

MicroStep - MIS

MSB780 & MSB780X

Digital Barometers

Digital Barometers MSB780 and MSB780X, developed and manufactured by MicroStep-MIS, are designed for use in professional meteorological and aviation applications requiring reliable and highly accurate measurement, fast dynamic response, and advanced long-term stability. Sensor is a solid-state transducer where frequency of oscillation is dependent on density of the air inside. The sensor has superior accuracy and long term stability in compare with silicon capacitive transducer based technology.



BAROMETER OF A WORLDCLASS QUALITY

Accuracy

Calibration in our accredited laboratory ensures the high accuracy of the barometer, which the users can benefit from in their applications.

Stability

MSB780(X) barometer provides excellent long-term stability. It is ideal for the most demanding applications, where exactness is required during a long measurement period.

Reliability

MSB780 barometer is able to provide self-tests and error reporting via SDI-12 and serial lines. This feature significantly reduces the risk of error when measuring with a barometer.

Durability

MSB780(X) is a robust product made of durable hardware components. The heavy-duty metal enclosure of the barometer ensures life-long durability.



1300+ barometers
manufactured and
supplied worldwide

FEATURES



Excellent total
accuracy
[-50°C to +80°C]
0,15 hPa



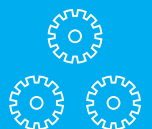
Digital output



Fully temperature
compensated



Typical long-term
stability better than
0.05 hPa / year



1 to 3 transducers



MSB780 is built to withstand the most challenging environmental conditions, which are often faced in various environmental monitoring applications. The barometer is a low power consumption microprocessor-controlled sensor suitable also for solar and battery-powered applications. The sensor is operable in the temperature range from $-50\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$. The excitation range is from 5 to 35 V DC.

MSB780 is a robust product made of durable hardware components enclosed in a heavy-duty metal IP 66 enclosure. This digital barometer comes factory calibrated with a manufacturer calibration certificate. The version named MSB780 comes with one transducer, while the X version of the digital barometer is extendible up to three transducers and embedded display. We also offer a portable high-precision barometer.



MSB780 is a robust product made of durable hardware components enclosed in heavy-duty metal IP 66 enclosure.



The digital barometer is extendible up to three transducers and embedded display.



MSB780X TS is a high precision barometer suitable for usage in the field.

Vibrating Cylinder Technology

A solid-state transducer implemented in the barometer offers the product of premium quality. It operates on a principle of a vibrating cylinder where the natural frequency of the cylinder oscillation depends upon the applied pressure inside. The vibrating cylinder is embedded in a vacuum housing and the inside of the cylinder is connected to an air source. The use of high-elasticity and low hysteretic materials results in a highly stable and high-resolution measurement method. Classed as a “vibrating element” sensor, the device presents exceptional measurement performance by virtue of its operating mechanism.



MSB780X can be equipped with three solid-state transducers for use in applications that require it.

Technical specifications

Performance

Barometric pressure range	500 hPa to 1100 hPa (or as specified)
Linearity	< 0.02 hPa
Hysteresis	< 0.02 hPa
Accuracy (20 °C to 25 °C)	0.10 hPa
Total accuracy	0.15 hPa (–50 °C to +80 °C)
Typical long-term stability	better than 0.05 hPa/year
Response time	2 s
Number of transducers	1 to 3

Operating environmental

Temperature range	–50 °C to +80 °C
Display operating temperature	–10 °C to +60 °C
Relative humidity	(0 to 100) %RH
Overpressure limit	4000 hPa (not affecting sensor calibration)
Burst pressure limit	7000 hPa
Enclosure	IP 66, IP 65 with display

Inputs and outputs

Supply voltage	5 to 32 V DC
Power supply current	32 mA @ 12 V DC (1 sensor, without display)
Resolution	0.001 hPa
Communication	RS-232, RS-485 (optional), SDI-12, USB (optional)
Protocol	ASCII, user defined message
Analog output (optional)	voltage, current

Mechanical

Dimensions	115 x 90 x 57 mm (MSB780) / 157 x 100 x 80 mm (MSB780X)
Weight	520 g (MSB780) 1050 g (MSB780X 1D - one pressure element) 1100 g (MSB780X 2D - two pressure elements) 1150 g (MSB780X 3D - three pressure elements)

Factory calibration

Calibration point [hPa]	Typical uncertainty U [hPa]
500	0.07
560	0.07
620	0.07
680	0.07
740	0.07
800	0.07
860	0.07
900	0.07
980	0.07
1040	0.07
1100	0.07

Analog output accuracy

The accuracy of the analog output is calculated with extension factor $k = 2$ over the temperature range.

