

OM.TP400T-02

OPERATOR'S MANUAL

Pressure Transducer
model TP-400T

0614-002888A

 NIHON KOHDEN

GENERAL HANDLING PRECAUTIONS

This device is intended for use only by qualified medical personnel. Use only Nihon Kohden approved products with this device. Use of non approved products or in a non approved manner may affect the performance specifications of the device. This includes, but is not limited to, batteries, recording paper, pens and extension cables and cords for electrodes, input boxes and AC power.

Please read these precautions thoroughly before attempting to operate the instrument.

1. To safely and effectively use the instrument, its operation must be fully understood.
2. When installing or storing the instrument, take the following precautions:
 - (1) Avoid moisture or contact with water, extreme atmospheric pressure, excessive humidity and temperatures, poorly ventilated areas, and dusty saline or sulphuric air.
 - (2) Place the instrument on an even, level floor. Avoid vibration and mechanical shock even during moving.
 - (3) Avoid placing in an area where chemicals are stored or where there is danger of gas leakage.
 - (4) The power line source to be applied to the instrument must correspond in frequency and voltage to specifications, and have sufficient current capacity.
 - (5) Choose a room where a proper grounding facility is available.

3. Before Operation

- (1) Check that the instrument is in perfect operating order.
- (2) Check that the instrument is grounded properly.
- (3) Check that all cords are connected properly.
- (4) Pay extra attention when the instrument is in combination with other instruments to avoid misdiagnosis or other problems.
- (5) All circuitry used for direct patient connection must be doubly checked.
- (6) Check that battery voltage and battery condition are perfect when using battery-operated models.

4. During Operation

- (1) Both the instrument and the patient must receive constant, careful attention.

- (2) Turn power off or remove electrodes and/or transducers when necessary to assure the patient's safety.

- (3) Avoid direct contact between the instrument and the patient.

5. To Shutdown After Use

- (1) Turn power off with all controls returned to their original positions.
- (2) Remove the cords gently; do not use force to remove them.
- (3) Clean the instrument together with all accessories to keep them ready for their next use.

6. The instrument must receive expert, professional attention for maintenance and repairs. When the instrument is not functioning properly, it should be clearly marked to avoid operation while it is out of order.

7. The instrument must not be altered or modified in any way.

8. Maintenance and Inspection:

- (1) The instrument and parts must undergo regular maintenance inspection at least every 6 months.
- (2) If stored for extended periods without being used, make sure prior to operation that the instrument is in perfect operating condition.
- (3) Technical information such as circuit diagrams, parts list, descriptions, calibration instructions or other information is available for qualified user technical personnel upon request from your Nihon Kohden distributor.

9. When the instrument is used with an electrosurgical instrument, pay careful attention to the application and/or location of electrodes and/or transducers to avoid possible burn to the patient.

10. When the instrument is used with a defibrillator, make sure that the instrument is protected against defibrillator discharge. If not, remove patient cables and/or transducers from the instrument to avoid possible damage.

WARRANTY POLICY

Nihon Kohden Corporation (NKC) shall warrant its products against all defects in materials and workmanship for one year from the date of delivery. However, consumable materials such as recording paper, ink, stylus and battery are excluded from the warranty.

NKC or its authorized agents will repair or replace any products which prove to be defective during the warranty period, provided these products are used as prescribed by the operating instructions given in the operator's and service manuals.

No other party is authorized to make any warranty or assume liability for NKC's products. NKC will not recognize any other warranty, either implied or in writing. In addition, service performed by someone other than NKC or its authorized agents or technical modification or change of products without prior consent of NKC may be cause for voiding this warranty.

Defective products or parts must be returned to NKC or its authorized agents, along with an explanation of the failure. Shipping costs must be pre-paid.

This warranty does not apply to products that have been modified, disassembled, reinstalled or repaired without Nihon Kohden approval or which have been subjected to neglect or accident, damage due to accident, fire, lightning, vandalism, water or other casualty, improper installation or application, or on which the original identification marks have been removed.

In the USA and Canada other warranty policies may apply.

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Section 1 CAUTIONS

Users are kindly requested to read through the following instructions for proper and safe operation of the pressure transducer.

1-1 Disinfection and sterilization

***Do not steam-autoclave the transducer.
Loosely secure the dome on the transducer to protect the diaphragm during sterilization and while in stock.***

1-2 Measurement

- (1) Do not close both inlets of the dome even for a short time after filling the dome of transducer with solution. A sealed dome leads to excessive, damaging pressure on the transducer even with a slight change in temperature. After filling up the dome, leave either of the inlets open to the atmosphere or connect it to the flush system.
- (2) Use a syringe larger than 10mL for flush purposes. A small-capacity syringe applies excessive pressure and damages the transducer when an incorrect cock operation is done.
- (3) Use extension tubes made of hard material to avoid waveform distortion.
- (4) Do not sharply bend the cord or leave it wound up for gas sterilization.

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- (5) Handle the transducer, the dome and other accessories carefully so as not to drop and damage the instruments.

1-3 Dome handling

- (1) Do not touch the diaphragm with sharp-pointed tool or solid instrument.
- (2) Do not reuse or sterilize used disposable filmed domes (TA1010D).
- (3) Replace a reusable dome without film (TA1011) with a new dome if it leaks after repeated use.

1-4 Safety protection

The model TP-400T is an insulated transducer. It is therefore not necessary to disconnect the connectors during defibrillation or while an electrosurgery unit is being used. To protect the patient, disconnect the non-insulated types transducer and the amplifier.

Section 2 GENERAL DESCRIPTION

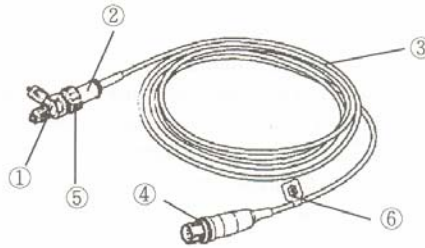
The model TP-400T is a direct pressure transducer that has been specially developed for your daily clinical examination of cardiac catheterization, ICU, CCU pressure monitor, etc. Its structure is designed to adequately meet the safety requirements for isolated from defibrillators, excessive pressure resulting from false cock operation or shocks given to the transducer if dropped by mistake as well as the requirements for disinfection and sterilization.

