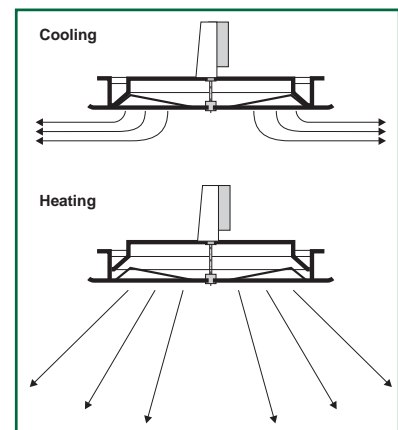


# Swirl diffuser NWPplus



Swirl diffuser NWPplus is a ceiling diffuser with an integrated connection box. It is suitable for premises such as offices, hotels, hospitals, restaurants, conference rooms and other facilities where good thermal comfort is required.

The diffuser NWPplus has a unique function, which means that the diffusion pattern can be adjusted from horizontal to vertical.

This characteristic makes the terminal very useful for rapid heating.

When the air flow pattern has been set to vertical, the temperature in the premises will rise ca six times more rapidly than normal. This means that good thermal comfort can be restored in a very short period after an interruption.

Changing the air flow pattern from vertical and back to horizontal occurs when a control signal is given to the actuator in the diffuser. We recommend using the automatic diffuser control terminal from Fläkt Woods.

Swirl diffuser NWPplus has an air flow range of between 17 and 342 l/s (60 - 1 230 m<sup>3</sup>/h).

The diffuser is supplied with a connection box including an electric actuator. It can be adjusted either manually or by the electric actuator. The connection box is provided as standard with a control damper and measurement socket for measurement of the air flow. The connection box can be insulated on request with sound attenuating material.

The NWPplus terminal can be provided as an accessory with a front panel of 594 x 594 mm or a panel which is adapted for installation in a false ceiling. The automatic control terminal RNP-1 for master/slave is available as an accessory.

## Quick-selection

Size	Air flow		Installation height above the floor, m	Sound level L <sub>A10</sub> , dB(A)
	l/s	m <sup>3</sup> /h		
NWPplus-160	17 - 61	60 - 220	2.4 - 4.7	22 - 44
NWPplus-180	21 - 83	75 - 300	2.4 - 5.4	20 - 45
NWPplus-250	39 - 133	140 - 480	2.7 - 6.0	26 - 47
NWPplus-315	56 - 194	200 - 700	2.7 - 6.7	20 - 46
NWPplus-355	111 - 267	400 - 960	2.9 - 6.9	25 - 42
NWPplus-400	139 - 342	500 - 1230	2.9 - 8.7	25 - 46

## Product facts

### Swirl diffuser NWPplus

Intended for ceiling installation

Has an integrated connection box

Adjustable diffusion pattern

Suitable for rapid heating of premises

Broad flow range

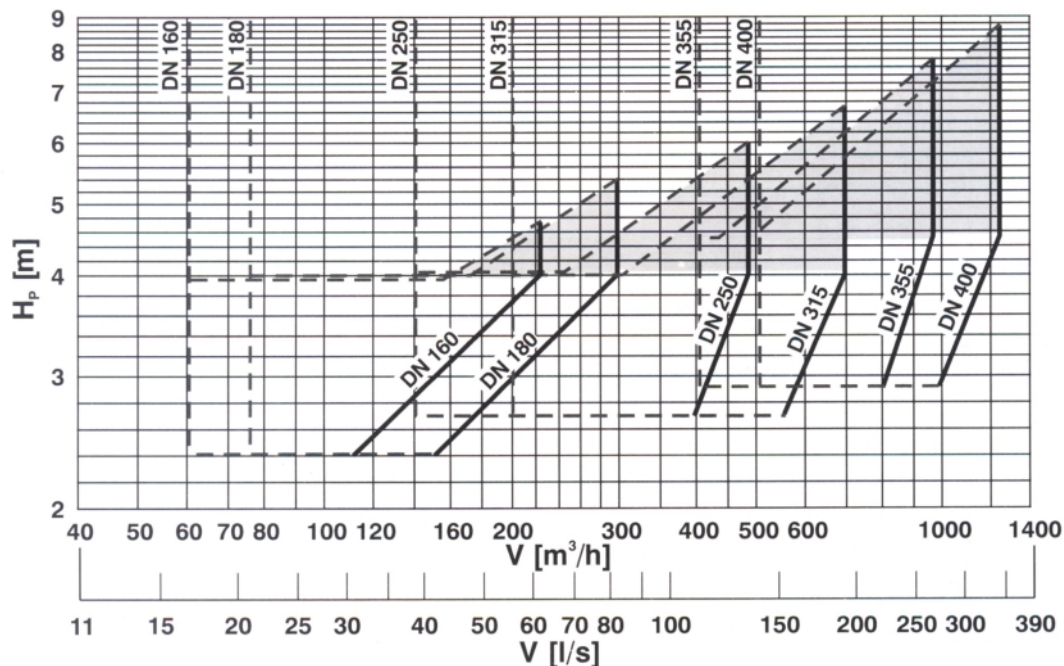
### Product code example:

Swirl diffuser NWPP-250-1-1-1 with connection box SKA-250-1-2-1. Terminal of size 250 in round design with manual regulation of the flow pattern. The diffuser has an integrated acoustically insulated connection box which has a built-in adjusting and measurement damper. The connection box is equipped with rubber gasket duct connection.

The diffuser is painted in standard colour RAL 9010.

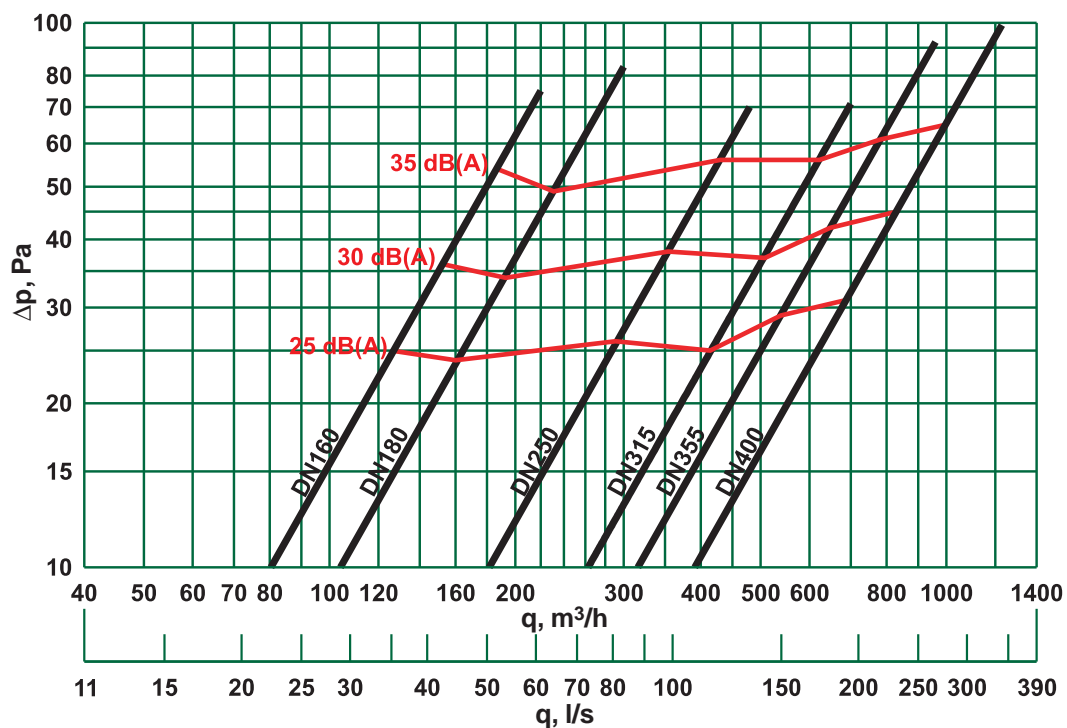
# Air flow, pressure drop, sound level

Summary graph - operating range



$H_p$  = diffuser installation height (height above the floor).

