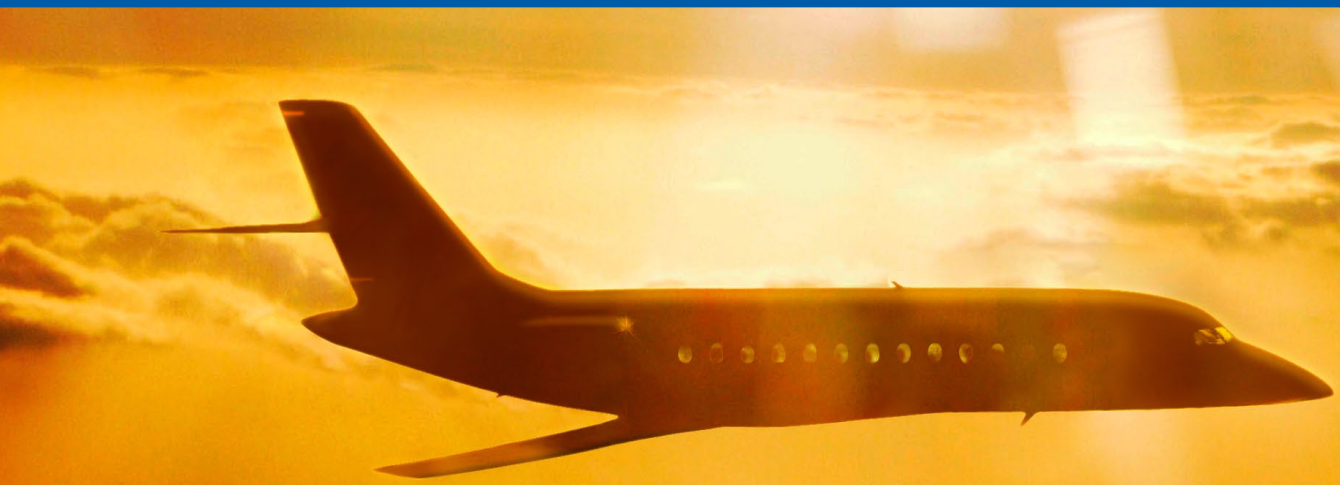
D. Marchiori

MM14-BW

Automated Pressure Calibration System

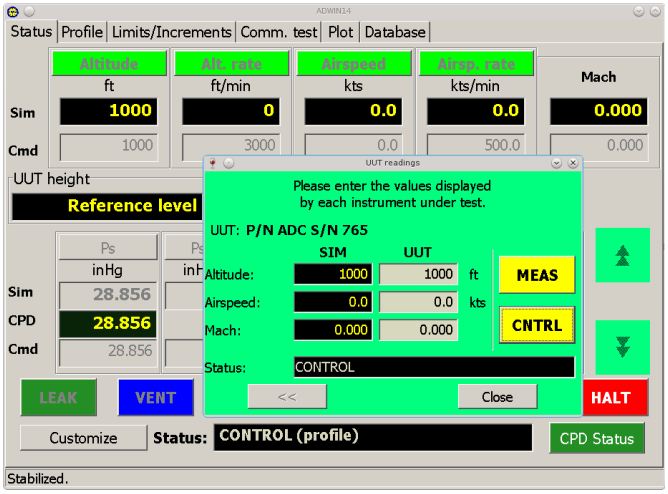
- Better than 25ppm accuracy
- Automatic calibration in aircraft pitot and static ranges
- High Performance Primary Standard pressure balance
- Integral Transfer Standard
- UUT calibration up to 3.9 Bar Absolute
- Pressure and Vacuum pumps included



MM14-BW Automated Pressure Calibration System

FEATURES

- Accuracy better than 25 ppm via Primary Standard
- Automatic calibration in the Pitot and Static aircraft ranges
- High Performance Primary Standard pressure balance
- Primary Standard allows continuous pressure measuring
- Integral Transfer Standard with 40ppm accuracy
- Transfer Standard resolution: 0.2 Pa (static), 0.5 Pa (pitot)
- UUT calibration up to 3,900 hPa abs.
- 3 diaphragm pumps for the UUT pressure control
- Oil vacuum pump for Primary Standard vacuum reference
- Automatic verification/calibration of the Transfer Standard
- Automatic calibration of Air Data Test Sets



Example display showing the normal operating mode during an accuracy test of the UUT

DUAL-STANDARD PRESSURE CALIBRATOR WITH CONTINUOUS PRESSURE MEASUREMENT

The MM14-BW digital automatic pressure calibration system combines high technology and comprehensive features to allow easy calibration of pressure systems such as Air Data Test Sets. The MM14-BW incorporates both a Primary Standard pressure balance and an accurate dual pressure Transfer Standard, for automatic verification of the UUT.

