MVG

Modular Vacuum Grippers

COVAL
vacuum managers

EN

OPERATING INSTRUCTIONS

This manual is intended for users of **MVG** series vacuum grippers. It contains all the information you need to integrate the grippers, as well as the instructions for use and maintenance.

The operating instructions were originally drafted in French (original version).
They must be kept for any future use.
Subject to technical changes, mistakes or printing errors.

For any additional information, please contact COVAL:

International:
- E-mail: coval@coval.com
- Tel: +33 (0)4 75 59 91 91

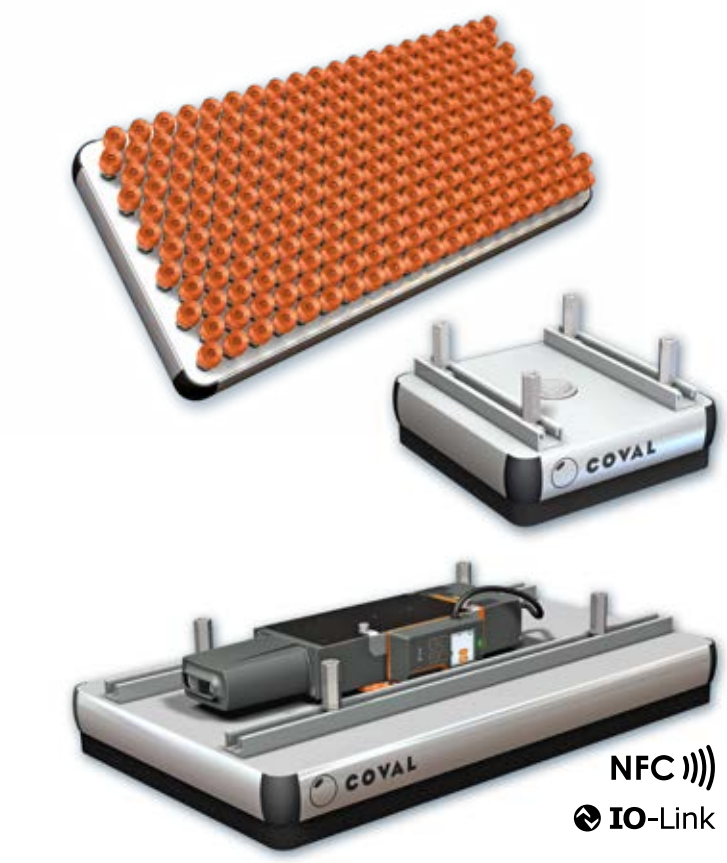
COVAL S.A.S. (Head Office)
ZA Les Petits Champs
10 allée Jean-Baptiste Venturi
26120 Montélier France

- Web : www.coval.com

USA:
- E-mail: contact-us@coval.com
- Tel: (919) 233 4855

COVAL VACUUM TECHNOLOGY INC.
901 Jones Franklin Road
Suite 100
Raleigh, NC 27606

- Web: www.coval-inc.com



**PRIOR TO COMMISSIONING THIS PRODUCT,
PLEASE CAREFULLY READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS.**

Retrouvez tous les documents en différentes langues sur le site COVAL : https://doc.coval.com/MVG

All documents are available in multiple languages on the COVAL website: https://doc.coval.com/MVG

Finden Sie alle Dokumente in verschiedenen Sprachen auf der COVAL-Homepage: https://doc.coval.com/MVG

Tutti i documenti nelle differenti lingue sono presenti sul sito COVAL: https://doc.coval.com/MVG

Podrá encontrar todos los documentos en diferentes idiomas en la página web de COVAL: https://doc.coval.com/MVG

SUMMARY

1. IMPORTANT INFORMATION 3
2. SAFETY INSTRUCTIONS 3
3. INSTRUCTIONS FOR USE 4
3.1. Basic Installation 4
3.2. Commissioning and decommissioning 4
3.3. Operating the vacuum gripper 5
3.4. Transportation and Storage 5
3.5. Maintenance 5
3.6. Disposal 5
4. NAMEPLATE 5
5. IDENTIFYING YOUR MODEL 6
6. TECHNOLOGIES USED 7
6.1. Gripping Interface 7
6.2. Flow Control Technologies 8
6.3. Multi-zone 8
7. OVERVIEW, DIMENSIONS, AND MOUNTING 9
7.1. Overview 9
7.2. Dimensions and Mounting Options 9
7.3. Gripping Interface Dimensions 12
8. INSTALLING THE VACUUM GRIPPER 13
8.1. Pneumatic Supply for Vacuum Grippers Equipped with One or More CMS HDE Vacuum Generators 14
8.2. Pneumatic Connection 14
8.2.1. MVG vacuum gripper equipped with a multi-stage vacuum generator 15
8.2.2. MVG vacuum gripper equipped with 2 multi-stage vacuum generators 15
8.2.3. MVG vacuum gripper without integrated vacuum generator (GON) 15
8.3. Connecting a Vacuum Switch 16
8.4. Electrical Connections: CMS HDE with Vacuum Generator Control (CMSHDE_S_ / CMSHDE_V_) 16
8.5. Vacuum Level Display (MVG with VA or VF option) 17
9. INSTALLING AND OPERATING REMOTE HMI (MVG WITH VI OPTION) 17
9.1. Dimensions 17
9.2. Installing the Remote HMI, part no. HMIHD1M84P 18
9.3. Configuring a Remote HMI 18
9.4. Front Panel Dialog 19
10. HMI DETAILS AND FEATURES 19
10.1. Powering On 19
10.2. Details of the Main Screen 19
10.3. Keypad Functions 20
11. SUMMARY OF FUNCTIONS 20
11.1. Accessing Live Diagnostic Data 20
11.2. Menu Tree 21
12. LOCKING/UNLOCKING THE KEYPAD 22
13. PROCESS SETTINGS 22
13.1. Setting Threshold 1 22
13.2. Auto Blow-off 23
14. USER SETTINGS 23
14.1. Language 23
14.2. Screen 23
14.3. Units 23
15. DEVICE SETTINGS 24
15.1. Input/Output Switching Mode: PNP or NPN 24
15.2. NO / NC 24
16. DIAGNOSTICS 24
16.1. Device Info 24
16.2. Cycle Counters 24
16.3. Manual Mode 25
16.4. Calibration 25
16.5. Reset Settings 26
17. EVENTS AND ALARMS 26
18. IO-LINK PARAMETER SETTINGS 27
18.1. IO-Link Communication 27
18.2. Cyclical Data (PDI/PDO) 27
18.3. Acyclical Data 28
19. NFC 29
19.1. Technical Data 29
19.2. Using NFC 29
19.3. Functionality 30
19.4. Downloading the COVAL VACUUM MANAGER NFC App 30
20. CHARACTERISTICS 31
21. OPERATING THE VACUUM GRIPPER 32
21.1. Version with Foam Gripping Interface 32
21.1.1. Version with foam and flow control technology using valves 33
21.1.2. Version with foam and flow control technology using flow control nozzle 34
21.2. Version with Suction Cup Gripping Interface 35
21.3. Version with COVAL-flex Gripping Interface 36
22. MAINTENANCE 37
22.1. Frequency 37
22.2. Replacing the Gripping Foam 38
22.3. Replacing Suction Cups 38
22.4. Disassembling the CMS HDE Series Vacuum Generator 39
22.5. Maintenance Procedures for a Vacuum Generator, CMS HDE Series 40
22.5.1. Cleaning the filter screen on the compressed air supply 40
22.5.2. Cleaning the vacuum filter and the vacuum check valve 40
22.5.3. Cleaning the multi-stage venturi profiles 42
22.5.4. Replacing the solenoid valves 43
22.5.5. Replacing the pressure connection end plate for CMSHDE90X__NVO 43
22.5.6. Replacing the valve block for CMSHDE90X__SVOC15P / VVOC15P and CMSHDE90X__SVX_ / VVX_ 43
22.5.7. Replacing the exhaust silencer 44
22.6. Performing Airtightness Test on Vacuum Gripper 44
23. SPARE PARTS 45
23.1. Spare Foam Gripping Interface 45
23.2. Spare Suction Cups 45
23.3. CMS HDE Series Multi-Stage Vacuum Generators 45
23.4. Spare Parts for CMS HDE Series Vacuum Generators 46
23.5. Vacuum Switch and Vacuum Gauge 49
23.6. Accessories 49
24. GLOSSARY 49
25. WARRANTY 49
26. RECYCLING 49
27. EC DECLARATION 50

NOTE:
This document provides detailed operating instructions for the **MVG** series vacuum grippers. The modular design of the **MVG** gives them great flexibility in the choice of format, gripper interface, and vacuum generator, to perfectly match the application.
It is necessary to align the information detailed in this document to the specific features of your product model.

→ See the *specifications* insert on the cover of the simplified manual supplied with the product to identify the MVG model.

1. IMPORTANT INFORMATION

This document contains important instructions and information regarding various stages in the life cycle of the product:
- Transporting, storing, commissioning, and decommissioning.
- Operating and servicing.

The operating instructions correspond to the product actually delivered.

This document is part of the product and the instructions below must be followed:
- Read this document carefully and observe the instructions to ensure safe installation, optimal operation of the product and to avoid any malfunction.
- Keep the document within reach of the product so that the staff can easily access it.

- **Failure to observe the instructions specified in this document may lead to injury or even death!**
- **COVAL will not be held liable for any damage or breakdown as a consequence of failure to observe instructions.**

For any additional information, please contact COVAL:

International:
- E-mail: coval@coval.com
- Tel.: +33 (0)4 75 59 91 91

USA:
- E-mail: contact-us@coval.com
- Tel: (919) 233 4855

2. SAFETY INSTRUCTIONS

Only qualified personnel should be authorized to use the components. These individuals must be trained in the following areas:
- Installing pneumatic and electric equipment.
- Applicable safety rules and requirements for using components and installing them in devices, machines, and production lines.
- Appropriate handling of components and their respective products.
- Proper use of the operating materials and supplies.
- The latest applicable EC directives, legislations, decrees, and standards, as well as the current state of the technology for its intended use.
- Any special measures necessary to meet these requirements, as well as the current state of the technology.
- Installation in a secure environment.

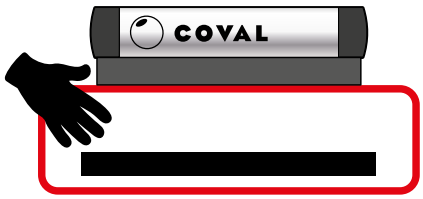
The vacuum gripper is solely intended for use in automated applications and in secure areas.

The improper use of components, use of operating materials and supplies other than those defined, improper voltages, and/or other environmental conditions may lead to failure, damage, and/or injury.

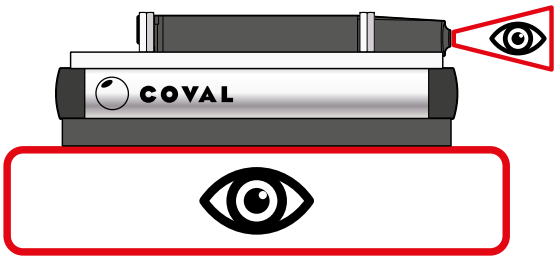
This list must be considered as an overview and does not claim to be exhaustive. It can be further expanded by users according to their particular needs.

HAZARD AREAS

Area where there is a risk of crushing



Area where there is a risk of air ejection



Notes for the manufacturer of the final machinery and for the end user

- Standing or walking in the operating area of the vacuum gripper is strictly prohibited. In the event of a power or pneumatic supply failure, the load handled by the gripper will be released.
- Never look inside and/or introduce hands into cavities, holes, or openings (e.g. air exhausts, openings/holes under the suction cups, etc.).
- The vacuum gripper described in this manual is designed for implementation in industrial systems. In other words, It must not be used under any conditions other than those specified.
- Once the vacuum gripper is installed, the manufacturer of the final machinery is responsible for the final assessment of safety systems applied prior to putting the facility into operation. It is the responsibility of the manufacturer of the final machinery to specify the PPE required for operators standing in the vicinity as well as for those who have access to the operating area. Furthermore, the said manufacturer must certify final commissioning in accordance with applicable local rules and regulations.

3. INSTRUCTIONS FOR USE

3.1. Basic Installation

In order to ensure flawless installation and operation, the following rules must also be observed:

- Vacuum grippers must be carefully removed from their packaging.
- Vacuum grippers must be protected against any and all damage.
- During installation and maintenance work, the vacuum generator must be de-energized (air and power) and secured against any unauthorized activation.
- Any attempt to alter the vacuum gripper is strictly prohibited.
- The area surrounding the vacuum gripper and the location where it is used must be kept clean (no outdoor use).
- Only the fittings/connectors provided may be used.
- During installation, only flexible tubes and tubes that are suitable for the specific operating material may be used (Improper tubing and/or electrical lines are a major safety hazard- **including risk of death!**).
- Conductive and live cable lines must be insulated, of an adequate size, and properly installed.
- Pneumatic and electric lines must be connected to the component in a stable and safe manner.
- Ensure that any physical contact with electric parts is prevented (protect electrical contacts).
- Only available fastening means described in this document maybe used and tightening torques must be used accordingly.
- The possibility of power or pneumatic supply interruption must be taken into consideration to ensure people and systems are protected at all times.
- Emergency stops should be accounted for when designing the system.

3.2. Commissioning and decommissioning

Commissioning:

- Ensure the flexible tubes for compressed air and power supply are connected correctly using the appropriate connectors.

Decommissioning (prior to any disassembly or maintenance work):

- Ensure the gripper is not holding any objects to be handled (load may drop).

3.3. Operating the vacuum gripper

Intended use
The vacuum gripper is solely intended for use in automated applications and in secure areas.
Use cases depend on the gripping interfaces used → see chapter 6.

Unintended use
The vacuum gripper may not be used for the following:
- Manual applications.
- Uses other than those established by the manufacturer or specified in this manual.
- In direct contact with hazardous materials (molten masses, radioactive products), water, steam, or in environments where dripping or splashing water, oil, etc. may occur.
- In explosive, acidic, alkaline, or saline atmospheres.
- In environments subject to strong vibrations and/or shocks.

3.4. Transportation and Storage

When handling the vacuum gripper, only use equipment that is suitable for its dimensions and weight.
For proper storage of the system and its spare parts, we recommend the following:
- Do not store in outdoor areas or areas exposed to bad weather, excessive moisture, or direct sunlight
- In a reasonably clean environment, place the system in such a way that it rests on a stable support base, and ensure that the device cannot tip over.
- Store the gripper in a manner where the interface is uncompressed.

3.5. Maintenance

Maintenance must be performed in accordance with the instructions in this manual. Prior to performing any maintenance work, follow the instrutions provided in section 3.2.

3.6. Disposal

When disposing of the system or any of its constituent parts that are no longer functional, follow the procedure below:

Waste electrical and electronic equipment (WEEE) must not be disposed of in urban waste collection bins but given to the appropriate recycling organization (see section 26 on RECYCLING).

- **Failure to observe the above safety instructions may lead to failure, damage, and injury—even risk of death.**
- **The components of the device that are no longer in working order must be recycled in an environmentally-friendly manner!**

4. NAMEPLATE

The nameplate is affixed to the vacuum gripper in such a way that it is legible at all times.

It includes the following information:
- Part number
- Serial number
- Weight
- CE marking

Sample nameplate

Always provide the part and serial numbers of the product when you contact COVAL.

5. IDENTIFYING YOUR MODEL

MVG	...	X	...	D	VSA33JK	X		H	X		SPxxx

LENGTH

Overall length (mm): from 150 to 1200 mm → ...

WIDTH

Overall width (mm): from 150 to 1000 mm → ...

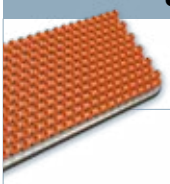
HOLE/CUP PATTERN LAYOUT

Staggered	Q
Straight*	D

** Only available for "maxi" type gripping interface with minimum suction cup Ø 26mm.*

Specific incremental number → SPxxx

SUCTION CUPS GRIPPING INTERFACES



"mini" type interface: 2.5 bellows suction cups Ø 14 mm in silicone 35 Shore with flow control nozzles	VSP14BF
"medium" type interface: 1.5 bellows suction cups Ø 25 mm in natural rubber with flow control nozzles.	VSA25JI
"maxi" type interface: 1.5 bellows suction cups Ø 33 mm in natural rubber with flow control nozzles.	VSA33JK
"maxi" type interface: 2.5 bellows suction cups Ø 30 mm in white silicone 35 Shore with flow control nozzles.	MVS30EK

FILTER

X	Without

TECHNOLOGY

H	Flow control nozzles

FOAM GRIPPING INTERFACES

Foam "mini" type interface: EPDM (thickness 20 mm)	F2S
Foam "maxi" type interface: EPDM (thickness 20 mm)	F2B

FILTER

X	Without
F	With filter

TECHNOLOGY

H	Flow control nozzles
E	Airtight valves
V	Check valves

COVAL-flex GRIPPING INTERFACES

COVAL-flex gripping interfaces are designed to meet the needs of specific applications. COVAL's sales team would be happy to provide any recommendations or further information you may require should your application be able to use any of their special features.

6. TECHNOLOGIES USED

6.1. Gripping Interface

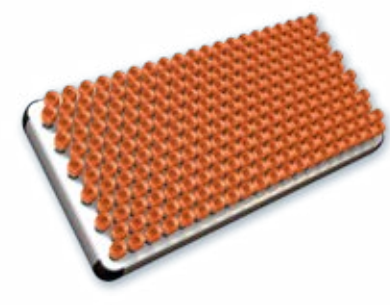
With **MVG series**, COVAL gives you a choice of 3 complementary gripping interface technologies: vacuum grippers with foam, suction cup grippers, and grippers with a COVAL-flex interface.
In order to optimize the performance of the **MVG series** for different applications, the vacuum grippers are available in different gripping patterns, hole diameters, and cup sizes.
→ A broad range which meets all application requirements.

"FOAM" Interface

- Handling of rigid products.
- Gripping textured or uneven surfaces.
- Flow control nozzles, airtight valves, or check valves.
- 2 standard hole diameters (Ø 12, 16mm) and 2 standard hole patterns.

"SUCTION CUP" Interface

- Handling of flexible products.
- Wide range of cup options.
- Flow control nozzles in multiple diameters.
- 4 types of standard suction cups (Ø 14, Ø 25, Ø 30 and Ø 33 mm).
- 3 standard cup patterns.



