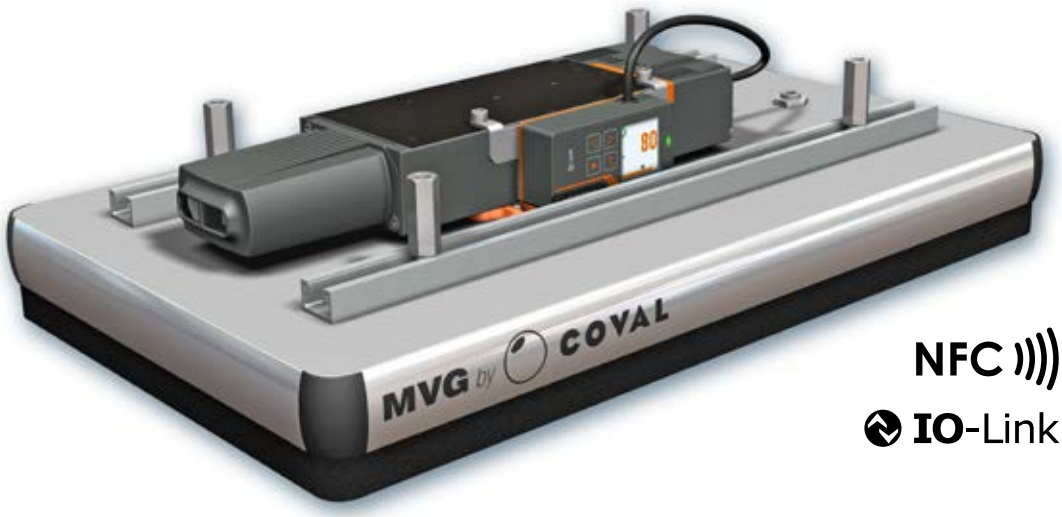
COVAL

vacuum managers

MVG

Modular Vacuum Grippers



NFC

IO-Link

ADVANCED VACUUM SOLUTIONS

MVG

Modular Vacuum Grippers

General Information

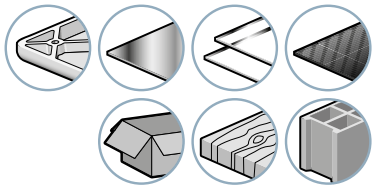
COVAL's MVG series vacuum grippers fully meet integrator and end user expectations in terms of power, robustness, communication, and ease of setup and use, while they remain compact and lightweight for easier integration in a smart factory.

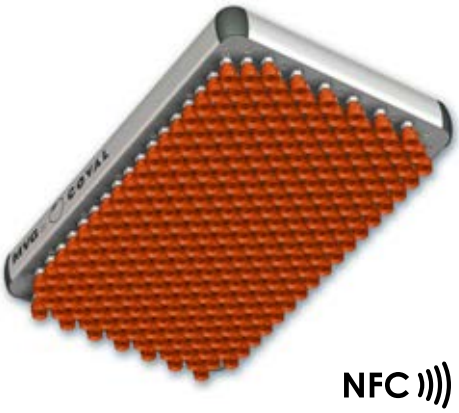
Their highly modular and flexible design makes them an optimal solution for handling objects of various sizes, shapes, and weights.

COVAL's next generation vacuum grippers feature CMS HDE series multi-stage vacuum pumps. These pumps have a heavy-duty design offering high reliability even in harsh environments (IP65) and a long service life, withstanding up to 50 million cycles. The modular design of these vacuum pumps contributes to their durability and allows for special configurations as well as targeted maintenance of specific parts to optimize repairability.

Next generation CMS HDE multi-stage vacuum pumps thus further increase the reliability of MVG series vacuum grippers and their adaptability.

Industry-specific applications





NFC

IO-Link

Custom Made by Design

The modular design of the MVG series vacuum grippers with standard sub-assemblies provides great flexibility when it comes to selecting dimensions, gripping interface, and the vacuum generator to fully meet the application requirements.

Moreover, to optimize production cycles and palletization planning, MVG grippers can be equipped with several independent gripping zones (multi-zone), ensuring multiple or staggered gripping/release points.

Advantages

- Customized formats
- Compact and lightweight
- Multi-zone
- IO-Link and NFC communication interface
- Adapts to products
- Adapts to installation
- Easy to install and use
- Readily available
- COVAL service

Applications

MVG series vacuum grippers offer a unique solution for handling products in different industrial sectors:

- Packaging
- Plastics
- Metal
- Glass
- Concrete/stone
- Composites
- Wood

MVG

Modular Vacuum Grippers

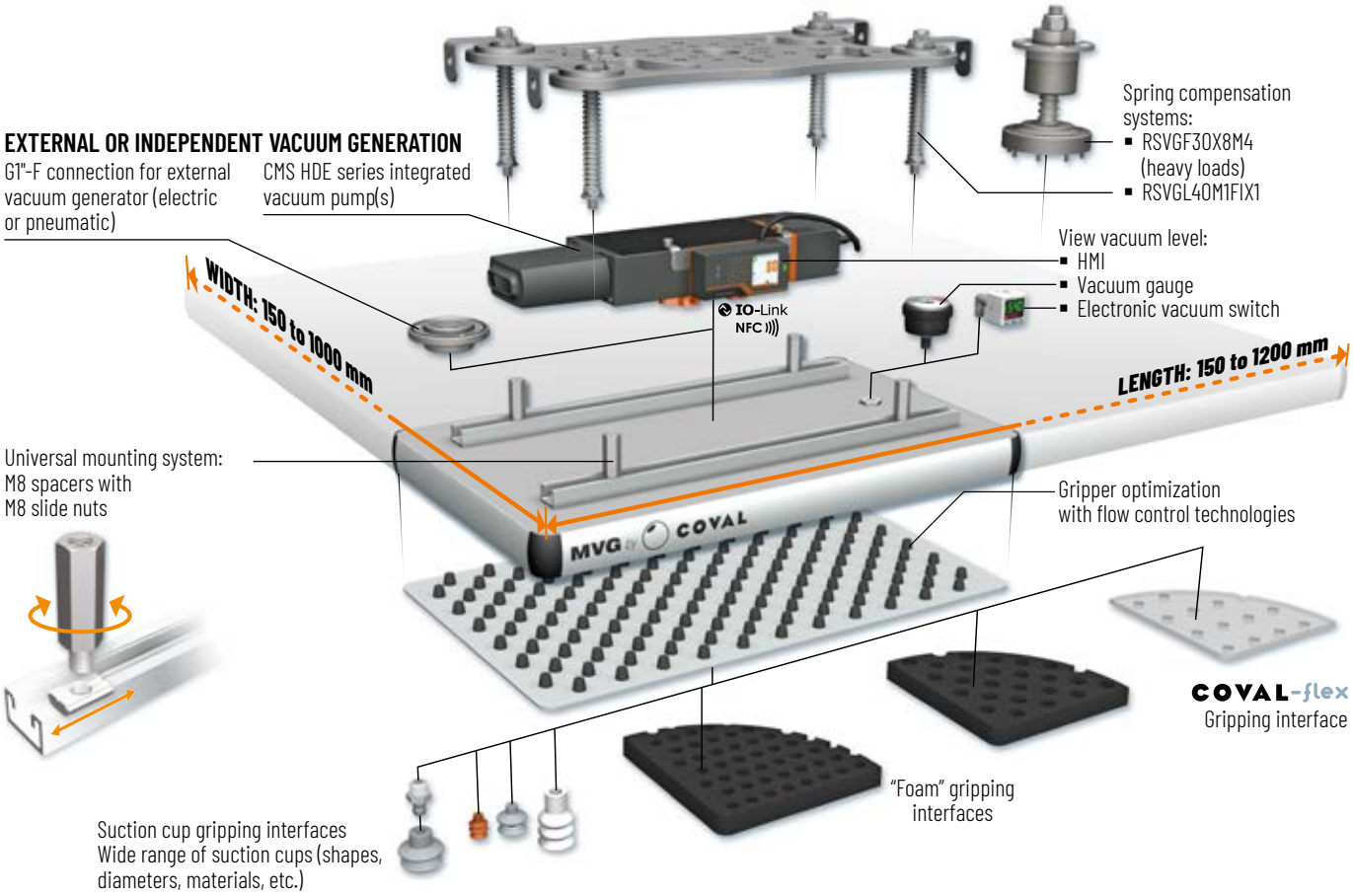
General Information

Custom sizes
From 150 x 150 to 1200 x 1000 mm

Ultra-lightweight
Reduced payload weight

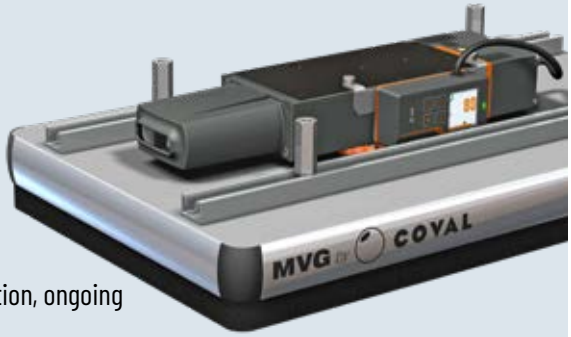
Configurable gripping interface
depending on the products to be handled

Communication and control
- Digital inputs/outputs (SIO)/IO-Link
- HMI
- NFC



ADD COMMUNICATION AND SMART TECHNOLOGY

Integrating the CMS HDE multi-stage **VX** version vacuum pumps on **MVG** vacuum grippers makes them easier to use and set up.



- Clear and efficient HMI.
- Onboard installation and diagnostic tools.
- Digital inputs/outputs (SIO)/IO-Link (quick and cost-effective installation, ongoing diagnostics, centralized setup, and efficient communication).
- Straightforward setup and diagnostics.

A **MVG** vacuum gripper equipped with a CMS HDE vacuum pump becomes more versatile and fully compatible with the handling robots at the heart of Industry 4.0.

MVG

Modular Vacuum Grippers

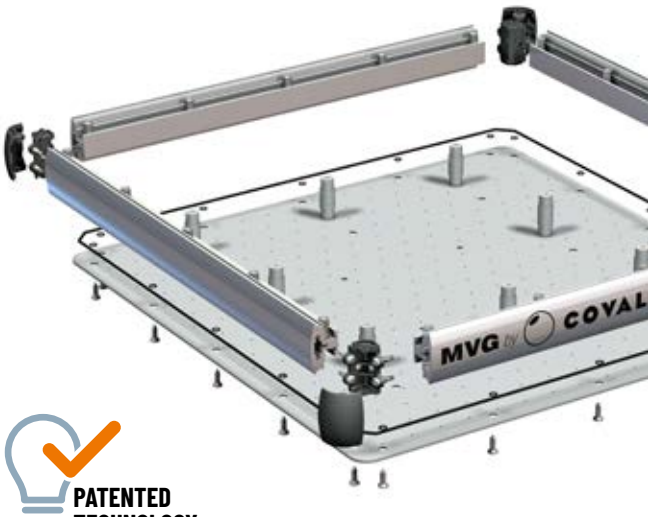
Ultra-Lightweight and Multi-Zone Design

Ultra-Lightweight and Compact Design

The main objective in designing the MVG vacuum gripper was to reduce its footprint and weight as much as possible, while keeping a highly modular configuration to meet the needs of robotic applications.

With their patented assembly concept, MVG vacuum grippers fully meet this objective. The lightweight and strong aluminum profile frame allows for easy integration on robots. Furthermore, the vacuum connections on MVG vacuum grippers is located at the top, which makes the grippers even more compact.

The technologies and materials used in the MVG vacuum gripper's design considerably reduce the payload weight, which makes it the benchmark in its area, allowing for smaller robots to be implemented, increasing accelerations, and thus optimizing the installation for cost savings.



PATENTED TECHNOLOGY

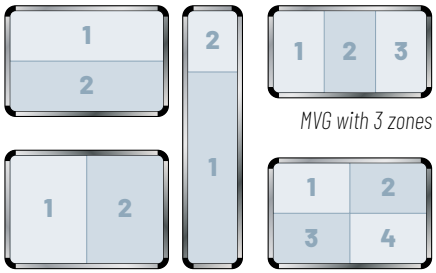
Multi-Zone

Independent gripping zones can be created on MVG vacuum grippers to ensure optimized vacuum management (higher vacuum levels, fewer leaks, and lower energy consumption). To achieve this, each zone has its own integrated or external vacuum generator.

- ➔ Staggered grip/release points
- ➔ Management of formats to be handled
- ➔ Optimized palletizing layers
- ➔ Single or multiple grip/release points

As each multi-zone application is different, COVAL will gladly assist in determining the best configuration for your process.

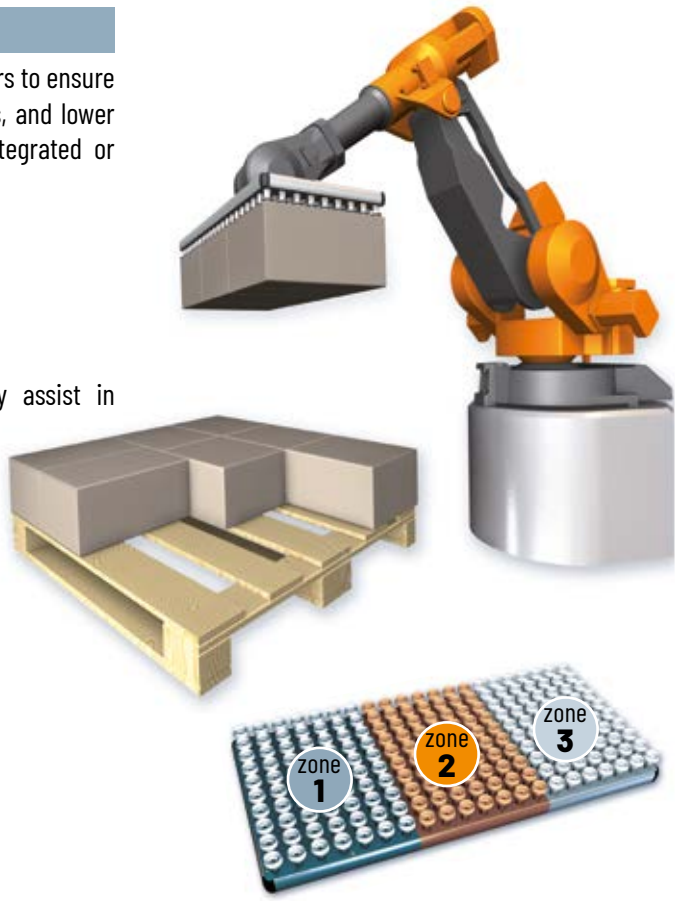
Examples of configuration:



MVG with 3 zones

MVG with 2 zones

MVG with 4 zones



MVG

Modular Vacuum Grippers

Integrated Technologies

COVAL's MVG series lets you choose among three gripping interface technologies that can be combined to meet your vacuum handling needs: foam, suction cups, or COVAL-flex.

To optimize the performance of MVG series vacuum grippers according to the application at hand, available grip patterns have various spacing and hole diameters: ➔ a broad range that meets all your application requirements.

