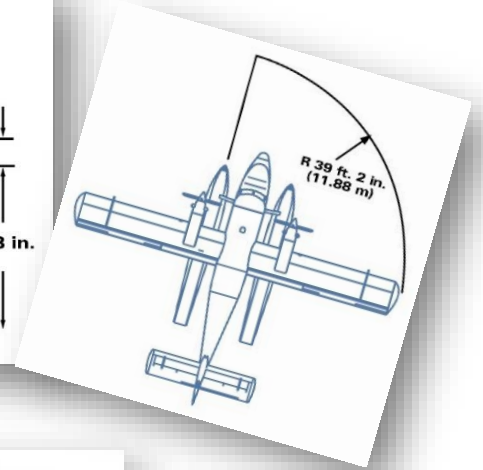
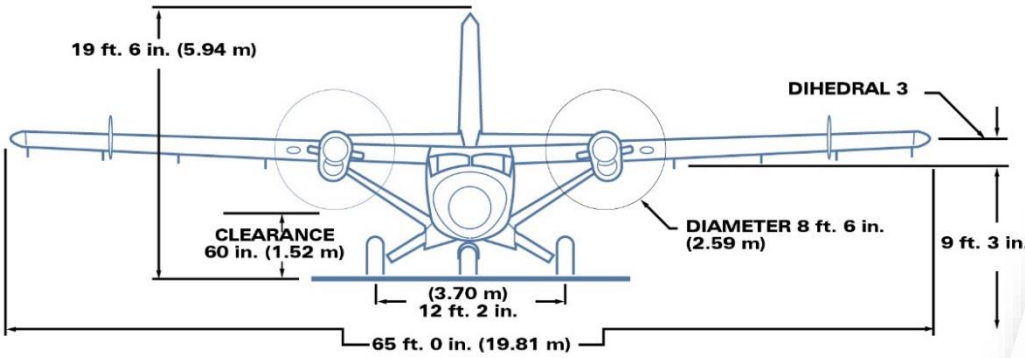


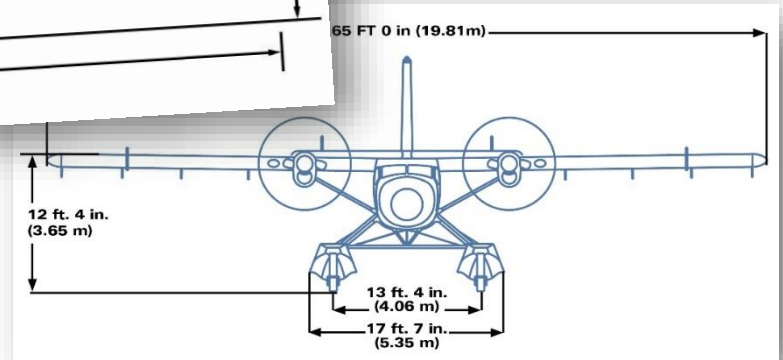
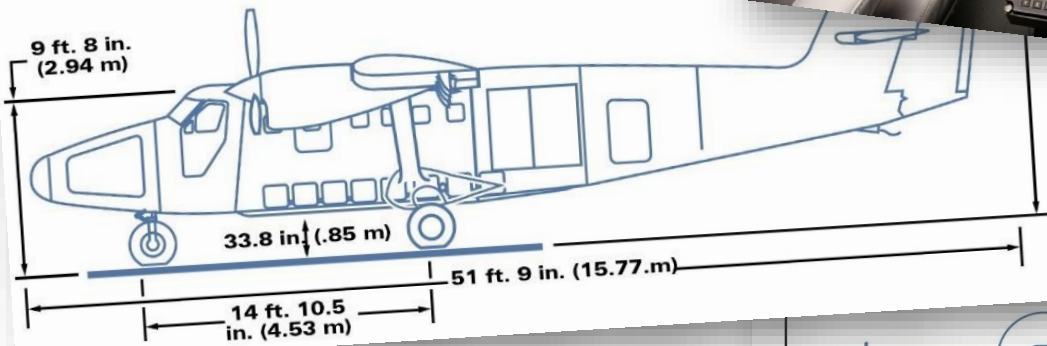
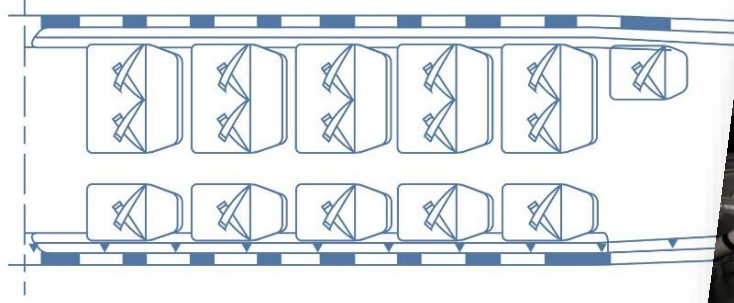
Twin Otter

SERIES 400

TECHNICAL SPECIFICATIONS & STANDARD EQUIPMENT LIST



STANDARD 19 SEAT CONFIGURATION





TECHNICAL SPECIFICATIONS & STANDARD EQUIPMENT LIST

Aircraft Overview

The Viking DHC-6 Series 400 Twin Otter aircraft is an all-metal, high wing monoplane, powered by two wing-mounted turboprop engines, each driving a three-bladed, reversible pitch, fully feathering propeller. The aircraft carries a pilot, co-pilot, and up to 19 passengers, depending upon the seating configuration.

The Series 400 is an updated version of the Series 100, 200, and 300 Twin Otters. As with previous series updates, changes made have been selected to take advantage of newer technologies that permit more reliable and more economical operations. Aircraft dimensions, construction techniques, and primary structures have not changed.

The aircraft is manufactured at Viking Air Limited facilities in Alberta and British Columbia, Canada. The type certificate (A-82 from Transport Canada) is held by Viking Air Limited.

The most significant change made to the Series 400 has been the introduction of a Honeywell Primus Apex® integrated avionics suite. In addition to providing flat panel display of all flight instrumentation, the Apex suite also provides flat panel display of all engine parameters, all aircraft system parameters, all radio frequencies, the active flight plan, terrain and topography around the aircraft, weather radar, TCAS, and TAWS status.

