Universal test stand for pneumatic components

>PP200STA<

Schematic diagram:

Developed to test aircraft pneumatic components up to these performance data:

- **Air flow:** max. 3kg/s
- **Compressed air:** max. 30bar
- **Temperature:** max. 650°C

> Automatic report generation
> Modular construction with one central pneumatic/hydraulic supply <PP200SP> and three independent test stands
> Fully automatic test runs based on component maintenance manuals (CMMs) test procedures
> 3 self-sufficient test stands:
  - Test stand for Valves and High Flow Components <PP200VHF>
  - Test stand for Air Cycle Machines <PP200ACM>
  - Test stand for Air Turbine Starters <PP200ATS>
PNEUMATIC TEST STAND FOR VALVES AND HIGH FLOW COMPONENTS <PP200VHF>

- Dynamic flow tests under hot air- and cold air conditions to 3.0kg/s, 30bar, max. 650°C
- Quick clamping device for high dynamic flow tests with time-saving adaption of the unit under test (UUT)
- Working area with free switchable supplies and measurements for static and dynamic tests
- Vacuum chamber for cabin pressure components
- Closed test chamber with inspection window
- Port- and case-leakage measurements
- Split vacuum chamber for leakage measurement, Volume: approx. 160 litres / 97 litres
- Vacuum reservoir for leakage measurement, Volume: approx. 25 litres
- High accuracy of pressure- and flow measurements possible due to graduation
- Diving basin (capacity: 840 litres) for leakage tests
## TECHNICAL DATA

### Input data pneumatic circuits:
- 3.0kg/s, max. 7bar, cold air
- 0.67kg/s, max. 30bar, cold air
- 3.0kg/s, max. 7bar, hot air 700°C
- 0.67kg/s, max. 30bar, hot air 700°C

### Quick clamping device:
- 0 - 3kg/s, 0 - 30bar, 20 - 650°C
- 0 - 0.15kg/s, 0 - 42bar, 20 - 450°C

### High pressure circuit for static test with air or nitrogen:
- 5 - 350bar

### Vacuum supply:
- 0.1 - 1bar absolute
- Nominal suction capacity: 570m³/h and 11m³/h

### Measurements:
- **Flow**:
  - 0.004 - 25000Nl/min, ± 1% o.m.r.
- **Pressure**:
  - 0 - 400mbar to 0 - 400bar, ± 0.25% o.m.r.
  - 18 free sensors
- **Temperature**:
  - 0 - 100°C to 0 - 1000°C, ± 0.5 - 4°C

### Electrical connections:
- **Test stand**:
  - 3/N/PE AC 50Hz 400V max. 32A
- **UUT supply**:
  - 2 DC 28V
  - 1/N/PE AC 400Hz 115V

### Dimensions:
- Length: 7300mm
- Width: 3650mm
- Height: 2600mm
PNEUMATIC TEST STAND FOR AIR CYCLE MACHINES <PP200ACM>

- Hundred percent inspection of Air Cycle Machines
- Acquisition of pressure, flow, temperatures, leakage, speed, vibration
- Universal controlled heat exchanger to test several ACM-types on one test stand
- Closed test chamber with inspection window
- 2-fold redundant speed measurement with safety monitoring
- Elevating truck for easy adapting of the units under test
## TECHNICAL DATA

### Input data pneumatic circuits:
- 1.32kg/s, max. 7bar, cold air
- 1.32kg/s, max. 7bar, hot air 700°C

### Supply Air Cycle Machine:
- 0 - 6bar, 20 - 250°C

### Heat exchanger:
- 0 - 6bar, max. 250°C
- Max. 160kW cooling capacity

### Measurements:
- **Flow:**
  - 0 - 1.32kg/s, ± 2% o.m.r., 2 steps
- **Pressure:**
  - 0 - 10bar, ± 0.25% to ± 1% o.m.r.
  - 0 - 100mbar diff, ± 0.25% o.m.r.
- **Temperature:**
  - -40 - 800°C, ± 0.5°C to ± 4°C
- **Humidity:**
  - 0 - 100% r.H., ± 5% o.m.r.

### Electrical connections:
- **Test stand:**
  - 3/N/PE AC 50Hz 400V max. 32A
- **UUT supply:**
  - 2 DC 28V
  - 1/N/PE AC 400Hz 115V

### Dimensions:
- **Test frame:**
  - Length: 2745mm
  - Width: 1200mm
  - Height: 2940mm
- **Operating desk:**
  - Length: 1600mm
  - Width: 1000mm
  - Height: 1360mm
PNEUMATIC TEST STAND FOR AIR TURBINE STARTERS <PP200ATS>

