

PAD-CLIMATE-SYSTEM

Assembly instruction and operators manual

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1. Introduction

1.1. Brief description of BARKU Pad-Climate-Systems

The BARKU Pad-Climate-System is a cooling- and humidification system for agricultural buildings for animal husbandry and for industrial complexes.

The system consists essentially of a pump which pumps water into a spray tube. Through holes, water sprays against a Deflector. This distributes the water surface covering over the Pads. The water goes on the one hand a part through the Pads and the other part evaporated. The surplus water is caught in the water gutter and discharged partially and given on the other hand again to the pump.

1.2. Preface to the manual

This manual facilitates is becoming acquainted with of the Pad-Climate-System and it points out the intended use of the System. The manual contains important notes, as the System is to be operated surely, properly and economically. Their attention helps to avoid dangers to decrease repair costs and down-times and to increase the reliability and the life span of the System. The manual is to be supplemented around instructions due to existing national regulations for accident prevention and to environmental protection. The manual must be constantly at the place of work of the plant available.

The manual is to be read and used from each person to, those assigned with work with/on the System e.g.









- operation, including preparation, disturbance recovery in the work routine, removal
- of scraps, care, disposal of operating and auxiliary materials
- maintenance (maintenance, inspection, repair) and/or
- transport.

Beside the manual and in the user country and in the employment place valid obligatory regulations for accident prevention are to be considered also the recognized specialized technical rules for security and professional working.

2. General information

2.1. Warnings and symbols

You will come across the following symbols while reading this manual.

	Warns of general danger
	Warns of dangerous electrical current
	Warns of cold
	Warns of corrosive substances
	Warns of flammable substances
	Substances detrimental to health
	General mandatory sign
	Mandatory sign indicating protective gloves

2.2. Designated use

BARKU Pad-Climate-System is exclusively intended for cooling applications in stables.

Any other use shall not be regarded as proper. The manufacturer will not be liable for any ensuing damage; this risk shall be borne by the user alone.

Designated use also includes:

- observing all of the information in the Operating Instructions and
- carrying out all service and maintenance work as required.

BARKU Pad-Climate-Systems may only be operated, maintained and serviced by personnel familiar with these measures and the potential dangers associated with the system.

2.3. General safety guidelines - intended use

These Operating Instructions include the most important information for operating the Pad-Climate-Systems in a safe manner.



The relevant guidelines for the prevention of accidents as well as other generally recognised technical safety and medical regulations for the workplace must be observed.

Check that the safety and functional equipment works safely and correctly:

- prior start-up
- at the appropriate intervals
- after modifications or maintenance.

The specifications outlined by the water and energy utility companies must also be observed.

The system is exclusively intended for cooling/air-conditioning. Another use, like e.g. for pumping other liquids than water is considered than not intended. For damage resulting from this the manufacturer/supplier is not responsible. The risk carries alone the user.

To the intended use also belongs the attention of the manual and the adherence to of the inspection and maintenance conditions.

2.4. Obligations



A basic prerequisite for safe handling and smooth operation of this Pad-Climate-System is knowledge of the basic safety information and safety guidelines. These Operating Instructions, and the safety instructions in particular, must be observed by all persons working on the Pad-Climate-System. Furthermore, all regulations and guidelines governing the prevention of accidents and applicable for the respective site must also be observed.

The Pad-Climate-System may only be used as designated when it is in a safe technical state. Any problems which may impair safety must be remedied without delay.

Organisational measures:

All safety equipment must be examined at regular intervals.

2.5. Warranty and liability

As a general rule, our “General Terms and Conditions Governing Sale and Supply” shall apply.

Warranty and liability claims in the event of personal and material damage are excluded if they are attributable to one or more of the following causes:

- non-designated use of the Pad-Climate-system,
- improper fitting, commissioning, operation and service of the system,
- operation of the system despite defective safety equipment or safety and protective equipment which has been fitted incorrectly or is non-functional,
- non-observance of the information in the Operating Instructions as regards transport, storage, fitting, commissioning, operation, service and equipment of the system,
- independent structural modifications to the system,
- poor supervision of components subject to wear,
- repairs carried out incorrectly,
- catastrophes caused by foreign bodies and forces majeures.

2.6. Electrical system



Always isolate the power supply before working on the electrical system.

All tasks extending beyond the framework of system maintenance may only be carried out by qualified personnel.

Always isolate the power supply when working on the device and secure against unauthorised reactivation by another person. Examine electrical cables for visible damage prior to commissioning. Replace any damaged lines before putting the device into operation. Damaged or destroyed plug devices must be replaced by a qualified electrician. Do not remove plugs from sockets by pulling the cable. Covering electrical components can give rise to heat concentration with high temperatures which can in turn destroy the equipment and cause fires.

3. Assembly

3.1. Assembly information

Please read the following pages carefully. The instructions in this manual apply for various Pad-Climate-Systems. For this reason, we would ask you to select and apply the sections which concern you.

When using this manual for BARKU standard versions, please note all alterations to and/or deviations from the scope of your supply.

3.2. Pad location in building

For poultry or livestock applications, the top of the Pads should be at the highest level at which cooling is desired. The Pads should be located on one end of the building except in cases where the resulting air velocity exceeds the comfort level for the animals being housed. In these cases, the Pads should be on both sides at both ends of the house, with the fans on both sides in the middle. See figure 1.

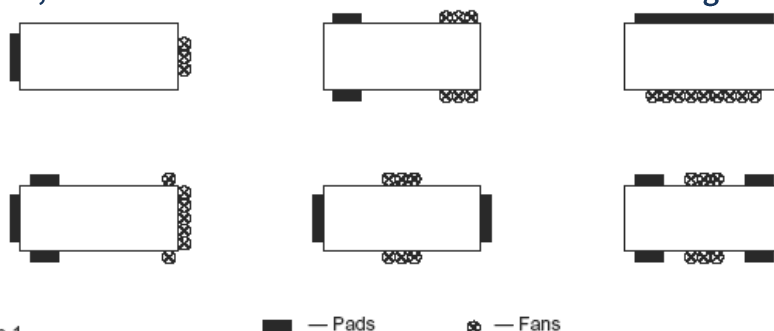


Figure 1

■ — Pads

▣ — Fans

Many other designs are acceptable.

