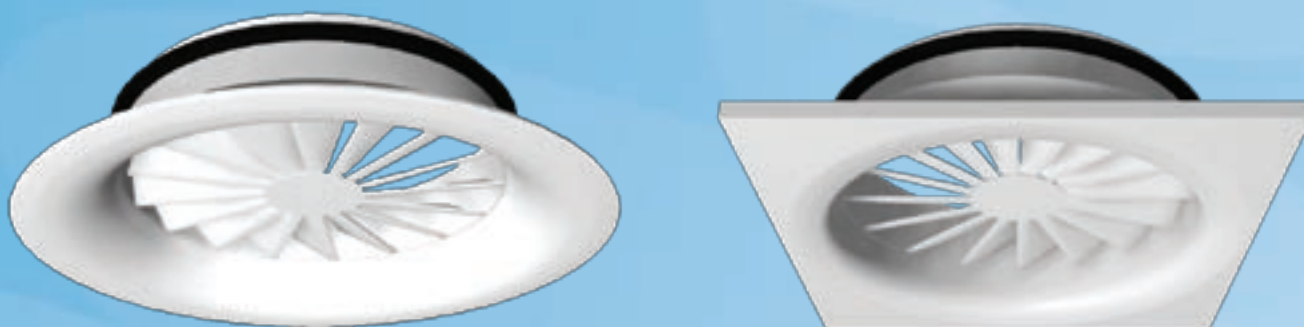


TSR/TSS

Swirl Diffuser



- Radial horizontal air supply
- Air velocity is effectively reduced due to high mixing effect
- Circular duct connection with gasket
- All sizes available as an adapted version for installation in a modular 600x600 mm suspended ceiling (TSS)

Accessories

- Balancing plenum with measurement and adjustment functions
- Mounting bracket for plenum installation

MATERIAL AND FINISHING

PART	MATERIAL	NOTE
Casing	Steel	
Front vane panel	Steel	
Coupling sleeve with gasket	Galvanised steel	Gasket of rubber compound
Mounting bracket	Galvanized steel	
Finishing	Epoxy painted White RAL 9010	Special colours available

ACCESSORIES

ACCESSORY	CODE	DESCRIPTION
Balancing plenum	TRI	For balancing, equalising the airflow and attenuating the duct noise
Mounting bracket	BR	Bracket for plenum installation

QUICK SELECTION

qv	Pa	120	240	360	480	600	720	960	1200	1440	1800	2160	2640	3120
	l/s	10	20	30	40	50	60	80	100	120	150	180	220	260
	m ³ /h	36	72	108	144	180	216	288	360	432	540	648	792	936
TSR/A-125 TSS/A-125	LpA	15	27	38	46									
	ΔPst	7	27	60	106									
	ΔPtot	7	28	63	113									
	Ld	1,4	2,0	2,6	3,4									
	Lmin	-	-	-	-									
	L0.2	1,5	2,1	3,0	4,0									
TSR/A-160 TSS/A-160	LpA		21	26	32	39	44							
	ΔPst		9	20	36	56	81							
	ΔPtot		10	22	38	60	86							
	Ld		1,8	2,2	2,6	3,0	3,4							
	Lmin		-	-	-	-	-							
	L0.2		2,0	2,3	3,0	3,8	4,4							
TSR/A-200 TSS/A-200	LpA			22	24	27	31	38	45					
	ΔPst			7	13	20	29	52	81					
	ΔPtot			8	14	22	31	56	87					
	Ld			1,8	2,2	2,4	2,8	3,4	4,0					
	Lmin			-	-	-	-	-	-					
	L0.2			2,0	2,3	2,8	3,4	4,8	6,0					
TSR/A-250 TSS/A-250	LpA						23	28	33	38	45			
	ΔPst						10	18	29	41	65			
	ΔPtot						11	20	31	45	70			
	Ld						2,2	2,8	3,2	3,4	4,2			
	Lmin						-	-	-	-	-			
	L0.2						2,4	3,4	4,6	5,8	7,4			
TSR/A-315 TSS/A-315	LpA								21	25	31	36	42	48
	ΔPst								12	18	28	40	59	83
	ΔPtot								13	19	30	43	64	90
	Ld								2,4	2,6	3,0	3,4	4,0	4,4
	Lmin								-	-	-	-	1,0	1,0
	L0.2								3,4	4,0	4,6	5,6	6,8	8,0

LpA values presented with room attenuation 4 dB (red 10m² - sab). When using room attenuation 8 dB (red 25m² - sab):
LpA - 4dB.

