CMS HD HEAVY DUTY

Multi-stage Vacuum Pumps

COVAL vacuum managers

EN

OPERATING INSTRUCTIONS

This manual is intended for users of the **CMS HD** series Heavy Duty multi-stage vacuum pumps.
They include information on how to integrate vacuum pumps, as well as on their 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.

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NFC

IO-Link

**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/CMSHD

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

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

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

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

SUMMARY

1. IMPORTANT INFORMATION

This document contains important instructions and information regarding the product's various operational phases:
- Transport, storage, commissioning and decommissioning
- Use and maintenance

The operating instructions correspond to the product actually delivered.

This document is part of the product and the following information must be observed:
- Please carefully read this document and observe the instructions to ensure safe installation, optimal operation of the product, and to avoid any malfunction
- Please keep the document within reach of the product so that the staff can easily access it.

Important:
- 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.

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- E-mail: coval@coval.com
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2. INSTRUCTIONS FOR USE AND SAFETY

2.1. ASSEMBLY/DISASSEMBLY

Only qualified personnel is authorized to use the components. Such personnel must be trained in the following areas:
- Applicable safety rules and requirements for using components and installing them in devices, machines, and machine lines.
- Appropriate handling of components and their respective products.
- Proper use with the operating materials.
- The latest applicable EC directives, legislations, decrees and standards, as well as the current technical standards.

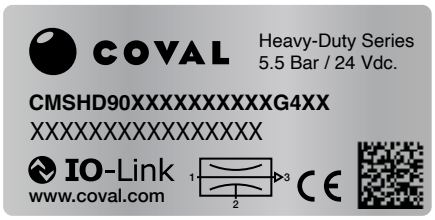
The improper use of components with other operating materials than those defined, other voltages, or under other environmental conditions can lead to failure, damage, and injury.
This list is considered an overview and does not claim to be exhaustive. Users can complement it according to their particular needs.

2.2. SAFETY INSTRUCTIONS

In order to ensure flawless installation and operation, the following rules must also be observed:
- The components must be carefully removed from their packaging.
- The components must be protected against any and all damage.
- During installation and maintenance work, remove the voltage and pressure from the Venturi pump and ensure that unauthorized personnel cannot restart it.
- Any attempt to alter the components is strictly prohibited.
- The area surrounding the components and the location where used must be kept clean.
- Standing under the payload being handled by the vacuum pump and in its pathway is strictly prohibited.
- Only the fittings/connectors provided may be used.
- During installation, only use flexible tubes and tubes that are suitable for the specific operating material (tubes that come loose or electrical connection lines constitute a major safety hazard—including risk of death!).
- Conductive and live cables lines must be insulated, of appropriate size, and properly installed.
- Pneumatic and electric lines must be connected to the component in a stable and safe manner.
- Prevent any physical contact with electric parts (protect electrical contacts).
- Only use the available fastening means described in section 6.5.
- Always observe the latest applicable directives, regulations, and standards as well as the current technical standards for suggested use.
- Wherever necessary, users must take specific measures to meet the requirements of applicable directives, legislations, regulations, and standards as well as the current technical standards.

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 (refer to section 26)!

2.3. NAMEPLATE



The nameplate is affixed to the left side of the vacuum pump and under the silencer so that it is legible at all times.
It includes the following information:

- Product part number
- Serial number
- Optimal operating pressure
- Supply voltage
- Pneumatic symbol with the location of the various ports found on the product:
  - 1/ Pneumatic supply
  - 2/ Vacuum outlet
  - 3/ Venturi exhaust
- Datamatrix code containing the part number and serial number of the vacuum pump.

3. MAIN FUNCTIONS OF CMS HD VACUUM PUMPS

COVAL's **CMS HD** series of multi-stage heavy duty vacuum pumps for industry specific applications are the result of many years of listening to feedback from manufacturers, integrators, and users in the food, packaging, and robotics industries.
The**CMS HD** multi-stage vacuum pumps meet customer expectations in terms of power, robustness, ease of configuration and use, communication, and modularity. The series achieves this while remaining compact and light for simplified integration in a smart factory.

CMS HD vacuum pumps have the following characteristics:

- Vacuum generated by a Venturi effect (maximum negative pressure: -80 kPa, i.e. 80% vacuum)
- With or without vacuum and blow-off control
- Vacuum control: NC or NO
- Blow-off: Standard or powerful, controlled or automatic timed
- With or without vacuum switch
- Digital inputs/outputs mode (SIO) / IO-Link

Remote HMI option features the following:

- High-visibility color display with clear multi-lingual messages and straightforward settings menu
- Easy setup made possible by NFC technology and COVAL Vacuum Manager mobile app

PRESCRIBED USE

CMS HD vacuum pumps are designed to generate vacuum for gripping and handling parts using suction cups.
Authorized gases: only non-hazardous gases such as air and nitrogen.

Once the device is installed, make sure that the device remains clear of any moving parts.

CMS HD vacuum pumps are not suitable for the following purposes:

- **Transporting liquids or granules**
- **Filling compressed air tanks, driving pressure elements (valves, cylinders, etc.)**
- **Vacuuming dangerous materials**
- **Vacuuming any aggressive gases or products**
- **Handling people or animals**
- **Usage in environments subject to explosion hazard**
- **Usage in medical applications**

COVAL is not liable for any damage resulting from improper use of the vacuum pump.

4. OVERVIEW OF CONFIGURATIONS

CMS HD WITHOUT CONTROL

CMSHD90X	100	N	V0	G4	K

SUCTION FLOW RATE	
700 Nl/min *(24.72 SCFM)*	50
1100 Nl/min *(38.85 SCFM)*	100
1600 Nl/min *(56.50 SCFM)*	150

EXHAUST	
K	Through-type silencer
E	Exhaust collector
F	Diffuser

Sample part number consisting of a multi-stage vacuum pump without control:

CMSHD90X100NV0G4K

Multi-stage vacuum pump without control, max. vacuum 80%, suction flow rate 960 Nl/min with through-type silencer

CMS HD WITH CONTROL

CMSHD90X	100	S	VX	C15X	G4	K	D

SUCTION FLOW RATE	
700 Nl/min *(24.72 SCFM)*	50
1100 Nl/min *(38.85 SCFM)*	100
1600 Nl/min *(56.50 SCFM)*	150

GENERATOR CONTROL	
Vacuum pump with **NC** vacuum control and **NC** blow-off control. Choice of blow-off settings (only on CMSHD__**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		CONNECTORS	
Multi-stage vacuum pump without vacuum switch and HMI	V0	C15P	▪ One M12 5-pin male PNP
▪ Simplified CMS HD 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			 IO-Link
		C18X	▪ One M12 8-pin male configurable as PNP or NPN ▪ One M8 4-pin male for remote HMI ▪ Digital Output DO2 configurable 24 V DC / NO
			 IO-Link
		C24X	▪ Two M12 4-pin male configurable as PNP or NPN ▪ One M8 4-pin male for remote HMI ▪ Digital Output DO2 configurable 24 V DC / NO
			 IO-Link

EXHAUST*	
K	Through-type silencer
E	Exhaust collector
F	Diffuser

** Exhaust accessories are delivered mounted in line by default.*

PRESSURE SENSOR	
None on **V0** versions	–
Standard on **VX** versions	D

Sample part number consisting of a multi-stage vacuum pump with control:

CMSHD90X100SVXC15XG4FD

Multi-stage vacuum pump with control, max. vacuum 80%, suction flow rate 1100 Nl/min (38.85 SCFM), NC vacuum and blow-off control, one M12 5-pin connector and one M8 4-pin connector, with diffuser.

5. LAYOUT

5.1. CMS HD "TAILOR-MADE" SOLUTION

Different configurations available for the exhaust:

CMSHD____K
Silencer

CMSHD__NVO_
Pressure connection end plate

CMSHD90X50_ / CMSHD90X100_
Simple body

CMSHD__SVO / VVO_
Control valve block for vacuum and blow-off without vacuum switch

CMSHD____F Diffuser

CMSHD____E Collector exhaust

CMSHD90X150_
Double body

Note: Exhaust options are delivered mounted in line. They can be mounted by the user at 90° on the front panel of the CMS HD.

CMSHD_SVX / VVX_
Control valve block for vacuum and blow-off with vacuum switch, pressure sensor, compatible with remote HMI

Remote HMI
Part No.: **HMIHD1M84P**

5.2. LAYOUT OF A CMS HD WITH CONTROL + REMOTE HMI ACCESSORY

Digital inputs/outputs
(SIO) / IO-Link
M12 connectors available in 3 versions:
- one 5 or 8-pin connector
- or two 4-pin connectors

- NC, NO vacuum control
- Blow-off controlled or automatic timed

Onboard installation and diagnostic tools:
- Vacuum network sizing support and clogging detection
- Supply pressure and voltage monitoring

M8 connector
for remote HMI

Vacuum generation with
multi-stage Venturi pump:
- high suction rates
- silent operation

Accessory: remote HMI
Part No.: HMIHD1M84P

Gripping status indicator light (2 colors)

1.54" high-visibility color LCD display
with clear multilingual messages and
straightforward settings menu

Settings keypad

Clear and efficient HMI:
includes all required inputs for full
operation of CMS HD multi-stage vacuum pumps.

NFC

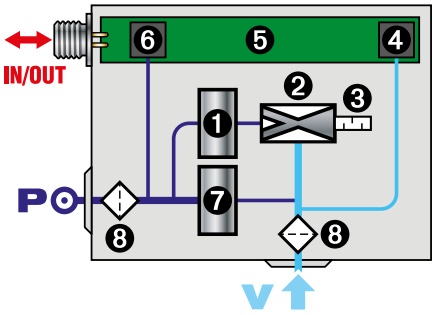
Straightforward setup and diagnostics
made possible by NFC technology
and COVAL Vacuum Manager mobile
application.

6. TECHNICAL DATA

6.1. INTEGRATED FUNCTIONS

CMS HD multi-stage vacuum pumps with control include all the "vacuum" functions required for an easy, efficient, and economical use of compressed air and suitable for any application:

❶ "Vacuum" solenoid valve
❷ Multi-stage Venturi pump
❸ Through-type silencer
❹ Electronic vacuum switch
❺ Integrated electronics
❻ Pressure sensor
❼ "Blow-off" solenoid valve
❽ Removable filter screens

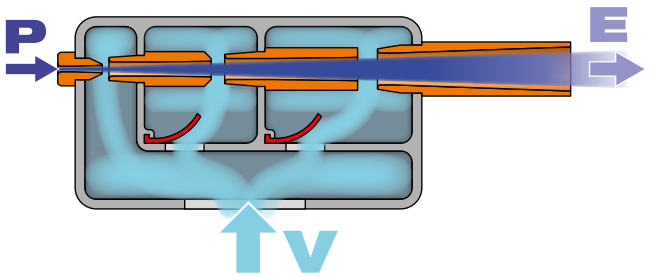


6.2. PRIMARY FUNCTIONS OF MULTI-STAGE TECHNOLOGY

Multi-stage technology consists of maximizing the energy input of the compressed air by cascading several stages of Venturi profiles and by combining their respective flows.

Intermediate valves allow the progressive isolation of each stage to obtain a maximum vacuum level.

This technology makes it possible to generate a high suction flow rate at a low vacuum level.