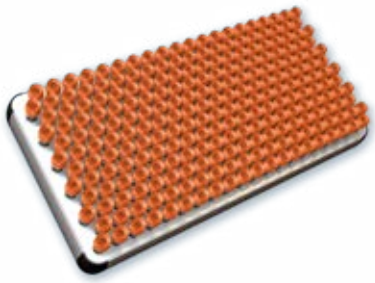
Choice of Gripping Interface

"FOAM" Interface

- Handle rigid products
- Grip textured or uneven surfaces
- Flow control nozzle, airtight valve, or check valve
- 2 hole diameters (Ø 12 and 16 mm)
- 2 grip patterns

"SUCTION CUP" Interface

- Handle flexible products
- Wide range of options
- Flow control nozzle (various diameters)
- 4 types of standard suction cups (Ø 14, Ø 25, Ø 30 and Ø 33 mm)
- 3 grip patterns



"COVAL-flex" Interface

- Handle aluminum cans, canned food, glass containers, etc.
- Flexible, extremely tear-resistant interface
- Grip pattern fully customizable according to the application

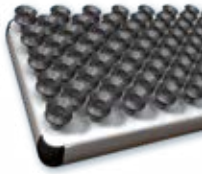
Grip Patterns

"MINI"

- Reduced hole spacing, to grip smaller objects
- Tight grip pattern ensures a strong hold, even with randomly placed objects

"MEDIUM"

- A medium-tight grip pattern between mini and max
- Ideal for handling dense loads with a reduced gripping surface



"MAX"

- Large gripping surface to grip heavy loads
- Ideal for handling objects with a rigid gripping surface

MVG

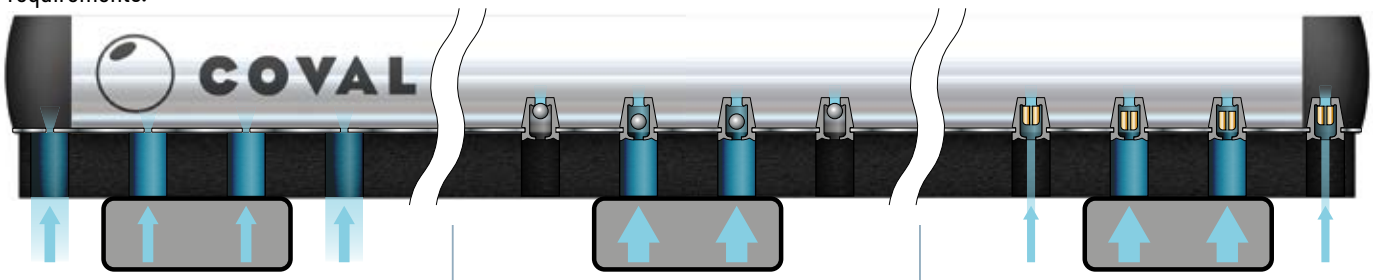
Modular Vacuum Grippers

Integrated Technologies

Flow Control Technologies

COVAL offers three different flow control technologies to optimize your vacuum gripper and fully address your application requirements.

The COVAL vacuum management team will gladly help you choose and configure your MVG vacuum gripper.



Flow control nozzles

- Limits the leakage rate in uncovered areas
- Cost-effective solution
- Customizable calibration
- Horizontal and vertical handling

Airtight valves *(COVAL patent)*

- Isolates uncovered areas
- Saves energy
- Meets specific needs
- Instant gripping
- Quick release with blow-off
- Horizontal handling

Check valves *(COVAL patent)*

- Limits the leakage rate in uncovered areas
- Instant gripping
- Highly versatile applications
- Quick release with blow-off
- Horizontal handling

Vacuum Generation

Integrated vacuum generator, CMS HDE series

Integrating a multi-stage vacuum generator on the MVG gripper provides a comprehensive and compact gripping solution, and ensures easy integration in your process.

Options: add a vacuum and/or blow-off control valve with M12 connector and a vacuum level display (electronic vacuum switch display or vacuum gauge), or an HMI with LCD display.

Advantages:

- A comprehensive solution
- 3 levels of suction power
- Option: vacuum and blow-off control
- Option: vacuum level display
- Option: IO-Link communication interface

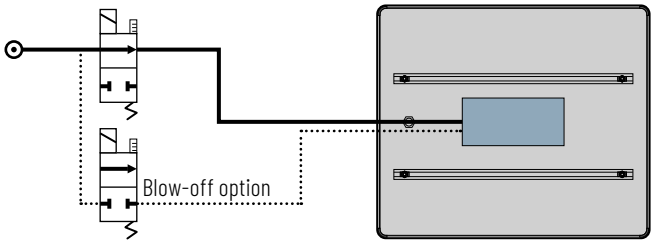
External vacuum generator

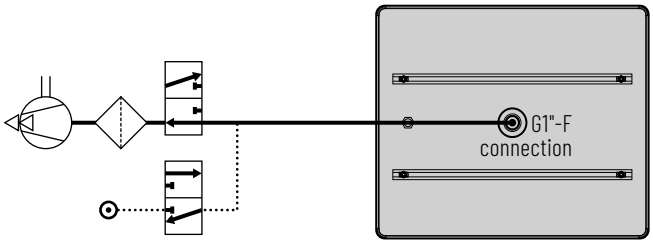
MVG vacuum grippers can also be used with an external vacuum generator. Depending on the application, an independent generator may be required (impeller, electric vacuum pump, or CMS HD series multi-stage vacuum pump). Version G0 of the MVG series vacuum grippers features a G1"-F flange to easily connect the vacuum source.

Option: add a vacuum level display (electronic vacuum switch display or vacuum gauge).

Advantages:

- Reduced weight
- Adapts to environment in which it is used
- Option: vacuum level display





Technical data of integrated CMS HDE series multi-stage vacuum pumps

Vacuum gripper	Integrated vacuum pump	Consumption (Nl/min)	Flow rate (Nl/min)	Max. vacuum (%)	Noise level (dBA)
MVG_____**D1**	**CMSHDE__50**	220	700	80	59
MVG_____**D2**	**CMSHDE__100**	420	1100	80	62
MVG_____**D3**	**2xCMSHDE__100**	840	2200	80	65

Vacuum pump configurations by gripper length

Integrated vacuum pump	Version	Min. gripper dimensions*
CMSHDE__**50** (Version D1)	Without control (version NVO)	450 x 260 mm
	With control (versions VOC15P and VXC15P)	500 x 260 mm
CMSHDE__**100** (Version D2)	Without control (version NVO)	450 x 260 mm
	With control (versions VOC15P and VXC15P)	500 x 260 mm
2xCMSHDE__**100** (Version D3)	Without control (version NVO)	900 x 260 mm

** Dimensions are indicative and may change depending on selected options.*

MVG

Modular Vacuum Grippers

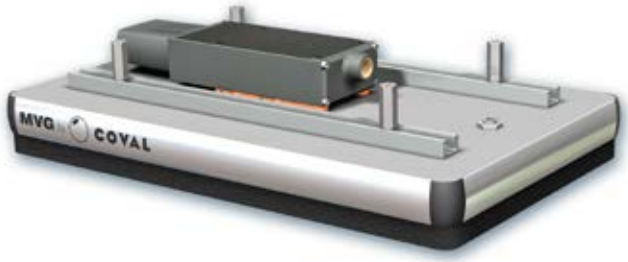
Integrated Multi-Stage Vacuum Pumps

To adequately address the requirements of each application, there is a wide range of **CMS HDE series** multi-stage vacuum pump configurations to choose from for MVG series vacuum grippers.

