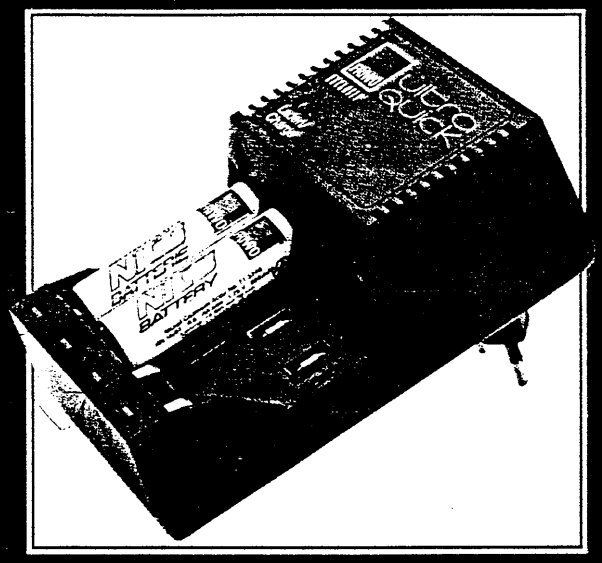
575-781/800 THE EXCLUSIV RANGE

FRIWO®
EXCLUSIV



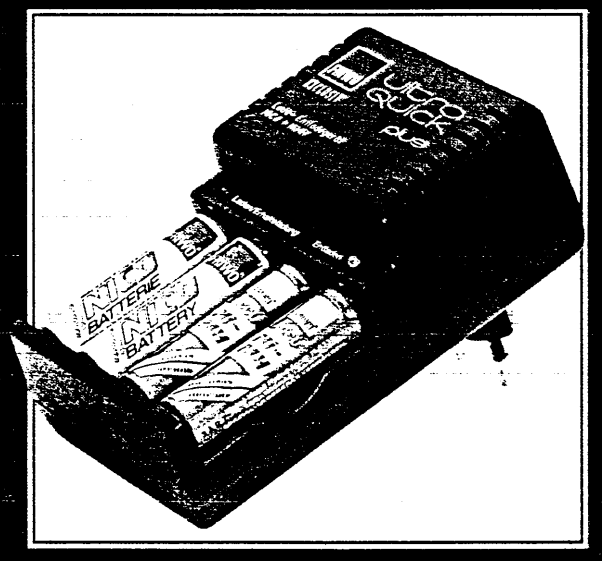
ultra quick — 1 Hour Charger

for 1-4 NiCd cells Mignon AA

Charging current
Fast charging : approx 600 mA
Trickle charging : approx 13 mA
Charging time : approx 1 hour
Packing : Individual colour printed box

The ULTRA QUICK 1 hour charger features a dual safety control system using temperature sensing and time. Charging is indicated by a red LED. If during the charging process an individual cell reaches a predetermined temperature (45°C) then charging ceases, indicated by a green LED for that cell. If the temperature is not reached before one hour, then the integrated timer will stop the fast charge and automatically drop to a safe trickle charge on all cells, indicated by 4 LEDs. The batteries can be left on trickle so they are always ready for use.

Order No. 11.7117



ultra quick plus

Fast Charger / Discharger

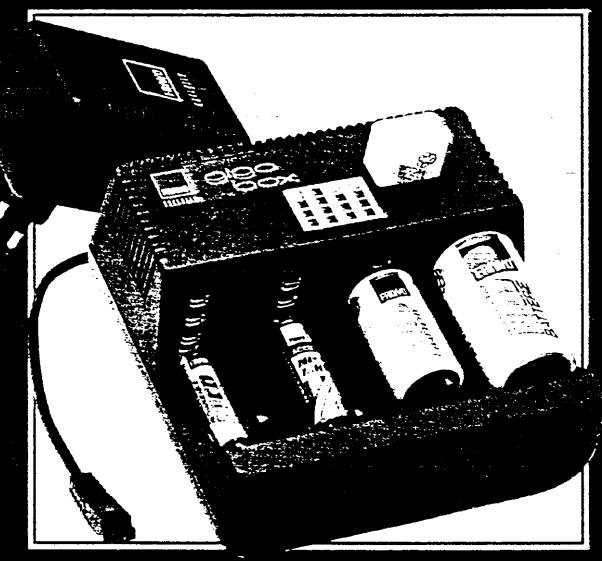
for a combination of NiCd and NiMH batteries type Mignon AA 500 - 1.200 mAh

new

Charging current : approx 500 mA
Trickle charging : Impulse
Charging time : from 1 hour
Packing : Individual colour printed box

The discharge / charge process ensures cells are always charged to their maximum capacity. The Ultra Quick Plus will charge both NiCd and NiMH of varying capacities. The charging process is controlled by -ΔV sensing and by an integrated timer. The timer automatically switches to trickle impulse charge after approximately 160 mins. The different functions are indicated by LEDs.

