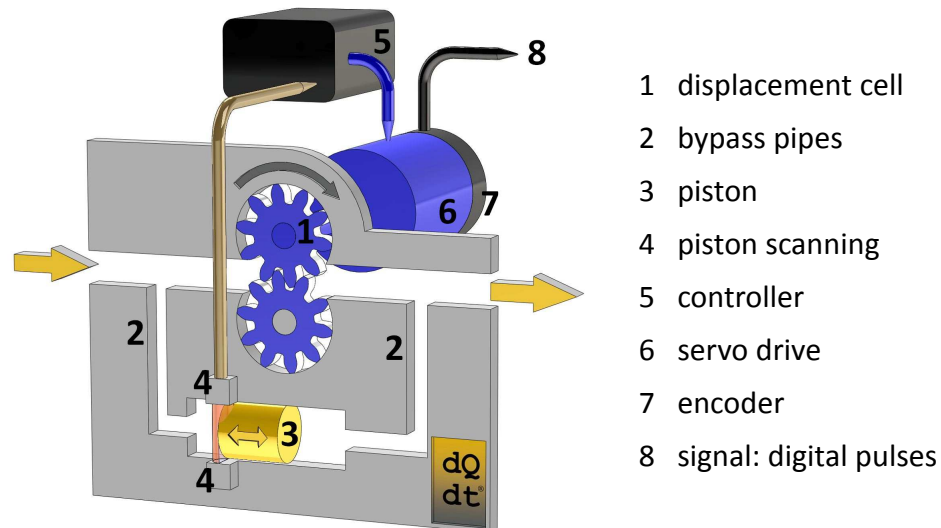


4 The measuring principle without pressure loss



- 1 displacement cell
- 2 bypass pipes
- 3 piston
- 4 piston scanning
- 5 controller
- 6 servo drive
- 7 encoder
- 8 signal: digital pulses

1. The $\Delta p = 0$ measuring principle

The measuring cell is an positive displacement gear meter.
It transports the fluid from the inlet (left) to the outlet (right)

The axis of the top gear is directly connected to the encoder (7) via the servo drive (6). The encoder generates 500 pulses per turn (8). The volume of one turn is exactly determined in the dQdt calibration laboratory. The reciprocal result is the calibration factor: pulses per ml.

The detection of pressure gradients is operated by a piston (3). The piston section is connected to the inlet and the outlet of the flow meter via the bypass pipes (2). The position of the piston is scanned by sensors (4) and the controller (5) calculates the speed of the servo drive (6). When the piston does not move there is no pressure gradient among inlet and outlet and the adjusted gear speed corresponds exactly to the flow.

The adjusting of pressure gradients is so fast that only the stationary state is seen in practice. Load steps are followed by the meter nearly immediately (< 50ms). These qualities enable very dynamic measurements, a very large measuring range (> 1:400) and the exact acquisition of lowest flows (down to 0,002 L/h).