Manual

piFLOW®p

CONTENTS

FEATURES

- Compact and modular design.
- Rubber and plastic materials in conveyor are antistatic.
- COAX® technology.
- Energy efficient and low noise level.
- Easy to maintain and clean.
- The conveyor is designed according to USDA guidelines.
- Designed mainly for industries handling food, chemical and pharmaceutical products.
- Steel quality ASTM 316L.
- Solution that contributes to dust-free conveying.
- The filter bag has filtration 5 µm.
- Automatic filter cleaning.
- Fully pneumatic.
- All material in direct contact with the conveyed product complies with FDA and EC No. 1935/2004, EC No. 10/2011.

SAFETY INSTRUCTIONS

THE INTENDED USE OF THE CONVEYOR

The intended use for a Piab vacuum conveyor is to convey powders, granules, tablets and capsules in batches in a pipe system.

DIRECTIVES VALID FOR PIAB VACUUM CONVEYORS

Piab vacuum conveyors are follow directive 2006/42/EC which have two levels of declarations:

- Declaration of conformity - directive 2006/42/EC, Annex 2A
- Declaration of incorporation of partly completed machinery - directive 2006/42/EC, Annex 2B

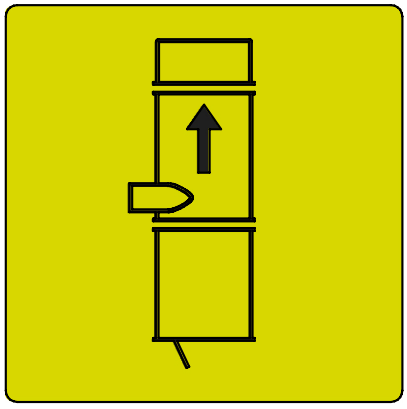
As an option, a Piab vacuum conveyor can be classified according to the ATEX equipment directive 2014/34/EU.

If the conveyor is installed and used in another main system, the installer is responsible of carrying out a risk analysis for the system as a whole.

START/STOP OF THE CONVEYOR

The conveyor is started either with the control unit or via another main control system. The conveyor stops if the supply of compressed air is suddenly interrupted. The conveyor must be re-started by the operator even if the supply of compressed air is reactivated.

CORRECT ORIENTATION OF THE INLET MODULE



Correct orientation of the inlet module

VACUUM POWER AT THE INLET

Careless usage and incorrect installation of the feeding point of the vacuum system may cause injuries. The vacuum level is concentrated at the feeding point and may cause injuries to eyes and mucous membranes.

- Never aim a suction tube, a feed nozzle or a hose at anyone.
- The larger the suction inlet, the higher the power and danger.

- The installation must be made so that the inlet cannot come in contact with the operator or any other persons.
- Always remember to disconnect the supply of compressed air when cleaning or servicing the vacuum conveyor.

Vacuum power at the inlet

EXHAUST FROM THE VACUUM PUMP

The exhaust air from the conveyor's vacuum pump may, in certain applications, constitute a risk and cause injuries. If the filter is not intact when powder with small particles is conveyed, the particles may penetrate the filter and enter the pump, and continue into the atmosphere, with possible contamination. Never look directly into the outlet of the vacuum pump. Do not forget to disconnect the supply of compressed air when cleaning or servicing the vacuum conveyor.

Exhaust from the vacuum pump

SAFETY IN REGARDS OF EXPLOSION

How does a dust explosion occur?

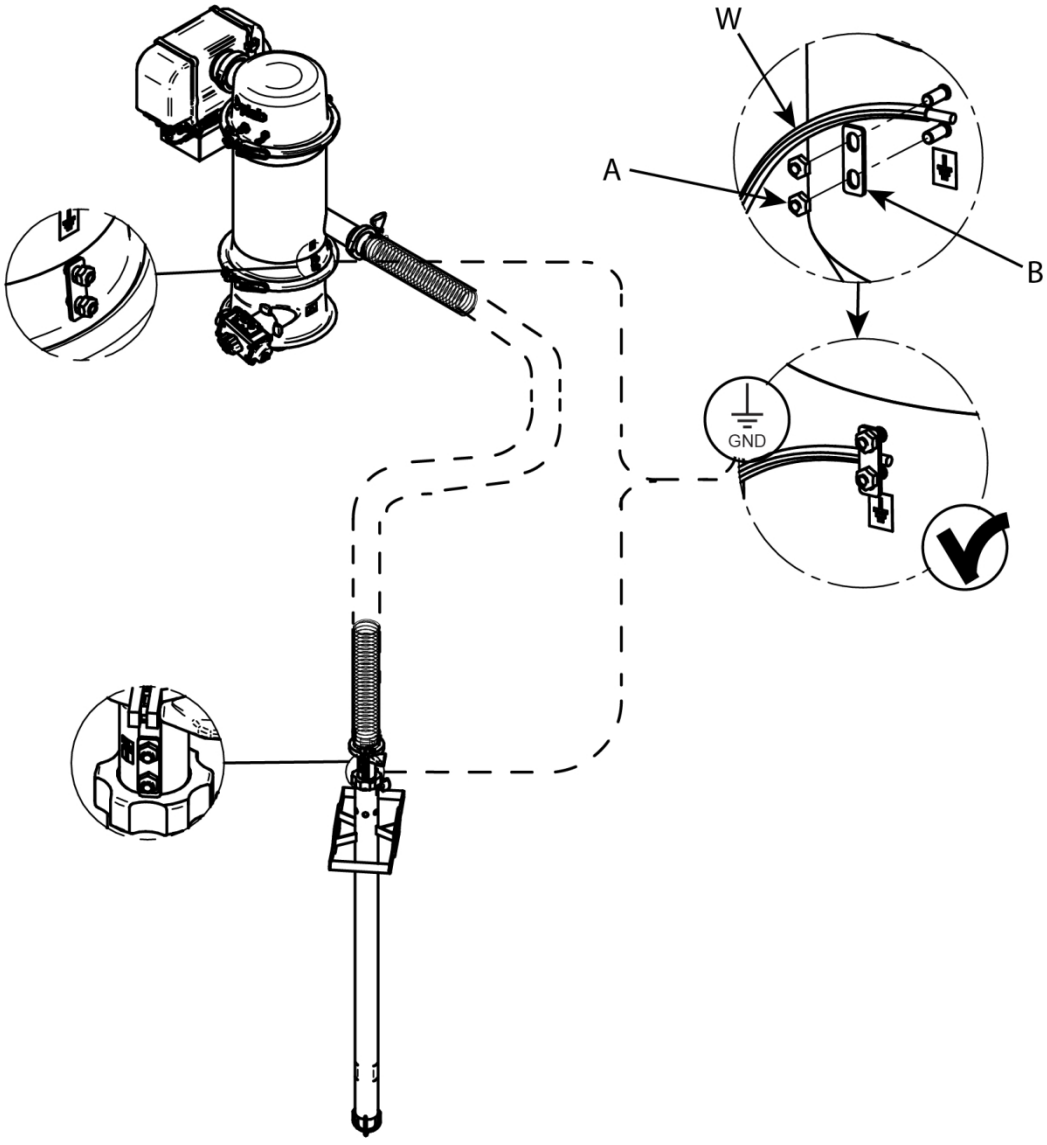
When handling and conveying dry powders and materials made up of small particles, there is a risk that a dust explosion may occur. Dust explosions may occur when certain finely divided materials are mixed with air (oxygen) after which the mixture is ignited by, for example, a spark.

SAFE MOUNTING

For safe use, the following shall be observed as to mounting of a Piab vacuum conveyor:

- Give special attention to the drawings of the manual, as this shows how to mount the seals between the conveyor's steel modules.
- Give special attention to correctly mount the filter(s). It is important that dust leakage passing the filter device is avoided. Possible leaks in the filter will cause blow-out of dust via the exhaust of the pump into the surroundings.
- The clamp rings that interconnect the modules are an important link for electric bonding between the conveyor's main parts. It is of utmost importance that these clamp rings are always mounted and that their latches are always in "locked" position.

- Grounding. In order to discharge electrostatic energy from the conveyor, it must be grounded, and all its parts must be electrically bonded to each other. The grounding shall be done with earth wire with a 16 mm² area (copper wire). It is important that all units of the conveyor system, such as feed station and receiver, are grounded to the same earth (equipotential grounding). Grounding connector for earth wires is available on all Piab vacuum conveyors. (See pictures below.)



