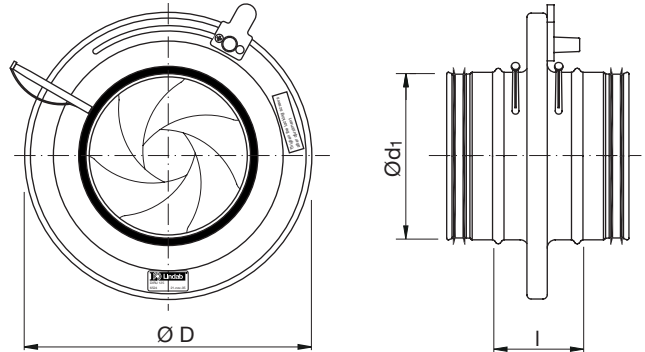


Damper with flow meter

DIRU



Dimensions



Description

The damper DIRU with flow meter offers measurement of the air flow. DIRU has following characteristics: low noise level, centric flow, fixed measurement nozzles for accurate flow measurement and is equipped with regulating facilities which can be fully opened, which means that you do not need cleaning covers. It fulfils tightness class C.

The dimensioning graph are to be used to determine the pressure drop over the damper with flow meter and to give information regarding the sound effect level at different settings. When balancing the system the balancing graphs should be used.

There is a separate assembly, measuring, balancing and maintenance instruction for dampers with flow meter.

The damper blades forms a measuring flange which allows flow measuring. By measuring the pressure difference between the measure nozzles, you can through the equation on the damper derive the flow q [l/s]. The setting value of the damper and the correction factor (k-factor) is the same number which means that you do not have to read a graphs in order to get the k-factor from a setting value.

The air flow is regulated with a handle.

Ø 80–630 fullfills pressure class A in closed position.

Material

The damper is made of hot-dip galvanized sheet steel.

Installation

Consider required straight distance after or before disturbance, as mentioned on the card attached to the measurement nozzles, to obtain accurate flow measurement.

Cleaning

By fully open the damper, one get access to the duct. Do not forget to readjust the damper after cleaning.

Ød ₁ nom	ØD mm	l mm	m kg
80	135	52	0,60
100	163	54	0,80
125	210	63	1,20
150	230	53	1,40
160	230	60	1,40
200	285	62	2,00
250	333	62	2,60
300	406	65	3,00
315	406	63	3,40
400	560	70	6,90
500	644	60	7,90
630	811	60	11,9

Ordering example

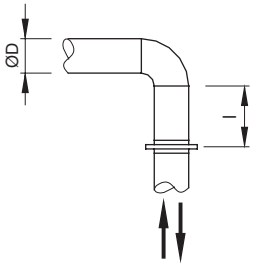
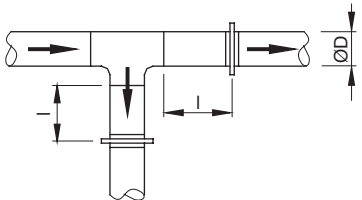
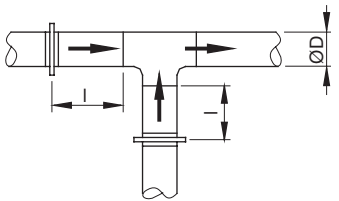
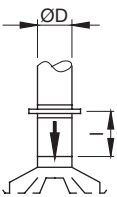
Product	DIRU	160
Dimension Ød ₁		

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18

Damper with flow meter

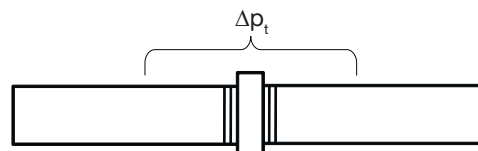
DIRU

Technical data for DIRU, DIRBU and DIRVU

l = straight distance before and after disturbances	Method error ± 7%
	$l \geq 1 D$
	$l \geq 1 D$
	$l \geq 3 D$
	$l \geq 3 D$

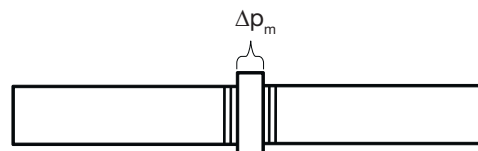
Dimensioning

The dimensioning graphs show the pressure drop over the damper with flow meter, Δp_t . They should be used to determine the pressure drop and to provide information about sound effect levels at different settings.



Balancing

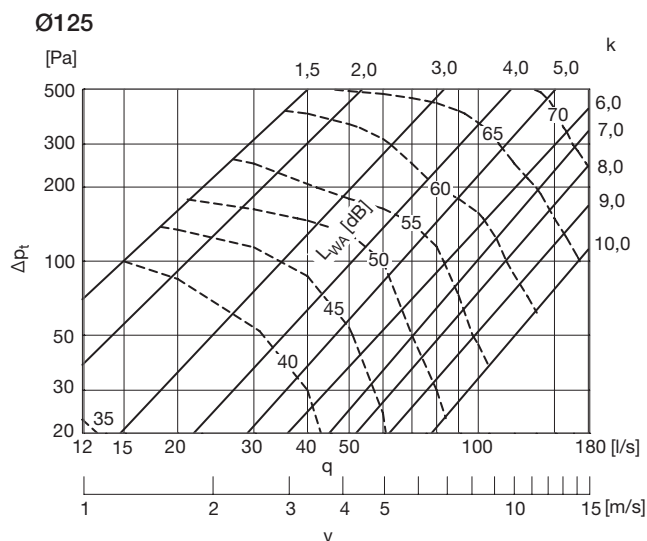
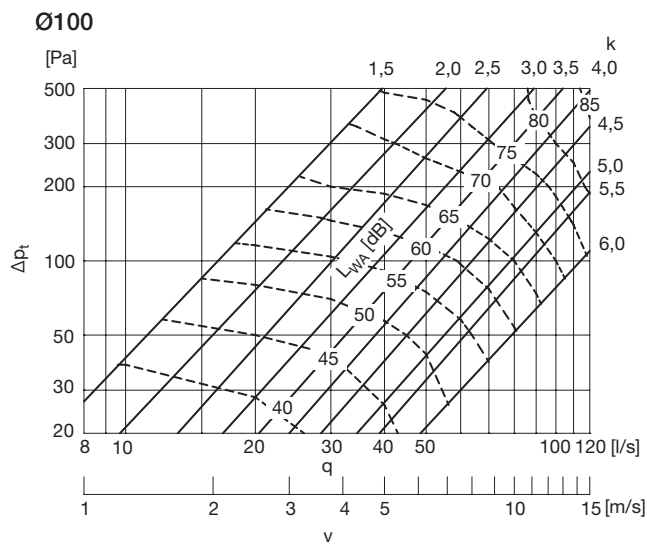
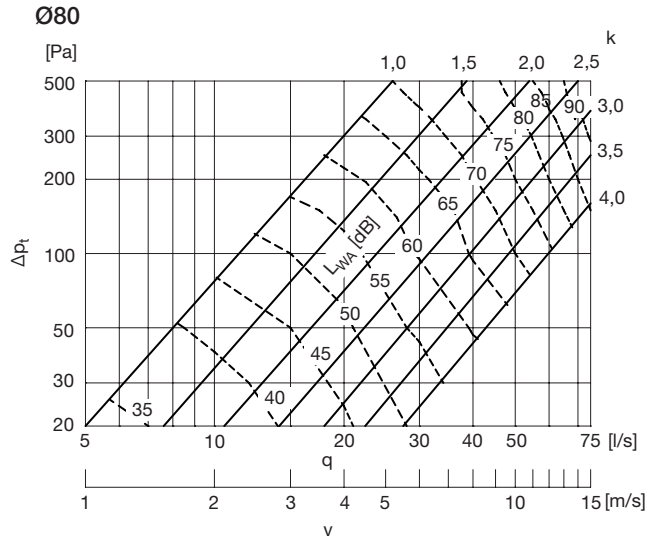
The balancing graphs show the flow as a function of the measured pressure, Δp_m . These graphs should be used to balance the system.