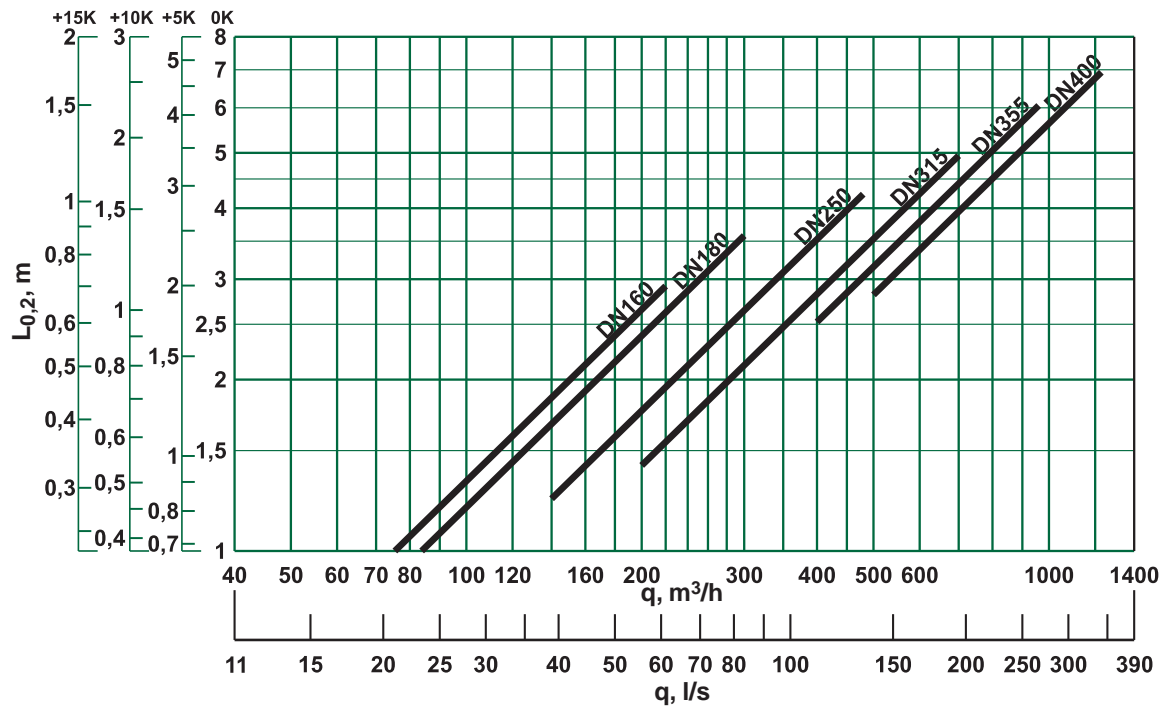
Pressure drop and sound level



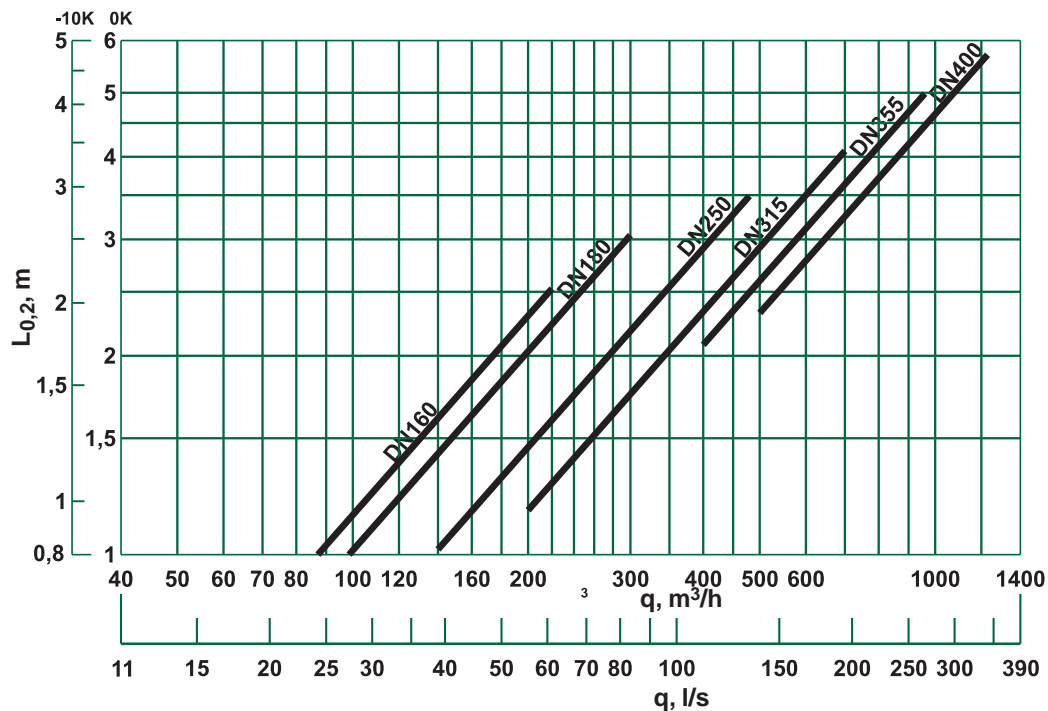
In the above graph the sound levels are indicated in dB(A) for a reference room with 10 m<sup>2</sup> room absorption, equivalent to 4 dB room attenuation.

