

## Product Catalogue 2010



HEATING



Efficiency  
Quality  
Performance  
Reliability



## Energy saving is our business...

- 71% of homeowners are mainly influenced by advice from the installer<sup>1</sup>
- Turn your thermostat down 1°C to save 10% on your heating bill<sup>1</sup>



### Heating systems should be the priority for energy saving in most homes

In UK energy terms, the amount of gas used in our homes is about the same as the total amount of electricity produced for homes, businesses, industry and transport put together.<sup>3</sup>

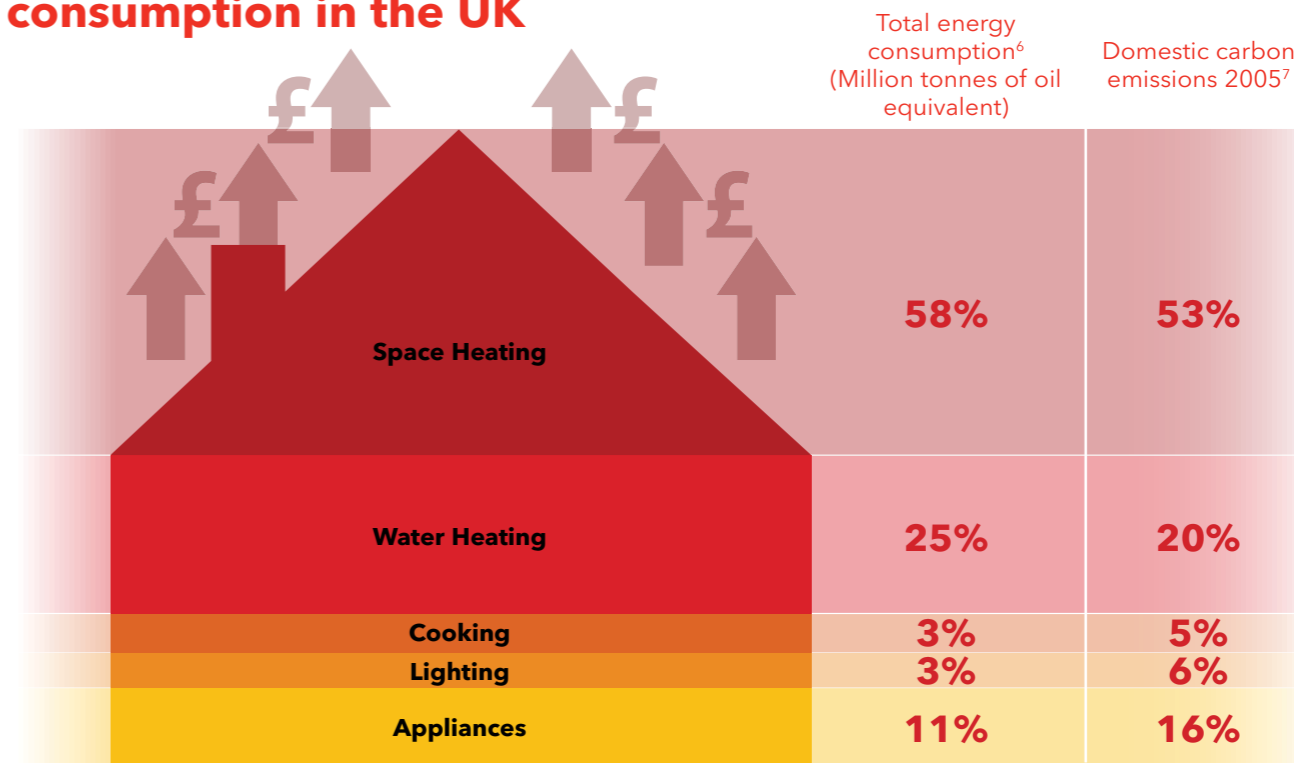
- 84% of the energy used in an average home with a boiler is for the heating and hot water, and this accounts for about 70% of the carbon emissions.<sup>4</sup>
- A recent EU study concluded that the carbon emissions from gas and oil central heating boilers were of the same magnitude as that from all road transport.<sup>5</sup>



### Engineers and Heating Installers are pivotal to energy savings in the UK

- Heating controls are a proven measure that can reduce total household energy use by 17-23%.<sup>2</sup>
- They are a low cost energy saving measure.
- There are a millions of UK homes without basic heating controls.
- Householders without controls have a limited potential to reduce their energy use through behaviour change.

## Split of domestic energy consumption in the UK



### Proposed minimum standards for heating controls

- All homes with a boiler and radiators should be able to:
  - Automatically turn off heating when not required (Time control)
  - Automatically prevent the building getting warmer than it needs to be (Temperature control)
  - Avoid overheating parts of the house that are unoccupied or need lower temperatures (Zone control)
  - Turn the boiler off when no heat is required (boiler interlock)
- This requires a programmer, a room thermostat and TRVs, plus the ability to use them correctly.

## Huge potential for installers!

About 80% of UK homes don't have these minimum requirements

	Owner occupied homes		All rented homes		Total	
Homes with no room thermostat	40%	6,133,526	45%	2,428,520	41%	<b>8,548,198</b>
Homes without thermostatic radiator valves	61%	9,441,243	73%	3,936,474	65%	<b>13,395,429</b>
Homes without minimum control requirements (room thermostat, programmer and TRVs)	79%	12,290,253	89%	4,792,850	83%	<b>17,040,912</b>
Homes with no controls	5%	707,944	9%	489,576	6%	<b>1,237,111</b>

1 Energy Savings Trust  
 2 Source: Energy Saving Trust and calculations using the EU EcoBoiler model developed for the Energy Using Products Directive  
 3 BERR Energy Flow Chart 2007  
 4 Policy Brief: Improving the energy performance of domestic heating and hot water systems, Defra 2008  
 5 Eco-design Boilers, Executive Summary | 30 Sept. 2007| VHK for European Commission  
 6 Source: Energy consumption in the United Kingdom: domestic data tables 2008 update (BERR)  
 7 Source: UK Climate Change Programme 2006

## Ten Good Reasons to choose Drayton

- 1 **Market-leading products**
- 2 **Reliable and energy efficient products conforming to EN60730**
- 3 **Quality tested products, manufactured using Six Sigma methodology**
- 4 **Industry-leading customer services support and technical help**
- 5 **Well respected and trusted Brand**
- 6 **Widely available within all leading UK stockists**
- 7 **Easy to use and simple to install products**
- 8 **Single source broad portfolio including under-floor heating**
- 9 **EST recommendation on all energy saving products**
- 10 **Accredited UK manufacturing facility (ISO9001 and ISO14001)**



Quality



Reliability



Performance



Efficiency

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Fit, forget and Drayton to the next job



## RTS Room Thermostats

The RTS range of thermostats utilise electronic sensing to provide accurate temperature control. Five models are available to suit all domestic applications including frost protection and combi boilers.



## Combi-Stat

Using a simple, traditional dial, the Combi-Stat provides accurate temperature control, suitable for 2 or 3 wire combination boilers (with current up to 6A).



### Models:

- RTS1:** Standard model
- RTS2:** With LED 'ON' indicator
- RTS3:** Frost thermostat
- RTS4:** Volt-free contacts  
(Suitable for combi boilers)
- RTS5:** Energy saver room thermostat with (volt-free change over contacts)
- RTS9:** Volt-free heating/cooling change over switch with call for heat LED indicator
- RTS10:** Volt-free heating/cooling change over switch with call for heat LED indicator (Min-Max)

### Features:

- Range limiting stops
- Set point locking
- Surface or conduit box mounting
- Double insulated

### Technical data

Model	RTS
Sensing element	Electronic
Temperature range	
RTS1, 2, 4, 5 & 9	10°C to 30°C
RTS3:	3°C to 10°C
RTS10:	14°C to 30°C
Switch rating	2 (1) A 230V a.c.
Switch type	
RTS1, 2, 3 & 7:	S.P.S.T.
RTS4, 9 & 10:	S.P.D.T. volt-free
RTS5	S.P.D.T. 2(1)A
Differential	
RTS1, 2, 4, 9 & 10:	<0.6°C at 4°/hour
RTS3:	1°C typical
Wiring regulations	Designed for fixed wiring only to comply with the current I.E.E. regulations

### Application:

- Suitable for 2 or 3 wire combination boilers
- Ideal for 2 or 3 wire retro-fit applications

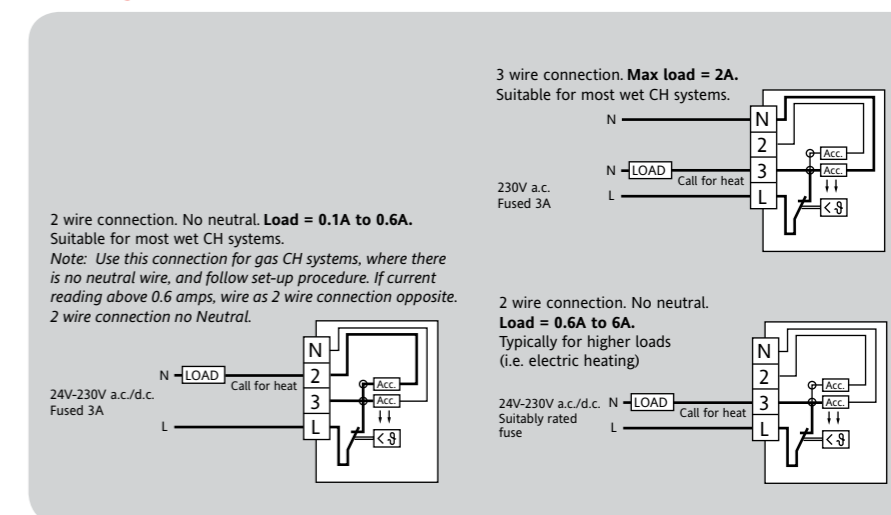
### Features:

- Range limiting stops
- Set point locking
- Surface or conduit box mounting
- Double insulated

### Combi-Stat

Product	Part No.
Combi-Stat	24028

### Wiring connections



### Wiring connections

Fig. 1 RTS1, RTS2, RTS3

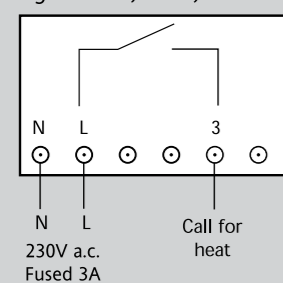
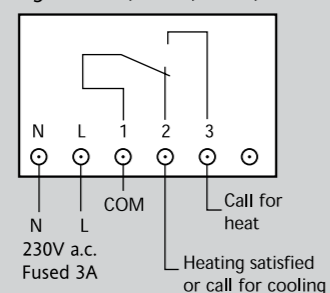


Fig. 2 RTS4, RTS5, RTS9, RTS10



### RTS Room Thermostats

Product	Part No.
RTS1 SPST Contacts	24001
RTS2 SPST With LED Indicator	24002
RTS3 SPST Frost Thermostat	24003
RTS4 SPDT Volt Free contacts	24004
RTS5 SPDT Energy Saver	24005
RTS9 SPDT Volt Free +LED	24030
RTS10 SPDT Volt Free +LED (Min 14°C)	24031
RTS Patress	24022

### Technical data

Model	Combi-Stat
Sensing element	Bi-metal
Temperature range	10°C to 30°C
Switch rating	6 (2) A 230V a.c./d.c. 24-230V a.c./d.c.
Switch type	S.P.S.T.
Differential	1°C typical
Wiring regulations	Designed for fixed wiring only to comply with the current I.E.E. regulations



## Digistat<sup>+</sup> Room Thermostat

Drayton's stylish Digistat<sup>+</sup> with tactile, audible & visual feedback. Featuring a familiar dial control with a digital display to show that the temperature has been set accurately every time.

The product can be configured with a minimum temperature setting to protect the vulnerable.



### Features:

- Conventional dial adjustment
- Tactile dial
- Tactile & audible feedback via click of the dial
- Visual feedback via digital display
- Set-back feature
- Min/Max temperature setting
- Battery powered
- Digital display situated above dial for ease of reading

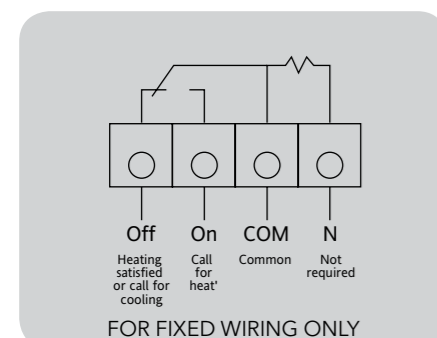
### Technical data

Model	Digistat <sup>+</sup>
Power supply	2 x AA Size, 1.5V alkaline batteries
Switch Type & Rating:	SPDT 2(1)A 12-230V a.c./d.c. Volt free
Temperature range	5 to 30°C
Control Accuracy	+ 0.5K @ 20°C
Ambient Temperature	Operating 0°C to 50°C / Storage -20°C to 55°C
Applicable Standards	EN60730-1:2001; EN60730-2-7:1992 73/23/EEC Low Voltage Directive 89/336/EEC EMC Directive
Mounting	Suitable for surface or conduit box mounting
Wiring	Relay: Designed for fixed wiring only, to comply with current I.E.E. regulations

### Digistat<sup>+</sup>

Product	Part No.
Digistat <sup>+</sup>	30002

### Wiring connections



## Digistat<sup>+</sup>RF Room Thermostat Wireless System

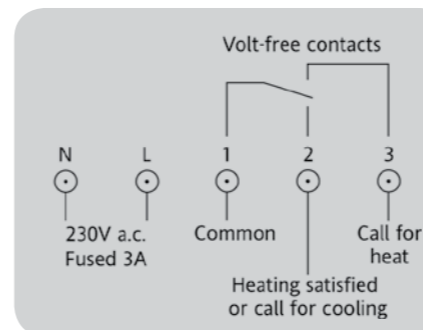
Drayton's stylish wireless Digistat<sup>+</sup>RF with tactile, audible and visual feedback. Featuring a familiar dial control with a digital display to show that the temperature has been set accurately every time.

- User adjustable set-back feature - at the push of a button
- User adjustable Min/Max temperature setting
- Digital Display situated above dial for ease of reading

The product can be configured with a minimum temperature setting to protect the vulnerable.



### SCR Receiver wiring



### Features:

- Conventional dial adjustment
- Tactile dial
- 1°C setting steps
- Tactile and audible feedback via click of the dial.
- Visual feedback via digital display
- Set-back feature
- Min/Max temperature setting
- Battery powered
- Digital display situated above dial for ease of reading

### Technical data

Model	Digistat <sup>+</sup> RF
Power supply	2 x AA Size, 1.5V alkaline batteries
Radio frequency:	433 MHz
Radio Signal Range:	30m typically. The range may be affected by the composition / density and number of walls between the Digistat <sup>+</sup> RF and SCR.
Temperature Range:	5 to 30°C
Control Accuracy:	+ 0.5K @ 20°C
Ambient Temperature:	Operating 0°C to 50°C / Storage -20°C to 55°C
Applicable Standards:	EN60730-1:2001; EN60730-2-7:1992 73/23/EEC Low Voltage Directive 89/336/EEC EMC Directive EN300220-1
Mounting:	Suitable for surface or conduit box mounting
Wiring:	No wiring required
Model	Single Channel Receiver (SCR)
Power supply:	230V a.c.
Switch Type & Rating:	SPDT (voltage free) 2(1)A 230V a.c. or 24V a.c./d.c.
Wiring:	Designed for fixed wiring only, to comply with current I.E.E. regulations
Reception Frequency:	433 MHz

### Digistat RF Wireless Systems

Product	Part No.
Digistat <sup>+</sup> RF ROOM STAT+SCR	RF601
Digistat <sup>+</sup> RF TRANSMITTER (SPARE)	31003
Digistat <sup>+</sup> SCR RECEIVER SPARE	22149

New for 2010

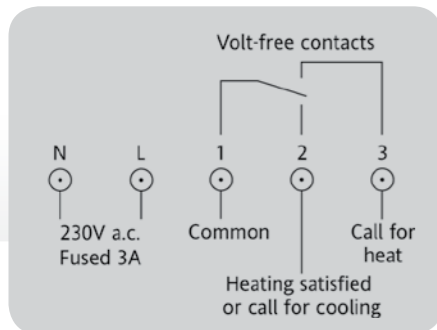
Drayton



## Digistat<sup>+</sup>1RF Room Thermostat Wireless System

Drayton's stylish new Digistat<sup>+</sup>1RF. Featuring large buttons and an easy to read large and clear digital display to show that the temperature has been set accurately. The product can be configured with a minimum temperature setting to protect the vulnerable.

### SCR Receiver wiring



### Technical data

Model	Digistat <sup>+</sup> 1RF
Power supply	2 x AA Size, 1.5V alkaline batteries
Radio frequency:	433 MHz
Radio Signal Range:	30m typically. The range may be affected by the composition / density and number of walls between the Digistat <sup>+</sup> 1RF and SCR.
Temperature Range:	5 to 30°C
Control Accuracy:	+ 0.5K @ 20°C
Ambient Temperature:	Operating 0°C to 40°C / Storage -20°C to 55°C
Mounting:	Suitable for surface or conduit box mounting
Wiring:	No wiring required

Model	Digistat SCR
Power supply:	230V a.c.
Switch Type & Rating:	SPDT (voltage free) 2(1)A 230V a.c. or 24V a.c./d.c.
Wiring:	Designed for fixed wiring only, to comply with current I.E.E wiring regulations (BS7671)
Reception Frequency:	433 MHz
Relevant EC Directives	2006/95/EC Low Voltage Directive 2004/108/EC Electromagnetic Compatibility Directive 1995/5/EC R&TTE Directive 2006/66/EC Battery Directive
Applied Standards:	EN60730-1; EN60730-2-9 ETSI EN 300 220-3; ETSI EN 301 489-3

### Digistat<sup>+</sup>1RF Wireless Systems

Product	Part No.
Digistat <sup>+</sup> 1RF ROOM STAT + SCR	RF710
Digistat <sup>+</sup> 1RF TRANSMITTER SPARE	22190
Digistat <sup>+</sup> 1RF SCR RECEIVER SPARE	22149

## Easy Electronic Clock Thermostats Easy 2, Easy 3

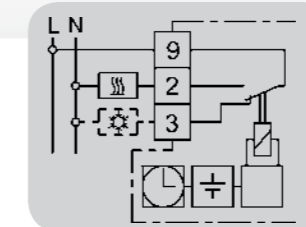
Drayton presents a range of simple-to-use programmable controls with traditional analogue clock face.



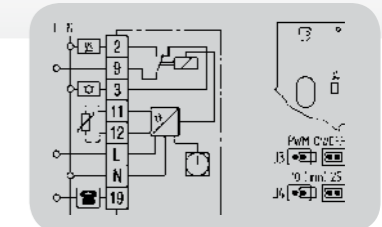
### Features:

- Separate dials for comfort and set-back temperatures
- 5 operational modes via setting dial for Comfort / Set-back / Automatic / Frost protection / Off
- Hinged cover to give neat appearance

### Easy 2



### Easy 3



### Technical data

Model	Easy 2 Battery	Easy 3 Mains
Temperature Setting Range:		
Room Temperature	5 to 30°C	5 to 30°C
Set-Back Temperature	5 to 30°C (setting under cover)	5 to 30°C (setting under cover)
Frost Protection	~ 5°C (fixed)	~ 5°C (fixed)
Contact (Relay)	1 change-over, voltage free	1 change-over, voltage free
Operating Voltage	1.5V Battery (service life ~2 years)	230 V a.c.
Switching Current/Voltage	10 mA to 10 A cosφ = 1 max. 4A cosφ = 0.6	10 mA to 16 A * cosφ = 1 max. 4A cosφ = 0.6
Hysteresis	~ 0,5 K	~ 0,5 K; *
LED Indicators		Call for heat / Set-back
Power Reserve		~ 100 h
Protection Class of Housing	IP 30 / insulated	IP 30 / insulated
Temperature Sensor	NTC Internal	NTC Internal (remote sensor F 193 720 or F 190 021 optional, max 50m)
Dimensions	160 x 80 x 36 mm	160 x 80 x 36mm

\* at 16 A and operation without remote sensor: hysteresis ~ 2,5 K

### Easy Electronic Clocks

Product	Part No.
Easy 2	515 2701 91 111
Easy 3	517 2701 51 111

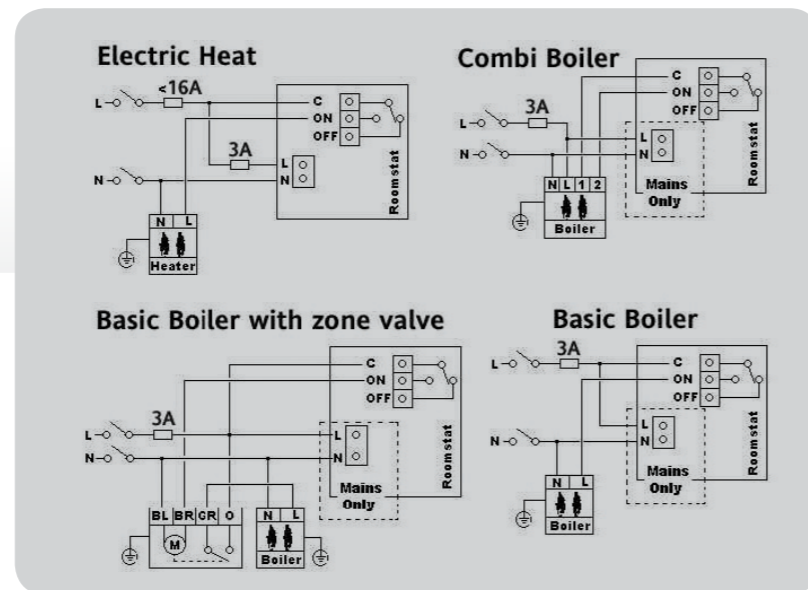


## Digistat Range Programmable Room Thermostats

Drayton brings you a range of Digistat<sup>+</sup> programmable room thermostats. They are easy to install, easy to use and offer a supreme level of heating control and comfort. The range comes with a wealth of big pluses for both installers and users.



