

Assembly manual

KCM Ejector Manifold



KENOS

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1. IDENTIFICATION DATA

Each system is identified by a label on which the reference data of the same is indelibly marked. For any communication with Piab AB or service centers always refer to the label information and state both the Product code and item number.

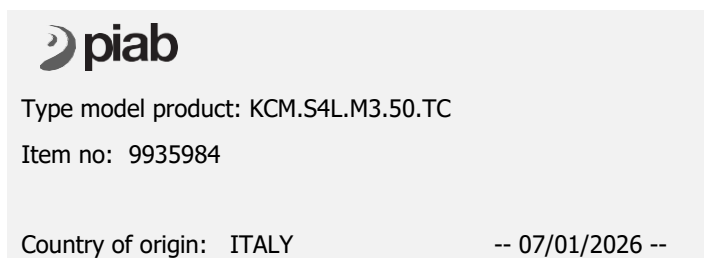


Figure 1: *Example of identification label.*



Figure 2: *Example of identification label on a KCM ejector.*

For any communication with Piab AB or service centers always refer to the label information.

2. GENERAL SAFETY INSTRUCTION

The correct use of pneumatic equipment within a system is the responsibility of the system designer or the person who determines its technical specifications.



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 the explosion of closed containers, and vacuum may lead to the implosion of closed containers. The vacuum generator, even if silenced, makes noise: if necessary, wear suitable 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. The discharge air has a high output speed. Do not obstruct the discharge of the gripper module. 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. Consider the possibility of pressure drops in the pneumatic supply line: then provide for a safety system that, in order to prevent injury to the operator or damage to the machine prevent the risk of the piece being released.

Consider the possibility the electrical or pneumatic supply is interrupted, to protect persons and systems. Consider the emergency stop when designing the system.

Pneumatic supply and connection

The supply pressure should not exceed the recommended one of 7 Bar. 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. For more information, see the Installation and Commissioning section.

Electric connection

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.

Carefully follow the electrical wiring instructions, paying close attention to avoiding the short-circuiting of loads.

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

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.

Safety instructions

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

Storage

For a correct storage of the system or its spare parts, we recommend: Exclude outdoor areas, areas exposed to the elements or with excessive humidity or exposed to direct sunlight. The environment must be sufficiently clean, arrange the system almost in such a way that it has a stable base of support and make sure that there is no risk of unexpected movements.

**Intended use**

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

The products handled by this equipment must have the following characteristics:

They must not be deformed;

Have a uniform height over the entire gripping surface. Any height differences must be reported in the agreement. If they are not reported, Piab AB and / or Kenos will not be responsible for malfunction.

**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;

3. DANGEROUS AREAS

Areas with danger of air ejection

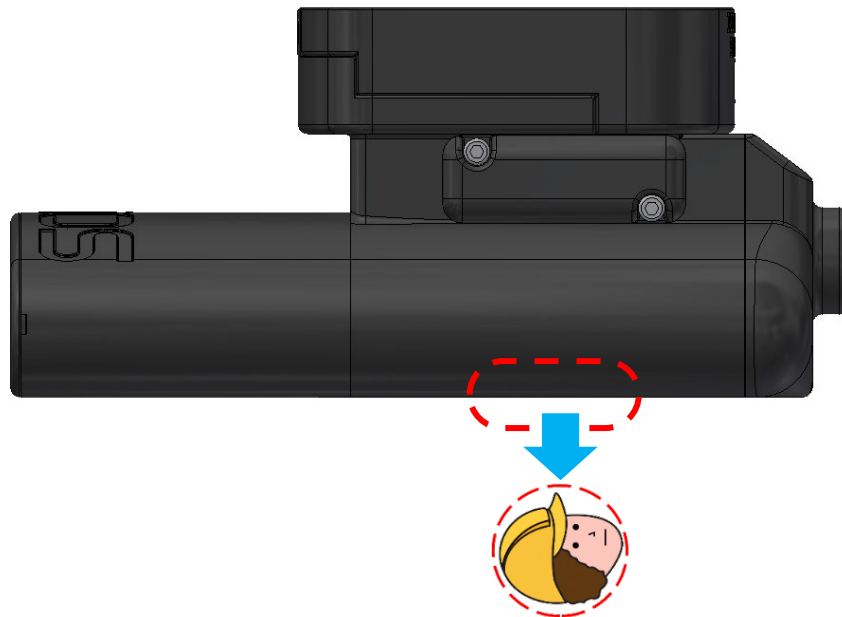


Figure 3: Red dashed rectangle and blue arrows show the area with danger of air ejection.

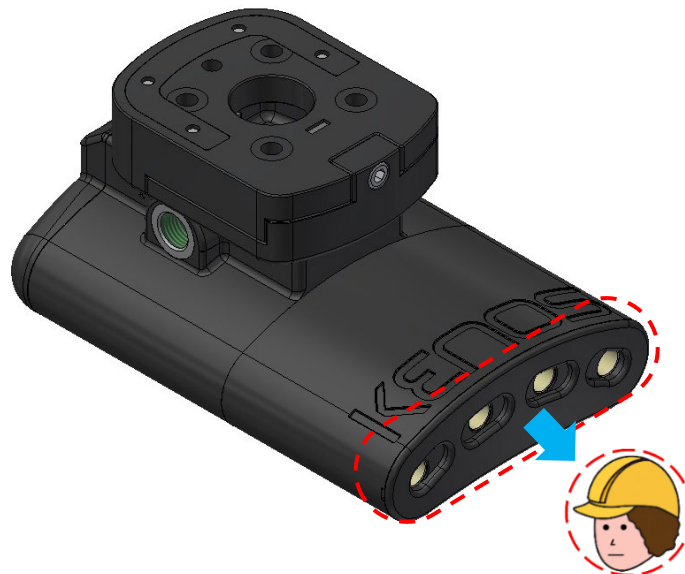


Figure 4: Red dashed rectangle and blue arrows show the area with danger of air ejection.

Notes for the final manufacturer of machinery and end user:

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 look and / or insert the hands in cavities, holes or openings (for example: air discharge, openings / holes under the foam etc.).

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

The final evaluation of the safety systems to be applied for starting up the system, after the assembly of the gripping module, is the task of the final manufacturer of machinery. It is up to the final manufacturer of machinery to report the 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.

4. PICTOGRAMS



Figure 5: Picture of KCM with warning signs.



Warning!

Generic danger. Warning!



Warning!

Danger of air ejection or expulsion of particles!

Pictograms related to the operator's qualification highlighted in this manual.



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.

