ADTS 405 Series
Air Data Test Systems

- High accuracy
- RSVM compatible
- Flightline and rack mount versions
- Civil and military specifications
- Integral or remote pressure/vacuum supplies
- Fully programmable for aircraft type
- Single operator, ground or cockpit
- Protection for aircraft instruments
Druck is the foremost supplier of air data test systems, with over 25 years experience in the design and manufacture of advanced pressure measuring instruments and sensors.

The ADTS 405 is the latest in a series of reliable, high accuracy, air data test systems. The rugged, compact design has evolved as a result of Druck’s continuous research and development, customer feedback and experience gained from manufacturing thousands of automatic pressure controllers. This has enabled performance, maintainability, and operational simplicity to be optimized.

The ADTS 405 series is a proven world leader and industry standard specified by many:
- National and international civil airlines
- Military forces
- Aircraft manufacturers
- Ground support organizations
- Corporate fleet owners

The ADTS 405 is a twin-channel Ps and Pt pressure control system used for the precision calibration/verification of aircraft pitot statics, compliant with RVSM (Reduced Vertical Separation Minima) requirements.

Fully programmable for a wide range of fixed or rotary wing aircraft operating envelopes, the ADTS 405 enables vital flight instrumentation such as altimeters, airspeed indicators, rate of climb indicators, Mach meters and air data computers to be accurately and rapidly tested. A remote control hand terminal enables the instrument to be driven from the cockpit or flight deck by a single operator.
The rack mounting ADTS 405 features in the flightline ADTS 405F.

Remote hand terminal allows aircraft test from cockpit.

Flightline version features integral pressure/vacuum supplies.

Ac powered or 28 Vdc from aircraft supply.

Pitot-static connections supplied with interconnecting pressure hoses.

Single rugged military style case, with wheels for flightline use.

Dual carrying handles provided for ease of transportation.

Hand terminal cable extension allows up to 50 m (160') remote operation.
ADTS 405 Series

Air Data Test Systems

This versatile instrument can be supplied in three formats:

- ADTS 405 - RACK MOUNTED UNIT
- ADTS 405F - TRANSPORTABLE FLIGHTLINE UNIT
- ADTS 405C - TOWABLE CART UNIT

ADTS 405 - RACK MOUNTED UNIT

This is a compact, 19” rack mounting unit for laboratory or workshop use. It is ideal for integration with ATE systems, or simply for use as a convenient bench top tool. Pneumatic connections are available via either the front or rear panel to suit specific applications. An optional matched pressure/vacuum supply unit (PV103R) is available as a separate rack module.

ADTS 405F - TRANSPORTABLE FLIGHTLINE UNIT

This is a self contained portable unit with integral pressure/vacuum supplies, housed in a single military standard enclosure. It is ideal for calibration and simulation on the flightline.

ADTS 405C - TOWABLE CART UNIT

This is a self-contained unit with both pressure/vacuum sources, mounted in a towable enclosure. It is ideal where security is paramount and provides lockable storage for associated hoses and fittings. A simplified termination plate is provided for both electrical and pneumatic connections which also allows an optional Line Switching Unit (LSU 100) to be fitted. This enables centralized control of multiple aircraft tests, which can be carried out sequentially by automatic switching of up to four Ps and Pt ports.

INSTRUMENT OPERATION

All the instruments can be controlled directly via the membrane keypad/display on the front panel. A remote control terminal for cockpit/flight deck operation is supplied as standard (optional for ADTS 405). This enables a single person to complete the entire test program, whilst conveniently seated in the aircraft.

A wide range of calibrations and simulations can be performed which monitor and control Ps, Pt, Qc, Mach, Rate of Climb, EPR. The instrument can be scaled in numerous units including ft, knots, in Hg, mbar, psi, in H20. In addition Mach or airspeed can be held constant whilst altitude is controlled.

