

Rosenberg Reference Code

Current

- D = double inlet
- E = single inlet

- R = centrifugal fan

- A = external rotor motor

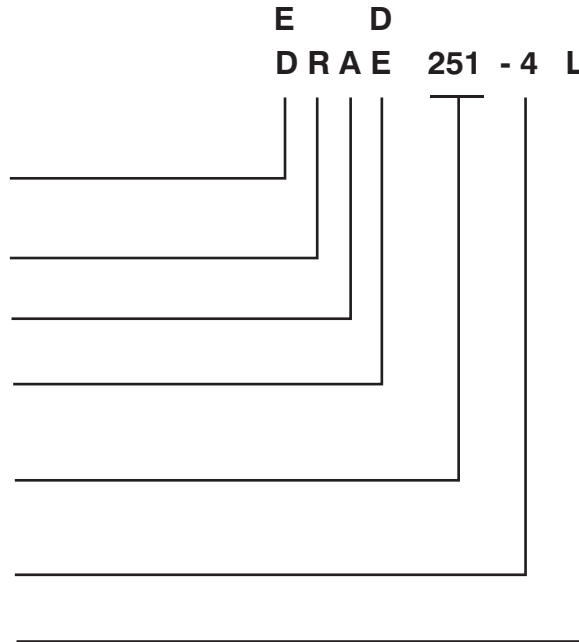
- E = single phase A.C.
- D = three phase A.C.

Impeller diameter

- 355 = 355mm (14 inches)

Number of poles

- L = Larger casing width



Characteristics and Construction

The high efficient centrifugal fans have been specially developed for modern ventilation and air conditioning applications and are ideal for the movement of air and non-aggressive gas and vapours.

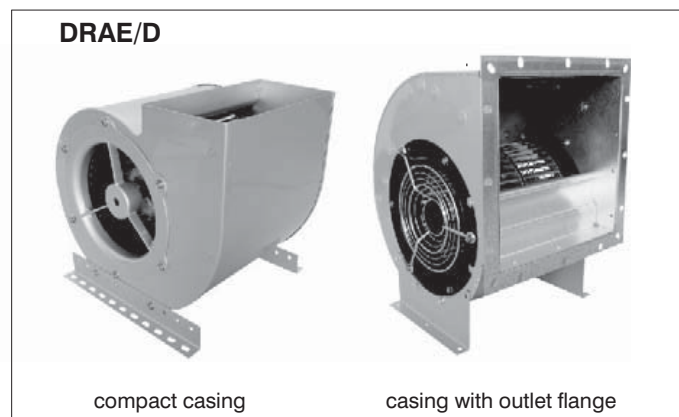
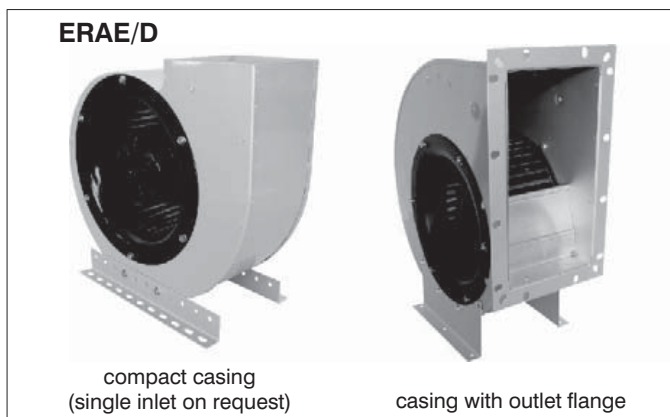
They are mainly used in air handling units, hygienic units, clean room filter units.

They find further application in the cooling of electrical motors and generators (e.g. in wind parks), ventilation of switch cabinets, air conditioning (e.g. in trains).

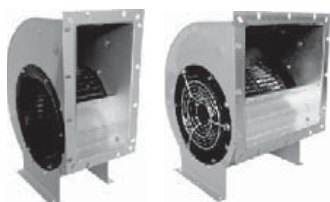
A high power density with a very compact design is provided by the combination of forward curved wheel and external rotor motor.

The following design models are available:

- ERAE/D: single inlet centrifugal fan
- DRAE/D: double inlet centrifugal fan



Casings

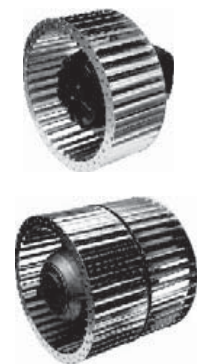


The casings of the high efficiency centrifugal fans are made of galvanized sheet metal. The side parts are produced with nut sets to fix the mounting brackets, which can be fixed in steps of 90°.

Epoxy coating on request.

ECOFIT series : steel painted black or plastic scroll.

Impellers



The impellers with 38-42 forward curved blades are made of galvanized sheet metal. They are mounted directly to the external rotor motor.

ECOFIT series : galvanised steel or plastic impeller.

The impellers are statically and dynamically balanced together with the external rotor motor according to quality level G2,5 DIN ISO 1940.

Direction of rotation

Direction of rotation for fan types ERA is clockwise viewed from the inlet side, but for fan types DRA it is anti-clockwise viewed from the cable outlet
Caution: Low air volume at wrong direction of spin!

ECOFIT series : direction of rotation is indicated in the catalogue on each datasheet.

Motors



Rosenberg external rotor motors are manufactured in protection class IP54.

ECOFIT external rotor motors are manufactured in protection class IP44 or IP54 for GDF.

The winding insulation corresponds to insulation Class F (UL - approved).

Bearings are deep groove ball type in sealed housing. Special grease lubrication provides maintenance-free operation, low-noise and extended life.

ECOFIT series : ball bearings closed on both sides are used. Special grease lubrication provides maintenance-free operation, low-noise and extended life.

Motor protection

All motors are equipped with thermal contacts, wired in series. Thermal contacts are temperature dependent control elements, sensing the winding temperature of the motor. These contacts protect the motor windings from overload, failure of a mains phase, standstill of the motor and of high temperature rise to the medium ventilated. In addition to the mounted thermal contacts we recommend the use of our motor protection control units.

Rosenberg also offers 5-step speed controllers, RTE and RTD.

Motors are equipped with the motor protection in connection with thermal contacts. An additional motor protection switch is not required.

Electrical connection	<p>The nominal voltage given on the nameplate provides maximum allowable voltage tolerance of $\pm 10\%$. Flying leads are standard. The connection ends are 10 cm (4 inches) dismantled and equipped with end splices. Standard cable length is 68 cm (27 inches) Special cable lengths are available on request. ECOFIT motors : refer to drawings.</p>
Voltages types	<p>For single phase operation, motors are available for 115V, 208/230V and 277V. All 230V motors could also be used at 1~230V, 50Hz. For three phase operation, motors are available for 208V / 230VD // 460V Y. 575V and other special voltages are available on request.</p> <p>Please reference 60Hz-curves:</p> <ul style="list-style-type: none"> - Standard three phase motor can be used at 460V (Star connection) and 230V (Delta connection). In Delta connection the motors are also suitable for 208V 3~ power supplies). - The performance curves show that the 230VD performance is a little less than the 460VY performance. <p>The standard three phase motors could also be used at 400V Y, 50Hz.</p> <p>ECOFIT series : for single phase operation, motors are available for 115V, 60Hz. Most of them are usable on 50Hz (refer to drawings).</p>
Speed control	<p>Speed control can be provided for fans that demand optimal adjustment of the operation point. Speed control is obtained by “Voltage Control” and “Frequency Control”, as described below.</p> <p>Voltage control</p> <p>The speed control is provided by reduction of the terminal voltage. If the voltage will be reduced the speed of the motor decreases and the air volume flow sinks in proportion with the speed. The matching voltage controllers can be provided on request.</p> <p>Frequency control</p> <p>All voltage controllable fans for three-phase power supplies can also be speed controlled by frequency converter from 60Hz downwards. The speed control is realized by reduction of the power supply frequency. At higher frequencies than 60Hz the motor will be thermally overloaded.</p> <p>With operation of the motors on a frequency controller the maximum speed of voltage increase of 500V /μs must not be exceeded. According to the frequency converter type and the length of the cable between motor and frequency converter additional components must be planned. Please refer to the operation manual of the frequency converter.</p>
Protection against accidental contact	<p>The fans are constructed for installation within applications. We do not include guards of any kind as a part of our standard product offering. Please contact your Rosenberg representative for accessory information.</p> <p>Before initial operation all required protection components must be installed and connected. Adherence to all electrical and safety codes, including National Electric Codes (NEC), National Fire Protection Association (NFPA) standards and Occupational Safety and Health Act (OSHA) should be followed and are responsibility of the customer. All electrical connections should be performed only by qualified personnel.</p>

Information on safety of machinery

Rosenberg radial fans are usable machines according to the EC Council Directive on Machinery. They are marked with a CE label and delivered with a declaration of conformity.

The dangers of the fan as well as necessary technical measures of safety are judged according to the VDMA standard sheet number 24167: Fans, demands of safety.

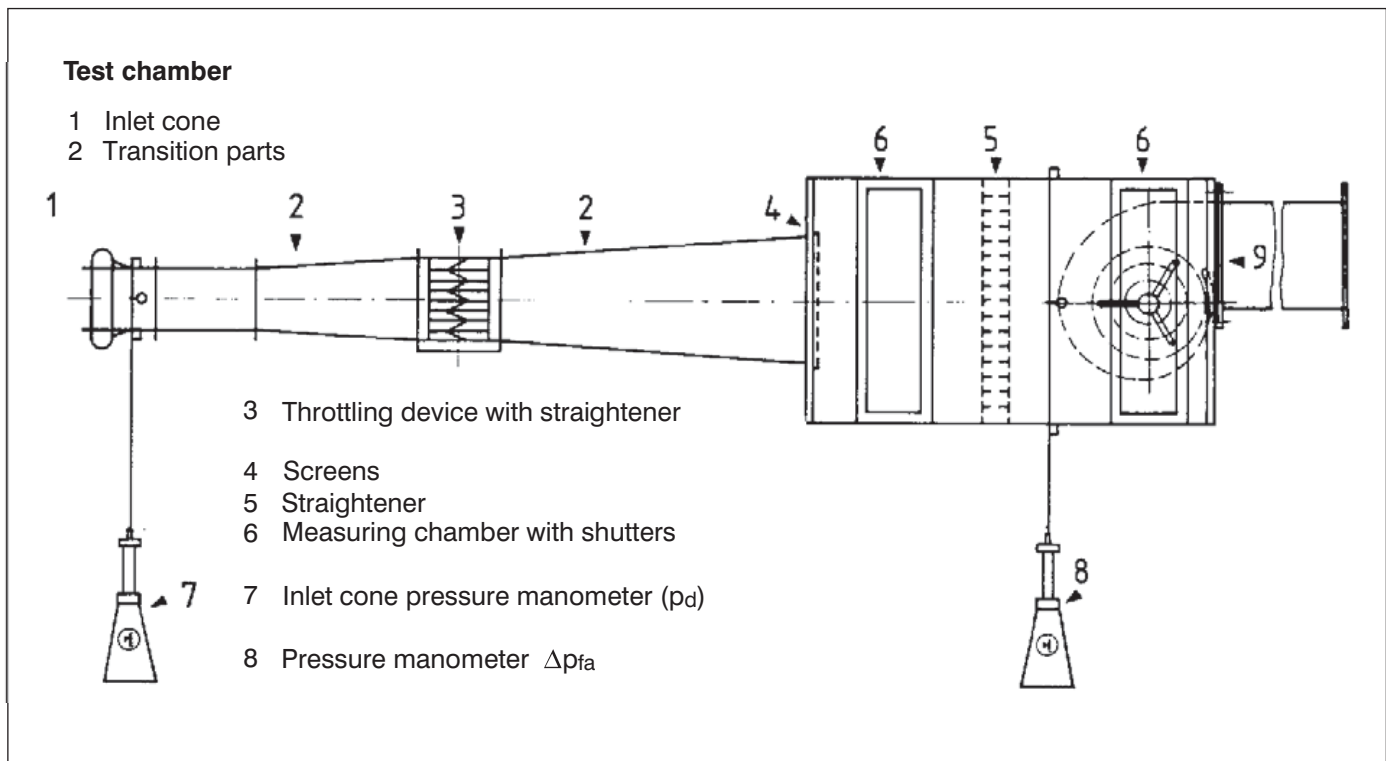
The operation manual contains additional measures of safety to be realized on site to make the fan match the EC Council Directive on Machinery 98/37/EC.

Advantages of Rosenberg high efficient centrifugal fans:

- Compact and space saving design with external rotor motor drive and high performance forward curved impeller
- Low for maintenance direct drive fans (no belt wear or belt replacement necessary)
- Various control possibilities
- Customers requirements can be met without problems
- Easy installation in any position
- Extremely low starting currents
- Motor protection through thermal contacts in motor winding

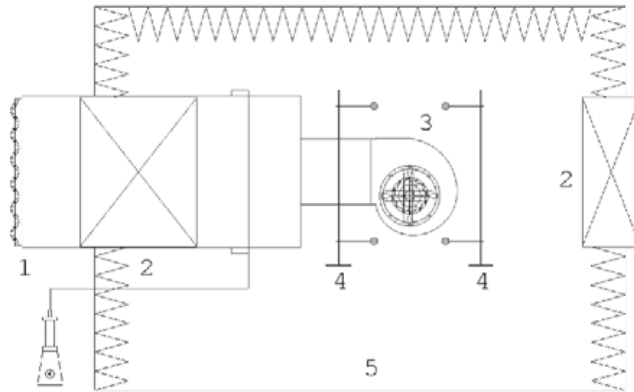
Air Performance Curves

The air performance curves have been established using the inlet test method in the test chamber as shown below according to German standard DIN 24163. They are valid for air with a density of 0.075#/ft³ with a temperature of 68°F. The performance curves were made in mounting position A (free inlet, free outlet) and show the pressure increase, available on inlet side, p_{fa} as a function of the volume.



