

AN INSTALLATION UNIT IN A HEATING OR COOLING SYSTEM

The present invention relates to an installation unit in an energy distribution system – for a heating or cooling system – a number of functions or products having been integrated into an installation and service unit, which allows completely new conditions for the installation work as well as for the maintenance jobs in the system.

In the installations, which exist today, for a heating or cooling system, a number of components or functions are integrated, which jointly provide a system for the energy distribution out to the various apparatuses or premises, which exist in the particular case.

In these systems there is e.g. an integration of components for controlling the temperature regulating valves and/or thermostat valves – often provided with some type of adjustment devices – as well as a number of additional functions, e.g. connection points for filling or discharge of the system, for flushing, for dirt collection, for a deaeration device, for flow regulation, for various types of reading of e.g. volume flow or energy as well as various types of supervision. These various functions and components respectively often are mounted adjacent or directly connected to the heating or cooling assemblies; i.e. valves etc. are often mounted directly connected to a radiator or a cooling battery, a connector, namely out in the various rooms/premises.

In modern systems some of the above-mentioned functions are used, but the installation engineering or rather the systems available for the construction of the complete distribution system has a few drawbacks, which the present invention seeks to eliminate.

The worst drawback of the modern systems is the fact, that they have been developed from simple systems, in which a smaller number of components or functions were jointly integrated.

However, in modern complicated systems, not only regarding the energy components but regarding the entire construction process, there has been a continued construction of the systems already constructed, an optimization of the costs for the various integrated components often being done, without considering the entirety, the whole system, the entirety today being influenced by many different jointly responsible participants.

As regards the modern systems, there is often a conflict between various participants in connection with the construction process. The various working moments will, using the modern systems, be completely dependent on each other. Also, in other phases of the installation process often different interests collide.

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As an example it can be mentioned, that an adjustment of an energy distribution system often is done, when the premises already are being used and when the particular premises are not available in the same way as in an earlier phase of the construction process. Also, in other situations considerable problems regarding the accessibility arise, when a construction must be adjusted or some components must be exchanged or the like.

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The energy distribution systems have so far been constructed with a suboptimization as an initial position. This suboptimization means, that the systems will comprise a number of components, which per se, considered separately, are cost efficient, but that the total cost of the system "in situ" or for its maintenance has not been considered thoroughly, when the constructions have been developed.

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Not only the cost of the installation but much more its cost and its function during the technical life of the system consequently is the basic theory behind the present invention. Thanks to the present invention entirely new conditions have been obtained for the manufacture, the installation and the maintenance of an energy distribution system, which conditions allow completely new possibilities during the various phases of the construction and the useful life of a building.

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These thoughts and this object are realized according to the present invention by carrying out the construction according to what has been stated in the introduction mainly in such a way, as is set forth in the characterizing clause of claim 1. Additional characterizing features of and advantages of the invention are set forth in the following description, reference being made to the enclosed drawings, which show a preferred but not limiting embodiment of the invention. In detail, in diametrical, partially schematic sections or in perspective views:

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Fig. 1 shows a general view of an embodiment of a complete installation unit;

Fig. 2 a general view of an installation unit without a cabinet;

Fig. 3 distributors in various mounting positions;

35 Fig. 4 the principle of interconnecting a functional component;

Fig. 5 a distributor, mounted in a holding profile;

Fig. 6 a functional component; and

Fig. 7 a distributor with mounted functional components.

- 5 Fig. 1 shows an example of how a complete installation unit 1 according to the present invention is constructed; and Fig. 2 shows an embodiment of an installation unit without a cabinet 7.

These figures show a design, which only is one example of how integrated component parts are
10 assembled. Thus, within the scope of the inventive idea, a complete installation unit 1 may be provided with additional components, which may be directly or indirectly mounted on distributors 3 or alternatively constitute e.g. complementary parts to the functional component. Functional component 5 may e.g. represent electrical adjustment means, instead of the manual ones, shown in the figures, as well as mounted transmitters for remote reading and remote
15 control respectively of the mounted valves: Also, as examples pressure and temperature transmitters may be mounted in the various measuring nipples 12, 13, 17 and 67, which consequently allow a direct or indirect reading.

