COVAL

vacuum managers

MPXS

Controlled Communicating Micro Vacuum Pumps

IO-Link

AIR Saving Control

ADVANCED VACUUM SOLUTIONS

MPXS

Controlled Communicating Micro Vacuum Pumps

General Information

IO-Link

Air Saving Control

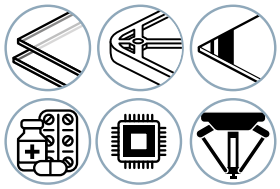
The **MPXS series** micro vacuum pumps represent a significant advancement in vacuum handling technology. Their ultra-compact and lightweight design makes them ideal for integration close to suction cups on robots or automated systems. This proximity, combined with the integrated single-stage Venturi technology, reduces cycle times and meets the demands of high-speed applications, particularly in the plastics, electronics, and pharmaceutical sectors.

Equipped with Air Saving Control (ASC) vacuum regulation technology, the **MPXS** micro vacuum pumps ensure an average energy saving of 90%. They also feature built-in diagnostic tools and an IO-Link communication interface, ensuring simple and effective integration into connected production processes.

The modularity of the **MPXS** series offers a wide range of configurations, providing great flexibility in installation and use to adapt to the varied needs of industrial applications.

COVAL's **MPXS** micro vacuum pumps are the ideal solution to optimize your gripping processes, offering unmatched performance, efficiency, and adaptability for demanding industrial applications.

Industry-specific applications



Full scale

Main Features

- Ultra-compact and lightweight: 12.5 mm wide and 87 g minimum.
- Maximum vacuum: 85%.
- Suction flow rates: - Nozzle Ø 0.7 mm → 15 Nl/min
  - Nozzle Ø 1.0 mm → 26 Nl/min
- Vacuum control: NC (Normally Closed) or NO (Normally Open).
- Standard or adjustable powerful blow-off, controlled or automatic timed.
- Vacuum check valve.
- Integrated open silencer or exhaust collector.
- Standalone micro vacuum pumps or bankable from 1 to 8 modules with common pressure and collectable exhaust.
- High-visibility display with clear multilingual messages and simplified setup menu.
- Electronic vacuum switch and 24 V DC contact output.
- Standard Input/Output (SIO) / IO-Link mode.
- Intelligent vacuum regulation system ASC (Air Saving Control) ensuring an average energy saving of 90%.
- Power supply voltage monitoring.

Applications

The compact and lightweight nature of the **MPXS Series** micro vacuum pumps allow installation as close as possible to the suction cups, thereby reducing cycle times and energy consumption.

They are ideal for high speed gripping applications:

- Plastics processing
- Electronics
- Pharmaceutical

...

MPXS

Controlled Communicating Micro Vacuum Pumps

General Information

IO-Link

AIR Saving Control

Ultra-compact and lightweight design

- 12.5 mm wide
- 87 g minimum
- Volume: 74 cm^3

Vacuum generation with single-stage Venturi pump

- Short evacuation times
- No moving parts
- Dust resistant
- No maintenance required

Onboard diagnostic tools

- Cycle counters (vacuum and blow-off control, objects gripped, objects lost, etc.)
- Alarm counters
- Supply voltage monitoring

Available configurations

- Standalone module
- Bank from 1 to 8 modules with common pressure and collectable exhaust

Inputs / Outputs Digital (SIO) / IO-Link

- One M8 6-pin connector male A coded

Simple and efficient HMI

Control status LEDs:

- Green LED: vacuum control
- Orange LED: blow-off control

2 setting buttons

High-visibility display with clear messages and straightforward settings menu

Gripping status indicator light:

- Green: object gripped
- Yellow: ASC disabled due to vacuum leakage (object held in place)
- Red: object lost

Vacuum check valve

AIR Saving Control

Air Saving Control (ASC), our smart vacuum control system: Averages 90% energy savings

IO-Link

IO-Link communications interface: allows for simple and efficient integration of MPXS micro vacuum pumps into the process

Open clog-free silencer or exhaust collector depending on the version

High-visibility display

Multilingual alert and/or setup messages

EN FR DE IT ES

IO-Link active

ASC (Air Saving Control) Indicator: active vacuum regulation

Instantaneous vacuum level (in kPa, % of vacuum, mbar, or inHg)

MPXS

Controlled Communicating Micro Vacuum Pumps

Integration and Performance

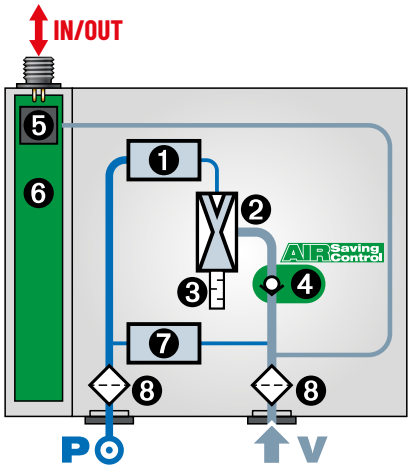
IO-Link

AIR Saving Control

Integrated Functions

The **MPXS Series** micro vacuum pumps integrate all the necessary functions into a compact footprint for a simple, efficient solution adapted to each application:

❶ Vacuum solenoid valve
❷ Single-stage Venturi pump
❸ Open silencer or exhaust collector
❹ Vacuum check valve
❺ Electronic vacuum switch
❻ Integrated electronics
❼ Blow-off solenoid valve
❽ 200 µm filter screen



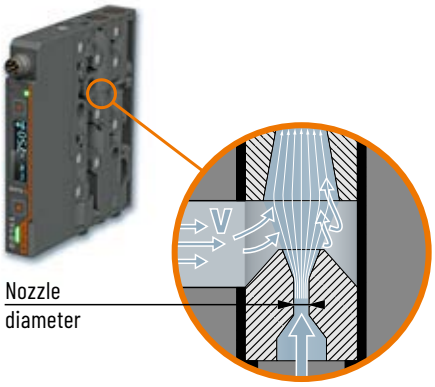
+ AIR Saving Control
90% energy savings *(on average)*

The combined action of the non-return valve ❹ and of the integrated electronics ❻ automatically ensures ASC management.
➔ **Once the vacuum has been established, the pump does not consume any more air to hold the object.**

Performance Determined by the Venturi Pump's Nozzle Diameter

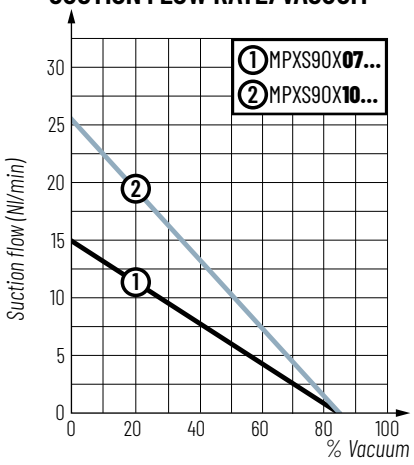
The table specifies the performance levels and evacuation times generated for each nozzle diameter available.
When handling air tight objects, the ASC vacuum control system can help to considerably reduce the consumption of compressed air.

