FAN USE

Fully controlled, low-pressure RO radial fans are intended to be installed directly in square air ducts. They are very convenient when used especially for simple venting installations. With small fan types equipped with a hinged panel (an impeller), the service panel can be easily loosened and opened by loosening two screws so these fans are ideal, e.g., for kitchen exhaust hoods, where higher levels of grease and the need for periodical cleaning of the impeller can be expected. Ideally, they can be used along with other components of the Vento modular system which ensure inter-compatibility and balanced parameters.

OPERATING CONDITIONS, POSITION

These fans are designed for indoor and outdoor applications, and to transport air without solid, fibrous, sticky, aggressive, respectively explosive impurities. For outdoor applications it is necessary to finish the fans with a protective coating (except the rating plates). The transported air must be free of corrosive chemicals or chemicals aggressive to zinc, aluminium and/or plastics. Acceptable temperature of transported air according to fan type can range from -25 ºC to -40 ºC up to +55 ºC to +70 ºC, see table # 2.
The RO fans can work in any position, which enables free access to the terminal box and motor.
We recommend adding a 1 to 1.5 m long piece of straight duct to the fan's outlet to reduce pressure losses in an assembly.

DIMENSIONAL RANGE

RO fans are manufactured in a range of nine sizes according to the A x B dimensions of the connecting outlet flange and enable to realize devices with flow rates up to approximately 11.000 m^3/h. Fans of the 30-15, 40-20 and 50-25 dimensional ranges are manufactured with a hinged impeller, larger types as solid.

MATERIALS

The external casing and connecting flanges of RO fans are made of galvanized steel sheets (Zn 275 g/m2). Impeller blades – with backward curved blades are made of plastics, diffusers are made of aluminium. Motors are made of aluminium alloys, copper and plastics. All materials are carefully verified and checked so they ensure long service life and reliability of the fans.

MOTORS

Compact single-phase asynchronous motors with an external rotor and a resistance armature are used as drives. The motors are situated inside the impeller, and during operation are optimally cooled by the flowing air. The motor's high quality enclosed ball bearings with permanent lubricating filling enable the fans to reach a service life above 40,000 operating hours without maintenance. The motor electric protection degree is IP 44, respectively IP 54 with certain types.

ELECTRICAL EQUIPMENT

Single-phase motors are equipped with a starting capacitor which is mounted on the fan casing. The wiring is terminated in a terminal box of IP 54 protection degree. For wiring diagrams, refer to the section "The Wiring" at the end of the chapter.

MOTOR PROTECTION

As standard, permanent and automatic monitoring of the internal motor temperature is used in all motors of RO fans. The limit temperature is monitored by thermal contacts (TK-thermo-contacts) situated in the motor winding. The thermo-contacts are miniature thermal tripping elements which are connected to the supply circuit for impellers up to 250 mm in diameter (single-phase), and to the control circuit of the protective contractor for impellers from 310 mm in diameter (three-phase). They automatically protect the motor against overloading due to excessive temperature of transported air, etc.

FAN OUTPUT CONTROL

The output of all RO fans can be fully controlled by changing the speed. The fan's speed is changed depending on the voltage at the motor terminals. Following voltage controllers can be used with fans:

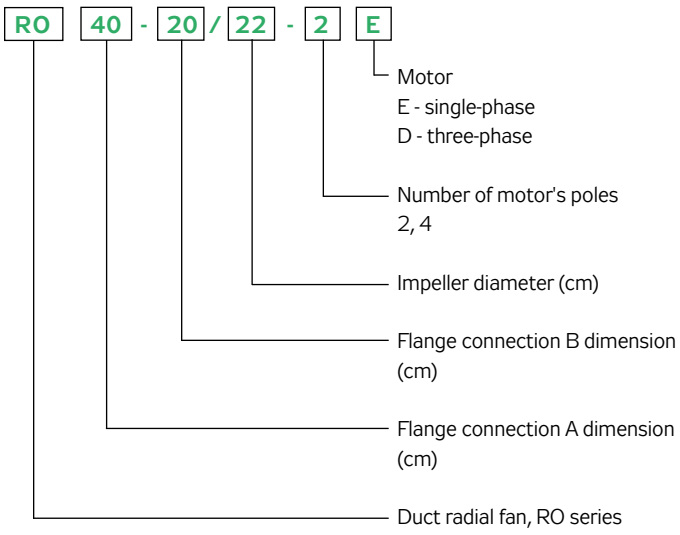
- PE for stepless control (single-phase fans only)
- TRN or TRR for the five-stage control

From the application and financial point of view – the initial costs (respectively price/performance ratio) and the operating costs – it is not suitable to use the RO fans with speed control. If output control is required, it is better to use RE fans equipped with EC motors..

FAN DESCRIPTION AND DESIGNATION

The key for type designation of RO fans in projects and orders is defined in figure # 1. For example, type designation RO 40-20 / 22-2E specifies the type of fan, impeller and motor.

FIGURE 1 – TYPE DESIGNATION OF RP FANS



The most commonly used names of parts and fan assemblies defines a figure # 2.

ACCESSORIES

RO fans belong in the wide range of Vento modular venting and air-handling system components. Any air-handling set-up, from simple venting to sophisticated comfortable air-conditioning, can be created by selecting suitable elements.

DIMENSIONS, WEIGHTS AND PERFORMANCE

For important dimensions of RP fans, refer to Figure # 3 and Table # 1.
For basic parameters refer to table # 2.

FIGURE 2 – RO FAN DESCRIPTION (HINGED TYPE)

