

Operating Manual

HV Tester 25 kV

128311841

Consultation with Megger

The present system manual has been designed as an operating guide and for reference. It is meant to answer your questions and solve your problems in as fast and easy a way as possible. Please start with referring to this manual should any trouble occur.

In doing so, make use of the table of contents and read the relevant paragraph with great attention. Furthermore, check all terminals and connections of the instruments involved.

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1 GENERAL

The HV Tester is a generator of high direct voltages.

The insulation of cables, electrical plant and plant components can be tested for electric strength with this set. The insulation resistance of test objects can be determined by measuring current and voltage using integrated measuring instruments.

Thanks to its small size and low weight, the HV Tester is portable and can be used directly on site. The clear arrangement of controls and displays makes the set comfortable to handle.

The set has an integrated rechargeable battery.

A special protective ground circuit ensures a high level of safety.

1.1 Safety instructions

All persons involved in the transport, installation, operation, maintenance and repair of this system must have read this user manual carefully.

The system and its accessories are in accordance with the current state of safety technology at the time of delivery. Owing to the work processes involved, however, there may be parts of the system and its peripherals, which cannot be given optimum protection without an unreasonable reduction in function and usability.

The following safety instructions must be complied with.

GENERAL INSTRUCTIONS

Work on this system and its peripherals must only be performed by qualified and/or trained staff. Other persons must be kept away.

This user manual must be available for the supervisory, operating and maintenance staff to refer to.

Improper use may endanger life and limb, the system and connected equipment, as well as the efficient functioning of the system.

Always use correct tools in perfect condition.

Checks must be made to ensure that the relevant safety regulations are being complied with.

Only operate the system if it is in technically perfect condition.

No non-original parts may be used for the system and its peripherals, as the necessary safety will not be guaranteed. No mode of working, which detracts from the safety of the system must be used.

The user is under an obligation to report any changes in the system to the supervisor responsible without delay.

ELECTROTECHNICAL INSTRUCTIONS

The system and all additional equipment must be connected properly. The relevant DIN and VDE regulations must be complied with.

Maintenance work must only be carried out when the system is switched off (dead) and then only by qualified and/or trained staff.

1.2 INDICATIONS USED IN THE DESCRIPTION

Important instructions concerning personal protection, work safety and technical safety are indicated as follows:

WARNING: Warning indicates work and operating procedures, which must be complied with in full to exclude the possibility of persons being put at risk. This includes instructions concerning particular dangers when handling the system.

ATTENTION: Attention indicates work and operating procedures, which must be complied with in full to prevent the system/peripherals from being damaged or destroyed.

N.B.: N.B. indicates special technical requirements to which the user must pay particular attention when using the system.

2 TECHNICAL DESCRIPTION

2.1 Description of the set

2.1.1 Scope of supply

The scope of supply includes the following:

Item	Description
00001	HV Tester 25 kV with built in batteries and softcase
00002	Mains connecting cable
00003	Connecting cable for external battery
00004	Protective ground cable (green/yellow)
00005	Operation ground cable (black)
00006	HV- connecting cable (shielded) incl. clamp
00007	User manual /Service pack
00008	Packing

Table 1 Scope of supply

2.1.2 Use of the set

The HV Tester 25 kV is used for electrical testing of power cables and plant with direct voltage:

Areas of application include:

- Reclosing control after repairs and work on power cables, etc.
- Testing newly laid cables before initial use
- Testing disconnected cables
- Testing electrical equipment

CAUTION: Owing to the high voltages, which occur, special safety measures are required. These are explained in chapter 1.1 on page 1.

2.2 Design of the set

The compact HV Tester 25 kV is very portable thanks to its small size and low weight and can be used directly on-site. State-of-the-art technique and clearly designed operation panel for easy application. The control and display elements as well as the high-voltage outlet are arranged on the control panel.

A timer is provided for pre-selecting the testing time.

