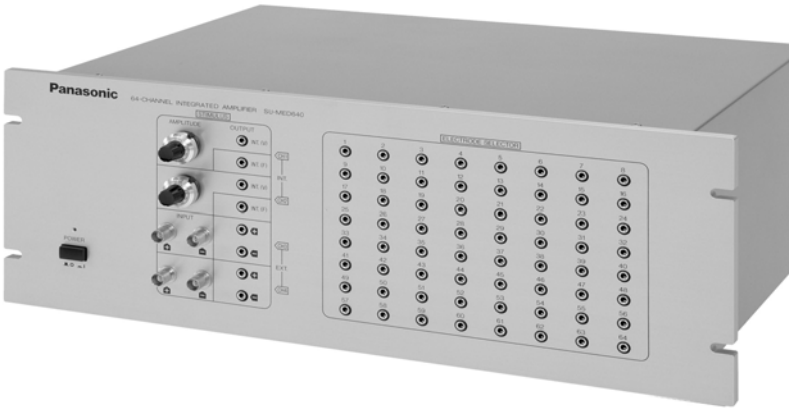
MED64 *An advanced and easy-to-use solution for in-vitro Electrophysiology*

Operating Instructions

MED64 Integrated Amplifier

P/N: SU-MED640P



ALPHA MED SCIENTIFIC

Safety Precautions

Before using this unit please read these operating instructions carefully. Take special care to follow the warnings indicated on the unit itself as well as the safety suggestions listed below. Keep these precautions handy for future reference.

The unit may be used only in the operating conditions and positions specified manufacturer.
Unless otherwise agreed the following applies to this unit.

1. Pollution category: II (Indoor use only)
2. Installation over voltage category: II
3. Altitude: max.2,000 m

Placement

Avoid placing the unit in areas of:

- direct sunlight
- high temperature
- high humidity
- excessive vibration
- uneven surfaces (Place the unit on a flat level surface.)

Such conditions might damage the cabinet and/or other component parts and thereby shorten the unit's service life.

Stacking

Never place heavy items on top of the unit or the AC power cord.

Voltage

- It is very dangerous to use a “high voltage” AC power source such as for an air conditioner. A fire might be caused by such a connection.
- A DC power source can not be used. Be sure to check the power source carefully.

Power cord protection

- Avoid using AC power cords with cuts, scratches, or poor connectors, as this may result in fire or electric shock. Excessive bending, pulling or slicing of the cord should also be avoided.
- Do not pull on the cord when you are disconnecting the power, as this could cause an electric shock. Grasp the plug firmly when you disconnect the power supply.
- Never touch the plug with wet hands or a serious electric shock could result.

Foreign Materials

- Ensure that no foreign objects (e.g. - needles, coins, screwdrivers), accidentally fall into the unit. Otherwise, a serious electric shock or malfunction could occur.
- Be extremely careful about spilling water or liquid on or into the unit, as a fire or electric shock could occur (Disconnect the power plug and contact your dealer immediately if this occurs).
- Avoid spraying volatile chemicals (e.g.- insecticides, alcohol, paint thinner) on or into the unit as they contain flammable gases which can be ignited.
- Insecticides, alcohol, paint thinner and similar chemicals should never be used to clean the unit as they can cause flaking or cloudiness to the cabinet finish.

Service

- Never attempt to repair, disassemble or modify the unit if there seems to be a problem. A serious electric shock could result if you ignore this precautionary measure.
- If a problem occurs during operation (smoke is detected, etc.) contact your dealer immediately.
- Disconnect the power supply if the unit will not be used for a long time. Otherwise the operation life could be shortened.

Safety-related symbols used on equipment and documentation:

Frame or chassis
TERMINAL

Environmental conditions

- Indoor use.
- Altitude up to 2000 m.
- Temperature: 5 - 40 C.
- Maximum relative humidity 80% for temperatures up to 31 C decreasing linearly to 50% relative humidity at 40 C.
- Mains supply voltage fluctuations not to exceed +/- 10% of the nominal voltage.