The model TP-400T pressure transducer has a strain gauge made of diffusion-type semiconductors to precisely convert the pressure applied to its diaphragm into electric signals. This highly reliable data conversion is ensured by our high-precision machining and assembly techniques.

Users are kindly requested to read through this operator's manual and those of the amplifiers and other auxiliary equipments which will be connected to the transducer to assure satisfactory operation with full functional capability.

Section 3 COMPONENTS AND FUNCTION

No	Component	Function
1	Dome	Transmits the pressure induced from a catheter or other devices to the diaphragm of this transducer.
2	Transducer	Converts a pressure signal given to the diaphragm into an electric signal.
3	Output cord	Conveys the electric signal to the amplifier or to the transmitter. A tube is installed inside to release the back pressure of the diaphragm.
4	Output connector	Connected to the amplifier or the transmitter. A compensation circuit is incorporated for sensitivity and temperature characteristics.
5	Lock Nut	Fastens the dome
6	Defibrillation discharge protection mark	Indicates defibrillation discharge protection according to IEC Standard (IEC601-2-34).



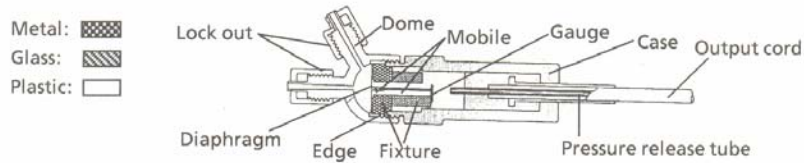
Section 4 CONSTRUCTION

The construction of TP-400T transducer is as illustrated below. This instrument is composed of the dome that transmits the pressure received from a catheter or other devices to the diaphragm, the diaphragm that converts the pressure into the displacement, the mobile that conveys the displacement from the diaphragm to the gauge, the gauge that converts the displacement into the balance variation of the bridge circuit, and the gauge and the fixture that fixes the diaphragm.

Both the mobile and the fixture are made of a metal part that secures the diaphragm and a glass part that electrically insulates the diaphragm from the gauge. Edges are provided on the dome to prevent water leaks from the diaphragm transducer joint.

In addition to the conductor for transmitting the electric signals, a tube is incorporated in the output cord to release the back pressure of the diaphragm.

The output connector contains a compensation circuit for sensitivity and temperature characteristics.



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Connector model: HR-13P-5P(2)
Code No.: 078639

Pin No.	Signal
1	Shield
2	Signal (+)
3	Power (+)
4	Power (-)
5	Signal (-)

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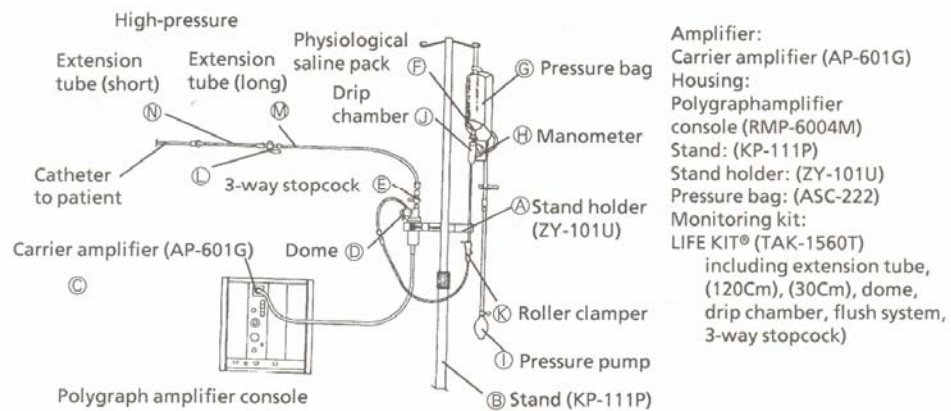
Section 5 PREPARATION AND MEASUREMENT

To take blood pressure using the model TP-400T transducer, the catheter or the cannula is first filled with heparin added physiological saline solution and then inserted into one of the patient's blood vessels. To record or monitor the pressure waveforms, connect the amplifier which amplifies the electric signals output from the transducer, a recorder and monitor.

The transducer itself has no adjustable dials or switches. To make it ready for correct measurement, connect the transducer to the tubes through which the pressure is led out, and other peripheral devices correctly. The handling of our manometer stand MP-65 or MP-255, if used, is illustrated in its operator's manual.

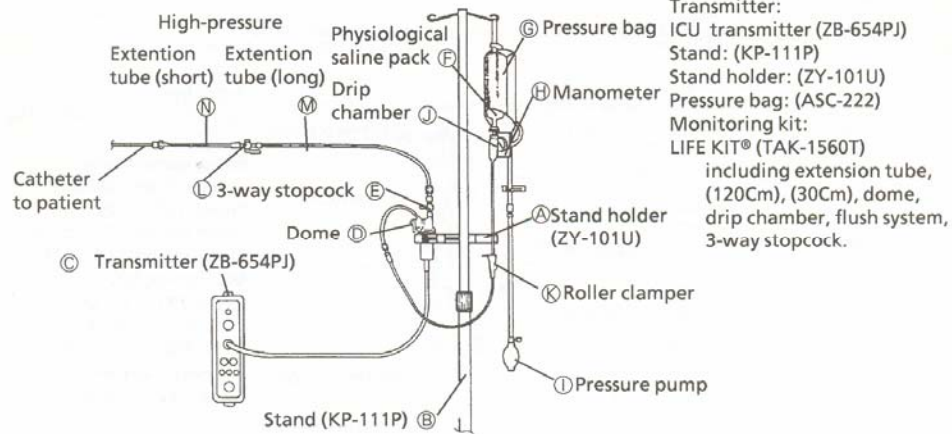
5-1 Configuration 1

The standard combination of model TP-400T transducer is illustrated below.



5-2 Configuration 2

The standard combination of model TP-400T transducer is illustrated below.



