



Vacuum pumps202, 204 & 206
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VMAA Series Smart Pump®

Dual module vacuum generator

VMAA-M200-25321, 35321, 45321

- High vacuum flow
- Low air consumption
- Wide operating pressure range
- Modular construction provides application flexibility
- Reduced installation, and maintenance
- Intuitive programming interface available on 45321/45311
- Automatic blow-off function available on 45321/45311
- Air conservation

Technical data

Medium:
Lubricated or non-lubricated air filtered to 40 micron

Vacuum level range:
0 to 86 kPa
Maximum vacuum level attained at 5 bar

Vacuum flow:
425 l/m @ 5 bar

Response time:
(at sea level)
Evacuates 28 litres to 50,8 -kPa in 3,3 seconds at 6 bar)

Supply pressure:
Minimum 2,4 bar
Maximum 6,9 bar

Supply requirements:
280 l/m @ 5 bar

Vacuum filter:
180 micron

Operating temperature:
0 to 50°C

Consult our Technical Service for use below +2°C

Air consumption:
444 l/m @ 4 bar
534 l/m @ 5 bar
630 l/m @ 6 bar

Mounting:
Integral bracket provided for preferred vertical mounting

Electrical connections:
5 pin M12, male, single key micro connector

Pneumatic connections:
(1) Vacuum port: 3/4 NPT or ISO 'G'
(1) Pressure inlet: 3/8 NPT or ISO 'G'
(1) Gauge port: 1/8 NPT

Sound level:
82 dBA

Materials

Body: aluminum and zinc die-casting
Jet housing: polycarbonate
Seals: Viton®, polyurethane, Buna-N
Weatherproofing: NEMA 4X, IP66:



Options selector

VMAA-M200-★★★★★

Product series
Single channel, modular vacuum generator

Size/flow of pump
M200 = 2 jet module

Variants	Substitute
Solenoid controlled vacuum and blow-off	253
Solenoid controlled vacuum and blow-off	353
w/4-20 mA sensor feedback output	
Fully programmable digital unit	453

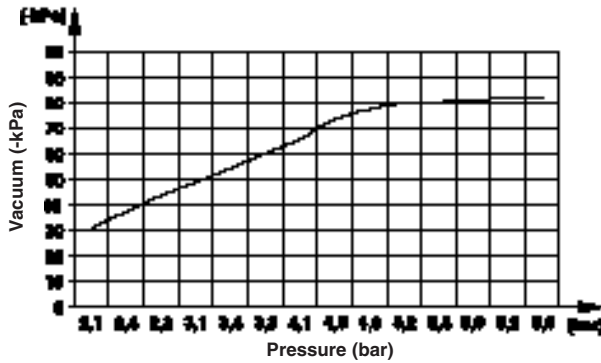
Ports	Substitute
NPT threaded ports	21
ISO G threaded ports	11

VMAA Series Smart Pump®

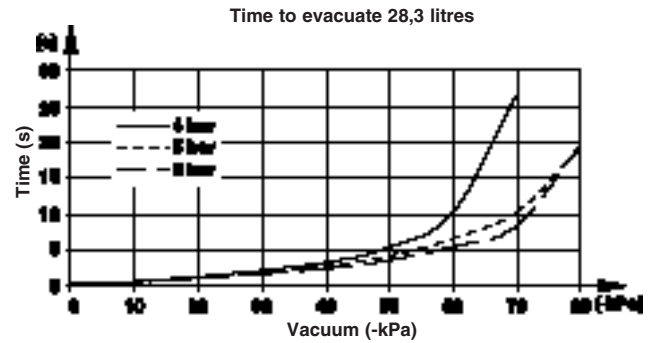
Dual module vacuum generator
VMAA-M200-25321, 35321, 45321

