PuPu PUMP

PROFESSIONALIZING GLOBAL PIT EMPTYING SERVICES

GUIDELINE FOR WORKING WITH THE PUPU PUMP

MODULE 2 | PUMP ASSEMBLY

PuPu PUMP

For more information, visit www.pupu-pump.com

Disclaimer

The instruction guide is available in English and French and has been developed for use in technical training courses for the intended users. In case you want to organize such a training, you may contact PRACTICA for further information and support

---

The PuPu PUMP is a product developed by PRACTICA

PRACTICA
Geulweg 16 | 3356 LB Papendrecht | The Netherlands
www.practica.org

FOREWORD

PRACTICA develops technologies for major global challenges. A very clear one is the need for better sanitation services and products in the coming decades with the rapid population growth in urban centers.

Half of the world's population use on-site sanitation systems like pit latrines and septic tanks. These get full and need to be emptied regularly. Over 60% of the urban population in Africa and Asia rely on manual emptying services because vacuum trucks cannot access certain areas, services are absent or costs are too high. Vacuum trucks require large investments and keeping them up and running is a challenge. Pits can have a high degree of solids and trash, making it a very difficult job to do. Manual emptiers use shovels and buckets and may need to go inside the latrine to remove the fecal sludge. The job is dangerous, degrading and poses health risks to emptiers and households, while poor dumping practices effects the environment, especially its water resources.

The PuPu pump operates as a Pull/Push system and provides a complementary solution for global pit emptying. It is portable, affordable and simple to operate and equips NGO's, utilities and emptying businesses in a clean and professional way for pit emptying. The repairability lowers operational barriers, while the speed of operation increases the number of pits that can be emptied daily. It can operate in densely populated areas and serve pits with accessibility issues, thick sludge and debris.

During emptying, it can pump the sludge directly to a tank of any size on a vehicle of choice. This way, sludge transportation for safe disposal and treatment becomes very simple.

COLOPHON

Available modules in this guide

Module 1

Professionalizing pit emptying

This module describes the PuPu pump specifications and configurations. It explains how to operate the equipment for emptying, fluidization and mixing and how it can be linked to transport. It is meant for NGO's, emptying businesses, utilities, and governments that want to professionalize pit emptying.

