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Datasheet for the decision of 15 July 2025

Case Number: T 1994/23 - 3.2.03

Application Number: 17732480.3

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Title of invention:
HEAT TRANSFER SYSTEM

Patent Proprietor:
E.ON Sverige AB

Opponent:
Energy Machines ApS

Headword:

Relevant legal provisions:
EPC Art. 54, 56
EPC R. 99(2)
RPBA 2020 Art. 12(4)

Keyword:
Oral proceedings - Oral submission by an accompanying person (no)
Statement of grounds of appeal - insufficient substantiation (no)
Novelty - (yes)
Inventive step

Decisions cited:
G 0004/95

Catchword:

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Boards of Appeal

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Case Number: T 1994/23 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 15 July 2025

Appellant: (Opponent)	Energy Machines ApS Bryghuspladsen 8, 4. 402 1473 Copenhagen K (DK)
Representative:	Bjerkén Hynell KB P.O. Box 1061 101 39 Stockholm (SE)
Respondent: (Patent Proprietor)	E.ON Sverige AB 66 205 09 Malmö (SE)
Representative:	Bals & Vogel Patentanwälte PartGmbB Konrad-Zuse-Str. 4 44801 Bochum (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 6 November 2023 rejecting the opposition filed against European patent No. 3488153 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	C. Herberhold
Members:	B. Goers
	J. Hoppe

Summary of Facts and Submissions

I. European patent No. 3 488 153 relates to a heat transfer system comprising a heating circuit, a cooling circuit and a heat pump.

II. The opposition division decided to reject the opposition filed against the patent on the grounds of Article 100(a) EPC in conjunction with Articles 54 and 56 EPC.

This decision was appealed by the opponent ("appellant").

III. At the oral proceedings before the Board, the final requests were as follows.

The opponent requested that the decision under appeal be set aside and that the patent be revoked.

The patent proprietor ("respondent") requested that the appeal be dismissed (main request),
or, as an auxiliary measure, that the patent be maintained in amended form based on any of the following auxiliary requests in the given order:

- auxiliary requests 3, 1, 2, 4 to 6 and 26 (for auxiliary request 26: including an adapted description with paragraphs 1 to 61, as filed during the oral proceedings on 15 July 2025, received 17:13) or
- based on auxiliary requests 7 to 25 and 27 to 39, filed with the reply on 15 July 2024, or auxiliary request 40, filed on 1 July 2025.

IV. Documents referred to in this decision:

D1: WO 03/042600 Al
Appendix 1: google search result: "definition of connected"
Appendix 2: google search result: "definition of circuit"
Appendix 3: Excerpt from "Plant engineering" chapter, Mechanical Engineer's Reference book, 12th edn., ed. E.H. Smith, Butterworth-Heinemann Ldt., 1994, page 15/96

V. Relevant claim wording

(a) Independent claim 1 of the main request (patent as granted) reads (feature numbering added in "[]"):

"[a] *A heat transfer system comprising: a heating circuit (30) having: a heat source (32) configured to heat incoming heat transfer fluid;*
[b] *a heat emitter (38) configured to consume heat from incoming heat transfer fluid for heating surroundings of the heat emitter;*
[c] *a feed conduit (34) configured to, from the heat source (32) to the heat emitter (38),*
carry heat transfer fluid having a first temperature, and
[d] *a return conduit (36) configured to, from the heat emitter (38) to the heat source (32), carry heat transfer fluid having a second temperature, the second temperature being lower than the first temperature;*
[e] *a cooling circuit (40) having: a heat extractor (42) configured to extract heat from heat transfer fluid;*

[f] *a cooler (48) configured to absorb heat from its surroundings in order to cool the soundings of the cooler (48) by transferring absorbed heat to heat transfer fluid,*
[g] *a feed conduit (44) configured to, from the heat extractor (42) to the cooler (48), carry heat transfer fluid having a third temperature, and*
[h] *a return conduit (46) configured to, from the cooler (48) to the heat extractor (42), carry heat transfer fluid having a fourth temperature,*
the fourth temperature being higher than the third temperature;
[i] *and a heat pump (50) having: an evaporator heat exchanger (51) having a first circuit (52a) for circulating heat transfer fluid and a second circuit (52b) for circulating heat transfer fluid, wherein the first circuit (52a) has an inlet (53a) and an outlet (53b) connected to the cooling circuit (40), wherein the inlet (53a) of the first circuit (52a) is connected to the return conduit (46) of the cooling circuit (40),*
[j] *a condenser heat exchanger (54) having a third circuit (52c) for circulating heat transfer fluid and a fourth circuit (52d) for circulating heat transfer fluid,*
wherein the fourth circuit (52d) has an inlet (55a) and an outlet (55b) connected to the heating circuit (30), wherein the second circuit (52b) and the third circuit (52c) is a common circuit (56) of the first and second heat exchangers (51, 54);
[k] *wherein the fourth temperature is lower than the second temperature.*"