"COVAL-flex" Interface

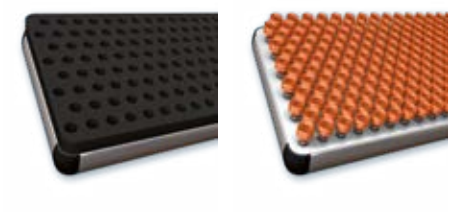
- Handling of aluminum cans, canned food, glass containers, etc.
- Flexible interface, extremely tear-resistant.
- Hole pattern dependent upon application requirements, completely customizable.

Standard Hole/Cup Patterns

In order to optimize the performance of the **MVG series** for different applications, the vacuum grippers are available in different gripping patterns, hole diameters, and cup sizes.

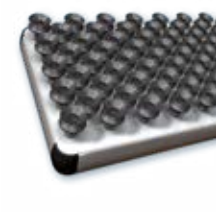
"MINI" type

- Reduced hole spacing, allowing small, flexible pieces to be gripped.
- The multitude of gripping points guarantees a strong grip, even with random positioning of products.



"MEDIUM" type

- An intermediate distribution of gripping points between the "mini" and "maxi" type.
- Ideal for handling dense loads with reduced gripping surface.

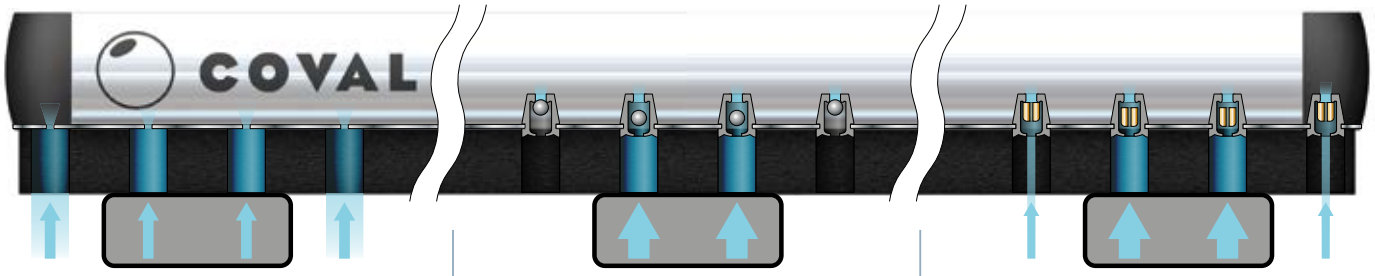


"MAXI" type

- Large gripping point surfaces, allowing heavy loads to be gripped.
- Ideal for gripping parts with rigid gripping surfaces.

6.2. Flow Control Technologies

COVAL offers 3 flow control technologies to optimize your vacuum gripper and perfectly respond to the constraints of your application.



Flow control nozzles

- Limits the leakage rate of uncovered zones.
- Economical solution.
- Customizable calibration.
- Horizontal and vertical handling.

Airtight valves *(COVAL patent)*

- Isolates uncovered zones.
- Provides energy savings.
- Meets specific needs.
- Instant gripping.
- Quick release to blow-off.
- Horizontal handling.

Check valves *(COVAL patent)*

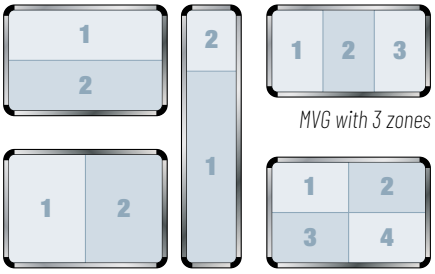
- Limits the leakage rate of uncovered zones.
- Instant gripping.
- High versatility of applications.
- Quick release to blow-off.
- Horizontal handling.

6.3. Multi-zone

COVAL's Multi-zone technology provides independently defined vacuum zones on the same gripper. For this reason, each zone has a separate vacuum pump, either integrated or external.

As each multi-zone application is different, we will work with you to determine the best configuration for your process.

Examples of configuration:



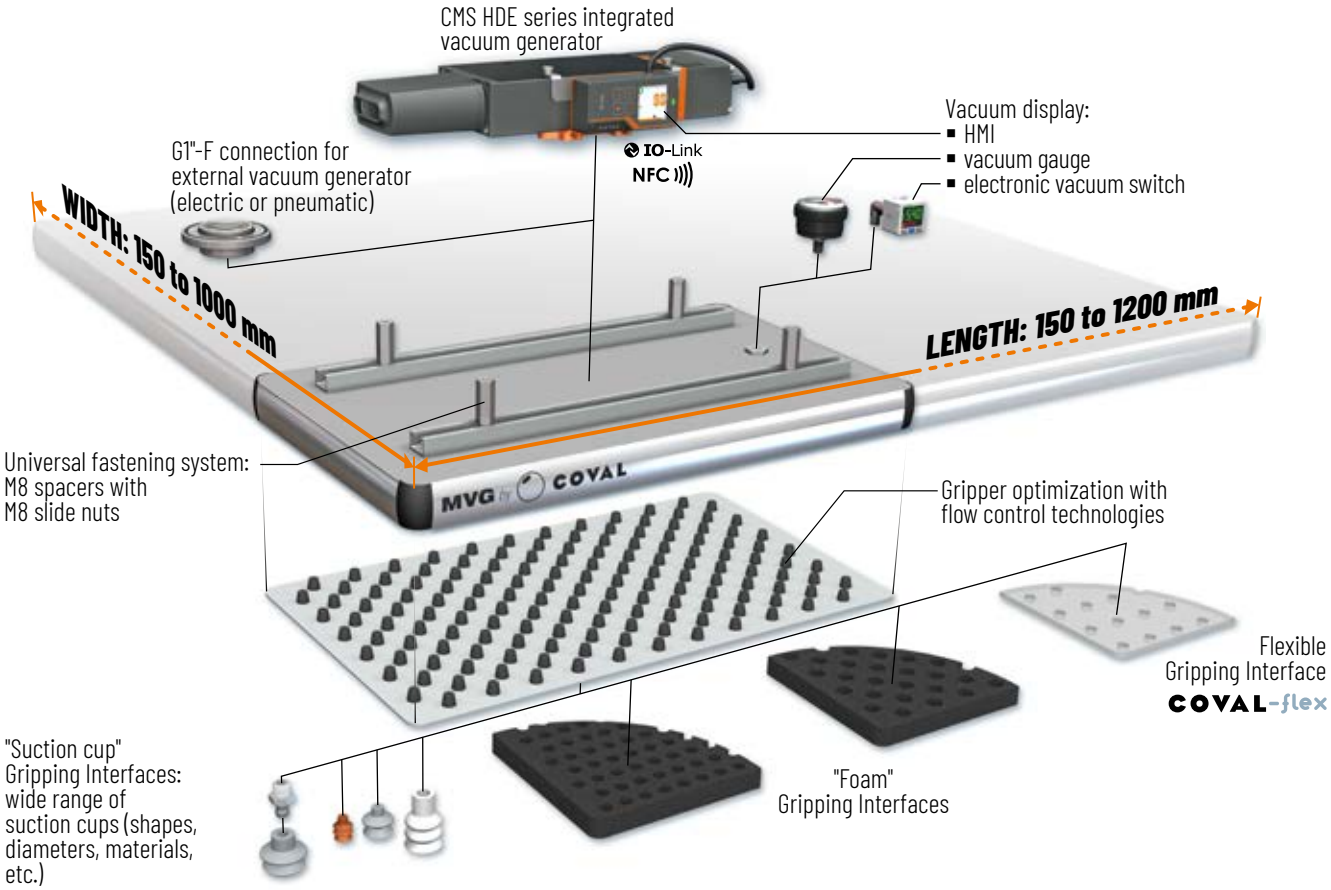
MVG with 3 zones

MVG with 2 zones

MVG with 4 zones

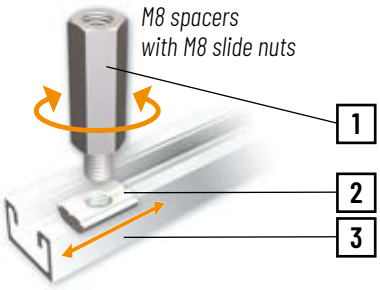
7. OVERVIEW, DIMENSIONS, AND MOUNTING

7.1. Overview



7.2. Dimensions and Mounting Options

COVAL MVG series vacuum grippers can be mounted on all types of automated or robotic systems, using M8 spacers that slide into the aluminum rails (fastened with M8 screws).
Permissible tightening torque on spacers: 20 N m max.

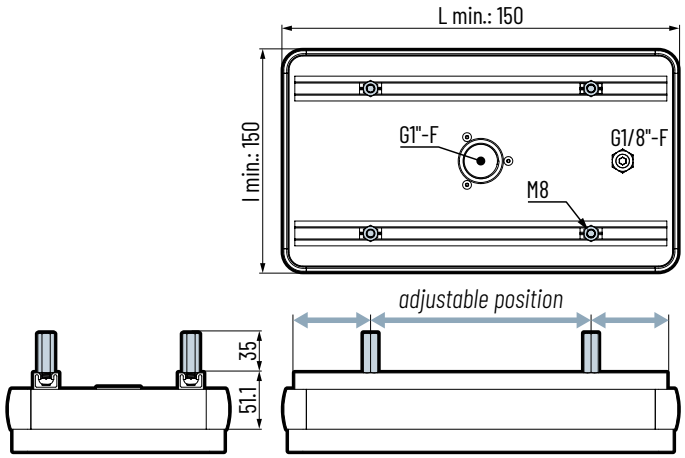


Label	Description	Part No.
1	M8 hexagonal spacer	80007670
2	M8 fastening nut	02030270
3	MVG mounting rail	80006169

VERSION GO (with external vacuum generator)

The number of M8 spacers depends on the dimensions of the vacum gripper.

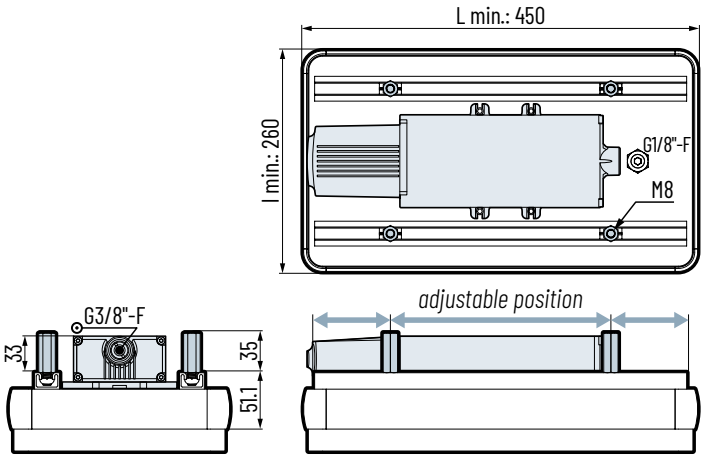
Permissible tightening torques:
- Spacers: 20 N m
- G1" vacuum connection: 25 N m



VERSION with a multistage vacuum generator, CMS HDE series, without control

The number of M8 spacers depends on the dimensions of the vacum gripper.

Permissible tightening torques:
- Spacers: 20 N m
- G3/8" pressure connection: 10 N m



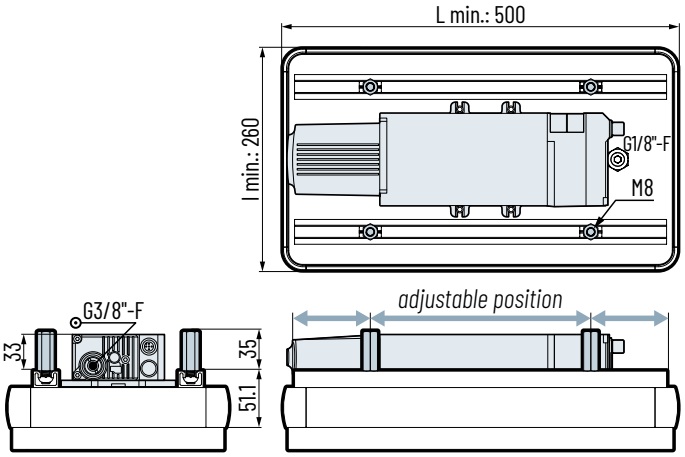
For more details, please refer to the plan supplied with your order.

Note: all dimensions are in mm.

VERSION with a multistage vacuum generator, CMS HDE series, with control

The number of M8 spacers depends on the dimensions of the vacum gripper.

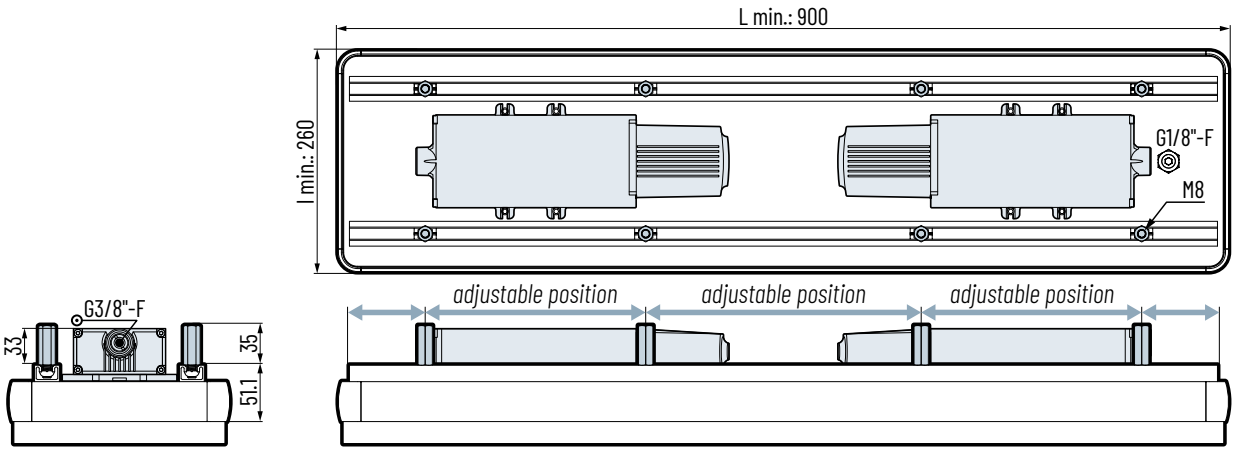
Permissible tightening torques:
- Spacers: 20 N m
- G3/8" pressure connection: 10 N m



VERSION with 2 multistage vacuum generators, CMS HDE series, without control

The number of M8 spacers depends on the dimensions of the vacum gripper.

Permissible tightening torques:
- Spacers: 20 N m
- 2 x G3/8" pressure connection: 10 N m



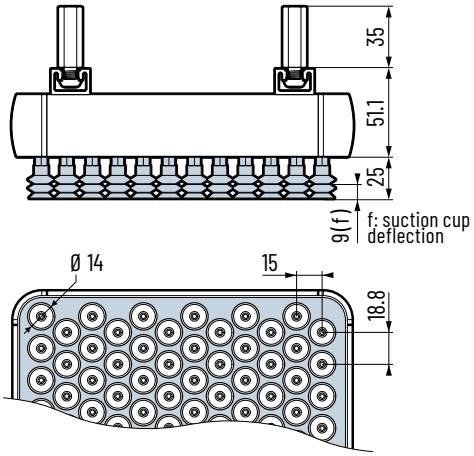
For more details, please refer to the plan supplied with your order.

Note: all dimensions are in mm.

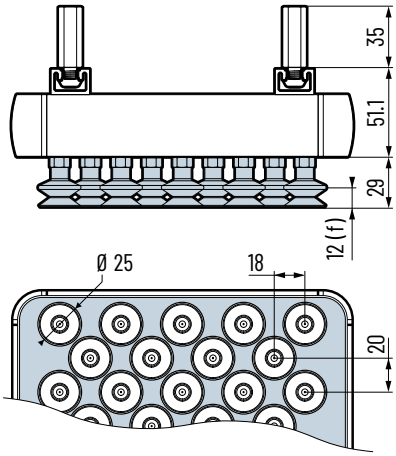
7.3. Gripping Interface Dimensions

MVG SERIES WITH SUCTION CUP GRIPPING INTERFACE

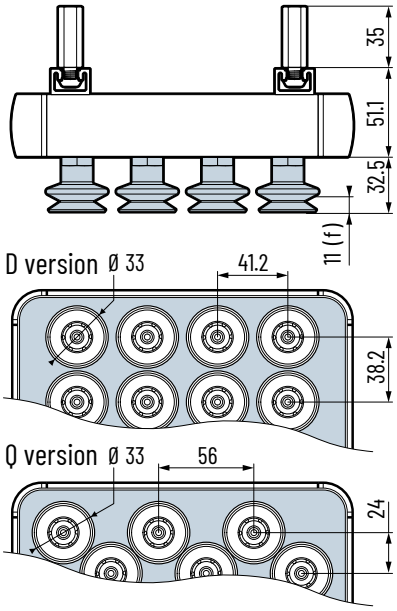
"mini" type suction cup interface



"medium" type suction cup interface

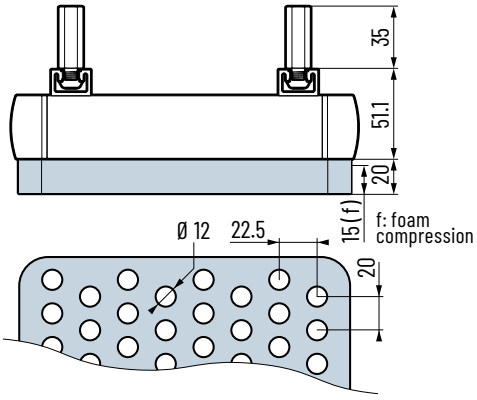


"maxi" type suction cup interface

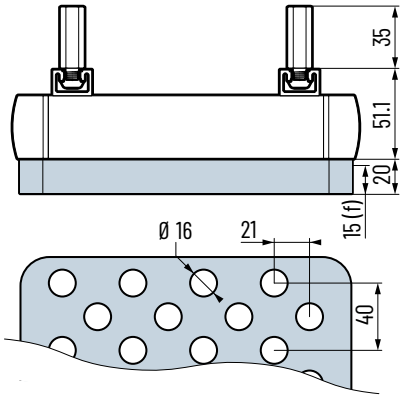


MVG SERIES WITH FOAM GRIPPING INTERFACE

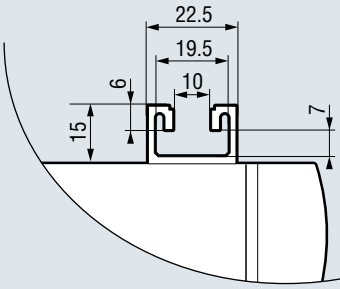
"mini" type foam interface



"maxi" type foam interface

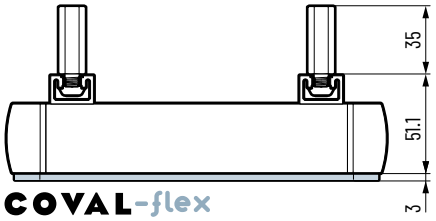


Mounting rail

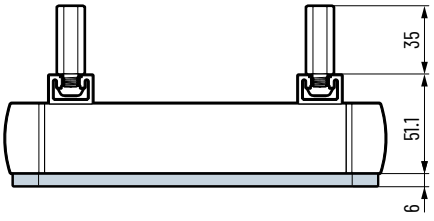


MVG SERIES WITH "COVAL-FLEX" GRIPPING INTERFACE

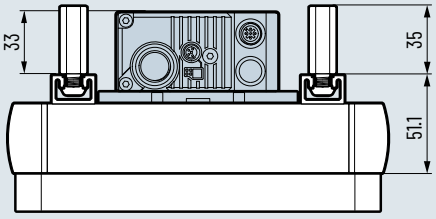
3 mm thick "COVAL-flex" interface



6 mm thick "COVAL-flex" interface



MVG SERIES WITH CMS HDE VACUUM GENERATOR



Note: all dimensions are in mm.

