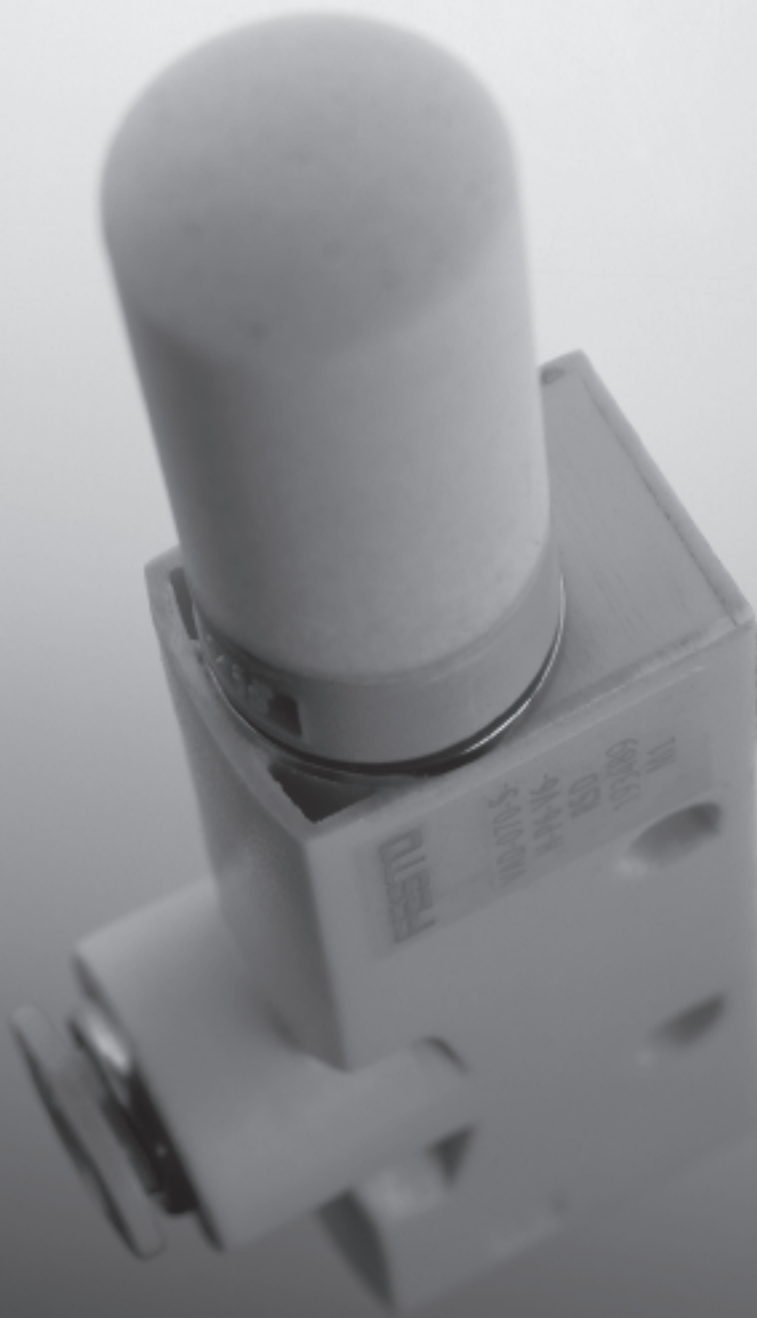




- High vacuum levels of up to 93%
- Easy connection of holders and suction cups
- Lightweight and compact design
- No wearing parts
- Long service life
- Vacuum monitoring with vacuum switch
- VN-20/30, VN-P, VN-M/B:



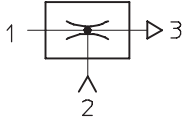
Vacuum generators

Key features

FESTO

Product overview

Vacuum generator



All Festo vacuum generators have a single-stage design and operate according to the venturi principle. The product families described below

have been designed for a wide range of applications. The different performance classes of the individual

product families make it possible to select vacuum generators tailored to suit specific requirements.

Standard and inline ejectors

VN-...

→ 6 / 1.1-13



- Nominal size 0.45 ... 3 mm
- Max. vacuum 93%
- Temperature range 0 ... +60 °C
- A range of extremely effective generators suitable for use directly in the workplace
- Available as straight or T-shaped housing
- Low space requirement
- Low-cost
- No wearing parts
- Extremely fast evacuation time
- Vacuum switch (optional)
- Optional with additional functions:
 - integrated eject pulse
 - electric control for vacuum ON/OFF
 - combination of eject pulse and control

VAD-.../VAK-...

→ 6 / 1.1-54



- Nominal size 0.5 ... 1.5 mm
- Max. vacuum 80%
- Temperature range -20 ... +80 °C
- Range of vacuum generators with sturdy aluminium casing
- VAK-...: Built-in reservoir
- VAD-...: Connection for additional external reservoir
- Maintenance-free
- VAK-...: Reliable setting down of workpieces

Vacuum generators

Key features

FESTO

Vacuum generators
Pneumatic

1.1

Compact ejectors

VADM-...VADMI-...

→ 6 / 1.2-8



- Nominal size
0.45 ... 3 mm
- Max. vacuum
84%
- Temperature range
0 ... +60 °C
- Compact design
- Minimal installation work required
- Short response times
- Built-in solenoid valve (on/off)
- VADMI-...: Additional built-in solenoid valve for ejector pulse
- Filter with display
- Air-saving circuit (optional)
- Vacuum switch (optional)
- Reliable setting down of workpieces

VAD-M-.../VAD-M-I-...-I-...

→ 6 / 1.2-28



- Nominal size
0.7 ... 2 mm
- Max. vacuum
85%
- Temperature range
0 ... +40 °C
- Compact design
- Minimal installation work required
- Short response times
- Built-in solenoid valve (on/off)
- VAD-M-I-...: Additional built-in solenoid valve for ejector pulse
- Reliable setting down of workpieces

Vacuum generators VN

Features

At a glance

- Vacuum generators for high vacuum levels of up to 93%
- Laval nozzles in six nominal sizes:
 - 0.45 mm
 - 0.7 mm
 - 0.95 mm
 - 1.4 mm
 - 2.0 mm
 - 3.0 mm
- Vacuum generators for high suction rates resulting in very short evacuation times
- Low space requirement
- Compact and sturdy design
- Wear-resistant and maintenance-free
- Modular system: Large selection of different types
- Can be used directly in the workplace, making them very effective
- Plastic housing
- Versatile connection options:
 - Push-in connector QS
 - Screw-in thread
 - Push-in sleeve
 - Screw-in silencer
- Easy mounting thanks to the double-sided latching function of the mounting plate
- With or without integrated vacuum switch to monitor the vacuum with PNP output

Two housing types

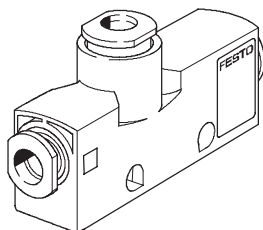
Standard T-type

Connection options:

- QS push-in connectors
- Female thread
- Male thread
- Silencers

Mounting options:

- Direct mounting with screws
- Indirect mounting by latching onto a mounting plate. This plate is suitable for H-rails 35x7.5 to DIN EN 50 022.



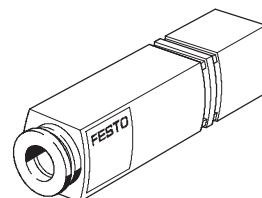
In-line version

Connection options:

- QS push-in connectors
- Push-in sleeve

Mounting options:

Extremely compact housing with supply and vacuum port arranged in a line and with unducted exhaust air. As a result, this housing type can be installed directly into the tubing line.



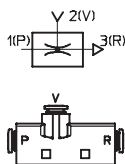
Two operating principles

Standard

- T-type housing

Design:

Supply port at 90° to vacuum port. The drawn-in flow is diverted 90° from V to R.

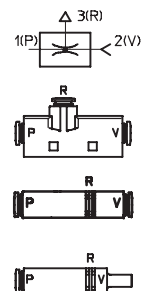


Inline

- T-type housing with exhaust port
- Straight housing without exhaust port for space-saving assembly in a tubing line or directly in the suction cup holder

Design:

Supply and vacuum ports arranged in-line.



Vacuum generators VN

Features

FESTO

Vacuum generators
Pneumatic

1.1

Two variants

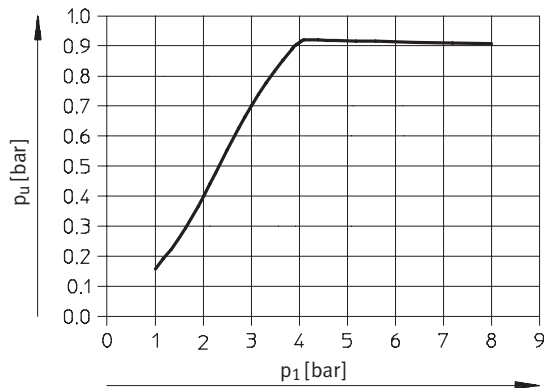
High vacuum

up to 93%

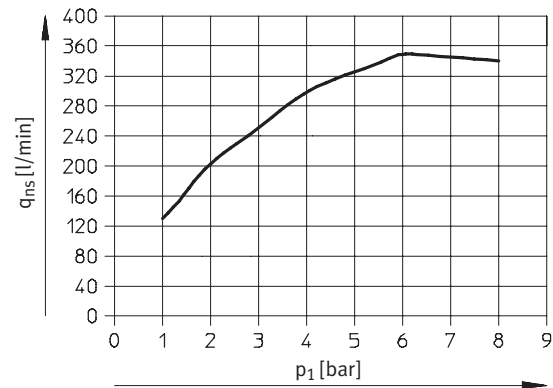
High suction volume

up to 339 l/min which results in very short evacuation times

Vacuum p_u as a function of operating pressure p_1



Suction rate q_{ns} as a function of operating pressure p_1

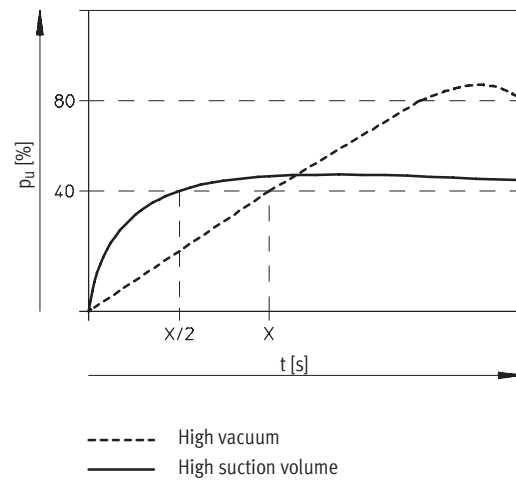


System comparison

High vacuum – high suction volume

The first type of generator has been optimised for the generation of high vacuum at comparatively lower suction flow rates.

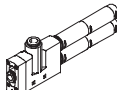
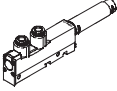
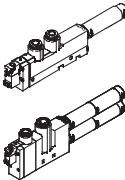
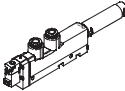
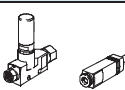
The second type of generator, on the other hand, can achieve very short evacuation times because of the high suction flow rate at relatively low vacuum.



Vacuum generators VN

Product range overview

FESTO

Function	Version	Type	Nominal size	Housing width								Supply port (1)					
				T-type					Inline			Push-in connector PQ	Female thread PI				
				10	14	16	18	24	10	13	14.5						
			[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]						
High vacuum	Standard H																
		VN-05-H	0.45	■	—	—	—	—	—	—	—	■	■				
				—	■	—	—	—	—	—	—	■	■				
		VN-07-H	0.7	■	—	—	—	—	—	—	—	■	■				
				—	■	—	—	—	—	—	—	■	■				
	VN-10-H	0.95	—	■	—	■	—	—	—	—	■	■					
			—	—	—	■	—	—	—	—	■	—					
	VN-14-H	1.4	—	—	—	■	—	—	—	—	■	■					
		VN-20-H	2.0	—	—	—	—	■	—	—	—	■	■				
		VN-30-H	3.0	—	—	—	—	■	—	—	—	■	■				
	Standard H with integrated vacuum switch																
		VN-05-H-...-P	0.45	—	—	■	—	—	—	—	—	■	—				
		VN-07-H-...-P	0.7														
		VN-10-H-...-P	0.95														
	Standard H with ejector pulse																
		VN-05-H-...-A	0.45	—	■	—	—	—	—	—	—	■	■				
		VN-07-H-...-A	0.7														
		VN-10-H-...-A	0.95														
		VN-14-H-...-A	1.4														
	Standard H with solenoid valve																
		VN-05-H-...-M	0.45	—	■	—	—	—	—	—	—	■	—				
		VN-07-H-...-M	0.7														
		VN-10-H-...-M	0.95														
		VN-14-H-...-M	1.4														
		VN-20-H-...-M	2.0														
		VN-30-H-...-M	3.0														
	Standard H with solenoid valve and ejector pulse																
	VN-05-H-...-B	0.45	—	■	—	—	—	—	—	—	■	—					
	VN-07-H-...-B	0.7															
	VN-10-H-...-B	0.95															
	VN-14-H-...-B	1.4															
Inline M																	
	VN-05-M	0.45	■	—	—	—	—	—	—	—	■	■					
			—	■													
			—	—									—	—	■	—	—
			—	—									—	—	—	—	—
	VN-07-M	0.7	■	—	—	—	—	—	—	—	■	■					
			—	■													
			—	—									—	—	■	—	—
			—	—									—	—	■	—	—
VN-10-M	0.95	—	—	—	—	—	—	—	■	—	■	—					
Inline M with ejector pulse																	
	VN-05-M-...-A	0.45	—	—	—	—	—	—	—	■	■	—					
	VN-07-M-...-A	0.7															

Vacuum generators VN

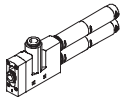
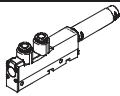
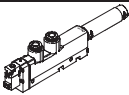
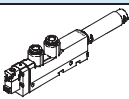
Product range overview

Type	Vacuum port (2)				Exhaust port (3)			Switching function		→ Page
	Push-in connector VQ	Female thread VI	Male thread VA	Push-in sleeve VT	Push-in connector RQ	Female thread RI	Silencer RO	Fixed hysteresis O1	Variable hysteresis O2	
Standard H										
VN-05-H	■	■	- ■	-	■	■	■	-	-	6 / 1.1-11
VN-07-H	■	■	- ■	-	■	■	■	-	-	
VN-10-H	■	■ -	■	-	■	■ -	■	-	-	
VN-14-H	■	■	■	-	■	■	■	-	-	
VN-20-H	■	■	■	-	-	-	■	-	-	
VN-30-H	■	■	■	-	-	-	■	-	-	
Standard H with integrated vacuum switch										
VN-05-H-...-P	■	-	-	-	-	-	-	■	■	6 / 1.1-27
VN-07-H-...-P										
VN-10-H-...-P										
Standard H with ejector pulse										
VN-05-H-...-A	■	■	-	-	-	-	■	-	-	6 / 1.1-33
VN-07-H-...-A										
VN-10-H-...-A										
VN-14-H-...-A										
Standard H with solenoid valve										
VN-05-H-...-M	■	-	-	-	-	-	■	-	-	6 / 1.1-33
VN-07-H-...-M										
VN-10-H-...-M										
VN-14-H-...-M										
VN-20-H-...-M										
VN-30-H-...-M										
Standard H with solenoid valve and ejector pulse										
VN-05-H-...-B	■	-	-	-	-	-	■	-	-	6 / 1.1-33
VN-07-H-...-B										
VN-10-H-...-B										
VN-14-H-...-B										
Inline M										
VN-05-M	■	■	-	-	■	■	■	-	-	6 / 1.1-11
	■	-	-	■	-	-	-	-	-	
VN-07-M	■	■	-	-	■	■	■	-	-	
	■	-	-	■	-	-	-	-	-	
VN-10-M	■	-	-	-	-	-	-	-	-	
Inline M with ejector pulse										
VN-05-M-...-A	■	-	-	-	-	-	-	-	-	6 / 1.1-33
VN-07-M-...-A										

Vacuum generators VN

Product range overview

FESTO

Function	Version	Type	Nominal size	Housing width								Supply port (1)		
				T-type					Inline			Push-in connector PQ	Female thread PI	
				10	14	16	18	24	10	13	14.5			
				[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]			
High suction rate	Standard L													
		VN-05-L	0.45	■	—	—	—	—	—	—	—	■	■	
		VN-07-L	0.7	—	■	—	—	—	—	—	—	■	■	
		VN-10-L	0.95	—	■	—	—	—	—	—	—	■	■	
		VN-14-L	1.4	—	—	—	■	—	—	—	—	■	■	
		VN-20-L	2.0	—	—	—	—	■	—	—	—	■	■	
		VN-30-L	3.0	—	—	—	—	■	—	—	—	■	■	
	Standard L with integrated vacuum switch													
		VN-05-L-...-P	0.45	—	—	■	—	—	—	—	—	■	—	
		VN-07-L-...-P	0.7											
		VN-10-L-...-P	0.95											
	Standard L with ejector pulse													
		VN-05-L-...-A	0.45	—	■	—	—	—	—	—	—	■	■	
		VN-07-L-...-A	0.7											
		VN-10-L-...-A	0.95											
		VN-14-L-...-A	1.4											—
	Standard L with solenoid valve													
		VN-05-L-...-M	0.45	—	■	—	—	—	—	—	—	■	—	
		VN-07-L-...-M	0.7											
		VN-10-L-...-M	0.95											
		VN-14-L-...-M	1.4											—
	Standard L with solenoid valve and ejector pulse													
		VN-05-L-...-B	0.45	—	■	—	—	—	—	—	—	■	—	
		VN-07-L-...-B	0.7											
		VN-10-L-...-B	0.95											
		VN-14-L-...-B	1.4											—
	Inline N													
		VN-05-N	0.45	—	■	—	—	—	—	—	—	—	■	■
				—	—	—	—	—	—	■	—	—	■	—
	Inline N with ejector pulse													
		VN-05-N-...-A	0.45	—	—	—	—	—	—	—	■	■	—	
		VN-07-N-...-A	0.7											

