

Assembly Manual

KFG Series

Kenos[®] Flexigrip



KENOS



This manual is available in the following languages at piab.com:



Chinese



English



French



German



Italian



Japanese



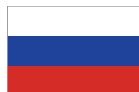
Korean



Polish



Portuguese



Russian



Spanish



Swedish

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1. Introduction to the manual

1.1 About the manual

- The responsible party for the production site must ensure that this manual is read and understood.
- The section on safety should be studied extra carefully.
- The manual should be stored on a known and easily accessible place, which can be digital.
- Carefully study the applicable parts of the manual before performing service and maintenance of the equipment.

1.2 Safety signs used in the manual

Take note of all warnings, mandatory and other signs in this manual.

1.2.1 Warning signs

The warning signs have the following meaning:



Warning!

Breach of this information may result in death or serious injury!



Warning!

Vacuum force



Warning!

Exhaust



Warning!

Unrestricted exhaust



Warning!

Risk of crushing or entrapment of upper limbs

1.2.2 Mandatory signs

The mandatory signs have the following meaning:



Note!

Information that needs extra attention!



Wear eye protection



Wear ear protection

1.2.3 Other signs



Generic operator

Operator without specific skills, able to perform only simple tasks on the orders of qualified technicians.



Mechanical maintenance technician

Qualified technician able to intervene on the mechanical parts to make the necessary adjustments, maintenance and repairs.



Electric maintenance technician

Qualified technician is proposed for all the electrical interventions of regulation, maintenance and repairs.

1.3 Target group

This manual, especially the section about safety, shall be read by all staff who will perform any type of work with the product or equipment:

- Operating personnel
- Service and maintenance personnel
- Cleaning staff (cleaning of equipment and the area around it)

2. Safety instruction

2.1 General safety

The gripping module described in this manual is designed for implementation in industrial systems and therefore it must not be used with the conditions other than those specified.

The correct use of the pneumatic equipment within a system is the responsibility of the system designer or person responsible for the technical specifications.

The machine owner will certify the final commissioning according to the regulations in force for each individual country.

The use of safety guards is recommended to minimize the risk of injury to persons. Pay close attention to the fact that compressed air may lead to explosion of closed containers, and vacuum may lead to the implosion of closed containers.

Consider the possibility of pressure drops in the pneumatic supply line. Provide for a safety system that prevents the risk of load being released, in order to prevent personnel injury or machine damages.

Consider the possibility of interrupted electrical or pneumatic supply, to protect persons and systems.

Consider the emergency stop when designing the system.



Warning!
Vacuum force



Warning!
The discharge air has a high output speed. Do not obstruct the discharge of the gripper module.

2.2 Safe usage

It is up to the manufacturer of machinery to assess and convey the Personal Protective Equipment (PPE) needed by the operators or other personnel accessing to the work area.



Wear ear protection
The vacuum generator, even if silenced, makes noise: if necessary, wear suitable protection.



Wear eye protection

In the event that, contrary to indications, dusts, oil mists, fumes, etc. are suctioned, these will be mixed with the discharge air of the vacuum generator and expelled via the discharge conduit; use suitable, approved air filters to avoid possible intoxications.

Ensure that the components are properly secured. Regularly check that connections are in good working order, as high cycles or vibrations may cause them to loosen.



Warning!

- It is prohibited stopping or passing through the work area of the gripper module. In case of electrical or pneumatic supply failure, the load handled by the module is released.
- Never insert hands in cavities, holes or openings, for example air discharge, openings or holes under the foam etc.



Warning!

- Never look into cavities, holes or openings, for example air discharge, openings or holes under the foam etc.
- If the compressed air contains impurities, the components may malfunction. Install a filter upstream of the component; the filter grade should be at least 5 µm. Air containing excessive quantities of condensate may cause the components to malfunction. Installing condensate drains or dryers prevents these malfunctions.

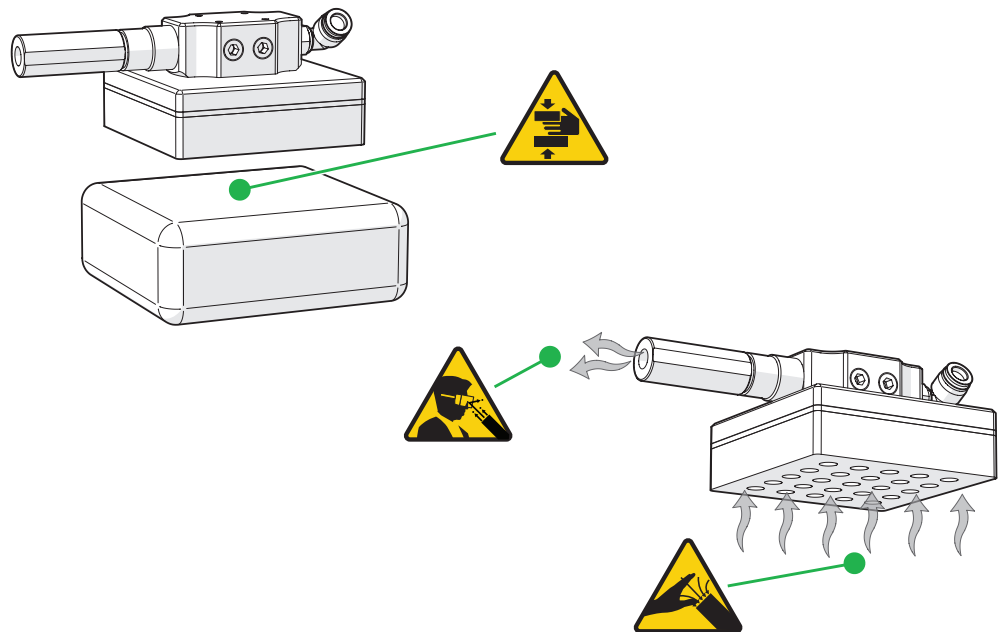


Figure 1 Areas of the KFG unit with warning signs.

2.2.1 Assembly

Compressed air may be dangerous if used by unskilled personnel. Assembling, using and maintaining systems should solely be carried out by experienced and specially trained personnel. Both for fastening and supplying, solely use the bores and methods provided by the manufacturer.

Prior to assembly and disassembly of the components, cut off voltage and pressure. Install and maintain the components only after thoroughly reading and understanding this manual.

2.2.2 Starting and operating

The final evaluation of the safety systems to be applied for starting up the product, after the assembly, is the task of the final manufacturer of machinery.

It is up to the final manufacturer of machinery to report the Personal Protective Equipment (PPE) needed by the operators who are stationed in the surroundings or the operators who have access to the work area. In addition, the same manufacturer will certify the final commissioning according to the regulations in force for each individual country.

2.2.3 Maintenance

Maintenance must be carried out in accordance with the instructions in this manual. Prior to any maintenance work, check the conditions to prevent the sudden release of pieces, then suspend pneumatic/electrical supply, and discharge residual pressure.

2.2.4 Safety instructions



Warning!

The supply pressure should not exceed the recommended value of 7 bar (102 psi).



