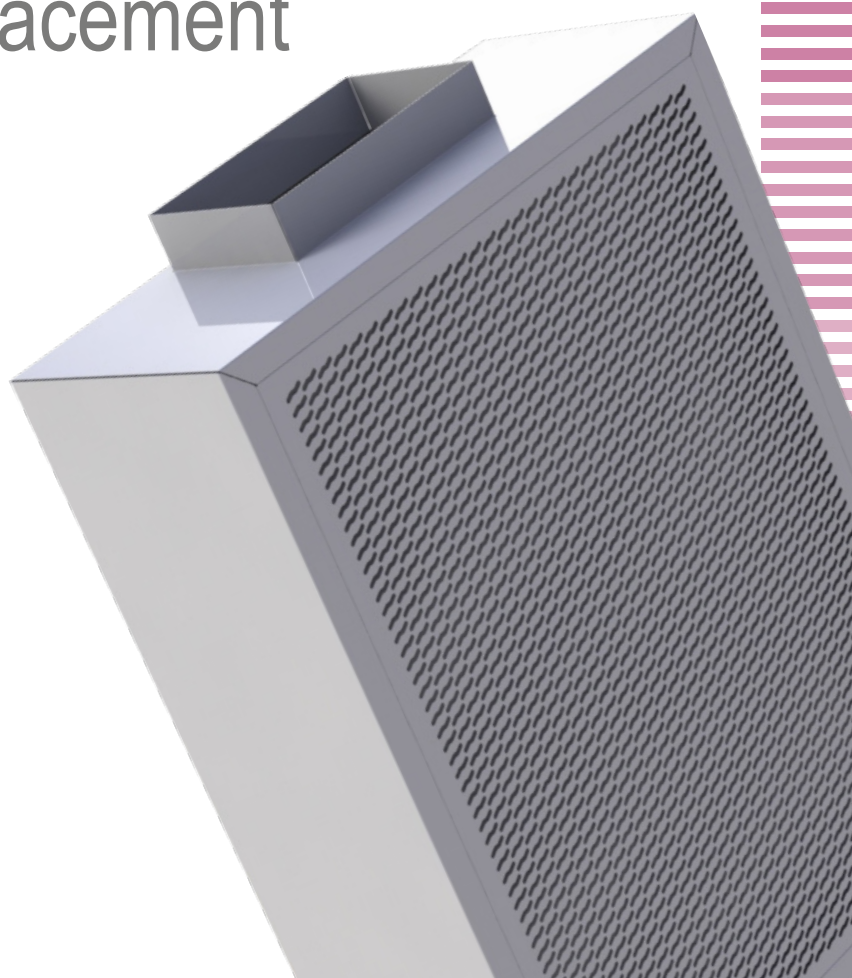


KOOLAIR

S-90

Displacement diffusers

Displacement



ISO 9001

BUREAU VERITAS
Certification

Sistema de Gestión

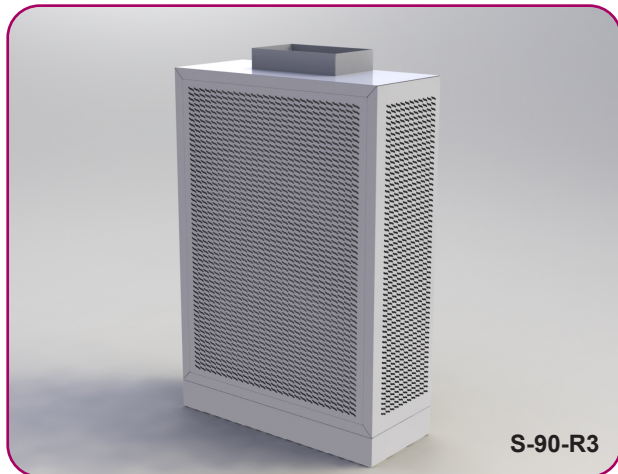


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General characteristics

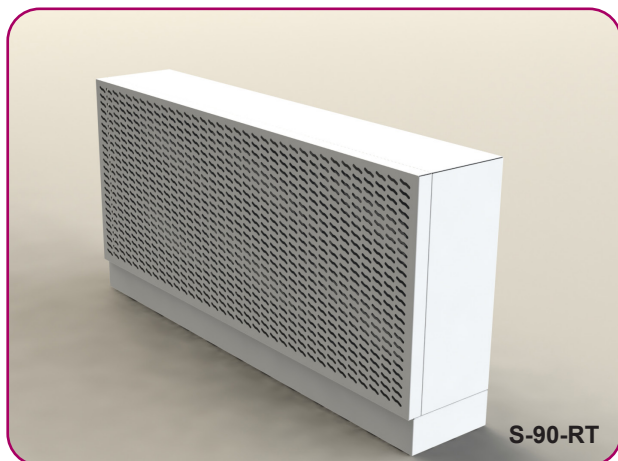


Description

The S-90 rectangular diffusers are displacement units for floor installation. The unit includes upper and lower covers and a perforated air distribution face plate. Connections can be made through the upper or lower cover.

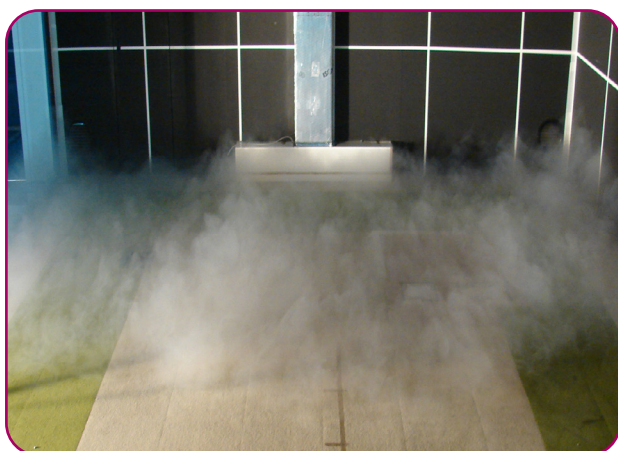
The units are of galvanised steel sheet construction with aluminium sections and include an air equalising plate (painted in black) inside, as well as static pressure measurement to obtain the supply flow rate. The standard finish is RAL 9010 white paint, although any RAL colour is available upon request.

The S-90-44 version has a larger free air outlet area than the standard S-90 diffuser to provide an outlet velocity reduction of 35%.



Applications

The rectangular S-90 displacement diffusers can be used in both comfort and industrial environments. Air is supplied from the occupied area level at a slow outlet velocity (< 0.8 m/s) to minimise turbulence. Depending on the size, the units can also supply large air volumes. Air is supplied at a temperature difference of -1 to -6 °C with respect to the ambient temperature.



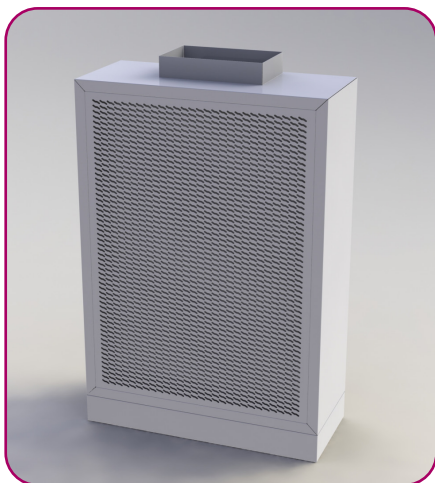
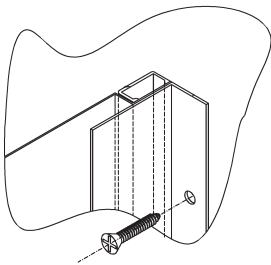
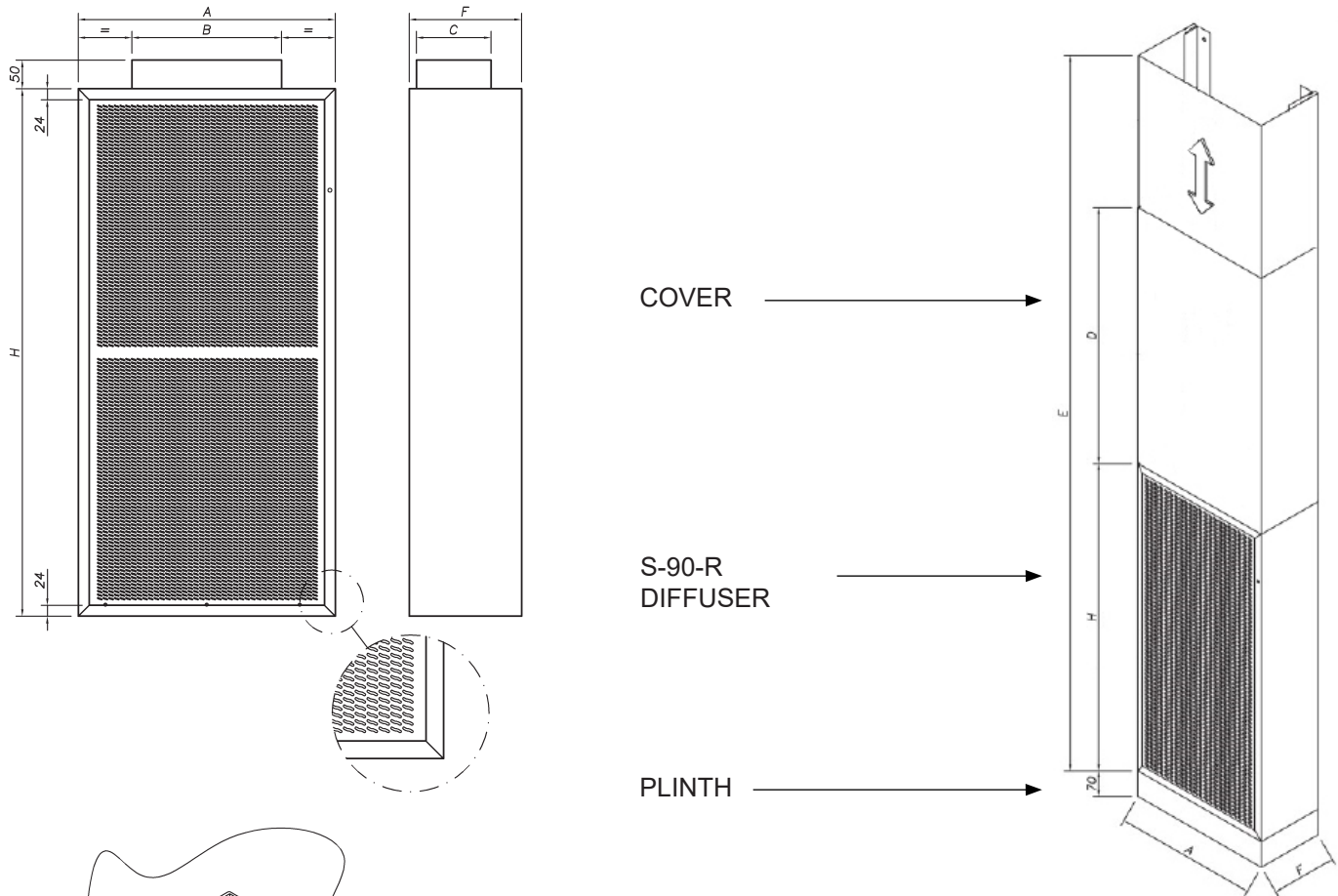
S-90 Series Rectangular Models

S-90-R	Rectangular
S-90-R3	3-Way Rectangular
S-90-RT	Horizontal Rectangular
S-90-RE	Flush-mounte Rectangular

S-90-R Model - Rectangular

Dimensions

The S-90-R diffuser is a rectangular displacement unit that supplies the air at low velocity to the habitable area. Optional accessories include a plinth (-Z) and decorative cover (-ET).



