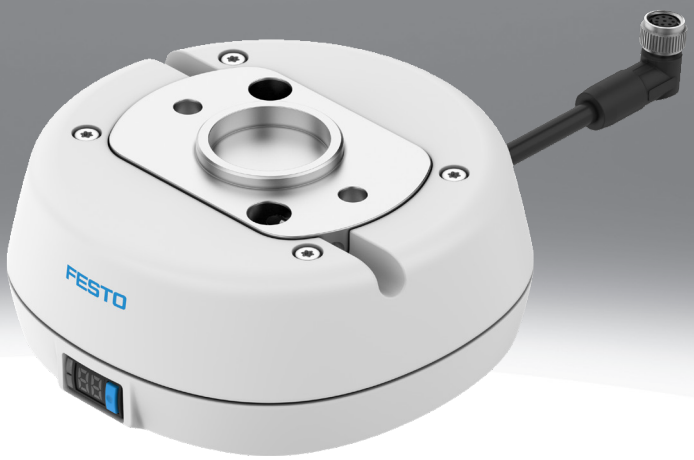
Vacuum generator OVEH



Characteristics

At a glance

Vacuum generator for Human-Robot Collaboration (HRC) applications, where the basic functionalities such as vacuum generator, sensors, display and operation are integrated in a compact housing.

- Can be used with many different cobots and robots thanks to the mechanical robot interface according to ISO 9409-1-50-4-M6
- Preset ejector pulse
- With integrated pressure sensor with various switching outputs as well as LCD display, IO-Link® and teach function
- Central connector plug M8 (8-pin) for supplying the solenoid valves as well as control and parameterisation of the sensor/switching output

Diagrams

Link oveh

The diagrams shown in this document are also available online. These can be used to display precise values.

Vacuum type

There are two vacuum generator versions for use in different applications.

[H]	High vacuum

Vacuum generators for high vacuum are optimised to generate a high vacuum. Application examples include dense materials such as sheet metal.

[L]	High suction rate

Vacuum generators for high suction volume flows can achieve very short evacuation times due to the high suction volume flow. Application examples include air-permeable materials such as cardboard packaging where external air needs to be levelled out.

Exhaust connection

[UA]	Open silencer UO

Open silencer to reduce contamination of the suction nozzle.

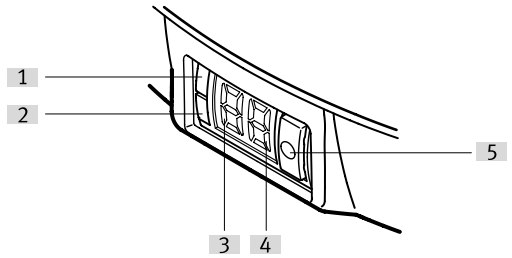
Vacuum valve

[C]	Normally closed

Solenoid valve for control of the compressed air supply in the switching function NC - normally closed, i.e. no vacuum generation in the initial position of the solenoid valve.

Output signal vacuum sensor

[PNLK]	PNP or NPN or IO-Link®



Control components and displays:
[1] Switching status display / LED1
[2] Switching status display / LED2
[3] Number segment LED display / segment 1
[4] Number segment LED display / segment 2
[5] Key

Characteristics

Robot connection	
[HRC]	Human-robot collaboration ISO 9409-1-50-4-M6

The mechanical interface of the vacuum ejector is designed in accordance with ISO 9409-1-50-4-M6 so that it can be mounted on the most commonly used co-bots/robots.

Type code

001	Series	
OVEH	Vacuum generator	

002	Vacuum generation	
7	Laval nozzle 0.7 mm	
10	Laval nozzle 0.95 mm	

003	Vacuum type	
H	High vacuum	
L	High suction rate	

004	Supply air connection	
Q6	Push-in connector 6 mm	

005	Vacuum connection	
G18	Female thread G1/8	

006	Exhaust connection	
UA	Open silencer UO	

007	Vacuum valve	
C	Normally closed	

008	Output signal vacuum sensor	
PNLK	PNP or NPN or IO-Link®	

009	Electrical connection	
R12	M8 individual plug, 8-pin	
SR12	M8 single socket, 8-pin	

010	Robot connection	
HRC	Human-robot collaboration ISO 9409-1-50-4-M6	

Datasheet

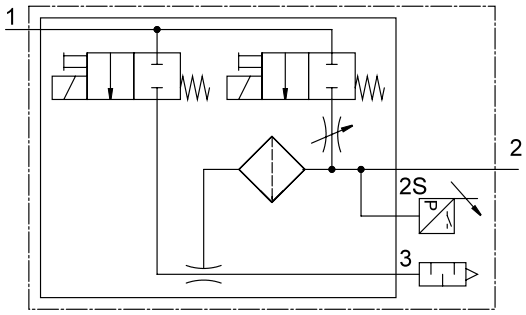
Connection to robot

OVEH-10-H-Q6-G18-UA-C-PNLK-**R12**-HRC (Part no. 8205189)
OVEH-7-H-Q6-G18-UA-C-PNLK-**R12**-HRC (Part no. 8205191)
OVEH-10-L-Q6-G18-UA-C-PNLK-**R12**-HRC (Part no. 8205193):
Compatible with all robots with connector M8x1, 8-pin and switching input NPN/PNP.

OVEH-10-H-Q6-G18-UA-C-PNLK-**SR12**-HRC (Part no. 8205190)
OVEH-7-H-Q6-G18-UA-C-PNLK-**SR12**-HRC (Part no. 8205192)
OVEH-10-L-Q6-G18-UA-C-PNLK-**SR12**-HRC (Part no. 8205194):
Compatible with all robots with plug M8x1, 8-pin and switching input NPN/PNP.
Examples of compatible robots:

- Fanuc CRX-5iA, CRX-10iA, CRX-10iA/L, CRX-20iA/L, CRX-25iA
- Universal Robots UR3e, UR5e, UR10e, UR16e (with new robot connection using UR adapter)
- Hanwha HCR-3A, HCR-5A, HCR-12A (with adapter IO1/IO2)
- Yaskawa HC10
- Siasun SCR3, SCR5

