

P2012 TRAVELLER



Innovation in aviation



Introduction

The piston powered twin engine aircraft market is today characterized by very few models and the majority of aircraft in operation belonging to this category are older than 35 years and are no longer in production. Tecnam Aircraft Industries is committed to the design, development and production of a new, innovative, efficient and affordable next-generation 11 seater twin aircraft, complying with both FAR part 23 and EASA CS-23 requirements.

The airplane design, named Tecnam **P2012 Traveller**, was developed by Tecnam Research and Design team is under development at Tecnam Aircraft Industries following a preliminary design by Professor Luigi Pascale, Tecnam's well renowned and award

winning expert in the design of many general aviation aircraft.

The Tecnam P2012 Traveller will first see service as a passenger aeroplane with US based Cape Air but has been designed from the start to be a very versatile and flexible aerial platform, offering many multi role opportunities including Hydro, VIP, cargo shipping, parachuting and medevac services.

The key features of the aircraft have been developed in close co-operation with potential customers.

Designed primarily with the passenger in mind, the P2012's large cabin can accommodate up to 11 seats (with a maximum of nine passengers).

Easy cabin access, cabin comfort and spacious luggage compartments have all been specifically designed to ensure a pleasurable flight experience.

The aircraft will be equipped with two powered Lycoming TEO-540-C1A engines rated 375hp each. This modern engine is fully electronically controlled, fuel injected and provided with several features to pre-

serve component life in addition to saving fuel. The mixture lever is no longer present on the cockpit pedestal since the entire control of mixture is made automatically. The P2012 has been designed to comply with both FAR Part 23 and EASA CS-23, for which certification will be achieved at the same time, in order to expedite as many country validations as possible.




1070 nm
Max Range


190 ktas
Max Cruise Speed


11 seats
9 Passengers + 1-2 crew


1350 kg (lbs 2976)
Useful Load


Low in service
costs


Easy
maintenance


Single or dual
pilot


State of art
design

Market analysis

The Part 135 dedicated aircraft market is today based on old 'heritage' models, many of which are coming to the end of their useful commercial life.

The arrival into service of the next-generation 11 seat P2012 Traveller has been much anticipated by many airlines, who have been demanding a replacement for the many hundreds of 'heritage' aeroplanes in the FAR23/CS23 category currently in service around the world.

Airlines have been demanding a replacement for many hundreds of airplanes in the Part 23/CS23 category currently in service around the world - as many are now coming to the end of their useful commercial life.

The main rationale behind the design, development and introduction of the P2012 Traveller is to ensure that not only passenger's demand for comfort and safety are met, but also that potential operators of the P2012 Traveller are now able to afford an airplane with significantly improved direct operating costs, more efficient and modern maintenance procedures and appreciation for ensuring that the industry takes into account global environmental considerations such as the need for lower fuel burn and less noise emissions. As shown in the table, all the aircraft within the 8-11 seats segment were introduced more than 45 years ago and many are still in commercial service use today, flying with an average age of 50 years!

With a forecast of an annual reduction of only 0.1% flight hours for the next 20 years¹, the need of a modern and far more efficient aircraft is self-evident. It is noticeable that almost all aircraft listed in the table are characterized by a twin-engine arrangement, with the Caravan as the only single-engine aircraft in this category that has had commercial success. However in most countries commercial passenger transportation with a single engine aircraft is forbidden.

One of the essential features potential operators have also requested for this next-generation aircraft is to have short take-off capability, enabling them to operate on very short or even non-prepared runways. The P2012 has been designed to have a very low minimum control speed and this results in a take-off distance of about 1970 ft over the obstacle. The following table shows the technical comparison between the Tecnam P2012 Traveller and its direct competitors (including aircraft no longer in production).

¹ GAMA data: Actually in US more than 1.100 piston airplanes operate as Passengers Carrying Platforms. They have now an average age of 45 years and within 20 years they will be 65 years old.





Model Spec.	[unit]	C402	Kodiak	Navajo	B2N	P2012 Traveller
Service Entry		1966	2005	1967	1965	2019
Wing Span	m	13.45	13,07	12.4	14.94	14
Length	m	11.09	10,42	9.94	10.86	11.8
Height	m	3.49	4.48	3.96	4.18	4.4
Cabin height	m	1.27	1.45	1.29	1.30	1.36
Cabin width	m	1.42	1.37	1.26	1.10	1.48
Cabin length	m	4.98	4,83	4.42	4.60	6.9
Landing gear		Retr.	Fixed	Tricycle Retr.	Tricycle Fixed	Tricycle Fixed
Engine manufacturer		Contin.	PW	Lycoming	Lycoming	Lycoming
Engine Model		TSIO520VB	PT6A-34	TIO-540A	IO-540	TEO540C1A
Engine Power	hp	2x325	1x750	2x310	2x300	2x375
Propeller manufacturer		McCauley	Hartzell	McCauley	Hartzell	MT-Prop
Prop. diameter	m	2.25	2.44	2.03	1.98	2.10
Max gross weight	kg	3107	3286	2948	2994	3600
Std. empty weight	kg	1845	1708	1990	1667	2250
Useful load	kg	1262	1600	958	1128	1350
Seating capacity (pax)		9	9	7	9	9
Fuel capacity	lt	780	1211	708	492	800
Wing loading	lb/sqft	30.30	30,01	28.35	20.31	29.0
Power loading	lb/hp	10.54	9,67	10.48	11.00	10.6
Speed, VNE	kt	230	187	226	183	240
Cruise speed 75%	kt	190 (FL 100)	151 (FL 120)	180 (FL 100)	139 (SL)	190 (FL 100)
Min control speed	kt	80	Na	74	Na	74
Stall sp. landing	kt	71	60	63	40	60
Best RoC	ft/min	1450	1371	1395	860	1500
Range - Max (FL 100, 75%)	nm	960	998	850	503 (FL?)	907
Takeoff distance	m	670	982	695	371	600
Landing distance	m	757	1430	554	299	500

Single Pilot vs Dual Pilot

One of the main advantages of the P2012 Traveller is the option to operate in single pilot mode in most countries around the world when carrying passengers.

While under FAA requirements it is possible to carry commercial passengers on a single engine aircraft, such as the Caravan. In most of countries this is not allowed.

This means that, in order to carry passengers for hire or commercial gain the aircraft must be at least multi engine. Nevertheless, an aircraft powered by two turboprop engines is classified as "complex" and thus it requires the presence of a co-pilot. This dual pilot requirement significantly increases the overall operating cost. Not only is it a question of funding an additional pilot but primarily as a result for the need for a "dual pilot" cockpit configuration results in the need for perfect symmetry of all the functions and displays, most of them simply doubled!