Vacuum reached / Nozzle dia. (mm)	Evacuation time[1] (s) of a volume of 5 cl[2] 50%	60%	70%	80%	Max. vacuum (%)	Air drawn in (Nl/min)	Air consumed (Nl/min)	Air pressure level (bar)
0.7	0.15	0.25	0.42	0.70	85	15	22	3.7
1.0	0.09	0.14	0.24	0.37	85	26	44	3.7

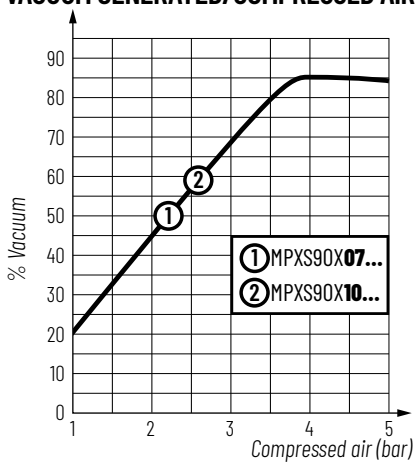


(1) Out of valve response time. (2) Example of a 5 cl volume: 4 suction cups 1.5 bellows Ø 25 (VSA25) + 4 airlines 4x6 mm lg 600 mm + 1 airline 4x6 mm lg 500 mm.

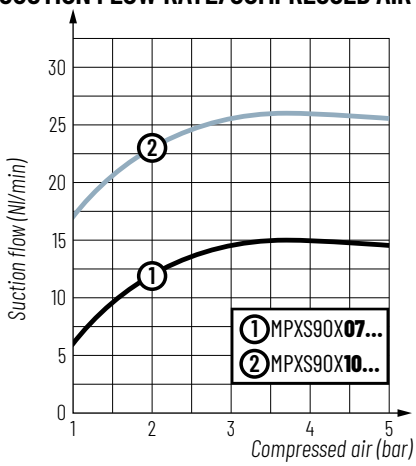
SUCTION FLOW RATE/VACUUM



VACUUM GENERATED/COMPRESSED AIR



SUCTION FLOW RATE/COMPRESSED AIR



MPXS

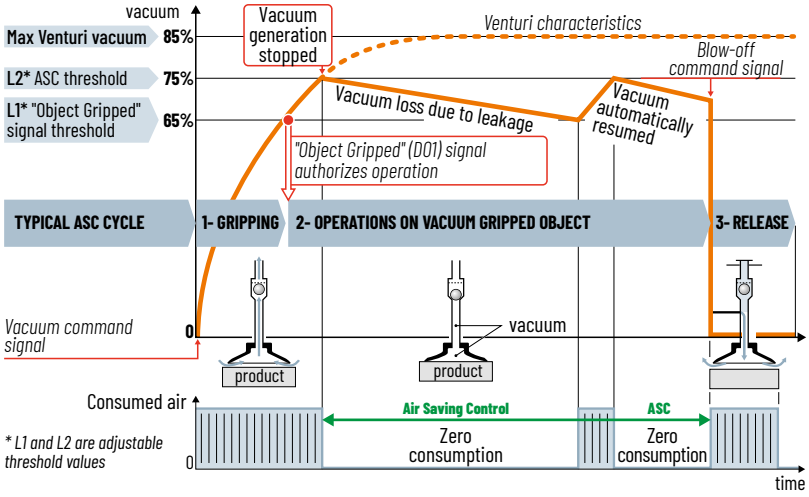
Controlled Communicating Micro Vacuum Pumps

Energy Savings and Smart Adaptation

IO-Link

AIR Saving Control

AIR Saving Control Averages 90% Energy Savings



Air Saving Control (**ASC**) is a smart vacuum control system that stops the consumption of compressed air as soon as the required level of vacuum is reached, thus avoiding any unnecessary consumption and contributing to savings on the equipment's operating costs.

For airtight objects the **MPXS** micro vacuum pumps automatically execute the above **ASC** cycle, leading to maximal energy savings according to the following 3 phases:

1. Object is gripped: vacuum generated by the Venturi pump.
2. Operations on object held in place by vacuum: at the L2 vacuum threshold (75%), the supply of the Venturi pump is cut off → the consumption becomes zero; the object remains held in place due to the non-return valve. Microleaks will generally cause the vacuum level to fall slowly. Each time it falls below L2 (75%) by more than the hysteresis value, vacuum generation is briefly resumed until it reaches threshold L2.
3. Object is released: by an external or an automatic timed blow-off command (according to the settings).

1- Gripping + Transfer (nozzle dia. 1 mm, emptying 0.3 l)

Phase	Duration	Air consumption		
		without ASC	with ASC	
Gripping	1.19 s	1.05 Nl	1.05 Nl	Energy savings achieved
Transfer	5 s	4.42 Nl	0	
Release	0.2 s	0.05 Nl	0.05 Nl	
		5.52 Nl	1.10 Nl	80 %

2- Clamping + Operations (nozzle dia. 1 mm, emptying 0.3 l)

Phase	Duration	Air consumption		
		without ASC	with ASC	
Clamping	1.19 s	1.05 Nl	1.05 Nl	Energy savings achieved
Operations	60 s	53 Nl	0	
Release	0.2 s	0.05 Nl	0.05 Nl	
		54.10 Nl	1.10 Nl	98 %

→ Resulting savings

ASC energy savings are major as shown in the 2 examples below:

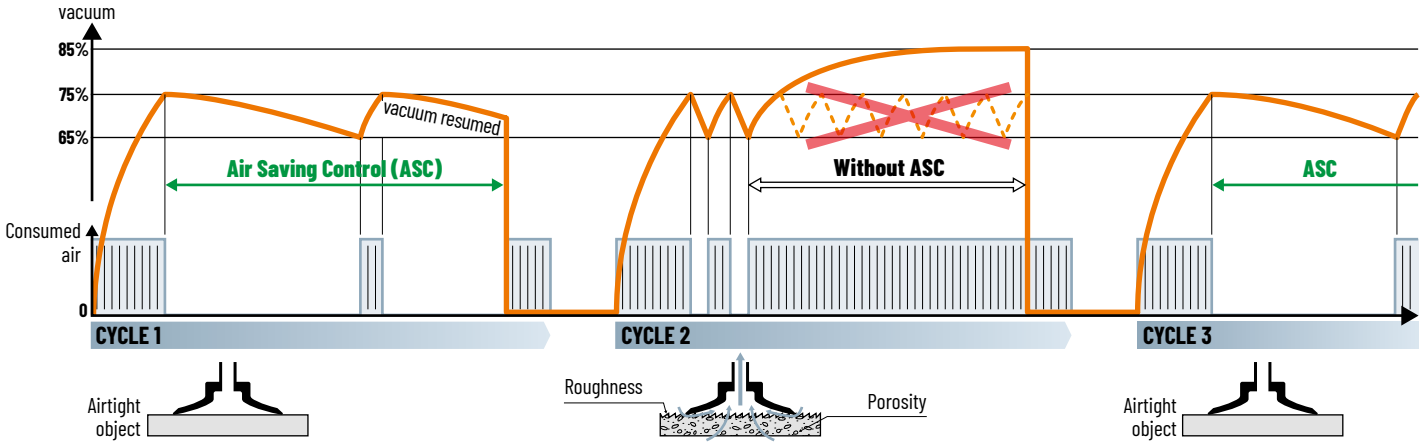
- 80% savings when transferring a object after gripping.
- 98% savings when clamping a object during an operation lasting 1 min.

