

MPG

Instructions manual



Parts list + Assembling guideline

MPG

Munters Plastic Gutter

MPG

Installation manual

Original instructions
Revision 1.4

Thank You

Thank you for purchasing a Munters Plastic Gutter! Munters equipment is designed to be the highest performing and highest quality you can buy. With the proper installation and maintenance it will provide many years of service.

Please Note

To achieve maximum performance and insure long life from your Munters product it is essential that it be installed and maintained properly. Please read all instructions carefully before beginning installation.

This document is destined for the user of the apparatus: it may not be reproduced in whole or in part, committed to computer memory as a file or delivered to third parties without the prior authorization of the assembler of the system. Munters Italy S.p.A. reserves the right to effect modifications to the apparatus in accordance with technical and legal developments and to make alterations to specifications, quantities, etc., for production or other reasons, subsequent to publication.

Warranty

For Warranty information please refers to "General terms and condition of sale" available on https://www.munters.com/globalassets/terms-and-policies/condizioni_generali_vendita.pdf

Conditions and Limitations:

- Products and Systems involved in a warranty claim under the "General terms and condition of sale" shall have been properly installed, maintained and operated under competent supervision, according to the instructions provided by Munters;
- Malfunction or failure resulting from misuse, abuse, negligence, alteration, accident or lack of proper installation or maintenance shall not be considered a defect under the Warranty.



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WARNING

All the components **MUST** be stored in a clean and dry environment.



ATTENTION

The following guidelines should be used and closely followed when assembling the MPG.

In order to guarantee proper performance and correct functioning of the system, the installer must understand the importance of quality construction-work and the use of quality materials. Attention to details relating the assembly work, proper sealing or prevention of air leaks is highly necessary and must be undertaken by the installer.



WARNING

- Max environment temperature during assembling and/or storage shall not exceed 50°C
- Protect MPG from direct sunrays when not in operation. Do not stock in sealed packages under direct sunrays.

1. GENERAL INFORMATION

1.1 Disclaimer

Munters reserves the right to make alternations to specifications, quantities, dimensions etc. for production or other reasons, subsequent to publication. The information contained herein has been prepared by qualified experts within Munters. While we believe the information is accurate and complete, we make no warranty or representation for any particular purposes. The information is offered in good faith and with the understanding that any use of the units or accessories in breach of the directions and warnings in this document is at the sole discretion and risk of the user.

1.2 Introduction

Congratulations on your excellent choice of purchasing a Munters Plastic Gutter!

In order to realize the full benefit from this product it is important that it is installed, commissioned and operated correctly. Before installation or using the MPG, this manual should be studied carefully. It is also recommended that it is kept safely for future reference. The manual is intended as a reference for installation, commissioning and day-to-day operation of the Munters MPG.

Your attention will help to avoid hazards and reduce repair costs and downtimes while increasing reliability and durability of the system. The manual should be supplemented by the applicable national provisions on accident prevention and environmental protection.

1.3 Intended use

The MPG - Munters Plastic Gutter is intended for evaporative cooling applications in agricultural and horticultural buildings, specifically for livestock and plant farming. MPG helps to reduce the air temperature through evaporative cooling, by allowing the incoming air pass across the CELdek® or any evaporative cooling pads installed on the system. The MPG is suitable only for 150mm (6inch) evaporative cooling pads.

The Munters Plastic Gutter system has been engineered and designed for the intended use described above. Any other use it is not allowed and will be considered a misuse. Damage resulting from improper use, including the non-observance of all instructions contained in this manual, as well as non-complying with the required cleaning and maintenance instructions, will void the warranty and the liability on behalf of the manufacturer. The end-user assumes full responsibility.

1.4 Notes

Date of release: 2020.

Munters cannot guarantee to inform users about the changes or to distribute new manuals to them.

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1.5 Disposal

This product must be disposed according to the laws governing the local provisions for recycling. If required, contact your local authorities for information regarding the available disposal facilities.

2. BEFORE USE

Safe functioning is assured only if the installation, operation, maintenance rules and guidelines are carefully read, understood and followed.

2.1 General safety instructions

Operator training is necessary before using the air heater:

- read and understand the instructions contained in the manual delivered with the MPG;
- contact Munters in case training is necessary;
- Inform the maintenance staff and operators on the functioning manners and methods.

This manual contains the most important information for the air conditioning system. The relevant provisions on accident prevention and any other generally accepted technical safety and health provisions for the workplace must be observed.

The specifications provided by the water and power supply companies must also be observed.

2.2 Delivery check

Upon receipt, inspect the item for external damage and if found, inform the forwarding agent immediately. If undamaged, open the boxes and check the quantities of products in each box against the packing list. If there is any differences please contact your agent. If not used (stored), do not open the boxes and keep them in a closed, safe and dry place. Check the data on all the rating plates of the accessories such as pumps (voltage and frequency).

2.3 Packaging and transport

Since the gutter segments consist of numerous long pieces, pay attention during the handling and the storing of the pieces. If the kits are stored in a bundle, the sides of the bundle should be supported to prevent the heap from collapsing and causing injury.

2.4 MPG glue-free concept design

The MPG consists of an innovative and patented system that reduces the assembly time while improving quality. In particular, the MPG does not use glue in order to seal of the bottom water gutter or the frame components.



NOTE The only components that need glue concern the accessory such as Distribution Kit. For detailed info please refer to *Chapter 3*.

2.5 Environmental conditions

The installer and/or user is responsible for preparing a suitable area for installation of the equipment and complying with the requirements and national law governing safety at places of work.

Environmental conditions for installing and operating the equipment are as follows:

Operating ambient temperature range	
-10°C / +40°C	+14°F / +104°F



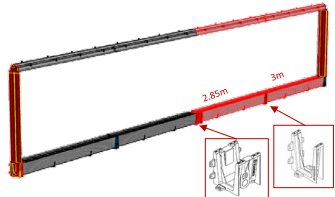
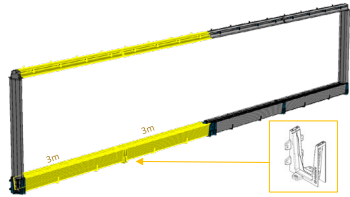
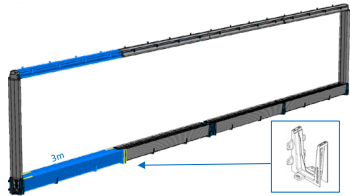

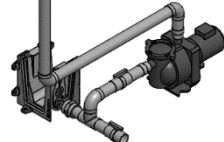
IMPORTANT The winterization of the system is mandatory as soon as the cooling season is over (temperature below 10°C or 50°F). The system has to be flushed out (all water out), completely dried and cleaned. The water pump must be removed and stored in a safe place.

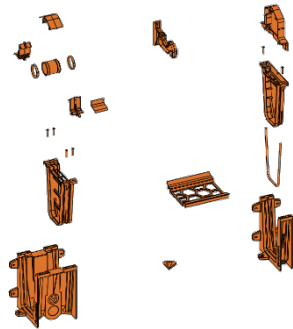
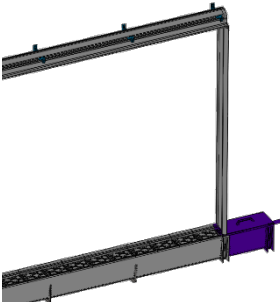

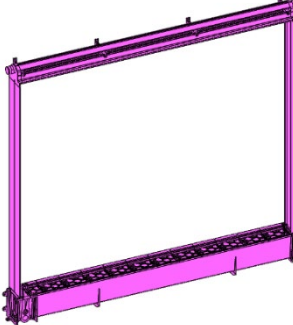



IMPORTANT Protection against splash water (rain): the water pump has to be covered with suitable materials (which are not supplied as standard). Do not wrap the pump completely to avoid condensation.

2.6 Description of the MPG system

The MPG system is made by individual kits. The MPG kits are defined by their collective purposes, each multiple of 3 meters long sections. The kits are listed below and can be identified using the labels attached on packaging.

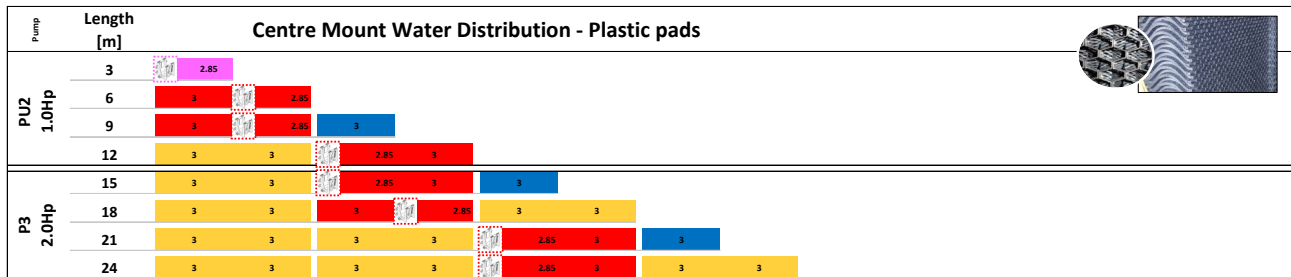
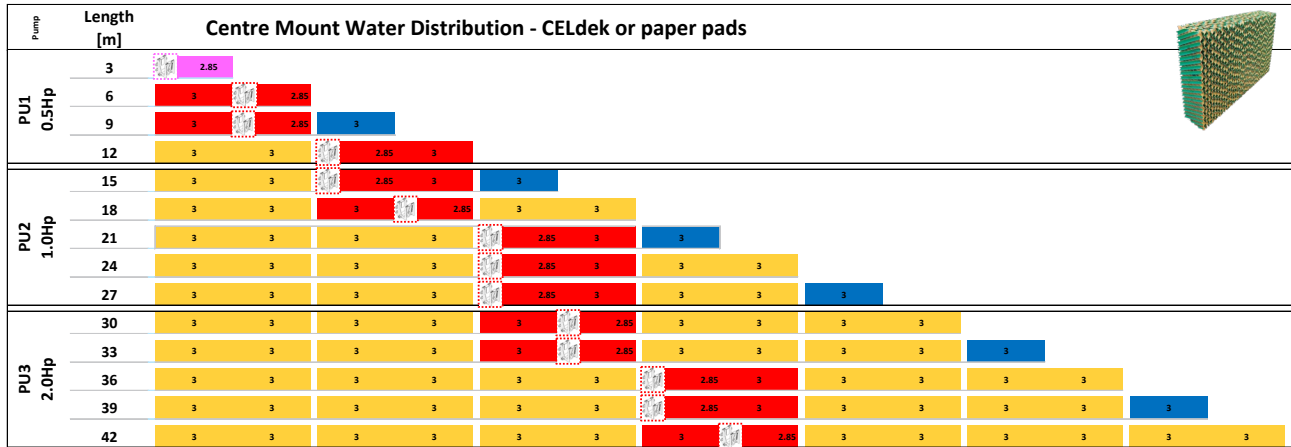
Symbol code	Colour code	Short description	Sketch (e.g. 12m system)
BE	RED	<p>Base Element (total length 6m)</p> <ul style="list-style-type: none"> - The kit contains 2pcs of bottom water tanks (with two different lengths 3m and 2.85m) - Contains the supply connection bracket (aka discharge bracket) which can be placed anywhere (middle or sides) for as long as it is coupled with the 2.85m long water gutter (Detailed info see manual) - The kit is packaged in a single box together with ending kit (lateral kit) <p>Note: Each pad wall section must include one 1pc Base element</p> <p>Ending kit (aka Lateral kit)</p> <ul style="list-style-type: none"> - Standard height 2.5m (for lower pad heights, cut down to desired pad height) - The kit is packaged inside the BE box <p>Note: Each pad wall section must include 1pc Ending kit</p>	
ME6	YELLOW	<p>Middle Element (6m long)</p> <ul style="list-style-type: none"> - The kit contains 2 pcs of bottom water tank (3m long each) - The kit is packaged in a single carton box <p>Note: difference compared to BE kit is that it doesn't contain the supply connection bracket)</p>	
ME3	BLUE	<p>Middle Element (3m long)</p> <ul style="list-style-type: none"> - The kit contains 1 pc of bottom water tank (3m long) - The kit is packaged in a single carton box <p>Note: difference compared to BE kit is that it doesn't contain the supply connection bracket)</p>	
DK	GREY	<p>Distribution kit (aka plumbing kit)</p> <ul style="list-style-type: none"> - All the piping, joints, elbows needed to connect the water pump to the MPG system - The water pipes (tubes) have to be cut accordingly, depending on the layout or positioning of the system - Can be placed anywhere (middle or sides) together with supply connection bracket - The kit is packaged in a single carton box <p>Note: this kit is available on request as an accessory and does <u>not</u> contain Glue or Teflon tape!</p>	
PU	BLACK	<p>Water pump</p> <ul style="list-style-type: none"> - Different models depending on the size, voltage and frequency - The pump is packaged in a single carton box - More detailed info, see pump manual <p>Note: available on request as an accessory to MPG</p>	

Symbol code	Colour code	Short description	Sketch
SK	ORANGE	<p>Spare parts kit</p> <ul style="list-style-type: none"> - Contains replacement parts for the unlikely event of breakage, damage or lost items during installation <p>Note: purchased separately and delivered in dedicated carton box For more spare parts (larger size components) it is recommended to utilize the ME3, ME6 or BE boxes as spare parts.</p>	
IK	PURPLE	<p>Inspection kit (for float valve)</p> <ul style="list-style-type: none"> - This kit is used to allow the user to inspect and adjust the float valve without removing the Cooling Pads <p>Note: purchased separately and delivered in dedicated carton box</p>	
FK	GREEN-BLUE	<p>Flushing kit</p> <ul style="list-style-type: none"> - This kit is used to allow the user to flush the water from the lateral sides of the system <p>Note: purchased separately and delivered in dedicated carton box</p>	
BE3	PINK	<p>Base Element 3m (Short)</p> <p>For swine applications</p> <ul style="list-style-type: none"> - contains supply connection bracket (aka discharge bracket) which can be placed anywhere (middle or sides, see layout) and a single 2.85mt long Water gutter (tank) - packaged in a single box together with Lateral profiles <p>Lateral profiles</p> <ul style="list-style-type: none"> - standard 2.5m high (cut down to desired size) - packaged inside BE 3 box 	
PS	BROWN	<p>MPG Pump Support Bracket Kit</p> <ul style="list-style-type: none"> - Kit used to allow the fixing of the Pump in hanging position (suspended) when placing on the floor is not possible 	

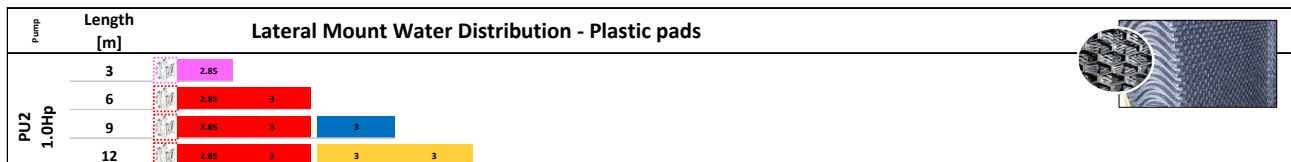
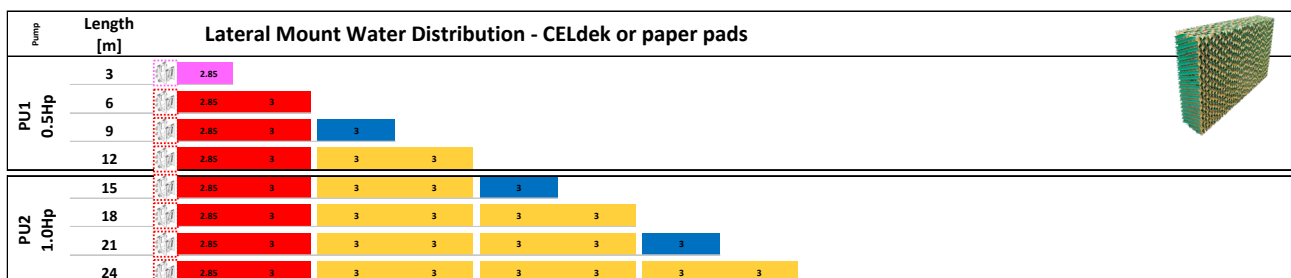
2.7 Overview and system specifications

Depending of the type of evaporative cooling pad used (CELdek paper pads or Plastic pads), the water supply of the MPG system can be installed in 2 different variations:

- **Central mount water distribution:** water pump is placed at the centre of the pad wall. The connection to the pump (inflow) must be done frontally, through the SUPPLY UNIT CONNECTION BRACKET *ref 5*;



- **Lateral mount water distribution:** water pump is placed at the end of the pad wall. The connection to the pump (inflow) can be done either ways between the BOTTOM GUTTER END COVER *ref.18* or through the SUPPLY UNIT CONNECTION BRACKET *ref 5*.

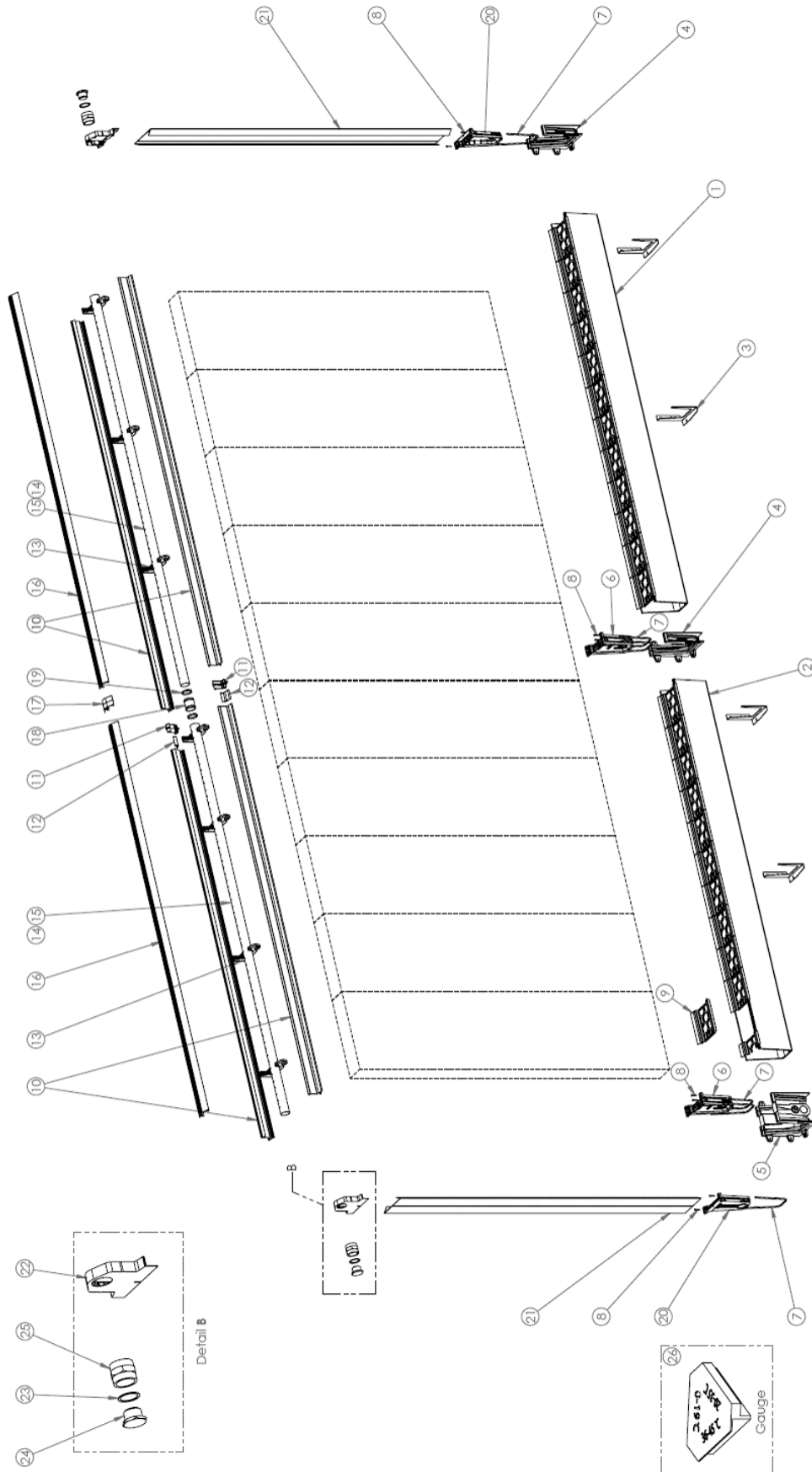


NOTE The above pad wall lengths [meters] are the maximum lengths achievable with a single water pump. Contact Munters in case of different pad wall lengths or layouts e.g. two water pumps per pad wall.

