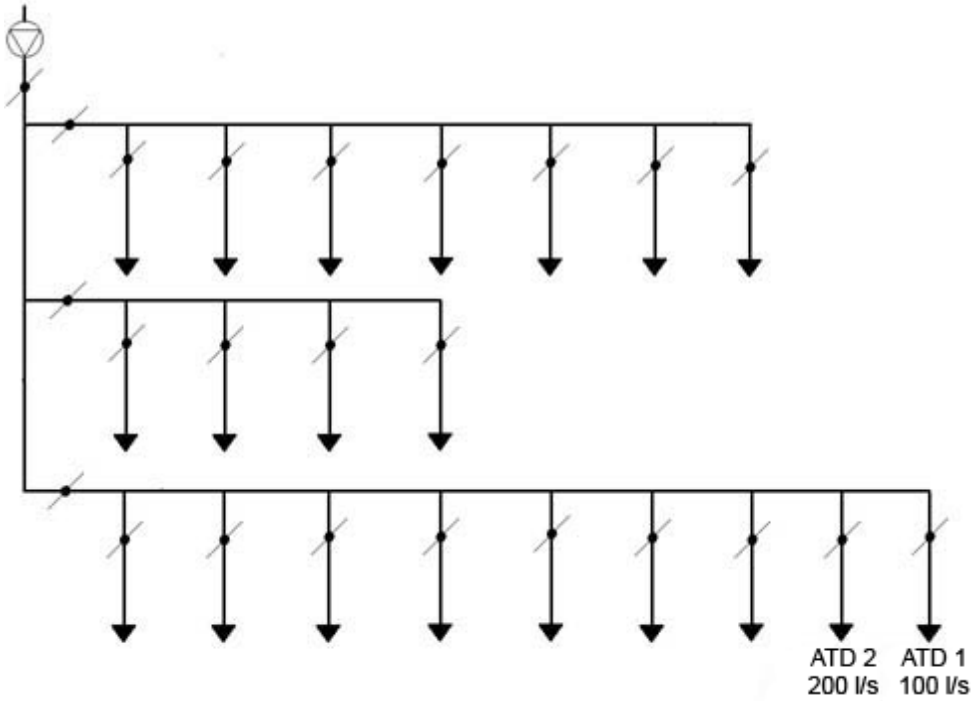
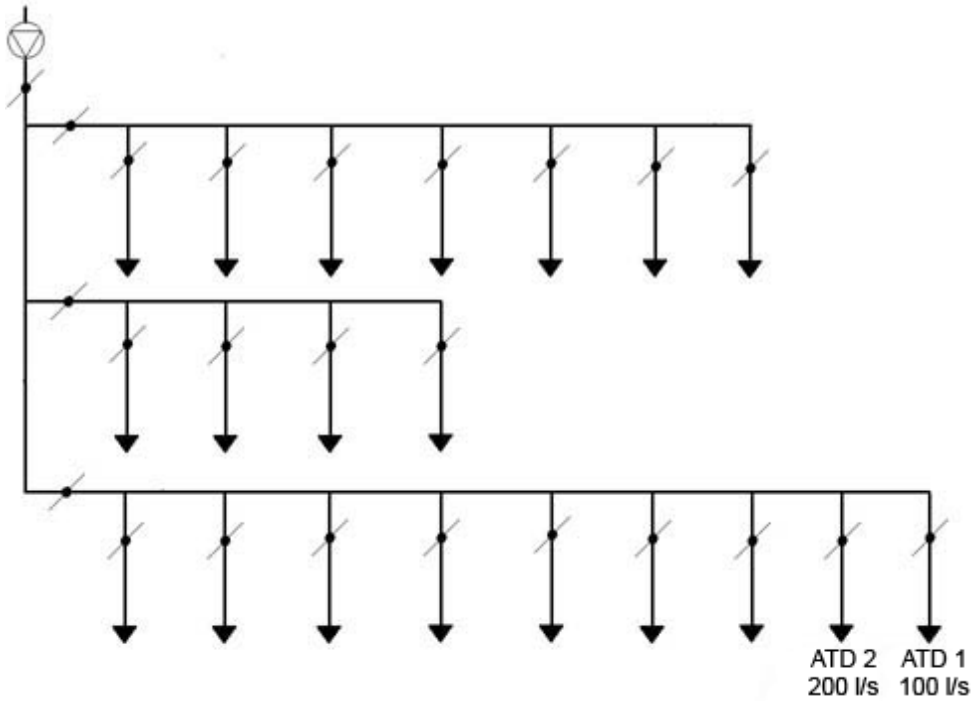
Ventilation balancing according to the proportional method