MVG__D_N0K

CMSHDE_**NVO**G4K multi-stage vacuum pump

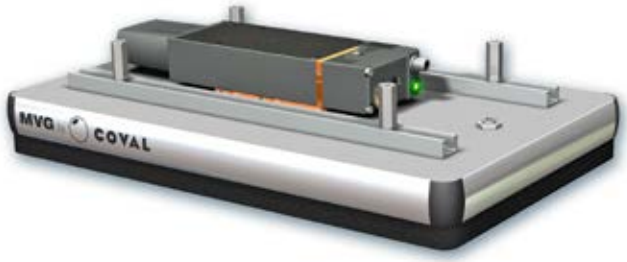
- Without control



MVG__D_S1/V1K

CMSHDE__**V0C15P**G4K multi-stage vacuum pump

- With vacuum and blow-off control
- Without vacuum switch
- One M12-5-pin connector
- Visual vacuum/blow-off indicators
- Digital inputs/outputs mode

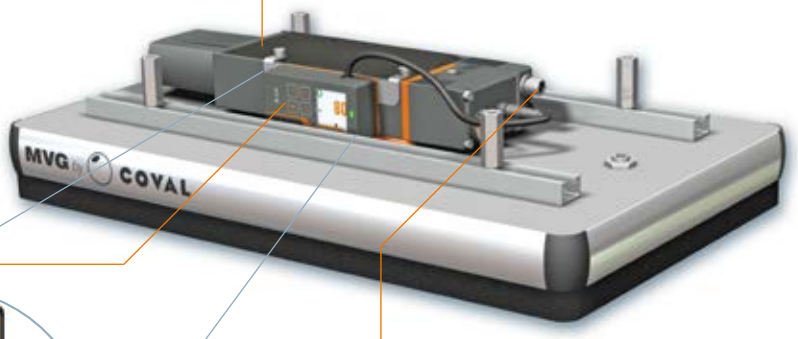


MVG__D_S2/V2K

CMSHDE__**VXC15P**G4KD multi-stage vacuum pump

- With vacuum and blow-off control
- With vacuum switch and pressure sensor
- One M12-5-pin connector
- One M8 4-pin connector for the HMI (option VI)
- Digital inputs/outputs mode (SIO)/IO-Link

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



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

Status indicator (2 colors)

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

Settings keypad

Inputs/Outputs
Digital inputs/outputs (SIO)/IO-Link
- M12 5-pin connector

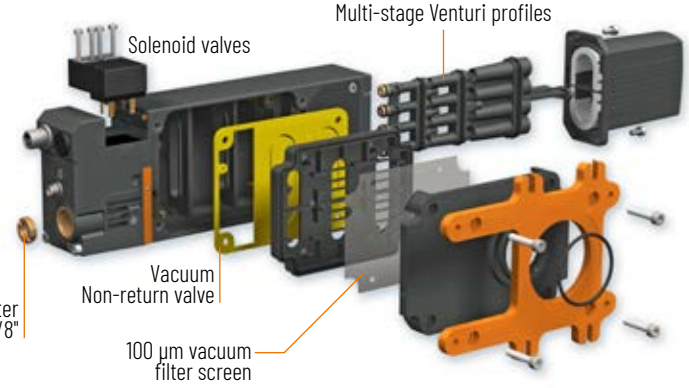
NFC

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

Modularity/Maintenance

The CMS HDE 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 parts may require replacement or cleaning.

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



MVG

Modular Vacuum Grippers

Straightforward Communication

Easier Integration, Use, and Diagnostics

Designed to keep vacuum gripper use and management as straightforward as possible and thus allowing for their easy integration in your smart factory, MVG__**S2**/**V2**_ vacuum grippers include various features that allow for their setup, use, and diagnostics in all situations and at all levels (operators, process, networked factory).

Settings, Diagnostics, and Process Data

CONFIGURABLE SETTINGS

- Choice of language: EN, FR, DE, IT, or ES
- "Object gripped" control thresholds
- Automatic blow-off
- Unit of measurement for vacuum: kPa, %, mbar, inHg
- Unit of measurement for pressure: MPa, bar, psi
- Software updates

DIAGNOSTIC

- Cycle counters (vacuum and blow-off control, objects gripped, objects lost, etc.)
- Clogging detection function
- Supply pressure and voltage monitoring
- Software version
- Product part number and serial number

PROCESS INPUT DATA

- Vacuum and blow-off control

PROCESS OUTPUT DATA

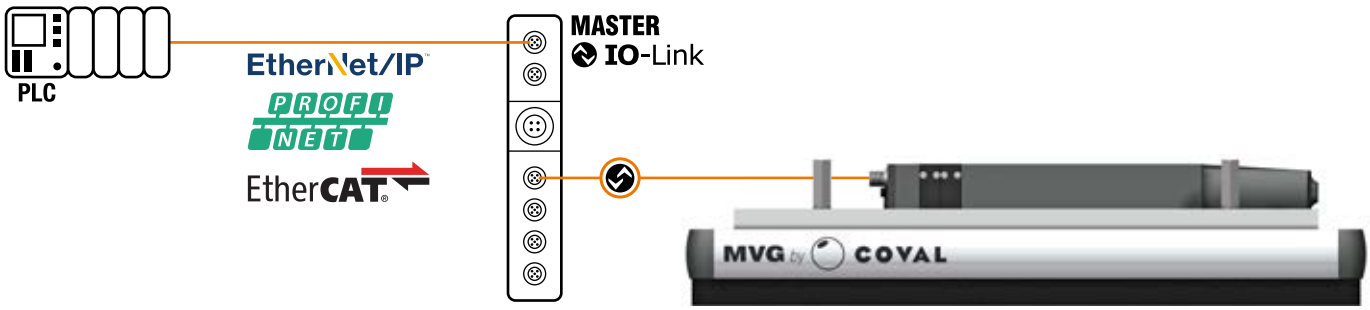
- Instantaneous vacuum level
- Object gripped and object lost information
- Alarms (high/low pressure, high/low voltage)
- Instantaneous pressure level

IO-Link

The IO-Link system that is integrated in **CMSHDE_VXC15X** multi-stage vacuum pumps ensures efficient real-time communication between MVG vacuum grippers and any higher-level protocol (EtherNet/IP, PROFINET, EtherCAT, etc.) required to monitor the production line. It can be used to control pumps, configure settings, and get feedback to ensure maximum productivity.

Advantages:

- Straightforward wiring, installation, and setup
- Remote setup, control, and diagnostics
- Easier preventive maintenance and vacuum pump replacement without manual setup
- Installation and diagnostic tools, and more



MVG

Modular Vacuum Grippers

Straightforward Communication

Mounted or Remote HMI

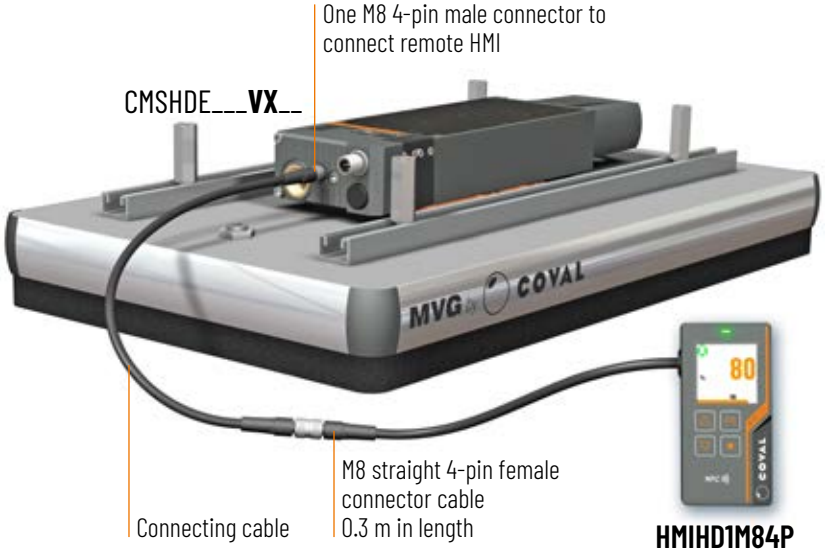
To make it easier to set up and use the vacuum grippers, the MVG range includes an HMI that can be mounted on the vacuum gripper or installed remotely.

