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Translation of the Original Instructions

AVS Römer smartflow
Type EGP 1/2/3 in test operation

Date: 12/2023

1. General instructions

⚠ CAUTION

- Careful and cautious actions are required during all work with the pump in order to prevent physical injury and damage to property.
- Only trained specialist personnel may carry out assembly/installation work.

- Only carry out assembly work with suitable tools.
- Carefully assemble all connections, seal and check they have a tight fit.
- Install the tubes without kinks to ensure that a correct flow of medium is guaranteed.

- When working on the pump, the system must be disconnected from the power supply and secured to avoid being switched on again.

- After disconnecting the power supply, wait at least 3 minutes before starting work as there may be residual voltage.
- The pump may only be operated with a SELV power supply unit.
- The pump must not be modified.

Milk, drinking water or other liquids used in the test operation must not enter the food cycle and are not suitable for consumption due to precautionary measures.

To ensure functionality and tightness, the pump must not be opened.

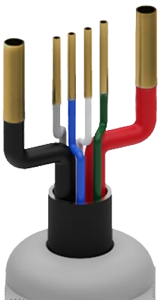
The product may only be operated as a prototype for testing or validation purposes under controlled conditions.

The device in which the product has been installed may only be put into operation once it has been established that it complies with the provisions of all directives. The evaluation is carried out by the user.

2. Connect Power Supply

The Pump is powered via a pre-installed connection cable.

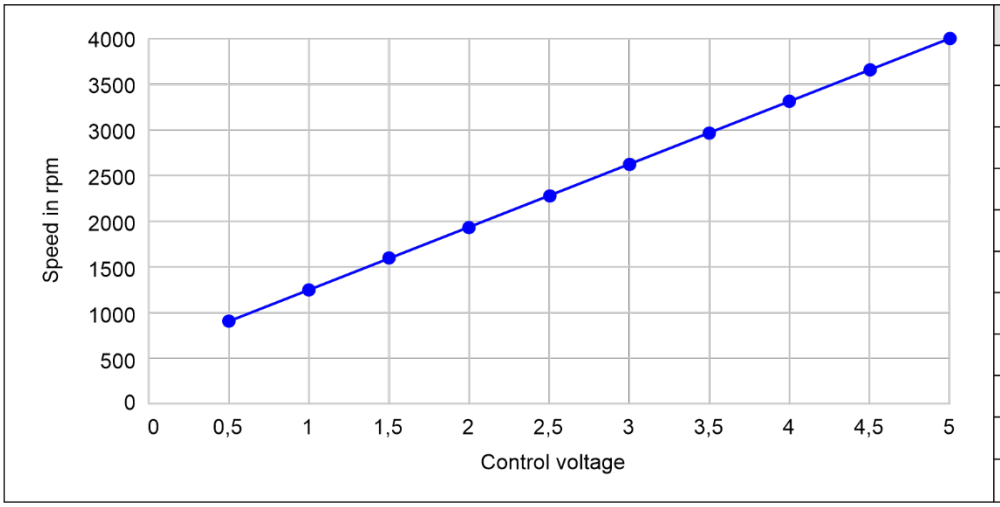
Cable assignment	
red	Supply voltage +
black	Supply earth -
green	RS485 A (+) / I²C SDA
white	RS485 B (-) / I²C SCL / speed signal
blue	control voltage + / control current + / PWM
grey	signal earth -