The Windows®based PC provides a user friendly and effective software interface as well as full automatic control of the primary and transfer standards. Verification and adjustment of DMA Air Data Test Sets is fully automatic. Manual operation is also available as is easy verification of equipment from other manufacturers.

AUTOMATIC AND MANUAL PROCEDURES

The MM14-BW supports both automatic and manual modes of operation.

In automatic mode, the program runs a defined list of set points. In manual mode, the operator can set the individual target pressures.

DMA Air Data Test Sets can be calibrated automatically when connected through the supplied USB cable. Preset calibration profiles are available for all DMA equipment.

When calibrating other manufactures equipment, the software allows manual input of the readings.

PRIMARY STANDARD

The Primary Standard is the well known CPD8000 from Degranges & Huot. All output data is read and processed by the built-in software. The Primary Standard is always active, operating in a watchdog mode, monitoring the accuracy of the Transfer Standard.

UUT calibrations can be carried out either against the Primary or the Transfer Standard. Calibration of the UUT against only the Transfer Standard enables full automatic operation of the calibration system with reduced start up time. It also offers rate measurement, not possible via the Primary standard.

TRANSFER STANDARD

The Transfer Standard is a DMA MPS46-BW dual pressure controller using two absolute pressure transducers. The transducers incorporate advanced numerical processing filters, to achieve linearity that is better than 25 ppm F.S. The twin channel capability enables differential sensors to be calibrated which is not available by the Primary Standard.

The test of the built-in Transfer Standard is fully automatic and all results of the comparison test, Primary Standard versus Transfer Standard, are stored on the PC's hard drive.

