the t.amp

S-75 MK II, S-100 MK II, S-150 MK II

User Manual

Power Amplifier

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Table of contents


PEAK
0
-3
-6
-13
SIG
CH-1
CH-2
PRO
BR
PAR
POWER
the t.amp S-75 mk2
PROFESSIONAL POWER AMPLIFIER
POWER
the t.amp S-100 mk2
PROFESSIONAL POWER AMPLIFIER
POWER
the t.amp S-150 mk2
PROFESSIONAL POWER AMPLIFIER
POWER

1 General information

This document contains important instructions for the safe operation of the product. Read and follow the safety instructions and all other instructions. Keep the document for future reference. Make sure that it is available to all those using the product. If you sell the product to another user, be sure that they also receive this document.

Our products and documentation are subject to a process of continuous development. They are therefore subject to change. Please refer to the latest version of the documentation, which is ready for download under *www.thomann.de*.

1.1 Symbols and signal words

In this section you will find an overview of the meaning of symbols and signal words that are used in this document.

Signal word	Meaning
DANGER!	This combination of symbol and signal word indicates an immediate dangerous situation that will result in death or serious injury if it is not avoided.
WARNING!	This combination of symbol and signal word indicates a possible dangerous situation that can result in death or serious injury if it is not avoided.
NOTICE!	This combination of symbol and signal word indicates a possible dangerous situation that can result in material and environmental damage if it is not avoided.

Warning signs	Type of danger
	Warning – high-voltage.
	Warning – danger zone.

2 Safety instructions

Intended use

This device amplifies electric audio frequency signals to operate passive speakers. Use the device only as described in this user manual. Any other use or use under other operating conditions is considered to be improper and may result in personal injury or property damage. No liability will be assumed for damages resulting from improper use.

This device may be used only by persons with sufficient physical, sensorial, and intellectual abilities and having corresponding knowledge and experience. Other persons may use this device only if they are supervised or instructed by a person who is responsible for their safety.

Safety

DANGER!

Risk of injury and choking hazard for children!

Children can suffocate on packaging material and small parts. Children can injure themselves when handling the device. Never allow children to play with the packaging material and the device. Always store packaging material out of the reach of babies and small children. Always dispose of packaging material properly when it is not in use. Never allow children to use the device without supervision. Keep small parts away from children and make sure that the device does not shed any small parts (such knobs) that children could play with.

DANGER!

Danger to life due to electric current!

Within the device there are areas where high voltages may be present. Never remove any covers. There are no user-serviceable parts inside. Do not use the device when covers, safety equipment or optical components are missing or damaged.

DANGER!

Danger to life due to electric current!

A short circuit could lead to a fire hazard and risk of death. Always use proper ready-made insulated triple-core mains cable with a safety plug. Do not modify the mains cable or the plug. In case of isolation damage, disconnect immediately the power supply and arrange repair. If in doubt, seek advice from a qualified electrician.

WARNING!

Possible hearing damage due to high volumes on speakers or headphones!

With speakers or headphones connected, the device can produce volume levels that may cause temporary or permanent hearing impairment. Over an extended period of time, even levels that seem to be uncritical can cause hearing damage. Do not operate the device permanently at a high volume level. Decrease the volume level immediately if you experience ringing in your ears or hearing impairment.

NOTICE!

Risk of fire due to covered vents and neighbouring heat sources!

If the vents of the device are covered or the device is operated in the immediate vicinity of other heat sources, the device can overheat and burst into flames. Never cover the device or the vents. Do not install the device in the immediate vicinity of other heat sources. Never operate the device in the immediate vicinity of naked flames.

NOTICE!

Damage to the device if operated in unsuitable ambient conditions!

The device can be damaged if it is operated in unsuitable ambient conditions. Only operate the device indoors within the ambient conditions specified in the “Technical specifications” chapter of this user manual. Avoid operating it in environments with direct sunlight, heavy dirt and strong vibrations. Avoid operating it in environments with strong temperature fluctuations. If temperature fluctuations cannot be avoided (for example after transport in low outside temperatures), do not switch on the device immediately. Never subject the device to liquids or moisture. Never move the device to another location while it is in operation. In environments with increased dirt levels (for example due to dust, smoke, nicotine or mist): Have the device cleaned by qualified specialists at regular intervals to prevent damage due to overheating and other malfunctions.

