atos
the smart electrohydraulics

Pressure valves

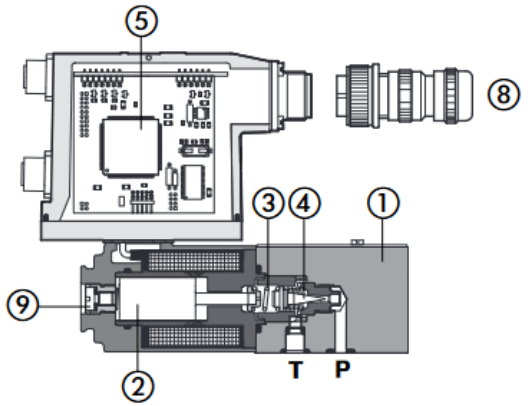
1. Types of relief valves

What is a relief valve?

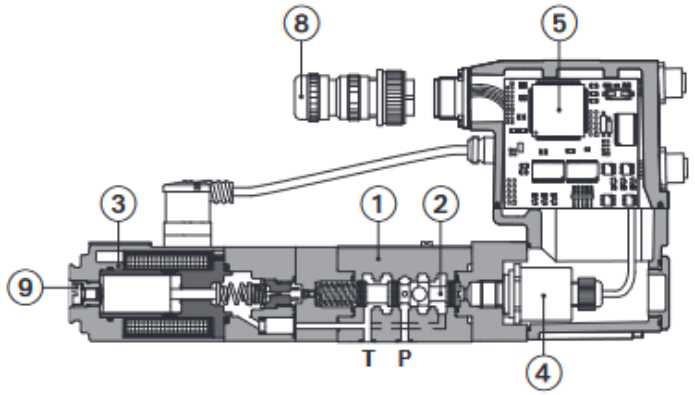
- **Relief valves** *is a device used to limit pressure within a hydraulic circuit*
- *Primary function: Protect a circuit's equipment from pressure overloads*
- *When the pressure exceeds the maximum limit set, the shutter opens the passage of the fluid under pressure:*

  A fraction of the fluid flow rate on the line is discharged

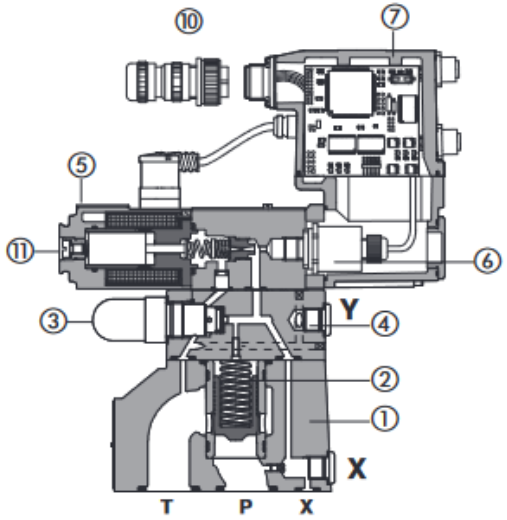
  The regulated pressure returns less than the target



RZMO-AES-BC-010



RZMO-RES-P-BC-030



AGMZO-RES-P-BC-20

1. Types of relief valves

Valves to be tested

RZMO-AEB-NP-010/100:

