

FP975

*7-day electronic
programmer*

Installation & User Instructions



Certification Mark

This product complies with the following EC Directives:

Electro-Magnetic Compatibility Directive.

(EMC) (89\336\EEC), (92\31\EEC)

Low Voltage Directive.

(LVD) (73\23\EEC), (93\68\EEC)

CE

Danfoss

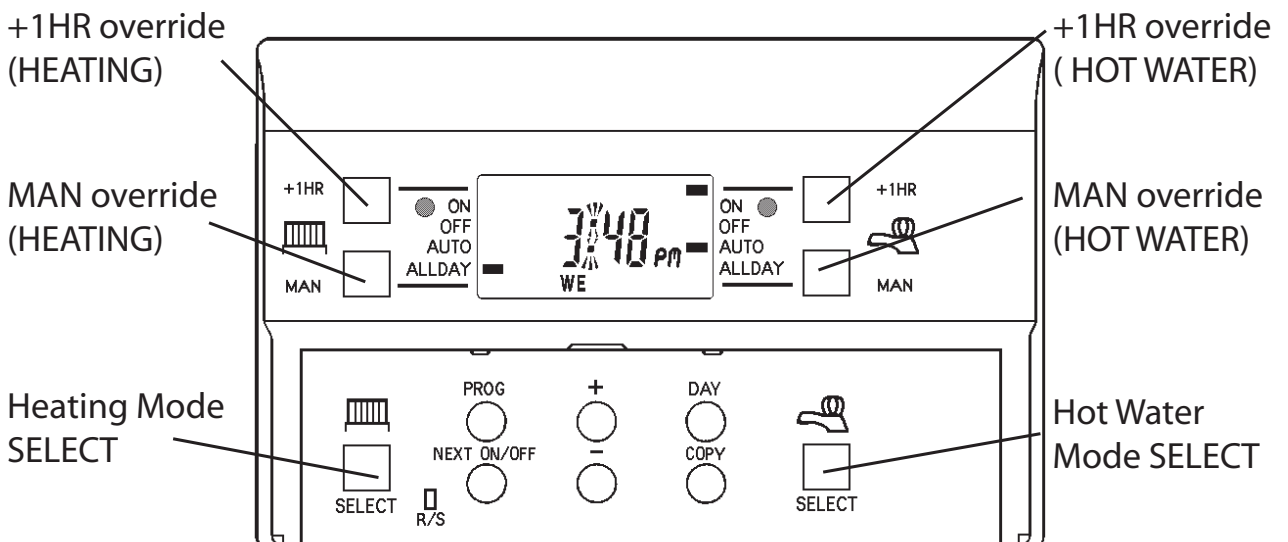
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Installation Instructions

Please Note:

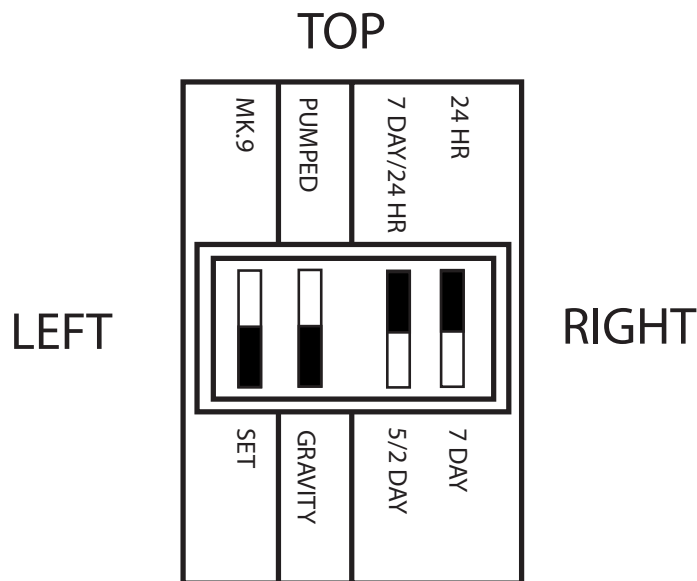
This product should only be installed by a qualified electrician or heating installer, and should be in accordance with the current edition of the IEEE wiring regulations.

Product specification

Specification	
Power supply	230 Vac \pm 15%, 50/60 Hz
Switching action	2 x SPDT voltage free, Type 1BS
Switch rating	10-230 Vac, 3(1)A
Battery back-up	24 hours minimum
Timing Accuracy	\pm 1 min/month
Setting/Running Accuracy	\pm 1 minute
Max. Ambient Temperature	45°C
Dimensions, mm (W, H, D)	148 x 96 x 42
Design standard	EN 60730-2-7
Control Pollution Situation	Degree 2
Rated Impulse Voltage	2.5kV
Ball Pressure Test	75°C

DIL Switch Settings

Before mounting the unit, ensure the 4 DIL switches on the rear of the unit have been moved to the required settings.



MK.9 or SET

The FP975 is supplied fitted with a Danfoss Randall SET wallplate. However the FP975 will also mount directly onto a Danfoss Randall MK.9 wallplate without the need for wiring changes. However when used with existing MK.9 wallplates the left hand switch must be set in the MK.9 position to re-configure the time control to match MK.9 wiring connections.

PUMPED or GRAVITY

When this switch is in the **PUMPED** position the Heating and Water outputs are **UNLINKED**. When in the **GRAVITY** position the Water output is **LINKED** to the Heating output so that whenever the Heating is **ON** the Water will also be **ON** regardless of the Water programme.

Place the switch in the **PUMPED** position if the system being controlled is a) fully pumped with a mid-position valve, b) fully pumped with a two port zone valve in each circuit, c) **GRAVITY** Hot Water, **PUMPED** Heating with a two port zone valve with SPDT auxillary switch in the gravity primary circuit (and wired in accordance with diagrams on pages 10-11).

Place the switch in the **GRAVITY** position if the system being controlled is a) fully pumped, but with only a single two port zone valve in the Heating circuit, b) **GRAVITY** Hot Water, **PUMPED** Heating with no zone valves.

7 Day, 5/2 Day or 24 Hour

When both switches are in the **7 DAY** position each day of the week may be programmed with different **ON/OFF** times. When the switch is in the **5 DAY/2 DAY** position, weekdays (Mon-Fri) can be programmed with one set of **ON/OFF** times, and weekends (Sat-Sun) can be programmed with a different set. When both switches are in the 24 hour position the same set of times will be repeated in every 24 hour period.

New Installation

1. Fix the wallplate to the wall or plaster box as required.

When fixing the wallplate note that the terminals are at the top, and the vertical centre line of the unit lies between terminals N & L.