GROUNDING OF THE piFLOW® CONVEYOR:

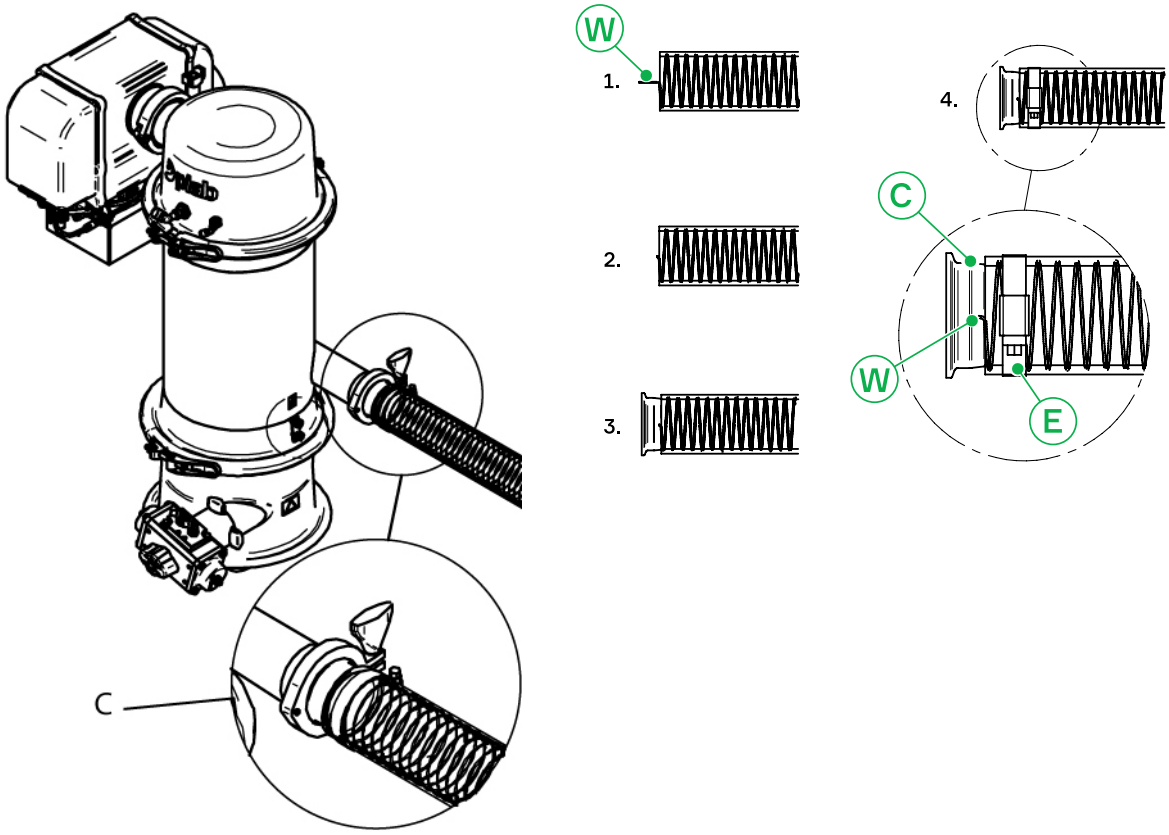
1. Strip off the isolation from the earth wire (W).
2. Loosen the nuts (A) on the conveyor and insert the stripped cable (W) end under the clamping plate (B).
3. Tighten the nuts (A) so that the earth wire (W) is securely clamped.
4. Connect all grounding points of the conveyor system to the same earth.

GROUNDING OF PIPE SYSTEM AND ACCESSORIES

Grounding of hoses connected to the vacuum conveyor and to accessories. Ground hoses by using the wire from the hose and connecting it to the ground.

Grounding of hoses with TC fittings:

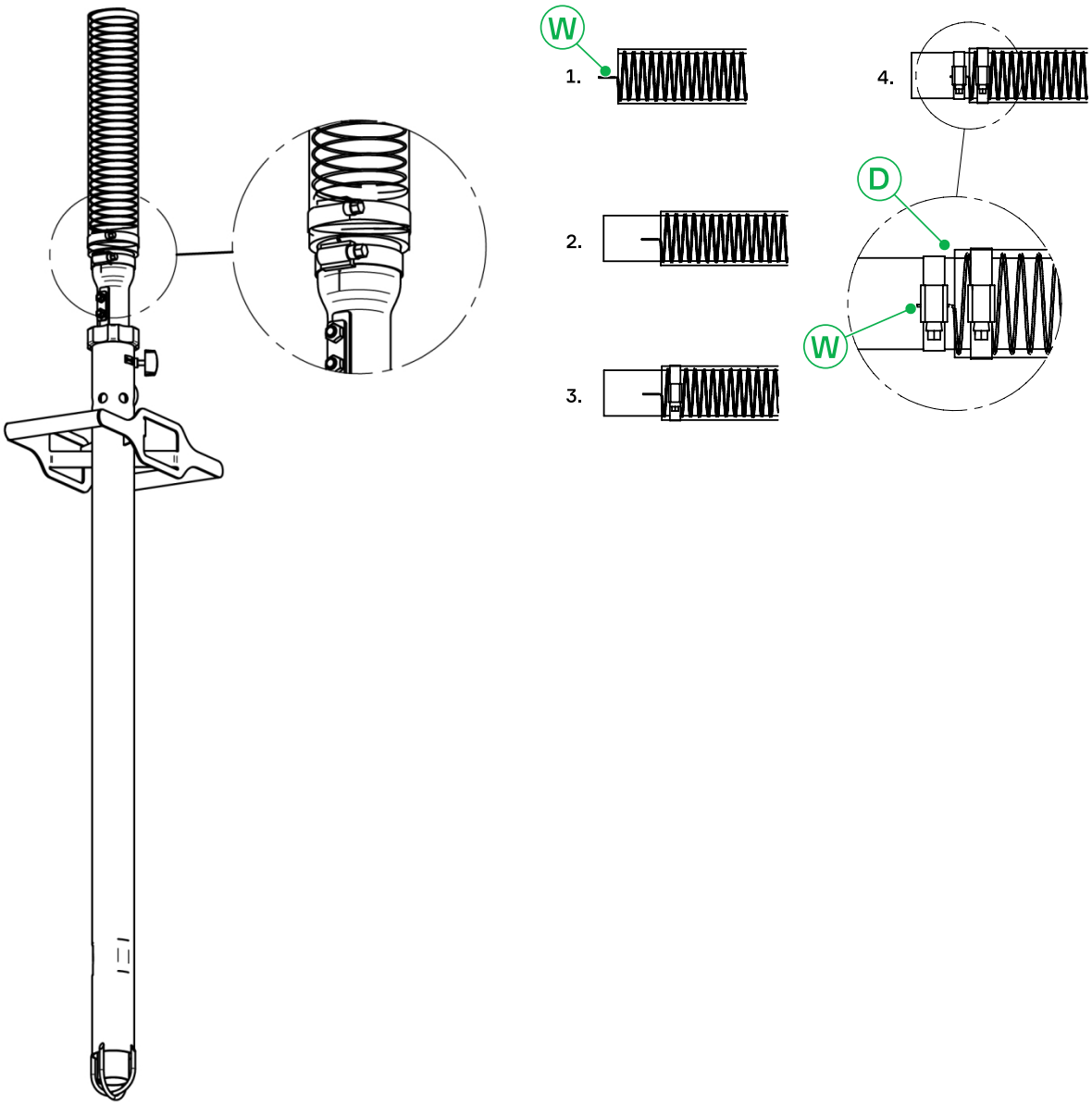
1. Free the earth wire (W) from the wall of the hose so that the metal of the earth wire (W) is exposed.
2. Bend the earth wire (W) 90 degrees inwards, so that it is placed along the inside of the hose wall.
3. Press the hose onto the TC fitting (C) and make sure that the earth wire (W) is in contact with the TC fitting (C).
4. Fasten the hose to the TC fitting (C) using a clamp ring.



(on the left is an example of a TC fitting (C))

Grounding of hose with pipe ends:

1. Free the earth wire (W) from the wall of the hose so that the metal of the earth wire (W) is exposed. Bend the earth wire (W) so that it points in the same direction as the hose.
2. Press the hose onto the pipe end (D).
3. Fasten the hose with a clamp ring to the pipe end (D).
4. Fasten the earth wire (W) with a second clamp ring on the pipe end (D) and make sure that the wire has contact with the pipe.



On the left is an example of a pipe end fitting (D).