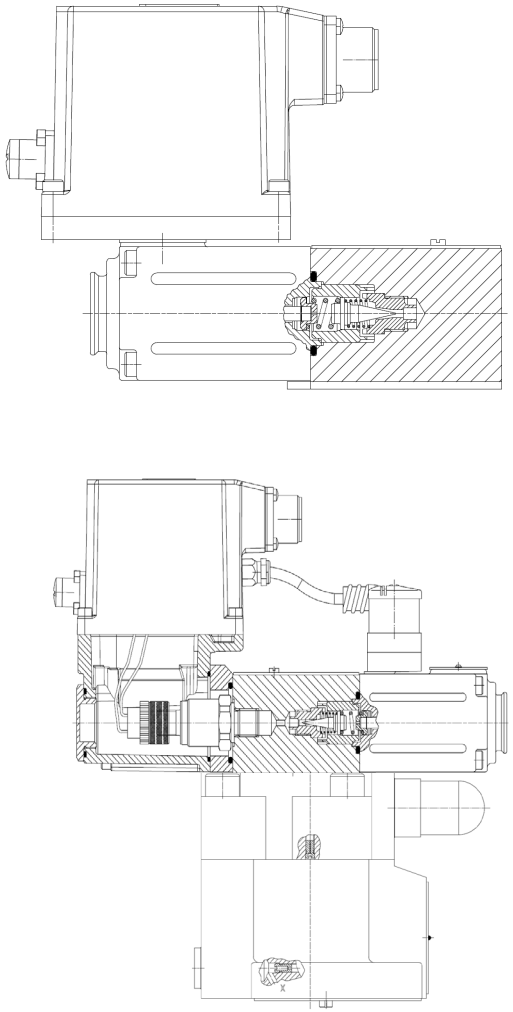
- *Poppet type, direct, digital proportional relief valves for pressure open loop controls.*
- *Max flow: 4 l/min.*
- *Flow rate for tests: 1l/min*

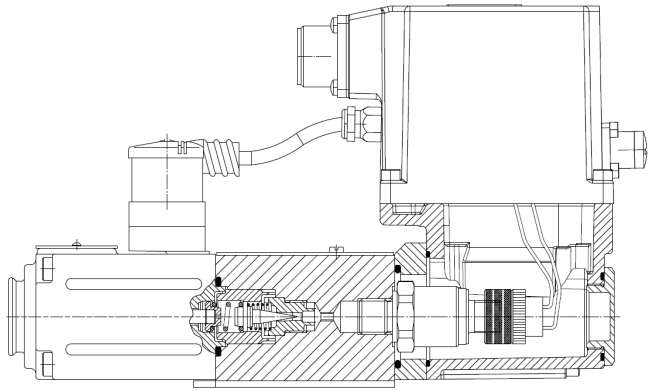
RZMO-REB-P-NP-010/210:

- *Poppet type direct operated digital proportional relief valves with on-board pressure transducer for pressure closed loop controls*
- *Max flow: 4 l/min.*
- *Flow rate for tests: 1l/min*

AGMZO-REB-P-NP-10/210:

- *Poppet type, piloted, digital proportional relief valves with on-board pressure transducer for pressure closed loop controls*
- *Max flow: 200 l/min.*
- *Flow rate for tests: 50l/min*

