This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

The fans are started sequentially. Fans 1 and 2 get to suitable parts of their characteristics. Fan 3 can't get out of stall.

At 20 seconds, damper 1 opens

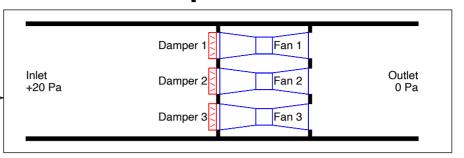
At 40 seconds, fan 1 starts

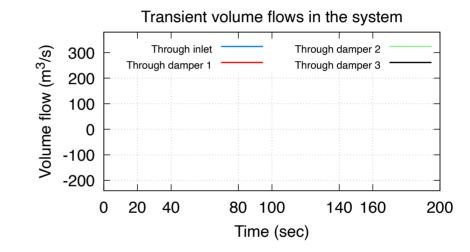
At 80 seconds, damper 2 opens

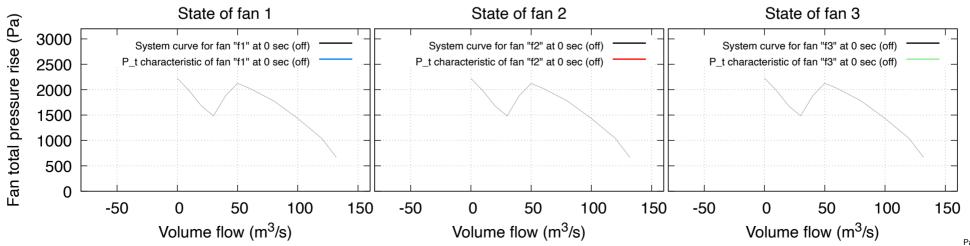
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

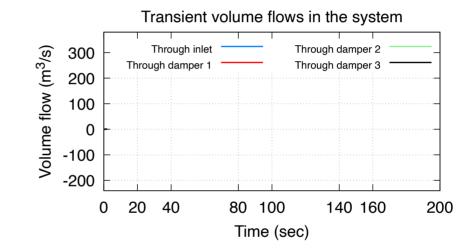
At 80 seconds, damper 2 opens

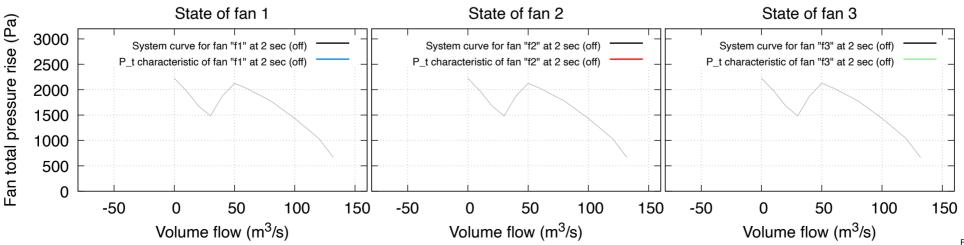
At 100 seconds, fan 2 starts

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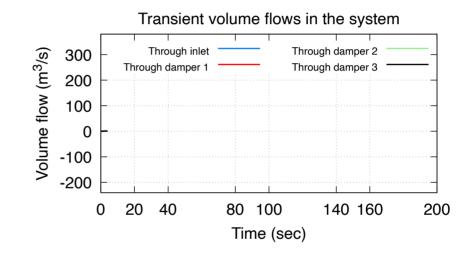
At 80 seconds, damper 2 opens

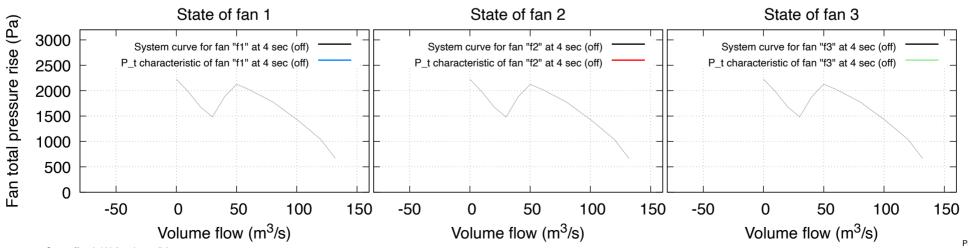
At 100 seconds, fan 2 starts

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At 40 seconds, fan 1 starts

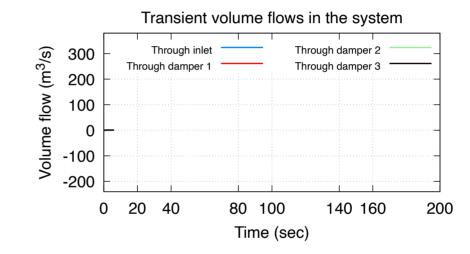
At 80 seconds, damper 2 opens

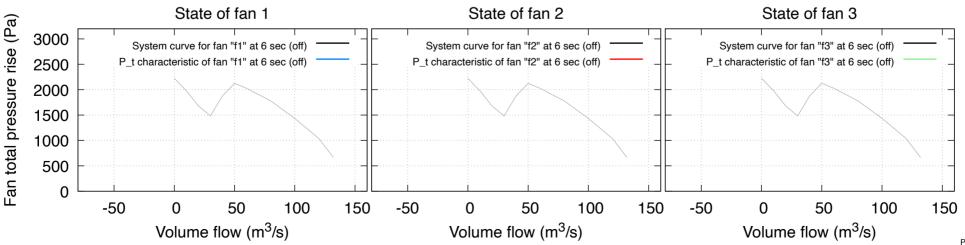
At 100 seconds, fan 2 starts

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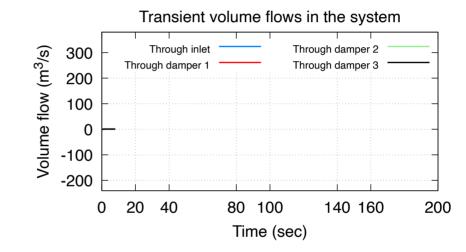
At 80 seconds, damper 2 opens

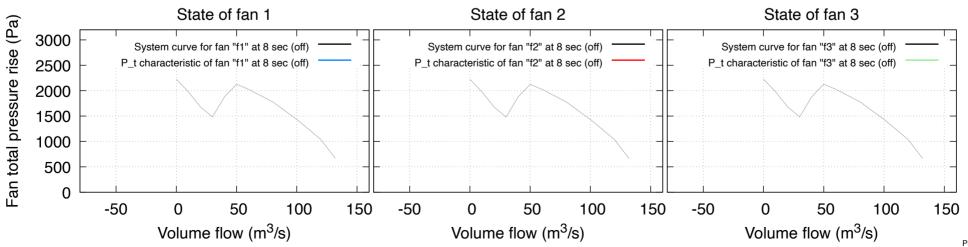
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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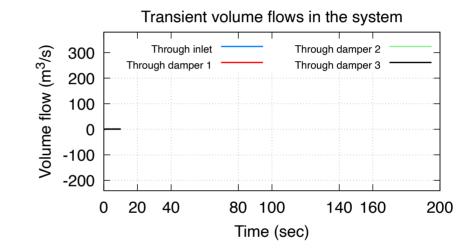
At 80 seconds, damper 2 opens

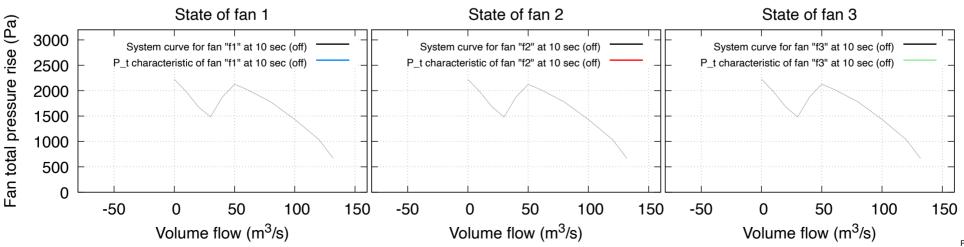
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

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At 40 seconds, fan 1 starts

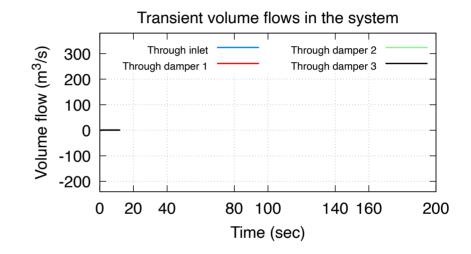
At 80 seconds, damper 2 opens

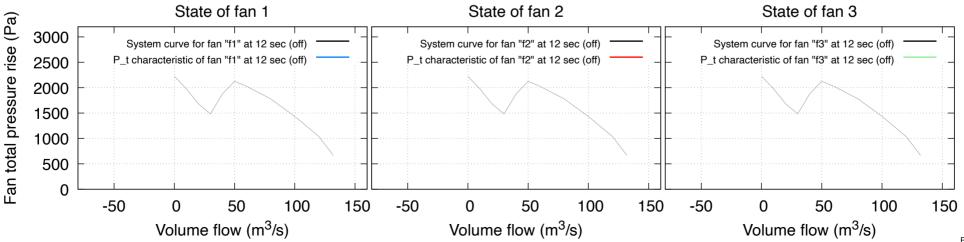
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



rage /

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Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 40 seconds, fan 1 starts

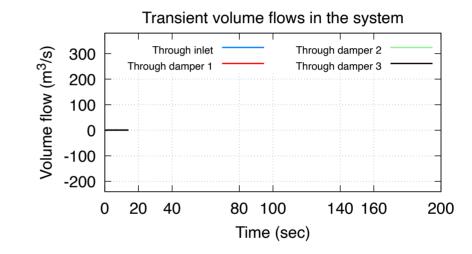
At 80 seconds, damper 2 opens

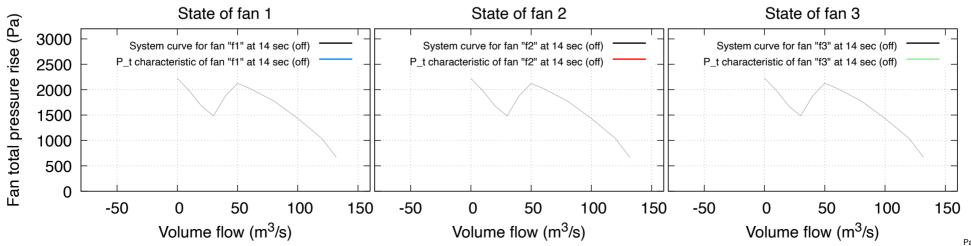
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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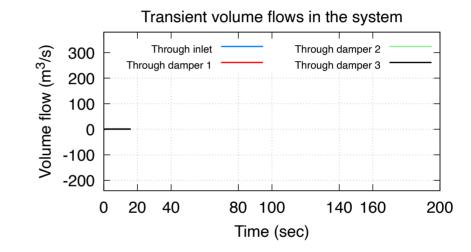
At 80 seconds, damper 2 opens

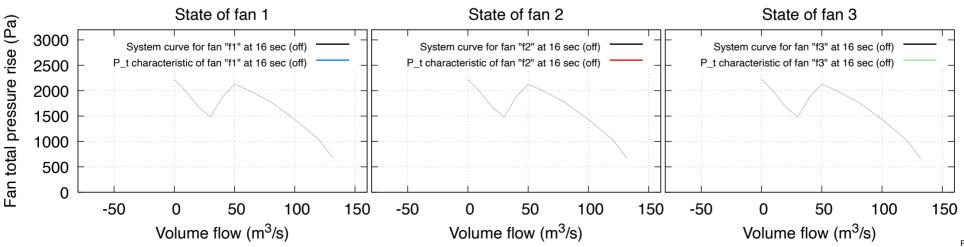
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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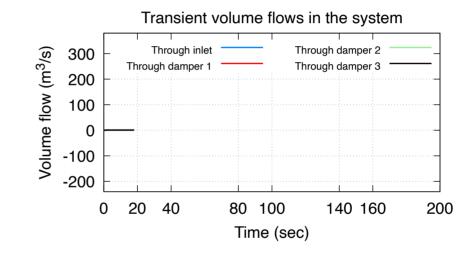
At 80 seconds, damper 2 opens

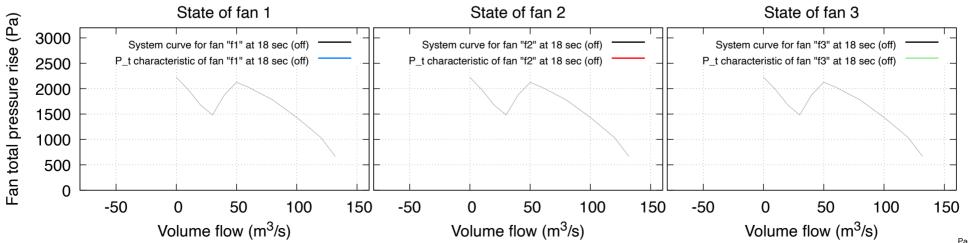
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

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At 40 seconds, fan 1 starts

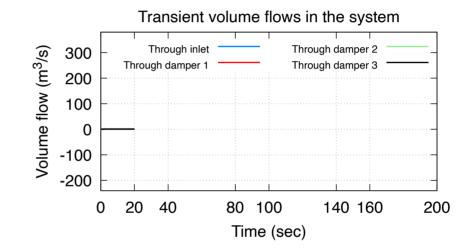
At 80 seconds, damper 2 opens

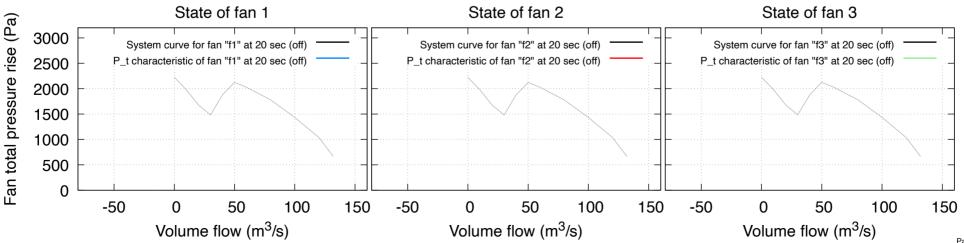
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



rage II

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Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

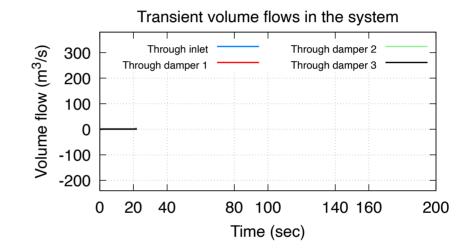
At 80 seconds, damper 2 opens

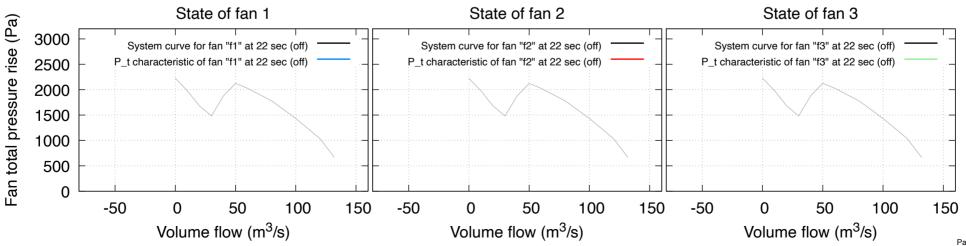
At 100 seconds, fan 2 starts

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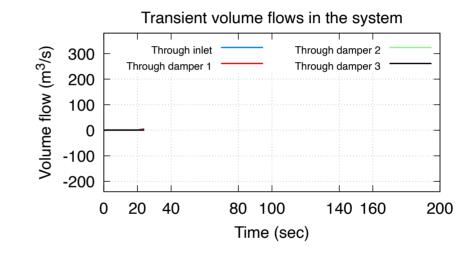
At 80 seconds, damper 2 opens

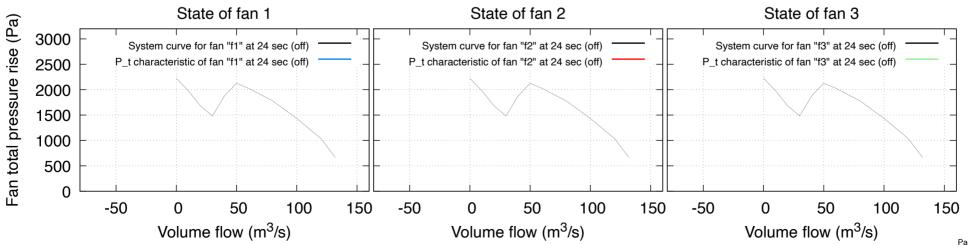
At 100 seconds, fan 2 starts

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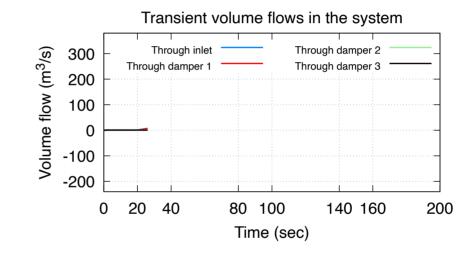
At 80 seconds, damper 2 opens

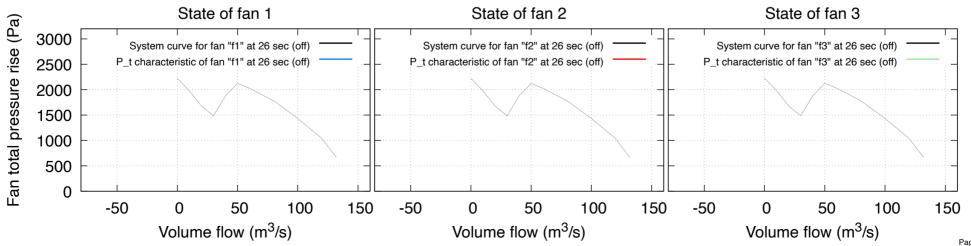
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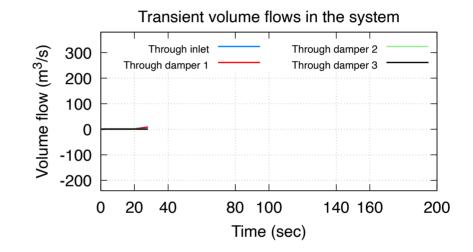
At 80 seconds, damper 2 opens

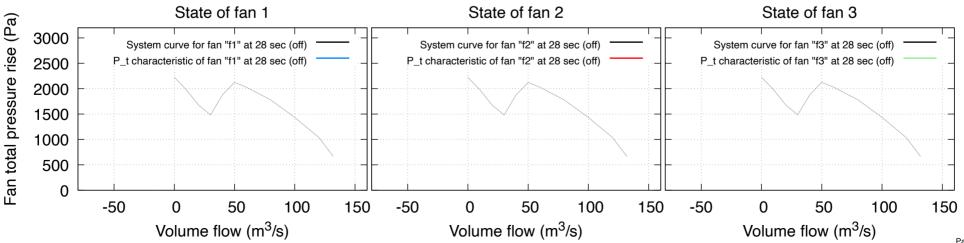
At 100 seconds, fan 2 starts

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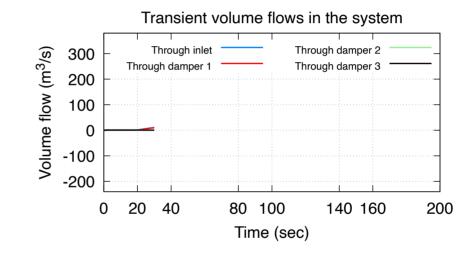
At 80 seconds, damper 2 opens

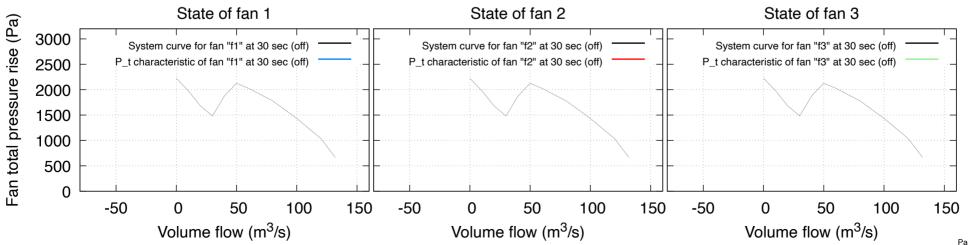
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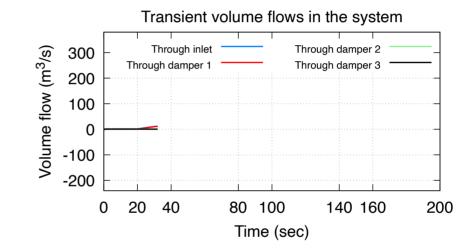
At 80 seconds, damper 2 opens

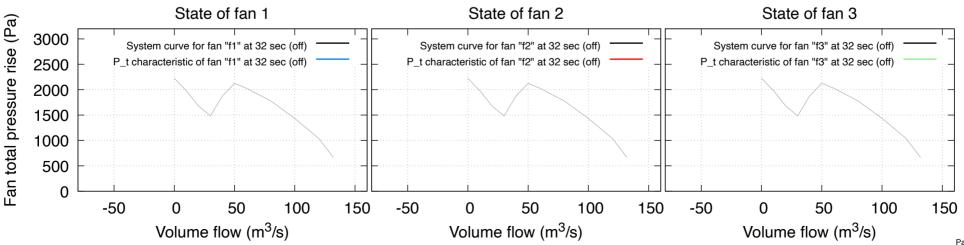
At 100 seconds, fan 2 starts

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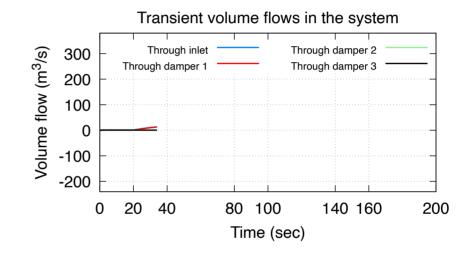
At 80 seconds, damper 2 opens

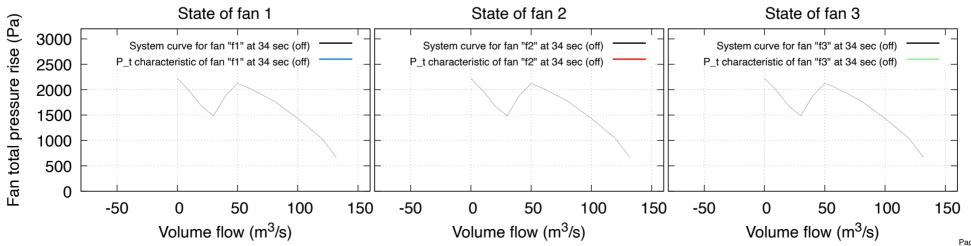
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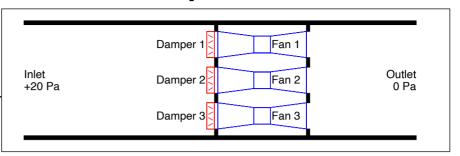
At 40 seconds, fan 1 starts

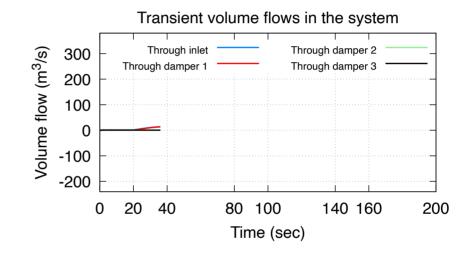
At 80 seconds, damper 2 opens

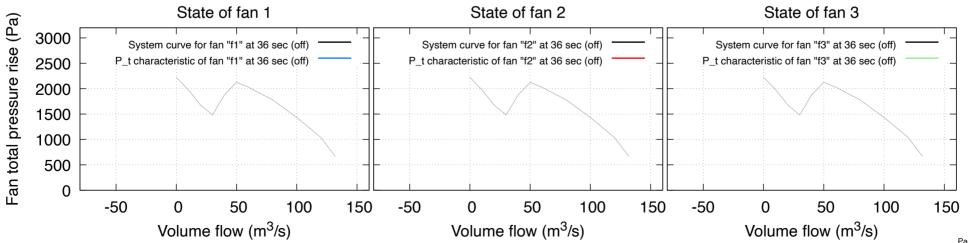
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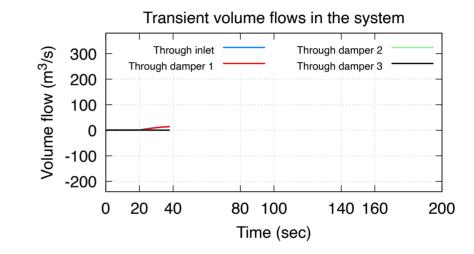
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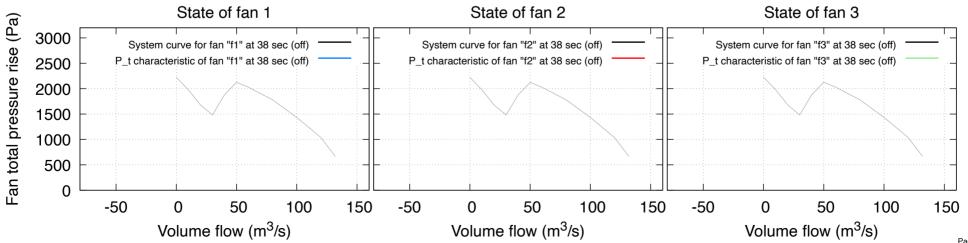
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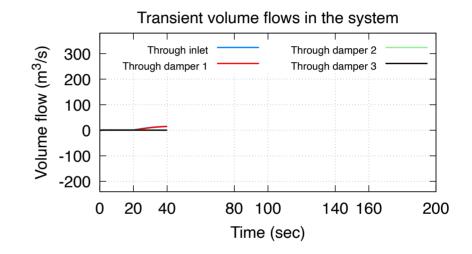
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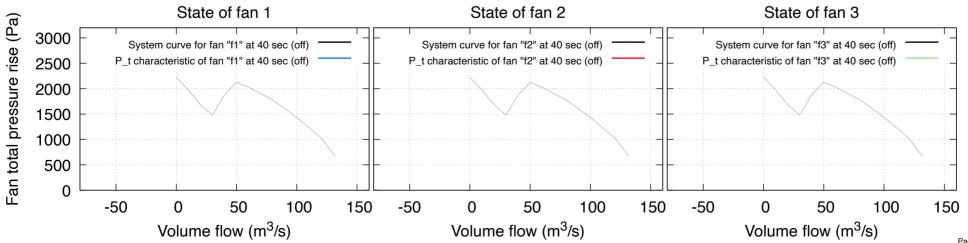
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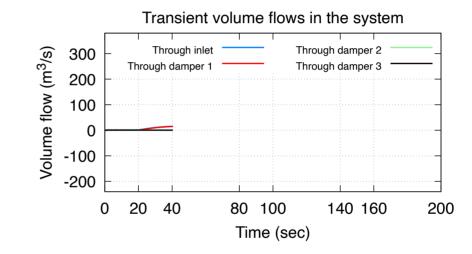
At 80 seconds, damper 2 opens

