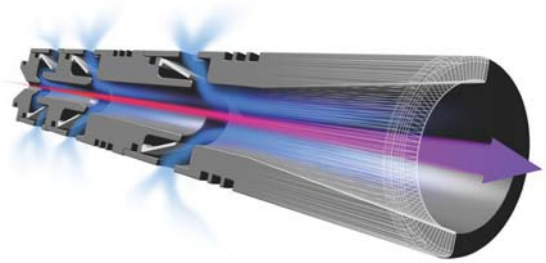
Vacuum pumps/generators

COAX® technology

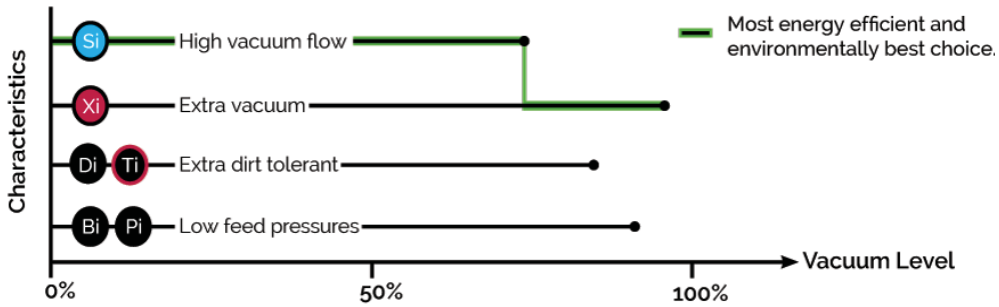
Piab vacuum pumps/generators are predominately based on the patented COAX® technology.

COAX® is an advanced solution for creating vacuum with compressed air. Based on Piab's multistage technology, COAX® cartridges are smaller, more efficient and more reliable than conventional ejectors, which allow for the design of a flexible, modular and efficient vacuum system. A vacuum system based on COAX® technology can provide you with three times more vacuum flow than conventional systems, allowing you to increase speed with high reliability while reducing energy consumption. COAX® cartridges exist in several sizes (MIDI, MINI & MICRO) and models (Bi, Pi, Si, Ti, Xi and Di), making them suitable for every application. The technology ensures excellent performance at both low and high feed pressures. Pumps based on COAX® technology can operate within the feed pressure range of 25 to 87 psi.



Custom integration

- The two-stage COAX® cartridge MICRO is probably the world's smallest multistage vacuum ejector. Its low weight makes it suitable to integrate close to the suction point in high speed pick and-place applications of small objects.
- The two-stage COAX® cartridge MINI has small mounting dimensions and the three-stage COAX® cartridge MINI has high initial vacuum flow.
- The two-stage COAX® cartridge MIDI has small mounting dimensions and the three-stage COAX® cartridge MIDI has high initial vacuum flow. The MIDI cartridges are efficient generators of blow-air and are also suitable for fast evacuation of large volumes.



COAX® MICRO family

MICRO Bi03-2

MICRO Si02-2

MICRO Ti05-2

MICRO Xi2.5-2

The two-stage COAX® cartridge MICRO is probably the world's smallest multistage vacuum ejector. Its low weight makes it suitable to integrate close to the suction point in high speed pick-and-place applications of small objects.

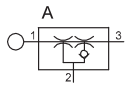
Vacuum flow

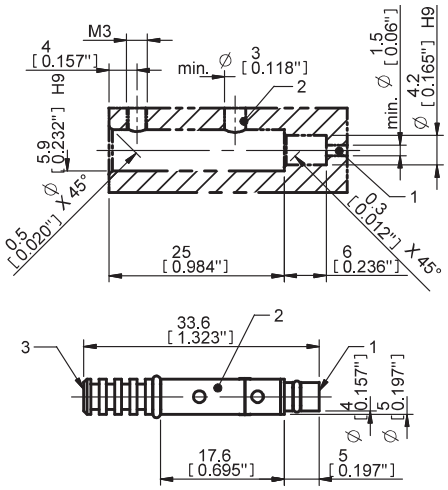
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)									Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	-inHg
MICRO Bi03-2	26	0.30	0.49	0.32	0.13	0.08	0.07	0.05	0.03	0.01	–	24.5
MICRO Si02-2	87	0.25	0.59	0.44	0.25	0.17	0.15	0.13	0.08	0.04	–	22.1
MICRO Ti05-2	58	0.57	0.68	0.59	0.49	0.36	0.21	0.15	0.08	0.04	0.01	24.8
MICRO Xi2.5-2	73	0.28	0.51	0.36	0.21	0.13	0.08	0.06	0.04	0.02	0.02	27.2

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)								Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	-inHg
MICRO Bi03-2	26	0.30	14.2	39.6	110	181	283	453	793	1444	24.5
MICRO Si02-2	87	0.25	11.6	28.6	56.9	93.4	139	195	289	–	22.1
MICRO Ti05-2	58	0.57	9.34	20.7	34	56.6	87.8	142	235	470	24.8
MICRO Xi2.5-2	73	0.28	13.9	34.8	70.2	127	207	320	510	793	27.2

Dimensional drawing





Ordering information

For a complete list of available pumps and combinations with further information visit piab.com. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

COAX® MINI family


MINI Di16-2


MINI Pi12-2


MINI Pi12-3


MINI Pi12-3 FS


MINI Si08-2


MINI Si08-3 FS


MINI Si08-3


MINI Xi10-2


MINI Xi10-3


MINI Xi10-3 FS

The two-stage COAX® cartridge MINI has small mounting dimensions and the three-stage COAX® cartridge MINI has high initial vacuum flow.

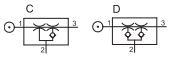
Vacuum flow

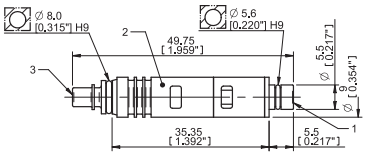
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	27	-inHg
MINI Di16-2	87	1.59	1.36	1.21	1.04	0.87	0.74	0.61	0.38	0.08	–	–	73
MINI Pi12-2	46	0.93	1.44	1.27	0.93	0.57	0.40	0.30	0.21	0.13	0.06	–	90
MINI Pi12-3	46	0.93	2.97	1.27	0.93	0.57	0.40	0.30	0.21	0.13	0.06	–	90
MINI Pi12-3 FS	46	0.93	2.97	1.27	0.93	0.57	0.40	0.30	0.21	0.13	0.06	–	90
MINI Si08-2	87	0.93	1.63	1.42	1.08	0.70	0.49	0.34	0.25	0.17	–	–	75
MINI Si08-3	87	0.93	2.84	1.55	1.17	0.74	0.49	0.36	0.28	0.17	–	–	75
MINI Si08-3 FS	87	0.93	2.84	1.55	1.17	0.74	0.49	0.36	0.28	0.17	–	–	75
MINI Xi10-2	73	0.97	1.59	1.33	1.04	0.70	0.40	0.32	0.23	0.15	0.095	0.023	94
MINI Xi10-3	73	0.97	3.03	1.48	1.06	0.70	0.40	0.32	0.23	0.15	0.095	0.023	94
MINI Xi10-3 FS	73	0.97	3.03	1.48	1.06	0.70	0.40	0.32	0.23	0.15	0.095	0.023	94

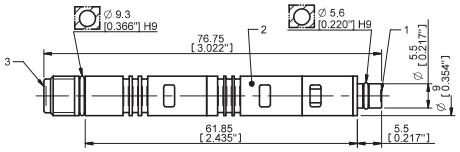
Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)									Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	27	-inHg
MINI Di16-2	87	1.59	4.81	9.91	16.4	23.8	32.6	44.7	70.5	—	—	73
MINI Pi12-2	46	0.93	4.81	9.06	16.4	31.1	51.0	76.5	113	181	—	90
MINI Pi12-3	46	0.93	2.27	6.51	13.9	28.3	48.1	73.6	110	178	—	90
MINI Pi12-3 FS	46	0.93	2.27	6.51	13.9	28.3	48.1	73.6	110	178	—	90
MINI Si08-2	87	0.93	3.96	8.78	15.6	25.5	39.6	59.5	87.8	—	—	75
MINI Si08-3	87	0.93	2.83	7.08	13.6	22.7	36.8	56.6	82.1	—	—	75
MINI Si08-3 FS	87	0.93	2.83	7.08	13.6	22.7	36.8	56.6	82.1	—	—	75
MINI Xi10-2	73	0.97	3.96	8.50	17.0	28.3	45.3	65.1	99.1	150	252	94
MINI Xi10-3	73	0.97	2.55	7.36	14.2	25.5	42.5	62.3	96.3	147	249	94
MINI Xi10-3 FS	73	0.97	2.55	7.36	14.2	25.5	42.5	62.3	96.3	147	249	94

Dimensional drawing







Ordering information

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COAX® MIDI family

MIDI Pi48-2 MIDI Pi48-3 MIDI Si32-2 MIDI Si32-3 MIDI Xi40-2 MIDI Xi40-3

The two-stage COAX® cartridge MIDI has small mounting dimensions and the three-stage COAX® cartridge MIDI has high initial vacuum flow. The MIDI cartridges are efficient generators of blow-air and are also suitable for fast evacuation of large volumes.

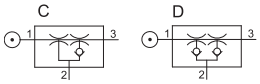
Vacuum flow

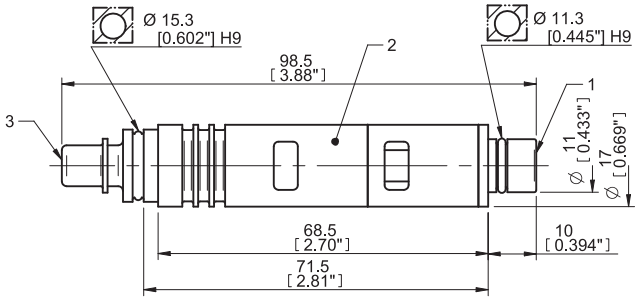
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	27	-inHg
MIDI Pi48-2	45	4.24	5.9	5.3	3.8	2.3	1.4	1.1	0.7	0.5	0.2	—	26.6
MIDI Pi48-3	45	4.34	11.87	5.3	3.8	2.3	1.4	1.1	0.7	0.5	0.2	—	26.6
MIDI Si32-2	87	3.71	7.0	6.4	5.5	3.6	1.9	1.3	1.1	0.7	—	—	22.1
MIDI Si32-3	87	3.71	12.71	7.4	5.5	3.6	1.9	1.3	1.1	0.7	—	—	22.1
MIDI Xi40-2	65	3.88	5.9	4.9	3.4	2.1	1.5	1.2	0.9	0.7	0.4	0.1	28
MIDI Xi40-3	65	3.88	12.5	6.4	4.2	2.8	1.5	1.2	0.9	0.7	0.4	0.1	28

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)									Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	27	-inHg
MIDI Pi48-2	45	4.24	0.85	1.98	3.68	7.36	13	19.8	28.3	45.3	113	26.6
MIDI Pi48-3	45	4.34	0.57	1.7	3.4	7.08	12.7	19.8	28.3	45.3	113	26.6
MIDI Si32-2	87	3.71	0.85	1.98	2.83	5.10	9.34	15	22.7	—	—	22.1
MIDI Si32-3	87	3.71	0.57	1.42	2.83	5.10	9.34	15	22.7	—	—	22.1
MIDI Xi40-2	65	3.88	1.13	2.55	4.81	7.93	12.5	17.8	25.5	36.8	65.1	28
MIDI Xi40-3	65	3.88	0.62	1.76	3.4	6.23	10.5	16.1	23.8	34	62.3	28

Dimensional drawing





Ordering information

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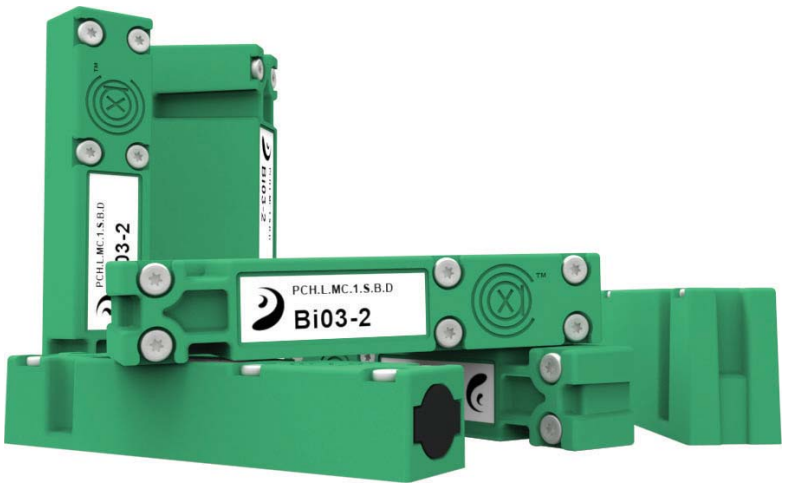
piCHIP10X family



The lightweight piCHIP10X unit is a small vacuum pump which is optimized for integration. It is flexible enough to surface mount quickly on a variety of materials. With its almost silent operation, the piCHIP10X is ideal for clean room operations. Medical and electronic industries are best suited to use this product in their vacuum applications. Because COAX® cartridges are up to twice as fast as other cartridges and provide three times more flow than a conventional ejector with the same air consumption, the piCHIP10X is able to provide a high performance even at low or fluctuating feed pressures (14.5-87 psi).

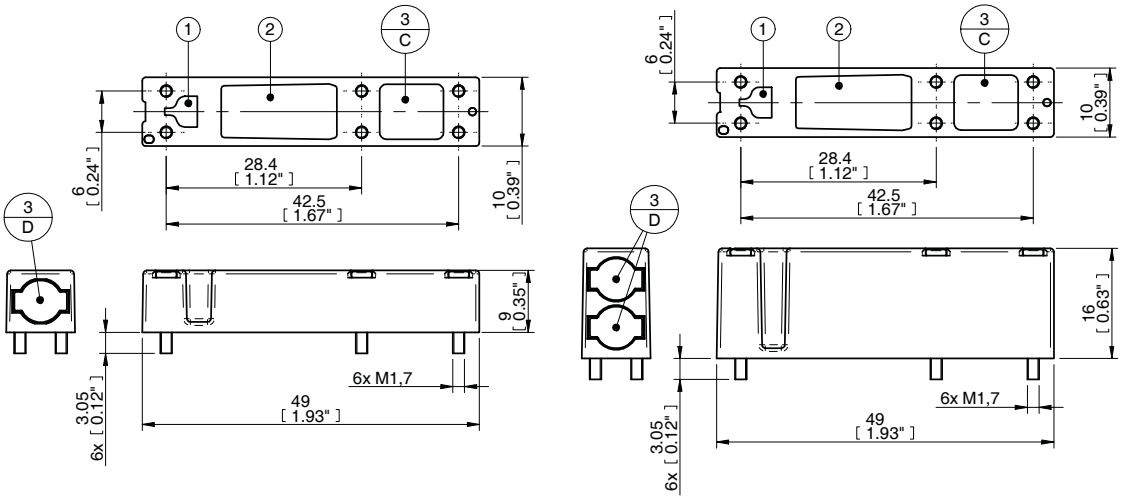
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)									Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	-inHg
MICRO Bi03-2	26	0.30	0.49	0.32	0.13	0.08	0.07	0.05	0.03	0.01	–	24.5
MICRO Si02-2	87	0.25	0.59	0.44	0.25	0.17	0.15	0.13	0.08	0.04	–	22.1
MICRO Ti05-2	58	0.57	0.68	0.59	0.49	0.36	0.21	0.15	0.08	0.04	0.01	24.8
MICRO Xi2.5-2	73	0.28	0.51	0.36	0.21	0.13	0.08	0.06	0.04	0.02	0.02	27.1