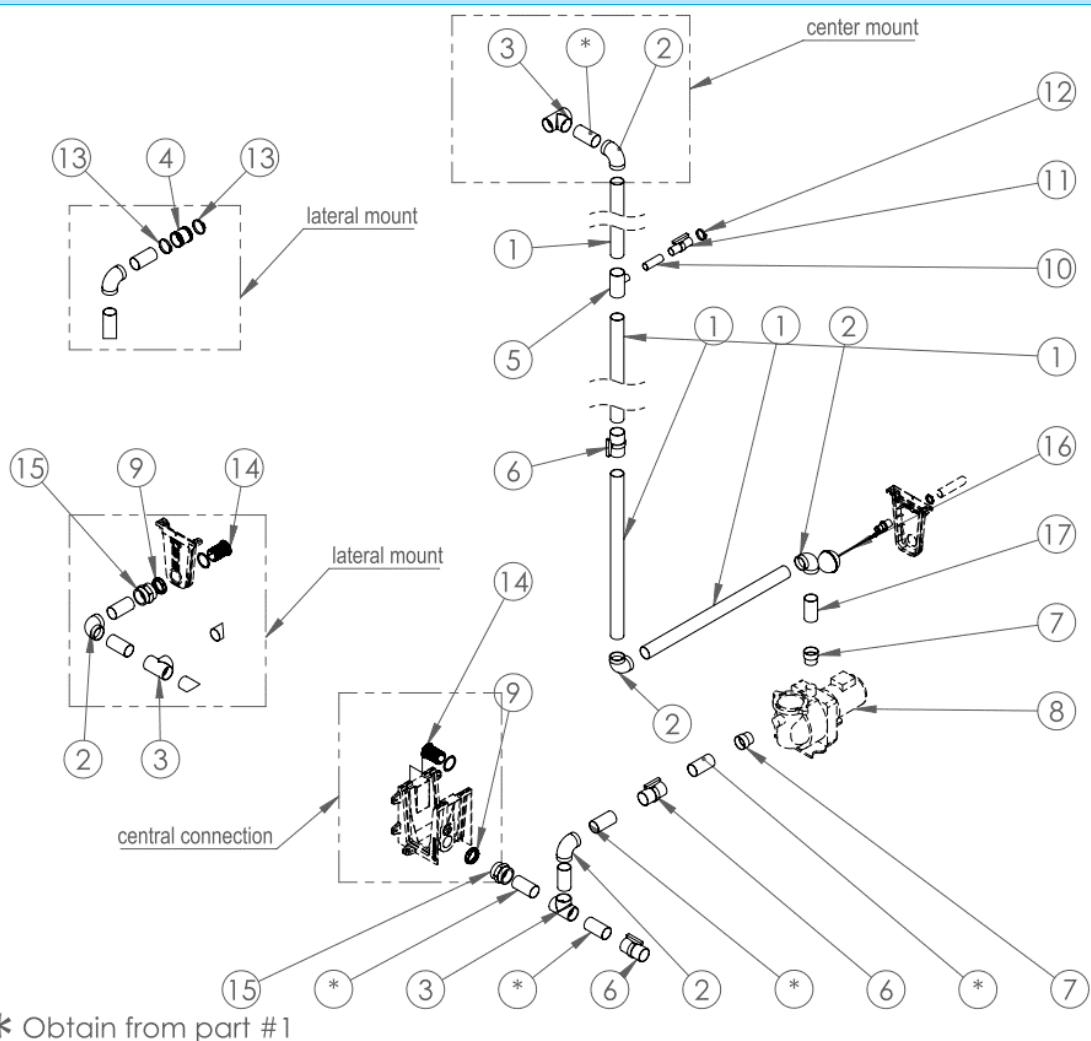
IMPORTANT For pad wall lengths different from multiples of 3 meters, the installer and/or user must cut the MPG profiles accordingly. Munters doesn't assume responsibility in case of wrong cutting of the components.

3. PART LIST

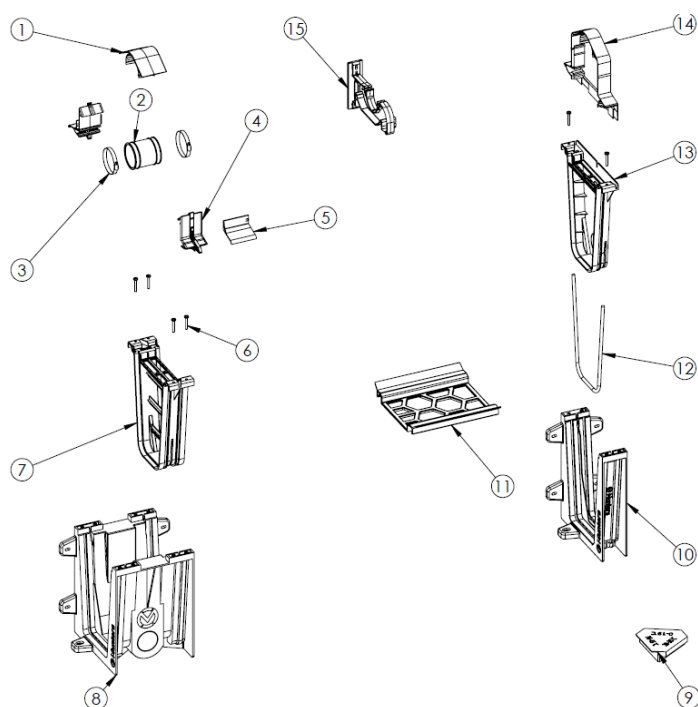
MPG – General Overview Base Element kit



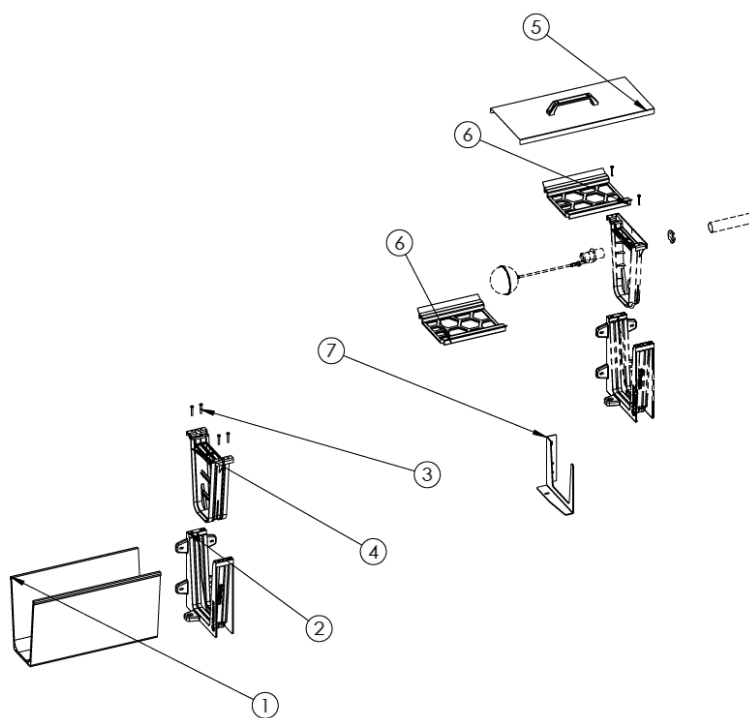
Distribution kit - Packing List



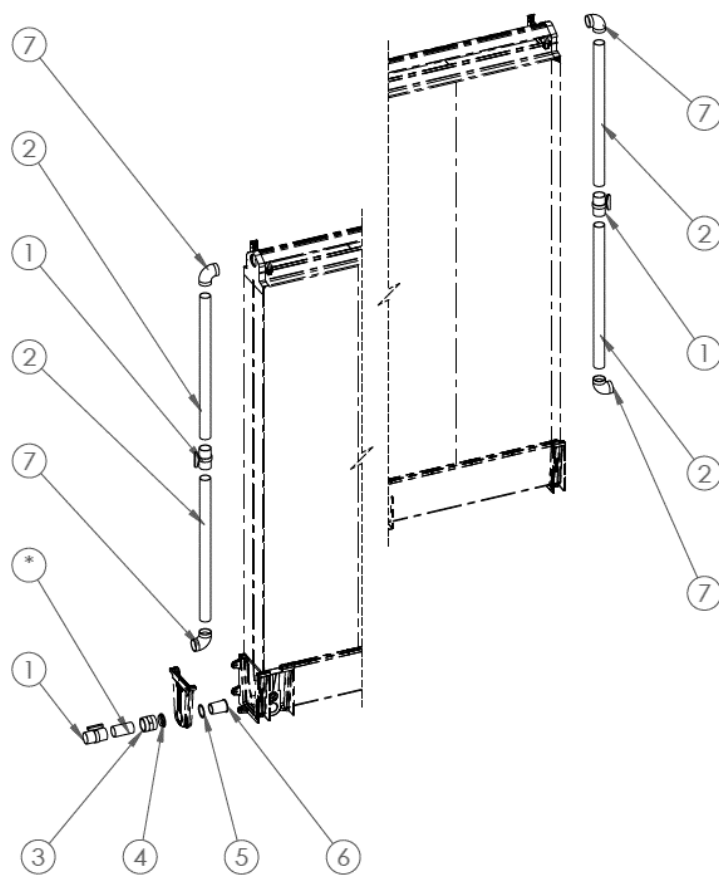
Spare parts kit - Packing List



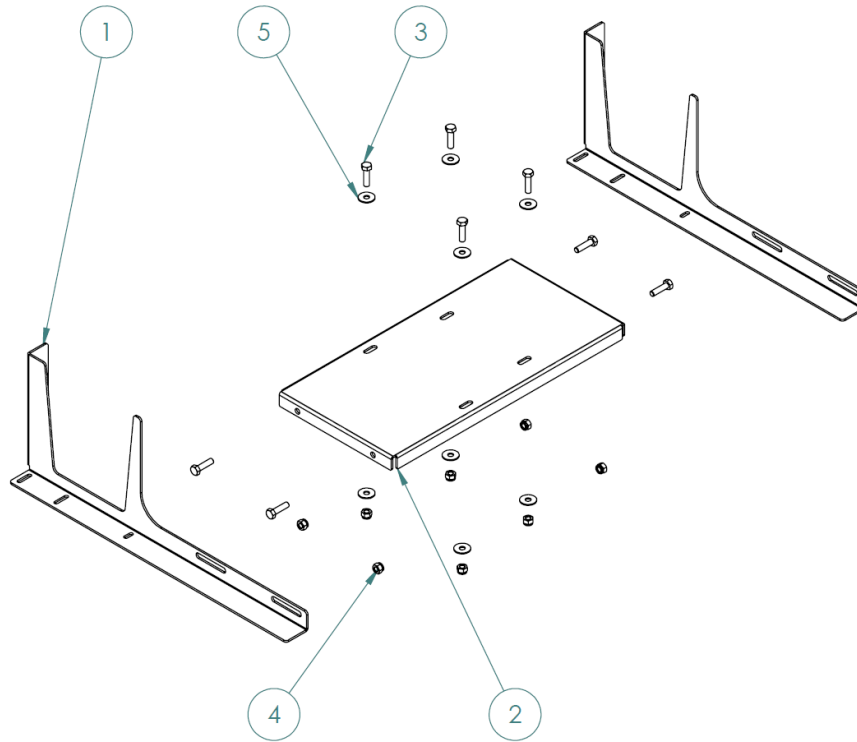
Inspection kit (for float valve) - Packing List



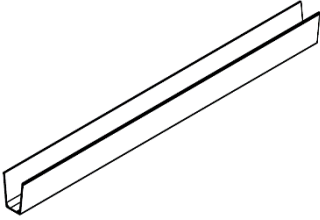
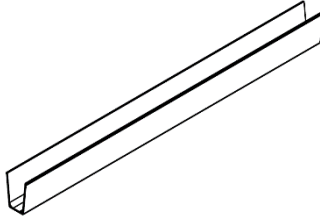
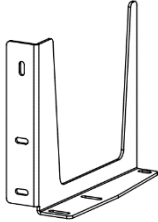
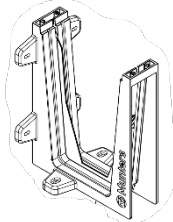
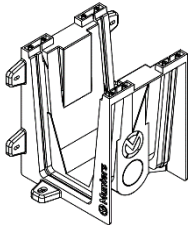
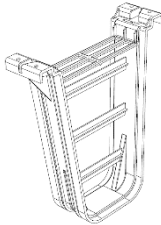


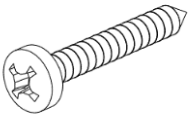
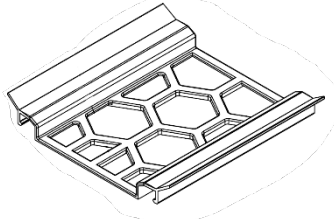
Flushing kit - Packing List



Pump Support Bracket - Packing List



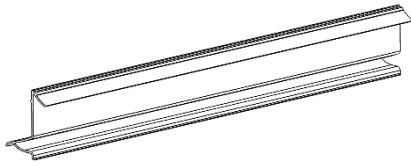
MPG – Components (detailed)

1  BOTTOM WATER GUTTER – 3000 mm	2  SHORT* BOTTOM WATER GUTTER – 2850 mm
3  METAL MIDDLE BRACKET	4  EXTERNAL JOINT BRACKET
5  SUPPLY UNIT CONNECTION BRACKET	6  INTERNAL JOINT BRACKET
 IMPORTANT The SUPPLY UNIT CONNECTION BRACKET <i>ref</i> 5 may be placed anywhere (centrally or laterally) for as long as it is coupled with the SHORT BOTTOM WATER GUTTER – 2850mm <i>ref.</i> 18 (Detailed info see manual).	
 IMPORTANT The screws for fixing the MPG to the structure are <u>not</u> included. Recommended fixing screws for the cement wall are M8 x 65 Hex Coach Screw, Plastic plug Ø10mm and washer Ø8x24.	
7  SCREW FOR INTERNAL JOINT BRACKET	8  PAD SUPPORT



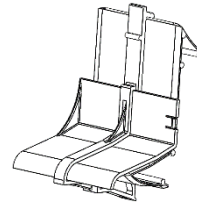
WARNING Use only original parts supplied or recommended by Munters. Do not use a different type of SCREW FOR INTERNAL JOINT BRACKET than the one supplied by Munters. The use of non-original parts exonerates Munters from any warranty or liability claims.

9



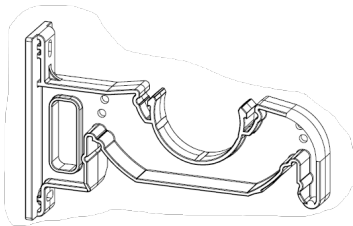
PAD GUIDE

10



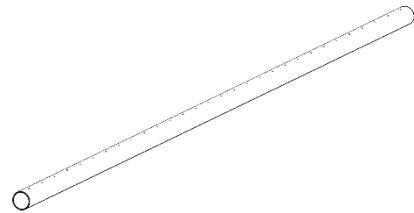
PAD GUIDE COUPLER (2 pieces)

11



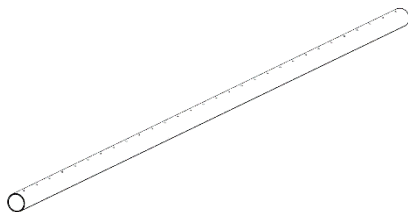
TOP BRACKET

12



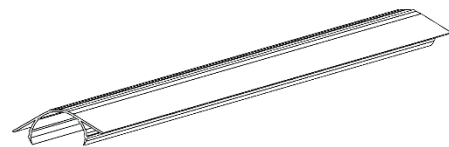
CELdek (paper) Pad WATER DISTRIBUTION PIPE – holes d 100 mm

13



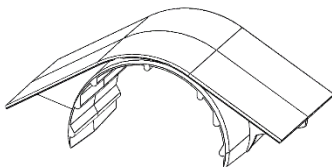
Plastic Pad WATER DISTRIBUTION PIPE – holes d 50 mm

14



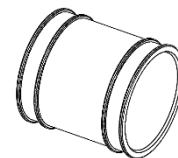
DEFLECTOR

15



DEFLECTOR COUPLING

16



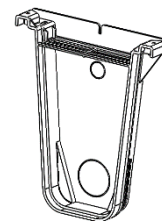
PIPE CONNECTOR (rubber)

17

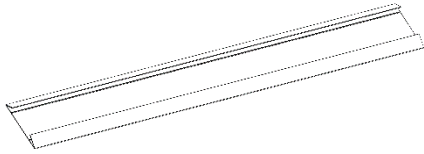
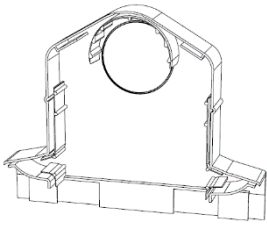
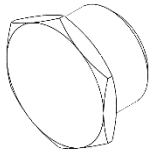
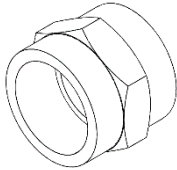


Metal CLAMP FOR PIPE CONNECTOR

18



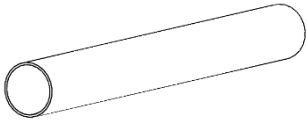
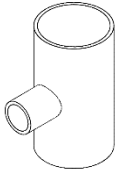
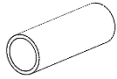
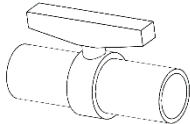

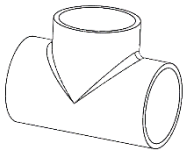
BOTTOM GUTTER END COVER

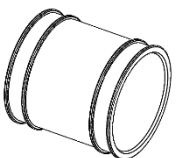

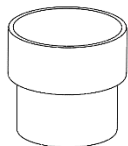
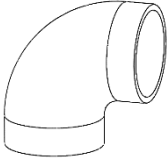
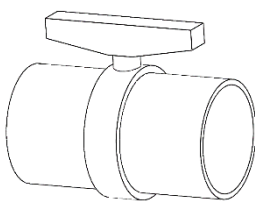
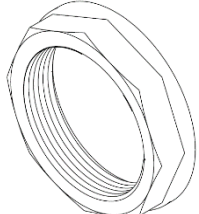
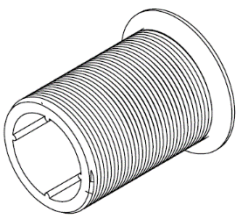
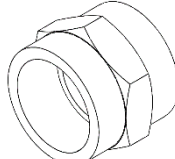
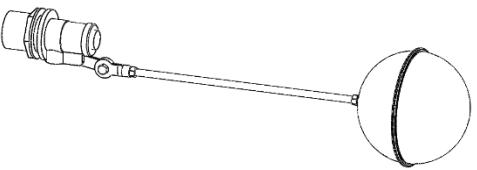
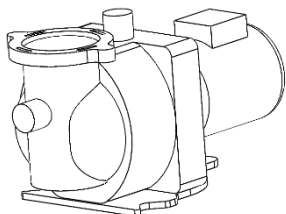
19	 <p>LATERAL PROFILE (suitable for 2.5m high pads)</p>	20	 <p>END COVER FOR DEFLECTOR</p>
21	 <p>PLUG PVC-U G 2" Incl. GASKET</p>	22	 <p>ADAPTOR SOCKET PVC-U Ø 63 – G 2"</p>

Distribution Kit – Components (detailed)



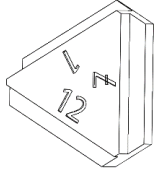
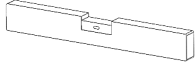
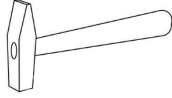


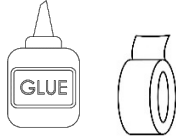


IMPORTANT The Glue or Teflon tape required to assemble the water distribution kit are not included. These must be provided by the installer accordingly.

23	 <p>PVC PIPE Ø63 L800 WITHOUT HOLES</p>	24	 <p>TEE 90° REDUCING 63-25</p>
25	 <p>PVC PIPE Ø25</p>	26	 <p>BALL VALVE METRIC Ø25</p>
27	 <p>CLAMP FOR PIPE CONNECTOR Ø25</p>	28	 <p>TEE 90° Ø63</p>

29	 <p>PIPE CONNECTOR (rubber)</p>	30	 <p>CLAMP FOR PIPE CONNECTOR</p>
31	 <p>PIPE CONNECTOR ADAPTER Ø 63- Ø 50</p>	32	 <p>ELBOW 90° Ø63</p>
33	 <p>BALL VALVE Ø63</p>	34	 <p>BACKING NUT TANK ADAPTOR 2"</p>
35	 <p>TANK ADAPTOR GAS 2" incl GASKET</p>	36	 <p>ADAPTOR SOCKET PVC-U Ø63 - 2"</p>
37	 <p>FLOAT VALVE INCL.GASKETS</p>	38	 <p>Water PUMP (on request)</p>

4. RECOMMENDED ASSEMBLY TOOLS and MATERIALS

Ref.	Picture	Description
1		HEAVY DUTY DRILLING MACHINE WITH TORQUE ADJUSTMENT
2		CHALK LINE OR ANY OTHER INSTRUMENT FOR MARKING HORIZONTAL LEVEL E.G. LASER
3		GAUGE FOR INSTALLATION (Item supplied with each Base Element kit, as standard)
4		SPIRIT LEVEL
5		SMALL HAMMER
6		SAWING MACHINE (circular)
7		LADDER
8		GLUE and Teflon Tape (Item not supplied with Distribution kit; must be supplied by the customer)



NOTE For assembling the Distribution Kit, Munters recommends to use PVC glue types such as “Gitang Plus” by Sigill or “PVC Heavy Duty” by Oatey. Quantity just enough depending of the job.



NOTE The proper type of fixing screw must be provided by the customer, depending of the installation wall material type. The recommended fixing screws for the wall are: M8 x 65 Hex Coachscrew, Plastic plug diam.10mm and washer Ø8x24.

5. ASSEMBLY GUIDELINES

5.1 Required wall opening (layout)

As installation conditions vary widely, it is important to consider that below installation descriptions are of general character and need to be adapted to suit own installation conditions.

For explanatory purposes, a pure tunnel ventilated house will be used, with Central Mount water distribution and CELdek evaporative cooling pads like [Figure 1](#).

Optional structure: if the installation building has a robust, stable, plane (straight horizontal and vertical) wall that is constructed of concrete or brickwork, no substructure to support the frame is needed.

Furthermore, the placement of the MPG directly on the floor saves time compared to installing the MPG in suspended (hanging) position, therefore Munters recommends whenever possible to consider placing the MPG directly on the floor or similar structure, to support the weight from the bottom.

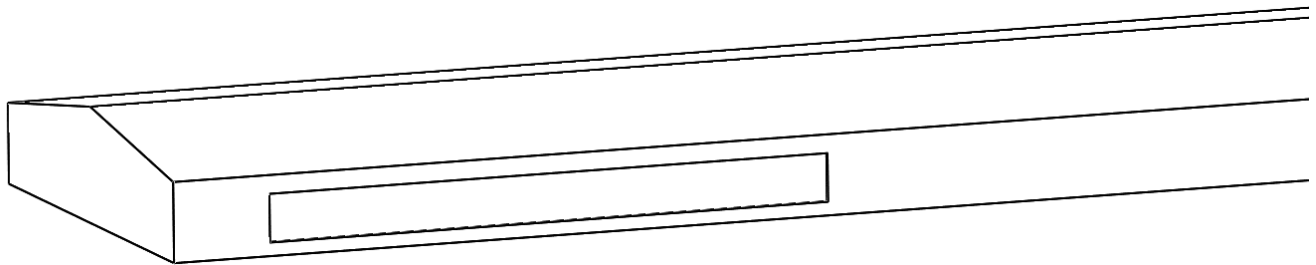


Figure 1

In the following paragraphs it is described the installation procedure for an 18 meter long wall opening. [See Figure 2](#).