5. R.E.S.S. 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	AR PASS
1.1 - General consideration			
1.1.1 - Definitions	✓	✓	✓ Allowed
1.1.2 - Standard of safety integration	✓	✓	
1.1.3 - Materials and products	✓	✓	
1.1.4 - Lighting	⊗		
1.1.5 - Machine design for handling purposes	✓	✓	
1.1.6 - Ergonomics	⊗		
1.1.7 - Jobs	⊗		
1.1.8 - Seats	⊗		
1.2 - Control systems			
1.2.1 - Safety and reliability of control systems	⊗		
1.2.2 - Command devices	⊗		
1.2.3 - Starting	⊗		
1.2.4 - Stop			
1.2.4.1 - Normal shutdown	⊗		
1.2.4.2 - Operational shutdown	⊗		
1.2.4.3 - Emergency stop	⊗		
1.2.4.4 - Machine assembly	⊗		
1.2.5 - Selection of the control or operating mode	⊗		
1.2.6 - Failure of the power supply circuit	⊗		
1.3 - Protective measures against mechanical hazards			
1.3.1 - Risk of loss of stability	⊗		
1.3.2 - Risk of breakage during operation	✓	✓	✓ Allowed
1.3.3 - Risks due to falling or projection of objects	✓	⊗	
1.3.4 - Risks due to surfaces, edges or sharp corners	✓	✓	✓ Allowed
1.3.5 - Risks due to combined machines	⊗		
1.3.6 - Risks associated with changes in operating conditions	⊗		
1.3.7 - Risks due to moving elements	✓	⊗	⊗ Not Allowed
1.3.8 - Choice of protection against risks due to moving elements			
1.3.8.1 - Mobile transmission elements	⊗		
1.3.8.2 - Mobile elements that participate in the processing	✓	⊗	
1.3.9 - Risks of uncontrolled movements	⊗		
1.4 - Characteristics required for guards and protective equipment			
1.4.1 - General requirements	⊗	⊗	
1.4.2 - Particular requirements for guards			
1.4.2.1 - Fixed guards	⊗		
1.4.2.2 - Interlocked mobile guards	⊗		
1.4.2.3 - Adjustable guards that limit access	⊗		
1.4.3 - Particular requirements for protective devices	⊗		

ESSENTIAL SAFETY REQUIREMENTS (p.2)		CONFORMITY'		
1.5 - Risks due to other hazards		APL	CNF	AR PASS
1.5.1 - Electricity		⊗		
1.5.2 - Static energy		⊗		
1.5.3 - Energy other than electricity		✓	⊗	⊗ Not Allowed
1.5.4 - Assembly errors		✓	✓	✓ 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 dangerous materials and substances		⊗		
1.5.14 - Risk of being trapped in the machine		⊗		
1.5.15 - Risks of slipping, tripping or falling		⊗		
1.5.16 - Lightning		⊗		
1.6 - Maintenance		APL	CNF	AR PASS
1.6.1 - Machine maintenance		✓	✓	
1.6.2 - Access to workplaces and intervention points used for maintenance		⊗		
1.6.3 - Isolation from energy supply sources		⊗		
1.6.4 - Operator intervention		⊗		
1.6.5 - Cleaning of internal parts		✓	✓	✓ Allowed
1.7 - Information		APL	CNF	AR PASS
1.7.1 - Machine information and warnings				
1.7.1.1 - Information and information devices		✓	✓	✓ Allowed
1.7.1.2 - Alarm devices		⊗		
1.7.2 - Warnings regarding residual risks		✓	✓	
1.7.3 - Marking of machines (fabricant internal label)		✓	✓	
1.7.4 - Instructions				
1.7.4.1 - General drafting principles		✓	✓	
1.7.4.2 - Contents of the instructions		✓	✓	
1.7.4.3 - Illustrative and promotional publications		⊗		

Status table:

	Applicability	Conformity	AR Card Pass ⁽¹⁾
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	⊗ Not Allowed

⁽¹⁾ The meaning of "AR card pass" value is the value that indicates, according to the assessment carried out, if the VR card is subject to risk assessment and if the requirement being assessed is "regulatory compliant" (Compliance).

⁽²⁾ The AR PASS "Not Allowed" results indicate a potential risk that must be resolved by the Final Integrator Manufacturer who places the machine on the market.

6. INSTALLATION

6.1 Mounting on the handling system

The KCM ejector is secured with a robot flange. During the ejector configuration the customer can select different ISO standard flanges to connect the ejector with the customer robot.

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

On the shipping box of the ejector there is the robot connection flange disassembled from the ejector. Follow the steps below for a correct installation:



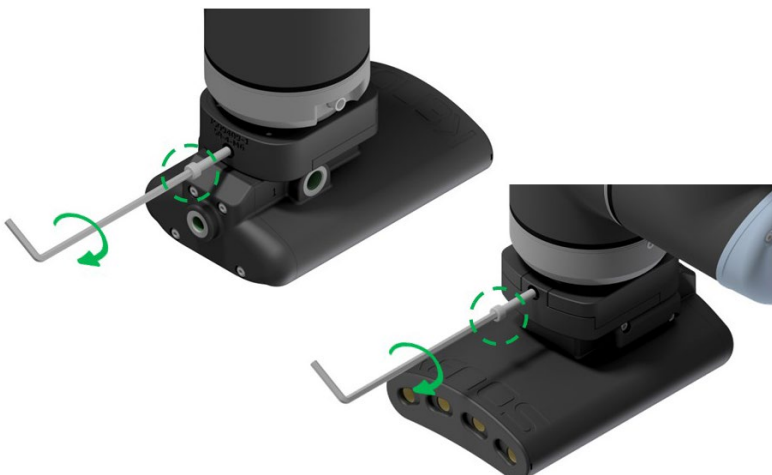
Step: 6.1.1

- Position the ejector flange on the robot flange.
- Fix the flange with 4 countersunk screws.



Step: 6.1.2

- Insert the ejector into the flange, fitting it in the correct direction as shown in the image on the side.



Step: 6.1.3

- Fix the 2 screws supplied with the ejector kit.

Figure 6: Installation of KCM ejector on robot.

6.2 Mounting accessories

The KCM ejector must be used with Piab gripping systems, see examples below:

piCOBOT® Foam Grippers:



Direct mounting:

- Fix the piCOBOT® foam gripper using the 4 screws M5x25mm on the KCM ejector.
- Assemble the foam on the piCOBOT® gripper.



Quick change:

- Assemble the tool changer pump side using the 4 screws M5x12mm.
- Fix the piCOBOT® foam gripper with the tool changer.

Figure 7: Installation of gripping foam on KCM ejector.

6.3 Ejector exhaust

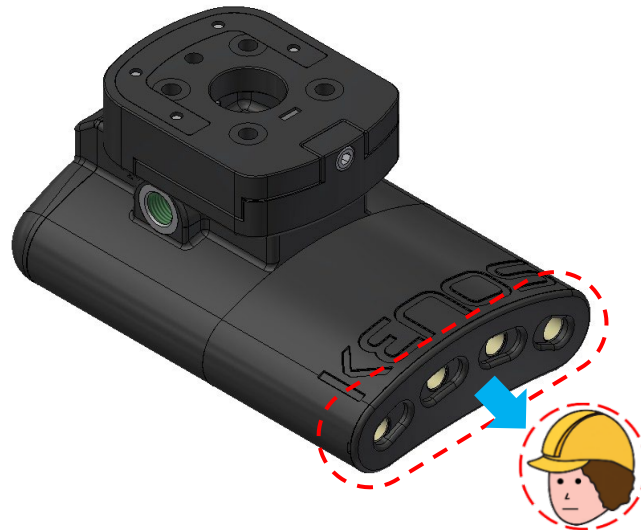


Figure 8: Exhaust air flow.