The investment generally pays for itself within a few months.

ENERGY SAVING APP

Calculate the savings you can generate with COVAL's **ASC** technology using the ENERGY SAVING APP available online.

Smart Adaptation



The above illustration shows the **MPXS**'s ability to adapt. **ASC** operation is automatic for any object that is adequately airtight (cycle 1). Should a leakage occur (cycle 2), due to a rough or porous object, or due to a leak in the vacuum network, the vacuum pump would automatically detect the anomaly, complete the cycle without **ASC** in order to keep production running, and report the situation for possible maintenance. Production keeps running. As soon as everything returns to normal (cycle 3), operation with **ASC** is automatically restored.

MPXS

Controlled Communicating Micro Vacuum Pumps

Straightforward Communication

IO-Link

Air Saving Control

Easier Integration, Use, and Diagnostics

The **MPXS** micro vacuum pump series includes various features that enable setup, use, and diagnostics in all situations and at all levels (operators, process, networked factory), with the goal of keeping the use and management of the pumps as straightforward as possible, allowing for easy integration in your smart factory.

Settings, Diagnostics, and Process Data

CONFIGURABLE SETTINGS

- Choice of language: EN, FR, DE, IT or ES.
- "Object Gripped" and ASC control thresholds.
- ASC vacuum control system management.
- Automatic blow-off.
- Vacuum measurement unit: kPa, %, mbar, inHg.

DIAGNOSTICS

- Cycle counters (vacuum and blow-off control, objects gripped, objects lost, etc.).
- Alarm counters (ASC errors, objects lost, high/low voltage, output overcurrent, etc.).
- Supply voltage monitoring.
- Software version.
- Product item number and serial number.

PROCESS INPUT DATA

- Vacuum and blow-off control.

PROCESS OUTPUT DATA

- Instantaneous vacuum level.
- Object gripped and object lost information.
- ASC vacuum control system status.
- Alarms (high/low voltage).

HMI

The **MPXS** micro vacuum pump HMI allows for easy and efficient reading of the pump's operation.

The high-visibility display includes all required inputs for full operation:

- Main information is easy to read.
- Multilingual: EN - FR - DE - IT - ES.
- Simple and clear event messages.
- Settings and diagnostics menus.
- Configurable display orientation: 0 – 180°.
- Lockable to prevent undesired changes.

Gripping status indicator light:

- Green: object gripped.
- Yellow: ASC disabled due to vacuum leakage (object held in place).
- Red: object lost.

Control status LEDs:

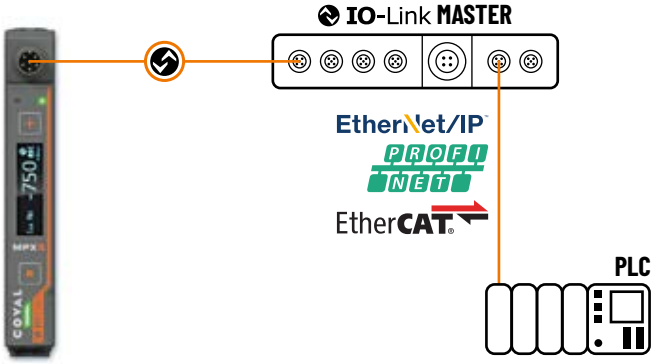
- Green LED: vacuum control
- Orange LED: blow-off control

IO-Link

The IO-Link system provides efficient real-time communication between **MPXS** micro vacuum pumps and any higher-level protocol (EtherNet/IP, PROFINET, EtherCAT, etc.) required to monitor the production line. It can be used to control pumps, configure settings, and get feedback to ensure maximum productivity.

Advantages:

- Straightforward wiring, installation, and setup.
- Availability of diagnostic status data.
- Simpler preventive maintenance and vacuum pump replacement without manual setup, and more.



MPXS

Controlled Communicating Micro Vacuum Pumps

Selection Guide

IO-Link

Air Saving Control

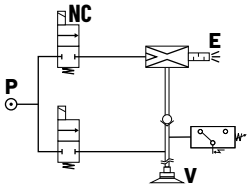
Vacuum Control: 2 Solutions

Model MPXS_S:
Vacuum pump with **NC** vacuum control and **NC** blow-off.

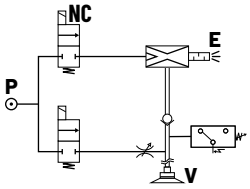
In the event of power failure, vacuum is no longer generated. In the event of compressed air failure, the vacuum is no longer maintained.

- NC blow-off and vacuum control: solenoid valves
- Choice of blow-off settings:
  - Controlled by external signal
  - Automatic timer from 50 to 9950 ms (advantage: saves one controller output).

NC vacuum control
Standard blow-off (**F1**)



NC vacuum control
Adjustable powerful blow-off (**F3**)



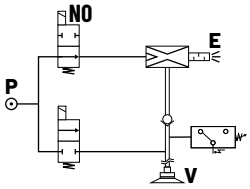
P: *Pressure / Compressed Air* **V**: *Vacuum / Suction Cup* **E**: *Exhaust*

Model MPXS_V:
Vacuum pump with **NO** vacuum control and **NC** blow-off.

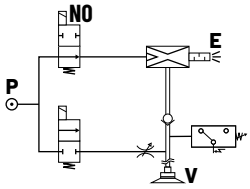
In the event of power failure, vacuum is still generated: object is held in place ➔ fail-safe.
In the event of compressed air failure, the vacuum is no longer maintained.

- NO vacuum control solenoid valve.
- NC blow-off control solenoid valve.

NO vacuum control
Standard blow-off (**F1**)



NO vacuum control
Adjustable powerful blow-off (**F3**)



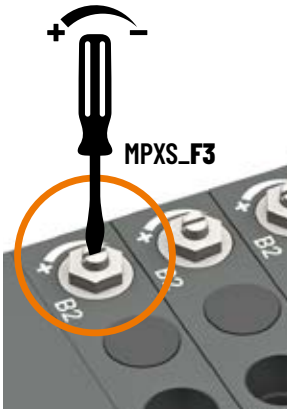
P: *Pressure / Compressed Air* **V**: *Vacuum / Suction Cup* **E**: *Exhaust*

Blow-off Function

The MPXS micro vacuum pumps offer 2 blow-off versions to meet all application needs:

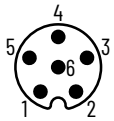
- **Standard blow-off (MPXS_F1 version)**
  The blow-off flow is directed into the vacuum network, ensuring the release of parts in most applications.
  → Network pressure (blow-off flow rate of 7 Nl/min at 3.7 bar).

