

# MARK COMPACT HEAT RECOVERY UNIT

0661151\_R01





# Read this document before installing the appliance

EN

## Warning

An incorrectly performed installation, adjustment, alteration, repair or maintenance activity may lead to material damage or injury. All work must be carried out by approved, qualified professionals. If the appliance is not positioned in accordance with the instructions, the warranty shall be voided. This appliance is not meant for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they are under supervision or are instructed about the use of the appliance by a person who is responsible for their safety. Children should be monitored to make sure that they will not play with the appliance.

## 1 The aim of this manual

This manual is intended to correctly install and maintain the Mark air handling units during its lifetime. It is recommended to study this manual well so that the appliance can be maintained correctly. In case problems arise, this manual can help the user to make a quick diagnose. Changes and maintenance should be executed by qualified personnel to avoid damage to the appliance. This appliance is not meant for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they are under supervision or are instructed about the use of the appliance by a person who is responsible for their safety. Children should be monitored to make sure that they will not play with the appliance.

The information in this document is subject to change without notice. The most recent version of this manual is always available at [www.markclimate.com/downloads](http://www.markclimate.com/downloads).

## 2 General description

The Mark air handling units meet all regulations.

The design of the units guarantees a minimal consumption of energy.

The applied materials and components guarantee a long durability.

### 2.1 General features

The housing is made of sandwich panels (45 mm) which consist of:

- Coated galvanized outer plate (polyester 25 micron, colour RAL 9002).
- The internal panelling is made of Aluzinc AZ 185 with a C4 corrosion resistance
- Environmentally friendly water-foamed PUR, 45kg /m<sup>3</sup> which guarantees a high acoustic and thermal insulation.
- Thermal bridge-free construction.

## **2.2 Compact series with aluminum counterflow heat exchanger**

The Mark Compact series consists of fully wired, compact ventilation units, qualified for both internal as external placing. The units distinguish themselves by very low internal air speeds and are therefore guaranteed for a minimal consumption of energy per m<sup>3</sup> of displaced air (SFP Value). Due to their low air speeds and the accurate selection of ventilators, the level of sound is extremely low.

### *Features:*

- Aluminium counterflow plate heat exchangers, efficiency up to 90%.
- Fans provided by motors with EC technology.
- Full bypass possible by applying face and bypass valves.
- Frost protection of the exchangers included in the regulations.
- Application of high quality filters for the lowest possible air resistance.

### *Optional:*

- Integrated valves for fresh air, return air, recirculation air.
- Integrated silencers.
- Integrated pre- and re-heater, electrical, warm water, change-over.
- Integrated cooler, cold water, DX, change-over.

## **2.3 IC integrated cooling system including control system (Optional)**

The Mark Compact series can be constructed with an integrated cooler (IC). Depending on the cooling capacity, the cooling system is constructed with one or more compressors of which the first compressor is digital. The digital compressor can be set up in power from 10-100%. The DX-cooler and condenser are included in the unit. The cooler in the supply air, the condenser in the exhaust air. The installation is completely connected and filled with medium R 410A. The cooling system is included in the unit's control system. The hydraulic- and electrical scheme can be found inside the folder on the inside of the inspection door of the cooling section. This is also the section where the log of the installation can be found.

# **3 Installation**

On receipt, check immediately that the supply had been delivered in full. Check also for any damage caused during transportation. If what is delivered does not comply with the goods indicated on the packing list, and/or damage during transportation is recorded, the recipient must state this on the delivery note indicating the date of receipt. If the recipient fails to comply with the requirements above, he shall have no right to claim.

## **3.1 Placement [1] [2]**

To avoid contact noise, we recommend that the Mark Compact be placed on a level, vibration-free floor or roof structure. The roof structure must be sufficiently stable, and must have enough load-bearing points to prevent the unit from bending. The Mark Compact must be attached to the roof structure or platform. The unit must be placed on a level surface to ensure that any condensation is properly drained off. If the unit is lifted, the cabinet will twist slightly. The surface on which the Mark Compact will be placed, should be flat. If the surface is not completely flat, the frame should be "levelled".