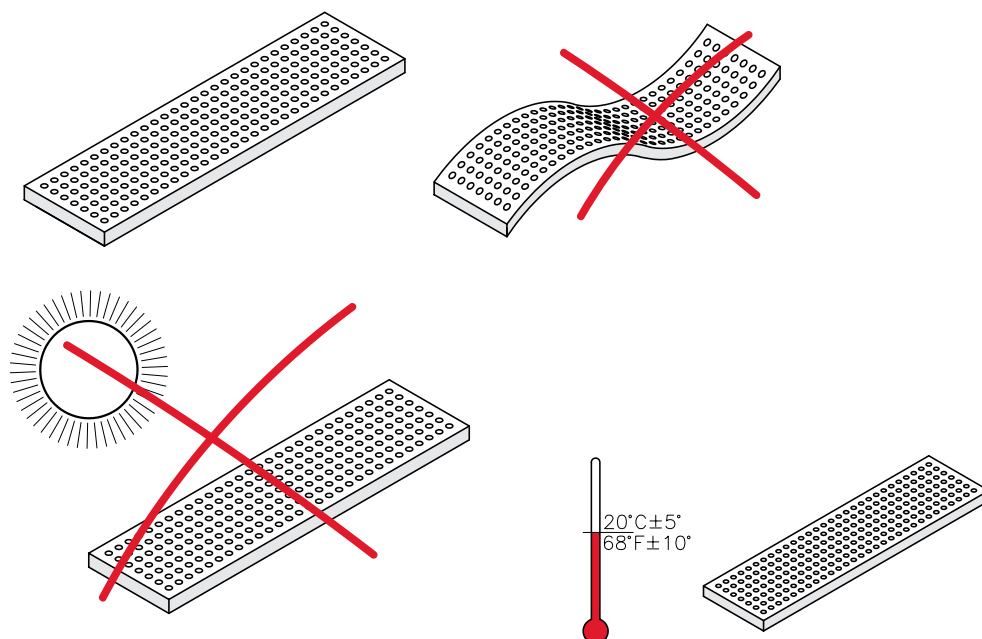
Warning!

- Handle the components with care.
 - During installation and maintenance, cut off voltage and pressure.
 - Follow the installation and commissioning instructions.
 - Modifying the components is prohibited. Handle the components with care.
 - Cleaning the environment and place of use is recommended.
 - The pneumatic connections should be permanently connected to the component.
-

2.2.5 Storage

For a correct storage of the product and its spare parts, avoid outdoor areas, areas exposed to direct sunlight and excessive humidity. The environment must be sufficiently clean, arrange the system so that it has a stable base of support and make sure that there is no risk of unexpected movements.

- Temperature 20°C (68°F) and in a dry location.
- Store foams in flat position and avoid folding.
- Avoid direct sun- or artificial light.
- Store in relaxed condition, free from tensions.
- Store in a dust-free location.
- Protect from chemicals.



2.3 Intended use

The gripper is intended exclusively for handling, lifting and storing products of appropriate size, as reported in the agreement.

2.4 Misuse

The gripper must not be used:

- For uses other than those established by the manufacturer or reported in this manual.
- In direct contact with corrosive gases, chemical products, water, vapor or in environments with droplets or splashes of water, oil, etc.
- In explosive atmospheres.
- In environments subject to strong vibrations and/or impacts.

2.5 Essential Safety Requirements - Applied and respected

Essential Safety Requirements concerning machines, are contained in Annex I of the Machinery Directive 2006/42/EC. They are stringent and not modifiable but are still applicable only when they are relevant (i.e. when there is a danger).

ESSENTIAL SAFETY REQUIREMENTS (p.1)		CONFORMITY		
1 - ESSENTIAL HEALTH AND SAFETY REQUIREMENTS		APL	CNF	RA Pass
1.1 - GENERAL REMARKS				
1.1.1 - Definitions		✓	✓	✓ Allowed
1.1.2 - Principles of safety integration		✓	✓	
1.1.3 - Materials and products		✓	✓	
1.1.4 - Lighting		⊗		
1.1.5 - Design of machinery to facilitate its handling		✓	✓	
1.1.6 - Ergonomics		⊗		
1.1.7 - Operating positions		⊗		
1.1.8 - Seating		⊗		
1.2 - CONTROL SYSTEMS		APL	CNF	RA Pass
1.2.1 - Safety and reliability of control systems		⊗		
1.2.2 - Command devices		⊗		
1.2.3 - Starting		⊗		
1.2.4 - Stopping				
1.2.4.1 - Normal stop		⊗		
1.2.4.2 - Operational stop		⊗		
1.2.4.3 - Emergency stop		⊗		
1.2.4.4 - Assembly of machinery		⊗		
1.2.5 - Selection of control or operating mode		⊗		
1.2.6 - Failure of the power supply		⊗		
1.3 - PROTECTION AGAINST MECHANICAL HAZARDS		APL	CNF	RA Pass
1.3.1 - Risk of loss of stability		⊗		
1.3.2 - Risk of break-up during operation		✓	✓	✓ Allowed
1.3.3 - Risks due to falling or ejected objects		✓	⊗	⊗ Not Allowed
1.3.4 - Risks due to surfaces, edges or angles		✓	✓	✓ Allowed

1.3 - PROTECTION AGAINST MECHANICAL HAZARDS	APL	CNF	RA Pass
1.3.5 - Risks related to combined machinery	⊗		
1.3.6 - Risks related to variations in operating conditions	⊗		
1.3.7 - Risks due to moving parts	✓	⊗	⊗ Not Allowed
1.3.8 - Choice of protection against risks arising from moving parts			
1.3.8.1 - Moving transmission parts	⊗		
1.3.8.2 - Moving parts involved in the process	✓	⊗	⊗ Not Allowed
1.3.9 - Risks of uncontrolled movements	⊗		

1.4 - REQUIRED CHARACTERISTICS OF GUARDS AND PROTECTIVE DEVICES	APL	CNF	RA Pass
1.4.1 - General requirements	✓	⊗	⊗ Not Allowed
1.4.2 - Special requirements for guards			
1.4.2.1 - Fixed guards	⊗		
1.4.2.2 - Interlocking movable guards	⊗		
1.4.2.3 - Adjustable guards restricting access	⊗		
1.4.3 - Special requirements for protective devices	⊗		

ESSENTIAL SAFETY REQUIREMENTS (p.2)	CONFORMITY
-------------------------------------	------------

1.5 - RISKS DUE TO OTHER HAZARDS	APL	CNF	RA Pass
1.5.1 - Electricity supply	⊗		
1.5.2 - Static electricity	⊗		
1.5.3 - Energy supply other than electricity	✓	⊗	⊗ Not Allowed
1.5.4 - Error of fitting	✓	✓	✓ Allowed
1.5.5 - Extreme temperatures	⊗		
1.5.6 - Fire	⊗		
1.5.7 - Explosion	⊗		
1.5.8 - Noise	✓	✓	✓ Allowed
1.5.9 - Vibrations	⊗		
1.5.10 - Radiation	⊗		
1.5.11 - External radiation	⊗		
1.5.12 - Laser radiation	⊗		
1.5.13 - Emission of hazardous materials and substances	✓	✓	✓ Allowed

ESSENTIAL SAFETY REQUIREMENTS (p.2)		CONFORMITY		
1.5 - RISKS DUE TO OTHER HAZARDS		APL	CNF	RA Pass
1.5.14 - Risk of being trapped in a machine		☑	☑	
1.5.15 - Risks of slipping, tripping or falling		⊗		
1.5.16 - Lightning		⊗		
1.6 - MAINTENANCE		APL	CNF	RA Pass
1.6.1 - Machinery maintenance		☑	☑	
1.6.2 - Access to operating positions and servicing points		⊗		
1.6.3 - Isolation of energy sources		⊗		
1.6.4 - Operator intervention		⊗		
1.6.5 - Cleaning of internal parts		⊗		
1.7 - INFORMATION		APL	CNF	RA Pass
1.7.1 - Information and warnings on the machinery				
1.7.1.1 - Information and information devices		☑	☑	☑ Allowed
1.7.1.2 - Warning devices		⊗		
1.7.2 - Warning of residual risks		☑	☑	
1.7.3 - Marking of machinery		⊗		
1.7.4 - Instructions				
1.7.4.1 - General principles for the drafting of instructions		☑	☑	
1.7.4.2 - Contents of the instructions		☑	☑	
1.7.4.3 - Sales literature		⊗		

Status table

	Applicability (APL)	Conformity (CNF)	RA Pass ^{(1) (2)}
1	⊗ Not applicable	Not to be established	☑ Allowed
2	☑ Applicable	☑ Compliant	☑ Allowed
3	☑ Applicable	⊗ Not compliant	⊗ Not Allowed
4	☑ Applicable	Ⓢ Not established	⊗ Not Allowed
5	Ⓢ Not examined	Absent value	Absent value

⁽¹⁾ "RA pass" "Allowed" means Standards Compliance, in the event that the device has been subjected to the Risk Assessment.

