LEVEL

E-TILT TILT SWITCH

OPERATING MANUEL

Information in this manual is reviewed and completely reliable. Responsibility is not assumed due to any typing error.
Products in this manual are available only for information purpose and they may be changed without notice.



Model

E-TILT 02 - Compact model
E-TILT 05 - Standard model
E-TILT 06 - Hard Condition model

Advantages

High operational stability
Easy installation
Cost-efficient design
High wear resistance
Eco-friendly

Important Notes

Used Symbols :

: Caution **: Note** **: Disposal**

- Please read this manual carefully before installation of the **tilt switch**. User is responsible for accidents and losses arising from failure to comply with the warnings in this manual.
- In the event that **tilt switch** is broken, take measures in order to prevent accidents and losses which can occur in its system.
- There is not any fuse and circuit breaker on the instrument; they should have been added to the system by the user.
- This manual should be stored in an easily accessible place for subsequent use.
- The manufacturer's liability cannot exceed the purchase price of the device according to the law.
- Do not make any modification on the instrument and do not try to repair it. Reparation should be made by authorized service staff.
- Do not operate the system before making assembly in compliance with the assembly chart related to the instrument.
- Products which do not contain label and serial number are considered to be excluded from the warranty scope.
- The instrument's useful life, determined and announced by the ministry, is 10 years.

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1. General Information

1.1. Material Acceptance

Check that there is no damage on the packages during the transportation immediately after the material acceptance. If packages are damaged, open the packages immediately and check whether products are affected or not, if there is any damage, send your complaint report to the transporter company and its photocopy to the address of our company.

1.2. Information About Areas of Application

E-TILT tilt sensor is produced mercury free switch which offers higher stability and sensitivity. Interior body is filled with epoxy resin which protects
electronic part from environmental effects. E-TILT works in vertical axis. A time relay can be implemented if delay is required.

Areas of Application :

Conveyor belts, silos, telescopic arms for ship loading ...

Ambient Conditions: Relative Humidity: 0-98 %RH **Ambient temperature:** 60 °C (It is not used under -20 °C)

1.3. Working principle

E-TILT mercury-free sensor technology is an electromechanical safety switch designed to provide level and blockage control in bulk material handling systems. Unlike traditional mercury switches, it offers an environmentally friendly and highly stable operating mechanism. The sensing section is fully isolated against moisture, dust, and corrosion.

• **Vertical Axis Operation:** Under normal conditions, the sensor hangs freely on the vertical axis (at a 90° upright position).
• **Angular Change Detection:** When the probe is tilted to the right, left, forward, or backward due to contact with bulk materials (such as grain, powder, coal, etc.), the internal sensor is activated once the tilt exceeds a predefined threshold angle from the vertical position.
• **Sensitivity and Stability:** Mercury-free sensors are designed to provide high sensitivity and operational stability. The triggering angle is typically 15° (±3°) depending on the model, but can also be configured as 25°, 35°, or 45° (±10°) according to application requirements.
• **Signal Output:** As a result of the detected tilt change, the switch opens or closes the electrical circuit. This contact signal can be processed by an electronic control unit to monitor conveyor belt conditions, perform level control in silos, or detect chute blockages.
• **Environmental Protection:** The internal housing of the sensor is filled with epoxy resin. This encapsulation material protects sensitive electronic components from adverse environmental effects such as moisture, dust, and vibration, ensuring improved stability and reliability.
• **Fault Prevention:** To prevent false triggering caused by sudden material fluctuations or wind effects, a time relay can be integrated into the system to enable delayed operation.

E-TILT, with its mercury-free design, complies with EU environmental regulations and enhances industrial system safety by converting physical tilt into an electronic signal.
It is manufactured from non-toxic and durable materials such as metal or plastic.

1.4. Technical Specifications and General Applications

Tilt Angle (Perpendicular to the right and left)	Maximum Contact Current/Voltage
15° ± 3° (Std.)	1,5 A / 120 VAC NC 0.6 A / 240 VAC
25° ± 10°	Opt. 1,5 A / 120 VAC 0.6 A / 240 VAC
35° ± 10°	Opt.12,5A / 120 VAC 7A / 240 VAC
45° ± 10°	Opt.1 A / 120 VAC 0.4 A / 240 VAC
Max. Switching Capacity	100 - 200 VA
Housing Material	304 St. St; Opt: 316 St. St ; PVC
Operating Temperature	(-) 40 °C / (+) 100 °C
Cable Length	2 m. (Std.) Additional length can be provided upon request.
Cable Material	PVC (Max. 60 °C) Opt: Silicone, Rubber
Protection Class	IP 67

Note: Hanging chains are not included. CE



Applications

It is primarily used to monitor the presence or absence of bulk materials, material levels, and the safe positioning of equipment.

