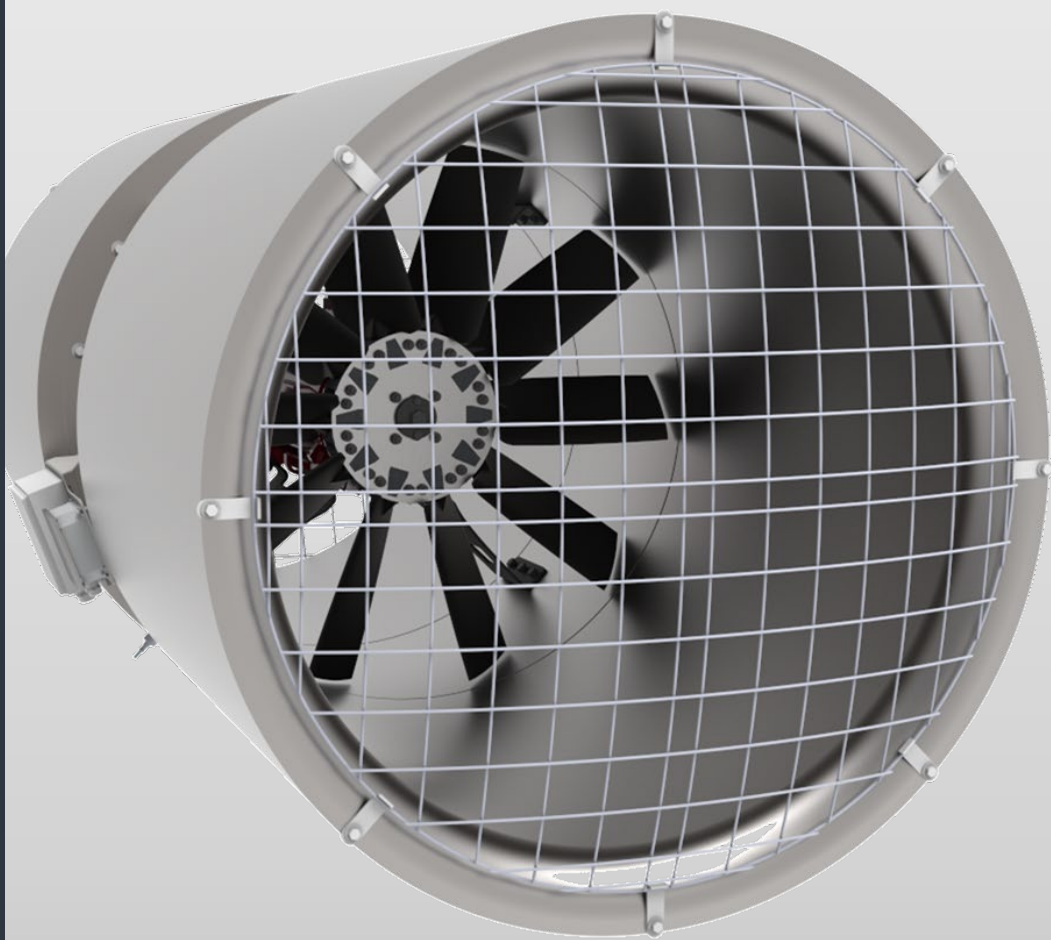




DE CARDENAS



JET FANS DJF

CATALOGUE

A company of Boldrocchi Group

GENERAL INFORMATION

The fans have been developed for ventilation of tunnels with aggressive atmospheres such as road traffic and train tunnels. They provide an effective way of handling polluted air and smoke from fires. The fans are in fact part of many concepts for firefighting.

The complete range of DJF fans meets all designer's and final user needs, are available with impeller diameters from 630 mm to 1600 mm and thrusts from 150 N to 2500 N.

All sizes of the range could be delivered with unidirectional or reversible flow (reversibility > 95%). On demand, fans can be supplied with a built-in "smart system" for an accurate running of thrust and short time inverse flow direction change, real-time monitoring of the life parameters remotely managed by the tunnel control system or by wireless device.

Designed, manufactured and certified according to the standards EN 12101-3:2015, the fans could be divided into three resistance class according to temperature and operating time requirement under temperature.

