

INSTRUCTION MANUAL
FOR
GLYCERIN-BATH TYPE PRESSURE GAGE
GV50, GV51, GV55, GV56

NAGANO KEIKI CO., LTD.

Contents

	Page
1. Preface	2
2. Usage	2
3. Features	2
4. Specifications	3
5. Precautions for Transportation, Storage and Uncrating	3
6. Construction	5
7. Working Principle	6
8. Installation Outline	6
9. Operation	6
10. Maintenance	7

1. Preface

Read this instruction manual carefully before trying to use the glycerin-bath type pressure gauge. Being a pressure gauge, it is basically a consumable, which should be handled with utmost care and maintained very carefully.

2. Usage

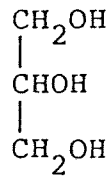
This pressure gauge is most suitable for use in a place where violent vibration, pulsation, shock, etc. is present and conventional pressure gauge can not be used for a long time.

3. Features

- 1) Curling type case structure completely shuts off external atmosphere. The gauge is made of stainless steel, and features very excellent resistance against atmosphere.
- 2) Harmless glycerin ($C_3H_8O_3$) and glycerin water solution are used as filling liquid, permitting use of this gauge also in the food industry. There is no danger of fire as they are equivalent to Class 4 Third Petroleum as specified in the Fire Services Act.
- 3) Safety window is provided to maintain precision under temperature fluctuation and in case Burdon tube is broken.

- 4) Very excellent durability is available upto the high range of the gauge particularly in the medium pressure [maximum pressure 5MPa(50kgf/cm²) or more], which is most commonly used in practical application, because pressure-resistant element is used.

< Glycerin chemical formula >



4. Specifications

Specifications	Size	
	60	75
Type	A, B, D(Stem mount, Flush mount)	A, B, D(Flush mount)
Pressure range	0.1MPa(1kgf/cm ²) ~ 100MPa(1000kgf/cm ²) (Vacuum gauge, Compound gauge)	
Wetted parts	SUS316	
Connection	G1/4B(PF) R1/4(PT) (1/4NPT)	G3/8B(PF) R3/8(PT) (3/8NPT)

5. Precautions for Transportation, Storage and Uncrating

1) Precautions for Transportation

This is a precision-processed measuring equipment. If you drop it, it may not be used. Be specially careful when you transport it.

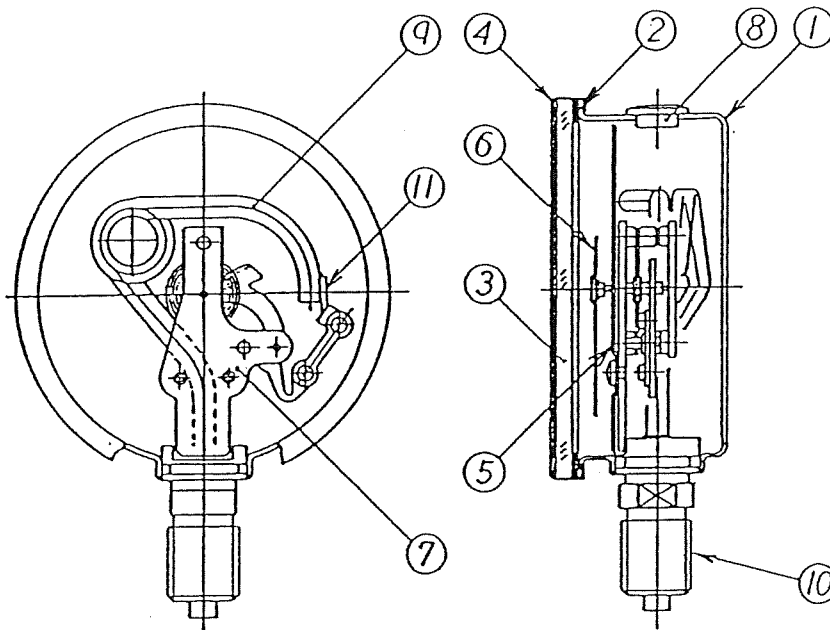
2) Precautions for Storage

Keep the instrument in a place free from humidity, vibration, dust, etc. When you stack, do not stack too high, to prevent deformation of boxes. Keep it so that it will not fall during storage.

3) Precaution for Uncrating

Do not handle the box roughly when you uncrate it. Uncrate the box in a sufficiently spacious place so that you will not drop the instrument by mistake when uncrating it.

6. Construction



11	Tip
10	Socket
9	Bourdon tube
8	Blowout disk
7	Movement
6	Pointer
5	Dial plate
4	Cover
3	Glass
2	Packing
1	Case
No.	Name

Construction is, as shown above, roughly the same as that of an ordinary pressure gauge. Since glycerin (water solution) is injected, the inside and outside of the instrument are sealed by gasket for complete seal-up.

Liquid quantity is so determined that there is a space on top to allow for thermal expansion, etc.

The minimum enclosing quantity is on the uppermost part of the scale circle line.

7. Working Principle

Just the same as an ordinary pressure gauge, displacement of Bourdon tube due to pressure is enlarged by the movement and then indicated on the dial plate by a pointer.

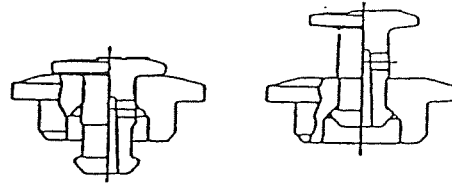
8. Installation Outline

- 1) Mounting posture: Install the pressure gauge correctly upright.
- 2) To mount the pressure gauge, apply a spanner on the flat part of stock and tighten. Never hold the case of the pressure gauge by hand when installing.
- 3) Glycerin-bath type pressure gauge is basically designed to resist vibration, pulsation and shock. However, the smaller the vibration, pulsation and shock, the longer the service life of the pressure gauge is. It is necessary to study and provide appropriate countermeasures to reduce vibration, pulsation and shock when installing the gauge.

9. Operation

- 1) Do not apply pressure beyond the pressure range.
- 2) Normal operating pressure should be used at one-half or less of the maximum scale (range).

- 3) Pull up the vent plug when using a pressure gauge whose pressure range is 1MPa (10kgf/cm²) or less. Push the vent plug down when transporting the range.



When transporting In use

10. Maintenance

- 1) It is probable that this pressure gauge may be installed in an environment of quite unfavorable conditions. Perform periodical checks with the frequency of about once every 6 months (indication inspection, etc.).

< Outline of Periodical Check >

(1) Indication Inspection

Apply pressure from zero to maximum pressure sequentially. Keep maximum pressure applied for half an hour. Then decrease pressure down to zero sequentially. During this pressure increase and decrease, read the indication at the maximum pressure, and approximately 30% and 60% of the maximum pressure.

(a) Indication error must be $\pm 1.5\%$ or less of the maximum scale.

(b) The absolute value of the indication errors in pressure increase and pressure decrease must be 1.5% or less of the maximum scale.

(c) The pointer should not deviate from the zero scale when the gauge is held in the same posture as the actual installation.

** A reference gauge such as dead weight tester is required for the above indication inspection.**

(2) Apperance Inspection

Check contamination, reduction in volume and leak of glycerin.

- 2) When a failure is detected during use or inspection, it is recommended to replace it with a new one since the glycerin-enclosed pressure gauge is subject to severe operating conditions and in most cases the Bourdon tube and/or inboard machine may have been broken.
- 3) Remove the pressure gauge and place closing plugs when performing airtightness tests with a pressure above the pressure range.