According to a preferred embodiment of the invention the various components are mounted in a
20 cabinet to obtain a complete installation unit 1, which results in, that the installation – the installation work as well as the component placements – will be completely changed compared to the installation principles used today, resulting in the advantages, which the present invention allows.

- 25 The primary tube system is connected to the unit - intake 8 and return 9 respectively – connection tubes at 8 and 9 respectively comprising connection ends 10, which optionally are threaded, provided with flanges or are flat, as is shown in Fig. 1.

At connection 8 – on the intake side of the unit – a balancing valve 11, with its measuring
30 nipples 12 and 13 respectively, is mounted as a first component.

Balancing valve 11 advantageously has an internal thread at its two ends. By means of a connection piece 14 balancing valve 11 is connected to a distributor 3.

The connection piece has an external thread, directed towards balancing valve 11, and a bayonet holder at the end, which is connected to distributor 3.

5 The construction of the bayonet holder is shown in Fig. 3. Also, the separate distributors 3 are connected in an axial direction using the same principle and normally 2-4 distributors are connected in series. The last distributor is normally terminated with a connection piece 15, which is terminated with a plug 18, which also is mounted via a bayonet holder in connection piece 15.

10 At connection 9 – on the return side of complete installation unit 1 – a differential pressure valve 16 with its measuring nipple 17 is mounted as the last component. Differential pressure valve 16 preferably is threaded in its interior at its two ends and is connected to distributor 3 by means of a connection piece 14 in the same way as balancing valve 11. As the last component on return side 9 there is a connection piece 15, which
15 advantageously may be similar to the one, which is mounted on the intake side. As an alternative to plug 18 this connection piece may be provided with a coupling 19, in which in a particular case e.g. a discharge or a deaeration function is mounted.

20 Distributors 3 and connection pieces 14,15 are mounted in a profile 4, which is described in more detail below.

In order to be able to always carry out a simple installation or service of the complete system complete installation unit 1 is constructed in such a way, that complete cabinet 7 comprises a number of sides/parts, which, when assembled, constitute the complete cabinet. The complete
25 cabinet preferably is made of a metal sheet material or alternatively a suitable plastic material.

In order to carry out the installation work in a simple fashion and with a satisfactory accessibility to all the components cabinet 7 will comprise a back plate 20 and a bottom plate 21, which advantageously are bent in one piece. On this work piece – 20/21 – profile 4 is
30 fastened by means of screws or the like. Subsequently the valves, distributors, functional components and connection pieces, which will be used in the particular construction, will be mounted.

When the tube work/installation has been completed, lateral pieces 22 and 23 and lid 24
35 respectively will be mounted. Lateral piece 23 preferably is slit, allowing it to be pushed

inwards above connections 8 and 9, whereas lid 24 preferably consists of two portions in order to also allow a dismounting, after the connection of tubes 25 to the interacting tubes from e.g. radiators or convectors, which complete installation unit 1 interacts with. As the last step lid 24 is screwed or in another way fastened to sides 22 and 23 and the sides of bottom plate 21
5 respectively.

The distribution of the total flow outwards to the various consumption units, e.g. convectors, is done via stop valves 29, mounted in cut-offs 30 on distributors 3. Stop valve 29 has a tube coupling 31, to which a tubular loop 32 is connected and the return from this tubular loop 33 is
10 connected to return connection 34 by means of its tube coupling 35 to functional component 5.

The entire installation unit 1 is mounted and function tested, e.g. tested regarding pressure, in a factory, which allows a high degree of functional reliability.

15 A possible leakage in installation unit 1 can be easily indicated, since the unit is mounted in a cabinet 11, and this means, that the risk of moisture damages on the building is minimized.

