

ELECTRO-PNEUMATIC POSITIONER INSTALLATION AND MAINTENANCE IMPORTANT: READ BEFORE USE

1. INTRODUCTION

1.1 Principal of Operation

The V200 incorporates the force balance principal of operation. The desired value, in the form of pressure, affects the membrane (1) with the force that is created and transferred to the balance arm (2). The opposing force, which represents the actual control value, is provided by the feedback spring (5) and creating force in the opposite direction on the balance arm (2). The feedback spring, resting on the feedback arm (3), is positioned by the shape and response of the cam. The cam (4) is connected to the cylinder's (actuator) piston rod via the drive.

The pilot valve (6) is connected to the balance arm and follows the balance arm's movement. The system is stable when the gold plated spool (7) is in the neutral position and the forces that affect the balance arm is in equilibrium. As soon as signal change occurs or a change in

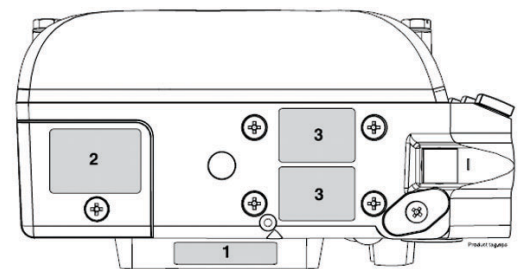
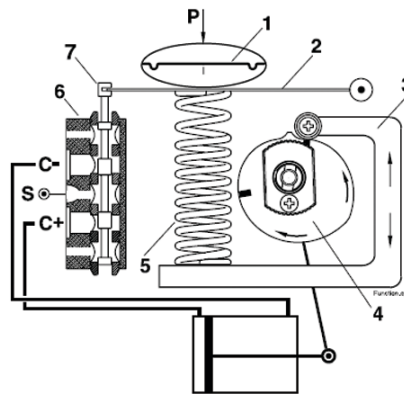
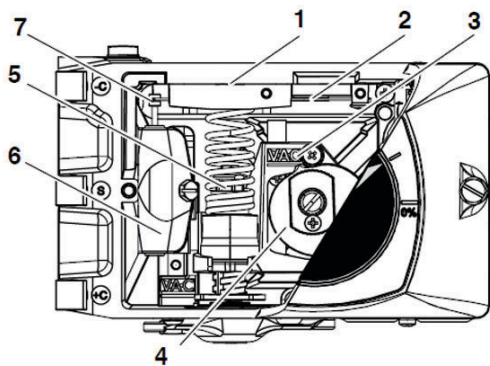
the position of the valve/actuator package occurs, the "force balance" is also changed and the spool responds. Air immediately begins to flow into the part of the actuator (C+ or C-) which allows the feedback mechanism to return the spool to the neutral position.

The system is self-stabilizing and searches for a steady state position.

1.2 Product Identification

The V200 identification tags, Serial number tag (1), product model tag (2) and feedback option tags (3) are placed as shown.

The product model tag contains information on control signal, maximum working pressure and temperature ranges. Other information can be shown depending on the model.



1.3 Air quality recommendations

Poor air quality is one of the main causes of premature functional problems with pneumatic and electro-pneumatic equipment. The pilot valve and IP-converter are precision instruments, and are therefore the most sensitive parts of the positioner.

a) Water in the supply air is a natural occurrence. This happens when air is compressed. The compression heats the air and the natural degree of water in the air can remain as moisture. When the air cools in pipes etc. the moisture condenses and becomes liquid water. Large quantities can build and sometimes flood small water separators. This excess water will eventually reach the control valve and positioner. This can cause corrosion damage to the IP converter, causing the unit to malfunction.

We strongly recommend the use of water separators with adequate capacity. Coalescing filters from a reputable manufacturer is an inexpensive way to help prevent unit malfunctions or failures, and add life to the product. These filters remove particles and moisture from air lines.

b) Oil in the supply air usually is from the main compressor. Oil can clog the small nozzles and disturb the flapper in the IP-converter. It can also cause the gold plated spool to "drag" within the pilot valve. The result is poor control or in the worst case, failure.

c) Particles in the air usually occur because of corrosion. Dirt and particles can block the small nozzles of the IP-converter. They can also cause the pilot valve to malfunction. The unit may completely fail.

To ensure normal operational safety with VAC positioner products, we recommend that a water separator and a <80 micrometer filter are mounted as close to the product as possible. If large amounts of oil are present an oil separator should be installed as well.

To further increase operational safety, we recommend that the working air is clean, dry and free of moisture, water, oil, particles and other contaminants, in accordance with the standard ANSI/SA – 7.0.01 – 1996.