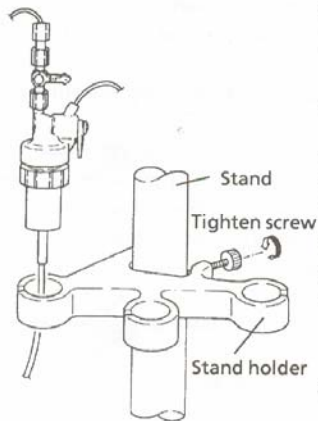
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5-3 Transducer installation and connection of amplifier and transmitter

5-3-1 To connect the amplifier

- (1) Secure the stand holder (A) on the stand (B).
- (2) Set the transducer on the stand holder (A).
- (3) Make sure the amplifier (AP-601G) is properly grounded, then connect the output connector of the transducer to the amplifier.
- (4) Select 500 for gain with the "GAIN FACTOR" dial of the amplifier.
- (5) Switch on the power and adjust the zero balance of amplifier
- (6) See if the transducer is operating properly.



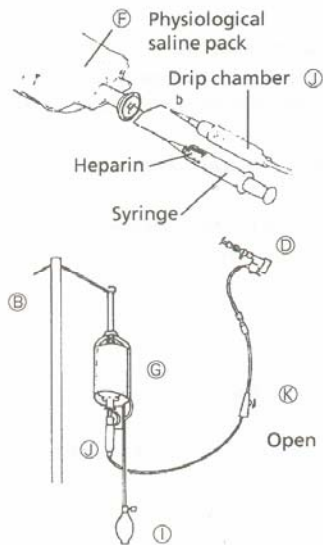
5-3-2 To connect the transmitter

- (1) Follow the above steps (1) and (2).
- (2) The zero point becomes stable two minutes after the voltage is applied to the transducer. Start amplifier zero balancing after two minutes.
- (3) Connect the output connector of transducer to the pressure connector of transmitter (ZB-654PJ).
- (4) Press the auto zero switch to make the zero balance.
- (5) See if the transducer is operating properly.

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5-4 Preparation of monitoring kit



- (1) Add 1,000 units of heparin into a physiological saline pack (F) containing 500mL of physiological saline solution. Thoroughly stir the solution. To add heparin, insert the needle of syringe erect into the rubber cap of the pack. Use the mixed solution as soon as possible without holding it over.
- (2) Tear off the seal of the sterilized LIFE KIT® and take out the monitoring kit.
- (3) Connect the drip chamber (j) of the monitoring kit to the physiological saline pack (F), and vent out any air inside. Even if it is quite small, the hole made by the pin needle of drip chamber causes leaks. Pierce the pin needle through the hole made by the previous heparin injection (see the illustration on the left).
- (4) Lightly press the drip chamber (J) to feed the solution into the chamber to about 1/3 of its capacity.
- (5) Hang the pressure bag on the stand (B).
- (6) Open up the roller clasper (K), and fill the monitoring kit with the solution.
- (7) Connect the connect port of the monitoring kit to the inlet.

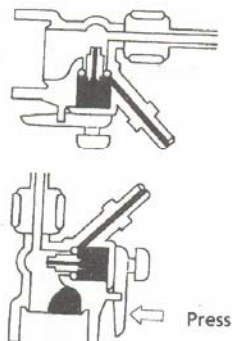
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port of the dome while allowing the solution overflow from the connect port.

5-5 Flush of dome and extension tube

Do not leave bubbles in the flushed dome and extension tube. Carefully flush the tube joints as bubbles tend to remain in the joints.



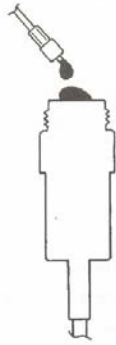
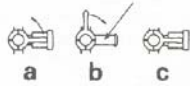
The pressure bag should not be pressurized until after both the dome and the extension tubes are fully flushed.

- (1) Slowly fill the SUPER-DOME® with solution without pressing the flush lever as shown.
- (2) When the solution begins to come out of the end of glass tube inside the SUPER-DOME®, press the flush lever to feed the solution to just below the rubber ring.
- (3) Hold the dome with the inlet to be connected to a catheter straight up and slowly fill the dome by controlling the flush lever.
- (4) Open the 3-way stopcock (E) on the dome to fill it with solution. Fill this part with solution by using the 3-way stopcock.
- (5) Fill the extension tubes (M) and (N) as well as the 3-way stopcock (L) on the extension tube.

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Fill this part with saline solution by cock operation (a), (b) and (c)

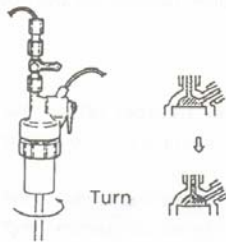


- (6) Disconnect the transducer from the stand holder (A), and take off the diaphragm protection dome.
- (7) Drip two to three drops of the solution overflowing from the tip of the extension tube on to the diaphragm of the transducer. Then clamp the dome so as not to leave air in the interspace between the dome film and the transducer diaphragm.
- (8) Set the transducer on the stand holder (A).
- (9) Pressurize the pressure bag up to 300mmHg using the pressure pump.

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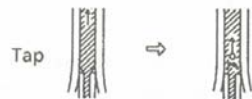
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5-6 Bubbles remaining in dome



- (1) Attach the dead-end cap on the open inlet of 3-way stopcock (L) and shut it off.
- (2) Open the 3-way stopcock (E).
- (3) Disconnect the transducer from the stand holder and hold it by hand.
- (4) By quickly turning the transducer as shown, bubbles can be gathered in the inlet, which stands perpendicular to the dome.
- (5) Press the flush lever to vent out the gathered bubbles.
- (6) Then close the 3-way stopcock (E) and leave the other 3-way stopcock (L) open.

5-7 Bubbles remaining in 3-way stopcock / extension tube



- (1) Stand the 3-way stopcock or the extension tube with its end upward through which to release bubbles.
- (2) Press the flush lever to start the solution flowing, and tap the outer point of cock or tube where bubbles remain. Do not tap the cock or tube too hard as it breaks up the bubbles. Tap only lightly to get them away from the wall.