Vacuum generators VN

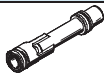
Product range overview

Type	Vacuum port (2)				Exhaust port (3)			Switching function		→ Page
	Push-in connector VQ	Female thread VI	Male thread VA	Push-in sleeve VT	Push-in connector RQ	Female thread RI	Silencer RO	Fixed hysteresis O1	Variable hysteresis O2	
Standard L										
VN-05-L	■	■	– ■	–	■	■	■	–	–	6 / 1.1-11
VN-07-L	■	■	■	–	■	■	■	–	–	
VN-10-L	■	■ –	■	–	■	■ –	■	–	–	
VN-14-L	■	■	■	–	■	■	–	–	–	
VN-20-L	■	■	■	–	–	–	■	–	–	
VN-30-L	–	■	■	–	–	–	■	–	–	
Standard L with integrated vacuum switch										
VN-05-L-...-P	■	–	–	–	–	–	–	■	■	6 / 1.1-27
VN-07-L-...-P										
VN-10-L-...-P										
Standard L with ejector pulse										
VN-05-L-...-A	■	■	–	–	–	–	■	–	–	6 / 1.1-33
VN-07-L-...-A										
VN-10-L-...-A										
VN-14-L-...-A										
Standard L with solenoid valve										
VN-05-L-...-M	■	–	–	–	–	–	■	–	–	6 / 1.1-33
VN-07-L-...-M										
VN-10-L-...-M										
VN-14-L-...-M										
Standard L with solenoid valve and ejector pulse										
VN-05-L-...-B	■	–	–	–	–	–	■	–	–	6 / 1.1-33
VN-07-L-...-B										
VN-10-L-...-B										
VN-14-L-...-B										
Inline N										
VN-05-N	■	■	–	–	■	■	■	–	–	6 / 1.1-11
	■	–	–	■	–	–	–	–	–	
Inline N with ejector pulse										
VN-05-N-...-A	■	–	–	–	–	–	–	–	–	6 / 1.1-33
VN-07-N-...-A										

Vacuum generators VN

Product range overview

FESTO

Function	Version	Type	Nominal size	→ Page
			[mm]	
High vacuum	Vacuum generator cartridge, standard H			
		VN-05-H	0.45	6 / 1.1-45
		VN-07-H	0.7	
		VN-10-H	0.95	
		VN-14-H	1.4	
		VN-20-H	2.0	
High suction rate	Vacuum generator cartridge, standard L			
		VN-05-L	0.45	6 / 1.1-45
		VN-07-L	0.7	
		VN-10-L	0.95	
		VN-14-L	1.4	
		VN-20-L	2.0	

Vacuum generators VN

Peripherals overview

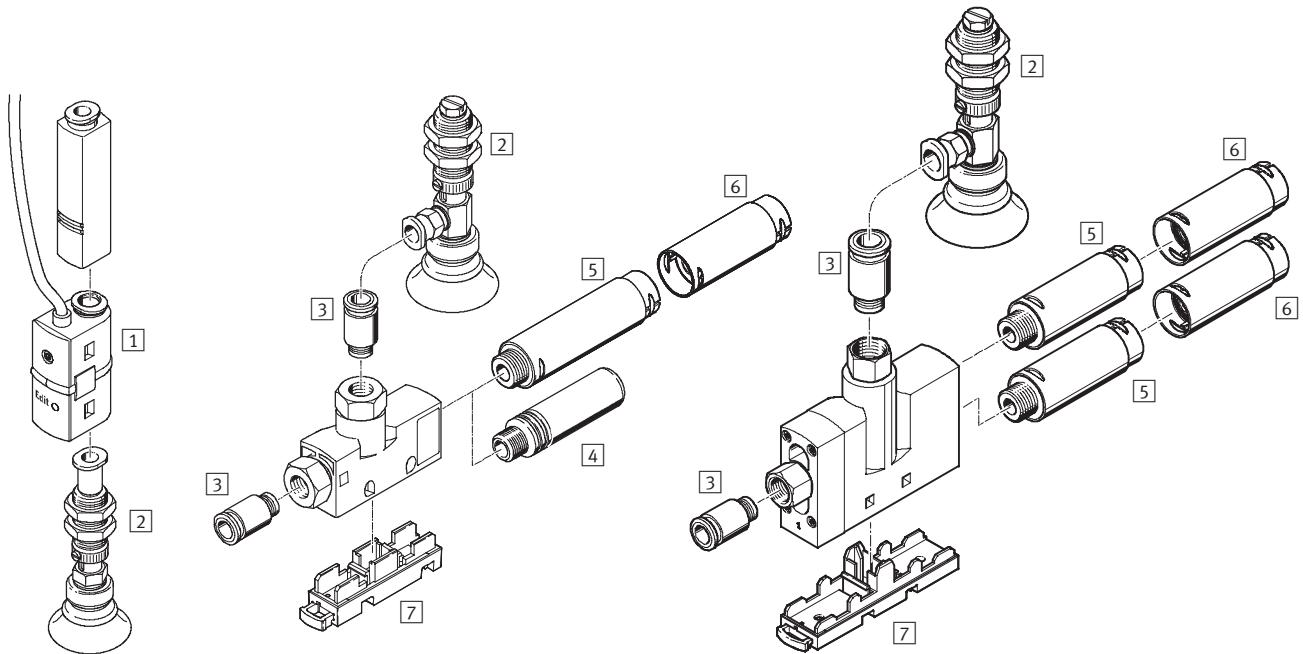
FESTO

VN-05/07/10/14

VN-20/30

Inline

T-type



Mounting attachments and accessories							
	VN-05/07/10/14					VN-20/30	→ Page
	Inline		T-type			T-type	
	10 mm	13 mm	10 mm	14 mm	18 mm	24 mm	
1 Pressure switch SDE5		■		■		■	6 / 5.1-39
2 Suction gripper ESG		■		■		■	6 / 2.1-6
3 Push-in fitting QS		–		■		■	Volume 3
4 Silencer UO		–	■	■	–	–	6 / 4.1-17
5 Silencer UOM		–	–	–	■	■	6 / 4.1-18
6 Silencer extension UOMS		–	–	–	■	■	6 / 4.1-18
7 Mounting plate VN-T		–		■		■	6 / 4.1-19
– Suction cup holder ESH		■		■		■	6 / 2.1-32
– suction cup ESS		■		■		■	6 / 2.1-47

Vacuum generators VN

Type codes

FESTO

Type		VN	05	H	T2	PQ1	VQ1	RQ1
VN	Vacuum generator							
Nominal laval nozzle size [mm]								
05	0.45							
07	0.7							
10	0.95							
14	1.4							
20	2.0							
30	3.0							
Ejector characteristic								
H	High vacuum/Standard							
L	High suction rate/Standard							
M	High vacuum/Inline							
N	High suction rate/Inline							
Housing type								
I2	Inline, grid dimensions 10 mm							
I3	Inline, grid dimensions 13 mm							
T2	T-type, grid dimensions 10 mm							
T3	T-type, grid dimensions 14 mm							
T4	T-type, grid dimensions 18 mm							
T6	T-type, grid dimensions 24 mm							
Supply port (1)								
PQ1	Push-in connector QS4							
PQ2	Push-in connector QS6							
PQ4	Push-in connector QS10							
PI2	Female thread M5							
PI4	Female thread G $\frac{1}{8}$							
PI5	Female thread G $\frac{1}{4}$							
Vacuum connection (2)								
VQ1	Push-in connector QS4							
VQ2	Push-in connector QS6							
VQ3	Push-in connector QS8							
VQ5	Push-in connector QS12							
VI2	Female thread M5							
VI4	Female thread G $\frac{1}{8}$							
VI5	Female thread G $\frac{1}{4}$							
VI6	Female thread G $\frac{3}{8}$							
VA4	Male thread G $\frac{1}{8}$							
VA5	Male thread G $\frac{1}{4}$							
VT1	Push-in sleeve $\varnothing$ 4 mm							
VT2	Push-in sleeve $\varnothing$ 6 mm							
Exhaust port (3)								
RQ1	Push-in connector QS4							
RQ2	Push-in connector QS6							
RQ3	Push-in connector QS8							
RI2	Female thread M5							
RI4	Female thread G $\frac{1}{8}$							
RI5	Female thread G $\frac{1}{4}$							
RO1	Silencer UO, minimal resistance							
RO2	Silencer UOM, minimal resistance							



Note

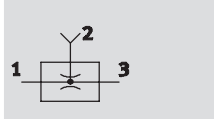
Possible combinations can be found in the ordering data.

Vacuum generators VN

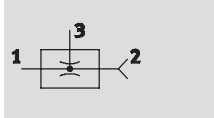
Technical data

FESTO

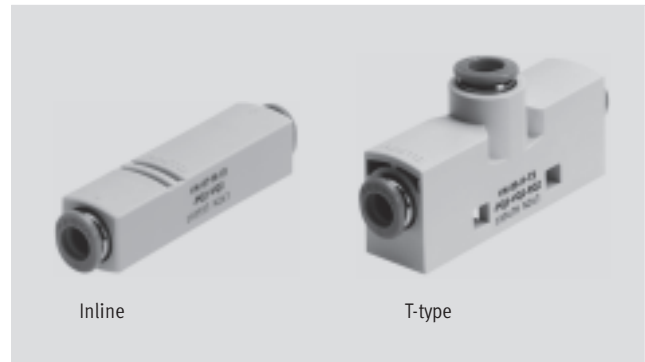
Function
VN Standard



VN Inline



- - Temperature range
0 ... +60 °C
- - Operating pressure
1 ... 8 bar



Vacuum generators
Pneumatic

1.1

General technical data – Standard										
Design		T-type								
Type		VN-05		VN-07		VN-10		VN-14	VN-20	VN-30
Grid dimension [mm]		10	14	10	14	14	18	18	24	24
Nominal size of laval nozzle [mm]		0.45		0.7		0.95		1.4	2.0	3.0
Ejector characteristic		High vacuum H								
		High suction rate L		–	High suction rate L					
Pneumatic connection 1	Push-in connector	QS4	QS6	QS4	QS6	QS6	QS6	QS6	QS10	QS10
	Female thread	M5	G½	M5	G½	G½	–	G½	G¼	G¼
Vacuum connection	Push-in connector	QS4	QS6	QS4	QS6	QS6	QS8	QS8	QS12	QS12
	Male thread	–	G½	–	G½	G½	G¼	G¼	G¼	G¼
	Female thread	M5	G½	M5	G½	G½	–	G¼	G¾	G¾
Pneumatic connection 3	Push-in connector	QS4	QS6	QS4	QS6	QS6	QS8	QS8	–	–
	Female thread	M5	G½	M5	G½	G½	–	G¼	–	–
	Silencer	min. resis.	min. resis.	min. resis.	min. resis.	min. resis.	min. resis.	min. resis.	min. resis.	min. resis.
Type of mounting		Via through-holes								
		Via H-rail								
		Via wall/surface bracket								
Assembly position		Any								

General technical data – Inline										
Design		T-type				Inline				
Type		VN-05		VN-07		VN-05		VN-07		VN-10
Grid dimension [mm]		10	14	10	14	10	13	10	13	13
Nominal size of laval nozzle [mm]		0.45		0.7		0.45		0.7		0.95
Ejector characteristic		High vacuum M								
		–	High suction rate N	–		–	High suction rate N	–		–
Pneumatic connection 1	Push-in connector	QS4	QS6	QS4	QS6	QS4	QS6	QS4	QS6	QS6
	Female thread	M5	G1/8	M5	G1/8	–				
Vacuum connection	Push-in connector	QS4	QS6	QS4	QS6	QS4	QS6	QS4	QS6	QS6
	Female thread	M5	G1/8	M5	G1/8	–				
	Push-in sleeve	–				4	6	4	6	–
Pneumatic connection 3	Push-in connector	QS4	QS6	QS4	QS6	–				
	Female thread	M5	G1/8	M5	G1/8	–				
	Silencer	min. resis.	min. resis.	min. resis.	min. resis.	–				
Type of mounting		Via through-holes				Inline installation				
		Via H-rail								
		Via wall/surface bracket								
Assembly position		Any								

- - Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Vacuum generators VN

Technical data

FESTO

Operating and environmental conditions		
Pneumatic connection	with push-in fitting	without push-in fitting
Operating pressure [bar]	1 ... 8	
Nominal operating pressure [bar]	6	
Operating medium	Dried, filtered and unlubricated compressed air	
Ambient temperature [°C]	0 ... +60	
Temperature of medium [°C]	0 ... +60	
Corrosion resistance class CRC ¹⁾	1	2

1) Corrosion resistance class 1 according to Festo standard 940 070

Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Performance data – High vacuum									
Ejector characteristic	Standard H						Inline M		
Nominal size of laval nozzle [mm]	0.45	0.7	0.95	1.4	2.0	3.0	0.45	0.7	0.95
Max. vacuum [%]	88	88	89	88	92	93	86	86	86
Operating pressure for max. vacuum [bar]	4.5	4.7	4.5	5.0	3.5	3.7	6.0	5.8	5.8
Max. suction rate with respect to atmosphere [l/min]	6.2	16	25	51.6	98	186	6.1	13.5	28
Operating pressure for max. suction rate [bar]	2.1	2.1	3.1	5.1	2.0	5.0	6.3	7.0	5.0
Pressurisation time ¹⁾ for 1 l volume at p ₁ = 6 bar [s]	4.8	1.9	1.1	0.5	0.2	0.1	4.7	2.1	0.96

1) Time required to build up vacuum to –0.05 bar.

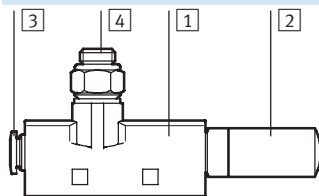
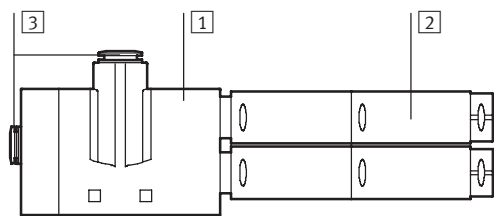
Performance data – High suction rate							
Ejector characteristic	Standard L						Inline N
Nominal size of laval nozzle [mm]	0.45	0.7	0.95	1.4	2.0	3.0	0.45
Max. suction rate with respect to atmosphere [l/min]	15.7	38.8	62.7	90.0	188.0	339.0	12.0
Operating pressure for max. suction rate [bar]	5.0	6.2	4.0	8.0	3.0	6.0	6.0
Pressurisation time ¹⁾ for 1 l volume at p ₁ = 6 bar [s]	1.7	0.5	0.46	0.25	0.15	0.1	1.57

1) Time required to build up vacuum to –0.05 bar.

Vacuum generators VN

Technical data



Materials		
Sectional view		
		
		
Vacuum generator VN-05/07/10/14		
1	Housing	Polyacetate, reinforced
2	Silencer	R01 Polyethylene
		R02 Wrought aluminium alloy, polyacetate, PU foam
3	Push-in fitting	Plastic, nickel plated brass
4	Connecting thread	Wrought aluminium alloy
–	Seals	Nitrile rubber
Note on materials		Free of copper and PTFE
		Free of paint wetting impairment substances
Vacuum generator VN-20/30		
1	Housing	Polyacetate, reinforced
2	Silencer	Wrought aluminium alloy, polyacetate, PU foam
3	Push-in fitting	Plastic, nickel plated brass
–	Connecting thread	Wrought aluminium alloy
–	Seals	Nitrile rubber
Note on materials		Free of copper and PTFE
		Free of paint wetting impairment substances

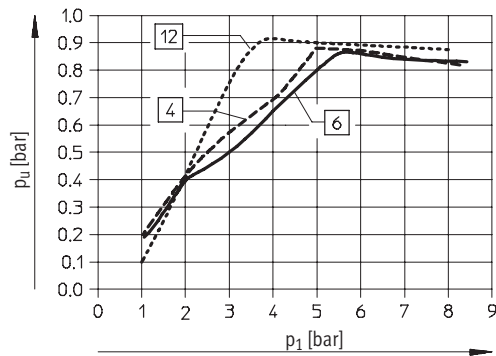
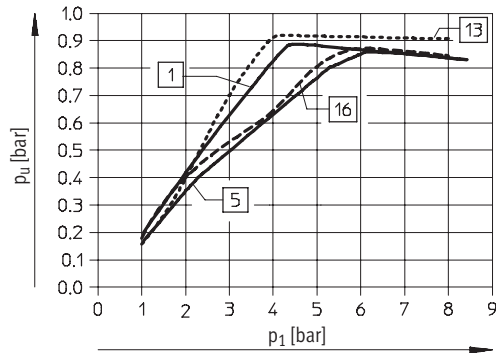
Vacuum generators VN

Technical data

FESTO

Vacuum p_u as a function of operating pressure p_1

High vacuum



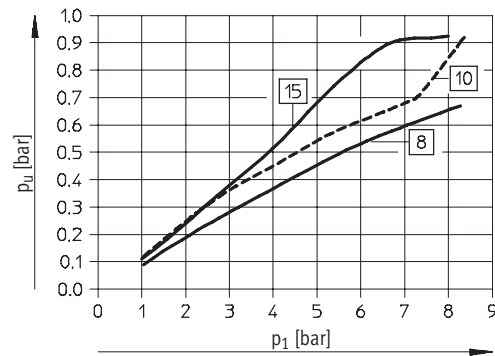
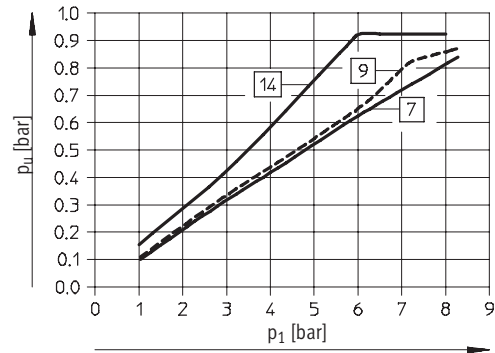
Standard:

- 1 VN-05-H...
- VN-07-H...
- VN-10-H...
- 4 VN-14-H...
- 12 VN-20-H...
- 13 VN-30-H...