⁽²⁾ "RA pass" "Not Allowed" results, means a potential risk that must be solved by the Final Integrator, who places on the market, this device on machinery.

3. Introduction to KFG gripping system

3.1 Manufacturer

Piab AB
PO Box 146
182 12 Danderyd

3.1.1 Identification data

Each gripping system is identified by a QR-label affixed to the product containing product identification information.

By scanning the QR-code using a QR-scanning application for your mobile phone, the following information will be provided:

Product: XXX

Spare foam: XXX

Country of origin: XXX
(For example, FR stands for France.)

Date of production: MM/DD/
YYYY

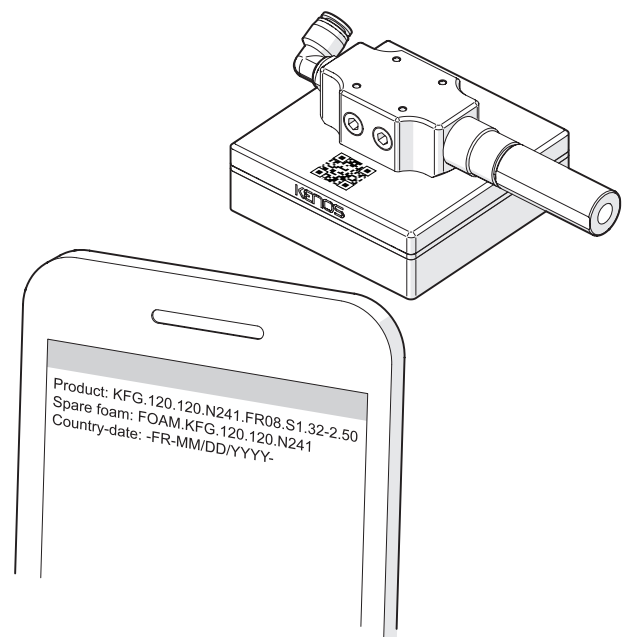


Figure 2 Example of QR-code on product.

3.2 Compliance

Piab's vacuum gripping system KFG series is in conformity with:

- DIRECTIVE 2006/42/CE of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC.
- REACH (EC 1907/2006).



Note!

If the vacuum gripping system will be integrated and installed in another main system, a risk analysis needs to be carried out for the system as a whole.

For more information see *chapter 2.5 Essential Safety Requirements - Applied and respected*.

3.3 Product overview and list of parts

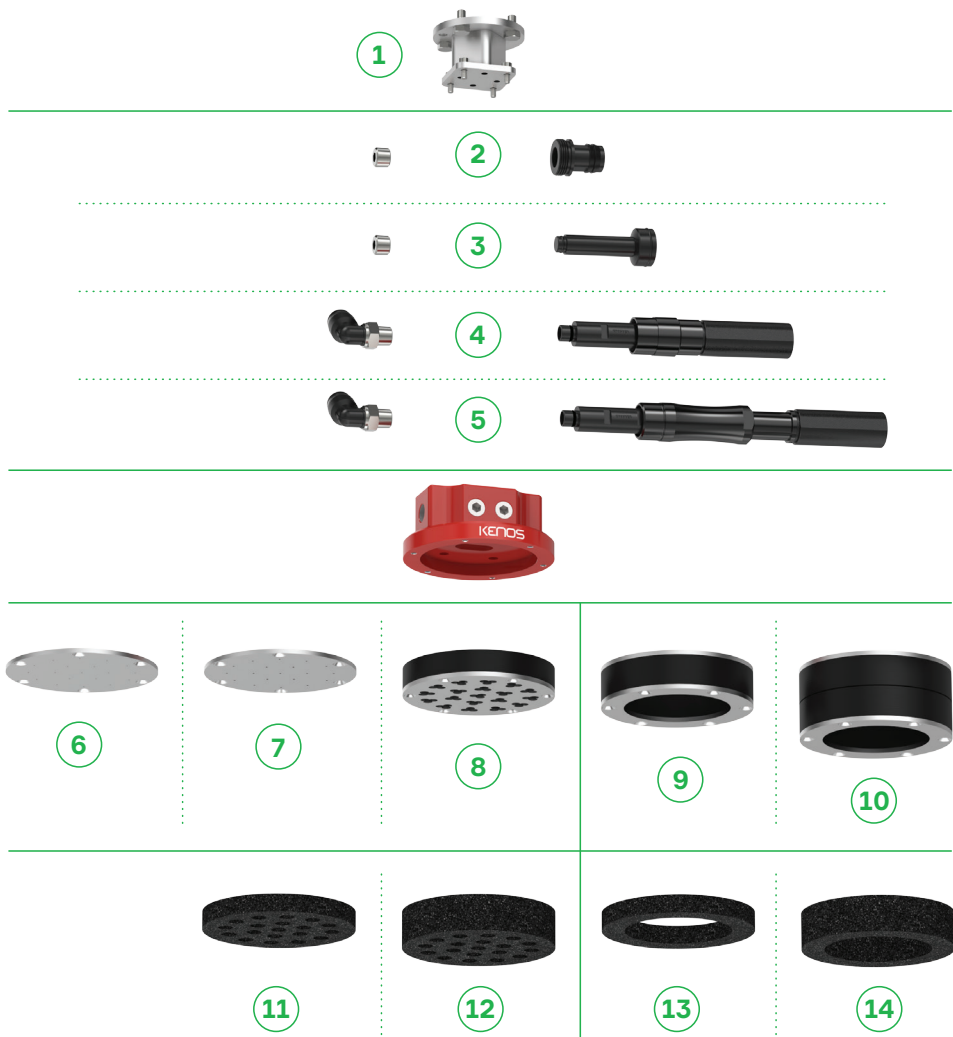
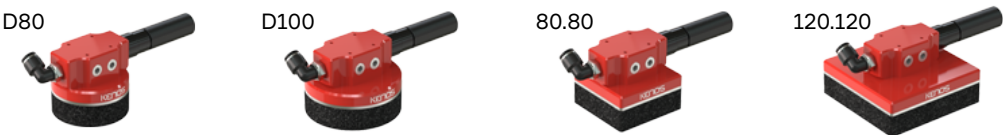


Figure 3 Exploded view - KFG Flexigrip range.



3.4 Customer code

KFG.	D80.	N121.	CVL.	S1.32-2.	X
Range of the gripper	Dimensions	Foam type*	Technology	Vacuum generator	Option
KFG Flexigrip	D80	13 N120 (12mm foam for BC versions)	6 FR08 (Flow reduction - regular flow)	4 S1.32-2 (2-stage ejector)	X: no options
	80.80	14 N240 (24mm foam for BC versions)	7 FR12 (Flow reduction - high flow)	5 S1.32-3 (3-stage ejector)	1 50: robot interface with screws on Ø50
	D100	11 N121 (12mm foam for CV and FR versions)	8 CVL (Check valve)	2 HB (Hose barb)	
	120.120	12 N241 (24mm foam for CV and FR versions)	9 BC1 (Bag cup - Normal frame) 10 BC2 (Bag cup - Double frame)	3 Plug (plugged inlet)	

* Replaceable part, see section 9.2 for details.