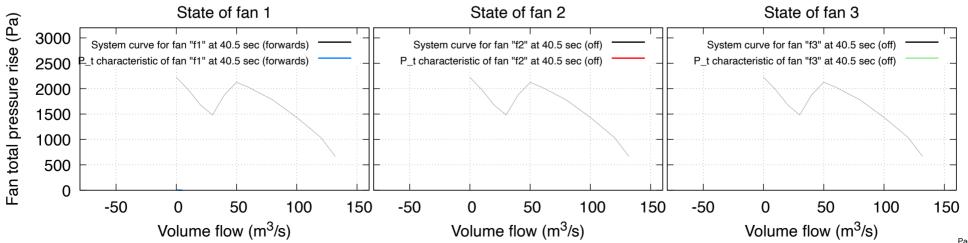
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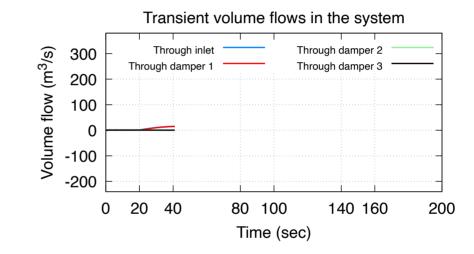
At 80 seconds, damper 2 opens

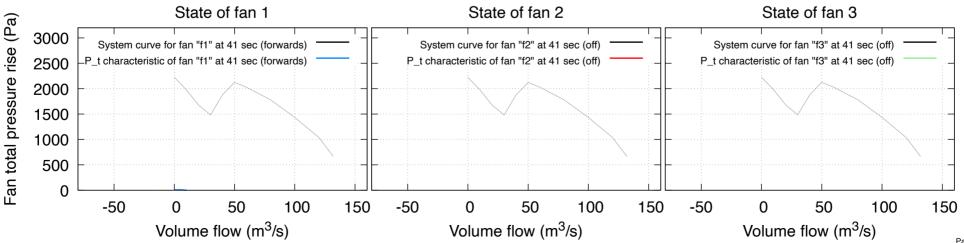
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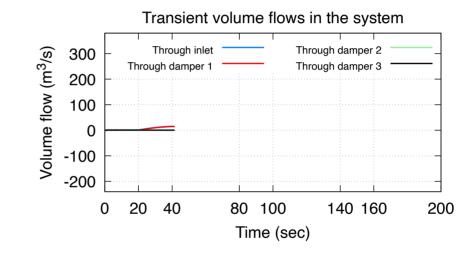
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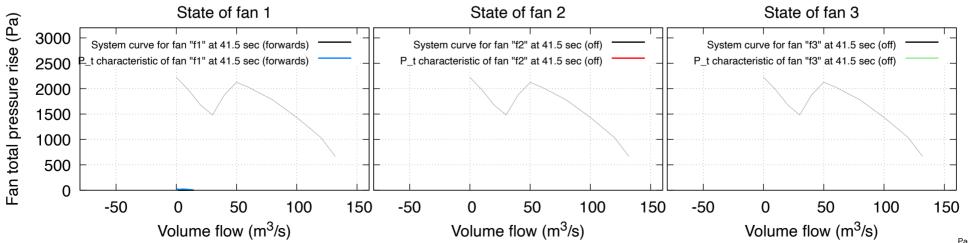
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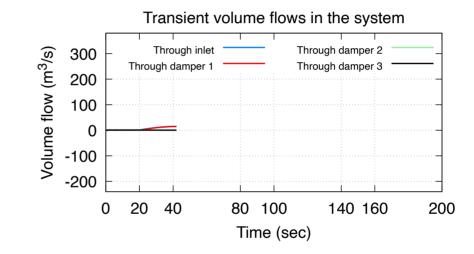
At 80 seconds, damper 2 opens

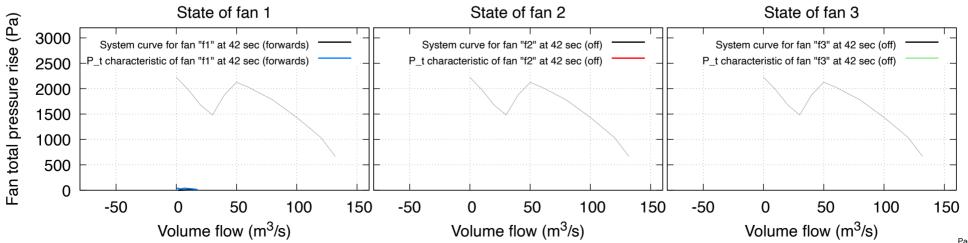
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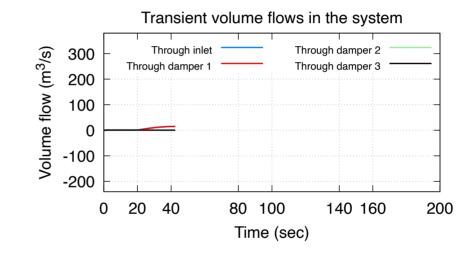
At 80 seconds, damper 2 opens

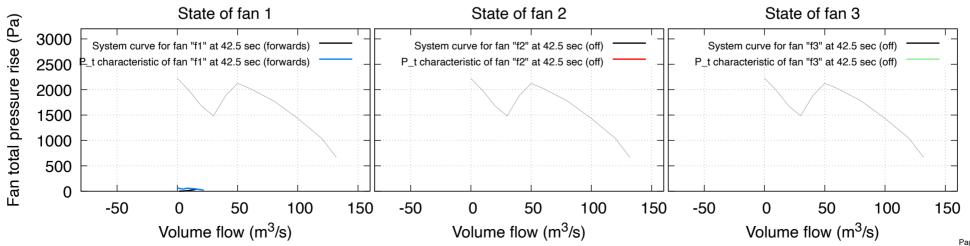
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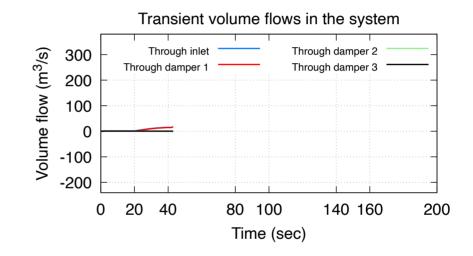
At 80 seconds, damper 2 opens

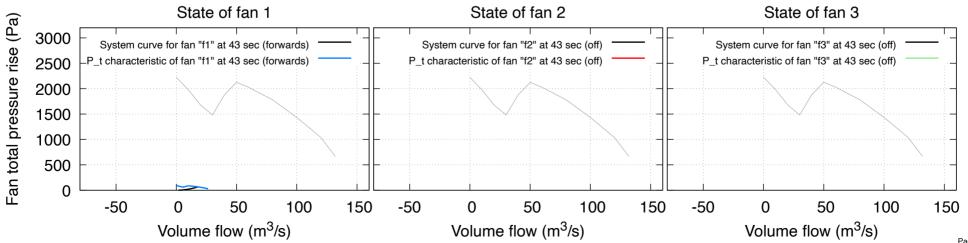
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At 40 seconds, fan 1 starts

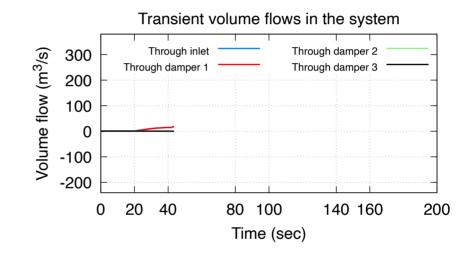
At 80 seconds, damper 2 opens

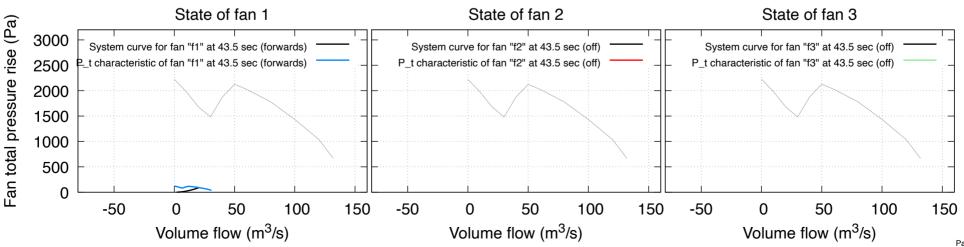
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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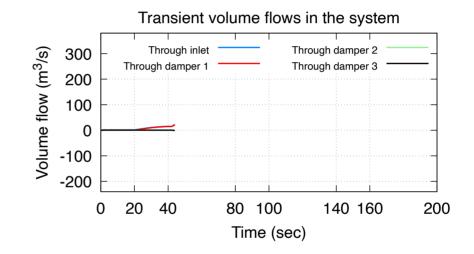
At 80 seconds, damper 2 opens

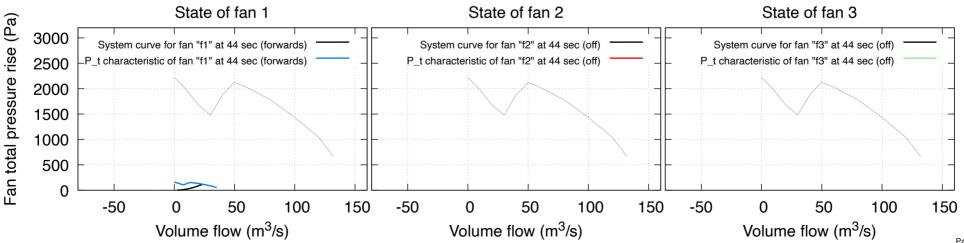
At 100 seconds, fan 2 starts

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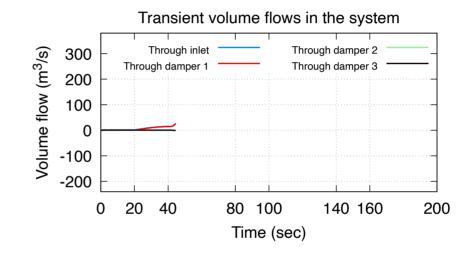
At 80 seconds, damper 2 opens

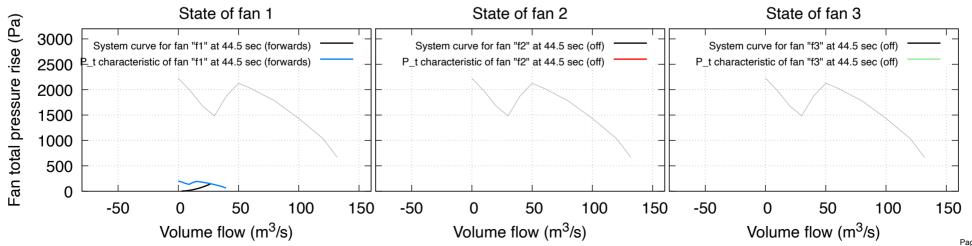
At 100 seconds, fan 2 starts

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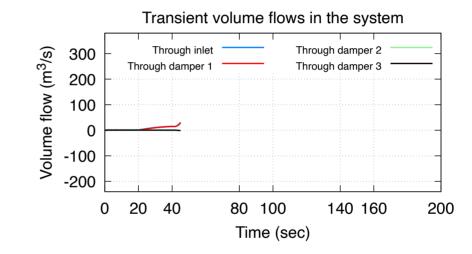
At 80 seconds, damper 2 opens

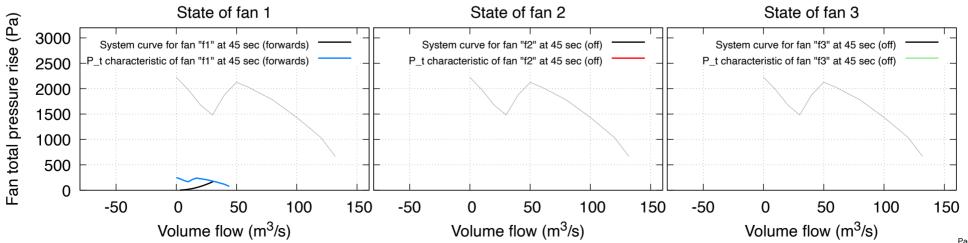
At 100 seconds, fan 2 starts

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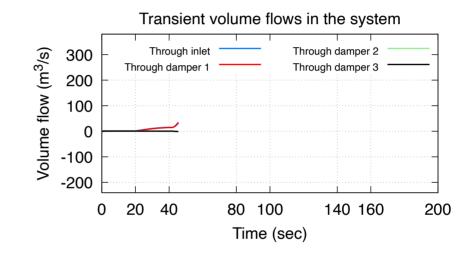
At 80 seconds, damper 2 opens

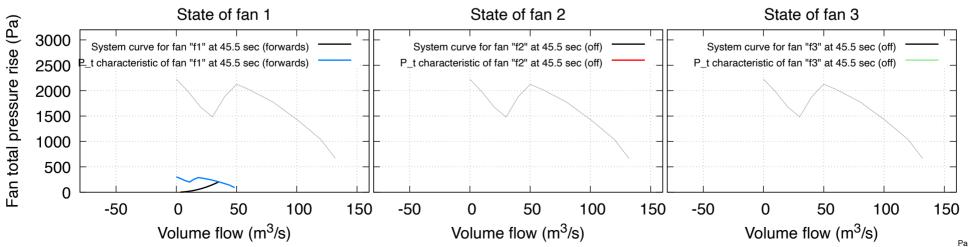
At 100 seconds, fan 2 starts

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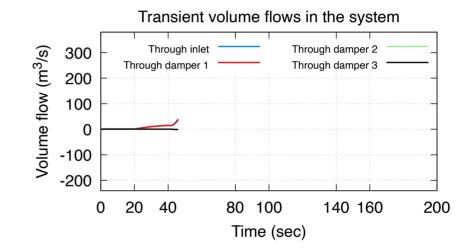
At 80 seconds, damper 2 opens

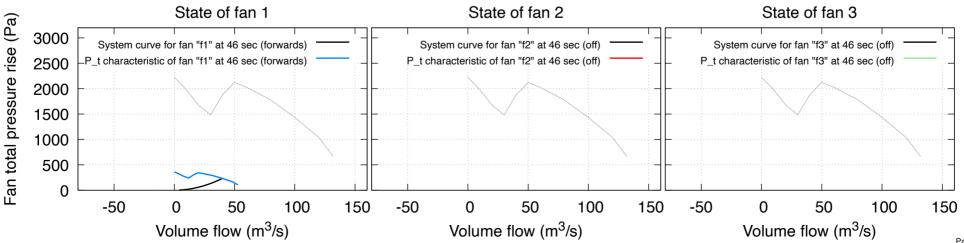
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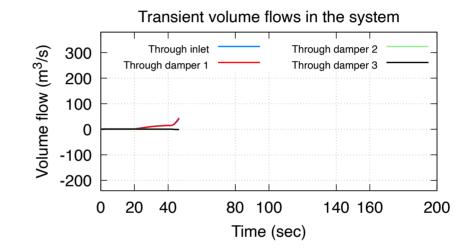
At 80 seconds, damper 2 opens

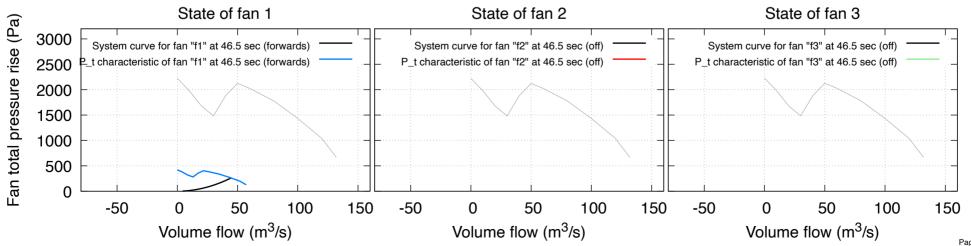
At 100 seconds, fan 2 starts

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At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.

Project no: 2 Project name: Software testing



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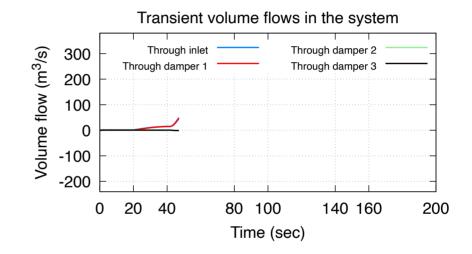
At 80 seconds, damper 2 opens

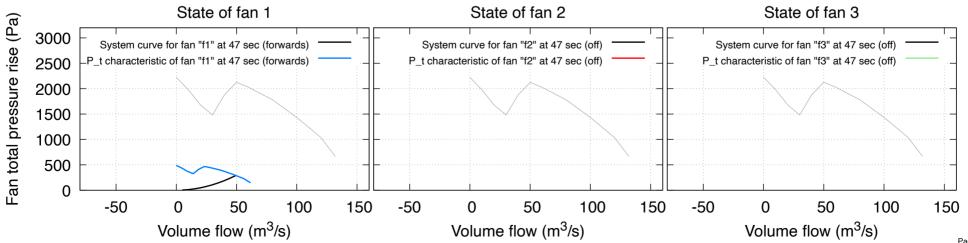
At 100 seconds, fan 2 starts

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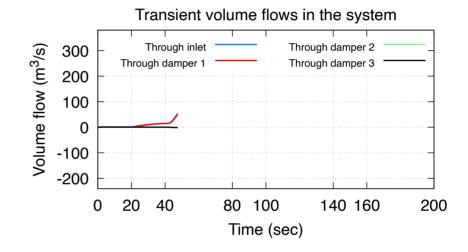
At 80 seconds, damper 2 opens

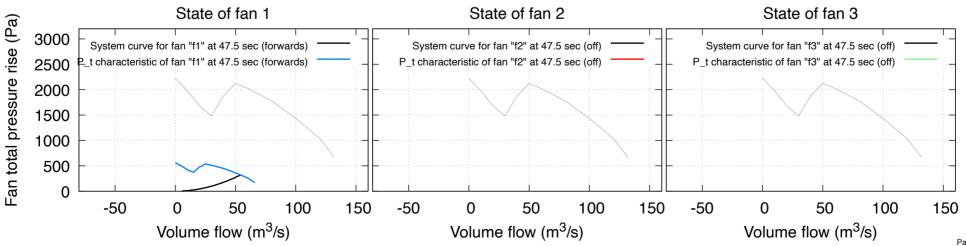
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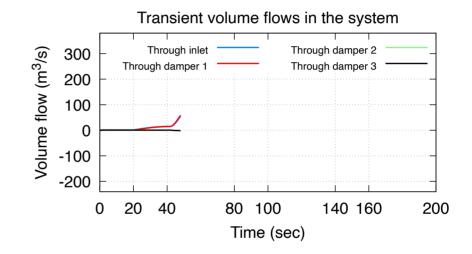
At 80 seconds, damper 2 opens

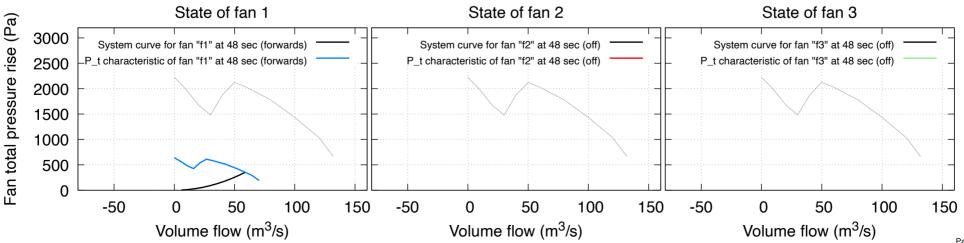
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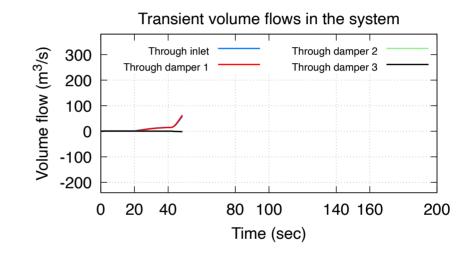
At 80 seconds, damper 2 opens

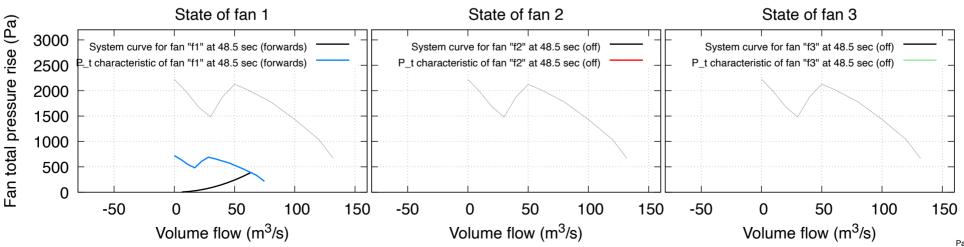
At 100 seconds, fan 2 starts

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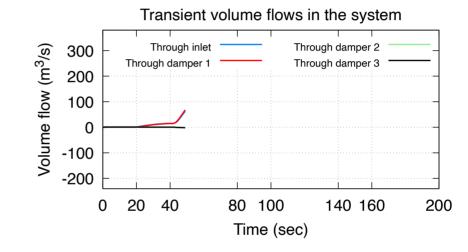
At 80 seconds, damper 2 opens

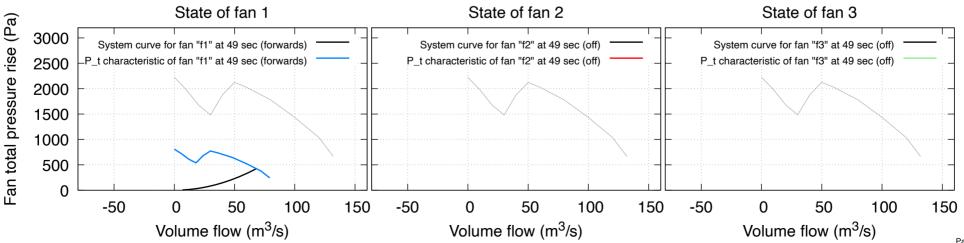
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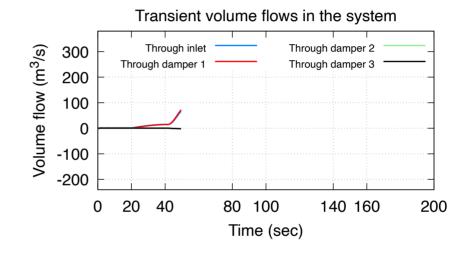
At 80 seconds, damper 2 opens

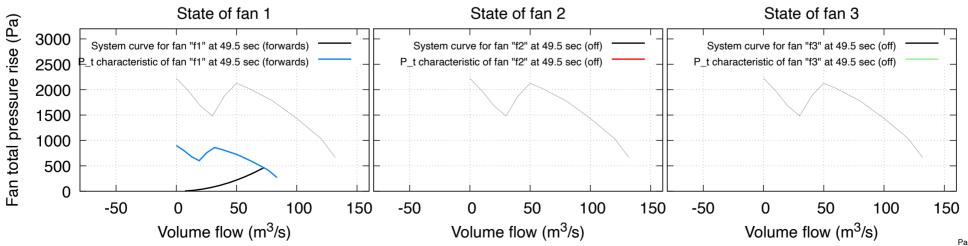
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



Created by Hobyah.py from ok-032-fans-in-parallel.txt, 11:34 on 26 May 2025 by ecb

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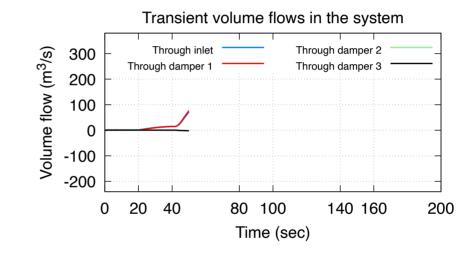
At 80 seconds, damper 2 opens

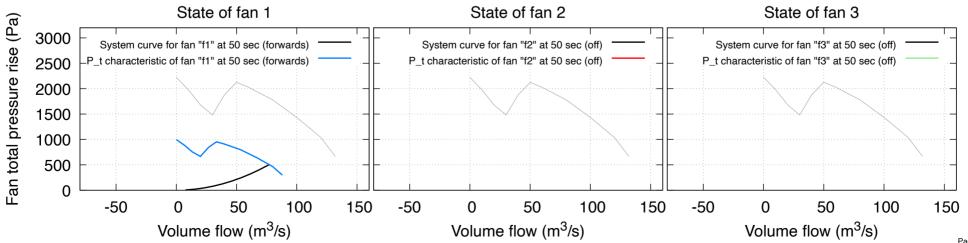
At 100 seconds, fan 2 starts

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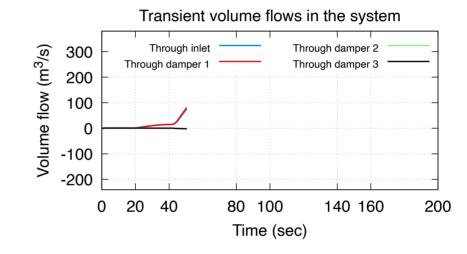
At 80 seconds, damper 2 opens

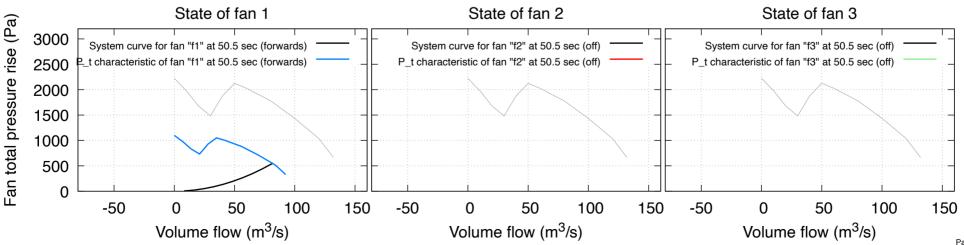
At 100 seconds, fan 2 starts

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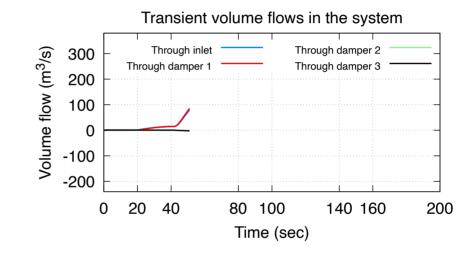
At 80 seconds, damper 2 opens

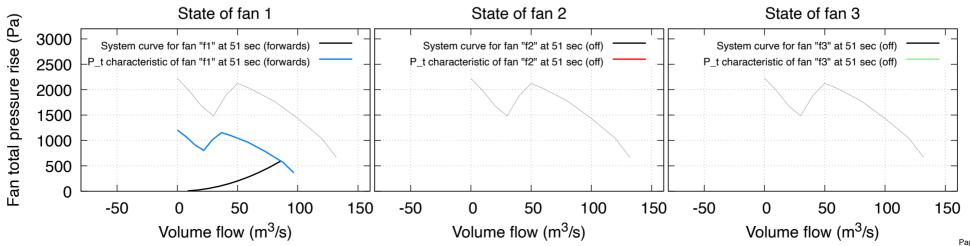
At 100 seconds, fan 2 starts

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Source file: ok-032-fans-in-parallel.txt.