NOTICE!

Damage to the device due to high voltages!

The device can be damaged if it is operated with the incorrect voltage or if high voltage peaks occur. In the worst case, excess voltages can also cause a risk of injury and fires. Make sure that the voltage specification on the device matches the local power grid before plugging in the device. Only operate the device from professionally installed mains sockets that are protected by a residual current circuit breaker (FI). As a precaution, disconnect the device from the power grid when storms are approaching or it the device will not be used for a longer period.

NOTICE!

Risk of fire due to installation of a wrong fuse!

Using fuses of a different type than compatible with the device may cause a fire and seriously damage the device. Only use fuses of the same type. Observe the labelling on the device casing and the information in the "Technical data" chapter.

NOTICE!

Interference with nearby electrical devices due to magnetic fields!

The device generates strong magnetic fields that can interfere with the function of poorly shielded devices. The magnetic fields are strongest directly above and below the Power Amplifier. You should therefore never place sensitive devices such as pre-amplifiers, radio transmission systems, or tape decks directly above or below the Power Amplifier. When placing the Power Amplifier in a rack, you should place it at the bottom thereof, and place any other equipment at the top of the rack.

NOTICE!

Possible staining due to plasticiser in rubber feet!

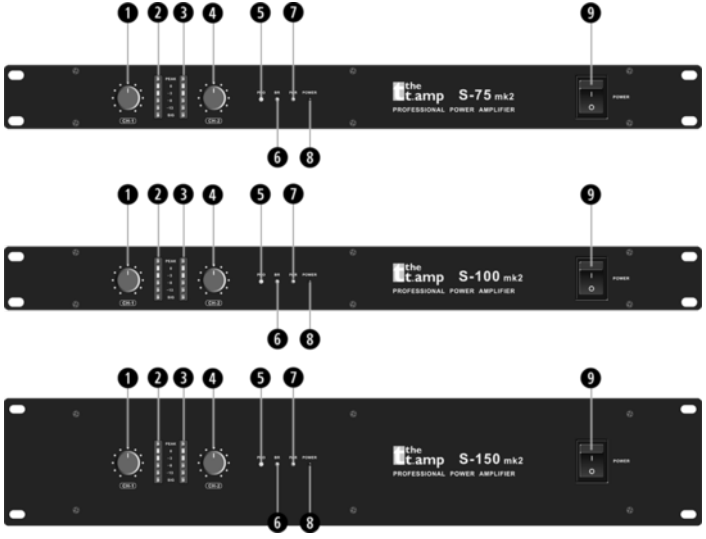
The plasticiser contained in the rubber feet of this product may react with the coating of the floor and cause permanent dark stains after some time. If necessary, use a suitable mat or felt slide to prevent direct contact between the device's rubber feet and the floor.

3 Features

- Output power 2 × 45 W to 250 W (depending on the model)
- Speaker Twist and terminal connections for speakers
- All protection circuits incl. soft start
- Input level switchable from –0 to +4 db
- Fanless operation
- Standby function

