



INSTRUCTION MANUAL FOR
MODEL KL60
PRESSURE TRANSMITTER

 **NAGANO KEIKI CO., LTD.**

Thank you for selecting the KL60 Pressure Transmitter. In order to fully utilize this machine, please read this instruction manual to the end.

Warning

1. Do not apply more than the maximum allowable pressure. Human injury or damage to surroundings may result due to burst or blow-up of the pressure elements.
2. Do not use these devices on measured objects which are corrosive to fluid or gas contacting areas. Human injury or damage to surroundings may result due to burst or blow-up of the pressure elements and exposure of dangerous measured objects.
3. Do not apply excessive weight, vibration or shock.
Human injury or damage to surroundings may result due to burst or blow-up of these devices and exposure of dangerous measured objects.
4. Use with the unspecified power supply may cause fire hazard or electric shock.
5. Use with the instrument temperature range.
Use outside the instrument temperature range may cause human injury or damage to surroundings due to burst or blow-up of the devices.
6. Connect wiring accurately according to the wiring drawings or instructions in the operation manual. Incorrect wiring may result in human injury or fire hazard.
7. Use devices with an explosion-proof construction when operating in places liable to have explosive gas, or otherwise runs the danger of explosion.
8. If the measured object is oxygen, use devices with anti-oil treatment.
Standard devices may possibly contain remaining oil, and there is danger of combustion and explosion if oil reacts with oxygen.
9. Accurately install these devices according to the installation instructions in the operation manual.
10. Never attempt to neither reconstruct the main body of devices nor add any new function to the devices, etc. Contact us for repairs.
11. For applications where a failure, a malfunction or other defect of this product might result in a serious damage, accident, etc., use multiple units of this product and configure protective circuits [1 out of 2], [2×(1 out of 2)], [2 out of 3] etc. according to their importance.

Note: Please contact NKS in advance when using these products may possibly result in a fatal or a serious injury due to malfunction or incorrect operation of these product

1. Introduction

Check the specifications of the product on receiving it. A problem will occur if the range, power source, output or other specifications of the unit are different from your operating conditions. Use a model of the specifications that suit your operating conditions.

2. Overview

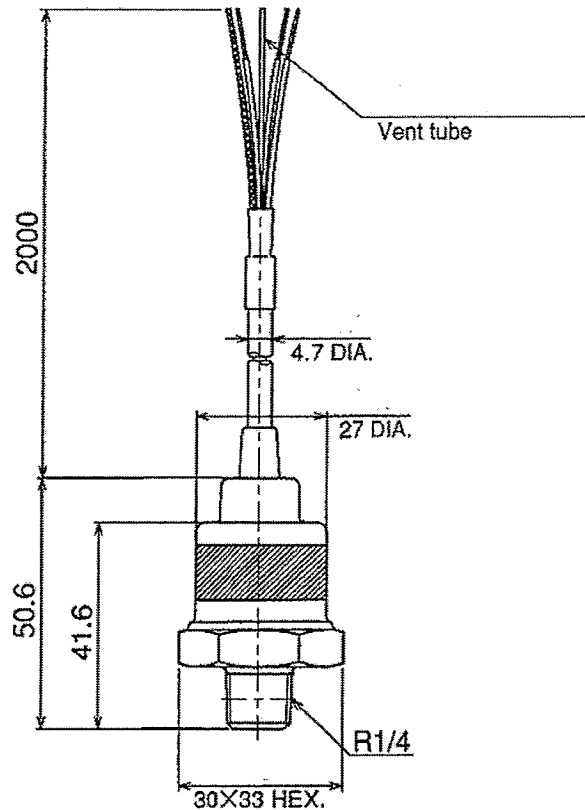
This is a compact-sized pressure transmitter using ceramic elements excellent in reproducibility and repeatability.

3. Specifications

Pressure range	Refer to the table		
Allowable pressure range	Refer to the table		
Fluid	Gas or liquid (not corrosive for wetted parts material)		
Fitting	R 1/4		
Output signal	Output & Load resistance	Supply voltage	Transmission method
	0.5~4.5VDC 100k Ω min.	5V DC \pm 10%	3 wire system
	1~5VDC 10k Ω min.	12~24V DC	3 wire system
	4~20mA DC 500 Ω max.	24V DC \pm 10%	2 wire system
Accuracy	\pm 0.5%F.S. (at 23 \pm 3 $^{\circ}$ C) incl. linearity and hysteresis \pm 3%F.S. (-30~100 $^{\circ}$ C)		
Operating temperature limits	-30~100 $^{\circ}$ C (no freezing)		
Storage temperature range	-40~120 $^{\circ}$ C (no freezing)		
Operating humidity limits	25~80% RH : 0~100 $^{\circ}$ C (no condensation)		
Casing protection structure	IP65 (Except the vent tube tip)		
CE marking	Applicable directive : 89/336/EEC Applicable standards : EN61326/1997,A1/1998,A2/2001,A3/2003 (EMI Class B / EMS Annex A, F)		
Withsatnd voltage	500V AC : 1mA or less, 1min (Between lead terminals group and case metal)		
Insulation resistance	10M Ω or more (Between lead terminals group and case metal)		
Material of wetted parts	Element: Alumina 96% Fitting: 304 st. st. O-ring: Fluorine rubber or EPDM (sulfur free)		
Material of case	PBT		
Weight	Approx. 60g excluding cable		

Pressure range	Allowable pressure range
0~50kPa	-50~250kPa
-20~20kPa	
0~0.1MPa	-0.1~0.5MPa
-50~50kPa	
0~0.2MPa	-0.1~1MPa
-0.1~0.2MPa	
0~0.3MPa	
-0.1~0.3MPa	
0~0.5MPa	

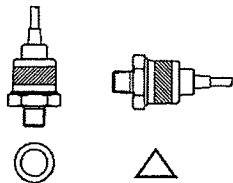
4. Dimensions



Unit : mm

5. Installation

- For the pressure-piping, do not over load to the fitting.
- A vertical mounting posture is recommended.



