MC-EE

Manual

MC-EE 20
MC-EE 30
MC-EE 40

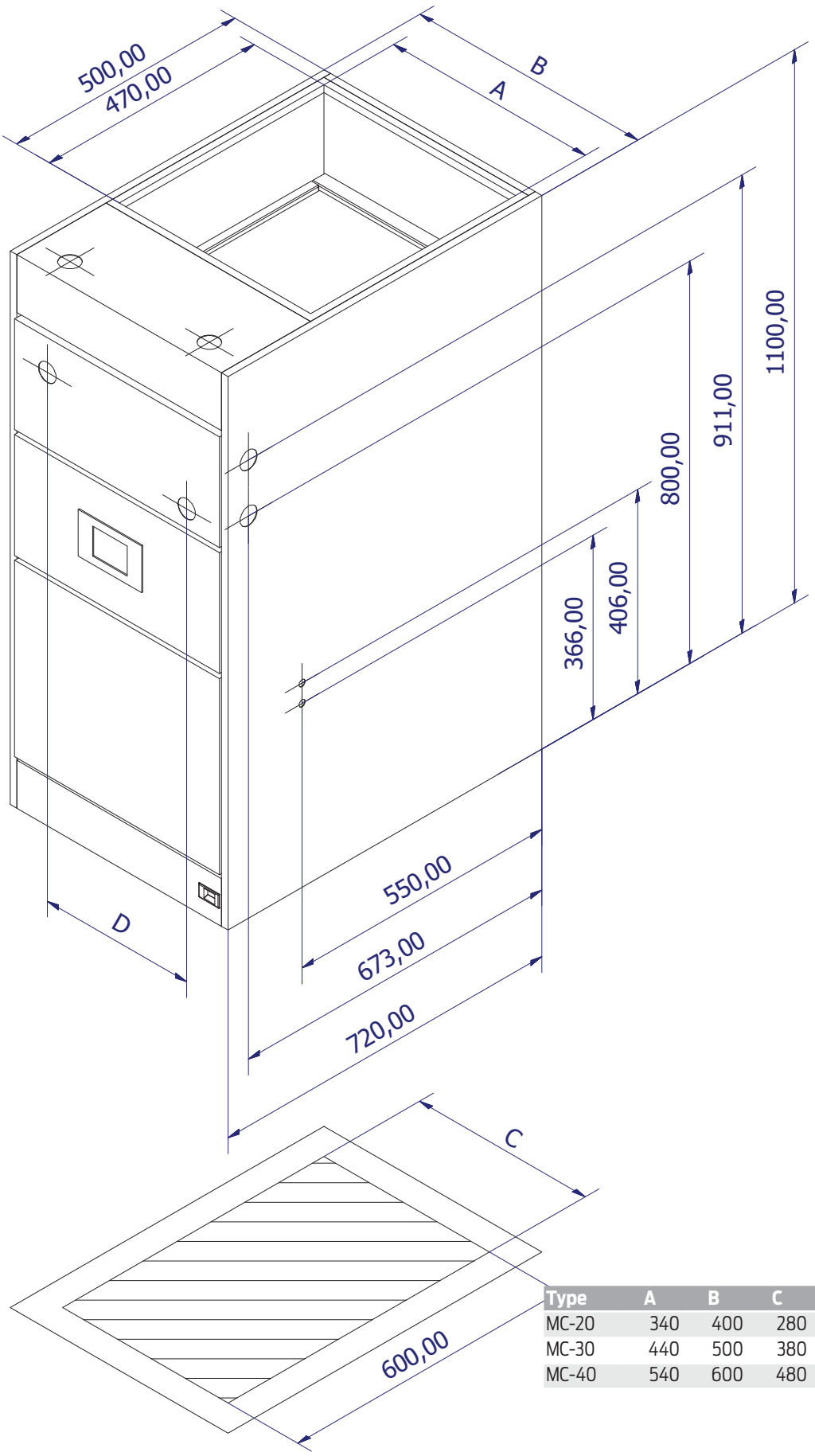
Air handlers featuring an advanced electronic modulating controller and electronically commutates high efficiency fan motor (electronically enhanced)

multiCalor

Heating Cooling Ventilating

Table of contents

Dimensions



Type	A	B	C	D
MC-20	340	400	280	220
MC-30	440	500	380	320
MC-40	540	600	480	420

1 General

The Multicalor MC-EE (modulating) air handling units are compact high performance units. The units are fitted with generously sized heat exchangers featuring 6 rows. This guarantees high air temperatures even with moderate supply water temperatures. As a result, the units are very well suited to be used in conjunction with modern condensing boilers.

