Product Information

devireg® 700

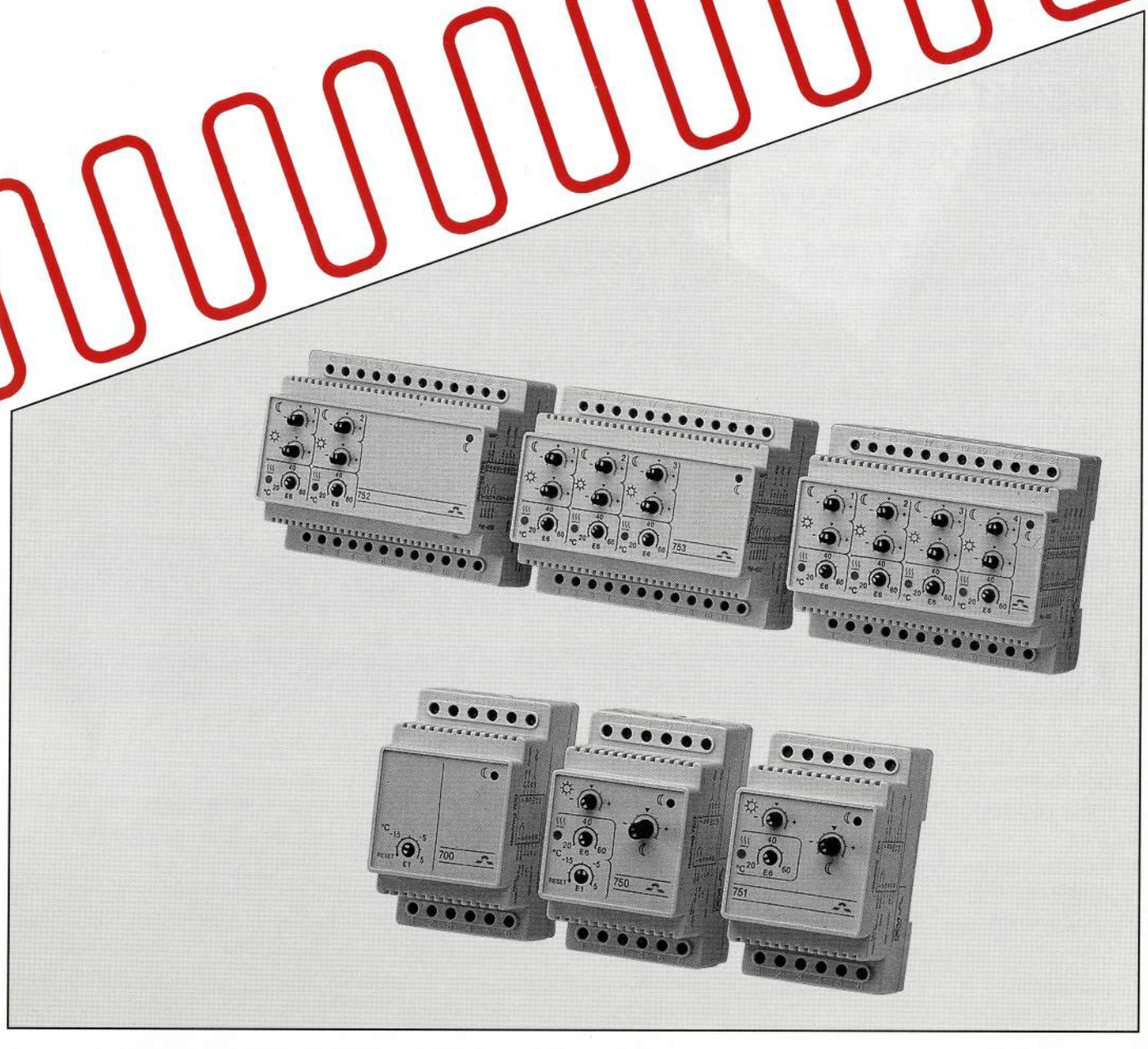
Group 19 96.08

Storage heating systems

The devireg® 700 series

- Ensures maximum economy by supplying exactly the right amount of heat energy required.
- Provides comfortable indoor temperatures regardless of changes in the outdoor temperature often experienced in Spring and Autumn.
- Uses less energy by delaying the heating period until the latest possible time during the available low tariff/off peak period.
- Is fully automated - a »fuzzy logic« system that shouldn't require further adjustment.
- Can be retrofitted into existing storage heating system installations.

