

Ultrasonic distance measuring systems

UDM



The ultrasonic distance measuring systems **UDM 1000** and **UDM 2000** facilitate highly accurate distance and thickness measurements in gaseous mediums on resonating surfaces, such as metals, glass, wood, liquids and many types of fabric. Whereby measuring accuracy amounts to up to $10\mu\text{m}$!

The measuring range starts from the sensor's front rim $+30\text{mm}$ up to approx. 2mtr for passive sensors without auxiliary reflector. For sensors with one or two auxiliary reflectors, the measuring range starts approx. 30mm behind the last auxiliary reflector in the sound's direction. Sensors with auxiliary reflectors are always used in cases, where highly accurate measurements are required. For measurements allowing for an accuracy of $\geq 3\text{mm}$, or for relative measurements, no auxiliary reflector is required.

Measuring accuracy solely depends on the sensors employed, and on environmental conditions. The ultrasonic measuring system always operates with a default definition of $2,5\mu\text{m}$. This is determined by the hardware employed, and by the pulse sequence. All calculations on the ultrasonic card are performed with 32 bit floating point arithmetic.

This new generation of ultrasonic devices have the following remarkable features:

- **high measurement frequency also for thickness measuring with two sensors of up to 400Hz by using a micro controller**
- **additional optical data interface for attachment of fibre-optic light guides**
- **easy programming of all parameters by LC-display and 4 input keys**
- **running-time dependent amplifying adjustment of ultrasonic sound signal**

The **UDM** systems have been designed for fitting different ultrasonic converters:

- ⇒ Sell radiator for highly accurate measurements, $\pm 0.01\text{mm}$ on short range
- ⇒ piezoceramic sound converter for measuring of longer distances (up to 2mtr)

Technical Data UDM 1000/2000-systems

Resolution:

15 ns = 2.5 µm in air for U 1000
150 ns = 25 µm in air for P 8000

Accuracy * :

Up to 40 mm : + / -10 µm,
for distances 40-100 mm +/-25 µm and
for distances 100-150 mm: +/-50 µm
active sensor P 8000

Repeatability:

+/-0.015 % sum of distances

Measuring frequency:

20-100 Hz , optional 200 Hz

Measurement range:

0 - 500 mm (depending on sensor) , starting at outer
edge of reference ridge ;
up to 2 m with special sensors

Allowable tilt of sensor:

+/-2.5 ° , depending on the surface of material and
measuring range

Power supply:

24 VDC/150 mA

Power consumption:

3 watts

Interfaces:

RS 232 - V.24 interface
Baud rates: 300,600,1200,2400,4800,9600
String - length : 8 bit
Stop bits : 1 stop bit
Parity: none
Optional: Optical serial interface

Optional outputs:

Analog: 0-10 VDC , 12 bit resolution

Operating temperature:

0 ° C - 40 ° C.

*per sensor , with fan and averaging over 10 values
Subject to technical changes. Version: January 2011

Humidity :

max. 95 % , non-condensing

Display:

2x24 character LCD screen

Programming:

The system can be operated and programmed manually
via 4 keys on the keypad. In addition, all parameters are
adjustable via interface.

Temperature compensation:

Permanent fast temperature compensation via reference
web

Averaging:

Programmable from 1-10000 measurements

Noise Filter :

Programmable for suppressing interference noise

Relay output (option):

Programmable relay output for good-/bad-sorting .
150 V / 1.25 A

Tolerance initial thickness (optional) :

Programmable upper and lower tolerance limit for
thickness value . Relay output 150 V / 1.25 A

Measurement validity:

Electrically isolated Valid output (optocoupler 35 V, 50
mA) for validity of measurement