4 Connections and controls

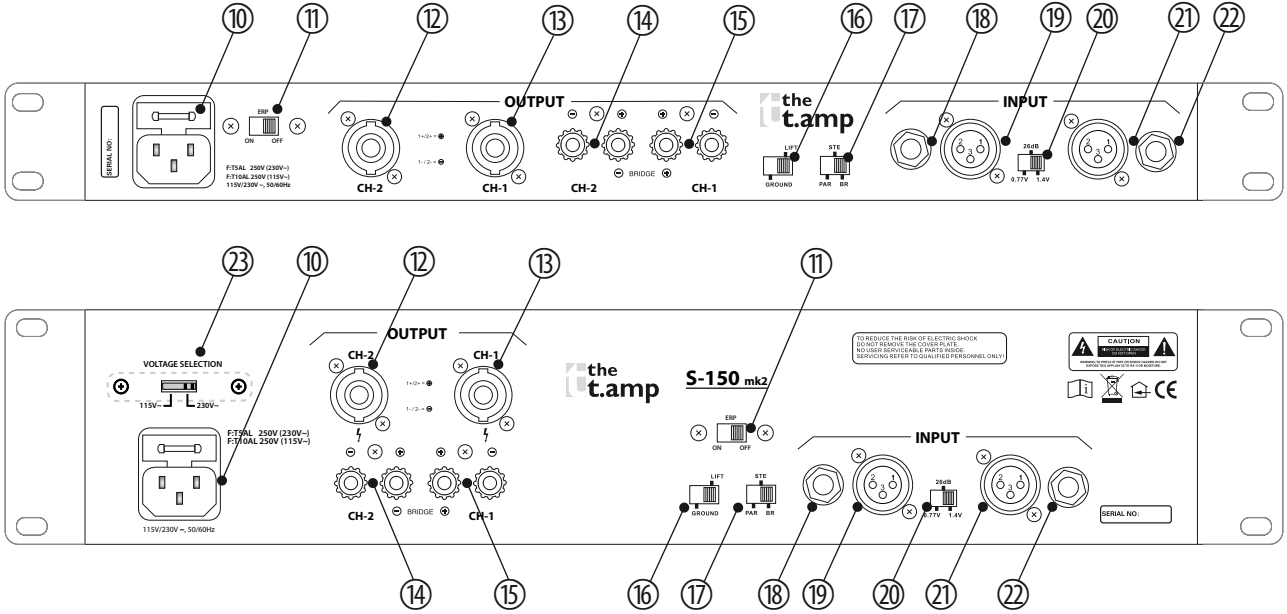
Front



1	*[CH-1]* | Input level controller for channel 1 Use the input level controllers CH-1 and CH-2 **(4)** on the front panel to control the signal amplification in the respective channel. If possible, turn this control fully to the right stop (= 0 dB attenuation) for optimal headroom. Professional power amplifiers then output their rated power, if the input voltage is 0.775 V or 1.4 V (depending on the position of the switch for the input sensitivity **[19]**).
2/3	*[PEAK]* | Indicator for level / maximum level These LED chains indicate the output power of the device in the respective. The PEAK indicator lights up when the output power reaches its maximum. If this indicator lights up continuously, the volume of the respective channel must be reduced. To do so, turn to the input level knob counter-clockwise.
4	*[CH-2]* | Input level controller for channel 2 Input level controller for channel 2, functionality is equal to point **(1)**.
5	*[PRO]* | Indicator for activated protection circuit This indicator lights up, if one of the following situations arises in one of the channels: • 3-5 seconds after switching on, as the speakers are still electrically disconnected from the power amplifier. • The temperature of the power amplifier transistors exceeds 85°C. • A malfunction exists in the device.
6	*[BR]* | Indicator for mono operation in bridged mode Please read more about the available operating modes in chapter *'Possible operation modes' on page 20*.

7	*[PAR]* | Indicator for mono operation in parallel mode Please read more about the available operating modes in chapter *'Possible operation modes' on page 20*.
8	*[POWER]* | Power indicator light Lights up green when the device is turned on. In standby mode, the LED lights up red. As soon as the unit receives a signal, it switches back to normal mode and the LED will light up green again.
9	*[POWER]* | ON/OFF switch Use this mains switch to turn the device on or off. The protection circuits are activated when the device is switched on. After a few seconds you will hear two 'clicks' - now the speakers are electrically connected to the power amplifier and the device is ready to operate. Electronic devices, and power amplifiers in particular, have especially high power consumption while they are switched on. Make sure not to turn on too many devices simultaneously. Otherwise you could overload the power supply circuit and trigger its fuse.

Back


⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒
SERIAL NO:
ERP
ON OFF
F:T5AL 250V (230V~)
F:T10AL 250V (115V~)
115V/230V ~, 50/60Hz
OUTPUT
CH-2
CH-1
CH-2
BRIDGE
CH-1
the t.amp
LIFT
GROUND
STE
PAR BR
INPUT
26dB
0.77V 1.4V
⑩ ㉓ ⑫ ⑬ ⑪
VOLTAGE SELECTION
115V~ 230V~
F:T5AL 250V (230V~)
F:T10AL 250V (115V~)
115V/230V ~, 50/60Hz
OUTPUT
CH-2
CH-1
CH-2
BRIDGE
CH-1
the t.amp
S-150 mk2
ERP
ON OFF
LIFT
GROUND
STE
PAR BR
INPUT
26dB
0.77V 1.4V
SERIAL NO:
CAUTION
⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒

10	Mains connector with fuse holder Connect the supplied power cord here and supply the device with mains voltage.
11	*[ERP ON | OFF]* | On / off switch for the standby function If the standby function is enabled, the device automatically switches to standby mode after 20 minutes without any input signal.
12/13	*[CH-1/2]* | Speaker outputs Connect speakers to the speaker outputs of channels 1 and 2 using SPK cables (wiring = 1+ 2+ 1– 2–).
14/15	*[CH-1/2]* | Speaker terminals You can connect the speakers to the cable terminals on the rear panel using either cable lugs or bare wire.
16	*[GROUND/LIFT]* | Earthing switch In normal operation, the signal source and the power amplifier(s) should share the same ground potential. In some constellations this can however lead to ground loops and thus to humming. If this happens, vary the toggle switch setting for ground potential on the rear panel of the device. In once setting, this switch connects the shield/ground of the input signal to the housing of the power amplifier and thus to mains earthing. In the other setting there is no electrical connection between the shield/ground of the input signal and the power amplifier housing.
17	*[STE / PAR / BR]* | Operating mode switch Use this switch to select the operating mode of the power amplifier: stereo (STE), parallel (PAR) or bridged (BR).
18	*[CH-2]* | Signal input jack Connect the line-level signal to be amplified to the 6.35 mm balanced jack input of channel with a jack cable.

19	*[CH-2]* | Signal input XLR Connect the line-level signal to be amplified to the XLR input of channel 2 using an XLR cable.
20	*[0.77V | 1.4V | 26dB]* | Operating mode switch The input sensitivity at which the power amplifier delivers its full rated power can be set with this switch between 0.775 V_{RMS} and 1.4 V_{RMS}). Often multiple power amplifiers are used simultaneously. In this case, switch to the “26 dB” position, and the signal will be amplified equally with 26 dB by all power amplifiers. You can combine different power amplifiers of the S-series and always get the same output level.
21	*[CH-1 (MONO)]* | Signal input XLR Connect the line-level signal to be amplified to the XLR input of channel 1 using an XLR cable.
22	*[CH-1 (MONO)]* | Signal input jack Connect the line-level signal to be amplified to the 6.35 mm balanced jack input of channel 1 with a jack cable.
23	*[VOLTAGE SELECTION]* | Supply voltage selection switch Before connecting the amplifier to the mains power supply, ensure that the mains voltage switch on the bottom of the device (or on the side for S-150) is in the position that corresponds to the actual power available (230 V~ in Germany). If in doubt, consult an electrician.

5 Installation and starting up

Unpack and check carefully there is no transportation damage before using the unit. Keep the equipment packaging. To fully protect the product against vibration, dust and moisture during transportation or storage use the original packaging or your own packaging material suitable for transport or storage, respectively.

Create all connections while the device is off. Use the shortest possible high-quality cables for all connections. Take care when running the cables to prevent tripping hazards.

DANGER!

Risk of death from electrical current!

The output voltages of modern high-performance amplifiers may result in death or serious injury.

Never touch the bare ends of loudspeaker cables when the amplifier is on.

NOTICE!

Interference with nearby electrical devices due to magnetic fields!

The device generates strong magnetic fields that can interfere with the function of poorly shielded devices. The magnetic fields are strongest directly above and below the Power Amplifier.

You should therefore never place sensitive devices such as pre-amplifiers, radio transmission systems, or tape decks directly above or below the Power Amplifier. When placing the Power Amplifier in a rack, you should place it at the bottom thereof, and place any other equipment at the top of the rack.

Rack mounting

Models S-75 and S-100

The device is designed for mounting in a standard 19-inch rack; it occupies one rack unit (RU).

Model S-150

The device is designed for mounting in 19-inch racks, it occupies two rack units (RU).

5.1 Tips on handling speakers

We recommend you to set up the speakers in a way, that the sound signals can reach the audience unobstructedly. It will often be helpful to mount the speakers on tripods. Thus, the sound will be evenly spread with maximum range throughout the audience area.

Always use high grade cable to connect your equipment. Otherwise you won't reach maximum sound quality.

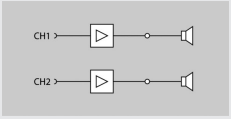
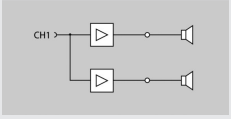
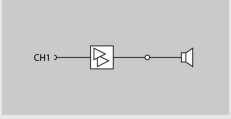
For optimum results both impedance and power handling of the speakers must match the requirements of the amplifier. Always follow the technical specifications of the speakers! The overall impedance of the connected loudspeakers must not deceed the minimum output impedance of the amp. The amps max. RMS output power should be 50 % above the power handling capacity of the connected speakers.

