Vacuum generators OVEM

Vacuum generators OVEM

Key features

At a glance

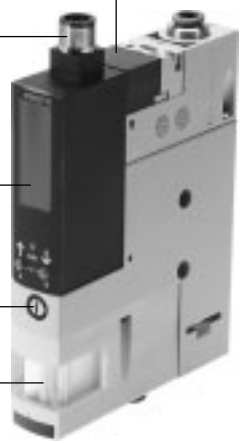
Accelerated vacuum reduction for safe placement of the workpiece by means of integrated solenoid valve for controlling the ejector pulse

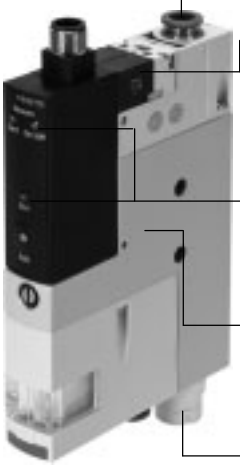
Central electrical connection via M12 plug

OVEM-...-2P/2N/PU/NU/PI/NI
Monitoring and visualisation of the vacuum by means of a vacuum sensor with LCD display (bar)

Adjustment of the ejector pulse via flow control screw

Prevention of contamination of the vacuum generator by means of integrated filter





Quick and secure installation thanks to QS fitting

Fast vacuum build-up by means of integrated solenoid valve for controlling the compressed air supply

OVEM-...-1P/1N
Monitoring of the vacuum and status displays for switching output and solenoid valves by means of a vacuum sensor with LED display

Prevention of pressure drops by means of integrated non-return valve

Maintenance-free operation and reduced noise level through integrated, open silencer

The modular vacuum generator series

The modular vacuum generator series OVEM offers a wide range of individually selectable functions, making it possible to find a solution for the most varied of applications.

Functions	Values
Laval nozzle	0.45 mm
	0.7 mm
	0.95 mm
	1.4 mm
	2.0 mm[1)]
Vacuum generator characteristic	High vacuum
	High suction rate
Housing size	20 mm, metric version, display in bar
	20 mm, NPT version, display in inchHg[2)]
Pneumatic connections	QS fittings, with or without open silencer
	QS fittings (inch), with or without open silencer[2)]
	G female thread, with or without open silencer
	NPT female thread, with or without open silencer[2)]
	Prepared for supply manifold
Normal position of the vacuum generator	Normally open, with or without ejector pulse
	Normally closed, with or without ejector pulse
Electrical connection	M12 plug (5-pin)
Vacuum sensor	Without vacuum sensor
	Switching output 1x PNP or 1x NPN[3)]
	Switching output 2x PNP or 2x NPN[4)]
	Switching output 1x PNP or 1x NPN and analogue output[4)]
Alternative vacuum display	inchHg[4)]
	inchH2O[2) 4)]
	bar[2) 4)]

1) Restricted number of functions
2) Product documentation ➔ Internet: ovem-npt
3) Vacuum sensor with LED display
4) Vacuum sensor with LCD display

Vacuum generators OVEM

Key features

The innovative vacuum generator

Economical

- Short switching times thanks to integrated solenoid valves
  - Vacuum on/off
  - Ejector pulse
- Quick, precise and safe placement of the workpiece by means of the ejector pulse
- Cost saving through preventive maintenance/service thanks to maintenance indicator
- Cost saving through integrated air-saving function
- Powerful supply of multiple vacuum generators via a common supply manifold (➔ page 18)
- Low-cost variants with one switching output (OVEM-...-1P/1N)

Easy to use

- Simple installation via M12 plugs and QS fittings
- Simple mounting via screws
- All control elements on one side
- Quiet operation thanks to integrated silencers
- Vacuum sensor with LCD display (OVEM-...-2P/2N/PU/NU/PI/N)
  - Vacuum is displayed numerically and as a bar chart
  - Important parameters and diagnostic information are displayed

Reliable

- Permanent monitoring of the entire vacuum system via a vacuum sensor to reduce downtimes (condition monitoring)
- Prevention of pressure drop by means of an integrated air-saving function in conjunction with an integrated non-return valve

Space-saving

All functions are compactly integrated in one unit

- No protruding elements such as valves or vacuum sensor
- Space-optimised installation is possible as all the control elements can be accessed from one side

Easy to maintain

- Integrated filter with inspection window for maintenance display
- Reduced contamination of the vacuum generator thanks to an open silencer

Choice of mounting types

- Direct mounting or via mounting bracket
- Straightforward mounting on H-rail via accessories
- Interlocking of multiple vacuum generators on a common supply manifold (➔ page 18)

Operating principle of OVEM

Vacuum ON/OFF

The compressed air supply is controlled by an integrated solenoid valve. The solenoid valve can be supplied with two different switching functions, NC and NO.

- NC - normally closed:
  The vacuum is generated when the vacuum generator is pressurised with compressed air and the solenoid valve has been switched.
- NO - normally open:
  The vacuum is generated when the vacuum generator is pressurised with compressed air and the solenoid valve is in the normal position.

Vacuum sensor

The set or taught-in reference value for the generated vacuum is monitored via an integrated vacuum sensor. If the reference value is reached or if it is not reached due to malfunctions (e.g. leakages, dropped workpiece), the vacuum sensor emits an electrical signal.

Ejector pulse

With a second integrated solenoid valve, an ejector pulse is activated and generated after the vacuum is switched off to release the workpiece safely from the suction cup and to reduce the vacuum quickly.

Connection to higher-level systems

The connection to higher-level systems as well as the configuration of the switching outputs depends on the type of vacuum sensor.

OVEM-...-1P/1N

- Switching inputs for actuating the solenoid valves for vacuum generation and ejector pulse
- One switching output for supplying a control signal
  - Configured as an N/O contact
  - Switching function configured as a threshold value comparator

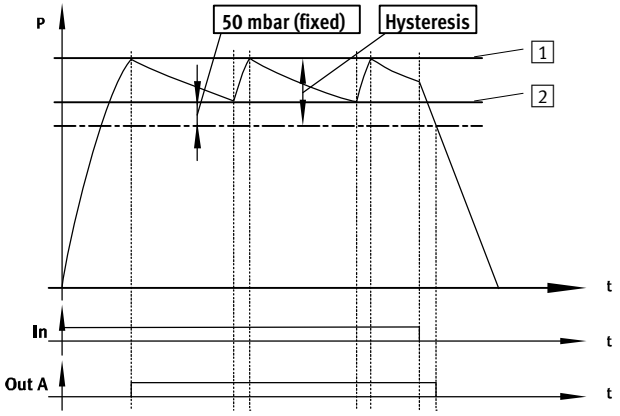
OVEM-...-2P/2N/PU/NU/PI/NI

- One digital switching input for actuating the solenoid valves
- Two digital switching outputs or one digital switching output and one analogue output for supplying control signals
  - Switching outputs can be configured as N/C or N/O contacts
  - Switching function of the outputs can be configured as a threshold value or window comparator
- If there are two switching outputs, these can be configured independently of each other. This enables tasks to be performed in parallel with one vacuum generator, reducing the time needed for sorting good and reject parts, for example.