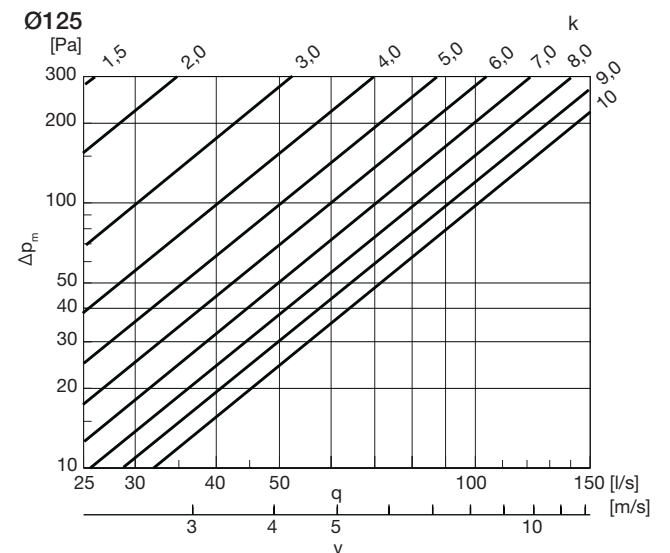
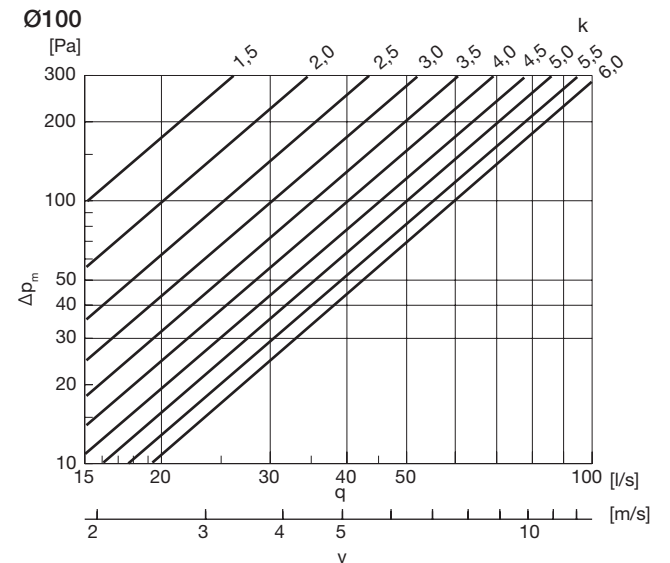
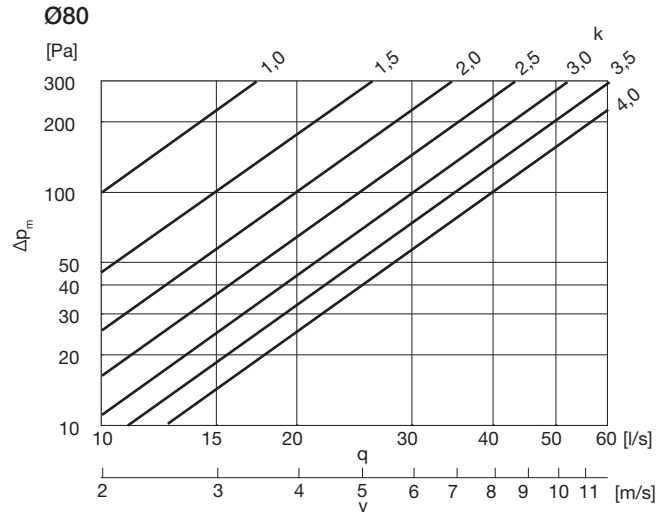
Damper with flow meter