# Air flow, throw

Throw for vertical air diffusion – Heating function



Throw for horizontal air diffusion – Cooling function



Max temperature difference for cooling:  $\Delta t_k = -12 \text{ K}$

Max temperature difference for heating (horizontal flow):  $\Delta t_v = +5 \text{ K}$

Max temperature difference for heating (vertical flow):  $\Delta t_v = +15 \text{ K}$

# Sound data, distance between two diffusers

## Definitions

q	air flow	l/s, m <sup>3</sup> /h
$\Delta p_t$	total pressure drop	Pa
L <sub>02</sub>	throw	m
L <sub>A10</sub>	sound pressure level with a room attenuation of 4 dB (10 m <sup>2</sup> room absorption area)	dB(A)
L <sub>W</sub>	sound power level	dB
K <sub>ok</sub>	octave band correction	dB
$\Delta L$	sound attenuation from the duct to the room	dB

## Sound power level

Size	Correction of sound level K <sub>ok</sub> in dB for octave bands, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
160	14	13	8	2	-8	-13	-19	-21
180	14	13	5	2	-6	-9	-15	-22
250	13	12	8	1	-5	-10	-16	-25
315	13	12	7	2	-3	-11	-17	-24
355	14	13	6	0	-3	-7	-13	-22
400	13	12	8	2	-6	-10	-16	-24

The sound power levels for different octave bands are obtained by adding together the sound pressure level L<sub>A10</sub> in dB(A), and the corrections K<sub>ok</sub> for the octave bands in the table with the help of the following formula:

$$L_W = L_{A10} + K_{ok}$$

Correction K<sub>ok</sub> is the mean value for the range of application of NWPplus.

## Sound attenuation

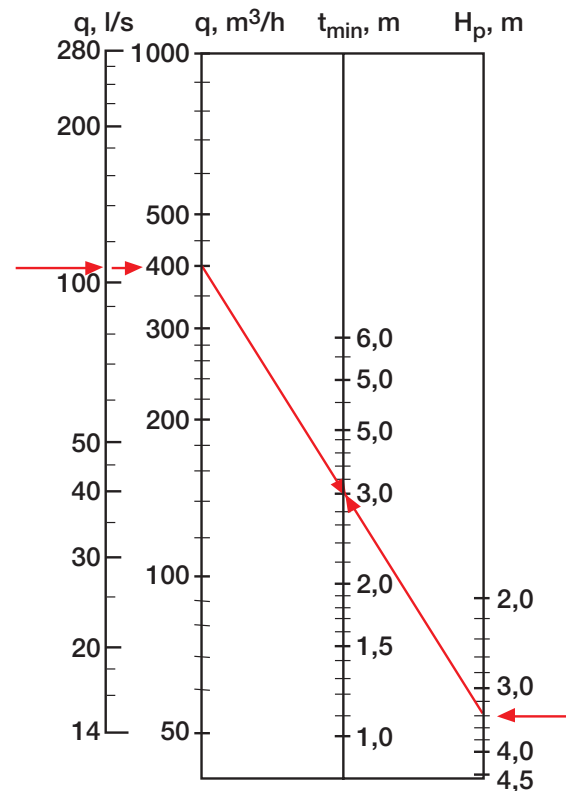
### Diffuser with uninsulated connection box

Size	Sound attenuation in dB for octave band, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
160	0	4	2	9	6	4	3	3
180	1	1	4	6	7	3	1	0
250	2	4	4	9	5	4	4	1
315	1	4	4	11	7	2	3	0
355	3	2	3	7	4	4	3	1
400	3	2	2	6	8	4	3	2