2. Surface cables can only enter from below the unit. If mounted on a plaster box, cables can enter from the rear through the aperture in the wallplate.
3. The FP975 offers direct plug-in replacement to the following models (see overleaf):

New Installation

Direct Plug-In Upgrade for Existing Programmers

Manufacturer	Model	Fully Pumped Systems Pumped/ Gravity Selector Position	Gravity H.W. Systems Pumped/ Gravity Selector Position	Wallplate Type	Mode Sw Position
Danfoss Randall	FP975	Pumped	Gravity	SET	SET
	922	Unlinked	Linked	MK.9	MK.9
	972	Unlinked	Linked	MK.9	MK.9
	SET 2*	Unlinked	Linked	SET	SET
	SET 5	Unlinked	Linked	SET	SET
Horstmann	Diadem 425	Pumped	Gravity	SET	SET
	Tiara 425	Pumped	Gravity	SET	SET
	Tiara 525	Pumped	Gravity	SET	SET
	Tiara 527	Pumped	Gravity	SET	SET



IMPORTANT NOTE

If the timeswitch to be replaced is listed below it may be worth considering a FP715 as an alternative to the FP975. The FP715 offers wallplate compatibility for those models listed below, although some re-wiring may be required.

MAKE	MODELS
ACL	LS2411, LS522, LS722, LP241, LP522, LP722
Drayton	Tempus 3, Tempus 4, Tempus 7
Landis & Gyr	RWB 2, RWB 2-9, RWB 200, RWB 252, RWB 20, RWB 40
Glowworm	Mastermind
Potterton	Mini-Minder

If the new unit is replacing an existing time control having an incompatible wiring configuration, then the wiring conversions (tables A & B, pages 12-19) will be of assistance.

4. For wiring connections please refer to diagrams on pages 10-11. Please note, the FP975 does not require an earth connection, although a terminal is provided for earth continuity purposes.
5. Ensure that the two retaining screws on the top of the timeswitch are fully unscrewed. Locate the retaining lugs on the bottom inside surface of the plug-in module under the wallplate base and hinge the unit upwards until the module is pressed fully against the top of the wallplate. Tighten the two screws on the top of the module to secure the module to the wallplate.

6. A small blanking plug is supplied to blank the unused recessed bottom fixing screw.
7. Before setting the programmes the unit should be **RESET** by pressing the recessed button marked **R/S**. Ensure the mains power to the control circuit is switched on, and check the circuits as follows.
8. Use the  (Hot Water) **SELECT** button to get to the ON mode to switch the hot water output **ON**. Adjust the cylinder thermostat and check that the service operates correctly. Use the **SELECT** button to get to **OFF** mode and check that the service does not operate.
9. Use the  (Heating) **SELECT** button to get to the **ON** mode to switch the heating output **ON**. Adjust any remote thermostat(s) and check that the service operates correctly. Use the **SELECT** button to get to **OFF** mode and check that the service does not operate.

Existing Installation

- ! Ensure that the power to the existing unit is switched off prior to removal.

SYSTEMS RE-USING EXISTING WALLPLATE

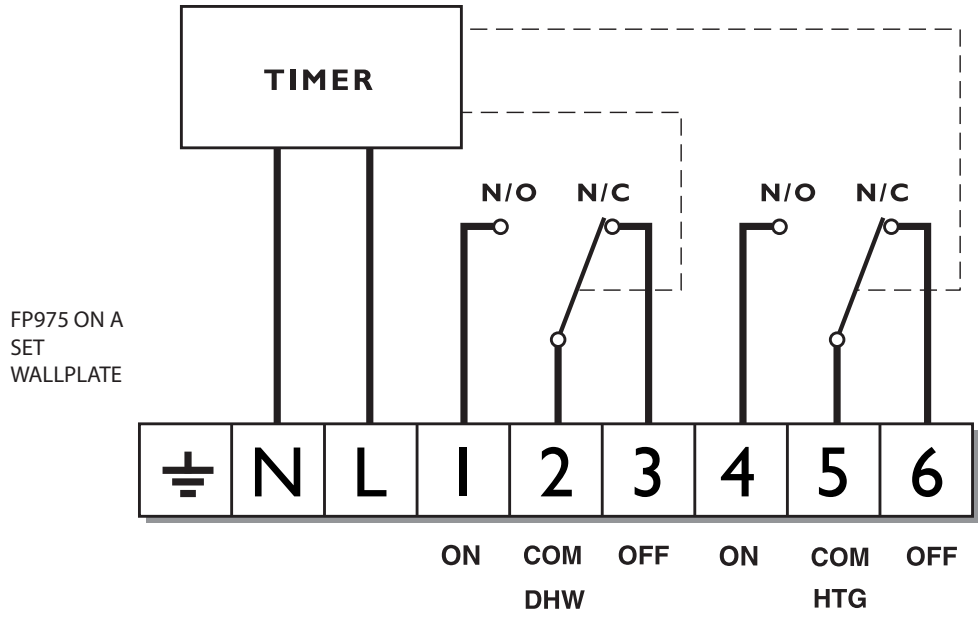
Use the table on page 6 to confirm wallplate compatibility.

- ❑ If the existing wallplate is of the SET pattern, follow instruction 5-9 from the “New Installations” sections.
- ❑ Should the existing product be a Danfoss Randall MK.9 time control the instructions below should be followed:
 1. Remove and discard the white test point cover fitted to the top of the MK.9 wallplate.
 2. Slide the small switches on the rear of the module marked MK.9 - SET to the MK.9 position.
 3. Ensure that the two retaining screws on the top of the timeswitch are fully unscrewed. Firmly press the module onto the wallplate and tighten the two screws on the top of the module. An additional fixing screw to hold the bottom of the unit onto the wallplate is packed separately and must be fitted. The screw should be placed into the recessed hole, beneath the programming flap, adjacent to the **COPY** button, screwed through the plastic retaining ring and securely tightened.
 4. Follow steps 5-9 from the “New Installations” section.

SYSTEMS HAVING INCOMPATIBLE BACKPLATES

Follow the “New Installations” instructions paying particular attention to item 3).

