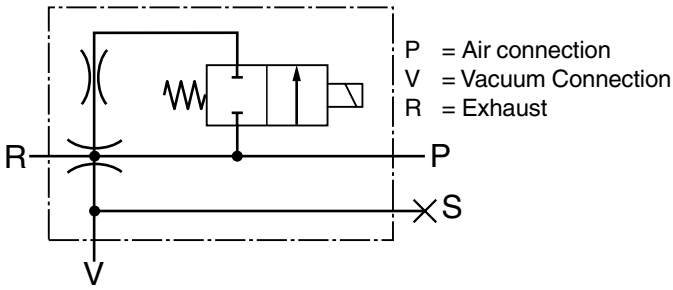
BOOSTER RELEASE Ejectors

- >80 % Vacuum at 5 bar
- Extremely compact
- Reactive
- Solenoid valve for the Booster Effect. Flow 15 Nl/min transformed to 110 Nl/min (BRE 25) and 38 Nl/min transformed to 250 Nl/min (BRE 60)
- The total Blow-off is the flow from the ejector, the solenoid valve and air withdrawn from the exhaust.
- Perfect for robot applications with rapid movements.
- For extremely rapid cycles, continuous vacuum generation and Blow-off impulse.
- Connection M5 for vacuum sensor
- Robust
- Facile attachment
- The ejector might be used as suction cup holder
- Service life > 100 million actuations
- Patented by AVAC

The Booster Release Ejector is designed to generate vacuum with the lowest air consumption possible.
The integrated solenoid valve links off the air flow from the primary nozzle into the vacuum port. It results in an extremely fast Blow-off supported by the flow from the ejector, solenoid valve and air withdrawn from the exhaust. When the vacuum level in the suction cup approaches the atmospheric pressure, the Blow-off flow is successively reduced and releases the work piece gently and with accuracy. The invention is patented by AVAC.

The small dimensions and low weight makes the ejector suitable for robot applications.



It provides a simple, flexible and transparent installation with minimal risk of vacuum loss in the suction cups. The solenoid valve instantly creates a release signal for all ejectors. The risk that the work piece is thrown out uneven is thus eliminated. The detail is released gently and at the appropriate place.

Ejector placed in central position

A common solution is to place the ejector in a central position outside the vacuum tooling system with several suction cups. This makes it necessary to use relatively large dimensions on the tubes for the vacuum supply to the suction cups in order to avoid excessive resistance. The result is unnecessarily large volumes to evacuate causing increased energy costs and time delays.

With one common Blow-off signal, sent to all suction cups, it is a risk that one suction cup is released before which creates a pressure drop in all other suction cups. There is a risk that details can be thrown out uncontrolled.

Also a single Booster Release ejector can be used centrally mounted for several suction cups if the capacity to generate vacuum and Blow-off is sufficient.

Locally placed ejector

All Booster Release ejector releases the work piece equally and simultaneously and there is no risk that the work piece may be hanging on one end or being released uneven. Another advantage is that the ejector can be used as a suction cup holder. The small dimensions and the low weight of the ejector have very little impact on handling capacity.

From a centrally located solenoid valve outside the vacuum tooling system a tube of small dimension for the compressed air is installed to the vacuum tooling system and is distributed to the Booster Release ejectors. An electricity cable is drawn up centrally to vacuum tooling system where it is distributed to all solenoid valves of the ejectors.

Advantages with the Booster Release ejectors

1. Minimum volume to evacuate for reduced energy consumption
2. The low weight enables use as suction cup holder in the vacuum tooling system
3. Simple installation at lower cost with reduced pipe dimensions
4. Simple and transparent electrical installation of the solenoid valves
5. Blow-off with varying flow provides a safe and gentle release of the work piece
6. Instantaneous and controlled Blow-off of multiple mounted ejectors
7. Service life solenoid valve > 100 million actuations and the ejector without any moving parts.