### Diffuser with insulated connection box

Size	Sound attenuation in dB for octave band, mean frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
160	0	5	4	13	8	8	9	9
180	1	1	7	10	11	7	7	8
250	2	5	5	13	10	10	9	9
315	1	5	7	15	12	6	9	8
355	3	3	6	8	6	9	9	7
400	3	2	4	7	10	9	10	7

## Distance between two diffusers



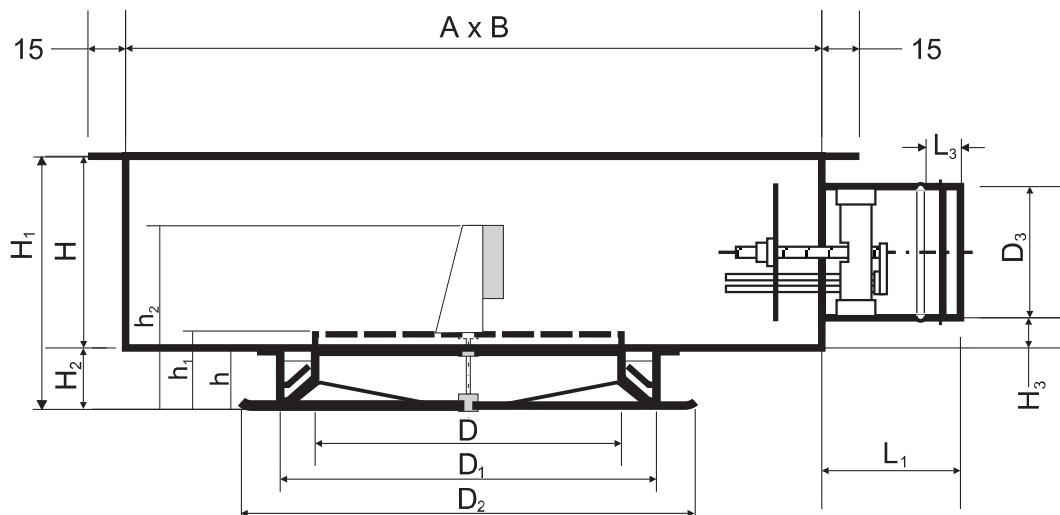
## Example

Total air flow, q <sub>tot</sub>	24 000 m <sup>3</sup> /h
Height above the floor, H <sub>p</sub>	3.4 m
Nominal diameter, DN	250 mm
Number of diffusers, n	60 pcs.
Air flow per diffuser	400 m <sup>3</sup> /h
Distance between diffusers, t <sub>min</sub>	3.0 m
Recommended max temperature difference for heating (vertical flow), $\Delta t_v$	+9° K

# Dimensions and weights, electrical and control equipment

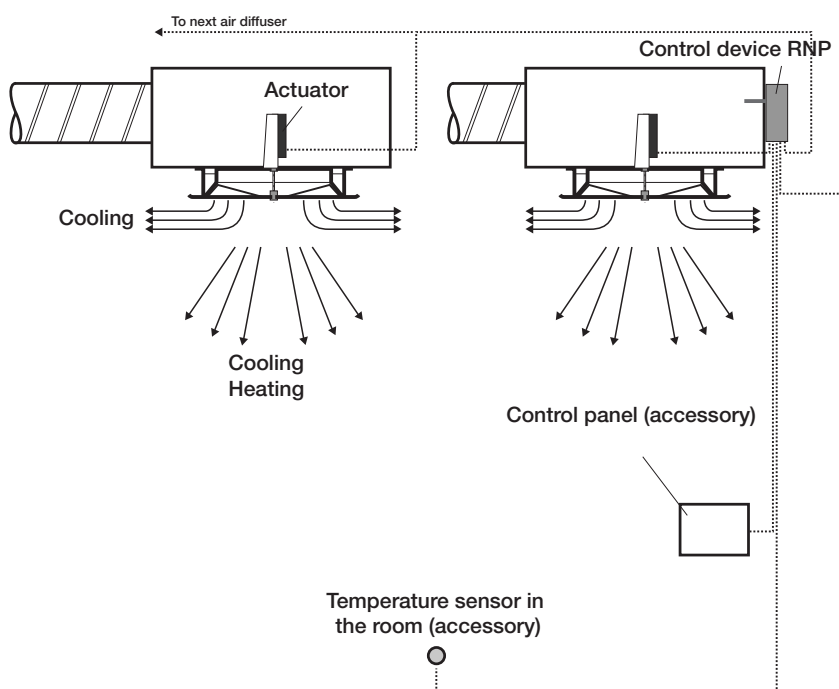
## Dimensions and weights

Connection box can be equipped either with a blade or a measurement and adjustment damper DTTZ.