3.3. Assembly order

Use the Table of Contents to find the assembly section you require. The assembly section describes the individual work steps in the assembly order. Individual components are provided with position numbers in the drawings. These position numbers can also be found in the text.

3.4. Spare parts

Spare parts for the Pad-Climate-System you will find in the "Spare parts list for Pad-Climate-Systems"

This contains the exact name of the respective part and its item number, which we require in the event of spare parts being ordered. In order to procure electrical components, we require information on the power supply, e.g. 230/400 V – 3 Ph. 50 Hz.

A current version is appended to these Assembly and Operating Instructions.

3.5. Recommended tools

The following is a list of tools needed for the installation of your BARKU Pad-Climate-System.

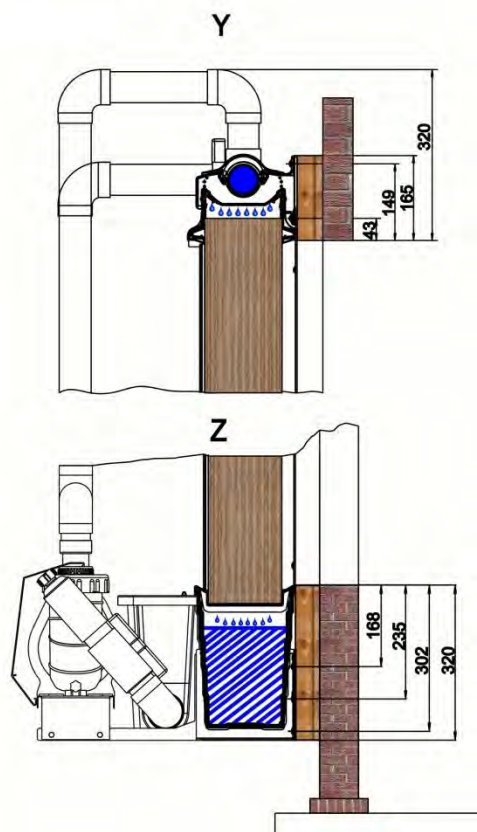
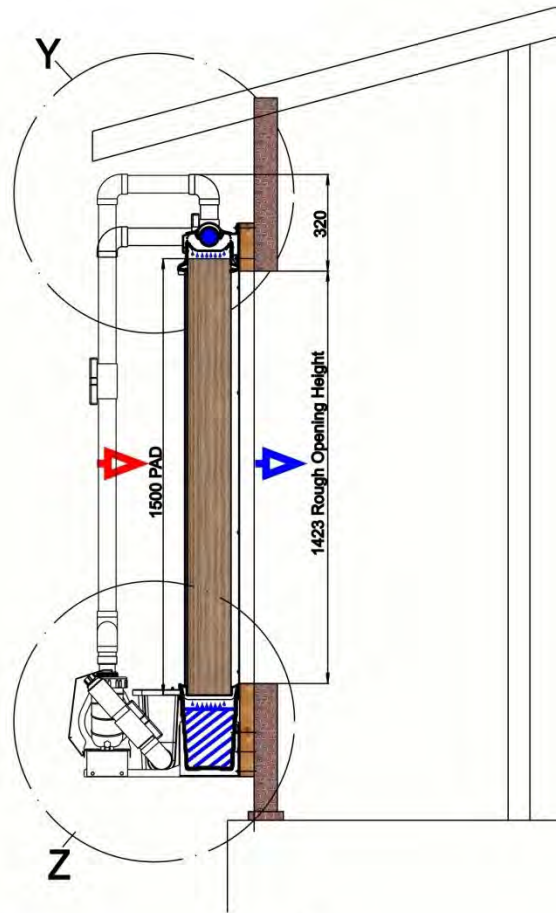
- Tape Measure
- Hack Saw
- Chalk Line
- Jigsaw or Circular Saw
- Level
- Screwdriver

3.6. Installation procedures

This opening in the stable should have a wood frame, all made of water-resistant wood.

For systems 3m to 12m (10ft to 40ft) long, the sump will be located at the end of the system.