The integration of several functions in an installation unit 1 according to the present invention results in several advantages.
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Thus, several functions have been assembled in just one place and consequently been removed from earlier locations, in which they have been scattered and e.g. mounted in various places and often connected to other components in the system. Thanks to the present invention a heating and cooling plant can be constructed in such a way, that the installation contractor mounts e.g.
25 radiators in the building at one moment and in a later stage interconnects the same to obtain installation unit 1. Also, the contractor can make his tubing from the heating or cooling assemblies up to the installation unit 1 at the same occasion and at a later occasion make the final interconnections of the various heating and cooling assemblies to the primary energy source or to tubing system originating from the same. It is also possible to connect e.g. one
30 portion of the building to the complete heating or cooling system without the need at this time to connect all other portions of the building. This means, that installation unit 1 in a first phase comprises several distributors 3, one or several of them being provided with plugs in connections 30. In a second installation step additional functional components 5 can be interconnected, if they are required. Even if from a structural engineering point of view it would

not be advantageous to mount the installation unit in a cabinet 7, this design is nevertheless an embodiment of how the present invention can be used – see Fig. 2.

5 The installation unit replaces the demand for externally, e.g. in each premise, mounted valves, designed to control the flow and then also the room temperature. By using functional components 5 and stop valves 29 and additional components, e.g. filters and stop valves, which may be specific for the installation, has in this way all the installation and preliminary adjustment work regarding the components, which normally constitute parts of normal cooling and heating installations, i.e. primarily flow regulating valves, stop valves, discharge valves and
10 filters, been removed from the various premises, and instead been united in just one place, the installation unit.

The installation unit can be mounted in an optional place, e.g. in a passage or in an appliance room. The separate locations, with their convectors or heating elements, which are connected to
15 the unit, consequently will be freed from all kinds of installation work, as soon as the intake and return ducts have been mounted between the devices and the installation unit. The interconnection of the ducts with the installation unit can be done in a later phase. This means, that the various premises do not have to be accessible in a later phase, when e.g. the final adjustment work will be done or a change will take place regarding the choice of components or
20 the service of the components. This is a great advantage in comparison with the presently used systems, in which this accessibility always is a requirement.

By using installation unit 1 according to the present invention a concentrated localization of the functional components can be attained and then also a number of advantages, as follows:

- 25 -Installation unit 1 allows an accessibility to this unit and consequently also to the interconnected components.
- All the service work can be carried out in just on place.
- The interconnection of installation unit 1 to primary tube system 6 can be done at one specific time and not necessarily connected at the time, when the separate premises are prepared or are
30 interconnected to the distribution unit.
- The interconnection and the connection of the separate rooms/premises can be done successively to the installation unit.
- Installation unit 1 can be developed with additional distributors 3, in case e.g. new premises or other room divisions must be connected in a later phase, without affecting already connected
35 premises.

- Supplementary uses of/exchanges of functional components can be done in a later phase.
- Measurement and supervision of the energy status of the various premises can be done through the installation unit.
- Using a complete installation unit 1 reduces the risk of water damages in the building.
- 5 -By using an installation unit, which is prefabricated, a controlled, functionally reliable product is obtained.

The various portions of installation unit 1 are described in detail in the following figures.

- 10 Fig. 2 shows installation unit 2, which comprises all the tubular and functional components, which are integral parts of complete installation unit 1, including profile 4, without a surrounding cabinet 7, and in a view, seen from the rear portion of the installation unit in relation to intake 8 and valve 9. As the last component connection piece 15 is mounted. In order to obtain an axial mounting position for the connection piece and consequently also other parts,
- 15 connected in series, connection piece 15 is provided with a flange 26. This flange has a diameter, which is proportional to profile 4 in such a way, that flange 26 bears against end gable 27 of the profile. With this fixed position of the connection piece and of the distributors certain positions for all the tube cut-offs are obtained, which originate from the distributors and consequently the position for the tubes 32 and 33 in relation to profile 4 is given. There is no
- 20 absolute retention of connection piece 15 or distributors 3 in the opposite axial direction, but lid 24 and its tube-leadthroughs 28 constitute there a support like the final connection of inlet 8 and return 9.

Fig. 3 shows the principal construction of distributor 3.

- 25 Normally the distributors are made with 2 pieces of cut-offs 30, but the number of the cut-offs varies preferably between 1 and 4 pieces. In these cut-offs functional components 5 are mounted, which may have a number of different functions or combinations of functions. In the description – see Fig. 4 – a preferred design of the interconnection of the functional component
- 30 and the distributors has been described, but this design is just one example within the scope of the invention. The design of the connections ends of the distributors is shown in Fig. 3A.