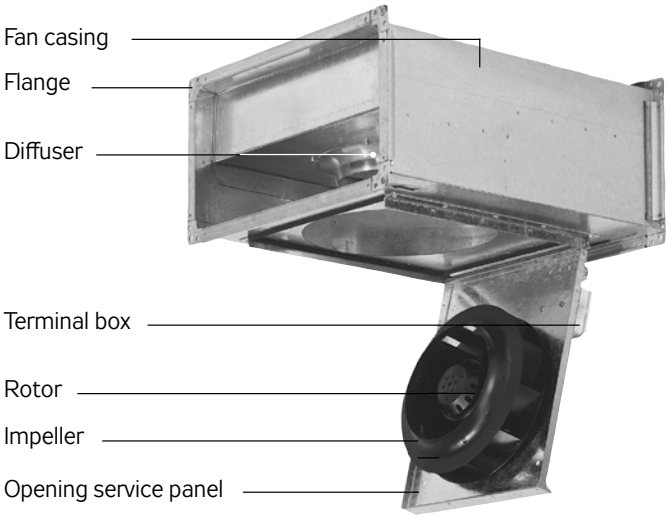


FIGURE 3 – FAN DIMENSIONAL DIAGRAM

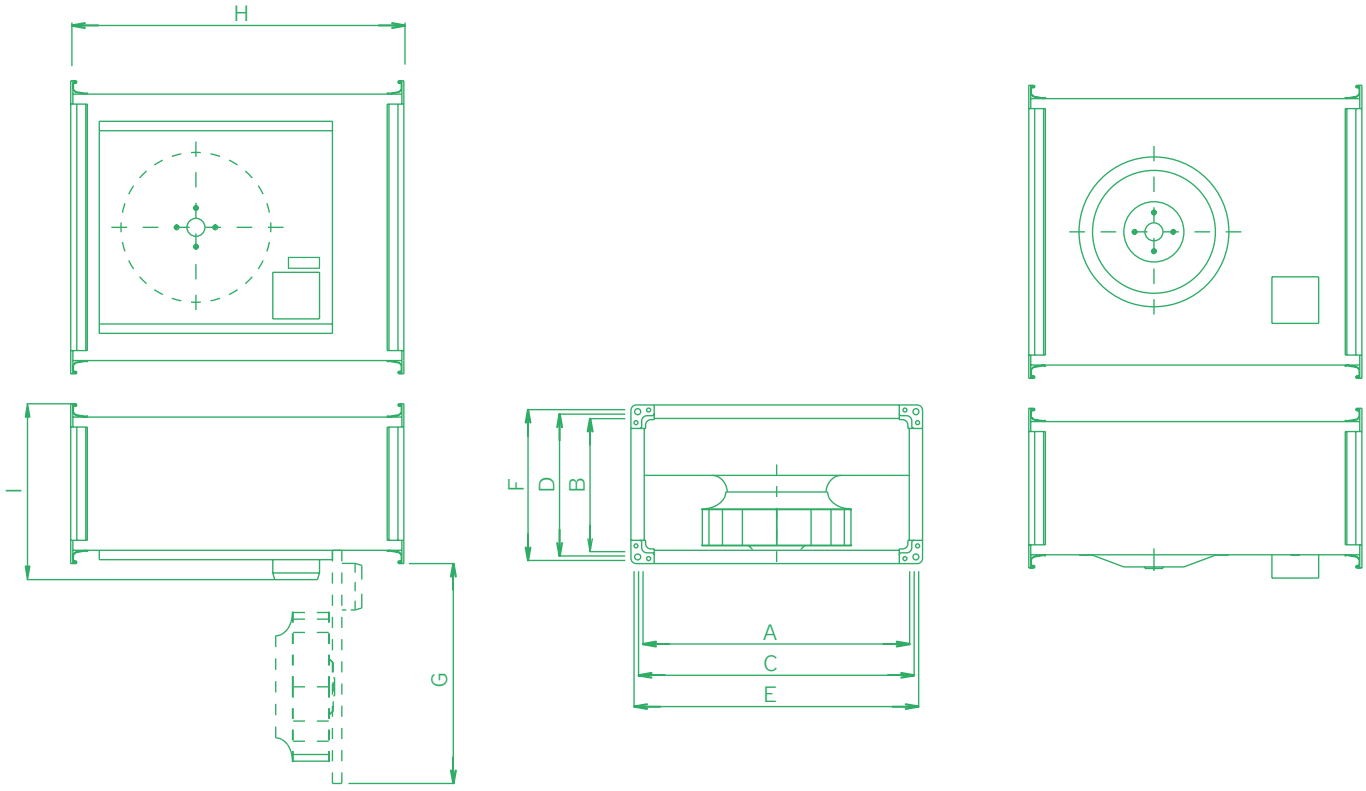


TABLE 1 – FAN DIMENSIONS

Fan Type	Dimensions in mm								
	A	B	C	D	E	F	G	H	I
RO 30-15/19-2E	300	150	320	170	340	190	258	400	215
RO 40-20/22-2E	400	200	420	220	440	240	280	500	265
RO 50-25/25-2E	500	250	520	270	540	290	355	530	315
RO 50-30/31-4D	500	300	520	320	540	340	-	565	380
RO 60-35/35-4D	600	350	620	370	640	390	-	720	430
RO 70-40/40-4D	700	400	720	420	740	440	-	780	480
RO 80-50/45-4D	800	500	820	520	840	540	-	885	580
RO 80-50/50-4D	800	500	820	520	840	540	-	885	580
RO 90-50/50-4D	900	500	930	530	960	560	-	985	590
RO 100-50/56-4D	1000	500	1030	530	1060	560	-	985	590

TABLE 2 – FAN BASIC PARAMETERS AND NOMINAL VALUES

Fan type	V_{max}	$\Delta p_{t\ max}$	$\Delta p_{t\ min}$	n_{nom}	U_{nom}	P_{max}	I_{max}	t_{min}	t_{max}	C	m	ErP2015
	m^3/h	Pa	Pa	min^{-1}	V	W	A	°C	°C	mF	kg	
SINGLE-PHASE FANS												
RO 30-15/19-2E	502	409	0	2345	230	52	0.23	-25	65	1.5	10	✓
RO 40-20/22-2E	1095	597	0	2601	230	155	0.7	-25	70	3.5	16	✓
RO 50-25/25-2E	1416	787	0	2772	230	250	1.1	-25	70	5	15	✓
THREE-PHASE FANS												
RO 50-30/31-4D	1901	305	0	1356	400	145	0.35	-25	55	-	21	✓
RO 60-35/35-4D	2971	411	0	1387	400	280	0.72	-25	60	-	25	✓
RO 70-40/40-4D	4218	526	0	1401	400	515	1.2	-40	60	-	32	✓
RO 80-50/50-4D	9153	914	0	1376	400	1520	2.91	-40	70	-	58	✓
RO 80-50/45-4D	5994	589	0	1365	400	710	1.45	-40	60	-	46	✓
RO 90-50/50-4D	9153	914	0	1376	400	1520	2.91	-40	70	-	69	✓
RO 100-50/56-4D	11146	726	0	1371	400	1950	3.98	-40	60	-	77	✓

SYMBOLS USED IN TABLE 2:

V_{max} maximum air flow rate

n fan speed measured at the highest efficiency working point (5b), rounded to tens

U nominal power supply voltage of the motor without control (all values in the table are to this voltage)

$P_{max.}$ electric motor maximal power output

$I_{max.}$ maximum phase current at voltage **U** (this value must be checked)

$t_{max.}$ maximum permissible transported air temperature at air flow **$V_{max.}$**

