

UNIVERSAL – R V3.0

NEW FEATURES on the V3.0

- **HEATING :**

As well as cooling, the Universal-R can now be used to control heating applications up to +105c, using the NTC probes supplied in box.

For temperatures above 105c and up to maximum +150c, please order special PTC probe (S6.SH), Part No. DIXL957

- **AUTOMATIC PROBE RECOGNITION:-**

The Universal-R can work with either NTC or PTC probes.

It can now automatically recognise which type of probe is connected and set itself accordingly.

During auto probe recognition, probe temperature must be Min. -50c, Max. + 60c

- **PROBES SUPPLIED AS STANDARD:**

The Universal-R is now supplied with 2 of the latest fully encapsulated NTC probes

- **HOT KEY PROGRAMMING:-**

You can now use a "Hot Key" (Part No. DIXL695) to transfer parameter settings between one Universal-R and another (V3.0 only)

- **DIGITAL INPUT:**

The Universal-R now has a digital input that you can configure to accept external signals, i.e. - door switch, pressure switch, alarms, energy saving etc.

**EVEN MORE FLEXIBILITY & MORE CONVENIENCE, THE
UNIVERSAL-R
CAN NOW REPLACE WELL OVER 100 OTHER CONTROLLERS !**

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2. GENERAL WARNING

WARNING: The Universal-R should always be installed by a suitably qualified person, in accordance with best electrical and refrigeration practice. Take time to read the instructions. Do not exceed the relay ratings. The Universal-R should not be considered a safety device, use suitable safety cutout devices when appropriate.

- 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.
- **Heating applications** – *Do not* exceed 105c with the NTC probes supplied. For higher temperatures (up to a maximum of 150c) use special PTC probes - our Part No. DIXL957.

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) that can be configured as Auxiliary, Alarm or to control a heater in Dead Band control (see parameter oAc)
Each instrument is fully configurable through special parameters that can be easily programmed through the keypad.

4. QUICK START UP PROCEDURE – Up and running in 6 easy steps

This Quick Start Up section is designed to get you up and running with the minimum of fuss. Just follow these 6 simple steps.

STEP 1 - Using the table below, decide which type of controller you wish the Universal-R to function as and take note of the required setting for parameter "tC"

Also take note of the number of probes to be connected.

Parameter "tC" setting	Type of Control	Number of probes required
1	On / Off thermostat – Cooling	x 1
2	Off cycle defrost (timed)	x 1
3	Electrical / Hot Gas defrost, time initiated / time terminated	x 1
4	Electrical / Hot Gas defrost, time initiated / temperature terminated	x 2
5	Electrical / Hot Gas defrost, time initiated / temperature terminated + evap. fan delay	x 2
6	On / Off thermostat – Heating	x 1

Note: "tC" settings 3, 4 & 5, default to Electrical Defrost. Hot Gas is possible by setting parameter "tdF" for gas defrost. Settings 1,2,3 & 6 do not require the 2nd probe to be fitted



STEP 2 - Install the new Universal-R and connect up the wiring and probe(s).

If in doubt, refer to Section on typical wiring connections



STEP 3 - Turn on the power supply to the controller

For 1 minute, you now have direct access (without pass code) to parameter "tC" and to start the automatic probe type recognition, after which these parameter settings will have to be done manually and the pass code will have to be entered.



STEP 4 - Within 1 minute from the power on, press the n button for 3 seconds, the controller will automatically recognise if the probes connected to it are PTC or NTC. During recognition time the controller will display: tPd (type of probe detection) followed by the kind of probe "ntc" or "Ptc" flashing for few seconds.

Notes: Probe temperature must be between -50c & + 60c for automatic probe recognition to work correctly. When using 2 x probes, both must be the same type, you cannot mix them.



STEP 5 – Within 1 minute from the power on, press the "SET + n " buttons for 3 seconds and the label "Pr2" will be shown, release the buttons and parameter "tC" will be displayed, then press the "SET" button again to see the current setting and adjust using the o & n buttons to the setting you require for your particular application.

Allow display to return to normal



STEP 6 - Press the "SET" button for 3 seconds until the small LED's at the top of the display start to flash and the Set Point value is displayed, then adjust the "Set Point" using the o & n buttons.