Range	Accuracy	Value	Range
0 to 1 V	< 0.13 mV	0.0080 %	0.0044 %
0 to 5 V	< 0.59 mV	0.0109 %	0.0009 %
0 to 10 V	< 1.18 mV	0.0113 %	0.0004 %
0 to 20 mA	< 0.020 mA	0.0755 %	0.0245 %
4 to 20 mA	< 0.020 mA	0.0776 %	0.0482 %

Touchscreen display

- optional

Order codes

Atmospheric pressure sensor MSB780, one transducer	MIS:MSB780.1.
Atmospheric pressure sensor MSB780, one transducer, large box	MIS:MSB780.1X.
Atmospheric pressure sensor MSB780, one transducer, large box, touchscreen display	MIS:MSB780.1XD.
Atmospheric pressure sensor MSB780, two transducers, large box	MIS:MSB780.2X.
Atmospheric pressure sensor MSB780, two transducers, large box, touchscreen display	MIS:MSB780.2XD.
Atmospheric pressure sensor MSB780, three transducers, large box	MIS:MSB780.3X.
Atmospheric pressure sensor MSB780, three transducers, large box, touchscreen display	MIS:MSB780.3XD.
RS-485 extension card for MSB780	MIS:MSB780.485
Digital electronic barometer with pressure connector, accredited calibration. 11 pressure points over the pressure range of the calibrated barometer. (minimum 500 hPa, maximum 1100 hPa), 3 cycles up-down.	KLA:P-1.1-9



	
DOPRAVNÝ ÚRAD TRANSPORT AUTHORITY	
SÚHLAS NA POUŽITIE LETECKÉHO POZEMNÉHO ZARIADENIA V CIVILNOM LETECTVE TYPE APPROVAL	
Č.: LPZ - S - 001/2014 No.	
<p>Týto dokumentom sa potvrdzuje, že nižšie uvedené výrobok sa môže použiť v civilnom letectve ako letecké pozemné zariadenie alebo jeho súčasť. This document certifies that the product described below may be used in civil aviation as an Aeronautical Ground Facility.</p>	
Výrobok: Product:	Digitálny barometer Digital barometer
Výrobca: Manufacturer:	MicroStep - MIS s.r.o., Čavojského 1, 841 14 Bratislava
Typové označenie: Type Designation:	MSB780
Technická špecifikácia: Technical Specification:	User's Guide version 2 Uživatelská príručka verzia 2
Použitý predpis: Certification Basis:	ICAO Annex 3, 18th Edition, July 2013
Obmedzenia: Restrictions:	Bez obmedzenia No restriction
<p>Popis, technické údaje, výkony a obmedzenia, pokyny pre zástavbu, obsluhu, údržbu a opravy sú uvedené v platnej dokumentácii. Tento dokument nie je súhlasom so zástavbou tohto výrobku. Tento dokument ostáva v platnosti, pokiaľ sa ho držiteľ nezdá alebo pokiaľ jeho platnosť Dopravný úrad nepozastaví, nezruší alebo nestanoví ukončenie platnosti inak. The description, technical data, performances and limitations, instructions for installation, servicing, maintenance and repairs are stated in valid documentation. This document is not the installation approval for this product. This document remains in effect until surrendered, revoked or otherwise terminated by the Transport Authority.</p>	
Vydané v: Issued at:	Bratislava
Dátum: Date	14. Február 2014 February 14, 2014
Podpis: Signature	 Ing. Martin Němec
Meno: Name	Riaditeľ
Funkcia: Title	Divízia civilného letectva Director Division of Civil Aviation

Type approval by the Transport Authority of the Slovak Republic for usage in civil aviation

	
MicroStep-MIS, spol. s r.o. Čavojského 1 841 04 Bratislava, Slovak Republic	
	
	
DECLARATION OF CONFORMITY	
Manufacturer:	MicroStep-MIS, spol. s r.o. Čavojského 1 841 04 Bratislava Slovakia
herewith declares, that Description:	Barometric Pressure Transducer
Type:	MSB 780
<p>is in conformity with the provisions of the following EU directives including the latest amendments and with national legislation implementing these directives:</p>	
Directive 2006/95/EC EMC Directive 2004/108/ES	
<p>and that conformity is declared based on fulfillment of following standards:</p>	
EN 61010-1:2010 EN 61326-1: 2006 EN 61000-3-2: 2006 EN 61000-3-3: 2006	
<p>WMO No. 8 Manual on Instruments and Methods of Observation Regulation (EC) No. 2018/1139 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency Regulation (EC) No. 552/2004 on the interoperability of the air traffic management network in Europe pursuant to Article 139 of Regulation (EC) No 2018/1139 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency Directive (RoHS) 2011/65/EU of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Directive (RoHS) 2015/863/EU amending Annex II to Directive 2011/65/EU Quality management systems ISO 9001:2015</p>	
<p>under the conditions declared by the manufacturer.</p>	
Bratislava June 5, 2020	
	
 Jozef Ornelka Managing Director MicroStep-MIS spol. s r.o.	
<p>www.microstep-mis.com Registered at Companies Register of the District Court Tel: + 421 2 602 00 760 IČO: 35 791 489 info@microstep-mis.com Bratislava I, in Section Sro, Insert No. 22037/B Fax: + 421 2 602 00 180 DIČ: SK202023271 F01 eng</p>	

Declaration of conformity