Advantages:

- Place the HMI on the vacuum gripper or in an easy-to-access and visible area
- Use a single HMI for several vacuum grippers
- Copy settings from one gripper to another
- Keep using the vacuum gripper even with the HMI removed

MVG vacuum grippers compatible with the HMI:

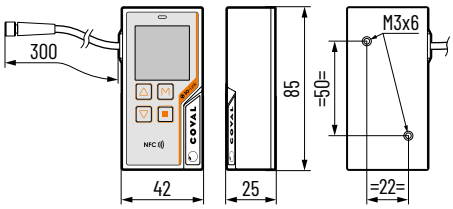
➔ MVG__**S2**/**V2**___ versions with M8 connector



MVG____**VI** version:

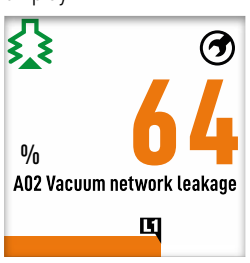
- HMI (part no.: **HMIHD1M84P**) + mounting plate (**HMIHD1FIXC**) mounted on the vacuum gripper

Accessory: Remote HMI (part no.: **HMIHD1M84P**)
See accessories for HMI.



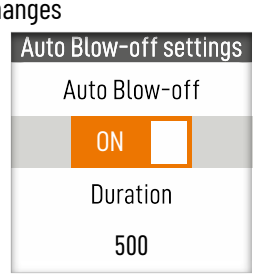
Note: all dimensions are in mm.

HMI Dialog Front Panel



The HMI allows for easy and efficient reading of the vacuum gripper's operation.
The high-visibility display includes all required inputs for full operation:

- Main information is easy to read
- Multilingual: EN – FR – DE – IT – ES
- Simple and clear event messages
- Intuitive settings and diagnostics menus
- Configurable display orientation: 0 – 90 – 180 – 270°
- Lockable to prevent undesired changes



Multilingual EN FR DE IT ES

MVG

Modular Vacuum Grippers

Straightforward Communication

NFC

The NFC wireless technology integrated in the 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 gripper to another
- Save up to 5 setting configurations
- COVAL support: Send a report specifying the settings and diagnostic data to the COVAL departments to get technical support.

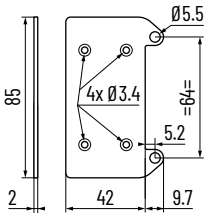
GET IT ON Google Play

Download on the App Store

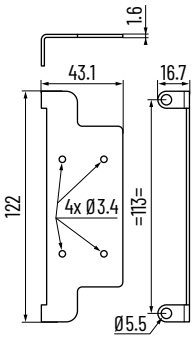
NFC APP: COVAL Vacuum Manager
Available for Android and iOS

Accessories for Remote HMI

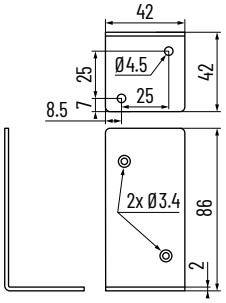
Front mounting plate
+ 2 x TORX M3x6
+ 2 x CHC M5x50
Part no.: **HMIHD1FIXA**



Side mounting plate
+ 2 x TORX M3x6
+ 2 x CHC M5x50
Part no.: **HMIHD1FIXC**



90° angled mounting plate
+ 2 x TORX M3x6
Part no.: **HMIHD1FIXB**



Connecting cable
M8 4-pin female/M8 4-pin male, compatible with cable chain

- 2 m length: part no. **CDM8MF4PL2**
- 5 m length: part no. **CDM8MF4PL5**
- Other lengths available upon request.

Note: all dimensions are in mm.

MVG

Modular Vacuum Grippers

Product Selection Guide

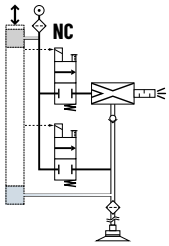
Multi-Stage Vacuum Pump Control

Where required, MVG series vacuum grippers with integrated multi-stage vacuum pump (versions D1 and D2) can be equipped with a vacuum and/or blow-off control valve to optimize object release. This also enables cleaning of the vacuum network, flow control nozzles, check valves, or airtight valves.

A vacuum switch or analog gauge is available as an option for those requiring a visual display of the vacuum level in the system (see below).

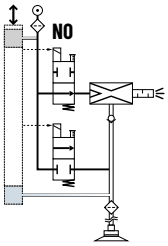
Vacuum Control: Two Solutions

Model MVG__S_: vacuum gripper featuring a 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 valves
- Choice of blow-off settings (only on MVG__**S2**_ models):
  - Controlled by external signal
  - Automatic timer from 50 to 9999 ms (advantage: saves one controller output)

Model MVG__V_: vacuum gripper featuring a vacuum pump with **NO** vacuum control and **NC** blow-off control.
In the event of power failure, vacuum is still generated: object is held in place ➔ fail-safe.



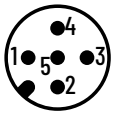
In the event of compressed air failure, the vacuum is no longer maintained.

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

Electrical Connections

MVG_**S1/V1**:

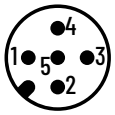
- One M12 5-pin male connector



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

MVG_**S2/V2**:

- 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 D01 – C/Q
5	24 V DC blow-off command

- One M8 4-pin male connector ➔ HMI

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

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

: connections for **IO**-Link

MVG

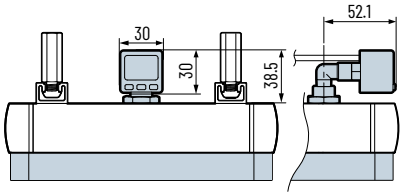
Modular Vacuum Grippers

Options, Dimensions, and Mounting Options

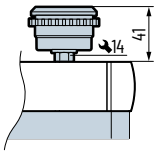
Vacuum Level Display

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

- **Option VA – electronic vacuum switch with digital display (PSD100CPNP): MVG_____X__VA**
  - Pressure rating range: 0 ~ -101.3 kPa
  - Pressure setting range: 10 ~ -101.3 kPa
  - Max. pressure: 300 kPa
  - Fluid: air, non-corrosive/non-flammable gas
  - Hysteresis: adjustable
  - Response time: ≤ 2.5 ms, with anti-vibration function
  - 7-segment LCD display: 2 color (red/green) main display, orange sub-display (refresh rate: 5 times/second)
  - Choice of pressure unit display: kPa, MPa, kgf/cm2, bar, psi, inHg, mmHg
  - Power supply voltage: 12 to 24 V DC ±10%
  - Current consumption: ≤ 40 mA (without load)
  - Repeatability (switch output): ≤ ±0.2% F.S. ±1 digit
  - Electrical connection: M8 (4-pin)
  - Degree of protection: IP40
  - Operating temperature: 0 – 50 °C
  - Enclosure material: PA 6.6 20%GF



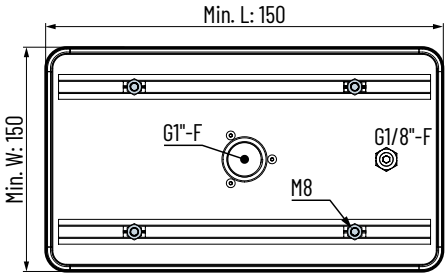
- **Option VF – vacuum gauge (VAF11140): MVG_____X__VF**
  - Damping: by silicone movement (patented)
  - Measuring: Bourdon tube in CuSn
  - Precision: cl. 2.5 (+/- 2.5% of max. scale value)
  - Enclosure: black ABS

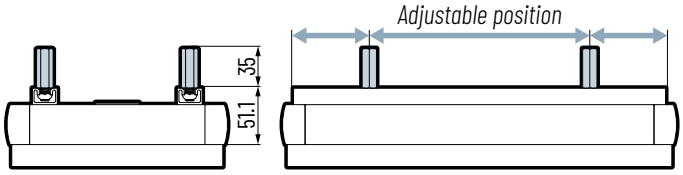


- **Option VI - IHM : MVG_____X__VI**

Version GO

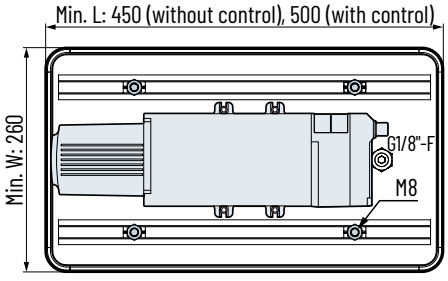
The GO version of COVAL MVG series vacuum grippers (with external vacuum generator) can be mounted on all types of automated or robotic systems, using M8 spacers that slide in the grooves on the aluminum profile (fastened using M8 screws).
The number of M8 spacers used depends on the vacuum gripper's size.