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)								Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	-inHg
MICRO Bi03-2	26	0.30	14.2	39.6	110	181	283	453	793	1444	24.5
MICRO Si02-2	87	0.25	11.6	28.6	56.9	93.4	139	195	289	–	22.1
MICRO Ti05-2	58	0.57	9.34	20.7	34.0	56.6	87.8	142	235	470	24.8
MICRO Xi2.5-2	73	0.28	13.9	34.8	70.2	127	207	320	510	793	27.1

Dimensional drawing



Ordering information

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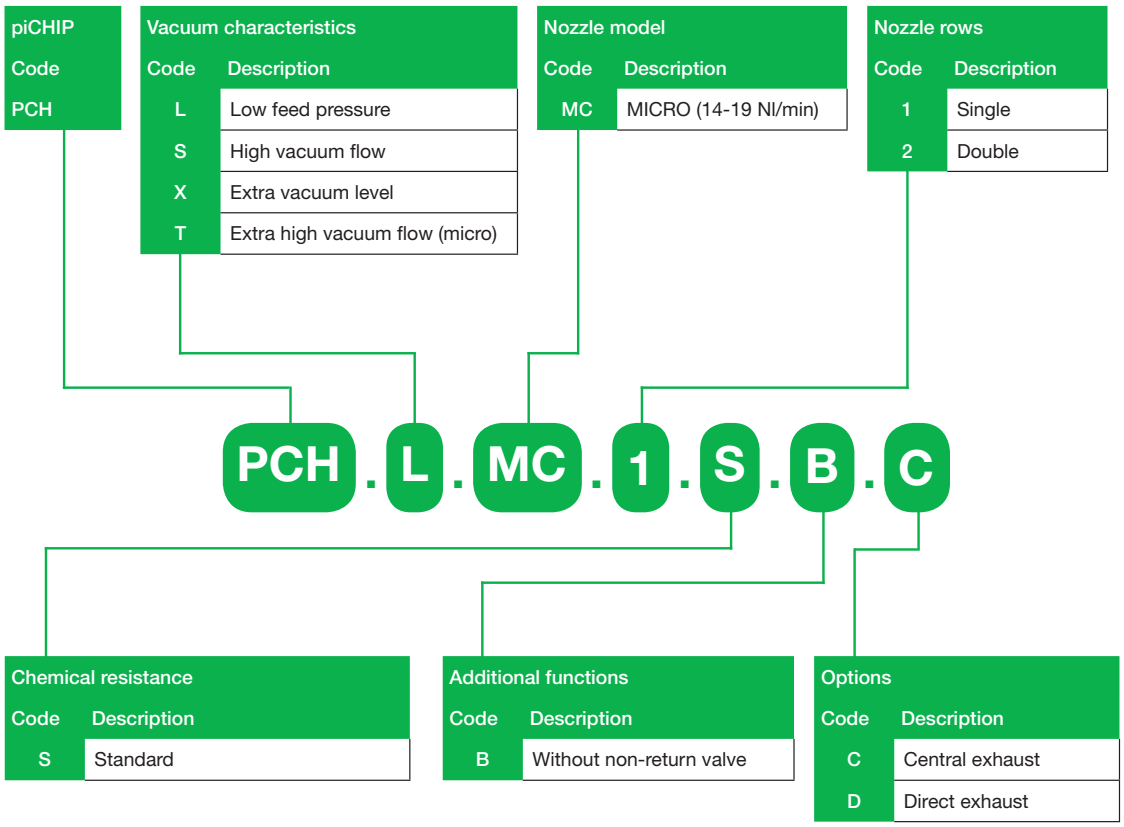
piCHIP10X – Customer Code



piCHIP Code
PCH

Vacuum characteristics	
Code	Description
L	Low feed pressure
S	High vacuum flow
X	Extra vacuum level
T	Extra high vacuum flow (micro)

Nozzle model	
Code	Description
MC	MICRO (14-19 Nl/min)

Nozzle rows	
Code	Description
1	Single
2	Double

Chemical resistance	
Code	Description
S	Standard

Additional functions	
Code	Description
B	Without non-return valve

Options	
Code	Description
C	Central exhaust
D	Direct exhaust

Inline MICRO family

piINLINE® are small lightweight inline ejectors that use the patented COAX® technology inside. They can be mounted directly on a hose close to the suction cup (or point of suction). Piab's piINLINE® ejector program offers much better performance with at least 40-50% lower energy consumption compared to competing Inline single-stage ejectors in corresponding sizes. Inline vacuum generators are especially common in electronic/semiconductor pick-and-place applications, dedicated packaging equipment, injection-molding automation and unloading/loading metal forming machines (bending, punching and laser-cutting)

The COAX® Cartridge Si/Ti for extra vacuum flow. Bi cartridge for reliability at low feed pressures. And Ti/Xi cartridge when high flow and deep vacuum is needed.

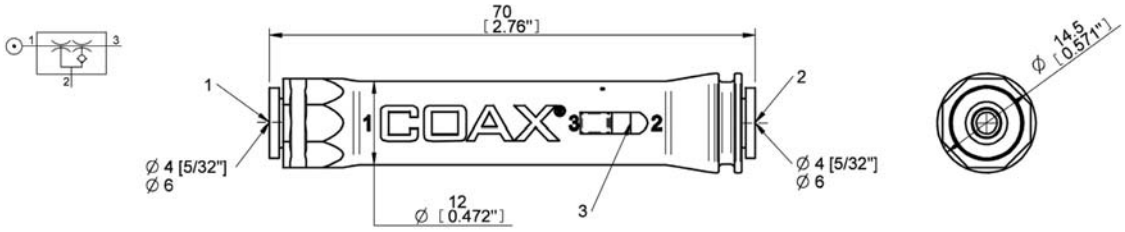
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)									Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	-inHg
MICRO Bi03-2	26	0.30	0.49	0.32	0.13	0.08	0.07	0.05	0.03	0.01	—	24.5
MICRO Si02-2	87	0.25	0.59	0.44	0.25	0.17	0.15	0.13	0.08	0.04	—	22.1
MICRO Ti05-2	58	0.57	0.68	0.59	0.49	0.36	0.21	0.15	0.08	0.04	0.01	24.8
MICRO Ti05-2	87	0.78	0.66	0.57	0.51	0.42	0.32	0.19	0.08	0.02	—	22.1
MICRO Xi2.5-2	73	0.28	0.51	0.36	0.21	0.13	0.08	0.06	0.04	0.02	0.02	27.1

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)								Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	-inHg
MICRO Bi03-2	26	0.30	14.2	39.6	110	181	283	453	793	1444	24.5
MICRO Si02-2	87	0.25	11.6	28.6	56.9	93.4	139	195	289	—	22.1
MICRO Ti05-2	58	0.57	9.34	20.7	34.0	56.6	87.8	142	235	470	24.8
MICRO Ti05-2	87	0.78	8.50	19.8	34.0	51.0	73.6	119	239	—	22.1
MICRO Xi2.5-2	73	0.28	13.9	34.8	70.2	127	207	320	510	793	27.1

Dimensional drawing



Ordering information

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Inline MINI family

piINLINE® are small lightweight inline ejectors that use the patented COAX® technology inside. They can be mounted directly on a hose close to the suction cup (or point of suction). Piab's piINLINE® ejector program offers much better performance with at least 40-50% lower energy consumption compared to competing inline single-stage ejectors in corresponding sizes. Inline vacuum generators are especially common in electronic/semiconductor pick-and-place applications, dedicated packaging equipment, injection-molding automation and unloading/loading metal forming machines (bending, punching and laser-cutting).

The COAX Cartridge Si cartridge for extra vacuum flow the Pi cartridge for high performance at low feed pressures. And the Xi cartridge when high flow and deep vacuum is needed.

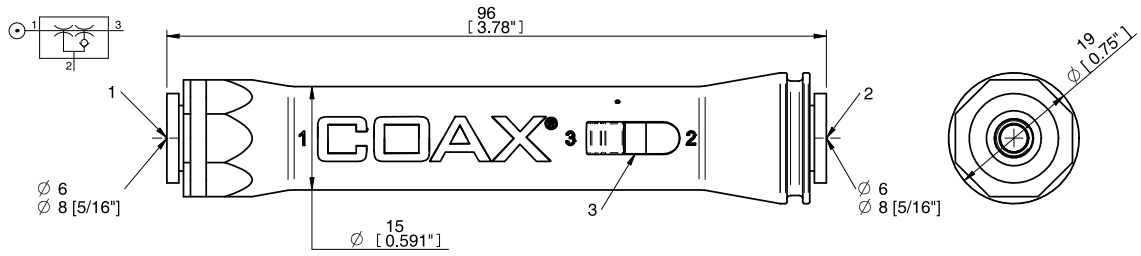
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	10	20	30	40	50	60	70	80	90	-inHg
MINI Si08-2	87	0.93	1.46	1.17	0.89	0.59	0.49	0.34	0.25	0.17	—	—	22.1
MINI Pi12-2	46	0.93	1.21	0.93	0.66	0.49	0.40	0.30	0.21	0.13	0.06	—	26.6
MINI Xi10-2	73	0.97	1.31	1.06	0.78	0.57	0.40	0.32	0.23	0.15	0.095	0.023	27.7

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)									Max vacuum
	psi	scfm	10	20	30	40	50	60	70	80	90	-inHg
MINI Si08-2	87	0.93	4.53	10.5	18.7	31.1	39.6	59.5	87.8	—	—	22.1
MINI Pi12-2	46	0.93	5.66	13.0	23.5	31.1	51.0	76.5	113	181	—	26.6
MINI Xi10-2	73	0.97	5.10	11.6	20.4	28.3	45.3	65.1	99.1	150	252	27.7

Dimensional drawing



Ordering information

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Inline MIDI family

piINLINE® are small lightweight inline ejectors that use the patented COAX® technology inside. They can be mounted directly on a hose close to the suction cup (or point of suction). Piab's piINLINE® ejector program offers much better performance with at least 40-50% lower energy consumption compared to competing inline single-stage ejectors in corresponding sizes. Inline vacuum generators are especially common in electronic/semiconductor pick-and-place applications, dedicated packaging equipment, injection-molding automation and unloading/loading metal forming machines (bending, punching and laser-cutting).

The COAX® Cartridge Si cartridge for extra vacuum flow the Pi cartridge for high performance at low feed pressures. And the Xi cartridge when high flow and deep vacuum is needed.

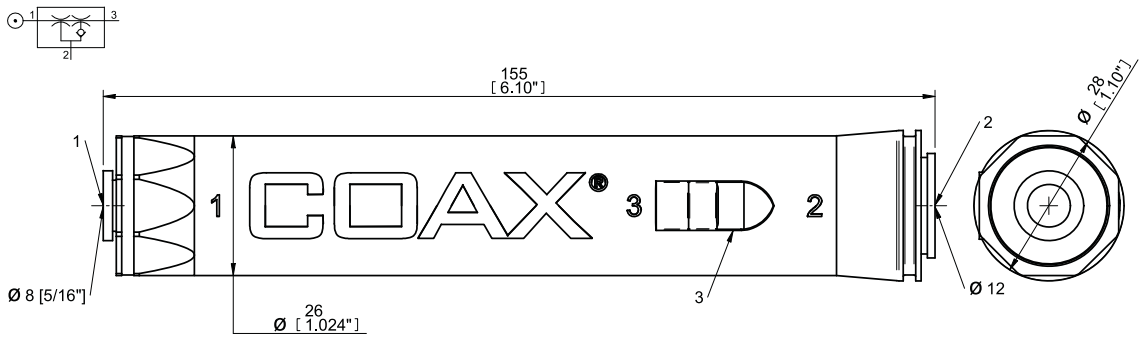
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	27	-inHg
MIDI Si32-2	87	3.71	6.57	5.3	4.03	2.54	1.48	1.27	1.06	0.74	—	—	22.1
MIDI Pi48-2	45	4.24	5.72	4.66	3.18	1.97	1.38	1.06	0.74	0.53	0.21	—	26.6
MIDI Xi40-2	65	3.88	5.93	4.87	3.39	2.12	1.55	1.23	0.91	0.68	0.38	0.06	28.1

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)									Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	27	-inHg
MIDI Si32-2	87	3.71	1.13	2.27	3.96	7.08	11.3	16.7	23.2	—	—	22.1
MIDI Pi48-2	45	4.24	1.13	2.83	5.1	8.5	13.6	20.1	29.7	52.4	113	26.6
MIDI Xi40-2	65	3.88	1.13	2.55	4.81	7.93	12.5	17.8	25.5	36.8	65.1	28.1

Dimensional drawing



Ordering information

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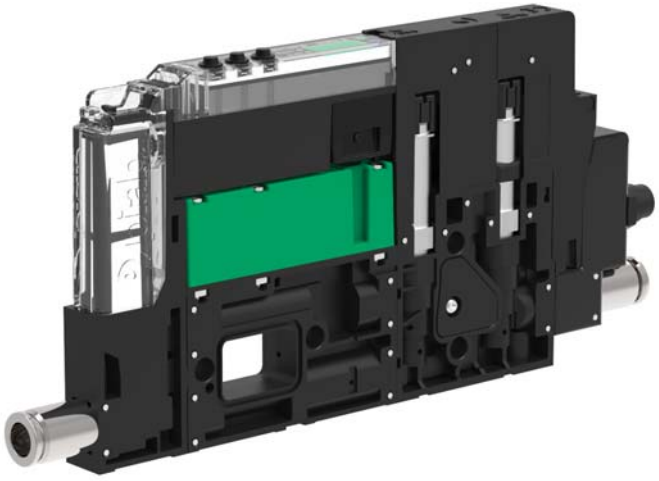
piCOMPACT®10X



piCOMPACT® is an ejector family with integrated controls, so called compact or ”all-in-one” ejector unit. It is a stackable platform with the possibility to mount several units in the same manifold and have common pneumatic and electrical connections. The focus during development has been on the most significant “key criteria” for these types of pumps, reliability and speed, as well as introducing some brand new attractive features/functions. That in combination with our state-of-the-art vacuum engine, COAX®, the product is outstanding. By working at low feed pressure and maximizing the utilization rate of the compressed air, the COAX® ejectors reduce energy consumption for manufacturers while increasing productivity and reliability. Its vacuum response to 15–18 -inHg is typically 30–50% faster compared to single stage technology. The piCOMPACT® is only 10 mm wide with a large 6 mm vacuum connection for maximum performance.

Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)								Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	-inHg
MICRO Bi03-2	31.9/29.0*	0.30	0.44	0.30	0.13	0.04	0.03	0.03	0.01	0.01	24.2
MICRO Si02-2	87.6/87*	0.23	0.55	0.38	0.20	0.11	0.10	0.08	0.06	0.04	22.1
MICRO Ti05-2	62.4/58*	0.49	0.66	0.59	0.47	0.34	0.19	0.13	0.10	0.05	24.8
MICRO Xi2.5-2	74/72.5*	0.28	0.49	0.32	0.17	0.09	0.08	0.06	0.05	0.03	26.9

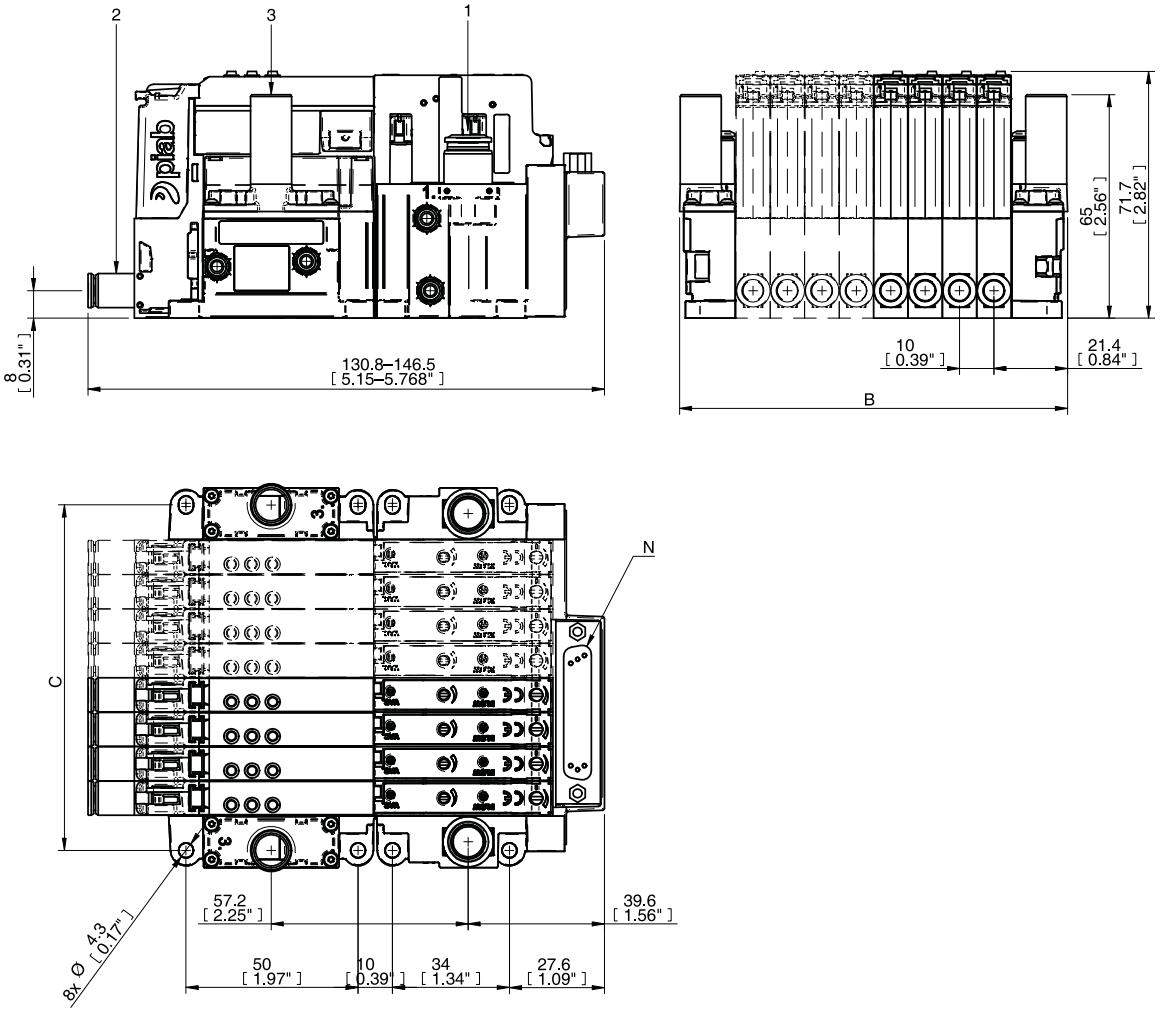
* Pump/nozzle.

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (ms) of 0.30 cu in to reach different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	27	Max	-inHg
MICRO Bi03-2	0.22/0.2*	0.30	5	9.9	20.4	52.8	99.4	153	228	354	552	—	652**	24.2
MICRO Si02-2	87.6/87*	0.23	5	8.90	16.2	30.6	48.3	68.4	95.0	136	—	—	185**	22.1
MICRO Ti05-2	62.4/58*	0.49	5.00	6.70	10.2	14.8	23.0	34.6	50.0	70.2	114	—	159**	24.8
MICRO Xi2.5-2	74/72.5*	0.28	5.10	8.90	16.2	35.0	59.0	86.6	121	169	250	421	464**	26.9

* Pump/nozzle ** Evacuation time (ms) at max vacuum level (-inHg).

Dimensional drawing



Ordering information

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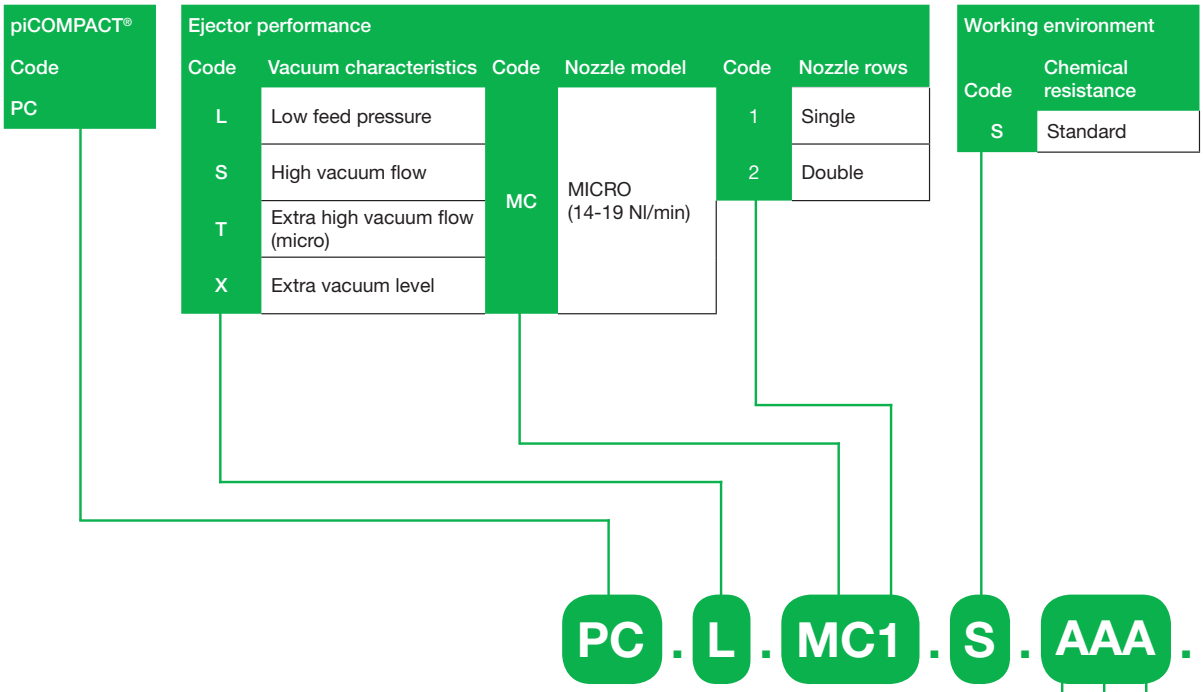
piCOMPACT®10X – Customer Code

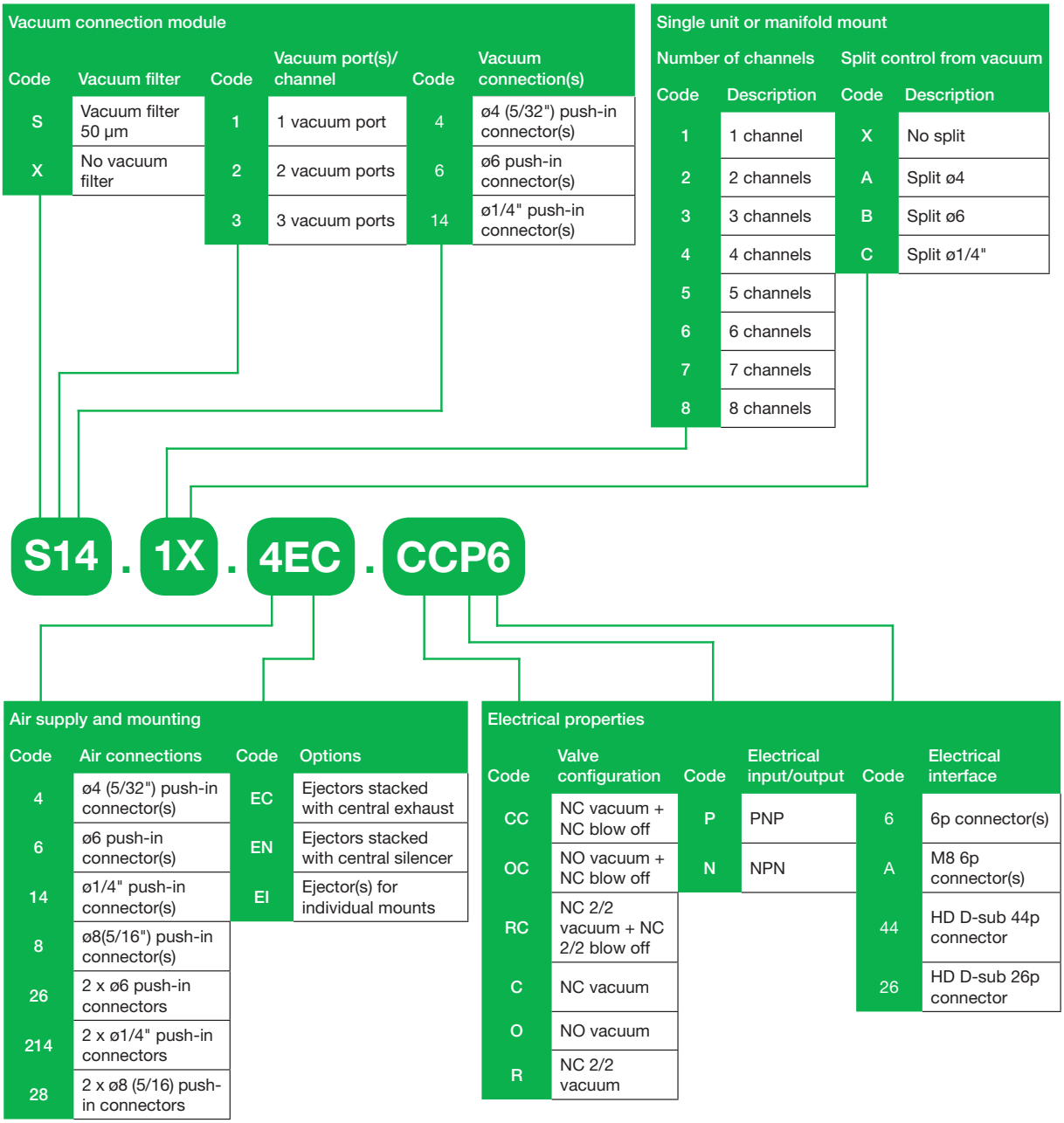


piCOMPACT®	
Code	
PC	

Ejector performance					
Code	Vacuum characteristics	Code	Nozzle model	Code	Nozzle rows
L	Low feed pressure	MC	MICRO (14-19 Nl/min)	1	Single
S	High vacuum flow			2	Double
T	Extra high vacuum flow (micro)				
X	Extra vacuum level				

Working environment	
Code	Chemical resistance
S	Standard

Functionality					
Code	Control functions	Code	Non-return valve	Code	Vacuum sensing
A	Electrical ES, vac and blow off	A	With non-return valve	A	Display, analog and digital output
B	Electrical ES, vac and automatic blow off	B	Without non-return valve	X	No vacuum sensing
C	Vac and blow off				
D	Vac and automatic blow off				
E	Vacuum on/off (vac)				



Vacuum connection module

Code	Vacuum filter
S	Vacuum filter 50 µm
X	No vacuum filter

Code	Vacuum port(s)/ channel
1	1 vacuum port
2	2 vacuum ports
3	3 vacuum ports

Code	Vacuum connection(s)
4	ø4 (5/32") push-in connector(s)
6	ø6 push-in connector(s)
14	ø1/4" push-in connector(s)

Single unit or manifold mount

Number of channels	
Code	Description
1	1 channel
2	2 channels
3	3 channels
4	4 channels
5	5 channels
6	6 channels
7	7 channels
8	8 channels

Split control from vacuum	
Code	Description
X	No split
A	Split ø4
B	Split ø6
C	Split ø1/4"

Air supply and mounting

Code	Air connections
4	ø4 (5/32") push-in connector(s)
6	ø6 push-in connector(s)
14	ø1/4" push-in connector(s)
8	ø8(5/16") push-in connector(s)
26	2 x ø6 push-in connectors
214	2 x ø1/4" push-in connectors
28	2 x ø8 (5/16) push-in connectors

Code	Options
EC	Ejectors stacked with central exhaust
EN	Ejectors stacked with central silencer
EI	Ejector(s) for individual mounts

Electrical properties

Code	Valve configuration
CC	NC vacuum + NC blow off
OC	NO vacuum + NC blow off
RC	NC 2/2 vacuum + NC 2/2 blow off
C	NC vacuum
O	NO vacuum
R	NC 2/2 vacuum

Code	Electrical input/output
P	PNP
N	NPN

Code	Electrical interface
6	6p connector(s)
A	M8 6p connector(s)
44	HD D-sub 44p connector
26	HD D-sub 26p connector

piCOMPACT®23

piCOMPACT® is an ejector family with integrated controls, so called compact or ”all-in-one” ejector unit. It is a stackable platform with the possibility to mount several units in the same manifold and have common pneumatic and electrical connections. The focus during development has been on the most significant “key criteria” for these types of pumps, reliability and speed, as well as introducing some brand new attractive features/functions. That in combination with our state-of-the-art vacuum engine, COAX®, the product is outstanding. By working at low feed pressure and maximizing the utilization rate of the compressed air, the COAX® ejectors reduce energy consumption for manufacturers while increasing productivity and reliability.Its vacuum response to 15–18 -inHg is typically 30–50% faster compared to single stage technology.

Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)									Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	-inHg
SX12	73.2/72.5*	1.53	2.59	2.18	1.65	1.10	0.57	0.44	0.32	0.19	0.06	25
SX42	68.2/62.4*	4.68	7.33	6.40	5.11	3.60	2.16	1.29	1.00	0.59	0.21	26.6

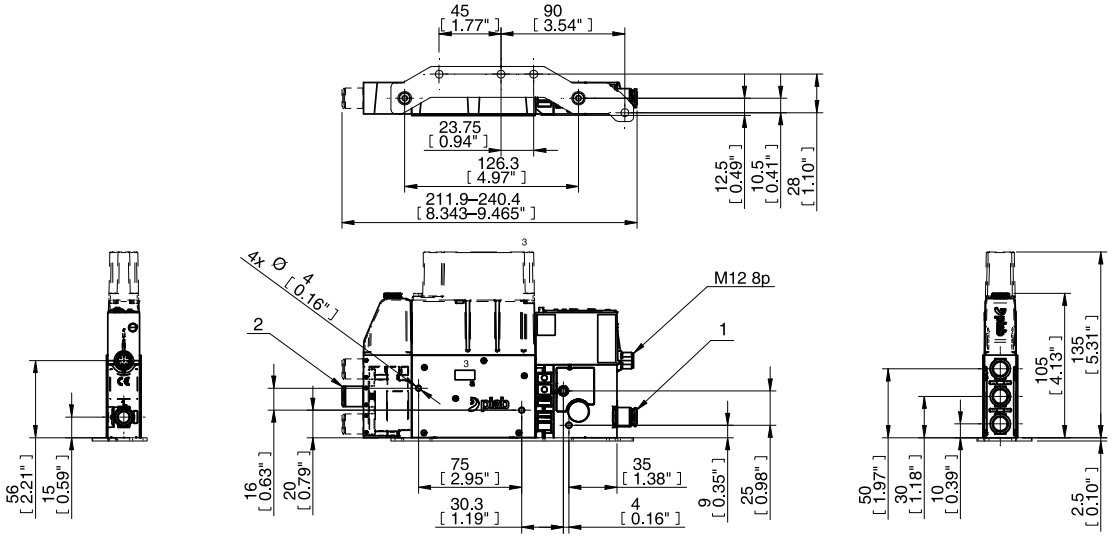
* Pump/nozzle.