8. INSTALLING THE VACUUM GRIPPER

For pneumatic and electrical connections, it is necessary to identify the vacuum pump model integrated into the housing. To do this, locate the vacuum pump part number on the nameplate.

IDENTIFY YOUR MULTISTAGE VACUUM PUMP MODEL, CMS HDE SERIES

CMS HDE without control

CMSHDE90X	100	N	V0	G4	K

SUCTION FLOW RATE

700 Nl/min (24.72 SCFM)	**50**
1100 Nl/min (38.85 SCFM)	**100**

EXHAUST

K	Through-type silencer

CMS HDE with control

CMSHDE90X	100	S	VX	C15X	G4	K		D

SUCTION FLOW RATE

700 Nl/min (24.72 SCFM)	**50**
1100 Nl/min (38.85 SCFM)	**100**

GENERATOR CONTROL

Vacuum pump with **NC** vacuum control and **NC** blow-off control. Choice of blow-off settings (only on CMSHDE__**SVX**_ models): ▪ Controlled by external signal ▪ Automatic timer from 50 to 9999 ms (advantage: saves one controller output).	**S**
Vacuum pump with **NO** vacuum control and **NC** blow-off control. ▪ Blow-off controlled by external signal	**V**

VACUUM SWITCH/HMI

Multi-stage vacuum pump without vacuum switch and HMI	**V0**	**C15P**	▪ One M12 5-pin male PNP ▪ Simplified CMS HDE with control, without settings and dialogs ▪ Digital inputs/outputs mode (SIO)
Multi-stage vacuum pump with integrated vacuum switch and pressure sensor, without HMI	**VX**	**C15X**	▪ One M12 5-pin male configurable as PNP or NPN ▪ One M8 4-pin male for remote HMI ▪ Electronic vacuum switch ▪ Digital Output DO1 "object gripped" 24 V DC / NO ▪ Digital input/outputs mode (SIO) / IO-Link ▪ Compatible with remote HMI

CONNECTORS

EXHAUST

K	Through-type silencer

PRESSURE SENSOR

None on **V0** versions	**-**
Standard on **VX** versions	**D**

8.1. Pneumatic Supply for Vacuum Grippers Equipped with One or More CMS HDE Vacuum Generators

COMPRESSED AIR OR VACUUM NETWORKS:
- Wear safety goggles
- Make sure all fittings and tubes are tightened securely
- Air line ends must be fastened to avoid any risk of being pulled off in the event of accidental breakage

Note: For MVG vacuum gripper without vacuum generator (version G0), see section 8.2.3 "Connecting an external vacuum source".

Pneumatic supply characteristics

- Non-lubricated air, filtered to 5 microns, according to standard ISO 8573-1:2010 [3:4:4].
- Operating pressure: from 2 to 8 bar.
- Optimal dynamic pressure:
  - CMSHDE_**NV0** (without control): 5.5 bar.
  - CMSHDE_**S**_/ CMSHDE_**V**_ (with control): 6 bar.
- 1 power supply for vacuum gripper equipped with a multi-stage vacuum generator (pressure connection: G3/8"-F with removable 350 µm filter screen).
- 2 power supplies for vacuum gripper equipped with 2 multi-stage vacuum generators (pressure connection: G3/8"-F with removable 350 µm filter screen).

Part No and technical data of the integrated CMS HDE series vacuum generators

Vacuum generators	Consumption (Nl/min) / *(SCFM)*	Flow rate (Nl/min) / *(SCFM)*	Max. vacuum (%)	Sound level (dBA)
CMSHDE_50_	220 / *7.77*	700 / *24.72*	80	59
CMSHDE_100_	420 / *14.83*	1100 / *38.85*	80	62
2 x CMSHDE_100_	840 / *29.66*	2200 / *77.69*	80	65

8.2. Pneumatic Connection

NOTE: MODULE PROTECTION
- Removable 100 µm filter screen integrated in the vacuum connection to protect the pump against particles.
- Possible additional filter on vacuum circuit: In the rare cases of fine dust in a wet environment, the use of an appropriate filter will prevent any internal clogging: → See COVAL catalog: "Filters for vacuum circuits"

Lengths and diameters of compressed air supply lines

Vacuum generators	Min. internal line dia.
CMSHDE_50_	Ø6 mm – max. length 2 m Ø8 mm – max. length 6 m
CMSHDE_100_	Ø6 mm – max. length 2 m Ø8 mm – max. length 6 m
2 x CMSHDE_100_	Ø8 mm – max. length 6 m

→ Flexible lines must be as short as possible in order to minimize response times.
→ Make sure there is no pollution in the device connections and lines.
→ Flexible lines must be connected without bends and without crushing them.

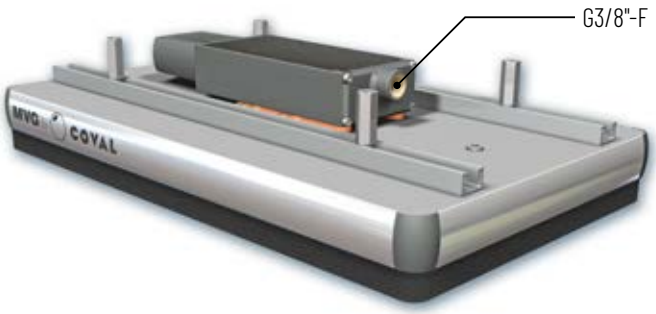
IF THESE CONDITIONS ARE NOT OBSERVED, YOU RISK THE FOLLOWING ISSUES:
- If the chosen internal diameter on the compressed air inlet is too small, the compressed air supply will be insufficient to achieve optimal performance. The generator will be unable to achieve the specified maximum vacuum rate.
- If the chosen internal diameter on the vacuum inlet is too small, the airflow is slowed down due to this restriction, which has a negative effect on suction power and on suction or exhaust time.

8.2.1. MVG vacuum gripper equipped with a multi-stage vacuum generator, CMS HDE series

Connect the compressed air to the G3/8" connection on the CMS HDE series multi-stage vacuum generator.

Permissible tightening torque:
- G3/8" pressure connection: 10 N m

Multi-stage vacuum generator without vacuum generator control: CMSHDE_N_

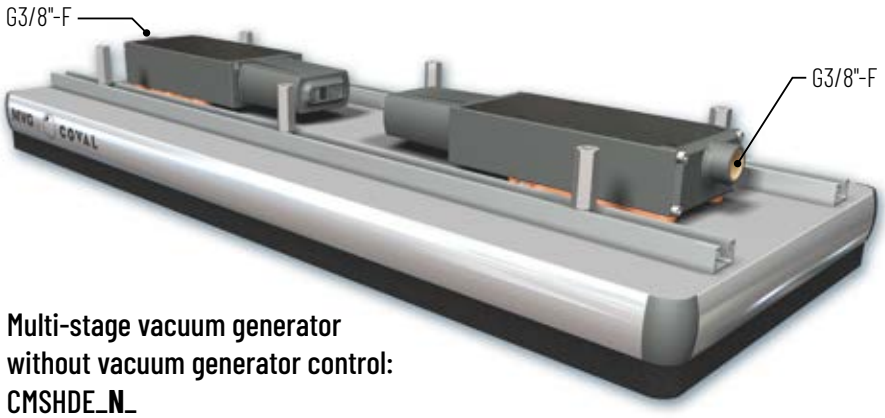


Multi-stage vacuum generator with vacuum generator control: CMSHDE_S_ / CMSHDE_V_)

8.2.2. MVG vacuum gripper equipped with 2 multi-stage vacuum generators, CMS HDE series

Connect the compressed air to the two G3/8" fittings located on the CMS HDE series multi-stage vacuum generators.

Permissible tightening torques:
- 2 x G3/8" pressure connection: 10 N m



Multi-stage vacuum generator without vacuum generator control: CMSHDE_N_

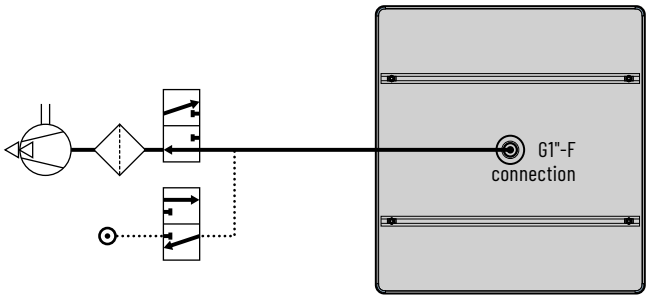
8.2.3. MVG vacuum gripper without integrated vacuum generator (**GO**N)

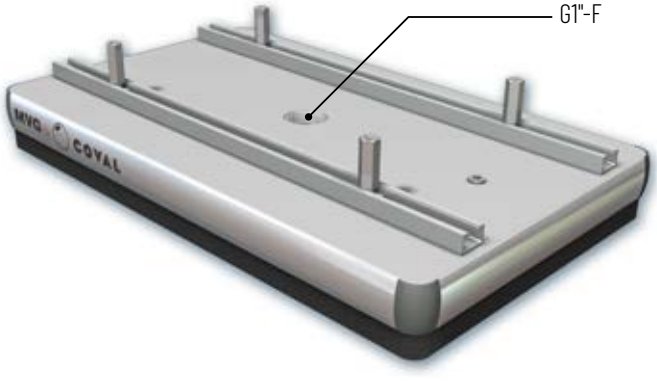
Connecting an external vacuum source

To allow for an external vacuum source to be connected, version **GO**N of the MVG vacuum gripper is equipped with a G1"'-F threaded flange.

Permissible tightening torque:
- G1" vacuum connection: 25 N m

Note: Diameter of supply pipes must be suitable for the flow rate of the external vacuum generator.



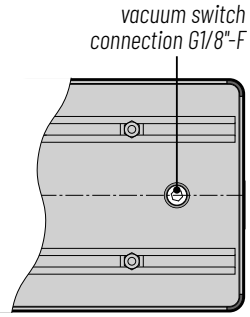


vacuum switch

8.3. Connecting a Vacuum Switch

In order for an external vacuum switch to be connected, the MVG vacuum gripper is equipped with a G1/8"-F connection.

Permissible tightening torque: vacuum switch connection G1/8"-F: 12 N m

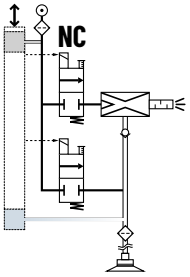


8.4. Electrical Connections: CMS HDE with Vacuum Generator Control (CMSHDE_S_ / CMSHDE_V_)

When required, CMS HDE series multi-stage vacuum generators, integrated into the MVG vacuum gripper, can be equipped with a vacuum and/or blow-off control valve to optimize the release of gripped objects. This also enables cleaning of the vacuum network, flow control nozzles, check valves, and airtight valves. A vacuum switch or analog gauge is available as an option should a visual display of the vacuum level in the system be needed (see below).

VACUUM CONTROL: 2 SOLUTIONS

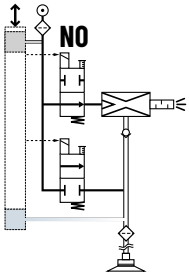
Model CMSHDE__S_: vacuum pump with **NC** vacuum control and **NC** blow-off control.
In the event of power failure, vacuum is no longer generated. In the event of compressed air failure, the vacuum is no longer maintained.



- NC blow-off and vacuum control: solenoid valves
- Choice of blow-off settings (only on CMSHDE__**SVX**_ models):
  - controlled by external signal.
  - automatic timer from 50 to 9999 ms (advantage: saves one controller output).

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



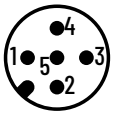
- NO vacuum control solenoid valve
- NC blow-off control solenoid valve
- Blow-off controlled by external signal

ELECTRICAL CONNECTIONS

CMS HDE vacuum pumps must be used with power supply units that provide Protective Extra Low Voltage (PELV) and supply voltage isolation according to EN 60204.

CMSHDE_VOC15P_:

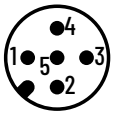
- One M12 5-pin male connector



1	/
2	24V DC suction command [1]
3	0V - GND
4	24V DC blow-off command
5	/

CMSHDE_VXC15X_:

- One M12 5-pin male connector



1	24V DC
2	24V DC suction command [1]
3	0V - GND
4	24V DC object gripped D01 - C/Q
5	24V DC blow-off command

- One M8 4-pin male connector → HMI

1	24V DC
2	RS485 (DATA+)
3	0V - GND
4	RS485 (DATA-)

: connections for IO-Link

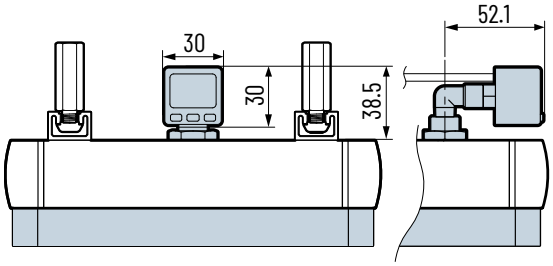
[1] 24V DC suction command, depending on version:
*- **S**: 24V DC vacuum control*
*- **V**: 24V DC vacuum off command*

8.5. Vacuum Level Display (MVG with VA or VF option)

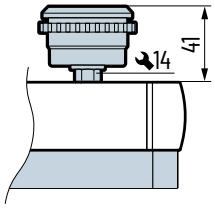
When required, MVG series vacuum grippers can include a vacuum level display with an electronic vacuum switch or vacuum gauge:

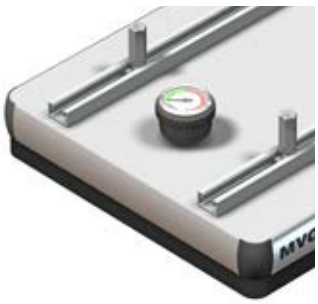
- **Option VA - electronic vacuum switch with 3-color display (PSD100CPNP):**

  - Pressure rating range: 0 ~ -101.3 kPa.
  - Pressure setting range: 10 ~ -101.3 kPa.
  - Max. pressure: 300 kPa.
  - Fluid: Air, non-corrosive/non-flammable gas.
  - Hysteresis: adjustable.
  - Response time: ≤ 2.5ms, with anti-vibration function.
  - 7 segment LCD display: 2 color (red/green) main display, orange sub-display (refresh rate: 5 times/sec).
  - Choice of pressure unit display: kPa, MPa, kgf/cm2, bar, psi, inHg, mmHg.
  - Power supply voltage: 12 to 24V DC ±10%.
  - Current consumption: ≤ 40 mA (without load).
  - Repeatability (switch ouptut): ≤ ±0.2% F.S. ±1 digit.
  - Electrical connection: M8 (4-pin).
  - Protection: IP40.
  - Ambient temperature range (operation): 0-50° C (32-106° F).
  - Material (enclosure): PA 6.6 20%GF.



- **Option VF - vacuum gauge (VAF11140):**
  - Vacuum gauge with needle.
  - Damping: by silicone movement (patented).
  - Measuring: Bourdon tube in CuSn.
  - Precision: +/- 2.5% of max. scale value.
  - Frame: black ABS





9. INSTALLING AND OPERATING REMOTE HMI (MVG WITH VI OPTION)

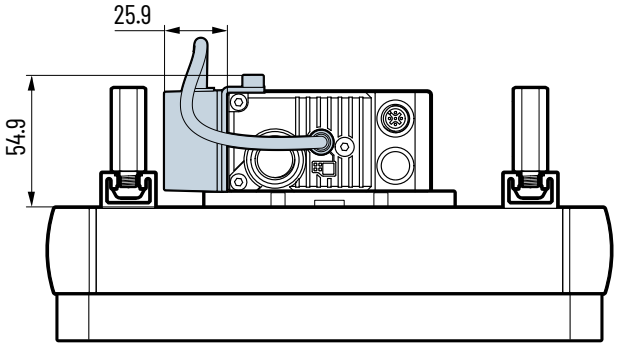
Part number:
- Option **VI**: integrated on the vacuum gripper:
- Option **HMIHD1M84P**: remote

Accessory only compatible with vacuum generator CMSHDE___**VX**__.

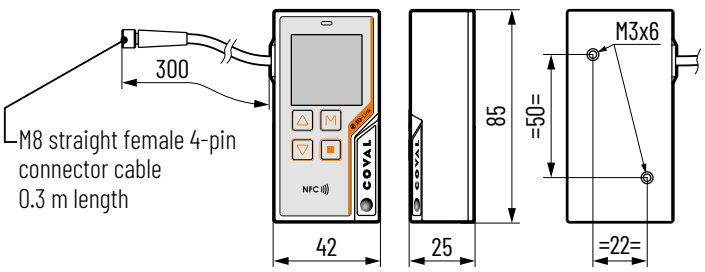
The CMSHDE___VX__ vacuum generators are supplied with the standard factory settings described in this manual.
To be able to modify them, you must use a remote HMI or configure the module using IO-Link.

