

A320 family specifications

The A320 family has four main variants. Each has several gross weight and engine options to choose from, making many combinations possible.

The evolution of the A320 family has led to four main variants: the A318, A319, A320 and A321. These share a common fuselage design, with a standard six-abreast economy class configuration, and have different lengths that accommodate between 107 and 185 seats. The range of seat sizes is similar to that offered by the 737NG family, although the A321 has five more seats than the 737-900ER.

The fuselage is known for its passenger comfort, offering 1-inch wider seats than its 737/757 rivals. The A320 family's main features, however, are: its fly-by-wire (FBW) flight control system; a common flightdeck and single pilot type rating; and use of common engine types and rotatable components in two or more of its variants. These features give a high level of commonality that provides reductions in flightcrew- and maintenance-related operating costs. The FBW flight-control system and common flightdeck not only allow the single type rating between the four variants, but also cross-crew qualification with other Airbus types that have FBW systems and the same or similar flightdecks.

These technical features and a wide

range of seat capacities, which satisfy many airlines' requirements, make the A320 family an attractive choice.

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The A320 family's principal variant is the A320. Its cabin allows 150 seats in a two-class layout (see table, page 7) of 12 first-class and 138 economy seats. This can be increased to 164 seats in an all-economy layout at 31-inch seat pitch, or as many as 180 seats at 29-inch seat pitch.

The initial A320 model, the A320-100, has a fuel capacity of 4,185 US Gallons (USG) and maximum take-off weight (MTOW) of 145,504lbs. It is powered by CFM56-5A1 engines, rated at 25,000lbs thrust. Its combination of gross weight and fuel capacity give it a range of about 1,800nm with a load of 164 passengers.

This initial model was not ordered in large numbers, since most potential customers showed more interest in having a higher gross weight and fuel capacity. Only 19 -100 series aircraft with CFM56-5A1 engines were ordered by British Caledonian, Air Inter and Air

France. Two have been destroyed, leaving just 17 in operation with British Airways and the Air France group.

A higher weight A320-200 model was also available from initial offerings to potential customers. This used the same CFM56-5A1 engine, but had a higher MTOW of 162,040lbs (73.5 tonnes) and fuel capacity of 6,300 USG. This weight variant has a range of 2,600nm (see table, page 7).

Later developments with the CFM56 engine led to an aircraft powered by the CFM56-5A3 rated at 26,500lbs thrust and with an MTOW of 166,450lbs (75.5 tonnes), while sharing the same fuel capacity of 6,300 USG. This weight variant has an extended range of 2,850nm (see table, page 7).

The CFM56-5A series could not be developed much further in additional thrust. Because this would prevent the -5A series being used on the stretched A321, the CFM56-5B series was developed to provide higher thrust growth potential. The CFM56-5B series' main difference over the -5A was an additional high-pressure compressor (HPC) stage. Both variants have a 68.3-inch wide intake fan and utilise a single-stage high-pressure turbine (HPT). The additional HPC stage allowed the CFM56-5B to be developed up to a rating of 33,000lbs thrust, thereby enabling the engine to be employed for a wider range of variants.

The CFM56-5B4, rated at 27,000lbs thrust, was first offered on the A320 in the mid-1990s. The -5B series was used to power the highest MTOW variant of the A320, which had a gross weight of 169,750lbs (77.0 tonnes). With the same standard fuel capacity of 6,300 USG, the aircraft had a range of 2,850nm.

The same weight variant is also available with supplementary fuel tanks, taking total capacity to 7,066 USG, and giving the aircraft a range of 3,050nm (see table, page 7).

Airbus offers customers flexibility in the A320 family with several engine thrust variants of the two main engine types for each MTOW variant. The three MTOW variants of the A320 are 162,050lbs (73.5 tonnes), 166,450lbs (75.5 tonnes) and 169,750lbs (77.0 tonnes). Each can be powered by three variants of the CFM56-5B: the -5B4 rated at 27,000lbs thrust; the -5B5 rated at 22,000lbs thrust; and the -5B6 rated at 23,500lbs thrust (see table, page 7).

There are five gross weight variants of the A320-200, and CFMI offers two variants of the CFM56-5A and three variants of the -5B series.



