



ENGINEERING
TOMORROW

Danfoss

Environmental **Product Declaration**



REACT, REDIA and REGUS

self-acting mechanical radiator thermostats with
built-in liquid-filled sensor

| | |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| EPD issued | 2023-06-12 |
| EPD expires | 2028-06-12 |
| EPD author | Danfoss Climate Solutions |
| EPD type | Cradle-to-grave |
| Declared unit | One thermostat over its 10 years of Reference Service Life |
| Products included | Product range of REACT, REDIA and REGUS models of self-acting mechanical radiator thermostats with built-in liquid-filled sensor |
| Manufacturing Location | Silkeborg, Denmark |
| Use Location | EU-27 (European Union) |
| Application | Manual thermostatic radiator valve for water-based heating system |
| Mass | 0,150 kg without packaging 0,164 kg with packaging (015G3090) |
| Dimensions (H×W×D) | Ø55 mm x 93,8 mm without packaging (015G3090) |
| Verification | <input type="checkbox"/> External <input checked="" type="checkbox"/> Internal <input type="checkbox"/> None |
| Produced to | Danfoss Product Category Rules (2022-09-20) |
| Internal independent verifier | Danfoss Power Electronics & Drives A/S |

DISCLAIMER

This EPD was prepared to the best of knowledge of Danfoss A/S. The life cycle assessment calculations were performed in accordance with ISO 14040 & 14044 and EN15804+A2.

All results were internally reviewed by independent experts. While this declaration has followed the guidance of ISO 14025, it has not been externally verified or registered by an EPD programme and therefore does not fully comply with the ISO 14025 standard.

This EPD has been published by Danfoss A/S on Danfoss Product Store and Danfoss Website. For questions, feedback or requests please contact your Danfoss sales representative.

Introduction

This Environmental Product Declaration (EPD) follows the Danfoss Product Category Rules (PCR) (2022-09-20). These rules provide a consistent framework for calculating and reporting the environmental performance of Danfoss' products and is aligned with relevant international standards, particularly ISO 14025:2006, EN 15804+A2:2019 and EN 50598-3:2015.

This document has been produced by Danfoss A/S following an internal verification process, but it is not a third-party verified document.

What is an EPD?

An EPD is a document used to communicate transparently, the quantified environmental impacts of a product over its lifecycle stages. This quantification is done by performing a Life Cycle Assessment (LCA) in line with a consistent set of rules known as a PCR (Product Category Rules).

An EPD provides:

- A product's carbon footprint together with other relevant environmental indicators, including air pollution, water use, energy consumption and waste, over its own life cycle (Modules A-C), as well as the expected benefits of reuse and recycling in reducing the impact of future products (Module D). See Table 1 for module descriptions.
- Environmental data allowing customers to calculate LCAs and produce EPDs for their own products.

Type of EPD

This EPD is of the type 'cradle-to-grave' and includes all relevant modules: production (A1-A3), shipping (A4) and installation (A5); operational energy use (B6); deconstruction (C1), waste collection and transport (C2), treatment (C3) and disposal (C4). It also includes potential net benefits to future products from recycling or reusing post-consumer waste (D). The codes in brackets are the module labels from EN 15804+A2. Modules concerning use, maintenance, repair, replacement, refurbishment (B1-B5) and operational water use (B7) are excluded, following the cut-off rules from EN 15804.

Table 1: Modules of the product's life cycle included in the EPD

| Product stage | | | Installation | | Use stage | | | | | | | End-of-life stage | | | | Benefits |
|---------------|-----------|-------------|--------------|--------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|-------------------|-----------|------------------|----------|----------------------------------------------|
| Raw materials | Transport | Manufacture | Transport | Installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-install. | Transport | Waste processing | Disposal | Benefits and loads outside system boundaries |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| X | X | X | X | X | MNR | MNR | MNR | MNR | MNR | X | MNR | X | X | X | X | X |

(X = declared module; MNR = module not relevant)

Product Description

The products studied in this report is the React, Redia and Regus new generation of mechanical radiator thermostats with built-in liquid-filled sensor that is part of the thermostatic radiator valve for water-based heating system.

The radiator thermostats help people to obtain comfort in their homes. By maintaining constant desired room temperatures and by helping to reduce energy consumption.

The thermostat optimizes the energy use via its liquid charging media with which it maintains a high regulating capacity and reactivity to temperature changes. The production location is Silkeborg, Denmark. See more information about the product on [Danfoss Product Store](#).

The EPD covers the entire product range of React, Redia and Regus with built-in liquid-filled sensor with the following product types:



Figure 1: Picture of the three models: React, Redia and Regus types

Reference Service Life

For the purpose of this EPD the reference service life (RSL) of the product is considered to be 10 years.

Intended market

The intended market of this study is EU-27 member states, and the baseline scenario involves the distribution, installation, and end-of-life in EU-27 member states. With regards to the use stage and the end-of-life stage, this EPD is not representative of regions other than the EU-27 member states.

Product Description

Table 2: Product composition*

| Product Composition | Group 1: RA click | | Group 2: RA nut | | Group 3: M30x1.5 | |
|-------------------------------|-------------------|--------------|-----------------|--------------|------------------|-------------|
| | kg | % | kg | % | kg | % |
| Metals | 0,0489 | 32,7% | 0,0456 | 34,9% | 0,0553 | 38% |
| Steel (excl. stainless steel) | 0,0469 | 31,4% | 0,0436 | 33,4% | 0,0377 | 26% |
| Copper and its alloys (Brass) | 0,0020 | 1,3% | 0,0020 | 1,5% | 0,0176 | 12% |
| Plastics & Rubbers | 0,0876 | 58,6% | 0,0718 | 55% | 0,0772 | 54% |
| ABS | 0,0313 | 20,9% | 0,0303 | 23,2% | 0,0315 | 22% |
| PC | 0,0012 | 0,8% | 0,0004 | 0,3% | 0,0010 | 1% |
| Other plastics | 0,0551 | 36,9% | 0,0411 | 31,5% | 0,0447 | 31% |
| Other materials | 0,0130 | 8,7% | 0,0130 | 10,0% | 0,0130 | 9% |
| Total product | 0,1495 | 100% | 0,1305 | 100% | 0,1455 | 100% |

*the EPD values are calculated for these three compositions (015G3090, 015G3690, 015G3030 in respected order) . All the other sales codes are within +/- 10% divided to three groups. The sales codes and product groups of all products covered in this EPD are presented in Annex 1.

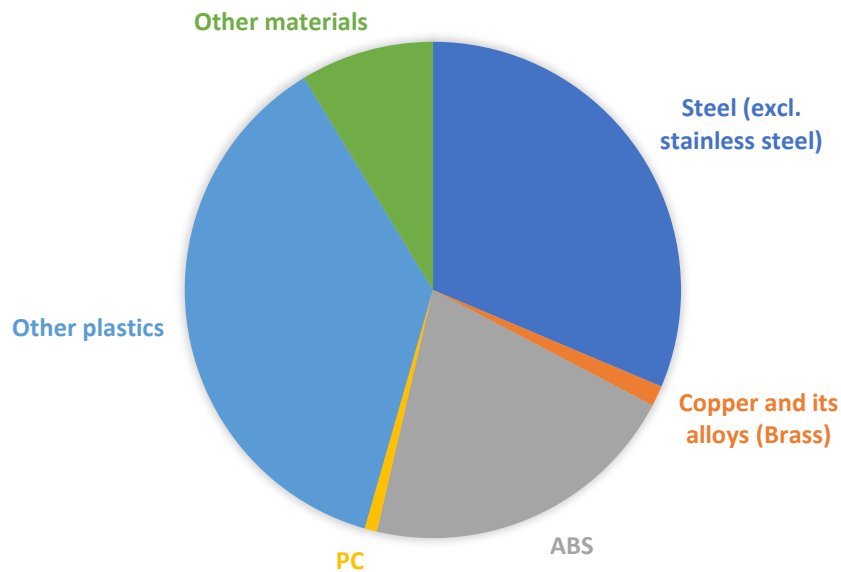


Figure 2: **Material Composition Overview for React RA click (015G3090)**

Overview of LCA study

Data quality

Data quality of the selected datasets is generally assessed as good and very good in terms of geographical, time and technology representativeness and applicability. Background data is from LCA for Experts (GaBi) database version 2023.

