

Main Fuel Accessories Test Stand

>MFAT1SR<



Pump Test Station



HMU/FMU Test Station

The test stand is developed for testing different fuel pumps, HMUs (hydromechanical metering units) und FMUs (fuel metering units) according to ATA Chapter 73.

It can also be adapted to other fuel components.

- > Explosion protection in accordance with ATEX Directive 94/9/EC
- > Two separated, independent test stations (for HMU/FMU and pumps) with individual PLC and computer
- > Multi-coupling systems for pressure measurement on the HMU/FMU test station
- > Manual, semi-automatic and automatic test runs
- > Effective noise protection through sound insulated setup

GENERAL INFORMATION

- > Modular setup (different modules supply the test stations with all required media and electric current)
- > Ergonomic design
- > Operation via control panel on swivel arm (HMU/FMU test station) or control console (pump test station)
- > Crane and chain hoist or extractable rescue winch to ease the UUT adaption
- > Maintenance friendly through walk-in hydraulic rooms
- > Extensive explosion protection concept with venting system, gas warning equipment and overtemperature shutdown 5°C (9°F) below the flashpoint
- > Cooling run after overtemperature shutdown for lowering the temperature of the medium
- > Test chambers with lockable safety doors; thus, good accessibility for UUT change, good sight during tests and additional protection of the operator through interlock
- > Drip pans in the base frame of the test stations to collect leakage during maintenance or in case of failure
- > During UUT exchange, any leaking medium is automatically filtered via drip pans and return tanks and is pumped back into the main tank
- > The test stand is resistant against the test medium and cleaning detergents (stainless steel and anodized aluminium front panels)
- > 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



Walk-in hydraulic rooms



Multi-coupling systems for pressure measurement



UUT on the pump test stand

AREA OF APPLICATION

P/N	Description	CMM	Engine
> Pump test station			
714900 series	Argo Tech	73-11-13	CFM56-5B/-5C
724400 series	Argo Tech	73-11-14	CFM56-5B/-5C
828300 series	Argo Tech	73-11-15	CFM56-7B
5006834 series	Hamilton Sundstrand	73-11-12	CF6-80C2
5009776 series	Hamilton Sundstrand	73-11-14	CF6-80E1
825501 series	Argo Tech	73-11-04	PW4000
723300 series	Argo Tech	73-11-05	PW4168
838000 series	Argo Tech	73-11-77	GE90-115B
829500 series	Argo Tech	73-11-01	CF34-8
837600 series	Argo Tech	73-11-02	CF34-10
721400 series	Argo Tech	73-12-11	Trent 700
> HMU/FMU test station			
1348M79 series	Woodward HMU	73-21-18	CFM56-5B/-5C
1348M79 series	Woodward HMU	73-21-78	CFM56-5B/-5C
8063-884	Woodward FMU	73-21-05	CF34-10
1853M56 series	Honeywell HMU	73-21-79	CFM56-7B
441789	Honeywell HMU	73-21-23	CF6-80C2
441790	Honeywell HMU	73-21-24	CF6-80C2
441860	Honeywell HMU	73-21-28	CF6-80E1
801000 series	Hamilton Sundstrand FMU	73-21-64	PW4000
808800 series 818580 series	Hamilton Sundstrand FMU	73-21-76	PW4168
8061-693	Woodward HMU	73-24-15	GE90-115B
8061-926	Woodward FMU	73-21-04	CF34-8
FMU701MK	Goodrich Engine FMU	73-21-43	Trent 700
FMU702	Aero Engine Controls FMU	73-21-44	Trent 702

OPTIONS

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

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TECHNICAL DATA

> Electrical supply (requirements):

Electrical supply of pump test station

Main supply:	3/N/PE AC 50Hz 400V
Nominal current:	400A
Nominal capacity:	277kVA
Pre-fuse:	500A gG

