

# ISO 9951:1993-12 (E)

## Measurement of gas flow in closed conduits; turbine meters

---

<b>Contents</b>		<b>Page</b>
<b>1</b>	<b>Scope</b> .....	<b>1</b>
<b>2</b>	<b>Normative references</b> .....	<b>1</b>
<b>3</b>	<b>Definitions and symbols</b> .....	<b>1</b>
<b>3.1</b>	<b>Definitions</b> .....	<b>1</b>
<b>3.2</b>	<b>Symbols and subscripts</b> .....	<b>2</b>
<b>4</b>	<b>Principle of the method of measurement</b> .....	<b>3</b>
<b>5</b>	<b>Flowrates</b> .....	<b>3</b>
<b>6</b>	<b>Meter construction</b> .....	<b>3</b>
<b>6.1</b>	<b>General</b> .....	<b>3</b>
<b>6.2</b>	<b>Materials</b> .....	<b>3</b>
<b>6.3</b>	<b>Shell</b> .....	<b>3</b>
<b>6.4</b>	<b>Connections and maximum flowrates</b> .....	<b>3</b>
<b>6.5</b>	<b>Length</b> .....	<b>3</b>
<b>6.6</b>	<b>Pressure tapplings</b> .....	<b>3</b>
<b>6.7</b>	<b>Flow direction</b> .....	<b>4</b>
<b>6.8</b>	<b>Meter having a removable meter mechanism</b> .....	<b>4</b>
<b>6.9</b>	<b>Overloading</b> .....	<b>4</b>
<b>6.10</b>	<b>Marking</b> .....	<b>4</b>
<b>7</b>	<b>Pressure testing</b> .....	<b>4</b>
<b>7.1</b>	<b>General</b> .....	<b>4</b>
<b>7.2</b>	<b>Test fluid</b> .....	<b>4</b>
<b>7.3</b>	<b>Strength test of the pressure-containing parts</b>	
<b>7.4</b>	<b>Meter leakage test</b> .....	<b>5</b>
<b>8</b>	<b>Performance characteristics</b> .....	<b>5</b>
<b>8.1</b>	<b>Error</b> .....	<b>5</b>
<b>8.2</b>	<b>Calibration</b> .....	<b>5</b>
<b>8.3</b>	<b>Meter position</b> .....	<b>5</b>
<b>8.4</b>	<b>Temperature range</b> .....	<b>5</b>
<b>8.5</b>	<b>Pressure loss</b> .....	<b>5</b>
<b>8.6</b>	<b>Installation conditions</b> .....	<b>6</b>
<b>8.7</b>	<b>Mechanically driven external equipment</b> .....	<b>6</b>
<b>9</b>	<b>Output and readout</b> .....	<b>6</b>
<b>9.1</b>	<b>General</b> .....	<b>6</b>
<b>9.2</b>	<b>Counters</b> .....	<b>6</b>
<b>9.3</b>	<b>Flowrate Output</b> .....	<b>6</b>
<b>9.4</b>	<b>Mechanical Output</b> .....	<b>6</b>
<b>9.5</b>	<b>Voltage-free contact</b> .....	<b>6</b>
<b>9.6</b>	<b>Electrical pulse output</b> .....	<b>6</b>
<b>9.7</b>	<b>Electrical safety</b> .....	<b>6</b>
<b>Annexes</b>		
<b>A</b>	<b>Recommendations for use</b> .....	<b>7</b>
<b>B</b>	<b>Other meter Performance characteristics</b> .....	<b>9</b>

<b>C Data computation and presentation</b> .....	<b>10</b>
<b>D Field checks</b> .....	<b>11</b>
<b>E Perturbations</b> .....	<b>12</b>