Wiring



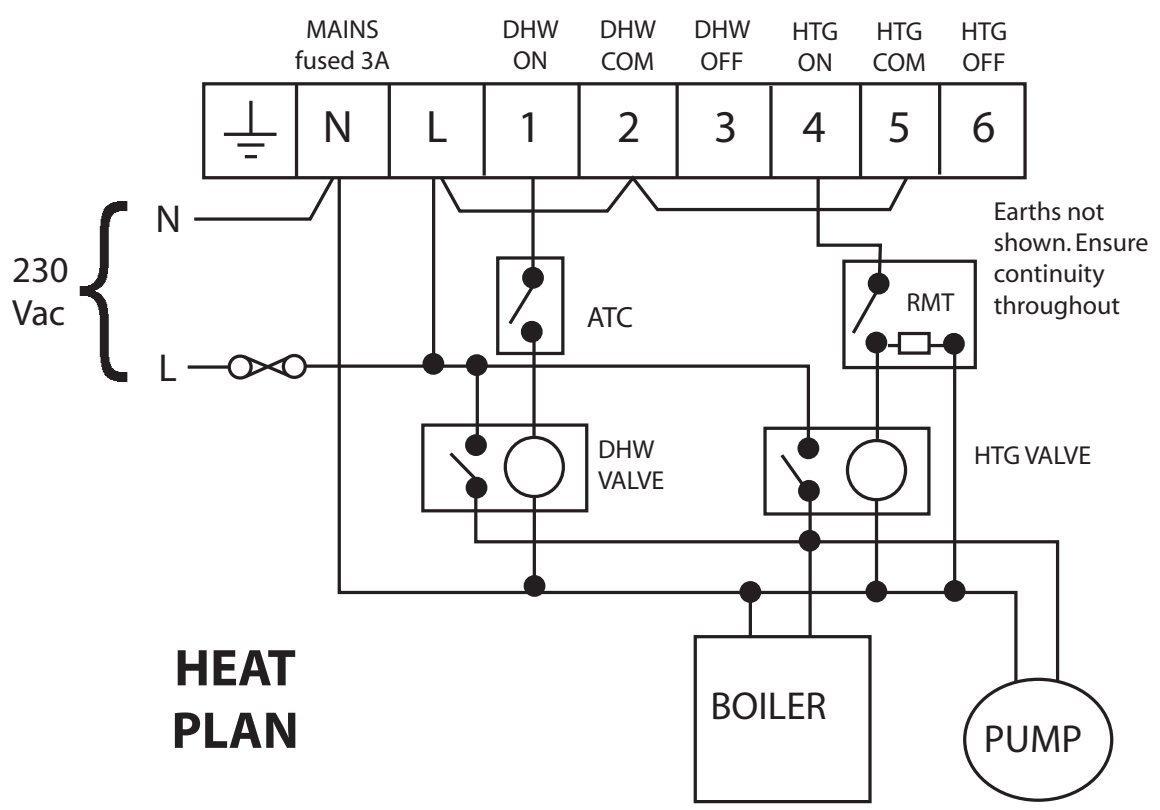
For Wiring Conversion tables see pages 12-19

For 230 Vac systems link L, 2 & 5

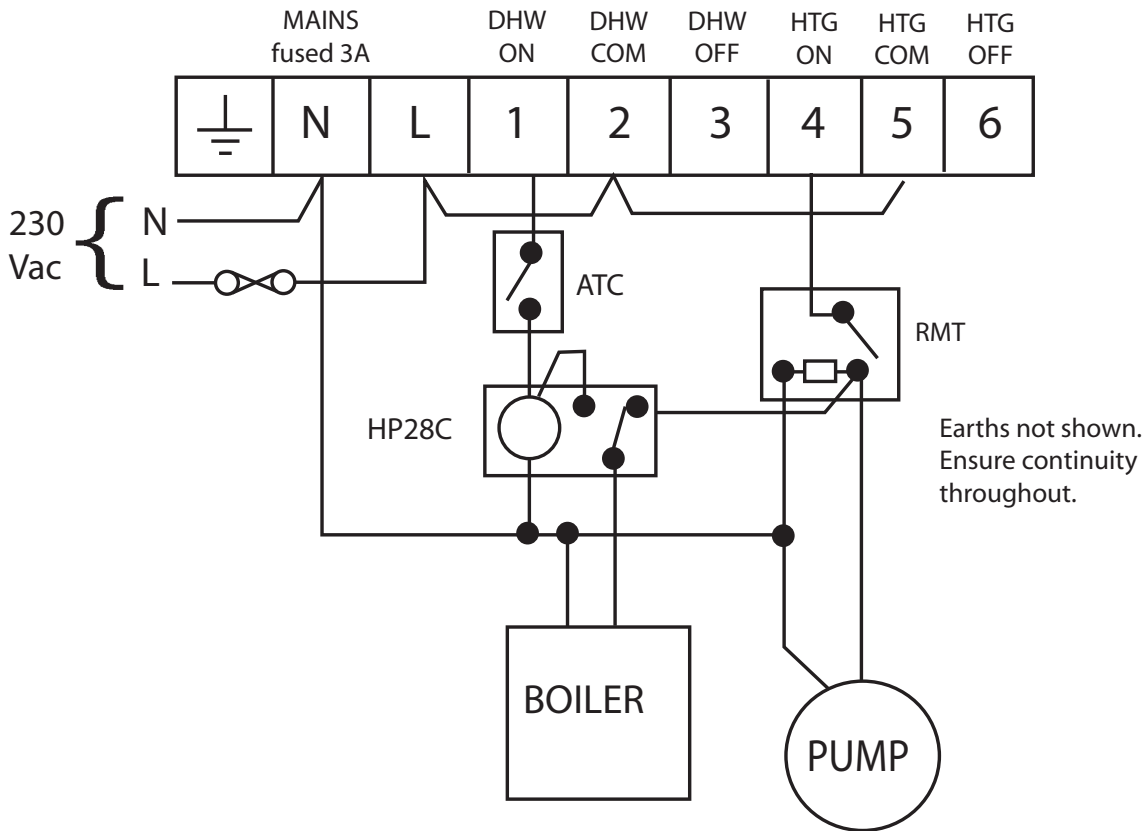
Always switch off mains first and never fit programmer to a live wallplate.