The blue arrows show the exhaust air flow, DO NOT COVER THE HOLES UNDER THE WRITTEN KENOS.

6.4 Pneumatic connection for basic version and integrated solenoid valve version

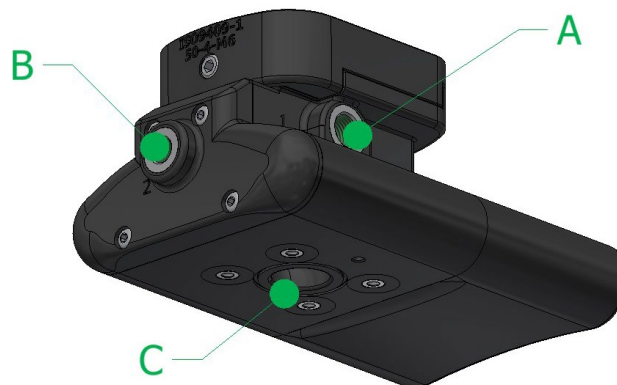


Figure 9: Pneumatic connections on KCM ejector.



Figure 10: Pneumatic connections on KCM ejector solenoid valve version.

POS.	DESCRIPTION
A	Connection G1/4" for compressed air
B	Connection G1/8" for vacuum monitoring
	Compressed air connection G1/8" for blow-off
C	Vacuum connection Ø20mm

6.5 Solenoid valve

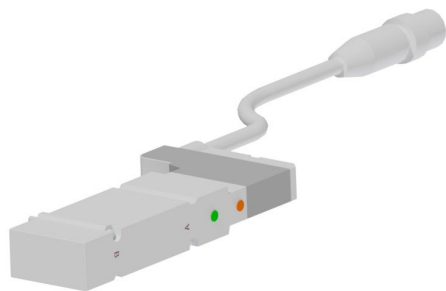


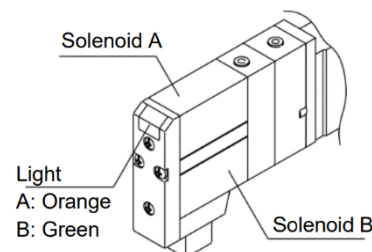
Figure 11: Solenoid valve.

Solenoid valves characteristics:

Fluid	Air
Operating pressure range (MPa/psi)	0.15-0.7/22-87psi
Operating temperature (°C/F)	-10 +50 / 14-122 without icing
Manual override	Non-locking push type
Lubrication	Not required
Impact/Vibration resistance (m/s ²)	150/30
Electrical connection	M12 4 pin waterproof connector, Male
Coil rated voltage (Vcc)	24
Allowable voltage	± 10% rated voltage
Current consumption (mA)	27
Surge voltage suppressor	Zener Diode
Indicator light	LED
Solenoid valve A	Vacuum
Solenoid valve B	Blow off

Light indication:

When equipped with light and surge voltage suppressor, the indicator light window turns orange when solenoid A is energized, and it turns green when solenoid B is energized.



Manual Override Operation:

Handle carefully, as connected equipment can be actuated through manual override operation.

■ Non-locking push type

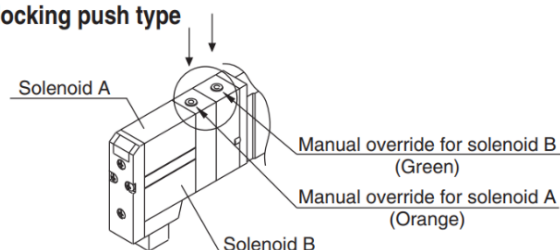


Figure 12: Solenoid valves with components indications.

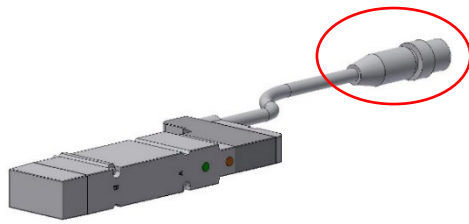
Connection destination (female side) connector cable:

Connector Size	Pin	Manufacturer	Applicable series
M12	4	Correns Corporation	VA-4D
		OMRON Corporation	XS2
		Azbil Corporation	PA5-41
		Hirose Electric OMRON Corporation Ltd.	HR24
		DDK Ltd.	CM01-8DP4S

Note: This connector is a female connector for (1) relay output model and (2) single unit / sub-plate.

M12 Waterproof Connector Wiring Specifications:

Note: Solenoid valves have no polarity.



4 pin connector (M12) plug

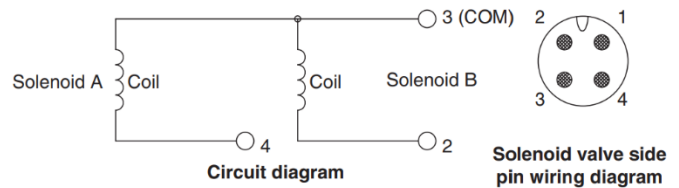
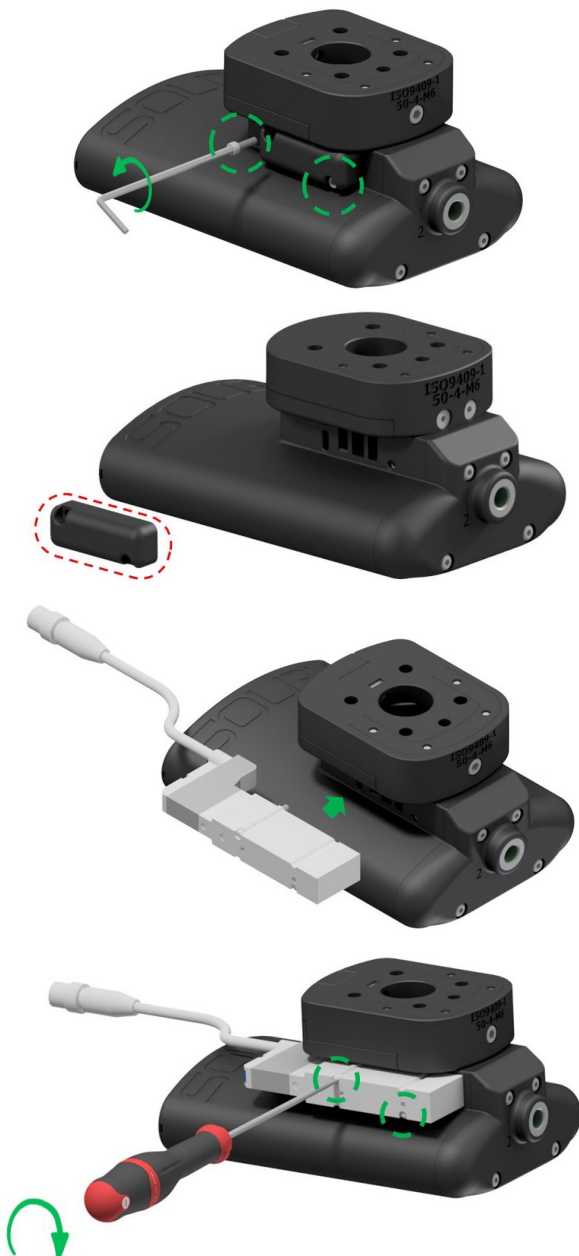


Figure 13: Connector schema of solenoid valve.

