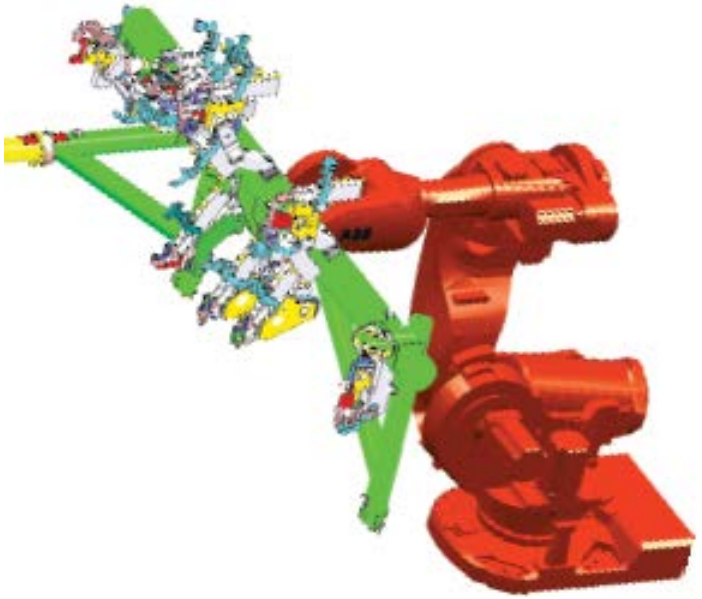
Topic:	**OVEM Quick setup Guide – Quick setup guide pack**	28.10.2015
Who To:	**Commissioning / Maintenance**	Revision 1.0

OVEM QUICK SETUP GUIDE PACK



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The following document is a Quick set-up guide for the Vacuum generator **OVEM-20-H-B-G(P)O-OE-N-2P** for installations within Volvo Cars.

Please note: For more detailed information, please consult the manufacturer's manual which is the primary reference for correct and safe use is.

Prepared by
Marc Mertens - ISM Festo BE
Johan Thielemans- Festo BE

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1. Safety

- Please read the relevant manual on the OVEM vacuum handling unit to ensure safe use of the unit, available on the Festo Website.
- Compressed air is dangerous, depressurise systems before carrying out installation / maintenance tasks.

2. Notes

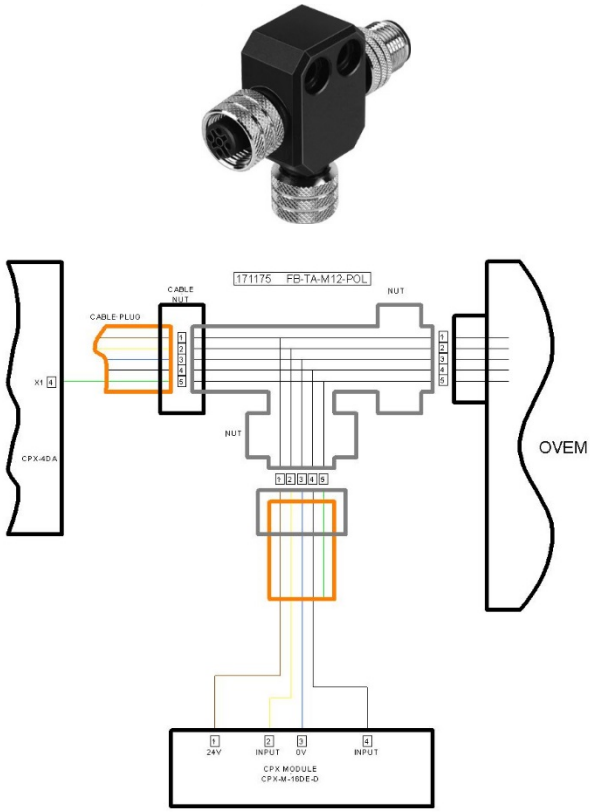
1. The correct size/type unit must have been selected to suit the relevant application. The laval nozzle size width of available units varies from 05/07/10/14/20. (Volvo cars default = 20). Full reference code for projects is: OVEM-20-H-B-G(P)O-0E-N-2P

2. The unit should be mounted to allow access to top & front, 3 button controls, to allow removal and cleaning of filter elements and unrestricted exhaust. It is designed for internal use only.