DIRU, DIRBU, DIRVU

Pressure drop graphs with noise data for dimensioning



Flow graphs for balancing

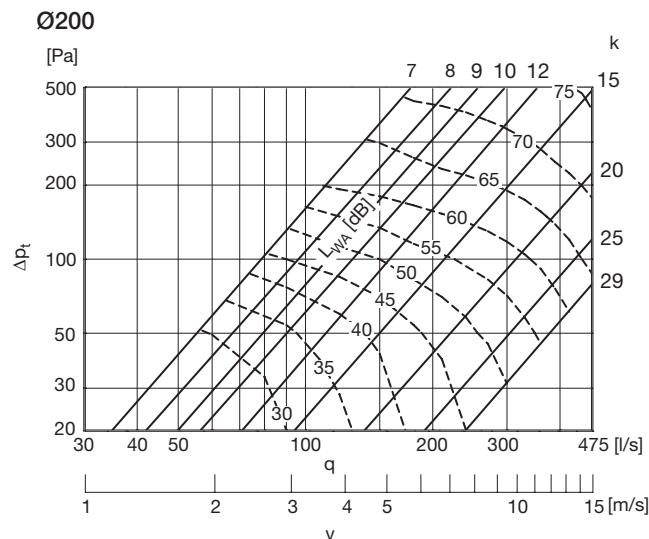
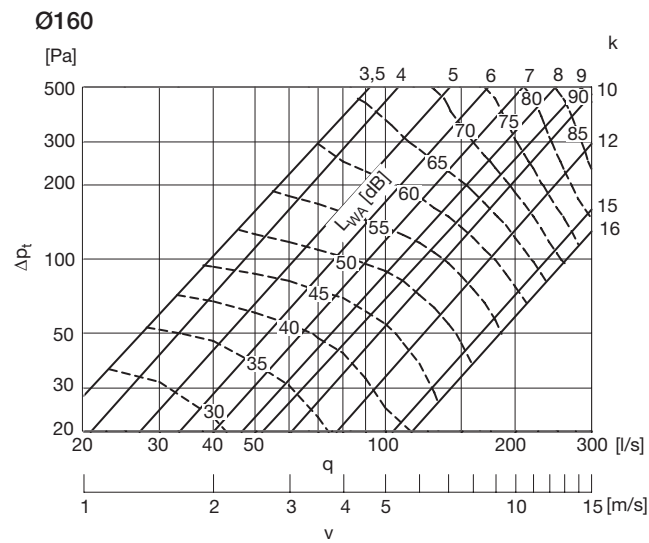
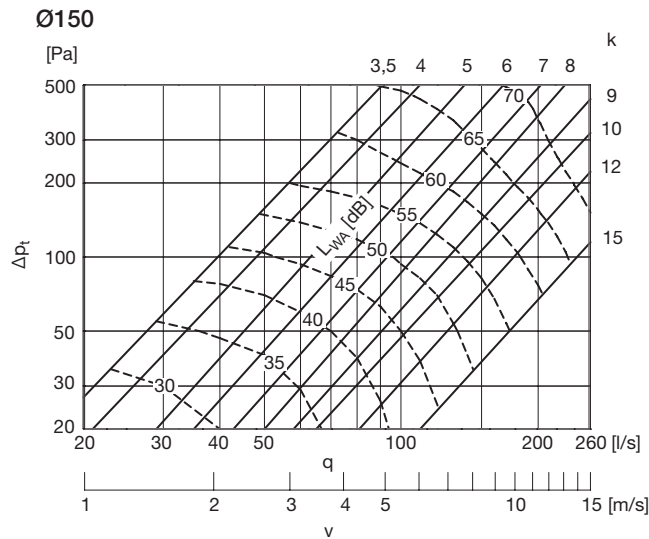


- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18

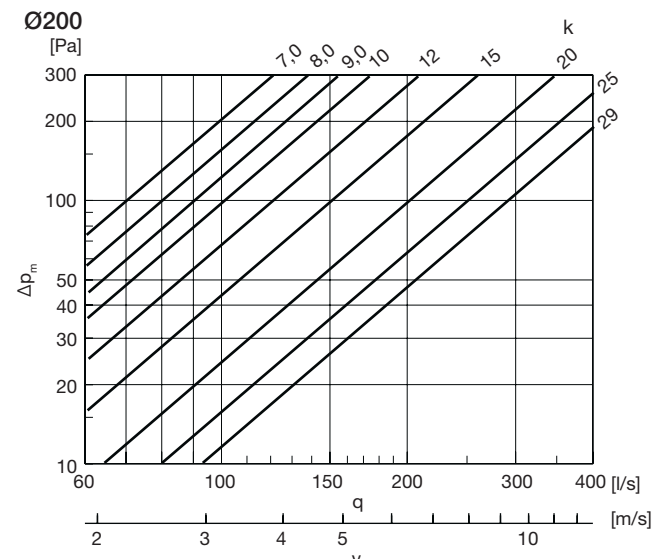
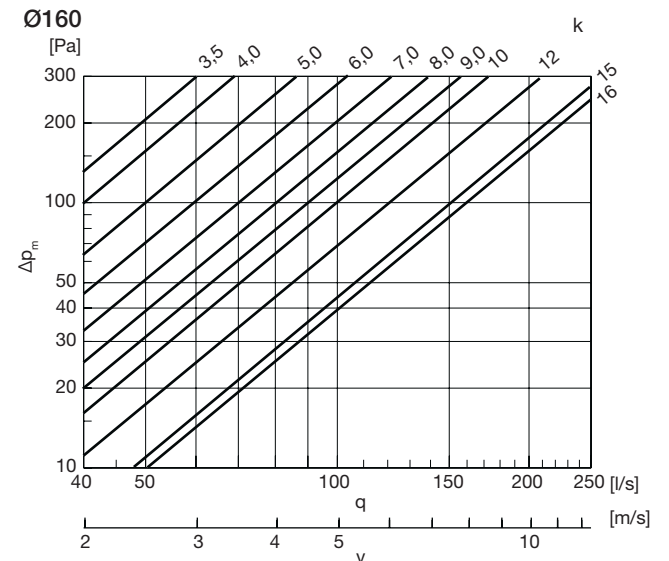
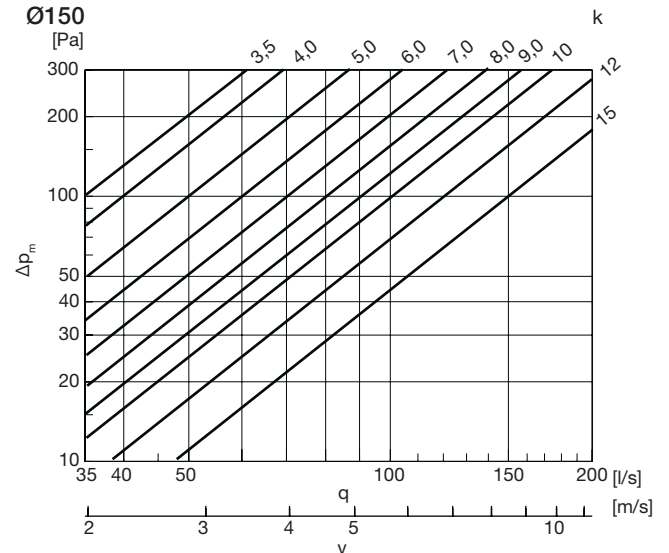
Damper with flow meter