(b) Claim 1 of auxiliary request 3 has the following additional feature compared with claim 1 of the main request:

"[1] wherein the outlet (55b) of the fourth circuit (52d) is connected to the return conduit (36) of the heating circuit (30),"

(c) Claim 1 of auxiliary request 1 has the following additional feature compared with claim 1 of the main request:

"[2] wherein the outlet (53b) of the first circuit (52a) is connected to the return conduit (46) of the cooling circuit (40)"

(d) Claim 1 of auxiliary request 2 has the following additional features compared with claim 1 of the main request:

"[2] wherein the outlet (53b) of the first circuit (52a) is connected to the return conduit (46) of the cooling circuit (40),
[3] wherein the inlet (53a) of the first circuit (52a) is connected to the return conduit (46) of the cooling circuit (40) upstream relative to the outlet (53b) of the first circuit (52a)"

(e) Claim 1 of auxiliary request 4 has the following additional features compared with claim 1 of the main request:

"[4] wherein the inlet (55a) of the fourth circuit (52d) is connected to the return conduit (36) of the heating circuit (30),
[1] wherein the outlet (55b) of the fourth circuit (52d) is connected to the return conduit (36) of the heating circuit (30)"

(f) Claim 1 of auxiliary request 5 has the following additional features compared with claim 1 of the main request:

"[1] wherein the outlet (55b) of the fourth circuit (52d) is connected to the return conduit (36) of the heating circuit (30),
[4] wherein the inlet (55a) of the fourth circuit (52d) is connected to the return conduit (36) of the heating circuit (30)
[5] upstream relative to the outlet (55b) of the fourth circuit (52d),"

(g) Claim 1 of auxiliary request 6 has the following additional features compared with claim 1 of the main request:

"[4] wherein the inlet (55a) of the fourth circuit (52d) is connected to the return conduit (36) of the heating circuit (30),
[1] wherein the outlet (55b) of the fourth circuit (52d) is connected to the return conduit (36) of the heating circuit (30),
[4] wherein the inlet (55a) of the fourth circuit (52d) is connected to the return conduit (36) of the heating circuit (30)
[5] upstream relative to the outlet (55b) of the fourth circuit (52d)"

(h) Claim 1 of auxiliary request 26 has the following additional feature compared with claim 1 of the main request:

"[6] wherein the outlet (55b) of the fourth circuit (52d) is connected to the feed conduit (34) of the heating circuit (30)"

VI. The appellant's arguments relevant to the present decision can be summarised as follows.

(a) Oral submissions by an accompanying person

Oral submissions by Mrs Mittendorf during oral proceedings should not be allowed. The qualification of the accompanying person and the subject-matter to be presented were not stated sufficiently in advance as required by the criteria of G 4/95.

(b) Allegation of non-substantiation and admittance of Appendices 1 to 3

The attacks were sufficiently substantiated in the statement setting out the grounds of appeal. Appendices 1 to 3 should be admitted.

(c) Main request - novelty

The subject-matter of claim 1 was not novel over D1 since the first and fourth circuits defined in claim 1 were integral parts of the cooling and heating circuits disclosed in D1, Figure 2. The temperature relation of feature [k] was implicitly disclosed in D1, Figure 2.

(d) Main request - inventive step

The subject-matter of claim 1 did at least not involve an inventive step. It had already been disclosed in the embodiments of Figures 1 to 3 of D1 that controllability could be positively affected by the provision of by-passes and valves. As D1 disclosed states in which the heat pump is not operated, the

provision of such by-passes was obvious in view of the embodiment in Figure 2 of D1.