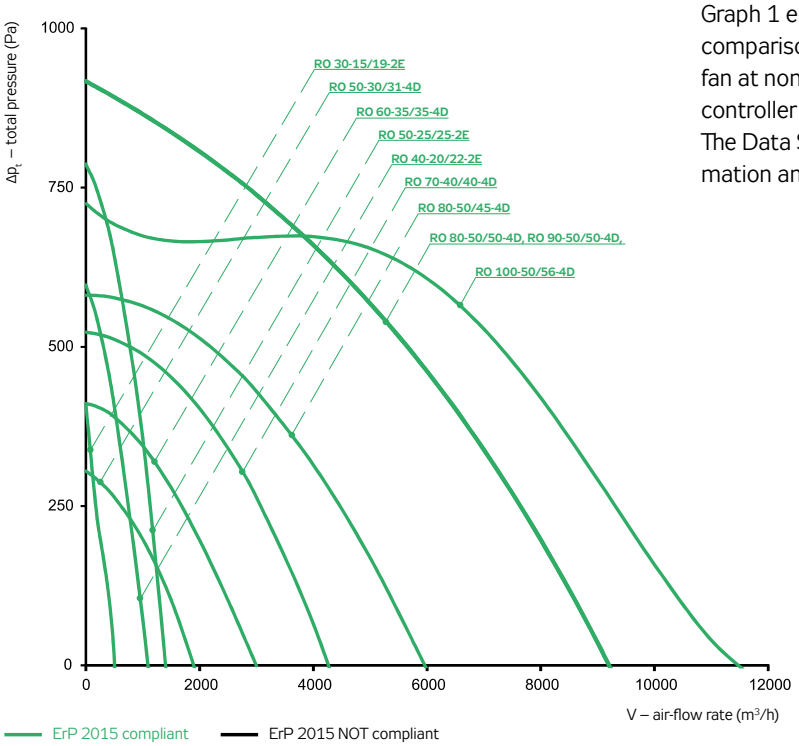
C capacitor capacity with single-phase fans

FM. frequency inverter

m weight of the fan (±10%)

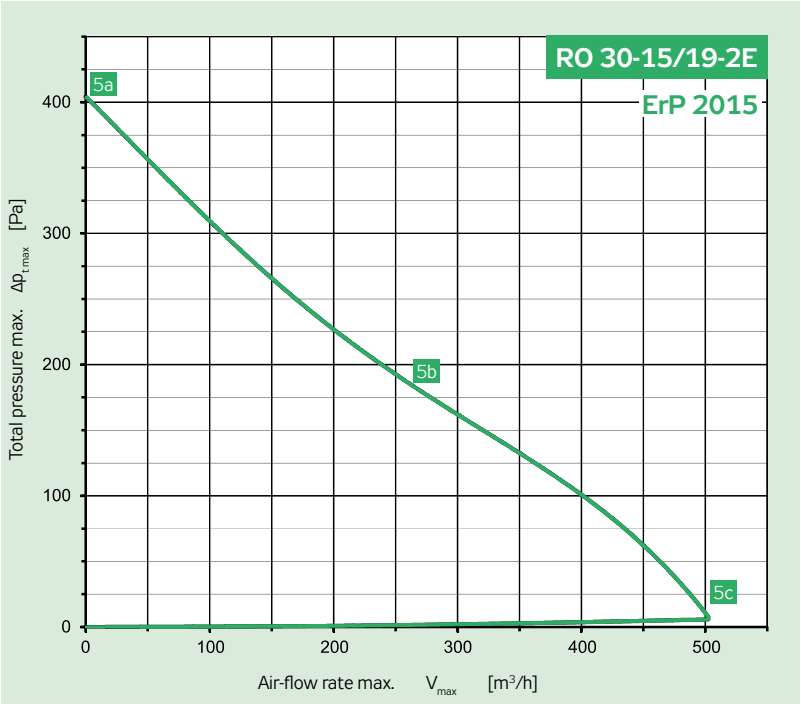
ErP2015 Fan compliance with the requirements of Regulation 2009/125/EC (NOT compliant fans must not be used within EU region)

GRAPH 1 – RO FAN CHARACTERISTICS QUICK SELECTION



DATA SECTION

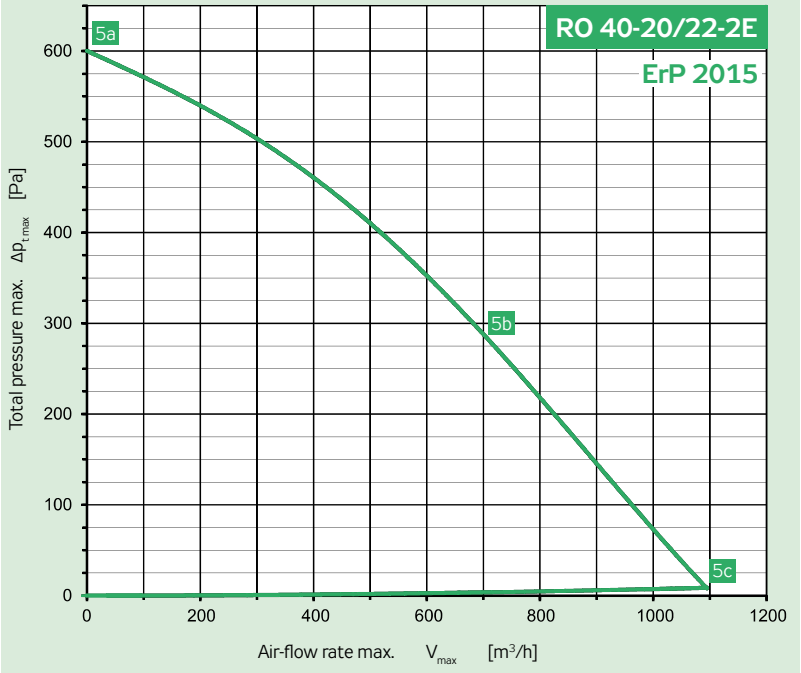
Graph 1 enables quick selection of a suitable fan and alternate comparison of RO fans. Only the highest characteristics of each fan at nominal supply voltage, i.e. without a controller or with a controller set to five stage, are included in this graph.
The Data Section of the catalogue contains all important information and measured data of RO fans.



Power supply		230 V	50 Hz
Max. electric input	P_{max}	[W]	52
Max. current (5c)	I_{max}	[A]	0.23
Mean speed	n	[min⁻¹]	2345
Capacitor	C	[F]	1.5
Max. working temp.	t_{max}	[°C]	65
Max. air-flow rate	V_{max}	[m³/h]	502
Max. total pressure	$\Delta p_{t\,max}$	[Pa]	409
Min. static pressure (5c)	$\Delta p_{c\,min}$	[Pa]	0
Weight	m	[kg]	10
Five-stage controller	type		TRN 2E
Protecting relay	type		-

	Sání	Výtlak	Okolí
Bod	5b	5b	5b
	Total sound power level L_{MAX}[dB(A)]		
L_{WA}	66	69	50
	Sound power level L_{WAokt} [dB(A)]		
125 Hz	44	48	33
250 Hz	56	59	41
500 Hz	63	66	48
1000 Hz	56	60	37
2000 Hz	59	62	39
4000 Hz	52	55	30
8000 Hz	41	41	19

