DMA-Aero

MPS46

Laboratory Air Data Test Set

- Independent Ps and Pt control
- Accuracy exceeds RVSM requirements
- Height only 3.5" x 19" (2U) rack mount
- Multiple line switching option
- GPIB/RS232/USB ATE compatibility

MPS46 Precision Laboratory Digital Air Data Test Set

SUPPLYING AIR DATA TEST SETS TO THE WORLD

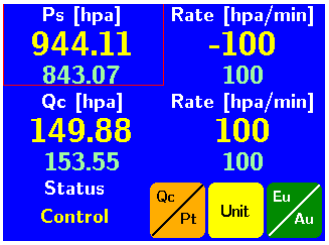
DMA traces its origins back to 1938, mainly as a test equipment manufacturer to support European aviation requirements. Today DMA supply precision Air Data Test Sets and other aviation ground support equipment to aircraft manufacturers, repair stations and operators throughout the world.

LABORATORY TESTER FOR DEMANDING APPLICATIONS

The MPS46 is a rack mount or table top digital technology Air Data Test Set incorporating many standard features normally found on more expensive test instruments. As well as the standard Static and Pitot twin channel MPS46 unit, a single Ps channel version is available as the MPS46M (mono). A twin channel version with internal pumps is available as the MPS46P. The instruments are housed in a standard 19 inch by 2U enclosure, resulting in a compact rugged design.

EASY INTUITIVE INTERFACE

Using logical key press routines the MPS46 is easy to use by both beginners and experts. Testing and trouble shooting can be performed via the keypad or adjacent full color touch-screen display. Optionally remote control can be via GPIB, USB, RS232 or Ethernet.



All the important air data functions are simultaneously displayed on all interfaces, constant screen or menu changes are not required. Readings of both commanded and measured test values are displayed.

Laboratory testing can also be performed by a PC, including the MPSMON Panel PC. The comprehensive manuals include all the control instructions. ADWIN36 software is available as a ready-to-run PC based interface.

ACCURACY ACHIEVED BY THE END OF SELF TEST

Two high performance piezo resistive absolute transducers are utilized for the static and pitot channels. Pressure and temperature characterisation is applied to the sensors ensuring very high accuracy is achieved at all operating pressure values, without any significant warm-up time.

PRESSURE AND VACUUM SUPPLIES

The MPS46 requires external pressure and vacuum supplies connected via appropriate fittings on the rear panel. DMA do manufacture a rack mounted Pressure and Vacuum Unit, see the EPSR2 data sheet for details. The MPS46P is also available. This is a version of the MPS46 with internal, small capacity, pumps. See details on the Standard Specification listing.

AUTOMATED CALIBRATION

Calibration, performed by software, is fast and simple since no mechanical adjustments are required. Calibration factors are password protected for security. The resultant accuracy of the sensors exceeds the RVSM industry requirements.

FLEXIBLE MULTIPLE LINE SWITCHING OPTION

The MPS46 as standard provides 2 connectors for altitude and 2 for airspeed on the instrument front panel. and on the rear panel are further single ports for Ps and Pt.

An optional multiple line switching capability permits fast and safe isolation of 3 lines per channel by means of isolation valves to isolate leaking channels. Control is possible from any of the local or remote user interfaces. Combinations of line switching are also possible for numerous fault finding routines.

LOW POWER CONSUMPTION FOR HIGH RELIABILITY

Careful consideration during the design ensures low power consumption giving minimal internal temperature rise which consequently results in high reliability: typically 60 W power consumption from the a.c. line.

BUILT IN SAFETY LIMITS FOR UUT PROTECTION

The MPS46 is designed for maximum safety during testing. Key DMA design features protect both the test set and the systems under test. Negative Qc, a pressure condition of Ps greater than Pt, is prevented in both manual and automatic operation. If a.c. power is lost then the Unit Under Test (UUT) is safely isolated and can be manually vented preventing instrument and test set damage.

Numerous pre-set factory or user programmed safe limits are provided to prevent damage to the UUT. These limits can be modified by the user either temporarily or permanently, with password protection if desired.

THE MPS46P

The MPS46P is a version of the MPS46 that also includes internal pressure and vacuum pumps resulting in a totally self contained air data test set with no requirement for external pumps.