(e) Auxiliary requests 1 to 6 - inventive step

The subject-matter of claim 1 of auxiliary requests 1 to 6 did not involve an inventive step for the same reasons as the main request since no further distinguishing features were established by the amendments.

(f) Auxiliary request 26 - inventive step

The new distinguishing feature [6] was within the usual modifications obvious to a skilled person.

VII. The respondent's arguments relevant to the present decision can be summarised as follows.

(a) Oral submissions by an accompanying person

Oral submissions during oral proceedings were common practice and Mrs Mittendorf should thus be allowed to speak.

(b) Allegation of non-substantiation and admittance of Appendices 1 to 3

The opponent's attacks of lack of novelty and inventive step were not sufficiently substantiated in the statement setting out the grounds of appeal. Appendices 1 to 3 should have been filed already during opposition proceedings and should not be admitted.

(c) Main request - novelty

The subject-matter of claim 1 was novel over D1 since the first and fourth circuits could not be understood as integral parts of the cooling and heating circuits but did form separate parallel flow paths as required by features [d], [h], [i],[j] and [k]. Such flow paths were not disclosed in D1, Figure 2, and the heat exchangers of the heat pump as defined by claim 1 were different to those disclosed in D1. Furthermore, D1 did not disclose the temperature relation of feature [k].

(d) Main request - inventive step

The subject-matter of claim 1 involved an inventive step. The improved controllability and maintenance of the system as well as the more flexible integration of the heat pump achieved by the distinguishing features were not made obvious from D1 alone nor from the common general knowledge.

(e) Auxiliary requests 1 to 6 - inventive step

The subject-matters of claim 1 of each of auxiliary requests 1 to 6 involved an inventive step. D1, Figure 2, disclosed none of the new features added in these requests. Since D1 did not disclose two parallel flow paths, it could not establish or suggest the further distinguishing features.

(f) Auxiliary request 26 - inventive step

The new distinguishing feature [6] addressed the problem of improving the use of energy resources. Its implementation in the system of D1 would have required redesigning the heating circuit, for which D1 provided

the skilled person with no instructions or guidance. The subject-matter of claim 1 was thus neither suggested nor obvious from D1 or the common general knowledge.

Reasons for the Decision

1. Oral submissions by an accompanying person

The respondent's request to allow oral submissions by Mrs F. Mittendorf as "an employee of the representative" (i.e. as a person accompanying the professional representative of a party) during oral proceedings before the Board was rejected.

In accordance with G 4/95, such oral submissions can only be made with the permission of and under the discretion of the EPO (headnote II.a). In exercising its discretion, the EPO applies the criteria set out in headnote II.b, according to which the request should specify, *inter alia*, the qualifications of the accompanying person and the subject-matter of the proposed oral submission. Contrary to the respondent's belief, there is thus no "common practice" which would routinely allow accompanying persons to make oral submissions during oral proceedings. Rather the "common practice" is governed by the criteria established in G4/95 as discussed above.

In the case in hand, the respondent clarified only during oral proceedings that Mrs Mittendorf was a "chemist". No information was provided on the subject-matter to be presented other than that Mrs Mittendorf

was familiar with the technology of the patent. The Board considers this insufficient substantiation of the subject-matter, these statements being furthermore not made "sufficiently in advance of the oral proceedings" (G4/95, headnote 2.b.(ii)).

The fact that the appellant did not immediately request that the oral submissions by Mrs Mittendorf not be allowed in the written proceedings in reply to the respondent's request is not relevant in view of the Board's discretion and the criteria to be applied according to G4/95.

2. Allegedly inadmissible elements of the appellant's appeal case

The respondent argued that the statement setting out the grounds of appeal had "serious deficiencies" and that "attacks concerning novelty and inventive step needed to be sufficiently substantiated, which had not been done for all attacks". In the respondent's view, the attacks made with reference to these deficiencies were inadmissible.

In addition, the respondent contested that the alleged common general knowledge relied on by the appellant on pages 12, last paragraph to page 13, fourth paragraph of the statement setting out the grounds of appeal was sufficiently proven. The common general knowledge mentioned here appears to be the following:

- the "prevention of circulation through the heat energy transferring member reduces pressure loss [...] and energy required to pump fluid"

- "the heat pump needs to have means for taking it offline [e.g. during maintenance]"

Furthermore, the respondent argued that appendices 1 to 3 were an amendment under Article 12(4) RPBA, for which submission only in appeal the appellant provided no justification, and which could and should have been filed in the opposition proceedings.

