

Test Stand For Air, Fuel And Oil Components

>TBAFOVH1<



The test stand is developed to test A/C components requiring one or more types of medium at the same time for being operated. Thus, it provides supply and test circuits for fuel and lubricating oil in the high pressure range. In the low pressure range, it provides supply and test circuits for fuel, air and nitrogen.

The lubricating oil supply provides an adjustable temperature regulation.

It can be adapted for various A/C components.

- > Pneumatic supply and measuring circuits (vacuum to high pressure) are provided with different flows
- > Supply and return lines can be purged with air before UUT exchange
- > Electrical measurements and supplies are performed via the plug connections mounted in the test chamber
- > An extensive range of application is allowed by numerous circuits with required parameters and for different media
- > Explosion protection complies with ATEX-directive 94/9/EC

RANGES OF APPLICATION

Components	CMM	Components	CMM
ACC ACTUATOR	75-24-52	VSV ACTUATOR	75-32-02
AIR COOLED OIL COOLER	79-21-42	VSV ACTUATOR	75-32-21
FCOC FUEL OIL HEAT EXCHANGER	79-21-43	IDG COOLER	73-11-65
NO.4 BEARING SCAVENGE VALVE	79-23-52	HPT CLEARANCE VALVE HIGH PRESSURE TURBINE LEARANCE VALVE	75-22-14
NO.4 BEARING SCAVENGE VALVE	79-25-41	3.5 INCH MODULATING ACC VALVE	75-24-35
OIL QUANTITY TRANSMITTER	79-31-19	14TH STG BLEED CONVERTER VALVE	75-31-39
OIL COOLER AND RELIEF BYPASS VAVLE ASSEMBLY	24-11-05	FDRV VALVE FUEL DIVERTER AND RETURN VAVLE	73-18-52
SERVO FUEL HEATER	73-11-24	AMV AIR MODULATING VALVE	79-21-56
SERVO FUEL HEATER	73-11-77	L.P.C. BLEED MASTER ACTUATOR	75-38-02
AIR/OIL-IDC COOLER ASSEMBLY	24-10-09	L.P.C. BLEED SLAVE ACTUATOR	75-38-03
IDG AIR OIL COOLER	24-10-14	NO. 3 BEARING SHUTOFF VALVE	79-21-11
IDG OIL PRESSURE RELIEF VALVE	24-12-24	IDG/VSCF AIR/OIL COOLER	24-11-03
SERVO FUEL/OIL HEAT EXCHANGER	73-11-22	IDG FUEL/OIL COOLER	24-11-04
IDG FUEL/OIL HEAT EXCHANGER	73-11-71	VSCF/LUBE OIL/OIL COOLER	24-25-01
TCC VALVE TURBINE CLEARANCE CONTROL VALVE	75-21-11	VBV ACTUATOR	75-32-28
HEAT EXCHANGER	79-22-22	LUBE/SERVO FUEL OIL COOLER	79-21-03
OIL LEVEL SENSOR	79-31-02	OIL LEVEL SENSOR	79-31-22
VSV ACTUATOR	75-31-32		

MISCELLANEOUS INFORMATION

- > Using different coupling types prevents any mix up of the media on the UUT plug connections
- > The large test chamber is provided with an extractible mounting platform, a drip tray and a safety door of 4mm laminated safety glass which can be interlocked for safety purposes
- > The ergonomic telescope-swivel arm is fitted with a height-adjustable operating unit and screens
- > A drip tray with leakage warning switch is installed in the lower range of the test stand (fuel range)
- > Numerous freely interconnectable measurements of pressure, differential pressure, flow and temperature are provided for all used media