Size	A	H	F	B	C	D	E
600x800-25	600	800	250	250	150	1530	
600x1000-30	600	1000	300	250	200	1300	2400 3500
600x1200-30	600	1200		270		1130	~
600x1500-30	600	1500		400		1230	2800 ~ 3500
800x800-30	800	800		300		1530	
800x1000-30	800	1000		350		1330	2400 3500
800x1200-30	800	1200		400		1130	~
800x1500-30	800	1500		500		1230	2800 ~ 3500
1000x1200-30	1000	1200		500		1130	2400 ~ 3500
1000x1500-30	1000	1500		650		1230	
1000x1800-30	1000	1800		700		930	
1200x1500-30	1200	1500		700		1230	
1200x1800-30	1200	1800		850		930	2800 ~ 3500
1200x2000-30	1200	2000		900		730	
1500x1800-30	1500	1800		1000		930	
1500x2000-30	1500	2000		1200		730	

S-90-R Model - Rectangular

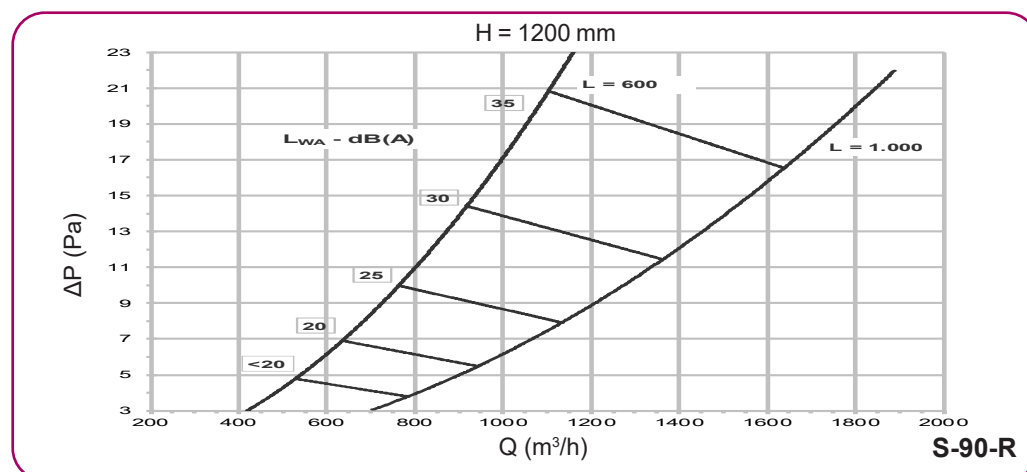
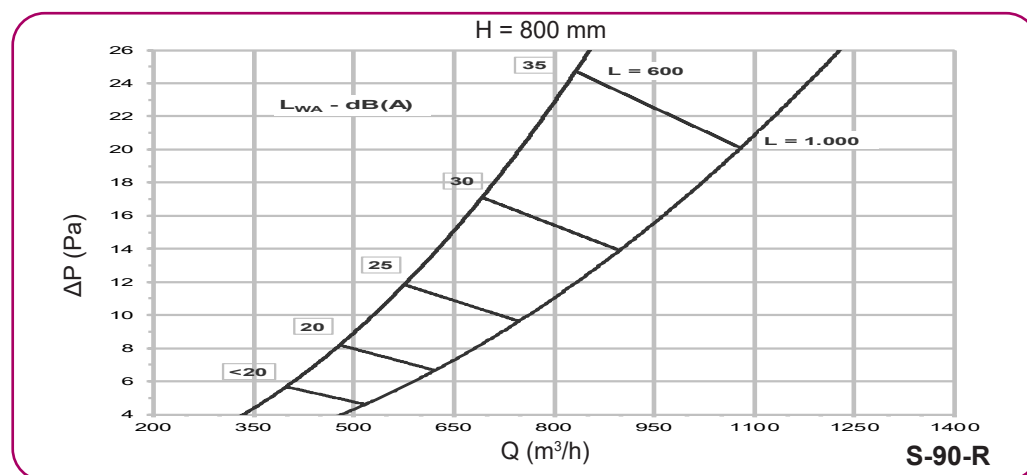
Technical data

The air flow, pressure drop and horizontal throw of the air jet are listed below for a velocity of 0.20 m/s in the occupied area, based on a specific sound level.

S-90-R Quick selection table				
Flow rate - Sound level L_w - Pressure drop - Throw				
Model	m^3/h (Pa) [m]			
	20 dB(A)	25 dB(A)	30 dB(A)	35 dB(A)
600x800-25	480 (8) [4,6]	570 (12) [5,5]	680 (17) [6,7]	820 (24) [7,8]
600x1200-30	650 (7) [3,6]	750 (10) [4,5]	920 (14) [5,3]	1100 (21) [6,4]
600x1500-30	870 (6) [4,3]	1050 (9) [4,7]	1270 (13) [6,3]	1500 (18) [8,0]
1000x1500-30	1250 (5) [4,0]	1500 (7) [5,0]	1800 (10) [5,5]	1170 (15) [7,0]
1200x2000-30	1600 (4) [6,0]	1950 (6) [7,3]	2330 (8) [8,5]	2800 (12) [10,1]

Pressure drop and sound level selection charts

These charts allow the sound level and pressure drop data to be obtained from the supply flow rate.



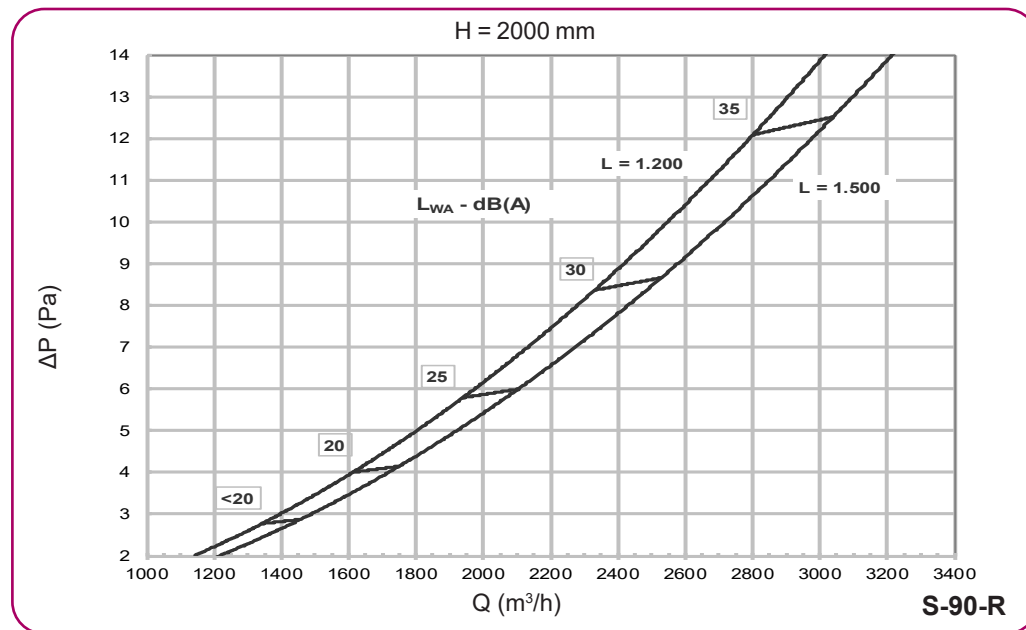
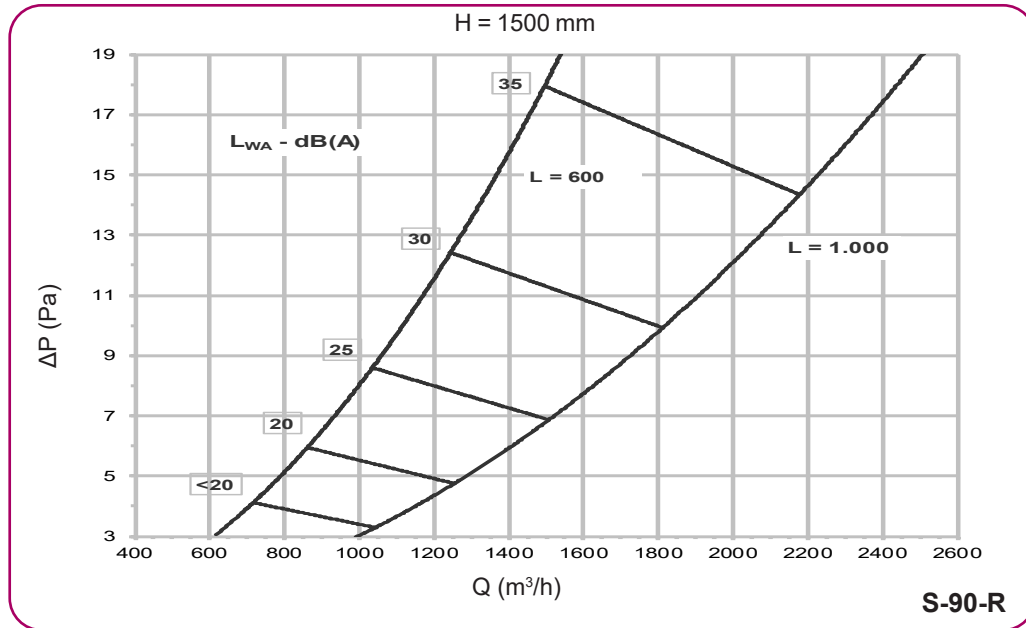
Symbols:

Q (m^3/h): Air flow per displacement unit
 ΔP (Pa): Pressure drop
 L_{WA} (dBA): Sound power level

S-90-R Model - Rectangular

Pressure drop and sound level selection charts

These charts allow the sound level and pressure drop data to be obtained from the supply flow rate.



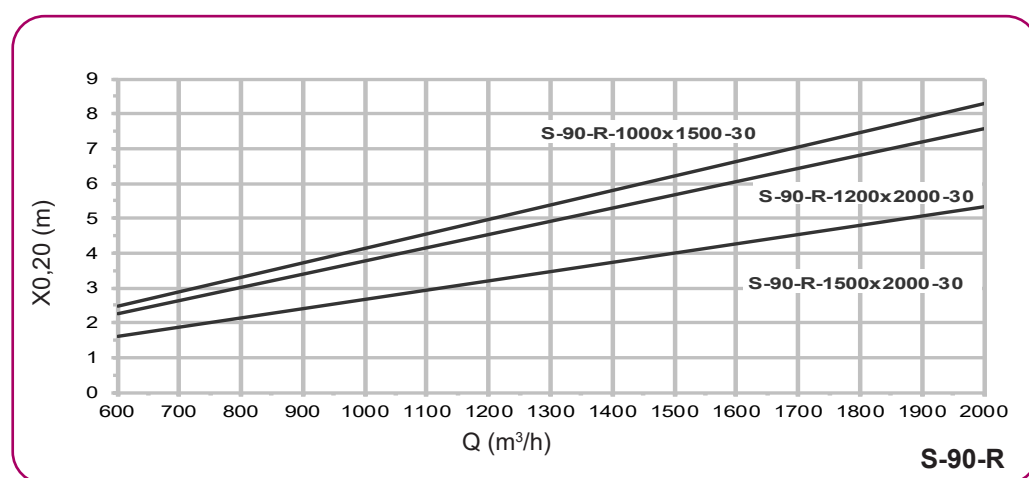
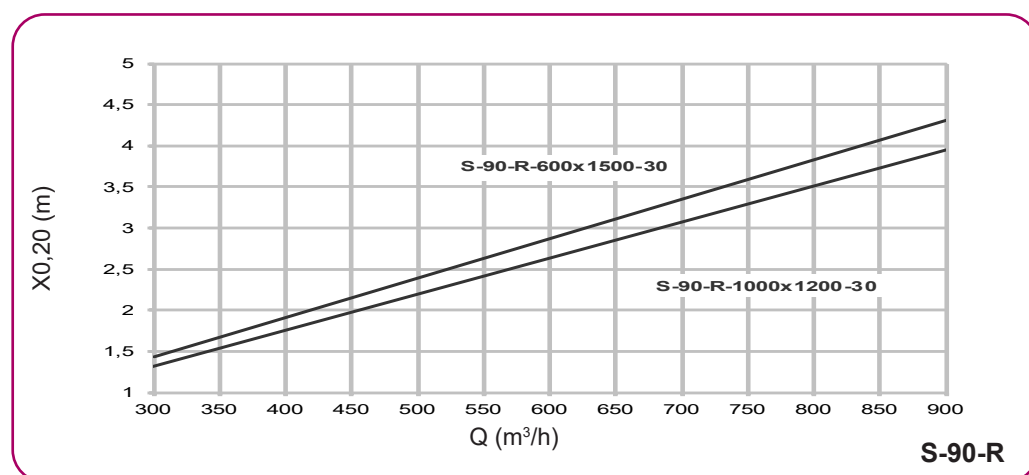
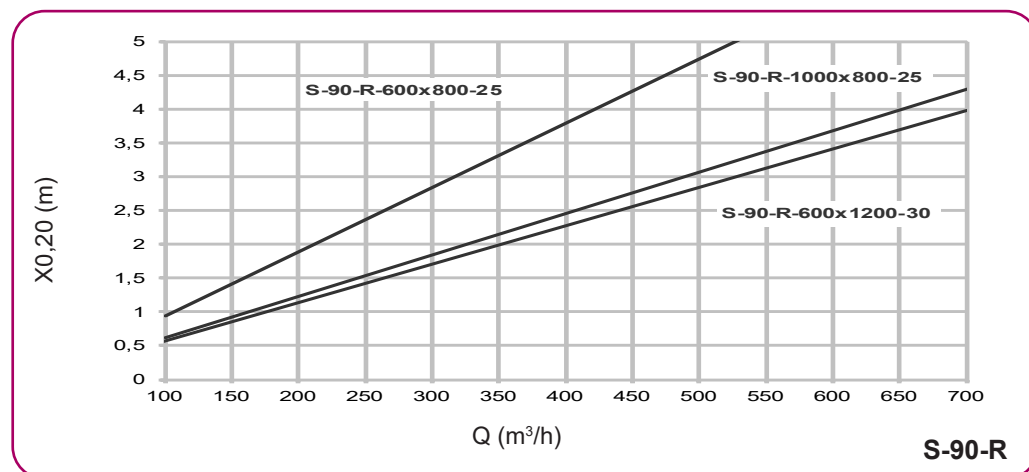
Symbols:

- Q (m³/h): Air flow per displacement unit
- ΔP (Pa): Pressure drop
- L_{WA} (dBA): Sound power level

S-90-R Model - Rectangular

Selection charts

The selection charts shown allow the horizontal throw of the air jet to be obtained from the supply flow rate, when the velocity in the occupied area is 0.20 m/s.



