

## **Vacuum generators VN**

For faster vacuum generation

**FESTO**



Decentralised, faster  
vacuum generation for  
greater productivity

**Info 402**

## At home directly in the gripping area: Vacuum generators VN

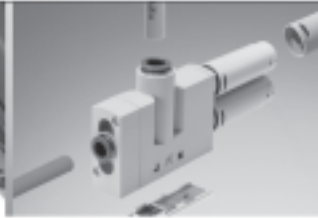
Decentralised vacuum generation guarantees faster evacuation times, thereby increasing productivity. New: the large nominal diameters of vacuum generators VN provide a higher suction rate. Unrivalled: vacuum generators VN-P with integrated vacuum monitoring.



Reliable



Directly in the gripping area



Plug & work®



reddot design award  
winner 2007

### More efficient

The low weight and minimum space requirement of the vacuum generator VM mean it can be used directly in the gripping area. Short lines permit fast evacuation of large volumes with little energy consumed.

### Short cycle times

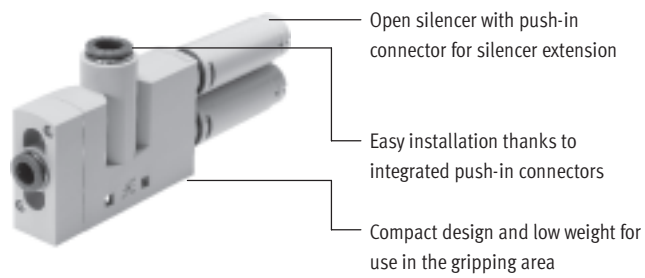
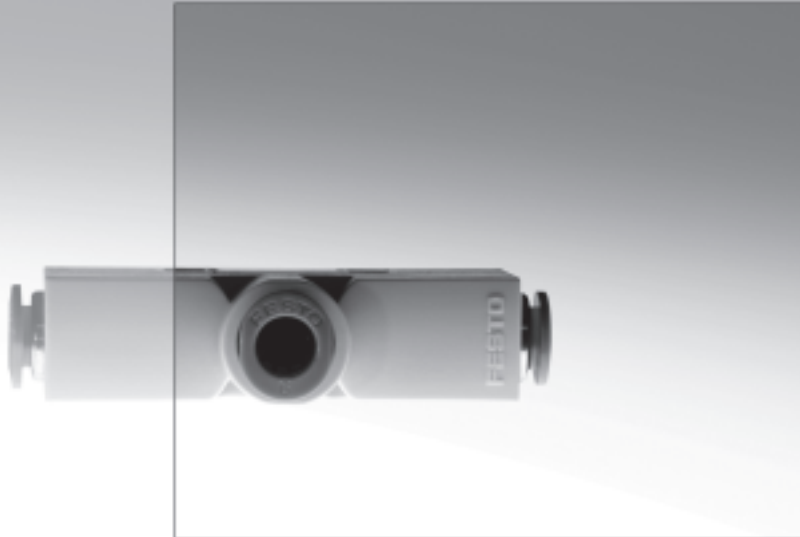
The new nominal widths ensure reliable vacuum supply and rapid vacuum build-up, even with multiple suction cups.

### More reliable access

Integrated vacuum monitoring allows the vacuum generators to reliably register whether or not workpieces are present.

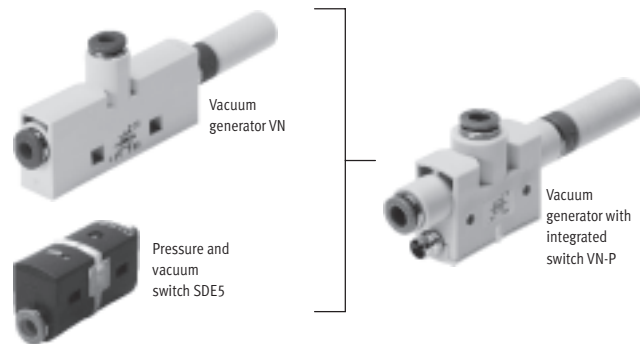
### Quicker to install

Thanks to Festo plug & work® Complete solution in comparison with the vacuum pump. There is no need for the installation of a reservoir, long lines or special vacuum valves.



Our integration specialists combined the proven vacuum generators VN with the functionality of the vacuum sensor SDE5. Integrated vacuum monitoring

allows the vacuum generators to reliably register whether or not workpieces are present. Easy to use – “teach-in” at the touch of a button.



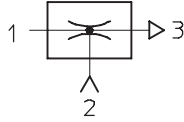
# Vacuum generators

Key features

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## 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-...

→ 15



- 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-...

Technical data → Internet: vad



- 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

## Compact ejectors

VADM-.../VADMI-...

Technical data → Internet: vadm



- 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-...

Technical data → Internet: vad-m



- 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

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## 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

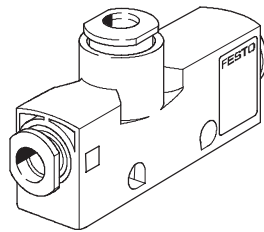
### Standard T-type

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.



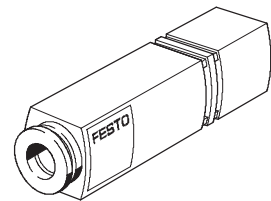
### In-line version

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.



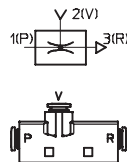
## Two operating principles

### Standard

- T-type housing

#### Design:

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

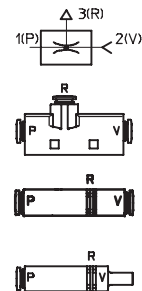


### In-line

- 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

## Two variants

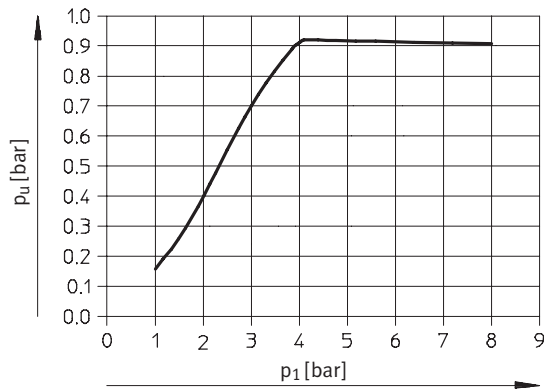
High vacuum

up to 93%

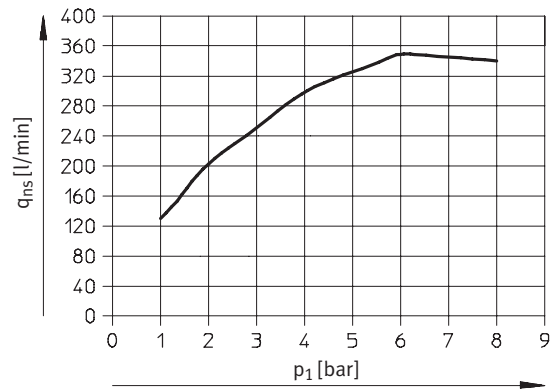
High suction volume

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  $p_1$

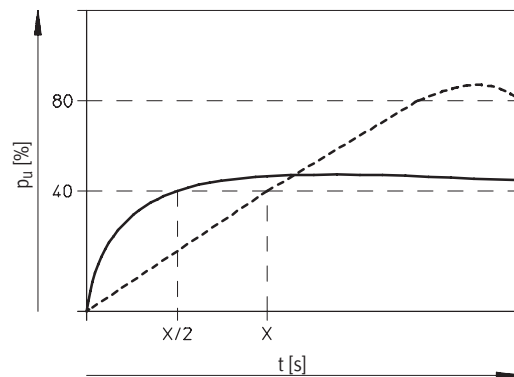


## System comparison

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.


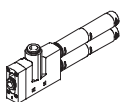

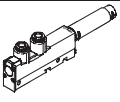
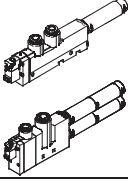
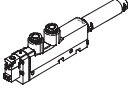
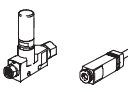

The second type of generator, on the other hand, can achieve very short evacuation times because of the high suction flow rate at relatively low vacuum.



----- High vacuum  
 ——— High suction volume

## Vacuum generators VN

Product range overview

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



## Vacuum generators VN


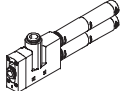

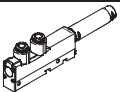
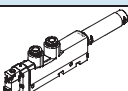
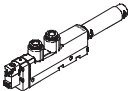
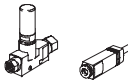

Product range overview

Type	Vacuum port (2)				Exhaust port (3)			Switching function		→ Page/ Internet
	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	
<b>Standard H</b>										
VN-05-H	■	■	- ■	-	■	■	■	-	-	13
VN-07-H	■	■	- ■	-	■	■	■	-	-	
VN-10-H	■	■ -	■	-	■	■ -	■	-	-	
VN-14-H	■	■	■	-	■	■	■	-	-	
VN-20-H	■	■	■	-	-	-	■	-	-	
VN-30-H	■	■	■	-	-	-	■	-	-	
<b>Standard H with integrated vacuum switch</b>										
VN-05-H...P	■	-	-	-	-	-	-	■	■	29
VN-07-H...P		-	-	-	-	-	-	-	-	
VN-10-H...P		-	-	-	-	-	-	-	-	
<b>Standard H with ejector pulse</b>										
VN-05-H...A	■	■	-	-	-	-	■	-	-	35
VN-07-H...A										
VN-10-H...A										
VN-14-H...A										
<b>Standard H with solenoid valve</b>										
VN-05-H...M	■	-	-	-	-	-	■	-	-	35
VN-07-H...M										
VN-10-H...M										
VN-14-H...M										
VN-20-H...M										
VN-30-H...M										
<b>Standard H with solenoid valve and ejector pulse</b>										
VN-05-H...B	■	-	-	-	-	-	■	-	-	35
VN-07-H...B										
VN-10-H...B										
VN-14-H...B										
<b>Inline M</b>										
VN-05-M	■	■	-	-	■	■	■	-	-	13
	■	-	-	■	-	-	-	-	-	
VN-07-M	■	■	-	-	■	■	■	-	-	
	■	-	-	■	-	-	-	-	-	
VN-10-M	■	-	-	-	-	-	-	-	-	
<b>Inline M with ejector pulse</b>										
VN-05-M...A	■	-	-	-	-	-	-	-	-	35
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	Female thread	
				10	14	16	18	24	10	13			14.5
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	PQ	PI			
High suction rate	<b>Standard L</b>												
		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	-	-	-	-	■	-	-	-	■	■
	<b>Standard L with integrated vacuum switch</b>												
		VN-05-L...-P	0.45	-	-	■	-	-	-	-	-	■	-
		VN-07-L...-P	0.7	-	-	■	-	-	-	-	-	■	-
		VN-10-L...-P	0.95	-	-	-	■	-	-	-	-	■	-
	<b>Standard L with ejector pulse</b>												
		VN-05-L...-A	0.45	-	■	-	-	-	-	-	-	■	■
		VN-07-L...-A	0.7	-	■	-	-	-	-	-	-	■	■
		VN-10-L...-A	0.95	-	-	-	■	-	-	-	-	■	■
		VN-14-L...-A	1.4	-	-	-	■	-	-	-	-	■	■
	<b>Standard L with solenoid valve</b>												
		VN-05-L...-M	0.45	-	■	-	-	-	-	-	-	■	-
		VN-07-L...-M	0.7	-	■	-	-	-	-	-	-	■	-
		VN-10-L...-M	0.95	-	-	-	■	-	-	-	-	■	-
		VN-14-L...-M	1.4	-	-	-	■	-	-	-	-	■	-
	<b>Standard L with solenoid valve and ejector pulse</b>												
		VN-05-L...-B	0.45	-	■	-	-	-	-	-	-	■	-
		VN-07-L...-B	0.7	-	■	-	-	-	-	-	-	■	-
VN-10-L...-B		0.95	-	-	-	■	-	-	-	-	■	-	
VN-14-L...-B		1.4	-	-	-	■	-	-	-	-	■	-	
<b>Inline N</b>													
	VN-05-N	0.45	-	■	-	-	-	-	-	-	■	■	
			-	-	-	-	-	-	■	-	■	-	
<b>Inline N with ejector pulse</b>													
	VN-05-N...-A	0.45	-	-	-	-	-	-	-	■	■	-	
	VN-07-N...-A	0.7	-	-	-	-	-	-	-	■	■	-	

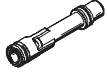
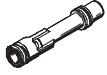
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Product range overview

Type	Vacuum port (2)				Exhaust port (3)			Switching function		→ Page/ Internet
	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	
<b>Standard L</b>										
VN-05-L	■	■	- ■	-	■	■	■	-	-	13
VN-07-L	■	■	■	-	■	■	■	-	-	
VN-10-L	■	■ -	■	-	■	■ -	■	-	-	
VN-14-L	■	■	■	-	■	■	-	-	-	
VN-20-L	■	■	■	-	-	-	■	-	-	
VN-30-L	-	■	■	-	-	-	■	-	-	
<b>Standard L with integrated vacuum switch</b>										
VN-05-L-...-P	■	-	-	-	-	-	-	■	■	29
VN-07-L-...-P										
VN-10-L-...-P										
<b>Standard L with ejector pulse</b>										
VN-05-L-...-A	■	■	-	-	-	-	■	-	-	35
VN-07-L-...-A										
VN-10-L-...-A										
VN-14-L-...-A										
<b>Standard L with solenoid valve</b>										
VN-05-L-...-M	■	-	-	-	-	-	■	-	-	35
VN-07-L-...-M										
VN-10-L-...-M										
VN-14-L-...-M										
<b>Standard L with solenoid valve and ejector pulse</b>										
VN-05-L-...-B	■	-	-	-	-	-	■	-	-	35
VN-07-L-...-B										
VN-10-L-...-B										
VN-14-L-...-B										
<b>Inline N</b>										
VN-05-N	■	■	-	-	■	■	■	-	-	13
	■	-	-	■	-	-	-	-	-	
<b>Inline N with ejector pulse</b>										
VN-05-N-...-A	■	-	-	-	-	-	-	-	-	35
VN-07-N-...-A										

## Vacuum generators VN

Product range overview

Function	Version	Type	Nominal size	→ Page/ Internet
			[mm]	
High vacuum	Vacuum generator cartridge, standard H			
		VN-05-H	0.45	47
		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	47
		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