Vacuum generators OVEM

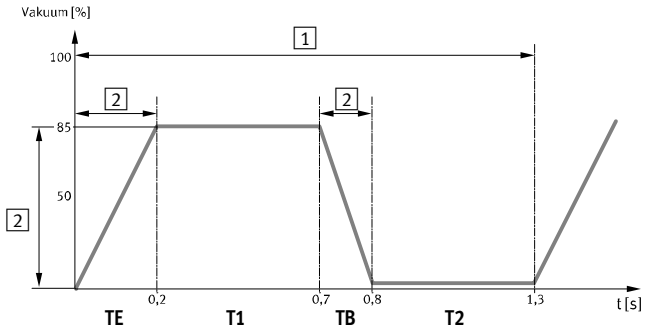
Key features

OVEM-...-2P/2N/PU/NU/PI/NI – Air-saving function LS (-CE, -OE)



If the desired threshold value 1 for the vacuum is reached, vacuum generation is automatically switched off. A non-return valve prevents the reduction of the vacuum. Nonetheless, leakage (e.g. due to rough workpiece surfaces) will slowly reduce the vacuum. If the pressure drops below the threshold value 2, vacuum generation is automatically switched on. Vacuum is generated until the set threshold value 1 is reached again.

OVEM-...-2P/2N/PU/NU/PI/NI – Condition monitoring and diagnostics



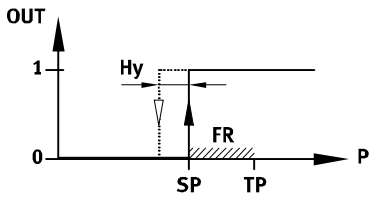
1 Cycle time
2 Monitoring
TE Evacuation time
T1 Transport time
TB Air supply time
T2 Return time

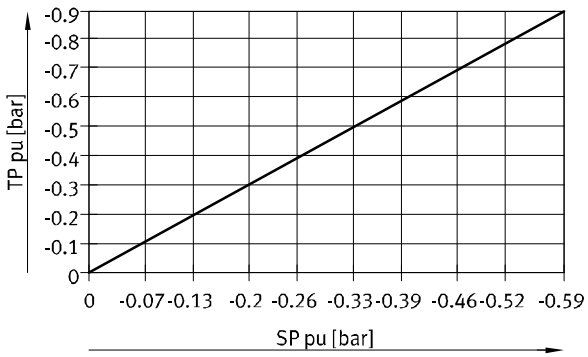
The main operating parameters
- vacuum
- evacuation time and
- air supply time

are continuously measured in the vacuum generator and compared with the individually set reference values (condition monitoring). If deviations in the reference values occur, these will be determined by the vacuum generator and shown on the display (diagnostics). An electrical signal will also be transmitted to the higher-order controller.

This permits preventative action
- in order to prevent machine failure or downtime, for example, through timely maintenance
- and to ensure process reliability (adherence to the cycle time).

OVEM-...-1P/1N – From the teach-in point to the switching point



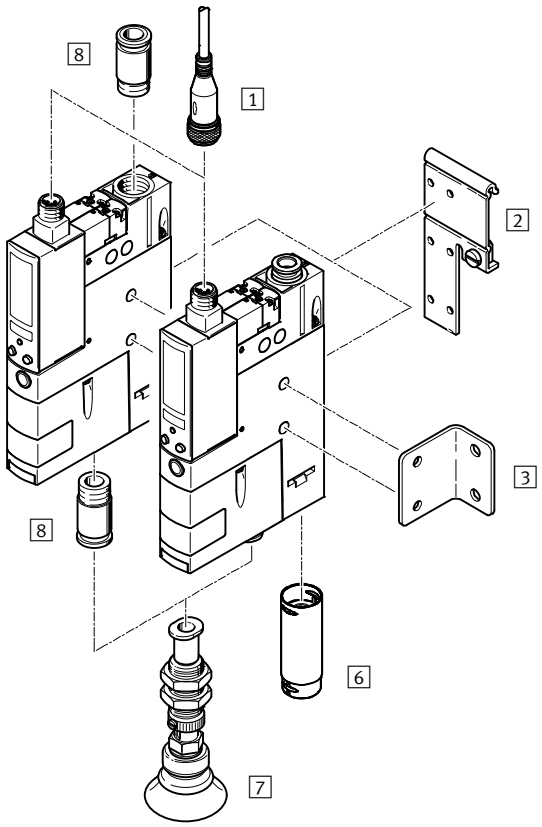


TP Teach-in point
SP Switching point
Hy Hysteresis
FR Functional reserve

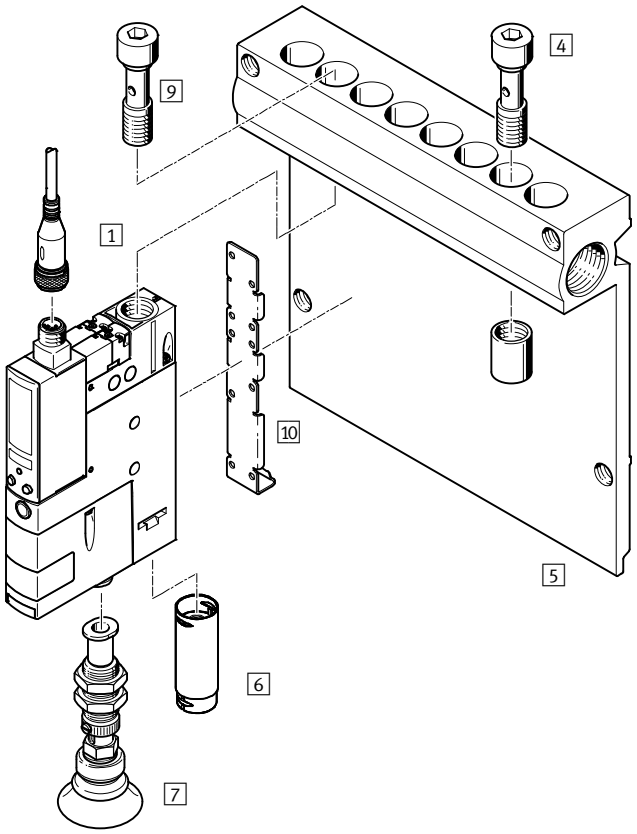
The switching point is determined from the teach-in point and the functional reserve.
A functional reserve (35% of the teach-in pressure) is subtracted from the teach-in pressure (SP = TP – 0.35*TP).

For example, a switching point of –0.33 bar is set at a teach-in pressure of –0.5 bar.
The hysteresis is fixed.

OVEM-...-QS/QO/GN/GO-...



OVEM-...-PL/PO-...[1)]



1) Hollow bolt 9 and mounting bracket 10 are included in the scope of delivery of the OVEM-...-PL/PO-....