Noise levels

The tests and their performance curves were made according to DIN 45635, part 38, according to the envelope surface method, after collection several test points by a cube shaped test area.



- 1 shutter door
- 2 sound attenuator
- 3 test sample
- 4 measurement arrangement
- 5 acoustic measuring room with reflecting floor

The characteristic diagram shows the “A” decibel Sound Power level $L_{W(A)}$. This corresponds to the free-outlet sound power level $L_{W(A)6}$.

The free inlet sound power level $L_{W(A)5}$ can be obtained by the relative sound power level or according to following calculation:

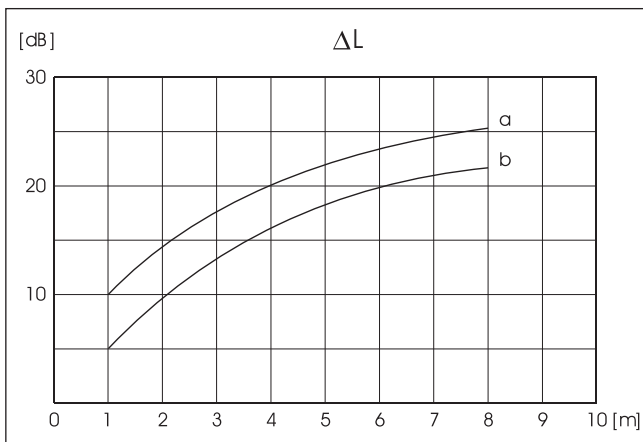
$$L_{W(A)5} = L_{W(A)} - 3 \text{ dB(A)}$$

For the exact determination of the sound protection measures the sound power level of the octave bands are important.

$$L_{W\text{oct}} = L_{W(A)} + L_{w\text{rel}}$$

DRAE ; DRAD	$L_{WA_{rel}}$ A-weighted at $V = 0,5 * V_{max}$							
fM [Hz]	125	250	500	1000	2000	4000	8000	Hz
Outlet side 4-pole	-21	-13	-8	-4	-7	-8	-15	dB
Inlet side 4-pole	-18	-13	-10	-5	-4	-10	-16	dB

ERAЕ ; ERAD	$L_{WA_{rel}}$ A-weighted at $V = 0,5 * V_{max}$							
fM [Hz]	125	250	500	1000	2000	4000	8000	Hz
Outlet side 4-pole	-23	-10	-8	-4	-7	-9	-16	dB
Inlet side 4-pole	-19	-11	-11	-5	-5	-8	-14	dB



The expected sound pressure level on the outlet side can only be approximately determined as the ambient influences can lead to strong deviations.

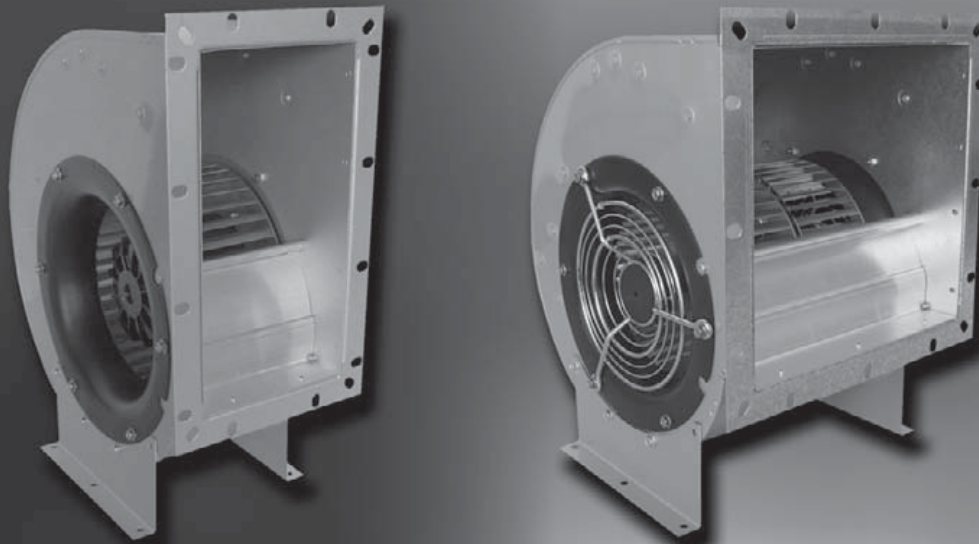
$$L_{P(A)} = L_{W(A)} - D L$$

a= without reflections

b= with reflections

High Efficiency Radial Fans

with forward curved radial impellers

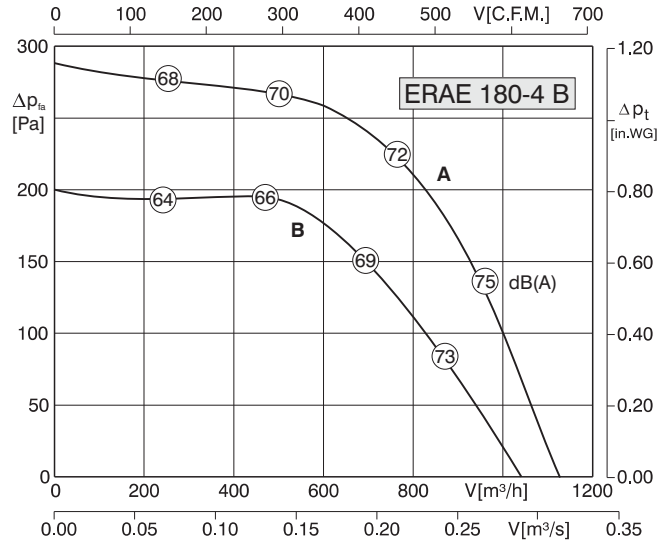


Advantages:

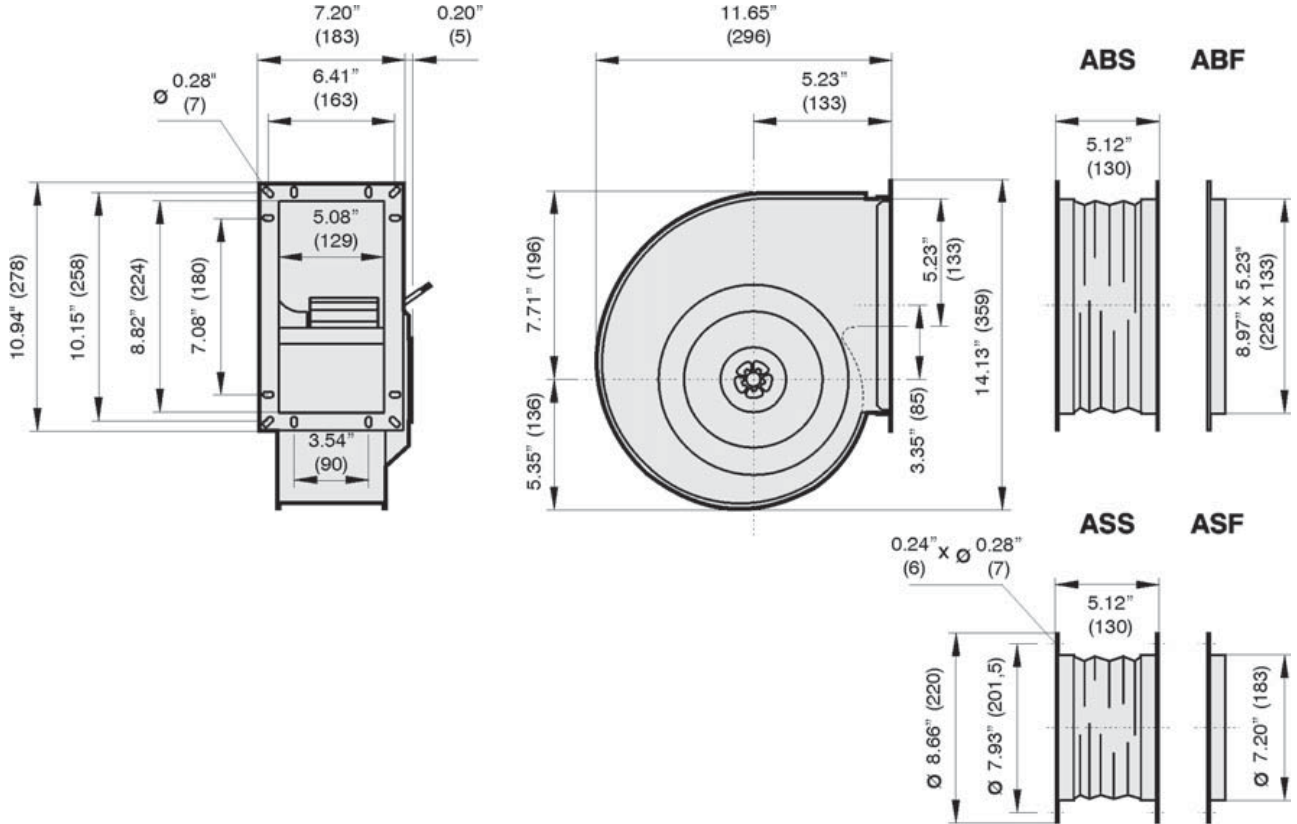
- The speed is 0-100% adjustable using auto transformers or electronic control
- Easy air volume adjustments via a large range of control products based on pressure and temperature
- Compact and space saving design
- Easy installation in many positions
- Extremely low starting currents
- Motor protection by thermal contacts in motor windings



- compact and space saving design
- 100% speed controllable through auto transformers
- Motor protection through thermal contacts as standard

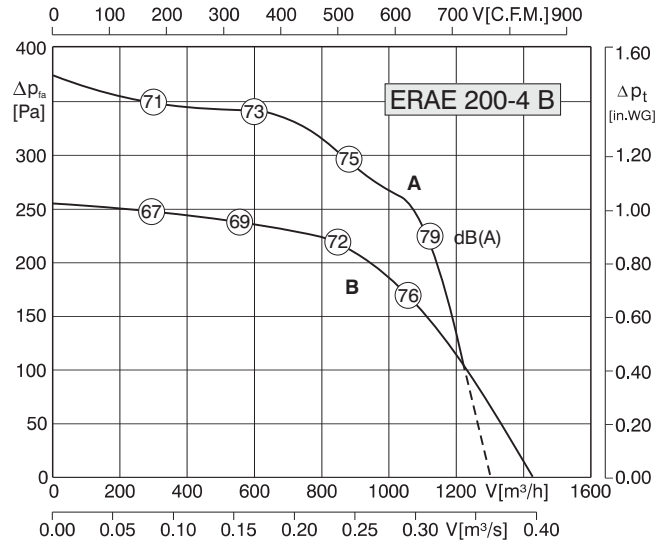


Type	U [Volt]	f [Hz]	Curve	P ₁ [kW]	I _N [A]	n [min ⁻¹]	t _r [°F]	t _r [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	█ [kg]
ERAE 180-4 B	1~120	60	A	0.29	2.50	1480	122	50	16	15	1.7	54	01.024	7.0
ERAE 180-4 B	1~230	60	A	0.29	1.25	1480	122	50	4	15	1.7	54	01.024	7.0
ERAE 180-4 B	1~230	50	B	0.20	0.93	1365	158	70	4	17	2.5	54	01.024	7.0