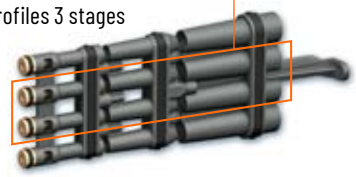


6.3. PERFORMANCE CHARACTERISTICS

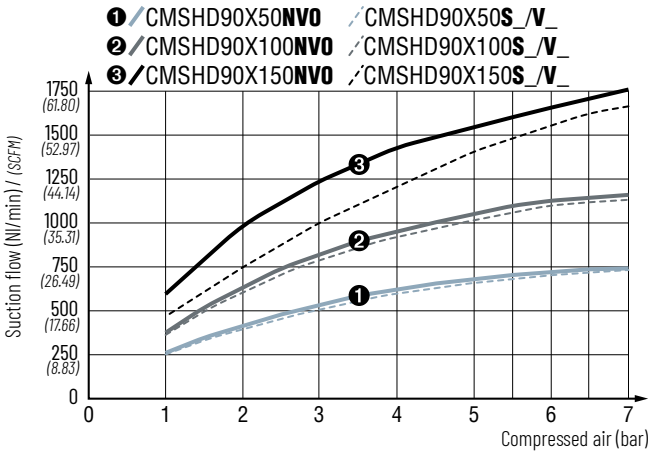
Models	Max. vacuum (%)	Air drawn in (Nl/min) (SCFM)	Air consumed (Nl/min) (SCFM)	Air pressure level* (bar)
CMSHD90X50	80	**700** (24.72)	**220** (7.77)	5.5
CMSHD90X100	80	**1100** (38.85)	**420** (14.83)	5.5
CMSHD90X150	80	**1600** (45.91)	**620** (21.90)	5.5

** 6 bar for versions with control:*
*CMSHD90X**50S**_/ CMSHD90X**50V**_/ CMSHD90X**100S**_/ CMSHD90X**100V**_*
** 6.5 bar for versions with control:*
*CMSHD90X**150S**_/ CMSHD90X**150V**_*

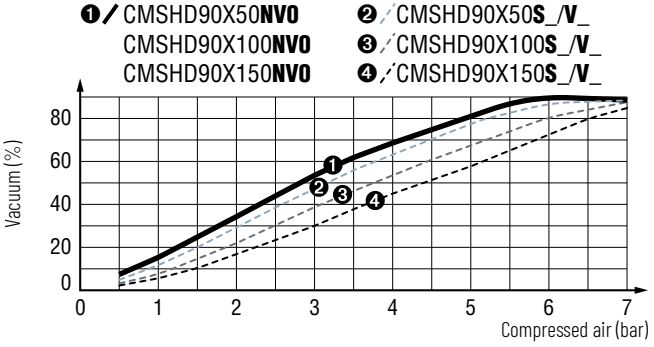
- CMSHD90X**50**__: 2 profiles 3 stages
- CMSHD90X**100**__: 4 profiles 3 stages
- CMSHD90X**150**__: 6 profiles 3 stages



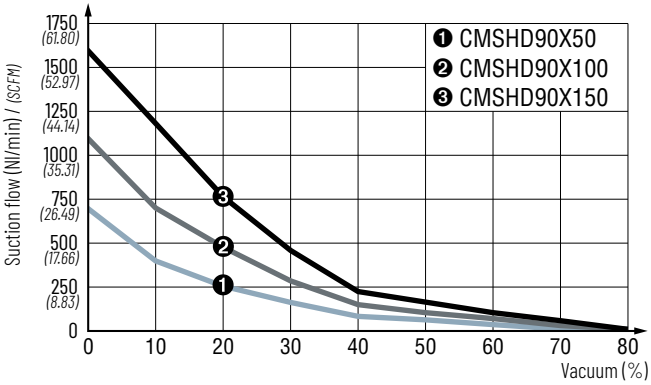
Suction flow / Compressed air



Vacuum / Compressed air



Suction Flow / Vacuum



The values represent the average characteristics of our products.

6.4. 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:
  - CMSHD_NV0 (without control): 5.5 bar
  - CMSHD90X50S/50V/100S/100V_ (with control) : 6 bar
  - CMSHD90X150S/150V_ (with control) : 6,5 bar
- Pressure connection: G3/8"-F with removable 350 µm filter screen
- Vacuum connection: G1"-F with removable 100 µm filter screen
- Connection for version with exhaust collector: G1"-F
- Vacuum switch connection G1/8"-F
- Max. vacuum: 80%
- Air suction flow rate: 700 to 1600 Nl/min (24.72 to 56.50 SCFM)
- Air consumption: 220 to 620 Nl/min (7.77 to 21.90 SCFM)
- Noise level:
  - with silencer:
    - CMSHD90X50__K: 59 dBA
    - CMSHD90X**100**__**K**: 62 dBA
    - CMSHD90X**150**__**K**: 67 dBA
  - with diffuser (CMSHD__F version): + 10 dBA to the silencer version
- Degree of protection: IP65
- Max. operating frequency: 4 Hz
- Endurance: 50 million cycles
- Weight:
  - CMSHD without control:
    - CMSHD__50/100: 645 g
    - CMSHD__**150**: 1330 g
  - CMSHD with control:
    - CMSHD__50/100: 890 g
    - CMSHD__**150**: 1575 g
- Operating temperature: from 0 to 50° C (32 to 122° F)
- 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%)
- 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
- Inputs/outputs protected against reversed wiring and polarity
- Consumption: 170 mA max. (without load)
- Input/Output switching mode: PNP or PNP/NPN configurable
- Digital inputs/outputs mode (SIO) / IO-Link

DO1/DO2 output signals (only on CMSHD___**VX**__ models)

- Configurable as PNP or NPN
- NO or NC
- Breaking capacity: 330 mA
- DO1: object gripped output (factory setting 40%)
- DO2 configurable (see parameter settings)

Diagnostics

- 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.)
- Vacuum network sizing support to prevent head losses
- Clogging detection function
- Supply pressure monitoring
- Supply voltage monitoring
- Product part number and serial number
- Software version

Indicator on model CMSHD__**V0C15P**___

- Status LED for control functions:
  - green LED: vacuum control
  - orange LED: blow-off control

Information displayed on remote HMI

- 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 remote HMI or IO-Link (only on CMSHD___**VX**__ models)

- Choice of blow-off type:
  - 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%
- DO2 configurable (24 V DC) (only on CMSHD___**VXC24X**_ and **VXC18X**_ models):
  - Object lost (default)
  - or Power supply fault (below 21.6 V or above 26.4 V)
  - or Pressure fault (below 5 bar or above 8 bar)

+ Additional settings available with the remote 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

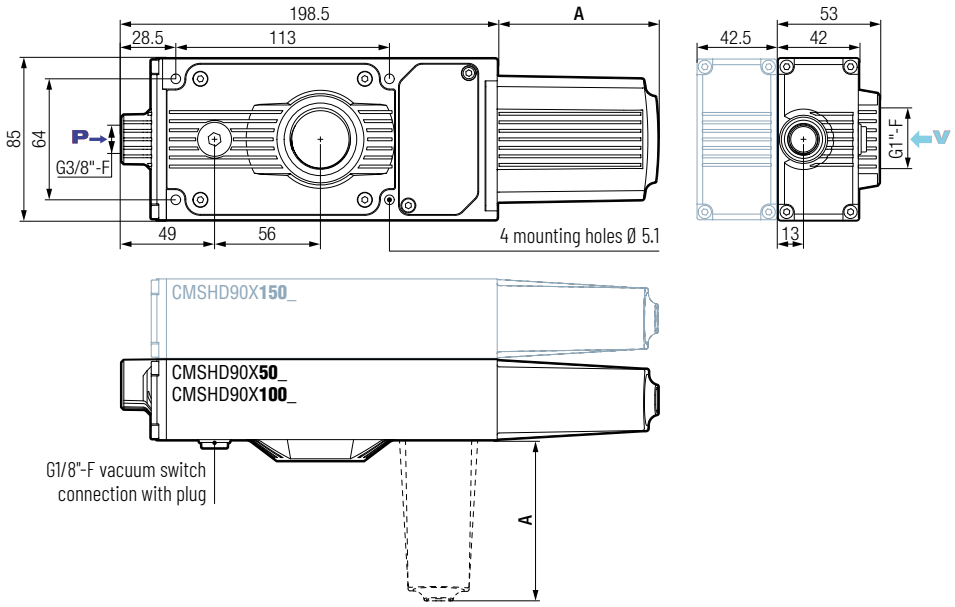
- Revision: 1.1
- Transmission rate: COM3 - 230.4 kbit/s
- Min. cycle time: 1 ms
- SIO mode: Yes
- Process Data Input (PDI): 6 bytes
- Process Data Output (PDO): 1 byte
- IO device description file (IODD) available for download

NFC

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

6.5. DIMENSIONS AND INSTALLATION

CMS HD WITHOUT CONTROL

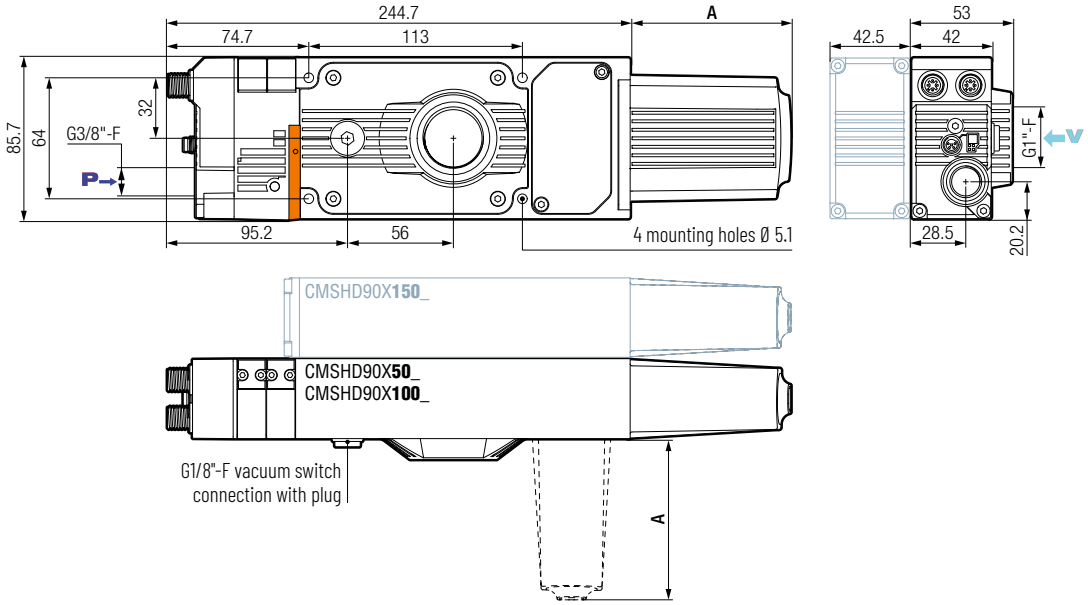


Note: all dimensions are in mm.

3D COVAL Data

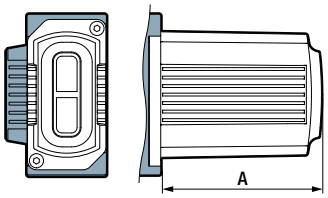
You can access 3D files of all our products in formats compatible with the main CAD software on our website www.coval.com

CMS HD WITH CONTROL

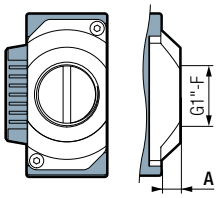


EXHAUST OPTIONS

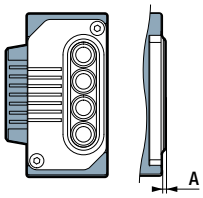
Through-type silencer
Version CMSHD___**K**



Exhaust collector
Version CMSHD___**E**



Diffuser
Version CMSHD___**F**



Exhaust Type	A
Silencer	85
Collector	10
Diffuser	2

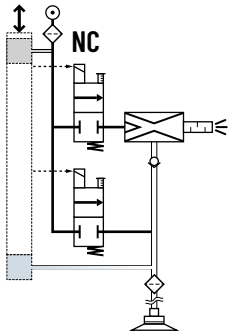
7. FINDING YOUR MODULE

In order to meet all your needs, the CMS HD range includes vacuum pumps with NC or NO solenoid valve vacuum control. For efficient use of your vacuum pump with this operating manual, please identify your model by its part number.