Materials

Housing:	aluminium black anodized
Nozzles:	Brass

Temperature

Temperature range	-10 to +50 ˚C

Compressed air

Pressure	max 8 bar
Optimum supply pressure	5 bar

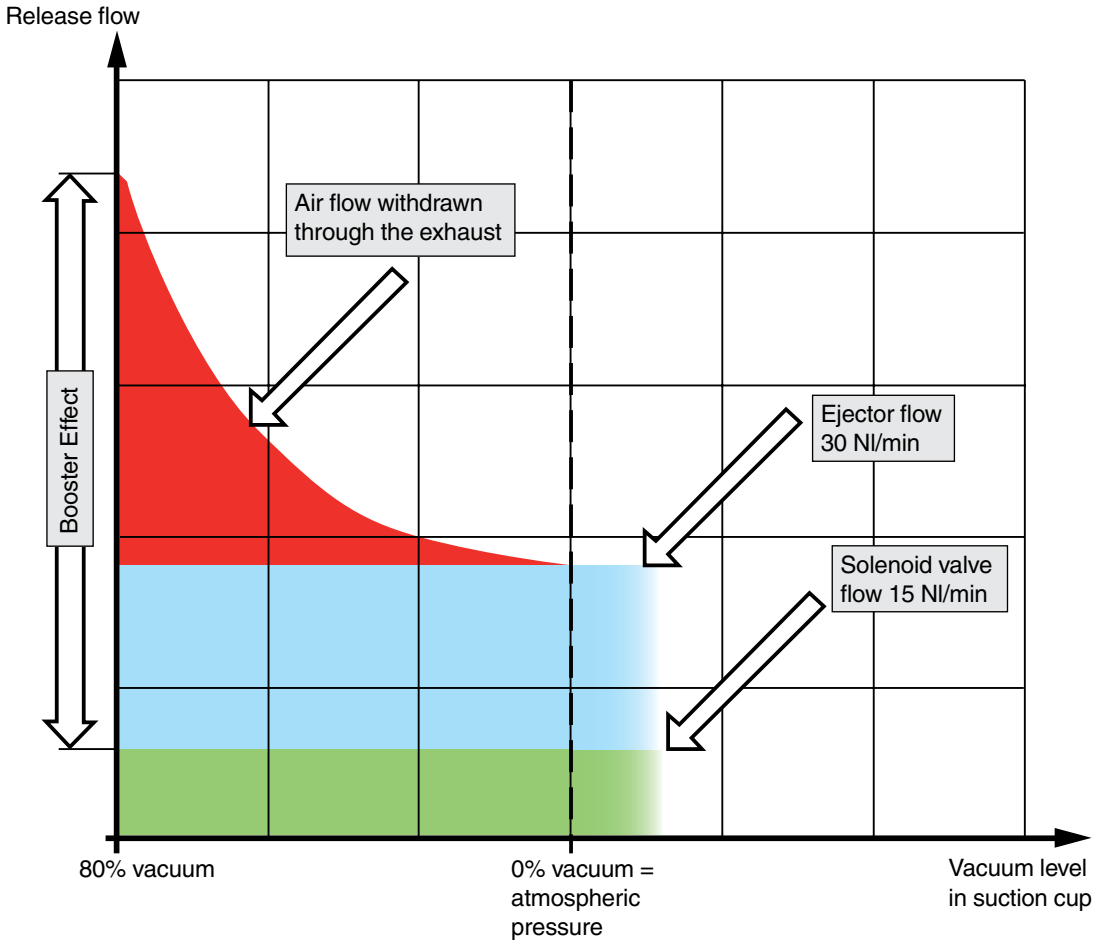
Vacuum Lifter with the ejector in central position

