



# Commissioning guide 2009

**TROX<sup>®</sup> TECHNIK**

 **Auranor**

a partner to rely on

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This guide provides correction factors for measurement of air flow rates in TROX Auranor's valves and measuring units. Use of calibrated micromanometer with one decimal point accuracy is recommended.

The air flow rate is calculated by using the following formula:

$$q[l/s] = k \cdot \sqrt{\Delta p_i [Pa]}$$

Differential pressure for the air flow rate required:

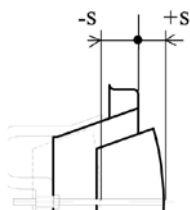
$$\Delta p_i [Pa] = \left( \frac{q[l/s]}{k} \right)^2$$

$q$  = air flow rate in l/s (1 l/s = 3.6 m<sup>3</sup>/h).

$\Delta p_i$  = differential pressure over the unit's measuring nipples or between pressure outlet and room.

# Extract air terminal devices

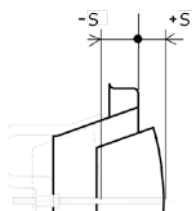
1



**LVS**

Measured by means of measuring head to the rear of cone inside the valve.

Centre cone position	Dim. / correction factor			
Cone dim.	100	125	160	200
-20	-	-	-	3,36
-15	-	1,37	1,91	4,51
-10	-	2,05	2,64	5,8
-5	1,44	2,67	3,56	6,9
0	2,19	3,46	4,74	8,3
+5	3,05	4,49	5,8	10,1
+10	4,04	6,0	6,9	11,1
+15	5,4	7,1	8,7	13,4



### KSO

Measured by means of measuring head to the rear of cone inside the valve

Centre cone position Cone dim.	Dim. / correction factor			
	100	125	160	200
-15	0,5	-	-	-
-12	0,8	-	-	-
-10	1,0	1,5	2	-
- 5	1,4	2,1	2,8	-
- 3	-	-	1,8	-
0	1,9	2,7	3,6	2,4
+ 5	2,3	3,3	4,4	3,8
+10	2,8	4	5,3	5
+15	-	-	6,2	6,3
+20	-	-	-	7,5
+25	-	-	-	8,6

**Space-1**

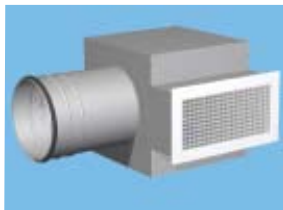
Measured by means of measuring head to the rear of opening

Slot opening in mm	Dim. / correction factor			
	100	125	160	200
A	100	125	160	200
35	1,4	-	-	-
45	1,6	1,7	-	-
50	-	2,0	2,0	2,0
55	2,0	-	-	-
60	-	2,4	2,4	2,4
70	-	2,9	3,0	2,9
75	-	3,2	-	-
80	-	-	3,5	3,4
90	-	-	3,8	3,9
100	-	4,7	4,5	4,2
110	-	-	-	4,8
130	-	-	5,2	5,5



**LØV-A with Luna plenum box**  
Measured at the plenum box measuring outlet.

LØV-A Dim.	Luna Dim.	Correction factor
125	100-125	9,6
	125-125	9,8
160	125-160	15,9
	160-160	19,0
200	160-200	29,0
	200-200	30,3
250	200-250	40,7
	250-250	43,2
315	250-315	59,0
	315-315	66,9

**URA with plenum box**

Measured at the plenum box measuring outlet.

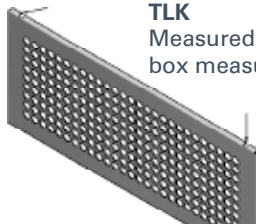
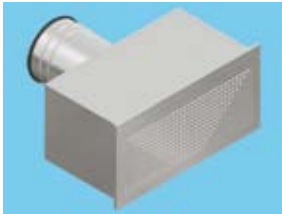
URA			
Dim.	Spigot entry		C-factor
200x100	125	B	12,6
200x100	125	S	11,5
200x100	125	LS	12,3
300x100	160	B	18,3
400x100	160	B	25,6
300x100	160	S	19,9
400x100	160	S	27,0
300x100	160	LS	19,6
400x100	160	LS	26,9
300x150	200	B	29,9
500x100	200	B	32,2
300x150	200	S	33,2
500x100	200	S	33,8
300x150	200	LS	32,5
500x100	200	LS	34,7
400x150	250	B	39,6
400x200	250	B	54,5
500x150	250	B	51,6