Inline:

- 5 VN-05-M...
- 6 VN-07-M...
- 16 VN-10-M...

High suction rate



Standard:

- 7 VN-05-L...
- 8 VN-07-L...
- 9 VN-10-L...
- 10 VN-14-L...
- 14 VN-20-L...
- 15 VN-30-L...

Inline:

- 8 VN-05-N...

Vacuum generators VN

Technical data

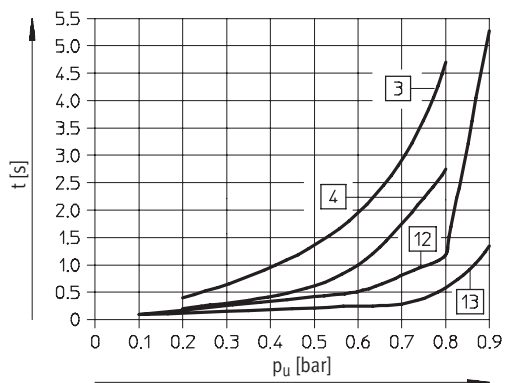
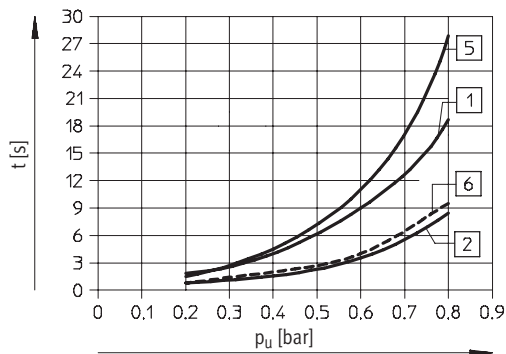
FESTO

Vacuum generators
Pneumatic

1.1

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

High vacuum



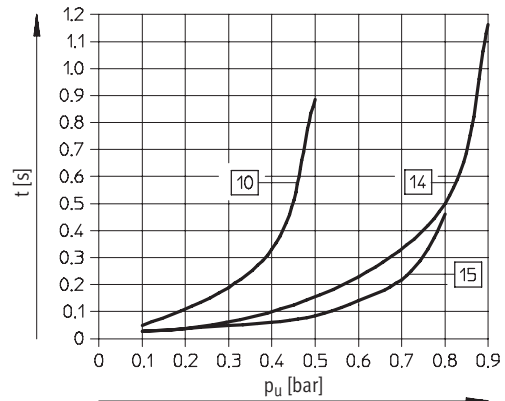
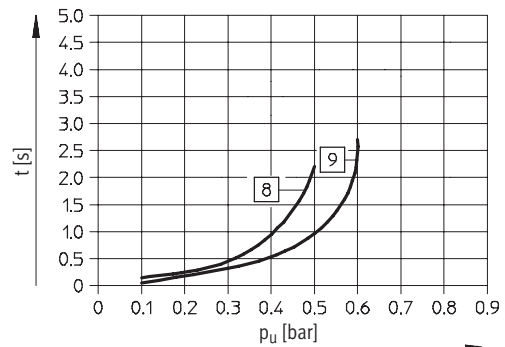
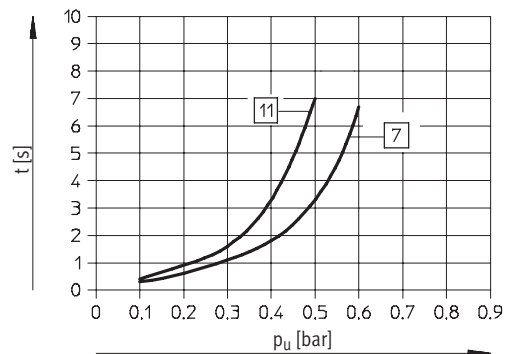
Standard:

- 1 VN-05-H...
- 2 VN-07-H...
- 3 VN-10-H...
- 4 VN-14-H...
- 12 VN-20-H...
- 13 VN-30-H...

Inline:

- 5 VN-05-M...
- 6 VN-07-M...
- 3 VN-10-M...

High suction rate



Standard:

- 7 VN-05-L...
- 8 VN-07-L...
- 9 VN-10-L...
- 10 VN-14-L...
- 14 VN-20-L...
- 15 VN-30-L...

Inline:

- 11 VN-05-N...

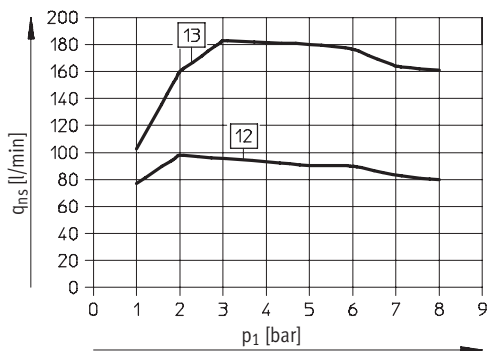
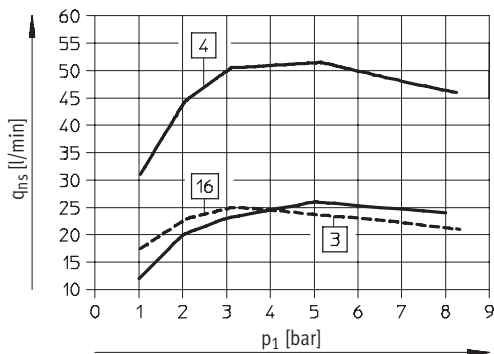
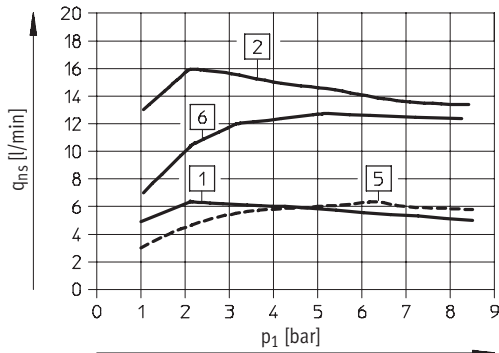
Vacuum generators VN

Technical data

FESTO

Suction rate q_{ns} (with respect to atmosphere) as a function of operating pressure p_1

High vacuum



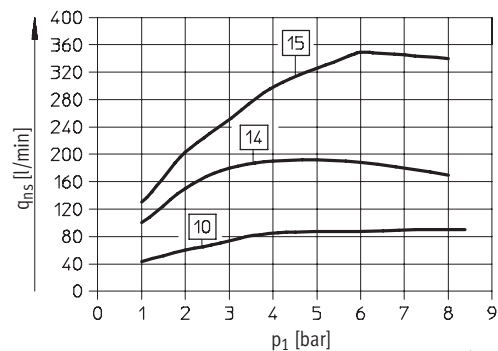
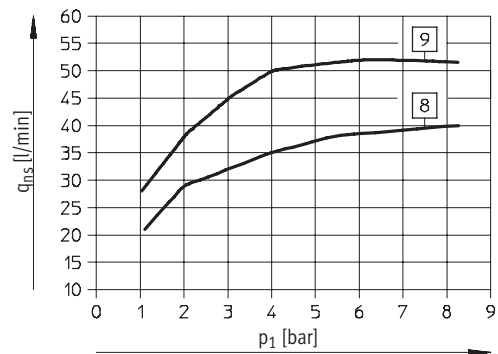
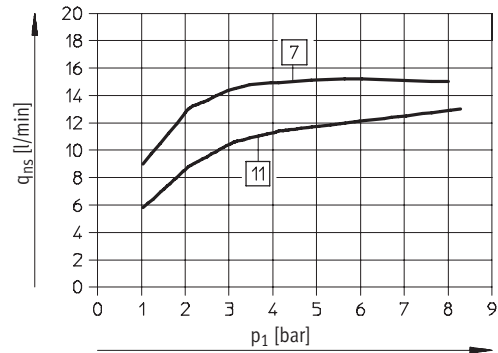
Standard:

- 1 VN-05-H...
- 2 VN-07-H...
- 3 VN-10-H...
- 4 VN-14-H...
- 12 VN-20-H...
- 13 VN-30-H...

Inline:

- 5 VN-05-M...
- 6 VN-07-M...
- 16 VN-10-M...

High suction rate



Standard:

- 7 VN-05-L...
- 8 VN-07-L...
- 9 VN-10-L...
- 10 VN-14-L...
- 14 VN-20-L...
- 15 VN-30-L...

Inline:

- 11 VN-05-N...

Vacuum generators VN

Technical data

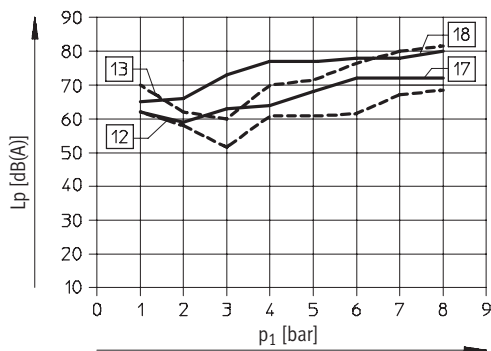
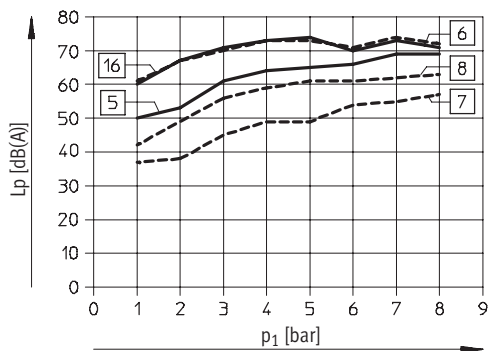
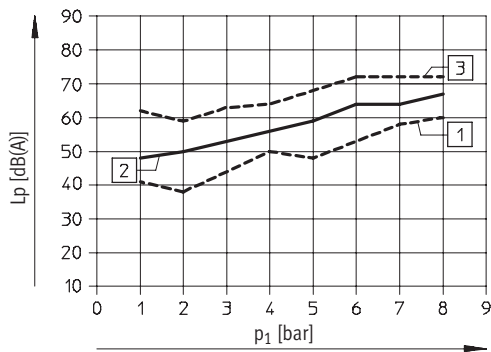
FESTO

Vacuum generators
Pneumatic

1.1

Noise level L_p (at distance of 1 m) as a function of operating pressure p_1

High vacuum



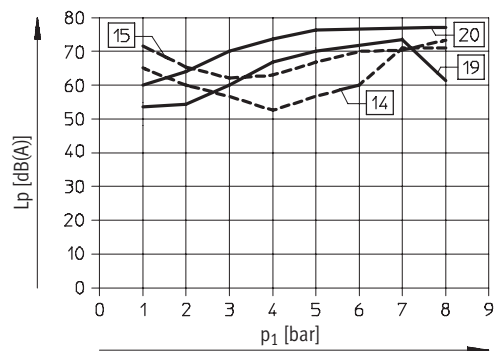
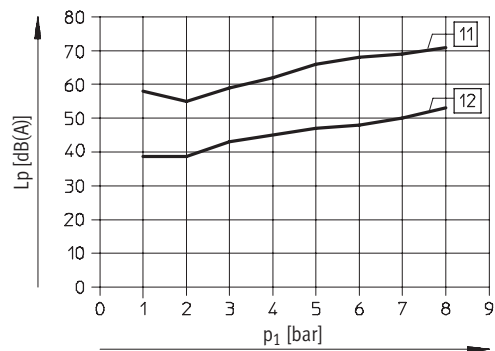
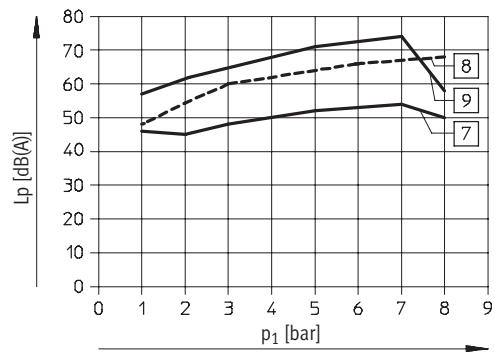
Standard:

- 1 VN-05-H-...-R01
- 2 VN-07-H-...-R01
- 3 VN-10-H-...-R01
- 17 VN-10-H-...-R02
- 18 VN-14-H-...-R02
- 12 VN-20-H-...-R02
- 13 VN-30-H-...-R02

Inline:

- T-type
- 7 VN-05-M-...-R01
- 8 VN-07-M-...-R01
- 16 VN-10-M-...-R01
- Inline
- 5 VN-05-M-I3-...
- 6 VN-07-M-I3-...

High suction rate



Standard:

- 7 VN-05-L-...-R01
- 8 VN-07-L-...-R01
- 9 VN-10-L-...-R01
- 19 VN-10-L-...-R02
- 20 VN-14-L-...-R02
- 14 VN-20-L-...-R02
- 15 VN-30-L-...-R02

Inline:

- T-type
- 12 VN-05-N-...-R01
- Inline
- 11 VN-05-N-I3-...

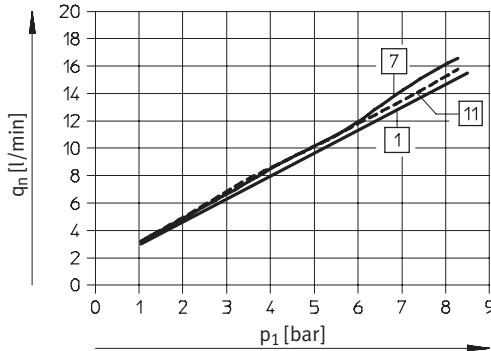
Vacuum generators VN

Technical data

FESTO

Air consumption q_n as a function of operating pressure p_1

High vacuum/high suction rate

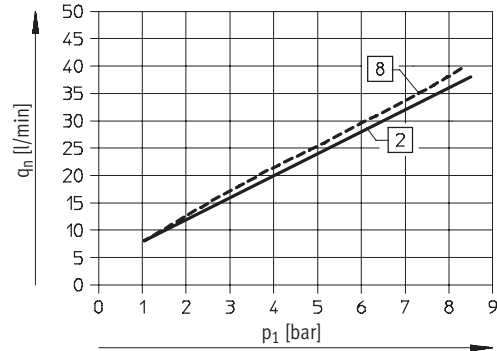


Standard:

- 1 VN-05-H...
- 7 VN-05-L...

Inline:

- 1 VN-05-M...
- 11 VN-05-N...

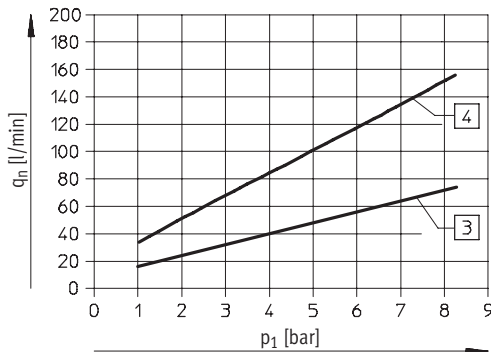


Standard:

- 2 VN-07-H...
- 8 VN-07-L...

Inline:

- 2 VN-07-M...

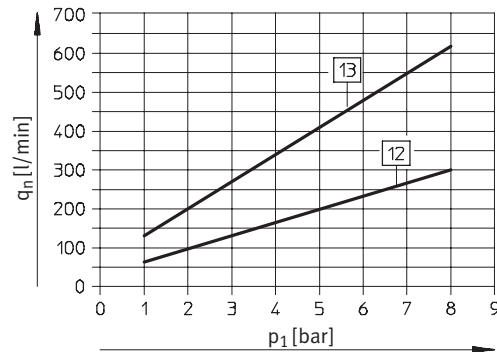


Standard:

- 3 VN-10-H...
- VN-10-L...
- 4 VN-14-H...
- VN-14-L...

Inline:

- 3 VN-10-M...



Standard:

- 12 VN-20-H...
- VN-20-L...
- 13 VN-30-H...
- VN-30-L...

Vacuum generators VN

Technical data

FESTO

Vacuum generators
Pneumatic

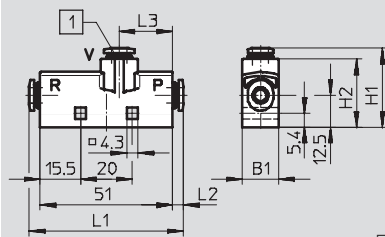
1.1

Dimensions – T-type/Standard, VN-05/07/10/14

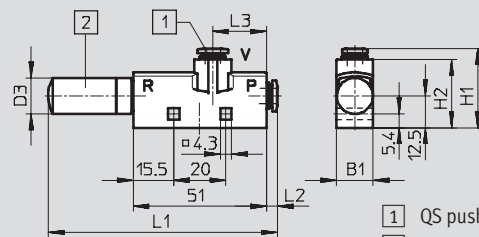
Download CAD data → www.festo.com/en/engineering

VN-...-T...-PQ...-VQ...-RQ...

VN-...-T...-PQ...-VQ...-RO...



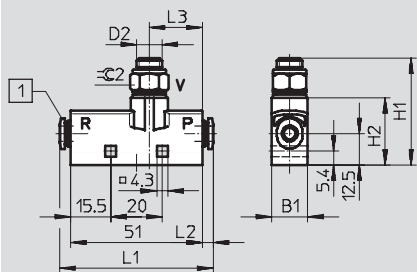
1 QS push-in connector



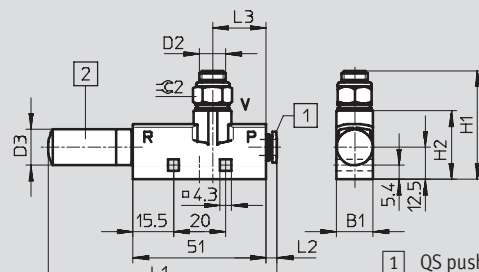
1 QS push-in connector
2 Silencer

VN-...-T...-PQ...-VA...-RQ...