The most economical solution to performing passengers transport especially over small distances is via a twin engine, single pilot operation with a capable, modern and efficient piston aircraft such as the Tecnam P2012 Traveller.

The P2012 cockpit design, in addition to the provision of workload reducing equipment such as the state-of-art autopilot, will significantly improve the pilot's work station and lower stress during long IFR flights.





Sizing and configuration

The sizing and overall dimensions of the P2012 has been achieved through the use of classical fine methodologies and approach.

The design of the aircraft has been accomplished starting from the following design specifications:

a) Ease of cabin access and cabin comfort;

b) Spacious luggage compartments (nose and tail located);

c) Reduced take-off run and take-off from non prepared runways capability;

d) Max cruise speed of about 190 kts at flight altitude of 10.000ft KTAS;

e) Range exceeding 950 nm;

The high-wing configuration ensures easy

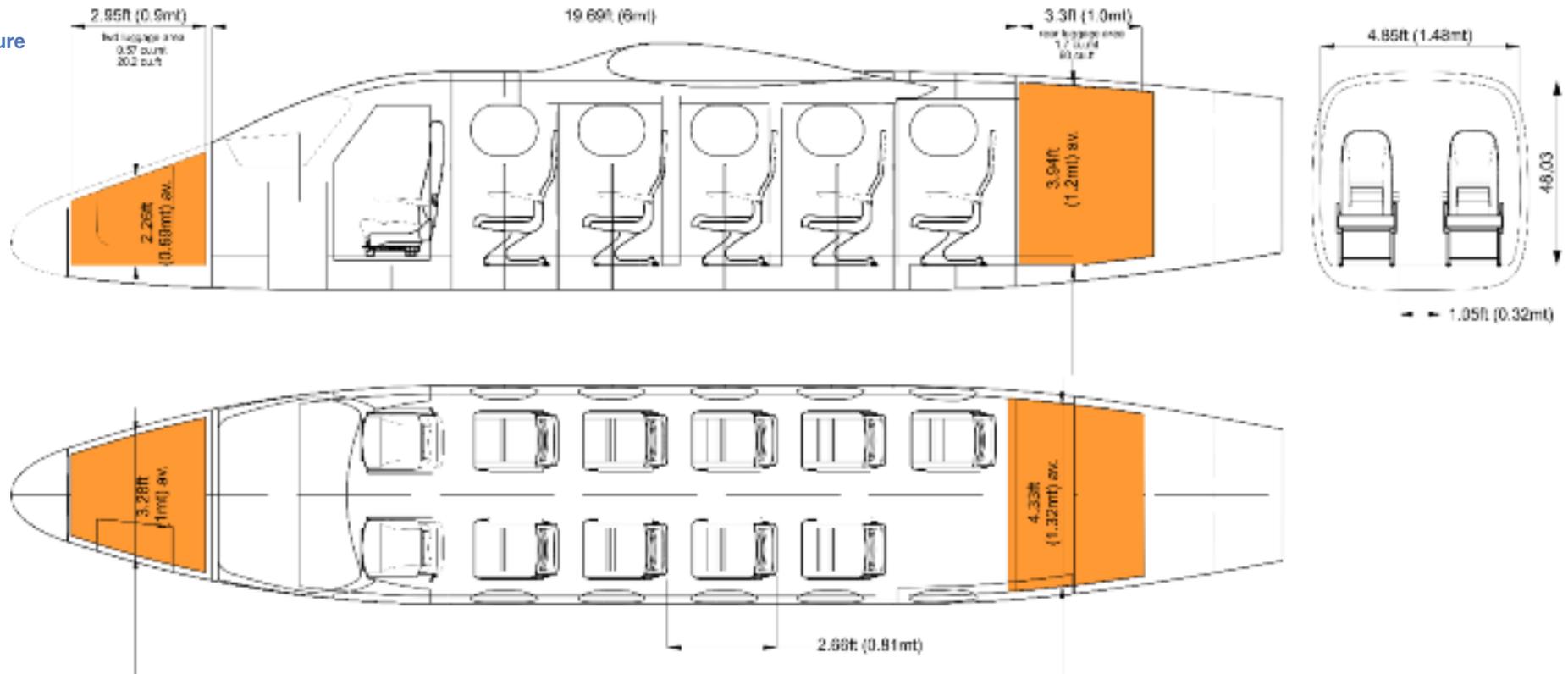
cabin access, high internal volumes and a low ground clearance. The result in terms of seating arrangement, seat-pitch and access doors opening are detailed in the following drawings.

Easy cabin access and high level of cabin comfort, together with the wide access doors lead to an internal design that enables many other operations including cargo², ambulance,

VIP, parachute SMP, which will further ensure the commercial success of the aircraft through easy re-configuration for many different possible applications.