Model CMSHD__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.

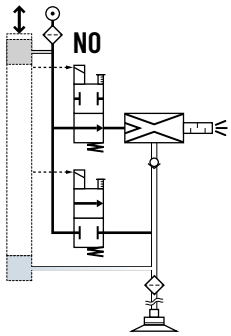
- NC blow-off and vacuum control: solenoid valves
- Choice of blow-off settings (only on CMSHD___**SVX**_ models):
  - Controlled by external signal
  - Automatic timer from 50 to 9999 ms (advantage: saves one controller output)



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

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

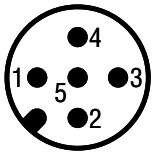
- NO vacuum solenoid valve
- NC blow-off control solenoid valve
- Blow-off controlled by external signal



8. ELECTRICAL CONNECTIONS

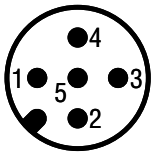
CMS HD vacuum pumps must be used with power supply units that provide a Protective Extra Low Voltage (PELV) and with an isolation of the supply voltage according to EN 60204.

VOC15P:
- One M12 5-pin male connector



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

VXC15X:
- One M12 5-pin male connector

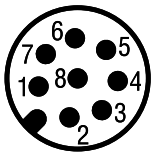


1	24 V DC
2	24 V DC suction command (1)
3	0 V - GND
4	24 V DC object gripped DO1 - C/Q
5	24 V DC blow-off command

+ One M8 4-pin male connector
→ remote HMI

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

VXC18X:
- One M12 8-pin male connector

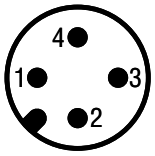


1	24 V DC object gripped DO1
2	24 V DC
3	/
4	24 V DC suction command (1)
5	24 V DC object lost DO2 - C/Q (2)
6	24 V DC blow-off command
7	0 V - GND
8	/

+ One M8 4-pin male connector
→ remote HMI

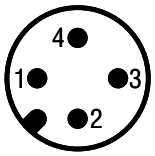
1	24 V DC
2	RS485 (DATA+)
3	0 V - GND
4	RS485 (DATA-)

VXC24X:
- Two M12 4-pin male connectors



IN

1	/
2	24 V DC blow-off command
3	0 V - GND
4	24 V DC suction command (1)



OUT

1	24 V DC
2	24 V DC object lost DO2 (2)
3	0 V - GND
4	24 V DC object gripped DO1 - C/Q
5	/

+ One M8 4-pin male connector
→ remote HMI

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

: connections for IO-Link

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

(2) *DO2 configurable:*
- *Object lost (default)*
- *or Power supply fault (below 21.6 V or above 26.4 V)*
- *or Pressure fault (below 5 bar or above 8 bar)*

9. CONNECTIONS

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

9.1. PRESSURE SUPPLY CONNECTION

- Non-lubricated air, filtered to 5 microns, according to standard ISO 8573-1:2010 [3:4:4]
- Optimal dynamic pressure: - 5.5 bar for version without control (CMSHD_**NVO**)
  - 6 bar for versions with control (CMSHD_**S**_/ CMSHD_**V**_)
- 350 µm filter screen integrated in the vacuum connection to protect the pump against particles.

➔ Compressed air connection through a G3/8"-F port (mark 1 on pneumatic socket).

CMS HD without control (CMSHD_N_)

CMS HD with control (CMSHD_S_/ CMSHD_V_)

9.2. VACUUM CIRCUIT CONNECTION

➔ Connection through a G1"-F port (mark 2 on pneumatic socket).

For short response times and minimum consumption, try reducing the volume to evacuate. To this end, as the module is installed as close as possible to the suction cups, ensure the length of the tube connecting the suction cups to the module is as short as possible.

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"**

Device	Min. internal tube dia.		
	Compressed air inlet	Suction inlet	Exhaust collector
CMSHD90X50	6 mm dia. - max. length 2 m 8 mm dia. - max. length 6 m	25 mm dia. - max. length 9 m.	25 mm dia. - max. length 4 m.
CMSHD90X100	6 mm dia. - max. length 2 m 8 mm dia. - max. length 6 m	25 mm dia. - max. length 6 m.	25 mm dia. - max. length 4 m.
CMSHD90X150	8 mm dia. - max. length 6 m	25 mm dia. - max. length 3.5 m.	25 mm dia. - max. length 4 m.

➔ Flexible tubes must be as short as possible in order to minimize response times.
➔ Make sure there is no pollution in the device connections and tubes.
➔ Flexible tubes 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.**

10. EQUIPMENT OPTIONS FOR EXHAUST

10.1. THREE EQUIPMENT OPTIONS

Different configurations are available to equip the CMS HD exhaust:

Through-type silencer
Version **CMSHD___K**
- Reduced noise level
- Non-clogging

Diffuser
Version **CMSHD___F**
- Ultra-compact

Exhaust collector
Version **CMSHD___E**
- G1" female connection

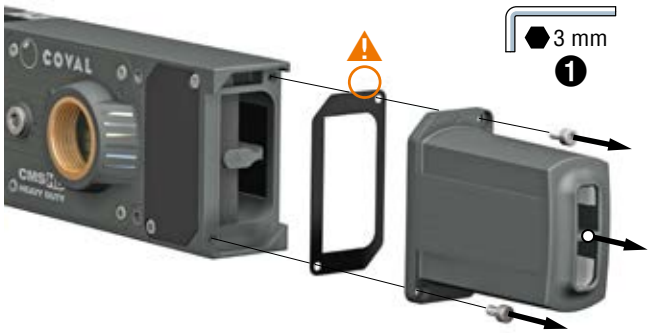
The exhaust options are delivered in-line but, depending on the environment, they can be positioned by the user on the front panel.

10.2. MOUNTING EQUIPMENT ON FRONT PANEL OF CMS HD FOR EXHAUST AT 90° ANGLE

NOTE: When mounting the exhaust option onto the front panel, the internal silencer in the pump body must be removed to ensure proper operation of the pump.

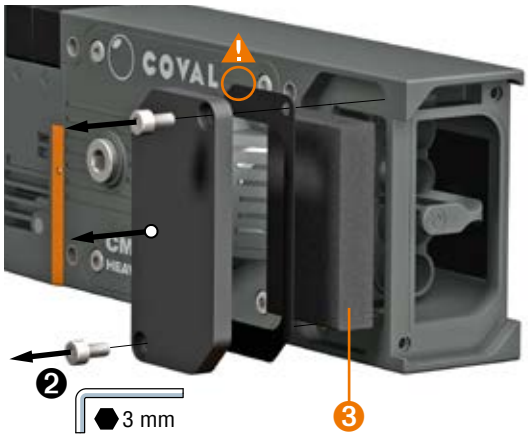
- ❶ Remove the 2 M4x8 CHC screws using a 3 mm hexagon bit socket to remove the inline exhaust option.

  ⚠ Caution: The gasket may be stuck to the exhaust option.



- ❷ Remove the 2 M4x8 CHC screws using a 3 mm hexagon bit socket to remove the blank end plate located on the front panel of the CMS HD.

  ⚠ Caution: The gasket may be stuck to the end plate.



❸ **Remove the acoustic foam located under the blank end plate to ensure proper operation of the vacuum pump.**

- ❹ Place the gasket in its groove on the front panel.

  ⚠ Pay attention to the direction of the gasket: the internal cutout of the gasket must match the shape of the body.

- ❺ Set the exhaust option in place on the front panel of the CMS HD.

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

- ❼ Place the gasket in its groove at the CMS HD's end.

  ⚠ Pay attention to the direction of the gasket: the internal cutout of the gasket must match the shape of the body.

- ❽ Set the blank end plate in place.

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

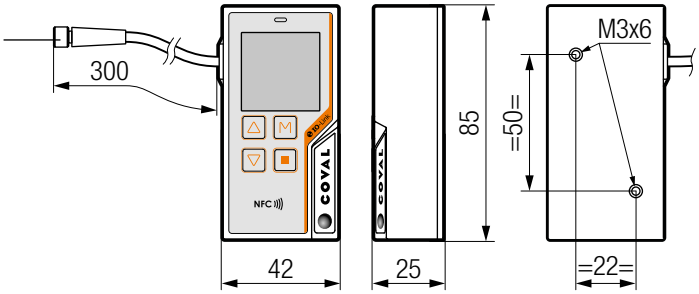
11. INSTALLING AND OPERATING REMOTE HMI (ACCESSORY)

Part number of remote HMI: **HMIHD1M84P**.
Accessory only compatible with multi-stage vacuum pumps CMSHD90X_**SVX/VVX_**.

The CMSHD90X_**SVX/VVX_** 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.

11.1. DIMENSIONS

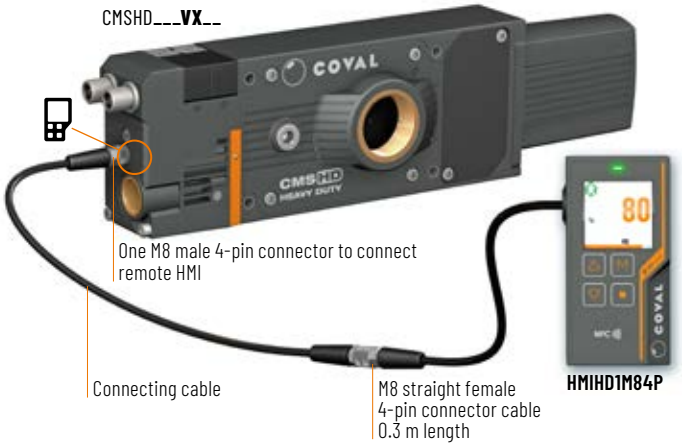
M8 straight female 4-pin connector cable
0.3 m length



11.2. INSTALLING THE REMOTE HMI

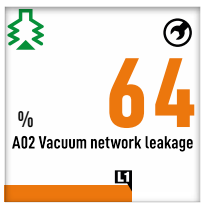
Connect the HMI's M8 female 4-pin connector to the M8 male connector on the pump's valve block (mark).
If necessary, use a M8 female 4-pin / M8 male 4-pin connecting cable, compatible with drag chain:

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



11.3. 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)

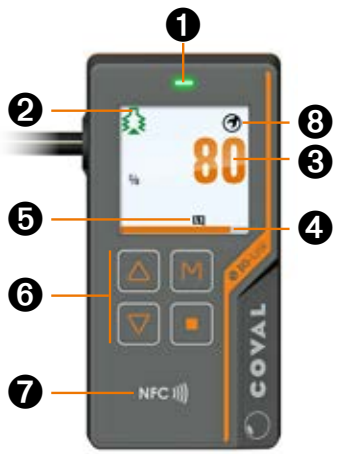
❹ Bar chart indicating the instantaneous vacuum level

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

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

❼ NFC antenna

❽ Maintenance indicator



11.4. CONFIGURING A REMOTE HMI

Reminder: The remote HMI (part no. **HMIHD1M84P**) can only be used with CMSHD90X_**SVX/VVX**_ multi-stage vacuum pumps.