VN-...-T...-PQ...-VA...-RO...



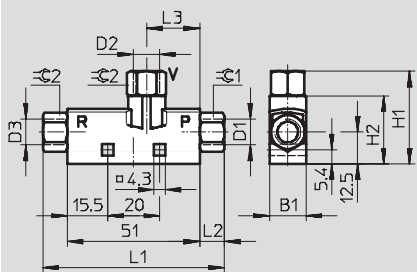
1 QS push-in connector



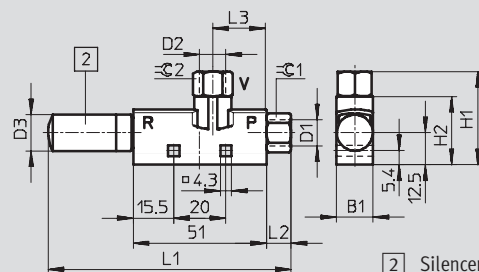
1 QS push-in connector
2 Silencer

VN-...-T...-PI...-VI...-RI...

VN-...-T...-PI...-VI...-RO...



1 QS push-in connector



2 Silencer

Type	B1	Connections			H1	H2	L1	L2	L3	≡C1	≡C2
		P D1	V D2	R D3							
VN-...-T2-PQ1-VQ1-RQ1	10	QS4	QS4	QS4	31.3	27.7	58.2	3.6	24.3	-	-
VN-...-T2-PQ1-VQ1-RO1				9.8 ¹⁾			86.8			-	-
VN-...-T2-PI2-VI2-RI2		M5	M5	M5	61		9	9			
VN-...-T2-PI2-VI2-RO1				9.8 ¹⁾	88.2		9	9			
VN-...-T3-PQ2-VQ2-RQ2	14	QS6	QS6	QS6	30.4	26.2	59.4	4.2	25.5	-	-
VN-...-T3-PQ2-VQ2-RO1				13.8 ¹⁾			97.6				-
VN-...-T3-PQ2-VA4-RQ2			G1/8	QS6	41.5		59.4			13	
VN-...-T3-PQ2-VA4-RO1				13.8 ¹⁾	97.6						
VN-...-T3-PI4-VI4-RI4		G1/8		G1/8	70		13				
VN-...-T3-PI4-VI4-RO1				13.8 ¹⁾	102.9			9.5			
VN-...-T4-PQ2-VQ3-RQ3	18	QS6	QS8	QS8	35.9	30.7	63.8	4.2	25.5	-	-
VN-...-T4-PQ2-VQ3-RO2				17.8 ¹⁾			125.5				-
VN-...-T4-PQ2-VA5-RQ3			G1/4	QS8	50.5		63.8			17	
VN-...-T4-PQ2-VA5-RO2				17.8 ¹⁾	125.5						
VN-...-T4-PI4-VI5-RI5		G1/8		G1/4	81.4		9.5	13			
VN-...-T4-PI4-VI5-RO2				17.8 ¹⁾	128.8						

1) Ø Silencer

- Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Vacuum generators VN

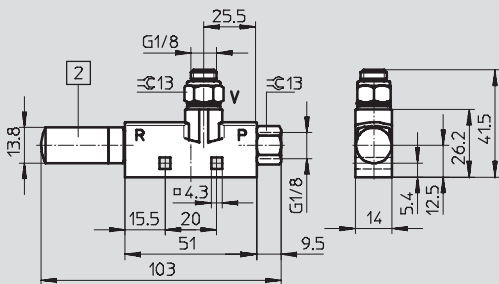
Technical data

FESTO

Dimensions – T-type/Standard, VN-10

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VN-10-L-T3-PI4-VA4-R01



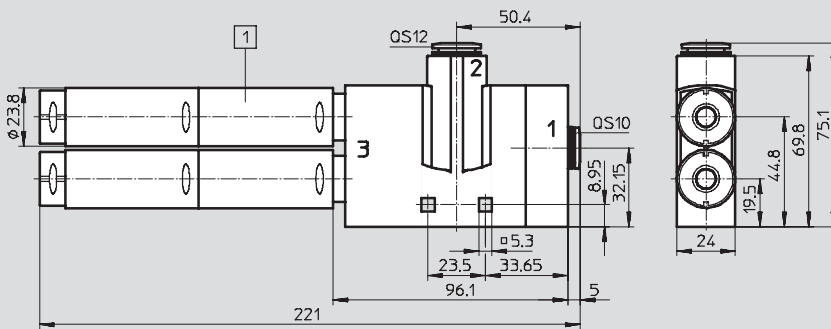
2 Silencer

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Dimensions – T-type/Standard, VN-20/30

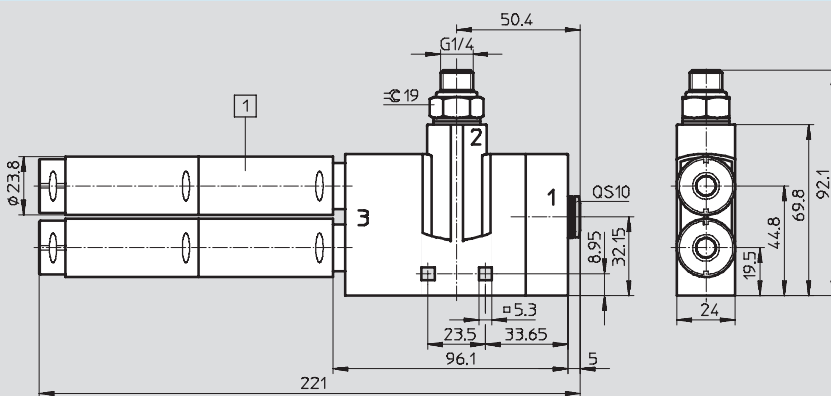
Download CAD data → www.festo.com/en/engineering

VN-...-T6-PQ4-VQ5-R02



1 Silencer

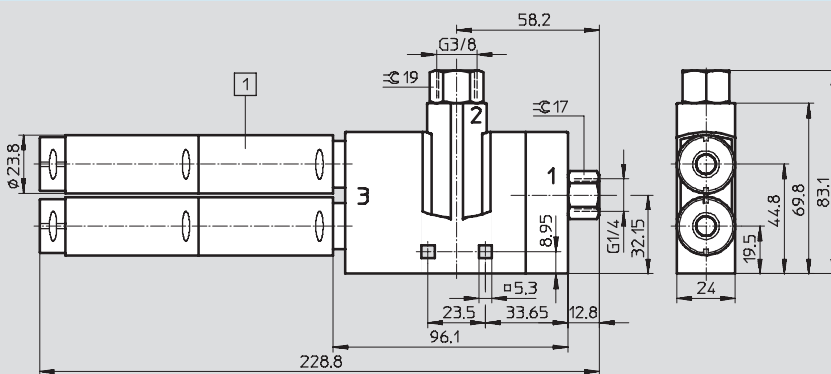
VN-...-T6-PQ4-VA5-R02



1 Silencer

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

VN-...-T6-PI5-VI6-R02



1 Silencer

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Vacuum generators VN

Technical data

FESTO

Vacuum generators
Pneumatic

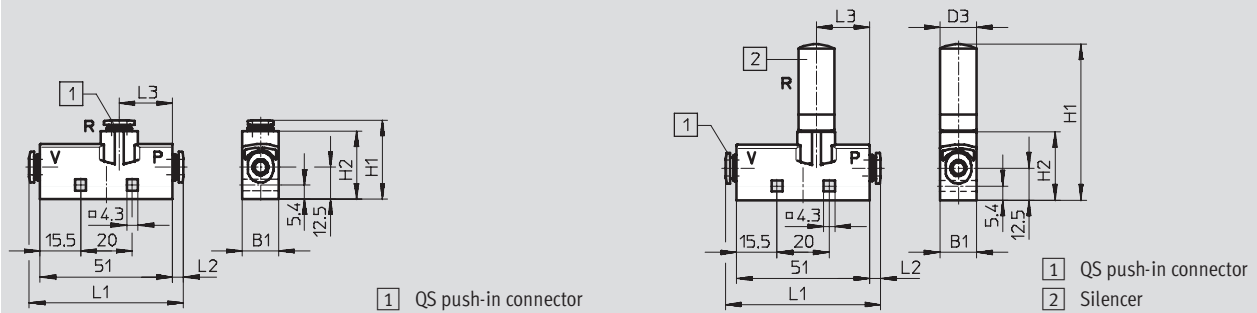
1.1

Dimensions – T-type/Inline, VN-05/07

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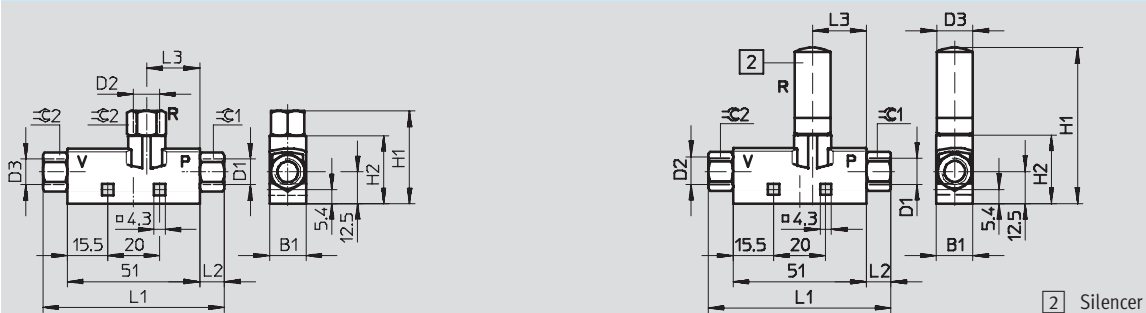
VN-...-T...-PQ...-VQ...-RQ...

VN-...-T...-PQ...-VQ...-R01



VN-...-T...-PI...-VI...-RI...

VN-...-T...-PI...-VI...-R01



Type	B1	Connections			H1	H2	L1	L2	L3	≡C1	≡C2
		P D1	V D2	R D3							
VN-...-T2-PQ1-VQ1-RQ1	10	QS4	QS4	QS4	31.3	27.7	58.2	3.6	24.3	-	-
VN-...-T2-PQ1-VQ1-R01				9.8 ¹⁾	59.9						
VN-...-T2-PI2-VI2-RI2		M5	M5	M5	32.7		61	5		9	9
VN-...-T2-PI2-VI2-R01				9.8 ¹⁾	59.9						
VN-...-T3-PQ2-VQ2-RQ2	14	QS6	QS6	QS6	30.4	26.2	59.4	4.2	25.5	-	-
VN-...-T3-PQ2-VQ2-R01				13.8 ¹⁾	68.6						
VN-...-T3-PI4-VI4-RI4		G ¹ / ₈	G ¹ / ₈	G ¹ / ₈	35.7		70	9.5		13	13
VN-...-T3-PI4-VI4-R01				13.8 ¹⁾	68.6						

1) Ø Silencer

Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

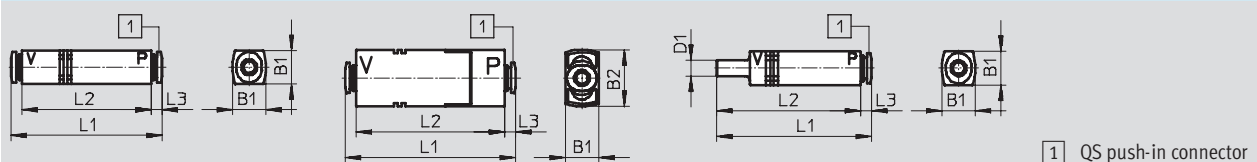
Dimensions – Inline, VN-05/07/10

Download CAD data → www.festo.com/en/engineering

VN-05/07-...-I...-PQ...-VQ...

VN-10-M-I3-PQ2-VQ2

VN-05/07-...-I...-PQ...-VT...



Type	B1	B2	Connections		D1 Ø	L1	L2	L3
			P	V				
VN-05/07-...-I2-PQ1-VQ1	10	-	QS4	QS4	-	57.4	50.2	3.6
VN-05/07-...-I2-PQ1-VT1				-	4	61.6	58	
VN-05/07-...-I3-PQ2-VQ2	13	-	QS6	QS6	-	58.6	50.2	4.2
VN-10-M-I3-PQ2-VQ2		22		-	-	66.1	57.7	
VN-05/07-...-I3-PQ2-VT2		-		-	6	60.2	56	

Vacuum generators VN

Technical data

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Ordering data and weights – Standard								
T-type								
Housing width [mm]	Nominal size [mm]	Weight [g]	High vacuum H		Weight [g]	High suction rate L		
			Part No.	Type		Part No.	Type	
with push-in connector								
10	0.45	15.1	526 100	VN-05-H-T2-PQ1-VQ1-RQ1	15.1	526 114	VN-05-L-T2-PQ1-VQ1-RQ1	
	0.7	15.4	526 101	VN-07-H-T2-PQ1-VQ1-RQ1		–	–	–
14	0.45	22	193 478	VN-05-H-T3-PQ2-VQ2-RQ2	22	193 561	VN-05-L-T3-PQ2-VQ2-RQ2	
	0.7	22	193 479	VN-07-H-T3-PQ2-VQ2-RQ2	22	193 562	VN-07-L-T3-PQ2-VQ2-RQ2	
	0.95	22	193 480	VN-10-H-T3-PQ2-VQ2-RQ2	22	193 563	VN-10-L-T3-PQ2-VQ2-RQ2	
18	0.95	26.9	526 147	VN-10-H-T4-PQ2-VQ3-RQ3	26.4	526 157	VN-10-L-T4-PQ2-VQ3-RQ3	
	1.4	27	193 482	VN-14-H-T4-PQ2-VQ3-RQ3	27	193 565	VN-14-L-T4-PQ2-VQ3-RQ3	
with push-in connector and silencer								
10	0.45	14.3	193 569	VN-05-H-T2-PQ1-VQ1-R01	14.3	193 595	VN-05-L-T2-PQ1-VQ1-R01	
	0.7	14.6	193 570	VN-07-H-T2-PQ1-VQ1-R01		–	–	–
14	0.45	23	193 488	VN-05-H-T3-PQ2-VQ2-R01	22.8	193 571	VN-05-L-T3-PQ2-VQ2-R01	
	0.7	23	193 489	VN-07-H-T3-PQ2-VQ2-R01	23.1	193 572	VN-07-L-T3-PQ2-VQ2-R01	
	0.95	23	193 490	VN-10-H-T3-PQ2-VQ2-R01	23.3	193 573	VN-10-L-T3-PQ2-VQ2-R01	
18	0.95	35.3	549 251	VN-10-H-T4-PQ2-VQ3-R02 	35.7	549 253	VN-10-L-T4-PQ2-VQ3-R02 	
	1.4	35.4	547 707	VN-14-H-T4-PQ2-VQ3-R02 	35.1	547 710	VN-14-L-T4-PQ2-VQ3-R02 	
24	2.0	182	193 495	VN-20-H-T6-PQ4-VQ5-R02	182	193 578	VN-20-L-T6-PQ4-VQ5-R02	
	3.0	182	193 497	VN-30-H-T6-PQ4-VQ5-R02	–	–	–	
with push-in connector, vacuum connection with male thread								
14	0.45	24	193 516	VN-05-H-T3-PQ2-VA4-RQ2	24	193 599	VN-05-L-T3-PQ2-VA4-RQ2	
	0.7	23	193 517	VN-07-H-T3-PQ2-VA4-RQ2		24	193 600	VN-07-L-T3-PQ2-VA4-RQ2
	0.95	24	193 518	VN-10-H-T3-PQ2-VA4-RQ2		24	193 601	VN-10-L-T3-PQ2-VA4-RQ2
18	0.95	32.5	526 153	VN-10-H-T4-PQ2-VA5-RQ3	32.5	526 163	VN-10-L-T4-PQ2-VA5-RQ3	
	1.4	33	193 520	VN-14-H-T4-PQ2-VA5-RQ3	33	193 603	VN-14-L-T4-PQ2-VA5-RQ3	
with push-in connector, vacuum connection with male thread and silencer								
14	0.45	24	193 526	VN-05-H-T3-PQ2-VA4-R01	24.5	193 609	VN-05-L-T3-PQ2-VA4-R01	
	0.7	25	193 527	VN-07-H-T3-PQ2-VA4-R01		24.8	193 610	VN-07-L-T3-PQ2-VA4-R01
	0.95	25	193 528	VN-10-H-T3-PQ2-VA4-R01		25	193 611	VN-10-L-T3-PQ2-VA4-R01
18	0.95	41.4	549 252	VN-10-H-T4-PQ2-VA5-R02 	41.5	549 254	VN-10-L-T4-PQ2-VA5-R02 	
	1.4	41.2	547 706	VN-14-H-T4-PQ2-VA5-R02 	40.9	547 709	VN-14-L-T4-PQ2-VA5-R02 	
24	2.0	189	526 145	VN-20-H-T6-PQ4-VA5-R02	189	526 135	VN-20-L-T6-PQ4-VA5-R02	
	3.0	189	526 146	VN-30-H-T6-PQ4-VA5-R02	189	526 136	VN-30-L-T6-PQ4-VA5-R02	