4. Technical data

4.1 Pneumatic technical information

Description	Unit	COAX® Si32-2 MIDI-cartridge (1 nozzle)	COAX® Si32-3 MIDI-cartridge (1 nozzle)
Feed pressure, optimal	MPa [psi]	0.60 [87.00]	0.60 [87.00]
Max vacuum at opt. pressure	-kPa [-inHg]	75.00 [22.10]	75.00 [22.10]
Air consumption at opt. pressure/nozzle	l/s [scfm]	1.75 [3.71]	1.75 [3.71]
Max vacuum flow at opt. pressure/nozzle	l/s [scfm]	3.30 [6.99]	6.00 [12.71]

4.2 Compressed air

Description	Type
Supply air connection size	6 mm quick connector for compressed air. NOTE: Minimal 4 mm internal diameter by up to 2 meters [6.5ft]
Air quality	DIN ISO 8573-1 class 4

4.3 Temperature

Description	Unit	Value
Operating temperature environment*	°C [°F]	0-50 [32-122]
Operating temperature workpiece*	°C [°F]	0-50 [32-122]

*Without condensation or frost

4.4 Gripping forces

Gripping force* at different vacuum levels								
Size / Vacuum level	-kPa [-inHg]	10 [2]	20 [5]	30 [8]	40 [11]	50 [14]	60 [17]	70 [20]
D80	N [lbf]	12 [2,6]	24 [5,3]	35 [7,9]	47 [10,6]	59 [13,2]	71 [15,9]	82 [18,5]
D100		15 [3,4]	30 [6,7]	45 [10,1]	60 [13,4]	75 [16,8]	90 [20,1]	104 [23,5]
80.80		13 [2,8]	25 [5,6]	38 [8,5]	50 [11,3]	63 [14,1]	75 [16,9]	88 [19,8]
120.120		20 [4,4]	39 [8,8]	59 [13,2]	79 [17,7]	98 [22,1]	118 [26,5]	137 [30,9]

*Theoretic gripping force at optimum feed pressure on rigid and stable surface with completely covered module, without safety factor.



Note!

It is recommended to run preliminary tests with original samples before a full-scale implementation. Piab can perform these tests for you.

5. Installation



Warning!

- Prior to assembly/disassembly of the components, cut off voltage and pressure. Install and maintain the components only after thoroughly reading and understanding this manual.
- Handle the components with care.
- Modifying the components is prohibited.
- The electrical and pneumatic connections should be permanently connected to the component.
- Carefully follow the electrical wiring instructions, paying close attention to avoiding the short-circuiting of loads.
- Connect the cables separately from power or high voltage lines, avoiding parallel wiring or wiring in the same conduit of the same lines. Control circuits that include sensors and coils may malfunction due to the noise from these other lines.
- Compressed air may be dangerous if used by unskilled personnel. Assembly should be carried out by experienced and specially trained personnel.
- For fastening and supplying, solely use the bores and methods provided by the manufacturer.

5.1 Start up



Note!

It is recommended to run preliminary tests with original samples before a full-scale implementation. Piab can perform these tests for you.

5.1.1 Pneumatic connection

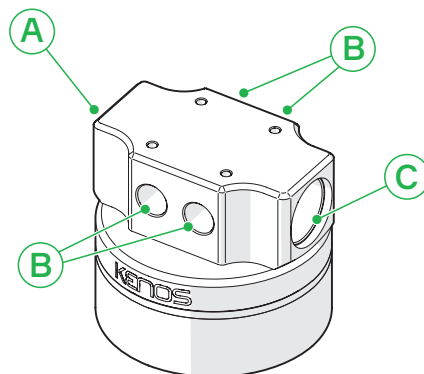


Figure 4 Basic ejector version with single row.

- (A) Compressed air inlet G 1/4".
- (B) Blow-off/sensing ports G 1/4".
- (C) Vacuum cartridge connection OR hose barb.

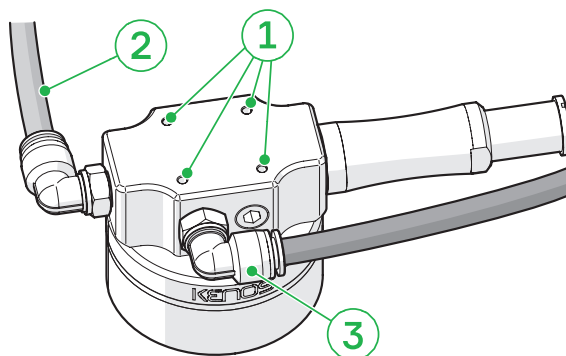
5.1.2 Internal vacuum generation

1. Fix the gripper(s) on the manipulator with 4x M4 screws.

**Note!**

It is suggested to use an appropriate tightening torque for the fixing bolts / screws according to the application, type of screws and to the regulation in force in each country.

- 2A. Connect the compressed air tube to the gripper.



- 2B. Connect electro valves to control compressed air infeed.
- 3A. (Optional) Connect blow-off connection.
- 3B. (Optional) Connect electro valves for compressed air infeed.

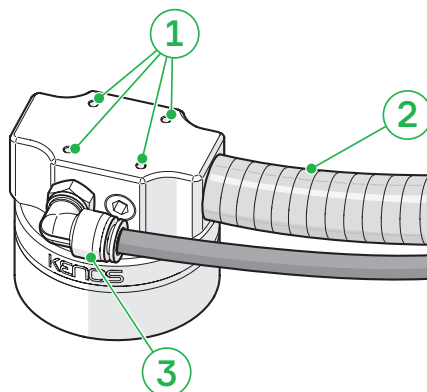
5.1.3 External vacuum generation

1. Fix the gripper(s) on the manipulator with 4x M4 screws.

**Note!**

It is suggested to use an appropriate tightening torque for the fixing bolts / screws according to the application, type of screws and to the regulation in force in each country.

2. Connect hose barb to external vacuum source.



- 3A. (Optional) Connect blow-off connection.
- 3B. (Optional) Connect electro valves for compressed air infeed.

5.1.4 Ejector exhaust

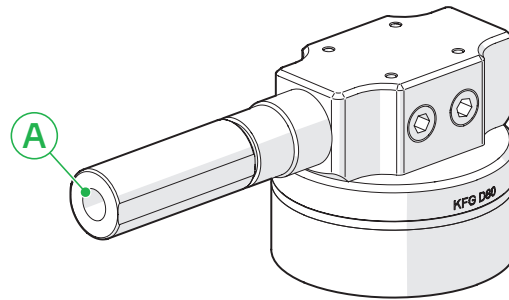


Figure 5 Ejector exhaust.

A Inline ejector exhaust - do not cover.



Warning!

Ejector exhausts need to be uncovered/unhindered.

5.2 UR installation

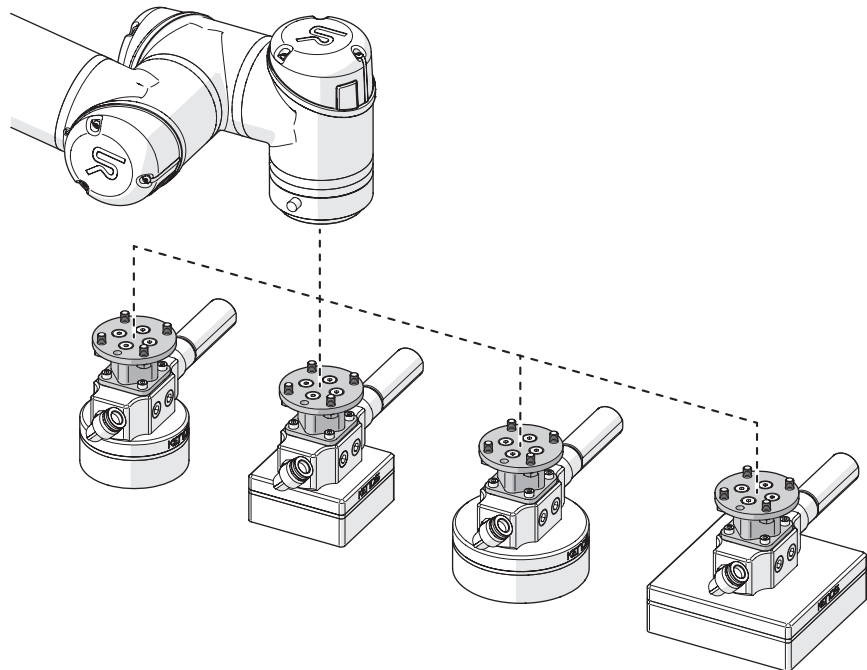


Figure 6 Kenos FlexiGrip range with UR mounting plate.

5.2.1 Kit for UR Installation

Components included

- 1x foam gripper KENOS FlexiGrip
- 1x fixture for UR robot (4xM6 on Ø50)
- 1x KIT
 - 1x valve to activate compressed air
 - 1x cable to wire the valve to the robot cabinet
 - 3m of pneumatic tubing

5.2.2 Installing the gripper and programming the UR robot

See the separate manual for Piab's URCap for PolyScope X for how to install the gripper to a UR robot, and how to program the UR robot with attached gripper.