2.1 Allegation of non-substantiation of novelty and inventive-step attacks

While raising this point, the respondent itself failed to explain why the arguments on pages 3 to 16 of the statement of grounds were insufficient with respect to the requirements set out in Rule 99(2) EPC and Article 12(2) and (3) RPBA.

In its statement setting out the grounds of appeal, the appellant set out which parts of the decision under appeal were - in its view - incorrect and provided arguments why this was the case. The appellant contested the opposition division's claim interpretation that formed the basis for the assessment of Article 54 EPC. Therefore, there is a direct link between the contested decision and the statement setting out the grounds of appeal (see e.g. page 4, first two paragraphs or page 11, second and third paragraph).

As already set out in point 6.1 of the preliminary opinion of the Board, the Board thus sees no reason to hold any of the appellant's submissions on the merits of the case in appeal inadmissible based on a lack of substantiation.

There is also no such thing as a "partially inadmissible" appeal (see Case Law of the Boards of Appeal, 11th edn., 2025, V.A.2.6.8).

2.2 Admittance of appendices 1 to 3

None of appendices 1 (see point 3.4.2), 2 (see point 3.4.3) and 3 (see point 4.2.4) is relevant for this decision. The question of their consideration in the appeal proceedings can, therefore, be left undecided.

3. Main request - novelty

The subject-matter of claim 1 of the main request is novel over D1.

3.1 Claim interpretation and reference to the requirements of Article 123(2) EPC

The appellant argued that the opposition division had, by means of its interpretation of the wording of claim 1 as filed, "added the implicit feature to the claim that the return conduit must be a continuous flow path from the cooler to the heat extractor".

It is understood that the appellant did not raise a new objection against an unallowable extension of subject-matter, which would anyway not be allowable as it would represent a new ground for opposition (namely Article 100(c) EPC), but merely advocates for a claim interpretation without this allegedly implicit feature.

The respondent argued that D1 did not disclose a system falling within the definition of features [d], [h], [i], [j] and [k], which were thus not disclosed in D1.

As will be explained in the following, the opponent's novelty objection is not persuasive since D1 does not disclose features [i] and [j]. However, features [d], [h] and [k] are disclosed.

3.2 Features [d] and [h]

Contrary to the respondent's view the return conduits defined by features [d] (in the heating conduit) and [h] (in the cooling circuit) are not distinguishing features over the system disclosed in Figure 2 of D1 and correspond to the following conduits:

- heating circuit 12: conduit from heat emitter 3 to heat source 2
- cooling circuit 11: conduit from cooler 22 to heat extractor 21

The evaporator and condenser of the heat pump are shown in Figure 2 of D1 only in a schematic way by boxes 15 and 16, i.e. without the internal fluid paths of the heat exchangers. However, for a skilled person it is implicit that the heat pump 2 in Figure 2 of D1 and its fluid paths correspond to the heat pump as shown in Figure 1 of the patent (see also D1, page 6, first paragraph).

The fact that these conduits encompass the condenser resp. evaporator flow path of the heat pump is not excluded by features [d] and [h].

For this reason the appellant's request not to admit the argument that features [d]and [h] were not disclosed can be left undecided.

3.3 Feature [k]

Feature [k] ("wherein the fourth temperature is lower than the second temperature") is also not a distinguishing feature over D1.

The temperature relation defined here is a functional feature of the system which is implicitly disclosed in D1. The defined temperature gradient is the precondition for the operation of a heat pump in the direction of heat transport disclosed in Figure 2 of D1, which is determined by the direction of operation of compressor 17 (clearly and unambiguously disclosed by the symbol indicated "17" in Figure 2 of D1) and the location of evaporator 15 and condenser 16. Due to the compressor, the temperature of the heat transfer fluid is increased beyond the evaporation temperature, inherently resulting in a second temperature (in the heating circuit) being higher than the fourth temperature (in the cooling circuit).

The fact that D1 encompasses the option to use heat from flue gases for heating the medium in the first cooling circuit 11 (see page 11, lines 31 to 35) does not lead to any other conclusion on the direction of heat transport in the heat pump.