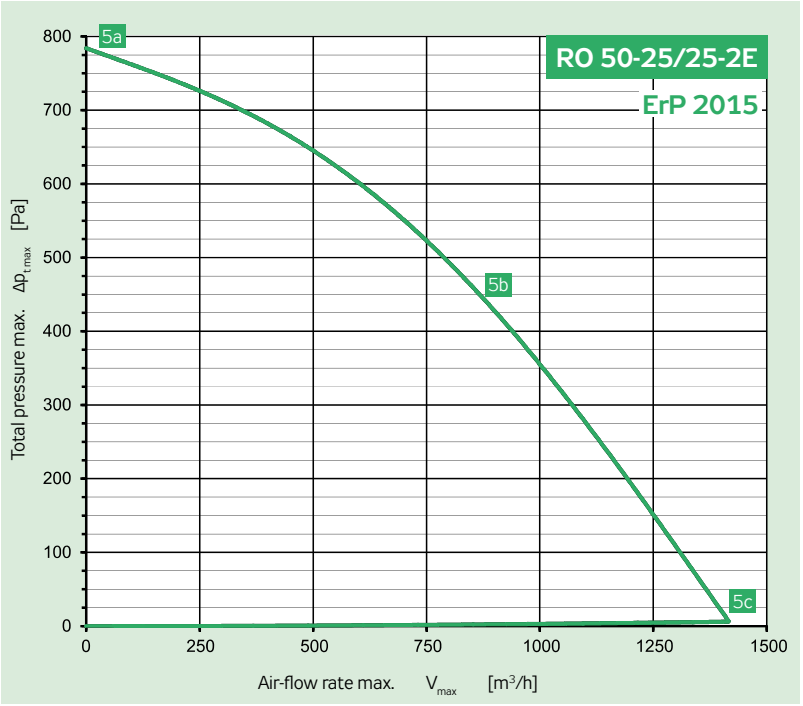
Parameters in selected points	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c
Voltage U [V]			230												
Current I [A]	0.2		0.2		0.2										
Electric input P [W]	49		48		48										
Speed n [min⁻¹]	2950		2345		2457										
Air-flow rate V [m³/h]	0		267		502										
Static pressure Δp_s [Pa]	409		186		0										
Total pressure Δp_t [Pa]	409		187		6										



Power supply		230 V	50 Hz
Max. electric input	P_{max}	[W]	155
Max. current (5c)	I_{max}	[A]	0.70
Mean speed	n	[min⁻¹]	2601
Capacitor	C	[F]	3.5
Max. working temp.	t_{max}	[°C]	70
Max. air-flow rate	V_{max}	[m³/h]	1095
Max. total pressure	$\Delta p_{t\,max}$	[Pa]	597
Min. static pressure (5c)	$\Delta p_{c\,min}$	[Pa]	0
Weight	m	[kg]	16
Five-stage controller	type		TRN 2E
Protecting relay	type		-

	Sání	Výtlak	Okolí
Bod	5b	5b	5b
	Total sound power level L_{MAX}[dB(A)]		
L_{WA}	72	75	55
	Sound power level L_{WAokt} [dB(A)]		
125 Hz	57	60	46
250 Hz	64	68	49
500 Hz	63	66	48
1000 Hz	67	71	48
2000 Hz	66	69	46
4000 Hz	61	64	39
8000 Hz	51	54	29

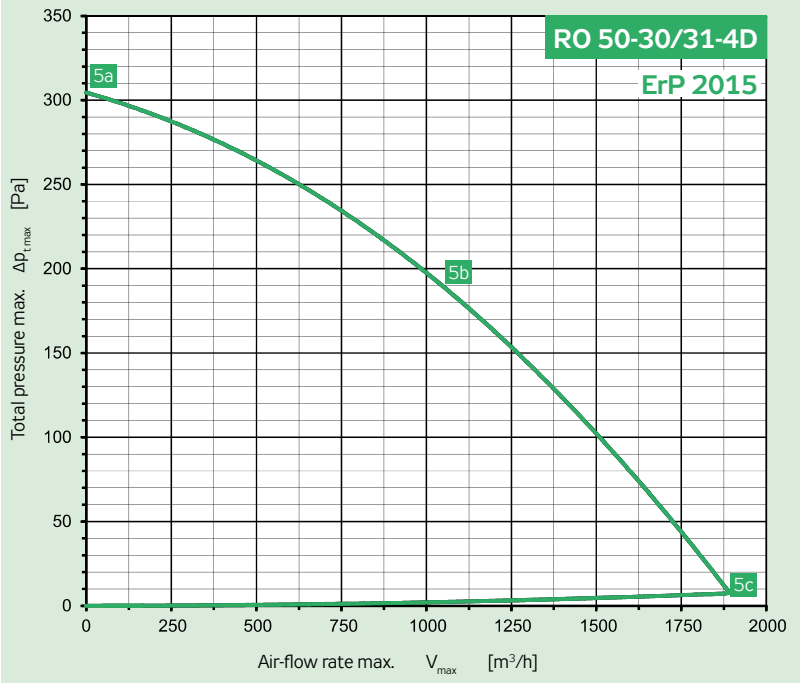
Parameters in selected points	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c
Voltage U [V]			230												
Current I [A]	0.4		0.6		0.6										
Electric input P [W]	94		148		133										
Speed n [min⁻¹]	2880		2601		2671										
Air-flow rate V [m³/h]	0		604		1095										
Static pressure Δp_s [Pa]	597		347		0										
Total pressure Δp_t [Pa]	597		350		9										



Power supply		230 V	50 Hz
Max. electric input	P_{max}	[W]	250
Max. current (5c)	I_{max}	[A]	1.10
Mean speed	n	[min⁻¹]	2772
Capacitor	C	[F]	5
Max. working temp.	t_{max}	[°C]	70
Max. air-flow rate	V_{max}	[m³/h]	1416
Max. total pressure	$\Delta p_{t\,max}$	[Pa]	787
Min. static pressure (5c)	$\Delta p_{c\,min}$	[Pa]	0
Weight	m	[kg]	15
Five-stage controller	type		TRN 2E
Protecting relay	type		-

	Sání	Výtlak	Okolí
Bod	5b	5b	5b
	Total sound power level L_{MAX}[dB(A)]		
L_{WA}	72	74	54
	Sound power level L_{WAokt} [dB(A)]		
125 Hz	58	54	47
250 Hz	64	62	49
500 Hz	59	66	45
1000 Hz	67	70	48
2000 Hz	66	68	46
4000 Hz	62	66	40
8000 Hz	58	59	36