Vacuum generators VN

Technical data

Ordering data and weights – Standard								
T-type								
Housing width [mm]	Nominal size [mm]	Weight [g]	High vacuum H		Weight [g]	High suction rate L		
			Part No.	Type		Part No.	Type	
with female thread								
10	0.45	12.9	526 102	VN-05-H-T2-PI2-VI2-RI2	13	526 116	VN-05-L-T2-PI2-VI2-RI2	
	0.7	13.2	526 103	VN-07-H-T2-PI2-VI2-RI2		–	–	–
14	0.45	21	193 498	VN-05-H-T3-PI4-VI4-RI4	21	193 581	VN-05-L-T3-PI4-VI4-RI4	
	0.7	21	193 499	VN-07-H-T3-PI4-VI4-RI4		21	193 582	VN-07-L-T3-PI4-VI4-RI4
	0.95	22	193 500	VN-10-H-T3-PI4-VI4-RI4		22	193 583	VN-10-L-T3-PI4-VI4-RI4
18	1.4	36	193 502	VN-14-H-T4-PI4-VI5-RI5	36	193 585	VN-14-L-T4-PI4-VI5-RI5	
with female thread and silencer								
10	0.45	12.9	526 104	VN-05-H-T2-PI2-VI2-RO1	12.9	526 118	VN-05-L-T2-PI2-VI2-RO1	
	0.7	13.2	526 105	VN-07-H-T2-PI2-VI2-RO1		–	–	–
14	0.45	22	193 507	VN-05-H-T3-PI4-VI4-RO1	22.3	193 590	VN-05-L-T3-PI4-VI4-RO1	
	0.7	23	193 508	VN-07-H-T3-PI4-VI4-RO1		22.6	193 591	VN-07-L-T3-PI4-VI4-RO1
	0.95	23	193 509	VN-10-H-T3-PI4-VI4-RO1		22.8	193 592	VN-10-L-T3-PI4-VI4-RO1
18	1.4	39.8	547 705	VN-14-H-T4-PI4-VI5-RO2	39.5	547 708	VN-14-L-T4-PI4-VI5-RO2	
24	2.0	183	526 141	VN-20-H-T6-PI5-VI6-RO2	183	526 131	VN-20-L-T6-PI5-VI6-RO2	
	3.0	183	526 142	VN-30-H-T6-PI5-VI6-RO2		183	526 132	VN-30-L-T6-PI5-VI6-RO2
with female thread, vacuum connection with male thread and silencer								
14	0.95	–	–	–	25.9	543 315	VN-10-L-T3-PI4-VA4-RO1	

Ordering data and weights – Inline							
T-type							
Housing width [mm]	Nominal size [mm]	Weight [g]	High vacuum M		Weight [g]	High suction rate N	
			Part No.	Type		Part No.	Type
with push-in connector							
10	0.45	14.5	526 106	VN-05-M-T2-PQ1-VQ1-RQ1	–	–	–
	0.7	15.4	526 107	VN-07-M-T2-PQ1-VQ1-RQ1			
14	0.45	21	193 536	VN-05-M-T3-PQ2-VQ2-RQ2	22	193 619	VN-05-N-T3-PQ2-VQ2-RQ2
	0.7	22	193 537	VN-07-M-T3-PQ2-VQ2-RQ2	–	–	–
with push-in connector and silencer							
10	0.45	13.7	526 108	VN-05-M-T2-PQ1-VQ1-R01	–	–	–
	0.7	14.6	526 109	VN-07-M-T2-PQ1-VQ1-R01			
14	0.45	22	193 540	VN-05-M-T3-PQ2-VQ2-R01	22.8	193 623	VN-05-N-T3-PQ2-VQ2-R01
	0.7	23	193 541	VN-07-M-T3-PQ2-VQ2-R01	–	–	–
with female thread							
10	0.45	12.4	526 110	VN-05-M-T2-PI2-VI2-RI2	–	–	–
	0.7	13.3	526 111	VN-07-M-T2-PI2-VI2-RI2			
14	0.45	21	193 544	VN-05-M-T3-PI4-VI4-RI4	21	193 627	VN-05-N-T3-PI4-VI4-RI4
	0.7	21	193 545	VN-07-M-T3-PI4-VI4-RI4	–	–	–
with female thread and silencer							
10	0.45	12.3	526 112	VN-05-M-T2-PI2-VI2-R01	–	–	–
	0.7	13.2	526 113	VN-07-M-T2-PI2-VI2-R01			
14	0.45	22	193 548	VN-05-M-T3-PI4-VI4-R01	22.3	193 631	VN-05-N-T3-PI4-VI4-R01
	0.7	22	193 549	VN-07-M-T3-PI4-VI4-R01	–	–	–

Vacuum generators VN

Technical data

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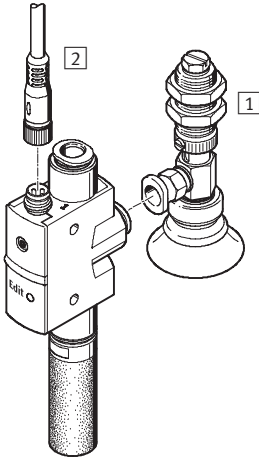
Ordering data and weights – Inline							
Inline							
Housing width [mm]	Nominal size [mm]	Weight [g]	High vacuum M		Weight [g]	High suction rate N	
			Part No.	Type		Part No.	Type
with push-in connector							
10	0.45	10.2	193 580	VN-05-M-I2-PQ1-VQ1	–	–	–
	0.7	10.5	193 586	VN-07-M-I2-PQ1-VQ1			
13	0.45	15	193 552	VN-05-M-I3-PQ2-VQ2	16	193 635	VN-05-N-I3-PQ2-VQ2
	0.7	16	193 553	VN-07-M-I3-PQ2-VQ2	–	–	–
	0.95	23.5	193 554	VN-10-M-I3-PQ2-VQ2			
with push-in connector and push-in sleeve							
10	0.45	7.1	193 587	VN-05-M-I2-PQ1-VT1	–	–	–
	0.7	8	193 588	VN-07-M-I2-PQ1-VT1			
13	0.45	12	193 555	VN-05-M-I3-PQ2-VT2	12	193 637	VN-05-N-I3-PQ2-VT2
	0.7	13	193 556	VN-07-M-I3-PQ2-VT2	–	–	–

Vacuum generators VN-P, with integrated vacuum switch

Peripherals overview and type codes

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Peripherals overview



Mounting attachments and accessories		→ Page
1	Suction gripper ESG	6 / 2.1-6
2	Plug socket with cable SIM-M8	6 / 4.1-25
-	Suction cup holder ESH	6 / 2.1-32
-	suction cup ESS	6 / 2.1-47

Type codes

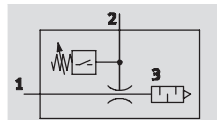
		VN	-	05	-	H	-	T4	-	PQ2	-	VQ2	-	O2	-	P
Type																
VN	Vacuum generator															
Nominal size [mm]																
05	0.45															
07	0.7															
10	0.95															
Ejector characteristic																
H	High vacuum/Standard															
L	High suction rate/Standard															
Housing type																
T4	T-type, grid dimensions 16 mm															
Supply port (1)																
PQ2	Push-in connector QS6															
Vacuum connection (2)																
VQ2	Push-in connector QS6															
Switching function																
O1	Threshold value with fixed hysteresis, 2 teach-in points, NO contact															
O2	Threshold value with variable hysteresis, NO contact															
Electrical output																
P	Switch output PNP															

Vacuum generators VN-P, with integrated vacuum switch

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Technical data

Function
VN Standard



-  - Temperature range
0 ... +60 °C

-  - Operating pressure
1 ... 8 bar



- Threshold value comparator with fixed or variable hysteresis
- Teach-in setting option for threshold value and hysteresis

General technical data			
Design	T-type		
Type	VN-05	VN-07	VN-10
Grid dimension [mm]	16	16	16
Nominal size [mm]	0.45	0.7	0.95
Ejector characteristic	High vacuum/Standard H High suction rate/Standard L		
Pneumatic connection 1	QS6		
Vacuum connection	QS6		
Pneumatic connection 3	Silencer, minimal resistance		
Measuring principle	Piezoresistive		
Measured variable	Relative pressure		
Pressure measuring range [bar]	-1 ... 0		
Type of mounting	Via through-holes		
Assembly position	Any ¹⁾		
Cleaning recommendation	Soap suds		
Product weight [g]	33	36	36

1) The collection of condensate in the sensor should be prevented.

Operating and environmental conditions	
Operating pressure [bar]	1 ... 8
Nominal operating pressure [bar]	6
Operating medium	Dried, filtered and unlubricated compressed air
Ambient temperature [°C]	0 ... +50
Temperature of medium [°C]	0 ... +60
Corrosion resistance class CRC ¹⁾	1

1) Corrosion resistance class 1 according to Festo standard 940 070
Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

Performance data						
Ejector characteristic	High vacuum/Standard H			High suction rate/Standard L		
Nominal size [mm]	0.45	0.7	0.95	0.45	0.7	0.95
Max. vacuum [%]	92	92	93	—	—	—
Operating pressure for max. vacuum [bar]	4.9	4.4	3.5	—	—	—
Max. suction rate with respect to atmosphere [l/min]	7.2	16.2	21.8	13.6	30.9	41.5
Operating pressure for max. suction rate [bar]	3	3	3	5	4	5

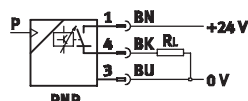
Vacuum generators VN-P, with integrated vacuum switch

Technical data

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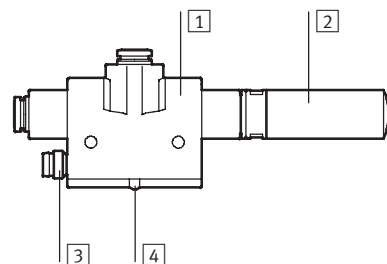
Electrical data		
Operating voltage range	[V DC]	15 ... 30
Residual ripple	[%]	10
Electrical connection		M8x1, 3-pin
Switch-on/switch-off times	[ms]	≤ 4
Switch output		PNP
Max. output current	[mA]	100
Residual current	[mA]	≤ 0.3
Voltage drop	[V]	≤ 1.5
Switching element function		NO contact
Switching function		Threshold value comparator with fixed hysteresis Threshold value comparator with variable hysteresis
Threshold value setting range	[bar]	-1 ... 0
Accuracy	[% FS] ¹⁾	1.5
Hysteresis	[% FS] ¹⁾	2 (threshold value comparator with fixed hysteresis)
Long-term drift	[% FS] ¹⁾	Max. ±0.5
Temperature coefficient of switching point	[%/K]	0.05
Type of display/switching status display		LED
Inductive protective circuit		Adapted to MZ, MY, ME coils
Protection against short circuit		Pulsed
Protection against polarity reversal		For all electrical connections
Protection against overloading		Yes
Protection class		IP40 (to EN 60 529)
CE symbol		EU conformity in accordance with the directive 89/336/EEC (EMC)

1) % FS = % of the measuring range final value (full scale)

Electrical outputs ¹⁾	Pin allocations
1 switch output PNP	
Plug M8x1	
	1 = +24 V 3 = 0 V 4 = Output A 

1) Core colours indicated apply when using plug sockets with cable SIM-M8-3... → 6 / 4.1-25

Materials
General view



Vacuum generator		
1	Housing	Polyacetate, reinforced
2	Silencer	Polyethylene
3	Plug housing	Polyamide, nickel and chrome plated brass
4	Fibre optics	Polycarbonate
-	Key pad	Silicone rubber
-	Seals	Nitrile rubber
	Note on materials	Contains paint-wetting impairment substances

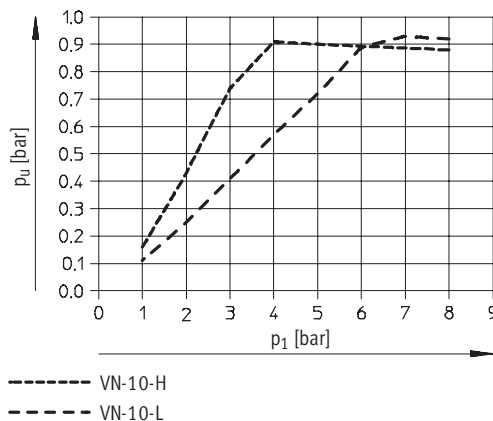
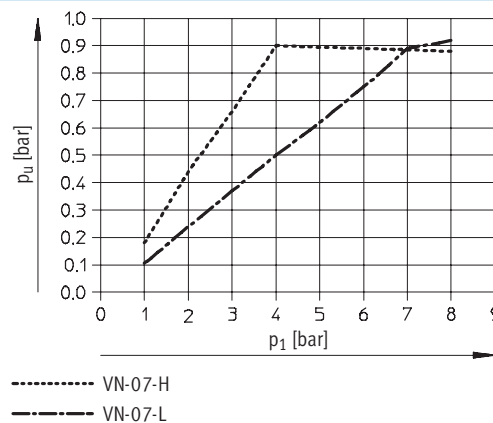
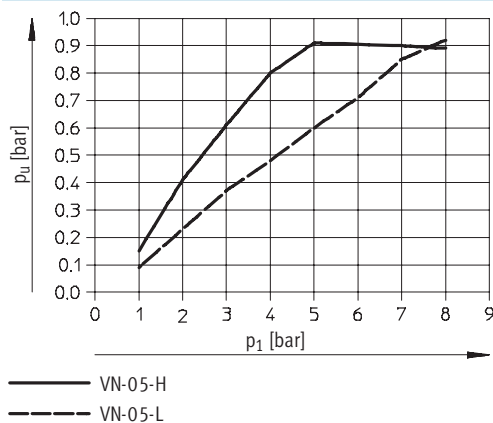
Vacuum generators VN-P, with integrated vacuum switch

Technical data

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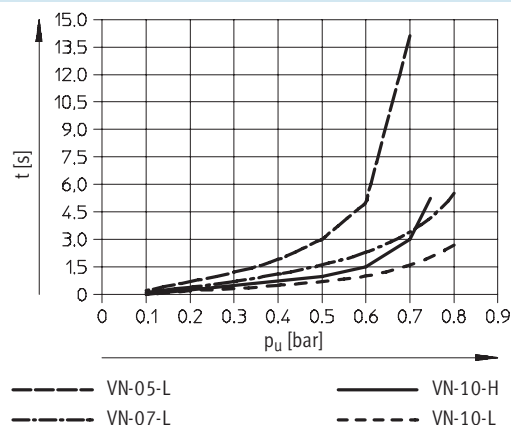
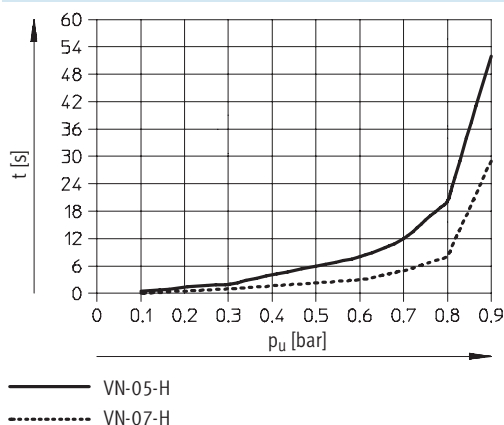
Vacuum p_u as a function of operating pressure p_1

High vacuum/high suction rate



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

High vacuum/high suction rate

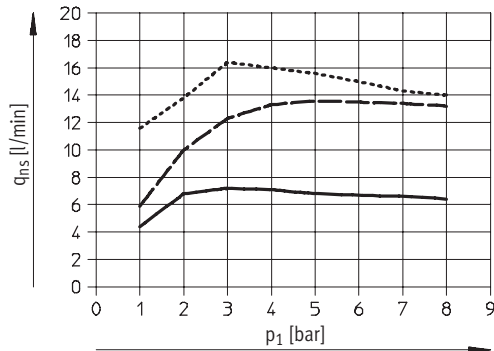


Vacuum generators VN-P, with integrated vacuum switch

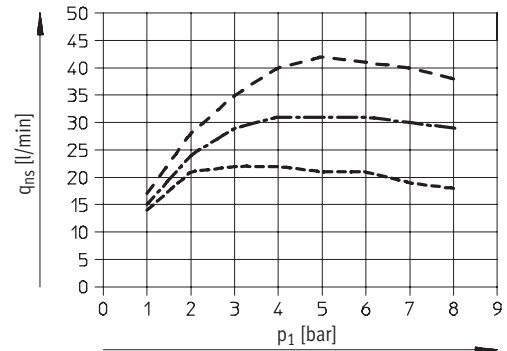
Technical data

Suction rate q_{ns} (with respect to atmosphere) as a function of operating pressure p_1