Created by Hobyah.py from ok-032-fans-in-parallel.txt, 11:34 on 26 May 2025 by ecb

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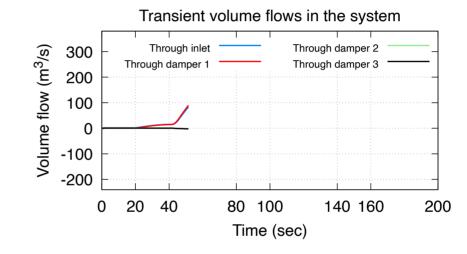
At 80 seconds, damper 2 opens

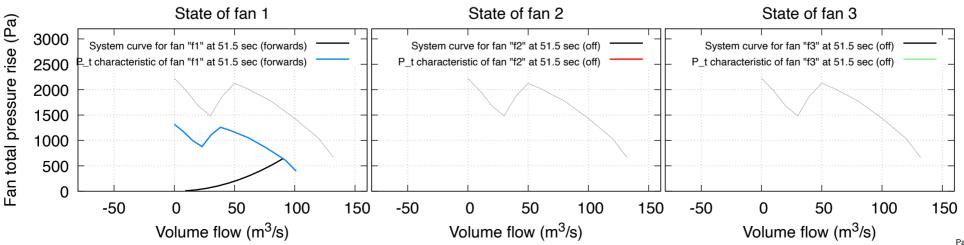
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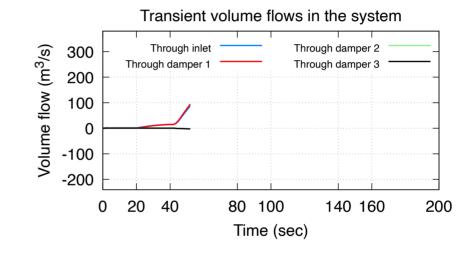
At 80 seconds, damper 2 opens

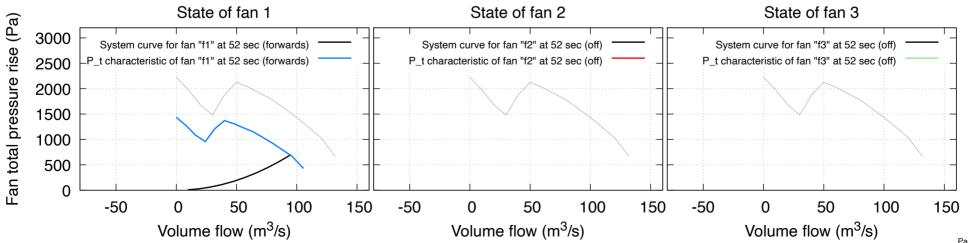
At 100 seconds, fan 2 starts

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Source file: ok-032-fans-in-parallel.txt.



Fage 4

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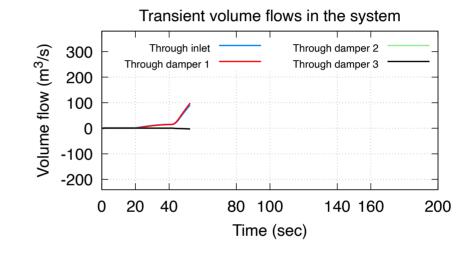
At 80 seconds, damper 2 opens

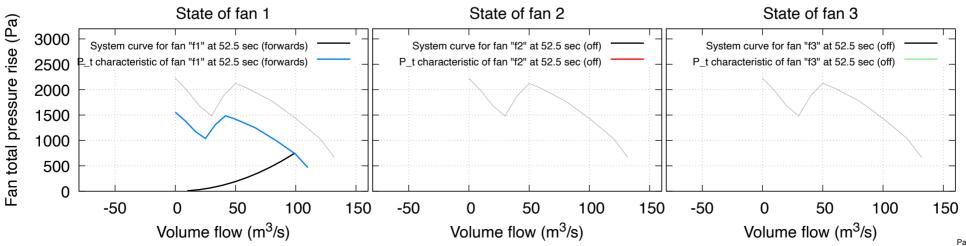
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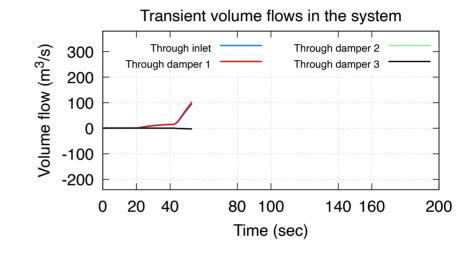
At 80 seconds, damper 2 opens

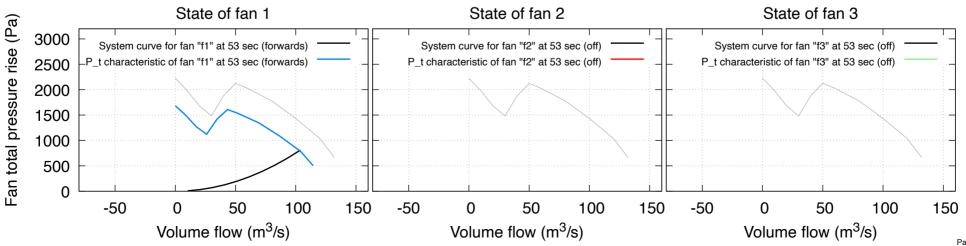
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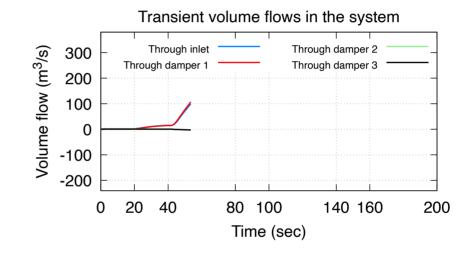
At 80 seconds, damper 2 opens

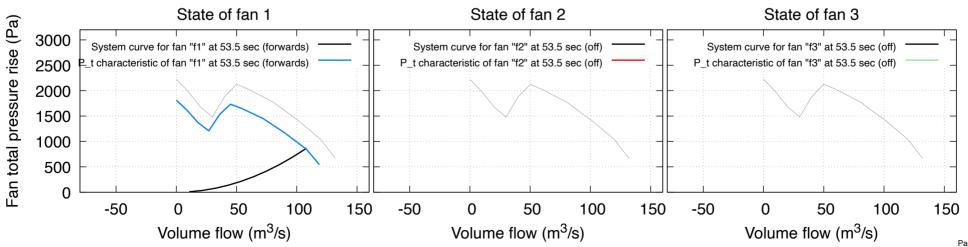
At 100 seconds, fan 2 starts

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Source file: ok-032-fans-in-parallel.txt.



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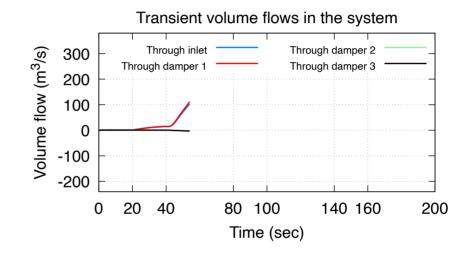
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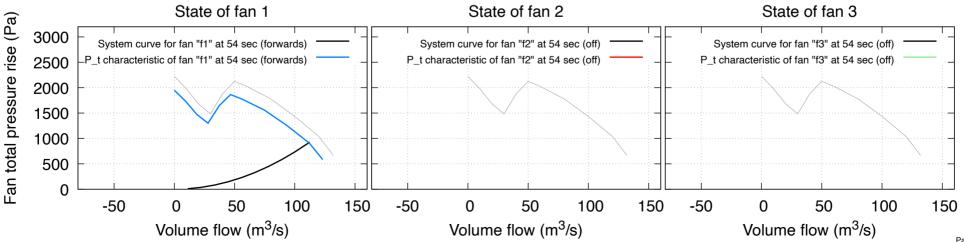
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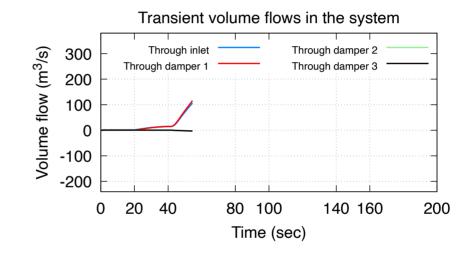
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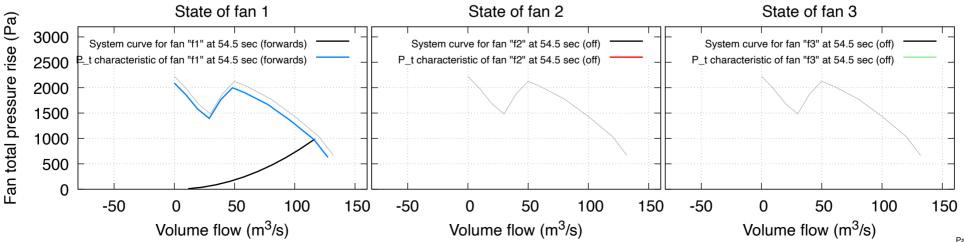
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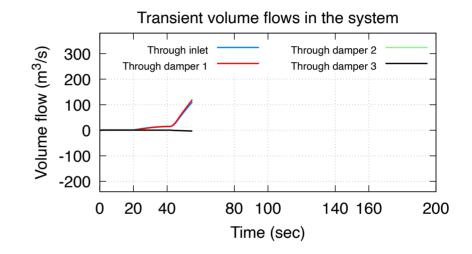
At 80 seconds, damper 2 opens

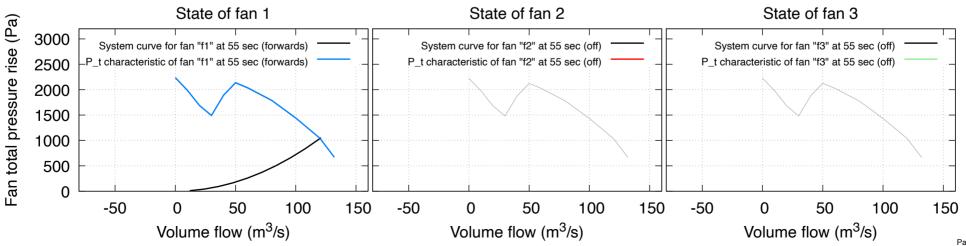
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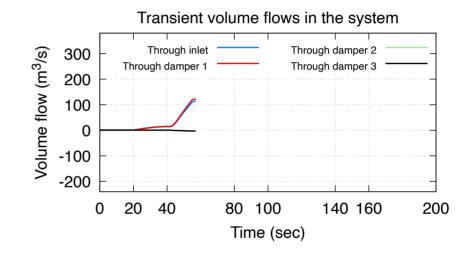
At 80 seconds, damper 2 opens

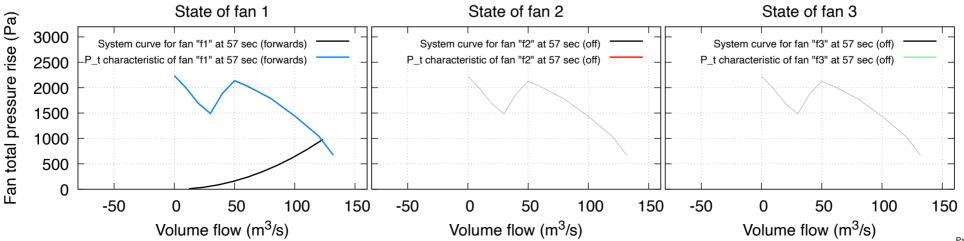
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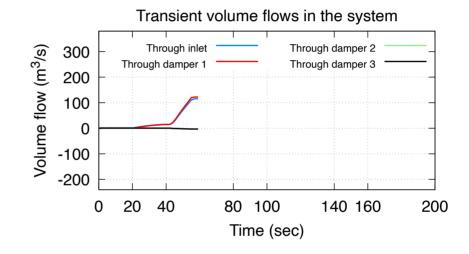
At 80 seconds, damper 2 opens

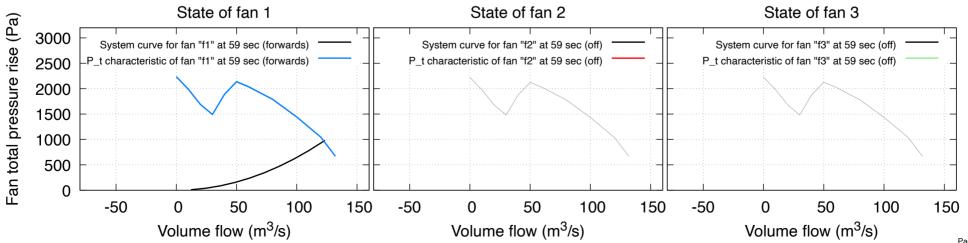
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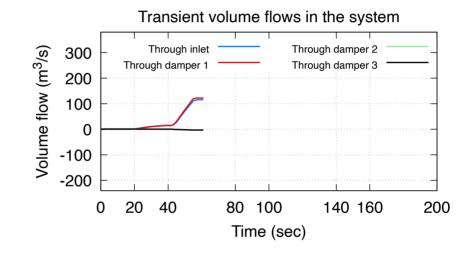
At 80 seconds, damper 2 opens

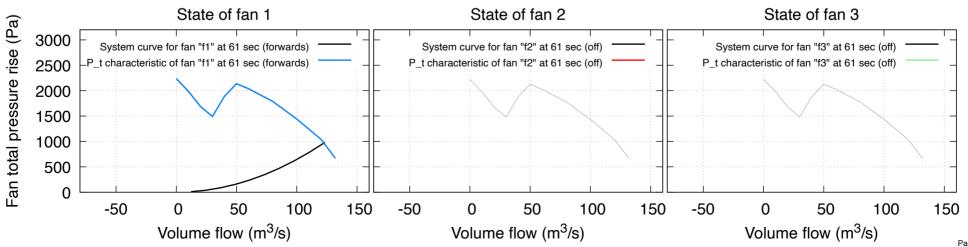
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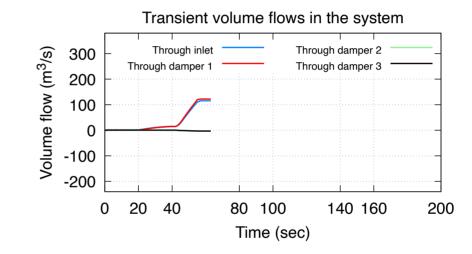
At 80 seconds, damper 2 opens

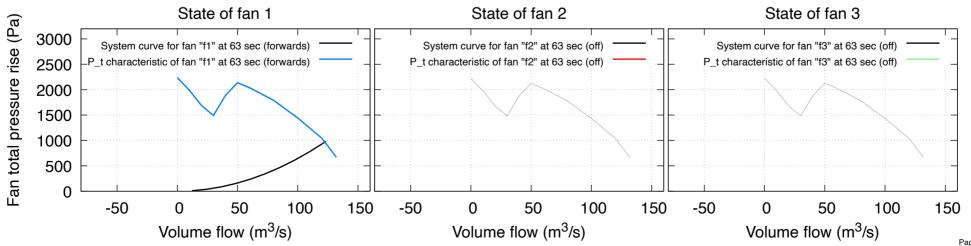
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

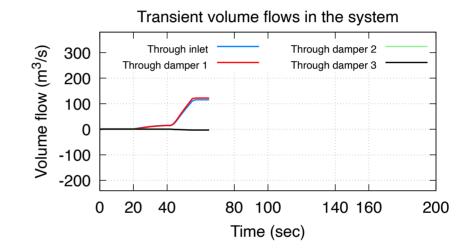
At 80 seconds, damper 2 opens

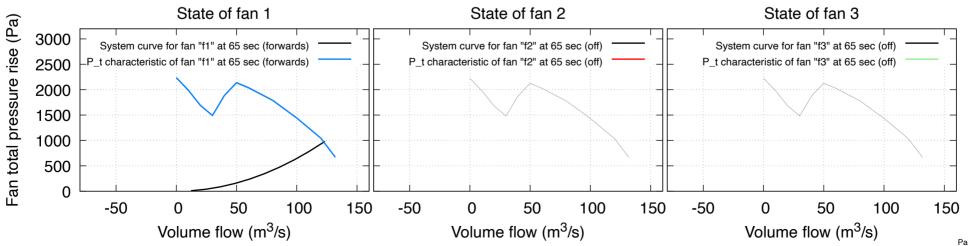
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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At 20 seconds, damper 1 opens

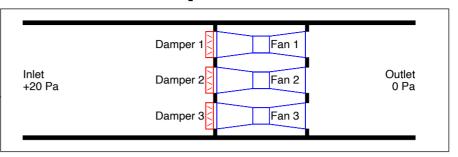
At 40 seconds, fan 1 starts

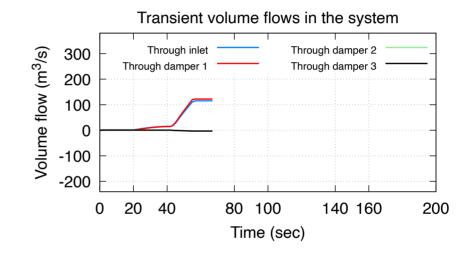
At 80 seconds, damper 2 opens

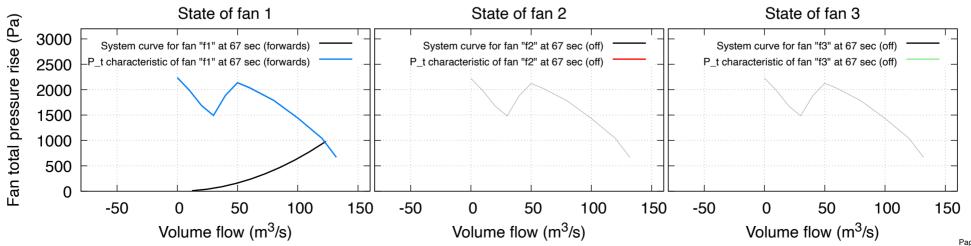
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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At 40 seconds, fan 1 starts

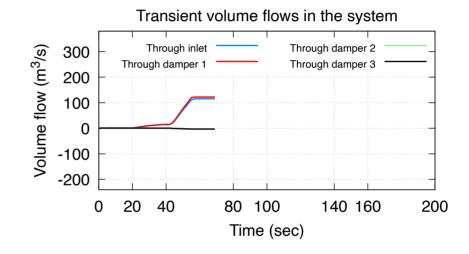
At 80 seconds, damper 2 opens

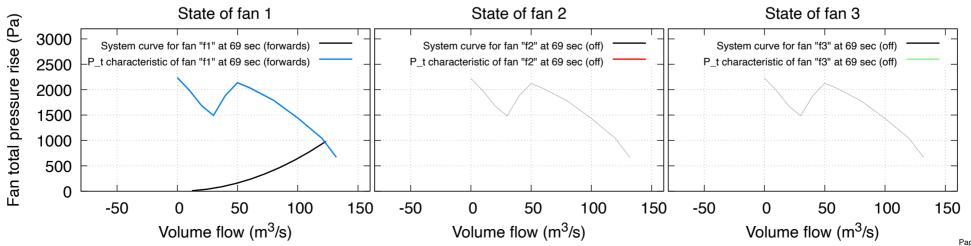
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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At 40 seconds, fan 1 starts

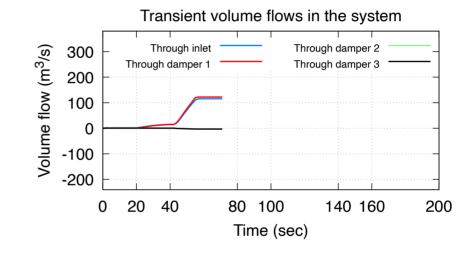
At 80 seconds, damper 2 opens

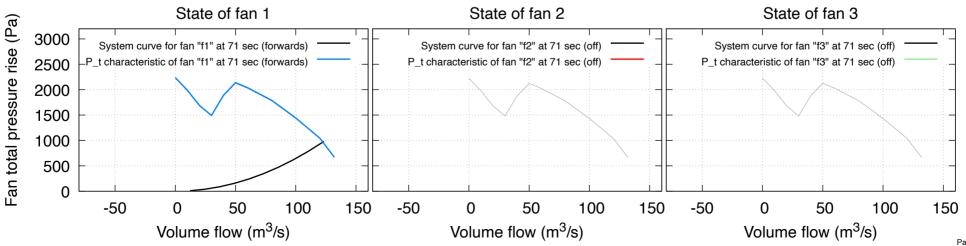
At 100 seconds, fan 2 starts

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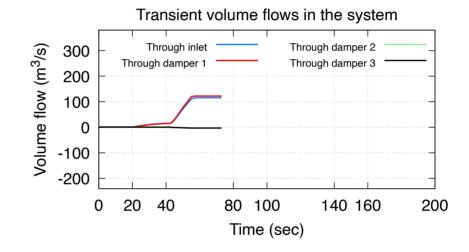
At 80 seconds, damper 2 opens

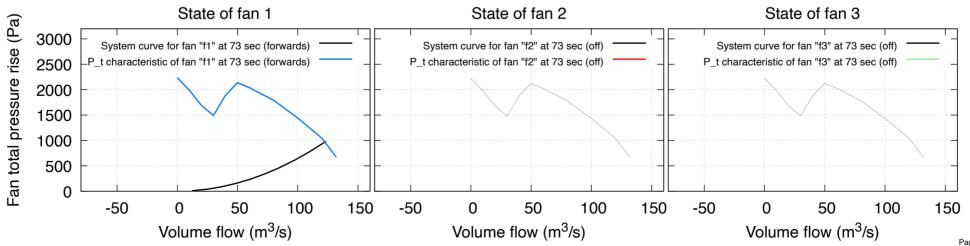
At 100 seconds, fan 2 starts

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At 160 seconds, fan 3 starts









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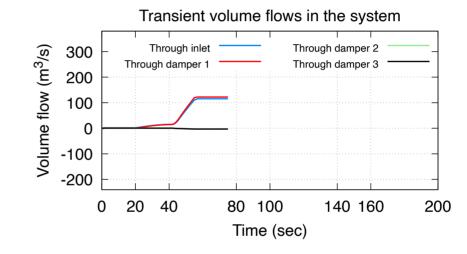
At 80 seconds, damper 2 opens

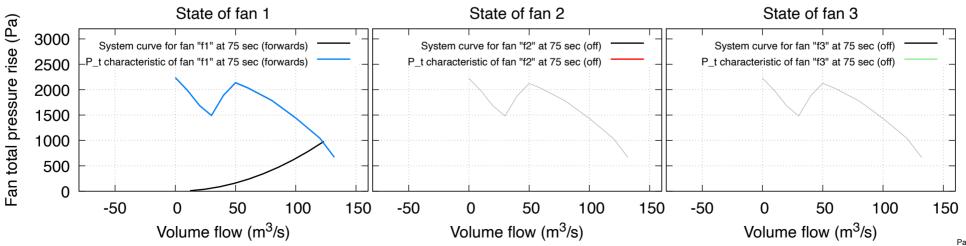
At 100 seconds, fan 2 starts

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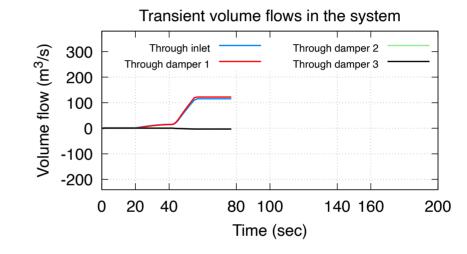
At 80 seconds, damper 2 opens

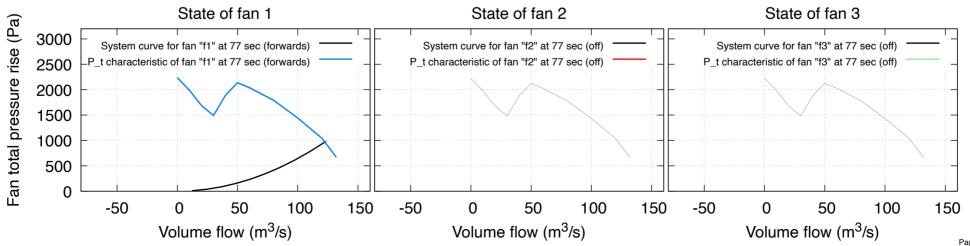
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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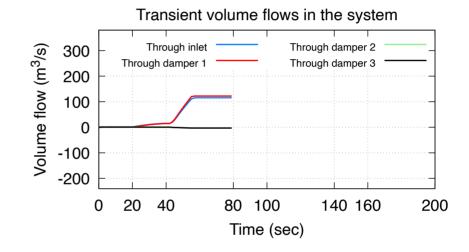
At 80 seconds, damper 2 opens

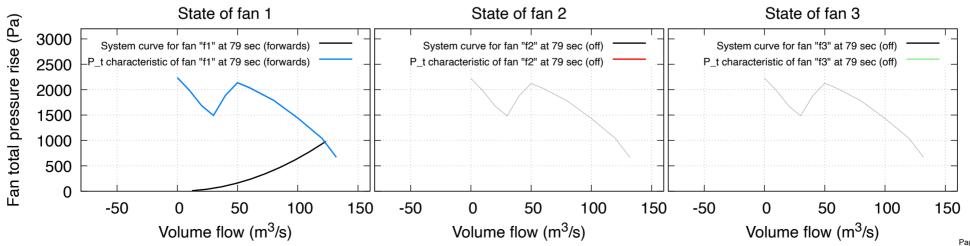
At 100 seconds, fan 2 starts

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At 160 seconds, fan 3 starts









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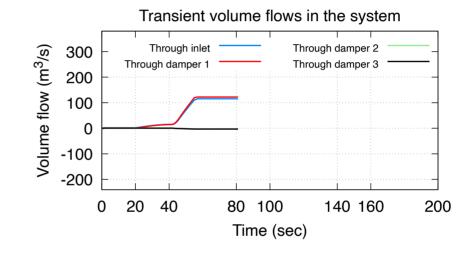
At 80 seconds, damper 2 opens

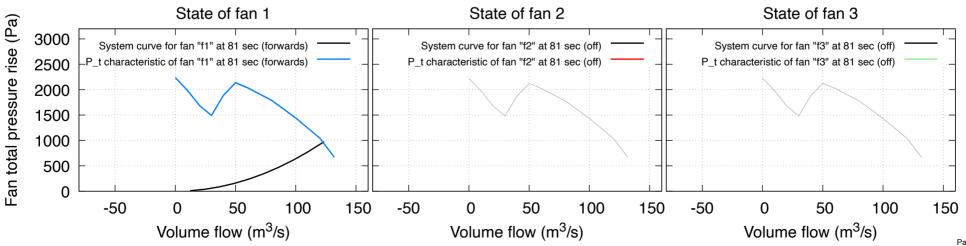
At 100 seconds, fan 2 starts

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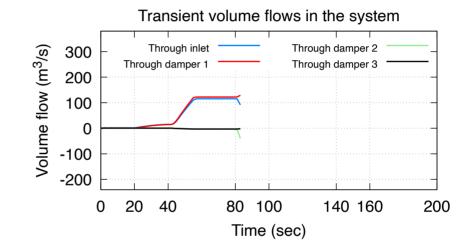
At 80 seconds, damper 2 opens

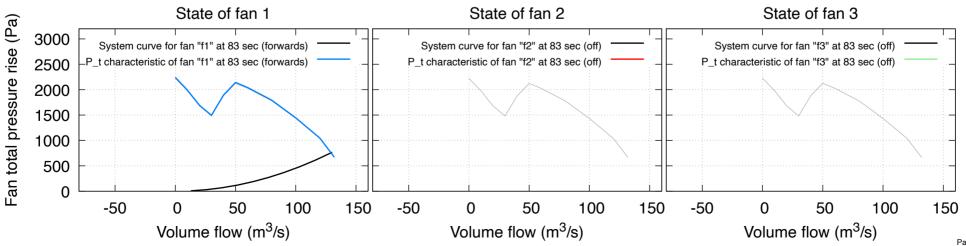
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

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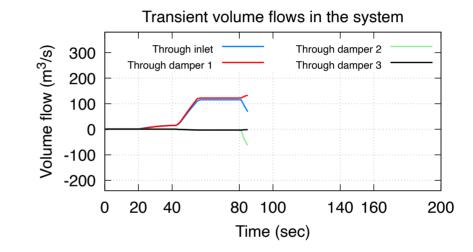
At 80 seconds, damper 2 opens