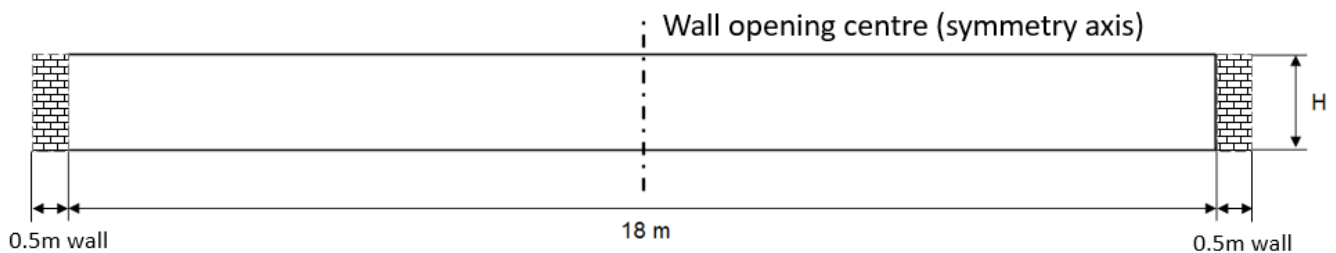


Figure 2



NOTE Depending of the design, it is recommended to consider 0.5m (2ft) of free space at side(s), for connecting the incoming water system and/or for installing the Inspection kit (for float valve).

The below sketches of [Figure 3](#) provide all distances necessary for the correct installation of the MPG.

The height of the wall opening is dependent on the pad height. The MPG is supplied, as standard, with Lateral profiles (ending kit) suitable for cooling pads with dimensions of 2500mm (8.2ft) tall and 150mm (6inch) thick. For pads shorter than 2500mm (e.g. 2000, 1800, 1500, 1200, 1000mm), the installer must cut the lateral profiles accordingly.



NOTE Because of imperfections in the walls and depending of the layout, it is recommended to cover the gaps resulted between the MPG and walls, using metal sheet and bolts. If the resulting gaps are not properly covered, than the house may leak air or light from outside.

5.2 Central mount water distribution (pump placed in the centre, by the symmetry axis)

Step 1

The installation of the brackets that will hold the Bottom Water Gutter has the following layout:

- (1 pc) Supply Unit Connection Bracket positioned at the centre of the wall opening;
- (6 pcs) External Joint Brackets that need to be positioned at a distance of about 3m;
- (12 pcs) Metal Middle Brackets positioned at the distance described in the following Steps.



IMPORTANT When the Supply Unit Connection Bracket is positioned in the middle (see centre line of the wall opening), the Float Valve (incoming fresh water supply) will be installed on either sides (left/right side) as needed.

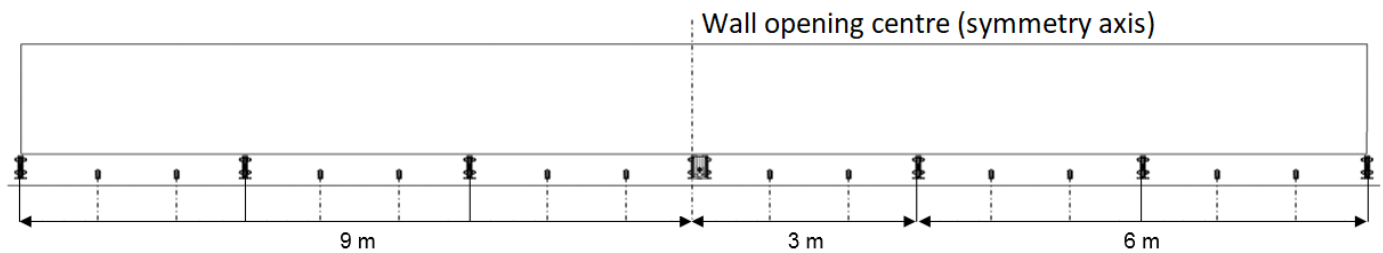


Figure 4

Step 2

The first component to position is the Supply Unit Connection Bracket [ref. 5]. Depending if the water pump will be installed in the middle or sides, the orifice of the Supply Unit Connection Bracket must be cut or drilled accordingly.



NOTE Be sure to have the horizontal surface of the wall opening completely plane. Use a Spirit Level [ref. 4 / Assembling Tools]. See Figure 5. The MPG must be installed on a flat surface, i.e. 0% slope.



ATTENTION Since for explanatory purpose the Pump is placed in the middle, before fixing the Supply Discharge Bracket to the wall, it is recommended to pre-assemble the Tank Adaptor. Info step 33. If the Pump is not placed in the middle than the Tank adaptor can be fixed later the Side bottom Covers.

Place the indicated rib of the Supply Unit Connection Bracket at the centre and 20mm under the wall opening edge, as indicated in Figure 5. Verify the correct horizontal level using the spirit level.

Next, mark the contour of the bracket, remove it and drill the holes in the wall, making sure to respect the initial marks.

Use the holes alignment to trace a horizontal line on the installation wall, which will serve as a level reference line for all the other brackets holes ② and ③. Use the Chalk line [ref. 2 / Assembling Tools]. See Figure 5.

Then, fix the Supply Unit Connection Bracket to the wall with 4pcs of screws. Note that the proper type of fixing screws have to be selected, depending on the wall material type (wall-mounting screws must be provided by customer).

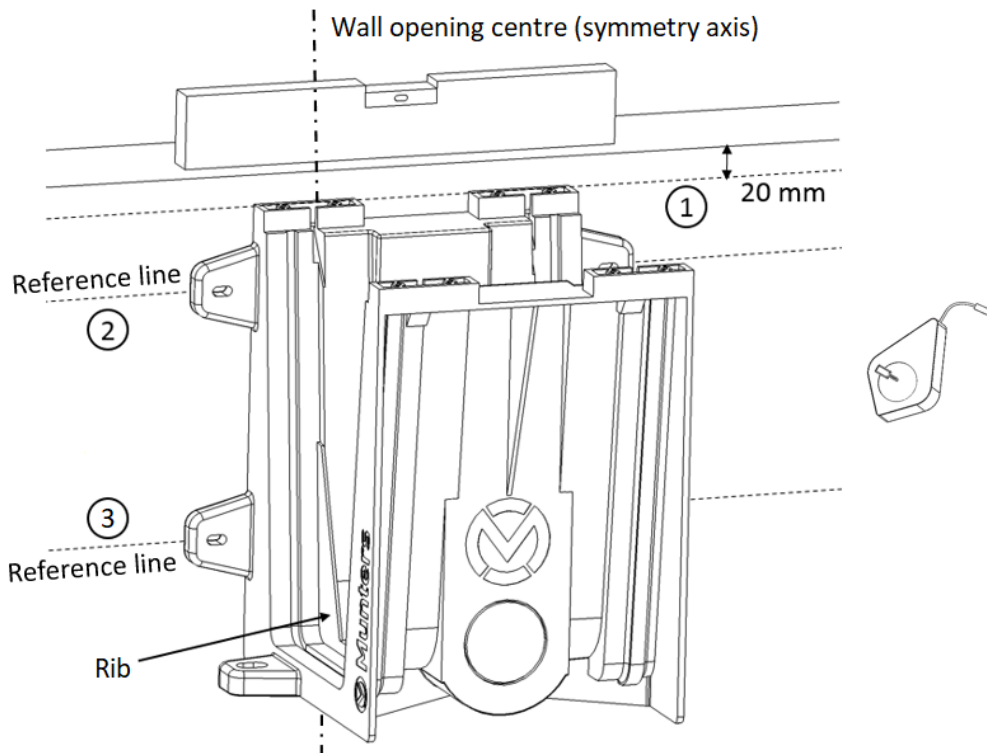


Figure 5

Step 3

Continue by fixing (2 pcs) Metal Middle Brackets [ref. 3] to the wall as indicated below. See Figure 6.



NOTE Make sure that the lower holes of the Supply Unit Connection Bracket are aligned with the middle hole of the Metal Middle Brackets [ref. 3]. See Figure 6.

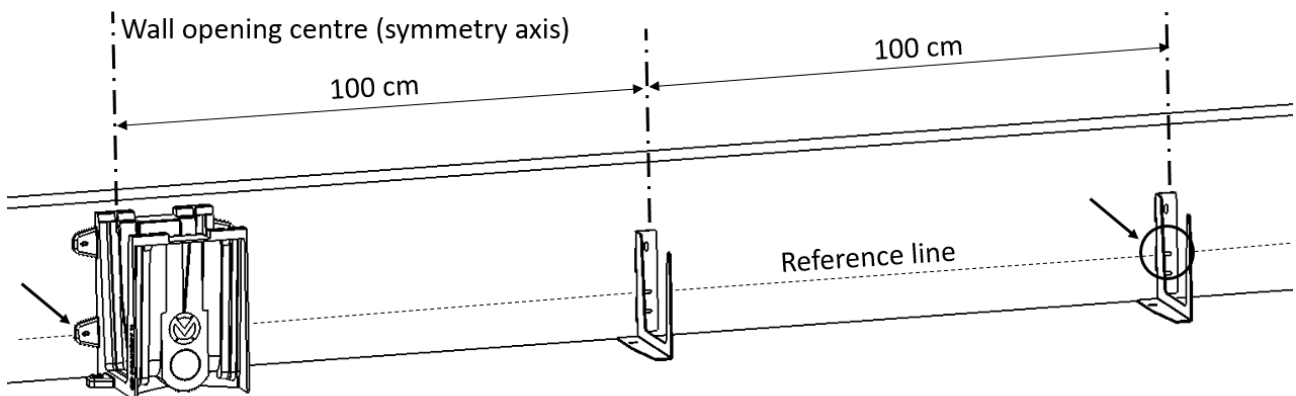


Figure 6

Step 4

Position the External Joint Bracket [ref. 4], using as reference the Short Water Bottom Gutter 2850mm [ref. 2] and the Gauge for Installation [ref. 3 / Assembling Tools]. See Figure 7.

Place the Short Water Gutter against the Supply Unit Connection Bracket (aligning left towards centre line). Then place the Gauge for Installation against the Short Bottom Water Gutter choosing the correct side of the triangle, depending on the ambient temperature during the actual installation (see table below). For explanatory purposes, the below example demonstrates the correct installation at an ambient temperature during installation of 37°C/Gauge Side 1.

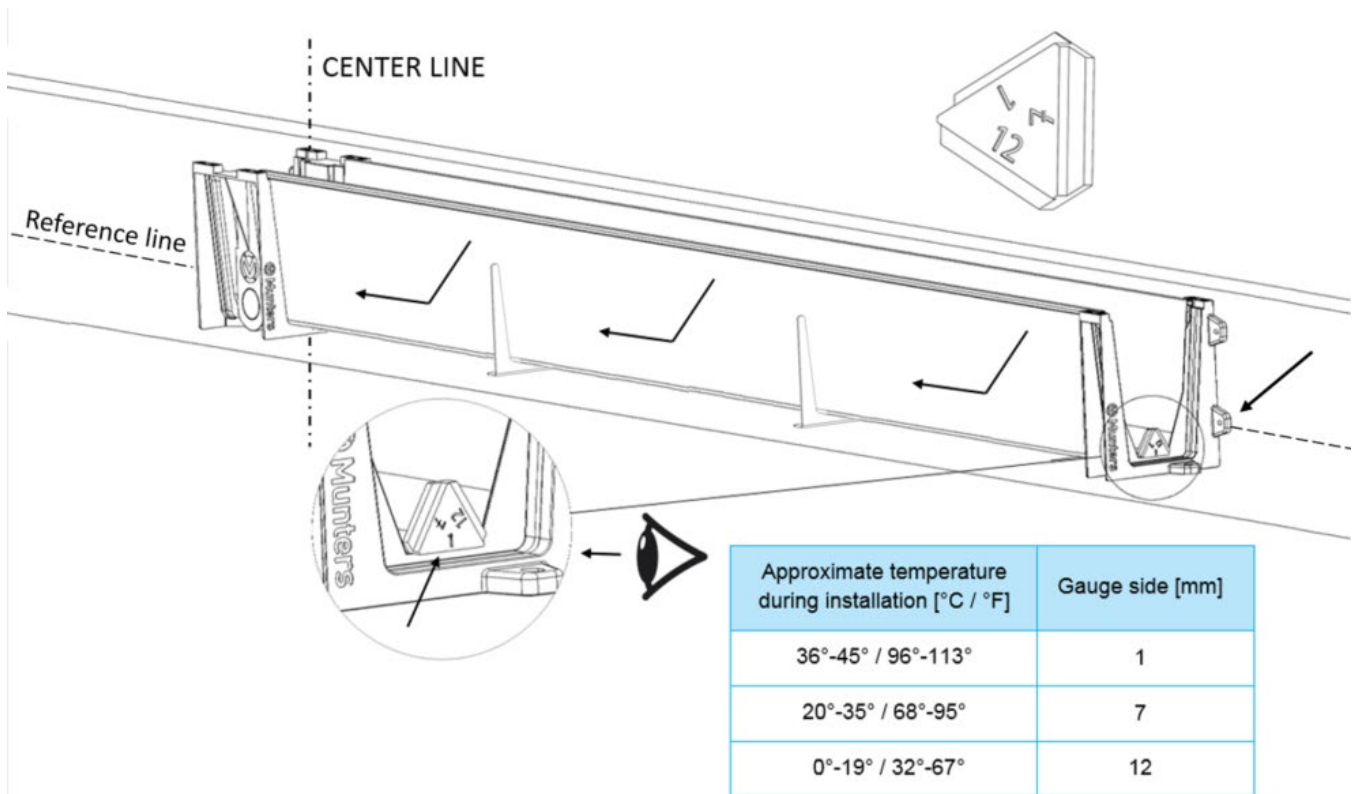


Figure 7

Once the External Joint Bracket is correctly positioned, mark the holes for fixing. Then, remove the Short Bottom Water Gutter with the Gauge for Installation and fix the External Joint Bracket to the wall with 4pcs screws).

Step 5

Position the Short Bottom Water Gutter [ref. 2] in the brackets paying attention to place it against the Supply Unit Connection Bracket. Align left towards the centre line. See Figure 8.



NOTE Pay attention to avoid mismatch. In the Base Element box, there are 2 Bottom Water Gutters with 2 different lengths. The Short Bottom Water Gutter 2850mm must always be interconnected (used together) with the Supply Unit Connection Bracket, independently of where it is placed (centrally or laterally).

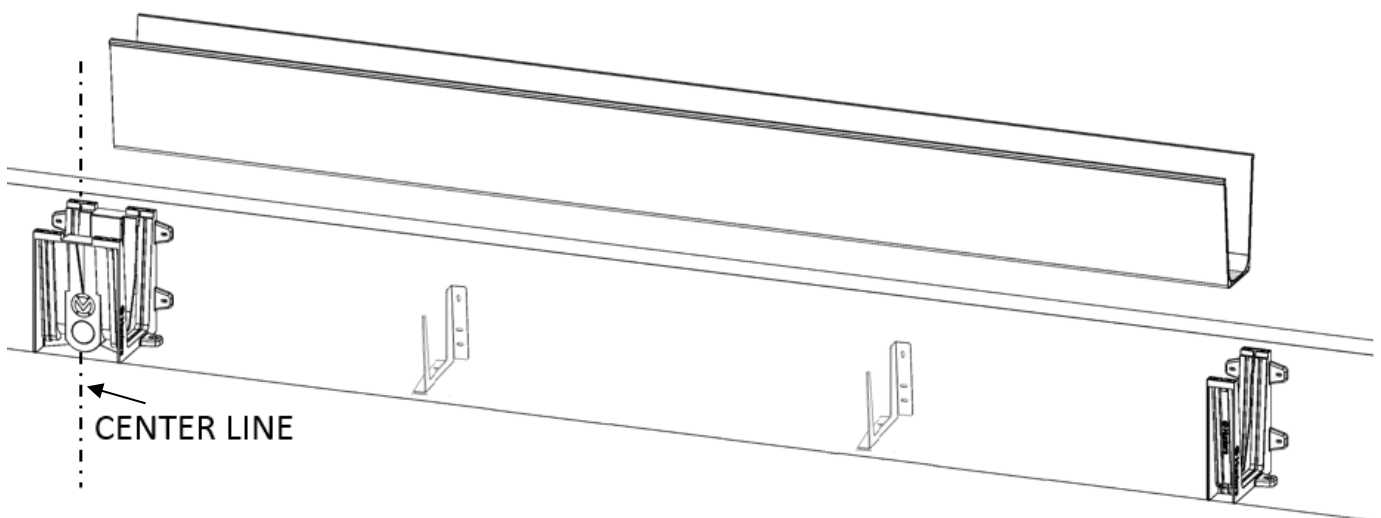


Figure 8

Step 6

Next, insert the Internal Joint Bracket [ref. 6] utilizing the rib of the Supply Unit Connection Bracket as a guide in order to insert it perpendicularly.

Fix it to the Supply Unit Connection Bracket by means of (4 pcs) Screws for thermoplastic [ref. 7]. See Figure 9.



WARNING Fix the screws using the Cordless Drill [ref.1 / Assembling Tools] by applying a torque of 6 Nm. Pay attention not to damage the plastic components by applying incorrect torque.



WARNING Use only original parts supplied or recommended by Munters. Do not use a different type of SCREW FOR INTERNAL JOINT BRACKET than the one supplied by Munters. The use of non-original parts exonerates Munters from any warranty or liability claims.

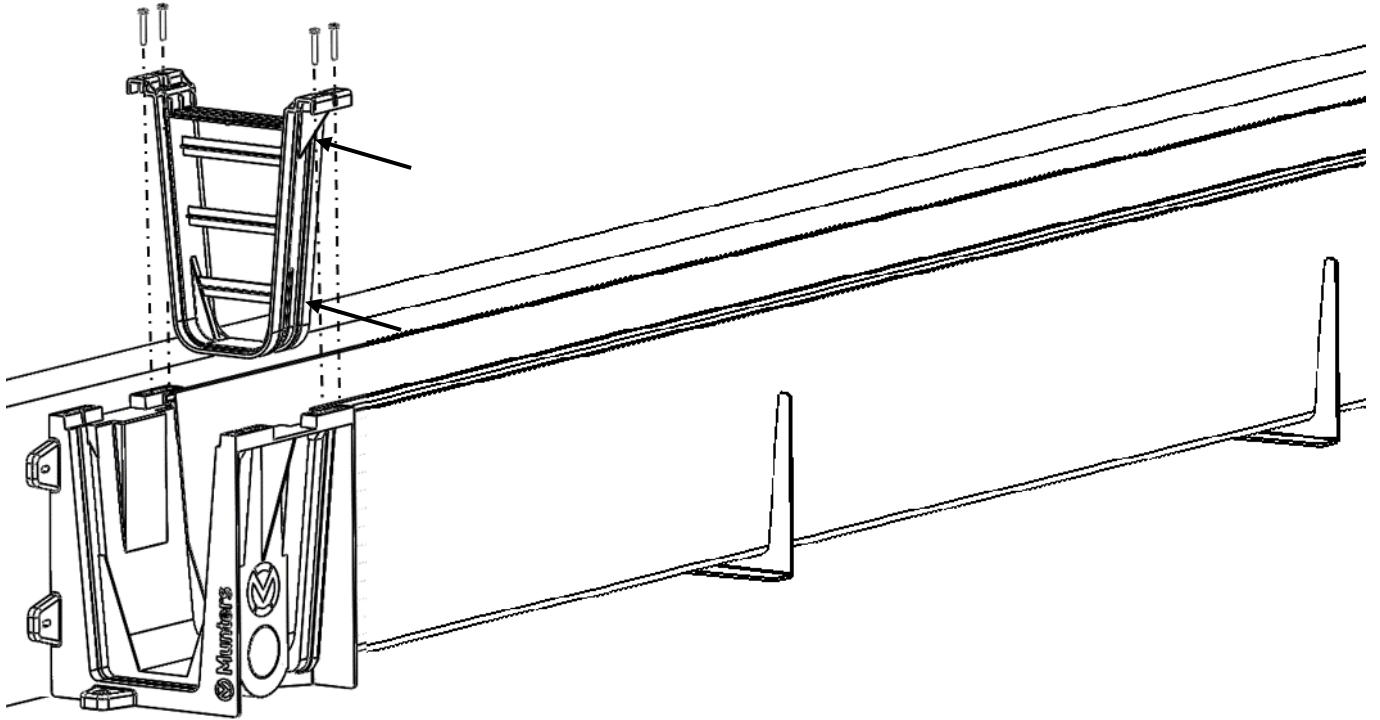


Figure 9

Step 7

Continue the assembling of the Bottom Water Gutters by repeating the assembling procedure of Step 4 and Step 5.

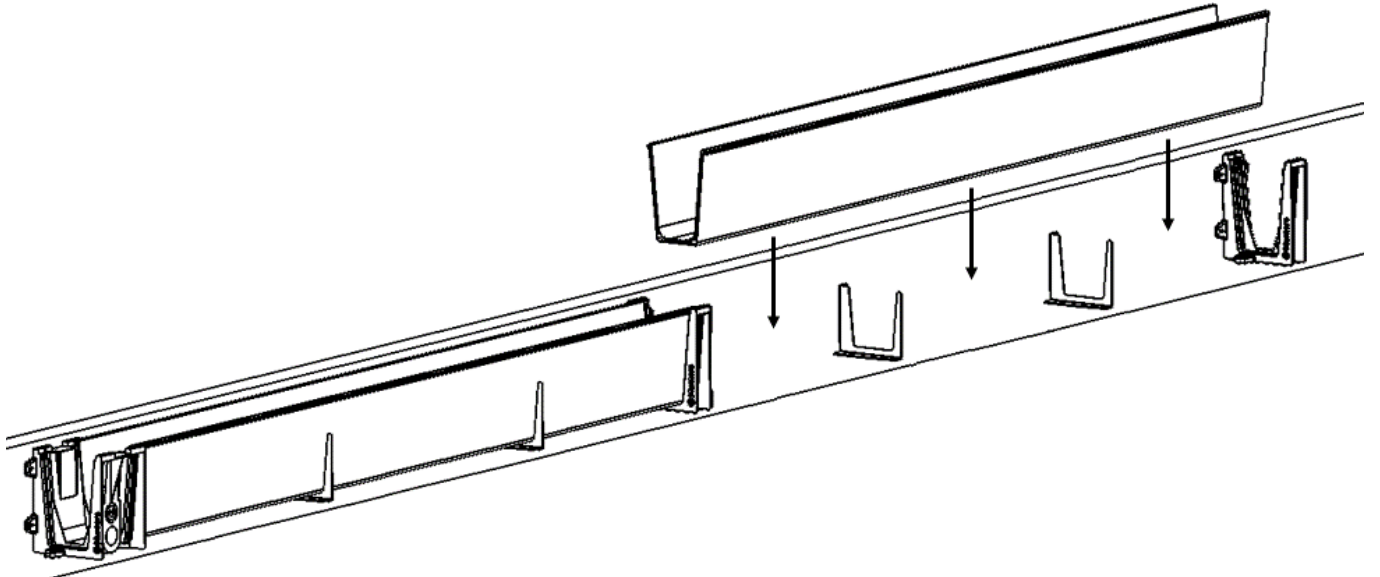


Figure 10

Step 8

Each time, insert the Internal Joint Bracket [ref. 6] and fix it to the External Joint Bracket by means of (4 pcs) Screws for thermoplastic [ref. 7]. See Figure 11.