The fans of the MC units are installed downstream of the heat exchangers. This ensures that the fan motors are always optimally cooled and the life span of the fan bearings is increased. Special attention has been paid to the air tightness of the units, so leak losses are minimal. The heat exchanger compartments is insulated by means of a thick layer of air, so heat losses are minimal. The apparatus is supplied ready to use. It is sufficient to install on site the hot water supply lines, the air ducts and the electrical supply.

The MC-EE is fitted with an advanced controller based on an Atmel RISC microcontroller and a high performance and high efficiency electronically controlled fan motor.

In standard use the apparatus is used to distribute recycled air to which not more than 25% outside air has been added, or to distribute up to 100% outside air after heat reclaim. The unit is factory supplied in this version.

In outside air version the unit is used to distribute air to which more than 25% outside air is added. You can activate a special program in the controller as to maintain a minimum air temperature (for best results an optional modulating 3-way valve should be connnected). When this option is activated, a basic frost-protection is activated to help protect the heat exchanger in case of frost danger. Nevertheless we suggest adding a suitable anti-freeze solution to the heating circuit if the unit is used as an outside air version.

The Multicalor MC units are available as upflow models. If you need a downflow unit, you can turn simply around the unit and flip the controller panel. Pay attention as to not drop the panel – this may damage the flatcable connector.

2 Technical data

2.1 General

The units comply to the machine directive 89/392/EEG, the low voltage directive 73/23/EEG and the EMC directive 89/336/EEG.

The MC units are available in 3 sizes. Each unit is fitted with an electronically commutated fan. You can easily change the maximum airflow by reprogramming the unit via the touscreen.

2.2 Prestaties van de toestellen

Unit		MC-EE 20	MC-EE 30	MC-EE 40
Fan data	Type	9/7	10/8	10/10
Motor power	Watt	376	550	736
Air flow (min-max)	m³/h	1 500	2 250	3 000
Opgenomen vermogen (80% speed)	A	1.40	1.90	2.20
Hydraulic pressure drop	kPa	3.51	3.81	4.61
Heating output (75/65-20ºC (EN442))	kW	20.0	30.0	40.0
Waterdebiet	l/s	0.5	0.74	0.98
Weight	kg	68	78	88

2.3 Correction factors for other hot water supply- or entering air temperatures

Hot water supply	Air temperature entering the unit					
	30	25	20	18	15	10
90/70	99%	109%	119%	123%	129%	138%
75/65	81%	90%	100%	104%	110%	119%
70/50	52%	63%	74%	78%	84%	94%
60/50	48%	58%	68%	72%	78%	88%
45/40	23%	34%	44%	48%	54%	64%

3.1 General

The MC-EE is fitted with an advanced controller based on an Atmel RISC microcontroller and a high performance and high efficiency electronically controlled fan motor.

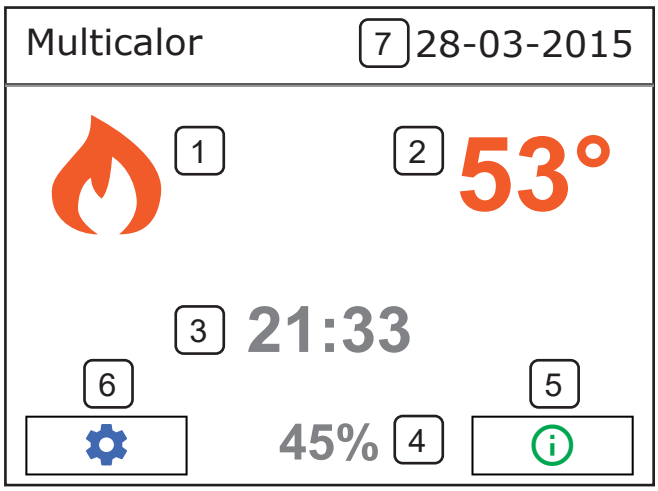
A control panel has been installed on the appliance to change the different settings of the appliance. The control panel is equipped with a capacitive touch screen and a TFT colour screen.

3.2 The control panel

A control panel has been installed on the appliance to change the different settings of the appliance. The control panel is equipped with a capacitive touch screen and a TFT colour screen.

3.2.1 Basic screen

The following information is displayed on the screen as standard.