Units incorrectly installed can cause the inspection doors in the Mark Compact to jam and possibly result in the unit leaking. With units with a condensation extractor, the height of the installation structure must be at least the same, or higher, than the required siphon height. Note: the Mark Compact may not replace the roof in the location where it is installed [3].

#### *Storage on-site*

Parts of the Mark Compact which are supplied in packaging must be unpacked immediately down to the outer plating to prevent corrosion from forming, unless otherwise advised by the manufacturer. If the materials are not moved to the installation location immediately, the recipient must apply the following measures:

- Remove the packaging.
- Store the appliance covered. (If for internal use)
- Store the appliance on a level surface.
- Seal any openings to prevent contaminants from getting into the appliance.

### **3.2 Transport to the installation location [4]**

The Mark Compact is supplied complete or in parts. The recipient is responsible for unloading and transport to the installation location. Note the following points:

- Use a fork lift truck with forks which are long enough to lift the appliance safely.
- Also be aware of the lifting torque, the weight of the appliance, the spread of weight and the distance between the forks.
- Place appliances only in the position indicated.

### **3.3 Transport safety**

If necessary, moving parts (which are sensitive to being transported) should be blocked. The fitter should remove these blocks once the appliance is in its location. The blocks are red.

### **3.4 Lifting options [4]**

The Mark Compact is supplied in such a way that it can be lifted. This may differ per appliance. Note the instructions supplied with the appliance. If the appliance is supplied in several parts, these parts must be lifted separately. In almost all cases, a hoist must be used during lifting to prevent damage to the units. The angle of suspension must never be greater than 60°.

### **3.5 Minimum distances [5]**

Always ensure that the largest components in air handling units can be exchanged. You can use the following guidelines:

- the minimum width on the operating side is the width of the unit:
- motor at least 1 metre from the fan
- heat exchanger/cool exchanger, width of unit + 200 mm
- gas-fired heat source, width of unit + 400 mm
- bag filters (removable from the side) 700 mm
- keep to the width of the unit as a minimum for other parts which are removable from the side

### **3.6 Duct connections**

In an indoor installation, the air ducts of the Mark Compact must be insulated to prevent condensation on the outside of the duct. In outdoor installation, the outer ducts have to be insulated in order to maintain the efficiency of the unit. It is recommended to install a silencer in

the supply and extract air duct. This will prevent any noise from the fan. Besides that, noise transfer (cross-talk) from one room to the other caused by the connecting duct work must be prevented. For this, a crosstalk attenuator has to be applied.

### 3.7 Condensation drain [6] [7]

In the section where the drip tray is placed there is a maximum under pressure of 650 Pa. In order to drain the condensation water well, it is necessary to place a ball siphon. This siphon is positioned on the outside of the air handling unit and connected to the condensation drainage (min. 40 mm). This condensate can be drained through a drainpipe. In an outdoor installation the condensate water can be drained through the siphon on the roof or other sewerage. It is not permitted to connect several outlet pipes to a single, shared siphon. The heat recovery unit produces the most condensation water in the cold months. For outdoor installations, a heated siphon is available. The siphon pipe must not be connected directly to the sewage, but must be able to flow freely into the sewage.

– In case of overpressure the ball seat should be mounted 60mm under the lowest point of the drip tray. Remove the plug out of the bleed hole. [6]

– In case of underpressure the ball seat should be mounted below the lowest point of the drip tray according to the formula below. [7]

$$H_{min} = \frac{P_{a \text{ underpressure}}}{10mm} + 10mm$$

### 3.8 Frost protection

To prevent freezing of the aluminum heat exchanger there is a security in the electric controls. This works fully automatically and is pre-programmed in the factory.

### 3.9 Electrical connections

The Mark Compact is completely wired internally. The isolator switch and cable box are wired and mounted on the outside of the heat recovery unit. The isolator switch is connected with the power supply.