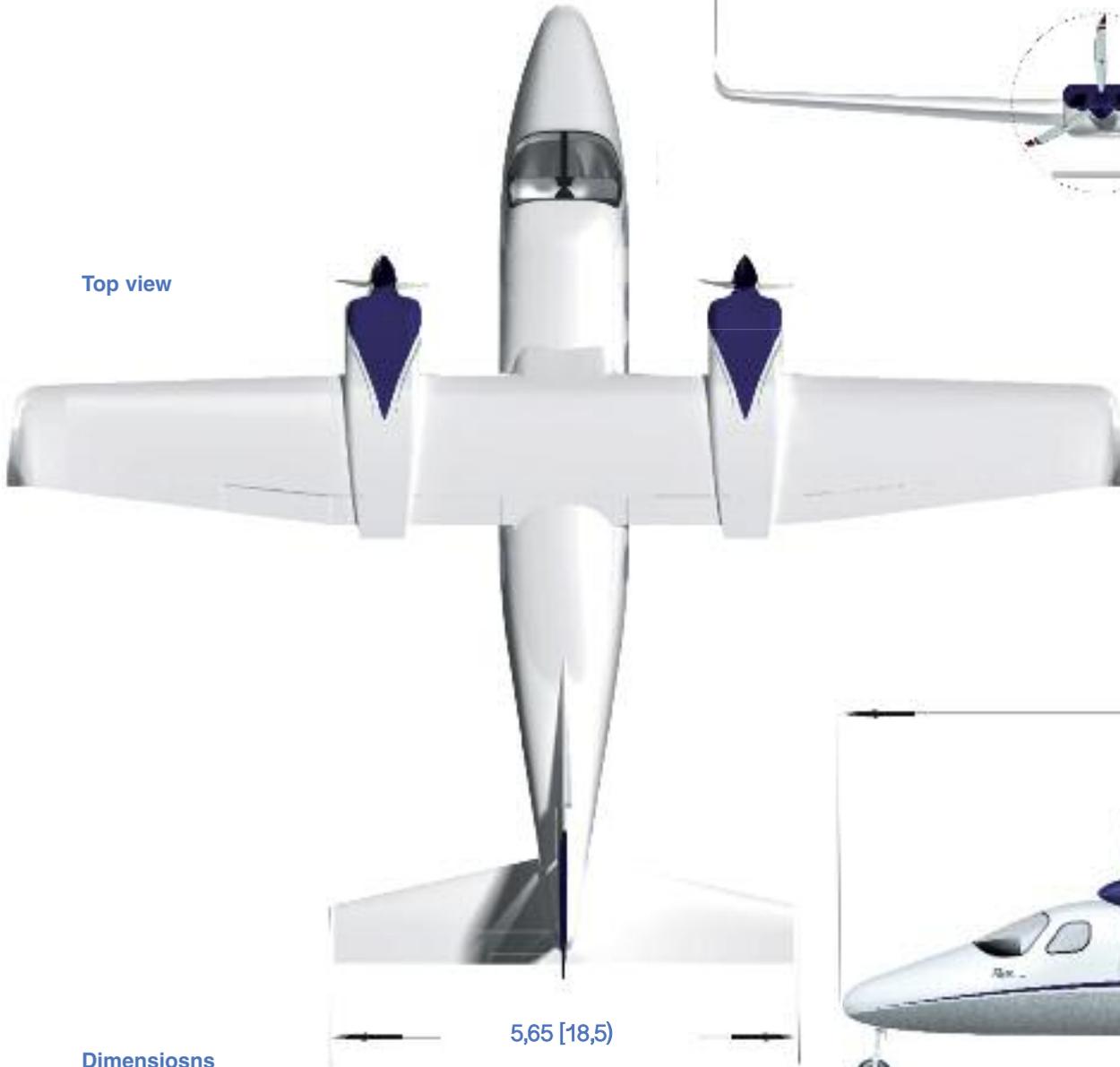
² Standard commercial airline aircraft seat rails will allow the use of commercial cargo fittings for belts and straps.

Cabin seats pitch and measure in metres



General view

Top view



14 [45,93]

Front view



A step change in the delivery of air transportation

Dimensions in metres [feet]

5,65 [18,5]

11,8 [38,6]

4,40 [14,4]

Side view



Technical description

The P2012 Traveller is an all-metal structure, high wing, twin-engine, unpressurized, piston aircraft with fixed tricycle landing gear.

The aircraft can accommodate up to 11 occupants. Suitable allowance for luggage and optional equipment is also provided both in a wide nose compartment and in the rear side of the fuselage. Easy and fast seat removal and a large rear door allows for a quick and roomy cargo re-configuration with available volumes shown in the following picture.

The fuselage is made of light aluminium alloy formed frames, beams, stringers and skins coupled by rivets and bolts.

Some major items such as beams, wing and tail surface attachments, main spar caps are made from billets.

The cantilever wing is also made by a traditional light alloy construction, with two spars configuration coupled with formed sheet metal ribs and GFRP leading edge.

A NACA five digit airfoil has been selected for the semi-tapered wing platform: this offers low drag, high maximum lift coefficient and small aerodynamic moment. Integral fuel tanks are located in the wing box, behind leading edge and between the two spars (less fire risk) for a capacity of 400 litres (106 USG) each (total of 800 litres, 212 USG). Wide slot light aluminium alloy flaps, electri-

cally controlled, allow low stall speeds offering potential for very steep approaches and short landings.

The vertical tail consists of a conventional vertical stabilizer and a rudder; the horizontal surface consists of a stabilizer and an elevator.

Wide trim-tabs are provided on all control surfaces, rudder is provided by standard yaw-damper as well (integrated with the standard provided automatic flight control system).

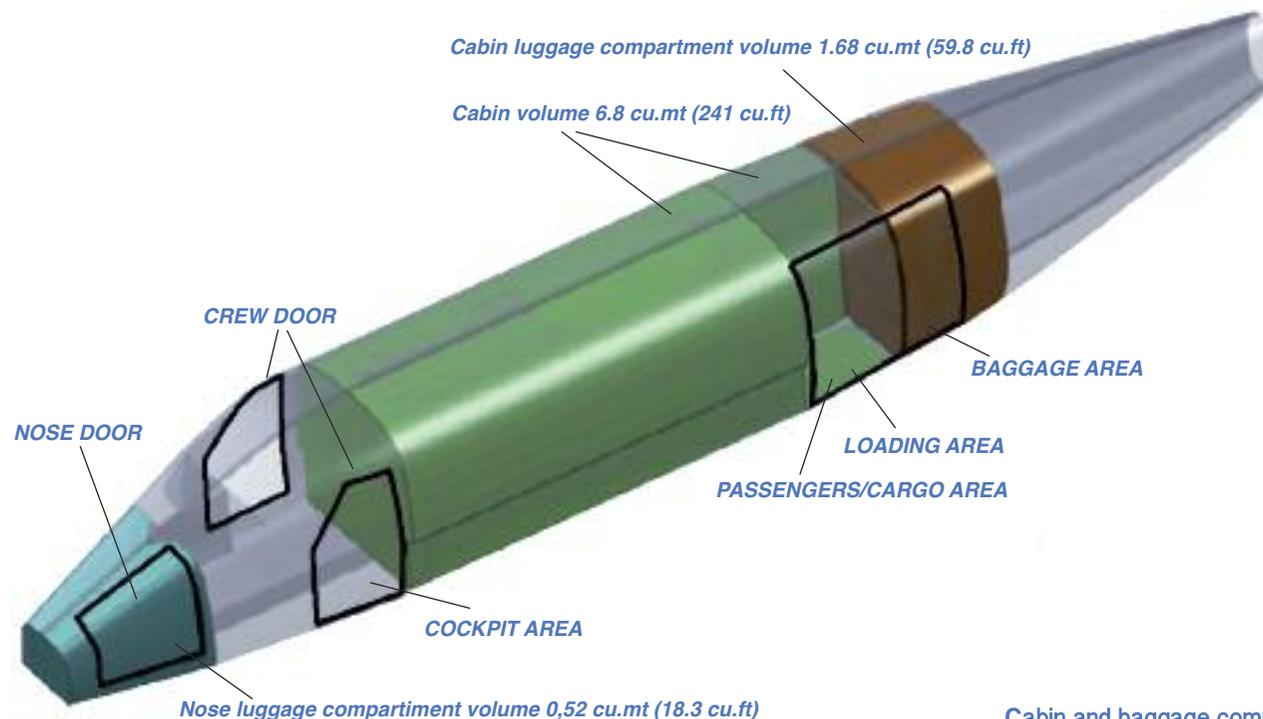
The main landing gear is composed by two fixed and robust legs containing the oleo-pneumatic shock absorber. These legs are fitted on the fuselage via a strong, cantilever beam faired by a small streamlined pods which may be easily to be removed for maintenance purposes.