IMPORTANT: Finally turn off the power then turn back on again

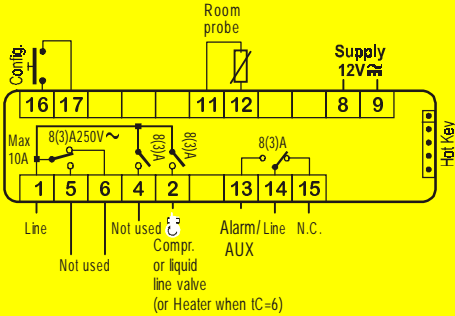


We recommend you you check the parameter default settings listed in these instructions to ensure they suit your particular application. If you need to make further parameter adjustments or you require more information, read the following sections

5. TYPICAL CONNECTIONS - FOR GENERAL GUIDANCE ONLY

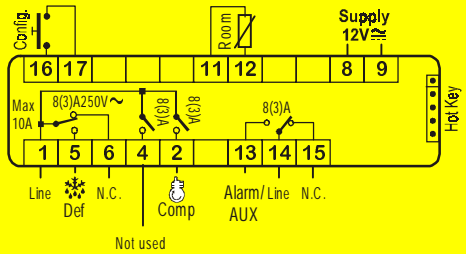
Parameter tC = 1, 2 or 6

On / Off thermostat or Off Cycle Defrost Controller



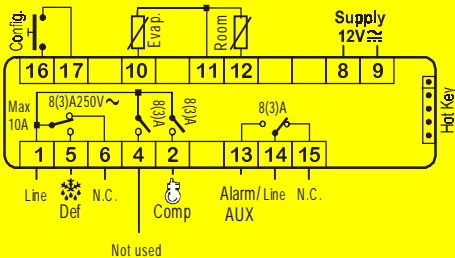
Parameter tC = 3

Forced defrost controller, time initiated & time terminated



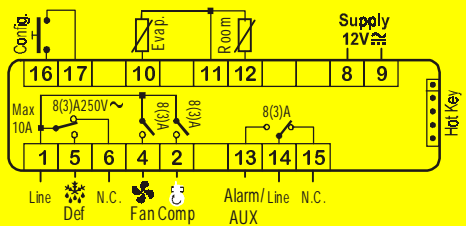
Parameter tC = 4

Forced defrost controller, time initiated & temperature terminated



Parameter tC = 5

Forced defrost controller, time initiated & temperature terminated with evaporator fan delay after defrost



6. 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. Once "tC" has been set correctly, you can then alter any other parameter if you need to.

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- 6					
Type (category) of controller	tC	1 = On / Off Thermostat						
		2 = Off cycle defrost						
		3 = Time / time defrost						
		4 = Time / temp defrost						
		5 = Time / temp defrost + fan delay						
		6 = On / Off Thermostat for heating						
Probe type	PbC	0 = PTC 1 = NTC	1	1	1	1	1	1
Differential	HY	0.2 ÷ 30.0 °c	2.0	2.0	2.0	2.0	2.0	2.0
Minimum Set Point limit	LS	- 50 °c + Set Point	-50.0	-50.0	-50.0	-50.0	-50.0	-50.0
Maximum Set Point limit	US	Set Point ÷ 150 °c	50.0	50.0	50.0	50.0	50.0	50.0
Anti-short cycle delay	AC	0 ÷ 30 mins.	1	1	1	1	1	1
Temperature alarm configuration	ALC	0 = Relative to SP 1 = Absolute	1	1	1	1	1	1
High temperature alarm	ALU	0 ÷ 50 °c (Relative) ALL÷150 °c (Absolute)	50	50	50	50	50	50
Low temperature alarm	ALL	0 ÷ 50 °c (Relative) - 50 °c ÷ ALU (Absolute)	- 50	- 50	- 50	- 50	- 50	- 50
Temperature alarm delay	ALd	0 ÷ 250 mins.	15	15	15	15	15	15
Delay of temperature alarm at start up	dAO	0 ÷ 720 mins.	90	90	90	90	90	90
Outputs activation delay at start up	OdS	0 ÷ 250 mins.	0	0	0	0	0	0
Thermostat override	CCT	0 ÷ 990 mins.	0	0	0	0	0	0
Defrost delay after thermostat override	dAF	0 ÷ 250 mins.	2	2	2	2	2	2
Interval between defrosts	IdF	1 ÷ 250 hours	4	6	6	6	6	6
Delay start of defrost	dSd	0 ÷ 59 mins.	0	0	0	0	0	0
(Maximum) duration of defrost	MdF	0 ÷ 250 mins.	15	15	30	30	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