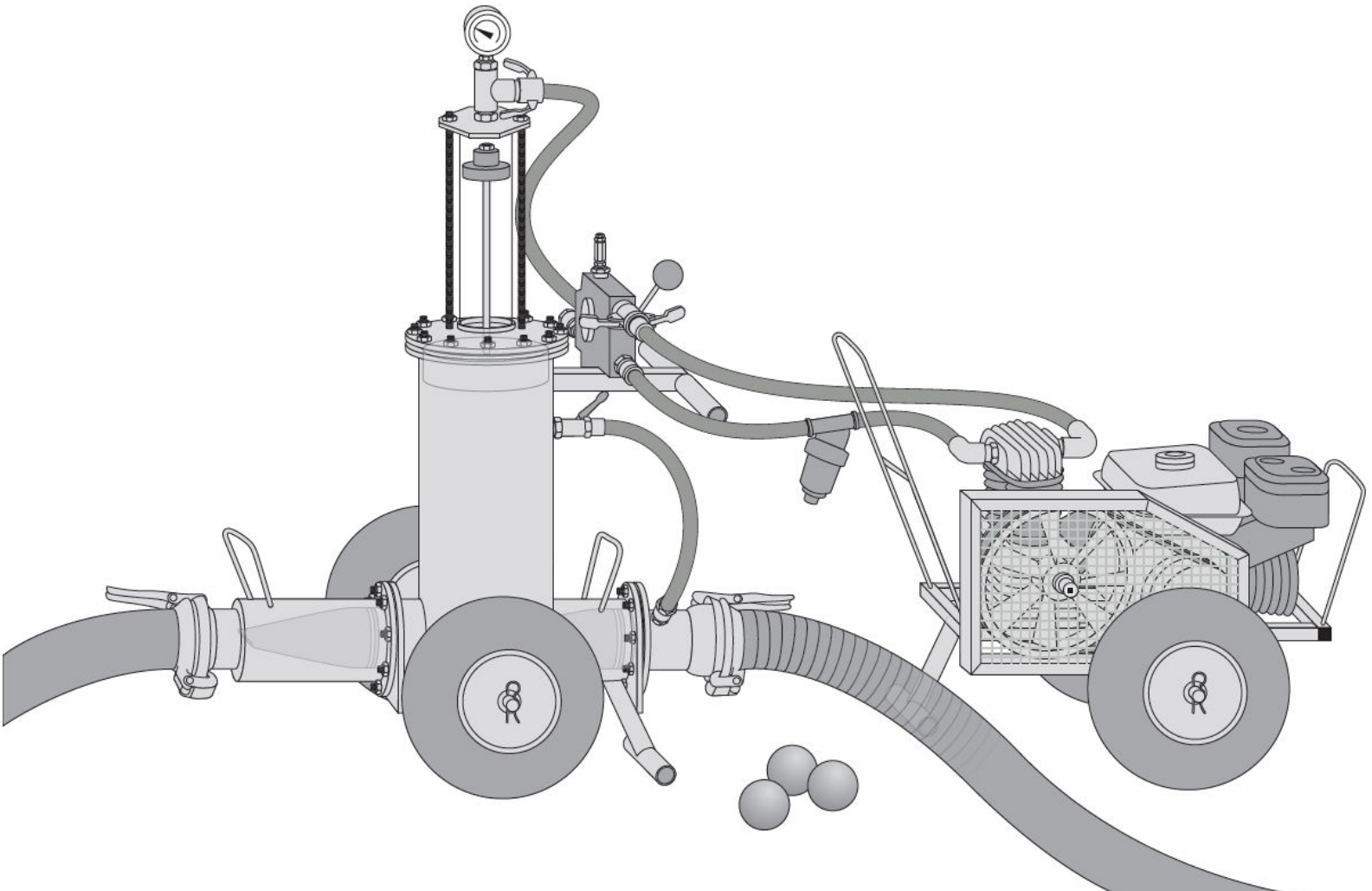
Module 2

Pump assembly

Module 2 provides a step by step guide to assemble the pump unit and compressor unit together. It provides references for distributors and other users.