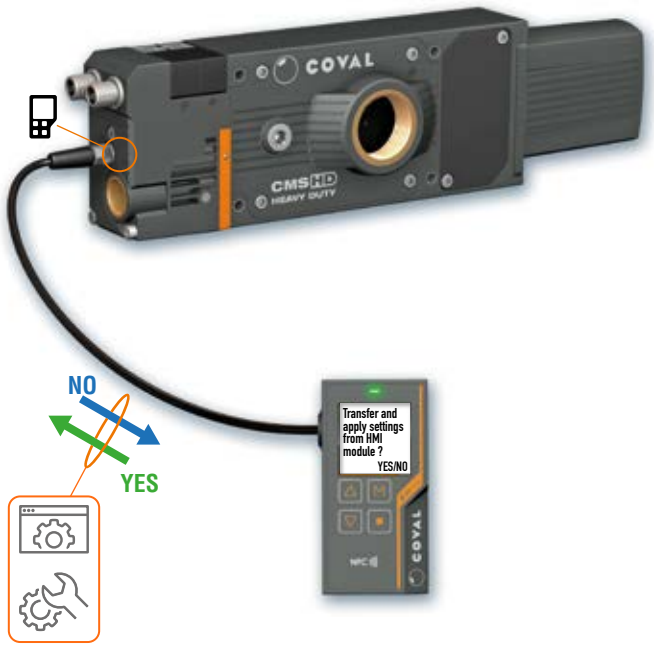
The CMSHD90X_**SVX/VVX**_ multi-stage vacuum pumps are supplied with the standard factory settings described in this manual. To be able to modify them, you must use a remote HMI or configure the module using IO-Link.

Configuration procedure

Step 1: Connect the remote HMI to M8 connector (mark) on the CMS HD. The CMS HD 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 HD 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 HD 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. 15)
- L1/h1
- Automatic blow-off

Device settings (for details see sect. 17)
- PNP/NPN
- NO/NC
- Output 2 mode

12. HMI DETAILS AND FEATURES

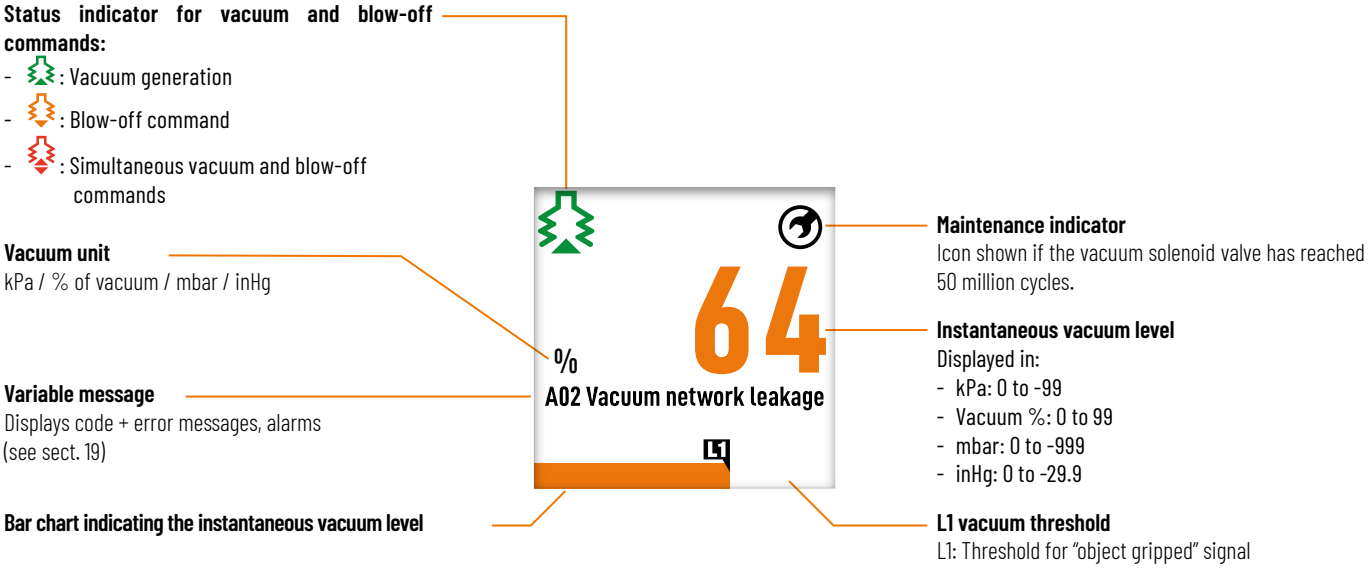
12.1. MAIN SCREEN

12.1.1. 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.

12.1.2. Details of the main screen



Note: See detailed description of screens and menus in section 20.

12.1.3. 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

13. SUMMARY OF FUNCTIONS

13.1. ACCESSING LIVE DIAGNOSTIC DATA

Main screen

→ M + ▽ / Lock/unlock keypad (see sect. 14)

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

13.2. MENU TREE

Main screen

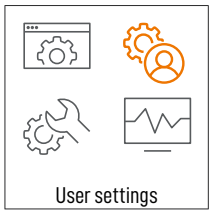
→ M + ▽ → 🔑 / 🔓 Lock/unlock keypad (see sect. 14)

→ M →

Process settings 1/2
L1/h1
Auto Blow-off

Process settings (see sect. 15)
- **L1/h1**: threshold and hysteresis for "object gripped"
- **Automatic blow-off** (CMSHD__**S**_ only): enable/disable and configure timed automatic blow-off

▽

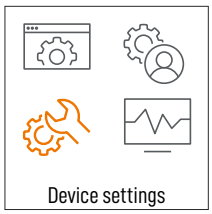


→ M →

User settings
Language
Screen
Units

User settings (see sect. 16)
- **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

▽



→ M →

Device settings
PNP/NPN
NO/NC
Output-2 mode

Device settings (see sect. 17)
- **PNP/NPN**: input/output switching mode
- **NO/NC**: outputs 1/2 Normally Open or Normally Closed
- **Output-2 mode**: pressure fault, power supply fault, object lost

▽

→ M →

Diagnostic
Device info
Cycle counters
Vacuum network test
Manual mode
Calibration
Reset settings

Diagnostic (see sect. 18)
- **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.
- **Vacuum network test**: support function to dimension vacuum network
- **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)

14. 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.

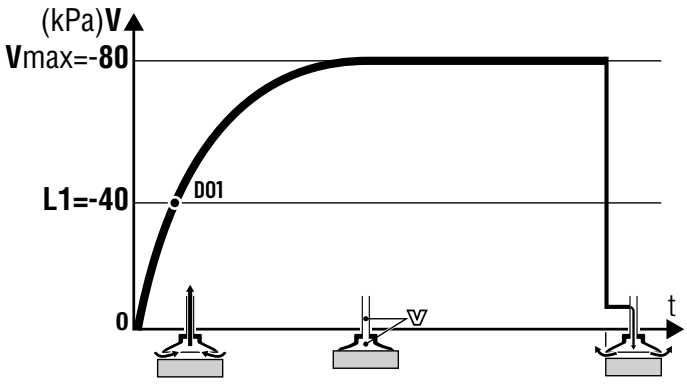
15. PROCESS SETTINGS

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

15.1. 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	CMSHD version S	OFF

15.2. 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 for CMSHD_**S** (refer to section 8, 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).

16. USER SETTINGS

Main menu	Secondary menu	Display conditions	Factory settings
	Language	Permanent	English

16.1. LANGUAGE

To make the CMS HD 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°

16.2. SCREEN

The display goes into sleep mode after 10 min. if no external commands are received (suction 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

16.3. 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

17. DEVICE SETTINGS

Main menu	Secondary menu	Display conditions	Factory settings
	PNP/NPN	Permanent	PNP

17.1. 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 outputs (DO1/DO2).

Main menu	Secondary menu	Display conditions	Factory settings
	NO/NC	Output 1: Permanent Output 2: CMSHD_VXC18X CMSHD_VXC24X	Output 1: NO Output 2: NO

Main menu	Secondary menu	Display conditions	Factory settings
	Output 2 mode	CMSHD_VXC18X CMSHD_VXC24X	Grip fault

17.2. NO/NC

The 2 contact outputs (DO1 and DO2) can be set to either NO (Normally Open) mode or NC (Normally Closed) mode.
Factory setting:
- DO1 "Object gripped": NO
- DO2 "Object lost": NO

Note: DO2: only for CMSHD_**VXC18X** and **VXC24X**.

17.3. CONFIGURABLE DO2 OUTPUT

The DO2 contact output can be configured to make available any information useful for your process.
Grip fault (24 V DC): The signal is active when the vacuum command is active and the vacuum level is less than L1-h1. The LED on the HMI's front panel is red.

Or configurable as follows:
- Air pressure fault (lower than 5 bar or greater than 8 bar)
- Power supply fault (lower than 21.6 V or greater than 26.4 V)

Note: DO2: only for CMSHD_**VXC18X** and **VXC24X**.

18. DIAGNOSTIC

Main menu	Secondary menu	Display conditions	Factory settings
	Device info	Permanent	

18.1. DEVICE INFO

The information concerning the CMS HD are available on the following 3 screens:
"Device info" screen 1/3:
The complete part number of the CMS HD consists of the following 2 parts:
- Part 1/2: e.g. CMSHD90X50
- Part 2/2: e.g. SVXC15XG4KD

Example of complete part number:
CMSHD90X50SVXC15XG4KD

"Device info" screen 2/3:
IO firmware version and IO serial number

"Device info" screen 3/3:
IHM firmware version and IHM serial number

Main menu	Secondary menu	Display conditions	Factory settings
	Cycle counters	Permanent	

18.2. 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.

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.

Main menu	Secondary menu	Display conditions	Factory settings
	Cycle counters	Permanent	

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).

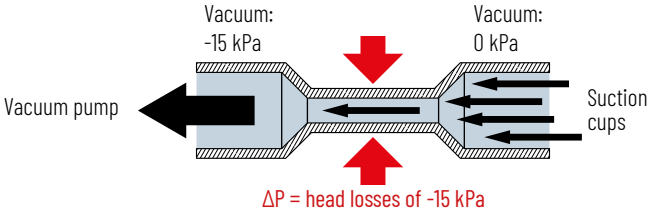
18.3. VACUUM NETWORK TEST

The CMS HD vacuum pump is equipped with a tool to help with sizing and detecting when the vacuum network is clogged to avoid head losses.

A properly sized vacuum network, i.e. with a minimum of head losses, will help to optimize the evacuation and blow-off times, and increases the performance of your facility.
Head losses are often due to tubes with an inner diameter that is too small in relation to their length and/or to T-fittings that lead to restrictions and do not enable the pump's air intake flow rate to circulate properly.

Note: For a reminder of tube diameters and lengths, refer to section 9 Connections.

Example of a restriction in a vacuum network



VACUUM NETWORK TESTING PROCEDURE

1- Vacuum network sizing support

The first time the vacuum pump is installed on the vacuum network, start the **Installation check** and follow the instructions.
This check is to be performed without the suction cups being in contact with the part to be handled and is used to measure the head losses on the vacuum network.
Once the test has been started, the head loss measurement (**reference measurement**) is displayed as well as the test results:

- **TEST OK**: head loss < -20 kPa = vacuum network is properly sized
- **TEST FAILED**: head loss > -20 kPa = vacuum network needs to be optimized

In this case, adjust the lengths and/or inner diameters of the tubes and replace T-fittings with straight or Y-fittings. Once all the changes have been made, restart the test to obtain a correct reference measurement that will be used for the **periodic check**.