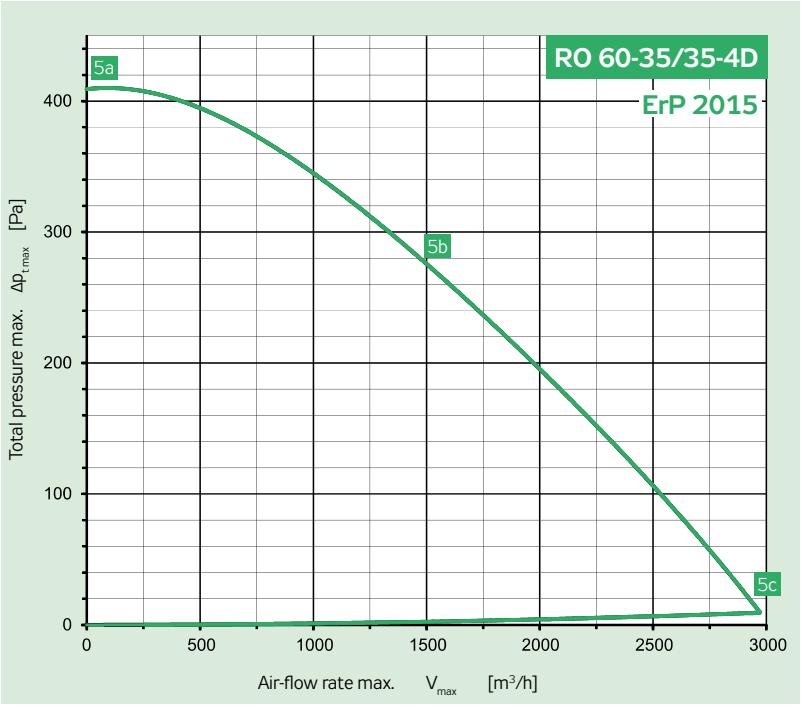
Parameters in selected points	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c
Voltage U [V]			230												
Current I [A]	0.6		1.1		0.9										
Electric input P [W]	141		246		204										
Speed n [min⁻¹]	2910		2772		2831										
Air-flow rate V [m³/h]	0		803		1416										
Static pressure Δp_s [Pa]	787		488		0										
Total pressure Δp_t [Pa]	787		490		6										



Power supply	Y	3 × 400 V	50 Hz
Max. electric input	P_{max}	[W]	145
Max. current (5c)	I_{max}	[A]	0.35
Mean speed	n	[min⁻¹]	1356
Capacitor	C	[F]	-
Max. working temp.	t_{max}	[°C]	55
Max. air-flow rate	V_{max}	[m³/h]	1901
Max. total pressure	$\Delta p_{t\,max}$	[Pa]	305
Min. static pressure (5c)	$\Delta p_{c\,min}$	[Pa]	0
Weight	m	[kg]	21
Five-stage controller	type		TRN 2D
Protecting relay	type		STD

	Sání	Výtlak	Okolí
Bod	5b	5b	5b
	Total sound power level L_{MAX}[dB(A)]		
L_{WA}	62	66	51
	Sound power level L_{WAokt} [dB(A)]		
125 Hz	62	66	51
250 Hz	57	60	41
500 Hz	53	56	39
1000 Hz	57	60	38
2000 Hz	52	55	32
4000 Hz	47	50	25
8000 Hz	39	42	17

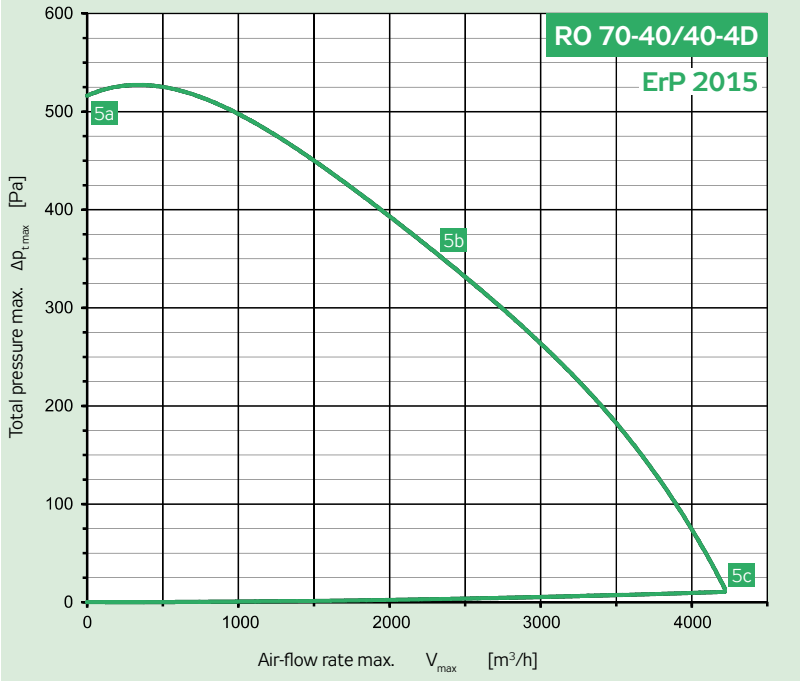
Parameters in selected points	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c
Voltage U [V]			400												
Current I [A]	0.3		0.3		0.3										
Electric input P [W]	67		136		121										
Speed n [min⁻¹]	1450		1356		1380										
Air-flow rate V [m³/h]	0		1053		1901										
Static pressure Δp_s [Pa]	305		189		0										
Total pressure Δp_t [Pa]	305		192		7										



Power supply	Y	3 × 400 V	50 Hz
Max. electric input	P_{max}	[W]	280
Max. current (5c)	I_{max}	[A]	0.72
Mean speed	n	[min⁻¹]	1387
Capacitor	C	[F]	-
Max. working temp.	t_{max}	[°C]	60
Max. air-flow rate	V_{max}	[m³/h]	2971
Max. total pressure	$\Delta p_{t\,max}$	[Pa]	411
Min. static pressure (5c)	$\Delta p_{c\,min}$	[Pa]	0
Weight	m	[kg]	25
Five-stage controller	type		TRN 2D
Protecting relay	type		STD

	Sání	Výtlak	Okolí
Bod	5b	5b	5b
	Total sound power level L_{MAX}[dB(A)]		
L_{WA}	64	70	50
	Sound power level L_{WAokt} [dB(A)]		
125 Hz	58	61	47
250 Hz	55	64	40
500 Hz	59	65	44
1000 Hz	58	64	39
2000 Hz	55	61	35
4000 Hz	48	54	26
8000 Hz	39	43	17