- This figure shows, that the distributor has a female part 36 and a male part 37. These two parts are joined and then O-ring 38 in the female part will glide upwards on cylindrical part 39 of the
- 35 male part. The female part has an inner diameter 41 with an O-ring groove 40 and a short

cylindrical part 42 outside the O-ring groove, with the same diameter as 41. The female part is terminated with two shoulders 44, positioned in a diametrical direction in relation to each other and which each extend preferably somewhat less than 90° around the periphery of the female part. The shoulders have an inner diameter, which is somewhat larger – preferably 1-4 mm –
5 than inner diameter 41 of the female part and an axial extension, which preferably is 2-4 mm.

Male part 37 is designed in such a way, that outer diameter 39 with its front oblique surface 45 cooperates with inner diameter 41 of the female part and with O-ring 38 and at the same time as male part 37 has two cylindrical portions 46, which after the interconnection of the distributors
10 engage groove 43 of the female part and consequently lock the distributors in an axial direction. Cylindrical portions 46 are located at the same distance from flange 47 of the distributor, which constitutes the end of the male part inwards towards the distributor, like the thickness of shoulders 44, and has a thickness, which is adjusted to and which cooperates with groove 43 and its width. In a radial direction the length of cylindrical portions 46 are coordinated to enable
15 them to be inserted between the two shoulders 44 of female part 36 and the distance, which exists between these shoulders.

Fig. 3B shows, how distributors 3 are interconnected. In the upper figure the male and the female parts have been pushed into each other, cylindrical part 39 of the male part being
20 integrated with O-ring 38 of the female part and with inner diameter 41 of the female part. However, in the upper figure the right distributor has not been turned yet in relation to the connection of the interconnecting distributor, which means, that in this position shoulders 44 of the female part have not engaged the projecting cylindrical portions 46 of the male part. In the lower part in Fig. 3B the right distributor has been turned 90° . In this position the cooperating
25 connection ends – the male and the female parts - have occupied their final positions and this means, that the two distributors are mutually locked in an axial direction. In this position all cut-offs 30 are parallel and directed in the same direction. In connection with the subsequent mounting of the distributors in profile 4 also their mutual position in a rotational direction will be locked. The locking is done, because locks 65, which are located on the periphery of the
30 distributor and which are located with a 90° division and where a spring extends through the center for cut-offs 30 and the rest thus with a 90° displacement to this plane, engage with corresponding groove 64 in profile 4. The length, height and width of the springs have been evaluated. The length is practically about the same as the distributor excluding its connection ends, whereas the width or thickness is about 2-6 mm and the height preferably is about 5-30
35 mm. The springs preferably are provided with recesses 77, which make them less expensive to

manufacture and which of course can vary as to shape and number within the scope of the invention. The distributor can of course be designed with only 2 or 3 springs, but 4 springs result in casting technology advantages, since a more even material distribution in the blank to the distributor is obtained. Consequently shrinkages during casting can be avoided. The
5 mounting of the distributor in the profile is described thoroughly, reference being made to Fig. 5.

Fig. 4 shows, how the various functional components 5 are mounted on distributor 3. Cut-offs 30 of the distributors are designed in such a way, that a functional component 5 and its
10 connection end 55 can be pushed into cut-off 30 and be fixed by means of a locking ring 48. In more detail cut-off 30 is designed with a turned interior surface 49, which cooperates with a guide pin 50 on connection end 55, the guide pin having a diameter, which cooperates with surface 49 in order to give the functional component a
15 guided, stabilized fastening in distributor 3. Outside surface 49 – at a larger distance from the center of the distributor – there is a second interior turned surface 51 and this surface cooperates with second cylindrical part 52 on the functional component, which has a somewhat, preferably 2-5 mm, larger diameter than guider pin 50. The length of these two turned parts 50 and 52 respectively preferably is 10-20 mm. On the cylindrical part 52 there is also an O-ring groove 53 with a mounted O-ring 54.