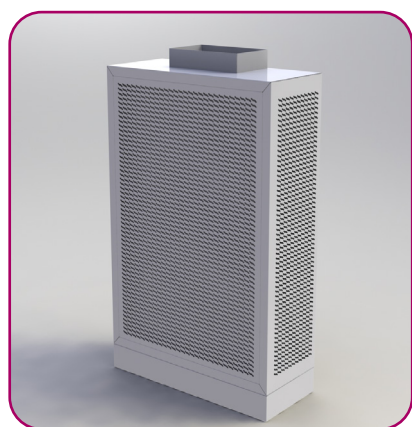
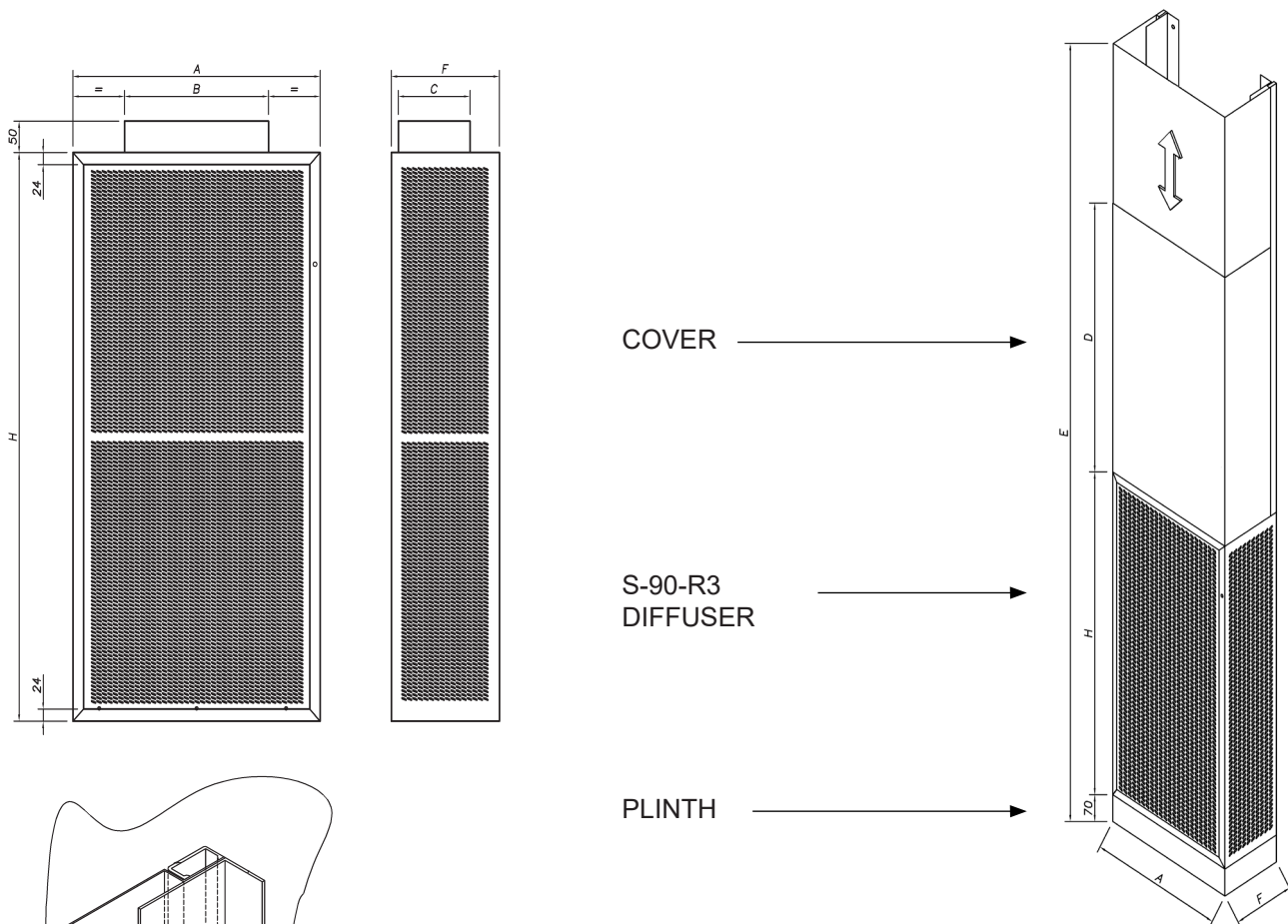
Symbols:

Q (m³/h): Air flow per displacement unit
 X_{0,20} (m): Horizontal throw of the air jet, when the velocity in the occupied area is 0.20 m/s for a temperature difference of T = -3 °C

S-90-R3 Model - 3-Way rectangular

Dimensions

The S-90-R3 diffuser is a rectangular displacement unit that supplies the air at low velocity to the habitable area in three directions. Optional accessories include a plinth (-Z) and decorative cover (-ET).



Size	A	H	F	B	C	D	E		
600x800-25	600	800	250	250	150	1530			
600x1000-30	600	1000	300	250	200	1300	2400	3500	
600x1200-30	600	1200		270		1130	~		
600x1500-30	600	1500		400		1230	2800	~	3500
800x800-30	800	800		300		1530			
800x1000-30	800	1000		350		1330	2400	3500	
800x1200-30	800	1200		400		1130	~		
800x1500-30	800	1500		500		1230	2800	~	3500
1000x1200-30	1000	1200		500		1130	2400	~	3500
1000x1500-30	1000	1500		650		1230			
1000x1800-30	1000	1800		700		930			
1200x1500-30	1200	1500	700	1230					
1200x1800-30	1200	1800	850	930	2800	~	3500		
1200x2000-30	1200	2000	900	730					
1500x1800-30	1500	1800	1000	930					
1500x2000-30	1500	2000	1200	730					

S-90-R3 Model - 3-Way rectangular

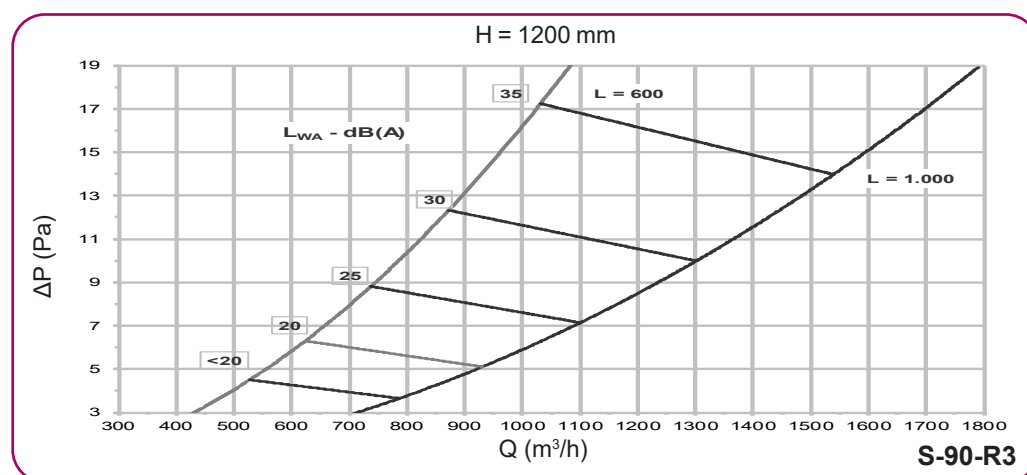
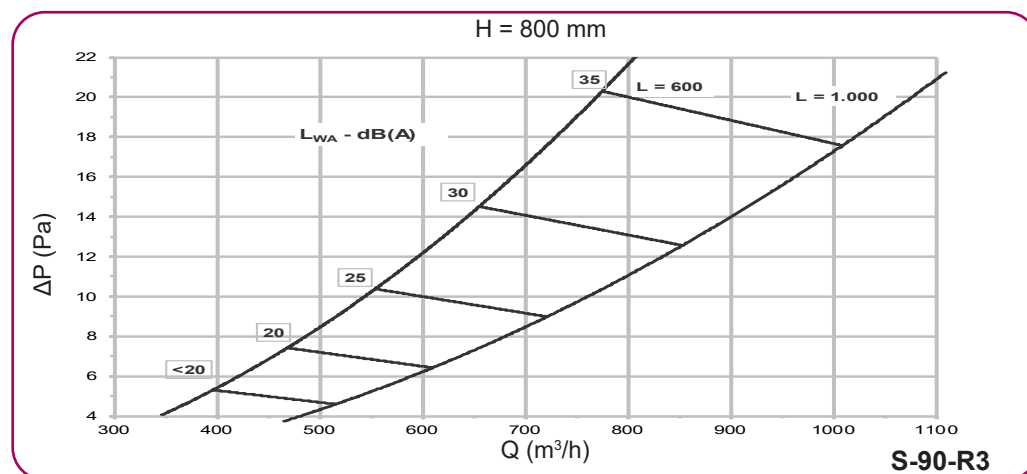
Technical data

The air flow, pressure drop and horizontal throw of the air jet are listed below for a velocity of 0.20 m/s in the occupied area, based on a specific sound level.

S-90-R3 Quick selection table				
Flow rate - Sound level L_w - Pressure drop - Throw				
Model	m ³ /h (Pa) [m]			
	20 dB(A)	25 dB(A)	30 dB(A)	35 dB(A)
600x800-25	470 (7) [2,5]	560 (11) [3,1]	650 (14) [3,3]	780 (21) [4,0]
600x1200-30	630 (6) [2,4]	750 (9) [2,7]	870 (12) [3,3]	1020 (17) [3,8]
600x1500-30	850 (5) [1,9]	1000 (7) [2,2]	1200 (11) [2,7]	1400 (15) [3,3]
1000x1500-30	1250 (4) [2,0]	1450 (6) [2,3]	1750 (9) [2,7]	2050 (15) [3,3]
1200x2000-30	1620 (4) [1,6]	1900 (5) [1,8]	2250 (7) [2,2]	2650 (10) [2,6]
1200x2000-35	1940 (4) [1,7]	2250 (5) [2,3]	2650 (8) [2,6]	3200 (10) [3,5]

Pressure drop and sound level selection charts

These charts allow the sound level and pressure drop data to be obtained from the supply flow rate.



