OPERATOR'S MANUAL

RESPIRATORY AMPLIFIER

AR-601G

VENTILATORY VOLUME UNIT

AQ-601G

97June

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.

CONTENTS

Introduction

The Respiratory Amplifier AR-601G and the Ventilatory Volume Amplifier AQ-601G are plug-in units for Polygraph System RM-6000 series.
The AR-601G is a sine wave carrier amplifier designed to measure respiratory flow or pressure in combination with the Pneumotachograph transducer MFP-1200.
The AQ-601G integrates the respiration signal received from the AR-601G to acquire ventilatory volume.

Please read this manual thoroughly prior to operation. Also refer to the operator's manual of the main unit and the other plug-in units.

Features

Respiratory Amplifier

1. Once zero balance of the amplifier connected to the transducer is performed, further operation for zero balance is not required until the transducer is replaced.
2. The GAIN FACTOR dial eliminates manometer calibration.
3. Three types of the measuring unit indication panel are provided for various measurements.
4. A square wave calibration signal permits easy calibration.
5. The AQ-601G is automatically calibrated and zero balanced when connected to the AR-601G.

Ventilatory Volume Amplifier

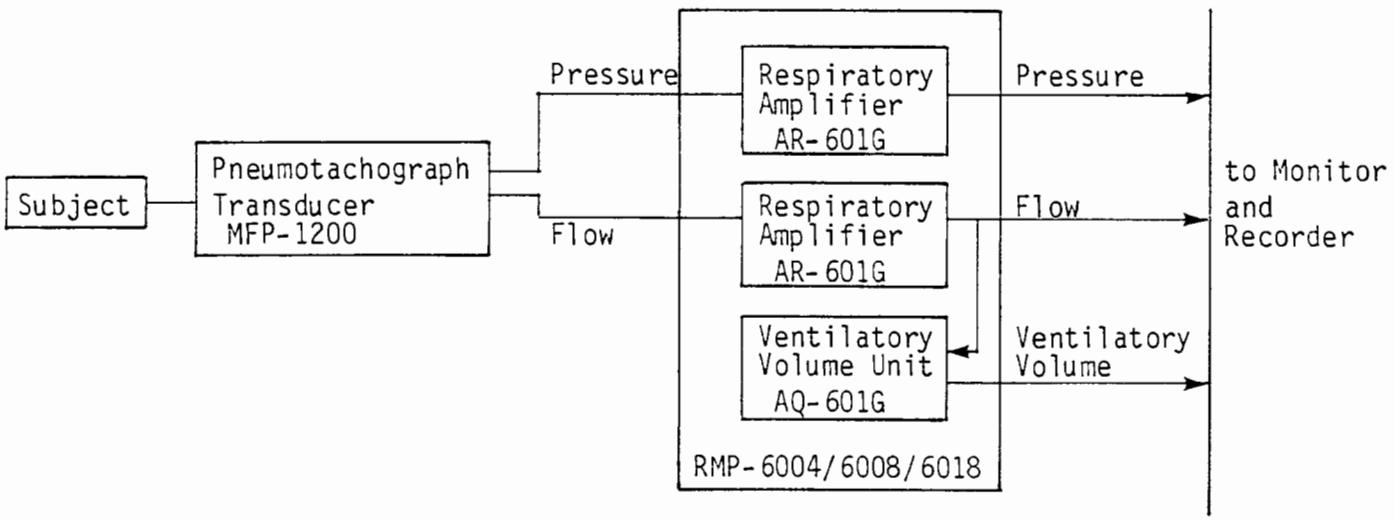
1. Since the AQ-601G is controlled by the control signal from the AR-601G, only the sensitivity control is provided on the panel for easy operation.
2. Built-in automatic balancing circuit simplifies balancing operation of the integration circuit.
3. Three types of a rectifier to preprocess the input signal for the integrator.
4. Two integration reset modes ; manual and trigger level reset.

Composition

The AR-601G and the AQ-601G are plugged in the Polygraph Amplfier Console (RMP-6004/6008/6018).
Examples of the system composition and a block diagram are shown in the following figures:

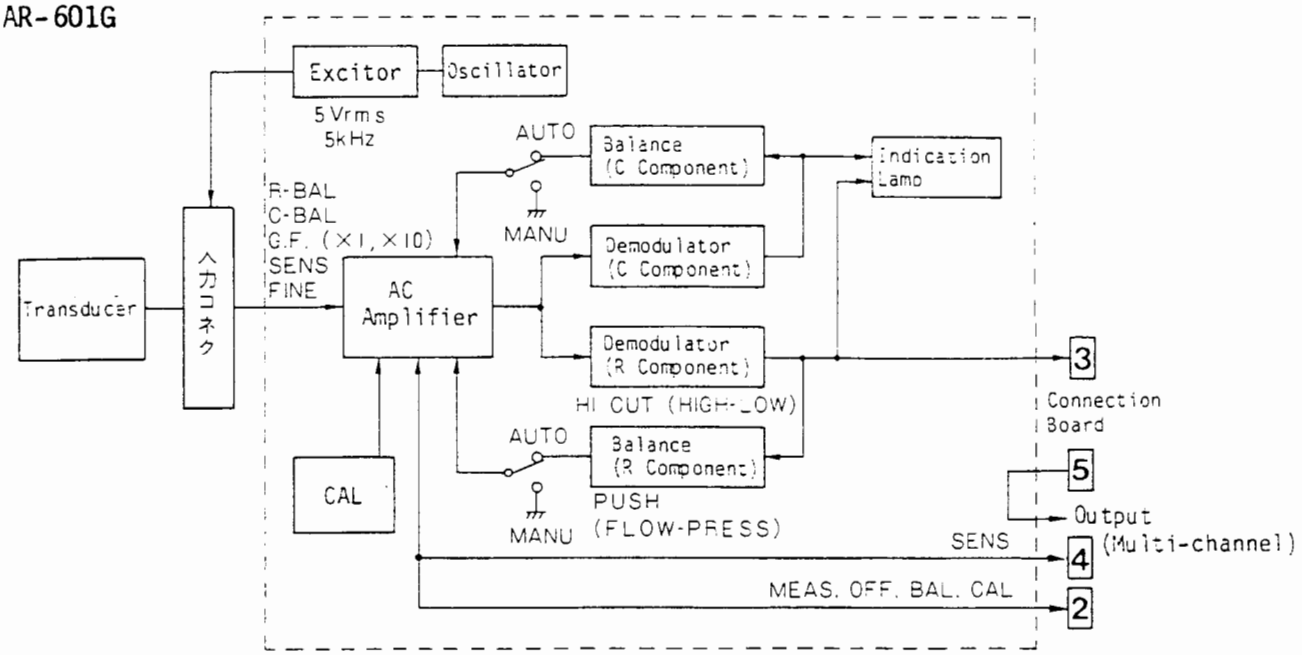
COMPOSITION EXAMPLES

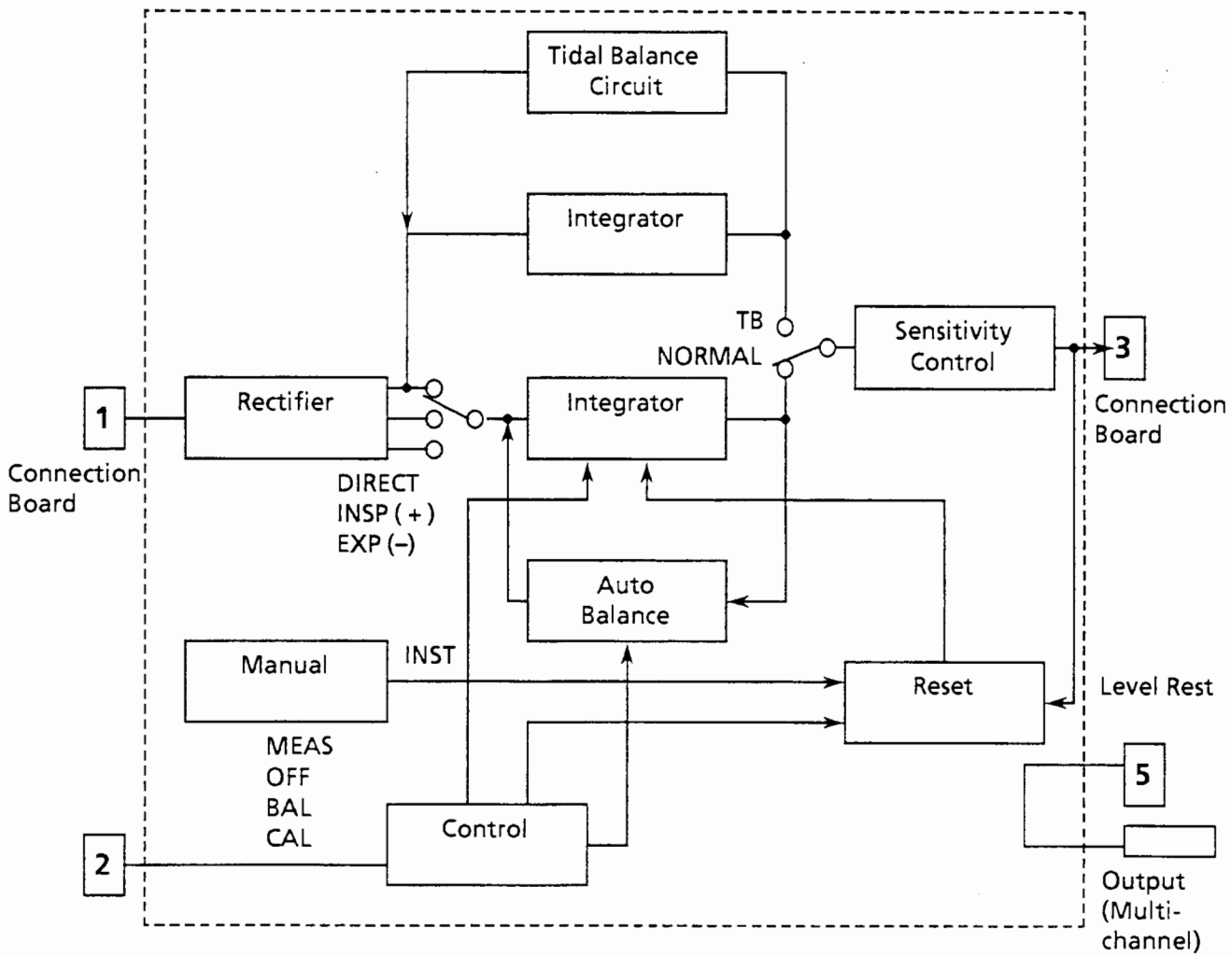
Respiratory Flow and Pressure Measurement



BLOCK DIAGRAM

AR-601G

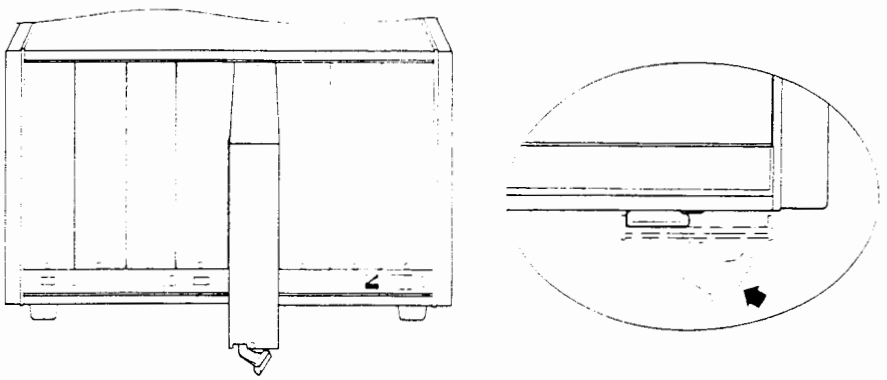



Tidal Balance Circuit
Integrator
TB
NORMAL
Sensitivity Control
3
Connection Board
1
Rectifier
Integrator
Connection Board
DIRECT
INSP (+)
EXP (–)
Auto Balance
Manual
INST
Reset
Level Rest
MEAS
OFF
BAL
CAL
Control
5
2
Output (Multi-channel)

Controls and Switches

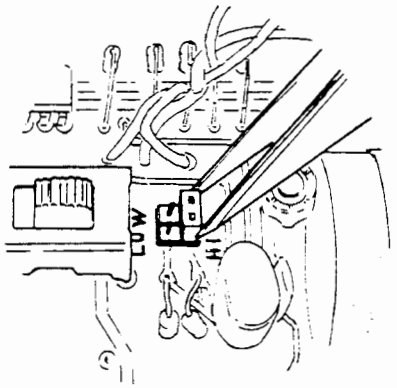
Refer to figure on page 19.

(1) **MEAS-OFF-BAL-CAL**	MEAS : Turns the amplifier on. OFF : Turns the amplifier off. BAL : Balances the amplifier connected to the transducer. CAL : Sensitivity calibration.
(2) C Capacitor Balance	Adjusts zero balance. (Refer to AUTO BALANCE on page 8, 11 and PRESET ADJUSTMENT on page 13.)
(3) R Resistor Balance	
(4) Balance Indication Lamp	Press the PUSH switch to perform zero-balance. Upon completing balancing, the balance indication lamp turns from red to green.
(5) **PUSH**	
(6) **GAIN FACTOR**	Adapts the output of the transducer to the sensitivity of the amplifier. Setting the number of the GAIN FACTOR according to the indication on the transducer is equivalent to manometer calibration.
(7) **SENSITIVITY** Step Control	Selects the sensitivity.
(8) **SENSITIVITY** Fine Control	Controls the fine sensitivity.
(9) Module Lock Lever	Pull this lever to draw out the unit from the Polygraph Amplifier Console. After setting the internal switch, be sure to attach the side shield plate to the plug-in unit and restore the unit.
(10) **FLOW-PRESS**	Selects the measuring parameter. FLOW : Respiratory flow PRESS : Respiratory pressure



(11) **HIGH-LOW** Filter Selection Socket

Selects the cut-off frequency.
HIGH : 100Hz
LOW : 30Hz
Set the plug into the socket to be selected.