Performance data

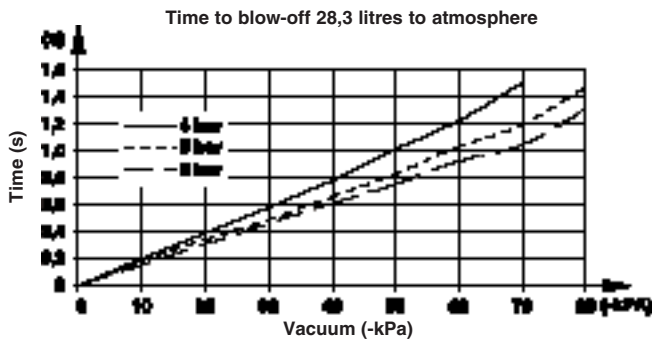
VMAA-M200-353★★



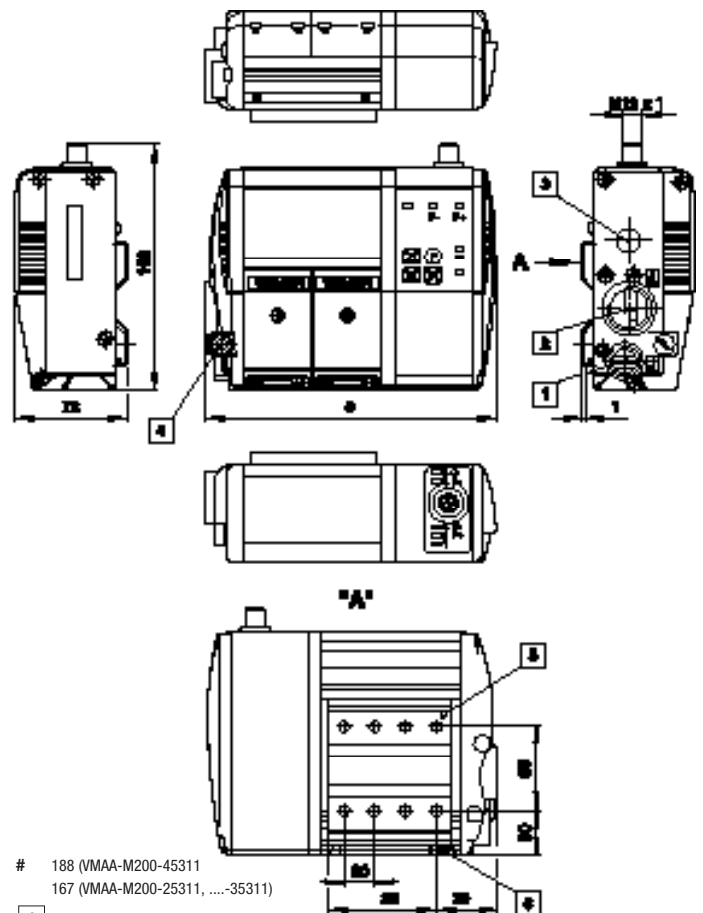
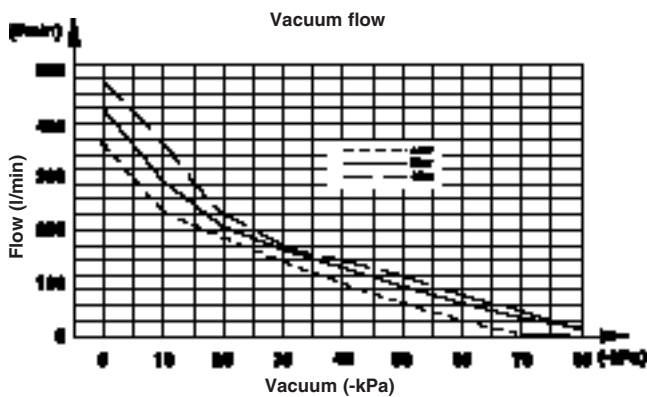
VMAA-M200-353★★



VMAA-M200-353★★



VMAA-M200-353★★

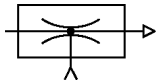


188 (VMAA-M200-45311)
167 (VMAA-M200-25311,-35311)

- 1 Supply port (P+) G 3/8 or 3/8 NPT
- 2 Vacuum port (P-) G 3/4 or 3/4 NPT
- 3 Exhaust
- 4 Vacuum gauge 1/8 NPT
- 5 Mounting bracket
- 6 Locking screw

Single stage vacuum pumps

M/58112



- Very high induced air capacity
- 14% lower air consumption than comparable single stage units
- No wearing parts
- Compatible with a wide range of vacuum line contaminants
- Allows direct connection of suction cups and piped exhaust facility