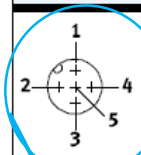
3. The OVEM unit requires an air supply, set up to 4 bar pressure (max.), with a flow adequate to suit the application, see manual/software for relevant calculations. By default, when the air supply is connected, vacuum will be generated.

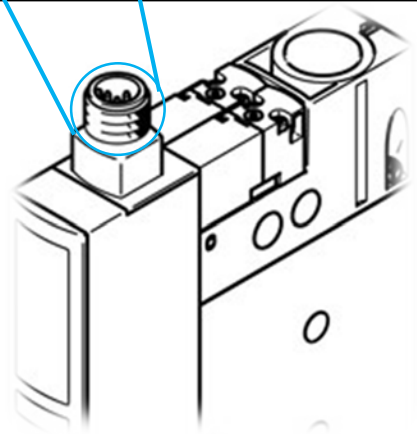
4. The unit requires a 24VDC power supply cable with provision for two outputs and one input. Pre SEPT. 2015 part ref #171175.

3. Connections



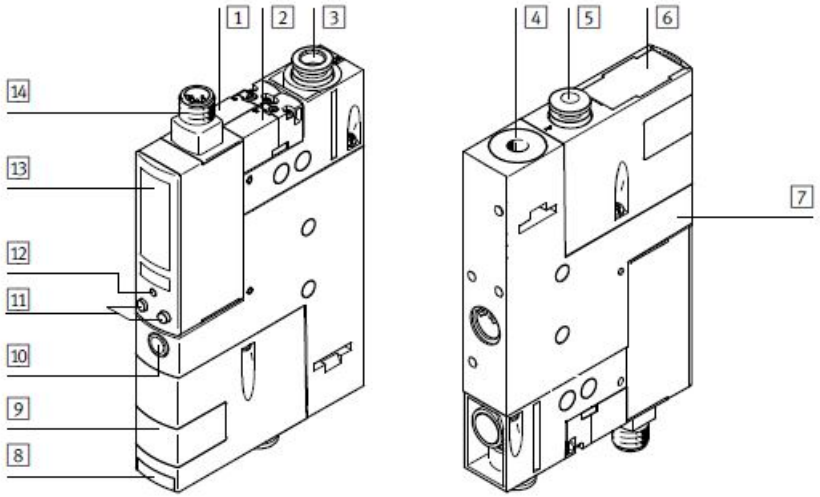
Pin allocation

Plug M12x1, 5-pin	Pin	Meaning
		OVEM-...-2P/2N/PU/NU/PI/NI
	1	Supply voltage +24 V DC
	2	Output B (function depending on variant)
	3	0 V
	4	Output A (switching output for vacuum sensor)
	5	Switching input In (vacuum ON/OFF and ejector pulse)



4. OVEM Layout

1.1 Overview



1 Solenoid valve ejector pulse (E)
2 Solenoid valve vacuum ON/OFF(V)
3 Supply port
4 Exhaust port / silencer
5 Vacuum port
6 Replaceable filter element
7 Housing with mounting holes
8 Slide for changing the filter
9 Filter housing with inspection window
10 Flow control screw for adjusting the intensity of the ejector pulse
11 Operating buttons
12 EDIT button
13 LCD display
14 Plug connector for electrical connection (M12)

