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# TYPE-CERTIFICATE DATA SHEET

No. EASA.IM.A.229

**for**  
EMB-110

**Type Certificate Holder**  
Yaborã Indústria Aeronáutica S.A.

Av. Brig. Faria Lima. 2170  
12227-901 São Jose dos Campos SP  
Brazil

For models:    EMB-110P2  
                  EMB-110K1  
                  EMB-110P1



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## **SECTION 1: EMB-110 (ALL VARIANTS)**

### **I. General**

1. Airworthiness Category: Normal Category
2. Certifying Authority: ANAC Agência Nacional de Aviação Civil Gerência Geral de Certificação de Produtos Aeronáuticos  
P.O. Box 6001  
12228-901 - São José dos Campos – SP – Brazil
3. Type Certificate Holder: Yaborã Industria Aeronáutica S.A.  
Av. Brig. Faria Lima. 2170  
12227-901 São Jose dos Campos SP  
Brazil

### **II. EASA Certification Basis**

1. Certification Basis (ANAC):
  - a) Type Certificate 7202 issued on 20 December 1972 based on the applicable requirements of the RBHA 23, corresponding to US Federal Aviation Administration (FAA) FAR 23 effective on 01 February 1965, including Amendment 23-7 effective September 1969, plus:
    - RBHA/FAR 23.1529 Amdt. 23-8, effective on 5 February 1970;
    - RBHA/FAR 23.1351(c)(4) Amdt. 23-14 effective on 20 December 1973;
    - RBHA/FAR 23.1441 through 23.1449, Amdt. 23-9 effective on 17 June 1970;
  - b) RBHA/FAR 23.1545(a) equivalent level of safety.
  - c) In addition:
    - The EMB-110P2 and EMB-110P1 models in the passenger configuration comply with:
      - The special conditions established in the letter nº 341-IFI/77, dated 21 March 1977;
      - The RBHA/FAR 25.853 Amdt. 25-32 effective 01 May 1972;
      - The SFAR 27 until Amdt 27-1 effective 01 January 1975;
      - The Appendix A of RBHA/FAR-135 effective 19 June 1970;
      - The RBHA/FAR 36 until Amdt. 36-6 effective 24 January 1977;
      - The RBHA 1348/01 (corresponding to SFAR 41 until Amdt. A effective 14 April 1980; see Note 1);
    - The EMB-110K1 and EMB-110P1 models in the cargo configuration comply with:
      - The special conditions established in the letter nº 1982-IFI/76 dated 22 December 1976;
      - The SFAR 27 Amdt. 27-1 effective 01 January 1975,
      - The RBHA 1350 (corresponding to FAR 25) 25.853, 25.855, 25857(a) or (e) and 25.787 (Amdt. 25-32 effective 01 May 1972) and with RBHA/FAR 25.1439 effective on 24 December 1964);
      - The FAR 36 Amdt. 36-6 effective on 24 January 1977.



## 2. Environmental Protection:

- 2.1. Noise: FAR Part 36 amendment 4 effective 3 February 1975 and amendment 6 effective 24 January 1977.

## III. Technical Characteristics and Operational Limitations

1. Description: The airplane is monoplane, low-wing, twin-turboprop intended mainly for private commercial transportation of passengers (P1, P2), cargo and special services (K1, P1). The structure is all-metal, stressed skin type, with wings and empennage in cantilever construction semi-monocoque fuselage. The landing gear is tricycle, retractable and single wheel type. The airplanes are turbine powered, equipped with constant speed three blade propellers, with reversible pitch and automatic feathering.

2. Equipment:

- a) The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft.
- b) In addition the aircraft must be equipped with the Flight Manual or Pilot's Operating Handbook MO-110P2/275
- c) The "Basic Equipment Check List - Chart A" for the models: EMB-110K1, EMB-110P1 and EMB-110P2 lists all the required and optional equipment. For the models EMB-110 P2, EMB-110K1 and EMB-110P1 the "Chart A" is included in the approved Pilot's Operating Handbook. For the other models the "Chart A" is included Weight and Balance Manual (OT-1C95-5).

For EMB-110P1 and EMB-110K1 operating in the cargo configuration, see Note 2 for required equipment.

3. Dimensions:

Length: 14.59m  
Span: 15.33m  
Height: 4.92m  
Wing Area: 29.1m<sup>2</sup>

## 4. Engine

4.1. Model: The airplane is powered by two turboprop Pratt & Whitney of Canada Ltd. PT6A-34.

### 4.2 Limitations:

	ESHP	SHP	PROP SHAFT SPEED	TIT (° C)
Takeoff:	783	750	2 200	790
Max. Continuous:	783	750	2 200	790
Starting (2 sec):				1 090



Max. Reverse (1 min):		400	2 068	790
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## 5. Propeller

5.1 Model: 2 Hartzell HC-B3TN-3C/T10178H-8R or /T10178-8R with spinner  
Hartzell D3434 -5; -5P; -6P; -12P; -17P; -18P; or  
2 Hartzell HC-B3TN-3D/T10178HB-8R or /T10178B-8R with spinner  
Hartzell D3434 -6; -6P; -12P; -17P; -18P; or  
2 Hartzell HC-B3TN-3C/T10178HB-8R or /T10178B-8R with spinner  
Hartzell D3434 -6; -6P; -12P; -17P; -18P.