DIRU, DIRBU, DIRVU

Pressure drop graphs with noise data for dimensioning



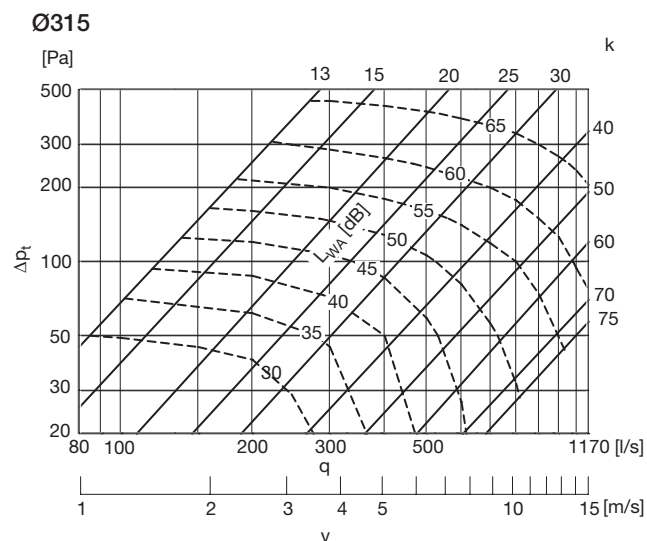
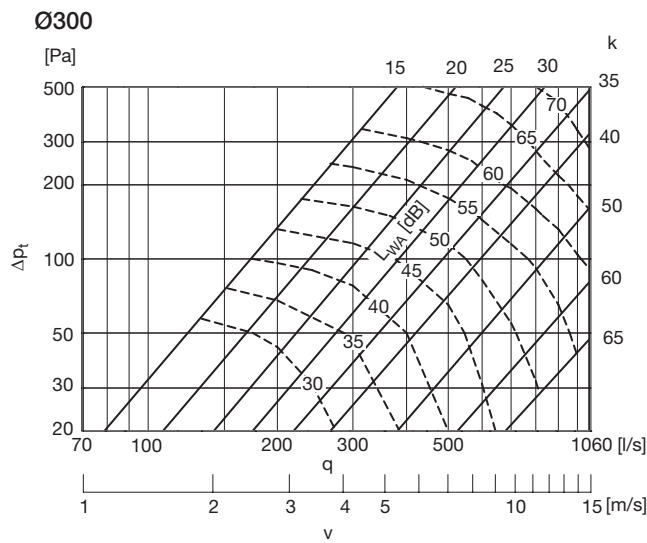
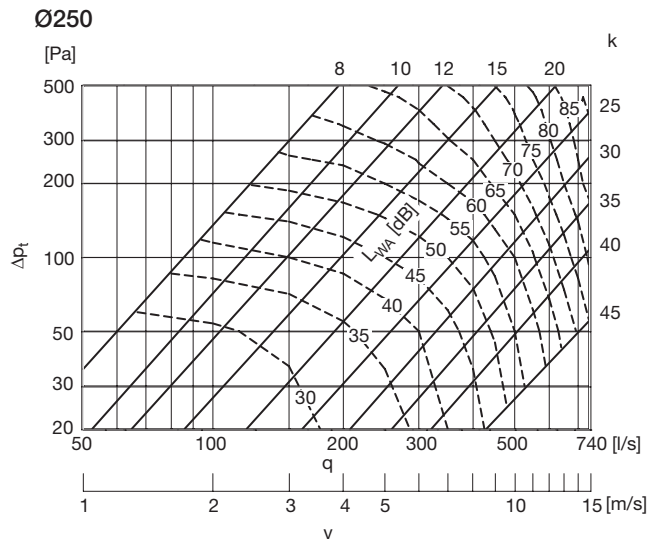
Flow graphs for balancing



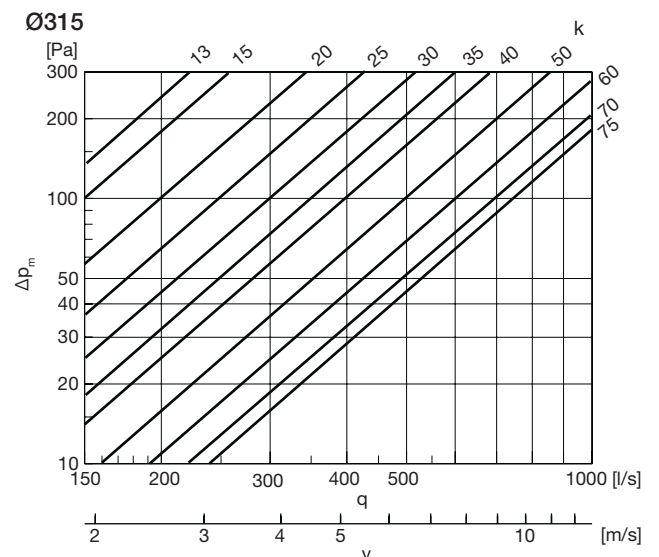
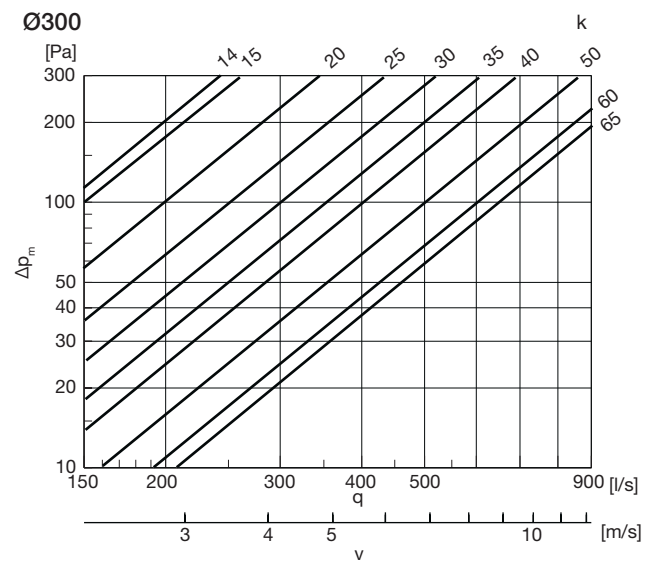
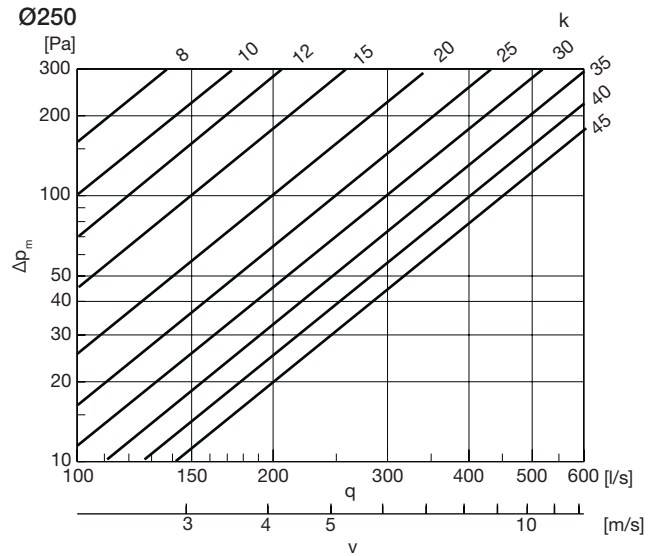
Damper with flow meter

