COVAL

vacuum managers

modules GEM

compact integrated vacuum pumps

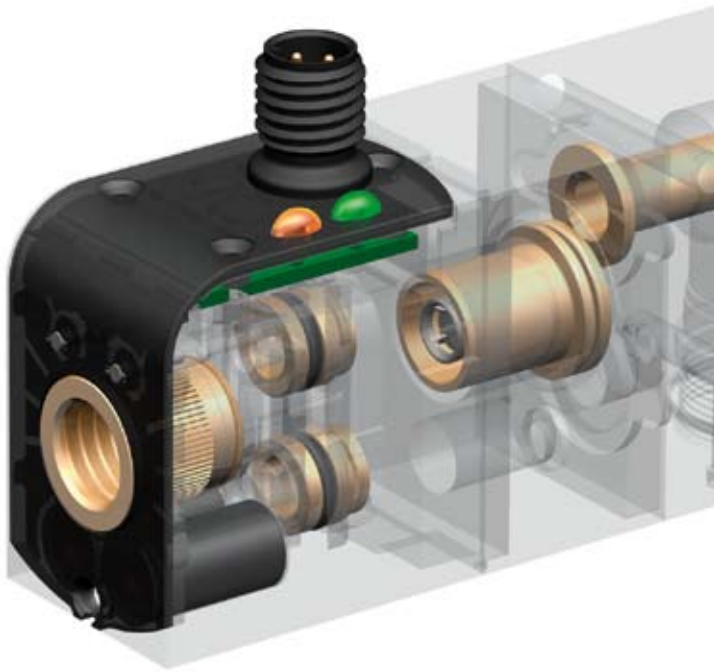
www.coval.com

twin tech™

twin tech™ : A new in industrial

*With « **Twin Tech™** » the association of two patented technologies by COVAL the new **GEM** series vacuum pump guarantees optimal performance, a significant reduction in the sound level as well as air consumption in a single compact, integrated, light weight module.*

***COVAL is an ISO 9001: V2000 certified company** which offers innovative solutions integrating reliable and optimized components with intelligent functionalities. The focus is to provide the most personalized and economic solution to a given application while assuring a significant improvement in the productivity and the safety of the vacuum users around the world.*



ivc

Integrated Vacuum Control

INTEGRATED SOLENOID PILOTS

A traditional single or multi stage vacuum pump must be equipped with additional peripheral modules necessary for its functioning: solenoid-pilots, valve and electronic circuit, supply pressure regulator, vacuum switch and blow-off valve, which lead to increased dimensions, weight, complex wiring and additional cost of the overall vacuum system.

The patented ***ivc*** technology of COVAL allows the integration of all necessary functions into a single compact and light weight module. The installation is drastically simplified: no need to select, order and install additional peripheral modules as it comes in a ready to use plug and play format.

A single compact module

perspective
vacuum technology

With Twin Tech COVAL offers a complete vacuum management solution

Summary

ipr

Intelligent Pressure Regulation

OPTIMIZED COMPRESSED AIR CONSUMPTION

Even the multi stage models of traditional vacuum pumps are noisy and consume substantial amounts of compressed air. COVAL resolves this problem with the ***ipr*** technology.

The internal intelligence of the GEM vacuum pumps combine permanently the function of the integrated pressure regulation system to the venturi profile whatever be the pressure in the air network. The unique combination of the pressure regulator and venturi reduces both the sound level and the energy consumption significantly.

Silence and energy savings

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Advantages of

Integrated Vacuum Control

Advantages:

DIRECT CONTROL, 24VDC – 0.7W
COVAL innovation, the integration of the micro solenoid pilots, the valves and the electronic control circuit makes the module independent and simplifies its implementation:
Direct connection from a programmable controller, normalized M12 connector, built-in visual LEDs and auxiliary manual controls facilitate the operation.