3. Analogue Control

a.) Voltage control

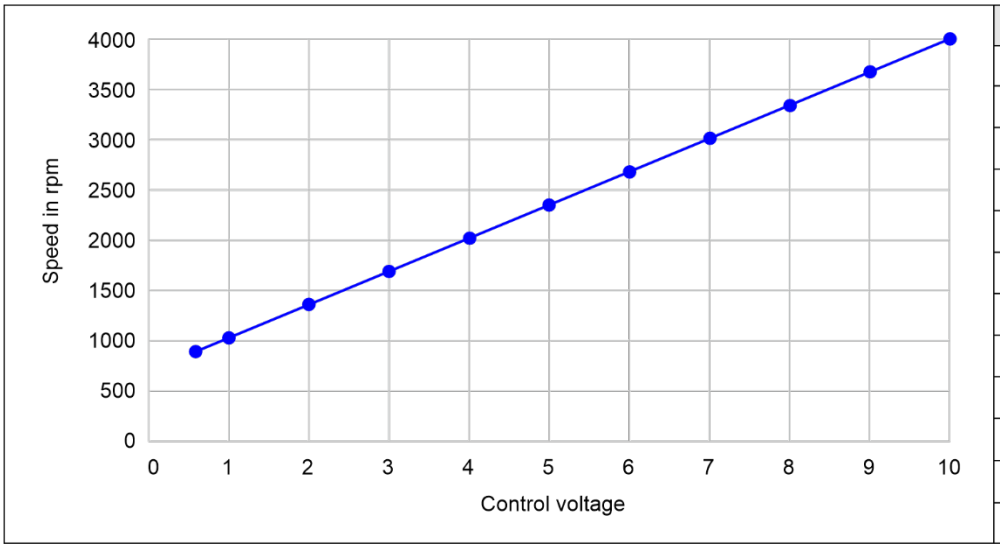
Forward operation from 0 V to 5 V



U in V	n in 1/min	Direction
0	0	stop
0,5	940	forwaard
1	1280	
1,5	1620	
2	1960	
2,5	2300	
3	2640	
3,5	2980	
4	3320	
4,5	3660	
5	4000	

The speed characteristic curve starts at a control voltage of 0.5 V. Below this value, the speed is zero. There is also a switch-off hysteresis to ensure switch-off in an operating state of less than 0.48 V and switch-on at 0.5 V for restart.

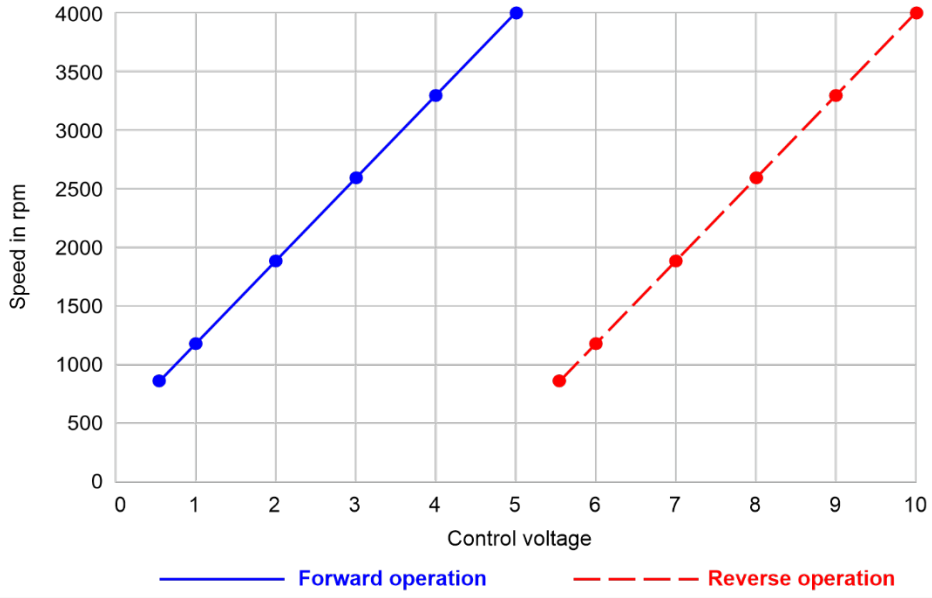
Forward operation from 0 V to 10 V



U in V	n in 1/min	Direction
0	0	stop
0,5	940	forwaard
1	1101	
2	1423	
3	1745	
4	2067	
5	2390	
6	2712	
7	3034	
8	3356	
9	3678	
10	4000	

The speed characteristic curve starts at a control voltage of 0.5 V. Below this value, the speed is zero. There is also a switch-off hysteresis to ensure switch-off in an operating state of less than 0.48 V and switch-on at 0.5 V for restart.

Forward and reverse operations from 0 V to 10 V (F/R)



U in V	n in 1/min	Direction
0	0	stop
0,5	940	forwaard
1	1280	
2	1960	
3	2640	
4	3320	
5	4000	
5,1	0	stop
5,5	940	reverse
6	1280	
7	1960	
8	2640	
9	3320	
10	4000	