COMPACT		600	1400	2000	3200
Max. air volume	m <sup>3</sup> /h	600	1400	2000	3200
Max. external pressure	Pa	250	425	150	1140
Efficiency	%	90	90	90	90
Maximum current consumption per unit	A	3,6	4,7	4,7	7,9
Unit weight	kg	175	218	215	335
Supply voltage (50Hz)	V	1~230	1~230	1~230	3~400+N

The electric power supply of this air handling unit is either 230V or 400V. This depends on the size of the unit. This information can be found on the type plate on the inside of the inspection door. The information on the type plate also shows the fuse value to select the right fuse in the building.

On the cable box a remote control and cabling for BMS, start / stop, fire and any other external controllers can be connected. The schedule for the above connections can be found in the control compartment of the heat recovery unit.

The heat recovery unit is prepared for a fire signal. If the unit receives a fire signal, it is turned off. Once the unit is turned off, the heat recovery unit must be restarted using the control panel.

## 4 Control system

### 4.1 Integrated control system

The Mark Compact series is supplied with an extremely modern control system which is standardly delivered as a “stand alone”. The control system is very flexible and especially designed for balanced ventilation systems where it can be expanded and modified to the needs of the client. The control system is suitable for the most conventional data communication-protocols and can easily be added in for example building management systems. The detailed and intelligent design makes the control system very user-friendly. The built-in webserver, with three user levels, makes the use and operation of the control system very easy and effective. The control system is ready for the future, is flexible and saves time and costs because of its user-friendliness. Due to the intelligent user-interface, the control system is easy to implement, use and maintain. The control system is reliable and tuned to a lowest possible energy use of the installation. The control system communicates through RS 485 Modbus and is built around a powerful ARM9 processor. The operation is based on Linux.

## 5 Operation

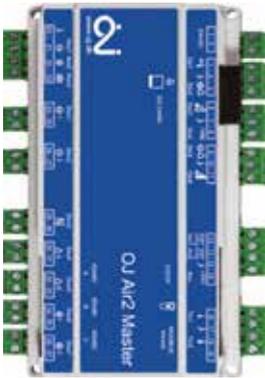
The control system of the unit can be used in two ways.

### 5.1 Operation with OJ user interface with touch panel

OJ user interface with touch panel (article number: 0631374) is a user friendly control panel for commissioning and setting the daily operation of the Mark Compact. The control panel is very easy to use, thanks to the logical menu's, easy navigation and recognizable symbols. For more information and operation please see the instruction of the user interface (article number 0664220).

### 5.2 Operation with a computer

The unit can be operated with a PC or laptop. Connect the PC or laptop through a LAN cable with the master in the junction box.



The LAN connection TCP/IP can be found on the top of the master.

Also connect the hand terminal with the connection wire in the junction box to the unit. Then put the isolation switch **“ON”**.

Leave the inspection door open (watch out for the turning parts of the fan!).

Start Internet Explorer and enter the following IP Address: **192.168.1.100**

The next screen will be shown: (image 3).