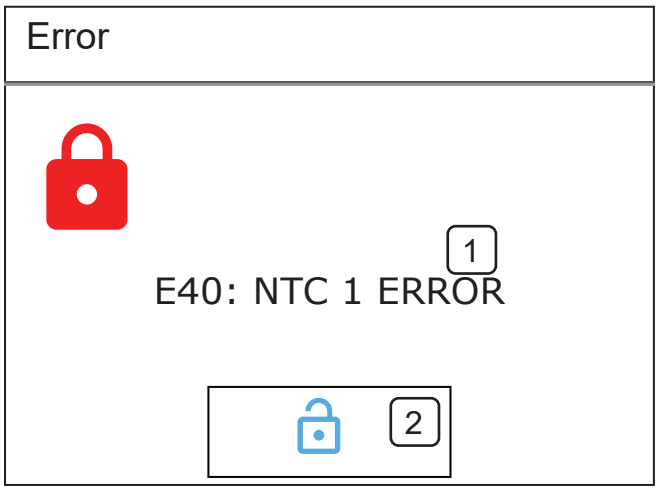
Legend

Number	Meaning
1	Function mode of the appliance
2	Air temperature
3	Time
4	Fan speed
5	Information menu button
6	Settings menu button
7	Date

3.2.2 Locking

If an error occurs that puts the safe operation of the appliance at risk, the appliance will be locked. The cause for locking the appliance is shown on the screen. The locking can be cancelled by pressing the unlock button. If the error, however, has not been resolved, the appliance will again be locked.

You must then contact your installer or the manufacturer for a solution.



Legend

Number	Meaning
1	Error message
2	Unload button

3.3 Changing settings

By pressing the setting button ⚙ the first screen of the setting menu will be displayed.

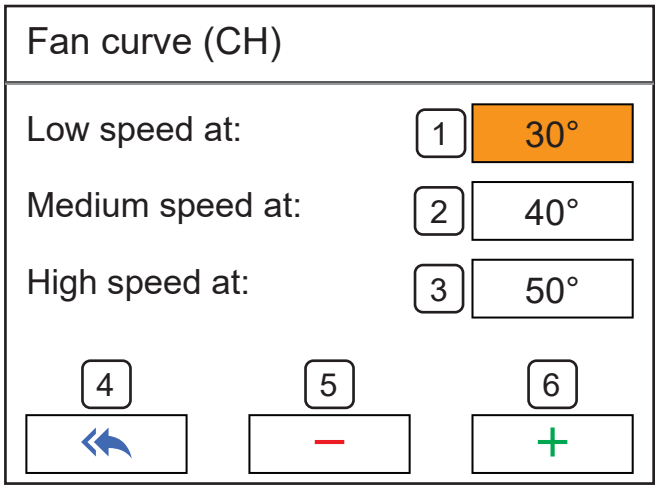
Legend

Number	Meaning
1	System settings
2	Settings in relation to the air heater operation
3	Screen cleaning
4	Back to the previous menu

A number of settings are discussed. Since all screens are accessible through the same process, not all screens will be discussed.

3.3.1 Low, average and high temperature

You can set 3 air temperatures on the MC-EE: a low, average or high value. To set these values, press the air heater (2) menu button, next, system fan and then the first fan curve option on the setting menu.

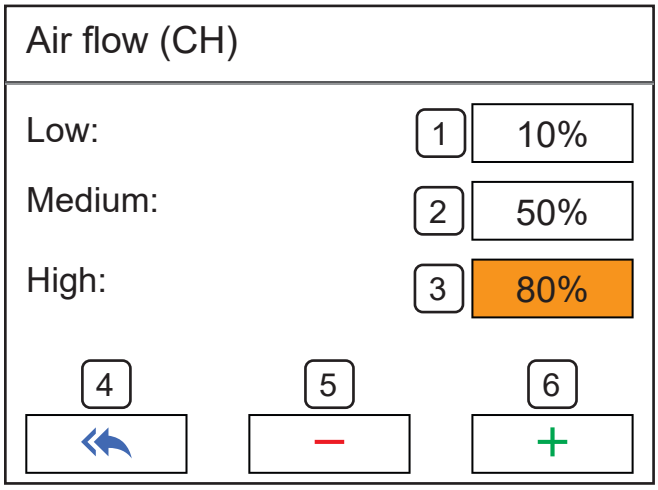


Next, select the value that you want to change. The selected value (1) will be displayed using an orange colour. By pressing the key ⊞ (5) or ⊟ (6)), you can change the set value.