9.1. Dimensions

Option **VI**

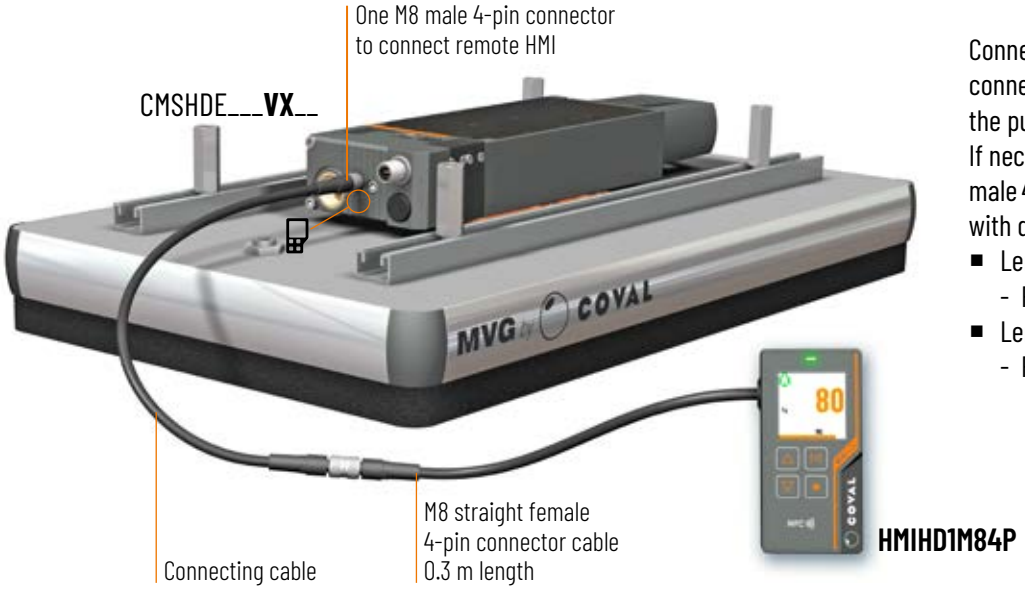


Remote HMI version: **HMIHD1M84P**



Note: all dimensions are in mm.

9.2. Installing the Remote HMI, part no. HMIHD1M84P



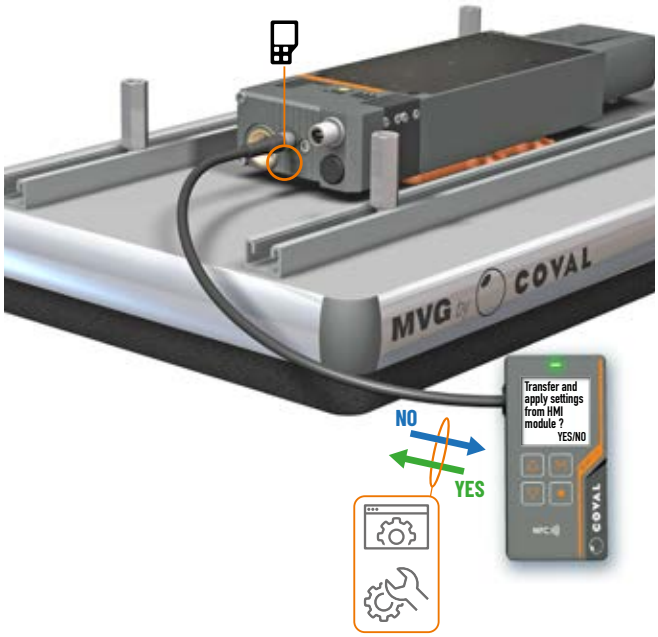
Connect the HMI's M8 female 4-pin connector to the M8 male connector on the pump's valve block (marked).
If necessary, use a M8 female 4-pin / M8 male 4-pin connecting cable, compatible with drag chain:

- Length 2 m:
  - Part no. **CDM8MF4PL2**
- Length 5 m:
  - Part no. **CDM8MF4PL5**

9.3. Configuring a Remote HMI

Reminder: The remote HMI (part no. **HMIHD1M84P**) can only be used with multi-stage vacuum pumps CMSHDE___**VX**__.

The CMSHDE___**VX**__ multi-stage vacuum pumps are supplied with the standard factory settings described in this manual. To be able to modify them, you must use a remote HMI or configure the module using IO-Link.



Configuration procedure

Step 1: Connect the remote HMI to M8 connector (marked) on the CMS HDE. The CMS HDE must be powered on.

Step 2: When the HMI is powered on, a message is displayed asking which settings should be used (HMI or IO).

➔ ***Transfer and apply settings from the HMI module? YES/NO?***

Step 3: Choose either YES or NO.

- **NO** (selected by default): If the user presses M or does nothing within 5 seconds, the settings present in the vacuum switch of the CMS HDE are transferred to the remote HMI.
- **YES**: The process settings and device settings contained in the remote HMI are transferred to the vacuum switch of the CMS HDE and applied immediately.

This operation can be used to copy settings from one product to the next. The device's own product ID, serial number and device name remain unchanged. Likewise, the display settings (language, vacuum and pressure units, display rotation), also called "user settings", are not transferred since they are only related to the remote HMI.

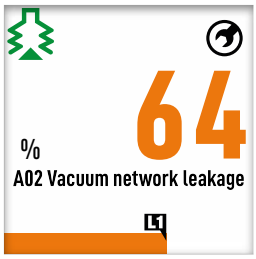
Reminder:

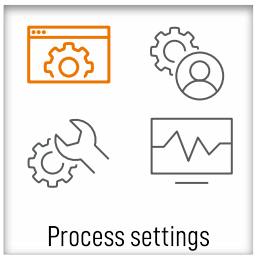
Process settings (for details see sect. 13)
- L1/h1
- Automatic blow-off

Device settings (for details see sect. 15)
- PNP/NPN
- NO/NC

9.4. Front Panel Dialog

The HMI allows for easy and efficient reading of the pump's operation.
The 1.54" high-visibility color LCD screen gives real-time access to the process data, settings, and diagnostic data.





❶ Gripping status indicator light:
- Green: object gripped
- Red: object lost

❷ Status indicator for vacuum and blow-off control:
- Vacuum generation
- Blow-off
- Simultaneous vacuum and blow-off control

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

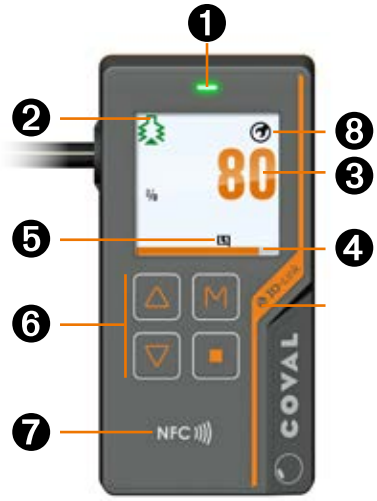
❹ Bar chart indicating the instantaneous vacuum level

❺ L1 vacuum threshold: threshold for "object gripped" signal

❻ Keypad: M button (menu), △ and ▽ buttons ■ button (return)

❼ NFC antenna

❽ Maintenance indicator



10. HMI DETAILS AND FEATURES

10.1. Powering On

The following occurs when the device is powered on:
- 1: COVAL logo is displayed (for about 15 seconds).
- 2: Main screen is displayed showing the vacuum level.
- 3: The keypad is locked by default.

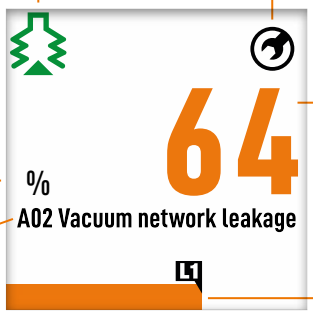
Note: During the startup phase (1), the product is immediately operational in terms of inputs/outputs (suction/blow-off commands, contact outputs). Only the "HMI" part is being initialized during this phase.

10.2. Details of the Main Screen

Status indicator for vacuum and blow-off commands:
- : Vacuum generation
- : Blow-off command
- : Simultaneous vacuum and blow-off commands

Vacuum unit
kPa / % of vacuum / mbar / inHg

Variable message
Displays code + error messages, alarms (see sect. 17)



Bar chart indicating the instantaneous vacuum level

Maintenance indicator
Icon shown if the vacuum solenoid valve has reached 50 million cycles.

Instantaneous vacuum level
Displayed in:
- kPa: 0 to -99
- Vacuum %: 0 to 99
- mbar: 0 to -999
- inHg: 0 to -29.9

L1 vacuum threshold
L1: Threshold for "object gripped" signal

10.3. Keypad Functions

The keypad consists of 4 keys used to navigate to the various menus/screens and to change the parameters, etc.

Navigate to screens and menus
Increase/decrease values
Hold down to quickly scroll through values

From main screen: access main menu
Validate menus and settings

From main screen: access secondary screen
From menus: return to previous menu

11. SUMMARY OF FUNCTIONS

11.1. Accessing Live Diagnostic Data

Main screen

→ M + ▽ : Lock/unlock keypad

■

Live Data (1/2)
Input/Output mode
SIO
Inlet pressure
0.1259 Mpa
Air consumption
46 Nl/min

Secondary screens: live diagnostic data

Shows operating mode of device (automatic detection) and communication status (if IO-Link):
- SIO: standard input/output mode.
- IO-Link: IO-Link mode and communication established.

Instantaneous supply pressure monitoring
(bar, MPa, psi depending on unit defined in dedicated menu)
Value is shown in **orange** if it is outside the authorized range. Otherwise, it is shown in **green**.

▽

Live Data (2/2)
Power supply voltage
20.5 V
Vacuum cycles
1012927
Blow off cycles
1024773

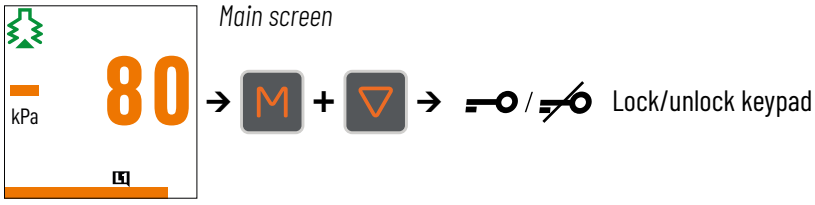
Instantaneous air consumption in Nl/min

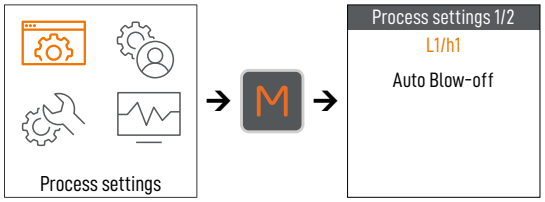
Power supply monitoring
Value is shown in **orange** if it is outside the authorized range. Otherwise, it is shown in **green**.

Vacuum and blow-off cycles

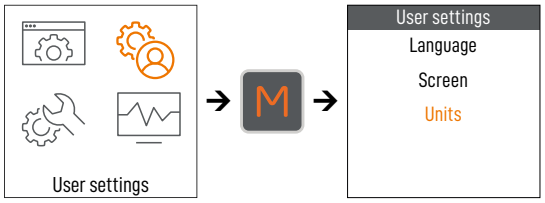
M

11.2. Menu Tree

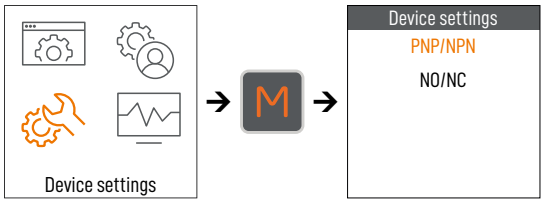




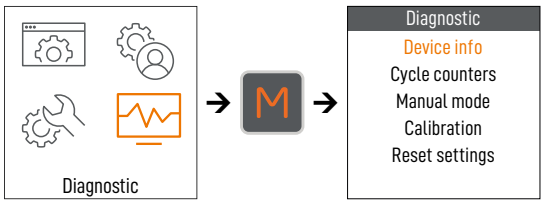
Process settings
- **L1/h1**: threshold and hysteresis for "object gripped"
- **Automatic blow-off** (CMSHDE_**SVX**_ only): enable/disable and configure timed automatic blow-off



User settings
- **Language**: choose language (EN, FR, DE, ES, IT)
- **Screen**: enable/disable standby mode, screen rotation setting (0, 90, 180 or 270°)
- **Units**: choose unit of measure for vacuum and pressure



Device settings
- **PNP/NPN**: input/output switching mode
- **NO/NC**: output 1 Normally Open or Normally Closed



Diagnostic
- **Device info**: part number, device name, firmware version, serial number
- **Cycle counters**: vacuum and blow-off control, objects gripped and lost, voltage and supply pressure faults, etc.
- **Manual mode**: manual vacuum and blow-off commands
- **Calibration**: calibrate vacuum and pressure sensor
- **Reset settings**: reset process settings or all settings (restore "factory" settings)

12. LOCKING/UNLOCKING THE KEYPAD

1- Simultaneously pressing the **M** and ▽ keys unlocks the keypad (pressing them again locks it).
2- Pressing the keys to scroll through the following displayed messages ***K01 Keyboard locked, M + Down to unlock*** and ***K02 Keyboard unlocked.***
3- The display automatically returns to the vacuum level 0 kPa.

13. PROCESS SETTINGS

Main menu	Secondary menu	Display conditions	Factory settings
	L1/h1	Permanent	L1= -40 kPa h1= -10 kPa

13.1. Setting Threshold 1

Reminder of the "factory" setting

This initial factory setting is suitable for most applications.

Threshold L1 :

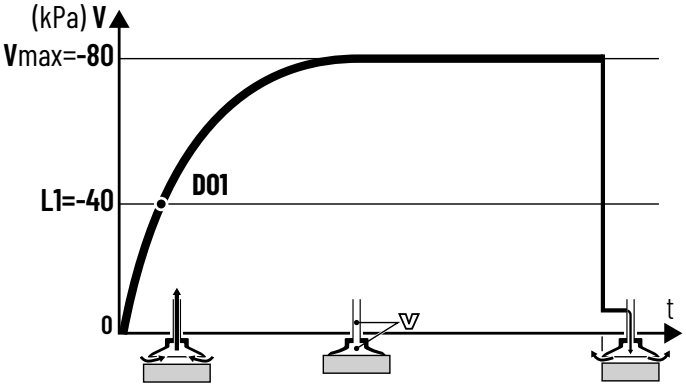
L1= -40 kPa, vacuum threshold that generates the D01 "object gripped" signal.

h1= -10 kPa, L1 hysteresis, drop in vacuum that will make the D01 signal "object gripped" disappear.

The figure below explains how this "factory" setting works.

Recommendations

Recommended value: Hysteresis from -1 to -20 kPa.



Main menu	Secondary menu	Display conditions	Factory settings
	**Auto Blow-off**	CMSHDE version **SVX**	OFF

13.2. Auto Blow-off

Timed automatic blow-off eliminates the need for a controller output and controls the blow-off as soon as vacuum control is stopped and for a configurable amount of time.
The initial "factory" setting for blow-off is the "blow-off controlled by external signal" option.
This setup is only available CMSHDE_**SVX**_
(refer to section 8.4, electrical connections)

OFF: Auto blow-off disabled = blow-off controlled by external signal
ON: Auto blow-off enabled
If enabled, the duration of the automatic blow-off can be adjusted from 50 to 9999 ms (factory setting 500 ms).

14. USER SETTINGS

Main menu	Secondary menu	Display conditions	Factory settings
	**Language**	Permanent	English

14.1. Language

To make the CMS HDE easier to use and configure, all information, messages and menus are available in the following 5 languages:
- EN: English
- FR: French
- DE: German
- IT: Italian
- ES: Spanish

Main menu	Secondary menu	Display conditions	Factory settings
	**Screen**	Permanent	Sleep mode: ON Rotation: 0°

14.2. Screen

The display goes into sleep mode after 10 min. if no external commands are received (vacuum or blow-off) and no key is pressed on the keypad.
- ON: Sleep mode enabled
- OFF: Sleep mode disabled

Rotation:
To make it easier to read the information displayed on the screen of the remote HMI, the display on the screen can be rotated according to how the vacuum pump is placed in the facility.
The display rotation can be configured as follows: 0 / 90 / 180 / 270°

Main menu	Secondary menu	Display conditions	Factory settings
	**Units**	Permanent	Vacuum: kPa Pressure: MPa

14.3. Units

The unit of measure to display the vacuum level can be selected from among the following:
- kPa
- %
- mbar
- inHg

The unit of measure to display the pressure can be selected from among the following:
- MPa
- Bar
- psi

15. DEVICE SETTINGS

15.1. Input/Output Switching Mode: PNP or NPN

Select PNP or NPN to choose the switching mode for inputs (vacuum and blow-off commands) and for output (D01).

Main menu	Secondary menu	Display conditions	Factory settings
	NO/NF	Output 1: Permanent	Output 1: NO

15.2. NO / NC

- The contact output (D01) can be set to either NO (Normally Open) mode or NC (Normally Closed) mode.
- Factory setting:
- D01 "Object gripped": NO

16. DIAGNOSTICS

Main menu	Secondary menu	Display conditions	Factory settings
	Device info	Permanent	

16.1. Device Info

The information concerning the CMS HDE are available on the following 3 screens:

"Device info" screen 1/3:

The complete part number of the CMS HDE consists of the following 2 parts:

- Part 1/2: e.g. CMSHD90X50
- Part 2/2: e.g. SVXC15XG4KD

Example of complete part number: CMSHDE90X50SVXC15XG4KD

"Device info" screen 2/3:

IO firmware version and IO serial number

"Device info" screen 3/3:

HMI firmware version and HMI serial number

Main menu	Secondary menu	Display conditions	Factory settings
	Cycle counters	Permanent	

16.2. Cycle Counters

The menu used to access counters consists of 4 screens.

Screen 1/4:

- **Vacuum commands:** Total number of times vacuum solenoid valve activated (external/customer command).
- **Blow-off commands:** Number of times blow-off solenoid valve activated (external command and automatic blow-off).
- **Gripped parts:** Number of parts handled by the vacuum pump.

Main menu	Secondary menu	Display conditions	Factory settings
	**Cycle counters**	Permanent	

Screen 2/4:

- **Lost parts:** Number of parts lost during handling stage.
- **Power too high faults**: Number of vacuum or blow-off commands that have occurred while the supply voltage was greater than 26.4 V.
- **Power too low faults:** Number of vacuum or blow-off commands that have occurred while the supply voltage was lower than 21.6 V.

Screen 3/4:

- **Pressure too high faults:** Number of vacuum or blow-off commands that have occurred while the pressure was greater than 8 bar.
- **Pressure too low faults:** Number of vacuum or blow-off commands that have occurred while the pressure was lower than 5 bar.
- **Vac. and blow-off cmds:** Number of times the vacuum and blow-off commands have been activated simultaneously. To ensure efficient blow-off, vacuum generation must be stopped to set down the part.

Screen 4/4:

- **Blow-off faults:** Number of unloading cycles during which blow-off did not work properly (residual vacuum rate after blow-off).

Main menu	Secondary menu	Display conditions	Factory settings
	**Manual mode**	Permanent	

16.3. Manual Mode

The CMS HDE vacuum pump is equipped with an electronic manual control for the vacuum and blow-off solenoid valves.
Pressing and holding △ once activates the vacuum solenoid valve (green suction cup icon lights up on the main screen), while pressing and holding▽ once activates the blow-off solenoid valve (orange suction cup icon lights up on the main screen).