First, this connection is clearly marked as optional in D1 ("it is also possible"). Second, flue gases from the heating boiler are only available when the heating boiler in the second circuit 12 is in operation, the heat energy transferring member 23 being taken functionally out of the circuit otherwise by valve 28 (see the sentence bridging pages 11 and 12). Therefore, the argument that the direction of heat transport (and in response the temperature relation of feature [k]) is

inverted in this configuration and that there is always some heat transfer from the flue gases to the first medium in the cooling circuit 11 is not persuasive.

3.4 Features [i] and [j]

3.4.1 Concerning feature [i], the novelty objection hinges on the understanding of the wording: "wherein the first circuit has an inlet and an outlet connected to the cooling circuit, wherein the inlet of the first circuit is connected to the return conduit of the cooling circuit". The two diverging lines of understanding discussed were the following.

(a) The wording requires that the first circuit branches off from and extends in parallel to the cooling circuit (see Figures 1 and 2 of the patent), as argued by the respondent.

(b) The wording encompasses that the first circuit be an integral part of the cooling circuit, i.e. the inlet and outlet of the evaporator be connected to the cooling circuit to form a continuous flow path, (see cooling circuit 11 in Figure 2 of D1), as argued by the appellant.

A similar point arose regarding feature [j] (related to the heating circuit and the fourth circuit), according to which "the fourth circuit (52d) has an inlet (55a) and an outlet (55b) connected to the heating circuit (30)".

3.4.2 However, it is not persuasive that features [i] and [j] encompass embodiments according to interpretation b).

The decisive wording in claim 1 in favour of the respondent's understanding is the following:

- feature [i]: "wherein the first circuit has an inlet and an outlet connected to the cooling circuit"

- feature [j]: "wherein the fourth circuit has an inlet and an outlet connected to the heating circuit"

According to these definitions the first and fourth circuits have an inlet and an outlet (thus defining a side circuit) connected to the corresponding, main cooling/heating circuit.

The general definitions of the term "connected" in appendix 1 cannot be applied with the same breadth to the connection of fluid lines in the case in hand and are thus not relevant for this decision. It is clear from common understanding of the term "circuit" and also supported by the embodiments in the figures of the patent that features [i] and [j] do not simply require that the inlet and outlet of the evaporator and condenser of the heat pump be connected and thus integrated in-line into the cooling and heating circuit.

A skilled person, applying a common and technically sensible understanding of the term "circuit", would not interpret a continuous circuit (such as circuits 11 and 12 disclosed in D1, Figure 2) as being virtually sub-divided into separate pieces (which do not form a closed cycle) that are then considered to be parts (or sub-circuits) "connected" in series. Also, the use of the terms "inlet" and "outlet" in this context would

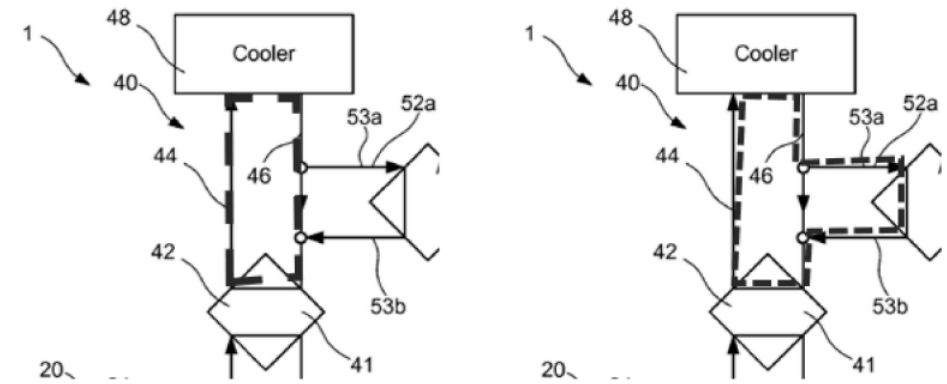
not fit to the skilled person's understanding of the terms.

The only convincing understanding is that the first and fourth circuits branch off and are distinct from the cooling and heating circuits, thus forming **parallel** flow paths.

3.4.3 The appellant's argument that the term "circuit" (reference was made to appendix 2) required a closed loop starting and finishing at the same place, thus making it not applicable to a parallel fluid line such as the first and fourth circuit as claimed is also not persuasive.