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- (3) As bubbles start flowing, hold the 3-way stopcock or the extension tube in the way to allow bubbles rise and flow out of the cock or the tube.

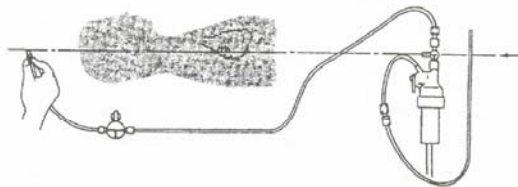
5-8 Zero-balance adjustment for transducer

- (1) Adjust the level of the 3-way stopcock (E) on the dome by moving up / down the stand holder (A) so as to position the cock with the right atrium of the patient.
- (2) Check to see if bubbles remain inside the dome and the extension tubes of transducer as well as between the dome film and the diaphragm.
- (3) Make sure the infusion is working properly by observing the drip chamber (J). A drip should fall from the drip chamber every 15 to 20 sec. If this timing is not followed, check to see if the pressure of pressure bag reads 300mmHg on the pressure gauge (H) and if the 3-way stopcock (L) on the extension tube is open.
- (4) Input the amplifier calibration signals or use other means to see if the amplifier or the transmitter is properly connected to the transducer and if the recorder or monitor operation is normal.

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- (5) Set the tip of the short extension tube (N) and the 3-way stopcock (E) on the level with the right atrium of patient. Then make the zero-balance adjustment for the amplifier or transmitter connected according to the relevant operator's manual.

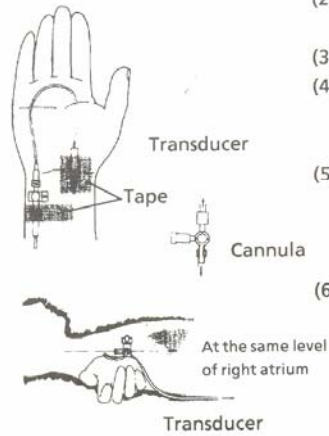


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SECTION 6 MEASUREMENT

6-1 Measurement



- (1) Make sure no bubbles remain in the extension tubes.
- (2) Make sure that both the 3-way stopcocks on the patient side and the transducer side are opened accordingly.
- (3) Press the flush lever for flushing.
- (4) Then connect the extension tubes to the cannula or the catheter retained in the patient, and secure the tubes with adhesives as shown to the left.
- (5) Press the MEAS switch of amplifier and either the recording switch of recorder or the sweep button switch of CRT monitor. Then the pressure waveforms are recorded or displayed. Adjust the sensitivity or other controls, if necessary.
- (6) The zero pressure reading can be confirmed in the pressure measurement by setting the 3-way stopcock (E) on a level with the right atrium of patient and setting the other 3-way stopcock(L) to stop the blood transmission from the cannula.

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6-2 Pressure generated by syringes

A pressure of about 5atm can normally be generated by the syringe with a section of 1cm². Certain incorrect cock operations may apply excessive pressure to the transducer. To avoid this use a syringe larger than 10mL for flushing and constantly watch the pressure monitor while flushing.

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SECTION 7 DISINFECTION AND STERILIZATION

DO NOT STEAM AUTOCLAVE THE TRANSDUCER

7-1 Sterilization using ethylene oxide gas

- (1) Cover the connectors of the transducer, which has been cleaned and dried after use, with a polyethylene bag and secure it with a rubber band. Secure the dome loosely on the transducer.
- (2) Loosely wind the cord over the transducer, and place it in the sterilization bag.
- (3) Sterilize the transducer and dome with ordinary ethylene oxide gas.
- (4) Vent out the gas and stock the sterilized instruments in the appropriate place.

Do not bend the cords. Make as a large loop of cord as possible to make it easy to exhaust air from inside the transducer and protect it from damage, which may be caused by rapid changes of pressure during gas sterilization. Loosely secure the dome on the transducer for sterilization to protect the diaphragm. The dome may be damaged by sterilization if clamped too tight.

7-2 Disinfection using chemical solution

- (1) Wash the transducer and the dome separately with water. Then soak both in any of the chemical solutions. Do not wet the output connector when washing the transducer.
- (2) After finishing disinfection, rinse the transducer and the dome with sterilized water and wipe them with clean dry gauze.
- (3) Temporarily set the dome on the transducer. Do not fix the dome tightly.
- (4) Wrap the transducer with a clean 20cm square gauze loosely and wrap it again with a sterilized cloth.
- (5) Loosely wind the cord over the sterilized cloth.
- (6) Store the transducer and the dome in a clean dry place.

Do not dip the dome with the transducer into the disinfectant. Loosely secure the dome on the transducer to protect the diaphragm after wiping off water. Do not get the connectors wet.

Type	Main ingredient	Description	Dilution	Dipping time	Post-treatment
For Surgical instruments	DETERGICIDE®	DETERGICIDE®	750 times	30 minutes or more	Keep in 4000 times diluted solution
	Benzalkonium Chloride	SEPTOL OSVAN®	100 times	10 minutes	Dry after washing
	Benzethonium Chloride	HYAMINE®	100 times	10 minutes	Dry after washing
For clinical instruments	Glutaraldehyde	STERIHYDE®	2W / V%	1 hour or more	Dry after washing
	Glutaraldehyde	CIDEX®	2.25W / V%	1 hour or more	Dry after washing

SECTION 8 SPECIFICATIONS

Measuring range	- 50 to 300mmHg
Max. over-pressure	10,000mmHg
Volume displacement	0.1mm ³ /100mmHg
Rated excitation voltage	3V
Permissible voltage to be applied	10V
Rated output voltage	7.5mV/5V/300mmHg
Output sensitivity	500 μ V/V/100mmHg
No-load impedance	\pm 10% FS
Accuracy	0.5% FS
Zero point drift by temperature	0.07% FS / °C typ.
Insulation resistance	Diaphragm/electric circuits 100M Ω , 500VDC
Dielectric strength	10,000 VDC for one minute
Leak current	2 μ A, max. at 240Vrms, 60Hz

SECTION 9 STANDARD ACCESSORIES

	CODE No.	
Dome (GB01WM)	074385	1 pc.
3-way stopcock	075134	1 pc.