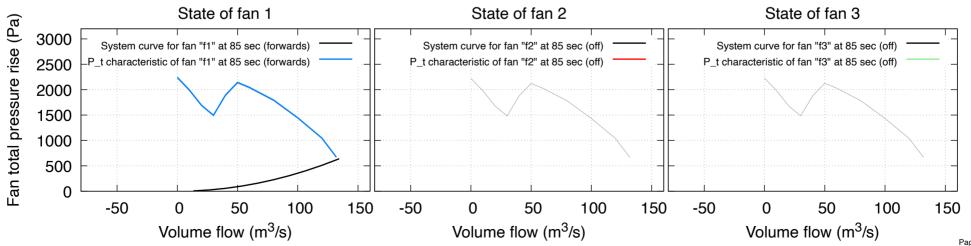
At 100 seconds, fan 2 starts

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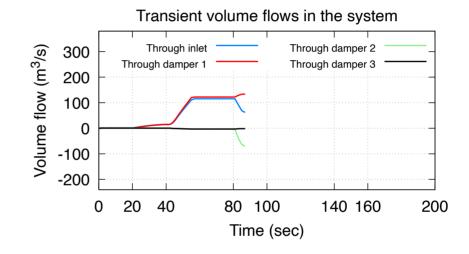
At 80 seconds, damper 2 opens

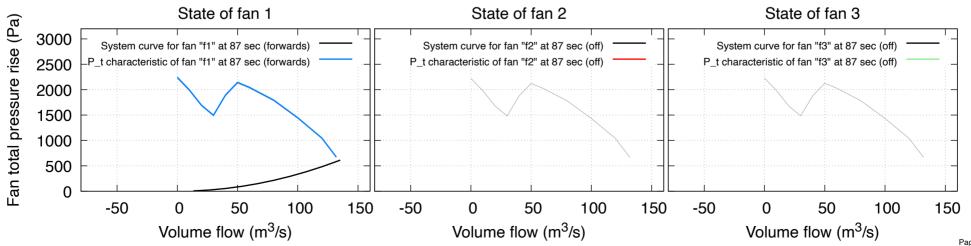
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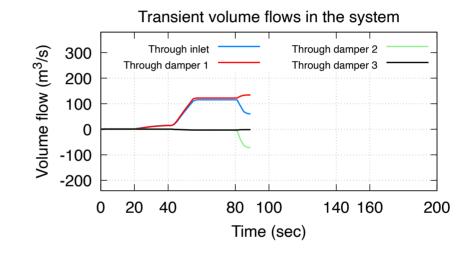
At 80 seconds, damper 2 opens

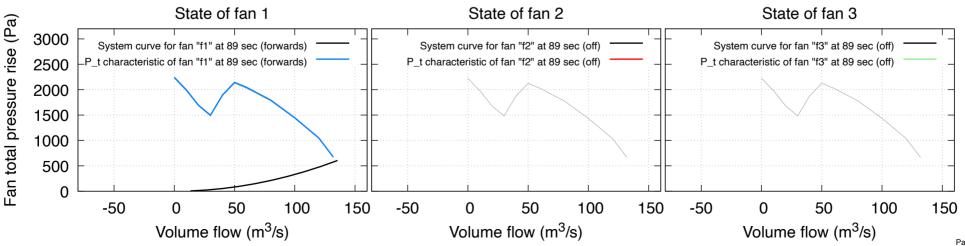
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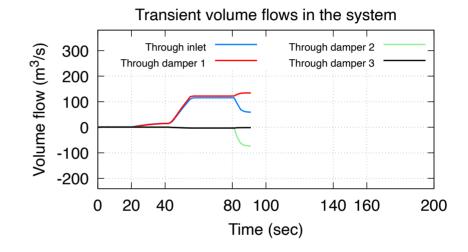
At 80 seconds, damper 2 opens

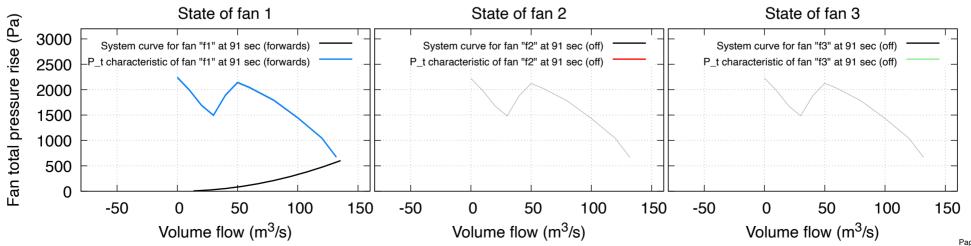
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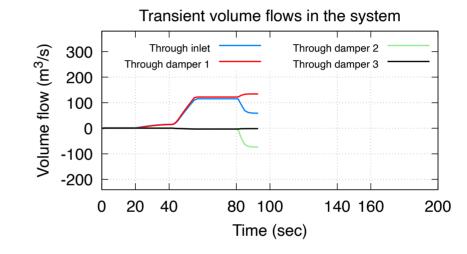
At 80 seconds, damper 2 opens

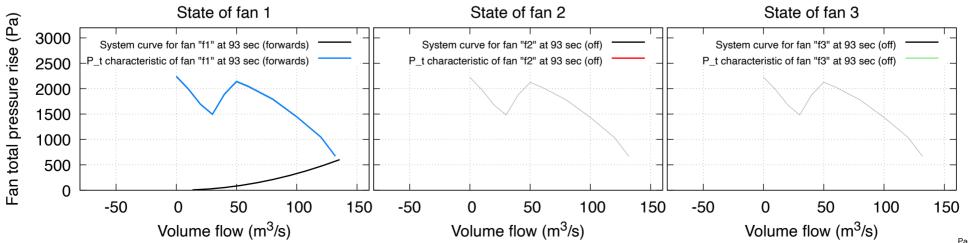
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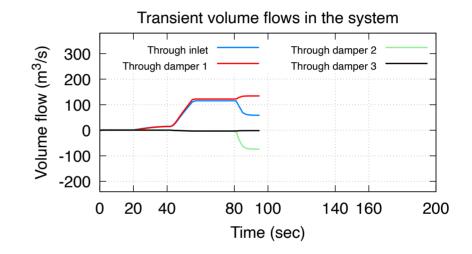
At 80 seconds, damper 2 opens

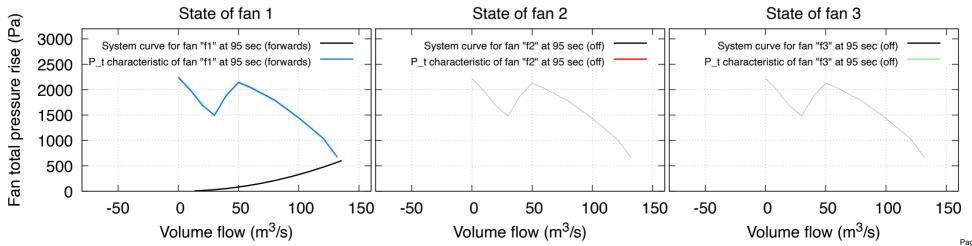
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



Created by Hobyah.py from ok-032-fans-in-parallel.txt, 11:34 on 26 May 2025 by ecb

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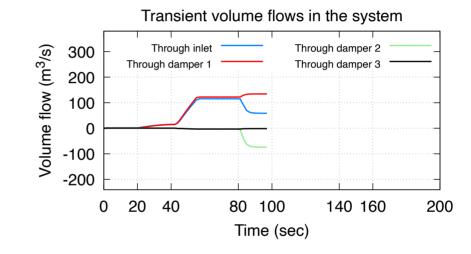
At 80 seconds, damper 2 opens

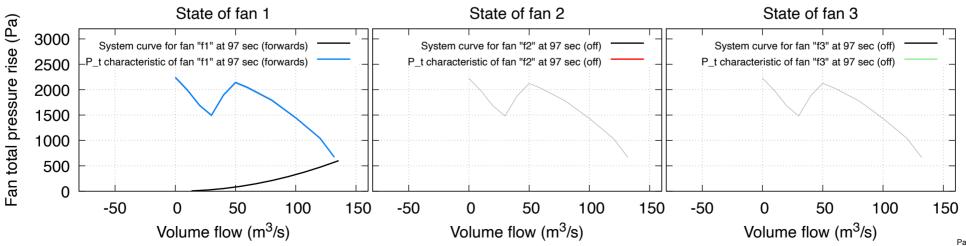
At 100 seconds, fan 2 starts

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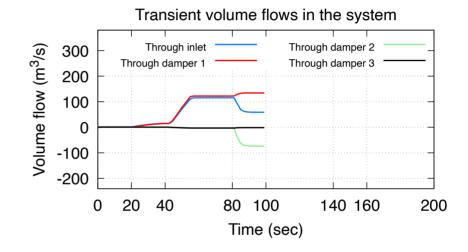
At 80 seconds, damper 2 opens

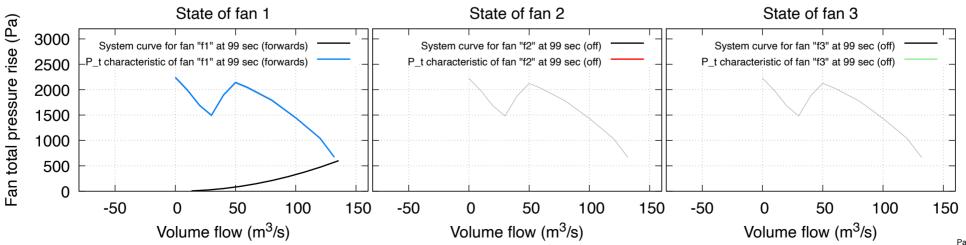
At 100 seconds, fan 2 starts

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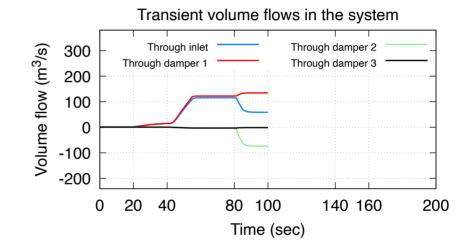
At 80 seconds, damper 2 opens

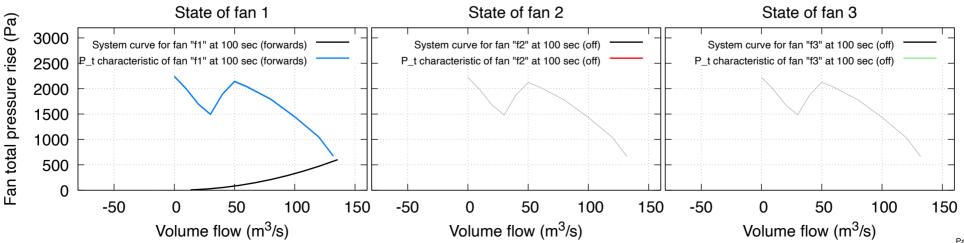
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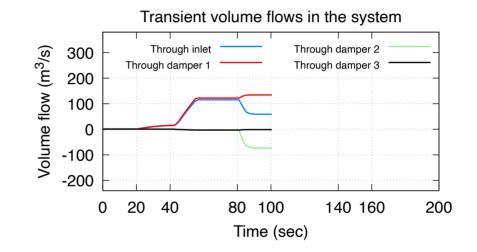
At 80 seconds, damper 2 opens

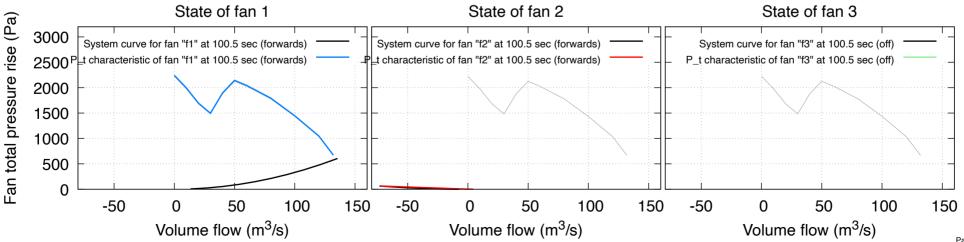
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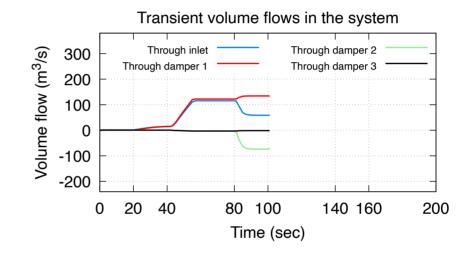
At 80 seconds, damper 2 opens

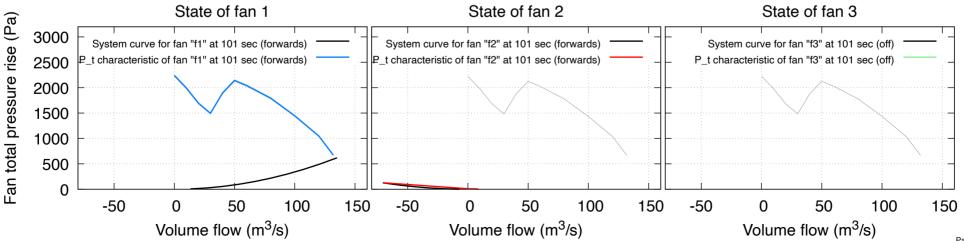
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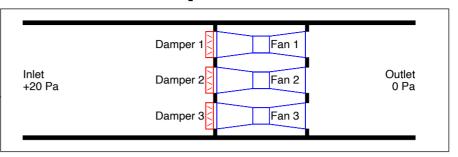
At 40 seconds, fan 1 starts

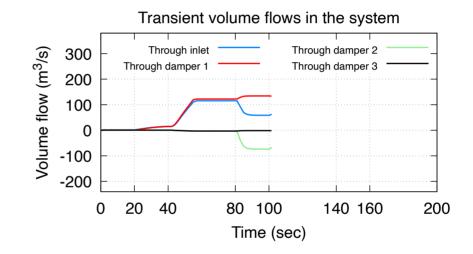
At 80 seconds, damper 2 opens

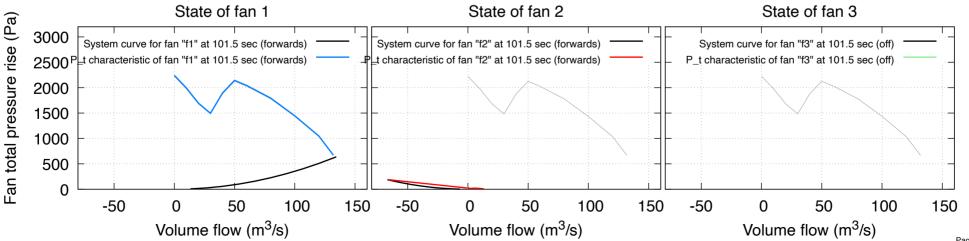
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Source file: ok-032-fans-in-parallel.txt.

J

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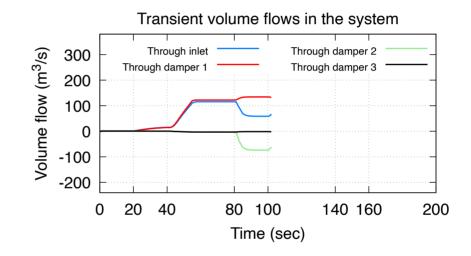
At 80 seconds, damper 2 opens

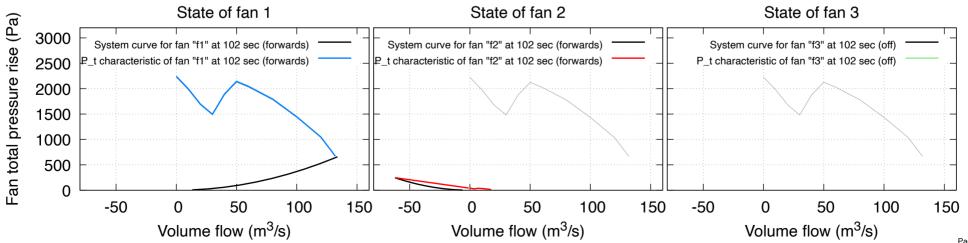
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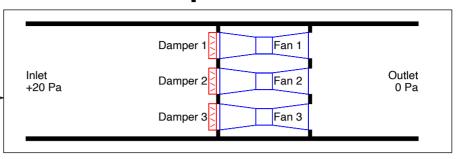
At 40 seconds, fan 1 starts

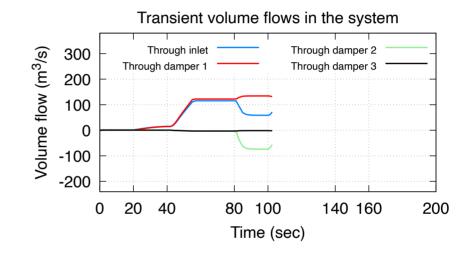
At 80 seconds, damper 2 opens

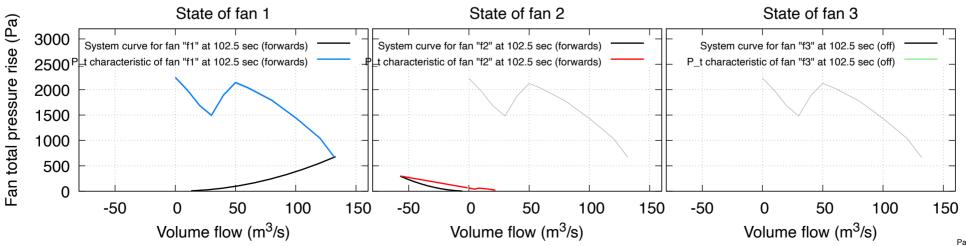
At 100 seconds, fan 2 starts

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Source file: ok-032-fans-in-parallel.txt.



Created by Hobyah.py from ok-032-fans-in-parallel.txt, 11:34 on 26 May 2025 by ecb

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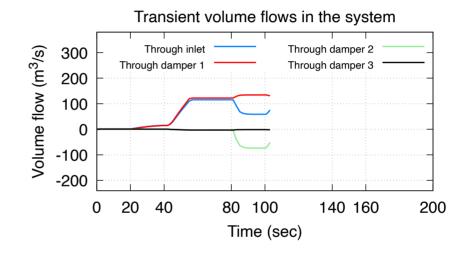
At 80 seconds, damper 2 opens

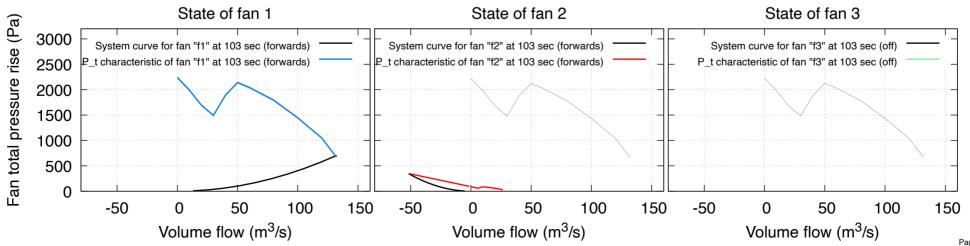
At 100 seconds, fan 2 starts

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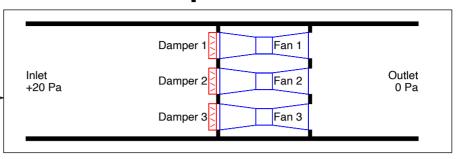
At 40 seconds, fan 1 starts

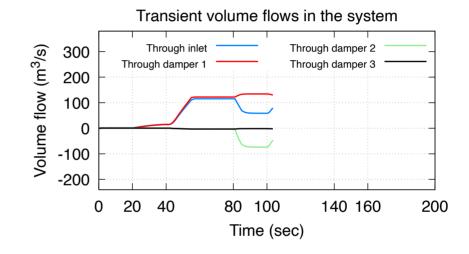
At 80 seconds, damper 2 opens

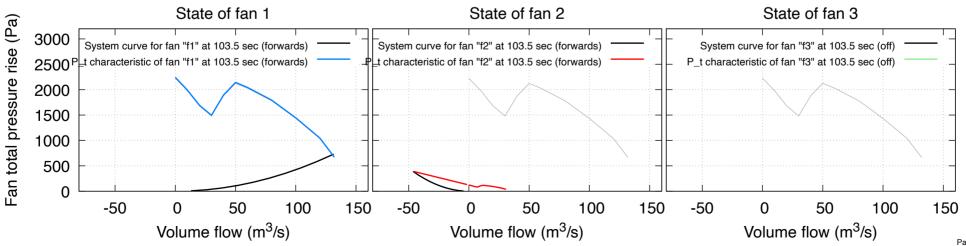
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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At 40 seconds, fan 1 starts

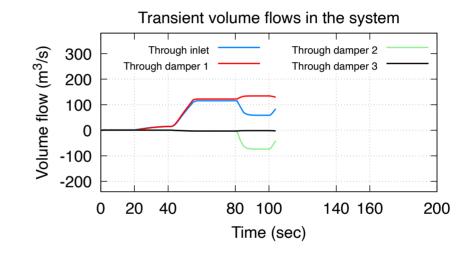
At 80 seconds, damper 2 opens

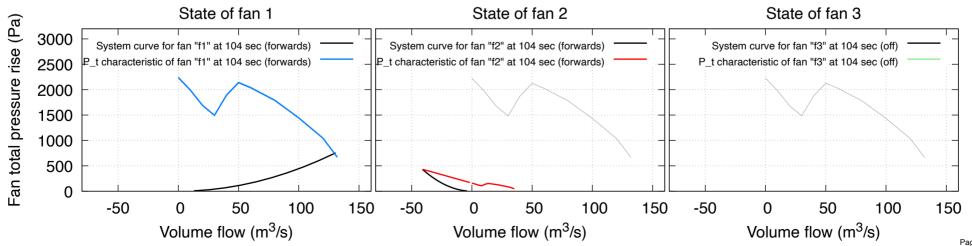
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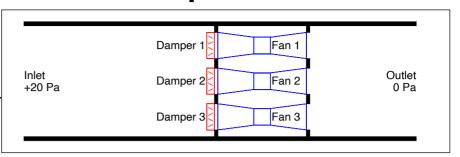
At 40 seconds, fan 1 starts

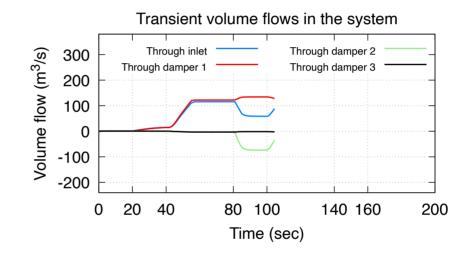
At 80 seconds, damper 2 opens

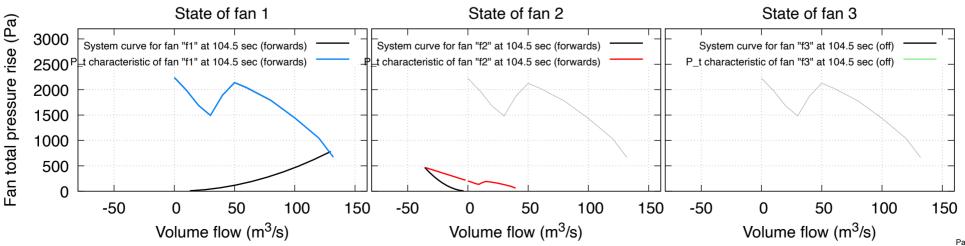
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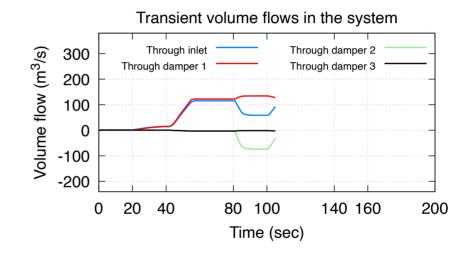
At 80 seconds, damper 2 opens

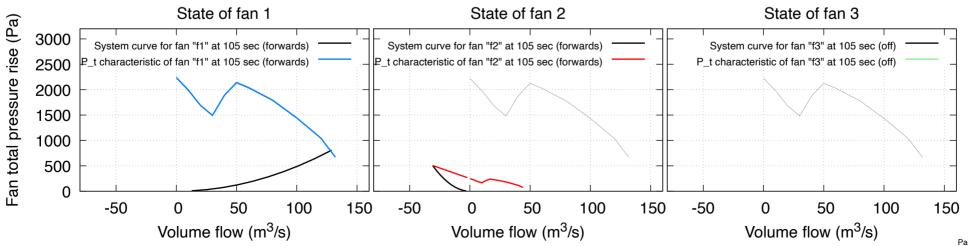
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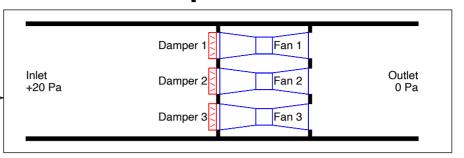
At 40 seconds, fan 1 starts

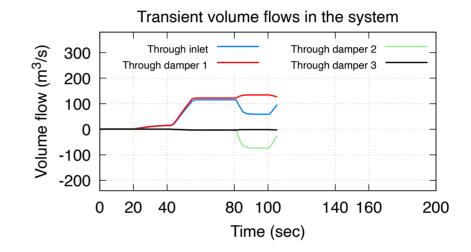
At 80 seconds, damper 2 opens

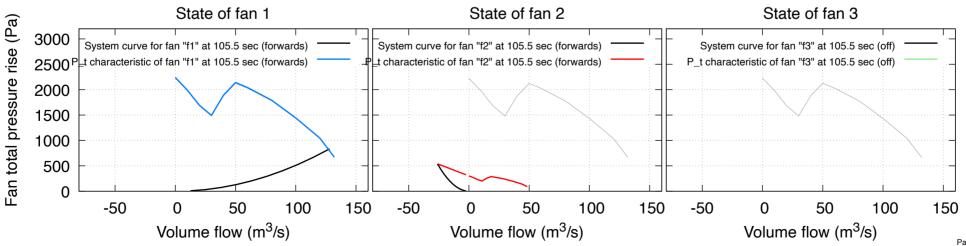
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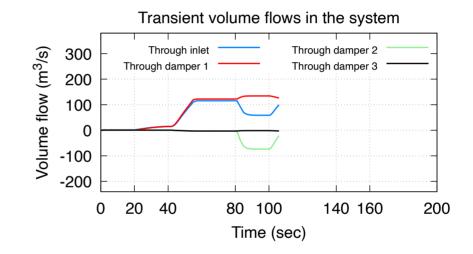
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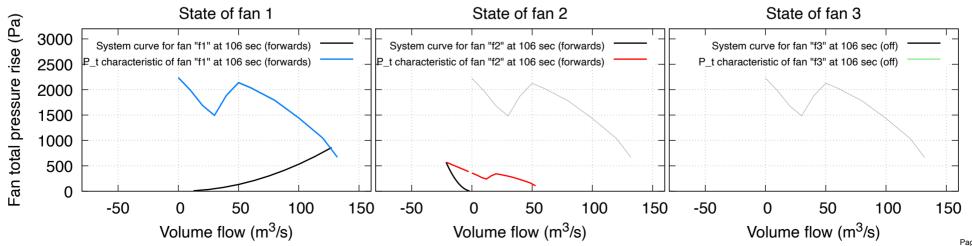
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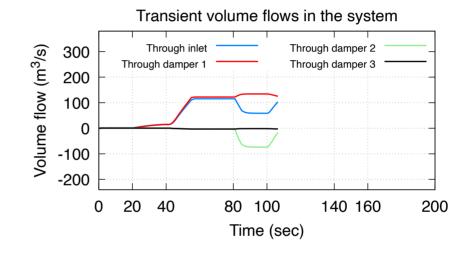
At 80 seconds, damper 2 opens