- **Adjustable powerful blow-off (MPXS_F3 version)**
  This blow-off version allows for very rapid release of parts in cases where the pump cannot be positioned close to the suction cups or to minimize cycle times. The MPXS_F3 features an adjustment screw with a locking nut to tailor the power as needed. → Network pressure with amplification valve (adjustable blow-off flow rate from 16 to 55 Nl/min at 3.7 bar).



Electrical Connections and Cables

One M8 6-pin connector male, A-Coded



IN / OUT

1	24 V DC
2	24V DC PNP suction command (1)
3	0 V - GND
4	24 V DC object gripped DO1 - C/Q
5	24 V DC PNP blow-off command
6	/

: *Connections for* **IO**-Link

(1) 24 V DC suction command, depending on version:
*- **S**: 24 V DC vacuum control*
*- **V**: 24 V DC vacuum off command*

Accessories for MPXS Micro Vacuum Pumps

Connection Cables

Part No.: CCM8F6PCM12M5PL05
M8 6-pin female snap-in elbow / M12 5-pin male straight connectors, AWG24, PUR, length 0.5 m.

Part No.: CCM86PCL2
M8 6-pin female snap-in elbow, AWG24, PUR, length 2 m.

MPXS

Controlled Communicating Micro Vacuum Pumps

Configurations

IO-Link

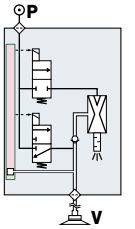
AIR Saving Control

Standalone vs Bank

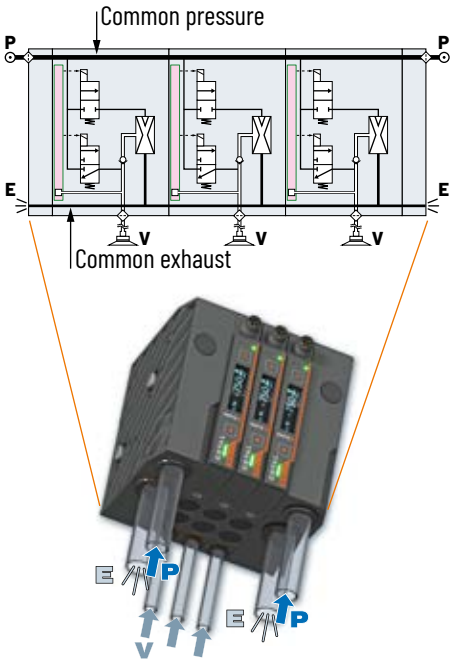
Standalone **MPXS** micro vacuum pumps cater to the most common applications: a single micro vacuum pump controls one or several suction cups, all operating in the same sequence.

When multiple suction cups operate in different sequences, several micro vacuum pumps are needed, which can be configured as:

- Multiple standalone micro vacuum pumps;
- Or a bank consisting of 1 to 8 micro vacuum pumps with a shared internal pressure and a collectable common exhaust.



Standalone MPXS micro vacuum pump



Bank of 3 MPXS micro vacuum pumps supplying suction cups according to different sequences

Standalone Version

- Ultra-thin and light

Compressed air
4x6 mm push-to-connect

Exhaust
integrated silencer
(option: collection 4x6 mm push-to-connect)

Vacuum
4x6 mm push-to-connect

MPXS

Controlled Communicating Micro Vacuum Pumps

Configurations

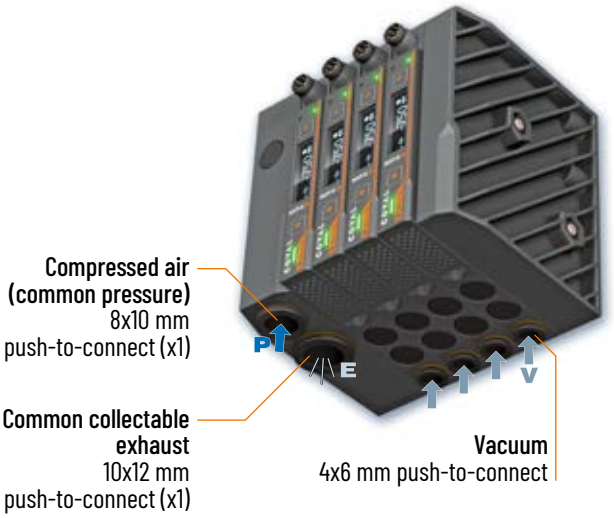
IO-Link

Air Saving Control

Bankable Version

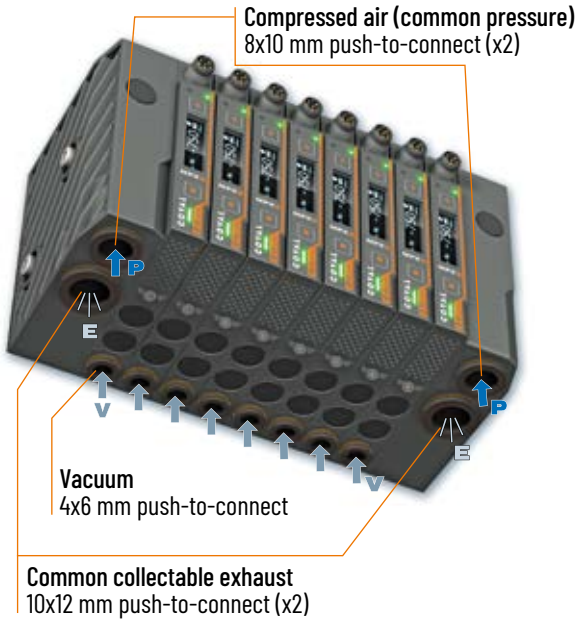
BANK EQUIPPED WITH **SINGLE** END SET - LEFT (MPXS___B_LX)

- Nozzle Dia. 0.7 mm: 1 to 8 modules per bank
- Nozzle Dia. 1.0 mm: 1 to 4 modules per bank
- 1 x Common Pressure
- 1 x Unrestricted and collectable exhaust



BANK EQUIPPED WITH **DOUBLE** END SET (MPXS___B_DX)

- 1 to 8 modules per bank
- 2 x Common Pressure
- 2 x Unrestricted and collectable exhaust



Composition of Banks

Standard banks are composed of 1 to 8 identical **MPXS** vacuum modules in the MPXS_**EB** version, an end set consisting of a head module and a tail module, and assembly screws corresponding to the number of modules in the bank.

The end sets are available in two versions:

- **Single** version – left: 1 x Common Pressure and 1 x Unrestricted and collectable exhaust
- **Double** version: 2 x Common Pressure and 2 x Unrestricted and collectable exhaust

Standard banks are cataloged and delivered assembled.

For banks composed of different MPXS vacuum modules, it is necessary to order the sub-assemblies separately:

- X MPXS micro vacuum pump modules for the bank (version MPXS_**EB**)
- An end set for the bank
- An assembly screw kit

Specific banks are delivered unassembled.