Balancing without SwemaTwin
The ventilation system is divided in a number of branches.
Choose the branch which has the highest flow in relation to the projected flow.
That is the highest quotient: $Q_{measured}$ / $Q_{projected}$. (Q=Flow)
Select the reference ATD on chosen branch. The reference ATD is the ATD that is furthest away on the branch. The reason is that this ATD often has the lowest flow in relation to projected value. ($Q_{measured}$ / $Q_{projected}$) and need not to be Throttled. If there is another ATD with lower flow relation. (index ATD) you shall throttle the reference ATD, so you get the same relation as on the index ATD. (The index ATD will and shall be completely open after balancing.)
Now, start to adjust ATD 2 to get the same relation ($Q_{measured}$ / $Q_{projected}$) as for the reference ATD (ATD 1). When you throttle ATD 2 the flow at the reference typically rises.
Go back and forth to see what influence your adjustment caused.
That means that ATD 2 has to be changed a few times before the relation is reached. ($Q_{measured}$ / $Q_{projected}$). (Two persons can also be involved when balancing - one adjusts and one reads the reference ATD and reports the result directly or by mobile phone or radio.

Example: The reference ATD, ATD 1 is projected to 100 l/s och ATD 2 to 200l/s.(ATD 2 should be twice the flow of ATD 1.) Unadjusted, ATD 1 reads 125 and ATD 2 300l/s. For the reference ATD $Q_{measured}$ / $Q_{projected}$=1,25 and 1,5 for ATD 2.
By throttling ATD 2 to 250 the correct relation to ATD 1 (1,25) is tried to be reached.
What is then the flow at ATD 1? It measures 135l/s. By throttling the flow at ATD 2 some air moved over to ATD 1. There is a need to go back to ATD 2 to adjust to 270 l/s. Now the flow decreased by to 132l/s at ATD 1. ATD 2 is adjusted to 264. ATD 1 increases to 133.
It is accepted and ATD 3 is going to be balanced. ATD 3 is balanced o the reference (ATD 1) in the same way as ATD 2t.
Thereafter ATD 4...9. Now all ATDS on the branch have the same relation: $Q_{measured}$ / $Q_{projected}$.
The same procedure is made for the other branches until they are all balanced.
Thereafter the branches are balanced as if they were single ATDs. As measuring points the reference ATDs on each branch can be used.
All ATDs have now the same flow relation ($Q_{measured}$ / $Q_{projected}$).
Adjust the the total flow by adjusting the fan. Ready.



Balancing with SwemaTwin

As in the example above the flow in the reference ATD (Air Terminal Device) is changed when another ATD is adjusted.

SwemaTwin always shows the relation between the ATD that is measured and the reference ATD in %.

Balance the relation between the two TADs according to drawing. In the example above the relation between ATD 2 and 1 should be 200%.

Regardless of what flow is measured on ATD 2, ATD 2 should be balanced to measure double the flow of ATD 1. (200%).

Swema 3000 shows the flow that is measured on ATD 2 together with the flow of the reference ATD, ATD 1.By using SwemaTwin there is no need to run back and forth between the ATD that is to be balanced and the reference ATD. Continue the same way on ATD 3...9. Balance each branch to the correct relation within each branch. Then balance each branch proportionally and finally adjust the total flow and each ATD will have the correct flow.