Class	Maximum Temperature [°C]	Operating Time [h]
F 200	200	2
F 300	300	1
F 400	400	2



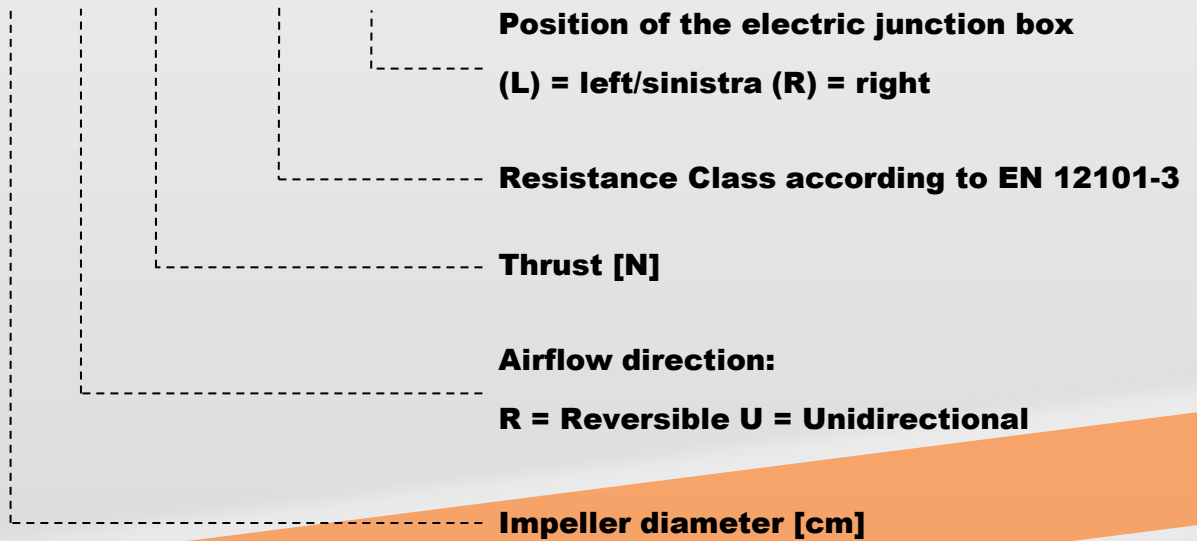
CERTIFICATE



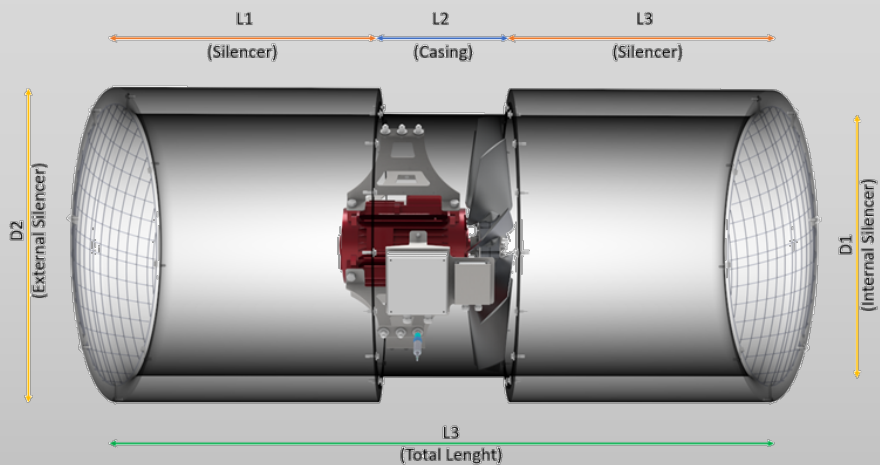
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FAN CODIFICATION

DJF 125 R 1500 F400 (R)