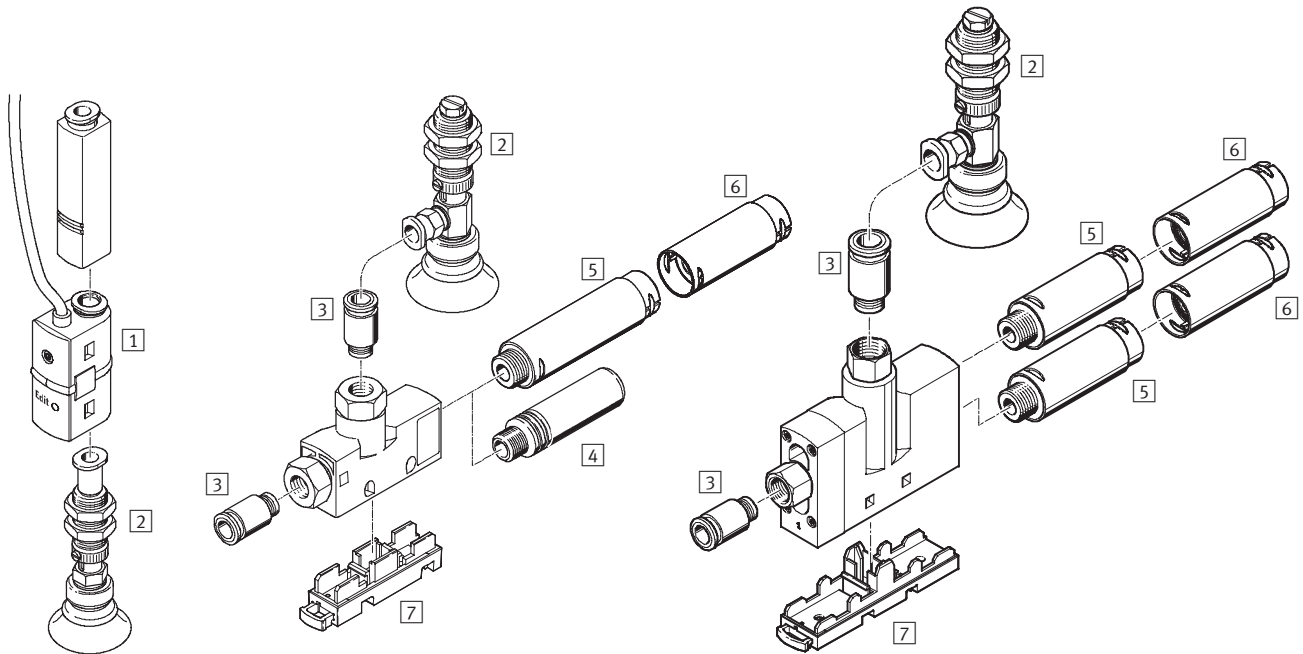
FESTO

VN-05/07/10/14

VN-20/30

Inline

T-type

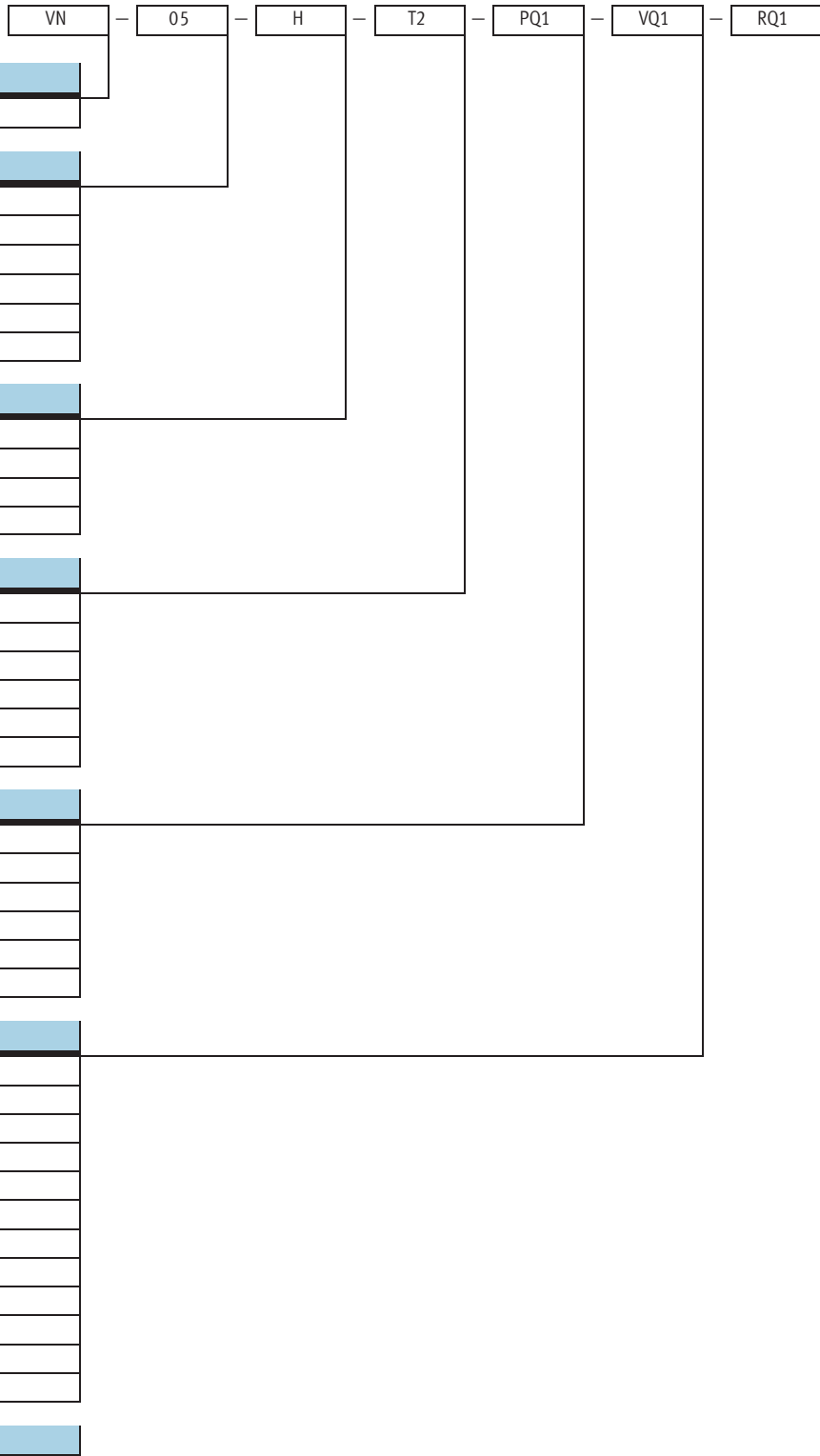


Mounting attachments and accessories								→ Page/Internet
	VN-05/07/10/14					VN-20/30		
	Inline		T-type			T-type		
	10 mm	13 mm	10 mm	14 mm	18 mm	24 mm		
1 Pressure switch SDE5		■			■		sde5	
2 Suction gripper ESG		■			■		esg	
3 Push-in fitting QS		-			■		qs	
4 Silencer UO		-	■	■	-		50	
5 Silencer UOM		-	-	-	■		51	
6 Silencer extension UOMS		-	-	-	■		51	
7 Mounting plate VN-T		-		■			52	
- Suction cup holder ESH		■			■		esh	
- suction cup ESS		■			■		ess	

# Vacuum generators VN

Type codes

FESTO



Type	
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

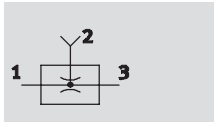
Exhaust port (3)	
RQ1	Push-in connector QS4
RQ2	Push-in connector QS6
RQ3	Push-in connector QS8
RI2	Female thread M5
RI4	Female thread G $\frac{1}{8}$
RI5	Female thread G $\frac{1}{4}$
RO1	Silencer UO, minimal resistance
RO2	Silencer UOM, minimal resistance

-  - Note  
Possible combinations can be found in the ordering data.

# Vacuum generators VN

Technical data

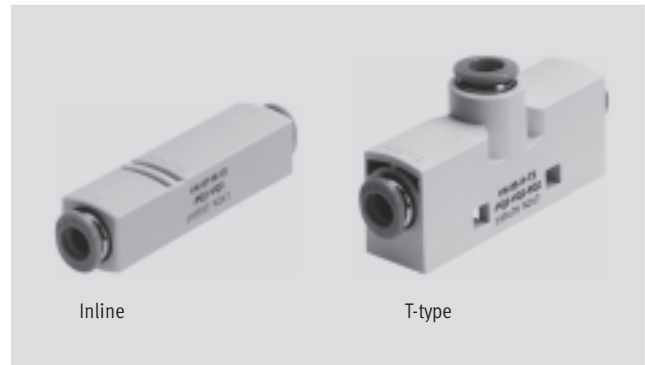
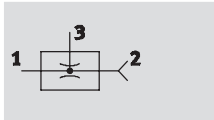
Function  
VN Standard



Temperature range  
0 ... +60 °C

Operating pressure  
1 ... 8 bar

VN Inline



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	G1/8	M5	G1/8	G1/8	–	G1/8	G1/4	G1/4
Vacuum connection	Push-in connector	QS4	QS6	QS4	QS6	QS6	QS8	QS8	QS12	QS12
	Male thread	–	G1/8	–	G1/8	G1/8	G1/4	G1/4	G1/4	G1/4
	Female thread	M5	G1/8	M5	G1/8	G1/8	–	G1/4	G3/8	G3/8
Pneumatic connection 3	Push-in connector	QS4	QS6	QS4	QS6	QS6	QS8	QS8	–	–
	Female thread	M5	G1/8	M5	G1/8	G1/8	–	G1/4	–	–
	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 <sup>1)</sup>	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 <sup>1)</sup> for 1 l volume at p <sub>1</sub> = 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 <sup>1)</sup> for 1 l volume at p <sub>1</sub> = 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.

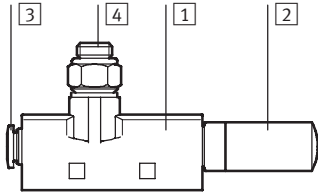


# Vacuum generators VN

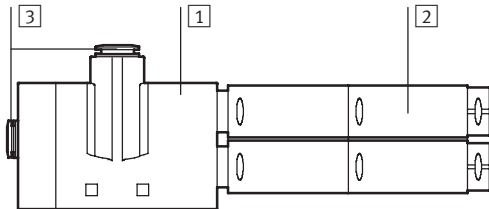
Technical data

## 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
		R02 Contains 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
		Contains paint-wetting impairment substances

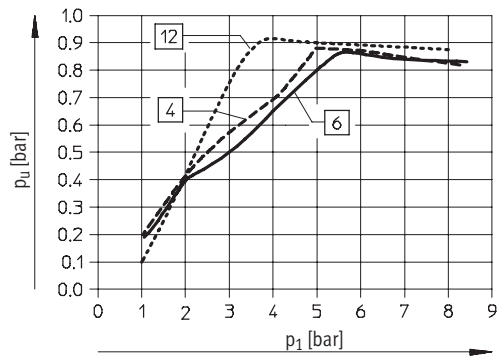
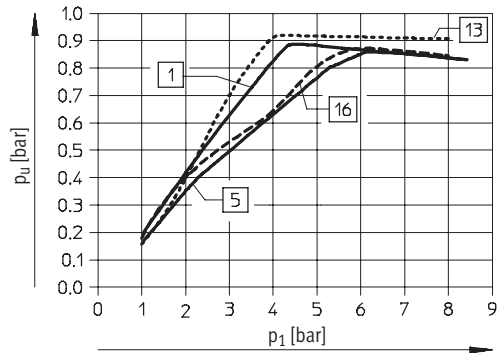
# Vacuum generators VN

Technical data

FESTO

## Vacuum $p_u$ as a function of operating pressure $p_1$

High vacuum



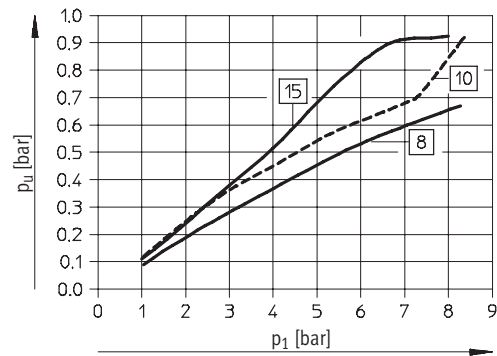
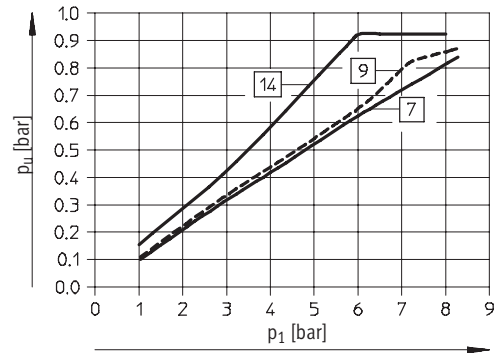
Standard:

- 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...

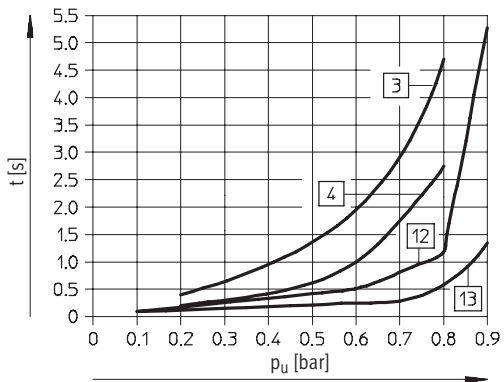
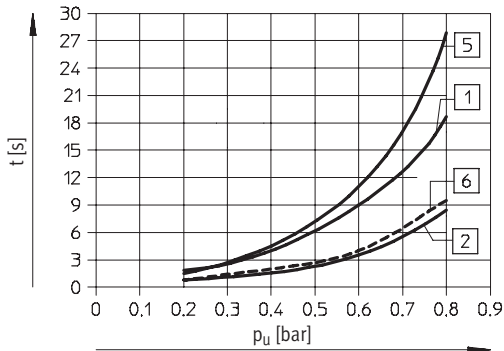
# Vacuum generators VN

Technical data



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

High vacuum



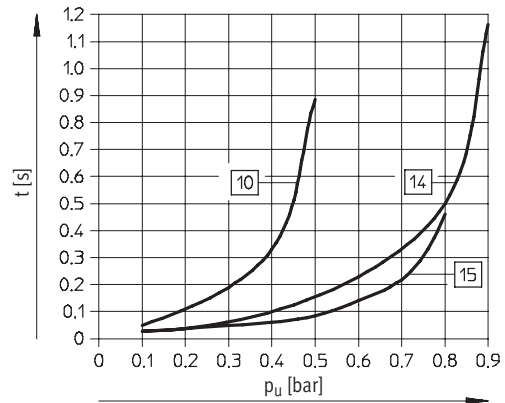
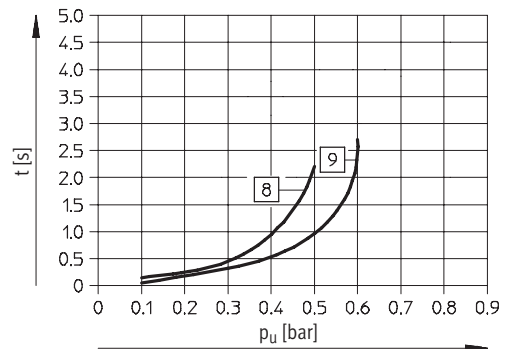
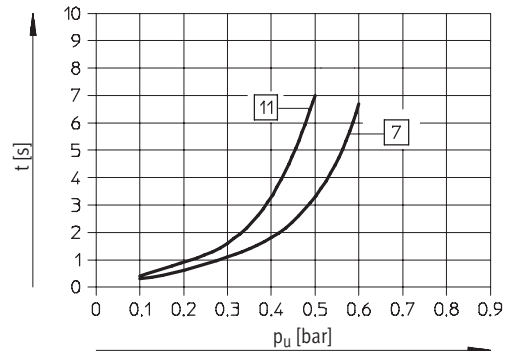
Standard:

- 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...