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)								Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	-inHg
SX12	73.2/72.5*	1.53	2.32	5.69	10.6	19.1	34.5	54.2	84.4	175	25
SX42	68.2/62.4*	4.68	1.08	2.10	3.48	5.78	10.1	16.3	24.9	48.7	26.6

* Pump/nozzle.

Dimensional drawing



Ordering information

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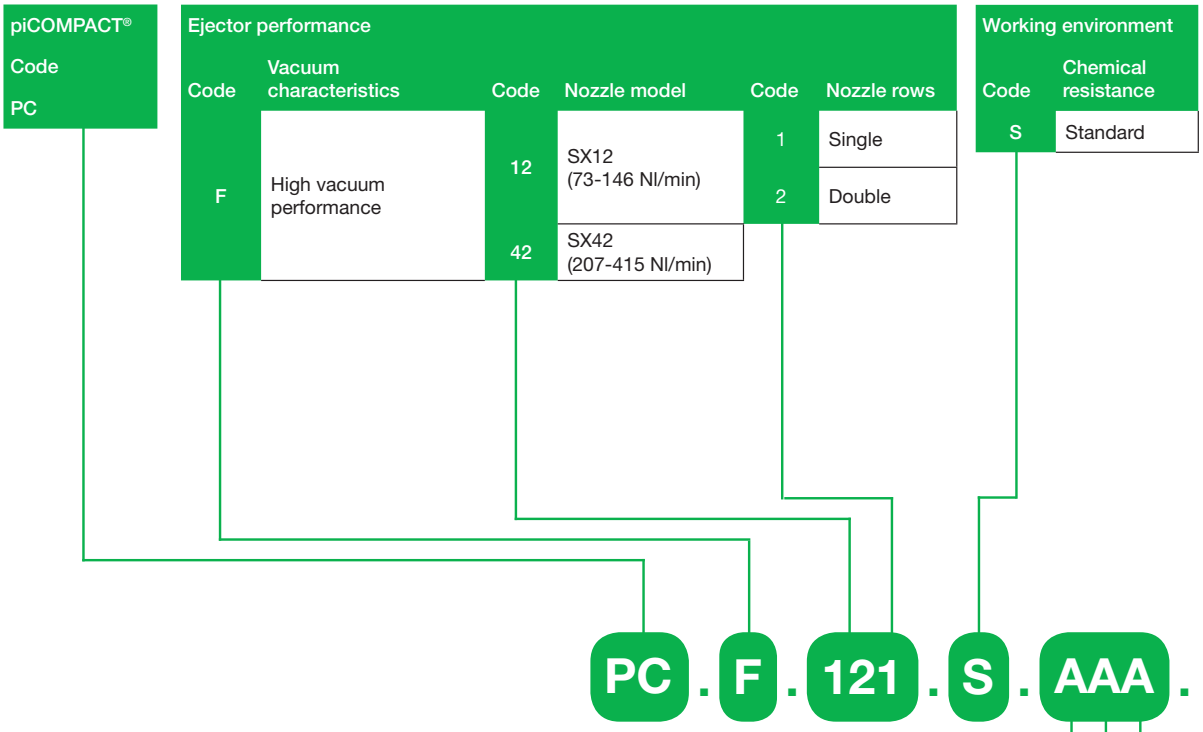
piCOMPACT®23 – Customer Code

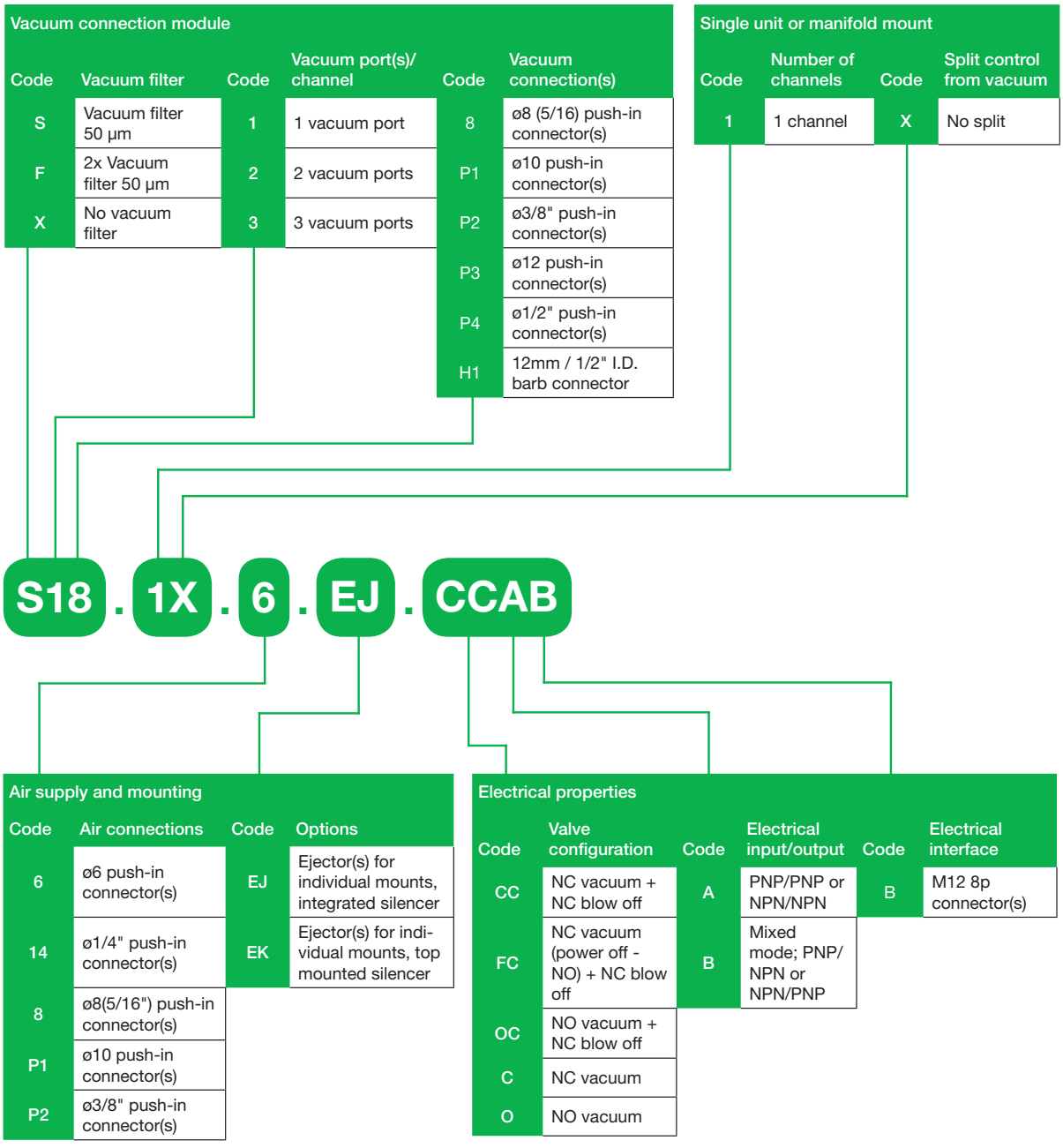


Functionality

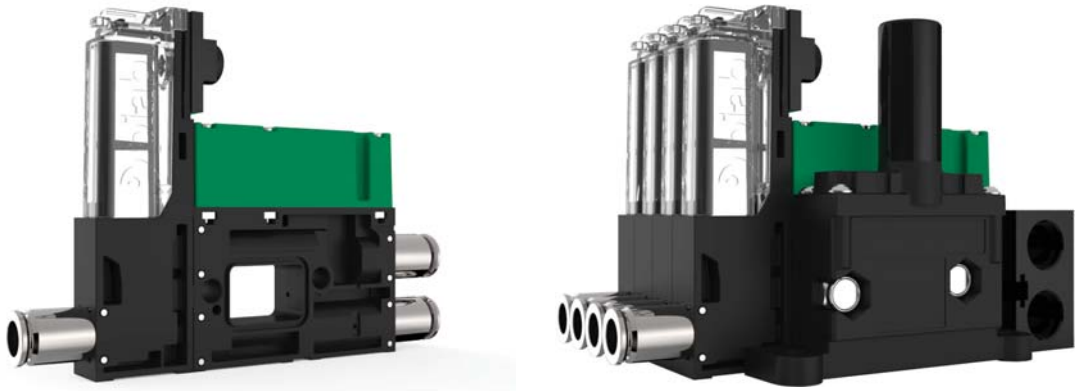
Code	Control functions
A	Electrical ES, vac and blow off
B	Electrical ES, vac and automatic blow off
C	Vac and blow off
D	Vac and automatic blow off
E	Vacuum on/off (vac)

Code	Non-return valve
A	With non-return valve
B	Without non-return valve

Code	Vacuum sensing
A	Display, analog and digital outputs
B	Display, 2x digital outputs
C	Display, leakage warning and digital outputs
X	No vacuum sensing


Vacuum connection module
Code
Vacuum filter
Code
Vacuum port(s)/ channel
Code
Vacuum connection(s)
S
Vacuum filter 50 µm
1
1 vacuum port
8
ø8 (5/16) push-in connector(s)
F
2x Vacuum filter 50 µm
2
2 vacuum ports
P1
ø10 push-in connector(s)
X
No vacuum filter
3
3 vacuum ports
P2
ø3/8" push-in connector(s)
P3
ø12 push-in connector(s)
P4
ø1/2" push-in connector(s)
H1
12mm / 1/2" I.D. barb connector
Single unit or manifold mount
Code
Number of channels
Code
Split control from vacuum
1
1 channel
X
No split
S18 . 1X . 6 . EJ . CCAB
Air supply and mounting
Code
Air connections
Code
Options
6
ø6 push-in connector(s)
EJ
Ejector(s) for individual mounts, integrated silencer
14
ø1/4" push-in connector(s)
EK
Ejector(s) for individual mounts, top mounted silencer
8
ø8(5/16") push-in connector(s)
P1
ø10 push-in connector(s)
P2
ø3/8" push-in connector(s)
Electrical properties
Code
Valve configuration
Code
Electrical input/output
Code
Electrical interface
CC
NC vacuum + NC blow off
A
PNP/PNP or NPN/NPN
B
M12 8p connector(s)
FC
NC vacuum (power off - NO) + NC blow off
B
Mixed mode; PNP/ NPN or NPN/PNP
OC
NO vacuum + NC blow off
C
NC vacuum
O
NO vacuum

piPUMP10X



Compact/stackable vacuum pumps are air-driven multistage ejector families, based on COAX® technology, It provides a high operational reliability, in case of fluctuating or low compressed-air pressure. Excellent performance when a quick response time when deep vacuum is needed. There is also a quick vacuum non-return valve as an option.

Vacuum flow

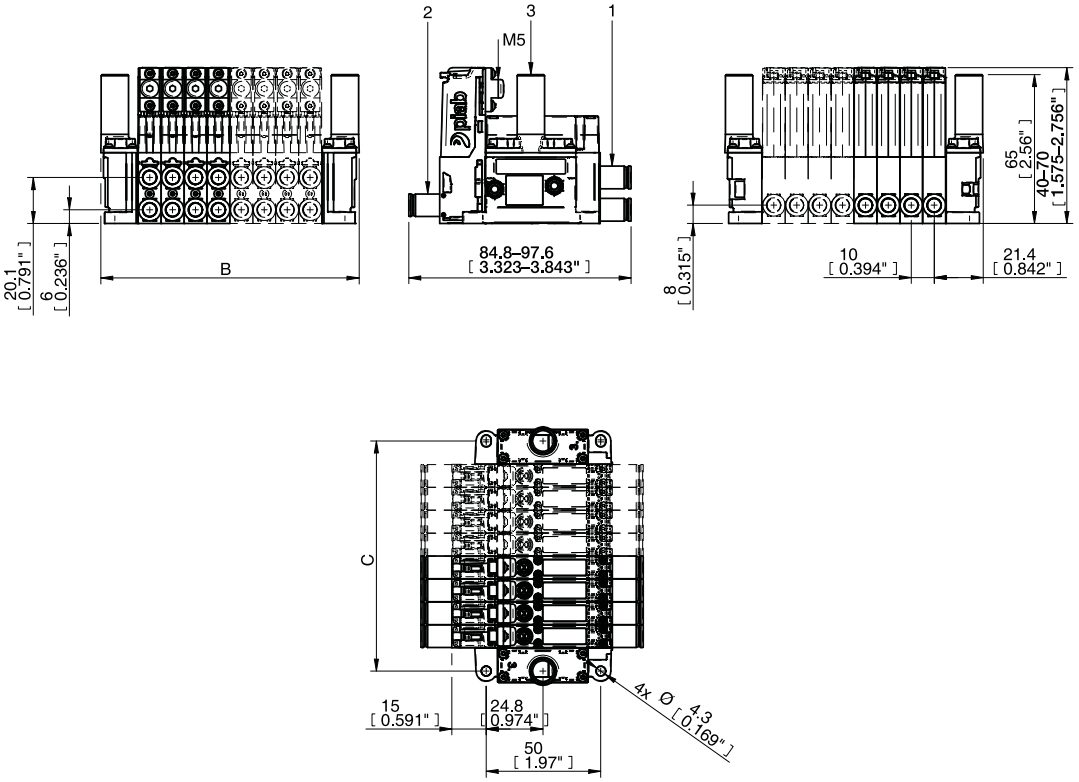
COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)								Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	-inHg
MICRO Bi03-2	29	0.30	0.44	0.30	0.133	0.044	0.034	0.030	0.015	0.008	24.2
MICRO Si02-2	87	0.23	0.55	0.38	0.201	0.112	0.095	0.081	0.057	0.040	22.1
MICRO Ti05-2	58	0.49	0.66	0.59	0.466	0.339	0.186	0.133	0.095	0.049	24.8
MICRO Xi2.5-2	73	0.28	0.49	0.32	0.167	0.093	0.076	0.064	0.049	0.028	26.8

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (ms) of 0.30 cu in to reach different vacuum levels (-inHg)											Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	27	Max	-inHg
MICRO Bi03-2	29	0.30	5	9.9	20.4	53	99	153	228	354	552	—	652*	24.2
MICRO Si02-2	87	0.23	5	8.9	16.2	31	48	68	95	136	—	—	185*	22.1
MICRO Ti05-2	58	0.49	5	6.7	10.2	14.8	23	35	50	70	114	—	159*	24.8
MICRO Xi2.5-2	73	0.28	5.1	8.9	16.2	35	59	87	121	169	250	421	464*	26.8

*Evacuation time (ms) at max vacuum level (-inHg)