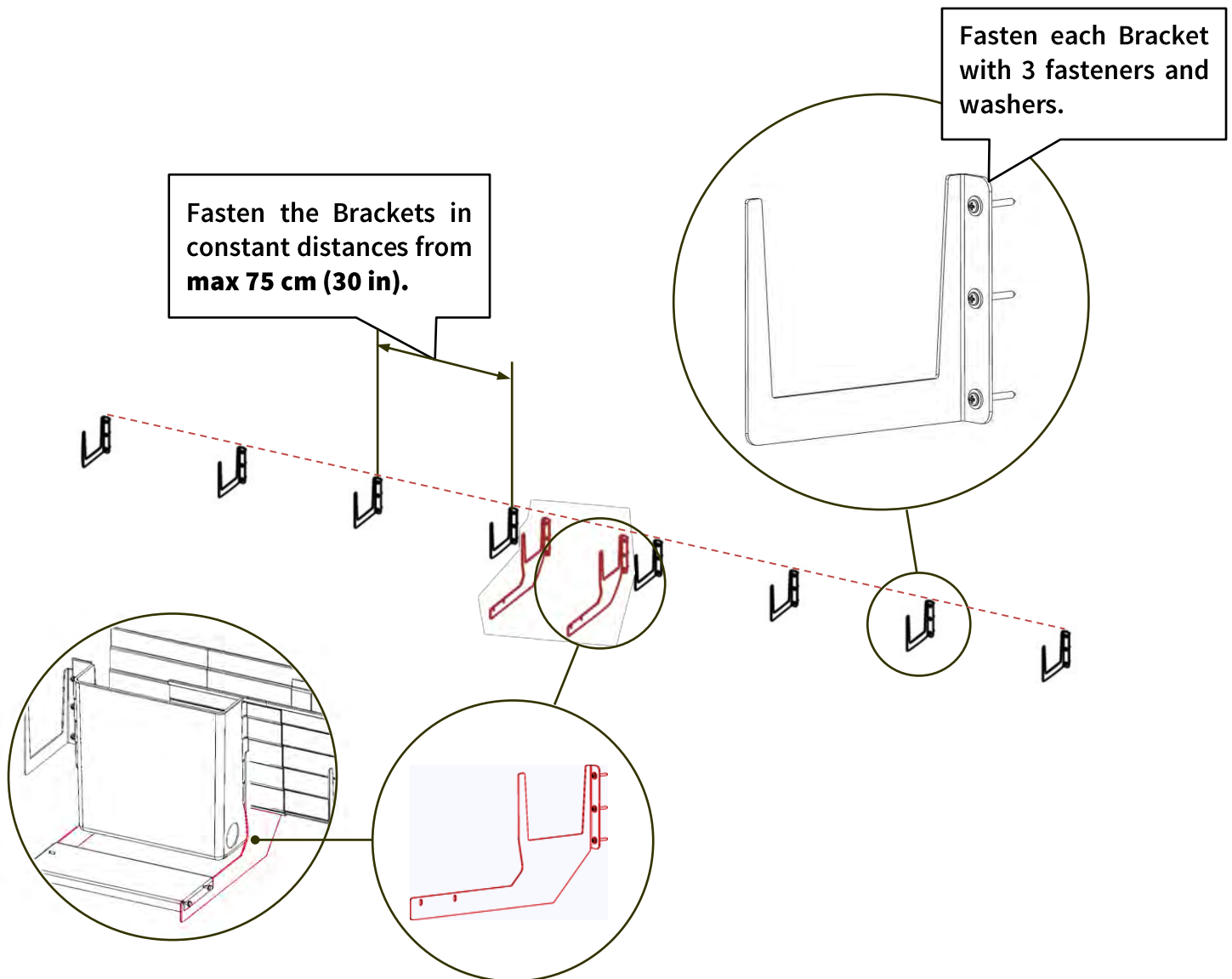
For systems 12m to 24m (40ft to 80ft) long, the sump will be located at the center of the system.



3.7. Assembling

3.7.1. Bracket for Watergutter

The Brackets for the Watergutter are beginning fastened from the Supply Unit. Measure off the two Brackets for the Supply Unit and those or the last Bracket. Then mark with a chalk line the horizontal connection.



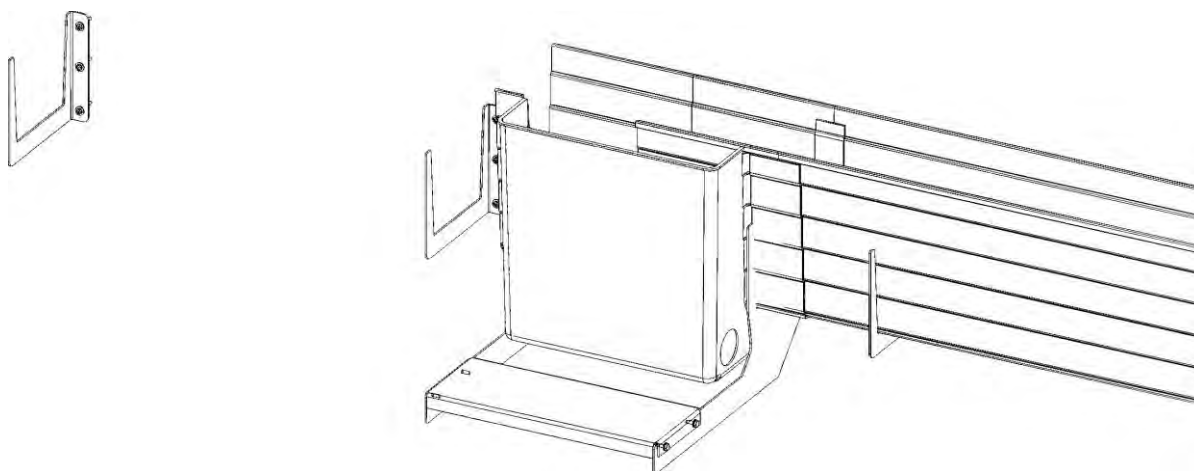
The Supply Unit is already pre-assembled. The Brackets of the Supply Unit must also been fastened in desired position.



The uniform load of the ready for use system is 75 kg/m (165 lb/m)!

3.7.2. Watergutter

Beginn the glueing of the Watergutter and the Coupler for Watergutter with the housing of the Supply Unit up to the End Cover.



Consider the following points for a waterproof connection:

- sufficient adhesive quantity in the coupler particularly in the corners and at the front of the Watergutter (Adhesive should get out from the coupler)
- Brisk processing (see 3.7.3 Glued connections)
- Accurate seat of the coupler and the Watergutter to each other (push Watergutter up to the stop into the coupler).
- During drying (24 hours) do not move the entire system any longer.

3.7.3. Glued connections

BARKU recommends "Tangit" adhesive for glued connections.

Many connection elements in the BARKU product range are designed as glued connections. Please observe the following manufacturer instructions in order to ensure secure connections.

The pipe must be cut at a right angle and burred. The areas to be glued must be clean and dry. Clean the ends of the pipe on the outside and the connecting elements on the inside using a cleaning agent (please check compatibility) and woven felt. Always use new woven felt. The areas to be glued must be fully dry before applying the adhesive.

Push the pipe and connecting element without twisting until the limit stop and hold tight for a few seconds until the glue has set. Immediately following joining, remove superfluous glue with the woven felt as otherwise the pipe will be etched too strongly. Owing to the fast setting features of the adhesive, the join parts must be pushed together within 4 minutes of applying the glue. The open period for Tangit depends on the ambient temperature and/or film thickness.



