

Change Note		CN-063
Change to: Technical Assumption 45 and 61		
Description: Primary Differential Pressure tests		
References: Paragraphs 2.20, 2.21, 2.22, Table 1		
Change originator: JA		Date of request: 15/12/21
Rev: 01	Date authored: 17/01/22	Proposed change to assumption: Y

1. Proposed Approach

Intead of having 50 kPa in all test it is proposed to change the DP depending on the test.

The proposed changes are as follows:

Proposed Heating test (1a, 1b, 1c, 1d, 1e, 1f)

Due to the technical challenge, low impact on resident comfort, and additional resources that would be required to implement the test, a variable DP heating test is not recommended for the space heating tests (test 1a – 1f). Instead, it is proposed that tests 1b and 1e (1kW heating) are performed with 200 kPa DP, with the other tests remaining at 50 kPa. This approach doesn't provide a challenge for the test houses and the heating operation of the HIU at 200 kPa can be assessed.

Proposed DHW Dynamic test (2a & 2b)

Based on previous considerations it is proposed to perform a Dynamic DHW demand test (tests 2a and 2b) with variable DP on the primary. The new test will show the performance of the HIU at different flows with 50 kPa and 200 kPa of DP on the primary. This will show how the HIU would perform in the reference building at maximum and minimum DP.

A 25 kPa fluctuation in DP has also been added to assess the HIU reaction to DP changes during the typically operating conditions. In order to assess the HIUs performance at low (50 kPa) and high (200 kPa), the 25 kPa fluctuation have been introduced within the 180 second low (0.06 l/s), medium (0.10 l/s), and high (0.13 l/s) flow rate tests at both DPs.

Figure 1 shows the proposed test flows and DP values over time.

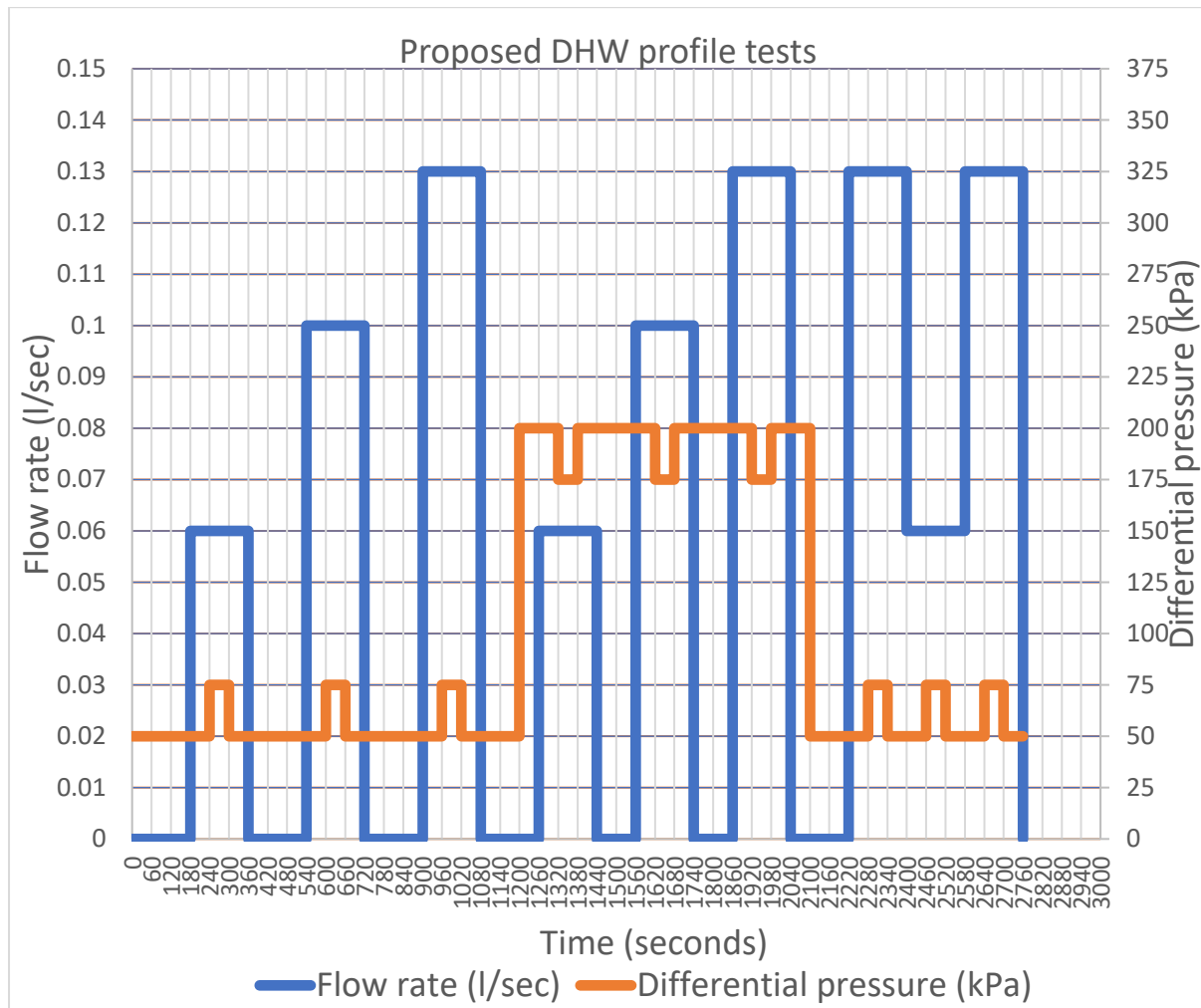


Figure 1: Proposed secondary flows and DP for DHW dynamic test (2a & 2b)

Low flow DHW test (3a and 3b, test 3c and 3d are added)

Previous low flow tests show that the output of a HIU may fluctuate at low flow conditions. High DP challenges the authority of the control valve at low flows and might increase DHW outlet temperatures fluctuations that could represent a health and safety risk. It is recommended to test low flow at minimum and maximum pressure. This would add test 3c and 3d to the test regime. 3a and 3b would remain as the existing (high temperature) HT and (low temperature) LTs test at 50 kPa. Tests 3c and 3d would be introduced as the HT and LT test with the higher 200 kPa DP.

Keep-warm and DHW response time (4a, 4b, 5a, 5b)

As variable DP would not be expected to significantly affect the performance of a HIU during the keep-warm and DHW response time tests, undertaking multiple tests at different DP would increase considerably the test time and the cost of the test without adding much value to the test. It is recommended to keep performing the test with 50 kPa constant.

2. Rationale (underlying basis for the change)

In real life operating conditions, a HIU will not operate with constant 50 kPa DP on the primary side. The DP the HIUs are exposed changes depending on the DHN conditions. It is

proposed that a series of tests with variable DP on the primary side. The reasoning for the DP values chosen is explained in technical note TN-17.

3. Impact of change (e.g. implications for test rig)

Primary DPCV will be replaced by a variable speed pump that will control the pressure on the primary side of the HIU. Test rig will need to be carefully assessed to get equal DP during the test of different HIUs across all test houses.

Evaluation of change			
Date evaluated: 18/01/22	Those present: BESA HIU Technical Committee	Additional info required?: No	Modification to proposed approach?: No
Details: Rationale explained in TN-017.			
Signed off: Yes			