2- Periodic check

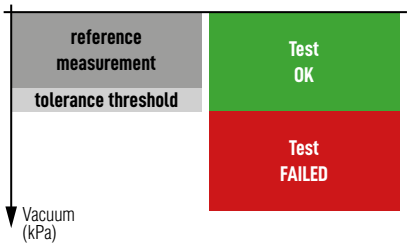
Note: This function is only available if the test results from the previous step are OK. It can be accessed from the HMI or via IO-Link.

Caution: This function must only be used during periodic maintenance of the facility (not during production), i.e. without any part being gripped.

The **Periodic check** function is used to perform the following operations:

- Unclogging the network by temporarily activating the blow-off command
- Measuring the current head loss to compare it with the reference measurement

If the value measured during the periodic check exceeds the **reference measurement + tolerance threshold**, the test fails, which indicates the vacuum network is clogged or faulty.



Description from HMI:

Press **M** to access the **Periodic check** menu.

- The **tolerance threshold** is shown: for example **-10 kPa** (default value).
- If necessary, adjust the value: range of values from -1 to -20 kPa
- Press **M** to start the test. The vacuum pump automatically carries out the following cycle:
  - Blow-off for 3 seconds to clean the network
  - Suction, then wait for 3 seconds

  ➔ Results:
  - The measured head loss value is shown in kPa.
  - Test OK: The network's head loss value is lower than the reference measurement + tolerance threshold.
  - Test failed: If the network's head loss value is greater than the reference measurement + tolerance threshold.

Test results:

This menu is used to view the results of the last test carried out:

- **Reference**: Indicates the reference measurement made during step 1 of the Vacuum network test
- **Threshold**: Indicates the value of the set **tolerance threshold**
- **Last measure**: Indicates the value measured during the last periodic check

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

18.4. MANUAL MODE

The CMS HD 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	

18.5. CALIBRATION

Vacuum sensor calibration

The calibration procedure may only be performed when the vacuum net- work 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	

18.6. RESET SETTINGS

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

- Process settings
- All settings
- Maintenance status

19. 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. 14)
K02 Keypad unlocked	When you press **M** and ▽ simultaneously, when the keypad is locked	This message is cleared automatically after 1 s.	See sect. 14
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 (> 26.4 V)	Supply voltage higher than 26.4 V	Supply voltage is set within the recommended voltage range (24 V DC +/-10%)	Use a regulated 24 V DC power supply +/-10%
A04 Power supply too low (< 21.6 V)	Supply voltage is lower than 21.6 V	Supply voltage is set within the recommended voltage range (24 V DC +/-10%)	Use a regulated 24 V 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 (5 to 8 bar)	Check the supply pressure on the compressed air network
A06 Input pressure too low (< 5 bar)	Supply pressure is lower than 5 bar	Supply pressure is set within the recommended pressure range (5 to 8 bar)	Check the supply pressure on the compressed air network

20. IO-LINK PARAMETER SETTINGS

CMS HD vacuum pumps (version **VX**) 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.

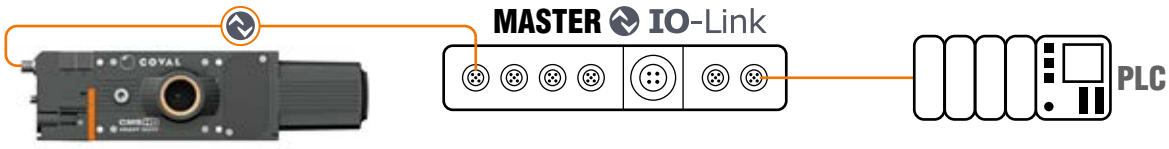
20.1. IO-LINK COMMUNICATION

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

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

20.2. CYCLICAL DATA (PDI/PDO)



Process Data Output – From the IO-Link master to CMS HD

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

PDO1
VAC – Vacuum command
BLO – Blow-off command

Process Data Input – From CMS HD 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 (> 26.4 V)
TLV – Too low voltage (< 21.6 V)

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 26.4 V
	TLV - Too Low Voltage	7	BOOL	RO		Power supply voltage lower than 21.6 V (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

20.3. ACYCLICAL DATA

IDENTIFICATION

Index (dec)	Parameter	Length (byte)	R/W	Unit	Value			Comment
					min	Typ.	max	
7	Vendor ID	2	RO	-		0x04		0x0421 = COVAL SAS
8						0x21		
9	Device ID	3	RO	-		0x00		0x3001 = CMSHD Series
10						0x30		
11						0x01		
16	Vendor name	9	RO		COVAL SAS			
17	Vendor text	15	RO		Vacuum managers			
18	Product name	32	RO		CMSHD–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			Comment
					min	Typ.	max	
64	Gripped product threshold L1	2	RW	mbar	10	400	999	Recommendations: 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	650	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			Comment
					min	Typ.	max	
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
92	Switching output 2 (DO2)	1	RW	-	0	0	1	0: NO / 1: NC
93	Specific wiring	1	RW	-	0	0	1	0: OFF / 1: ON (reverse DO1 ↔ DO2)

DIAGNOSTIC

Index (dec)	Parameter	Length (byte)	R/W	Unit	Value			Comment
					min	Typ.	max	
100	Custom device name	20	RW	-		CMSHD		Free field, 20 characters max.
101	HMI serial number	20	RO	-		20420852461000000		
▼ Vacuum network diagnostic feature ▼								
2	Start vacuum network diagnostic (initial check)	1	WO			164 / 0xA4		The vacuum network diagnostic feature aims to periodically measure the vacuum drop to compare it to the initial measurement done when commissioning the ejector.
2	Start vacuum network diagnostic (periodic check)	1	WO			165 / 0xA5		An alarm is triggered when the measured vacuum drop is greater or equal to Vacuum drop reference (index 103) + Allowed vacuum drop threshold (index 105).
102	Last test result	1	RO	-	0	0	2	0: Test not done 1: Test failed 2: Test OK
103	Vacuum drop reference	2	RO	mbar	0	0	999	Vacuum drop measured when commissioning the ejector (Start vacuum network diagnostic (initial check), value 164d). Must be ≤ 200 mbar for test result to be OK.
104	Last vacuum drop measured value	2	RO	mbar	0	0	999	
105	Allowed vacuum drop threshold	2	RW	mbar	10	100	200	Defines the allowed margin of vacuum drop before triggering the "Clogged vacuum network" alarm.
▼ 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 setting ▼								
2	Reset process settings	1	WO	-		166 / 0xA6		
2	Reset all settings	1	WO	-		130 / 0x82		

21. NFC

21.1. 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).

21.2. 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 HD 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

21.3. 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.

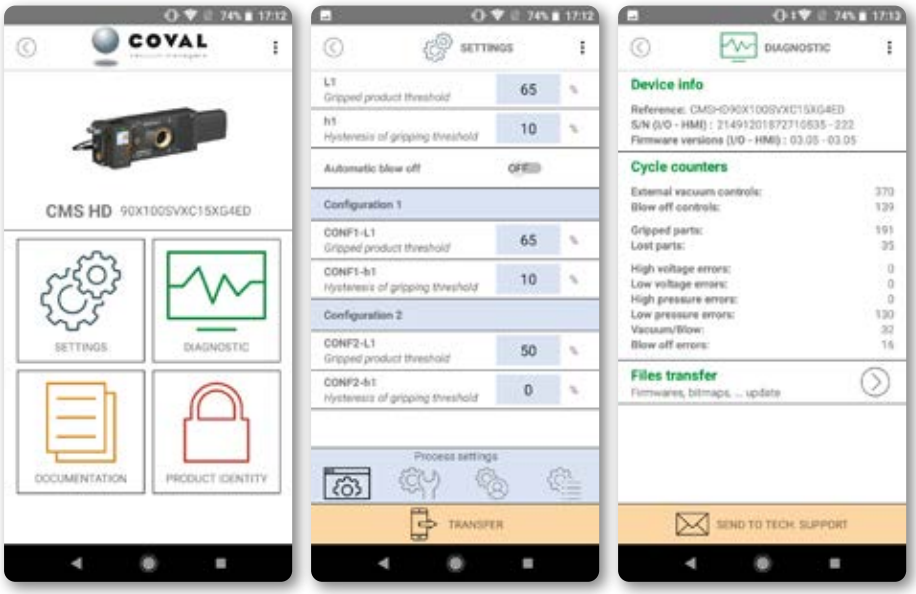
Additional functions:

- 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.

21.4. 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/**

22. MAINTENANCE

22.1. TROUBLESHOOTING

Failure	Possible cause	Remedy
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. The vacuum build-up is too slow.	A filter is clogged in the facility.	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.
	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 tube diameters
Cannot hold the payload in place.	Vacuum level too low	Check the values of threshold L1
	Suction cup too small or insufficient number of suction cups	Choose a larger suction cup and/or increase the number of suction cups.

Establish the frequency of maintenance activities based on the cycle rates, the environment, and the type of load.
To carry out maintenance work on CMS HD vacuum pumps, the compressed air supply must be shut off.

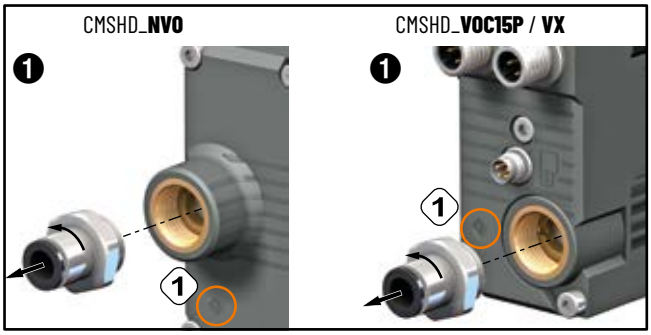
22.2. MAINTENANCE PROCEDURES

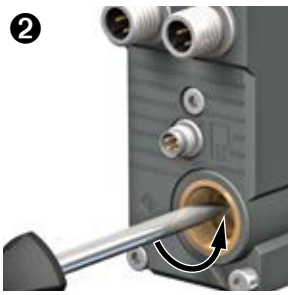
Prior to working on the pump, make sure the compressed air network is depressurized and that the connector(s) has (have) been removed.

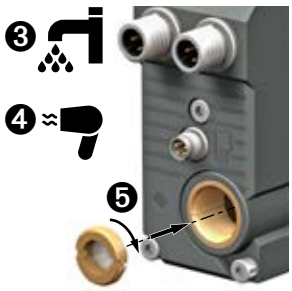
22.2.1. Cleaning the filter screen on the compressed air supply

(Mark ① on the pressure connection end plate for pumps without control (CMSHD_**NVO**), or on the control valve block on pumps with control (CMSHD_**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.







22.2.2. Cleaning the Vacuum Filter and the Vacuum Check Valve

(Mark ② on front end plate of the CMS HD—Vacuum connection side).

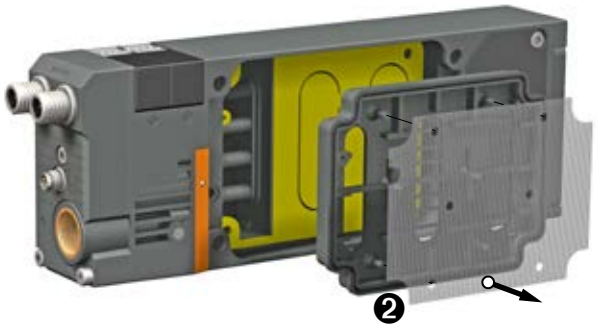
NOTE: This procedure is for all models of the CMS HD, simple body (version CMSHD90X50_/100_**) and double body (CMSHD90X**150_**).**

⚠ **Do not remove the rear aluminum end plate.**

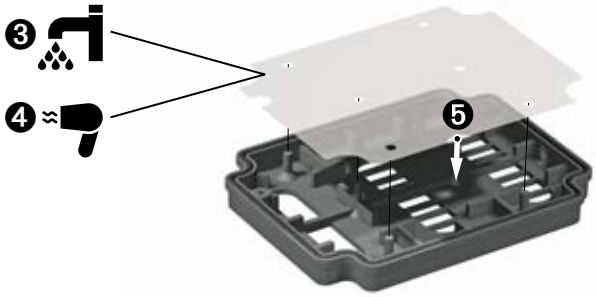
- ❶ Remove the 4 M4x20 CHC screws from the end plate (mark 2), using a 3 mm hexagon bit socket, and then remove the front end plate.