If you press ↞ (4), les modifications sont sauvegardées automatiquement et vous quittez l'écran du menu.

3.3.2 Low, average and high speed

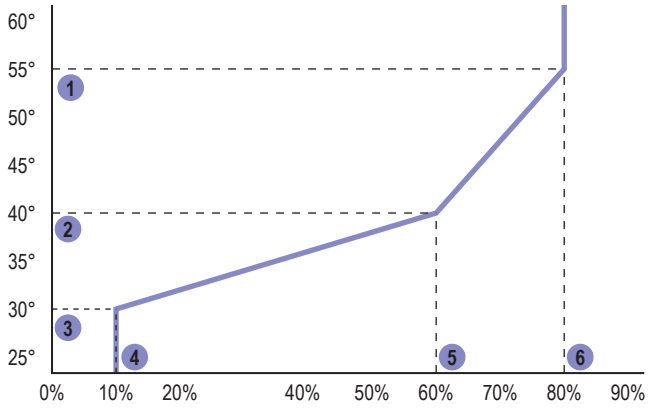
On the MC-EE, 3 air speeds can be set for heating: a low, average or high value. To set these values, press the air heater (2) menu button, next, system fan and, as last, the air flow rate.



Next, select the value that you want to change. The selected value (for example, 3) will be displayed using an orange colour. By pressing the keys ⊞ (6) or ⊟ (5), you can change the set value.

If you press ↞ (4), the changes are automatically saved and you will exit the menu screen.

3.3.3 Relationship between the air temperature and air speed, fan curve

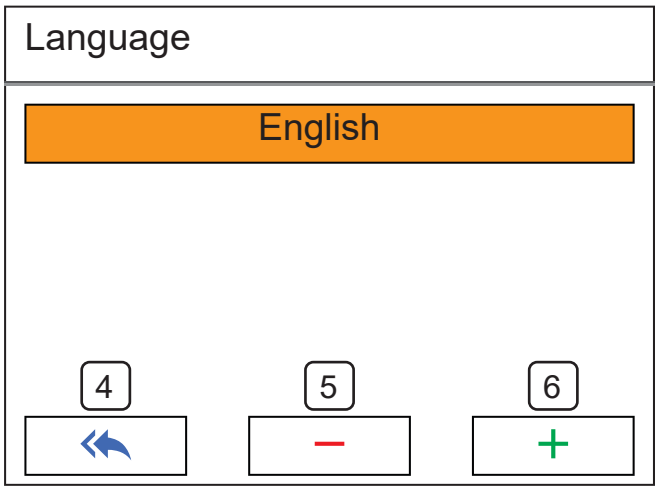


The relationship between the air temperature and air speed is displayed in the above graph. If the air temperature is lower than the "low value" (3) parameter, the fan is operational at the "low" (4) speed. If the air temperature is higher than the "high value" (1) parameter, the fan is operational at the "high" (6) speed. In-between these values, the speed of the fan is automatically adjusted based on the air temperature.

The "average value" (5) and "average" (2) parameters serve as an additional checking point to ensure you have more control over the air flow rate.

3.3.4 Setting the language

The control can be set to different languages. To access this setting, press the “system” (1) button in the setting menu and, next, the third option: Language.



Next, you can set the required language with the ⊞ (6) or ⊟ (5).

3.3.5 Setting the time and date

The time and date can be set similarly (not applicable when using the RC21 thermostat).

3.3.6 Screen cleaning

The touch screen can be temporarily switched off for cleaning by pressing the clean screen button. Clean the screen using a microfibre cloth or with a paper tissue.

3.3.7 Installer’s menu

Specific parameters can be found on an installer’s menu to stop thoughtless changes. This installer’s menu can only be accessed if a password (a code) is entered.

Installer code

Code	User lever
123456	Power user
007007	Installer

The code for the “engineer” user level is only released after following training at Multicalor.

Changes do not normally have to be implemented in this menu.

3.3.8 Information screens

A number of parameters can be read by pressing the information button on the main menu. The information in these screen can only be read. The parameters cannot be changed. Provisionally, these screens only contain the version number of the operating software.

3.1 General

- We wish to emphasize that only qualified fitters or contractors shall install the air heater.
- The installation shall be done in accordance with the latest issue of all local standards as well as the installation manual of the device concerned.
- Ensure that the conditions of local utility provision (electrical supply) match the device settings before installing the device or making it operational.