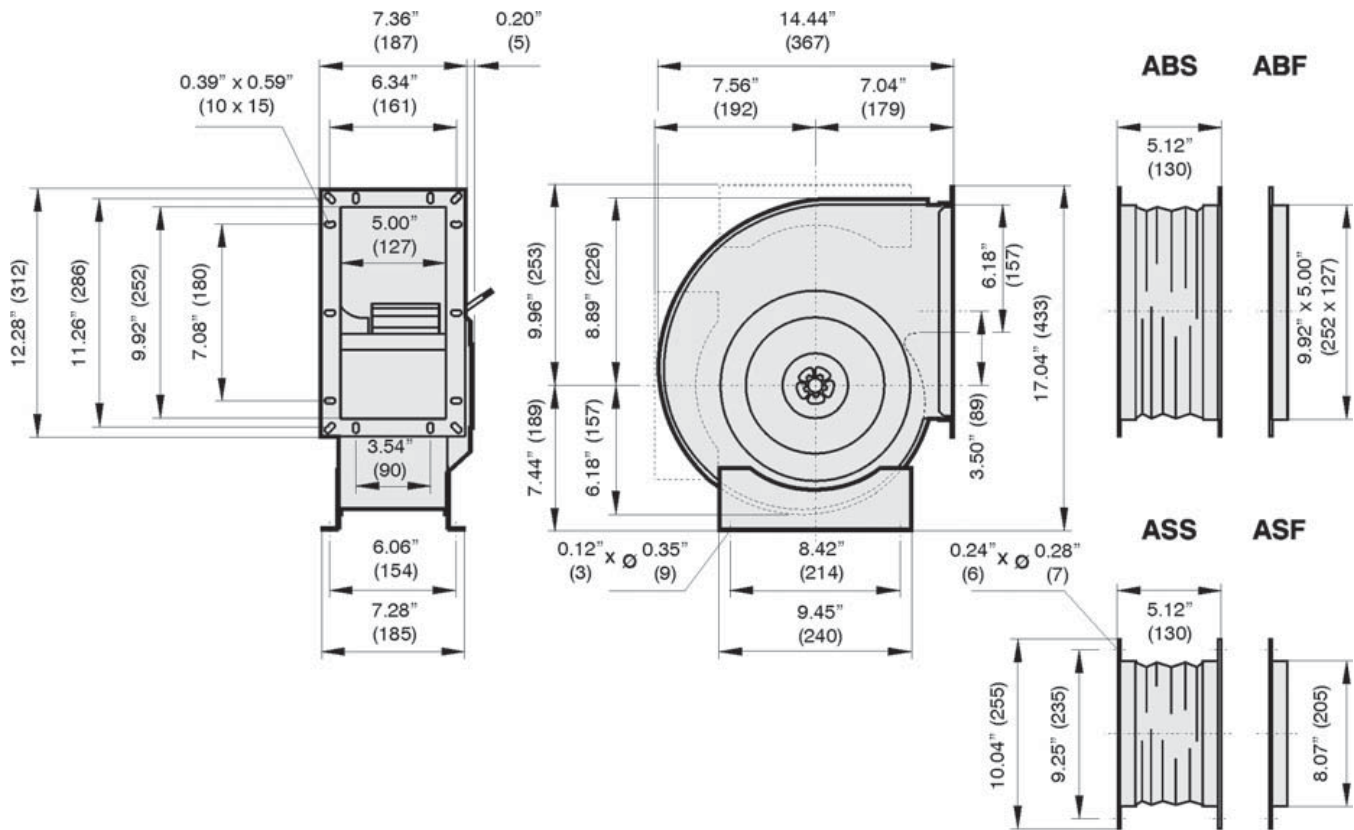




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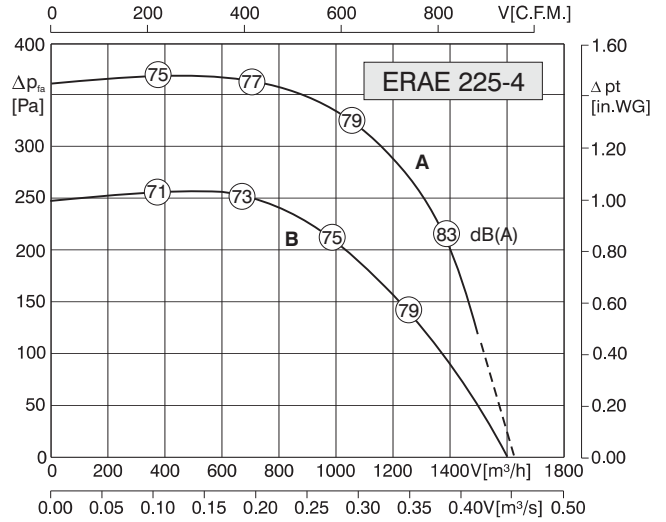


Type	U [Volt]	f [Hz]	Curve	P _i [kW]	I _N [A]	n [min ⁻¹]	t _R [°F]	t _R [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	■ [kg]
ERAE 200-4 B	1~120	60	A	0.40	3.50	1340	122	50	24	2.0	1.3	54	01.024	8
ERAE 200-4 B	1~230	60	A	0.40	1.75	1340	122	50	10	2.0	1.3	54	01.024	8
ERAE 200-4 B	1~230	50	B	0.35	1.60	1180	122	50	10	2.0	1.6	54	01.024	8

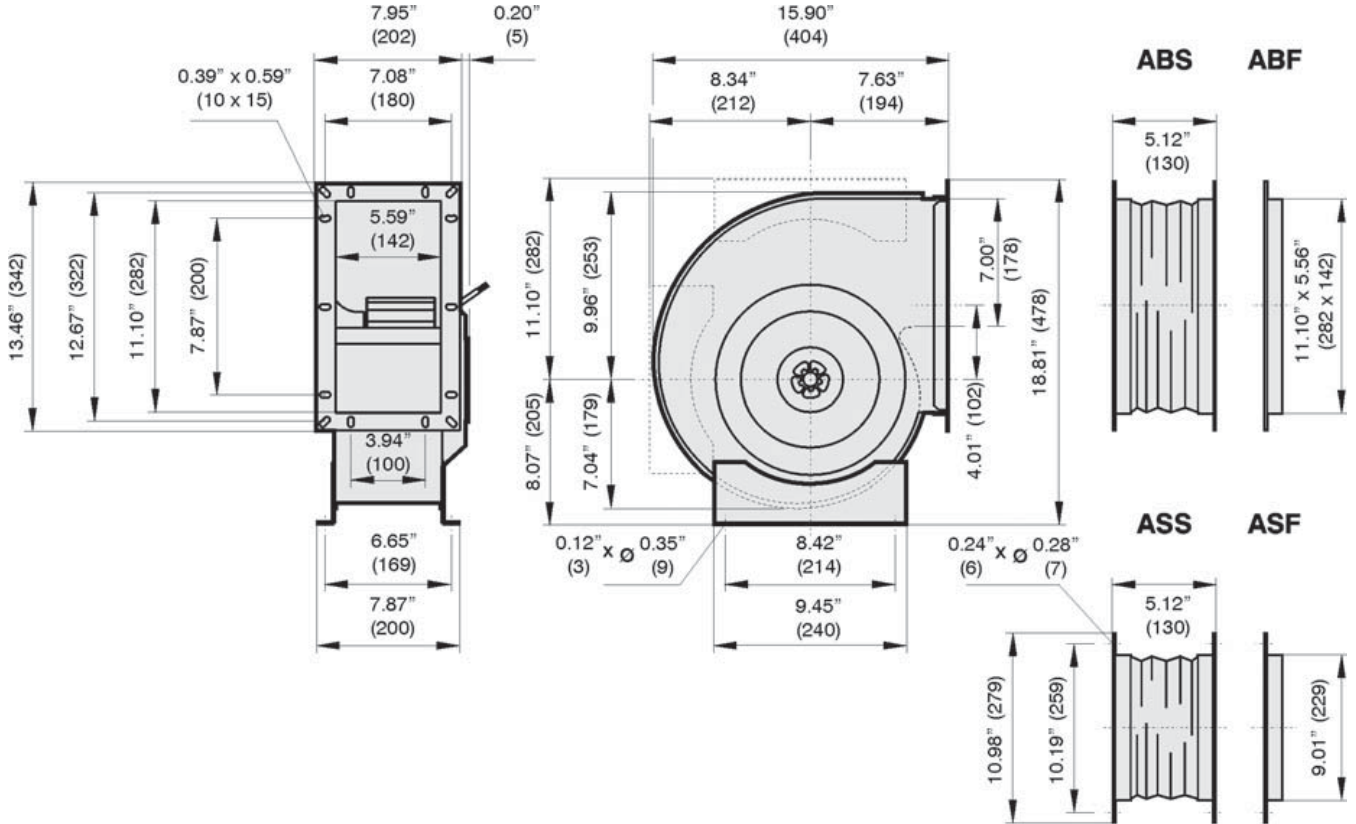




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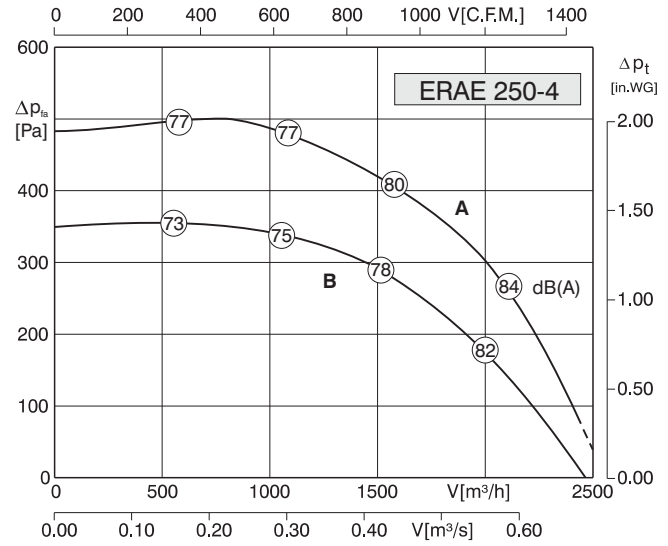


Type	U [Volt]	f [Hz]	Curve	P ₁ [kW]	I _N [A]	n [min ⁻¹]	t _r [°F]	t _r [°C]	C [μF]	ΔI [%]	I _A /I _N	△	☆	█
ERAE 225-4	1~120	60	A	0.55	5.20	1570	122	50	30	8	1.8	54	01.024	12
ERAE 225-4	1~230	60	A	0.55	2.60	1570	122	50	8	8	1.8	54	01.024	12
ERAE 225-4	1~230	50	B	0.47	2.40	1350	140	60	8	17	2.6	54	01.024	12

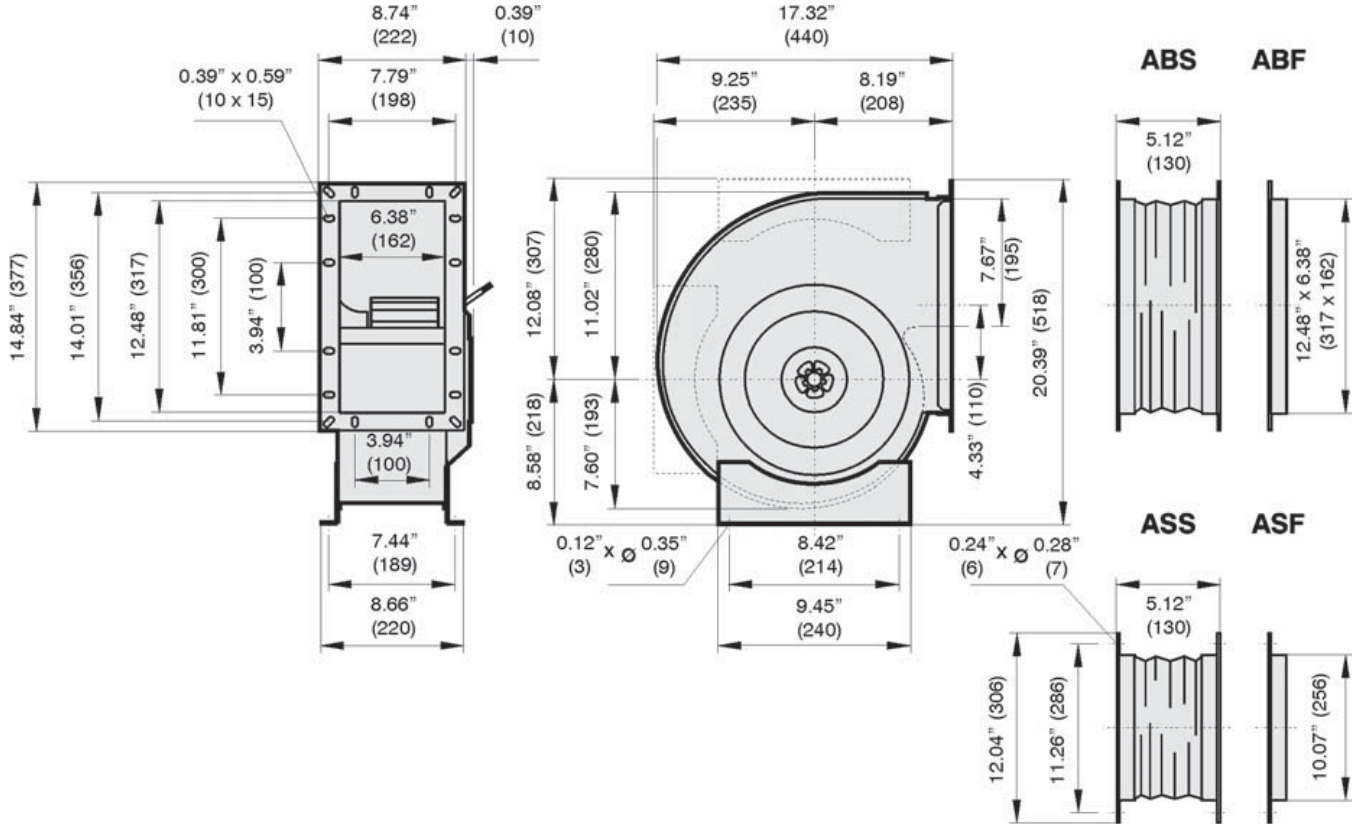




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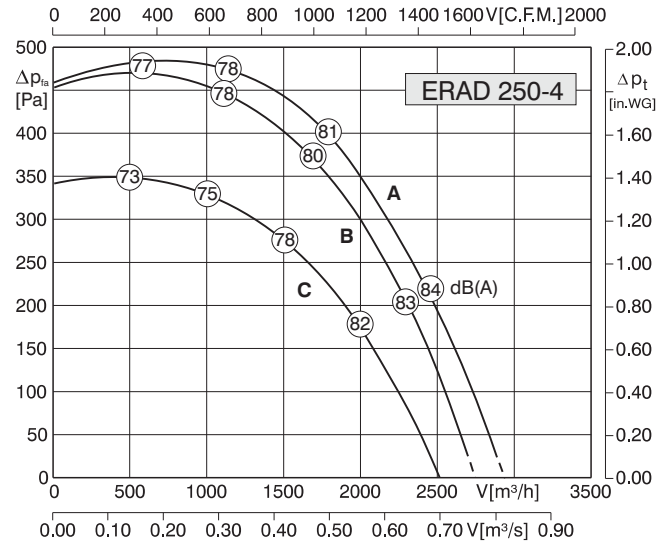