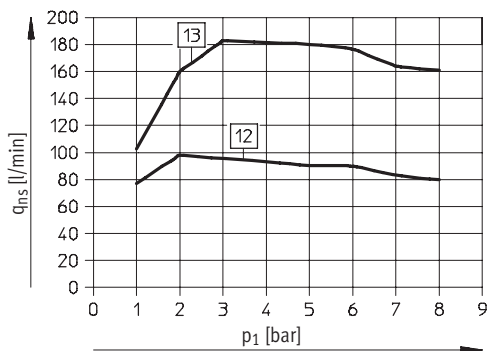
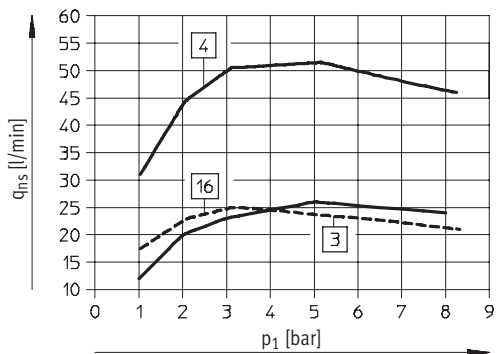
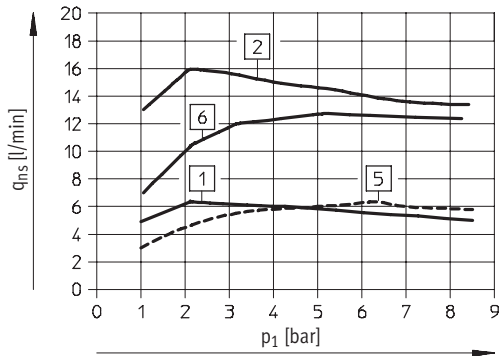
# Vacuum generators VN

Technical data

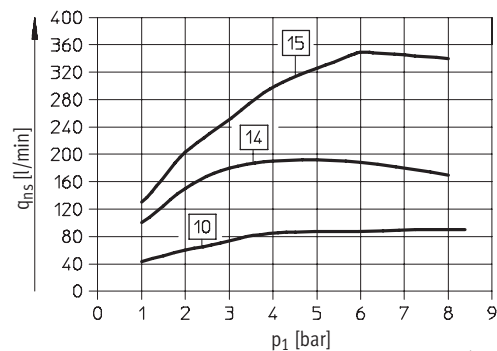
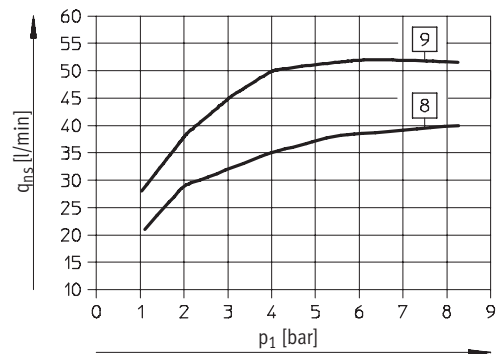
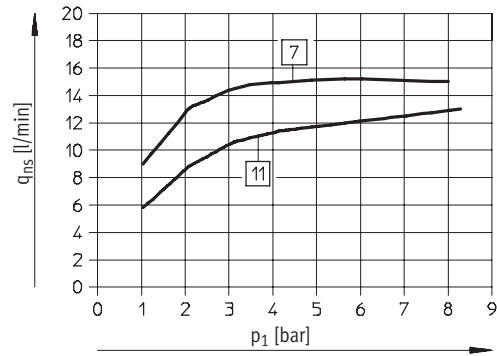
FESTO

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

High vacuum



High suction rate



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...

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...

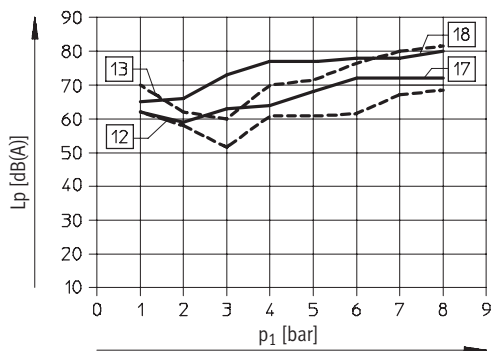
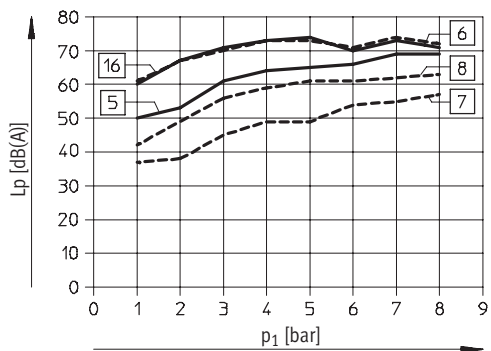
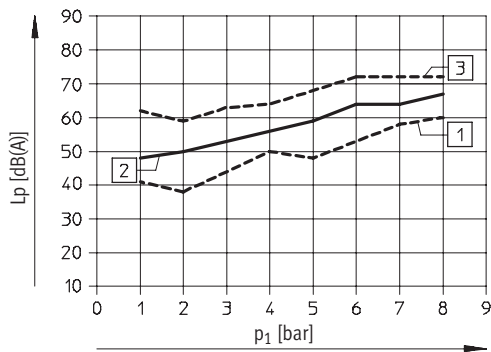
# Vacuum generators VN

Technical data

FESTO

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

High vacuum



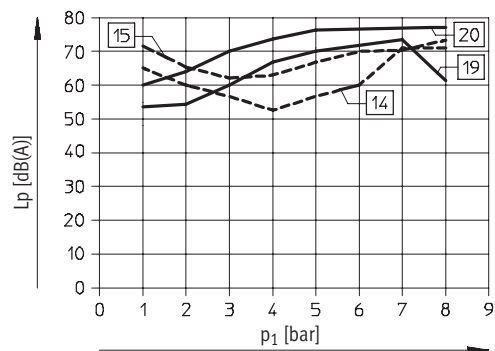
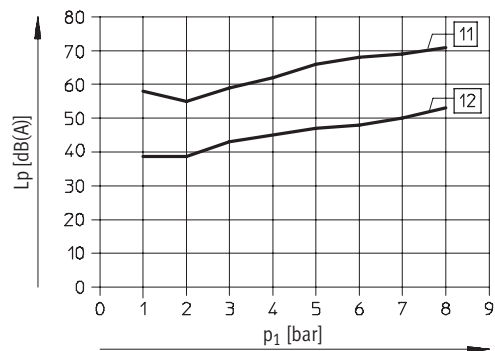
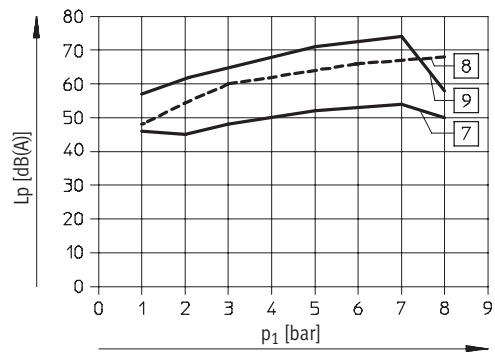
Standard:

- 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-...

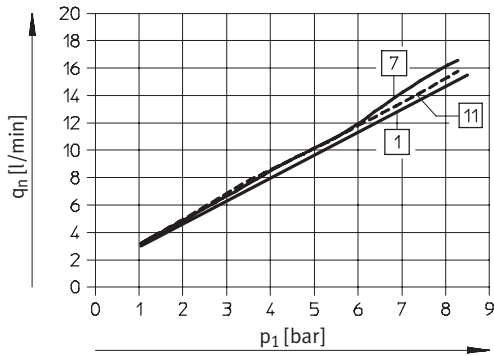
# Vacuum generators VN

Technical data

FESTO

## Air consumption $q_n$ as a function of operating pressure $p_1$

High vacuum/high suction rate

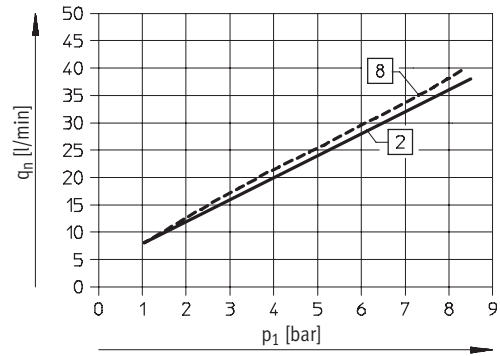


Standard:

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

Inline:

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

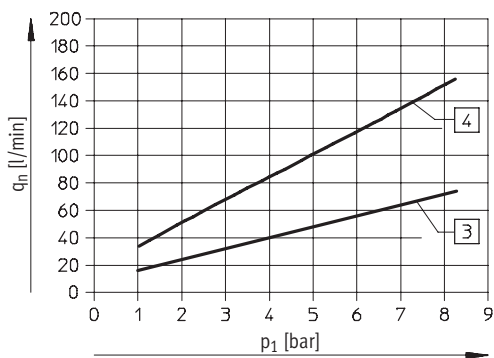


Standard:

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

Inline:

- 2 VN-07-M...

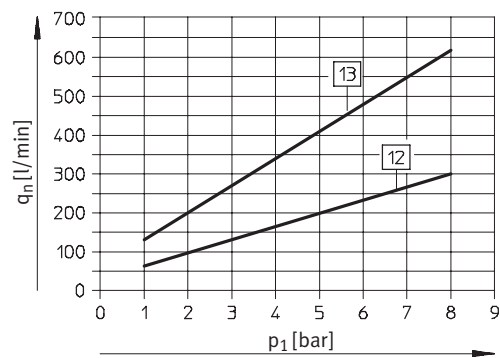


Standard:

- 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

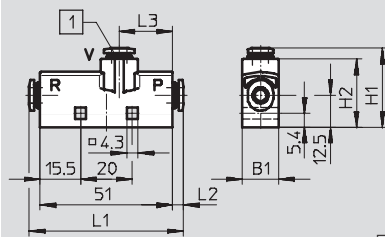
Technical data

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

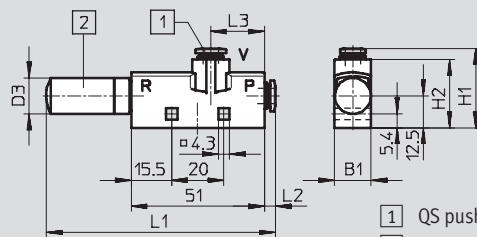
Download CAD data → [www.festo.com](http://www.festo.com)

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

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



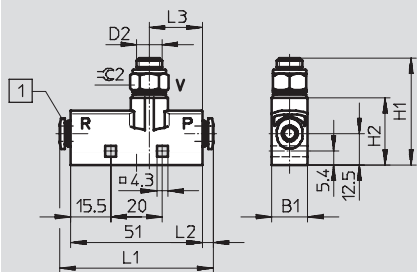
1 QS push-in connector



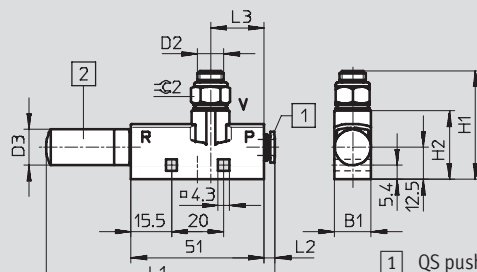
1 QS push-in connector  
2 Silencer

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

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



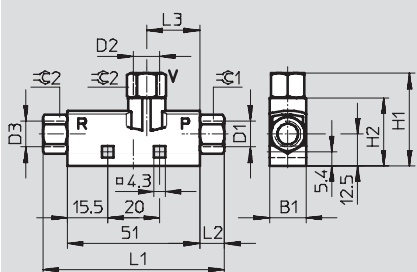
1 QS push-in connector



1 QS push-in connector  
2 Silencer

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

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



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 <sup>1)</sup>			86.8						
VN-...-T2-PI2-VI2-RI2		M5	M5	M5			61						
VN-...-T2-PI2-VI2-RO1				9.8 <sup>1)</sup>			88.2						
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 <sup>1)</sup>			97.6						
VN-...-T3-PQ2-VA4-RQ2			G <sup>1</sup> / <sub>8</sub>	G <sup>1</sup> / <sub>8</sub>			QS6	41.5				59.4	
VN-...-T3-PQ2-VA4-RO1							13.8 <sup>1)</sup>	97.6					
VN-...-T3-PI4-VI4-RI4		G <sup>1</sup> / <sub>8</sub>	G <sup>1</sup> / <sub>8</sub>	G <sup>1</sup> / <sub>8</sub>			35.7	70				9.5	13
VN-...-T3-PI4-VI4-RO1				13.8 <sup>1)</sup>				102.9					
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 <sup>1)</sup>			125.5						
VN-...-T4-PQ2-VA5-RQ3			G <sup>1</sup> / <sub>4</sub>	G <sup>1</sup> / <sub>4</sub>			QS8	50.5				63.8	
VN-...-T4-PQ2-VA5-RO2							17.8 <sup>1)</sup>					125.5	
VN-...-T4-PI4-VI5-RI5		G <sup>1</sup> / <sub>8</sub>	G <sup>1</sup> / <sub>8</sub>	G <sup>1</sup> / <sub>4</sub>			48.15	81.4				9.5	13
VN-...-T4-PI4-VI5-RO2				17.8 <sup>1)</sup>				128.8					

1) ∅ Silencer

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

# Vacuum generators VN

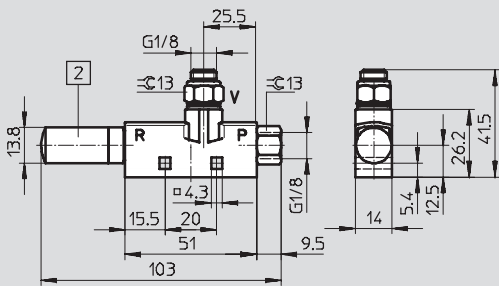
Technical data

FESTO

## Dimensions – T-type/Standard, VN-10

Download CAD data → [www.festo.com](http://www.festo.com)