- To test Air Turbine Starters
- Measured variables: vibration, speed, torque, pressure, flow, temperature, electric resistance, run up period
- Mass simulation unit with 2 flywheel masses (6.78kgm² resp. 22.10kgm²)
- Drive of the UUT via electric motor for overrunning test
- Check of the mechanical centrifugal clutch
- All tests in one clamping can be performed manually, semi- and fully automatic
- Video monitoring of the UUT
- Closed test chamber with inspection window
**TECHNICAL DATA**

<table>
<thead>
<tr>
<th>&gt; <strong>Input data pneumatic circuits:</strong></th>
<th>&gt; <strong>Electrical connections:</strong></th>
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<tr>
<td>3.5kg/s, max. 7bar, cold air</td>
<td><strong>Test stand:</strong></td>
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<td>2.0kg/s, max. 7bar, hot air 700°C</td>
<td>3/N/PE AC 50Hz 400V max. 32A</td>
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<td>&gt; <strong>Supply Air Turbine Starter:</strong></td>
<td><strong>UUT supply:</strong></td>
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<tr>
<td>3.5kg/s, 0 - 6bar, max. 250°C</td>
<td>2 DC 28V</td>
</tr>
<tr>
<td>&gt; <strong>Measurements:</strong></td>
<td>1/N/PE AC 400Hz 115V</td>
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<tr>
<td><strong>Flow:</strong></td>
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<tr>
<td>0 - 3.5kg/s, ± 2% o.m.r.</td>
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<tr>
<td><strong>Speed:</strong></td>
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<tr>
<td>0 - 18000rpm, ± 2rpm</td>
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<tr>
<td><strong>Temperature:</strong></td>
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<tr>
<td>0 - 800°C, ± 2°C</td>
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<tr>
<td>&gt; <strong>Mass simulation:</strong></td>
<td>&gt; <strong>Dimensions:</strong></td>
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<tr>
<td>Flywheel mass 1: 6.78kgm², max. 6000rpm</td>
<td><strong>Test frame:</strong></td>
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<td>Flywheel mass 2: 22.1kgm², max. 6000rpm</td>
<td>Length: 2745mm</td>
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PNEUMATIC / HYDRAULIC SUPPLY <PP200SP>

> Pneumatic and hydraulic supply of the test stands <PP200VHF>, <PP200ACM> and <PP200ATS>

> Hot air generation:
  - Propane heater: 1300kW
  - Propane heater: 650kW
  - Electric heater: 75kW
  - Heat exchanger

> Compressed-air generation:
  - Compressor max. 30bar
  - Compressor max. 42bar
  - Cooling unit for compressed air
  - 4 x 1000 litres compressed air reservoir

> Hydraulic supply:
  - Hydraulic supply unit max. 150bar

> Mixer for temperature controlled commixture of cold and hot air

> Control via the test stands <PP200VHF>, <PP200ACM> und <PP200ATS>
## TECHNICAL DATA

### Compressed-air supply for the unit:
- 3.5kg/s, 6.6 - 7.2bar, ambient temperature

### Propane heater:
- 650kW, 0.67kg/s, 700°C, 30bar
- 1300kW, 1.5kg/s, 700°C, 7bar

### Electric heater:
- 75kW, 0.15kg/s, 550°C, 42bar

### Compressed air compressors:
- 0.67kg/s, 30bar, 160kW
- 0.15kg/s, 42bar, 75kW

### Hydraulic supply unit:
- 25l/min, 150bar

### Compressed air reservoir:
- 42bar, 4 x 1000 litres capacity

### Cooling unit:
- Air rate 21300m³/h
- 92kW refrigerating capacity
- 36kW connected load

### Measurements:
- **Temperature:**
  - -20 - 800°C, ± 4°C
- **Pressure:**
  - 0 - 60bar, ± 0.25% o.m.r.

### Electrical connections:
- **Main current:** 3/N/PE AC 50Hz 400V, max. 160A
- **Emergency current:** 1/N/PE AC 50Hz 230V, max. 25A
- **Compressor (30bar):** 3/PE AC 50Hz 400V, max. 350A
- **Compressor (42bar):** 3/PE AC 50Hz 400V, max. 200A
- **Electric heater:** 3/PE AC 50Hz 400V, max. 125A
- **Propane heater (7bar):** 3/PE AC 50Hz 400V, max. 50A
- **Propane heater (30bar):** 3/PE AC 50Hz 400V, max. 50A

### Outputs:
- **Supply <PP200VHF>:**
  - 3.0kg/s, max. 7bar, cold air
  - 0.67kg/s, max. 30bar, cold air
  - 3.0kg/s, max. 7bar, hot air 700°C
  - 0.67kg/s, max. 30bar, hot air 700°C
- **Supply <PP200ACM>:**
  - 1.32kg/s, max. 7bar, cold air
  - 1.32kg/s, max. 7bar, hot air 700°C
- **Supply <PP200ATS>:**
  - 3.5kg/s, max. 7bar, cold air
  - 2.0kg/s, max. 7bar, hot air 700°C

Technical data are subject to change!