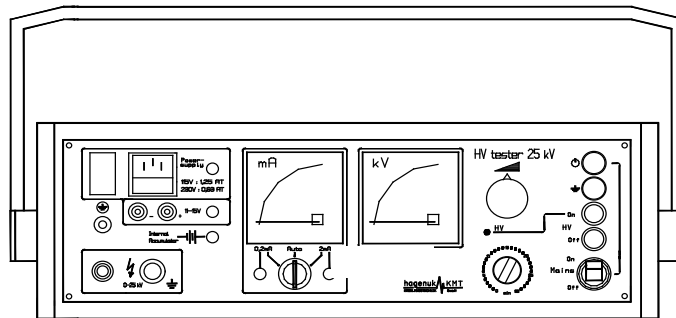


Figure 1 HV Tester 25 kV

2.3 Function

Before the set can be used, the HV Tester 25 kV has to be grounded properly.

When the high-voltage adjuster is set to zero and the timer works, the test voltage can be switched on at the press of a button and increased continuously between 0 V and the nominal voltage.

The condition of the test object with regard to electric strength and insulation quality can be determined from the values for test voltage and leakage current displayed on the operation unit.

After testing, the object under test is discharged through the built-in discharging facility.

2.4 Specifications

Power supply	mains 115 or 230 V AC built-in rechargeable batteries external DC voltage 11-15 V
Power consumption	120 W max
DC output voltage	0...25 kV (negative polarity, infinitely variable)
Output current	1.5 mA
Short-circuit current	1.6 mA \pm 0.1 mA
Voltage measuring range	0 - 30 kV
Current measuring range	0 – 0.2 mA and 0 - 2 mA
Discharge energy	3000 J max.
Operating time at full load with built-in batteries	approx. 45 min
Operating temperature	-25°C to + 55 °C
Output	short circuit and open circuit proof
Weight incl. batteries	approx. 13.5 kg
Dimensions (W x H x D)	467 mm x 167 mm x 284 mm

3 PREPARATION FOR USE

3.1 Operating requirements

The carrying handle of HV Tester 25 kV can be adjusted by exerting gentle sideways pressure on the buttons on either side in the joint area.

WARNING: The clearance between the high-voltage unit and grounded or live parts as stipulated in DIN VDE 0104 must be complied with.

CAUTION: Warning notices reading

<p>DANGER! HIGH - VOLTAGE</p>

When the equipment is set up in the field, it must be placed outside the cable trench and protected against dirt and moisture.

The HV Tester should be set up inside the cordon at a distance of approx. 3 m from the high-voltage, preferably at operating height.

3.2 Power supply

3.2.1 Internal rechargeable battery

The set has an integrated rechargeable battery. This supplies power when the "Mains" key switch is actuated.

The mains and external battery, if connected, take precedence, however, and cause the internal battery to be switched off.

If the voltage is too low, the colour of the LED [13] p. 11 changes from green to red. The high voltage will then be switched off after approximately 10 minutes.

3.2.2 Mains

If the set is connected to the mains, the external DC voltage and internal battery are switched off (signalled by the green LED [11] p. 11). Mains operation is accompanied by recharging / floating operation of the internal battery.

The set is switched on with the "Mains" key switch, which is signalled by the white standby indicator [4] p. 11.

The HV Tester 25 kV has a monitoring circuit which switches the high voltage off if the voltage is too low.

The set remains connected to the mains even once the "Mains" key switch has been turned off, allowing recharging / floating operation of the internal battery.

CAUTION: Take care of the voltage selector switch [1], p. 9!

3.2.3 External battery

The external DC voltage must be in the 11-15 V range. This is indicated by the green LED [12] p. 11. If the voltage is too low, the colour changes to red. The high voltage will then be switched off after approximately 10 minutes.

3.2.4 Maintenance procedure (internal battery)

To charge the internal battery connect the mains supply to the HV Tester (LED [11] p.11 lights up).