FUZZY LOGIC



Purpose

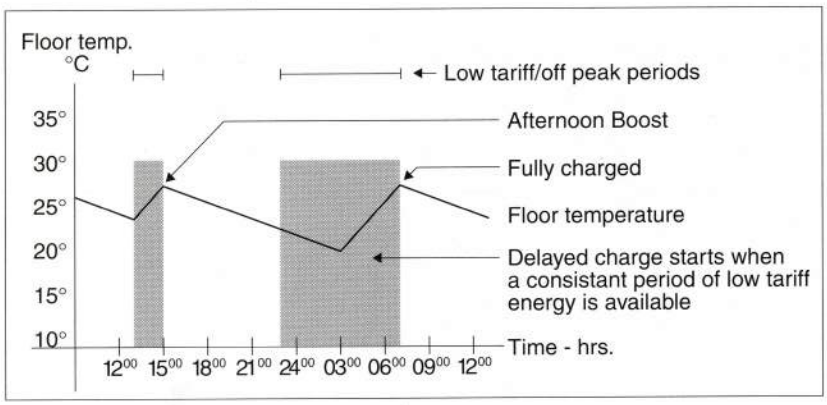
Storage heating systems

The function of the **devireg®** 700 regulator is to reduce running costs and to make storage heating systems more controllable.

In areas where low or off peak tariffs exist, it can be an advantage to use storage heating as opposed to a direct acting system.

To get the most from such a system, it is necessary to use a controller that measures changes in the outdoor temperature, monitors the desired indoor temperature and also the duration of the available low tariff period to calculate the time required to supply the exact charging periods for the heating system.

The **devireg®** 700 Series controllers can be simply combined to cover virtually any storage heating system configuration to produce the most effective, intelligent, automatic and economical solutions available.



Typical floor temperature for a system with a delayed charge period over 24 hours.

Operating Principle

»Fuzzy Logic«

The **devireg®** 700 controller is the central control unit, which, with the help of a technique called »Fuzzy Logic«, regulates the charge required by a storage heating system.

It uses its fuzzy logic to provide simple answers based on a lot of »fuzzy« or unclear inputs. Answers which can be based on »intuition« and »self education«.

The amount of heat remaining in the floor and the outdoor air temperature are two crucial pieces of information required when calculating the daily charge. Via a sensor, the unit continually measures the outdoor temperature.
From this measurement two average temperatures are calculated:

- The average temperature over the last hour.
- The average temperature over the last twenty four hours.

From these figures the **devireg®** 700 controller predicts quite accurately the outdoor temperature and its variation a day in advance.
The temperature in the floor is measured constantly so that the amount of heat remaining in the floor is also known.
Consequently only the exact amount of heat energy required is supplied to the heating system during the recharging period. This ensures a very economical operating system.

Operating Features

Varying low tariff/off peak periods

Consistent low tariff periods: (delayed regulating):

As soon as the **devireg®** 700 controller is connected to the mains, it starts to monitor the outside temperature as well as registering the timing of the low tariff/off peak periods.

After the first 24 hours of being connected, it will recharge and register the stored heat in the system and, as it gains more »experience«, adjust its functions accordingly.
In this way the unit becomes capable of automatically recharging the slab in a most effective and economical manner.
For example, if the heating system requires a 4 hour charge during an 8 hour low tariff period it will choose the last 4 hours of the low tariff period to recharge the system. Running costs are accordingly reduced.

When low tariff periods are consistent, the system invariable operates in this »delayed supply«, low energy loss format.

Varying low tariff periods (continual regulation)

Should the low tariff period vary in time and length from day to day, or when the tariffs are constant over 24 hours, recharging reverts to beginning the charge at the start of the low tariff period and to cease according to the charge period required.