Vacuum Lifter with the Booster Release ejectors placed locally

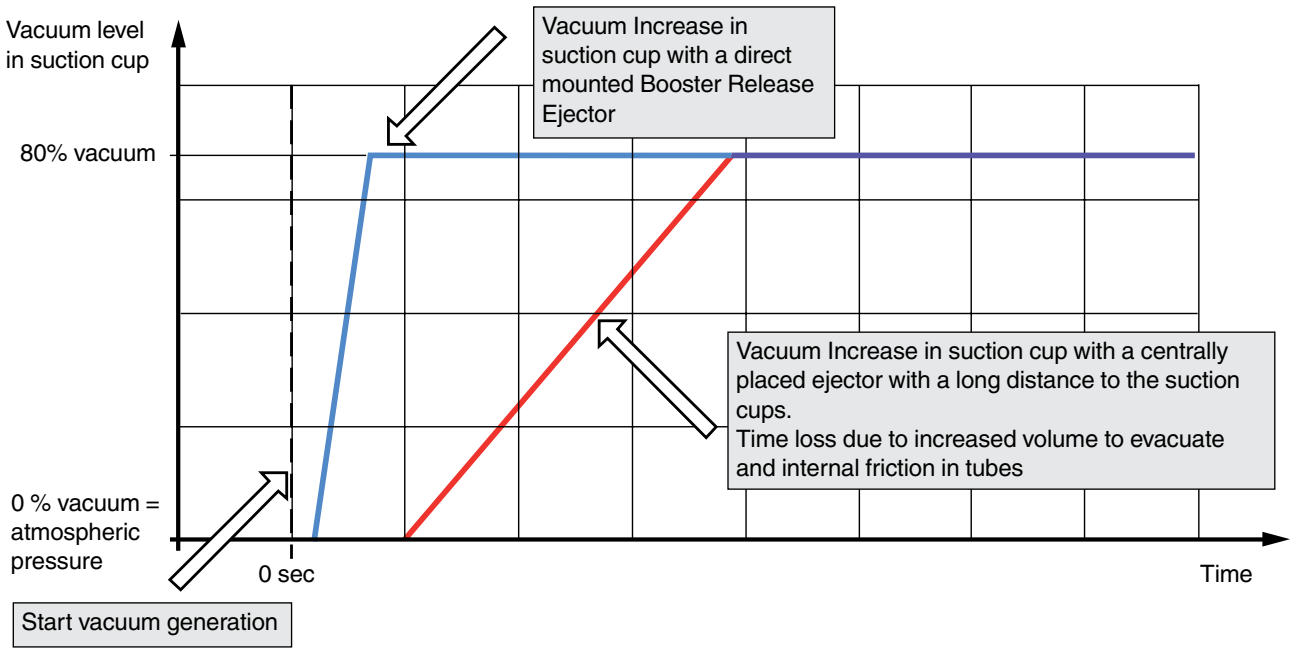
The Booster Release Ejector offers you as user:

- Blow-off with Booster Effect
- Solenoid valve flow of 15 Nl/min (BRE 25) and 38 Nl/min (BRE 60)
- The Booster Effect creates a Blow-off of 110 Nl/min at start and 45 Nl/min at the end (BRE 25) and blow-off of 250 Nl/min at start and 75 Nl/min at the end (BRE 60).
- Minimizes the time of Blow-off and releases the work piece gentle and with accuracy.