(12) **MANU-AUTO** Balance Mode Selector

Selects balance mode.
MANU : When adjusting the preset balance.
(Refer to PRESET BALANCE on page 13.)
AUTO : Usual setting except in above case.

(13) **PNOR-PCHK**
CNOR-CCHK

For factory adjustment.
Should be set to PNOR and CNOR.

(14) **x1 - x10** Gain Factor Multiplier

Selects the coefficient (x1 or x10) for the GAIN FACTOR.

The following sockets should be set according to the type of the Polygraph Amplifier Console (RMP-6004/6008 or RMP-6018). These are, however, already set in the factory.

(15) Annotation Selection Socket

Selects the alphanumeric annotation information (sensitivity and measuring unit) for a recorder and a monitor oscilloscope.
When changing the measuring unit indication panel, reset three sockets.

A : 20, 10, 5, 2 (cmH_2O)	CAL=±10cmH_2O
B : 2, 1, 0.5, 0.2 (L/s)	CAL=±1L/s
C : 200, 100, 50, 20 (mL/s)	CAL=±100mL/s
D : 20, 10, 5, 2 (mL/s)	CAL=±10mL/s

This socket is available only when the plug-in unit is installed in the RMP-6018M. In the RMP-6004/6008M this selector is not available.

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(1) TOTAL SENSITIVITY Step Control	Controls the total sensitivity of integration. The list indicated on the panel shows the relation between AQ-601G and AR-601G. (Refer to TOTAL SENSITIVITY INTERPRETATION on page 12.)
(2) TOTAL SENSITIVITY Fine Control	Controls fine sensitivity.
(3) Module Lock Lever	Pull this lever to draw out the unit from the Polygraph Amplifier Console. After setting the internal switch, be sure to attach the side shield plate to the plug-in unit and restore the unit.
(4) DIRECT-INSP-EXP Waveform Rectifier	Selects rectification mode. DIRECT : Integrates both inspire and expire waveforms. INSP : Integrates an inspire waveform. EXP : Integrates an expire waveform.
(5) Tidal Balance Select Switch	Selects Tidal Balance mode or Auto Balance mode. To measure stable ventilatory volume waveforms for a long time, set to TB.

Measurement

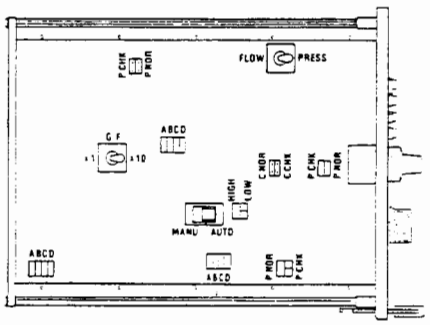
(RESPIRATORY PRESSURE)

INTERNAL SWITCH SETTING

Pull the unit lock lever and draw out the AR-601G from the Polygraph Amplifier Console. Remove the side shield plate from the amplifier and check to see that the following switches are set properly as follows.

AR-601G

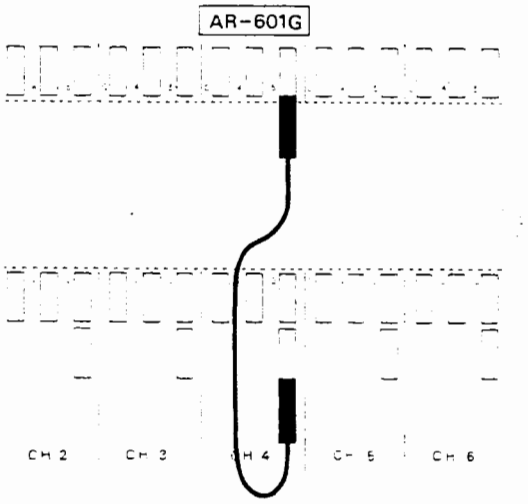
FLOW-PRESS selector (10) ...	PRESS
HIGH-LOW selector (11)	According to purpose
MANU-AUTO selector (12)	AUTO
Gain Factor Selector (14) ..	x10



After setting the internal switches, be sure to re-attach the side shield plate to the plug-in unit and restore the unit.

CONNECTION BOARD WIRING

Draw out the connection board from the Polygraph Amplifier Console.
Connect sockets 3 and 5 of the corresponding channel with the connection lead. After connection, restore the connection board to the console.

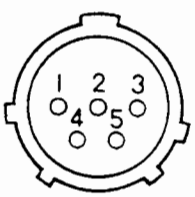


POWER ON

After making sure that the ground lead and power cord are properly connected, turn on the power of the rack, console, monitor and recorder.
Check to see that the power indication lamps light.

TRANSDUCER CONNECTION

Connect the PRESSURE output of the MFP-1200 to the independent input connector on the Polygraph Amplifier Console (channel corresponds to the AR-601G for pressure).
Pin wiring of the connector of the transducer is as follows.

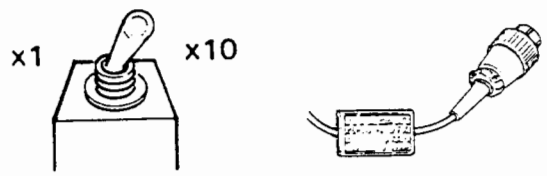


Pin No.		Signal
1	:	Shield
2	:	Signal(+)
3	:	Excitor(+)
4	:	Excitor(-)
5	:	Signal(-)

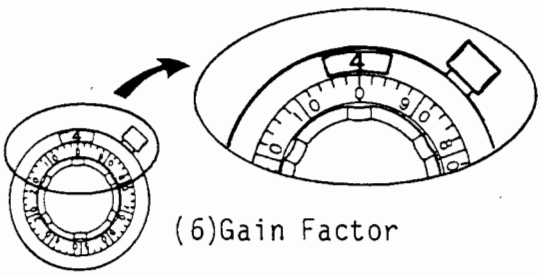
Connector type	SRC06A13-5P
Code No.	5310067

GAIN FACTOR SETTING

Set the number of the GAIN FACTOR dial (6) to the same number as shown on the indication panel attached to the differential transducer (TP-603T).
The gain factor value is the product of the read of the GAIN FACTOR dial (0 to 999) and the multiplier of the gain factor selector (x1 or x10).
Following example shows to set the GAIN FACTOR to 4000.



(14)Gain Factor Multiplier



(6)Gain Factor

Gain Factor = 400 x 10 = 4000

After setting, lock the dial.