Nihon Kohden Corporation Head Office

31-4, Nishiochiai 1-chome, Shinjuku-ku,
Tokyo 161-8560, Japan

International Division Sales Department

Tokyo (Head Office)
Telephone: 81(3)5996-8036
Facsimile: 81(3)5996-8100

Nihon Kohden Singapore PTE LTD

70 Shenton Way, #14-05 Marina House
SINGAPORE 079118
Telephone: 224-6700
Facsimile: 224-6216

Nihon Kohden China Service Centers

上海维修站
上海市徐汇区徐家汇蒲西路 221 号
电话: 021-6469-3758 传真: 021-6469-9016

北京维修站
北京市复兴路 61 号 恒信商务大厦西 207 室
电话: 010-6827-3967 传真: 010-6827-6576

广州维修站
广州市沿江中路 195~197 号 沿江大厦 712 室
电话: 020-8333-3949 传真: 020-8333-3958

沈阳维修站
沈阳市和平区常德街 59 号 4 楼
电话/传真: 024-387-3072

Nihon Kohden America, Inc.

2601 Campus Drive, Irvine, CA 92612, U.S.A.
Telephone: (949)250-3959
Facsimile: (949)250-3210

Nihon Kohden Europe GmbH

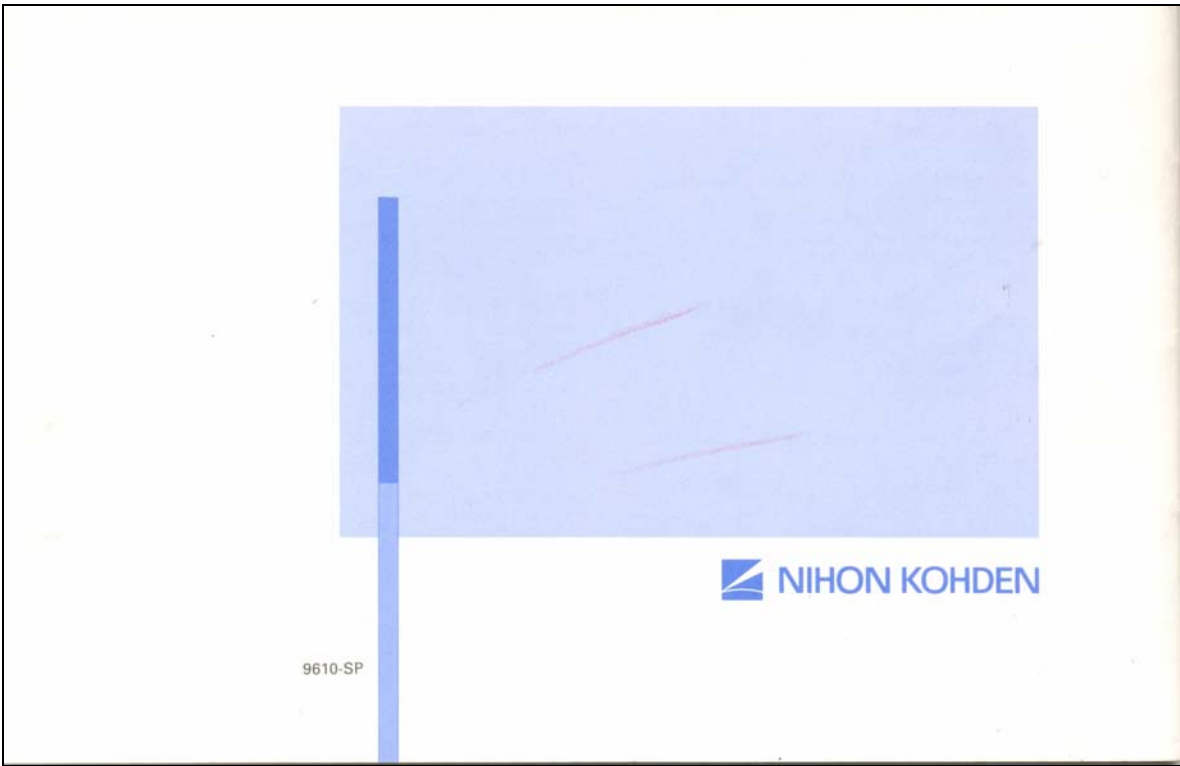
Saalburgstraße 157, Bürohaus 1,
D-61350 Bad Homburg v.d.H., Germany

German Sales Division
Telephone: 49(6172)309200
Facsimile: 49(6172)303611

European Marketing Division
Telephone: 49(6172)96710
Facsimile: 49(6172)967199

Nihon Kohden UK Ltd

462 London Road, Isleworth,
Middlesex TW7 4EP, U.K.
Telephone: 0181-568-5655
Facsimile: 0181-560-9066



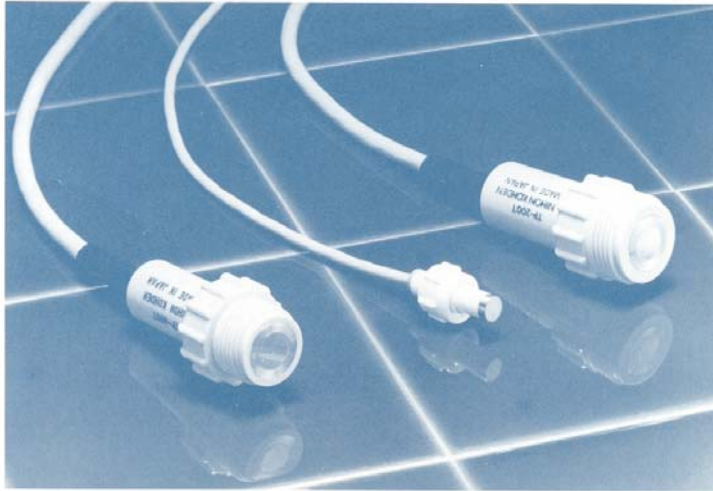
PRESSURE TRANSDUCERS

models
 TP-200TL
 TP-200T
 TP-400T
 TP-300T

Used for Measurement of Biophysiological Pressures Including Blood Pressure, and Bladder Internal Pressure.