INFRASTRUCTURAL REQUIREMENTS

<p>> Electrical supply (requirements):</p> <p>Mains connection: 3/N/PE AC 50Hz 400V Nominal current: max. 180A Short-circuit current: max. 50kA Performance: 125kVA Prefuse: 200A Gg</p> <p>The computer supply is tapped off upstream of the system main switch</p>	<p>> Compressed air supply 1 (requirements):</p> <p>Pressure: min. 11bar (159.5psi) Flow: min. 0.2kg/min (0.4lb/min) Temperature: min. 14°C (57.2°F), max. 35°C (95°F)</p>
<p>> Cooling water supply (requirements):</p> <p>Temperature: max. 12°C (53.6°F) (supply) max. 80°C (176.0°F) (return) Pressure: max. 10bar (145.0psi) Flow: max. 100l/min (26.4USgal/min)</p>	<p>> Compressed air supply 2 (requirements):</p> <p>Pressure: min. 57bar (826.7psi) Flow: min. 0.9kg/min (2.0lb/min) Temperature: min. 14°C (57.2°F), max. 35°C (95°F)</p>
<p>> Venting system (requirements):</p> <p>Supply air: approx. 2,700m³/h Exhaust air: approx. 3,400m³/h Exhaust air (ATEX): approx. 3,400m³/h</p>	<p>> Compressed air supply 3 (requirements):</p> <p>Pressure: min. 11bar (159.5psi), max. 12bar (174psi) Flow: min. 0.25kg/s (0.6lb/min) max. 0.5kg/s (1.0lb/min) Temperature: min. 14°C (57.2°F), max. 35°C (95°F)</p>
	<p>> Nitrogen supply (requirements):</p> <p>Pressure: max. 350bar (5,076.3psi) Flow: max. 50NI/min (1.8scfm)</p>

TECHNICAL DATA

<p>> Dimensions and weight:</p> <p><u>Test stand:</u> Width: 5,900mm (232.3in) Depth: 2,150mm (84.6in) by variable operating panel up to 4,800mm (189.0in) Height: 3,050mm (120.1in) Weight: approx. 7,200kg (15,873lb)</p> <p><u>Switch cabinet:</u> Width: 1,900mm (74.8in) Depth: 680mm (26.8in) Height: 2,250mm (88.6in) Weight: approx. 500kg (1,102lb)</p>	<p>> Operating and storage conditions:</p> <p>Installation height: max. 1,000m (3,280ft) MSL Operating temperature: +15 to +30°C (59 to 86°F) Storage temperature: 0 to +60°C (32 to 140°F) Relative humidity: 20 to 80% (non-condensing) Protection class: IP43 Permanent noise emission: 79dB(A) in 1m (39.4in) distance</p> <p>Installation must be performed in a non-explosive area</p>
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PARAMETERS

> Lubricating oil:

Main tank: 180l (47.6USgal)

High pressure circuit 1 / Measuring circuit 1:
max. 245bar (3,553.4psi)
max. 20lpm (5.3USgpm)

High pressure circuit 2 / Measuring circuit 2:
max. 245bar (3,553.4psi)
max. 20lpm (5.3USgpm)

Return: max. 245bar (3,553.4psi)
max. 20lpm (5.3USgpm)

Free return takes place directly into the main tank

> Fuel:

Main tank: 700l (184.9USgal)

Low pressure circuit 1 / Measuring circuit 2:
max. 24bar (348.1psi)
max. 450lpm (118.9USgpm)

Low pressure circuit 2 / Measuring circuit 3:
max. 24bar (348.1psi)
max. 150lpm (39.6USgpm)

High pressure circuit 1 / Measuring circuit 1:
max. 245bar (3,553.4psi)
max. 20lpm (5.3USgpm)

Return: max. 245bar (3,553.4psi)
max. 20lpm (5.3USgpm)

Free return takes place directly into the main tank

Cooling circuit serves for cooling the fuel

> Air:

Low pressure-air circuit 1:
-1 to max. 12bar (-14.5 to max. 174.0psi)
max. 0.2kg/min (0.4lb/min)

Low pressure-air circuit 2:
max. 12bar (174.0psi)
max. 0.2kg/min (0.4lb/min)

High pressure-air circuit 1 / High pressure-air circuit 2:
max. 60bar (870.2psi)
max. 0.875kg/min (1.9lb/min)

Measuring circuit 1:
max. 60bar (870.2psi)
90 to 25,000lpm (3.18 to 883scfm)

Measuring circuit 2:
max. 60bar (870.2psi)
0.1 to 100lpm (0.0035 to 3.515scfm)

Measuring circuit 3:
-1 to 60bar (-14.5 to 870.2psi)
0.002 to 0.8lpm (0.000071 to 0.028scfm)

Freely interconnectable measuring circuit in- and outlets:
with different parameters

High flow compressed air circuit:
max. 12bar (174.0psi)
max. 0.5kg/s (1.1lb/s)

> Nitrogen:

High pressure: 2.5 to 350bar (36.3 to 5,076.3psi)

Low pressure: max. 10bar (145.0psi)