General technical data



Ejector characteristic	High suction rate, Standard	High vacuum, Standard	
Nominal size, Laval nozzle	0.95 mm	0.7 mm	0.95 mm
Type of mounting	With mounting kit, To ISO 9409		
Mounting position	Any		
Integrated function	Ejector pulse, electrical Pressure sensor On/off valve, electric Filter Silencer, closed		
Valve function	Closed		
Design	Human-robot collaboration (HRC)		
Measurement method	Piezoresistive pressure sensor with display		
Measuring principle	Piezoresistive		
Measured variable	Pressure		
Pneumatic connection, port 1	For tubing outside diameter of 6 mm		
Pneumatic connection, port 3	Open silencer		
Vacuum connection	G1/8		
Note on vacuum connection	Additional accessories possible		
Grade of filtration	40 µm		
Switching function	Freely programmable		
Switching element function	NC or NO, switchable		
Setting options	IO-Link® Teach-in Via display and buttons		
Protocol	IO-Link®		
Silencer design	Open		
Manual override	None		
Protection against tampering	PIN code		
Product weight	415 g		

Datasheet

Pressure measuring range	
Display type	LED indicator, 2 digits
Pressure measuring range	-0.1 ... 0 MPa
Pressure measuring range	-1 ... 0 bar
Pressure measuring range	-14.5 ... 0 psi
Accuracy in ± % FS	1.5 %FS
Reproducibility of switching values FS	0.3%

Technical data – IO-Link®	
IO-Link, Protocol version	Device V 1.1
IO-Link, Profile	Smart sensor profile
IO-Link, Function classes	Binary data channel (BDC) Process data variable (PDV) Identification Diagnostics Teach channel
IO-Link, communication mode	COM2 (38.4 kBaud)
IO-Link, SIO-Mode support	Yes
IO-Link, Port class	A
IO-Link, Process data length OUT	0 bytes
IO-Link, Process data length IN	2 bytes
IO-Link, Process data content IN	14 bit PDV (pressure measurement value) 2 bit BDC (pressure monitoring)
IO-Link, Min. cycle time	3 ms
IO-Link, Data storage required	0.5 Byte

Operating and environmental conditions	
Operating pressure	0.2 ... 0.7 MPa
Operating pressure	2 ... 7 bar
Operating pressure	29 ... 101.5 psi
Nominal operating pressure	0.4 MPa
Nominal operating pressure	4 bar
Nominal operating pressure	58 psi
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]
Note on operating and pilot medium	Lubricated operation not possible
Ambient temperature	0 ... 50°C
Media temperature	0 ... 50°C
Relative air humidity	Max. 93% at 40°C
Degree of protection	IP40
CE mark (see declaration of conformity)	To EU EMC Directive
UKCA marking (see declaration of conformity)	To UK instructions for EMC
Corrosion resistance class CRC [1)]	2 - Moderate corrosion stress
Vibration resistance	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6
Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
Recommended cleaning/purification	Soapy water

1) More information www.festo.com/x/topic/crc

Datasheet

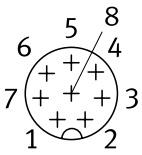
Performance data – High vacuum		
Nominal size, Laval nozzle	0.7 mm	0.95 mm
Operating pressure for max. suction flow rate	0.4 MPa	
Operating pressure for max. suction flow rate	4 bar	
Operating pressure for max. suction flow rate	58 psi	
Operating pressure for max. vacuum	0.45 MPa	0.41 MPa
Operating pressure for max. vacuum	4.5 bar	4.1 bar
Operating pressure for max. vacuum	65.25 psi	59.45 psi
Max. vacuum	92%	
Max. suction flow rate against atmosphere	15 l/min	18 l/min
Air supply time at nominal operating pressure with ejector pulse	1.2 s	1 s
Sound pressure level at nominal operating pressure	48 dB(A)	55 dB(A)
Sound level at nominal operating pressure	60 dB(A)	66 dB(A)

Performance data – High suction rate	
Operating pressure for max. suction flow rate	0.6 MPa
Operating pressure for max. suction flow rate	6 bar
Operating pressure for max. suction flow rate	87 psi
Max. vacuum	85%
Max. suction flow rate against atmosphere	30 l/min
Air supply time at nominal operating pressure with ejector pulse	0.4 s
Sound pressure level at nominal operating pressure	55 dB(A)
Sound level at nominal operating pressure	66 dB(A)

Datasheet

Electrical data	
Electrical connection 1, cable outlet	Angled
Electrical connection 1, design	Round
Electrical connection 1, connector system	M8x1, A-coded, to EN 61076-2-104
Electrical connection 1, number of connections/cores	8
Electrical connection 1, used connections/cores	5
Electrical connection 1, tightening torque	0.2 Nm
Electrical connection input, function	Ejector pulse, Power supply, Vacuum generation
Electrical connection output, function	Digital output
Cable characteristic	Suitable for robot applications
Cable diameter	5 mm
Cable diameter tolerance	± 1 mm
Cable length	0.3 m
Reverse polarity protection	Yes
Switching status indication	Yellow LED
Short circuit current rating	Yes
Operational voltage range DC	21.6 ... 26.4 V
Duty cycle	100%
Max. output current	100 mA
Switching output	PNP/NPN, switchable
Characteristic coil data	24 V DC: 1.0 W

Pin allocation plug

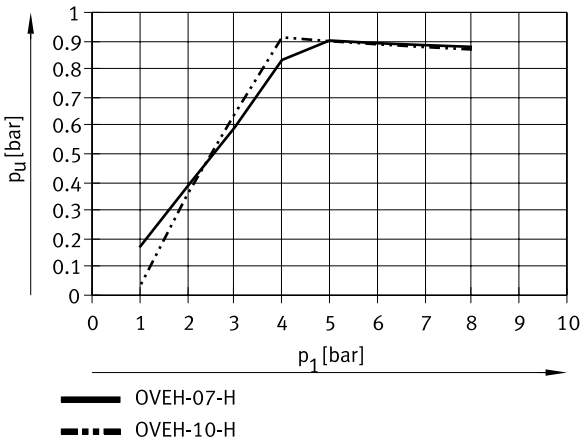


[1] Not assigned
[2] Not assigned
[3] Not assigned
[4] Digital output 2 (NPN/PNP, freely programmable via IO-Link® or display buttons)
[5] Supply voltage +24 V DC
[6] Digital switching input 2 (ejector pulse „off“ = 0V / „on“ = 24V)
[7] Digital switching input 1 (vacuum „off“ = 0V / „on“ = 24V)
[8] 0 V DC