If you notice distortion during operation, either the amp or the speaker is overloaded. This may permanently damage the amp or the speaker. Always reduce the volume when you hear distortion.

5.2 Other useful hints

Possible operation modes

Depending on the individual application, the amplifier can be used in different operation modes:

Stereo mode	
	The two amplifier channels operate independently of one another, either channel (CH1 and CH2) is amplified and connected to loudspeakers, the volume can be controlled separately for the two outputs.
Parallel mode	
	The two amplifier channels receive the same input signal from channel CH1 and loudspeakers are connected to each amplifier, the volume for both outputs is controlled by the volume control of CH1.
Bridged mode	
	The two amplifier channels are internally connected in such a way that twice the output power is available. Only the input signal from channel CH1 is amplified and loudspeakers are connected only to the correspondingly marked output. The volume is controlled by the volume control of CH1.

For each output of the amplifier, the total impedance resulting from the loudspeakers connected to it must not be below the allowed minimal impedance of the amplifier output. Connecting more than one loudspeaker to an amplifier output, please consider:

- If the loudspeakers are connected in a series, the individual impedances will be added up.
- If the loudspeakers are connected in parallel, the reciprocal of the total impedance equals the sum of the reciprocals of the individual impedances.

Example: Using two loudspeakers which have the same impedance, the impedance doubles if they are connected in a series, but it halves if they are connected in parallel.

For detailed information related to this topic please refer to our Online Guide "PA Speakers"' (*www.thomann.de*).

6 Technical specifications

Model type		**S-75**	**S-100**	**S-150**
Amplifier class		AB	AB	AB
Input impedance		20 kΩ (active, balanced)		
Input level		21 dBV / 9 V		
Output power	$_{RMS}$8 Ω, stereo	2 × 45 W	2 × 65 W	2 × 85 W
	$_{RMS}$ 4 Ω, stereo	2 × 75 W	2 × 100 W	2 × 150 W
	$_{RMS}$ 8 Ω, bridged	150 W	200 W	250 W
Frequency response		10 Hz … 50 kHz, –1.5 dB		
Signal-to-noise ratio, A-weighted, RMS		> 80 dB	> 80 dB	> 85 dB
Total harmonic distortion (THD)		< 0.06 %, @ 50 % of maximum output power	< 0.08 %, @ 50 % of maximum output power	< 0.1 %, @ 50 % of maximum output power
Damping factor (1 kHz, 8 Ω)		> 150 dB		
Sensitivity		0.77 V … 1.4 V (26 dB)		

Model type		**S-75**	**S-100**	**S-150**
Gain		29 dB/26 dB/ 24 dB(0.775 V/26 dB/ 1.4 V)	30 dB/26 dB/ 24.5 dB(0.775 V/ 26 dB/1.4 V)	30.5 dB/26 dB/ 25.5 dB(0.775 V/26 dB/ 1.4 V)
Slew rate		35 V/µs	35 V/µs	40 V/µs
Crosstalk @ rated power (1 kHz, 8 Ω)		> 70 dB		
Power consumption	1/2 nominal power 8 Ω	Typical current consumption depending on the output power level (A_{RMS}). All values based on a 230 V ~ mains voltage and a 1 kHz input signal at 0 dB (sine).		
		65 W	100 W	120 W
Supply voltage		115 - 230 V ~ 50/60 Hz		
Fuse		115 V: 5 mm × 20 mm, 10 A, 250 V, slow-blow 230 V: 5 mm × 20 mm, 5 A, 250 V, slow-blow		
Protective circuits		Short-circuit current limitation, DC voltage fault, fuse for supply voltage, limiter, temperature, mains transients		
Installation		19", 1 RU	19", 1 RU	19", 2 RU
Dimensions (W × H × D)		483 × 330 × 44	483 × 330 × 44	483 × 320 × 88
Weight		7.5 kg	7.5 kg	11.5 kg

Model type	S-75	S-100	S-150
Ambient conditions	Temperature range		0 °C…40 °C
	Relative humidity		20 %…80 % (non-condensing)

Further information

Model type	S-75	S-100	S-150
Power 4 Ω / channel	75 W	100 W	150 W
Channels	2	2	2
2 Ω stable	No	No	No
DSP / frequency	No	No	No
Convection cooling	Yes	Yes	Yes

7 Plug and connection assignment

Introduction

This chapter will help you select the right cables and plugs to connect your valuable equipment in such a way that a perfect sound experience is ensured.