MAIN DIMENSIONS

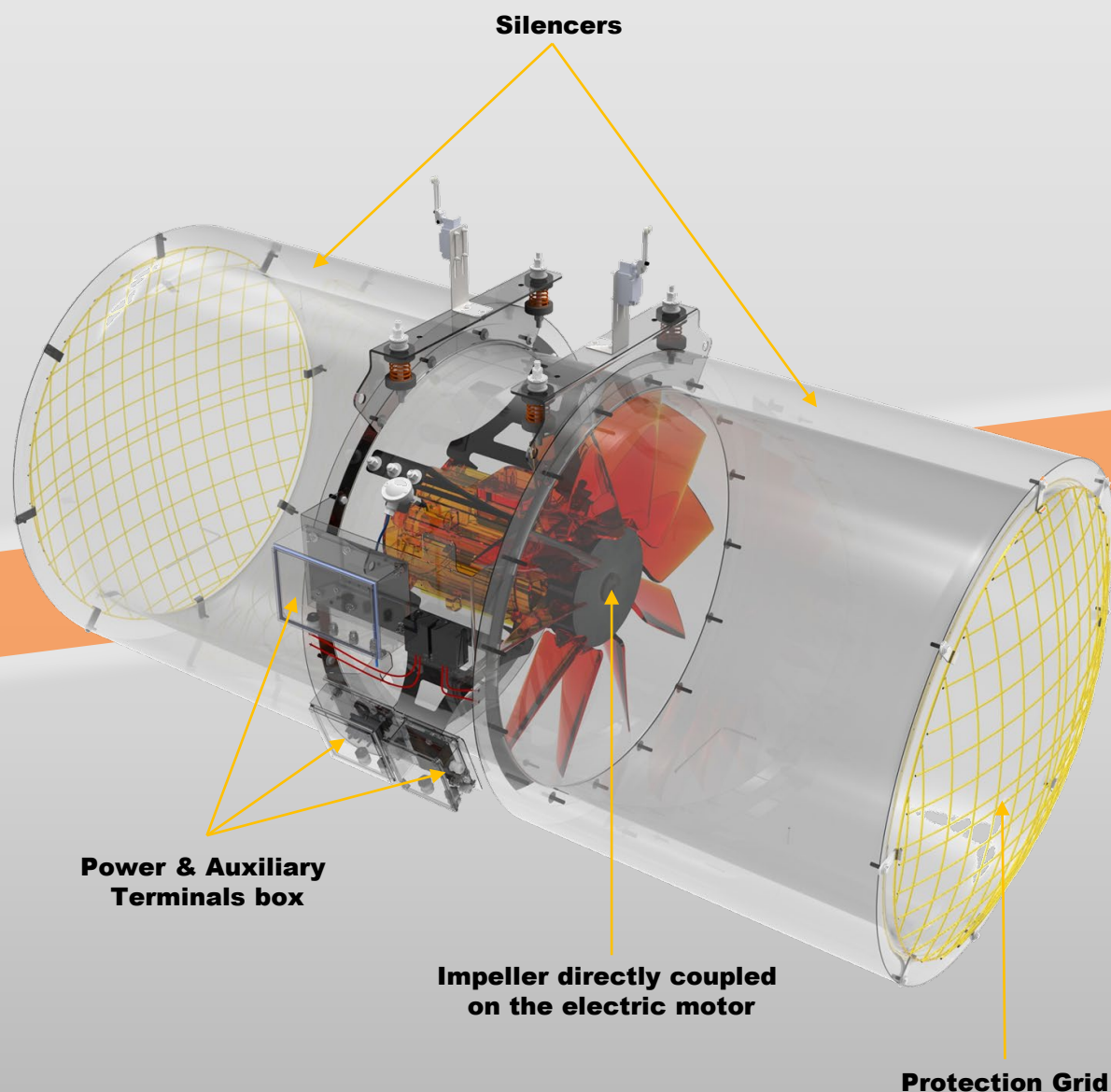


DJF SIZE	L1 [mm]	L2 [mm]	L3 [mm]	D1 [mm]	D2 [mm]	Weight [kg]
63	630	500	1760	630	830	262
71	710	500	1920	710	910	472
90	900	500	2300	900	1100	531
100	1.000	500	2500	1000	1200	596
112	1.120	500	2740	1120	1320	742
125	1.250	650	3150	1250	1450	968
140	1.400	850	3650	1400	1600	1312
160	1.600	950	4150	1600	1800	1524

(*) De Cardenas reserves the right to make technical changes

PRODUCT DESCRIPTION

The DJF is designed and built to operate in continuous service in the environmental conditions present at the installation site and withstand the mechanical, corrosive, thermal and humidity actions to which it will be exposed during operation.