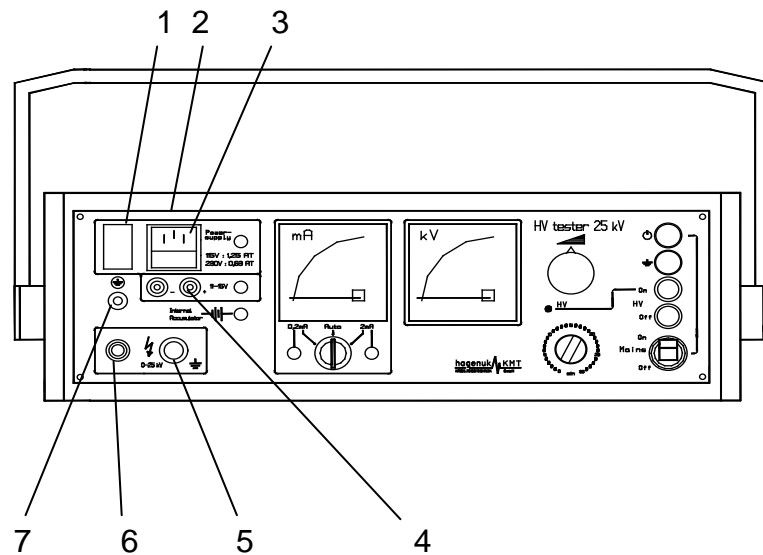
The 'Mains' key switch doesn't have to be switched on.

It takes approx. 10 hours to fully charge the internal battery from low battery level.

The current is changed automatically between recharging / floating operation of the internal rechargeable battery.

3.3 Connecting the test equipment

The connecting cable is in the front of the carrying case.



- 1 Voltage selector
- 2 Power supply
- 3 Fuse (1.25 A slow for 115 V and 230 V)
- 4 Connector for external battery
- 5 Station ground
- 6 HV connector
- 7 Protective conductor terminal

Figure 2 HV Tester 25 kV

Before the test equipment is connected, safe isolation from supply must be established and safeguarded in accordance with DIN VDE 0105. The requirements of DIN VDE 0104 and DIN VDE 0105 must be complied with. The test equipment should be connected in the following order:

1. Ground and short-circuit the conductor of the test object that is not going to be tested (connect to station ground or auxiliary ground point). In the case of ungrounded test objects, the tester can only be used if an auxiliary ground is provided.
2. Establish a conductive connection between the station/auxiliary ground and the ground terminal [5] of the HV Tester 25 kV.
3. In the case of mains operation the ground safety circuit checks whether the protective ground (protective conductor terminal [7]) and station ground have the same potential. The yellow lamp indicates that the potential is the same. If the lamp does not light up, the potential of the station ground must be checked and a connection established between the protective ground terminal and the station ground. The housing of the HV Tester has the same potential as the protective ground terminal.
4. In the case of internal or external batteries establish a conductive connection between the protective conductor terminal [7] and station ground.
5. Connect the high-voltage terminal [6] to the test object.

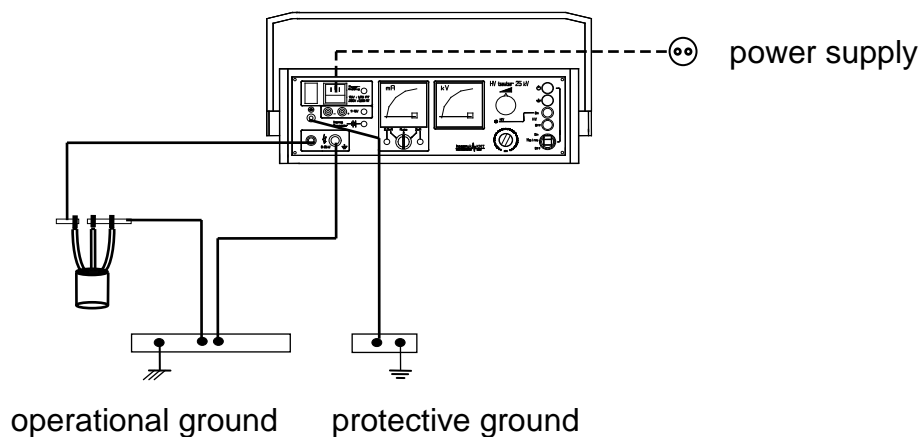


Figure 3 Example for connecting HV Tester 25 kV

4 OPERATING INSTRUCTIONS

4.1 Controls and displays

The controls and displays needed to operate the HV Tester are on the front of the operation unit.