Product Description & Installation

The **devireg**® 700 Series product description

The **devireg**® 700 Series of controllers is a combination of master and one or more slave units or a combined master and slave unit as illustrated in the following schedule:

devireg®	Unit	Rooms	Sensor	Room units
700	Master	-	Outdoor	* Up to 400 (type 751 - 754)
750	Master and Slave	1	Outdoor + Wire	* Up to 400 (type 751 - 754)
751	Slave	1	Wire	
752	Slave	2	Wire	
753	Slave	3	Wire	
754	Slave	4	Wire	

*Note: Up to 100 slave units can be connected to a **devireg**® 700/750 master unit allowing control of up to 400 systems or rooms.

As previously mentioned the master unit continuously monitors the outdoor temperature via an outdoor sensor and registers the low tariff periods from an external signal.

It uses this information to perform statistical calculations to regulate other **devireg**® 700 Series slave units. These slave units monitor the actual floor temperature to calculate the level of charge required for the system.
A facility is also provided that limits the floor temperature to a pre-set maximum.

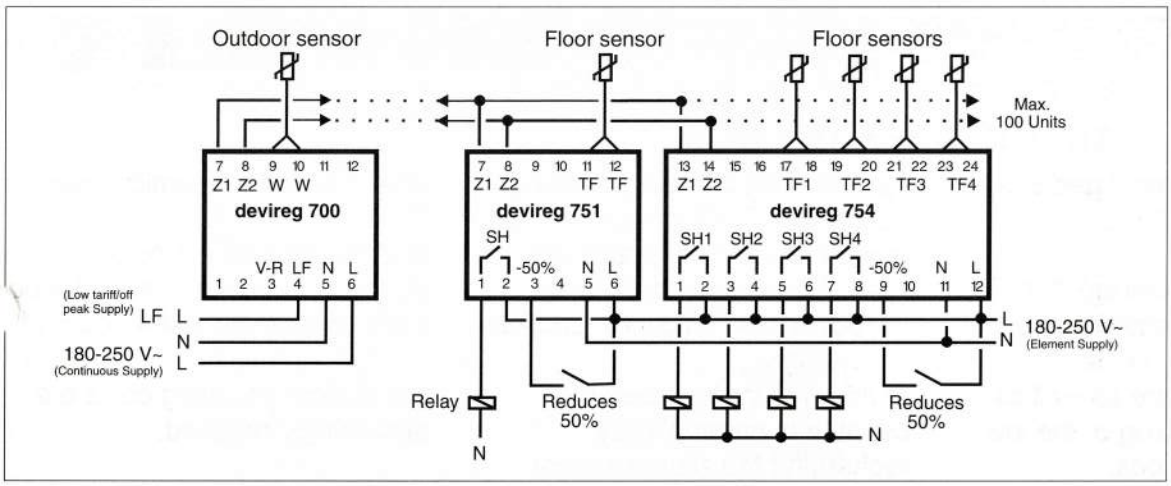
Installation:

The **devireg**® 700 Series controllers are usually mounted on a din rail in a heating electrical sub board or the main switchboard.

The outdoor sensor should be installed outside, flush with the surface of a South facing external wall and at a minimum height of 2.5 m above ground level. The indoor, in-floor, »removable« wire sensor should be positioned, towards the centre of a »heating cable open loop«, and at the same level as the heating cables. The sensor cable is installed inside a 16-20 mm conduit which is sealed at the »in-floor« end to avoid the ingress of concrete during the pour. This conduit should extend a minimum of 1-2 metres into the heated zone.

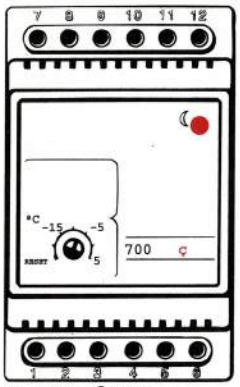
To change to continual regulation during a low tariff period, connect terminal 3 to a phase. When no phase is connected to terminal 3, delayed regulation is used.