The MPS46P offers the same range and accuracy performance as many flight line testers. Altitude and Airspeed ranges, and RVSM accuracies, satisfy the FAA mandated Civil aircraft operating regimes.

The internal no-maintenance diaphragm pumps are guaranteed for 5000 hours operation. They run only when the internal microprocessor system signals extra supplies are called for and operate with low noise levels. A moisture drain is fitted to allow venting of any internal condensation.

Where operation at higher levels of altitude and airspeed than the standard MPS46P civil capability is required then connectors for external Pressure and vacuum are available on the rear panel and a pump unit such as the EPSR2 can be used to achieve the higher performance.

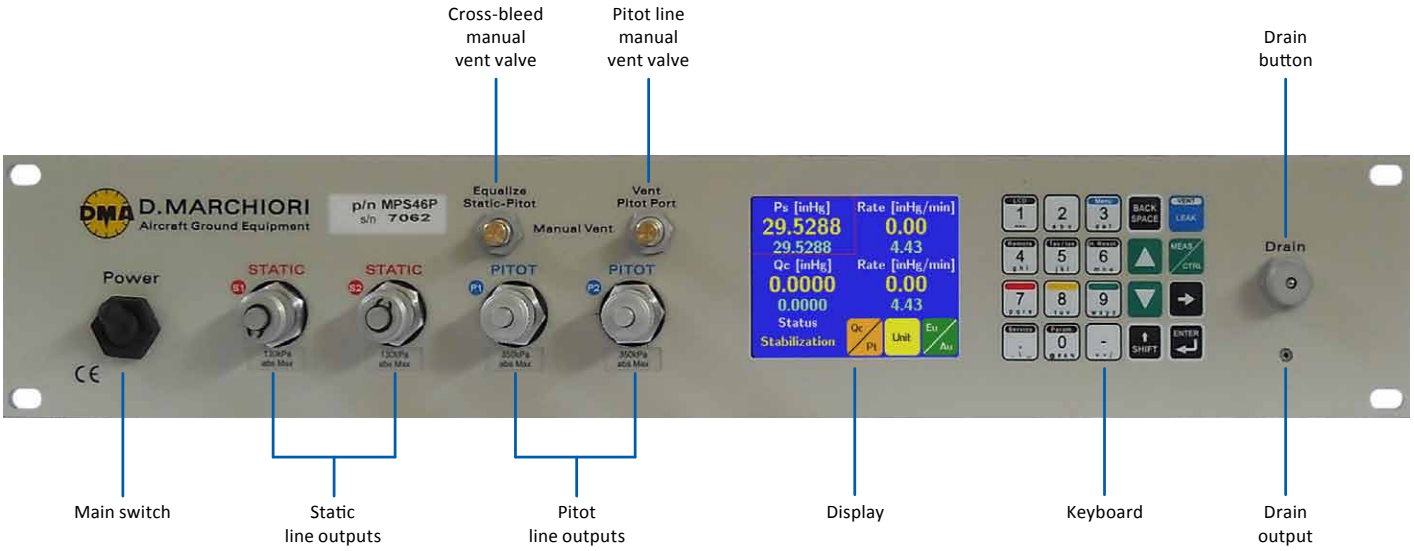
Operating differences to the standard MPS46 are highlighted in the Specification area.