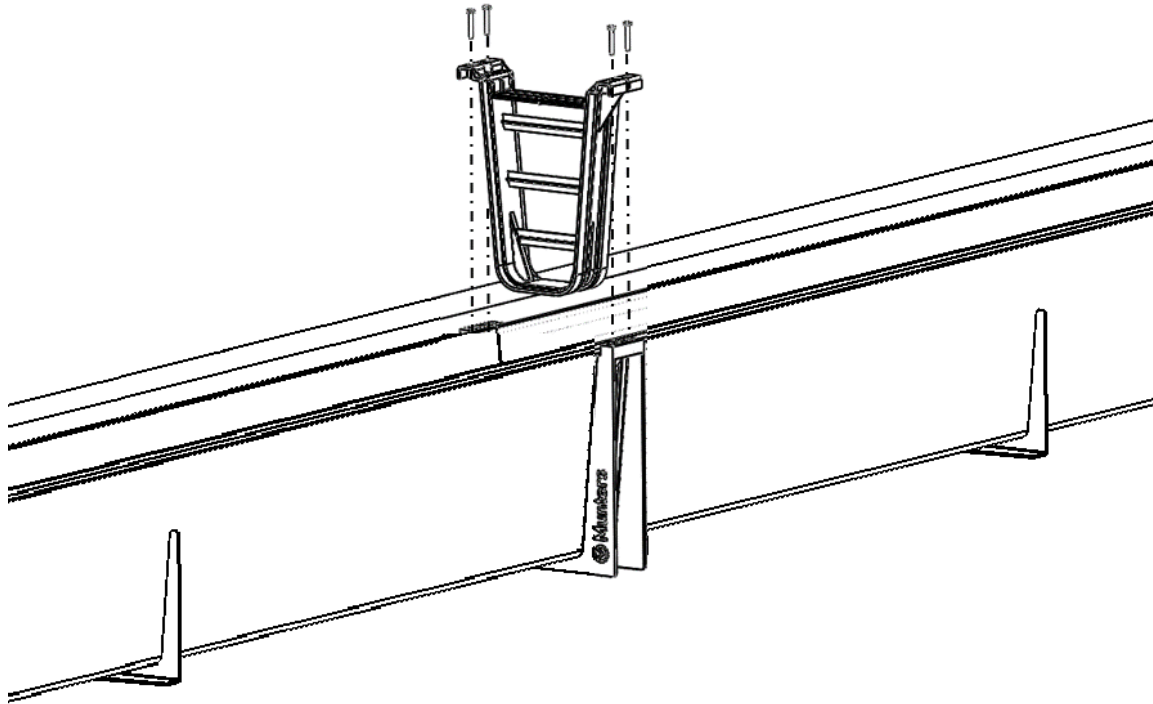


Figure 11

Step 9

To check if the installation was correctly performed, analyse the inspection window present in the Internal Joint Bracket and verify the correct positioning of the Bottom water gutter as below. See Figure 12.

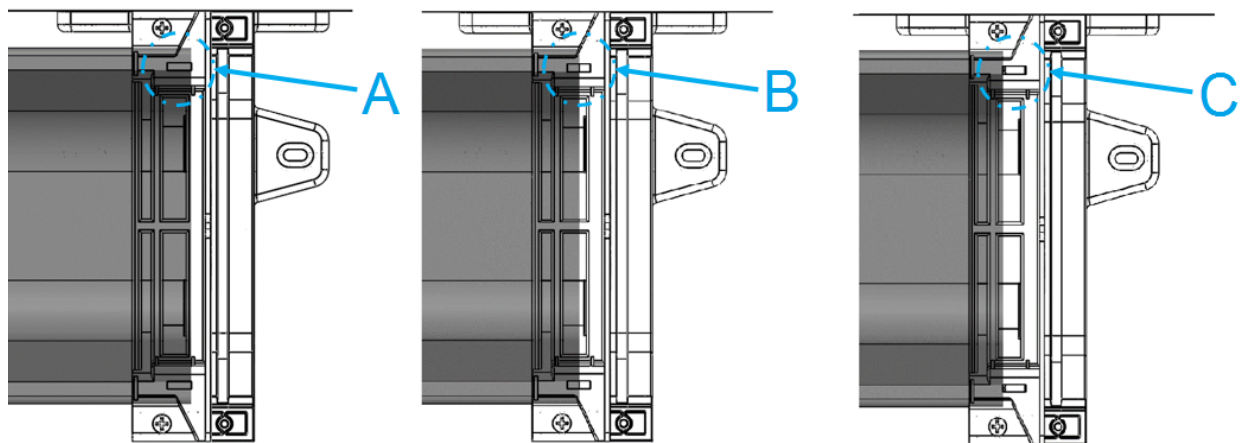





Figure 12

Ambient temperature [°C]	Ambient Temperature [°F]	Case
36°-45°	96°-113°	A - 
20°-35°	68°-95°	B - 
0°-19°	32°-67°	C - 

Repeat thoroughly the procedure explained from Step 4 to Step 9 until the end of the wall opening.

Step 10

Using a Small Hammer [ref. 5 / Assembling Tools] gently break the pre-cut hole in the Bottom Gutter End Cover [ref. 18] to insert the Float Valve [ref. 37] and the inflow (Water Supply). Tighten correctly the Float Valve using its backing nut and placing the gaskets on each side. Use two wrenches to properly fix the float valve without breaking the end cover. Then, close the right side of the Munters Gutter System by installing the Bottom Gutter End Cover [ref. 18] and fixing it to the External Joint Bracket by means of (2 pcs) Screws for thermoplastic [ref. 7]. See Figure 13.

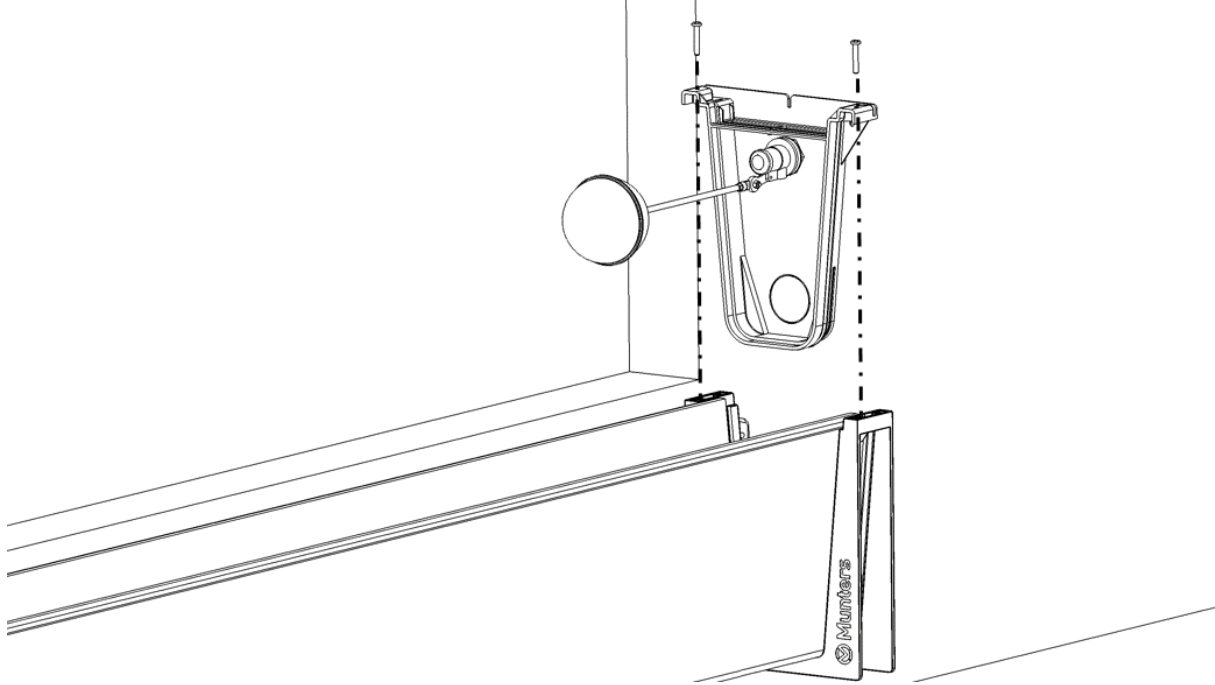


Figure 13



ATTENTION The Fresh Water supply (Float Valve) may be installed on either wall sides, left or right, depending customer preference. In case the Fresh Water Supply (Float Valve) is intended on the opposite side (left side in our case), invert procedure between Step 10 and Step 13.



WARNING Use only flexible piping for connecting the fresh water supply. Do not use rigid PVC or metal piping as it may affect the correct functioning of the gaskets.

Step 11

To double check if the installation was performed correctly, analyse the inspection window present in the Bottom Gutter End Cove and check it according to below table. See Figure 14.

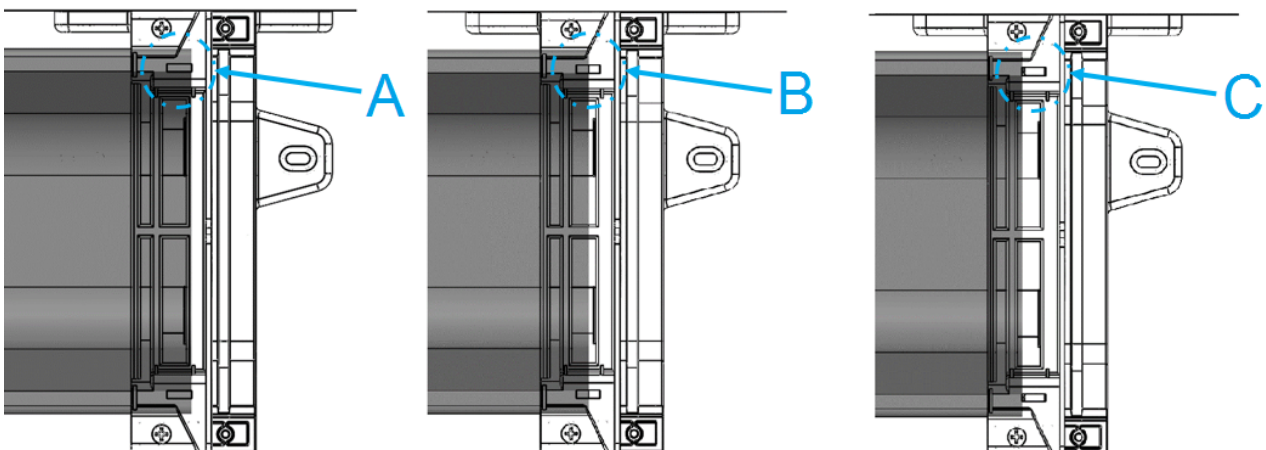





Figure 14

Ambient Temperature [°C]	Ambient Temperature [°F]	Case
36°-45°	96°-113°	A - 
20°-35°	68°-95°	B - 
0°-19°	32°-67°	C - 

If the installation was performed correctly, proceed to next steps. If the installation wasn't performed correctly, repeat the above steps until it is correctly done.

Step 12

Repeat the procedure explained from [Step 3](#) to [Step 9](#) completing the installation at the left-hand side of the Supply Unit Connection Bracket (left side compared to the centre line).

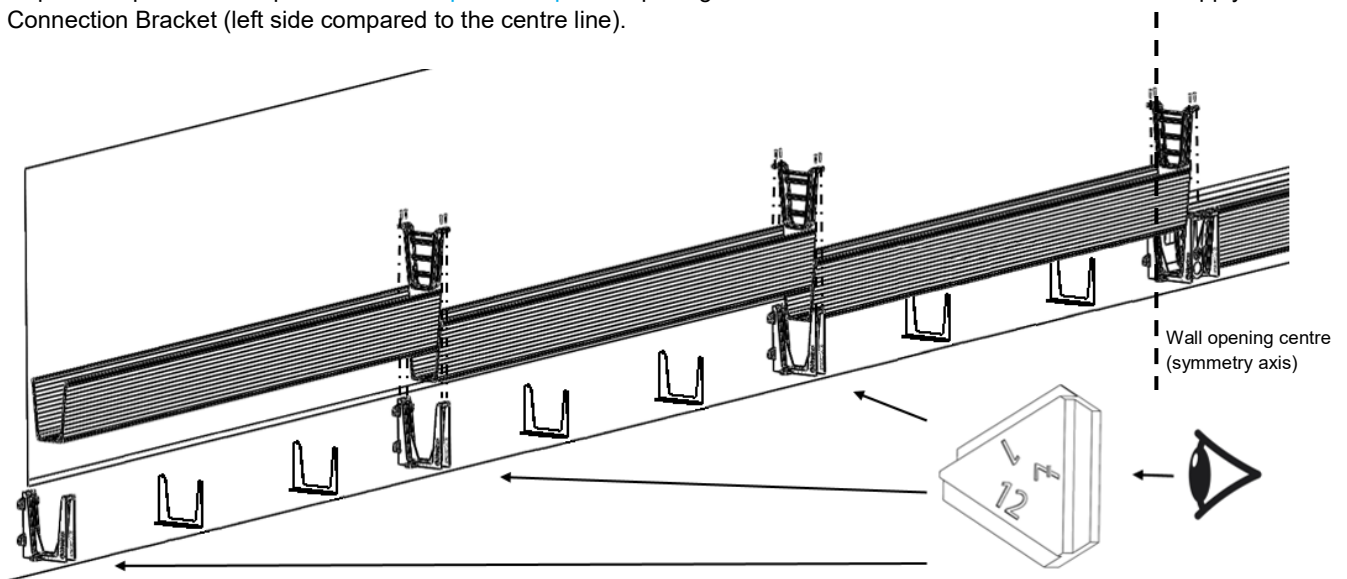


Figure 15

Step 13



IMPORTANT With a Small Hammer [*ref. 5 / Assembling Tools*] gently break the pre-marked hole of the Bottom Gutter End Cover [*ref. 18*] in order to foresee the Overflow orifice. The overflow connection and extension are not provided in the kits, these have to be arranged by customer

Close the left hand side of the Munters Gutter System installing the Bottom Gutter End Cover [*ref. 18*] and fixing it to the External Joint Bracket by means of (2 pcs) Screws for thermoplastic [*ref. 7*]. See [Figure 16](#).

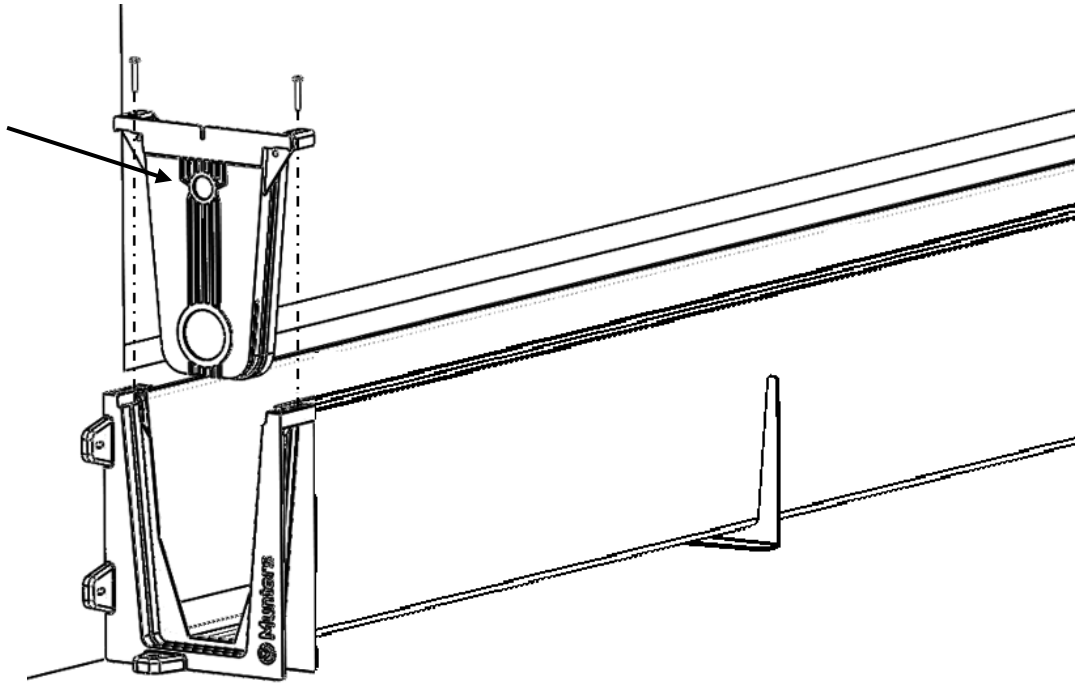


Figure 16



ATTENTION In case the customer wishes to position the Float valve (incoming Water Supply) on this side, invert procedure with previous [Step 10](#).



WARNING Use only flexible piping for connecting the fresh water supply. Do not use rigid PVC or Metal piping as this may affect the correct functioning of the gaskets.

Step 14

Install all the Pad Supports [ref. 8] on the Bottom Water Gutter. The Pad Supports must be positioned one next to each other. Do not leave space in between the pad supports. [See Figure 17](#).

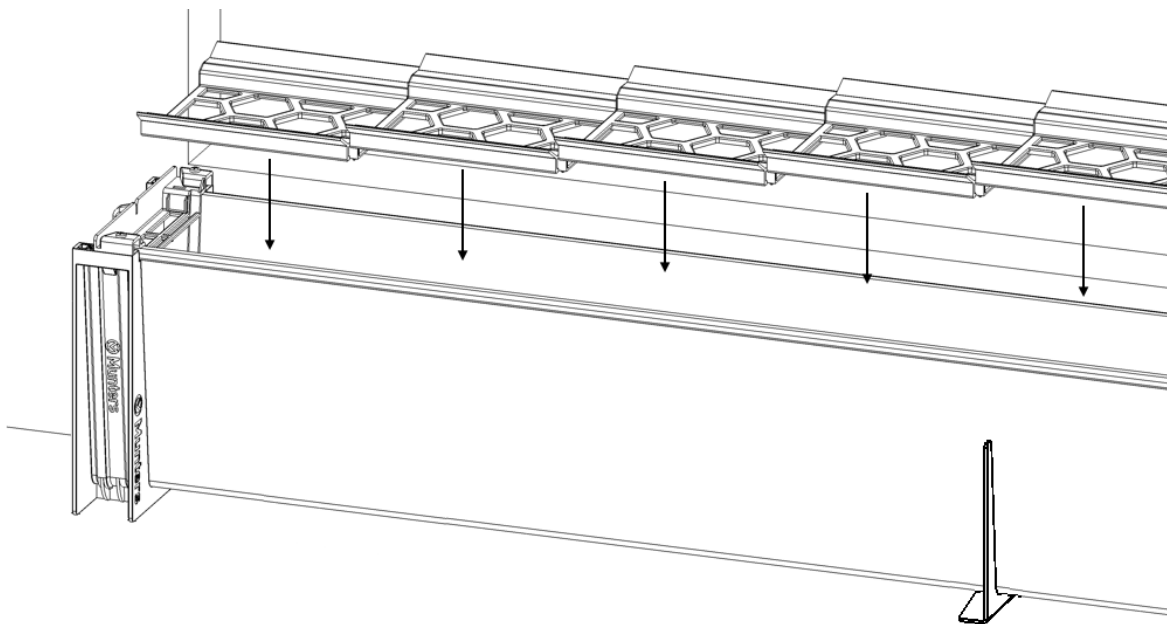


Figure 17

Step 15

Below is described the arrangement of the upper part of the Munters Gutter System.

Depending of the pad height type, measure the vertical distance between the Supply Unit Connection Bracket and the Top Bracket [ref. 11] as indicated in [Figure 3](#).

Once the Top Bracket [ref. 11] is in correct position, use the holes alignment of the Top Bracket to trace a horizontal line on the installation wall, which will later serve as a level reference for all the other holes of the brackets. Use the Chalk line [ref. 2 / Assembling Tools].

Start by fixing the first Top Bracket (left hand) at a distance of 10 cm from the Wall Opening side edge using 4pcs screws (not provided in the kits).

Then fix all the other Top Brackets at a distance of 100 cm with 2 screws per bracket (which must be provided by the customer), until the end of the Installation Wall. [See Figure 18](#).

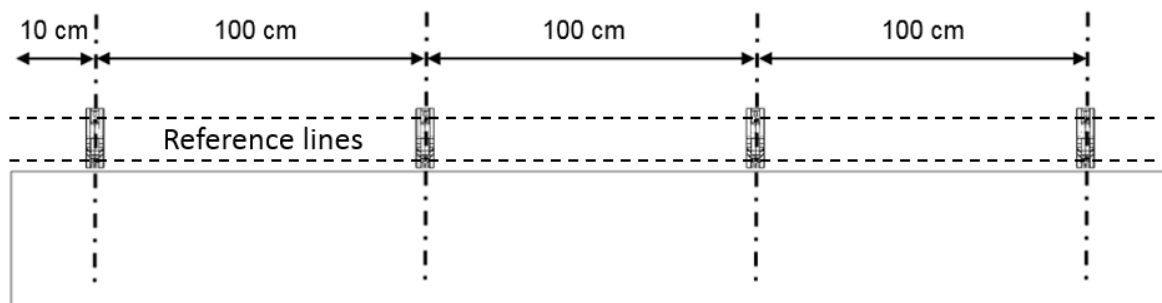


Figure 18

Step 16

Insert the Pad Guide [ref. 9] in the Top Bracket on the wall side. [See Figure 19](#).

Align in correspondence of the Wall Opening side edge.