Mounting attachments and accessories	OVEM-...-QS/QO/GN/GO-...				OVEM-...-PL/PO-...		→ Page/Internet
	QS	QO	GN	GO	PL	PO	
1 Connecting cable NEBU-M12	■				■		20
2 H-rail mounting kit OABM-H	■				–		19
3 Mounting bracket HRM-1	■				–		20
4 Blanking plug OASC-G1-P	–				■		19
5 Common supply manifold OABM-P...	–				■		18
6 Silencer extension UOMS-¼	–	■2)	–	■2)	–	■2)	20
7 Suction gripper ESG	■				■		esg
8 Push-in fitting QS	–		■		–		quick star
– Suction cup holder ESH	■				■		esh
– Suction cup ESS	■				■		ess

2) Silencer extension UOMS-¼ 6 is included in the scope of delivery of the OVEM-20.

Vacuum generators OVEM

Type codes

OVEM	–	10	–	H	–	B	–	QO	–	CE	–	N	–	2P	–	

Type	
OVEM	Vacuum generator

Nominal size of laval nozzle [mm]	
05	0.45
07	0.7
10	0.95
14	1.4
20	2.0

Ejector characteristic	
H	High vacuum
L	High suction rate

Housing width	
B	Grid dimension 20 mm

Pneumatic connections	
QS	P-V-R with QS fitting
QO	P-V with QS fitting, R with open silencer
GN	P-V-R with female thread
GO	P-V with female thread, R with open silencer
PL	Prepared for common supply manifold, V-R with QS fitting
PO	Prepared for common supply manifold, V with QS fitting, R with open silencer

Normal position of the vacuum generator	
ON	NO, normally open (vacuum generation)
OE	NO, normally open (vacuum generation) with ejector pulse
CN	NC, normally closed (no vacuum generation)
CE	NC, normally closed (no vacuum generation) with ejector pulse

Electrical connection	
N	Plug M12 (5-pin)

Vacuum sensor	
–	Without vacuum sensor
1P	1 switching output PNP
1N	1 switching output NPN
2P	2 switching outputs PNP
2N	2 switching outputs NPN
PU	1 switching output PNP, 1 analogue output 0 ... 10 V
PI	1 switching output PNP, 1 analogue output 4 ... 20 mA
NU	1 switching output NPN, 1 analogue output 0 ... 10 V
NI	1 switching output NPN, 1 analogue output 4 ... 20 mA

Vacuum display	
–	bar
H	inchHg

Vacuum generators OVEM

Technical data

FESTO

Function

NC, normally closed:

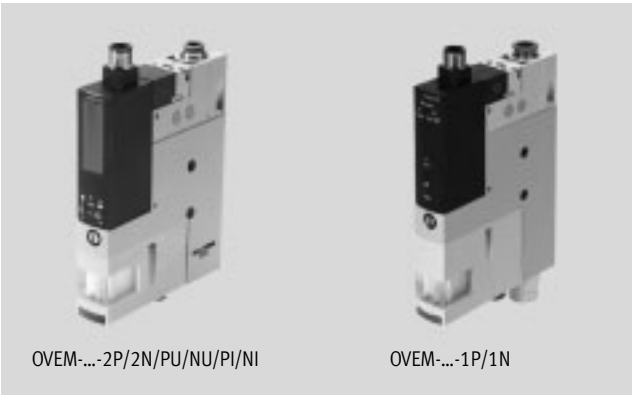
- Ejector pulse
- QS fitting or G female thread
- With open silencer
- Prepared for common supply manifold

NO, normally open:

- Ejector pulse
- QS fitting or G female thread
- With open silencer
- Prepared for common supply manifold

Temperature range
0 ... +50 °C

Operating pressure
2 ... 8 bar



OVEM-...-2P/2N/PU/NU/PI/NI

OVEM-...-1P/1N

General technical data						
Type		OVEM-05	OVEM-07	OVEM-10	OVEM-14	OVEM-20
Nominal size of laval nozzle	[mm]	0.45	0.7	0.95	1.4	2.0
Grid dimension	[mm]	20				
Grade of filtration	[µm]	40				
Mounting position		Any				
Type of mounting		Via through-hole				
		Via female thread				
		Via accessories				
Pneumatic connection 1 (P)		➔ Dimensions on page 12				
Vacuum port (V)		➔ Dimensions on page 12				
Pneumatic connection 3 (R)		➔ Dimensions on page 12				

Technical data – Design			
Type		OVEM-05/07/10/14/20-...-QO/PO/GO	OVEM-05/07/10/14/20-...-QS/GN/PL
Design		Modular	
Ejector characteristic		High vacuum/standard H	
		High suction rate/standard L	
Silencer design		Open	–
Integrated function	ON/CN	On-off valve, electrical	On-off valve, electrical
		Vacuum sensor[1]	Vacuum sensor[1]
		Filter	Filter
		Silencer, open	–
	OE/CE	On-off valve, electrical	On-off valve, electrical
		Ejector pulse, electrical	Ejector pulse, electrical
		Flow control valve	Flow control valve
		Vacuum sensor[1]	Vacuum sensor[1]
		Air-saving function, electrical[2]	Air-saving function, electrical[2]
		Non-return valve	Non-return valve
		Filter	Filter
		Silencer, open	–
Valve function	ON/OE	Open	
	CN/CE	Closed	
Manual override		Non-detenting	
		Additionally via control buttons[2]	

1) Only with OVEM-...-2P/2N/PU/NU/PI/NI/1P/1N
2) Only possible with OVEM-...-2P/2N/PU/NU/PI/NI

Vacuum generators OVEM

Technical data

Operating and environmental conditions			
Type		OVEM-05/07/10/14/20-...-QO/PO/GO	OVEM-05/07/10/14/20-...-QS/GN/PL
Operating pressure	[bar]	2 ... 8	2 ... 6
Nominal operating pressure	[bar]	6	
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium		Operation with lubricated medium not possible	
Ambient temperature	[°C]	0 ... +50	
Temperature of medium	[°C]	0 ... +50	
Relative air humidity	[%]	5 ... 85	
Degree of contamination		3	
Corrosion resistance class CRC[1)]		2	
CE mark (see declaration of conformity)		To EU EMC Directive[2)]	
Certification		cULus - Listed (OL)	
		C-Tick	

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Performance data – High vacuum																					
Type		OVEM-05				OVEM-07				OVEM-10				OVEM-14				OVEM-20			
Normal position of the vacuum generator		ON	OE	CN	CE	ON	OE	CN	CE	ON	OE	CN	CE	ON	OE	CN	CE	ON	OE	CN	CE
Max. vacuum	[%]	93																			
Operating pressure for max. vacuum	[bar]	5.1				4.1				3.5				3.6				5.3			
Max. suction rate with respect to atmosphere	[l/min]	6				16				19.5				50.5				86.5			
Suction rate at p_1 = 6 bar	[l/min]	5.9				15.1				18.6				46				80.5			
Air supply time[1)] for 1 l volume, at p_1 = 6 bar	[s]	4.8	2	4.8	2	1.9	0.4	1.9	0.4	1.2	0.2	1.2	0.2	0.6	0.2	0.6	0.2	0.4	0.2	0.4	0.2
Noise level at p_1 = 6 bar	[db(A)]	51				58				73				77				74			

1) Time required to reduce vacuum to –0.05 bar.