The ADTS 405 series is specifically designed to ensure that the instrument or aircraft system under test cannot be damaged.
TEST PROGRAM MANAGEMENT

Optional Test Program Manager (TPM) software enables the system to be run directly from a PC such as a laptop. This feature permits complex test routines to be stored, actioned and resulting data formatted as required.

The TPM allows programs to be downloaded from a PC and stored internally within the instrument, reducing the need for bulky manuals and test routines in the confined space of the cockpit.

THE PREFERRED CHOICE OF THE MILITARY

Military authorities throughout the world have adopted the ADTS 405F variant as standard equipment such as:

US Army
NSN 4920-01-388-6790

US Navy
NSN 4920-01-449-8072

UK RAF
NSN 6625-99-567-0696
The remote control terminal is a rugged handheld unit which provides the operator with all the display and keypad facilities featured on the ADTS 405 front panel. Operation from the flightdeck is then possible by a single operator. An 18m long and a 2m long cable are supplied as standard. Examples of the many keypad functions are listed below:

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT/Ps</td>
<td>Altitude read and value entry.</td>
</tr>
<tr>
<td>SPEED/Qc</td>
<td>Airspeed read and value entry.</td>
</tr>
<tr>
<td>Mach/Pt</td>
<td>Mach number.</td>
</tr>
<tr>
<td>EPR</td>
<td>Engine Pressure Ratio test (Ps/Pt for inlet/exhaust.)</td>
</tr>
<tr>
<td>RoC/Ps Rate</td>
<td>Rate of Climb value entry and timing display.</td>
</tr>
<tr>
<td>Rate Timer</td>
<td>Select timing for RoC testing or leak testing.</td>
</tr>
<tr>
<td>Hold</td>
<td>Freeze control value to 'on state' at current conditions.</td>
</tr>
<tr>
<td>Rate</td>
<td>Rate control for Pt channel.</td>
</tr>
<tr>
<td>Leak Measure/Control</td>
<td>Select Measure or Control Mode</td>
</tr>
<tr>
<td>Ground</td>
<td>Controlled vent to ground and read QFE/QNH.</td>
</tr>
<tr>
<td>Local/Remote</td>
<td>Control transferred to ATE/IEEE 488.</td>
</tr>
<tr>
<td>Port</td>
<td>Select multi-outputs on Ps and Pt if fitted.</td>
</tr>
<tr>
<td>Print</td>
<td>Print displayed values if printer connected.</td>
</tr>
<tr>
<td>Execute Test</td>
<td>Manual stepping of inbuilt TPM program.</td>
</tr>
<tr>
<td>Program Help</td>
<td>Provides advice to operator on control procedures as required.</td>
</tr>
<tr>
<td>Set Up</td>
<td>Select units, limits, local conditions, display format, etc.</td>
</tr>
</tbody>
</table>

Cart version ADTS 405C
ADTS 405 Series

Air Data Test Systems

**MEASUREMENT SPECIFICATION**

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>OPERATING RANGE</th>
<th>RESOLUTION</th>
<th>ACCURACY</th>
<th>REPEATABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altitude</td>
<td>-3,000 to +80,000 ft</td>
<td>1 ft</td>
<td>±1 ft at sea level (1)</td>
<td>±2 ft</td>
</tr>
<tr>
<td>Static Sensor</td>
<td>35 to 135 mbar abs (1 to 40 in Hg)</td>
<td>0.01 mbar</td>
<td>±0.03 mbar</td>
<td>±0.05 mbar</td>
</tr>
<tr>
<td>Airspeed</td>
<td>10 to 850 knots or 19 to 1,000 knots</td>
<td>0.1 kts</td>
<td>±0.07 kts at 50 kts</td>
<td>±0.05 kts</td>
</tr>
<tr>
<td>Pitot Sensor</td>
<td>35 to 2700 mbar abs (1 to 80 in Hg)</td>
<td>0.01 mbar</td>
<td>±0.015% RDG</td>
<td>±0.015%</td>
</tr>
<tr>
<td>Rate of Climb</td>
<td>0 to 6000 ft/min sq ft</td>
<td>1 ft/min</td>
<td>+0.1% of value</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Mach</td>
<td>0 to 10,000 knots</td>
<td>0.001</td>
<td>Better than 0.005</td>
<td>Better than 0.005</td>
</tr>
<tr>
<td>Engine Pressure Rate (EPR)</td>
<td>0.1 to 10</td>
<td>0.001</td>
<td>Better than 0.005</td>
<td>Better than 0.005</td>
</tr>
</tbody>
</table>