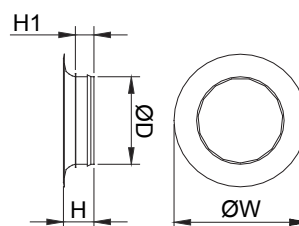
Pa Supply air cooling capacity, W
LpA A-weighted sound pressure level, reduced by total equivalent absorption surface of 10m², dB(A) red 10m² - sab
ΔPst Static pressure drop, Pa

ΔPtot Total pressure drop, Pa
Ld Distance from the supply unit, at which air jet detaches from ceiling, m
Lmin Minimum distance between central lines of two supply units, m (V3 = 0,25m/s at 1.8m height)
L0.2 Isothermal throw length, m when residual velocity of supply air jet 0,2 m/s
Room temperature (Tr) = 24 °C
Supply air temperature (Ta) = 14 °C
Room height = 2,8 m

DIMENSIONS

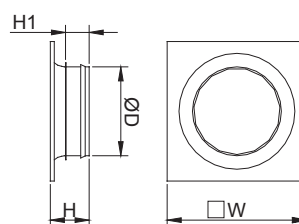
TSR

NS	ØW	H	H1	ØD
125	200	56	28	123
160	250	66	35	158
200	300	75	43	198
250	350	75	43	248
315	450	90	50	313

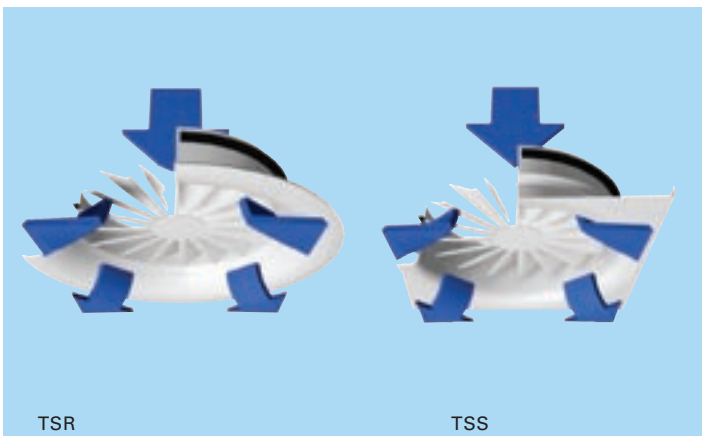
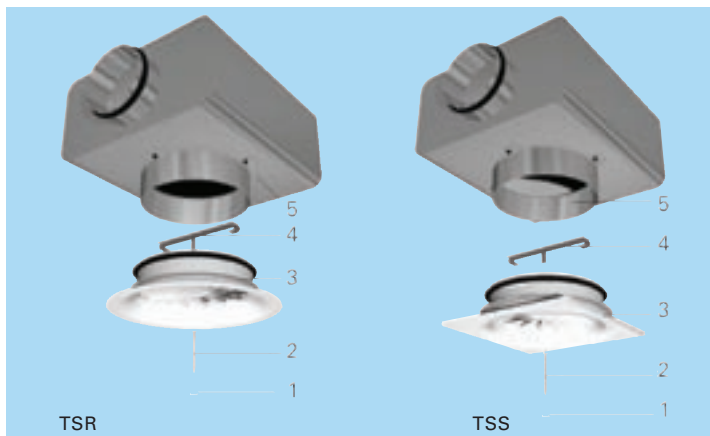


TSS

NS	W	H	H1	ØD
125	198	56	28	123
160	248	66	53	158
200	248	75	43	198
250	298	75	43	248
315	398	90	50	313



The dimension W for TSS/B all sizes in suspended ceiling installation is 595 mm.