230 Vac Fully Pumped System - Two 2-port Zone Valves with Aux. Sw. PUMPED switch selection

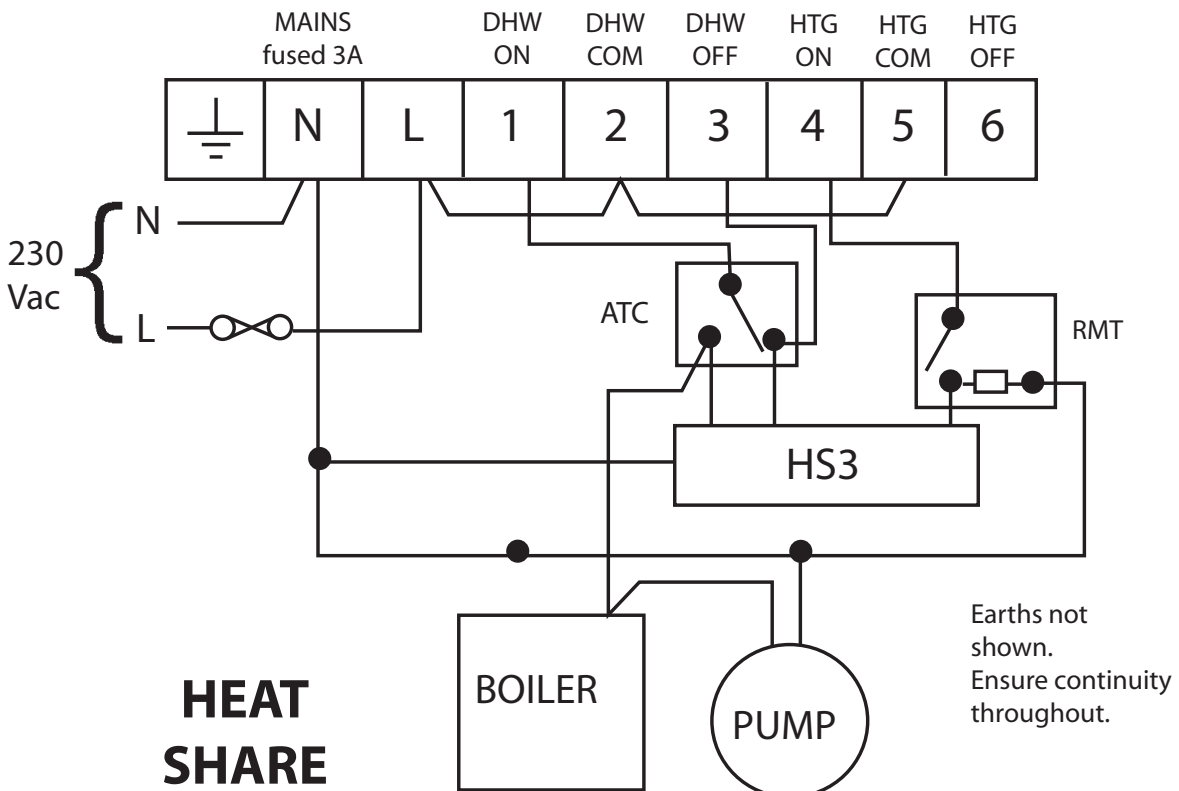
Wiring






















230 Vac Controlled Gravity Hot Water - Pumped Heating System PUMPED switch selection



230 Vac Fully Pumped System - 3-port Mid-position Valve PUMPED switch selection









WIRING CONVERSIONS to be used when replacing the following programmers with the FP975. Some time controls are connected differently depending on the type of system they are controlling. Consult the column














Table A DANFOSS RANDALL FP975 (SET MODE) Fully Pumped Systems - ensure Pumped/Gravity switch is in 'Pumped' position	MAINS			WATER		
		N	L	ON	COM	OFF
		N	L	1	2	3
DANFOSS RANDALL 4033		7	6	4	1	5
HORSTMANN 423, AMETHYST 7 & 10		2,3	1	5	-	4
HORSTMANN 424 GEM		2,3	1,10	4	5	6
HORSTMANN LEUCITE 423 & 424		2	1	3	5	4
HONEYWELL ST669		N	L	6	8	7
POTTERTON EP2000, EP3000		N	L	3	-	1
RANDALL 3033		1,7	6	4	-	5
RANDALL 702		N	L	3	6	4
SANGAMO FORM 1 410 & 414		4,5	6	1	3	2
SANGAMO S409/1		N,1,3	L	2	-	-
SANGAMO S409/3		3,6	7	5	-	4
SATCHWELL LIBRA & DHP 2201		1	2	6	7	8
SATCHWELL ET 1401 & 1451		1	2	7	6	8
SMITHS IND. CENTROLLER 90		1	2	5	-	-
SMITHS IND. CENTROLLER 1000		N	L	3	-	1
SWITCHMASTER 800 & 805		N	L	3	-	4
SWITCHMASTER 900 & 9000		N	L	3	-	4

headed "NOTE This conversion ..." to determine whether Table A (pages 12-15) or Table B (pages 16-19) should be used. If in any doubt, contact our Technical Services Department before proceeding with the replacement.










HEATING			NOTE This conversion applies only if....	An additional terminal block may be required where these disconnected leads (or pairs) should be terminated			
ON	COM	OFF		A	B	C	D
4	5	6	LINK L - 2 - 5	A	B	C	D
2	-	3					
7	-	6		8			
7	8	9	Terminals 5,8 & 10 are LINKED				
6	7	8	Terminals 5 & 7 are LINKED				
3	5	4					
4	5	2	Programme selectors UNLINKED	A	B	C	D
2	-	3					
1	5	2					
8	-	7					
5	-	-		6,4			
1	-	2					
3	4	5					
4	3	5					
4	-	-		3	6		
4	-	2	Programme selectors UNLINKED				
1	-	2					
1	-	2	Programme selectors UNLINKED	A	B	C	

Table A cont.. DANFOSS RANDALL FP975 (SET MODE)	MAINS			WATER		
		N	L	ON	COM	OFF
		N	L	1	2	3
VENNER CHC/W2 (WITH STAT)		N,2,4	L	1	-	-
VENNER CHC/W2 (AIR STAT LINKED)		N,2,4	L	1	-	-
VENNER VENOTROL 80M & 80PM (WITH AIR STAT)		N,3	L	2	-	1
VENNER VENOTROL 80M & 80PM (AIR STAT LINKED)		N,3	L	2	-	1

HEATING			NOTE This conversion applies only if...	An additional terminal block may be required where these disconnected leads (or pairs) should be terminated			
ON	COM	OFF		A	B	C	D
4	5	6	LINK L - 2 - 5				
A/S	-	-	Used in a system having independent control of water and heating	A/S 3			
3	-	-					
A/S	-	4		A/S 5			
5	-	4					

Table B DANFOSS RANDALL FP975 (SET MODE) Gravity DHW, Pumped Heating Systems - ensure Pumped/Gravity switch is in 'Gravity' position	MAINS			WATER	
		N	L	ON	COM
		N	L	1	2
DANFOSS RANDALL 102/102E/102E5/102E7		5	3,6	1	-
HORSTMANN 423 DIAMOND POTTERTON 423		N	L,1,3	2	-
HORSTMANN 424 DIAMOND		N	L,1,3	2	-
HORSTMANN CORAL 423 & 424		2,3	1	BOILER (8)	-
POTTERTON EP2000, EP3000		N	L	3	-
DANFOSS RANDALL 3060 & 3020P		1,7	6	4	-
RANDALL 701		N	L	3	6
SANGAMO M5 410 FORM 4		4,5	3	1,6	-
SANGAMO S409 FORMS 1 & 4		N,1,3	L	2	-
SANGAMO (EARLY MODEL) S410 FORM 4		N,2	L	1,3	-
SATCHWELL LIBRA		1	2	6	7
SMITHS IND. CENTROLLER 100		N	L	3	-
SMITHS IND. CENTROLLER 60		1	2	5	-
SMITHS IND. CENTROLLER 10		N	L	3	-
SMITHS IND. CENTROLLER 70		1	2	5	-
SMITHS IND. CENTROLLER 1000		N	L	3	-
SWITCHMASTER 320 & 350		N	4,L	3	-
SWITCHMASTER 400		N	L	3	-
SWITCHMASTER 600		N	L	3	-
SWITCHMASTER 900 & 9000		N	L	3	-