### Digistat<sup>+</sup> range wiring



## Digistat Range Programmable Room Thermostat Wireless Systems

In addition we have 2 programmable room thermostat wireless systems, a breakthrough in programmable thermostats. The 2 wireless systems available are the Digistat<sup>+</sup>2RF (24hour) and Digistat<sup>+</sup>3RF (5-2day/7day).



### Benefits of a cost effective wireless system:

- No carpets and floor-boards to lift
- No damage to wall coverings
- No unsightly surface wiring
- Positioning no longer restricted to areas accessible by cable runs
- No brick or plaster work to chase out
- No damage to fabrics and furnishings in the process

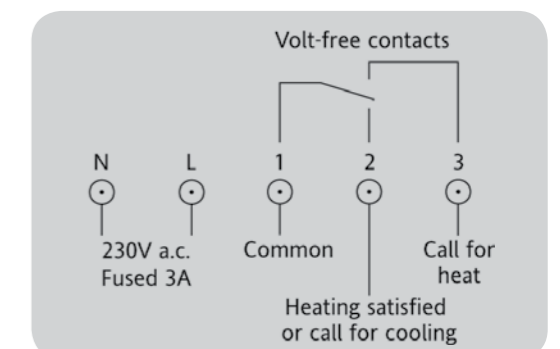
### Features:

- Easy to use
- Easy to programme using only 4 buttons
- Memory-saver programme and clock never needs resetting in the event of power loss
- Automatic summer, winter time change
- Pre-set clock
- 3 built-in standard pre-defined programmes
- A choice of 2, 4 or 6 time/temperature events/day (user selectable)
- Easy to read large LCD display (showing actual time and room temperature)
- Easy temperature override
- Holiday mode
- Manual mode
- Temperature limit locks (high & low)
- Intelligent Delayed Start option (see page 53)
- 12/24 hour clock choice
- Contemporary design
- Part L compliant (Part J in Scotland)
- Suitable for combi boilers, electric heat, hydronic under-floor and zoning (Digistat<sup>+</sup>2 & Digistat<sup>+</sup>3)
- No wires needed between room unit & receiver (Digistat<sup>+</sup>2RF & Digistat<sup>+</sup>3RF)
- Suitable for combi-boilers and zone control (Digistat<sup>+</sup>2RF & Digistat<sup>+</sup>3RF)

### Technical data

Model	Digistat+3/+2	Digistat+3RF/2RF	Digistat SCR Receiver
Power Supply	Battery 2 x 1.5V alkaline IEC LR6 (AA) batteries	Mains 230V a.c. Wireless 2 x 1.5V alkaline IEC LR6 (AA) batteries	230V a.c.
Battery Life	3 years typical	2 years typical	
Switch Rating	16(2)A 230V a.c.		2(1)A 230V a.c. or 24V a.c./d.c.
Switch type	SPDT (voltage free contacts)		SPDT (voltage free)
Min. recommended current	10mA @ 24V a.c. (inductive)		
Ambient temperature	Operating 0°C to 50°C Storage -20°C to 85°C	Operating 0°C to 40°C Storage -20°C to 55°C	
Ambient Humidity (non-condensing)	Operating 25% to 85% Storage 15% to 95%	Operating 25% to 90% Storage 15% to 95%	
Temperature Range	0°C to 32°C	5°C to 32°C	
Timing resolution	1 minute		
Temperature resolution	0.1°C	0.5°C	
Wiring	Designed for fixed wiring only, to comply with IEE wiring regulations		
Radio/Reception frequency	433 MHz		
Relevant EC Directives	2006/95/EC Low Voltage Directive 2004/180/EC Electromagnetic Compatibility Directive 1995/5/EC R&TTE Directive 2006/66/EC Battery Directive		
Applied Standard	EN60730-1, EN60730-2-7, ETSI EN 300 220-3;	EN60730-2-9, ETSI EN 301 489-3	

### SCR Receiver wiring



### Digistat<sup>+</sup> & Digistat<sup>+</sup>RF Range

Product	Part No.
Digistat <sup>+</sup> 3 (Battery) 7 day 5-2 Day	22083
Digistat <sup>+</sup> 2 (Battery) 24Hr	22084
Digistat <sup>+</sup> 3 (Mains) 7 day 5-2 Day	22087
Digistat <sup>+</sup> 2 (Mains) 24Hr	22088
Digistat <sup>+</sup> 2RF (24HR) ROOM STAT+SCR	RF700
Digistat <sup>+</sup> 3RF (5-2) /7DAY ROOM STAT+SCR	RF701
Digistat <sup>+</sup> 2RF TRANSMITTER (SPARE)	22090
Digistat <sup>+</sup> 3RF TRANSMITTER (SPARE)	22092
Digistat <sup>+</sup> SCR RECEIVER SPARE	22149



## Lifestyle LP and LPSi Electronic Time Controls



With all the features of Drayton's market leading LP time controls, the LPSi features a service interrupter to alert householders when their boiler service is due. Thirty days before the boiler is due to be serviced the LPSi enters a warning period. During this time, the backlit display flashes providing a visual warning and the resident can read when the service is due on the display. All buttons/programming features are fully functional during this time. If the boiler is not serviced despite the warnings, the LPSi will then reduce the comfort level in the property to a safe but uncomfortable level, encouraging the resident to call an engineer to check their heating system.

Drayton's Lifestyle LP time controls have a series of great features plus a contemporary style, while still maintaining their popular large buttons, streamlined, design and ease of use.

### Features:

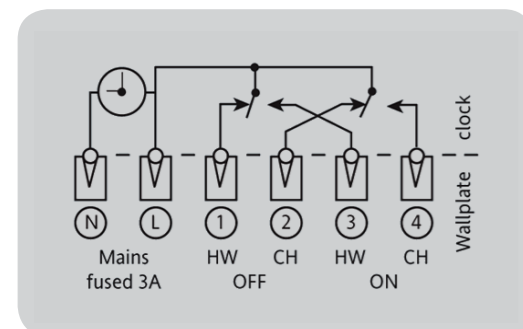
- Easy to use
- Automatic summer/winter time change
- Memory saver - programme and clock never need resetting in the event of loss of power
- Easy to read, backlit screen
- New contemporary design
- Pre-set clock
- On/once/timed/off switching options
- 3 timing periods per day
- Programme advance buttons
- All programmers suitable for fully pumped or gravity heating systems
- Timeswitches are ideal for combination boilers and control of additional zones etc. (voltage free contacts)
- Universal backplate
- Part L Compliant (Part J in Scotland)
- Proven reliability



### Extra features for LPSi

- Service period selectable
- Reduces comfort level
- Warning period
- Visual indication on LCD
- Audible alarm
- Backlit display flashes providing visual warning
- Separate reset unit
- Standard back-plate

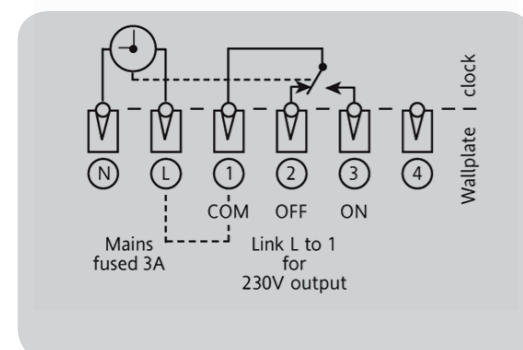
### Programmer internal wiring



### Technical data

Model	Lifestyle LP and LPSi
Voltage	230V a.c.
Output	Programmers: 230V a.c. Timeswitches: According to supply to common terminal - voltage free contacts
Rating	2 (1) A 230V a.c. each switch
Ambient temperature	Operating: 0°C to 50°C Storage: -20°C to 50°C
Battery Type	Lithium
Without mains power	Display: Blank Time and programme: Always retained
Timing resolution	1 minute
Programming resolution	1 minute
Wiring	Designed for fixed wiring only, to comply with current I.E.E. regulations
Maintenance	No user maintenance should be attempted

### Timeswitch internal wiring



### LP & LPSi Electronic time controls

Product	Timing Periods	Part No.
LP111 Timeswitch	24 hour	25477
LP711 Timeswitch	7 day	25478
LP112 Programmer	24 hour (common timings for heating & hot water)	25473
LP241 Programmer	24 hour (separate timings for heating & hot water)	25474
LP522 Programmer	5 day/2 day (separate timings for heating & hot water)	25475
LP722 Programmer	7 day (separate timings for heating & hot water)	25476
LPSi Reset Unit		25489
LP241Si Programmer	24 hour (separate timings for heating & hot water)	25490
LP522Si Programmer	5 day/2 day (separate timings for heating & hot water)	25491
LP722Si Programmer	7 day (separate timings for heating & hot water)	25492
LP111Si Timeswitch	24 hour	25493
LP711Si Timeswitch	7 day	25494





## SM1 Mechanical Timeswitch and SM2 Mechanical Programmers

The SM1 single channel timeswitch and SM2 twin channel programmer gives style and ease of use to suit most domestic pumped and gravity heating systems.



## Motorised Valves

The new Drayton 2 port, diverter and mid-position valves are available in 22mm and 28mm.

All models feature "snap-on" actuators and have industry-standard wiring and dimensions.



### Motorised Valves

Product	Part No.
<b>Complete valve and actuator</b>	
22mm 2 Port zone valve - 5 wire SPST switch	27100
22mm Mid-position valve	27101
22mm 3 Port diverter valve - no switch	27102
22mm 3 Port diverter valve - 5 wire SPST switch	27111
28mm 2 Port zone valve - 6 wire SPDT switch	27205
28mm Mid-position valve	27206
28mm 3 Port diverter valve - no switch	27207
<b>Spare valve bodies</b>	
22mm 2 Port body	27600
22mm 3 Port body	27602
28mm 2 Port body	27601
28mm 3 Port body	27603
1" 3 Port body	27620
1" 2 Port body	27619
3/4" 3 Port body	27618
3/4" 2 Port body	27617
<b>Spare actuators</b>	
3 Wire Zone valve actuator - no switch	27652
5 Wire Zone valve actuator - SPST switch	27650
6 Wire Zone valve actuator - SPDT switch	27653
3 Wire Zone valve actuator - no switch	27654
5 Wire Zone valve actuator - SPST switch	27656
6 Wire Zone valve actuator - SPDT switch	27657
Mid-position actuator	27651

### Technical data

Model	Motorised Valves
Standard motor voltage	230V a.c. 5 watts
Valve operation: 2 Port	standard valves - energise to open
Diverter	energise to open port A
Mid-position	heating, hot water or a combination of both
Operating time	2 Port: motor 14 secs., spring return 6 secs. Diverter: motor 12 secs., spring return 6 secs.
Max. static pressure	8.6 bar
Max. differential pressure	See opposite 0.7 bar
Water temperature	93°C max., 2°C min
Max. ambient temperature	52°C
Valve body	Brass forging
Connections	22mm compression; 28mm compression
Lead length	1 Metre
Switch ratings	24v - 230V a.c. 3(1)A

### Features:

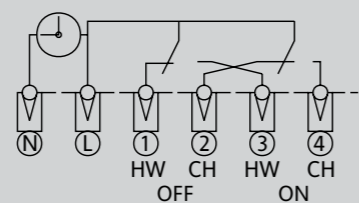
- Single and dual channel
- Advance feature
- Modern styling
- LED indication
- 4 position slide (ease of setting)
- Intuitive time setting for ON/OFF
- Suitable for gravity and pumped systems
- Positive switching of time
- Two ON/OFF time functions per day
- All day option
- Universal industrial standard back-plate

### Technical data

Model	SM1 24 hour timeswitch SM2 24 hour programmer
Power Supply	230V a.c.
Switch Rating	2 (1) A 230V a.c.
Ambient temperature	Operating: 0°C to 45°C Storage: 0°C to 50°C
Wiring	Designed for fixed wiring only, to comply with current I.E.E. regulations
Maintenance	No user maintenance should be attempted

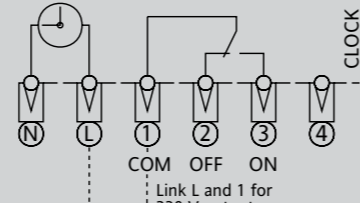
### Wiring Connections

#### Dual Channel: SM2 Programmer



### Wiring Connections

#### Single Channel: SM1 Timeswitch

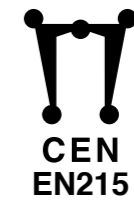


### SM1 and SM2

Product	Part No.
SM1	29205
SM2	29206

### Features:

- "Snap-on" actuators can be removed at the push of a button
- 2 Port, diverter and mid-position available in 22mm and 28mm
- 100% tight shut off
- Manual lever and valve position indicator
- Spring return
- Replaceable actuators
- Replaceable motors
- Simple industry-standard wiring
- Easily replaces most makes



## Thermostatic Radiator Valves (TRVs)

Drayton is the leading UK manufacturer of TRVs. Drayton has a comprehensive range to suit all applications from wax filled TRV's to top-of-the-range liquid filled TRV's that offer the ultimate in accuracy and responsiveness.



### Why use TRVs?

Used to control the temperature in individual rooms, the TRV helps homeowners to be more energy efficient by preventing rooms from overheating, helping to reduce energy bills. Also, the liquid-fill versions ensure optimum sensitivity, increasing the reaction speed to temperature changes, which in turn further reduces energy consumption and wastage.

### Key benefits

CEN approved to EN215 ensuring quality, reliability, energy saving and safety.

Attractive design

Full range of accessories; automatic by-pass valves, pushfit elbows and lockshield valves

Drayton TRV heads are designed to be interchangeable with any other valve body in the Drayton TRV range

Complete range to suit all budgets

### Key features:

#### TRV4

- Contemporary iconic design
- Ultra sensitive liquid-filled chrome head
- Easy to clean, no dust traps
- Non-stick internals
- Radiator can be balanced from the TRV
- Frost protection position
- 15mm angle can be flow or return mounted both vertically or horizontally

#### TRV4 All-Chrome

- Complements chrome radiators
- Suitable for domestic radiators and towel rails
- Providing an elegant chrome finish

#### RT414

- Reverse flow capability
- Easy-grip adjusting cap
- Stylish head design
- Liquid-filled sensor
- Stylish head design
- Positive off position

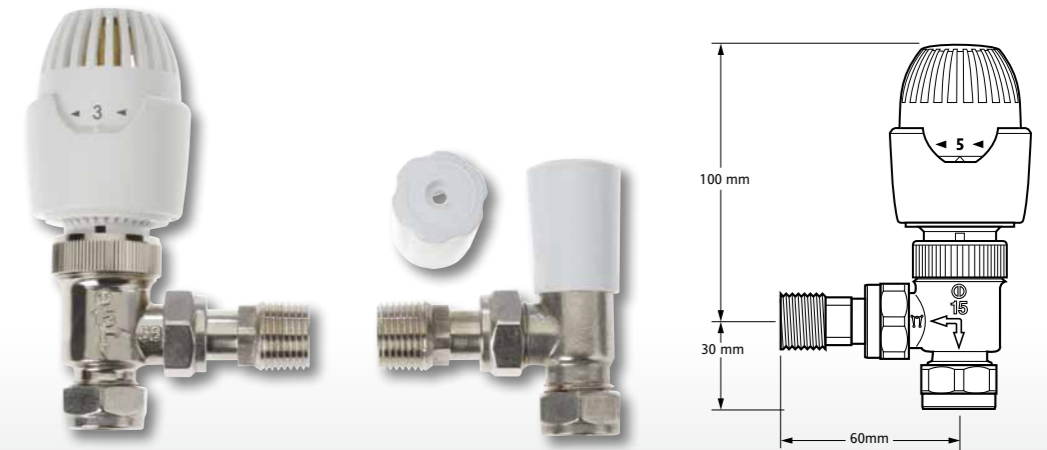
#### RT212

- Lower cost wax-sensor
- Easy grip adjusting cap
- Compact design

## RT212 TRV

RT212 is manufactured in our UK factory and rigorously tested to conform to the EN 215 standard which is recognised throughout Europe.

The 15mm Angled Valve can be mounted vertically or horizontally on flow or return.



### Features:

- Compact design
- 12°C to 29°C setting range
- Non-stick valve internals
- Range limiting
- 8°C frost protection setting
- Positive off position
- Double gland seal
- Reverse flow body (15mm angle)
- Pre-setting as standard
- M30 x 1.5 head connection
- Radiators can be balanced from the TRV
- White wheelhead caps available (part no. 07 35 123) - converts valve body into balancing/ isolating valve to replace lockshield
- Range of adaptors available for plastic (PEX) and multi-layer pipe
- Low-cost wax sensor

For commissioning instructions see page 57

### Technical data

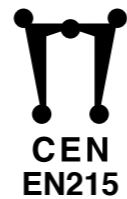
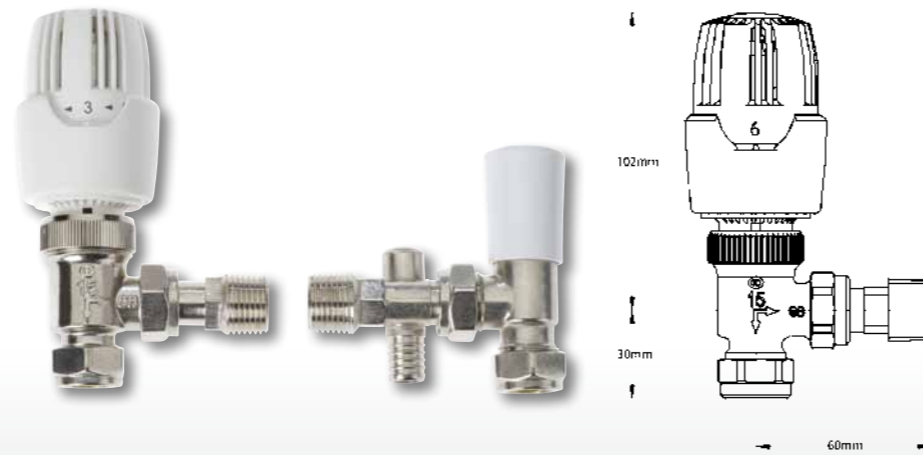
Model	RT212 Head
Maximum Sensor Operating Temperature	50°C
Setting numbers	1 to 6
*Frost protection	8°C
Temperature setting range	Approx. 12°C to 29°C
Sensitivity	0.22mm/°C
Hysteresis	0.7 K
Water temperature influence	0.9 K
Differential pressure influence	0.15 K
Response time	25 minutes

RT212 Product Head	Part No.
RT212 Integral head only	08 08 099
<b>Head and valve</b>	
RT212 15mm angle	08 08 015
RT212 15mm straight	08 08 115
RT212 10mm angle	08 08 010
RT212 10mm straight	08 08 110
RT212 8mm angle	08 08 008
RT212 8mm straight	08 08 108
<b>Head, valve and accessories</b>	
RT212 15mm angle with lockshield	08 08 260
RT212 15mm angle with 8&10mm reducers	08 08 810
RT212 15mm angle with 10mm push-fit elbows	08 08 211
RT212 15mm angle with lockshield and 10mm push-fit elbows	08 08 263
RT212 15mm angle with lockshield and DOTP	08 08 264
RT212 15mm angle with lockshield, DOTP and 10mm push-fit elbows	08 08 268

# RT414 TRV

The Drayton RT414 TRVs provides control of individual room temperatures.

With integral thermostatic sensing head and reverse flow capability, the 15mm angle valve can be flow or return mounted both vertically or horizontally.



