

OLYMPUS®

INSTRUCTIONS

U-RFL-T

POWER SUPPLY UNIT

This instruction manual only covers the power supply that is for the Olympus Power Supply Unit U-RFL-T. To obtain optimum performance and to familiarize yourself fully with the use of this power supply unit, we recommend that you also study the instruction manual for the microscope to be used. Retain this instruction manual in an easily accessible place near the work desk for future reference.



AX7114

IMPORTANT

This mercury burner power supply unit is only designed for use with Olympus mercury burner light source attachments. When using this power supply unit, always refer to the instruction manual for the AX, BX, BX2, IX, etc., reflected light fluorescence module.



SAFETY PRECAUTIONS

1. The applicable lamp housing is a mercury burner configuration Olympus lamp housing (U-ULH, U-ULS100HG, U-LH100HG, etc.)
2. The high pressure mercury burner (mercury arc lamp) used should be a USH102D burner (mfd. by Ushio Electric) or HBO103W/2 burner (mfd. by OSRAM).
 - ⚠ The ultraviolet rays emitted by the burner are harmful for the eyes and should not be directly looked at with unprotected eyes. Consequently, the burner should never be turned ON as long as the lamp housing is not mounted on the microscope.
3. When the burner hour counter of the power supply unit indicates 200 or 300 hours, turn the main switch to "O" (OFF) and allow the mercury burner to cool for at least 10 minutes before replacing it.
 - ⚠ High-pressure gas is sealed within the mercury burner. Thus, if it is continued to be used past its service life expectancy, the glass tube may deform and may sometimes rupture.
4. When disposing of the mercury burner, always follow national and local laws and guidelines.
5. The power supply unit contains high-voltage components. Never attempt to modify or disassemble the power supply unit.
6. High voltage is applied to ignite the mercury burner. To prevent any hazards, always turn the main switch on the power supply unit to "O" (OFF), unplug the power cord plug from the mains outlet and disconnect the mercury burner socket cord plug from the U-RFL-T and wait for at least 10 minutes before replacing the burner.
7. Never switch the main switch to "I" (ON) while the mercury burner socket connection cord plug is not plugged in. Dangerous high voltage may be output from the output connector.

Safety Symbols

The following symbols are found on the power supply unit. Study the meaning of the symbols, and always use the power supply unit and the lamp housing in the safest possible manner.

Symbol	Explanation
	Indicates that the surface becomes hot, and should not be touched with bare hands.
	Indicates that high voltage (upper 1 kV) inside, improper handling could result in an electric shock to the user.
	Before use, carefully read the instruction manual. Improper handling could result in injury to the user or damage to the equipment.
	Indicates that the main switch is ON.
	Indicates that the main switch is OFF.

Warning Labels

Warning labels are affixed at parts where special precaution is required when handling and using the equipment. Always heed the warnings.

Warning label position	Power supply unit (U-RFL-T):	Top surface	
		Rear panel	
	100W lamp housing (U-LH100HG):	Rear panel	[Warning against high temperature]
	100W APO lamp housing (U-LH100HGAP0):	Rear panel	[Warning against high voltage]
	Lamp housing (U-ULH);		[Warning against ultraviolet rays]
	Socket (U-ULS100HG);	on the side	

If warning labels become soiled, peel off, etc. contact your local Olympus representative to have them replaced.

1 Getting Ready

1. A power supply unit is a precision instrument. Install it on a level surface. Handle it with care and avoid subjecting it to sudden or severe impact. To prevent obstruction of the air flow, it is important to make sure to leave at least 100 mm (4 in.) of free space around and above the power supply unit.
2. Do not use the power supply unit where it is subjected to direct sunlight, high temperature and humidity, dust or vibrations. (For operating environment conditions, refer to and adhere to the conditions specified in Section 4, SPECIFICATIONS on page 5.)
3. To avoid a potential shock hazard and ensure the electrical safety, be sure to **ground** the power cord wire. If the power supply unit is not grounded, Olympus can no longer warrant the electrical safety and performance of the equipment.
4. Always make sure that the main switch is moved to "O" (OFF) before connecting the power cord plug to the wall outlet.
5. For disposal of the mercury burner after use, please observe the applicable ordinance or regulations of the local government. Contact Olympus in case of doubt.

