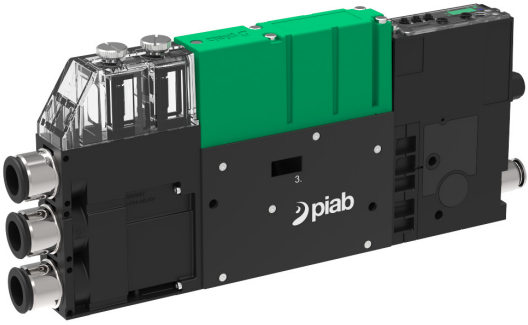
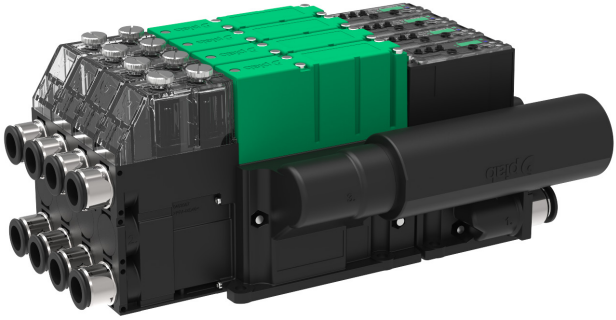
MANUAL

piCOMPACT®23





piab

CONTENTS

FEATURES

- Flexible configuration options to perfectly match application needs.
- Configurable vacuum ejector based on COAX® technology with integrated controls.
- Optimized design for high reliability and fast cycle times.
- High Speed valves with adaptive PWM (Pulse Width Modulation) to reduce heat generation and further improve reliability.
- Valve protection (Automatic Condition Monitoring, ACM, function).
- Integrated automatic air/energy-saving function (ES) with adjustable hysteresis that will further reduce energy usage (up to 90–95%). Activate and optionally sets itself automatically (Automatic Level Determination, ALD, function).
- Light weight package thanks to high-performance plastic parts.
- Optional Bi-stable (latching) on/off valve, provides security in case for emergency stop. The valve remains in the last position.
- Patented Intelligent Blow-off (IBO) automatically stops the blow-off when vacuum is removed from system and optimises the usage of blow-off air.
- Self-Adhesion Control (SAC), a useful and patented feature to automatically avoid unwanted vacuum in the cups during positioning.

INTENDED USE

- The product shall be used to evacuate air (non liquids) from a volume to create vacuum for gripping, holding and processes
- The product can be used to blow air for surface cleaning and to remove vacuum from a volume
- The product can be used to detect and monitor vacuum
- The product shall be used in environments within the product's specifications and certifications
- The product shall be installed in accordance to installation instructions
- The product shall be maintained in accordance to maintenance instructions
- Troubleshooting shall be conducted in accordance to manual instructions
- The safety instructions shall be followed
- For professional use only.

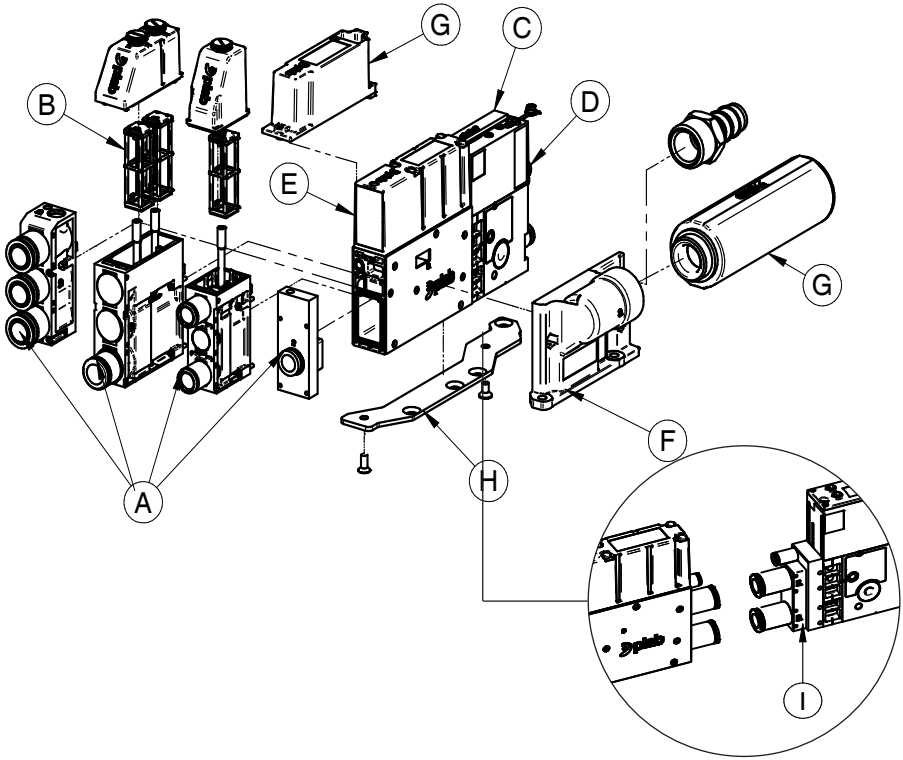
MISUSE

- Result from readily predictable human behavior.
- The product shall not be used to evacuate liquids.
- The product shall not be used to evacuate solid content without the use of filter.
- The product shall not be used in a fully closed compartment (non ventilated) if not exhaust is piped away.
- The product shall not be used as stand alone safety system to fulfill international l ifting norms.
- The exhaust shall not be restricted or blocked.
- The vacuum and exhaust port shall not simultaneous be blocked when unit is generating vacuum.
- The product shall not be used to create vacuum or blow for other purposes than the intended use.
- Vacuum and exhaust air can cause severe injuries, keep hands, legs, hair and eyes away from vacuum inlets and exhausts.
- Do not install or operate you product if damaged.
- Do not operate the product if compressed air line is not properly secured, loose compressed air lines can cause severe injuries.
- Using compressed air pressure and/or electrical voltage outside specification can cause severe damage due to performance loss.
- Blow-off functions or ejector exhaust shall not be used to pressurize sealed com partments such as cylinders and/or tank-volumes.

English

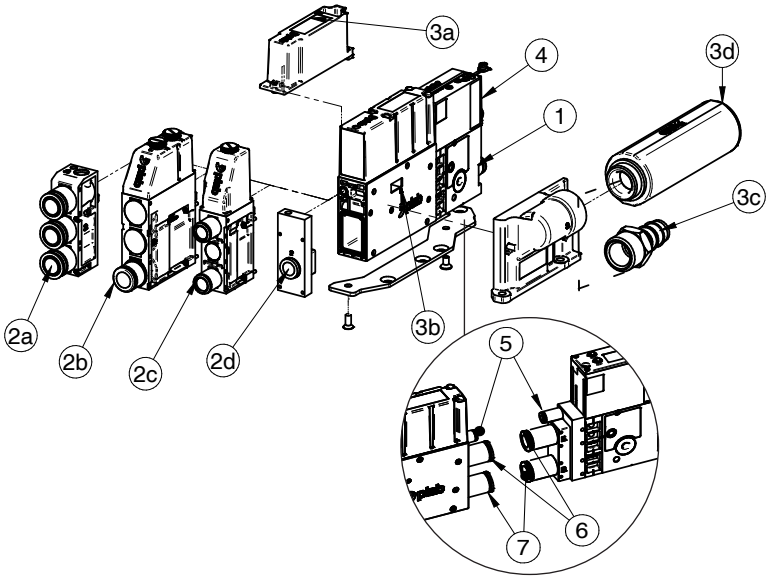
OVERVIEW

Overview 1 channel



Pos.	Description	Note
A	Vacuum connection block	
B	Vacuum filter	
C	Vacuum Sensor Switch / No sensor	
D	Valve module	
E	1x COAX® cartridge / 2x COAX® cartridge	
F	Gable for side mounted silencer	G 3/4” threads
G	Top mounted silencer/Side mounted silencer	
H	Fastening plate	Only for integrated or topmounted silencer and when “no split” is selected
I	Connection block	Only for split

Connections 1 channel



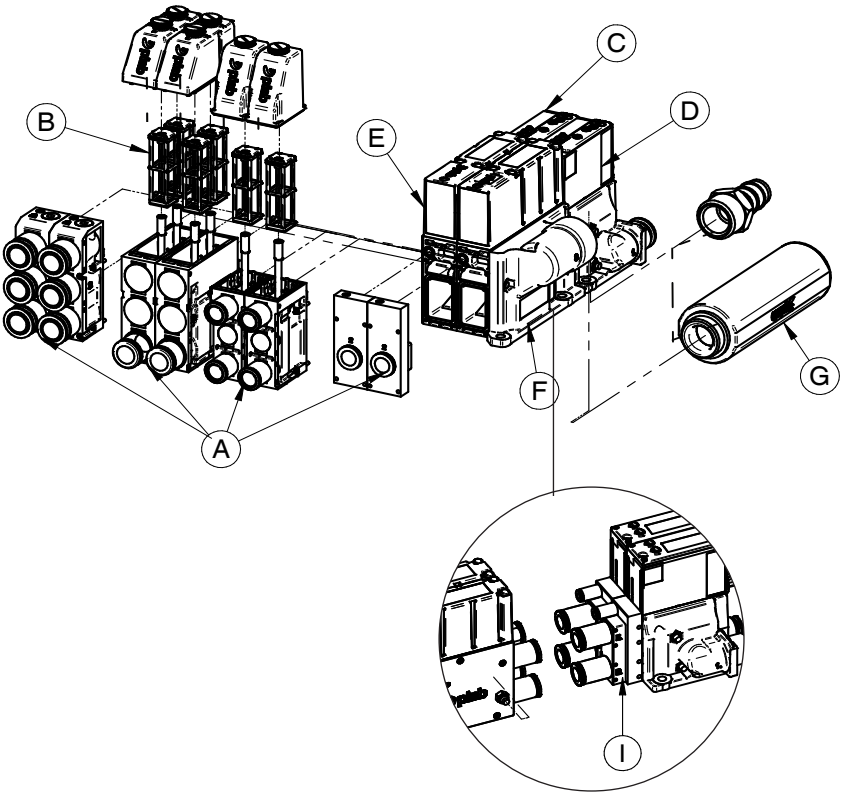
Pos.	Description	Size
1	Compressed air	Push-in: Ø6 / Ø1/4" / Ø8 (Ø5/16") / Ø10 / Ø3/8"
2a	Vacuum port (1-3 ports)	Push-in: Ø10 / Ø3/8" / Ø12 / Ø1/2" Barb: Ø12 /Ø1/2"
2b	Vacuum port (1-3 ports)	Push-in: Ø10 / Ø3/8" / Ø12 / Ø1/2" Barb: Ø12 /Ø1/2"
2c	Vacuum port (1-3 ports)	Push-in: Ø8 (Ø5/16") / Ø10 / Ø3/8"
2d	Vacuum port	Push-in: Ø10
3a	Exhaust on top (top mounted silencer)	
3b	Exhaust on the side (integrated silencer/ topmounted silencer)	
3c	Central exhaust , no side mounted silencer	
3d	Central exhaust, side mounted central silencer	
4	Connector	M12 8p, A-code
5*	Sensor connection split	Ø4
6*	Valve air connection split (vacuum)	Push-in: Ø6 / Ø1/4" / Ø8 (Ø5/16") / Ø10 / Ø3/8"
7*	Blow-off air connection split	Push-in: Ø6 / Ø1/4" / Ø8 (Ø5/16") / Ø10 / Ø3/8"
8	Sensing port	Plugged / G1/8"