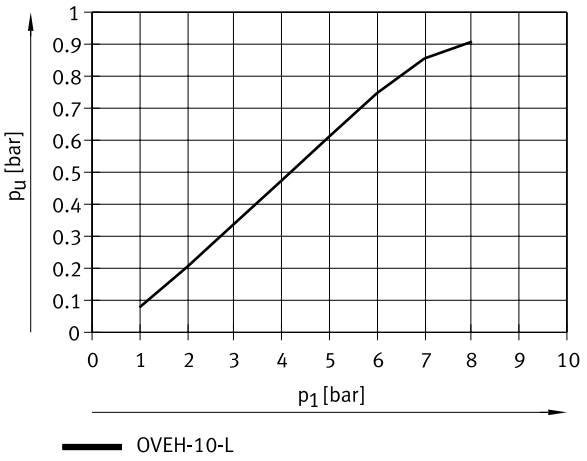
Materials	
Material housing	Reinforced PA
Material receiver nozzle	POM
Material transmitter nozzle	Wrought aluminium alloy
Material adjusting screw	Steel
Material hollow bolt	Wrought aluminium alloy
Material screws	Steel
Material connecting thread	Anodised wrought aluminium alloy
Material seals	NBR
Material filter	POM
Material silencer	Reinforced PA, Packaging unit
Material cable sheath	PVC
Cable sheath colour	Black
Note on materials	RoHS compliant
LABS (PWIS) conformity	VDMA24364-B1/B2-L

Datasheet

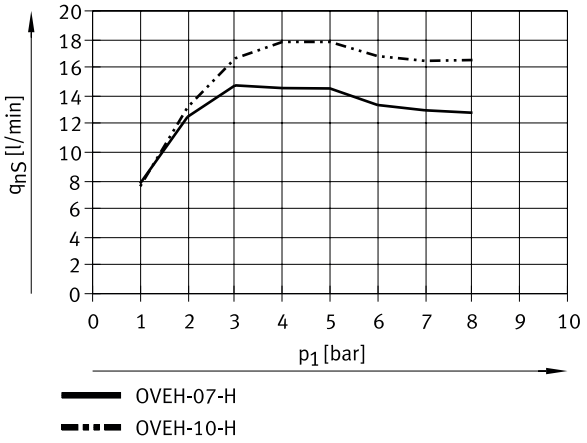
Vacuum pu as a function of operating pressure p1 (high vacuum)



Vacuum pu as a function of operating pressure p1 (high suction volume flow)

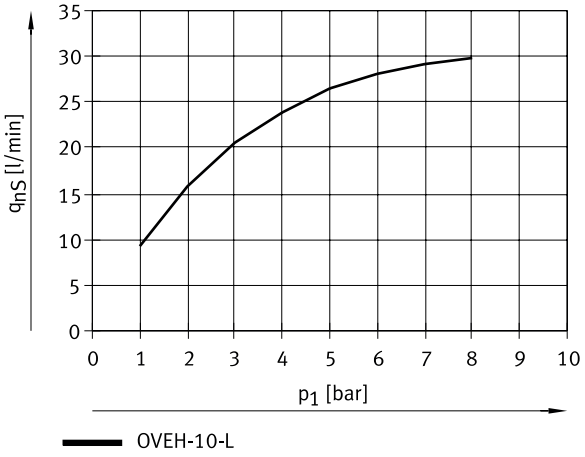


Suction volume flow qnS in relation to atmosphere as a function of operating pressure p1 (high vacuum)

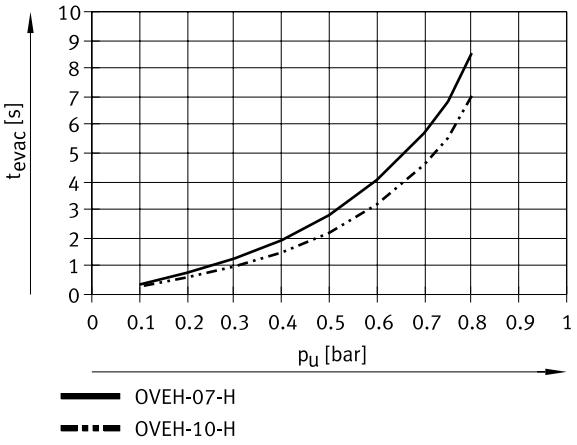


Datasheet

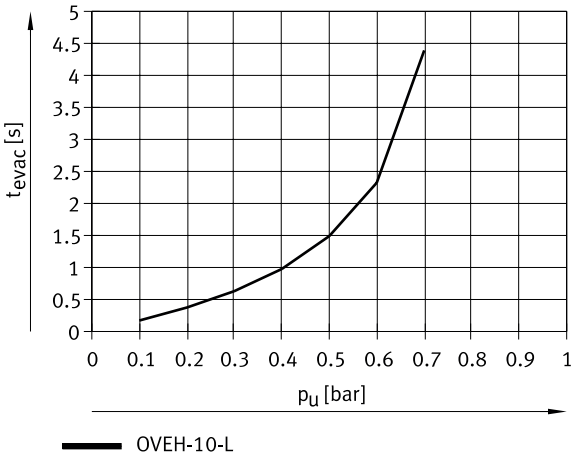
Suction volume flow qnS in relation to atmosphere as a function of operating pressure p1 (high suction volume flow)



Evacuation time t as a function of vacuum pu for 1 l volume at 6 bar operating pressure (high vacuum)

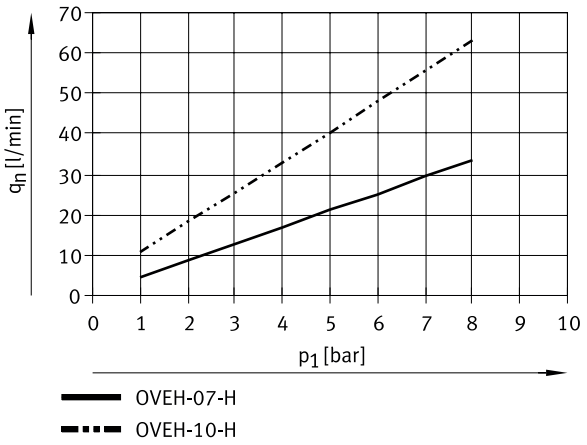


Evacuation time t as a function of vacuum pu for 1 l volume at 6 bar operating pressure (high suction volume flow)