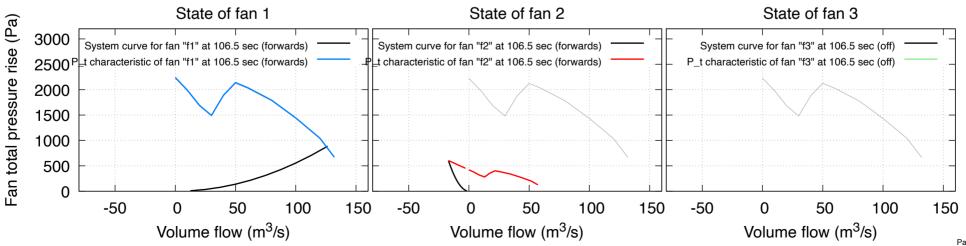
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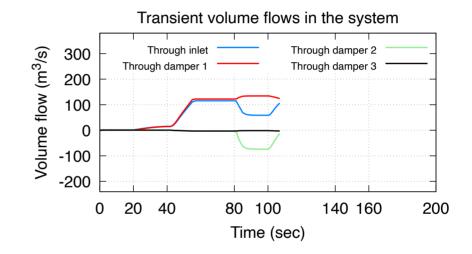
At 80 seconds, damper 2 opens

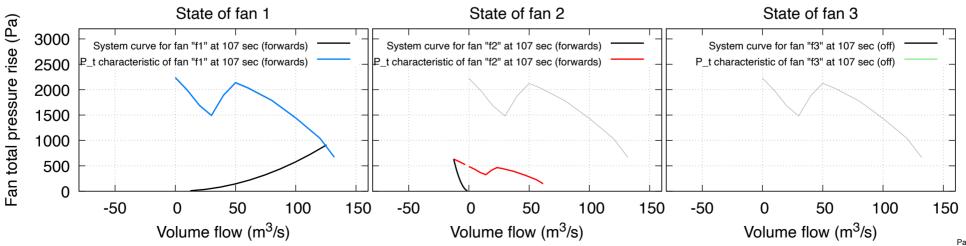
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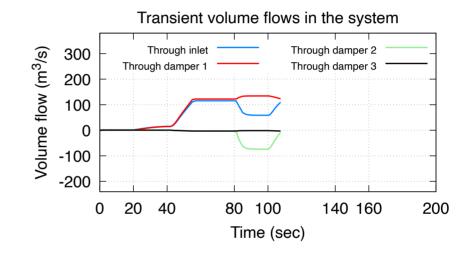
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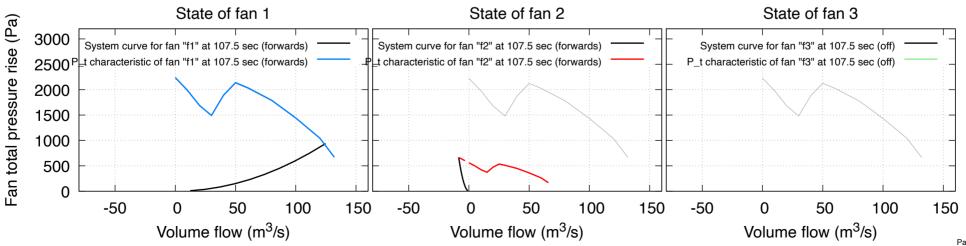
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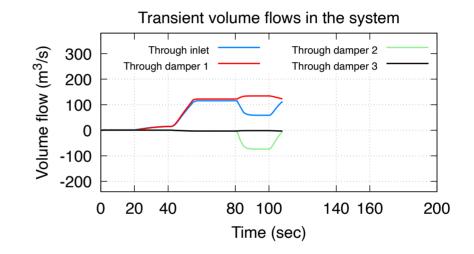
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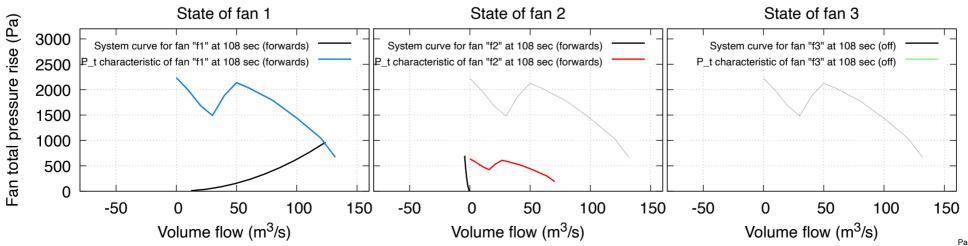
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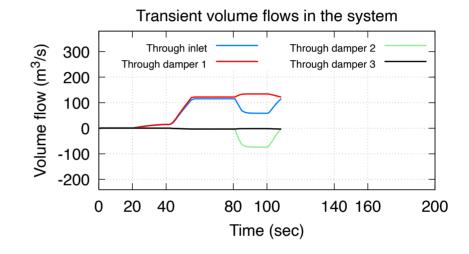
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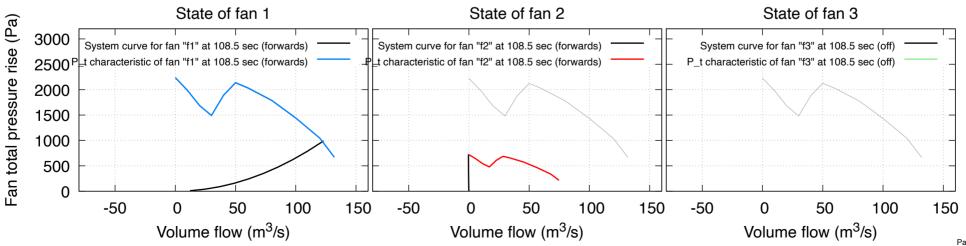
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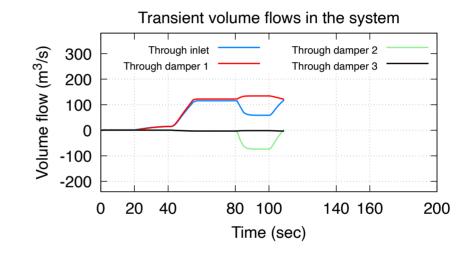
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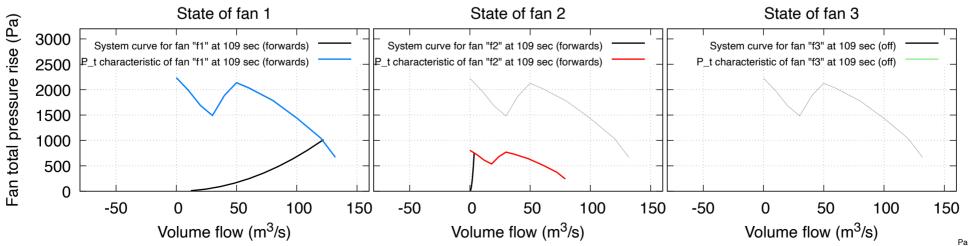
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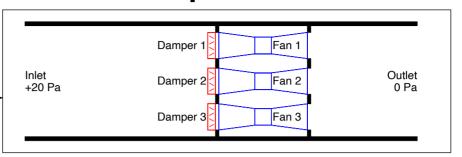
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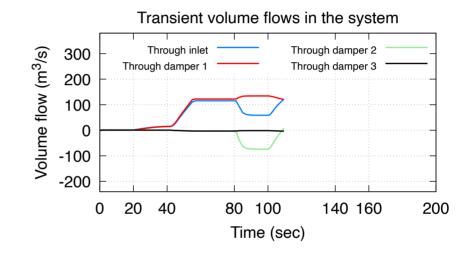
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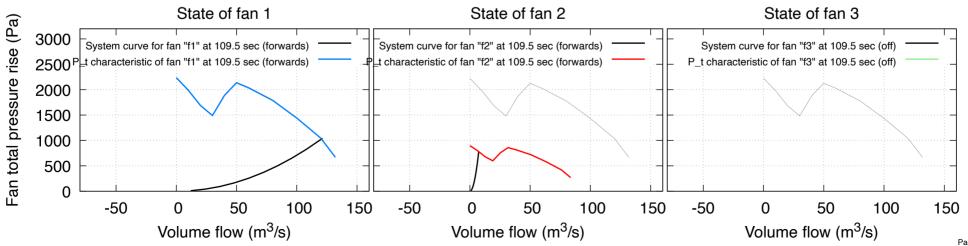
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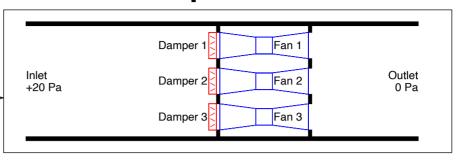
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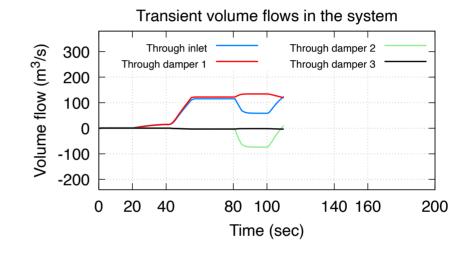
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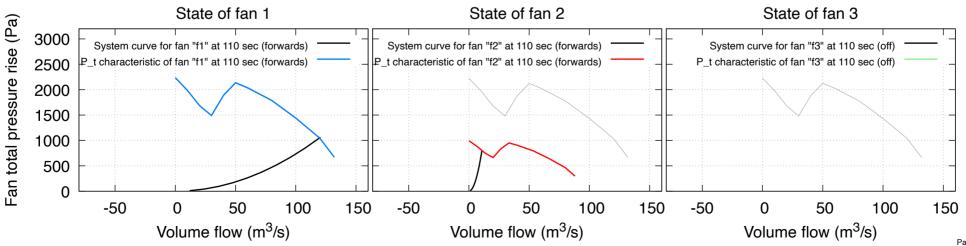
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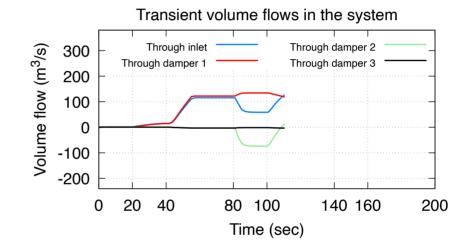
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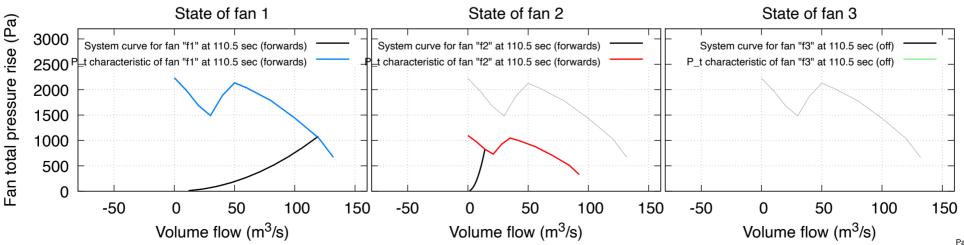
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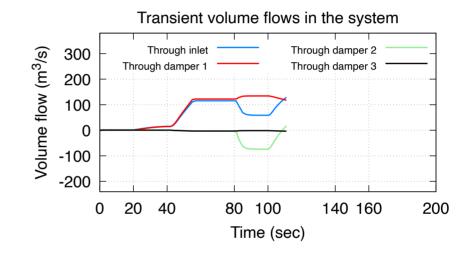
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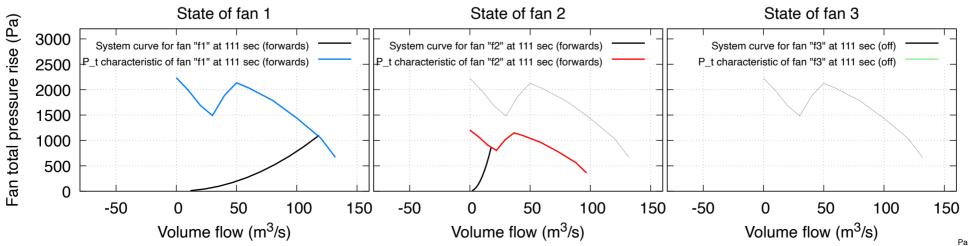
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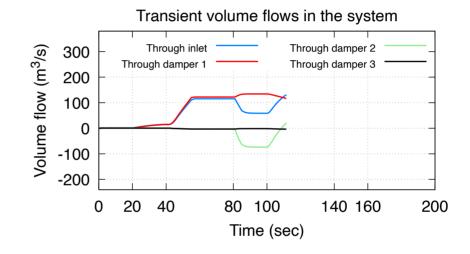
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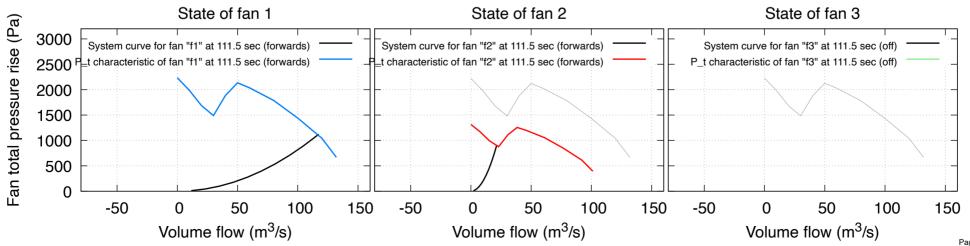
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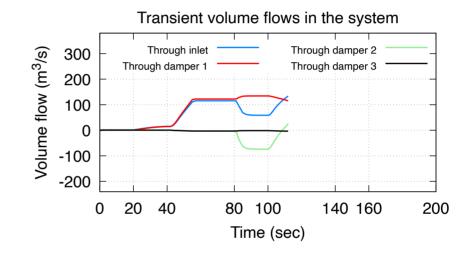
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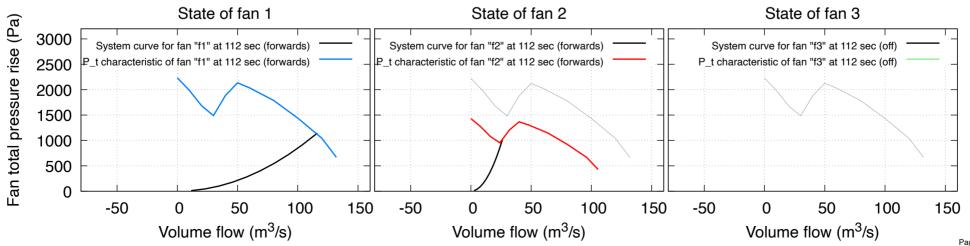
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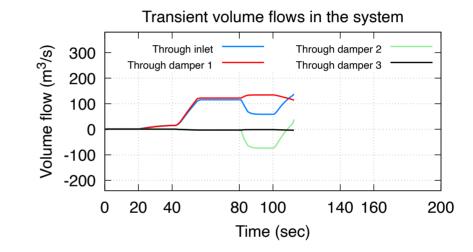
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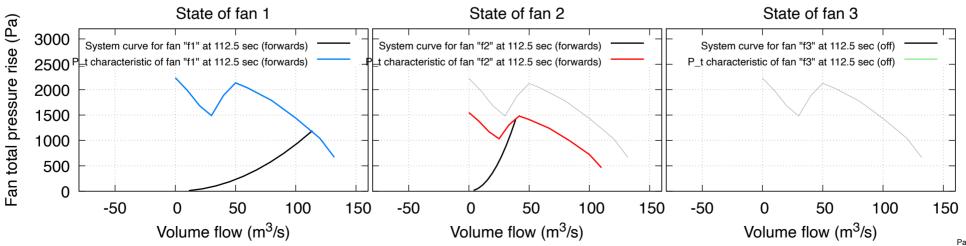
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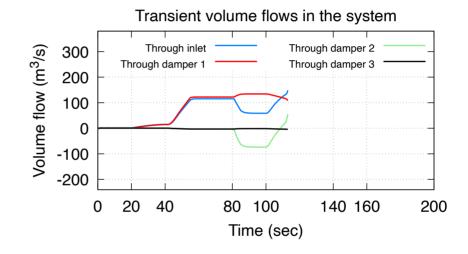
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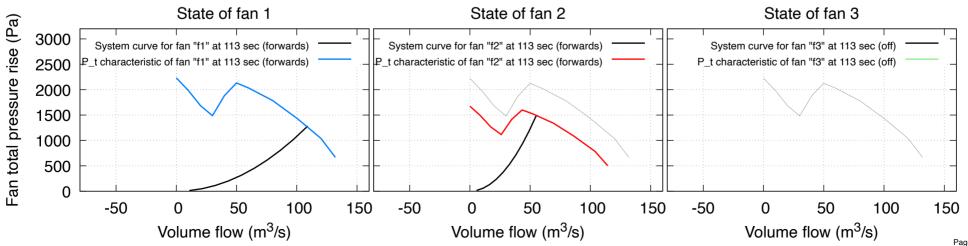
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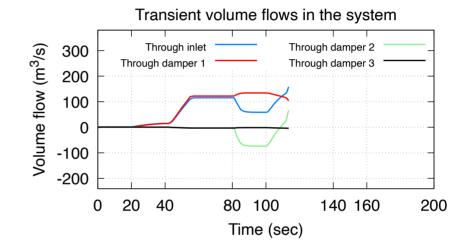
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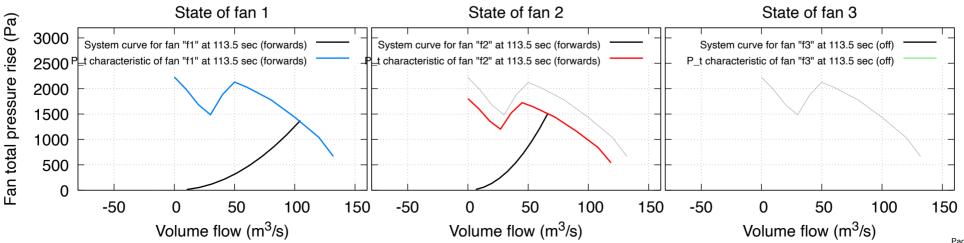
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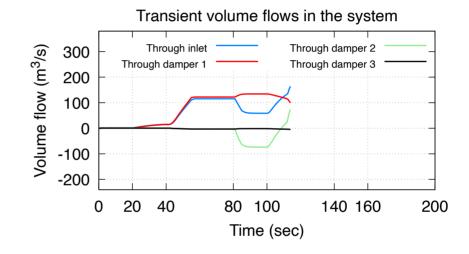
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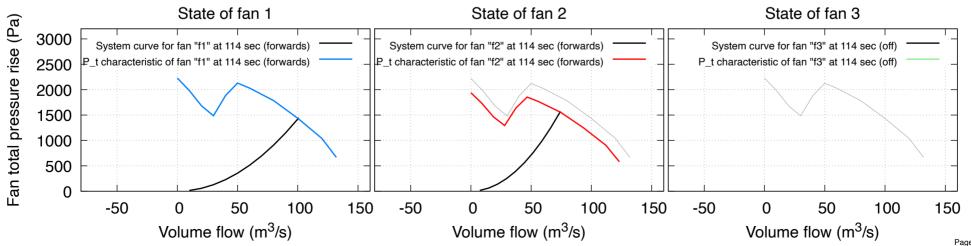
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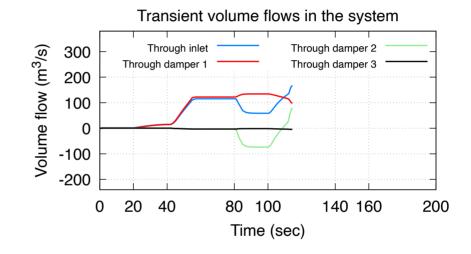
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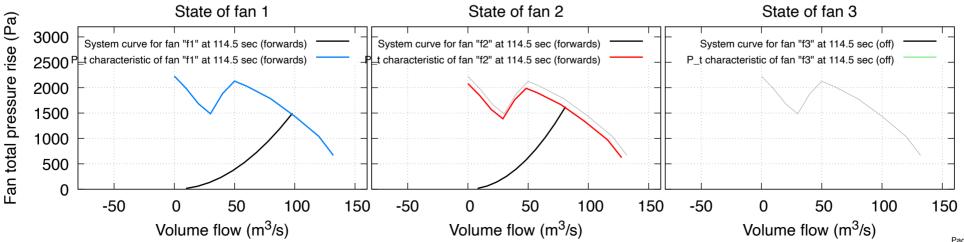
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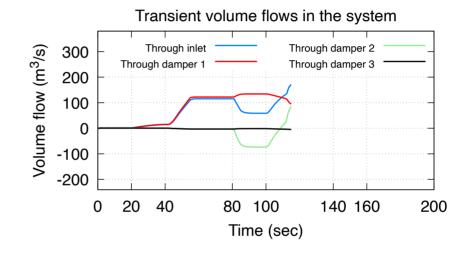
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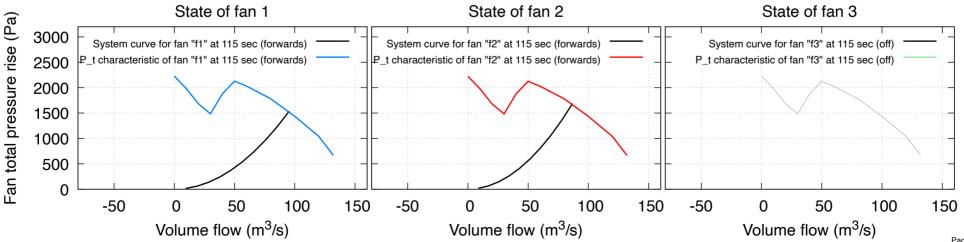
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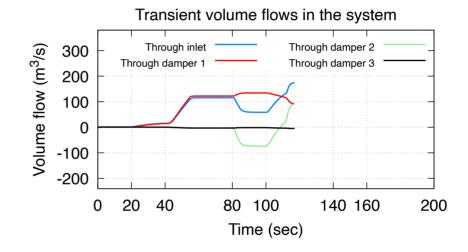
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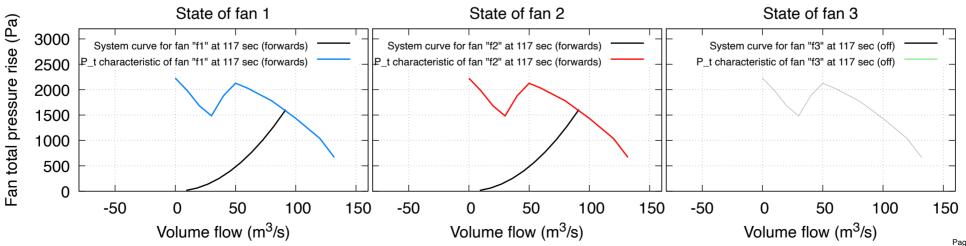
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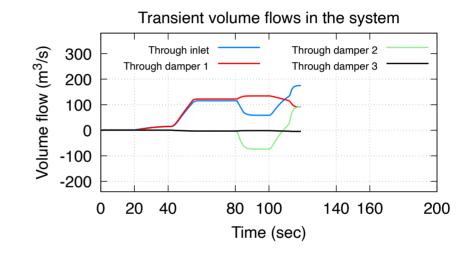
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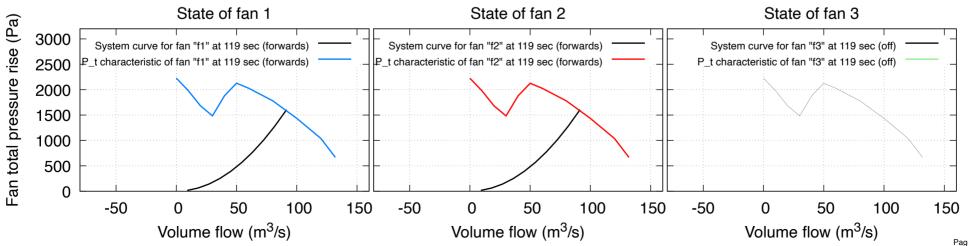
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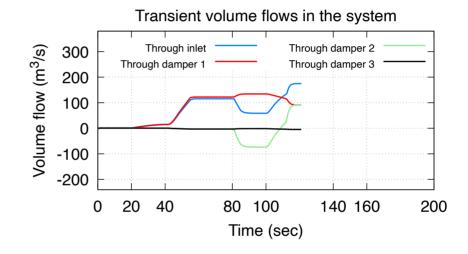
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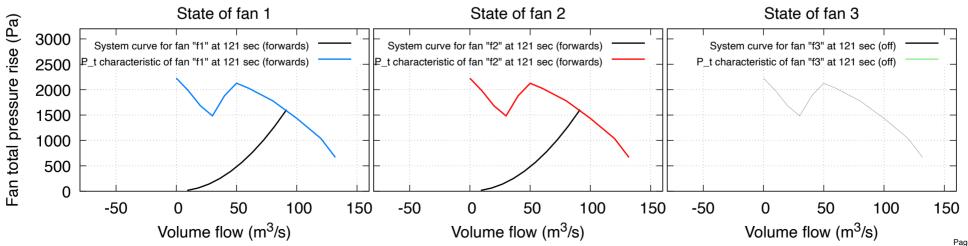
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At 40 seconds, fan 1 starts

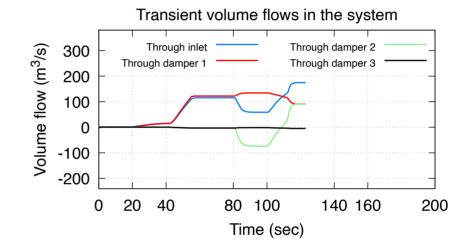
At 80 seconds, damper 2 opens

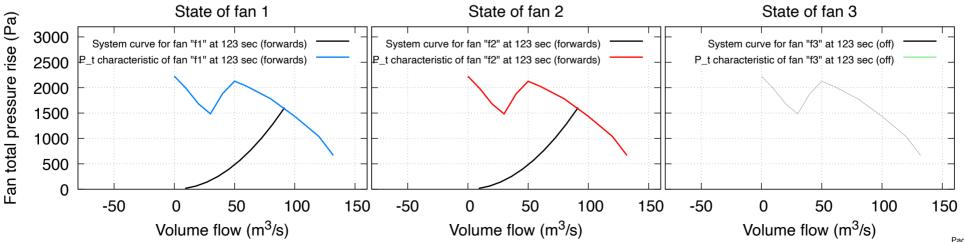
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

The fans are started sequentially. Fans 1 and 2 get to suitable parts of their characteristics. Fan 3 can't get out of stall.