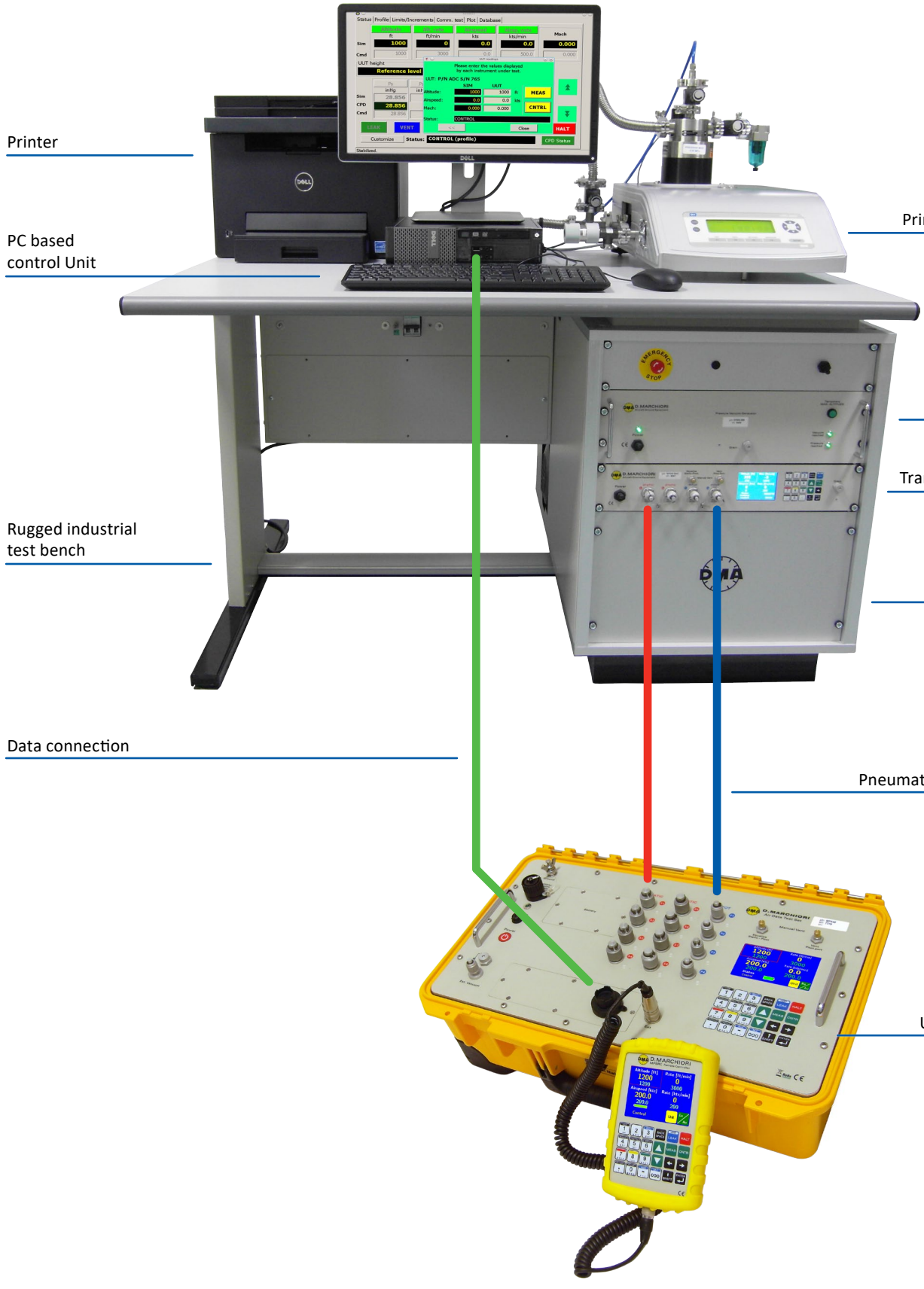
UNITS

Target pressures can either be specified in selectable aeronautical units (altitude, airspeed,etc.) or in pressure values (either absolute or differential pressure) with a selection of different pressure units available to work in.

PUMPS

The MM14-BW pumps are housed within the cabinet and provide for the total needs of the equipment. The two stage oil based vacuum pump generates the necessary ultra high vacuum for the Primary Standard absolute pressure reference. The three diaphragm pumps enable the MPS46-BW2 Transfer Standard to deliver the required full range pressure and vacuum equivalent to 1,000 knots and 100,000 feet of altitude.

CPD8000


Printer
PC based
control Unit
Automatic
Primary Standard
Diaphragm
pump unit
MPS46-BW2
Transfer Standard
Rugged industrial
test bench
Dual stage oil
pump unit
Data connection
Pneumatic connections
Unit under test

MM14-BW Automated Pressure Calibration System

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	PARAMETER			RANGE		RESOLUTION		ACCURACY	
				MEASURE	CONTROL	MEASURE	SETPOINT	PRIMARY	TRANSFER
STATIC	Altitude		(ft)	-7,000→100,000	-7,000→100,000	1	1	up to 25 ppm	40 ppm F.S.
	Vertical speed		(ft/min)	0→60,000	0→60,000	1	1	-	± 1% of setting
	Static		*(inHg abs)* (hPa abs)	*0.3→38* 10→1300	*0.3→38* 10→1300	*0.0001* 0.002	*0.0001* 0.002	up to 25 ppm	40 ppm F.S.
PITOT	Airspeed	Standard	(kts)	10→1,000	10→1,000	1 @ < 50 0.1 @ > 50	0.1	-	± 0.8 @ 50 ± 0.1 @ > 500
		Ultra low speed function [2]	(kts)	2→200	2→200	0.1 @ > 20			± 0.03 hPa
	Airspeed slew rate		(kts/min)	0→900	0→900	10	10	-	± 10 ± 1% of setting
	Mach No.		(mach)	0→6	0→6	0.001	0.001	-	< ± 0.002
	Pitot		*(inHg abs)* (hPa abs)	*0.3→115* 10→3900	*0.3→115* 10→3900	*0.0001* 0.005	*0.0001* 0.005	up to 25 ppm	40 ppm F.S.
	Engine Pressure Ratio		(EPR)	1→2.5 @ Sea level	1→2.5 @ Sea level	0.001	0.001	-	± 0.001

Notes:
The accuracy value for the Primary Standard is certified by International traceable laboratories.
The Transfer Standard must be calibrated every three months against the Primary Standard to achieve the indicated accuracy.

STANDARD TEST FUNCTIONS

- pressure/vacuum generation
- automatic leak check
- controlled venting to ambient
- altitude/airspeed input
- static/dynamic(Qc)/total pressure input
- altitude/airspeed rates input
- static/dynamic(Qc) pressure rates input
- Mach Number input
- TAS/IAS toggle, TAS temperature correction
- UUT height offset correction
- multiple measurement units available.

DISPLAY AND CONTROLS

All the operations are controlled through the PC with dedicated software

CALIBRATION

Primary Standard: three year interval.
Transfer Standard: three month intervals, performed using software.
The Transfer Standard is continuously verified by the Primary Standard during normal use.

WARRANTY

2 years

DISPLAYED UNITS

Altitude: ft, m, hm
Airspeed: kts, km/h, mph
Pressure: inHg, hPa, kPa, Pa, psi, mmHg, inH2O

ENVIRONMENTAL

Temperature range
Operating:+10°C to +35°C
CE compliant

PHYSICAL SPECIFICATIONS

Weight: 190 kg. (270 lbs.)
Dimensions: L 160 cm, W 120 cm, H 110 cm (63" x 47" x 43")

POWER SUPPLY

Power requirement: 115-220 Vac; 50-60 Hz.

Ongoing development results in specifications being subject to change without notice

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