**Notes.**
1. Accuracy at ambient 5 °C to 35°C
   - For -10 °C to +50 °C x 1.5.
   - For 12°C lab use x 0.5.
2. 105,000 ft available (control with suitable vacuum pump).
3. 100,000 ft/min rates selectable
   - Limit protected for safety
   - Volume dependant.
4. Limits settable to prevent excessive mach. (Civil limit Mach 1.)

**RACKMOUNTED ADTS 405**

The ADTS 405 is a 19" rack mounting module housing the main control system with local front panel display and keypad. The remote hand terminal is optional for this model and a matched separate pressure/vacuum supply unit is available - please refer to PV 103R Datasheet.

**Scalings Factors**

- **Altitude:** ft metres
- **Airspeed:** knots, km/h, mph
- **Others:** mbar, in Hg, H2O (4°C, 20°C, 60°F), mm Hg, kPa, hPa, psi.
- **Temperature:**
  - Simple keypad instruction, 12 month interval
  - ± 0.5% per °C
  - Calibration Stability: 50 ppm per year.
- **Recalibration:**
  - Power Failure Protection
    - In the event of a power interruption, the output ports will be vented to ambient conditions safely.
    - On power reconnect, the system is in measure mode.
- **Set Test:**
  - Integral test routines and reporting for both electrical and pneumatic faults.
- **Digital Interfaces:**
  - Parallel printer interface available as standard.
  - IEEE488.2 optional - earlier versions also available.
- **Temperature Range:
  - Calibrated 5 °C to 35 °C
  - Operating -10 °C to 50 °C
  - Storage -20 °C to 70 °C
- **Sealing:**
  - ADTS 405 front panel is rainproof.
  - Humidity:
    - 0 - 90% condensing. "Tropicalised" pcb's to MIL-T-28800
- **Shock/Vibration:**
  - MIL-T-28800 Class 2
- **Safety Performance:**
  - EN50081-1 for EMC emissions
  - EN50082-1 for EMC immunity
  - EN61010 for electrical and mechanical safety
- **Physical:**
  - 13 kg (29 lb) nominal. Case dimensions 485 x 270 x 305 mm (19" x 10.5" x 12").
- **Pneumatic Connections:**
  - Front panel mounted fittings with blanking caps.
  - Static - AN-6 37° flare
  - Pitot - AN-4 37° flare
  - Fitted with replaceable filters.
  - Vacuum (AN6) and pressure (AN4) supply fittings on rear panel with 2.5m (8') long mating hoses.
- **Pneumatic Supplies:**
  - Integral pneumatic supplies (PV 103F). Auxiliary pressure/vacuum unit is available - please refer to Druck.
  - Other equipment. Supply for vacuum hold down static adaptors also provided.

**FLIGHTLINE ADTS 405F**

Transportable military cased version incorporating the ADTS 405 with built-in pressure/vacuum supplies. Control is via local keypad/display or standard remote control terminal.

**Power Supply**
- 90 - 260V ac, 47 to 440 Hz, 500 VA. 28V dc option available.
- Digital Interfaces:
  - Standard parallel printer connection accessible via front panel protection cover. IEEE488 optional.
- **Sealing:**
  - Weatherproof in operating mode (lid removed).
- **Electro Magnetic Compatibility:**
  - To MIL-STD-461D
- **Physical:**
  - 35 kg (77 lb) and 762 x 320 x 480 mm (30" x 13" x 19") nominal. Wheels supplied for ease of transport.
- **Pressure/Vacuum Unit:**
  - Integral pneumatic supplies (PV 103F), Auxiliary connections for external supplies to boost or drive other equipment. Supply for vacuum hold down static adaptors also provided.