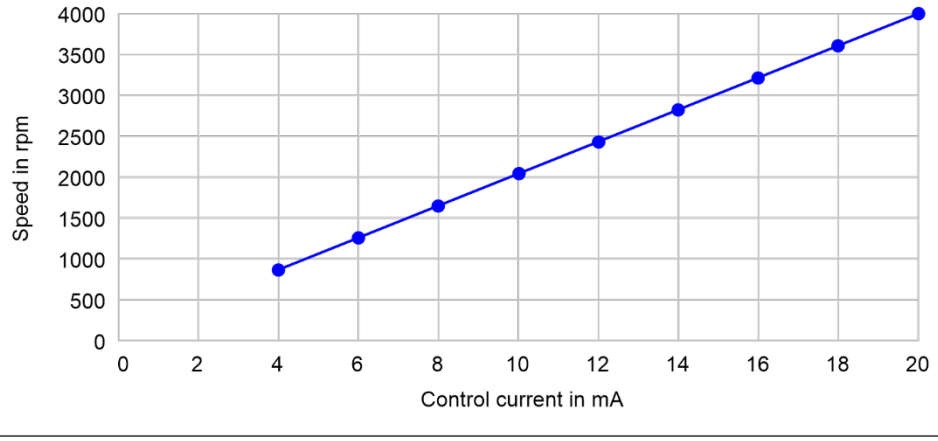
The speed characteristic curve starts at a control voltage from 0.5 V to 5 V and from 5.5 V to 10 V. The speed is zero at less than 0.5 V and between greater than 5 V and less than 5.5 V.

The following switch-off hystereses exist in addition:

- in forward operation, switch-off occurs in an operating state of less than 0.48 V and switch-on at 0.5 V for restart
- in forward operation, switch-off occurs in an operating state of greater than 5.1 V and switch-on at 5 V for restart
- in reverse operation, switch-off occurs in an operating state of less than 5.4 V and switch-on at 5.5 V for restart

b.) Current Control

Forward operation from 4 mA to 20 mA



I in mA	n in 1/min	Direction
0	0	stop
4	940	forwaard
6	1323	
8	1705	
10	2088	
12	2470	
14	2853	
16	3235	
18	3618	
20	4000	

The speed characteristic curve starts at a control current of 4 mA. Below this value, the speed is zero. There is also a switch-off hysteresis to ensure switch-off in an operating state of less than 3.57 mA and switch-on at 4 mA for restart.

4. Digital Control

An evaluation of the digital functions can be carried out very easily via the AVS Römer Mastertool software. The pump has a digital interface with which the parameters can be controlled and read out. The communication is based on a master-slave principle. The pump acts as a slave and the address can be freely assigned. When using the pump in digital mode, it is recommended to connect the analog control signal to ground!
The digital functions can be evaluated using the AVS Römer Mastertool software. This is available on request.

a.) Control with RS485

Modbus RTU is used as the communication protocol. The baud rate can be either 9600 or 57600 baud.
A detailed interface description (communication protocol) is available on request.

b.) Control with I²C

Only I²C standard mode with 7bit standard addressing is supported.
A detailed interface description (communication protocol) is available on request.

5. Speed output

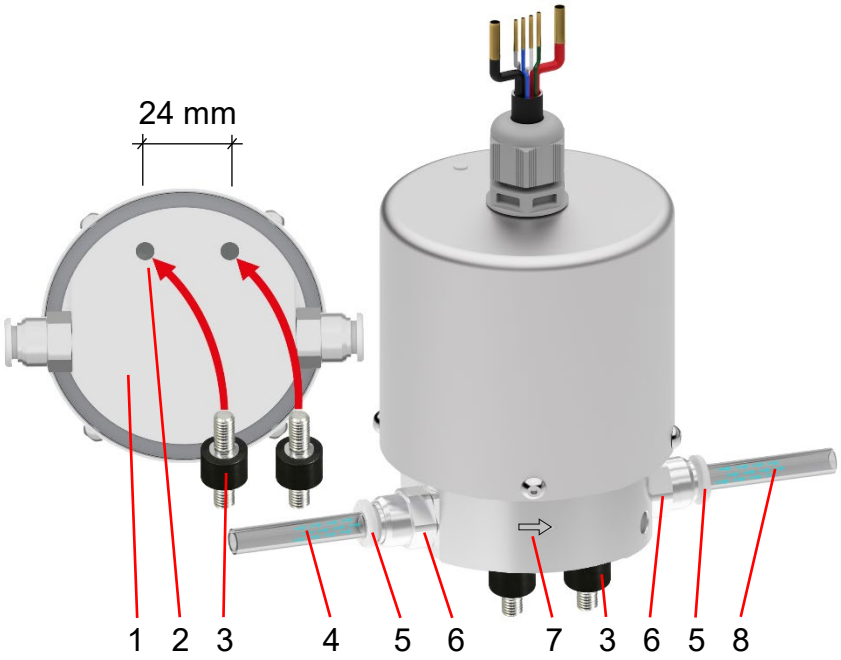
Speed	Frequency
940 rpm	940 Hz
1000 rpm	1000 Hz
1500 rpm	1500 Hz
2000 rpm	2000 Hz
2500 rpm	2500 Hz
3000 rpm	3000 Hz
3500 rpm	3500 Hz
4000 rpm	4000 Hz

If configured properly, a PWM speed signal with an amplitude of 5 V, duty cycle = 50% and a frequency range of between 940 Hz and 4000 Hz is output.
The use of a digital interface is not possible due to the speed signal.