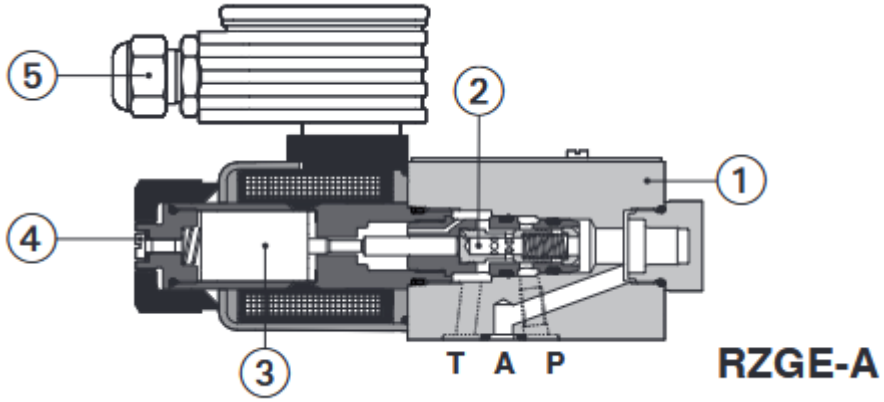




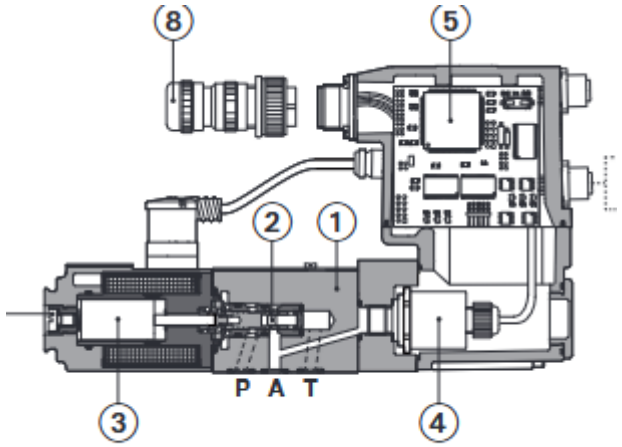
1. Types of reducing valves

What is a reducing valve?

- **Reducing valves** *is a device used to limit pressure in a part of the hydraulic circuit*
- *Primary function: Protect a part of circuit's equipment from pressure overloads*
- *When upstream pressure is higher and exceeds the limit set, downstream pressure is kept constant*



RZGE-A



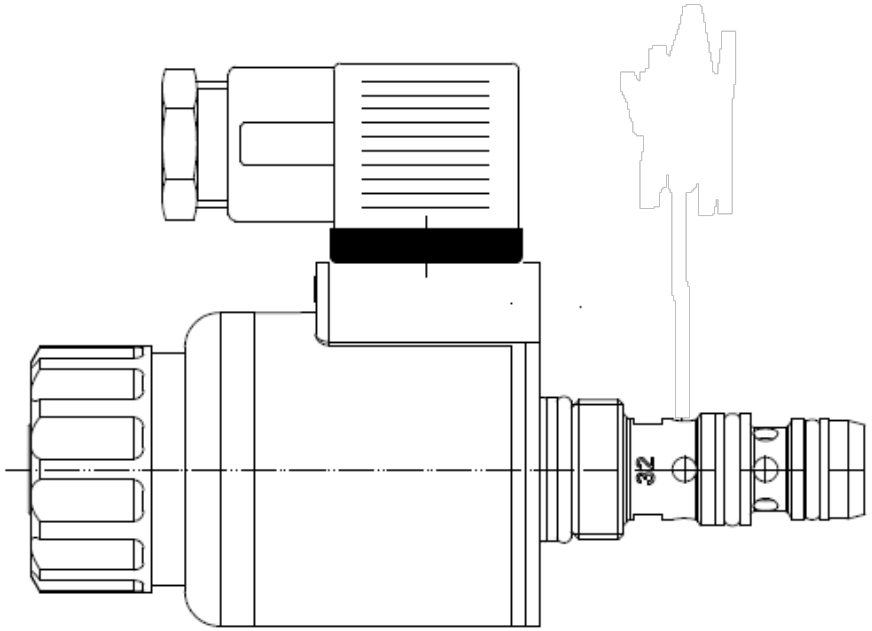
RZGO-RES-P-BC-010

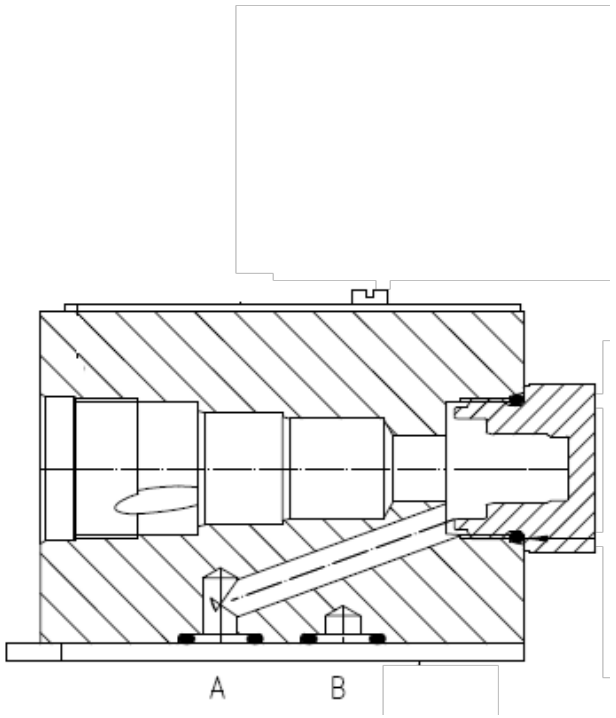
1. Types of reducing valves

Valves to be tested

RZGE-A-010/210:

- *Poppet type, direct, proportional pressure reducing valves for open loop pressure*
- *controls.Max flow: 12 l/min.*
- *Flow rate for tests: 1l/min*





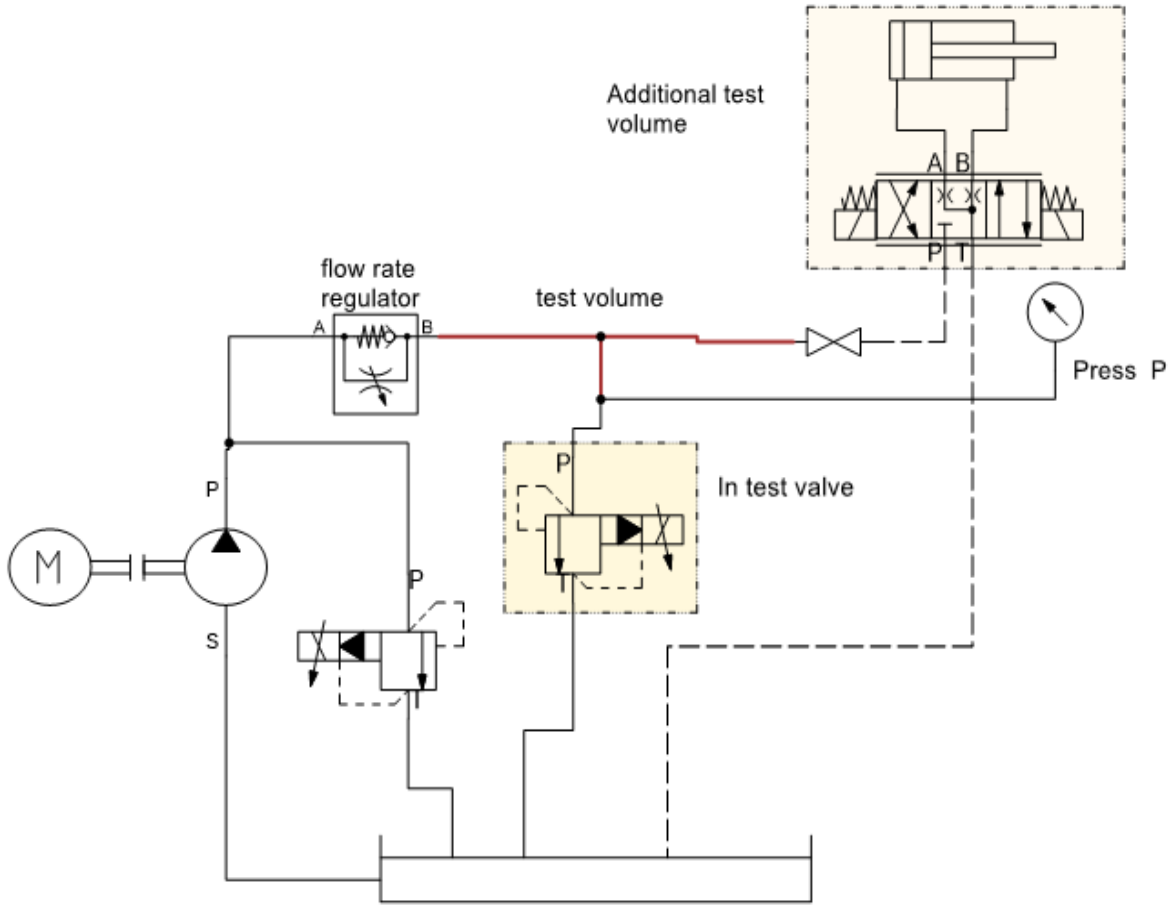
2. Functional tests

Hydraulic schematic

Hydraulic schematic for pressure valves:

Response times and valve stability are affected by:

- *Entry flow rate*
- *Plant volume*
- *Stiffness of the implant*

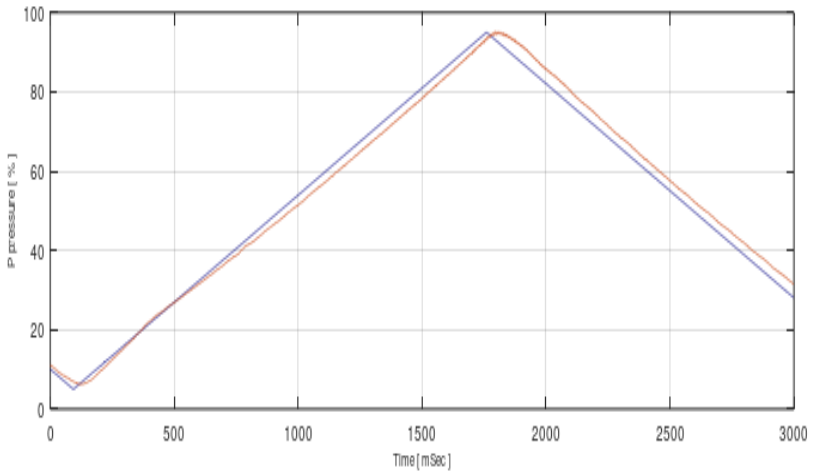


2. Functional tests

Preliminary tests

FLUSHING

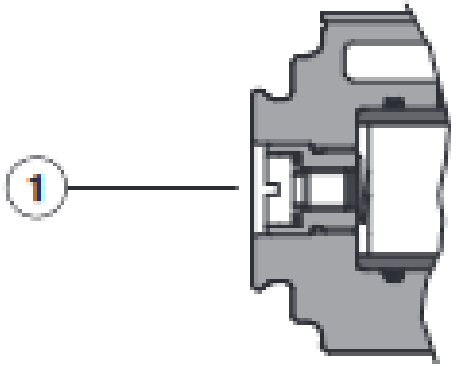
- *Set the flow rate for the valve in test.*
- *Give the valve a triangular wave control with amplitude 10%-90% and let it move for about a minute*



-Reference
-Regulated pressure

AIR BLEEDING

- *The air eventually trapped inside the solenoid must be bled-off though the screw (1) located at the rear side of the solenoid housing.*
  The presence of air may cause pressure instability and vibrations.
- *Set pressure to the minimum possible and unscrew*
- *Repeat the process 2/3 times*



2. Functional tests

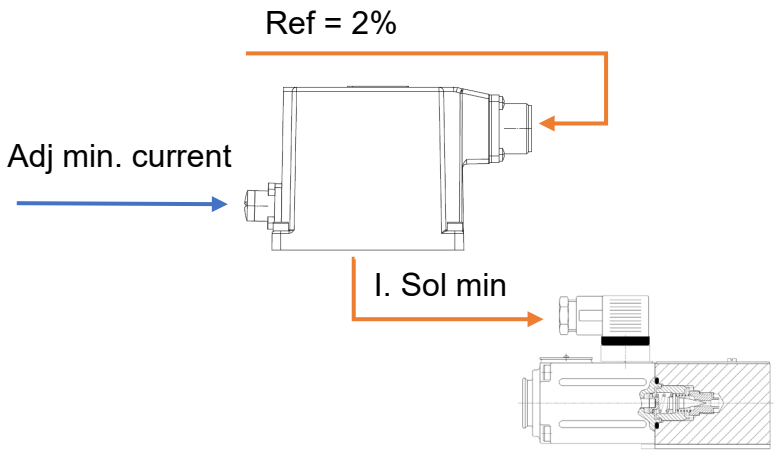
Regulation of MINIMUM CURRENT and MAXIMUM CURRENT