2 Maintenance and Storage

1. Clean all glass components by wiping gently with gauze. To remove fingerprints or oil smudges, wipe with gauze slightly moistened with a mixture of ether (70%) and alcohol (30%).
⚠ Since solvents such as ether and alcohol are highly flammable, they must be handled carefully. Be sure to keep these chemicals away from open flames or potential sources of electrical sparks—for example, electrical equipment that is being switched on or off. Also remember to always use these chemicals only in a well-ventilated room.
2. Do not attempt to use organic solvents to clean the non-optical components of the equipment. To clean these, use a lint-free, soft cloth lightly moistened with a diluted neutral detergent.
3. Do not disassemble any part of the power supply unit as malfunction or damage may occur.

3 Caution

If the equipment is operated in a manner not specified by this manual, the safety of the user may be imperiled. In addition, the equipment may also be damaged. Always operate the equipment as outlined in this instruction manual.

The following symbols are used to set off text in this instruction manual.

- ⚠** : Indicates that failure to follow the instructions in the warning could result in bodily harm to the user and/or damage to equipment (including objects in the vicinity of the equipment).
- ★** : Indicates that failure to follow the instructions could result in damage to equipment.
- ©** : Indicates commentary (for ease of operation and maintenance).

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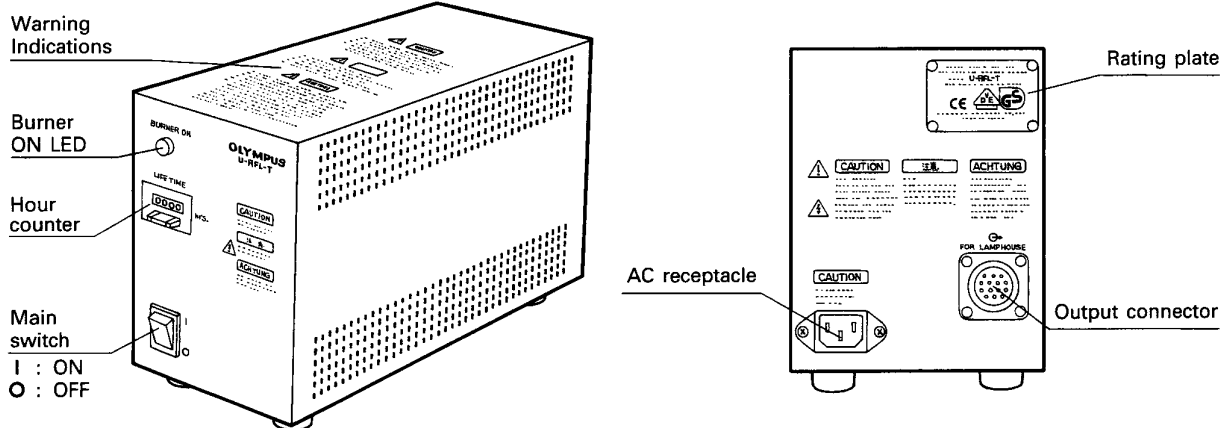
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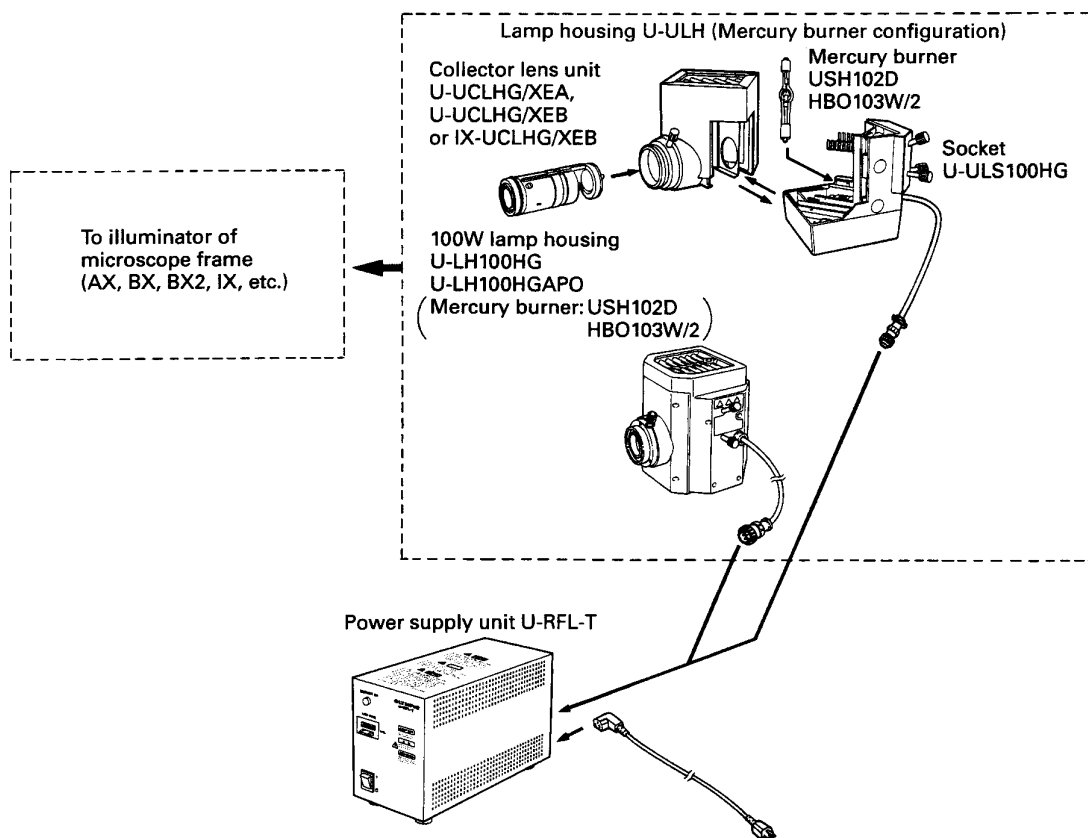
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1 NOMENCLATURE



2 ASSEMBLY

2-1 Assembly Diagram



2-2 Mounting the Mercury Burner

⚠ High voltage is applied to ignite the mercury burner, to prevent any hazards, conform that the main switch on the power supply unit is switched to "O" (OFF), unplug the lamp housing cord and power cord plug, and wait at least 10 minutes before proceeding with the replacement.