The flight compartment layout has been modernized, and all switches have been moved from the flight compartment roof to the sub-panels below each primary flight display.

Engines have been upgraded from the PT6A-27 to the PT6A-34. The engine continues to be flat rated to 620 horsepower, and all take-off and landing distances remain unchanged. Full flat rated take-off power from the PT6A-34 is available to ISA +27°C.

A lightweight commuter interior is fitted as standard. Interior and exterior lighting has been upgraded to LED or high intensity discharge (xenon) lighting. Cabin ventilation, heating, and optional air conditioning systems have been modernized.

1. General Description

Aircraft Dimensions

Overall Height.....19 ft. 6 in (5.94 m)
Overall Length.....51ft. 9 in (15.77 m)

Wing Span.....65 ft. 0 in (19.81 m)
Horizontal Tail Span.....20 ft. 8 in (6.29 m)

Cabin Dimensions

Length.....18 ft. 5 in (5.61 m)
Height.....4 ft. 11 in (1.50 m)
Width.....5 ft. 9 in (1.75 m)

Left Side cabin doors

50 in x 56 in (1.27 m x 1.42 m)

Right side cabin door

30 in x 45 in (0.76m x 1.16m)

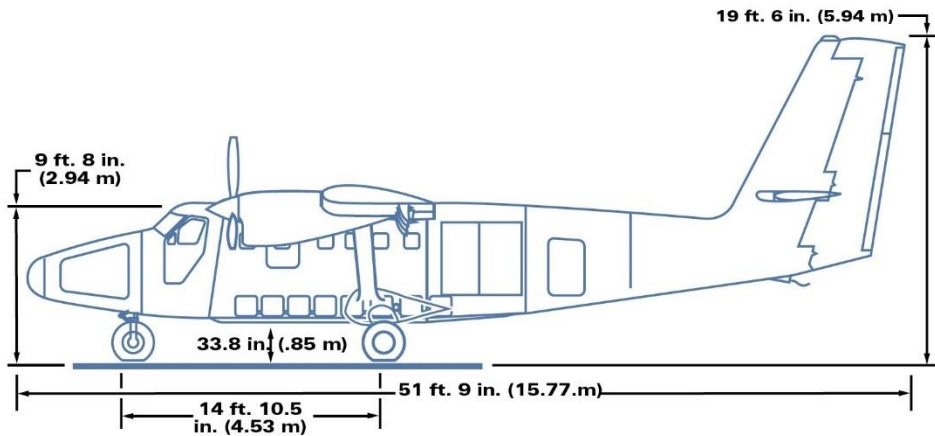
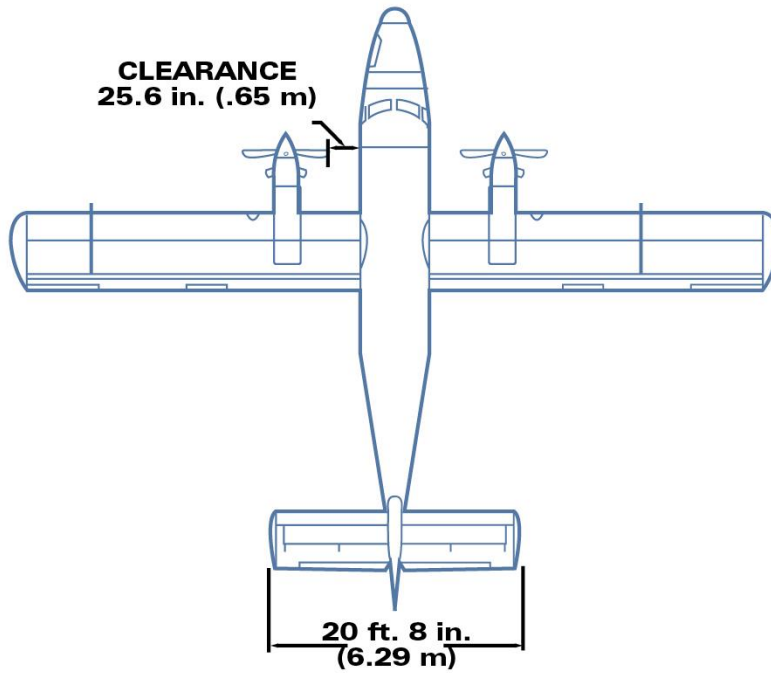
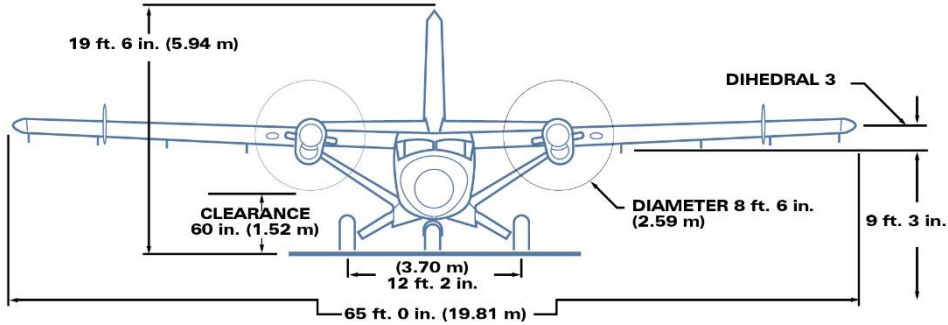
2. Design Weights & Capacities

Max. Takeoff Weight.....12,500 lbs. (5,670 kg.)
Max. Landing Weight.....12,300 lbs. (5,579 kg.)
Equipped Weight Empty.....7,445 lbs. (3,377 kg.)
Fuel Capacity.....374.5 US Gallons (1,419 l)

Optional Long Range Fuel.....89 US Gallons (337 l)

TECHNICAL SPECIFICATIONS & STANDARD EQUIPMENT LIST

3. General Arrangement





TECHNICAL SPECIFICATIONS & STANDARD EQUIPMENT LIST

4. Performance

The following performance data is intended to demonstrate the aircraft's capability in a typical flight profile.