High vacuum/high suction rate



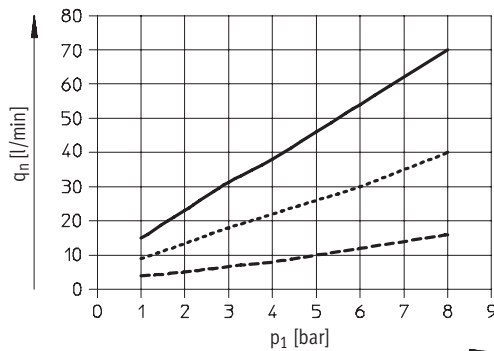
— VN-05-H
 - - - VN-05-L
 VN-07-H



- · - · - VN-07-L
 - - - VN-10-H
 VN-10-L

Air consumption q_n as a function of operating pressure p_1

High vacuum/high suction rate

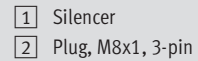


— VN-05
 VN-07
 - - - VN-10

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Vacuum generators
Pneumatic

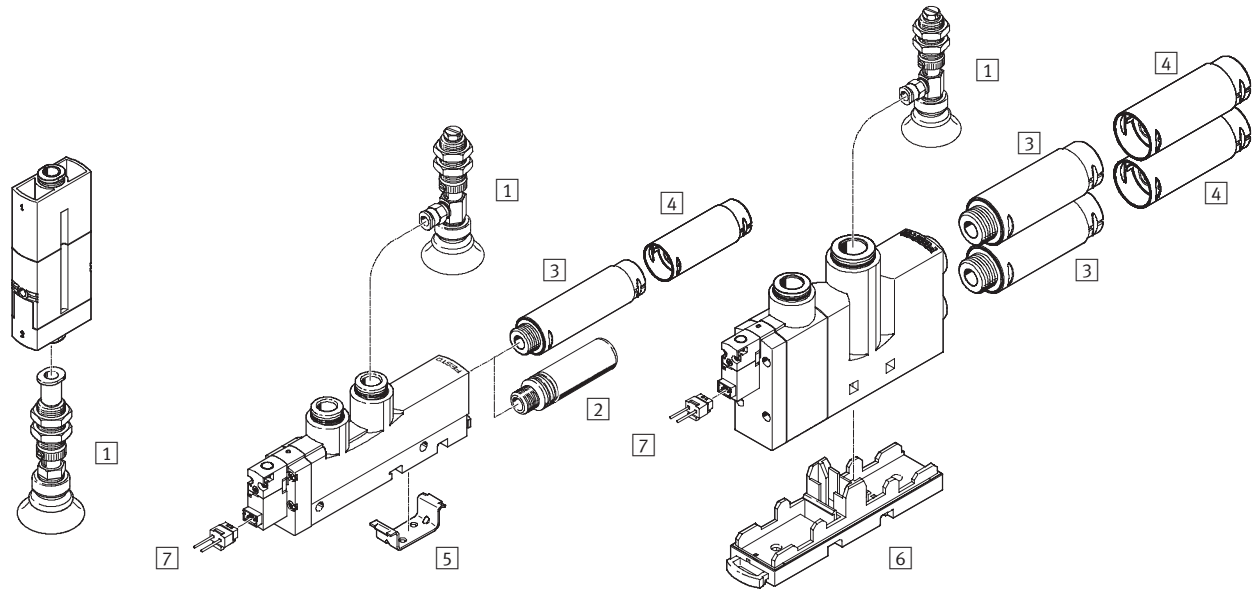
with push-in connector and silencer

1.1

Vacuum generators VN-A/M/B, with additional functions

Peripherals overview

Inline	T-type	
VN-05/07-...-A	VN-05/07/10/14-...-A/M/B	VN-20/30-...-M



Mounting attachments and accessories										
		Inline	T-type							➔ Page
		VN-05/07	VN-05/07/10			VN-14			VN-20/30	
		A	A	M	B	A	M	B	M	
1	Suction gripper ESG	■	■			■			■	6 / 2.1-6
2	Silencer UO	–	■			–			–	6 / 4.1-17
3	Silencer UOM	–	–			■			■	6 / 4.1-18
4	Silencer extension UOMS	–	–			■			■	6 / 4.1-18
5	Mounting bracket VN-T3/T4	–	■			■			–	6 / 4.1-20
6	Mounting plate VN-T6-BP-NRH	–	–			–			■	6 / 4.1-19
7	Plug socket KMH	–	–	■	■	–	■	■	■	6 / 4.1-24
–	Suction cup holder ESH	■	■			■			■	6 / 2.1-32
–	Suction cup ESS	■	■			■			■	6 / 2.1-47

Vacuum generators VN-A/M/B, with additional functions

Type codes

FESTO

		VN	–	05	–	H	–	T3	–	PQ2	–	VQ2	–	RO1	–	M
Type																
VN	Vacuum generator															
Nominal size of laval nozzle [mm]																
05	0.45															
07	0.7															
10	0.95															
14	1.4															
20	2.0															
30	3.0															
Ejector characteristic																
H	High vacuum/Standard T-type															
L	High suction rate/Standard T-type															
M	High vacuum/Inline															
N	High suction rate/Inline															
Housing type																
I3	Inline, grid dimension 14.5 mm															
T3	T-type, grid dimension 14 mm															
T4	T-type, grid dimension 18 mm															
T6	T-type, grid dimension 24 mm															
Supply port (1)																
PQ2	Push-in connector QS6															
PQ3	Push-in connector QS8															
PQ4	Push-in connector QS10															
PI4	Female thread G $\frac{1}{8}$															
PI5	Female thread G $\frac{1}{4}$															
Vacuum port (2)																
VQ2	Push-in connector QS6															
VQ3	Push-in connector QS8															
VQ5	Push-in connector QS12															
VI4	Female thread G $\frac{1}{8}$															
VI5	Female thread G $\frac{1}{4}$															
Exhaust port (3)																
RO1	Silencer UO, minimal resistance															
RO2	Silencer UOM, minimal resistance															
Additional functions																
A	Ejector pulse															
M	Solenoid valve for vacuum ON/OFF															
B	Solenoid valve for vacuum ON/OFF and ejector pulse															



Note

Possible combinations can be found in the ordering data.

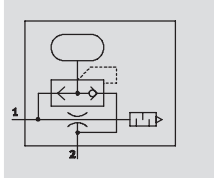
Vacuum generators VN-A/M/B, with additional functions

Technical data

Function

VN-A

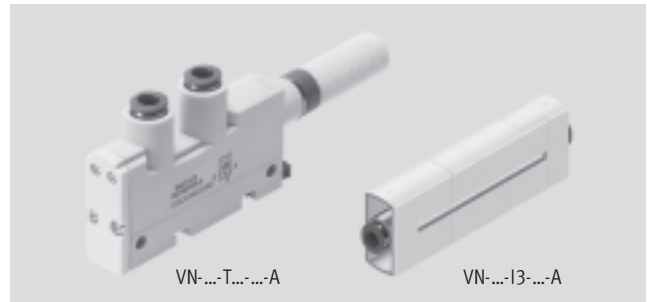
Pneumatic ejector pulse



VN-A

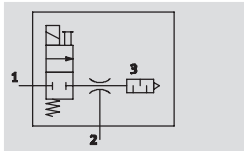
-  - Temperature range
0 ... +60 °C

-  - Operating pressure
1 ... 8 bar



VN-M

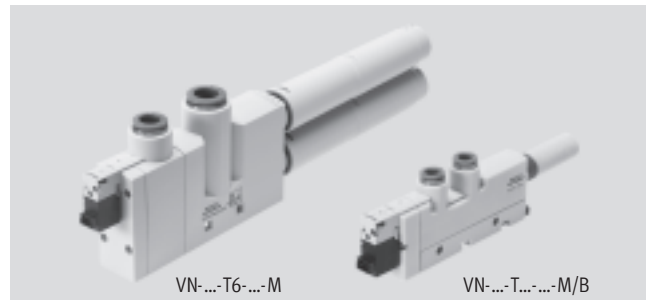
Electrical solenoid valve



VN-M / VN-B

-  - Temperature range
0 ... +50 °C

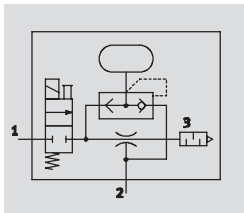
-  - Operating pressure
2 ... 8 bar



VN-B

Pneumatic ejector pulse

Electrical solenoid valve



General technical data – Standard																			
Constructional design				T-type															
Type				VN-05			VN-07			VN-10			VN-14			VN-20		VN-30	
Grid dimension [mm]				14			14			14			18			24		24	
Integrated function				A	M	B	A	M	B	A	M	B	A	M	B	M		M	
Nominal size of laval nozzle [mm]				0.45			0.7			0.95			1.4			2.0		3.0	
Ejector characteristic				High vacuum/Standard H (T-type)															
				High suction rate/Standard L (T-type)														–	
Pneumatic port 1		Push-in connector		QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS8	QS8	QS8	QS10	QS10		
		Female thread		G1/8	–	–	G1/8	–	–	G1/8	–	–	G1/4	–	–	–	–		
Vacuum port		Push-in connector		QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS8	QS8	QS8	QS12	QS12		
		Female thread		G1/8	–	–	G1/8	–	–	G1/8	–	–	G1/4	–	–	–	–		
Pneumatic port 3				Silencer, minimal resistance															
Type of mounting				Via through-holes															
				Via H-rail														–	
Mounting position				Any															
Cleaning recommendation				Soapy water															

-  - Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Vacuum generators VN-A/M/B, with additional functions

Technical data

FESTO

General technical data – Inline		
Constructional design	Inline	
Type	VN-05	VN-07
Grid dimension [mm]	14.5	14.5
Integrated function	A	A
Nominal size of laval nozzle [mm]	0.45	0.7
Ejector characteristic	High vacuum/Inline M High suction rate/Inline N	
Pneumatic port 1	QS6	
Vacuum port	QS6	
Type of mounting	Via through-holes	
Mounting position	Any	
Cleaning recommendation	Soapy water	

Operating and environmental conditions					
Pneumatic connection		Via push-in fitting		Via female threads	
Integrated function		A	M	B	A
Operating pressure	[bar]	1 ... 8	2 ... 8		1 ... 8
Nominal operating pressure	[bar]	6			
Operating medium		Dried, filtered and unlubricated compressed air			
Ambient temperature	[°C]	0 ... +60	0 ... +50		0 ... +60
Temperature of medium	[°C]	0 ... +60	0 ... +50		0 ... +60
Corrosion resistance class CRC ¹⁾		1		2	

1) Corrosion resistance class 1 to Festo standard 940 070

Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

Corrosion resistance class 2 to Festo standard 940 070

Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Performance data – High vacuum														
Ejector characteristic	Standard H												Inline M	
Nominal size of laval nozzle [mm]	0.45			0.7			0.95			1.4			2.0	3.0
Integrated function	A	M	B	A	M	B	A	M	B	A	M	B	M	M
Max. vacuum [%]	92			92			93			92			92	93
Operating pressure for max. vacuum [bar]	4.9			4.4			3.5			3.5			3.5	3.7
Max. suction rate with respect to atmosphere [l/min]	7.2			16.2			21.8			48.8			98	186
Operating pressure for max. suction rate [bar]	3			3			3			2			2	2
Pressurisation time ¹⁾ for 1 l volume, at p ₁ = 6 bar [s]	3.63	3.9		1.5	1.69		0.96	1.06		0.43	0.5		0.24	0.13
Pressurisation time with test volume ²⁾ , at p ₁ = 6 bar [ms]	20	116	41	16	91	32	13	62	30	8	49	31	–	–

1) Time required to build up vacuum to –0.05 bar.

2) Test volume at the vacuum port: VN-05 = 15 cm³, VN-07/10 = 30 cm³, VN-14 = 45 cm³

Vacuum generators VN-A/M/B, with additional functions

Technical data

Performance data – High suction rate													
Ejector characteristic	Standard L												Inline N
Nominal size of laval nozzle [mm]	0.45			0.7			0.95			1.4			0.45 0.7
Integrated function	A	M	B	A	M	B	A	M	B	A	M	B	A A
Max. suction rate with respect to atmosphere [l/min]	13.6			30.9			40.5			92.6			13.3 32.6
Operating pressure for max. suction rate [bar]	5			4			5			5			5 4
Pressurisation time ¹⁾ for 1 l volume, at p ₁ = 6 bar [s]	1.93	1.97		0.79	0.83		0.62	0.67		0.28	0.32		2.24 0.89
Pressurisation time with test volume ²⁾ , at p ₁ = 6 bar [ms]	16	76	37	14	59	31	12	48	28	8	40	32	– –

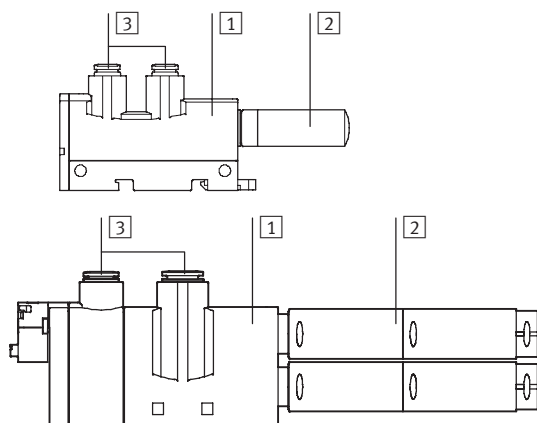
1) Time required to build up vacuum to –0.05 bar.

2) Test volume at the vacuum port: VN-05 = 15 cm³, VN-07/10 = 30 cm³, VN-14 = 45 cm³

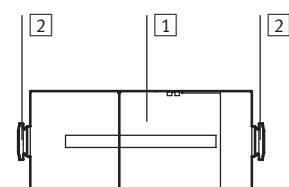
Technical data – Solenoid valve	
Operating voltage range [V DC]	21.6 ... 26.4
Duty cycle [%]	100
Protection class	IP40 (to EN 60 529)
Valve function	2/2-way valve
Manual override	By pushing

Materials

Sectional view



Vacuum generator VN – Standard	
1 Housing	Reinforced polyacetate Reinforced polyamide
2 Silencer	RO1 Polyethylene RO2 Wrought aluminium alloy, polyacetate, PU foam
3 Push-in fitting	Plastic, nickel plated brass
– Jet nozzle	Wrought aluminium alloy
– Receiver nozzle	Polyacetate
– Seals	Nitrile rubber
Note on materials	Free of copper and PTFE Free of paint wetting impairment substances



Vacuum generator VN – Inline	
1 Housing	Reinforced polyacetate Reinforced polyamide
2 Push-in fitting	Plastic, nickel plated brass
– Jet nozzle	Wrought aluminium alloy
– Receiver nozzle	Polyacetate
– Seals	Nitrile rubber
Note on materials	Free of copper and PTFE Free of paint wetting impairment substances

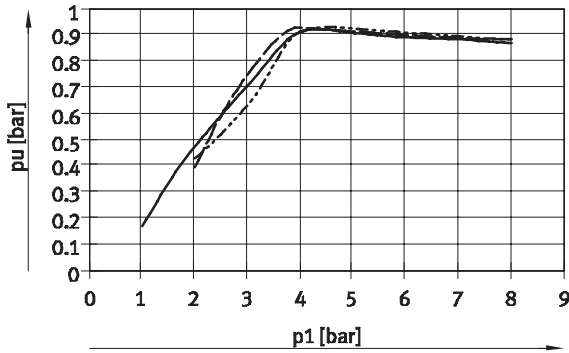
Vacuum generators VN-A/M/B, with additional functions

FESTO

Technical data

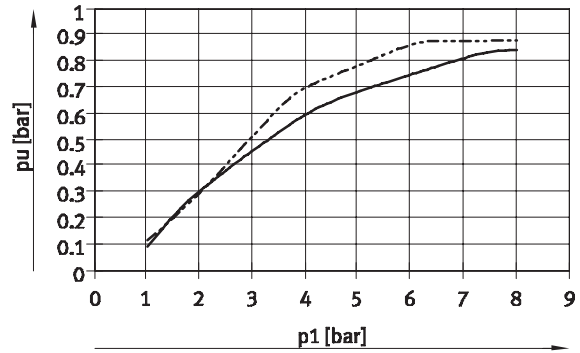
Vacuum p_u as a function of operating pressure p_1