Order No. 11.8603



giga box — Microprocessor controlled Discharger/ Charger

for a combination of 1-4 NiCd and NiMH cells of the following types Micro AAA; Mignon AA; Baby C; Mono D; and one 9V block.

new

Charging current : approx 700 mA
Trickle charging : Impulse
Charging time : from 1 hour
Packing : Individual colour printed box

The unit comprises a charging box with a separate plug-in power supply. The GIGA BOX is capable of charging 1-4 batteries of different types, sizes and capacities, as well as a 9V block. Operating the discharger then ensures all cells are charged to their maximum capacity. The microprocessor controls the voltage gradient and terminates the charging process correspondingly. A multiple array of LEDs shows the charging state for each cell being charged. An acoustic signal indicates the completion of charging and the GIGA BOX automatically changes to an impulse trickle charge.

Order No. 11.8605

POWER SUPPLIES

APPLICATIONS

FRIWO mains adaptors are designed to power equipment fitted with an input socket. Mains adaptors give a constant supply of power and therefore avoid the limitations of using batteries. Hence most consumer equipment powered by low voltage is fitted with a socket for an external supply.

Plug-in adaptors

These adaptors have the mains plug incorporated in their base so they can be inserted directly into the mains socket. They are small and compact and have various voltages to power modern electronic equipment such as Radios, cassette players, small computers, calculators, dictaphones and other similar equipment.

Desk top adaptors

These adaptors have the mains lead (2m long) for connection to a mains socket. All these power supplies have a regulated secondary voltage. They are available with various voltages and are generally a higher power range than plug-in. Application: radiotelephones, computers, printers and other similar equipment.

Choosing the right adaptor for each application

The choice of adaptor depends on the equipment to be powered. It is important to determine the input voltage (V) and the current (mA or A), this sometimes can be shown as volts multiplied by current (VA or W), of the equipment. FRIWO offer a wide range of mains adaptors to suit most types of equipment.

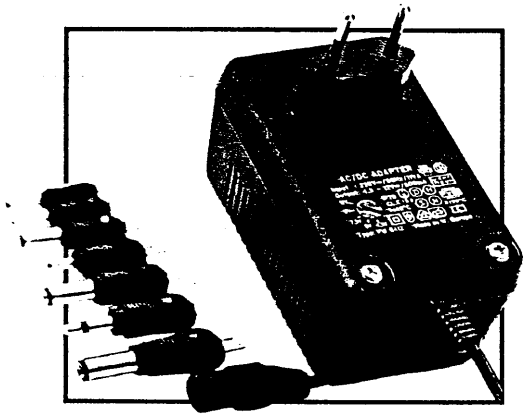
Regulated or unregulated

Most low current battery powered products will work satisfactorily with unregulated adaptors and, being less complex are not as expensive as regulated adaptors. Variations in input voltage will have a small effect on the output with unregulated adaptors and no effect on regulated adaptors. When unregulated adaptors are lightly loaded, the output voltage will rise. As the current loading increases to full load, the output voltage falls to the selected or designed voltage. For example the power demanded ba a radio or cassette recorder will vary with the volume setting. In a regulated adaptor the voltage remains constant whatever the loading.

MADE IN GERMANY
2 YEARS WARRANTY

Adaptors in operation

FRIWO adaptors are designed to run on a mains electric supply (for Europe 230 VAC +/- 10% 50 Hz) and are manufactured to suit most country's mains voltage and plug configuration (see page 12). There are two ranges of adaptors. Firstly a range with selectable voltage outputs, the voltage being set by a rotarry switch in the base. They are supplied with a set of output connectors common to most eqipment. Secondly a range of fixed output mains adaptors for use with specific types of equipment.



FRIWO®

APPLICATIONS

Mains chargers in combination with the appropriate rechargeable cells are an alternative economic solution for powering battery operated equipment. FRIWO offer a range of chargers for NiCd cells, Lead acid/solid gel cells (see page 19) and the new NiMH cells. Generally the chargers are designed to operate on mains electric supply (in Europe 230 VAC +/- 10% 50Hz) and are manufactured to suit most country's mains supply and plug configuration (see page 12).

The right charger to use

Firstly determine the type of cell to be charged (NiCd, NiMH or Lead acid/gel). Then determine the size, capacity (mAh) and charging current or charge, also whether the cells are charged insitu or removed from the equipment. All this information will help you select the correct FRIWO chargers form the following pages.