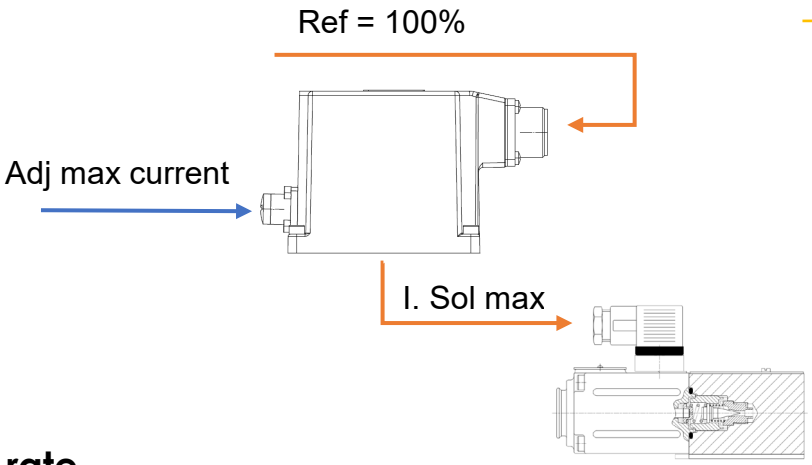
MINIMUM CURRENT

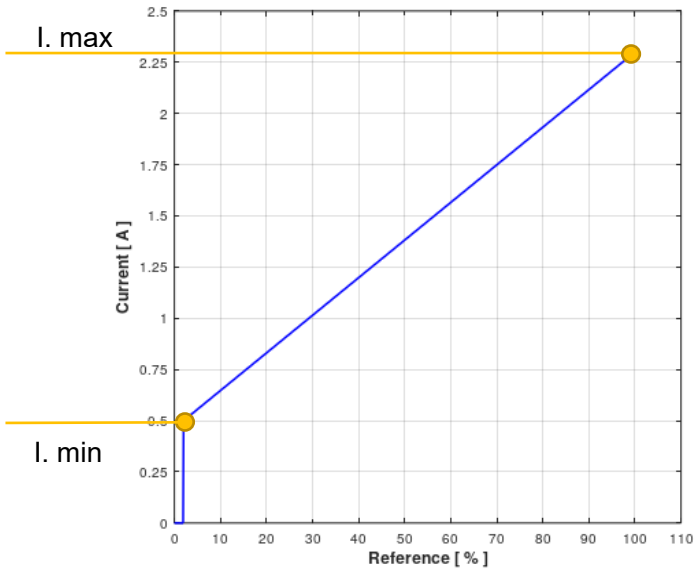
It is the current supplied to the solenoid necessary to appreciate an increase in pressure starting from the minimum pressure condition.

MAXIMUM CURRENT

It is the current supplied to the solenoid necessary to obtain the maximum pressure expected for the valve under test.