A. Industrial Bulk Solid Material Processing and Storage (Powder, Grain, etc.)

- Silo and Hopper Monitoring: Used to provide high-level or low-level alarms in silos and bunkers..
- Chute Blockage Detection: Detects material accumulation and blockages in transfer chutes.
- Stockpile Monitoring: Used to monitor the height of bulk material piles beneath conveyor belts or in open storage areas.
- Crushers: Used to control the material level inside crusher chambers.

B. Ensuring Safe Operation of Conveyor Systems

- Material Flow Monitoring: Detects the presence or absence of material flow on conveyor belts.
- Belt Slippage Detection: Used to monitor conveyor belt alignment and slippage conditions.
- Tripper Discharge: Monitors the discharge status and high-level control of tripper cars.

C. Safety and Additional Applications

- Ship Loading Systems: Used to monitor the position of telescopic loading arms in ship loading operations.
- Industrial Equipment Safety Monitoring: By monitoring the safe operating angles of cranes or platforms, the system can stop equipment to prevent accidents.
- Liquid Level Monitoring: Certain specialized models can also be used in water or liquid level control applications.

General Applications



Conveyor Belt Systems



Grain and Cement Storage Silos

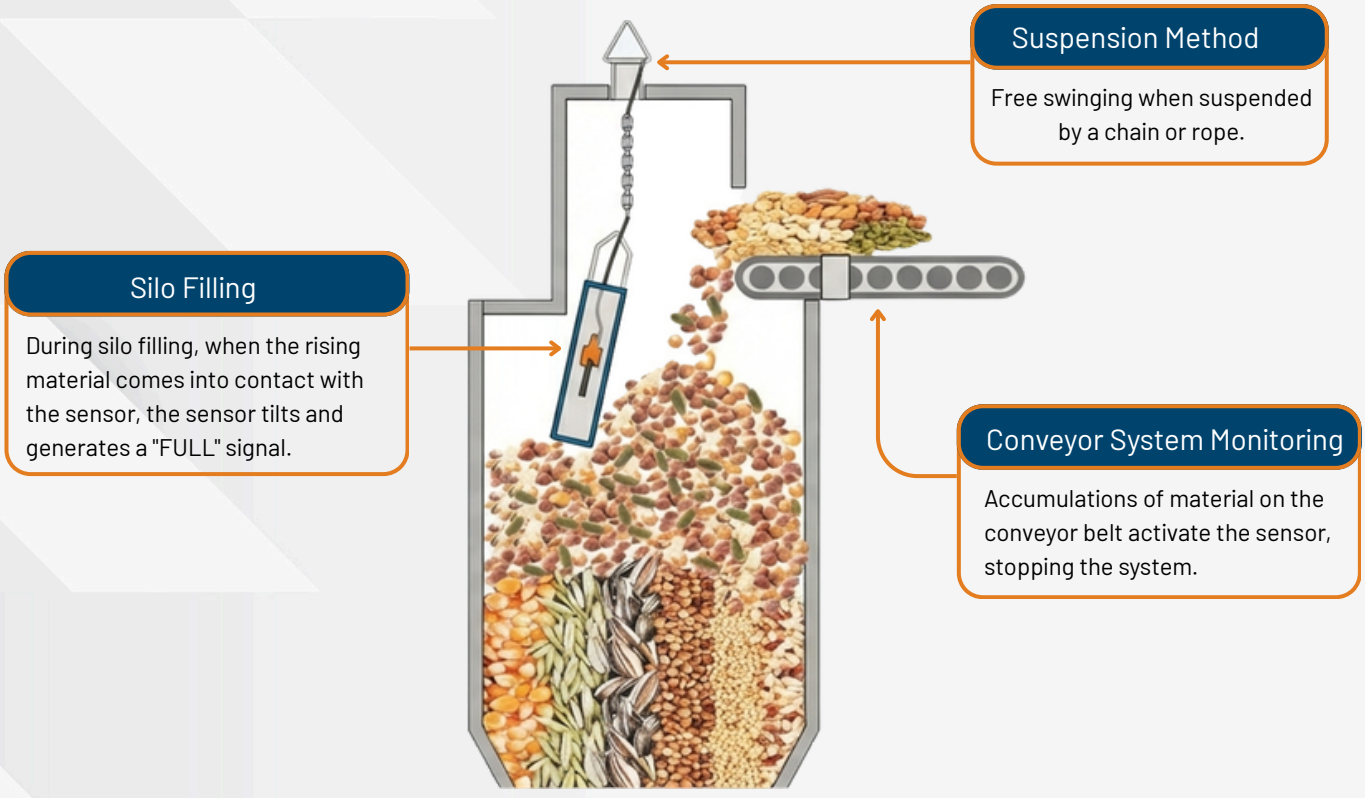


Vessel Loading



Grain and Cement Storage Silos

Application Example: Silo and Conveyor Belt Monitoring



Optional Accessories

- **Corrosion-resistant suspension chains** that allow the switch to hang freely in a vertical position and remain securely suspended.
- **Mounting brackets** that enable the probe to be firmly affixed to a stable support.
- **Electronic control unit** that processes the signal from the switch and helps prevent false alarms.
- **E-GSM Alarm Device** that enables remote notifications or message transmission in case of an alarm condition.
- **Protective shield** mounted above the probe to protect it from sudden material impacts and high-flow material discharge.
- Cable protection accessories, such as **steel braided sleeves**, to prevent cable damage.

E-GSM Alarm Device – Two Inputs
Battery-powered and/or externally powered operation.
Supplied with 2 lithium batteries and a 12 V adapter.
SIM card (postpaid or prepaid) not included.



Wireless surveillance and alert management
Dual-port system with instant notifications to mobile devices.

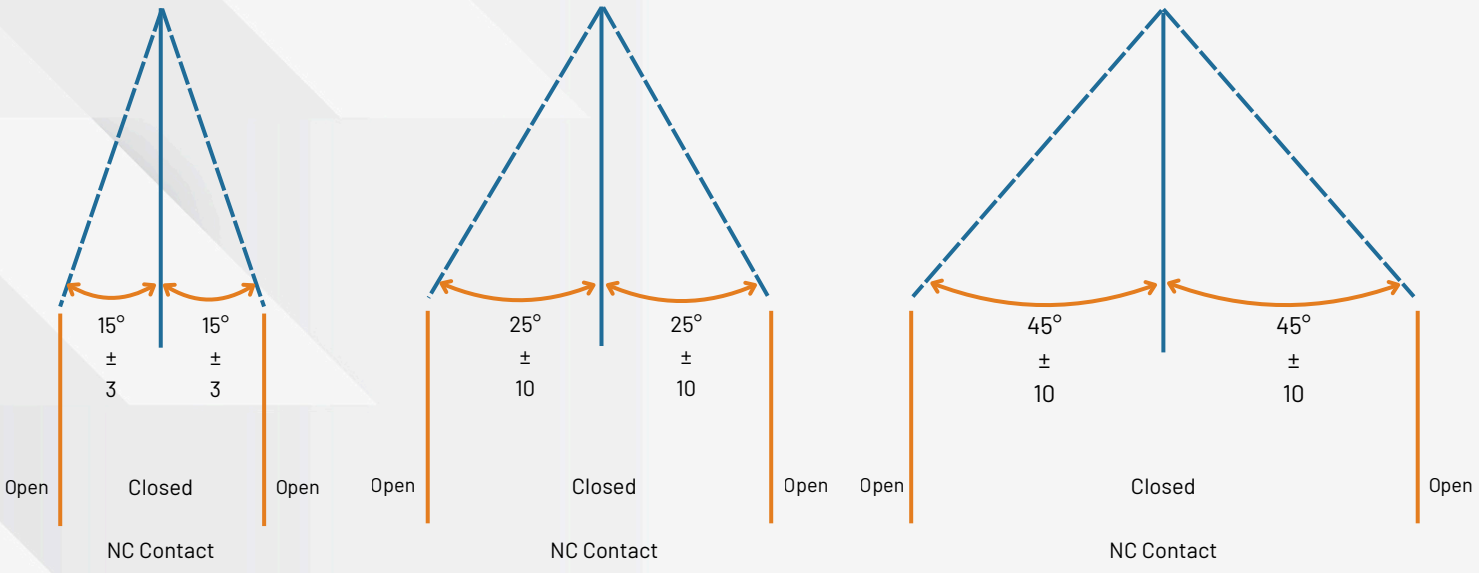
E-GSM Alarm System



False Signal Mitigation:
It mitigates false alarms triggered by abrupt impacts or wind-induced vibrations.