Allocation and cut-off criteria

The allocation is made in accordance with the provisions of EN 15804+A2. All major raw materials and all the essential energy are included. All hazardous materials and substances are considered in the inventory. Data sets within the system boundary are complete and fulfil the criteria for the exclusion of inputs and output criteria.

System boundaries

The results in this EPD are split into life cycle modules following EN 15804 (Figure 1): production (A1-A3), distribution (A4), use (B6) and the end of the product's life (C1-C4). Module D represents environmental benefits and loads that occur beyond the system boundary (i.e., in future products).

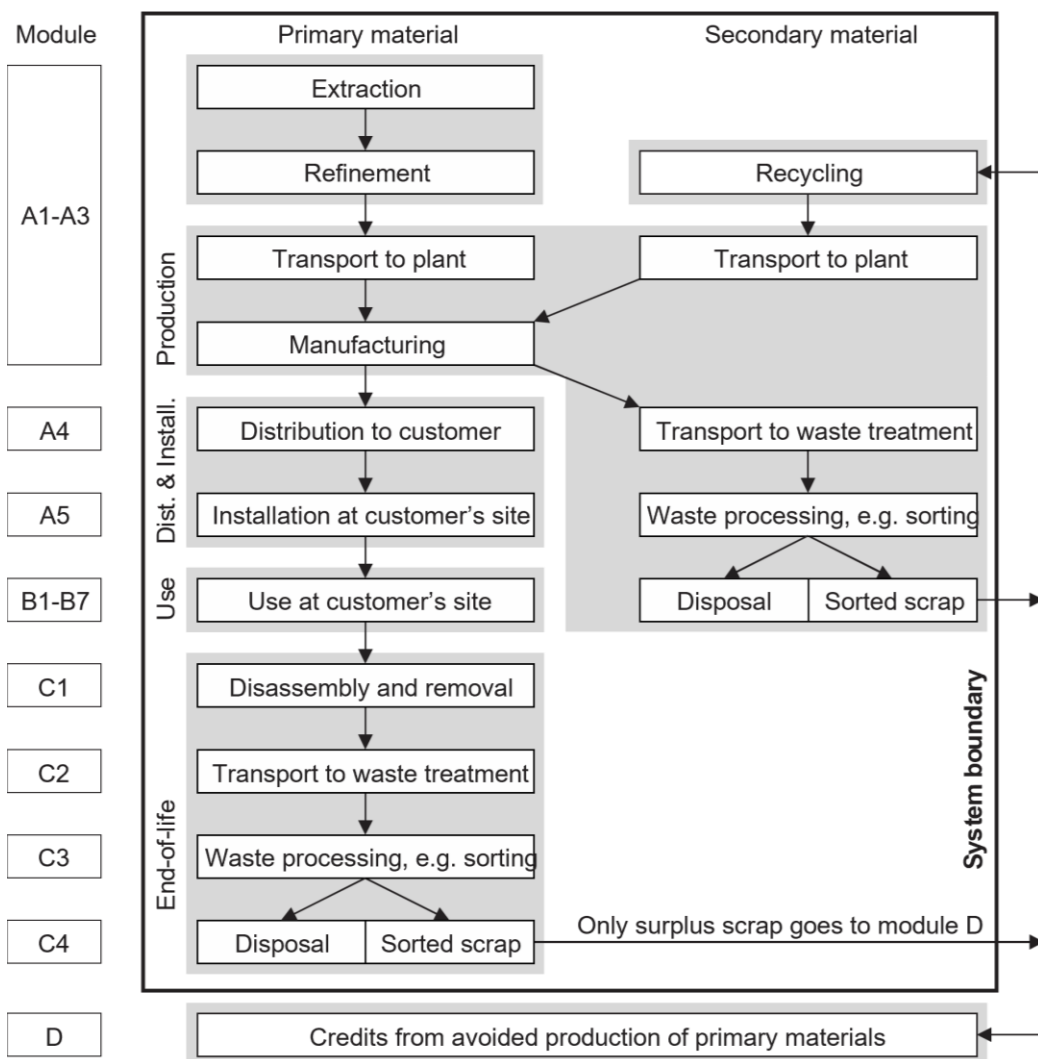


Figure 3: Modular structure used in this EPD (following EN 15804+A2)

Overview of LCA study

Product and packaging manufacture (A1-A3)

Final manufacturing occurs in Silkeborg, Denmark, and the Danfoss QEHS management system is certified to ISO 9001, ISO 14001, and ISO 45001, and in addition, the quality management system is compliant to IATF 16949. Where waste generated on-site is recyclable, it is separated and recycled. For further information, [see here](#). The product is shipped in the packaging described in Table 2 below. All packaging materials can be safely recycled or incinerated if appropriate local facilities are available.

Table 3: Packaging materials

| Packaging material | Mass (kg) |
|------------------------|---------------|
| Paper and cardboard | 0,0141 |
| Total packaging | 0,0141 |

Table 4: Biogenic carbon content in product and packaging

| | Total (excluding recycling) |
|--------------------------------------------------------|-----------------------------|
| Biogenic carbon content in product [kg] | - |
| Biogenic carbon content in accompanying packaging [kg] | 0,0061 |

Shipping and installation (A4-A5)

Distribution is assumed to occur to customers in EU-27 member states. Transportation at 2000 km distance by truck is assumed between the factory and the final customer. This assumption was made following EN 50598-3, section 7.11 on default distance assumptions.

Module A5 includes disposal of packaging materials only, the benefits from e.g., energy recovered after plastic incineration are allocated to module D. The product is assumed to be installed by hand. Energy use in handheld tools during installation is not included as it falls under the cut-off criteria.

Use phase (B1-B6)

The Reference Service Life (RSL) applied in this EPD is 10 years. As the radiator thermostat is a mechanical product, it does not require any electricity input to operate the thermostat. The energy used for heating in the radiator system is out of the system boundaries and functional unit of the current product and LCA study.

Overview of LCA study

End-of-life (C1-C4)

The standard end-of-life procedure from EN 50598-3 has been applied:

- Manual dismantling is used to separate recyclable bulk materials, e.g. bulk metals and plastics.
- Shredding is used for the remaining parts, such as printed circuit board assemblies.
- Ferrous metals, non-ferrous metals and bulk plastics are recovered through recycling.
- The remaining materials go to either energy recovery or landfill.

In line with EN 15804+A2, only the 'net scrap' (i.e., the leftover recyclable materials remaining after inputs of recycled content required in the manufacturing phase are first satisfied) is used to calculate the benefits and loads beyond the system boundary (Module D).

Two scenarios are examined for the end-of-life.

1. Recycling scenario with 100% of the product sent to recycling at the end-of-life, excluding fractions that cannot be recycled or incinerated (e.g., glass reinforcing in glass-filled plastics) and are sent to landfill (C3.1, C4.1, D.1)

This scenario illustrates best case performance. It assumes a 100% collection rate and best available recycling technologies. Under this scenario electrical cables, and all metals, flat glass and unreinforced plastics found within the body and chassis of the product are recycled. Printed circuit board assemblies are incinerated, and the copper and precious metals (gold, silver, palladium, and platinum) are recycled.

2. Landfill scenario with 100% of the product sent to landfill (C3.2, C4.2, D.2).

This scenario assumes that the whole product, including its packaging, is landfilled. It is designed to represent a poor end-of-life-route where valuable resources are lost.

Benefits and loads beyond the system boundary (D)

Module D considers the net benefit of recycling (including energy recovery) of materials in the product and packaging, taking account of losses in the recycling process and the recycled material used in the production of the product. Module D covers the two end-of-life scenarios, as described above.