Measurement and/or monitoring of blood pressure is one of the most important physiological parameters in the studies of cardiovascular dynamics, diagnostics of cardiac diseases, patient monitoring, evaluation of circulatory system, etc.

In order to satisfy a diversity of needs, there are several types of blood pressure transducers available from Nihon Kohden for use with Nihon Kohden blood pressure measuring systems. The tables below and on the following pages offer information to help you choose the best transducer for your specific needs:



Nihon Kohden Pressure Transducers with dome removed—from left to right—
 TP-400T/TP-300T/TP-200T

	TP-200TL†	TP-200T	TP-400T††	TP-300T†††
Applications & Design Features	<ul style="list-style-type: none"> * Detailed blood pressure waveform monitoring in animal experiments * Electrically isolated * Semiconductor strain gage * For low pressure measurement 	<ul style="list-style-type: none"> * Detailed blood pressure waveform monitoring in animal experiments * Electrically isolated * Semiconductor strain gage 	<ul style="list-style-type: none"> * Detailed blood pressure waveform measurement in catheterization, patient monitoring in operating room, ICU, CCU, etc. * Electrically isolated * Semiconductor strain gage—strong against shock and vibration 	<ul style="list-style-type: none"> * Continuous blood pressure monitoring in ICU, CCU, etc. * Electrically isolated * Semiconductor strain gage—strong against shock and vibration

†Good thermal coefficient

††Replaceable with Spectramed P23XL

†††Replaceable with Spectramed P10EZ



Blood Pressure Measurement in Catheterization



Blood Pressure Monitoring in ICU



TP-200T



TP-400T



TP-300T



Spectramed[†] P23XL*

*New model replaces the P23ID

†Formerly called Gould



Spectramed[†] P10EZ*

*New model replaces the P50

†Formerly called Gould

SPECIFICATIONS

	TP-200TL	TP-200T	TP-400T	TP-300T
1) Measuring Range:	-50 to +300mmHg	-50 to +300mmHg	-50 to +300mmHg	-50 to +300mmHg
2) Sensitivity Output Voltage/ Input Pressure for 1V Excitation	500 μ V/V/100mmHg	500 μ V/V/100mmHg	500 μ V/V/100mmHg	500 μ V/V/100mmHg
3) Max. Over- pressure	+10,000mmHg -760mmHg	+10,000mmHg -760mmHg	+10,000mmHg -760mmHg	+10,000mmHg -760mmHg
4) Volume Displacement:	0.1mm ³ /100mmHg, approximately	0.1mm ³ /100mmHg, approximately	0.1mm ³ /100mmHg, approximately	0.1mm ³ /100mmHg, approximately
5) Dielectric Strength	10,000V DC (Withstands 500 joules of defibrillator discharge)			
6) Leak Current	2 μ A max. at 240Vrms 60Hz	2 μ A max. at 240Vrms 60Hz	2 μ A max. at 240Vrms 60Hz	2 μ A max. at 240Vrms 60Hz
7) Thermal Coefficient of Sensitivity (Typical)	$\pm 0.075\%/^{\circ}\text{C}$	$\pm 0.075\%/^{\circ}\text{C}$	$\pm 0.075\%/^{\circ}\text{C}$	$\pm 0.075\%/^{\circ}\text{C}$
8) Zero Drift	$\pm 0.01\%$ full scale/ $^{\circ}\text{C}$	$\pm 0.075\%$ full scale/ $^{\circ}\text{C}$	$\pm 0.075\%$ full scale/ $^{\circ}\text{C}$	$\pm 0.075\%$ full scale/ $^{\circ}\text{C}$
9) Accuracy	0.5% full scale	0.5% full scale	0.5% full scale	—
10) Rates Excitation Voltage	3V DC or AC 5kHz or lower carrier frequency	3V DC or AC 5kHz or lower carrier frequency	3V DC or AC 5kHz or lower carrier frequency	3V DC or AC 5kHz or lower carrier frequency
11) Dimensions (Including dome) Net Weight Excluding cable and connector	Length: 50mm Max. Diameter: 22.5mm ϕ 40grams	Length: 50mm Max. Diameter: 22.5mm ϕ 40grams	Length: 50mm Max. Diameter: 22.5mm ϕ 40grams	Length: 26mm Max. Diameter: 13.5mm ϕ 5grams
12) Standard Accessories	Dome 1 pc. Housing Case 1 pc.	Dome 1 pc. Housing Case 1 pc.	Dome 1 pc. Housing Case 1 pc.	Dome 1 pc. Housing Case 1 pc.