### Features:

- Compact Design
- Off Position
- 10°C to 26.5°C setting range
- Range limiting
- 6.5°C frost protection setting
- Reverse flow body (15mm angle)
- M30 x 1.5 head connection
- Ultra sensitive liquid filled sensor

### Technical data

#### RT414 Thermostatic Radiator Valve

RT414 is rigorously tested to conform to the EN 215 standard, which is recognised throughout Europe.

Maximum Sensor Temperature	50°C
Temperature setting range	0 = Shut off position. Valve open at approx. 0°C
* Frost protection	Below 6.5°C
Setting numbers 1 to 6	Apptox. 10°C to 26.5°C
Sensitivity	0.22mm/°C
Hysteresis	0.35 K
Water temperature influence	1 K
Differential pressure influence	0.15 K
Response time	25 minutes

### RT414 Thermostatic Radiator Valves

Product	Part No.
RT414 TRV Head Only	10 10 099
RT414 15mm Angle Body	10 10 015
RT414 15mm Angle + L/Shield	10 10 260
RT414 15mm Angle + L/Shield + D/OTP	10 10 264
RT414 15mm Straight + L/Shield	10 10 360

For commissioning instructions see page 57

# TRV4 TRV

Britain's best selling range of thermostatic radiator valves set the standards for design, performance and quality. Including TRV4 Lockshield and Pushfit Packs to suit most domestic and commercial heating systems.



### Features:

- Ultra sensitive liquid filled sensor
- Hygienic wipe clean surfaces, no dust traps
- Iconic design
- Half / full click stop settings

### Technical data

#### TRV4 Thermostatic Radiator Valve

Maximum Sensor Temperature	50°C	
Setting numbers	Integral sensor 1 to 5 then MAX	Remote sensor 1 to 7 then MAX
* Frost protection	Integral and Remote sensor below 8°C	
Temperature setting range	Integral and Remote sensor 1 to max = approx 10°C to 30°C	
Sensitivity	0.22mm/°C	
Hysteresis	Integral sensor 0.4 K	Remote sensor 0.6 K
Water temperature influence	Integral sensor 0.8 K	Remote sensor 0.4 K
Differential pressure influence	Integral sensor 0.15 K	Remote sensor 0.10 K
Response time	Integral sensor 20 minutes	Remote sensor 20 minutes

### TRV4

Product	Part No.	Product	Part No.
8mm Angle or straight TRV4	07 05 168/169	TRV4 15mm Angle + L/S (ALL CHROME)	07 05 170
10mm Angle or straight TRV4	07 05 152/155	TRV4 15mm Straight + L/S (ALL CHROME)	07 05 171
15mm Angle or straight TRV4	07 05 150/151	TRV4 integral (standard) Head	07 25 006
1/2" angle or straight TRV4	07 05 153/156	TRV4 15mm Angle2M remote	07 05 158
3/4" angle or straight TRV4	07 05 154/157	TRV4 2M remote Head only	07 25 007
All Chrome TRV4 15mm angle boxed	07 05 150C	TRV 6M remote Head only	07 25 008
All Chrome TRV4 15mm straight boxed	07 05 151C	TRV4 15mm Angle + L/S	07 05 180
TRV4 Integral (ALL CHROME) Head	07 03 013		



## Lockshield and Manual Valve

Suitable for domestic radiators and towel rails, available in either chrome or satin nickel finish to suit the Drayton TRV range.



### Technical data

Model	Lockshield and Manual Valve
Maximum working pressure	10 bar
Maximum working pressure	3 bar (Push-fit)
Maximum differential pressure	0.6 bar
Recommended differential pressure	0.2 bar
Maximum ambient temperature	50 °C
Maximum flow water temperature	120 °C
Maximum flow water temperature	110 °C (Push-fit)
Connections :	Compression fittings meet EN 1254-2
Standards :	Conforms to BS 2767-10



### Chrome finish to match TRV4

Product	Part no.
15mm Angle lockshield with white cap	07 05 900
15mm Angle lockshield with drain off tap	07 05 901
15mm Drain off tap	07 05 902
15mm Angle lockshield with integral drain off tap	07 05 903
10mm Push-fit elbow	07 05 904
15mm Push-fit elbow	07 05 905
15mm Straight lockshield with white cap	07 05 906
15mm Angle with chrome cap	07 15 215
15mm Straight with chrome cap	07 15 216
10mm Compression elbow	07 05 907
15mm Compression elbow	07 05 908

### Satin nickel to match RT212, RT414

Product	Part no.
15mm Angle lockshield with white cap	08 08 900
15mm Angle lockshield with drain off tap	08 08 901
15mm Drain off tap	08 08 902
15mm Angle lockshield with integral drain off tap	08 08 903
10mm Push-fit elbow	08 08 904
15mm Push-fit elbow	08 08 905
15mm Straight lockshield with white cap	08 08 906
10mm Compression elbow	08 08 907
15mm Compression elbow	08 08 908

## EB Body Range and Adaptors

### EB body and adaptor range features

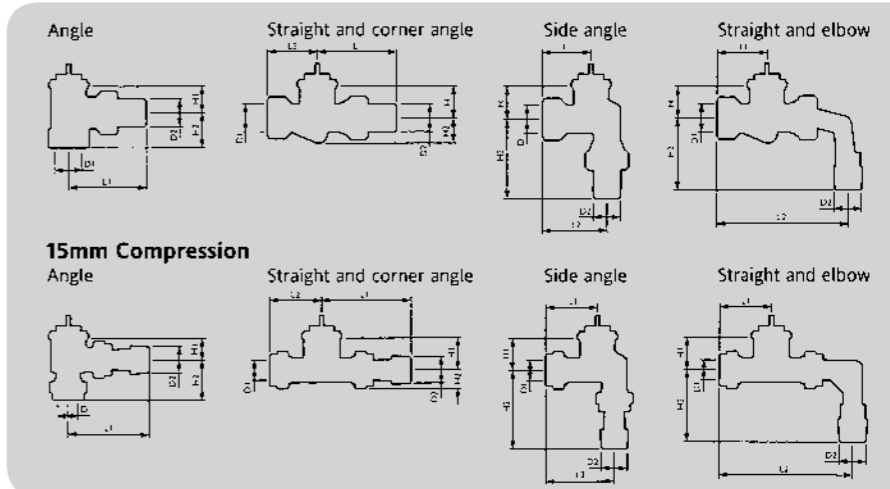
- PES internals, that have proved resistant to sticking in systems that are installed in hard water areas
- Pre-setting as standard
- Double gland seal, top seal replaceable without draining down
- Reverse flow 15mm angle body, in chrome, cobalt gold and incalux gold
- Valves can be used for wheelhead/lockshield applications
- Single pipe variants available
- Full range of copper, pex and composite pipe adaptors



### Description of use

All Drayton two pipe EB bodies come with pre-setting internals as standard. This enables the system radiators to be accurately balanced to the required flow rates, which are shown in the Kv tables opposite.

The bodies can be used with any of the Drayton thermostatic heads with a M30 x 1.5 ring nut or the wheelhead/ lockshield cap.



### Single pipe valves

Dimensions	Angle					Straight					
	H1	H2	L1	D1	D2	H1	H2	L1	L2	D1	D2
1/2" BSP	29	24	64	Rp1/2	R1/2	30	16	64	41	Rp1/2	R1/2
3/4" BSP	27	28	66	Rp3/4	R3/4	30	21	69	45	Rp3/4	R3/4
1" BSP	30	30	74	Rp1	R1	30	26	77	48	Rp1	R1

### Two pipe valves

Dimensions	Angle					Straight and corner angle					Side angle					Straight and elbow									
	H1	H2	L1	D1	D2	H1	H2	L1	L2	D1	D2	H1	H2	L1	L2	D1	D2	H1	H2	L1	L2	D1	D2		
3/8" BSP (DN10)	17	22	54	Rp3/8	R3/8	23	13	52	33	Rp3/8	R3/8	22	48	33	44	Rp3/8	R3/8	-	-	-	-	-	-	Rp3/8	R3/8
15mm (compression)	16	30	60	15	R1/2	23	14	66	39	15	R1/2	23	58	39	42	15	R1/2	23	53	39	97	15	R1/2	R1/2	
1/2" BSP (DN15)	19	26	58	Rp1/2	R1/2	22	16	57	37	Rp1/2	R1/2	22	57	36	48	Rp1/2	R1/2	22	53	57	97	Rp1/2	R1/2	Rp1/2	R1/2
3/4" BSP (DN20)	18	29	66	Rp3/4	R3/4	23	21	66	40	Rp3/4	R3/4	-	-	-	-	Rp3/4	R3/4	-	-	-	-	-	-	Rp3/4	R3/4

### Key features at a glance

- Non sticking valve internals
- Pre-setting as standard on all valve bodies
- Internals replaceable (without draining down)
- Range of adapters available for plastic (PEX) and multi layer pipe

For EB Flow Capacity see page 59



## Automatic By-Pass Valve

The automatic by-pass valve is designed to maintain a minimum flow rate in heating systems fitted with thermostatic radiator valves.

### Application

The automatic by-pass valve is designed to maintain a minimum flow rate in heating systems fitted with thermostatic radiator valves. When all the TRVs are open the by-pass valve remains closed, allowing the full boiler output to circulate around the heating system.

As TRVs sense that selected room temperatures are reached and start to close, the by-pass valve starts to open, maintaining optimum flow through the boiler and so eliminating possible damage to the boiler and pump. Installation of the by-pass valve will minimise noise often experienced when flow through the boiler decreases.

### Installation

The by-pass should be installed between the flow and return with flow in the direction of the arrow.

If a higher capacity is required for large installations it is possible to install two or more valves in parallel.

### Setting

The valve can be manually adjusted from 0.05 Bar to 0.5 Bar. The graph opposite shows the flow curves of the settings at 0.1, 0.2, 0.3, 0.4 and 0.5 Bar. A setting of 0.2 - 0.3 Bar is sufficient for most common installations. If the differential pressure is too low or the by-pass flow is too high, the pressure setting should be increased. If the differential pressure is too high or the by-pass flow too low, the pressure setting should be decreased.

### Technical data

Model	Automatic By-Pass Valve
Connections	22mm compression joints
Setting range	0.05 to 0.5 Bar
Working pressure	16 bar
Working temp.	120°C Intermittent

### Features:

- Maintains optimum flow
- Automatic operation
- Set and forget
- Ensures quiet operation
- High quality
- Reliable

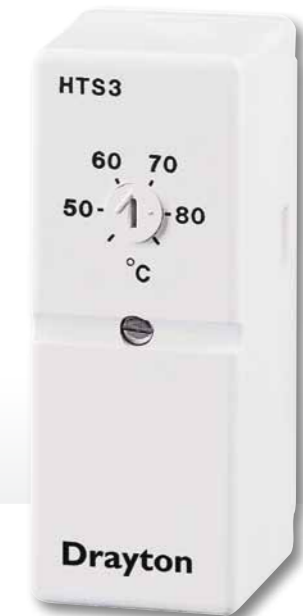
### Automatic Bypass Valve

Product	Part No.
22mm Angle auto bypass valve	07 02 020

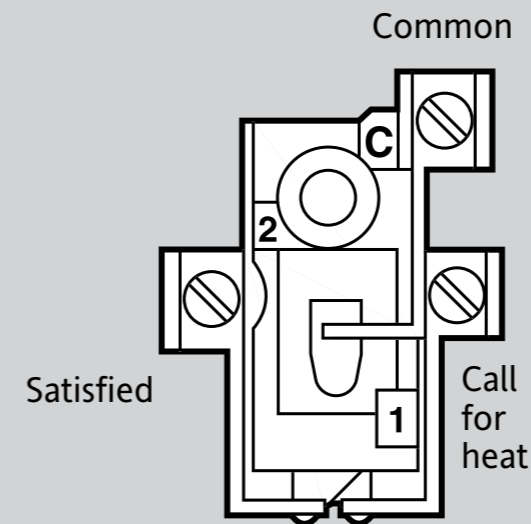


## HTS3 Cylinder Thermostat

The HTS3 cylinder thermostat controls the domestic hot water temperature to suit your lifestyle and gives energy savings when set between the recommended 60°C to 65°C.



### Wiring connections



### Features:

- Easy fixing to all hot water cylinders
- Suited to all systems
- Tamper resistant
- Double insulated

### HTS3 Cylinder Thermostat

Product	Part No.
HTS3	13007

### Technical data

Model	HTS3
Sensing element	Bi-metal
Temperature range	50°C to 80°C
Switch rating	3 (1) A 230V a.c.
Switch type	S.P.D.T.
Differential	8°C approximately
Fixing	Plastic coated spring wire, hook and eye
Wiring	To comply with the current I.E.E. regulations



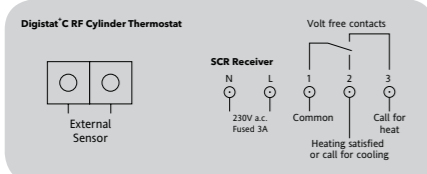
## Digistat<sup>+</sup>C RF Cylinder Thermostat Wireless Systems

Drayton's stylish new wireless Digistat<sup>+</sup>C RF with tactile, audible & visual feedback. Featuring a familiar dial control with a digital display to show that the temperature has been set accurately every time.

- User adjustable Min/Max temperature setting
- Digital Display situated above dial for ease of reading

The Digistat<sup>+</sup>C RF cylinder thermostat controls the domestic hot water temperature to suit your lifestyle and gives energy savings when set between the recommended 60°C to 65°C.

### Wiring connections



### Features:

- Conventional dial adjustment  
Tactile dial
- 5°C setting steps
- Tactile & audible feedback via click of the dial.
- Visual feedback via digital display
- Min/Max temperature setting
- Battery powered
- Digital display situated above dial for ease of reading



### Technical data

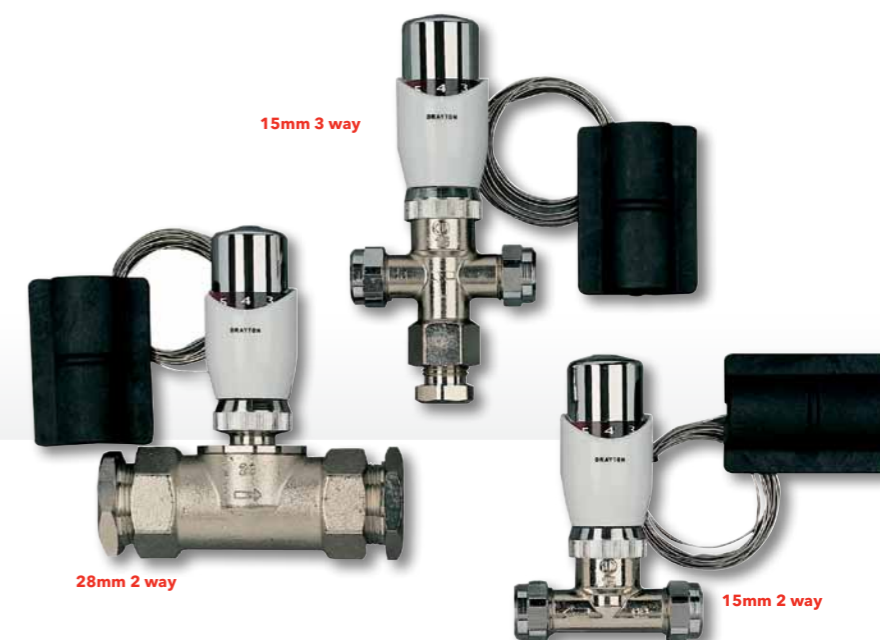
Model	Digistat+1RF
Power supply	2 x AA Size, 1.5V alkaline batteries
Radio frequency:	433 MHz
Radio Signal Range:	30m typically. The range may be affected by the composition / density and number of walls between the Digistat+1RF and SCR.
Temperature Range:	5 to 30°C
Control Accuracy:	+ 0.5K @ 20°C
Ambient Temperature:	Operating 0°C to 40°C / Storage -20°C to 55°C
Mounting:	Suitable for surface or conduit box mounting
Wiring:	No wiring required
	Digistat SCR
Power supply:	230V a.c.
Switch Type & Rating:	SPDT (voltage free) 2(1)A 230V a.c. or 24V a.c./d.c.
Wiring:	Designed for fixed wiring only, to comply with current IEE wiring regulations. (BS7671)
Reception Frequency:	433 MHz
Relevant EC Directives	2006/95/EC Low Voltage Directive 2004/108/EC Electromagnetic Compatibility Directive 1995/5/EC R&TTE Directive 2006/66/EC Battery Directive
Applied Standards:	EN60730-1; EN60730-2-9 ETSI EN 300 220-3; ETSI EN 301 489-3

### Digistat<sup>+</sup>C RF Wireless Systems

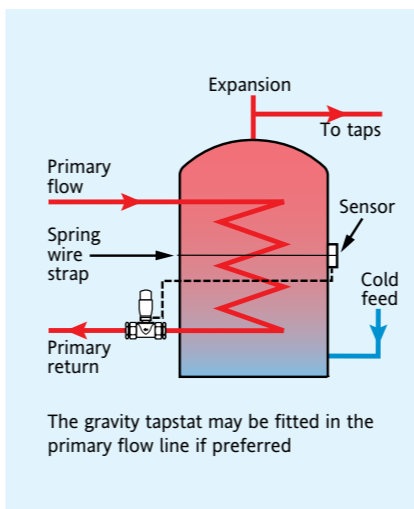
Product	Part No.
Digistat <sup>+</sup> C RF CYLINDER STAT+SCR+SENSOR	13616
Digistat <sup>+</sup> SCR RECEIVER SPARE	22149
Digistat <sup>+</sup> SCR RF TRANSMITTER SPARE	13618
Digistat <sup>+</sup> SCR RF SENSOR SPARE	13619

## Tapstat Cylinder Controls

Self-acting tapstats control domestic hot water temperatures on gravity or pumped primary systems preventing scalding and fuel wastage.



### Installation



### Technical data

Model	Tapstat	
Max. static pressure	147 psi (10 bar)	
Max. primary flow temperature	100°C continuous 120°C intermittent	
Max. differential pressure*	15mm 2 way	59 psi (4 bar)
	15mm 3 way	29 psi (2 bar)
	28mm gravity	7 psi (0.5 bar)
KV value (fully open)	15mm 2 way	1.1
	15mm 3 way	1.1
	28mm gravity	4.6
Setting range	32°C to 72°C	

\* The differential pressures stated are maximum limits. It is not recommended that Tapstats are used at pressures above 8.8 psi (0.6 bar) as noise may be experienced in the system.

### Features:

- High quality
- Self acting (non electric)
- Range limiting stops
- Remote sensor with 2m capillary
- Compression fittings for copper pipe
- Simple to install

### Tapstat Cylinder Controls

Product	Part No.
Tapstat Sensing head	07 45 012
15mm 2-way Tapstat (Pumped)	07 45 015
15mm 3-way tapstat (Pumped)	07 45 016
28mm 2-way Tapstat (Gravity)	07 45 017
MK3-Mk4 tapstat conversion head	07 91 011

## PTS1 Pipe Thermostat

The PTS1 Pipe Thermostat can be used in domestic or commercial installations for applications such as high or low limit.

It is typically used in conjunction with the Drayton RTS3 Air Frost Thermostat\*, to provide two stage frost protection for boilers and exposed pipework.