Installation of the pipe system and accessories in a safe way

- The whole pipe system and all accessories must be electrically bonded with the conveyor and other units or machines that are included in the conveyor system. The conveyor system must be connected to the same grounding point (equipotential).
- Hoses that are used are recommended to be made of dissipative (antistatic) material or fitted with a molded grounding spiral. Both ends of the grounding spiral must be connected to earth via the pipe system or the machine the hose is connected to.
- The pipe ends at the pipe joints of the system are also recommended to be bonded to each other.

SAFE USAGE

a. Read the manual before starting the installation and operation.

b. Only trained people/staff shall operate the Piab vacuum conveyor system.

c. If an ECU is used, it is forbidden to open the covers on the ECU and valve units. NOTE- The lid to the touch screen can be opened but should during operation stay closed.

d. Safe cleaning of the touch screen is by using a damp cloth.

e. Ambient temperature for the vacuum conveyor: 5ºC to +50ºC (41°F to 122°F).

f. The temperature of the conveyed material (powder, granules) may not exceed +60°C (140°F).

g. It is important that 'foreign matters' are prevented from entering the conveying system.

h. Parts or other foreign matters may be electrostatically charged and cause igniting sparks.

i. Burning/glowing matters may not be allowed to enter the conveyor system.

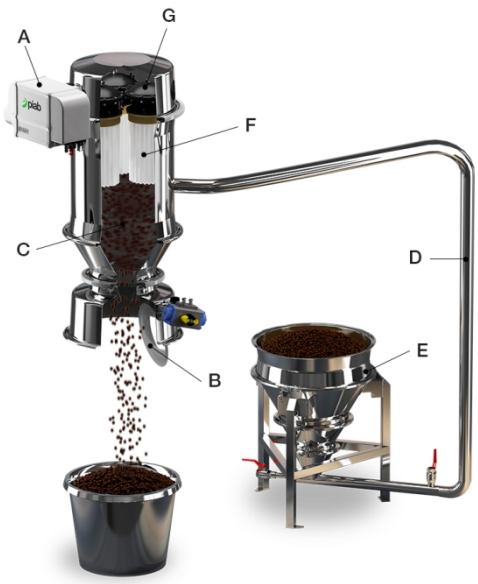
j. It is prohibited to open or disassemble any part of the conveying system during operation! Before disassembling any part of the conveying system, the equipment must be closed down and the supply of compressed air

TECHNICAL DATA

Technical data

Description	Unit	Value
Material	-	ASTM 316L, EPDM, NBR, ePTFE, PET, PA, Al, SS, PP
Temperature range – conveyed material	°C	0-60
Temperature range - ambient	°C	5-50
Weight	kg	43
Finish – general surface	Ra	0.6
Finish – product contact surface	Ra	0.4
Feed pressure, max.	MPa	0.7
Feed pressure range	MPa	0.4-0.6
Air consumption range	Nl/s	40-56
Noise level range	dBA	69-77
Vacuum max	-kPa	60-75
Filter area	m²	0.42
Min particle size	µm	5.0
Material batch volume	L	14
Feed pressure, max. - actuator	MPa	0.4
Feed pressure range - control	MPa	0.4-0.6
Safety classification	-	IP54

Function



1. Vacuum is created by ejector pump (A) with compressed air through COAX® technology. The pump (A) can be automatically controlled.
2. The bottom valve (B) closes and the vacuum increases in the container (C) and the conveying line (D).
3. The material is conveyed from the feed station (E) into the conveying line and then to the container (C), where the material is to be separated from the carrying air.
4. The filter (F) protects the pump and the surrounding area from dust and small particles.
5. During the conveying time, the air shock tank (G) is filled with compressed air.
6. At a pre-set time, the material conveying phase stops, and the bottom valve (B) is opened. The material is discharged at the same time as the charging of the air shock is de-activated and the compressed air cleans the filter from dust and small particles.
7. When the pump starts again, this process is repeated, and a new cycle starts. The suction time and emptying times are normally controlled by a pneumatic or an electrical control system.

Piab's definition of product contact area in the conveyor

The positions in the table below correspond to the letters in the figure above. Feed station, feed adapter and piping is not part of definition, since these parts differ depending on installation.

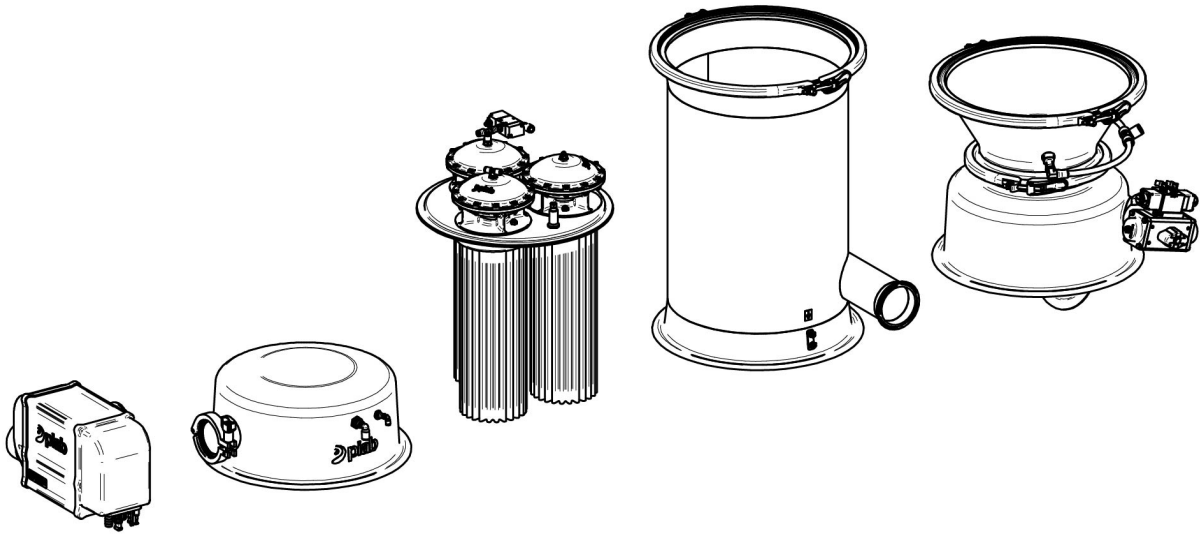
Pos.	Description	Unit	Value
B	Bottom valve	m²	0.3611
C	Container	m²	0.6995
F	Filter	m²	0.42
Total		m²	1.4806

INSTALLATION

Mounting

LIFTING A PIAB VACUUM CONVEYOR

When lifting the Piab vacuum conveyor use either lifting devices or demount the Piab vacuum conveyor in smaller units to meet working environmental regulations of how much a person is allowed to lift. Always empty the Piab vacuum conveyor before lifting.

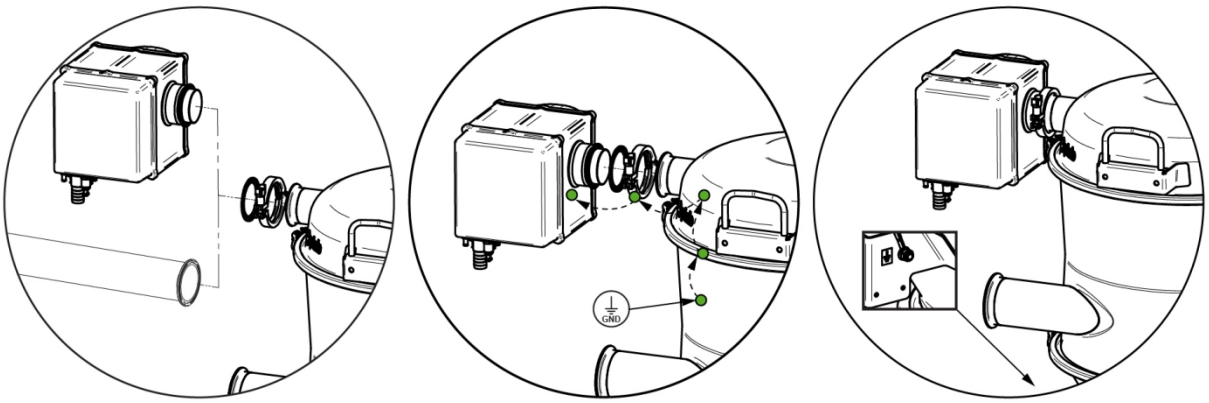


MOUNTING OF THE CONVEYOR

The conveyor is delivered mounted. When mounting it after cleaning/servicing, it is important that seals and filters are mounted correctly to avoid leakage.

