



# Simplex

## User manual



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# Security

## General regulations

The user manual applies to Simplex.

The user manual is written for users of Simplex.

The user manual does not include instructions for the assembly of Simplex. This is provided in a separate assembly guide.

Read the user manual and familiarize yourself with Simplex before using it.

## Manuals for visually impaired individuals

Contact your local dealer if you have difficulty reading this user manual. Your local dealer can provide a digital copy of this manual. This allows for enlarging the manual or reading it aloud from your screen reading software.

## Purpose and intended use.

Simplex is an accessory unit that can be integrated with the E-Drive electric drive system, which, in turn, is combined with a manual wheelchair. Simplex is designed to assist a caregiver or a family member in an assisting role while operating a wheelchair. It aims to provide power assistance and enhanced mobility for manual wheelchair users.

The prerequisites for using the product are that the individual in question has at least one arm with sufficient strength to operate the handlebar on the product. Furthermore, sufficient cognition and motor skills are necessary for the person to operate the product safely. The assessment of the individual's ability is carried out by Decon or a representative appointed by Decon, such as assistive device centres and dealers.

The product can be used both indoors and outdoors.

Information about which wheelchair models Simplex can be mounted on can be found at [www.decon.se](http://www.decon.se).

## Not intended use

Any use that does not correspond to the description in this user manual. This also includes technical specifications.

# Labelling

The type plate, as described below, is located on the back of Simplex (forward in the direction of travel).



The symbols used on the label are explained below:



Pay attention to the user manual!



Medical device



Serial number



Date of manufacture



Name and address of the manufacturer



Article number



Sorted as electronic waste. Simplex is subjected to the European WEEE Directive.

## Symbols



### **WARNING!**

Risk of serious personal injury or death.

An operation which, if not performed correctly, may result in injury to the operator or other persons.

### **! CAUTION!**

Risk of material damage.

An operation that, if not performed correctly, may lead to material damage.



### **INFO**

Other important or explanatory information.

## Warnings

### Before you use Simplex for the first time



### **WARNING!**

The user shall have read and understood the manual and understand the interfaces of Simplex.



### **WARNING!**

Practice driving on a level and safe area, until you acquainted yourself with the use of Simplex.

### Driving



### **WARNING!**

Do not hang clothes, bags or other equipment on the handle.



### **WARNING!**

Never operate Simplex while sitting in the wheelchair yourself.



### **WARNING!**

Check the remaining battery capacity before crossing a road. If the battery capacity is low, Simplex may stop.

 **INFO**

If possible, use the parking brake of the wheelchair, when stopping at a pedestrian crossing, or similar.

### Road conditions

 **WARNING!**

Do not use Simplex outdoors in heavy rain or snow. Drivers of other vehicles may have difficulty seeing you. If it starts to rain or snow when you are outdoors, make your way indoors as quickly as possible.

 **WARNING!**

Do not use Simplex on icy surfaces. There is a risk that you won't be able to stop.

 **WARNING!**

Do not drive in areas with deep snow or standing water. There is a risk that you will lose control.

### Railroad crossings

 **WARNING!**

Check the remaining battery capacity before crossing a railroad. If the battery capacity is low, Simplex may stop.

### Storage and transport

 **WARNING!**

Do not store Simplex where it may get wet from rain or in places with high humidity.

 **WARNING!**

Avoid storage in direct sunlight or high temperatures.

 **CAUTION!**

During transport, position the wheelchair to avoid damage to Simplex.

### Cleaning

 **CAUTION!**

Never wash Infinity with a hosepipe or high-pressure washer. Do not use a steam cleaner. The electronic devices may be damaged, which can lead to serious malfunctions.

## **! CAUTION!**

Do not clean with solvents such as petrol or thinner. This may damage parts of Simplex.

## **INFO**

Simplex may be disinfected using a cloth soaked in alcohol.

## **General use**

## **WARNING!**

Do not use Simplex near devices that generate strong radio waves. If Simplex is near a radio wave source and starts to function abnormally, turn off the power immediately, and manually move the wheelchair from the current location.