Electrical supply of HMU/FMU test station

Main supply:	3/N/PE AC 50Hz 400V
Nominal current:	470A
Nominal capacity:	326kVA
Pre-fuse:	500A gG

Electrical supply of cooling unit

Main supply:	3/N/PE AC 50Hz 400V
Nominal current:	380A
Nominal capacity:	263kVA
Pre-fuse:	400A gG

> Pneumatic supply (requirements):

Pneumatic supply

Flow:	max. 100l/min (26.4USgal/min)
Pressure:	6 to 10bar (87 to 145psi) dry and oilfree
Quality:	ISO 8573-1242

Venting system of the test stations

Supply air/test room:	approx. 700m ³ /h (24,700ft ³ /h)
Connection supply air:	Ø250mm (9.84in)
Exhaust air:	approx. 800m ³ /h (28,300ft ³ /h)
Connection exhaust air:	Ø315mm (12.4in)

Venting system fuel supply unit

Supply air/test room:	approx. 700m ³ /h (24,700ft ³ /h)
Connection supply air:	Ø250mm (9.84in)
Exhaust air:	approx. 800m ³ /h (28,300ft ³ /h)
Connection exhaust air:	Ø315mm (12.4in)

> Hydraulic parameters:

UUT supply

Medium:	MIL-PRF-7024E Type II
Temperature:	max. 33°C (91.4°F) Cooling run max. 60°C (140°F)
Main tank:	approx. 1.400l (370USgal), stainless steel

- Pump test station

Flow, pressure:	max. 30,800kg/h at max. 3.45bar (max. 68,000lb/h at 50psi) at max. 10bar (145psi)
Drive motor:	0 to 8,500U/min, max. 185kW, max. 420Nm (3,720lbfm)

- HMU/FMU test station

Flow, pressure:	max. 27,700kg/h at max. 152bar (max. 61,123lb/h at max. 2,200psi)
Drive motor:	0 to 8,000U/min, max 4.7kW

Hydraulic aggregate

Medium:	FUCHS RENOLIN MR 15 VG 46
Pressure:	150bar (2,180psi)
Flow:	max. 20l/min (5.28USgal/min)
Volume tank:	63l (16.6USgal)

Cold water set

Refrigerant cold water set:	R410A
Refrigerant system cooling:	water + 30% antifrogen N
Cooling capacity:	460kW
Flow:	85m ³ /h (3,000ft ³ /h)
Inlet and outlet:	Ø125mm (4.92in)

> Operating conditions:

Operating temperature:	+18°C to +38°C (64.4 to 100°F)
Storage temperature:	0°C to +60°C (32 to 140°F)
Height:	up to 1,000m (3,280ft) over MSL
Rel. air humidity:	10 to 95% (non-condensing)
Altitude:	in a non-explosive area
Permanent noise emission:	max. 79dB(A) in 1m (39.4in) distance

TECHNICAL DATA (Continuation)

> Dimensions and weight:

Pump test station

- Test stand and switch cabinet
 Width: 2,070mm (81.5in)
 Depth: 4,150mm (163in)
 Height: 2,390mm (94.1in)
 Weight: approx. 4,320kg (9,520lb)

- Control console

Width: 1,610mm (63.4in)
 Depth: 1,100mm (43.3in)
 Height: 1,460mm (57.5in)
 Weight: approx. 210kg (463lb)

HMU/FMU test station

Width: 2,070mm (81.5in)
 Depth: 3,620mm (143in)
 Height: 3,260mm (128in)
 Weight: approx. 3,880kg (8,550lb)

Fuel Supply Unit

Width: 2,070mm (81.5in)
 Depth: 4,550mm (179in)
 Height: 2,810mm (111in)
 Weight: approx. 6,900kg (15,200lb)

Cooling unit

Width: 2,190mm (86.2in)
 Depth: 4,480mm (176in)
 Height: 2,100mm (82.7in)
 Weight: approx. 4,700kg (10,400lb)

