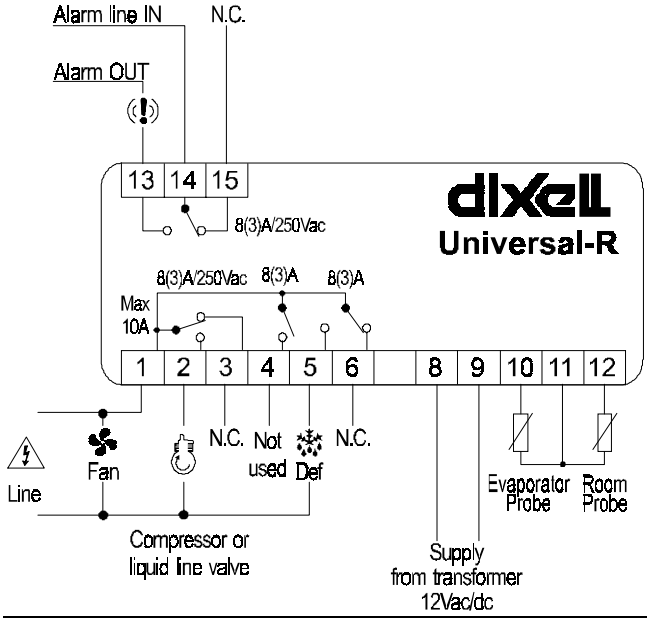
Quick Reference

9. TYPICAL CONNECTIONS - FOR GENERAL GUIDANCE ONLY

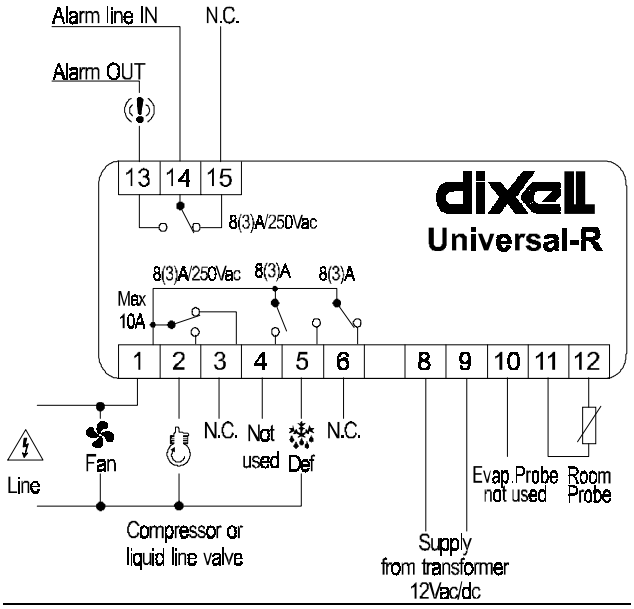
Parameter tC = 1 or 2
On / Off thermostat or Off Cycle Defrost Controller



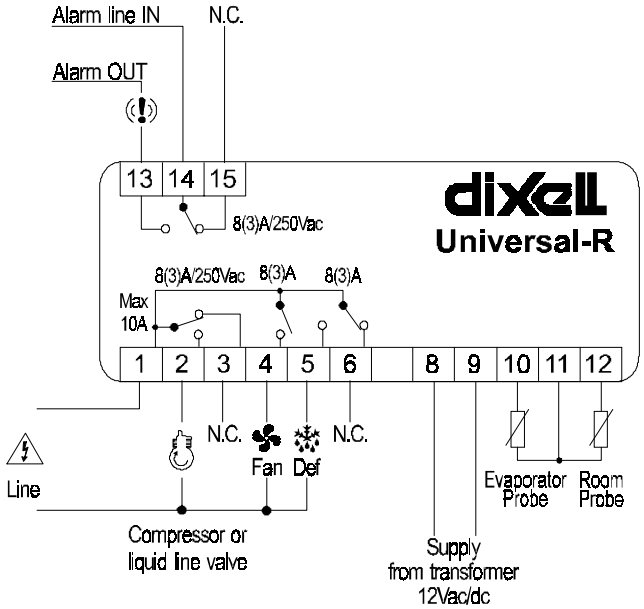
Parameter tC = 4
Forced defrost controller, time initiated & temperature terminated.



Parameter tC = 3
Forced defrost controller, time initiated & time terminated.