3.1.1 Transport damage

Please check the air heater for transport damage upon delivery. If damage is observed, this shall be mentioned on the waybill and you shall advise your supplier thereof in writing.

3.1.2 Packaging

The air heaters are always packaged in a box made from recycled paper. We ask you not to earmark the paper for waste disposal, but for further recycling.

3.1.3 Location

- Adhere to the following guidelines when selecting a location for the device:
- place the unit in a central position in relation to the ducting system;
- place the unit on a flat and solid surface;
- if installation surface is wet, then raise the unit;
- Always place the device in such a way that it is insulated from the construction–building structure to avoid the transmission of noise and vibrations.

Attention:

I The unit must be installed level!

I The device must be installed in a frost free location. If impossible, please add a suitable anti-freeze to the hydraulic system as to protect the heat exchanger from frost damage.

I If a return air is inspired in the combustion compartment, then under no condition devices with an open combustion circuit may be present in the installation area!

3.1.4 Minimal clearance

When installing please provide minimal clearance around the unit:

- keep 50 mm clearance around the sides of the unit;
- keep a minimum of 50 mm between hot water supply and any flammables..
- At the front of the device there shall be at least 720 mm of free service space (ensure a comfortable standing height).

3.1.5 Transport on site

Never move the air heaters by tilting them on their angles, as this may irrevocably damage the device encasing. Such damage is not covered by the device's warranty.

3.2 Electrical installation

The electrical installation shall always be performed according to the latest issue of the relevant standards and the prescriptions of the local energy provider (utility).

I Mind your safety: always ground the unit.

3.2.1 Electrical connections

In the casing different cut-outs are provided to run cables through. The PCB features a the mains power 230V~AC (marked L, N and GND). Connect with a cable to a 230V~AC power supply. A seperate earthing plug is provided next to the PCB. We recommend that the machine should be directly connected to a switchboard with 16A fuses.

3.2.2 Thermostat

The device works perfectly together with the Honeywell electronic programmable thermostat Vision thermostat. This thermostat is suited for heating, ventilation and cooling, and has been specifically designed for use with warm air systems. Connect the thermostat as per the instructions on the wiring diagram.

Attention: mind the connections. (See chapter electrical wiring)

Mount the room thermostat at an approximate height of 1.6 m, in a central position in the living room and readily accessible to the normal air circulation in the room.

Always mount the thermostat on an inner wall shielded from the effects of other heat sources including exhaust grilles, powered devices, direct sunlight, etc. Accordingly, we also do not recommend placement near windows, outer walls (<1.20 m) or in the vicinity of stairs. For additional information on assembly and programming we refer to the thermostat manual.

4.3.3 Advanced options

4.3.3.1 External condensing unit relay

The PCB features a relay that can make or break an external condensing unit supply or control line. For further information, please contact Multicalor and the condensing unit manufacturer. The coolrequest terminal is RE 1.

4.3.3.2 Burner relay

This contact is used to create a heat request on the boiler. or it can be used to power a solenoid or a circulator. It could also be used to power an oil burner on an oil fired boiler. The RE 3 connector will close when the MC unit needs heat, open when the air temperature is higher than the calculated set–point.

4.3.3.3 Heat pump relay

The PCB features a relay RE2 that can be used to control a heat pump.

Contact us for more information.

4.3.3.4 3-way Valve

It's possible to control a 3-way valve via the 0-10V control voltage.

Contact us for more information.

4.3.3.5 Extension board

It's possible to connext an extension PCB board to achieve multiple zone control.

For more information contact the manufacturer.

4.4 Installing the hot water supply lines

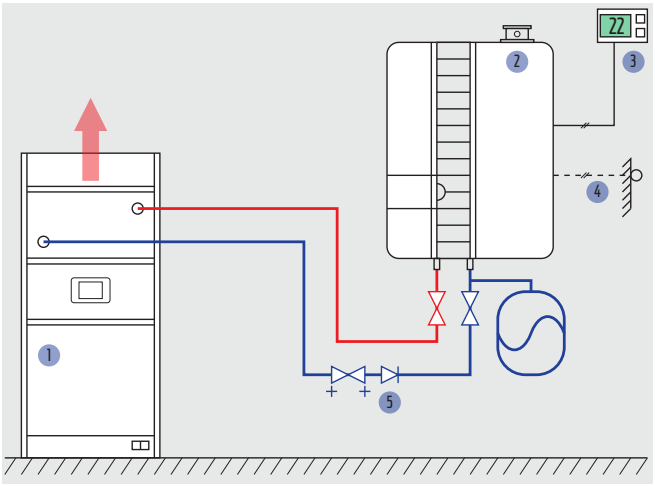
The diameter of the supply lines is 28mm. Usually hot water supply is from the front, but for ease of installation the supply lines can also be brought in from the sides or the top of the unit (UP F only). The heat exchanger is installed with rubber grommets as to minimise leakage.