STOL Takeoff and Landing Distances

Takeoff dist. to 50 ft. (15.2 m)	1,200 ft. (366 m)
Landing dist. from 50 ft. (15.2 m)	1,050 ft. (320 m)

**Note: the use of short takeoff and landing capability of the aircraft is governed by local regulatory authority rules, regulations, and allowed procedures. Specific approved procedures and related required safety factors (eg. Accelerate stop distances) may impact the achievable takeoff and landing distances. Potential operators should be aware of local requirements and consult the approved aircraft flight manual for performance data.*

SFAR 23 Takeoff and Landing Distances

Takeoff dist. to 50 ft. (15.2 m)	1,490 ft. (454 m)
Landing dist. from 50 ft. (15.2 m)	1,510 ft. (460 m)
Accelerate Slow Distance to 35 kt	2,045 ft. (623 m)
Accelerate - Stop Distance	2,220 ft. (675 m)

Maximum Cruise Speeds, TAS

Sea Level	170 kt
5000 ft.	181 kt
10,000 ft.	182 kt

Enroute Rate of Climb at Sea Level

Both engines at max climb power	1,600 ft./min
One engine at max continuous power	340 ft./min

Service Ceiling (Rate of Climb 100 ft./min)

Both engines max climb power	25,000 ft. (7,620 m)
One engine max cont. power	11,600 ft. (3,536 m)

Payload Range

At Maximum Cruise Speed:

Payload for 100 nm range	4,348 lbs. (1,972 kg)
Payload for 250 nm range	3,828 lbs. (1,736 kg)

Payload Range Continued

Maximum Range (Zero Payload):

With standard tankage	763 nm (1,413 km)
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Maximum Range (Full Fuel & 2270 lbs. Payload):

With standard tankage	702 nm (1,300 km)
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Maximum Endurance:

With standard tankage	6.9 hrs.
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Performance Assumptions Used

- All takeoff distances are based on both engines operating at takeoff power throughout. The takeoff and landing distances are given at sea level, zero wind and from a dry concrete level surface.
- STOL landing distance assumes retardation with wheel brakes and both engines reversed. The CAR 3 and SFAR 23 landing distances and accelerate stop distance assume retardation with wheel brakes only.
- Payload range and maximum range data is based on the following assumptions:
 - Cruise at 10,000 ft. (3,048 m);
 - Fuel reserve for 45 minutes at cruise altitude and long range speed; and
 - Fuel consumption is based on engine manufacturer's specifications.
- Maximum endurance data is based on the following assumptions:
 - The takeoff weight equals the Operational Empty Weight, full fuel and 1,000 lbs. (454 kg) of equipment;
 - Maximum endurance speed at 10,000 ft.;
 - Fuel reserve for 45 minutes at maximum endurance speed and altitude; and
 - Fuel consumption is based on engine manufacturer's specifications.
- All data is generated with intake deflector in the retracted position and bleed for heating, ventilating and deicing turned "off". Performance varies depending on external configuration. All performance numbers are given at ISA conditions.

5. Fuselage

With the exception of the conical nose section, the fuselage primary structure is of an all-metal conventional construction with frames, stringers, and skin all made of aluminum alloy.

The external surfaces of the standard aircraft are primed with a chromated epoxy primer and finished with a polyurethane topcoat.

The fuselage is comprised of five permanently attached sections: the nose section; the flight compartment; the fuselage forward cabin; the fuselage rear cabin; and the rear fuselage.

Nose Section

The nose section, manufactured in three sections, consists of a nose cap, center, and rear sections. The nose cap is a radome, and the center section is a carbon fibre composite assembly with a Nomex[®] foam core, forming the nose baggage compartment. The upward and outward-opening nose baggage compartment access door, located on the left side of the nose section, is equipped with a prop rod to hold the door open and two latches, the forward of which can be locked externally by key.

Flight Compartment Section

The flight compartment extends from the forward bulkhead aft to a flight compartment / cabin bulkhead and consists of a conventional skin and stringer frame bulkhead structure. Two forward, outward-opening doors, one on the left and one on the right, are provided for external access to the flight compartment. Bird impact-resistant plastic windshield panels are standard.

Access to the flight compartment from the cabin is provided by a central doorway in the flight compartment / cabin bulkhead.

Forward & Rear Cabin Sections

The forward fuselage section extends from the flight compartment / cabin bulkhead to a frame forward of the left door surround, and the rear section extends from this same bulkhead aft to a cabin/rear baggage compartment bulkhead. These sections form one large main cabin section.

The cabin section consists of floor, side and roof panel assemblies. The roof panels are stiffened by longitudinal stringers, with the exception of the center portion which is a honeycomb core sandwich panel.

The left cabin entrance door is comprised of two sections. The aft section is a dual cargo door, locked and unlocked from within,

and the forward half is a quickly detachable airstair door, complete with handrails. The airstair door can be locked and unlocked externally.

Two plug-type emergency exits are provided in the main cabin: one in each side panel at the forward end of the cabin.

Eight acrylic plastic windows are installed on the right side of the cabin: one in the forward emergency exit, one in the right cabin door, and six in the side panel. Seven similar windows are installed on the left side of the cabin: one in the forward emergency exit, one in the rear cargo door, and five in the side panel.

The complete main cabin has a total usable volume of approximately 384 cubic feet (10.9 m³).

Rear Fuselage Section

The rear fuselage section, which contains the rear baggage compartment, extends aft in a gradual taper from the bulkhead dividing it from the cabin section to the rudder hinge line.

6. Wings

The wing consists of the left and right mainplanes, which are rectangular in plan form and of constant section. Each mainplane is attached to the fuselage structure, at roof level, by two bolts through fork and lug fittings at the front and rear spars, and is supported by a lift strut having single bolt attachments at each end. A double-slotted, full-span flap/aileron system is installed at each mainplane trailing edge.

Each wing structure is a box of constant section, manufactured from high strength aluminum alloy, and consists of main and rear spars, a short front spar at the root end, and top and bottom skin panels.

Both mainplane leading edges are hinged between the fuselage and nacelle to permit access for servicing. Access is also provided to the mainplane interior for the maintenance of flap and aileron control systems. Five hinge arms are provided on each mainplane rear spar to carry the flap/aileron system.