Environmental performance

This section presents the environmental performance of the REACT, REDIA and REGUS built-in liquid sensor Radiator Thermostats. Figure 4 presents the environmental impact of the product across a number of environmental impact categories (following EN 15804+A2:2019) per life cycle stage, over its full 10-year life cycle, including Global Warming Potential. The results are applicable to the product range of REACT, REDIA and REGUS built-in liquid sensor thermostats with all different connection types.

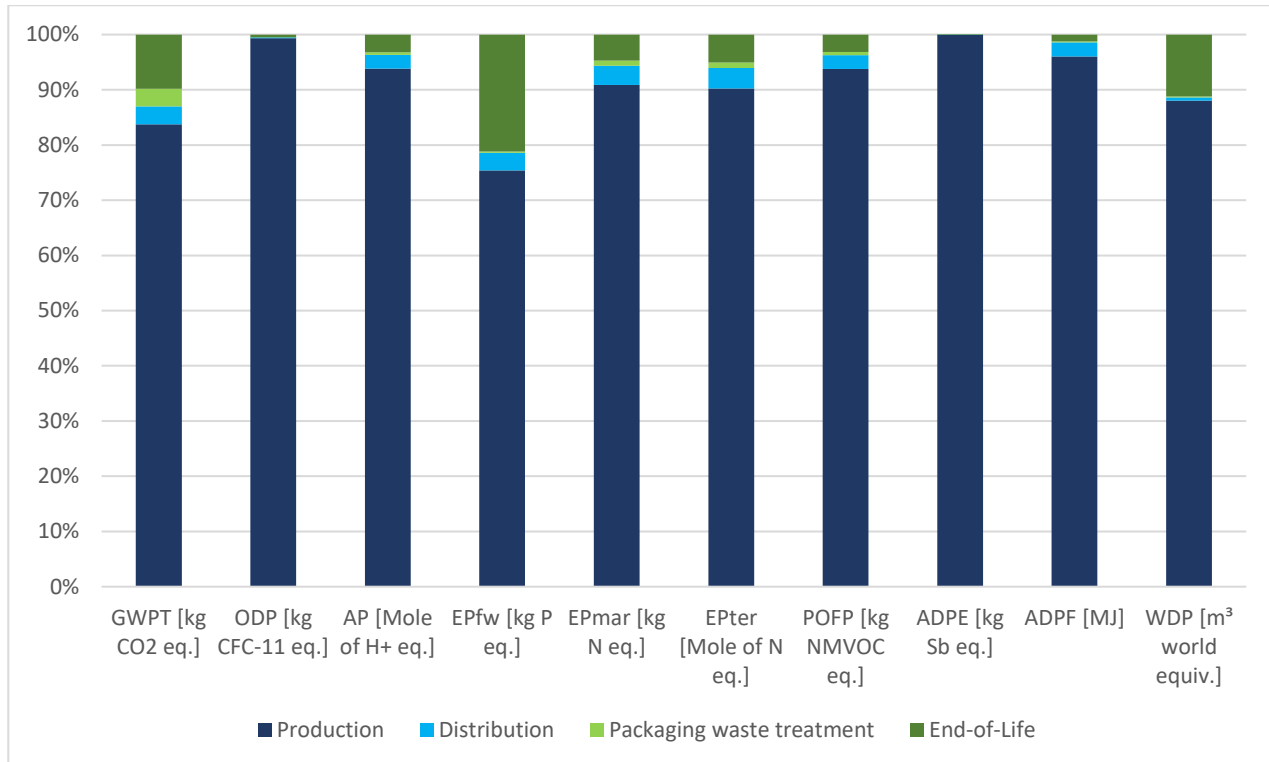


Figure 4/a: Group 1: RA click Breakdown of environmental impacts by life cycle stages (see Table 6 for descriptions of environmental impact indicators). Use phase is zero.

Environmental performance

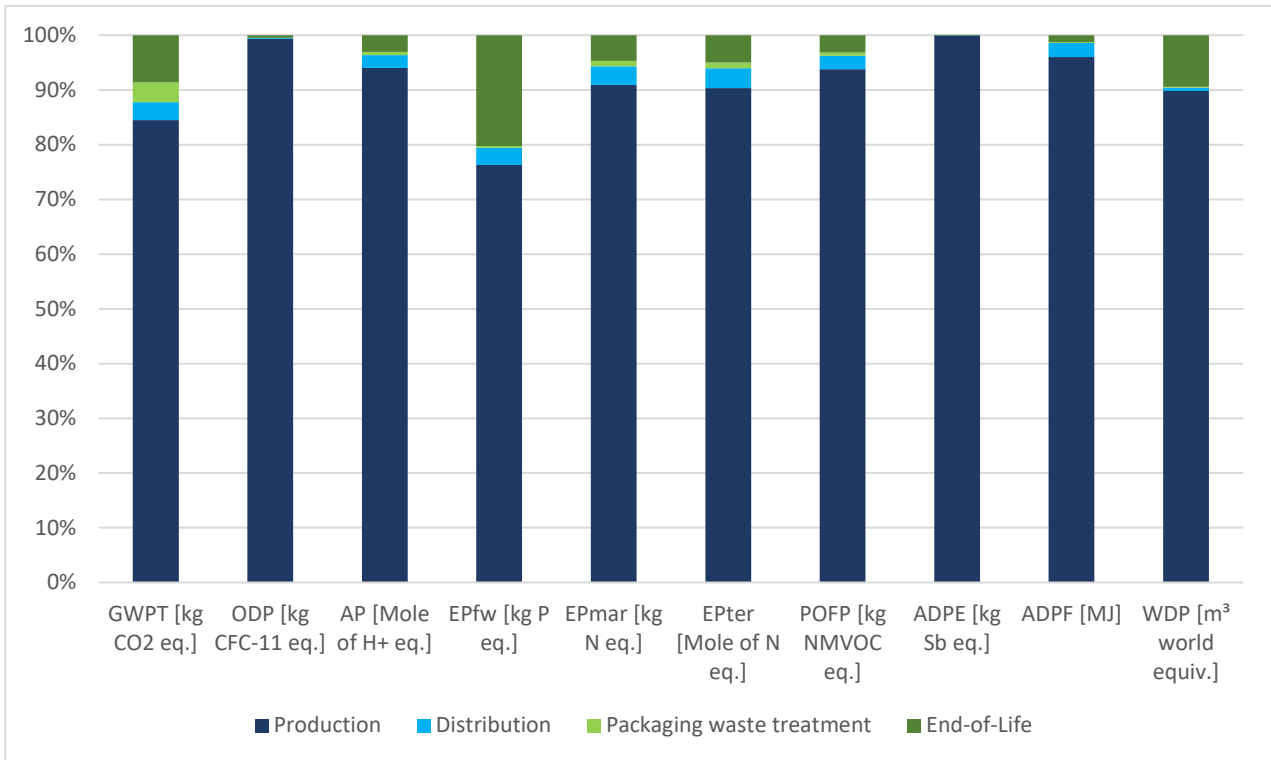


Figure 4/b: Group 2: RA nut Breakdown of environmental impacts by life cycle stages (see Table 6 for descriptions of environmental impact indicators). Use phase is zero.