Technical data

Medium:
Compressed air, filtered and non-lubricated

Operating pressure:
5 bar optimum
8 bar maximum

Operating temperature:
-20° to +150°C

Consult our Technical Service for use below +2°C

Vacuum:
-0,85 bar maximum (M/58112/09)
-0,90 bar maximum (M/58112/11)

Weight:
0,054 kg (M/58112/09)
0,157 kg (M/58112/11)

Sound level:
66/74 dB (A) vacuum port closed/open (M/58112/09)
71/82 dB (A) vacuum port closed/open (M/58112/11)

Materials

Housing: anodised aluminium
Nozzles: brass

Induced air (NI/min), free air

Model	0 bar	- 0,1 bar	- 0,2 bar	- 0,3 bar	- 0,4 bar	- 0,5 bar	- 0,6 bar	- 0,7 bar	- 0,8 bar
M/58112/09	28	24	18	14	11	8	5,5	3	1
M/58112/11	55	47	36	28	23	17	12	6	2,5

Time (sec) for evacuation of 1 litre volume to vacuum

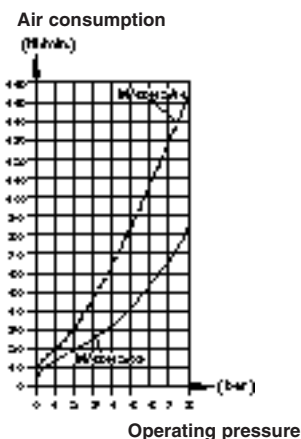
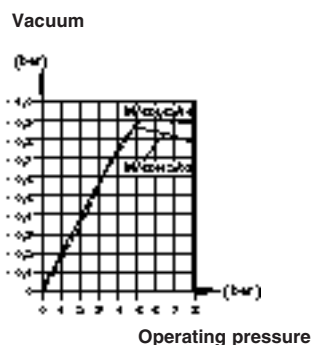
Model	- 0,1 bar	- 0,2 bar	- 0,3 bar	- 0,4 bar	- 0,5 bar	- 0,6 bar	- 0,7 bar	- 0,8 bar	-0,85 bar	-0,9 bar
M/58112/09	0,27	0,56	0,89	1,44	2,00	2,88	4,31	7,97	14,36	-
M/58112/11	0,15	0,31	0,49	0,72	1,00	1,41	2,08	3,71	5,60	8,11

Note: Values given in the tables are theoretical and apply to an operating pressure of 5 bar.

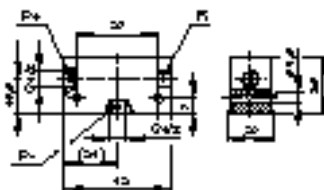
Recommended tube dimensions (internal diameter)

Model	Compressed air	Vacuum	Exhaust
M/58112/09	> Ø 3	> Ø 5	> Ø 6
M/58112/11	> Ø 3	> Ø 7	> Ø 9

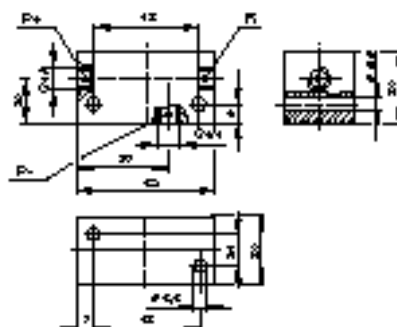
Operating characteristics



M/58112/09



M/58112/11





Pressure sensor technology

Norgren leads the international market in pressure sensor with a comprehensive range of electronic and electrical products for the most demanding conditions, covering both high technology and everyday applications.

Pneumatics/vacuum/allfluid

Comprehensive range of pressure sensors.

Superior design for greater reliability

Wide choice of sensors.

Advanced pressure monitoring.

