

COVAL

vacuum managers

CMS

Multi-stage Mini Vacuum Pumps



ADVANCED VACUUM SOLUTIONS

CMS M

Multi-stage Mini Vacuum Pumps

General Information

The **CMS M Series** multi-stage mini vacuum pumps, with their robust and ultra-compact design, are suitable for applications requiring high suction rates such as gripping porous parts, emptying tanks, or random gripping when integrated into vacuum grippers.

The **CMS M Series** is available in 2 suction flow rates, with or without vacuum and blow-off control, and 2 exhaust configurations.



Industry-specific applications

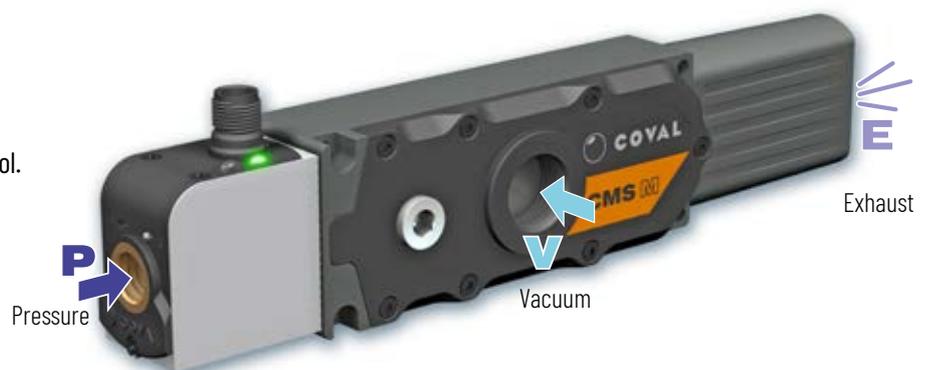


Advantages

- Robust: resistant to the harsh environments of production lines.
- High performance: optimized multi-stage venturi system that guarantees powerful suction flow rates and reduced compressed air consumption.
- Modular: configurable according to needs and easy maintenance.

Main Specifications

- 80% vacuum
- 2 powerful suction flow rates:
 - CMSM90X15__ → 10.59 SCFM
 - CMSM90X30__ → 19.42 SCFM
- With or without vacuum and blow-off control.
- Vacuum control: NC, NO.
- One M12 4-pin male connector.
- 2 exhaust configurations.



A Complete Range

For each application, a suitable CMS M:

CMSM__NVO__

- Without control.



CMSM__SVO_ / VVO_

- With vacuum and blow-off control.
- One M12 4-pin male connector.
- Inputs / Outputs Digital mode.
- Visual indicators of vacuum and blow-off controls.



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General Information



CMS M, a tailor-made solution

CMSM__NVO__

Pressure connection
end plate



CMSM90X15_ / CMSM90X30_

Body with multi-stage
Venturi profiles



Vacuum switch connection
G1/8"-F with plug



CMSM___E
Exhaust collector



CMSM___K
Through-type silencer



CMSM__SVO_ / VVO__

- Control valve block for vacuum and blow-off:
 - Vacuum control: NC or NO
 - One M12 4-pin male connector
- Status LED for the control functions:
 - Green LED = vacuum control.
 - Orange LED = blow-off control.

Accessories

Vacuum Switch with 3-color Display:

- PSD100CPNP
 - 1 digital output PNP and 1 analog output.
 - M8 connector.
- PSD100LPNP2
 - 2 digital outputs PNP.
 - cable 2 m length.