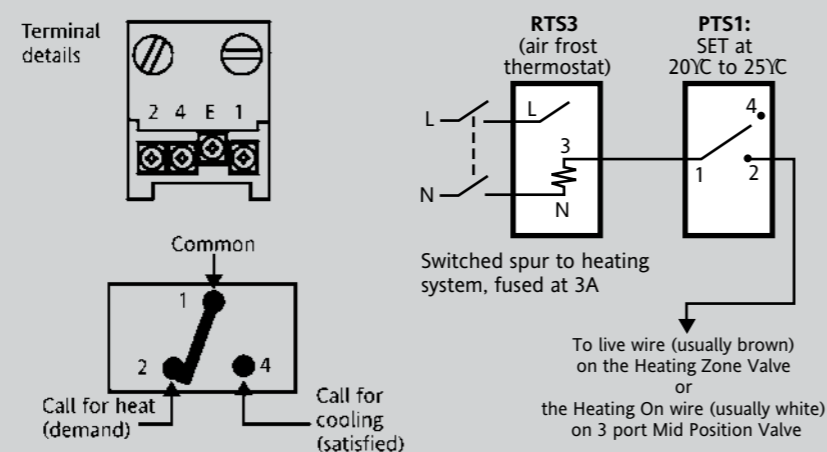
### Technical data

Model	PTS1
Setting range	20°C to 90°C
Ambient temperature	-35°C to 120°C
Switching differential	8k
Sensitivity	1k/min
Switch type	SPDT (volt free)
Switch rating	15(2.5)A 230V a.c.
Sensing element	liquid
Knob locking device	Supplied
Fixing wire	Supplied
Enclosure protection rating	IP40

### Features:

- Frost protection solution when used in conjunction with the RTS3 air frost thermostat
- Changeover contacts
- Lockable setting knob
- High or low limit applications
- Conduit adaptor/gland seal
- Concealed cover fixing screw

### Wiring connections



For boiler frost protection using PTS1 in conjunction with a standard frost thermostat

## Control Packs



Biflo Control Packs					
Part No.	Programmer	Room Stat	Cylinder Stat	Valve	Wiring Centre
PBBE66	LP241	RTS1	HTS3	22mm Mid Position*	LWC1
PBBE66S	LP241Si	RTS1	HTS3	22mm Mid Position	LWC1
PBBE669S	LP241Si	RTS9	HTS3	22mm Mid Position	LWC1
PBBE68	LP241	RTS1	HTS3	22mm Mid Position*	LWC3
PBBE86	LP522	RTS1	HTS3	22mm Mid Position*	LWC1
PBBE86S	LP522Si	RTS1	HTS3	22mm Mid Position	LWC1
PBBE869S	LP522Si	RTS9	HTS3	22mm Mid Position	LWC1
PBBE88	LP522	RTS1	HTS3	22mm Mid Position*	LWC3
PBBE96	LP722	RTS1	HTS3	22mm Mid Position*	LWC1
PBBE969S	LP722Si	RTS9	HTS3	22mm Mid Position	LWC1
PBBE98	LP722	RTS1	HTS3	22mm Mid Position*	LWC3
SMBE362	SM2	RTS1	HTS3	22mm Mid Position	LWC1
SMBE382	SM2	RTS1	HTS3	22mm Mid Position	LWC3



Twinzone Control Packs					
Part No.	Programmer	Room Stat	Cylinder Stat	Valve	Wiring Centre
PBTE66	LP241	RTS1	HTS3	2 x 22mm 2-Port*	LWC1
PBTE68	LP241	RTS1	HTS3	2 x 22mm 2-Port*	LWC3
PBTE86	LP522	RTS1	HTS3	2 x 22mm 2-Port*	LWC1
PBTE88	LP522	RTS1	HTS3	2 x 22mm 2-Port*	LWC3
PBTE96	LP722	RTS1	HTS3	2 x 22mm 2-Port*	LWC1
PBTE98	LP722	RTS1	HTS3	2 x 22mm 2-Port*	LWC3
SMTE362	SM2	RTS1	HTS3	2 x 22mm 2-Port	LWC1

Further pack options including untimed versions are available on request.  
\*For 28mm versions, add B to the end of the part number.

<b>PTS1</b>	
<b>Product</b>	<b>Part No.</b>
PTS1	03 01 260

\* See page 6



### Unvented Control Packs

Part No.	Programmer	Room Stat	Cylinder Stat	Valve	Wiring Centre
UWH62	LP241	RTS1	-	22mm 2-Port*	LWC1
UWH72	LP112	RTS1	-	22mm 2-Port*	LWC1
UWH82	LP522	RTS1	-	22mm 2-Port*	LWC1
UWH92	LP722	RTS1	-	22mm 2-Port*	LWC1



### Combi Packs

Part No.	Timeswitch	Room Stat
COM1114	LP111	RTS4
COM7114	LP711	RTS4



### Pump Plan Packs

Part No.	Programmer	Room Stat	Cylinder Stat
PP112	LP112	RTS1	HTS3
PP241	LP241	RTS1	HTS3
PP522	LP522	RTS1	HTS3
PP722	LP722	RTS1	HTS3
PP241S	LP241Si	RTS1	HTS3

Further pack options including untimed versions are available on request.  
\*For 28mm versions, add B to the end of the part number.

## Wiring Centres

Wiring centres provide a safe and convenient method of system wiring. All controls can be neatly connected making operational testing a simple task.



### Features:

- Easy to use
- Simplifies wiring and circuit testing
- Suited to all popular heating systems
- A safe means of connection
- Large terminals
- Easy access
- Voltage warning label
- Complies with BS6220

### Technical data

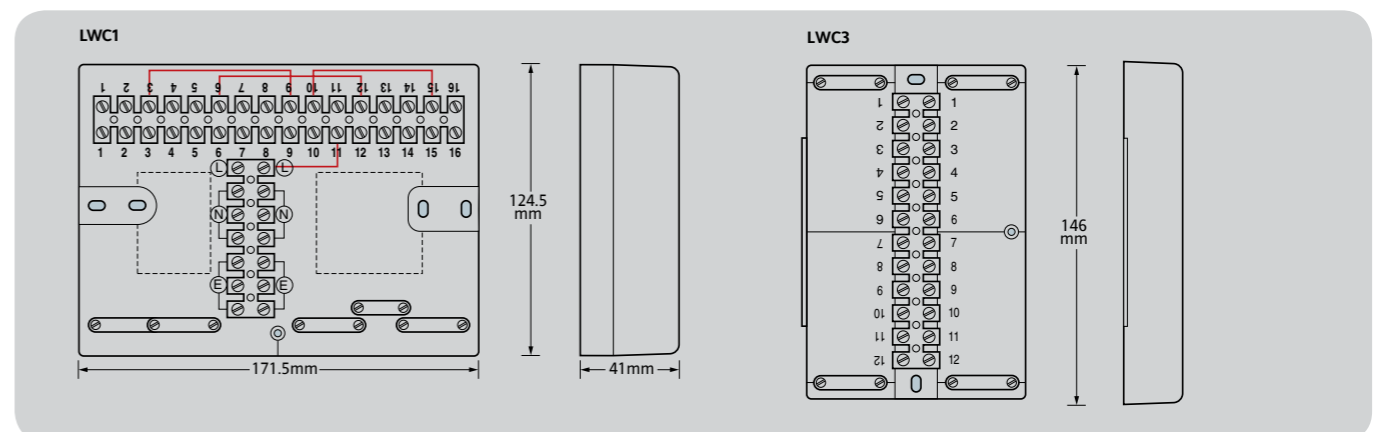
	LWC1	LWC3
12 way junction box	-	✓
16 way wiring centre	✓	-
Manufactured in flame-retardant plastic	✓	✓
Cable clamps supplied	✓	✓
Top or bottom cable entry bays	-	✓
Large diameter wiring terminals	✓	✓
Wiring links provided to suit most systems	✓	-
Cable identification labels included	✓	-

- with full installation instructions

### Wiring Centres

Product	Part No.
LWC1 Wiring Centre	28001
LWC3 Junction Box	28003

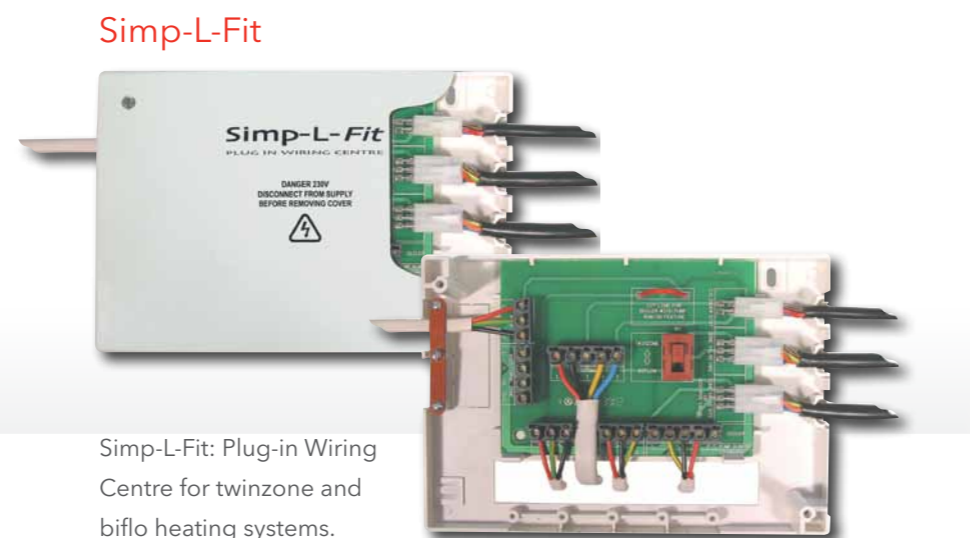
### Dimensions





## Simp-L-Fit Packs

The Simp-L-Fit plug-in wiring centres reduce installation time and eliminate the possibility of incorrect wiring when used with the Drayton Simp-L-Fit range of products.



Simp-L-Fit: Plug-in Wiring Centre for twinzone and biflo heating systems.

### Features:

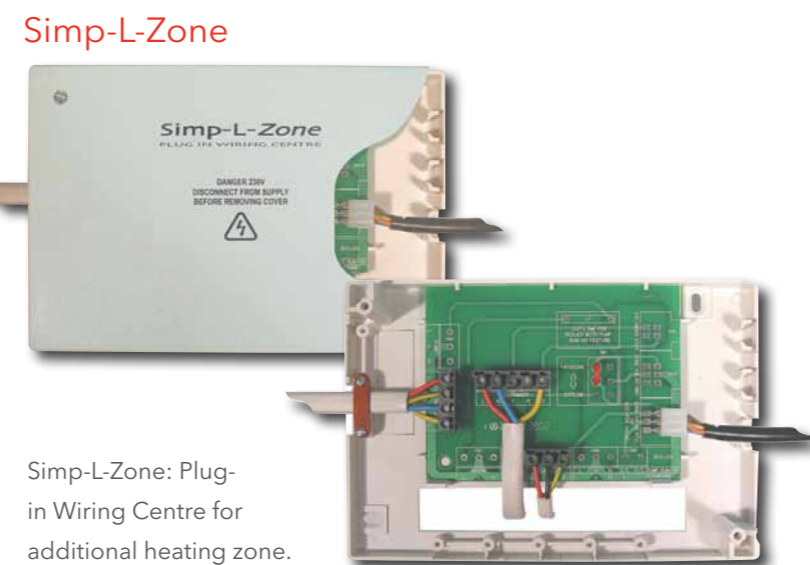
- Available in Biflo & Twinzone versions
- Additional Plug-In Zoning packs available

### Simp-L-Fit Plug-in Wiring Centre:

- Reduces installation time
- Eliminates incorrect wiring
- Complies with 89/336/EEC and 73/23/EEC
- Suitable for twinzone or biflo systems (selectable 2 position switch)
- Plug-in connections for valves and cylinder stat

### Simp-L-Zone Plug-in Wiring Centre for additional heating zone

- Quick connection to Simp-L-Fit plug-in wiring centre to add additional heating zone
- Plug-in connection for zone valve



Simp-L-Zone: Plug-in Wiring Centre for additional heating zone.

## Simp-L-Fit

Conventional heating control packs require wiring of all the controls individually. Simp-L-Fit improves on this by providing a plug-in connector on both the motorised valve and cylinder thermostat allowing simple connection to the wiring centre.

The Simp-L-Fit plug-in heating control packs reduce overall installation time and eliminate the possibility of incorrect wiring.

Simp-L-Fit heating control packs also offer the option to add an additional heating zone by using the Simp-L-Zone pack also available.

Simp-L-Fit heating control packs are suitable for mid position, zone and multi-zone systems.

### Pack Contents

#### Additional Zone Simp-L-Zone Heating Control Packs

Part No.	Programmer	Room thermostat	Zone valve (x1) Plug-in	plug-in wiring centre
P319103	LP111	RTS1	22mm 2 port	Simp-L-Zone

Suitable for twinzone heating systems only.

#### Biflo Simp-L-Fit Heating Control Packs

Part No.	Programmer	Room thermostat	Cylinder thermostat plug-in	Biflo valve plug-in	Plug-in wiring centre	Simp-L-Fit replacement of
P234112	LP241	RTS1	HTS3	22mm 3 port	Simp-L-Fit	Biflo 66
P235112	LP522	RTS1	HTS3	22mm 3 port	Simp-L-Fit	Biflo 86
P236112	LP722	RTS1	HTS3	22mm 3 port	Simp-L-Fit	Biflo 96

#### Twinzone Simp-L-Fit Heating Control Packs

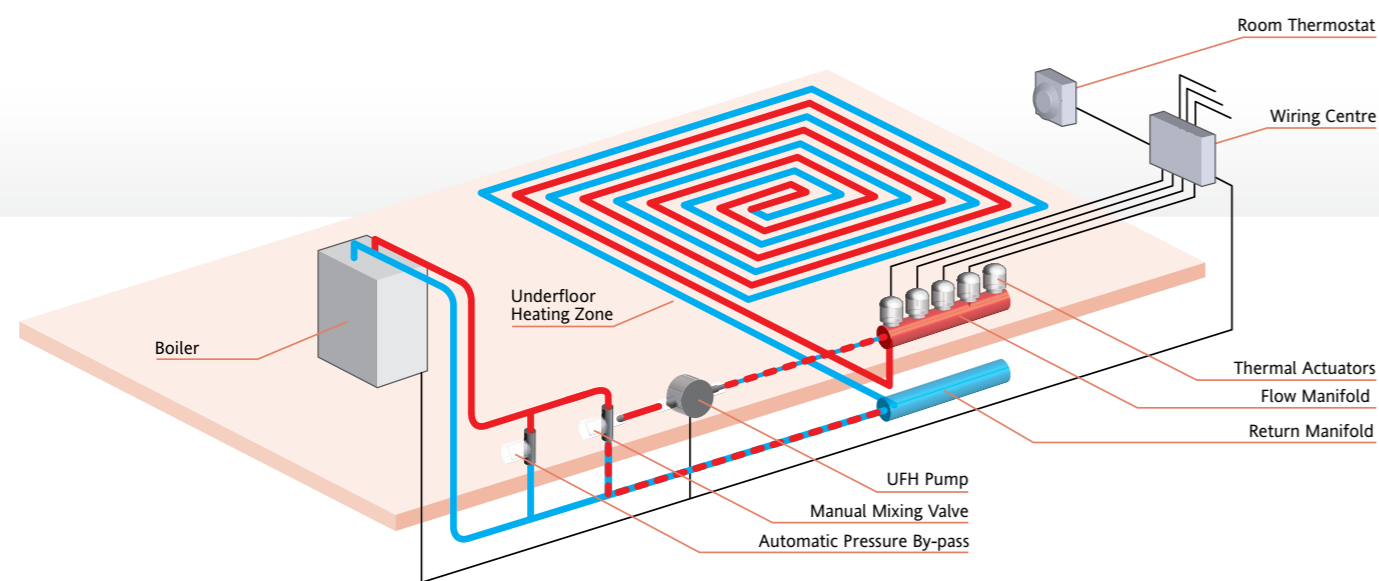
Part No.	Programmer	Room thermostat	Cylinder thermostat plug-in	Biflo valve plug-in (X2)	Plug-in wiring centre	Simp-L-Fit replacement of
P124111	LP241	RTS1	HTS3	22mm 2 port	Simp-L-Fit	Twinzone 66
P125111	LP522	RTS1	HTS3	22mm 2 port	Simp-L-Fit	Twinzone 86
P126111	LP722	RTS1	HTS3	22mm 2 port	Simp-L-Fit	Twinzone 96

### Plug In Wiring Centers

Product	Part No.
Simp-L-Fit Biflo heating pack	P231112
Simp-L-Fit Twinzone heating pack	P121111
Simp-L-Zone	P312103

TS+ New for 2010

## Underfloor Heating Controls Hydronic and Electric



Under floor schematic

Drayton has launched a comprehensive range of underfloor heating controls. As an established market leader in heating controls coupled with the underfloor experience of our European sister company, Drayton underfloor heating controls possess extremely high standards of quality, flexibility, robustness and usability. In line with our core expertise, the Drayton offering does not include pipe, insulation or energy sources but simply the controls to ensure that complete systems operate to their maximum efficiency.

Selecting the appropriate controls for an underfloor heating installation is of critical importance in maximising system comfort, energy efficiency and reliability. Drayton offers a one-stop shop for your controls needs, delivering a broad and differentiated range to enable you to get your controls selection right first time.

**For further details see our specialist Underfloor Heating brochure.**

## Thermal Actuators

The next-generation TS+ Thermal Actuator built on the success of the TS Actuator.

Smaller to fit on new compact manifolds and with improved water ingress protection.

### Features:

- Water and dust resistant to IP54 rating
- Can be mounted in any orientation - even upside down
- Provides visual confirmation of valve position
- Standard connection (M30 x 1.5mm) to manifolds
- Valves can be opened and closed by hand, great for commissioning and service
- Stylish and compact

TS Thermal Actuator is used in conjunction with room thermostats to control individual zones or rooms.

### Features:

- Provides visual confirmation of valve position
- Standard connection (M30 x 1.5mm) to manifolds
- Valves can be opened and closed by hand, great for commissioning and service
- Robust & reliable design

### Thermal Actuators

Product	Part No.
TS 5.11/230	0409 1001 1017
TS+ 5.11/230	0493 1001 1017

### TS+ Thermal Actuator



### TS Thermal Actuator



## Thermostats & Connection Strips

The RTR-E 6124 room thermostat has a high control accuracy that can be used to control temperature in individual rooms and zones.

### Features:

- Automatic setback via external connection strip EVU 230 PL
- Bi-metal thermostat with thermal feedback and high precision
- Distinct connections and large connecting space for quick and easy installation
- Temperature limiting and locking under setting dial

The EV wired connection strips link room thermostats to the thermal actuators allowing independent temperature control of each zone.

### Features:

- 6-zone connecting strip EV 230 PL
- Wall mounting on DIN rail
- Easy to connect without screwdriver
- Dimensions: 305 x 90 x 60mm
- LED mains indicator
- Pump logic and protection

### Features:

- As EV 230 PL with the following additional features
- 7-day programming of up to 6 independent zones
- Backlit LED display
- 5 preset programs
- Holiday function
- For use with room thermostats with set-back function e.g RTR-E 6124

### RTR-E 6124



### EV 230 PL



### EV-U 230 PL



### Thermostats & Connection Strips

Product	Part No.
RTR-E 6124	111 1102 51 133
EV 230 PL	0101 24 141 533
EV-U 230 PL	0101 22 141 533

## Thermostats - Wireless

The wireless Instat+ 868-r is a programmable electronic clock room thermostat with a large LCD digital display which shows actual temperature and time.

### Features:

- Wireless connectivity avoids the need to re-decorate and provides flexibility on mounting position
- Energy-saving optimum start feature
- Easy to use with only 4 buttons
- Automatic address allocation to create wireless link effortlessly
- With real-time clock and automatic summer/winter time change

The Instat 868-r1 wireless room thermostat can be used to control temperature in individual rooms and zones.

### Features:

- With setback function (-4K or -2K)
- Selector switch for permanent comfort, permanent setback, automatic function or off
- LED indicating learning mode and low battery strength
- Tamperproof with temperature limiting and temperature locking facility

### Wireless Thermostats

Product	Part No.
Instat+ 868-r	0536 21 296 033
Instat 868-r1	0536 10 291 933

**For further details request our specialist Underfloor Heating brochure, from our customer services department. Contact details on back cover.**

### Instat+ 868-r Wireless Programmable Room Thermostat



### Instat 868-r1 Wireless Room Thermostat



The Instat 868 wireless system provides a cost effective solution to the problems encountered during the installation of standard wired comfort controls.

Consider the benefits of a wireless system:

- No carpets and floor-boards to lift
- No damage to wall coverings
- No unsightly surface wiring
- Positioning no longer restricted to areas accessible by cable runs
- No brick or plaster work to chase out
- No damage to fabrics and furnishings in the process

## Connection Strips - Wireless

The Instat wireless connection strips link room thermostats to the thermal actuators using proven 868 MHz wireless technology and are designed to work seamlessly with the 868-r and 868-r1 wireless thermostats. This facilitates independent temperature control of each zone.