- ⓘ Install an automatic air bleed valve in the supply circuit.
- ⓘ Install ball valves and flexible tubing so the heat exchanger can be easily removed for inspection or cleaning.

4.4.1 Hydraulic installation, simple version

You can choose to install the MC in a simple way. However, this will result in a loss of certain options.

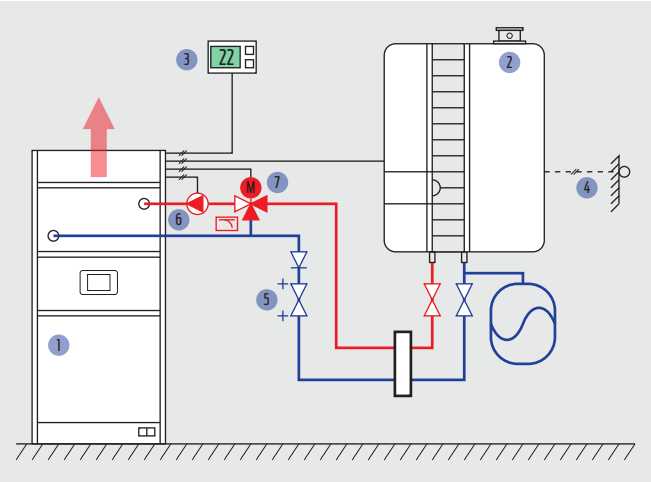
If you choose this way of installing, it is adviseable to have the water temperature of the boiler limited by means of a weather dependent controller.



Onderdeel	Functie
1	Air heater MC-EE
2	Boiler
3	Thermostat
4	Optional outside sensor
5	One-way valve

4.4.2 Hydraulic installation, extended version

- We suggest using valves with following KVS factors:
  MC20: KVS10
  MC30: KVS10
  MC40: KVS16
- We suggest that you do not give priority to the hot water system but install the system in such a way that both heating and hot water demand can run together.
- Best results are obtained if the boiler temperature is controlled via a weather compensator.



Number	Function
1	Heat exchanger MC-EE
2	Boiler
3	Thermostat connected to MC-EE
4	Optional outside sensor
5	One-way valve
6	Circulator (Field wiring)
7	3-way valve; 0-10V control voltage (O1)

Attention

I The 3-way valve must be powered externaly

4.5 Installing the ducting system

4.5.1 Fitting the supply ducts

Fit a matching supply air on the unit. The height of the plenum should be at least as high as the width of the unit. The supply air plenum should, like the supply ducting system, be thermally insulated. The supply air duct should be of a sufficient size to permit air displacement with normal speeds and pressure losses.

4.5.2 Fitting the return air ducts

Noise problems are often created if air heaters are used with very short and/or undersized return air ducts. These problems can be avoided by:

- insulating the return air ducts by means of an acoustic liner;
- installing a sound damper in the return air ducts;
- making sure the that there are at least 2 **generously sized** 90º turns in the ducting system;
- Increasing both diameter and length of the return air ducts.

You can connect the return air duct to the left, right or the bottom of the unit. We strongly suggest using only the bottom return air opening (**please remove the cut-out when commissioning**). If possible, install the unit on an insulated plenum, on which side return ducts can be connected. If you do not have sufficient free space to use an insulated return air plenum, it is possible to install an optional side filter frame. However, in doing so, a large part of the acoustic insulation is lost. Always use a return air duct and return air from OUTSIDE of the combustion compartment. If you do wish to apply an open return, make sure that there are (will be) no other devices with open combustion circuit in the installation area.

4.6 Commissioning

4.6.1 Switching the apparatus ON an OFF

Normally the machine shall permanently be supplied with mains power. At the installation or maintenance stage you may proceed as follows to switch on or off the device.

Proceed as follows to switch the machine ON:

- Connect the mains power.
- Set the room thermostat at the desired setting.