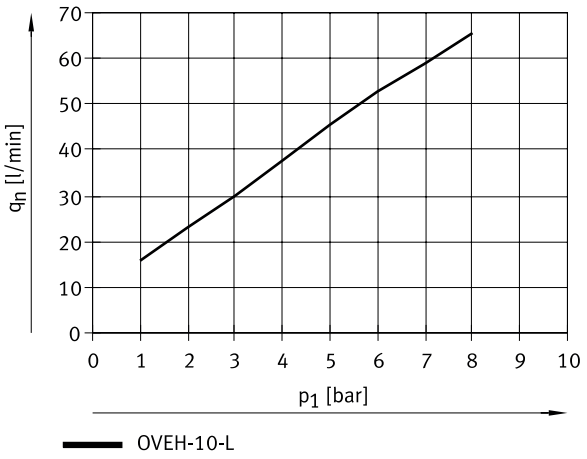


Datasheet

Air consumption qn as a function of operating pressure p1 (high vacuum)

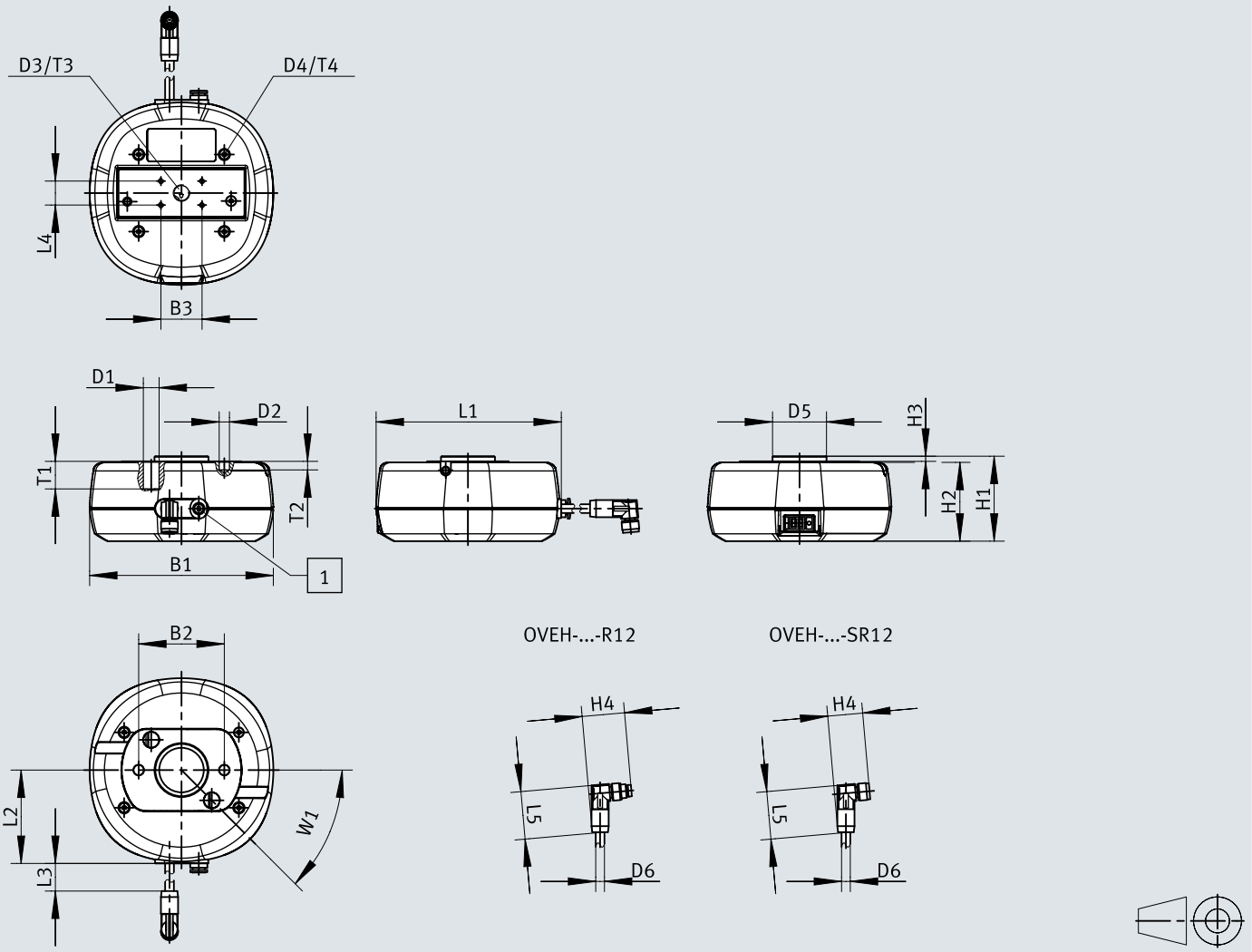


Air consumption qn as a function of operating pressure p1 (high suction volume rate)



Dimensions

Dimensions – OVEH Download CAD data www.festo.com



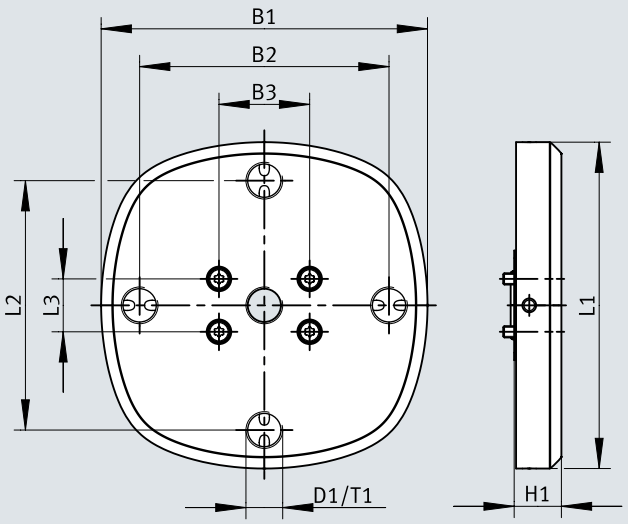
[1] Air port Q6

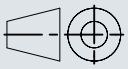
	B1	B2 ±0,03	B3 ±0,1	D1 ø H12	D2 ø H7	D3	D4	D5 ø h7	D6 ø	H1	H2
OVEH-10-H-Q6-G18-UA-C-PNLK-R12-HRC	107,3	50	24	9,2	6	G1/8	M3	31,5	5,1	49,6	46
OVEH-10-H-Q6-G18-UA-C-PNLK-SR12-HRC											
OVEH-7-H-Q6-G18-UA-C-PNLK-R12-HRC											
OVEH-7-H-Q6-G18-UA-C-PNLK-SR12-HRC											
OVEH-10-L-Q6-G18-UA-C-PNLK-R12-HRC											
OVEH-10-L-Q6-G18-UA-C-PNLK-SR12-HRC											