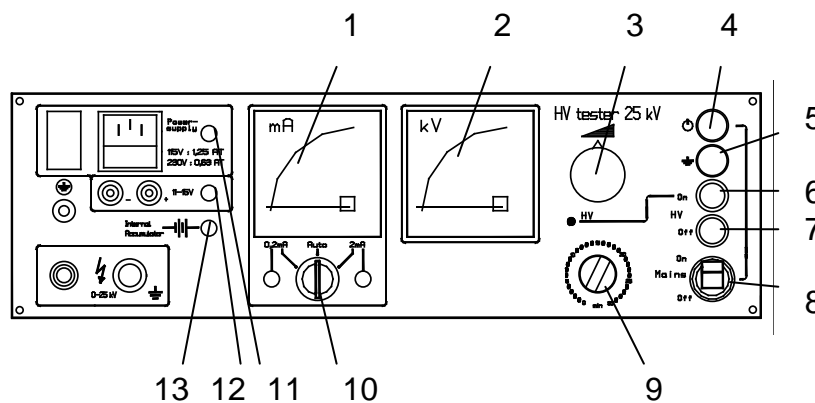


Figure 4 Front of the HV Tester 25 kV

The following tables explain the controls:

Item	Description	Remarks
1	Ammeter	Displays the current flowing through the test object
2	Voltmeter	Displays the voltage connected to the test object
3	HV adjuster	Adjuster for the high-voltage with forced zero position
4	"Unit on" lamp	Lights up white when the unit is switched on with the mains switch [8]
5	"Ground terminal" lamp	Lights up yellow when the HV Tester is grounded properly
6	Illuminated "HV on" button	Green lit button for switching on the high voltage
7	Illuminated "HV off" button	Illuminated button for switching off the high voltage (lights up when the high-voltage is switched on)
8	Mains key switch	
9	Timer	
10	"Current measuring range" selector switch	Switches between the current measuring ranges or 'AUTO'
11-13	LED's	for Power supply, internal batteries and external batteries

Table 2 Controls and displays (part 2)

4.2 OPERATING PROCEDURE

4.2.1 Performing measurements

When the mains key switch is turned on, the white pilot lamp (Figure 4 p. 11 [4]) lights up. If the equipment is grounded properly, the yellow pilot lamp also lights up.

If this does not happen, the HV Tester still has to be grounded (protective conductor terminal).

This pilot lamp [5] signals proper connection of the station and protective grounds independently of the high voltage being connected.

The equipment will only work when both lamps are lit and the timer is in action.

The illuminated green "**HV on**" [6] button switches the high voltage on if the HV adjuster [3] in zero position at left stop (second switching operation, interlock, forced zero position).

Tip: If you want to select testing times shorter than 5 min, turn the rotary knob of the timer first beyond the position "5" and then to the desired time.

The red illuminated "**HV off**" [7] button lights up at the same time, indicating that the "high voltage is switched on".

The test voltage can now be set by **slowly** turning the adjuster anticlockwise. While doing this, remember to follow the increase in voltage and current on the instruments.

The output current can be measured in two measuring ranges (0.2 mA, 2 mA), which can be set using a selector switch [10].

In the central switch position (Auto), the measuring range is changed automatically.

The relevant LED indicates the selected measuring range.

N.B.: The end stage of the HV Tester is secured against thermal overload by a reverse voltage divider. In case of overload (e.g., short-circuit at the output), the output current is reduced to a value of about 0,5 mA.

4.2.2 Ending testing

Once testing is complete, turn the voltage down and switch the equipment off ("HV off" Figure 4 p. 11 [7]).

When the test time expires, the high voltage is switched off automatically by the timer and the discharge device is activated. The discharge process of the test object can be followed on the measuring instrument.