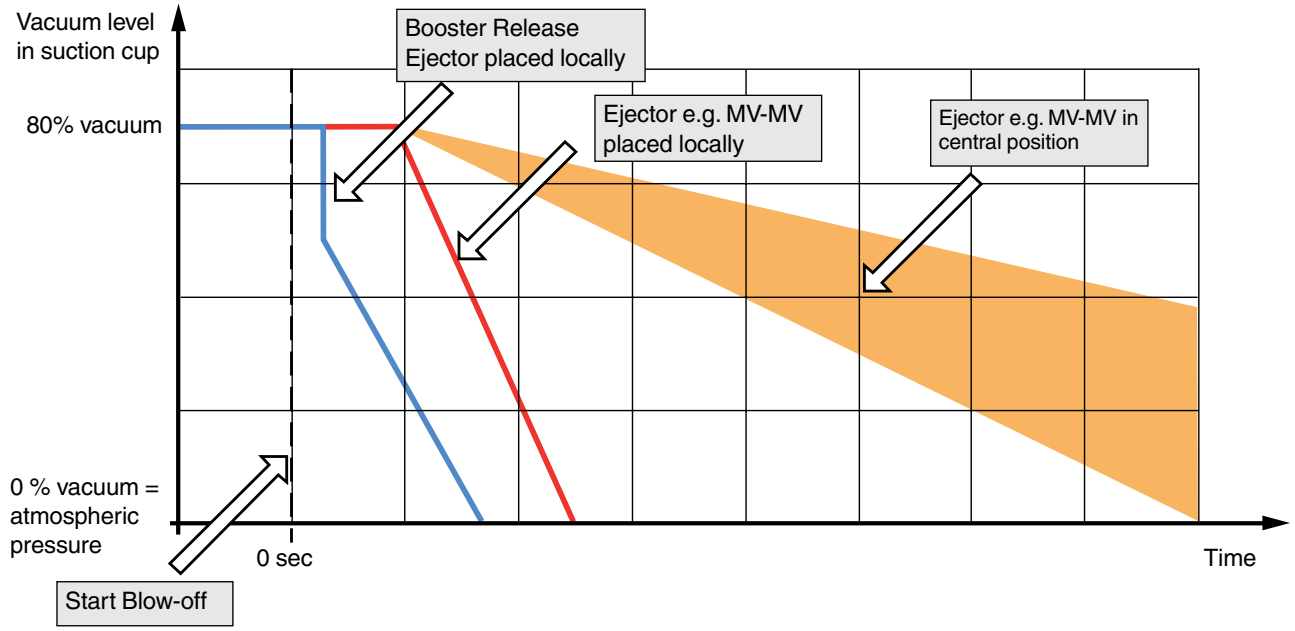
Blow-off with Booster Effect



Time savings vacuum generation



Time savings Blow-off



Takes advantage of the characteristics of the media

Advantage compressed air signal

A compressed air signal is significantly faster than a vacuum signal, therefore it is beneficial to place the ejector near the suction cups. The tube dimensions can be reduced considerably.

Advantage electrical signal

At Blow-off an electrical signal is given to all ejectors which will release the work piece instantaneously. The sensor to Blow-off mode takes approximately 5 ms and with a flat 50 mm suction cup it releases in 3.5 ms.

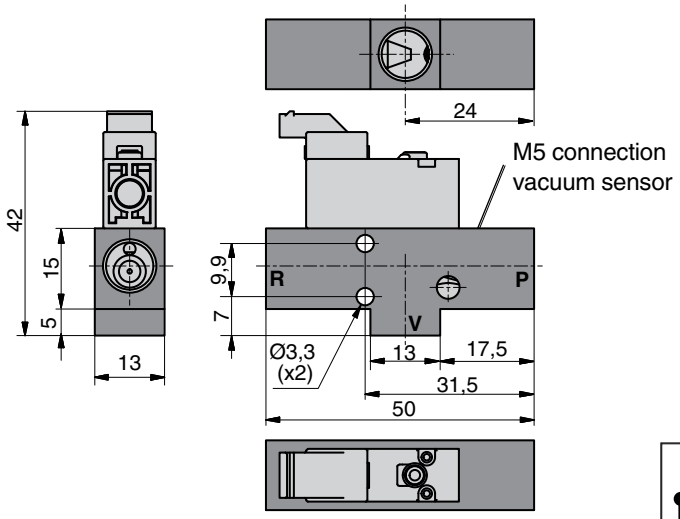
Reduced air consumption

The tubing don´t need to alternate between overpressure and vacuum and can be kept relatively thin which results in a reduced air consumption. In addition, the atmosphere contributes with approximately half of the booster release effect which increases with further compressed air savings.

Conclusion

The response time for achieving vacuum and for Blow-off is considerably shorter and is done with higher accuracy compared to an ejector remotely located from the suction cup. The low weight of the ejector makes it able to handle heavier loads. A life of >100 million actuations will ensure a reliable function and a long service life with reduced air consumption.

AVAC 25 MV-BR



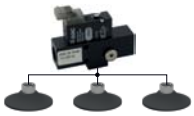
P = Air connection
V = Vacuum Connection
R = Exhaust

3D CAD FILES (STEP)
Download via:
http://www.avac.se/en/home/

Vacuum flow of the ejector and the primary nozzle diameter

Designation	Vacuum flow at different vacuum level [Nl/min]									Primary nozzle(s) Ø mm
	0%	10%	20%	30%	40%	50%	60%	70%	80%	
AVAC 25 MV-BR	26.0	21.0	18.3	15.5	13.3	10.3	7.3	2.5	0.4	0.8