The weak electromagnetic waves emitted by Simplex may affect other electronic devices, such as automatic doors and anti-theft systems of the type used in stores. In this case, turn the power of and operate the wheelchair manually.



## Warranty

The warranty period for Simplex is 2 (two) years from the date of purchase.

If there is a material or manufacturing defect on your Simplex during this warranty period, the defective parts will be replaced or repaired free of charge. The warranty covers the Simplex unit, but not the adapter set. This warranty does not cover faults caused either by intentional misuse by the user or careless use, such as faults caused by use other than that specified in this manual. This warranty also does not cover faults that have occurred as a result of modification of the unit or continuous use under conditions other than the specified conditions, for example maximum weight exceeded etc. Scratches, matting and dirt on the surface of the product as a result of normal use are not covered by the warranty.

If warranty repairs are necessary, contact the dealer where you purchased the unit.

The estimated service life is 6 years, but depends on the usage conditions, environment and usage frequency. The service life denotes the period during which the performance of the product shall be maintained through maintenance and inspections by the dealer.

### **Product safety and recall information**

Contact your dealer or the manufacturer of Simplex for product safety information and any recalls.

# Product description

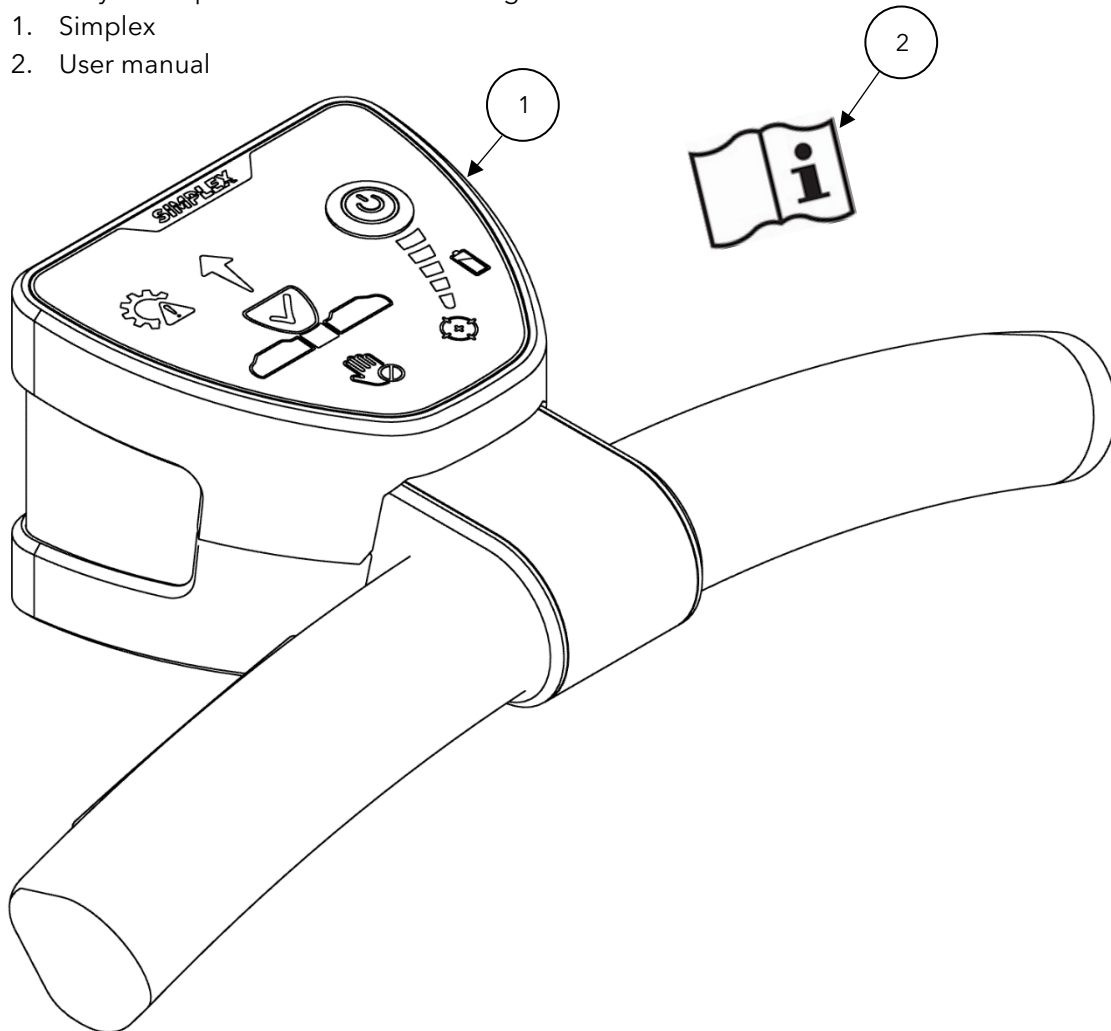
## Technical data

Compatible drive system		Decon E-Drive
Total dimensions, excl. adapter set		305x137x86 mm (WxLxH)
Total weight, excl. adapter set		980 g
Operating conditions	Environment	Indoor and outdoor
	Temperature	-25°C to 50°C
	Humidity	No condensation
Enclosure integrity (IEC-60529)		IPX4 (resists splashing of water)
Wheelchair classification (EN 12184:2022)		Class B
Other		See E-Drive's documentation for operating instructions and technical specifications.

## Scope of delivery

The delivery of Simplex includes the following:

1. Simplex
2. User manual



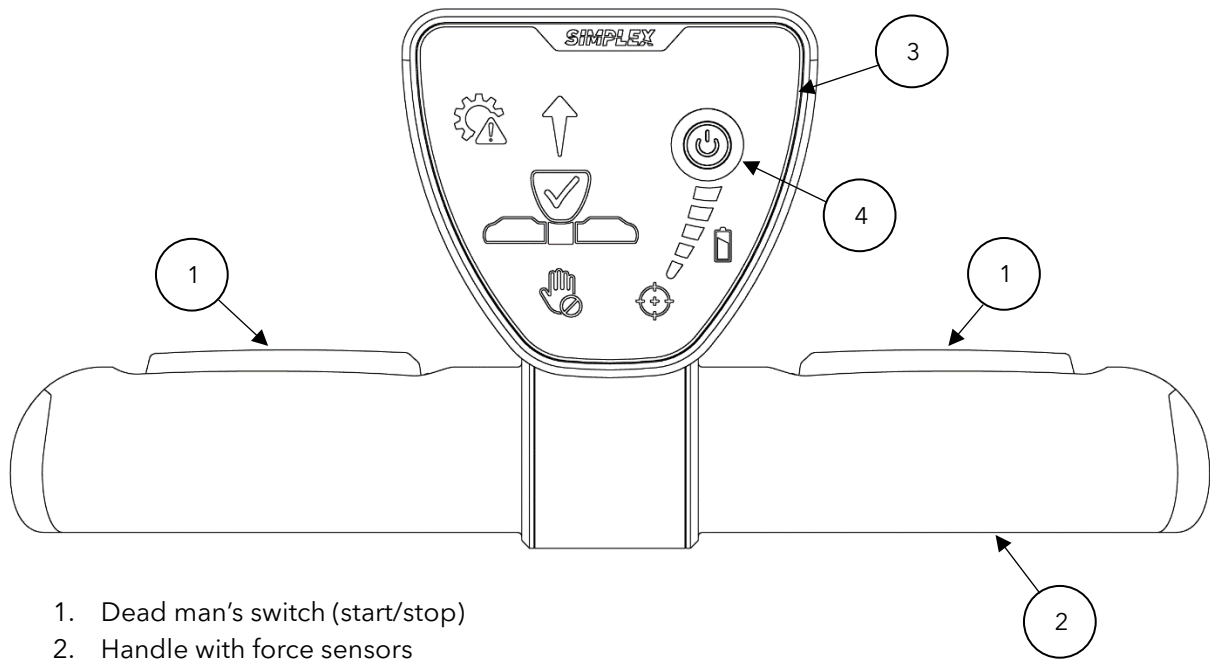
### Adapter set



An adapter set is required to mount Simplex on a wheelchair. The adapter set must be installed by a trained technician. The adapter set is ordered separately.