Parameter tC = 5
Forced defrost controller, time initiated & temperature terminated with evaporator fan delay after defrost.



Quick Reference

READ ON IF YOU NEED MORE DETAIL :

10. PARAMETERS – THEIR FUNCTIONS IN DETAIL

tC **Type of Controller :** Tells the Universal-R which type of controller it will be operating as.
1 = On / Off refrigeration thermostat – 1 relay &1 probe
2 = Combined thermostat with off cycle defrost timer – 1 relay & 1 probe
3 = Combined thermostat with time initiated & time terminated defrost – 2 relays & 1 probe
4 = Combined thermostat with time initiated & temperature terminated defrost – 2 relays & 2 probes
5 = Combined thermostat with time initiated, temperature terminated defrost + evaporator fan control with delay after defrost – 3 relays & 2 probes

PbC **Probe Type**: Configures the controller to work with PTC or NTC probes.
0 = PTC, 1 = NTC

Hy **Differential**: (0,2°C ÷ 12,0°C) - Sets the degrees above Set Point at which the compressor cuts in.

LS **Minimum set point limit**: (-50°C ÷ SET) - Sets the lower limit of set point adjustment.

US **Maximum set point limit**: (SET °÷ 150°C) - Sets the upper limit of set point adjustment

AC **Anti-short cycle delay**: (0 ÷ 30 min) minimum interval between the compressor stop and the next possible restart.

ALC **Temperature alarm configuration** :
0 = Related to Set Point
1 = Absolute

Note : Related means alarms are linked to the Set Point and will follow it if it is adjusted. In this case ALU & ALL set degrees over & under Set Point for alarm. Absolute means ALU & ALL will set fixed alarm temperatures, which are not effected by any Set Point adjustment.

ALU **High temperature alarm**: **ALC = 0** from 0 ÷ 50°C; **ALC = 1** from ALL ÷ 150°C

ALL **Low temperature alarm**: **ALC = 0** from 0 ÷ 50°C; **ALC = 1** from -50°C ÷ ALU

ALd **Temperature alarm delay**: (0 ÷ 250min) time interval between an alarm condition occurring and the alarm signalling.

dAO **Delay of temperature alarm at start-up**: (from 0 ÷ 720 min; res. 10min) time delay of any temperature alarm during pull down following "power on".

OdS **Outputs activation delay at start up:** (0 ÷ 250min) Time delay before any output relay activates following "power on".

CCt **Thermostat override**: (0 ÷ 990min; res. 10 min) Period during which the compressor will run continuously, irrespective of temperature. Setting this parameter to 0 prohibits this function.

dAF **Defrost delay after fast freezing**: (0 ÷ 250 min) time interval between the end of the thermostat override period and the start of the following defrost related to it.

IdF **Interval between defrosts**: (1 ÷ 250 hours) Time interval between the beginning of two consecutive defrosts.

dSd **Delay start of defrost** :(0 ÷ 59min) Delay between reaching the defrost interval time (as defined by parameter IdF) and the defrost actually starting. Used to stagger defrosts between multiple systems.

MdF **(Maximum) duration of defrost**:(0 ÷ 250 min) Time duration of defrost when only one probe is in use, or defrost time out override when second (evaporator) probe is in use.

dtE **Defrost termination temperature**: (-50 ÷150°C) Sets the defrost termination temperature. Measured by the evaporator probe.

dFd **Display during defrost**: 0 = real temperature; 1 = temperature at defrost start; 2 = set point; 3 = "dEF" label; 4 = "dEG" label

dAd **Defrost display time out**: (0 ÷ 250 min). After a defrost, the controller will revert to current temperature display when the temperature is back down within it's normal working range, or after the time set in this parameter, which ever is the sooner.

tdF **Defrost type**: 0 = electrical heater 1 = hot gas. If set for hot gas, compressor runs during defrost.

Fdt **Drain down time**: (0 ÷ 60min) Drain down time. Runs concurrently with Fdt (Fan delay time)

dPO **First defrost after power-on**: (0 = Immediately; 1 = after the IdF interval time)

FnC **Fan operating mode**: 0 = cycles on / off with the compressor, OFF during defrost; 1 = continuous mode, OFF during defrost; 2 = cycles on / off with the compressor, ON during defrost; 3 = continuous mode, ON during defrost; 4 = fan relay is used as 2nd compressor output

FSt **Fan stop temperature**: (-50 ÷ 150°C) Temperature above which the evaporator fan stops (during the normal refrigeration cycle)

Fnd **Fan delay after defrost:** (0 ÷ 250 min) The time interval between end of defrost and evaporator fans starting. Runs concurrently with Fdt (Drain time). Always keep Fnd longer that Fdt.