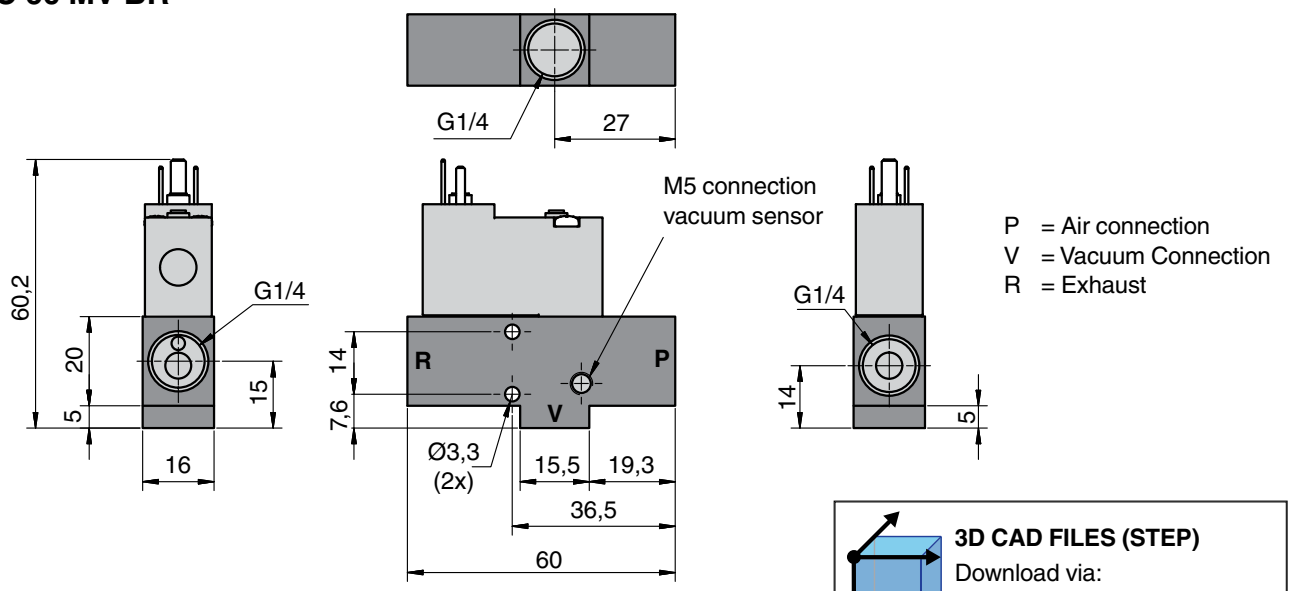
In practice

	Booster Release ejector placed locally				Booster Release ejector in central position
					
	Flat cup Ø30 mm Volume 1,7 cm³	Flat cup Ø50 mm Volume 7 cm³	Flat cup Ø80 mm Volume 36 cm³	Flat cup Ø100 mm Volume 58 cm³	Unit with 3 flat cups with Ø30 mm, connected to ejector with totally 30 cm tube Ø8/6 mm. Total volume 3 x 1.7 + 10 = 15.1 cm³
Evacuation time in ms					
0 ⇒ 50% vacuum	3	12	65	104	27
0 ⇒ 60% vacuum	4	17	90	145	38
0 ⇒ 70% vacuum	7	27	140	226	59
Blow-off time in ms					
50% vacuum ⇒ 0	<1	3,5	18	29	7
60% vacuum ⇒ 0	<1	4,0	20	32	8
70% vacuum ⇒ 0	1	4,3	22	35	9

0 = atmospheric pressure

Designation	Connecting threads P,V and R	Air consumption Nl/min	Solenoid valve flow Nl/min	Flow blow off Nl/min	Evacuation- / Blow-off time for 1 liter volume to % vacuum / atmospheric pressure			Weight g	Order no.
					0 ⇒ 50% / 50% ⇒ 0 (s)	0 ⇒ 60% / 60% ⇒ 0 (s)	0 ⇒ 70% / 70% ⇒ 0 (s)		
AVAC 25 MV-BR	G1/8	30	15	110 - 45	1.80 / 0.50	2.50 / 0.56	3.90 / 0.61	35	112 025 09

AVAC 60 MV-BR



3D CAD FILES (STEP)
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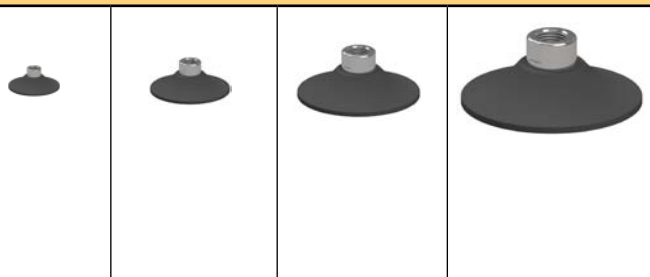
http://www.avac.se/en/home/

Vacuum flow of the ejector and the primary nozzle diameter

Designation	Vacuum flow at different vacuum level [Nl/min]									Primary nozzle(s) Ø mm
	0%	10%	20%	30%	40%	50%	60%	70%	80%	
AVAC 60 MV-BR	65	52	40	35	31	24	18	11	1	1,2