Switch cabinet

Width: 1,810mm (71.3in)
 Depth: 610mm (24in)
 Height: 1,900mm (74.8in)
 Weight: approx. 500kg (1,100lb)

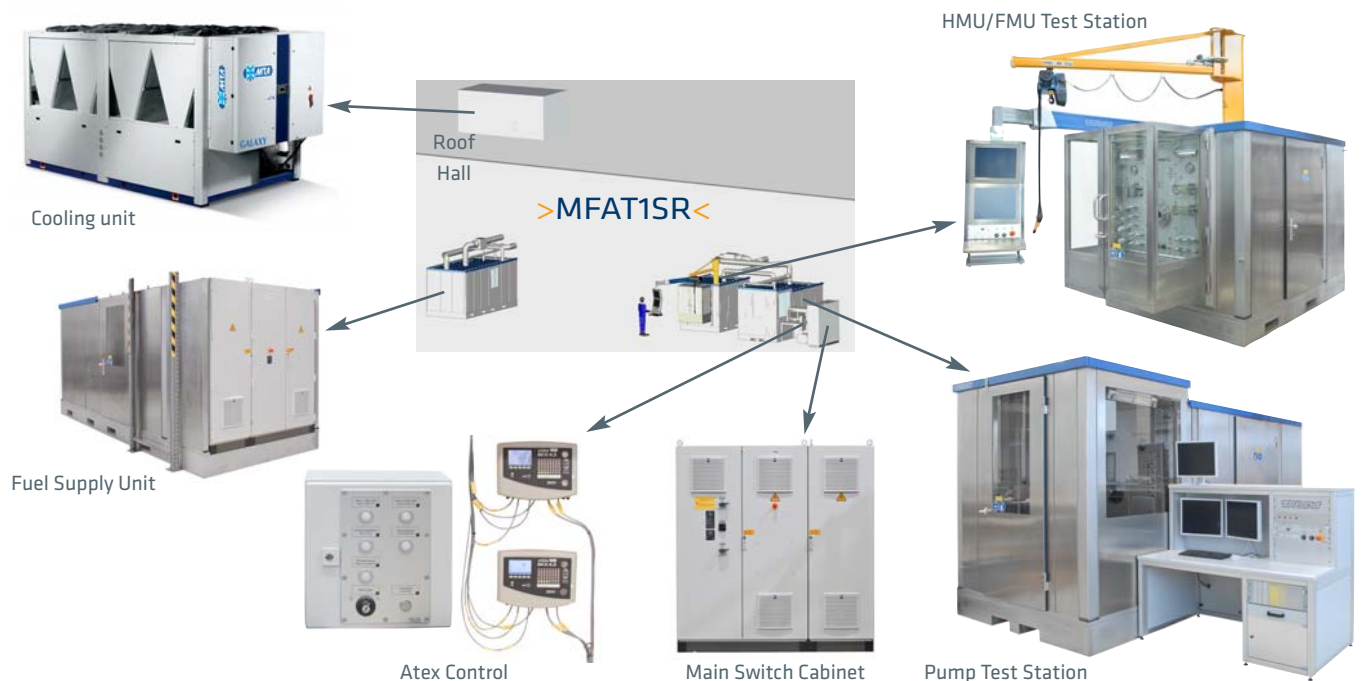
Explosion protection

- ATEX- control
 Width: 300mm (11.8in)
 Depth: 160mm (6.3in)
 Height: 300mm (11.8in)
 Weight: approx. 7kg (15.4lb)

- Gas warning equipment

Width: 300mm (11.8in)
 Depth: 110mm (4.33in)
 Height: 800mm (31.5in)
 Weight: approx. 8kg (17.6lb)

Venting and piping are not listed (above the modules).



