Service Manual

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Service Information

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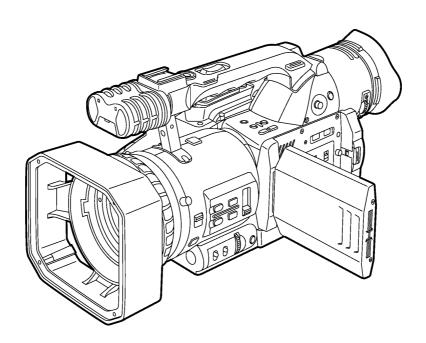
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Digital Video Camera Recorder AG-DVX100AP/AN AG-DVX100AE/EN AG-DVC180AMC



Panasonic

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This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

AG-DVX100AP Specifications

[GENERAL]

Supply voltage: DC 7.2/7.9 V

Power consumption:

6.8 W (when viewfinder is used) 7.8 W (when LCD monitor is used) 9.2 W (max.)

ndicates safety information.

Ambient operating temperature

32°F to +104°F (0°C to +40°C)

Ambient operating humidity

10% to 85% (no condensation)

Weight

3.731 lb (1.69 kg)

(excluding battery and accessories)

Dimensions (W \times H \times D)

5 1/2×6 5/16×14 3/8 inches

(139×160×364 mm)

Recording format

Digital video SD format

Tape format

Mini DV

Recorded video signals

525i (NTSC)

In the progressive mode, the signals are converted into the 525i system and recorded.

Shooting mode

60i (525i)

Progressive mode (30P, 24P or 24P

advance)

Recorded audio signals

PCM digital recording

16 bits: 48 kHz/2 channels

12 bits: 32 kHz/4 channels

Recording tracks

Digital video, audio signals:

helical track

Time code:

helical track (sub-code area)

Tape speed

SP mode: 18.812 mm/sec. LP mode: 12.555 mm/sec.

Recording time (when AY-DVM60 is used)

SP mode: 60 minutes LP mode: 90 minutes

Tape used

6.35 mm wide metal tape

FF/REW time

Approx. 85 sec. (when AY-DVM60 is used)

Pick-up device

Interline transfer 1/3-inch CCD image senser

 $(\times 3)$

Number of pixels

Total number of pixels: 410,000, Number of effective pixels: 380,000

(pixel offset system)

Lens

Leica DICOMAR optical image stabilizer lens, motorized/manual mode switching, 10× zoom

F1.6 (f = 4.5 to 45 mm)

(35 mm equivalent: 32.5 to 325 mm)

Optical system

Prism system

ND filters

1/8, 1/64

Gain

0, +3, +6, +9, +12, +18 dB (60i mode)

0, +3, +6, +9, +12 dB (progressive mode)

(Fixed at 0 dB in the slow shutter mode)

Shutter speeds

Preset

60i mode:

1/60 (OFF), 1/100, 1/120, 1/250, 1/500,

1/1000, 1/2000 sec.

30P mode:

1/30, 1/50 (OFF), 1/60, 1/120, 1/250,

1/500, 1/1000 sec.

24P, 24P (ADV) mode:

1/24, 1/50 (OFF), 1/60, 1/120, 1/250,

1/500, 1/1000 sec.

Synchro scan

60i mode : 1/60.3 to 1/250.0 sec.

30P mode: 1/30.1 to 1/250.0 sec.

24P, 24P (ADV) mode:

1/24.1 to 1/250.0 sec.