HEATING				NOTE This conversion applies only if....	An additional terminal block may be required where these disconnected leads (or pairs) should be terminated			
OFF	ON	COM	OFF		A	B	C	D
3	4	5	6	LINK L - 2 - 5	A	B	C	D
-	2	-	-					
-	4	-	-		5	6		
-	4	-	-		5			
-	AIR STAT (8)	-	-		4,7	5	6	
1	4	5	2	Programme selectors LINKED	A	B	C	D
-	2	-	-		3	5		
4	1	5	2					
2	8	-	7					
-	5	-	-		6,4			
-	4	-	-	1 & 3 are LINKED				
8	3	4	5					
-	2	-	-		1	4		
-	4	-	-		3			
-	2	-	-		1,4			
-	4	-	-		3	6		
1	4	-	2	Programme selectors LINKED				
-	1	-	-		2			
-	1	-	4		2			
-	1	-	-		2	4		
4	1	-	2	Programme selectors LINKED	A	B	C	

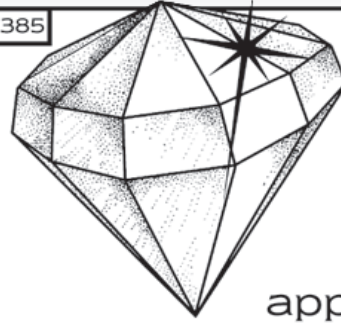
Table B cont.... DANFOSS RANDALL FP975 (SET MODE)	MAINS			WATER	
		N	L	ON	COM
		N	L	1	2
VENNER VENOTROL		N,A,M	L,L1	V	-
VENNER VENOTROL 80 (AIR STAT)		N,1, 3,4	L	2	-
VENNER VENOTROL 80 (AIR STAT LINKED)		N,1, 3,4	L	2	-
VENNER CHC/W2 (WITH STAT)		N,2,4	L	1	-
VENNER CHC/W2 (AIR STAT LINKED)		N,2,4	L	1	-
VENNER VENOTROL 80P (WITH AIR STAT)		N,1,3	L	2	-
VENNER VENOTROL 80P (AIR STAT LINKED)		N,1,3	L	2	-

HEATING				NOTE This conversion applies only if...	An additional terminal block may be required where these disconnected leads (or pairs) should be terminated			
OFF	ON	COM	OFF		A	B	C	D
3	4	5	6	LINK L - 2 - 5	A	B	C	D
-	S,F	-	-		T,P	O		
-	A/S	-	-		A/S, 5			
-	5	-	-					
-	A/S	-	-	Used in a system having control of WA- TER ONLY or WATER & HEATING TOGETHER	A/S, 3			
-	3	-	-					
-	A/S	-	4		A/S, 5			
-	5	-	4					

TACMA

**THE ASSOCIATION
OF CONTROLS
MANUFACTURERS**

11385



**Crystal
Mark**

Clarity
approved by
Plain English Campaign

The text below has been edited and approved by the Plain English Campaign, who has issued a Crystal Mark to be displayed with it.

What is a programmer?

...an explanation for householders.

Programmers allow you to set 'On' and 'Off' time periods. Some models switch the central heating and domestic hot water on and off at the same time, while others allow the domestic hot water and heating to come on and go off at different times.

Set the 'On' and 'Off' time periods to suit your own lifestyle. On some programmers you must also set whether you want the heating and hot water to run continuously, run under the chosen 'On' and 'Off' heating periods, or be permanently off.

The time on the programmer must be correct. Some types have to be adjusted in spring and autumn at the changes between Greenwich Mean Time and British Summer Time.

You may be able to temporarily adjust the heating programme, for example, 'Override', 'Advance' or 'Boost'. These are explained in the manufacturer's instructions.

The heating will not work if the room thermostat has switched the heating off. And, if you have a hot-water cylinder, the water heating will not work if the cylinder thermostat detects that the hot water has reached the correct temperature.

User Instructions

Your programmer

The FP975 allows you to switch your heating and hot water on and off at times that suit you.

You can programme up to 3 ON/OFF times per day for the heating and the hot water and the two systems can be operated independently.

Preset Programmes

Your FP975 comes ready programmed with a set of operating times which often suit most people.

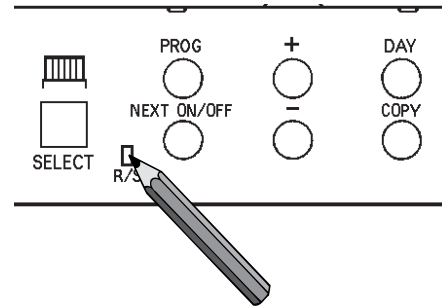
Event No.	Hot Water & Heating	Mon-Fri	Sat-Sun*
1	1st ON	6:30	7:30
2	1st OFF	8:30	10:00
3	2nd ON	12:00	12:00
4	2nd OFF	12:00	12:00
5	3rd ON	17:00	17:00
6	3rd OFF	22:30	22:30
* Available in 5/2 day mode only See page 23 for explanations of different settings			

If you want to change any of these settings, you can do so by following the instructions on pages 24-29.

Before you start

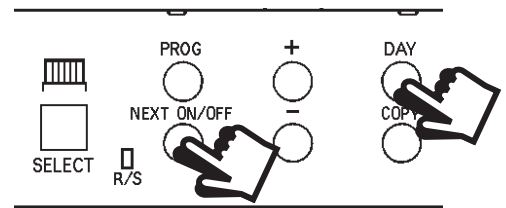
Open the flap on the front of the clock. Press the **RESET (R/S)** button using a non-metallic object (e.g. pencil/matchstick) until you hear a click and the red light on the front of the unit flashes once.

This will cancel all manual overrides.



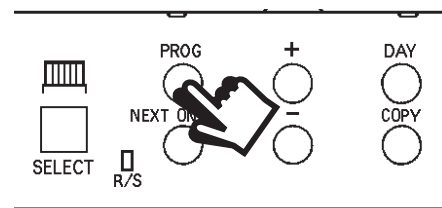
Choice of 24hr or AM/PM display

Press and hold **DAY & NEXT ON/OFF** for 1.5 seconds to toggle between 24hr clock and AM/PM display, as required.