MOUNTING OF THE PUMP

Stabilize the conveyor to prevent tipping due to its offset center of gravity.
The provided metallic TC clamp ring must be used while the pump is in service to maintain grounding.



1 2 3

INSTALLATION OF THE CONVEYING PIPELINE

Correct dimensioning and installation are crucial for the system to work in the best possible way. Please contact your local Piab distributor as to dimensioning of the diameters of the pipes, their length, number of bends and optional pipe emptying function. It is important that the pipeline system is sealed in order to prevent the conveyed powder from leaking from the equipment to cause damage to other devices and injuries. It is also important to make sure that no foreign matters can inadvertently be sucked into the conveyor.

SOME BASIC TIPS

- The conveying pipeline should be installed without having any unnecessary bends.
- Avoid inclined rises in the conveying pipeline.
- The radius of the pipeline should be at least 10 times the pipe diameter.
- Choose pipes instead of hoses where possible.
- Avoid all types of edges and restrictions at pipe joints and connections.

COMPRESSED AIR

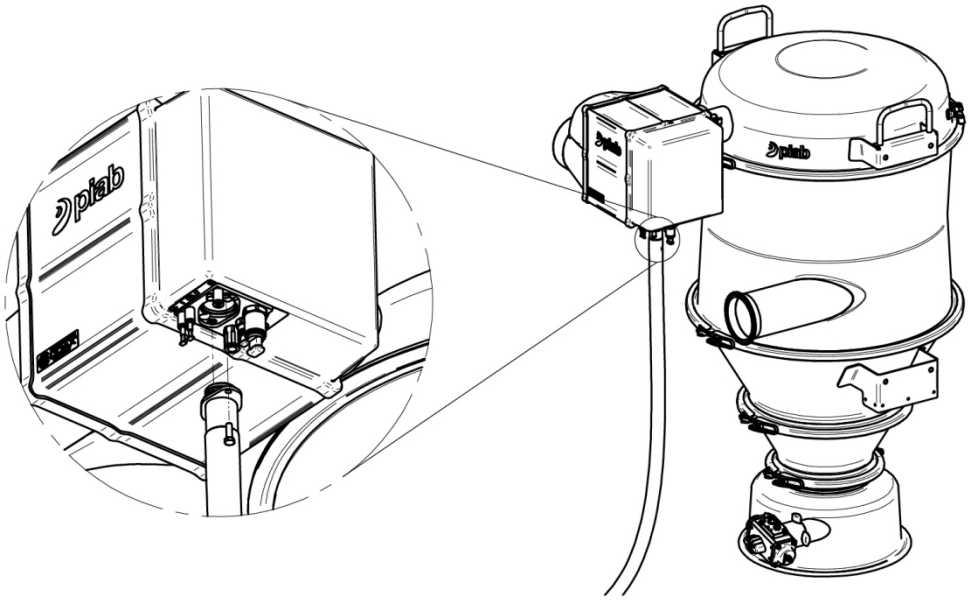
We recommend that compressed air of at least quality class 3, as to particle size and concentration of solid contaminants, is used (ISO norm 8573.1) for Piab's vacuum pumps. This means that only a maximum of 5 mg/m3 of a maximum of 5 µm size particles may be present in the compressed air.

PREVENTING PRESSURE DROPS IN THE AIR SUPPLY

It is important to correctly dimension the compressed-air hose that supplies the conveyor so that unnecessary pressure drops do not occur. The longer the hose, the larger the dimension required. Also, remember that push-in connections with built-in non-return valves may cause pressure drops. Also, take into consideration that there may be other devices in the compressed-air network that might consume compressed air.

INSTALLATION OF COMPRESSED AIR

Make sure that the 1'' compressed air fittings are connected to the pump.



The feed pressure of the compressed air is between 0.4 MPa (58 psi) and 0.6 MPa (87 psi) for Piab vacuum conveyors and pneumatic vacuum pumps. Careless usage of compressed air may cause injuries.

- The compressed air may not be used for any other purpose than specified.
- All applicable safety regulations for installation, operation and maintenance must be followed.
- Always disconnect the supply of compressed air when cleaning or servicing the Piab vacuum conveyor.
- You are responsible for your own and other people's safety at the place of work.

Contact your local Piab distributor if you have any questions.

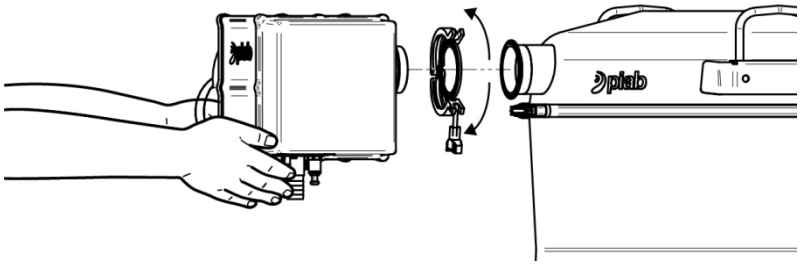
DISCONNECTING THE COMPRESSED-AIR PIPELINE

Before the compressed-air pipeline can be disconnected, the pressure to the pump must be turned off and the pipeline evacuated.

DISMOUNTING THE CONVEYOR

The conveyor must be emptied of its content/material before dismounting is started. The compressed-air supply and electrical power shall be disconnected before dismounting the conveyor.

Always secure the pump from falling off when TC clamp is removed.



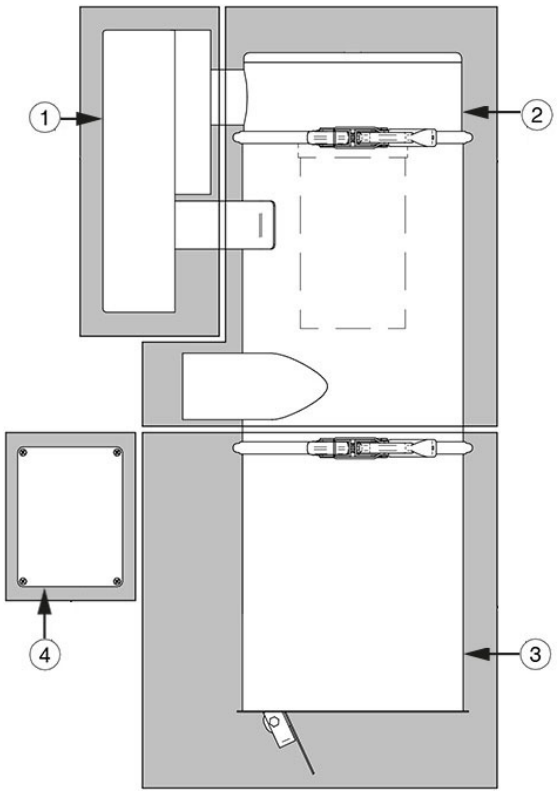
POSITION OF THE OPERATOR

The operator shall be in a position where it is easy to start and stop the conveyor.

REMOTE CONTROL OF THE CONVEYOR

When using remote control, the system builder should ensure that the conveyor cannot be simultaneously operated from two locations.