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



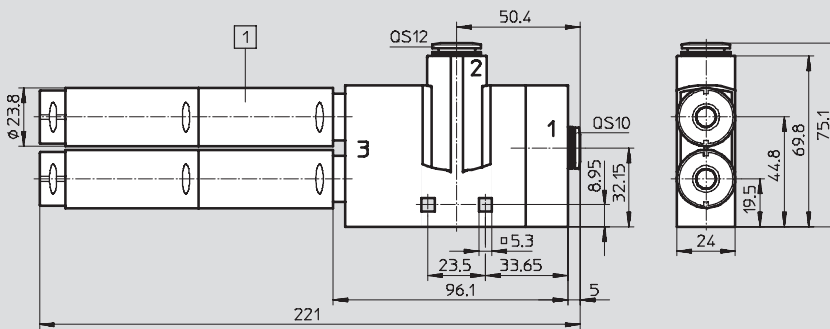
2 Silencer

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

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

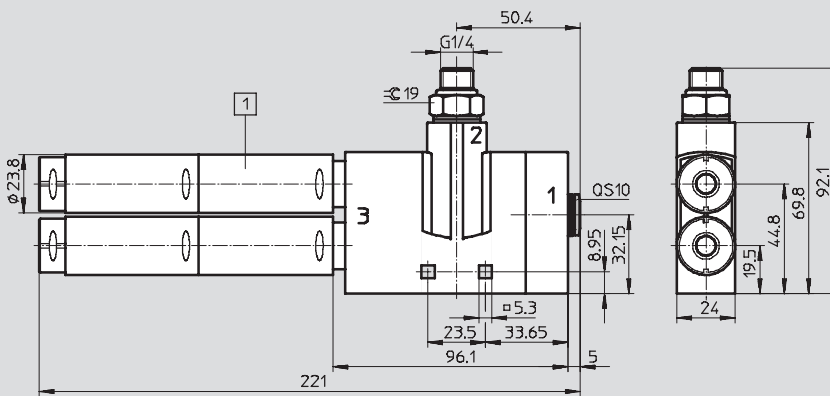
Download CAD data → [www.festo.com](http://www.festo.com)

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



1 Silencer

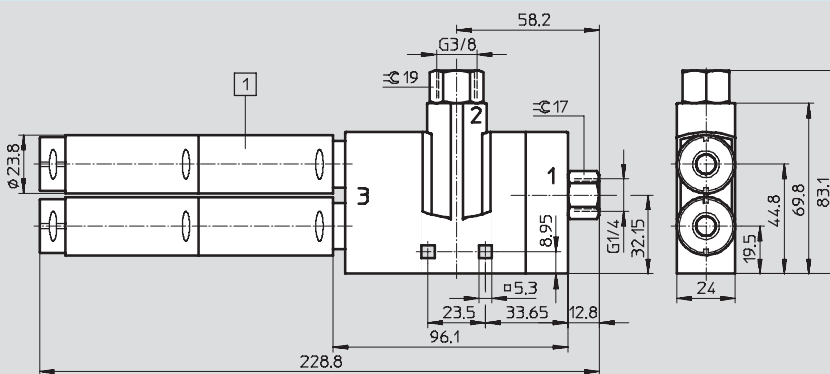
VN-...-T6-PQ4-VA5-R02



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

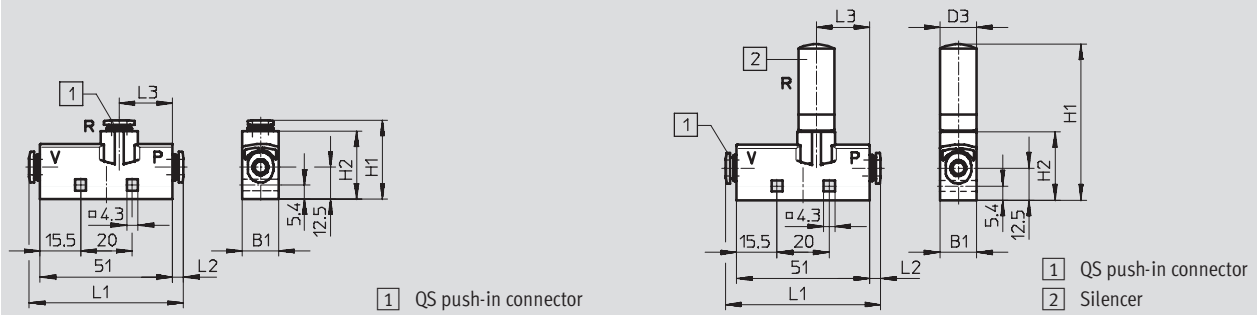
FESTO

## Dimensions – T-type/Inline, VN-05/07

Download CAD data → [www.festo.com](http://www.festo.com)

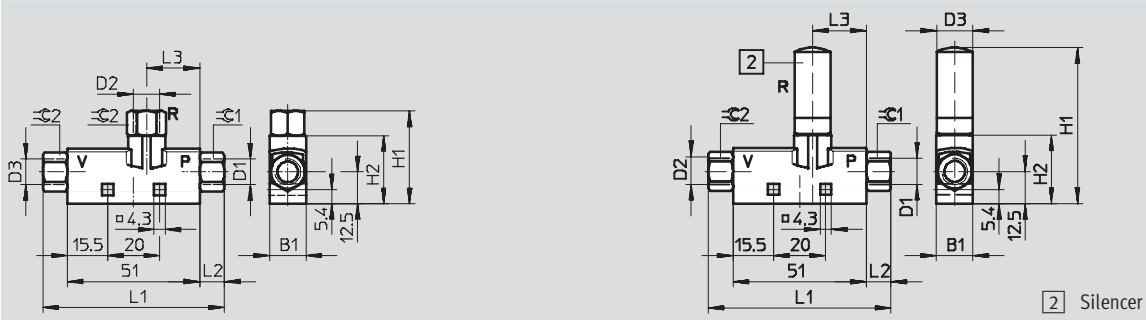
VN-...-T...-PQ...-VQ...-RQ...

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 <sup>1)</sup>	59.9						
VN-...-T2-PI2-VI2-RI2		M5	M5	M5	32.7						
VN-...-T2-PI2-VI2-R01				9.8 <sup>1)</sup>	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 <sup>1)</sup>	68.6						
VN-...-T3-PI4-VI4-RI4		G <sup>1</sup> / <sub>8</sub>	G <sup>1</sup> / <sub>8</sub>	G <sup>1</sup> / <sub>8</sub>	35.7						
VN-...-T3-PI4-VI4-R01				13.8 <sup>1)</sup>	68.6						

1) ∅ Silencer

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

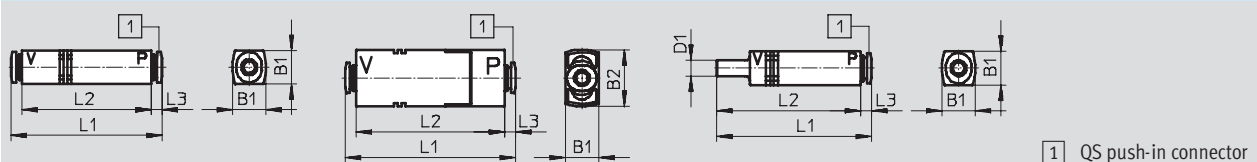
## Dimensions – Inline, VN-05/07/10

Download CAD data → [www.festo.com](http://www.festo.com)

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

VN-10-M-I3-PQ2-VQ2









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



Type	B1	B2	Connections		D1 ∅	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		-		-	60.2	56		

# 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 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-RO1	–	–	–
	0.7	14.6	526 109	VN-07-M-T2-PQ1-VQ1-RO1		–	–
14	0.45	22	193 540	VN-05-M-T3-PQ2-VQ2-RO1	22.8	193 623	VN-05-N-T3-PQ2-VQ2-RO1
	0.7	23	193 541	VN-07-M-T3-PQ2-VQ2-RO1		–	–
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-RO1	–	–	–
	0.7	13.2	526 113	VN-07-M-T2-PI2-VI2-RO1		–	–
14	0.45	22	193 548	VN-05-M-T3-PI4-VI4-RO1	22.3	193 631	VN-05-N-T3-PI4-VI4-RO1
	0.7	22	193 549	VN-07-M-T3-PI4-VI4-RO1		–	–

# Vacuum generators VN

Technical data

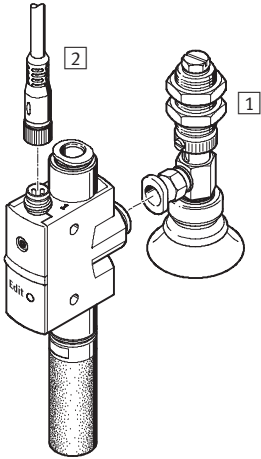
Ordering data and weights – Inline							
Inline							
Housing width [mm]	Nominal size [mm]	Weight [g]	High vacuum M		Weight [g]	High suction rate N	
			Part No.	Type		Part No.	Type
with push-in connector							
10	0.45	10.2	193 580	VN-05-M-I2-PQ1-VQ1	-	-	-
	0.7	10.5	193 586	VN-07-M-I2-PQ1-VQ1			
13	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

FESTO

Peripherals overview and type codes

## Peripherals overview



Mounting attachments and accessories		→ Page/Internet
1	Suction gripper ESG	esg
2	Plug socket with cable, 3-pin NEBU-M8	54
-	Suction cup holder ESH	esh
-	Suction cup ESS	ess

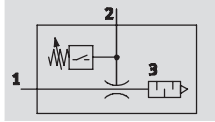
## Type codes



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

# Vacuum generators VN-P, with integrated vacuum switch

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 <sup>1)</sup>		
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 <sup>1)</sup>	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

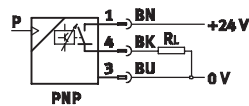
Technical data

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] <sup>1)</sup>	1.5
Hysteresis	[% FS] <sup>1)</sup>	2 (threshold value comparator with fixed hysteresis)
Long-term drift	[% FS] <sup>1)</sup>	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 <sup>1)</sup>	Pin allocations
<b>1 switch output PNP</b>	

Plug M8x1



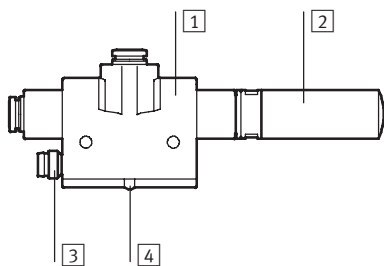
1 = +24 V  
3 = 0 V  
4 = Output A



1) Core colours indicated apply when using plug sockets with cable NEBU-M8, 3-pin. → 54

## Materials

General view



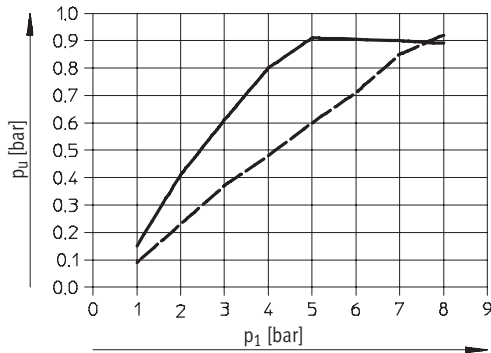
Vacuum generator		
1	Housing	Polyacetate, reinforced
2	Silencer	Polyethylene
3	Plug housing	Polyamide, nickel and chrome plated brass
4	Fibre optics	Polycarbonate
-	Key pad	Silicone rubber
-	Seals	Nitrile rubber
	Note on materials	Contains paint-wetting impairment substances

# Vacuum generators VN-P, with integrated vacuum switch

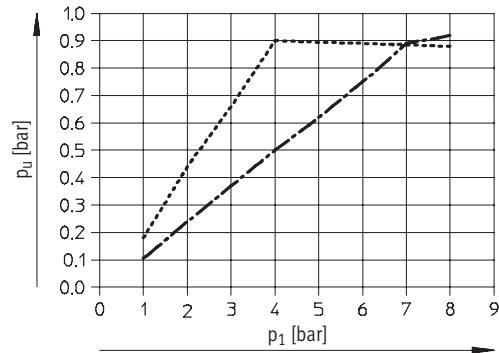
Technical data

## Vacuum $p_u$ as a function of operating pressure $p_1$

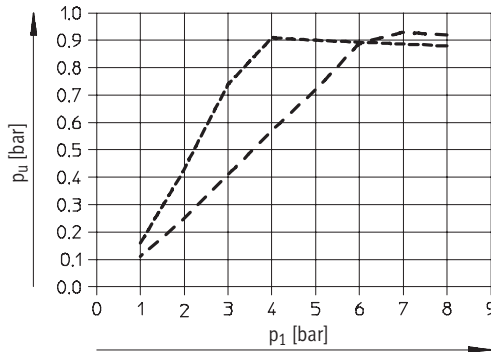
High vacuum/high suction rate



— VN-05-H  
- - - VN-05-L



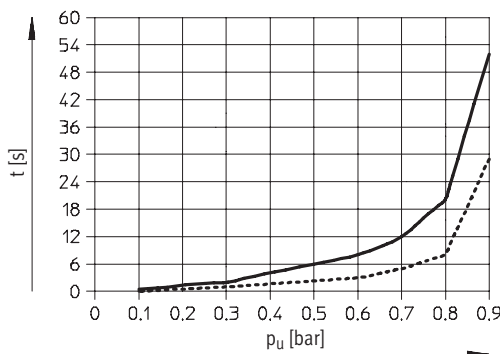
..... VN-07-H  
- · - · - VN-07-L



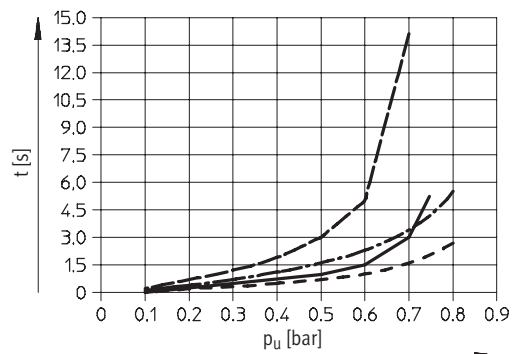
- - - VN-10-H  
- · - · - VN-10-L

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

High vacuum/high suction rate



— VN-05-H  
..... VN-07-H



- - - VN-05-L      - · - · - VN-10-H  
- · - · - VN-07-L      - - - VN-10-L

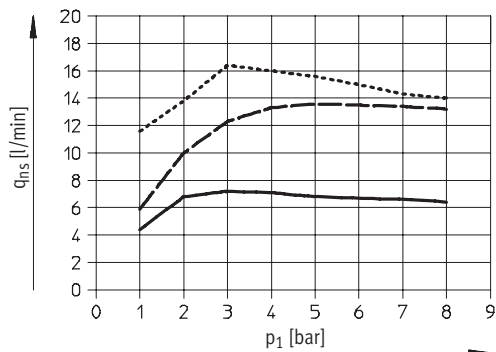


# Vacuum generators VN-P, with integrated vacuum switch

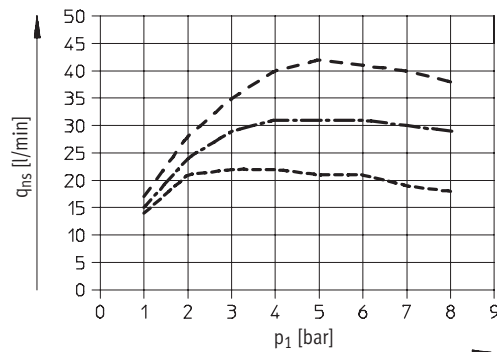
Technical data

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

High vacuum/high suction rate



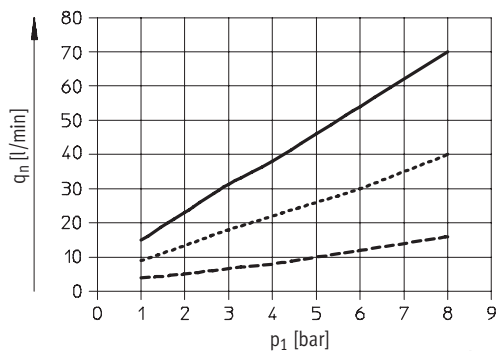
- VN-05-H
- - - VN-05-L
- ..... VN-07-H



- · - · - 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



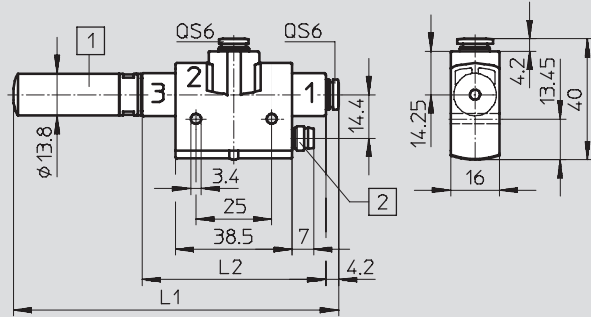
- - - VN-05
- ..... VN-07
- VN-10

# Vacuum generators VN-P, with integrated vacuum switch

Technical data

**Dimensions**

Download CAD data → [www.festo.com](http://www.festo.com)