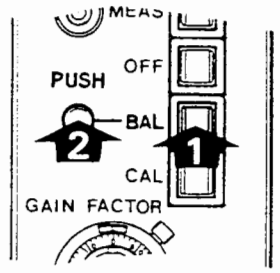
AUTO-BALANCE

NOTE

If the AR-601G is not totally calibrated with the Pneumotachograph Transducer MFP-1200, perform the preset balance (See PRESET BALANCE on page 13). When they are totally calibrated, adjust the amplifier as follows.

1. Make sure that no signal is applied to the transducer.

2. Set the MEAS-OFF-BAL-CAL switch(1) to BAL.
   Press the PUSH switch(5) and the indication lamp will light red.



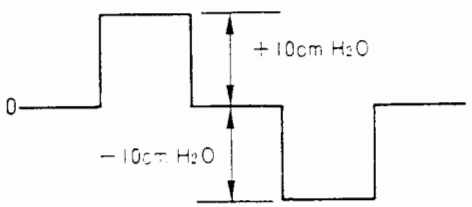
3. 2sec later, the lamp turns to green to show that balancing is complete.
   If the red lamp flickers and does not turn to green, the amplifier is out of auto-balance adjusting range.
   In such a case, perform preset balance adjustment. (Refer to PRESET BALANCE on page 13.)

SENSITIVITY CALIBRATION

1. Make sure that the GAIN FACTOR dial is set properly.

2. Push the CAL switch(1) and a square waveform of $\pm 10 cmH_2O$ will appear.

3. Set the SENSITIVITY selector(7) to $10 cmH_2O$/DIV and adjust pen deflection to 10mm with the fine SENSITIVITY control(8).



MEASUREMENT

After above adjustment, set the MEAS-OFF-BAL-CAL switch(1) to MEAS.
Apply an input signal to the transducer.
Set the SENSITIVITY selector(7) properly according to the purpose and start recording.

Measurement

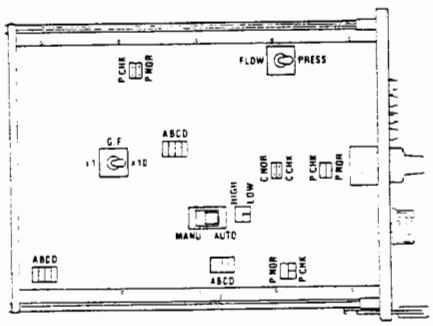
(RESPIRATORY FLOW AND VENTILATORY VOLUME)

INTERNAL SWITCH SETTING

Pull the unit lock lever and draw out the AR-601G and the AQ-601G from the Polygraph Amplifier Console.
Remove the side shield plate from the amplifier and check to see that the following switches are set properly as follows.

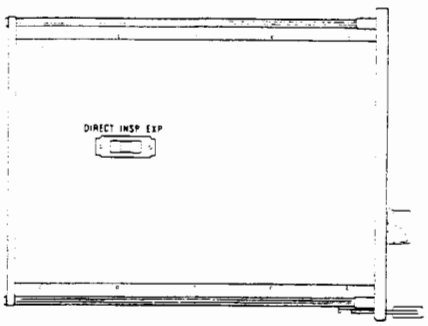
AR-601G

FLOW-PRESS selector (10) ... FLOW
HIGH-LOW selector (11) ..... According to purpose
MANU-AUTO selector (12) .... AUTO
Gain Factor Selector (14) .. x1



AQ-601G

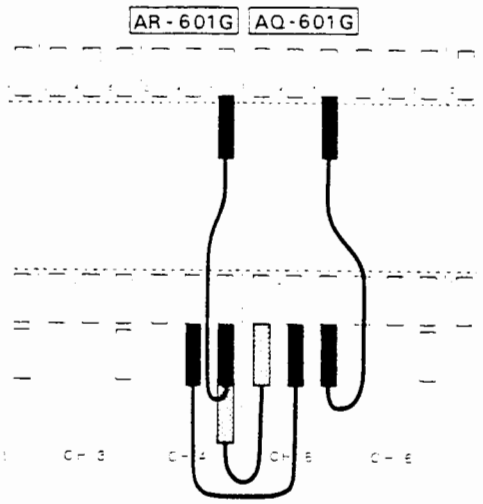
DIRECT-INSP-EXP selector .... According to purpose



After setting the internal switches, be sure to re-attach the side shield plate to the pulg-in unit and restore the unit.

CONNECTION BOARD WIRING

Draw out the connection board from the Polygraph Amplifier Console.
Connect terminals as follows.



Socket No.3 and No.5
  Ouputs to a monitor and a recorder.
Socket No.3 and No.1
  Inputs respiratory signal to the AQ-601G.
Socket No.2 and No.2
  Inputs control signal (MEAS-OFF-BAL-CAL) to the AQ-601G.

After connection, restore the connection board to the console

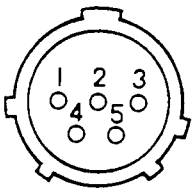
POWER ON

After making sure that the ground lead and power cord are properly connected, turn on the power of the rack, console, monitor and recorder.
Check to see that the power indication lamps light.

TRANSDUCER CONNECTION

Connect the FLOW output of the MFP-1200 to the independent input connector on the Polygraph Amplifier Console (channel corresponds to the AR-601G for flow).

Pin wiring of the connector of the transducer is as follows.



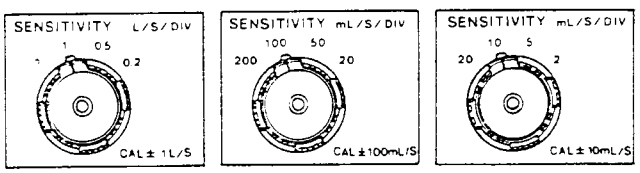
Pin No.		Signal
1	:	Shield
2	:	Signal(+)
3	:	Excitor(+)
4	:	Excitor(-)
5	:	Signal(-)

Connector type SRC06A13-5P
Code No. 5310067

GAIN FACTOR SETTING

NOTE

Prior to GAIN FACTOR setting, make sure that the type of the unit indication panel confirms to the type of the transducer. If not, replace the panel with a suitable one (provided as standard accessories).

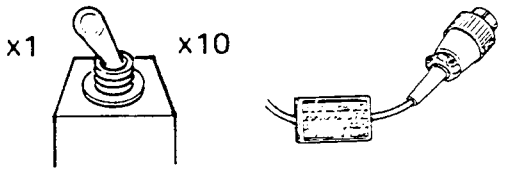


Measuring unit indication panel

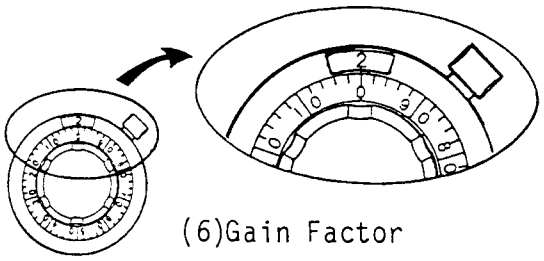
Proper Combination for Flow measurement

Panel	Differential Transducer	Flow Resistance Tube
L/s/DIV	TP-602T	TV-112T TV-122T
100mL/s /DIV		TV-132T TV-142T
10mL/s /DIV		TV-241T

Set the number of the GAIN FACTOR dial (6) to the same number as shown on the indication panel attached to the differential transducer (TP-602T).
The gain factor value is the product of the read of the GAIN FACTOR dial (0 to 999) and the multiplier of the GAIN FACTOR selector (x1 or x10).
Following example shows to set the GAIN FACTOR to 200.