Ambient temperatue	Processing time	Film thickness
20 °C (68 °F)	approx. 4 min.	1 mm
25 °C (77 °F)	3 min.	1 mm
30 °C (86 °F)	2 min.	1 mm
40 °C (104 °F)	1 min.	1 mm
> 40 °C (>104 °F)	< 1 min.	1 mm

Stress: Do not move the pipes for at least 5 minutes after gluing. At temperatures below 10°C (50 °F), this period is extended to a minimum of 15 minutes.


Pressure test: The pipes should not be filled nor should a pressure test be carried out until 24 hours after the last gluing procedure. We recommend rinsing pipes and possibly even leaving them full of water if they are not put into operation immediately.

Please observe the protective measures described by the manufacturer.

Please also observe additional information in the data sheets and guidelines on the prevention of accidents supplied by the professional associations, e.g. VBG 15, VBG 81, M017 and the Safety Data Sheets.

	Tangit contains tetrahydrofurane and cyclohexanone. Xi = irritable Irritates the eyes and breathing apparatus
	“Tangit” adhesive is highly flammable. F = easily flammable!

Tangit is highly inflammable. Its solvent vapours are heavier than air and can form explosive mixtures. For this reason, always ensure sufficient ventilation when processing, drying or gluing using Tangit. In workrooms and adjoining rooms: No smoking! No welding! No naked flames and avoid generating sparks! Prior to welding work, accumulations of solvent vapours and explosive mixtures must be removed. Fill pipelines with water, rinse well and blow through. Do not seal pipes during the drying phase. Longer inhalation of these solvent vapours can lead to impaired health. Store used woven felt in closed containers. If the substance comes into contact with the eyes, rinse thoroughly with water and consult a doctor.

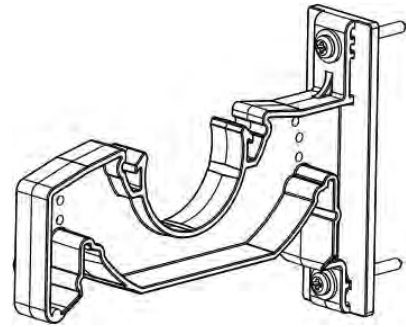
	We recommend wearing protective gloves as a precaution for preventing contact with the skin.
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Safety advice:

- **Must be kept out of reach of children.**
- **Keep away from ignition sources – no smoking.**
- **Avoid contact with eyes.**
- **If ingested, consult a doctor and show packaging or label.**

3.7.4. Top Bracket

Measure off the place for the Top Bracket above the Supply Unit. Measure off the place for the top Bracket at the end(s). Then mark with a chalk line the horizontal connection between these points. Fasten the Top Brackets in the distance from max 75 cm (30 in). Fasten each Top Bracket with two fasteners and washers.