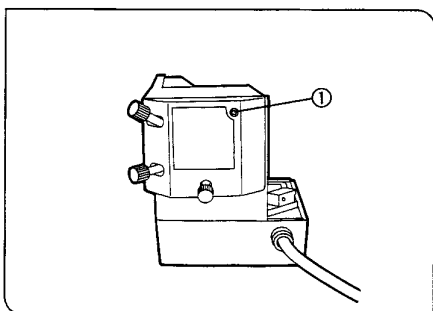


Fig. 1

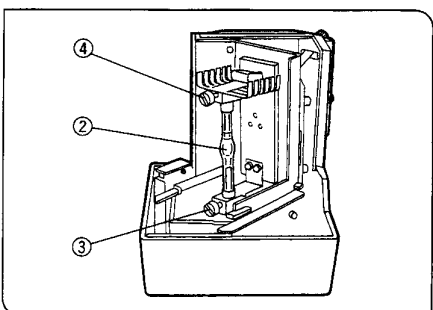


Fig. 2

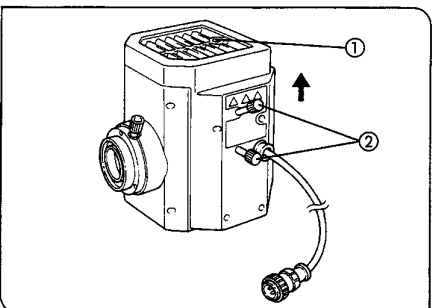


Fig. 3

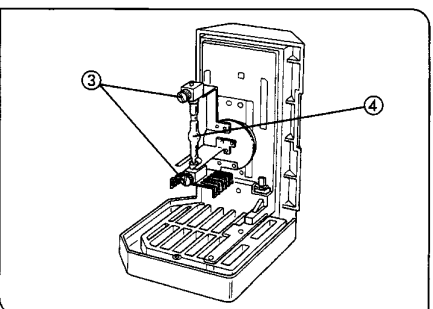


Fig. 4

When using the lamp housing U-ULH

1. Using the Allen screwdriver provided with the microscope frame, loosen the burner socket clamping screw ①. (Fig. 1)
2. Loosen the burner clamping screws ③ and ④ and remove the transport post. (For burner replacement, remove the used burner.) (Fig. 2)
3. Insert the + pole of the mercury burner ② into the + terminal and tighten the + clamping screw ③.

Then loosen the - clamping screw ④ (marked UP). Insert the - pole of the burner into the - terminal and tighten the - clamping screw ④. (Fig. 2)

⚠ Be sure to use a USH102D burner (mfd. by Ushio Electric) or HBO103W/2 (mfd. by OSRAM).

⚠ Be careful and avoid leaving fingerprints or dirt on the mercury burner. Attached stain may cause distortion in glass which could result in a ruptured burner. If stained, clean by wiping gently with gauze slightly moistened with a mixture of ether (70%) and alcohol (30%).

★ To prevent possible damage to the burner, the collector lens can only be installed or removed while the socket and lamp housing are separated.

When using the 100W lamp housing U-LH100HG/LH100HGAP0

1. Loosen the burner socket clamping screw ① using the Allen screwdriver. (Fig. 3)
2. While holding the upper part of the lamp housing, pull it vertically to remove the socket.

★ Do not hold the centering knob ②. Doing so may cause malfunction.

3. Place the socket upside down as shown in Fig. 4.
- ④ Loosen the two burner clamping screws ③ to remove the transport lock when using the unit for the first time or to remove the old burner when replacing with a new one. (Fig. 4)

4. Securely attach the + pole of the specified mercury burner ④ to the upper mount and the - pole to the lower mount. (Fig. 4)

⚠ Be sure to use a USH102D burner (mfd. by Ushio Electric) or HBO103W/2 (mfd. by OSRAM).

⚠ Be careful and avoid leaving fingerprints or dirt on the mercury burner. Attached stain may cause distortion in glass which could result in a ruptured burner. If stained, clean by wiping gently with gauze slightly moistened with a mixture of ether (70%) and alcohol (30%).

5. Replace the socket with the burner mounted and tighten the burner socket clamping screw ①.

④ While aligning the exterior of the lamp housing with that of the socket, let down the lamp housing vertically until it fits over the socket.

④ For details on mounting the collector lens unit and the lamp housing on the microscope frame, refer to the instruction manuals for the reflected light fluorescence modules for the AX, BX, BX2, IX, etc., microscope frames, respectively.