Type	U [Volt]	f [Hz]	Curve	P _i [kW]	I _N [A]	n [min ⁻¹]	t _R [°F]	t _R [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	■ [kg]
ERAE 250-4	1~120	60	A	0.99	8.60	1320	122	50	64	-	1.5	54	01.024	17.5
ERAE 250-4	1~230	60	A	0.99	4.30	1320	122	50	16	-	1.5	54	01.024	17.5
ERAE 250-4	1~230	50	B	0.77	3.50	1300	149	65	16	-	1.7	54	01.024	17.5

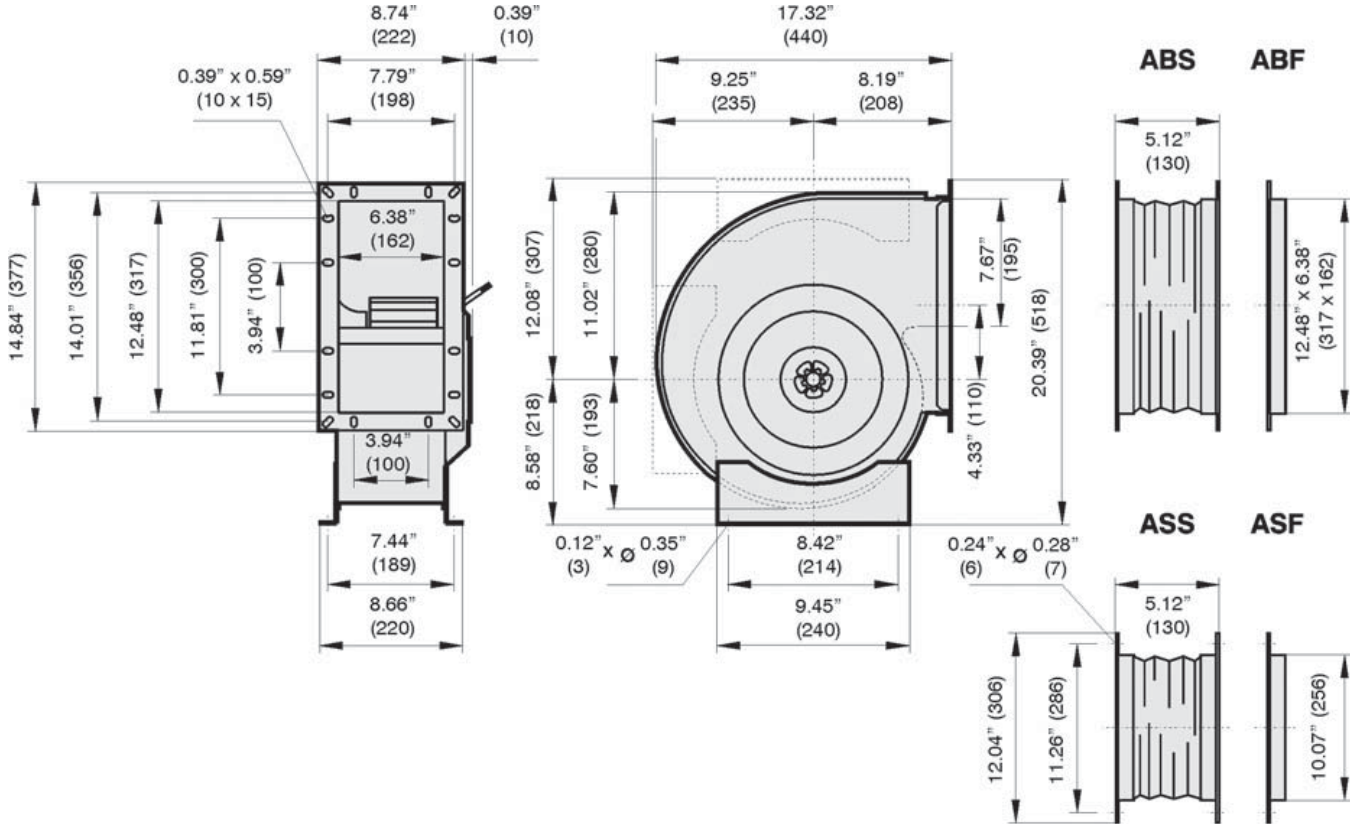




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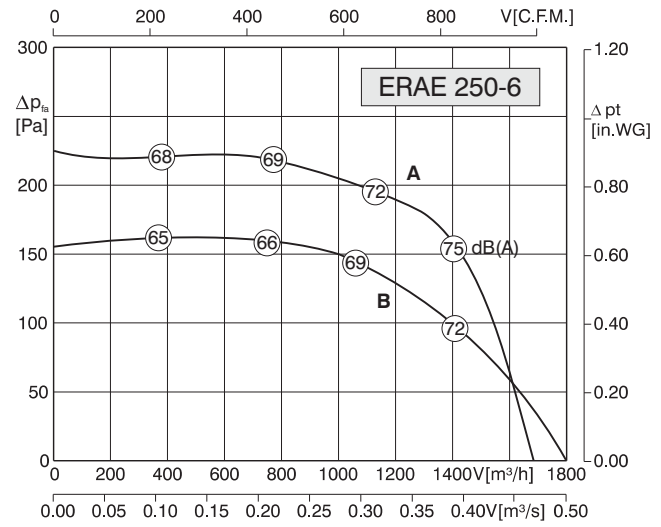


Type	U [Volt]	f [Hz]	Curve	P ₁ [kW]	I _N [A]	n [min ⁻¹]	t _r [°F]	t _r [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	Ⓜ [kg]
ERAD 250-4	3~460Y	60	A	1.15	1.90	1400	122	50	-	-	2.6	54	01.005	18
ERAD 250-4	3~230D	60	B	1.00	3.10	1325	140	60	-	-	2.6	54	01.006	18
ERAD 250-4	3~400Y	50	C	0.75	1.60	1230	149	65	-	-	3.6	54	01.005	18

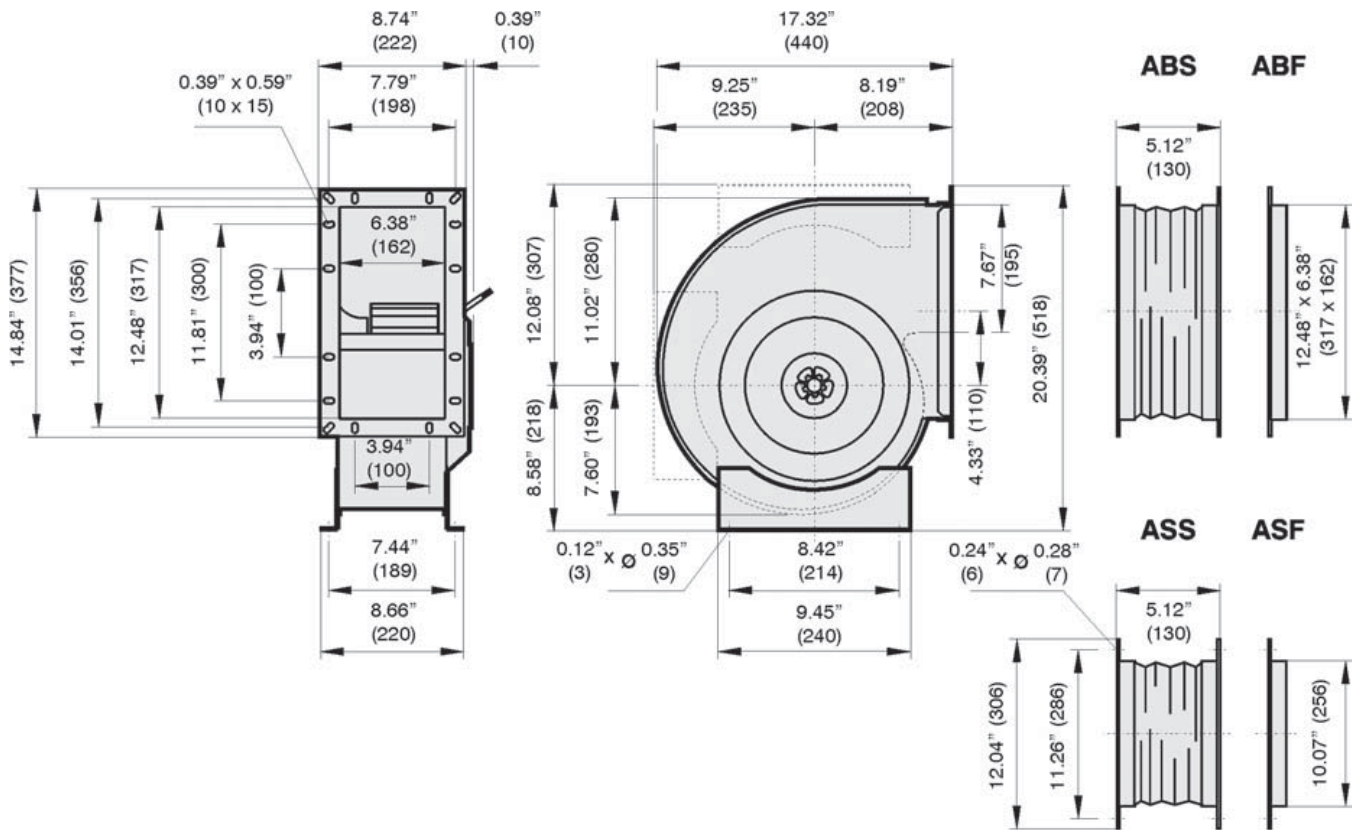




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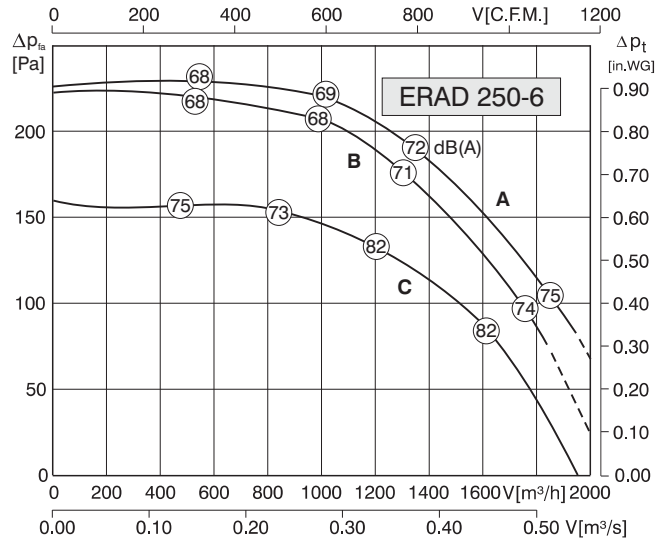


Type	U [Volt]	f [Hz]	Curve	P _i [kW]	I _N [A]	n [min ⁻¹]	t _R [°F]	t _R [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	■ [kg]
ERAE 250-6	1~120	60	A	0.35	3.10	720	122	50	24	-	1.1	54	01.024	15
ERAE 250-6	1~230	60	A	0.35	1.55	720	122	50	6	-	1.1	54	01.024	15
ERAE 250-6	1~230	50	B	0.30	1.30	760	140	60	6	-	1.4	54	01.024	15