Proceed as follows to switch the machine OFF:

- Set the room thermostat 5ºC lower than the actual temperature.
- Disconnect mains power.

4.6.2 Setting the air temperature

You will need to set the minimum and maximum air temperature of the unit. This can be done by the display. For more information please refer to chapter 3.

4.6.3 Setting the air flow

You will need to set the minimum and maximum air flow of the unit. This can be done by the electronic display. For more information please refer to chapter 3.

5 Maintenace

5.1 Maintenance by the end user

5.1.1 Cleaning the air filter

The standard air filter is a synthetic air filter with a life span of 1 year. However the filter requires monthly cleaning, to be performed as set out below:

- Set the thermostat 5ºC lower than the environment temperature.
- You may wait until the apparatus has cooled down.
- Disconnect the mains.
- Remove the air filter and use a vacuum cleaner to clean it
- Put the filter back into the machine.
- Restore the mains.
- Set the room thermostat again to the required value.

Never remove the air filter from an MC unit. The machine must always be fitted with a EU3 (or better) air filter. Heating or ventilating without a filter may pollute the heat exchanger to such an extent that the machine may incur irretrievable damage, which the warranty does not cover.

5.1.2 Cleaning the casing

The casing may be cleaned with a soft humid cloth. Do not use aggressive media such as bleaching water, solvents or petrol, as these products are likely to damage the paint.

5.1.3 Cleaning the display

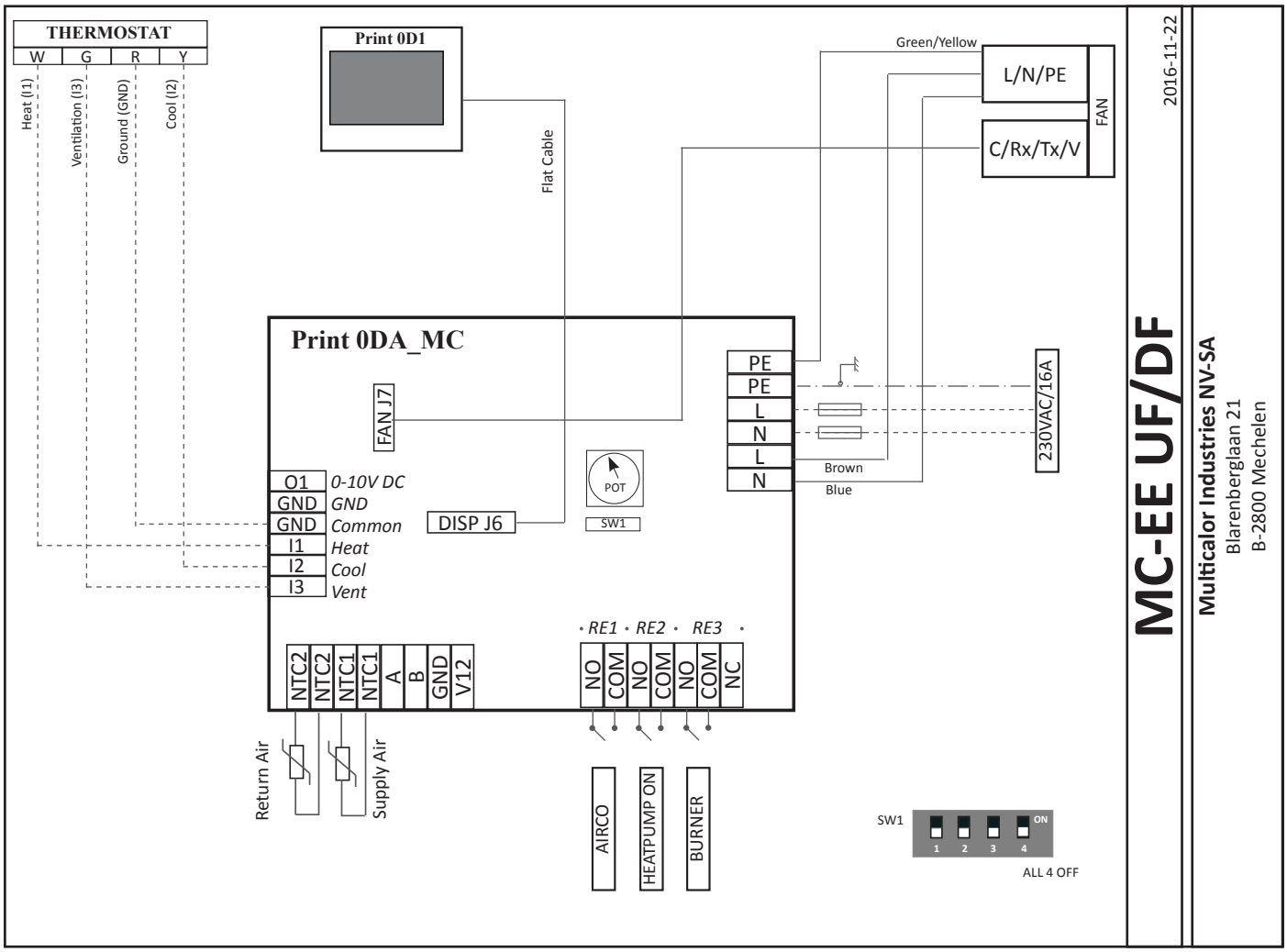
The touch screen can be temporarily switched off for cleaning by pressing the clean screen button. Clean the screen using a microfibre cloth or with a paper tissue.