In practice

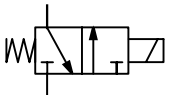
	Booster Release ejector placed locally				Booster Release ejector in central position
					
	Flat cup **Ø50 mm** Volume7 cm³	Flat cup **Ø80 mm** Volume 36 cm³	Flat cup **Ø100 mm** Volume 58 cm³	Flat cup **Ø125 mm** Volume 120 cm³	Unit with 3 flat cups with **Ø50 mm**, connected to ejector with totally 30 cm tube Ø8/6 mm. Total volume 3 x 7 + 14 = 35 cm³
Evacuation time in ms					
0 ⇒ 50% vacuum	4,7	24	39	81	24
0 ⇒ 60% vacuum	7,0	36	58	120	35
0 ⇒ 70% vacuum	10,3	53	85	176	51
Blow-off time in ms					
50% vacuum ⇒ 0	1,2	6	10	20	6
60% vacuum ⇒ 0	1,3	7	11	23	7
70% vacuum ⇒ 0	1,5	8	13	26	8

0 = atmospheric pressure

Designation	Connecting threads P,V and R	Air consumption Nl/min	Solenoid valve flow Nl/min	Flow blow off Nl/min	Evacuation- / Blow-off time for 1 liter volume to % vacuum / atmospheric pressure			Weight g	Order no.
					0 ⇒ 50% / 50% ⇒ 0 (s)	0 ⇒ 60% / 60% ⇒ 0 (s)	0 ⇒ 70% / 70% ⇒ 0 (s)		
AVAC 60 MV-BR	G1/4	60	40	200 - 120	0,84 / 0,16	1,02 / 0,19	1,72 / 0,22	85	**112 060 09**

Specifications

Solenoid Valve for AVAC 25 MV-BR:

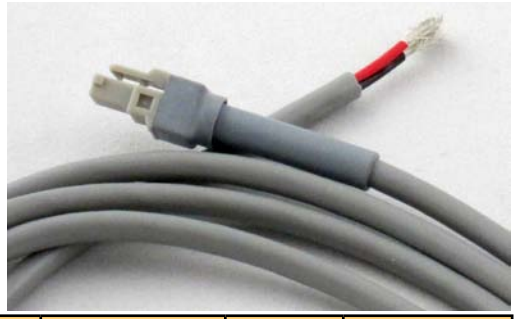


NC

Manual override

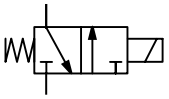
Voltage:	24 VDC +/-10 %
Power:	0,9 Watt
Ambient temperature:	-10 °C to +50 °C
Duty cycle:	100 %
Activation/deactivation time:	5ms / 5ms
Protection class:	IP 40 (with cable connector mounted)
Service life:	>100 million sensors under normal conditions.
Max pressure:	8 bar
Air flow 1 – 2:	10 Nl/min (Qn)

Cable



Designation	Cable Length m	Weight g	Order no.
Cable	1.5	34	590 001 30

Solenoid Valve for AVAC 60 MV-BR



NC

Technical data

Voltage	24 VDC
Power	1,8 W
Max. pressure	10 bar
Protection class	IP65 (with cable connector mounted)

Designatio	Order no.
Solenoid valve 24 VDC NC	505 024 11

Cable connector according to EN175301-803,

(former DIN 43650-B), ISO 6952, to be ordered separately

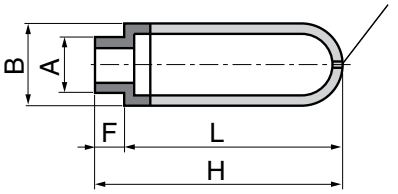
Designation	Order no.
Cable connector with LED and surge protection	590 024 02

We recommend using the cable connector equipped with LED indicators for an easy overview and troubleshooting, and equipped with surge protection in order to both protect and provide other electrical/electronic equipment a longer lifespan.

Silencer

Designation	Weight g	Order no.
Silencer G1/8	2	620 018 10
Silencer G1/4	3	620 014 10

Hole to reduce the risk of clogging.



A	B	F	L	H
G1/8	12,5	5,5	28,5	34
G1/4	15,5	7	35,5	42,5

Operating Instructions
http://www.avac.se/pdfi/I-BRE.pdf