6.6 Installation of solenoid valve module

It is possible to install the module with the solenoid valve on the ejector. It is possible to buy the module as an accessory (see chapter 11. ACCESSORIES).

Follow the steps below for a correct installation:



Step: 6.6.1

- Remove the 2 screws on the plastic cover.

Step: 6.6.2

- Remove the plastic cover and the O-ring.

Step: 6.6.3

- Position the solenoid valve in the same position as the image.

Step: 6.6.4

- Fix the 2 screws on the solenoid valve.

Figure 14: Installation of solenoid valve steps.

6.7 Vacuum switch accessory



Figure 15: *Piab vacuum switch.*

Vacuum switch characteristics:

Current, max.	125mA
Current, consumption	40mA
Display	7 segment LCD 3 colour display (Red/Green/Orange)
High-voltage resistance (VAC)	1000 VAC
Insulation at 500 VDC	50 MΩ
Safety classification	IP40
Supply voltage	12–24 VDC
Valve function	PNP NO/NC (2x)
Vibration resistance	10-150-10 scan for 1min Hz (1,5mm or 10G, 2h in XYZ direction)
Hysteresis	Adjustable, 1-8 kPa
Signal range	0–101.3 -kPa
Fluid	Filtered air, Non-corrosive / Non-flammable gas
Temperature	0 - 50 °C

2 PNP+Copy function

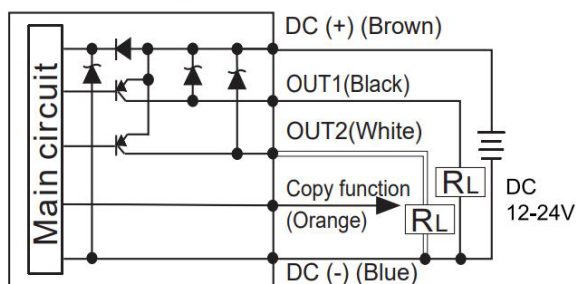


Figure 16: *Vacuum switch wiring diagrams.*

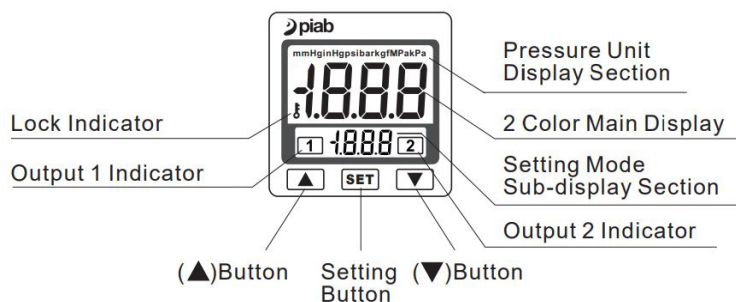


Figure 17: *Vacuum switch panel description.*

For vacuum switch settings, see attached specific manual / data sheet.

6.8 Ejector characteristics:

For each cartridge MIDI Si32-2:



Figure 18: Image of Piab® cartridge MIDI Si32-2.

Vacuum flow:

Feed pressure:	Air consumption:	Vacuum flow (NI/s) at different vacuum levels (-kPa)									Max vacuum:
MPa	NI/s	0	10	20	30	40	50	60	70		-kPa
0.4	1.25	3.1	2.6	1.9	1.2	0.8	0.4	0.1	-		60
0.5	1.5	3.2	2.9	2.2	1.4	0.85	0.62	0.35	0.18		70
0.6	1.75	3.3	3.0	2.6	1.7	0.9	0.6	0.5	0.35		75

For each cartridge MIDI Pi48-2:



Figure 19: Image of Piab® cartridge MIDI Pi48-2.

Vacuum flow:

Feed pressure:	Air consumption:	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum:
MPa	NI/s	0	10	20	30	40	50	60	70	80		-kPa
0.17	1.37	2.6	1.7	1.2	0.7	0.4	0.12	-	-	-		55
0.22	1.62	2.7	2	1.5	0.9	0.55	0.45	0.26	0.07	-		73
0.31	2.05	2.8	2.5	1.8	1.1	0.65	0.5	0.35	0.25	0.1		90
0.4	2.54	2.8	2.5	2.1	1.5	1.1	0.66	0.36	0.26	0.08		86

For each cartridge MIDI Xi40-2:



Figure 20: Image of Piab® cartridge MIDI Xi40-2.

Vacuum flow:

Feed pressure:	Air consumption:	Vacuum flow (NI/s) at different vacuum levels (-kPa)										Max vacuum:
MPa	NI/s	0	10	20	30	40	50	60	70	80	90	-kPa
0.45	1.83	2.8	2.3	1.6	1.0	0.73	0.58	0.43	0.32	0.18	0.03	95
0.5	2	2.8	2.4	1.8	1.2	0.72	0.54	0.4	0.3	0.14	0.02	94
0.6	2.33	2.7	2.4	2.0	1.5	0.9	0.52	0.4	0.31	0.16	0.03	94