(14)Gain Factor Multiplier



(6)Gain Factor

Gain Factor = 200 x 1 = 200

After setting, lock the dial.

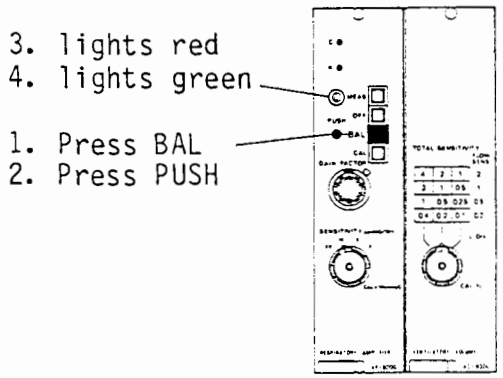
AUTO-BALANCE

NOTE

If the AR-601G is not totally calibrated with the Pneumotachograph Transducer MFP-1200, perform the preset balance (See PRESET BALANCE on page 13). When they are totally calibrated, adjust the amplifier as follows.

1. Make sure that no signal is applied to the transducer.

2. Set the MEAS-OFF-BAL-CAL switch(1) to BAL.
   Press the PUSH switch(5) and the indication lamp will light red.

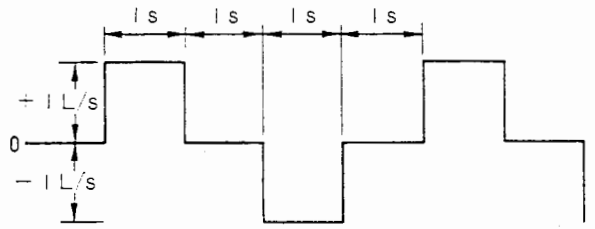


3. 12 sec. later, the lamp turns to green to show that balancing is complete. If the red lamp flickers and does not turn to green, the amplifier is out of auto-balance adjusting range. In such a case, perform preset balance adjustment (Refer to PRESET BALANCE on page 13).

SENSITIVITY CALIBRATION

1. Make sure that the GAIN FACTOR dial is set properly.

2. Push the CAL switch(1) and a square waveform of ±10mL/s, ±100mL/s or ±1L/s is applied to the AR-601G and AQ-601G.

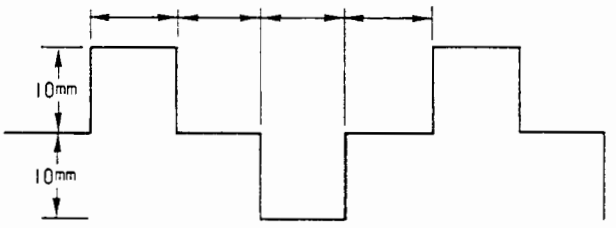


CAL output waveform of AR-601G

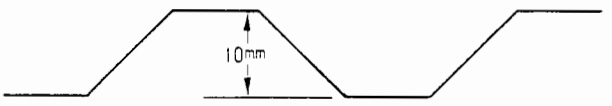
3. Set the SENSITIVITY selector(7) of the AR-601G to 1L/s/DIV and the TOTAL SENSITIVITY selector(1) of the AQ-601G to center.

4. Adjust pen deflection to 10mm with the fine SENSITIVITY control of the AR-601G and AQ-601G.

AR-601G



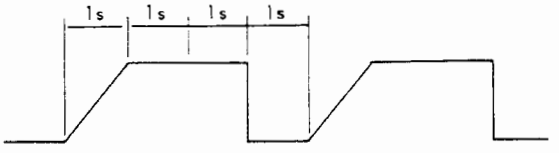
AQ-601G



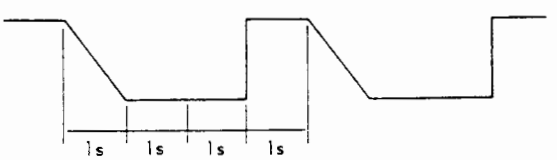
NOTE

When the DIRECT-INSP-EXP switch is set to INSP or EXP, calibration waveform will be as follows.

INSP



EXP



MEASUREMENT

After above adjustment, press the MEAS switch(1) of the AR-601G to measure the signal. The respiratory waveform is output from the AR-601G, while the ventilatory volume waveform is output from the AQ-601G. Adjust the sensitivity of the AR-601G according to the purpose so that the waveform of proper amplitude is recorded.

NOTE

High frequency noise may be induced when using an electrocautery.

RESET (AQ-601G)

When the DIRECT-INSP-EXP switch is set to INSP or EXP position, an integrated waveform will be saturated over the operating range. To reset the waveform, two reset modes are available.

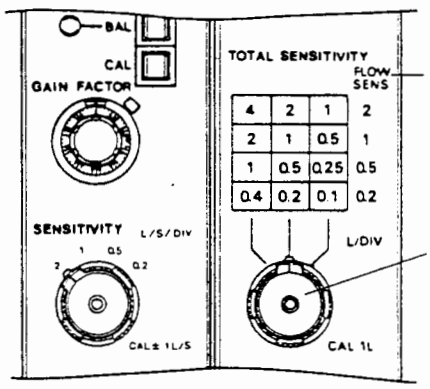
Manual Reset

Press the INST switch on the Polygraph Amplifier Console to reset.

Level Reset

When the integrated waveform exceeds ±5V, the waveform is reset.

TOTAL SENSITIVITY INTERPRETATION (AQ-601G)

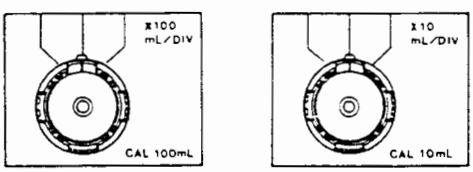


Total sensitivity is the sensitivity of the output of the AQ-601G determined by the product of the SENSITIVITY of the AR-601G and the multiplier of the AQ-601G.
If the SENSITIVITY of the AR-601G is set to 2L/s/DIV;

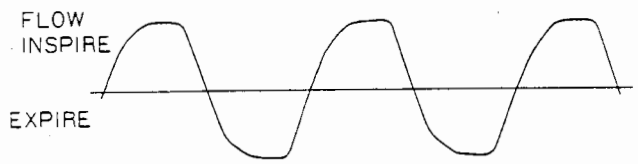
Multiplier	Output
x2 (Left)	4L/s/DIV
x1 (Center)	2L/s/DIV
x0.5 (Right)	1L/s/DIV

When the measuring unit indication panel of the AR-601G is replaced, that of the AQ-601G should also be replaced.