Fig. 1 Control sections and connections

5. Flow Diagrams

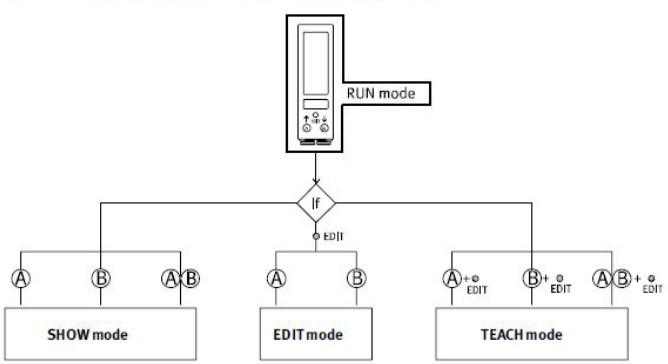
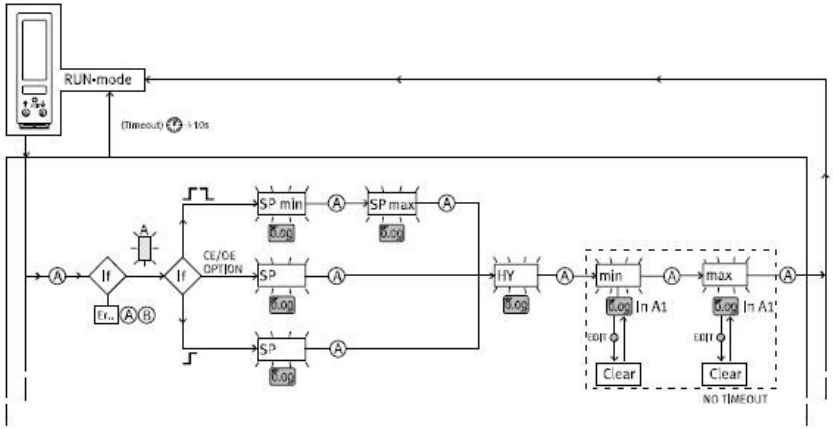
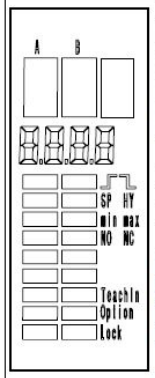
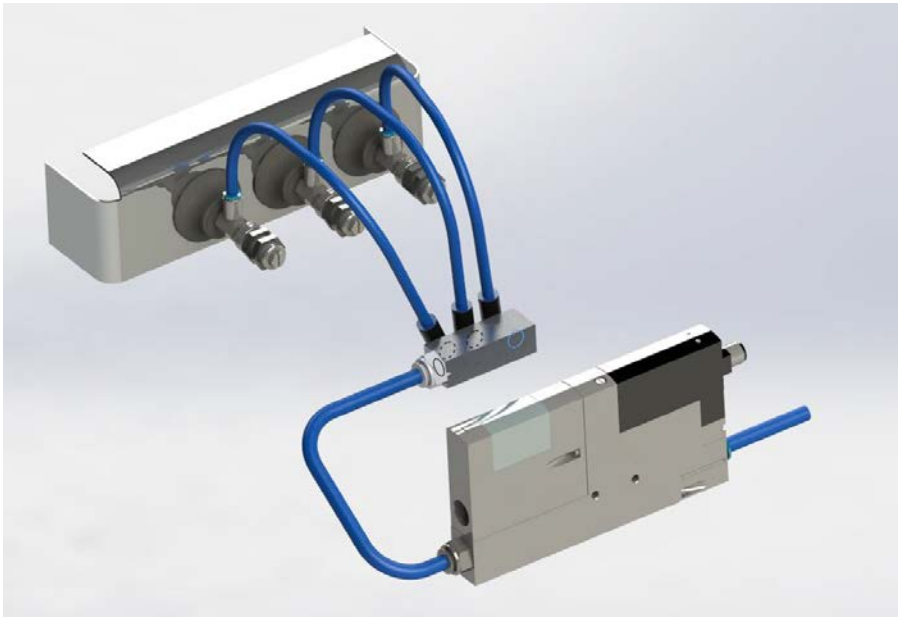


Fig. 3: Operating states of the OVEM



Display	Icon	Description	Modes RUN	SHOW	EDIT	TEACH
		Switching output set/not set	X			
		Switching output selected/not selected		X	X	X
	Segment Switch input In lights up	There is a signal at the switch input	X			
		Manual override active			X	
		Threshold value comparator		X	X	
		Window comparator		X	X	
	[msec]	Reject pulse (time setting)		X	X	
	[SP]	Switching point		X	X	
	[SP] [min]	Lower switching point (switching point – min.)		X	X	
	[SP] [max]	Upper switching point (switching point – max.)		X	X	
	[SP] [max]	Diagnosis: Limit value evacuation time		X	X	
	[SP] [max]	Diagnosis: Limit value pressurization time		X	X	
	[HY]	Hysteresis		X	X	
	[NO]	Switching character. of normally open contact		X	X	
	[NC]	Switching character. of normally closed contact		X	X	
	[min] / [max]	Extreme values: min./max. measured input value (In A1) 1)		X		
	[min] [msec]	Min. evacuation time		X		
	[max] [msec]	Min. evacuation time		X		
	[min] [msec]	Min. pressurization time		X		
	[max] [msec]	Max. pressurization time		X		
	[Teach]	Teach mode active				X
	[Option]	Air-save function active	X	X	X	

6. Typical Vacuum Distribution



Installations of vacuum systems should keep tubing lengths from OVEM to cups as short as possible and maintain legs of equal lengths.