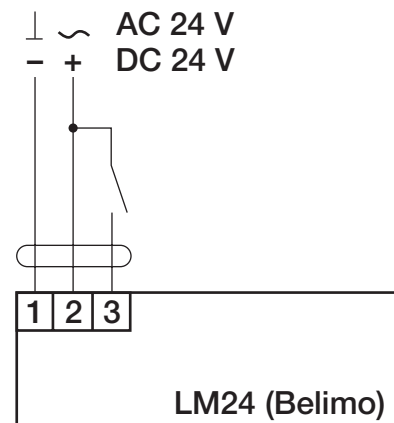


Size	DN	A	B	D	D1	D2	D3	L1	L3	H	H1	H2	H3	h	h1	h2
160	160	390	390	159	204	240	125	90	30	250	325	75	63	40	65	225
180	180	390	390	179	228	270	160	90	30	250	325	75	46	42	67	227
250	250	490	490	249	312	375	200	90	40	250	325	75	36	45	70	230
315	315	580	580	314	390	470	250	100	40	250	325	75	14	55	80	240
355	355	640	640	354	438	530	250	100	40	300	378	78	26	55	80	240
400	400	720	720	399	492	600	315	100	60	350	430	80	18	60	85	245

## Master/Slave connection with control terminal RNP



## Connection diagram actuator



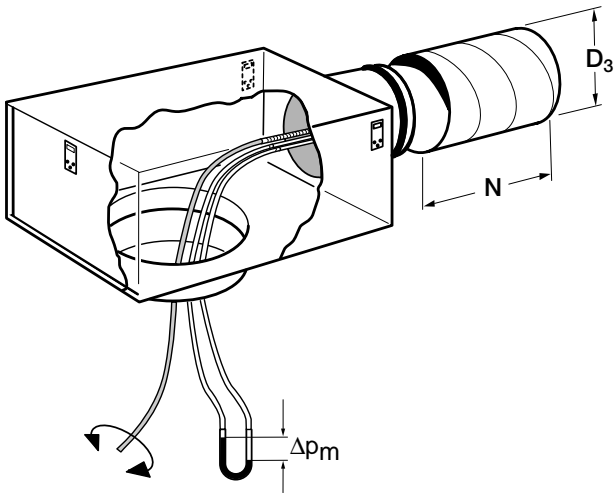
Supply voltage	24 V VAC $\pm 20\%$ (50 / 60 Hz) 24 V VDC $\pm 10\%$
Power consumption	2 W
Connection cable	3 x 0.75 mm <sup>2</sup>

Adjustment, descriptive text, product code

Adjustment DTTZ damper

$$q = k \frac{\Delta p_m}{(l/s)}$$

$$q = 3,6k \frac{\Delta p_m}{(m^3/h)}$$



ØD3, mm	k	Nmin, mm
125	13.0	500
160	25.3	500
200	38.0	500
250	63.5	750
315	97.0	750

Descriptive text

Swirl diffuser NWPplus for ceiling installation manufactured by Fläkt Woods in size, e.g. 250, with insulated connection box with integral flow measurement function and electric actuator.

Product code

Swirl diffuserNWPP-aaa-b-c-d

Size160, 180, 250, 315, 355, 400

Design1 = circular  
2 = rectangular, cover plate 594x594

Flow pattern regulation1 = manual regulation damper  
2 = motorised regulation  
3 = vax servomotor

Diffuser colour1 = RAL9010 standard colour  
(if any other colour is wanted this is indicated with X in the code and the proper RAL-code)

Connection boxSKA-aaa-b-c-d

Size160, 180, 250, 315, 355, 400

Type0 = uninsulated box  
1 = insulated box

Damper0 = without  
1 = blade damper  
2 = measurement and adjustment damper DTTZ

Duct connection0 = without rubber gasket  
1 = with rubber gasket

Accessory

Control terminal RNP