*Hose not included

English

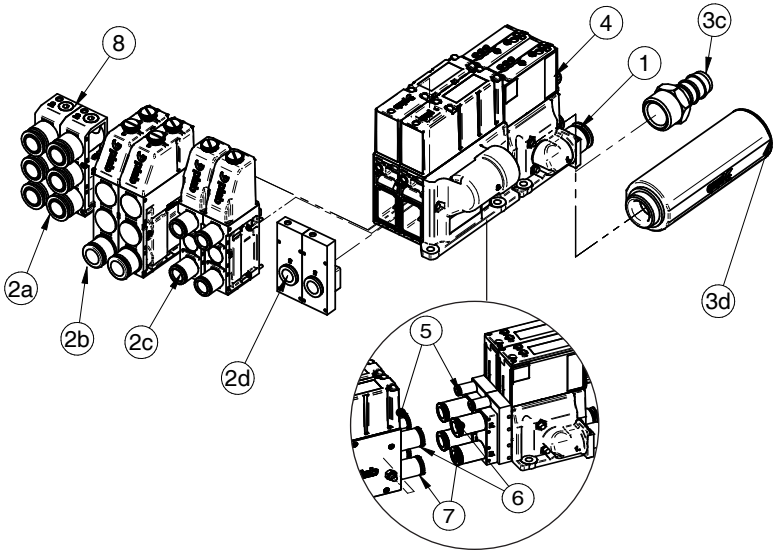
OVERVIEW

Overview 2 channels



Pos.	Description	Note
A	Vacuum connection block	
B	Vacuum filter	
C	Vacuum Sensor Switch / No sensor	
D	Valve module	
E	1x COAX® cartridge / 2x COAX® cartridge	
F	Gable	Exhaust on the side, not for split, G 3/4” threads
G	Side mounted silencer	Exhaust on the side
I	Connection block	Only for split

Connections 2 channels

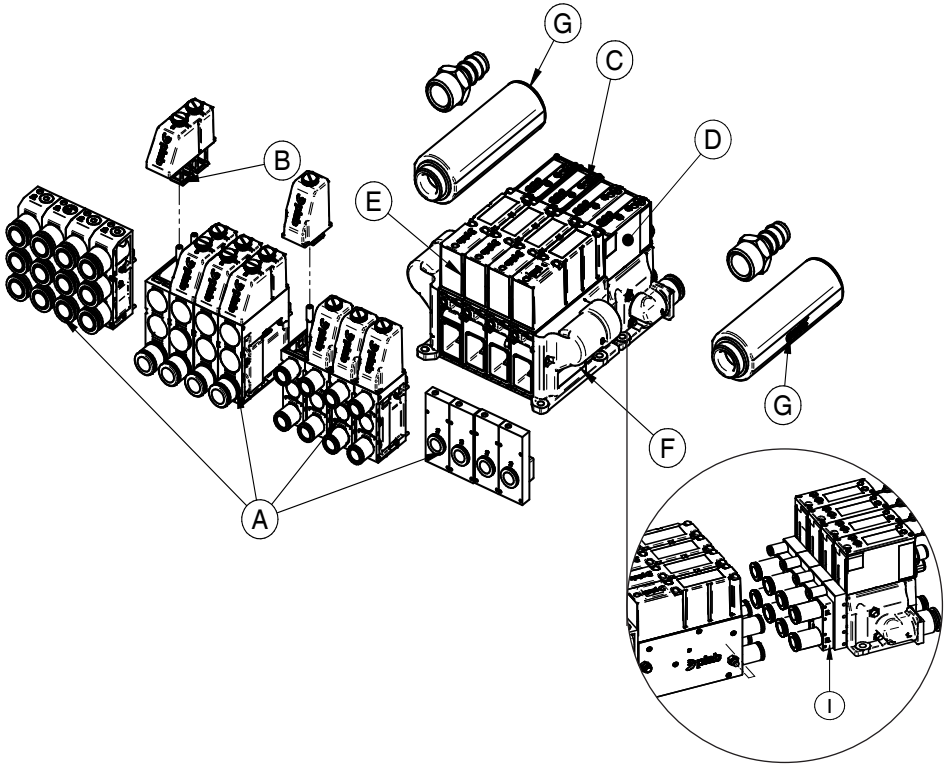


Pos.	Description	Size
1	Compressed air (common feed)	Push-in: Ø6 / Ø1/4” / Ø8 (Ø5/16”) / Ø10 / Ø3/8”
2a	Vacuum port (1-3 ports)	Push-in: Ø10 / Ø3/8” / Ø12 / Ø1/2” Barb: Ø12 /Ø1/2”
2b	Vacuum port (1-3 ports)	Push-in: Ø10 / Ø3/8” / Ø12 / Ø1/2” Barb: Ø12 /Ø1/2”
2c	Vacuum port (1-3 ports)	Push-in: Ø8 (Ø5/16”) / Ø10 / Ø3/8”
2d	Vacuum port	Push-in: Ø10
3c	Central exhaust (no side mounted silencer)	
3d	Central exhaust, side mounted central silencer	
4	Connector (one connector/ channel)	M12 8p, A-code
5*	Sensor connection split	Ø4
6*	Valve air connection split (vacuum)	Push-in: Ø6 / Ø1/4” / Ø8 (Ø5/16”) / Ø10 / Ø3/8”
7*	Blow-off air connection split	Push-in: Ø6 / Ø1/4” / Ø8 (Ø5/16”) / Ø10 / Ø3/8”
8	Sensing port	Plugged / G1/8”

*Hose not included

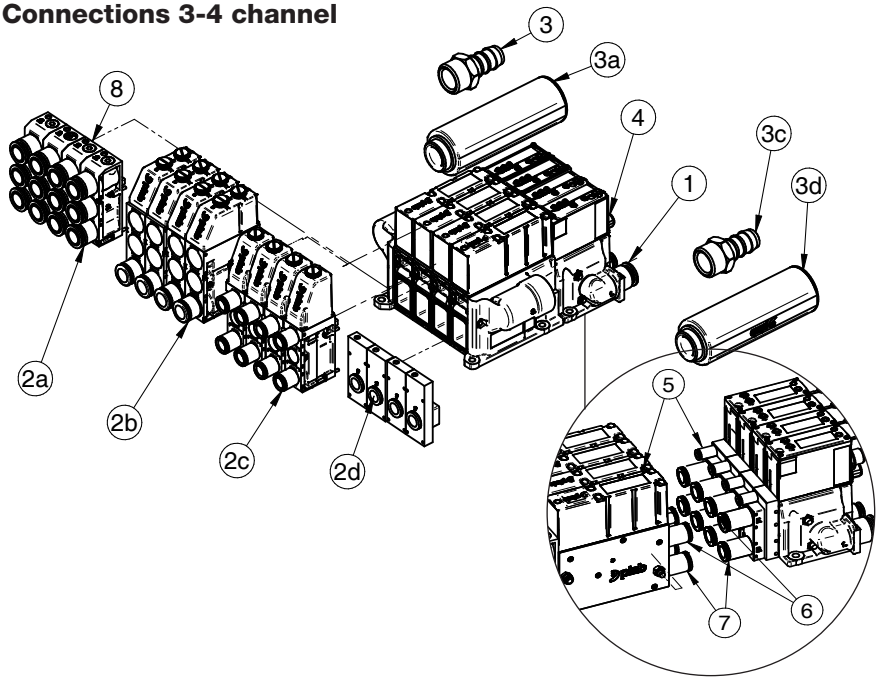
OVERVIEW

Overview 3-4 channel



Pos.	Description	Note
A	Vacuum connection block	
B	Vacuum filter	
C	Vacuum Sensor Switch / No sensor	
D	Valve module	
E	1x COAX® cartridge / 2x COAX® cartridge	
F	Gable	Exhaust on the side, not for split, G 3/4” threads
G	Side mounted silencer	Exhaust on the side
I	Connection block	Only for split

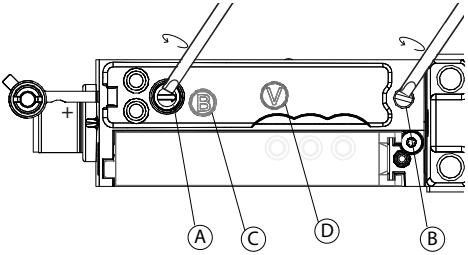
Connections 3-4 channel



Pos.	Description	Size
1	Compressed air (2x common feed)	Push-in: Ø6 / Ø1/4" / Ø8 (Ø5/16") / Ø10 / Ø3/8"
2a	Vacuum port (1-3 ports)	Push-in: Ø10 / Ø3/8" / Ø12 / Ø1/2" Barb: Ø12 /Ø1/2"
2b	Vacuum port (1-3 ports)	Push-in: Ø10 / Ø3/8" / Ø12 / Ø1/2" Barb: Ø12 /Ø1/2"
2c	Vacuum port (1-3 ports)	Push-in: Ø8 (Ø5/16") / Ø10 / Ø3/8"
2d	Vacuum port	Push-in: Ø10
3c	Central exhaust (no side mounted silencer)	
3d	Central exhaust, side mounted central silencer	
4	Connector	M12 8p, A-code
5*	Sensor connection split	Ø4
6*	Valve air connection split (vacuum)	Push-in: Ø6 / Ø1/4" / Ø8 (Ø5/16") / Ø10 / Ø3/8"
7*	Blow-off air connection split	Push-in: Ø6 / Ø1/4" / Ø8 (Ø5/16") / Ø10 / Ø3/8"
8	Sensing port	Plugged / G1/8