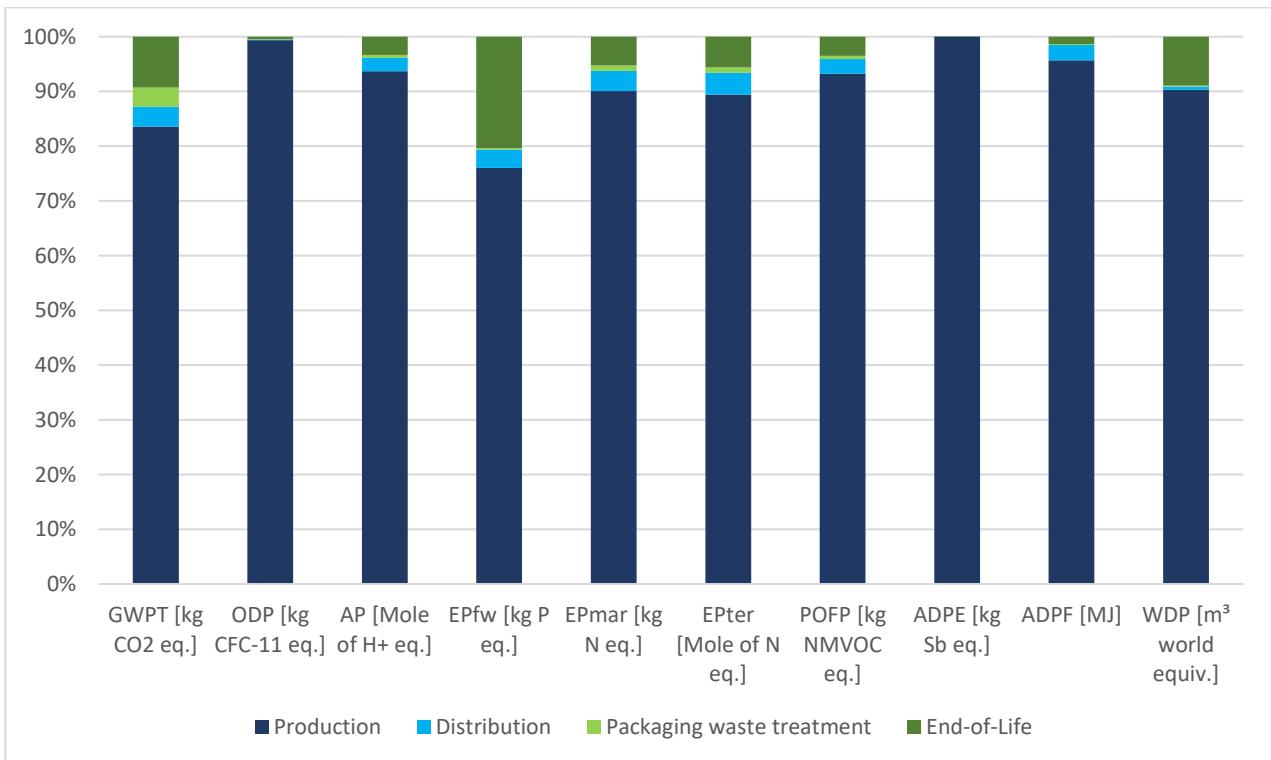


Figure 4/c: Group 3: M30x1.5 Breakdown of environmental impacts by life cycle stages (see Table 6 for descriptions of environmental impact indicators). Use phase is zero.

Table 5/a: Environmental impact indicators (*Group 1: RA click*)

| | Production | Distribution | Packaging waste treatment | Use | End-of-Life | | | | | | (not included in Figure 4) | |
|----------------------------------------|--------------------------------------------------|------------------------------------------|------------------------------------------------------------|----------------------------------------------------|---------------------------------------------|---------------------------------------------|--------------------------------|---------------|-------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------|--------------|
| Life cycle stages based on EN 15804+A2 | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
| Description | Manufacture of the product from 'cradle-to-gate' | Transport of the product to the customer | Installation of the product and disposal of used packaging | Use of the product over its lifetime e.g. 10 years | Deinstallation of the product from the site | Transport of the product to waste treatment | Processing waste for recycling | | Disposal of waste that cannot be recycled (through landfill and incineration) | | Potential benefits and loads beyond the system boundary due to reuse, recycling, and energy recovery | |
| Environmental Impact Indicators | | | | | | | | | | | | |
| GWPT [kg CO2 eq.] | 6,29E-01 | 2,46E-02 | 2,38E-02 | 0,00E+00 | 0,00E+00 | 1,39E-03 | 9,33E-03 | 0,00E+00 | 1,27E-01 | 8,49E-03 | -3,16E-01 | -9,37E-02 |
| GWPF [kg CO2 eq.] | 6,50E-01 | 2,44E-02 | 1,52E-03 | 0,00E+00 | 0,00E+00 | 1,39E-03 | 9,25E-03 | 0,00E+00 | 1,27E-01 | 8,48E-03 | -3,15E-01 | -9,36E-02 |
| GWPB [kg CO2 eq.] | -2,22E-02 | 0,00E+00 | 2,22E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| GWPLULUC [kg CO2 eq.] | 8,69E-04 | 2,25E-04 | 1,77E-06 | 0,00E+00 | 0,00E+00 | 3,37E-08 | 8,47E-05 | 0,00E+00 | 1,74E-07 | 7,28E-06 | -5,32E-04 | -5,32E-05 |
| ODP [kg CFC-11 eq.] | 2,15E-12 | 3,17E-15 | 1,63E-16 | 0,00E+00 | 0,00E+00 | 1,63E-19 | 1,19E-15 | 0,00E+00 | 8,09E-15 | 1,20E-14 | 7,11E-14 | 2,35E-13 |
| AP [Mole of H+ eq.] | 1,61E-03 | 4,20E-05 | 8,62E-06 | 0,00E+00 | 0,00E+00 | 1,91E-06 | 5,76E-05 | 0,00E+00 | 1,58E-05 | 3,25E-05 | -7,50E-04 | -2,05E-04 |
| EPfw [kg P eq.] | 2,13E-06 | 8,90E-08 | 7,63E-09 | 0,00E+00 | 0,00E+00 | 3,02E-10 | 3,34E-08 | 0,00E+00 | 2,05E-09 | 1,16E-06 | -2,57E-07 | -8,60E-09 |
| EPmar [kg N eq.] | 4,34E-04 | 1,66E-05 | 4,40E-06 | 0,00E+00 | 0,00E+00 | 7,60E-07 | 2,81E-05 | 0,00E+00 | 5,26E-06 | 1,01E-05 | -1,82E-04 | -5,08E-05 |
| EPter [Mole of N eq.] | 4,60E-03 | 1,90E-04 | 4,83E-05 | 0,00E+00 | 0,00E+00 | 8,37E-06 | 3,12E-04 | 0,00E+00 | 7,84E-05 | 1,11E-04 | -1,92E-03 | -5,48E-04 |
| POFP [kg NMVOC eq.] | 1,42E-03 | 3,77E-05 | 8,17E-06 | 0,00E+00 | 0,00E+00 | 1,81E-06 | 5,34E-05 | 0,00E+00 | 1,31E-05 | 2,59E-05 | -5,89E-04 | -1,76E-04 |
| ADPE [kg Sb eq.] | 1,45E-05 | 1,60E-09 | 1,03E-10 | 0,00E+00 | 0,00E+00 | 4,96E-11 | 6,02E-10 | 0,00E+00 | 9,75E-11 | 2,48E-10 | -5,99E-06 | -1,54E-09 |
| ADPF [MJ] | 1,23E+01 | 3,32E-01 | 2,03E-02 | 0,00E+00 | 0,00E+00 | 2,01E-02 | 1,25E-01 | 0,00E+00 | 2,94E-02 | 1,22E-01 | -4,94E+00 | -1,12E+00 |
| WDP [m ³ world equiv.] | 4,45E-02 | 2,94E-04 | 8,94E-05 | 0,00E+00 | 0,00E+00 | 2,35E-06 | 1,11E-04 | 0,00E+00 | 1,12E-02 | -1,77E-06 | -1,70E-02 | -2,06E-03 |