Time Relay

Switching Angles



Technical Pictures

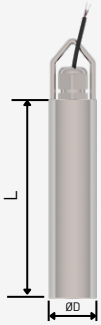
Model	Dimensions	
	L (mm)	D (mm)
E-TILT 02	100	21
E-TILT 05	200	21
E-TILT 06	175	40



E-TILT 02
(Compact Model)
For compact areas



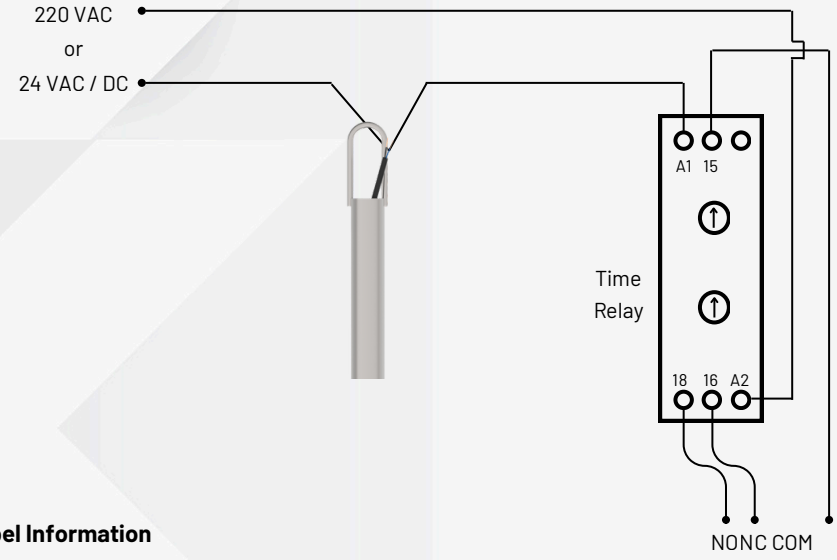
E-TILT 05
(Std. Model)
General Purpose



E-TILT 06
(Heavy-Duty Model)
For demanding circumstances

1.5. Electrical Installation

Make the electrical connection of the instrum ent according to details on its label, table and cable figures in this manual.



1.6. Label Information

- **Product Label**

(Dot Matrix)





Q.C • **Quality Mark**

- **Packaging Label**



1.7. Content of Package

Please check whether you have taken delivery of below listed content completely or not and check its conformity with criterions in your order.

- E-Tilt Level switch
- This operating manual

1.8. Target Group

This operating manual has been prepared for qualified technical personnel.

1.9. Security Notes



Following notes should be taken into consideration in order to avoid dangers which can occur on the operator and around the ambient:

Installation, operation and maintenance of this instrument should be made only by people who have read the operating manual and who are knowledgeable about work safety!
It should be complied with work safety, accident prevention regulations and national installation standards.
Product should be used only within the scope of stated specifications!
You can assemble the instrument only when pressure is not available!

2. Installation

2.1. General Notes

Installation of the instrument must be carried out only by authorized and qualified personnel.
Do not apply excessive force to the instrument during installation.
Do not operate the **tilt sensor** at pressures exceeding the recommended operating pressure.
The contact adjustment of the instrument is sensitive. Do not carry the device by its cable and take care to prevent any damage.
Ensure that no magnetic particles are present in the operating environment.
Unless otherwise specified, the maximum operating pressure must not be exceeded.

2.2. General Installation Stages

· Carefully remove the **tilt sensor** from its packaging.
· Check whether the material applied to the **tilt sensor** is suitable for the intended application. If it is not suitable, please contact the manufacturer.
· Then follow the instructions given below according to the design and installation structure.