DIRU, DIRBU, DIRVU

Pressure drop graphs with noise data for dimensioning



Flow graphs for balancing

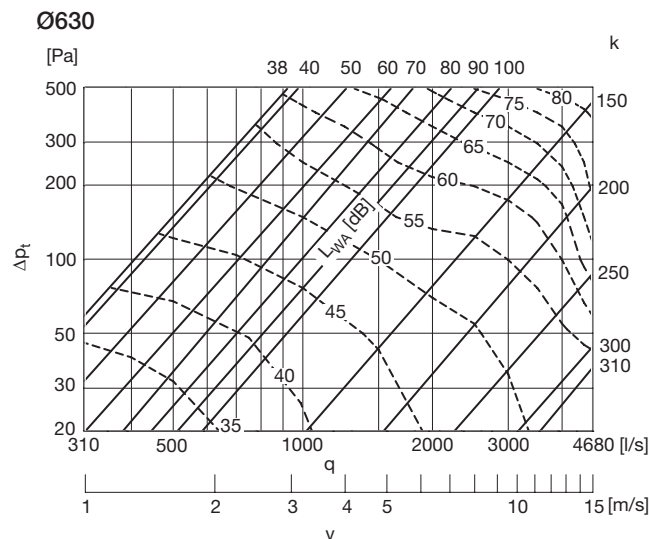
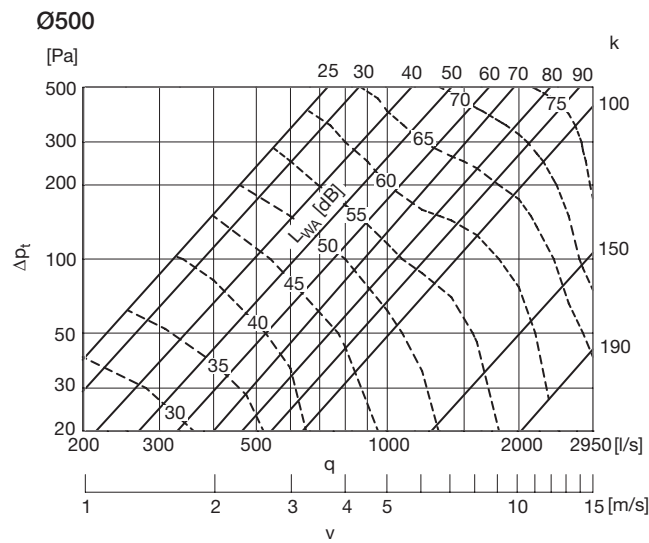
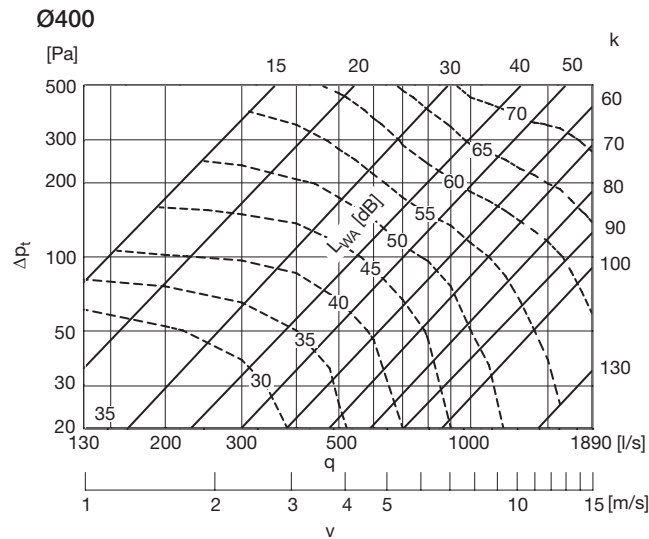


- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18

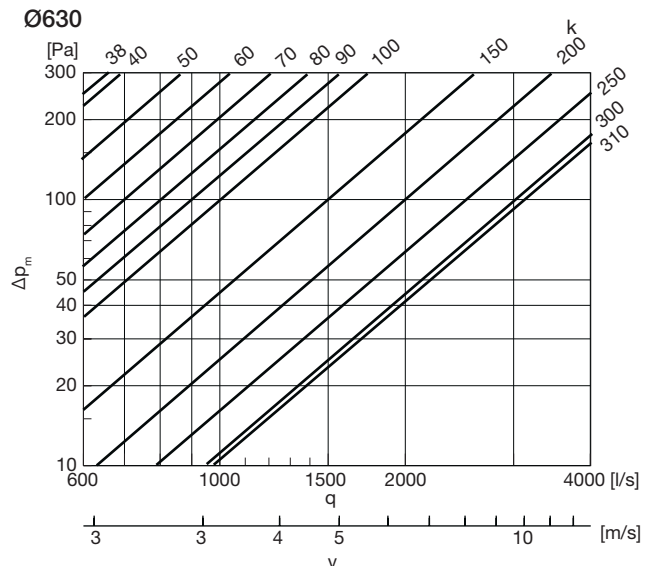
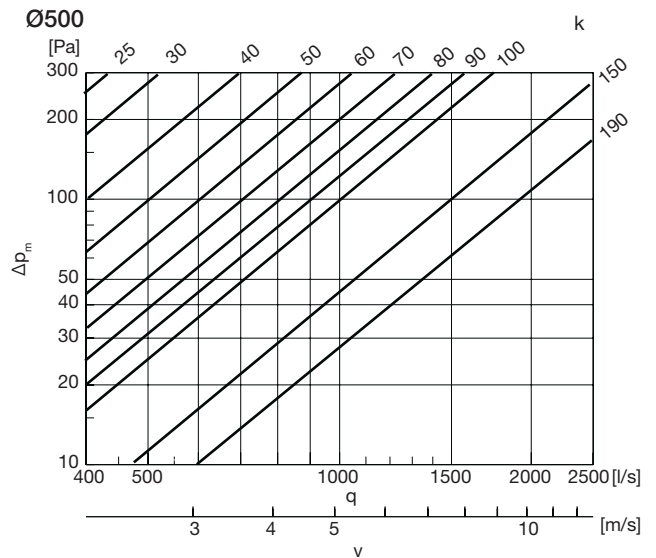
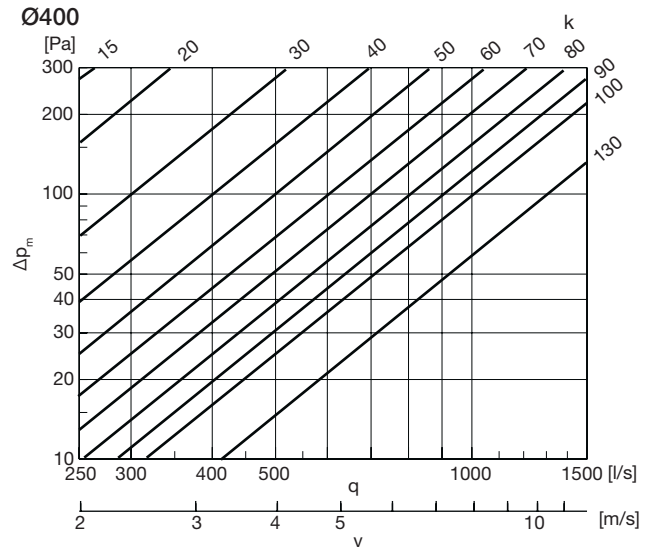
Damper with flow meter

DIRU, DIRBU, DIRVU

Pressure drop graphs with noise data for dimensioning



Flow graphs for balancing



Damper with flow meter

DIRU, DIRBU, DIRVU

Sound data

Sound power level L_{W} , [dB] to duct in the octave bands 1–8, 63–8000 Hz, as a function of dimension, flow and pressure drop.