Module 2

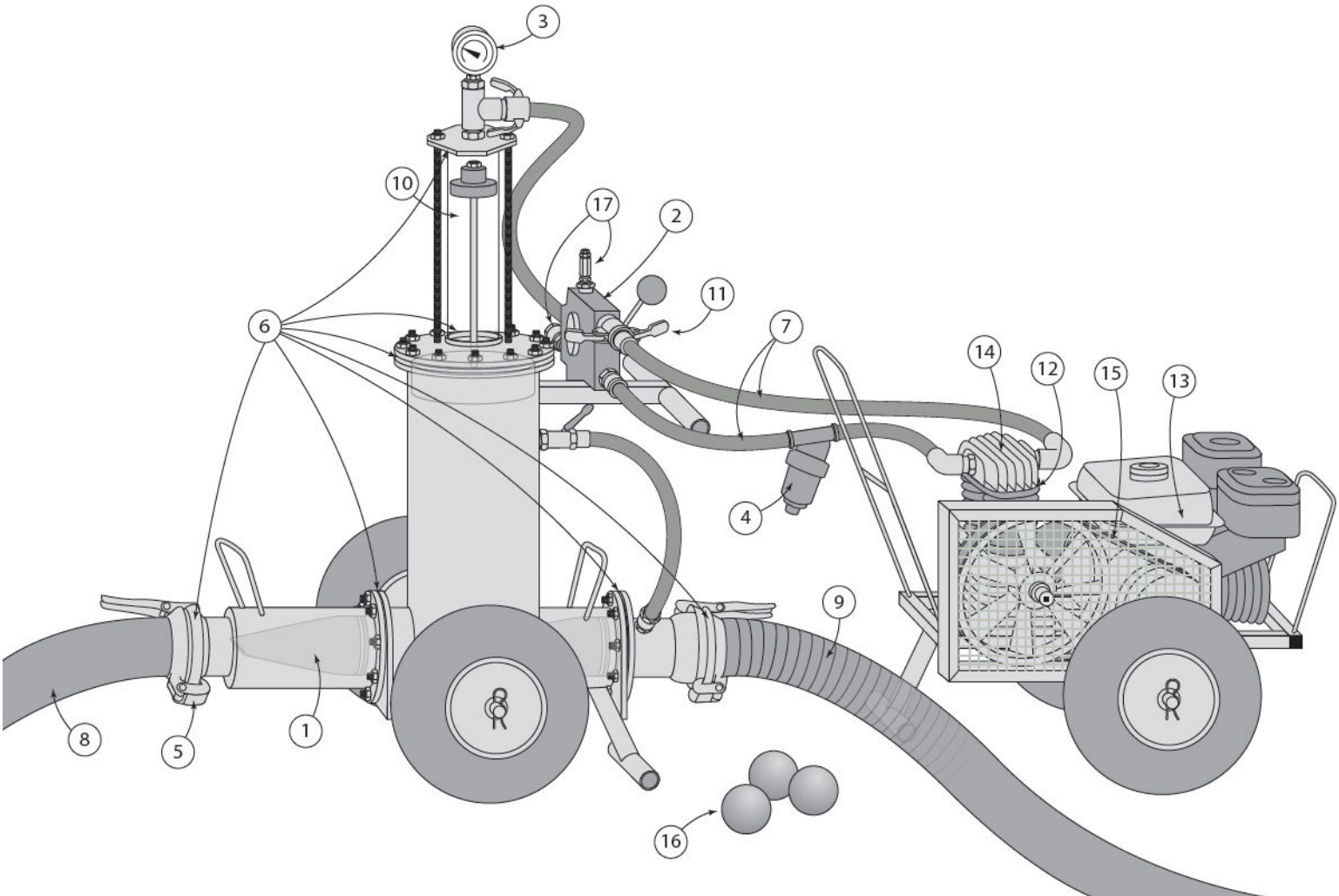
PuPu pump assembly



PuPu pump parts

The PuPu pump consist of a pump unit and compressor unit. If needed, spare parts can be selected from the table below.

Part Nr.	Part name	Part Nr	Part name
1	Duckbill valve	**9**	Sludge suction hose (reinforced type)
2	Control block	**10**	Transparent tube
3	Pressure gauge	**11**	Air hose fitting set (camlock type)
4	Filter	**12**	Gasket set for compressor
5	Sludge hose coupling set	**13**	Engine
6	O-ring set	**14**	Compressor
7	Air hoses	**15**	Belt
8	Sludge delivery hose (lay flat type)	**16**	Pigging balls



Assembling the pump unit

STEP 1: Fit duckbill valve to the pump body using the hose clamp. Start on the short side (outlet) of the pump

STEP 2: Cut the O-ring at length, add magic glue and push it together firmly

STEP 3: Lower the **outlet unit** over the duckbill valve

STEP 4: Fix the outlet unit with bolts, washers and nuts

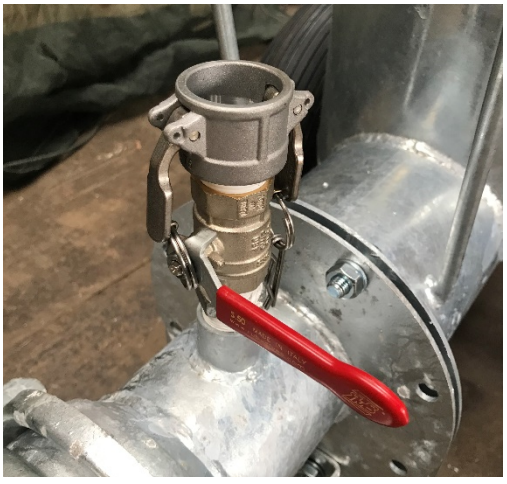
STEP 5: Repeat step 1-4 but now for the inlet unit of the pump

