ANAC
AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL

TYPE CERTIFICATE DATA SHEET No. ER-9411

ER-9411-02
Sheet 01

ENSTROM

MODELS
480
480B

15 October 2013

Type Certificate Holder:

THE ENSTROM HELICOPTER CORPORATION
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This data sheet, which is part of Type Certificate No. 9411, prescribes conditions and limitations under which the product, for which the Type Certificate was issued, meets the airworthiness requirements of the Brazilian Aeronautical Regulations.

I - ENSTROM 480 (Normal Category Rotorcraft) - 5PCLH, approved 12 September 1995. (See Notes 5 to 10, 12, 13 and 24).

ENGINE

One Allison 250-C20W.

FUEL SPECIFICATION

Mil-T-5624, Grade JP-4 or JP-5; Aviation Turbine Fuels ASTM-D1655 Jet A or A-1 (or Allison Spec EMS-64) or Jet B; Mil-DTL-83133, Grade JP-8.

ENGINE LIMITS

	Takeoff (5 min.)	Max. Continuous
Torque Pressure	67 psi (285 hp)	60 psi (256 hp)
Output Shaft Speed	103% (6 196 rpm)	103% (6 196 rpm)
Turbine Outlet Temperature	810° C	737° C
Gas Generator Speed	105% (53 519 rpm)	105% (53 519 rpm)

ROTOR LIMITS

Power Off		Power On	
Maximum	385 rpm	Maximum	365 rpm
Minimum	334 rpm	Minimum	357 rpm

AIRSPEED LIMITS

Never exceed 225 km/h (140 mph) (122 knots) IAS. For reduction in V_{NE} with altitude and gross weight, see Brazilian approved Rotorcraft Flight Manual.

C.G. LIMITS

Maximum Forward C.G. is +3 403 mm (+134.0 in), at all G.W. up to 998 kg (2 200 lb), decreasing linearly to +3 463 mm (+136.35 in), at 1 292 kg (2 850 lb).
Maximum Aft C.G. is +3 632 mm (+143.0 in), at all G.W. up to 1 134 kg (2 500 lb), decreasing linearly to +3 594 mm (+141.50 in), at 1 292 kg (2 850 lb).
Lateral: Maximum asymmetric moment ± 86,41 kgm (7 500 in-lb).

ALTITUDE LIMITS

3 962 m (13 000 feet) maximum height density altitude. For Reduction in altitude with gross weight, see Brazilian approved Rotorcraft Flight Manual

MAXIMUM WEIGHTS	1 292 kg (2 850 lb)
MINIMUM CREW	One (1) at +2 517 mm (+99.1 in) station.
PASSENGERS	One (1) at +2 260 mm (+89.0 in), and Three (3) at +2 872 mm (+113.1 in); or One (1) at +2 517 mm (+99.1 in) and One (1) at +2 872 mm (+113.1 in).
MAXIMUM BAGGAGE	68 kg (150 lb) at +4876 mm (+192.0 in)
FUEL CAPACITY	339.5 liters (266.6 kg) (89.7 Gallons-588 lb) at + 3673 mm (+144.6 in); See NOTE 1 for data on unusable fuel.
OIL CAPACITY	6.6 liters (5.7 kg) (12.6 lb) at +3886 mm (+153.0 in)
CONTROL SYSTEM RIGGING	Refer to Maintenance Manual.
SERIAL NUMBERS ELIGIBLE	S/N 5002 thru 5016 (See Notes 5 and 15).

II - ENSTROM 480 (Normal Category Rotorcraft) - 5PCLH, approved 12 September 1995.
Originally Manufactured in Compliance with or Modified per Note 11. (See Notes 5 to 10, 12, 13 and 24.) (This version of the model 480 differs from the basic model 480 in that installation of the items listed in Enstrom Drawing 4230002 permits operation with increased main rotor rpm and torque limits.)

ENGINE	One Allison 250-C20W.
FUEL SPECIFICATION	Mil-T-5624, Grade JP-4 or JP-5; Aviation Turbine Fuels ASTM-D1655 Jet A or A-1 (or Allison Spec EMS-64) or Jet B; Mil-DTL-83133, Grade JP-8.