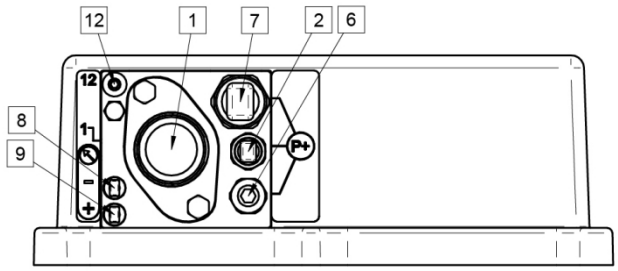
Connection and function



1. VACUUM PUMP
2. FILTER SHOCK
3. BOTTOM VALVE
4. CONTROL UNIT

1. VACUUM PUMP

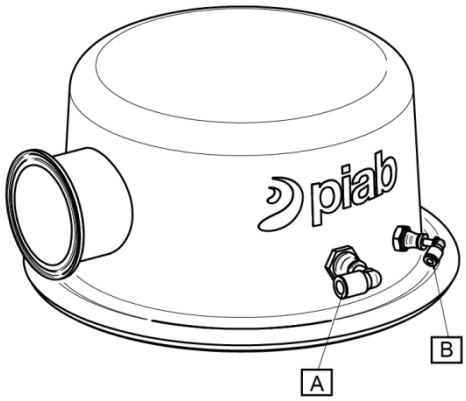
Connections



Port	Function	Tubing dimension OD/ID (mm)	Colour	Connections
1	Compressed air, in	1”	-	
2	Control unit, air supply	6/4	-	4. CONTROL UNIT (Port 1)
6	Filter shock, air supply	8/6	Black	2. FILTER SHOCK (Port A)
7	Fluidisation (not used)	12/9	-	
8	Sensing port (p-)	4/2	-	
9	Sensing port (p+)	4/2	-	
12	Vacuum pump, start	4/2	Green	4. CONTROL UNIT (Port 7)

2. FILTER SHOCK

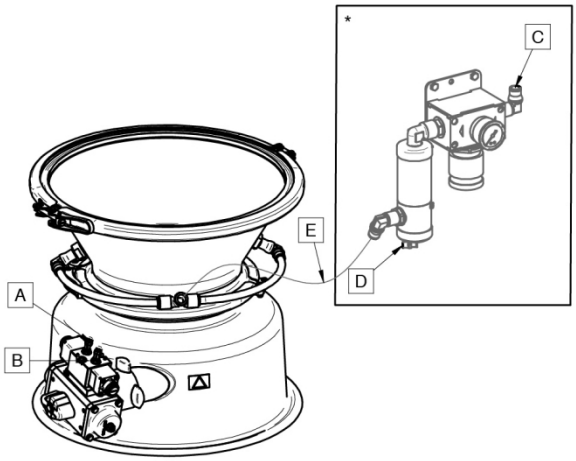
Connections



Port	Function	Tubing dimension OD/ID (mm)	Colour	Connections
A	Filter shock, air supply	8/6	Black	1. VACUUM PUMP (Port 6)
B	Filter shock, signal	4/2	Brown	4. CONTROL UNIT (Port 3)

3. BOTTOM VALVE

Connections

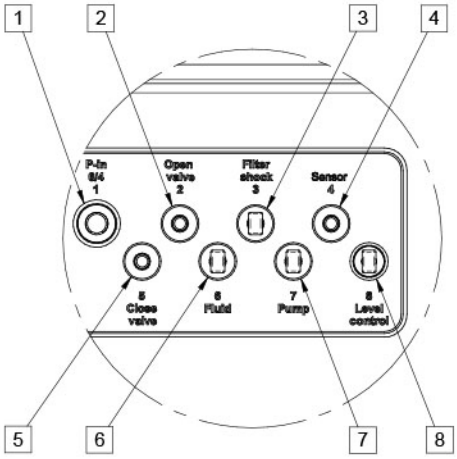


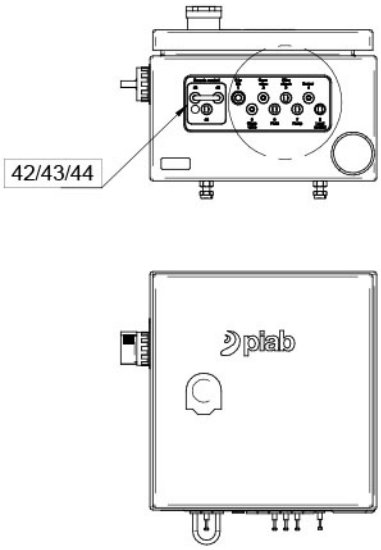
Port	Function	Tubing dimension OD/ID (mm)	Colour	Connections
A	Bottom valve, open	4/2	Blue	4. CONTROL UNIT (Port 2)
B	Bottom valve, closed	4/2	Yellow	4. CONTROL UNIT (Port 5)
C	Fluidisation, air supply	12/9	-	
D	Fluidisation, signal	4/2	White	
E	Fluidisation, connection	12/9	-	

** Optional part*
A (Blue) Regulator factory preset: 0.36 MPa (52.2 psi)
B (Yellow) Regulator factory preset: 0.24 MPa (34.8 psi)

4. CONTROL UNIT

Connections





Port	Function	Tubing dimension OD/ID (mm)	Colour	Connections
1	Compressed air, in	6/4	Black	1. VACUUM PUMP (Port 2)
2	Bottom valve, open	4/2	Blue	3. BOTTOM VALVE (Port A)
3	Filter shock, signal	4/2	Brown	2. FILTER SHOCK (Port B)
4	Pipe emptying signal	4/2	White	
5	Bottom valve, closed	4/2	Yellow	3. BOTTOM VALVE (Port B)
6	Fluidisation, signal	4/2	White	
7	Vacuum pump, start	4/2	Green	1. VACUUM PUMP (Port 12)
8	Level detector	4/2	Black	
42/43/44	Remote control start/stop	4/2	Green/yellow/blue	

NOTE! The connections must be plugged when not in use

START-UP

Start-up of a Piab vacuum conveyor should be carried out according to a simple pattern in order to quickly be able to start production. The following instruction is a step-by-step guide for start-up and tuning the conveyor.

1. Installation
Make sure that the conveyor is connected according to the safety instructions.

2. Feed pressure
Start the conveyor in an 'idling' mode, i.e., without conveying any powder. See more information in the function description of the chosen control unit.
Now check the feed pressure at the filter regulator. During operation of the pump, the pressure shall be between 0.45 MPa (65 psi) and 0.65 MPa (94 psi).

3. Sealing efficiency
Make sure that the feeding end of the conveying pipeline is fully closed and that there is a vacuum gauge connected to the pump.
The vacuum gauge should display:
61–75 -kPa (18–22 -inHg) at a feed pressure of 0.5-0.6 MPa (72-87 psi)
if the system is completely sealed.

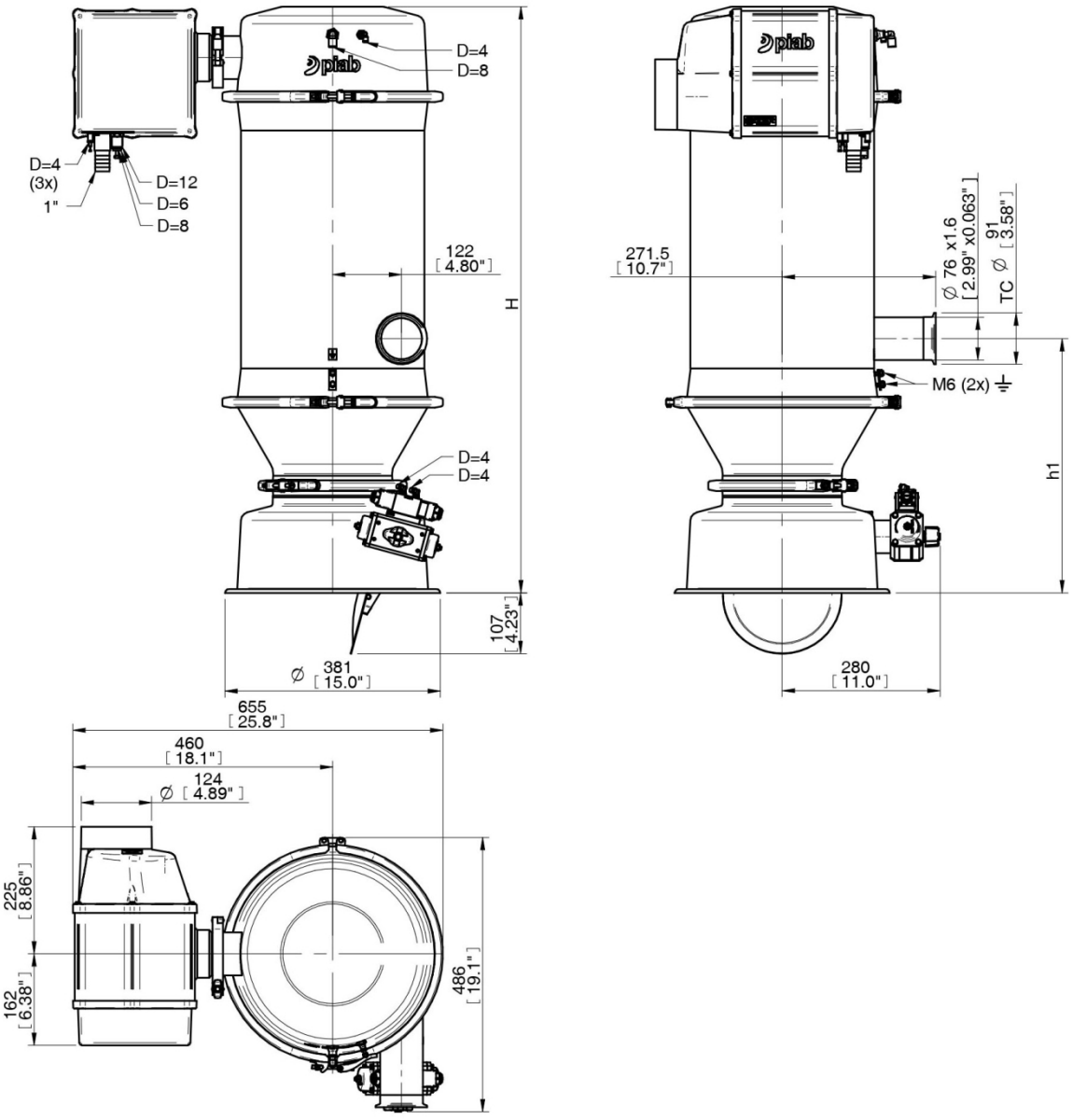
4. Carrier air (for feed adapter and feed nozzle)
Adjust the carrier air (the extra air that facilitates conveying of the powder) at the feed adapter or feed nozzle. Always begin by setting the adjustment valves with large openings = plenty of carrier air.

