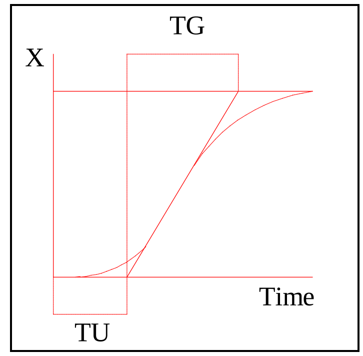
Calculating the Proportional value for Chlorine controllers



$$XP = \frac{X}{Y} \times \frac{TU}{TG} \times \frac{Y\,max}{X\,max} \times 100\%$$

X = Change of Chlorine concentration from initial sensing point to steady state (in ppm.)

Y = Metering rate (as a percentage of stroke frequency at a set stroke length.)

TU = Distance of velocity lag in seconds (Time from start of dosing until Chlorine is sensed.)

TU is influenced by the distance between the metering point and the point where the measuring water is extracted, the length of the measure water line and the velocity of flow. These factors cause a certain time to pass until the Chlorine change is registered at the controller.

TG = Compensating time in seconds

The Chlorine value will now increase for some time after the so-called compensating time TG , it will seek a new balanced Chlorine value.

Y max = Metering rate = 100%

X max = Chlorine = 2.0 ppm

In the following example, metering was started with a stroke rate of 50%. After 14, seconds we can see the first reaction at the controller. After another 100 seconds, the Chlorine value remains almost steady. The newly set Chlorine value is 0.5 ppm values above the initial value.

$$XP = \frac{.5\ ppm}{50\%} \times \frac{14\ seconds}{100\ seconds} \times \frac{100\%}{2.0\ ppm} \times 100\% = 7\%$$

$$XP = \frac{X}{Y} \times \frac{TU}{TG} \times \frac{Y\,max}{X\,max} \times 100\% \quad \text{(Proportioning band)}$$

Set proportional bandwidth with potentiometer 9. Full CW on the potentiometer will give a proportional band of 5%. Full CCW will give a band of 10%.