dim $\varnothing d_1$	Pressure drop [Pa]	Velocity app. 1 [m/s]								Velocity app. 3 [m/s]								Velocity app. 6 [m/s]							
		Centre frequency [Hz]								Centre frequency [Hz]								Centre frequency [Hz]							
		63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
80		Flow 5 [l/s]								Flow 15 [l/s]								Flow 30 [l/s]							
	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74	73	70	68	61	61	61	49	
	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	70	68	63	54	50	49	37	
	100	-	-	-	-	-	-	-	65	58	52	45	42	40	37	23	68	67	66	58	52	47	43	31	
	50	-	-	-	-	-	-	-	62	55	50	39	35	32	23	17	65	64	62	53	48	42	35	24	
	20	56	45	31	24	18	13	3	9	60	53	43	34	28	21	11	15	62	61	56	48	42	34	23	18
100		Flow 8 [l/s]								Flow 25 [l/s]								Flow 45 [l/s]							
	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95	90	76	67	58	49	40	36	
	200	-	-	-	-	-	-	-	85	78	65	55	46	37	28	24	86	79	68	56	47	38	29	25	
	100	-	-	-	-	-	-	-	74	67	54	44	35	26	17	13	77	70	57	47	38	29	20	16	
	50	-	-	-	-	-	-	-	66	59	46	36	27	18	9	7	70	63	50	40	31	22	13	11	
	20	53	48	35	25	17	9	2	1	60	53	40	30	22	14	5	4	66	59	46	36	27	18	9	8
125		Flow 10 [l/s]								Flow 45 [l/s]								Flow 75 [l/s]							
	300	-	-	-	-	-	-	-	83	78	67	56	46	37	29	26	85	80	69	58	48	39	31	28	
	200	-	-	-	-	-	-	-	74	69	58	47	37	28	20	17	78	73	62	51	41	32	24	21	
	100	-	-	-	-	-	-	-	63	58	47	36	26	17	9	6	72	67	56	45	35	26	18	15	
	50	54	49	39	28	18	9	2	2	60	55	44	33	23	14	6	5	70	65	54	43	33	24	16	13
	20	52	48	37	26	16	7	1	1	58	52	41	30	20	11	3	4	67	62	51	40	30	21	13	10
150		Flow 20 [l/s]								Flow 50 [l/s]								Flow 110 [l/s]							
	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85	79	67	57	49	41	32	29	
	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	72	60	50	42	34	25	22	
	100	-	-	-	-	-	-	-	64	58	46	36	28	20	12	9	71	65	53	43	35	27	18	15	
	50	-	-	-	-	-	-	-	56	50	38	28	20	12	5	4	66	60	48	38	30	22	13	10	
	20	45	39	27	17	9	1	1	1	51	45	33	23	15	7	3	3	62	56	44	34	26	18	9	6
160		Flow 20 [l/s]								Flow 60 [l/s]								Flow 120 [l/s]							
	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90	81	71	61	53	45	36	33	
	200	-	-	-	-	-	-	-	77	68	58	48	40	32	23	20	82	73	63	53	45	37	28	25	
	100	-	-	-	-	-	-	-	69	60	50	40	32	24	15	12	74	65	55	45	37	29	20	17	
	50	-	-	-	-	-	-	-	60	51	41	31	23	15	7	6	68	59	49	39	31	23	14	11	
	20	47	37	28	18	10	1	2	1	53	45	34	24	16	9	4	3	63	54	44	34	26	18	9	6
200		Flow 30 [l/s]								Flow 95 [l/s]								Flow 190 [l/s]							
	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93	83	74	65	57	51	44	40	
	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84	74	65	56	48	42	35	31	
	100	-	-	-	-	-	-	-	67	57	48	39	31	25	18	14	75	65	56	47	39	33	26	22	
	50	-	-	-	-	-	-	-	56	46	37	28	20	14	9	6	66	56	47	38	30	24	17	13	
	20	-	-	-	-	-	-	-	52	42	33	24	16	10	5	4	63	53	44	35	27	21	14	10	
250		Flow 50 [l/s]								Flow 150 [l/s]								Flow 290 [l/s]							
	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	87	77	67	65	55	50	43	40	
	200	-	-	-	-	-	-	-	71	61	51	49	39	34	27	24	77	67	57	55	45	40	33	30	
	100	-	-	-	-	-	-	-	60	50	40	38	28	23	16	13	67	57	47	45	35	30	23	20	
	50	-	-	-	-	-	-	-	51	41	31	29	19	14	7	4	59	49	39	37	27	22	15	12	
	20	44	34	24	22	12	7	2	1	48	38	28	26	16	11	4	3	55	45	35	33	23	18	11	8
300		Flow 70 [l/s]								Flow 210 [l/s]								Flow 420 [l/s]							
	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82	74	65	63	56	51	42	41	
	200	-	-	-	-	-	-	-	70	62	53	51	44	39	30	29	73	65	56	54	47	42	33	32	
	100	-	-	-	-	-	-	-	59	51	42	40	33	28	19	18	64	56	47	45	38	33	24	23	
	50	-	-	-	-	-	-	-	49	41	32	30	23	18	9	8	58	50	41	39	32	27	18	17	
	20	33	25	16	14	7	4	2	1	42	34	25	23	16	11	3	2	53	45	36	34	27	22	13	12
315		Flow 80 [l/s]								Flow 230 [l/s]								Flow 465 [l/s]							
	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83	76	67	65	59	54	45	45	
	200	-	-	-	-	-	-	-	71	64	55	53	47	42	33	33	74	67	58	56	50	45	36	36	
	100	-	-	-	-	-	-	-	59	52	43	41	35	30	21	21	65	58	49	47	41	36	27	27	
	50	46	39	30	28	22	17	8	8	48	41	32	30	24	19	10	10	59	52	43	41	35	30	21	21
	20	34	27	18	16	10	5	2	1	43	36	27	25	19	14	6	7	56	49	40	38	32	27	18	18
400		Flow 130 [l/s]								Flow 370 [l/s]								Flow 750 [l/s]							
	300	-	-	-	-	-	-	-	72	65	57	56	50	46	40	38	81	74	66	65	59	55	49	47	
	200	-	-	-	-	-	-	-	64	57	49	48	42	38	32	30	73	66	58	57	51	47	41	39	
	100	-	-	-	-	-	-	-	56	49	41	40	34	30	24	22	65	58	50	49	43	39	33	31	
	50	42	35	27	26	20	16	10	8	50	43	35	34	28	24	18	16	59	52	44	43	37	33	27	25
	20	32	25	17	16	10	6	2	1	44	37	29	28	22	18	12	10	55	48	40	39	33	29	23	21
500		Flow 200 [l/s]								Flow 590 [l/s]								Flow 1180 [l/s]							
	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89	79	70	64	56	50	41	36	
	200	-	-	-	-	-	-	-	75	65	56	50	42	36	27	22	84	74	65	59	51	45	36	31	
	100	-	-	-	-	-	-	-	69	59	50	44	36	30	21	16	79	69	60	54	46	40	31	26	
	50	-	-	-	-	-	-	-	63	53	44	38	30	24	15	10	72	62	53	47	39	33	24	19	
	20	45	35	26	20	12	6	2	1	57	47	38	32	24	18	9	4	67	57	48	42	34	28	19	14
630		Flow 310 [l/s]								Flow 940 [l/s]								Flow 1870 [l/s]							
	300	-	-	-	-	-	-	-	79	69	62	57	52	49	46	40	86	76	69	64	59	56	53	46	
	200	-	-	-	-	-	-	-	73	63	56	51	46	43	40	34	80	70	63	58	53	50	47	41	
	100	-	-	-	-	-	-	-	67	57	50	45	40	37	34	28	74	64	57	52	47	44	41	36	
	50	54	44	37	32	27	24	21	15	62	52	45	40	35	32	29	23	69	59	52	47	42	39	36	30
	20	49	39	32	27	22	19	16	9	55	45	38	33	28	25	22	17	60	50	43	38	33	30	27	21