MATERIAL FOR PRODUCTION

Casing, Brackets, Silencers and Supports can be manufactured with the following materials:

- carbon-steel plate, galvanized by immersion after working
- steel plate galvanized and painted with epoxy resin
- stainless steel plate AISI 304L
- stainless steel plate AISI 316L

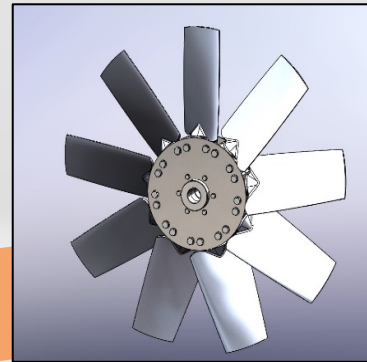
IMPELLER

The impeller (axial type) is directly coupled to the motor shaft. The blades are airfoil with high aerodynamic efficiency (symmetrical if Reversible) and are fixed to the hub through blocks that allow adjustment of the pitch angle with the impeller in stop position.

Both the blades and the blocks are made of Silumin aluminum alloy (Al Si 10 Mg) according to UNI 1706 ENAB 43100. The blades and blocks are then heat treated in order to guarantee high fatigue resistance.

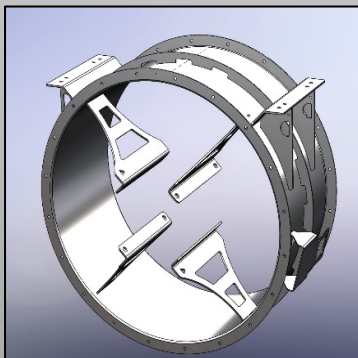
The blades and blocks are made by a gravity "casting" process. For this reason, the blades are checked for the integrity and uniformity of the fusion by radiographic examination under "X" rays according to ASTM - grade E155 standards to check the presence of gaseous occlusions inside the casting. The hub, in alloy steel protected by anti-corrosion treatment, is equipped

with a seat that allows direct coupling to the crankshaft, provided with a special tab. Blades, blocks and hub are fixed together by two discs in AISI 316L stainless steel.



CASING AND SUPPORTS

The casing with a cylindrical structure, is built with perforated flanges both on the suction side and on the blowing side, made in accordance with ISO 6580. It is complete with two supports to which dedicated brackets are connected allowing the installation of the fan under the vault of the tunnel. The brackets are designed specifically for each individual application, varying in height and inclination. The case is constructed so as not to be excited by the natural operating frequencies and is also designed for the installation of a vibration sensor for continuous monitoring of the vibratory state of the fan.



The motor support wings are designed to ensure the necessary rigidity to the system and in the same time ensuring high aerodynamic efficiency.

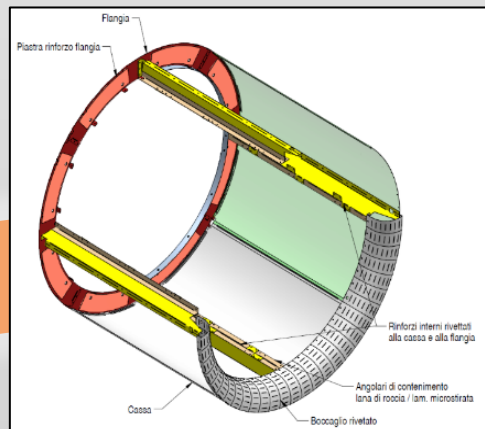
The volute can be built with the supports of the terminal boxes (power & signals) both on the right and on the left side in order to adapt to any pre-existing cable in the tunnel.

SILENCERS

The two cylindrical silencers are self-supporting and fixed directly to the casing. They have 4 reinforcement beams suitable for joining the external sheet with the internal one, in addition to the coupling flange and the front mouthpiece, to form an aeronautical derivation structure. They consist of an external mantle and a perforated internal sheet. Both the external mantle and the internal sheet are made with the same material and the same finish used for the fan volute.