- Specialist solutions to customer requirements
- Monitoring vacuum to 800 bar
- Neutral and aggressive measuring fluids
- Electro-mechanical and electronic signal processing

18D

Standard switch for series application
Compact design
Competitive price
Microswitch with gold plated contacts
Fluid connection in thread and flange available
Accuracy $\pm 3\%$
ATEX approval

18S - Allfluid

Allfluid analogue sensor
Slim and robust stainless steel sensor for all kinds of industrial applications and working fluids up to 800 bar.
Versions with 4 ... 20 mA or 0 ... 10 V output signal are available

18S - Pneumatics

Temperature compensated
Vacuum and overpressure
Robust design for pneumatic and industrial applications
Electronic pressure sensors are components which are usually positioned next to the point of measurement. The fluidic signal is converted into a standard pressure proportional analogue output signal of 4 ... 20 mA by means of a piezo-resistant sensor and an electronic circuit, which amplifies, linearises and temperature compensates the signal

33D

Display of system pressure and unit (pressure unit programmable)
Compact and robust design
Easy programming of set points and additional functions
Transistor output signals 1 x PNP/2 x PNP/1 x PNP + 4 to 20 mA
Electronic lock
Switching status indicated by LED
Standard M12x1 electrical connection (IP 65)
For pneumatic, all fluid and hydraulic applications

20D

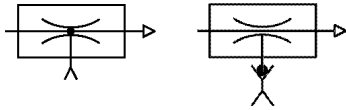
Gold-plated contacts
Weatherproof (silver-plated contacts)
For pneumatic, allfluid and hydraulic applications
ATEX approval

40D

Space saving design
Easy programming of set points
Design with display
Special functions selectable
Analogue (1 to 5V) and digital outputs, as NO/NC programmable
Revolving display

Multi stage vacuum pumps

M/58102



- Fast response
- Compact, lightweight
- Low sound level
- Compressed air driven
- Simple installation
- Standard and non-return valve types

Technical data

Medium:
Compressed air, filtered and non-lubricated

Operation:
Multi ejector system

Operating pressure:
6 bar maximum

Operating temperature:
-20°C to +80°C for M/58102/10 to M/58102/30
-20°C to +60°C for M/58102/60 to M/58102/120

Consult our Technical Service for use below +2°C

Vacuum:
-0,87 bar maximum

Materials

- M/58102/10 to M/58102/30
ABS vacuum chips with 30% glass filling
- Sub-base: aluminium
- Seals: nitrile rubber
- M/58102/60 to M/58102/120
Case: aluminium
- End caps: ABS
- Mountings: steel
- Seals: nitrile rubber or polyurethane

Model	Type	Silencer**	Induced air (NI/min)*	Air consumption (NI/min)*	kg
M/58102/10	Standard	Ported	80	49	0,080
M/58102/20	Standard	Ported	160	98	0,095
M/58102/30	Standard	Ported	240	144	0,110
M/58102/60	Standard	Integral	480	285	0,855
M/58102/90	Standard	Integral	708	471	1,105
M/58102/120	Standard	Integral	910	528	1,150
M/58102/N/10	Non-return valve	Ported	80	49	0,080
M/58102/N/20	Non-return valve	Ported	160	98	0,095
M/58102/N/30	Non-return valve	Ported	240	144	0,110
M/58102/N/60	Non-return valve	Integral	480	285	0,855
M/58102/N/90	Non-return valve	Integral	708	471	1,105
M/58102/N/120	Non-return valve	Integral	910	528	1,150

*Values given are theoretical and apply to an operating pressure of 6 bar.

**For models with ported silencer, use silencer number M/58019, for model with integral silencer use gauge M/58080

Characteristics

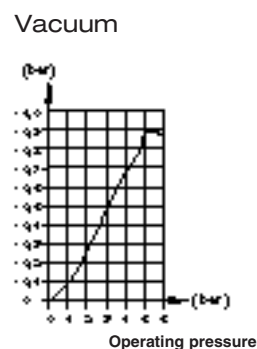
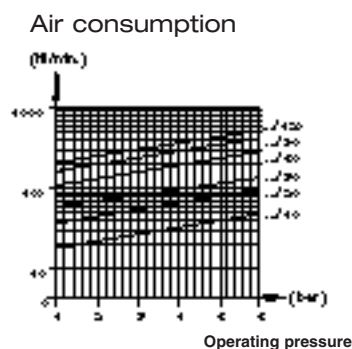
Induced air (NI/min), free air