7. Single point lesson for showing settings for Output A

1a. From the RUN screen Press A once to view set point of output A
Displays the value in mbar (e.g. 0.700)

1b. Press again to see Hysteresis of Output A
Displays the value in mbar (e.g 0.250)

1c. Press again to see Min. Flow Retained Value
Displays the value in mbar (e.g 0.400)

1d. Press again to see Max. Flow Retained Value
Displays the value in mbar (e.g 0.700)
Press again to return to RUN screen

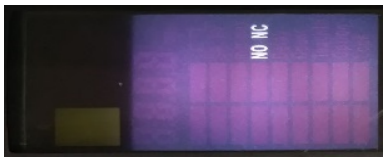
8. Single point lesson for editing settings for Output A

2a. From RUN screen press edit button once
- i) While A is flashing press and release edit again

2b. Press edit again to view set point of output A in -mbar.
- i) Press A to increase, B to decrease

2c. Press edit again to see Hysteresis of Output A.
- i) Press A to increase, B to decrease

2d. Press and release edit, NO or NC output option
- i) Press A to change, the one flashing is the one selected
- ii) Press the Edit button to confirm the selection



9. Single point lesson for setting Duration Pulse

3a. From the RUN screen Press edit button.
- i) Press button B, yellow B icon will flash
- ii) Press button B again, white Led bar will flash

3b. Press edit button, reject time setting will be displayed.
- i) Press A to increase time and B to decrease. (ms)

3c. Press edit button, the FORC option will be displayed.
- **if required and in a SAFE state**, press A to switch off vacuum
- **if required and in a SAFE state**, press B to force eject pulse

LED bar will appear each time A or B is pressed, indicating the solenoid is energised.

10. General Principal of operation

1. Vacuum cups come in good contact with part, vacuum turned on. (output off).
2. A good seal contact allows vacuum level to climb to set point.
3. If set point reached, output A/B is switched, output is given to controls, and next operation can be enabled.
4. If LS (power saver function) is enabled and good part contact seal is achieved, the air consumption will shut off provided the vacuum is within the set parameters (e.g. threshold hysteresis), if after more than 1 second the vacuum drops below the set level then the air consumption will switch back on to raise the level of vacuum back to the required set level again. This process will continue until the part needs to be removed, thus reducing air consumption.
5. When the part needs to be removed, the reject input signal needs to be applied by the control system.
6. While the reject signal is applied, it switches off the vacuum solenoid, and drives the reject solenoid for the set time only (40 - 9999ms. Default =200ms) (See Page 11 to change).
7. The flow of air during the reject time set can be increased or decreased by the turning the screw on the front of the OVEM unit, clockwise reduces flow, anti-clockwise increases flow. It is important that the balance of reject time, flow (front screw) speed of breakaway, allow the part to break free of the vacuum cups completely.
8. The Vacuum will come back on again as soon as the reject input is removed.

11. LS power saver Troubleshooting

Description	Remedy
LS (Low power consumption) mode does not operate	High leakage rate in the vacuum circuit – Check all joints and ensure cups are well mated.
LS (Low power consumption) mode operates once only, (LCD display [min] [max] flash.) Press A button - if Error 38 is displayed then the unit has deactivated the LS mode and vacuum is operating at full flow and thus using higher volume of compressed air. This condition will automatically revert to LS after the next reject pulse has been applied and released.	Part “bounced” against seals more than once in 1 second (1Hz) - Check mechanical seal at vacuum cups