Vacuum Gauge

- VAF11140



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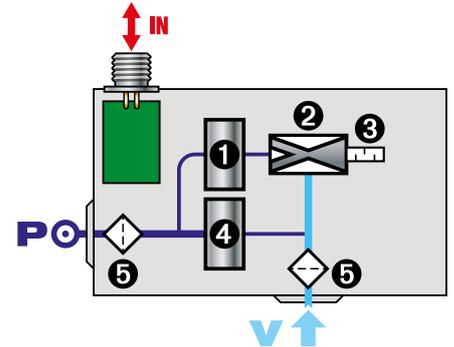
Integration and Performance



Integrated Functions

CMS M multi-stage mini vacuum pumps 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 "Blow-off" solenoid valve
- ❺ Filter screens

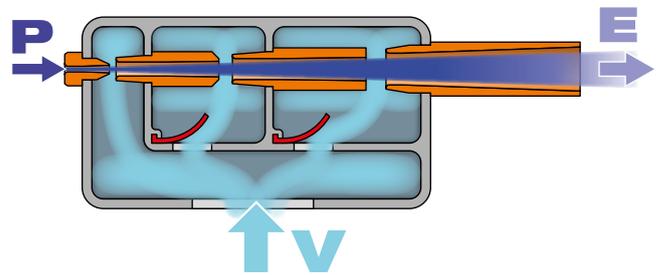


Primary Functions of Multi-stage Technology

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.

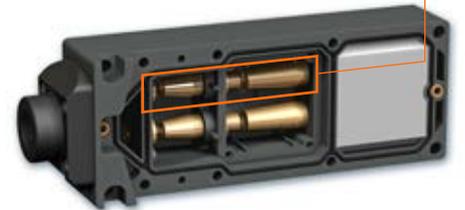


Performance Determined by CMS M Model

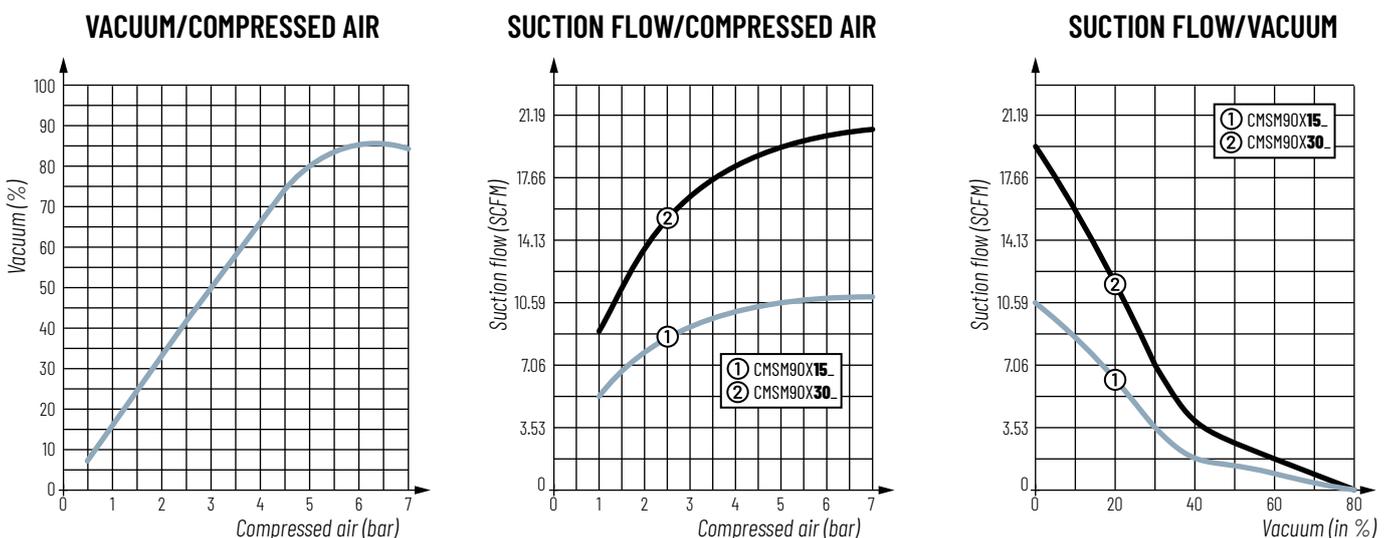
Vacuum achieved	Time to create vacuum (seconds) for a volume of 1 liter				Max. vacuum (%)	Air drawn in (SCFM)	Air consumed (SCFM)	Air pressure level* (bar)
	45 %	55 %	65 %	75 %				
Model								
CMSM90X15	0.21	0.35	0.60	1.14	80	10.59	5.30	5
CMSM90X30	0.11	0.18	0.30	0.56	80	19.42	9.89	5