Wait 10 seconds or press **M** to exit the mode.

Main menu	Secondary menu	Display conditions	Factory settings
	**Calibration**	Permanent	

16.4. Calibration

Vacuum sensor calibration

The calibration procedure may only be performed when the vacuum network is at atmospheric pressure.
Note: Zero point correction is only possible within a +/-5% range around atmospheric pressure.
Follow the instructions in the "Vacuum sensor" menu.

Pressure sensor calibration

The calibration procedure may only be performed when the compressed air supply pressure is null.
Note: Zero point correction is only possible within a +/-5% range around atmospheric pressure.
Follow the instructions in the "Pressure sensor" menu.

Main menu	Secondary menu	Display conditions	Factory settings
	**Reset Settings**	Permanent	

16.5. Reset Settings

Various settings on CMS HDE vacuum pumps can be reset to revert to the "factory settings":

- Process settings
- All settings
- Maintenance status

17. EVENTS AND ALARMS

Whenever necessary, messages are displayed on the main screen during operation to warn about an event, error, or alarm:

EVENTS

Message	Condition for raising	Condition for clearing	Action
K01 Keypad locked, **M** + ▽ to unlock	When you press a button without having unlocked the keypad	This message is cleared automatically after 1 s.	If necessary, unlock the keypad (see sect. 12)
K02 Keypad unlocked	When you press **M** and ▽ simultaneously, when the keypad is locked	This message is cleared automatically after 1 s.	See sect. 12
I01 Manual mode, △ - Vacuum ▽ - Blow-off	Upon confirming the menu Diagnostic/Manual mode	This message is cleared automatically after 10 s or when you change screens.	Pressing and holding △ activates the vacuum solenoid valve Pressing and holding ▽ activates the blow-off solenoid valve

ALARMS

Message	Condition for raising	Condition for clearing	Action
A01 Lost part	Suction command active and vacuum level lower than L1-h1. The LED on the HMI's front panel is red.	Vacuum control is stopped and/or blow-off is activated	Check the various parameter settings, the vacuum pump's supply pressure, as well as the quality of the vacuum network and the suction cup size in relation to the load being handled.
A03 Power supply too high (> 26.4V)	Supply voltage higher than 26.4 V	Supply voltage is set within the recommended voltage range (24V DC +/-10%)	Use a regulated 24V DC power supply +/-10%
A04 Power supply too low (< 21.6V)	Supply voltage is lower than 21.6V	Supply voltage is set within the recommended voltage range (24V DC +/-10%)	Use a regulated 24V DC power supply +/-10%
A05 Input pressure too high (> 8 bar)	Supply pressure is greater than 8 bar	Supply pressure is set within the recommended pressure range	Check the supply pressure on the compressed air network (see sect. 8.1)
A06 Input pressure too low (< 5 bar)	Supply pressure is lower than 5 bar	Supply pressure is set within the recommended pressure range	Check the supply pressure on the compressed air network (see sect. 8.1)

18. IO-LINK PARAMETER SETTINGS

CMSHDE__**VX**__ multi-stage vacuum pumps feature an IO-Link communications interface based on the IEC 61131-9 standard. This protocol is used to establish a point-to-point link between a sensor/actuator and an IO-Link input/output module called "IO-Link master", which is connected to the programmable logic controller.

18.1. IO-Link Communication

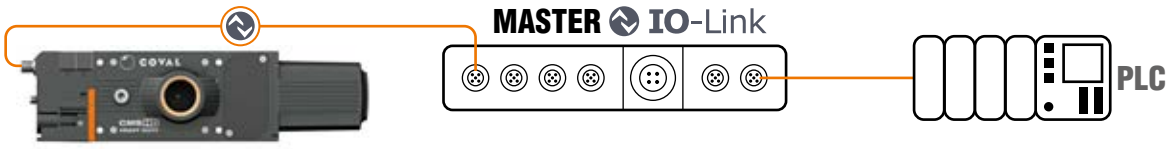
IO-Link

IO-Link revision	1.1
Transmission rate	COM3 - 230.4 kbit/s
Min. cycle time	1 ms

SIO mode	Yes
Process data input (PDI)	6 bytes
Process data output (PDO)	1 byte

Update of IO Device Description (IODD) file: available for download.

18.2. Cyclical Data (PDI/PDO)



Process Data Output -From the IO-Link master to CMS HDE

VACUUM/BLOW-OFF COMMANDS							
PDO1							
-	-	-	-	-	-	BLO	VAC

PDO1
VAC – Vacuum command
BLO – Blow-off command

Process Data Input - From CMS HDE to IO-Link master

VACUUM SWITCH SIGNALS/ALARMS								/							
PDI1								PDI2							
TLV	THV	TLP	THP		LP		PG	-	-	-	-	-	-	-	-

INSTANTANEOUS VACUUM LEVEL															
PDI3								PDI4							
0	0	0	0	0	0	1	1	0	1	0	1	1	1	0	0

INSTANTANEOUS COMPRESSED AIR PRESSURE															
PDI5								PDI6							
0	0	0	1	0	1	0	0	0	1	1	0	1	0	0	1

PDI1
PG – Part/object gripped
LP – Lost part (object lost)
THP – Too high pressure (> 8 bar)
TLP – Too low pressure (< 5 bar)
THV – Too high voltage (> 26.4V)
TLV – Too low voltage (< 21.6V)

Process Data	Parameter	Bit	Length (byte)	R/W	Unit	Comment
PDI1	PG – Part gripped (L1)	0	BOOL	RO		Vacuum level greater than L1 then between L1 and L1-h1
	LP – Lost Part	2	BOOL	RO		Vacuum level lower than L1-h1 during part handling
	THP – Too High Pressure	4	BOOL	RO		Compressed air level greater than 8 bar
	TLP – Too Low Pressure	5	BOOL	RO		Compressed air level lower than 5 bar (dynamic)
	THV – Too High Voltage	6	BOOL	RO		Power supply voltage greater than 26.4V
	TLV – Too Low Voltage	7	BOOL	RO		Power supply voltage lower than 21.6V (dynamic)
PDI2	-	0-7	8xBOOL	RO		Not used
PDI3 / PDI4	Instant vacuum level	0-15	2	RO	mbar	Instantaneous vacuum level (0 to -1013 mbar)
PDI5 / PDI6	Instant pressure level	0-15	2	RO	mbar	Instantaneous compressed air pressure level (0 to 10,000 mbar)
PDO1	VAC – Vacuum command	0	BOOL	RW		0: vacuum OFF
						1: vacuum ON
	BLO – Blow-off command	1	BOOL	RW		0: Blow-off OFF
						1: Blow-off ON
	-	2-7	6xBOOL	RW		Not used

18.3. Acyclical Data

IDENTIFICATION

Index (dec)	Parameter	Length (byte)	R/W	Unit	Value min	Value Typ.	Value max	Comment
7	Vendor ID	2	RO	-		0x04		0x0421 = COVAL SAS
8						0x21		
9	Device ID	3	RO	-		0x00		0x3001 = CMSHDE Series
10						0x30		
11						0x01		
16	Vendor name	9	RO		COVAL SAS			
17	Vendor text	15	RO		Vacuum managers			
18	Product name	32	RO		CMSHDE–X–––––––			Complete part number
19	Product ID	10	RO		CMSHDCxx			Simplified part number
20	Product text	38	RO		Heavy Duty Vacuum Pump			
21	Serial number	8	RO		20420852461000000			
22	Hardware revision	3	RO		1.0			
23	Firmware revision	22	RO		io 03.05_hmi 03.05			

PROCESS SETTINGS

Index (dec)	Parameter	Length (byte)	R/W	Unit	Value min	Value Typ.	Value max	Comment
64	Gripped product threshold L1	2	RW	mbar	10	400	999	Recommandations: h1 ≥ 10 L1 > h1
65	Gripping threshold hysteresis h1	2	RW	mbar	0	100	999	
72	Automatic blow-off	1	RW	-	0	0	1	0: OFF / 1: ON Automatic blowing triggered as soon as vacuum control is disabled.
73	Automatic blow-off duration	2	RW	msec	100	500	9999	
▼ Preset configurations ▼								
74	CONF1-L1	2	RW	mbar	10	400	999	
75	CONF1-h1	2	RW	mbar	0	100	999	
78	CONF2-L1	2	RW	mbar	10	500	999	
79	CONF2-h1	2	RW	mbar	0	0	999	
2	Configuration 1 selection	1	WO	-	162 / 0xA2			Enables the following settings: CONF1-L1/h1
2	Configuration 2 selection	1	WO	-	163 / 0xA3			Enables the following settings: CONF2-L1/h1

DEVICE SETTINGS

Index (dec)	Parameter	Length (byte)	R/W	Unit	Value min	Value Typ.	Value max	Comment
90	I/O switching type	1	RW	-	0	0	1	0: PNP / 1: NPN
91	Switching output 1 (DO1)	1	RW	-	0	0	1	0: NO / 1: NC

DIAGNOSTIC

Index (dec)	Parameter	Length (byte)	R/W	Unit	Value			Comment
					min	Typ.	max	
100	Custom device name	20	RW	-		CMSHDE		Free field, 20 characters max.
101	HMI serial number	20	RO	-		20420852461000000		
▼ Cycle counters ▼								
110	Vacuum commands counter	4	RO	-	0	0	1E+08	
112	Blow-off commands counter	4	RO	-	0	0	1E+08	
113	Grip counter	4	RO	-	0	0	1E+08	
114	Grip faults counter	4	RO	-	0	0	1E+08	
117	Power supply too high faults counter	4	RO	-	0	0	1E+08	
118	Power supply too low faults counter	4	RO	-	0	0	1E+08	
119	Vacuum and blow-off at the same time counter	4	RO	-	0	0	1E+08	
120	Pressure too high faults counter	4	RO	-	0	0	1E+08	
121	Pressure too low faults counter	4	RO	-	0	0	1E+08	
122	Blow-off faults counter	4	RO	-	0	0	1E+08	
▼ Sensors calibration ▼								
2	Vacuum sensor calibration	1	WO	-		160 / 0xA0		
2	Pressure sensor calibration	1	WO	-		161 / 0xA1		
▼ Factory settings ▼								
2	Reset process settings	1	WO	-		166 / 0xA6		
2	Reset all settings	1	WO	-		130 / 0x82		

19. NFC

19.1. Technical Data

The remote HMI (item no.: HMIHD1M38P) includes Near Field Communication (NFC) technology that enables short-range wireless data transfers between two devices.
The remote HMI includes an NFC tag that gives mobile devices read and/or write access to the diagnostic data and pump settings, provided they feature this technology and have the COVAL Vacuum Manager mobile app installed (available on App Store and Google Play).

19.2. Using NFC

Proceed as follows for efficient use and optimal connection between devices:

- Locate the NFC antenna on your mobile device
- **When prompted by the app** (initial connection or settings update), place your mobile device as parallel as possible to the front panel of the remote HMI making sure to align the NFC antennas.

CMS HDE data can be read or written regardless of whether the vacuum pump is switched on or off. However, firmware updates require the pump to be switched on.

NFC antenna

19.3. Functionality

The NFC wireless technology integrated in the remote HMI together with the COVAL Vacuum Manager app allow you to access and make changes to all the configuration and diagnostic functions using your mobile devices.

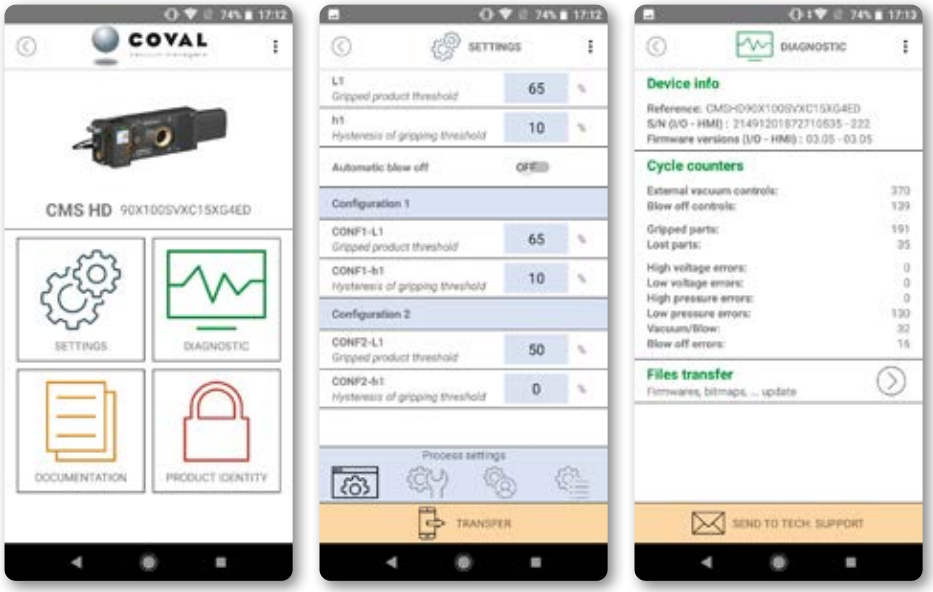
Additional functions:

- Read/write settings with the device powered off or on
- Copy settings from one CMS HD to another
- Save up to 5 setting configurations
- COVAL support: Send a report specifying the settings and diagnostic data to COVAL for technical support.

19.4. Downloading the COVAL VACUUM MANAGER NFC App

Mobile apps available:

- Android, version 8.1 and higher.
- iOS, version 13 and higher.



NFC APP:
COVAL VACUUM MANAGER

iOS Version — Download on the App Store

Android Version — GET IT ON Google Play

or → ***https://doc.coval.com/***

20. CHARACTERISTICS

General Characteristics
- Temperature: from 0 to 50°C (32 to 122° F).
- Material of the gripper: aluminum, PA 6.6 15% GF, brass, stainless steel, neoprene.
- Foam gripping interface material: EPDM.
- Suction cup gripping interface materials:
  - "mini" type interface: silicone 35 Shore.
  - "medium" type interfaces: natural rubber 50 Shore.
  - "maxi" type interfaces: natural rubber 50 Shore or white silicone 35 Shore.

Multi-stage Vacuum Pumps General Characteristics
- Supply: non-lubricated air, filtered to 5 microns, according to standard ISO 8573-1:2010 [3:4:4]
- Operating pressure: from 2 to 8 bar
- Optimal dynamic pressure:
  - CMSHDE_**NVO** without control: 5.5 bar.
  - CMSHDE_**S**_/ CMSHDE_**V**_ with control: 6 bar.
- Pressure connection: G3/8"-F with removable 350 µm filter screen
- Max. vacuum: 80%
- Air suction flow rate: 700 to 2200 Nl/min
- Air consumption: 220 to 840 Nl/min
- Noise level: – CMSHDE90X**50**__**K**: 59 dBA
  – CMSHDE90X**100**__**K**: 62 dBA
- Degree of protection: IP65
- Max. operating frequency: 4 Hz
- Endurance: 50 million cycles
- Materials: PA GF, brass, aluminum, steel, NBR, PU, FKM
- M12 and M8 male connectors (depending on version)

Integrated electronics
- 24 V DC power supply (regulated ±10%)
- Inputs/outputs protected against reversed wiring and polarity
- Consumption: 170 mA max. (without load)

Only on models CMSHDE___**VX**__:
- Vacuum measuring range: 0 to 99%
- Pressure measuring range: 0 to 10 bar
- Vacuum and pressure measurement accuracy: ±1.5% of the range, compensated for temperature
- Input/Output switching mode: PNP or PNP/NPN configurable
- Digital inputs/outputs mode (SIO) / IO-Link

DO1 output signal
Only on models CMSHDE___**VX**__:
- Configurable as PNP or NPN
- NO or NC
- Breaking capacity: 330 mA
- DO1: object gripped output (factory setting 40%)

Diagnostic
Only on models CMSHDE___**VX**__:
- Instantaneous vacuum level (unit transmitted over IO-Link: mbar)
- Available information: Object gripped, object lost
- Cycle counters (vacuum, blow-off, object gripped, object lost, etc.)
- Supply pressure monitoring
- Supply voltage monitoring
- Product part number and serial number
- Software version

Indicator on models CMSHDE__**VOC15P**__:
- Status LED for control functions:
  - Green LED: vacuum control
  - Orange LED: blow-off control

Information displayed on HMI (VI option)
- LED gripping status indicator on front panel (Green: object gripped, Red: object lost)
- 1.54" high-visibility color LCD display:
  - Displays vacuum level with bar graph and thresholds
  - Warns when service life has been exceeded (> 50 million cycles)
  - Explicit fault messages
  - "Suction cup" icon indicating the status of control functions:
    - Green suction cup: vacuum control
    - Orange suction cup: blow-off control
    - Red suction cup: simultaneous vacuum and blow-off control
  - Configurable display orientation: 0 - 90 - 180 - 270°

Parameter settings available with the HMI or IO-Link
Only on models CMSHDE___**VX**__:
- Choice of blow-off type (only CMSHDE__**SVX**_):
  - Controlled
  - Automatic timed, adjustable from 50 to 9999 ms
- Object gripped (L1) control thresholds
- Whenever required by the application, specific threshold and hysteresis settings that are different from the initial factory settings can be defined: L1 = 40%, h1 = 10%

Additional settings available only with the HMI
(performed with 4-key membrane keyboard):
- Choice of language: EN, FR, DE, IT, or ES
- Choice of vacuum measurement unit (kPa, %, mbar, inHg)
- Choice of pressure measurement unit (MPa, bar, psi)
- Monostable electrical manual controls

Communication
IO-Link
- Revision: 1.1
- Transmission rate: COM3 - 230.4 kbit/s
- Min. cycle time: 1 ms
- SIO mode: Yes
- Process Data Input (PDI): 6 bytes
- Process Data Output (PDO): 1 byte
- IO device description file (IODD) available for download

NFC
- COVAL VACUUM MANAGER mobile app available:
  - Android, version 8.1 and higher
  - iOS, version 13 and higher

21. OPERATING THE VACUUM GRIPPER

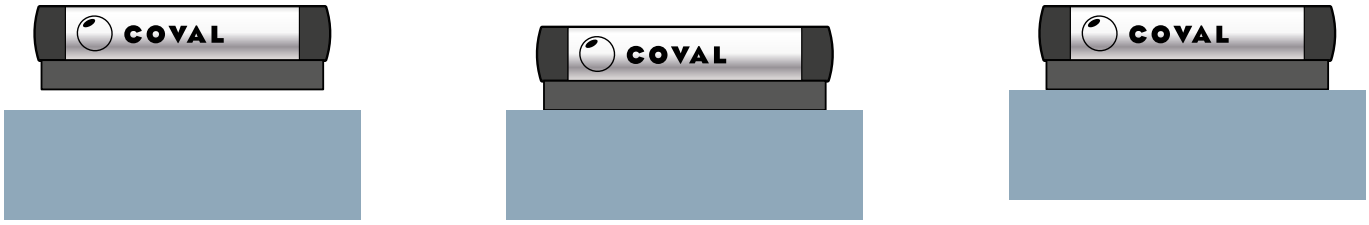
21.1. Version with Foam Gripping Interface