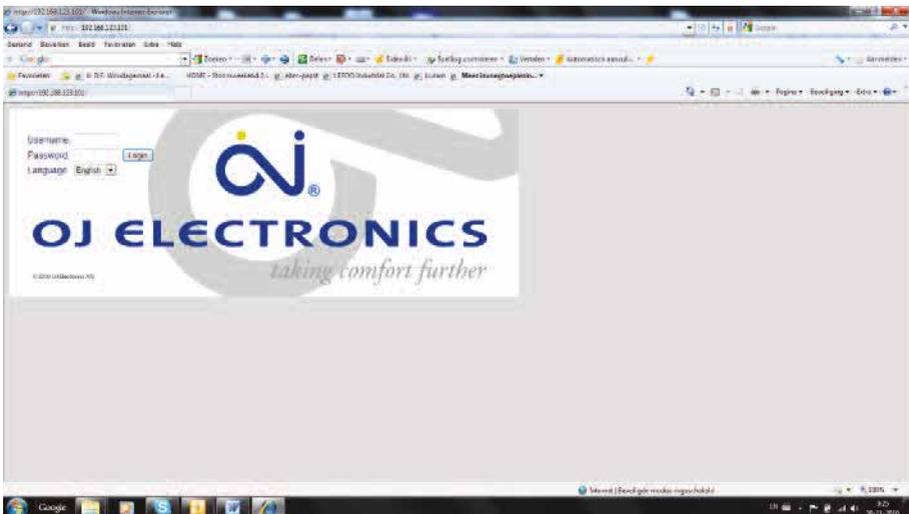


Image 3

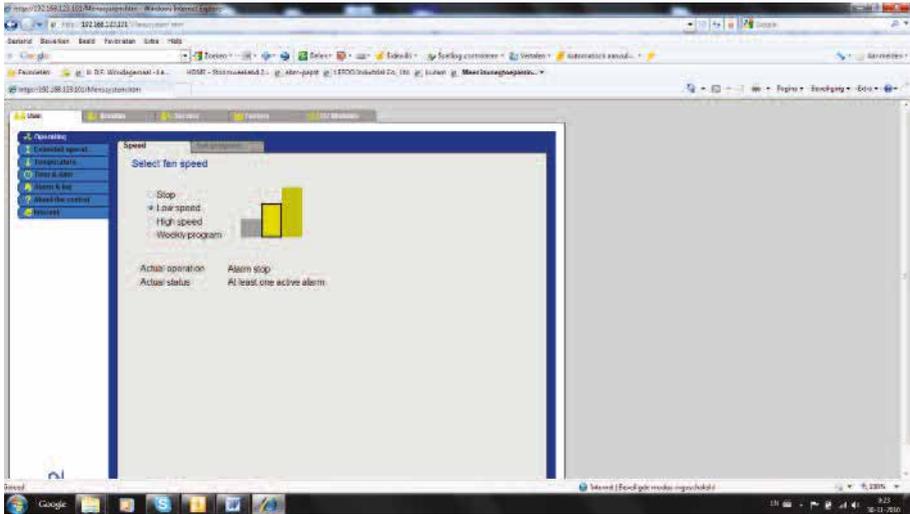
Enter the user name: **USER**

Enter the password: **111**

For installer level, enter the user na: **INSTALLE**

Enter the password: **222**

The next screen will be shown: (image 4).



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Image 4

Through the tabs on the top side and left side of the screen the actual status of the unit can then be seen and possible changes can be modified. This depends on the factory installed levels. The menu structure is in general the same as the above-mentioned instructions of the hand terminal. For modifications and/or reading out actual values with pc or laptop the same instructions can be used.

## 6 Maintenance

### 6.1 Filters

The filters need to be periodically checked on pollution. We advise to do this twice a year, depending on the pollution on site. Change the filters when they are seriously polluted. Under normal circumstances this will be every six months. The unit can never be used without filters. Next to clearing the supplied air, the filters also have the task to protect the components in the unit. This guarantees a long durability of the unit and saves costs for maintenance.

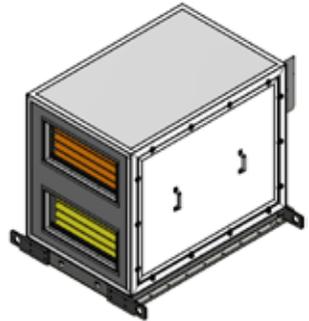
### 6.2 Heat exchanger

During the inspection of the filters the aluminium counterflow heat exchanger also needs to be checked for pollution. Severe pollution can occur because of filters that are not replaced on time or used at all. This can lead to a decrease of the capacity and an increase of the energy consumption. In case the heat exchanger is badly polluted, the service department of Mark BV needs to be contacted immediately.

### 6.3 Inspection panel

The inspection panel is secured with panel stops. To remove the panel, the panel stops must be loosened with a wrench, after which the panel stops can be easily turned. This allows the panel to be completely removed.

The externally mounted hinge fittings allow a completely smooth interior which prevents dirt accumulation in the unit. The airtight closure of the doors in relation to the housing is ensured by a special hygienic rubber profile according to ISO 846.



### 6.4 Spare parts

For spare parts you can contact our service department.

### 6.5 Checking and Cleaning the Siphons

The siphons must be checked for contamination and cleaned if necessary.

