

IO.MS-100.01(ENG)

# APLISENS

MANUFACTURE OF PRESSURE TRANSMITTERS  
AND CONTROL INSTRUMENTS

## USER'S MANUAL

INDUSTRIAL PRESSURE GAUGES  
(MANOMETERS)

**MS-100K**



(PRESSURE GAUGES WITH DIAPHRAGM SEALS)

**MS-100**

Edition B

WARSAW MAY 2011

Marking used

Symbol	description
	Warning to proceed strictly in accordance with the information contained in the documentation in order to ensure the safety and full functionality of the device.
	Information particularly useful during installation and operation of the device.

## **BASIC REQUIREMENTS AND SAFETY IN USE**



- **The manufacturer will not be liable for damage resulting from incorrect installation, failure to maintain the device in a suitable technical condition, or use of the device other than for its intended purpose.**
- The installation should be executed by qualified staff with the authorization necessary for installing devices for pressure measurement.
- The installer is responsible for executing the installation in compliance with this instruction manual and standards concerning safety for the type of installation executed.
- In installations with manometers, in case of leakage, there exists a hazard to personnel due to pressurized installations. All safety and protection measures must be observed during installation, maintenance, usage and inspections.
- In case of failure the device should be disconnected and returned to the manufacturer, or his authorized representative for repair.

The manufacturer reserves the right to make changes (not having a negative impact on the operational and metrological parameters of the products) without updating the contents of the technical manual.

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## 1. INTRODUCTION

**1.1.** This user's manual is a document for users of **MS-100K** industrial pressure gauges and **MS-100** pressure gauges with diaphragm seals, comprising data and instructions necessary to familiarize the user with the functioning and maintenance of manometers. Indispensable recommendations regarding installation, exploitation and emergency proceedings are also included hereby.

**1.2.** Data concerning diaphragm seals and **MS-100** manometers with diaphragm seals are included in „information sheets” concerning diaphragm seals.

## 2. USER MATERIALS

Customers receive the manometers in unit and/or bulk packaging.

The “Product Certificate” being the guarantee is attached to the delivery.

Each batch of manometers is equipped with an “instruction manual”.

The “Declaration of conformity” is available on demand.

## 3. DESIGNATION. CHARACTERISTIC FEATURES

**3.1.** MS-100K industrial manometers are designed for measuring pressure of fluids and gasses up to 150°C temperature.

The pressure range of the measured medium should correspond with 3/4 range of the manometer for constant pressures and 2/3 range in case of pulsating pressures.

**3.2.** Burdon tube pressure gauges are mechanical pressure measuring devices, which are sensitive to many factors typical of industrial applications. The use of diaphragm seals will significantly improve the reliability of the manometers, and is often a necessary condition for measurements to be made.

Manometers with appropriate diaphragm seals marked MS-100 are used:

to measure the pressure of media which are:

- contaminated, viscous, solidifying,
- at high or low temperature,
- chemically reactive;

in cases of:

- mechanical vibrations of the system,
- pulsating pressure,

where there is a need for:

- protection of the system against unsealing in case of a fault with the manometer,
- aseptic measurement conditions in the food and pharmaceuticals industries.

## 4. TECHNICAL DATA

Standard measurement ranges: 0...1; 0...1.6; 0...2.5; 0...4; 0...6; 0...10; 0...16 bar;  
0...25; 0...40; 0...60; 0...100; 0...160; 0...250; 0...400 bar;  
-1...0; -1...0.6; -1...1.5; -1...5; -1...9; -1...15 bar;

Accuracy	1%
Casing diameter	Ø100
Connection thread	G1/2" or M20x1,5
Connection outlet	radial (special – back version)
Operating temperature range	-20°C ÷ 60°C
Medium temperature range	0°C ÷ 150°C

Medium temperature range for manometer-diaphragm seal unit depends on the diaphragm seal and may vary from -60°C ÷ 31 5°C

Casing material	0H18N9 (304ss)
Process connection and measuring element material (for version with diaphragm seals)	H17N13M2T (316Ti) brass
Casing protection rating	IP54 (IP65 – Glycerine version)

With an appropriate selection of manometer and diaphragm seal, taking into account the width of the measurement range, the measurement accuracy of the unit is in accordance with the precision class of manometers.

#### Special versions:

**glycerine** – casing filled with glycerine

**T** – back connection outlet.

## 5. CONSTRUCTION

The casing box is made of stainless steel and has a window made of safe industrial glass. The pressure gauge's measuring element and process connector are made of stainless steel (or brass for versions with diaphragm seals).

## 6. INSTALLATION AND CONNECTION

Manometers shall be installed in socket appropriate to the connector type or on the valve.