- 1 Silencer
- 2 Plug, M8x1, 3-pin

Type	L1	L2
VN-05	93.6	44.2
VN-07	107	60.5
VN-10		

**Ordering data**

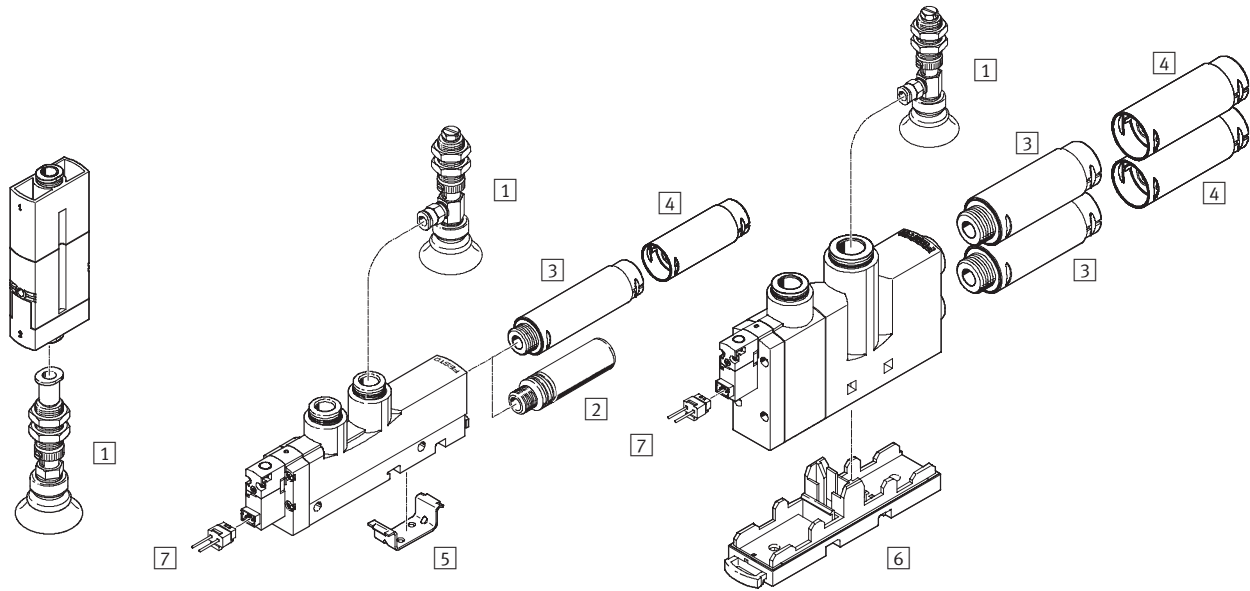
with push-in connector and silencer

Nominal size [mm]	Switching function		High vacuum/Standard H		High suction rate/Standard L	
	Threshold value with fixed hysteresis	Threshold value with variable hysteresis	Part No.	Type	Part No.	Type
0.45	■	–	536 796	VN-05-H-T4-PQ2-VQ2-01-P	536 798	VN-05-L-T4-PQ2-VQ2-01-P
	–	■	536 797	VN-05-H-T4-PQ2-VQ2-02-P	536 799	VN-05-L-T4-PQ2-VQ2-02-P
0.7	■	–	536 800	VN-07-H-T4-PQ2-VQ2-01-P	536 802	VN-07-L-T4-PQ2-VQ2-01-P
	–	■	536 801	VN-07-H-T4-PQ2-VQ2-02-P	536 803	VN-07-L-T4-PQ2-VQ2-02-P
0.95	■	–	536 804	VN-10-H-T4-PQ2-VQ2-01-P	536 806	VN-10-L-T4-PQ2-VQ2-01-P
	–	■	536 805	VN-10-H-T4-PQ2-VQ2-02-P	536 807	VN-10-L-T4-PQ2-VQ2-02-P

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

Peripherals overview

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




Mounting attachments and accessories										→ Page/Internet
	Inline	T-type								
	VN-05/07	VN-05/07/10			VN-14				VN-20/30	
	A	A	M	B	A	M	B	M		
1 Suction gripper ESG	■	■			■			■	esg	
2 Silencer UO	-	■			-			-	50	
3 Silencer UOM	-	-			■			■	51	
4 Silencer extension UOMS	-	-			■			■	51	
5 Mounting bracket VN-T3/T4	-	■			■			-	52	
6 Mounting plate VN-T6-BP-NRH	-	-			-			■	52	
7 Plug socket with cable, 2-pin KMH	-	-	■	■	-	■	■	■	53	
- Suction cup holder ESH	■	■			■			■	esh	
- Suction cup ESS	■	■			■			■	ess	

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

Type codes

		VN	-	05	-	H	-	T3	-	PQ2	-	VQ2	-	RO1	-	M
<b>Type</b>																
VN	Vacuum generator															
<b>Nominal size of laval nozzle [mm]</b>																
05	0.45															
07	0.7															
10	0.95															
14	1.4															
20	2.0															
30	3.0															
<b>Ejector characteristic</b>																
H	High vacuum/Standard T-type															
L	High suction rate/Standard T-type															
M	High vacuum/Inline															
N	High suction rate/Inline															
<b>Housing type</b>																
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															
<b>Supply port (1)</b>																
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 $\frac{1}{4}$															
<b>Vacuum port (2)</b>																
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 $\frac{1}{4}$															
<b>Exhaust port (3)</b>																
RO1	Silencer UO, minimal resistance															
RO2	Silencer UOM, minimal resistance															
<b>Additional functions</b>																
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.

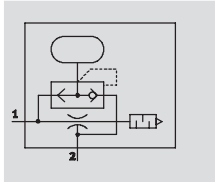
# Vacuum generators VN-A/M/B, with additional functions

Technical data

## Function


### VN-A

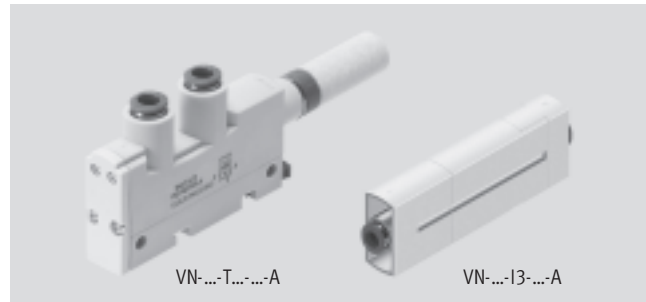
Pneumatic ejector pulse



### VN-A

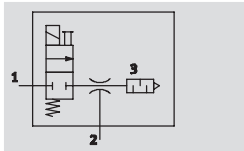
 Temperature range  
0 ... +60 °C

 Operating pressure  
1 ... 8 bar




### VN-M

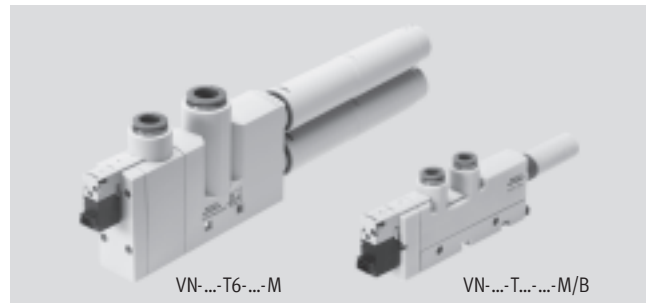
Electrical solenoid valve



### VN-M / VN-B

 Temperature range  
0 ... +50 °C

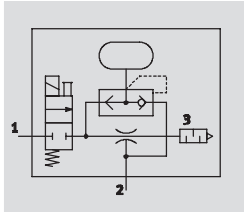
 Operating pressure  
2 ... 8 bar



### 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		
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	QS6	QS6	QS6	QS6	
		Female thread	G1/8	-	-	G1/8	-	-	G1/8	-	-	G1/4	-	-	-	
Vacuum port		Push-in connector	QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS6	QS6	
		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

General technical data – Inline		
Constructional design	Inline	
Type	VN-05	VN-07
Grid dimension [mm]	14.5	14.5
Integrated function	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 <sup>1)</sup>	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	
	0.45			0.7			0.95			1.4			2.0	3.0	0.45	0.7
Nominal size of laval nozzle [mm]																
Integrated function	A	M	B	A	M	B	A	M	B	A	M	B	M	M	A	A
Max. vacuum [%]	92			92			93			92			92	93	93	93
Operating pressure for max. vacuum [bar]	4.9			4.4			3.5			3.5			3.5	3.7	4.3	4.3
Max. suction rate with respect to atmosphere [l/min]	7.2			16.2			21.8			48.8			98	186	7.2	16.6
Operating pressure for max. suction rate [bar]	3			3			3			2			2	2	2	2
Pressurisation time <sup>1)</sup> for 1 l volume, at p <sub>1</sub> = 6 bar [s]	3.63	3.9		1.5	1.69		0.96	1.06		0.43	0.5		0.24	0.13	4.1	1.69
Pressurisation time with test volume <sup>2)</sup> , at p <sub>1</sub> = 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 cm<sup>3</sup>, VN-07/10 = 30 cm<sup>3</sup>, VN-14 = 45 cm<sup>3</sup>

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

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Technical data

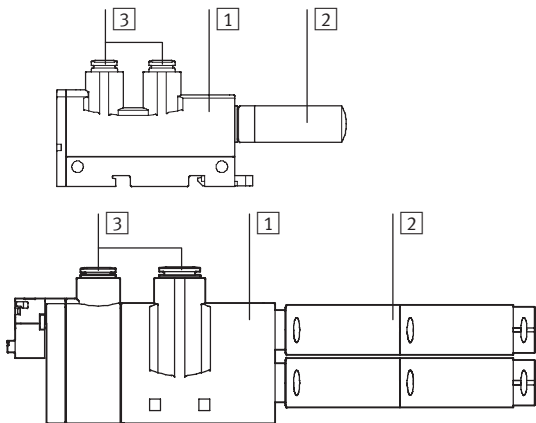
Performance data – High suction rate														
Ejector characteristic	Standard L												Inline N	
Nominal size of laval nozzle [mm]	0.45			0.7			0.95			1.4			0.45	0.7
Integrated function	A	M	B	A	M	B	A	M	B	A	M	B	A	A
Max. suction rate with respect to atmosphere [l/min]	13.6			30.9			40.5			92.6			13.3	32.6
Operating pressure for max. suction rate [bar]	5			4			5			5			5	4
Pressurisation time <sup>1)</sup> for 1 l volume, at p <sub>1</sub> = 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 <sup>2)</sup> , at p <sub>1</sub> = 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 cm<sup>3</sup>, VN-07/10 = 30 cm<sup>3</sup>, VN-14 = 45 cm<sup>3</sup>

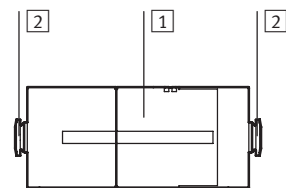
Technical data – Solenoid valve	
Operating voltage range [V DC]	21.6 ... 26.4
Duty cycle [%]	100
Protection class	IP40 (to EN 60 529)
Valve function	2/2-way valve
Manual override	By pushing

## 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
		RO2 Contains paint-wetting impairment substances



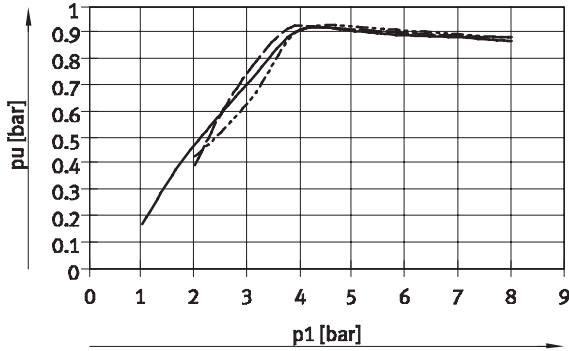
Vacuum generator VN – Inline		
1	Housing	Reinforced polyacetate Reinforced polyamide
2	Push-in fitting	Plastic, nickel plated brass
–	Jet nozzle	Wrought aluminium alloy
–	Receiver nozzle	Polyacetate
–	Seals	Nitrile rubber
	Note on materials	Free of copper and PTFE

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

Technical data

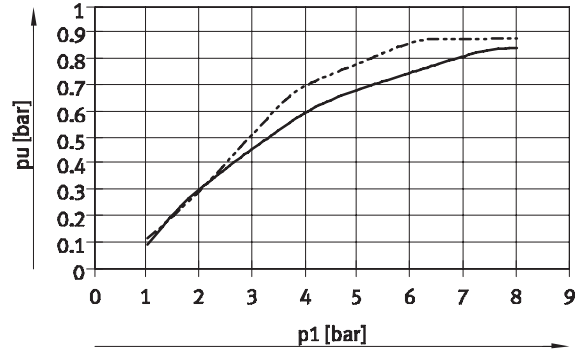
## Vacuum $p_u$ as a function of operating pressure $p_1$