## 7 Safety

The installation of the Mark Compact unit needs to be performed according to the general en local building codes, safety instructions and municipal installation instructions, electrical company and waterworks. The unit may only be operated when all ducts are connected and inspection doors are locked. This way the contact with moving parts is prevented. The unit is supplied with an isolation switch. Before inspection and/or maintenance of the unit, the isolation switch needs to be set "OFF". The isolation switch could potentially be locked with a padlock.

## 8 Unit (intended use)

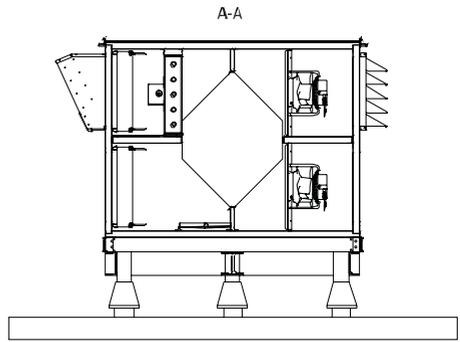
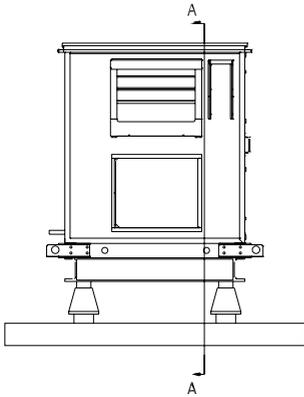
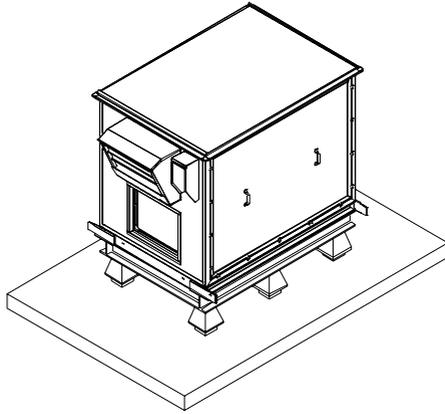
The Mark Compact units are designed for use in comfort installations. The units are not constructed for the extraction of aggressive damp and high temperatures. Every other use will be qualified as not intended use. The manufacturer does not accept any liability regarding the resulting damage or injury.

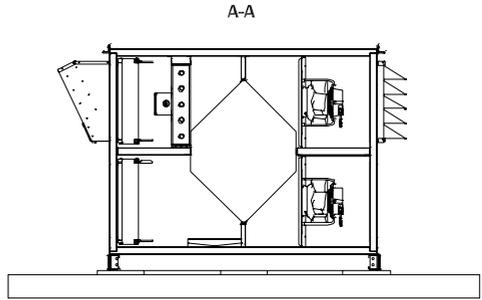
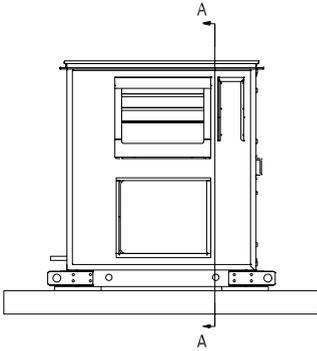
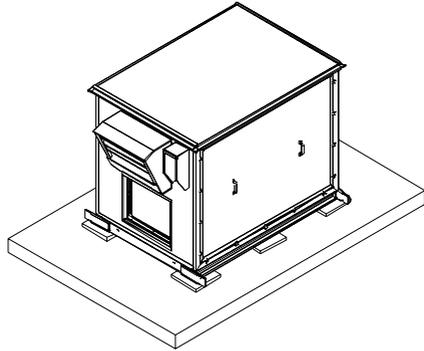
## 9 Liability