Installation

CODE DESCRIPTION

1	Plastic plug
2	Central fixing screw
3	Tsr diffuser
4	Mounting bracket
5	Tri plenum

The diffuser is connected either directly to the duct by screwing or riveting, or alternatively to the TRI balancing plenum.

The recommended minimum safety distance upstream of the diffuser is 3xD.

Installation with plenum TRI

The mounting bracket should be used for installing TSR/TSS to TRI plenum to allow easy diffuser removal.

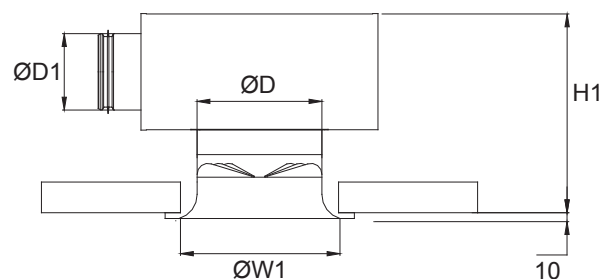
The collar of TRI plenum can be installed either internally in the plenum or externally on the bottom of the plenum. The height of the unit for the external installation is presented in the table below. When the collar is installed internally, the total height H is reduced by 60 mm.

The technical performance for the combination of supply air diffuser and TRI plenum is presented separately for the two different installations. See HIT Design software.

Function

Horizontal radial swirl jet is supplied into the space through the profiled spiral blades of the diffuser. Supply air jet velocity is efficiently reduced due to the high mixing effect.

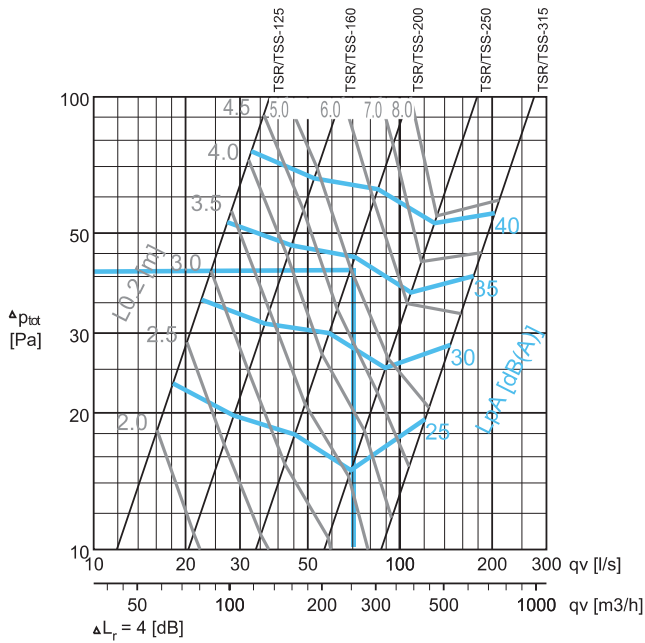
TSR (d)	D	TRI	H	A
125	100	TRI-100-125	246-276	170
125	125	TRI-125-125	276-306	170
160	125	TRI-125-160	276-305	210
160	160	TRI-160-160	316-346	210
200	160	TRI-160-200	316-346	250
200	200	TRI-200-200	366-396	250
250	250	TRI-250-250	366-396	300
250	250	TRI-250-250	430-460	300
315	250	TRI-250-315	430-460	390
315	315	TRI-315-315	476-506	390



PRODUCT MODELS

CODE	DESCRIPTION
TSR/A	Standard model
TSR/B	Model with suspended ceiling panel

Pressure drop, throw pattern and sound data



Selection example :

Requirements : $q_v = 70$ l/s
 $L_{pA} \leq 35$ dB(A)
 $L_{0,2} < 2$ m

Selection : TSR / TSS-200
 $L_{pA} = 34$ dB(A)
 $L_{0,2} < 5$ m
 $\Delta P_{tot} = 43$ Pa