ENGINE LIMITS

	Takeoff (5 min.)	Max. Continuous
Torque Pressure	68 psi (285 hp)	63 psi (256 hp)
Output Shaft Speed	103% (6 196 rpm)	103% (6 196 rpm)
Turbine Outlet Temperature	810° C	737° C
Gas Generator Speed	105% (53 519 rpm)	105% (53 519 rpm)

ROTOR LIMITS

Power Off		Power On	
Maximum	385 rpm	Maximum	372 rpm
Minimum	334 rpm	Minimum	365 rpm

AIRSPEED LIMITS	Never exceed 232 km/h (144 mph) (125 knots) IAS. For reduction in V_{NE} with altitude and gross weight, see Rotorcraft Flight Manual Supplement No. 6.
C.G. LIMITS	Maximum Forward C.G. is +3 403 mm (+134.0 in), at all G.W. up to 998 kg (2 200 lb), decreasing linearly to +3 463 mm (+136.35 in), at 1 292 kg (2 850 lb).

C.G. LIMITS (Cont.) Maximum Aft C.G. is +3 632 mm (+143.0 in), at all G.W. up to 1 134 kg (2 500 lb), decreasing linearly to +3 594 mm (+141.50 in), at 1 292 kg (2 850 lb).
Lateral: Maximum asymmetric moment ± 86,41 kgm (7 500 in-lb).

ALTITUDE LIMITS 3 962 m (13 000 feet) maximum height density altitude. For Reduction in altitude with gross weight, see Brazilian approved Rotorcraft Flight Manual

MAXIMUM WEIGHTS 1 292 kg (2 850 lb)

MINIMUM CREW One (1) at +2 517 mm (+99.1 in) station.

PASSENGERS One (1) at +2 260 mm (+89.0 in), and Three (3) at +2 872 mm (+113.1 in); or One (1) at +2 517 mm (+99.1 in) and One (1) at +2 872 mm (+113.1 in).

MAXIMUM BAGGAGE 68 kg (150 lb) at +4876 mm (+192.0 in)

FUEL CAPACITY 339.5 liters (266.6 kg) (89.7 Gallons-588 lb) at + 3673 mm (+144.6 in); See NOTE 1 for data on unusable fuel.

OIL CAPACITY 6.6 liters (5.7 kg) (12.6 lb) at +3886 mm (+153.0 in)

CONTROL SYSTEM RIGGING Refer to Maintenance Manual.

SERIAL NUMBERS ELIGIBLE S/N 5002 thru 5042, and 5044. (See Notes 5, 14 and 15).

III - ENSTROM 480B (Normal Category Rotorcraft) - 5PCLH, approved 05 October 2005. (See Notes 6 to 10, 12, 16 to 19, and 20 to 27).

ENGINE One Rolls-Royce 250-C20W.

FUEL SPECIFICATION Mil-T-5624, Grade JP-4 or JP-5; Aviation Turbine Fuels ASTM-D1655 Jet A or A-1 (or Allison Spec. EMS-64) or Jet B; Mil-DTL-83133, Grade JP-8.

ENGINE LIMITS

	Takeoff (5 min.)	Max. Continuous
Torque Pressure	72 psi (305 hp)	65 psi (276 hp)
Output Shaft Speed	103% (6 196 rpm)	103% (6 196 rpm)
Turbine Outlet Temperature	810° C	737° C
Gas Generator Speed	105% (53 519 rpm)	105% (53 519 rpm)

ROTOR LIMITS

Power Off		Power On	
Maximum	385 rpm	Maximum	372 rpm
Minimum	334 rpm	Minimum	365 rpm

AIRSPEED LIMITS Never exceed 232 km/h (144 mph) (124 knots) IAS. For reduction in V_{NE} with altitude and gross weight, see Brazilian approved Rotorcraft Flight Manual.