Please note these advices, because especially in 'Sound & Light' caution is indicated: Even if a plug fits into the socket, an incorrect connection may result in a destroyed power amp, a short circuit or 'just' in poor transmission quality!

Balanced and unbalanced transmission

Unbalanced transmission is mainly used in semi-professional environment and in hifi use. Instrument cables with two conductors (one core plus shielding) are typical representatives of the unbalanced transmission. One conductor is ground and shielding while the signal is transmitted through the core.

Unbalanced transmission is susceptible to electromagnetic interference, especially at low levels, such as microphone signals and when using long cables.

In a professional environment, therefore, the balanced transmission is preferred, because this enables an undisturbed transmission of signals over long distances. In addition to the conductors 'Ground' and 'Signal', in a balanced transmission a second core is added. This also transfers the signal, but phase-shifted by 180°.

Since the interference affects both cores equally, by subtracting the phase-shifted signals, the interfering signal is completely neutralized. The result is a pure signal without any noise interference.

1/4" TS phone plug (mono, unbalanced)

1	Signal
2	Ground, shielding

1/4" TRS phone plug (mono, balanced)

1	Signal (in phase, +)
2	Signal (out of phase, –)
3	Ground

1/4" TRS phone plug (stereo, unbalanced)

1	Signal (left)
2	Signal (right)
3	Ground

1/4" TS phone plug (mono, unbalanced)

1	Signal
2	Ground

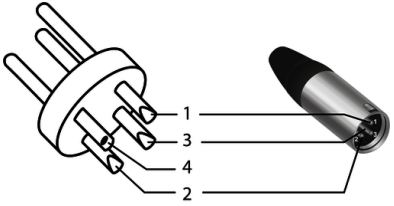
3.5 mm TRS phone plug (mono, balanced)

1	Signal (in phase, +)
2	Signal (out of phase, –)
3	Ground

Three-pole 1/8" mini phone jack (stereo, unbalanced)

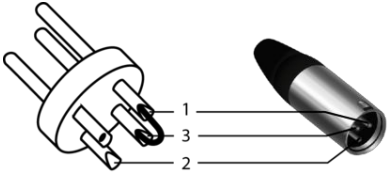
1	Signal (left)
2	Signal (right)
3	Ground, shielding

XLR plug (balanced)



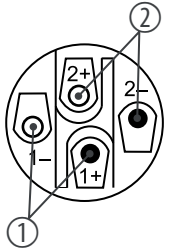
1	Ground, shielding
2	Signal (in phase, +)
3	Signal (out of phase, –)
4	Shielding on plug housing (option)

XLR plug (unbalanced)



1	Ground, shielding
2	Signal
3	Bridged to pin 1

Speaker Twist chassis connector



1, +	Signal 1 (in phase)
1, –	Signal 1 (out of phase)
2, +	Signal 2 (in phase)
2, –	Signal 2 (out of phase)

8 Cleaning

Fan grids

The fan grids of the device must be cleaned of any contamination, such as dust, etc. on a regular basis. Before cleaning, switch off the device and disconnect mains-operated devices from the mains. Only use pH-neutral, solvent-free and non-abrasive cleaning agents. Clean the unit with a slightly damp lint-free cloth.

9 Protecting the environment

Disposal of the packaging material

For the transport and protective packaging, environmentally friendly materials have been chosen that can be supplied to normal recycling.

Ensure that plastic bags, packaging, etc. are properly disposed of.

Do not just dispose of these materials with your normal household waste, but make sure that they are collected for recycling. Please follow the notes and markings on the packaging.

Disposal of your old device

This product is subject to the European Waste Electrical and Electronic Equipment Directive (WEEE) in its currently valid version. Do not dispose with your normal household waste.

Dispose of this device through an approved waste disposal firm or through your local waste facility. When discarding the device, comply with the rules and regulations that apply in your country. If in doubt, consult your local waste disposal facility.