EXTENDED VACUUM PERFORMANCE
- maximum vacuum level: up to 90%
- flow rate: up to 385 Nl/mn

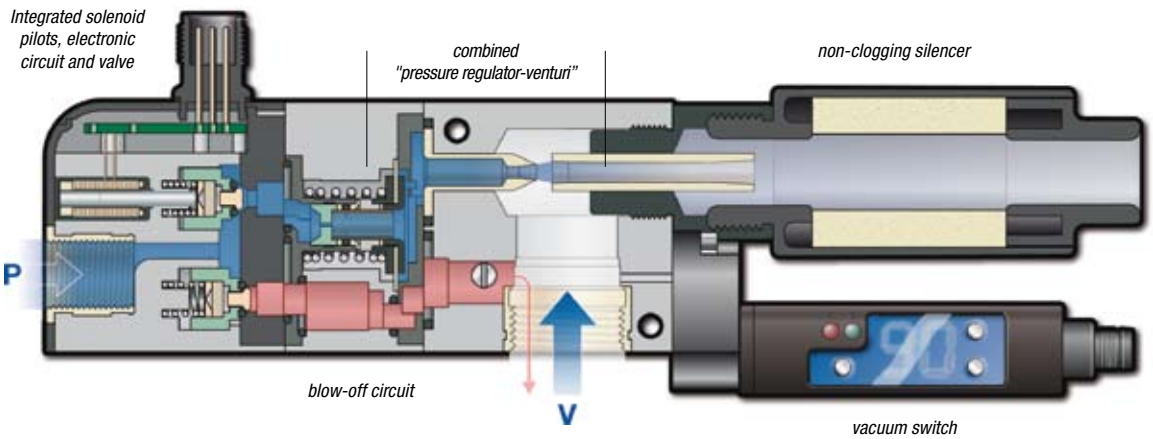
COMPACT & LIGHT WEIGHT
In contrast to the traditional and multi stage vacuum pumps, the GEM series integrates all miniaturized peripheral devices in one compact and light weight unit.

INTEGRATED BLOW-OFF
Full pressure blow-off with adjustable flow-rate, by choice:
- controlled by 2 solenoid-pilots
- temporized by electronic control circuit (1 unique control)

FLEXIBLE CONFIGURATIONS
The GEM series is especially developed by COVAL to facilitate the determination of specific module corresponding for your application needs:
- choice of vacuum level (90% or 60%) and different vacuum flow rates up to 385 Nl/min according to your needs.
- thus making it possible for you to optimize the necessary functions valid for your specific application (i.e.: modules with or without blow-off).
- the proposed accessories permit you to adapt the GEM series vacuum pump to your environment (adjustable vacuum-switch, part presence checking, non-return valve,…).

As the industry moves towards integrated automation solutions, COVAL identifies and integrates the latest trends in automation technology into its product innovation programs through collaborations and partnerships with renowned organisations and experts in multiple domains of science and technology.

Profile of the integrated functions



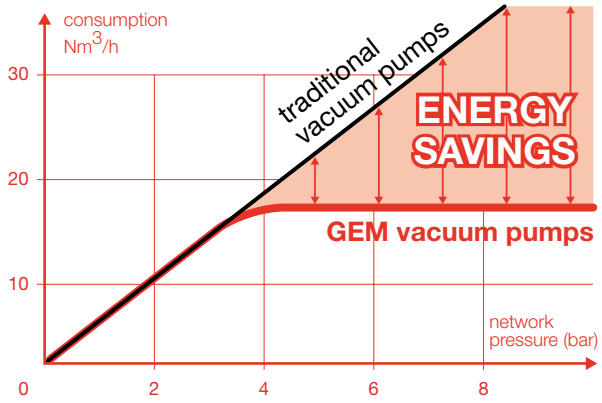
twin tech™ technology

ipr Intelligent Pressure Regulation

Advantages:

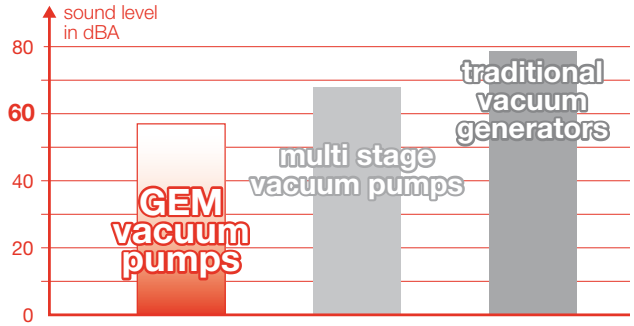
ENERGY SAVINGS

The innovative combination of “pressure regulation-venturi” ipr optimizes the functioning of the vacuum pumps whatever the supply pressure.
This results in substantial savings on compressed air consumption which is examined in the adjacent figure.
(Refer to page 7 for measured values).