*Hose not included

Valve module



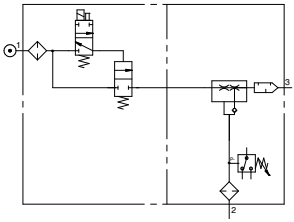
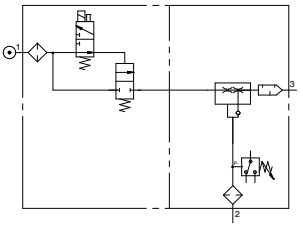
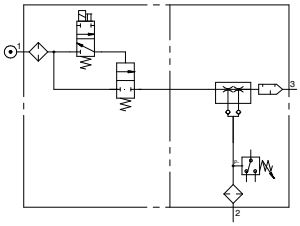
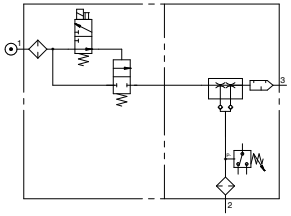
Top view of pump

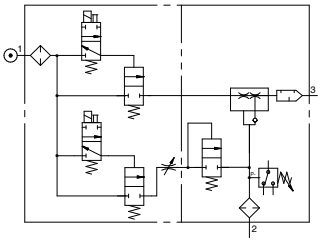
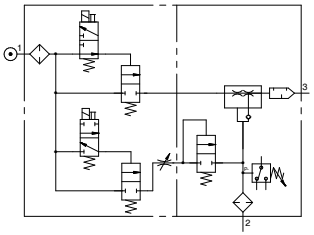
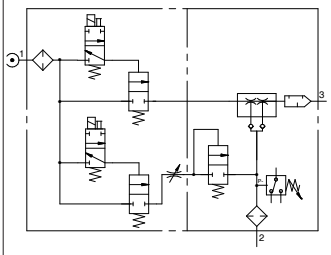
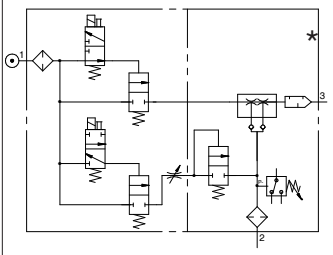
Pos.	Description	Note
A	Time setting, automatic blow off (optional)	$Ø_{max}$ = 3.4 [0.133”], default 0.5 sec
B	Flow setting, blow flow	$Ø_{max}$ = 3.7 [0.146”]
C	Manual override, blow-off valve (optional)	Push button to activate
D	Manual override, vacuum valve (optional)	Push button to activate

Pneumatic diagrams

Note: Filter and vacuum sensor are optional

1. Compressed air, 2. Vacuum, 3. Exhaust

	Vacuum NC	Vacuum NO
Without non-return valve		
With non-return valve		

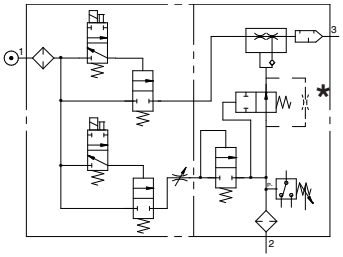
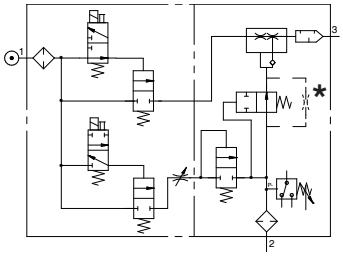
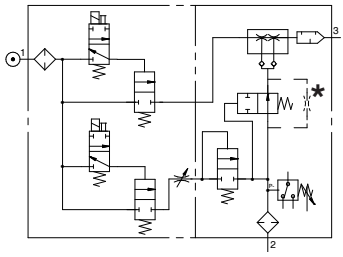
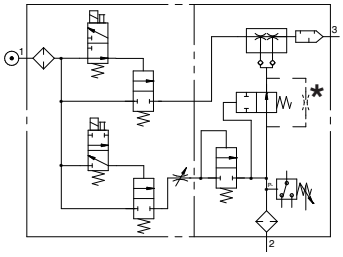
	Vacuum NC & Blow-off NC	Vacuum NO & Blow-off NC
Without non-return valve		
With non-return valve		

*Also the “fail safe” version (power off – NO), in running mode the vacuum valve behaves like a NC valve but if power is lost the valve goes into NO mode leaving compressed air for continuous vacuum.

English

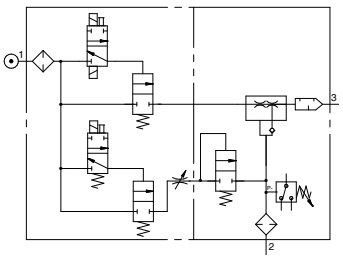
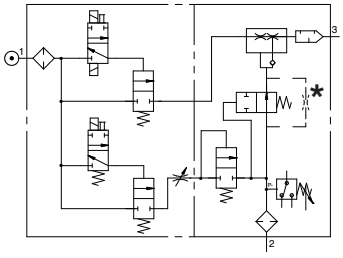
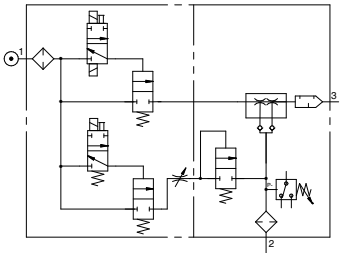
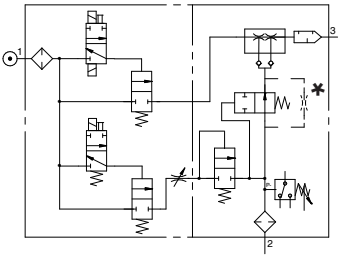
Vacuumhovering (PVH) and amplified blow-off (ABO)

1. Compressed air, 2. Vacuum, 3. Exhaust

	Vacuum NC	Vacuum NO
Without non-return valve		
With non-return valve		

Pneumatic diagram, bi-stable

1. Compressed air, 2. Vacuum, 3. Exhaust

	Vacuum bi-stable & Blow-off NC	Vacuum bi-stable & Blow-off NC + PVH / ABO
Without non-return valve		
With non-return valve		

*Only for PVH

INSTALLATION

WARNING! Do not install or operate your piCOMPACT®23 if damaged during transport, handling or use. Damage may result in bursting and cause injury or property damage.

Pneumatic installation

piCOMPACT®23 can be installed in any orientation. Ensure that the exhaust from the ejector is not blocked. When connecting oil free compressed air and vacuum hoses to the unit, it is important to choose proper pipe dimensions to prevent pressure drops. Avoid restrictive inner diameters, long piping distances, sharp bends and small sized connections.

Pneumatic technical information (per channel)

		Unit	COAX®			
			SX12		SX42	
			x1	x2	x1	x2
Feed pressure, pump at opt.		MPa [psi]	0.504 [73.2]	0.515 [74.7]	0.47 [68.2]	0.54 [78.3]
Feed pressure, nozzle at opt.		MPa [psi]	0.5 [72.5]		0.43 [62.4]	
Max vacuum at opt. pressure		-kPa [-inHg]	85 [25]		90 [26.6]	
Air consumption at opt. pressure		Nl/s [scfm]	0.72 [1.52]	1.44 [3.05]	2.21 [4.68]	4.42 [9.36]
Max vacuum flow at opt. pressure		Nl/s [scfm]	1.22 [2.58]	2.44 [5.16]	3.46 [7.33]	6.92 [14.7]
Flow, blow off at 0.5 MPa [72.5 psi] No counter pressure / Counter pressure 0.1 MPa [14.5 psi]	Without hatch	Nl/s [scfm]	0-2.3/0 [0-0.08/0]		0-4.3/0 [0-0.15/0]	
	With hatch, ABO		0-2.8/2.7 [0-0.1/0.1]		0-4.4/4.3 [0-0.16/0.15]	
	With hatch, PVH		0-2.7/1.5 [0-0.1/0.05]		0-4.4/2.2 [0-0.16/0.08]	

Compressed air quality

Quality of the compressed air shall fulfil the requirements in DIN ISO 8573-1 class 4.

Min. recommended hose diameter, outer/inner diameter

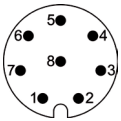
Car-tridge	Vacuum		Compressed air 1 channel		Compressed air 2 channel		Compressed air 3-4 channel	
	mm	Inches	mm	Inches	mm	Inches	mm	Inches
SX12	8/6	5/16/1/4	6/4	1/4/5/32	8/6	5/16/1/4	2x 8/6	2x 3/8/5/16
SX12 x2	10/8 *	3/8/5/16 *	8/6	5/16/1/4	10/8	3/8/5/16	2x 10/8	2x 3/8/5/16
SX42	12/10	1/2/3/8	8/6	5/16/1/4	10/8	3/8/5/16	2x 10/8	2x 3/8/5/16
SX42 x2	12/10 *	1/2/3/8 *	10/8	3/8/5/16	12/10	1/2/3/8	2x 12/10	2x 1/2/3/8

**Recommended minimum dual fittings.*

Minimum recommended hose diameters are valid for hose lengths up to 2m (6 ft). For longer lengths, use larger hose diameters or multiple hoses to avoid reduced vacuum flow performance and the risk for false vacuum signals from sensors/switches.
If 3-4 units are used in a manifold with a push-in, please use both compressed air supply ports for optimum performance.
Use hose clamps and or cable ties to avoid tension and damage to the hose and hose connectors

Electrical installation

Electrical connection 1 channel, pin configuration



1 channel, M12 8p

Pin No.	Name	Description	Note	Wire Colour
1	V_{sys}	Supply voltage, 24 VDC (V+)		White
2	GND	Common, 0 VDC (V-)		Brown
3	V1	Vacuum on		Green
4	V2	Blow-off on		Yellow
5	S1	Switch output 1, Max 100 mA		Grey
6*	S2	Switch output 2, Max 100 mA	See info on next page	Pink
	LW	Leakage Warning output, Max 100 mA		
	A	Analog output, 1-5 VDC		
7*	PNP/PNP	PNP mode, do not connect pin 7	See fig. A on next page	Blue
	NPN/NPN	NPN mode, connect pin 7 to pin 2	See fig. B on next page	
	PNP/NPN	Mixed mode PNP/NPN, do not connect pin 7	See fig. C on next page	
	NPN/PNP	Mixed mode NPN/PNP, connect pin 7 to pin 2	See fig. D on next page	
8*	ES	Disable ES function, set to “High”	See info on next page.	Red
	ATBO	Disable ATBO function, set to “High”		

**Different operating alternatives depending on your piCOMPACT®23 configuration.*

ES= Energy Saving

ATBO= Time Delayed Blow-Off

“High” = 24 VDC PNP, 0 VDC NPN

Electrical connection 1 channel, cable

Use cable ties to avoid tension and damage to the cable and the piCOMPACT®23 ejector

English

Different possible pin In-/Out-put alternatives

Depending on your piCOMPACT®23 configuration you are able to give and /or receive different pin In-/Out-puts.