### Features:

- 4 or 6 channel receiver device for Instat 868-r and Instat 868-r1 room thermostats
- Pump logic and protection (one output used)
- LED indicator for each channel

### Instat 868-a4



### Instat 868-a6



### Features:

- Instat 868-a8U 8 channel programmable receiver with clock
- For independent timed control of up to 8 zones using Instat 868-r1 room thermostats
- Pump logic and protection (one output used)
- Backlit display
- Holiday function
- Up to 6 time/temp pairs per day

### Instat 868-a8U



### Instat 868-a1

### Features:

- Receivers for Instat 868-r1 transmitters and Instat+ 868-r
- LED to indicate malfunction / loss of signal
- Emergency operation in case of malfunction
- Reverse function for cooling instead of heating
- Reset button
- Single channel receiver



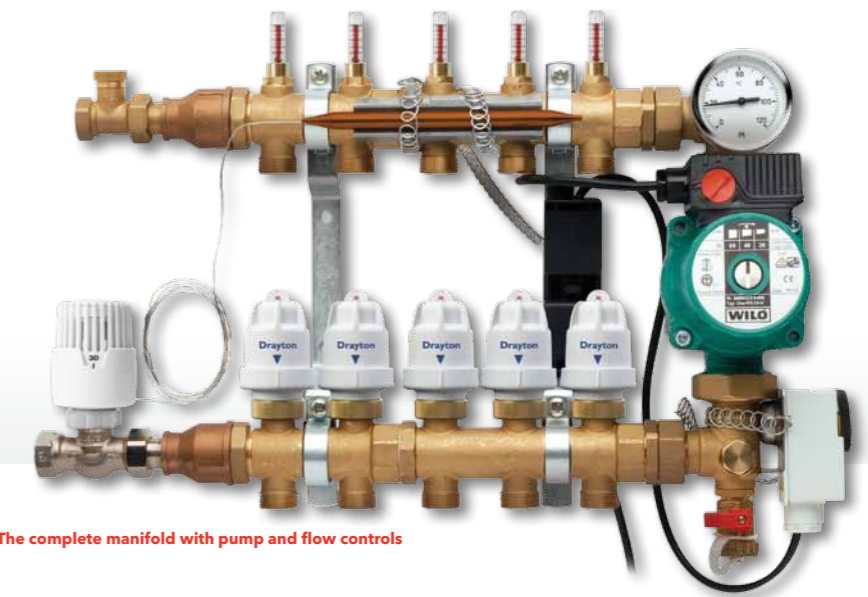
### Wireless Controls

Product	Part No.
Instat 868-a4	0536 40 140 033
Instat 868-a6	0536 60 140 033
Instat 868-a8U	0536 80 140 033
Instat 868-r1	0538 10 291 933
Instat 868-a1	0538 30 140 002

## Hydronic Controls

The Drayton MSV Manifold and KRS-B Pump and Flow Pack provides the installer with a complete solution for underfloor heating. The components are also available individually. Please see the Drayton Underfloor Heating brochure for detailed information and part numbers.

- MSV Manifolds
- MSV Manifold Components
- FL50 Flow Controls
- Flow Control Packs
- KRS-B Pump and Flow Control Pack



The complete manifold with pump and flow controls

### Manifold features:

- Compact design
- Corrosion resistant due to high quality MS63 brass
- The manifold can be sized according to the complexity of the system
- Supplied with airvents and fill cocks, shut-off ball valves, valves in each return port, and restrictors in each flow port



DFM flow indicator

### Hydronic controls

	Manifolds	Flow Controllers	Pump packs
<b>Description</b>	Brass manifolds available in multiple pre-assembled configurations or as modular components.	Flow controllers available as individual components or as packs with added mixing valve, high-limit thermostat and bypass valve	A complete pack for flow temperature control containing circulation pump, flow control, high-limit thermostat, mixing valve and all connecting parts

### Benefits

Select individual components or complete solutions.

Easy to install and commission.

High-quality reliable products with full warranty and service support

## Electric Underfloor Heating

The latest generation of electronic temperature controllers for floor heating



Floor Temperature Controller



Room Temperature Controller with floor temperature limiter

### Variations

Model	Digistat <sup>+</sup> 3F	Digistat <sup>+</sup> 3L	
Part No.	22195	22196	
Temperature Setting Range	Floor temperature 10 to 40°C	Room temp. 7 to 32°C	Floor temp. 10 to 40°C
Power Supply	Mains; 230V a.c.		
Remote sensor	Included		

### General Technical Data

Relay output	1 change-over (voltage free)
Switching current	Max. 16 (4) A
Mode of regulation	proportional controller (PWM)
PWM cyclus time	10 or 25 min.
Connection	via screw-type terminals
Timing resolution	1 minute
Temperature resolution	0.1°C
Pollution situation	Degree 2
Protection level	IP30
Wiring:	Designed for fixed wiring only, to comply with I.E.E. wiring regulations

## Electric Underfloor Heating

Programmable Room Thermostat

Drayton presents a simple-to-use programmable control with traditional analogue clock face.



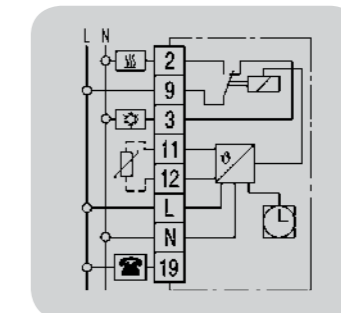
### Features:

- For Electric Underfloor Heating
- Two models available: Floor temperature controller and room temperature controller with floor limiter
- Day and night temperatures independently selectable
- 5 operational modes via setting dial for Day / Night / Automatic / Frost protection / Off
- With 24 hour clock
- With remote sensor for measuring the floor temperature (if sensor fails, emergency operation 30 % heating)
- Hinged cover

### Programmable Thermostat

Product	Part No.
Easy 3L	517 2707 51 112
Easy 3F	517 2705 51 112

### Wiring connections



### Technical data

Model	Easy 3L	Easy 3F
Part No.	517 2707 51 112	517 2705 51 112
Temperature setting range:	Room temperature 5 to 30°C	1 to 5 Numerical scale (10 to 50°C)
Set-back temperature	5 to 30°C (under cover)	1 to 5 Numerical scale (10 to 50°C)
Frost protection	5°C fixed	Setting under cover 10°C (fixed)
Contact (Relay)	1 change-over, voltage-free	1 change over, voltage free
Operating voltage	230V a.c.	230V a.c.
Switching current	10 mA to 16 A $\cos \varphi = 1$ / max. 4 A $\cos \varphi = 0.6$ / max. 10 thermal actuators	10 mA to 16 A $\cos \varphi = 1$ / max. 4 A $\cos \varphi = 0.6$
Mode of regulation:	proportional controller (quasi-continuous due to PWM) or On-Off	
Proportional band	~ 1.5 K	
Cycle period	adjustable, 10 or 25 minutes	
Indicator lamps	Call for heat / Set-Back	Call for heat / Set-Back
Timer: Switching time setting	every 15 min daily timer / every 1 h weekly timer	
Power reserve	~ 100 h	~ 100 h
Protection class of housing	IP 30 / insulated	IP 30 / insulated
Dimensions	160 x 80 x 36 mm	160 x 80 x 36 mm

### Programmable Thermostats

Product	Part No.
Digistat <sup>+</sup> 3F	22195
Digistat <sup>+</sup> 3L	22196

## Electric Underfloor Heating

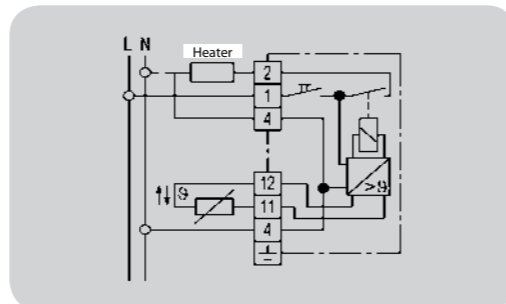
**Non-programmable room thermostat - with remote sensor**



### Technical data

Model	FR-E 525 31 / 30°C
Part No.	515 1107 51 133
Temperature range	5 to 30°C
Contact (Relay)	not voltage-free / normally open contact
Operating voltage	230V a.c.
Switching current	14 (4) A
Hysteresis	~1 K
Switch and Indicator lamp	LED indicator - Mains on/off and call for heat
Protection class of housing	IP30 double insulated
Remote sensor	Included
Dimensions	75 x 75 x 25.5 mm

### Wiring connections



### Features:

- Electronic temperature controller with remote sensor
- Wall mounted
- Range limitation setting under dial
- On / Off switch

## Solar Thermal Controller & Sensors

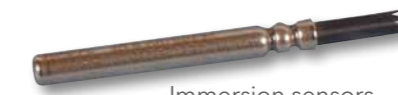
The new Drayton SHR 521 20 controller was developed for Solar Thermal Systems and can be used for domestic hot water heating.

It was designed with the typical UK solar thermal application in mind and will call for back-up heating from the boiler when solar power is not available.

It is very easy to set up and use. The new multifunctional display shows the collector or store temperature and simple pictograms inform the user about the function and real-time situation of the controller and the system.



Bolt on sensors



Immersion sensors

### Features:

- Stylish easy to install housing
- Backlit display with pictograms
- Simple 3 button operation
- Intuitive menu mode
- Thermostat function provides backup heat from boiler in winter
- Prevents collector and store from over heating
- Monitors the complete solar thermal installation
- 2 or 3 Sensors included (FKP6 and FRP6)

### Technical data

Model	SHR 521 20
Housing material	Plastic, PC-ABS and PMMA
Protection level	IP 20/DIN 40050
Ambient temperature	0 to 40°C
Dimensions	172 x 110 x 46 mm
Mounting	Wall mounting
Display	Backlit LCD display with pictograms
Operation	by three simple pushbuttons
Inputs	up to 4 Pt 1000 temperature sensors
Output	2 relays
Switching current	max. 4 A
Power supply	210 to 250V a.c
Power consumption	~ 2 VA

### Solar Thermal Controller

Product	Part No.
SHR 521 20 2 SENSORS	0521 20 140 001
SHR 521 20 3 SENSORS	0521 20 140 002
Collector FKP6 IMMERSION SENSOR	0521 91 020 100
Store FRP6 IMMERSION SENSOR	0521 91 020 200
Collector FKP9 BOLT ON SENSOR	0521 91 020 300
Store FRP9 BOLT ON SENSOR	0521 91 020 400

## Drain Easy Kit

A valuable time-saving kit to avoid system draining for repairs and replacements on open vented 'wet' central heating systems.

### Drain Easy kit

The Drayton Drain Easy kit comprises two durable rubber plugs, a tie and a radiator bleed key.

It is designed to facilitate removal of valves, repair of leaks etc. on an open vented wet central heating system without draining down, consequent loss of inhibitor, and risk of major air locks during refilling. It can only be used where the header (feed and expansion) tank is no more than 30ft (9 metres) above the lowest point in the system and only one break in the system is being made at a time.

The most important benefit of using the Drain Easy kit is to allow easy replacement of standard radiator valves with energy-saving TRVs. Thermostatic radiator valves such as the Drayton TRV4 offer substantial reductions in running costs over normal valves, coupled with improved comfort as room temperatures may be set individually.

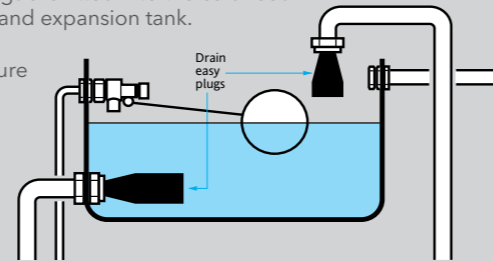
It is also a valuable emergency kit which will allow various repair and maintenance jobs such as the replacement of failed pipes, valves, radiators etc. to be undertaken quickly and easily.



### Fitting

The specially-shaped Drain Easy plugs are fitted into the cold feed and the expansion pipe of the feed and expansion tank.

After releasing some inherent pressure in the system with the bleed key supplied, and building up a vacuum by allowing water to flow for about 1 minute, any single item such as a pump, valve or radiator may be removed without further loss of system water/inhibitor.



### Specification

Kit contents	Two Rubber male plugs, radiator bleed key, 1m tiecord, full instructions.
Materials	Plugs: Ethylene propylene Bleed key: Brass stamping
Limitations	<ul style="list-style-type: none"> <li>• Suitable for 15mm and 22mm pipework.</li> <li>• Not to be used on direct, unvented or primatic systems or auto-vented systems.</li> <li>• Not to be used on systems with a header tank more than 30ft (9 metres) above the systems lowest point.</li> <li>• No lubricating oils to be applied.</li> <li>• Only one section of pipework can be disconnected at a time e.g. No three-way valves - one two-way disconnection only.</li> </ul>

## Décor Plate & Spacer Box

### Decor Plate Features:

- Simple to install
- Reduces the need for redecoration
- Covers the spaces left by the majority of competitor models
- Two-part construction allows fixings to be invisible
- Can be used in conjunction with "Spacer Box"

### Spacer Box Features:

- Simple to install
- Suitable for LP, Tempus & SM Range of Clocks
- Suitable for single or double electrical wiring boxes
- Universal back plate fits directly onto using fixings provided
- Can be used in conjunction with "Décor Plate"



### Décor Plate

The Decoration plate provides a simple and effective means to cover "bare patches" left in the décor when replacing other makes of Time Controls. It is designed with a two-part construction allowing all fixings to be invisible providing a clean and professional finish.

### Spacer Box

The Spacer Box provides a convenient way to house all wiring in installations where the existing Programmer has been used as a wiring centre. The Spacer Box is also effective in installations where tiling is to be fitted around the Time Control allowing removal of the control to still be achieved.

### Décor Plate & Spacer Box

Product	Part No.
Décor Plate and Spacer Box	28011
RTS Pattress	24022

### Drain Easy Kit

Product	Part No.
Drain Easy Kit	07 01 165

## Programmer Compatibility Guide

### The quick and easy way to compare, upgrade and replace existing programmers

Drayton manufacture electronic and electro-mechanical programmers and timeswitches suitable for replacing most makes found in use today. Our expertise in product development has produced a range of high quality controls offering ease of use and long term reliability for which we are renowned.

Before removing an existing programmer, it is essential to note wire colours and terminal positions and to ensure the new backplate is wired in accordance with these conversion charts.

Check that a **3 amp** fuse is fitted before mains power is restored to the system, this will avoid costly damage to electronic components should a system fault occur.

PROGRAMMER TERMINAL COMPARISONS								
Make	Model	Earth	Neutral	Live	H/W off	C/H off	H/W on	C/H on
<b>CURRENT MODELS</b>								
Drayton Lifestyle	LP112, LP241, LP522, LP722, LP241Si, LP522Si, LP722Si		N	L	1	2	3	4
Drayton	SM2		N	L	1	2	3	4
<b>DISCONTINUED / COMPETITORS' MODELS</b>								
Switchmaster	400, 600 (No connection to terminal 4 on 600)		N	L		4	3	1
Switchmaster	805, 900, 900i		N	L	4	2	3	1
Drayton	Tempus 6, 7		N	L	1	2	3	4
ACL	MP (Towerchron)		2	1				
ACL	FP (Towerchron)		2	1	8	11	6	10
Drayton	Tempus 3, 4, 6, 7 (Old models)		N	L	1	2	3	4
British Gas	EMP2		N	L	1	2	3	4
British Gas	UP1		N	L	1	2	3	4
Danfoss Randall	CP15, CP715, FP15, FP715 (Mk18), CP715 Si, FP715 Si		N	L	1	2	3	4
Danfoss Randall	3020P, 3060	E	7	6			4	2
Danfoss Randall	4033 (link 1-6)	E	7	6	5	3	4	2
Danfoss Randall	102, 102E, 102E5, 102E7, (link 6-3)	E	5	6			1	2
Danfoss Randall	701 (link L-5 and 5-6)	E	N	L			3	1
Danfoss Randall	702 (link L-5 and 5-6)	E	N	L	4	2	3	1
Danfoss Randall	922, 972 (link L-2 and 2-5)	E	N	L	1	4	3	6
Danfoss Randall	SET2, SET2E, SET3E, SET3M, FP975, SET5 (link L-2 and 2-5)	E	N	L	3	6	1	4
Grasslin Towerchron	DP 72, QE2		N	L	1	2	3	4
Honeywell	ST 699/799 (link L-5 and 5-8)		N	L	7	4	6	3
Honeywell	ST 6200, ST 6300, ST 6400, ST 6450, ST6400S, ST9400A/C, ST9400S, ST9500C		N	L	1	2	3	4
Honeywell	ST 7100 (link L-3 and 3-6)		N	L	7	4	8	5
Horstmann	525, 527, 425 Diadem, H21, H27, H121, Tiara, (link L-2 and 2-5), Channelplus H21XL, H27XL, H27ZXL	E	N	L	3	6	1	4
Horstmann	Centaur Plus C21, C27		N	L	1	2	3	4
Landis & Staefa	RWB2, RWB2E, 20, 40, 102, 200, 252 & 270, RWB9		N	L	1	2	3	4
Myson	Microtimer (link L-5 and 5-8)		N	L	7	4	6	3
Potterton Myson	All EP2000's, EP3000's, EP6000's, (link L-5 and N-N)		N	L	1	2	3	4
Potterton Myson	Mini Minder		N	L	1	2	3	4
Sunvic	Select 207		N	L	1	2	3	4
Sunvic	SP50, SP100 (link L-3)		N	L	1	4	2	5

## Timeswitch Compatibility Guide

### The quick and easy way to compare, upgrade and replace existing timeswitches

These tables show the wiring conversion necessary to replace an existing programmer.

**New Tempus and Lifestyle 'LP' models directly replace former ACL-Lifestyle 'ILP/LP/LS' and Drayton Tempus programmers with the same number**, the only models requiring wiring modifications are old Tempus 1/2 and LS112 (remove link L to 1 on the backplate). Invensys Controls can accept no liability for wiring errors at the time of installation, for any reason.

TIMESWITCH TERMINAL COMPARISONS									
Make	Model	Earth	Neutral	Live	Common	On	Off	Spare	
<b>CURRENT MODELS</b>									
Drayton Lifestyle	LP111, LP711, LP111Si, LP711Si		N	L	1	3	2	4	
Drayton	SM1		N	L	1	3	2	4	
<b>DISCONTINUED / COMPETITORS' MODELS</b>									
Drayton	Tempus 1 and 2		N	L	1	3	2	4	
Switchmaster	300, 980		N	L	4	1			
ACL	TC (Towerchron)		2	1	4	7			
Drayton	Tempus 1 and 2 (Old models)		N	L	1	2	3	4	
British Gas	EMT2		N	L	1	3	2	4	
British Gas	UT1		N	L	1	3	2	4	
Danfoss Randall	TS15, 75 (Mk18)	E	N	L	1	4	2	5/6	
Danfoss Randall	TS715, TS715 Si		N	L	1	4	2	3	
Danfoss Randall	TS975	E	N	L	5	4	6	1,2,3	
Danfoss Randall	SET1, SET1E	E	N	L	5	4	6		
Danfoss Randall	SET4	E	N	L	5	4	6		
Danfoss Randall	103, 103E, 103E5, 103E7	4	5	6	3	1		2	
Danfoss Randall	911, 971	E	N	L	5	6	4	2	
Grasslin Towerchron	QE1		N	L	2	4	3		
Grasslin Towerchron	T2001, T2001Q	E	N	L		7			
Honeywell	ST 6100A, ST 6100C, ST6100S, ST9100A/C, ST9100S		N	L	1	4	2		
Honeywell	ST 7000B		N	L	1	2	3	4	
Horstmann	Centaur SC1, SC7			L		3	2		
Horstmann	Channelplus H17XL, H11XL	E	N	L		4	6		
Horstmann	Centaur Plus C11, C17		N	L	2	4	3		
Horstmann	Emerald 423, Pearl Auto		N	L	2	4	3		
Horstmann	517, Coronet, H11, H17	E	N	L	3	4			
Myson	Microtimer (link L-5 and 5-8)	E	N	L	5	4	6		
Landis & Staefa	RWB3		N	L		4	3		
Landis & Staefa	RWB30, RWB50, 100, 152, 170		N	L	2	4	3		
Landis & Staefa	RWB7	E	N	L	2	4	3		
Potterton Myson	EP4000, 4001, 4002, 5002		N	L	5	4	2		
Sangamo	M6	E	4	6	3	1	2		
Smiths	Centroller Mk1 & Mk2		N	L	3	2			
Smiths	Centroller 30		1	2		4/5			
Smiths	Centroller 300, 980		N	L	4	1			
Sunvic	Select 107		N	L	1	3	2	4	
Sunvic	SP20, SP35		N	L	3	5	4	5	
Venner	Vennerette		N	L	LINE	LOAD			



## Room Thermostat Compatibility Guide

Please note the list opposite of current Drayton Models and the discontinued/ competition models can be replaced by the Digistat<sup>+</sup>2 and <sup>+</sup>3 (battery) product.

Digistat<sup>+</sup>2 and <sup>+</sup>3 (battery) Programmable Room Thermostats are battery operated and double insulated therefore neutral and earth connections are not required. Unused existing cables should be safely isolated.

Digistat<sup>+</sup>2 and <sup>+</sup>3 (battery) can replace the existing basic or programmable room thermostats and where there is no room thermostat presently fitted would enhance the heating systems comfort and economy. Digistat<sup>+</sup>2 and <sup>+</sup>3 can be used in conjunction with existing Timeswitches and Programmers.

When fitting the Digistat<sup>+</sup>2 and <sup>+</sup>3 (battery) to an existing system the timeswitch/ programmer controlling the central heating system should be in a constant ON position to allow the correct operation. Note the programmable thermostat controls both time and temperature of the heating system.