  ⚠ Caution, the gaskets may be stuck to the end plate. Make sure they are properly placed in their groove.

- ❷ Remove the filter basket and take out the vacuum filter.

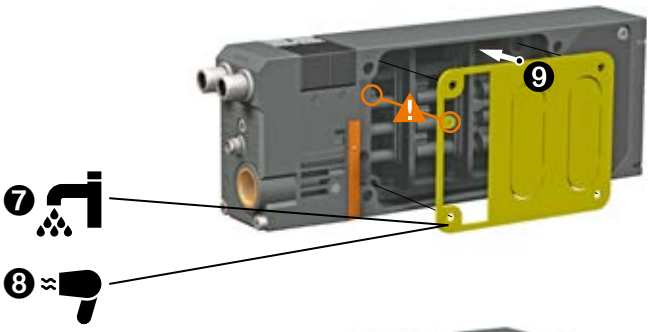


- ❸ Clean the vacuum filter.
- ❹ Dry the vacuum filter.
- ❺ Mount the vacuum filter back onto the filter basket.
  ⚠ Make sure the vacuum filter is not deformed.

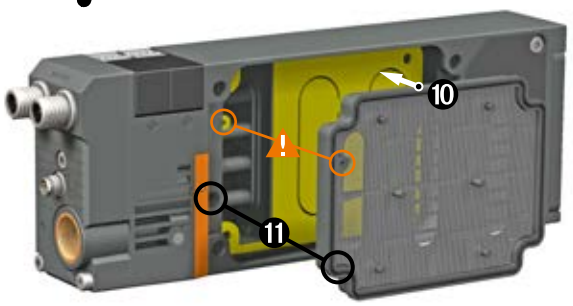


- ❻ Remove the vacuum check valve.

- ❼ Clean the vacuum check valve with water and soap (no solvents).
- ❽ Dry the vacuum check valve.
- ❾ 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 HD's body.



- ❿ 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 HD's body.
- ⓫ Make sure that the 2 gaskets are properly placed in their groove.



- ⓬ Place the end plate in its groove.
- ⓭ Tighten the 4 M4x20 CHC screws (mark ②) to the end plate using a 3 mm hexagon bit socket (tightening torque 1.6 Nm).

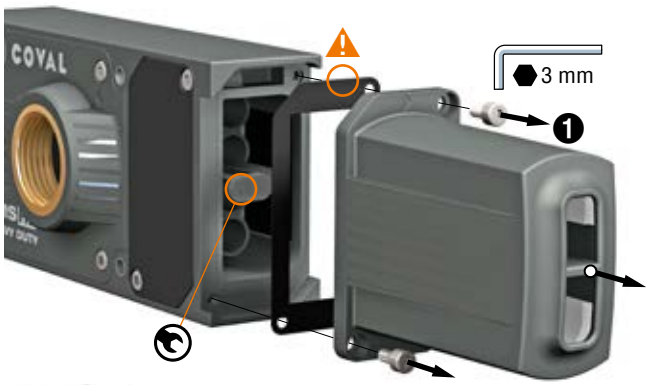
NOTE: Replacing the "Vacuum" check valve and the vacuum filter.
- **For CMSHD90X_50/100: Use the maintenance kit (part no.: 80007379) that contains 1 vacuum check valve, 1 vacuum filter, 2 flat gaskets for exhaust, 1 acoustic foam, and 1 set of o-rings and molded gaskets.**
- **For CMSHD90X_150: Use the maintenance kit (part no.: 80007380) that contains 1 vacuum check valve, 1 vacuum filter, 4 flat gaskets for exhaust, 1 acoustic foam, and 1 set of o-rings and molded gaskets.**

22.2.3. Cleaning the Multi-stage Venturi Profiles

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

- ❶ Remove the 2 M4x8 CHC screws using a 3 mm hexagon bit socket to remove the exhaust option or the blank end plate (depending on type of assembly).

  ⚠ Caution: The gasket may be stuck to the end plate or exhaust option.

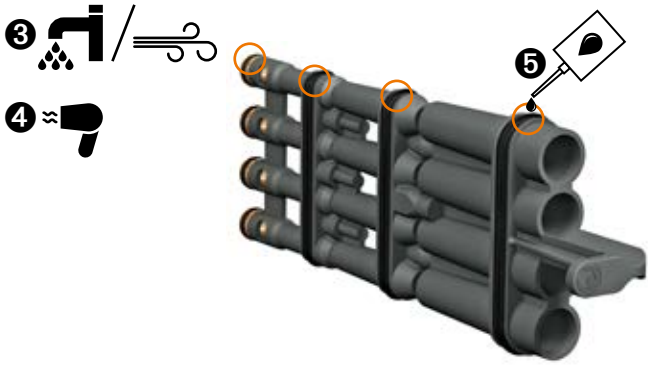


- ❷ Extract the "multi-stage Venturi profile" assembly from the body by pulling on the hook (mark ↺).

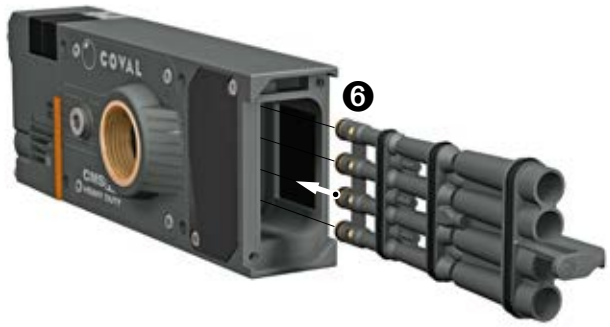
  Note: The "multi-stage Venturi profile" assembly may sometimes be difficult to extract manually. Use a screwdriver as a lever on the hook.

- 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 place in their groove.

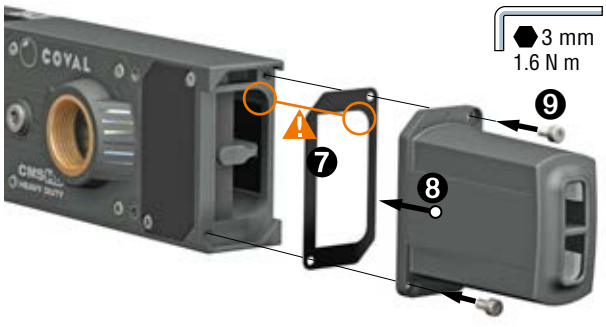


- ❻ Insert the "multi-stage Venturi profile" assembly and push it until it clips in. The clip should not protrude from the body.

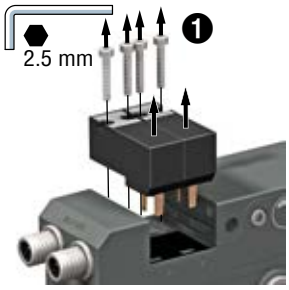


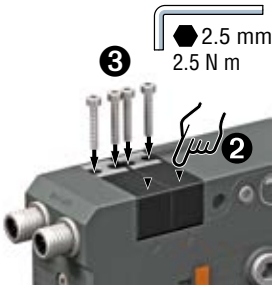
- ❼ Set the gasket in place.

  ⚠ 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 option or blank end plate in place.
- ❾ Tighten the 2 M4x8 CHC screws using a 3 mm hexagon bit socket (tightening torque 1.6 Nm).



22.2.4. Replacing the Solenoid Valves

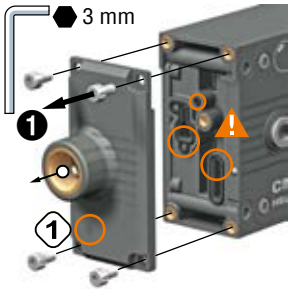


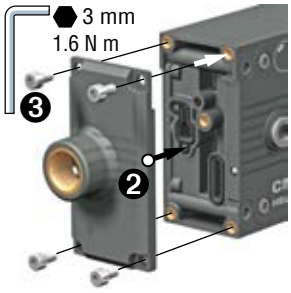


- ❶ Remove the M3x18 CHC screws that hold in place the solenoid valve(s) to be replaced (use a 2.5 mm male hexagon bit socket).
- ❷ Replace the solenoid valve(s) as required (for item numbers, refer to sect. 23).
  ⚠ Caution: Make sure to properly place the pins of the solenoid valves in the respective holes by pressing slightly.
- ❸ Tighten the M3x18 CHC screws (tightening torque 1.6 Nm)

22.2.5. Replacing the Pressure Connection End Plate for CMSHD90X__NV0

(Mark ① on the end plate).
Spare part numbers: refer to sect. 23 (to replace the gaskets, use the maintenance kit matching the CMS HD model).

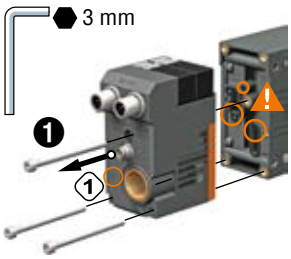


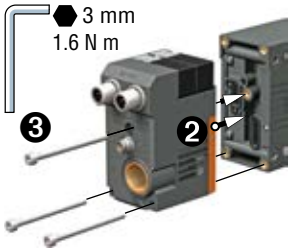


- ❶ Remove the 4 M4x8 CHC screws using a 3 mm hexagon bit socket to remove the pressure connection end plate.
  ⚠ Caution: Make sure that the 3 gaskets are properly placed in their groove.
  If necessary, replace the 3 gaskets (see Maintenance Kit).
- ❷ Replace the pressure connection end plate and set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

22.2.6. Replacing the Valve Block for CMSHD90X__SV0C15P / VV0C15P and CMSHD90X__SVX_ / VVX_

(Mark ① on the valve block).
Spare part numbers: refer to sect. 23 (to replace the gaskets, use the maintenance kit matching the CMS HD model).

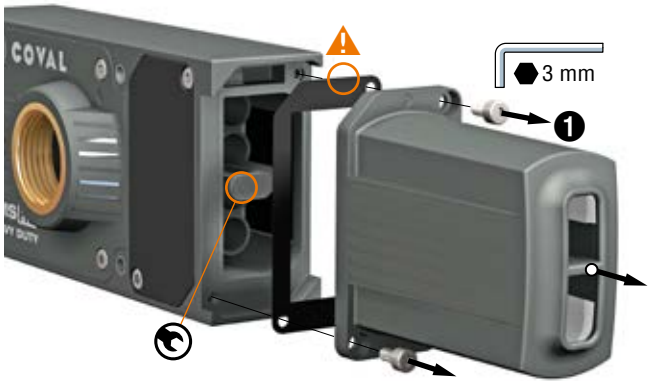




- ❶ Remove the 3 M4x55 CHC screws using a 3 mm hexagon bit socket to remove the valve block.
  ⚠ Caution: Make sure that the 3 gaskets are properly placed in their groove.
  If necessary, replace the 3 gaskets (see Maintenance Kit).
- ❷ Replace the valve block and set the new one in place.
- ❸ Tighten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

22.2.7. Replacing the Exhaust Options

Spare part numbers: refer to sect. 23 (to replace the gaskets, use the maintenance kit matching the CMS HD model).



