Test Bench For Fuel Cylinder

The test stand has been developed to test Rafale M88 engine-cylinders.

Cylinders for the following components can be tested:

- Starter with / without servo valve
- Nozzle with / without LVDT
- Low pressure compressor with servo valve

It can be adapted for other cylinders.

- Primary explosion protection according to ATEX- directive 94/9/EC
- Extensive explosion-proof concept with venting system, gas warning equipment and overtemperature shutdown under the flashpoint
- Test chamber with lockable safety door, good access for UUT exchange and inspection possible during the tests
- Manual and semi-automatic test procedures
- High pressure supply via compressed air operated proportional amplifier
GENERAL INFORMATION

> Effective noise protection by sound insulated setup
> Ergonomic design
> Operation via mobile control console with extractable keyboard and integrated printer
> Additional screen beside the test chamber
> Cooling run after overtemperature shutdown to reduce medium temperature
> Extremely maintenance friendly by accessible hydraulic room
> Adapter cabinet to store the UUT adapters and other accessories
> Drip tray in the base frame to collect leakage during maintenance or in case of failure
> Medium leaking during UUT exchange can be pumped back automatically into the main tank via the drip tray and the return tank
> By the stainless steel setup as well as the anodized aluminium front panels, the test stand is resistant against the test medium and cleaning detergents
> LAN-connection enables maintenance of the TEST-FUCHS test stand software, test procedures, network printer as well as trouble shooting on the device
> Easy and quick calibration via the TEST-FUCHS standard software

APPLICATION AREA

> Vérin Tuyère M88
> Vérin Maître Tuyère M88
> Vérin de Stator M88
> Vérin Roue Directrice d’Entrée M88
> Vérin Maître Stator M88
## TECHNICAL DATA

### Hydraulic supply (requirements):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>Water</td>
</tr>
<tr>
<td>Cooling water agent</td>
<td>Antifrogen N</td>
</tr>
<tr>
<td>Temperature</td>
<td>max. 18°C (64.4°F)</td>
</tr>
<tr>
<td>Pressure</td>
<td>4 to 5bar (58 to 72.5psi)</td>
</tr>
<tr>
<td>Quality</td>
<td>Industrial quality (at least VDI2035, VDI 3803)</td>
</tr>
<tr>
<td>Water hardness</td>
<td>&lt;6°dH</td>
</tr>
<tr>
<td>Chlorine content</td>
<td>&lt;250 mg/l (0.002086lb/USgal)</td>
</tr>
</tbody>
</table>

### Hydraulic parameters:

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>F35</td>
</tr>
<tr>
<td>Temperature</td>
<td>max. 33°C (91.4°F), during cooling run max. 60°C (140°F)</td>
</tr>
<tr>
<td>Main tank</td>
<td>Volume approx. 120l (31.7USgal), Stainless steel</td>
</tr>
<tr>
<td>Low pressure pump</td>
<td>max. 50l/min at 80bar, (13.2USgal/min at 1,160psi)</td>
</tr>
<tr>
<td></td>
<td>max. 165bar (2,400psi)</td>
</tr>
<tr>
<td>High pressure pump</td>
<td>Static, max. 285bar (4,130psi)</td>
</tr>
</tbody>
</table>

### Electrical supply (requirements):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains connection</td>
<td>3/PE AC 50Hz 400V</td>
</tr>
<tr>
<td>Nominal current</td>
<td>70A</td>
</tr>
<tr>
<td>Nominal power</td>
<td>48.5kVA</td>
</tr>
<tr>
<td>Prefuse</td>
<td>125A</td>
</tr>
</tbody>
</table>

### Pneumatic supply (requirements):

- **Pneumatic supply**
  - Flow: max. 250NL/min (8.83scfm)
  - Pressure: 20bar (290psi) (dry and oil-free)
  - Quality: ISO 8573-1 ISO Code 1-4-2
  - Temperature: 15 to 35°C (59 to 95°F)

- **Ventilation system**
  - Supply air by test room: min. 350m³/h (12,400ft³/h)
  - Temperature: max. 35°C (95°F)
TECHNICAL DATA

Measurements:
- Temperature:
  (2 off) 0 to 70°C (32 to 158°F) ±0.5°C (0.9°F)
- LVDT-stroke measurement:
  (4 off) 0 to 7VRMS ±0.05% o.f.s.
  (2 off) 0 to 5mARMS ±1% o.f.s.
  (2 off) 0 to 1mADC ±5% o.f.s.
  (2 off) -50 to +50mm (-1.97 to +1.97in) ±0.03mm (0.001in)
  (1 off) -40 to +40mm (-1.57 to +1.57in) ±0.03mm (0.001in)
- Servo:
  (1 off) 0 to 105mADC ±0.5% o.f.s.
  (2 off) 0 to 20VDC ±1% o.f.s.
- Compressed air
  (1 off) 0 to 25bar (0 to 363psi) ±0.5% o.f.s.
- Pressure fuel
  (1 off) 0 to 6bar (0 to 87psi) ±0.5% o.f.s.
  (1 off) 0 to 40bar (0 to 580psi) ±0.5% o.f.s.
  (1 off) 0 to 30bar (0 to 4,350psi) ±0.33% o.f.s.
  (3 off) 0 to 30bar (0 to 4,350psi) ±0.5% o.f.s.
- Mass flow fuel
  (2 off) 0.1 to 60kg/min (0.22 to 132lb/min) ±0.2% o.f.s.
- Density fuel
  (2 off) 0.7 to 0.9kg/l (5.84 to 7.51lb/USgal) ±0.005kg/l (0.042lb/USgal)
- Volume flow fuel
  (1 off) 0.4 to 80l/min (0.106 to 92.5USgal/min) ±0.5% o.f.s.

Dimensions and weight:
- Test stand, network cabinet and adaption cabinet (without ventilation)
  Length: approx. 2,950mm (116in)
  Depth: approx. 2,600mm (102in)
  Height: approx. 3,550mm (140in)
  Weight: approx. 2,580kg (5,690lb)
- Switch cabinet
  Length: approx. 1,050mm (41.3in)
  Depth: approx. 550mm (21.7in)
  Height: approx. 2,050mm (80.7in)
  Weight: approx. 250kg (550lb)
- Control console
  Length: approx. 800mm (31.5in)
  Depth: approx. 750mm (29.5in)
  Height: approx. 1,200mm (47.2in) (keyboard extracted)
  Weight: approx. 160kg (350lb)

Operating conditions:
- Operating temp.: 5 to 35°C (59 to 86°F)
- Storage temp.: 0 to 55°C (41 to 140°F)
- Height: up to 1,000m (3,280ft) via MSL
- Rel. air humidity: 10 to 95% (non-condensing)
- Installation: in a non-explosive area
- Permanent noise emission: max. 72.5dB(A)
  in 1m (39.4in) distance

OPTIONS
A wide range of options is available to fulfil our customers’ requirements.
e.g.: Adaption to numerous UUTs, requirements to the test program, dimensioning,...