Title: EL positioner option: Special characteristic to give butterfly valve control for linear valve flow vs. input signal

Upon request Kinetrol can supply a positioner fitted with a circuit that will provide an output characteristic to suit a butterfly valve. By replacing the standard circuit (with 10 non-linear and one linear control response curves) by one containing a microprocessor programmed with 10 different non-linear curves and one linear, the valve can be controlled to give optimum flow control with a butterfly valve.

In general the pressure drop across a valve will change as the valve opens, and this changes the flow/valve position characteristic. The five solid line curves on the graph linearise the response for valve pressure drops which fall to a range of values as the valve is opened fully, see below.

The values below are the pressure drop with the valve full open expressed as a percentage of the pressure drop with the valve closed.
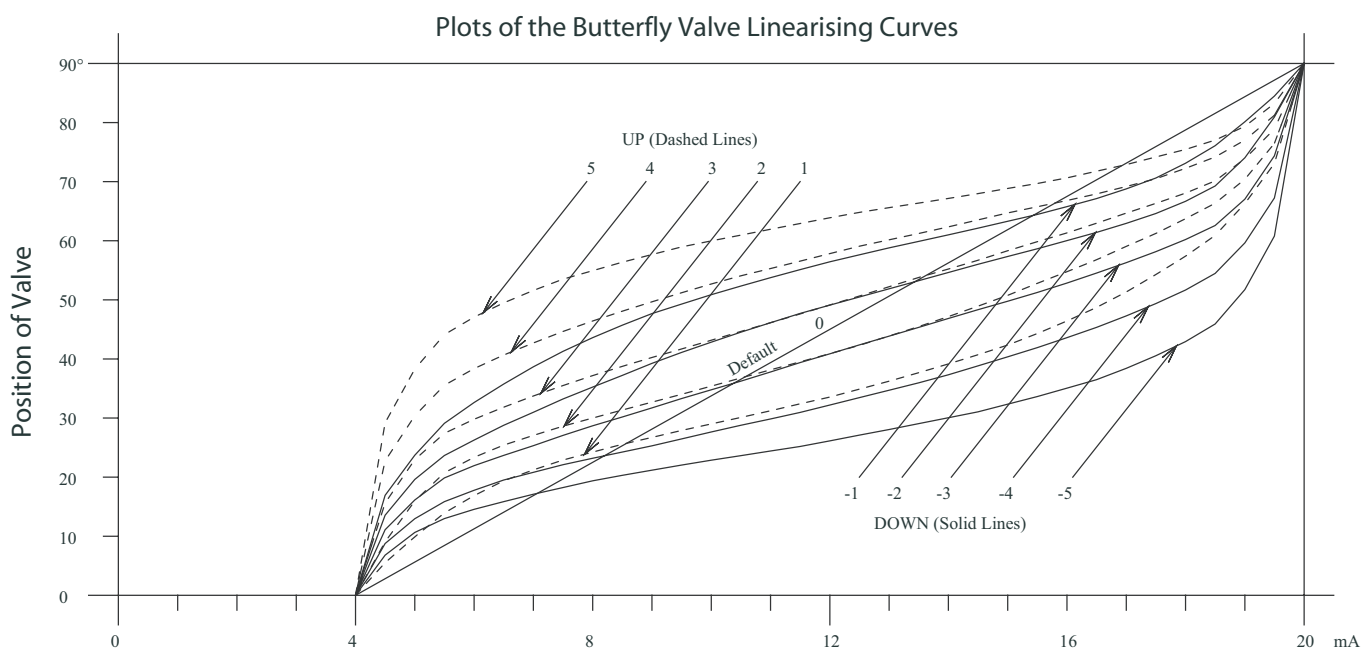
Curve -1 for 100% (this should be used to linearise a butterfly valve which is operating with a constant pressure drop)
Curve -2 for 30%
Curve -3 for 10%
Curve -4 for 3%
Curve -5 for 1%

Plots of the Butterfly Valve Linearising Curves

Example

A butterfly valve controlling the flow of a fluid with a 10% constant pressure drop, gives 50% of its fully open flow at an angle of opening of roughly 40 degrees. We would thus reccommend the user set the control response to curve -3, here 12mA (half signal) would open the valve to 40 degrees to allow 50% flow rate. The user can select one of the eleven pre-programmed curves by going into SETUP mode (see TD 76 section 4.13).