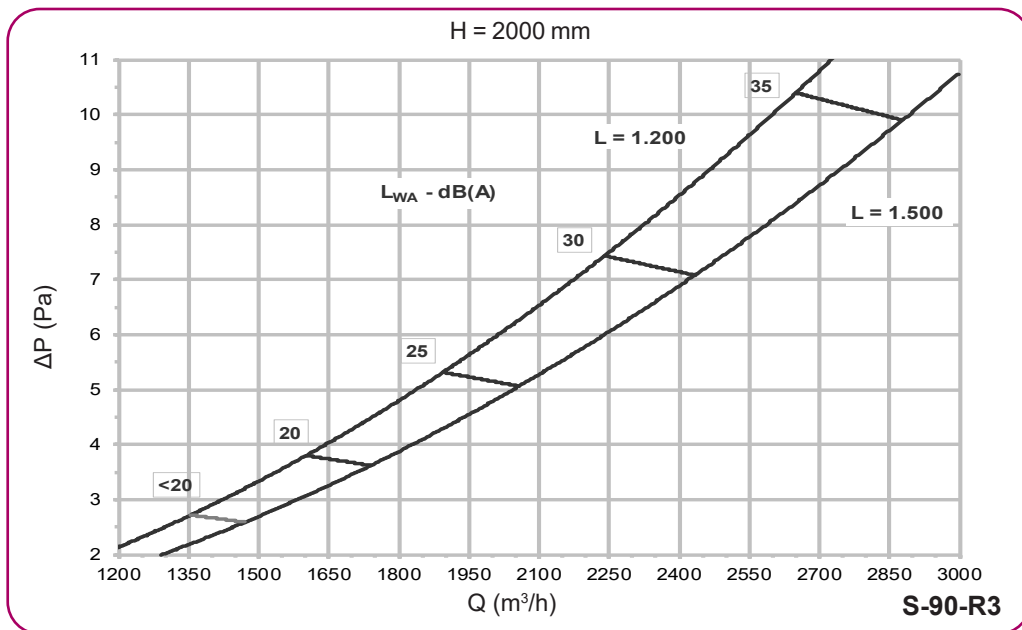
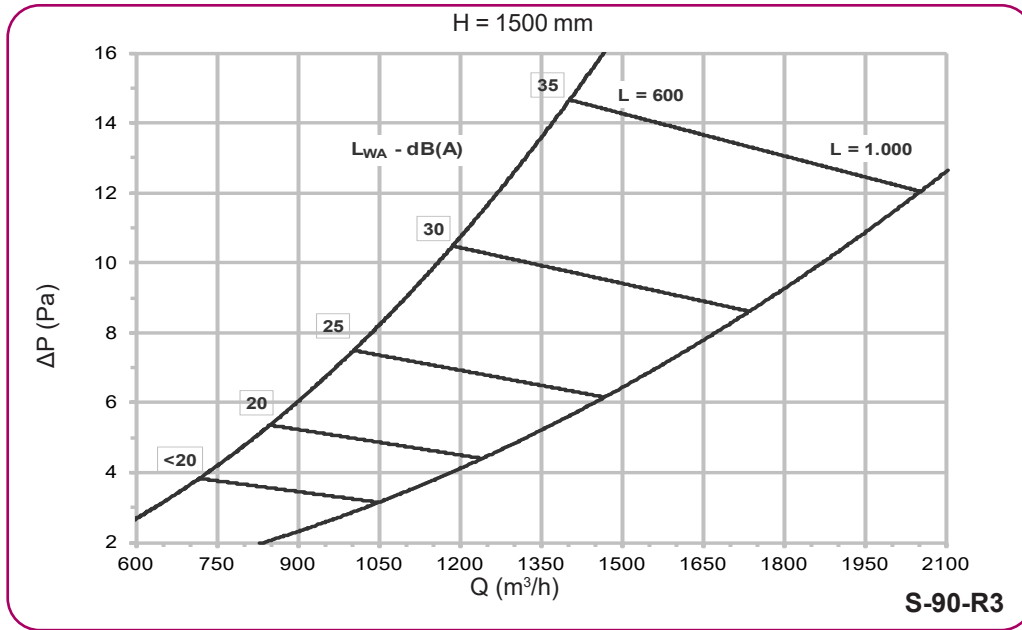
Symbols:

Q (m³/h): Air flow per displacement unit
 ΔP (Pa): Pressure drop
 L_{wA} (dBA): Sound power level

S-90-R3 Model - 3-Way rectangular

Pressure drop and sound level selection charts

These charts allow the sound level and pressure drop data to be obtained from the supply flow rate.



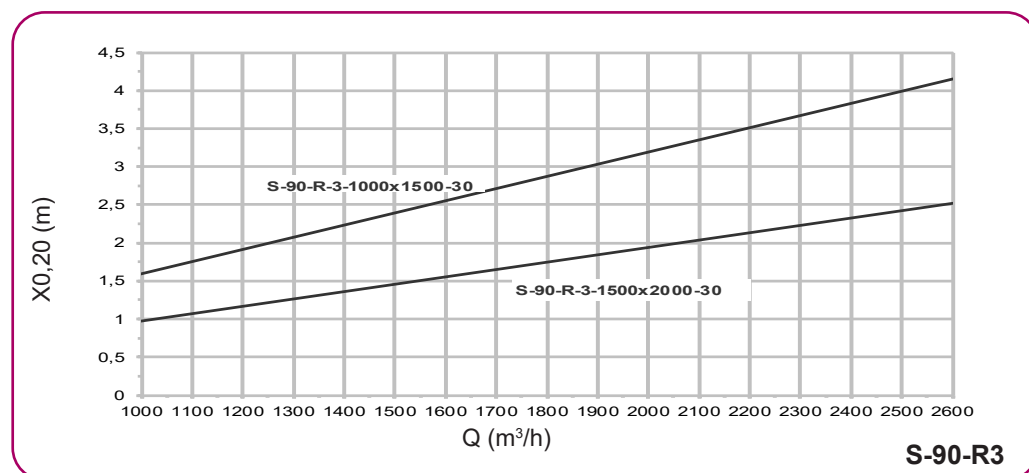
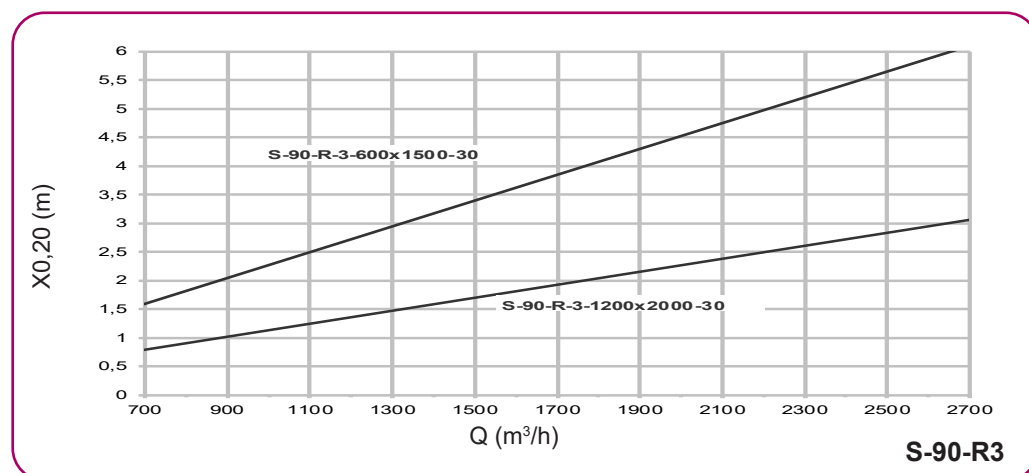
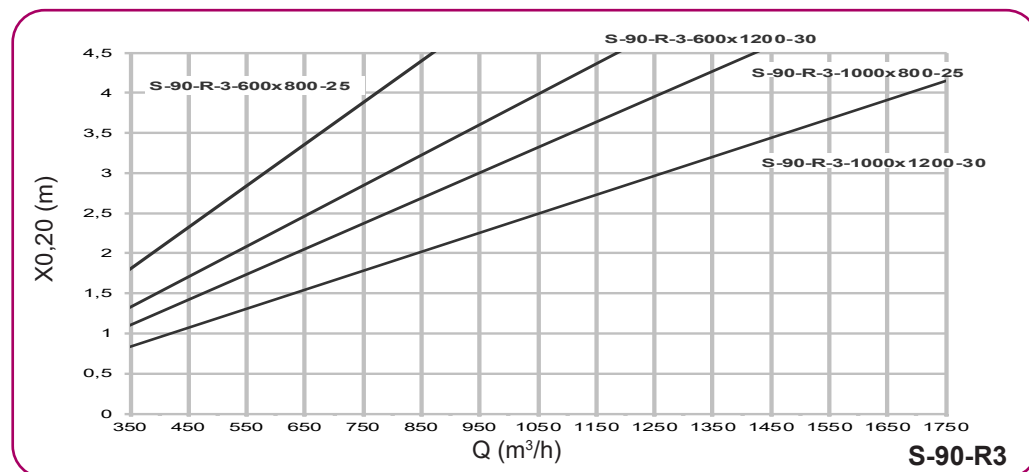
Symbols:

- Q (m³/h): Air flow per displacement unit
- ΔP (Pa): Pressure drop
- L_{WA} (dBA): Sound power level

S-90-R3 Model - 3-Way rectangular

Selection charts

The selection charts shown allow the horizontal throw of the air jet to be obtained from the supply flow rate, when the velocity in the occupied area is 0.20 m/s.



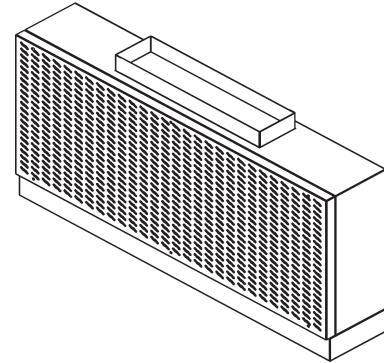
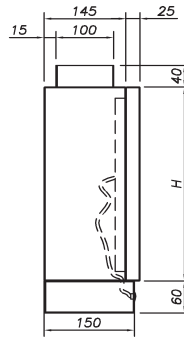
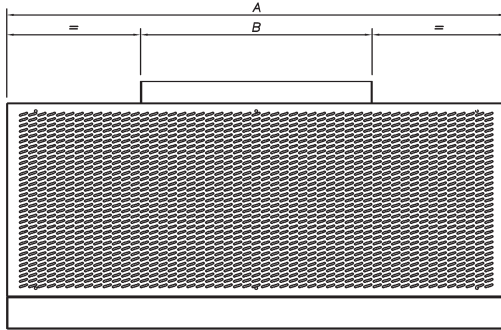
Symbols:

Q (m³/h): Air flow per displacement unit
 X_{0,20}(m): Horizontal throw of the air jet, when the velocity in the occupied area is 0.20 m/s for a temperature difference of T = -3 °C

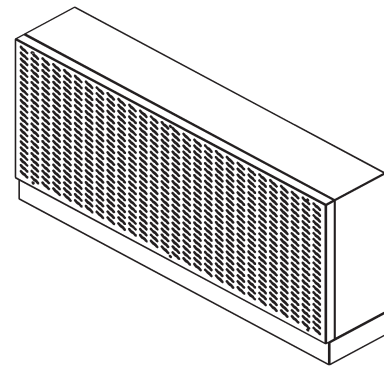
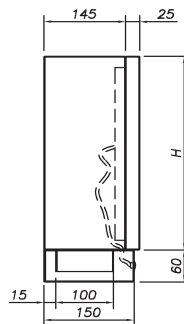
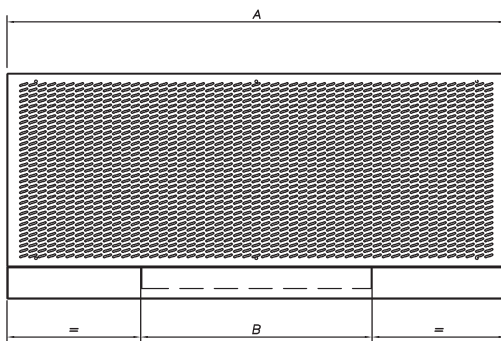
S-90-RT Model - Horizontal rectangular

Dimensions

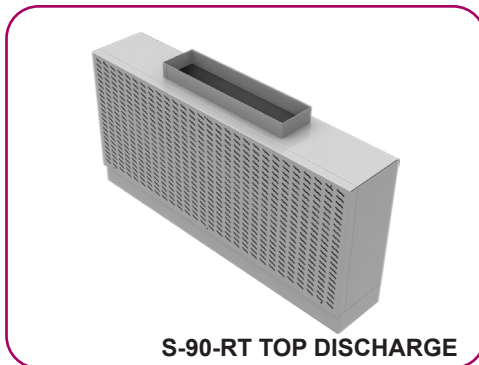
The S-90-RT diffuser is a horizontal rectangular displacement unit that supplies the air at low velocity to the habitable area. Optional accessories include a plinth (-Z).