Model	0 bar	-0,1 bar	-0,2 bar	-0,3 bar	-0,4 bar	-0,5 bar	-0,6 bar	-0,7 bar	-0,8 bar
M/58102/10	80	55	32	28	25	18	13	5	1,5
M/58102/20	160	110	64	56	50	36	26	10	3
M/58102/30	240	165	96	84	75	54	39	15	4,5
M/58102/60	480	270	182	168	150	108	78	30	9
M/58102/90	708	427	273	252	225	162	117	45	13,5
M/58102/120	910	568	355	336	300	216	156	60	18

Time (sec) for evacuation of 1 litre volume to vacuum

Model	-0,1 bar	-0,2 bar	-0,3 bar	-0,4 bar	-0,5 bar	-0,6 bar	-0,7 bar	-0,8 bar	-0,85 bar
M/58102/10	0,070	0,200	0,450	0,750	1,150	1,730	2,610	4,130	5,820
M/58102/20	0,035	0,100	0,230	0,370	0,570	0,860	1,320	2,070	2,920
M/58102/30	0,023	0,070	0,150	0,250	0,380	0,580	0,870	1,380	1,940
M/58102/60	0,012	0,034	0,080	0,120	0,190	0,290	0,440	0,690	0,970
M/58102/90	0,007	0,023	0,050	0,080	0,130	0,190	0,290	0,460	0,650
M/58102/120	0,006	0,017	0,040	0,060	0,100	0,150	0,220	0,350	0,490

Note: Values given in the tables are theoretical and apply to an operating pressure of 6 bar.



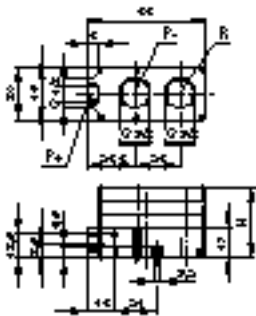
Multi stage vacuum pumps

M/58102

Recommended tube dimensions (internal diameter)

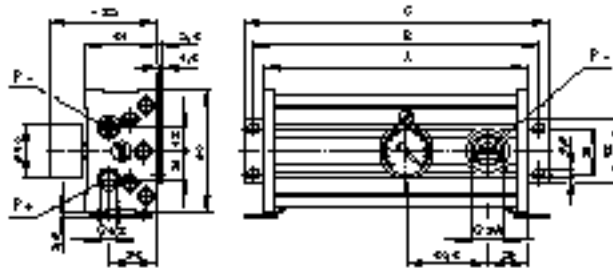
Model	Compressed air	Vacuum	Exhaust
M/58102/10	> Ø 3	> Ø 7	> Ø 9
M/58102/20	> Ø 3	> Ø 7	> Ø 9
M/58102/30	> Ø 4	> Ø 9	> Ø 9
M/58102/60	> Ø 4	> Ø 19	-
M/58102/90	> Ø 5	> Ø 19	-
M/58102/120	> Ø 5	> Ø 22	-

M/58102/10, M/58102/20, M/58102/30
M/58102/N/10, M/58102/N/20, M/58102/N/30



	H
M/58102/10	24,5
M/58102/20	32
M/58102/30	39,5

M/58102/60, M/58102/90, M/58102/120
M/58102/N/60, M/58102/N/90, M/58102/N/120



	A	B	C
M/58102/60	136	154	168
M/58102/90	196	214	228
M/58102/120	196	214	228

Suction cups

M/58300

Ø 6 to 150 mm



Wide variety of cup sizes

Choice of cup designs and material type

Flat cups ideal where minimal movement is required for pliable materials

Bellows cups ideal where level compensation is required

Technical data

Medium:

Vacuum

Operating temperature:

-10°C to +70°C for nitrile rubber cups

-30°C to +200°C for silicone cups

Consult our Technical Service for use below +2°C

Materials

M/58000/01

Cups: nitrile rubber

Connection fittings: aluminium

M/58000/02

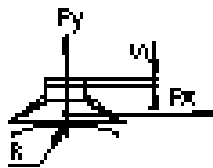
Cups: silicone

Connection fittings: aluminium

Model	Ø mm	F _y (N)			R (mm)	S (mm)	V (cm ³)	kg
		-0,2 bar	-0,6 bar	-0,9 bar				
M/58301/*	6	0,5	1,5	2,3	5	1,5	0,017	0,001
M/58302/*	8	1	2,5	3,5	7	1,5	0,041	0,001
M/58303/*	10	1,5	4	6	9	2	0,065	0,001
M/58304/*	15	2,7	8	12	12	4	0,330	0,001
M/58305/*	20	5	15,5	23	13	2	0,500	0,008
M/58306/*	25	9	26,5	40	17,5	2,5	0,750	0,010
M/58307/*	30	11	34	51	26	2,5	1,3	0,012
M/58308/*	40	19	57,5	86	37	3,5	3	0,011
M/58309/*	50	30	91	135	41	4	4,2	0,016
M/58310/*	80	86	260	390	100	6	21	0,058
M/58311/*	120	180	540	810	365	6	82	0,359
M/58312/*	150	280	842	1250	380	9	177	0,59
Bellows								
M/58403/*	10	1,5	3,5	5	3	4	0,225	0,003
M/58404/*	15	3	6	8	5	6	0,750	0,004
M/58405/*	20	6	10	14	8	5	1,40	0,005
M/58407/*	30	12	22	28	15	12	4,75	0,013
M/58408/*	40	22	40	50	30	10	9,25	0,017
M/58409/*	50	34	66	84	40	15	26,25	0,026
M/58410/*	75	75	170	230	70	14	76	0,075
M/58411/*	110	140	350	460	85	36	111	0,386
M/58412/*	150	300	700	900	250	38	260	0,918

*Insert material code. nitrile: 01, silicone: 02

Note: Theoretical values are given in this table. Always allow a safety factor of > 2.



$$F_x = \mu \times F_y$$

where μ is the frictional coefficient of the material being handled.

An approximate guide:

Plastic $\mu = 0,4$ to $0,5$

Steel, oiled $\mu = 0,1$ to $0,3$

Glass $\mu = 0,3$ to $0,5$

Material characteristics

	Nitrile rubber	Silicone
Wear resistance	Good	Fair
Oil resistance	Excellent	Fair
Weather resistance	Good	Excellent
Ozone resistance	Fair	Excellent

Suction cups

M/58300

Ø 6 to 150 mm

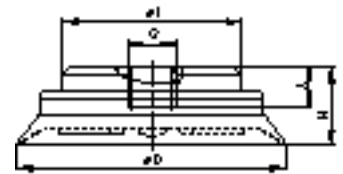
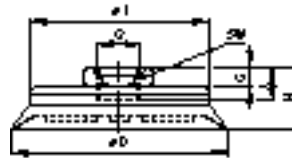
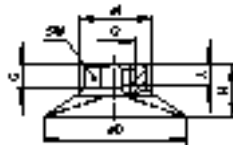
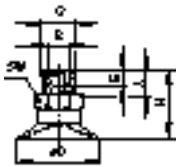
Flat cups

Ø 6 ... 30

Ø 40 & 50

Ø 80

Ø 120 & 150



Model	Ø D	A	B	C	E	G	H	Ø I	SW (A/F)
M/58301	6	4,5	-	-	-	M 5	15	-	8
M/58302	8	4,5	-	-	-	M 5	16	-	8
M/58303	10	4,5	-	-	-	M 5	20	-	8
M/58304	15	4,5	-	-	-	M 5	21	-	8
M/58305	20	8	M5	-	7	G1/8 A	19,5	-	14
M/58306	25	8	M5	-	7	G1/8 A	20	-	14
M/58307	30	8	M5	-	7	G1/8 A	20,5	-	14
M/58308	40	6	-	9	-	G1/8	23	24	14
M/58309	50	6	-	11	-	G1/8	26	26	14
M/58310	80	13	-	3,5	-	G1/8	21,5	53	19
M/58311	120	9,5	-	-	-	G1/2	34,5	65	-
M/58312	150	9,5	-	-	-	G1/2	41,5	65	-

