

RADIATORS · A CHECK AT A CHOSEN SUPPLY

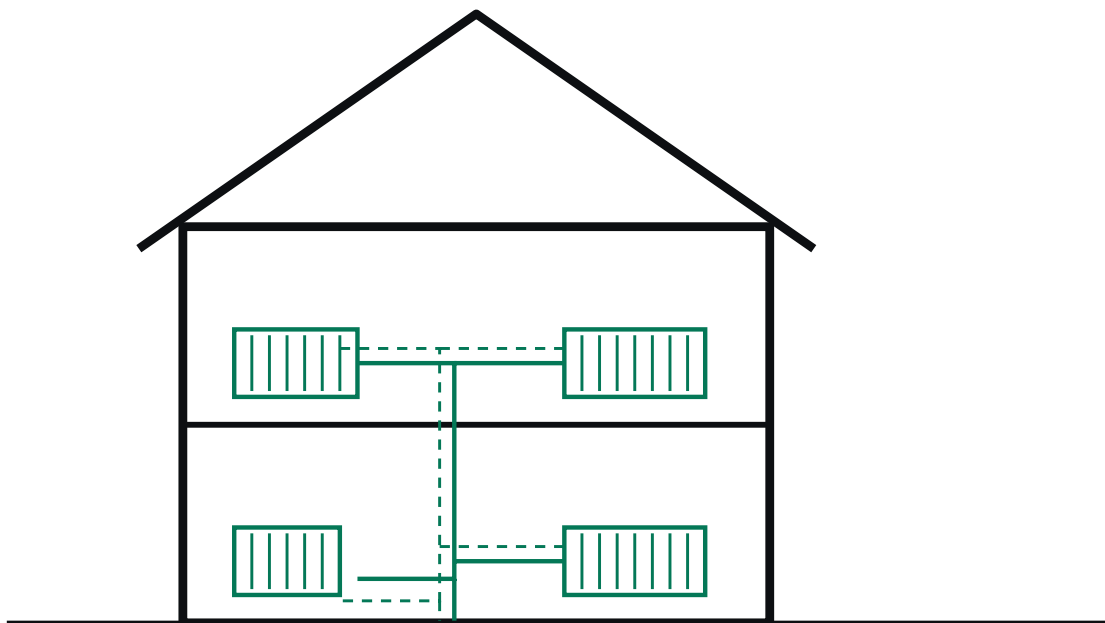
Radiator check

13 rooms · heat loss from the room-by-room calculation

FOR

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Supply the house needs

50 °C

Chosen supply / return

50/43 °C

Rooms short of output

0/13

Output room by room

The house needs a supply of **50 °C**.

Every room has its full output at 50/43 °C.

50 °C

Supply the house needs

50/43 °C

Chosen supply / return

0/13

Rooms short of output

Room	T °C	Heat loss W	Source	AT 50/43 °C		Enough from °C
				Output W	Balance W	
Kitchen-diner	20	563	calculated	1,637	+1,074	35
WC	20	120	calculated	401	+281	35
Utility room	20	314	calculated	757	+443	35
Porch	20	170	calculated	183	+14	49
Hall	20	267	calculated	338	+71	46
Living room	20	793	calculated	2,521	+1,728	35
Guest room	20	464	calculated	1,173	+709	35
Children's room	20	409	calculated	1,507	+1,097	35
Bathroom	24	305	calculated	790	+485	35
Study	20	354	calculated	959	+604	35
Landing	20	252	calculated	253	+1	50
Main bedroom	20	553	calculated	1,516	+963	35
Bedroom	20	496	calculated	1,063	+566	35

The output includes the underfloor heating in: Kitchen-diner, WC, Utility room, Living room, Guest room, Children's room, Bathroom, Study, Main bedroom, Bedroom.

Radiators to swap

The smallest change that covers the room at 50/43 °C: one radiator first, the same height, a stronger type or a longer one.

No room needs a change at 50/43 °C.

How we worked it out

Each radiator's output from its characteristic at the chosen supply and return, against the room's heat loss.

$$\Phi = \Phi_n \cdot (\Delta T / \Delta T_n)^n$$

The radiator's exponent characteristic, EN 442-2, 5.5.1.1

Φ_n - the radiator's output at the rating point 75/65/20 °C, $\Delta T_n = 50$ K, n - the radiator's exponent.

$$\Delta T = (\theta_s + \theta_r) / 2 - \theta_i$$

The water-to-air temperature difference, EN 442-2, 3.1.2.2

θ_s , θ_r - supply and return, here 50 and 43 °C; θ_i - the room temperature.

$$\theta_{s,house} = \max \theta_{s,min,i}$$

HeatAlgo's model, not a standard

$\theta_{s,min,i}$ - the lowest supply at which room i has its full output, searched in 1 °C steps from 35 to 80 °C. The room that asks the most sets the house's supply.

Where a radiator's output comes from

Generic (indicative): the median of several makers' public datasheets for the panel radiator's type and height.

From the datasheet: the output at 75/65/20 and the exponent n typed from this radiator's own datasheet.

Assumed: a radiator described without a rating, taken as a type 22 panel of the same size (a towel rail as half a type 11), exponent 1.3.

Where a room's heat loss comes from

Calculated: the room's design heat load from this project's calculation to EN 12831-1.

What the calculation leaves out

Mounting factors (a niche, a cover, the connection) - the maker's datasheet gives them.

Heat from pipes that run through the room.

A floor in a room with loops in this project's Underfloor heating module gives that module's result: its loops' output at its own supply temperature.

See the method: a reference house calculated in full: heatalgo.com/en/compliance

What **this report** rests on

EN 442-2	The radiator's exponent characteristic (#02, #04).
EN 12831-1	The rooms' design heat load from the calculation (#02).
EN 1264	The floor's output in a room with a radiator and underfloor heating.

Formulas and sources of the figures: page #04.