Slow shutter

60i mode: 1/4, 1/8, 1/15, 1/30

30P mode: 1/4, 1/8, 1/15

24P/24P (ADV) mode:

1/6, 1/12

Minimum subject illuminance

3 lux (F1.6, 18 dB gain, 50 IRE video output)

Lens hood

Large-sized lens hood with wide angle of

view

Filter diameter

72 mm

LCD monitor

3.5-inch LCD color monitor, 200,000 pixels

Viewfinder

0.44-inch LCD color viewfinder, 180,000

pixels

Internal microphone

Stereo microphone

Internal speaker

20 mm diameter

Specifications

[VIDEO]

Sampling frequency

Y: 13.5 MHz, PB/PR: 3.375 MHz

Quantizing

8 bits

Video compression system

DCT + variable length code

Error correction

Reed-Solomon product code

[AUDIO]

Sampling frequency

48 kHz/32 kHz

Quantizing

16 bits/12 bits

Frequency response

20 Hz to 20 kHz

Wow & flutter

Below measurable limits

[CONNECTORS]

VIDEO IN/OUT (input/output automatically switched)

Pin jack, analog composite input/output, 1.0 V [p-p], 75 Ω

S-VIDEO IN/OUT (input/output automatically switched)

S-connector, Y/C separate signal input/output, Y: 1.0 V [p-p], C: 0.286 V [p-p], 75 Ω

AUDIO IN/OUT (input/output automatically switched)

Pin jacks $\times 2$ (CH1, CH2) Input: 316 mV, high impedance Output: 316 mV, 600 Ω

DV

4-pin, digital input/output, IEEE 1394 standard complied with

INPUT 1, INPUT 2

XLR (3 pins) \times 2 (CH1, CH2)

LINE/MIC switching, high impedance

LINE: 0 dBu

MIC: -50 dBu/-60 dBu (menu selection)

DC INPUT

7.9 V

PHONES

Stereo (3.5 mm diameter)

CAM REMOTE

Mini jack (2.5 mm diameter)

[AC ADAPTER]

Power Source:

110/120/220/240 V AC, 50/60 Hz

Power Consumption:

18 W

indicates safety information.

Weight

0.35 lb (0.16 kg)

Dimensions (W \times H \times D)

2 $13/16 \times 1$ $13/16 \times 4$ 5/8 inches $(70 \times 44.5 \times 116 \text{ mm})$

[OPTIONAL ACCESSORIES]

Wide conversion lens

AG-LW7208G

16:9 conversion lens

AG-LA7200G

XLR microphone

AG-MC100G

Hard carrying case

AG-HT100G

Soft carrying case

AG-SC100G

Battery

CGR-D16 (1600 mAh: product equivalent to

battery supplied)

CGP-D28 (2800 mAh)

CGA-D54 (5400 mAh)

AC adapter kit

AG-B15 (product equivalent to AC cable, DC cable and AC adapter supplied)

Cleaning tape

AY-DVMCLA

Weight and dimensions shown are approximate. Specifications are subject to change without notice.

Specifications

[GENERAL]

Supply voltage:

DC 7.2 V (Battery)

DC 7.9 V (AC adapter)

Power consumption:

6.8 W (when viewfinder is used)

7.8 W (when LCD monitor is used)

9.2 W (max.)

indicates safety information.

Ambient operating temperature

0°C to +40°C

Ambient operating humidity

10% to 85% (no condensation)

Weight

1.69 kg (excluding battery and accessories)

Dimensions (W \times H \times D)

 $139 \times 160 \times 364 \text{ mm}$

Recording format

Digital video SD format

Tape format

Mini DV

Recorded video signals

625i (PAL)

In the progressive mode, the signals are converted into the 625i system and recorded.

Shooting mode

50i (625i)

Progressive mode (25P)

Recorded audio signals

PCM digital recording

16 bits: 48 kHz/2 channels 12 bits: 32 kHz/4 channels

Recording tracks

Digital video, audio signals:

helical track

Time code:

helical track (sub-code area)

Tape speed

SP mode: 18.831 mm/sec. LP mode: 12.568 mm/sec.