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TECHNICAL DATA (Continuation)

> Measurements:

Pump test station

- Density

(1-off) 0.7 to 0.9kg/l (5.84 to 7.51lb/USgal)
±0.005kg/l (0.042lb/USgal)

- Pressure:

(2-off) 0 to 10bar (0 to +145psid) not calibrated
(1-off) 0 to 250bar (0 to 3,630psi) not calibrated
(1-off) -6.9 to +6.9bar (-100 to +100psid)
±0.2% of full scale
(2-off) 0 to 10bar (0 to 145psi)
±0.3% of full scale
(2-off) 0 to +27.6bar (0 to 400psid)
±0.2% of full scale
(1-off) 0 to +34.5bar (0 to 500psi)
±0.25% of full scale
(1-off) 0 to +34,5bar (0 to 500psi)
±0.2% of full scale
(2-off) 0 to 145bar (0 to 2,100psi)
±0.3% of full scale
(1-off) 0 to 193bar (0 to 2,800psi)
±0.3% of full scale
(3-off) -0 to 193bar (0 to 2,800psi)
±0.15% of full scale

- Rotational speed

(1-off) 0 to 9,000U/min ±1U/min

- Torque

(2-off) -250 to +250Nm (-2,210 to +2,210lbfin)
±0.25% of full scale

- Flow:

(1-off) 1.7 to 40kg/min (3.75 to 88.2lb/min)
±0.2% of measuring value
(1-off) 2 to 150l/min (0.53 to 39.6USgal/min)
±0.3% of measuring value
(2-off) 5 to 600l/min (1.32 to 159USgal/min)
±0.3% of measuring value

- Temperature

(1-off) 0 to 65°C (32 to 149°F) ±0.5°C (0.9°F)
(1-off) 0 to 70°C (32 to 158°F) ±2°C (3.6°F)
(2-off) 0 to +70°C (32 to 158°F) ±1°C (1.8°F)
(5-off) 0 to +70°C (32 to 158°F) ±0.5°C (0.9°F)

HMU/FMU test station

- Pressure:

(3-off) 0 to 10bar (0 to +145psid) not calibrated
(2-off) 0 to 250bar (0 to 3,630psi) not calibrated
(1-off) -48.3 to +48.3bar (-700 to +700psid)
±0.2% of full scale
(1-off) -48.3 to +48.3bar (-700 to +700psid)
±0.125% of full scale
(1-off) -34.5 to +34.5bar (-500 to +500psid)
±0.2% of full scale
(5-off) -27.6 to +27.6bar (-400 to +400psid)
±0.2% of full scale
(2-off) -27.6 to +27.6bar (-400 to +400psid)
±0.125% of full scale
(1-off) -20.7 to +20.7bar (-300 to +300psid)
±0.2% of full scale
(2-off) -13.8 to +13.8bar (-200 to +200psid)
±0.2% of full scale
(1-off) -6.9 to +6.9bar (-100 to +100psid)
±0.125% of full scale
(2-off) 0 to 13.8bar (0 to 200psi)
±0.25% of full scale
(1-off) 0 to 13.8bar (0 to 200psid)
±0.125% of full scale
(1-off) 0 to +27.6bar (0 to 400psid)
±0.2% of full scale
(1-off) 0 to +34.5bar (0 to 500psi)
±0.3% of full scale
(1-off) 0 to 41.4bar (0 to 600psi)
±0.25% of full scale
(1-off) 0 to 68.9bar (0 to 1,000psid)
±0.2% of full scale
(12-off) 0 to 100bar (0 to 1,450psi)
±0.3% of full scale
(1-off) 0 to 103bar (0 to 1,500psi)
±0.2% of full scale
(3-off) 0 to 145bar (0 to 2,100psi)
±0.3% of full scale
(1-off) 0 to 145bar (0 to 2,100psi)
±0.25% of full scale
(2-off) 0 to 193bar (0 to 2,800psi)
±0.3% of full scale
(3-off) -0 to 193bar (0 to 2,800psi)
±0.15% of full scale

TECHNICAL DATA (Continuation)