Completing a Bank

It is possible to add an MPXS micro vacuum pump to an existing bank by ordering the desired MPXS micro vacuum pump module in the EB version, along with the assembly screw kit corresponding to the new number of modules in the bank.

MPXS

Controlled Communicating Micro Vacuum Pumps

Configuring a Vacuum Pump

IO-Link

AIR Saving Control

STANDALONE MPXS MICRO VACUUM PUMP

MPXS90X	10	S	C16	P	R2	F1	E

NOZZLE DIA.

0.7 mm dia.	07
1.0 mm dia.	10

GENERATOR CONTROL

Vacuum **NC** and blow-off **NC**	S
Vacuum **NO** and blow-off **NC**	V

BLOW-OFF

Standard blow-off	F1
Adjustable powerful blow-off	F3

EXHAUST COLLECTION

X	Without
E	With

Sample part number:

MPXS90X07SC16PR2F1X

MPXS Micro Vacuum Pump, maximum vacuum 85%, nozzle 0.7 mm dia., controlled by an NC vacuum solenoid valve and an NC blow-off solenoid valve, 1 M8 6-pin connector, with standard blow-off and open silencer.

MPXS MICRO VACUUM PUMPS IN BANK

MPXS90X	10	S	C16	P	R2	F1	EB4		L	X

NOZZLE DIA.

0.7 mm dia.	07
1.0 mm dia.	10

GENERATOR CONTROL

Vacuum **NC** and blow-off **NC**	S
Vacuum **NO** and blow-off **NC**	V

BLOW-OFF

Standard blow-off	F1
Adjustable powerful blow-off	F3

NUMBER OF MODULES

EB1	Bank of 1 MPXS module
EB2	Bank of 2 MPXS modules
EB3	Bank of 3 MPXS modules
EB4	Bank of 4 MPXS modules
EB5	Bank of 5 MPXS modules
EB6	Bank of 6 MPXS modules
EB7	Bank of 7 MPXS modules
EB8	Bank of 8 MPXS modules

BANK END SETS

L	**Single Left** End Set for a bank of 1 to 4 MPXS modules with a 1.0 mm nozzle, and up to 8 MPXS modules with a 0.7 mm nozzle. ▪ 1 x common pressure connection, push-to-connect 8x10 mm ▪ 1 x Exhaust collector, push-to-connect 10x12 mm
D	**Double** End Set for a bank of 1 to 8 MPXS modules. ▪ 2 x common pressure connections, push-to-connect 8x10 mm ▪ 2 x Exhaust collectors, push-to-connect 10x12 mm

Sample part number:

MPXS90X10VC16PR2F3EB8DX

Assembled bank of 8 MPXS modules, maximum vacuum 85%, 1.0 mm nozzle, controlled by an NO vacuum solenoid valve and an NC blow-off solenoid valve, 1 M8 6-pin connector, with adjustable powerful blow-off and equipped with a double end set.

MPXS90X07SC16PR2F1EB4LX

Assembled bank of 4 MPXS modules, maximum vacuum 85%, 0.7 mm nozzle, controlled by an NC vacuum solenoid valve and an NC blow-off solenoid valve, 1 M8 6-pin connector, with standard blow-off and equipped with a simple left end set.

Accessories

Mounting Accessories for Standalone MPXS Micro Vacuum Pumps

- Part No. **MPXFIXA**
  Front panel installation kit for **standalone** MPXS module (1 plate + 4 fastening screws)
- Part No. **MPXFIXB**
  DIN rail installation kit for **standalone** MPXS module (1 mounting plate + 5 screws and 1 clip)

Mounting Accessories for MPXS Micro Vacuum Pump Banks

- Part No. **MPXFIXC**
  DIN rail mounting kit for MPXS **bank** (2 clips + 2 fastening screws)
- Part No. **MPXFIXD**
  Front panel mounting kit for MPXS **bank** (2 plates + 4 fastening screws)

Connection Cables for MPXS Micro Vacuum Pumps

- Part No. **CCM8F6PCM12M5PL05**
  M8 6-pin female snap-in elbow / M12 5-pin male straight connectors, AWG24, PUR, length 0.5 m.
- Part No. **CCM86PCL2**
  M8 6-pin female snap-in elbow, AWG24, PUR, length 2 m.

MPXS

Controlled Communicating Micro Vacuum Pumps

Build Your Own Bank Assembly

IO-Link

Air Saving Control

To build a custom bank assembly containing different **MPXS** micro vacuum pumps, you need to order the parts below separately.

Note: Custom bank assemblies come unassembled.

1 Select the Bank End Set

MPXSETAL	**Single Left Bank End Set:** ▪ Head module on the left with 8x10 mm pressure connection and 10x12 mm exhaust collector. ▪ Tail module on the right (simple). → For a bank of 1 to 4 MPXS micro vacuum pump modules with a 1.0 mm nozzle, and up to 8 modules with a 0.7 mm nozzle.
MPXSETAD	**Double Bank End Set:** ▪ Head and tail modules with 8x10 mm pressure connection and 10x12 mm exhaust collector. → For a bank of 1 to 8 MPXS micro vacuum pump modules.

2 Select the Micro Vacuum Pump Modules for Bank

MPXS90X	10	S	C16	P	R2	F1	EB

NOZZLE DIA.		GENERATOR CONTROL		BLOW-OFF	
0.7 mm dia.	**07**	**S**	Vacuum **NC** and blow-off **NC**	**F1**	Standard blow-off
1.0 mm dia.	**10**	**V**	Vacuum **NO** and blow-off **NC**	**F3**	Adjustable powerful blow-off

3 Select the Assembly Screw Kit

Assembly Screw Kit for a **Single Left** Bank Version	
MPXSETVB1L	For a bank of **1 MPXS module**
MPXSETVB2L	For a bank of **2 MPXS modules**
MPXSETVB3L	For a bank of **3 MPXS modules**
MPXSETVB4L	For a bank of **4 MPXS modules**
MPXSETVB5L	For a bank of **5 MPXS modules**
MPXSETVB6L	For a bank of **6 MPXS modules**
MPXSETVB7L	For a bank of **7 MPXS modules**
MPXSETVB8L	For a bank of **8 MPXS modules**

Assembly Screw Kit for a **Double** Bank Version	
MPXSETVB1D	For a bank of **1 MPXS module**
MPXSETVB2D	For a bank of **2 MPXS modules**
MPXSETVB3D	For a bank of **3 MPXS modules**
MPXSETVB4D	For a bank of **4 MPXS modules**
MPXSETVB5D	For a bank of **5 MPXS modules**
MPXSETVB6D	For a bank of **6 MPXS modules**
MPXSETVB7D	For a bank of **7 MPXS modules**
MPXSETVB8D	For a bank of **8 MPXS modules**