**The information is a guide only.**

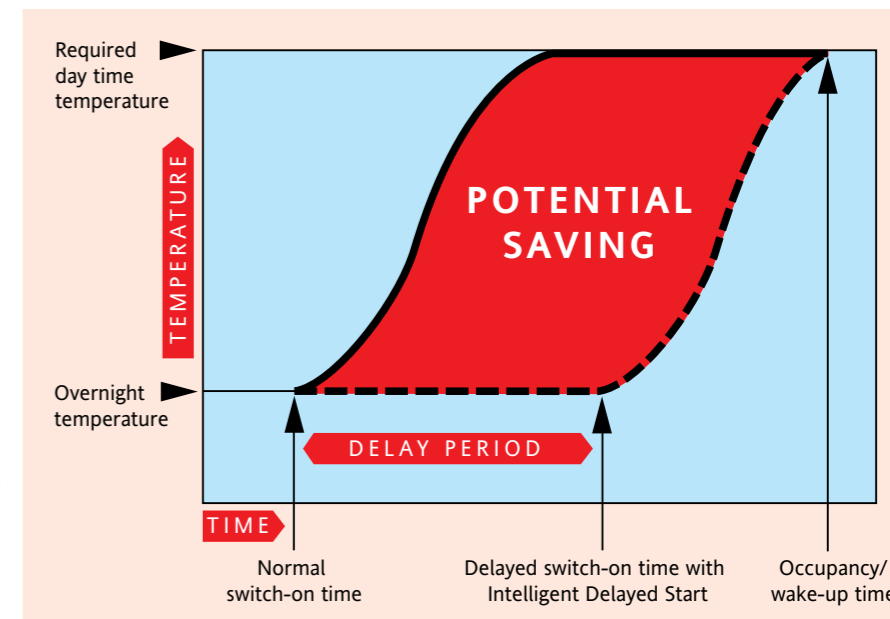
**Installation of the Digistat<sup>+</sup> range should be carried out by a qualified electrician. Please refer to the wiring diagram shown in the Digistat<sup>+</sup>2 and <sup>+</sup>3 (battery) Installation instructions.**

ROOM THERMOSTAT TERMINAL COMPARISONS							
Make	Model	Earth	Neutral	Live	Common	Satisfied	Demand
<b>CURRENT MODELS</b>							
Drayton	Digistat+, +1, +2 and +3 (Battery)				C	Off	On
Drayton	Digistat <sup>+</sup> 2 and <sup>+</sup> 3 (Mains)		N	L	C	Off	On
Drayton	RTS 1, 2		N		L		3
Drayton	RTS 4, 5 & 6, 9		N	L	1	2	3
<b>DISCONTINUED / COMPETITORS' MODELS</b>							
Drayton	Digistat 1, 2, 3, 3i and 4				1	2	3
Drayton	RT/RTE		4		1	3	2
ACL Lifestyle	PT 271, 371		N	L	1	2	3
ACL Lifestyle	OPT 170, PT 110, 170		N	L	4		3
Danfoss Randall	TP2, 3, 4, 5, 5E, RT1				1	2	3
Danfoss Randall	TP 5000, RT51, RT52, TP5000 Si				B	A	C
Danfoss Randall	TP7000				1	3	2
Danfoss Randall	TP75				3	6	5
Danfoss Randall	TP75H				COM	OFF	ON
Danfoss Randall	RET-B				3	1	2
Danfoss Randall	TP7000M		N	L	1	3	2
Danfoss Randall	TP6000M		N	L	1	3	4
Danfoss Randall	RET M, MD		N	L	2	3	4
Danfoss Randall	TP75M, MA		N	L	1	2	4
Danfoss Randall	TP 1	E	N		L	2	1
Danfoss Randall	RD3, RD3A		4		1		2
Danfoss Randall	RTC, RTM, RSR	E	N		3	2	1
Danfoss Randall	RMT 230		4		1	3	2
Danfoss Randall	R504		N		3	2	1
Danfoss Randall	RET 230, NL213		N		L	4	3
Danfoss Randall	TP5000M Si, TP5000MA Si		N	L	2	1	3
Honeywell	CM31, 37, 41, 51, 61, 67, CM700, CM901, CM907				A	C	B
Honeywell	CT200, T6620, DT200, DT90E				A	C	B
Honeywell	T6060/6160/6063/6360		2		1	4	3
Horstmann	Centuarstat 1 & 7		4		1	3	2
Horstmann	HRT 1	E	4		1		2
Landis & Gyr/Siemens	REV 11, 12				L		L1
Landis & Gyr/Siemens	RAD 1	E			1	3	2
Landis & Staefa	RAA02		N		1	Y3	Y2
Myson	MPRT, MRTE				2		1
Myson	MRT1		4		1		3
Potterton	PRT 1		N		L		H
Potterton	PRT2 & 100 ST		N		TL		H
Potterton	PRT 100 DT		N		TL	C	H
Sunvic	TLX 6501				1	3	2
Sunvic	TLX 7501				3	1	2
Sunvic	TLX 2251	E			3		1
Sunvic	TLX 2222, 2259, 2267	E	4		3		1
Sunvic	TLX 2356	E			3	2	1
Sunvic	TXL 3101, 5101		2		1		8
Sunvic	TLX 4101, 4102				2	3	1
Sunvic	TLX 5201, 5202		2		1	6	8
Sopac	TA 351	E	4		1	2	3
Tower	SS	E	4		1		2

## Principles of Intelligent Delayed Start

### Benefits of Intelligent Delayed Start

- Can save in excess of 10% of heating fuel
- SAP and NHER rated
- Unique self-learning software that matches delay times to house and heating system characteristics
- Helps reduce harmful CO<sup>2</sup> emissions
- Adapts start up time to suit heating and building conditions
- No extra programming required



If a heating system is on for 8 hours per day, a 1 hour saving = 12.5%

### Principle of Intelligent Delayed Start

The majority of people set their heating to come on one hour before they get up. This is usually long enough to ensure that the rooms are up to temperature, even in the coldest conditions.

During milder weather a full one hour preheat is probably not required. So

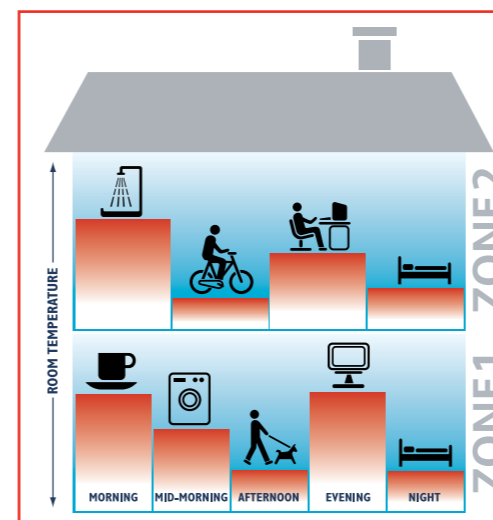
in some cases, the boiler could be burning fuel unnecessarily for up to 1 hour.

The Intelligent Delayed Start feature saves this fuel wastage by measuring the room temperature when the heating is due to switch on. The unit then decides whether

to switch on straight away, or delay the start for up to 1 hour. By using delayed start, savings in excess of 10% can be achieved without compromising comfort.

**Available on RTS5, Digistat<sup>+</sup>2, Digistat<sup>+</sup>2 RF, Digistat<sup>+</sup>3, Digistat<sup>+</sup>3 RF.**

## Principles of Zone Control



An illustration of zone control in a typical home.

The Digistat<sup>+</sup> range has greater flexibility and can give huge savings in domestic heating.

Programmable Room Thermostats can be used in conjunction with existing Timeswitches and Programmers. (Programmers fitted on existing installations should be set to "ON" or "Constant" to allow correct operation of the Programmable Room Thermostat).

## Twinzone control systems

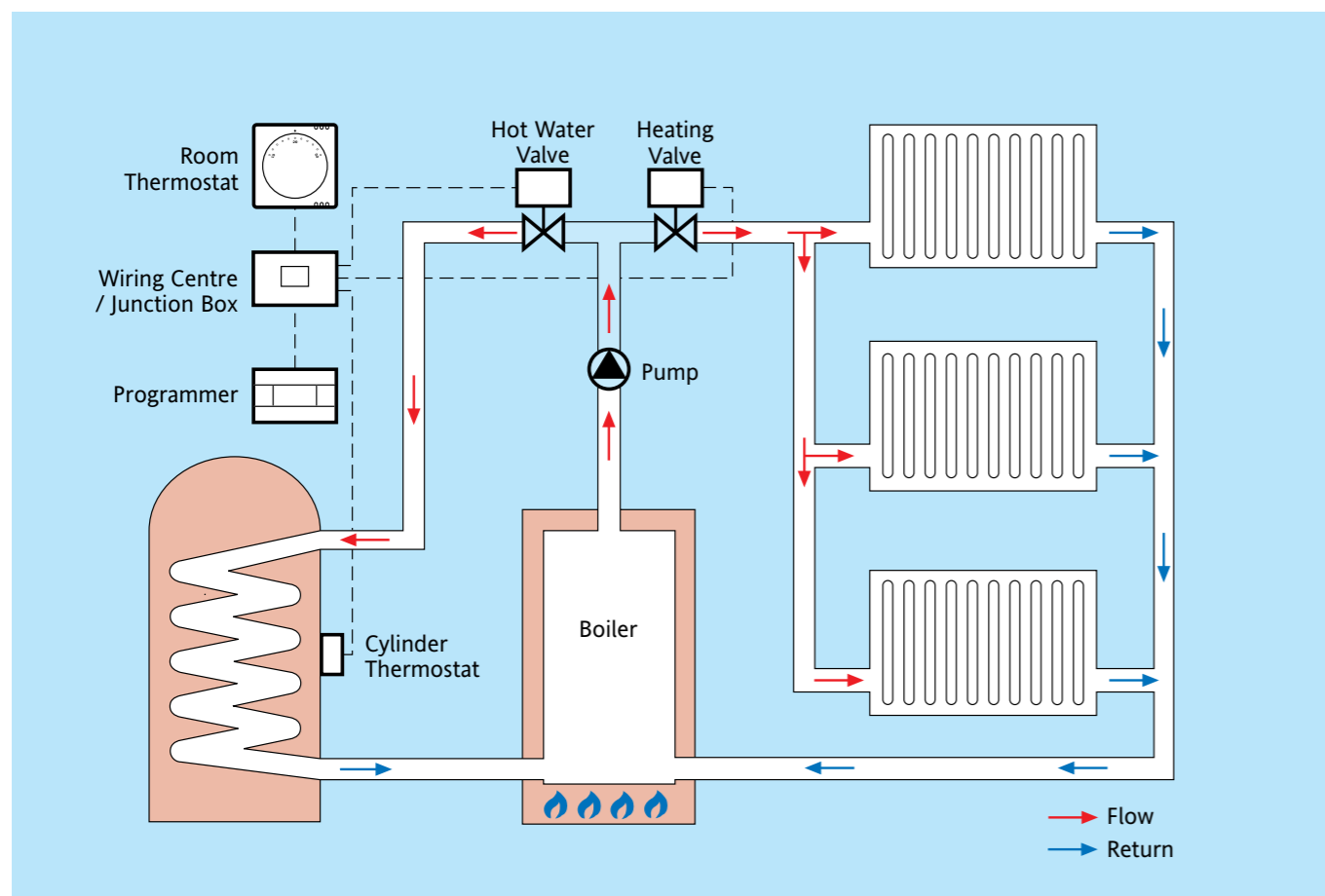
For fully pumped systems

### Operation

In a fully pumped zone system the boiler provides a common supply of heated water which is fed to the motorised valves by the pump. The two port valve on each circuit will open or close depending on demand from the thermostats - see table below.

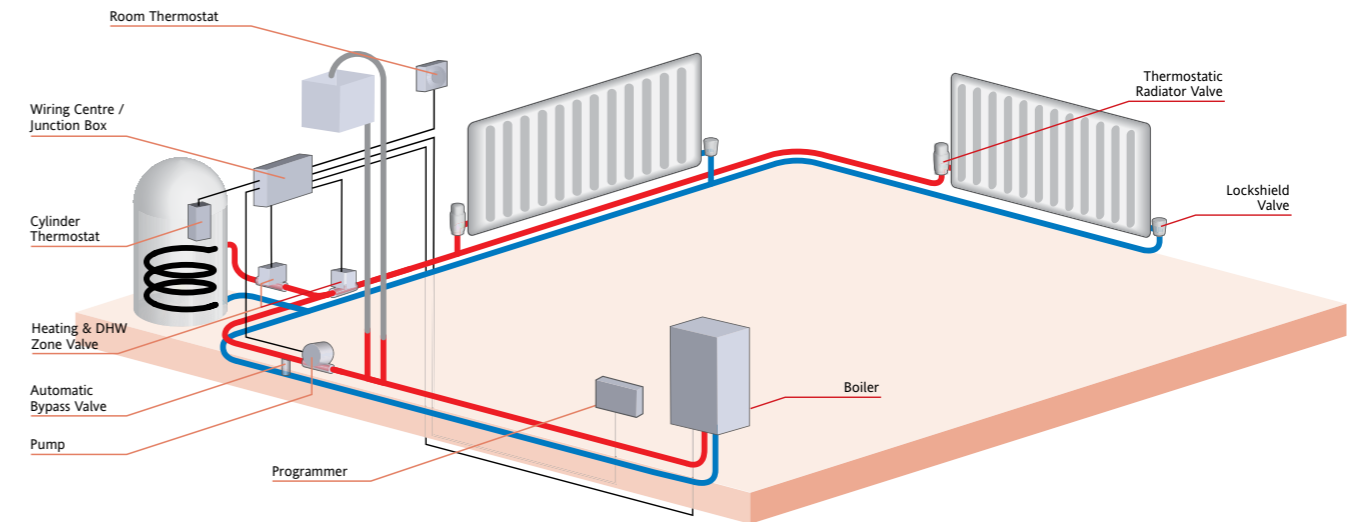
Each valve controls the flow of heated water to the heating or hot water circuits independently. The boiler and pump will continue running whilst there is a demand from one or both thermostats. If both thermostats become satisfied the pump and boiler will switch off to save fuel.

Room Thermostat	Cylinder Thermostat	Valve Positions
Calling for heat	Calling for heat	Both valves open
Calling for heat	Satisfied	Heating valve open
Satisfied	Calling for heat	DHW valve open



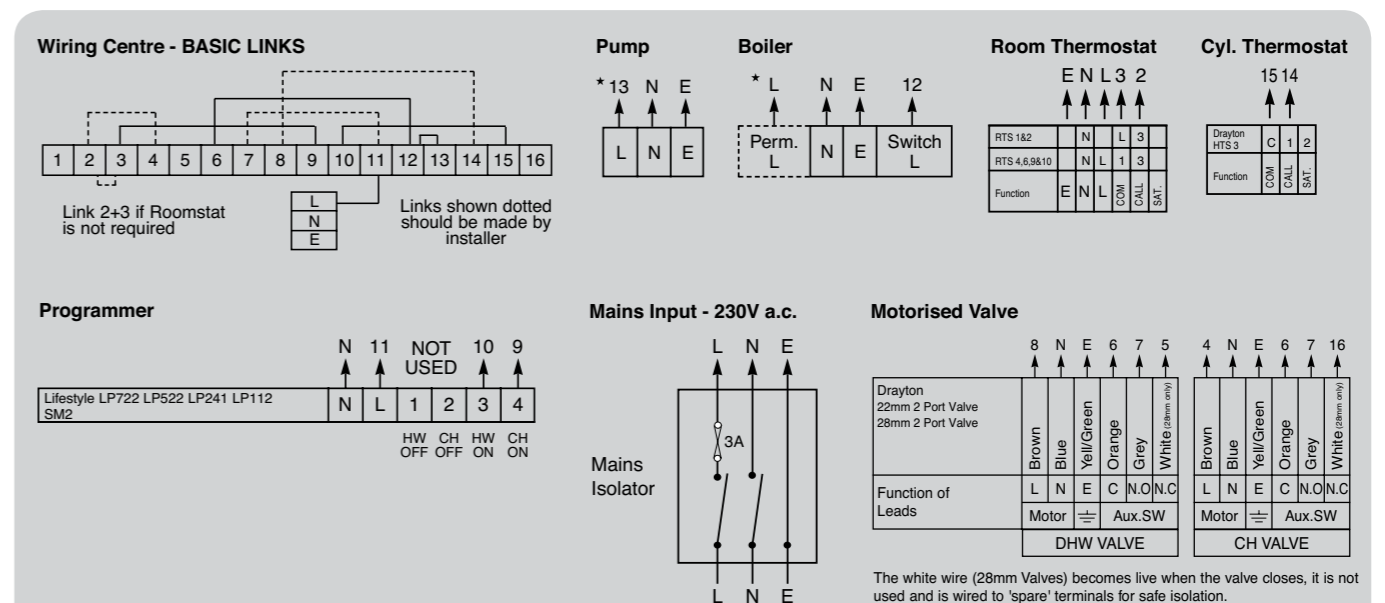
## Twinzone control systems

### Wiring Diagrams for LWC1 Wiring Centres



Room thermostat			Time Control			TRV	Wiring Centre	Cylinder Thermostat	Motorised Valve (x2)
Non-programmable	Hard wired	RTS	Timer	Electronic	Lifestyle LP	RT212	LWC1	HTS3	22mm mid position
						Combi-Stat	LWC3	Digistat+C RF	
						Digistat+			
Programmable	Hard wired	Easy		Mechanical	SM1	RT414			
						Digistat+ RF			
						Digistat+ Range			
	Wireless	Digistat+ Range		Mechanical	SM2	TRV4			

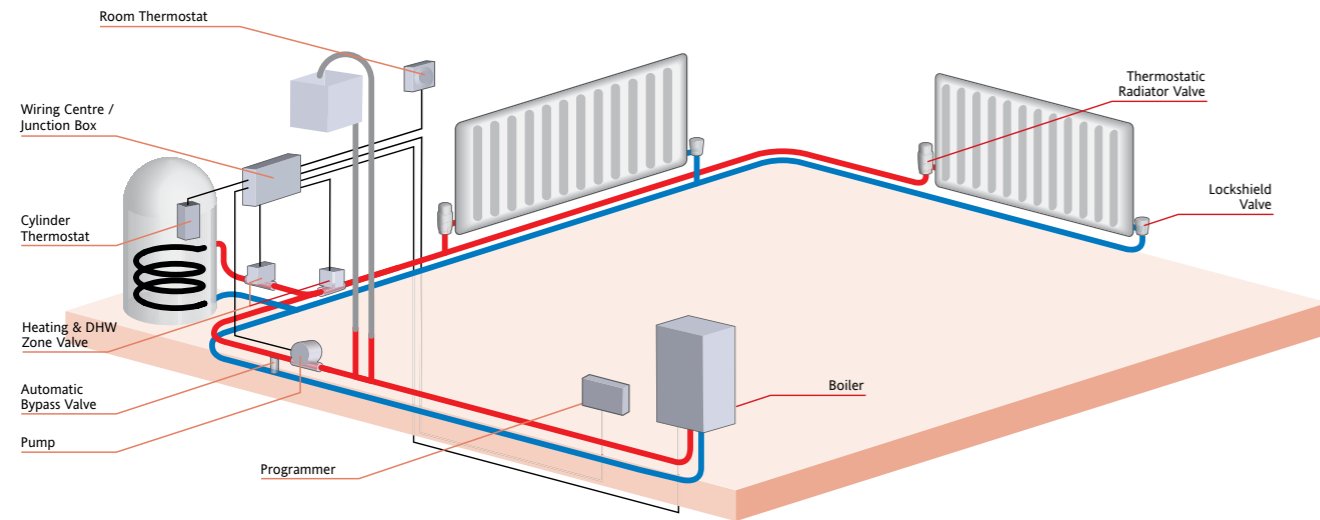
### Wiring Information for Twinzone Control Systems with LWC1 Wiring Centres



\*Refer to Boiler Handbook for wiring details of Pump Overrun boilers. Use boiler manufacturers instructions.