Table 5/b: Environmental impact indicators (*Group 1: RA nut*)

| | Production | Distribution | Packaging waste treatment | Use | End-of-Life | | | | | | (not included in Figure 4) | |
|----------------------------------------|--------------------------------------------------|------------------------------------------|------------------------------------------------------------|----------------------------------------------------|---------------------------------------------|---------------------------------------------|--------------------------------|---------------|-------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------|--------------|
| Life cycle stages based on EN 15804+A2 | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
| Description | Manufacture of the product from 'cradle-to-gate' | Transport of the product to the customer | Installation of the product and disposal of used packaging | Use of the product over its lifetime e.g. 10 years | Deinstallation of the product from the site | Transport of the product to waste treatment | Processing waste for recycling | | Disposal of waste that cannot be recycled (through landfill and incineration) | | Potential benefits and loads beyond the system boundary due to reuse, recycling, and energy recovery | |
| Environmental Impact Indicators | | | | | | | | | | | | |
| GWPT [kg CO2 eq.] | 5,55E-01 | 2,15E-02 | 2,38E-02 | 0,00E+00 | 0,00E+00 | 1,20E-03 | 8,76E-03 | 0,00E+00 | 9,47E-02 | 7,11E-03 | -2,87E-01 | -8,66E-02 |
| GWPF [kg CO2 eq.] | 5,76E-01 | 2,13E-02 | 1,52E-03 | 0,00E+00 | 0,00E+00 | 1,20E-03 | 8,68E-03 | 0,00E+00 | 9,47E-02 | 7,10E-03 | -2,86E-01 | -8,65E-02 |
| GWPB [kg CO2 eq.] | -2,22E-02 | 0,00E+00 | 2,22E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| GWPLULUC [kg CO2 eq.] | 8,25E-04 | 1,97E-04 | 1,77E-06 | 0,00E+00 | 0,00E+00 | 2,90E-08 | 7,94E-05 | 0,00E+00 | 1,30E-07 | 6,23E-06 | -5,12E-04 | -5,00E-05 |
| ODP [kg CFC-11 eq.] | 1,80E-12 | 2,77E-15 | 1,63E-16 | 0,00E+00 | 0,00E+00 | 1,40E-19 | 1,12E-15 | 0,00E+00 | 6,03E-15 | 1,00E-14 | 1,28E-13 | 2,18E-13 |
| AP [Mole of H+ eq.] | 1,48E-03 | 3,67E-05 | 8,62E-06 | 0,00E+00 | 0,00E+00 | 1,64E-06 | 5,40E-05 | 0,00E+00 | 1,18E-05 | 2,76E-05 | -7,00E-04 | -1,90E-04 |
| EPfw [kg P eq.] | 1,86E-06 | 7,77E-08 | 7,63E-09 | 0,00E+00 | 0,00E+00 | 2,60E-10 | 3,14E-08 | 0,00E+00 | 1,53E-09 | 9,53E-07 | -2,28E-07 | -8,20E-09 |
| EPmar [kg N eq.] | 3,91E-04 | 1,45E-05 | 4,40E-06 | 0,00E+00 | 0,00E+00 | 6,54E-07 | 2,64E-05 | 0,00E+00 | 3,92E-06 | 8,59E-06 | -1,68E-04 | -4,70E-05 |
| EPter [Mole of N eq.] | 4,15E-03 | 1,66E-04 | 4,83E-05 | 0,00E+00 | 0,00E+00 | 7,20E-06 | 2,92E-04 | 0,00E+00 | 5,85E-05 | 9,44E-05 | -1,78E-03 | -5,07E-04 |
| POFP [kg NMVOC eq.] | 1,26E-03 | 3,29E-05 | 8,17E-06 | 0,00E+00 | 0,00E+00 | 1,56E-06 | 5,01E-05 | 0,00E+00 | 9,74E-06 | 2,21E-05 | -5,45E-04 | -1,62E-04 |
| ADPE [kg Sb eq.] | 1,45E-05 | 1,40E-09 | 1,03E-10 | 0,00E+00 | 0,00E+00 | 4,27E-11 | 5,65E-10 | 0,00E+00 | 7,27E-11 | 2,09E-10 | -5,98E-06 | -1,36E-09 |
| ADPF [MJ] | 1,07E+01 | 2,90E-01 | 2,03E-02 | 0,00E+00 | 0,00E+00 | 1,73E-02 | 1,17E-01 | 0,00E+00 | 2,19E-02 | 1,02E-01 | -4,47E+00 | -1,02E+00 |
| WDP [m ³ world equiv.] | 4,05E-02 | 2,57E-04 | 8,94E-05 | 0,00E+00 | 0,00E+00 | 2,02E-06 | 1,04E-04 | 0,00E+00 | 8,39E-03 | 7,74E-06 | -1,57E-02 | -1,88E-03 |

Table 5/c: Environmental impact indicators (Group 3: M30x1.5)

| | Production | Distribution | Packaging waste treatment | Use | End-of-Life | | | | | | (not included in Figure 4) | |
|----------------------------------------|--------------------------------------------------|------------------------------------------|------------------------------------------------------------|----------------------------------------------------|---------------------------------------------|---------------------------------------------|--------------------------------|---------------|-------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------|--------------|
| Life cycle stages based on EN 15804+A2 | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
| Description | Manufacture of the product from 'cradle-to-gate' | Transport of the product to the customer | Installation of the product and disposal of used packaging | Use of the product over its lifetime e.g. 10 years | Deinstallation of the product from the site | Transport of the product to waste treatment | Processing waste for recycling | | Disposal of waste that cannot be recycled (through landfill and incineration) | | Potential benefits and loads beyond the system boundary due to reuse, recycling, and energy recovery | |
| Environmental Impact Indicators | | | | | | | | | | | | |
| GWPT [kg CO2 eq.] | 5,58E-01 | 2,40E-02 | 2,38E-02 | 0,00E+00 | 0,00E+00 | 1,35E-03 | 1,01E-02 | 0,00E+00 | 1,03E-01 | 7,80E-03 | -2,74E-01 | -7,07E-02 |
| GWPF [kg CO2 eq.] | 5,79E-01 | 2,38E-02 | 1,52E-03 | 0,00E+00 | 0,00E+00 | 1,35E-03 | 9,97E-03 | 0,00E+00 | 1,03E-01 | 7,79E-03 | -2,73E-01 | -7,07E-02 |
| GWPB [kg CO2 eq.] | -2,22E-02 | 0,00E+00 | 2,22E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| GWPLULUC [kg CO2 eq.] | 8,63E-04 | 2,19E-04 | 1,77E-06 | 0,00E+00 | 0,00E+00 | 3,27E-08 | 9,13E-05 | 0,00E+00 | 1,41E-07 | 6,99E-06 | -5,20E-04 | -3,52E-05 |
| ODP [kg CFC-11 eq.] | 1,97E-12 | 3,08E-15 | 1,63E-16 | 0,00E+00 | 0,00E+00 | 1,58E-19 | 1,28E-15 | 0,00E+00 | 6,56E-15 | 1,10E-14 | 2,31E-14 | 2,49E-13 |
| AP [Mole of H+ eq.] | 1,55E-03 | 4,09E-05 | 8,62E-06 | 0,00E+00 | 0,00E+00 | 1,85E-06 | 6,20E-05 | 0,00E+00 | 1,28E-05 | 3,08E-05 | -6,70E-04 | -6,56E-05 |
| EPfw [kg P eq.] | 1,98E-06 | 8,66E-08 | 7,63E-09 | 0,00E+00 | 0,00E+00 | 2,93E-10 | 3,60E-08 | 0,00E+00 | 1,66E-09 | 1,02E-06 | -2,44E-07 | 1,90E-08 |
| EPmar [kg N eq.] | 3,94E-04 | 1,61E-05 | 4,40E-06 | 0,00E+00 | 0,00E+00 | 7,38E-07 | 3,03E-05 | 0,00E+00 | 4,27E-06 | 9,61E-06 | -1,61E-04 | -3,52E-05 |
| EPter [Mole of N eq.] | 4,18E-03 | 1,85E-04 | 4,83E-05 | 0,00E+00 | 0,00E+00 | 8,12E-06 | 3,36E-04 | 0,00E+00 | 6,36E-05 | 1,06E-04 | -1,70E-03 | -3,80E-04 |
| POFP [kg NMVOC eq.] | 1,28E-03 | 3,67E-05 | 8,17E-06 | 0,00E+00 | 0,00E+00 | 1,76E-06 | 5,75E-05 | 0,00E+00 | 1,06E-05 | 2,46E-05 | -5,21E-04 | -1,23E-04 |
| ADPE [kg Sb eq.] | 2,36E-05 | 1,56E-09 | 1,03E-10 | 0,00E+00 | 0,00E+00 | 4,81E-11 | 6,49E-10 | 0,00E+00 | 7,91E-11 | 2,32E-10 | -6,77E-06 | 1,04E-05 |
| ADPF [MJ] | 1,11E+01 | 3,23E-01 | 2,03E-02 | 0,00E+00 | 0,00E+00 | 1,95E-02 | 1,34E-01 | 0,00E+00 | 2,38E-02 | 1,12E-01 | -4,53E+00 | -9,11E-01 |
| WDP [m ³ world equiv.] | 4,68E-02 | 2,86E-04 | 8,94E-05 | 0,00E+00 | 0,00E+00 | 2,28E-06 | 1,19E-04 | 0,00E+00 | 9,13E-03 | 1,87E-05 | -1,61E-02 | 1,54E-03 |