2-3 Cable and Cord Connections

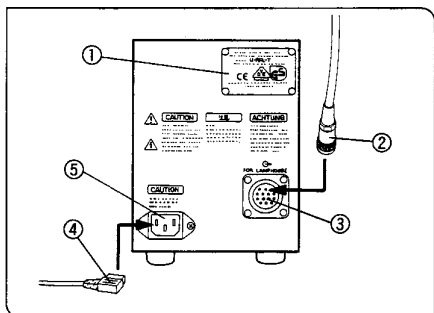


Fig. 5

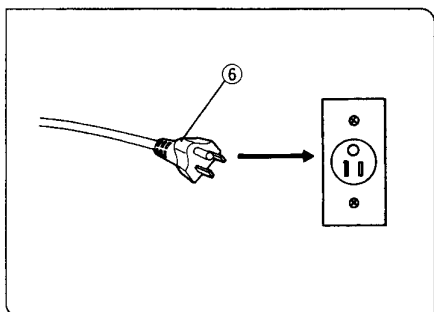


Fig. 6

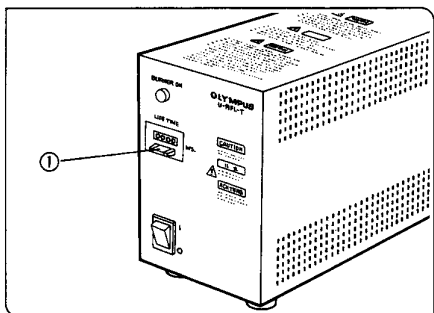


Fig. 7

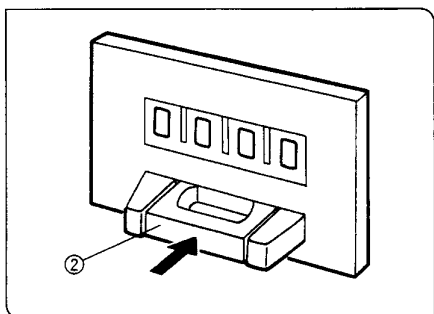


Fig. 8

⚠ Cords are vulnerable when bent or twisted. Never subject them to excessive force.

⚠ Make sure that the main switch is set to "O" (OFF) before connecting cords and cables.

1. Verify that the voltage and frequency of the AC mains outlet match the requirements indicated on the rating plate ① on the power supply unit. (Fig. 5)

2. Plug the mercury burner socket connecting cord plug ② firmly into the output connector ③. (Fig. 5)

⚠ Always use the power cord provided by Olympus. If no power cord is provided, please select the proper power cord by referring to the section "PROPER SELECTION OF THE POWER SUPPLY CORD" at the end of this instruction manual. If the proper power cord is not used, Olympus can no longer warrant the electrical safety and performance of the equipment.

3. Plug the power cord connector ④ into the AC receptacle ⑤. (Fig. 5)

4. Plug the power cord plug ⑥ into a wall outlet. (Fig. 6)

⚠ Connect the power cord correctly and ensure that the ground terminal of the power supply unit and that of the wall outlet are properly connected. If the equipment is not grounded, Olympus can no longer warrant the electrical safety and performance of the equipment. When installing the power cord, route the power cord away from the lamp housing. Should the power cord come in contact with the hot lamp housing, the power cord could melt and cause electric shock.

⚠ Set up cords sufficiently away from the lamp housing. Otherwise cord covering may melt, posing a risk of electric shock.

Resetting the Burner Life Time Hour Counter (Figs. 7, 8)

1. To reset the burner life time counter to "000.0", press the center portion ② of the reset button ① on the power supply unit's front panel.

Ⓢ The counter shows elapsed time in hours. In order not to impair the safety of the equipment, replace the burner when the counter indicates "200.0" hours (USH102D) or "300.0" hours (HBO103W/2). Before replacing the burner, wait at least 10 minutes after turning the burner off.

⚠ The mercury burner contains high-pressured gas and it may crack if used beyond the specified life time.

3 PREPARATION FOR OBSERVATION

3-1 Igniting the Mercury Burner

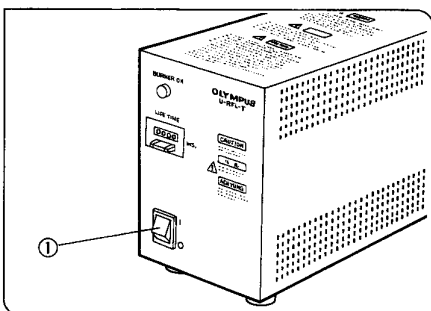


Fig. 9

⚠ Never switch the main switch to "I" (ON) while the mercury burner socket connecting cord plug is not plugged in. Dangerous high voltage may be output from the output connector.