Recommendation:

- Operating temperature: from -40 to 120 °C (from -40 to 248 °F)
- Avoid protruding shapes
- Pay attention to the angle of approach and stroke of robot
- Percentage of foam gripping interface coverage: MVG vacuum grippers are configurable products, custom-made according to the user's needs and specifications. The percentage of coverage of the gripping interface must comply with the user's specifications and COVAL's recommendations during the design of the vacuum gripper.
- Gripper position:
  - Always place the gripper in the center of the load to be handled
  - MVG vacuum grippers are designed to handle loads using a horizontal motion
- We advise against using the MVG for vertical gripping as the foam could deteriorate quickly:
  - In rare cases of vertical use, tests should be performed prior to commercial use
  - COVAL will not be held liable for any premature foam degradation

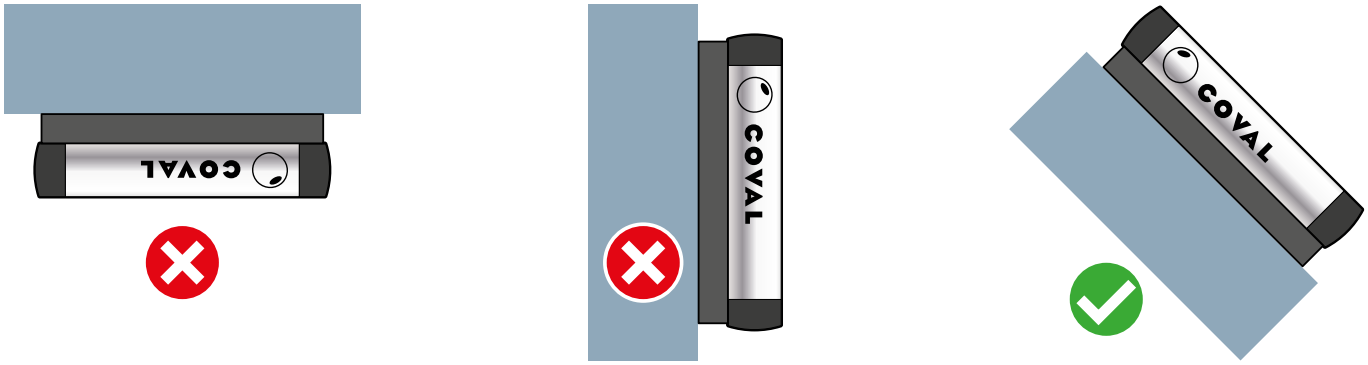
21.1.1. Version with foam and flow control technology using valves
Models MVG_**E** (airtight valves) and MVG_**V** (check valves)

A working cycle of a **MVG** vacuum gripper includes the following steps:



1. Position the vacuum gripper above the object to be handled with the foam gripping interface parallel to the object's surface.
2. Bring the vacuum gripper into contact with the entire surface of the object to be handled and slightly compress the foam.
3. Activate the vacuum.
4. Handle the object.
5. Deposit the object by stopping the vacuum and blowing it off, if necessary.

Note: If you activate the vacuum before the vacuum gripper is in contact with the object, the object will not be suctioned because the check valves will be closed and will not allow gripping.



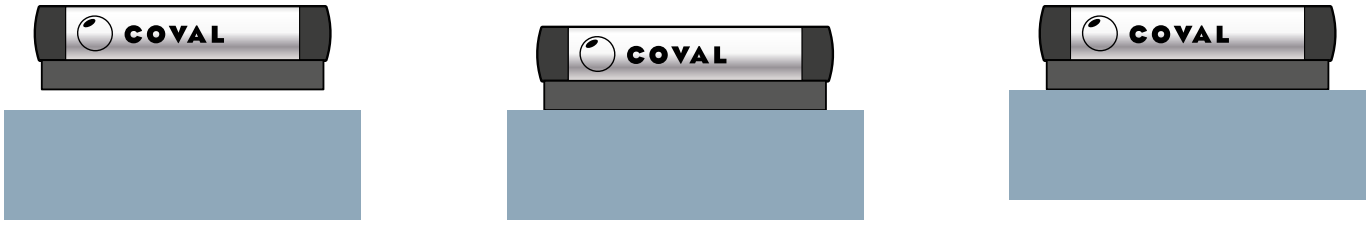
- The **MVG** vacuum gripper with valves is designed for horizontal use:
  - Admissible inclination: 45° max.
  - The use of the vacuum gripper at 180° or 90° is not allowed.
- Standing or walking in the working area of the empty gripper is strictly prohibited. In the event of a power or pneumatic supply failure, the load handled by the gripper will be released.
- The maximum vertical acceleration allowed with flow control technology using valves is 5 m/s^2 (16 ft/s^2).
- Caution: When check valves or airtight valves are used in the vacuum gripper, the vacuum value measured by the vacuum switch cannot be used as a reliable indication of the grip on the object. The vacuum switch indicates the vacuum level inside the gripper, and due to the action of the valves (closing of valves), the vacuum level will be high even when the object is not present.

Note: We recommend always performing preliminary tests with samples of the objects to be handled.

Contact the COVAL team to perform validation tests, if necessary.

21.1.2. Version with foam and flow control technology using flow control nozzle Model MVG_H (low control nozzle)

A working cycle of a **MVG** vacuum gripper includes the following steps:



1. Place the vacuum gripper above the object to be handled with the foam grip interface parallel to the object's surface.
2. Bring the vacuum gripper into contact with the object and slightly compress the foam.
3. Activate the vacuum.
4. Handle the object.
5. Deposit the object by stopping the vacuum and blowing it off, if necessary.

Note: In this case, the vacuum can be activated either before or after contact with the object.

- Standing or walking in the working area of the empty gripper is strictly prohibited. In the event of a power or pneumatic supply failure, the load handled by the gripper will be released.
- With the flow control nozzle, the vacuum level measured by the vacuum switch in the gripper is the actual vacuum present at the object's surface. In this case, the vacuum switch can be used to check the grip on the object.
- Caution: Please note that the vacuum level is influenced by the degree of coverage of the vacuum gripper on the object, as well as the porosity of the object handled.

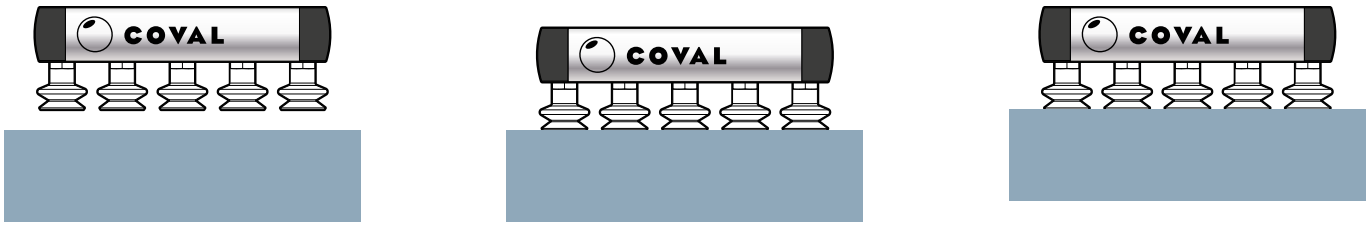
Note: Handling with the vacuum gripper in an upright position may subject the gripping foam to shearing stress. Depending on the load's weight and/or center of gravity, the foam may deteriorate quickly. We recommend always performing preliminary tests on actual samples of the objects to be handled.

Contact the COVAL team to perform validation tests if necessary.

21.2. Version with Suction Cup Gripping Interface

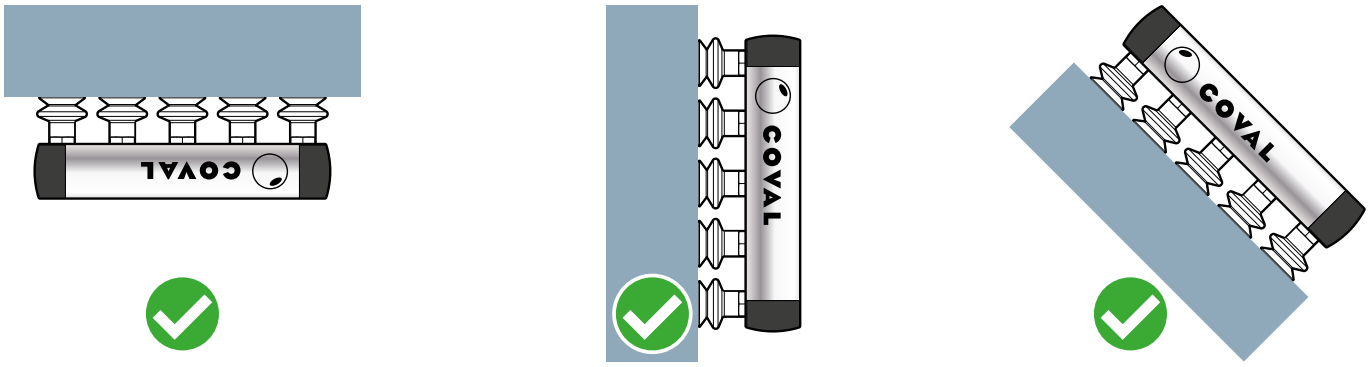
- Operating temperature: dependant on the material of the suction cups used.
- Food compatibility: Dependant on the material of the suction cups used.
- Avoid protruding shapes.
- Pay attention to the approach angle and stroke of the robot.

A working cycle of a **MVG** vacuum gripper includes the following steps:



1. Place the vacuum gripper above the object to be handled with the suction cups gripping interface parallel to the object's surface.
2. Bring the vacuum gripper into contact with the object.
3. Activate the vacuum.
4. Handle the object.
5. Deposit the object by stopping the vacuum and blowing it off, if necessary.

Note: In this case, the vacuum can be activated either before or after contact with the object.



- Standing or walking in the working area of the empty gripper is strictly prohibited. In the event of a power or pneumatic supply failure, the load handled by the gripper will be released.
- With the flow control nozzle, the vacuum level measured by the vacuum switch in the vacuum gripper is the actual vacuum present at the object's surface. In this case, the vacuum switch can be used to check the grip on the object.
- Caution: Please note that the vacuum level is influenced by the degree of coverage of the vacuum gripper on the object, as well as the porosity of the object to be handled.

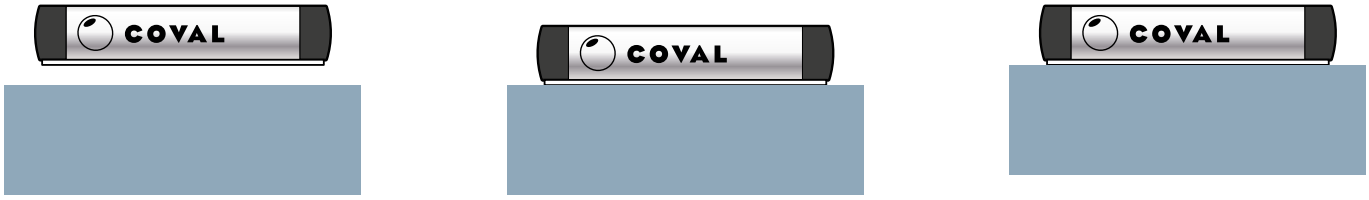
Note: We recommend always performing preliminary tests on actual samples of the objects to be handled.

Contact the COVAL team to perform validation tests if necessary.

21.3. Version with COVAL-flex Gripping Interface

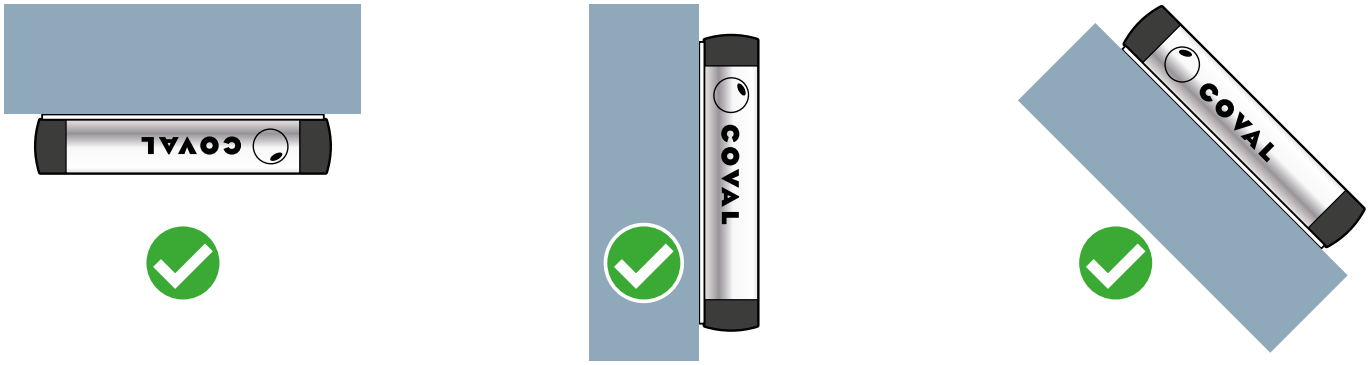
- Operating temperature: from -0 to 120 °C (from -32 to 248 °F)
- Avoid protruding shapes
- Usage: gripping hollow products, such as cans, glass, or jars, that must comply with food safety regulations (CE 1935/2004).
- Caution: low deflection (< 1 mm)
- Pay attention to the angle of attack and stroke of robot.

A working cycle of a **MVG** vacuum gripper includes the following steps:



1. Place the vacuum gripper above the object to be handled with the gripping interface parallel to the object's surface.
2. Bring the vacuum gripper into contact with the object.
3. Activate the vacuum.
4. Handle the object.
5. Deposit the object by stopping the vacuum and blowing it off, if necessary.

Note: In this case, the vacuum can be activated either before or after contact with the object.



- Standing or walking in the working area of the empty gripper is strictly prohibited. In the event of a power or pneumatic supply failure, the load handled by the gripper will be released.
- With the flow control nozzle, the vacuum level measured by the vacuum switch in the vacuum gripper is the actual vacuum present at the object's surface. In this case, the vacuum switch can be used to check the grip on the object.
- Caution: Please note that the vacuum level is influenced by the degree of coverage of the vacuum gripper on the object, as well as the porosity of the object to be handled.

Note: Handling with the gripper in a vertical position may subject the COVAL-flex interface to shearing stress.
Depending on the load's weight and/or center of gravity, the COVAL-flex interface may deteriorate quickly.
We recommend always performing preliminary tests on actual samples of the objects to be handled.

Contact the COVAL team to perform validation tests if necessary.

22. MAINTENANCE

22.1. Frequency

Determination of the maintenance frequency according to the rates, environment, and type of load:

➔ ***To be defined by the user according to gripping efficiency and visible wear of gripping interface.***

Maintenance plan

	Daily	Weekly	Monthly	Every 6 months	Every year
Check the maximum vacuum level		✕			
Check the tightness of parts				✕	
Check the suction cups/foams/COVAL-flex	✕				
Check the electrical connections			✕		
Check the vacuum supply		✕			
Check the general condition					✕
Clean the outside of the gripper				✕	

Troubleshooting

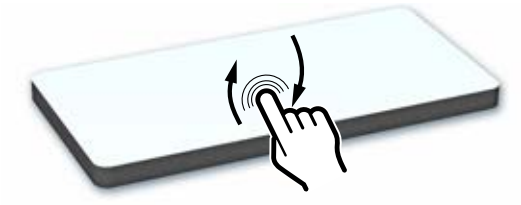
Failure	Possible cause	Remedy
Vacuum level too low or vacuum not reached fast enough	The internal diameter of the air line is too small	Use tubes with a larger internal diameter
	Gasket damaged	Check and replace as required
	Leakage in lines	Check tubes
	The foam or suction cups may be damaged	Replace any damaged suction cup or foam
Object not gripped	Low vacuum level	See above
	Insufficient suction flow rate	Increase the vacuum generator's suction flow rate
	Lifting speed is too fast	Reduce lifting speed, avoid acceleration peaks
	Suction cup inserts are clogged	Clean inserts
	Objects are not suitable for lifting with this system	Replace the gripping solution
Gripping interface wears out very quickly	The vacuum gripper is not correctly placed on the object to be handled	The vacuum gripper must be parallel with the gripping surface
The vacuum pump does not work.	No supply voltage or power supply defective.	Check the electrical connection and the pin assignment on the M12 connector(s)
	No compressed air supply	Check the compressed air supply
The vacuum level is not correct.	A filter is clogged in the facility or network.	Clean or replace the filter screen of the vacuum connection. If the facility includes an additional vacuum filter, clean or replace the filter cartridge.
	Vacuum check valve clogged.	Clean or replace the vacuum check valve.
	Leakage in the vacuum network	Check the fittings and tubes.
The vacuum build-up is too slow.	Suction cup leakage	Check the suction cup.
	Pressure too low	Increase the pressure (refer to technical data).
	Inner diameter of tubes too small	See recommendations for air line diameters.
Cannot hold the payload in place.	Vacuum level too low	Check the L1 threshold
	Suction cup too small or insufficient number of suction cups	Choose a larger suction cup and/or increase the number of suction cups.

22.2. Replacing the Gripping Foam

1. Manually remove the used foam interface.

2. Clean the plate with a chemical degreaser (e.g. acetone) to remove unwanted compounds (adhesive residue, grease, etc.).

3. On the replacement foam, rub the protective film on the adhesive side for a few seconds to activate the cells and promote bonding.



4. Remove the protective film.

5. Adhere foam to plate by aligning the holes.

6. Turn the gripper over and place it on a flat, smooth and clean surface. Press lightly on the gripper for 30 seconds so that the foam is uniformly adhered to the plate.

22.3. Replacing Suction Cups

The suction cups are mounted on barbed fittings. Simply pull the suction cup to remove it.

Tip for mounting the suction cups:
Soak the suction cup neck in lukewarm water to facilitate the mounting on the fitting.

22.4. Disassembling the CMS HDE Series Vacuum Generator

Prior to working on the pump, make sure the compressed air network is depressurized and that the electrical connector(s) has (have) been removed.