C.G. LIMITS	Longitudinal: Maximum Forward C.G. is +3 403 mm (+134.0 in), at all G.W. up to 998 kg (2 200 lb), decreasing linearly to +3477 mm (+136.9 in), at 1 361 kg (3 000 lb). Maximum Aft C.G. is +3 632 mm (+143.0 in), at all G.W. up to 1 134 kg (2 500 lb), decreasing linearly to +3580 mm (+140.95 in), at 1391 kg (3 000 lb). Lateral: Maximum asymmetric moment ± 86,41 kgm (7 500 in-lb)
ALTITUDE LIMITS	3 048 m (10 000 feet) maximum height density altitude at 1 391 kg (3 000 lb) gross weight. 3 962 m (13 000 feet) maximum height density altitude at 1 293 kg (2 850 lb) gross weight. For Reduction in altitude with gross weight, see Brazilian approved Rotorcraft Flight Manual
MAXIMUM WEIGHTS	1 391 kg (3 000 lb)
MINIMUM CREW	One (1) at +2 517 mm (+99.1 in) station.
PASSENGERS	One (1) at +2 260 mm (+89.0 in), and Three (3) at +2 872 mm (+113.1 in); or One (1) at +2 517 mm (+99.1 in) and One (1) at +2 872 mm (+113.1 in); or One (1) at + 2 565 mm (+101.0 in) and Two (2) at +2 872 mm (+113.1) in. (See Note 19)
MAXIMUM BAGGAGE	68 kg (150 lb) at +4876 mm (+192.0 in)
FUEL CAPACITY	339.5 liters (266.6 kg) (90 gallons- 607 lb) at + 3 673 mm (+144.6 in); See NOTE 1 for data on unusable fuel.
OIL CAPACITY	6.6 liters (5.7 kg) (12.6 lb) at +3886 mm (+153.0 in)
CONTROL SYSTEM RIGGING	Refer to Maintenance Manual.
SERIAL NUMBERS ELIGIBLE	S/N 5043, 5045 and subsequent. (See Notes 14 and 15).

DATA PERTINENT TO ALL MODELS

DATUM	3640 mm (143.334 in.) forward of main rotor hub centerline
LEVELING MEANS	Lower longeron of pylon section.
SERIAL NUMBERS ELIGIBLE	A FAA Certificate of Airworthiness for Export, endorsed as noted under Import Requirements, must be submitted for each individual rotorcraft for which application for a Brazilian Airworthiness Certificate is made.
IMPORT REQUIREMENTS	A Brazilian Airworthiness Certificate must be issued in the basis of the Airworthiness Certificate for Exportation issued by the FAA, including the following statement: "The rotorcraft covered by this Certificate has been inspected, tested and found to comply with the Brazilian approved type design as defined by the ANAC Type Certificate No 9411, and is in condition for safe operation." (See Note 4).

CERTIFICATION BASIS Brazilian Type Certificate No. 9411 issued on 12 September 1995 based on the RBHA 27, which endorses the FAR 27, effective 01 February 1965, as amended by 27-1 thru 27-23, effective 03 October 1988; RBHA/FAR 27.337, 27.351, 27.395, 27.401, 27.501, 27.613, 27.629, 27.663, 27.685, 27.727, 27.783, 27-861 and 27.865(a) as amendment 27-26, effective 05 April 1990; RBHA/FAR 27.775 as amended by 27-27, effective 22 October 1990; RBHA/FAR 27.2 as amendment 27-28, effective 16 September 1991; and RBHA/FAR 36 amendment 20 (Appendix J) effective 11 September 1992, plus the Brazilian Special Conditions listed in the CTA Fax/letter nº 385/FDH/IFI/93, dated 20 September 1993.

EQUIPMENT The basic required equipment as prescribed in the applicable airworthiness regulations must be installed in the helicopters for certification, and, in addition, those equipments established in the FAA approved Brazilian Rotorcraft Flight Manual issued for the applicable helicopters serial numbers.

NOTES:

NOTE 1 Current Weight and Balance Report, with List of Equipment included in the certificated empty weight, interior arrangement and loading instructions, when necessary, must be provided for each helicopter at the time of the original certification. The Certificated empty weight and corresponding center of gravity locations must include unusable fuel as tabulated below:

Model	Fuel Bladder Part Number	Unusable Fuel
480	4122009, -1, -2 & -4	0.9 kg (2 lb) at +3 642 mm (+143.4 in)
480	4122052, -1 & -2	5.17 kg (11.4 lb) at +3 642 mm (+143.4 in)
480B	4122052, -1 & -2	5.17 kg (11.4 lb) at +3 642 mm (+143.4 in)

NOTE 2 Rotorcraft operation must be in accordance with the FAA approved Brazilian Rotorcraft Flight Manual.
All required placards listed in the limitations Section of the Aircraft Flight Manual must be installed in the appropriated locations.
All markings and placards for passenger information, external markings for emergency, and load limits in cargo/baggage compartments must be presented in Portuguese or bilingual. For the approved marking and placards translations contact the TC holder and/or ANAC at the following address: normas.aeronaves@anac.gov.br.