### High vacuum – Standard

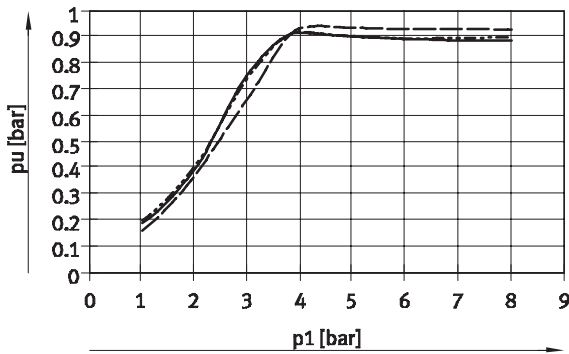


- VN-05-H
- - - VN-07-H
- · - VN-10-H

### High suction rate – Standard



- VN-05-L
- - - VN-10-L

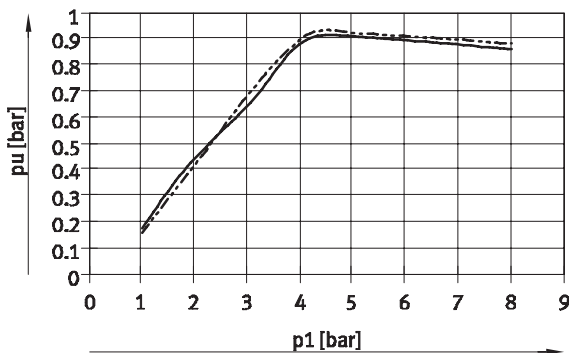


- VN-14-H
- - - VN-20-H
- · - VN-30-H



- VN-07-L
- - - VN-14-L

### High vacuum – In-line



- VN-05-M
- - - VN-07-M

### High suction rate – In-line



- VN-05-N
- - - VN-07-N

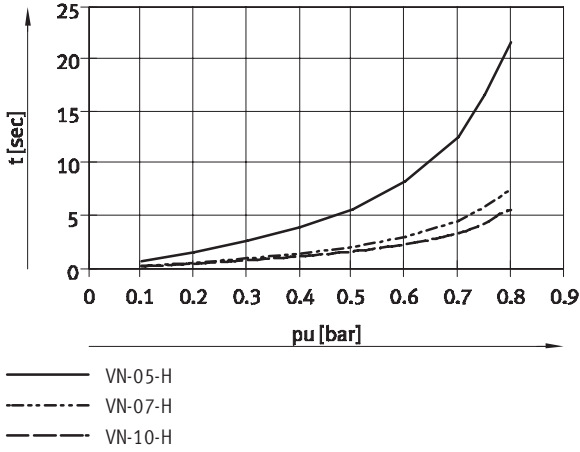


# Vacuum generators VN-A/M/B, with additional functions

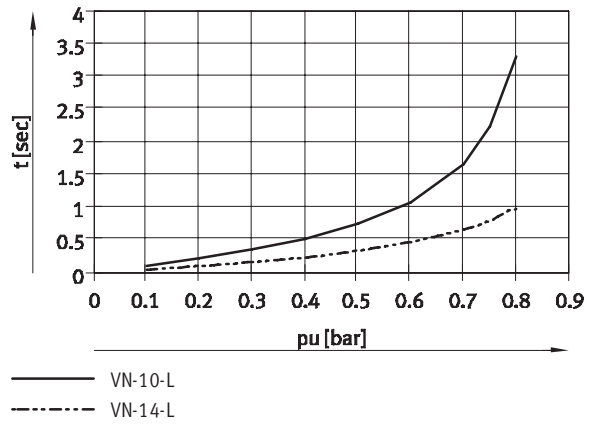
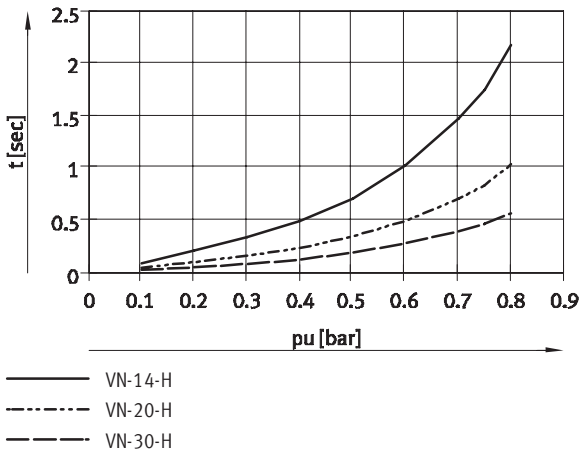
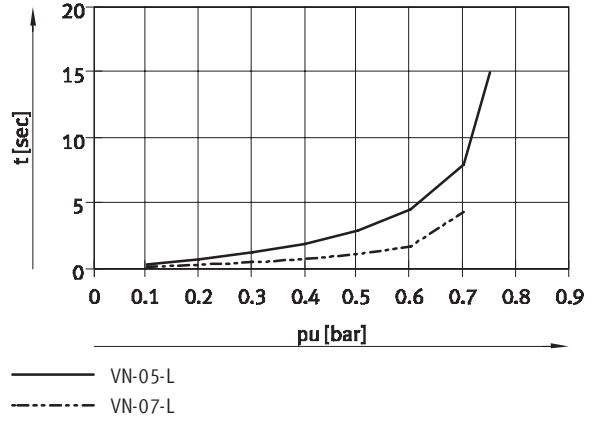
Technical data

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

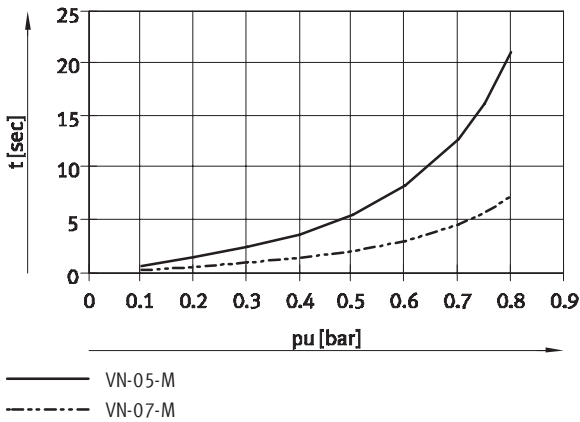
### High vacuum – Standard



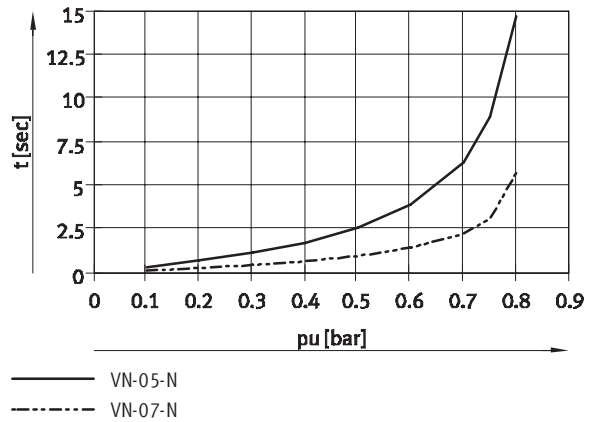
### High suction rate – Standard



### High vacuum – In-line



### High suction rate – In-line

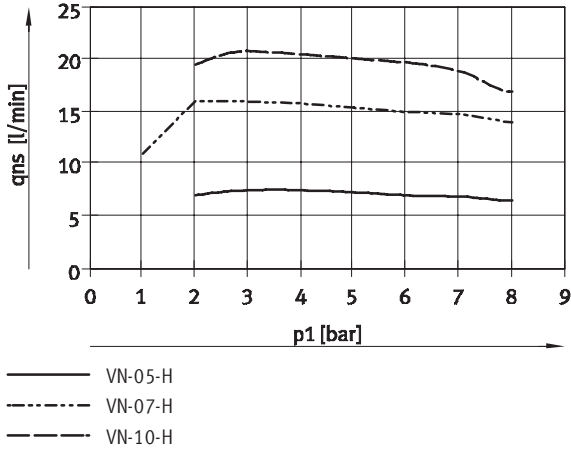


# Vacuum generators VN-A/M/B, with additional functions

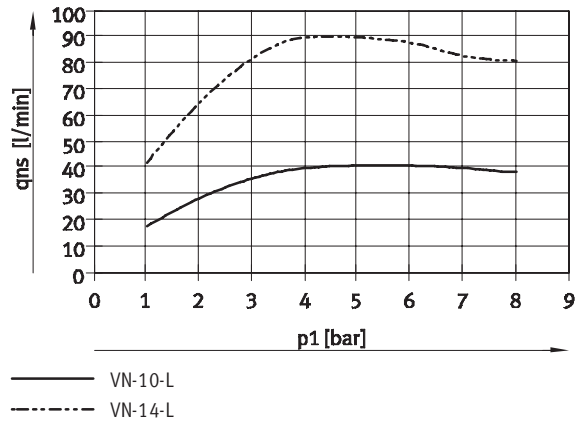
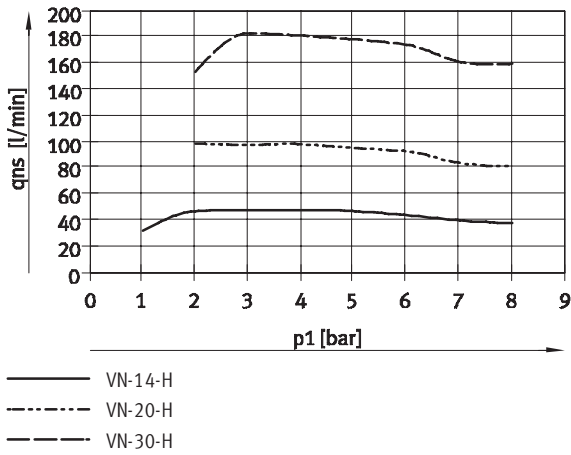
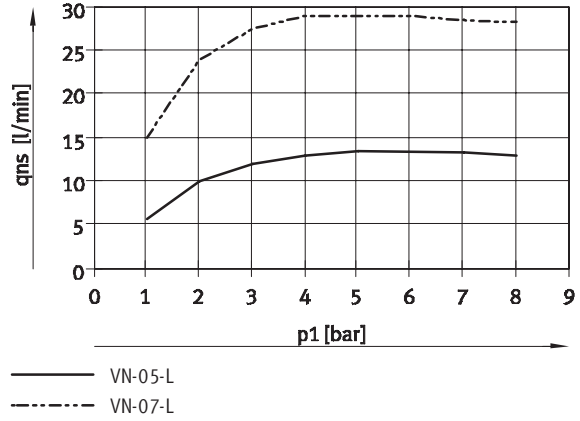
Technical data

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

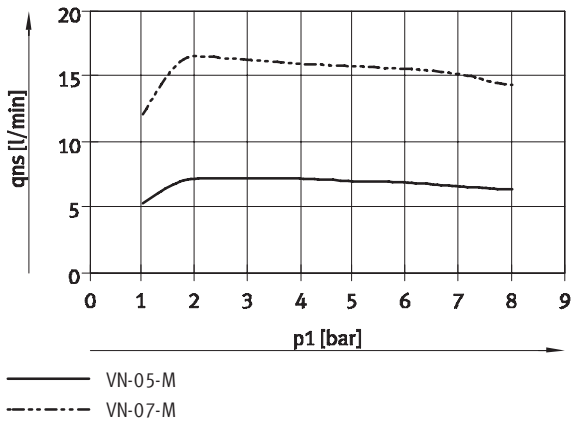
### High vacuum – Standard



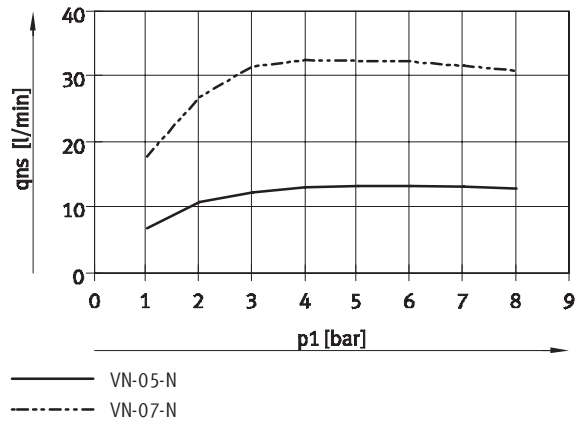
### High suction rate – Standard



### High vacuum – In-line



### High suction rate – In-line



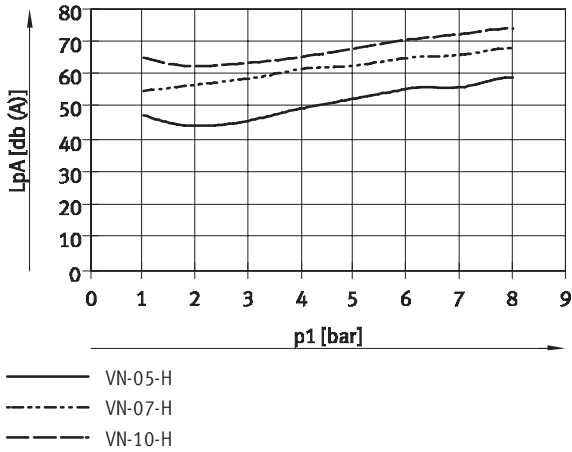
# Vacuum generators VN-A/M/B, with additional functions

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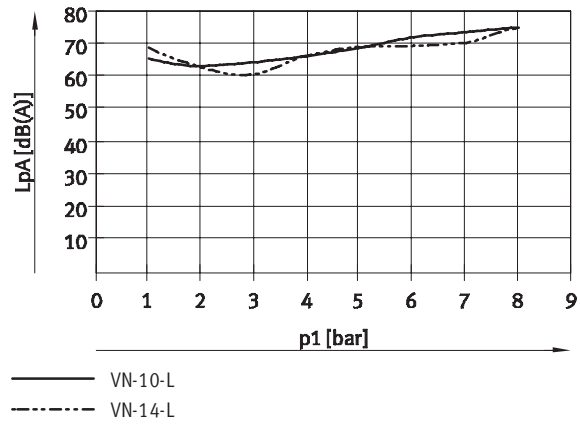
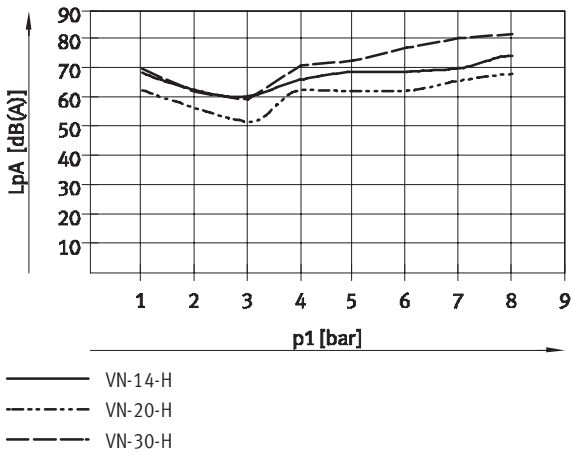
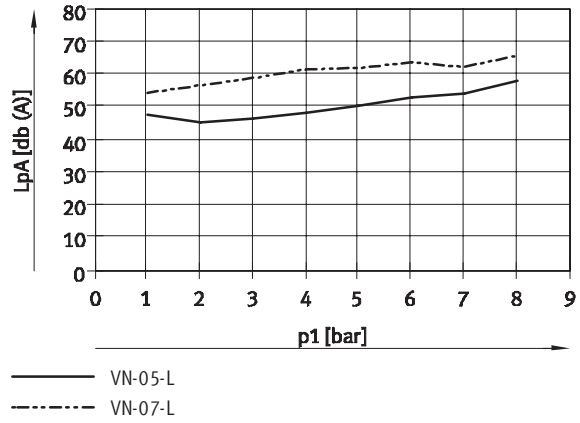
Technical data

