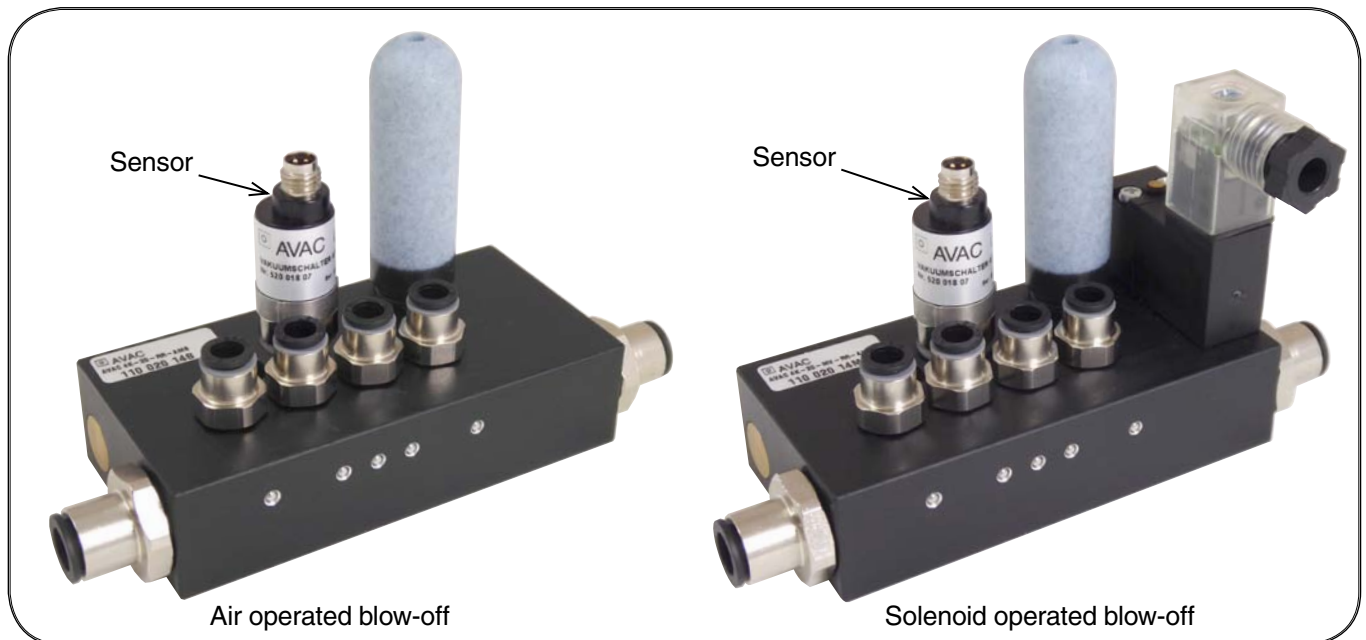


AVAC MULTI-CIRCUIT Ejectors

Separate Vacuum Circuits – AVAC Monitoring System (AMS)



A cost effective Vacuum Sensing System for MULTI-CIRCUIT Ejectors.
 All circuits are working independently and can be monitored with one single sensor.

Innovation prize "Award for Blechexpo"



AVAC MULTI-CIRCUIT Ejector AMS was appointed the most innovative product in category Handling technology/robotics at the Blechexpo 2017 in Stuttgart, the international trade fair for sheet metal working.

Feedback

Predictive maintenance

By monitoring the time to reach the preset vacuum level, an increase of time might indicate a system leakage. This feedback is useful to plan corrective maintenance work in order to prevent unexpected equipment failures.

Digital

- The sensor monitors the vacuum level in all circuits
- E.g. one suction cup without contact means no feedback signal
- Feedback, released object

Analog

- The sensor monitors the vacuum level in all circuits
- Indicates number of suction cups in contact with the object/s
- Useful with different shapes of objects
 - Expected suction cups in contact
 - Recognizing object shape
- Feedback, released object

Installation of AVAC MULTI-CIRCUIT Ejectors with solenoid operated blow-off and AVAC Monitoring System (AMS)

AMS



Reduced Costs

- Fewer Sensors
- Fewer system inputs
- Simplified installation
- Fewer fittings
- Fewer cables
- Simplified maintenance

Traditional installation of ejectors and vacuum sensors.






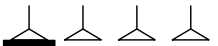
4
or
26

Products to be purchased, mounted and connected.








Charts for vacuum values in the sensor port as a function of the number of suction cups engaged/open and ejector capacity 85%.