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In order to be able to fix functional component 5 to distributor 3 connection end 55 is provided with a resilient, open/slit locking ring 48, mounted in a groove 56, which is located on cylindrical part 57, which has a diameter, which is a few additional mm longer than the adjacent cylindrical surface 52. Cylindrical part 57 locks the position of locking ring 48 in an axial
25 direction and this locked position is also secured by flange part 58, which constitutes the transition from connection end 55 of the functional component to that part, which contains the functional part itself.

On cut-off 30 of the distributor there is a cylindrical interior surface 59, immediately outside
30 surface 51, with a turned groove 60, which has a width and a depth, which are chosen in order to be able to cooperate with locking ring 48 and cylindrical part 57 of connection end 55.

When connection end 55 is pushed into cut-off 30, the two open end portions 61 of locking ring 48 are pressed together and are not released, until the connection end has entered into its final

position. Then the legs of the locking ring spring outwards and into groove 60 and locks the connection in an axial direction.

5 The functional component can always be dismounted, since it is then only necessary to press the two end portions together or the legs on locking ring 48 and subsequently it is easy to draw out connection 55 from cut-off 30.

10 In order to control the functional component – prevent it from rotating – cut-off 30 is provided with two diametrically opposed projecting portions 62. These portions 62 have an inner diameter, which is somewhat larger than the outer diameter of the cooperating recess 63 in connection end 55. When functional component 5 is pushed into the distributor, projecting portions 62 climb on or pass surface 63 on connection end 55. The periphery and the projecting length of portions 62 is coordinated with corresponding recess 63 in flange portion 58 of connection end 55.

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Fig. 5 shows, how a distributor 3 is mounted in profile 4.

Profile 4 preferably is an extruded Al-profile and its main task it to rotationally fix the distributor. According to the present invention the profile is designed to be able to fix two rows of distributors, which means, that one row with e.g. three integrated distributors are placed in one row, whereas the corresponding three distributors are mounted in a second row.

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25 The distributors are fixed in a rotational direction, since profile 4 is provided with circular segments 73 and 74 respectively with three and two respective grooves 64, which have a width and a depth, which are coordinated with the thickness and the radial extension of springs 65 on distributors 3. Distributors 4 preferably have springs, one spring passing through the center of cut-off 30. These springs may within the scope of the present invention have various lengths and shapes, but the function to control the position of the distributors in relation to profile 4 as well as to obtain an improved symmetry regarding the manufacture/casting of the distributors is the main function.

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35 The distance between the two distributor rows in profile 4, from the center of the distributors, is to be chosen in such a way, that it will be easy to obtain a simple joining of the various components, which will be mounted in a certain installation situation. Thus, a distance is chosen in a height direction as well as in another direction, which means, that components can

be mounted and service be carried out and at a minimal cost. One example of a distance between the two rows is, that “a = 80 mm” and “b = 40 mm”. The “a-distance” is a measure, which indicates the lateral displacement between the centers of the two distributor rows, whereas the “b-distance” indicates the height difference between the centers of the distributor rows.

Profile 4 essentially is an L-profile, which also has been developed to comprise two circular portions and which in a cross-section is designed in such a way, that these circular segments constitute portions, which touch the two legs of the L-profile. The L-profile has a bottom surface 70 and an angular surface 71, which in its upper part has a reinforcement 72, which constitutes an extension of surface 71 and preferably has an angle of 90°.

Reinforcement 72 extends at right angles from angular surface 71 and is also then bent again downwards towards bottom surface 70. Reinforcement 72 is finally transformed into a first concave circular segment 73 with a circumference of altogether 180°, which in its rear part, after 90° reaches angular surface 71, where the angular surface constituting the bottom of one of the three grooves 64, which have been formed on circular segment 73. In the lower edge of circular segment 73 the profile extends an additional distance, a surface 75, away from angular surface 71 and in parallel with bottom surface 70. Depending on the diameter of distributor 3, which preferably is smaller, than what is true for measurement “b” for the profile, the profile comprises also an oblique plane 76, which connects surface 75 with a second cylindrical, concave circular segment 74, which at its lower part is terminated with a groove 64, the bottom part of which constitutes a part of the total bottom surface 70. Circular segment 73 is provided with three grooves 64 with a 90° division, the center groove extending at right angles outwards from angular surface 71.