7. PARTS LIST

7.1 Ejector body

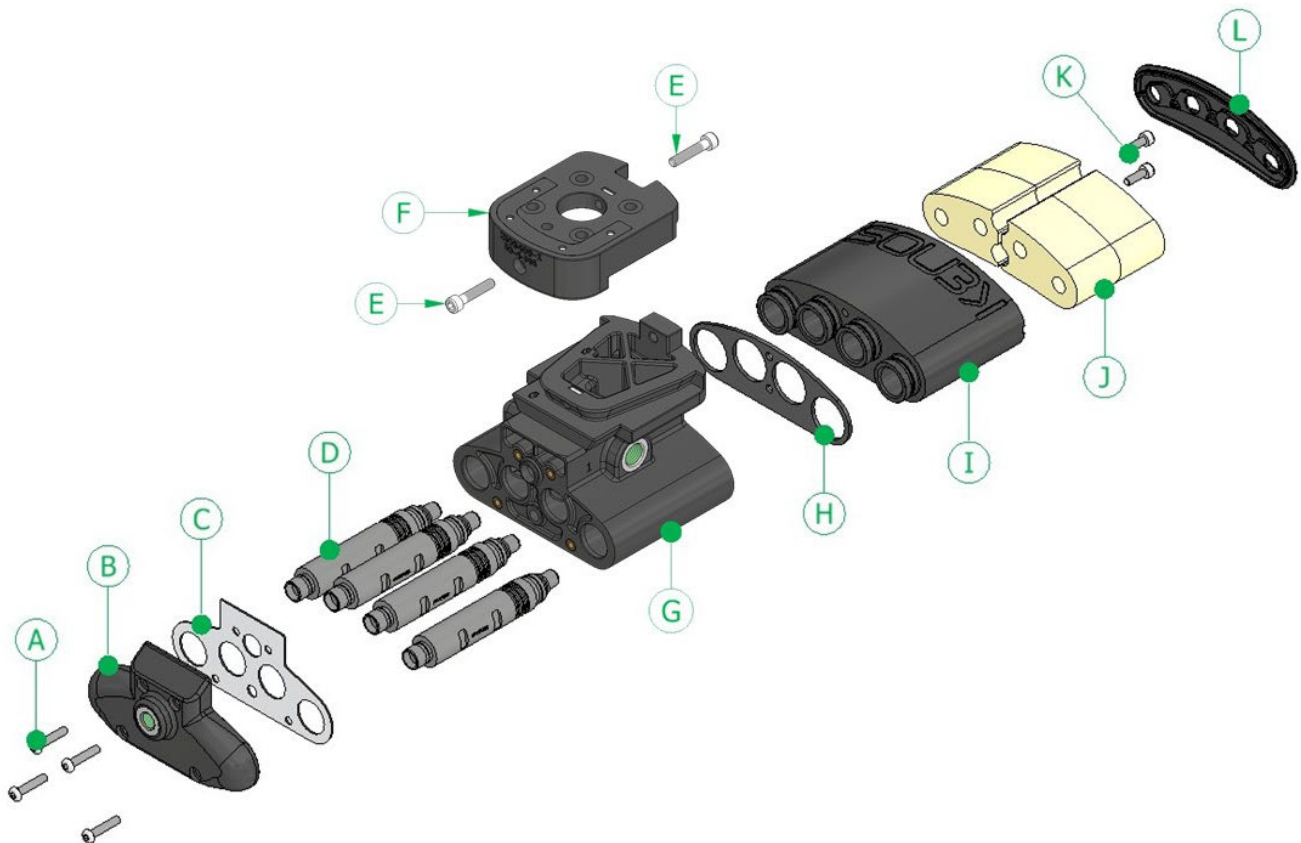


Figure 21: Exploded view drawing of KCM ejector.

POS.	DESCRIPTION
A	Screws
B	Cartridge cover
C	Ejector cover gasket
D	Cartridges
E	Screws
F	Robot flange
G	Ejector body
H	Silencer gasket
I	Silencer body
J	Silencer
K	Screws
L	Silencer cover

- The ejector can keep from 1 to 4 cartridges. If there are the necessity you can remove the blind cartridges and add more cartridges to increase the flow capacity.
- The entire ejector consists of a single body with integrated silencer.
- Almost of the spare parts are available on chapter 15.

8. MAINTENANCE

8.1 Annual maintenance plan

Control step		Daily	Weekly	Monthly	Every 6 months	Every 12 months
Check max vacuum level of the ejector			X			
Check supply air pressure			X			
Check the air connection			X			
Check the silencer and the exhaust holes				X		
Check the electrical connection				X		
Check tightening					X	
Clean ejector exterior					X	
Check the general condition						X

8.2 Ejector maintenance

It is important to perform periodic cleaning of the ejector to avoid performance reductions due to dirt. If the work environment contains dust, sawdust and volatile microparticles, periodic cleaning of the ejector must be increased.

Attention: the ejector maintenance must be made by a specialized mechanical technician.

Follow the steps below for correct maintenance:



Step: 8.2.1

- Remove the silencer cover using a flat screwdriver.
- Insert the screwdriver on the slot and push out gently the silencer cover.

Step: 8.2.2

- Remove the silencer cover.

Step: 8.2.3

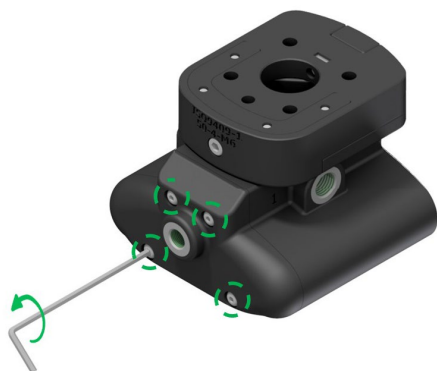
- Remove the two screws inside the silencer body.

Step: 8.2.4

- Remove the cartridges using a pliers.



Cleaning of the body:



Step: 8.2.5

- Replace the cartridges with new one.

Step: 8.2.6

- Remove the 4 screws on the cartridges cover.

Step: 8.2.7

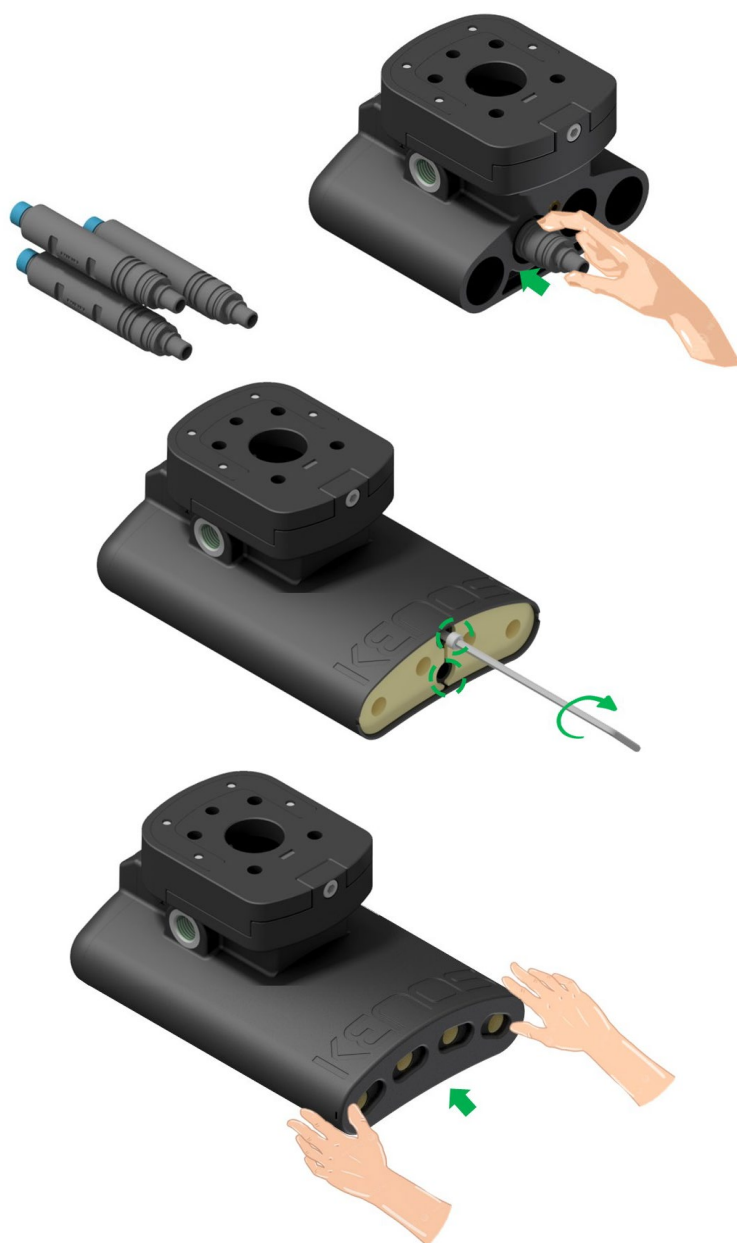
- Remove the cartridges cover with the gasket.