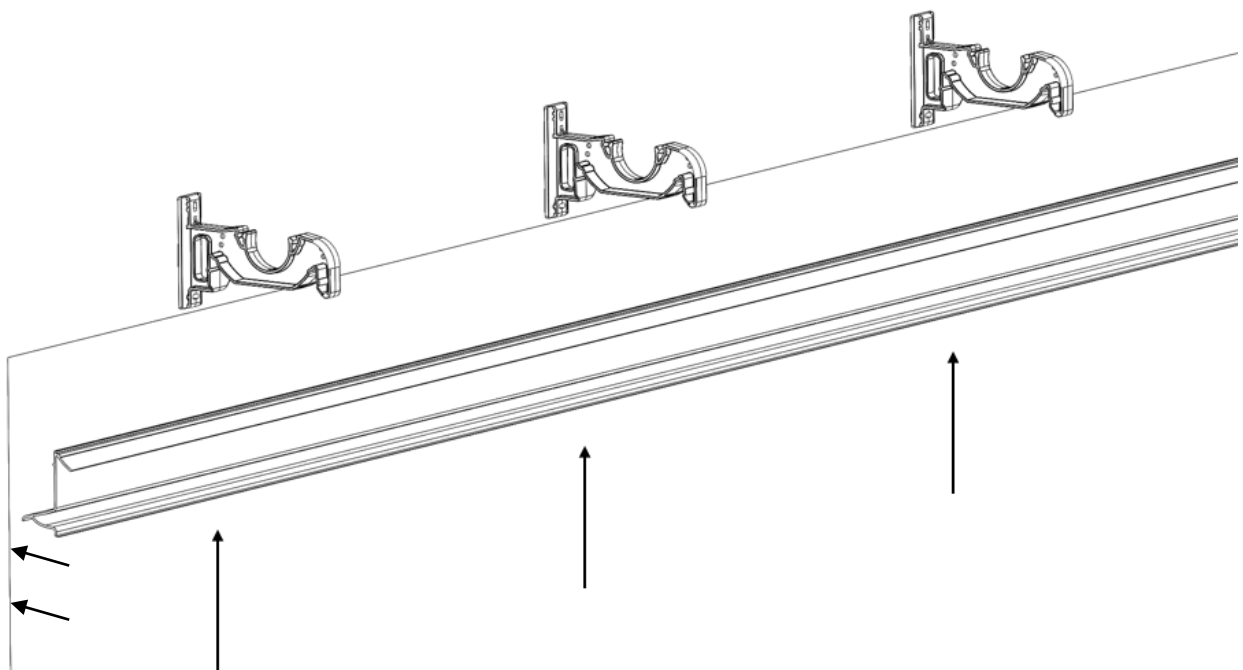


Figure 19

Step 17

On each Pad Guide [ref. 9] insert the Pad Guide Coupler [ref. 10] to join the Pad Guides together. See Figure 20.

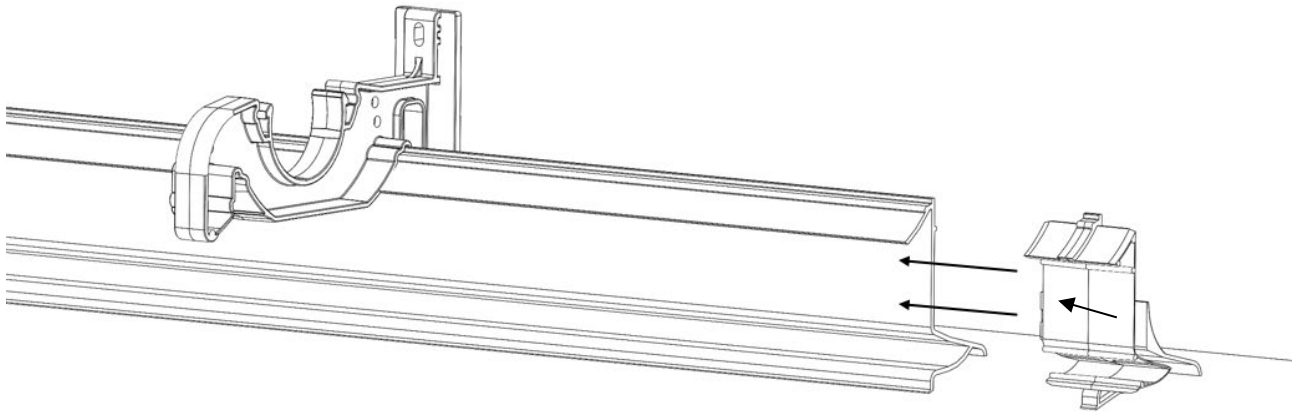


Figure 20

Step 18

Push the slider of the Pad Guide Coupler, insert the next Pad Guide and then secure it by placing back the slider half way. See Figure 21.

Repeat this procedure until the required length.

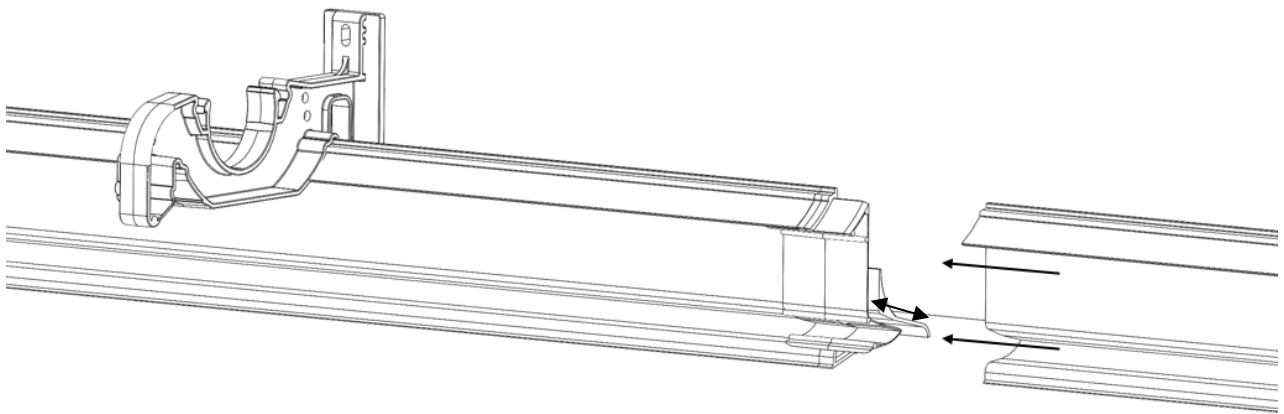


Figure 21

Step 19

Insert the Water Distribution Pipe [ref. 12] in the Top Brackets. See Figure 22.

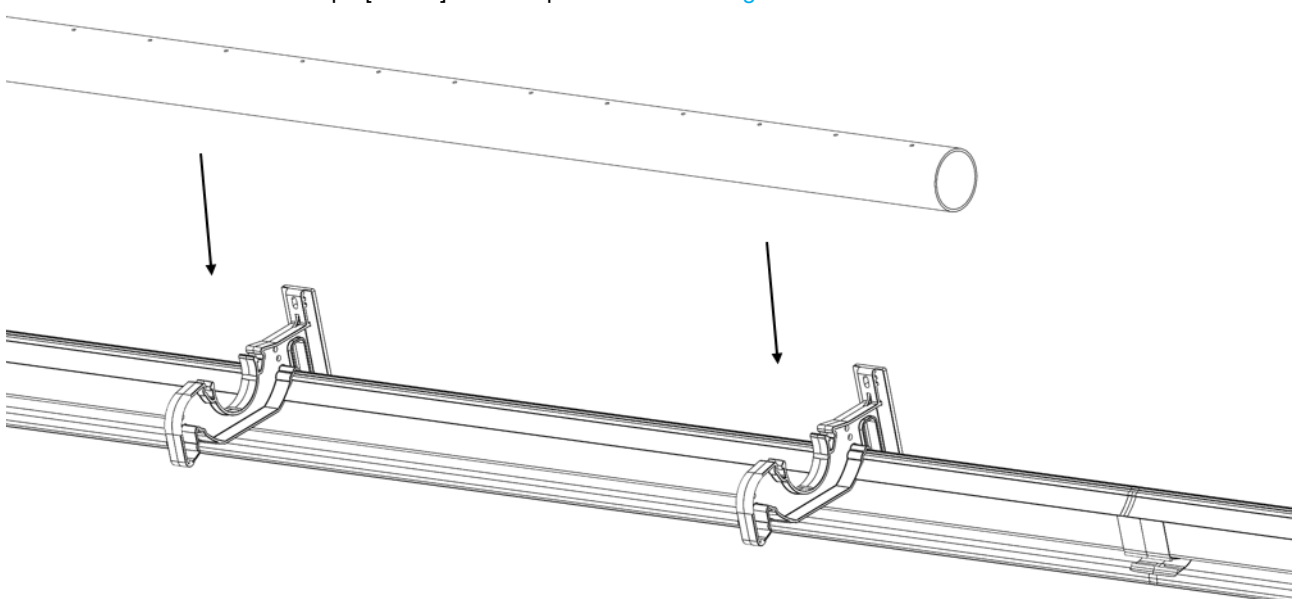


Figure 22

Step 20

The holes of the water distribution pipe must point upwards at an angle of 30° against the vertical plane, considering that air flow direction (from outside to inside). See Figure 23.



ATTENTION Never locate the holes along the bottom of the distributor pipe. If so, the holes will clog with silt from the bottom of the pipe.

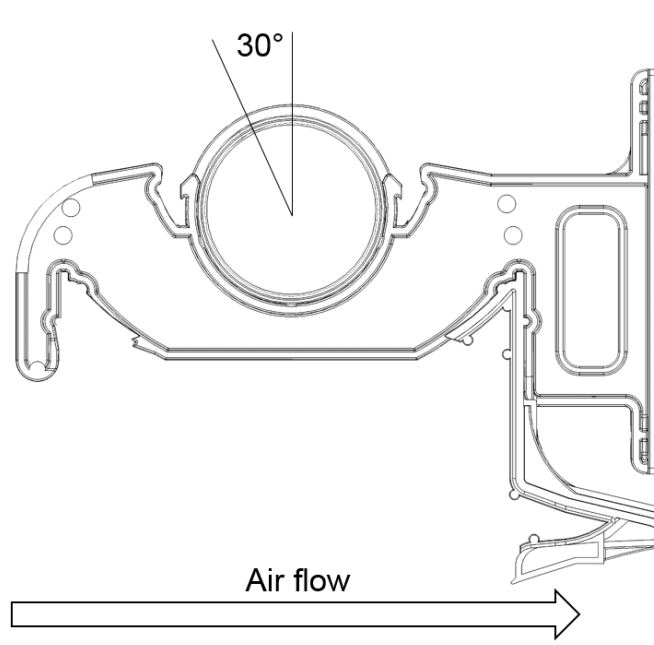


Figure 23

Step 21

Insert the Pipe Connector [ref. 16]. Then join with the next Water Distribution Pipe as in Figure 24.

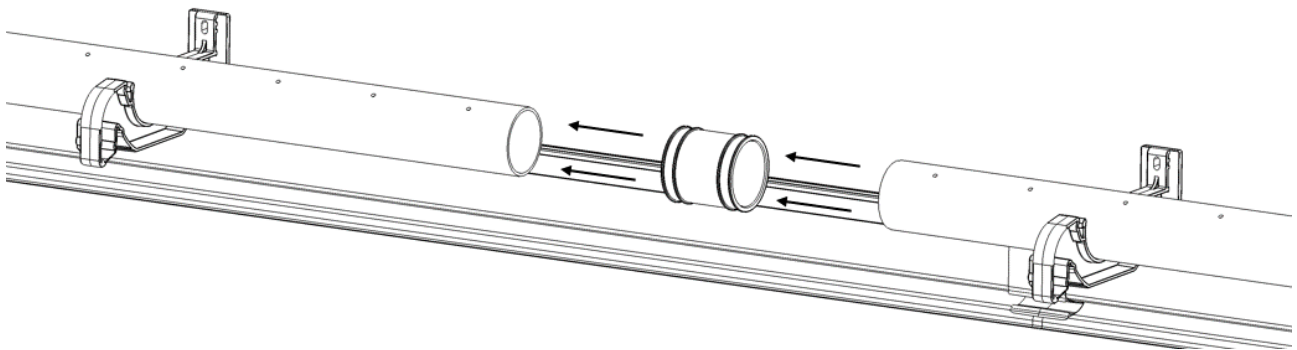


Figure 24

Step 22

Secure the all Pipe Connectors [ref. 16] using the (2 pcs) Metal Clamps [ref. 17]. See Figure 25. Mind the position of the fixing screw (at the bottom of the pipe to allow fixing the cover).

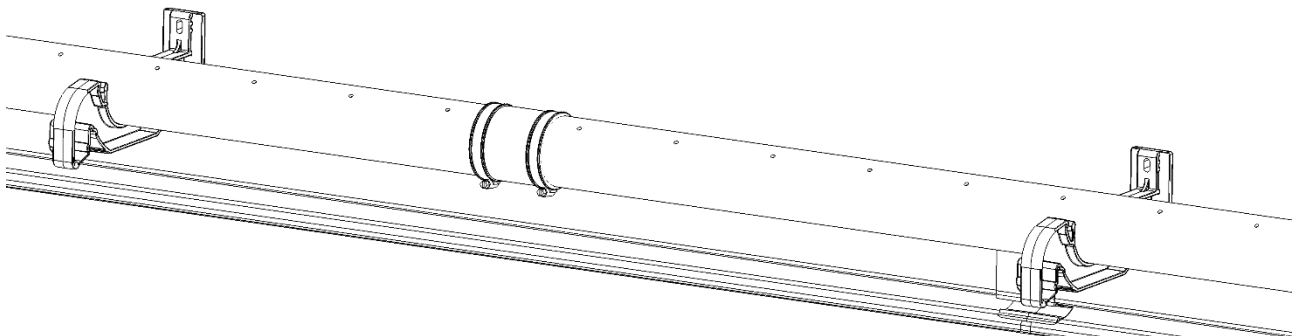


Figure 25

Step 23

For Central mount water distribution, foresee the positioning of the TEE 90° Ø63 [ref. 28] component at the centre of the system. See Figure 26. Secure it properly (glue must be provided by the customer) right in correspondence with Supply Unit Connection Bracket.

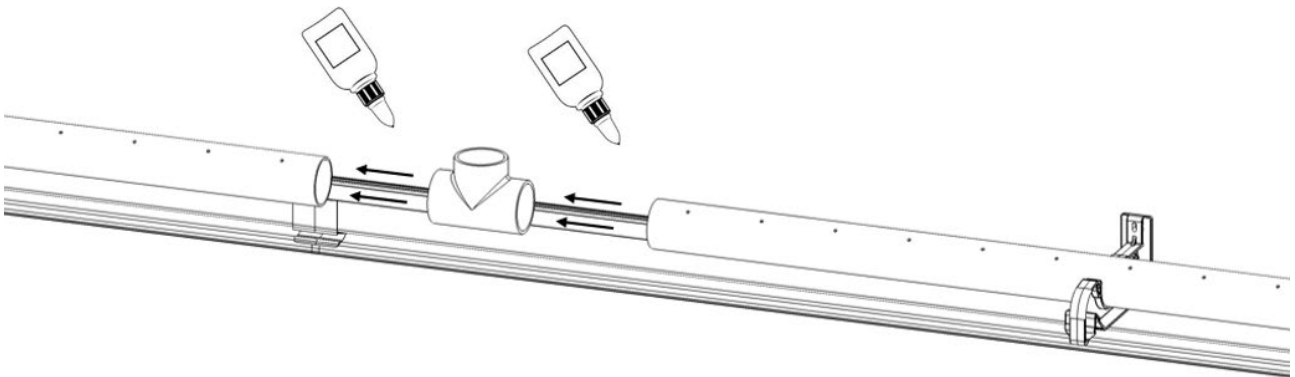


Figure 26

Munters recommends drilling manually 2 holes in the vicinity of the T joint to avoid dry strips in correspondence with T joint. Then, continue with the installation of the Water Distribution Pipes and Pipe Connectors accordingly until the end of the wall.

Step 24

Insert the Deflector [ref. 14] and clip it in to the Top Brackets. See Figure 27.

Mind the position of the screws of metal clamp. If the screws are at the bottom than the Cover will be correctly inserted in the location (without interference).

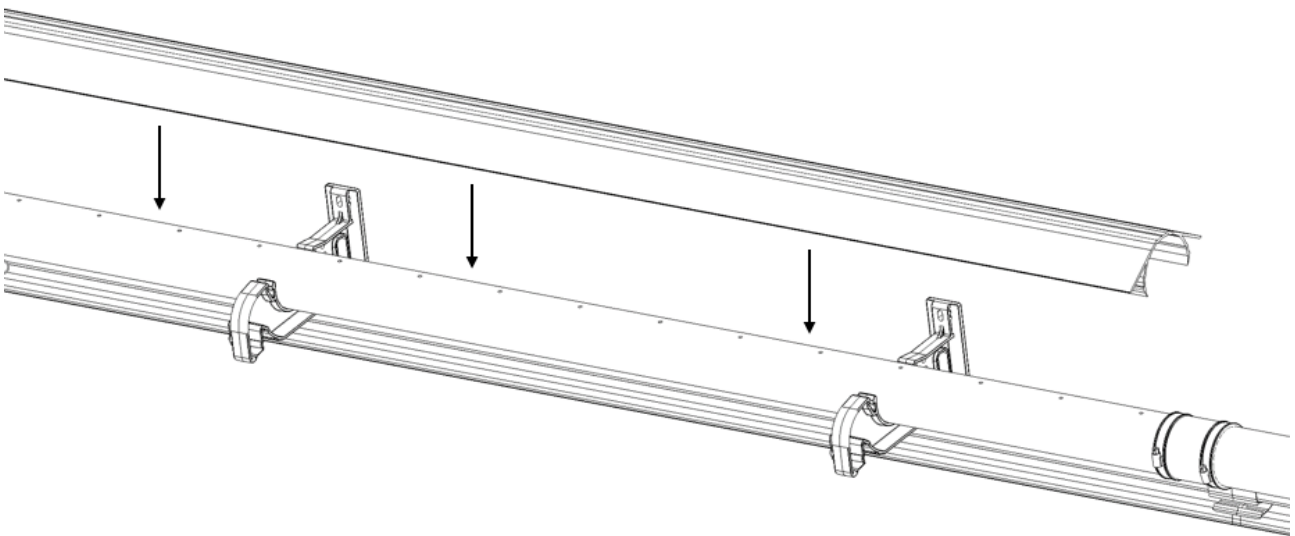


Figure 27

Step 25

Add the Deflector Coupling [ref. 15] in order to join all the Deflectors together. See Figure 28.

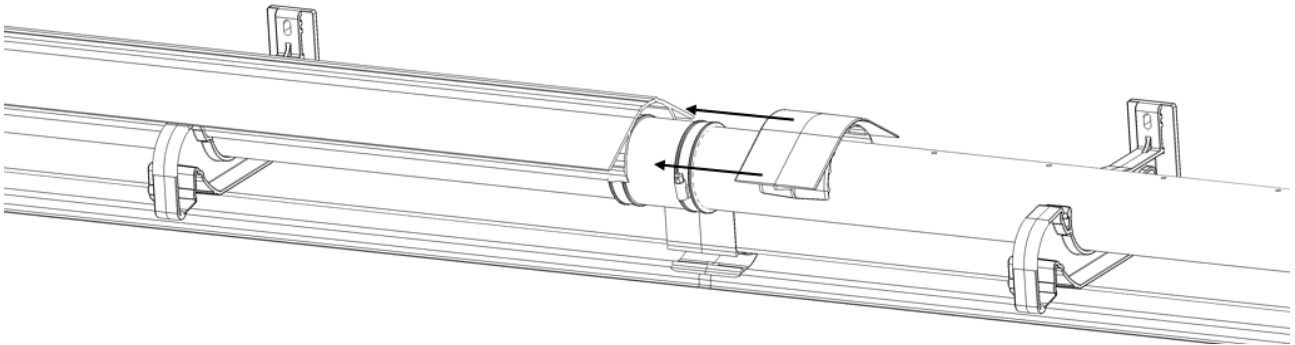


Figure 28

Step 26

Fix all the Deflectors until the needed length is reached. See Figure 29.

For Central mount water distribution, foresee the positioning of the TEE 90° Ø63 [ref. 28] component at the centre of the system and arrange the cutting of the Deflector accordingly.

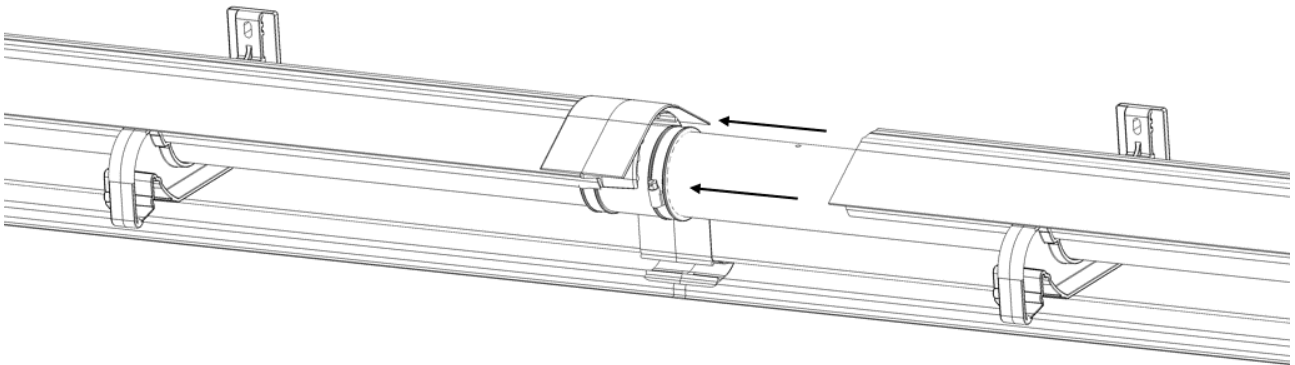


Figure 29

Step 27

Start the placing of all the CELdek Pads onto the Munters Gutter System. See Figure 30.



IMPORTANT Mind the correct angle orientation of the pads. Wrong orientation of the pads will cause water carryover inside the building or dry spots.