Ot **Thermostat probe calibration**: (-12.0 ÷ 12.0°C) Adjustment for thermostat probe offset.

OE **Evaporator probe calibration**: (-12.0 ÷ 12.0°C) Adjustment for evaporator probe offset.

rES **Display resolution** : 0 = With decimal point, 1 = Without decimal point

CF **Temperature measurement unit**: 0 = Celsius; 1 = Fahrenheit.
Warning : If you alter the setting of parameter rES (decimal point on / off) re-check the settings of all temperature related parameters – Set Point, HY, LS, US, ALU, ALL, dtE, FSt, Ot & OE, as they can be effected

COn **Compressor ON time with faulty probe** (0 ÷ 250 min) Emergency control if the thermostat probe fails. This is the compressor "ON" time.

COF **Compressor OFF time with faulty probe** (0 ÷ 250 min) Emergency control if the thermostat probe fails. This is the compressor "OFF" time.

tbA **Alarm muting :** 0 = Alarm relay remains active when alarm buzzer is muted. 1 = Alarm relay is cancelled when alarm buzzer is muted.

Ptb **Parameter table :** Read only – for factory use

rEL **Software release :** Shows the software release number

Prd **Evaporator probe :** Shows the current temperature sensed by the evaporator probe

11. BUTTONS – WHAT ARE THEIR FUNCTIONS

11.1 INDIVIDUAL BUTTON FUNCTIONS

SET: **Display current Set Point** - Press and release the SET button and the Set Point is displayed for 5sec. This will not allow the Set Point to be altered.

To alter the Set Point - Hold the button pressed for at least 2sec, Set Point change mode is entered indicated by the small LED's flashing. Change the Set Point using the ▲ and ▼ buttons. The new value can be stored either by pressing the **"SET"** button (the instrument restores temperature display) or by waiting the exit time-out to expire (15sec).

▲ (**UP**): Used to scroll through parameter labels or to increase parameter settings. Keep pressed for a faster change. Also used to initiate Thermostat override. (See section 13, Fast Chill / Freeze)

▼ (**DOWN**): Used to scroll through the parameter labels or to decrease parameter settings. Keep pressed for a faster change.

❄ **Manual Defrost:** Press this button for 3sec. A manual defrost cycle will start and the defrost LED will illuminate. (Not possible if parameter **"tC"** = 1)

COMBINATION BUTTON FUNCTIONS

▲ + ▼ **Lock & unlock the buttons:** Pressing these together for 3secs. will lock or unlock them. The display will flash "POF" or "POn for a few seconds to confirm locking or unlocking respectively.

SET + ▼ **Enter programming mode:** Keep both buttons pressed for 3secs. and programming mode is entered. The first label is displayed

SET + ▲ **Exit programming mode:** Press together to return to normal display

12. PROGRAMMING MODE

To enter programming mode, press the **SET** & ▼ together for a few seconds, until the first label is displayed. **Pr2** is normally the only label you will see here. If not, use the ▲ or ▼ button to scroll to the Pr2 label. Pr2 is a sub-menu containing all parameters.

Now press **SET**. The display briefly flashes "PAS", asking for the pass code, which is :-

3 2 1

Then the digits will change and start flashing **"0 - - ".** Starting with the left hand digit, enter the pass code using the ▲ , ▼ and **SET** buttons as follows,

3 → SET → 2 → SET → 1 → SET

The first parameter **"tC"** will now be displayed. Press **SET** to see it's value, use the ▲ & ▼ buttons to alter the value, press **SET** to store it and move on to the next parameter. **Always** set **"tC"** first before setting the other parameters.

Note : If you remove the security code protection from any of the parameters, their labels will appear in this first level and their values can be viewed and altered without using the security code.(See section 18, Removing Security Protection)

12.1 EXIT TIME OUT - IMPORTANT

If no button is pressed for 15 seconds, any alteration will be stored and the display returns to normal

13. OTHER FEATURES OF THE UNIVERSAL-R

13.1 LED'S

As well as the main digital display, there are some small LED's with symbols on the front panel. These are used to monitor the loads controlled by the instrument. Each LED's function is described in the following table.