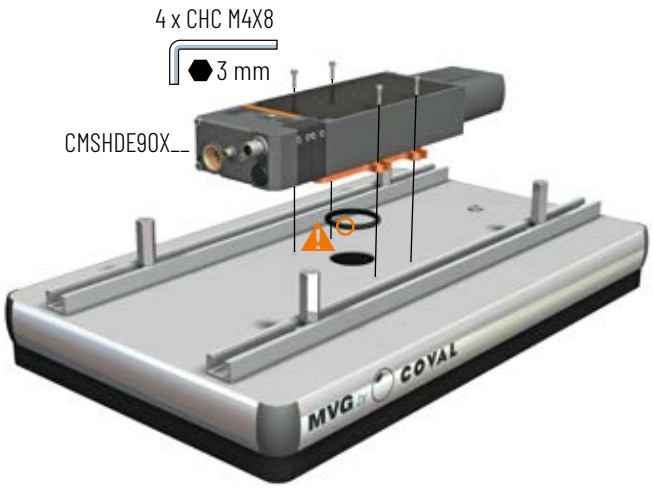
1. Unscrew the 4 CHC M4X8 screws, using a 3 mm hexagon bit socket, to remove the CMS HDE from the vacuum gripper.
⚠ Pay attention to the seal.

2. Replace the CMS HDE (see part number in section 23.3).

3. Make sure to place the seal in the corresponding groove on the CMS HDE mounting plate.

4. Position the CMS HDE by centering the vacuum port of the CMS HDE opposite the vacuum supply port of the vacuum gripper.

5. Tighten the 4 CHC M4X8 screws using a 3 mm hexagon bit socket. Tightening torque: 2.5 N m.

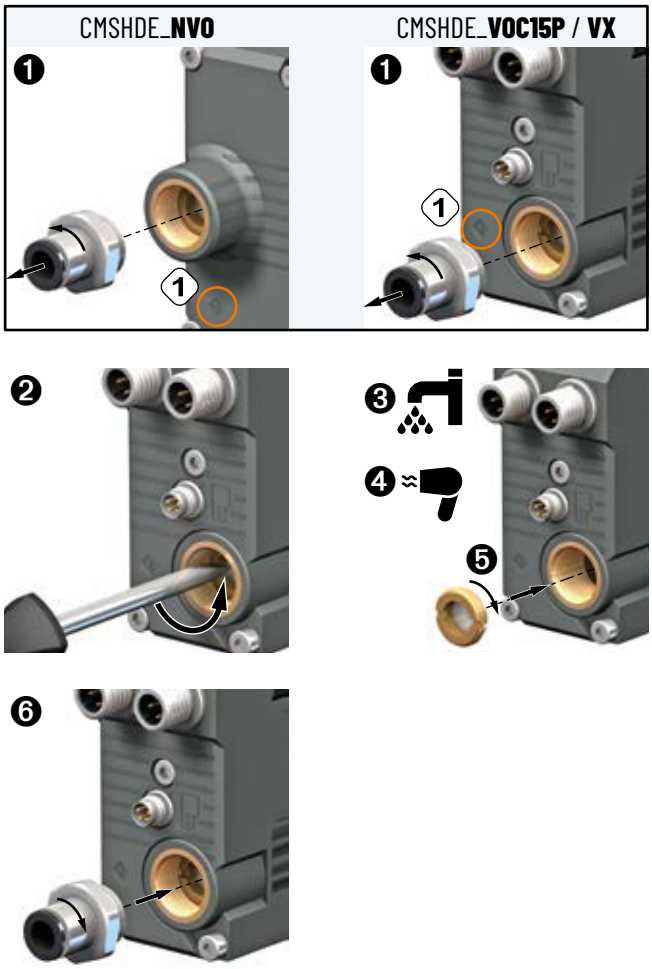


22.5. Maintenance Procedures for a Vacuum Generator, CMS HDE Series

22.5.1. Cleaning the filter screen on the compressed air supply

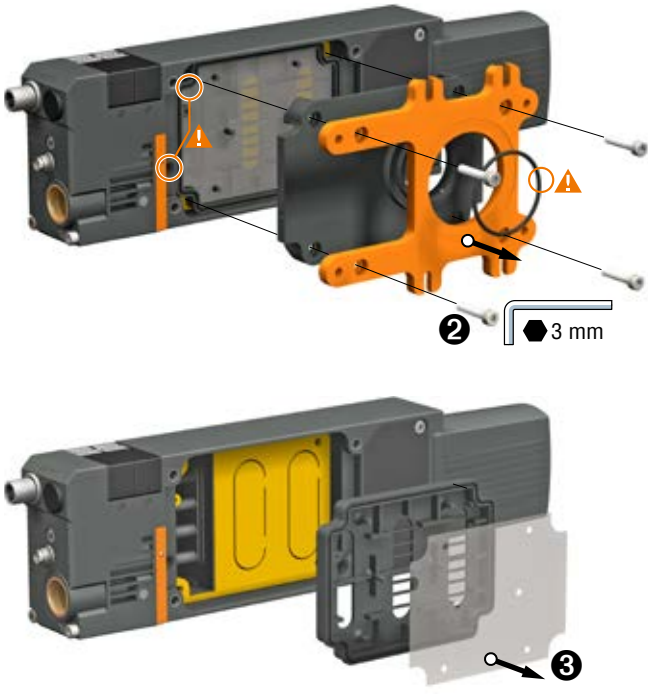
(Marked ① on the pressure connection end plate for pumps without control (CMSHDE_**NVO**), or on the control valve block on pumps with control (CMSHDE_**VOC15P** and **VX**).

- ❶ Loosen the G3/8" fitting to access the filter screen.
- ❷ Use a slotted screwdriver. Turn counterclockwise.
- ❸ Clean the protective grid.
- ❹ Dry the grid.
- ❺ Reassemble the grid by screwing clockwise.
- ❻ Mount the G3/8" fitting back in place.

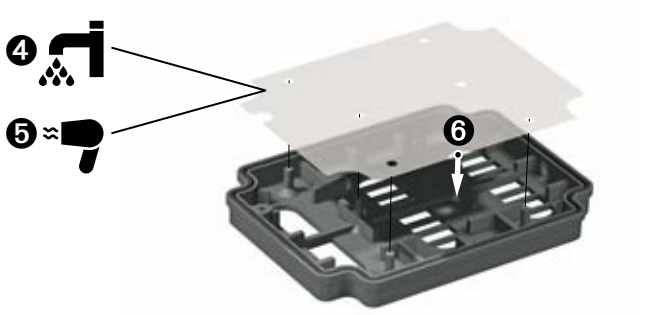


22.5.2. Cleaning the vacuum filter and the vacuum check valve

- ❶ Remove the CMS HDE vacuum generator from the MVG gripper (see section 22.4).
- ❷ Unscrew the 4 M4x20 CHC screws from the end plate, using a 3 mm hexagon bit socket, and then remove the mounting interface and the front end plate.
  ⚠ Caution, the gaskets may be stuck to the end plate. Make sure they are properly placed in their groove.
- ❸ Remove the filter basket and take out the vacuum filter.

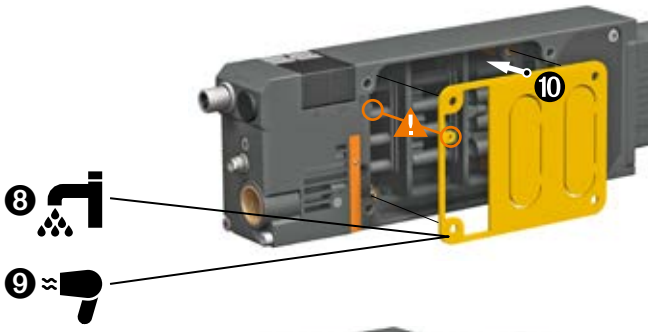


- ❹ Clean the vacuum filter.
- ❺ Dry the vacuum filter.
- ❻ Mount the vacuum filter back onto the filter basket.
  ⚠ Make sure the vacuum filter is not deformed.

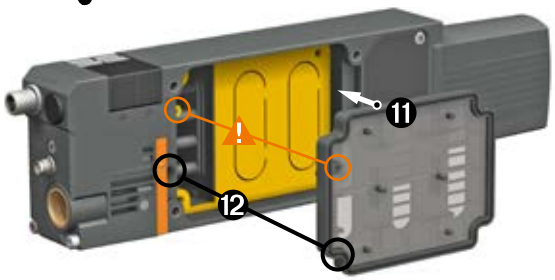


- ❼ Remove the vacuum check valve.

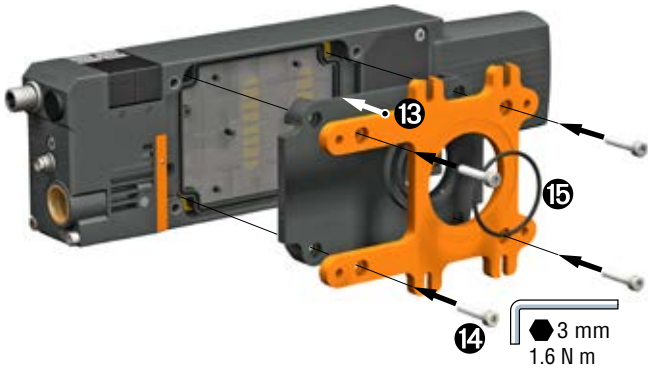
- ❽ Clean the vacuum check valve with water and soap (no solvents).
- ❾ Dry the vacuum check valve.
- ❿ Place the vacuum check valve in its groove.
  ⚠ Observe the mounting direction of the vacuum check valve by placing the check valve's notch opposite the notch on the CMS HDE's body.



- ⓫ Set the filter basket in place.
  ⚠ Observe the mounting direction of the filter basket by placing the basket's notch opposite the notch on the CMS HDE's body.
- ⓬ Make sure that the 2 gaskets are properly placed in their groove.



- ⓭ Place the end plate in its groove and the mounting interface.
- ⓮ Tighten the 4 M4x20 CHC screws using a 3 mm hexagon bit socket (tightening torque 1.6 N m).
- ⓯ Position the gasket in its groove.
- ⓰ Mount the CMS HDE vacuum generator on the MVG (see section 22.4).



NOTE: Replacing the vacuum check valve and the vacuum filter for CMSHDE90X_50/100 : Use the maintenance kit (part no.: 80008817) that contains 1 vacuum check valve, 1 vacuum filter, 2 flat gaskets for exhaust, 1 acoustic foam, and 1 set of o-rings and molded gaskets.

22.5.3. Cleaning the multi-stage venturi profiles

(Marked ↺ on the "multi-stage Venturi profile" assembly).

⚠ If necessary, remove the CMS HDE vacuum generator from the MVG gripper (see section 22.4).

- ❶ Remove the 2 M4x8 CHC screws using a 3 mm hexagon bit socket to remove the exhaust silencer.
  ⚠ Caution: The gasket may be stuck to the end plate or exhaust option.

- ❷ Extract the "multi-stage Venturi profile" assembly from the body by pulling on the hook (marked ↺).

Note: The "multi-stage Venturi profile" assembly may sometimes be difficult to extract manually. Use a screwdriver as a lever on the hook.

- ❸ Clean the "multi-stage Venturi profile" assembly with water and soap (no solvents) or using a blast of compressed air.

- ❹ Dry the "multi-stage venturi profile" assembly.

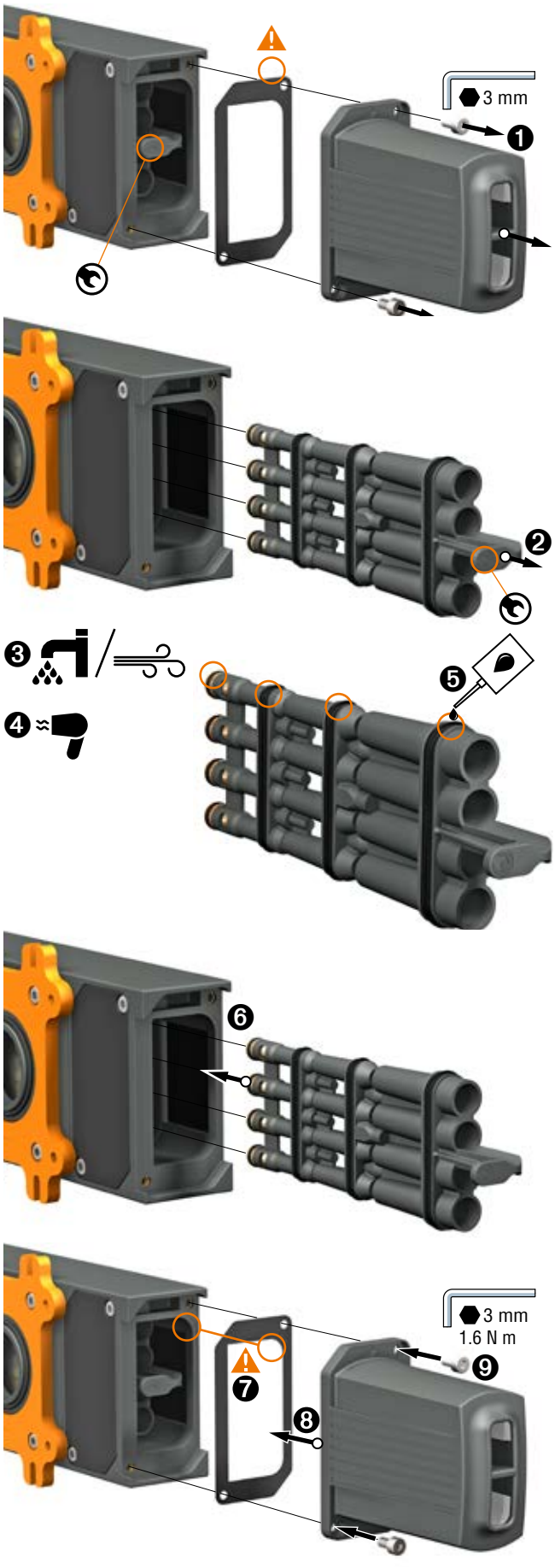
- ❺ Grease the gaskets on both sides using mineral oil.
  ⚠ Make sure the lip seals are properly placed in their groove.

- ❻ Insert the "multi-stage Venturi profile" assembly and push it until it clips in. The clip should not protrude from the body.

- ❼ Set the gasket in place.
  ⚠ Pay attention to the direction of the gasket: the internal cutout of the gasket must match the shape of the body.

- ❽ Set the exhaust silencer in place.

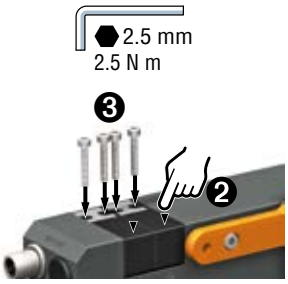
- ❾ Tighten the 2 M4x8 CHC screws using a 3 mm hexagon bit socket (tightening torque 1.6 N m).



22.5.4. Replacing the solenoid valves

⚠ If necessary, remove the CMS HDE vacuum generator from the MVG gripper (see section 22.4).

- ❶ Remove the M3x18 CHC screws that hold in place the solenoid valve(s) to be replaced (use a 2.5 mm allen wrench).
- ❷ Replace the solenoid valve(s) as required (for item numbers, refer to sect. 23.4).
  ⚠ Caution: Make sure to properly place the pins of the solenoid valves in the respective holes by pressing slightly.
- ❸ Tighten the M3x18 CHC screws (tightening torque 1.6 N m).

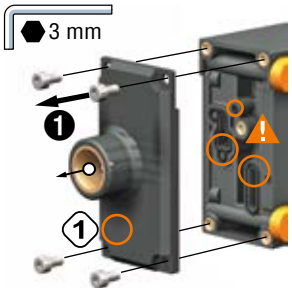


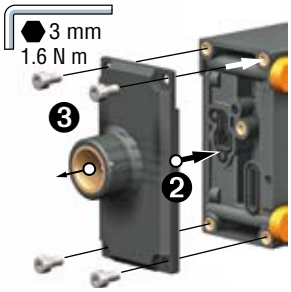
22.5.5. Replacing the pressure connection end plate for CMSHDE90X__NV0

(Mark ① on the end plate).
Spare part numbers: refer to sect. 23.4 (to replace the gaskets, use the maintenance kit matching the CMS HDE model).

⚠ If necessary, remove the CMS HDE vacuum generator from the MVG gripper (see section 22.4).

- ❶ Remove the 4 M4x8 CHC screws using a 3 mm hexagon bit socket to remove the pressure connection end plate.
  ⚠ Caution: Make sure that the 3 gaskets are properly placed in their groove.
- If necessary, replace the 3 gaskets (see Maintenance Kit).
- ❷ Replace the pressure connection end plate and set it in place.
- ❸ Tighten the 4 M4x8 CHC screws using 3 mm hexagon bit socket (tightening torque 1.6 N m).



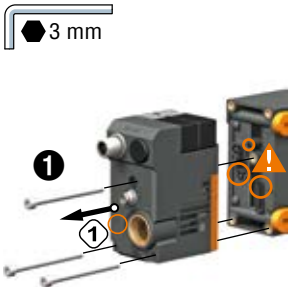


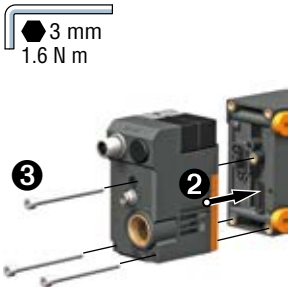
22.5.6. Replacing the valve block for CMSHDE90X__SV0C15P / VV0C15P and CMSHDE90X__SVX_ / VVX_

(Marked ① on the end plate).
Spare part numbers: refer to sect. 23.4 (to replace the gaskets, use the maintenance kit matching the CMS HDE model).

⚠ If necessary, remove the CMS HDE vacuum generator from the MVG gripper (see section 22.4).

- ❶ Remove the 3 M4x55 CHC screws using a 3 mm allen wrench to remove the valve block.
  ⚠ Caution: Make sure that the 3 gaskets are properly placed in their groove.
- If necessary, replace the 3 gaskets (see Maintenance Kit).
- ❷ Replace the valve block and set the new one in place.
- ❸ Tighten the 3 M4x55 CHC screws using 3 mm allen wrench (tightening torque 1.6 N m).





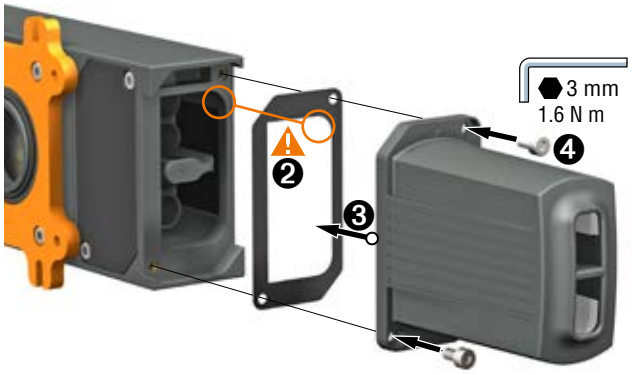
22.5.7. Replacing the exhaust silencer

Spare part numbers: refer to sect. 23.4 (to replace the gaskets, use the maintenance kit matching the CMS HDE model)

⚠ If necessary, remove the CMS HDE vacuum generator from the MVG gripper (see section 22.4).