Pin 6 functions

-Pump equipped with an S2-Switch output 2 signal:
Pin 6 gives a “High” digital output signal on the ES high level.

-Pump equipped with a LW-Leakage Warning signal:
Pin 6 gives a “High” digital output signal if the ES function is deactivated automatically.

-Pump equipped with an A-Analogue output signal:
Pin 6 gives a continuous analogue signal from 1-5 volt.

Pin 7 functions

-Pump equipped with an PNP/PNP or NPN/NPN In-/Out-puts:

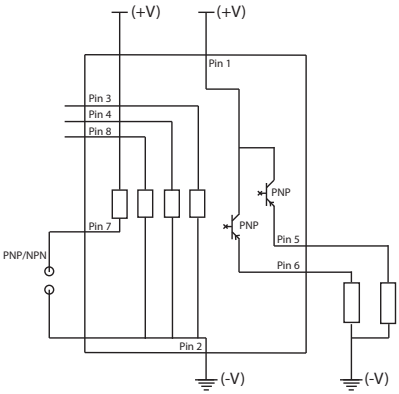


Figure A (PNP/PNP-mode)

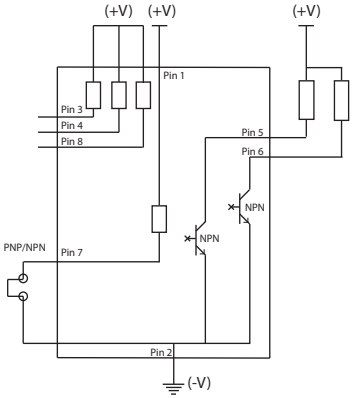


Figure B (NPN/NPN-mode)

-Pump equipped with mixed mode (PNP/NPN or NPN/PNP In-/Out-puts):

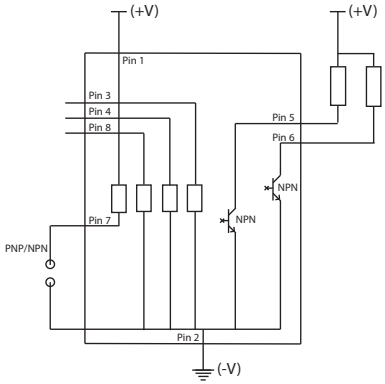


Figure C (Mixed mode PNP/NPN)

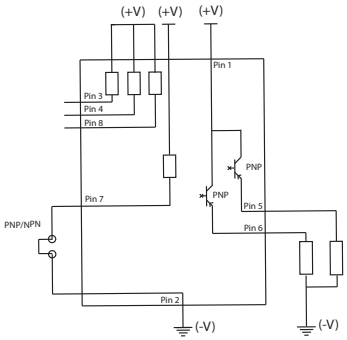


Figure D (Mixed mode NPN/PNP)

Pin 8 functions

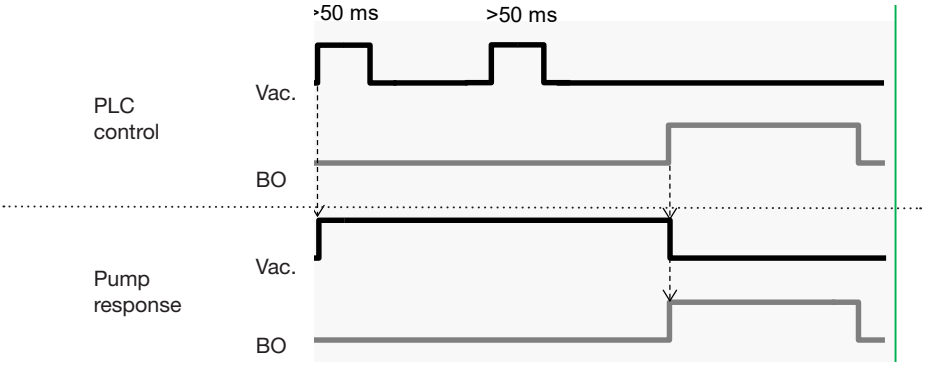
-Pump equipped with an ES function:
Automatic ES function can be turned off by setting pin 8 to “High”.

“High” = 24 VDC PNP, 0 VDC NPN

Valve control Bi-stable models

A Bi-stable (latching) valve will stay in its last position in case of emergency stop or power failure. Since the impulse controlled valve stays in last position, open or closed a part in a gripper will not be dropped.

IMP-Only configureable with standard external Blow-Off controls.



Bi stable valve option

A bi-stable (latching) valve will stay in its last position in case of a power failure or an emergency stop. The implementation of this for piCOMPACT®23 is outlined below;

Complete power failure/ power down

In case of a complete power failure, the piCOMPACT®23 bi-stable valve will secure the vacuum valve to be remained or switched into the vacuum state according to the set vacuum state from e.g. the PLC.

In a vacuum scenario where ES is not present or active and a complete power failure occurs the piCOMPACT®23 bi-stable valve will secure the vacuum valve to be remained in vacuum state ON.

In a vacuum scenario where ES is present and active and a complete power failure occurs the vacuum valve is OFF but the pump still holds a part. The ES mode of the pump will not be retained, instead the piCOMPACT®23 will sense the coming power failure and the bi-stable valve will switch the vacuum valve to vacuum state ON before the complete power failure occurs.

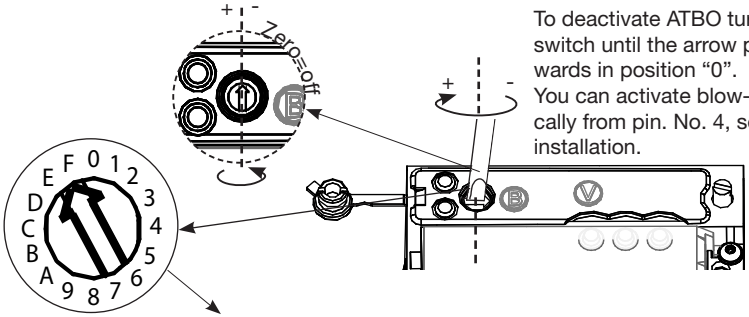
Digital IO-shut down / E-stop halt conditions

If there is a lost signal communication, for example if the actuator IO is cancelled during emergency stop, the piCOMPACT®23 bi-stable valve will remain operating its last known input control (vacuum control state) as long as power and compressed air is present.

OPERATIONAL

Automatic Timer Blow-Off (ATBO) settings

The Automatic Blow-Off Time will be increased when turning the rotary switch clockwise. For shorter blow-off times turn the rotary switch counter clockwise.



To deactivate ATBO turn the rotary switch until the arrow points upwards in position “0”.
You can activate blow-off electrically from pin. No. 4, see electrical installation.

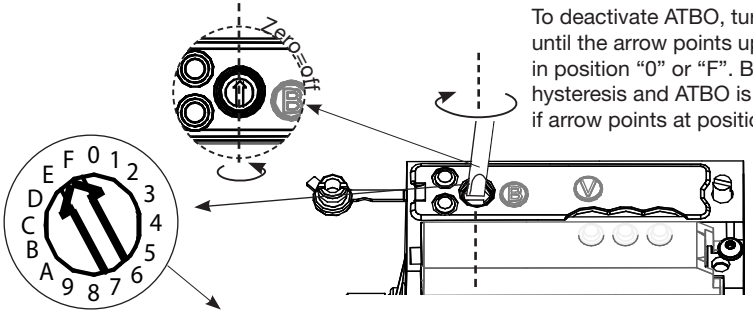
Rotary switch positions on pump-conversion to blow-off times

Rotary switch positions on pump (figs not visible on pump)	0	1	2	3	4*	5	6	7	8	9	A	B	C	D	E	F MAX
Blow-off time (s)	off	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.5	2.0	2.5	3.0

*Default settings

Automatic Timer Blow-Off (ATBO) and SAC hysteresis settings

The automatic blow-off time and SAC hysteresis will change according to table below when turning the rotary switch on the pump. Low SAC hysteresis= high sensitivity of the system. Sac duration time is 75ms.



To deactivate ATBO, turn the screw until the arrow points upwards in position “0” or “F”. Both SAC hysteresis and ATBO is deactivated if arrow points at position “0”.

Rotary switch positions on pump-conversion to blow-off times and SAC hysteresis

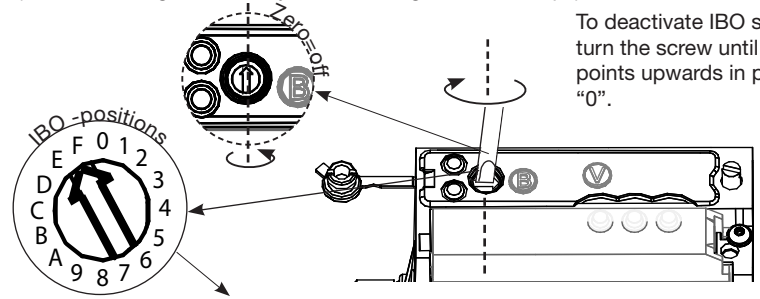
Rotary switch positions on pump (figs not visible on pump)	0	1	2	3	4*	5	6	7	8	9	A	B	C	D	E	F MAX
Blow-off time (s)	off	0.2	0.5	0.2	0.5	0.8	1.5	0.2	0.5	0.8	1.5	0.2	0.5	0.8	1.5	off
SAC hysteresis	off	1	1	2	2	2	2	3	3	3	3	4	4	4	4	2

*Default settings

English

IBO sensitivity settings

IBO sensitivity will change (level 0-3) when turning the screw on pump according to table below. IBO sensitivity can be adjusted from level 0 (suitable for small vacuum system) to level 3 (suitable for large vaccum system with large vacuum drops).



To deactivate IBO sensitivity, turn the screw until the arrow points upwards in position "0".