The wing tips, which are removable for servicing and maintenance, have internal lightning protection bonding strips that are secured to each wing structure to provide a ground for electrical discharge. Electrical wiring to each wing tip is routed through conduit tubing for protection.

7. Empennage

The tail group is comprised of a horizontal stabilizer, an elevator, a vertical stabilizer, and a rudder.

Horizontal Stabilizer

The horizontal stabilizer is a one-piece unit, consisting of front and rear full span spars and full span top and bottom skin/stringer panels. Hinge arms extending rearward from the rear spar carry the elevator.

Elevator

The elevator consists of left and right-hand units, joined at the aircraft centerline by bolted torque tubes. Each elevator unit is of a conventional all-metal construction, comprising two span-wise spars with intersecting chord-wise ribs, covered with swaged skin panels to provide torsional strength. The elevator is aerodynamically and mass balanced to meet flutter criteria, mass balancing being achieved by attaching lead weights to the outboard horns. The left elevator unit incorporates a pilot-operated trim tab, and the right elevator unit incorporates a wing flap/elevator interconnect tab.

Vertical Stabilizer

The vertical stabilizer is of conventional form, consisting of front and rear spars connected by ribs and covered by vertical skin/stringer panels. The rear spar is provided with two hinge brackets for rudder attachment (a third rudder hinge attachment is located on the rear fuselage structure).

Rudder

The rudder consists of a main spar and ribs covered with swaged skin panels. The leading edge of the rudder is faired with a symmetrical D-shaped nose. The rudder is aerodynamically and mass balanced as required to meet control force and flutter criteria, with mass balancing achieved by attaching lead weights to the rib of the rudder horn. Two tabs are provided on the rudder trailing edge; the upper trim tab is operated manually by the pilot, while the lower is a variable mechanically-gear assist tab.

8. Landing Gear

Standard Landplane

The landing gear is non-retractable and consists of two main landing gear units and a nose landing gear unit. Each main landing gear unit consists of a wheel mounted on a stub axle that is attached to a Y strut assembly hinged to the side of the fuselage. Compression urethane shock absorbers are connected between the Y strut and the fuselage. A hydraulically-operated brake assembly is embodied in each wheel unit. Each main landing gear leg is enclosed in a two-piece fairing.

The nose landing gear consists of a pneumatic/hydraulic shock strut with a hydraulically operated steering mechanism and a nose wheel installed in the strut fork assembly.

A tail bumper is installed on the underside of the rear fuselage.

Nose Wheel Steering

The nose wheel is steerable over a range of 60 degrees to the left and to the right of the center position for the purpose of low speed ground maneuvering.

Wheel Brake System

Cleveland wheels and brakes, manufactured by Parker Hannifin, are provided as standard equipment. Each brake is a single caliper, 4 piston, external disc design, with sintered metallic pads. The main landing gear consists of two cast magnesium divided wheels.

9. Powerplants

The aircraft is equipped with two 750-shaft horsepower PT6A-34 engines, flat rated to 620 horsepower. The engines use a single line fuel delivery system that feeds 14 nozzles from the same manifold. Purolator fuel filters are provided. An engine wash spray ring is provided as standard in each nacelle.

Fire detecting and extinguishing systems are installed in both engine nacelles to provide warning of fire and the means to extinguish a fire.

Engine/Propeller Controls

The engine and propeller controls are mounted in the overhead console in the flight compartment, and consist of power levers, propeller levers, and engine fuel levers.

Power Levers

The power levers move in slots in a quadrant labelled THROTTLE. Each power lever controls engine gas generator speed in the forward and reverse power ranges and propeller blade angle in the beta range.

Propeller Levers

Two propeller levers are located side by side in the overhead console, and they move in slots in a quadrant labelled PROP RPM.

Engine Fuel Levers

The fuel levers move in slots in a quadrant in the overhead console. The quadrant is labelled FUEL. Each lever is connected to the engine fuel shut-off valve on the Fuel Control Unit (FCU) which controls the delivery of fuel to the engine.

10. Propellers

The two propellers are Hartzell HC-B3TN-3D, metal, counterweight, three-bladed, fully feathering, reversible, and speed governed units. Each propeller is 8 feet 6 inches (2.6 m) in diameter and has a blade angle range of -15° (full reverse) to $+87^{\circ}$ (feathered), and a low pitch pickup setting of $+17^{\circ}$. Each is controlled in the constant speed range and when feathered by the propeller lever through a propeller governor on the propeller reduction gearbox. The power lever is connected to the propeller reverse cam mechanism for control of the propeller in the beta ($+17^{\circ}$ to -15°) range.

Each propeller system incorporates a propeller overspeed governor and an automatic feathering system.

Propeller Autofeather System

An automatic propeller feathering system is provided which automatically feathers the propeller of an underpowered engine when a decrease in torque to below approximately 20 PSI is detected.

11. Systems

Electrical Systems

The electrical system is a 28 volt, direct current, single wire installation with the airframe used as ground return. The aircraft is entirely 28 volt powered. There are no inverters or fuses.

Primary DC power is supplied by two engine-driven starter-generators. Power is supplied via battery when the generators are inoperative. Electrical power is distributed through a multiple bus system consisting of left, right, hot battery, and battery/external power busses.

An external power receptacle is located on the fuselage left side aft of the cargo doors; it is covered by a spring-loaded access panel.

Lighting

With the exception of the landing lights, which are high intensity discharge (xenon), and the wing inspection lights, which are incandescent, all interior and exterior lighting is provided by LED (light emitting diode) arrays. All LED lamps are 'high reliability' specification

Fuel System

Fuel is contained in forward and aft fuselage tanks located in the lower fuselage beneath the cabin floor. A filler neck and cap for each tank is provided on the left side of the fuselage. Each tank consists of four interconnected flexible rubber cells, one of which is a collector cell into which fuel is transferred from the other cells through a boost pump operated ejector. The fuel is delivered by boost pumps to the engines.

Ice and Rain Protection

A windshield wiper system is installed to provide ice and rain protection for the windshield.

An engine intake deflector and diffuser are installed in the lower cowl of each engine to prevent the entry of snow and ice into the engine plenum chamber.