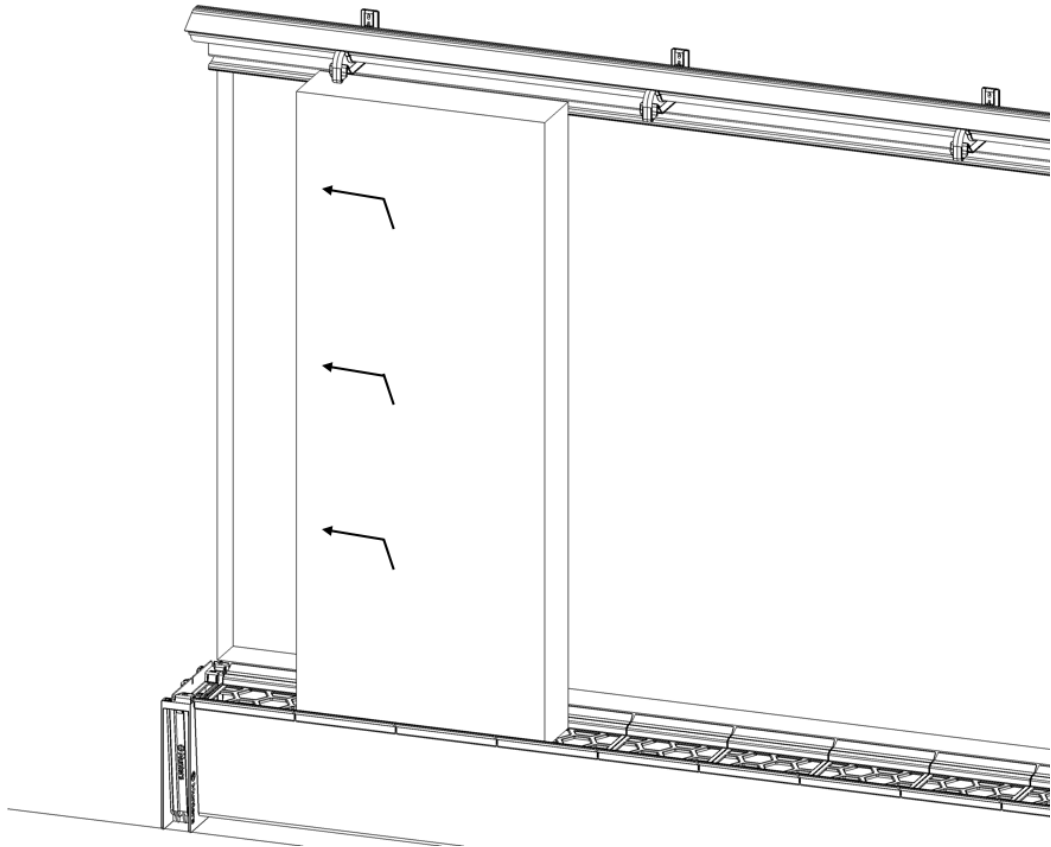


Figure 30

Step 28

Continue to insert all the Pads until all pads are correctly placed.

Insert the Pad Guide [ref. 9] in the Top Brackets, on the external side of the wall to keep the Pads in place as Figure 31.

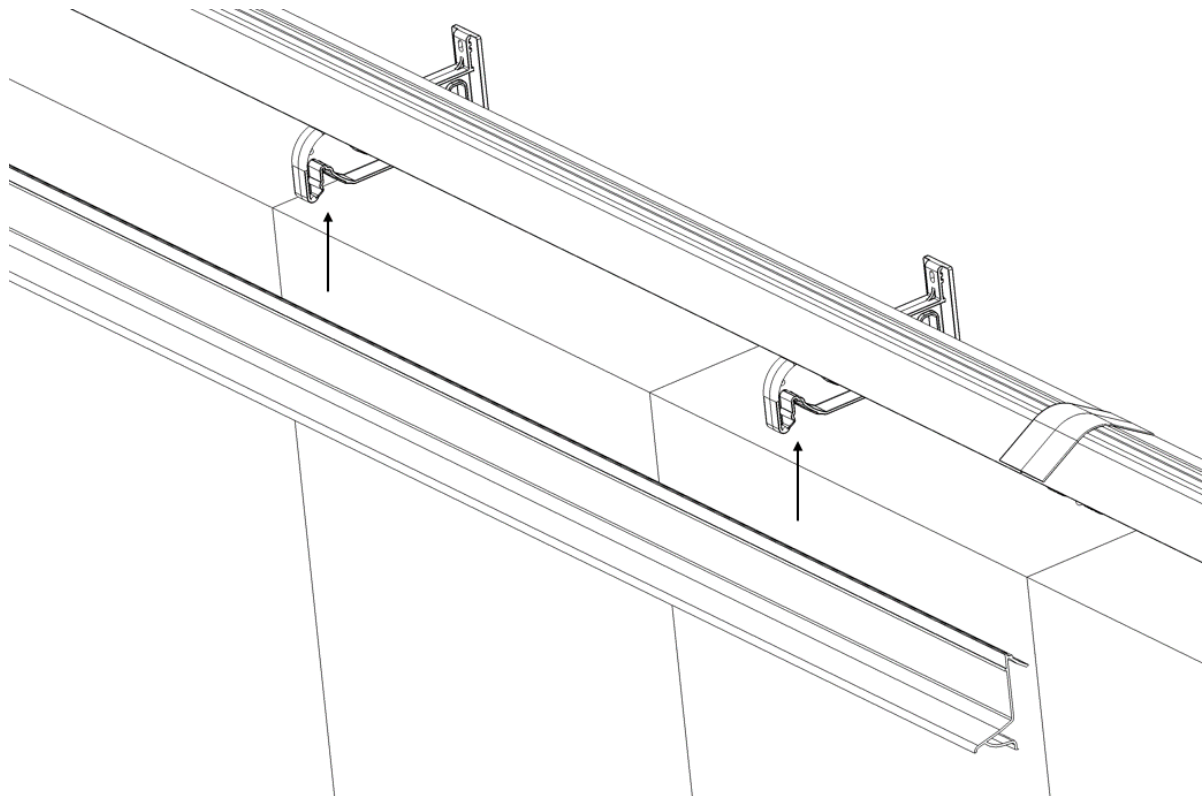


Figure 31

Step 29

Repeat the procedure from [Step 17](#) by inserting the Pad Guide Coupler [*ref. 10*] to connect the all Pad Guides together. Push the slider of the Pad Guide Coupler to the left and then insert the next Pad Guide. [See Figure 32](#). Secure the connection by pushing the slider to the right, half way between the pad guides.

Repeat this procedure until the required length.



NOTE that the system allows easy access to the top part, in order to perform Maintenance or Cleaning as needed. No tools required due to the simple Click-system.

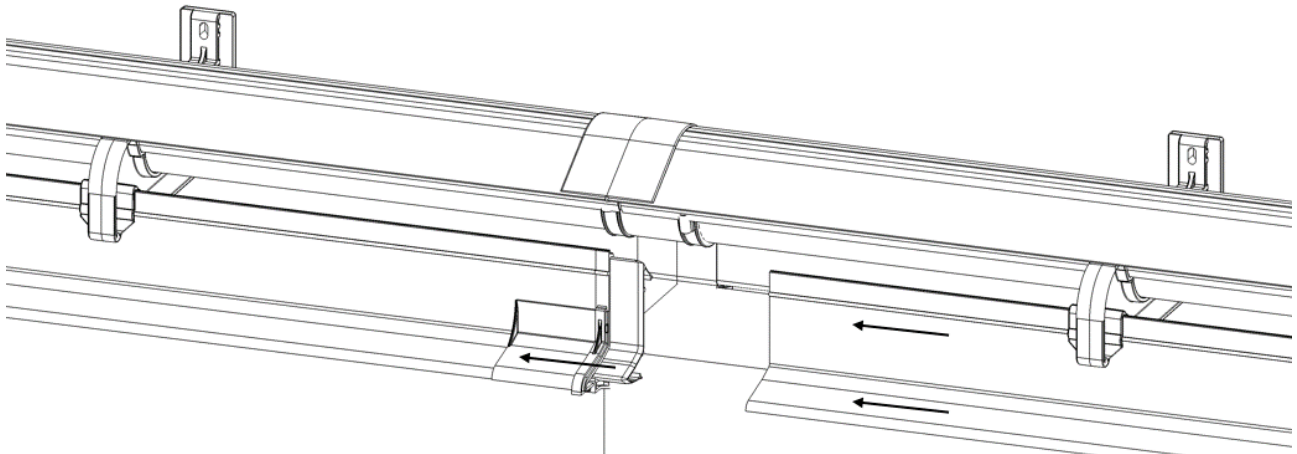


Figure 32

Step 30

By using a small hammer, gently break the pre-marked hole in the End Cover for Deflector [*ref. 20*] to allow the water distribution pipe mounting.

Pay attention to cut the water pipes correctly to size and remove possible burrs.

Insert the End Cover for Deflector [*ref. 20*] on both sides of the installation. [See Figure 33](#).

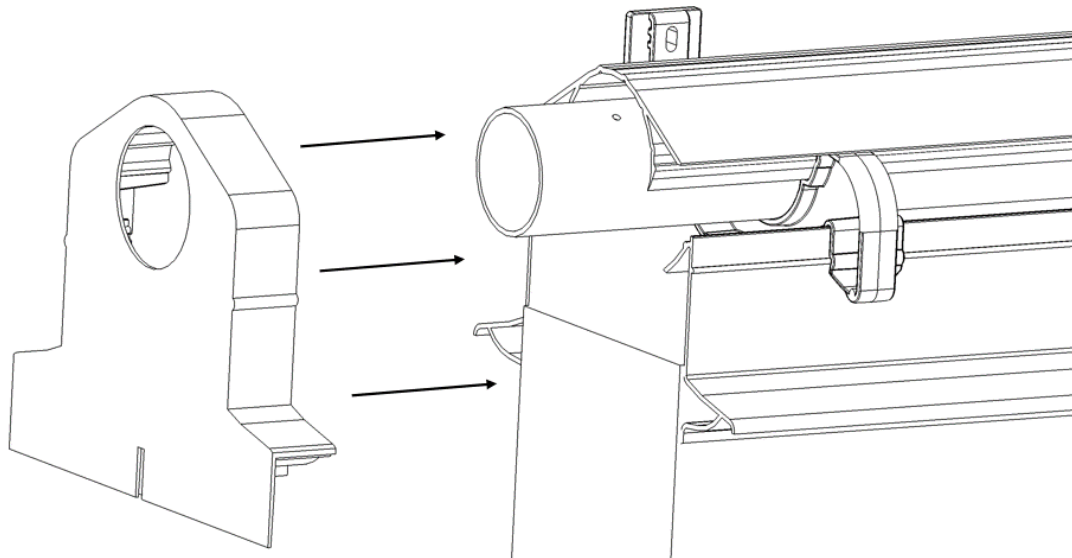


Figure 33

Step 31

Proceed with attaching the Adaptor Socket [ref. 22] to the Pipe by using glue (not provided in the kits). Then insert the Plug + Gasket [ref. 21] into the Adaptor Socket. See Figure 34. No need to use Teflon tape, use the gaskets.



ATTENTION The Pipe must stick out maximum 40mm from the End Cover. If necessary, cut the Pipe accordingly.

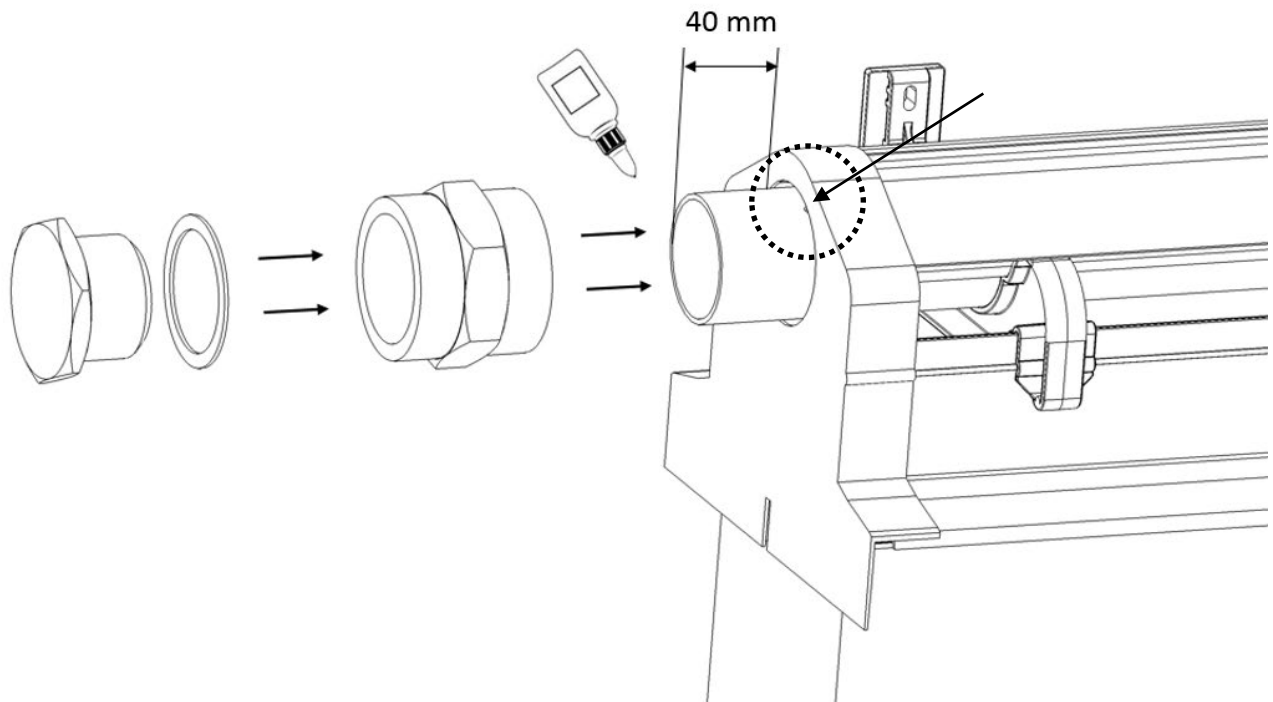


Figure 34



IMPORTANT After the cutting the distribution pipe, seal off any water distribution hole sticking out, if resulted in the vicinity or outside the Top cover. Recommended sealing using metal rivet and glue.

Step 32

Place the Lateral Profile [ref. 19]. Firstly, insert it in the top End Cover for Deflector and after let it slide in the Bottom Gutter End Cover. See Figure 35.

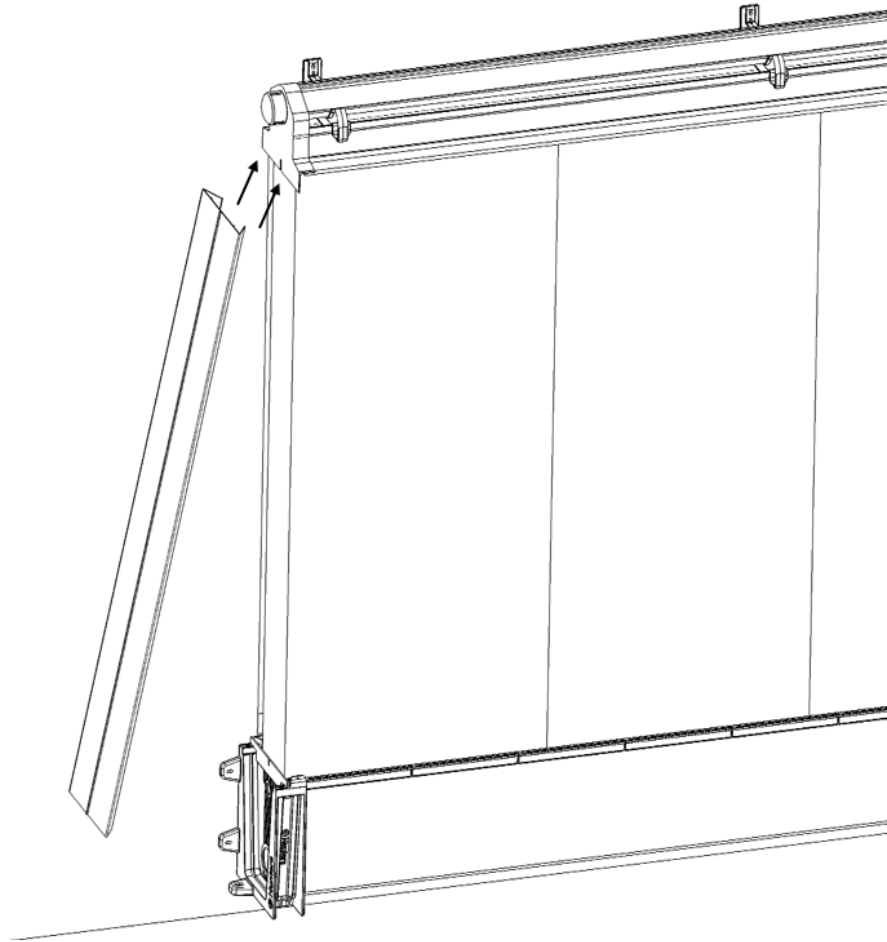


Figure 35

NOTE The Lateral Profile delivered as standard is suitable for 2.5m high Pads. If needed, cut down accordingly for smaller pad heights (2m, 1.8m, 1.5m, 1.2m or 1m).



Step 33

In order to install the water pump in the middle (central mount water distribution), use the hole prepared before, to connect the pump (inflow) using the Tank adaptor [ref.35] and the rest of the components in the Distribution Kit. See Figure 3.



WARNING The provided PVC pipe must be cut on site at the desired length according to Layout. Ensure straight cuts when sawing the pipes. Then clean the front of the pipes and deburr them to 15° angle. Missing or improper pipe chamfers will prevent permanently tight connections!



NOTE Depending on the Water Pump type, the manufacturer's manual is provided with each unit. Refer to the manual and read the OEM documentation for detailed information.

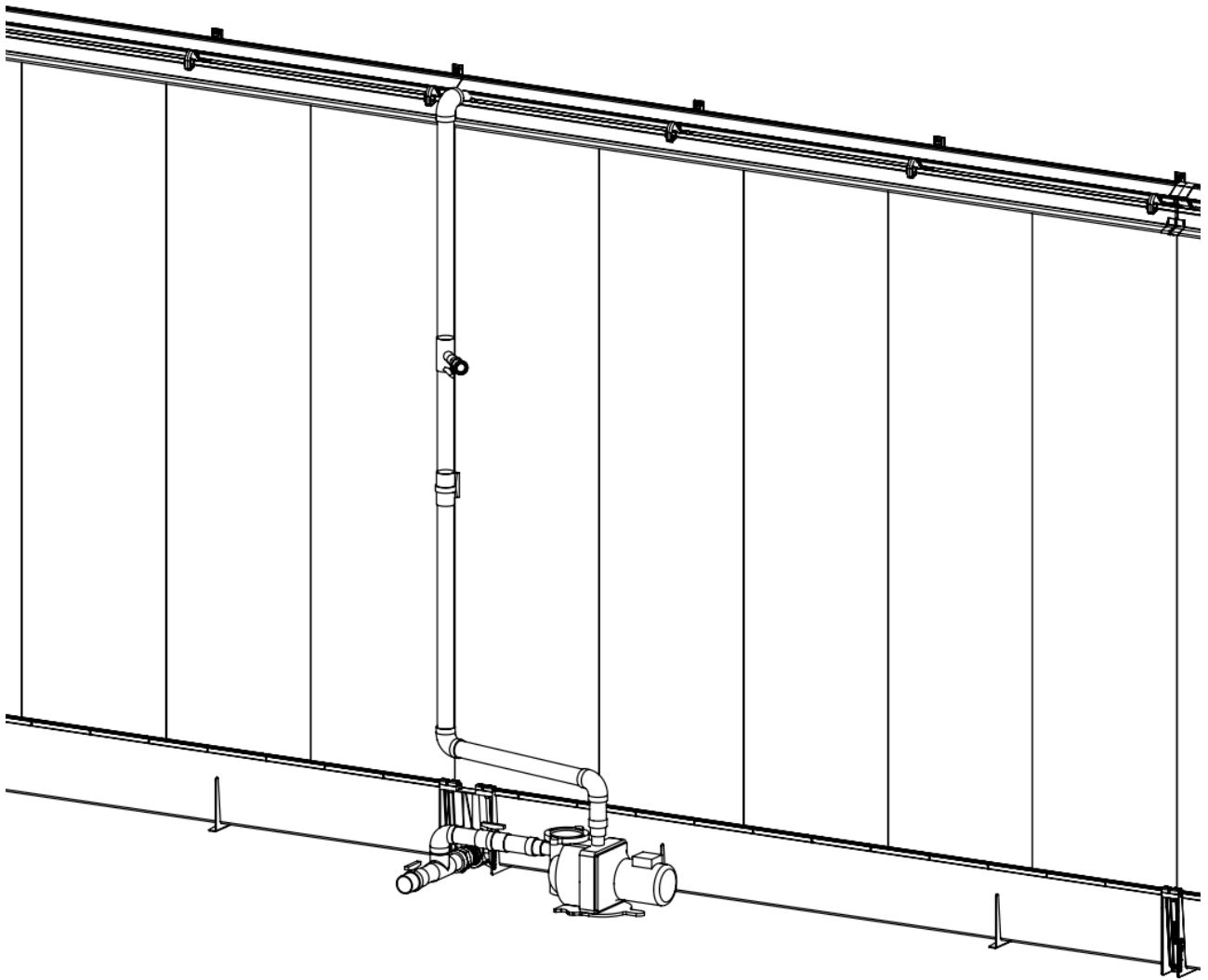


Figure 36

5.3 Lateral mount water distribution (pump placed laterally)

In case of installing the MPG with the lateral mount water distribution, the water pump must be arranged laterally. The connection to the pump (inflow) can be done either ways, between the BOTTOM GUTTER END COVER [ref. 18] or through the SUPPLY UNIT CONNECTION BRACKET [ref 5].

In the following paragraphs it is described the installation procedure for an 18 meter long wall opening with Lateral water feed.

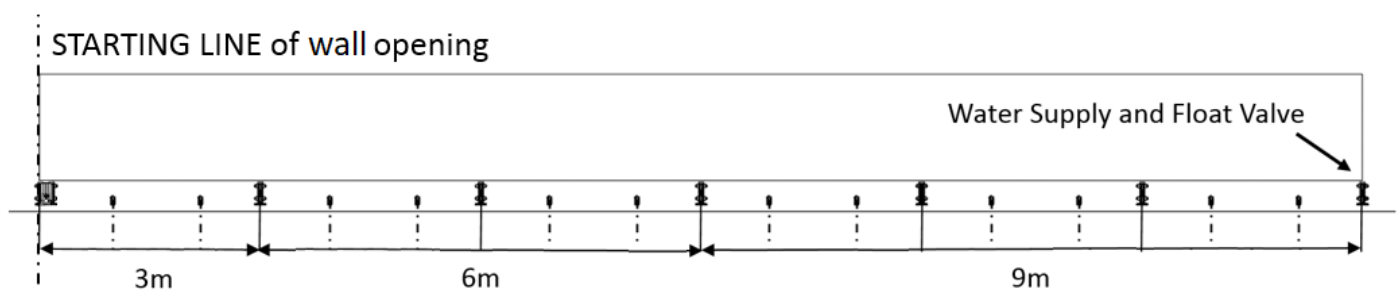


Figure 37

Start the installation repeating the procedure explained from [Step 2](#) to [Step 11](#).