5.2.3 Uninstall the gripper

1. Turn off the compressed air and switch off the robot.
2. Remove compressed air tubing from the robot.
3. Remove valve wire from robot cabinet.
4. Unscrew the 4x M6x12 from the robot wrist to uninstall the gripper.

5.3 Example installations

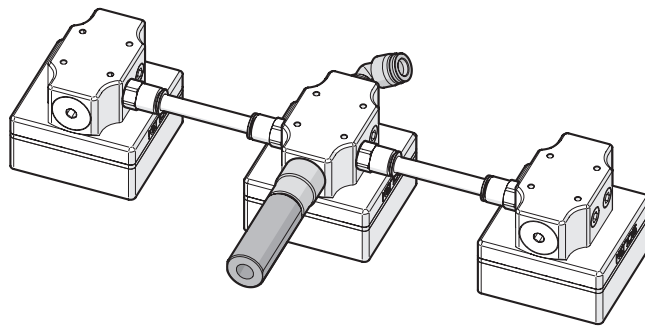


Figure 7 *Interconnection (option) - internal vacuum.*

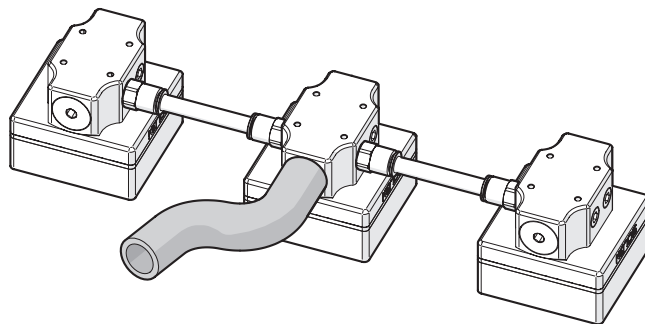


Figure 8 *Interconnection (option) - external vacuum.*

6. Pneumatic diagrams

- 1a Compressed air supply for vacuum
- 1b Compressed air supply for blow-off/vacuum sensing/vacuum distribution
- 2 2a 2b Vacuum
- 3 Exhaust

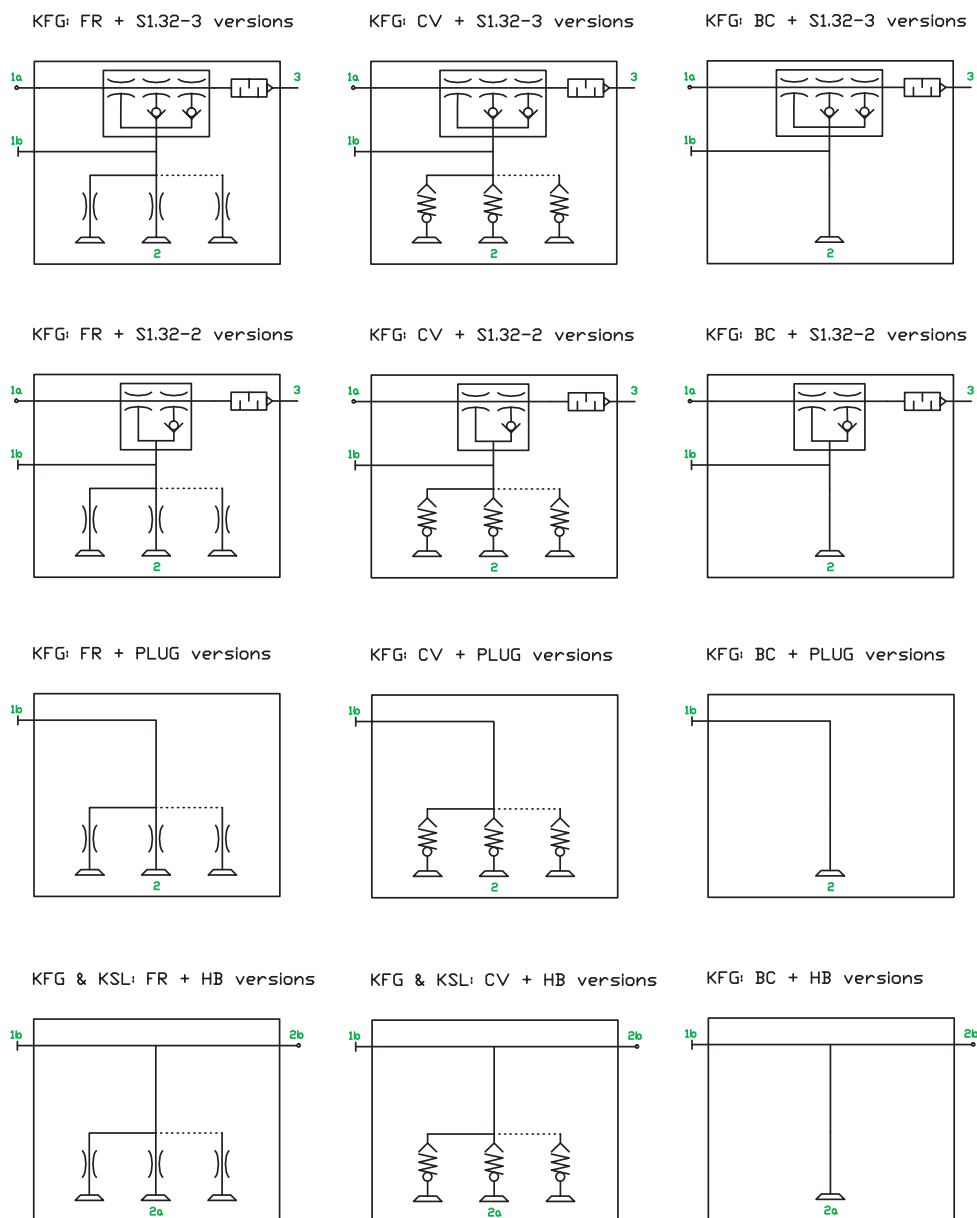


Figure 9 Pneumatic diagrams - Kenos Flexigrip.

7. Working cycle



Warning!

Stopping inside or passing through the work area of the gripper module is prohibited. In case of electrical or pneumatic supply failure, the load handled by the gripper module is released.



Note!

It is recommended to run preliminary tests with original samples before a full-scale implementation. Piab can perform these tests for you.

7.1 Controlling the gripping system

It is necessary to feed the gripper with compressed air as follows (please refer to pick-up/release diagram).

1. Pick-up position

Open compressed air infeed. For CV version, valves not covered by products will close. The other valves will stay open and grip the products. The manipulator should start its movement only when the correct vacuum level is reached.

According to the condition of foams, number of and unit product surface, pick-up vacuum level must be at least of -50kPa.

2. Release position

Close compressed air infeed. Needle of pressure gauge must be at atmospheric pressure and valves in the gripper should fall down (CV version).

3. Blow-off position (optional)

To release quickly and to clean the gripper, it is possible to blow-off inside the system. For that purpose, while closing compressed air infeed network, open compressed air blow-off network. Once the atmospheric pressure is reached, the valves in the CV version of the gripper will release the object.

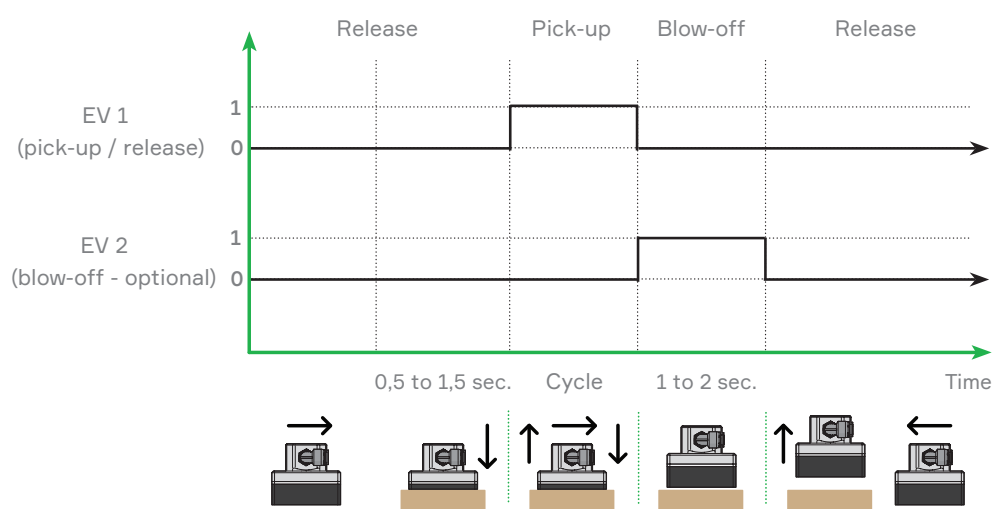


Figure 10 Pickup / Release pneumatic diagram.