Heating and Ventilating System

The heating and ventilating system utilizes bleed air from the engines and ram air from a scoop intake in the fuselage to provide heated, ram, or mixed air to maintain appropriate temperatures in the cabin and flight compartment.

Heated air is circulated through ducts beneath the flooring to outlets at the base of each cabin wall and in the flight compartment floor. Two tubes, one for each side of the windshield, deliver heated air to the windshield defrost outlets. The same ducts also circulate cooling ram air or a mixture of heated air and ram air in the cabin and flight compartment.

Two additional tubes, one for each side of the flight compartment, deliver unconditioned ram air to the punkah louvers located on each outboard side of the instrument panel. Additional ducts deliver ram air to the cabin through individual passenger punkah louvers located in the cove molding ducts on each side of the cabin upper walls. A fan is installed in the air intake duct for forced ram air ventilation when on ground.

A third dedicated supply hose connected to the fresh air intake plenum supplies outside air to the main avionics bay.

Hydraulic System

The hydraulic system operates the wing flaps, nose wheel steering, wheel brakes and (if installed) the wheel-skis. The main components of the system are an electric motor-driven pump, an emergency hand pump, a reservoir, damping and brake accumulators, flap and nose wheel steering actuators, brake valves, and a flap selector.

Stall Warning System

The stall warning system consists of two lift detecting vanes and switches (which are connected in parallel) located on the left wing leading edge.

Flight Controls

The flight controls are conventionally operated through pulley and cable systems and mechanical linkage by a control column, control wheel and rudder pedals. The control column is of a dual Y configuration located on the aircraft centerline with a control wheel pivoted at the upper end of each arm. The ailerons lower with the wing flaps and their degree of movement, including degree of differential movement, increases proportionately with flap deflection. The ailerons move differentially at any flap position. The left elevator, rudder and left aileron are equipped with flight adjustable trim tabs, and the right elevator with a trim tab that is interconnected with the flaps. A geared tab (a servo tab) is installed on each aileron and on the rudder.

Wing Flap System

The wing flaps consist of inboard and outboard fore flaps and an inboard trailing flap on each wing. Each aileron is hinged to its corresponding outboard fore flap. The wing flaps are operated hydraulically by an actuator in the cabin roof through a system of push-pull rods, levers, and bellcranks, and can be selected to any desired setting within a range of 0° to 37.5° by a flap selector lever. A flap-elevator interconnect tab on the right elevator is linked to the flap control system and operates simultaneously with the flaps to provide compensating longitudinal trim.

12. Flight Deck & Primus Apex® Avionics Suite

Base Specification

The standard aircraft includes the following avionics.

- Left and Right Pilot Primary Flight Displays and PFD Controllers
- Upper and Lower Center MFD Displays (2 total)
- MFD Controller, Including Keyboard
- Display Reversion Control Panel
- Flight Director Panel
- Flight Management System (FMS)
- Dual Channel, Dual Source Air Data and AHRS System (ADAHRS)
- Dual Multi-Mode Digital Radio (MMDR) with VHF Com, VHF Nav, ADF and Glideslope
- ART 2000 Weather Radar
- King KRA 405B Radar Altimeter
- Dual KGS 200 GPS Installation
- Honeywell MK VI Class A TAWS (EGPWS)
- Dual KXP 2290 Mode S Diversity (EHS) Transponders
- KTA 910 TCAS I
- Dual KN-63 DME
- GH3100 Electronic Standby Instrument System (ESIS) with Battery Backup
- One Magnetic Standby Compass
- 406 MHz ELT with Navigation Interface
- Honeywell AR-120 120-Minute Solid-State Cockpit Voice Recorder (CVR)
- One Thommen Quartz Chronometer
- Dual KMA 29 Audio Panel
- Aural Warning System
- Cabin Address System with Independent Amplifier
- Two 14v convenience outlets in flight compartment

Primus Apex® Avionics Suite

The aircraft is equipped with a Honeywell Primus Apex® 'glass cockpit' integrated avionics system interconnected via various data buses. The Apex system architecture is designed to allow multiple system options, future system enhancements, and future feature upgrades – many of which can be installed by way of software upgrades. The integrated design approach provides a consistent display format across all of the instrument panel display units and display controllers.

Cockpit Layout

The avionics suite is based on a four-display unit layout, arranged in a T configuration. All the cockpit controls, switches, and displays are readily accessible to the pilot for single pilot operation. There is a single overhead panel located directly above the left pilot windshield that contains controls for engine starting, ignition, DC electrical, and landing lights. Circuit breaker panels are located on the left wall of the flight compartment and at the base of the instrument panel pedestal. All aircraft system controls and switches are located on two sub-panels, directly below the two primary flight displays.

Instrument Panel Description

The left display unit (DU) is the pilot's primary flight display (PFD), the center upper DU is normally used for the situational awareness multi-function display (MFD), the lower MFD is normally used for the systems MFD, and the right DU is the co-pilot's PFD. The presentation of information on the two MFD's can be electronically swapped to display systems on the upper MFD and situational awareness on the lower MFD.

These four display panels are installed in a single-piece, shock mounted instrument panel.

To the right of the pilot's PFD is the Electronic Standby Instrument System (ESIS), the main function of which is to display altitude, attitude, heading, and airspeed in the event of a total failure of the primary avionics system or a total electrical failure. The ESIS is powered by a dedicated battery that is entirely independent of the main DC electrical system.

A Thommen quartz chronometer is located inboard of the co-pilot's PFD. The clock occupies a 3 ATI standard space, and two additional 3 ATI spaces are provided below the clock for optional equipment such as HF radio or satellite communications controls.

The KMC 2210 PFD and radio control panels are directly inboard of each PFD. The KMA 29 audio control panels are directly above each PFD. The KMC 2210 flight guidance control panel is directly above the upper multifunction display.

Fuel system controls and switches are located directly below the ESIS, on the left side of the instrument panel. Engine fire control switches are mounted outboard of the flight guidance control panel.

The MFD controller, the display reversion control panel, and dimming control for the instrument panel are located on the aft face of the center control yoke.