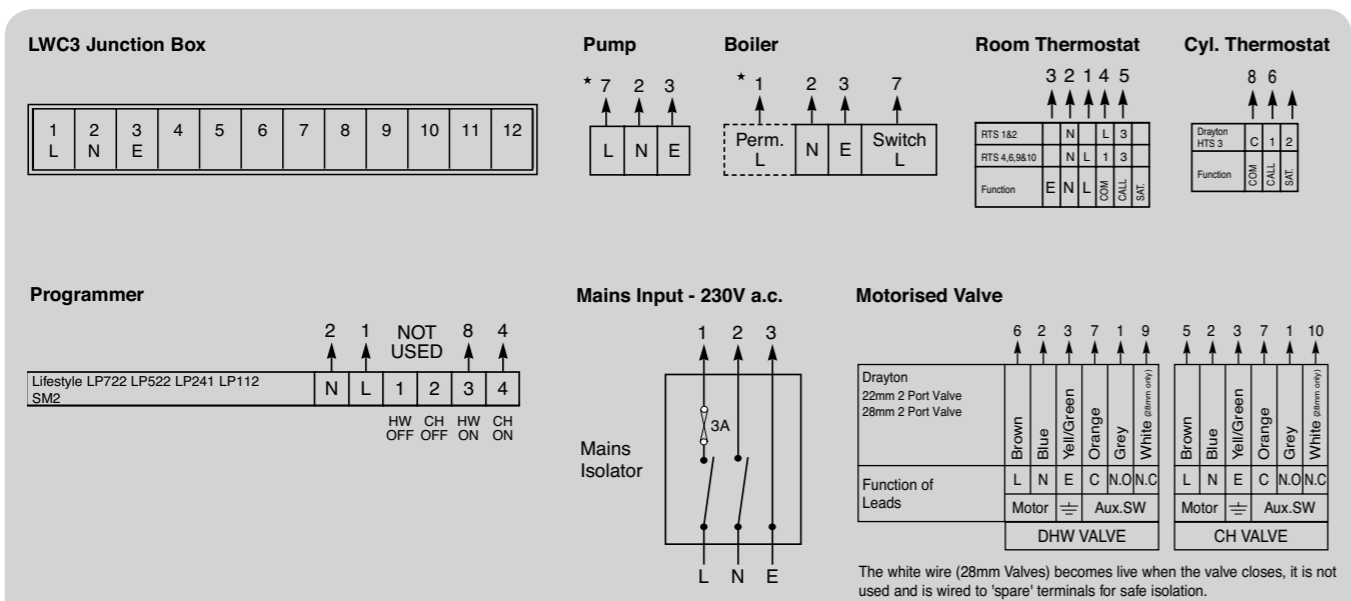
**Connections:** The numbers printed at the tip of each arrow represent the Wiring Centre Terminals to which those leads or terminals should be connected.

## Twinzone control systems Wiring Diagrams for LWC3 Junction Boxes



Room thermostat		Time Control			TRV	Wiring Centre	Cylinder Thermostat	Motorised Valve (x2)
Non-programmable	Hard wired	RTS	Timer	Electronic	Lifestyle LP	RT212	LWC1	22mm mid position
		Combi-Stat		Mechanical	SM1	RT414	LWC3	
		Digistat+	Programmer	Electronic	Lifestyle LP	TRV4		
Programmable	Hard wired	Digistat+RF		Mechanical	SM2			
		Easy						
		Digistat+ Range						
	Wireless	Digistat+ Range						

### Wiring Information for Twinzone Control Systems with LWC3 Junction Boxes



## Biflo control system

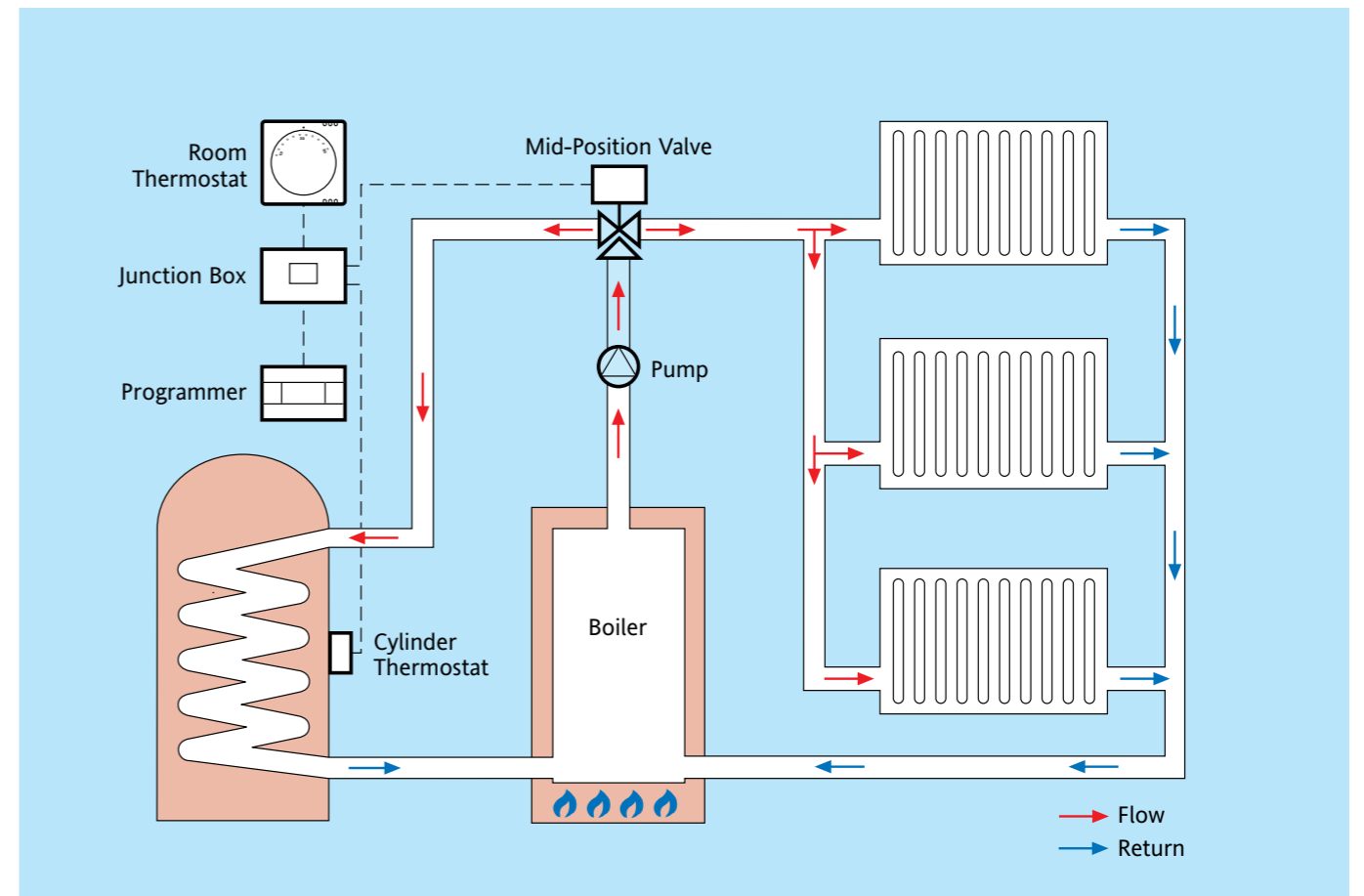
For fully pumped systems

### Operation

In a fully pumped system the boiler provides a common supply of heated water which is fed to the motorised valve by the pump. The mid-position valve has three positions of operation, these depend on demand from the thermostats - see table below.

In 'mid-position' the valve directs the flow of heated water to both heating and hot water circuits. Should either thermostat become satisfied, the valve will move leaving only the heating or the hot water port open. The boiler and pump will continue running whilst there is a demand from one or both thermostats. If both thermostats become satisfied the pump and boiler will switch off to save fuel.

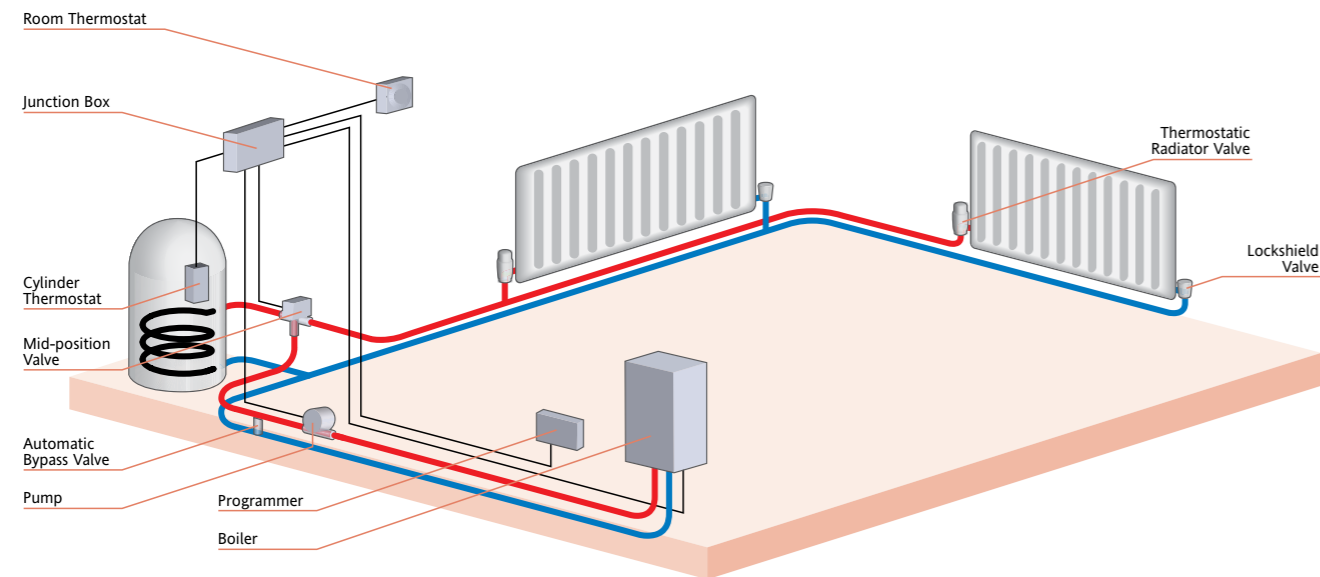
Room Thermostat	Cylinder Thermostat	Valve Positions
Calling for heat	Calling for heat	Mid-position 'M'
Calling for heat	Satisfied	Heating only 'H'
Satisfied	Calling for heat	Hot water only 'W'



\*Refer to Boiler Handbook for wiring details of Pump Overrun boilers. Use boiler manufacturers instructions.

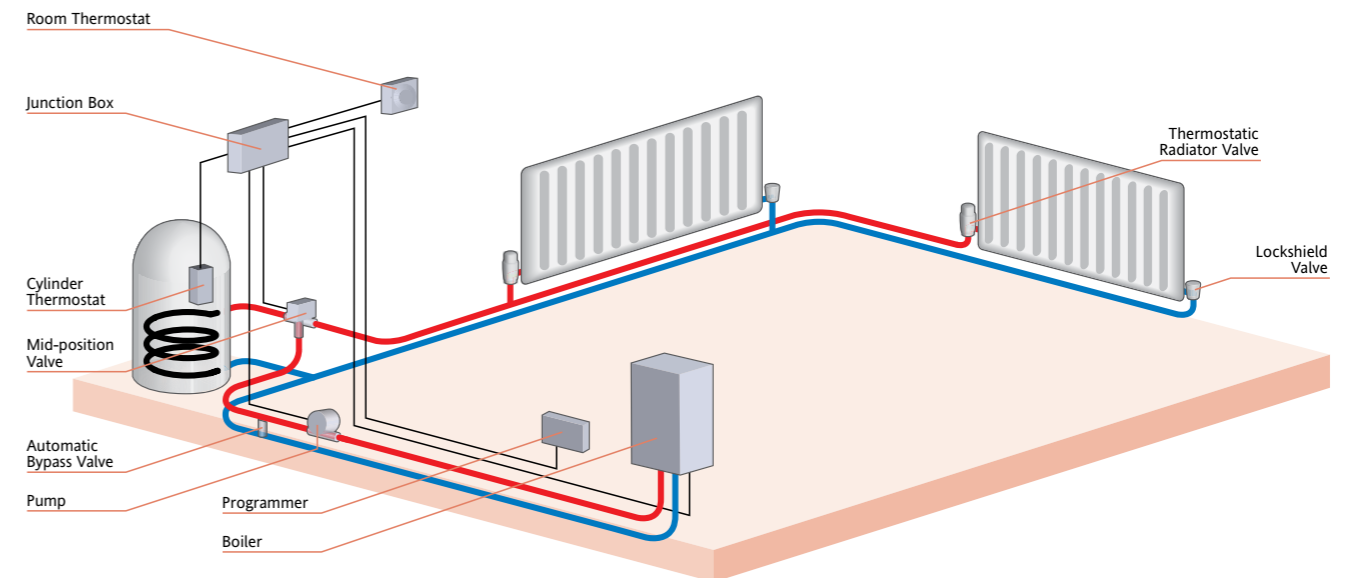
**Connections:** The numbers printed at the tip of each arrow represent the Junction Box Terminals to which those leads or terminals should be connected.

## Biflo Valve control systems Wiring Diagrams for LWC1 Wiring Centre



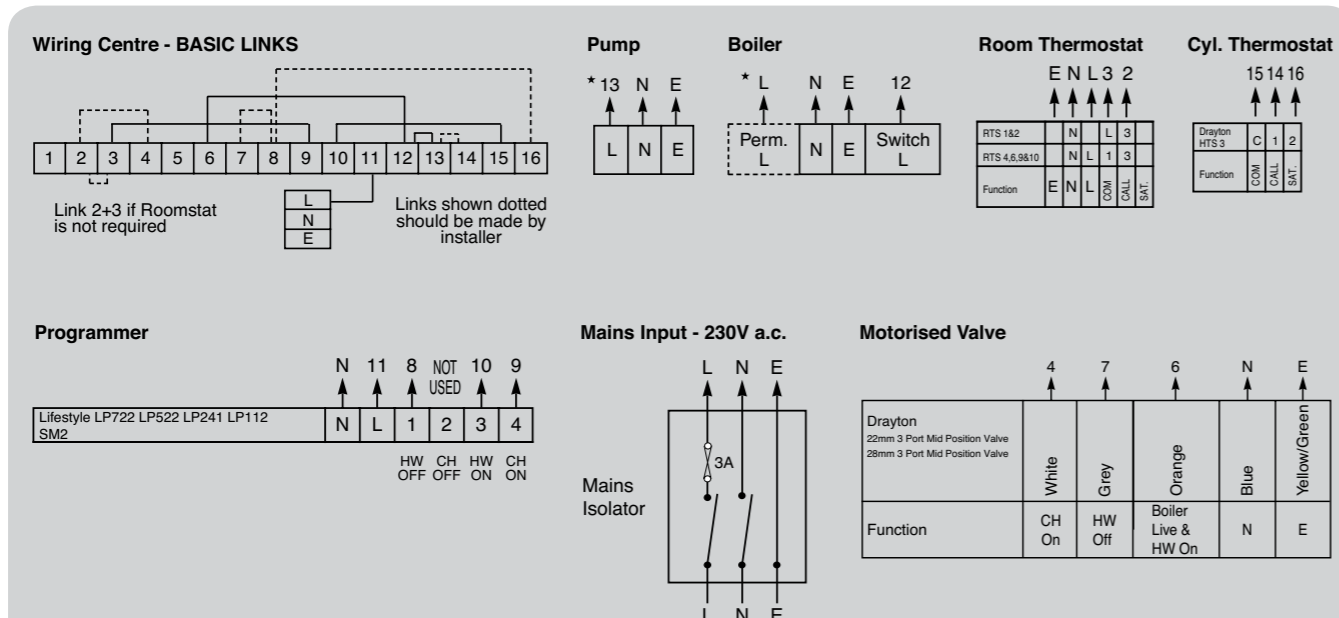
Room thermostat			Time Control			TRV	Wiring Centre	Cylinder Thermostat	Motorised Valve (x2)
Non-programmable	Hard wired	RTS	Timer	Electronic	Lifestyle LP	RT212	LWC1	HTS3	22mm mid position
		Combi-Stat		Mechanical	SM1	RT414	LWC3	Digistat+C RF	
		Digistat+	Programmer	Electronic	Lifestyle LP	TRV4			
Digistat+RF	Mechanical	SM2							
Programmable	Hard wired	Easy							
		Digistat+ Range							
		Digistat+ Range							

## Biflo Valve control systems Wiring Diagrams for LWC3 Junction Boxes

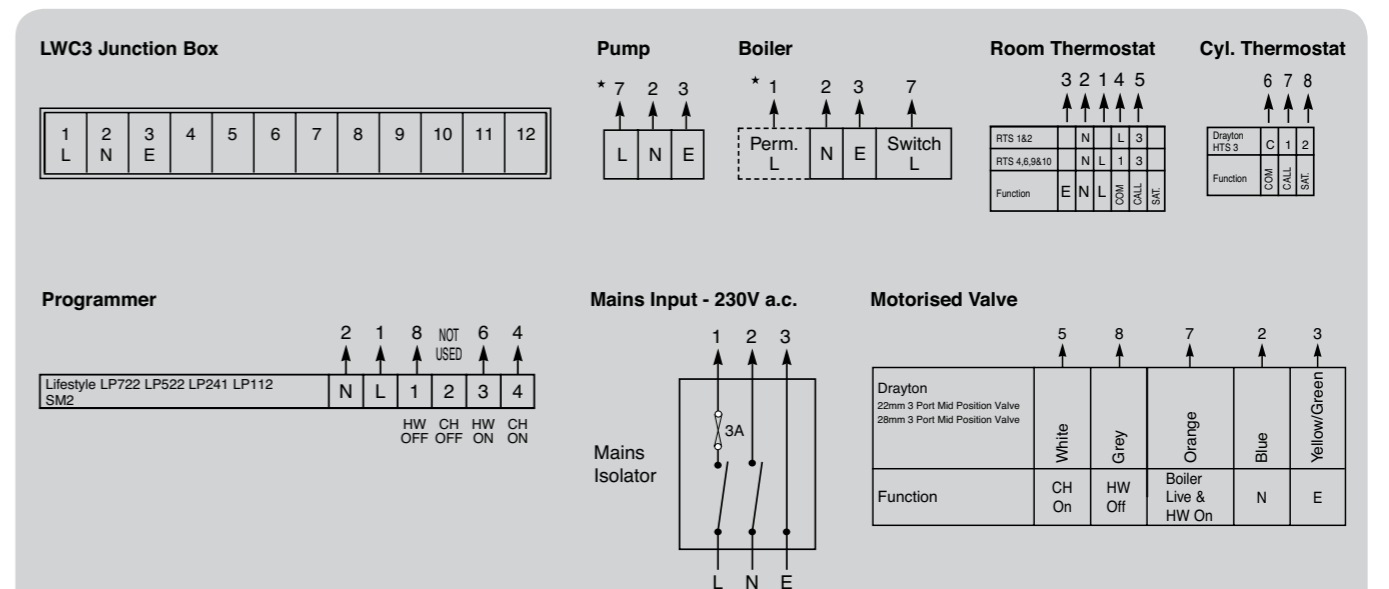


Room thermostat			Time Control			TRV	Wiring Centre	Cylinder Thermostat	Motorised Valve (x2)
Non-programmable	Hard wired	RTS	Timer	Electronic	Lifestyle LP	RT212	LWC1	HTS3	22mm mid position
		Combi-Stat		Mechanical	SM1	RT414	LWC3	Digistat+C RF	
		Digistat+	Programmer	Electronic	Lifestyle LP	TRV4			
Digistat+RF	Mechanical	SM2							
Programmable	Hard wired	Easy							
		Digistat+ Range							
		Digistat+ Range							

### Wiring Information for Biflo Control Panels with LWC1 Wiring Centres



### Wiring Information for Biflo Control Panels with LWC3 Junction Boxes



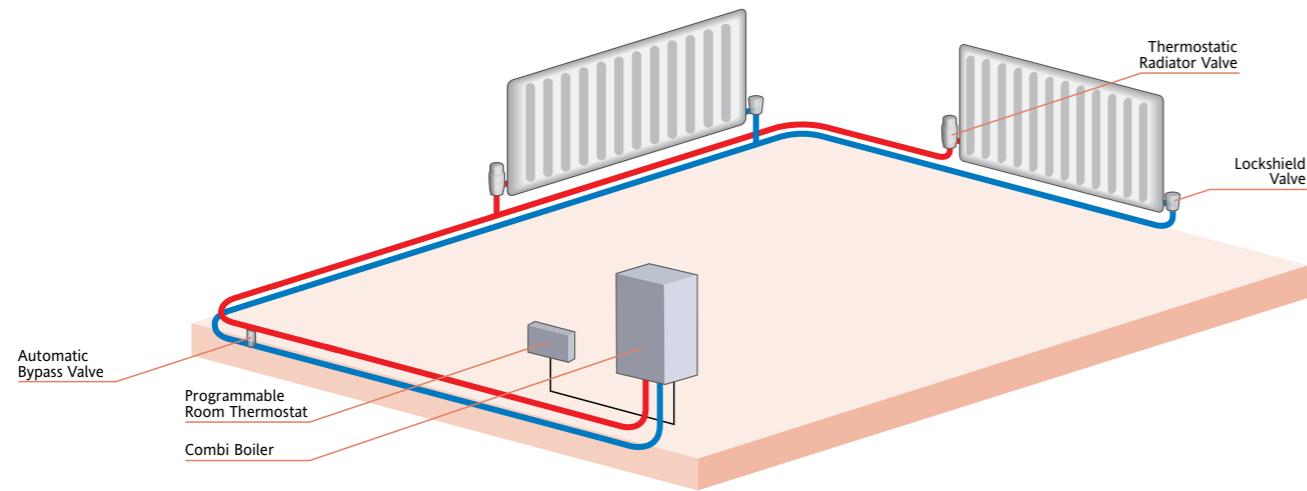
\*Refer to Boiler Handbook for wiring details of Pump Overrun boilers. Use boiler manufacturers instructions.