2.3. Special Notes

· After installation, ensure that there is no mechanical stress on the shaft. Any mechanical stress may cause a shift in the characteristic curve.
· The **tilt sensor** must be mounted perpendicular to the tank wall or conveyor.
· If the device is installed outdoors and there is a risk of lightning, appropriate protective measures must be taken.

2.4. Installation For Mechanical Connections

· Select a suitable suspension bracket using an appropriate chain or rope.
· Ensure that the suspension mounting surface is clean and smooth.
· Assemble the instrument manually.
· The tilt sensor must be installed at a 90° vertical angle. During forward and backward linear movement, the contact angles should be checked.

2.5. Order Form : You may use the sample models as a reference for coding.

1	MODEL E-TILT
	Compact Type - **02**
	Standard Mini Type - **05**
	Heavy-Duty Type - **06**

2	CERTIFICATE	
	No - **0**	(EN10204-3-1) Material Certification - **1**

3	SWITCHING ANGLE (Contact Current)	
	15° ± 3° (Std) (1.5 A / 120 VAC - 0.6 A / 240 VAC) - **05**	45 ° ± 10 ° (1.5 A / 120 VAC - 0.6 A / 240 VAC) - **10**
	25° ± 10° (1.5 A / 120 VAC - 0.6 A / 240 VAC) - **06**	45° ± 10° (1 A / 120 VAC - 0.4 A / 240 VAC) - **11**
	35° ± 10° (12.5 A / 120 VAC - 0.7 A / 240 VAC) - **08**	Private - **x**

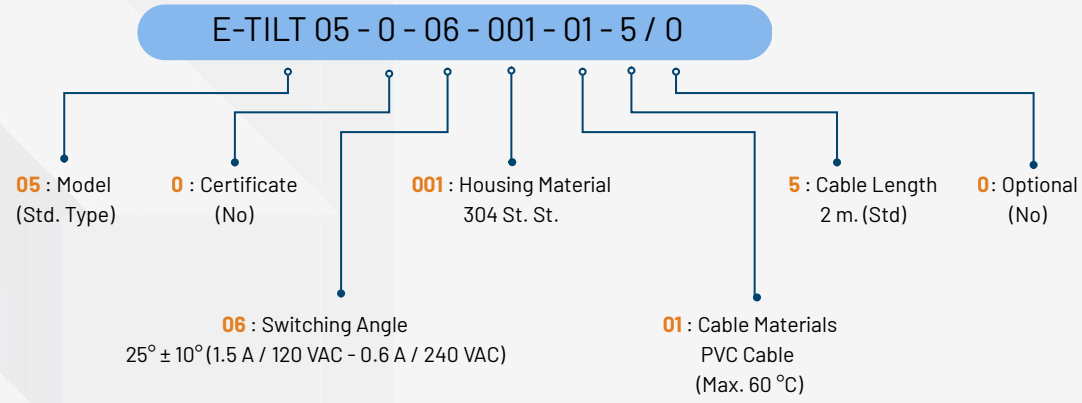
4	HOUSING MATERIAL	
	304 Stainless Steel - **001**	PVC - **061**
	316 Stainless Steel - **002**	Private - **x**

5	CABLE MATERIAL	
	PVC Cable (Maximum 60 °C) - **01**	Silicone Cable (Maximum 200 °C) - **03**
	PVC Cable (Maximum 105 °C) - **02**	Thick Silicone Cable - **M1**
		Private - **x**

6	CABLE LENGTH (m) L	
	2 m. (Std) - **2**	Private - **x**

7	OPTIONAL	
	None / **0**	E-GSM Apparatus / **E-GSM**
	Omron Timer Relay (0.1s-1200h/24-240 VAC/DC) / **R3**	Hanging Chain / **A**
		Private / **x**

EXAMPLE MODEL

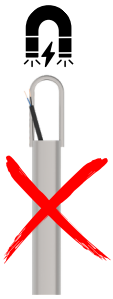


2.6. Warnings

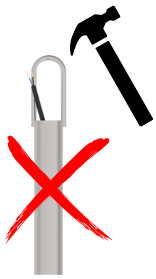
Please pay attention to following matters in order to operate your flow switch properly.



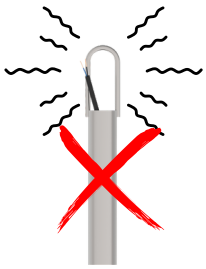
Contact between the cable and steam may lead to insulation problems.