The lower sub-panel on the left side contains all switches for internal and external lighting and for the most commonly used ice and rain protection controls. The lower right sub-panel contains switches for heating and ventilation controls, certain emergency and configuration functions, and for optional surface de-ice boots.

Engine fire detection indication and control switches are mounted outboard of the flight guidance control panel, at the top center of the instrument panel. Dimming controls for instrument panel lighting are mounted forward of the multifunction controller on the control yoke.

Primary Flight Display

The Primary Flight Display (PFD) provides all the essential flight data to the pilot. The PFD displays attitude, heading, airspeed and altitude in the left 2/3 window.

Attitude information is displayed on the electronic Attitude Direction Indicator (ADI) and heading and course information on the electronic Horizontal Situation Indicator (HSI).

Systems Multifunction Display (MFD)

The upper MFD display is normally used for situational awareness formats (primarily mapping) with various other system displays (primarily the flight plan) in dedicated windows. The bezel buttons on the sides of the MFD are used to select formats and control various systems.

The lower MFD display is normally used for the aircraft systems displays, for control of the various components of the avionics system, and for the display of CAS (Crew Alerting System) messages.

Flight Management System (FMS)

The Flight Management System (FMS) provides flight planning capability, navigation information and flight performance data to the pilot. The FMS is capable of managing flight planning details from aircraft take-off to touchdown including predictions of fuel and time.

The FMS uses two navigation databases, which contain worldwide or regional data, namely a custom database which contains flight plans and pilot defined waypoints and an aircraft database consisting of aircraft specific parameters used in FMS performance calculations.

The FMS uses information from the databases stored in memory and information from the GPS and ADAHRS to calculate and display navigational and flight planning information.

Flight planning information can be entered by the pilot using the MF Controller keyboard.

The FMS shows information on the PFD and upper MFD for:

- Flight planning
- Navigation
- Situational awareness
- Flight performance data

APEX Avionics System Functionality

The Apex system connects to and controls the following stand-alone Honeywell equipment:

- Air Data Attitude Heading Reference System (ADAHRS)
- Multi-Mode Digital Radios (MMDR)
- Weather Radar System (WX)
- Radar Altimeter System (RA)
- Global Positioning System (GPS)
- Class A Terrain Awareness and Warning System (TAWS)
- Dual Mode S Transponders
- Traffic Collision Avoidance System (TCAS I)
- Distance Measuring Equipment (DME)

ADAHRS

The aircraft is equipped with one dual channel KSG 7200 Air Data and Attitude Heading Reference System (ADAHRS). Each channel has a separate power supply. The system provides primary attitude, heading and air data parameters from each channel to the Modular Avionics Unit (MAU). This design ensures that a single component failure will not affect both channels.

Multi-Mode Digital Radio

Two multi-mode Digital Radio (MMDR) integrated transceivers are installed in the nose avionics bay. Each MMDR comprises one transmitter and six receivers. The single transmitter is a 2,280 channel, 16 watt, double sideband amplitude modulation communication transmitter capable of 8.33 or 25 kHz channel spacing operation

Weather Radar

The ART 2000 weather radar system gives the pilot a horizontal display of thunderstorms or high density precipitation in front of the aircraft.

The installation consists of a 4kW radar transmitter, a receiver, and an integral processing unit, all installed in the nose radome.

The antenna pedestal elevation assembly permits the radar beam to be tilted up or down 15 degrees. Tilt may be controlled manually on the multifunction controller or may be determined automatically.

The system displays storm intensity levels in colour against a black background. Rainfall intensity is presented in four colours: green, yellow, red, and magenta, with magenta representing rainfall of the highest intensity.

The radar system can also be used for ground mapping (GMAP). In GMAP mode, prominent landmarks are displayed which enable the pilot to identify coastlines, hilly or mountainous regions, cities, or in some cases even large structures.

Weather radar information can be displayed as overlays on the PFDs and the navigation map display of the MFD.

Radar Altimeter

The radar altimeter system measures the aircraft height Above Ground Level (AGL). The digital readout for radio altitude is displayed in white text in a black box in the lower center part of the attitude display on the PFD. The radar altitude display is removed at altitudes greater than 2,500 feet. When altitude is less than 550 feet, the lower portion of the PFD altitude tape will show a yellow cross hatched box to indicate ground proximity. The radar altimeter is an integral component of the Class A TAWS (Terrain Awareness and Warning System).

Global Positioning System

Two independent Global Positioning System (GPS) sensors are installed in the nose avionics bay. The receivers use 24 channels grouped in 3 hardware groups each consisting of 8 channels. One group of 8 channels is used for navigation at any given time. The GPS sensor unit calculates and outputs navigation data, satellite measurement data, Receiver Autonomous Integrity Monitoring (RAIM) and Predictive RAIM (PRAIM).

TAWS

The Honeywell Mk VI Enhanced Ground Proximity Warning System (EGPWS) consists of a TAWS computer and configuration module installed in the nose avionics bay. TAWS provides an enhanced capability of reducing accidents caused by controlled flight into terrain. The system achieves this by receiving a variety of aircraft parameters as inputs, then applying alerting algorithms to provide the flight crew with aural messages and visual annunciation and display.

Dual Mode S Transponders

A KXP 2290 Mode S transponder is installed behind each pilot's PFD controller. The transponder provides Air Traffic Control Radar Beacon System (ATCRBS), Mode-S.

TCAS I Traffic Advisory System

The TCAS display is integrated into the Apex system, and TCAS alerts are voiced through the aural warning system. The system uses a processor, two directional antennas (upper and lower) and a configuration module. Aural alerts are provided through the audio panel and from there onward to the crew headsets. TCAS I provides traffic advisories (TA), but does not provide resolution advisories (RA). TCAS II is an option.

Distance Measuring Equipment (DME)

Two KN-63 DME transceivers are installed in the nose avionics bay. The maximum range of the DME transceiver is 389 nautical miles.

Additional Flight Deck Systems

Standby Instrument System (ESIS)

An Electronic Standby Instrument System (ESIS) is installed and displays altitude, attitude, airspeed, and magnetic heading. The ESIS is completely independent from the APEX system.

Magnetic Standby Compass

An illuminated magnetic standby compass is mounted at the top of the windshield center post.