Second circular segment 74 comprises only two grooves 64, one of them extending at right angles outwards from bottom surface 70 and the second groove being displaced 90° and towards angular surface 71. The radius of the two circular segments 73 and 74 is chosen in such a way, that it will interact with the outer diameter of distributors 3.

Profile 4 may of course be designed in a somewhat different way within the scope of the invention. Its main function is to fix distributors 3 in suitable positions and also indirectly in relation to cabinet 7, since the profile preferably will be fastened to cabinet 7 with screws in a suitable way.

The profile also provides a high degree of motion regarding the mounting of the distributors and then also other components. Since the profile is completely open in its end portions, it is easy to replace the distributors, because they do not have to be screwed or in other ways be
5 locked in an axial direction.

Fig. 6 shows schematically, how a functional component 5 is designed.

This component may e.g. be a stop valve, a deaeration valve or a control valve.
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Fig. 6 shows a simple check valve 66 with a measuring nipple 67. These details are not described exhaustively, because they just constitute examples of components, which can be used in the complete installation unit 1.

15 Fig. 7 shows, how a functional component 5 is connected to distributor 3 and to the load side.

From installation unit 1 a number of loops or tubes 32, connected in parallel, extend outwards to radiators or convectors or similar energy devices and the return from these loops 33 is connected to return connection 34 of functional component 5 by means of e.g. a tube coupling
20 35. According to Fig. 7 distributor 3 is in this case provided with two cut-offs 30 and thus to these two cut-offs two functional components are connected. Functional components are in this case a standardized variant of a temperature-guided check valve 66 with mounted directly acting adjusting devices 69. Also, in this case the functional component is provided with a measuring nipple 67.

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The described design of the functional component must only be regarded as one example of the construction of the complete installation unit 1.

COMPONENT LIST

	1 = complete installation unit	2 = installation unit
	3 = distributor	4 = profile
5	5 = functional component	6 = primary tube system
	7 = cabinet	8 = intake
	9 = return	10 = connection end
	11 = balancing valve	12 = measuring nipple
	13 = measuring nipple	14 = connection piece
10	15 = connection piece with a plug	16 = differential pressure valve
	17 = measuring nipple	18 = plug
	19 = coupling	20 = back plate
	21 = bottom plate	22 = lateral piece
	23 = lateral piece	24 = lid
15	25 = -	26 = flange
	27 = end flange	28 = tube lead-through
	29 = stop valve	30 = cut-off
	31 = tube coupling	32 = tubular loop
	33 = tubular loop	34 = return connection
20	35 = tube coupling	36 = female part
	37 = male part	38 = O-ring
	39 = cylindrical part	40 = O-ring groove
	41 = inner diameter	42 = cylindrical part
	43 = groove	44 = shoulder
25	45 = radius	46 = cylindrical portions
	47 = flange	48 = locking ring
	49 = turned surface	50 = guide pin
	51 = turned surface	52 = cylindrical part
	53 = O-ring groove	54 = O-ring
30	55 = connection end	56 = groove
	57 = cylindrical part	58 = flange part
	59 = cylindrical surface	60 = groove
	61 = end parts	62 = projecting parts
	63 = recess	64 = groove
35	65 = springs	66 = check valve

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|---|-----------------------------|------------------------------|
| | 67 = measuring nipple | 68 = - |
| | 69 = adjusting device | 70 = bottom surface |
| | 71 = angular surface | 72 = reinforcement |
| | 73 = first circular segment | 74 = second circular segment |
| 5 | 75 = surface | 76 = oblique plane |
| | 77 = recess | |

