ENGINEERING TOMORROW
sheet
AB-QM f low checker DN 40 -250
Verifying the f low on DN 40
to DN 250 AB-QM valves

Contents

AB-QM 3TP Flow Checker

Flow verification in an installation

To verify that an installation functions according to the design specifications checking only the most critical valve in the installation is needed (see figure 1).
The AB-QM maintains a constant differential pressure over the valve and any excess pressure will automatically be throt tled. If there is not enough differential pressure the valve cannot reach the set flow.
The valve that is furthest away from the pump or the valve in the circuit with the highest resistance has the lowest available differential pressure, so if this critical valve has enough pressure it means the other valves will also function properly.
Important :
To get a useful measurement the installation should run on full load, so all actuators in the installation should be opened fully. This ensures that you are measuring under the most unfavorable circumstances. The AB-QM's will have more differential pressure available when the installation is working on partial load.

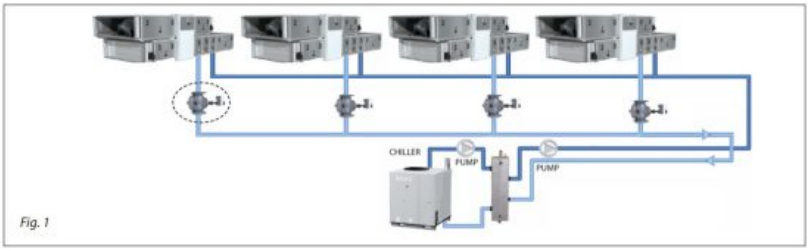


Fig. 1

Method of verification

Measure the differential pressure across the control valve.
The measuring nipples are placed in such a way that p1−p2 is measured (see figure 2).
Therefore the measured differential pressure can be used to calculate the flow directly. It ’s necessary to use the table that was derived fromstatistical measurements Since the measurements across the measuring points are influenced by the dynamic pressure, turbulences, flow pat terns, internal tolerances, set ting accuracy and accuracy of the measuring equipment we believe that the total accuracy of the measurement is lower than performance of the valve.
Therefore we recommend not to adjust the set ting when the results are within 10 % of the expected flow.

Calculat ing the flow

ΔPcv=p1-p2

$$Q = kv_{Cv} \times \sqrt{\Delta p_{Cv}}$$

For kv Cv values see tables in figure 4 and 7

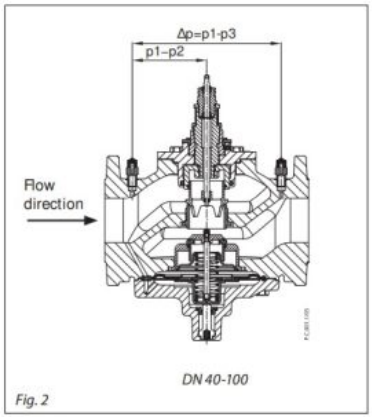


Fig. 2

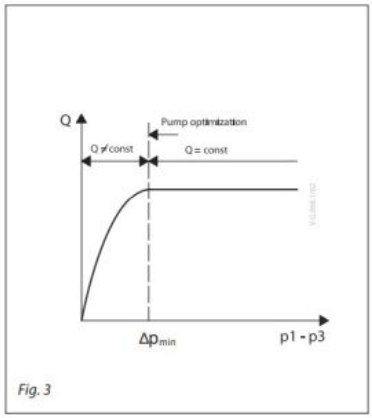


Fig. 3

Presetting	DN 40	DN 50 / DN 50H F	DN 65 / DN 65H F	DN 80 / DN 80H F	DN 100 / DN 10 0HF
s %	kvCv (m3/ h)				
20.0 %	3.40	4.60	4.20	15.50	19.50
22.5 %	4.08	5.55	5.48	17.19	21.94
25.0 %	4.80	6.50	6.75	18.88	24.38
27.5 %	5.43	7.45	8.03	20.56	26.81
30.0 %	6.10	8.40	9.30	22.25	29.25
32.5 %	6.78	9.35	10.58	23.94	31.69
35.0 %	7.50	10.30	11.85	25.63	34.13
37.5 %	8.13	11.25	13.13	27.31	36.56
40.0 %	8.80	12.20	14.40	29.00	39.00
42.5 %	9.48	13.15	15.68	30.69	41.44
45.0 %	10.20	14.10	16.95	32.38	43.88
47.5 %	10.83	15.05	18.23	34.06	46.31
50.0 %	11.50	16.00	19.50	35.75	48.75
52.5 %	12.18	16.95	20.78	37.44	51.19