Dimensional drawing



Ordering information

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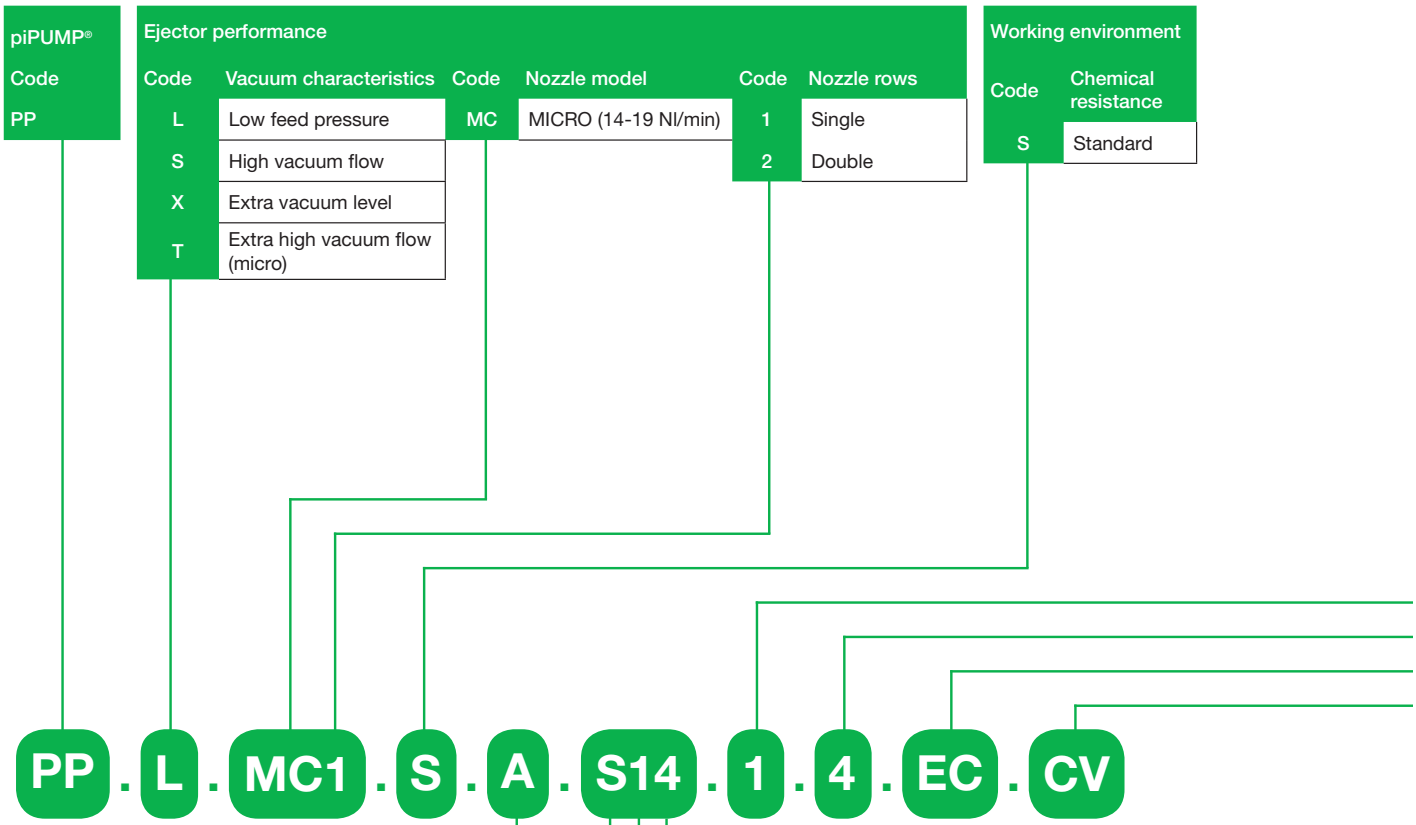
piPUMP10X – Customer Code



piPUMP® Code
PP

Ejector performance					
Code	Vacuum characteristics	Code	Nozzle model	Code	Nozzle rows
L	Low feed pressure	MC	MICRO (14-19 Nl/min)	1	Single
S	High vacuum flow			2	Double
X	Extra vacuum level				
T	Extra high vacuum flow (micro)				

Working environment	
Code	Chemical resistance
S	Standard

Functionality	
Additional function	
Code	Description
A	With non-return valve
B	Without non-return valve

Vacuum connection module					
Vacuum filter		Vacuum port(s)/channel		Vacuum connection(s)	
Code	Description	Code	Description	Code	Description
S	Vacuum filter 50 µm	1	1 vacuum port	4	ø4 (5/32") push-in connector(s)
X	No vacuum filter	2	2 vacuum ports	6	ø6 push-in connector(s)
		3	3 vacuum ports	14	ø1/4" push-in connector(s)

Single unit or manifold mount	
Code	Number of channels
1	1 channel
2	2 channels
3	3 channels
4	4 channels
5	5 channels
6	6 channels
7	7 channels
8	8 channels

Air supply and mounting			
Code	Air connections	Code	Options
4	ø4 (5/32”) push-in connector(s)	EC	Ejectors stacked with central exhaust
6	ø6 push-in connector(s)	EX	Ejectors stacked without central exhaust
14	ø1/4” push-in connector(s)	EN	Ejectors stacked with central silencer
18	1/8” NPSF Common feed	X	No option

Release functions	
Code	Release functions
CV	Blow off check valve

P3010 family

Compact/stackable vacuum pumps are air-driven multistage ejector families, based on COAX® technology, they are equipped with integrated controls and special functions, such as on/off valve, blow-off valve, vacuum switch, energy saving function etc. They are configurable platforms, making it easy to specify the exact control functions needed for the system.

It is available with three-stage COAX® cartridge MINI. Choose an Si cartridge for extra vacuum flow, a Pi cartridge for high performance at low feed pressure or an Xi cartridge when high flow and deep vacuum is needed. The P3010 includes a flow-through silencer and a built-in vacuum filter for harsh environments. It is suitable for fast and reliable evacuation in sealed systems

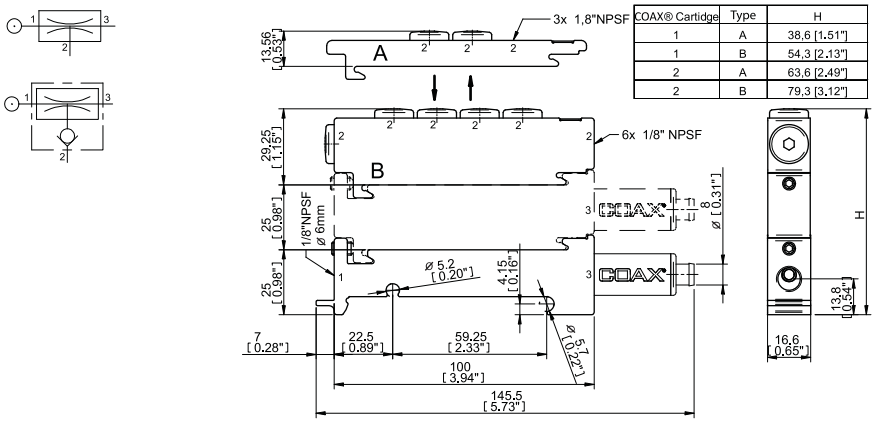
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	27	-inHg
MINI Pi12-3	46	0.93	2.97	1.27	0.93	0.57	0.40	0.30	0.21	0.13	0.06	–	26.6
MINI Si08-3	87	0.93	2.84	1.55	1.17	0.74	0.49	0.36	0.28	0.17	–	–	22.1
MINI Xi10-3	73	0.97	3.03	1.48	1.06	0.70	0.40	0.32	0.23	0.15	0.095	0.023	27.7

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)									Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	27	-inHg
MINI Pi12-3	46	0.93	2.27	6.51	13.9	28.3	48.1	73.6	110	178	–	26.6
MINI Si08-3	87	0.93	2.83	7.08	13.6	22.7	36.8	65.1	130	–	–	22.1
MINI Xi10-3	73	0.97	2.55	7.36	14.2	25.5	42.5	62.3	96.3	147	249	27.7

Dimensional drawing



COAX® Cartidge	Type	H
1	A	38,6 [1.51"]
1	B	54,3 [2.13"]
2	A	63,6 [2.49"]
2	B	79,3 [3.12"]

Ordering information

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Accessory descriptions

P3010 Quick release

The quick release function has a volume of 0.18–3.67 in^3. Quick release is done by accumulating and utilizing the feed-air pressure as a boost. The ON/OFF is activated simultaneously with the P3010

P3010 ES

The P3010 has an integrated air-saving function (piSAVE onoff) that minimizes the air consumption by controlling the incoming air flow to the pump. Large hysteresis is recommended for sealed vacuum handling applications such as metal sheet, glass or plastic handling. And small hysteresis is recommended if a very accurate vacuum level has to be maintained in the process. It has an adjustable ES switch level and is a pneumatic function.

Solenoid Valve

The solenoid valve is an electric 3/2 valve with a possibility for manual override. As it has push in connections it is quick and easy to mount. The body has three M5 ports. It is suitable for compressed air with a filtration of 40 µm.

Vacuum switch

A vacuum switch can be used for many different applications. It converts a vacuum signal into a electric or pneumatic signal. Vacuum switches are available in many different versions, from very small electro-mechanicals with pre-set settings to pneumatics or programmable fully electronics. Some switches are design to fit directly into the P3010 with an Ø 6 mm push-in.

AVM™2

The AVM™2 unit has built-in control and monitoring functions. The integrated energy saving function (ES) minimizes the air consumption in sealed systems. It has valves for vacuum on/off and blow-off with electrical power failsafe function. The AVM has digital outputs, 16 pre-set combinations of vacuum levels, digital vacuum level display and a mechanical valve for blow-off flow adjustment.

CU

The CU has electric valves for vacuum on/off and blow-off and a mechanical valve for blow-off flow adjustment. It also has a special M12 4-pin cable assembly with LED for status of valve signal.

P3010 – Customer Code

P3010
Code
P3010

Code	Connection interface
00	Housing connection Ø6 mm
01	Housing connection 1/8”

Code	COAX® Cartridge module
AA	COAX® Cartridge module Si08-3 FS x1
AB	COAX® Cartridge module Si08-3 AFS x1
AC	COAX® Cartridge module Si08-3 FS x2
AD	COAX® Cartridge module Si08-3 AFS x2
AE	COAX® Cartridge module Pi12-3 FS x1
AF	COAX® Cartridge module Pi12-3 AFS x1
AG	COAX® Cartridge module Pi12-3 FS x2
AH	COAX® Cartridge module Pi12-3 AFS x2
AI	COAX® Cartridge module Xi10-3 FS x1
AJ	COAX® Cartridge module Xi10-3 AFS x1
AK	COAX® Cartridge module Xi10-3 FS x2
AL	COAX® Cartridge module X10-3 AFS x2

P3010 . 00 . AA . 01 . AA . 00

Code	Connection modules / function
01	Connection module high 6x1/8”
02	Connection module low 3x1/8”
04	Function Quick-release module 10/6 - 3
05	Function Quick-release module 8/6 - 30
06	Function Quick-release module 8/6 - 60
07	Function Quick-release module 10/6 - 30
08	Function Quick-release module 10/6 - 60
09	Function Quick-release module 1/4”/6 - 3 (NPSF)
10	Function Quick-release module 1/4”/6-30 (NPSF)
11	Function Quick-release module 1/4”/6-60 (NPSF)
12	Function Quick-release module 8/6-3
27	Function AVM™2 NO
28	Function AVM™2 NC (power off - NO)
29	Function CU NC
30	Function AVM™2 NO auto blow-off (1 sec)
31	Function AVM™2 NC auto blow-off (1 sec)
32	Function AVM™2 NC 2 (power off - NC)
33	Function CU NO

Code	Energy saving
AA	No energy saving (included in AVM2)
AB	Solenoid valve DS23
AC	piSAVE onoff 2/2 NO large hysteres
AD	piSAVE onoff 2/2 NO small hysteres

Code	Vacuum sensing
00	No vacuum sensing (included in AVM2)
01	Vacuum switch PNP NO MM8
02	Vacuum switch NPN NO MM8
05	Vacuum switch PNP NO LM8
09	Vacuum switch PNP NO DM8
10	Vacuum switch NPN NO DM8
11	Vacuum switch Inductive, adj. Knob
18	Vacuum switch VS4015 9 -inHg
19	Vacuum switch VS4015 15 -inHg
20	Vacuum switch VS4015 21 -inHg
21	Vacuum switch VS4016 9 -inHg
22	Vacuum switch VS4016 15 -inHg
23	Vacuum switch VS4016 21 -inHg

piab

P5010 family

Compact/stackable vacuum pumps are air-driven multistage ejector families. based on COAX® technology. they are equipped with integrated controls and special functions. such as on/off valve. blow-off valve. vacuum switch. energy saving function etc. They are configurable platforms. making it easy to specify the exact control functions needed for the system.

It has a patented COAX® push-in technology that allows insertion and removal of the cartridge without tools. It is available two or three-stage COAX® cartridge MIDI. Choose an Si cartridge for extra vacuum flow. a Pi cartridge for high performance at low feed pressure or an Xi cartridge when high flow and deep vacuum is needed. The P5010 has an integrated flow-through silencer that is unaffected by dust and dirt. It provides substantially lower air-consumption as compared to conventional ejectors of similar sizes.

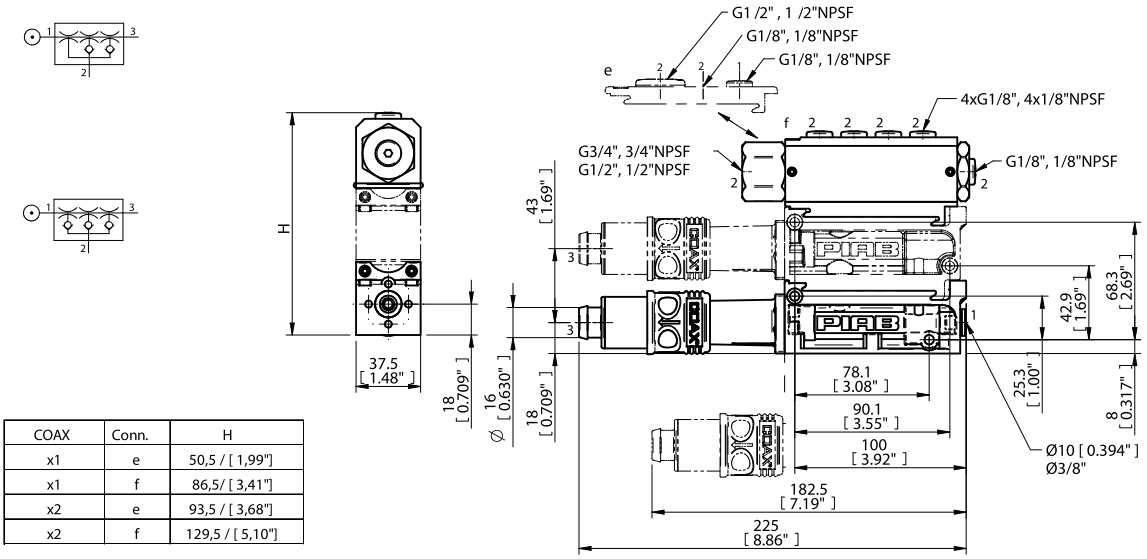
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	10	20	30	40	50	60	70	80	90	-inHg
Pi48-2	45	4.24	5.9	5.3	3.8	2.3	1.4	1.1	0.7	0.5	0.2	—	26.6
Pi48-3	45	4.34	11.9	5.3	3.8	2.3	1.4	1.1	0.7	0.5	0.2	—	26.6
Si32-2	87	3.71	7.0	6.4	5.5	3.6	1.9	1.3	1.1	0.7	—	—	22.1
Si32-3	87	3.71	12.7	7.4	5.5	3.6	1.9	1.3	1.1	0.7	—	—	22.1
Xi40-2	65	3.88	5.9	4.9	3.4	2.1	1.5	1.2	0.9	0.7	0.4	0.1	28.0
Xi40-3	65	3.88	12.5	6.4	4.2	2.8	1.5	1.2	0.9	0.7	0.4	0.1	28.0

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)									Max vacuum
	psi	scfm	10	20	30	40	50	60	70	80	90	-inHg
Pi48-2	45	4.24	0.85	1.98	3.68	7.36	13.0	19.8	28.3	45.3	113	26.6
Pi48-3	45	4.34	0.57	1.70	3.40	7.08	12.7	19.8	28.3	45.3	113	26.6
Si32-2	87	3.71	0.85	1.98	2.83	5.10	9.34	15.0	22.7	—	—	22.1
Si32-3	87	3.71	0.57	1.42	2.83	5.10	9.34	15.0	22.7	—	—	22.1
Xi40-2	65	3.88	1.13	2.55	4.81	7.93	12.5	17.8	25.5	36.8	65.1	28.0
Xi40-3	65	3.88	0.62	1.76	3.40	6.23	10.5	16.1	23.8	34.0	62.3	28.0

Dimensional drawing



COAX	Conn.	H
x1	e	50,5 / [1,99"]
x1	f	86,5/ [3,41"]
x2	e	93,5 / [3,68"]
x2	f	129,5 / [5,10"]

Ordering information

For a complete list of available pumps and combinations with further information visit piab.com. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

Accessory descriptions

AVM™2

The AVM™2 unit has built-in control and monitoring functions. The integrated energy saving function (ES) minimizes the air consumption in sealed systems. It has valves for vacuum on/off and blow-off with electrical power failsafe function. The AVM has digital outputs, 16 pre-set combinations of vacuum levels, digital vacuum level display and a mechanical valve for blow-off flow adjustment.