Recording time (when AY-DVM60 is used)

SP mode: 60 minutes LP mode: 90 minutes

Tape used

6.35 mm wide metal tape

FF/REW time

Approx. 85 sec. (when AY-DVM60 is used)

Pick-up device

Interline transfer 1/3-inch CCD image senser $(\times 3)$

Number of pixels

Total number of pixels: 470,000, Number of effective pixels: 440,000 (pixel offset system)

Lens

Leica DICOMAR optical image stabilizer lens, motorized/manual mode switching, $10 \times$ zoom F1.6 (f = 4.5 to 45 mm)

(35 mm equivalent: 32.5 to 325 mm)

Optical system

Prism system

ND filters

1/8, 1/64

Gain

0, +3, +6, +9, +12, +18 dB (50i mode) 0, +3, +6, +9, +12 dB (progressive mode) (Fixed at 0 dB in the slow shutter mode)

Shutter speeds

Preset

50i mode:

1/50 (OFF), 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000 sec.

25P mode:

1/25, 1/50 (OFF), 1/60, 1/120, 1/250, 1/500, 1/1000 sec.

Synchro scan

50i mode:

1/50.2 to 1/248.0 sec.

25P mode:

1/25.1 to 1/248.0 sec.

Slow shutter

50i mode:

1/3, 1/6, 1/12, 1/25 sec.

25P mode:

1/3, 1/6, 1/12 sec.

Minimum subject illuminance

3 lux (F1.6, 18 dB gain, 50 % video output)

Lens hood

Large-sized lens hood with wide angle of view

Filter diameter

72 mm

LCD monitor

3.5-inch LCD colour monitor, 200,000 pixels

Viewfinder

0.44-inch LCD colour viewfinder, 180,000 pixels

Internal microphone

Stereo microphone

Internal speaker

20 mm diameter

Specifications

[VIDEO]

Sampling frequency

Y: 13.5 MHz, PB/PR: 6.75 MHz

Quantizing

8 bits

Video compression system

DCT + variable length code

Error correction

Reed-Solomon product code

[AUDIO]

Sampling frequency

48 kHz/32 kHz

Quantizing

16 bits/12 bits

Frequency response

20 Hz to 20 kHz

Wow & flutter

Below measurable limits

[CONNECTORS]

VIDEO IN/OUT (input/output automatically switched)

Pin jack, analogue composite input/output, 1.0 V [p-p], 75 Ω

S-VIDEO IN/OUT (input/output automatically switched)

S-connector, Y/C separate signal input/output, Y: 1.0 V [p-p], C: 0.3 V [p-p],

AUDIO IN/OUT (input/output automatically switched)

Pin jacks $\times 2$ (CH1, CH2) Input: 316 mV, high impedance

Output: 316 mV, 600 Ω

DV

4-pin, digital input/output, IEEE 1394

standard complied with

INPUT 1, INPUT 2

XLR (3 pins) \times 2 (CH1, CH2)

LINE/MIC switching, high impedance

LINE: 0 dBu

MIC: -50 dBu/-60 dBu (menu selection)

DC INPUT

7.9 V

PHONES

Stereo (3.5 mm diameter)

CAM REMOTE

Mini jack (2.5 mm diameter)

[AC ADAPTER]

Input:

100 – 240 V AC, 50/60 Hz, 20 W

Output:

Video camera: DC 7.9 V, 1.4 A (max.)

Charge: DC 8.4 V, 1.2 A

indicates safety information.

Weight

0.16 kg

Dimensions (W \times H \times D)

 $70\times44.5\times116$ mm

[OPTIONAL ACCESSORIES]

Wide conversion lens

AG-LW7208G

16:9 conversion lens

AG-LA7200G

XLR microphone

AG-MC100G

Hard carrying case

AG-HT100G

Soft carrying case

AG-SC100G

Battery

CGR-D16S (1600 mAh)

CGP-D28S (2800 mAh)

CGA-D54S (5400 mAh: product equivalent to

battery supplied)

AC adapter kit

AG-B15E (product equivalent to AC cable,

DC cable and AC adapter supplied)

Cleaning tape

AY-DVMCLC

Weight and dimensions shown are approximate. Specifications are subject to change without notice.