First, the appellant's argument is not consistent with its own approach of virtually subdividing a closed circuit into virtual sub-circuits. Second, the definition of "circuits" used in the patent is not in conflict with the definition in appendix 2. As - even considering appendix 2 - it would not change the Board's conclusions, the question of its admittance could be left open.

As exemplified by the appellant in its statement setting out the grounds of appeal, in the following figure (showing an excerpt from Figures 1, 2 and 4 of the patent with the cooling circuit and the first circuit; dashed lines being added by the opponent), the two parallel flow paths according to interpretation a) allow for two distinct, and closed, circulation loops being established.



3.4.4 The scope of claim 1 is indeed broader than the two structures presented in the above figures. While claim 1 defines that both the inlets and outlets of the first and fourth circuits are connected to the cooling and heating circuits, the exact location of the inlets and outlets remain undefined in the claim, with the sole exception of the inlet of the first circuit (being defined as connected to the return conduit of the cooling circuit).

3.4.5 In the system of Figure 2 of D1, the cooling and the heating circuit (11,12) have the evaporator and condenser included in the main circuit. This is a configuration wherein the first and fourth circuits (features [i] and [j]) coincide with the return conduits of the heating and cooling circuits as defined by features [d] and [h].

For this reason, D1 does not disclose the fluid lines which bypass the heat pump's heat exchangers (evaporator and condenser) as part of the (main) heating and cooling circuits defined by features [i] and [j].

Therefore, since D1 does not disclose such by-passes, the subject-matter of claim 1 is novel over D1.

3.4.6 During oral proceedings the appellant raised for the first time the argument that according to page 5, lines 5 to 9 of D1, the heat pump was "connected to" the circuits and was not part of the first and second circuits (11, 12). The respondent requested that this argument not be admitted under Article 13(2) RPBA. Since the appellant's argument is, *prima facie*, not convincing, the new argument was not admitted.

It is noted that in both the patent and D1, there is an overlap of the circuits and the heat pump since the circuits include the fluid channels of the evaporator and condenser.

4. Main request - inventive step

The opponent's objection that the subject-matter of claim 1 of the main request did not involve an inventive step starting from Figure 2 of D1 and considering common general knowledge is persuasive for the following reasons.

4.1 As explained above, the first and fourth circuit are, according to features [i] and [j], connected to the inlets and outlets of the evaporator and condenser of a heat pump which corresponds to an integration of a standard heat pump into a heating and cooling circuit, as also shown in Figure 2 of D1.

Therefore, the only structural difference between the system of claim 1 and that disclosed in Figure 2 of D1 is that no bypass for the evaporator and the condenser is specified (features [i] and [j]).

4.2 Technical effect and objective technical problem

4.2.1 The respondent argued that the heat pump defined by claim 1 was not a conventional ("handelsübliche") but a special heat pump, different from that disclosed in D1. Features [i] and [j] required that the first and fourth circuits were an integral part of the heat pump. For this reason the claimed system allowed both more flexible operation and integration of the heat pump compared with the system of D1.

This is not persuasive.

A conceptional difference between the first and second circuit disclosed in D1 compared with the first and fourth circuit defined by claim 1, independent of the wording used on page 5 of D1 has no basis in the features of claim 1. The functional definitions used in claim 1 to describe the circuits and conduits connecting the various heat sources and sinks cannot establish a structural difference over the conventional heat pump shown in D1. The respondent's reference to an effect described in paragraph [0016] of the patent ("the installation of the heat pump causes a minimum of interference on and adaptation of the control system of the heat pump") with the claimed heat pump allegedly facilitating a subsequent integration of such heat pump module to pre-existing cooling and heating circuits is thus not supported by the claim features.

4.2.2 Also the further technical problem defined by the respondent - in line with the conclusion of the opposition division - namely that the distinguishing features allow for "improving the controllability of mass flow towards the evaporator and enhancing the maintainability of the heat pump", is not persuasive as

it is too specific given the features of the system defined by claim 1.

It is first to be noted that the patent does not mention any effect related to the distinguishing features. It does not explain what is achieved by providing a bypass in parallel to the heat pump heat exchangers. According to paragraphs [0052] and [0053], the heat extractor/heater is controlled together with the heat pump to establish the third/first temperature. This is possible independent of whether all the fluid or only a part of the fluid in the main circuit is subjected to the heat pump's heat exchanger. Also with the system of D1, i.e. without bypasses, the same effect is obtained by the combination of heat extractor 21 and, when necessary, heat pump 1.