5. Cycle times
Adjust the time cycle of the system. Always begin with short suction time and long emptying time. See more information in the function description of the chosen control unit.
Add product to the system. Start the vacuum conveyor and measure the product volume after discharge. Adjust the suction time to meet the recommended batch volume of the configured Piab vacuum conveyor. Make sure not to convey more than specified batch volume to avoid over-filling.
Check emptying time and adjust if needed.
Check the vacuum level in the system. Adjust if needed. You might need to change suction- and emptying time.

6. It is recommended to document all settings and capacity of the start-up.
The vacuum conveyor is now ready for operation.

DIMENSIONS

Vacuum conveyor



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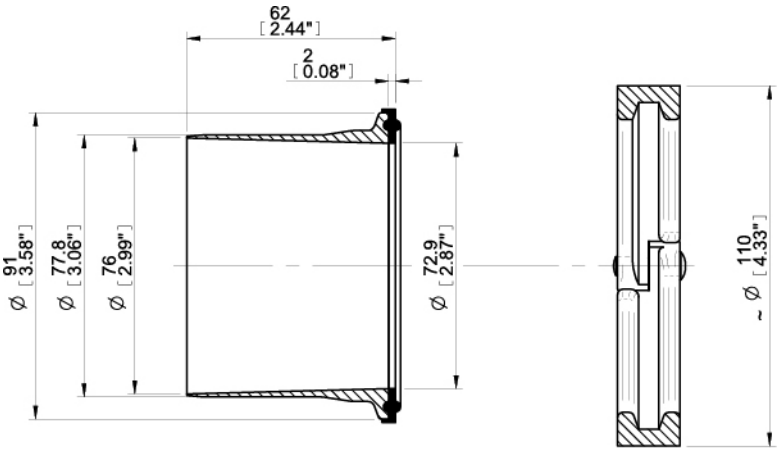
h1	450 [17.72'']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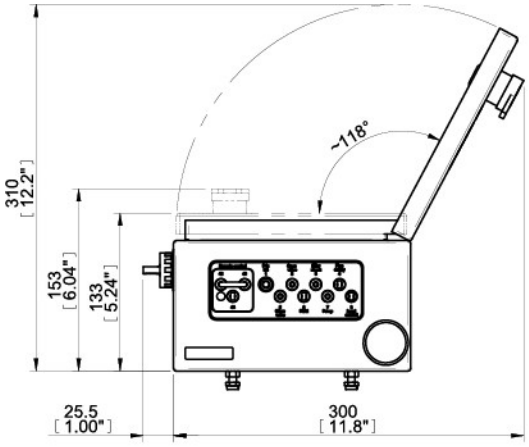
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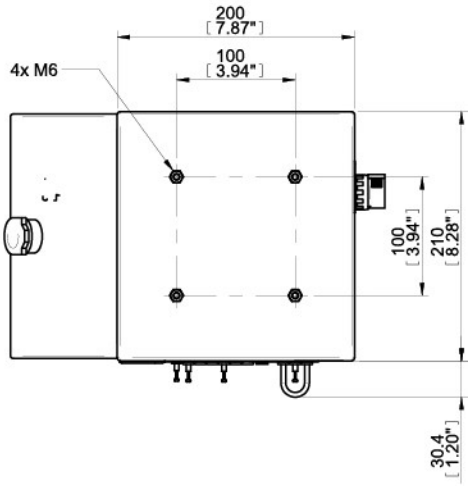
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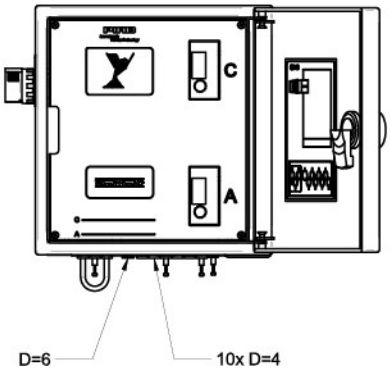
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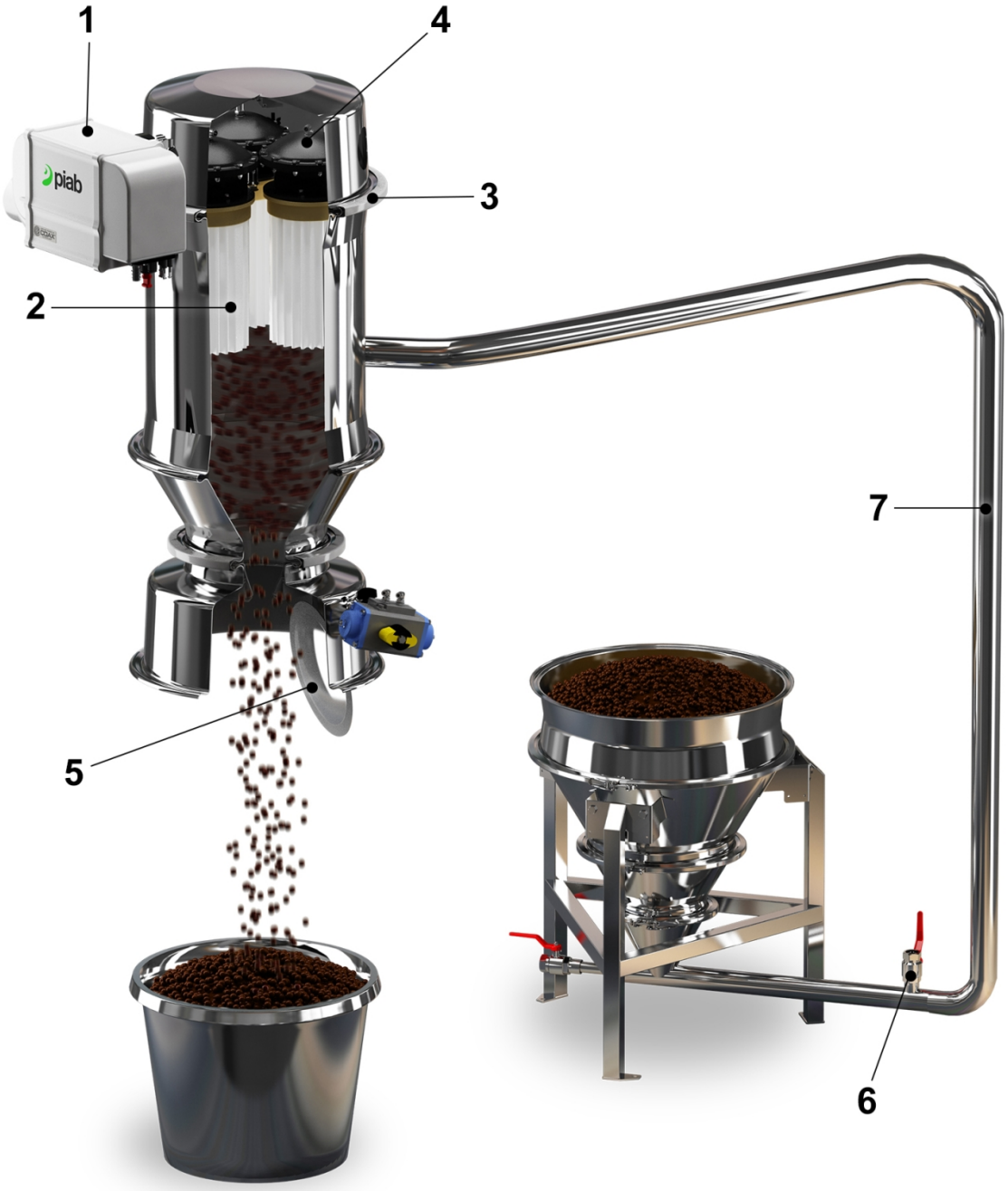
TROUBLE-SHOOTING