ATTENTION: After four discharge processes at a maximum, a break of about 30 minutes shall be taken.

Once the displayed high-voltage reading has dropped to 0, the test object can be grounded and the HV Tester disconnected.

Finally ground/short-circuit the test object yourself.

WARNING: The high-voltage connector must not be plugged in / unplugged when live.

In an emergency, the high voltage must be switched off by a second operator pressing the red "HV off" button.

4.2.3 Safety measures

The set must only be operated by electricians in accordance with DIN VDE 1005. It must only be operated in areas, which have been secured and/or cordoned off and marked in accordance with DIN VDE 0104 and DIN VDE 0105.

In an emergency, the high voltage must be switched off and grounded by a second operator pressing the red "HV off" button.

N.B.: Never put equipment with moisture condensation into operation.

Please also follow the safety instructions in chapter 1.

Reliable grounding of the HV Tester is always necessary in addition to adequate protection against electric shock.

CAUTION: Care must be taken during testing that the far end is also reliably protected against electric shock.

Be aware that residual charges may still be present after discharge in the case of capacitive tests.

WARNING: Parallel cables may also still be charged after testing.

5 CARE, MAINTENANCE AND REPAIR

The repair work, which can be done on the HV Tester by the user is limited to the replacement of fuses and lamps. Fuses, lamps and tools are included in the service kit.

The HV Tester 25 kV is test equipment and as such must be handled and looked after with care.

Moisture, external soiling, direct sunlight and ambient temperatures in excess of 55°C must be avoided.

The exchange of the internal rechargeable battery has to be carried out by a service workshop.

Don't store the HV Tester with empty battery!



Tento symbol indikuje, že výrobek nesoucí takovéto označení nelze likvidovat společně s běžným domovním odpadem. Jelikož se jedná o produkt obchodovaný mezi podnikatelskými subjekty (B2B), nelze jej likvidovat ani ve veřejných sběrných dvorech. Pokud se potřebujete tohoto výrobku zbavit, obraťte se na organizaci specializující se na likvidaci starých elektrických spotřebičů v blízkosti svého působiště.



Dit symbool duidt aan dat het product met dit symbool niet verwijderd mag worden als gewoon huishoudelijk afval. Dit is een product voor industrieel gebruik, wat betekent dat het ook niet afgeleverd mag worden aan afvalcentra voor huishoudelijk afval. Als u dit product wilt verwijderen, gelieve dit op de juiste manier te doen en het naar een nabij gelegen organisatie te brengen gespecialiseerd in de verwijdering van oud elektrisch materiaal.



This symbol indicates that the product which is marked in this way should not be disposed of as normal household waste. As it is a B2B product, it may also not be disposed of at civic disposal centres. If you wish to dispose of this product, please do so properly by taking it to an organisation specialising in the disposal of old electrical equipment near you.



Този знак означава, че продуктът, обозначен по този начин, не трябва да се изхвърля като битов отпадък. Тъй като е B2B продукт, не бива да се изхвърля и в градски пунктове за отпадъци. Ако желаете да изхвърлите продукта, го занесете в пункт, специализиран в изхвърлянето на старо електрическо оборудване.



Dette symbol viser, at det produkt, der er markeret på denne måde, ikke må kasseres som almindeligt husholdningsaffald. Eftersom det er et B2B produkt, må det heller ikke bortskaffes på offentlige genbrugsstationer. Skal dette produkt kasseres, skal det gøres ordentligt ved at bringe det til en nærliggende organisation, der er specialiseret i at bortskaffe gammelt el-udstyr.



Sellise sümboliga tähistatud toodet ei tohi käidelda tavalise olmejäätmena. Kuna tegemist on B2B-klassi kuuluva tootega, siis ei tohi seda viia kohalikku jäätmekäitluspunkti. Kui soovite selle toote ära visata, siis viige see lähimasse vanade elektriseadmete käitlemisele spetsialiseerunud ettevõttesse.