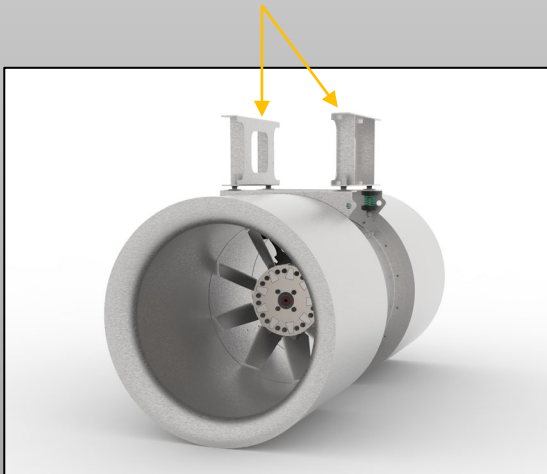
Between the external and internal sheets there is a padding in sound-absorbing material with high acoustic performance specially designed starting from the octave band noise of the fan. The sound-absorbing material is rot-proof, anti-mold and non-flammable in fire reaction class 0 and / or A1 according to EN 13501-1.

The two silencers are bolted to the fan on one side and a toroidal profile incorporated into the silencer on the other to reduce the formation of vortices at the air inlet and reduce the pressure drops at the inlet. The two silencers are also equipped with special slots for the escape of any condensation formed inside the silencer body, so as to guarantee the acoustic performance of the sound-absorbing material unchanged over time.



SUSPENSION SYSTEM

FAN'S BRACKETS



The suspension system is suitable for all the actual metro & tunnel application and allows to fix the fan either to the ceiling or to the wall of the tunnel, moreover, with a least amount of space necessary.

ELECTRIC MOTOR

The electric motor is alternating current, asynchronous induction, three-phase with squirrel cage rotor and cooling according to IEC 34-6 standards. The motor complies with IEC Standards 34-1 and 34-5 and is suitable for direct starting and via soft-starter with continuous operation in multi-voltage 400 V / 690 V.

The motor can be started by a 400V inverter, if is required even at a voltage of 690V, a special impregnation of the windings will be carried out and it will be equipped with special DE-NDE bearings suitable for the purpose.

The construction is in B30 form (code I IMB30) in order to ensure maximum fan efficiency, improving the quality of the air flow that hits the impeller. The motor is of the totally closed type without cooling fan: TEAO (Totally Enclosed Air Over) and is cooled in the air flow of the fan. The motor also ensures rapid starting of the fan, even with a voltage reduced by 15%.

The mechanical protection of the motor and terminal box is IP55 and the motor insulation class is H. The bearings are of the pre-lubricated type sized according to ISO 281 - L 10 for a life of 20,000 hours, with an average life of the bearing of 100,000 hours.

ACCESSORIES

The fan in the standard configuration is supplied with the rigid suspension system (designed according the installation point), two silencers, two protection grids and the vibration transmitter to ensure the minimum safety equipment. On demand, the following accessories can be supplied together with the DJF fan:

- Smart System (1)
- Suspension system with anti-vibration springs
- Multi-points Vibration detection system (additional vibration transmitter on motor or fan casing)
- Anti-condensation heater
- Temperature detection system (PTC or PT100 on windings / Bearings)
- Horizontal switch set
- Safety chain or safety ropes

(1) "Smart system" for real-time monitoring of fan life parameters, managed by the tunnel control system or by wireless device. For more information, please contact De Cardenas technical office.