FUNCTIONING SILENCE

The new GEM series vacuum pumps developed by COVAL offer an exceptionally silent functioning and guarantee a significant reduction with regard to the authorized sound level.
The reduction in the sound level may attain 20 dBA.



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The new GEM

GEM applications

With a wealth of 20 years experience behind it, COVAL has particularly studied the polyvalence of this range, which can adapt itself very quickly to your needs and your constraints: optimization of the vacuum level, the flow rate and the auxiliary functions.

PACKAGING MACHINES
Automatic packing system requires more and more flexibility and rapidity.
The GEM range is perfectly adapted to meet these requirements by offering an optimum evacuation time and incorporating vacuum and blow-off functions with a large choice of vacuum switches ; all this with a reduction of noise level and air consumption.

ROBOTIC HANDLING TOOLS
COVAL is the reference for a number of years in robotic vacuum handling systems for the automotive industry and others. The GEM range vacuum generation is even more versatile and compact (M12 connectors) with the optimization of the vacuum control thanks to different possibilities (vacuum and/or blow-off control, models with automatic, timed and adjustable blow-off…).
The GEM range offers additionally an optimization of the efficiency and on-vehicle weight, and a low sound level, with small dimensions.

PLASTIC INDUSTRY
The GEM range is the perfect answer to your multiple and optimized handling needs. Thanks to its wide using range, it is ideal for end of line part gripping, by handling your product fast and secure. Its built-in controls facilitate connections and accelerate cycles and the unit can be fitted with high precision vacuum switches.

CLAMPING
The GEM range, thanks to its wide range of possibilities, is the ideal tool for vacuum clamping and transfer handling whatever your application and environment is.
Its technology allows it to work in all positions without filter and guarantees you an attenuation of air consumption and sound level.

YOU ARE UNIQUE: on simple request, COVAL is able to analyse your equipment and make a functioning and consumption simulation integrating the GEM modules adapted to your needs.

modules of COVAL

Exceptional performance

ENERGY SAVINGS

With a traditional vacuum pump, the air consumption increases with the pressure in the network.
Thanks to the integrated combination "pressure regulator-venturi", **the GEM vacuum pumps optimize the energy consumption resulting in substantial energy savings whatever be the network pressure.**
The energy savings may attain more than 50%.

nozzle ø	compressed air consumption (Nl/mn)				
1.2 mm	65	108	thanks to **GEM**, at 6 bar you will save up to **37%** of compressed air	139	thanks to **GEM**, at 8 bar you will save up to **51%** of compressed air
1.5 mm	97	157		203	
2 mm	179	278		357	
2.5 mm	260	404		519	
3 mm	385	614		797	
network pressure	4 to 8 bar	6 bar		8 bar	
	GEM	traditional vacuum generators			

SILENT TECHNOLOGY

With a traditional vacuum pump, the sound emitted through the exhaust equipped with a silencer increases with the pressure in the network. Thanks to the integrated combination "pressure regulator-venturi" and the optimized silencer, **the GEM vacuum pumps provide an exceptionally silent functioning whatever the pressure.**

nozzle ø	sound level (dBA)				
1.2 mm	57	76	thanks to **GEM** sound level attenuation until **20** dBA at 6 bar	84	thanks to **GEM** sound level attenuation until **30** dBA at 8 bar
1.5 mm	57	77		85	
2 mm	57	78		85	
2.5 mm	65	76		85	
3 mm	67	78		85	
network pressure	4 to 8 bar	6 bar		8 bar	
	GEM	traditional vacuum generators			