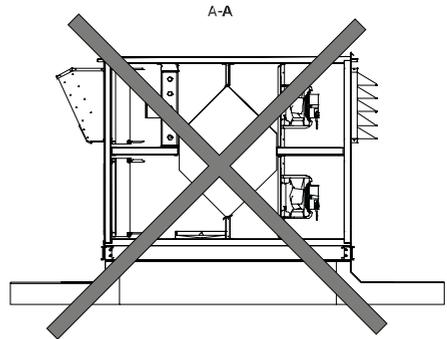
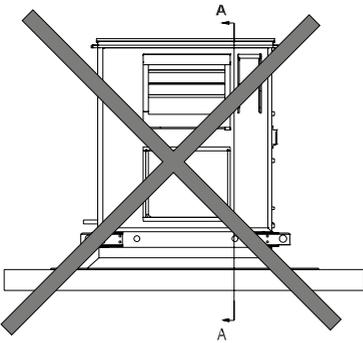
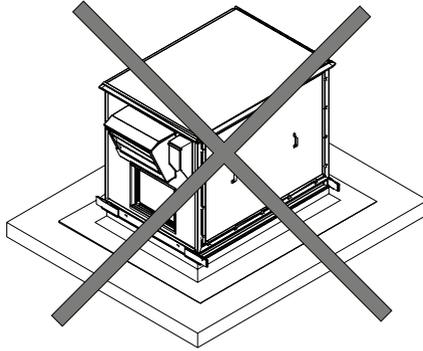
The Mark Compact unit is designed and manufactured for use in "Balanced ventilation systems in comfort installations". Every other use is considered as "unintended use" and can lead to damage to the Mark Compact unit or personal injury, for which the manufacturer cannot be held accountable.