**CART MOUNTED ADTS 405C**

Towable, chassis mounted package incorporating the ADTS 405 with pressure/vacuum supplies and ability to include a Line Switching Unit (LSU) for multiple Ps and Pt outlets. For LSU please refer to separate Product Note. Control is via cart mounted display or standard remote hand terminal.

**Power Supply**
- As ADTS 405F with 10m (33') retractable ac power lead.
- **Sealing:**
  - Weatherproof with all doors closed.
- **Physical:**
  - 250 kg (550 lb) and 1150mm high x 1350mm long x 700mm wide (54" x 45" x 27") nominal.
  - **Towing:**
    - Maximum safe speed 15 km/h (10mph). Foam filled wheels 381mm (15") diameter and a steering wheel 254mm (10") diameter, nominal.
ADTS 405 S e r i e s

Air Data Test Systems

OPTIONS

(A) ADTS 405 Remote Control Terminal
A handheld remote control facility for the Rackmount ADTS 405 (standard with ADTS 405F/ADTS 405C). Complete with 2m (6') long cable.

(B) Lid Mounted Switching Manifold
Two 5 way manifolds for multiple output Ps & Pt ports. Each line has an individual manual shut-off valve.

(C) 28 Vdc Operation
In addition to ac supply, a second power connector enables 28 Vdc input for Rack, Flightline or Cart versions.

(D) ADTS 405 Bench Case
A case to enclose the ADTS 405 19in rack unit for benchtop use.

(E1) IEEE488 Interface (SCPI version)
Current ADTS communications protocol.

(E2) IEEE488 Interface (1975 version)
Compatible with earlier ADTS units.

(E3) IEEE488 Interface (SCPI & 1975)
Both (E1) and (E2) provided for user choice.

(F) ADTS 405 Rear Ps/Pt Connections
Duplicate connections provided at the rear in addition to front panel.

(G) Test Program Manager
A software package with serial interface mode adaptor. Permits laptop PC based control and program download for resident test routines. Please refer to Product Note for further details.

(H) Altimeter Encoder Interface
For altimeters with ICAO reporting encoders. Permits display of the bit stream and reporting of altitude value.

(J) ARINC 429 Interface
Permits the ADTS to monitor data from an aircraft bus, display the 12 pitot static label information and transmit to the aircraft. Please refer to Product Note for further details.

ACCESSORIES

ac power lead - 5m length (16' approx) Ps + Pt hoses - 2.5m lengths (8' approx) Pressure/vacuum hoses (ADTS 405 only)

Operation manual and calibration certificate also supplied as standard.

CALIBRATION STANDARDS

Instruments manufactured by Druck are calibrated against precision calibration equipment traceable to international standards.

Continuing development sometimes necessitates specification changes without notice.

RELATED PRODUCTS

Pressure/Vacuum Supply Unit
For use with the ADTS 405, the PV 103R is a 19" rack mounting module for ATE systems and features low maintenance dry pumps.

Line Switching Unit
Enabling automatic selection of multiple Ps and Pt outlets, the LSU 100 (rack version) or LSU 101 (flightline version) is available for use with Druck Air Data Test Systems.

Calibrators and Pressure Sensors
Druck offer a complete range of precision calibrators for the field, workshop or laboratory. These include primary and secondary pressure standards from Druck companies, Ruska Instrument Corporation and Pressurements. Druck also manufacture a wide range of pressure transducers and transmitters for ground/flight test and flight qualified applications.

ORDERING INFORMATION

Please state the following (where applicable):-
1. ADTS 405, ADTS 405F or ADTS 405C.
2. Pressure range required for Pt.
4. Options and related products if required.

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