At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

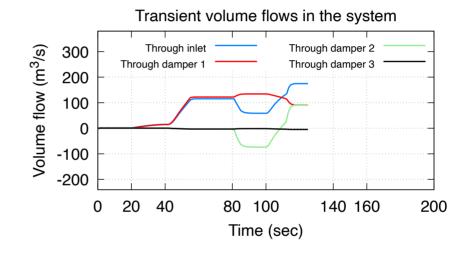
At 80 seconds, damper 2 opens

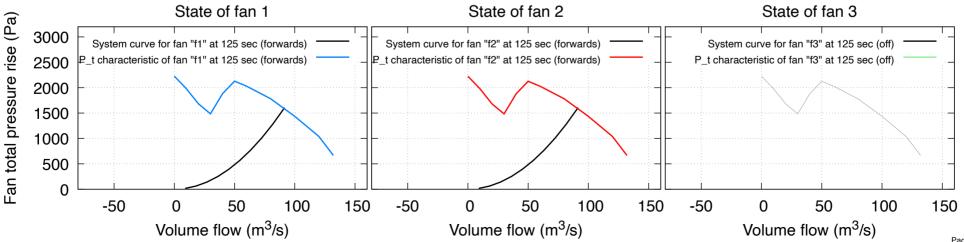
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

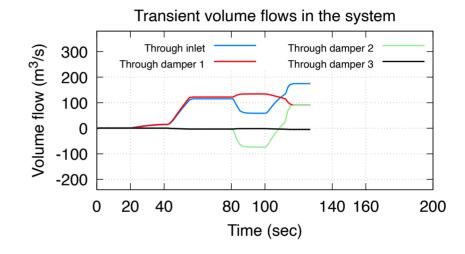
At 80 seconds, damper 2 opens

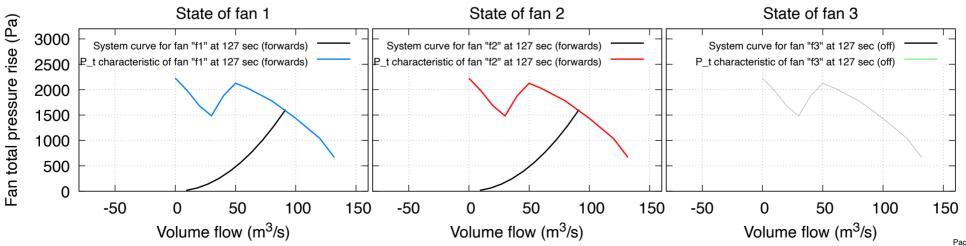
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



Created by Hobyah.py from ok-032-fans-in-parallel.txt, 11:34 on 26 May 2025 by ecb

This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

The fans are started sequentially. Fans 1 and 2 get to suitable parts of their characteristics. Fan 3 can't get out of stall.

At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

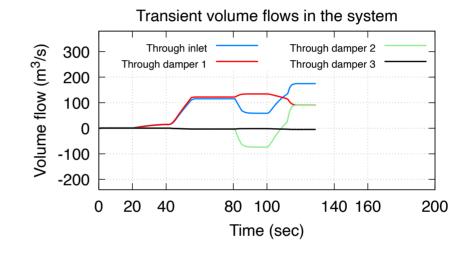
At 80 seconds, damper 2 opens

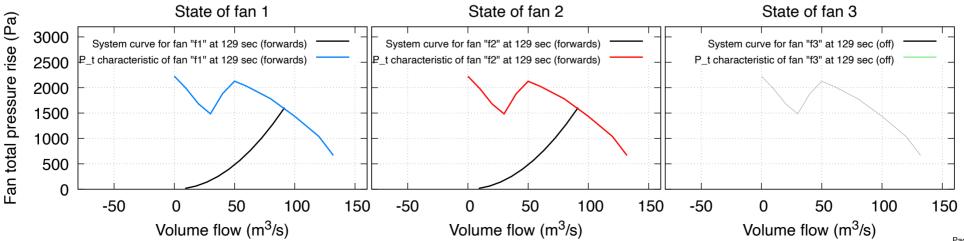
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



rage III

This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

The fans are started sequentially. Fans 1 and 2 get to suitable parts of their characteristics. Fan 3 can't get out of stall.

At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

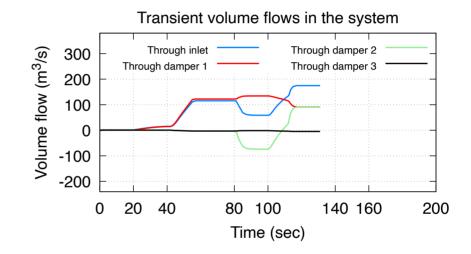
At 80 seconds, damper 2 opens

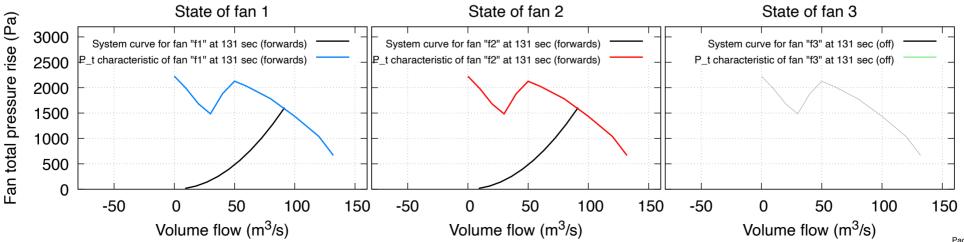
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

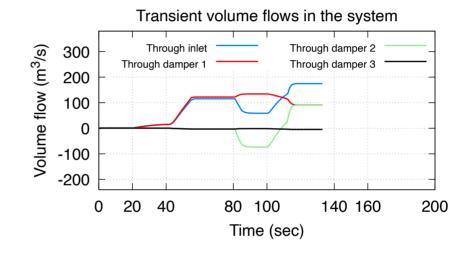
At 80 seconds, damper 2 opens

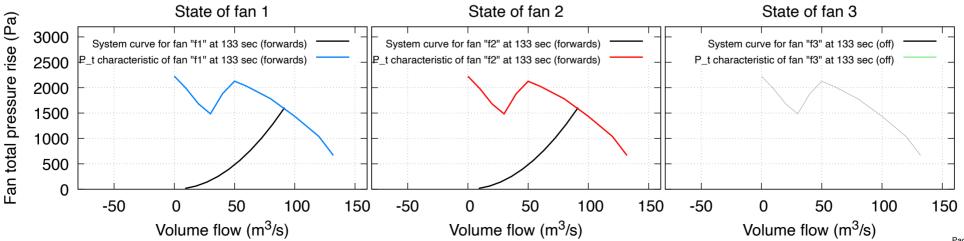
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

The fans are started sequentially. Fans 1 and 2 get to suitable parts of their characteristics. Fan 3 can't get out of stall.

At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

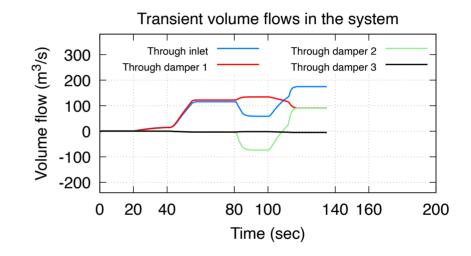
At 80 seconds, damper 2 opens

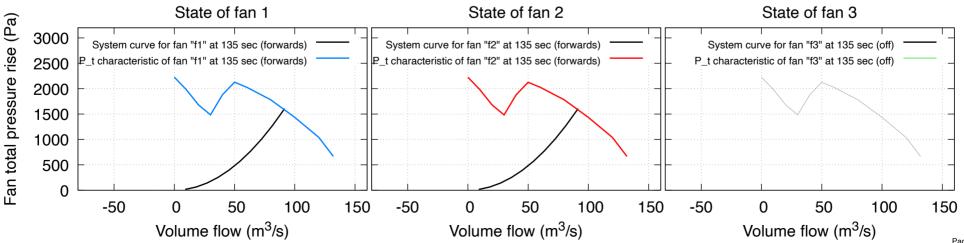
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

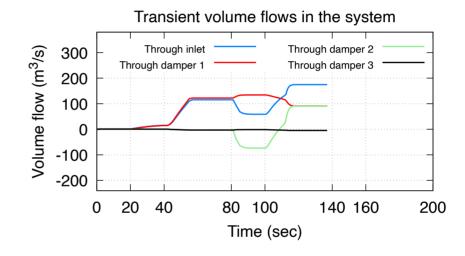
At 80 seconds, damper 2 opens

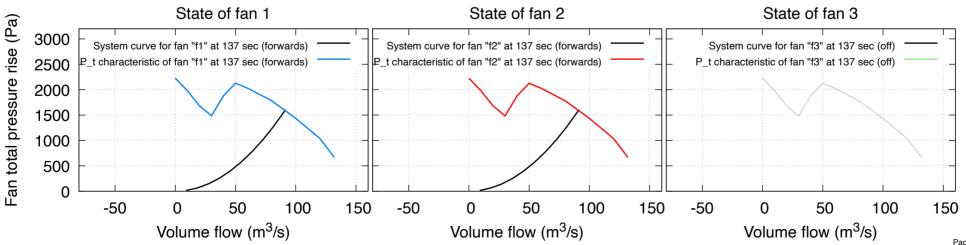
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



Created by Hobyah.py from ok-032-fans-in-parallel.txt, 11:34 on 26 May 2025 by ecb

This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

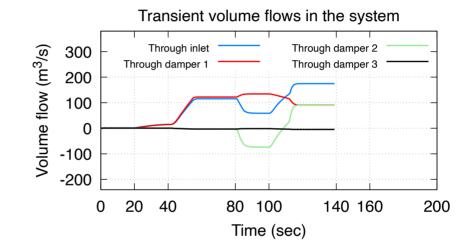
At 80 seconds, damper 2 opens

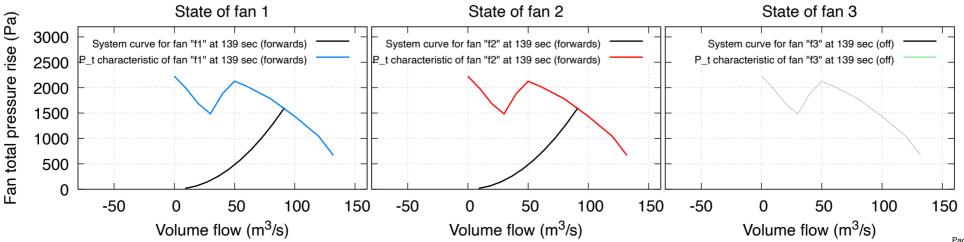
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



Page 116

This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

The fans are started sequentially. Fans 1 and 2 get to suitable parts of their characteristics. Fan 3 can't get out of stall.

At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

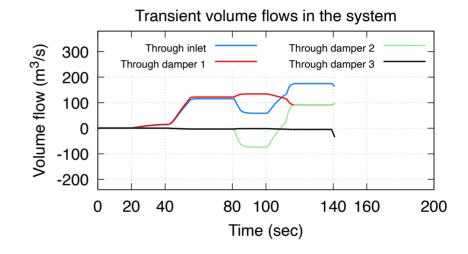
At 80 seconds, damper 2 opens

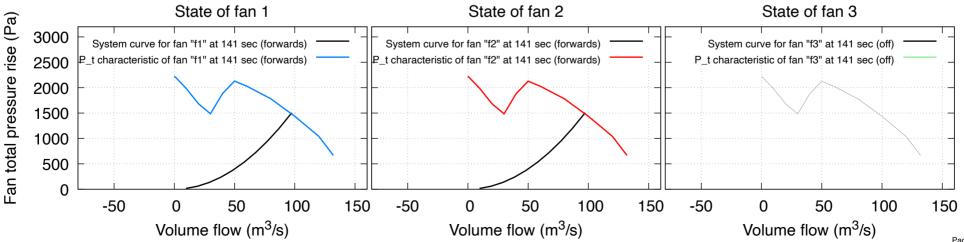
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.

F

This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

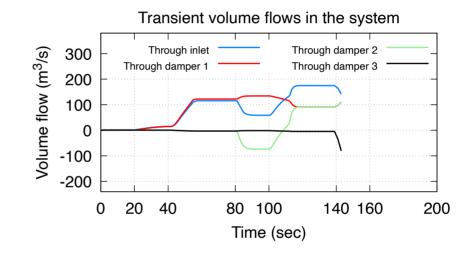
At 80 seconds, damper 2 opens

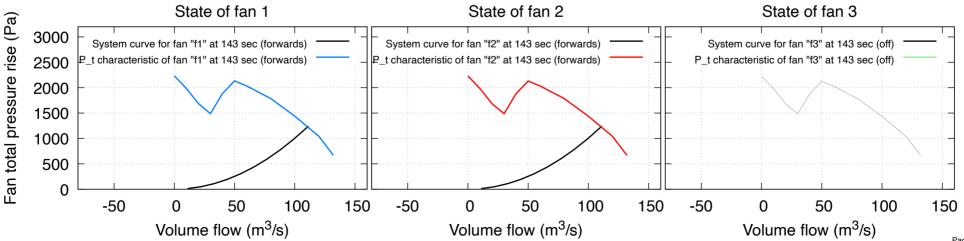
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

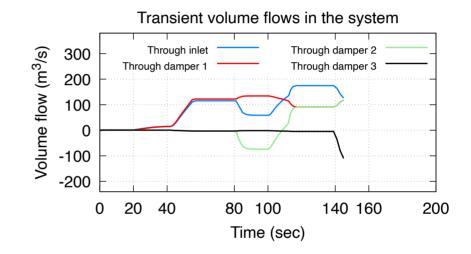
At 80 seconds, damper 2 opens

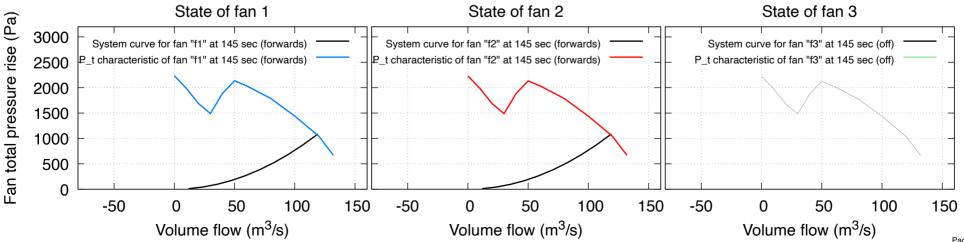
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.

Page 119

This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

The fans are started sequentially. Fans 1 and 2 get to suitable parts of their characteristics. Fan 3 can't get out of stall.

At 20 seconds, damper 1 opens

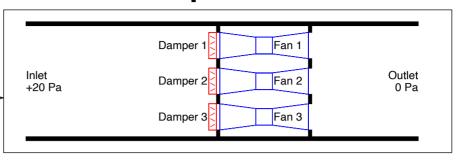
At 40 seconds, fan 1 starts

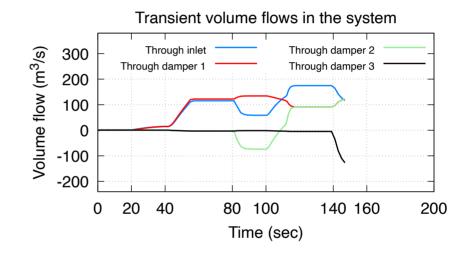
At 80 seconds, damper 2 opens

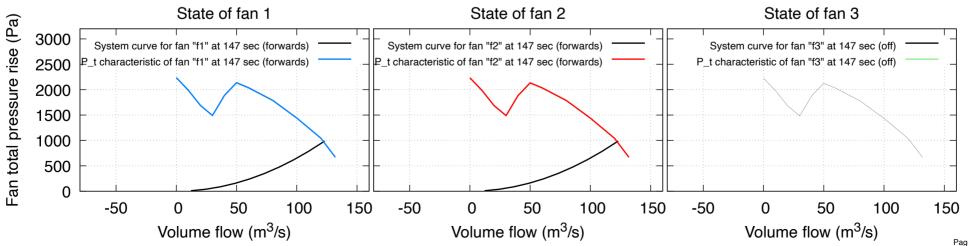
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



Created by Hobyah.py from ok-032-fans-in-parallel.txt, 11:34 on 26 May 2025 by ecb

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Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

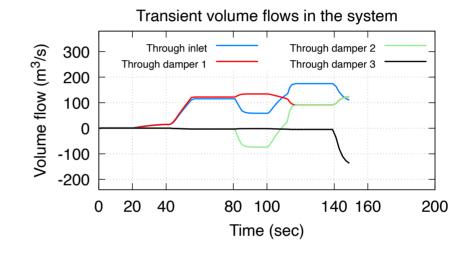
At 80 seconds, damper 2 opens

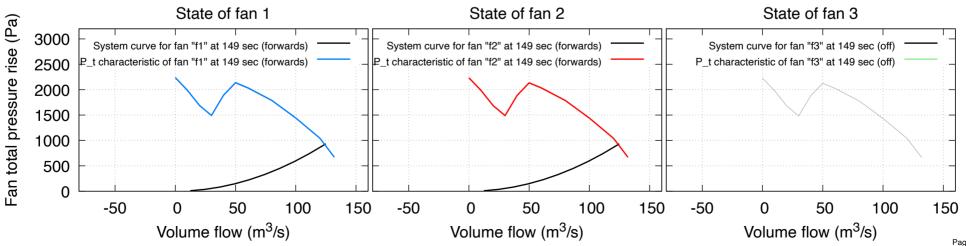
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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At 40 seconds, fan 1 starts

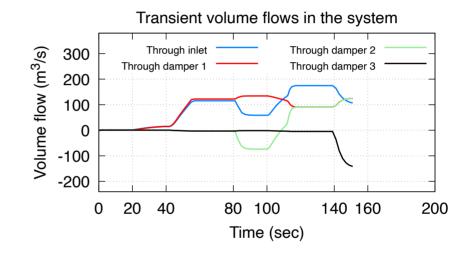
At 80 seconds, damper 2 opens

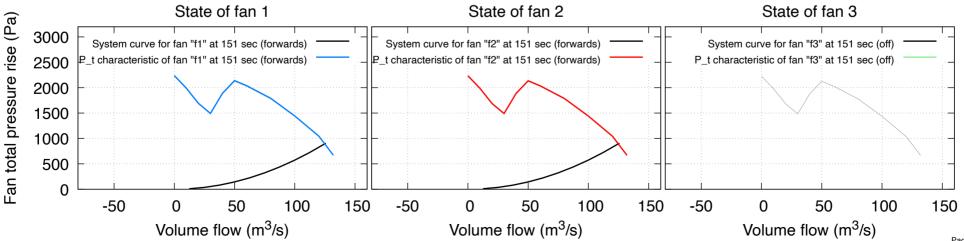
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



Page 122

This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

The fans are started sequentially. Fans 1 and 2 get to suitable parts of their characteristics. Fan 3 can't get out of stall.

At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

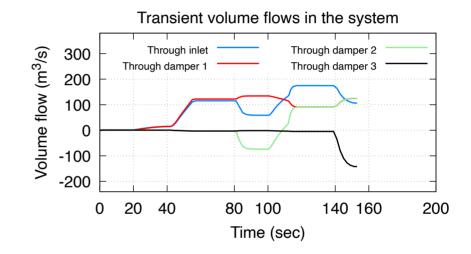
At 80 seconds, damper 2 opens

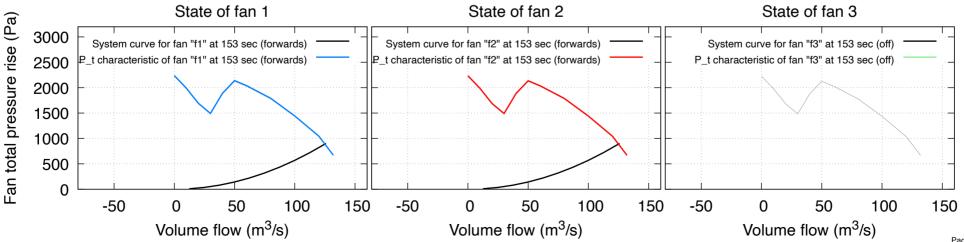
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.

ſ

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At 40 seconds, fan 1 starts

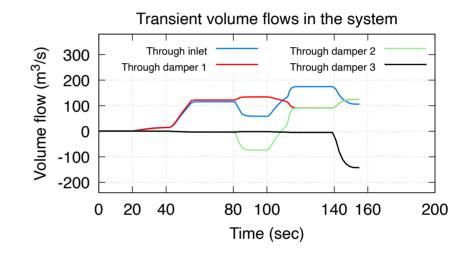
At 80 seconds, damper 2 opens

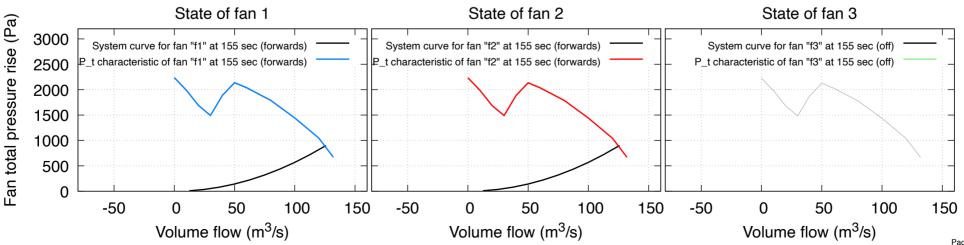
At 100 seconds, fan 2 starts

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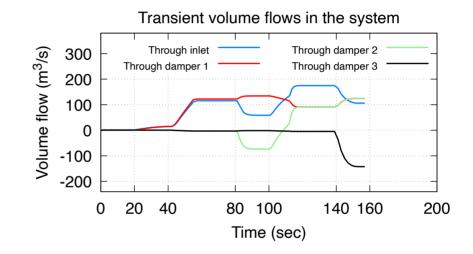
At 80 seconds, damper 2 opens

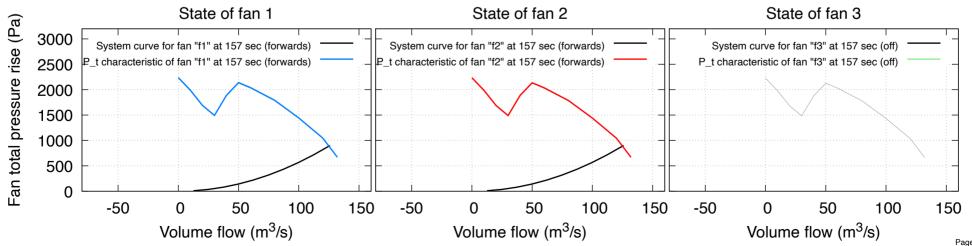
At 100 seconds, fan 2 starts

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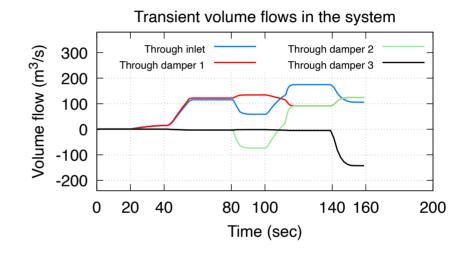
At 80 seconds, damper 2 opens

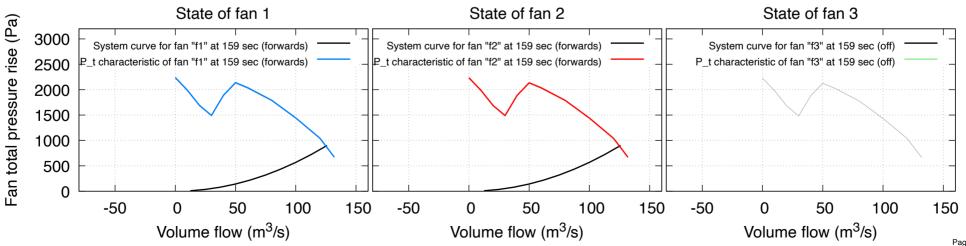
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

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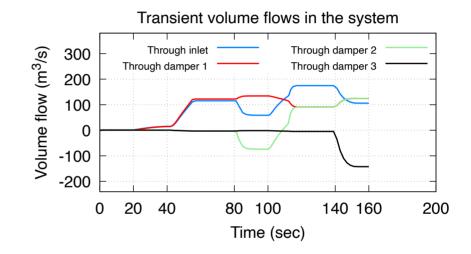
At 80 seconds, damper 2 opens

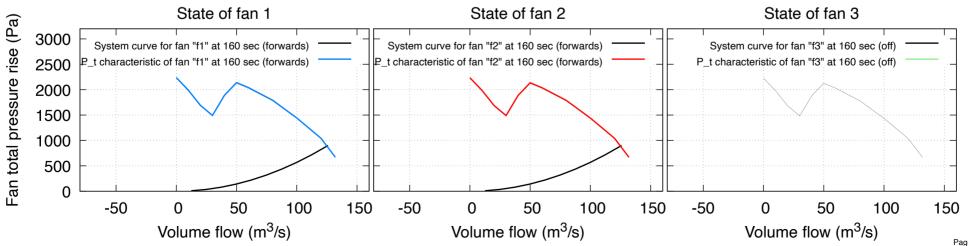
At 100 seconds, fan 2 starts

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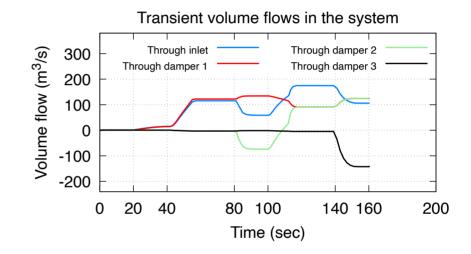
At 80 seconds, damper 2 opens

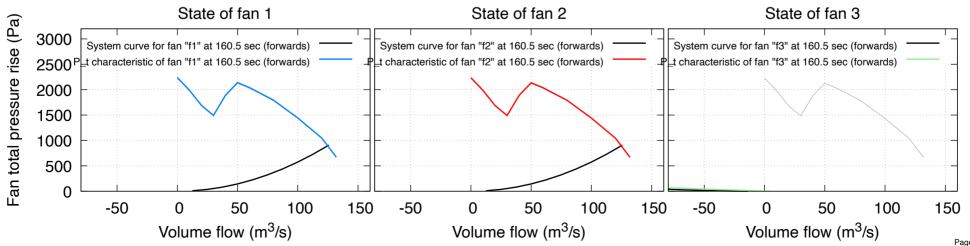
At 100 seconds, fan 2 starts

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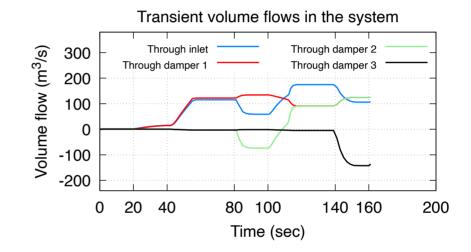
At 80 seconds, damper 2 opens

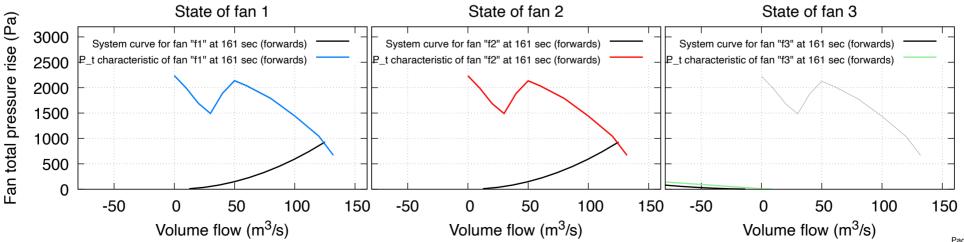
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



Page 129

This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 20 seconds, damper 1 opens

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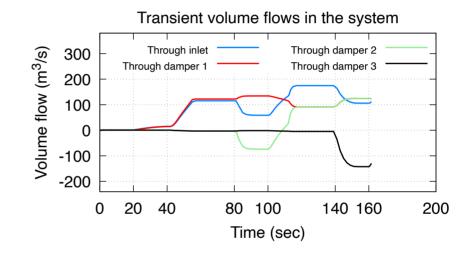
At 80 seconds, damper 2 opens