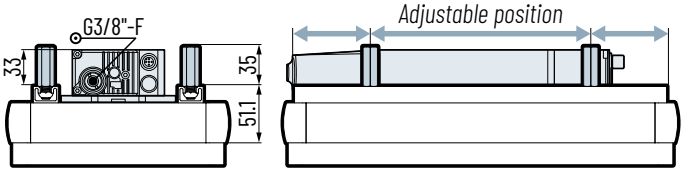




Version D1 or D2

The D1 and D2 versions of COVAL MVG series vacuum grippers (with an integrated CMS HDE series vacuum generator) can be mounted on all types of automated or robotic systems, using M8 spacers that slide in the grooves on the aluminum profile (fastened using M8 screws).
The number of M8 spacers used depends on the vacuum gripper's size.





3D COVAL Data 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. Dimensions are indicative and may change depending on selected options.

MVG

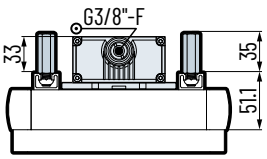
Modular Vacuum Grippers

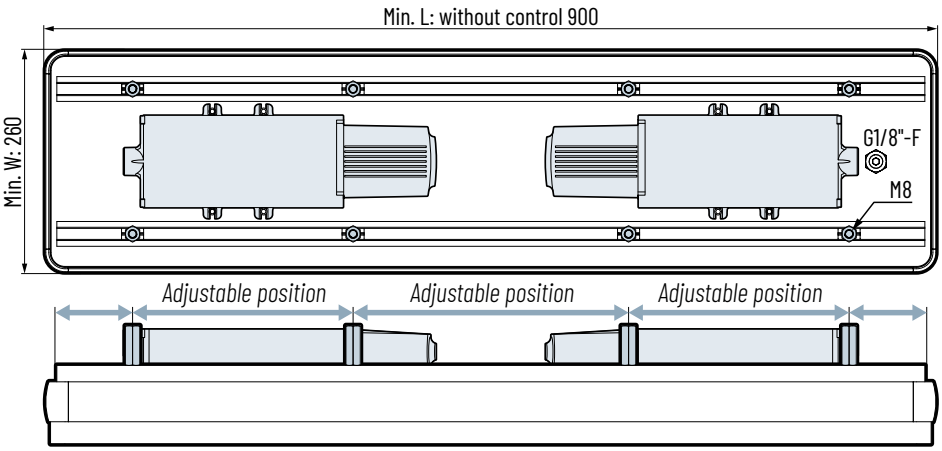
Dimensions and Mounting Options

Version D3

The D3 version of COVAL's MVG series vacuum grippers (with two integrated CMS HDE series vacuum generators) feature adjustable M8 spacers.

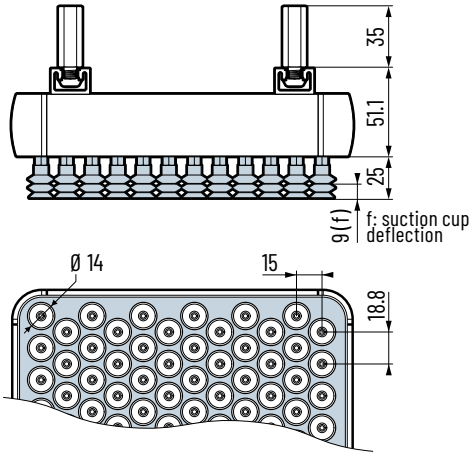
The number of M8 spacers used depends on the vacuum gripper's size.



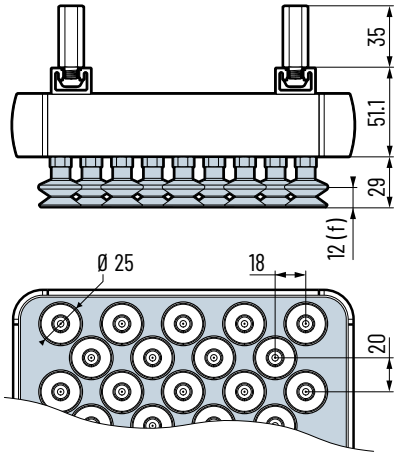


MVG Series with Suction Cup Gripping Interface

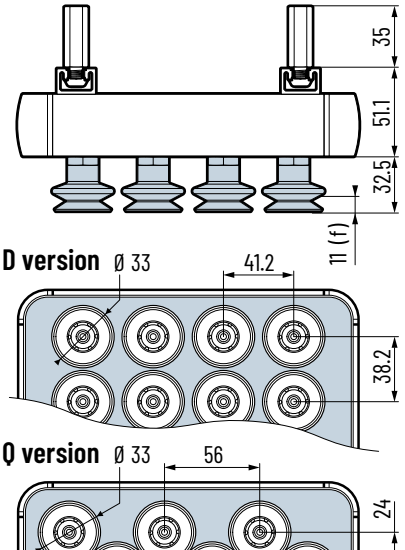
"Mini" suction cup interface



"Medium" suction cup interface

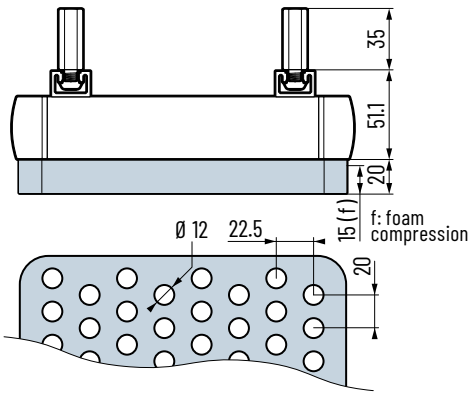


"Max" suction cup interface

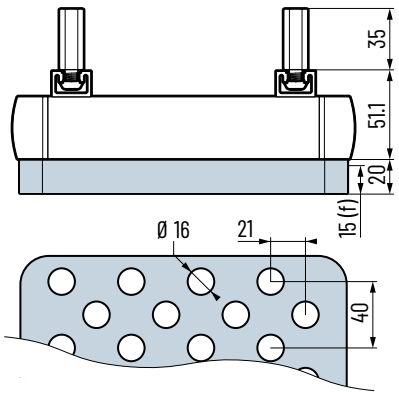


MVG Series with Foam Gripping Interface

"Mini" foam interface



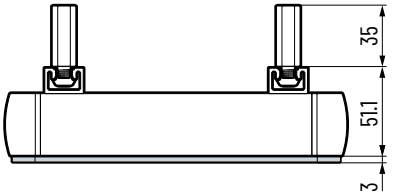
"Max" foam interface



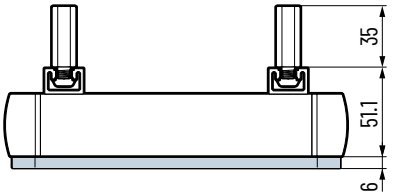
"COVAL-flex" Gripping Interface

COVAL-flex

"COVAL-flex" interface, 3 mm thick



"COVAL-flex" interface, 6 mm thick



Note: all dimensions are in mm.