NOTE: Adjustments to be made at constant flow rate

2. Functional tests

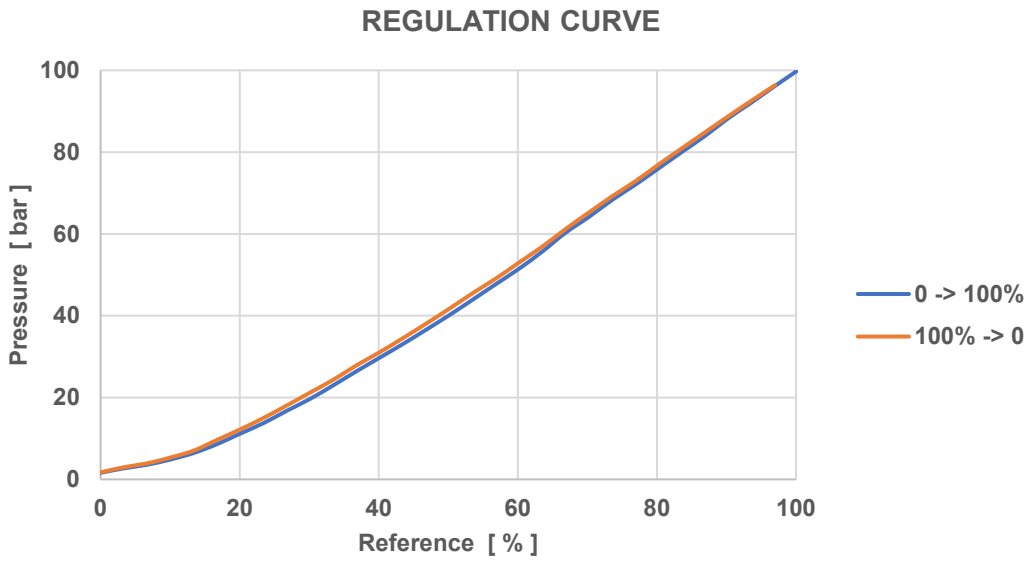
CHARACTERISTIC CURVES

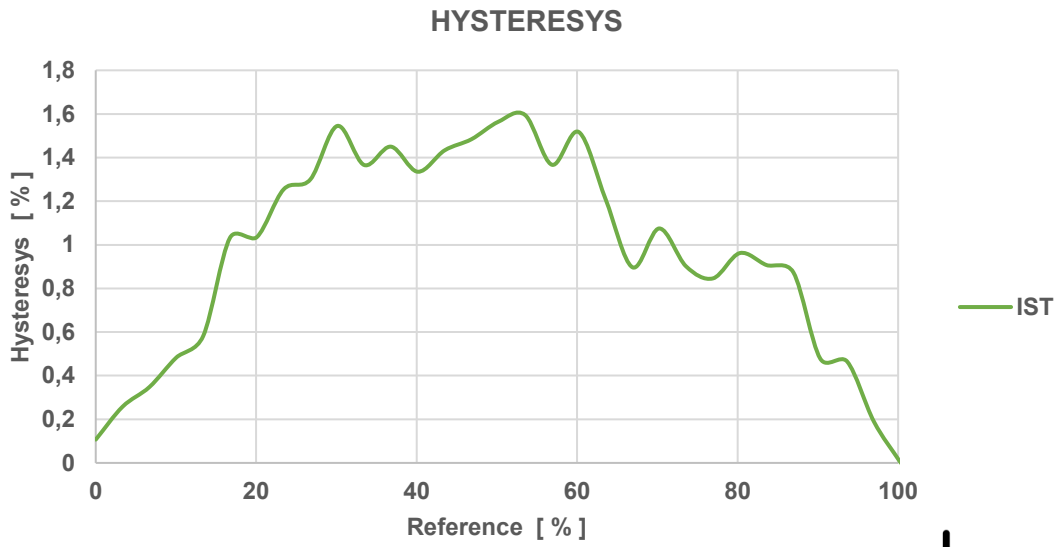
REGULATION CURVE

- *Measurement of the pressure regulated according to the electrical control supplied.*
- *It is performed by increasing the reference command provided to the valve from 0 to 100%.*
- *Constant flow rate*

HYSTERESYS

- *Point difference between the curve obtained by providing an electrical control signal from 0 to 100% and the one obtained with a command from 100% to 0.*
- *Constant flow rate*