SAFETY PRECAUTIONS

GENERAL GUIDELINES

- When servicing, observe the original lead dress. If a short circuit is found, replace all parts, which have been over-heated or damaged by the short circuit.
- After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
- After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

- Unplug the AC cord and connect a jumper between the two prongs on the plug.
- 2. Measure the resistance value, with an ohm meter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. The resistance value must be more than $5M\Omega$.

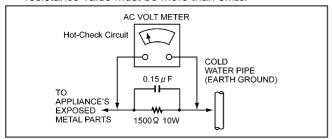


Figure1

LEAKAGE CURRENT HOT CHECK (See Figure 1)

- Plug the AC cord directly into the AC outlet.
 Do not use an isolation transformer for this check.
- 2. Connect a $1.5 \mathrm{K}\Omega$, 10W resistor, in parallel with a 0.15μ F capacitor, between each exposed metallic part on the set an a good earth ground such as a water pipe, as shown in Figure1.
- 3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
- 4. Check each exposed metallic part, and measure the voltage at each point.
- Reverse the AC plug in the AC outlet repeat each of the above measurements.
- 6. The potential at any point should not exceed 0.15 volts RMS. A leakage current tester (Simpson Model 229 equivalent) may be used to make the hot checks, leakage current must not exceed 0.1 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

ABOUT LEAD FREE SOLDER (PbF)

Distinction of Pbf PCB:

PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

Caution:

- Pb free solder has a higher melting point than standard solder; Typically the melting point is 50–70°F (30-40°C) higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 700±20°F (370±10°C).
- Pb free solder will tend to splash when heated too high (about 1100°F/600°C).

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically sensitive (ED) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

- Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground.
 - Alternatively, obtain and wear a commercially available discharging wrist trap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
- After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
- 3. Use only a grounded tip soldering iron to solder or unsolder ES devices.
- 4. Use only an anti-static solder removal device classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
- Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
- Do not remove a replacement ES device from its protective package until immediately before you are ready to install it.
 - (most replacement ES devices are package with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
- Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
 - CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
- 8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise hamless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

X-RADIATION

WARNING

- 1. The potential source of X-radiation in EVF sets is the High Voltage section and the picture tube.
- When using a picture tube test jig for service, ensure that jig is capable of handling 10kV without causing X-Radiation.

Note: It is important to use an accurate periodically calibrated high voltage meter.

Measure the High Voltage. The meter (electric type) reading should indicate 2.5kV, ±0.15kV. If the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure. To prevent an X-Radiation possibility, it is essential to use the specified picture tube.

IMPORTANT

"Unauthorized recording of copyrighted television programs, video tapes and other materials may infringe the right of copyright owners and be contrary to copyright laws."



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER TO SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (service) instructions in the literature accompanying the appliance.

WARNING:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, KEEP THIS EQUIPMENT AWAY FROM ALL LIQUIDS-USE AND STORE ONLY IN LOCATIONS WHICH ARE NOT EXPOSED TO THE RISK OF DRIPPING OR SPLASHING LIQUIDS, AND DO NOT PLACE ANY LIQUID CONTAINERS ON TOP OF THE EQUIPMENT.

CAUTION:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

CAUTION:

Do not install or place this unit in a bookcase, built-in cabinet or any other confined space in order to maintain adequate ventilation. Ensure that curtains and any other materials do not obstruct the ventilation to prevent risk of electric shock or fire hazard due to overheating.

CAUTION:

The socket-outlet shall be installed near the equipment and shall be easily accessible.

FCC Note:

This device complies with Part 15 of the FCC Rules. To assure continued compliance follow the attached installation instructions and do not make any unauthorized modifications.

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION:

Danger of explosion or fire if battery is mistreated.

- Replace only with same or specified type.
- Do not disassemble or dispose of in fire.
- Do not store in temperatures over 60°C.
- Use specified charger for rechargeable batteries.
- Do not recharge the battery if it is not a rechargeable type.

For Remote Controller

- Replace battery with part No. CR2025 only.
- Do not recharge the battery.

Notice (U.S.A.only):

This product has a fluorescent lamp that contains a small amount of mercury.