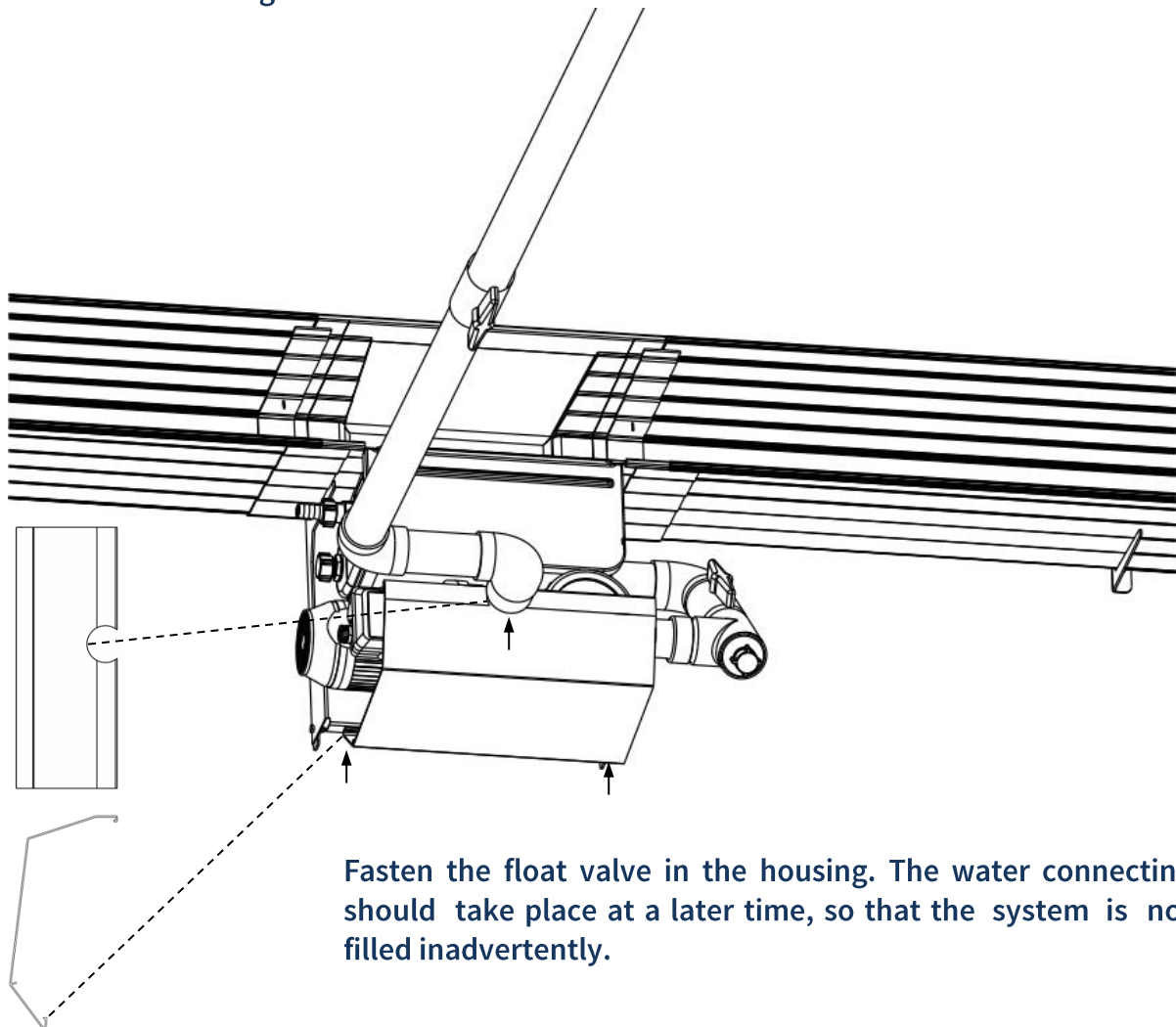
3.7.5. Supply Unit

Build the piping between the Supply Unit and the Water Distribution Pipe.



Pay attention to straight cuts of the pipe! Subsequently, bevel and if necessary clean the front of the pipes. Contamination or splinters in the tubing system can reduce the efficiency of the system or cause damage!

Cut and stick together the whole piping system from the pump to the sump. Place the Pump Cover on the Supply Unit for preventing dirt and splashing water to the Pump. Consider the arrangement of the construction units as shown in the sketch.

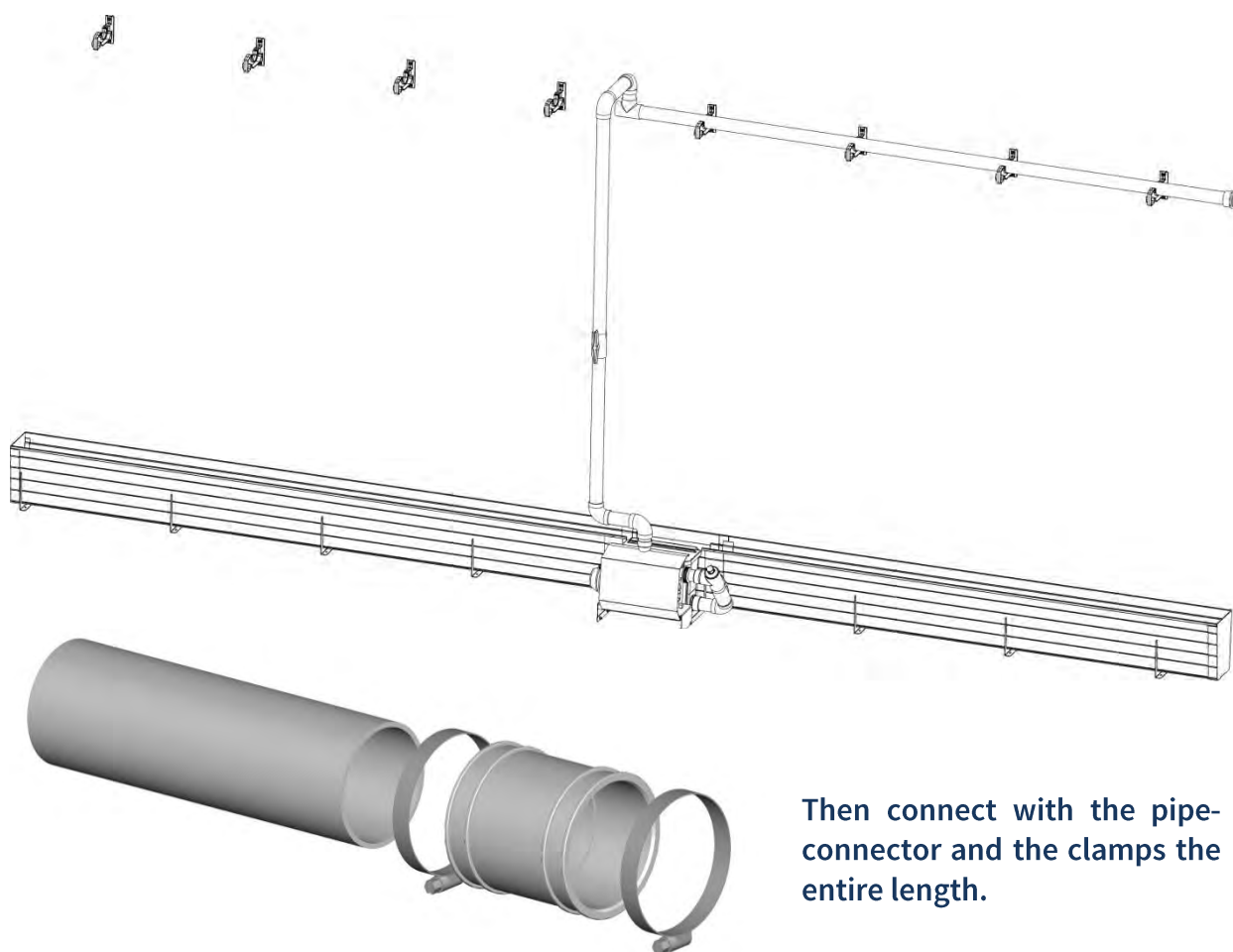
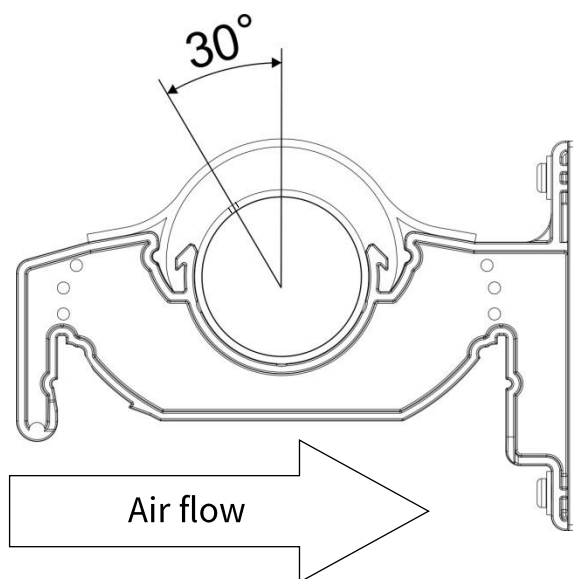


Fasten the float valve in the housing. The water connecting should take place at a later time, so that the system is not filled inadvertently.