Wiring Diagram

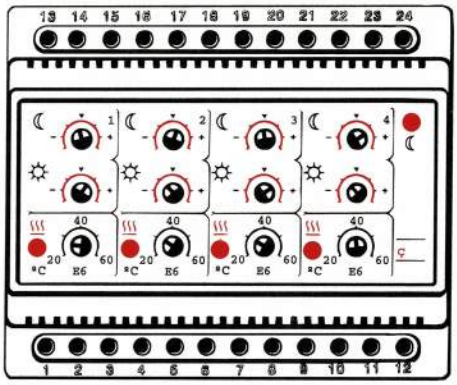


Typical wiring arrangement for 5 zones

Setting the Controls



devireg® 700



devireg® 754

Floor Design W/m²	Surface	E6 Setting
120 to 149	Ceramic Tiles	35°C
	Carpet	40°C
	Well insulated	45°C
150 to 170	Ceramic Tiles	40°C
	Carpet	45°C
	Well insulated	50°C
over 170	Ceramic Tiles	45°C
	Carpet	50°C
	Well insulated	55°C

Typical E6 setting guide

E1 - Full charge or floor heating capacity enablement:
Usually set to a design temperature such as the average minimum outside winter air temperature.
Reset: Enables the 24 hour clock and all of the controls to be reset to zero.

E6 - Maximum floor temperature selection:
Adjusted according to floor heating design criteria in W/m² and the type of flooring.
See typical E6 setting guide above.

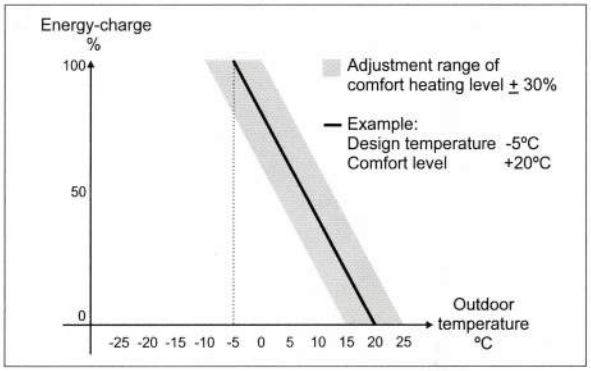
☾ - Morning comfort heating level selection:
Can be varied by ± 30%.

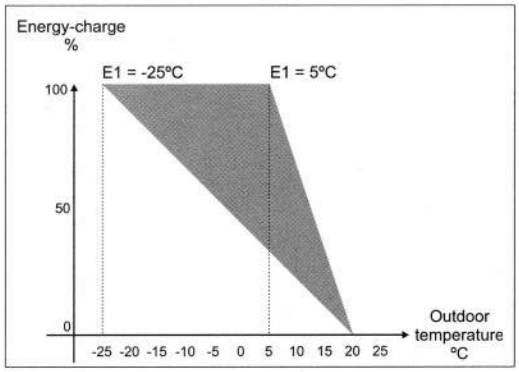
☼ - Afternoon/evening comfort heating level selection:
Can be varied by ± 30%.
Once adjustments have been made, the thermostat will automatically keep the chosen temperatures regardless of weather conditions and the time of year.

- lamp:
The lamp is:
-green when the heating system is deactivated and the remaining heat in the floor is less than the preset (E6), level.
- red when the heating system is activated but the heat level has not reached the preset (E6), level.
- not illuminated when the preset temperature level is reached and the heating system is deactivated.

☾ - Lamp:
- When illuminated, the built in clock has registered the night period i.e., 11 hours from when the thermostat registers the first low tariff period during the night period.
- When flashing rapidly, an error has been detected in the system.

Charging





The above diagram illustrates how the charging period is dependent on the outdoor temperature.
For an outside temperature of -5°C the system provides a 100% charge.
For an outside temperature of 20°C the system provides a 0% charge.
Also illustrated is the band of movement of the curve for ± 30% variation in comfort heating selection settings.

Similarly, the above diagram illustrates the effect of the E1 adjustment on the slope of the charging curve.

That is, the angle of the curve can be altered accordingly. The lower the temperature setting, the flatter the curve.

For more information or an obligation free quotation please contact **DE-VI Comfort Heat** on (03) 348 0070 or your local representative:

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