

# Test stand for generators, IDGs and CSDs

## >LMP300<



The test stand is developed to test air- and oil-cooled AC and DC generators, VSCFs, CSDs, IDGs and DC starter as well as DC starter generators of all current manufacturers.

It is possible to adapt and extend this test stand with the help of additional adaptations.

- > Acquisition of measured data for voltage, current, frequency, power, speed vibration, pressure, temperature, flow, PMG, excitation, solenoid, sensor technology (UUT), servo valve, CT, magnetic trim etc.
- > In order to meet specific UUT requirements the following features are provided: open and closed hydraulic circuits, lubrication ports, scavenge connections and return connections as well as cooling of the UUT
- > Tests can be carried out manually or automatically. The test stand is operated by a control console which is located in a separate control room.

## RANGE OF APPLICATION

- > Air- and oil-cooled AC and DC generators, VSCFs, CSDs and IDGs  
Power: up to 425kVA  
Nominal voltage: 200V or between 360V and 407V  
Nominal frequency: between 370Hz and 2kHz  
Rotational speed: up to 30,000rpm
- > Air- and oil-cooled DC starter and DC starter generators

## GENERAL INFORMATION

- > The test stand consists of a drive unit, one hydraulic power unit, one control console, switch cabinet, system and measuring cabinets (e.g.: for drive unit or motor control), one starter current supply as well as one ohmic and inductive load decade
- > A pneumatic shock absorber is fitted to compensate vibrations of drive motor and spur gear
- > Quick release adapters are supplied by compressed air and - at the push of a button - enable secure, fast and easy mounting of UUTs on both UUT drives
- > Test medium is heated up to a max. of 150°C
- > A separate cooling system is fitted to cool test medium, gear box oil, drive motor and UUTs
- > The fitted flushing circuit removes entrapped air out of the hydraulic system
- > A wide range of accessories completes the test stand e.g. mechanic adaptations, test hoses and cables

## TECHNICAL DATA

<p>&gt; <b>UUT drive:</b></p> <p>Three-phase motor ventilated (HQLa 280P)                  Voltage: 3 AC 380V star 60Hz                  Power: 600kW                  Rotational speed: 0 to 3,150rpm (max. 4,500rpm)                  Torque: 3,180Nm                  sin/cos rotary encoder ERN480                  Temperature monitoring                  Type of protection IP54R</p>	<p>&gt; <b>Universal voltage regulator (UVR):</b></p> <p>Universal regulator instead of the original - GCU for all UUTs                  PWN or linear control (switchable)                  Servo valve control                  Excitation max. 100V / 10A                  Integrated safety monitoring of generatros                  Integrated current transducer instead of original CT out of the aircraft                  Supply via DC current supply or PMG</p>
<p>&gt; <b>Spur gear:</b></p> <p>Rotational speed: Input: 0 to 3,150rpm                  (approx.) Output 1: 0 to 18,000rpm                  Output 2: 0 to 30,000rpm                  Transformation: Output 1: 1 : 6                  (approx.) Output 2: 1 : 10                  Gear box oil: Shell Turbo CC46                  Capacity: approx. 200l (approx. 53USgal)                  Gear box oil supply: approx. 145l/min / max. 12bar                  (approx. 38USgpm / max. 174psi)                  Lubrication: by means of an electric lubrication oil                  pump (start procedure) and mechanic                  lubricating oil pump</p>	<p>&gt; <b>Hydraulic supply:</b></p> <p>Test medium: Mobil Jet Oil II                  Capacity: approx. 140l (approx. 37USgal)                  Flow: max. 85lpm (max. 22USgpm)                  Temperature (return): max. 160°C (max. 320°F)                  Electrical heater: 12kW                  Filter (supply line): 10mic                  Filter (return): 20mic                  Test filter (return): (paper) filter element                  (to evaluate the UUT)</p>
<p>&gt; <b>Load decade:</b></p> <p><u>AC load:</u>                  (including automatic load control)</p> <p>Voltage: 3 x 200V / 3 x 400V switchable                  Frequency: 370Hz to 2kHz (up to 50kVA)                  370Hz to 1kHz (up to 425kVA)                  Power: 0 to 425kVA, performance factor 0.6 ind. to 1                  50% overload for 10min                  100% overload for 10sec                  different charge levels/phase up to 12kVA</p> <p><u>DC load:</u>                  30VDC max. 1,000A</p> <p><u>PMG load:</u>                  DC load is continuously variable                  AC load is adjustable in steps (&lt;0.05A), three-phase</p>	<p>&gt; <b>Scavenge connection:</b></p> <p>Flow: approx. 100lpm (approx. 26gpm)                  Filter: 20mic</p>
<p>&gt; <b>Measuring data acquisition system:</b></p> <p>Quick, decentralized, synchronous measurement and control                  Integrated, flexible signal conditioning                  Real time measuring system manufactured by Sigmatek                  Analog resolution: 18bit                  Accuracy of analog measurements: 0.02% of full scale                  Data acquisition rate: up to 40kHz / channel                  Digital regulators: 5kHz</p>	<p>&gt; <b>Actuating pressure circuit:</b></p> <p>Flow: approx. 8lpm (approx. 2gpm)                  Pressure: max. 30bar (max. 435psi)</p>
<p>&gt; <b>Cooling air:</b></p> <p>UUT: Capacity: approx. 1,000m<sup>3</sup>/h                  UUT drive: Capacity: approx. 4,500m<sup>3</sup>/h</p>	<p>&gt; <b>Starter current supply:</b></p> <p>Voltage: 0 to 30VDC                  Current: 0 to 2,000A</p>
	<p>&gt; <b>DC current supply (seperate excitation):</b></p> <p>0 to 100VDC, 0 to 15A adjustable</p>
	<p>&gt; <b>Infrastructural requirements:</b></p> <p><u>Electrical supply:</u>                  Mains connection: 3/N/PE AC 50Hz 400V                  Nominal current: max. 1,200A                  Power: 830kVA                  Back-up fuse: 1,250A gl</p> <p>Computer and maintenance supply are tapped by the mains</p> <p><u>Pneumatic supply:</u>                  Pressure: 6 to 10bar (87 to 145psi)</p> <p><u>Cooling water supply (gear box and hydraulic system):</u>                  Temperature: 15°C or 27°C (59°F or 80.6°F)                  Flow: max. 270l/min (max. 71.3USgpm)                  Pressure: min. 3bar (min. 43.5psi)</p> <p><u>Cooling air:</u>                  Load decade: Capacity: approx. 35,000m<sup>3</sup>/h</p>