URA			
Dim.	Spigot entry		C-factor
400x150	250	S	43,0
400x200	250	S	60,3
500x150	250	S	53,8
400x150	250	LS	41,9
400x200	250	LS	59,1
500x150	250	LS	52,3
500x200	315	B	74,4
500x300	315	B	114,1
600x200	315	B	95,4
600x300	315	B	147,7
500x200	315	S	83,7
500x300	315	S	134,4
600x200	315	S	103,7
600x300	315	S	165,9
500x200	315	LS	83,7
500x300	315	LS	126,7
600x200	315	LS	97,5
600x300	315	LS	150,4

**TLH**

Measured at front by means of nipple  
in centre hole

Dim.	Correction factor
100	3,8
125	5,4
160	10,3



**TLK**

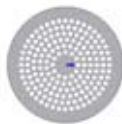
Measured at the plenum box measuring outlet.

The diagram shows the recess for the measuring tube and control wire.

TLK-K, L and V		Correction factor	
Type	Dim.	LØV (K = Short / L = Long)	Opus (V = Variable)
Rear entry	100	9,0	5,5
	125	11,2	7,9
	160	17,6	12,7
	200	23,1	14,8
	250	41,3	27,8
Side-entry spigot	100	8,9	5,5
	125	11,3	7,9
	160	19,6	12,7
	200	25,5	14,8
	250	41,1	28,1

**LØV-R with Luna plenum box**

Measured at the plenum box measuring outlet



The diagram shows where the control wire should be pulled out through the opening ("Leaf-flap") in the centre at the front.

LØV-R Dim.	Luna Dim.	Correction factor	
		Standard box	Low.profile box
100	100-100	5,3	4,5
125	100-125	7,3	6,7
160	100-160	12,3	9,4
125	125-125	7,7	6,8
160	125-160	11,4	9,5
200	125-200	15,2	11,7
160	160-160	12,5	12,0
200	160-200	16,1	14,8
250	160-250	22,9	21,2
200	200-200	16,5	15,4
250	200-250	25,1	23,5
315	200-315	31,3	27,5
250	250-250	26,6	24,5
315	250-315	32,0	28,1
	315-315	30,7	29,4

**TLG-LØV with Luna plenum box**

Measured at the plenum box measuring outlet.

TLG-LØV	Luna	Correction factor standard box			Correction factor standard box		
		Dim.	Dim.	Min.	Med.	Max.	Min.
100	100-100	6,1	6,4	6,6	5,2	5,2	5,2
125	100-125	8,2	8,5	9,1	8,0	8,0	8,3
160	100-160	12,3	13,3	14,1	10,9	11,1	11,1
125	125-125	8,4	9,0	9,5	8,0	8,8	8,9
160	125-160	11,4	12,2	12,5	10,8	11,1	11,2
200	125-200	17,0	18,4	18,9	12,6	12,8	12,8
160	160-160	13,1	14,1	14,7	13,5	14,7	14,9
200	160-200	17,3	18,1	19,3	17,3	18,5	19,4
250	160-250	24,0	26,9	27,5	23,0	25,2	24,7
200	200-200	17,8	18,7	20,1	18,8	20,6	21,4
250	200-250	27,0	30,8	32,1	25,8	29,5	30,5
315	200-315	35,3	39,4	35,3	32,7	35,7	36,6
250	250-250	29,2	34,1	35,9	27,7	32,6	33,0
315	250-315	38,0	43,3	45,1	34,4	38,7	40,1
	315-315	38,9	45,0	48,0	38,3	44,2	46,3

**Opus-R with Luna plenum box**

Measured at the plenum box measuring outlet.