Maintenance

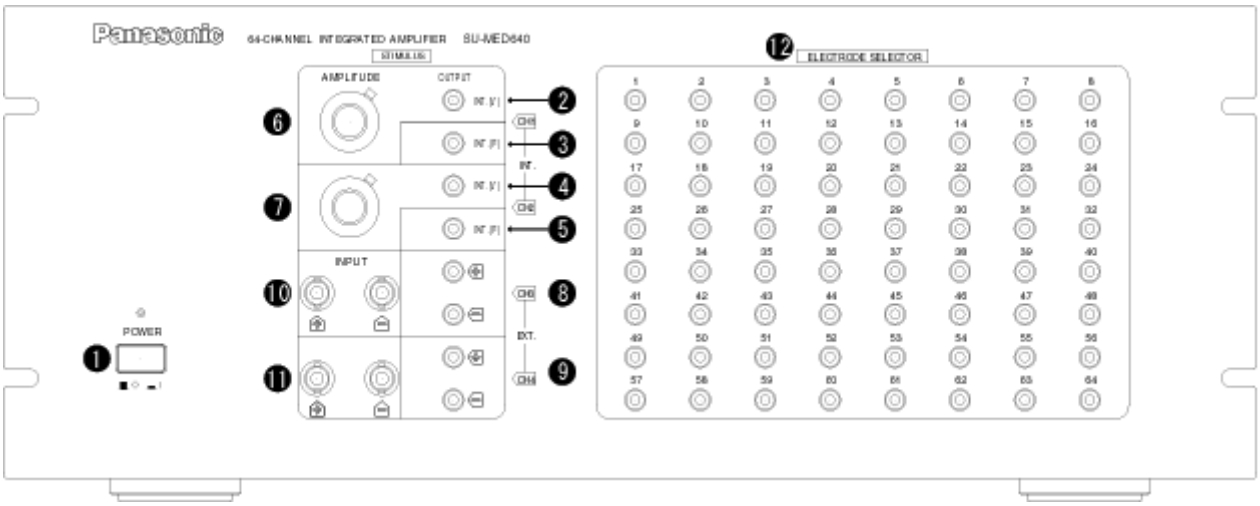
Clean the cabinet, panel and controls with a soft cloth lightly moistened with mild detergent solution.
Do not use any type of abrasive pad, scouring power or solvent such as alcohol or benzine.

Fuse (F1)

Rating: 125 V, 630 mA

Components and their functions

Front panel



(1) POWER

To turn the amplifier on and off.

Caution: Do NOT turn on the power with a stimulation cord connected on the output terminal of the internal stimulators (#2, 3, 4 & 5). This may cause damage to the microelectrode(s) on the probe.

(2) OUTPUT INT(V) [CH1]

The output terminal for the variable, internal channel 1 (CH1) constant current stimulator. The amplitude of the current delivered is variable (V) and can be adjusted with dial (6)[*1].

(3) OUTPUT INT(F) [CH1]

The output terminal for the fixed, internal channel 1 (CH1) constant current stimulator. The amplitude of the current delivered is fixed (F) and set on the computer[*1].

(4) OUTPUT INT (V) [CH2]

The output terminal for the variable, internal channel 2 (CH2) constant current stimulator. The amplitude of the current delivered is variable (V) and can be adjusted with dial (7)[*1].

(5) OUTPUT INT(F) [CH2]

The output terminal for the fixed, internal channel 2 (CH2) constant current stimulator. The amplitude of the current delivered is fixed (F) and set on the computer[*1].

(6) AMPLITUDE [CH1]

This 'potentiometer' is used to adjust the output amplitude for the variable, CH1 stimulator (2). The initial (x1)amplitude, which is set in the computer software, can be adjusted in 0.1 steps between 0 and 10 times.

(7) AMPLITUDE [CH2]

This 'potentiometer' is used to adjust the output amplitude for the variable, CH2 stimulator (4). The initial (x1)amplitude, which is set in the computer software, can be adjusted in 0.1 steps between 0 and 10 times.

(8) OUTPUT EXT [CH3]

The output terminal for an external stimulus isolation unit (see page 4)[*2,*3].

(9) OUTPUT EXT [CH4]

The output terminal for an external stimulus isolation unit (see page 4)[*2,*3].

(10) INPUT EXT [CH3]

The input terminals (+ & -) for an external stimulus isolation unit.

