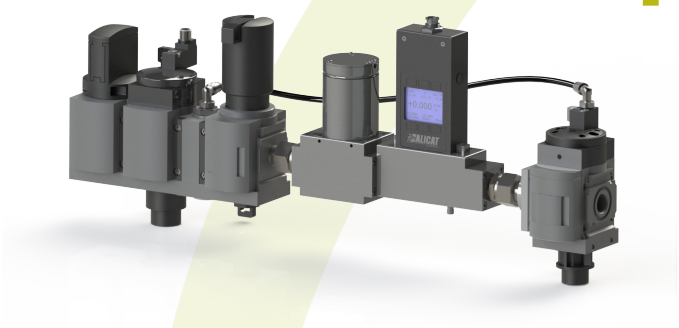
Speed Control Unit
for process transfer lines and all types of fluids

RVO©



Optional :

Gaskets :

OVERVIEW :

The RVO Speed Control Unit continuously and autonomously adjusts the pig's most suitable push pressure. It allows the RVO to be continuously controlled during the pigging process. This system can be used irrespective of the particularities of the line to pig or the product to recover. The controller is autonomous with instant data access.

KEY BENEFITS :

«Knowing how to anticipate the essential flows and pressures to control the pigging»

Compared to a standard system with a manual controller (fixed pressure), the RVO controller:

- Protects the lines from pressure surges
- Prevents the pig from blocking
- Eliminates the product's «Karcher®» effect on arrival
- Ensures user safety and the security of the installations
- Adapts to different kinds of products that can be transferred on the same line
- Increases the pig's life

It also has the particularity of:

- Detecting the pig's end of life
- Detecting a leak on the line

APPLICATIONS :

- Pigging all types of liquids on the transfer line
- Equipment specially adapted to lines conveying viscous liquids, liquids with solids or liquids that congeal (creams, chocolate, caramel, etc.)

TECHNICAL SPECIFICATIONS:

Since the push air is a compressible gas, it inevitably generates a «buffer» effect:
In some cases, the pig consumes more air than the system allows, creating a pressure difference. The push pressure then drops until it is lower than the minimum take-off pressure of the pig's blades, which causes the pig to stop on its way until the air returns to its initial pressure. Then, the pig suddenly starts again at high speed, creating instantaneous air consumption, and thus an immediate pressure drop, which in turn causes the pig to stop, and so on... This «buffer» phenomenon multiplies the number of untimely stops of the pig on a line, which results in premature wear, as the pig's blades «gum up» with each violent restart.

How the RVO controller works:
During the entire duration of a pigging operation, the RVO takes 100 measurements per second of the instantaneous air flow consumed by the pig, in order to obtain a value representative of its speed. The controller then calculates the difference between this speed and the set speed and corrects the push pressure 10 times per second until the set speed is reached. Thus, when the pig exceeds its target speed, the controller detects this and decreases the push pressure until the pig returns to its target speed; when the pig stops in the line, the controller detects a drop in its air consumption, and then increases the pressure until the pig releases and its speed returns to the target level.

The RVO controller is especially recommended in case of:

- Pump outlet pressure greater than 2 bar
- Long line and/or DN greater than 2½» (DN 65)
- Big riser pipes of liquid to be pushed
- Significant density and/or viscosity of the product to be pigged
- Several liquids of different natures to be pigged on the same line
- The manual control's efficiency is insufficient, resulting in a risk to users and surrounding equipment
- Desire to increase the life of the pig and surrounding equipment
- Packaging lines with open hoppers at the end of the line: the RVO considerably reduces the risk of splashing (stable liquid flow)

Installation & use:
The RVO controller is installed as close as possible to the station, upstream of the push liquid delivery valve(s). The controller can be used to feed several lines, provided that one pigging is completed before another is started, as the controller is designed to control the speed of one pig at a time. If the isometric allows it, it can push the same pig for the OUTFLOW & for the RETURN FLOW.

COMPONENTS:

The RVO controller consists of the following components in the following order:

- a 3/2-way manual shut-off valve with lockout,
- a 3/2-way NF 24Vdc solenoid valve for pneumatic assistance,
- a manual pressure regulator with built-in pressure gauge,
- a 24Vdc self-contained mass control core,
- a 3/2-way NF emergency decompression valve (from 0 bar) with built-in pressure gauge,

• Cut-off valve:

Manually operated 3/2-way valve, lockable in both positions (lock not supplied as standard). Manually isolates upstream and decompresses downstream, so the equipment can be locked away in the locker.