MEASUREMENTS

> **Air - Flow (16 off)**

Range: 0.0016 to 0.8NI/min (0.00006 to 0.03scfm)
 Tolerance: $\pm 2\%$ of measuring range
 to
 Range: 1,000 to 25,000NI/min (35.3 to 882.9scfm)
 Tolerance: $\pm 0.3\%$ of measuring range
 $\pm 1.3\%$ of measured value

> **Air - Humidity (1 off)**

Range: 0 to 100%
 Tolerance: $\pm 5\%$

> **Air - Pressure (18 off)**

Range: 800 to 1,200mbar abs. (11.6 to 17.4psia)
 Tolerance: $\pm 0.5\%$ of measuring range
 to
 Range: 0 to 60bar (0 to 870.2psi)
 Tolerance: $\pm 0.25\%$ of measuring range

> **Air - Temperature (4 off)**

Range: 0 to 100°C (32 to 212°F)
 Tolerance: $\pm 1^\circ\text{C}$ (1.8°F)

> **Direct current voltage (1 off)**

Range: 0 to 16VDC
 Tolerance: $\pm 0.25\%$ of full scale

> **Direct current voltage (1 off)**

Range: 0 to 40VDC
 Tolerance: $\pm 0.25\%$ of full scale

> **Nitrogen (2 off)**

Range: 0 to 400bar (0 to 5,801.5psi)
 Tolerance: $\pm 0.25\%$ o.m.r.

> **Fuel - Flow (5 off)**

Range: 0 to 4lpm (0 to 1.1USgpm)
 Tolerance: $\pm 0.5\%$ of measuring range
 to
 Range: 10 to 450lpm (2.6 to 118.9USgpm)
 Tolerance: $\pm 0.5\%$ of measuring range

> **Fuel - Pressure (24 off)**

Range: 0 to 6bar (0 to 87.0psi)
 Tolerance: $\pm 0.25\%$ of measuring range
 to
 Range: 0 to 250bar (0 to 3,625.9psi)
 Tolerance: $\pm 0.25\%$ of measuring range

> **Fuel - Temperature (13 off)**

Range: 0 to 50°C (32 to 122°F)
 Tolerance: $\pm 1^\circ\text{C}$ (1.8°F)

> **Lubricating oil - Flow (3 off)**

Range: 0 to 4lpm (0 to 1.1USgpm)
 Tolerance: $\pm 0.5\%$ of measuring range
 to
 Range: 0 to 30lpm (0 to 7.9USgpm)
 Tolerance: $\pm 0.5\%$ of measuring range

> **Lubricating oil - Pressure (19 off)**

Range: 0 to 3bar (0 to 43.5psi)
 Tolerance: $\pm 0.25\%$ of measuring range
 to
 Range: 0 to 250bar (0 to 3,625.9psi)
 Tolerance: $\pm 0.25\%$ of measuring range

> **Lubricating oil - Temperature (7 off)**

Range: 0 to 100°C (32 to 212°F)
 Tolerance: $\pm 1^\circ\text{C}$ (1.8°F)

> **Servo current (2 off)**

Range: -60 to 60mADC
Tolerance: ±0.5% of full scale

> **Servo voltage (2 off)**

Range: -40 to 40VDC
Tolerance: ±0.5% of measuring range

> **Solenoid current (2 off)**

Range: 0 to 1ADC
Tolerance: ±0.5% of measuring range

> **Solenoid voltage (2 off)**

Range: 0 to 35VDC
Tolerance: ±0.5% of measuring range

> **LVDT voltage RMS (4 off)**

Range: 0 to 10Vrms
Tolerance: ±0.05% of full scale

> **LVDT voltage excitation (1 off)**

Range: 0 to 10Vrms
Tolerance: ±0.2% of full scale

> **LVDT Voltage DEM (4 off)**

Range: -10 to 10Vrms
Tolerance: ±0.05% of full scale

> **Stroke (1 off)**

Range: 0 to 100mm (0 to 3.9in)
Tolerance: ±0.03% of measuring range



Separate switch cabinet (on customer request with special varnish) with operating unit and ATEX-control stations



Anodized front plate with colour coded UUT connections (depending on operating medium)

OPTIONS

A wide range of options is available to fulfil our customers' requirements.
e.g.: adaption to a number of UUTs, requirements concerning the test program, dimensioning,...