CU

The CU has electric valves for vacuum on/off and blow-off and a mechanical valve for blow-off flow adjustment. It also has a special M12 4-pin cable assembly with LED for status of valve signal.

P5010 ES

The P5010 has an integrated air-saving function (piSAVE onoff) that minimizes the air consumption by controlling the incoming air flow to the pump. Large hysteresis is recommended for sealed vacuum handling applications such as metal sheet, glass or plastic handling. And small hysteresis is recommended if a very accurate vacuum level has to be maintained in the process. It has an adjustable ES switch level and is a pneumatic function.

P5010 – Customer Code

P5010
Code
P5010

Connection interface	
Code	Description
00	Housing, connection Ø 10 mm
01	Housing, connection Ø 3/8"

P5010 . 00 . AA . 01

COAX® Push-in	
Code	Description
AA	COAX® push-in module Si32-2X1
AB	COAX® push-in module Si32-3X1
AC	COAX® push-in module Si32-2X1, non-return valve
AD	COAX® push-in module Si32-3X1, non-return valve
AE	COAX® push-in module Si32-2X2
AF	COAX® push-in module Si32-3X2
AG	COAX® push-in module Si32-2X2, non-return valve
AH	COAX® push-in module Si32-3X2, non-return valve
AI	COAX® push-in module Pi48-2X1
AJ	COAX® push-in module Pi48-3X1
AK	COAX® push-in module Pi48-2X1, non-return valve
AL	COAX® push-in module Pi48-3X1, non-return valve
AM	COAX® push-in module Pi48-2X2
AN	COAX® push-in module Pi48-3X2
AO	COAX® push-in module Pi48-2X2, non-return valve
AP	COAX® push-in module Pi48-3X2, non-return valve
AQ	COAX® push-in module Xi40-2X1
AR	COAX® push-in module Xi40-3X1
AS	COAX® push-in module Xi40-2X1, non-return valve
AT	COAX® push-in module Xi40-3X1, non-return valve
AU	COAX® push-in module Xi40-2X2
AV	COAX® push-in module Xi40-3X2
AW	COAX® push-in module Xi40-2X2, non-return valve
AX	COAX® push-in module Xi40-3X2, non-return valve

Connection modules/function	
Code	Description
01	Connection module low, G connection
02	Connection module high, G connection
03	Connection module low, NPSF connection
04	Connection module high, NPSF connection
05	Function AVM™2 NO, G connection
06	Function AVM™2 NC (power off - NO), G connection
07	Function AVM™2 NO, NPSF connection
08	Function AVM™2 NC (power off - NO), NPSF connection
09	Function CU NC, G connection
10	Function CU NC, NPSF connection
11	Function ES Vacustat 2/2 NO large hysteres
12	Function ES Vacustat 2/2 NO small hysteres
13	Function AVM™2 NO, automatic blow-off (1 sec), G connection
14	Function AVM™2 NC, automatic blow-off (1 sec), G connection
15	Function AVM™2 NC 2 (power off - NC), G connection
16	Function AVM™2 NO, automatic blow-off (1 sec), NPSF connection
17	Function AVM™2 NC, automatic blow-off (1 sec), NPSF connection
18	Function AVM™2 NC 2 (power off - NC), NPSF connection

VGS™2010 family

Piab VGS™ – A product design where different suction cups are integrated with vacuum cartridges based on the patented COAX® technology. The “vacuum gripper” makes selection, sizing and installation of a vacuum system easier. With a VGS™ you will enjoy the benefits of a more cost-efficient and reliable decentralized vacuum system. It has a low weight at 0.88–1.38 oz..

It is available with a two-stage COAX® cartridge MICRO. Choose Bi for low feed pressure, Si for high vacuum flow, Xi for extra vacuum and Ti at 0.4/0.6 MPa for extra capacity/dirt tolerance. This VGS™ is compatible with any suction cup with G1/8” male fitting.

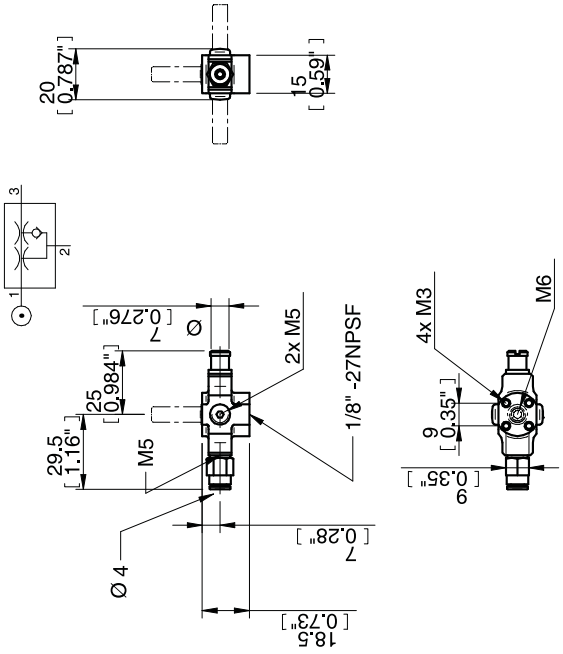
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)								Max vacuum
	psi	scfm	0	10	20	30	40	50	60	70	-inHg
MICRO Bi03-2	58	0.19	0.53	0.32	0.17	0.15	0.11	0.06	–	–	17.7
MICRO Si02-2	73	0.21	0.57	0.40	0.19	0.17	0.15	0.11	0.04	–	20.7
MICRO Ti05-2	58	0.19	0.53	0.32	0.17	0.15	0.11	0.06	–	–	17.7
MICRO Ti05-2	73	0.21	0.57	0.40	0.19	0.17	0.15	0.11	0.04	–	20.7
MICRO Xi2.5-2	87	0.25	0.59	0.44	0.25	0.17	0.15	0.13	0.08	0.04	22.1

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)								Max vacuum
	psi	scfm	10	20	30	40	50	60	70	80	-inHg
MICRO Bi03-2	58	0.19	7.08	4.25	2.27	1.98	1.42	0.85	–	–	17.7
MICRO Si02-2	73	0.21	7.65	5.38	2.55	2.27	1.98	1.42	0.57	–	20.7
MICRO Ti05-2	58	0.19	7.08	4.25	2.27	1.98	1.42	0.85	–	–	17.7
MICRO Ti05-2	73	0.21	7.65	5.38	2.55	2.27	1.98	1.42	0.57	–	20.7
MICRO Xi2.5-2	87	0.25	7.93	5.95	3.40	2.27	1.98	1.70	1.13	0.57	22.1

Dimensional drawing



Ordering information

For a complete list of available pumps and combinations with further information visit piab.com. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

VGS™2010 – Customer Code

Code	Housing
VGS2010	Housing

Code	COAX®
AA	No COAX® cartridge (slave unit)
AB	COAX® cartridge MICRO Bi03-2
AF	COAX® cartridge MICRO Si02-2
AJ	COAX® cartridge MICRO Xi2.5-2
AN	COAX® cartridge MICRO Ti05-2

VGS2010 . AB . 01 . BA

Code	Mounting orientation
00	4x M3 top, flush mount
01	M6 19 mm top, profile kit
02	M6 19 mm right, profile kit
03	M6 19 mm left, profile kit

Code	Suction cup
BA	No suction cup
DA	BX25P 30°/60° Shore A
DB	BX25P 60° Shore A
DC	FC20P 50° Shore A
DD	F25CP 50° Shore A
DE	OB20x60P 60° Shore A
DF	OF10x30P 50° Shore A
DG	OF15x45P 50° Shore A

VGS™3010 family

Piab VGS™ – A product design where different suction cups are integrated with vacuum cartridges based on the patented COAX® technology. The “vacuum gripper” makes selection, sizing and installation of a vacuum system easier. With a VGS™ you will enjoy the benefits of a more cost-efficient and reliable decentralized vacuum system. It has a low weight at 3.91–12.0 oz..

It is available with two- or three-stage COAX® cartridge MINI. Choose a Di cartridge, for very harsh environments, combining high dust and high humidity levels, an Si cartridge for extra vacuum flow, a Pi cartridge for high performance at low feed pressure or an Xi cartridge when high flow and deep vacuum is needed. The three-stage cartridge will give extra high initial vacuum flow, which is suitable in high speed applications. The VGS™ is compatible with any suction cup with G3/8” male fitting.

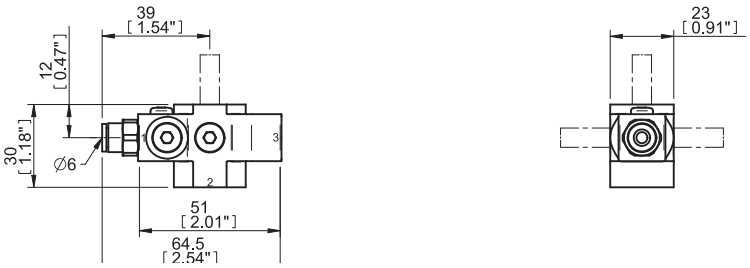
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	27	-inHg
MINI Pi12-2	46	0.93	1.44	1.27	0.93	0.57	0.40	0.30	0.21	0.13	0.06	—	26.6
MINI Pi12-3	46	0.93	2.97	1.27	0.93	0.57	0.40	0.30	0.21	0.13	0.06	—	26.6
MINI Si08-2	87	0.93	1.63	1.42	1.08	0.70	0.49	0.34	0.25	0.17	—	—	22.1
MINI Si08-3	87	0.93	2.84	1.55	1.17	0.74	0.49	0.36	0.28	0.17	—	—	22.1
MINI Xi10-2	73	0.97	1.59	1.33	1.04	0.70	0.40	0.32	0.23	0.15	0.08	0.023	27.7
MINI Xi10-3	73	0.97	3.03	1.48	1.06	0.70	0.40	0.32	0.23	0.15	0.08	0.023	27.7
MINI Di16-2	87	1.59	1.36	1.21	1.04	0.87	0.74	0.61	0.38	0.08	—	—	21.5

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)									Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	27	-inHg
MINI Pi12-2	46	0.93	4.81	9.06	16.4	31.1	51.0	76.5	113	181	—	26.6
MINI Pi12-3	46	0.93	2.27	6.51	13.9	28.3	48.1	73.6	110	178	—	26.6
MINI Si08-2	87	0.93	3.96	8.78	15.6	25.5	39.6	59.5	87.8	—	—	22.1
MINI Si08-3	87	0.93	2.83	7.08	13.6	22.7	36.8	56.6	82.1	—	—	22.1
MINI Xi10-2	73	0.97	3.96	8.50	17.0	28.3	45.3	65.1	99.1	150	252	27.7
MINI Xi10-3	73	0.97	2.55	7.36	14.2	25.5	42.5	62.3	96.3	147	249	27.7
MINI Di16-2	87	1.59	4.81	9.91	16.4	23.8	32.6	44.7	70.5	—	—	21.5

Dimensional drawing



Ordering information

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VGS™3010 – Customer Code

Code	Housing
VGS3010	Housing

Code	COAX®
AA	No COAX® cartridge (slave unit)
AB	MINI Pi12-2
AC	MINI Pi12-3
AD	MINI Pi12-2, non-return valve
AE	MINI Pi12-3, non-return valve
AF	MINI Si08-2
AG	MINI Si08-3
AH	MINI Si08-2, non-return valve
AI	MINI Si08-3, non-return valve
AJ	MINI Xi10-2
AK	MINI Xi10-3
AL	MINI Xi10-2, non-return valve
AM	MINI Xi10-3, non-return valve
AN	MINI Di16-2

Code	Mounting orientation
00	4x M4 top, flush mount
01	M8 16 mm top
02	M8 16 mm right
03	M8 16 mm left
04	M8 27 mm top, profile kit
05	M8 27 mm right, profile kit
06	M8 27 mm left, profile kit
07	M6 22 mm top, profile kit
08	M6 22 mm right, profile kit
09	M6 22 mm left, profile kit
11	Ball joint VGS™3010 right
12	Ball joint VGS™3010 left
13	Lock-pin VGS™3010 right
14	Lock-pin VGS™3010 left
15	Level compensator LC30

VGS3010 . AB . 01 . BA

Suction cup
Visit piab.com for the full range of suction cups available for VGS™3010

VGS™3040 family

This is a product design where different suction cups can be integrated with vacuum cartridges based on the patented COAX® technology. The “vacuum gripper” makes selection, sizing and installation of a vacuum system easier. With a VGS™ you will enjoy the benefits of a more cost-efficient and reliable decentralized vacuum system. The VGS™ is compatible with any suction cup with G3/8” male fitting. It has a low weight at 7.20–12.0 oz..

It is available with two- or three-stage COAX® cartridge MINI. Choose a Di cartridge, for very harsh environments, combining high dust and high humidity levels, an Si cartridge for extra vacuum flow, a Pi cartridge for high performance at low feed pressure or an Xi cartridge when high flow and deep vacuum is needed. The three-stage cartridge will give extra high initial vacuum flow, which is suitable in high speed applications.

It is available in lockpin 16, 19 or balljoint mountings, industry standard as well as level compensator to compensate for differences in level of object. It can also be fitted with different functions as energy saving, release or blow off.