MPXS

Controlled Communicating Micro Vacuum Pumps

Dimensions and Installation Options

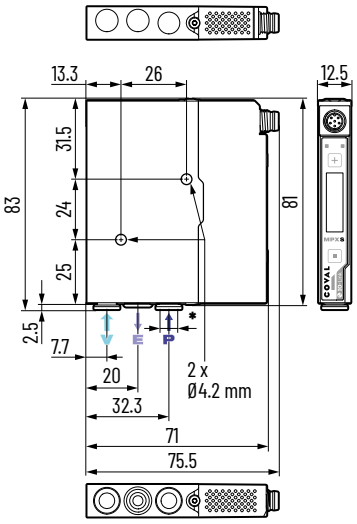
IO-Link

Air Saving Control

Standalone Module

LATERAL INSTALLATION

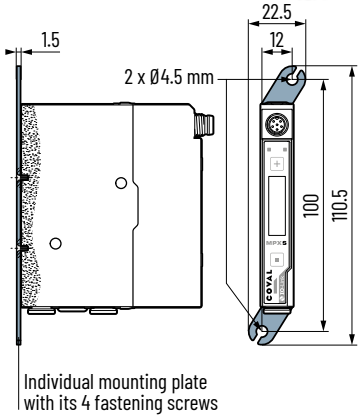
2 x 4.2 mm dia.
(for two Ø 4 mm through screws or bolts with large washers).



***** Push-to-connect:
-**V** (vacuum / suction cup): 4x6 mm
-**E** (exhaust collection, E option): 4x6 mm
-**P** (pressure / compressed air): 4x6 mm

MOUNTING FROM FRONT

2 x 4.5 mm dia.
(for M4 screws)



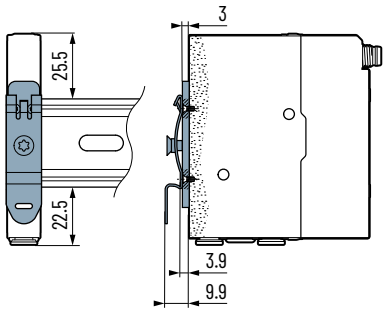
Individual mounting plate with its 4 fastening screws

For front panel installation, order the following installation kit:

Part No.: **MPXFIXA**
(1 plate + 4 fastening screws)

INSTALLATION ON DIN RAIL

For a static installation (e.g., in a cabinet), an MPXS micro vacuum pump can be mounted on a DIN rail.

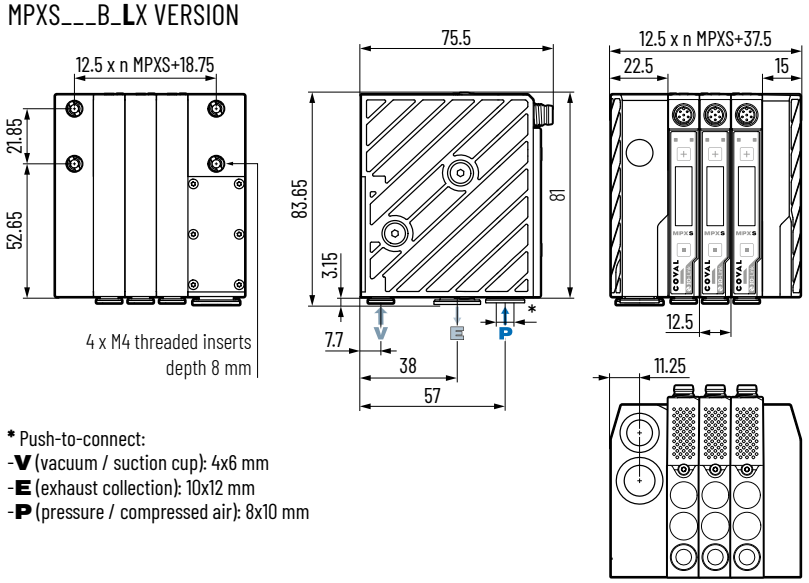


In this case, it must be equipped with an installation clip that is to be ordered separately:

Part No.: **MPXFIXB**
(1 bracket + 1 clip + 5 fastening screws)

Bank

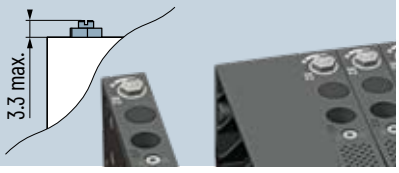
MPXS___B_**L**X VERSION



***** Push-to-connect:
-**V** (vacuum / suction cup): 4x6 mm
-**E** (exhaust collection): 10x12 mm
-**P** (pressure / compressed air): 8x10 mm

Dimensions of the MPXS_F3 Option (Adjustable Powerful Blow-off)

The MPXS micro vacuum pumps in the F3 version feature an adjustment screw with a locking nut to adjust the blow-off power.



3D COVAL Data — You can access 3D files of of all COVAL products in formats compatible with the main CAD software on COVAL's website **www.coval.com**

Note: All dimensions are in mm.

MPXS

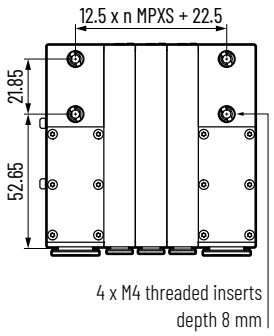
Controlled Communicating Micro Vacuum Pumps

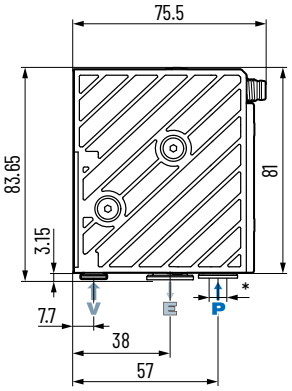
Dimensions and Installation Options

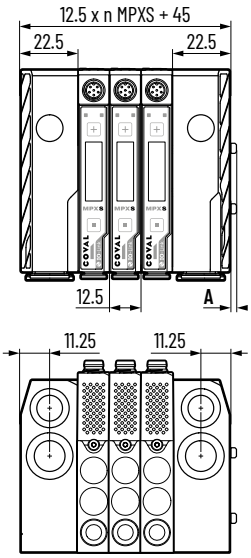
IO-Link

Air Saving Control

MPXS___B_**D**X VERSION







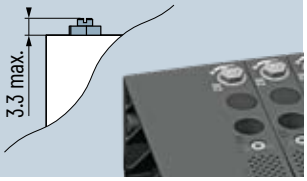
Dimensions

Part No.	A
MPXS___**B1D**X	0
MPXS___**B2D**X	3
MPXS___**B3D**X	0
MPXS___**B4D**X	3
MPXS___**B5D**X	0
MPXS___**B6D**X	3
MPXS___**B7D**X	0
MPXS___**B8D**X	0

***** Push-to-connect:
-**V** (vacuum / suction cup): 4x6 mm
-**E** (exhaust collection): 10x12 mm
-**P** (pressure / compressed air): 8x10 mm

Dimensions of the MPXS_F3 Option (Adjustable Powerful Blow-off)

The MPXS micro vacuum pumps in the F3 version feature an adjustment screw with a locking nut to adjust the blow-off power.