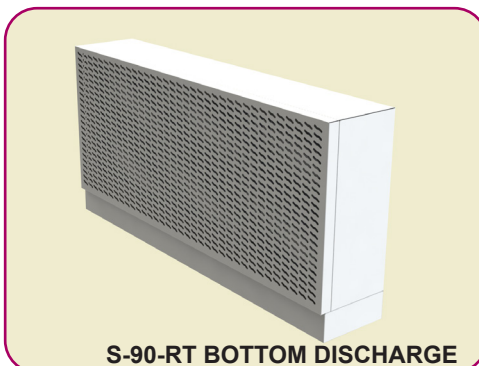
S-90-RT TOP DISCHARGE



S-90-RT BOTTOM DISCHARGE



S-90-RT TOP DISCHARGE



S-90-RT BOTTOM DISCHARGE

Size	A	H	B
850x200	850	200	350
1250x200	1250	200	350
1650x200	1650	200	350
850x350	850	350	400
1250x350	1250	350	400
1650x350	1650	350	400
1050x500	1050	500	500
1450x500	1450	500	500
1850x500	1850	500	500
1050x650	1050	650	700
1450x650	1450	650	700
1850x650	1850	650	700
1250x800	1250	800	850
1650x800	1650	800	850
2050x800	2050	800	850

S-90-RT Model - Horizontal rectangular

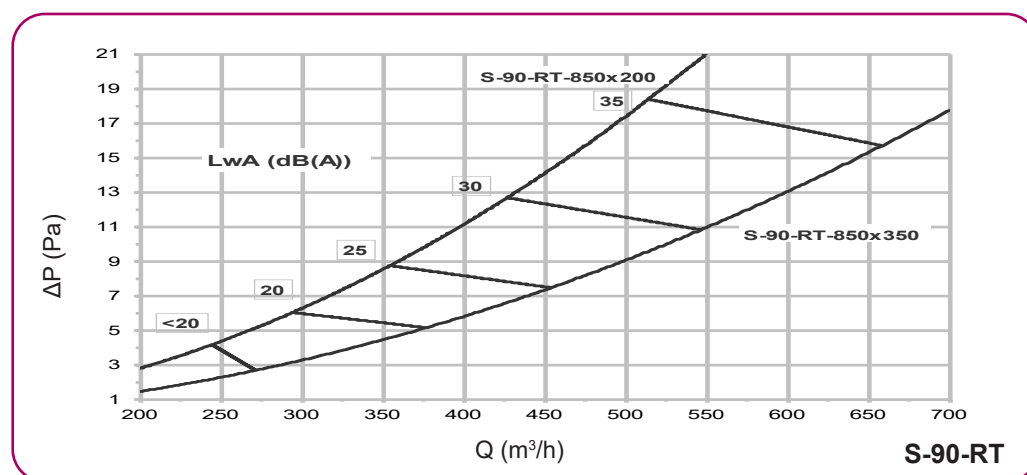
Technical data

The air flow, pressure drop and horizontal throw of the air jet are listed below for a velocity of 0.20 m/s in the occupied area, based on a specific sound level.

S-90-RT Quick selection table				
Air flow - Pressure drop				
Model	m ³ /h (Pa) [m]			L _{WA} (dBA)
	Vk=0,3 m/s	Vk=0,5 m/s	Vk=0,7 m/s	
850x200	50 (1)	90 (2)	120 (2)	<25
1250x200	90 (1)	120 (2)	180 (2)	
1650x200	120 (1)	180 (2)	250 (2)	
850x350	100 (1)	150 (1)	220 (2)	
1250x350	150 (1)	220 (2)	300 (3)	
1650x350	180 (1)	300 (3)	400 (5)	
1050x500	180 (1)	300 (2)	400 (3)	
1450x500	260 (1)	350 (1)	500 (5)	
1850x500	300 (1)	500 (2)	650 (8)	
1050x650	220 (1)	350 (2)	500 (3)	
1450x650	250 (1)	500 (3)	650 (4)	
1850x650	400 (1)	650 (4)	850 (7)	
1250x800	350 (1)	500 (2)	700 (3)	
1650x800	400 (1)	700 (2)	900 (5)	
2050x800	500 (2)	900 (5)	1200 (10)	

Pressure drop and sound level selection charts

These charts allow the sound level and pressure drop data to be obtained from the supply flow rate.



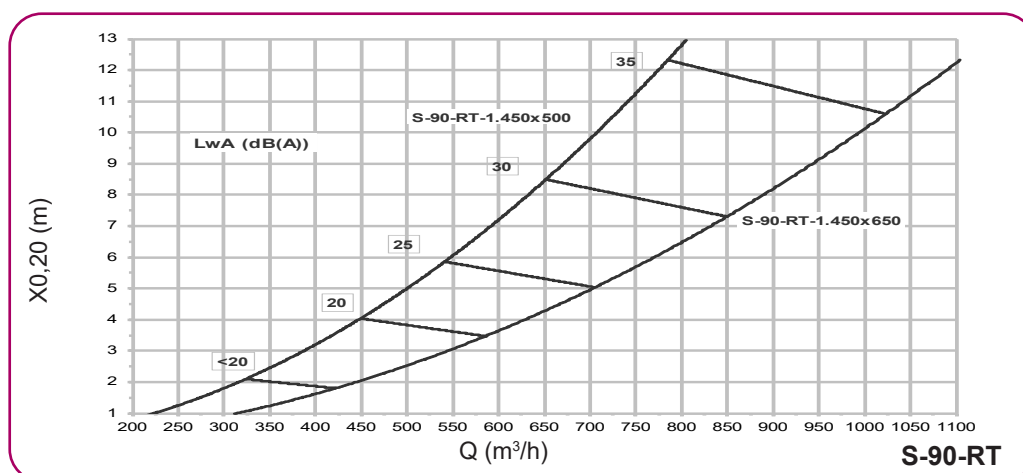
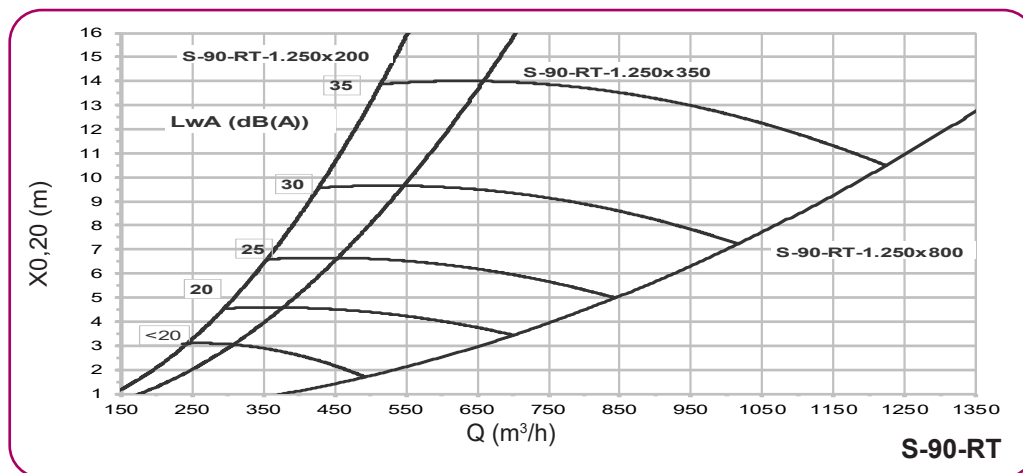
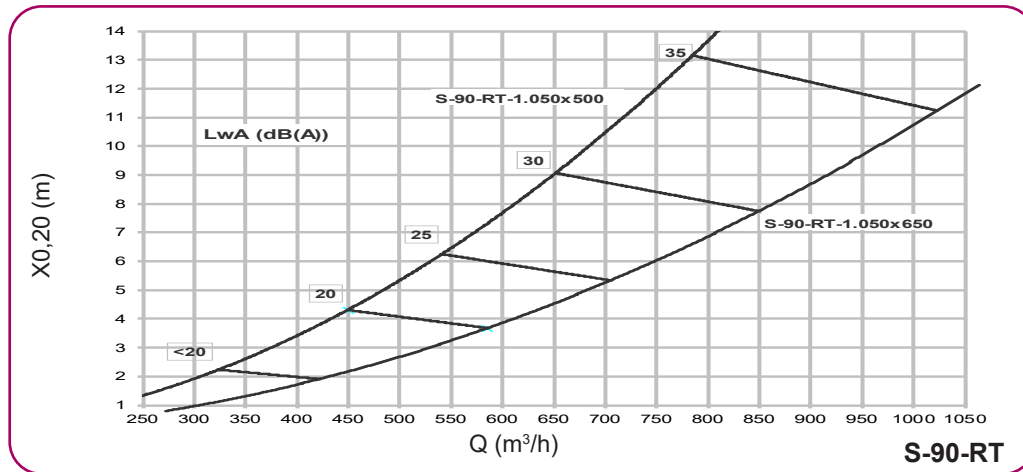
Symbols:

Q (m³/h): Air flow per displacement unit
 ΔP (Pa): Pressure drop
 L_{WA} (dBA): Sound power level

S-90-RT Model - Horizontal rectangular

Pressure drop and sound level selection charts

These charts allow the sound level and pressure drop data to be obtained from the supply flow rate.



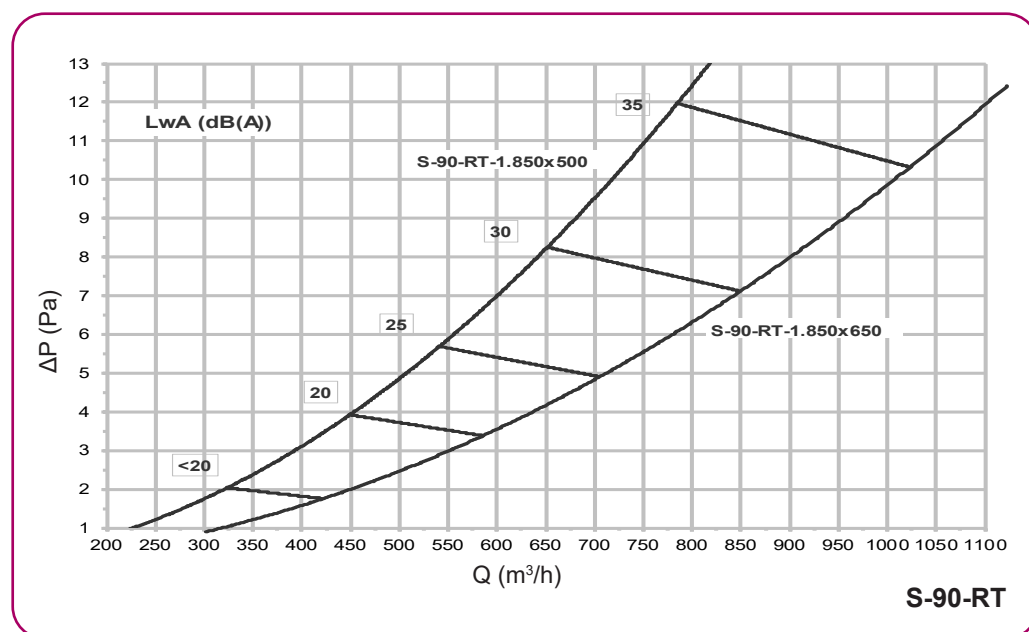
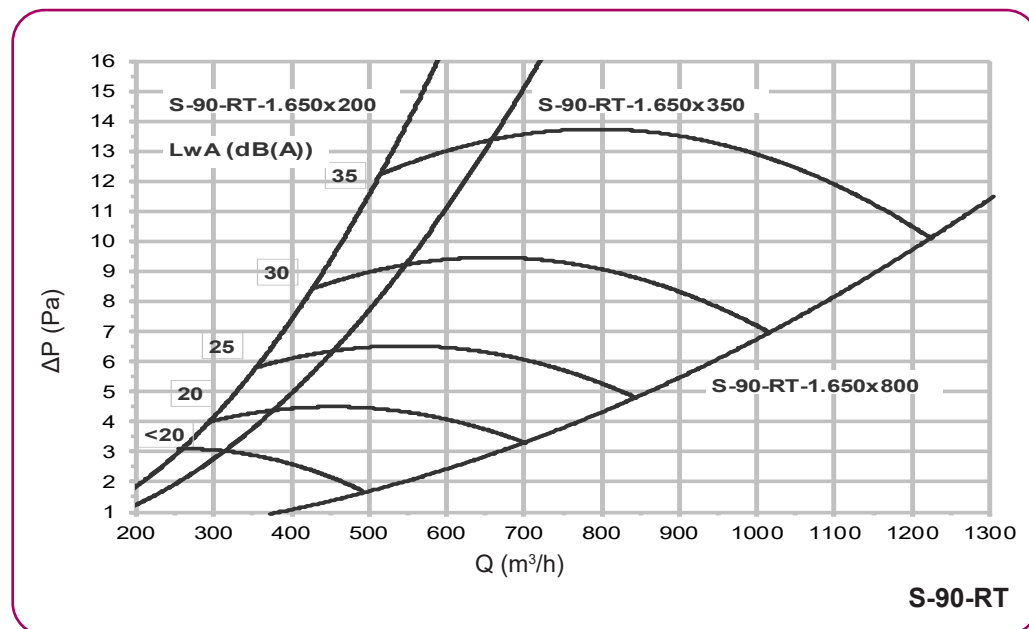
Symbols:

- Q (m³/h): Air flow per displacement unit
- ΔP (Pa): Pressure drop
- L_{WA}(dBA): Sound power level

S-90-RT Model - Horizontal rectangular

Pressure drop and sound level selection charts

These charts allow the sound level and pressure drop data to be obtained from the supply flow rate.