THE MPS46M

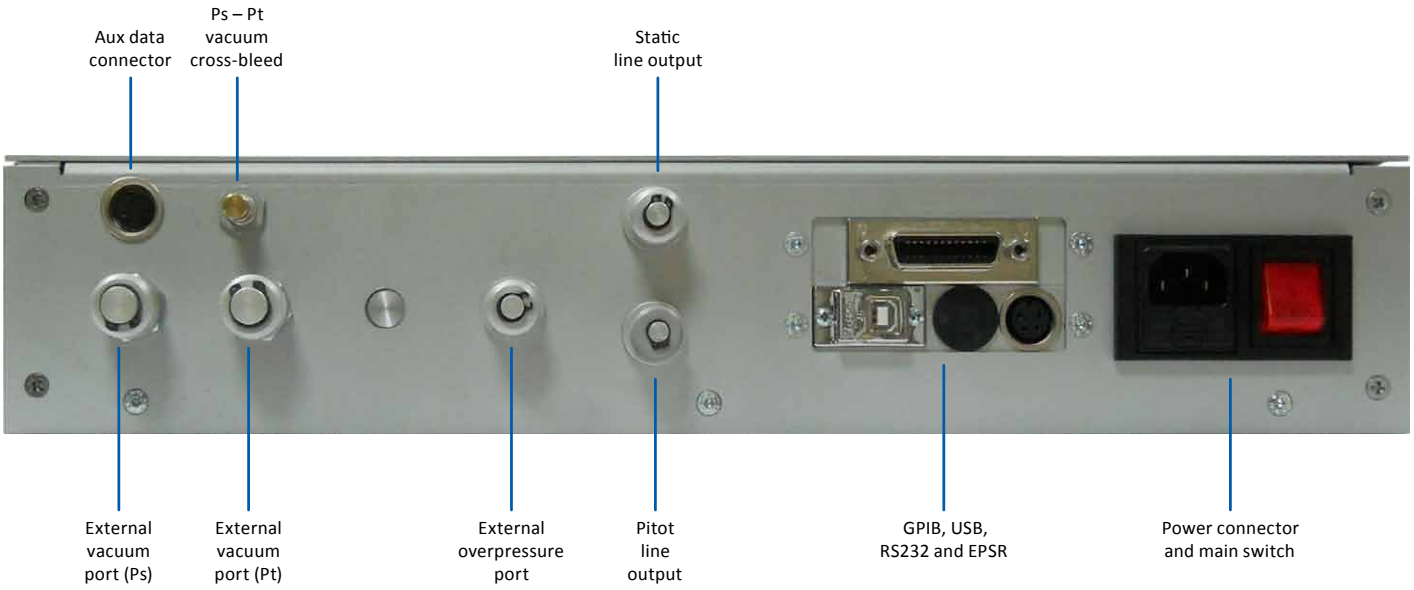
The MPS46M is a mono, single channel version of the MPS46 that provides only the Static absolute capability of the standard instrument.

The single channel MPS46M requires external pumps as standard. It is also available with internal pumps as the MPS46PM.

Operating differences to the Standard MPS46 are essentially that only Static (altitude) capabilities are provided.



Front panel



Rear panel

MPS46 Standard Specifications

DMA-Aero

	PARAMETER			RANGE		RESOLUTION		ACCURACY	CONTROL STABILITY
				MEASURE	CONTROL	MEASURE	SETPOINT		
STATIC	Altitude	Standard	(ft)	-7,500→100,000	-7,500→80,000 [1]	1	1	± 2 @ SL ± 4 @ 30,000 ± 8 @ 50,000	± 2 [3]
		Option J3	(ft)	-7,500→100,000	-7,500→100,000 [2]				
		Option J4	(ft)	-15,500→100,000	-15,000→80,000 [6]				
	Vertical speed	Standard	(ft/min)	0→6,000	0→6,000	5 @ < 3,000 [5]	1	± 10 ± 1% of reading	± 10 ± 1% of reading
		High rate option [4]	(ft/min)	0→60,000	0→60,000				
	Static	Standard	*(inHg abs)* (hPa abs)	*0.3→38* 10→1300	*0.8→38* [1][6] 27→1300	*0.0001* 0.002	*0.0001* 0.002	*± 0.0013 @ 3.5, ± 0.002 @ 30* ± 0.045 @ 100, ± 0.07 @ 1000	*0.002* 0.07
		Option J4	*(inHg abs)* (hPa abs)	*0.3→50* 10→1700	*0.8→50* [6] 27→1700			*± 0.01 @ 50 inHg* ± 0.34 @ 1700 hPa	
PITOT	Airspeed	Standard	(kts)	10→1,000	10→1,000 [2][7]	1 @ < 50 0.1 @ > 50	0.1	± 0.8 @ 50 ± 0.1 @ > 500	± 1
		Ultra low speed function	(kts)	2→200	2→200	0.1 @ > 20		± 0.03 hPa	± 0.03 hPa
	Airspeed slew rate		(kts/min)	0→900	0→900	10	10	± 10 ± 1% of reading	± 5%
	Mach No.		(mach)	0→6	0→6	0.001	0.001	< ± 0.002	± 0.002
	Pitot		*(inHg abs)* (hPa abs)	*0.3→103* 10→3500	*0.3→103* [2][7] 10→3500	*0.0001* 0.005	*0.0001* 0.005	*±0.0025 @ 3.5, ±0.004 @ 30* *±0.006 @ 80 inHg* ± 0.085 @ 100, ± 0.14 @ 1000 ± 0.2 @ 2700 hPa	*± 0.003* ± 0.1
	Engine Pressure Ratio		(EPR)	1→2.5 @ SL	1→2.5 @ SL	0.001	0.001	0.001	± 0.001