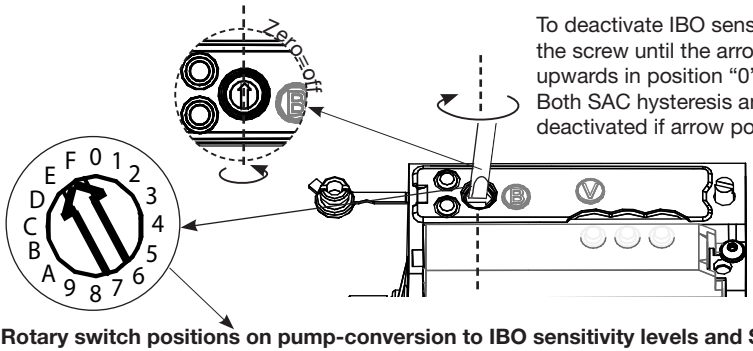
Rotary switch positions on pump-conversion to IBO sensitivity levels

Rotary switch positions on pump (figs not visible on pump)	0	1	2	3	4*	5	6	7	8	9	A	B	C	D	E	F
IBO sensitivity levels	off	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2

*Default settings

Settings of IBO sensitivity and SAC hysteresis

The IBO sensitivity level and SAC hysteresis will change according to table below when turning the rotary switch on the pump. Low SAC level= high sensitivity of the system. IBO sensitivity can be adjusted from level 0 (suitable for small vacuum system) to level 3 (suitable for large vaccum system with large vacuum drops). Sac duration time is 75ms.



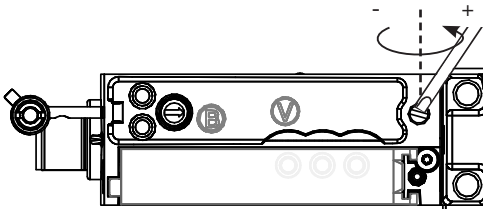
To deactivate IBO sensitivity, turn the screw until the arrow points upwards in position "0" or "F". Both SAC hysteresis and IBO are deactivated if arrow points at "0".

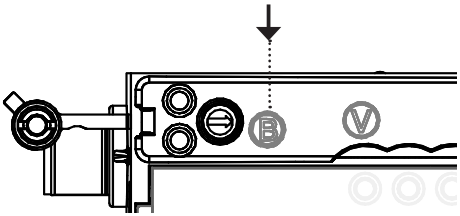
Rotary switch positions on pump-conversion to IBO sensitivity levels and SAC hysteresis

Rotary switch positions on pump (figs not visible on pump)	0	1	2	3	4*	5	6	7	8	9	A	B	C	D	E	F MAX
IBO sensitivity levels	off	0	1	2	3	0	1	2	3	0	1	2	3	2	3	off
SAC hysteresis	off	1	1	1	2	2	2	2	2	3	3	3	3	4	4	1

*Default settings

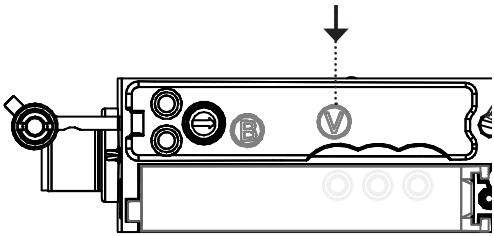
Flow setting, blow-off flow
Blow-off flow decreases when turning the screw clockwise. For increasing flow, turn it counter clockwise.



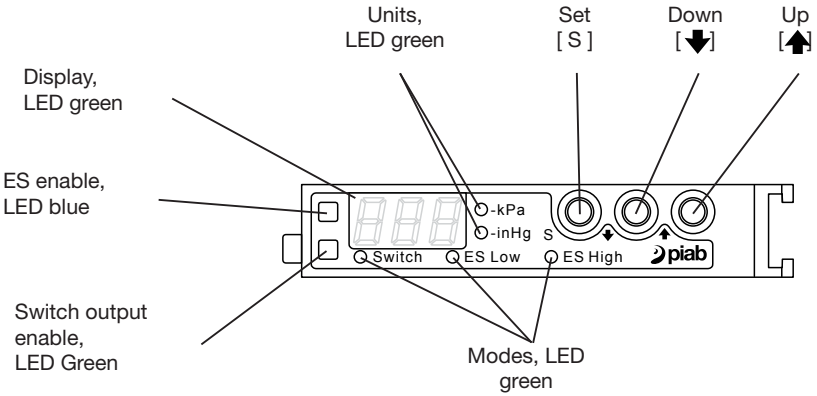


Blow-off valve manually override
Push button B firmly to manually activate the blow-off valve.

Vacuum valve manually override
Push button V firmly to manually activate the vacuum valve.

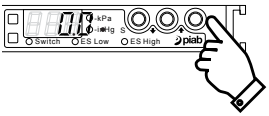


Interface

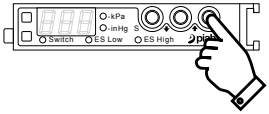


Setting the pressure unit

Changing the pressure unit to -kPa



1. Press and hold [ ]



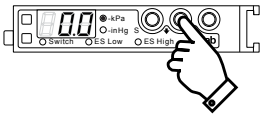
2. Display turned off.

3. Wait 3 sec.

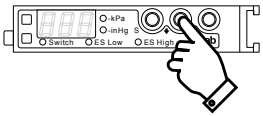
4. Release [ ].

5. Unit showing *-kPa*

Changing the pressure unit to -inHg



1. Press and hold [ ]



2. Display will be turned off.

3. Wait 3 sec.

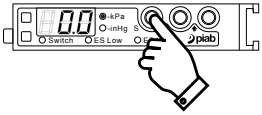
4. Release [ ].

5. Unit showing *-inHg*

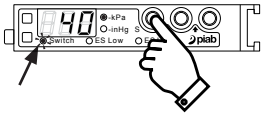
Setting the switch, ES low and ES high value

Optional only for ES units

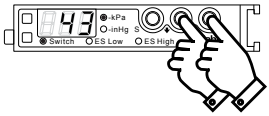
Changing switch value



1. Press and hold [S]
2. Wait 3 sec.
3. Release [S]
4. Press [S] to select switch mode



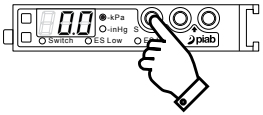
5. Press [▼] or [▲] to set the switch value



6. Leave it for 5 sec.

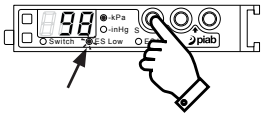
Changing ES low & high value

1. Press and hold [S]

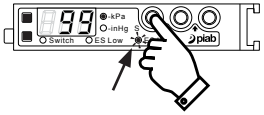


2. Wait 3 sec.
3. Release [S]
4. Press [S] to select ES low/high mode

ES low

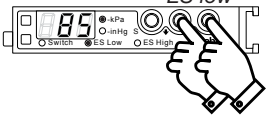


ES high

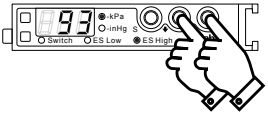


5. Press [▼] or [▲] to set the ES low/ high value

ES low

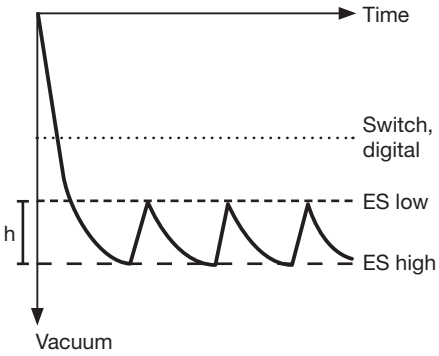


ES high



6. Leave it for 5 sec.

Vacuum chart

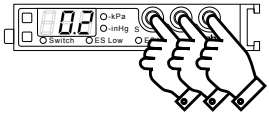


h=hysteresis

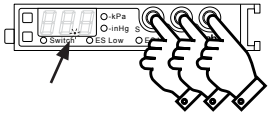
Switch < ES low < ES high
Order cannot be changed

Zero resetting

Setting the display value to zero



1. Press and hold [S]+[▼]+[▲]

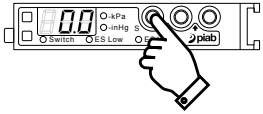


2. Display showing flashing dot.

3. Wait 5 sec.

4. Release [S]+[▼]+[▲]

5. Display showing 0Ad



6. Press [S] to set value to zero

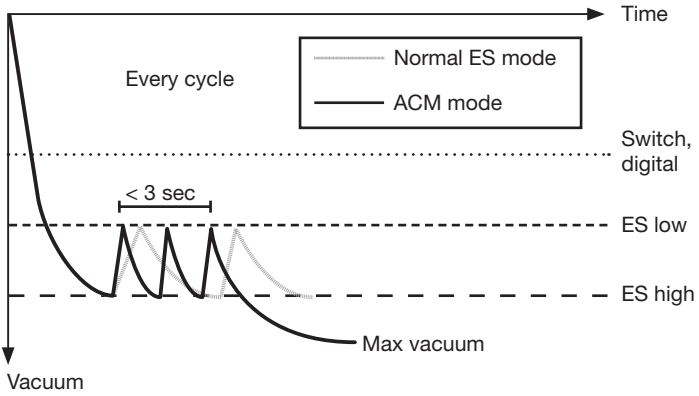
7. Leave it for 5 sec.

It is possible only with an atmospheric pressure equivalent to ±3% or less of F.S.(Full Scale)

ACM (Automatic “ES” Condition monitoring)

Optional only for ES units

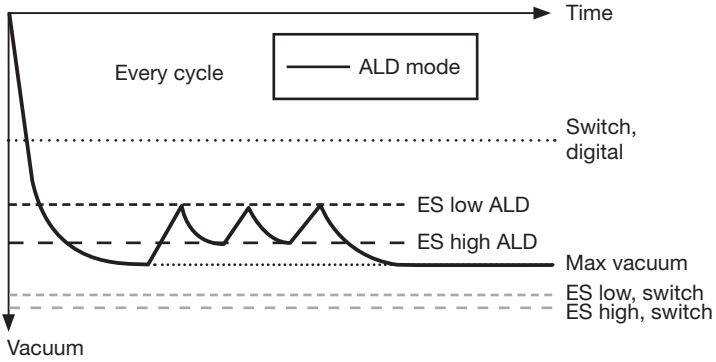
To protect the life span of the valves, an automatic override function is implemented. If the supply valve is restarted 2 times within 3 sec, the ES function is deactivated for the rest of the cycle. A nice feature if leakage occasionally can occur. If your piCOMPACT®23 is configured with a leakage warning output the feature can also be used to monitor the wear of the suction cups. When ES is off, it may be time to change suction cups.