UNIVERSAL R	Label	Adjustment Range	Factory defaults with parameter "tC" 1- 6					
Thermostat probe calibration	Ot	- 12.0 ÷ 12.0 °C	0.0	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	0
Temperature measurement unit (°C/°F)	CF	0 = ° Celsius 1 = ° Fahrenheit	0	0	0	0	0	0
Compressor ON time with faulty probe	COn	0 ÷ 250 mins.	15	15	15	15	15	15
Compressor OFF time with faulty probe	COF	0 ÷ 250 mins.	30	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	1
Digital input configuration	dic	0=Start defrost: 1=Door switch 2=Auxiliary relay: 3=Energy saving 4=Remote On/OFF: 5=Generic alarm: 6=Serious alarm	5	5	5	5	5	5
Digital input polarity	diP	0=Closed circuit: 1=Open circuit	0	0	0	0	0	0
Digital input delay	did	0-255 minutes	0	0	0	0	0	0
Door open – compressor / fan status	odc	0=No change: 1=Fan off 2=Compressor off: 3=Compressor & Fan off	0	0	0	0	0	0
Configure the 4 th relay	oAc	0=Alarm relay: 1 = Heater relay (for Neutral Zone) 2=Auxiliary relay	0	0	0	0	0	0
Alarm relay polarity	AoP	0 = 13-14 closed with alarm 1 = 13-14 open with alarm	0	0	0	0	0	0
Door open alarm delay	doA	0-250 minutes	15	15	15	15	15	15
Exclude temperature alarm - door open	dot	0-250 minutes	20	20	20	20	20	20
Restart regulation with door open alarm	rrd	0=No: 1=Yes	0	0	0	0	0	0
Temperature deviation from normal Set Point during Energy Saving	HES	-30°C / +30°C	0	0	0	0	0	0
Parameter table	Ptb	For factory use only	-	-	-	-	-	-
Software release number	rEL	Read only	-	-	-	-	-	-
Evaporator probe temperature	Prd	Read only	-	-	-	-	-	-

READ ON IF YOU NEED MORE DETAIL

7. 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 PTC or NTC sensors from most other leading brands. If the existing sensors are incompatible or possibly faulty, they can be replaced by the two new NTC sensors which come supplied with the Universal-R. (When ever practical, replacement of the sensors is always recommended as good practise.)

LAE

MTR11/T1RDS	MTR11/T1RES	SDU11/T1RES	SDU11/T1REBS	SDU112
MCDU11/T1RDS	MCDU11/T1RDS/1	MCDU11/T1RDS/2	MCDU11/T1RDS/3	CDC112/T1R2S
CDC112/T1RES	CDC112/T1RBS	SDU12/T0RES	SDU12/T0REB	SDU12/T0RD
SDU12/T0RDC	LDU151E	LDU152E	CDC112/T1R2	CDC112/T1R3B

Carel

IR32S	IR32Y	IR32C	CR32S	CR32T
CR32X	CR32Y	PJ32Y	PJ32S	PJ32X
PJ32C				

Eliwell

EWPC901	EWPC902	EWPC961	EWPC970	EWPC971
EWPC974	EWXP977A	EWTC101	EWXP161	EWXP161AR
EWXP170	EWXP171	EWXP174	EWXP174AR	EWXP117A
EWXP185	IC901	IC902	ID961	ID961LX
ID970	ID970LX	ID971	ID971LX	ID974
ID974LX				

SAE

RT31	RC31	RC31-1000	RC31-0100	RC32-0000
RC33	DC31 (PTC)			

Intek

RK31	RK32	RK33	TK31	DK31 (PTC)
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Every

EC3-120	EC3-130	EC3-131	EC3-110	EC3-111
EC3-180	EC3-181	EC3-185	FK200A	FK201A
FK201T	FK202A	FK202T	FK203B	FK203C
FK203T	FK214A			

Dixell

XR110C*	XR120C*	XR130C*	XR140C*	XR150C*
XR160C*	XR170C*	XR10C	XR20C	XR30C
XR40C	XR50C	XR60C	XR70C	* Not RS485 versions

Teddington

EK-R31	EK-R32	EK-R33		
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Danfoss

EKC201-084B7005	EKC201-084B7008	EKC201-084B7011	EKC201-084B7012	EKC201-084B7006
EKC201-084B7007	EKC201-084B7009	EKC201-084B7010		

Penn

MR1PM12R-1C	MR1PM230R-1C	MR2PM12R-1C	MR3PM12R-2C	MR4PM12R-2C
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Beta

RD31	RT31	BL21	RC31	BL32
RC32	BL33	RC33		

8. 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

6 = On / Off heating thermostat – 1 relay & 1 probe

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.

Note: with **tc=6** (heating applications) the Hy value is automatically set **below** the Set Point. If the temperature decreases and reaches set point minus differential the regulation output is activated and then turned off when the temperature reaches the set point value again.

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.

ldF 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 ldF) 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. Set it to zero to disable defrost cycles.