8. Maintenance

8.1 General Advice

- All adjustments and service on the gripper should only be made by a trained operator.
- When the manipulator is not in operation, do not let the foams be compressed.

Elements/Frequency	Daily	Weekly	6 months	12 months	Type	Observation
Foam	✓				Visual	If the gripper is not working properly, refer to gripper's instruction of use.
Vacuum source				✓	Refer to vacuum generator instructions of use.	Replace the air tightness joints if necessary.
Check the silencer		✓				Replace the silencer if necessary.
Check tightenings			✓			Tighten the screws if necessary.
Check compressed air supply		✓				
Check the compressed air connection		✓				Replace the fitting(s) if necessary.
Check the general condition						
Clean gripper exterior				✓		Do not use abrasive products or solvents.

8.2 Cleaning of valves and holes

8.2.1 Cleaning check valves (CV version) or flow reductor (FR version) without dismantling

1. Remove the gripper from the robot.
2. Pull off the foam.
3. Clean from the bottom side with a pressure washer (respect a distance of 50 cm - 1,64' minimum between nozzle and gripper) or with hot water jet.
4. Ensure that all holes of the bottom plate are fully opened.
5. Let the gripper dry.
6. Apply new foam pad (see section 8.3.2 for more information).

8.2.2 Cleaning check valves (CV version) or flow reductor (FR version) with dismantling

1. Remove foam pad.
2. Unscrew all screws in the outside of the gripper and remove inside assembly.
3. Unscrew M4 screws on the bottom plate and check-valve chamber while making sure valves stay in the check-valves chamber.
4. Place all valves in a container and clean them with soap and water.
5. If gripper seals are damaged, replace them as needed.
6. Reposition all valves in the check-valve chamber ensuring they are dry.
7. Return screws for the bottom plate and tighten.
8. Apply new foam pad (see section 8.3.2 for more information).

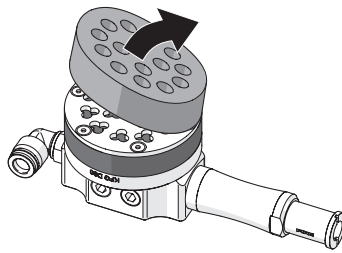
8.3 Replacing worn out foam

8.3.1 State of foams

- After a large number of cycles, the cell structure of the foam can change, and depends on objects lifted and cycles. When the closed cells of the foam are damaged and opened, they let more air flow through the gripper than the vacuum generator is able to compensate. If required vacuum levels cannot be reached the foam has to be changed.
- Be careful that the holes in the foam pad and the bottom plate align perfectly to avoid blocking vacuum ports.
- The condition of the foam is much more sensitive when gripping small surface products. You can get confirmation of foam condition by putting a small product and after a big product under the gripper.

8.3.2 Replacing foam

1. Pull out the old foam.

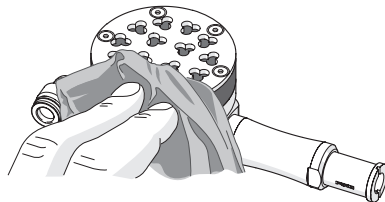


2. Clean gripper's bottom side with dish washing liquid.

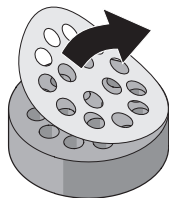


Note!

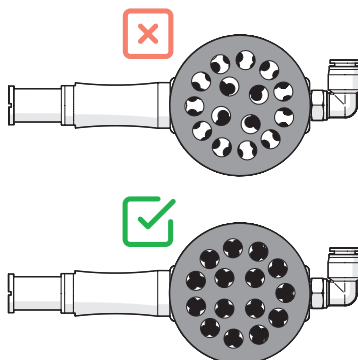
Cleaning is not needed on every foam change, small glue residue on the plate are acceptable. If cleaning need to be done make sure to also clean the check valves so they will not get stuck.



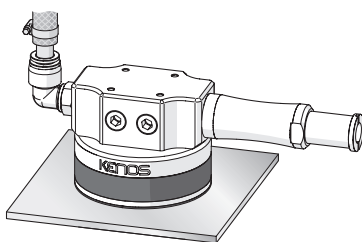
4. Pull out protection sheet from new pad.



5. Apply new pad on bottom side while making sure foam's holes coincide with gripper's holes.



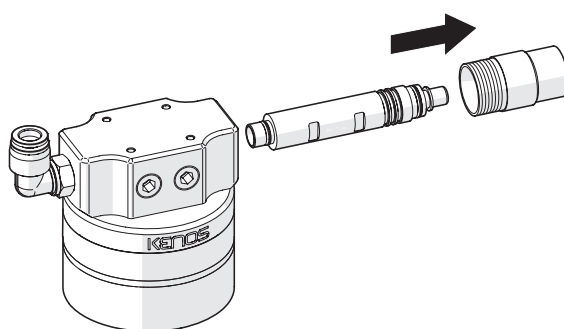
- Pick a non-porous plate (wood, aluminum, etc...) a few seconds for a better grip.



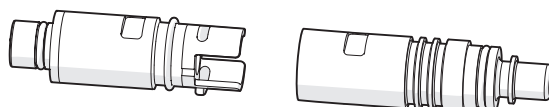
- If possible, run manipulator just after changing foams in order to better stick the foam(s).

8.4 Disassembly, Cleaning, Re-assembly of ejector

- Remove socket and ejector and dismantle fittings.



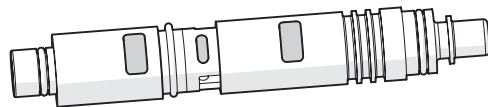
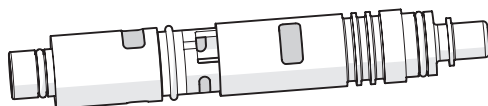
- Disassemble the ejector and clean the ejector and manifold with soap and water.



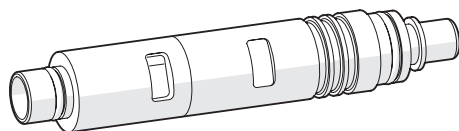
- Reassemble the ejector.

**Note!**

Pay attention to the alignment of the different stages.

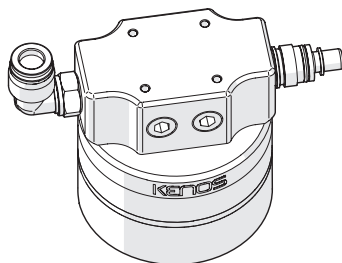


- Step 3a

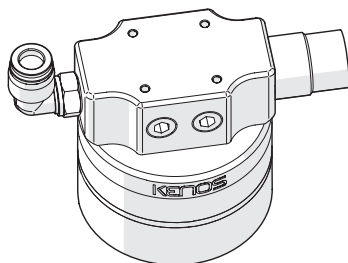


- Step 3b

4. Reinstall the ejector and socket on the opposite order to step 1.



5. Test the gripper when the ejector is reinstalled.



9. Spare parts and accessories

9.1 Single spare parts list

Article no	Description
0107124	COAX® cartridge MIDI Si32-2
0107053	COAX® cartridge MIDI Si32-3
0243974	Holder for MIDI Si32-2
0243991	Holder for MIDI Si32-3
3216009	Silencer

9.2 Foam spare parts

The spare foam code can be deducted from the product code.
There are two different types of steps for the foam spare parts.