Notes: Control capability on all load volumes: Static: 0 to 125 cu. in. (2 L), Pitot: 0 to 80 cu. in. (1.3 L). Larger volumes acceptable

[1] Achievable with internal pumps on MPS46P [2] Requires external pumps [3] Control stability: Typically ±10ppm FS pressure at 40,000 ft into leak tight system

[4] High rate achievable into small system volumes [5] 5 up to 3,000 ft/min, 20 up to 6,000 ft/min, 50 up to 15,000 ft/min, 100 above 15,000 ft/min

[6] Option J3 extends control to 100,000 ft (10 hPa, 0.3 inhg). Option J3 can be combined with option J4. [7] Internal pumps only achieve 850 kts (2600 hPa, 77 inhg)

STANDARD TEST FUNCTIONS

- Automatic leak check
- Controlled venting to ambient
- Altitude/airspeed input *
- Static/dynamic(Qc)/total pressure input *
- Altitude/airspeed rates input*
- Mach Number input*
- EPR generation*
- TAS / IAS toggle, TAS temperature correction*
- Altitude offset correction
- 30 user test programmed profiles of 26 steps each
- Ultra low speed (2 to 200 kts) for improved accuracy and stability*
- Audible indication when approaching set point

** Note: MPS46M offers only Static/Altitude functions*

DISPLAY AND KEYPAD

Integral display and keypad in splash proof and shock protected front panel.
Back lit color LCD displays all test parameters.

DISPLAYED UNITS

Altitude: ft, m, hm
Airspeed: kts, km/h, mph
Pressure: inHg, hPa, kPa, Pa, psi, mmHg, inH_2O 4°C

CALIBRATION

One year interval, performed using software.

PHYSICAL SPECIFICATIONS

Weight MPS46: 22 lbs. (10 kg.)
Weight MPS46P: 27 lbs. (12 kg.)
Dimensions: W 19 x D 11 x H 3.5 in.
(W 483 x D 280 x H 89 mm)
Connections: AN-4 (Ps), AN-3 (Pt)
AN fittings with o-rings allow finger tight connections.

ENVIRONMENTAL

Temperature range
Operating: 0°C to +50°C
Storage: -20°C to +70°C
Front panel splash-proof. CE compliant.

POWER SUPPLY

Universal supply: 90-240 VAC; 50-400 Hz. 60 W

WARRANTY

Unit: 2 Years

SOFTWARE LIBRARY

Command Set (RS232, USB, GPIB, Ethernet)
Customer interface software for modular ATE applications.

OPTIONS

B1 USB port §
B3 Ethernet port §
B4 IEEE488 GPIB control (RS232 is standard) §
B5 ARINC429 monitoring interface §
B7 Gray Code Altitude Device Read-out §
E2 2+2 Multiple Pitot and Static internal isolators controlled from keypad. §
E3 3+3 Multiple Pitot and Static internal isolators controlled from keypad. §
F0 ADWIN36 PC Control software
J3 Ps control extended to 0.3 inHg, 100,000 ft ‡
J4 Ps control extended to 50 inHg, -15,000 ft ‡
– Custom Pitot/Static connections available

‡ *Options J3 & J4 require external pumps and can both be combined if required*

§ *Refer to DMA-Aero for option combination limitations*

ASSOCIATED PRODUCTS

Remote line switching unit.
MPSMON desk mounted remote control unit
EPSR2 Rack mount vacuum/pressure supply
PAMB11 Pressure indicator/transfer standard

Ongoing development results in specifications being subject to change without notice

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