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 ldF 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 than 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.
- dic Digital input operating mode:** configures the digital input function:
 0 = Starts a defrost;
 1 = Input from a door switch (see parameter odc)
 2 = Activates the auxiliary relay;
 3 = Starts Energy Saving; (Control Point becomes Set Point +/- value in HES)
 4 = Remote On/OFF. (puts the controller into standby)
 5 = Generic external alarm (normal regulation continues)
 6 = Serious external alarm (regulation is stopped)
- diP Configurable digital input polarity:**
 0 : the digital input is activated by closing the circuit
 1 : the digital input is activated by opening the circuit
- did Time interval/delay for digital input alarm:**(0÷255 min.) it defines the time delay between the detection and the subsequent signalling of the alarm.
- odc Compressor and fan status when open door:**
 0 = normal; 1 = Fan OFF; 2= Compressor OFF; 3 = Compressor and fan OFF.
- oAc: Auxiliary relay configuration (0 = Alarm; 1 = Dead Band; 2 = Auxiliary)**
- AOp Alarm relay polarity:** 0 = 13-14 closed with alarm; 1 = 13-14 open with alarm
- doA: Door open alarm delay (0÷250min)**
- dot: Temperature alarm exclusion with door open (0÷250min)**
- rrd Regulation restart with door open (0=no; 1 = yes)** If yes, regulation will restart when "door open" alarms
- HES Temperature increase during the Energy Saving cycle :** (-30,0°C ÷ 30,0°C / -54÷54°F) sets the increasing value of the set point during the Energy Saving cycle.
- 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

9. BUTTONS – WHAT ARE THEIR FUNCTIONS

9.1 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 or 6)

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

10. 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)

10.1 EXIT TIME OUT - IMPORTANT

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

11. OTHER FEATURES OF THE UNIVERSAL-R

11.1 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

12. THERMOSTAT OVERRIDE (not available when parameter "tC" = 1 or 6)

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.

13. DEFROST TYPES

Parameter "tC" = 1 or 6 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

14. 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.

15. SPECIAL APPLICATIONS – TWIN COMPRESSOR – DEAD BAND CONTROL

16.1 TWIN 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. Both compressors will stop simultaneously

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.

16.2 DEAD BAND CONTROL (cooling & heating)

With oAc = 1, the compressor relay controls cooling as normal but the 4th (auxiliary) relay is used to control a heater. The value entered in parameter HY will now be set equal on both sides of the SET POINT. Example: if HY = 1°C that will create a 2°C Dead Band

At SET POINT + HY, cooling switches on. At SET POINT – HY, heating switches on. Either cooling or heating switch off when temperature returns to SET POINT

16. ALARMS

Message – Mode	Cause	Outputs
"EE" Flashing Alternating with room temperature	Data or memory failure	Alarm output ON; Other outputs unchanged
"P1" Flashing Alternating with room temperature	Thermostat probe failure	Alarm output ON; Compressor output according to parameters "CO _n " and "CO _F "
"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.
"dA" Alternating with room temperature	Door open alarm	Alarm output ON; Outputs re-start if parameter rrd= 1
"EA" Alternating with room temperature	Generic external alarm	Alarm output ON; Other outputs unchanged.
"bAL" Alternating with room temperature	Serious external alarm	Alarm output ON; Other outputs OFF.

16.1 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

16.2 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.

16.3 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.

17. REMOVING SECURITY 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.

18. 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.

19. ELECTRICAL CONNECTIONS

The instrument is provided with screw terminal block to connect cables with a cross section up to 2,5 mm². 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.

20. 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.

21. TECHNICAL DATA

Housing:	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 $\leq 2,5$ 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 NTC, range -40 / + 105c 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) $\pm 0,5$ °C ± 1 digit

22. FAULT FINDING

Problem	Possible reason	Notes
Display flashing HA	<ul style="list-style-type: none"> Temperature too high 	<ul style="list-style-type: none"> Check cooling system Check alarm settings
Display flashing LA	<ul style="list-style-type: none"> Temperature too low 	<ul style="list-style-type: none"> Check cooling system Check alarm settings
Display flashing P1	<ul style="list-style-type: none"> Fault with thermostat probe. Wrong type of probe fitted (NTC/PTC) 	<ul style="list-style-type: none"> Check probe connections and resistance value Change probe type or alter parameter PbC
Display flashing P2	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	<p>Check for electrical spikes and interference. Fit filters DIXL930 & DIXL932</p> <p>Ensure probe cables are separated from power cables.</p> <p>Re-check all parameter settings</p> <p>Replace controller if still not working.</p>
Display flashing dA	Door has been left open too long	Shut the door
Display flashing EA	A non serious external alarm has been detected by the digital input	Trace and rectify the external problem
Display flashing BAL	A serious external alarm has been detected by the digital input	Trace and rectify the external problem
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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