3.7.6. Water Distribution Pipe

Begin with the sticking of the Water Distribution Pipe together with the T-Glue Coupler of the Supply Unit.

Note! The holes of the Water Distribution Pipe must stand on 30 degrees with the air flow from the outside.



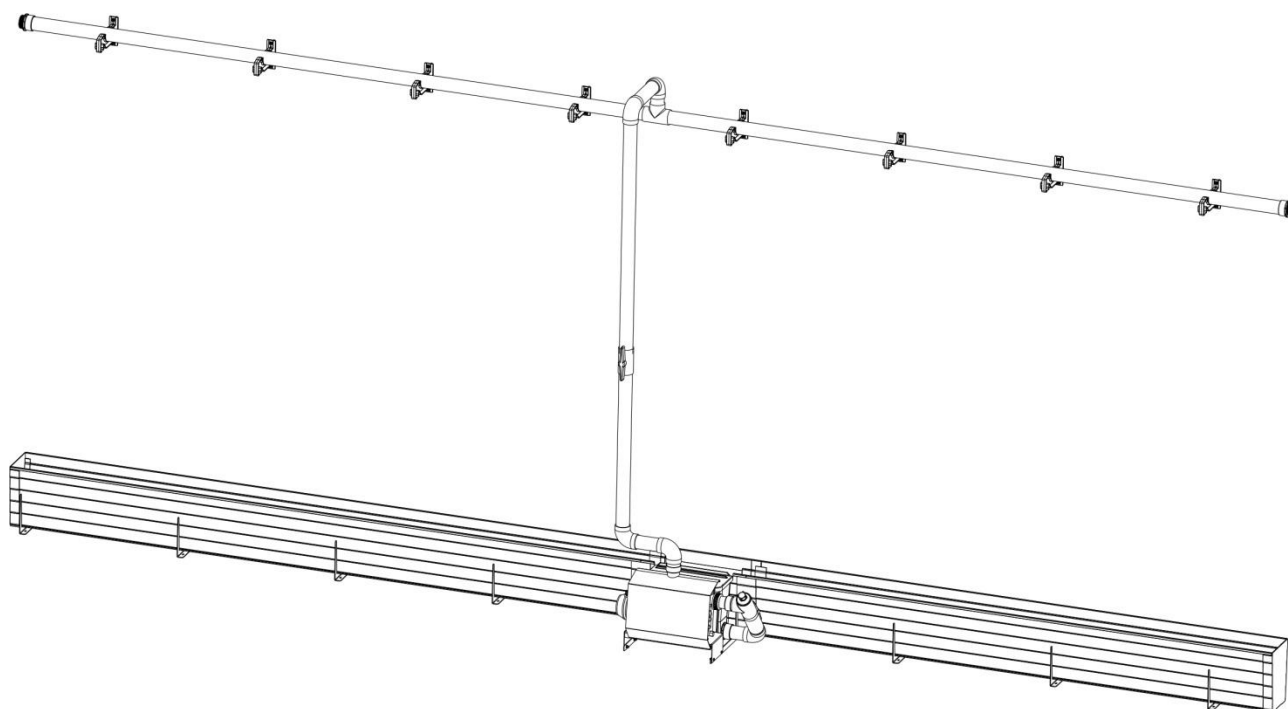
Then connect with the pipe-connector and the clamps the entire length.



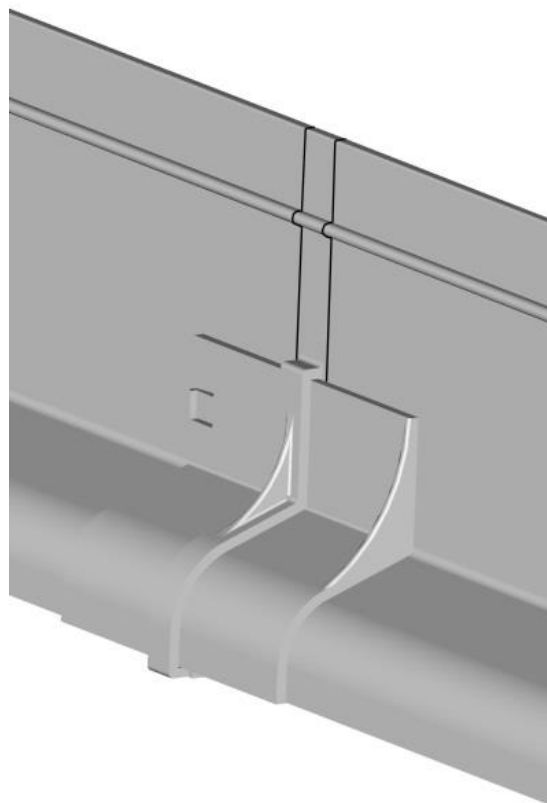
Pay attention to straight cuts of the pipe! Subsequently, belve and if necessary clean the front of the pipes. Contamination or splinters in the tubing system can reduce the efficiency of the system or cause damage!

3.7.7. Pad Guide

Fasten the entire Pad Guide at the wall side through clip in.



Use the Pad Guide Coupler to connect them over the whole length. For closing the Pad Guide Coupler push slider to right and clip in the left Pad Guide.