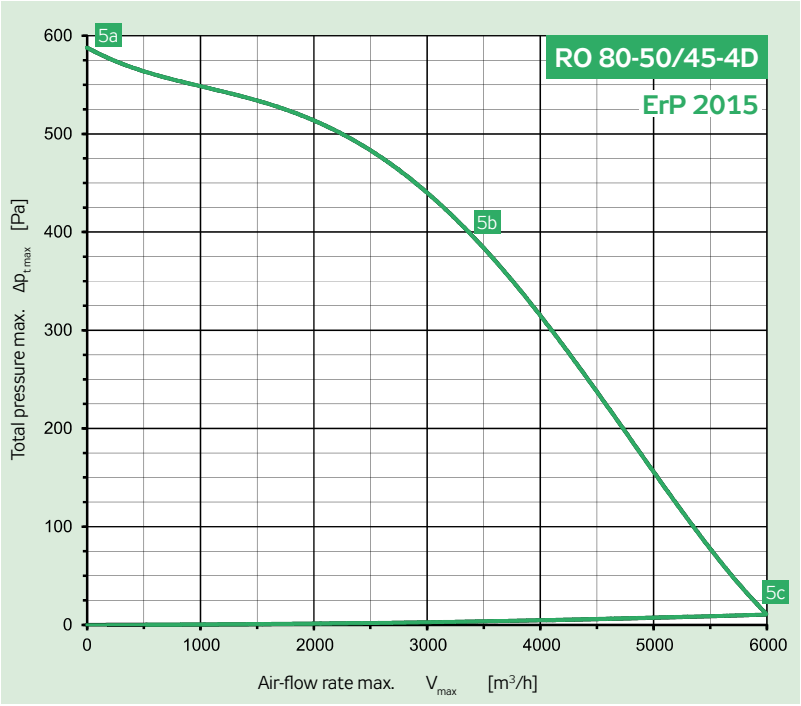
Parameters in selected points	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c
Voltage U [V]			400												
Current I [A]	0.7		0.7		0.7										
Electric input P [W]	145		278		222										
Speed n [min⁻¹]	1470		1387		1359										
Air-flow rate V [m³/h]	0		1498		2971										
Static pressure Δp_s [Pa]	411		279		0										
Total pressure Δp_t [Pa]	411		281		9										



Power supply	Y	3 × 400 V	50 Hz
Max. electric input	P_{max}	[W]	515
Max. current (5c)	I_{max}	[A]	1.20
Mean speed	n	[min⁻¹]	1401
Capacitor	C	[F]	-
Max. working temp.	t_{max}	[°C]	60
Max. air-flow rate	V_{max}	[m³/h]	4218
Max. total pressure	$\Delta p_{t\,max}$	[Pa]	526
Min. static pressure (5c)	$\Delta p_{c\,min}$	[Pa]	0
Weight	m	[kg]	32
Five-stage controller	type		TRN 2D
Protecting relay	type		STD

	Sání	Výtlak	Okolí
Bod	5b	5b	5b
	Total sound power level L_{MAX}[dB(A)]		
L_{WA}	68	73	55
	Sound power level L_{WAokt} [dB(A)]		
125 Hz	65	65	54
250 Hz	59	65	44
500 Hz	59	63	44
1000 Hz	59	68	40
2000 Hz	58	64	38
4000 Hz	54	59	32
8000 Hz	53	57	31

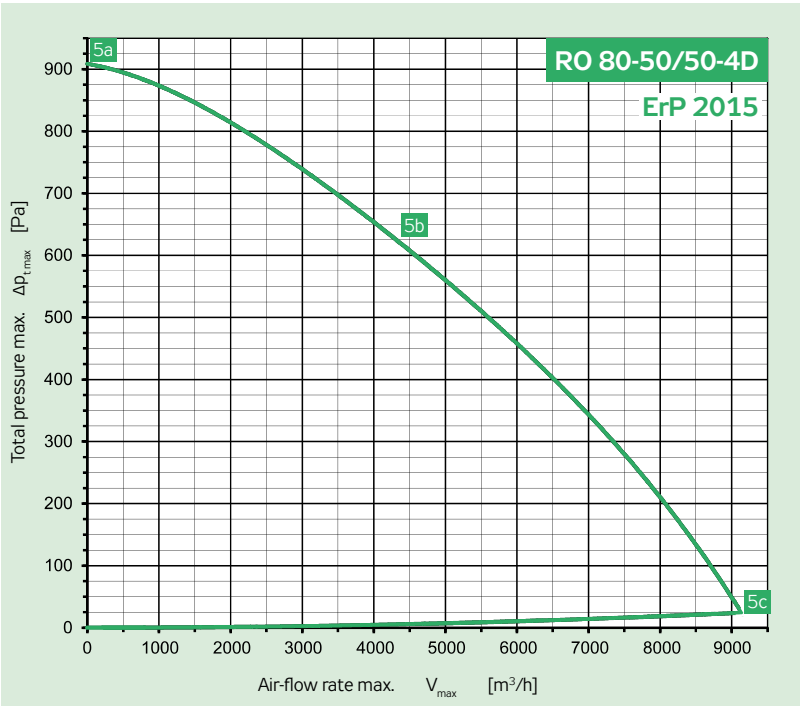
Parameters in selected points	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c
Voltage U [V]			400												
Current I [A]	1.0		1.1		1.1										
Electric input P [W]	269		505		424										
Speed n [min⁻¹]	1470		1401		1387										
Air-flow rate V [m³/h]	0		2341		4218										
Static pressure Δp_s [Pa]	522		362		0										
Total pressure Δp_t [Pa]	522		365		11										



Power supply	Y	3 × 400 V	50 Hz
Max. electric input	P_{max}	[W]	710
Max. current (5c)	I_{max}	[A]	1.45
Mean speed	n	[min⁻¹]	1365
Capacitor	C	[F]	-
Max. working temp.	t_{max}	[°C]	60
Max. air-flow rate	V_{max}	[m³/h]	5994
Max. total pressure	$\Delta p_{t\,max}$	[Pa]	589
Min. static pressure (5c)	$\Delta p_{c\,min}$	[Pa]	0
Weight	m	[kg]	46
Five-stage controller	type		TRN 2D
Protecting relay	type		STD

	Sání	Výtlak	Okolí
Bod	5b	5b	5b
	Total sound power level L_{MAX}[dB(A)]		
L_{WA}	74	81	60
	Sound power level L_{WAKokt} [dB(A)]		
125 Hz	69	69	58
250 Hz	61	62	46
500 Hz	67	70	52
1000 Hz	68	77	49
2000 Hz	67	76	47
4000 Hz	60	68	38
8000 Hz	50	54	28