Opus-R Dim.	Luna Dim.	Correction factor	
		Standard box	Low-profile box
125	100-125	4,3	4,2
160	100-160	8,3	7,6
	125-160	8,2	7,7
200	125-200	10,1	9,1
	160-200	10,4	10,2
250	160-250	16,5	16,1
	200-250	18,7	17,1
315	200-315	18,3	18,2
	250-315	19,0	18,3



### Opus-K with Luna plenum box

Measured at the plenum box measuring outlet.

Opus-K Dim.	Luna Dim.	Correction factor	
		Standard box	Low -profile box
160	100-160	6,8	6,4
	125-160	6,8	6,7
200	125-200	10,3	9,1
	160-200	10,6	10,7
250	160-250	16,1	15,8
	200-250	16,5	17,9
315	200-315	22,2	22,8
	250-315	23,3	22,5
400	250-400	29,5	28,3
	315-400	30,4	29,2



**RFD with Luna plenum box**  
Measured at the plenum box measuring outlet

RFD Dim.	Luna Dim.	Correction factor	
		Standard box	Low-profile box
125	100-125	4,7	4,7
160	100-160	7,6	7,5
	125-160	7,7	7,4
200	125-200	11,9	10,1
	160-200	11,9	11,6
250	160-250	17,4	16,8
	200-250	17,5	17,9
315	200-315	23,9	23,4
	250-315	24,7	25,9
400	250-400	36,1	35,0
	315-400	30,1	-

**Tellus-LØV**

Measured at the plenum box  
measuring outlet.

Tellus-LØV			
Dim.	Slot height	Correction high	Correction low
100	min.	14,1	14,5
	mid.	15,0	16,1
	max.	16,2	16,8
125	min.	13,2	14,3
	mid.	13,8	15,2
	max.	15,0	16,5
160	min.	18,9	19,8
	mid.	21,0	22,2
	max.	22,8	24,3
200	min.	32,2	32,9
	mid.	35,2	37,5
	max.	38,9	41,4
250	min.	36,8	37,9
	mid.	45,1	48,0
	max.	51,4	52,7
315	min.	60,7	55,2
	mid.	71,3	67,8
	max.	81,2	78,1



## Tellus-Opus

Measured at the plenum box measuring outlet

Tellus-Opus		
Dim.	Slot height	Correction factor
125	min.	15,5
	mid.	18,2
	max.	20,3
160	min.	23,2
	mid.	26,7
	max.	28,7
200	min.	26,2
	mid.	35,0
	max.	39,6
250	min.	41,3
	mid.	54,2
	max.	67,7



### TUB

Measured at the valve's measuring outlet

TUB Dim.	Correction factor / Length		
	2m	4m	6m
160	21,2	28,3	30,1
200	29,8	40,7	40,4
250	48,7	68,7	69,6



### Siv-inn PP and PK

The air flow rate is determined by measuring the pressure at the front-centre nipple, and is calculated by using the following formula:

$$q[\text{l/s}] = K \times \sqrt{\Delta p_i [\text{Pa}]} \times A_{\text{eff}^*}$$

where  $K = 149$

$p_i$  = the pressure measured in a perforated hole in the clover pattern [Pa]

$A_{\text{eff}^*}$  = net panel area [m<sup>2</sup>].



## Displacement ventilation

# 17



### Siv-inn Inlaid

Measured at front centre by means of nipple

Dim.	300-600	600-300	400-400	600-600	600-900
Correction factor	14,1	15,3	28,1	40	61,6



## Displacement ventilation

# 18



### Siv-inn 1 1/4R and 1/2R

100-315: Measured at front by means of nipple

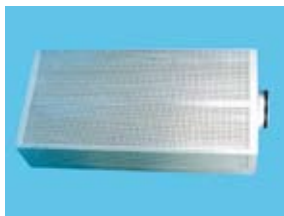
400: Measured at the valve's measuring outlet

Dim.	100	125	160	200	250	315	400
Correction factor	16,5	21,6	40,7	58	72,6	112,5	122