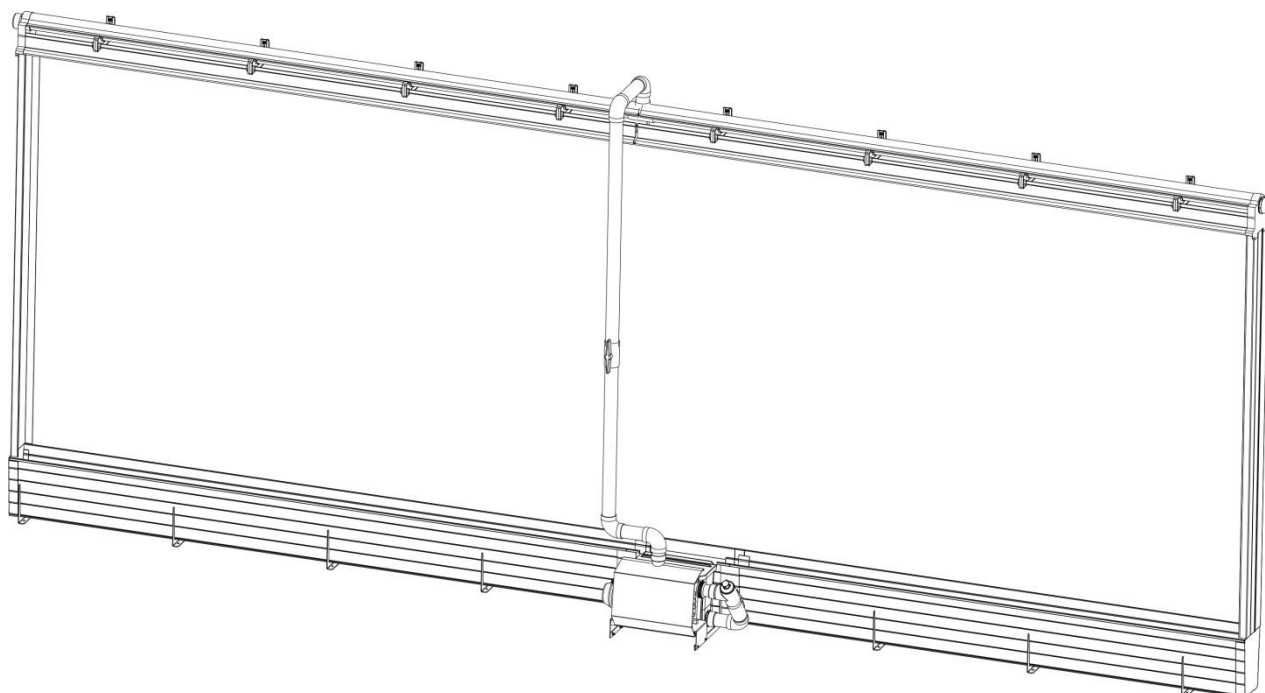


3.7.8. Covers

After the demanded drying time of all glue connections press the entire Pad Support on the Watergutter. Fasten the Pad Covers with in each case 6 screws evenly over the length distributed. For closing the Deflector section set up the Endcover for Deflector. Glue the Transition Piece at (to) the End(s) and screw the Sealing Cap on the Transition Piece. Consider the drying time (24 hours)!

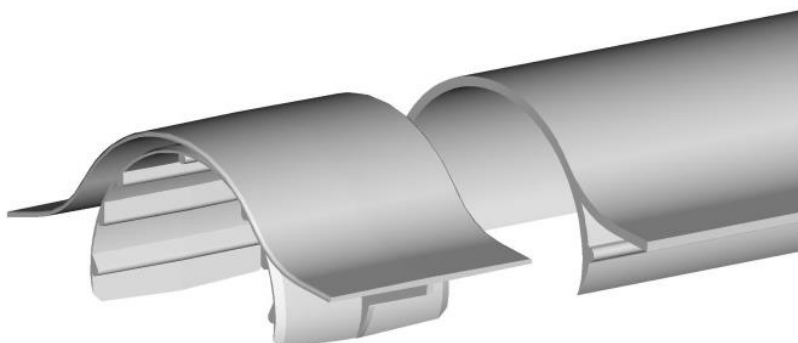
Push the first Pad into the Pad Cover. Put the other Pad onto the Pad Support. Fasten the Pad Guide for each middle element afterwards. Use to connect the Pad Guide to the Pad Guide Coupler.

Push the last but one Pad into the Pad Cover. Then place the last Pad to the free position and fasten with the Pad Guide.



3.7.9. Deflector

Clip in the Deflector over the whole length and use the Deflector Couplings to connect them.



4. Operating instructions

4.1. Concept of evaporative cooling

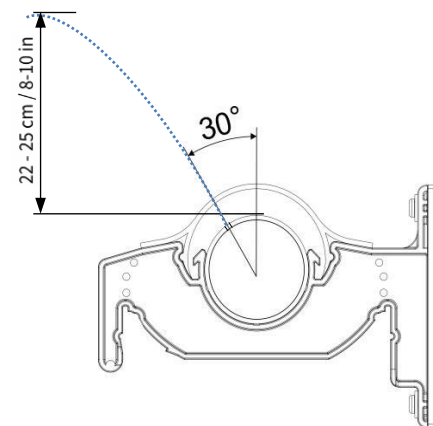
To offset periods of extreme temperature that affect in-house environments and therefore production, BARKU Pad-Climate-Systems are used with outstanding success. The benefits of evaporative Pad cooling are obtained by moving large quantities of air through water-saturated Pads. The resulting evaporation of water will lower the air temperature. This method of cooling can provide dependable relief from heat stresses in periods of hot weather. Suited for all geographic locations, a BARKU Pad-Climate-System delivers the greatest economic benefits in areas where higher temperatures during longer periods of time are normal.