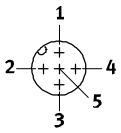
Performance data – High suction rate																	
Type		OVEM-05				OVEM-07				OVEM-10				OVEM-14			
Normal position of the vacuum generator		ON	OE	CN	CE	ON	OE	CN	CE	ON	OE	CN	CE	ON	OE	CN	CE
Max. suction rate with respect to atmosphere	[l/min]	13				31.5				45				92			
Suction rate at p_1 = 6 bar	[l/min]	12.8				31.5				45.1				88.7			
Air supply time[1)] for 1 l volume, at p_1 = 6 bar	[s]	2	1.3	2	1.3	1	0.2	1	0.2	0.8	0.2	0.8	0.2	0.4	0.2	0.4	0.2
Noise level at p_1 = 6 bar	[db(A)]	45				53				64				70			

1) Time required to reduce vacuum to –0.05 bar.

Technical data – Vacuum sensor									
Electrical switching output		2P	2N	PU	NU	PI	NI	1P	1N
Mechanical									
Measured variable		Relative pressure							
Measuring principle		Piezoresistive							
Pressure measuring range	[bar]	–1 … 0							
Accuracy FS[1]	[%]	±3						±0.5	
Repetition accuracy of switching value FS[1]	[%]	0.6						0.6	
Setting options		Via display and keys						Teach-in	
Threshold value setting range	[bar]	–0.999 … 0						–1 … 0	
Hysteresis setting range	[bar]	–0.9 … 0						–	
Setting range for ejector pulse time	[ms]	20 … 9,999 (OVEM-05)						–	
		40 … 9,999 (OVEM-07/10/14/20)						–	
Display type		4-character alphanumeric, backlit LCD						LED	
Displayable units	–	bar						–	
	H	inchHg						–	
Display range	[bar]	–0.999 … 0						–	
	[inchHg]	–29.5 … 0						–	
Switching status display		Visual						Visual	
Switching position display		LCD						LED	
Electrical connection		Plug M12x1, 5-pin							
Electrical									
Switching output		2x PNP	2x NPN	1x PNP	1x NPN	1x PNP	1x NPN	1x PNP	1x NPN
Switching input to standard		IEC 61131-2							
Switching element function		N/O contact							
		N/C contact						–	
Switching function		Window comparator						–	
		Threshold value comparator[2]							
Fixed hysteresis	[mbar]	–						20	
Operating voltage range	[V DC]	20.4 … 27.6							
Duty cycle	[%]	100							
Coil characteristics 24 V DC	[W]	Low-current phase: 0.3							
		High-current phase: 2.55							
Max. current consumption	[mA]	270		180					
Max. output current	[mA]	100							
Idle current	[mA]	< 70						< 80	
Residual current	[mA]	0.1							
Insulation voltage	[V]	50							
Surge capacity	[kV]	0.8							
Voltage drop	[V]	≤ 1.5							
Inductive protective circuit		Adapted to MZ, MY, ME coils							
Analogue output	[V]	–		0 … 10		–		–	
	[mA]	–		–		4 … 20		–	
Permitted load resistance for analogue output	[ohms]	–		Min. 2,000		Max. 500		–	
Accuracy of analogue output FS[1]	[%]	–		4				–	
Protection against short circuit		Yes							
Protection against overloading		Yes							
Reverse polarity protection		For all electrical connections							
Protection class		IP65							
Electrical protection class		III							

1) % FS = % of the measuring range final value (full scale)
2) OVEM-...-1P/1N threshold value with fixed hysteresis

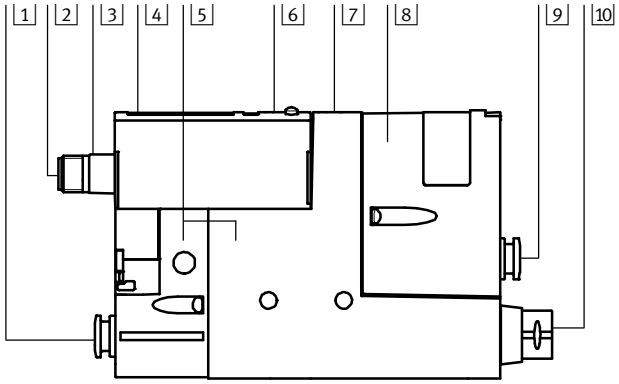
Pin allocation

Plug M12x1, 5-pin	Pin	Meaning	
		OVEM-...-2P/2N/PU/NU/PI/NI	OVEM-...-1P/1N
	1	Supply voltage +24 V DC	Supply voltage +24 V DC
	2	Output B (function depending on variant)	Switching input for vacuum ON/OFF
	3	0 V	0 V
	4	Output A (switching output for vacuum sensor)	Switching output[1)]
	5	Switching input In (vacuum ON/OFF and ejector pulse)	Switching input for ejector pulse ON/OFF

1) Pin 4 not used in types without vacuum sensor

Materials

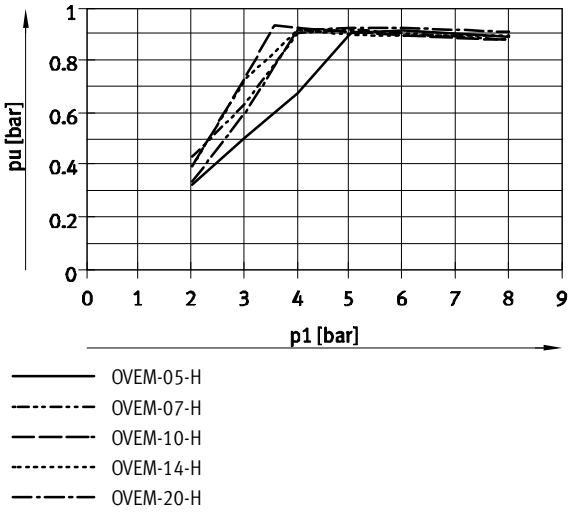
Sectional view



Type OVEM			2P/2N/PU/NU/PI/NI	1P/1N
1	Fitting	QS/QO	Nickel-plated brass	
	Connecting thread	GN/GO	Anodised wrought aluminium alloy	
2	Pin contacts		Gold-plated brass	
3	Plug housing		Nickel-plated brass	
4	Inspection window		PA	–
5	Housing		Die-cast aluminium, PA-reinforced	
6	Key pad		TPE-U	PA-reinforced
7	Adjusting screw	CE/OE	Steel	
8	Filter housing		PA-reinforced	
9	Fitting	QS/QO/PL/PO	Nickel-plated brass	
	Connecting thread	GN/GO	Anodised wrought aluminium alloy	
10	Silencer	QO/GO/PO	Wrought aluminium alloy, PU foam	
	Fitting	QS/QO/PL/PO	Nickel-plated brass	
		GN/GO	Anodised wrought aluminium alloy	
–	Screws		Steel	
–	Pins		Steel	
–	Jet nozzle		Wrought aluminium alloy	
–	Receiver nozzle		POM	
–	Filter		Fabric, PA, sintered steel	
–	Seals		Nitrile rubber	
–	Hollow bolt	PL/PO	Wrought aluminium alloy	
–	Mounting bracket	PL/PO	Stainless steel	
Note on materials			RoHS-compliant	
		QO/GO/PO	Contains PWIS (paint-wetting impairment substances)	