IMPORTANT In case of Lateral mount water distribution, install the float valve opposite to the water pump (other end side). Do not use rigid PVC or Metal piping for connecting the fresh water supply, use only flexible water pipe for connecting the fresh water supply.

Step 34



IMPORTANT With a Small Hammer [ref. 5 / *Assembling Tools*] gently break the pre-marked hole of the Bottom Gutter End Cover [ref. 18] in order to prevent the overflow of the tank.

Close the left side of the system installing the Bottom Gutter End Cover [ref. 18] and fixing it to the Supply Unit Connection Bracket by means of (2 pcs) Screws for thermoplastic [ref. 7]. See Figure 38.



WARNING Tighten the screws using the Cordless Drill [ref. 1 / *Assembling Tools*] by applying a torque of 6 Nm. Pay attention not to damage the plastic components by applying higher torque.

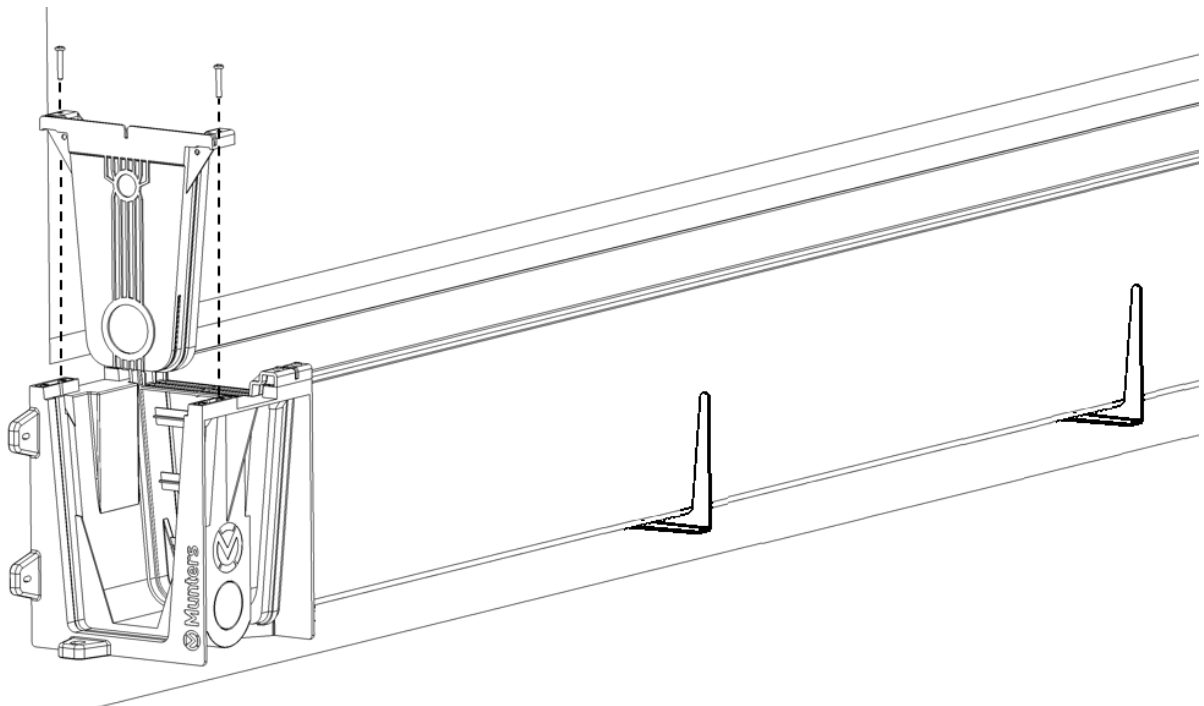


Figure 38

Continue the installation of the MPG with lateral water feed, repeating the procedure explained in the paragraph above from Step 14 to Step 22 and from Step 24 to Step 30.

Step 35

In order to install the water pump on the side (Lateral mount water distribution), use the hole prepared before, to connect the pump using components in Distribution Kit. See Figure 3. Do not place the Float valve near the Pump.



WARNING The provided PVC pipe must be cut on site at the desired length. Ensure straight cuts when sawing the pipes. Then clean the front of the pipes and deburr them to 15° angle. Missing or improper pipe chamfers will prevent permanently tight connections!



NOTE Depending on the Pump type, the manufacturer's manual is provided with each unit. Refer to the pump manual and read the OEM documentation for detailed information.

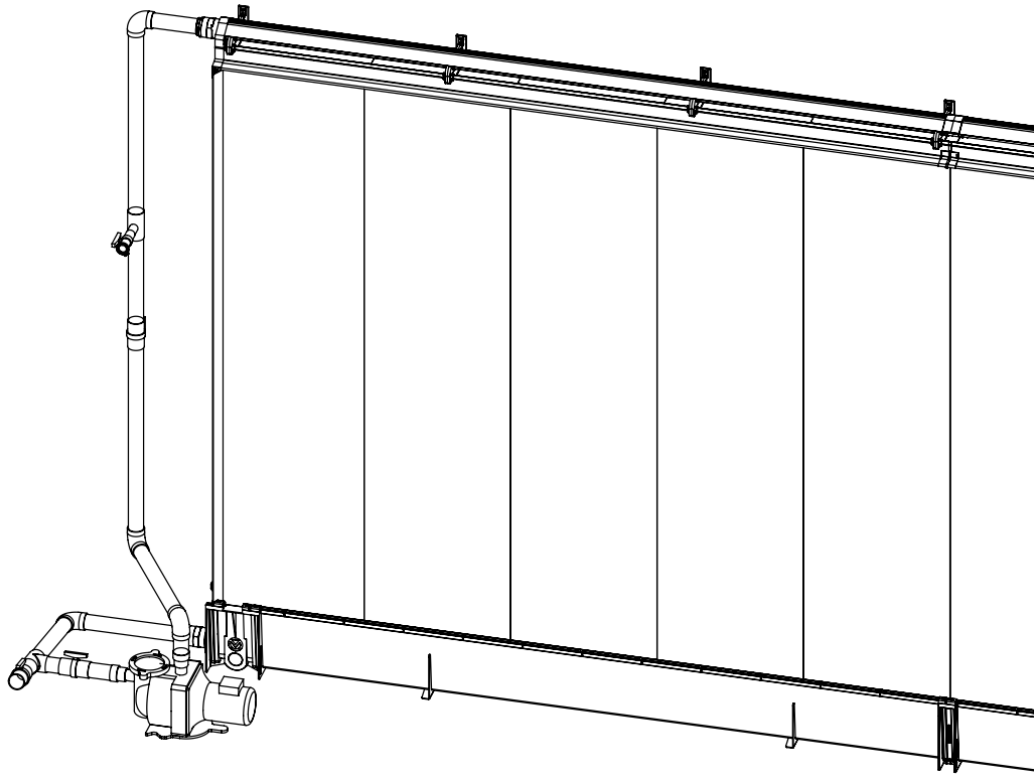


Figure 39

5.4 Inspection kit assembly (for float valve)

The inspection kit allows the user to adjust, service or inspect the float valve, without the need to remove the pads. Depending of the type of installation, there are two possible ways to install the inspection kit.

Continuous running wall installation

Below example demonstrates the assembly of the inspection kit for 6mt of gutter installed on continuous (flat, without interruptions).

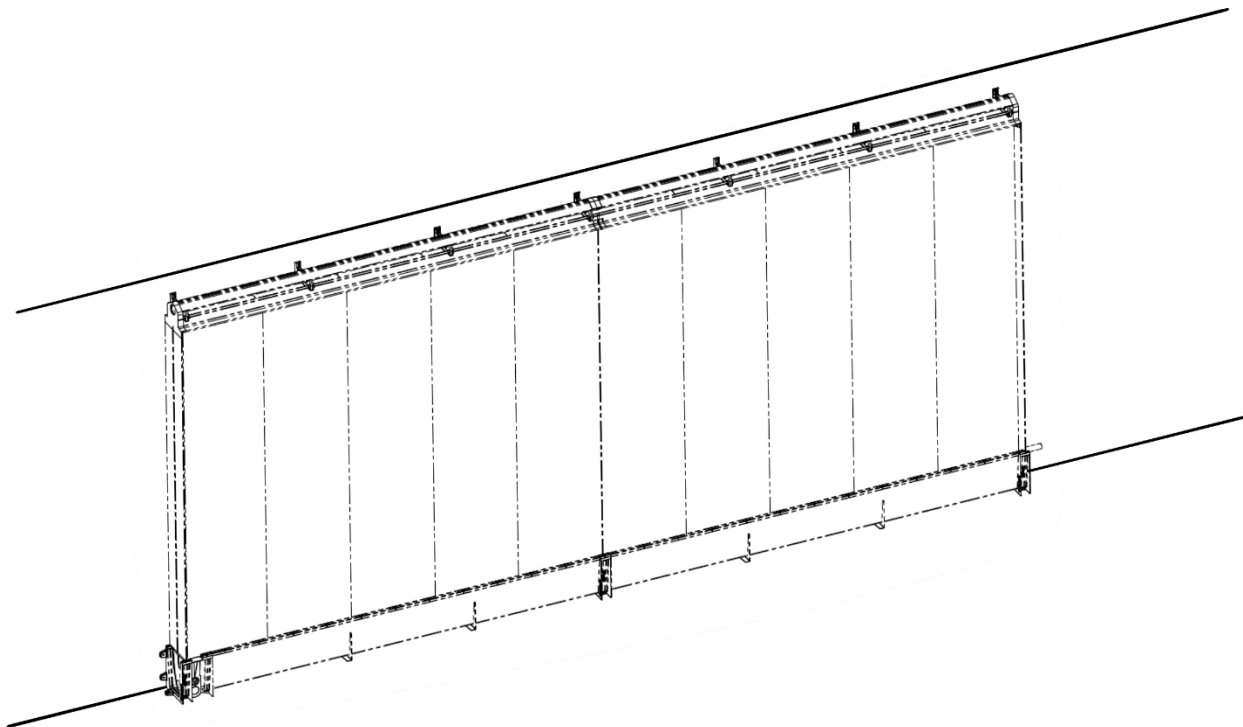


Figure 40

Continuous wall allows the positioning of the inspection kit as an extension of the MPG wall.

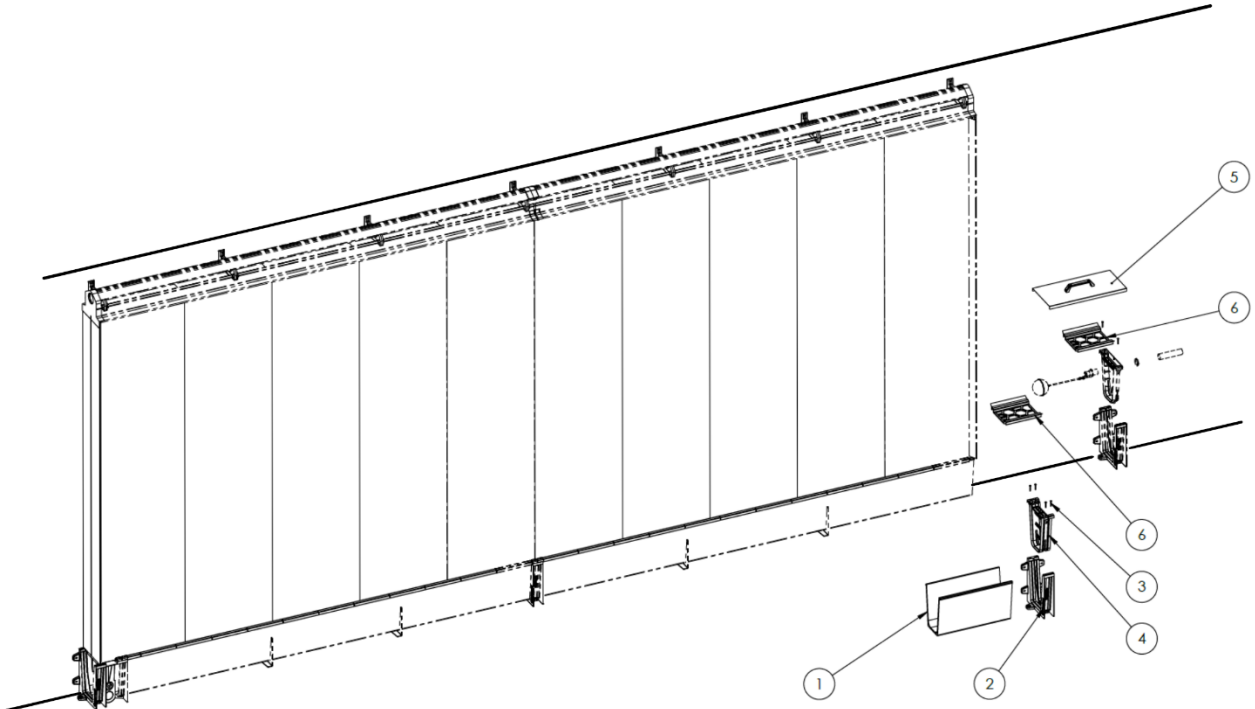


Figure 41

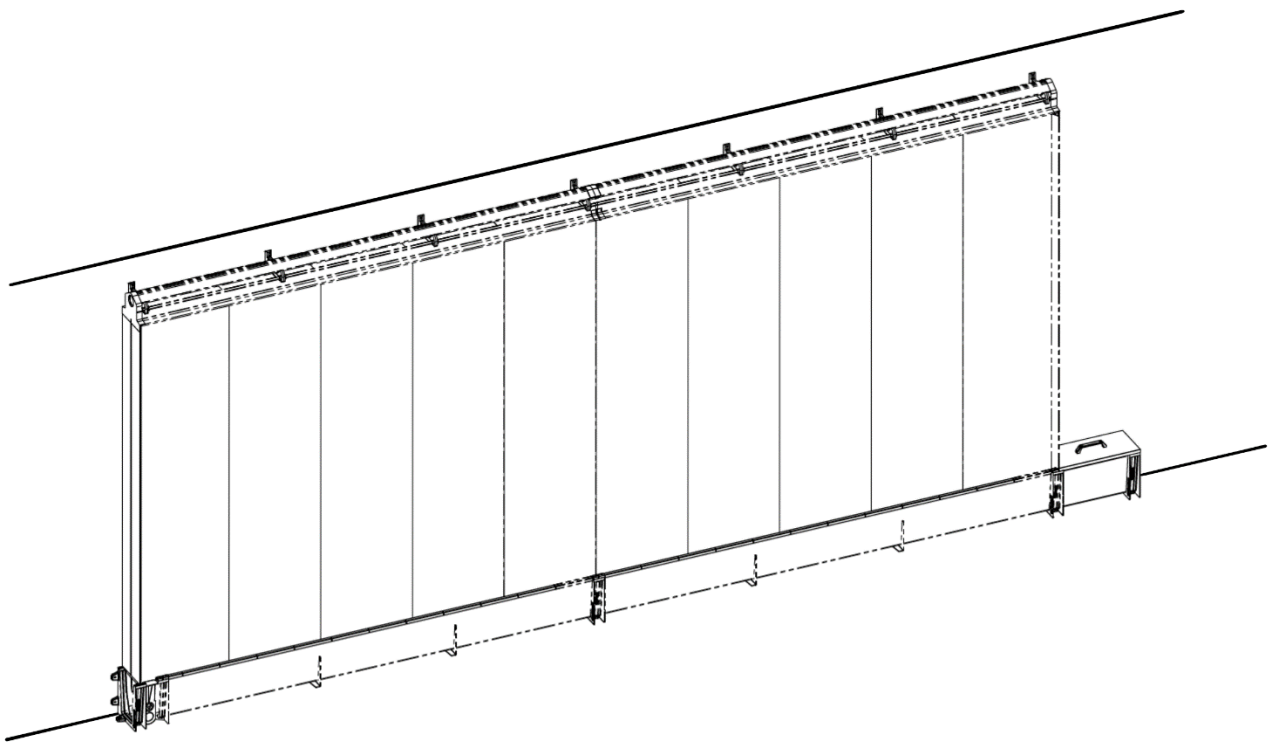


Figure 42

Wall with interruptions (limited length available)

Below example demonstrates the assembly of the inspection kit for 6m of gutter installed on wall with limited length (length is similar to the length of the gutter system). In this case, the small section of water gutter is inserted between the last 2 sections of MPG wall, to guarantee that the hanging part will be correctly supported by the brackets.

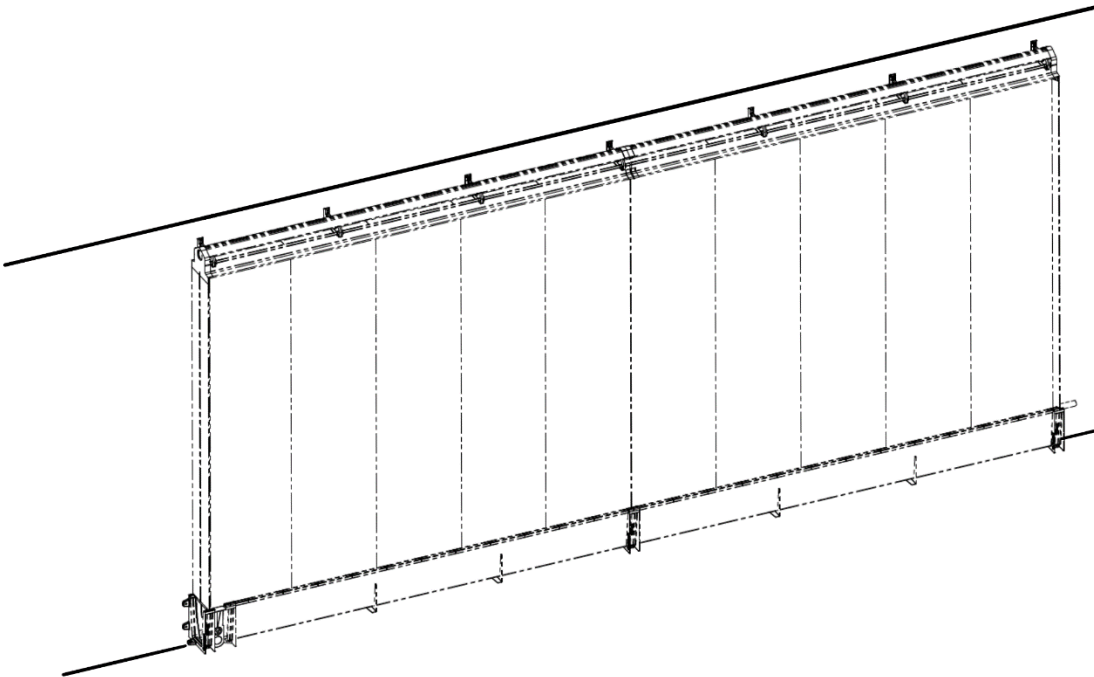


Figure 43

Installation of the kit is done by inserting extension tank between the last two segments. The suspended section will be reinforced with additional metal bracket to guarantee the correct support.

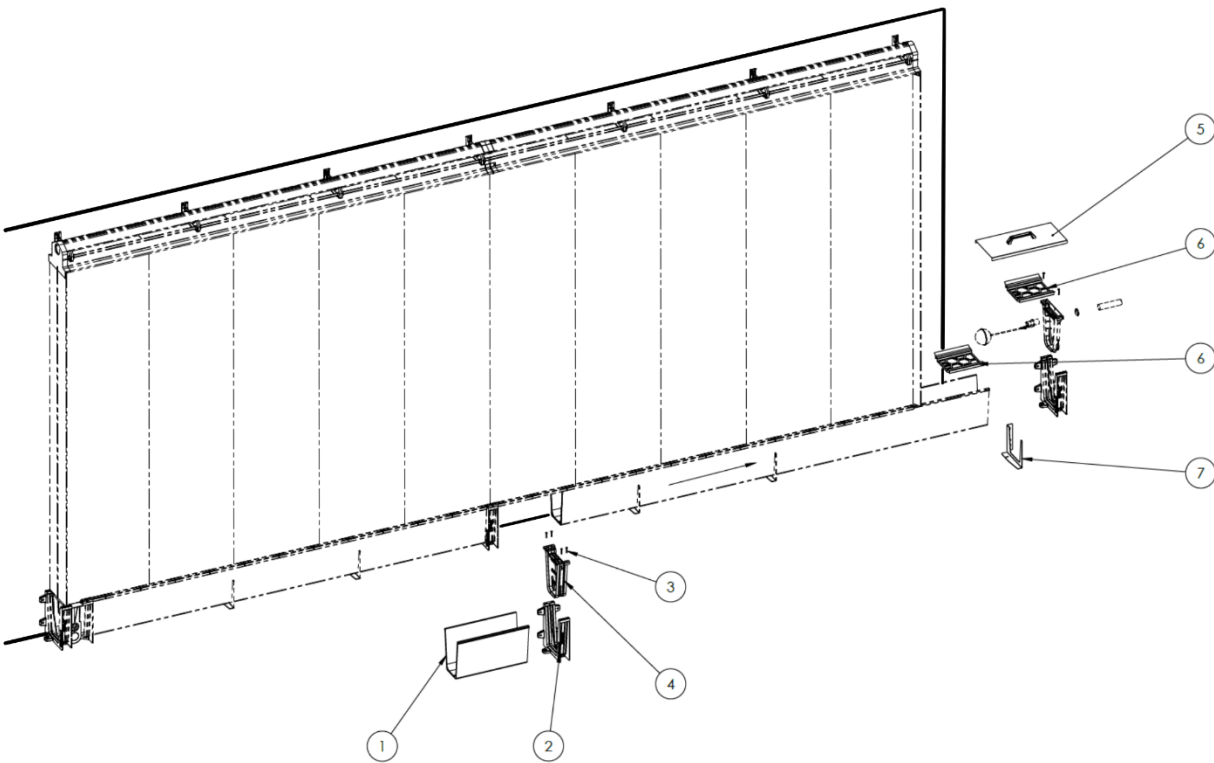


Figure 44

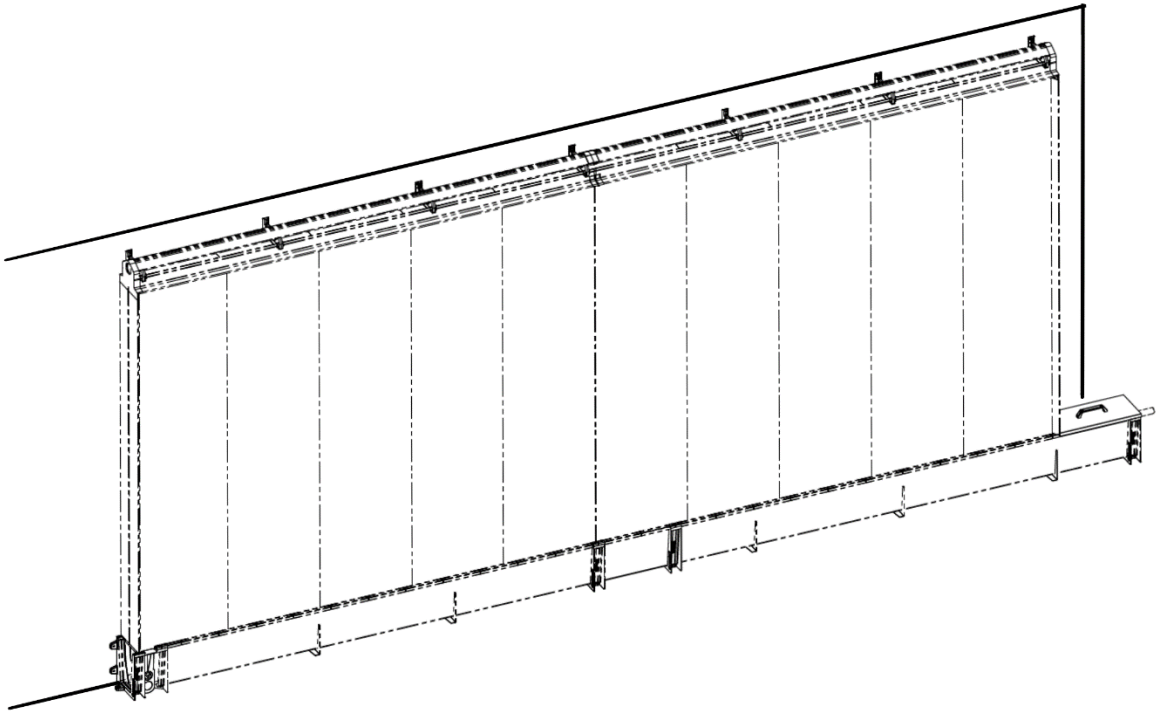


Figure 45

5.5 Flushing kit assembly

The flushing kit allows the user to empty the piping system of all the water and impurities contained inside the gutter system. This operation should be performed at regular intervals (1 time per week) or more often in case the top distribution pipe becomes obstructed. The first signs of obstructed top water distribution pipes appear under the form of dry spots (cooling pads do not get water needed for cooling).

