Modular E-pump testing solution

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Modular E-pump testing solution

Motivation

- Rapidly increasing demand for electrical driven components
- On-demand supply of cooling for conventional, hybrid, fuel-cell, battery powertrains -> Large varity of applications
- Rigid conditions from -40 up to 150 °C for coolant and ambient
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Request

- Easy and quick adaptation to specific customer needs
- Robust and highly reliable design
- Mechanical, electrical and digital competences
- Short delivery time and attractive price level

Our approach

- Fully digital development process
- Data driven development and analysis
- Modular, extendable and scalable design
- Easy adaptation to customer needs
- Approved technologies (hard- and software)
- Quick assembly and installation
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"Digital twin" - for development, analysis and lifetime service
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Conditioning and DUT circuit

- Flow meter
- Throttle valve
- Circulation pump
- Heat exchanger
- Flow heater
- Hydraulic separator unit
- Pressure measurement
- Active pressure control
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Configuration

- DUT module
- Conditioning module
- Gas extraction interface
- Conditioning circuit
- Active pressure control
- Cooling module interfaces
- Window
- Climate DUT chamber
- Air conditioning module
- DUT circuit
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Extendable and scalable solution

- Combination of modules for small and large pumps or differing features is possible
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Customized and tailored to specific needs

Functional test and hydraulic development ➔ Control development ➔ Endurance test
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Double-pump module
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Pump testing unit

- Control solution is based on „all-inclusive“ development tool
  - Test bench conditioning
  - Pump communication & control
  - Measurement and data acquisition

- PWM/LIN/CAN Communication module
  - Scalable up to eight pumps/module
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EUtest Software - test bench automation

- Visualisation
- Manual and automatic operation
- Editable, automated processes
- Autonomous operation
  - Automatic characteristic diagram
  - Signal acquisition and management
  - Data analysis
- Test bench monitoring
  - Alarm definition
  - Alarm handling
- Data management
- Remote-Service
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EUtect Software - test bench automation
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Data management and analysis (EU-MDM)

Inboxes

Inbox 1
Inbox 2
Inbox 3
Inbox 4

Outboxes

Outbox

Loading
Loading
Loading
Loading

Data Archive
Raw-Data

Metadata Extraction
Automatic Data Processing
Simulation

Dataset Information

EU-MDM Database

Data Archive Processed Files

.pdf
.xls
.mat
.tdms
.mp4

Reporting

Data Archive Report Results

Event & Dataset Information

Engineer

User

Data Logger Administration
Logger <-> System <-> Time

Tools

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14
Thank you!

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