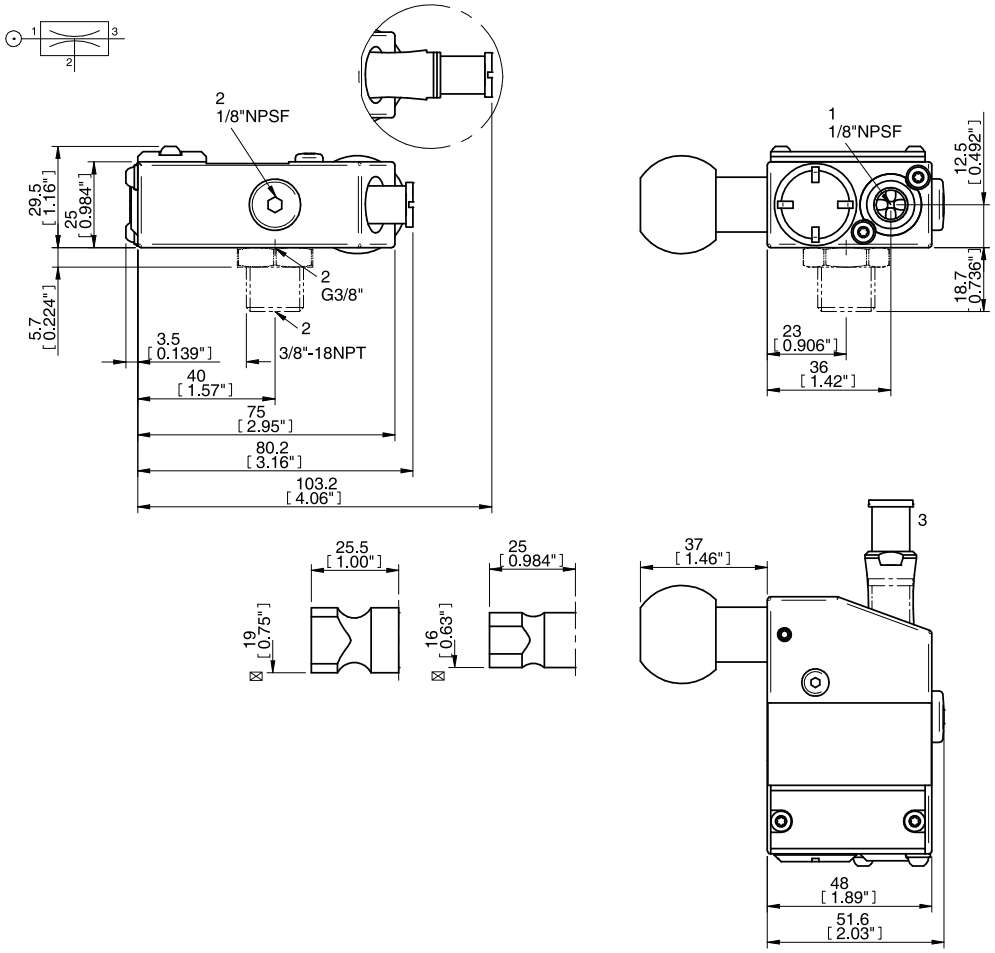
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	27	-inHg
MINI Si08-2	87	0.93	1.63	1.42	1.08	0.70	0.49	0.34	0.25	0.17	—	—	22.1
MINI Si08-3	87	0.93	2.84	1.55	1.17	0.74	0.49	0.36	0.28	0.17	—	—	22.1
MINI Xi10-2	73	0.97	1.59	1.33	1.04	0.70	0.40	0.32	0.23	0.15	0.095	0.023	27.7
MINI Xi10-3	73	0.97	3.03	1.48	1.06	0.70	0.40	0.32	0.23	0.15	0.095	0.023	27.7
MINI Pi12-2	46	0.93	1.44	1.27	0.93	0.57	0.40	0.30	0.21	0.13	0.03	—	26.6
MINI Pi12-3	46	0.93	2.97	1.27	0.93	0.57	0.40	0.30	0.21	0.13	0.03	—	26.6

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)									Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	27	-inHg
MINI Si08-2	87	0.93	3.96	8.78	15.6	25.5	39.6	59.5	87.8	—	—	22.1
MINI Si08-3	87	0.93	2.83	7.08	13.6	22.7	36.8	56.6	82.1	—	—	22.1
MINI Xi10-2	73	0.97	3.96	8.50	17.0	28.3	45.3	65.1	99.1	150	252	27.7
MINI Xi10-3	73	0.97	2.55	7.36	14.2	25.5	42.5	62.3	96.3	147	249	27.7
MINI Pi12-2	46	0.93	4.81	9.06	16.4	31.1	51.0	76.5	113	181	—	26.6
MINI Pi12-3	46	0.93	2.27	6.51	13.9	28.3	48.1	73.6	110	178	—	26.6

Dimensional drawing



Ordering information

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Accessory descriptions

VGS™3040 with profile mount

It makes the attachment easy to a standard extrusion and profile systems with an adjustable position. This will give a quick setup and changeover.

VGS™3040 with level compensator

It is available with level compensator to compensate for differences in level of object.

VGS™3040 with piSAVE onoff

It has an integrated energy-saving device, piSAVE onoff, results in very low air consumption in sealed applications. The built-in blow off check valve will provide a fast release of the object It has an adjustable vacuum controlled 2/2 NO valve and is available with large hysteresis for object handling and small hysteresis for process applications.

VGS™3040 with piSAVE release

It has a built-in quick release for fast release of object. It works with an internal or separate feed of air. It equalises pressure in the suction cups to provide fast release of the product. The piSAVE release will provide an extra fast release by accumulating and utilizing the feed-air pressure as a boost. It has an ON/OFF activated simultaneously with the ejector and no additional controls required — use a single 3/2 control valve for the ejector and piSAVE release.

VGS™3040 with blow off

It has a built-in blow off check valve for fast release of object. Prevents vacuum from being pulled through the blow-off lines, which means faster response time and completely independent vacuum units.

VGS™3040 – Customer Code

Code	Housing
VGS3040	Housing

Code	COAX® cartridge
AB	COAX® cartridge MINI Pi12-2
AC	COAX® cartridge MINI Pi12-3
AD	COAX® cartridge MINI Pi12-2, non-return valve
AE	COAX® cartridge MINI Pi12-3, non-return valve
AF	COAX® cartridge MINI Si08-2
AG	COAX® cartridge MINI Si08-3
AH	COAX® cartridge MINI Si08-2, non-return valve
AI	COAX® cartridge MINI Si08-3, non-return valve
AJ	COAX® cartridge MINI Xi10-2
AK	COAX® cartridge MINI Xi10-3
AL	COAX® cartridge MINI Xi10-2, non-return valve
AM	COAX® cartridge MINI Xi10-3, non-return valve

Code	Mounting style
00	No mounting style
01	Mounting Lock pin 16 mm
02	Mounting Lock pin 19 mm
03	Mounting Ball joint
04	Mounting Lock pin 16 mm level compensator
05	Mounting Lock pin 19 mm level compensator
06	Mounting Ball joint level compensator
07	Mounting Extrusion mount level compensator
08	Mounting Profile mount
09	Mounting Profile mount

VGS3040 . AB . 01 . AA . 01 . AA

Code	Energy saving
AA	No energy saving
AB	piSAVE onoff 19.5 -inHg
AC	piSAVE onoff, Adjustable (factory set at 13.5 -inHg)

Code	Release function
01	Release Blow-off
02	piSAVE release internal
03	piSAVE release external

Code	Vacuum connection
AA	G3/8" female
AB	G3/8" male - 3/8" NPT male adapter

VGS™5010 family

Piab VGS™ – A product design where different suction cups are integrated with vacuum cartridges based on the patented COAX® technology. The “vacuum gripper” makes selection, sizing and installation of a vacuum system easier. With a VGS™ you will enjoy the benefits of a more cost-efficient and reliable decentralized vacuum system. It has a low weight at 14.6–24.0 oz..

The VGS™5010 is specially designed for handling larger parts, such as car body sheets as it is compatible with any suction cup with G1/2” male fitting. It is also available with a two or three-stage COAX® cartridge MIDI. Choose an Si cartridge for extra vacuum flow, a Pi cartridge for high performance at low feed pressure or an Xi cartridge when high flow and deep vacuum is needed. The three-stage cartridge will give extra high initial vacuum flow, suitable in high speed applications.

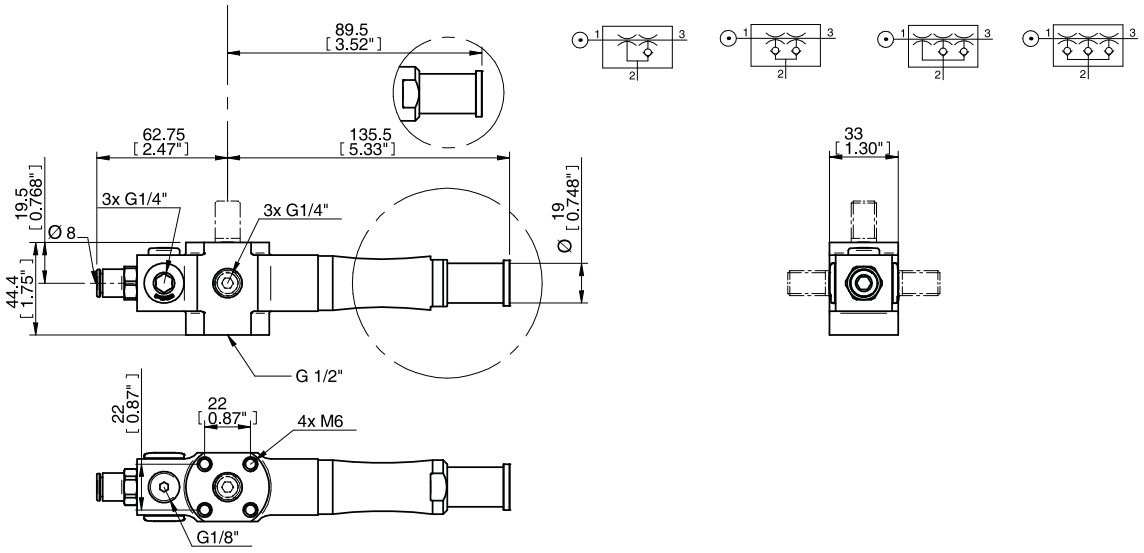
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	27	-inHg
MIDI Pi48-2	45	4.24	5.93	5.30	3.81	2.33	1.38	1.06	0.74	0.53	0.21	—	26.6
MIDI Pi48-3	45	4.34	11.9	5.30	3.81	2.33	1.38	1.06	0.74	0.53	0.21	—	26.6
MIDI Si32-2	87	3.71	6.99	6.36	5.51	3.60	1.91	1.27	1.06	0.74	—	—	22.1
MIDI Si32-3	87	3.71	12.7	7.42	5.51	3.60	1.91	1.27	1.06	0.74	—	—	22.1
MIDI Xi40-2	65	3.88	5.93	4.87	3.39	2.12	1.55	1.23	0.91	0.68	0.38	0.06	28
MIDI Xi40-3	65	3.88	12.5	6.36	4.24	2.75	1.55	1.23	0.91	0.68	0.38	0.06	28

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)									Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	27	-inHg
MIDI Pi48-2	45	4.24	0.03	0.07	0.13	0.26	13.0	19.8	28.3	45.3	113	26.6
MIDI Pi48-3	45	4.34	0.02	0.06	0.12	0.25	12.7	19.8	28.3	45.3	113	26.6
MIDI Si32-2	87	3.71	0.03	0.07	0.1	0.18	9.34	15.0	22.7	—	—	22.1
MIDI Si32-3	87	3.71	0.02	0.05	0.1	0.18	9.34	15.0	22.7	—	—	22.1
MIDI Xi40-2	65	3.88	0.04	0.09	0.17	0.28	12.5	17.8	25.5	36.8	65.1	28
MIDI Xi40-3	65	3.88	0.022	0.062	0.12	0.22	10.5	16.1	23.8	34.0	62.3	28

Dimensional drawing



Ordering information

For a complete list of available pumps and combinations with further information visit piab.com. On our webpage you will also be able to find dimensional drawings, CAD-drawings and much more. Register and get full access to all resources available.

VGS™5010 – Customer Code

Code	Housing
VGS5010	Housing

Code	COAX® cartridge
AA	No COAX® cartridge (slave unit)
AB	COAX® cartridge MIDI Pi48-2
AC	COAX® cartridge MIDI Pi48-3
AD	COAX® cartridge MIDI Pi48-2, non-return valve
AE	COAX® cartridge MIDI Pi48-3, non-return valve
AF	COAX® cartridge MIDI Si32-2
AG	COAX® cartridge MIDI Si32-3
AH	COAX® cartridge MIDI Si32-2, non-return valve
AI	COAX® cartridge MIDI Si32-3, non-return valve
AJ	COAX® cartridge MIDI Xi40-2
AK	COAX® cartridge MIDI Xi40-3
AL	COAX® cartridge MIDI Xi40-2, non-return valve
AM	COAX® cartridge MIDI Xi40-3, non-return valve

Code	Mounting style
00	4x M6 top, flush mount
01	4x M6 top, angle bracket
02	M12 20 mm top
03	M12 20 mm right
04	M12 20 mm left
05	M12 20 mm top, angle bracket
06	M12 20 mm right, angle bracket
07	M12 20 mm left, angle bracket

VGS5010 . AB . 00 . BA

Code	Suction cup
BA	No suction cup
CO	BF110P 30°/60° Shore A
CP	BF110P 60° Shore A
CQ	BX110P 30°/60° Shore A
CR	BX110P 60° Shore A
CS	F110P 30°/60° Shore A
CT	F110P 60° Shore A
CU	OB65x170P 30°/60° Shore A
CV	OB65x170P 60° Shore A
CX	BL50-3P 30°/70° Shore A
CY	BX75P 30°/60° Shore A
CZ	BX75P 60° Shore A

COAX® in piGRIP®

This is a fully decentralized vacuum unit based on patented COAX® technology. It provides the quickest response time and very high energy efficiency. The COAX® in piGRIP® is available with a variation of two stage COAX® MICRO cartridges. The COAX in piGRIP is compatible with any suction cup with G1/8" male fitting.

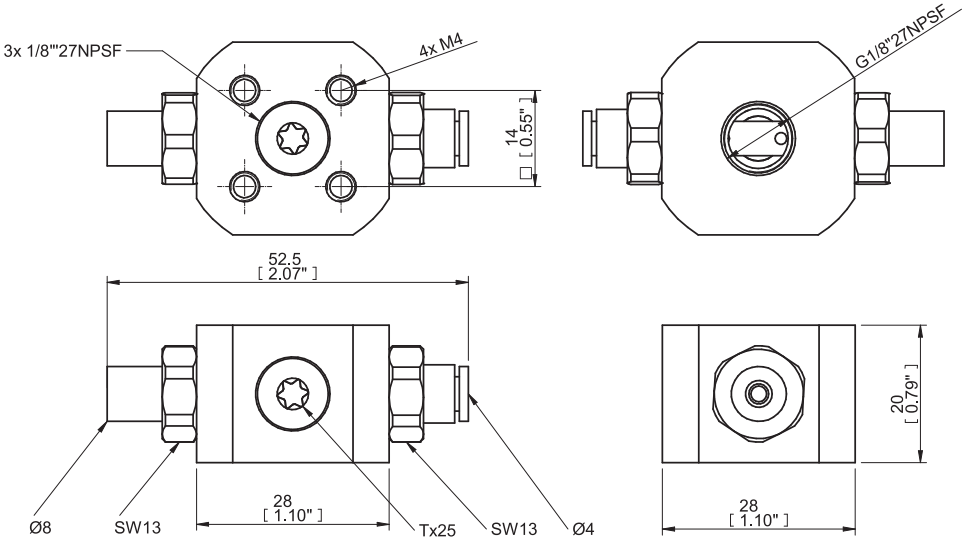
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)									Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	-inHg
MICRO Bi03-2	26	0.30	0.49	0.32	0.13	0.08	0.074	0.049	0.028	0.013	—	24.5
MICRO Si02-2	87	0.25	0.59	0.44	0.25	0.17	0.15	0.13	0.08	0.04	—	22.1
MICRO Ti05-2	58	0.57	0.68	0.59	0.49	0.36	0.21	0.15	0.08	0.04	0.008	24.8
MICRO Xi2.5-2	73	0.28	0.51	0.36	0.21	0.13	0.08	0.06	0.04	0.02	0.02	27.1

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)								Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	-inHg
MICRO Bi03-2	26	0.30	14.2	39.6	110	181	283	453	793	1444	24.5
MICRO Si02-2	87	0.25	11.6	28.6	56.9	93.4	139	195	289	—	22.1
MICRO Ti05-2	58	0.57	9.34	20.7	34.0	56.6	87.8	142	235	470	24.8
MICRO Xi2.5-2	73	0.28	13.9	34.8	70.2	127	207	320	510	793	27.1

Dimensional drawing



Ordering information

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piCLASSIC

It is available with a three-stage COAX® cartridge MIDI. Choose an Si cartridge for extra vacuum flow, a Pi cartridge for high performance at low feed pressure or an Xi cartridge when high flow and deep vacuum is needed. This pump has a substantially lower air consumption compare to competition, it is compact with no moving parts. It can be configured with 1–6 cartridges. This pump can easily be upgraded with more capacity if needed. And it is also easy to disassemble for maintenance.