STEP 6: Fix the pump stand

STEP 7: Attach the wheels. Push the rod through the first wheel and fix it with the pin

STEP 8: Apply Teflon tape to the connector and fix it at the pump inlet

STEP 9: Add the valve and camlock coupling using teflon tape



STEP 10: Take one end cap and attach the valve and camlock coupling using teflon tape

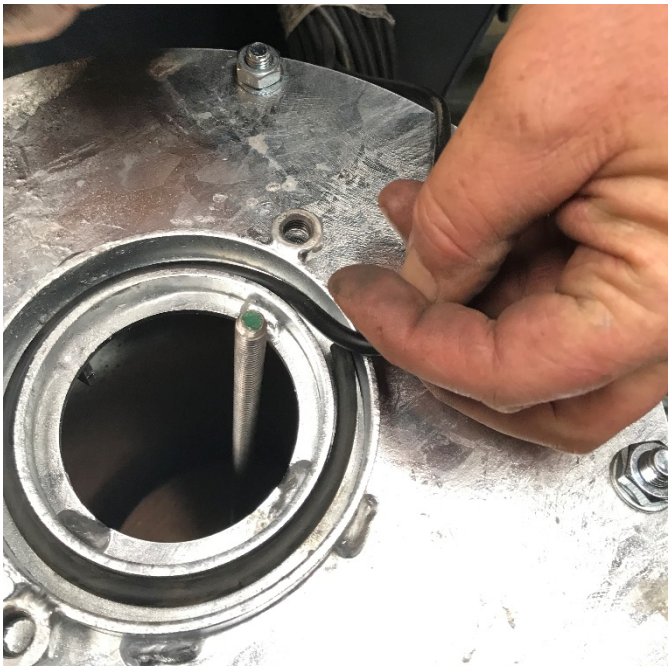
STEP 11: The water hose can now be connected to the valve with a nipple and hose clamp. Attach on the end of the hose the non-return valve

STEP 12: Add the control block, fix it using the long bolt and nut. Add female and male camlocks with teflon tape

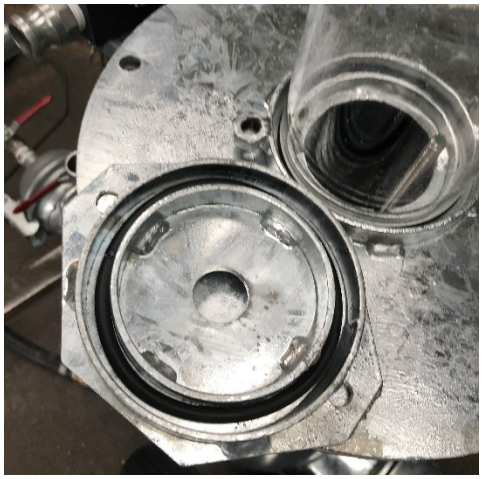
STEP 13: Add the hose connector and one-way valve to the left of the control block and a pressure release valve on top using teflon tape. Add the air hose with a male connector