ALD (Automatic “ES” Level Determination)

Optional only for ES units

The unit will measure max achievable vacuum on the object every cycle and automatically set an optimized ES level and hysteresis- The calculation is re-calculated every cycle to give the most reliable condition every time a new object is handled. The calculation is based on set part present signal level and max achievable vacuum measured by an analog sensor.



If manually change ES low and ES high it will deactivate ALD function. To reactivate ALD return ES low and ES high to default value.

Disable ES and ATBO functions (pin 8)

-Pump equipped with an ES function:
Automatic ES function can be turned off by setting pin 8 to “High”.

“High”**=** 24 VDC PNP, 0 VDC NPN
ATBO = Time delayed blow-off
ES = Energy saving

Adaptive Pulse Width Modulation (A-PWM)

Adaptive Pulse Width Modulation (A-PWM) reduces the power to the valves when they are in holding position and allows for full power when switching the valves to achieve as quick a response as possible. The adaptive part allows for fluctuating voltage without impacting functionality. A-PWM will significantly reduce power consumption, generate a lower temperature, increase robustness of the installation and extend life time of unit. Onboard function.

Automatic Timer Blow-off (ATBO)

Automatic Timer Blow-off (ATBO) means that the compressed air release function will start automatically after the vacuum valve is turned off. The blow-off duration is set with a timer (0–3 sec) integrated on the piCOMPACT®. ATBO will save on I/Os needed to control piCOMPACT®, can be of great importance if several units are connected to one controller. It makes programming easer and can be used to fine-tune blow-off duration to cut cycles time by a person without software skills. Selectable function.

Intelligent Blow-off (IBO)

Intelligent Blow-off (IBO) is an alternative to save compressed air for part release, in many vacuum applications the big air consumer. The blow-off duration is optimised and blow-air will automatically stop when all vacuum is removed from the system. IBO is a self-learning function and only needs a few cycles to optimise blow-off duration for different system volumes. In the initial cycles, an extra blow-off puff can be presented to fully remove vacuum. Selectable function.

Amplified Blow-off (ABO)

An internal valve will automatically close the flow-path to the ejector cartridge(s) during blow-off. 100% of the compressed air during blow-off goes to the cup(s) and gives a very strong and efficient part release. A recommended function for large sealed systems. Amplified blow-off will cut cycle times. The dust-proof design of the internal valve is patented and tested for over 50 million cycles. Selectable function.

Self Adhesion Control (SAC)

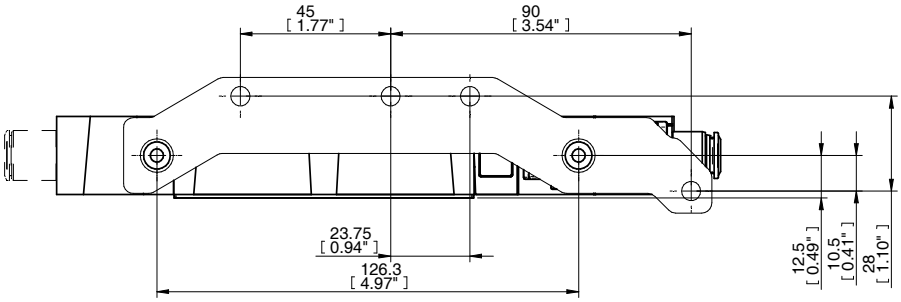
Self Adhesion Control (SAC) automatically removes “unwanted” vacuum with short blow puffs if the piCOMPACT® vacuum control valve has not been activated. Unwanted vacuum is typically created by an ergonomic vacuum handling device/manipulator where a vacuum check/non-return valve is included. For example, ejectors with ES feature have a check/non-return valve inside. When suction cups are applied against a sealed object, the weight of the handling device compresses the cups and create a small bonding force. The force can be enough to move the object in an uncontrolled manner and even cause personal injuries if glass or metal sheets with sharp edges are handled. SAC will eliminate this problem completely. Selectable function. SAC hysteresis is adjustable by using the rotary switch on the pump (see page 19-20).

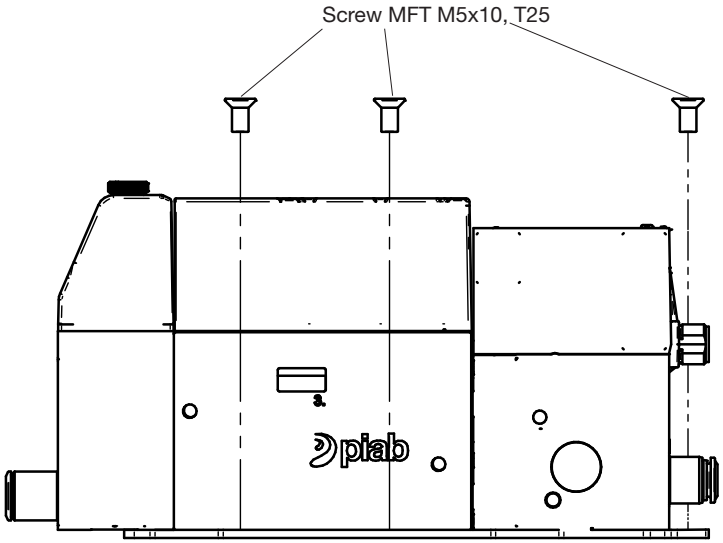
Pre-Vacuum Hovering (PVH)

A special feature recommended for applications where blow-off air is used pre vacuum generation to hover over the cups in order to clean or position the cups right on the object. When using ergonomic vacuum handling devices (manipulators) this is a typical user scenario. Selectable function.