## Overview Simplex

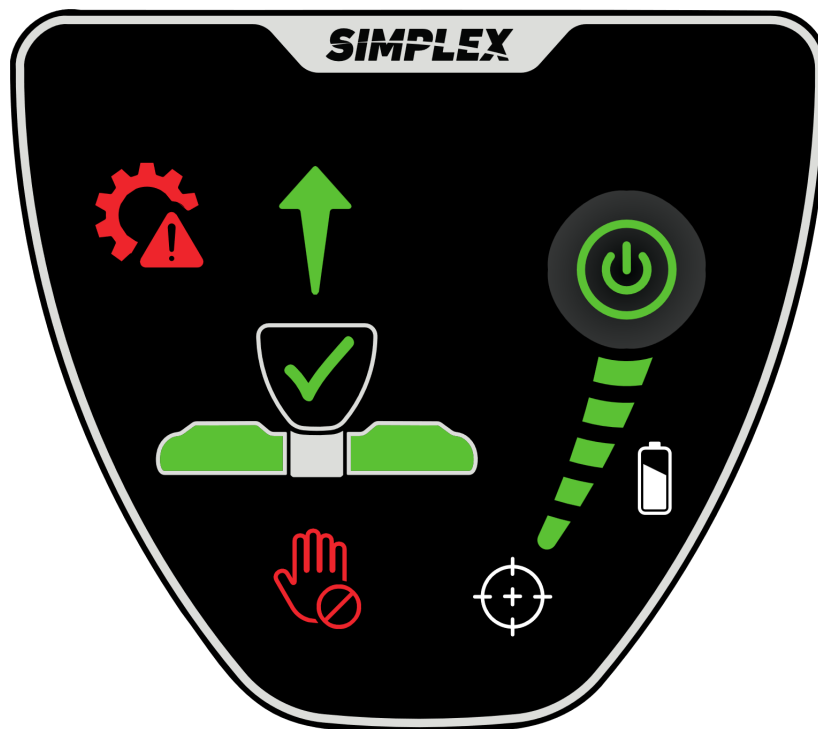
Simplex is an accessory to E-Drive, which controls the speed based on the force applied to the handle.








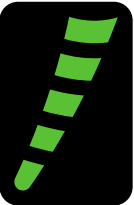



1. Dead man's switch (start/stop)
2. Handle with force sensors
3. Display
4. Switch (on/off)

# Display

Simplex' display has the following indicators:



Indicator	Name	Status	Description
	Switch (on/off)	Off	Simplex Off
		Green	Simplex On
	Ready	Green	Simplex is ready to start.
	Started	Green	E-Drive is started.
	Warning/error	Yellow	Indicates a warning, in combination with the battery level indicator. Simplex can still be operated.

		Red	Indicates an error, in combination with the battery level indicator. Simplex stops and cannot start as long as the error remains.
	Battery symbol	White	The battery level is shown.
		Yellow/red	Indicates warning/error from the battery.
	Battery level	In combination with the battery symbol, green/yellow/red.	Shows the batter level in 5 steps.
		In combination with the warning symbol	Shows error code (See chapter Troubleshooting).
		Blue - rolling indication	Calibration ongoing
		White - rolling indication	E-Drive starts
	Calibration	White - steady light	Simplex is not ready, calibration is ongoing.
		White - blink	Calibration updated
	Release the handle	Red - steady light	Simplex is not ready. Do not touch the handle.
		Red - blinking	Simplex not ready, release the handle.
	Left/right	In combination with the warning symbol, yellow/red	Indicates warning/error from the left and right wheel respectively.
		Yellow/red	The calibration is bad / A force is applied to the handle.
		Green	The force on the handle is small.