Move the main switch ① on the power supply unit to "I" (ON). Between 5 to 10 minutes are required for the arc to stabilize after the burner is ignited. (Fig. 9)

★ Some mercury burners may not ignite the first time the power is turned ON. If the burner does not light up in approximately 10 seconds after switching the main switch ① to "I" (ON), switch the main switch to "O" (OFF) once, then wait 5 to 10 minutes before turning it ON again. Repeat as necessary.

★ To avoid shortening the life of the burner, do not turn the burner off within 15 minutes after ignition.

★ After turning the burner off, it cannot be re-ignited before the mercury vapor cools and condenses to a liquid. Wait for at least 3 minutes before restarting the burner.

⚠ Opening the lamp housing while the burner is ignited is extremely dangerous. Even if the lamp housing is accidentally opened, interlock mechanism will activate and switch off the power automatically. To restore the power, switch the main switch of the power supply unit to "O" (OFF) and lock the lamp housing properly. Then switch the main switch to "I" (ON) again. The lamp housing will become extremely hot during operation. Always allow it to cool sufficiently before opening.

⚠ Ensure that the hour counter is reset to "000.0" after replacement of the burner.

3-2 Centering the Mercury Burner

Center the mercury burner as described in the respective instruction manuals provided with the AX, BX, BX2, IX, etc. reflected light fluorescence attachments.

4 SPECIFICATIONS

■ Power Supply Unit

Item	Specifications
1. Illumination system	Auto-ignition
2. Life meter (counter)	Indicates accumulated burner ignition time.
3. Input rating	220 – 240V ~ 1.8A 50 / 60 Hz (U-RFL-T-200)
4. Dimensions	150 mm (W) X 295 mm (D) X 200 mm (H) (5.91 in. (W) X 11.6 in. (D) X 7.87 in. (H))
5. Weight	4.8 kg (10.6 lb.)

■ Operating Environment

• Indoor use
• Altitude: Max. 2000 m
• Ambient temperature: 5° to 40°C (41° to 104°F)
• Maximum relative humidity 80% for temperatures up to 31°C (88°F) decreasing linearly through 70% at 34°C (93°F), 60% at 37°C (99°F) to 50% relative humidity at 40°C (104°F)
• Main supply voltage fluctuations not to exceed $\pm 10\%$ of the nominal voltage.
• Pollution Degree 2 (in accordance with IEC 664)
• Installation/Overvoltage Category II (in accordance with IEC 664)

5 TROUBLESHOOTING GUIDE

Under certain conditions, performance of this unit may be adversely affected by factors other than defects. If problems occur, please review the following list and take remedial action as appropriate. If you cannot solve the problem after checking the entire list, please contact your local Olympus representative for assistance.

Problem	Cause	Remedy
a. The main switch LED does not light.	The power cord is not connected.	Connect the power cord correctly.
b. Main switch indicator lights, but the mercury burner does not ignite.	Improperly connected connectors.	Connect correctly.
	The burner is not installed.	Install the burner.
	The lamp housing interlock mechanism is activated.	Tighten the burner socket clamping screw.
	Auto ignition is malfunctioning.	Turn the main switch on the power supply to "O" (OFF). Turn to "I" (ON) again. (Repeat as necessary.)
c. The burner flickers or is dark.	Insufficient time has elapsed since the burner was turned on.	Wait for 10 minutes after turning on the burner.
	The burner life has expired.	Replace the mercury burner when the hour counter reading exceeds 200 hours (USH102D) or 300 hours (HBO103W/2).

■ PROPER SELECTION OF THE POWER SUPPLY CORD

If no power supply cord is provided, please select the proper power supply cord for the equipment by referring to "Specifications" and "Certified Cord" below:

CAUTION: In case you use a non-approved power supply cord for Olympus products, Olympus can no longer warrant the electrical safety of the equipment.