The nose gear, steerable type, is fixed and consists of an oleo-pneumatic shock absorber leg, attached on the first fuselage bulkhead. It is provided by an anti shimmy damper. Two Cleveland wheels of 6.50-10

for main landing gear and 6.00-6 for nose are installed.

The primary flight controls are conventional and characterized by easy maintenance with control cables coupled by push pull rods, all visible through the immediate removal of the cabin floor nomex sandwich CFRP panels.

¹ GAMA data: Actually in US more than 1.100 piston airplanes operate as Passengers Ccarrying Pplatforms. They have now an average age of 45 years and within 20 years they will be 65 years old.



Cabin and baggage compartments volumes



Internal dimensions, confort and characteristics

Passengers will be accommodated in a cabin whose measures are constant for the whole length of the fuselage extension as opposed to 'legacy' aircraft in this class which traditionally feature a tapered fuselage in the back portion, there providing less space and especially disadvantaging passengers seated in the rear rows Tecnam P2012 has the advantage of having a cabin whose measures are constant for its whole extension, so that the ergonomics remains the same for all passengers and seats.

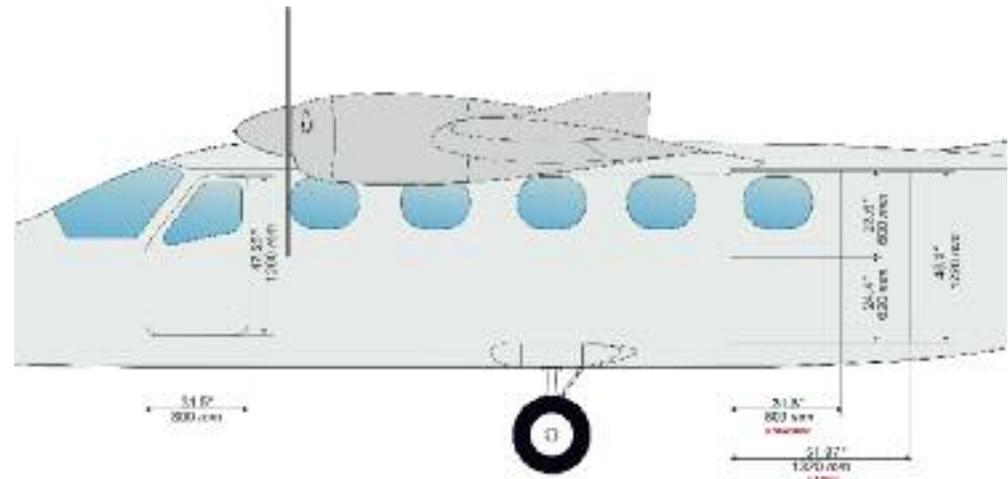
The conclusion is that advantages of the P2012 configuration include:

- P2012 offers additional 0.26ft (80mm) for overhead space compared with its competitors;
- P2012 offers additional 0.15ft (46mm) of cabin width;
- P2012 offers a seats pitch of 32in (0.813m).

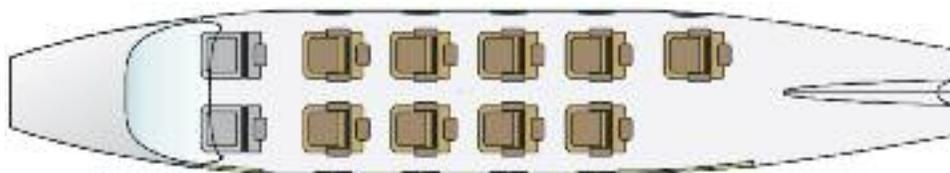
Following pictures show the ventilation layout and a preliminary interior configuration.

The access to the cabin is enabled via three doors, two for flight crew and one in the rear side divided in 3 separate hatches for passenger's access only or for cargo/baggage loading purposes. An integrated handrail allows a comfortable entrance and exit.

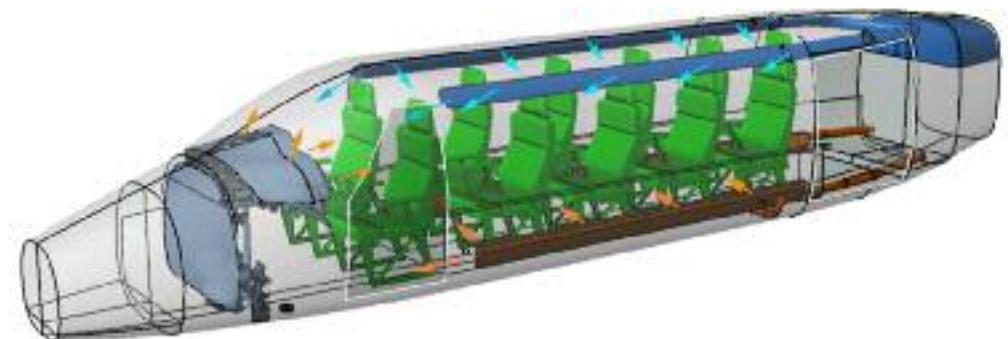
passenger's access only or for cargo/baggage loading purposes. An integrated handrail allows a comfortable entrance and exit.