	H3	H4	L1	L2	L3 ±3	L4 ±0,1	L5	T1	T2	T3	T4
OVEH-10-H-Q6-G18-UA-C-PNLK-R12-HRC	3	25	108,1	54,5	302,7	14	28	16,1	5	7	7,5
OVEH-10-H-Q6-G18-UA-C-PNLK-SR12-HRC		20,5									
OVEH-7-H-Q6-G18-UA-C-PNLK-R12-HRC		25									
OVEH-7-H-Q6-G18-UA-C-PNLK-SR12-HRC		20,5									
OVEH-10-L-Q6-G18-UA-C-PNLK-R12-HRC		25									
OVEH-10-L-Q6-G18-UA-C-PNLK-SR12-HRC		20,5									

Dimensions

Dimensions – OAMC-PA-G18-5 Download CAD data www.festo.com

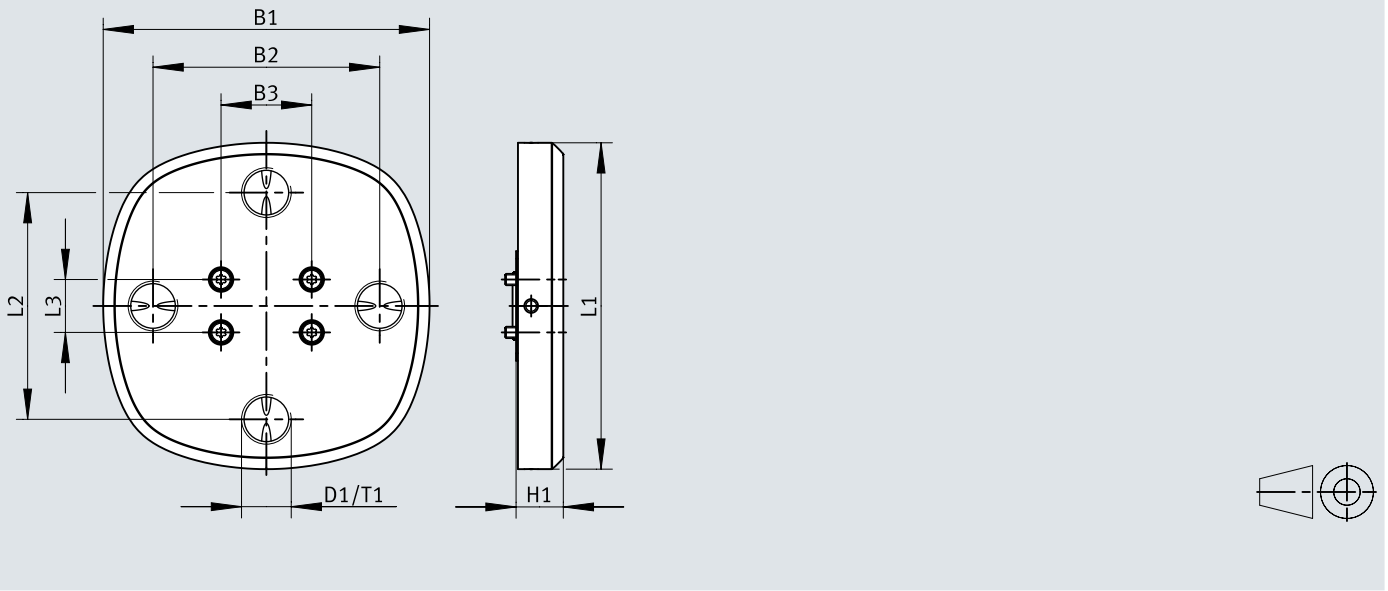




	B1	B2	B3	D1	H1	L1	L2	L3	T1
OAMC-PA-G18-5	86,4	66	24	G1/8	12,5	86,4	66	14	5,9

Dimensions

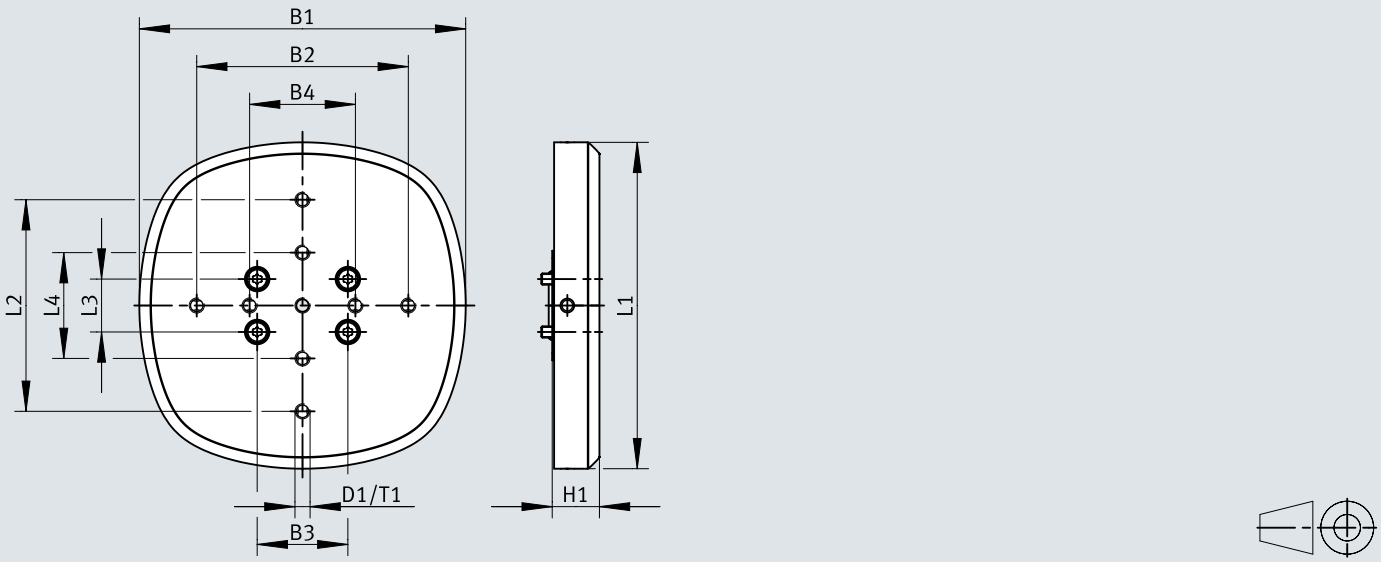
Dimensions – OAMC-PA-G14-4 Download CAD data www.festo.com