Step: 8.2.8

- Clean the plastic module with compressed air, cloth and degreaser.

Step: 8.2.9

- Insert the cartridges cover with the gasket fixing the 4 screws.

**Step: 8.2.10**

- Insert the cartridges on the plastic body of the ejector.

Step: 8.2.11

- Fix the two screws inside the silencer body.

Step: 8.2.12

- Assemble the silencer by applying light pressure until you hear a "click".

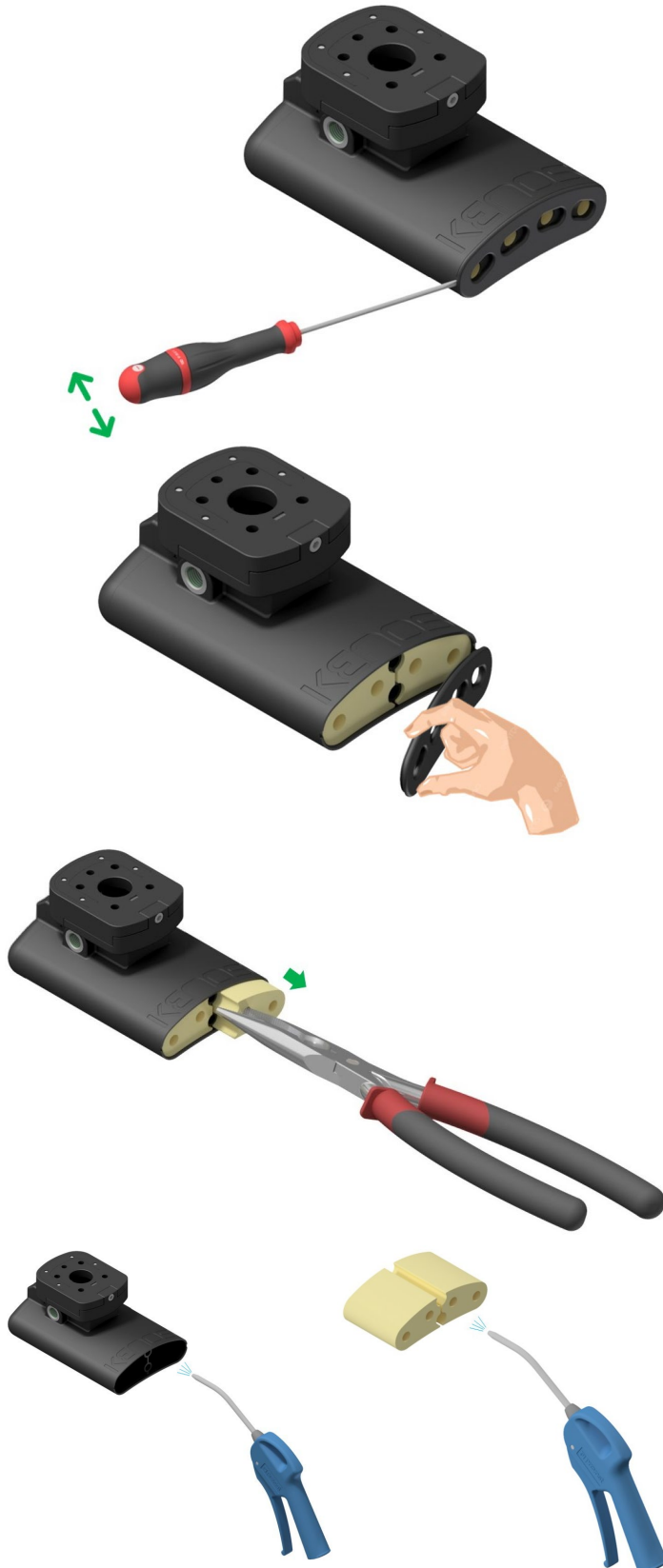
Figure 22: *Ejector maintenance steps.*

8.3 Silencer maintenance

It is important to perform periodic cleaning of the silencer to avoid performance reductions due to dirt. If the work environment contains dust, sawdust and volatile microparticles, periodic cleaning of the silencer must be increased.

Attention: the silencer maintenance must be made by a specialized mechanical technician.

Follow the steps below for correct maintenance:



Step: 8.3.1

- Remove the silencer cover using a flat screwdriver.
- Insert the screwdriver on the slot and push out gently the silencer cover.

Step: 8.3.2

- Remove the silencer cover.

Step: 8.3.3

- Remove the 4 pcs. of the silencer foam using a pliers.

Step: 8.3.4

- Blow with compressed air inside the plastic body of the silencer.
- Blow with compressed air the silencer foam.

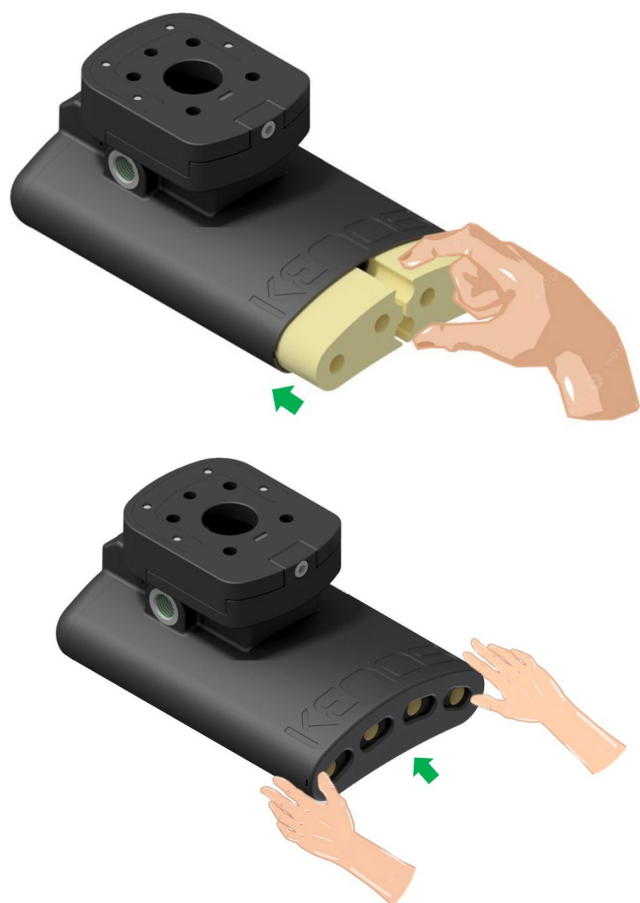


Figure 23: *Silencer maintenance steps.*

Step: 8.3.5

- If the silencer foam is too dirty or damaged, replace it.
- See in chapter 15 for the spare parts.
- Insert the 4 pcs. of the silencer foam in the plastic body.