TECHNICAL DATA UNIDIRECTIONAL FLOW – 50 Hz

Fan references	Inner Size [mm]	Thrust ⁽¹⁾ [N]	Air Flow [m³/s]	Air Speed [m/s]	Shaft Power [kW]	Motor power [kW] / pole	Noise Level ⁽²⁾ [dB(A)]
DJF 63 U	630	350	9,8	29,7	10	11 – 2	68
DJF 63 U	630	500	11,8	35,4	17,5	18,5 – 2	70
DJF 71 U	710	425	11,8	29,9	10	11 – 2	70
DJF 71 U	710	630	14,4	36,4	18	18,5 – 2	72
DJF 71 U	710	840	16,6	42,1	27,5	30 – 2	74
DJF 90 U	900	500	16,3	25,6	10	11 – 4	68
DJF 90 U	900	740	19,8	31,1	18	18,5 – 4	69
DJF 100 U	1000	640	20,5	26,1	14	15 – 4	67
DJF 100 U	1000	1000	25,6	32,6	27	30 – 4	69
DJF 100 U	1000	1150	27,4	34,9	33,5	37 – 4	70
DJF 112 U	1120	940	27,8	28,2	21	22 – 4	68
DJF 112 U	1120	1340	33,2	33,7	36	37 – 4	70
DJF 112 U	1120	1540	35,5	36,1	44	45 – 4	72
DJF 125 U	1250	1250	35,7	29,1	29	30 – 4	69
DJF 125 U	1250	1430	38,2	31,2	36	37 – 4	70
DJF 125 U	1250	1650	41,1	33,5	44	45 – 4	71
DJF 125 U	1250	1870	43,7	35,6	54	55 – 4	73
DJF 125 U	1250	2300	48,5	39,5	74	75 – 4	75
DJF 140 U	1400	1500	43,9	28,5	36	37 – 6	66
DJF 140 U	1400	1710	46,8	30,4	44	45 – 6	68
DJF 140 U	1400	1840	48,6	31,6	54	55 – 6	69
DJF 160 U	1600	2200	60,7	30,2	54	55 – 6	73
DJF 160 U	1600	2480	64,4	32,1	64	65 – 6	75

(1) At temperature of 20°C, density of 1.2 kg/m³, and at a pressure equal to 101324 Pa, without the protection grids.

(2) The indicated values are referred to the free-field sound pressure at 10 meters with a directivity of 45° with 1D silencers without pod.

TECHNICAL DATA

REVERSIBLE FLOW – 50 Hz

Fan references	Inner Size [mm]	Thrust ⁽¹⁾ [N]	Air Flow [m ³ /s]	Air Speed [m/s]	Shaft Power [kW]	Motor power [kW] / pole	Noise Level ⁽²⁾ [dB(A)]
DJF 63 R	630	300	8,8	28,3	10	11 – 2	68
DJF 63 R	630	450	11,8	34,7	14	15 – 2	70
DJF 71 R	710	385	11,3	28,5	10	11 – 2	71
DJF 71 R	710	570	13,7	34,6	18	18,5 – 2	73
DJF 71 R	710	730	15,5	39,2	26	30 – 2	75
DJF 90 R	900	445	15,4	24,1	10	11 – 4	69
DJF 90 R	900	550	17,1	26,8	16	18,5 – 4	70
DJF 100 R	1000	620	20,1	25,7	14	15 – 4	68
DJF 100 R	1000	800	22,9	29,1	21	22 – 4	69
DJF 100 R	1000	960	25,1	31,9	27	30 – 4	71
DJF 112 R	1120	860	26,6	27	21	22 – 4	69
DJF 112 R	1120	1230	31,8	32,3	36	37 – 4	71
DJF 112 R	1120	1400	33,9	34,4	44	45 – 4	73
DJF 125 R	1250	1150	34,3	28	29	30 – 4	71
DJF 125 R	1250	1320	36,7	29,9	36	37 – 4	72
DJF 125 R	1250	1510	39,3	32	44	45 – 4	73
DJF 125 R	1250	1730	42,1	34,3	54	55 – 4	75
DJF 125 R	1250	2140	46,8	38,1	74	75 – 4	77
DJF 140 R	1400	950	34,9	22,7	21	22 – 6	66
DJF 140 R	1400	1190	39,1	25,4	29	30 – 6	67
DJF 140 R	1400	1350	41,6	27	36	37 – 6	68
DJF 160 R	1600	2020	58,2	28,9	54	55 – 6	75
DJF 160 R	1600	2300	62,1	30,9	64	65 – 6	77

(1) At temperature of 20°C, density of 1.2 kg/m³, and at a pressure equal to 101324 Pa, without the protection grids.

(2) The indicated values are referred to the free-field sound pressure at 10 meters with a directivity of 45° with 1D silencers without pod.