A320 FAMILY SPECIFICATIONS

A320	-100	-200	-200	-200	-200	-200
MTOW lbs	145,504	162,040	166,450	162,050	166,450	169,750
MTOW tonnes	66.0	73.5	75.5	73.5	75.5	77.0
Dual-class seats	150	150	150	150	150	150
Engine variants	CFM56-5A1	CFM56-5A1/ V.2500-A1	CFM56-5A3/ V.2500-A1 bump	CFM56-5B5/ V.2527-A5	CFM56-5B6/ V.2527-A5	CFM56-5B4/ V.2527-A5
Fuel volume USG	4,185	6,300	6,300	22,000	23,500	27,000
Range nm	1,800	2,600/ 2,600	2,850/ 2,870	2,600/ 2,600	2,850/ 2,870	2,850/ 2,870
Supplementary fuel volume USG						7,066
Range nm						3,050
A321	-200	-200	-200	-200	-200	-200
MTOW lbs	183,000	187,400	187,400	196,200	196,200	206,130
MTOW tonnes	83.0	85.0	85.0	89.0	89.0	93.5
Dual-class seats	185	185	185	185	185	185
Engine variants	CFM56-5B4/ V.2530-A5	CFM56-5B1/ V.2530-A5	CFM56-5B1/ V.2530-A5	CFM56-5B2/ V.2533-A5	CFM56-5B2/ V.2533-A5	CFM56-5B3/ V.2533-A5
Fuel volume USG	6,260	6,260	6,260	7,040	7,040	7,800
Range nm	2,200/ 2,200	2,340/ 2,370	2,340/ 2,370	2,670/ 2,700	2,670/ 2,700	3,000/ 3,000
A319	-200	-200	-200	-200	-200	-200
MTOW lbs	141,100	149,920	149,920	154,330	154,330	166,450
MTOW tonnes	64.0	68.0	68.0	70.0	70.0	75.5
Dual-class seats	124	124	124	124	124	124
Engine variants	CFM56-5A4/-5A5/ V.2522-A5	CFM56-5B5/ V.2522-A5	CFM56-5B5/ V.2522-A5	CFM56-5B6/ V.2524-A5	CFM56-5B6/ V.2524-A5	CFM56-5B7/ V.2527-A5
Fuel volume USG	6,300	6,300	6,300	6,300	6,300	6,300/7,070/7,830
Range nm	1,800	2,600	2,600	2,950	2,950	3,050/3,450/3,700
A318	-200	-200	-200	-200	-200	-200
MTOW lbs	130,070	135,580	138,890	142,200	145,500	149,900
MTOW tonnes	59.0	61.5	63.0	64.5	66.0	68.0
Dual-class seats	106	106	106	106	106	106
Engine variants	CFM56-5B8 PW6122	CFM56-5B8 PW6122	CFM56-5B8 PW6122	CFM56-5B9 PW6124	CFM56-5B9 PW6124	CFM56-5B9 PW6124
Fuel volume USG	6,300	6,300	6,300	6,300	6,300	6,300
Range nm	1,450/ 1,400	1,950/ 1,850	2,200/ 2,150	2,500/ 2,450	2,800/ 2,700	3,200/ 3,100

In most cases airlines select a high gross weight and high-thrust airframe-engine combination, with high-rated engines providing better field performance but higher fuel burn (see *A320 family fuel burn performance, page 16*). Airlines may select a lower-rated engine for high gross weight aircraft, however.

Other developments of the -5B4 employed a dual annular combustor (DAC) to reduce NOx emissions.

Alongside the CFM56, International Aero Engines (IAE) developed the V.2500-A1 for use on the first models of the A320-200 in 1988, which were rated at 25,000lbs thrust. No -100s were equipped with the V.2500-A1.

The first V.2500-powered A320-200 had the same MTOW of 162,040lbs (73.5 tonnes) and fuel capacity of 6,300

USG, as the CFM56-5A1-powered aircraft. This gave it a range of 2,600nm (see *table, this page*).

The V.2500-A1 was developed with a thrust bump, which gave the engine a rating of 26,500lbs thrust for take-off in hot and high conditions. This engine was used to power aircraft with an MTOW of 166,450lbs (75.5 tonnes), a fuel capacity of 6,300 USG and range of 2,870nm (see *table, this page*).

Like the CFM56, the V.2500 had to be adapted to provide enough power for larger developments of the aircraft. The V2500-A5 series was therefore evolved, its key differences over the -A1 series being an increase in fan width from 63 to 63.5 inches, and a higher coreflow allowing higher thrust ratings. There are five -A5 series variants rated at between 23,000lbs and 32,000lbs thrust.

The V.2527-A5 was developed for the A320-200, rated at 26,500lbs thrust.

This is used to power the three gross models of the A320, the highest of which is 169,750lbs (77.0 tonnes), and has a range of 2,870nm with the standard fuel capacity of 6,300USG. With supplementary fuel tanks and a total capacity of 7,066 USG, the aircraft's range is extended to 3,050nm.

A321

The A321 was the second variant to be developed, following large sales of the similarly-sized 757 in the 1980s. The A321 has a standard two-class seat capacity of 185, about 10 seats fewer than the 757-200 when the two aircraft are similarly configured.

The first orders for the aircraft were



IAE offers just one or two thrust variants of the V.2500-A5 for each member of the A320 family.

USG (see table, page 7).

There are three variants of the V.2500-A5: the V.2522-A5 rated at 22,000lbs; the V.2524-A5 rated at 23,500lbs; and the V.2527-A5 rated at 26,500lbs.

More than 110 A319s powered by the V.2522-A5 have been built and are in service with Air China, British Airways, South African Airways and United Airlines.