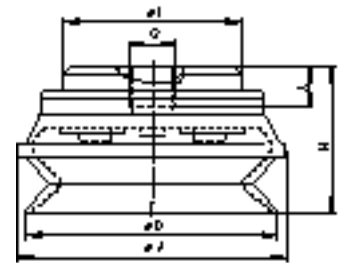
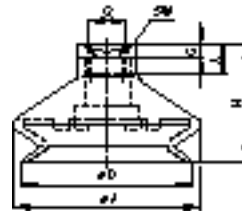
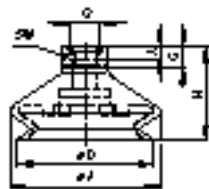
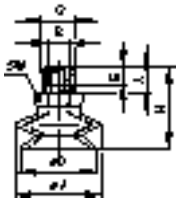
Bellows cups

Ø 10 ... 30

Ø 40 & 50

Ø 75

Ø 110 & 150



Model	Ø	A	B	C	Ø D	E	G	H	Ø I	Ø J	SW (A/F)
M/58403	10	5	-	-	11	-	M 5	26	-	12	7
M/58404	15	5	-	-	16	-	M 5	29	-	17	7
M/58405	20	7,5	M5	-	22	7	G1/8 A	30,5	-	24	14
M/58407	30	7,5	M5	-	33	7	G1/8 A	39	-	36	17
M/58408	40	6	-	9	43	-	G1/8	37	-	46	17
M/58409	50	6	-	9	53	-	G1/8	43	-	59	17
M/58410	75	12	-	4	78	-	G1/8	50	-	83	21
M/58411	110	9,5	-	-	110	-	G1/2	66,5	65	122	-
M/58412	150	9,5	-	-	150	-	G1/2	85,5	65	167	-

Vacuum switches

M/58028/VB, .../VF (Pneumatic)

M/58027/VAP/P, .../VAN/P (Electronic)

M/58024/VB, .../VF (Electrical)



Quick easy installation.

Converts vacuum signal into pneumatic, electronic or electrical output

Fully adjustable switching points

Digital and analogue output on electronic type

Technical data

Medium:

Vacuum (M/58027, M/58024)
Compressed air filtered and non-lubricated (M/58028/VB, M/58028/VF)
See individual technical details

Materials

Pneumatic

Body: polyacetal

Electronic

Housing: zinc

End caps: polycarbonate

Electrical

Body: zinc plated

Diaphragm: silicone

Technical data (pneumatic)

Operation:

M/58028/VB Normally open

M/58028/VF Normally closed

Operating pressure:

2 to 6 bar (pressure valve)

Adjustment :

-0,3 to -0,85 bar

Operating temperature:

-10°C to +80°C

Consult our Technical Service for use below +2°C

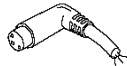
Tube:

Ø 4 mm

Model	Type	Function	kg
M/58028/VB	Pneumatic	Normally open	0,032
M/58028/VF	Pneumatic	Normally closed	0,032
M/58027/VAN/P	Electronic	NPN + LED	0,028
M/58027/VAP/P	Electronic	PNP + LED	0,028
M/58024/VB	Electrical	Normally open	0,090
M/58024/VF	Electrical	Normally closed	0,090

Accessories for electronic switch

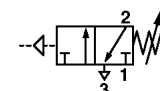
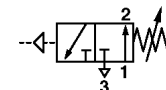
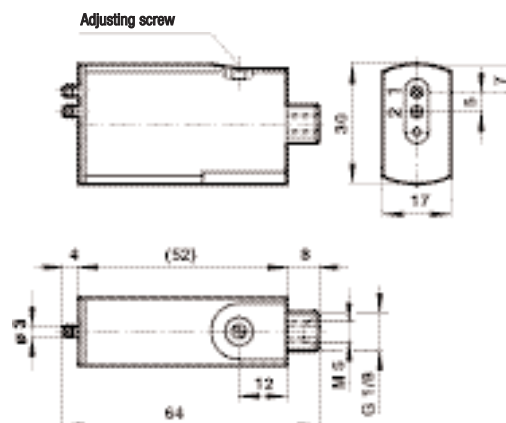
Plug in cable



M/P72014/5

5 m cable length.

M/58028/VB, M/58028/VF



Vacuum switches

M/58028/VB, .../VF (Pneumatic)

M/58027/VAP/P, .../VAN/P (Electronic)

M/58024/VB, .../VF (Electrical)

Technical data (electronic)

Operation:

M/58027/VAP/P PNP with LED

M/58027/VAN/P NPN with LED

Supply voltage (U_b):

10,8 to 30 V d.c.