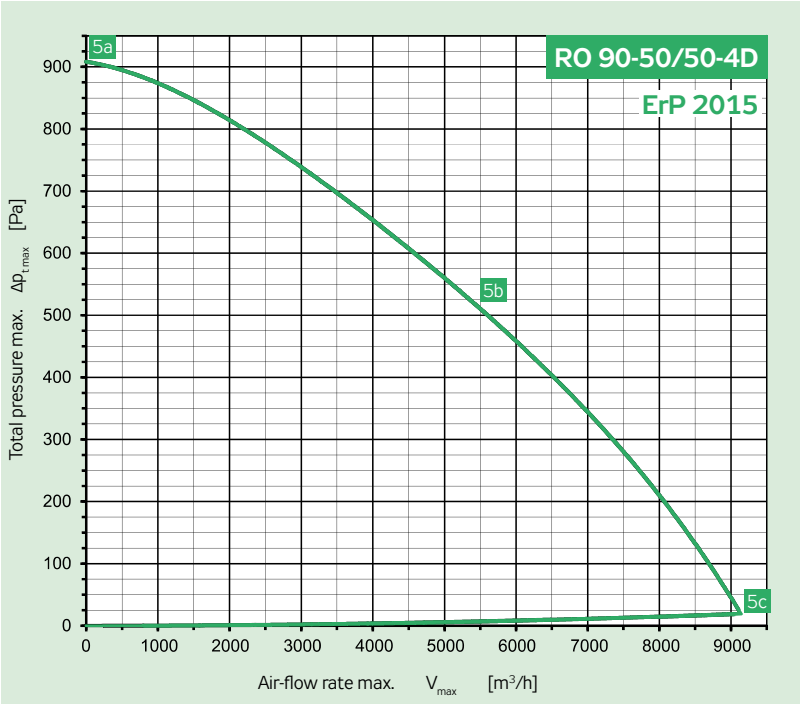
Parameters in selected points	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c
Voltage U [V]			400												
Current I [A]	1.0		1.4		1.3										
Electric input P [W]	292		679		539										
Speed n [min⁻¹]	1450		1365		1399										
Air-flow rate V [m³/h]	0		3391		5994										
Static pressure Δp_s [Pa]	589		389		0										
Total pressure Δp_t [Pa]	589		392		10										



Power supply	Y	3 × 400 V	50 Hz
Max. electric input	P_{max}	[W]	1520
Max. current (5c)	I_{max}	[A]	2.91
Mean speed	n	[min⁻¹]	1376
Capacitor	C	[F]	-
Max. working temp.	t_{max}	[°C]	70
Max. air-flow rate	V_{max}	[m³/h]	9153
Max. total pressure	$\Delta p_{t\,max}$	[Pa]	914
Min. static pressure (5c)	$\Delta p_{c\,min}$	[Pa]	0
Weight	m	[kg]	58
Five-stage controller	type		TRN 4D
Protecting relay	type		STD

	Sání	Výtlak	Okolí
Bod	5b	5b	5b
	Total sound power level L_{MAX}[dB(A)]		
L_{WA}	77	84	62
	Sound power level L_{WAKokt} [dB(A)]		
125 Hz	70	75	59
250 Hz	68	77	53
500 Hz	71	77	56
1000 Hz	70	78	51
2000 Hz	69	74	49
4000 Hz	64	70	42
8000 Hz	59	64	37

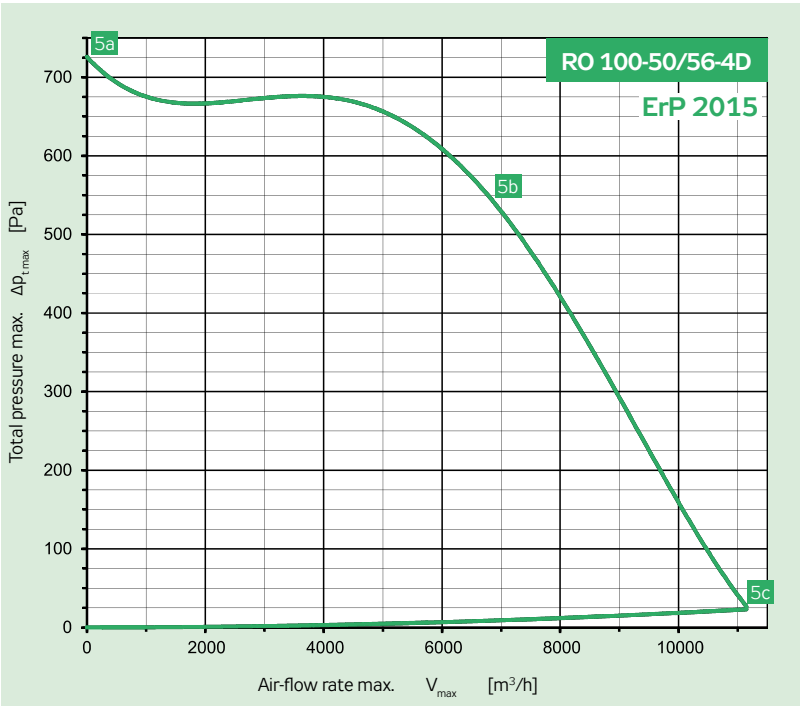
Parameters in selected points	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c
Voltage U [V]			400												
Current I [A]	1.8		2.8		2.7										
Electric input P [W]	589		1460		1378										
Speed n [min⁻¹]	1460		1376		1388										
Air-flow rate V [m³/h]	0		4344		9153										
Static pressure Δp_s [Pa]	914		630		0										
Total pressure Δp_t [Pa]	914		635		24										



Power supply	Y	3 × 400 V	50 Hz
Max. electric input	P_{max}	[W]	1520
Max. current (5c)	I_{max}	[A]	2.91
Mean speed	n	[min⁻¹]	1376
Capacitor	C	[F]	-
Max. working temp.	t_{max}	[°C]	70
Max. air-flow rate	V_{max}	[m³/h]	9153
Max. total pressure	$\Delta p_{t\,max}$	[Pa]	914
Min. static pressure (5c)	$\Delta p_{c\,min}$	[Pa]	0
Weight	m	[kg]	69
Five-stage controller	type		TRN 4D
Protecting relay	type		STD

	Sání	Výtlak	Okolí
Bod	5b	5b	5b
	Total sound power level L_{MAX}[dB(A)]		
L_{WA}	77	84	62
	Sound power level L_{WAOkt} [dB(A)]		
125 Hz	70	75	59
250 Hz	68	77	53
500 Hz	71	77	56
1000 Hz	70	78	51
2000 Hz	69	74	49
4000 Hz	64	70	42
8000 Hz	59	64	37

Parameters in selected points	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c
Voltage U [V]			400												
Current I [A]	1.8		2.8		2.7										
Electric input P [W]	589		1460		1378										
Speed n [min⁻¹]	1460		1376		1388										
Air-flow rate V [m³/h]	0		4344		9153										
Static pressure Δp_s [Pa]	914		630		0										
Total pressure Δp_t [Pa]	914		634		19										



Power supply	Y	3 × 400 V	50 Hz
Max. electric input	P_{max}	[W]	1950
Max. current (5c)	I_{max}	[A]	4.00
Mean speed	n	[min⁻¹]	1371
Capacitor	C	[F]	-
Max. working temp.	t_{max}	[°C]	60
Max. air-flow rate	V_{max}	[m³/h]	11146
Max. total pressure	$\Delta p_{t\,max}$	[Pa]	726
Min. static pressure (5c)	$\Delta p_{c\,min}$	[Pa]	0
Weight	m	[kg]	77
Five-stage controller	type		TRN 7D
Protecting relay	type		STD

	Sání	Výtlak	Okolí
Bod	5b	5b	5b
	Total sound power level L_{MAX}[dB(A)]		
L_{WA}	84	89	67
	Sound power level L_{WAOkt} [dB(A)]		
125 Hz	69	70	58
250 Hz	73	72	58
500 Hz	79	81	64
1000 Hz	76	85	57
2000 Hz	79	85	59
4000 Hz	72	78	50
8000 Hz	64	66	42