STEP 14: Fix the rod and wooden disk using bolts, nuts and washers

STEP 15: Make an O-ring and **a**ttach the flange with bolts, nuts and washers



STEP 16: Make 2 O-ring for the bottom and top of the transparent tube



STEP 17: Attach plastic discs on the rod and lower the transparent tube

STEP 18: Attach top plate with nipple. Then T-piece, camlock and pressure gauge

Assembling the compressor unit

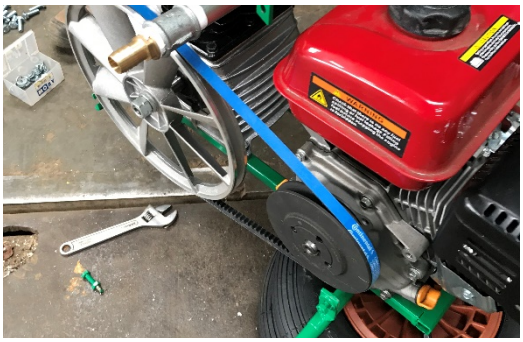
STEP 1: Place the compressor on the frame and attach it with the bolts and nuts

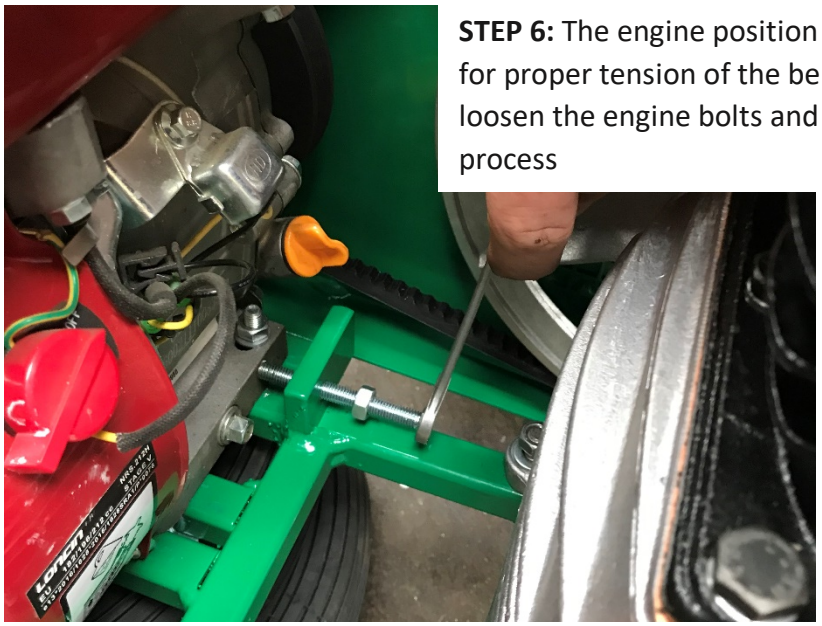
STEP 2: Assemble the suction inlet and pressure outlet using teflon tape

STEP 3: Fix the engine on the frame with bolts and nuts and add the pulley with the key and taper bush

STEP 4: Make sure the pulleys on the engine and compressor are well aligned. Then lock the engine pulley with the screws. Tighten screws with force

STEP 5: Fit the belt loosely, then move the engine backwards to increase the tension





STEP 6: The engine position can now be adjusted for proper tension of the belt. Make sure to loosen the engine bolts and nuts during this process