Emergency Locator Transmitter (ELT)

An ELT is installed in the empennage connected to an antenna installed on the top of the fuselage just ahead of the vertical stabilizer. The ELT transmits on the international distress frequencies of 121.5, 243.0 and 406 MHz.

Cockpit Voice Recorder (CVR)

A four channel Honeywell AR 120 cockpit voice recorder with 120 minute recording capacity is fitted. The CVR is integrated with the Apex system and captures radio communication, intercom communication, and input from a flight compartment area microphone that is mounted in the center of the flight compartment, directly below the glareshield. The CVR uses flash memory modules to record data, and has no moving parts. It is equipped with an underwater location beacon.

Clock

An illuminated quartz chronometer is located on the instrument panel, to the right of the upper multifunction display. A setting knob is provided beside the clock face.

Intercom

An intercom for communication between the pilots (and, if desired, an observer) is standard. The Series 400 has a single-position rocker switch that when pressed, transmits on the radio only. Crew communications are automatically triggered via the voice-activated intercom.

Passenger Address System

A passenger address system uses an 18 watt amplifier that is located in the forward avionics rack, and broadcasts through six speakers mounted in the passenger cabin roof.

13. Interior

A lightweight interior package is standard fitment to all aircraft. This commuter interior complies with FAR 23.853 at amendment 23-49 flammability specifications.

Seating

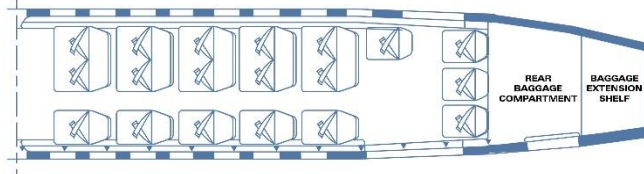
Nineteen upholstered seats are fitted in the cabin, with provisions for under seat stowage of hand baggage. The 6th row consists of a single seat, providing a larger entry area at the airstair door.

The seating configuration can be adapted to suit a lesser number of cabin seats, or for mixed passenger and cargo operation.

Passenger seats can be removed and re-installed when necessary for the transportation of cargo. The first six rows of seats are secured to the Douglas track that is attached to the floor rails and cabin side rails. The seventh (last) row of seats is supported by fittings on the cabin rear bulkhead at station 332 in a manner similar to theatre seats, and flip up to the upper stowed position.

All passenger seats are equipped with lap type safety belts, and LED overhead lighting and cabin air outlets are available for each seat position.

STANDARD 19 SEAT CONFIGURATION



14. Cargo and Baggage Loading

The front and rear baggage compartments have usable volumes of 36 and 88 cubic feet (1.0 and 2.5 m³) respectively. A maximum load of 285 pounds (130 kg) can be carried in the forward (nose) baggage compartment.

The rear baggage compartment can carry up to 500 pounds (225 kg), of which a maximum of 150 pounds (68 kg) may be loaded on the rear baggage compartment aft shelf extension.

Baggage tie-down rings are provided in each baggage compartment.

15. Exterior Finishing

The basic aircraft specification is a Standard all-over white paint with black exhaust tracks (PPG Paint Codes: White T12165 BAC

70846 and Black: T74320). Custom paint options outlined in the Twin Otter Series 400 Options Guide.

16. Additional Loose Equipment

- Maintenance Laptop & Computer Case
- ESD Wrist Strap (2)
- PCMCIA LAN Kit
- EGPWS Smart Cable
- MK VI EGPWS RS-232 Cable
- Serial Cable (3)
- CD Wallet
- Primus Apex System SW CD
- FMS Aircraft Performance Database CD
- ADAHRS Certification CD
- KSG7200 Mx Program CD
- MAU Loadable Diagnostic Interface CD
- Approach Plate Holder
- CMC Remote Terminal CD
- TPU 66A / 67A CD
- Winviews EGPWS Diagnostic Software CD
- Air & Ground DAU Maintenance Plugs
- APM Options File CD
- APM Settings File CD (when aircraft program information provided by customer)
- EGPWS Terrain DB PCMCIA Card
- Equipment Bag
- LCD Screen Cleaner & Microfiber Cloth
- Fuel Dipstick Gauge
- Gust Lock
- Jury Strut Standard Landing Gear
- Cowl Plugs (2)
- Electronic Noise Cancelling Headsets (2)
- Propeller Restraining Device (2)
- Engine Exhaust Cover (4)
- Pitot Tube Cover (2)
- Door Stay for Aft Baggage Hold (1)
- Keys for Aircraft Doors (8)
- External Tie Down Rings (3)

17. Emergency Equipment

First Aid Kit

A first aid kit is located on the aft side of fwd cabin wall



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Portable Fire Extinguishers

A hand fire extinguisher is located on the aisle floor beside Co-pilot's seat in the flight compartment. A secondary hand fire extinguisher is located in the cabin, forward of the airstair door.

Emergency Exits

Two plug-type emergency exits are provided in the passenger cabin, one on each side of the cabin at the forward end. Each is secured in the closed position by two plates on the lower edge of the door and by the hatch release mechanism on the upper edge of the door; each is jettisoned by detaching the cover over the release mechanism, pulling down the release handle (which then becomes detached), and then pushing the door outward.