Type of trouble		Cause	Position
Poor/no conveying	Low/no vacuum	Leakage at sealings	3 Sealings
		Low/no pressure in compressed-air pipeline	1 Compressed-air connection
		Bottom lid is open/does not work	5 Bottom lid
		Leakage in conveying pipeline/joints	7 Conveying pipeline
	Deep vacuum	Clogged/contaminated filter	2 Filter
		Clogged conveying pipeline	7 Conveying pipeline
The filter shock does not work		Incorrected tubing installation	4 Filter shock
		The valve of the filter shock is defective/contaminated	4 Filter shock
		Low/no pressure to compressed-air	1 Compressed-air connection
Overfilling of the conveyor		Too long pump time/short emptying time	Control unit (not in the picture)
Powder dust from the pump exhaust		Filter defective/incorrectly mounted	2 Filter
Material dust from the pump exhaust		Filter defective/incorrectly mounted	2 Filter
Material is not discharging		Fluidisation is not working, Fluidisation not enabled for the material.	9 Feeding point
		Fluidisation is needed	9 Feeding point

SERVICE AND MAINTENANCE

Always remember to disconnect the supply of compressed air when cleaning or servicing the vacuum conveyor.

Time interval check/measure	Daily	Each month	Every second month	Every sixth month	According to experience	Date of start of new installation ..... Pressure drop at idling at the date of start ..... -kPa (-inHg) Date of filter change or filter washing .....
1 Check of feed pressure	X					
2 Check of sealing, conveyor/system		X				
3 Check of pressure drop during conveying	X					
4 Check of pressure drop during idling		X				
5 Cleaning of filter		X			(X)	
6 Change of filter/Check			X		(X)	
7 Emptying of filter regulator/change of filter kit			X			
8 Dismounting, cleaning/washing and checking	X			X	(X)	

Explanation of the schedule

1. Check the feed pressure

The work pressure of the compressed-air supply is checked during the operation of the conveyor/pump. Connect a manometer to the pump. The operational pressure should be approximately 0.5–0.6 MPa (72–87 psi).

2. Check the sealing

Check the conveyor by disconnecting the conveying hose/pipeline and applying a sealing rubber sheet against the end of the sleeve coupling while the pump is in operation. Read the vacuum level on a vacuum gauge connected to the pump or to a valve unit (optional for electromechanical pumps) and compare the value with the datasheet for the pump that is used. Repeat this checking procedure but with the feeding end of the conveying pipeline system sealed.

3. Checking the pressure drop during conveying of powder

Connect a vacuum gauge to the pump or to a valve unit (optional for electromechanical pumps) and read the value during normal operation/conveying. Compare the vacuum level with the values obtained when checking the start-up of the conveying system.

4. Checking the pressure drop during the idling operation

Connect a vacuum gauge to the pump or to a valve unit (optional for electromechanical pumps) and read the value during idling operation without conveying any powder. Carry out the first

check at start-up (date of start) and document the value in the table to the right above. When the pressure drop during idling has risen (and the vacuum level has decreased) by approximately 5–10 -kPa (1.5–3 -inHg) as compared to the start value, this is an indication that the filter needs to be washed/changed.

5. Cleaning the filter
See cleaning instructions for filters.

6. Change of filter
A change of filter shall be made at least once every six months. Notice that changing/cleaning of filter may be required at shorter intervals.

7. Emptying of filter regulator/change of filter kit
Check and dispose of possible contamination and water in the filter regulator on the feed pipeline once every two months. The filter kit of the filter regulator should be replaced once every year.

8. Dismantling, cleaning and checking
The conveyor should be dismantled regularly for checking and cleaning depending on the application and customer's internal service and maintenance program. For sanitary reasons, in the chemical and food industry, daily dismantling and washing are sometimes required.

CLEANING THE CONVEYOR

The whole conveyor should be disassembled at regular intervals for checking and cleaning.

NOTE: The conveyor is not designed for CIP – Clean In Place.

The supply of compressed air shall be disconnected from the pump. Dismount the pump the upper part of the filter unit and the air shock tanks. All these parts are on the "clean side" of the filter, i.e., they do not come in contact with the conveyed powder. Loosen the remaining clamp rings and dismount the modules, seals and filters. The steel parts can be washed with water and detergent according to local regulations. It is important to clean all parts that come in contact with the conveyed powder.

Cleanliness

Cleaning, cleanliness, and inspection of the plant for leakage are essential parts of safety. In general dust, deposits must be limited.

Cleaning instructions for COAX® cartridge

Rinse in water or use compressed air to blow off. Let dry before reinstalling.

General information for filters

- Handle the filters with care.
- Textile filters, pleated filters, and pleated rod filters (rod filters of sintered polymer) all have a filtration surface layer (membrane or surface coating). If the surface layer is damaged, the filtration degree and life will be shortened.
- When mounting and dismounting the filter, careful handling is essential. Often the filters are fitted into a filter plate. When the filter is dismounted from the Piab vacuum conveyor this must be made with care so that the filter membrane is not damaged by the plate edge of the filter plate. For the same reason, also mounting of the filter must be made carefully.

Cleaning instructions for textile filters

Dry cleaning

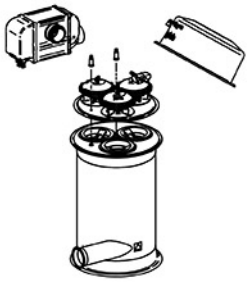
- Shock the filter some extra times without powder in the pipeline and conveyor.
- Brush the bag gently while it is still mounted on the filter support, with a camel hair brush, or some type of non-abrasive brush, to avoid damage to the membrane.

Wet cleaning

- The filter can be rinsed by using an indirect water spray with a standard low-pressure water hose (maximum 1 bar), while still mounted on the filter support.
- Hang the filter bag and allow them to dry. Assure to open the filter to allow them to dry the inside as well.
- Do not use solvent when cleaning.
- Do not use any type of industrial washing machine or any type of machine that uses an agitator.

TEXTILE FILTER REPLACEMENT

1.