How to read scientific numbers:

e.g. 2,05E02 = 2,05 x 10² = 205

2,04E-01 = 2,04 x 10⁻¹ = 0,204

Table 6: Environmental impact indicator descriptions

| Acronym | Unit | Indicator |
|----------|--------------------------|----------------------------------------------------------------------------|
| GWPT | kg CO ₂ eq. | Carbon footprint (Global Warming Potential) – total |
| GWPF | kg CO ₂ eq. | Carbon footprint (Global Warming Potential) – fossil |
| GWPB | kg CO ₂ eq. | Carbon footprint (Global Warming Potential) – biogenic |
| GWPLULUC | kg CO ₂ eq. | Carbon footprint (Global Warming Potential) – land use and land use change |
| ODP | kg CFC-11 eq. | Depletion potential of the stratospheric ozone layer |
| AP | Mole H+ eq. | Acidification potential |
| EPfw | kg P eq. | Eutrophication potential – aquatic freshwater |
| EPmar | kg N eq. | Eutrophication potential – aquatic marine |
| EPter | Mole of N eq. | Eutrophication potential – terrestrial |
| POFP | kg NMVOC eq. | Summer smog (photochemical ozone formation potential) |
| ADPE* | kg Sb eq. | Depletion of abiotic resources – minerals and metals |
| ADPF* | MJ | Depletion of abiotic resources – fossil fuels |
| WDP* | m ³ world eq. | Water deprivation potential (deprivation-weighted water consumption) |

Results for module A1-A3 are specific to the product. All results from module A4 onwards should be considered as scenarios that represent one possible outcome. The true environmental performance of the product will depend on actual use.

The results in this section are relative expressions only and do not predict actual impacts, the exceeding of thresholds, safety margins, or risks. EPDs from others may not be comparable.

Carbon footprint

Group 1: RA click: The total carbon footprint, cradle-to-grave, of the product is **7,51E-01 kgCO₂-eq** (A1-C4), based on the average use phase scenario. The carbon footprint of production of this product, cradle-to-gate, is **6,29E-01 kgCO₂-eq** (A1-A3).

Group 2: RA nut: The total carbon footprint, cradle-to-grave, of the product is **6,56E-01 kgCO₂-eq** (A1-C4), based on the average use phase scenario. The carbon footprint of production of this product, cradle-to-gate, is **5,55E-01 kgCO₂-eq** (A1-A3).

Group 3: M30x1.5: The total carbon footprint, cradle-to-grave, of the product is **6,67E-01 kgCO₂-eq** (A1-C4), based on the average use phase scenario. The carbon footprint of production of this product, cradle-to-gate, is **5,58E-01 kgCO₂-eq** (A1-A3).

Table 7/a: Resource use (Group 1: RA click)

| | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
|------------|----------|----------|----------|---------|---------|----------|-------------------|------------------|-------------------|------------------|------------------|-----------------|
| PERE [MJ] | 6,51E00 | 2,41E-02 | 8,49E-04 | 0,00E00 | 0,00E00 | 6,63E-05 | 9,07E-03 | 0,00E00 | 5,22E-03 | 9,78E-03 | -7,13E-02 | 8,26E-02 |
| PERM [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| PERT [MJ] | 6,51E00 | 2,41E-02 | 8,49E-04 | 0,00E00 | 0,00E00 | 6,63E-05 | 9,07E-03 | 0,00E00 | 5,22E-03 | 9,78E-03 | -7,13E-02 | 8,26E-02 |
| PENRE [MJ] | 9,79E00 | 3,33E-01 | 2,18E-02 | 0,00E00 | 0,00E00 | 2,01E-02 | 1,25E-01 | 0,00E00 | 2,94E-02 | 1,22E-01 | -4,96E00 | -1,13E00 |
| PENRM [MJ] | 2,51E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| PENRT [MJ] | 1,23E01 | 3,33E-01 | 2,18E-02 | 0,00E00 | 0,00E00 | 2,01E-02 | 1,25E-01 | 0,00E00 | 2,94E-02 | 1,22E-01 | -4,96E00 | -1,13E00 |
| SM [kg] | 1,40E-02 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| RSF [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| NRSF [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| FW [m3] | 2,47E-03 | 2,64E-05 | 2,95E-06 | 0,00E00 | 0,00E00 | 1,06E-07 | 9,93E-06 | 0,00E00 | 2,64E-04 | 3,48E-06 | -6,31E-04 | -9,51E-05 |

Table 7/b: Resource use (Group 2: RA nut)

| | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
|------------|----------|----------|----------|---------|---------|----------|-------------------|------------------|-------------------|------------------|------------------|-----------------|
| PERE [MJ] | 6,26E00 | 2,11E-02 | 8,49E-04 | 0,00E00 | 0,00E00 | 5,70E-05 | 8,50E-03 | 0,00E00 | 3,89E-03 | 8,20E-03 | -2,29E-02 | 8,02E-02 |
| PERM [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| PERT [MJ] | 6,26E00 | 2,11E-02 | 8,49E-04 | 0,00E00 | 0,00E00 | 5,70E-05 | 8,50E-03 | 0,00E00 | 3,89E-03 | 8,20E-03 | -2,29E-02 | 8,02E-02 |
| PENRE [MJ] | 8,54E00 | 2,91E-01 | 2,18E-02 | 0,00E00 | 0,00E00 | 1,73E-02 | 1,17E-01 | 0,00E00 | 2,19E-02 | 1,02E-01 | -4,49E00 | -1,03E00 |
| PENRM [MJ] | 2,13E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| PENRT [MJ] | 1,07E01 | 2,91E-01 | 2,18E-02 | 0,00E00 | 0,00E00 | 1,73E-02 | 1,17E-01 | 0,00E00 | 2,19E-02 | 1,02E-01 | -4,49E00 | -1,03E00 |
| SM [kg] | 1,31E-02 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| RSF [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| NRSF [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| FW [m3] | 2,15E-03 | 2,31E-05 | 2,95E-06 | 0,00E00 | 0,00E00 | 9,16E-08 | 9,31E-06 | 0,00E00 | 1,97E-04 | 3,13E-06 | -5,63E-04 | -8,66E-05 |

Table 7/c: Resource use (Group 3: M30x1.5)

| | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
|------------|----------|----------|----------|---------|---------|----------|-------------------|------------------|-------------------|------------------|------------------|-----------------|
| PERE [MJ] | 6,41E00 | 2,35E-02 | 8,49E-04 | 0,00E00 | 0,00E00 | 6,43E-05 | 9,77E-03 | 0,00E00 | 4,23E-03 | 9,03E-03 | -7,43E-02 | 1,03E-01 |
| PERM [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| PERT [MJ] | 6,41E00 | 2,35E-02 | 8,49E-04 | 0,00E00 | 0,00E00 | 6,43E-05 | 9,77E-03 | 0,00E00 | 4,23E-03 | 9,03E-03 | -7,43E-02 | 1,03E-01 |
| PENRE [MJ] | 8,86E00 | 3,24E-01 | 2,18E-02 | 0,00E00 | 0,00E00 | 1,95E-02 | 1,35E-01 | 0,00E00 | 2,39E-02 | 1,12E-01 | -4,55E00 | -9,17E-01 |
| PENRM [MJ] | 2,28E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| PENRT [MJ] | 1,11E01 | 3,24E-01 | 2,18E-02 | 0,00E00 | 0,00E00 | 1,95E-02 | 1,35E-01 | 0,00E00 | 2,39E-02 | 1,12E-01 | -4,55E00 | -9,17E-01 |
| SM [kg] | 1,97E-02 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| RSF [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| NRSF [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| FW [m3] | 2,35E-03 | 2,57E-05 | 2,95E-06 | 0,00E00 | 0,00E00 | 1,03E-07 | 1,07E-05 | 0,00E00 | 2,14E-04 | 3,69E-06 | -5,80E-04 | -4,73E-05 |