Charge time calculation

$$\frac{\text{Nominal capacity of cells (mAh)} \times \text{Charging factor (F)}}{\text{Charging current (mA)}} = \text{Time}$$

Where F = NiCd and NiMH 1.4, acid / gel 1.2
e.g. "C" size NiCd 1200 mAh charging 0.1 C

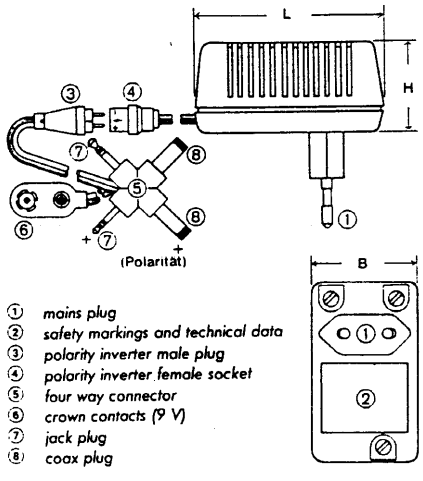
$$\frac{1200 \times 1.4}{120} = 14 \text{ hours}$$

Charging techniques

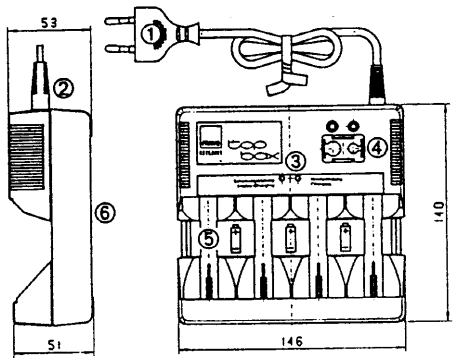
The standard method of charging applies a current equivalent to 1/10th of the nominal capacity of the cell. On this basis a fully discharged cell will be recharged in approximately 14 hours. Cells can be fast charged in controlled conditions in 1 hour, the controls being a combination of time or temperature or -V sensing. NiCd and NiMH cells are charged using a constant current and lead acid/solid gel cells require a constant voltage. All FRIWO chargers fully comply with the European regulations and for eese and safe use are provided with a comprehensive instruction manual and technical data.

Nickel Metal Hydride cells (NiMH)

NiMH cells are at the leading edge of technology. They are more enviromentally friendly because they contain none of the heavy metals such as Cadmium or Mercury. FRIWO claim to have produced the first charger single NiMH cells. These cells are particularly useful when portability and working capacity are important.



① mains plug
② safety markings and technical data
③ polarity inverter male plug
④ polarity inverter female socket
⑤ four way connector
⑥ crown contacts (9 V)
⑦ jack plug
⑧ coax plug



① mains lead and plug
② grommet
③ charging control (LED)
④ charging compartment for 9 V block cells
⑤ compartment for cylindrical cells
⑥ movable contact, "negative" slider
⑦ safety markings and technical data

MADE IN GERMANY
2 YEARS WARRANTY

NICD CELLS

APPLICATIONS

NiCd cells should be used when ever power consumption is relatively frequent and high. Compared to the cost of dry batteries, rechargeable NiCd are more economic and are cost effective after a few charge cycles. FRIWO NiCd cells can be charged / discharged frequently used on standby; trickle charged; fast charged.

FRIWO NiCd cells – safety guaranteed

FRIWO NiCd cells Incorporate a safety valve which protects them against improper use. Even occasional overcharging for periods up to 100 hours at a current of 1/10 of the cell capacity will have no adverse affect on their proper function. However it is advisable to always follow the instructions provided with the charger. This will ensure the cells are correctly charged and will prolong their live considerably. FRIWO cells can be fast charged safety with an appropriate charger.

NiCd cells in use

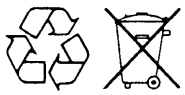
Normally NiCd cells are supplied uncharged and therefore before use will need charging. The cell will attain it's full working capacity after 2 or 3 charge/discharged cycles. This also applies when the cells are used intermittently or have been stored for a long period. The contacts of the cell should be kept clean and free from corrosion in order to ensure good electrical continuity. Care needs to be taken when disposing of NiCd cells DO NOT BURN THEM. NiCd cells are recyclable.

Comparison between dry batteries and NiCd cells

The nominal voltage of a dry battery (primary cell) is normally about 1.5 V / cell and the NiCd cell (secondary cell) is 1.24 V / cell. Dry cells in use lose their voltage as they lose their capacity and quickly drop to 0.75 V. Where as NiCd cells in use have a small initial drop in voltage and then the voltage remains constant until approx 90% of the capacity has been used. At that stage there is an abrupt drop in voltage and the cell would be considered discharged.

Recycling

Rechargeable NiCd cells with these symbols can be recycled. In some countrys there are special containers for spent NiCd cells.



Ni-Cd Cd