	B1	B2	B3	D1	H1	L1	L2	L3	T1
OAMC-PA-G14-4	86,4	60	24	G1/4	12,5	86,4	60	14	6,5

Dimensions

Dimensions – OAMC-PA-M4-9 Download CAD data www.festo.com



	B1	B2	B3	B4	D1	H1	L1	L2	L3	L4	T1
OAMC-PA-M4-9	86,4	56	24	28	M4	12,5	86,4	56	14	28	6

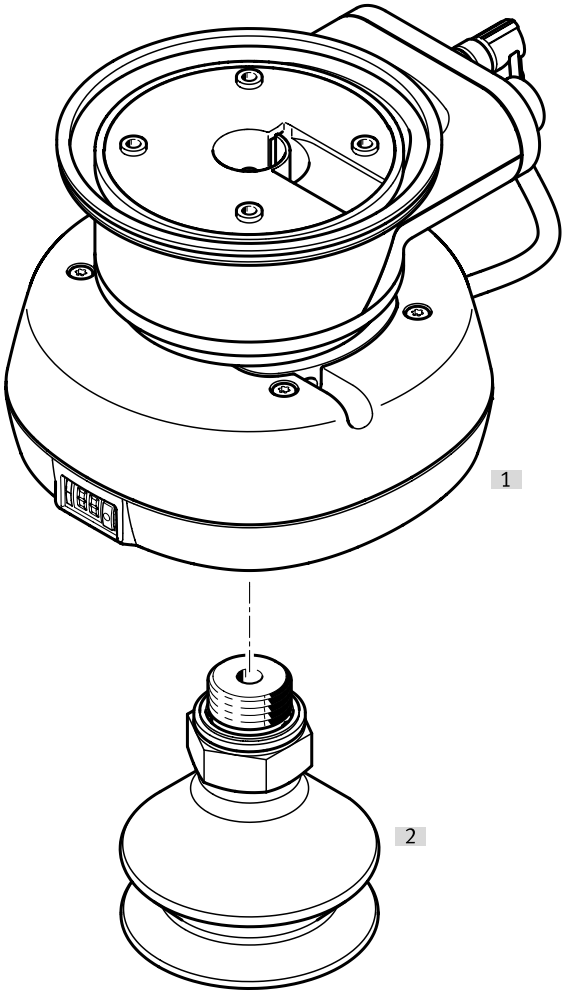
Ordering data

Ordering data

Ejector characteristic	Nominal size, Laval nozzle	Electrical connection 1, connection type	Product weight	Part no.	Type
High suction rate, Standard	0.95 mm	Cable with socket	415 g	**8205194**	**OVEH-10-L-Q6-G18-UA-C-PNLK-SR12-HRC**
		Cable with plug		**8205193**	**OVEH-10-L-Q6-G18-UA-C-PNLK-R12-HRC**
High vacuum, Standard	0.7 mm	Cable with socket		**8205192**	**OVEH-7-H-Q6-G18-UA-C-PNLK-SR12-HRC**
		Cable with plug		**8205191**	**OVEH-7-H-Q6-G18-UA-C-PNLK-R12-HRC**
	0.95 mm	Cable with socket		**8205190**	**OVEH-10-H-Q6-G18-UA-C-PNLK-SR12-HRC**
		Cable with plug		**8205189**	**OVEH-10-H-Q6-G18-UA-C-PNLK-R12-HRC**

Peripherals

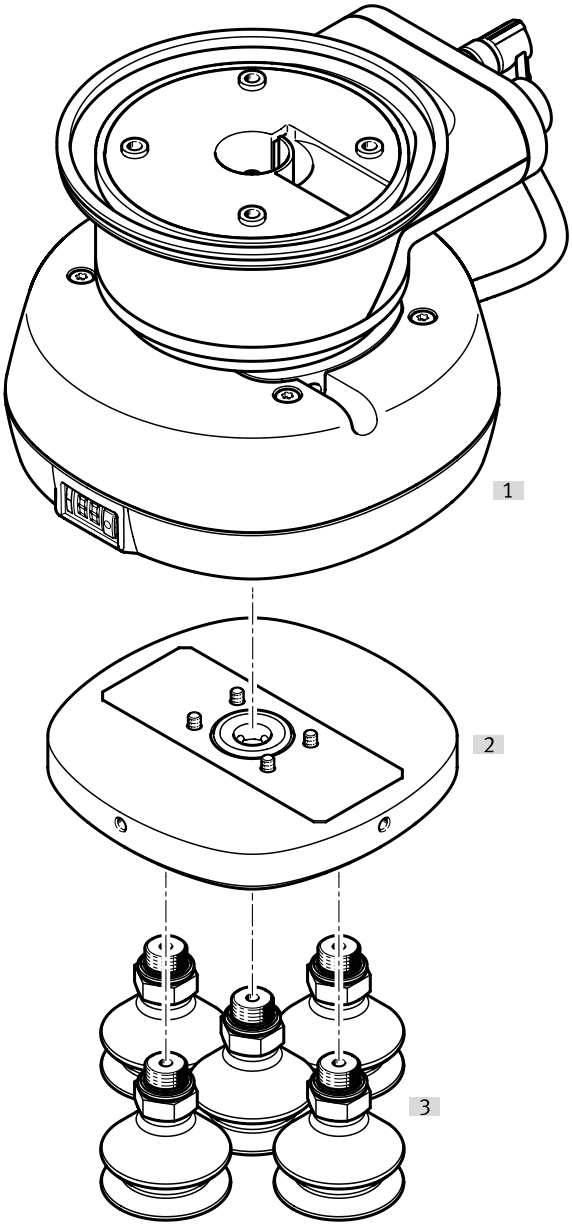
OVEH without adapter plate with 1 suction cup



Accessories			→ Link
	Type/order code	Description	
[1]	OVEH		oveh
[2]	Suction cups with connector VAS, VASB, OGVN	Suction cup sizes 15; 20; 30; 35	21
[3]	Vacuum security valve ISV	Optional, without illustration	21
[4]	Double nipple NPFC	Optional, without image, for suction cup with connection OGVN-...-F with female thread	21