(reverse polarity protection)

Switching voltage:

(U_b) -0,7 V

Quiescent current consumption:

25 mA

Digital output:

Normally open, 125 mA max.

Switching point:

Adjustable between 0 and -1 bar

Analogue output (0 to -1 bar):

1 to 5V d.c. ($\pm 0,004V$)

Response time:

< 5 ms

Protection rating:

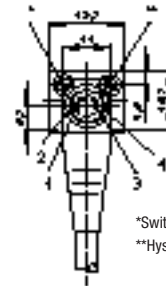
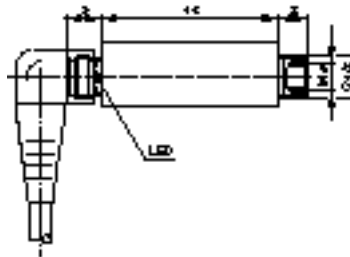
IP 65 (DIN40050) when fitted with connector

Operating temperature:

+50°C max.

Consult our Technical Service for use below +2°C

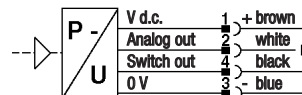
M/58027/VAN/P, M/58027/VAP/P



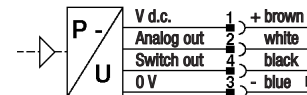
*Switching point trimmer S

**Hysteresis setting trimmer H

M/58027/VAN/P



M/58027/VAP/P



Technical data (electrical)

Operation:

M/58024/VB Normally open

M/58024/VF Normally closed

Switching voltage:

250 V d.c./a.c.

Switching current:

2 A max.

Adjustment:

-0,2 to -1 bar

Repeatability:

$\pm 0,1$ bar

Differential reset pressure:

Up to 0,2 bar

Switching frequency:

200/min.

Protection rating:

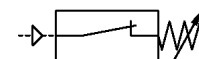
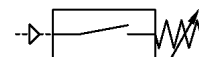
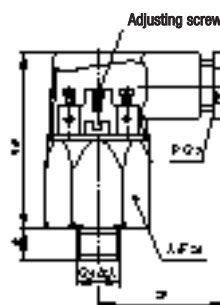
IP 55 (DIN40050)

Operating temperature:

-20°C to +80°C

Consult our Technical Service for use below +2°C

M/58024/VB, M/58024/VF



Additional products



Olympian Plus and ported vacuum filters

Idea for removing dirt, dust and free moisture from vacuum systems
G $\frac{1}{4}$ to G $\frac{1}{2}$ port sizes

Size	Bowl	Model
G $\frac{1}{4}$	Transparent	F73G-2GN-ET2
G $\frac{1}{4}$	Metal	F73G-2GN-ED2
G $\frac{3}{8}$	Transparent	F73G-3GN-ET2
G $\frac{3}{8}$	Metal	F73G-3GN-ED2
G $\frac{1}{2}$	Metal	F74G-4GN-ED2
G $\frac{3}{4}$	Metal	F17-600-M3HD
G1	Metal	F17-800-M3HD
G $\frac{1}{4}$	Metal	F68G-AGN-EC2
G $\frac{1}{2}$	Metal	F68G-BGN-EC2

25 μ m element units, ideal for the general protection of vacuum systems. Replacement 25 μ m or 5 μ m elements and mounting brackets available.

Flexible connectors for suction cups



For use where a vertical offset motion is involved on curved surfaces
Simple to install

Model	Type	Size
M/58001	Flexible connector	G $\frac{1}{8}$
M/58002	Flexible connector	G $\frac{1}{2}$

Level compensators for suction cups



Allows for variations in product positioning
For use with uneven product forms

Model	Type	Size
M/58007	Level compensator	M5
M/58008	Level compensator	G $\frac{1}{8}$
M/58009	Level compensator	G $\frac{1}{2}$

Vacuum gauges



0 to -1 bar calibration
Accurate vacuum level indication

Range	Model
0 ... -1 bar	M/58080

Silencers



Compact
Optimum air silencing characteristics

Range	Model
G $\frac{3}{8}$	M/58019