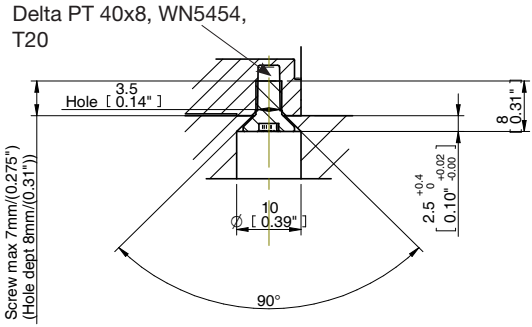
MOUNTING

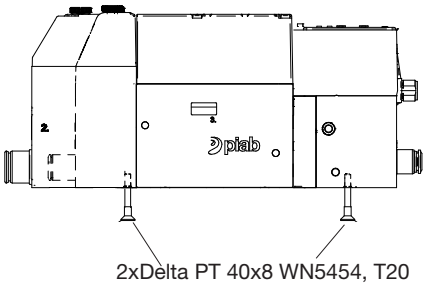
1 channel



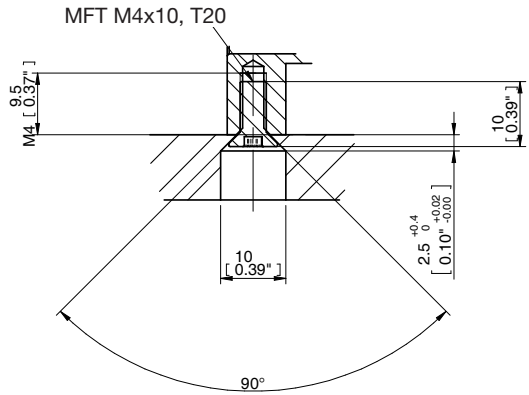


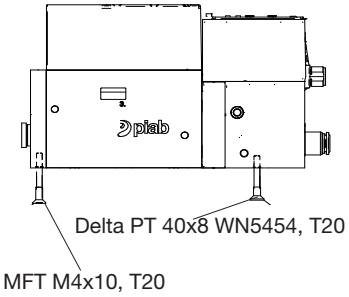
Custom mounting interface, with filter



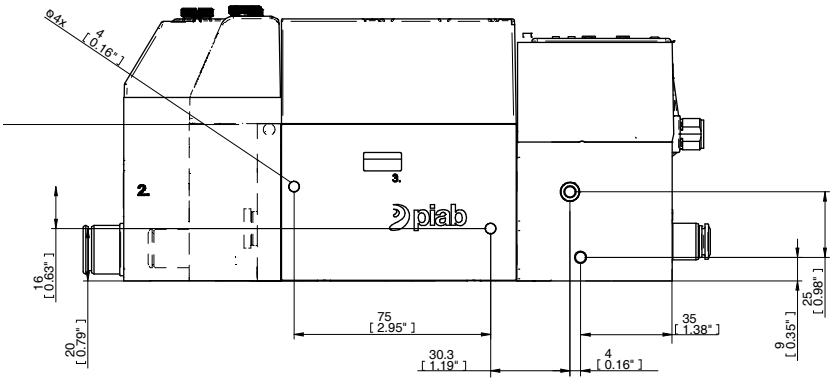


Custom mounting interface, without filter

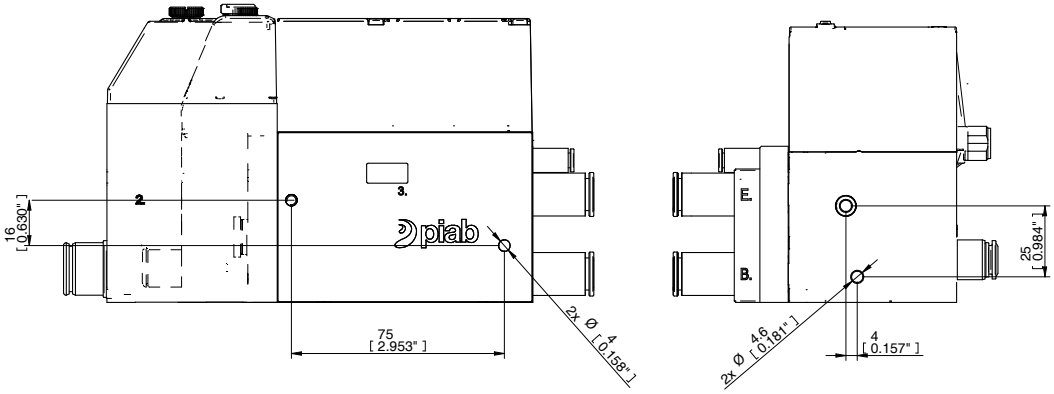




Side mounting, 1 channel

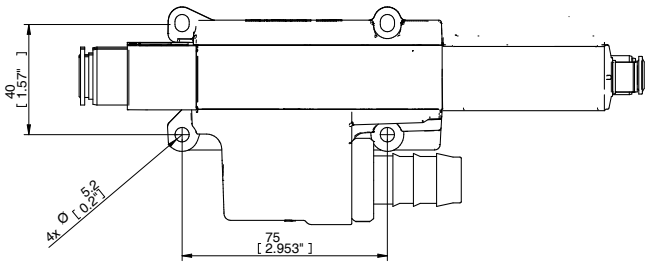


Side mounting interface, split

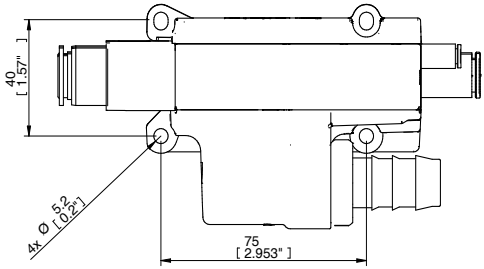


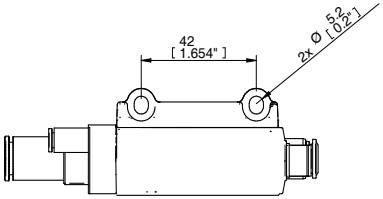
MOUNTING

1 channel



Split, manifold mount

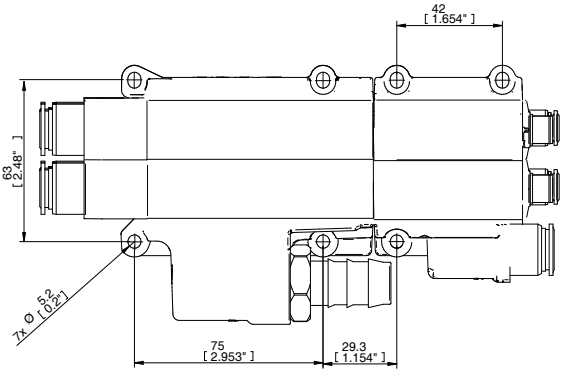




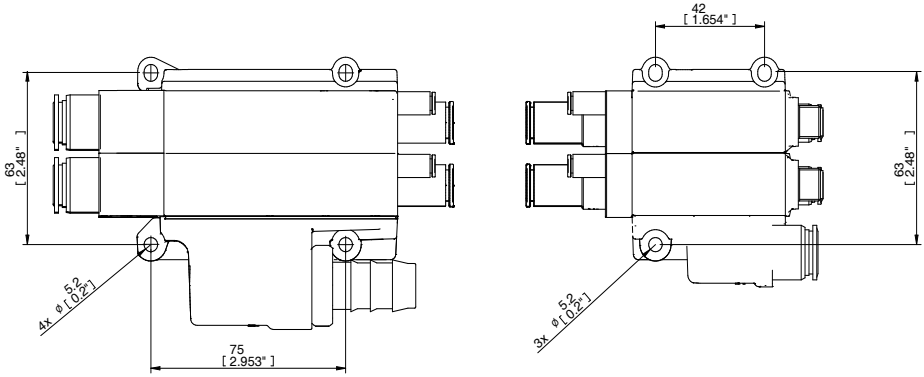
English

MOUNTING

2 channels

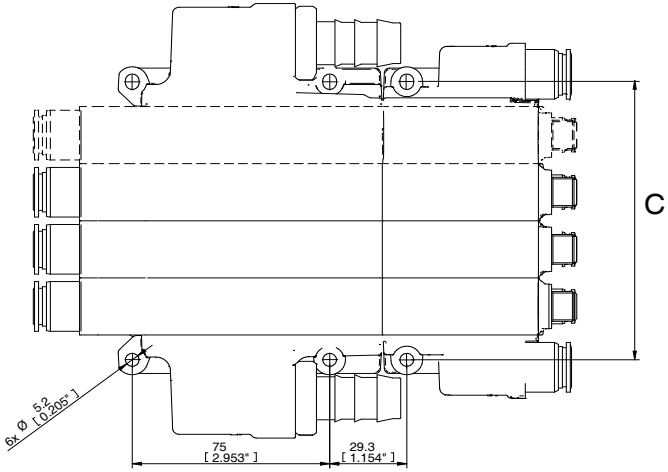


Split, manifold mount

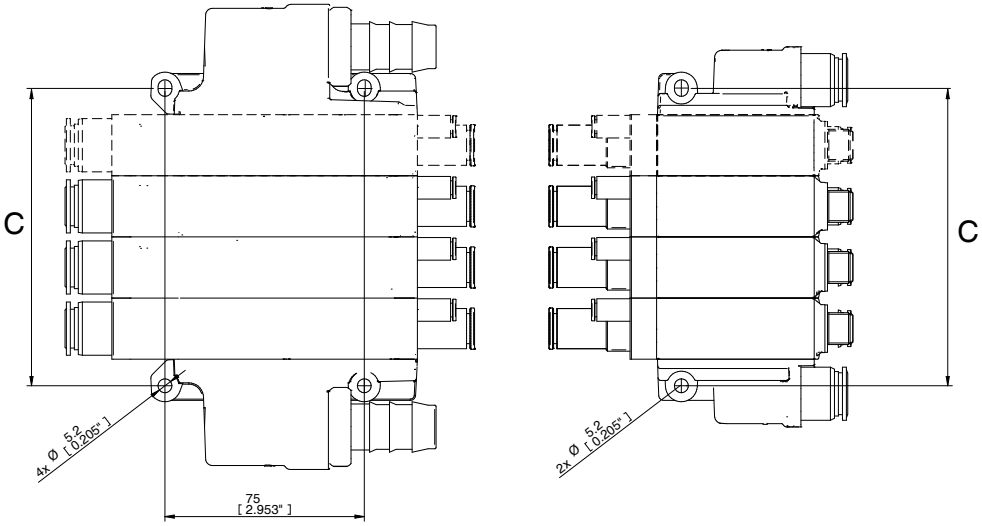


MOUNTING

3-4 channels

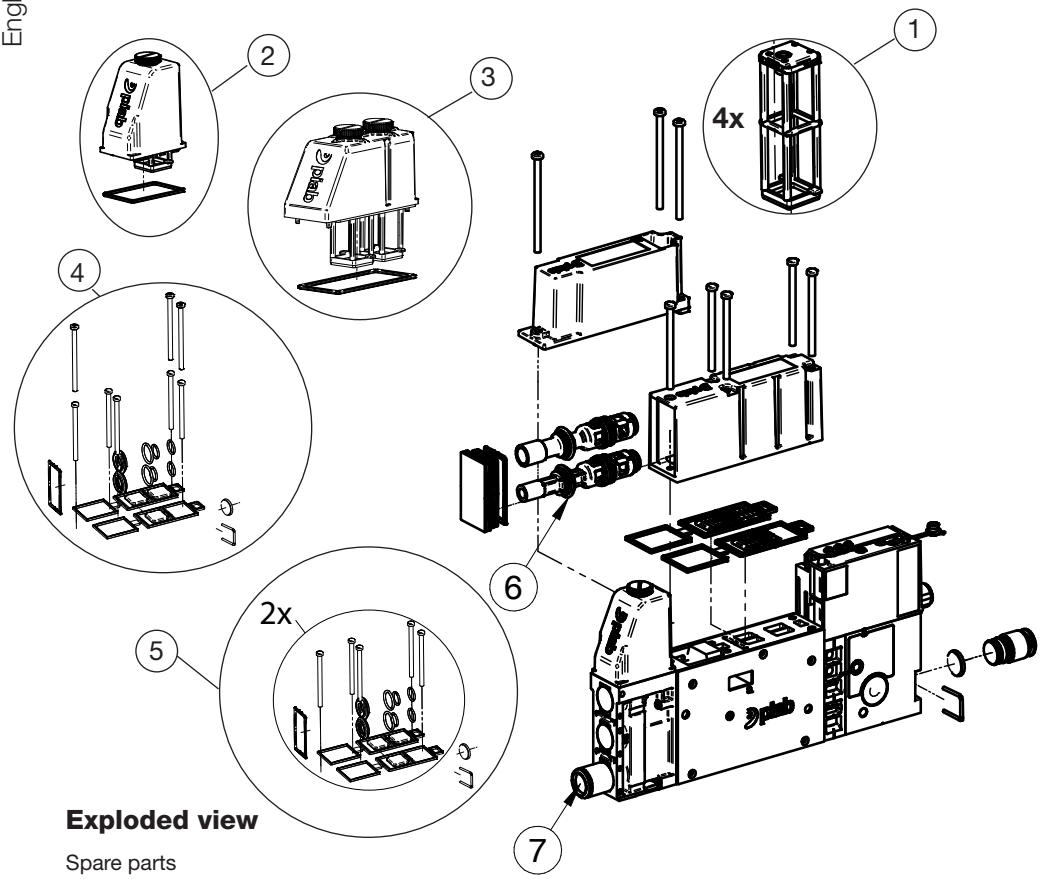


Split, manifold mount



	Unit	3 ch	4 ch
C	mm [in]	89 [3.50”]	112 [4,4”]

MAINTENANCE



Exploded view

Spare parts

Pos	Art. No	Description
1	0205487	Filter element FM23-50, 4 pcs-piCOMPACT®23/piPUMP23
2	0205572	Filter holder kit FM23-50-piCOMPACT®23/piPUMP23
3	0205573	Filter holder kit FM23L-50-piCOMPACT®23/piPUMP23
4	0205484	Spare Part Kit-piCOMPACT®23/piPUMP23
5	0207377	Spare Part Kit stacked-piCOMPACT®23/piPUMP23
7	0209028	Push-in connector 6 mm, EC20, 5 pcs
7	0209029	Push-in connector 1/4”, EC20, 5 pcs
7	0209030	Push-in connector 8 mm EC20, 5 pcs
7	0209031	Push-in connector 10 mm, EC20, 3 pcs
7	0209032	Push-in connector 3/8”, EC20, 3 pcs
7	0209033	Push-in connector 10 mm, EC30, 5 pcs
7	0209034	Push-in connector 3/8”, EC30, 5 pcs
7	0209035	Push-in connector 12 mm, EC30, 5 pcs
7	0209036	Push-in connector 1/2”, EC30, 5 pcs
6	0205575	COAX® cartridge SX12
6	0205724	COAX® cartridge SX42

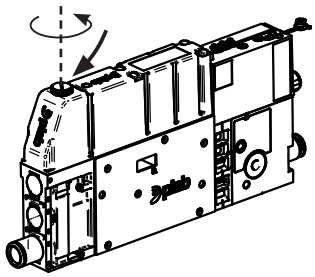
Cables

Art. No	Description
0110238	Cable M12 8-pin female, PUR, L=2m
0117746	Cable M12 8-pin female, PUR, L=5m
0207535	Y-cable M12 8-pin female, 2xM12 4-pin male, PNP, PUR, L=0.5m
0207534	Y-Cable M12 8-pin female, 2xM12 4-pin male, NPN, PUR, L=0.5m

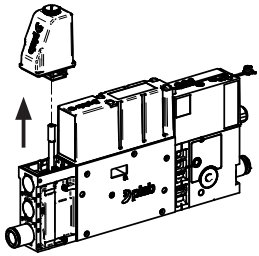
Before installation and when maintaining the piCOMPACT®23 check the product and attachments for damages or wear (such as hoses, hose clamps, clips etc) and replace the damage or worn parts as described in this maintenance section.