High vacuum – Standard

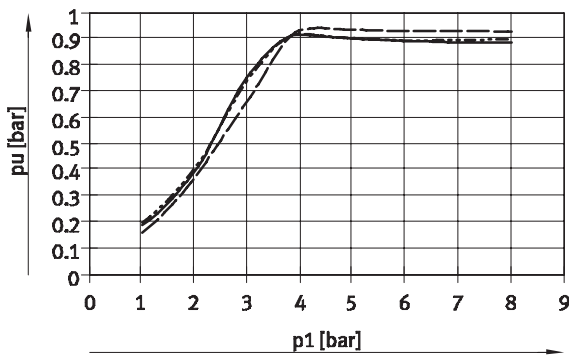


— VN-05-H
- - - VN-07-H
- · - VN-10-H

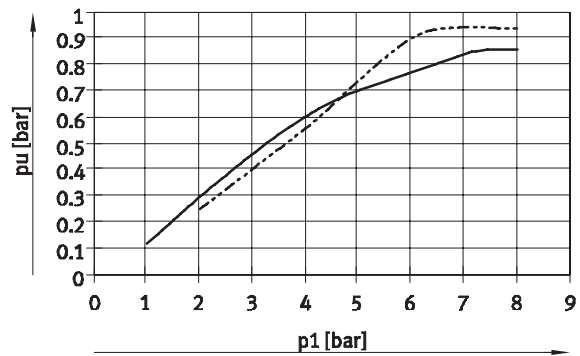
High suction rate – Standard



— VN-05-L
- - - VN-10-L

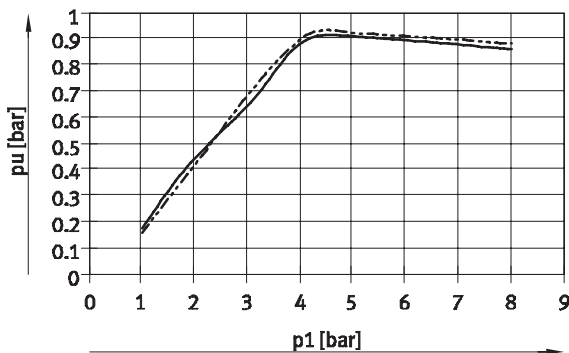


— VN-14-H
- - - VN-20-H
- · - VN-30-H



— VN-07-L
- - - VN-14-L

High vacuum – Inline



— VN-05-M
- - - VN-07-M

High suction rate – Inline



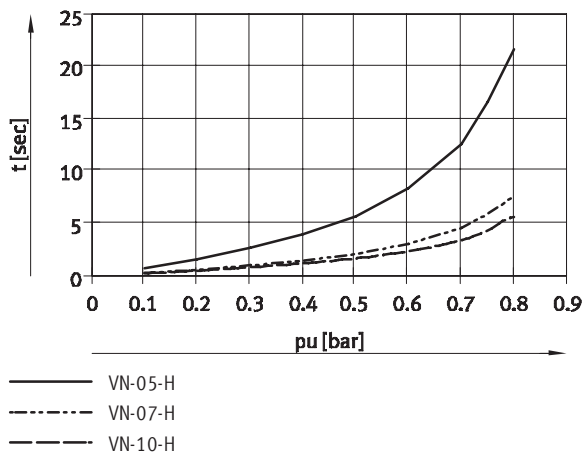
— VN-05-N
- - - VN-07-N

Vacuum generators VN-A/M/B, with additional functions

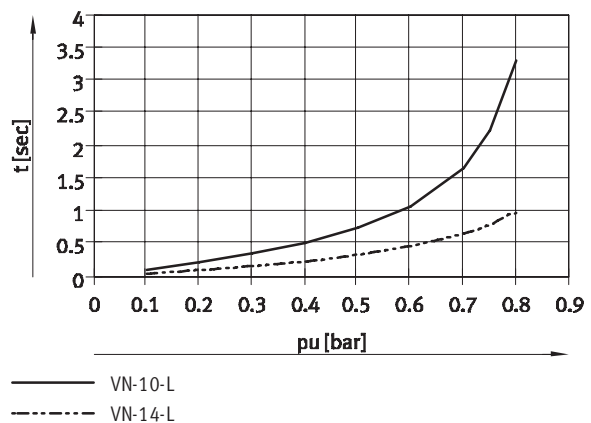
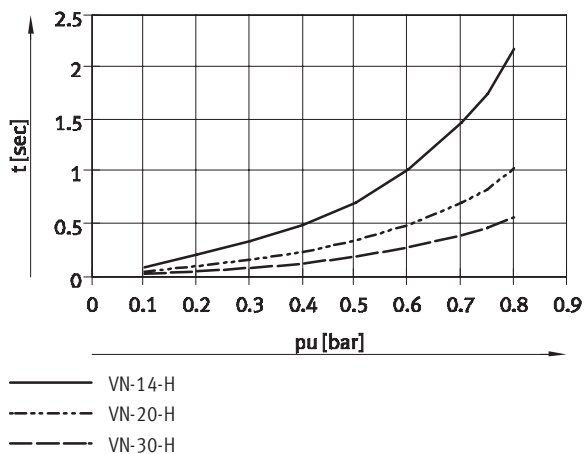
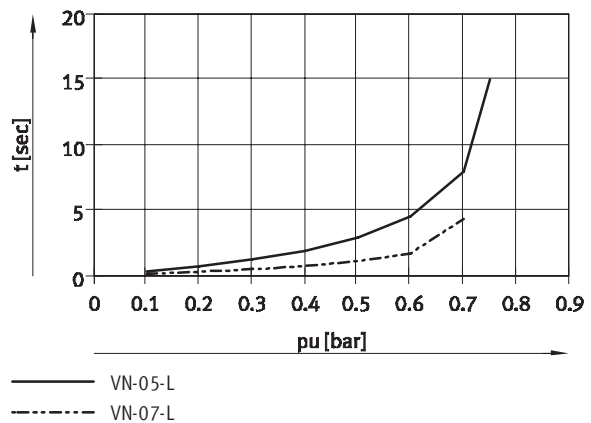
Technical data

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

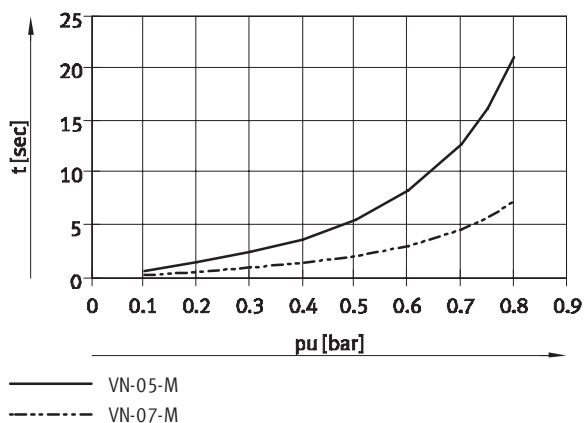
High vacuum – Standard



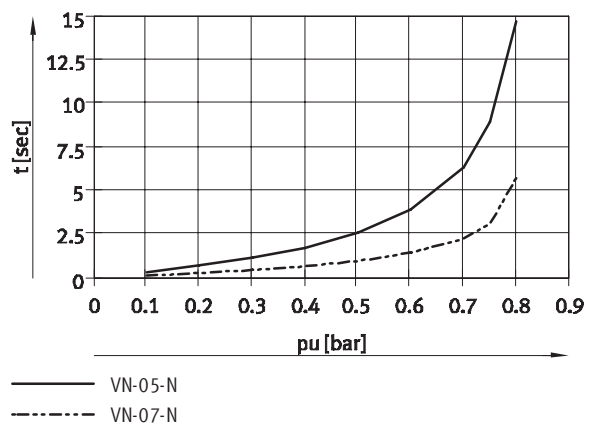
High suction rate – Standard



High vacuum – Inline



High suction rate – Inline



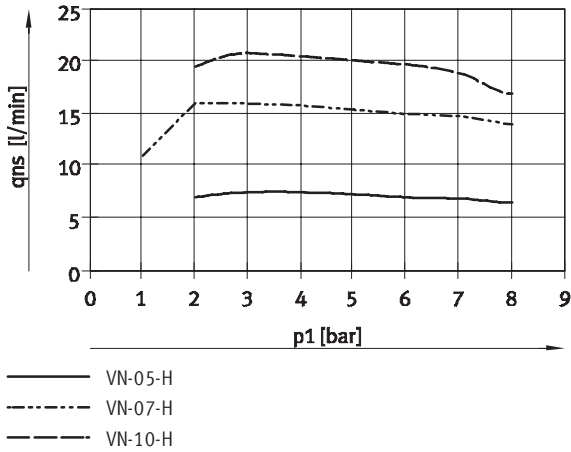
Vacuum generators VN-A/M/B, with additional functions

FESTO

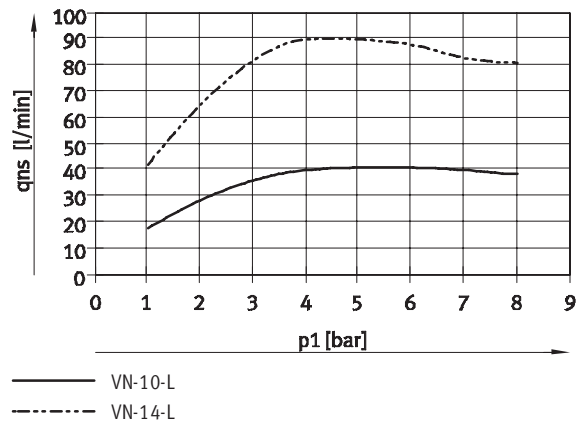
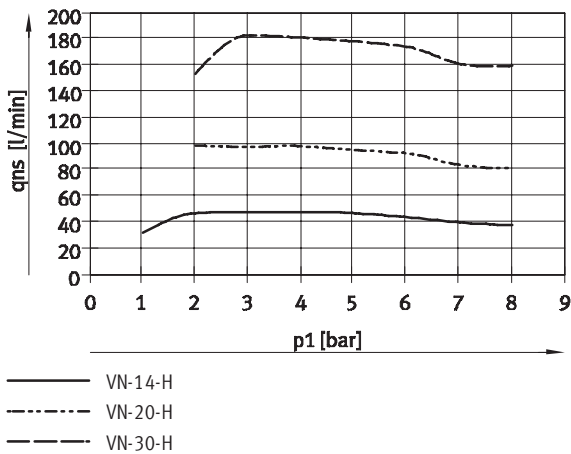
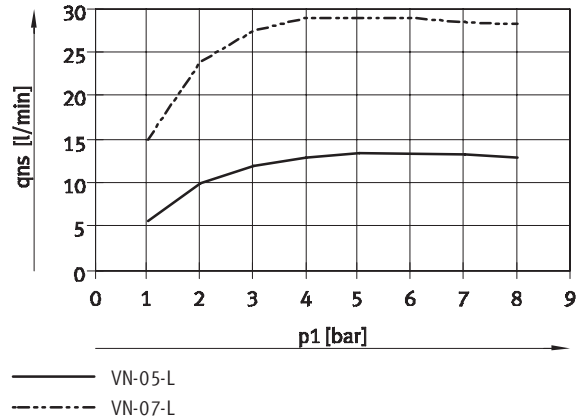
Technical data

Suction rate q_{ns} (with respect to atmosphere) as a function of operating pressure p_1

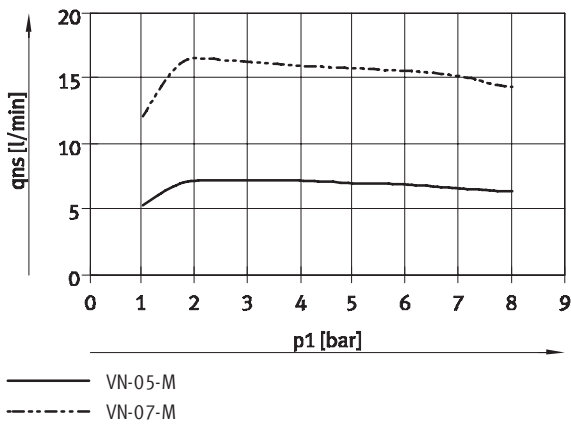
High vacuum – Standard



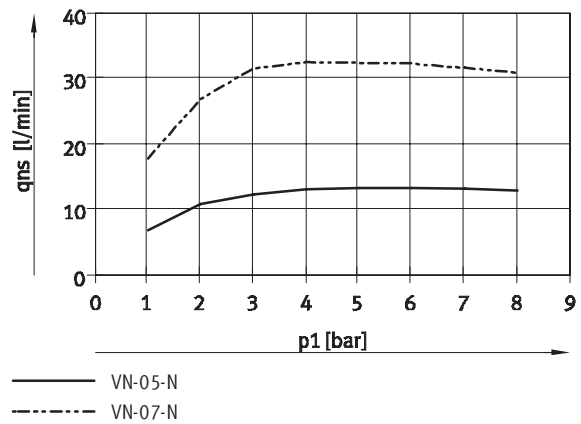
High suction rate – Standard



High vacuum – Inline



High suction rate – Inline



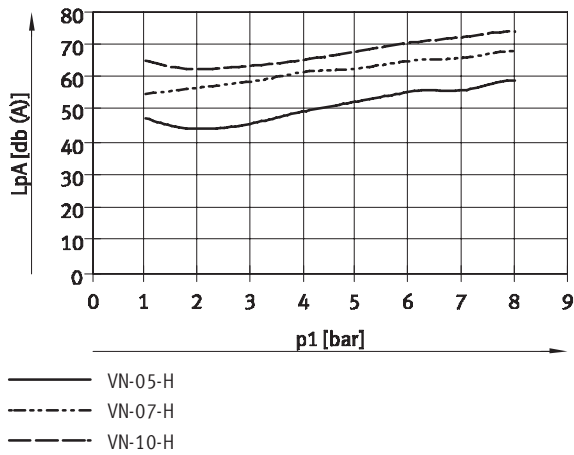
Vacuum generators VN-A/M/B, with additional functions

FESTO

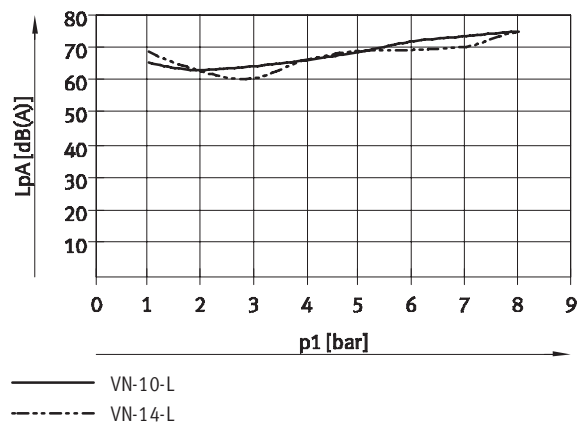
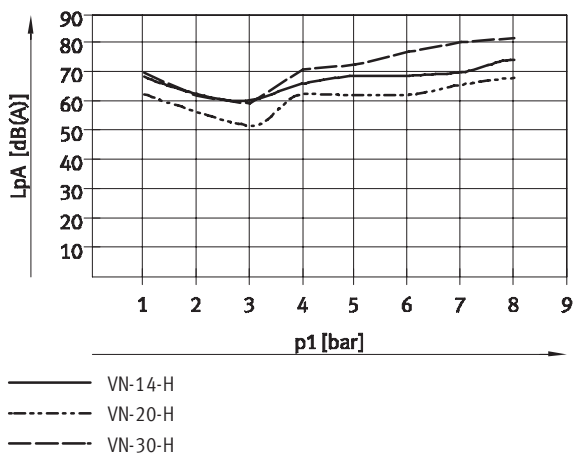
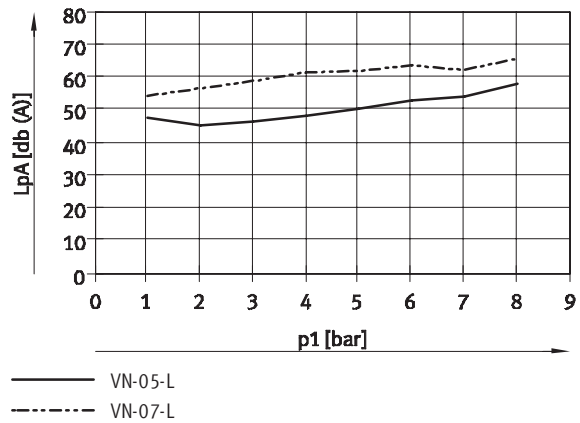
Technical data

Noise level L_p (at distance of 1 m) as a function of operating pressure p_1

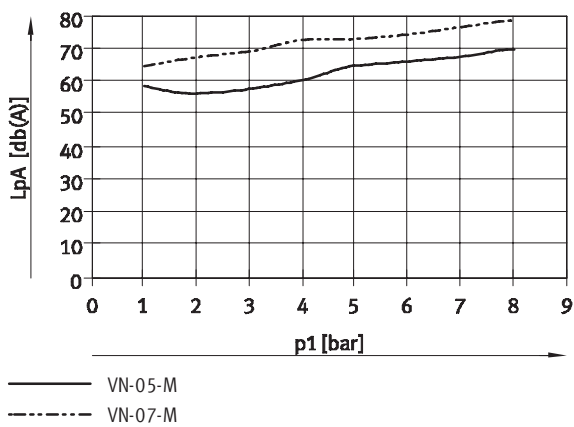
High vacuum – Standard



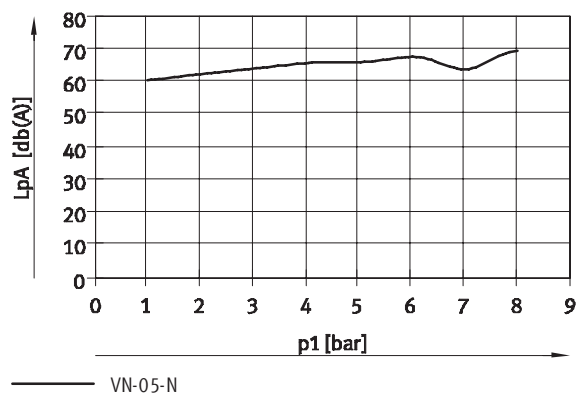
High suction rate – Standard



High vacuum – Inline



High suction rate – Inline



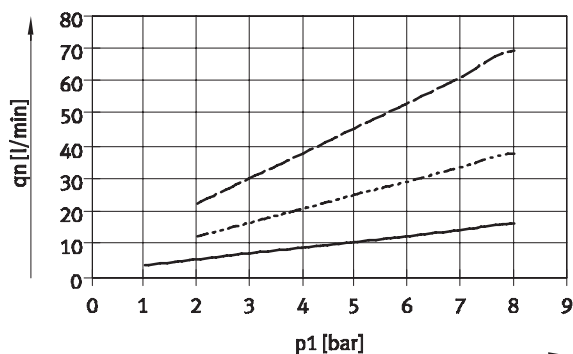
Vacuum generators VN-A/M/B, with additional functions

FESTO

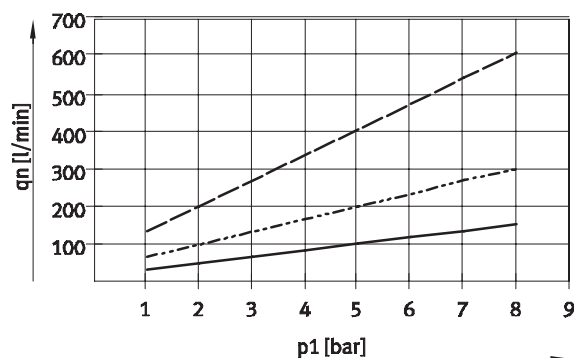
Technical data

Air consumption q_n as a function of operating pressure p_1

High vacuum/high suction rate



— VN-05
- - - VN-07
— VN-10



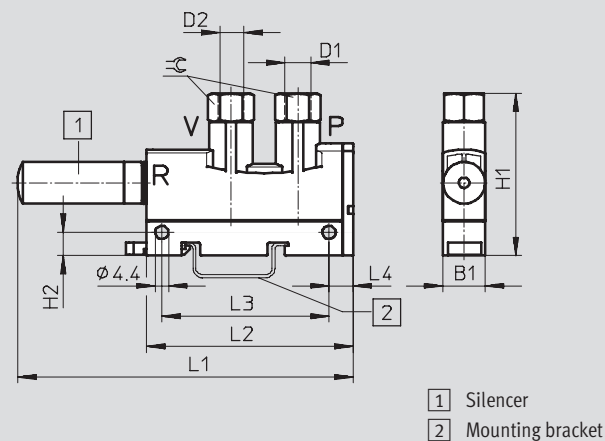
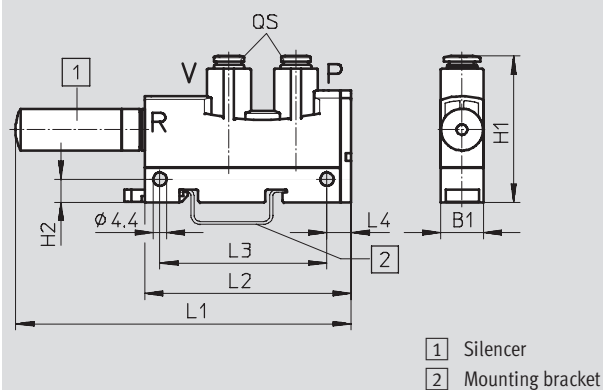
— VN-14
- - - VN-20
— VN-30