MVG

Modular Vacuum Grippers

Choosing and Ordering a Gripper

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

LENGTH

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

WIDTH

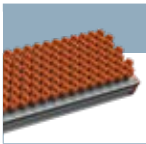
Overall width (mm): from 150 to 1000 mm → ...

GRIP PATTERN LAYOUT

Staggered	Q
Straight*	D

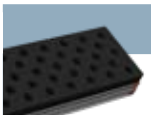
** Only available for "max" suction cup interface with min. suction cup dia. of 26 mm.*

SUCTION CUP GRIPPING INTERFACES



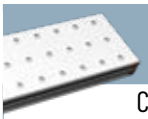
"Mini" interface: 2.5 bellows suction cups Ø 14 mm made of 35 Shore silicone with flow control nozzles	**VSP14BF**
"Medium" interface: 1.5 bellow suction cups Ø 25 mm made of natural rubber with flow control nozzles	**VSA25JI**
"Max" interface: 1.5 bellow suction cups Ø 33 mm made of natural rubber with flow control nozzles	**VSA33JK**
"Max" interface: 2.5 bellows suction cups Ø 30 mm made of 35 Shore white silicone with flow control nozzles	**MVS30EK**

FOAM GRIPPING INTERFACES



"Mini" interface: EPDM (20 mm thick)	**F2S**
"Max" interface: EPDM (20 mm thick)	**F2B**

COVAL-flex GRIPPING INTERFACES



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

FILTER

X	Without
F	With

TECHNOLOGY

H	Flow control nozzles
E	Airtight valves
V	Check valves

MVG

Modular Vacuum Grippers

Choosing and Ordering a Gripper

D1	S		1		K		VA

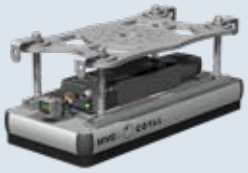
VERSION WITHOUT VACUUM GENERATOR		GENERATOR CONTROL		GENERATOR CONFIGURATION		EXHAUST	
Without generator	G0	N	Without	0	Without	X	Without

VERSIONS WITH VACUUM GENERATOR*		GENERATOR CONTROL		GENERATOR CONFIGURATION		EXHAUST	
1 x **CMSHDE_50**multi-stage vacuum pump Flow rate: 700 Nl/min	D1	N	Without	0	Without	K	Through-type silencer
1 x **CMSHDE_100**multi-stage vacuum pump Flow rate: 1100 Nl/min	D2	S*	**CMSHDE__S_** Multi-stage vacuum pump with **NC** vacuum control and **NC** blow-off control. Choice of blow-off settings (only on MVG__**S2**_ models): ▪ Controlled by external signal ▪ Automatic timer from 50 to 9999 ms (advantage: saves one controller output)	1	**CMSHDE____VOC15P_** Controlled multi-stage vacuum pump without vacuum switch or HMI ▪ One M12 5-pin male PNP ▪ Digital inputs/ outputs mode (SIO)		
2 x **CMSHDE_100**multi-stage vacuum pumps Flow rate: 2200 Nl/min	D3	V*	**CMSHDE__V_** Multi-stage vacuum pump with **NO** vacuum control and **NC** blow-off control. ▪ Blow-off controlled by external signal	2	**CMSHDE____VXC15X_** Controlled multi-stage vacuum pump with integrated vacuum switch and pressure sensor, without HMI ▪ One M12 5-pin configurable as PNP/NPN ▪ One M8 4-pin male for remote HMI ▪ Electronic vacuum switch ▪ Digital Output DO1"object gripped" 24 V DC/NO ▪ Digital inputs/ outputs mode (SIO)/ IO-Link ▪ Compatible with HMI (for option **VI**)		

** See table: "Vacuum pump configurations by gripper length".*

** Only for D1 and D2.*

VACUUM LEVEL DISPLAY	
Without	V0
 Electronic vacuum switch with display	VA
 Vacuum gauge	VF
 HMI on CMS HDE *(option only compatible with versions S2 and V2)*	VI



RSVGF/RSVGL mounting accessories, see "Accessories" page.

Integration of the VA, VF, and VI options depends on the gripper size and on the integrated vacuum generator(s).
→ To be confirmed during gripper engineering and design study.

MVG

Modular Vacuum Grippers

Examples of Assembled Part Numbers

MVG200X200QF2BFHXG0N0XV0

MVG vacuum gripper, 200 x 200 mm, "staggered" grip pattern layout, "max" EPDM foam gripping interface with filter, nozzles, and no integrated vacuum generator.
1.6 kg.

MVG500X265DVSA33JKXHXD2S1KVA

MVG vacuum gripper, 500 x 265 mm, "straight" grip pattern layout, "max" gripping interface, 1.5 bellow suction cups Ø 33 mm made of natural rubber with flow control nozzles, a CMSHDE_100 multi-stage vacuum pump, NC vacuum and blow-off control, and electronic vacuum switch with display for vacuum level display.
4.9 kg.

MVG380X250QVSP14BFXHXD2V2KVI

MVG vacuum gripper, 380 x 250 mm, "staggered" grip pattern layout, "mini" gripping interface, 2.5 bellows suction cups Ø 14 mm made of 35 Shore silicone with flow control nozzles, a CMSHDE_100_ multi-stage vacuum pump with NO vacuum control and NC blow-off control, vacuum switch, pressure sensor, and HMI.
4.9 kg.

MVG1000X400QF2SXHXD3N0KVF

MVG vacuum gripper, 1000 x 400 mm, "staggered" grip pattern layout, "mini" EPDM foam gripping interface with nozzles, CMS HDE 100 multi-stage vacuum pumps without control, and vacuum gauge for vacuum level display.
10.8 kg.

MVG

Modular Vacuum Grippers

Examples of Customized Versions

COVAL CUSTOMIZATION

There might be situations where the standard MVG configurations available here will not match your application requirements.

COVAL can provide customized solutions, based on your operating specifications, integrating specific functions (e.g. multi-zoning) or by suggesting a gripping interface based on the COVAL range of suction cups (a wide choice of shapes, diameters and materials) to efficiently meet all your requirements.

MVG410X280Z01G6XHXD2S1KVA

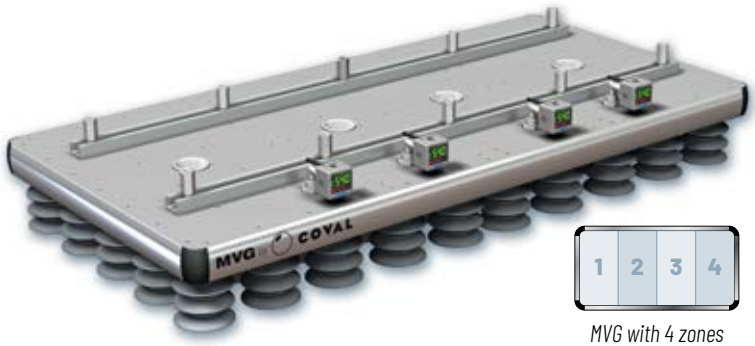
MVG vacuum gripper, 410 x 280 mm, "straight" grip pattern layout, 6 mm-thick COVAL-flex gripping interface with nozzles, a CMSHDE_100 multi-stage vacuum pump with NC vacuum and blow-off control, electronic vacuum switch with display for vacuum level display, and 4 through-holes for customer's fitting requirements.

5 kg.