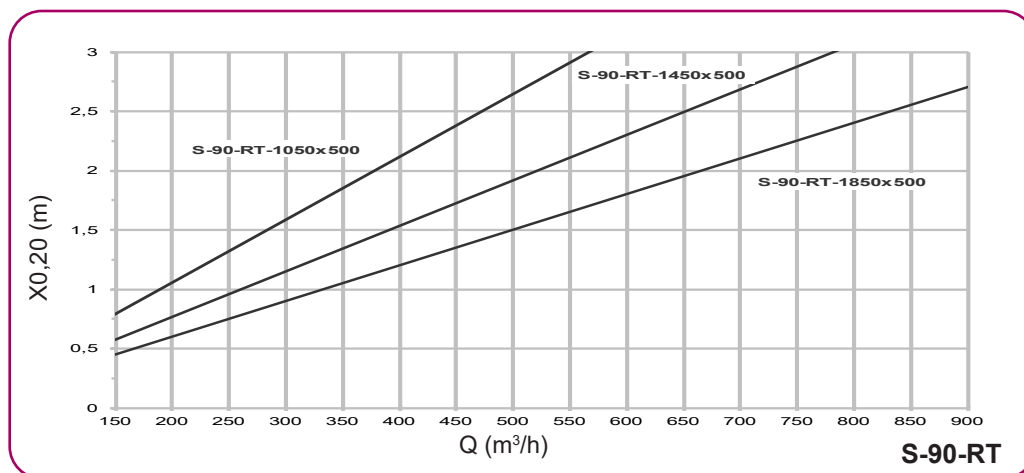
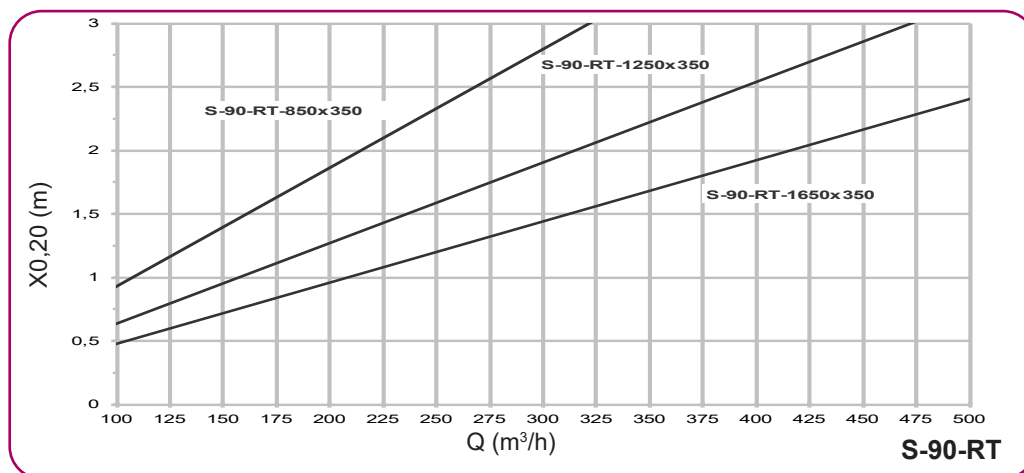
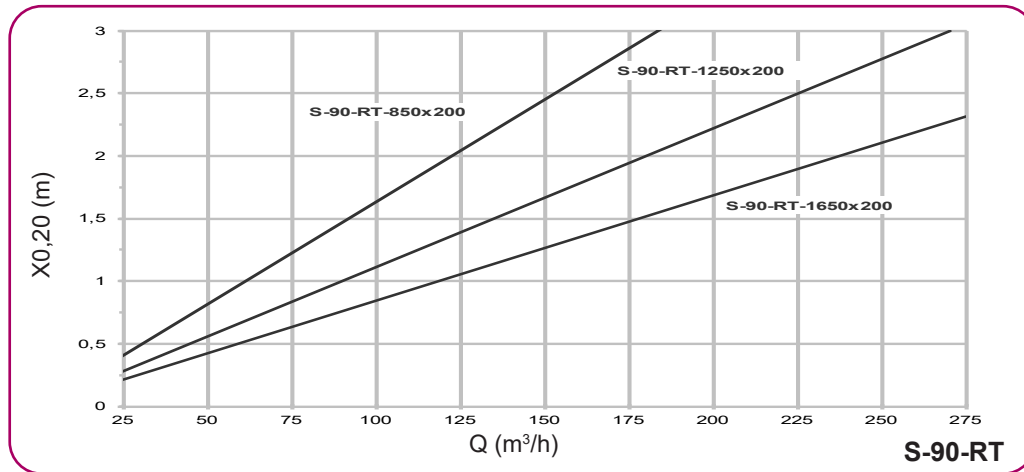
Symbols:

- Q (m³/h): Air flow per displacement unit
- ΔP (Pa): Pressure drop
- L_{wA} (dBA): Sound power level

S-90-RT Model - Horizontal rectangular

Selection charts

The selection charts shown allow the horizontal throw of the air jet to be obtained from the supply flow rate, when the velocity in the occupied area is 0.20 m/s.



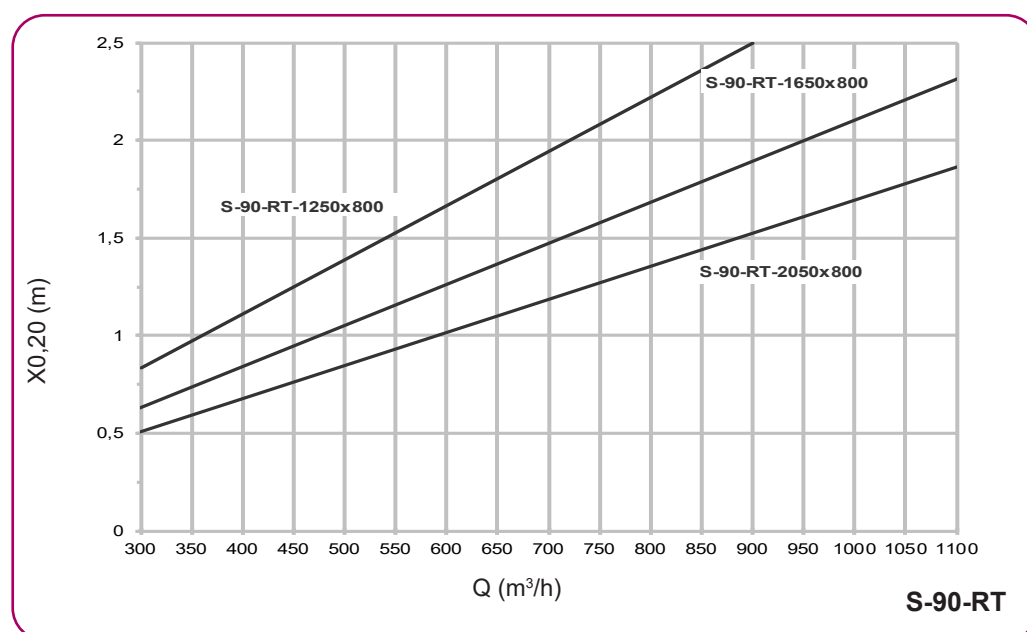
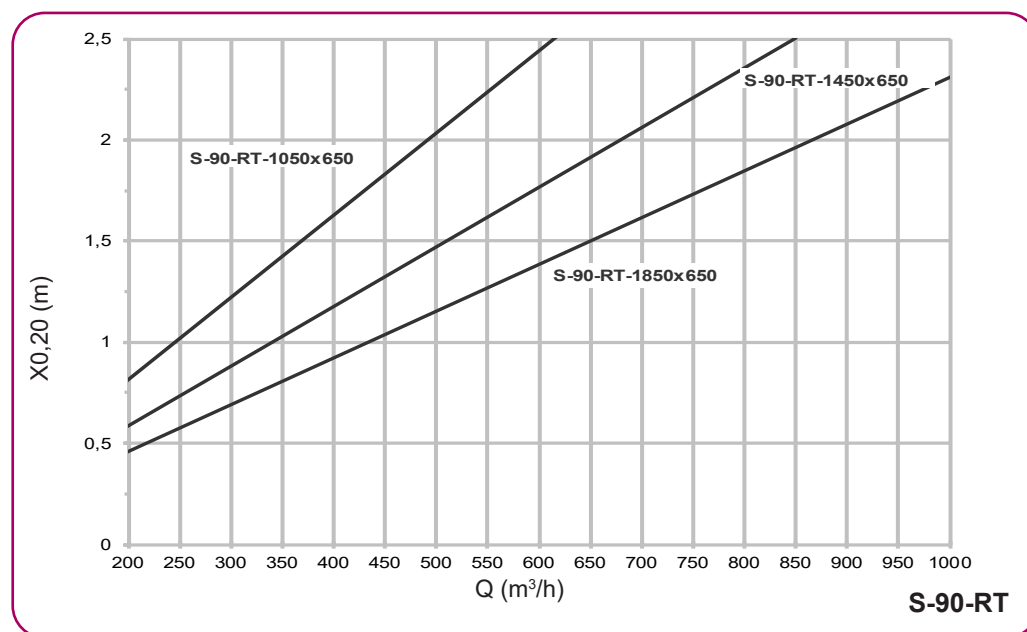
Symbols:

Q (m³/h): Air flow per displacement unit
 X_{0,20}(m): Horizontal throw of the air jet, when the velocity in the occupied area is 0.20 m/s for a temperature difference of T = -3 °C

S-90-RT Model - Horizontal rectangular

Selection charts

The selection charts shown allow the horizontal throw of the air jet to be obtained from the supply flow rate, when the velocity in the occupied area is 0.20 m/s.