CLAIMS

1. A device for an energy distribution system comprising a complete installation unit (1), which is connected to a primary tube system (6) via an intake (8) and a return (9) respectively, and a
5 balancing valve (11) with its measuring nipples (12) and (13) being mounted on the intake side and a differential pressure valve (16) with a measuring nipple (17) on the return side, the intake side and the return side being connected to a connection piece (14), which allows an interconnection to a connection end (36) of a distributor (3) on the respective intake side and return side, the distributor (3) in its turn being interconnected additionally with one or several
10 distributors, which all are provided with a connection end, a female part (36) and a male part (37) respectively and are mounted in a profile (4), which preferably is an extruded Al-profile, being designed to be able to fix and rotationally control two rows of distributors (3), in the various distributors one or several tube circuits being mounted in parallel outwards to the various heating or cooling assemblies, which are fed from the complete installation unit, a stop
15 valve (29) on a tubular loop (32) feeding the media outwards to the heating/cooling assembly, the medium being returned in a tube loop (33), which via a tube coupling (35) is connected to a return connection (34) on a functional component (5), and the functional component preferably being a check valve or a control valve and designed with a second connection end (55), which is connected to a cut-off (30) on the distributor (3), the medium subsequently flowing via the
20 differential pressure valve (16) back to the primary system via the return connection (9),
characterized in that the distributors (3) are mounted in the profile (4), which fixes the distributors in two rows, with an evaluated distance between these rows, the distributors (3) in the respective row being rotationally fixed, because two or alternatively three springs (65) on the distributor (3) slide into interacting grooves (64) in the profile (4).

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2. A device according to claim 1, **characterized in that** the distributors (3) are interconnected with the most adjacent distributor, the female part (36) of one of the distributors interacting with the male part (37) of the other adjacent distributor, the male part being designed in such a way, that a cylindrical part (39) with a front radius (45) interacts with an
30 inner diameter (41) and an O-ring (38) on the female part (36), at the same time as the male part (37) has two cylindrical portions (46), which after an interconnection and a rotation of one of the distributors, all the cut-offs (30) on the two distributors being turned in the same direction, engage a groove (43) in the female part and consequently locks the distributors in an axial direction.

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3. A device according to claim 1, **characterized in that** the distributor (3) is provided with a cut-off (30), to which various functional components (5) are connected, because the connection end (35) of the functional component (5) is pushed into the cut-off (30) and fixes the functional component in an axial direction by means of a locking ring (48) and
5 rotationally by means of two projecting portions (62).

4. A device according to claim 1 and 3, **characterized in that** the cut-off (30) has a turned interior surface (49), which interacts with a guide pin (50) on the connecting end (55) of the functional component (5), and in that, in order to secure an axial locking between
10 the functional component (5) and the distributor (3), connection end (55) has a resilient, open locking ring (48), mounted in a groove (56), which is placed on a cylindrical part (57), the cylindrical part (57) and its groove (56) locking the position of the locking ring (48) in an axial direction on the functional component, and, when connection end (55) is pushed into the cut-off (30), the cut-off (30) on the distributor with an inner cylindric surface (59) with a rounded
15 groove (60) receiving the locking ring (48) and after an engagement of locking ring (48) in groove (60) the functional component (5) being axially fixed to the distributor (3).

5. A device according to claims 1 and 3, **characterized in that** the cut-off (30) is provided with two diametrically opposed, projecting portions (62) with a inner diameter, which
20 is somewhat larger than the outer diameter of a recess (63) in the flange portion (58) and in that, when the functional component (5) is pushed into the cut-off (30), the projecting portions (62) climb and passes the recess (63), the functional component (5) subsequently being rotationally locked in relation to the distributor (3).

25 6. A device according to claim 1, **characterized in that** the distributors (3) are mounted in the profile (4), which preferably is designed in such a way, that two rows of distributors are rotationally fixed, the profile being provided with a first circular segment (73) and a second circular segment (74) respectively, the distance between the two circular segments preferably being 80 mm in one direction and 40 mm in a direction at right angles to the first one
30 and the entire profile (4) being fastened by screws or fixed in another way in the complete installation unit (1).

7. A device according to claim 1 and 6, **characterized in that** the circular segments (73) and (74) respectively, as regards their dimensions, are coordinated with the
35 distributors (3) and its springs (65), the grooves (64), located in the circular segments, having a

shape and a location within the circular segments, which give the distributors (3) in the profile (4) a controlled and definite position.

8. A device according to claim 1, **characterized in that** the profile (4) allows a mounting of additional distributors (3) in a later used or changed installation or service position, because the profile (4) in the actual installation case has been chosen with a length, which allows a mounting of additional distributors (3), the distributors being pushed into, from the opposite end of the profile (4) in relation to the connection ends (10) for the intake (8) and the return (9) respectively, said grooves (64), which guide the distributors.