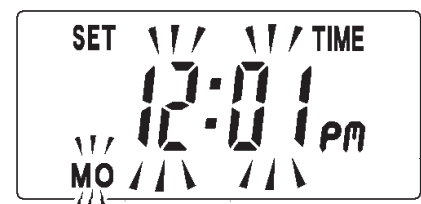
Setting the Date and Time

These settings are made during manufacture and only need to be made in the unlikely event that the unit has lost the settings.

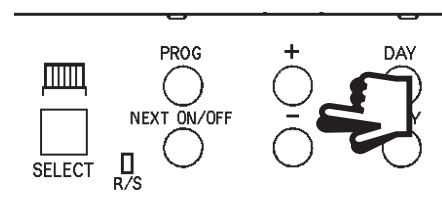


Setting the Date

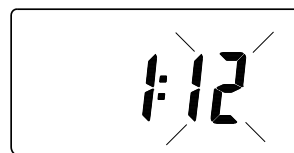
Press and hold **PROG** for 5 seconds to display year.



Use the + or - buttons to set the correct year.



Press **DAY** to display day and month.
Use the + or - buttons to set the correct month (Jan = 1, Feb = 2 etc.).



Press **DAY** to display day and month.
Use the + or - buttons to set day of month.



Press **PROG** to display the time.

The words **SET TIME** will appear at the top of the display & the time will flash on and off.



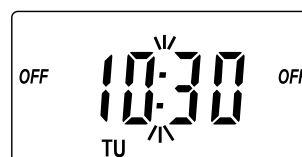
Use the + or - buttons to set the correct time (press and hold to change in 10 min. increments).

Setting the Day

The day of the week is set automatically.

Accepting the preset programmes

If you are happy to use the preset programmes on page 21, you don't need to do anything else.



To accept the factory presets just press the **PROG** button until the time appears & the colon in the display begins to flash.

Your unit is now in **RUN** mode and will control your heating and hot water according to the preset programmes.

Before you change the preset programmes

Your installer will have set your unit to operate in one of the following modes:

- ❑ **5/2 day** - one set of programmes for weekdays and another for weekends (**page 25-26**).
- ❑ **7 day** - different settings for each day of the week (**page 27-28**).

Please Note

The unit must be programmed in sequence and ON/OFF times cannot be set out of sequence.

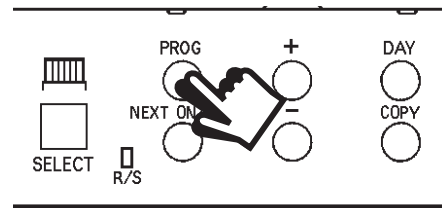
If you want to leave a preset time as it is, simply press **NEXT ON/OFF** to move on to the next setting.

Your timeswitch allows you to programme 3 ON and 3 OFF times each day. If you do not wish to use one of the ON/OFF settings, simply programme the ON time to be the same as the OFF time and the setting will not operate.

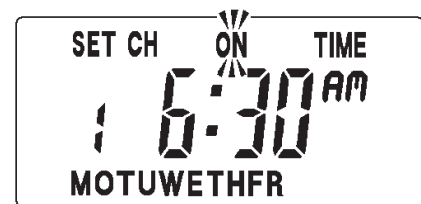
- **!** If at any time you get confused and need to reset your timings to the standard programme, press the RESET button to return to the preset programmes (see page 22).

Programming the heating in 5/2 day mode

1. Press **PROG** until **SET CH ON TIME** appears at the top of the display and **MOTUWETHFR** appears at the bottom of the display.

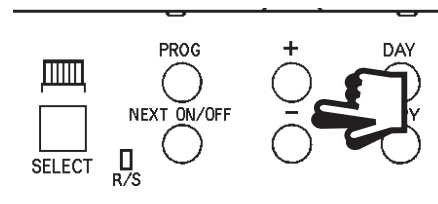


Use the **+** and **-** buttons to set the time you would like your heating to first come on in the morning (Event 1).

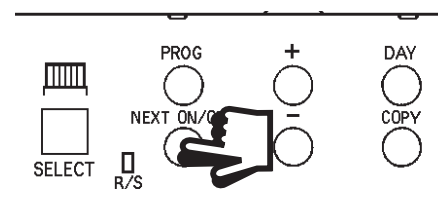


2. Press **NEXT ON/OFF** once only.

Use the **+** and **-** buttons to set the time you want your heating to go off (Event 2).



To move to the next setting, i.e. when you would like your heating to come on again (Event 3) press the **NEXT ON/OFF** button again.



3. Continue programming the central heating system **ON** and **OFF** times for weekday Events 4, 5 & 6 as in Step 2.

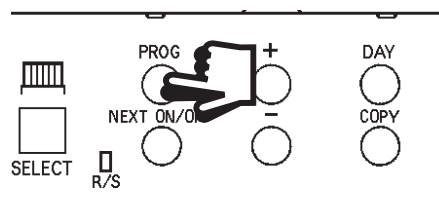
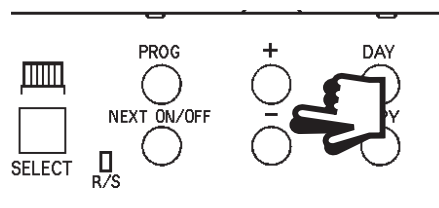
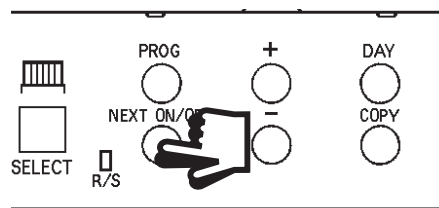
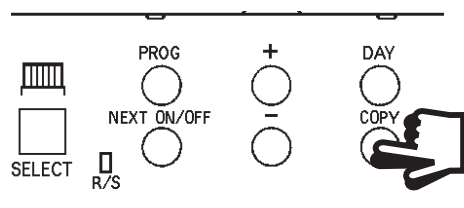
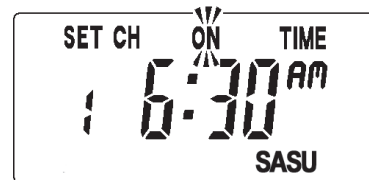
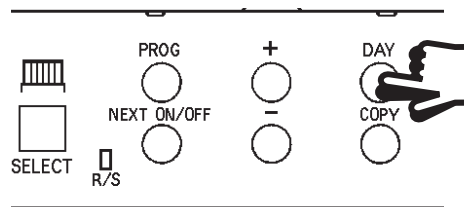
4. Press the **DAY** button once and **SASU** will appear at the bottom of the display.

Either press **COPY** to keep the same settings for Saturday and Sunday as you have programmed for Monday to Friday.

Alternatively, programme new ON/OFF times by pressing the **NEXT ON/OFF** button to move to the next setting and using the **+** and **-** buttons to set the time you want.