The patent is silent about whether and, if so, how the ratio between by-passed fluid and fluid directed to the heat pump (in the first and fourth circuit) can be adjusted, let alone controlled to further enhance the controllability. The disclosed system is also not suitable for such a control task because this would require a respective control means to adjust the split ratio between the by-pass and the first and fourth circuits. Such a control means is not defined in claim 1 and is not disclosed directly and unambiguously in the description either.

The only control valve mentioned in the patent is a "valve of valves [...] used to control the flow of heat transfer fluid into the return conduit 46 and the feed conduit 44, respectively". However, this valve is disclosed for an embodiment in which the outlet of the first conduit is connected to both the feed and return

line of the cooling circuit to adjust a split between both outlets (see paragraphs [0058] and [0059]).

4.2.3 With respect to the further alleged effect of improving the maintenance procedure by allowing the evaporator and condenser to be isolated from the circuit, this effect is likewise not supported by the features of the claim as no isolation valves are disclosed. Rather, the skilled person understands the circuits defined in claim 1 such that in normal operation, both the bypass and the parallel first and fourth circuits are open. The provision of a maintenance bypass would not inevitably lead to a configuration suitable for such a purpose (i.e. if using three-way valves, allowing only one of the circuits to be open at a time). Therefore, appendix 3 is also not relevant and a decision on its admittance is not required.

4.2.4 Indeed, the provision of by-passes parallel to the first and second circuits with the heat exchangers at least enables reducing the flow towards the heat pump. However, without any control means, this merely results in a fixed split ratio of the circulating stream between the by-pass and the first or fourth circuit. A fixed split alone does not provide a control function in the claimed system since this control would require a dedicated control means (valves or additional pumps) would be required.

However, this at least prepares the system to be adapted to changes in operating conditions. At such a general level, the objective technical problem of "improving the controllability of the system" (by increasing the degree of freedom) is acceptable.

4.3 Obviousness

The appellant argued that such (controllable) bypasses for allowing the system to adapt to changes in operating conditions were not only common general knowledge but were already applied in D1 at other parts of the system in Figure 2. The Board agrees at least the latter argument.

4.3.1 In D1, such bypasses ("valves" in the description and shown as valve-controlled by-passes in the figures) are specified for other heat exchangers in the cooling circuit 11 in the embodiments of Figure 1, 2 and 3:

- valve member 25 (with a bypass, see page 9, lines 26 to 32) "for controlling the flow of the second medium via the second heat energy transferring member" and which "suitably allows circulation of the first medium via the heat energy transferring member 22 [heat extractor] when indoor air is to be cooled and not allows such circulation otherwise"
- valve member 26 (with a bypass, see page 11, lines 23 to 26) "for controlling the circulation of the first medium to and fro [sic] the member 42 [heat extractor, see Figure 3]"
- valve member 28 (with a bypass, see page 11, line 35 to page 12, line 3) "for controlling circulation of the first medium to the member 23 [heat extractor]"

D1 also discloses such by-passes in the heating circuit (see Figure 3):

- valve member 37 (with a bypass, see page 7, lines 29 to 35) "is suitably controlled so that it allows

circulation of the second medium to the connection 30"

4.3.2 A bypass for the heat pump's evaporator and condenser is beneficial, for example, in operation states in which the energy-consuming heat pump is not needed or is only needed to a certain extent (D1 discloses further heat and cold sources in both circuits which still allow for operation of the circuits without a heat pump). For example, by-passing the heat exchangers of the heat pump can reduce pressure losses, an effect which the Board considers common general knowledge.

Operational states in which the heat pump is not used are also explicitly disclosed in D1 (see page 9, lines 12 to 23: "the heat pump does not have to be operated for cooling the indoor air, which is energy saving, and it is sufficient to operate the pump 14 for circulation of the first medium in the circuit 11").

As far as the respondent argued that the skilled person was demotivated to provide a bypass, since already switching off the heat pump was sufficient and the parallel bypass was a different technical concept this is not persuasive in view of the fact that D1 already suggests this very concept for other heat exchangers which are (temporarily) not used as explained above.