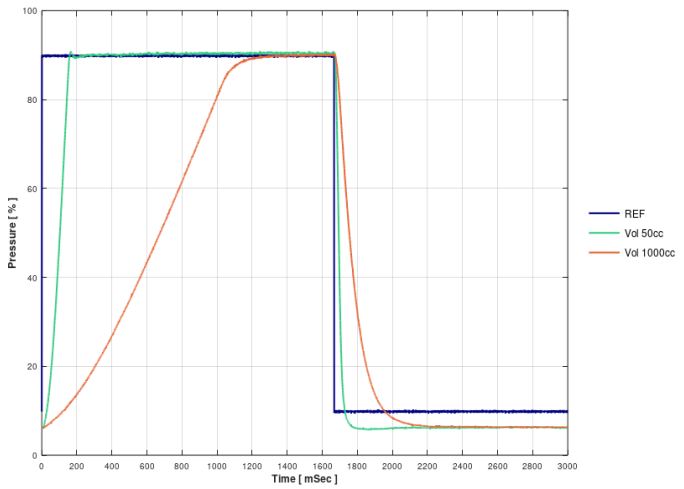
2. Functional tests

How volume affect the response times

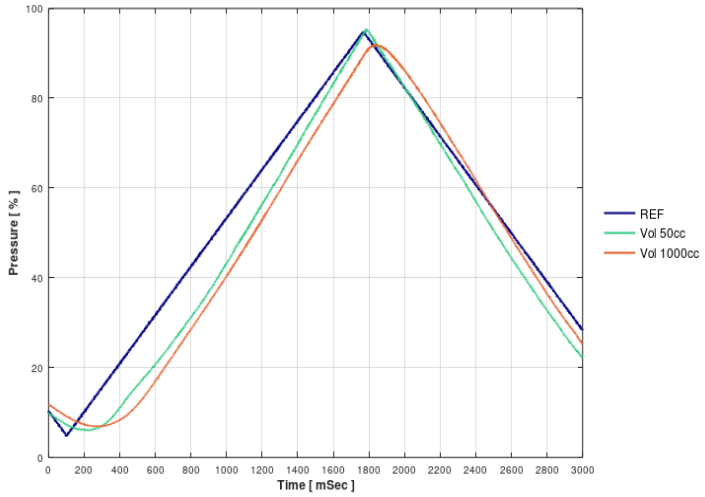
Measurement of the behavior of the regulated pressure in a period.

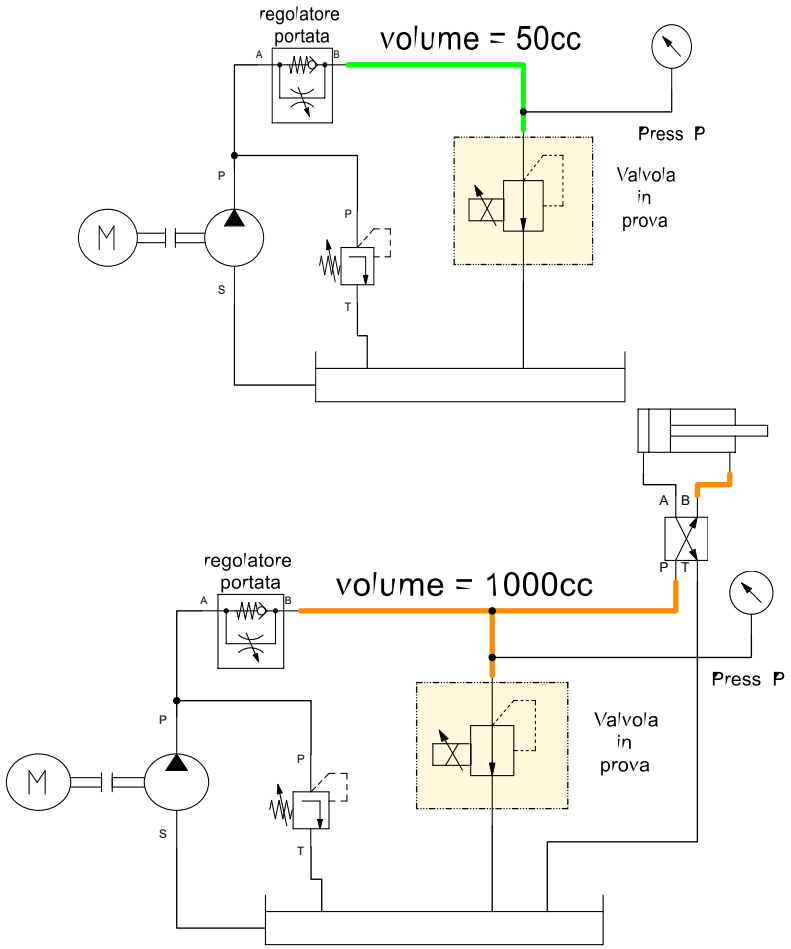
Several tests can be performed to evaluate the behavior of the regulated pressure:

- **Square wave commands.**



- **Triangular wave commands**





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