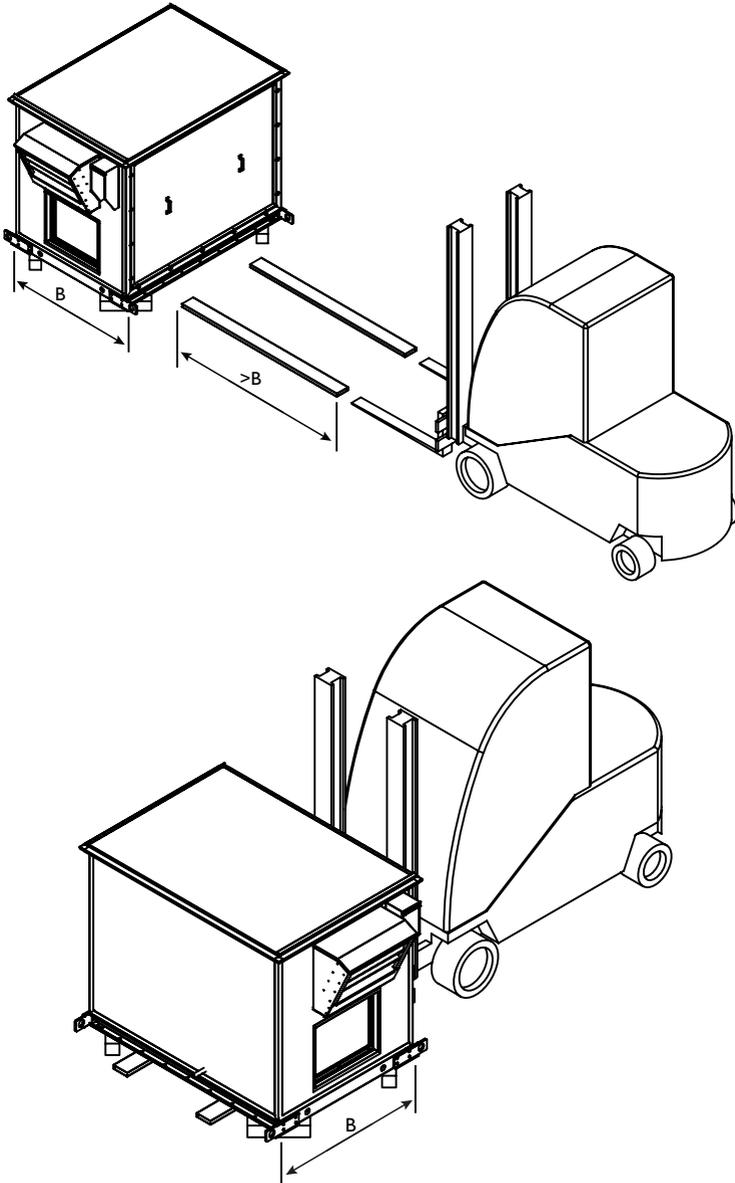
## 10 Warranty

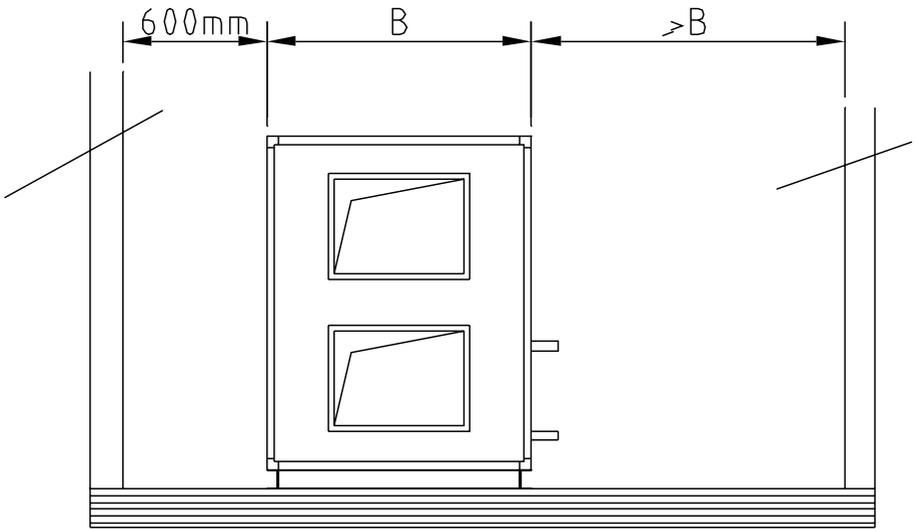
Mark BV constantly aims for an optimal quality of the applied materials and methods of manufacturing regarding the goods produced. The installation should be executed by the current regulations and in accordance with the accompanying installation and maintenance instructions from Mark BV. The manufacturer guarantees the correct operation of the Mark Compact for a period of one year after installation. Warranty can only be claimed for material- and/or constructional faults which arise during the warranty period. In case of a warranty claim the Mark Compact unit may not be disassembled without written permission of the manufacturer. Warranty on spare parts can only be granted when they are supplied by the factory and are installed by the acknowledged installer. The warranty expires when the appliance is used without filters. Mark BV aims for an improvement of the products and reserves the right to make changes in the design or change specifications without informing in advance.

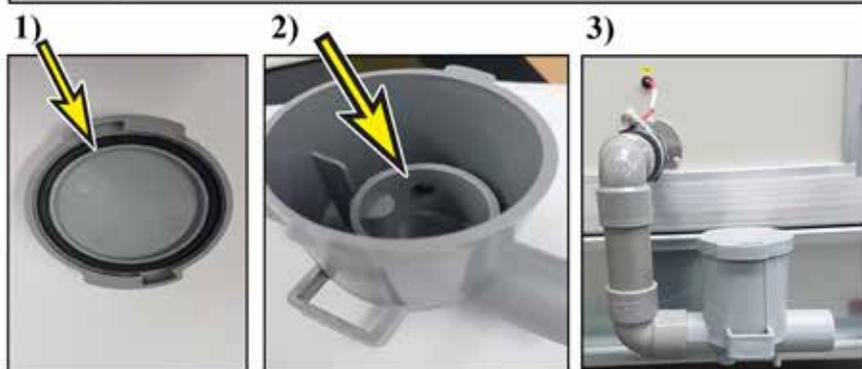
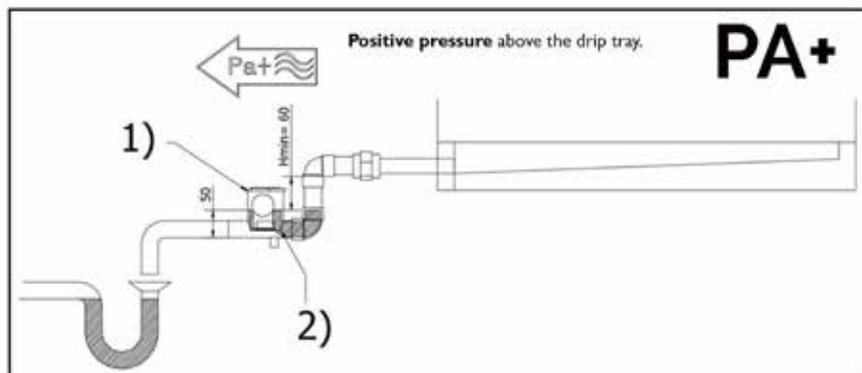