# Using Simplex

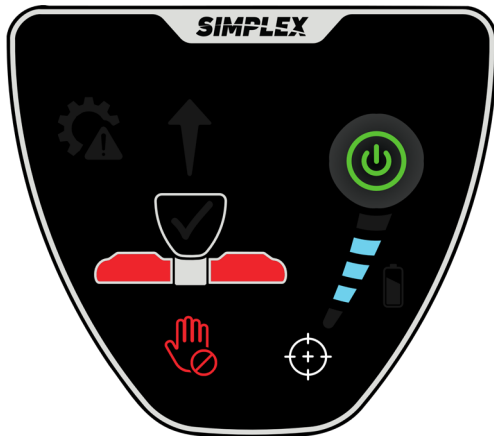
Simplex can only be used with Decon's E-Drive. Simplex shall be installed by a trained technician.

## Summary

1. Use the switch to turn Simplex on.
2. Wait for the indication ready.
3. Activate one or both dead man's switches.
4. When the indication started (green arrow) lights up, E-Drive is active. Control the speed and direction by pushing the handle in the desired direction.
5. Stop by first lowering the speed and then release the dead man's switches.

## Calibration

Simplex is automatically calibrated when the dead man's switch is inactive and the handle is not touched. Before the calibration is done the displays shows the indication calibration:



When the calibration is done, the indication ready is shown:



The calibration continues to be updated in background. For every update, the indication calibration blinks. Depending on temperature changes, etc., the calibration may need to be repeated. If this happens during use, stop, release the handle, and wait until the indication calibration to blinks.

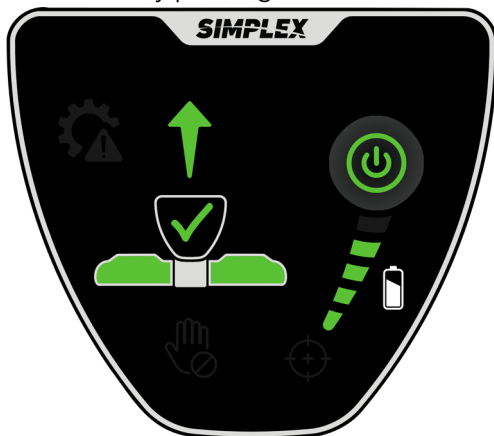
The indications left and right shows the error in the calibration or, alternatively, the force on the handle. Green corresponds to a low force, which means that the calibration is good and that Simplex will be ready for start. Red corresponds to a larger force, meaning that either a new calibration is needed, or the force needs to be removed from the handle.

## Start

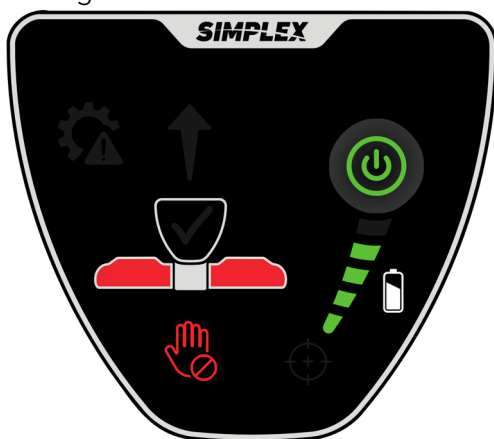
When the indication ready is shown, E-Drive can be started by activating one of the dead man's switches. The left, right or both hands can be used. The switches have three positions. In the middle position they are activated. Simplex stops if both dead man's switches are released, or if any switch is pressed to its third, fully depressed, position.

## Steering

When E-Drive has been started the indication started is shown. The wheelchair can now be controlled by pushing the handle in the desired direction. Simplex adapts the speed automatically.