Peripherals

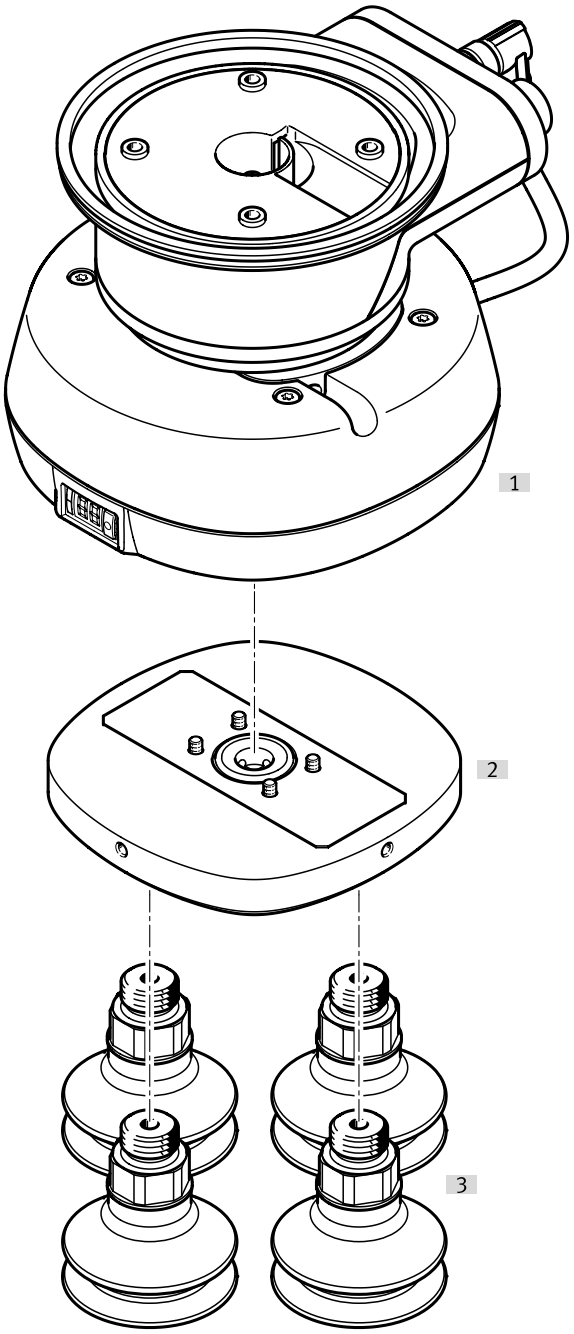
OVEH with adapter plate OAMC-PA-G18-5 with 5 suction cups



Accessories			→ Link
	Type/order code	Description	
[1]	OVEH		oveh
[2]	Adapter plate OAMC-PA-G18-5	Suction cup sizes 15; 20; 30; 35	21
[3]	Suction cups with connector VAS, VASB, OGVN	Suction cup sizes 15; 20; 30; 35	21
[4]	Vacuum security valve ISV	Optional, without illustration	21
[5]	Double nipple NPFC	Optional, without image, for suction cup with connection OGVN-...-F with female thread	21

Peripherals

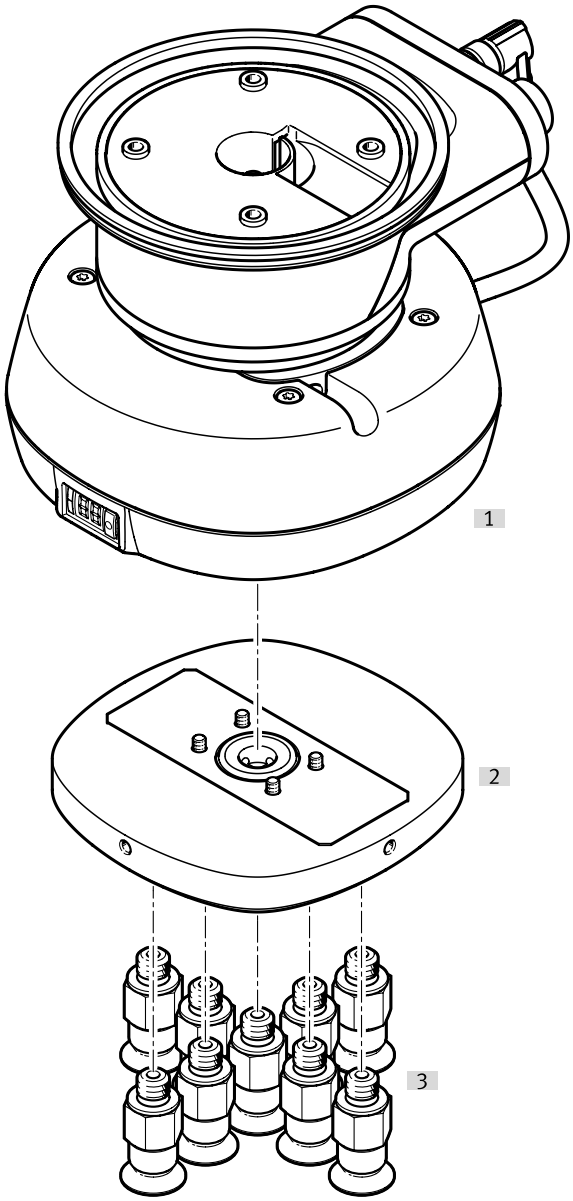
OVEH with adapter plate OAMC-PA-G14-4 with 4 suction cups



Accessories			→ Link
	Type/order code	Description	
[1]	OVEH		oveh
[2]	Adapter plate OAMC-PA-G14-4	Suction cup sizes 15; 20; 30; 35	21
[3]	Suction cups with connector VAS, VASB, OGVN, OGVM	Suction cup sizes 20; 30; 35; 40	21
[4]	Vacuum security valve ISV	Optional, without illustration	21
[5]	Double nipple NPFC	Optional, without image, for suction cup with connection OGVN-...-F with female thread	21

Peripherals

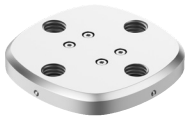
OVEH with adapter plate OAMC-PA-M4-9 with 9 suction cups



Accessories			→ Link
	Type/order code	Description	
[1]	OVEH		🔗 oveh
[2]	Adapter plate OAMC-PA-M4-9	Suction cup sizes 15; 20; 30; 35	21
[3]	Suction cup with connector ESS	Suction cup sizes 10; 15	22
[4]	Vacuum security valve ISV	Optional, without illustration	22