**Connections:** The numbers printed at the tip of each arrow represent the Wiring Centre Terminals to which those leads or terminals should be connected.

\*Refer to Boiler Handbook for wiring details of Pump Overrun boilers. Use boiler manufacturers instructions.

**Connections:** The numbers printed at the tip of each arrow represent the Junction Box Terminals to which those leads or terminals should be connected.

## Combi Boiler System



Room thermostat		Time Control			TRV	
Programmable	Hard wired	Easy	Timer	Electronic	Lifestyle LP	RT212
		Digstat+ Range				
Non-Programmable	Hard wired	Wireless	Programmer	Electronic	Lifestyle LP	TRV4
		RTS				
Wireless	Digstat+RF	Combi-Stat				
		Digstat+				
		Digstat+RF				

## Wiring Information for Combi Boiler Systems

**Room Thermostat (applicable to Digistat+ Range)**

FOR FIXED WIRING ONLY

**RTS1, RTS2, RTS3**

**SCR Receiver (applicable to Digistat+ RF Range)**

Volt-free contacts

Heating satisfied or call for cooling

**RTS4, RTS5, RTS9, RTS10**

Heating satisfied or call for cooling

**Combi-Stat**

3 wire connection. Max load = 2A. Suitable for most wet CH systems.

230V a.c. Fused 3A

2 wire connection. No neutral. Load = 0.1A to 0.6A. Suitable for most wet CH systems.

Note: Use this connection for gas CH systems, where there is no neutral wire, and follow set-up procedure. If current reading above 0.6 amps, wire as 2 wire connection opposite. 2 wire connection no Neutral.

24V-230V a.c./d.c. Fused 3A

2 wire connection. No neutral. Load = 0.6A to 6A. Typically for higher loads (i.e. electric heating)

24V-230V a.c./d.c. Suitably rated fuse

\*Refer to Boiler Handbook for wiring details of Pump Overrun boilers. Use boiler manufacturers instructions.

## Commissioning instructions Domestic heating systems with TRVs

**IMPORTANT: Read all instructions before commencing work. All work should be carried out by a competent person.**

This commissioning procedure should be carried out on any wet central heating system fitted with thermostatic radiator valves (TRVs). Failure to correctly balance a system can lead to complaints of inefficient operation and criticism of the operational abilities of thermostatic radiator valves, when in fact the valves are not the source of the problem. Common complaints raised by home owners include:

- Rooms are slow to reach temperature even though radiators are sized correctly
- Some rooms with correctly sized radiators never reach temperature during cold periods
- Room temperatures fluctuate particularly if the TRV is on a low setting.

It must be remembered that no amount of commissioning and adjustment will compensate for a poorly designed or installed system. There is no substitute for good design.

Drayton thermostatic radiator valves are designed, tested and certified to meet with the stringent European standard EN215 and are manufactured in factories assessed and certified to the quality standard ISO9001 (BS5750 Part 1).

To commission your heating system you will need two contact thermometers and a blue isolating cap for each TRV fitted. If you require extra caps telephone our Sales Office.

### Step 1 - System cleansing

Before filling a heating system and switching it on, it is imperative that a thorough flushing procedure is carried out to BS7593. Residues frequently found in new heating systems include grit, metal chippings, unused flux, solder residues, hemp and mineral oil. In existing systems rust and magnetite can also be present.

Whilst BS7593 and CIBSE Code W refer to flushing as part of their codes on water treatment and commissioning, the most practical advice is to use a proprietary cleanser and follow the manufacturers

instructions. Ensure that TRV heads are either set to the maximum setting or removed altogether during flushing as full flow through the system is required.

### Step 2 - Refilling

Having flushed the system thoroughly it is recommended that a proprietary inhibitor is added when the system is refilled. The inhibitor manufacturers instructions should be adhered to.

### Step 3 - System balancing

For a radiator to give the heat output it is capable of it must have water at the right temperature and flow rate. The flow temperature is obviously determined by the boiler thermostat but the flow rate is determined by a combination of the pump size/setting and the resistance through each and every loop of the heating circuit (ie. each and every radiator). In order to get equal flow rates through each radiator the system must be correctly balanced. This is usually achieved through adjustment of the lockshield valves on each radiator to achieve optimum flow. A white wheelhead cap is now available to fit on the Drayton range of valve bodies, once the cap is fitted to the body it can be used as a standard wheelhead/lockshield valve. If Drayton valves are use on both ends, see paragraph 4b overleaf.

Standards and codes covering balancing do exist but these generally call for sophisticated temperature measuring equipment and the provision of pressure tappings throughout the heating system. This is obviously not practical in the normal domestic installation so it is recommended you use the two contact thermometers for measuring pipe temperatures and take the following steps:

1. The boiler should be commissioned in accordance with the appliance manufacturer's instructions. Then the whole system should be brought up to design flow temperature with the pump running, all TRVs, lockshield valves and manual wheelhead valves should be fully open and the primary to the hot water cylinder closed.

2. Open and adjust the bypass, if fitted, in accordance with the boiler manufacturer's instructions. This normally involves closing all radiator valves and, with the boiler and pump running, adjusting the bypass to ensure minimum system noise at all flow temperatures, until the boiler thermostat switches off. The bypass should NEVER be left fully closed.

If more than 50% of the radiators have TRVs fitted, we recommend using an auto by-pass valve (such as the Drayton) and following instructions supplied. Before balancing the radiators check that water is not pumping over from, nor air being drawn into the open vent with the system in this condition.

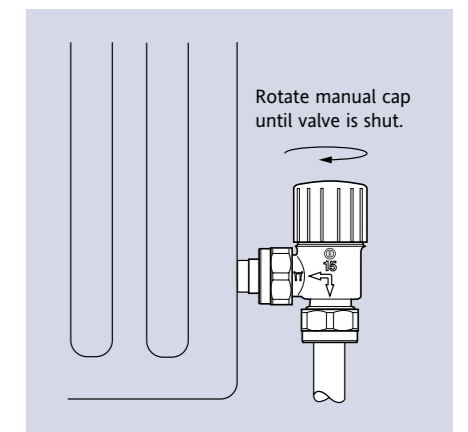


Fig. 1

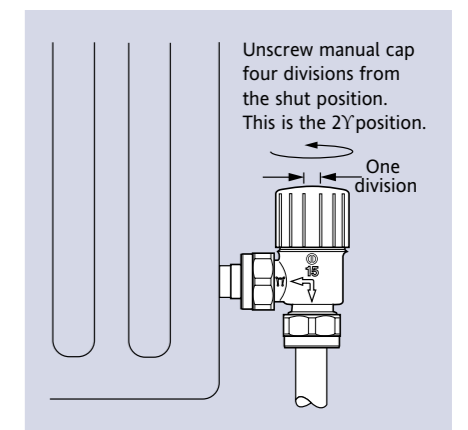


Fig. 2

3. Switch the boiler and pump off. Close all lockshield valves and using the manual caps also close any TRVs fitted on the system, (manual wheelhead valves must be left open) see Fig. 1.

#### 4a. Using standard lockshields

Starting with the radiator nearest to the pump, open the manual cap on the TRV body by four divisions (see Fig. 2). Open the lockshield valve by a 1/4 turn, fit the contact thermometers to the flow and return pipes adjacent to the valves, switch on the boiler and pump and wait for the temperature readings to stabilise. The lockshield valve needs adjusting to achieve the design temperature drop between flow and return (usually 11°C). Remember that to increase the temperature drop you need to slow the flow rate by closing the lockshield valve and vice versa.

#### 4b. Using Drayton valves both end

If a Drayton valve body with the white manual wheelhead cap (part no. 07 35 123) is being used in place of a lockshield (see Fig. 3), balance the radiator in one of the following ways:

i. if the flow rates and pressure differentials have been calculated for each radiator, set the valve with the thermostatic head fitted to the required pre-setting number, see Fig. 4 and table Fig. 5 to achieve the required Kv. Leave the isolating/balancing valve with the white wheelhead cap fully open.

ii. if the flow rates etc. are unknown, follow the instructions in 4a Using standard lockshields, above, but instead of opening the lockshield 1/4 of a turn, set the valve to which the white wheelhead cap is fitted, to pre-setting number 4, see Fig. 4. If, after the radiator temperature has stabilised, it is necessary to reduce the flow (increase temperature drop), set the valve to a lower pre-setting number. If the flow needs to be increased, select a higher number.

Note: Never set at in between or half numbers. Once the isolating/balancing valve has been set, fit the white wheelhead cap and leave it in the fully open position.

5. Repeat this procedure for all radiators working away from the pump.

6. Gradually open the primary flow to the hot water cylinder again using the contact thermometers to obtain 11°C drop between flow and return.

7. Fit the thermostatic heads to the radiator valves and set them to the desired temperature. Allow two hours for the room temperatures to stabilise.

#### Notes

i. If excessive noise is heard at any time during the system balancing routine this may indicate the pump 'head' is set too high or the pipework has been incorrectly sized causing the water to flow at an excessively high speed. It is strongly recommended that the differential pressure across the thermostatic valves should not exceed 0.2 bar to avoid flow related noise. A differential pressure regulating device, e.g. the Drayton Automatic by-pass valve should be used. Please refer to page 28.

ii. If a separate bypass has not been fitted, we would recommend a final check after the system has been balanced. Set all the TRVs to frost or off, with only the heating circuit "On" the open vent should be checked for pumping over or ingress of air.

iii. B.S. 5449 states that TRVs should not be the sole means of controlling a heating circuit. They must be used in conjunction with other controls, such as a room thermostat which will switch off the boiler when there is no demand for heating. TRVs must not be fitted in the same room or area as the room thermostat.

#### Replacement of gland seal

- Gland seal can be replaced without draining the system. However there may be a slight seepage of water when the old seal is removed. It is recommended that dust sheets/small bowl is used to catch any drips.
- Use the presetting key to remove the old gland seal (see diagram).
- Fit new Gland Seal and Re-tighten until the top of the Gland Seal is level with the top lip of the valve insert. DO NOT OVER TIGHTEN.

#### Replacement parts on EB bodies

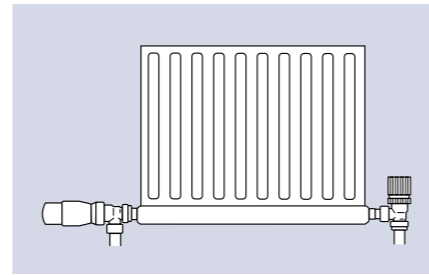
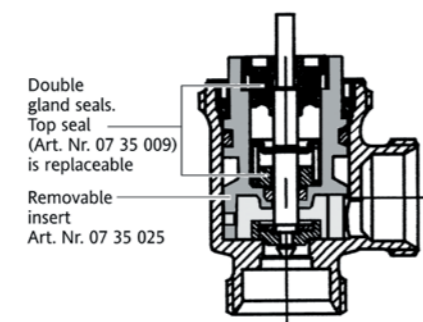
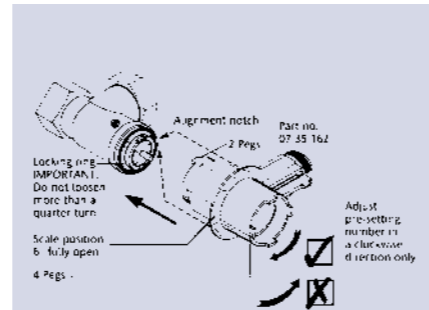


Fig. 3



i. Remove the thermostatic or wheelhead and loosen the locking ring.

**WARNING: DO NOT LOOSEN MORE THAN A QUARTER TURN (90°),** using the end of the adjusting key with the two unequal width pegs.

ii. The valve insert can now be rotated using the end of the adjusting key with the two unequal width pegs.

IMPORTANT: Adjust in a clockwise direction only.

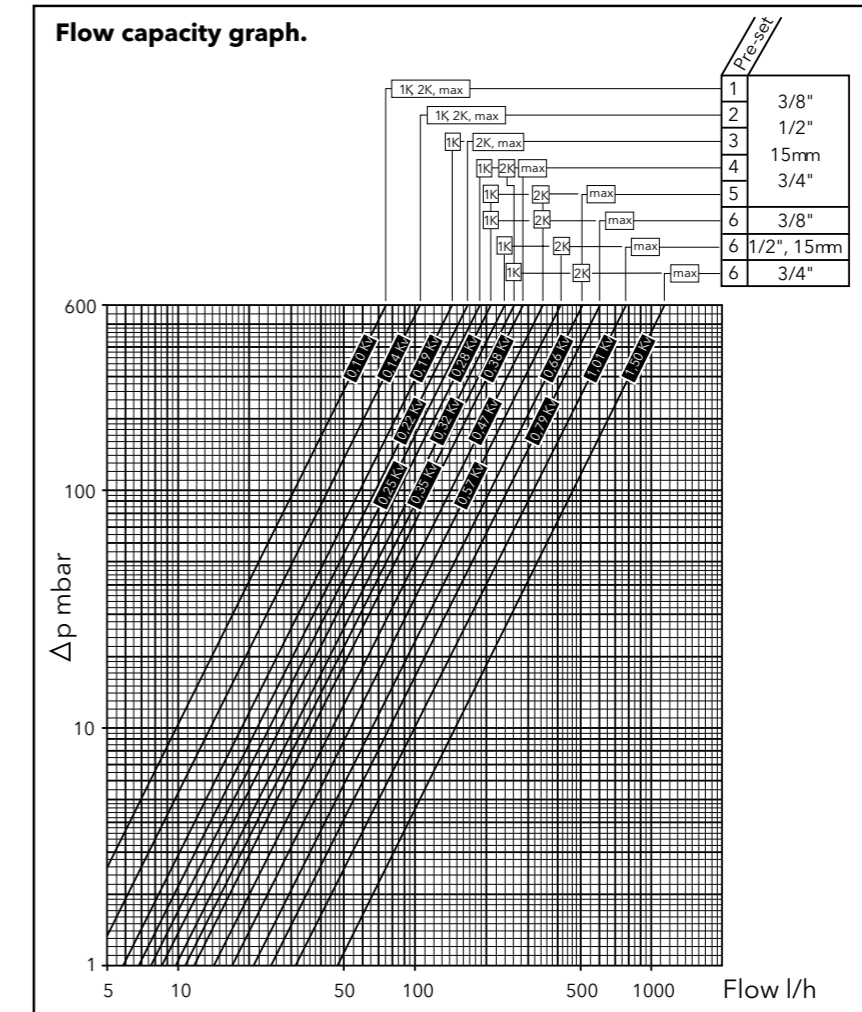
Note: The numbers on the key correspond with the numbers on the top rim of the valve insert.

iii. Line up required setting number with the semi-circular notch on the top of the valve body and then re-tighten the locking ring. DO NOT OVER TIGHTEN. Never set at in-between or half numbers.

Spare pre-setting keys are available in packs of two, part number 07 35 162.

Fig. 4

## EB Flow Capacity



Pre-setting	Pre-setting Nr.	Kv (1K)	Kv (2K)	Kvs (max)	a (2K)
EB 3/8"	1	0.10	0.10	0.10	-
	2	0.14	0.14	0.14	-
	3	0.19	0.22	0.22	-
	4	0.25	0.35	0.38	0.16
	5	0.28	0.47	0.66	0.48
	6	0.28	0.47	0.79	0.64
EB 15mm & 1/2"	1	0.10	0.10	0.10	-
	2	0.14	0.14	0.14	-
	3	0.19	0.22	0.22	-
	4	0.25	0.35	0.38	0.16
	5	0.28	0.47	0.66	0.48
	6	0.32	0.57	1.01	0.68
EB 3/4"	1	0.10	0.10	0.10	-
	2	0.14	0.14	0.14	-
	3	0.19	0.22	0.22	-
	4	0.25	0.35	0.38	0.16
	5	0.28	0.47	0.66	0.48
	6	0.35	0.66	1.50	0.80
EB 1/2" ASP/SSP	-	-	1.40	2.50	-
EB 3/4" ASP/SSP	-	-	1.40	4.50	-
EB 1" ASP/SSP	-	-	1.40	5.00	0.92

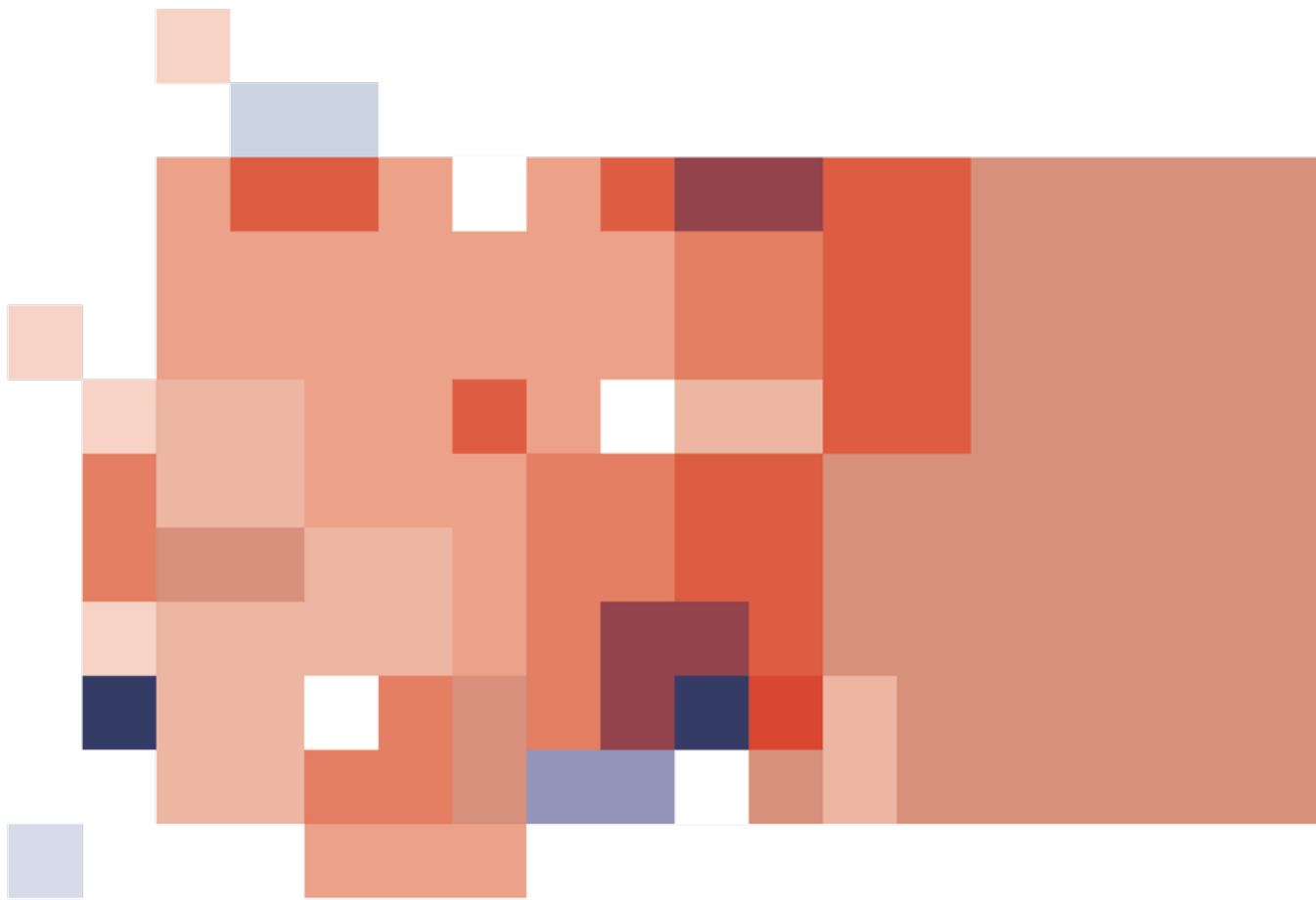
Kv is flowrate in m<sup>3</sup>/h at a differential pressure of 1 bar

$$Kv = \frac{Q}{\sqrt{\Delta p}}$$

Q = Flowrate m<sup>3</sup>/h

Δp = Differential pressure bar

Invensys Controls is a global provider of controls, systems and services used in the appliance, commercial refrigeration and heating, ventilation and air conditioning markets. In EMEA its key brands are: Drayton; Eberle, Eliwell and Ranco. It is a division of the Invensys Group, which is a global technology group, listed on the London Stock Exchange and a member of the FTSE 100 index.



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