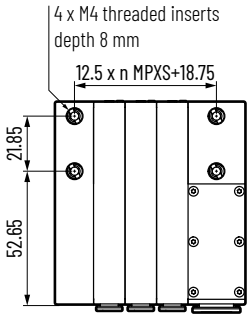


Note: All dimensions are in mm.

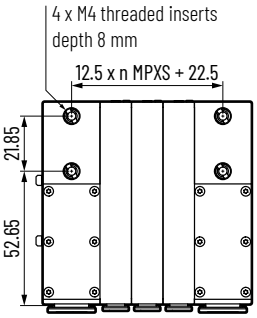
MOUNTING FROM REAR

4 x M4 threaded inserts
depth 8 mm

MPXS_B_**L**X VERSION



MPXS_B_**D**X VERSION

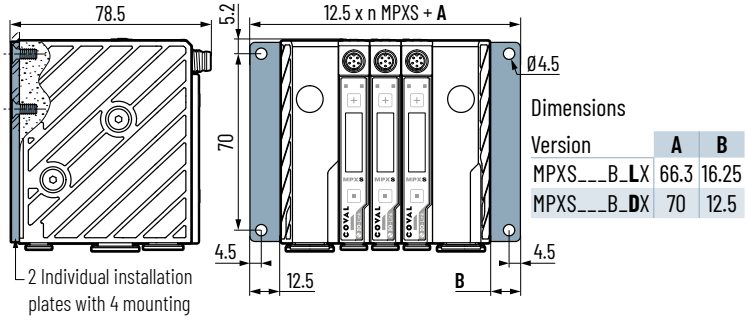


MOUNTING FROM FRONT

4 x 4.5 mm dia.
(for M4 screws)

For front panel installation, order the following installation kit:

Part No.: **MPXFIXD**
(2 plates + 4 fastening screws



2 Individual installation plates with 4 mounting screws

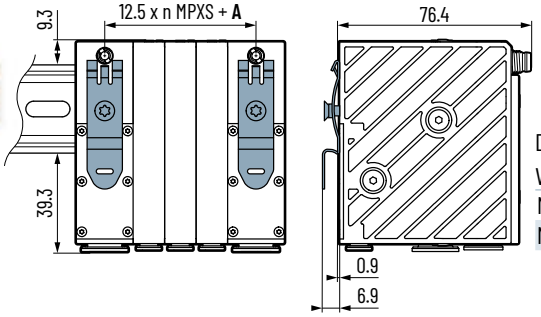
Dimensions

Version	A	B
MPXS___B_**L**X	66.3	16.25
MPXS___B_**D**X	70	12.5

INSTALLATION ON DIN RAIL

The bank can be mounted on a DIN rail for a static installation (e.g. in a cabinet).
In this case, it must be equipped with an installation clip that is ordered separately:

Part No.: **MPXFIXC**
(2 clips + 2 fastening screws)



Dimensions

Version	A
MPXS___B_**L**X	18.75
MPXS___B_**D**X	22.5

MPXS

Controlled Communicating Micro Vacuum Pumps

Technical Specifications

General characteristics

- Supply: non-lubricated air, filtered to 5 microns, according to standard ISO 8573-1:2010 [3:4:3].
- Operating pressure: from 3.5 to 7 bar.
- Optimal dynamic pressure per module: 3.7 bar *(bank supply pressure must be adjusted according to the number of modules to ensure 3.7 bar dynamic pressure / module).*
- Standard blow-off (MPXS__**F1**): network pressure (blow-off flow rate of 7 Nl/min at 3.7 bar).
- Adjustable powerful blow-off (MPXS__**F3**): network pressure with valve (flow rate adjustable from 16 to 55 Nl/min at 3.7 bar).
- Pressure connection:
  - Standalone vacuum pumps: 4x6 mm* push-to-connect with 200 µm filter screen.
  - Bank: 8x10 mm push-to-connect with 200 µm filter screen.
- Vacuum connection: 4x6 mm push-to-connect with 200 µm filter screen.
- Common collectable exhaust:
  - Standalone vacuum pumps: 4x6 mm push-to-connect.
  - Bank: 10x12 mm push-to-connect.
- Noise level:
  - Standalone vacuum pumps: max 66 dBA "without ASC". 0 dBA with ASC.
  - Bank of 1 to 4 vacuum pumps: max 74 dBA "without ASC". 0 dBA with ASC.
  - Bank of 5 to 8 vacuum pumps: max 82 dBA "without ASC". 0 dBA with ASC.
- Protection rating: IP40.
- Max. operating frequency: 4 Hz.
- Endurance: 30 million cycles.
- Weight:
  - Standalone vacuum pumps: MPXS___**F1**: 90 g, MPXS___**F3**: 94 g.
  - Bank: • MPXS_B_**L**X: 87 g (F1) or 91 g (F3) X number of stand-alone modules + 145 g for ends set.
    • MPXS_B_**D**X: 87 g (F1) or 91 g (F3) X number of stand-alone modules + 185 g for ends set.
- Operating temperature: from 0 to 50°C (32 to 122°F).
- Storage temperature: from -10°C to 60°C (14°F to 140°F)
- Materials: PA 6.6 GF, aluminum, stainless steel, brass, steel, NBR, PC+ABS, FKM, POM, PU. Housing materials comply with the requirements of UL standard 94 class HB.

Electrical controls

- Control voltage: 24V DC (regulated ± 10 %), PNP.
- Max. consumption: 60 mA (1.4 W) per vacuum and blow-off solenoid valve.
- Valve response time: - opening: 20 ms.
  - closure: 15 ms.

Integrated electronics

- 24 V DC power supply (regulated ± 10 %).
- Typical current consumption: < 10 mA / max. 16 mA.
- Measuring range: 0 to 99 % vacuum.
- Measurement accuracy: ± 2% of the range, compensated for temperature.
- Protected against reversed wiring and polarity.
- Protection against short circuits.
- Inputs switching type: PNP.
- LEDs for visualization of the controls:
  - Model **MPXS_S**, Vacuum pump with NC vacuum control and NC blow-off: • Green LED: vacuum control.
    • Orange LED: blow-off control.
  - Model **MPXS_V**, Vacuum pump with NO vacuum control and NC blow-off: • No LEDs: vacuum control.
    • Both LEDs on: blow-off control.

Electrical connections

- One M8 connector 6-pin, Male, A-Coded.
- IO-Link or SIO (Standard Inputs Outputs) operation.

Analysis of ASC vacuum control system (Air Saving Control)

- Permanent monitoring of leakage level: abort or automatically return to ASC operation.

DO1 configurable output signal "Object Gripped"

- PNP or NPN.
- NO or NC.
- Breaking capacity: 100 mA.
- Factory setting: PNP NO.
- Factory Set Value: 65% vacuum.