AR-601G	AQ-601G
L/s/DIV	×1L/DIV
100mL/s/DIV	×100mL/DIV
10mL/s/DIV	×10mL/DIV

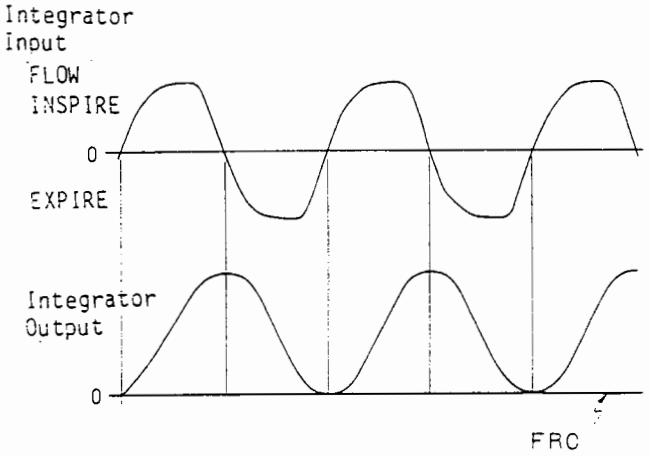


WAVEFORM RECTIFIER (DIRECT-INSP-EXP)

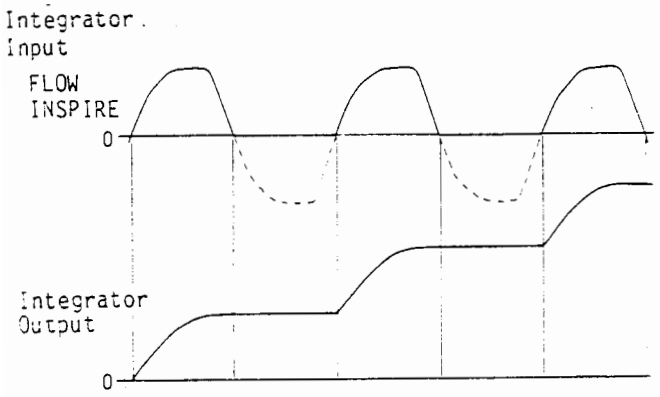


When the above waveform is applied to the AQ-601G, the following output waveform appears according to the DIRECT-INSP-EXP selector.

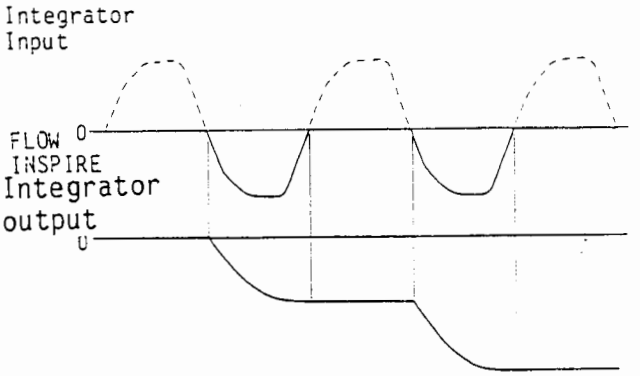
DIRECT



INSP



EXP



Preset Balance Adjustment

(AR-601G)

When replacing the transducer, be sure to perform the preset balance (CR adjustment). Once the adjustment is completed, no further adjustment is required.
Differential transformer is not required to be replaced.

1. Set the controls as follows.

   MANU-AUTO selector (12) ..... MANU
   MEAS-OFF-BAL-CAL switch (1) .. OFF
   SENSITIVITY selector (7) ..... Left
   GAIN FACTOR ..... Proper number
   Transducer ..... Vent to the air

2. Adjust the baseline position of the recorder and the monitor properly.

3. Set the MEAS-OFF-BAL-CAL switch to BAL. Minimize a trace shift with the R-BAL adjustment. Then minimize it with the C-BAL adjustment.
   If a trace shift can not be minimized to the baseline, decrease the sensitivity of the amplifier with the GAIN FACTOR dial(6) and the gain factor multiplier(14).

4. Turn the SENSITIVITY selector to increase the sensitivity and minimize a trace shift with the C and R adjustment alternatively. Repeat the CR adjustment at each sensitivity up to maximum sensitivity.

5. Re-set the GAIN FACTOR dial and the gain factor multiplier if they have been changed in procedure 3.

6. After the above adjustment, set the MANU-AUTO selector(12) to AUTO.

Alphanumeric Annotation

The AR-601G when plugged into the Polygraph Amplifier Console RMP-6018 provides the following alphanumeric data to be printed on a recorder equipped with annotation printing facility.

Measuring unit : cmH_2O, L/s, mL/s
Mode : MEAS, OFF, BAL, CAL
Sensitivity :

Sensitivity and unit	Internal socket
20-10-5-2 (cmH_2O/DIV)	A
2-1-0.5-0.2 (L/s/DIV)	B
200-100-50-20 (mL/s/DIV)	C
20-10-5-2 (mL/s/DIV)	D

TIDAL BALANCE

When the NORMAL-TB switch is set to TB, both inspire and expire waveforms are integrated.
Everytime a respiratory waveform changes from expire to inspire, the tidal balance circuit readjusts the balance to cancel the difference between the integrator inspire output (inspire volume) and the integrator expire output (expire volume).

When the NORMAL-TB switch is set to TB, the integrator output (ventilatory volume of the respiratory waveform) shifts from the baseline as follows.

1. Inspire volume = Expire volume
The expire end level of the integrator output is almost on the baseline.
2. Inspire volume > Expire volume
The expire end level of the integrator output is over the baseline.
3. Inspire volume < Expire volume
The expire end level of the integrator output is under the baseline.

Note:
The difference between the baseline and the expire end level of the integrator output is not caused by the FRC (Functional Residual Capacity) fluctuation.

<> Causes of the difference between inspire volume and expire volume

The diffrence between the inspire volume and the expire volume causes the baseline wandering of the integrator output.

1. The linearity of the sensitivity of the differential transformer depends on temperature and moisture.
During measurement, expired air expands because of the body temperature and becomes sticky from moisture from the lungs. Sticky air makes the sensitivity of the transfomer go high. The expire end level of the integrator output goes down from the baseline because the measured expire volume is larger than the inspire volume.

2. The sensitivity of the differential transformer and respiratory amplifier must be linear to get a stable integrator output. However the inspire flow and the expire flow are output almost the same sensitivities, the expire end level of the integrator output goes up or down because the linearity of the AR-601G is within +- 3%.

3. Preset balance has been adjusted to zero; however, temperature and humidity variation may cause an offset voltage on the differential transformer output and the amplifier circuit of the AR-601G.