Below example demonstrates the assembly of the flushing kit for 6mt of gutter.

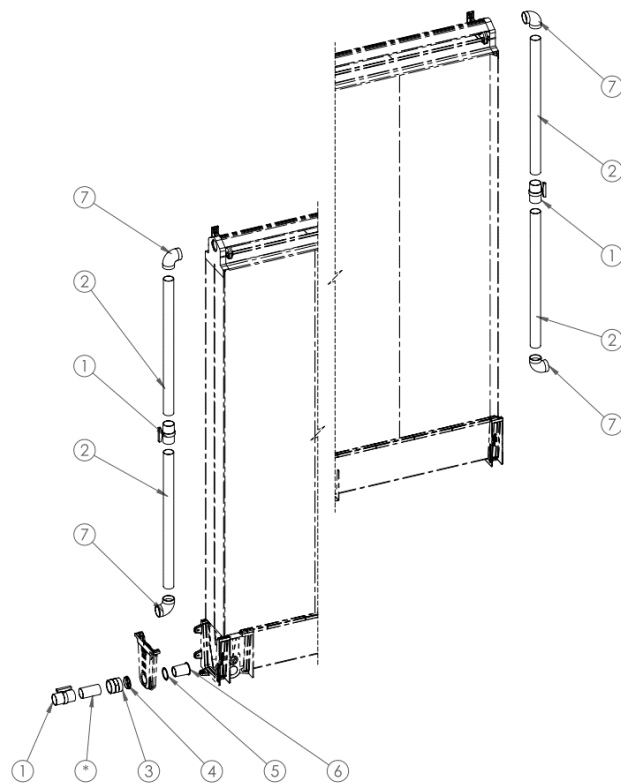


Figure 46

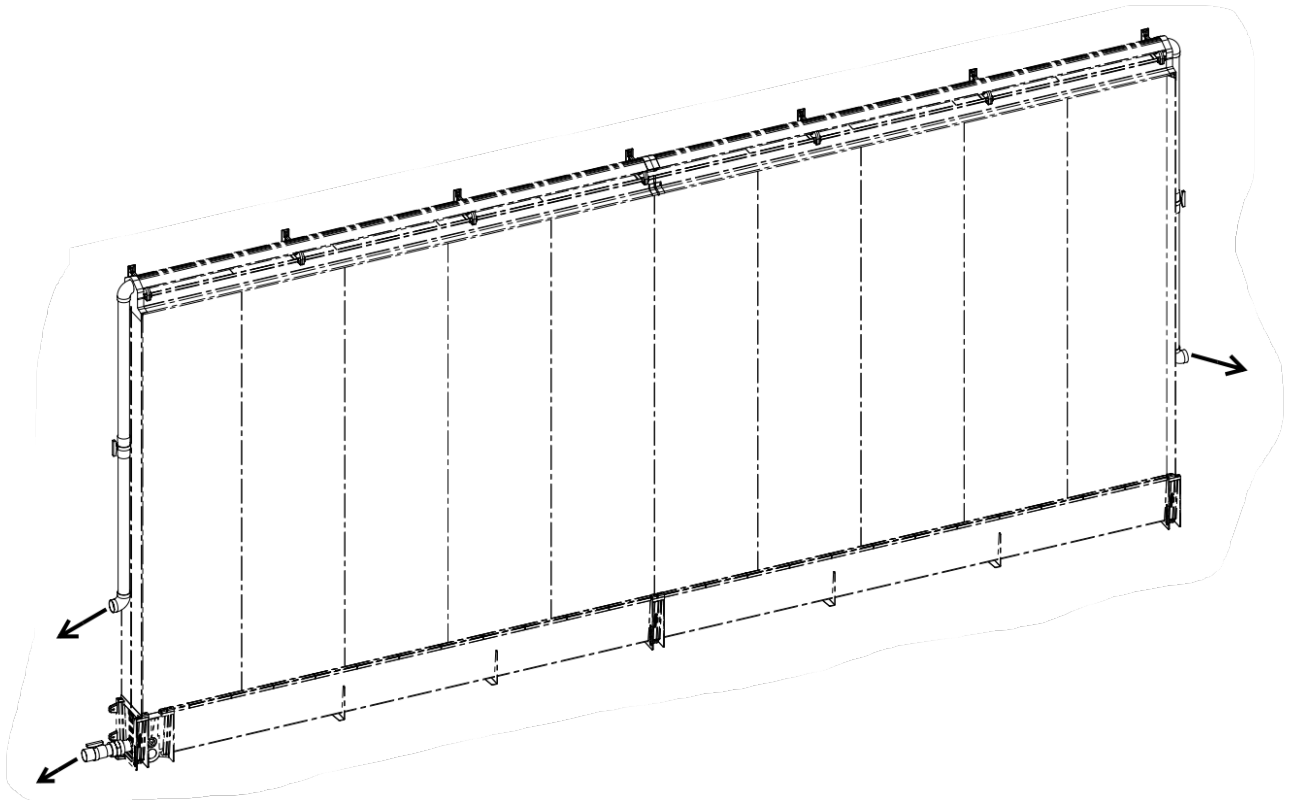


Figure 47



NOTE Check the correct orientation of the elbows. The elbows should be pointing away from the gutter system, in such way to allow the discharge of the water frontally.

5.6 Pump Support Bracket kit

The Pump Support Bracket kit allows the installation of the MPG Pump in suspended position.

To install the kit first begin the pre-assembling of the brackets according to the chosen design (centre-mount- or lateral-mount water distribution, left-hand- or right-hand direct, etc.) and then proceed to fix the kit on the wall. Lastly, connect the Distribution kit according to chosen design.

Below example demonstrates the assembly of the Pump Support Bracket kit for a lateral mount water distribution system.

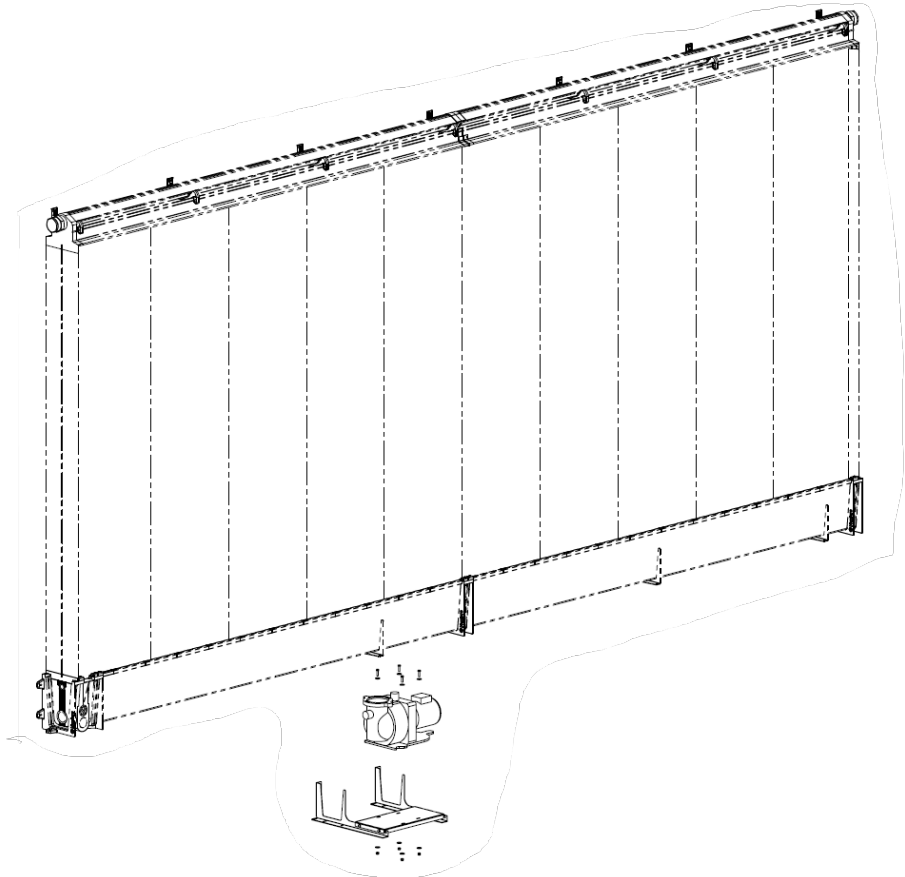


Figure 48

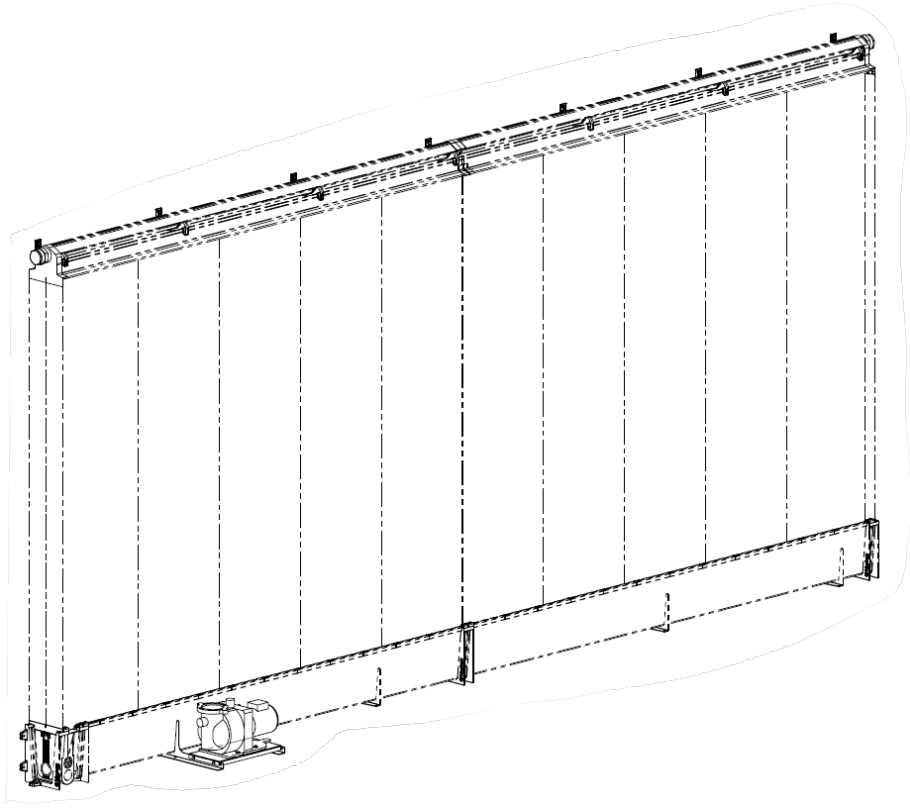


Figure 49

6. Operation

6.1 Commissioning and start-up

- Open the ball valves to allow the water flowing inside the piping
- Turn ON the electrical power and fresh water supply
- Allow the water tank to be filled approximately 20cm (8inch) height column of water
- Adjust the Float Valve so that the water level remains at approximately 20cm (8inch) height column identified on the Bottom End Cover as top rib.

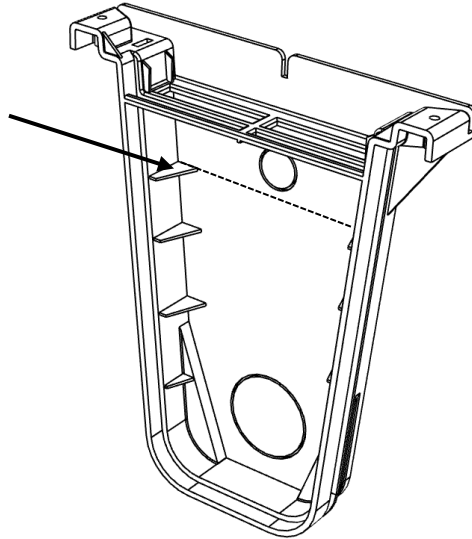


Figure 50



ATTENTION The water level inside the tank should be adjusted regularly, as it depends of the evaporation rate (function of Temperature and Humidity). For quick and easy adjustment of float valve, we recommend installing the Inspection Kit, as it allows the setting without the need to disassemble the cooling pads.

- Activate the pump according to the control setting (cooling thermostat or farm controller relay)
- Allow the cooling pads to become completely saturated
- Re-adjust the water level inside the tank accordingly

In case of CELdek (paper) pads first time soaking, please allow the water pump to run (wetting) for one or two days continuously, in order to allow the pads to soak-in properly. This will allow the user to optimize the real cooling phase. After these one or two days of continuous soaking of the pads, it is recommended to inspect the pad wall carefully, looking for any dry vertical strips. The dry vertical strips are an indication of the incorrect water distribution. In case dry strips are present, the installer or service worker has to solve or clean the water distribution line.

6.2 Correct water pressure and distribution

The correct water pressure is achieved when the water jet is sprayed at 25-30cm out of water distribution holes at farthest point from the water pump (DEFLECTOR cover removed and system operational). If the pressure is too weak, the water will not break up at the splash plate causing streaking and dry spots to occur, shortening the pad life and causing a poor performance of the system.

In case the water jet is not sprayed at 25-30cm out of the water distribution holes, the installer or service worker has to adjust accordingly the ball valve in the supply water pipe (coming from the water pump). Repeat this operation periodically at regular intervals (monthly basis during cooling season).

6.3 Normal operation

Under normal operation, the water pump should run constantly when air is passed through the pads. This is triggered by the signal arriving from farm controller (relay) or room thermostat. While the system is operating, the user or service worker need to search for sediments on the pads, which are typically caused by impurities drained in the recirculating water. If the sediments are accumulating on the surface of the pads, Munters recommends to increase the bleed-off rate.

6.4 Bleed-off

During the evaporation, only pure water evaporates therefore all the dissolved minerals, debris, dirt and dust will flush down in the recirculating water. In time, all these constituents will concentrate making the recirculating water become very loaded and with cloudy or milky appearance. As consequence, these constituents will deposit on the surface of the pads and inside the system, causing a premature shortening of the pad life and an increase in the energy consumption, because of the increased pressure drop (the effect of air passage of the pads being obstructed).

To prevent this from happening, Munters recommends to constantly drain (bleed-off) some of the recirculating water. The bleed-off rate (amount of water drained) depends widely of how much the cooling system is used, of the water quality including the mineral content, if the maintenance and cleaning procedure are properly carried out, etc. As a rule of thumb, constantly draining 10% of the total water flow, for a good to moderate water quality, will ensure an optimal pad life and energy consumption (fans).

In case the water quality is poor or the water has a very high mineral content, the bleed-off rate should be same as the evaporation rate.



IMPORTANT The bleed-off should be directed outside the cooling system. Do not direct the bleed-off back to the gutter because the purpose of the bleed-off will be cancelled.

To avoid the scale formation (hard deposits) we recommend to increase the flow of water over the face of the pad. Make certain the flow of water is even from one end of the distributor pipe to the other. Clean and flush the distributor pipe regularly, especially if dry streaks appear on the face of the pad.

6.5 Cooling pad check-list

The preventive maintenance and proper cleaning are key to extend the pad life to a maximum and to have trouble free operation. The most common problems associated with evaporative cooling applications are the Algae growth, scale build-up (hard crust deposited on surface of the pads) and dirt accumulation. However, all these common problems can be prevented by proper maintenance and cleaning routines, carried out at frequent regular intervals, depending largely of how much the cooling system is used (e.g. 1-2months up to 9months per year), of the water quality including the mineral content, if the maintenance and cleaning procedure are properly carried out, etc.

If the below guidelines are followed up properly, this will ensure a long service life for both the pads and the MPG system.

- Reduce the number of On/Off cycles
- Shade the pads and the cooling system
- Dry the pads out completely once every 24h (run fans with pump off)
- Maintain a suitable water bleed-off
- Drain and disinfect the entire water distribution system quarterly
- Avoid harmful contaminants, including dust, fumes, harsh cleaners and water treatment chemicals
- Run the recommended quantity of water over the pads
- Avoid dry areas (vertical stripes) on the pads. Dry areas which are "starved" for water will be the first to clog or soften
- Cleaning of the water filter(s) regularly. A dirty filter may reduce the water flow by more than 50%
- Removing stubborn deposits. Gentle Brushing in the direction of the corrugations will remove Algae and some minerals. Pad must be bone dry or the deposits will just smear around on the pads (making the situation worse)

To avoid the scale formation (hard deposits) we recommend increasing the flow of water over the face of the pad. Make certain the flow of water is even from one end of the distributor pipe to the other. Clean and flush the distributor pipe regularly, especially if dry streaks appear on the face of the pad.

6.6 Use of chemical substances

In general, chemical substances are not recommended for daily pad maintenance because:

- When used continuously or in too high a concentration, oxidizing biocides can destroy wood, cellulose and metals
- Chemicals dry out on the pad surface each time the water is turned off, causing the chemicals to lose their effectiveness
- Some chemicals are highly corrosive, aggressive and will harm the pads irreversibly
- Some chemicals contribute to microbial growth
- Many chemicals cause environmental problems
- The use chemicals is often mistaken with neglecting of proper maintenance requirements



IMPORTANT Use chemical substances carefully. There are no "miracle" chemicals. Learn to read the label and understand the ingredients. Munters declines any warranty and liability claims, does not assume responsibility for damage of the pads or MPG system caused by wrong use of chemical substances.

6.7 Water distribution pipes

Maintaining even water distribution on the pad wall is the most important aspect of ensuring the long service life. If the area of the pad does not receive proper water flow, it will clog or soften. Proper wetting of the pads means from top to down and throughout all the length. The checking of dry areas, spots or streaks on the pad surface should be done on daily base. In most cases when dry areas are present on the pad surface, the water distribution pipe is clogged with dirt or debris.

Usually the first signs of blockage will be at the far end of the pipe. The simplest way to clean the holes of the water distribution pipe is to install ball valves at the end of each distributor pipe. While the pump is running, open the valves and allow the water to flush out the dirt and debris from the pipe.

6.8 Algae treatment

Algae must have three essential elements to survive and proliferate. Disrupting (cancelling) one of these 3 will prevent algae proliferation:

- Light: shade the water distribution system. Do not use clear or translucent hoses, tanks, or water distributors. Make certain the system is shaded. In some cases it is recommended to share the pads.
- Moisture: dry the pads completely every 24 hours (run fans with pump off). Regular drying of the pads for several hours at a time will retard or stop the growth of most micro organisms. Set automatic controllers so the water to the pads turns off before the fans turn off. The extra air will help to dry the pads. Install a separate timer to the pumps which will turn the water off all night. There is little cooling effect from the pads between midnight and sun up. Minimize the number of drying cycles, though. Too many will wear the pad
- Nutrients: avoid nutrients from the air or from water. Do not use phosphate type scale control agents or detergents on the pads. They degrade to form phosphate type nutrients. Use water from deep wells or municipal supplies. Surface water from lakes and shallow wells may be high in nutrients. Old algae growth should be cleaned and removed from the system. When the pads are cleaned, algae and dirt are usually flushed into the gutter and go back to the water gutter. Remove spent, rotted pads as they may decompose to form nutrients.

6.9 Cleaning the system

- Shut-off the pump and clean the water filter(s)
- If possible, turn off the fans. If not possible, run the fans at minimum ventilation rate.
- Gently wash the pads using a hose (low water pressure). Remove the algae from pads and pipes.
- Flush the water gutter (tank)
- Flush the water distribution pipe. Open the ball valve at the ends of water distribution pipe; turn on the water pump; flush and lean the water distribution pipe for several minutes, allowing debris to be removed completely
- Remove the deflector (cover) and clean the holes in the water distribution pipe. Flush again.
- After final flush, turn off the water pump and close the ball valve at the ends of the water distribution pipe
- Refill the water gutter with clean fresh water
- Resume normal operation.

6.10 Winterizing the system

- Turn off the pump and close the ball valve for fresh water source
- Disconnect the pump from the mains
- Allow the pads to completely dry out before covering with curtains to avoid rotting
- Drain the water pump by removing the tap of the water pump to allow all dirt and water to flush out
- Drain all the water from the MPG system, until completely empty. Allow it to dry out completely
- Remove the pump water filter and clean it
- Remove the water pump and store it in a secure place until the next cooling season

The MPG - Munters Plastic Gutter system is developed by Munters Italy S.p.A.



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