NOTE 3 Information essential for the proper maintenance of the helicopter is contained in the pertinent model Maintenance Manual. The retirement times of critical parts are listed in the following table. These values of retirement times of service life can not be increased without ANAC Engineering Approval.
The following special notations augment the Service Life Table specifying limitations and/or special conditions associated with authorized Gross Weights and service lives.

SERVICE LIFE – HOURS				
Part Number	Component	Model	EH-480	EH-480B
		Weight (kg)	1.292	1.361
		(lb)	2.850	3.000
ECD 084-1	Tension – torsion strap		1.200*	1.200*
ECD 100 (All dash Numbers)	Tail rotor gear set		1.200	1.000
ECD-100-1, -2	Tail Rotor Gear set		1.200	1.000
ECD 4000 (All dash Numbers)	Drive Belt		5.500	5.500
ECD 4056 (All dash Numbers)	Bearing lower Pulley Assembly		1.200	1.200
20368	Reservoir Cylinder (Pop Out Floats)		◊	◊
28-13106-3	Ring Gear Carrier		2.500	2.500
28-13108 (All dash Numbers)	Main Rotor Ring Gear and Pinion Set		3.700	2.300
28-14207-9	Pitch Change Bellcrank Assembly		3.130	N/A
28-14280-1	Main Rotor Hub Plate (Upper)		5.000	N/A
28-14280-3	Main Rotor Hub Plate (Upper)		+	N/A
28-14280-5	Main Rotor Hub Plate (Upper)		+	4.592
28-14281-1	Main Rotor Hub Plate (Lower)		5.000	N/A
28-14281-3	Main Rotor Hub Plate (Lower)		+	N/A
28-14281-5	Main Rotor Hub Plate (Lower)		+	4.592
28-14320-15	Thrust Bearing (Lamiflex)		▲▲	N/A
28-150074-11, -13	Tail Rotor Spindle		1.200	1.200
4110006-17, -18	Pylon/Keel Attachment Plate		10.000	N/A
4112034-11	Vibration Absorber Beam (Tailcone)		3.835	3.835
4130002-11	Ring Gear Carrier		1.200	N/A
4130045 (All dash Numbers)	Main Rotor Ring Gear and Pinion Set		3.700	2.300
4131003 (All dash Numbers)	Splined Driveshaft, Overrunning Clutch		3.500	3.500
4166024-15, -23	Vibration Absorber Beam (Cyclic Control System)		1.200	1.200

▲▲ Retire from service 5 calendar years from date of manufacture all Lamiflex bearings serial number 5997 and prior.
Retire from service 5 calendar years from date of installation* or 8 calendar years from date of manufacture, which ever occurs first, all Lamiflex bearings serial numbers 5998 and subsequent.

* Date of installation is defined as the date the Lamiflex bearing packaging is opened.

\+ No time limit. Remove Component on condition per Maintenance Manual inspection criteria.

◊ Retire from service 15 years from the original test date marked on manufacture's label.

* Retire from service 24 months after date of installation or 1 200 hours, whichever occurs first.

N/A Not Approved for installation.

NOTE 4 The differences of the Brazilian airplanes in relation to the basic FAA type design are summarized below:

1. The Brazilian Airplane Flight Manual.
2. The Markings and Placards in the Portuguese language (See Note 2).

NOTE 5 Enstrom Model 480, S/N 5001 was certificated 07 June 1993, with 4-place seating. It is eligible for 5 place seating when retrofitted in conformeance with Enstrom drawing 4119775 "Aft Bench Seat Installation" and 4192034 "Battery Installation."

NOTE 6 Enstrom Models 480 and 480B are eligible for installation of Cargo Hook Kit No. 4220024. When so equipped they must be operated within the prescribed limitations of Flight Manual Supplement No. 1.

NOTE 7 Enstrom Models 480 and 480B are eligible for installation of Snowshoe Kit No. 4220016 when operated within the prescribed limitations of Flight Manual Supplement No. 2.

NOTE 8 Enstrom Models 480 and 480B are eligible for installation of external fuel filter Kit No. 4220035 when operated within the prescribed limitations of Flight Manual Supplement No. 3.

NOTE 9 Enstrom Models 480 and 480B are eligible for installation of Baggage Box Extension Kit No. 4220029 when operated within the prescribed limitations of Flight Manual Supplement No. 4.