18. Documentation & Technical Publications

Viking Publications:

- Canadian Technical Log Books (hard copy)
- Pilot Operating Handbook (hard copy & digital subscription)
- Emergency & Abnormal Procedures Quick Reference Handbook (hard copy)
- Aircraft Maintenance Manual (digital subscription)
- Wiring Diagrams Manual (digital subscription)
- Electrical Load Analysis (hard copy in acceptance binder)
- Ground Handling Manual (digital subscription)
- Structural Repairs Manual (digital subscription)
- Illustrated Parts Catalogue (digital subscription)
- Corrosion Prevention & Control Program (digital subscription)
- Inspection Requirements Manual (IR & IC) (digital subscription)
- Weight & Balance Manual (section 1) (digital subscription)
- Weight & Balance Manual (section 2) (digital subscription)
- Structural Components Service Life Limits (digital subscription)
- Avionics Airworthiness Limitations Manual (digital subscription)
- Master Minimum Equipment List (TCCA website)

Pratt & Whitney PT6A-34 Publications:

- Engine Technical Log Book (hard copy)
- Engine Specific Operating Instructions (in POH)
- Engine Maintenance Manual (digital subscription)
- Engine Illustrated Parts Catalogue (digital subscription)
- Engine Service Bulletins and Information Letters (web access)

Hartzell Propeller Publications:

- Propeller Owner's Manual (hard copy)
- Propeller Service Bulletins & Information Letters (web access)

Honeywell Avionics Publications:

- Pilot Operating Guide
- Installation Manual (digital subscription)
- Illustrated Parts Catalogue (digital subscription)
- Service Bulletins, Info Letters & Subscriptions (web access)

Manuals for any applicable Supplemental Type Certificates:

- Supplementary Maintenance Manual
- Supplementary Flight Manual
- Supplementary Parts Catalog

In addition, one (1) year digital subscriptions are provided for Aircraft Technical Publishers (ATP) as well as AVTRAK.

ATP provides an on-line resource/portal to the technical publications.

AVTRAK provides civilian operators/maintainers with maintenance planning and aircraft conformity resources.

19. Aircraft Limited Warranty

400 Series Factory Warranty

For new aircraft, Viking provides a 12 month or 500 flight hour, (whichever occurs first) limited warranty policy which covers non-conformance to technical specifications for the aircraft and any defects in material and/or workmanship under normal use and service. Viking's warranty policy is administered through Viking's Global Customer Support group. Individual (third party) component warranties are transferred to the customer upon delivery of the Aircraft.

P&WC PT6A-34 Engine Warranty

Pratt & Whitney Canada's (P&WC) standard warranty policy is 1000 flight hours from date of delivery. Post 1000 flight hours, P&WC offers a Primary Parts Service Policy (PPSP) and Extended Engine Service Policy (EESP).

Honeywell Avionics Warranty

Honeywell's standard warranty policy is 3 years. Additional warranty periods are available for an additional cost. Services are provided via Honeywell's Global Customer Support Center.

Hartzell Propeller Warranty

Hartzell Propeller's standard warranty covers one year or 1,000 flight hours upon installation on the aircraft (whichever occurs



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first), and the warranty on propeller de-ice boots is 18 months, or 2,000 flight hours upon installation on the aircraft (whichever occurs first).

20. Optional Entry-Into-Service Packages

Administered through a dedicated Entry-into-Service team, Viking's aircraft support program can be customized to include training, in-field support and the initial provisioning of spare parts, tools and equipment.

The following packages are optional and not included in the purchase price - pricing and information provided upon request.

Training

A complete training package for flight and maintenance crews is available for the Series 400 through a combination of courses offered by Viking, FlightSafety International and Pacific Sky Aviation.

Twin Otter Series 100-300 Pilot - Initial

FlightSafety International offers an initial legacy Twin Otter Series 100-300 training program. Successful completion of this course will enable pilots to be fully familiar with the legacy aircraft and its operation, as well as perform the duties and responsibilities associated with either a one-crew or two-crew cockpit operation as required.

Twin Otter Series 400 Pilot - Differences

For recent graduates of FlightSafety International's Twin Otter Series 100-300 Pilot Initial training course, or for experienced legacy Twin Otter pilots, Pacific Sky Aviation offers a Series 400 Pilot Differences course utilizing the customer's aircraft. The course focuses on the differences between the legacy aircraft and the Series 400, with a special emphasis on the Honeywell Apex avionics suite.

Twin Otter Series 400 Level D Full Flight Simulator

Viking's training partner, Pacific Sky Aviation, has established a state-of-the-art training facility in Calgary, AB, Canada, housing the first-of-its-kind Series 400 Level D Full Flight Simulator. Pilot training programs available on the simulator for Series 400 aircraft include Initial, Differences, Recurrent, Seaplane, as well as specialty training.

Twin Otter Series 400 Maintenance - Initial

Viking's Series 400 Initial Maintenance course is designed to meet the training requirements for a fully qualified aircraft maintenance engineer who has limited or no experience maintaining a Series 400. The course includes normal operation, inspection, service and repair of aircraft systems.

Twin Otter Series 400 Maintenance - Differences

Designed for technicians with previous experience on legacy Twin Otter aircraft, Viking offers a Series 400 Maintenance Differences course highlighting the differences between the legacy aircraft and the new Series 400, with special emphasis on the Honeywell Apex avionics suite.

Aircraft Ferry Services

Viking offers ferry services for new aircraft from the factory to operating locations anywhere in the world. Viking takes care of all of the flight planning, certification, overflight and lease/insurance requirements to ensure that the aircraft arrives on location and ready to go to work.

In-Field Support

Viking's experienced pilots and Field Service Representatives have worked with customers the world over to launch and refine their Twin Otter operations by providing support, advice, training and mentorship. Support activities can be tailored to the customer's specific needs, ranging from one-week mandates to multi-year programs.

Initial Provisioning and Maintenance+

Viking's Entry-Into-Service team works with operators of new Series 400 aircraft to design a tailored package of spares, tools, and ground support equipment, along with test and calibration instruments to ensure that the right parts and equipment are on hand at the right time. These initial provisioning packages are offered at discounted rates and are only available during the 12-month entry-into-service phase.

The newly introduced **Maintenance+** program takes Viking's support to the next level. Offering maintenance personnel peace of mind and the finance department budget predictability. As a "members only exclusive club" **M+** covers; component vendor management, rotatable exchange, expendable/consumable parts and a menu driven support program with expedient parts logistics and shipping included on a cost-per-flight-hour basis. **M+** greatly reduces the workload for maintenance and finance



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organizations by reducing staff requirements and internal system complexity, removing unknown shipping expenses, assisting planning and stops vendor/supply chain delay issues by providing the right part and the right time. **Maintenance+** allows the operators to reduce overhead expenses, set predictable budgets and focus on their core business.

21. Optional Equipment*

A full list of Optional Equipment is available in the “Twin Otter Series 400 Options Guide”.

**Note: Operators are responsible for selecting Optional Equipment required to meet local regulatory certification requirements.*