4.3.3 The provision of a bypass of the evaporator and condenser (15, 16) in the cooling and heating circuits (11, 12) to allow for a partial or complete bypass of the heat pump is thus obvious for a skilled person on the basis of the teaching in D1 alone. This conclusion is drawn based on D1 alone without using any of the appendices, and in particular without using appendix 3, such that the respondent's request not to consider them

plays no part in the context of the discussion of inventive step.

5. Auxiliary requests 1 to 6

The subject-matter of claim 1 of any of auxiliary requests 1 to 6 does not involve an inventive step for the following reasons.

5.1 Auxiliary requests 1 to 6 define permutations of the following additional features:

- feature [1]: "wherein the outlet of the fourth circuit is connected to the return conduit of the heating circuit"
- feature [2]: "wherein the outlet of the first circuit is connected to the return conduit of the cooling circuit"
- feature [3]: "wherein the inlet of the first circuit is connected to the return conduit of the cooling circuit upstream relative to the outlet of the first circuit"
- feature [4]: wherein the inlet of the fourth circuit is connected to the return conduit of the heating circuit"
- feature [5] "upstream relative to the outlet of the fourth circuit"

5.2 None of these features [1] to [5] establishes a further distinction over the system shown in Figure 2 of D1. Instead, these features define further details of the first and fourth circuits as shown in the embodiment in Figures 1, 2 and 3 of the patent in which both the inlet and the outlet of the first and fourth circuits are connected to the return lines of the cooling and heating circuits (see point 3.4.4 above).

Features [1] to [5] thus merely further define the embodiment of the system defined in claim 1, which, for establishing the distinguishing features, is compared with the system disclosed in Figure 2 of D1 as a starting point for the inventive-step discussion for the main request. The bypasses in parallel to the evaporator and condenser are thus still the only distinguishing features, and the conclusions for the main request as to their obviousness apply *mutatis mutandis*.

6. Auxiliary request 26

The appellant only raised an objection of lack of inventive step starting from D1 against auxiliary request 26.

6.1 The only additional feature compared with claim 1 of the main request is feature [6]: "wherein the outlet of the fourth circuit (i.e. the circuit forming the condenser outlet) is connected to the feed conduit of the heating circuit".

As the outlet of the fourth circuit (i.e. coming from the condenser) is now connected to the feed conduit of the heating circuit the structure of the heating circuit becomes significantly different to the heating circuit 12 in D1 in which the outlet of the fourth circuit is connected to the return conduit of the heating circuit 12. According to feature [c], the feed conduit of the heating circuit extends from the heat source to the heat emitter (see patent, Figure 4). It would thus now be required by the subject-matter of claim 1 that in the system of D1, Figure 2 the outlet of the condenser of the heat pump is connected to the

(feed) conduit extending between the heat source ("heat production unit 2") and the heat emitter ("system for heating premises and tap hot water 3") instead of being fed to the inlet of the heat source 2. Therefore, it cannot be argued, contrary to the main request, that simply the provision of a by-pass of the condenser is the distinguishing feature.

6.2 According to the respondent (by reference to paragraph [0005] of the patent), the technical problem was to improve the utilisation of energy resources. However, an improvement is not supported by the patent.

According to paragraph [0019] of the patent, this connection of the condenser of the heat pump to the heating circuit has the effect that "the installation of the heat pump causes a minimum of interference on and adaptation of a control system of the local heating system". It is further explained in paragraph [0053] that in this configuration, "the temperature of the heat transfer fluid returned to the feed conduit of the heating circuit is controlled" by the heat pump (and not by the heat production unit 2).

The objective technical problem is thus to enable an alternative structure of the heating circuit which allows for an alternative control of the feed conduit temperature.

6.3 As argued by the respondent, the skilled person receives no instruction or guidance on how to carry out such a modification. It was also not shown by the appellant that such a measure is within the common general knowledge.

Therefore, the subject-matter of claim 1 of auxiliary request 26 involves an inventive step.

7. It was undisputed that the adapted description complies with the requirements of the EPC. Therefore, auxiliary request 26 is allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent in amended form based on:

   - Claims: 1 to 9 of auxiliary request 26, filed with the reply on 15 July 2024
   - Description: paragraphs 1 to 61, filed on 15 July 2025 (received by email at 17:13)
   - Figures: 1 to 4 of the specification

The Registrar: The Chairman:

D. Grundner C. Herberhold

Decision electronically authenticated