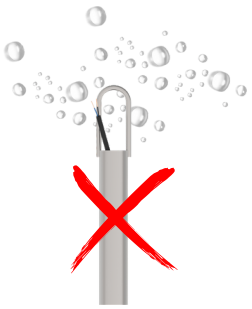
Keep away from magnetic fields; otherwise, the switch may be damaged and may not operate properly.



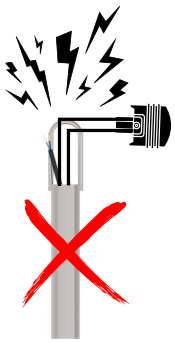
Do not drop the switch or expose it to impacts. Otherwise, its characteristics may change.



Vibration may cause instability



Do not connect the cable connection points below the liquid level; otherwise, insulation problems may occur.



Direct connection to the motor may cause excessive current, which can burn the relay of the switch.



Do not pull the device by the cable. Otherwise, its characteristics may change.



Please avoid using with liquids which damage materials of parts ,otherwise quality can not be maintained accurately



Do not install the switch in an inverted position. Otherwise, its characteristics may change.

3. Failure Delection

Breakdown	Probable cause	Failure detection\correction
No relay output / Continous relay output	-Connection angle is different than (vertical) -Applied values are higher than the suggested application current or voltage. -The product cable might be damaged.	-Set the connection angle to vertical position. -Notify the authorized service. -Notify the authorized service.
Unstable Switch	-Falling or being hit from outside -The product is exposed to vibration. -The appropriate angle has not been selected. -The product cable is pulled and the strength is applied	-Notify the authorized service. -It should be prevented from vibration affecting the product or connected to a place where vibration will not occur. -Notify the authorized service. -Notify the authorized service
Broken or dissolved housing	-Being subjected to a big impact in the work area -Being exposed to chemical effects that may damage the body	-The product should be protected, if necessary, it should be replaced. -Check the conditions and contact the manufacturer for the selection of the body from a durable material.

If you find an error, try to eliminate it by using this table or send the instrument to our service address for repair.

The instrument should be repaired only by authorized service!

4. Disassembly of Instrument

The device must be removed only when there is no flow and no pressure.

5. Service

The device does not require maintenance. If desired, it can be cleaned using mild cleaning solutions.

6. Recalibration

During the long service life of a tilt sensor, shifts in the switch point may occur. In such cases, recalibration is recommended. The calibration can be performed by your technical personnel, or the device can be sent to us for recalibration.

7. Repair - Manufacturer Address

If irreparable breakdowns occur, the instrument should be sent to us for repair purpose. Before this, the instrument should be cleaned carefully and packaged so as not to be broken. Furthermore, you should also add a detailed explanation which describes the breakdown while instrument is sent. If your instrument contacts with harmful substances, decontamination report should be also sent additionally. In the event that instrument does not have any decontamination report or our service department has doubts about instrument, repair process will not start until an acceptable report is sent.

Service -Manufacturer Company Name and Address:

If the instrument contacts with hazardous substances, necessary measures should be taken for decontamination!

Service -Manufacturer Company Name and Address:

LONCA MAK. SAN. TIC. A.Ş. Ferhatpaþa Mah. 37 Sok. No:78/A 34888 Ataşehir - İSTANBUL / TÜRKİYE

Phone : +90 216 50 50 555 / E-Mail: lonca@ensim.com.tr Web : www.ensim.com.tr

8. Disposal

The device must be disposed of in accordance with the European Directive 2012/19/EU (Waste Electrical and Electronic Equipment – WEEE). Waste electrical and electronic equipment must not be disposed of with household waste.

If the instrument has contacted with harmful substances, special attention should be paid for its disposal!

9. Terms of Warranty

The instrument has warranty legally for 24 months after delivery date. Warranty demands are not accepted in case of inappropriate operation, damage on the instrument or any modification on the instrument.

10. Terms of Return

In the return of materials, user should send an open list related to damage or problem, malfunction of the material to be returned or its operation in the different modification, with the instrument. If it is required to return the material, used in the dangerous, corrosive or toxic fluid, in this case, used part should be cleaned very carefully. Security of personnel should be ensured. All products to be returned should be sent to our company address, which we have stated.