- ❶ Remove the 2 M4x8 CHC screws using a 3 mm hexagon bit socket to remove the exhaust option or the blank end plate (depending on type of assembly).

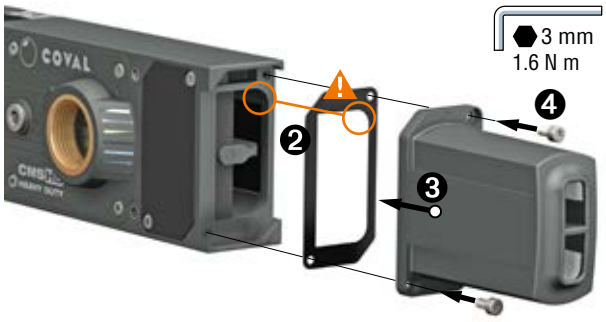
  ⚠ Caution: The gasket may be stuck to the end plate or exhaust option.

- ❷ Set the gasket in place.

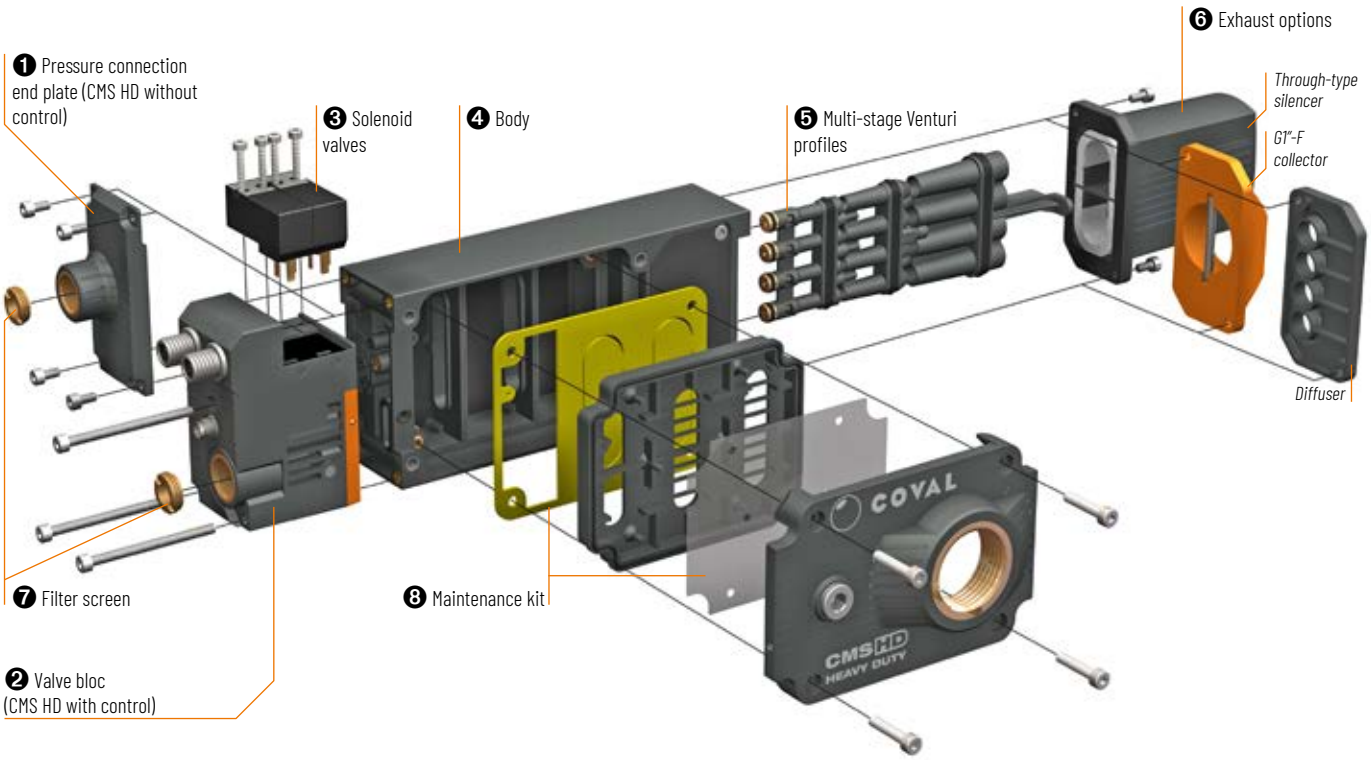
  ⚠ Pay attention to the direction of the gasket: the internal cutout of the gasket must match the shape of the body.

- ❸ Replace the exhaust option or blank end plate and set it in place.

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



23. SPARE PARTS



❶ PRESSURE CONNECTION END PLATE FOR CMS HD WITHOUT CONTROL (CMSHD__**NVO**)

Designation	Item code
Compressed air connection end plate	80007381

❷ VALVE BLOCK WITHOUT SOLENOID VALVE FOR CMS HD WITH CONTROL (CMSHD__**SVO/NVO** AND **SVX/VVX**)

(item code depends on CMS HD model)

For SVO/NVO models

For model	Designation	Item code
CMSHD90X___**VOC15P**G4_	One M12 5-pin male	CMSHDVB**VOC15P**

For SVX/VVX models

For model	Designation	Item code
CMSHD90X**50SVXC15**XG4**K**D	One M12 5-pin male / one M8 4-pin for remote HMI	CMSHDVB**50SVXC15**XG4**K**D
CMSHD90X**50SVXC15**XG4**E**D	One M12 5-pin male / one M8 4-pin for remote HMI	CMSHDVB**50SVXC15**XG4**E**D
CMSHD90X**50SVXC15**XG4**F**D	One M12 5-pin male / one M8 4-pin for remote HMI	CMSHDVB**50SVXC15**XG4**F**D
CMSHD90X**50SVXC18**XG4**K**D	One M12 8-pin male / one M8 4-pin for remote HMI	CMSHDVB**50SVXC18**XG4**K**D
CMSHD90X**50SVXC18**XG4**E**D	One M12 8-pin male / one M8 4-pin for remote HMI	CMSHDVB**50SVXC18**XG4**E**D
CMSHD90X**50SVXC18**XG4**F**D	One M12 8-pin male / one M8 4-pin for remote HMI	CMSHDVB**50SVXC15**XG4**F**D
CMSHD90X**50SVXC24**XG4**K**D	Two M12 4-pin male / one M8 4-pin for remote HMI	CMSHDVB**50SVXC24**XG4**K**D
CMSHD90X**50SVXC24**XG4**E**D	Two M12 4-pin male / one M8 4-pin for remote HMI	CMSHDVB**50SVXC24**XG4**E**D
CMSHD90X**50SVXC24**XG4**F**D	Two M12 4-pin male / one M8 4-pin for remote HMI	CMSHDVB**50SVXC24**XG4**F**D
CMSHD90X**50VVXC15**XG4**K**D	One M12 5-pin male / one M8 4-pin for remote HMI	CMSHDVB**50VVXC15**XG4**K**D
CMSHD90X**50VVXC15**XG4**E**D	One M12 5-pin male / one M8 4-pin for remote HMI	CMSHDVB**50VVXC15**XG4**E**D
CMSHD90X**50VVXC15**XG4**F**D	One M12 5-pin male / one M8 4-pin for remote HMI	CMSHDVB**50VVXC15**XG4**F**D
CMSHD90X**50VVXC18**XG4**K**D	One M12 8-pin male / one M8 4-pin for remote HMI	CMSHDVB**50VVXC18**XG4**K**D
CMSHD90X**50VVXC18**XG4**E**D	One M12 8-pin male / one M8 4-pin for remote HMI	CMSHDVB**50VVXC18**XG4**E**D
CMSHD90X**50VVXC18**XG4**F**D	One M12 8-pin male / one M8 4-pin for remote HMI	CMSHDVB**50VVXC15**XG4**F**D
CMSHD90X**50VVXC24**XG4**K**D	Two M12 4-pin male / one M8 4-pin for remote HMI	CMSHDVB**50VVXC24**XG4**K**D
CMSHD90X**50VVXC24**XG4**E**D	Two M12 4-pin male / one M8 4-pin for remote HMI	CMSHDVB**50VVXC24**XG4**E**D
CMSHD90X**50VVXC24**XG4**F**D	Two M12 4-pin male / one M8 4-pin for remote HMI	CMSHDVB**50VVXC24**XG4**F**D
CMSHD90X**100SVXC15**XG4**K**D	One M12 5-pin male / one M8 4-pin for remote HMI	CMSHDVB**100SVXC15**XG4**K**D
CMSHD90X**100SVXC15**XG4**E**D	One M12 5-pin male / one M8 4-pin for remote HMI	CMSHDVB**100SVXC15**XG4**E**D
CMSHD90X**100SVXC15**XG4**F**D	One M12 5-pin male / one M8 4-pin for remote HMI	CMSHDVB**100SVXC15**XG4**F**D
CMSHD90X**100SVXC18**XG4**K**D	One M12 8-pin male / one M8 4-pin for remote HMI	CMSHDVB**100SVXC18**XG4**K**D
CMSHD90X**100SVXC18**XG4**E**D	One M12 8-pin male / one M8 4-pin for remote HMI	CMSHDVB**100SVXC18**XG4**E**D
CMSHD90X**100SVXC18**XG4**F**D	One M12 8-pin male / one M8 4-pin for remote HMI	CMSHDVB**100SVXC15**XG4**F**D
CMSHD90X**100SVXC24**XG4**K**D	Two M12 4-pin male / one M8 4-pin for remote HMI	CMSHDVB**100SVXC24**XG4**K**D
CMSHD90X**100SVXC24**XG4**E**D	Two M12 4-pin male / one M8 4-pin for remote HMI	CMSHDVB**100SVXC24**XG4**E**D
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CMSHD90X**150SVXC24**XG4**F**D	Two M12 4-pin male / one M8 4-pin for remote HMI	CMSHDVB**150SVXC24**XG4**F**D
CMSHD90X**150VVXC15**XG4**K**D	One M12 5-pin male / one M8 4-pin for remote HMI	CMSHDVB**150VVXC15**XG4**K**D
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CMSHD90X**150VVXC24**XG4**F**D	Two M12 4-pin male / one M8 4-pin for remote HMI	CMSHDVB**150VVXC24**XG4**F**D

❸ SOLENOID VALVES FOR CMS HD

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

Version CMSHD90X_**S**...

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

Version CMSHD90X_**V**...

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

Solenoid valve position

Item code	Designation	Position			
		CMSHD90X_**S**...		CMSHD90X_**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 HD

(item code depends on CMS HD model)

For model	Designation	Item code
CMSHD90X**50/100**_	Simple body	CMSHDMB**S**
CMSHD90X**150**_	Double body	CMSHDMB**D**

❺ MULTI-STAGE VENTURI PROFILES FOR CMS HD

(item code depends on CMS HD model)

For model	Designation	Item code
CMSHD90X**50**_	Multi-stage profile assembly: 2 profiles 3 stages	80006475
CMSHD90X**100**_	Multi-stage profile assembly: 4 profiles 3 stages	80006476
CMSHD90X**150**_	2 multi-stage profile assemblies: - 2 profiles 3 stages - 4 profiles 3 stages	 80006475 80006476

❻ EXHAUST OPTIONS FOR CMS HD

For model	Item code
Through-type silencer (version **K**)	80004915
Diffuser (version **F**)	80007941
G1"-F collector (version **E**)	80006099

Note: CMSHD90X150 modules are equipped with a double body. They require 2 exhaust options.