Step: 8.3.6

- Assemble the silencer by applying light pressure until you hear a "click".

9. TROUBLESHOOTING


Note!

We recommend always running preliminary tests with original samples. We are available for running such tests.

Type of trouble	Cause	Solutions
Insufficient vacuum level or vacuum achieved too slowly	Operating pressure too low	Increase the pressure
	Internal diameter of pressure hose too small	Use hoses with larger internal diameter
	Damaged sealing	Check and replace if necessary
	Leak in pressure hose	Check hoses
	Dirty ejector	Clean
Object not gripped	Low vacuum level	See above
	Insufficient suction capacity	Insert one more cartridge ejector
	Lift is too fast	Slow down lift, avoid acceleration peaks
	Pieces not suitable for lifting with this system	Replace grip solution
	Occluded silencer	Replace silencer
Foam and suction cups wear very quickly	The system is not corrected placed on the workpiece	The gripping system must be parallel to the workpiece surface

10. ADAPTER PLATES

10.1 ISO9409-1-40-4-M6:

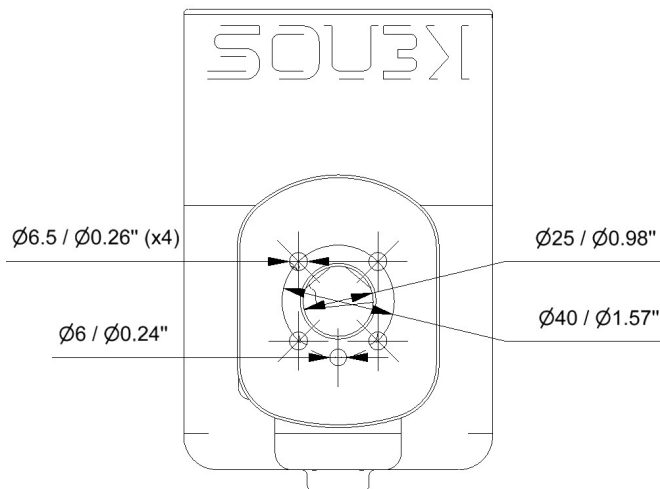


Figure 24: Drawing of robot fixing flange.

10.2 ISO9409-1-50-4-M6:

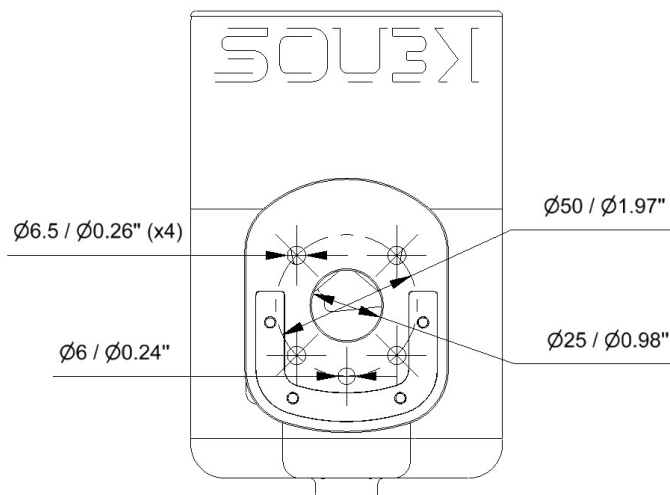


Figure 25: Drawing of robot fixing flange.

10.3 ISO9409-1-80-6-M8:

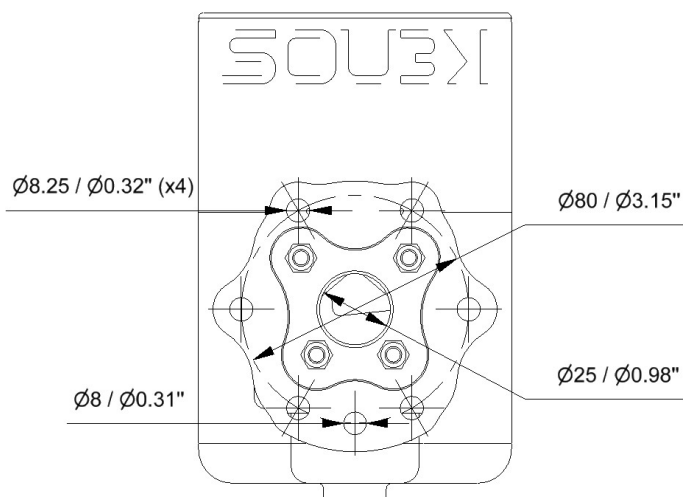


Figure 26: Drawing of robot fixing flange.

11. ACCESSORIES

11.1 Monitoring:



Figure 27: Image of monitoring components.

ITEM N° PIAB	DESCRIPTION
3101602	Vacuum gauge w. nut -100 kPa/-30 inHg
0212040	Vacuum Switch 3-color Digital Display M8

11.2 Quick change flange:



Figure 28: Image of tool changer.

ITEM N° PIAB	DESCRIPTION
0242610	piCOBOT® Tool Changer Pump Side

11.3 Solenoid valve:

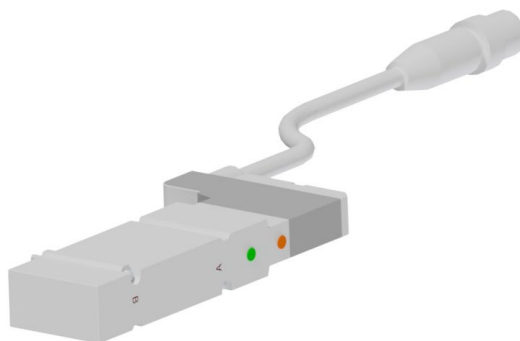


Figure 29: Images of solenoid valve.

ITEM N° PIAB	DESCRIPTION
0211614	Solenoid valve 2x3/2 N.C, V2 version (1pc.)
0256680	Solenoid valve 2x3/2 N.O / N.C, V4 version (1pc.)

12 TECHNICAL DATA

12.1 Air consumption

N° of cartridges:	Air consumption at 6 bar (NI/s)/ 87.0 psi (scfm):		Air consumption at 4 bar (NI/s)/ 58.0 psi (scfm):
	MIDI Si32-3	MIDI Xi40-3	MIDI Pi48-3
1 Cartridges	1.75 / 3.71	2.33 / 4.93	2.54 / 5.38
2 Cartridges	3.5 / 7.42	4.66 / 9.87	5.08 / 10.76
3 Cartridges	5.25 / 11.12	6.99 / 14.81	7.62 / 16.15
4 Cartridges	7.0 / 14.83	9.32 / 19.74	10.16 / 21.53

12.2 Pneumatic technical information

DESCRIPTION:	UNIT:	MIDI SI32-2 CARTRIDGE	MIDI Pi48-2 CARTRIDGE	MIDI Xi40-2 CARTRIDGE
Feed pressure, optimal	MPa [psi]	0.6 [87]	0.4 [87]	0.5 [87]
Max vacuum at opt. pressure	-kPa [-inHg]	75 [22.1]	86 [22.1]	94 [22.1]
Air consumption at opt. pressure / nozzle	NI/s [scfm]	1.75 [3.71]	2.54 [5.38]	2.33 [4.93]
Max vacuum flow at opt. pressure / nozzle	NI/s [scfm]	3.3 [6.99]	2.8 [5.93]	2.8 [5.93]