NOTE 10 Enstrom Model 480 and 480B are eligible for installation of Camera Door Kit No. 4220079 when operated within the prescribed limitation of Flight Manual Supplement No. 5.

NOTE 11 Enstrom model 480 is eligible for installation of Increased Rotor Speed Kit No. 4230002 when operated within the prescribed limitations of Flight Manual Supplement No. 6. This kit also requires oil cooling system installation, P/N 4129100-3, and installation of the ring gear carrier, P/N 28-13106-6, in the main rotor transmission.

NOTE 12 Enstrom Models 480 and 480B are eligible for installation of Air Conditioning System Kit No. 4220176 when operated within the prescribed limitations of Flight Manual Supplement No. 7; and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 1.

NOTE 13 Enstrom Models 480 and 480B are eligible for installation of Pop-Out Floats Kit No. 4220091 when operated within the prescribed limitations of Flight Manual Supplement No. 8 and No. 6, respectively; and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 2.

NOTE 14 Enstrom Model 480, Serial Numbers 5039 Thru 5042 and 5044 are eligible for conversion to Model 480B when equipped in accordance with Enstrom 480B Conversion Kit No. 4230026.

NOTE 15 Enstrom Model 480 Serial Numbers 5005, 5021, 5023, 5028 and 5035; and Enstrom Model 480B Serial Numbers 5102 and 5122 are ineligible for certification in any category.

NOTE 16 Enstrom Model 480B is eligible for installation of Nose Positioned Camera Mount Kit No. 4220180-5 when operated within the prescribed limitations of Flight Manual Supplement No. 8.

NOTE 17 Enstrom Model 480B is eligible for installation of Searchlight Kit No. 4220056-1 or -3 when operated within the prescribed limitations of Flight Manual Supplement No. 9.

NOTE 18 Enstrom Model 480B is eligible for installation of Chelton Flight Systems EFIS, No. 4220500 when operated within the prescribed limitations of Flight Manual Supplement No. 10, and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 4.

NOTE 19 Enstrom Model 480B is eligible for installation of 2+2 Seating Configuration, No. 4230042 (approved November 4, 2009) when operated within the prescribed limitations of Flight Manual Supplement No. 28-AC-036, and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 10 or latest revision.

NOTE 20 Enstrom Model 480B is eligible for installation of Avidyne Traffic Advisory System, No. 4220569 when operated within the prescribed limitations of Flight Manual Supplement No. 28-AC-027, and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 5 or latest revision.

NOTE 21 Enstrom Model 480B is eligible for installation of Garmin SL30 NAV/COM Transceiver, No. 4220558 when operated within the prescribed limitations of Flight Manual Supplement No. 28-AC-030, and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 5 or latest revision.

NOTE 22 Enstrom Model 480B is eligible for installation of Sandia Altitude Data System, No. 4220561 when operated within the prescribed limitations of Flight Manual Supplement No. 28-AC-035, and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 5 or latest revision.

NOTE 23 Enstrom Model 480B is eligible for installation of KTR 908/KFS 598A VHF Communication Radio, No. 4220611; KTR 909/KFS 599A UHF Communication Radio, No. 4220612; and KMA24H Audio System, No. 4220613 when operated within the prescribed limitations of Flight Manual Supplement No. 28-AC-040, and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement JGSDF Specific Configuration Avionics or latest revision.

NOTE 24 Enstrom Models 480 and 480B are eligible for installation of Safe Flight Powerline Detection System, No. 4220576 when operated within the prescribed limitations of Flight Manual Supplement No. 28-AC- 042, and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 5 or latest revision.

NOTE 25 Enstrom Model 480B is eligible for installation of the Partial Wide Instrument Panel, No. 4220602 when operated within the prescribed limitations of Flight Manual Supplement No. 28-AC-043, and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 6 or latest revision.

NOTE 26 Enstrom Model 480B is eligible for installation of NAT AMS44 Dual Channel Audio Controller and NAT 247 Audio Mixing Amplifier, No. 4220529 when operated within the prescribed limitations of Flight Manual Supplement No. 28-AC-048, and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 5 or latest revision.

NOTE 27 Enstrom Model 480B is eligible for installation of the Sandel SN3500 EHSI, No. 4220609 when operated within the prescribed limitations of Flight Manual Supplement No. 28-AC-049, and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 5 or latest revision.

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