SOUND LEVEL DATA

	q_v		ΔP_{st} (Pa)	ΔP_{tot} (Pa)	F (Hz)							LpA	NR	NC
	(l/s)	(m ³ /h)				63	125	250	500	1000	2000			
TSR/TSS-125	18	65	22	23	44	26	26	30	22	9	3	25	22	21
	22	79	34	36	45	32	31	35	29	18	3	30	27	25
	27	97	50	53	46	37	35	39	35	27	14	35	31	30
	33	119	71	76	47	42	38	42	41	34	24	40	37	36
TSR/TSS-160	29	104	19	20	50	30	30	28	18	4	3	25	20	18
	36	130	30	31	51	35	34	34	26	15	3	30	26	25
	44	158	44	47	51	40	38	39	33	24	10	35	32	30
	52	187	62	66	52	43	42	44	39	32	19	40	36	35
TSR/TSS-200	45	162	17	18	52	31	26	27	19	6	3	25	18	16
	59	212	28	30	53	38	33	33	27	18	3	30	25	24
	71	256	41	44	53	44	39	38	33	26	14	35	30	29
	85	306	58	62	54	48	43	43	39	34	24	40	35	34
TSR/TSS-250	69	248	14	15	51	32	29	27	18	3	3	25	19	17
	90	324	23	25	52	38	35	34	27	15	3	30	26	24
	109	392	34	37	52	42	39	38	33	25	13	35	31	29
	130	468	48	53	53	46	43	43	39	33	24	40	35	34
TSR/TSS-315	121	436	18	19	49	35	30	28	20	5	3	25	20	18
	146	526	26	28	51	40	35	33	27	14	3	30	25	23
	174	626	37	40	53	45	40	38	33	23	9	35	30	29
	204	734	51	55	54	49	45	42	39	31	18	40	35	34

LpA values presented with room attenuation 4 dB (red 10m² - sab). When using room attenuation 8 dB (red 25m² - sab): LpA - 4dB. NR/NC noise criteria

Adjustment

The TSR/TSS itself has no means for airflow adjustment.

In order to enable airflow adjustment and measurement of airflow rate it is recommended to connect the diffuser to the TRI balancing plenum. The supply flow rate is determined by using the measurement and adjustment module MSM. Detach the diffuser and pass the tubes and control spindle through the blades of the diffuser and replace the diffuser. Measure the differential pressure with a manometer. The flow rate is calculated using the formula below.

$$q_v = k * \sqrt{\Delta p_m}$$

Adjust the airflow rate by rotating the control spindle until the desired setting is achieved. Lock the damper position with a screw.

Replace the tubes and spindle into the plenum.

K-factor for installations with different safety distances (D= duct diameter)

TRI	> 8 x D	min 3 x D
125	9.9	12.6
160	16.9	21.9
200	28.3	31.0
250	47.9	51.5
315	78.6	-

Servicing

Wipe the diffuser with a damp cloth.

Option with balancing plenum

Detach the diffuser from the retaining mounting bracket. Remove the measurement and adjustment module by gently pulling the shaft (NB not the control spindle or measurement tubes!).

Wipe the parts with a damp cloth, instead of immersing in water.

Remount the measurement and adjustment module by pushing in the shaft until the unit meets the stopper. Replace the diffuser.

Suggested specifications

The diffuser shall be made of epoxy-painted steel with a white (RAL 9010) standard colour.

The swirl diffuser has fixed spiral blades ensuring a high mixing rate.

Alternative 1; no balancing plenum

The diffuser shall have an aluminium casing with a steel front vane panel and a spigot with integral gasket for connection to the circular duct.

Alternative 2; option with balancing plenum

The diffuser shall be connected with a mounting bracket to a balancing plenum equipped with a measurement and adjustment module.

The diffuser shall be detachable to provide access to the measurement and adjustment module in the plenum.

The balancing plenum shall have a spigot with integral gasket for airtight duct connection.

The balancing plenum shall comprise sound attenuation material made of polyester fibre with a washable surface.

Product code

TSR/S-D

TSS/S-D

S = Model

- A Standard
- B Model adapted to be fixed on a staff ceiling
- C Model adapted to be fixed on a staff ceiling (TSS)

D = Diameter of duct connection

125, 160, 200, 250, 315

Specifics and accessories

CO = Colour

- W White

Code example

TSR/A-125, CO=W

Sub products

TRI Plenum (Diffusers)