5.2 Propeler Limits: Pitch settings at 30 in (762mm):  
- Reverse: -11°  
- Feather: + 88,1°  
- Primary pick-up angle: 20, 2°  
- Secondary low pitch stop angle: 14°

Diameter: 93 in (2 362mm) (no further reduction permitted).

Number of blades: 3

## 6. Fluids

6.1 Fuel: JP-4, JP-5, Avjet A, Avjet A-1 and Avjet B under the specification PWA 522 or CPW 46 (see Note 3).

6.2 Oil: In accordance with P & W Specification PWA 521 or CPW 202 (MIL L 23699A).

## 7. Fluid capacities

7.1 Fuel: 1 720 liters (454 gal.) (2 tanks 860 liters at + 7 200 mm).  
Unusable Fuel: 28 liters (7.4 gal)(14 liters each tank).

7.2 Oil: 8,7 liters (2.3 gal) each engine at + 4 902 mm (193 in).  
1,1 liter (0.3 gal) each oil radiator at +4 890 mm (192.5) in.

## 8. Airspeed Limits (IAS):

Max. Operating Speed:	230 kias (426 km/h)
Maneuvering Speed *:	169 kias (313 km/h)*
Maximum Flap extension Speed *	
- 25%:	180 kias (334 km/h)
- 100%:	148 kias (274 km/h)
Maximum Landing gear extended and Operating Speed *:	146 kias (270 km/h)

\* See Operating Manual

## 9. Maximum Masses:

Takeoff: 5670 kgf (12 500 lb) (see Note 4)



Landing: 5 450 kgf (12 015 lb) (see Note 5)  
 Zero Fuel: 5 450 kgf (12 015 lb)  
 Ramp: 5 700 kgf (12 566 lb)

10. C.G. Range\*: 6 489 mm (255.5 in) to 6 909 mm (272.0 in) at 5670 kgf (12 500 lb).  
 6 382 mm (251.3 in) to 6 909 mm (272.0 in) at 4 000 kgf (8 818 lb) or less.

Straight-line variation between given points.

Moment change due to retraction of landing gear: 116000 kg.mm (10068 lb. in). The CG is shifted forward with retraction of landing gear.

\*Landing gear extended.

11. Datum: - A plan perpendicular to the fuselage centerline located at 6 850 mm (269.7 in) forward of the 28% wing chords line (frame 16).  
 - This line defined as 28% wing chords line is 943 mm (37.1 in) forward of the rear jacking points.

12. Control surface deflections:

Elevator:	22° ± 1° up	20° ± 1° down
Rudder:	25° ± 1° right	25° ± 1° left
Ailerons:	22° ± 1° up	14° ± 1° down
Elevator tab:		
- left:	32° ± 2° up*	32° ± 2° down*
- right:	deactivated	
Rudder tab (commanded):		
	12° ± 2° right	11° ± 2° left
Rudder tab (automatic):		
- rudder 25° right:	tab 12° ± 1° left	
- rudder 25° left:	tab 4.5° ± 1° left	
Aileron tab (commanded):		
	18° ± 3° up	18° ± 3° down
Aileron tab (automatic):		
	16° ± 2° up	8° ± 2° down
Flaps:	38° ± 1°	

13. Levelling Means: Plumb from the support in the upper internal part of frame 16 using as reference a mark on the floor.

14. Minimum Flight Crew: 1 pilot (VFR conditions) VFR conditions (see Note 6).





#### IV. Operating and Service Instructions

1. Flight Manual: Airplanes must be operated according to the AFM ref. AFM-110P1/381 revision 13 (or later approved revision) or Pilot's Operating Handbook MO-110P2/275 revision 20 (or later approved revision).
2. Maintenance Manual: T.O. 1C95A-2-1 revision 5 (or later approved revision).
3. Structural Repair Manual: T.O. 1C95A-3 revision 23 (or later approved revision).
4. Weight and Balance Manual: The approved Pilot's Operating Handbook contains detailed loading instructions for the models EMB-110P2, EMB-110K1 and EMB-110P1.