Replacement of piCOMPACT®23 filter(s)

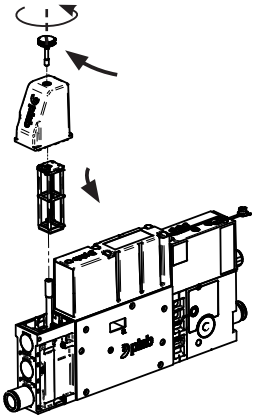
1. Release screw on top of filter to release filter holder and filter.



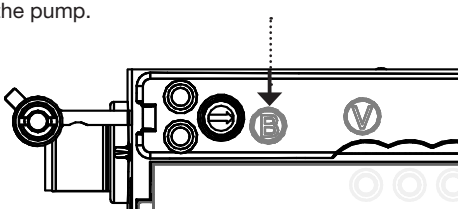
2. Lift up filter holder and filter.



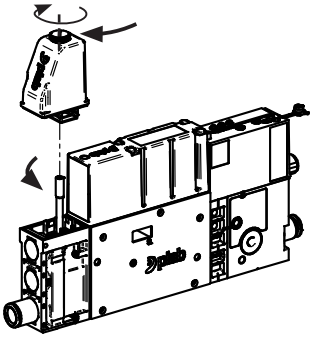
3. Release the screw completely to remove old filter from filter holder.



4. When the filter is out, check that no powder or dust is stuck inside filter base and if your pump is equipped with a “blow-off” function, clean the system by firmly pressing the “manual override button” (B-button) on the pump.



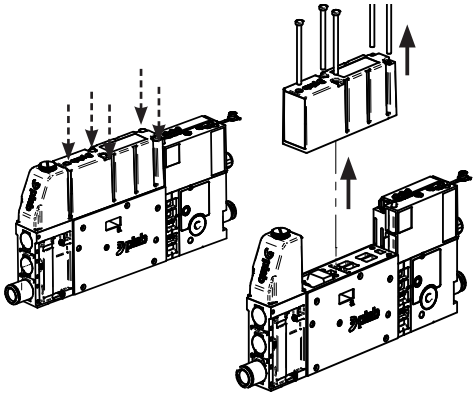
5. Place the new filter in the filter holder and place the filter holder in its position on the pump and tighten the screw again.



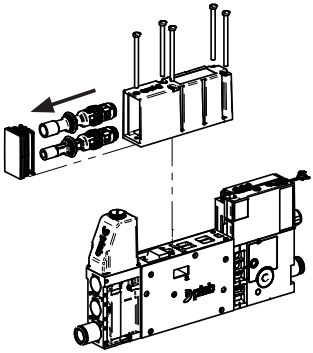
Note: If you have a piCOMPACT®23 comprising two filters, remove the two screws on top of filter holder before changing filter.

Replacement of COAX® cartridge

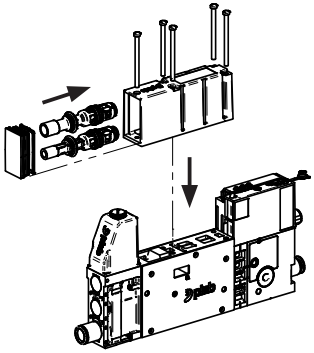
1. Release screws on top of the chip house and lift up the chip house.



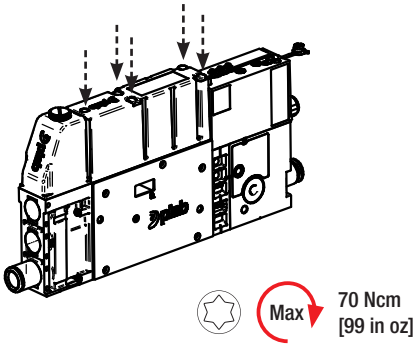
2. Remove screws completely and remove the chip plug and take out the COAX® cartridges. Remove COAX® by carefully using a small screwdriver or a pliers. Avoid using any tool ***inside*** the COAX® cartridge in order to remove it.



3. Replace the COAX® cartridges with new COAX® cartridges and remount the chip plug. Ensure COAX® o-rings are greased before mounting of COAX®. Use Klüber-synth UH1 14-151 or similar grease.



4. Remount the chip house and tighten the screws.



Note: when your piCOMPACT®23 is configured with a top mounted silencer, remove the top mounted silencer (three screws) before demounting the chip house.

TECHNICAL DATA

Pneumatic technical information

		Unit	COAX®			
			SX12		SX42	
			x1	x2	x1	x2
Feed pressure, pump at opt.		MPa [psi]	0.504 [73.2]	0.515 [74.7]	0.47 [68.2]	0.54 [78.3]
Feed pressure, nozzle at opt.		MPa [psi]	0.5 [72.5]		0.43 [62.4]	
Values specified are tested at:		-kPa [-inHg]	85 [25]		90 [26.6]	
		Nl/s [scfm]	0.72 [1.52]	1.44 [3.05]	2.21 [4.68]	4.42 [9.36]
Max vacuum flow at opt. pressure		Nl/s [scfm]	1.22 [2.58]	2.44 [5.16]	3.46 [7.33]	6.92 [14.7]
Flow, blow off at 0.5 MPa [72.5 psi] No counter pressure / Counter pressure 0.1 MPa [14.5 psi]	Without hatch	Nl/s [scfm]	0-2.3/0 [0-0.08/0]		0-4.3/0 [0-0.15/0]	
	With hatch, ABO		0-2.8/2.7 [0-0.1/0.1]		0-4.4/4.3 [0-0.16/0.15]	
	With hatch, PVH		0-2.7/1.5 [0-0.1/0.05]		0-4.4/2.2 [0-0.16 /0.08]	

General electric characteristics

Supply voltage	24 ±10% V
Current consumption	<200 mA

Valve module

Function on/off	Normally closed (NC*)/normally open (NO)/ Bi-stable
Function blow-off	Normally closed (NC)
Manual override (optional)	Yes, non-locking push style

Other data/Environmental data

Temperature range	-10 - 50°C [14-122°F] (bi-stable;-10 - 40°C [14-104°F])
Air humidity	% RH 35-85
Materials	PA, NBR, SS, POM, TPE, PVC, Brass, Al

**NC failsafe version is available (power off - NO). In running mode the valve behaves like a NC valve but if power is cut the valve goes into NO-mode leaving compressed air for continuous vacuum.*

CE

Technical data Vacuum Sensor Switch

Description	Unit	Value
Overpressure, max.	MPa [psi]	0.4 [58.0]
Material	-	PC, LCP, TPE, PA
Temperature range	°C [F]	-10 - 50 [32-122]
Signal range	-kPa [-inHg]	0-101 [0-29.9]
Hysteresis	kPa [inHg]	ES_{high} - ES_{low}=settable
Safety classification	-	IP54
Max output load S1, digital output	V	0.08
Max output load S2/LW, digital output	V	0.08
Analog output	V	1-5
Humidity	%RH	35-85
Response time	ms	<1
Accuracy	-	±3% of F.S. (Full Scale)
Ripple (Supply voltage)	VP	10%
Vibration resistant	Hz	10-55
Shock resistant	G	10
Display	-	3 digit num LED display

LW=Leakage Warning

Default setting

Description	Default value
Unit	-kPa
Switch value	40 -kPa
ES low value*	98 -kPa
ES high value*	99 -kPa
Filtering (analog switch)	0 ms

** ALD (Automatic Level determination) activated with default values.*

Error code

Code	Cause	Solution
E1	Electric overload detection for SW / Short-circuit protection for SW	Check Vacuum Sensor Switch otuput wiring for S1 / S2
E2	Pressure not whitin adjustable range	Only possible if atmospheric pressure equivalent to ±3% or less of F.S. (Full Scale).
E3	Internal error	Unplug power from piCOMPACT®23, then plug it back in.

English

WARNING! Do not install or operate your piCOMPACT®23 if damaged during transport, handling or use. Damage may result in bursting and cause injury or property damage.

(GB) Safety
(DK) Advarselsymboler
(DE) Warnsymbole
(ES) Señales de advertencia
(FR) Sécurité
(IT) Segnali di avvertenza
(NL) Waarschuwingssymbolen
(NO) Sikkerhet
(PT) Sinais Avisadores
(SE) Säkerhet
(FI) Varoitusmerkit
(ZH）安全
(PL) Bezpieczeństwo
(RU) Безопасность

- Vacuum force
- Vakuumkraft
- Vakuumkraft
- Fuerza de vacío
- Force d'aspiration
- Potenza di aspirazione
- Vacuumkracht
- Vakuumkraft
- Vácuo ligado
- Vakuumkraft
- Siła ssania
- Voimakas imu
- Сила вакуума
- .真空吸力

- Exhaust
- Udblæs
- Abluft
- Aire procedente
- Evacuation de l'air
- Aria di scarico
- Uitlaatlucht
- Eksos
- Saida de ar
- Utblås
- Poistoilma
- Wylot
- Выхлоп
- 排气

- Unrestricted exhaust
- Forbudt blokere udblæsningen
- Abluft nicht blockieren
- Prohibido bloquear la salida del aire
- Interdit de bloquer l´évacuation de l´air
- Lo scarico della pompa non deve
- essere ostruito
- Pompuitlaat vrijhouden
- Forbudt å blokkere eksos
- O escape da bomba deve ser livre
- Förbjudet blockera utblås
- Ulospuhalluksen esto kielletty
- Nieograniczony wylot
- Неограниченный выхлоп
- 自由排气

- Wear ear protection if you are working closer than 2-3m from the vacuum ejector in operation.

Values specified are tested at:

Room temperature (20ºC [68ºF] ± 3ºC [5.5ºF]).
Standard atmosphere (101.3 [29.9 inHg] ± 1.0 kPa [0.3 inHg]).
Relative humidity 0-100%.
Compressed air quality, DIN ISO 8573-1 class 4.

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No need to compromise

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