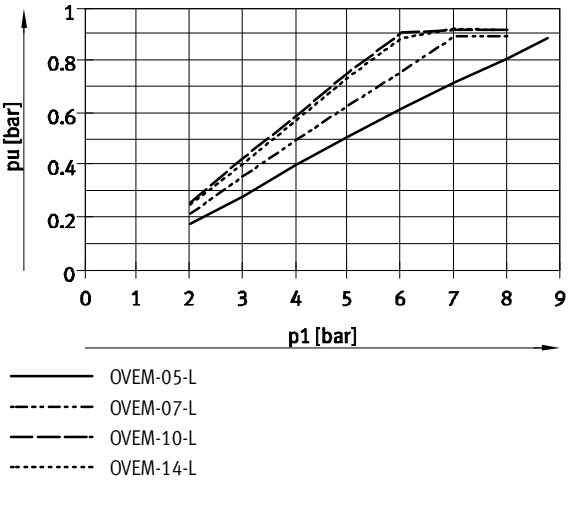
Vacuum p_u as a function of operating pressure p_1

High vacuum



OVEM-05-H
OVEM-07-H
OVEM-10-H
OVEM-14-H
OVEM-20-H

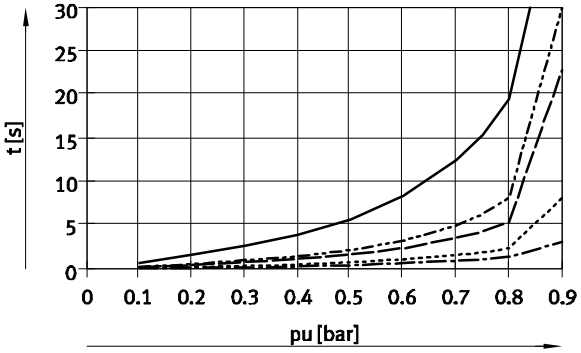
High suction rate



OVEM-05-L
OVEM-07-L
OVEM-10-L
OVEM-14-L

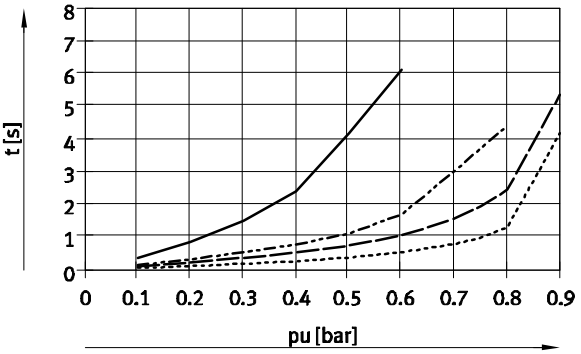
Evacuation time t as a function of vacuum p_u for 1 l volume at 6 bar operating pressure

High vacuum



OVEM-05-H
OVEM-07-H
OVEM-10-H
OVEM-14-H
OVEM-20-H

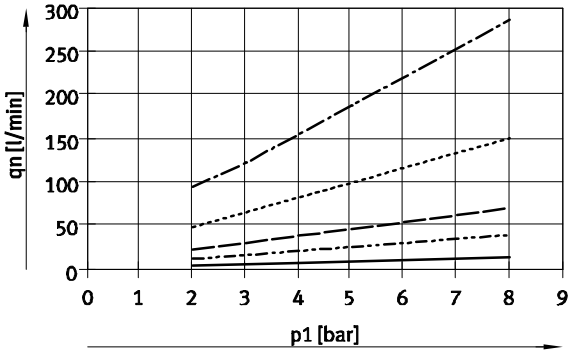
High suction rate



OVEM-05-L
OVEM-07-L
OVEM-10-L
OVEM-14-L

Air consumption q_n as a function of operating pressure p_1

High vacuum/high suction rate



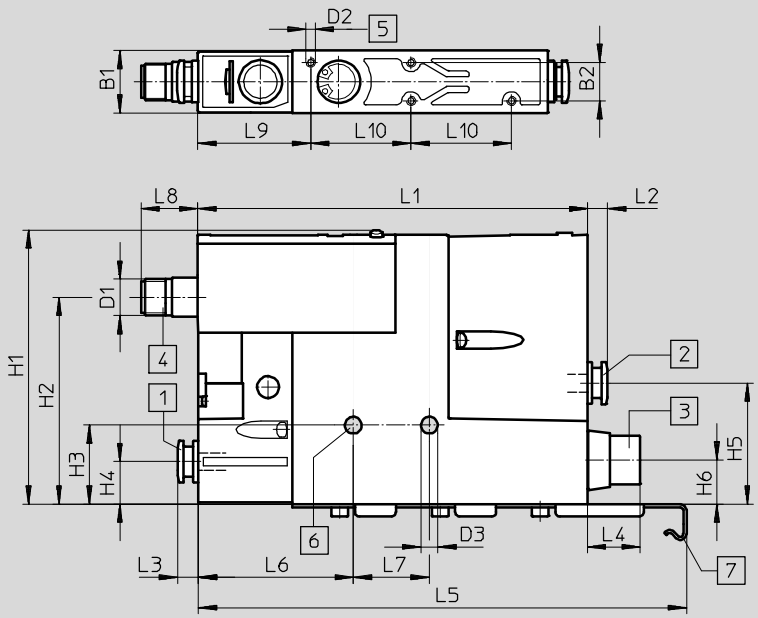
OVEM-05
OVEM-07
OVEM-10
OVEM-14
OVEM-20

Vacuum generators OVEM

Technical data

Dimensions Download CAD data ➔ **www.festo.com**

OVEM-05



1 Supply port (P)
2 Vacuum port (V)
3 Exhaust port (R)
4 Electrical connection to fit NEBU-M12G5-K-...
5 Mounting thread M3, max. tightening torque 0.8 Nm
6 Mounting hole, max. tightening torque 2.5 Nm
7 Mounting bracket (only with OVEM-...-PL/PO)

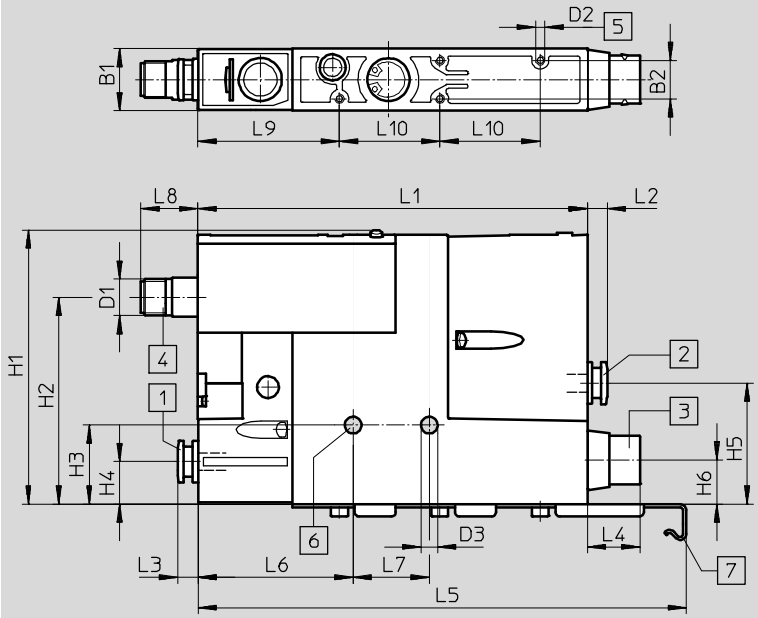
Type	Pneumatic connections			D1	D2	D3	B1	B2	H1	H2	H3	H4
	P	V	R									
OVEM-05-...-QS-...	QS-6	QS-6	QS-8	M12x1	M3	5.5	20.5	12.6	90	68	26	14.5
OVEM-05-...-QO-...			SD[2]									
OVEM-05-...-PL-...	(G¼)[1]	QS-6	QS-8									
OVEM-05-...-PO-...			SD[2]									
OVEM-05-...-GN-...	G⅛	G⅛	G⅛									
OVEM-05-...-GO-...			SD[2]									