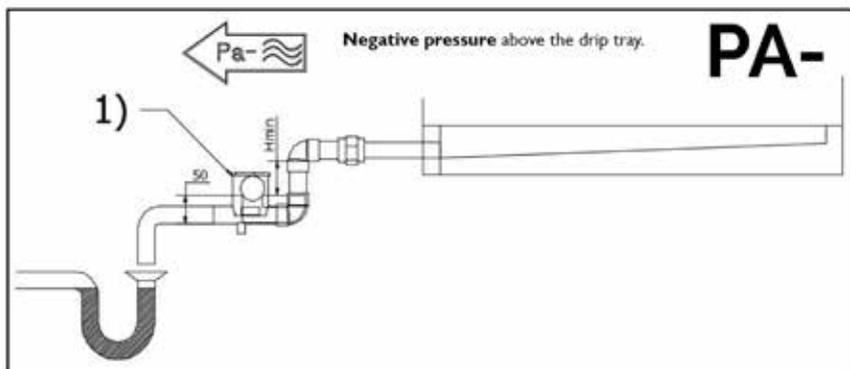






- 1) Place the O-ring gasket on the inside of the siphon cover.
- 2) Bleed hole - remove plug before use.  
This is needed to bleed water under the ball to assist in opening the siphon.
- 3) Option: place the heating element in the siphon.
- 4) To drain.

Hmin ? Hmin = 60 mm



- 1) Place the O-ring gasket on the inside of the siphon cover.
- Hmin ?** Pa- < 500 Pa: Hmin = 60mm  
 Pa- >= 500 Pa: Hmin = (Pa / 10)mm + 10mm.
- 2) Option: place the heating element in the siphon.
  - 3) To drain.



**MARK BV**

BENEDEN VERLAAT 87-89  
 VEENDAM (NEDERLAND)  
 POSTBUS 13, 9640 AA VEENDAM  
 TELEFOON +31 (0)598 656600  
 FAX +31 (0)598 624584  
 info@mark.nl  
 www.mark.nl

**MARK EIRE BV**

COOLEA, MACROOM  
 CO. CORK  
 P12 W660 (IRELAND)  
 PHONE +353 (0)26 45334  
 FAX +353 (0)26 45383  
 sales@markeire.com  
 www.markeire.com

**MARK BELGIUM b.v.b.a.**

ENERGIELAAN 12  
 2950 KAPellen  
 (BELGIË/BELGIQUE)  
 TELEFOON +32 (0)3 6669254  
 info@markbelgium.be  
 www.markbelgium.be

**MARK DEUTSCHLAND GmbH**

MAX-PLANCK-STRASSE 16  
 46446 EMMERICH AM RHEIN  
 (DEUTSCHLAND)  
 TELEFON +49 (0)2822 97728-0  
 TELEFAX +49 (0)2822 97728-10  
 info@mark.de  
 www.mark.de

**MARK POLSKA Sp. z o.o**

UL. JASNOGÓRSKA 27  
 42-202 CZĘSTOCHOWA (POLSKA)  
 PHONE +48 34 3683443  
 FAX +48 34 3683553  
 info@markpolska.pl  
 www.markpolska.pl

**S.C. MARK ROMANIA S.R.L.**

STR. KOS KAROLY NR. 1 A  
 540297 TARGU MURES  
 (ROMANIA)  
 TEL/FAX +40 (0)265-266.332  
 office@markromania.ro  
 www.markromania.ro