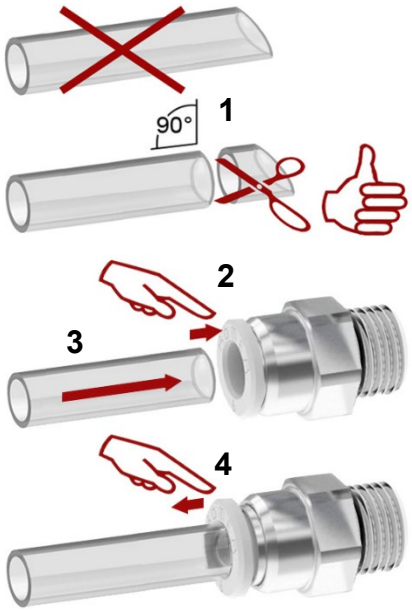
6. Connect medium tubes

When connecting the tubes at the inlet and outlet please pay attention to the flow direction. The flow direction is marked with an arrow (7) on the pump base.

(1) Pump base
(2) Threaded Hole M4
(3) Shock absorber M4
(4) Tube, suction side
(5) Release ring, push-in connection
(6) Screw connection with PTFE sealing ring (optional)
(7) Arrow for flow direction
(8) Tube, pressure side



Tighten screw connection with PTFE sealing ring to 10 Nm.



Assembling the tube:

1. Cut the tube at right angle.
➢ Only newly cut and undamaged tube guarantees tightness and safe operation.
2. Press in the release ring of the push-in connection using two fingers.
3. Insert the tube with the release ring pressed in.
4. Let go of the release ring again.

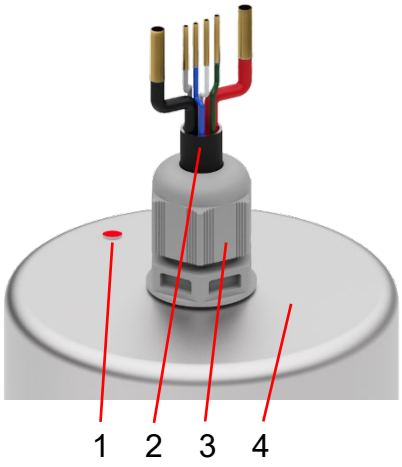
Disassembling the tube:

Press the release ring with two fingers and carefully pull out the tube.

7. Display operating status

The integrated LED shows the current operating status.

(1) Indicator LED
(2) Connection cable
(3) Cable gland
(4) Pump casing



Light signal		Description
🔵	**Flashing blue:**	Pump is ready to operate.
🟢	**Flashing green:**	The pump is not yet at the set speed.
	Continuous green:	Pump in operation and speed regulated.
🔴	**Flashing red:**	Malfunction, an unknown error has occurred.
🟡	**Flashing yellow:**	Preset values exceeded, pump is in active power limitation*.

When the supply voltage is applied, the LED flashes blue and the pump is ready for operation. If a control voltage/control current of greater than 0.5 V/4 mA is applied at the same time, the pump will start immediately. When the LED lights up green continuously, the pump has reached the correct speed.

* Power limitation: Manufacturer's protective configuration to not exceed the maximum power and settings in the parameters of the pump.

Remedy in the event of a fault / error message:

Light signal		Cause	Remedy
🔴	**Flashes 2x red:**	Internal error	Acknowledge error message**
🔴	**Flashes 3x red:**	Internal error	Acknowledge error message**
🔴	**Flashes 4x red:**	Internal error	Acknowledge error message**
🔴	**Flashes 6x red:**	Supply voltage outside the valid tolerance	Ensure correct supply voltage, then acknowledge error message**
🔴	**Flashes 7x red:**	Pump overheated	Cool down the pump, then acknowledge the error message**

** Acknowledge error message:

- Disconnect the power supply and reconnect
- via the digital interface
- Reset control voltage to 0 V or control current to 0 mA