TECHNICAL DATA UNIDIRECTIONAL FLOW – 60 Hz

Fan references	Inner Size [mm]	Thrust ⁽¹⁾ [N]	Air Flow [m³/s]	Air Speed [m/s]	Shaft Power [kW]	Motor power [kW] / pole	Noise Level ⁽²⁾ [dB(A)]
DJF 71 U	710	425	11,8	29,9	10	11 – 4	70
DJF 71 U	710	530	13,2	33,4	14	15 – 4	71
DJF 71 U	710	630	14,4	36,4	18	18,5 – 4	72
DJF 90 U	900	500	16,3	25,6	10	11 – 4	68
DJF 90 U	900	740	19,8	31,1	18	18,5 – 4	69
DJF 90 U	900	870	21,5	33,8	23	27 – 4	70
DJF 100 U	1000	760	22,3	28,4	18	18,5 – 4	67
DJF 100 U	1000	1000	25,6	32,6	27	30 – 4	69
DJF 100 U	1000	1150	27,4	34,9	33,5	37 – 4	70
DJF 112 U	1120	940	27,8	28,2	21	22 – 4	68
DJF 112 U	1120	1160	30,9	31,3	29	30 – 4	70
DJF 112 U	1120	1340	33,2	33,7	36	37 – 4	72
DJF 125 U	1250	1010	32,1	26,2	21	22 – 6	69
DJF 125 U	1250	1250	35,7	29,1	29	30 – 6	70
DJF 125 U	1250	1430	38,2	31,2	36	37 – 6	75
DJF 140 U	1400	1500	43,9	28,5	36	37 – 6	66
DJF 140 U	1400	1710	46,8	30,4	44	45 – 6	68
DJF 140 U	1400	1840	48,6	31,6	54	55 – 6	69
DJF 160 U	1600	2480	64,4	32,1	64	65 – 6	75

(1) At temperature of 20°C, density of 1.2 kg/m³, and at a pressure equal to 101324 Pa, without the protection grids.

(2) The indicated values are referred to the free-field sound pressure at 10 meters with a directivity of 45° with 1D silencers without pod.

TECHNICAL DATA

REVERSIBLE FLOW – 60 Hz

Fan references	Inner Size [mm]	Thrust ⁽¹⁾ [N]	Air Flow [m ³ /s]	Air Speed [m/s]	Shaft Power [kW]	Motor power [kW] / pole	Noise Level ⁽²⁾ [dB(A)]
DJF 71 R	710	300	9,9	25,1	6	11 – 4	71
DJF 71 R	710	600	14,1	35,5	17	18,5 – 2	72
DJF 71 R	710	800	13,7	34,6	28	30 – 2	73
DJF 90 R	900	445	15,4	24,1	10	11 – 4	69
DJF 90 R	900	660	18,7	29,4	18	18,5 – 4	70
DJF 90 R	900	820	20,8	32,8	24	27 – 4	72
DJF 100 R	1000	740	22	28	18	18,5 – 4	70
DJF 100 R	1000	960	25,1	31,9	27	30 – 4	71
DJF 100 R	1000	1050	26,2	33,4	31	37 – 4	73
DJF 112 R	1120	860	26,6	27	21	22 – 4	69
DJF 112 R	1120	1060	29,5	30	29	30 – 4	70
DJF 112 R	1120	1230	31,8	32,3	36	37 – 4	71
DJF 125 R	1250	920	30,7	25	21	22 – 6	70
DJF 125 R	1250	1150	34,3	28	29	30 – 6	71
DJF 125 R	1250	1320	36,7	29,9	36	37 – 6	72
DJF 140 R	1400	1350	41,6	27	36	37 – 6	68
DJF 140 R	1400	1550	44,6	29	44	45 – 6	70
DJF 140 R	1400	1770	47,6	31	54	55 – 6	72
DJF 160 R	1600	2300	62,1	30,9	64	65 – 6	77

(1) At temperature of 20°C, density of 1.2 kg/m³, and at a pressure equal to 101324 Pa, without the protection grids.

(2) The indicated values are referred to the free-field sound pressure at 10 meters with a directivity of 45° with 1D silencers without pod.



DE CARDENAS

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