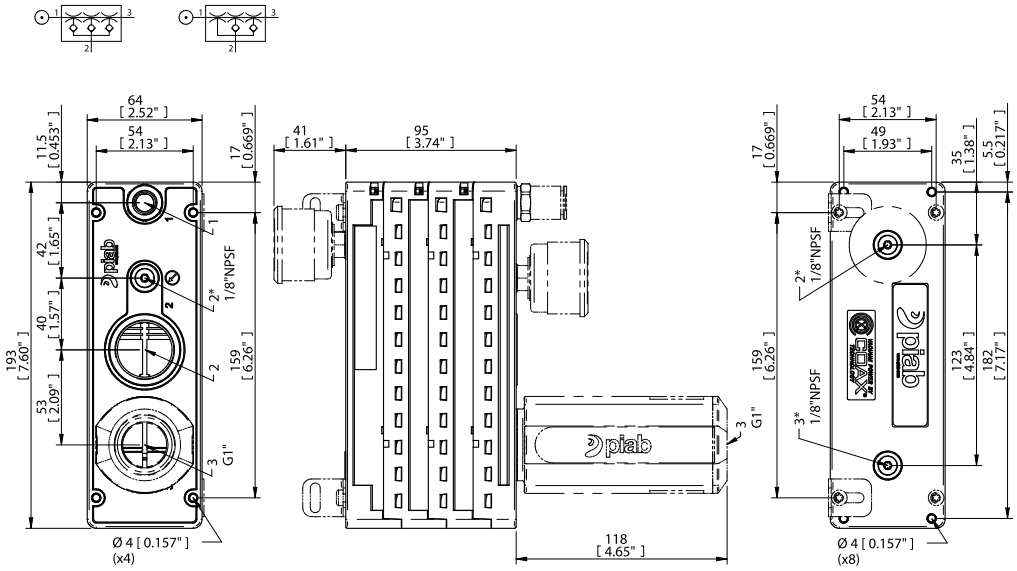
Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	27	-inHg
MIDI Si32-3 x1	87	3.71	12.7	7.42	5.51	3.60	1.91	1.27	1.06	0.74	—	—	22.1
MIDI Si32-3 x2	87	7.42	25.4	14.8	11.0	7.20	3.81	2.54	2.12	1.48	—	—	22.1
MIDI Si32-3 x3	87	11.12	38.1	22.2	16.5	10.8	5.72	3.81	3.18	2.33	—	—	22.1
MIDI Si32-3 x4	87	14.83	50.9	29.7	22.0	14.4	7.63	5.09	4.24	2.97	—	—	22.1
MIDI Si32-3 x5	87	18.54	54.0	33.5	26.3	18.0	9.54	6.36	5.30	4.45	—	—	22.1
MIDI Si32-3 x6	87	22.25	61.0	37.9	31.4	21.6	11.4	7.63	6.36	4.66	—	—	22.1
MIDI Pi48-3 x1	45	4.34	11.9	5.30	3.81	2.33	1.38	1.06	0.74	0.53	0.21	—	26.6
MIDI Pi48-3 x2	45	8.48	23.7	10.6	7.63	4.66	2.75	2.12	1.48	1.06	0.42	—	26.6
MIDI Pi48-3 x3	45	12.71	35.6	15.9	11.4	6.99	4.13	3.18	2.22	1.59	0.64	—	26.6
MIDI Pi48-3 x4	45	16.95	47.5	21.2	15.3	9.32	5.51	4.24	2.97	2.12	0.85	—	26.6
MIDI Pi48-3 x5	45	21.19	50.4	23.9	18.2	11.7	6.89	5.30	3.71	2.65	1.06	—	26.6
MIDI Pi48-3 x6	45	25.43	57.0	27.1	21.8	14.0	8.26	6.36	4.45	3.18	1.27	—	26.6
MIDI Xi40-3 x1	65	3.88	12.5	6.36	4.24	2.75	1.55	1.23	0.91	0.68	0.38	0.06	28
MIDI Xi40-3 x2	65	7.76	25.0	12.7	8.48	5.51	3.09	2.46	1.82	1.36	0.76	0.13	28
MIDI Xi40-3 x3	65	11.63	37.5	19.1	12.7	8.26	4.64	3.69	2.73	2.03	1.14	0.19	28
MIDI Xi40-3 x4	65	15.51	50.0	25.4	17.0	11.0	6.19	4.92	3.64	2.71	1.53	0.25	28
MIDI Xi40-3 x5	65	19.39	53.2	28.6	20.1	13.8	7.73	6.14	4.56	3.39	1.91	0.32	28
MIDI Xi40-3 x6	65	23.31	60.0	32.4	24.2	16.5	9.28	7.29	5.47	4.07	2.29	0.38	28

Evacuation times

COAX® Cartridge	Feed pressure	Air consumption	Evacuation time (s/cf) to reach different vacuum levels (-inHg)									Max vacuum
	psi	scfm	3	6	9	12	15	18	21	24	27	-inHg
MIDI Si32-3 x1	87	3.71	0.57	1.42	2.83	5.10	9.34	15.0	22.7	—	—	22.1
MIDI Si32-3 x2	87	7.42	0.28	0.71	1.42	2.55	4.81	7.65	11.3	—	—	22.1
MIDI Si32-3 x3	87	11.12	0.20	0.48	0.93	1.70	3.11	5.10	7.65	—	—	22.1
MIDI Si32-3 x4	87	14.83	0.14	0.37	0.71	1.27	2.35	3.68	5.66	—	—	22.1
MIDI Si32-3 x5	87	18.54	0.14	0.34	0.62	1.02	1.87	3.11	4.53	—	—	22.1
MIDI Si32-3 x6	87	22.25	0.11	0.28	0.51	0.85	1.56	2.55	3.68	—	—	22.1
MIDI Pi48-3 x1	45	4.34	0.57	1.70	3.40	7.08	12.7	19.8	28.3	45.3	113	26.6
MIDI Pi48-3 x2	45	8.48	0.28	0.85	1.70	3.68	6.51	9.91	14.2	22.7	56.6	26.6
MIDI Pi48-3 x3	45	12.71	0.20	0.57	1.13	2.27	4.25	6.51	9.34	15.0	37.7	26.6
MIDI Pi48-3 x4	45	16.95	0.14	0.42	0.85	1.70	3.11	5.10	7.08	11.3	28.3	26.6
MIDI Pi48-3 x5	45	21.19	0.14	0.40	0.79	1.42	2.55	3.96	5.66	9.1	22.7	26.6
MIDI Pi48-3 x6	45	25.43	0.11	0.37	0.71	1.13	2.27	3.40	4.81	7.6	19.0	26.6
MIDI Xi40-3 x1	65	3.88	0.62	1.76	3.40	6.23	10.5	16.1	23.8	34.0	62.3	28
MIDI Xi40-3 x2	65	7.76	0.31	0.88	1.70	3.11	5.38	8.21	11.9	17.0	31.1	28
MIDI Xi40-3 x3	65	11.63	0.20	0.59	1.13	1.98	3.40	5.38	7.93	11.3	20.7	28
MIDI Xi40-3 x4	65	15.51	0.17	0.45	0.85	1.56	2.55	3.96	5.95	8.5	15.6	28
MIDI Xi40-3 x5	65	19.39	0.14	0.40	0.74	1.25	1.98	3.11	4.81	6.8	12.5	28
MIDI Xi40-3 x6	65	23.31	0.14	0.34	0.62	1.13	1.70	2.83	3.96	5.7	10.5	28

Dimensional drawing



*) Sensing port

PCL.XXXX.S. AB

	1	2
AB	G1/4"	G1"
12B	Ø12	G1"

Ordering information

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Accessory descriptions

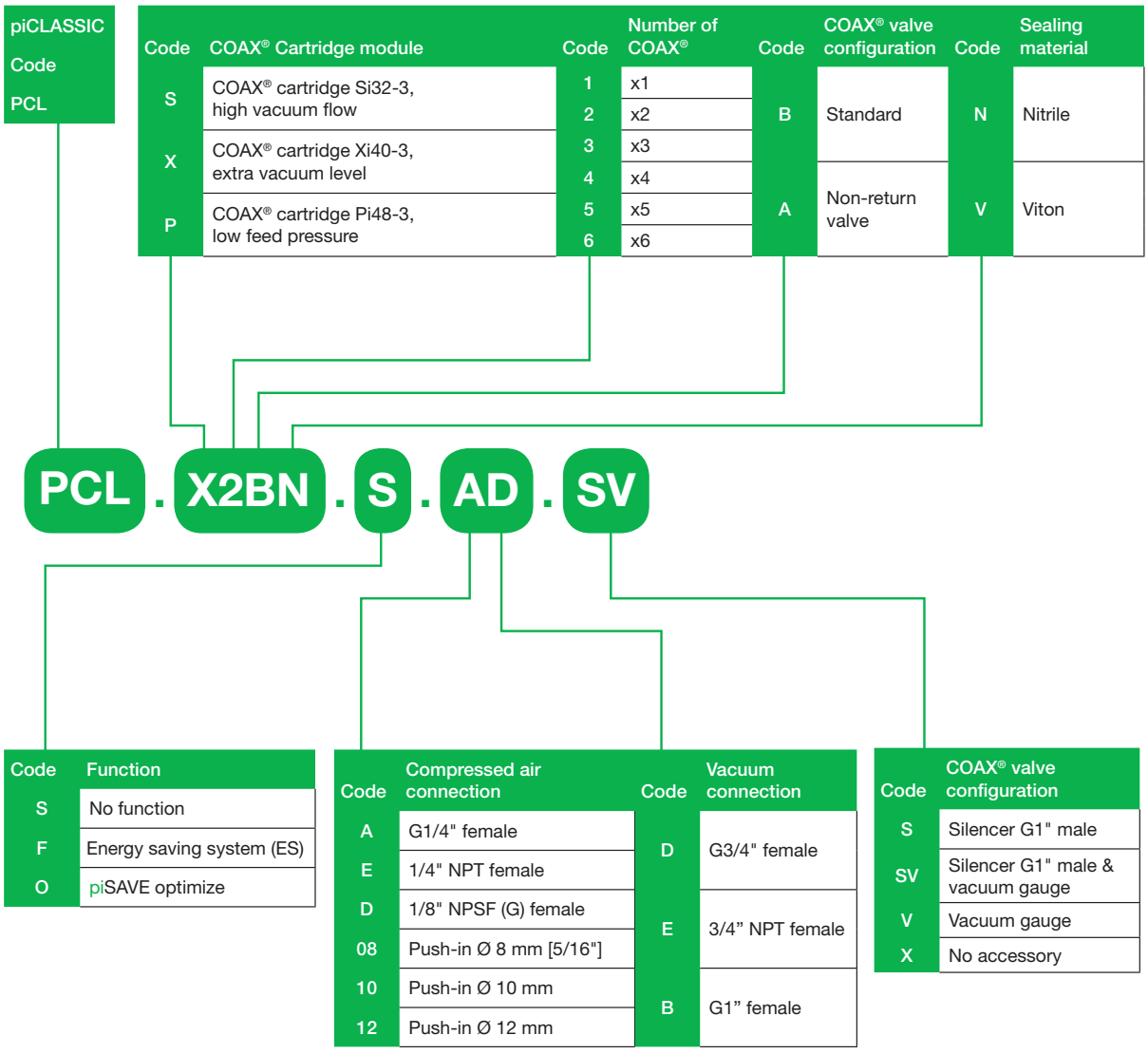
piCLASSIC Energy saving

piCLASSIC has an integrated air-saving function (piSAVE onoff) that minimizes the air consumption by controlling the incoming air flow to the pump. Large hysteresis is recommended for sealed vacuum handling applications such as metal sheet, glass or plastic handling. And small hysteresis is recommended if a very accurate vacuum level has to be maintained in the process. It has an adjustable ES switch level and is a pneumatic function.

piCLASSIC piSAVE optimize

The piSAVE optimize is a vacuum controlled proportional pressure regulator, a fully pneumatic device suitable for air-driven ejectors/pumps. The feed pressure to the vacuum pump/ejector is automatically regulated and controlled to maintain the set vacuum level. Air/energy usage is kept to a minimum for the application (optimized). It is recommended for leaking and sealed applications to save energy and secure the right vacuum level.

piCLASSIC – Customer Code



piCLASSIC Code
PCL

Code	COAX® Cartridge module
S	COAX® cartridge Si32-3, high vacuum flow
X	COAX® cartridge Xi40-3, extra vacuum level
P	COAX® cartridge Pi48-3, low feed pressure

Code	Number of COAX®
1	x1
2	x2
3	x3
4	x4
5	x5
6	x6

Code	COAX® valve configuration
B	Standard
A	Non-return valve

Code	Sealing material
N	Nitrile
V	Viton

Code	Function
S	No function
F	Energy saving system (ES)
O	piSAVE optimize

Code	Compressed air connection
A	G1/4" female
E	1/4" NPT female
D	1/8" NPSF (G) female
08	Push-in Ø 8 mm [5/16"]
10	Push-in Ø 10 mm
12	Push-in Ø 12 mm

Code	Vacuum connection
D	G3/4" female
E	3/4" NPT female
B	G1" female

Code	COAX® valve configuration
S	Silencer G1" male
SV	Silencer G1" male & vacuum gauge
V	Vacuum gauge
X	No accessory

P6010

As with the majority of our pumps, it is available with the patented COAX® technology and with a three-stage COAX® cartridge MIDI. Choose an Si cartridge for extra vacuum flow, a Pi cartridge for high performance at low feed pressure or an Xi cartridge when high flow and deep vacuum is needed. The P6010 consumes substantially less air compared to conventional ejectors. It also has quicker evacuation times and a low noise level. It is available with multiple connection alternatives. It can be configured with 1–4 cartridges.

Vacuum flow

COAX® Cartridge	Feed pressure	Air consumption	Vacuum flow (scfm) at different vacuum levels (-inHg)										Max vacuum
	psi	scfm	0	3	6	9	12	15	18	21	24	27	-inHg
Pi48-3 x1	45	4.24	11.9	5.30	3.81	2.33	1.38	1.06	0.74	0.53	0.21	—	26.6
Si32-3 x1	87	3.71	12.7	7.42	5.51	3.60	1.91	1.27	1.06	0.74	—	—	22.1/15.3*
Xi40-3 x1	65	3.88	12.5	6.36	4.24	2.75	1.55	1.23	0.91	0.68	0.38	0.06	28/15*
Pi48-3 x2	45	8.48	23.7	10.6	7.63	4.66	2.75	2.12	1.48	1.06	0.42	—	26.6
Si32-3 x2	87	7.42	25.4	14.8	11.0	7.20	3.81	2.54	2.12	1.48	—	—	22.1/15.3*
Xi40-3 x2	65	7.76	25.0	12.7	8.48	5.51	3.09	2.46	1.82	1.36	0.76	0.13	28/15*
Pi48-3 x3	45	12.71	35.6	15.9	11.4	6.99	4.13	3.18	2.22	1.59	0.64	—	26.6
Si32-3 x3	87	11.12	38.1	22.2	16.5	10.8	5.72	3.81	3.18	2.22	—	—	22.1/15.3*
Xi40-3 x3	65	11.63	37.5	19.1	12.7	8.26	4.64	3.69	2.73	2.03	1.14	0.19	28/15*
Pi48-3 x4	45	16.95	47.5	21.2	15.3	9.32	5.51	4.24	2.97	2.12	0.85	—	26.6
Si32-3 x4	87	14.83	50.9	29.7	22.0	14.4	7.63	5.09	4.24	2.97	—	—	22.1/15.3*
Xi40-3 x4	65	15.51	50.0	25.4	17.0	11.0	6.19	4.92	3.64	2.71	1.53	0.25	28/15*

*without/with 1x flap valve