## Displacement ventilation

# 19



**Siv-inn 2 Rekcangular**  
Measured at the valve's  
measuring outlet

Type	128-200	206-250	2010-315	2012-400
Correction factor	38,3	55	103	133



## Displacement ventilation

# 20



**Siv-inn 2 1/4R, 1/2R and 1/1R**  
Measured at the valve's  
measuring outlet

Dim..	315	400	500	630	800
Correction factor	101	155	207	307	370

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## Displacement ventilation

**Siv-inn 2000 1/4R and 1/2R**

Measured at the valve's measuring outlet

Dim.	125	160	200	250
Corr. factor	10,7	19,8	26,8	49,6

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## Displacement ventilation

**Siv-inn School**

Measured at the valve's measuring outlet

Dim.	125	160	200	250	315
Corr. factor	20,8	28,2	46,6	61	104



## Iris

Measured at the damper's measuring outlet

Iris Dim.	Position														
	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6	6,5	7	7,5	8
80	6,1	-	4,1	-	3,2	-	2,3	-	1,4	-	0,9	-	0,6	-	-
100	10,4	7,9	7,5	6,6	6,0	5,2	4,5	3,8	3,4	2,9	2,5	2,1	1,7	1,2	0,9
125	13,8	10,4	8,8	7,3	6,5	5,5	4,7	4,0	3,5	3,1	2,7	2,2	1,5	-	-
160	22,1	17,2	14,8	13,4	12,5	11,5	10,7	9,5	8,5	7,5	6,8	5,6	4,9	4,0	3,5
200	44,2	36,6	30,9	26,9	23,2	20,6	18,2	15,9	14,0	12,3	11,0	9,6	8,4	6,5	5,0
250	64,4	53,5	45,6	41,8	38,7	34,5	30,7	27,3	24,1	21,4	18,4	15,8	12,8	10,9	8,9
315	118	88,3	70,0	64,5	58,7	53,0	54,1	42,4	37,0	33,3	30,0	25,9	21,8	19,0	15,8
400	131	-	102	-	88,3	-	67,3	-	52,7	-	38,5	-	28,4	-	15,5
500	230	-	177	-	146	-	112	-	88,5	-	66,6	-	48,0	-	30,0
630	451	-	297	-	238	-	169	-	127	-	91,6	-	62,8	-	35,1
800	489	-	402	-	344	-	267	-	217	-	170	-	122	-	73,7

**Leo**

Measured by means of orifice plate



Leo Dim.	Correction factor
100	6,4
125	10,3
160	16,6
200	27,1
250	41,1
315	68,7
400	112,9
500	177
630	287

### KBI

Measured at the beam's measuring outlet



Type	Correction faktor
1200-10	1,34
1200-20	1,88
1200-30	2,63
1200-40	3,86
1200-50	5,81
1800-10	1,95
1800-20	2,69
1800-30	3,86
1800-40	6,03
1800-50	9,33
2400-10	2,59
2400-20	3,64
2400-30	5,15
2400-40	7,91
2400-50	11,11
3000-10	3,07
3000-20	4,34
3000-30	6,15
3000-40	9,27
3000-50	13,16
3600-10	4,01
3600-20	5,43
3600-30	7,55
3600-40	11,27
3600-50	15,75

**KBC**

Measured at the beam's measuring outlet


Type	Correction faktor
1200-1	1,32
1200-2	1,91
1200-3	2,60
1200-4	3,20
1800-1	1,41
1800-2	1,78
1800-3	2,42
1800-4	3,09
1800-5	3,78
1800-6	4,35
1800-7	5,65
1800-8	5,98
2400-1	1,37
2400-2	1,93
2400-3	2,47
2400-4	3,26
2400-5	3,91
2400-6	4,51
2400-7	5,18
2400-8	6,08
3000-1	1,61
3000-2	2,37
3000-3	2,80
3000-4	3,36
3000-5	3,91
3000-6	4,65

## Notes



A large, rectangular area with horizontal lines, intended for writing notes. The background of the entire page is a photograph of tall, golden-brown grasses blowing in the wind against a bright blue sky with soft white clouds. The grasses are in the foreground, slightly out of focus, creating a sense of depth and movement.

## Notes



A large, rectangular area with horizontal lines, intended for writing notes. The background of the entire page is a photograph of tall, golden-brown grasses blowing in the wind against a bright, cloudy sky. The grasses are in the foreground, and the sky is in the background.

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