2. INSTALLATION

2.1 Connections

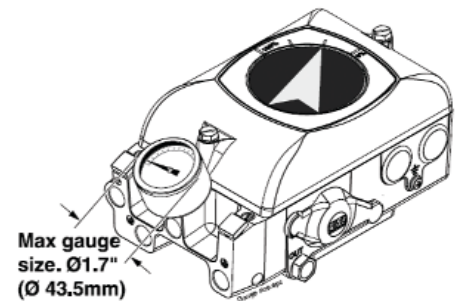
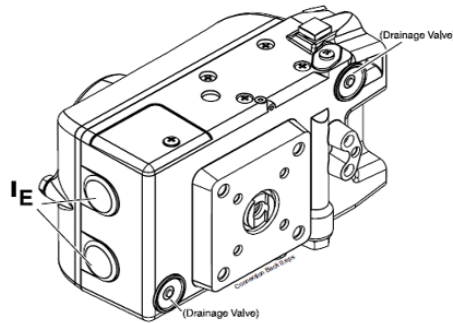
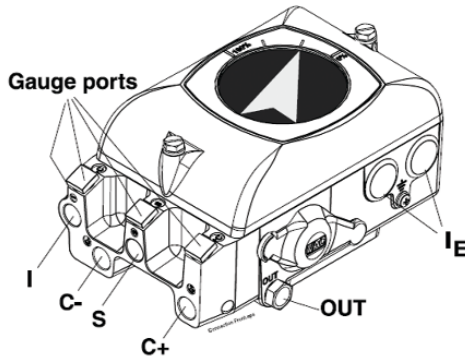
S - Supply air V200P: max. 145 PSI/1MPa; V200E: 23 – 145 PSI/0.15 – 1 MPa

I - Input, pressure signal V200P: 3 – 15 PSI/20 – 100kPa; V200E: Plugged

I_E - Input, current signal V200E: 4 – 20 mA (R_i max 250 ohm); V200P: Plugged

C+ - Actuator connection + stroke

C- - Actuator connection - stroke



OUT - All air from the actuator, IP and positioner is vented through this port. Standard equipped with a bug screen/silencer

- Air connections for male 1/4" NPT or G 1/4"
- Gauge connections for male 1/8" NPT or G 1/8"
- Cable entry for male 1/2" NPT or M20 cable fittings.
- G threads are indicated by an engraved G on the air connection side of the positioner.
- Gauge ports I, C+, C- and S are factory plugged. Remove plugs and replace with gauges.

2.2 4-20 mA connection

2.2.1 Connecting the control signal

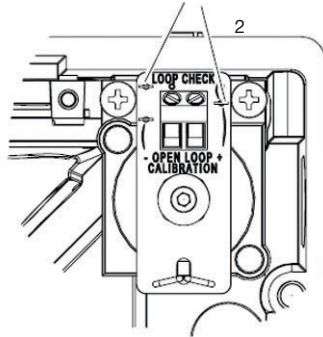
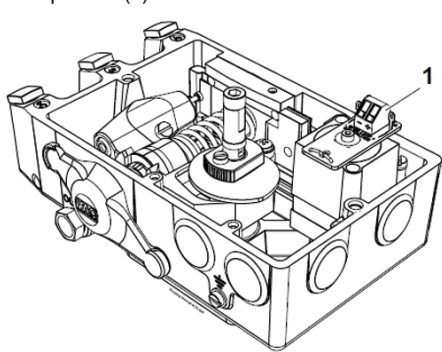
Remove the front cover and indicator. (See page 15)

Terminal block (1) is now easily accessible. Connect the cables to their respective pole.

Maximum cable size AWG 13 (2,5 mm²).

2.2.2 Checking the control signal

The control signal can be checked without having to break the signal loop. This is done by connecting a low ohmic ampere meter over the test points (2).



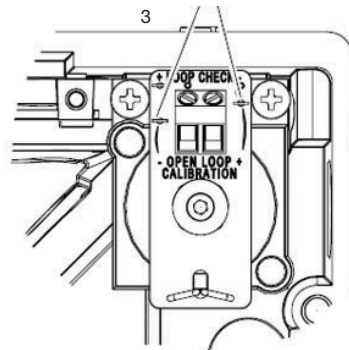
2.2.3 Bench test with the calibrator

When bench testing, it is possible to connect the control signal (signal generator clips) to the two points (3), thus eliminating the need for temporary leads.

2.2.4 Checking the IP internal circuit

With an ohm meter connected over the two test points (3) it is possible to check the IP's internal circuit.

At room temperature the meter should read ~150 – 200 ohms. No reading indicates an internal circuit break and the IP converter needs replacement.



The IP converter is factory-adjusted. No extra range or zero adjustments are necessary.

3. SAFETY INSTRUCTIONS

CAUTION: Beware of moving parts when positioner is operated!

CAUTION: Beware of parts with live voltage! A voltage, which is normally not dangerous, is supplied to the positioner. Avoid touching live parts and bare wires as well as short circuiting live parts and the housing.

CAUTION: Do not dismantle a pressurized positioner! Dismantling a pressurized positioner will result in uncontrolled pressure release. Always



isolate the relevant part of the pipeline. Release the pressure from the positioner and the piping. Failure to do this may result in damage or personal injury.

CAUTION: Do not exceed the positioner performance limitations!

Exceeding the limitations marked on the positioner may cause damage to the positioner, actuator and valve. Damage or personal injury may result.