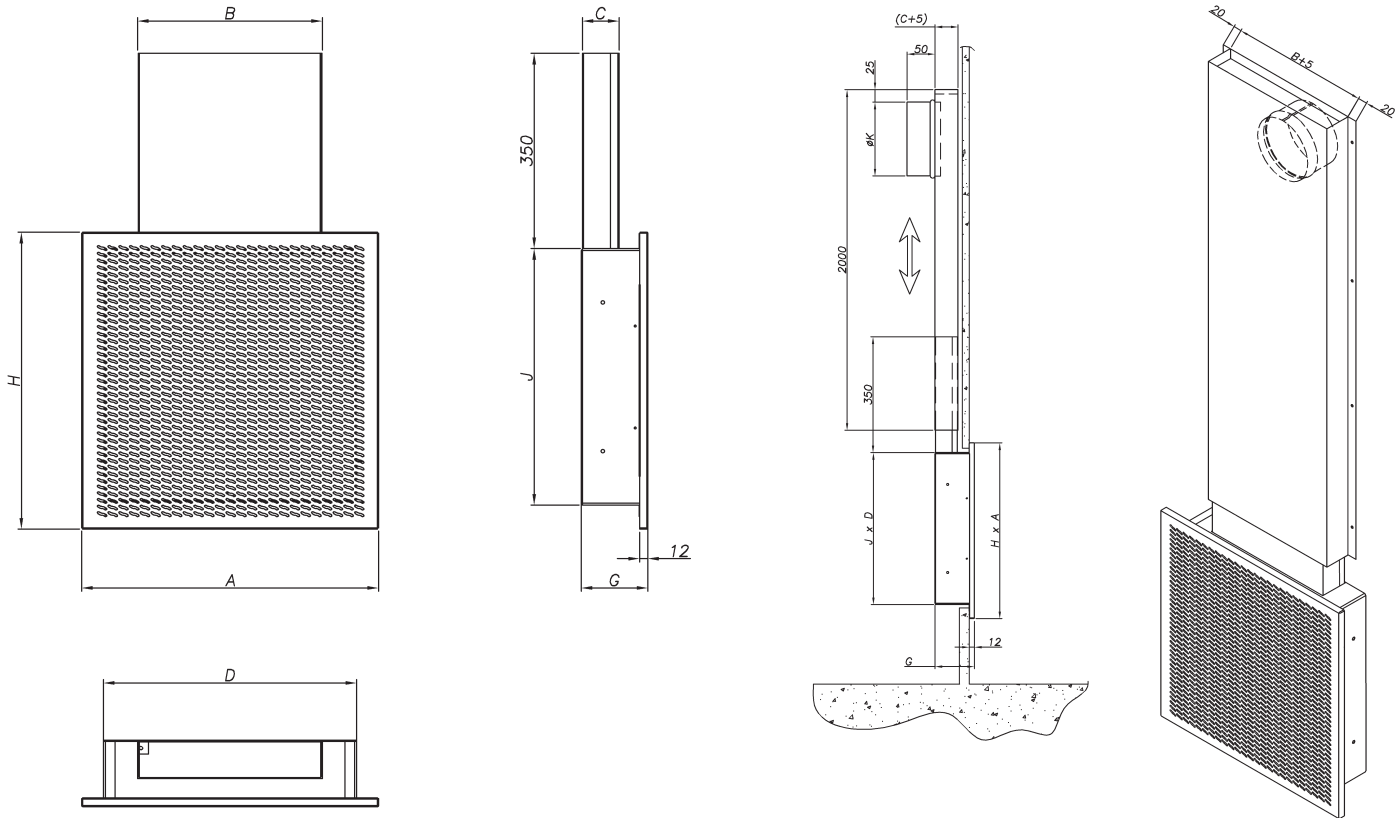
Symbols:

Q (m³/h): Air flow per displacement unit
 X_{0,20}(m): Horizontal throw of the air jet, when the velocity in the occupied area is 0.20 m/s for a temperature difference of T = -3 °C

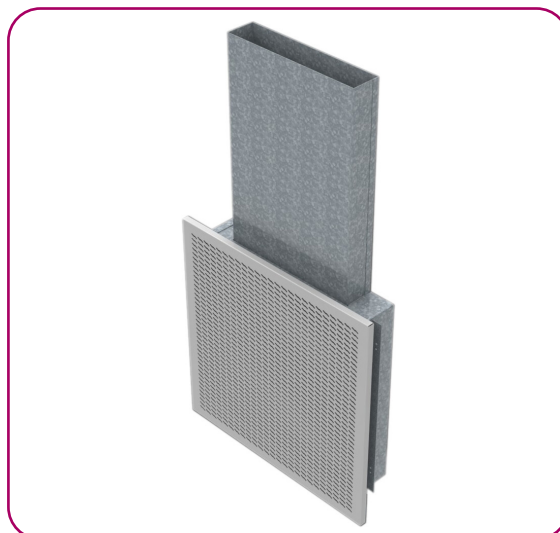
S-90-RE Model - Flush-mounted rectangular

Dimensions

The S-90-RE diffuser is a wall flush-mounted rectangular displacement unit that supplies the air at low velocity to the habitable area. Optional accessories include a telescopic plenum (-PT).



Size	A	H	J	D	B	C	G	K
400x400	402	402	345	345	250	50	92	99
500x500	502	502	445	445	350	60	102	124
600x600	602	602	545	545	450			159
900x600	902	602	545	845	600			199



S-90-RE Model - Flush-mounted rectangular

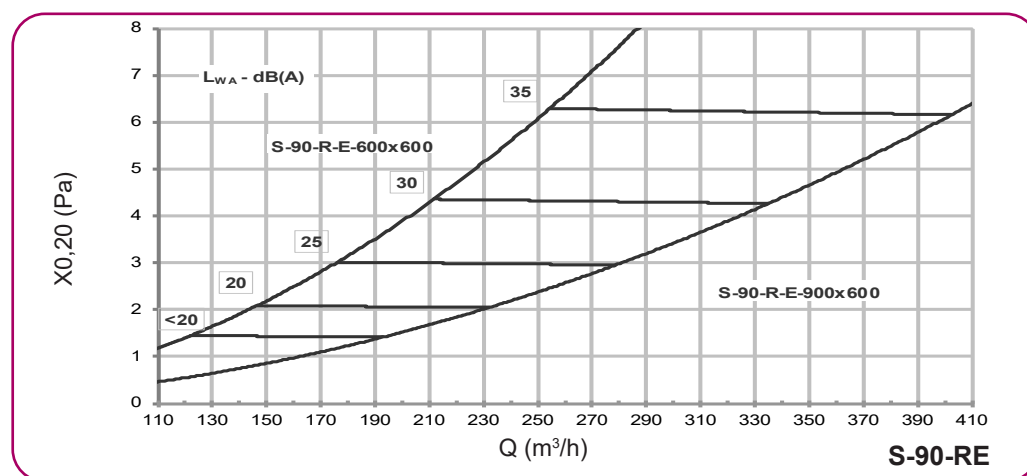
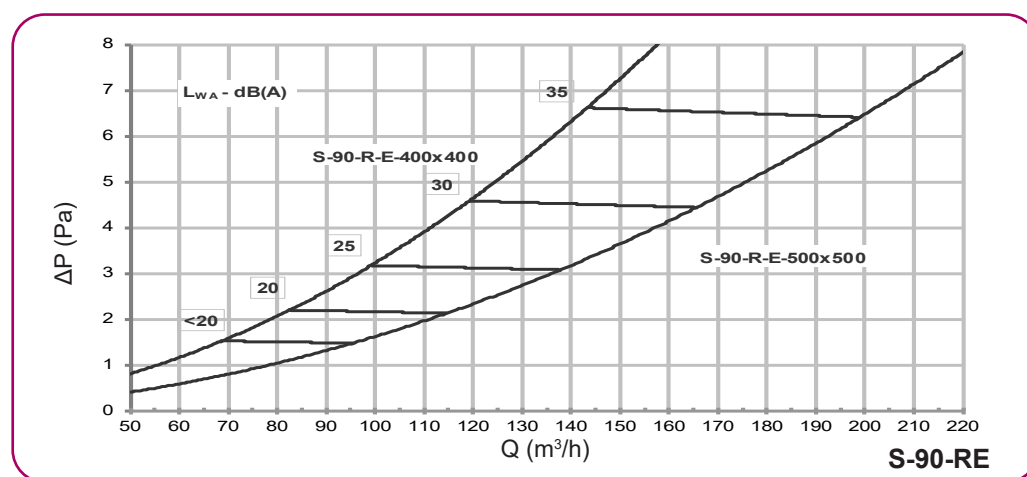
Technical data

The air flow, pressure drop and horizontal throw of the air jet are listed below for a velocity of 0.20 m/s in the occupied area, based on a specific sound level.

S-90-RE Quick selection table				
Air flow - Pressure drop				
Model	m ³ /h (Pa) [m]			L _{WA} (dBA)
	Vk=0,3 m/s	Vk=0,5 m/s	Vk=0,7 m/s	
400x400	50 (1)	80 (2)	120 (2)	<25
500x500	90 (1)	120 (2)	180 (5)	
600x600	130 (2)	180 (3)	250 (6)	
900x600	180 (1)	260 (3)	380 (5)	

Pressure drop and sound level selection charts

These charts allow the sound level and pressure drop data to be obtained from the supply flow rate.



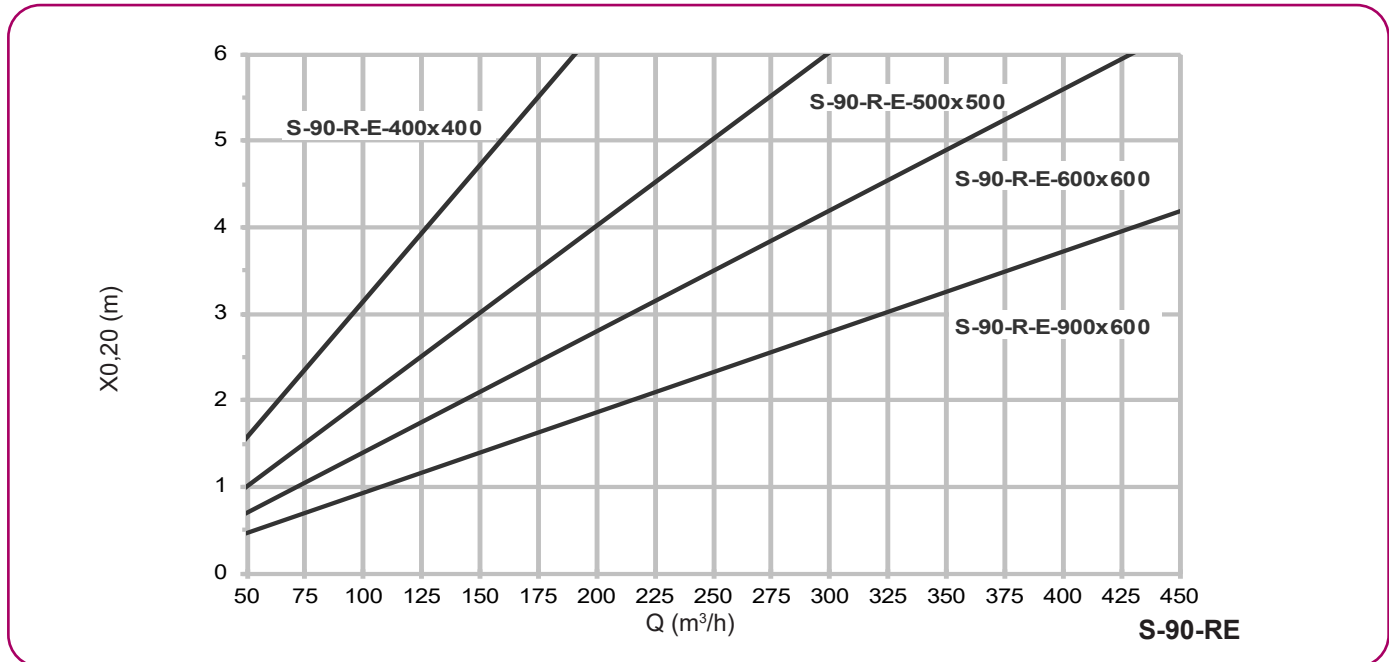
Symbols:

- Q (m³/h): Air flow per displacement unit
- ΔP (Pa): Pressure drop
- L_{WA}(dBA): Sound power level

S-90-RE Model - Flush-mounted rectangular

Selection charts

The selection charts shown allow the horizontal throw of the air jet to be obtained from the supply flow rate, when the velocity in the occupied area is 0.20 m/s.



