
Changes to legislation: There are outstanding changes not yet made to Commission Delegated Regulation (EU) No 812/2013. Any changes that have already been made to the legislation appear in the content and are referenced with annotations. (See end of Document for details) [View outstanding changes](#)

Commission Delegated Regulation (EU) No 812/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device (Text with EEA relevance)

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ANNEX VIII

Method for calculating the water heating energy efficiency of water heaters

1. For the purposes of compliance and verification of compliance with the requirements of this Regulation, calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other appropriate calculation methods that take into account the generally recognised state-of-the-art methods. They shall meet the technical parameters and calculations set out in points 2 to 6.

Technical parameters used for the calculations shall be measured in accordance with Annex VII.

2. Technical parameters of water heaters

The following parameters shall be calculated for water heaters under average climate conditions:

- (a) the water heating energy efficiency η_{wh} in %, rounded to one decimal place;
- (b) the annual electricity consumption *AEC* in kWh in terms of final energy, rounded to the nearest integer;

in addition, for water heaters using fuels under average climate conditions:

- (c) the annual fuel consumption *AFC* in kWh in terms of *GCV*, rounded to the nearest integer;

in addition, for solar water heaters under average climate conditions:

- (d) the heat generator water heating energy efficiency $\eta_{wh,nonsol}$ in %, rounded to one decimal place;
- (e) the annual auxiliary electricity consumption Q_{aux} in kWh in terms of final energy, rounded to one decimal place;

in addition, for solar water heaters and heat pump water heaters under colder and warmer climate conditions:

- (f) the parameters set out in points (a) to (e);

in addition for solar water heaters under average, colder and warmer climate conditions:

- (g) the annual non-solar heat contribution Q_{nonsol} in kWh in terms of primary energy for electricity and/or in kWh in terms of *GCV* for fuels, rounded to one decimal place.

3. Calculation of the water heating energy efficiency η_{wh}

- (a) Conventional water heaters and heat pump water heaters:

The water heating energy efficiency is calculated as follows:

$$\eta_{wh} = \frac{Q_{ref}}{(Q_{heat} + CC \times Q_{elec}) \times (1 - SCF \times smart) + Q_{cor}}$$

For water-/brine-to-water heat pump water heaters, the electricity consumption of one or more ground water pumps shall be taken into account.

- (b) Solar water heaters:

The water heating energy efficiency is calculated as follows:

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$$\eta_{wh} = \frac{0,6 \times 366 \times Q_{ref}}{Q_{total}}$$

Where:

$$Q_{total} = \frac{Q_{smart}}{1,1 \times \eta_{wh,smart} - 0,1} + Q_{aux} \times CC$$

4. Calculation of the annual electricity consumption AEC and the annual fuel consumption AFC

(a) Conventional water heaters and heat pump water heaters:

The annual electricity consumption *AEC* in kWh in terms of final energy is calculated as follows:

$$AEC = 0,6 \times 366 \times \left(Q_{elec} \times (1 - SCF \times smart) + \frac{Q_{cor}}{CC} \right)$$

The annual fuel consumption *AFC* in GJ in terms of *GCV* is calculated as follows:

$$AFC = 0,6 \times 366 \times (Q_{fuel} \times (1 - SCF \times smart) + Q_{cor})$$

(b) Solar water heaters:

The annual electricity consumption *AEC* in kWh in terms of final energy is calculated as follows:

$$AEC = \frac{CC \times Q_{elec}}{Q_{fuel} + CC \times Q_{elec}} \times \frac{Q_{total}}{CC}$$

The annual fuel consumption *AFC* in GJ in terms of *GCV* is calculated as follows:

$$AFC = \frac{Q_{fuel}}{Q_{fuel} + CC \times Q_{elec}} \times Q_{total}$$

5. Determination of the smart control factor *SCF* and of smart control compliance *smart*

(a) The smart control factor is calculated as follows:

$$SCF = 1 - \frac{Q_{fuel,week,smart} + CC \times Q_{elec,week,smart}}{Q_{fuel,week} + CC \times Q_{elec,week}}$$

(b) If $SCF \geq 0,07$, the value of *smart* shall be 1. In all other cases, the value of *smart* shall be 0.

6. Determination of the ambient correction term Q_{cor}

The ambient correction term is calculated as follows:

(a) for conventional water heaters using electricity:

$$Q_{cor} = -k \times (CC \times (Q_{elec} \times (1 - SCF \times smart) - Q_{ref}))$$

(b) for conventional water heaters using fuels:

$$Q_{cor} = -k \times (Q_{fuel} \times (1 - SCF \times smart) - Q_{ref})$$

(c) for heat pump water heaters:

$$Q_{cor} = -k \times 24h \times P_{stby}$$

Where:

the k-values are given in Table 8 for each load profile.