Specifications

Voltage Rating	125V AC (for 100-120V AC area) or, 250V AC (for 220-240V AC area)
Current Rating	6A minimum
Temperature Rating	60°C minimum
Length	3.05 m maximum
Fittings Configuration	Grounding type attachment plug cap. Opposite terminates in molded-on IEC configuration appliance coupling.

Table 1 Certified Cord

A power supply cord should be certified by one of the agencies listed in Table 1, or comprised of cordage marked with an agency marking per Table 1 or marked per Table 2. The fittings are to be marked with at least one of agencies listed in Table 1. In case you are unable to buy locally in your country the power supply cord which is approved by one of the agencies mentioned in Table 1, please use replacements approved by any other equivalent and authorized agencies in your country.

Country	Agency	Certification Mark	Country	Agency	Certification Mark
Argentina	IRAM		Italy	IMQ	
Australia	SAA		Japan	MITI	
Austria	ÖVE		Netherlands	KEMA	
Belgium	CEBEC		Norway	NEMKO	
Canada	CSA		Spain	AEE	
Denmark	DEMKO		Sweden	SEMKO	
Finland	FEI		Switzerland	SEV	
France	UTE		United Kingdom	ASTA BSI	
Germany	VDE		U.S.A.	UL	
Ireland	NSAI				

Table 2 HAR Flexible Cord

APPROVAL ORGANIZATIONS AND CORDAGE HARMONIZATION MARKING METHODS

Approval Organization	Printed or Embossed Harmonization Marking (May be located on jacket or insulation of internal wiring)		Alternative Marking Utilizing Black-Red-Yellow Thread (Length of color section in mm)		
			Black	Red	Yellow
Comite Electrotechnique Belge (CEBEC)	CEBEC	⟨HAR⟩	10	30	10
Verband Deutscher Elektrotechniker (VDE) e.V. Prüfstelle	⟨VDE⟩	⟨HAR⟩	30	10	10
Union Technique de l'Electricite' (UTE)	USE	⟨HAR⟩	30	10	30
Istituto Italiano del Marchio di Qualita' (IMQ)	IEMMEQU	⟨HAR⟩	10	30	50
British Approvals Service for Electric Cables (BASEC)	BASEC	⟨HAR⟩	10	10	30
N.V. KEMA	KEMA-KEUR	⟨HAR⟩	10	30	30
SEMKO AB Svenska Elektriska Materielkontrollanstalter	SEMKO	⟨HAR⟩	10	10	50
Österreichischer Verband für Elektrotechnik (ÖVE)	⟨ÖVE⟩	⟨HAR⟩	30	10	50
Danmarks Elektriske Materialkontroll (DEMKO)	⟨DEMKO⟩	⟨HAR⟩	30	10	30
National Standards Authority of Ireland (NSAI)	⟨NSAI⟩	⟨HAR⟩	30	30	50
Norges Elektriske Materielkontroll (NEMKO)	NEMKO	⟨HAR⟩	10	10	70
Asociacion Electrotecnica Y Electronica Espanola (AEE)	⟨UNED⟩	⟨HAR⟩	30	10	70
Hellenic Organization for Standardization (ELOT)	ELOT	⟨HAR⟩	30	30	70
Instituto Portages da Qualidade (IPQ)	np	⟨HAR⟩	10	10	90
Schweizerischer Elektro Technischer Verein (SEV)	SEV	⟨HAR⟩	10	30	90
Elektriska Inspektoratet	SETI	⟨HAR⟩	10	30	90

Underwriters Laboratories Inc. (UL)
Canadian Standards Association (CSA)

SV, SVT, SJ or SJT, 3 X 18AWG
SV, SVT, SJ or SJT, 3 X 18AWG

This device complies with the requirements of both directive 89/336/EEC concerning electromagnetic compatibility and directive 73/23/EEC concerning low voltage. The CE marking indicates compliance with the above directives.

MEMO

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