Doors dimension



High density

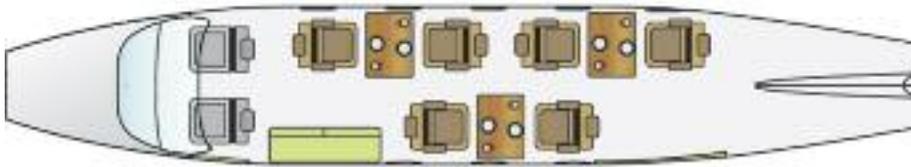


Cabin ventilation schematic



Interior configurations

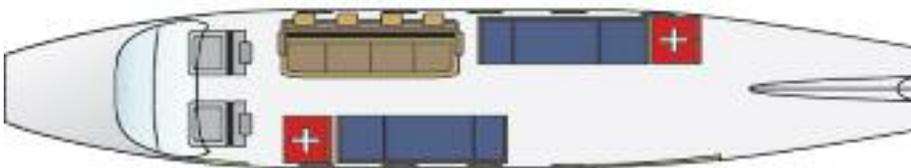
Executive



Cargo



Air Ambulance



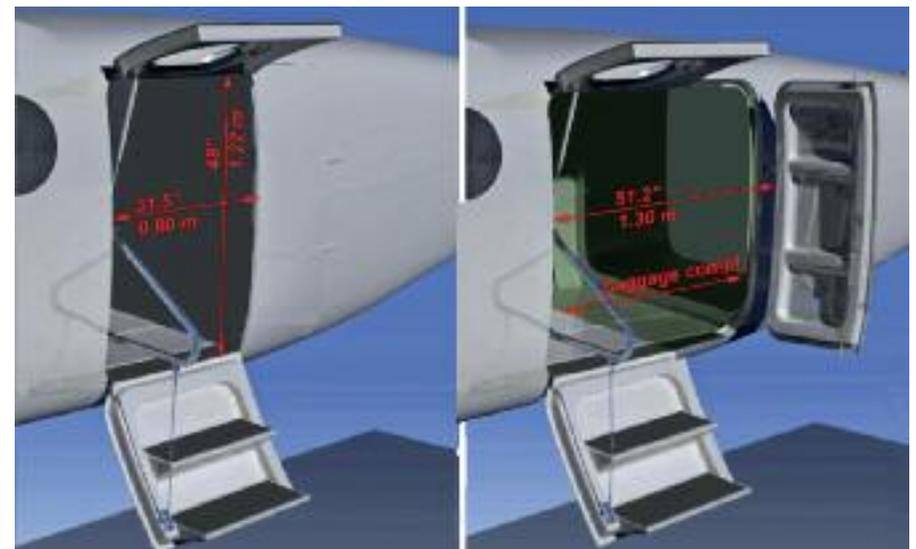
Parachute



Interior configurations



Typical arrangement of interior



Rear fuselage opening and step

Volumes and handling

	Tecnam P2012	Remarks
Baggage area (w/o cabin)	1.68 m ³ (rear) - 0.52 m ³ (nose) TOTAL = 2.2 m ³	P2012 has the best volume for baggage
Cabinvolume (w/o baggage area) from pilot seat shoulder to baggage area wall	6.8 m ³	P2012 has the largest cabin volume for passengers
Cargo ground handling Pax boarding	High wing, no wing strut presence, low cabin floor height from ground	P2012 has the best configuration for ground operations and handling
Propeller	Far from ground	With prop discs far from ground, P2012 lowers the risks of propellers damage



Large cargo load - Fast technical support



Weights and Performance table

Weights

BASIC EMPTY WEIGHT STANDARD	2250 kg	4960 lbs
OPERATIONAL EMPTY WEIGHT (single pilot + luggage)	2350 kg	5181 lbs
MTOW	3600 kg	7937 lbs
MAX LANDING WEIGHT	3600 kg	7937 lbs
RAMP WEIGHT	3620 kg	7981 lbs
ZERO FUEL WEIGHT (9 passengers + single pilot + luggage)	3480 kg	7672 lbs
WING LOADING	142 kg/m	29 lbs/ft
POWER LOADING	4.8 kg/hp	10.6 lbs/hp
FUEL CAPACITY	800 lt	212 US Gal

Performance

MAX CRUISE SPEED (KTAS)	190 kts@ 10.000 ft	
STALL SPEED (T.O. configuration)	65 kts	120 km/h
STALL SPEED (full flap)	60 kts	111 km/h
VMC	74 kts	137 km/h
RATE OF CLIMB	1500 ft/min	
RATE OF CLIMB (single engine)	300 ft/min	
TAKE OFF DISTANCE (50ft obs)	1970 ft	600 m
LANDING DISTANCE (50ft obs)	1640 ft	500 m
TAKE OFF RUN	1150 ft	350 m
LANDING RUN	820 ft	250 m



Powerplant

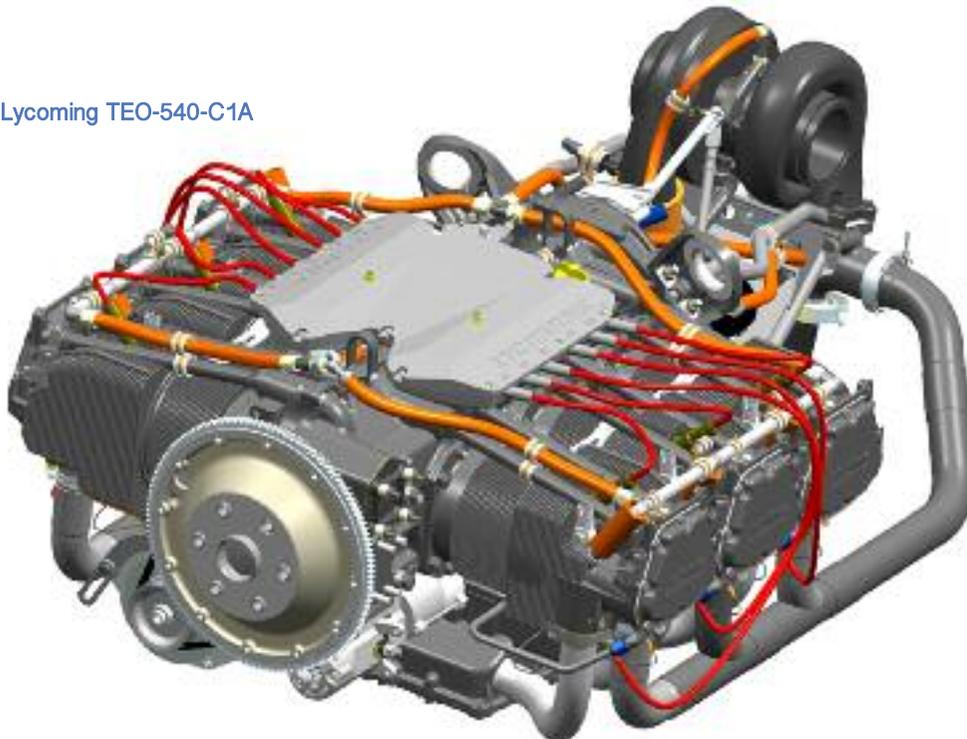
The Lycoming TEO-540-C1A Engine is a direct-drive six-cylinder, horizontally opposed, turbocharged, air-cooled engine. It has electronic fuel injection, electronic ignition, down exhaust. As equipment, the engine has an automotive type starter, one 28V alternator (140A) and a propeller governor pad.

The EECS (Electronic Engine Control) is an electronic, microprocessor controlled system that which continuously monitors and adjusts ignition timing, fuel injection timing, and fuel mixture based on operating conditions. The

EECS eliminates the need for magnetos and manual fuel/air mixture control lever.