MVG500X500Z01CBC85HPXHXD2S2KVI

MVG vacuum gripper, 500 x 500 mm, "straight" grip pattern layout, gripping interface with C series 1.5 bellow suction cups Ø 85 mm made of nitrile with nozzles, a CMSHDE_100 multi-stage vacuum pump with NC vacuum and blow-off control, vacuum switch, pressure sensor, HMI, and an M12 bulkhead adapter for sensor and a spring compensation system RSVGL40M1FIX1.

8.5 kg (MVG Vacuum Gripper) + 2 kg (RSVGL40M1FIX1 spring system).



MVG with 4 zones

MVG800X400Z04VS62JNXHXG0N0XVA

MVG vacuum gripper, 800 x 400 mm, "straight" grip pattern layout, gripping interface with VS series 2.5 bellows suction cups Ø 62 mm made of natural rubber with flow control nozzles, 4 independent zones equipped with an electronic vacuum switch with display, and no integrated vacuum generator.

11 kg.

MVG1200X600Z04F3BXHXG0N0XVA

MVG vacuum gripper, 1200 x 600 mm, "straight" grip pattern layout, "max" 30 mm-thick EPDM foam gripping interface with nozzles, 4 independent zones equipped with an electronic vacuum switch with display, and no integrated vacuum generator, equipped with a spring compensation system for heavy loads RSVGF30X8M4.

MVG with 4 zones

17.8 kg (MVG vacuum gripper) + 4.6 kg (RSVGF30X8M4 spring system).

RSVGL40M1FIX1: Spring compensation system

The **RSVGL** spring compensation systems are designed to compensate for surface irregularities while ensuring precise positioning of the vacuum gripper during part pick-up.

RSVGL40M1FIX1 is compatible with the MVG vacuum gripper range:

- Spherical joint effect with 11° of freedom.
- Compensation for flatness defects.
- High robustness.
- Mounting interface for industrial robots according to ISO 9409 standard.

Materials

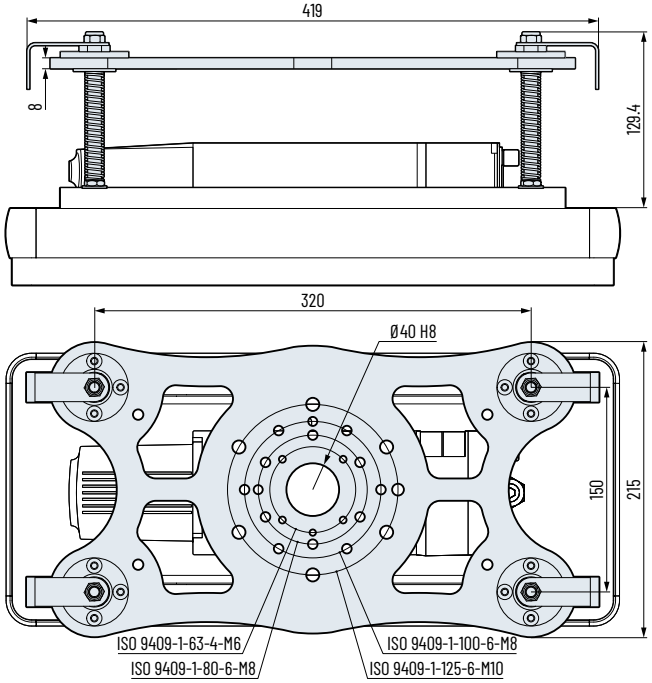
- Plate: aluminum.
- Shafts: stainless steel.
- Springs: steel.
- Fasteners: zinc-plated steel.

Characteristics

Stroke (mm)	Max. load (kg)	Mass (kg)	Max. tilt angle	Force at rest (N)	Spring stiffness (k)*
40	140	2	11°	37	2 N/mm

Includes 4 spring systems and 1 mounting plate.
** Data given for the complete RSVGL system, i.e. all 4 springs.*

Dimensions



RSVGF30X8M4: Spring compensation system for heavy loads

The **RSVGF** spring compensation systems are designed to compensate for surface irregularities while ensuring precise positioning of the vacuum gripper during part pick-up.

RSVGF30X8M4 is compatible with the MVG vacuum gripper range:

- Spherical joint effect with 14° of freedom.
- Compensation for flatness defects.
- High robustness.
- Heavy loads.

Materials

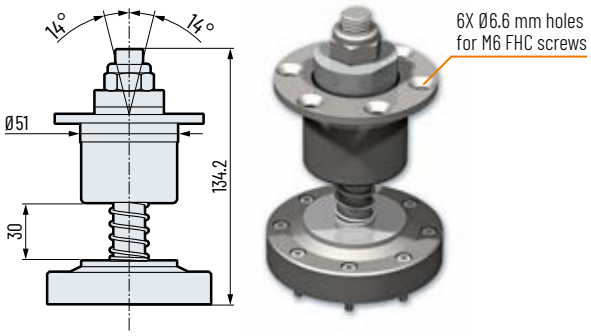
- Springs: steel.
- Fasteners: zinc-plated steel.
- Shafts: stainless steel.

Characteristics

Stroke (mm)	Max. load (kg)	Mass (kg)	Max. tilt angle	Force at rest (N)	Spring stiffness (k)*
30	240	4.6	14°	106	5.3 N/mm

Includes 4 TSVGF30X8M4 spring systems (without mounting plate).
** Data given for the complete RSVGF system, i.e. all 4 springs.*

Dimensions



The integration constraints of this spring system must be taken into account right from the design phase of the MVG vacuum gripper.
Coval will support you and validate technical feasibility with you according to your application requirements.

Note: all dimensions are in mm.

MVG

Modular Vacuum Grippers

Technical Specifications

General Specifications

- Operating temperature: 0 to 50 °C (32 to 122 °F)
- Material of gripper: aluminum, PA 6.6 15% GF, brass, stainless steel, neoprene
- Material of foam gripping interface: EPDM
- Materials of suction cup gripping interface:
  - Mini interface: 35 Shore silicone
  - Medium interface: 50 Shore natural rubber
  - Max interface: 50 Shore natural rubber or 35 Shore white silicone

Specifications of Multi-Stage Vacuum Pumps

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

Integrated electronics

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

Only on models CMSHDE___**VX**__ installed on MVG__**S2** / **V2** vacuum grippers:

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

DO1 output signal

Only on models CMSHDE___**VX**__ installed on MVG__**S2** / **V2** vacuum grippers:

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

Diagnostic

Only on models CMSHDE___**VX**__ installed on MVG__**S2** / **V2** vacuum grippers:

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

Indicator on model CMSHDE__**V0C15P__** installed on MVG__**S1** / **V1** vacuum grippers:

- Status LED for control functions:
  - Green LED: vacuum control
  - Orange LED: blow-off control

Information displayed on HMI (option VI)

- 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
  - The display rotation can be configured as follows: 0 – 90 – 180 – 270°.

Parameter settings available with the HMI or IO-Link

Only on models CMSHDE___**VX**__ installed on MVG__**S2** / **V2** vacuum grippers:

- Choice of blow-off type (only MVG_**S2**):
  - Controlled
  - Automatic timed, adjustable from 50 to 9999 ms
- Object gripped (L1) control thresholds
- Whenever required by the application, specific threshold and hysteresis settings that are different from the initial factory settings can be defined: L1 = 40%, h1 = 10%

+ Additional parameter settings available with the HMI

(performed with 4-key membrane keypad):

- 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

- The COVAL Vacuum Manager mobile app is available on the following devices:
  - Android version 8.1 and higher
  - iOS version 13 and higher

COVAL
vacuum managers

vacuum components

A TECHNOLOGICAL PARTNER ON A GLOBAL SCALE

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

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

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

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

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

Visit the following section on COVAL's website:
contacts > commercial network
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