Symbols:

- Q (m³/h): Air flow per displacement unit
- $X_{0,20}$ (m): Horizontal throw of the air jet, when the velocity in the occupied area is 0.20 m/s for a temperature difference of $T = -3$ °C

Selection example

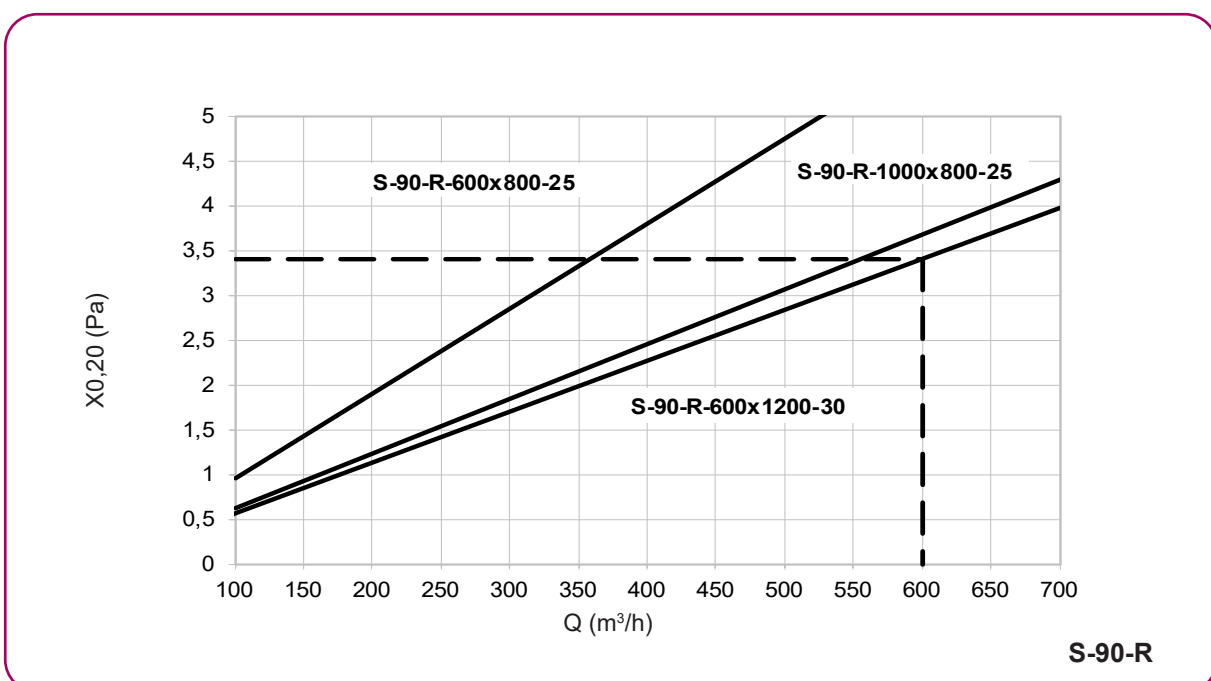
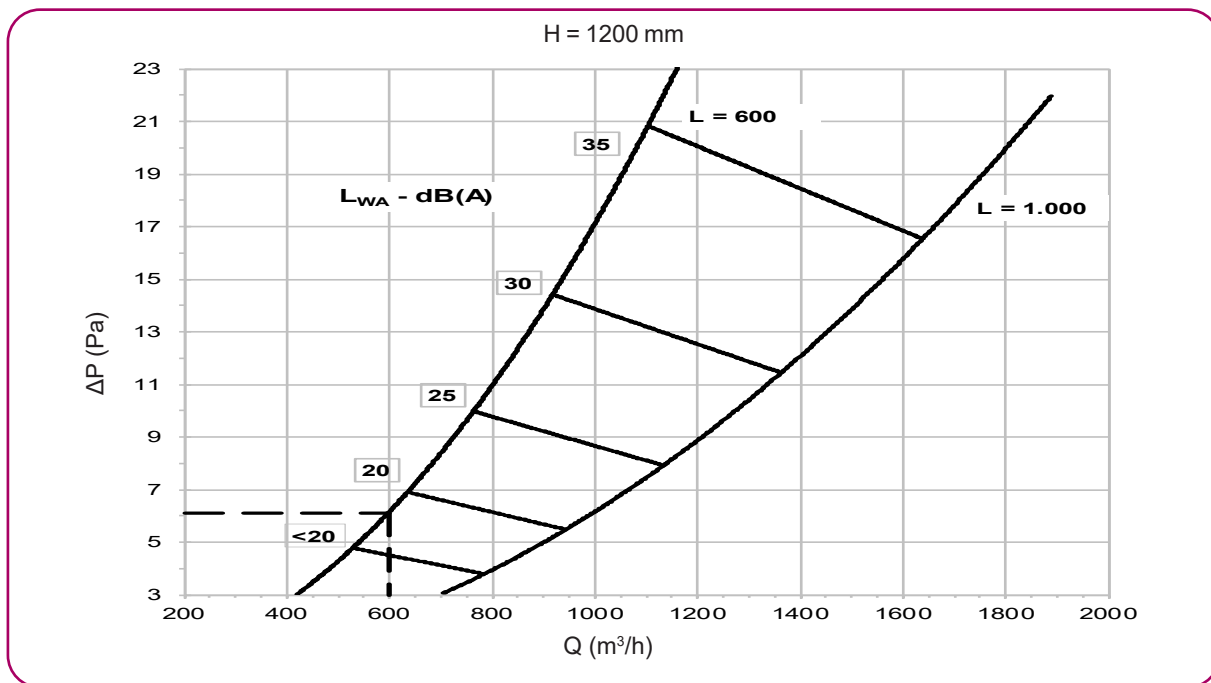
Air conditioning is to be provided to a room using a displacement system. Based on the architectural characteristics of the room, a decision was made to use the S-90-R rectangular diffuser of 600x1200 (LxH). The following data are assumed:

Unit supply air flow = 600 m³/h

Room dimensions = 10x10x4 (LxAxH)

Temperature difference (difference between supply temperature and ambient temperature) = 3 °C

The technical data for the selected diffuser is obtained from the catalogue charts:



Results

Pressure drop: 6 Pa

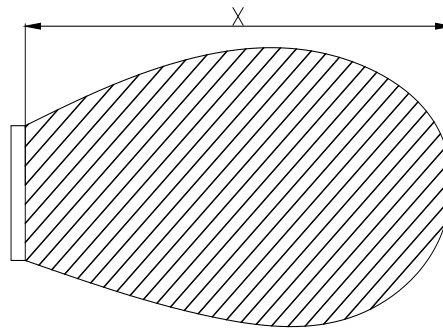
Sound power level: <20 dBA

(*) Distance where the velocity isovel achieves $V_x = 0.20$ m/s: 3.4 m

NOTE: (*) This data is known as the near zone and is defined as the area near the supply terminal unit in which the air velocity is higher than the velocity of 0.20 m/s for HVAC installations.

Floor mount:

Near zone **S-90-RE**



Correction factors

Coefficient table to correct the horizontal throw of the air jet, when the velocity in the occupied area reaches 0.20 m/s for a different temperature difference from the one used in the catalogue charts, which is $\Delta T = -3^\circ$ C.

ΔT	C
-1 °C	0,86
-2 °C	0,92
-3 °C	1,00
-4 °C	1,10
-5 °C	1,17
-6 °C	1,25

$X_{0.20 \text{ total}} = X_{0.20 \text{ Chart}} \times C$

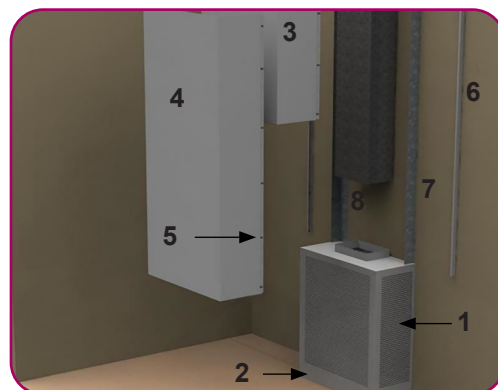
Installation

Assembly instructions for telescopic covers and bases of S-90 series diffusers.

All S-90 diffuser models and sizes are manufactured for installation with cover and plinth, except for S-90-RE diffusers which are flush mounted in the wall. The steps to be followed for installation are shown below:

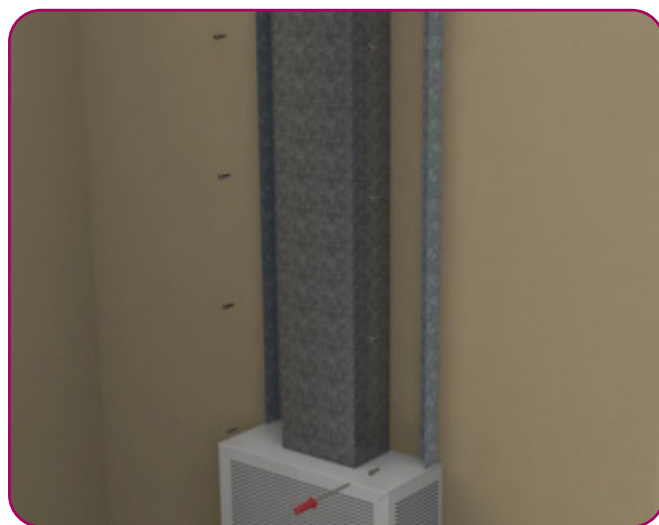
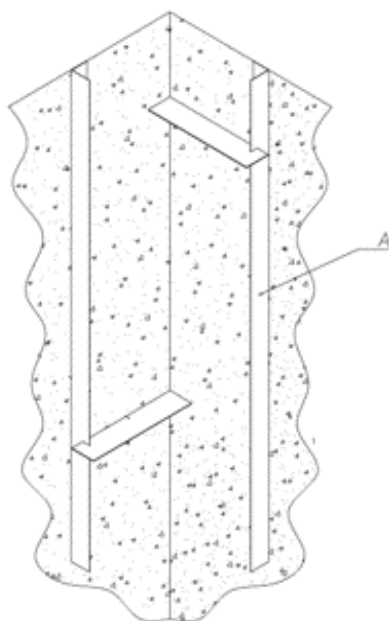
Existing components

Diffuser	1
Plinth	2
Upper cover	3
Lower cover	4
Band fasteners for trim section	5
Removable trim sections	6
Guide angles	7
Duct	8



To attach the upper and lower covers, use the (A) guiding brackets previously attached to the wall by screws.

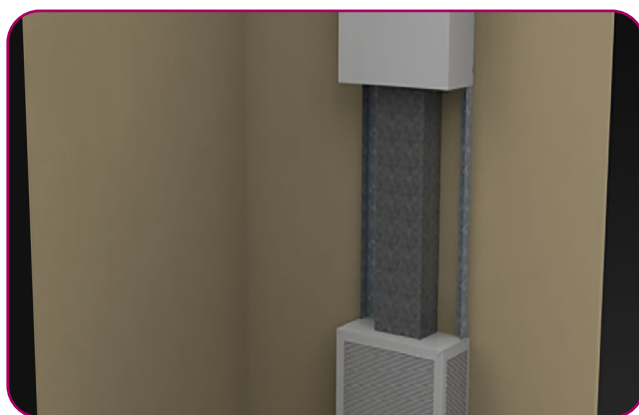
Position the air ductwork, fitting it to the diffuser and the wall properly in order to prevent leaks and noise.



Installation



To fix the upper cover and the lower cover, use the guide brackets, which are fixed to the wall with screws. Position the air duct, attaching it to the diffuser and the wall properly to prevent leakage and noise.



Fasten the upper cover with screws to the guide brackets, flush with the ceiling. Attach the lower cover in the same way by screwing it to the guide brackets.



Mount the decorative profiles by fastening them on the strips.

Codification

S-90-R-44 - 600x1500-30 - Z - RAL-9003 matt

1

2

3

4

1. Diffuser type:

- S-90-R** - Rectangular diffuser
- S-90-R3** - 3-way rectangular diffuser
- S-90-RT (upper connect.)** - Horizontal rectangular diffuser
- S-90-RT (lower connect.)** - Horizontal rectangular diffuser
- S-90-RE** - Flush-mounte rectangular diffuser
- S-90-R-44** - Rectangular diffuser for higher flow rates
- S-90-R3-44** - 3-way rectangular diffuser for higher flow rates
- S-90-RT-44 (conex. superior)** - Horizontal rect. diffuser for higher flow rates
- S-90-RT-44 (conex. inferior)** - Horizontal rect. diffuser for higher flow rates
- S-90-RE-44** - Flush-mounte rect. diffuser for higher flow rates

2. Model:

600x800-25	
600x1200-30	
600x1500-30	
1000x1500-30	For S-90R/R3
1200x2000-30	
1200x2000-35	
1500x2000-30	
850x200	
1250x200	
1650x200	
850x350	
1250x350	
1650x350	
1050x500	
1450x500	For S-90-RT
1850x500	
1050x650	
1450x650	
1850x650	
1250x800	
1650x800	
2050x800	
400x400	
500x500	
600x600	For S-90-RE
900x600	

3. Accessories:

- SA - without accessory
- Z - with plinth
- ET - with decorative cover (except for RT and RE)
- PT - with telescopic plenum (only available for RE model)

4. Treatment:

- RAL-9003 shine
- RAL-9003 matt
- RAL-9005 shine
- RAL-9005 matt
- RAL-9006 shine
- RAL-9006 matt
- RAL-9010 shine
- RAL-9010 matt
- RAL-9016 shine
- RAL-9016 matt
- Galvanized

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KOOLAIR, S.L.

Calle Urano, 26

Poligono industrial nº 2 – La Fuensanta

28936 Móstoles - Madrid - (España)

Tel: +34 91 645 00 33

e-mail: info@koolair.com

www.koolair.com