## MEASUREMENT RANGE

<p>&gt; <b>Temperature sensor (20-off):</b></p> <p>Range: 0 to +100°C (+32 to 212°F) Tolerance: ±1.0°C abs. (±1.8°F) to Range: 0 to +200°C (+32 to 392°F) Tolerance: ±2.0°C abs. (±3.6°F)</p>	<p>&gt; <b>Pressure sensor (6-off):</b></p> <p>Range: 0 to 4bar abs. (0 to 58.0psi abs.) Tolerance: ±0.25% of full scale to Range: 0 to 40bar (0 to 580.2psi) Tolerance: ±0.25% of full scale</p>
<p>&gt; <b>Torque (1-off):</b></p> <p>Range: -30 to +30Nm Tolerance: ±0.25% of full scale</p>	<p>&gt; <b>Frequency (4-off):</b></p> <p>Range: 200 to 2,000Hz Tolerance: ±0.01% of full scale to Range: 0 to 3,000Hz Tolerance: ±0.1Hz abs.</p>
<p>&gt; <b>Flowmeter and volume (1-off each):</b></p> <p>Range: 0 to 100lpm (0 to 26.4USgpm) Tolerance: ±0.45% of full scale</p> <p>Range: 0 to 30NI/min (0 to 1.1scfm) Tolerance: ±2% of full scale</p> <p>Range: 0 to 50l (0 to 13.2USgal) Tolerance: ±0.5% of full scale</p>	<p>&gt; <b>Direct current voltage (7-off):</b></p> <p>Range: 0 to 40VDC Tolerance: ±0.25% of full scale to Range: 0 to 250VDC Tolerance: ±0.25% of full scale</p>
<p>&gt; <b>Rotational speed (6-off):</b></p> <p>Range: 0 to 18,000rpm Tolerance: ±15rpm abs. to Range: 0 to 30,000rpm Tolerance: ±15rpm abs.</p>	<p>&gt; <b>Alternating current voltage (17-off):</b></p> <p>Range: 0 to 130VAC Tolerance: ±0.5% of full scale to Range: 0 to 500VAC Tolerance: ±0.2% of full scale</p> <p>Range: 0 to 10Vrms Tolerance: ±0.2% of full scale</p> <p>Range: 0 to 30Vpp Tolerance: ±0.5% of full scale</p>
<p>&gt; <b>Vibration (3-off):</b></p> <p>Range: 0 to 10g Tolerance: ±0.2% of full scale</p>	<p>&gt; <b>Phase shifting (1-off):</b></p> <p>Range: -270 to +90° Tolerance: ±0.3° abs.</p>
<p>&gt; <b>Direct current (7-off):</b></p> <p>Range: 0 to 100mADC Tolerance: ±0.25% of full scale to Range: 0 to 2,000ADC Tolerance: ±0.25% of full scale</p>	<p>&gt; <b>Real power (9-off):</b></p> <p>Range: 0 to 50kW Tolerance: ±0.5% of full scale to Range: 0 to 375kW Tolerance: ±0.5% of full scale</p>
<p>&gt; <b>Alternating current (16-off):</b></p> <p>Range: 0 to 10AAC Tolerance: ±0.5% of full scale to Range: 0 to 2,500AAC Tolerance: ±0.5% of full scale</p>	<p>&gt; <b>Apparent power (9-off):</b></p> <p>Range: 0 to 50kVA Tolerance: ±0.5% of full scale to Range: 0 to 375kVA Tolerance: ±0.5% of full scale</p>
<p>&gt; <b>Resistance (9-off):</b></p> <p>Range: 0 to 2000hm Tolerance: ±0.25% of full scale to Range: 0 to 150kOhm Tolerance: ±0.25% of full scale</p>	

## OPTIONS

Many options are possible for adaption,  
e.g. adaption to other aircraft types

Technical data are subject to change!