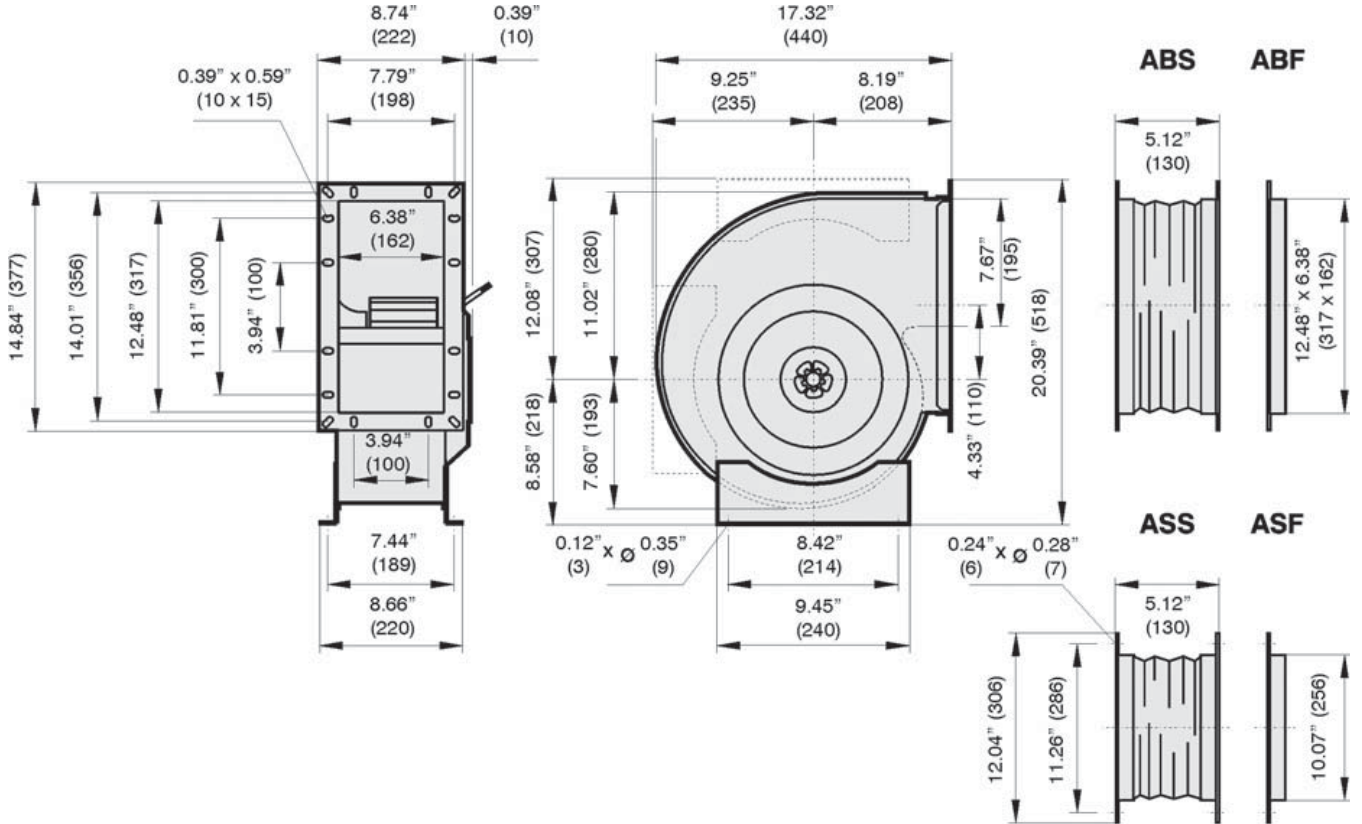




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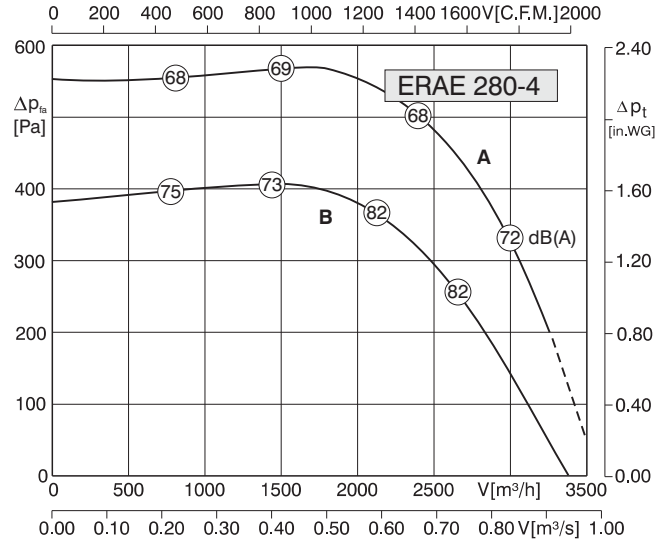


Type	U [Volt]	f [Hz]	Curve	P _i [kW]	I _N [A]	n [min ⁻¹]	t _r [°F]	t _r [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	█ [kg]
ERAD 250-6	3~460Y	60	A	0.40	0.75	990	122	50	-	-	1.9	54	01.005	15
ERAD 250-6	3~230D	60	B	0.35	1.20	930	140	60	-	-	1.9	54	01.006	15
ERAD 250-6	3~400Y	50	C	0.33	0.70	820	122	50	-	-	2.1	54	01.005	15

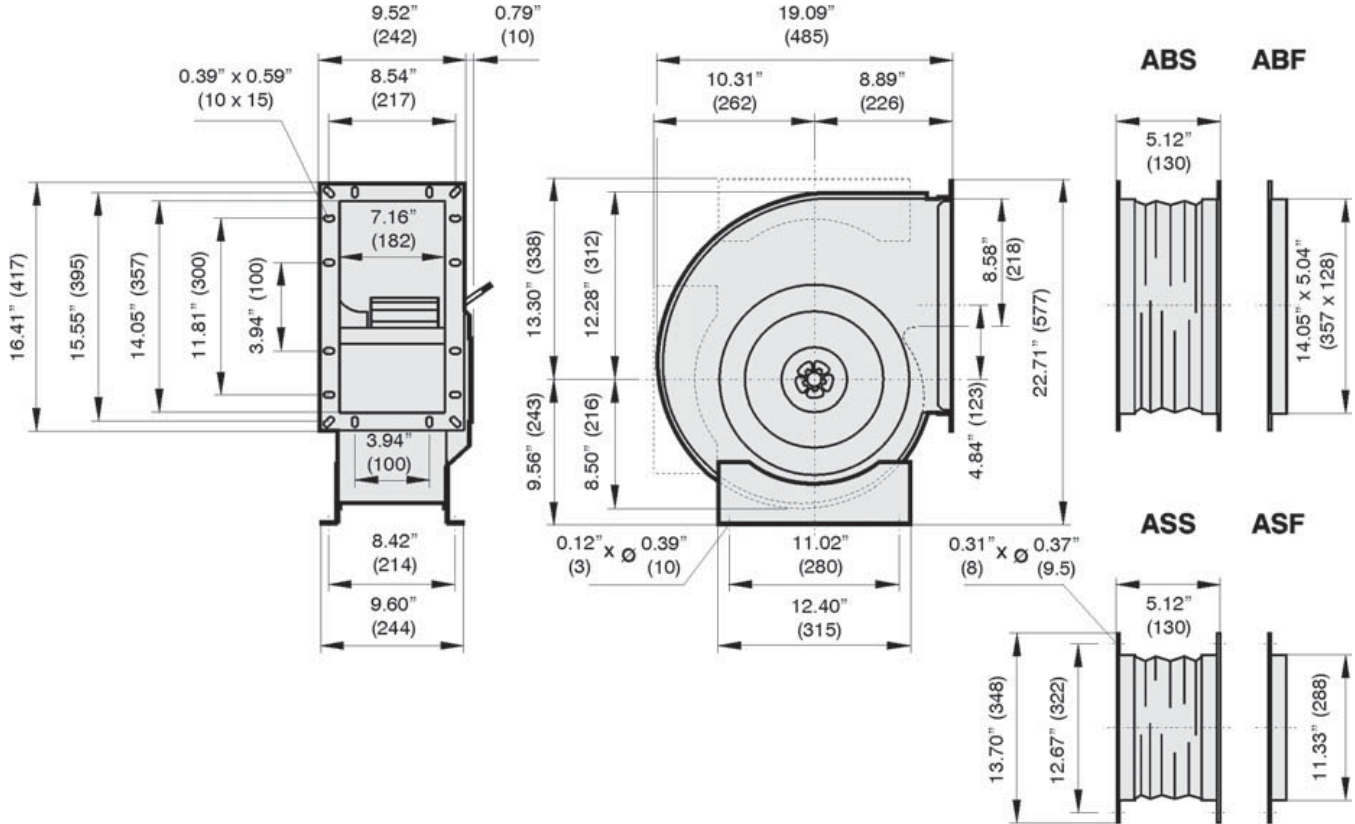




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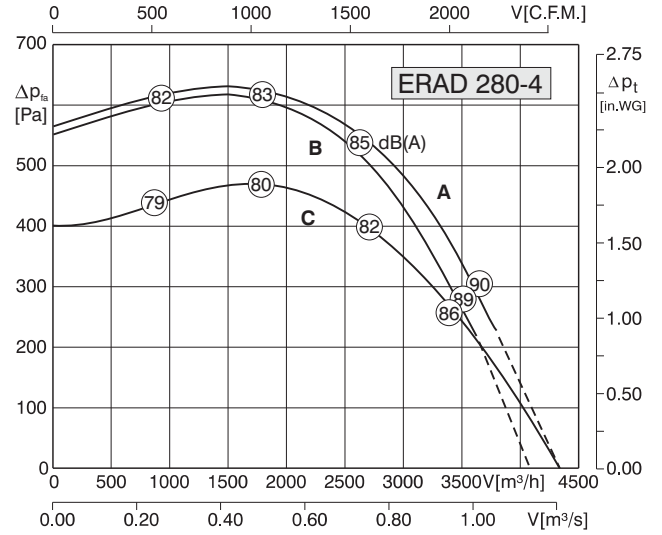


Type	U [Volt]	f [Hz]	Curve	P _i [kW]	I _N [A]	n [min ⁻¹]	t _R [°F]	t _R [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	■ [kg]
ERAE 280-4	1~120	60	A	1.70	15.2	1520	122	50	100	7	2.1	54	01.024	28
ERAE 280-4	1~230	60	A	1.70	7.60	1520	122	50	25	7	2.1	54	01.024	28
ERAE 280-4	1~230	50	B	1.45	6.80	1330	131	55	25	14	2.5	54	01.024	28

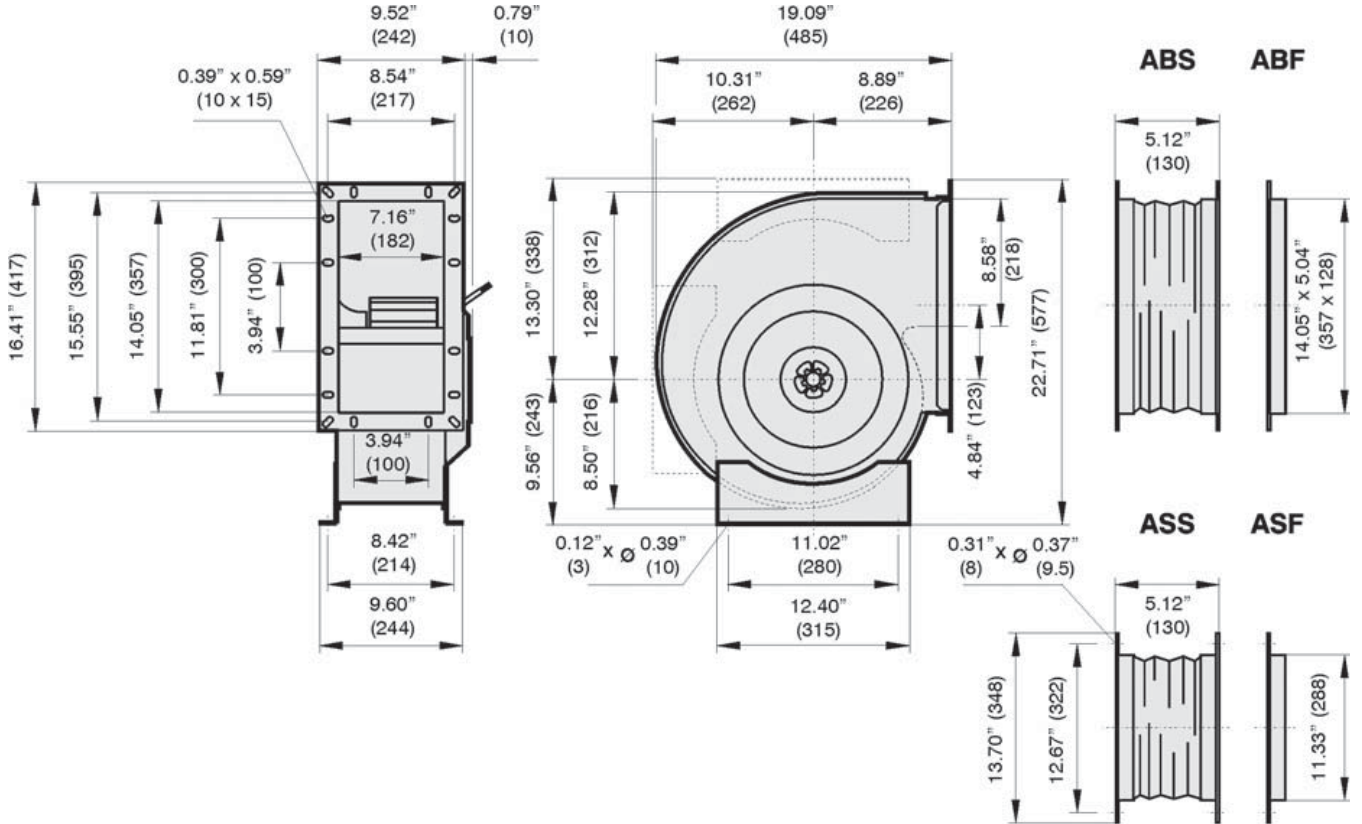




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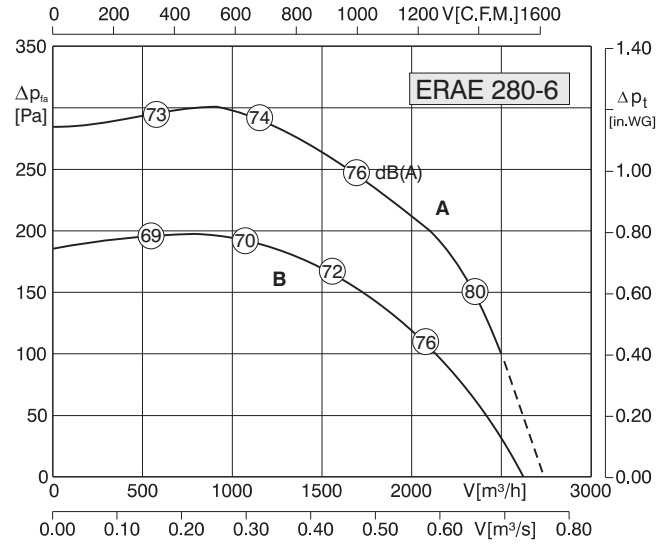