Table 8: Resource use indicator descriptions

| Acronym | Unit | Indicator |
|---------|----------------|-------------------------------------------------------------------------------------------------------------------------|
| PERE | MJ | Use of renewable primary energy excluding renewable primary energy resources used as raw materials |
| PERM | MJ | Use of renewable primary energy resources used as raw materials |
| PERT | MJ | Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) |
| PENRE | MJ | Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials |
| PENRM | MJ | Use of non-renewable primary energy resources used as raw materials |
| PENRT | MJ | Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) |
| SM | kg | Use of secondary material |
| RSF | MJ | Use of renewable secondary fuels |
| NRSF | MJ | Use of non-renewable secondary fuels |
| FW | m ³ | Net use of fresh water |

Table 9/a: Waste categories and output flows (Group 1: RA click)

| | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
|-----------|----------|----------|----------|---------|---------|----------|-------------------|------------------|-------------------|------------------|------------------|-----------------|
| HWD [kg] | 7,14E-07 | 1,03E-12 | 6,51E-14 | 0,00E00 | 0,00E00 | 1,38E-13 | 3,87E-13 | 0,00E00 | 5,29E-13 | 7,94E-12 | -5,98E-07 | -2,38E-08 |
| NHWD [kg] | 2,05E-02 | 5,07E-05 | 1,88E-06 | 0,00E00 | 0,00E00 | 2,01E-06 | 1,91E-05 | 0,00E00 | 5,98E-04 | 1,36E-01 | -1,70E-03 | -2,02E-04 |
| RWD [kg] | 2,46E-04 | 6,23E-07 | 5,36E-08 | 0,00E00 | 0,00E00 | 2,15E-08 | 2,34E-07 | 0,00E00 | 1,24E-06 | 1,20E-06 | -2,80E-05 | 1,27E-05 |
| CRU [kg] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| MFR [kg] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 8,14E-02 | 0,00E00 | 0,00E00 | 0,00E00 |
| MER [kg] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| EEE [MJ] | 7,51E-03 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 1,81E-01 | 0,00E00 | 0,00E00 | 0,00E00 |
| EET [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 3,25E-01 | 0,00E00 | 0,00E00 | 0,00E00 |

Table 9/b: Waste categories and output flows (Group 2: RA nut)

| | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
|-----------|----------|----------|----------|---------|---------|----------|-------------------|------------------|-------------------|------------------|------------------|-----------------|
| HWD [kg] | 6,91E-07 | 9,00E-13 | 6,51E-14 | 0,00E00 | 0,00E00 | 1,19E-13 | 3,63E-13 | 0,00E00 | 3,95E-13 | 6,54E-12 | -5,79E-07 | -2,30E-08 |
| NHWD [kg] | 1,91E-02 | 4,43E-05 | 1,88E-06 | 0,00E00 | 0,00E00 | 1,73E-06 | 1,79E-05 | 0,00E00 | 4,46E-04 | 1,17E-01 | -1,71E-03 | -2,34E-04 |
| RWD [kg] | 2,07E-04 | 5,44E-07 | 5,36E-08 | 0,00E00 | 0,00E00 | 1,85E-08 | 2,19E-07 | 0,00E00 | 9,26E-07 | 9,98E-07 | -1,61E-05 | 1,17E-05 |
| CRU [kg] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| MFR [kg] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 7,64E-02 | 0,00E00 | 0,00E00 | 0,00E00 |
| MER [kg] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| EEE [MJ] | 5,60E-03 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 1,35E-01 | 0,00E00 | 0,00E00 | 0,00E00 |
| EET [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 2,42E-01 | 0,00E00 | 0,00E00 | 0,00E00 |

Table 9/c: Waste categories and output flows (Group 3: M30x1.5)

| | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
|-----------|----------|----------|----------|---------|---------|----------|-------------------|------------------|-------------------|------------------|------------------|-----------------|
| HWD [kg] | 7,18E-07 | 1,00E-12 | 6,51E-14 | 0,00E00 | 0,00E00 | 1,34E-13 | 4,17E-13 | 0,00E00 | 4,29E-13 | 7,07E-12 | -6,01E-07 | -2,40E-08 |
| NHWD [kg] | 2,08E-02 | 4,94E-05 | 1,88E-06 | 0,00E00 | 0,00E00 | 1,95E-06 | 2,05E-05 | 0,00E00 | 4,86E-04 | 1,32E-01 | -1,17E-03 | 3,90E-04 |
| RWD [kg] | 2,31E-04 | 6,06E-07 | 5,36E-08 | 0,00E00 | 0,00E00 | 2,09E-08 | 2,52E-07 | 0,00E00 | 1,01E-06 | 1,09E-06 | -2,30E-05 | 1,47E-05 |
| CRU [kg] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| MFR [kg] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 8,78E-02 | 0,00E00 | 0,00E00 | 0,00E00 |
| MER [kg] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 |
| EEE [MJ] | 6,09E-03 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 1,47E-01 | 0,00E00 | 0,00E00 | 0,00E00 |
| EET [MJ] | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 0,00E00 | 2,64E-01 | 0,00E00 | 0,00E00 | 0,00E00 |

Table 10: Waste category and output flow descriptions

| Acronym | Unit | Indicator |
|---------|------|-------------------------------|
| HWD | kg | Hazardous waste disposed |
| NHWD | kg | Non-hazardous waste disposed |
| RWD | kg | Radioactive waste disposed |
| CRU | kg | Components for reuse |
| MFR | kg | Materials for recycling |
| MER | kg | Materials for energy recovery |
| EEE | kg | Exported energy (electrical) |
| EET | kg | Exported energy (thermal) |

Table 11/a: Additional indicators* (Group 1:RA click)

| | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
|-------------------------|----------|----------|----------|---------|---------|----------|-------------------|------------------|-------------------|------------------|------------------|-----------------|
| PM [Disease incidences] | 1,66E-08 | 2,90E-10 | 5,42E-11 | 0,00E00 | 0,00E00 | 2,65E-11 | 3,70E-10 | 0,00E00 | 8,80E-11 | 2,97E-10 | -8,53E-09 | -2,88E-09 |
| IRP [kBq U235 eq.] | 3,67E-02 | 9,29E-05 | 4,54E-06 | 0,00E00 | 0,00E00 | 3,05E-06 | 3,49E-05 | 0,00E00 | 2,00E-04 | 1,74E-04 | -4,87E-03 | 1,58E-03 |
| ETPfw [CTUe] | 5,26E00 | 2,35E-01 | 1,68E-02 | 0,00E00 | 0,00E00 | 1,46E-02 | 8,85E-02 | 0,00E00 | 1,55E-02 | 1,14E-01 | -1,90E00 | -3,74E-01 |
| HTPc [CTUh] | 9,06E-10 | 4,82E-12 | 2,71E-13 | 0,00E00 | 0,00E00 | 2,71E-13 | 1,82E-12 | 0,00E00 | 8,24E-13 | 5,06E-12 | -3,88E-10 | -1,34E-10 |
| HTPnc [CTUh] | 3,32E-08 | 2,70E-10 | 1,18E-11 | 0,00E00 | 0,00E00 | 1,18E-11 | 1,14E-10 | 0,00E00 | 2,85E-11 | 4,34E-10 | -3,78E-09 | -7,65E-10 |
| SQP [Pt] | 2,79E00 | 1,39E-01 | 3,83E-03 | 0,00E00 | 0,00E00 | 5,14E-05 | 5,21E-02 | 0,00E00 | 6,45E-03 | 1,02E-02 | -1,51E-01 | 5,49E-02 |