12. Troubleshooting Table 1 (Manual Extract)

Diag-nostic stage	Description	Display in		
		RUN mode	SHOW mode	TEACH mode
0	– Everything OK	No display		
1	– Still no function limitation, but operating parameters become worse. – Message at switch output Out B (logical channel di 1 active)	Segments [min] and [max] flash synchronously	Display fault code before each SHOW menu	Segments [min] and [max] flash synchronously
2	– Function still guaranteed, but with limitations (higher energy consumption, ...) – "emergency operation", servicing urgently required – Message at switch output Out B (logical channels di 1 or di 2 active)	LCD display and [min] [max] flash	Display fault code before each SHOW menu	LCD display and [min] [max] flash
3	– Function no longer guaranteed. – Message at switch output Out B (logical channels di 1 or di 2 active) and all controllable outputs of the device inactive	All segments flash and LCD display show the current fault	All segments flash except for LCD display	Cannot be reached because buttons are blocked

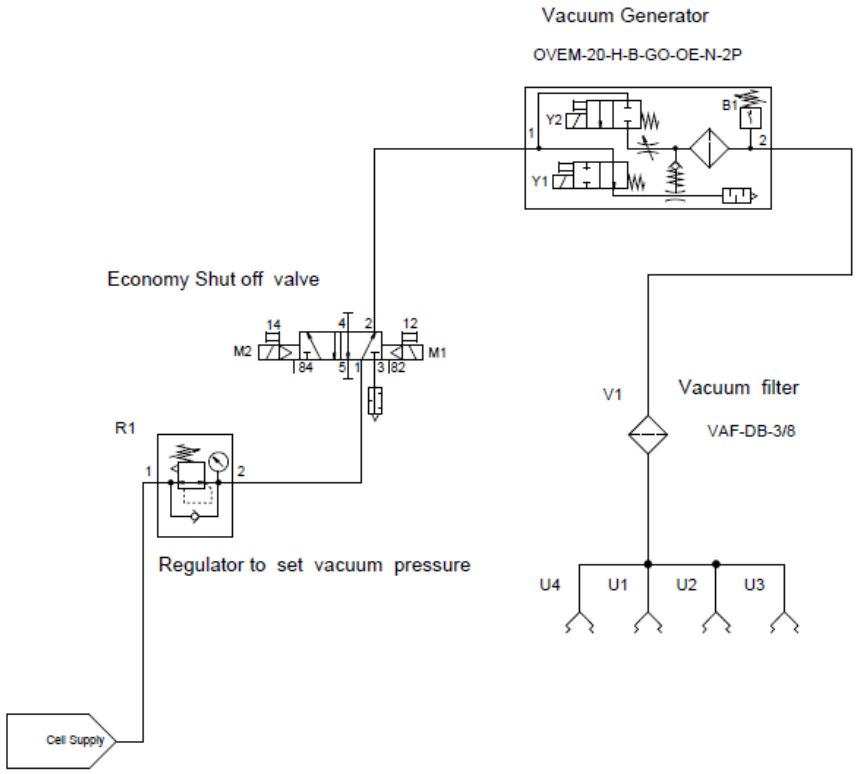
13. Troubleshooting Table 2 (Manual Extract)

Diag-nostic stage	Fault code	Description	Remedy
1 [1]	Er34	Evacuation time exceeded in 2 of 5 cycles	Check for leakage
	Er36	Pressurization time exceeded in 2 of 5 cycles	Check for leakage
2 [2]	Er33	Solenoid valve does not switch or not correctly. Plunger does not move, current through solenoid coil not sufficient, short circuit in solenoid coil	Press mechanical manual override several times. Check supply voltage. If there is no improvement, the device is defective. Send device to Festo.
	Er35	The set threshold of the evacuation time is exceeded double the value in 2 of 5 cycles	Check for leakage
	Er37	The set threshold of the pressurization time is exceeded double the value in 2 of 5 cycles	Check for leakage
	Er38	Switching frequency of the air-save function lies over the limit value 1 Hz	Check for leakage
		Possible fault when switching on the air-save function, switching point not logical	Reset input
3 [3]	Er17 [4]	Undervoltage in power supply < 15 V	Check the power supply
	Er01	Device defective	Exchange device
–	Er02 ... Er08	Reserved for extensions	–
	Er13 ... Er16	Reserved for extensions	–

1) [min] [max] flash synchronously; fault display in SHOW mode (→ Tab. 11:)
2) All segments flash. The smallest current fault number is shown.
3) Centre row of bar code segments flashes; fault display in SHOW mode (→ Tab. 11:)
4) Outputs are reset automatically (0-signal).