Type	H5	H6	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
OVEM-05-...-QS-...	40	14.5	115	6.5	6.5	12	–	51	25	18	37	33
OVEM-05-...-QO-...						–						
OVEM-05-...-PL-...					–	12	160.5					
OVEM-05-...-PO-...						–						
OVEM-05-...-GN-...				8.2	8.2	8.2	–					
OVEM-05-...-GO-...						–						

1) Thread for mounting on the common supply manifold ➔ 18
2) SD = Silencer

Dimensions Download CAD data ➔ **www.festo.com**

OVEM-07/10



1 Supply port (P)
2 Vacuum port (V)
3 Exhaust port (R)
4 Electrical connection to fit NEBU-M12G5-K-...
5 Mounting thread M3, max. tightening torque 0.8 Nm
6 Mounting hole, max. tightening torque 2.5 Nm
7 Mounting bracket (only with OVEM-...-PL/PO)

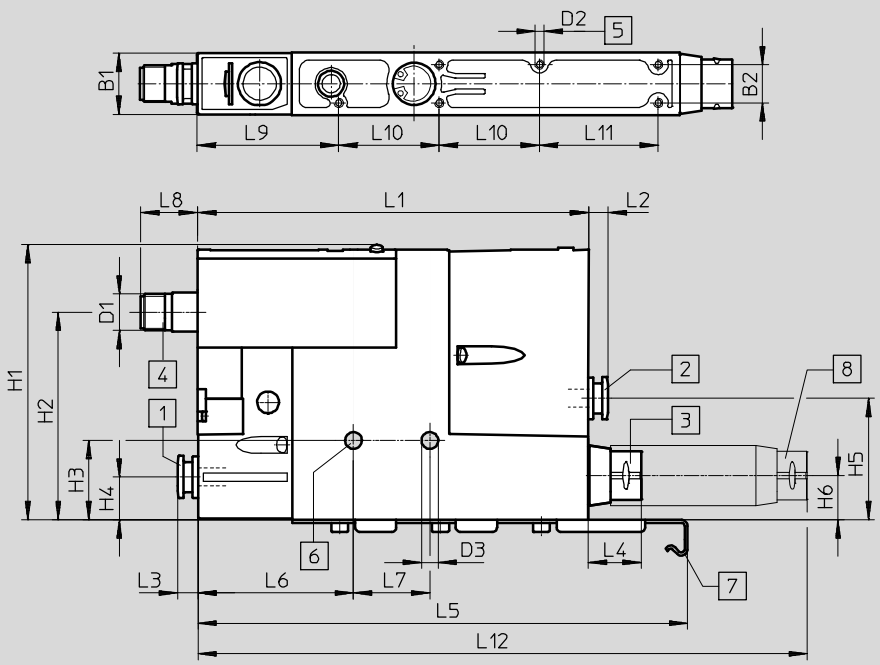
Type	Pneumatic connections			D1	D2	D3	B1	B2	H1	H2	H3	H4
	P	V	R									
OVEM-07/10-...-QS-...	QS-8	QS-8	QS-8	M12x1	M3	5.5	20.5	12.6	90	68	26	14.5
OVEM-07/10-...-QO-...			SD[2]									
OVEM-07/10-...-PL-...	(G¼)[1]	QS-8	QS-8									
OVEM-07/10-...-PO-...			SD[2]									
OVEM-07/10-...-GN-...	G¼	G¼	G⅜									
OVEM-07/10-...-GO-...			SD[2]									

Type	H5	H6	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
OVEM-07/10-...-QS-...	40	14.5	128	6.5	6.5	12	–	51	25	18	46.5	33
OVEM-07/10-...-QO-...						17.3						
OVEM-07/10-...-PL-...					–	12	160.5					
OVEM-07/10-...-PO-...						17.3						
OVEM-07/10-...-GN-...				17.2	17.2	–	–					
OVEM-07/10-...-GO-...						17.3						

1) Thread for mounting on the common supply manifold ➔ 18
2) SD = Silencer

Dimensions Download CAD data ➔ **www.festo.com**

OVEM-14/20



1 Supply port (P)
2 Vacuum port (V)
3 Exhaust port (R)
4 Electrical connection to fit NEBU-M12G5-K-...
5 Mounting thread M3, max. tightening torque 0.8 Nm
6 Mounting hole, max. tightening torque 2.5 Nm
7 Mounting bracket (only with OVEM-...-PL/PO)
8 Silencer extension (in the scope of delivery of the OVEM-20)

Type	Pneumatic connections			D1	D2	D3	B1	B2	H1	H2	H3	H4
	P	V	R									
OVEM-14/20-...-QS-...	QS-8	QS-8	QS-8	M12x1	M3	4.3	20.5	12.6	90	68	25	14.5
OVEM-14/20-...-QO-...			SD[2]									
OVEM-14/20-...-PL-...	(G¼)[1]	QS-8	QS-8									
OVEM-14/20-...-PO-...			SD[2]									
OVEM-14/20-...-GN-...	G¼	G¼	G⅜									
OVEM-14/20-...-GO-...			SD[2]									

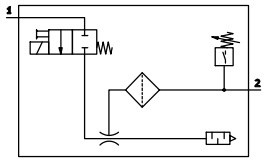
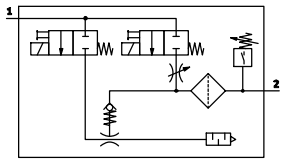
Type	H5	H6	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12
OVEM-14/20-...-QS-...	40	14.5	158	6.5	6.5	12	–	57	25	18	46.5	33	39	–
OVEM-14/20-...-QO-...						17.3								~230
OVEM-14/20-...-PL-...					–	12	160.5							–
OVEM-14/20-...-PO-...						17.3								~230
OVEM-14/20-...-GN-...				17.2	17.2	–	–							–
OVEM-14/20-...-GO-...						17.3								~230

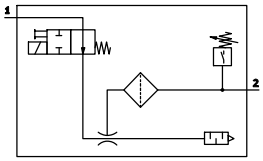
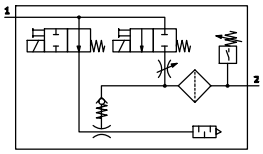
1) Thread for mounting on the common supply manifold ➔ 18
2) SD = Silencer