LED	MODE	Function
❄	ON	Cooling enabled
❄	FLASHING	Anti-short cycle delay in progress
🌀	ON	Fan enabled
🌀 & ❄	FLASHING	You are in programming mode
❄	ON	Defrost in progress
❄	FLASHING	Drip time in progress
✋	ON	Thermostat override enabled
(!) Alarm	ON	ALARM signal, or :- When in programming mode, in Pr2, if this lights up, it indicates that parameter is also accessible without security code, in the first level

14. THERMOSTAT OVERRIDE (not available when parameter "tC" = 1)

For rapid chilling or freezing, the thermostat can be overridden by pressing the ▲ button until the LED under the ✋ symbol lights up. The compressor will run in continuous mode, irrespective of temperature, for the time period set in parameter "**CCt**". Normal operation will then resume

automatically. The cycle can also be terminated manually by pressing the ▲ button again for about 3 seconds.

15. DEFROST TYPES

Parameter **"tC"** = 1 No defrost
Parameter **"tC"** = 2 Off cycle defrost by timer
Parameter **"tC"** = 3, 4 or 5 Forced defrost, Electrical or Hot Gas
Parameter **"tdF"** = 0 defrost is electrical – **"tdF"** = 1 defrost is by hot gas

16. EVAPORATOR FAN CONTROL (only when parameter "tC" = 5)

The fan control mode is selected by means of the "**FnC**" parameter:
FnC=0 fans will cycle ON and OFF with the compressor and **be off** during defrost**:**;
FnC=1 fans will run continuously, but **be off** during defrost
FnC=2 fans will switch ON and OFF with the compressor and **be on** during defrost *
FnC=3 fans will run continuously and **be on** during defrost *
* **Note :** Fans will stop if the temperature in parameter **FSt** is exceeded.
Parameter **"FSt"** sets the fan stop temperature. This is the maximum temperature, detected by the evaporator probe, above which the evaporator fans will stop.
Leave **"FSt"** above ambient during commissioning to avoid fan short cycle.
After defrost, there is a stand still drain time, set by parameter **"Fdt"** When this period has expired, the refrigeration cycle commence but the evaporator fans remain off until **"Fnd"** (fan delay) times out.

17. CONTROL OF A SECOND COMPRESSOR

If the evaporator fan relay is not being used, the Universal-R can control a second compressor with this relay, using parameter **"FnC"**. Parameter **"Fnd"** (normally used for fan delay) now becomes the delay between the starting of compressor 1 and 2.

FnC = 4 The evaporator fan relay is used to control the second compressor
Fnd = 0 to 250 (minutes) Time delay between the start of the 1st and 2nd compressors.

18. ALARMS

Message – Mode	Cause	Outputs
"EE" Flashing	Data or memory failure	Alarm output ON; Other outputs unchanged
"P1"Flashing	Thermostat probe failure	Alarm output ON; Compressor output according to parameters "COn" and "COF"
"P2" Alternating with room temperature	Evaporator probe failure	Alarm output ON; Other outputs unchanged; End defrost is timed
"HA" Alternating with room temperature	High temperature alarm	Alarm output ON; Other outputs unchanged.
"LA" Alternating with room temperature	Minimum temperature alarm	Alarm output ON; Other outputs unchanged.

18.1 MUTING ALARM BUZZER & RELAY

The alarm buzzer can be muted, by pressing any button. The controller will briefly show the reset "rES" label. Parameter **tbA** defines how the alarm relay will respond to the muting of the buzzer.
tbA = 0 The alarm relay will remain active until the alarm condition is rectified
tbA = 1 The alarm relay de-activates when the buzzer is muted
In either case, the display will flash an alarm label until the condition is rectified

18.2 ALARM "EE"

The Dixell Universal-R is provided with an internal watchdog verifying data and memory integrity. Alarm "**EE**" flashes when a failure in data or in the internal memory is detected. In such case the alarm output is enabled.
WHAT TO DO

1. Cancel the alarm by pressing a key.
2. Check the value of all parameters and restore correct values when wrong.
3. Check the correct instrument operation and in case of further errors replace it.

18.2.1 ALARM RECOVERY

Probe alarms "**P1**" and "**P2**" start 30 seconds after a fault in probe is detected; they automatically stop 30 seconds after the probe restarts normal operation. Check connections before replacing the probe.