Specifications

RESPIRATORY AMPLIFIER AR-601G

Transducer to be used	TP-602T, TP-603T
Bridge Excitation Voltage	5Vrms ±5% (Sine wave)
Bridge Frequency	5KHz ±10%
Internal Noise Level	<10μVp-p
Maximum Sensitivity	1V/75μVrms
High Frequency Responce	30, 100Hz ±20%
Sensitivity Control	4 steps (coarse), 10±2dB (fine)
Linearity	±3%
Maximum Input Voltage	>300mVrms
Maximum Ouput Voltage	>±5V
Output Impedance	<50Ω
Auto-balance	Accuracy <±50mV (output), Range >5mVrms (input)
Dimensions and Net Weight	50(W) x 200(H) x 280(D)mm, Approx. 1kg

VENTILATORY VOLUME UNIT AQ-601G

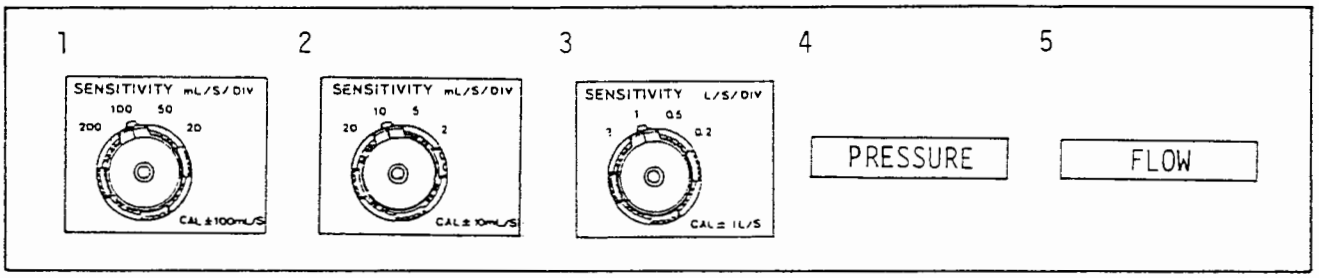
Input Circuit	Single-ended, 100KΩ-E
Input Waveform Rectifier	DIRECT, INSPIRE, EXPIRE
Sensitivity Control	
Step control	x2, x1, x0.5, accuracy <±3%
Fine control	10 ±2dB
Integration Linearity	<±5%, continuous integration for 100sec

Integration Reset	
Manual reset	Reset by the INST switch on the console
Level reset	Reset when the signal level is more than ±5V accuracy <±7%
Auto-balance	
Input balnce voltage	<±100mV
Output voltage (after balancing is completed)	<±20mV
Output Voltage	>±5V
Output Impedance	<50Ω
Dimensions and Net Weight	50(W) x 200(H) x 280(D)mm, Approx. 1kg
Tidal-balance	
Input balance voltage	<± 100mV

Standard Accessories

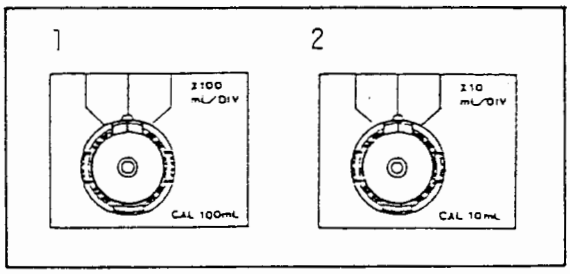
AR-601G RESPIRATORY AMPLIFIER

No.	Description	Q'ty	Code No.
1	Unit indication panel (100mL/s/DIV)	1	1124-013796
2	Unit indication panel (10mL/s/DIV)	1	1124-013804
3	Unit indication panel (L/s/DIV)	1	1124-013813
4	Parameter panel (PRESSURE)	1	1124-014242
5	Parameter panel (FLOW)	1	1124-014251



AQ-601G VENTILATORY VOLUME UNIT

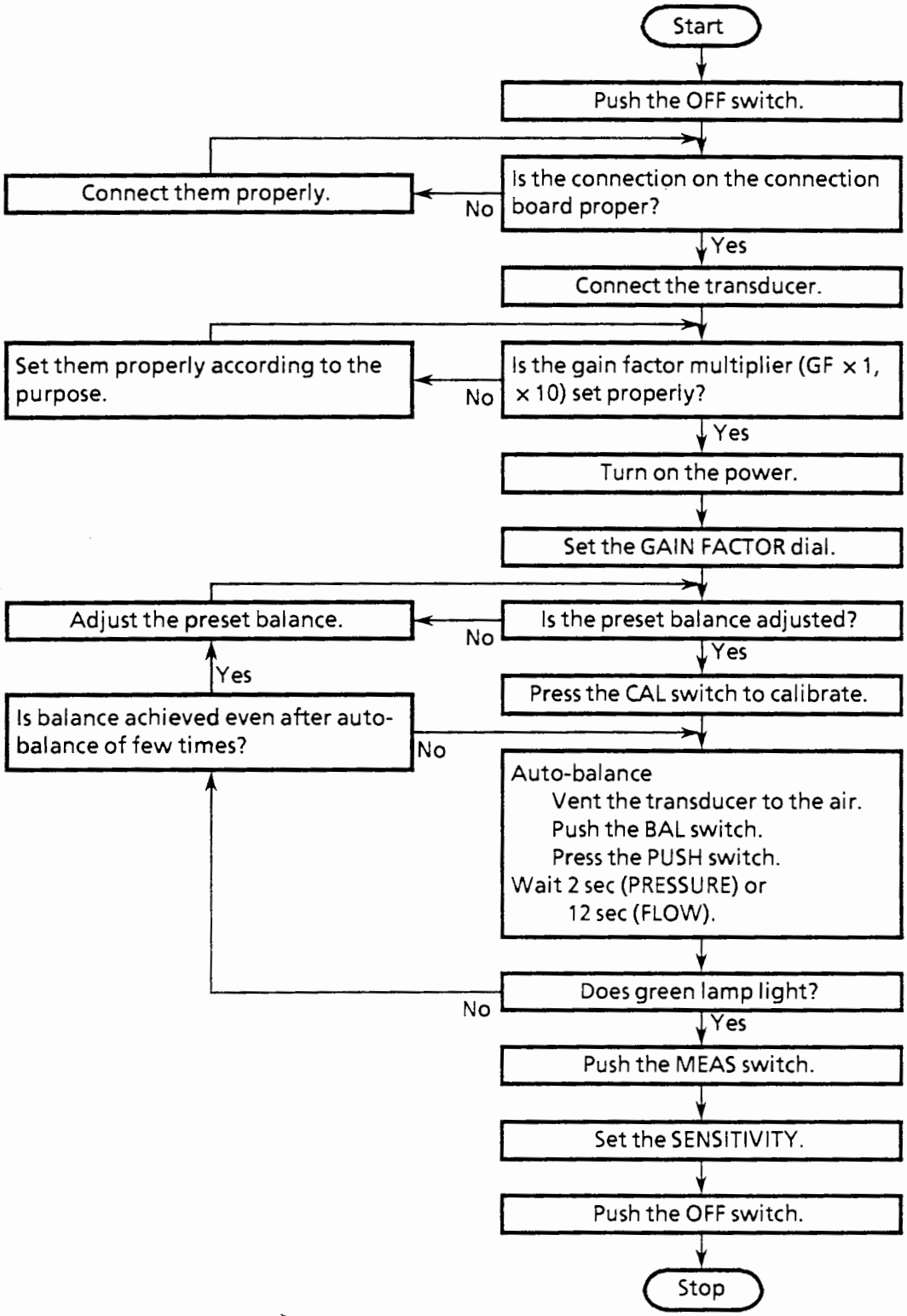
No.	Description	Q'ty	Code No.
1	Unit indication panel (100mL/s/DIV)	1	1124-014215
2	Unit indication panel (10mL/s/DIV)	1	1124-014224