It also contains lead in some components. Disposal of these materials may be regulated in your community due to environmental considerations.

For disposal or recycling information please contact your local authorities, or the Electronics Industries Alliance:

http://www.eiae.org.>

CAUTION:

TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

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Caution for AC Mains Lead

FOR YOUR SAFETY PLEASE READ THE FOLLOWING TEXT CAREFULLY.

This product is equipped with 2 types of AC mains cable. One is for continental Europe, etc. and the other one is only for U.K.

Appropriate mains cable must be used in each local area, since the other type of mains cable is not suitable.

FOR CONTINENTAL EUROPE, ETC.

Not to be used in the U.K.



FOR U.K. ONLY

If the plug supplied is not suitable for your socket outlet, it should be cut off and appropriate one fitted.



FOR U.K. ONLY

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 5 amp fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amps and that it is approved by ASTA or BSI to BS1362. Check for the ASTA mark p or the BSI mark p on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY. THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT: The wires in this mains lead are coloured in accordance with the following code:

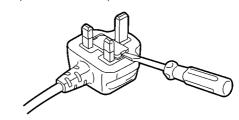
Blue: Neutral Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

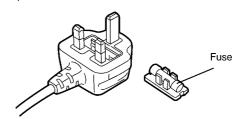
- The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
- The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.
- Under no circumstances shoul either of these wires be connected to the terminal in the plug which is marked with the letter E or by the Earth symbol <u>____</u>.

How to replace the fuse

1. Open the fuse compartment with a screwdriver.



2. Replace the fuse.



IMPORTANT

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Operating precaution

Operation near any appliance which generates strong magnetic fields may give rise to noise in the video and audio signals. If this should be the case, deal with the situation by, for instance, moving the source of the magnetic fields away from the unit before operation.

■ DO NOT REMOVE PANEL COVER BY UNSCREWING.

To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

CAUTION:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

CAUTION:

Do not install or place this unit in a bookcase, built-in cabinet or any other confined space in order to maintain adequate ventilation. Ensure that curtains and any other materials do not obstruct the ventilation to prevent risk of electric shock or fire hazard due to overheating.

AC Adapter

- The rating plate is on the underside of the AC Adapter.
- Disconnect the AC mains plug from the AC mains socket when not in use.

CAUTION:

Danger of explosion or fire if battery is mistreated.

- Replace only with same or specified type.
- Do not disassemble or dispose of in fire.
- Do not store in temperatures over 60°C.
- Use specified charger for rechargeable batteries.
- Do not recharge the battery if it is not a rechargeable type.

For Remote Controller

- Replace battery with part No. CR2025 only.
- Do not recharge the battery.

WARNING:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, KEEP THIS EQUIPMENT AWAY FROM ALL LIQUIDS-USE AND STORE ONLY IN LOCATIONS WHICH ARE NOT EXPOSED TO THE RISK OF DRIPPING OR SPLASHING LIQUIDS, AND DO NOT PLACE ANY LIQUID CONTAINERS ON TOP OF THE EQUIPMENT.

CAUTION:

The socket-outlet shall be installed near the equipment and shall be easily accessible.

indicates safety information.

Attention/Attentie

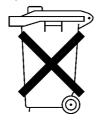
 Batteries are used for the main power source, memory back-up in the product and remote controller.

At the end of their useful life, you should not throw them away.

Instead, hand them in as small chemical waste.

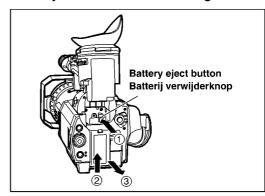
 Voor de primaire voeding en het reservegeheugen van het apparaat, alsmede voor de afstandsbediening, wordt gebruik gemaakt van een batterij.

Wanneer de batterij uitgeput is, mag u deze niet gewoon weggooien, maar dient u ze als klein chemisch afval weg te doen.



To remove the battery/ Verwijderen van de batterij

Main Power Battery
Batterij Voor Primaire Voeding



Panasonic