The main advantages and features of the Lycoming TEO-540-C1A engine are listed in the table below: as shown, include the P2012's advantage on fuel consumption, as well as the active engine protection it affords against knock, overboost and temperatures will thereby guarantee a trouble free engine life, compared with any other old generation, turbocharged engines.

Lycoming TEO-540-C1A



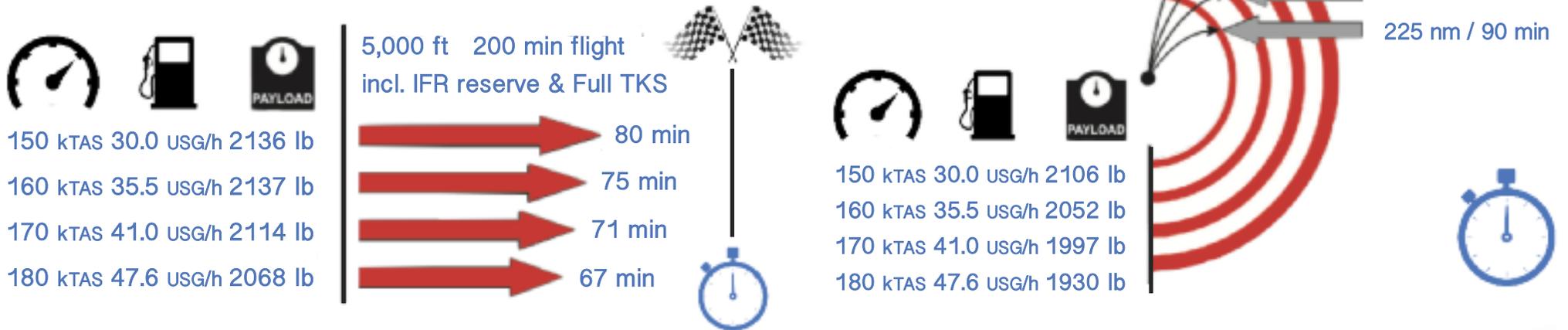
	TEO-540 -C1A	TIO-540-J2B
Fuel (Min Octane)	100/130, 100LL and UL100	100/130, or 100LL
Fuel Scheduling/Mapping	Changeable in Software	N.A.
Time limited takeoff rating	Anticipated in Software	N.A.
Alternator	1 x Alternator – 28 Volt, 140 Amp	Max 28 Volt, 70 Amp
Engine Protection features	Knock Control (independent for each cylinder) CHT, TIT over temp protection - Overspeed protection - Overboost protection	N.A.
Diagnostics	Notification of Shorted/Open Sensor or Actuators Out-of Range Failures In-Range Errors from sensor (Cross Checks) All faults are logged in the ECU memory Service Fault History Record since last clearing by an authorized service tool Record of "Fault clearing History"	N.A.
Pilot Interface	Only 2 Control Levers per engine (PWR, PROP) Single Button Start	3 Control Levers per engine Manual Start

Lycoming TEO-540 Vs TIO-540 main features comparison

Weights and Performances table

The illustration here show two typical conditions and related flight profiles: the first one is related to the endurance at 5,000' over a 200nm flight including IFR reserve and with

full FIKI capability. The second one represents the 99min flight (90min enroute) at several airspeed (kTAS) each one with the correspondent payload and range.



Tested Performance

P2012 - 3600 kg standard conditions sea level





Landing from 50 ft to touch down



250 m - 820 ft

Landing Distance (total)



500 m - 1640,42 ft

Standard avionics package

The P2012 Traveller is designed around a flexible, intuitive and low pilot workload with roomy and comfortable access for a second pilot when required.

NOTE: some optional equipment (such as the ADF) may be mandatory in some countries to enable the P2012 to fly under IFR conditions as an airline passenger transport.

The avionics suite is based on the latest generation **Garmin G1000 Nxi**, composed of two 10 inch PFDs and a single central 12 inchMFD. Remote redundant AHRS and ADC (inertial and air data units) provide the main flight and attitude information whilst a backup is provided by a small, vertical layout MD-302 (Mid-Continent). Communications and navigation are based on dual remote units which provide selectable data on the cockpit screens. An optionally provided Flight Management System keyboard allows immediate and comfortable insertion of frequencies and waypoints, while another optionally provided Garmin Flight Stream device allows an immediate and wireless link between flight suite and portable devices such as tablets or smartphones for immediate introduction of flight plans, waypoints, routes, frequencies etc...

A remote unit transponder, mode-S, is provided as standard with ADS-B OUT, ADS-B IN, FIS-B to match the incoming future Gen-

eral Aviation requirements for navigation and traffic awareness.

Dual heated pitot probes, one provided with AoA indication output, is also provided as standard to enhance the flight safety in all phases, supporting flight especially during single pilot operations.

A single, latest generation Garmin GMA 350C audio panel, manages the ATC and internal communications with several facilities such as 3D audio and separation

of pilot/co-pilot communication channels (split function). The standard avionics suite is then completed by the latest generation Garmin Automatic Flight Control System, with three axis of operations and provided by yaw damper (selectable also when A/P is OFF). A/P mode controller, installed on the top of flight deck, allows immediate interaction via dedicated pushbuttons and rotary wheels. Engines monitoring is fully integrated inside the avionics suite screens

and allows a perfect management of power, with significant and revolutionary features: fully automatic mixture control, absence of related lever and always guarantees the best fuel/air ratio for every single cylinder.

NOTE: refer to the following chapters for the list of standard and optional equipment available.



Cockpit layout

Standard P2012 Traveller Equipment

Standard avionic and flight instruments package

The following table describes the standard avionics package in terms of units, their quantity and main features description

Unit	Q.ty	Description
PFD LH	1	Primary Flight Display, Pilot In Command side (LH), shows the main flight and navigation data - dimension of screen is 10 inches. Annunciator lights and alarms are also displayed on PFD display
PFD RH	1	Primary Flight Display, co-pilot side (RH), shows the main flight and navigation data - dimension of screen is 10 inches. Annunciator lights and alarms are also displayed on PFD display
MFD (12in)	1	Multi Function Display - installed between LH and RH PFDs, provides via multiple pages menu information concerning: aircraft position and map (GPS), navigation and communication set frequencies, engines monitoring, fuel quantity, fuel flow and range management, electric busses power management and power sources monitoring, flaps position, flight time and total time and many other useful data
COM/NAV/GPS	2	Remote units, allow the management of dual channels communication and navigation frequencies, each one with standby frequency selection and frequency monitoring via PFD1, PFD2 and MFD
AHRS	2	Remote units, provide attitude information with redundancy to PFD
ADC	2	Remote units, provide air data information with redundancy to PFD. Calibration curve to display IAS-CAS-TAS is loaded in the PFD in order to provide "correction free" speeds
Magnetometers	2	Remote units, provide compass indication to PFDs. Their remote location allows interference free reading of magnetic heading
Compass	1	Central mounted, provides an additional reading of magnetic heading
MD302	1	Back up instrument, provides the redundancy on primary flight and airspeed data. It is normally powered by aircraft busses, emergency bus and it has an in-