Type	U [Volt]	f [Hz]	Curve	P ₁ [kW]	I _N [A]	n [min ⁻¹]	t _r [°F]	t _r [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	█ [kg]
ERAD 280-4	3~460Y	60	A	2.05	3.20	1585	122	50	-	4	3.0	54	01.005	24
ERAD 280-4	3~230D	60	B	1.90	5.50	1490	122	50	-	3	3.0	54	01.006	24
ERAD 280-4	3~400Y	50	C	1.55	2.90	1310	122	50	-	6	3.9	54	01.005	24

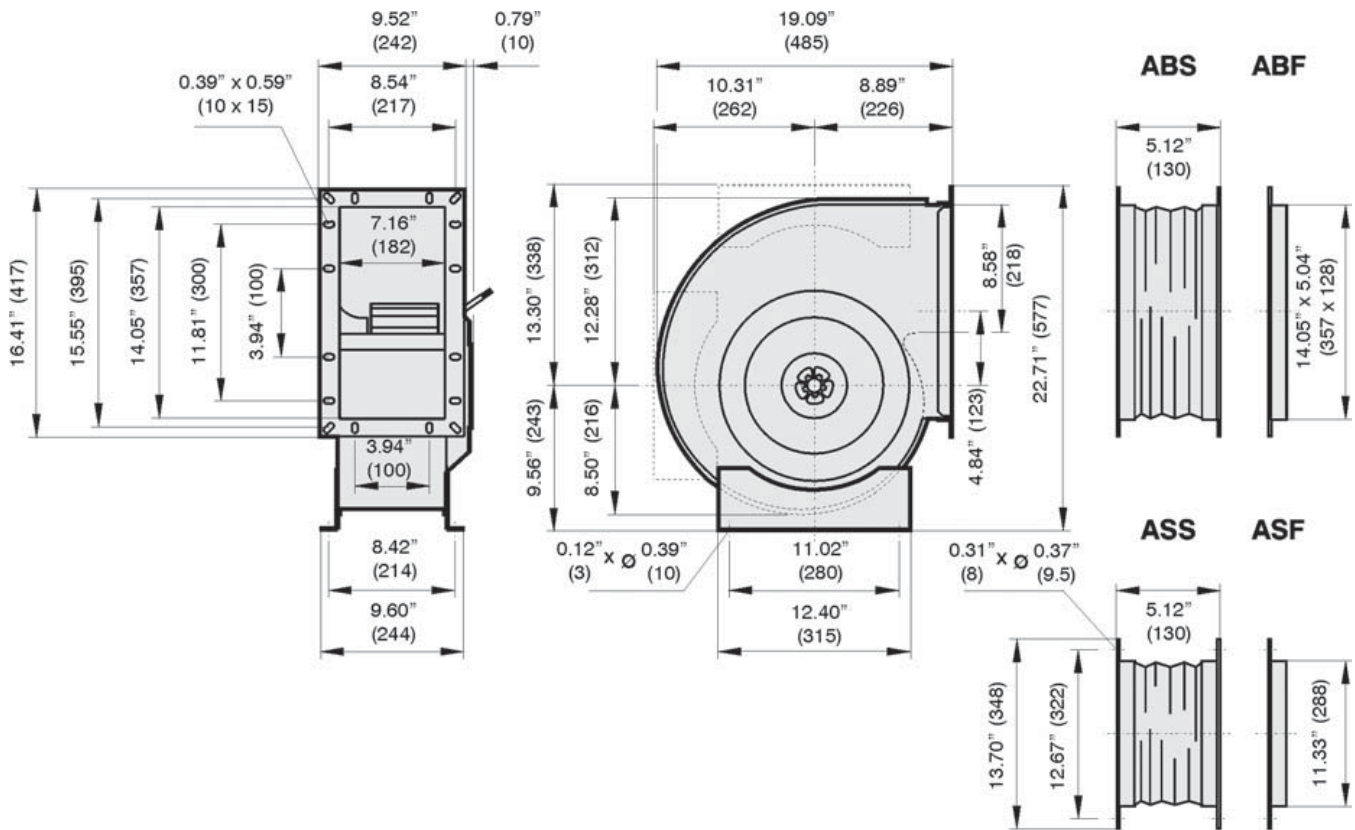




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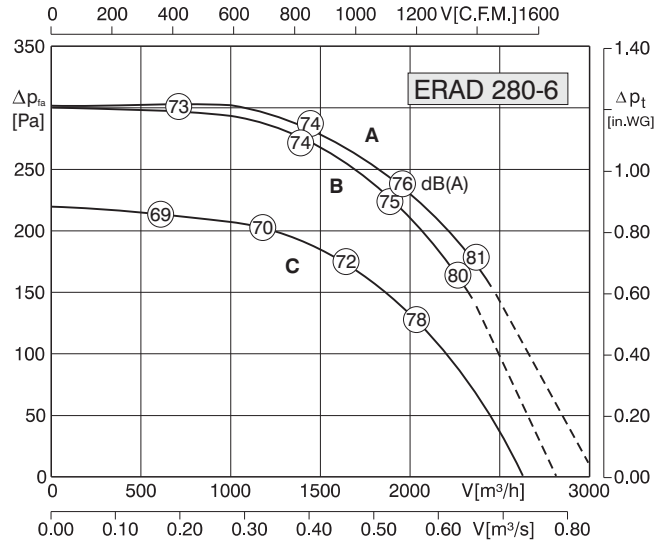


Type	U [Volt]	f [Hz]	Curve	P _i [kW]	I _N [A]	n [min ⁻¹]	t _R [°F]	t _R [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	■ [kg]
ERAE 280-6	1~120	60	A	0.67	3.00	1030	122	50	10	7	1.9	54	01.024	20
ERAE 280-6	1~230	60	A	0.67	6.00	1030	122	50	40	7	1.9	54	01.024	20
ERAE 280-6	1~230	50	B	0.60	2.90	880	122	50	10	14	2.2	54	01.024	20

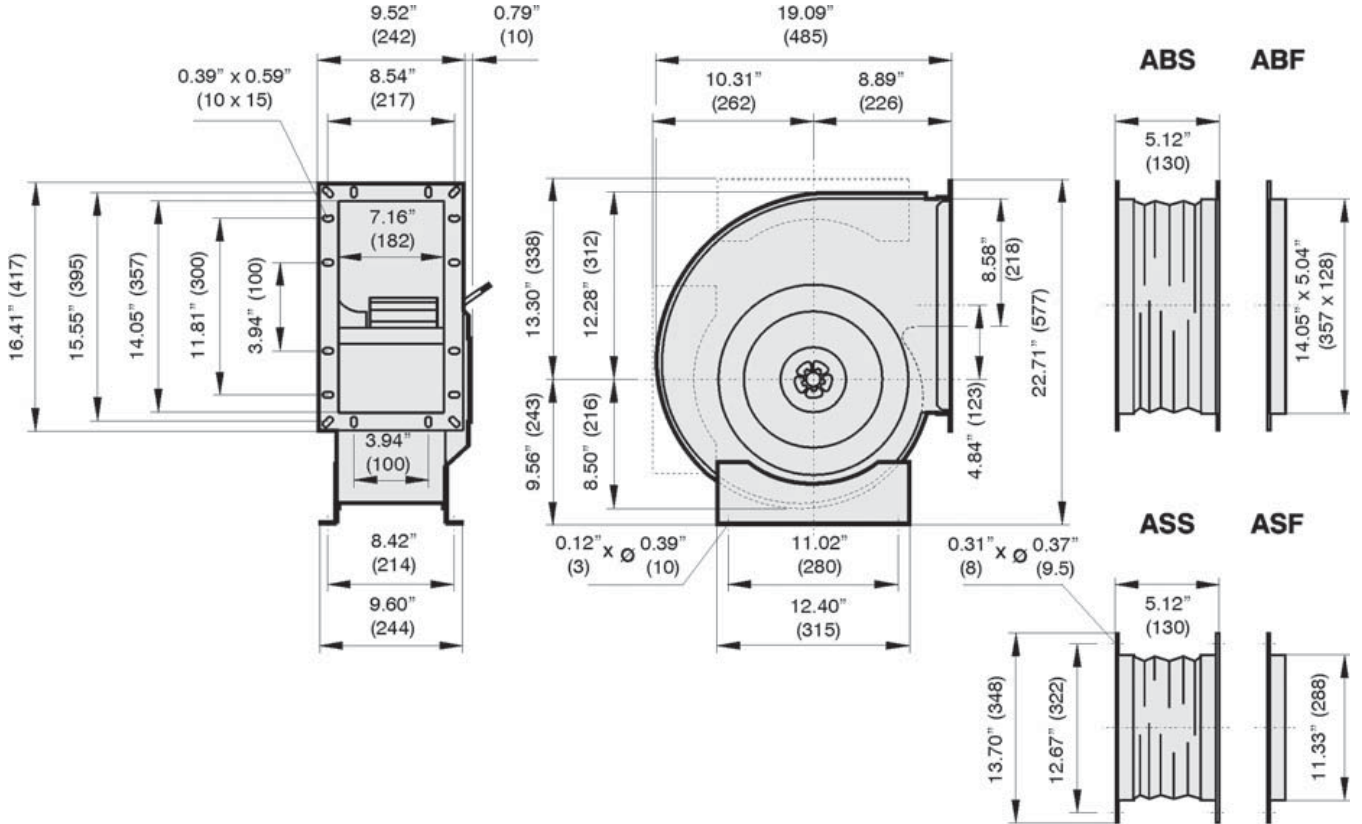




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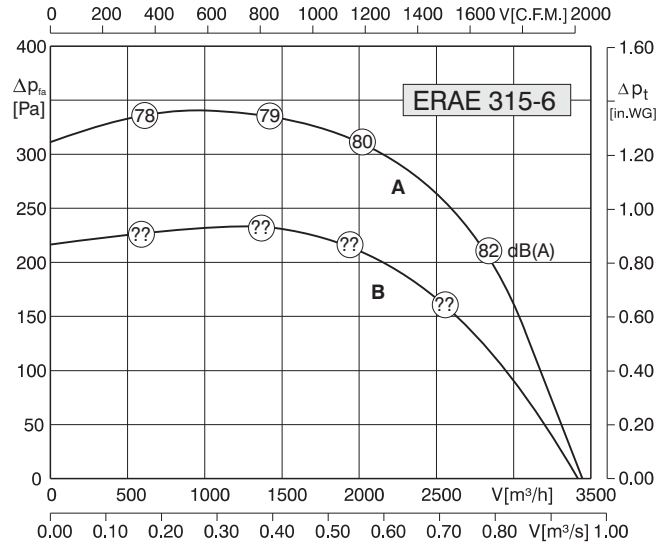


Type	U [Volt]	f [Hz]	Curve	P ₁ [kW]	I _N [A]	n [min ⁻¹]	t _r [°F]	t _r [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	█ [kg]
ERAD 280-6	3~460Y	60	A	0.60	1.05	1050	122	50	-	-	3.0	54	01.005	20
ERAD 280-6	3~230D	60	B	0.54	1.70	1020	122	50	-	-	3.0	54	01.006	20
ERAD 280-6	3~400Y	50	C	0.54	1.10	860	104	40	-	-	2.9	54	01.005	20