Vacuum generators OVEM

Technical data

FESTO

Ordering data and weight						
Circuit symbol	Description	Electrical switching output	Nominal size of laval nozzle [mm]	Weight [g]	Part No.	Type
NC – Normally closed						
	P-V with QS fitting, R with open silencer	2x PNP	0.45	317	**538834**	**OVEM-05-H-B-QO-CN-N-2P**
			0.7	322	**538835**	**OVEM-07-H-B-QO-CN-N-2P**
			0.95		**538836**	**OVEM-10-H-B-QO-CN-N-2P**
			1.4	370	**539998**	**OVEM-14-H-B-QO-CN-N-2P**
	With ejector pulse, P-V with QS fitting, R with open silencer	2x PNP	0.45	325	**538831**	**OVEM-05-H-B-QO-CE-N-2P**
			0.7	330	**538832**	**OVEM-07-H-B-QO-CE-N-2P**
			0.95		**538833**	**OVEM-10-H-B-QO-CE-N-2P**
			1.4	380	**539997**	**OVEM-14-H-B-QO-CE-N-2P**
			2.0	390	**8023700**	**OVEM-20-H-B-QO-CE-N-2P**
		2x NPN	0.7	330	**540018**	**OVEM-07-H-B-QO-CE-N-2N**
			0.95		**540019**	**OVEM-10-H-B-QO-CE-N-2N**
			1.4	380	**540020**	**OVEM-14-H-B-QO-CE-N-2N**
		PNP	0.45	313	**540021**	**OVEM-05-H-B-QO-CE-N-1P**
			0.7	321	**540022**	**OVEM-07-H-B-QO-CE-N-1P**
			0.95		**540023**	**OVEM-10-H-B-QO-CE-N-1P**
			1.4	371	**540024**	**OVEM-14-H-B-QO-CE-N-1P**
			2.0	390	**8023699**	**OVEM-20-H-B-QO-CE-N-1P**
	With ejector pulse, P-V with female thread, R with open silencer	2x PNP	0.7	335	**540015**	**OVEM-07-H-B-GO-CE-N-2P**
			0.95		**540016**	**OVEM-10-H-B-GO-CE-N-2P**
			1.4	385	**540017**	**OVEM-14-H-B-GO-CE-N-2P**
		2x NPN	0.7	335	**540012**	**OVEM-07-H-B-GO-CE-N-2N**
			0.95		**540013**	**OVEM-10-H-B-GO-CE-N-2N**
			1.4	385	**540014**	**OVEM-14-H-B-GO-CE-N-2N**
		PNP	0.45	302	**540025**	**OVEM-05-H-B-GO-CE-N-1P**
			0.7	325	**540026**	**OVEM-07-H-B-GO-CE-N-1P**
			0.95		**540027**	**OVEM-10-H-B-GO-CE-N-1P**
			1.4	375	**540028**	**OVEM-14-H-B-GO-CE-N-1P**
	With ejector pulse, prepared for common supply manifold, V with QS fitting, R with open silencer	2x PNP	2.0	415	**8023702**	**OVEM-20-H-B-PO-CE-N-2P**
		PNP	2.0		**8023701**	**OVEM-20-H-B-PO-CE-N-1P**

Ordering data and weight						
Circuit symbol	Description	Electrical switching output	Nominal size of laval nozzle [mm]	Weight [g]	Part No.	Type
NO – Normally open						
	P-V with QS fitting, R with open silencer	2x PNP	0.45	317	**538828**	**OVEM-05-H-B-QO-ON-N-2P**
			0.7	322	**538829**	**OVEM-07-H-B-QO-ON-N-2P**
			0.95		**538830**	**OVEM-10-H-B-QO-ON-N-2P**
			1.4	370	**539996**	**OVEM-14-H-B-QO-ON-N-2P**
	With ejector pulse, P-V with QS fitting, R with open silencer	2x PNP	0.45	325	**538825**	**OVEM-05-H-B-QO-OE-N-2P**
			0.7	331	**538826**	**OVEM-07-H-B-QO-OE-N-2P**
			0.95		**538827**	**OVEM-10-H-B-QO-OE-N-2P**
			1.4	380	**539995**	**OVEM-14-H-B-QO-OE-N-2P**
		2x NPN	0.7	331	**540009**	**OVEM-07-H-B-QO-OE-N-2N**
			0.95		**540010**	**OVEM-10-H-B-QO-OE-N-2N**
			1.4	380	**540011**	**OVEM-14-H-B-QO-OE-N-2N**
	With ejector pulse, P-V with female thread, R with open silencer	2x PNP	0.7	334	**540006**	**OVEM-07-H-B-GO-OE-N-2P**
			0.95		**540007**	**OVEM-10-H-B-GO-OE-N-2P**
			1.4	385	**540008**	**OVEM-14-H-B-GO-OE-N-2P**
		2x NPN	0.7	334	**540003**	**OVEM-07-H-B-GO-OE-N-2N**
			0.95		**540004**	**OVEM-10-H-B-GO-OE-N-2N**
			1.4	385	**540005**	**OVEM-14-H-B-GO-OE-N-2N**

Ordering table

Size		20	Conditions	Code		Enter code
M	Module No.	**539074**				
	Vacuum generator	Vacuum generator with solenoid valve for vacuum on/off and manual override		**OVEM**		OVEM
	Nominal size of laval nozzle [mm]	0.45		**-05**		
		0.7		**-07**		
		0.95		**-10**		
		1.4		**-14**		
		2.0		**-20**		
	Ejector characteristic	High vacuum		**-H**		
		High suction rate	1	**-L**		
	Housing size/width [mm]	20		**-B**		-B
	Pneumatic connections	All connections with QS fittings		**-QS**		
		Supply/vacuum port with QS fittings, exhaust port with open silencer		**-QO**		
		All connections with G female thread		**-GN**		
		Supply/vacuum port with G female thread, exhaust port with open silencer		**-GO**		
		Prepared for supply manifold, vacuum port and exhaust port with QS fittings		**-PL**		
		Prepared for supply manifold, vacuum port with QS fittings, exhaust port with open silencer		**-PO**		
	Normal position of the vacuum generator	NO, normally open (vacuum generation)		**-ON**		
		NO, normally open (vacuum generation) with ejector pulse		**-OE**		
		NC, normally closed (no vacuum generation)		**-CN**		
		NC, normally closed (no vacuum generation) with ejector pulse		**-CE**		
	Electrical connection	Plug M12 (5-pin)		**-N**		-N
O	Vacuum sensor (standard scale in bar)	Without vacuum sensor				
		1 switching output PNP		**-1P**		
		1 switching output NPN	1	**-1N**		
		2 switching outputs PNP		**-2P**		
		1 switching output PNP, 1 analogue output 0 ... 10 V		**-PU**		
		1 switching output PNP, 1 analogue output 4 ... 20 mA		**-PI**		
		2 switching outputs NPN		**-2N**		
		1 switching output NPN, 1 analogue output 0 ... 10 V	1	**-NU**		
		1 switching output NPN, 1 analogue output 4 ... 20 mA	1	**-NI**		
	Alternative vacuum display	inchHg	1	**-H**		