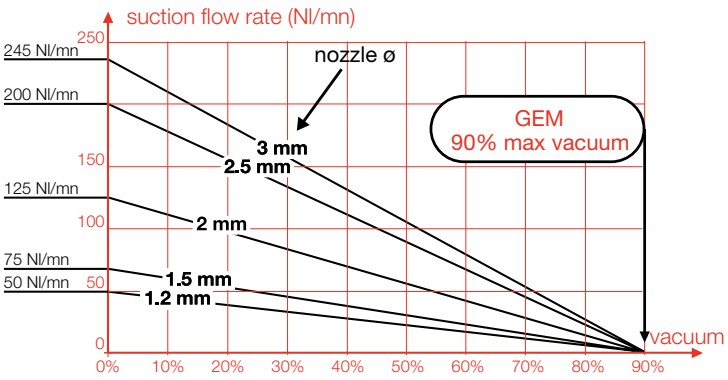
CLOG FREE DESIGN

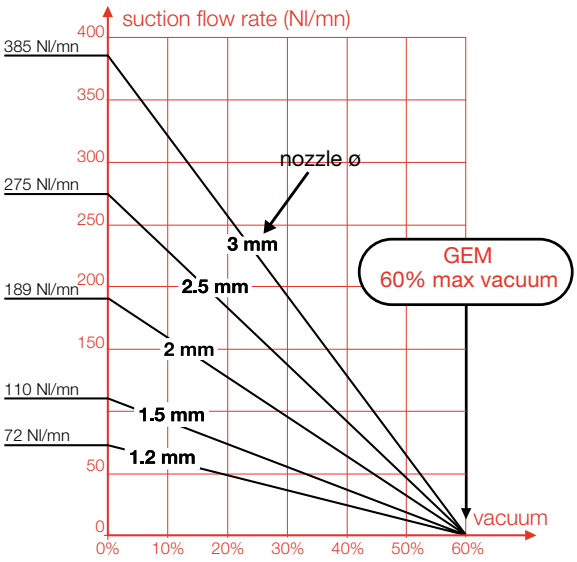
The applications equipped with multi stage vacuum pumps in dusty industrial environments are frequently subjected to clogging problems.
The problem can be attributed to their complex internal design and also the working principle of the multi stage vacuum pumps.
The new GEM modules offer a simple design and a non-clogging silencer which facilitate the evacuation of the absorbed particles during the suction phase.

VACUUM 60%-90%

According to the application and to the parts to be handled, the GEM vacuum pumps offer an extended vacuum range (60% or 90% vacuum).

SUCTION FLOW RATE





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GEM Series – Configuration of a

COMPOSED MODULE PART NUMBER	GEM	90	X	12

VACUUM LEVEL	
60% max. vacuum optimum for porous products	**60**
90% max. vacuum optimum for non-porous products	**90**

NOZZLE DIAMETER	
12	nozzle 1.2 mm ID
15	nozzle 1.5mm ID
20	nozzle 2 mm ID
25	nozzle 2.5 mm ID
30	nozzle 3 mm ID

The choice and dimensioning are particularly simple. On your request the GEM may be fitted out with the specificity corresponding to your activity.

CHOICE OF THE VACUUM PUMP CHARACTERISTICS

Select the required vacuum level (60 or 90%) and then the nozzle diameter necessary for the application. For a given application (gripping of porous product, non-porous product or emptying a volume) the choice will be done by following the methods described below:

1 Porous products

For instance: cardboard, raw wood, pastries…

> GEM PUMP 60% MAX. VACUUM

For the choice of the nozzle diameter and with regard to the product porosity, (leak rate), please refer to the curve “GEM 60 % max. vacuum” page 7.

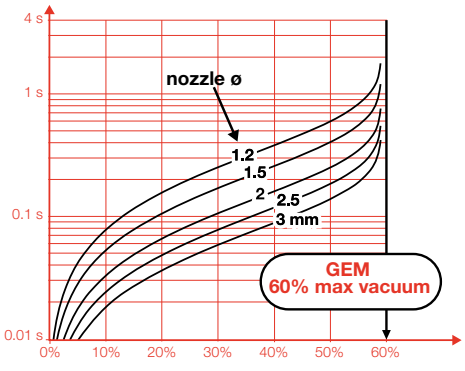
2 Non-porous products

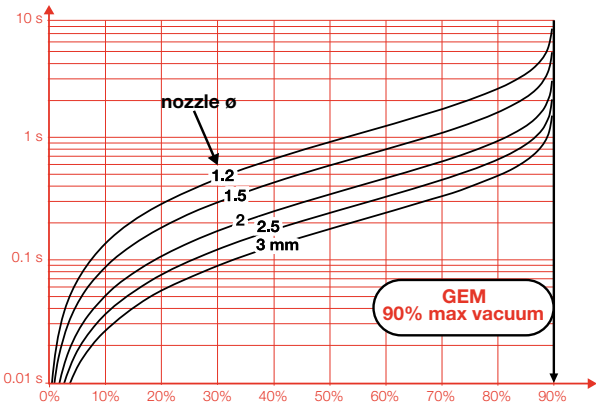
For instance: glass, plastic, coated wood, metal sheet…

> GEM PUMP 90% MAX. VACUUM

The nozzle diameter is determined by the requested time to grip the part with help of the curve below.