Parameters in selected points	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c
Voltage U [V]			400												
Current I [A]	2.7		4.0		3.8										
Electric input P [W]	881		1903		1584										
Speed n [min⁻¹]	1390		1371		1385										
Air-flow rate V [m³/h]	0		6964		11146										
Static pressure Δp_s [Pa]	726		516		0										
Total pressure Δp_t [Pa]	726		525		23										

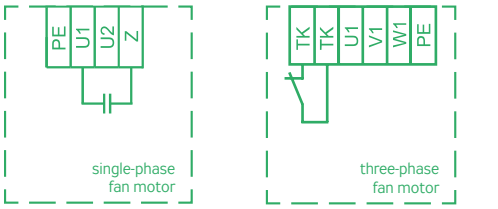
INSTALLATION

- RO fans (including other Vento elements and equipment) are not intended, due to their concept, for direct sale to end customers. Each installation must be performed in accordance with a professional project created by a qualified air-handling designer who is responsible for the proper selection of fan. The installation and commissioning may be performed only by an authorized company licensed in accordance with generally valid regulations.
- It is recommended to insert the DV elastic connections in front of and behind the fan.
- It is advisable to always place the KFD or VFK air filters, respectively VFT metal grease filter in front of the fan to protect the fan and duct against dirtying and dust fouling,
- In cramped areas, it is advisable to consider the necessity to situate directly behind the fan's outlet the duct adapting piece, attenuator, heat exchanger, heater, etc. Figure # 2 shows the fan's outlet design and arrangement. It is obvious that from the entire cross-section (e.g. 500 x 250) only 1/4 of the outlet cross-section is free. This means that the airflow velocities close behind the fan can be as much as four times higher than, for example, in the inlet. Therefore, the greater the distance of attenuators (or other resistant elements) from the outlet, the better. On the inlet side, the DV elastic connection will be sufficient as a distance piece in most cases.
- When positioned under the ceiling, it is advisable to situate the fan with its opening service panel directed downwards to ease access to the motor terminal box.

WIRING

- The wiring can be performed only by a qualified worker licensed in accordance with national regulations.
- Terminal box f is equipped with WAGO terminals; max. cross-section of connecting conductors 1.5 mm^2
- For wiring diagrams refer to figure # 4.

FIGURE 4 – WIRING DIAGRAM



TK
– motor thermo-contact terminals
U1, U2
– single-phase motor power supply terminals 230 V / 50Hz
PE
– protective conductor terminal
Z
– auxiliary winding

TK
– motor thermo-contact terminals
U1, V1, W1
– three-phase motor power supply terminals 400 V / 50 Hz
PE
– protective conductor terminal

The wiring diagrams with front-end elements (protective relays, controllers, control units) are included in the installation manual, respectively in the AeroCAD project.

On the following pages you will find some basic examples of the fan connection to output controllers and control units. AeroCAD software is available for precise design of the wiring.

EXAMPLE A
RO FANS WITHOUT OUTPUT CONTROL

a) An RO fan's single-phase connection in a simple venting system is shown in figure # 5 a).
This connection ensures:
- → Full thermal protection of the fan via built-in thermo-contacts which are connected in series with the motor winding. Fuse T1 protects only against short circuit.
- → Manual switching on/off of the fan using a switch.

If the motor winding is overheated above +130 ºC due to overloading, the thermo-contacts in the motor winding will open. Upon the thermo-contacts opening, the power supply will be automatically cut. After cooling down, the fan is automatically started.

b) An RO fan's three-phase connection in a simple venting system is shown in figure # 5 b).
This connection ensures:
- → Full thermal protection of the fan via built-in thermo-contacts and STD protecting relay.
- → Manual switching on/off of the fan using STD protecting relay buttons

After pressing the button marked "I" on the STD protecting relay, the fan starts and the button will stay in the depressed position, signalling the fan's operation. The fan can be stopped by pressing the button marked "0". If the motor winding is overheated above 130 ºC due to overloading, the thermo-contacts in the motor winding will open. Upon the thermo-contacts opening, which are interconnected with the fan terminal box, the STD protecting relay circuit TK, TK will be disconnected. As a reaction to this state, the STD protecting relay will disconnect the power supply to the overheated motor. After cooling down, the motor is not automatically restarted. The failure must be confirmed (unblocked) by the operator by pressing the black "I" button..

EXAMPLE B
RO FANS WITHOUT OUTPUT CONTROL
WITH A CONTROL UNIT

An RO fan without output control connection in more sophisticated venting systems using the control unit is shown in figure # 6.
This connection ensures:
- → Thermal protection of the fans against overheating. This protection is ensured via built-in thermo-contacts, which are connected in series with the motor winding in the case of single-phase RO fans and automatically interrupt the fan power supply, while in the case of three-phase fans the thermo-contacts are brought out into the control unit, which ensures switching off of the fans (the entire assembly, respectively).
- → The fan switching on/off by the control unit.

The air-handling system is started by the control unit. All protection and safety functions of the entire system are ensured by the control unit.

FIGURE 5 – FAN CONNECTION

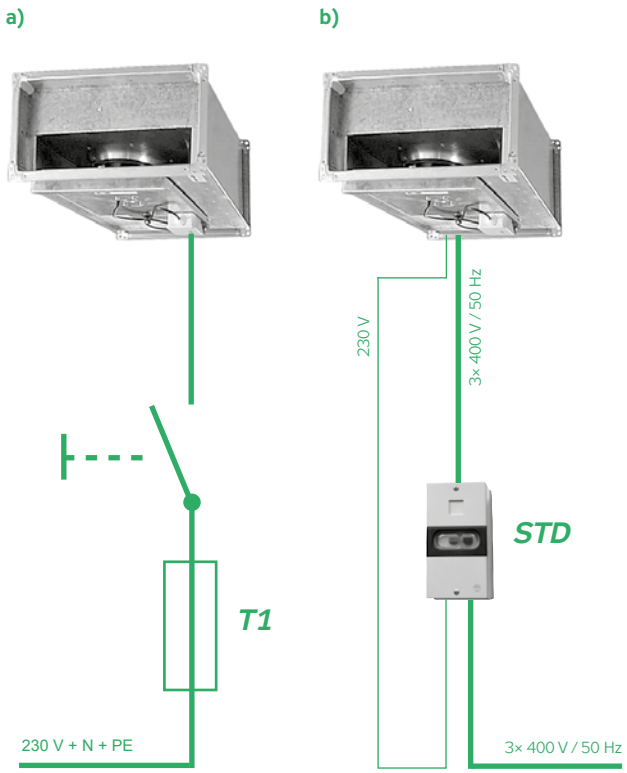


FIGURE 6 – FAN CONNECTION