- Screw with proper torque after sealing tape with $1\frac{1}{2}$ rotation to R1/4 thread and screw it into a female thread of piping.
- The casing structure is not a water-proof. Water must not splash on the cable and vent tube. (Casing protection structure: IP65)
- Input/output must be wired according to the connection diagram.

6. Transport

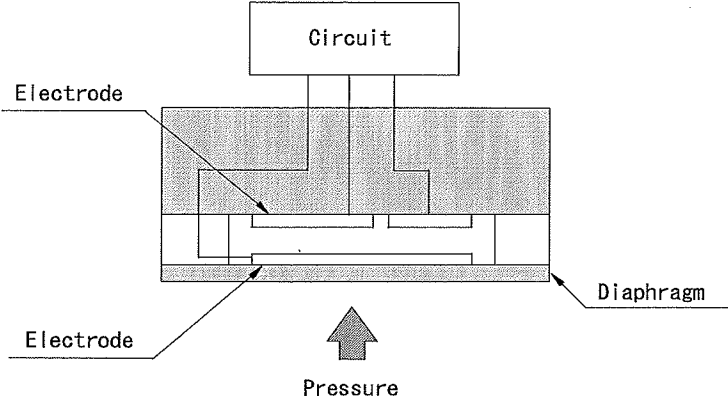
This is a precision instrument. The unit may become inoperable when it is dropped or given shocks. Transport the unit very carefully.

7. Storage

Store the unit in a dry and a vibration - free and dust - free place.

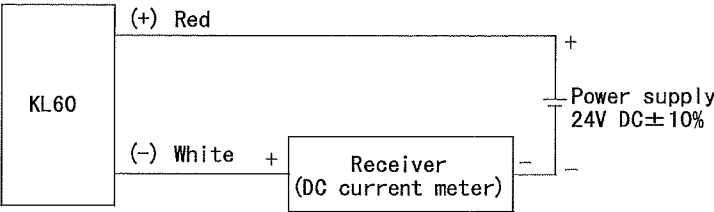
8. Operation principle

The pressure sensing element detects changes in capacitance between fixed electrode and moving electrode on a ceramic diaphragm to displace due to changes in pressure as signals with the dedicated ASIC.

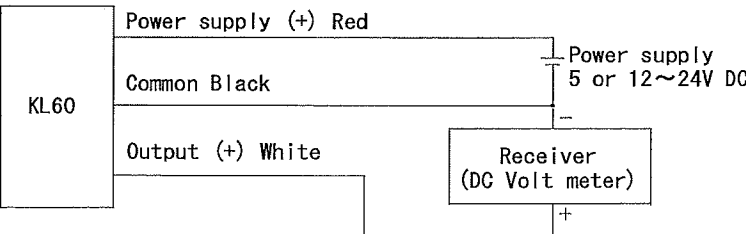


9. Wiring

2 wire system (The current output)



3 wire system (The voltage output)



*When connecting equipment that causes surge, etc., from the same power source, a varistor or the like should be connected to protect the transmitter.

10. Operation

After checking connection, turn the power on. The reference value at atmospheric pressure is shown in the following table.

Pressure range	Atmospheric pressure	Output		
		2 wire system	3 wire system	
0~50、100、200、300、500 kPa	0 MPa	4mA DC	0.5V DC	1.0V DC
-20~20 kPa	0 MPa	12mA DC	2.5V DC	3.0V DC
-50~50 kPa	0 MPa	12mA DC	2.5V DC	3.0V DC
-0.1~0.2 MPa	0 MPa	9.3mA DC	1.8V DC	2.3V DC
-0.1~0.3 MPa	0 MPa	8mA DC	7.5V DC	2.0V DC

11. CE marking

This instrument is approved for CE marking under the following conditions:

Conforming directive: 89/336/EEC

Conforming standard: EN61326: 1997, A1: 1998, A2: 2001, A3: 2003

(EMI Class B/EMS Annex A, F)

In addition, this instrument is approved for CE marking on condition that it is used in the environment electrically protected against lightning surge. (EN61000-4-5: 1995, Annex B, B. 3, Class0). Therefore, this instrument must not be used in environments where there is an anxiety of lightning surge. Do not use this instrument for security applications.

12. Maintenance

In general, according to the using condition, conduct a periodical inspection about twice a year. Should any abnormality be recognized, contact Nagano Keiki Co., Ltd.

Check Items:

- Visual inspection
- Pressure inlet for corrosion, dirt, clogging, leak, etc.
- Check the output with a standard pressure gauge.

13. Measures against Noise

Noise problems in many cases are too complicate to be solved easily, and noise can affect a smooth operation. Sometimes the measured value may fluctuate or result in different values because of the noise.

In principle, if the power line is mixed with a noise, check the noise source for taking the preventive step. If a noise occurs regularly, insert a filter for one of the remedial measures. It is also important to connect to the power source other than the one mixed with the noise.

Noise can also come into the signal line from outside induction. For the prevention, move the noise source away, change the direction, apply a magnetic shield, electrostatic shield, etc.

14. Miscellaneous

This instruction manual is not intended to be complete in every detail of the equipment or to cover all the variants. It is neither intended to provide for all necessary ancillary items regarding installation and maintenance.

Contact us when further details are required, or you are not fully satisfied with the above instructions.