		ternal battery to be used in extremely remote event of complete power loss (loss of both alternators and batteries)
DME – KN63	1	Garmin integrated DME
OAT probes	2	Provide the OAT value, also used by PFDs to reduce altitude and speed data providing correct reading of TAS
Audio Panel	1	Centrally mounted, it is a last technology audio management system made by Garmin (GMA 350c), featuring the "3D" audio function, COM1/2 SPLIT to enable pilot talking with COM1 and co-pilot communicating on COM2 frequency contemporarily. It is also provided by marker beacons overfly indication lamps
Pitot Probes	2	Both heated, allow safe information of airspeed even during IFR operation. One of them outputs Angle of Attack data, factory calibrated, for safe attitude and speed management in all phases of flight
Transponder	1	Single unit, remotely mounted, features Mode-S xtr, ADS-B OUT/IN, FIS-B providing state-of-art capabilities and being ready for incoming requirements on air traffic management
AFCS	1	Garmin made, state-of-art automatic flight control system with separate mode controller panel (GMC 710) provides the best solution for automatically controlling the aircraft during almost all flight phases, dramatically reducing the pilot's workload and allowing single pilot operation where its presence is mandatory to carry passengers for hire. All three axis are managed by A/P, with rudder servo that can be used also with A/P OFF as yaw damper. HDG, APR, NAV, ALT, VS and many other functions, such as a complete following a flight plan (including vertical navigation) are its main features
EIU	2	The engines interface units allow the engine data to be monitored in Garmin suite. 2x GEA71B fully redundant units are installed as standard
ELT	1	Remotely mounted, with emergency antenna outside the aircraft skin, the ELT is provided by a remote control switch on the pilot's cockpit side

Standard P2012 Traveller Equipment

Flight Controls

The following table shows and describes the main features of flight controls.

Control	Description
Brakes	Toe operated, braking system features 4 independent master cylinders and remote reservoir for easy access and refilling practices. Braking system is fully hydraulic while wheels and brakes are manufactured by Cleveland. Parking brake valve control is located on cockpit bottom pedestal
Control wheel	Two control yokes are installed on pilot and co-pilot sides, featuring charts holders and several switches to control: MIC, A/P disconnect, A/P CWS, pitch trim
Rudder pedals	Provided on both LH and RH sides with independent rudder and braking controls
Control locks	Provided for all surfaces, allows protection of control systems against wind gusts while aircraft is parked
Trim controls	Standard provided on pitch, rudder and aileron, they are all electrically operated with dedicated switch, emergency disconnect and indicators
Power controls	Central pedestal provided with: <ul style="list-style-type: none">• LH and RH engine PWR lever;• LH and RH prop levers. Props are full feathering delete;• Alternate air source control (LH and RH)
Flaps	Electrically controlled and monitored wing flaps with 3-position switch and flap overspeed annunciation inside PFDs for T/O position, too

Electrical Power and lights

The P2012 electrical system is based on 24Vdc busses. The primary electrical power source is provided by LH and RH engine driven alternators rated of 140A each. The secondary power source is provided by three batteries listed below:

- a. One Main battery (27Ah)
- b. One LH ECU battery (16Ah)
- c. One RH ECU battery (16Ah)

The batteries can operate individually or in combination in order to provide power to the loads on the distribution busses to start the engines. They also act as a reserve of power in emergency conditions (dual alternator failure). When the engines are running the alternators supply the power required in order to keep the batteries charged.

The system features four distribution buses, namely Main bus, Essential bus, LH bus, RH bus. Dedicated switches allow the selection of active/inactive busses. Essential bus is fed from 4 points and includes main electrical loads.

Electrical circuits other than engine starters are connected to the buses via circuit breakers, all located on cockpit overhead dedicated panel, easy to check, maintain and service. Switches are installed in order to allow the pilot the control of loads, where required.

An external power socket allows ground operations and is located on rear fuselage, adequately protected and far from propeller disc areas.

Exterior lights

All P2012 exterior lights are LED type, state-of-art technology featuring extremely long life, high illumination power and low electric consumption, including during the pre-engine start checklist. Lights provided as standard are listed in the table below:

Light/function	Description
LND Light	Full LED
TAXI Light	Full LED
NAV Light	Full LED, integrated with Strobe
STROBE Light	Full LED, integrated with NAV Lights
POSITION Light	Full LED, tail mounted single light
Courtesy Lights	Full LED, illuminates passenger entrance areas

Interior lights

All P2012 interior lights are LED type, state-of-art technology featuring extreme long life, high illumination power and low electric consumption. They provide a comfortable and efficient illumination of cockpit area, controls and passenger seats:

Light/function	Description
INSTR Light	Illuminates the cockpit panel and all the panel mounted instruments, providing dimming features for night flights
Map Light	Provides a source of illumination to be used to consult POH, charts or Documents
Overhead COCKPIT	Courtesy lamp, provide illumination of cockpit lining and related controls/monitoring equipment such as fuel selectors, breakers and switches
PAX Light	One for each seat (9 in total), they are independently controlled and swivelling upon passenger needs
Overhead CABIN	Courtesy lamps, provide illumination of cabin volume for night boarding procedures

Standard P2012 Traveller Equipment

Environmental

The P2012 environmental management features a standard heating and ventilation system. All aircraft will be manufactured with provisions and pre-installation of supporting racks for palletized and easy to remove air conditioning system. This will ensure an 27 efficient management of payload depending on the operation area and period, leaving on ground those items not requested for a certain period of flight operations. Air Conditioning system is optionally provided.

The following table shows the list of main environmental and air management systems provided as standard equipment:

Control	Description
Heating	Heating air is generated by a combustion heater, which provides hot air to passengers and pilot compartment. Hot air lines routing is easy to access via the removal of lower cabin lexan fairings. ON/OFF and heating power controls are on cockpit panel, air management section, while each passenger has the possibility to open/close/swivel his own vent
Defroster	Defroster flow picks up air from combustion heater
Ventilation	Standard P2012 equipment features a fresh air system management. Ventilation system can be easily connected to an optionally provided, palletised air conditioning unit
Soundproofing	Latest technology panels, together with sealing of all structural items and dedicated studies on cabin noise when subject to typical noise frequencies guarantee an adequate comfort to passengers while seated in P2012.