12.3 Air

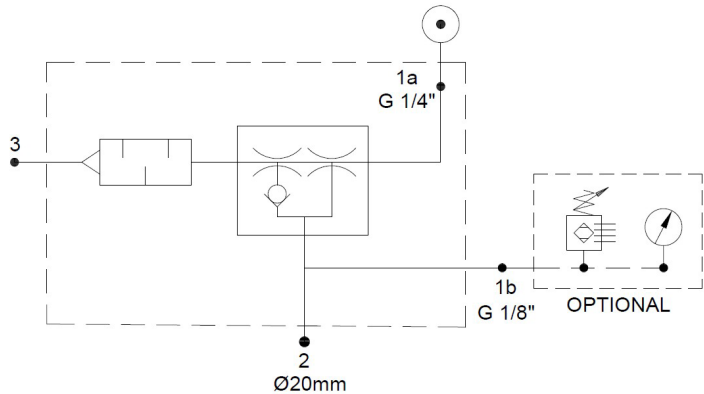
DESCRIPTION:	VALUE:
Supply air connection size	Ø8mm diameter by up to 2 meters (6.5ft)
Air quality	DIN ISO 8573-1 class 4

12.4 Temperature

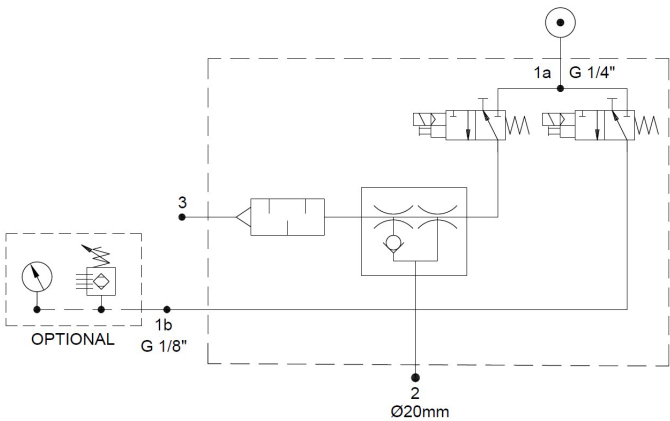
DESCRIPTION:	VALUE:
Operating temperature environment	10° - 50° (32 - 122F)
Operating temperature workpiece	10° - 50° (32 - 122F)

13. PNEUMATIC DIAGRAM

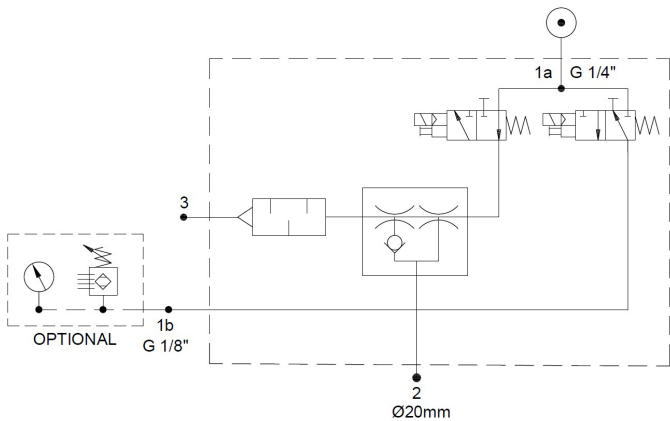
KCM ejector



KCM ejector (V2 version)



KCM ejector (V4 version)



LEGEND

1a	Pressure air supply for vacuum
1b	Pressure air supply for blow off or vacuum sensing
2	Vacuum
3	Exhaust

14. SPARE PARTS

14.1 Spare parts components

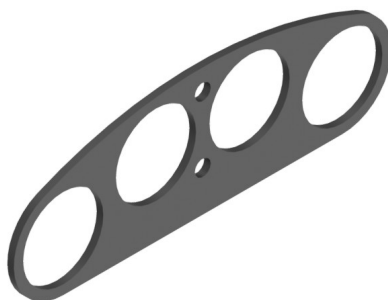


Figure 30: *Images of silencer cover gasket.*

ITEM N. PIAB	DESCRIPTION
0256681	Silencer cover gasket (1pc.)

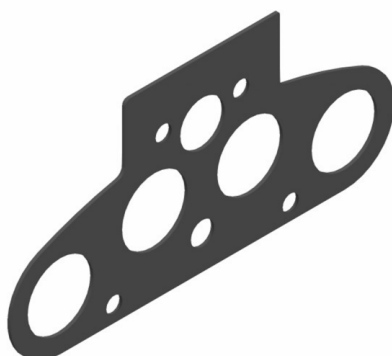


Figure 31: *Images of ejector cover gasket.*

ITEM N. PIAB	DESCRIPTION
0256682	Cartridges cover gasket (1pc.)

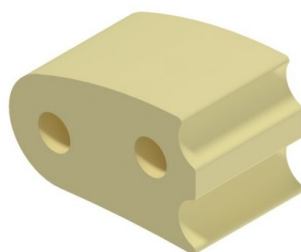


Figure 32: *Images of silencer.*

ITEM N. PIAB	DESCRIPTION
0256683	Ejector silencer (4pcs.)



Figure 33: *Image of Piab® cartridge MIDI Si32-2.*

ITEM N. PIAB	DESCRIPTION
0107124	COAX® cartridge MIDI Si32-2 (1pcs.)



Figure 34: Image of Piab® cartridge MIDI Pi48-2.

ITEM N. PIAB	DESCRIPTION
0107125	COAX® cartridge MIDI Pi48-2 (1pc.)



Figure 35: Image of Piab® cartridge MIDI Xi40-2.

ITEM N. PIAB	DESCRIPTION
0118747	COAX® cartridge MIDI Xi40-2 (1pc.)



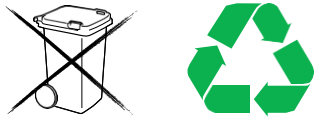
Figure 36: Image of blind cartridge for Midi COAX.

ITEM N. PIAB	DESCRIPTION
0256684	Blind Cartridge for Midi COAX (1pc.)

15. 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, sealing's, hoses, 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 willful 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 & Conditions shall apply to any repaired or replaced Products by the Seller.

16. RECYCLING AND DISPOSAL



In case of disposal of the system or non-working parts, follow these procedures:

Provide for disposal to Authorized Bodies, in full compliance with current regulations regarding waste. Where non-reusable and / or deemed RAEE "waste" such as electrical and electronic equipment are not to be given in urban waste collection bins. As far as the metal mass of the system is concerned, is sufficient to subdivide the different materials for correct recycling.

17. NOTES

This image shows a blank sheet of white paper with horizontal dashed lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting or typing. There are no margins, text, or other markings on the page.



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