Diagnostics

- Instantaneous vacuum level (unit transmitted over IO-Link: mbar).
- Available information: Object gripped, object lost, regulation in progress, regulation fault.
- Cycle counters (vacuum, blow-off, object gripped, object lost, ASC, etc.).
- Alarm Counters (ASC Errors, Object Lost, Low/High Voltage, Simultaneous Commands, Overheating, Output Overcurrent).
- Supply voltage monitoring.
- Product item number and serial number.
- Error code log and operational status indicators.
- Software version.

Information displayed

- Gripping status indicator light: Green: object gripped, Yellow: ASC disabled due to vacuum leakage (object held in place), Red: object lost.
- High-visibility display:
  - Live vacuum level (in kPa, % vacuum, mbar, or inHg).
  - Warns when service life has been exceeded (> 30 million cycles).
  - Explicit fault messages.
  - Configurable display orientation: 0 – 180°.

Parameter settings

- Performed with 2-key keyboard.
- Choice of language: EN, FR, DE, IT, or ES.
- Choice of blow-off type:
  - Controlled.
  - Automatic timed, adjustable from 50 to 9950 ms.
- Choice of vacuum measurement unit (kPa, %, mbar, inHg).
- Monostable electrical manual controls.
- Object gripped (L1) and L2 control thresholds.
- Whenever required by the application, specific threshold and hysteresis settings that are different from the initial factory settings can be defined:
  L1 = -65 kPa, h1 = -10 kPa, L2 = -75 kPa, h2 = -10 kPa.
- Activation/deactivation of the ASC control system.
- Activation/deactivation of the leakage level monitoring system (DIAG ECO) + adjustment of monitoring parameters.

Communication: IO-Link

- Revision: 1.1.4
- Transmission rate: COM1,2,3 up to 230.4 kbit/s.
- Min. cycle time: 1 ms.
- SIO mode: Yes.
- Process Data Input (PDI): 4 bytes.
- Process Data Output (PDO): 1 byte.
- IO device description file (IODD) available for download.

MPXS

Controlled Communicating Micro Vacuum Pumps

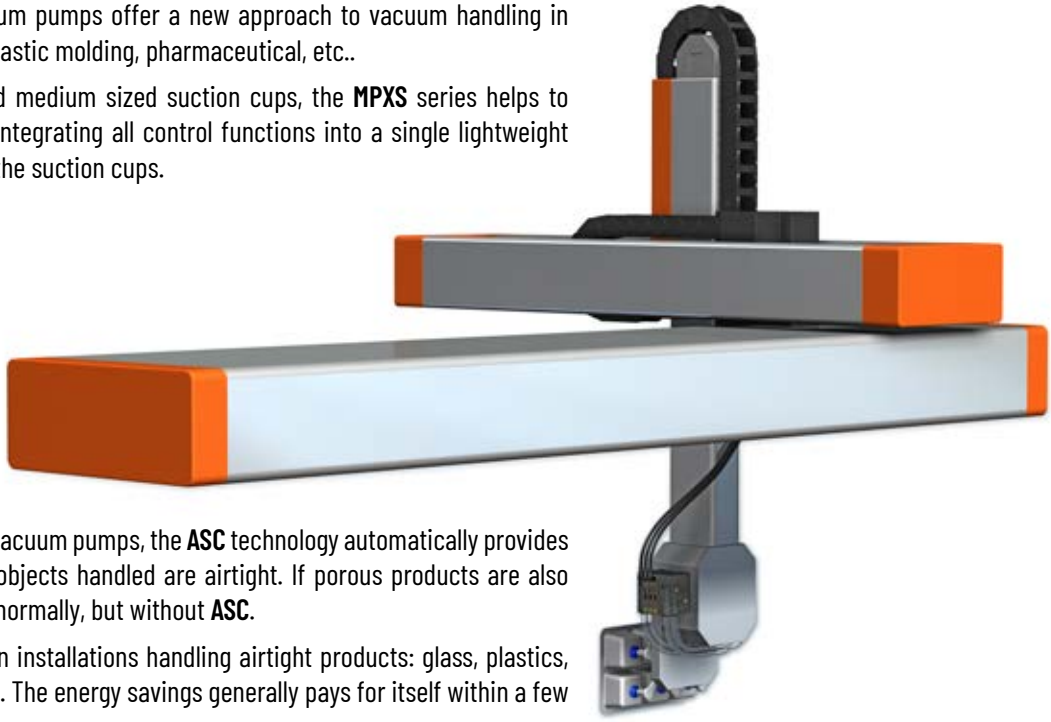
Applications

IO-Link

Air Saving Control

The **MPXS** series micro vacuum pumps offer a new approach to vacuum handling in numerous domains: robotics, plastic molding, pharmaceutical, etc..

Optimized to serve small and medium sized suction cups, the **MPXS** series helps to simplify the installation while integrating all control functions into a single lightweight micro-module, placed close to the suction cups.



Integrated in all **MPXS** micro-vacuum pumps, the **ASC** technology automatically provides 60-99% energy savings when objects handled are airtight. If porous products are also handled, production continues normally, but without **ASC**.

The **MPXS** series is applied on installations handling airtight products: glass, plastics, coated wood, metal sheets, etc.. The energy savings generally pays for itself within a few months.

The **MPXS** series may also be applied to mixed machines that handle airtight and porous objects: the adaptation to the type of product is totally automatic.

MPXE, MPXS: 2 Complementary Series

COVAL offers a variant of the MPXS controlled communicating micro vacuum pumps with the MPXE Series controlled micro vacuum pumps.

		MPXE 	MPXS 
Vacuum control (NC or NO)		■	■
Blow-off control (NC)		■	■
Automatic timed blow-off		/	■
Powerful blow-off (F3)		□	□
Electronic vacuum switch		■	■
Display		/	■
Vacuum level signal, analog output 5 V DC		■	/
Output signal "Object Gripped", Digital output 24 V DC (PNP/NPN)		/	■
Vacuum check valve		■	■
Automatic vacuum regulation (ASC)		/	■
Electrical Connectors:	- JST 5-pin	■	/
	- M8-6-pin male	/	■
Standalone or in Bank Module		■	■
IO-Link		/	■

■: Standard □: Option

COVAL
vacuum managers

vacuum components

A TECHNOLOGICAL PARTNER ON A GLOBAL SCALE

Located in the South of France, COVAL SAS designs, produces, and markets high-performance vacuum components and systems for industrial applications in all sectors worldwide.

An ISO 9001: V2015 certified company, COVAL innovates globally in vacuum handling. Our optimized components integrate intelligent and reliable functionalities, adapt to your industrial context, and safely improve your productivity.

With a strong spirit of innovation and technological advancements, the COVAL team is now recognized as an expert in developing reliable, economical, and productive custom solutions.

COVAL's references are found in major industrial sectors such as packaging, food processing, automotive, plastics, aerospace, and robotics, where vacuum handling is crucial for efficiency and productivity.

COVAL markets its products and services worldwide through its subsidiaries and authorized distributor network. Always attentive to its customers, COVAL supports the implementation of its solutions with a continuous and attentive relationship.

Visit the following section on COVAL's website:
contacts > commercial network
to view the most current list.

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