Only horizontal forces affect Simplex. Do not lift or push the handle downwards. Do not start steering before E-Drive is started. Simplex does not start if the force on the handle is too high. Then the indication release the handle is shown:



## Passing obstacles



### INFO

Simplex' handle is not intended to be lifted or pushed down. Move one or both hands to the wheelchair's push handles if needed.



## Care

### Cleaning

If Simplex becomes dirty due to normal use, clean Simplex with a lightly damp towel. If Simplex is heavily soiled, use a towel and a neutral detergent. Make sure that no detergent remains on Simplex after cleaning.

### Corrosion

Simplex parts that can be exposed to corrosion are made of aluminium, stainless steel or steel. The materials and the transitions between the materials have been surface treated, therefore, there is no increased risk of corrosion. Regardless of this, you should always wipe wet or damp surfaces on Simplex with a dry cloth after use.

### Maintenance

Use a copy of this page to note when and by whom the checks were performed. Save the details. The following checks should be performed every 6 months after the first use.

Unit	Action	Note	Date	Controller
Overview	Jammed parts			
	Check of adapter set			
	Dirty electrical connectors			
	Cables, visual inspection for damage.			
	Cables, check connections.			

## Repairs

- The user must not repair or service Simplex.
- The user must not remove and send parts of Simplex to the dealer for repair.
- If repair is required, contact your dealer even if the fault is of a less serious nature.
- If parts are damaged or missing, contact your dealer immediately. Return Simplex to your dealer to have parts replaced or repaired.
- For normal maintenance, repair or service, always contact your dealer. If Simplex is not repaired or all parts are not used during assembly, the user, people in its surroundings or property may be injured.
- To carry out repairs and service, the dealer uses the service manual, spare parts catalogue and other documentation. This documentation is not available to the user and the public.

## Waste disposal

When Simplex has expired and is to be scrapped, contact your local authorities for recycling information and follow their instructions.







Alternatively, you can contact your dealer for recycling of your used Simplex.









# Troubleshooting


Simplex is an accessory to E-Drive. In some cases, the manual of E-Drive is referred to for further troubleshooting.

## Errors and warnings from Simplex

Simplex displays detected errors and warnings with the warning symbol in combination with the battery level indicator. Warnings allow continued operation and are indicated with yellow. Errors stops E-Drive and are indicated with red.



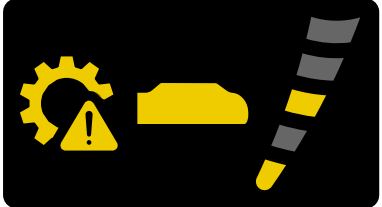

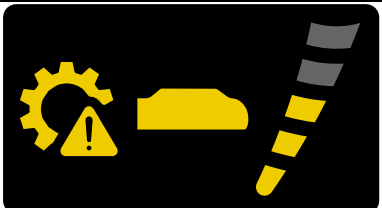
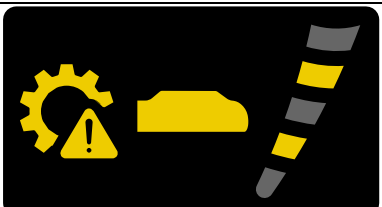
Indication	Code	Description	Action
	S3	The dead man's switch is held in between its 1 <sup>st</sup> and 2 <sup>nd</sup> position. Alternatively, the signals are invalid.	Release the dead man's switch and activate it again to start. Contact your dealer if the error remains.
	S4	The signals of the dead man's switch are invalid. Can also be caused by pushing the button too slowly and gently.	Restart Simplex using the switch. Contact your dealer if the error remains.
	S5	The left dead man's switch is in its third position.	Release the dead man's switch. Contact your dealer if the error remains.
	S6	The right dead man's switch is in its third position.	Release the dead man's switch. Contact your dealer if the error remains.
	S7	Error in the electronics of Simplex.	Contact your dealer.
	S8	Invalid battery voltage.	Restart Simplex using the switch. Contact your dealer if the error remains.