#### V. Notes

**Note 1:** In addition, the Airworthiness Certificate of these aircraft must incorporate following note: "CERTIFIED AIRCRAFT ACCORDING THE RBHA 1348/01 (SFAR-41A). IT DOES NOT COMPLY INTEGRALLY WITH THE REQUIREMENTS IN ANNEX 8 OF THE ICAO, FOR WEIGHTS ABOVE OF 12 500 LB (5670 KG)."

**Note 2:** For cargo service operation, Model EMB-110P1 or EMB-110K1 must be equipped with:

- Cargo compartment class E (see Operation Manual):
  - Cargo net for 9g (EMBRAER drawing 110P1-9878-10-01);
  - Anti-smoke curtain (EMBRAER drawing 110P1-9878-10-15);
  - Smoke detection System (EMBRAER drawing 110-9788-10-01);
  - Protective breathing system and full face oxygen masks (EMBRAER Drawing 110P1-710-10);
  - Retention cargo net 3g (see Operation Manual).
- Cargo compartment class A (see Operation Manual):
  - Retention cargo net 3g (see Operation Manual).

**Note 3:** It is allowed the utilization of aviation gasoline of any octane rating (MIL-G-7752) for a total period not superior to 150 hours of operation between general revisions of the engine.

**Note 4:** A weight and balance report listing all equipment included in the empty weight must be delivered with each airplane. The approved Pilot's Operating Handbook contains detailed loading instructions for the models EMB-110P2, EMB-110K1 and EMB-110P1.

The certificated empty weight and corresponding center of gravity location must include undrainable oil (not included in oil capacity) and unusable fuel (not included in usable fuel) as follows:

- the unusable fuel: 22 kgf(49 lb) at +7 260 mm (258.8 in); and
- the undrainable oil: 0,5 kgf(1.1 lb) at +5 750 mm (226.4 in).

**Note 5:** The Aircraft 110K1/P1/P2 will be able to have its maximum weight of landing increased for 5 670 kgf (12 500 lb) if incorporated in factory the main landing gear equipped with P/N 14575B or C and P/N 14570B or C, or, for the aircraft in operation, that incorporate the Bulletin of Service



EMBRAER no. 110-32-047. In this case the limits of change of CG are the following (Landing gear extended):

- 6 520mm (256.7 in) (11,1%) until 6909 mm (272 in) (31%) with 5670 kgf (12 500 lb) (for landing);
  - 6 489mm (255 in) ( 9,5%) until 6 909 mm (272 in) (31%) with 5 670 kgf (12 500 lb) (for takeoff);
  - 6476mm (255 in) ( 8,8%) to 6 909 mm (272 in) (31%) with 5 450 kgf (12 015 lb)
- Straight-line variation between given points.

**Note 6:** For the models EMB-110K1 and EMB-110P1, when operating in transport of charging with the load compartment in the classification A (as defined in the Operation Manual), always two crew are demanded.

The Models EMB-110P2, EMB-110K1 and EMB-110P1 can be operated in conditions IFR for one pilot only, if beyond the minimum equipment demanded by the applicable operational regulations, a headset and an approved, operational and endowed with approach way automatic pilot were installed in aircraft (consult the Flight manual to identify the approved models).



## **SECTION 2: EMB-110P2 MODEL**

### **I. General**

#### 1. Type/Model

- 1.1 Type: EMB-110  
1.2 Model: EMB-110P2

#### 2. EASA Type Certification Application Date: 21 March 1977

*Note: State of Design Authority certification application date for grandfathered products*

#### 3. ANAC Type Certificate Date: 15 September 1977 ANAC Type Certificate Data Sheet No. EA-7202

#### 4. EASA Type Certification Date: 15 September 1977

5. Additional Information: Model EMB-110P2 is derived from basic model EMB-110, through modifications in the fuselage, changes of the power plant group, new seats and internal arrangement, in accordance with the EMBRAER drawing number: 110P2-0000.

### **II. Technical Characteristics and Operational Limitations**

1. Maximum Passenger Seating Capacity: 23 seats (21 passengers and 2 crew).

2. Baggage/ Cargo Compartments: 240 kgf(529 lb) at +9 560 mm (376 in).

The EMB-110P2 baggage compartment may be modified per EMBRAER drawing number 110P1-856-10; in this case the maximum capacity will be 320 kgs (705 lb).

3. Serial Numbers Eligible: 110146, 110153, 110156, 110157, 110161, 110184, 110186, 110189, 110190, 110193, 110194, 110196, 110197, 110199, 110200, 110201, 110209, 110210, 110213, 110216, 110224, 110229, 110231, 110243, 110245, 110262, 110270, 110277, 110292, 110295, 110300, 110303, 110307, 110318, 110333 and 110401.