* 5.5 bar for controlled versions, CMSM...S./ CMSM...V

- CMSM90X15...: 1 profile 2 stage
- CMSM90X30...: 2 profiles 2 stage



Curves



CMS M

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Selection Guide

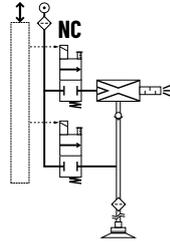


Vacuum Control: 2 Solutions

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

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

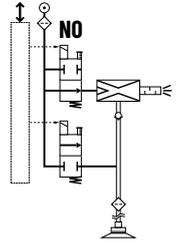
- NC blow-off and vacuum control: solenoid valves.



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

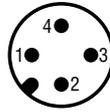
In the event of power failure, vacuum is still generated: object is held in place → fail-safe. In the event of compressed air failure, the vacuum is no longer maintained.

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



Electrical Connections

One M12 4-pin male connector.



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

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

Choice of 2 equipment options for the exhaust

Various configuration options are available for the CMS M exhaust:

Through-type silencer
CMSM__K version

- Reduction of the noise level
- Non-clogging



Exhaust Collector
CMSM__E version

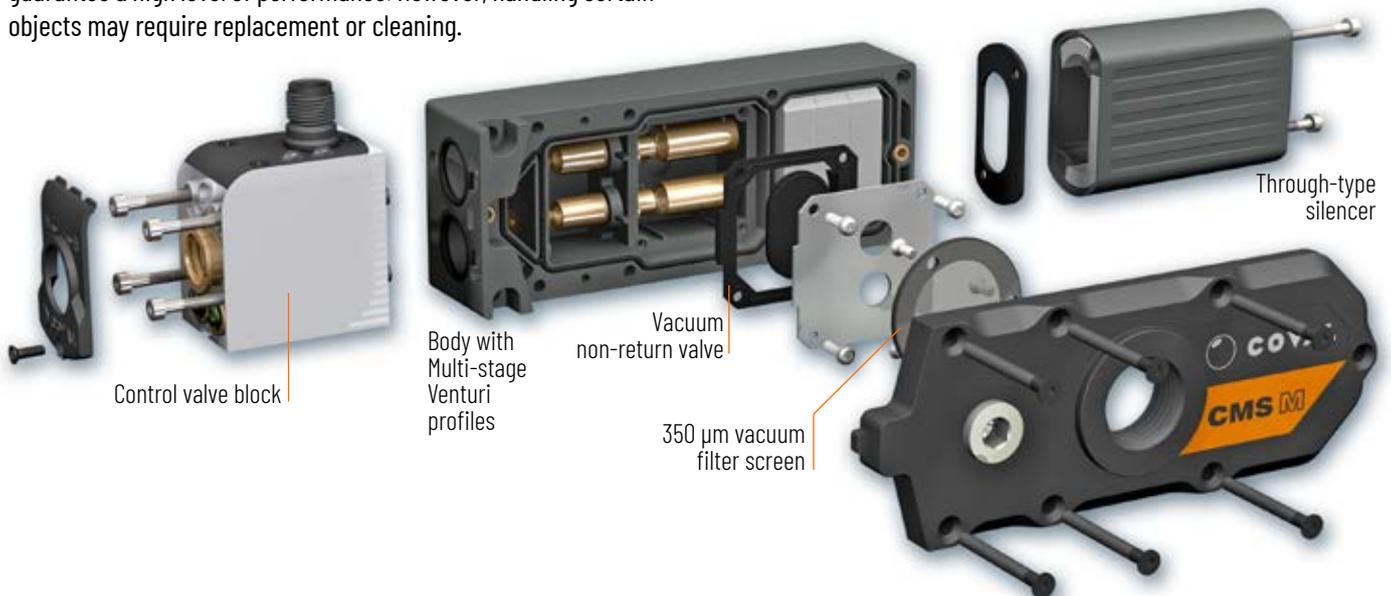
- G1/2" female connection.