Dimensions – T-type/Standard, VN-05/07/10/14

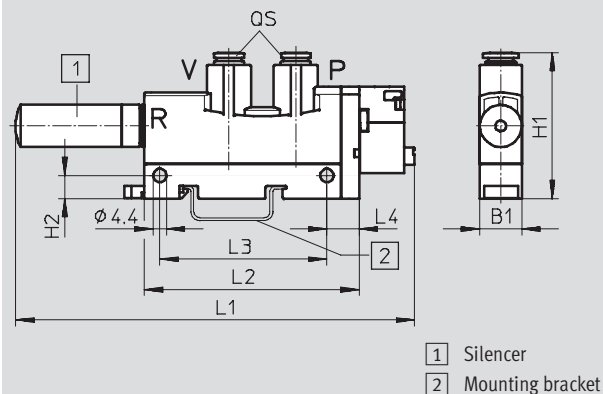
VN-...-T...-PQ...-VQ...-RO...-A

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VN-...-T...-PI...-VI...-RO...-A



VN-...-T...-PQ...-VQ...-RO...-M/B



Vacuum generators VN-A/M/B, with additional functions

Technical data

FESTO

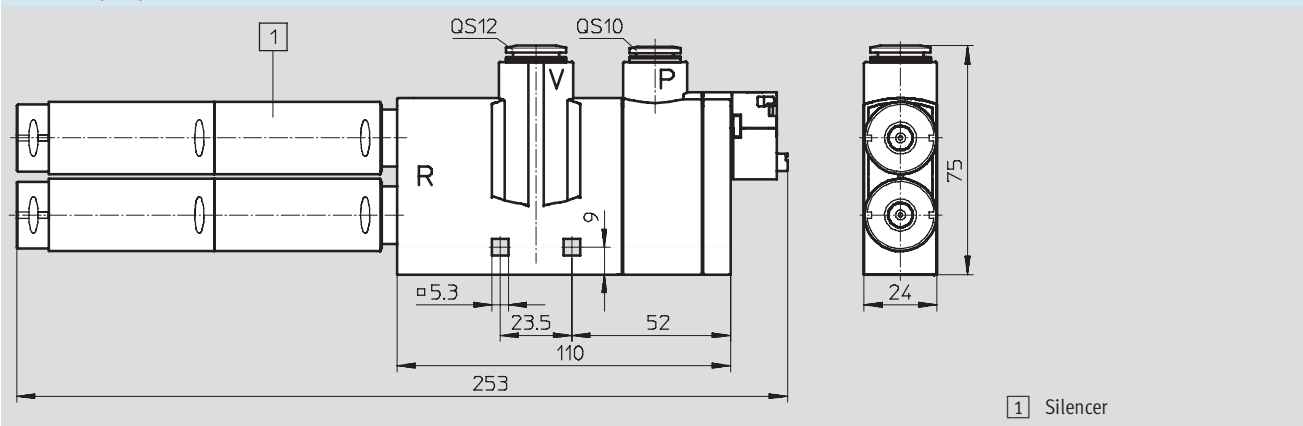
Type	B1	Connections		H1	H2	L1	L2	L3	L4	≡C
		P D1	V D2							
VN-05-...-T3-PQ2-VQ2-RO1-A	14	QS6	QS6	48	7.6	110	68	55	8	-
VN-07-...-T3-PQ2-VQ2-RO1-A						119				
VN-10-...-T3-PQ2-VQ2-RO1-A						110				
VN-05-...-T3-PI4-VI4-RO1-A		G1/8	G1/8	53		119				13
VN-07-...-T3-PI4-VI4-RO1-A										
VN-10-...-T3-PI4-VI4-RO1-A										
VN-14-...-T4-PQ3-VQ3-RO2-A	18	QS8	QS8	50	7.5	166	98	63	8.7	-
VN-14-...-T4-PI5-VI5-RO2-A		G1/4	G1/4	62						17
VN-05-...-T3-PQ2-VQ2-RO1-M/B	14	QS6	QS6	48	7.6	132	71	55	10.7	-
VN-07-...-T3-PQ2-VQ2-RO1-M/B						141				
VN-10-...-T3-PQ2-VQ2-RO1-M/B										
VN-14-...-T4-PQ3-VQ3-RO2-M/B	18	QS8	QS8	50	7.5	192	106	63	16.4	-

• Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Dimensions – T-type/Standard, VN-20/30

Download CAD data → www.festo.com/en/engineering

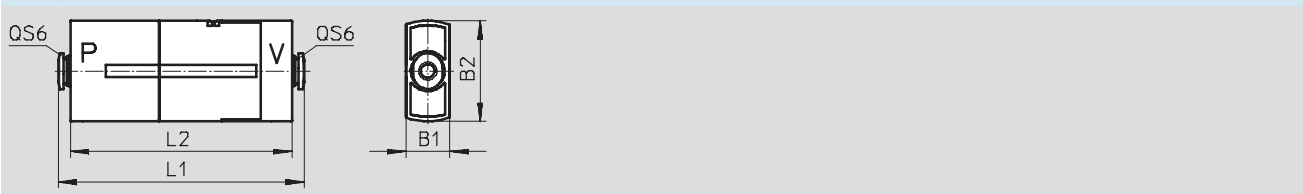
VN-...-T6-PQ4-VQ5-RO2-M



Dimensions – Straight type/Inline, VN-05/07

Download CAD data → www.festo.com/en/engineering

VN-05/07-...-I3-PQ2-VQ2-A



Type	B1	Connections		B2	L1	L2
		P	V			
VN-05-...-I3-PQ2-VQ2-A	14.5	QS6	QS6	33.1	81	73
VN-07-...-I3-PQ2-VQ2-A					97	89

Vacuum generators VN-A/M/B, with additional functions

Technical data

FESTO

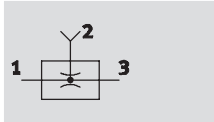
Ordering data and weights – Standard							
T-type							
Nominal diameter [mm]	Weight [g]	High vacuum H			Weight [g]	High suction rate L	
		Part No.	Type			Part No.	Type
With ejector pulse and push-in connector							
0.45	49	532 620	VN-05-H-T3-PQ2-VQ2-R01-A		49	532 621	VN-05-L-T3-PQ2-VQ2-R01-A
0.7	50	532 628	VN-07-H-T3-PQ2-VQ2-R01-A		50	532 629	VN-07-L-T3-PQ2-VQ2-R01-A
0.95	50	532 638	VN-10-H-T3-PQ2-VQ2-R01-A		50	532 639	VN-10-L-T3-PQ2-VQ2-R01-A
1.4	85	532 646	VN-14-H-T4-PQ3-VQ3-R02-A		85	532 647	VN-14-L-T4-PQ3-VQ3-R02-A
With ejector pulse and female thread							
0.45	49	537 225	VN-05-H-T3-PI4-VI4-R01-A		49	537 226	VN-05-L-T3-PI4-VI4-R01-A
0.7	50	532 632	VN-07-H-T3-PI4-VI4-R01-A		50	532 633	VN-07-L-T3-PI4-VI4-R01-A
0.95	50	532 642	VN-10-H-T3-PI4-VI4-R01-A		50	532 643	VN-10-L-T3-PI4-VI4-R01-A
1.4	94	532 719	VN-14-H-T4-PI5-VI5-R02-A		94	532 720	VN-14-L-T4-PI5-VI5-R02-A
With solenoid valve and push-in connector							
0.45	60	532 618	VN-05-H-T3-PQ2-VQ2-R01-M		60	532 619	VN-05-L-T3-PQ2-VQ2-R01-M
0.7	61	532 626	VN-07-H-T3-PQ2-VQ2-R01-M		61	532 627	VN-07-L-T3-PQ2-VQ2-R01-M
0.95	61	532 636	VN-10-H-T3-PQ2-VQ2-R01-M		61	532 637	VN-10-L-T3-PQ2-VQ2-R01-M
1.4	98	532 644	VN-14-H-T4-PQ3-VQ3-R02-M		98	532 645	VN-14-L-T4-PQ3-VQ3-R02-M
2.0	215	532 656	VN-20-H-T6-PQ4-VQ5-R02-M		–	–	–
3.0	215	532 662	VN-30-H-T6-PQ4-VQ5-R02-M		–	–	–
With solenoid valve, ejector pulse and push-in connector							
0.45	62	532 622	VN-05-H-T3-PQ2-VQ2-R01-B		62	532 623	VN-05-L-T3-PQ2-VQ2-R01-B
0.7	63	532 630	VN-07-H-T3-PQ2-VQ2-R01-B		63	532 631	VN-07-L-T3-PQ2-VQ2-R01-B
0.95	63	532 640	VN-10-H-T3-PQ2-VQ2-R01-B		63	532 641	VN-10-L-T3-PQ2-VQ2-R01-B
1.4	100	532 648	VN-14-H-T4-PQ3-VQ3-R02-B		100	532 649	VN-14-L-T4-PQ3-VQ3-R02-B

Ordering data and weights – Inline						
Inline						
Nominal diameter [mm]	Weight [g]	High vacuum M		Weight [g]	High suction rate N	
		Part No.	Type		Part No.	Type
With ejector pulse and push-in connector						
0.45	38	532 624 VN-05-M-I3-PQ2-VQ2-A		38	532 625 VN-05-N-I3-PQ2-VQ2-A	
0.7	41	532 634 VN-07-M-I3-PQ2-VQ2-A		41	532 635 VN-07-N-I3-PQ2-VQ2-A	

Vacuum generator cartridges VN

Technical data

Function



-  - Temperature range
0 ... +60 °C
-  - Operating pressure
1 ... 8 bar



General technical data						
Type		VN-05	VN-07	VN-10	VN-14	VN-20
Nominal size of laval nozzle	[mm]	0.45	0.7	0.95	1.4	2.0
Ejector characteristic		High vacuum, T-type/Standard H				
		High suction rate, T-type/Standard L				
Mounting position		Any				

Operating and environmental conditions		
Operating pressure	[bar]	1 ... 8
Nominal operating pressure	[bar]	6
Operating medium		Dried, filtered and unlubricated compressed air
Ambient temperature	[°C]	0 ... +60
Temperature of medium	[°C]	0 ... +60
Corrosion resistance class CRC ¹⁾		2

- 1) Corrosion resistance class 2 to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Performance data – High vacuum						
Ejector characteristic		Standard H				
Nominal size of laval nozzle	[mm]	0.45	0.7	0.95	1.4	2.0
Max. vacuum	[%]	92	92	93	92	92
Operating pressure for max. vacuum	[bar]	4.9	4.4	3.5	3.5	3.5
Max. suction rate with respect to atmosphere	[l/min]	7.2	16.2	21.8	48.8	98
Operating pressure for max. suction rate	[bar]	3	3	3	2	2
Pressurisation time ¹⁾ for 1 l volume, at p ₁ = 6 bar	[s]	4.43	1.67	1.02	0.48	0.23

- 1) Time required to build up vacuum to –0.05 bar.

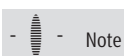
Vacuum generator cartridges VN

Technical data

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Performance data – High suction rate						
Ejector characteristic		Standard L				
Nominal size of laval nozzle	[mm]	0.45	0.7	0.95	1.4	2.0
Max. suction rate with respect to atmosphere	[l/min]	13.6	30.9	41.5	92.6	184.4
Operating pressure for max. suction rate	[bar]	5	4	5	5	5
Pressurisation time ¹⁾ for 1 l volume, at p ₁ = 6 bar	[s]	2.04	0.82	0.66	0.31	0.17

1) Time required to build up vacuum to –0.05 bar.



Note

Twice the suction rate can be generated through parallel connection of two vacuum generator cartridges. The respective suction rate then

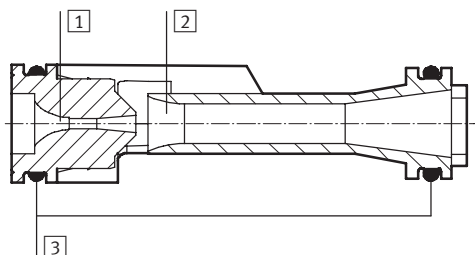
corresponds to the next highest performance level.

Example:

2x20-H corresponds to 1x30-H

Materials

Sectional view



Vacuum generator cartridge VN-05/07/10/14/20

1	Jet nozzle	Wrought aluminium alloy
2	Receiver nozzle	Polyacetate
3	Seals	Nitrile rubber



Note

The graphs plotting the technical data for the vacuum generator cartridge are the same as those for the vacuum generator VN-A/B/M.

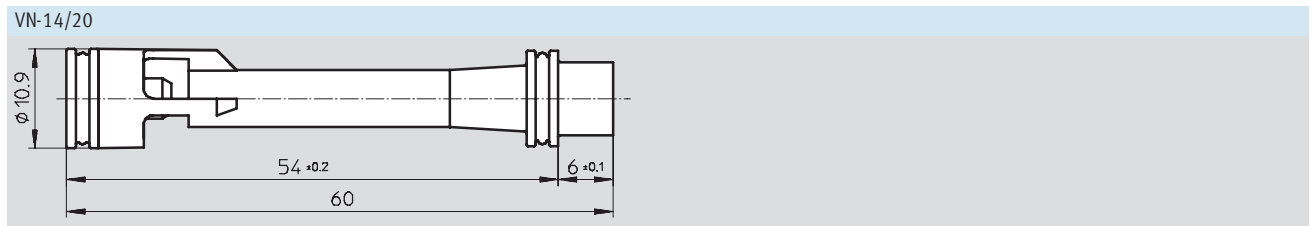
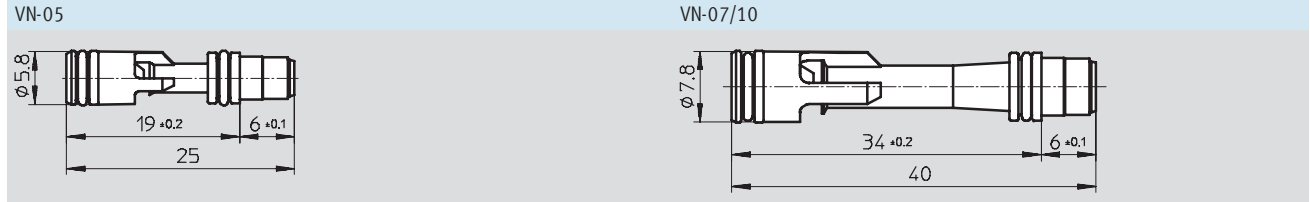
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Vacuum generator cartridges VN

Technical data

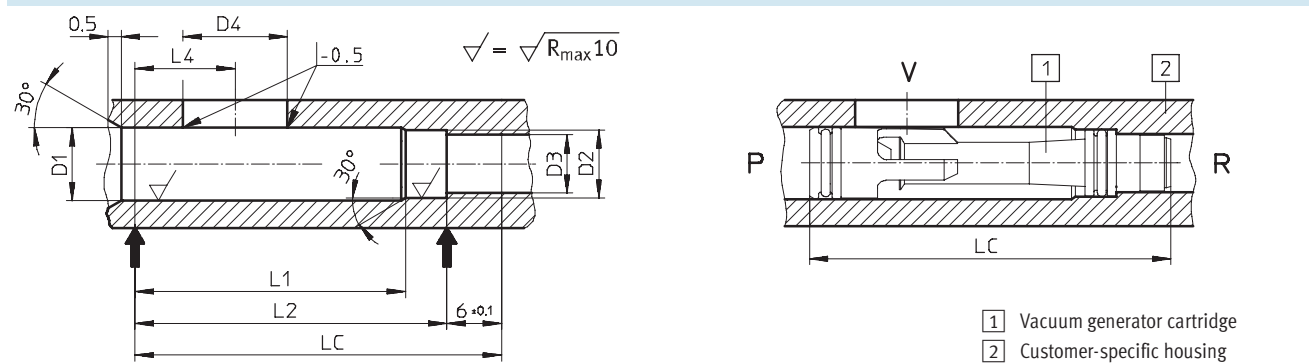
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Dimensions Download CAD data → www.festo.com/en/engineering



Locating hole for the vacuum generator cartridge

Dimensions Installation of the vacuum generator cartridge



Type	Dimensions of the locating hole						Vacuum port		
	D1 ¹⁾ +0.05	D2	D3	L1	L2 ±0.2	LC ²⁾	L4 ±0.2	D4 min. Ø ³⁾ max. Ø	
VN-05	6	5.7 +0.05	4.9 +0.1	14	19	25	9.5	3.0 3.5	
VN-07	8	7.5 +0.05	6.5 +0.1	29	34	40	11	6.0 7.5	
VN-10									
VN-14	11.1	10.7 -0.05	9.4 ±0.1	49	54	60	13	12.8 15.6	
VN-20									

- 1) For D1 with Ø 11.1: Select a core diameter of 11.8 +0.1 for a G3/4 threaded connection
2) Length of the vacuum generator cartridge
3) Minimum cross section, Festo recommends the largest possible cross section

Ordering data and weights									
T-type									
Nominal diameter [mm]	Weight [g]	High vacuum H					Weight [g]	High suction rate L	
		Part No.	Type		Part No.			Type	
With solenoid valve									
0.45	0.65	547 693	VN-05-H				0.65	547 694	VN-05-L
0.7	1.65	547 695	VN-07-H				1.65	547 696	VN-07-L
0.95	1.65	547 697	VN-10-H				1.65	547 698	VN-10-L
1.4	3.75	547 699	VN-14-H				3.75	547 700	VN-14-L
2.0	3.75	547 701	VN-20-H				3.75	547 702	VN-20-L