Emptying time for a 1 litre volume (given as an indication).



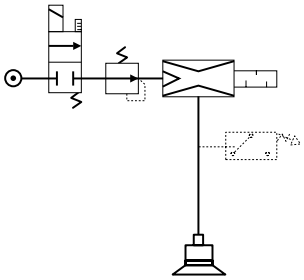


vacuum pump for a given application

	S		**V**	**A**

MODULE COMPOSITION

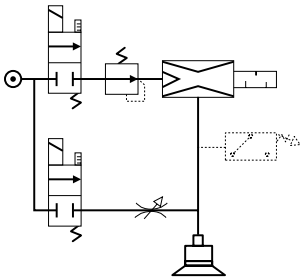
R — Simple vacuum pump, without blow-off



GEM__X__**R**V_

- The simplest composition
- Only one control signal

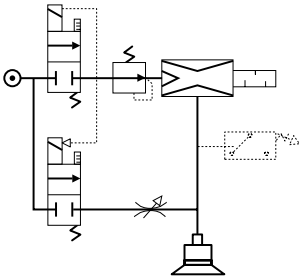
S — Vacuum pump with controlled blow-off



GEM__X__**S**V_

- Blow-off controlled by external signal, with adjustable flow rate
- 2 control signals

T — Vacuum pump with automatic and timed blow-off



GEM__X__**T**V_

- Blow-off controlled by the ejector shutdown and maintained for an adjustable time between 0 and 3 s, with adjustable flow rate
- Only one control signal

VACUUM SWITCHES

VA	**Display type electronic vacuum switch** 2 outputs on M8 connector
VB	**Electronic vacuum switch** 1 output on M8 connector
VC	**Vacuum switch with electrical contact** 1 output on M12 connector
VO	**No vacuum switch**

YOUR OPTIONS

On request, the following specifications can be obtained:

- **Vacuum pump control by solenoid pilot N.O.**
  With a solenoid pilot normally opened, the product remains gripped even in case of power failure.
  > to make some applications completely safe.
- **Module with non-return valve on the vacuum network**
  > to make other applications completely safe.
- **Module with integrated vacuum gauge**
  > vacuum level display.
- **DIN connector 15mm module**

EXAMPLE OF A STANDARD MODULE:

GEM 90X12SVA

(GEM vacuum pump, 90 % vacuum maximum, nozzle diameter 1.2 mm, with controlled blow-off, with display type electronic vacuum switch)

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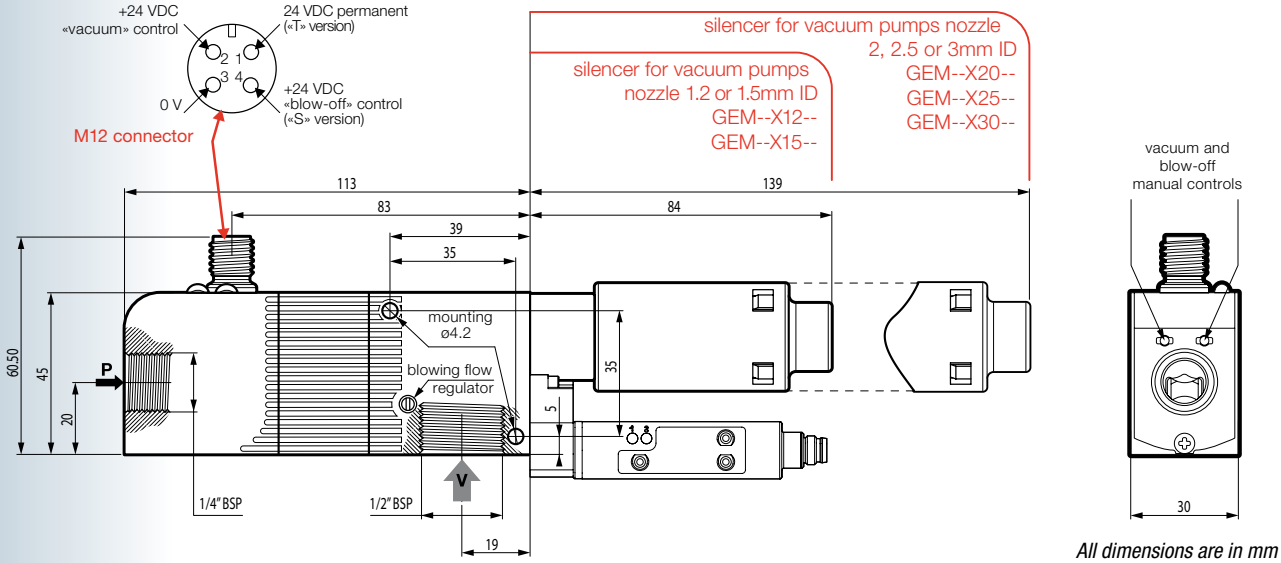
General characteristics, Size and Connections