Maintenance

The CMS M multi-stage vacuum pumps have been designed to withstand the demands from all your applications and to guarantee a high level of performance. However, handling certain objects may require replacement or cleaning.

The modular design of the CMS M multi-stage pumps ensures easy maintenance as the functions are all easily accessible.



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Configuring a Vacuum Pump



CMS M without control

CMSM90X 15 N VO G2 E

SUCTION FLOW RATE		EXHAUST OPTION	
10.59 SCFM (1 profile 2 stage)	15	K	Through-type silencer
19.42 SCFM (2 profiles 2 stage)	30	E	Exhaust collector

CMS M controlled

CMSM90X 30 S VO C14P G2 K

SUCTION FLOW RATE		GENERATOR CONTROL		EXHAUST OPTION	
10.59 SCFM (1 profile 2 stage)	15	S	Mini vacuum pump with NC vacuum control and NC blow-off	K	Through-type silencer
19.42 SCFM (2 profiles 2 stage)	30	V	Mini vacuum pump with NO vacuum control and NC blow-off	E	Exhaust collector

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

CMSM90X15NVOG2E

Mini multi-stage vacuum pump without control, max. vacuum 80%, suction flow rate 10.59 SCFM, with exhaust collector.



CMSM90X30SVO C14P G2 K

Mini multi-stage vacuum pump, max. vacuum 80%, suction flow rate of 19.52 SCFM, controlled by one NC vacuum control and one NC blow-off, one M12 4-pin connector, with through-type silencer.



Accessories

Electronic vacuum switch with 3-color display

- Vacuum connection: G1/8"-M.
- Pressure rating range: 0.0 ~ -101.3 kPa.
- Pressure setting range: 10.0 ~ -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/1 sec.).
- Choice of pressure unit display: kPa, MPa, kgf/cm², bar, psi, InHg, mmHg.
- Power supply voltage: 12 to 24 V DC ±10%.
- Current consumption: ≤ 40mA (without load).
- Repeatability (switch output): ≤ ±0.2% F.S. ±1 digit.
- Digital output: Max. load current: 125 mA, Max. supply voltage: 24 VDC, Residual voltage: ≤ 1.5 V.
- Protection: IP40.
- Ambient temperature range: 0 - 50° C (operation).

- Part No. **PSD100CPNP**
- One M8 4-pin connector.
- 1 digital output PNP (NO or NC).
- 1 analog output (Output voltage: 1 to 5 V ± 2.5% F.S. (within rated pressure range), linearity: ≤ ±1% F.S. / Output impedance: approx. 1 kΩ).
- Part No. **PSD100LPNP2**
- 2 m cable.
- 2 digital outputs PNP (NO or NC).



Vacuum gauge with needle

- Ø 40 mm: Part No. **VAFT1140**
- Damping: by silicone movement (patented).
- Measuring: Bourdon tube in CuSn.
- Precision: cl. 2.5 (+/- 2.5% of max. scale value).
- Frame: black ABS.
- Vacuum connection: G1/8"-M.



Power supply cable

- M12 4-pin, female - open end
- Part No. **CDM12N**: straight connector, length 2 m.
- Part No. **CDM12L5**: straight connector, length 5 m.
- Part No. **CCM12**: elbow connector, length 2 m.
- Part No. **CCM12L5**: elbow connector, length 5 m.



CMS M

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Technical Specifications and Dimensions