(11) INPUT EXT [CH4]

The input terminals (+ & -) for an external stimulus isolation unit.

(12) ELECTRODE SELECTOR

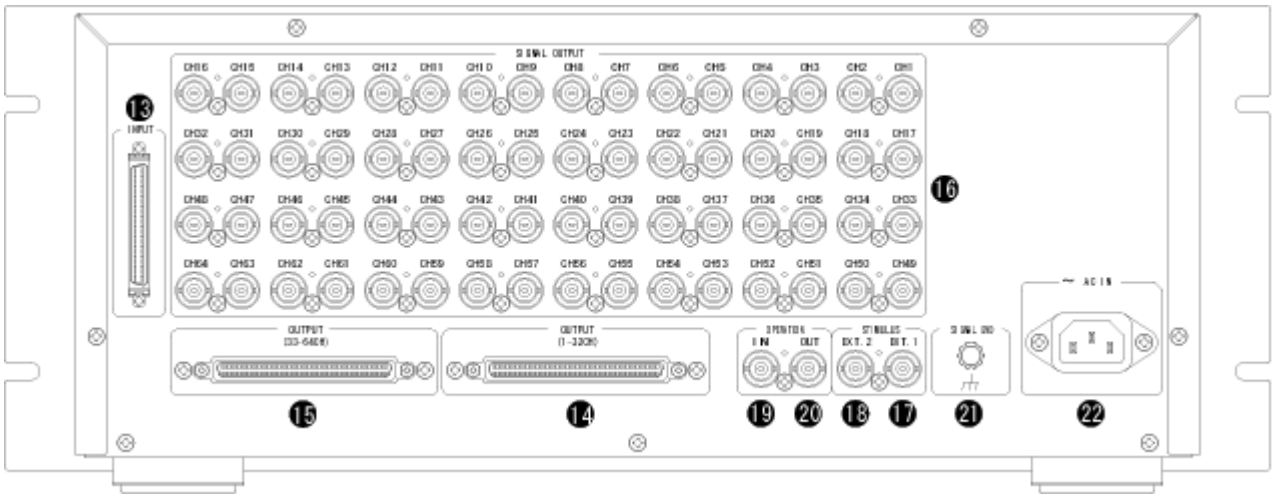
The terminal(s) used to select the stimulus electrodes on the MED probe. Use a MED64 stimultion cord to connect to either terminals (2) through (5) or terminals (8) and (9).

*1 The internal stimulus amplifier in this unit delivers constant current pulses between the electrode selected with ELECTRODE SELECTOR (12) and the reference electrodes (see page 5).

*2 The external stimulus isolation unit(s) can be used to deliver monopolar pulses (mono-phasic or bi-phasic) pulses between one of the 64 electrodes and the reference electrodes (as is the case for the internal stimulators). In this scenario, the MED64 stimulation cord is connected between the + or - output terminal and one probe electrode of your choice using the Electrode Selector panel (12).

*3 The external stimulus isolation unit(s) can also be used to deliver true bipolar pulses between 2 electrodes of your choice from the 64 available points.

Back Panel



(13) INPUT
For connecting to the MED probe, through the MED-CO3 connector, to the amplifier.

(14) OUTPUT(1-32CH)
For connecting the output of channels 1-32 to the to the first A/D board in the computer.

(15) OUTPUT(33-64CH)
For connecting the output of channels 33-64 to the to the second A/D board in the computer.

(16) SIGNAL OUTPUT
BNC connectors used to send analog outputs from selected recording channels to an external amplifier, signal processor, or other device (e.g. - oscilloscope).

(17) STIMULUS EXT 1
For connecting to an external stimulus isolation unit. Outputs the EXT 1 trigger pulse from the computer to the external stimulator.

(18) STIMULUS EXT 2
For connecting to an external stimulus isolation unit. Outputs the EXT 2 trigger pulse from the computer to the external stimulator.

(19) OPERATION IN
Input port for signals from exernal components.