5.2 Maintenance by the installer

The unit is nearly free of maintenance. It is sufficient to replace the air filter and to check the unit for leakage and proper functioning.

- Set the thermostat 5ºC lower than the environment temperature;
- You may wait until the apparatus has cooled down;
- Disconnect the mains;
- Remove and replace the air filter;
- Check unit for functioning and check for leaks;
- Verify pressure in the supply lines;
- Switch mains power on;
- Set the room thermostat again to the required value;

6 Electrical wiring



7 Warranty

7.1 General

Multicalor Industries NV guarantees the MC units against all manufacturing defects or material faults, subject to the terms and conditions described under 'Scope and duration of the warranty'. Moreover Multicalor Industries NV guarantees the machine will achieve the output indicated in normal conditions.

7.2 Scope and duration of the warranty

The warranty starts at the moment of purchase by the first user and entitles the beneficiary of the warranty, through the dealer or the service department of Multicalor Industries NV, to:

- One (1) year free exchange of faulty parts;
- Five (5) year free exchange of the heat exchanger, but exclusive of labour costs and travel expenses.

Replacement of parts does not change the initial warranty period, i.e. the warranty is not extended by the replacement of faulty parts.

7.3 Damage that is not covered by the warranty

All damage resulting from:

- Machine use which does not match normal household or light commercial use;
- Failure to meet the user instructions as summed up in the user manual;
- Insufficient or wrong maintenance;
- Irretrievable fouling up of the heat exchanger caused by heating, ventilating or cooling with a highly fouled up or absent dust filter;
- Modifications or adaptations to the machine not covered by prior written approval by Multicalor Industries NV;
- Repairs carried out with non-original parts or wrong equipment or materials;
- The heat exchanger when used in an atmosphere polluted with chlorine or other chemicals;
- Causes foreign to the machine, including (but not restricted to):
    1. Damage incurred during transport, including dents, scratches, etc.;
    2. Damage caused by disasters, including fire, lightning, flooding;
    3. Damage linked to frost;
    4. Damage caused by a departure from the normal power voltage, water or gas pres sure deviating widely from the nominal values suitable for the normal supply of the machine;
    5. Damage caused by a non-conformity of the installation to the local standards applicable.

7.4 Not covered under warranty

- Parts subject to normal wear, including air filters, fuel filters and other parts that have to be replaced periodically;
- Machines the serial number of which has been removed or altered;
- Travel expenses and labour costs if the matching warranty period has expired;
- Result damage caused by the faulty machine;
- Any loss of productivity attributable to the faulty machine;
- Any loss of use caused by a fault to the machine;
- When the machine proves unsuitable for the purposes for which the purchaser bought the machine.

7.5 Repairs

During the warranty period the customer may call upon the services of the dealer who sold the machine or, in Belgium, to the "after-sales" department of Multicalor Industries NV.

7.6 Service-parts

If it is necessary to replace a part, we recommend that the matching article code of the part concerned be mentioned on the order, in addition to the type of air heater, the machine's serial number as well as the name of the part concerned. The machine type and serial number are mentioned on the registration plate placed in the machine.

8 Statement of compliance

Multicalor Industries declares that the air handlers

- Multicalor MC 20
- Multicalor MC 30
- Multicalor MC 40

meet the provisions of the machine directive 89/392/EEC, the low-voltage directive 73/23/EEC as well as the EMC directive 89/336/EEC.

For more information contact your installer

Last modification
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