• 3/2-way NF solenoid valve for pneumatic assistance:

With its 24Vdc power supply, it provides pneumatic assistance to the 3/2-way emergency relief valve, allowing it to switch between 0 & 4 bar.

• Pressure reducing valve:

Relieves the upstream air pressure; this allows the user to set a limit to the maximum pressure available to the control core to push the pig.

• Control core:

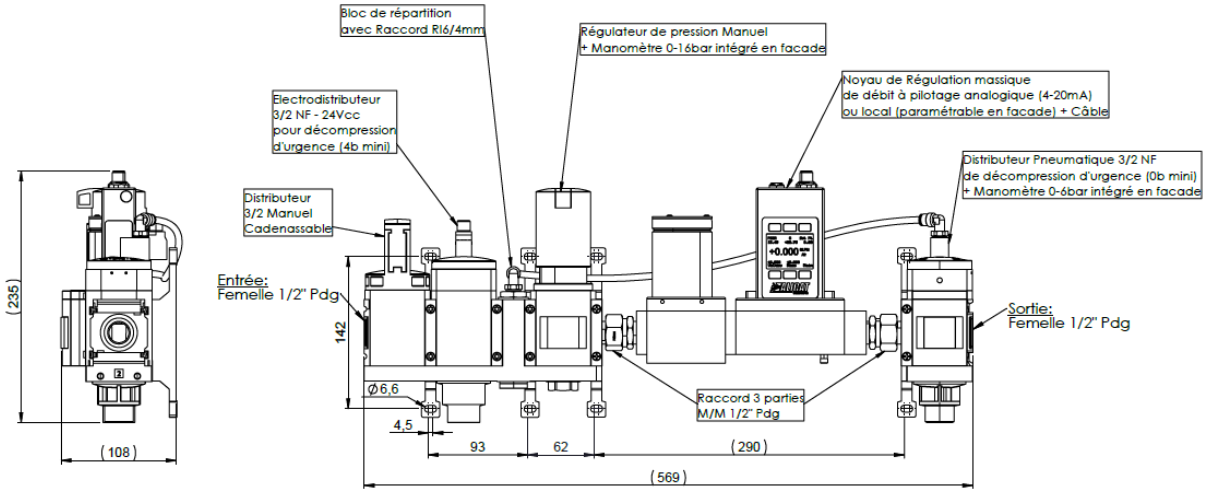
A machined stainless steel block incorporating a push flow control loop, which is composed of :

- a mass flowmeter (measures every 10 ms the instantaneous air flow consumed by the pig, in Nl/min),
- a proportional valve that varies the flow area according to the instructions received from the interface until the desired flow rate is obtained.
- a 24Vdc HMI interface used to backlight and thus electronically display the instantaneous air flow «Q» consumed by the pig in real time (in Nl/min).

A keypad on the front of the unit lets the user quickly select the local setpoint flow rate between 0 and 1300 Nl/min. Other instantaneous measurements can be displayed and many other types of push gas can be selected. An analogue 4-20 mA remote setpoint signal can be received from the controller and in return it can be provided with feedback. The response time of the control loop is < 100 ms, which means that the pig speed is automatically corrected more than 10 times per second.

• 3/2-way NF Pigging Emergency Stop (P.E.S.) valve:

Emergency stop for a pigging in progress. A pressure gauge built into the front panel displays instantaneously the pressure controlled by the core. This valve's pneumatic assistance lets it work downstream of the core on the controlled pressures, which are very low (usually ~1 bar). In the event of a lack of 24Vdc control voltage on the 3/2-way solenoid valve, the valve instantly loses its status and rapidly decompresses the downstream push gases, thanks to an identical flow section in both directions (inlet and outlet), thus allowing the pig to be stopped quickly. This safety feature, which does not exist with conventional manual controls, can pose a risk to users and surrounding equipment.



OPTIONS :

- Other push gases
- IP69K protection
- Complies with «ATEX 2014/34/UE zones 2 & 22, gas and dust»
- Adaptations to reduced space
- Reserve air supply upstream of the controller to remedy insufficient or fluctuating air flow in the main system

GUARANTEE :

12 months from the date of shipment (except in the case of special conditions)

COMPLI ANCE :

- Optional: Compliant with «**ATEX 2014/34/EC** zones 2 & 22, gas and dust»