- ❶ Remove the 2 M4x8 CHC screws using a 3 mm allen wrench to remove the exhaust silencer.
  ⚠ Caution: The gasket may be stuck to the end plate or exhaust silencer.

- ❷ Set the gasket in place.
  ⚠ Pay attention to the direction of the gasket: the internal cutout of the gasket must match the shape of the body.
- ❸ Replace the exhaust silencer and set it in place.
- ❹ Tighten the 2 M4x8 CHC screws using a 3 mm allen wrench (tightening torque 1.6 N m).



22.6. Performing Airtightness Test on Vacuum Gripper

To ensure the proper operation of MVG vacuum grippers following maintenance work, it is important to perform an airtightness test:

1. Place the gripper on a clean, smooth, flat, and waterproof surface.

2. Activate the vacuum.

3. Check the vacuum level on the electronic vacuum switch. It must be at least 80% (-800 mbar) at the vacuum generator's optimal operating pressure.
If the vacuum level is not reached, check the following:
- Quality of tested surface
- Wear of gripping foam and its adhesive
- Size of compressed air line (depending on configuration, see sect. 9.2)
- Quality of compressed air network (connections, tubes, leaks, or damage) and replace any defective components
- Pressure in compressed air network: optimal operating pressure is 6 bar

23. SPARE PARTS

23.1. Spare Foam Gripping Interface

The dimensions of MVG vacuum grippers vary according to model. To order replacement foam, please contact the COVAL team, specifying the complete reference number of the MVG gripper indicated on the nameplate.

23.2. Spare Suction Cups

Part number	*Ø (mm)*	*Material*	*Description*
VSP14SI3	Ø 14	Silicone 35 Shore	Red silicone, 2.5 bellows suction cup Ø14 mm
VSA25NR	Ø 25	Natural rubber	Natural rubber, 1.5 bellows suction cup Ø25 mm
VSA33NR	Ø 33	Natural rubber	Natural rubber, 1.5 bellows suction cup Ø33 mm
MVS302.5SIB	Ø 30	Silicone 35 Shore	White silicone, 2.5 bellows suction cup Ø14 mm

23.3. CMS HDE Series Multi-Stage Vacuum Generators

Generator without control valve: CMSHDE_**NVO**_

Part number
CMSHDE90X50NVOG4K
CMSHDE90X100NVOG4K
2 x CMSHDE90X100NVOG4K

Generator with control valve: CMSHDE_**VOC15P**_

Part number
CMSHDE90X50SVOC15PG4K
CMSHDE90X50VVOC15PG4K
CMSHDE90X100SVOC15PG4K
CMSHDE90X100VVOC15PG4K

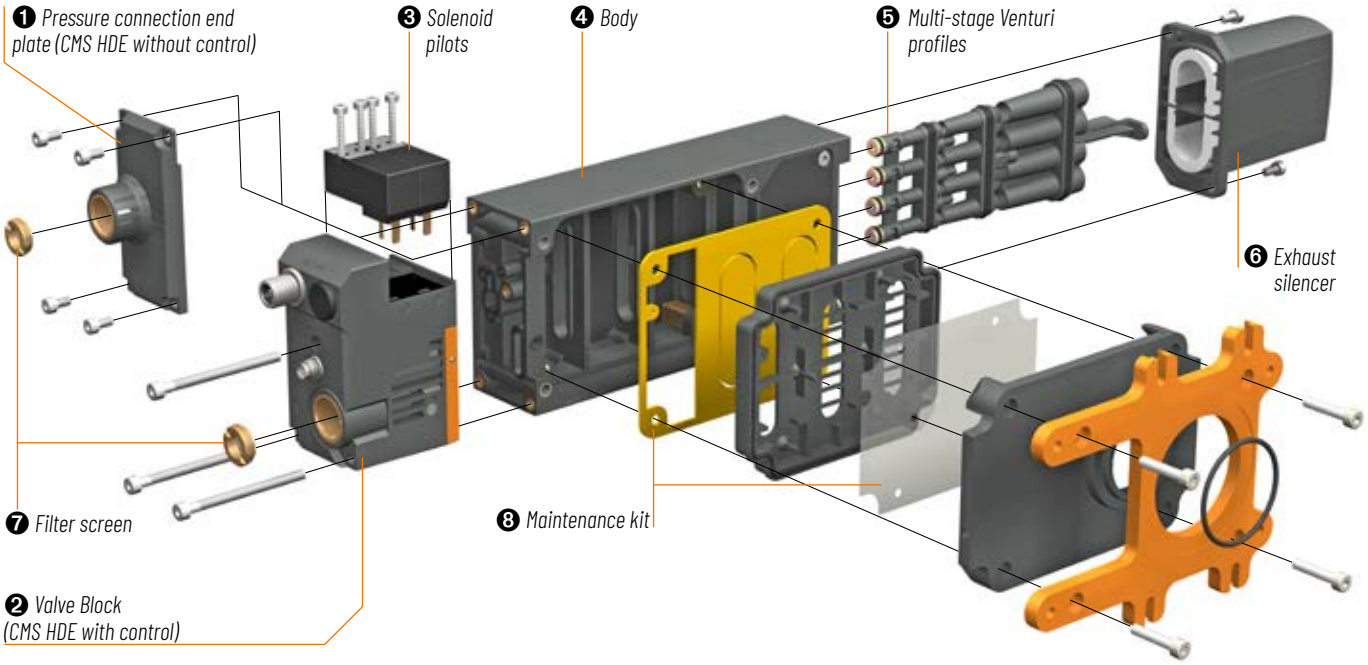
Generator with control valve: CMSHDE_**VXC15X**_

Part number
CMSHDE90X50SVXC15XG4KD
CMSHDE90X50VVXC15XG4KD
CMSHDE90X100SVXC15XG4KD
CMSHDE90X100VVXC15XG4KD

MVG vacuum grippers are configurable products, custom-made according to the user's needs and specifications, and it is possible that the spare parts for your particular configuration are not in this list.

Please refer to the specifications insert on the cover of the simplified manual supplied with the product or contact COVAL with the specific MVG part number for assistance.

23.4. Spare Parts for CMS HDE Series Vacuum Generators



❶ Pressure connection end plate for CMS HDE without control (CMSHDE__**NVO**)

Description	*Item code*
Compressed air connection end plate	**80007381**

❷ Valve block without solenoid valve for CMS HDE with control (CMSHDE__**SVO/NVO** and **SVX/VVX**)

(item code depends on CMS HDE model)

For **SVO/NVO** model

For model	*Description*	*Item code*
CMSHDE90X___VOC15PG4_	One M12 5-pin male	**CMSHDEVBVOC15P**

For **SVX/VVX** models

For models	*Description*	*Item code*
CMSHDE90X50SVXC15XG4KD	One M12 5-pin male / one M8 4-pin for remote HMI	**CMSHDEVB50SVXC15XG4KD**
CMSHDE90X50VVXC15XG4KD	One M12 5-pin male / one M8 4-pin for remote HMI	**CMSHDEVB50VVXC15XG4KD**
CMSHDE90X100SVXC15XG4KD	One M12 5-pin male / one M8 4-pin for remote HMI	**CMSHDEVB100SVXC15XG4KD**
CMSHDE90X100VVXC15XG4KD	One M12 5-pin male / one M8 4-pin for remote HMI	**CMSHDEVB100VVXC15XG4KD**

❸ Solenoid valves for CMS HDE

DETAILS ON SOLENOID VALVE POSITIONS AND FUNCTIONS ACCORDING TO CMS HDE VERSION

Version CMSHDE90X_**S**...

Position	Function
1	NC solenoid valve: vacuum control
2	NC solenoid valve: blow-off control

Version CMSHDE90X_**V**...

Position	Function
1	NO solenoid valve: vacuum control
2	NC solenoid valve: blow-off control

Solenoid valve position

Item code	*Description*	**Position**			
		CMSHDE90X_**S**...		CMSHDE90X_**V**...	
		1	**2**	**1**	**2**
80004627	NC – 3/2 – 24 V – 15 mm solenoid valve – 8 mm center distances	✖	✖		✖
80004628	NO – 3/2 – 24 V – 15 mm solenoid valve – 8 mm center distances			✖	

❹ Body for CMS HDE

For model	*Description*	*Item code*
CMSHDE90X**50/100**_	Simple body	**CMSHDEMBS**

❺ Multi-stage profile assembly for CMS HDE

(item code depends on CMS HDE model)

For model	*Description*	*Item code*
CMSHD90X**50**_	Multi-stage profile assembly: 2 profiles 3 stages	**80006475**
CMSHD90X**100**_	Multi-stage profile assembly: 4 profiles 3 stages	**80006476**

❻ Exhaust option for CMS HDE

Description	*Item code*
Through-type silencer	**80004915**

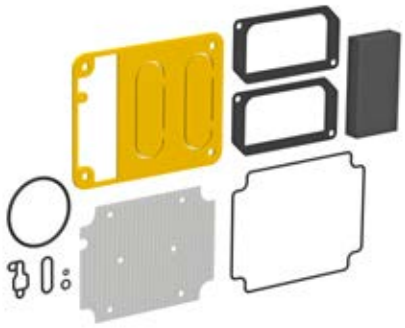
❼ Accessories

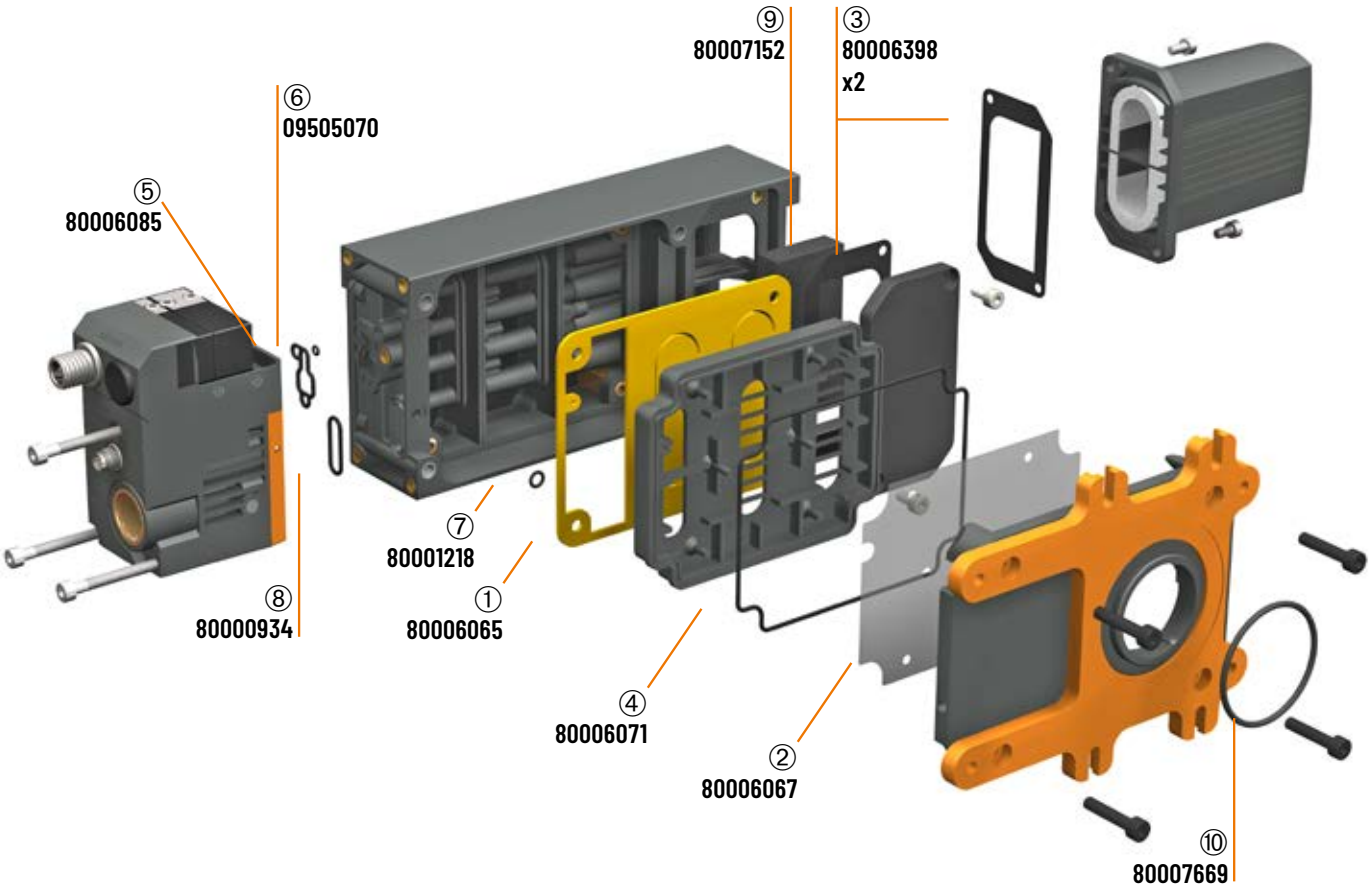
Description	*Item code*
350 µm filter screen – G3/8"	**80005035**

Description	*Item code*
Remote HMI	**HMIHD1M84P**

❽ Maintenance kit

For model	*Description*	*Item code*
CMSHDE90X**50/100**_	Maintenance kit containing: ① vacuum check valve (80006065) x1 ② vacuum filter (80006067) x1 ③ flat gaskets for exhaust (80006398) x2 ④ molded gasket for end plate (80006071) x1 ⑤ molded gasket for vacuum (80006085) x1 ⑥ O-ring 2x1 (09505070) x1 ⑦ O-ring 4x1,5 (80001218) x1 ⑧ O-ring 14x1,5 (80000934) x1 ⑨ acoustic foam (80007152) x1 ⑩ O-ring 37x2 (80007669) x1	**80008817**





23.5. Vacuum Switch and Vacuum Gauge

Part number	*Description*
PSD100CPNP	Vacuum switch for MVG___ **VA**

Part number	*Description*
VAF11140	Vacuum gauge for MVG___ **VF**

23.6. Accessories

Part number	*Description*
80004297	M8 spacers

24. GLOSSARY

- **HMI**: Human-machine interface
- **I/O**: Input / Output
- **SIO**: Standard input/output
- **DO**: Digital Output
- **SDCI**: Single-drop digital communication interface, commonly known as IO-Link
- **C/Q**: Connection for communication or switching signal
- **IODD**: IO device description, a file that provides all the properties required to establish the communication and the parameters to establish the desired function of a sensor or actuator
- **Acyclical data**: Data transmitted from the controller only following a request (e.g. settings data, diagnostic data)
- **Cyclical data**: Data automatically transmitted by the controller at regular intervals (processing data, changes to values)
- **COMx**: IO-Link communication transmission rate (COM1: 4.8 kbit/s, COM2: 38.4 kbit/s, COM3: 230.4 kbit/s)

25. WARRANTY

We provide a warranty for this product and for any COVAL spare parts in accordance with our general terms of sale (GTS).
The exclusive use of COVAL spare parts is a condition required to ensure the product's flawless operation and we will not be held liable for any damage resulting from the use of spare parts or accessories that are not made by COVAL.
Wearing parts are excluded from the warranty.

26. RECYCLING

Waste from electrical and electronic equipment (WEEE) is a category of waste consisting of equipment at the end of its life cycle that uses electricity or electromagnetic fields to operate and designed to be used at a voltage that does not exceed 1000 volts for alternating current and 1500 volts for direct current.
MVG vacuum grippers with solenoid pilots and vacuum switch are products that fall under this category of waste.

Waste from electrical and electronic equipment (WEEE) requires separately collection and recycling according to the European directive 2012/19/EU and to French legislation: decree no. 2014-928 from 19 August 2014.

COVAL is a member of ECOSYSTEM for the collection, decontamination and recycling of professional WEEE.
If you own any COVAL WEEE products, contact ECOSYSTEM who will collect and treat the products (Collection only applies to France):
https://www.ecosystem.eco/

27. EC DECLARATION

COVAL, the manufacturer, confirms that the product "MVG vacuum gripper" described in this manual meets the following applicable EC directives:

- **2006/42/EC**, Machinery Directive, 17/05/2006.
- **2011/65/EU**, Restriction of the use of hazardous substances in electrical and electronic equipment (ROHS 2), 08/06/2011.

The following harmonized standards have been applied:

- **NF EN 12100:2010**, Safety of machinery - General principles for design - Risk assessment and risk reduction, 12/2010.

COVAL
vacuum managers

A TECHNOLOGICAL PARTNER ON A GLOBAL SCALE

Located in the southeast region of France, COVAL conceives, manufactures and globally distributes high performance, advanced vacuum automation components and systems for industrial applications in all branches.

COVAL is an ISO 9001: V2015 certified company which offers innovative solutions integrating reliable and optimized components with intelligent functionalities. The focus is to provide the most personalized and economic solution to a given application while assuring a significant improvement in the productivity and the safety for the vacuum users around the world.

COVAL has an ambition for technical excellence and innovation. As a specialist in vacuum automation, COVAL is reputed for offering reliable, personalized, cost effective and productive solutions.

The references of COVAL can be found in several industrial sectors (Packaging, Automotive Industry, Plastic, Graphic, Aeronautic...) where vacuum handling is important for high efficiency and productivity.

COVAL markets its products and services all over Europe, in the United States and South America through its subsidiaries and authorized distribution network. COVAL strives to provide customer driven solutions and gives the best possible treatment to satisfy all its clients.

For all enquiries from Australia, Africa and Asia kindly contact COVAL head office in France.

COVAL S.A.S.
(Head Office)
E-mail: coval@coval.com
Phone: +33 (0)4 75 59 91 91
www.coval.com

COVAL INC.
E-mail: contact-us@coval.com
Phone: +1 (919) 233 4855
www.coval-inc.com

COVAL IBERICA
E-mail: contacto@coval.com
Phone: (+34) 930 185 441
www.coval-iberica.com

COVAL GERMANY
E-mail: kontakt@coval.com
Phone: +49 (0)7121 7999-250
www.coval-germany.com

COVAL ITALIA
E-mail: contatto@coval.com
Phone: +39 011 958 8660
www.coval-italia.com

COVAL CHINA
E-mail: sales@coval.net.cn
Phone: +86 21 64295600
www.coval.net.cn

ADVANCED VACUUM SOLUTIONS