More than 120 aircraft with the V.2524-A4 engine have been delivered to Air Macau, America West, Lan Airlines, Spirit Airlines, TACA and TAM.

Only a small number are powered by the V.2527-A5.

The different weight and fuel-capacity variants of the A319 have the same range when equipped with V.2500-A5 engines as those equipped with CFM56-5B series engines.

A318

The A318 was developed as a further shortening of the fuselage, taking two-class seat capacity down to 107 seats. This is similar to the 737-600. The aircraft has five gross weight options of 130,070lbs (59.0 tonnes), 135,580lbs (61.5 tonnes), 138,890lbs (63.0 tonnes), 142,200lbs (64.5 tonnes), 145,500lbs (66.0 tonnes) and 149,900lbs (68.0 tonnes). The aircraft uses the standard fuel capacity of 6,300 USG (see table, page 7).

The A318 utilises the CFM56-5B series and PW6000 series. In the case of the CFM56-5B, the variants available are the -5B8 and -5B9 rated at 21,600lbs thrust and 23,300lbs thrust. These are simply de-rated versions of the same basic -5B engine that powers the A319, A320 and A321.

The PW6000 was developed as an all-new engine with two variants available: the PW6122 rated at 22,100lbs thrust, and the PW6124 rated at 23,800lbs thrust.

When equipped with CFM56-5B engines, the A318 at its lowest gross weight option of 59.0 tonnes has a range of 1,450nm, while the highest gross weight option of 68.0 tonnes has a range of 3,200nm.

Range is slightly reduced for aircraft equipped with PW6000 engines, at 1,400nm for the lowest gross weight aircraft and 3,100nm for the highest gross weight model. **AC**

placed in 1989. Like the A320, the initial A321 models were light and had a short-range capability.

There are five MTOW variants of the A321: 183,000lbs (83.0 tonnes); 187,400lbs (85 tonnes); 196,200lbs (89.0 tonnes); 205,000lbs (93.0 tonnes); and 206,130lbs (93.5 tonnes).

These are all available with the standard fuel capacity of 6,260 USG, but there are also two options for supplementary fuel tanks that take total capacity to 7,040 USG and 7,800 USG.

As with the A320, there are several engine thrust variants available for the CFM56-5B and V.2500-A5: the CFM56-5B4 rated at 27,000lbs thrust; -5B1 rated at 30,000lbs thrust; -5B2 rated at 31,000lbs thrust; and the -5B3 rated at 33,000lbs thrust. Each is available for all the five different gross weight variants.

When equipped with CFM56-5B engines, the 83.0 tonne and 85.0 tonne variants have a range of 2,200nm and 2,340nm with a standard fuel capacity of 6,260 USG (see table, page 7). The 89.0 tonne gross weight aircraft has a range of 2,670nm, and the 93.5 tonne gross weight aircraft has a range of 3,000nm (see table, page 7).

Only 18 aircraft are equipped with CFM56-5B1 engines; these are operated by Air France, Swiss and Austrian Airlines. Another 14 have CFM56-5B2 engines and are in operation with Alitalia, an early customer for the A321.

More than 170 aircraft with -5B3 engines have been ordered to date.

There are two variants of the V.2500-A5 available for the A321: the V.2530-A5 rated at 30,400lbs thrust; and the V.2533-A5 rated at 33,000lbs thrust.

When equipped with V.2500-A5 engines, aircraft with a gross weight of

83.0 tonnes and 85.0 tonnes and standard fuel capacity of 6,260 USG have a range of 2,200nm and 2,370nm. Aircraft with a gross weight of 89.0 tonnes and fuel capacity of 2,700nm, or with a gross weight of 93.5 tonnes and fuel capacity of 7,800 USG, have a range of 3,000nm.

A319

The A319 was shortened and accommodates 124 seats in a two-class configuration. It has four gross weight options of 141,100lbs (64.0 tonnes), 149,920lbs (68.0 tonnes), 154,330lbs (70.0 tonnes) and 166,450lbs (75.5 tonnes). The aircraft has a standard fuel capacity of 6,300 USG, while the highest gross weight variant also has two supplementary fuel tank options that take fuel capacity to 7,070 USG and 7,830 USG (see table, page 7).

The aircraft utilises both CFM56-5A and -5B engines. The -5A series engines are the -5A4 and -5A5 rated at 22,000lbs thrust and 23,500lbs thrust.

The -5B5 variants are the -5B5, -5B6 and -5B7 rated at 22,000lbs thrust, 23,500lbs thrust and 27,000lbs thrust. This makes it possible for airlines to select a large number of airframe-engine combinations. The most popular engines on the A319 are the -5A5, -5B5 and -5B6, powering more than 530 aircraft.

When equipped with CFM56-5B engines, the four different gross weight models with a fuel capacity of 6,300 USG have a range of 1,800nm, 2,600nm, 2,950nm and 3,050nm. The higher gross weight variant has an extended range of 3,450nm with a supplementary fuel capacity of 7,070 USG and range of 3,700nm with a fuel capacity of 7,830