Tällä merkinnällä ilmoitetaan, että kyseisellä merkinnällä varustettua tuotetta ei saa hävittää tavallisen kotitalousjätteen seassa. Koska kyseessä on yritysten välisen kaupan tuote, sitä ei saa myöskään viedä kuluttajien käyttöön tarkoitettuihin keräyspisteisiin. Jos haluatte hävittää tämän tuotteen, ottakaa yhteys lähimpään vanhojen sähkölaitteiden hävittämiseen erikoistuneeseen organisaatioon.



Ce symbole indique que le produit sur lequel il figure ne peut pas être éliminé comme un déchet ménager ordinaire. Comme il s'agit d'un produit B2B, il ne peut pas non plus être déposé dans une déchetterie municipale. Pour éliminer ce produit, amenez-le à l'organisation spécialisée dans l'élimination d'anciens équipements électriques la plus proche de chez vous.



Cuireann an siombail seo in iúl nár cheart an táirgeadh atá marcáilte sa tsli seo a dhiúscairt sa chóras fuíoll teaghlaigh. Os rud é gur táirgeadh ghnó le gno (B2B) é, ní féidir é a dhiúscairt ach oiread in ionaid dhiúscairthe phobail. Más mian leat an táirgeadh seo a dhiúscairt, déan é a thógáil ag eagraíocht gar duit a sainfeidhmíonn i ndiúscairt sean-fhearas leictrigh.



Dieses Symbol zeigt an, dass das damit gekennzeichnete Produkt nicht als normaler Haushaltsabfall entsorgt werden soll. Da es sich um ein B2B-Gerät handelt, darf es auch nicht bei kommunalen Wertstoffhöfen abgegeben werden. Wenn Sie dieses Gerät entsorgen möchten, bringen Sie es bitte sachgemäß zu einem Entsorger für Elektroaltgeräte in Ihrer Nähe.



Αυτό το σύμβολο υποδεικνύει ότι το προϊόν που φέρει τη σήμανση αυτή δεν πρέπει να απορρίπτεται μαζί με τα οικιακά απορρίματα. Καθώς πρόκειται για προϊόν B2B, δεν πρέπει να απορρίπτεται σε δημοτικά σημεία απόρριψης. Εάν θέλετε να απορρίψετε το προϊόν αυτό, παρακαλούμε όπως να το παραδώσετε σε μία υπηρεσία συλλογής ηλεκτρικού εξοπλισμού της περιοχής σας.



Ez a jelzés azt jelenti, hogy az ilyen jelzéssel ellátott terméket tilos a háztartási hulladékokkal együtt kidobni. Mivel ez vállalati felhasználású termék, tilos a lakosság számára fenntartott hulladékgyűjtőbe dobni. Ha a terméket ki szeretné dobni, akkor vigye azt el a lakóhelyéhez közel működő, elhasznált elektromos berendezések begyűjtésével foglalkozó hulladékkezelő központhoz.



Questo simbolo indica che il prodotto non deve essere smaltito come un normale rifiuto domestico. In quanto prodotto B2B, può anche non essere smaltito in centri di smaltimento cittadino. Se si desidera smaltire il prodotto, consegnarlo a un organismo specializzato in smaltimento di apparecchiature elettriche vecchie.



Št zíme noráda, ka izstrādājumu, uz kura tā atrodas, nedrīkst izmest kopā ar parastiem mājsaimniecības atkritumiem. Tā kā tas ir izstrādājums, ko cits citam pārdod un lieto tikai uzņēmumi, tad to nedrīkst arī izmest atkritumos tādās izgāztuvēs un atkritumu savāktuvēs, kas paredzētas vietējiem iedzīvotājiem. Ja būs vajadzīgs šo izstrādājumu izmest atkritumos, tad rīkojieties pēc noteikumiem un nogādājiet to tuvākajā vietā, kur īpaši nodarbojas ar vecu elektrisku ierīču savākšanu.



Šis simbols rodo, kad juo paženklinto gaminio negalima išmesti kaip paprastų buitinių atliekų. Kadangi tai B2B (verslas verslui) produktas, jo negalima atiduoti ir buitinių atliekų tvarkymo įmonėms. Jei norite išmesti šį gaminį, atlikite tai tinkamai, atiduodami jį arti jūsų esančiai specializuotai senos elektrinės įrangos utilizavimo organizacijai.