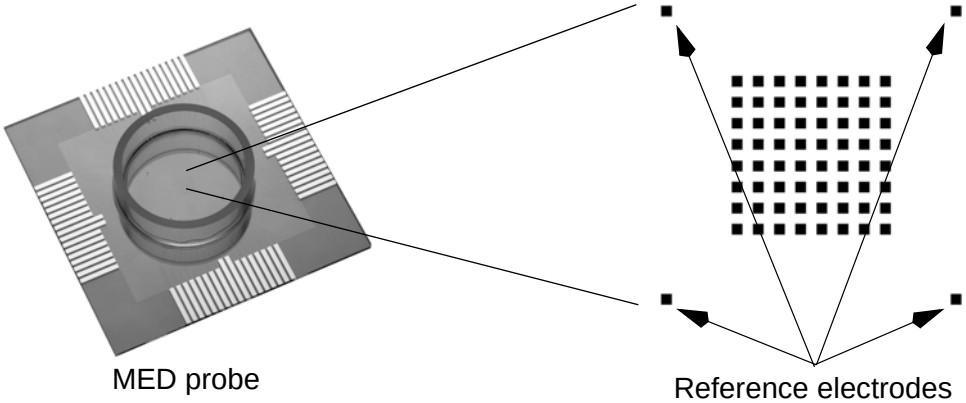
(20) OPERATION OUT
Output port for signals to the external components.

(21) SIGNAL GND
A ground terminal for signals.

(22) ~ AC IN
Insert the AC power supply cord here.

Reference Electrodes

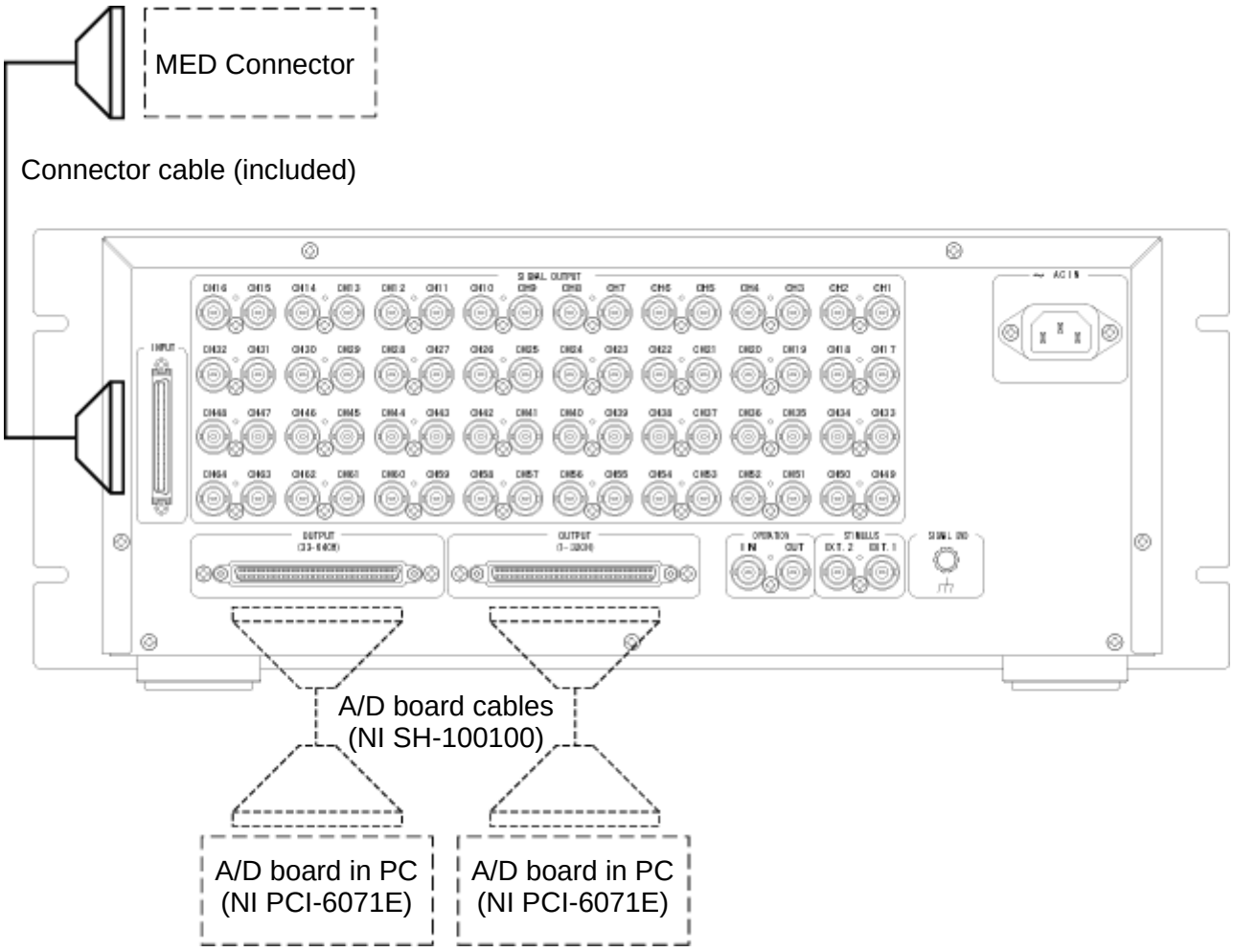
To optimize the signals from all 64 electrodes as recording/stimulating electrodes, reference electrodes have been added. This allows differential recording to be made between each channel and reference electrodes. It also optimizes the delivery of mono-polar stimuli, as they are delivered between the chosen (recording) electrode and the reference electrodes.