1 **L, 1N, NU, NI, H**

Not with nominal size of laval nozzle 2.0 mm

Transfer order code

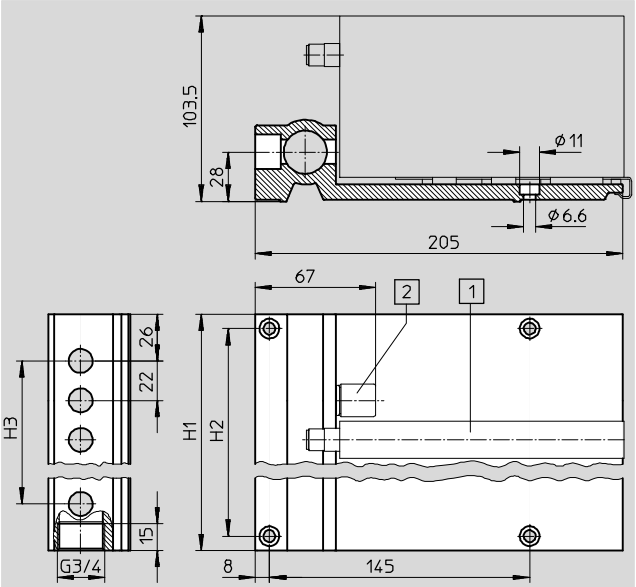
539074	OVEM	–		–		–	B	–		–		–	N	–		–	

Common supply manifold OABM-P
for vacuum generator
OVEM-...-PL/PO

Pneumatic connection 1: G¾
Type of mounting: Via through-hole

Material: Wrought aluminium alloy

Note on materials:
RoHS-compliant



Dimensions			
Number of device locations	H1	H2	H3
4	118	102	66
6	162	146	110
8	206	190	154

Tubing I.D. d_i as a function of total air consumption q_{nN}																	
Total air consumption [l/min]																	
50	75	154	175	225	310	400	480	500	750	890	1,000	1,190	1,340	1,850	2,240	2,300	2,900
Tubing I.D.[1] [mm]																	
≥ 2.5	≥ 2.9	≥ 3.8	≥ 4	≥ 4.4	≥ 5	≥ 5.5	≥ 5.9	≥ 6	≥ 7	≥ 7.5	≥ 8	≥ 8.4	≥ 8.8	≥ 10	≥ 10.8	≥ 11	≥ 12
Recommended tubing												Technical data ➔ Internet: pun, pan					
PUN-4	PUN-6			PUN-8			PUN-10			PUN-12		PUN-16					PAN-16

1) With a tubing length of 3 m

Note

The total air consumption of the fully equipped common supply manifold can be determined by adding the individual consumption of each generator used. Note that in the case of vacuum generators with ejector pulse (OE, CE), the individually set values for the ejector pulse (duration and intensity) can result in much higher air consumption.

Ordering data and weight					
	Number of device locations	CRC[1]	Weight [g]	Part No.	Type
Common supply manifold	4	2	767	**549456**	**OABM-P-4**
	6	2	1,045	**549457**	**OABM-P-6**
	8	2	1,330	**549458**	**OABM-P-8**

1) CRC2: Corrosion resistance class to Festo standard 940 070
Components with medium corrosion exposure. Externally visible components with significant decorative function in direct contact with normal industrial atmosphere or media such as coolants and lubricants.

Blanking plug OASC-G1-P
for common supply manifold
OABM-P-...

Type of mounting: Screw-in
Max. tightening torque: 10 Nm

Materials:
Hollow bolt: Wrought aluminium alloy
Blanking cap: Steel
Seals: Steel, nitrile rubber
Note on materials:
RoHS-compliant

Ordering data

	CRC[1)]	Weight [g]	Part No.	Type
Blanking plug	2	53	**549460**	**OASC-G1-P**

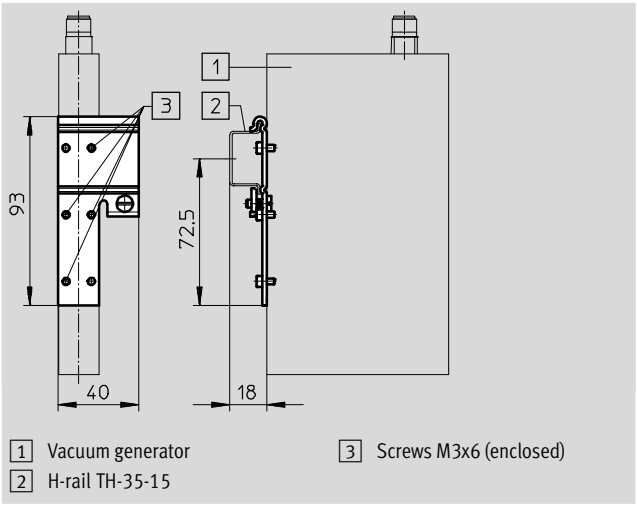
1) CRC2: Corrosion resistance class to Festo standard 940 070
Components with medium corrosion exposure. Externally visible components with significant decorative function in direct contact with normal industrial atmosphere or media such as coolants and lubricants.

H-rail mounting kit
OABM-H
for vacuum generator OVEM

Max. tightening torque for H-rail mounting: 0.8 Nm

Material: Galvanised steel

Note on materials:
RoHS-compliant

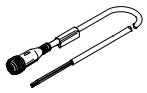
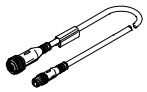
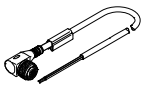


1 Vacuum generator
2 H-rail TH-35-15
3 Screws M3x6 (enclosed)

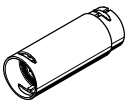
Ordering data

	Weight [g]	Part No.	Type
H-rail mounting kit	52	**549461**	**OABM-H**

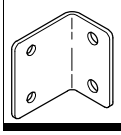
Ordering data – Connecting cable NEBU-M12 — Technical data ➔ Internet: nebu

	Electrical connection		Cable length [m]	Part No.	Type
	Straight socket, M12x1, 5-pin	Open end, 5-wire	2.5	**541330**	**NEBU-M12G5-K-2.5-LE5**
			5	**541331**	**NEBU-M12G5-K-5-LE5**
			10	**554038**	**NEBU-M12G5-K-10-LE5**
	Straight socket, M12x1, 5-pin	Straight plug, M8x1, 4-pin, rotatable thread	2.5	**554036**	**NEBU-M12G5-K-2.5-M8G4**
	Angled socket, M12x1, 5-pin	Open end, 5-wire	2.5	**567843**	**NEBU-M12W5-K-2.5-LE5**
			5	**567844**	**NEBU-M12W5-K-5-LE5**

Ordering data – Silencer extension UOMS — Technical data ➔ Internet: uoms

	Design structure	Mounting type	Part No.	Type
	Open silencer	Detenting	**538436**	**UOMS-¼**

Ordering data – Mounting bracket HRM — Technical data ➔ Internet: hrm

	Material	Part No.	Type
	Steel galvanised	**9769**	**HRM-1**