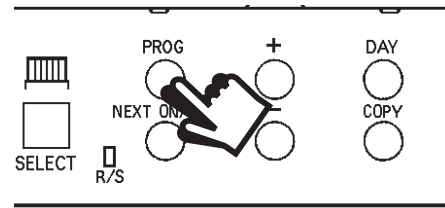
5. Press the **PROG** button to return the unit to **RUN** mode (time appears & colon in the display begins to flash).

6. **Proceed to page 29.**

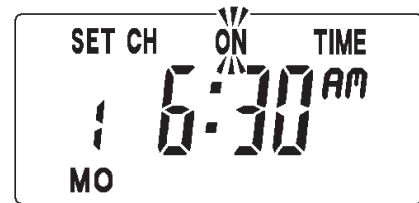


Programming the heating in 7 day mode

1. Press **PROG** until **SET CH ON TIME** appears at the top of the display and **MO** appears at the bottom of the display.

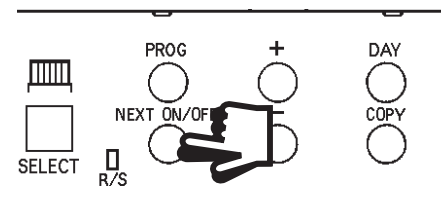
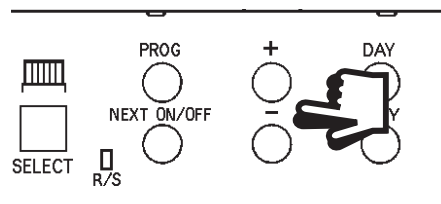


Use the **+** and **-** buttons to set the time you want your heating to first come on in the morning (Event 1).

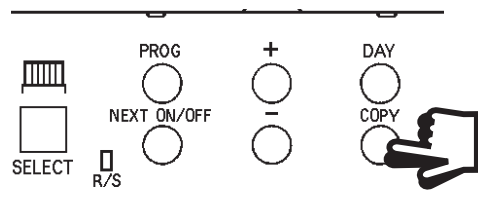


2. Press **NEXT ON/OFF** to move to Event 2.

Continue programming the heating **ON** and **OFF** times in this way by using the **+** and **-** buttons to set the time you want and pressing the **NEXT ON/OFF** button to move to the next setting.



3. Press **DAY** button once only. **TU** will appear at the bottom of the display.



Continue programming the rest of the week by pressing:

a) **NEXT ON/OFF** button to move to the next setting,

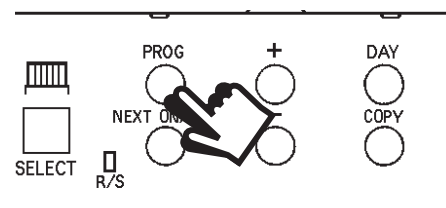
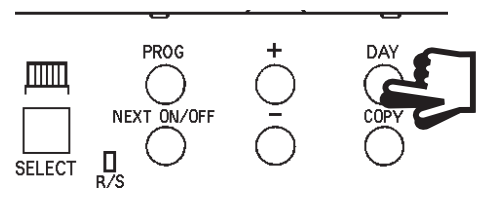
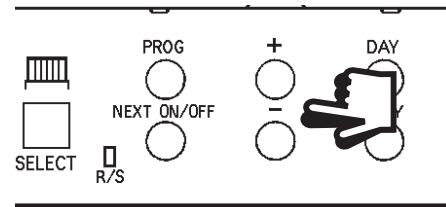
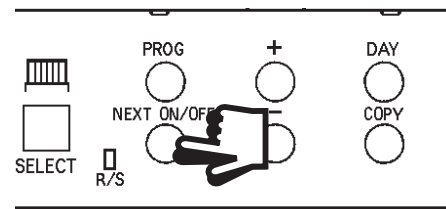
b) **+** and **-** buttons to amend the time,

c) **DAY** to advance to the next day.

Alternatively press **COPY** to keep the same settings as the day before.

4. Press the **PROG** button to return the unit to **RUN** mode (time appears & colon in the display begins to flash).

5. **Proceed to page 29.**



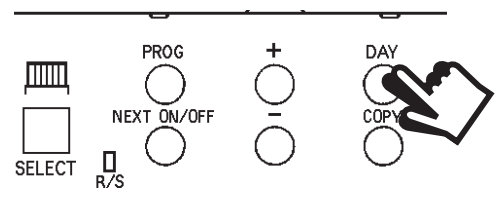
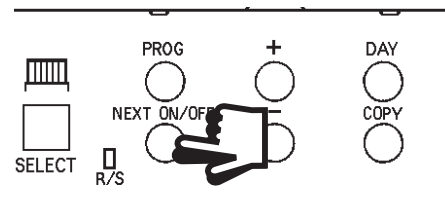
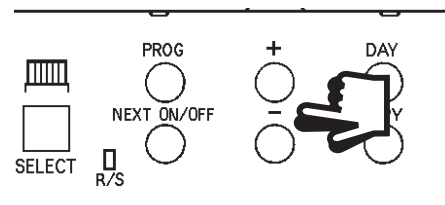
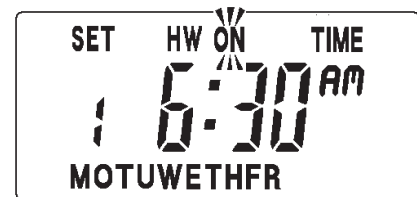
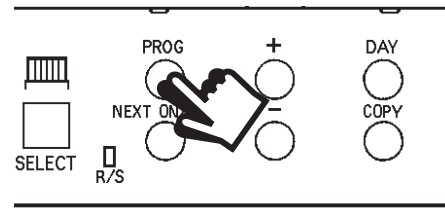
Programming the hot water

To set the hot water programme press the **PROG** button until **SET HW ON TIME** appears on the display.

Set the hot water programme in the same way as the heating programme, using:

- +** and **-** buttons to alter the time,
- pressing the **NEXT ON/OFF** button to move to the next setting,
- pressing **DAY** to advance through days of the week (7 day mode) or to advance to Saturday and Sunday programming (5/2 day mode).

Finally press **PROG** to return the unit to run mode (time appears & colon in the display begins to flash).



Running your Programme

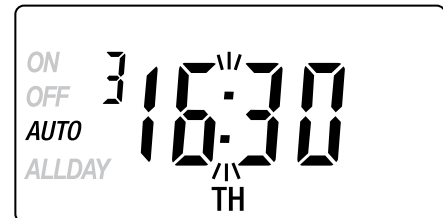


To run the central heating programme: press the **SELECT** button next to the radiator symbol.



To run the hot water programme: press the **SELECT** button next to the tap symbol.

As you press the **SELECT** button the display will change between **ON**, **OFF**, **ALLDAY** and **AUTO**.



