

Magnetizing Device for Servovalves

Description

(for professional uses only)

The magnetizing device is a part of the tests system ValveExpert. It consists of a variable transformer and an electromagnetic head (see the pictures below). Together with a servovalve test stand ValveExpert series, it allows adjust magnetic field of Alnico (typically 8–12% Al, 15–26% Ni, 5–24% Co, up to 6% Cu, up to 1% Ti) permanent magnets used in servovalves with mechanical feedback like Moog 76 series.

The variable transformer is used to adjust current through the coil of the magnetic head. The magnetic head has a switch which is used to magnetize & to demagnetize the magnets of the valve under adjustment.



Variable transformer



Magnetizing head

Short description of the magnetizing/demagnetizing process

Demagnetizing

1. Turn the handle of the variable transformer to the maximal position.
2. Put the coil above the first stage of the valve under adjustment.
3. Press the switch on the magnetizing head (demagnetizing position), remove the head from the valve, and switch off the magnetizing head. To exclude the extra heating of the coil, duration of this process must be very short. It takes usually less then a second. Note that demagnetizing does not depend from this time.
4. Check the flow rate of the servovalve. The flow should not depend of the control signal or this dependence must be very small.

Magnetizing

1. Turn the handle of the autotransformer in the “proper” position.
2. Put the coil above the first cascade of the valve.

3. Press the switch on the magnetizing head (magnetizing position) for a very short time. Duration of such an impulse should not be more than a second. Note that magnetizing level does not depend of this time and 200ms is enough for magnetization.
4. Remove the magnetizing head from the valve and check the flow of the servovalve. Usually it must be nominal flow $\pm 10\%$ at nominal signal.
5. Repeat the steps 1-4 if the value of the flow is not correct.

In order to find the “proper” position of the autotransformer handle we usually use three test points. It means that we magnetize a servovalve at three different levels. (We use 80, 120 and 150 values of the variable transformer handle). Then we prognosticate the “PROPER” position using a spline curve. But, with some experience, the “proper” position can be found experimentally without any computer extrapolation. Note that usually you have to demagnetize your valve completely if it is over-magnetized.

Note, current through the coil of the magnetizer can be up 6 A. It is a big power which heats the coil fast enough. Therefore, please care that your coil is not too hot (<50° C).