All dimensions are in mm

General characteristics

C.A supply 5µ filtered, non-lubricated air relevant to ISO 8573-1 class 4 standard

- Protection: class IP65
- Optimal working pressure: from 4 to 8 bars
- Blow-off: - network supply pressure
  - Adjustable flow rate
- Maximum vacuum: 60% or 90% according to model (refer page 8)
- Flow rate: from 50 to 385Nl/mn according to model (refer page 8)
- Air consumption: from 65 to 385Nl/mn according to model (refer page 7)
- Sound level: from 57 to 67dBA according to model (refer page 7)
- Voltage control: 24 V DC (regulated) +/- 10%
- Current draw: 30mA (0.7W) vacuum or blow-off
- Maximum working frequency: 2Hz
- Number of operations: 10 million cycles
- Weight: about 250g according to model
- Materials: PA 6-6 15%FG, POM, PC 15% FG, brass, aluminium, NBR
- Working temperature: from 10 to 60°C

Electrical connections

The female connectors, to be screwed, allow the electrical connection of a module (M12) and its vacuum switch (M8 or M12 according to model).

SPECIFICATIONS:

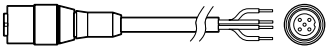
- Female connectors
- 2m PVC cable, pre-assembled four-core
- Protection IP65
- Connector wiring: brown white blue black:

SPECIAL CONNECTORS ON REQUEST:

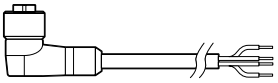
- PUR cable
- 5 or 10 m. length

M12 CONNECTORS

- straight CDM12



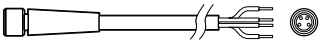
- elbowed CCM12



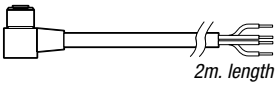
2m. length

M8 CONNECTORS

- straight CDM8



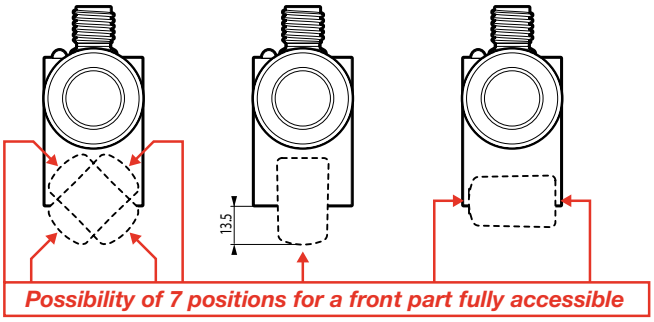
- elbowed CCM8

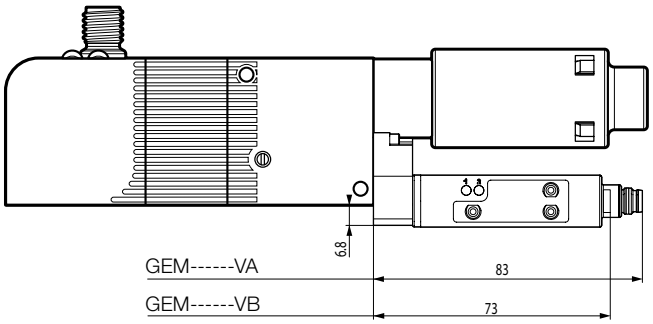


2m. length

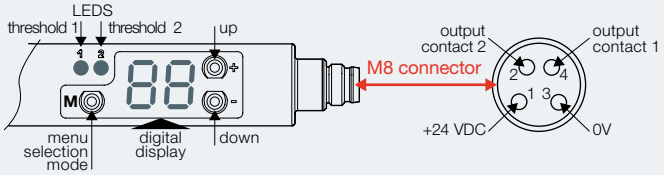
Vacuum Switches

1 - Modules with adjustable electronic vacuum switch GEM------VA ou GEM------VB

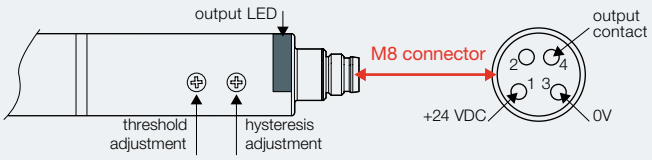




VACUUM SWITCH WITH DISPLAY, 2 OUTPUTS, GEM------VA
- Compatible fluids: non-corrosive gases; dry, non-lubricated air
- Adjusting range: -1 … 0 bar
- Hysteresis: adjustable from 0 to 99 %
- Maximum overpressure: 3 bars
- Repeatability: +/- 1 % of the range
- Output thresholds: 2 x NO/NC
- Switching capacity: 125mA transistor PNP
- Thresholds state display: 2 x LEDs
- Display unit: vacuum % (2 digits)
- Electrical connection: connector M8 (4 pins)
- Power supply: 18 to 30 VDC (regulated)
- Current draw: < 100mA
- Protection: IP 65
- Working temperature: 0 to 50°C.

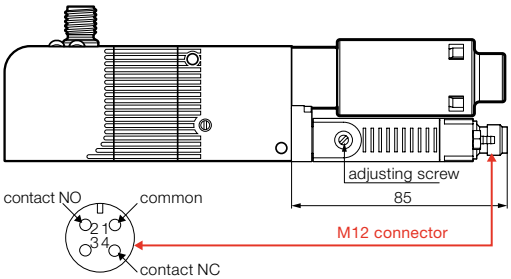


ELECTRONIC VACUUM SWITCH, 1 OUTPUT, GEM------VB
- Compatible fluids: non-corrosive gases; dry, non-lubricated air
- Adjusting range: -1 … 0 bar
- Hysteresis: 0 to 30 % adjustment by potentiometer
- Maximum overpressure: 3 bars
- Repeatability: +/- 1 % of the range
- Output threshold: 1 x NO
- Switching capacity: 125mA transistor PNP
- Thresholds state display: 1 x LED
- Electrical connection: connector M8 (4 pins)
- Power supply: 18 to 30 VDC (regulated)
- Current draw: < 20mA
- Protection: IP 50
- Working temperature: 0 to 50°C



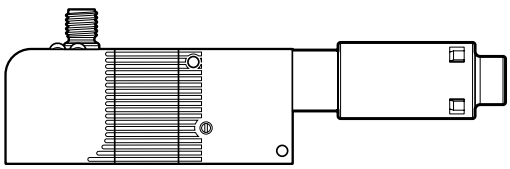
2 - Modules with electric vacuum switch GEM------VC

ELECTRIC VACUUM SWITCH, GEM------VC
- Compatible fluids: non-corrosive gases; dry, non-lubricated air
- Adjusting range: -350 to 850 mbar
- Hysteresis: 125 mbar
- Maximum overpressure: 2 bars
- Repeatability: 3 % of the range
- Output thresholds: 1 x NO, 1 x NC
- Switching capacity: 3A (breaking switch)
- Electrical connection: connector M12 (4 pins)
- Power supply: up to 125 Volts
- Protection: IP 40
- Operating temperature: -10 to 50°C
- Number of operation: 5 million cycles
- Maximum work rate: 30 cycles per minute



3 - Modules without vacuum switch GEM------V0

This model without vacuum switch has to be completed with an independent vacuum switch on the vacuum network or with a vacuum gauge in the case of a manual tank emptying.



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**"THE RIGHT VACUUM
THE PLACE YOU NEED IT
THE TIME YOU NEED IT"**

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

COVAL is an ISO 9001: V2000 certified company which offers innovative solutions integrating reliable and optimized components with intelligent functionalities. The focus is to provide the most personalized and economic solution to a given application while assuring a significant improvement in the productivity and the safety for the vacuum users around the world.

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

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

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

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

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COVAL VACUUM TECHNOLOGY INC.
212-112 Powell Drive
Raleigh, NC 27606

Phone: (919) 233-4855
Fax: (919) 233-4854

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