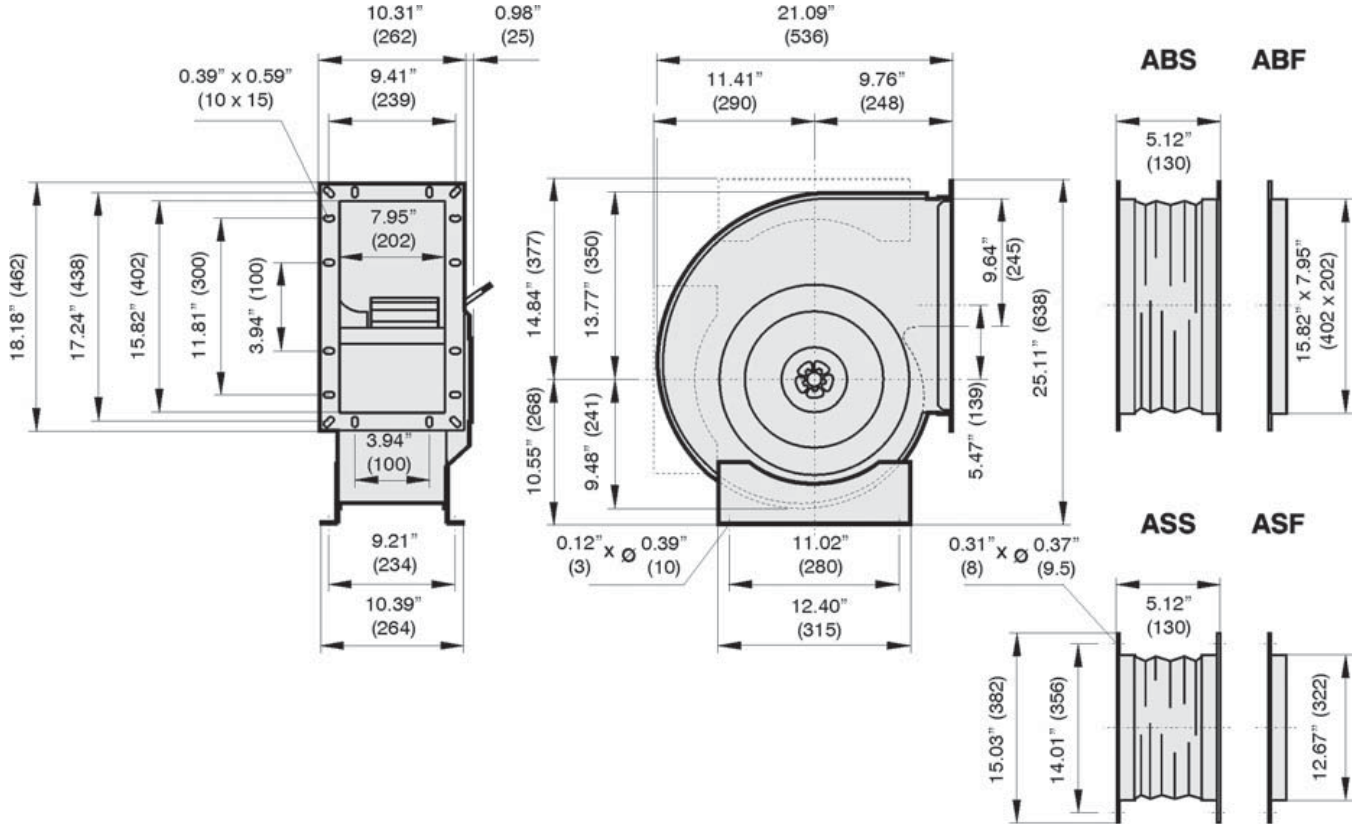




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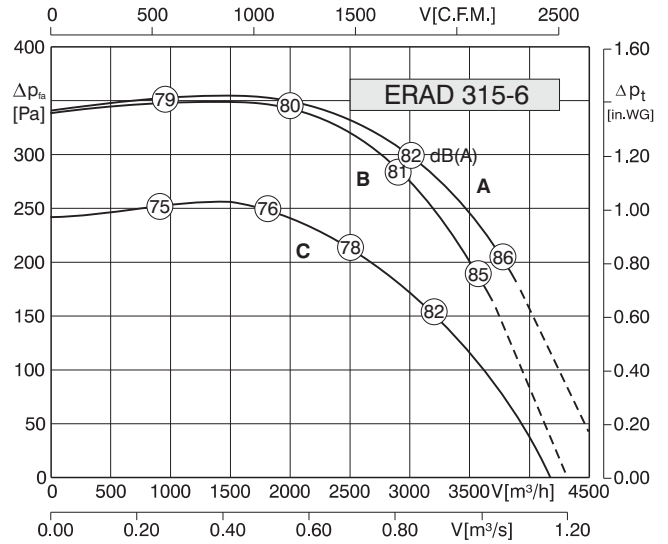


Type	U [Volt]	f [Hz]	Curve	P _i [kW]	I _N [A]	n [min ⁻¹]	t _R [°F]	t _R [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	■ [kg]
ERAE 315-6	1~120	60	A	1.15	5.60	835	140	60	64	-	1.4	54	01.025	32
ERAE 315-6	1~230	60	A	1.15	11.2	835	140	60	16	-	1.4	54	01.025	32
ERAE 315-6	1~230	50	B	0.96	5.30	804	158	70	16	-	1.6	54	01.025	32

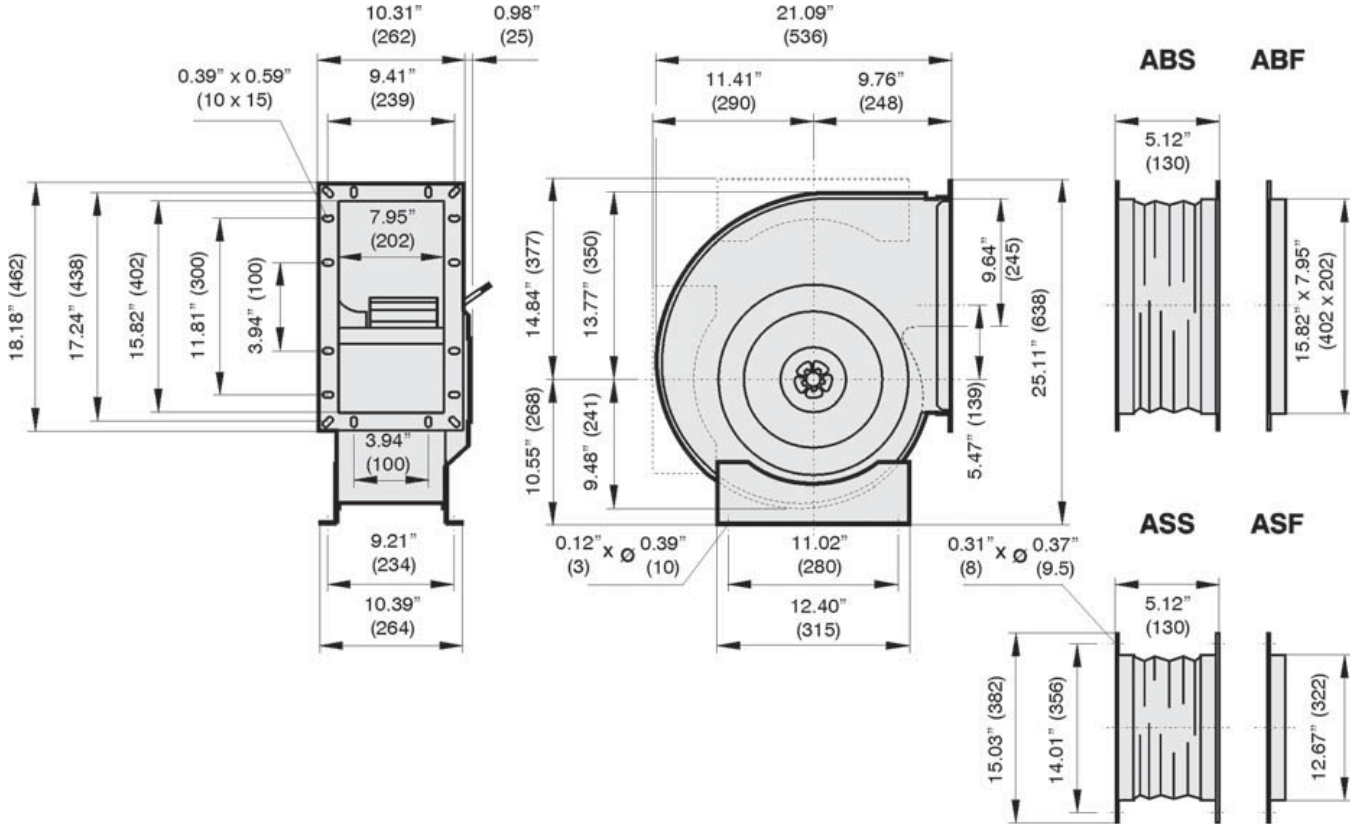




- compact and space saving design
- 100% speed controllable through auto transformers
- Motor protection through thermal contacts as standard

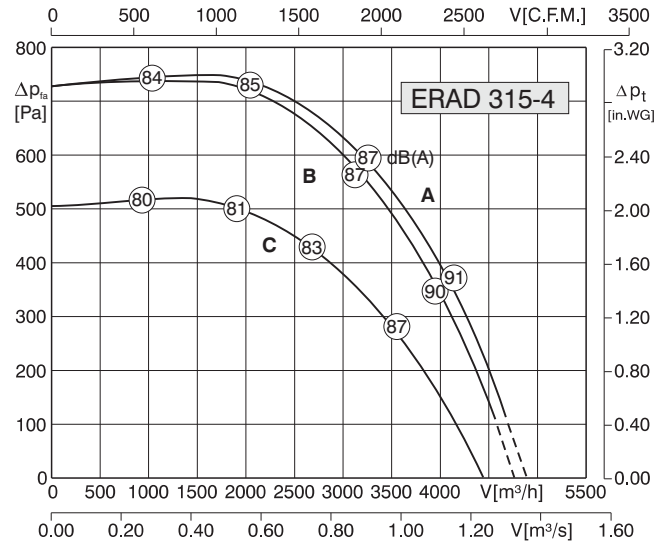


Type	U [Volt]	f [Hz]	Curve	P ₁ [kW]	I _N [A]	n [min ⁻¹]	t _r [°F]	t _r [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	█ [kg]
ERAD 315-6	3~460Y	60	A	1.20	2.1	1025	122	50	-	-	2.7	54	01.005	27
ERAD 315-6	3~230D	60	B	1.10	3.5	980	122	50	-	-	2.7	54	01.006	27
ERAD 315-6	3~400Y	50	C	0.95	2.1	850	122	50	-	-	2.5	54	01.005	27

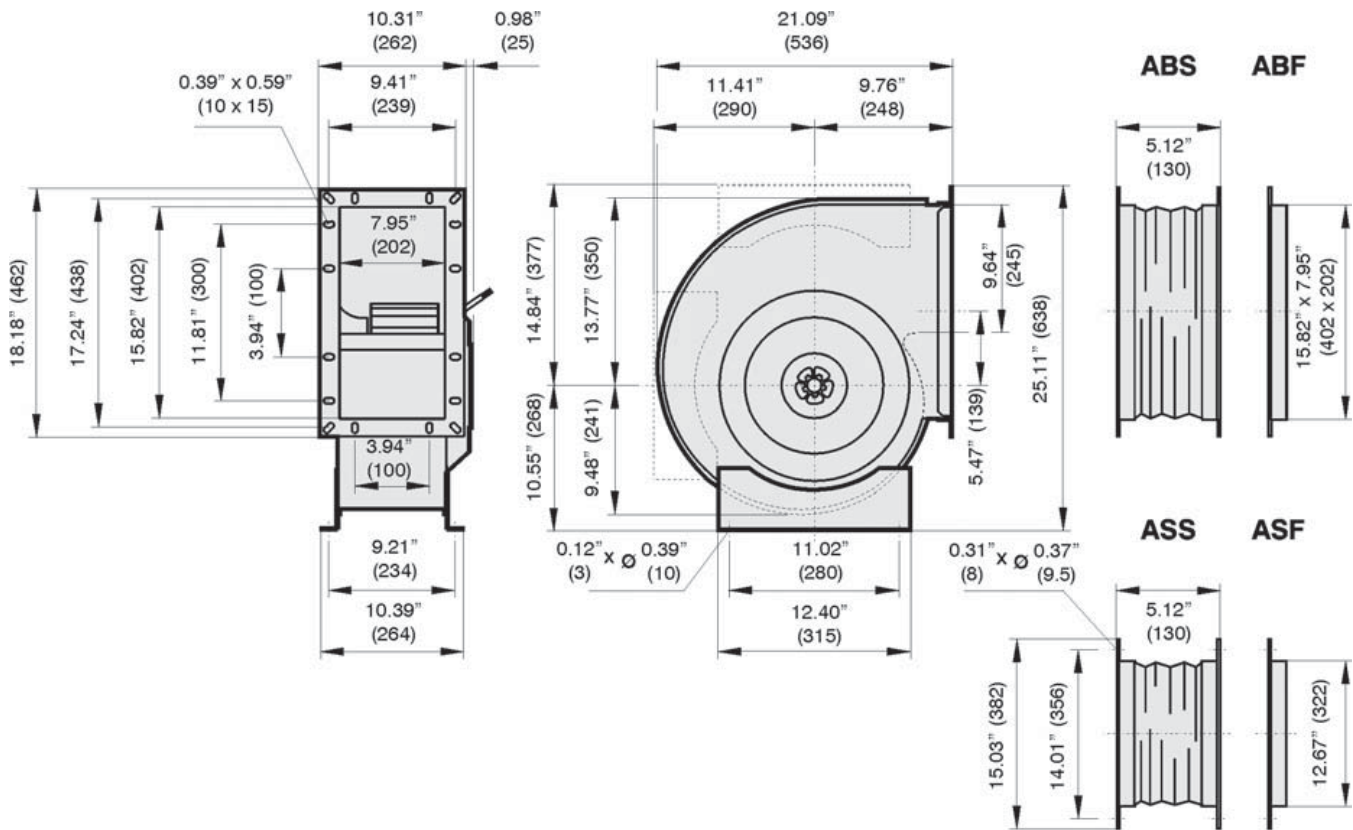




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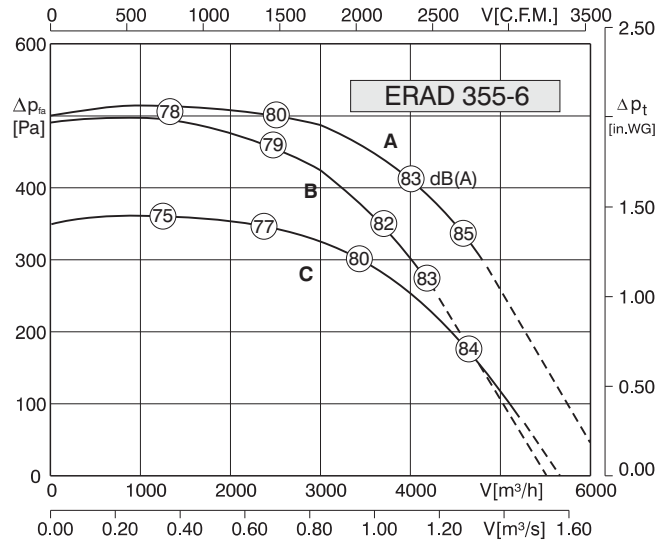