Damper with flow meter

DIRU, DIRBU, DIRVU

dim Ød ₁	Pressure drop [Pa]	Velocity app. 9 [m/s]								Velocity app. 12 [m/s]								Velocity app. 15 [m/s]							
		Centre frequency [Hz]								Centre frequency [Hz]								Centre frequency [Hz]							
		63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
80		Flow 45 [l/s]								Flow 60 [l/s]								Flow 75 [l/s]							
	300	79	76	74	73	72	73	75	60	84	80	78	79	80	79	83	76	89	84	82	85	88	85	91	92
	200	75	74	73	69	66	65	64	50	79	78	77	75	74	73	72	62	83	82	81	81	82	81	80	74
	100	71	72	72	65	60	57	53	40	74	76	76	71	68	67	61	48	-	-	-	-	-	-	-	-
	50	66	68	67	60	54	48	41	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
100		Flow 70 [l/s]								Flow 95 [l/s]								Flow 120 [l/s]							
	300	97	91	77	68	59	50	41	38	101	95	82	73	64	55	47	43	106	98	90	76	68	59	53	45
	200	89	82	69	59	50	41	32	30	95	87	77	65	56	47	39	35	101	92	85	71	62	53	46	40
	100	83	76	63	53	44	35	26	23	89	82	70	59	50	41	32	29	95	88	77	65	56	47	38	35
	50	77	70	57	47	38	29	20	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
125		Flow 110 [l/s]								Flow 145 [l/s]								Flow 180 [l/s]							
	300	86	82	71	60	50	41	33	30	88	84	73	62	52	43	35	32	90	86	75	64	54	45	37	34
	200	81	76	65	54	44	35	27	24	84	79	68	57	47	38	30	27	87	82	71	60	50	41	33	30
	100	78	73	62	51	41	32	24	21	81	76	65	54	44	35	27	24	84	79	68	57	47	38	30	27
	50	75	70	59	48	38	29	21	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
150		Flow 160 [l/s]								Flow 210 [l/s]								Flow 260 [l/s]							
	300	89	83	71	61	53	45	36	33	92	86	74	64	56	48	39	36	94	88	76	66	58	50	41	38
	200	83	77	65	55	47	39	30	27	87	81	69	59	51	43	34	31	91	85	73	63	55	47	38	35
	100	77	71	59	49	41	33	24	21	82	76	64	54	46	38	29	26	87	81	69	59	51	43	34	31
	50	73	67	55	45	37	29	20	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
160		Flow 180 [l/s]								Flow 240 [l/s]								Flow 300 [l/s]							
	300	97	88	78	68	60	52	43	40	105	96	86	76	68	60	51	48	113	104	94	84	76	68	59	56
	200	89	80	70	60	52	44	35	32	97	88	78	68	60	52	43	40	105	96	86	76	68	60	51	48
	100	81	72	62	52	44	36	27	24	89	80	70	60	52	44	35	32	97	88	78	68	60	52	43	40
	50	75	66	56	46	38	30	21	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
200		Flow 285 [l/s]								Flow 380 [l/s]								Flow 475 [l/s]							
	300	94	84	75	66	58	52	45	41	95	85	76	67	59	53	46	42	97	87	78	69	61	55	48	44
	200	86	76	67	58	50	44	37	33	89	79	70	61	53	47	40	36	92	82	73	64	56	50	43	39
	100	79	69	60	51	43	37	30	26	83	73	64	55	47	41	34	30	87	77	68	59	51	45	38	34
	50	73	63	54	45	37	31	24	20	78	68	59	50	42	36	29	25	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
250		Flow 440 [l/s]								Flow 590 [l/s]								Flow 740 [l/s]							
	300	94	84	74	72	62	57	50	47	102	95	82	80	70	65	58	55	110	106	90	88	78	73	66	63
	200	85	75	65	63	53	48	41	38	95	87	75	73	63	58	51	48	105	99	85	83	73	68	61	58
	100	76	66	56	54	44	39	32	29	88	79	68	66	56	51	44	41	100	92	80	78	68	63	56	53
	50	70	60	50	48	38	33	26	23	82	72	62	60	50	45	38	35	94	84	74	72	62	57	50	47
20	65	55	45	43	33	28	21	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
300		Flow 640 [l/s]								Flow 850 [l/s]								Flow 1060 [l/s]							
	300	84	76	67	65	58	53	44	43	88	80	71	69	62	57	48	47	92	84	75	73	66	61	52	51
	200	77	69	60	58	51	46	37	36	81	73	64	62	55	50	41	40	85	77	68	66	59	54	45	44
	100	70	62	53	51	44	39	30	29	74	66	57	55	48	43	34	33	78	70	61	59	52	47	38	37
	50	66	58	49	47	40	35	26	25	70	62	53	51	44	39	30	29	74	66	57	55	48	43	34	33
20	62	54	45	43	36	31	22	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
315		Flow 700 [l/s]								Flow 935 [l/s]								Flow 1170 [l/s]							
	300	84	77	68	66	60	55	46	46	85	78	69	67	61	56	47	47	86	79	70	68	62	57	48	48
	200	77	70	61	59	53	48	39	39	79	72	63	61	55	50	41	41	81	74	65	63	57	52	43	43
	100	70	63	54	52	46	41	32	32	74	67	58	56	50	45	36	36	78	71	62	60	54	49	40	40
	50	66	59	50	48	42	37	28	28	70	63	54	52	46	41	32	32	74	67	58	56	50	45	36	36
20	63	56	47	45	39	34	25	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
400		Flow 1130 [l/s]								Flow 1510 [l/s]								Flow 1890 [l/s]							
	300	87	80	72	71	65	61	55	53	88	81	73	72	66	62	56	54	89	82	74	73	67	63	57	55
	200	79	72	64	63	57	53	47	45	81	74	66	65	59	55	49	47	83	76	68	67	61	57	51	49
	100	71	64	56	55	49	45	39	37	74	67	59	56	52	48	42	40	77	70	62	61	55	54	45	43
	50	66	59	51	50	44	40	34	32	70	63	55	54	48	44	38	36	74	67	59	58	52	48	42	40
20	63	56	48	47	41	37	31	29	68	61	53	52	46	42	36	34	-	-	-	-	-	-	-	-	
500		Flow 1770 [l/s]								Flow 2360 [l/s]								Flow 2950 [l/s]							
	300	92	82	73	67	59	53	44	39	95	85	76	70	62	56	47	42	98	88	79	73	65	59	50	45
	200	88	78	69	63	55	49	40	35	92	82	73	67	59	53	44	39	96	86	77	71	63	57	48	43
	100	84	74	65	59	51	45	36	31	89	79	70	64	56	50	41	36	94	84	75	69	61	55	46	41
	50	77	67	58	52	44	38	29	24	82	72	63	57	49	43	34	29	87	77	68	62	54	48	39	34
20	73	63	54	48	40	34	25	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
630		Flow 2810 [l/s]								Flow 3740 [l/s]								Flow 4680 [l/s]							
	300	93	83	76	71	66	63	60	53	97	87	80	75	70	67	64	58	101	91	84	79	74	71	68	63
	200	86	76	69	64	59	56	53	47	90	80	73	68	63	60	57	51	94	84	77	72	67	64	61	55
	100	79	69	62	57	52	49	46	41	83	73	66	61	56	53	50	44	87	77	70	65	60	57	54	47
	50	72	62	55	50	45	42	39	33	74	64	57	52	47	44	41	35	76	66	59	54	49	46	43	37
20	63	53	46	41	36	33	30	24	64	54	47	42	37	34	31	25	-	-	-	-	-	-	-	-	