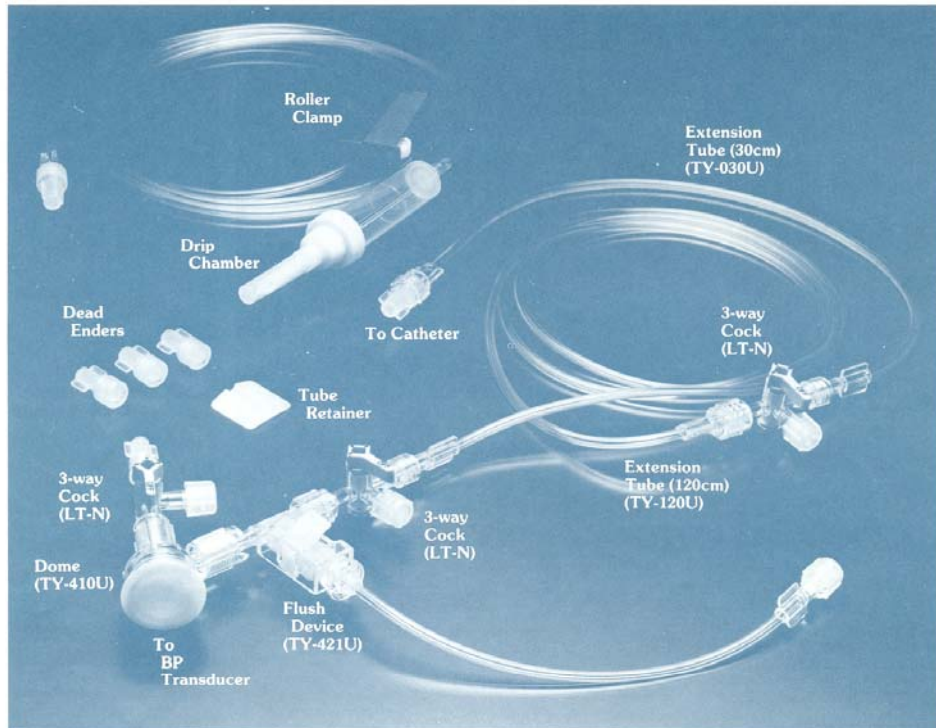
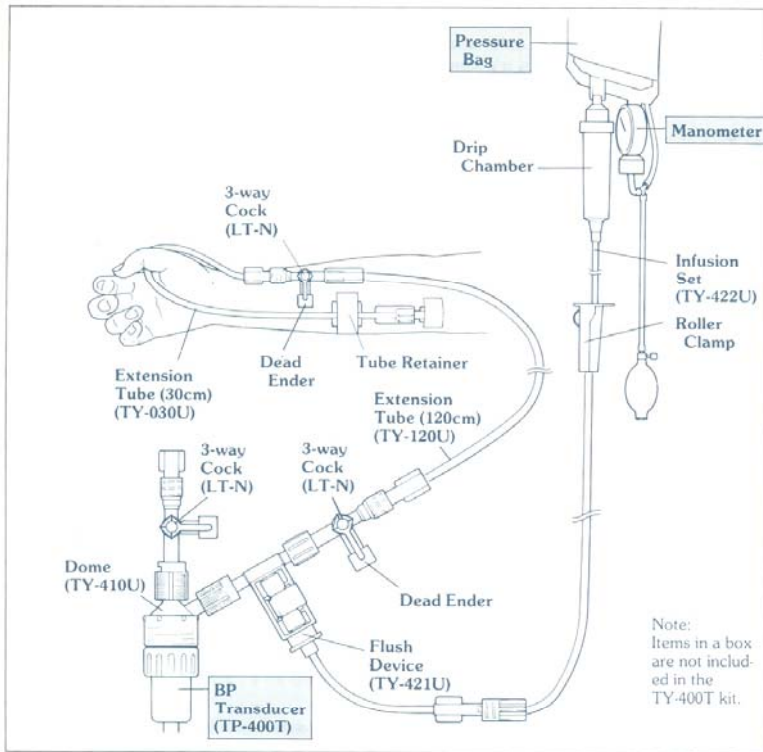


Photo shows the contents of the TY-400T blood pressure monitoring kit. The TY-400T consists of 10 individually packaged 10 kits.

The photo shows the TY-400T blood pressure monitoring kit. It is designed to be easily used with Nihon Kohden's TP-400T, Spectramed's P231D and P23 XL BP transducers so that even less experienced personnel can prepare a quality BP line.

Advantages

- 1) Simple preparation of the BP line
Each pack of the kit contains the necessary parts* to make a proper connection between the catheter and the BP transducer.
* See the illustrations for contents of each pack.
- 2) Dry-coupling with the BP transducer
Unlike the conventional wet-coupling, no special technique is required to assure a direct contact between the dome membrane and the transducer pressure receiving membrane.
- 3) Designed for easy air bubble dislodging and expelling
All the inside of the BP line is tapered at the connecting portion. This design greatly reduces the possibility of air bubbles lodging. (ex. extension tubing, 3-way stopcock, flush device.) Even if air bubbles lodge at any part within the line, they can be easily expelled.
- 4) Sharp-waveform oriented design
One of the key factors necessary for undamped sharp waveform reproduction is air bubble elimination. Another factor needed for contribution to maintain a good frequency response is the material of tubing. The material of the tubing used in the kit is flexible enough to run the BP line in a desired form, but also has the necessary rigidity.



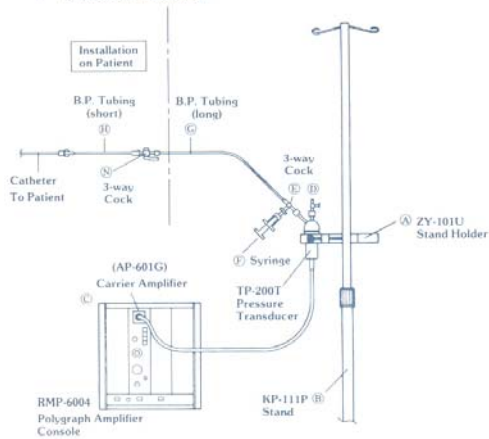
Some parts of the TY-400T can be separately available.
They come in the following package:

Type	Description	Specifications	Contents in Package
TY-410U	Dome	With a membrane	25 pcs.
TY-421U	Flush Device	Micro-volume injection 3mL/hour	25 pcs.
TY-422U	Infusion Set	Number of Drops in Drip Chamber: 60 drops/mL	25 pcs.
TY-015U*	Extension Tube (Hard type)	Length: 15cm O.D.: 3.5mm	25 pcs.
TY-030U	"	Length: 30cm O.D.: 3.5mm	25 pcs.
TY-060U*	"	Length: 60cm O.D.: 3.5mm	25 pcs.
TY-090U*	"	Length: 90cm O.D.: 3.5mm	25 pcs.
TY-120U	"	Length: 120cm O.D.: 3.5mm	25 pcs.
TY-150U*	"	Length: 150cm O.D.: 3.5mm	25 pcs.
TY-180U*	"	Length: 180cm O.D.: 3.5mm	25 pcs.
TY-210U*	"	Length: 210cm O.D.: 3.5mm	25 pcs.
TY-015S*	Extension Tube (Soft type)	Length: 15cm O.D.: 2.8mm	25 pcs.
TY-030S*	"	Length: 30cm O.D.: 2.8mm	25 pcs.
LT-N	3-way Cock	Rotating Luer lock Made by Hakko in Japan	50 pcs.