Dan is-simbolu jindika li l-prodott li huwa mmarkat b'dan il-mod m'ghandux jintrema b'hal skart normali tad-djar. Minhabba li huwa prodott B2B , ma jistax jintrema wkoll f'centri civici ghar-rimi ta' l-iskart. Jekk tkun tixtieq tarmi dan il-prodott, jekk joghgbok ghamel dan kif support billi tieghu ghand organizzazzjoni fil-qrib li tispécializza fir-rimi ta' taghmir qadim ta' l-eletriku.



Dette symbolet indikerer at produktet som er merket på denne måten ikke skal kastes som vanlig husholdningsavfall. Siden dette er et bedriftsprodukt, kan det heller ikke kastes ved en vanlig miljøstasjon. Hvis du ønsker å kaste dette produktet, er den riktige måten å gi det til en organisasjon i nærheten som spesialiserer seg på kassering av gammelt elektrisk utstyr.



Ten symbol oznacza, że produktu nim opatrzonego nie należy usuwać z typowymi odpadami z gospodarstwa domowego. Jest to produkt typu B2B, nie należy go więc przekazywać na komunalne składowiska odpadów. Aby we właściwy sposób usunąć ten produkt, należy przekazać go do najbliższej placówki specjalizującej się w usuwaniu starych urządzeń elektrycznych.



Este símbolo indica que o produto com esta marcação não deve ser deixado fora juntamente com o lixo doméstico normal. Como se trata de um produto B2B, também não pode ser deixado fora em centros cívicos de recolha de lixo. Se quiser desfazer-se deste produto, faça-o correctamente entregando-o a uma organização especializada na eliminação de equipamento eléctrico antigo, próxima de si.



Acest simbol indică faptul că produsul marcat în acest fel nu trebuie aruncat ca și un gunoi menajer obișnuit. Deoarece acesta este un produs B2B, el nu trebuie aruncat nici la centrele de colectare urbane. Dacă vreți să aruncați acest produs, vă rugăm s-o faceți într-un mod adecvat, ducând-ul la cea mai apropiată firmă specializată în colectarea echipamentelor electrice uzate.



Tento symbol znamená, že takto označený výrobok sa nesmie likvidovať ako bežný komunálny odpad. Keďže sa jedná o výrobok triedy B2B, nesmie sa likvidovať ani na mestských skládkach odpadu. Ak chcete tento výrobok likvidovať, odneste ho do najbližšej organizácie, ktorá sa špecializuje na likvidáciu starých elektrických zariadení.



Ta simbol pomeni, da izdelka, ki je z njim označen, ne smete zavreči kot običajne gospodinjске odpadke. Ker je to izdelek, namenjen za druge proizvajalce, ga ni dovoljeno odlagati v centrih za civilno odlaganje odpadkov. Če želite izdelek zavreči, prosimo, da to storite v skladu s predpisi, tako da ga odpeljete v bližnjo organizacijo, ki je specializirana za odlaganje stare električne opreme.



Este símbolo indica que el producto así señalado no debe desecharse como los residuos domésticos normales. Dado que es un producto de consumo profesional, tampoco debe llevarse a centros de recogida selectiva municipales. Si desea desechar este producto, hágallo debidamente acudiendo a una organización de su zona que esté especializada en el tratamiento de residuos de aparatos eléctricos usados.



Den här symbolen indikerar att produkten inte får blandas med normalt hushållsavfall då den är förbrukad. Eftersom produkten är en så kallad B2B-produkt är den inte avsedd för privata konsumenter, den får således inte avfallshanteras på allmänna miljö- eller återvinningsstationer då den är förbrukad. Om ni vill avfallshandla den här produkten på rätt sätt, ska ni lämna den till myndighet eller företag, specialiserad på avfallshantering av förbrukad elektrisk utrustning i ert närområde.