Step 0 is for BC version

Step 1 is for FR and CV versions



Note!

Check the customer code of the configured KFG product to verify the type.

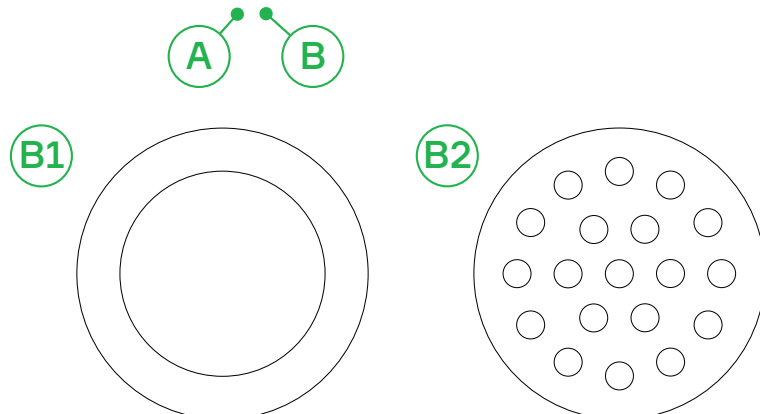
The first part of the customer code is the foam spare part code, when FOAM is put in front, see below.

KFG product code:

KFG.120.120.N241.FR08.S1.32-2.50

KFG spare part code:

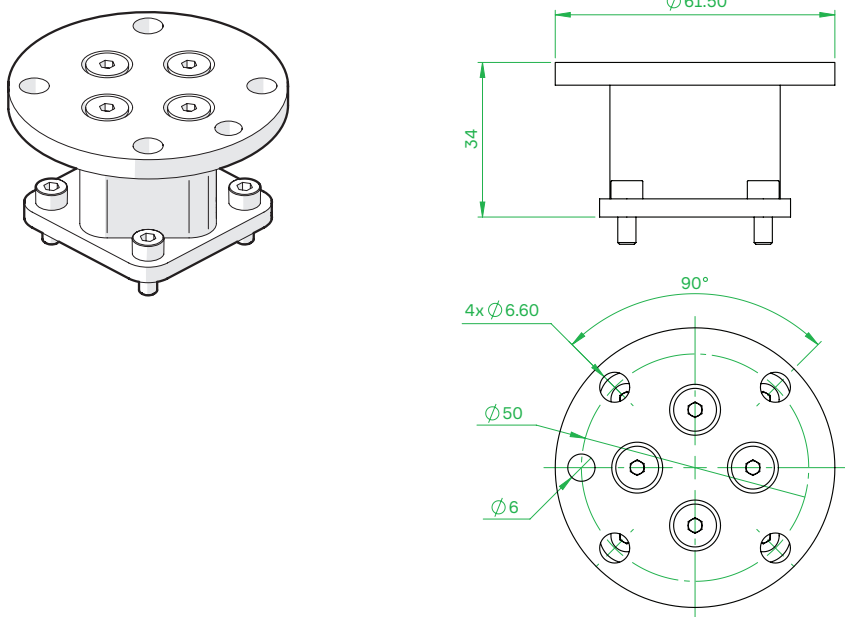
FOAM.KFG.120.120.N.24.1



A	Foam thickness
B	Foam version
B1	"0" for BC versions
B2	"1" for FR and CV versions

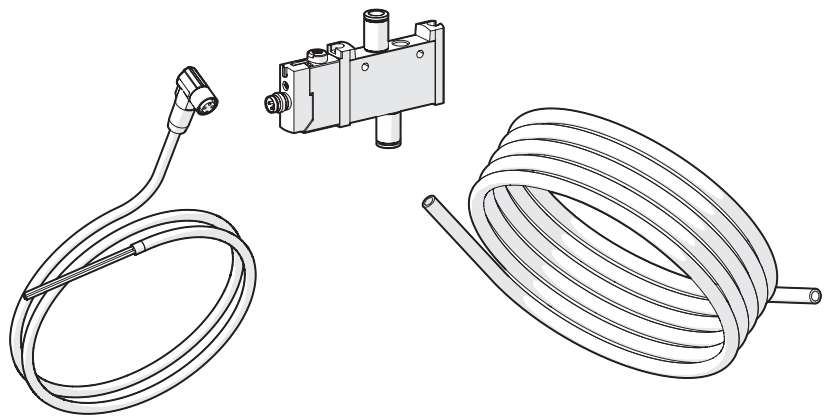
9.3 Accessories

9.3.1 Fixture 4m6-D50



Article number	Description	Type
0244496	Robot fixture kit $\varnothing 50$ mm	• 4xM6 screws • Fixture $\varnothing 50$mm ISO 9409-1-50-4-M6 • Compatibe with UR and Omron

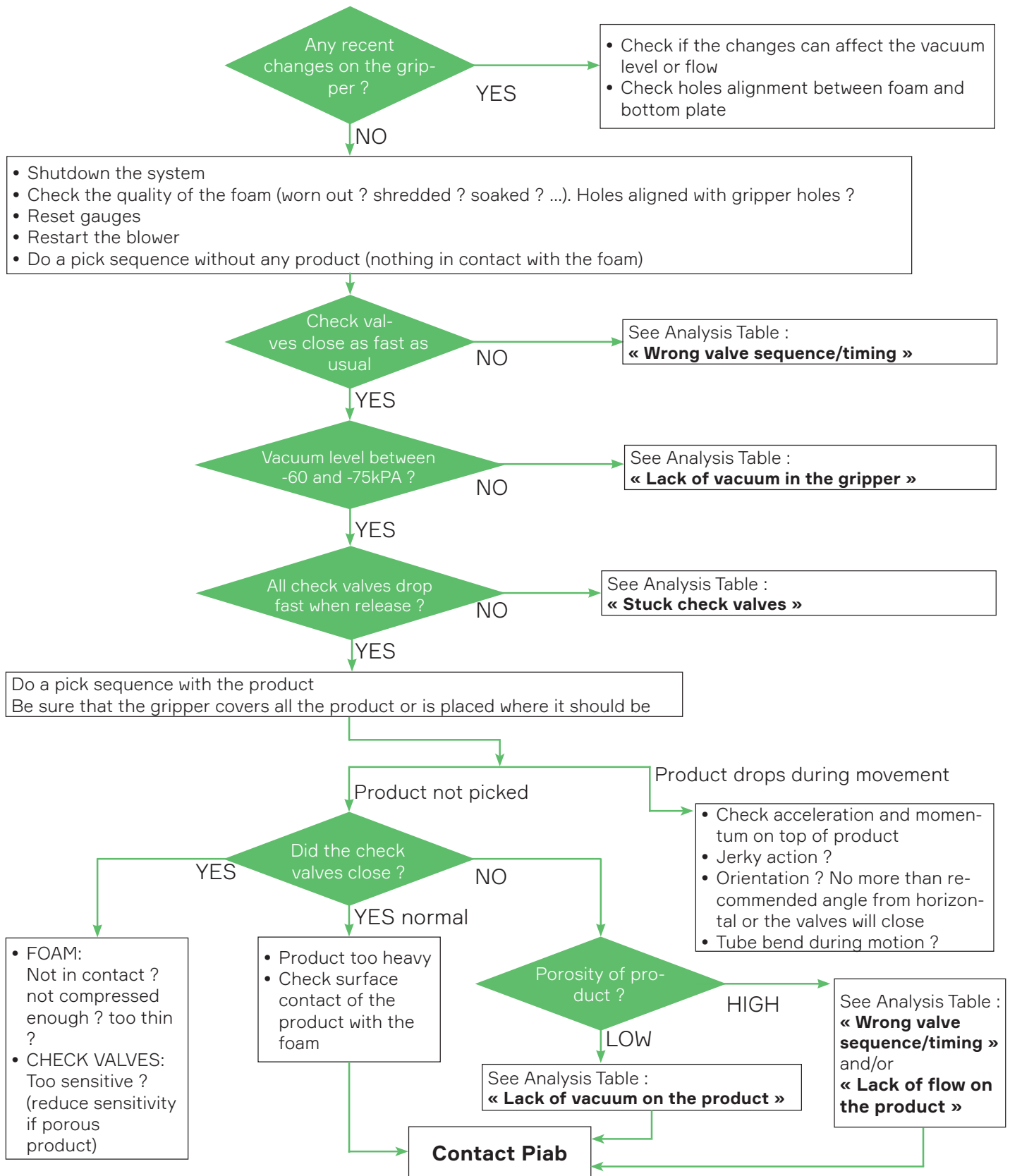
9.3.2 Valve kit for venturi ejector



Article number	Description	Type
0244497	Valve kit for venturi ejector	• Valve with Ø6mm fittings • Includes M8 connecting cable • 3m of pneumatic tubing Ø6mm
	Air quality	DIN ISO 8573-1 class 4

10. Troubleshooting Gripper

10.1 Troubleshooting Gripper



10.2 Problem analysis table



Note!