Related Instruments

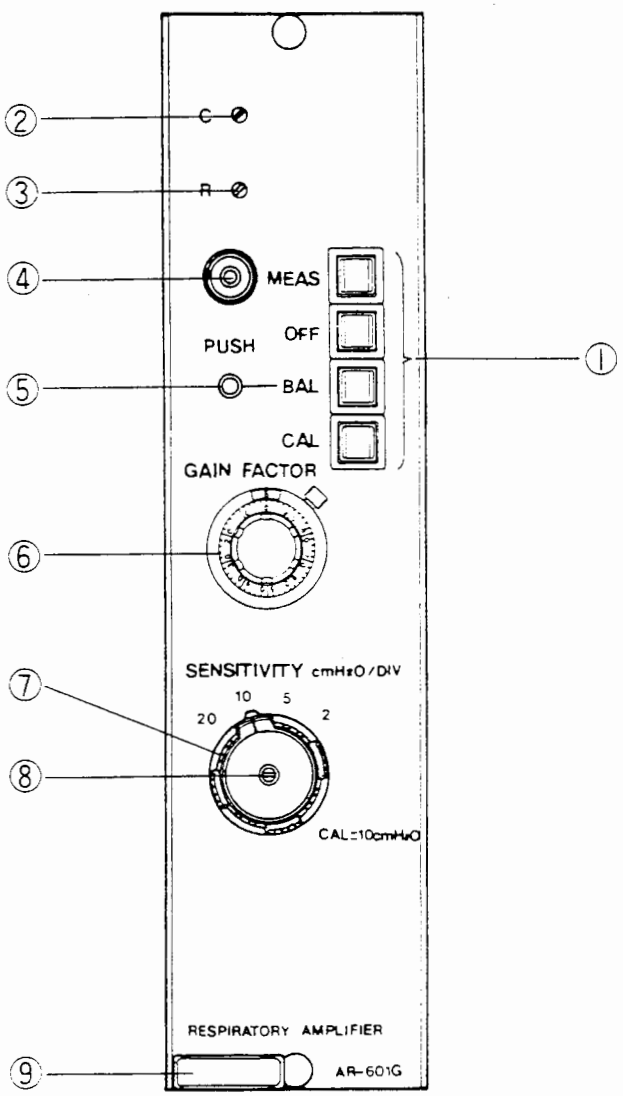
PNEUMOTACHOGRAPH TRANSDUCER MFP-1200

FLOWCHART FOR MEASUREMENT

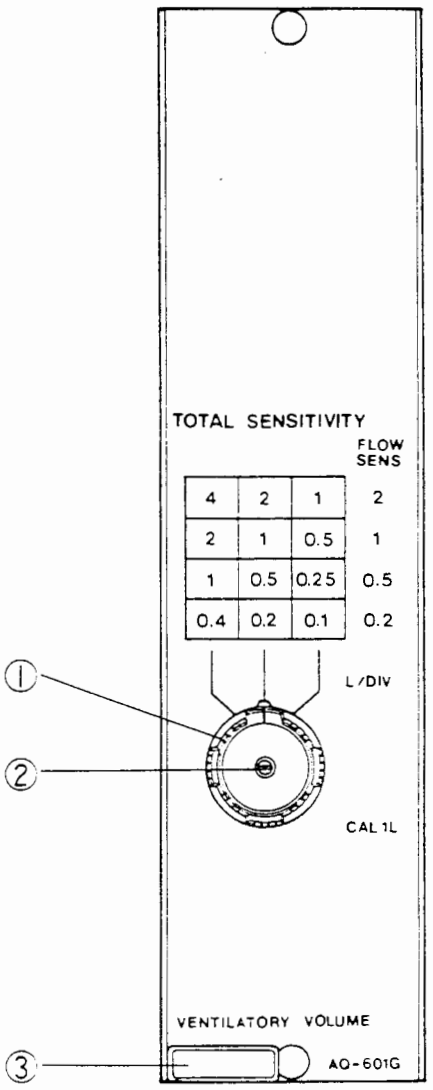


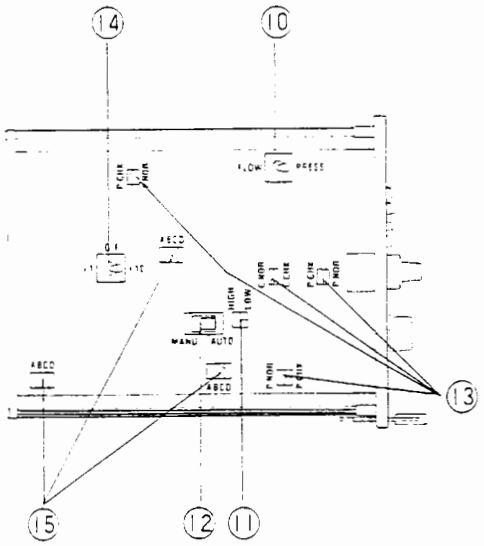
Panel Illustration

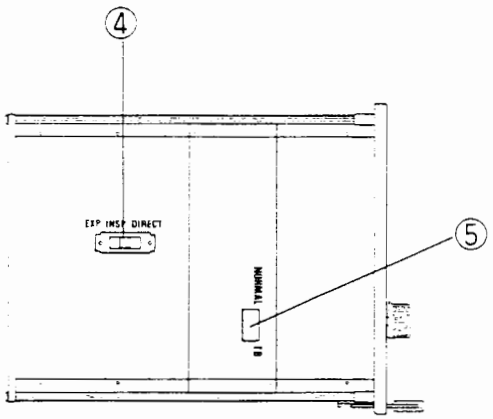
RESPIRATORY AMPLIFIER
AR-601G



VENTILATORY VOLUME AMPLIFIER
AQ-601G







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The model and serial number of your instrument are identified on the rear or bottom of the unit. Write the model and serial number in the spaces provided below. Whenever you call your distributor concerning this instrument, these two pieces of information should be mentioned for quick and accurate service.

Model _____ Serial number _____

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