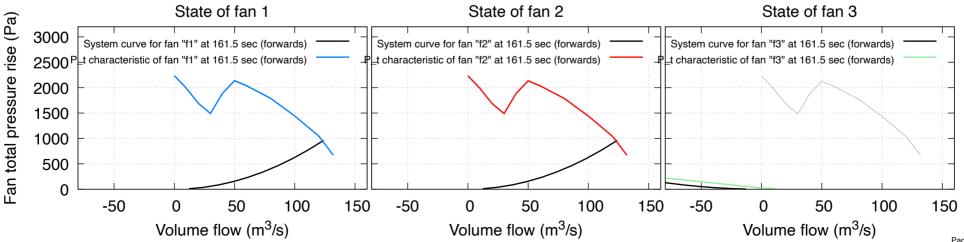
At 100 seconds, fan 2 starts

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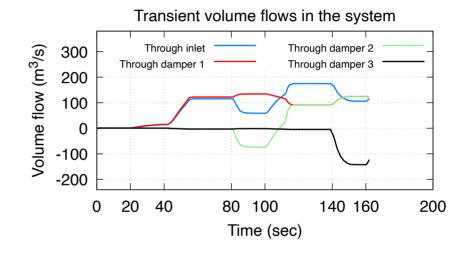
At 80 seconds, damper 2 opens

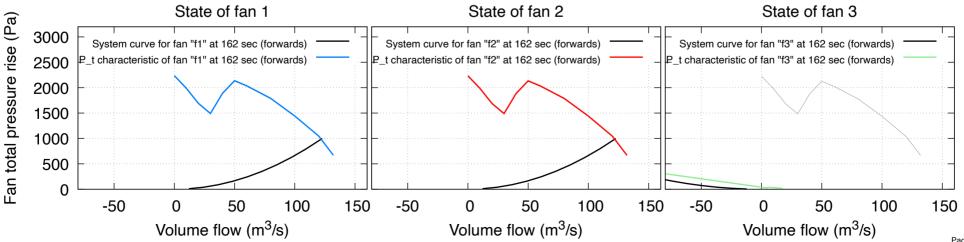
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









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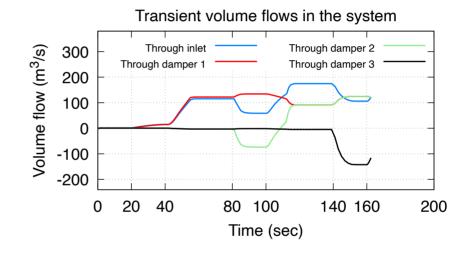
At 80 seconds, damper 2 opens

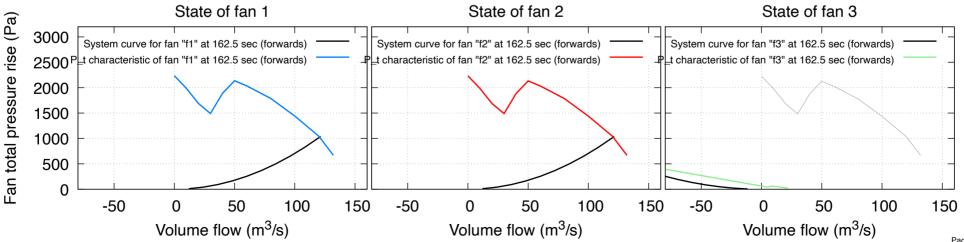
At 100 seconds, fan 2 starts

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At 160 seconds, fan 3 starts









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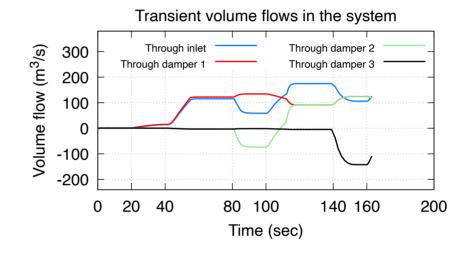
At 80 seconds, damper 2 opens

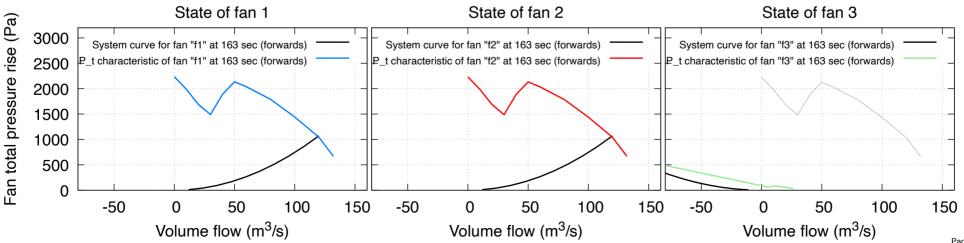
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



Page 133

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Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

The fans are started sequentially. Fans 1 and 2 get to suitable parts of their characteristics. Fan 3 can't get out of stall.

At 20 seconds, damper 1 opens

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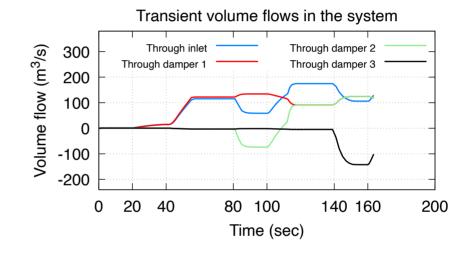
At 80 seconds, damper 2 opens

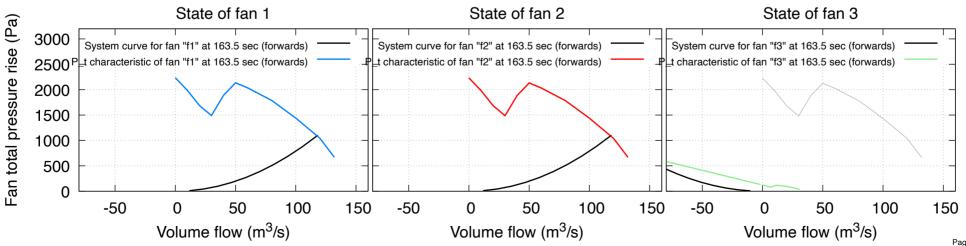
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts









This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

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At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

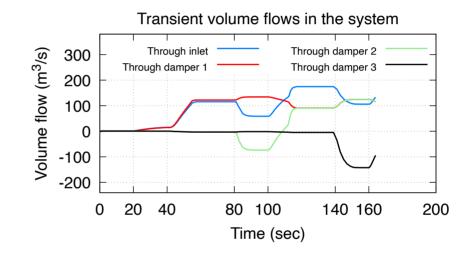
At 80 seconds, damper 2 opens

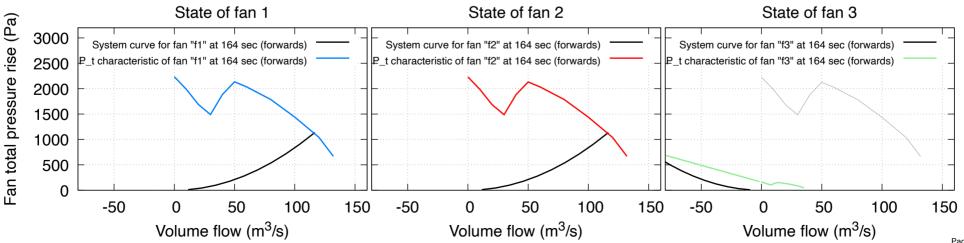
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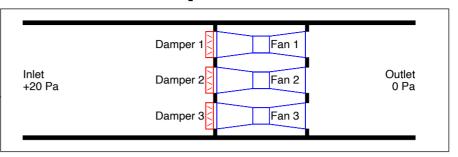
At 40 seconds, fan 1 starts

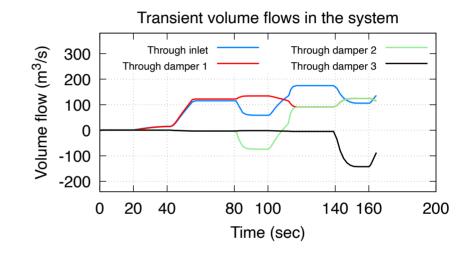
At 80 seconds, damper 2 opens

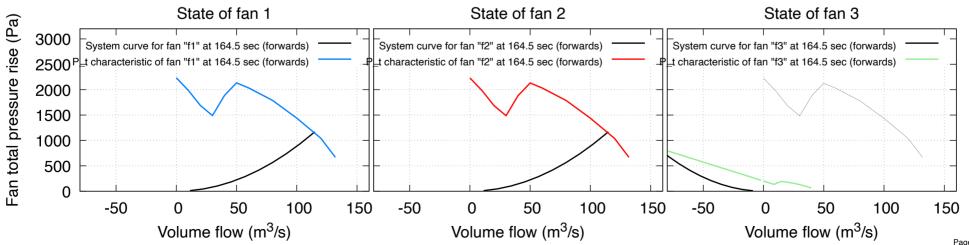
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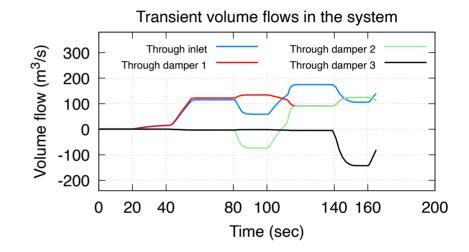
At 80 seconds, damper 2 opens

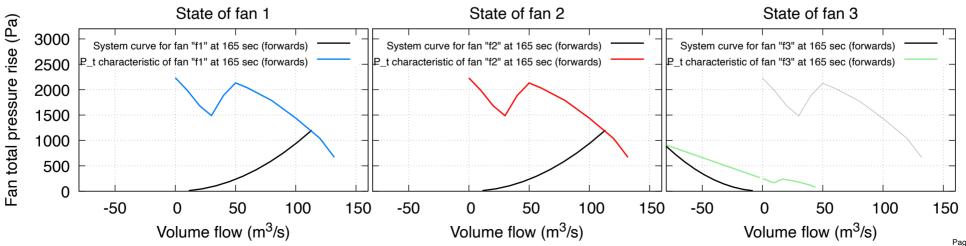
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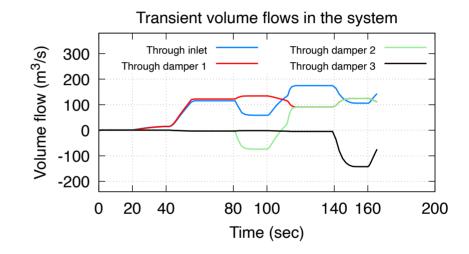
At 80 seconds, damper 2 opens

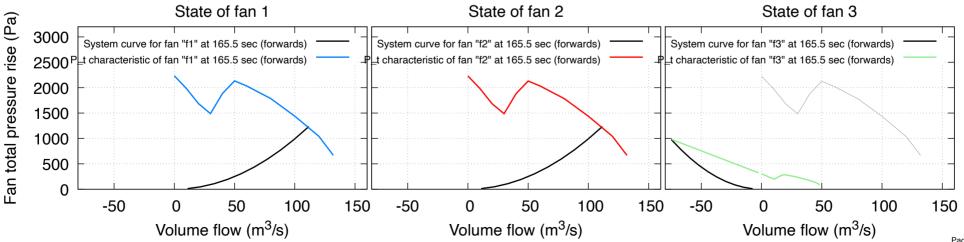
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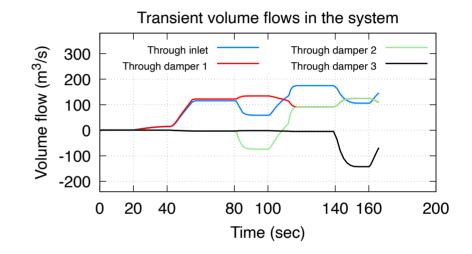
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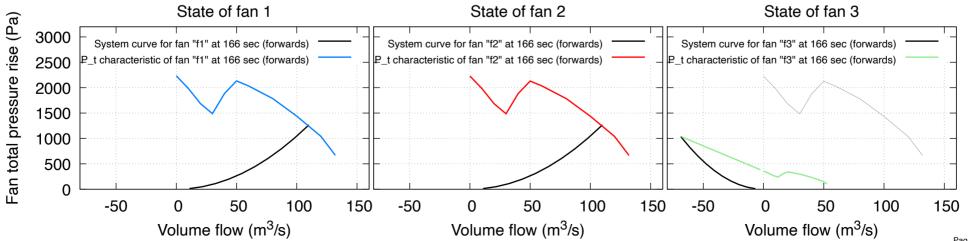
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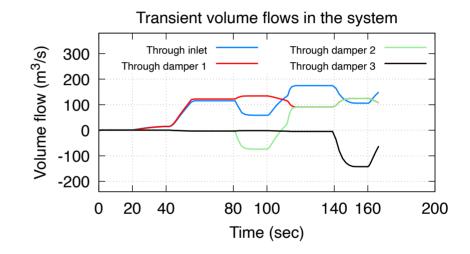
At 80 seconds, damper 2 opens

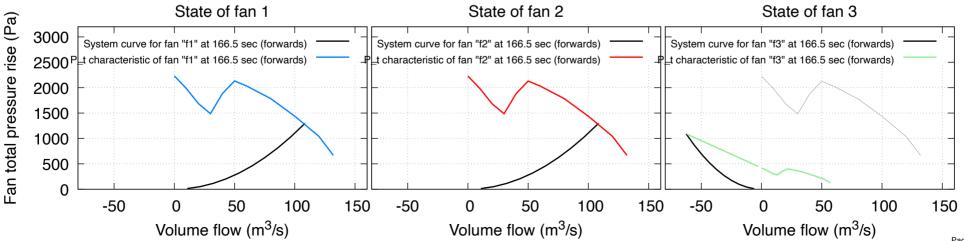
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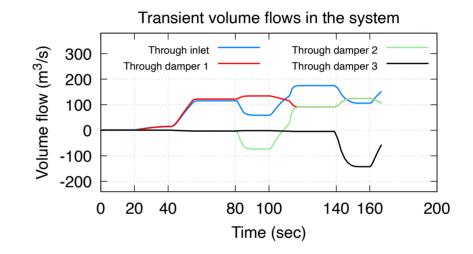
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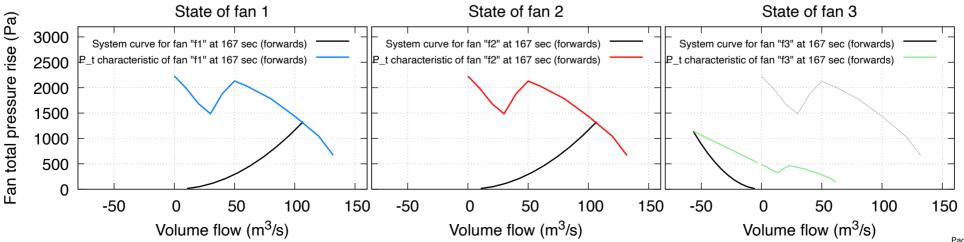
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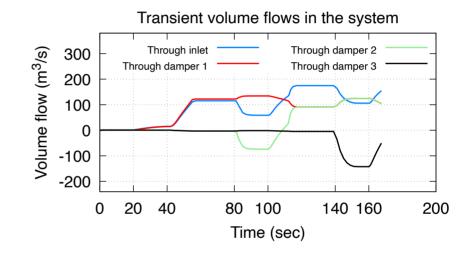
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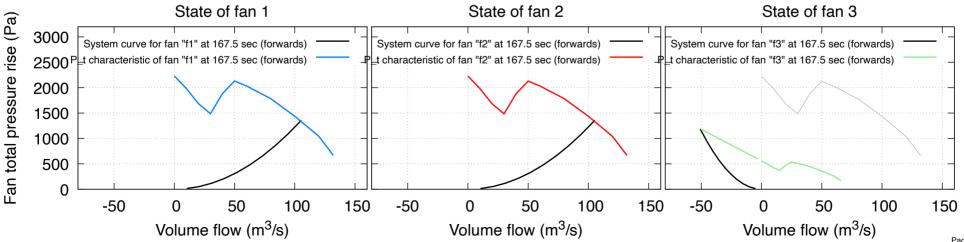
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Source file: ok-032-fans-in-parallel.txt.

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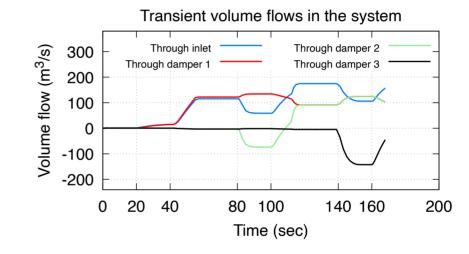
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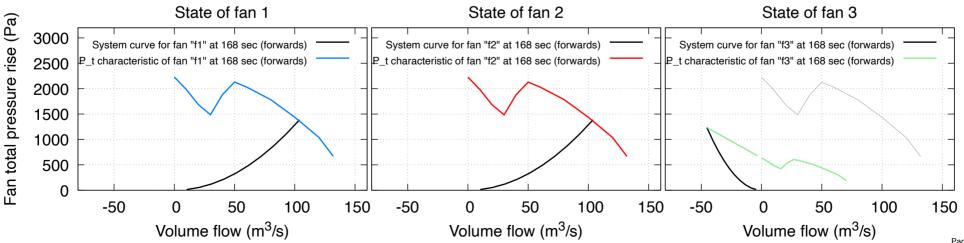
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Source file: ok-032-fans-in-parallel.txt.



Page 143

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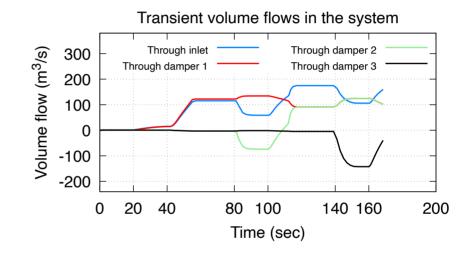
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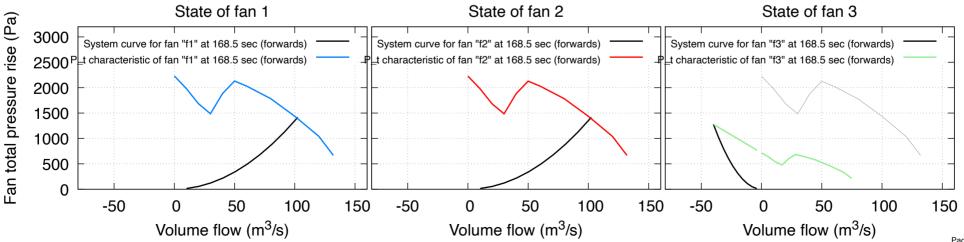
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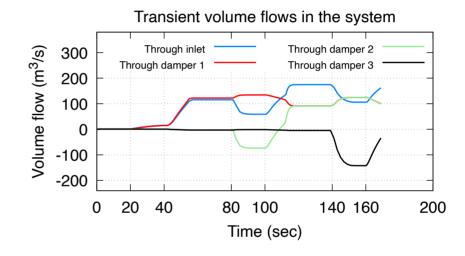
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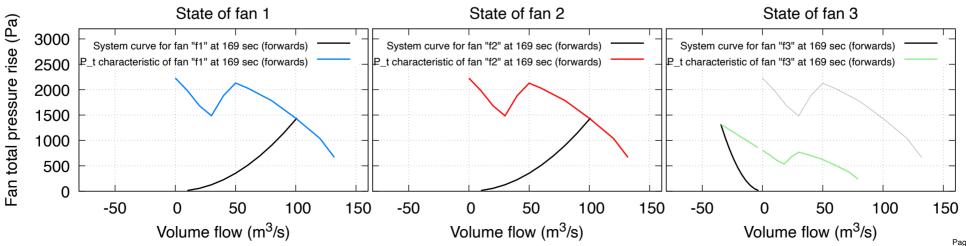
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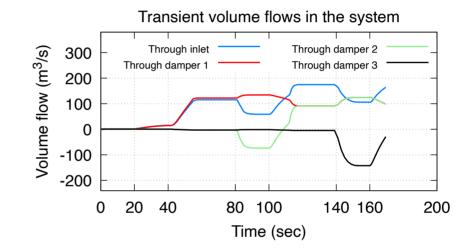
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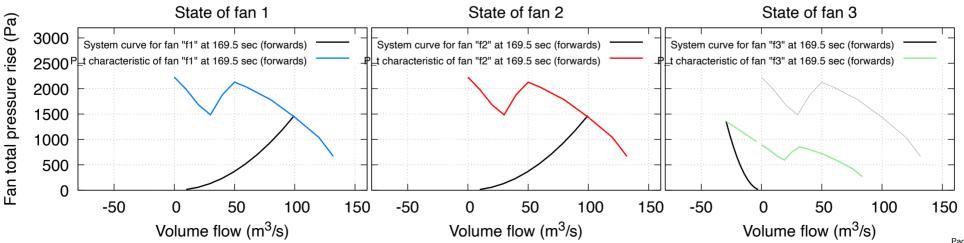
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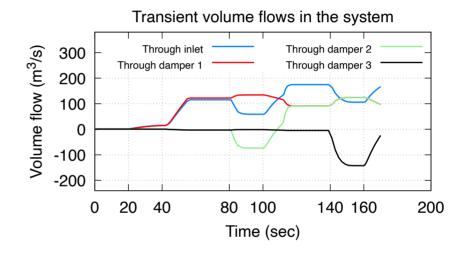
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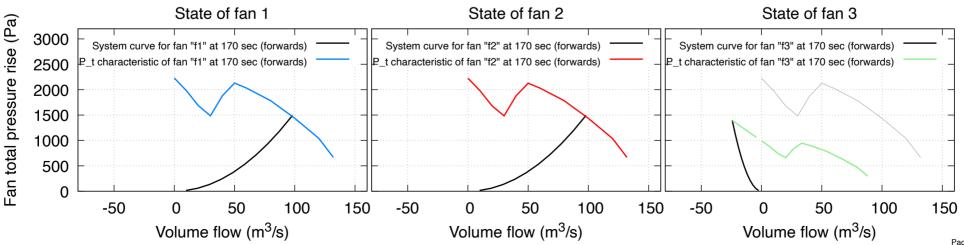
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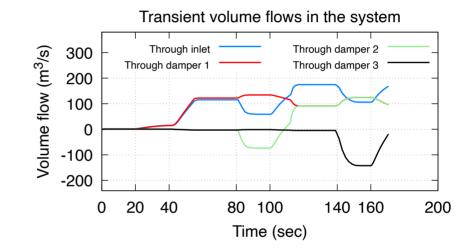
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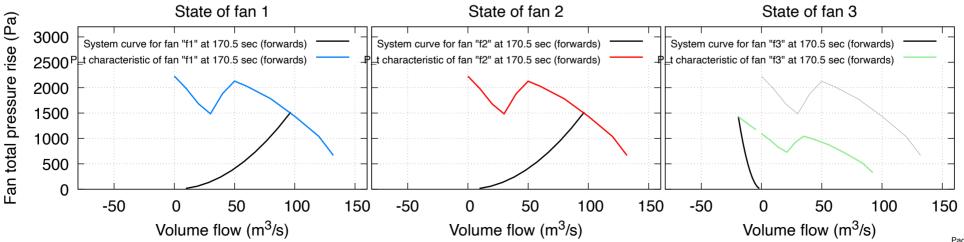
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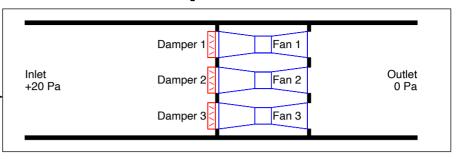
At 40 seconds, fan 1 starts

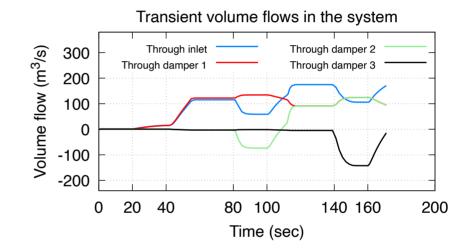
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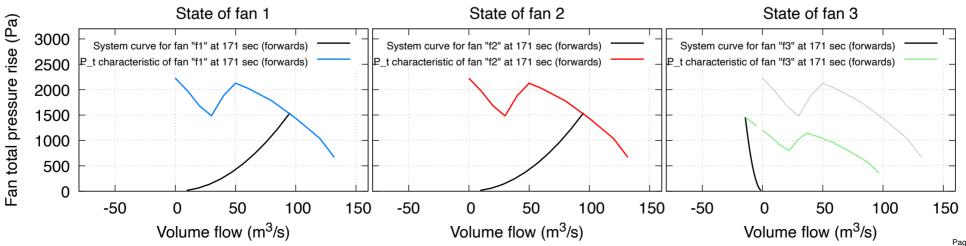
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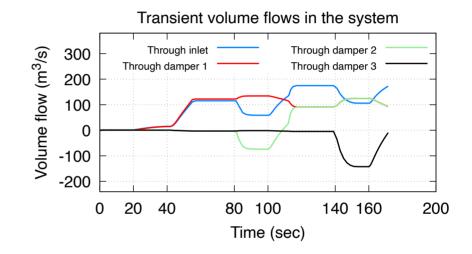
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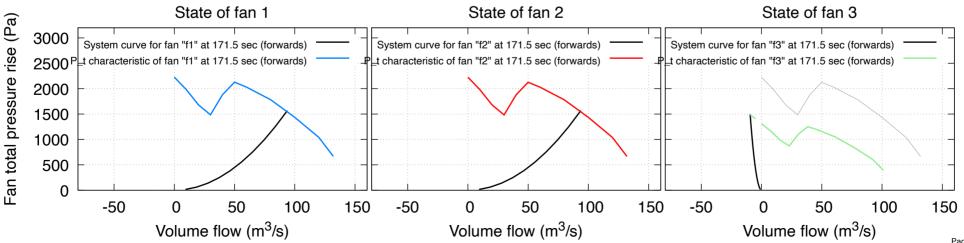
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Source file: ok-032-fans-in-parallel.txt.