Accessories

Adapter plate OAMC



Suction cup mounting	Suction cup mounting, quantity	Material plate	Product weight	Part no.	Type
Female thread G1/8	5	Anodised wrought aluminium alloy	215 g	8205195	OAMC-PA-G18-5
Female thread G1/4	4			8205196	OAMC-PA-G14-4
Female thread M4	9			8205197	OAMC-PA-M4-9

Accessories without adapter plate [1)]

Series	Short type code	Suction cup diameter	Material suction cup	Product weight	Part no.	Type
Suction cup complete	VAS	15 mm	PUR	11 g	1396087	VAS-15-1/8-PUR-B
			VMQ (silicone)	4 g	1376604	VAS-15-1/8-SI-B
		30 mm	PUR	12 g	1396090	VAS-30-1/8-PUR-B
			VMQ (silicone)	5 g	1377752	VAS-30-1/8-SI-B
Suction cups with connection, protective bellows	VASB	15 mm	PUR	11 g	1395671	VASB-15-1/8-PUR-B
			VMQ (silicone)	4 g	1377689	VASB-15-1/8-SI-B
		30 mm	PUR	14 g	1395690	VASB-30-1/8-PUR-B
			VMQ (silicone)	7 g	1377637	VASB-30-1/8-SI-B
Vacuum security valve	ISV			9 g	8217204	ISV-1/8-F1A
Fitting	NPFC			10 g	8133311	NPFC-D-2G18-M-F1A
Suction cup with connection	OGVN	20 mm	PUR	1.1 g	8204816	OGVN-20-A-U-G18
		35 mm		5.1 g	8204818	OGVN-35-A-U-G18-F
		52 mm		14.2 g	8204832	OGVN-52-A-U-G18-F

1) Double nipple NPFC: for suction cup with connection OGVN-...-F with internal thread

Accessories with adapter plate OAMC-PA-G18-5 (5 suction cup connections, max. diameter per suction cup = 30 mm) [1)]

Series	Short type code	Suction cup diameter	Material suction cup	Product weight	Part no.	Type
Suction cup complete	VAS	15 mm	PUR	11 g	1396087	VAS-15-1/8-PUR-B
			VMQ (silicone)	4 g	1376604	VAS-15-1/8-SI-B
		30 mm	PUR	12 g	1396090	VAS-30-1/8-PUR-B
			VMQ (silicone)	5 g	1377752	VAS-30-1/8-SI-B
Suction cups with connection, protective bellows	VASB	15 mm	PUR	11 g	1395671	VASB-15-1/8-PUR-B
			VMQ (silicone)	4 g	1377689	VASB-15-1/8-SI-B
		30 mm	PUR	14 g	1395690	VASB-30-1/8-PUR-B
			VMQ (silicone)	7 g	1377637	VASB-30-1/8-SI-B
Vacuum security valve	ISV			9 g	8217204	ISV-1/8-F1A
Fitting	NPFC			10 g	8133311	NPFC-D-2G18-M-F1A
Suction cup with connection	OGVN	20 mm	PUR	1.1 g	8204816	OGVN-20-A-U-G18
		35 mm		5.1 g	8204818	OGVN-35-A-U-G18-F

1) Double nipple NPFC: for suction cup with connection OGVN-...-F with internal thread

Accessories with adapter plate OAMC-PA-G14-4 (4 suction cup connections, max. diameter per suction cup = 40 mm) [1)]

Series	Short type code	Suction cup diameter	Material suction cup	Product weight	Part no.	Type
Suction cup complete	VAS	40 mm	PUR	26 g	1396092	VAS-40-1/4-PUR-B
			VMQ (silicone)	14 g	1379454	VAS-40-1/4-SI-B
Suction cups with connection, protective bellows	VASB		PUR	30 g	1395691	VASB-40-1/4-PUR-B
			VMQ (silicone)	18 g	1372910	VASB-40-1/4-SI-B
Vacuum security valve	ISV			16 g	8217205	ISV-1/4-F1A
Fitting	NPFC			17.2 g	8030272	NPFC-D-2G14-M
Suction cup complete	OGVM	20 mm	NBR	6 g	8073847	OGVM-20-G-N-G14F
				12 g	8073834	OGVM-20-A-N-G14F
		30 mm		7 g	8073848	OGVM-30-G-N-G14F
				8 g	8073816	OGVM-30-S-N-G14F
				15 g	8073835	OGVM-30-A-N-G14F
		40 mm		10 g	8073817	OGVM-40-S-N-G14F
				17 g	8073836	OGVM-40-A-N-G14F

Accessories

Accessories with adapter plate OAMC-PA-G14-4 (4 suction cup connections, max. diameter per suction cup = 40 mm) [1)]

Series	Short type code	Suction cup diameter	Material suction cup	Product weight	Part no.	Type
Suction cup with connection	OGVN	35 mm	PUR	5.1 g	**8204819**	**OGVN-35-A-U-G14**

1) Double nipple NPFC: for suction cup with connection OGVM-...-F with male thread

Accessories with adapter plate OAMC-PA-M4-9 (9 suction connections, max. diameter per suction cup = 10 mm)

Series	Short type code	Suction cup diameter	Material suction cup	Product weight	Part no.	Type
Suction cup complete	ESS	10 mm	Fluoro rubber	1.5 g	**189287**	**ESS-10-SF**
			NBR		**189288**	**ESS-10-SNA**
					189284	**ESS-10-SN**
				1.6 g	**189398**	**ESS-10-CN**
				1.8 g	**189374**	**ESS-10-BN**
			PUR	1.5 g	**189285**	**ESS-10-SU**
				1.8 g	**189375**	**ESS-10-BU**
			VMQ (silicone)	1.5 g	**189286**	**ESS-10-SS**
				1.6 g	**189399**	**ESS-10-CS**
				1.8 g	**189376**	**ESS-10-BS**
		15 mm	Fluoro rubber	1.9 g	**189337**	**ESS-15-EF**
					189292	**ESS-15-SF**
			NBR		**189289**	**ESS-15-SN**
					189334	**ESS-15-EN**
					189293	**ESS-15-SNA**
			PUR		**189290**	**ESS-15-SU**
					189335	**ESS-15-EU**
			VMQ (silicone)		**189291**	**ESS-15-SS**
					189336	**ESS-15-ES**
Vacuum security valve	ISV			1.5 g	**545996**	**ISV-M4**