Tab. 15: Fault code of the vacuum generator

14. Vacuum Generator - circuit



1. Normally open vacuum generator.

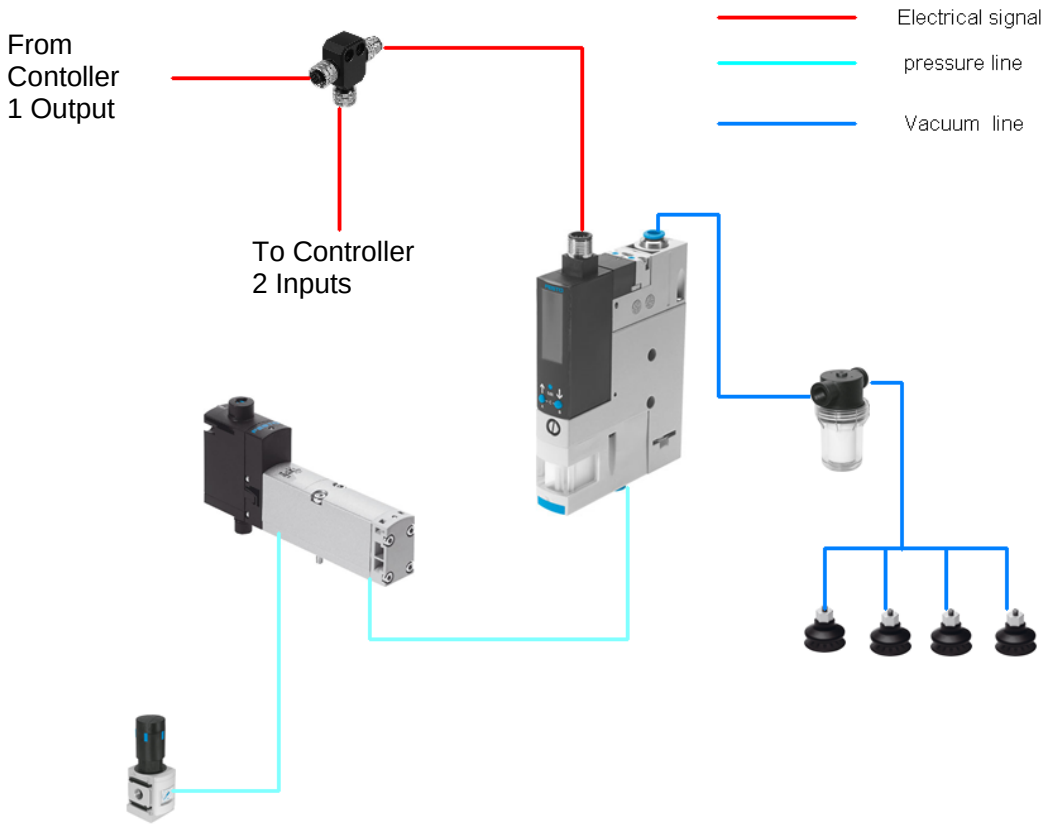
2. A 5/2 bi-stable solenoid valve must be fitted in the compressed air supply to each vacuum generator to isolate it to save air over breaks, weekend and holidays etc. This can be a « flat type » valve or fitted to the valve terminal.

3. All vacuum generators must be fitted with a pressure regulator to « fine tune » each vacuum generator to give optimum performance and the highest efficiency.