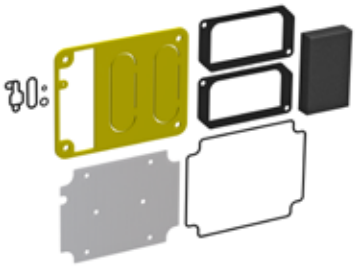
❼ ACCESSORIES

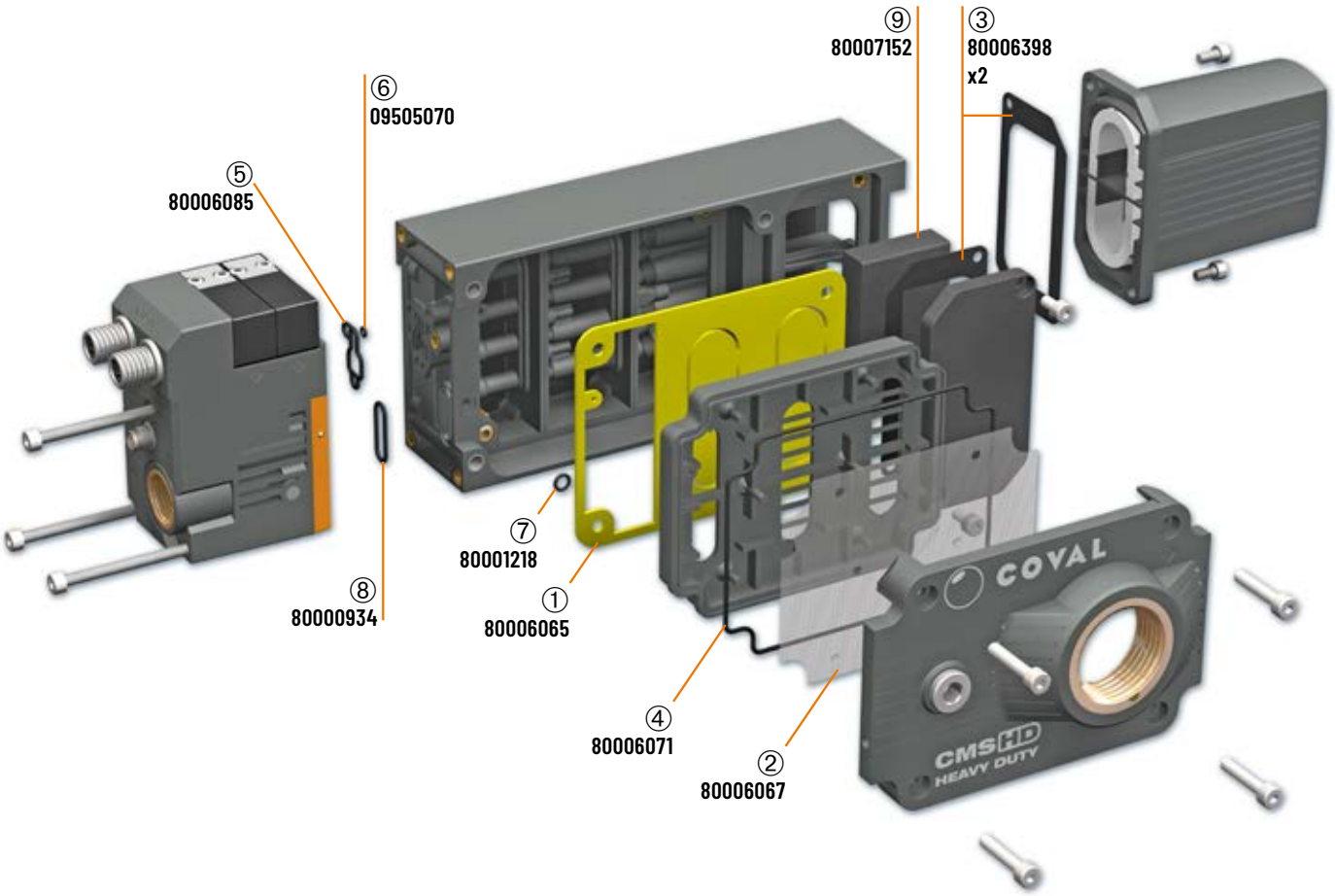
Designation	Item code
350 µm filter screen - G3/8"	80005035

Designation	Item code
Remote HMI	HMIHD1M84P

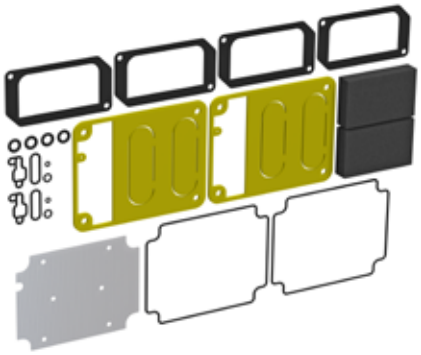
⑧ MAINTENANCE KIT

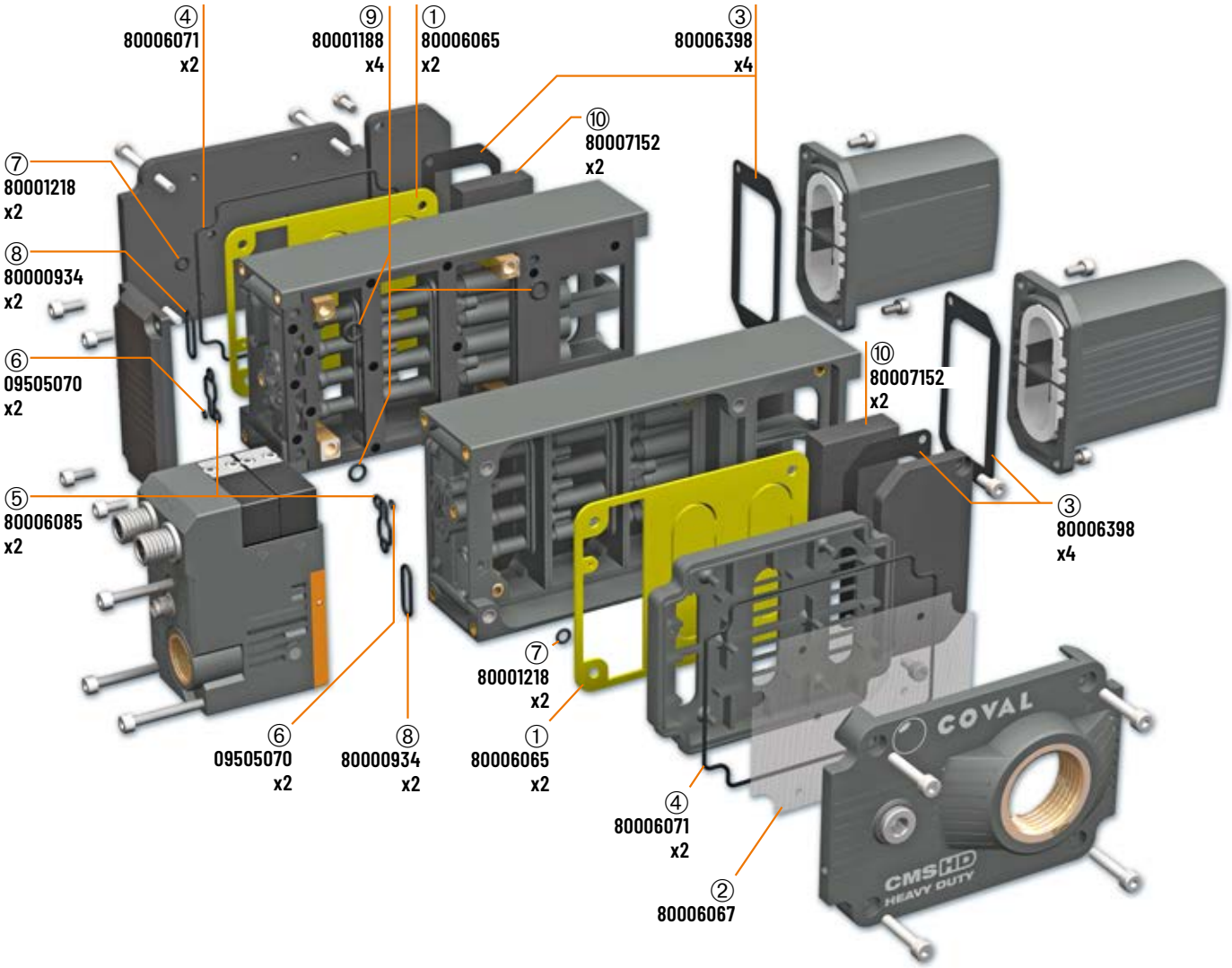
For model	Designation	Item code
CMSHD90X**50/100**_	Maintenance kit containing: ① vacuum check valve (80006065) x1 ② vacuum filter (80006067) x1 ③ flat gaskets for exhaust (80006398) x2 ④ molded gasket for end plate (80006071) x1 ⑤ molded gasket for "vacuum" (80006085) x1 ⑥ O-ring 2x1 (09505070) x1 ⑦ O-ring 4x1,5 (80001218) x1 ⑧ O-ring 14x1,5 (80000934) x1 ⑨ acoustic foam (80007152) x1	80007379





For model	Designation	Item code
CMSHD90X**150**_	Maintenance kit containing: ① vacuum check valve (80006065) x1 ② vacuum filter (80006067) x1 ③ flat gaskets for exhaust (80006398) x4 ④ molded gasket for end plate (80006071) x2 ⑤ molded gasket for "vacuum" (80006085) x2 ⑥ O-ring 2x1 (09505070) x2 ⑦ O-ring 4x1,5 (80001218) x2 ⑧ O-ring 14x1,5 (80000934) x2 ⑨ O-ring 5,5x1,5 (80001188) x4 ⑩ acoustic foam (80007152) x2	80007380





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.

CMS HD vacuum pumps 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 "CMS HD vacuum pump" described in this manual meets the following applicable EC directives:

- 2014/30/EU Electromagnetic Compatibility (EMC)
- 2011/65/EU Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment

The following harmonized standards have been applied:

- IEC 61000-6-2:2016 Electromagnetic Compatibility (EMC) – Immunity standard for industrial environments
- IEC 61000-6-4:2006/A1:2010 Electromagnetic Compatibility (EMC) – Emission standard for industrial environments
- EN 61000-4-2:2009 Electromagnetic Compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test

28. CERTIFICATES/TESTS

EMC	IEC 61000-6-2 (2016) Electromagnetic Compatibility (EMC). Generic standards – Immunity standard for industrial environments	NF EN 61000-4-2 (2009) Electrostatic discharges (ESD)	
		NF EN 61000-4-3 (2006) Radiated, radio-frequency, electromagnetic fields	
		NF EN 61000-4-4 (2013) Electrical fast transients (bursts)	
		NF EN 61000-4-6 (2014) Conducted disturbances, induced by radio-frequency fields	
		NF EN 61000-4-8 (2010) Magnetic fields	
	IEC 61000-6-4 (2007) + A1(2010) Electromagnetic Compatibility (EMC). Generic standards – Emission standard for industrial environments	NF EN 55011 (06/2016) NF EN 55032 (12/2015) Conducted emissions	
		NF EN 55011 (06/2016) NF EN 55032 (12/2015) Radiated emissions	
Degrees of protection	NF EN 60529 (2014)		IP65
	NF EN 60068-2-75 (2015)		IK 07
Temperature variations	IEC 60068-2-14 (2009)		0 °C +50 °C
Humidity	IEC 60068-2-30 (2005)		0 to 95%
Vibrations	NF EN 60068-2-6 (2008)		5 *g*
Shocks	NF EN 60068-2-6 (2008)		15 *g*

COVAL
vacuum managers

vacuum
components

A TECHNOLOGICAL PARTNER ON A GLOBAL SCALE

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

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

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

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

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

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