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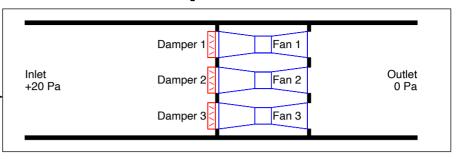
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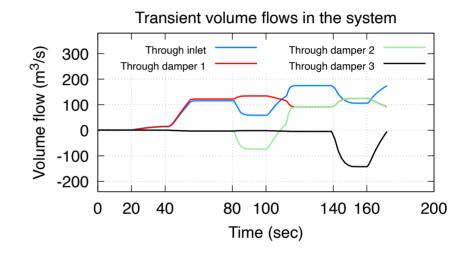
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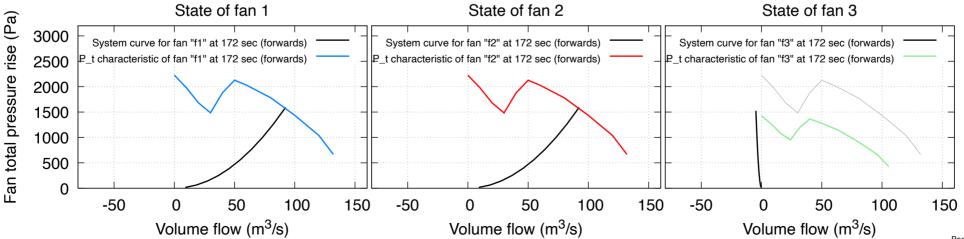
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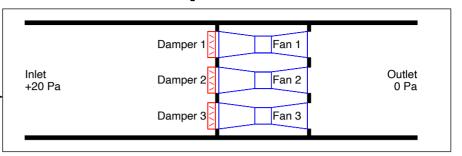
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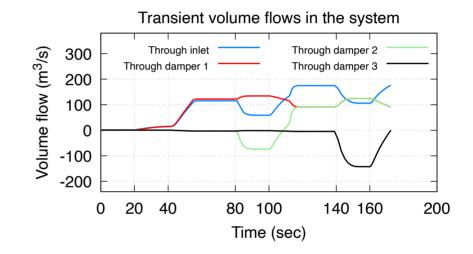
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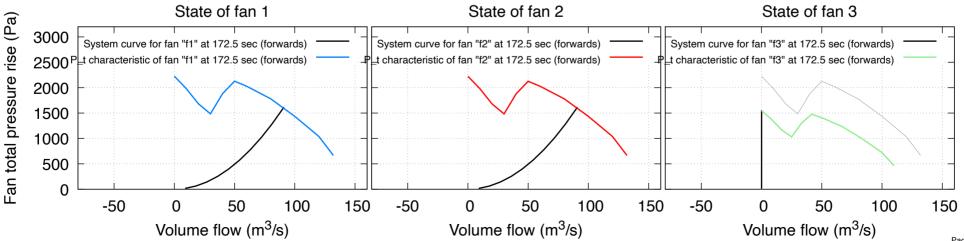
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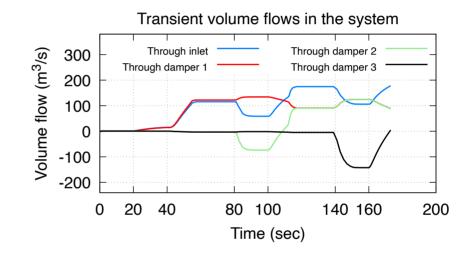
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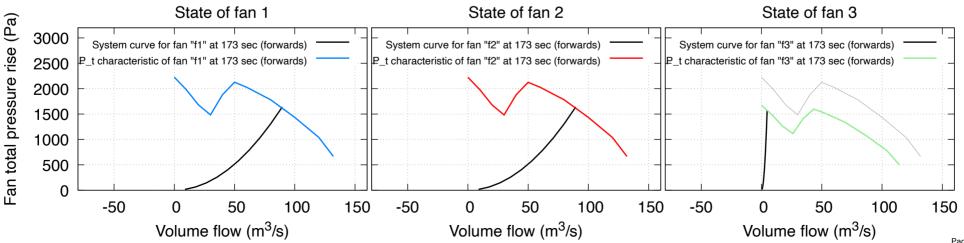
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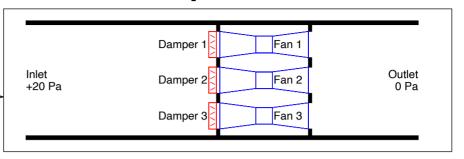
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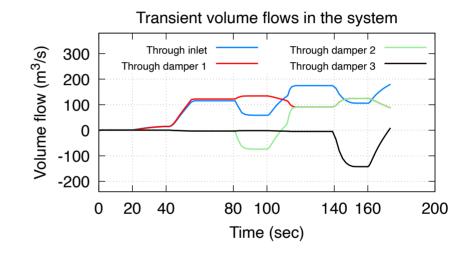
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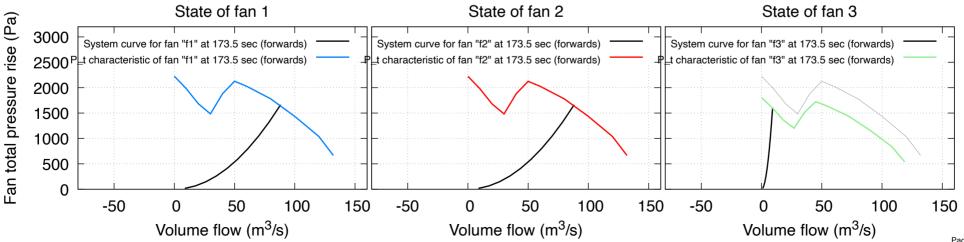
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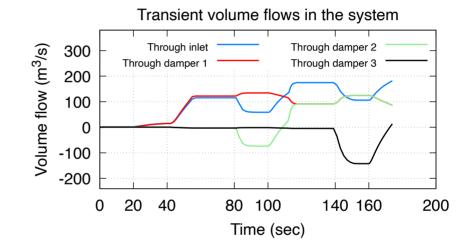
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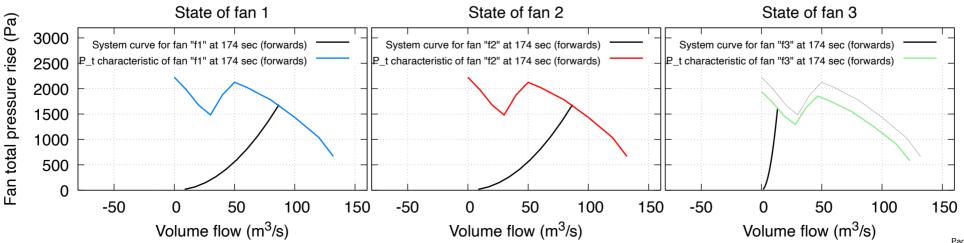
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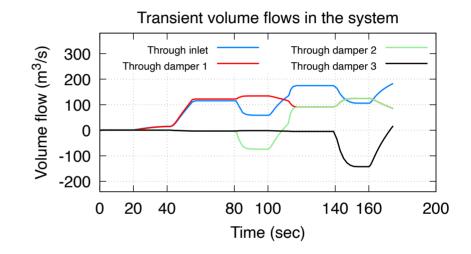
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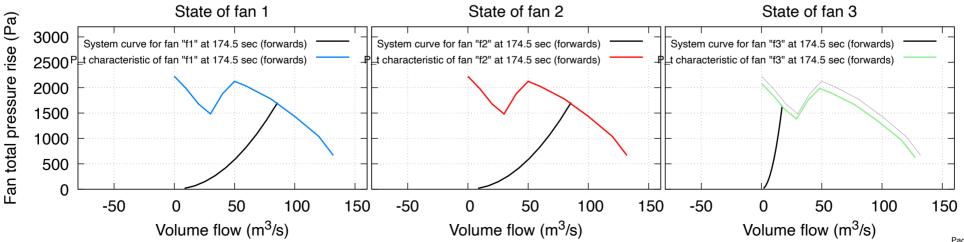
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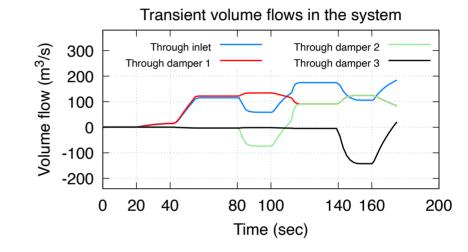
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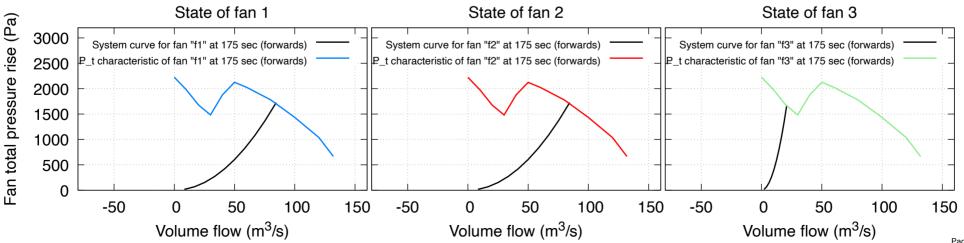
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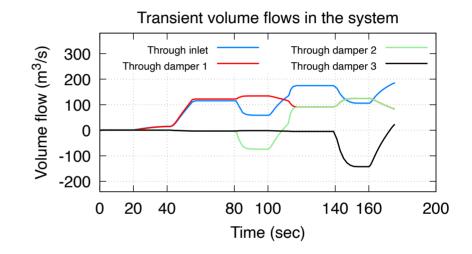
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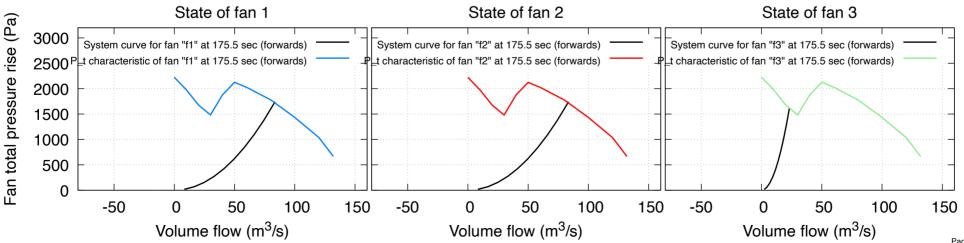
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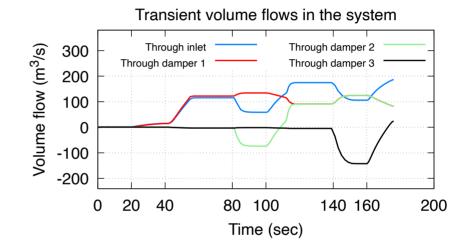
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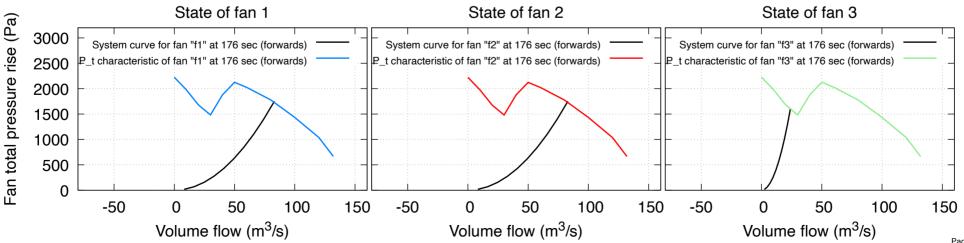
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Source file: ok-032-fans-in-parallel.txt.

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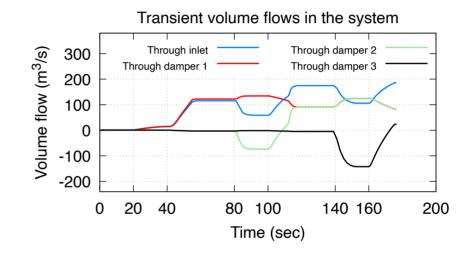
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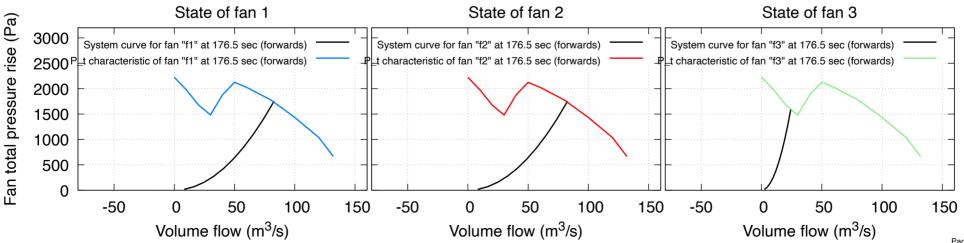
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This flipbook illustrates a problem that can occur when you try to run fans in parallel that are unsuitable for running in parallel.

Consider three identical fans with isolation dampers, in parallel:— The fans have a Q-P_{tot} characteristic with a bad stall hump.

The fans are started sequentially. Fans 1 and 2 get to suitable parts of their characteristics. Fan 3 can't get out of stall.

At 20 seconds, damper 1 opens

At 40 seconds, fan 1 starts

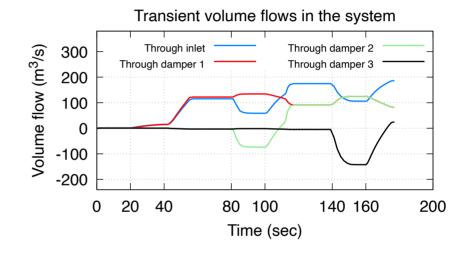
At 80 seconds, damper 2 opens

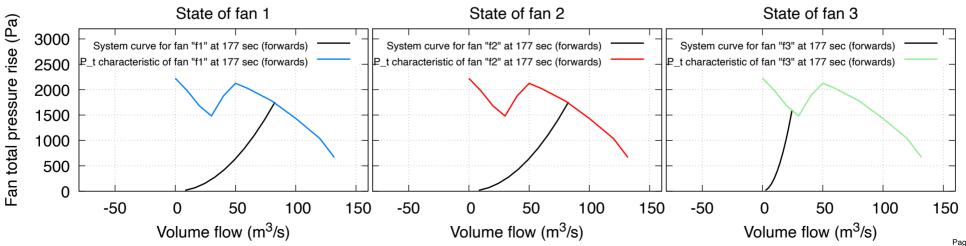
At 100 seconds, fan 2 starts

At 140 seconds, damper 3 opens

At 160 seconds, fan 3 starts







Source file: ok-032-fans-in-parallel.txt.



Created by Hobyah.py from ok-032-fans-in-parallel.txt, 11:34 on 26 May 2025 by ecb

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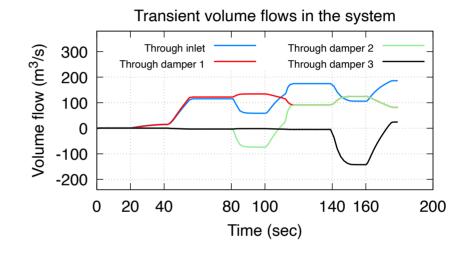
At 80 seconds, damper 2 opens

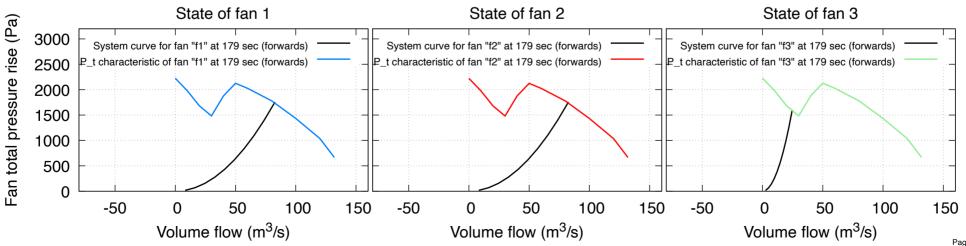
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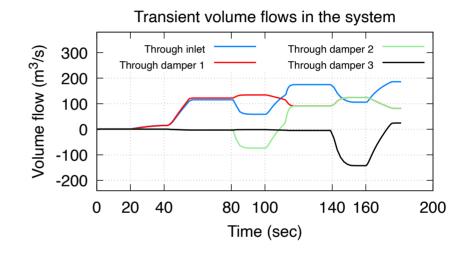
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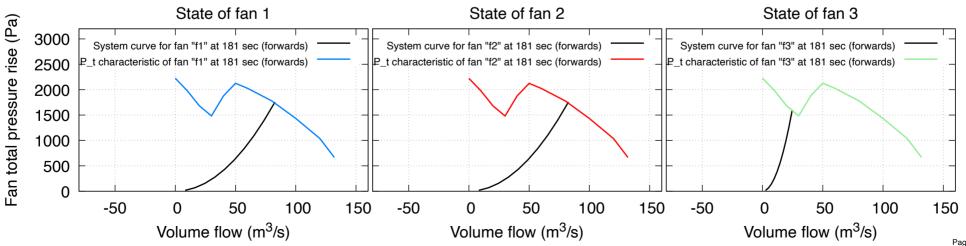
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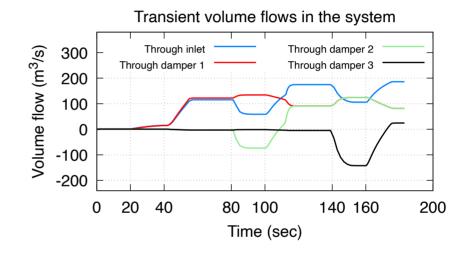
At 80 seconds, damper 2 opens

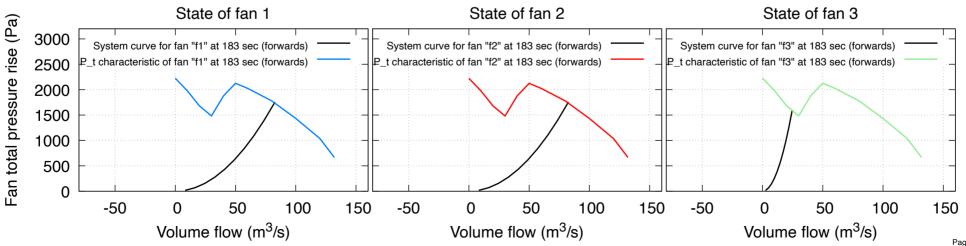
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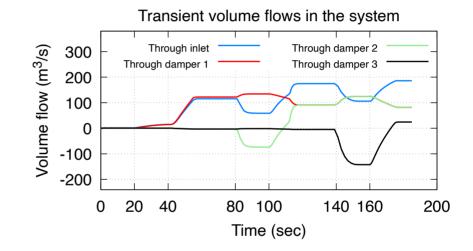
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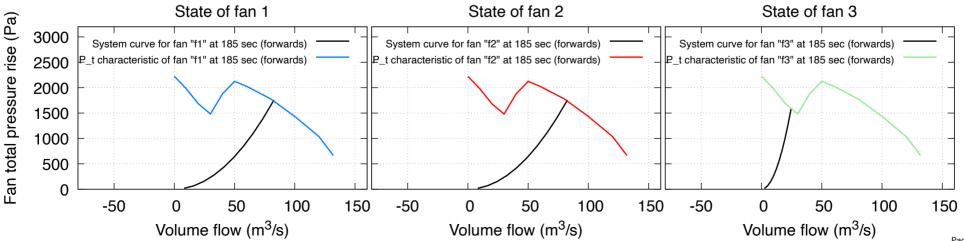
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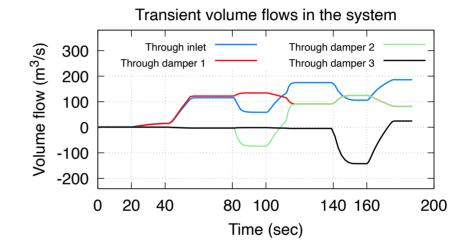
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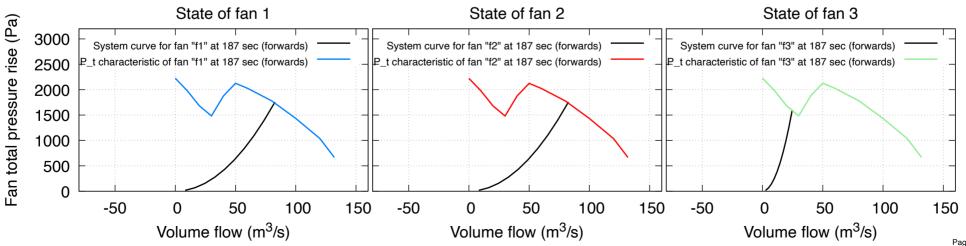
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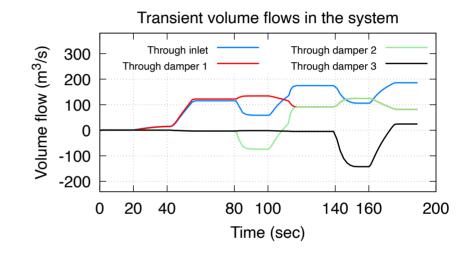
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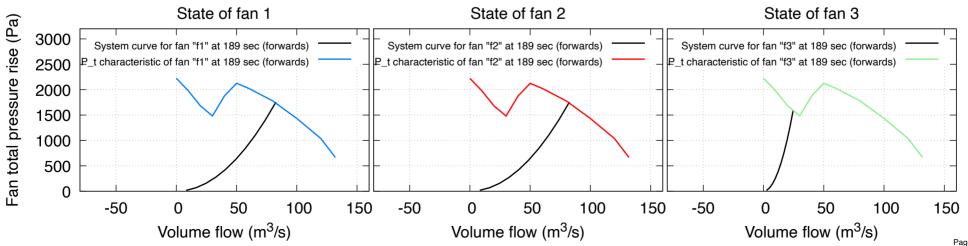
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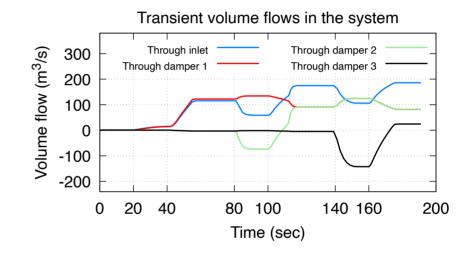
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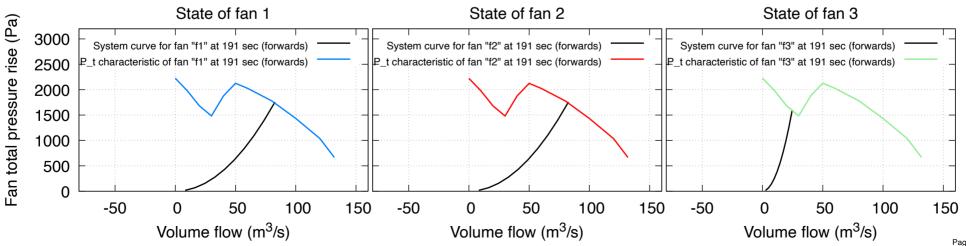
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Project no: 2 Project name: Software testing

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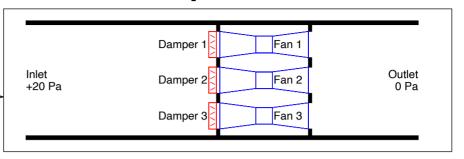
At 40 seconds, fan 1 starts

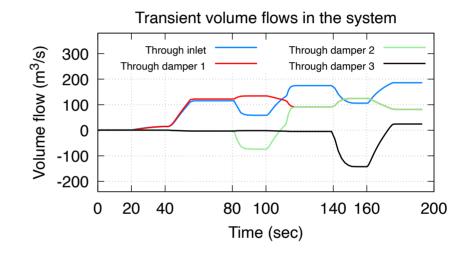
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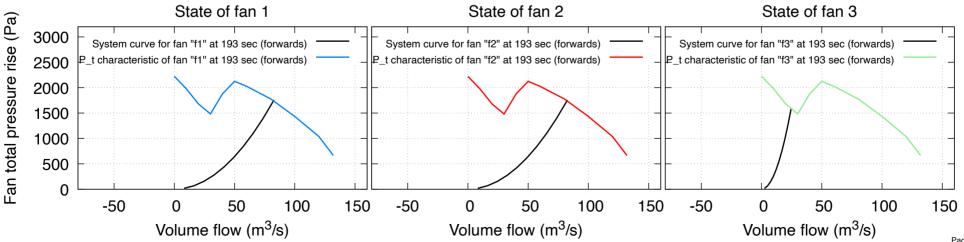
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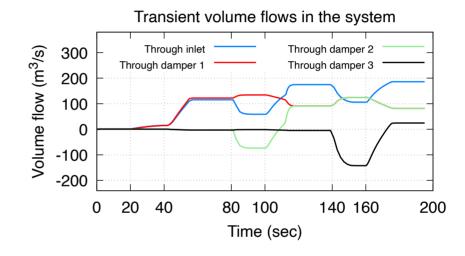
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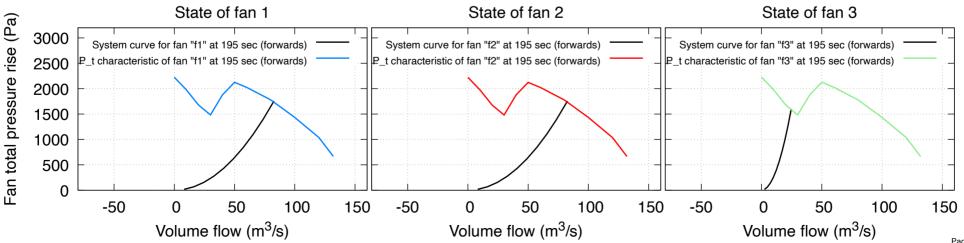
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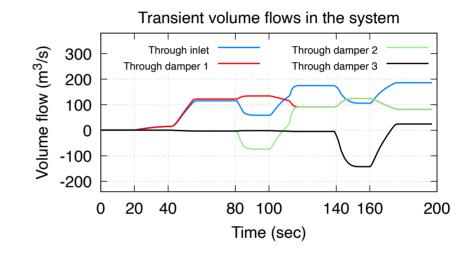
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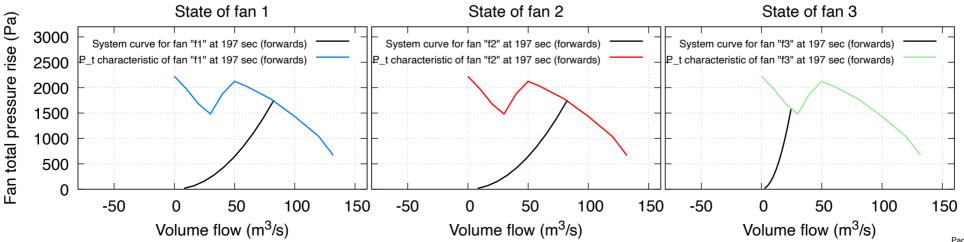
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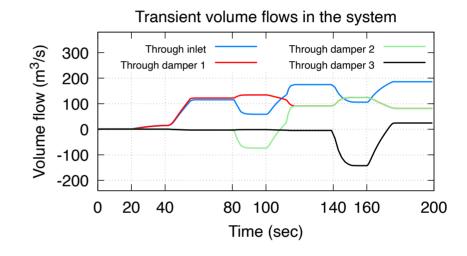
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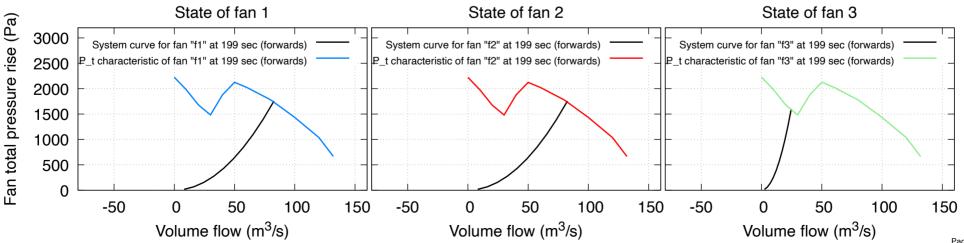
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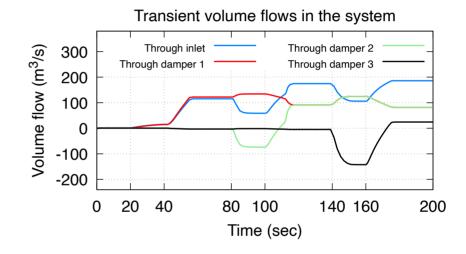
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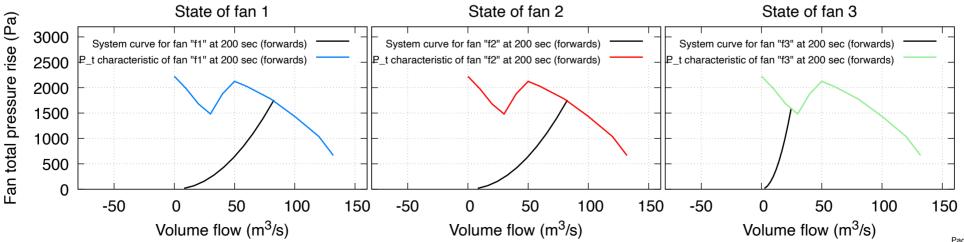
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