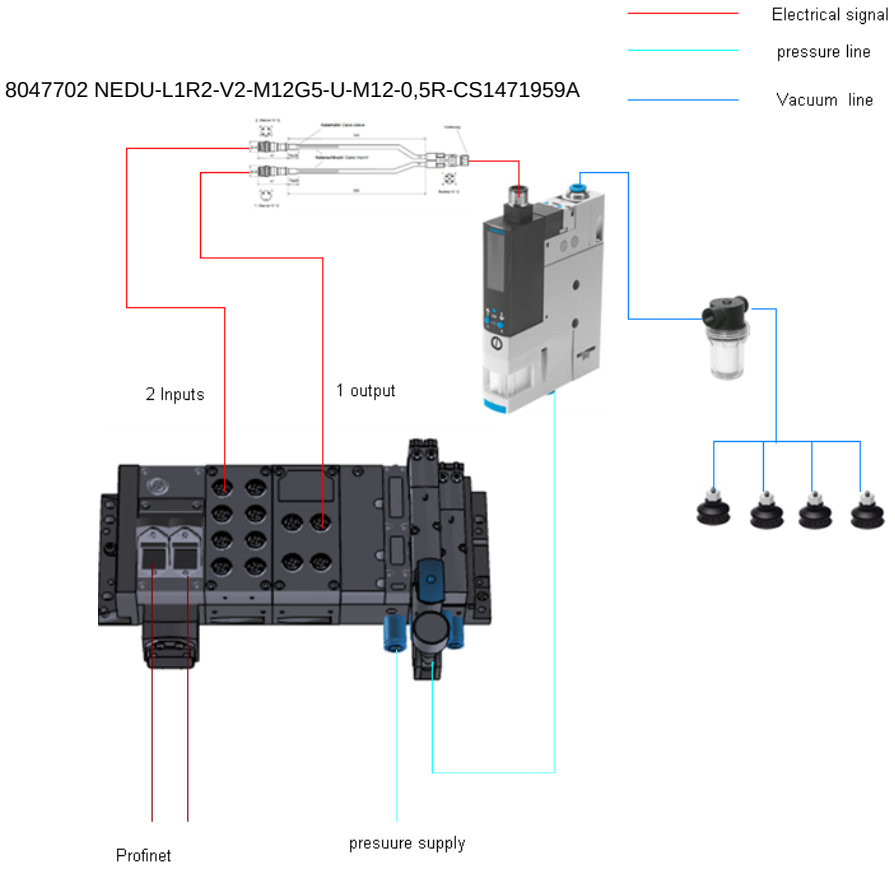
4. An air-saving function is « on board »in the vacuum generator.

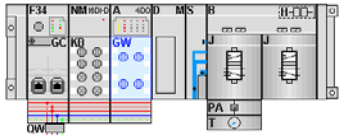
5. A Vacuum filter is mounted in the vacuum line to avoid that oil from the plates causes mal function of the generator.

15. Vacuum Generator - circuit single valve

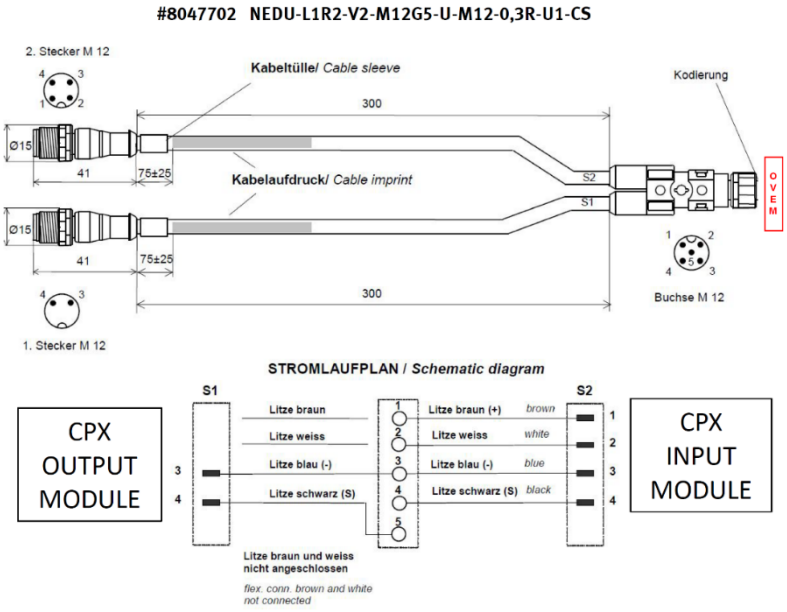


16. Vacuum Generator - circuit valve terminal





51E-F34GCQWNMKBAGW-D+GNGJBABC
32P-SGL-R-MBH-JPATJ



574321 NEBU-M12G5-E-5-Q8N-M12G5