- Before any intervention or opening of the gripper, please consult Piab.
- Assure that holes in the foam pad are precisely corresponding to gripper's bottom plate holes.
- Assure that compressed air infeed is according to manufacturer specifications.

Anomaly	Probable Causes	Remedies
Lack of vacuum in the gripper	Leaking gripper	• Listen for leaks, place your hand/ papers / duct tape on gripper and look for changes in vacuum level. • Do a gripper pick sequence then place a cardboard under the full gripper surface, check if vacuum level is correct, gradually uncover the check valves: a sudden drop in vacuum level indicates where the main leak is. If vacuum drops gradually then leaks are global: check parts alignment, check valves and seals. • Damaged or eroded components: Pay attention to chemical compatibility when using own cleaning products to ensure component durability (follow cleaning procedures). Deteriorated balls for check valves will not seal the same and can cause vacuum loss.
Wrong valve sequence/timing	Valve	• Check if compressed air pressure is at 6 bar.
Stuck check valves	Big debris like wood splinters, foam fragments, ...	• Blow compressed air insides all check valves. • Do multiple pick cycles without products. • May have to open the gripper and clean manually.
	Small particles like dust or powders	• Blow compressed air inside all check valves. • Clean with simple green.
	Handled product inside the gripper	• Follow cleaning procedures. • Contact Piab before opening the gripper if needed.
	Others	• Make sure there is no liquids, even water, inside the valves. If so, blow compressed air and/or follow cleaning procedure. Liquids on products can be transferred to valves during pick sequence. • In cold environments, ice may cause the check valves to stay closed.
Lack of flow or vacuum on the product	Foam	• Check the foam alignment, every hole must be centered with gripper holes. • Foam may be too porous for the product (overused foams becomes porous). • Foam may be too thick. • Foam is not compressed enough before activating the pick sequence.
	Flow below gripper	• If there is a filter in the foam, check if it needs to be cleaned. • Check the check valves: go to "stuck check valves".

Anomaly	Probable Causes	Remedies
Ejector	Leaking manifold	• Check O-rings below manifold. • Check gauges and fitting for leaks, add/replace Teflon tape if needed.
	Not enough vacuum/flow	• Follow procedure to remove cartridges and clean them. • Check if compressed air pressure is at 6 bar. • Compressed air tube diameter must be the same or decreasing from supply to manifold(s) and gripper(s). • Control tube length and number of cartridges per gripper.

11. Warranties

The Seller gives its Customers a one-year warranty from the receipt of the Products, accessories, control devices and Kenos® products included.

It is a duty of the Buyer to check the goods at the time of delivery at the agreed destination. Complaints relating to the state of the packaging, quantity, number or external characteristics of the Products (apparent defects) must be reported to the Seller, under penalty of forfeiture of the guarantee, by means of a reservation noted on the transport document upon receipt of the products; the transport document with the noted reservation must be forwarded to the Seller by fax, e-mail, registered mail with notice of collection, within 8 (eight) days of receipt of the goods.

The warranty covers manufacture and materials defects in the Products and it also covers if the Products do not conform to the Product specification, excluding minor defects, if reasonably acceptable and that do not compromise efficiency in their use.

The warranty does not apply to any Product (including any component or other parts in such Products (such as suction cups, filter elements, sealings, tubing, foam, etc.) or to the software of any Products) that it was used other than the intended purpose, and: (a) has been subjected to abuse, misuse, negligence, improper storage, improper handling, improper use, improper installation, abnormal physical stress, abnormal environmental or working conditions, or use, application, installation, care, control or maintenance contrary to any applicable manual or instructions for the Products issued by the Seller or good trade practice regarding the same; or (b) has been reconstructed, repaired or altered by any persons or entities other than the Seller or its authorized representatives, or have a defect as a result of fair wear and tear or wilful damage or caused by subsequent damages caused by other defective products.

The product warranty set forth in this Section is the only warranty given by the Seller in relation to the Products. The Customer may not rely, and has not relied, on any other information, statement or warranty (express or implied), whether based on applicable law or otherwise. In any case, the compensation is limited to the price of the Products agreed between the parties and is excluded for indirect damages.

During the warranty period, the Seller shall replace or repair, at its own expense, faulty Products determined by the Seller, in its sole discretion, to be covered by the warranty set out herein.

It is at the Seller's discretion whether a faulty Product should be returned to the Seller for replacement or if it should be repaired by the Seller at the location of the Customer. Any replaced Products shall become the property of the Seller.

The Seller is not responsible for the cost of fitting replacement parts or components of any Products in to any products or alike of the Customer.

These Terms and Conditions shall apply to any repaired or replaced Products by the Seller.

12. Recycling and disposal



Environmental aspects are considered in the development process of Piab's products to make sure that a minimal environmental footprint is used.

The ways of handling recycling and disposals vary from country to country, and therefore this process needs to be in full compliance with each national regulation.

If possible, disassemble the product into its various components. Batteries, electrical and electronic equipment should be handed over to an authorized body for disposal, as well as the metal parts. All other parts can either be recycled or assorted as waste.

[illegible]

Evolving around the world

EUROPE

France

Lagny sur Marne
+33 (0)16-430 82 67
info-france@piab.com

Etampes (Joulin)
+33 (0)1 69 92 16 16

Germany

Butzbach
+49 (0)6033 7960 0
info-germany@piab.com

Italy

Torino
+39 011 226 36 66
info-italy@piab.com

Due Carrare (Kenos)
+39 049 874 13 84
info-italy@piab.com

Poland

Gdansk
+48 58 785 08 50
info-poland@piab.com

Spain

Barcelona
+34 (0)93-633 38 76
info-es@piab.com

Sweden

Danderyd (HQ)
+46 (0)8-630 25 00
info-sweden@piab.com
+46 544 409 00
se-sales@piab.com

Helsingborg
+46 042-400 45 80
se-sales@piab.com

Karlstad
+46 054 55 80 90
se-sales@piab.com

Mullsjö
+46 392 497 85
sales@avac.se

United Kingdom

Loughborough
+44 (0)15-098 570 10
info-uk@piab.com

AMERICAS

Brazil

Sao Paulo
+55 (0)11-449 290 50
info-brasil@piab.com

Canada

Toronto (ON)
Lifting Automation
+1 (0)905-881 16 33
eh.ca.info@piab.com

Hingham (MA, US)
+1 800 321 7422
info-usa@piab.com

Mexico

Hingham MA (US)
+1 781 337 7309
info-mxca@piab.com

USA

Hingham (MA)
+1 800 321 7422
info-usa@piab.com

Fairborn (OH)
End of arm tooling EOAT
+1 937 352 1424
info-usa@piab.com

Hickory (NC)
+1 828 327 2290
info-usa@piab.com

ASIA

China

Shanghai
+86 40 0897 8668
info-china@piab.com

India

Pune
+91 8939 15 11 69
info-india@piab.com

Japan

Tokyo
+81 3 6662 8118
info-japan@piab.com

Singapore

Singapore
+65 6455 7006
info-singapore@piab.com