Connection to other components

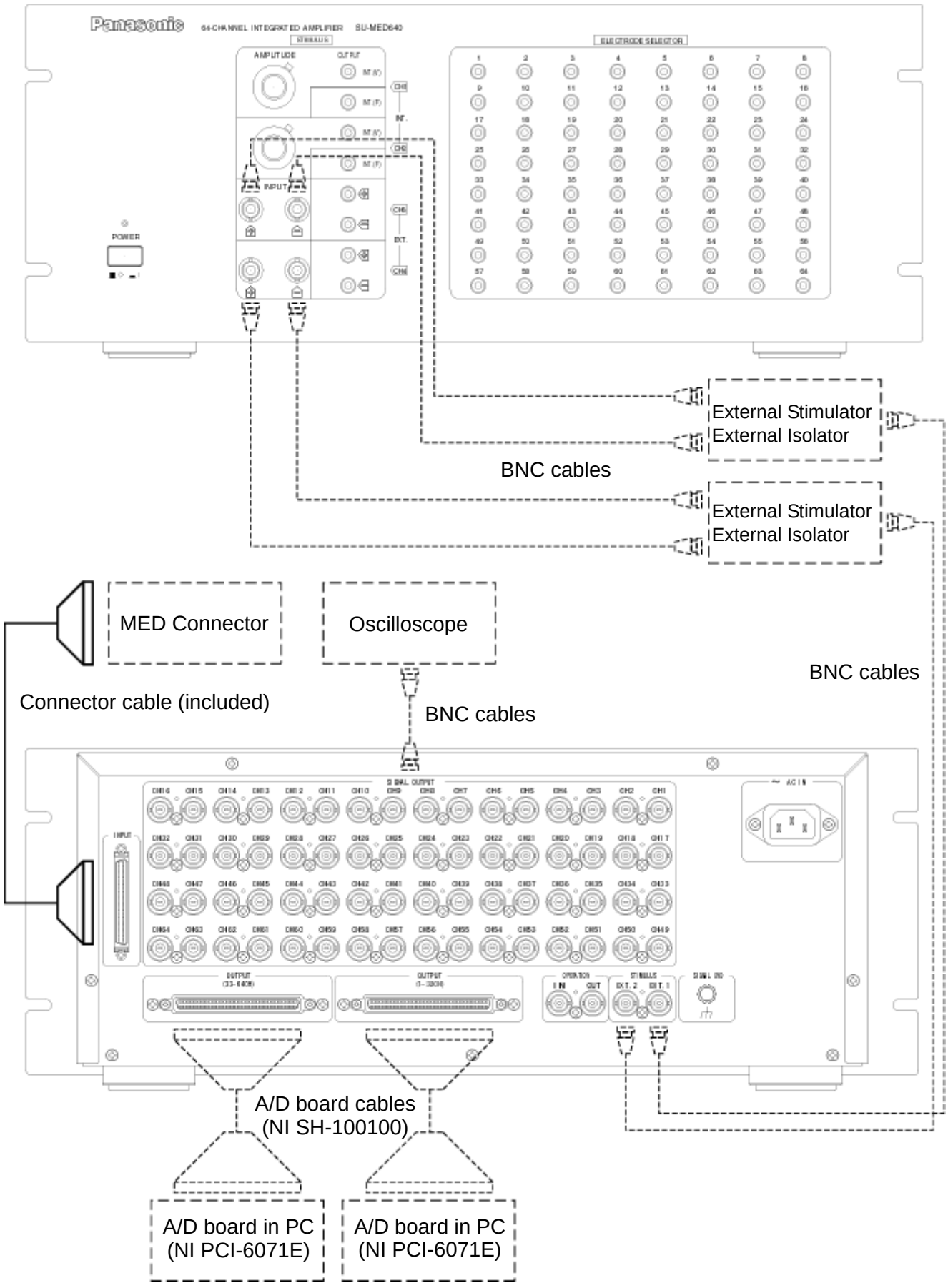
Usage of internal stimulus amplifier

(Components and cables indicated with dashed lines are not included)



Using the MED64 amplifier with External Devices (stimulator, isolator, oscilloscope).

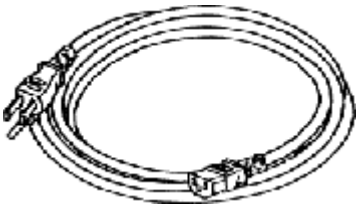
Caution: Do NOT connect MED64 stimulation cord on the internal stimulator outputs (CH1 or CH2).
(Components and cables indicated with dashed lines are not included.)



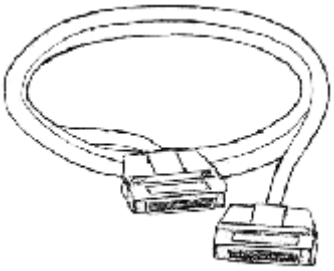
Precautions during use

Always, turn ON the amplifier power BEFORE starting up the software. The software sends information to the amplifier for initialization of the internal stimulators and other features (e.g. filtering) necessary for accurate recording of data. Failure to do so (i.e. turning ON power to the amplifier after the software starts up) will lead to inaccuracies in stimulus delivery and the data recorded.

Included accessories



Power supply cord (1 pc.)



Connector cable (1 pc.)

Stimulation cord(4 pcs.)

Warranty

This product will be repaired with new or refurbished parts, free of charge, for one (1) year from the date original purchase in the event of a defect in materials or workmanship.

The product warranty covers failures due to defects in materials or workmanship which occur during normal use. It does NOT cover damage which occurs in shipment or failures which are caused by products not supplied by Alpha MED Sciences. In