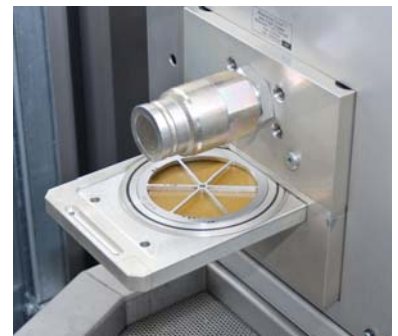
<p>- Density</p> <p>(1-off) 0.7 to 0.9kg/l (5.84 to 7.51lb/USgal) ±0.005kg/l (0.042lb/USgal)</p> <p>- Rotational speed</p> <p>(1-off) -9,000 to +9,000U/min ±1U/min</p> <p>- Flow:</p> <p>(1-off) 0.1 to 8l/min (0.026 to 2.11USgal/min) ±0.3% of measuring value ±0.003l/min (0.0008USgal/min)</p> <p>(3-off) 0.1 to 40l/min (0.026 to 10.6USgal/min) ±0.3% of measuring value ±0.003l/min (0.0008USgal/min)</p> <p>(1-off) 0.5 to 150l/min (0.13 to 39.6USgal/min) ±0.3% of measuring value ±0.003l/min (0.0008USgal/min)</p> <p>(1-off) 2 to 150l/min (0.53 to 39.6USgal/min) ±0.3% of measuring value</p> <p>(2-off) 5 to 600l/min (1.32 to 159USgal/min) ±0.3% of measuring value</p> <p>(1-off) 4 to 70kg/min (8.82 to 154lb/min) ±0.2% of measuring value</p> <p>(1-off) 1 to 2,000cm³/min (0 to 0.07ft³/min) ±0.2% of measuring value ±2.5cm³/min (0.001USgal/min)</p> <p>- Temperature</p> <p>(4-off) -5 to +70°C (23 to 158°F) ±1°C (1.8°F)</p> <p>(1-off) 0 to 65°C (32 to 149°F) ±2°C (3.6°F)</p> <p>(1-off) 0 to 70°C (32 to 158°F) ±2°C (3.6°F)</p> <p>(10-off) 0 to +70°C (32 to 158°F) ±0.5°C (0.9°F)</p> <p>- Frequency</p> <p>(1-off) 2,300 to 3,500Hz ±10PPM</p>	<p>- LVDT A,B</p> <p>(2-off) -90 to +270° ±0.04°</p> <p>(2-off) -1 to +1V/V ±0.03% of full scale</p> <p>- Voltage LVDT</p> <p>(4-off) 0 to +10V ±0.05% of full scale</p> <p>(1-off) 0 to 10VRMS ±0.5% of full scale</p> <p>(2-off) 0 to +10VRMS ±0.1% of full scale</p> <p>- Voltage Servo</p> <p>(7-off) -40 to +40VDC ±0.5% of full scale</p> <p>- Voltage Solenoid</p> <p>(8-off) 0 to 35VDC ±0.3% of full scale</p> <p>- Current Servo</p> <p>(6-off) -400 to +400mA ±0.05mA</p> <p>(6-off) -400 to +400mA ±0.05% of full scale</p> <p>(1-off) -100 to +100mA ±0.05% of full scale</p> <p>- Resistance</p> <p>(6-off) 0 to 100Ω ±0.014Ω</p> <p>(2-off) 0 to 1,000Ω ±0.011Ω</p> <p>(2-off) 0 to 3,000Ω not calibrated</p> <p><u>Fuel supply unit</u></p> <p>- Pressure:</p> <p>(1-off) 0 to +2.07bar (0 to 30psi) ±0.3% of full scale</p> <p>- Temperature</p> <p>(2-off) 0 to 70°C (32 to 158°F) ±1°C (1.8°F)</p> <p>(3-off) 0 to +70°C (32 to 158°F) ±0.5°C (0.9°F)</p>
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Pumps in the fuel supply unit



Rescue winch on the pump test station



Filter drawer on pump test station