55.0 %	12.90	17.90	22.05	39.13	53.63
57.5 %	13.53	18.85	23.33	40.81	56.06
60.0 %	14.20	19.80	24.60	42.50	58.50
62.5 %	14.88	20.75	25.88	44.19	60.94
65.0 %	15.55	21.70	27.15	45.88	63.38
67.5 %	16.26	22.65	28.43	47.56	65.81
70.0 %	16.90	23.60	29.70	49.25	68.25
72.5 %	17.58	24.55	30.98	50.94	71.81
75.0 %	18.25	25.50	32.25	52.63	75.38
77.5 %	18.93	26.45	33.53	54.31	78.94
80.0 %	19.60	27.40	34.80	56.00	82.50
82.5 %	20.28	28.35	36.08	57.69	86.06
85.0 %	20.95	29.30	37.35	59.38	89.63
87.5 %	21.63	30.25	38.63	61.06	93.19
90.0 %	22.30	31.20	39.90	62.75	96.75
92.5 %	22.98	32.15	41.18	64.44	100.31
95.0 %	23.65	33.10	42.45	66.13	103.88
97.5 %	24.33	34.05	43.73	67.81	107.44
100.0 %	25.00	35.00	45.00	69.50	111.00

Fig. 4 The flow is according to setting if the calculated flow is in the range of ±10 % of the set flow.

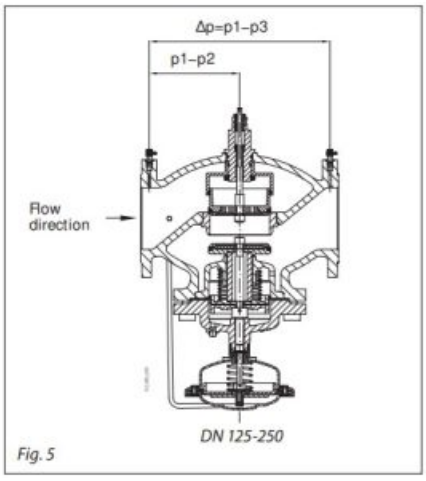


Fig. 5

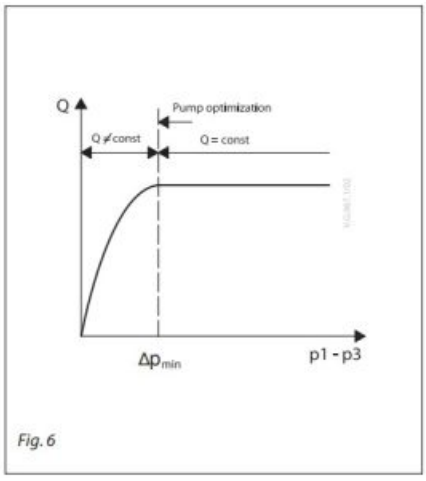


Fig. 6

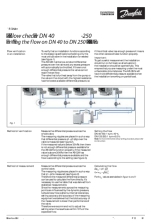
Presetting	**DN 125 / DN 125HF**	**DN 150 / DN 150HF**	**DN 200 / DN 200HF**	**DN 250 / DN 250HF**
s %	kvCv (m3/ h)			

20.0 %	40	53	57	86
22.5 %	45	60	66	99
25.0 %	49	67	75	112
27.5 %	53	74	85	125
30.0 %	57	81	94	138
32.5 %	61	88	104	150
35.0 %	65	95	113	163
37.5 %	69	101	122	176
40.0 %	73	108	132	189
42.5 %	77	115	141	202
45.0 %	82	122	151	215
47.5 %	86	129	160	227
50.0 %	90	136	170	240
52.5 %	94	143	179	253
55.0 %	98	150	188	266
57.5 %	102	157	198	279
60.0 %	106	163	207	292
62.5 %	110	170	217	304
65.0 %	114	177	226	317
67.5 %	119	184	235	330
70.0 %	123	191	245	343
72.5 %	127	198	254	356
75.0 %	131	205	264	369
77.5 %	135	212	273	381
80.0 %	139	219	283	394
82.5 %	143	225	292	407
85.0 %	147	232	301	420
87.5 %	152	239	311	433
90.0 %	156	246	320	446
92.5 %	160	253	330	458
95.0 %	164	260	339	471
97.5 %	168	267	348	484
100.0 %	172	274	358	497

102.5%	176	281	367	510
105.0%	180	287	377	523
107.5%	184	294	386	535
110.0%	189	301	396	548

Fig. 7 The flow is according to setting if the calculated flow is in the range of ±10% of the set flow.

Documents / Resources

	Danfoss AB-QM 3TP Flow Checker [pdf] Installation Guide 3TP, DN 40-250, AB-QM 3TP Flow Checker, AB-QM 3TP, Flow Checker, Checker

References

- User Manual