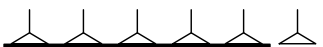



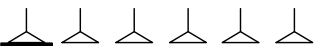
Vacuum level in MULTI-CIRCUIT Ejector 4K with AMS

	Circuit				Measured value in sensor port S
	1	2	3	4	
	85%	85%	85%	85%	85%
	81%	81%	81%	0%	60%
	80%	80%	0%	0%	21%
	78%	0%	0%	0%	4%

Vacuum level in MULTI-CIRCUIT Ejector 5K with AMS

	Circuit					Measured value in sensor port S
	1	2	3	4	5	
	85%	85%	85%	85%	85%	85%
	82%	82%	82%	82%	0%	68%
	80%	80%	80%	0%	0%	34%
	78%	78%	0%	0%	0%	13%
	76%	0%	0%	0%	0%	2%

Vacuum level in MULTI-CIRCUIT Ejector 6K with AMS

	Circuit						Measured value in sensor port S
	1	2	3	4	5	6	
	85%	85%	85%	85%	85%	85%	85%
	82%	82%	82%	82%	82%	0%	72%
	80%	80%	80%	80%	0%	0%	47%
	78%	78%	78%	0%	0%	0%	21%
	76%	76%	0%	0%	0%	0%	8%
	75%	0%	0%	0%	0%	0%	1%

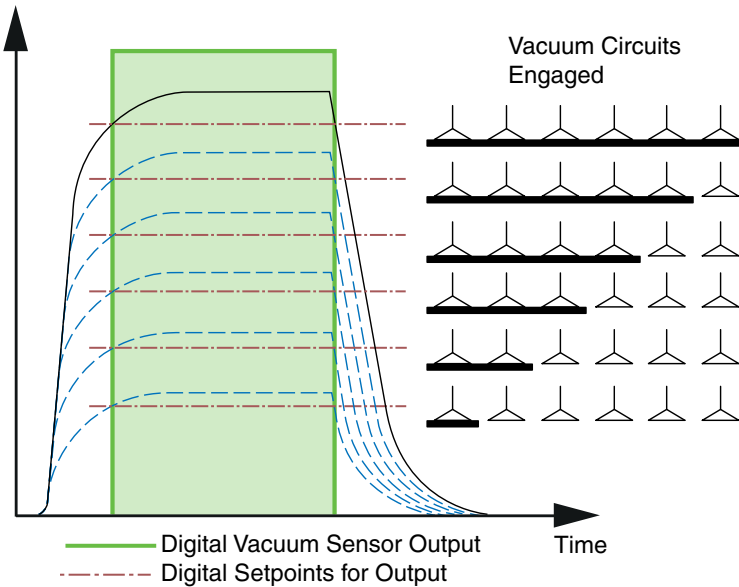
Vacuum levels in the charts are theoretical. The actual values depend on the volume, restrictions and potential leaks in the vacuum circuit. The actual values in the application should be measured so that the sensor can be adjusted accordingly.

Graphical Function Description

The graphs show the vacuum level in the sensor port (S) and how it is monitored by a sensor. Monitoring can be done with either digital or analog vacuum sensors.

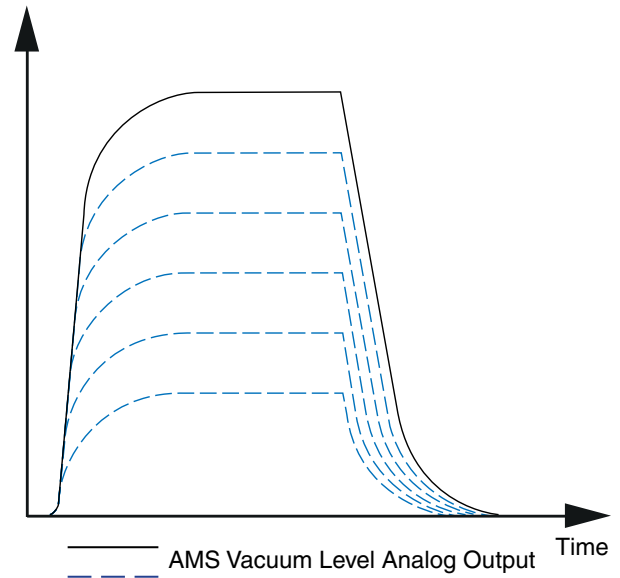
Digital Vacuum Sensor

Vacuum Level







Analog Vacuum Sensor

Vacuum Level



Evacuation and Blow-off time per circuit for suction cup volumes

In practice

MULTI-CIRCUIT Ejectors with supply pressure 5 bar				
				
	Flat cup Ø30 mm Volume 1,7 cm ³	Flat cup Ø50 mm Volume 7 cm ³	Flat cup Ø80 mm Volume 36 cm ³	Flat cup Ø100 mm Volume 58 cm ³
Time to evacuate a suction cup from 0 to 70% vacuum in ms				
Size 10 Nozzle Ø0.5 mm	21	85	436	702
Size 20 Nozzle Ø0.7 mm	12	47	238	383
Blow-off time from 70% vacuum to 0 in ms				
Size 10 Nozzle Ø0.5 mm	2	9	44	70
Size 20 Nozzle Ø0.7 mm	1	5	24	38

0 = atmospheric pressure

Tubings and connectors volumes not included.