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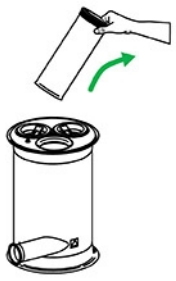
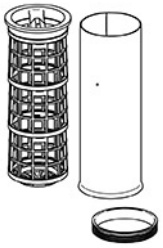
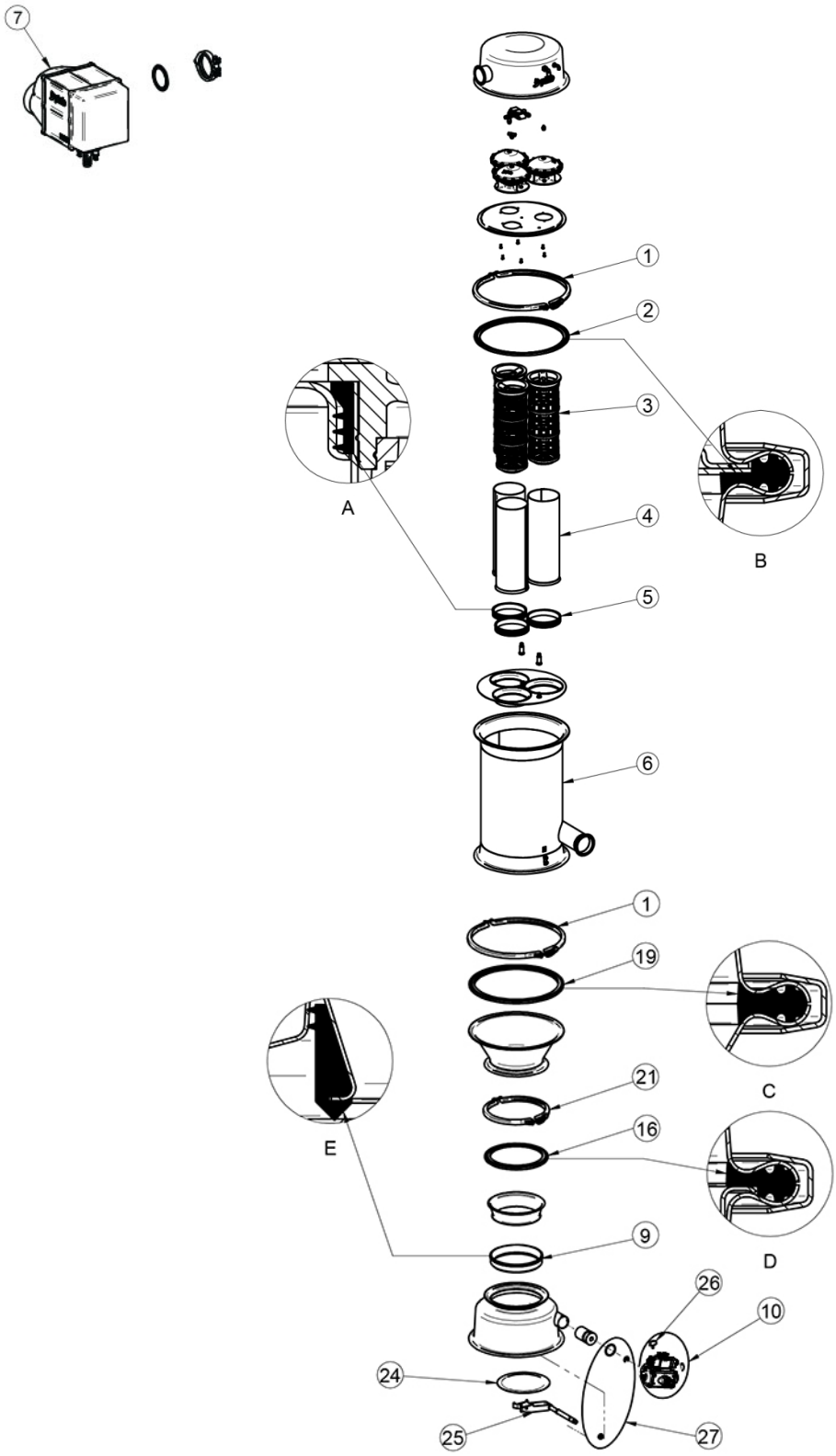


3.

4.



SPARE PARTS



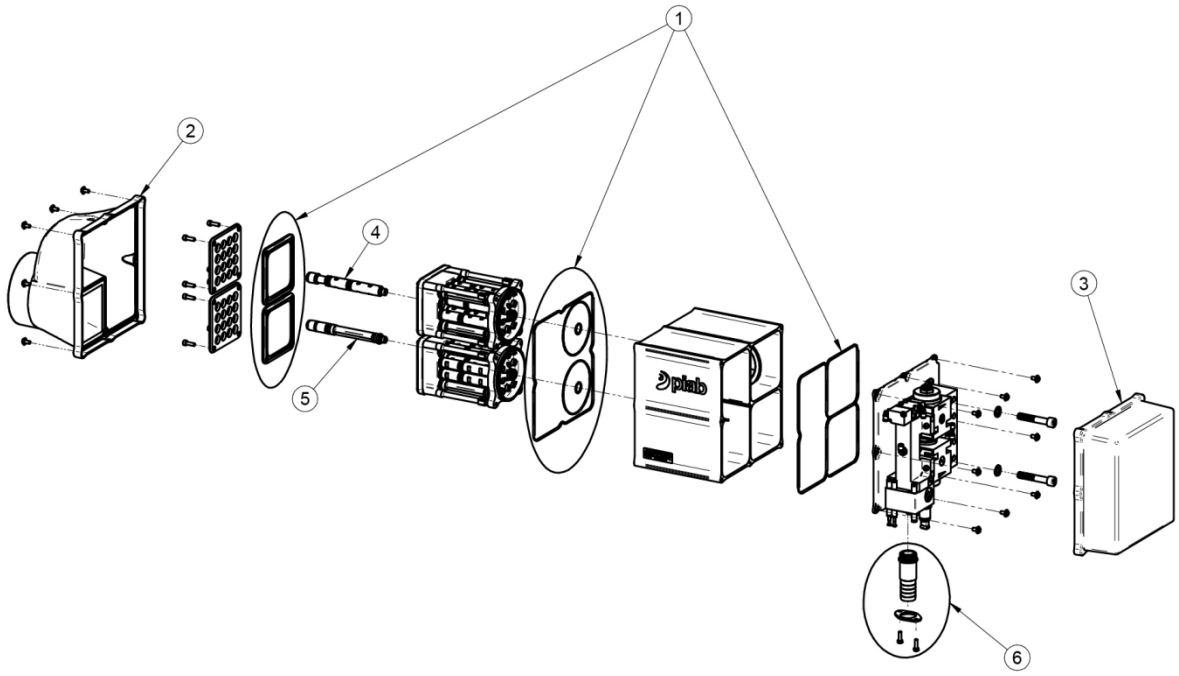
SPARE PARTS LIST

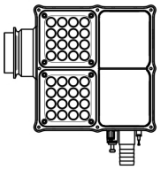
Pos.	Art. No.	Description	Qty
1	0103977	Clamp ring 33 cpl	2
2	0206436	Module Filter plate seal 33 NBR	1
3	0108110	Filter support w. bottom cpl, L=360	3
4	0205585	Textile filter D=125 L=360	3
5	0206440	Filter seal 125 NBR	3
6	0129266	Ø76TC 14 litres 04 filter	1
7	0201057	piPREMIUM800	1
9	0206439	Bottom valve seal 180 NBR	1
10	0205314	Actuator AP042 cpl SS w Regulator kit	1
16	0206434	Module Filter plate seal 21 NBR	1
19	0206435	Module seal 33 NBR	1
21	0103972	Clamp ring 21 cpl.	1
24	0103868	Flap D=228 cpl, Bottom valve 180	1
25	0122037	Arm AP, Bottom valve 180	1
26	0104020	Screw with handle	2
27	0129948	Sealing kit actuator	1

Art. No.	Description	Qty
0201578	Connection spare part kit, piFLOW®p Bottom valve unit	
	Angle connector M5 D=4	3
	Angle connector D=8 d=8	1
	Angle connector G1/2" D=12	2
	Reducer D=12 d=8	1
	T-connector D=12, 2x D=10	1
	Colour code ring 6, blue	1
	Colour code ring 6, white	1
	Colour code ring 6, yellow	1

VACUUM PUMP

Description	Art. No.
piPREMIUM800	0201057





○ COAX® cartridge

● Blind cartridge

SPARE PARTS LIST

Pos.	Art. No.	Description	Qty
1	0201323	Sealing kit piPREMIUM	1
2	0200797	Silencer cover cpl	1
3	0201250	Cover, Master cpl.	1
4	0107053	COAX® cartridge MIDI Si32-3	32
6	0200801	Air connection 1" cpl.	1

Art. No.	Description	Qty
0201572	Connection spare part kit, vacuum pump	
	Straight connector M5 D=4	3
	Straight connector G1/8" D=6	1
	Straight connector G1/8" D=8	1
	Straight connector G3/8" D=12	1
	Push ring D=4, Green	1
	Plug D=4 red	2
	Plug D=6 red	1
	Plug D=12 red	1

WARRANTIES

Piab offers a warranty to distributors, integrators and users of Piab products worldwide as per the following definitions:

- A five-year warranty is valid for vacuum conveyors excluding electromechanical pumps, sensors, electrical equipment and controls.
- A five-year warranty is valid for vacuum pumps excluding electromechanical pumps, accessories and controls.
- A two-year warranty is valid for electromechanical pumps.
- A one-year warranty is valid for other products.

General warranty principles:

- This Piab guarantees against defects in the manufacture and materials by normal use in a proper environment, when following the instructions for care, maintenance and control described in the appropriate Piab manual.
- Piab replaces or repairs, free of charge, faulty products provided that these are returned to Piab and found to be covered by the warranty.
- It is at Piab's discretion whether a faulty product should be sent back to Piab for replacement or if the repair shall be made locally at Piab's expense.
- Warranty does not include subsequent damages caused by defective products.

This warranty does not include wear parts such as filter elements, sealings, hoses, pipe fittings, pipe bends, sensors, pinch valves (in-line with conveyed material). Depending on the material conveyed, maintenance and replacement of wear parts differ.