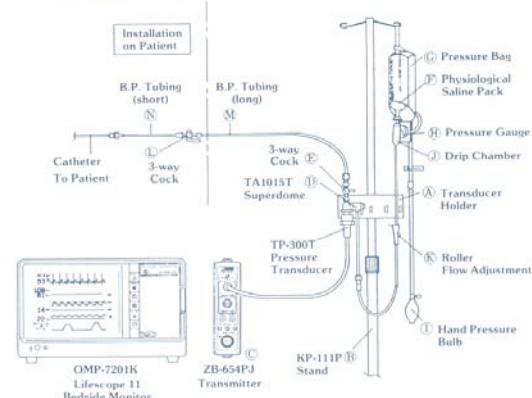
*Not included in the TY-400T blood pressure monitoring kit.

Other Direct Blood Pressure Measuring Systems Available

1) TP-200T/TP-200TL + Polygraph System



2) TP-300T + Patient Monitor



SUPPLIES

Supplies	TP-200T/TP-200TL	TP-300T
Reusable Domes	Dome Set, 4791101 * 12 pcs./set * Luer Lok fitting * Sterilized in fluid or by using ethylene oxide methods	Dome, TA1002† * Luer Lok fitting * Sterilized in sterilization fluid or by using ethylene oxide methods
Single-use Disposable Domes		Dome, TA1019† * With a plastic membrane; the blood line can be separated from the transducer diaphragm to ban the contact of infectious bacteria with the diaphragm. This eliminates the need of transducer sterilization * Luer Lok fitting Superdome, TA1017M† * With a unique continuous microflow/flush mechanism: A heparinized physiological saline line is connected to the mechanism for continuous microflow at the rate of 2 to 4ml/h (at 300mmHg bag pressure), and for a flush when necessary. * With a plastic separation membrane. * Luer Lok fitting * Contains 10 pcs.
3-way Cocks (Single-use, Disposable)	3-way Cocks, 4790878 * Luer Lok fitting * Sterilized * Disposable * 50 pcs. in a box	3-way Cocks, 4790967 * Luer Lok fitting * Sterilized * Disposable * 50 pcs. in a box

†Products of Spectramed*, U.S.A.

*Formerly called Gould

OPTIONAL ACCESSORIES

Optional Accessories	TP-200T/TP-200TL	TP-300T
Holders/Mounting Clips	Stand Holder, ZY-101U * Holds three TP-200T/TP-400T transducers. * Mounts to I.V. pole. * With adaptors for Spectramed P23XL.	Mounting Clip, TA9005† * Affixed to patient's arm by means of surgical tape to secure a TP-300T/Spectramed P10EZ. * Contains 10 pcs.

†Product of Spectramed, U.S.A.

STANDS FOR B.P. TRANSDUCERS

models MP-6S (Human/Animal)
MP-25S (Animal)

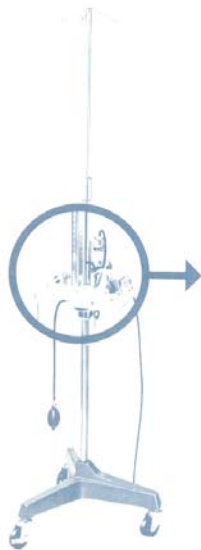
The stands for the blood pressure transducers come in either the floor-stand (Model MP-6S) or the bench-top stand (Model MP-25S) model. These stands are exclusively designed for easy

measurement of biophysiological pressures related to the living body by means of a direct measuring technique. Such parameters include arterial pressure, venous pressure, cerebrospinal fluid

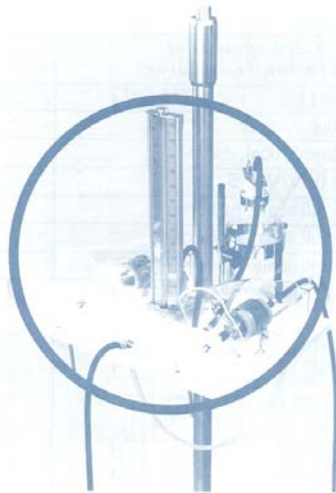
pressure, intraocular pressure, intrauterine pressure, systic pressure, etc. In the direct pressure measuring system, these stands play an important role in:

- 1) Supporting pressure transducers in position.
- 2) Providing a table to arrange a pressure measuring system compactly and neatly to prevent confusion in operation.
- 3) Preventing a hazardous mains current leakage to the subject through the pressure measuring assembly due to the dielectric material of the table.
- 4) Offering a transducer level adjustment to the heart or any other subject related to the measuring parameter. For example, the level of the system assembly table surface of the MP-6S is adjustable in a range between 800mm and 1,100mm from the floor level.
- 5) Providing a system sensitivity calibration facility to a mercury column of up to 260mmHg.
- 6) The MP-6S is equipped with an I.V. pole with three bottle hangers.

Descriptions	Manometer Stand, MP-6S	B.P. Transducer Bench-top Stand, MP-25S
Applications:	Catheterization, Cardiac operation	Animal experiments
Configurations:	Floor stand on a heavy weight tripod with 75mm casters. With a sampling and flushing system assembly table, and I.V. hangers.	Bench top stand on a tripod without casters. With a system assembly table.
System Assembly Table:	<ol style="list-style-type: none"> 1) B.P. transducer holder with transparent acrylic protective hood: 2 units 2) Stopcock assembly holder: 2 units 3) Mercury manometer (up to 260mmHg): 1 unit 4) Flush bottle: 1 unit 	<ol style="list-style-type: none"> 1) Pressure transducer holding hole and slots: 3 slots 2) TP 200 transducers 2) Mercury manometer (up to 260mmHg): 1 unit
Dimensions and Net Weight:	470 Wide × 1,350 High × 430 Deep (mm), approx. 19kg	400 Wide × 600 High × 400 Deep (mm), approx. 7kg
Single-use Disposable Stopcocks Used:	3-way cocks, 4790967 3 way 3 gang Cocks, 4791039	3-way Cocks, 4790878
Transducer Holder Adapters (Optional Accessory)		



The MP-6S with BP transducers. Shown approx. 1/16 actual size.



Stand Holder, ZY-101U →



The MP-25S with a BP transducer. Shown approx. 1/8 actual size.