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

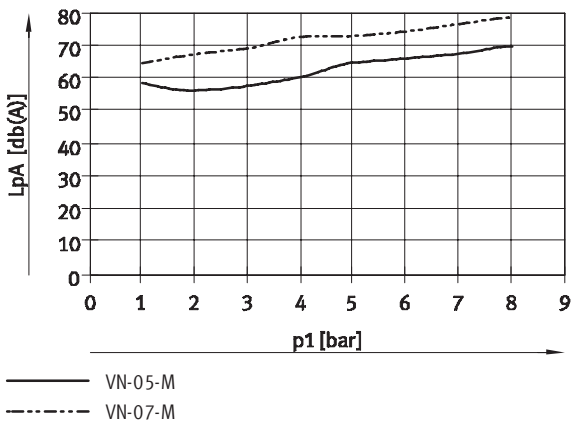
### High vacuum – Standard



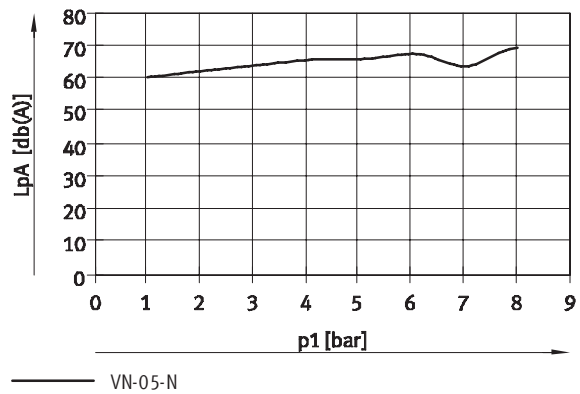
### High suction rate – Standard



### High vacuum – Inline



### High suction rate – Inline

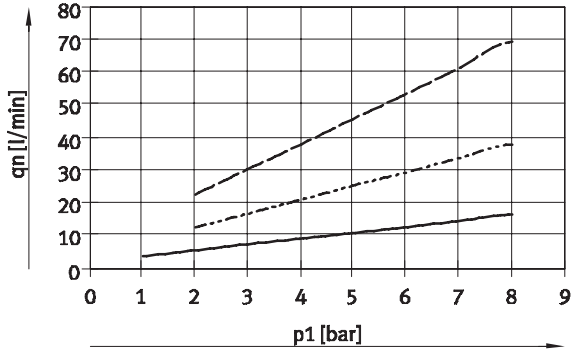


# Vacuum generators VN-A/M/B, with additional functions

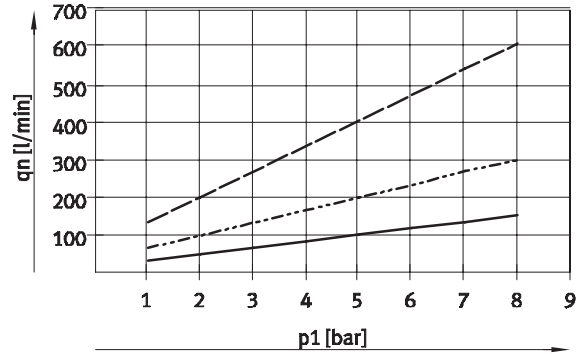
Technical data

## Air consumption $q_n$ as a function of operating pressure $p_1$

High vacuum/high suction rate



- VN-05
- VN-07
- - - - VN-10



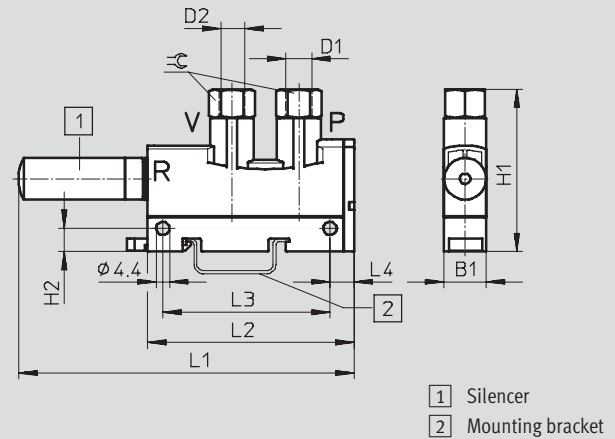
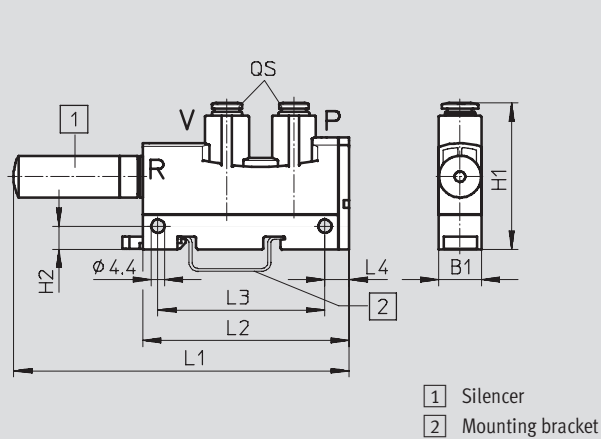
- VN-14
- VN-20
- - - - VN-30

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

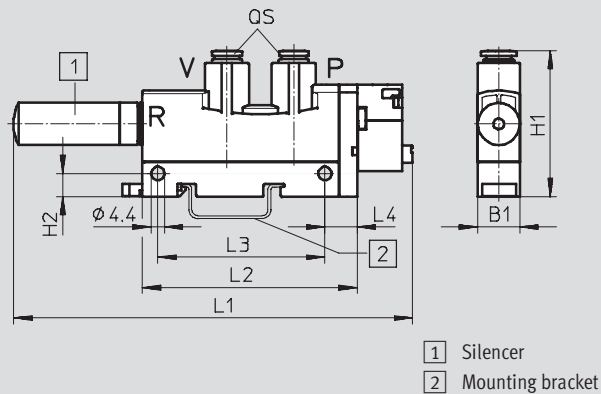
Download CAD data → [www.festo.com](http://www.festo.com)

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

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



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



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

Technical data

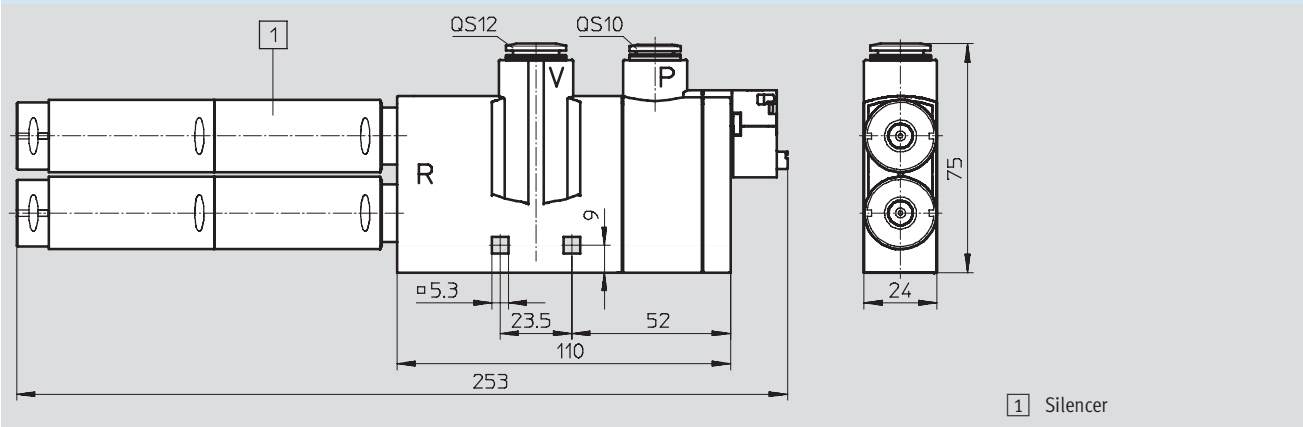
Type	B1	Connections		H1	H2	L1	L2	L3	L4	⌀
		P D1	V D2							
VN-05-...-T3-PQ2-VQ2-RO1-A	14	QS6	QS6	48	7.6	110	68	55	8	-
VN-07-...-T3-PQ2-VQ2-RO1-A						119				
VN-10-...-T3-PQ2-VQ2-RO1-A		110								
VN-05-...-T3-PI4-VI4-RO1-A		G $\frac{1}{8}$	G $\frac{1}{8}$	53		119				
VN-07-...-T3-PI4-VI4-RO1-A										
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		G $\frac{1}{4}$	G $\frac{1}{4}$	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](http://www.festo.com)

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

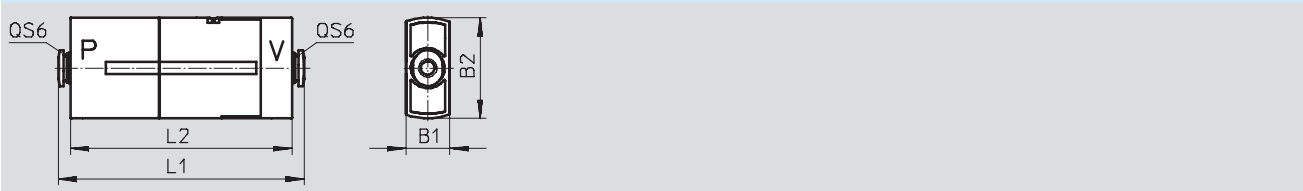


1 Silencer

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

Download CAD data → [www.festo.com](http://www.festo.com)

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

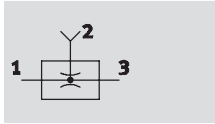
Ordering data and weights – Standard						
T-type						
Nominal diameter [mm]	Weight [g]	High vacuum H		Weight [g]	High suction rate L	
		Part No.	Type		Part No.	Type
With ejector pulse and push-in connector						
0.45	49	532 620	VN-05-H-T3-PQ2-VQ2-R01-A	49	532 621	VN-05-L-T3-PQ2-VQ2-R01-A
0.7	50	532 628	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 <sup>1)</sup>		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 <sup>1)</sup> for 1 l volume, at p <sub>1</sub> = 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

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 <sup>1)</sup> for 1 l volume, at p <sub>1</sub> = 6 bar	[s]	2.04	0.82	0.66	0.31	0.17

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

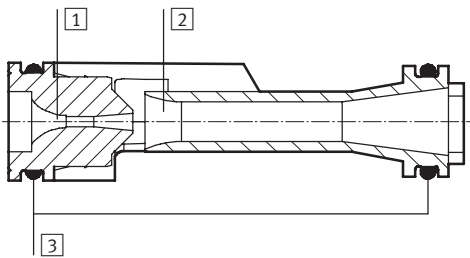
 **Note**

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**

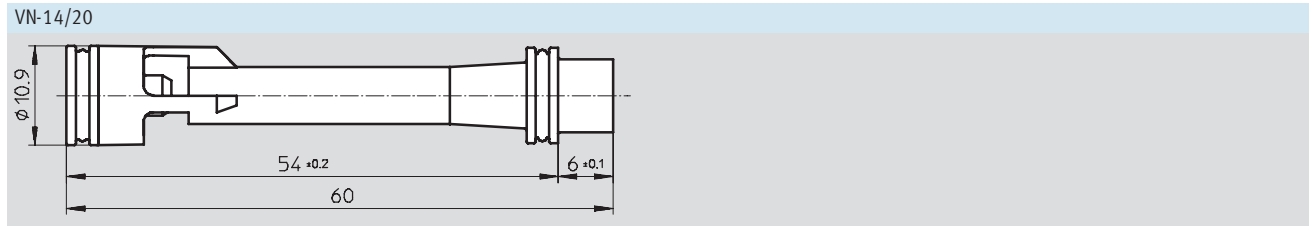
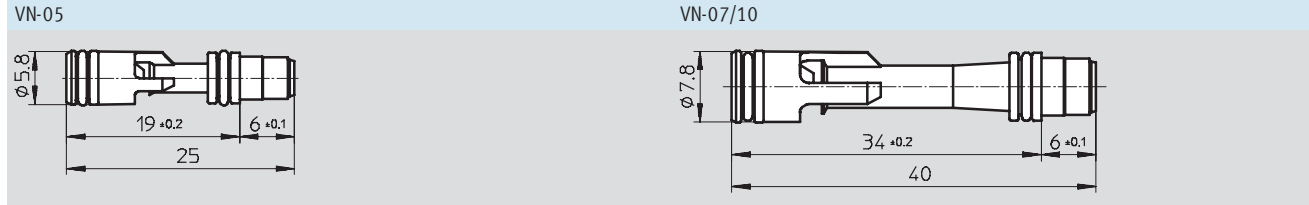
The graphs plotting the technical data for the vacuum generator cartridge are the same as those for the vacuum generator VN-A/B/M.  
 → From page 40.



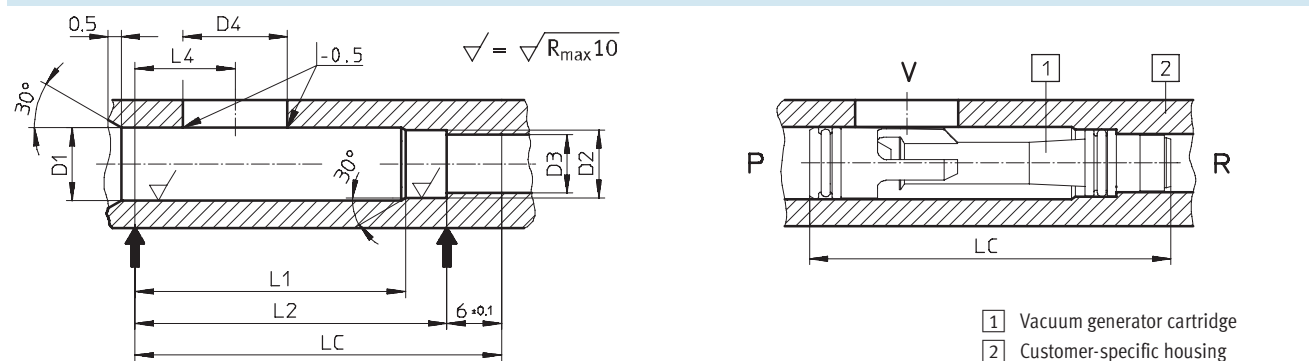
# Vacuum generator cartridges VN

Technical data

**Dimensions** Download CAD data → [www.festo.com](http://www.festo.com)



**Locating hole for the vacuum generator cartridge** Installation of the vacuum generator cartridge



- 1 Vacuum generator cartridge
- 2 Customer-specific housing

Type	Dimensions of the locating hole						Vacuum port		
	D1 <sup>1)</sup> +0.05	D2	D3	L1	L2 ±0.2	LC <sup>2)</sup>	L4 ±0.2	D4 min. Ø <sup>3)</sup>   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 G¼ 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

# Silencers UO

Technical data

FESTO

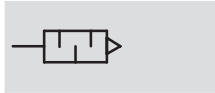
## Silencer UO

for vacuum generators VN-T2/T3

→ 15, 37

- Special minimal resistance silencer
- Facilitates trouble-free operation of the vacuum generator

Function



General technical data			
Size	M7	G1/8	G1/4
Pneumatic connection	M7	G1/8	G1/4
Type of mounting	Threaded connection		
Assembly position	Any		
Product weight [g]	2.5	5	8

Operating and environmental conditions	
Operating pressure of vacuum generator [bar]	0 ... 8
Operating medium	Dried compressed air
Ambient temperature [°C]	-10 ... +60
Corrosion resistance class CRC <sup>1)</sup>	2

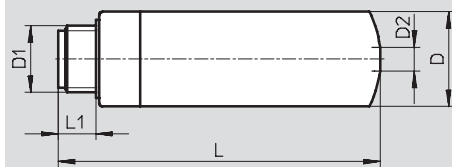
1) Corrosion resistance class 2 according to Festo standard 940 070

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.