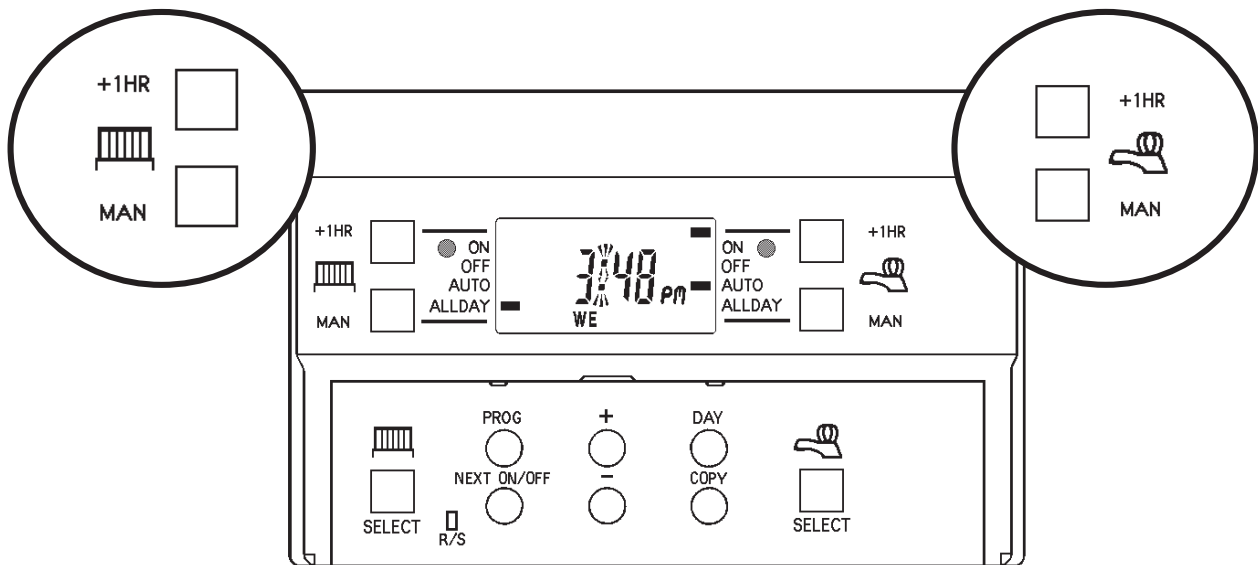
RUN mode

- AUTO** = the heating/hot water will come on and go off at the programmed times.
- ON** = the heating/hot water will remain on constantly.
- OFF** = the heating/hot water will not come on.
- ALLDAY** = the clock will turn the heating/hot water on at the first programmed ON and will leave it on until your last programmed OFF.

Select the option you require depending on your circumstances, time of year, etc.

Temporary override buttons

Sometimes you may need to change the way you use your heating temporarily, i.e. due to unusually cold weather. The FP975 has two convenient overrides which can be selected without affecting the set programme.



The grey buttons next to the **radiator symbol** are the **Heating** override buttons.



The grey buttons next to the **tap symbol** are the **Hot Water** override buttons.

+1HR

pressing this button when either system is in **AUTO** or **ALLDAY** mode will cause the heating/hot water to remain on for an extra hour. If it is pressed while the programme is **OFF** the heating/hot water will come on immediately for 1 hour then go off again.

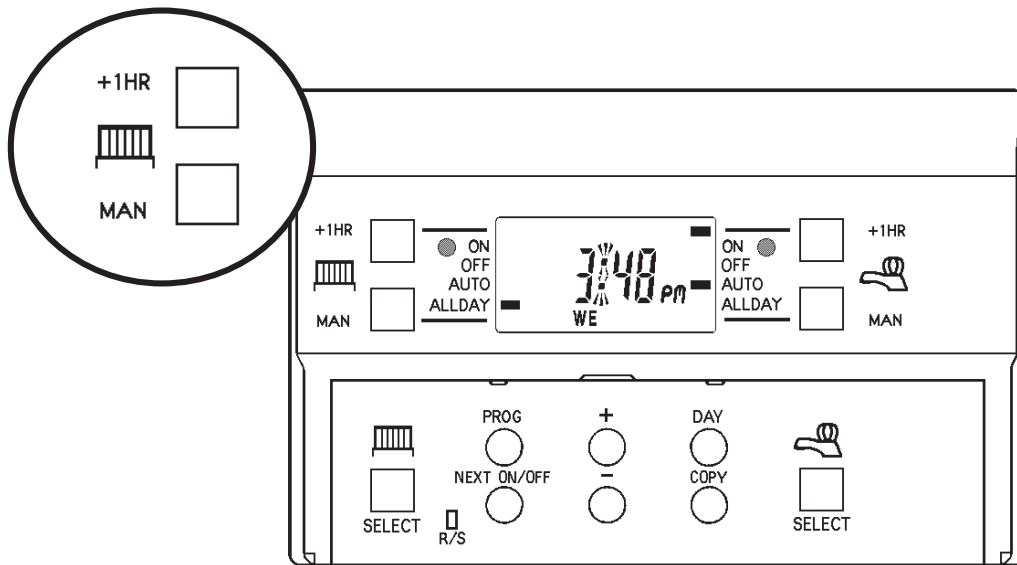
MAN

pressing this button when either system is in **AUTO** or **ALLDAY** mode will cause the heating/hot water to go **OFF** until the next programmed ON, or vice versa.

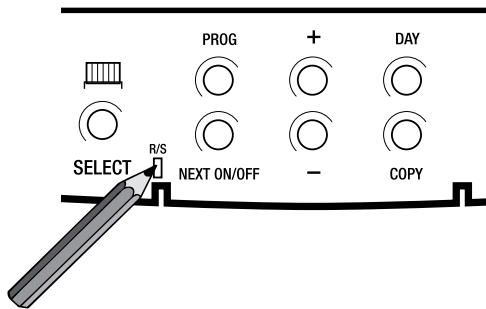
Making a Full Reset

If it is necessary to fully reset the unit, excluding the date and time, follow the instructions below.

1. Press and hold the **+1HR** and **MAN** buttons on the left hand side of the product.



2. Press the **RESET** button and hold for 3 seconds.



3. Release the **RESET** button. The display will change to show **the current time**.



Example

4. Finally, release both the **+1HR** and **MAN** buttons.

The unit is now fully reset and must be re-programmed, see pages 25-28.

Still having problems?

Call your local heating engineer:

Name:

Tel:

For problems relating to your heating controls ...

Visit our website:

www.danfoss-randall.co.uk

Email our technical department:

drl_technical@danfoss.com

Call our technical department

0845 121 7505

(8.45-5.15 Mon-Thurs, 8.45-4.45 Fri)

**For a large print version of these instructions
please contact the Marketing Services
Department on 0845 121 7400.**



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