Interior - standard airline package

The following table shows the list of cabin interior features provided as standard package for airline public transport.

Item	Description
Chart holder	Located on both control yokes, provide a clip-made retaining device for charts and checklists. In addition to the dedicated POH holder pocket, they improve the pilot(s) work place
Beverage cup holders	Useful provision for all seats
Rear Baggage partition	The wall is made, together with the retaining nets, to separate the baggage volume from passengers. As described in the previous chapters, rear door features a dedicated opening to extend the direct access to both cabin and rear baggage area
Safety belts	All restraint systems are made by 3 point safety belts, easy to use and car-style to offer an user friendly connection
Pilot(s) seats	Pilot and co-pilot seats are adjustable along their longitudinal position, vertically (through electric motor and dedicated switch)
Sunvisors	Pilots have two sunvisors adjustable and folding which, together with the deep cockpit upper cover, optimise navigation and approaches with sun ahead
Passenger seats	Passengers seats are fixed and provided with folding armrest and luggage area below them to stow bags or small luggage
Charging devices	One USB port is provided to each passenger, in order to re-charge

	smartphones and similar devices, while pilot(s) have both USB charger and 12V socket plug available to feed electronic devices
Tinted windows	Provision to protect passengers against direct sunlight will be integrated using tinted windows and windows covers
Advisory light	Illuminated sign incorporating backlighted “fasten seat belts” and “no smoking” announcements will be located in forward side of cabin
Doors	(Refer to the dedicated chapter) - Two pilots’ doors allow easy and unobstructed access to the crew seats, while at rear, three hatches provided door allows the access to passengers and baggage compartment. Big and brace supported nose compartment door allows the access to the nose luggage volume. “Door open” messages and warning lights are available on PFD annunciation panel
Floor	Strong sandwich made, CFRP panels constitute the entire floor covering. Their easy and fast removal allow the complete access to the fuselage sub-structure for cleaning, inspections and corrosion treatments.
Corrosion proofing	Entire airframe is corrosion treated using a process involving all the manufacturing and assembly phases: from light alloy surface treatments, to the use of Akzo-Nobel, worldwide available and military standards approved primers, up to the use of sealing compound joining sheet metals and structural elements will limit the corrosion of airframe. Drainage holes, quick and easy access to low points and treatment with ACF-50 corrosion proof compound complete the setup of P2012 to make it ready for environments.

Exterior

The following table shows the list of exterior features provided as standard with P2012.

Item	Description
Corrosion proofing	The use of Akzo-Nobel, worldwide available and military standard approved paints guarantees a corrosion proof life and easy repairs. Selected paint scheme and products are the same used for seaplanes operating in salt environments and is made up by the so-called Akzo <i>Base Coat/Clear Coat</i> .
Dual Color Livery	With white as standard, basic color, P2012 will be available with different liveries upon customer choices, including customized logo stickers on vertical tail.
Tie down point	Wing rings, tail ring and nose provision allow easy to manage tie down of aircraft while parked on ground.
Towing	Nose landing gear will be provided with steering disengage pin for towing operations, allowing up to 50L/50R degrees of nose gear towing angle. With steering pin disengaged, the rudder pedals connection rod allows +/-35° of steering angle for taxi operations.
Steering	Direct operated NLG allows steering angles up to 35 LH and RH that, together with differential braking action, allow 27ft (8.2m)
Stall warning	Stall warning switch, wing mounted, is provided with heating system
Door locks	All access doors and baggage compartment hatches are provided with key locks

Standard P2012 Traveller Equipment

Product documentation

Item	Description
Limited warranty	Manufacturer's limited warranty, 2 years
Manuals	Pilot Operating Handbooks, Maintenance Manual and Continued Airworthiness Instructions, Illustrated Parts Catalogue are provided in both hard copies and via a dedicated access to Tecnam server for soft copies
Checklists	Pilot's checklist plastified for easy reference when in-flight and during all pre-flight operations
Third parties equipment	Manuals for engines, avionics, propellers and all third parties equipment provided in addition to the Tecnam related instructions

Appendix

Optional Equipment list

The following table shows the preliminary list of optional equipment available to extend, improve or amplify flight operations and the P2012's capabilities to perform different missions. Optional equipment are listed divided by "ATA Chapter". Data concerning expected optional weight to follow during the aircraft and optional development.

Code	Item	Description	ATA
012-21-01	Air	Conditioning pallet mounted equipment, it is electrically System operated and uses the standard fresh airhoses routing. Its location will allow easyremoval for flight operations where air conditioning is not requested, saving payload.	21
012-23-01	Iridium	This equipment allows to receive weather data, make phone calls and send SMS when in flight and potentially all over the world. This equipment needs third parties subscription and related costs.	23
012-23-02	Passengers interphone system	This equipment will allow passenger to connect headphones and listen/talk with flight crew, for example during aerial tours, other than listen broadcasted music.	23
012-30-01	TKS ice protection	This option allows the P2012 to fly into known icing conditions, and features a fluid based anti ice, ice detector light and sensor, dedicated cockpit control panel. The protected parts are: wings	30

		leading edges, tail leading edges, windshield and propellers	
012-34-01	Synthetic View	This option allows the expansion of PFDs features allowing an expanded situational awareness thanks to the 3D elevation. This helps especially when flying in single pilot operations	34
012-34-02	Garmin MFD compatible charts	Different chart upload and updates solutions are available to display, inside the central MFD monitor, Safe Taxi charts, Airport directory and many other useful information	34
012-34-03	Garmin FMS GCU477	Flight Management System is a user friendly keyboard (also shown in Chapter 10) which allows pilot(s) fast selection of frequency, waypoints, map zoom, frequency swap between active and standby and many other features	34
012-34-04	Garmin Flight Stream	This option makes the P2012 cockpit a connected suite, with the possibility to link the avionics with a tablet and making them communicating efficiently, for example, to change frequencies, add/delete waypoints up to work on a entire flight plan from an FBO or Company offices to upload it directly into the aircraft avionics	34
012-34-05	Weather radar GWX70	Directly integrated with MFD screen, weather radar enhance the weather	34

		situational awareness with a direct view of storms, their height and lightnings events	
012-34-06	ADF (RA-3502/AC-3504)	Where deemed as necessary, by operators and/or simply by local CAA, this unit, together with ADF antenna, enables the function within Garmin PFD, and allows pilot to follow NDB based routes	34
012-34-07	TAS (GTS 800)	Working also in addition with ADS-B functions, Traffic Avoidance System allows to actively view traffic and display it on PFD/MFD, showing other airplanes even if they are not equipped with ADS-B out	34
012-34-08	Additional Transponder	This option allows the P2012 to fly into airspace where the second transponder is required.	34



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