STEP 7: The belt cover can now be placed and attached at 3 points

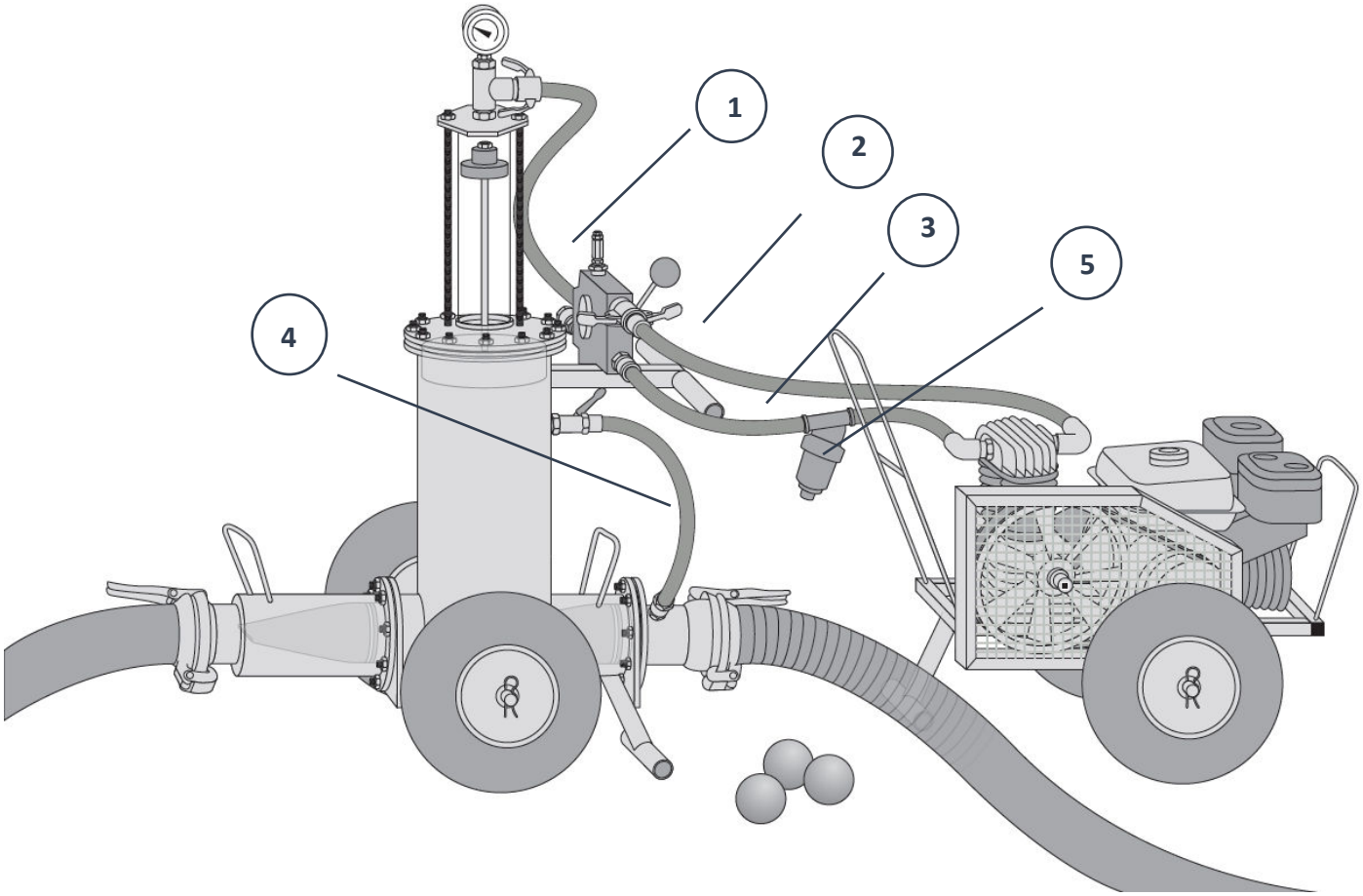
STEP 8: Add the wheels and fix them with the pins

Final steps

Pumping configuration

Add the air hoses.

- Connect 2 air hoses from the compressor to the pump (number 2 and 3). Both have a length of 3 meters. The air hose from the suction side of the compressor has an air filter (number 5) and is connected to the bottom of the control block.
- A short air hose of 0,75 meters (number 1) connects the control block with the top of the transparent tube
- A short air hose of 0,75 meter (number 4) is connected from the pump body to the end of the inlet unit. This is used for backwashing in case of blockages.



Transport and mixing configuration

During transport, the PuPu pump is fitted with endcaps instead of water hoses.
Also during fluidizing and mixing, the pump uses the endcaps, but then fitted with air hoses.

- The endcap on the suction side (A) has an air hose of 0,75 meter to draw water for fluidizing. For example, from a jerry can.

- The endcap on the delivery side (B) has an air hose of 3 meters and is connected to a metal rod for mixing