addition, this warranty does not cover failures resulting with results from alteration, accident, misuse, neglect, faulty installation, maladjustment of user controls, improper maintenance, modifications or service by anyone other than AMS or damage that is attributable to acts of God.

Please refer attached warranty card in detail.

Specifications

[Recording unit]	
Channels	64
Input impedance	100 MΩ
Maximum output voltage	+/- 12 Vp
Output impedance	2.2 kΩ
Amplification	x 1000 (60 dB)
Low-cut filter	0.1, 1, 10 and 100 Hz
(PC control, Stimulation 64 CH switch)	(4 settings, 12 dB/oct)
Frequency range (low-cut: 0.1 Hz)	0.1 Hz to 10 kHz (+0 dB to -3 dB)
Residual noise	< 4 mV (input; shor circuit)
[Stimulus unit]	
Output format	Constant current
Channels	
with variable dial (V)	2
without variable dial (F)	2
Amplification adjustment	0 to 10 times (in 0.1 steps)
Maximum output voltage	+/- 12 Vp
Maximum output amplitude	
with variable dial (V)	+/- 2 mAp
without variable dial (F)	+/- 2 mAp
[General]	
Power requirement	AC 120V, 60 Hz
Power consumption	33 W
Weight	13.0 kg
Dimensions	W 483 x H 186 x D 430 mm

Specifications may not be satisfied depending upon the type of computer or operating environments used.
Only for use in animal studies research.
Specifications and external appearance are subject to change without notice.

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Manufactured by **Alpha MED Scientific Inc.**

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