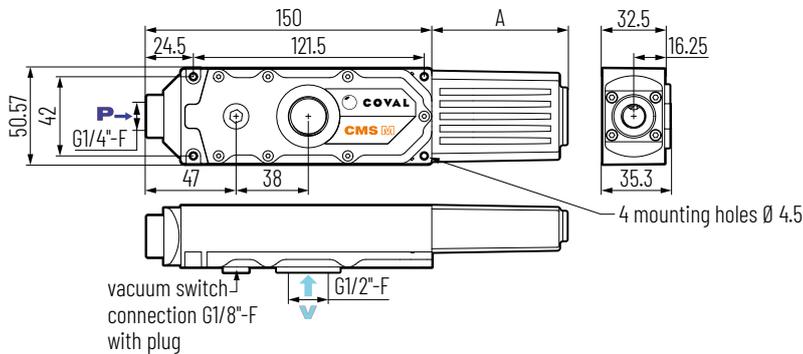


Technical specifications

- Supply: non-lubricated air, filtered to 5 microns, according to standard ISO 8573-1:2010 [3:4:4].
- Operating pressure: from 2 to 7 bar.
- Optimal dynamic pressure:
 - CMSM___NVO_ (without control): 5 bar.
 - CMSM___S_ / CMSM___V_ (controlled): 5.5 bar.
- Pressure connection: G1/4"-F with 200 µm filter screen.
- Vacuum connection: G1/2"-F with removable 350 µm filter screen.
- Connection for version with exhaust collector: G1/2"-F.
- Vacuum switch connection: G1/8"-F.
- Max. vacuum: 80%.
- Air suction flow rate: 10.59 to 19.42 SCFM.
- Air consumption: 5.30 to 9.89 SCFM.
- Noise level with through-type silencer :
 - CMSM90X15__K: 61 dBA.
 - CMSM90X30__K: 65 dBA.
- Degree of protection: IP40.
- Max. operating frequency: 2 Hz.
- Endurance: 30 million cycles.
- Operating temperature: from 32 to 122°F (from 0 to 50°C).
- Weight:
 - CMSM without control: - 275 g.
 - CMSM controlled: - 330 g.
- Materials:
 - Main body: PA GF, brass, NBR, PU.
 - Control valve body: PA 6 GF.
 - Pressure connection end plate (NVO version): aluminum.
 - Vacuum connection end plate: PETP.
 - Exhaust collector (CMSM___E version): aluminum.
 - Silencer: body PA FG, felt.
 - Internal parts of the pump: brass, aluminum.
 - Internal parts of the valve block: brass, aluminum, steel, NBR, PU, FKM.
 - Screws: zinc plated steel.
 - Seals and diaphragm: NBR, PU.
- Integrated electronics (CMSM_S / V version)**
 - 24 V DC power supply (regulated ±10%).
 - Consumption: 60 mA max. (without load).
 - Inputs/outputs protected against reversed wiring and polarity.

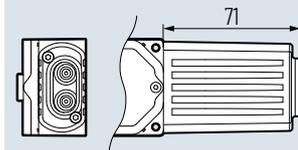
Dimensions

CMS M without control

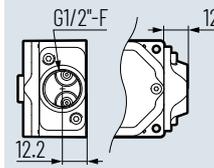


Exhaust options

CMSM___K version
Through-type silencer

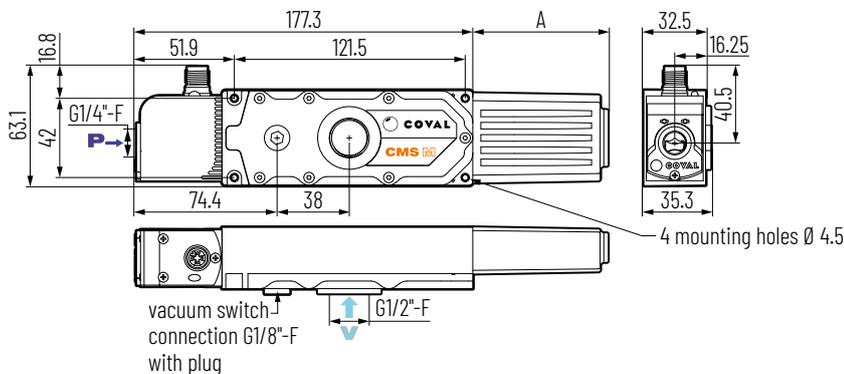


CMSM___E version
Exhaust collector



Exhaust type	A
Through-type silencer	71
Exhaust collector	12

CMS M controlled



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

Note: all dimensions are in mm.



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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