Materials	
Silencer insert	Polyethylene
Threaded collar	Polyethylene
Note on materials	Free of copper and PTFE

## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)



Connection	D ∅	D1	D2	L	L1
M7	9.8	M7	3	36.7	5.5
G1/8	13.8	G1/8	3.5	48	6.5
G1/4	17.8	G1/4	5.3	62.3	8.5

Ordering data		
Pneumatic connection	Part No.	Type
M7	197 582	UO-M7
G1/8	197 583	UO-1/8
G1/4	197 584	UO-1/4

## Silencers UOM

Technical data

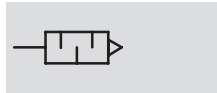
### Silencer UOM

#### Silencer extension UOMS

for vacuum generators VN-T4/T6

→ 15, 37

Function



- Special minimal resistance silencer
- Facilitates trouble-free operation of the vacuum generator
- Silencer extension for extending the silencer for further noise reduction



General technical data				
Type	UOM		UOMS	
Size	G1/4	G3/8	G1/4	G3/8
Pneumatic connection	G1/4	G3/8	-	
Design	Silencer, open			
Type of mounting	Screw-in		Engaging	
Assembly position	Any			
Type of seal on threaded collar	No seal			
Product weight	[g]	11.1	22.7	8.6
			17.5	



Operating and environmental conditions	
Operating pressure of vacuum generator	[bar] 0 ... 8
Operating medium	Compressed air
Ambient temperature	[°C] 0 ... +60
Corrosion resistance class CRC <sup>1)</sup>	2

1) 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.

Materials	
Housing	Polyacetate
Inner piping	Wrought aluminium alloy
Silencer insert	Polyurethane foam
Threaded plug	Polyacetate
Note on materials	Free of copper and PTFE Contains paint-wetting impairment substances

Dimensions		Download CAD data → <a href="http://www.festo.com">www.festo.com</a>
UOM		UOMS

Ordering data						
D	D1	D2	L	L1	L2	Part No. Type
∅		∅				
<b>Silencer</b>						
17.8	G1/4	-	73	8	10	<b>538 432 UOM-1/4</b>  New
23.8	G3/8	-	74	8.6	10.5	<b>538 433 UOM-3/8</b>
<b>Silencer extension</b>						
17.8	-	16	64.5	-	10	<b>538436 UOMS-1/4</b>  New
23.8	-	22	65.2	-	10.5	<b>538 437 UOMS-3/8</b>

## Accessories for vacuum technology

Accessories

**FESTO**

### Mounting plate VN-T...-NRH

for vacuum generator VN

→ 15

for mounting on H-rail or via through-hole

Ambient temperature: 0 ... +60 °C

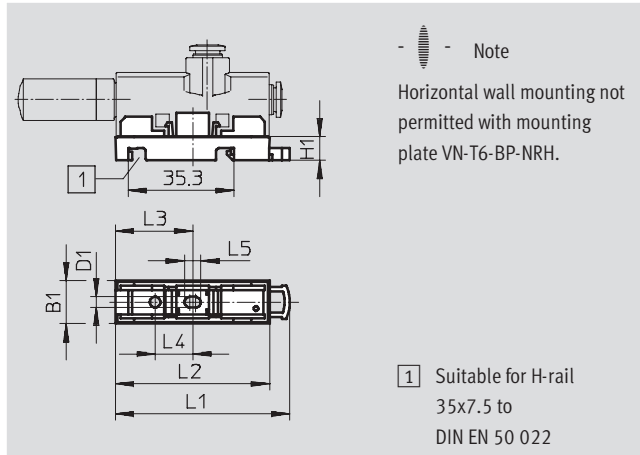
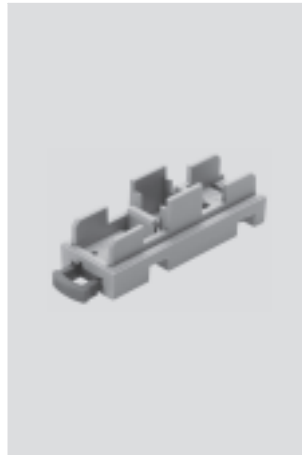
Material:

Plate VN-T2/T3/T4: Polyacetate, reinforced

Plate VN-T6: Polyamide, reinforced

Slide: Polyacetate

Free of copper and PTFE



Dimensions and ordering data													
Width [mm]	B1	D1	H1	L1	L2	L3	L4	L5	CRC <sup>1)</sup>	Weight [g]	Part No.	Type	
10	10.4	3.5	8	56.5	51	25.5	12.5	5.5	2	3.5	<b>196 951</b>	<b>VN-T2-BP-NRH</b>	
14	14.4	3.5	8	57.9	51.2	25.6	12.5	5.5	2	4.5	<b>193 641</b>	<b>VN-T3-BP-NRH</b>	
18	18.4									5.5	<b>195 279</b>	<b>VN-T4-BP-NRH</b>	
24	24	4.3	7.3	98	91	45.5	32.5	6.3	2	12.4	<b>196 956</b>	<b>VN-T6-BP-NRH</b>	New

1) 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.

### Mounting plate VN-T

for vacuum generators VN-A/B/M

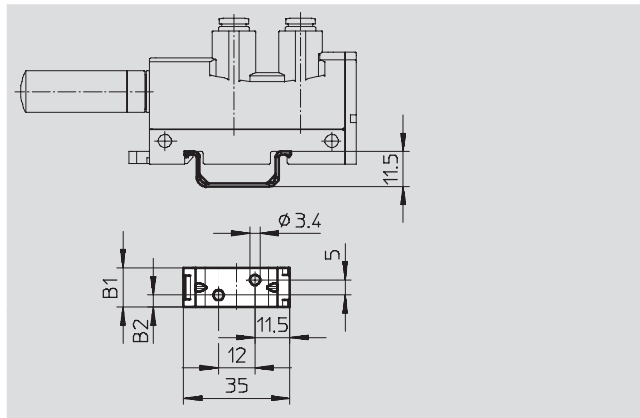
→ 37

For wall mounting with through hole for housing type T3/T4

Material:

Plate: Galvanised steel

Free of copper and PTFE



Note  
Mounting plate VN-T6-NRH must be used with housing type T6.

Dimensions and ordering data						
Width [mm]	B1	B2	CRC <sup>1)</sup>	Weight [g]	Part No.	Type
14	13	4	2	4.8	<b>547 436</b>	<b>VN-T3-BP</b>
18	17	6		6.4	<b>547 437</b>	<b>VN-T4-BP</b>

1) 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.

# Accessories for vacuum technology

Accessories

**Plug socket with cable KMH...**

- Pre-assembled
- Cable lengths 0.5 m, 1 m
- 2-pin plug socket
- Not suitable for chain link trunking



General technical data	
Type	KMH...
Electrical connection	2-pin plug socket
Type of mounting	Clip
Mounting position	Any
Operating voltage [V]	60 DC
Current-carrying capacity [A]	3
Cable diameter [mm]	1.3
Protection class to EN 60 529	IP40
Material of housing	Polyacetal
Material of contacts	Tin-plated bronze
Material of cable sheath	Polyvinyl chloride
Ambient temperature [°C]	-40 ... +105

Ordering data					
	Constructional design [mm <sup>2</sup> ]	Product weight [g]	Cable length (L1) [m]	Type	Part No.
	2x0.14	4	0.5	<b>KMH-0,5</b>	<b>197 263</b>
	2x0.14	7	1	<b>KMH-1</b>	<b>197 264</b>

**Dimensions** Download CAD data → [www.festo.com](http://www.festo.com)

Type KMH...

- 1 Pin 1, core colour black
- 2 Pin 2, core colour blue
- 3 Pin 3, core colour red
- L1 Length according to type (0.5 m, 1 m)

## Accessories for vacuum technology

FESTO

Accessories

### Connecting cable NEBU-M8...

Materials:

Polyurethane



NEBU-M8G3-K-...-LE3



NEBU-M8W3-K-...-LE3

Ordering data – Basic version		Technical data → Internet: nebu		
Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type
Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 333	NEBU-M8G3-K-2.5-LE3
		5	541 334	NEBU-M8G3-K-5-LE3
		10	541 332	NEBU-M8G3-K-10-LE3
Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 338	NEBU-M8W3-K-2.5-LE3
		5	541 341	NEBU-M8W3-K-5-LE3
		10	541 335	NEBU-M8W3-K-10-LE3

## What must be observed when using Festo components?

Specified limit values for technical data and any specific instructions must be adhered to by the user in order to ensure recommended operating conditions.

When pneumatic components are used, the user shall ensure that they are operated using correctly prepared compressed air without aggressive media.

When Festo components are used in safety-oriented applications, the user shall ensure that all applicable

national and local safety laws and regulations, for example the machine directive, together with the relevant references to standards are observed. Unauthorised conversions or modifications to products and systems from Festo involve a safety risk and are thus not permissible.

Festo does not accept any liability for resulting damages.

You should contact Festo's advisors if one of the following apply to your application:

- The ambient conditions and conditions of use or the operating medium differ from the specified technical data.
- The product is to perform a safety function.
- A risk or safety analysis is required.
- You are unsure about the product's suitability for use in the planned application.
- You are unsure about the product's suitability for use in safety-oriented applications.

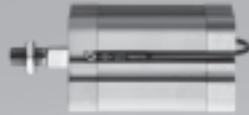
All technical data applies at the time of going to print.

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## Products and services – everything from a single source

Products incorporating new ideas are created when enthusiasm for technology and efficiency come together. Tailor-made service goes without saying when the customer is the focus of attention.



### Pneumatic and electrical drives

- Pneumatic cylinders
- Semi-rotary drives
- Handling modules
- Servopneumatic positioning systems
- Electromechanical drives
- Positioning controllers and controllers



### Valves and valve terminals

- Standard valves
- Universal and application-optimised valves
- Manually and mechanically actuated valves
- Shut-off, pressure control and flow control valves
- Proportional valves
- Safety valves

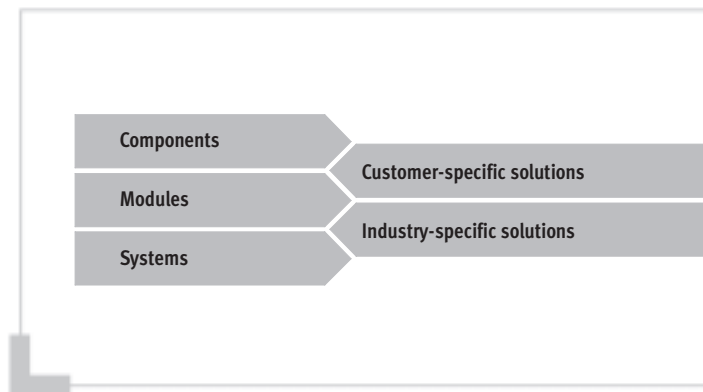
### Fieldbus systems/ electrical peripherals

- Fieldbus Direct
- Installation system CP/CPI
- Modular electrical terminal CPX



### Compressed air preparation

- Service unit combinations
- Filter regulators
- Filters
- Pressure regulators
- Lubricators
- On-off and soft-start valves
- Dryers
- Pressure amplifiers
- Accessories for compressed air preparation



## Services from Festo to increase your productivity – across the entire value creation sequence



### Engineering – for greater speed in the development process

- CAD models
- 14 engineering tools
- Digital catalogue
- FluidDRAW®
- More than 1,000 technical consultants and project engineers worldwide
- Technical hotlines



### Supply chain – for greater speed in the procurement process

- E-commerce and online shop
- Online order tracking
- Euro special manufacturing service
- Logistics optimisation





### Gripping and vacuum technology

- Vacuum generators
- Vacuum grippers
- Vacuum security valves
- Vacuum accessories
- Standard grippers
- Micro grippers
- Precision grippers
- Heavy-duty grippers



### Sensors and monitoring units

- Proximity sensors
- Pressure and flow sensors
- Display and operating units
- Inductive and optical proximity sensors
- Displacement encoders for positioning cylinders
- Optical orientation detection and quality inspection



### Controllers/bus systems

- Pneumatic and electropneumatic controllers
- Programmable logic controllers
- Fieldbus systems and accessories
- Timers/counters
- Software for visualisation and data acquisition
- Display and operating units



### Accessories

- Pipes
- Tubing
- Pipe connectors and fittings
- Electrical connection technology
- Silencers
- Reservoirs
- Air guns

### All in all, 100% product and service quality

A customer-oriented range with unlimited flexibility: Components combine to produce ready-to-install modules and systems. Included in this are special designs – since at Festo, most industry-specific products and customer-specific solutions are based on the 23,000 plus catalogue products. Combined with the services for the entire value creation sequence, the end result is unbeatable economy.



### Assembly – for greater speed in the assembly/commissioning process

- Prepack
- Preassembly
- Turnkey pneumatics
- Handling solutions



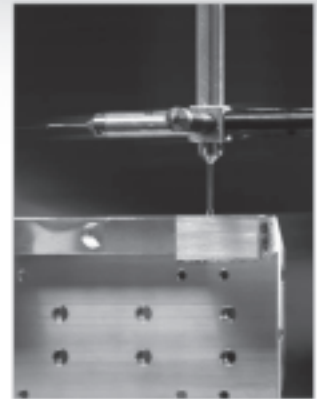
### Operation – for greater speed in the operational process

- Spare parts service
- Energy saving service
- Compressed air consumption analysis
- Compressed air quality analysis
- Customer service

## Aspects of quality

Quality can be viewed from a number of aspects. A short virtual tour of the Research and Development department, the Production department or the Customer Service Centre speaks more than a thousand words.

3D engineering and simulation



### Innovation quality

Let's look at some of the figures:

- 6.5% of turnover
- 2,800 patents with 100 new applications every year
- 3D engineering and simulation
- 10,600 employees worldwide
- Each and every one of them a lateral thinker

### Production quality

Your interest is quality and economy – therefore we place considerable value on:

- Minimum production tolerances
- Ultra-modern, proprietary production methods
- Core competencies in production
- Defined quality standards across the entire production chain
- Strict quality assurance systems: on that you can depend.



#### Price quality

**More service for less money.** Many of the new and further developments in the Festo product range have one thing in common: they are technically superior and more attractively priced than their predecessor product. Examples are to be found in all product segments: among the drives, valves, valve terminals; among the service units, and among the range of accessories.



#### Range quality

**For individual solutions.** Festo offers components as industry-specific catalogue products as well as standards-based and highly individual special designs. Ready-to-install combinations of these components play an integral part in the Festo product portfolio as modules or systems. Incidentally, an increasing number of components can be individually configured as modular products.



#### Didactic quality

**To complement the products and services for automation,** Festo Didactic offers exceptionally efficient training hardware, learning software and seminars of the highest quality. Optimally tailored to your value creation sequence. In short – training in practical applications for practical application.