BARKU Pad-Climate-System comprises the following components:

- Supply Unit
- Middle elements
- End kit

4.2. Prior Start up

- Connect the float valve to a suitable water supply.
- Connect the BARKU AQUA PUMP to a proper electrical current source.
- Water quantity and distribution can be adjusted by infinitely turning to the Deflector. Adjust the holes of the Water Distribution Pipe in an angle of 30 degrees to the outside.
- To reach the right water quantity, adjust the Ball Valve to a water cullum (which streams out of the holes) of 22-25 cm (8-10 in) height over the Water Distribution Pipe.



4.3. Operating

The durability of the Pads depends on its manufacturer and will last 5 or 6 years if properly maintained. When the water is circulated and evaporated, the mineral content of the remaining water gets higher. To keep the mineral content within workable levels, 5% to 10% of the circulated water must be bleeding off through the bleed off opening. When mineral deposits are observed on the Pad, increase the amount of bleed off.



The pH of the recirculated water must be maintained between 6 and 9. A pH of 7 is neutral. A pH above 9 or below 6 will drastically reduce the life of the Pad.

Algae growth and water bacteria in the Pads must be controlled. The Pads are treated with a fungus resistant additive, but this does not completely prevent algae growth. Treat the water with any of the chlorine algaecides (Calcium Hypochlorinates) used for swimming pools, such as HTH or Pace. Tablet forms of these algaecides are the most economical and best to use in the sump for slow release. Maintain the sump water for recirculation at 1 ppm (part per million) chlorine. If a chlorine smell is present, too much has been added. If any algae grows, tablets need to be added. Water pH and chlorine levels should be checked weekly. Kits for testing pH and chlorine may be purchased at any swimming pool supply store. The life of your Pad depends on its proper maintenance.

Clean the filter at least once a week, more often if foreign materials are present in the water system.

Flush pipe distribution system at least once a month. This is done by opening both Ball Valves while the pump is running and allowing water to flow through and out of the system.

Regulate your ventilation system so that the Pad system is turned off while all the fans are still running. This will pull air through the Pads after the water is turned off, allowing them to dry properly and killing any algae spores. Do not keep the Pads wet around the clock as this will make the Pads soft.

When the evaporative Pad system is operating, check the Pads for dry spots. When dry spots are observed, remove the Pad Cover and check the holes in the pipe. Clean any stopped up holes with a wire until adequate water flows from each hole.



DO NOT FLOW EXCESSIVE WATER ON THE PAD.

The Pads are more efficient if they have just enough water to keep them wet, but not a stream of water cascading down the Pad.

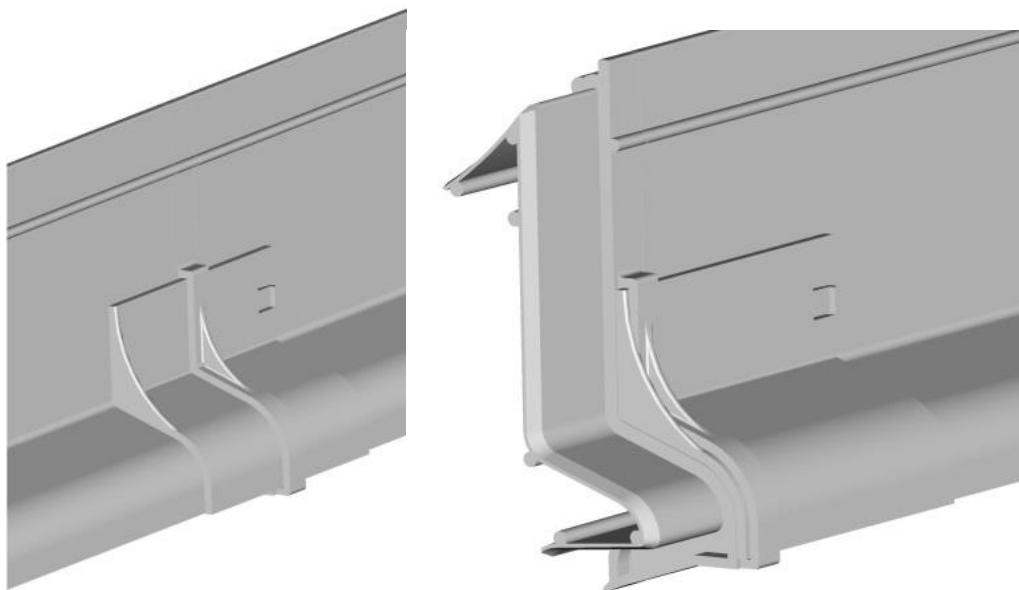
Drain and clean the sump as necessary to remove any dirt or trash that it may have accumulated.



At the end of the evaporative cooling season, drain the pump, sump and pipe system to avoid freezing damage in cold weather. If the pump cannot be completely drained, put anti-freeze in it.

4.4. To remove the Pad Guide

For opening the Pad Guide Coupler push slider to right and clip out the left Pad Guide.



5. Technical Data

5.1. Centrifugal-Pump BARKU AQUA 11

5.1.1. General technical data

Type of motor enclosure:	IP X4	
Class of insulation:	B	
Motor speed approx.:	2840 rpm	
Max. continuous sound intensity level (A):	≤70 dB ¹⁾	
Max. water temperature:	max. 60 °C	max. 140°F
Max. housing pressure:	max. 2,5 bar	
Performance:	0,45 kW	

5.1.2. 1 ~ 230 V / 50 Hz

Rated current:	3,20 A	
Weight:	7,60 kg	16,8 lb
Volumerate:	18 m ³ /h	4755 gal/h ²⁾

5.1.3. 3 ~ Y/Δ 230 V / 50/60Hz

Rated current:	2,15 A	
Weight:	9,10 kg	20,1 lb
Volumerate:	18 m ³ /h	4755 gal/h ²⁾

5.1.4. 3 ~ Y/Δ 400 V / 50/60Hz

Rated current:	1,25 A	
Weight:	9,10 kg	20,1 lb
Volumerate:	18 m ³ /h	4755 gal/h ²⁾

¹⁾ Measured with phonometer according to DIN 45635

²⁾ US liquid gallon