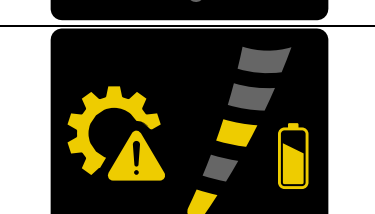
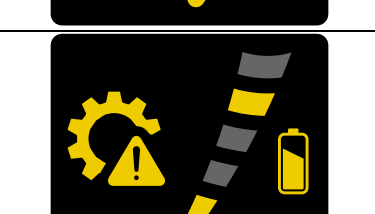
	S9	Force sensor error	Restart Simplex using the switch. Contact your dealer if the error remains.
	S10	Force sensor error	Restart Simplex using the switch. Contact your dealer if the error remains.
	S11	Temperature sensor error.	Restart Simplex using the switch. Contact your dealer if the error remains.
	S12	Communication error between Simplex and E-Drive.	Check the cables. Restart Simplex using the switch. Contact your dealer if the error remains.
	S13	Communication error between Simplex and E-Drive.	Check the cables. Restart Simplex using the switch. Contact your dealer if the error remains.
	S14	Communication error between Simplex and E-Drive.	Check the cables. Restart Simplex using the switch. Contact your dealer if the error remains.
	S15	E-Drive is already activated by another controller (e.g. joystick).	Turn the other controller off. Contact your dealer if the error remains.
	S16	Program error.	Restart Simplex using the switch. Contact your dealer if the error remains.



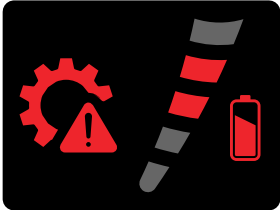



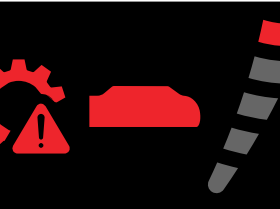

	S17	The calibration is reset.	<p>Let Simplex be turned on. A new calibration is automatically saved after 10 min. Contact your dealer if the error remains.</p>
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### Errors and warnings from E-Drive

For action and further information, see the user or service manual of E-Drive.







Indication	Equivalent indication from E-Drive's joystick	Description
	C1	The clutch of the left wheel is disengaged.
	C1	The clutch of the right wheel is disengaged.
	C5	E-Drive is stuck or overloaded.
	C5	E-Drive is stuck or overloaded.
	C6	E-Drive is stuck or overloaded.
	C6	E-Drive is stuck or overloaded.

	C7	E-Drive is stuck or overloaded.
	C8	E-Drive is stuck or overloaded.
	--	Communication error between E-Drive motors and battery.
	10	Battery level is 10% or less.
	E	The battery is empty.
	C9	The battery is cold.
	C9	The battery is cold.
	C9	The battery is hot.

	C9	The battery is hot.
	C9	There temperature sensor of the battery is faulty.
	E1-22	The battery voltage is too high.
	E2-14 / E3-14	See service manual of E-Drive.
	E2-15 / E3-15	See service manual of E-Drive.
	E2-16 / E3-16	See service manual of E-Drive.
	E2-17 / E3-17	See service manual of E-Drive.
	E2-18 / E3-18	See service manual of E-Drive.

	E2-19 / E3-19	See service manual of E-Drive.
	E2-20 / E3-20	See service manual of E-Drive.
	E2-21 / E3-21	See service manual of E-Drive.
	E2-22 / E3-22	See service manual of E-Drive.
	E2-23 / E3-23	See service manual of E-Drive.
	E2-24 / E3-24	See service manual of E-Drive.
	E2-25 / E3-25	See service manual of E-Drive.
	E2-26 / E3-26	See service manual of E-Drive.



	E2-27 / E3-27	See service manual of E-Drive.
	E2-28 / E3-28	See service manual of E-Drive.
	E2-29 / E3-29	See service manual of E-Drive.
	E2-30 / E3-30	See service manual of E-Drive.
	E2-31 / E3-31	See service manual of E-Drive.
	E2-32 / E3-32	See service manual of E-Drive.

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