TABLE 8

k-values

	3XS	XXS	XS	S	M	L	XL	XXL
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Changes and effects yet to be applied to the whole legislation item and associated provisions

- Signature words omitted by [S.I. 2019/539 Sch. 5 para. 10\(6\)](#)
- Annex 1(13) substituted by [S.I. 2019/539 Sch. 5 para. 10\(7\)](#)
- Annex 5 s. 1(c) word inserted by [S.I. 2019/539 Sch. 5 para. 10\(9\)](#)
- Annex 5 s. 2(c) word inserted by [S.I. 2019/539 Sch. 5 para. 10\(9\)](#)
- Annex 5 s. 3(c) word inserted by [S.I. 2019/539 Sch. 5 para. 10\(9\)](#)
- Annex 5 s. 4(c) word inserted by [S.I. 2019/539 Sch. 5 para. 10\(9\)](#)
- Annex 3 para. 1.2.1 image substituted by [S.I. 2020/1528 Sch. 5 para. 9\(2\)](#)
- Annex 3 para. 1.2.2 image substituted by [S.I. 2020/1528 Sch. 5 para. 9\(3\)](#)
- Annex 3 para. 1.2.3 image substituted by [S.I. 2020/1528 Sch. 5 para. 9\(4\)](#)
- Annex 3 para. 2.2 image substituted by [S.I. 2020/1528 Sch. 5 para. 9\(5\)](#)
- Annex 3 para. 3 image substituted by [S.I. 2020/1528 Sch. 5 para. 9\(6\)](#)
- Annex 3 para. 4 image substituted by [S.I. 2020/1528 Sch. 5 para. 9\(7\)](#)
- Annex 3 para. 5 image substituted by [S.I. 2020/1528 Sch. 5 para. 9\(8\)](#)
- Annex 3 para. 6 image substituted by [S.I. 2020/1528 Sch. 5 para. 9\(9\)](#)
- Annex 3 para. 7 image substituted by [S.I. 2020/1528 Sch. 5 para. 9\(10\)](#)
- Annex 3 para. 8 image substituted by [S.I. 2020/1528 Sch. 5 para. 9\(11\)](#)
- Annex 3 s. 1.1.3(b) words inserted by [S.I. 2019/539 Sch. 5 para. 10\(8\)](#)
- Annex 3 para. 4(d) words substituted by [S.I. 2020/1528 Sch. 5 para. 9\(12\)\(a\)](#)
- Annex 3 para. 5(d) words substituted by [S.I. 2020/1528 Sch. 5 para. 9\(12\)\(a\)](#)
- Annex 3 para. 6(d) words substituted by [S.I. 2020/1528 Sch. 5 para. 9\(12\)\(a\)](#)
- Annex 3 para. 7(d) words substituted by [S.I. 2020/1528 Sch. 5 para. 9\(12\)\(a\)](#)
- Annex 3 para. 8(d) words substituted by [S.I. 2020/1528 Sch. 5 para. 9\(12\)\(a\)](#)
- Annex 3 para. 4(d) words substituted by [S.I. 2020/1528 Sch. 5 para. 9\(12\)\(b\)](#)
- Annex 3 para. 5(d) words substituted by [S.I. 2020/1528 Sch. 5 para. 9\(12\)\(b\)](#)
- Annex 3 para. 6(d) words substituted by [S.I. 2020/1528 Sch. 5 para. 9\(12\)\(b\)](#)
- Annex 3 para. 7(d) words substituted by [S.I. 2020/1528 Sch. 5 para. 9\(12\)\(b\)](#)
- Annex 3 para. 8(d) words substituted by [S.I. 2020/1528 Sch. 5 para. 9\(12\)\(b\)](#)
- Annex 3 s. 1.1.3(b) words substituted in earlier amending provision [S.I. 2019/539, Sch. 5 para. 10\(8\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 7 para. 1 words substituted by [S.I. 2019/539 Sch. 5 para. 10\(10\)](#)
- Annex 8 para. 1 words substituted by [S.I. 2019/539 Sch. 5 para. 10\(11\)](#)
- Annex 9(7) omitted by [S.I. 2019/539 Sch. 5 para. 10\(12\)\(b\)](#)
- Art. 1(2)(c) words inserted by [S.I. 2019/539 Sch. 5 para. 10\(2\)\(a\)](#)
- Art. 1(2)(c) words inserted by [S.I. 2019/539 Sch. 5 para. 10\(2\)\(b\)](#)
- Art. 1(2)(c) words substituted in earlier amending provision [S.I. 2019/539, Sch. 5 para. 10\(2\)\(a\)](#) by [S.I. 2020/1528 reg. 4](#)
- Art. 1(2)(c) words substituted in earlier amending provision [S.I. 2019/539, Sch. 5 para. 10\(2\)\(b\)](#) by [S.I. 2020/1528 reg. 4](#)
- Art. 3(1)(c) words substituted by [S.I. 2019/539 Sch. 5 para. 10\(3\)](#)
- Art. 3(2)(c) words substituted by [S.I. 2019/539 Sch. 5 para. 10\(3\)](#)
- Art. 3(3)(b) words substituted by [S.I. 2019/539 Sch. 5 para. 10\(3\)](#)
- Art. 3(4)(c) words substituted by [S.I. 2019/539 Sch. 5 para. 10\(3\)](#)