Type	U [Volt]	f [Hz]	Curve	P _i [kW]	I _N [A]	n [min ⁻¹]	t _R [°F]	t _R [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	■ [kg]
ERAD 315-4	3~460Y	60	A	2.90	4.90	1635	122	50	-	9	4.8	54	01.005	36
ERAD 315-4	3~230D	60	B	2.75	8.30	1590	122	50	-	9	4.8	54	01.006	36
ERAD 315-4	3~400Y	50	C	2.05	4.40	1380	158	70	-	5	4.2	54	01.005	36

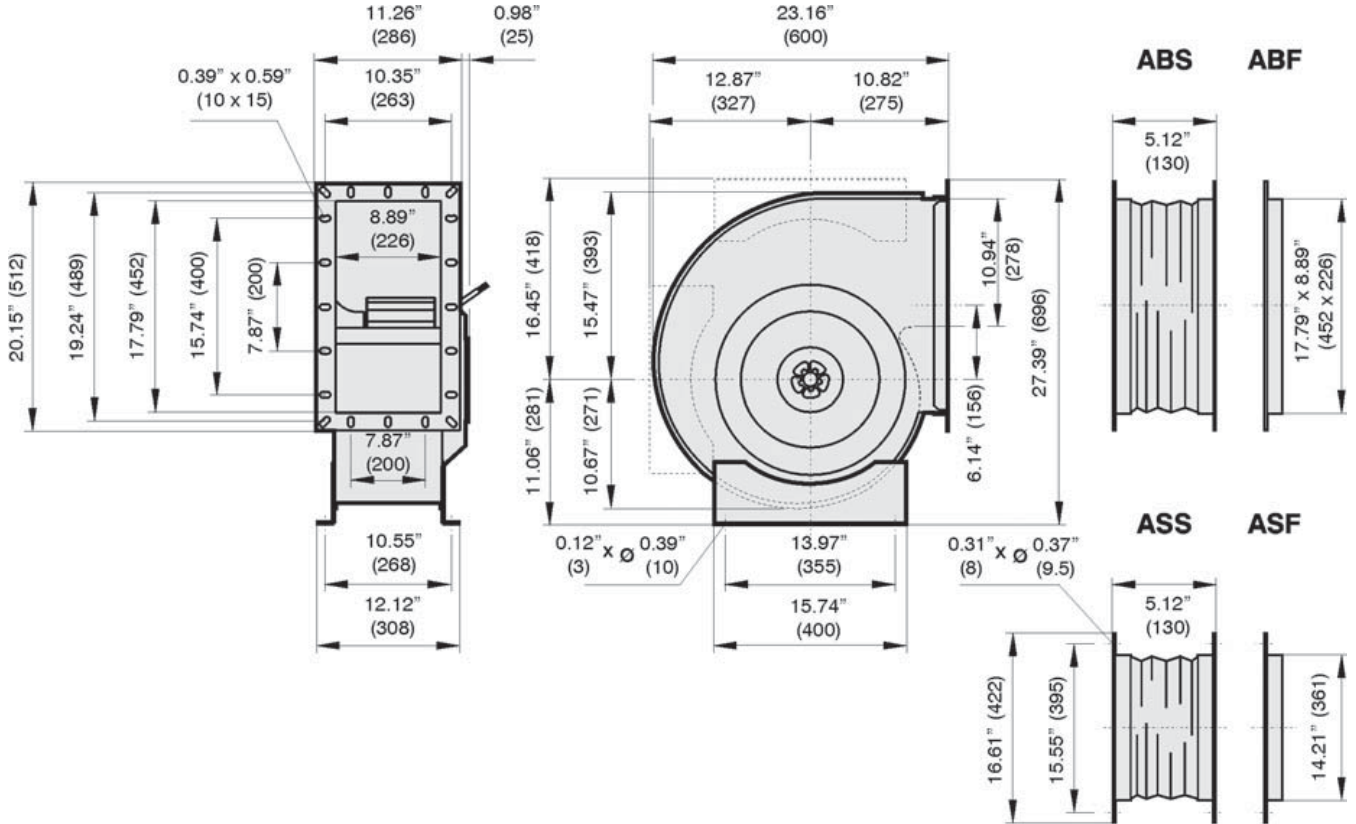




- compact and space saving design
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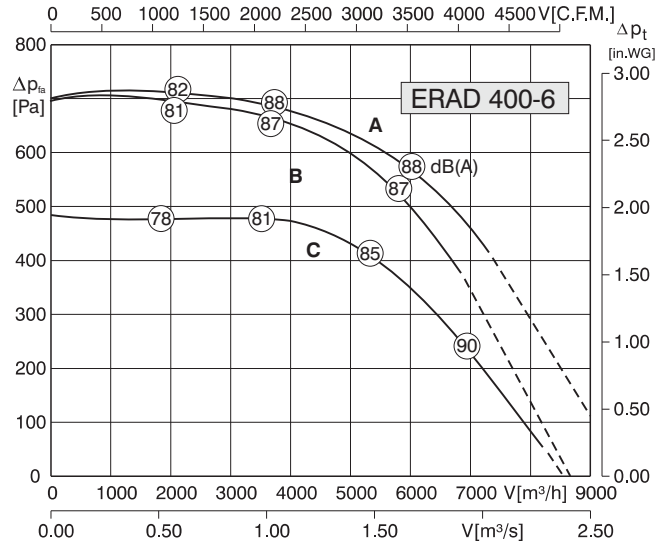


Type	U [Volt]	f [Hz]	Curve	P ₁ [kW]	I _N [A]	n [min ⁻¹]	t _r [°F]	t _r [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	★	█ [kg]
ERAD 355-6	3~460Y	60	A	1.70	2.8	960	122	50	-	-	2.5	54	01.005	35
ERAD 355-6	3~230D	60	B	1.50	4.7	880	122	50	-	-	2.5	54	01.006	35
ERAD 355-6	3~400Y	50	C	1.50	2.75	760	104	40	-	-	2.6	54	01.005	35

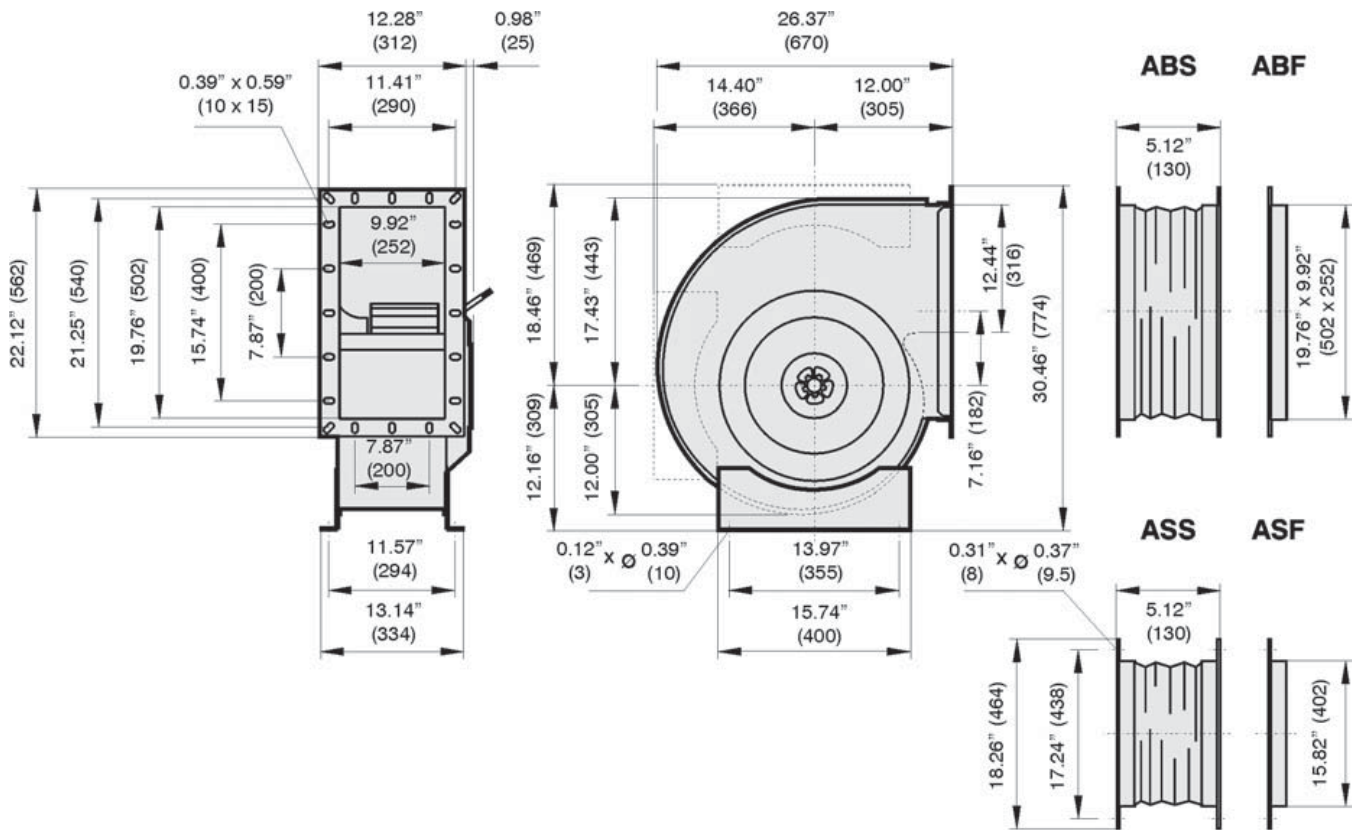




- compact and space saving design
- 100% speed controllable through auto transformers
- Motor protection through thermal contacts as standard

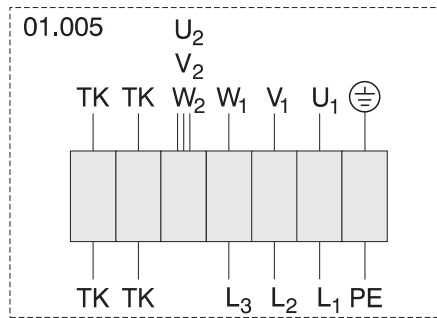


Type	U [Volt]	f [Hz]	Curve	P _i [kW]	I _N [A]	n [min ⁻¹]	t _R [°F]	t _R [°C]	C [μF]	ΔI [%]	I _A /I _N	▲	✱	█ [kg]
ERAD 400-6	3~460Y	60	A	3.50	5.45	1040	104	40	-	-	3.1	54	01.005	64
ERAD 400-6	3~230D	60	B	3.20	9.70	970	104	40	-	-	3.1	54	01.006	64
ERAD 400-6	3~400Y	50	C	3.00	5.50	860	104	40	-	-	3.1	54	01.005	64



No. 01.005

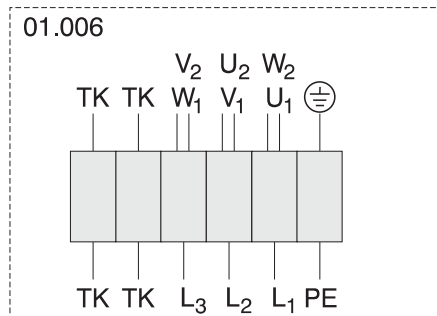
Three phase motor in Y connection with thermostatic switch. Changing of rotation direction by interchanging of 2 phases.



- U₁ brown
- V₁ blue
- W₁ black
- U₂ red
- V₂ grey
- W₂ orange
- TB white
- PE yellow-green

No. 01.006

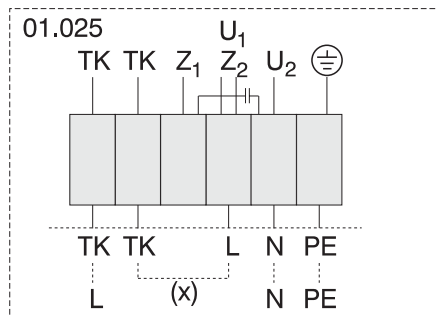
Three phase motor in delta connection with thermostatic switch. Changing of rotation direction by interchanging of 2 phases.



- U₁ brown
- V₁ blue
- W₁ black
- U₂ red
- V₂ grey
- W₂ orange
- TB white
- PE yellow-green

No. 01.025 anti-clockwise

Single phase A.C. motor with operating capacitor and thermostatic switch. Thermostatic switch wired in series with windings, if RE controllers are used. Insert bridge (x) and wire connections shown as dash-line on the drawing.



- U₁ brown
- U₂ blue
- Z₁ black
- Z₂ orange
- TB white
- PE yellow-green