Table 11/b: Additional indicators* (Group 2:RA nut)

| | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
|-------------------------|----------|----------|----------|---------|---------|----------|-------------------|------------------|-------------------|------------------|------------------|-----------------|
| PM [Disease incidences] | 1,53E-08 | 2,54E-10 | 5,42E-11 | 0,00E00 | 0,00E00 | 2,28E-11 | 3,47E-10 | 0,00E00 | 6,57E-11 | 2,53E-10 | -7,94E-09 | -2,67E-09 |
| IRP [kBq U235 eq.] | 3,07E-02 | 8,11E-05 | 4,54E-06 | 0,00E00 | 0,00E00 | 2,63E-06 | 3,27E-05 | 0,00E00 | 1,50E-04 | 1,44E-04 | -2,89E-03 | 1,45E-03 |
| ETPfw [CTUe] | 4,43E00 | 2,06E-01 | 1,68E-02 | 0,00E00 | 0,00E00 | 1,25E-02 | 8,30E-02 | 0,00E00 | 1,16E-02 | 9,60E-02 | -1,68E00 | -3,33E-01 |
| HTPc [CTUh] | 8,12E-10 | 4,21E-12 | 2,71E-13 | 0,00E00 | 0,00E00 | 2,33E-13 | 1,70E-12 | 0,00E00 | 6,15E-13 | 4,26E-12 | -3,62E-10 | -1,24E-10 |
| HTPnc [CTUh] | 2,62E-08 | 2,36E-10 | 1,18E-11 | 0,00E00 | 0,00E00 | 1,02E-11 | 1,07E-10 | 0,00E00 | 2,12E-11 | 3,66E-10 | -3,51E-09 | -7,00E-10 |
| SQP [Pt] | 2,55E00 | 1,21E-01 | 3,83E-03 | 0,00E00 | 0,00E00 | 4,43E-05 | 4,88E-02 | 0,00E00 | 4,81E-03 | 8,65E-03 | -1,20E-01 | 5,11E-02 |

Table 11/c: Additional indicators* (Group 3:M30x1.5)

| | A1-A3 | A4 | A5 | B6 | C1 | C2 | C3.1 Recycling | C3.2 Landfill | C4.1 Recycling | C4.2 Landfill | D.1 Recycling | D.2 Landfill |
|-------------------------|----------|----------|----------|---------|---------|----------|-------------------|------------------|-------------------|------------------|------------------|-----------------|
| PM [Disease incidences] | 1,54E-08 | 2,82E-10 | 5,42E-11 | 0,00E00 | 0,00E00 | 2,58E-11 | 3,99E-10 | 0,00E00 | 7,14E-11 | 2,83E-10 | -7,37E-09 | -1,55E-09 |
| IRP [kBq U235 eq.] | 3,41E-02 | 9,04E-05 | 4,54E-06 | 0,00E00 | 0,00E00 | 2,96E-06 | 3,76E-05 | 0,00E00 | 1,63E-04 | 1,57E-04 | -3,75E-03 | 1,46E-03 |
| ETPfw [CTUe] | 4,82E00 | 2,29E-01 | 1,68E-02 | 0,00E00 | 0,00E00 | 1,41E-02 | 9,54E-02 | 0,00E00 | 1,26E-02 | 1,58E-01 | -1,81E00 | -2,40E-01 |
| HTPc [CTUh] | 8,01E-10 | 4,69E-12 | 2,71E-13 | 0,00E00 | 0,00E00 | 2,63E-13 | 1,96E-12 | 0,00E00 | 6,69E-13 | 4,69E-12 | -3,33E-10 | -1,05E-10 |
| HTPnc [CTUh] | 2,83E-08 | 2,63E-10 | 1,18E-11 | 0,00E00 | 0,00E00 | 1,15E-11 | 1,23E-10 | 0,00E00 | 2,31E-11 | 4,06E-10 | -3,56E-09 | -1,52E-10 |
| SQP [Pt] | 2,74E00 | 1,35E-01 | 3,83E-03 | 0,00E00 | 0,00E00 | 4,99E-05 | 5,61E-02 | 0,00E00 | 5,23E-03 | 9,61E-03 | -1,55E-01 | 1,12E-01 |

Table 12: Optional indicator descriptions

| Acronym | Unit | Indicator |
|---------|-------------------|--------------------------------------------------------------------|
| PM | Disease incidence | Potential incidence of disease due to particulate matter emissions |
| IRP** | kBq U235 eq. | Potential human exposure efficiency relative to U235 |
| ETPfw* | CTUe | Potential Comparative Toxic Unit for ecosystems (fresh water) |
| HTPc* | CTUh | Potential Comparative Toxic Unit for humans (cancer) |
| HTPnc* | CTUh | Potential Comparative Toxic Unit for humans (non-cancer) |
| SQP* | Dimensionless | Potential soil quality index |

**Disclaimer for ADPE, ADPF, WDP, ETPfw, HTPc, HTPnc, SQP:* The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

***Disclaimer for ionizing radiation:* This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Additional environmental information

CEN (2015). *EN 50598-3:2015: Ecodesign for power drive systems, motor starters, power electronics and their driven applications – Part 3: Quantitative eco design approach through life cycle assessment including product category rules and the content of environmental declarations*. Brussels, Belgium: European Committee for Standardization.

CEN (2019). *EN 15804:2012+A2:2019: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products*. Brussels, Belgium: European Committee for Standardization.

Danfoss (2022). *Danfoss Product Category Rules: Environmental Product Declarations for Danfoss Products*. Nordborg, Denmark: Danfoss A/S.

ISO (2006a). *ISO 14025:2006: Environmental labels and declarations – Type III environmental declarations – Principles and procedures*. Geneva, Switzerland: International Organization for Standardization.

ISO (2006b). *ISO 14040:2006: Environmental management – Life cycle assessment – Principles and framework*. Geneva, Switzerland: International Organization for Standardization.

ISO (2006c). *ISO 14044:2006: Environmental management – Life cycle assessment – Requirements and guidelines*. Geneva, Switzerland: International Organization for Standardization.

Danfoss Climate Solutions

Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material. Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the product. All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.

Additional environmental information

Annex 1

The sales codes of all products covered in this EPD

Group 1: RA click – calculations based on REACT RA click – 015G3090 product

Including REACT and REDIA RA click models:

015G3090; 015G3094; 015G3098; 015G3080; 015G3088; 015G3290; 015G3390;
015G3398; 015G3392; 015G3396; 015G5421; 015G3380; 015G3388; 015G5320;
015G5422; 015G5423

Group 2: RA nut – calculations based on REGUS RA nut – 015G3690 product

Including REGUS RA nut models:

015G3690; 015G3698; 015G3695

Group 3: M30x1.5 – calculations based on REACT M30x1.5 – 015G3030 product

Including REACT M30x1.5 and REDIA RTD and Herz, and REGUS M30 models:

015G3030; 015G3034; 015G3038; 015G3330; 015G3338; 015G3339; 015G3336;
015G3350; 015G3356; 015G3337; 013G6010; 015G3839; 015G3636

Danfoss Climate Solutions

Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material. Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the product. All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.



Additional environmental information

Danfoss Climate Solutions

Any information, including, but not limited to information on selection of product, its application or use, product design, weight, dimensions, capacity or any other technical data in product manuals, catalogues descriptions, advertisements, etc. and whether made available in writing, orally, electronically, online or via download, shall be considered informative, and is only binding if and to the extent, explicit reference is made in a quotation or order confirmation. Danfoss cannot accept any responsibility for possible errors in catalogues, brochures, videos and other material. Danfoss reserves the right to alter its products without notice. This also applies to products ordered but not delivered provided that such alterations can be made without changes to form, fit or function of the product. All trademarks in this material are property of Danfoss A/S or Danfoss group companies. Danfoss and the Danfoss logo are trademarks of Danfoss A/S. All rights reserved.