In the case of thread differences between manometers and valves or fitting sockets (e.g. ½" and M20x1.5), an appropriate transition connector should be used.

If measuring the pressure of aggressive media, a separating container with inactive fluid should be used (not interacting with the medium).

When measuring pulsating pressures (piston pumps, compressors, etc) install a chamber vibration damper or siphons to eliminate vibration of the manometer hand.

When measuring steam pressure a siphon pipe should be installed in order to condense it so that fluid enters the gauge; otherwise hot steam might cause damage.

#### Manometers should be vented after installing.

Depending on the manometers construction venting can perform in the following way:



- housing of a pressure gauge with a vent valve – by a vent valve;
- housing of a pressure gauge with a rubber stopper - make the venting hole in a stopper;
- building self-venting - venting is achieved by diaphragm installed in a housing of a pressure gauge.

In order to enable carrying out such works as indication inspection, tightness inspection or hand return to 0, an appropriate three-way valve must be used.

Pressure may only be applied after ensuring that a manometer with measuring range corresponding to the measured range has been installed, the seals properly selected and all threaded connections properly tightened.



Attempting to unscrew the fixing outlets of a manometer under pressure may lead to leakage of the fluid being measured and subsequent risk to the personnel.

When disassembling the manometer it must be cut off from the process pressure or the pressure must be reduced to atmospheric pressure. Pay utmost attention and undertake precautions in the case of aggressive, caustic, explosive and any other hazardous media. If necessary flush that part of the installation.



Manometers with flange diaphragm seals must be installed on corresponding flanges on the objects.

It is recommended to match materials used for screw joints with respect to the pressure, temperature, flange material and selected sealing in such a way as to obtain a tight connection in the predicted working conditions.

Additional data regarding diaphragm seals are available in the catalogue cards "Diaphragm seals".

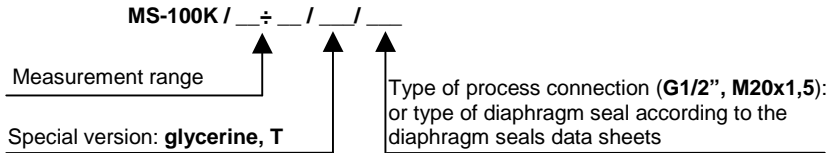
## 7. MAINTENANCE

Manometers are maintenance free devices and work within the ranges specified by the manufacturer. It is recommended to inspect the manometer every 6 months in order to check the indication accuracy thus determining whether a given manometer still complies with the accuracy class.

## 8. IDENTIFICATION AND MARKING FOR ORDERING

**8.1.** Each manometer and manometers with separators are equipped with a data plate with at least the following data: name of manufacturer, type of manometer, type of diaphragm seal and measuring range.

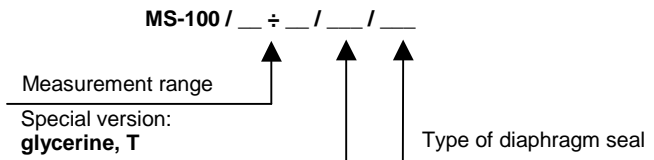
### 8.2. Ordering procedure for MS-100K manometers.



**Example:** Manometer MS-100K / range 0 ÷ 6 bar / glycerine / G1/2" connection

**MS-100K / 0 ÷ 6 bar / glycerine / G1/2"**

### 8.3. Ordering procedure for MS-100 manometers



**Example:** Manometer MS-100 / range 0 ÷ 6 bar / glycerine, standard radial connector / tantalum chemo-resistant diaphragm seal DN50

**MS-100 / 0 ÷ 6 bar / glycerine / S-Ch tantalum - DN50**

## 9. PACKING, STORAGE AND TRANSPORT

Manometers should be packed in unit and/or bulk packaging in such a way to protect them from damage in transportation. They should be stored in bulk packaging in covered rooms, free from vapour and aggressive substances in temperature from +5°C to +40°C, and with relative humidity not exceeding 85%.

In the case of manometers with diaphragm seals stored without packaging, the membranes should have covers protecting them from being damaged.

The manometers should be transported in protected packaging. The means of transportation may be road, sea or air, provided it eliminates direct atmospheric impact. Transportation conditions according to PN-81/M-42009.

## 10. GUARANTEE

The manufacturer guarantees proper working of the manometers within a 24-month period from the date of purchase as well as guarantee and post-guarantee service. For special executions the guarantee period has to be agreed upon between the user and the manufacturer; however it is not shorter than 12 months.

## 11. ADDITIONAL INFORMATION

The manufacturer reserves the right to introduce constructional and technological alterations not deteriorating the quality of the manometers.

## 12. DRAWINGS



Draw.1. MS-100K industrial manometer



Draw.2. MS-100 manometer with diaphragm seal