## **SECTION 3: EMB-110K1 MODEL**

### **I. General**

#### 1. Type/Model

1.1 Type:	EMB-110
1.2 Model:	EMB-110K1

2. EASA Type Certification Application Date: 29 March 1976

*Note: State of Design Authority certification application date for grandfathered products*

3. ANAC Type Certificate Date: 09 January 1978  
ANAC Type Certificate Data Sheet No. EA-7202

4. EASA Type Certification Date: 09 January 1978

5. Additional Information: Model EMB-110K1 is derived from basic model EMB-110, through modifications in the fuselage, changes of the power plant group, a strengthened floor and a charging door, in accordance with the EMBRAER drawing number: 110K1-0000.

### **II. Technical Characteristics and Operational Limitations**

1. Maximum Passenger Seating Capacity: 2 Seats (2 Crew). Approved only as charger.  
Maximum charge distributed on floor: 488 kg/m<sup>2</sup> (See Flight Manual).  
Maximum total charge: 1 804 kgf(3 977 lb).

2. Baggage/ Cargo Compartments: Not Applicable.

3. Serial Numbers Eligible: 110139, 110143, 110148, 110149, 110152, 110160, 110164, 110168, 110169, 110170, 110172, 110173, 110174, 110175, 110176, 110177, 110178, 110180, 110181 and 110183.



## **SECTION 4: EMB-110P1 MODEL**

### **I. General**

#### 1. Type/Model

1.1 Type:	EMB-110
1.2 Model:	EMB-110P1

2. EASA Type Certification Application Date: 14 February 1977

*Note: State of Design Authority certification application date for grandfathered products*

3. ANAC Type Certificate Date: 09 May 1978  
ANAC Type Certificate Data Sheet No. EA-7202

4. EASA Type Certification Date: 09 May 1978

5. Additional Information: Model EMB-110P1 is derived from basic model EMB-110, through modifications in the fuselage, changes of the power plant group, a strengthened floor and a charging door, in accordance with the EMBRAER drawing number: 110P1-0000.

### **II. Technical Characteristics and Operational Limitations**

1. Maximum Passenger Seating Capacity: 21 seats:

- 18 passengers and 3 crew, or
- 19 passengers (lateral seats) and 2 crew. This configuration is approved for private transportation.
- The Maximum charge distributed on floor is 488 kg/m<sup>2</sup>.

Maximum total charge: 1 804 kgf(3 977 lb).

2. Baggage/ Cargo Compartments: 320 Kgf (705 lb) at + 10 400 mm (409 in).

The EMB-110P1 baggage compartment may be modified per EMBRAER drawings number 110P1-863-40-51 and 110P1-856-24; in this case the maximum capacity will be 420 kgf (926 lb).

3. Serial Numbers Eligible: 110192, 110195, 110198, 110202 up to 110208, 110211, 110212, 110214, 110215, 110217 up to 110223, 110225 up to 110228, 110230, 110232 up to 110242, 110244, 110248 up to 110254, 110256 up to 110261, 110263, 110265 up to 110268, 110271 up to 110275, 110278 up to 110281, 110283, 110285 up to 110290, 110293, 110294, 110296, 110297, 110298, 110301, 110302, 110304, 110305, 110308 up to 110316, 110319, 110321 up to 110325, 110327 up to 110331, 110334, 110335, 110336, 110338 up to 110348, 110350 up to 110355, 110357,



110358, 110359, 110362 up to 110366, 110368 up to 110373, 110375 up to 110389, 110391 up to 110400, 110402 up to 110428, 110436, 110438, 110439, 110441, 110442, 110444 up to 110449, 110451, 110453, 110455, 110456, 110458 up to 110470, 110486, 110490, 110494, 110496, and 110498.



## SECTION ADMINISTRATIVE

### I. Acronyms & Abbreviations

AFM	Aircraft Flight Manual
ANAC	Agência Nacional de Aviação Civil
CG	Center of Gravity
EASA	European Aviation Safety Agency
ESHP	Equivalent Shaft Horsepower
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
IAS	Indicated airspeed
RBHA	Regulamento Brasileiro de Homologação Aeronáutica
SHP	Shaft Horse Power
TIT	Turbine Inlet Temperature
VFR	Visual flight rules

### II. Type Certificate Holder Record

Type Certificate Holder	Period
Embraer S.A. <sup>(1)</sup> Av. Brig. Faria Lima. 2170 12227-901 São Jose dos Campos SP Brazil	15 September 1977 to 30 January 2020
Yaborã Indústria Aeronáutica S.A. Av. Brig. Faria Lima. 2170 12227-901 São Jose dos Campos SP Brazil	Since 31 January 2020

Note <sup>(1)</sup>: Empresa Brasileira de Aeronáutica S.A. (EMBRAER) changed company name to Embraer S.A. effective November 19, 2010.

### III. Change Record

Issue	Date	Changes	TC Issue No. & Date
Issue 01	03 May 2021	Initial Issue	Initial Issue, 31 January 2020

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