Temperature alarms "**HA**" and "**LA**" automatically stop as soon as the thermostat temperature returns to normal values and when defrost starts.

19. REMOVING SECRURITY CODE PROTECTION

It is possible to allow access to any parameter without using the security code. To do this, go into Pr2 as previously described. Scroll to the label of the parameter you require and then press the **SET** and ▼ buttons in quick succession. The small alarm LED will light up indicating that access to this particular parameter is now possible without the security code. It's label will now appear when you are in the first programming level and it's value can be altered. Remove access using the same procedure and the LED will go out.

20. MOUNTING

The Universal-R should be mounted in a panel, in a 29 x 71 mm hole, and fixed using the special brackets supplied.
Ambient temperature for correct operation is 0 - 60 °C. Avoid places subject to strong vibrations, corrosive gases, excessive dirt or humidity, 20 – 85% non condensing. Make sure air can freely circulate through the cooling holes slots at the back of the controller.

21. ELECTRICAL CONNECTIONS

The instrument is provided with screw terminal block to connect cables with a cross section up to 2,5 mm^2. Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the probe cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current rating for each relay, in case of heavier loads use a suitable external relay.

22. PROBES

It is recommended to place the thermostat probe away from rapid air streams to correctly measure the average room temperature. Place the defrost termination probe among the evaporator fins in the coldest place, where most ice is formed, far from heaters or from the warmest place during defrost, to prevent premature defrost termination.

23. TECHNICAL DATA

ousing: Self extinguishing ABS.
Size : Frontal 32x74 mm; depth 70mm;
Mounting : Panel mounting in a 71x29 mm panel cut-out.
Frontal protection : IP65
Connections: Screw terminal block ≤ 2,5 mm^2 wiring.
Power supply : 12Vac/dc, -10% +15%**.**
Power absorption: 3VA max.
Display : 3 digits, red LED, 14,2 mm high.
Inputs : 1 or 2 probes, PTC or NTC
Probes (supplied) : 2 x PTC, range –20 / + 80c with 2 metre cables
Relay outputs :- **Amps Resistive (Inductive)**
compressor : SPDT relay 8(3)A, 250Vac
defrost : SPDT relay 8(3) A, 250Vac
fans : SPST relay 8(3)A, 250Vac
alarm : SPDT relay 8(3) A, 250Vac
Other output : Buzzer for an acoustic signal of alarms
Data storing In non-volatile memory (EEPROM).
Ambient temperature: 0 to 60 °C.
Ambient humidity: 20 to 85% (no condensing)
Storage temperature: -30 to 85 °C.
Operating range: **PTC:** -50÷150°C (-58÷302°F)
NTC: -50÷110°C (-58÷230°F)
Resolution: 0,1 °C or 1 °F (selectable)
Accuracy at 25°C: (range –40 to50°c)
±0,5 °C ±1 digit

24. FAULT FINDING

Problem	Possible reason	Notes
Display flashing HA	• Temperature too high	• Check cooling system • Check alarm settings
Display flashing LA	• Temperature too low	• Check cooling system • Check alarm settings
Display flashing P1	• Fault with thermostat probe. • Wrong type of probe fitted (NTC/PTC)	• Check probe connections and resistance value • Change probe type or alter parameter PbC
Display flashing P2	• Fault with evaporator probe • Wrong type of probe fitted (NTC/PTC) • Parameter tC has been set to 4 or 5 with no evaporator probe fitted	• Check probe connections and resistance value • Change probe type or alter parameter PbC • Fit evaporator probe or alter parameter tC
Display flashing EE	Data corruption	Check for electrical spikes and interference. Fit filters DIXL930 & DIXL932 Ensure probe cables are separated from power cables. Re-check all parameter settings Replace controller if still not working.
Buttons will not work	Buttons have been locked	Unlock buttons by pressing both ▲ & ▼ buttons until display flashes "POn"
Parameter cannot be adjusted over it's full range	Some other parameter is conflicting and preventing further adjustment	Check other parameter settings
Power on but no output operates Small LED's flashing	Anti short cycle in progress, relays being held off until it expires.	Wait or adjust parameters AC or OdS
Evaporator fan short cycling	Parameter FSt set too low	Adjust FSt to a higher setting. During commissioning, set it above ambient until pull down is complete, then re-set to a more suitable temperature.

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