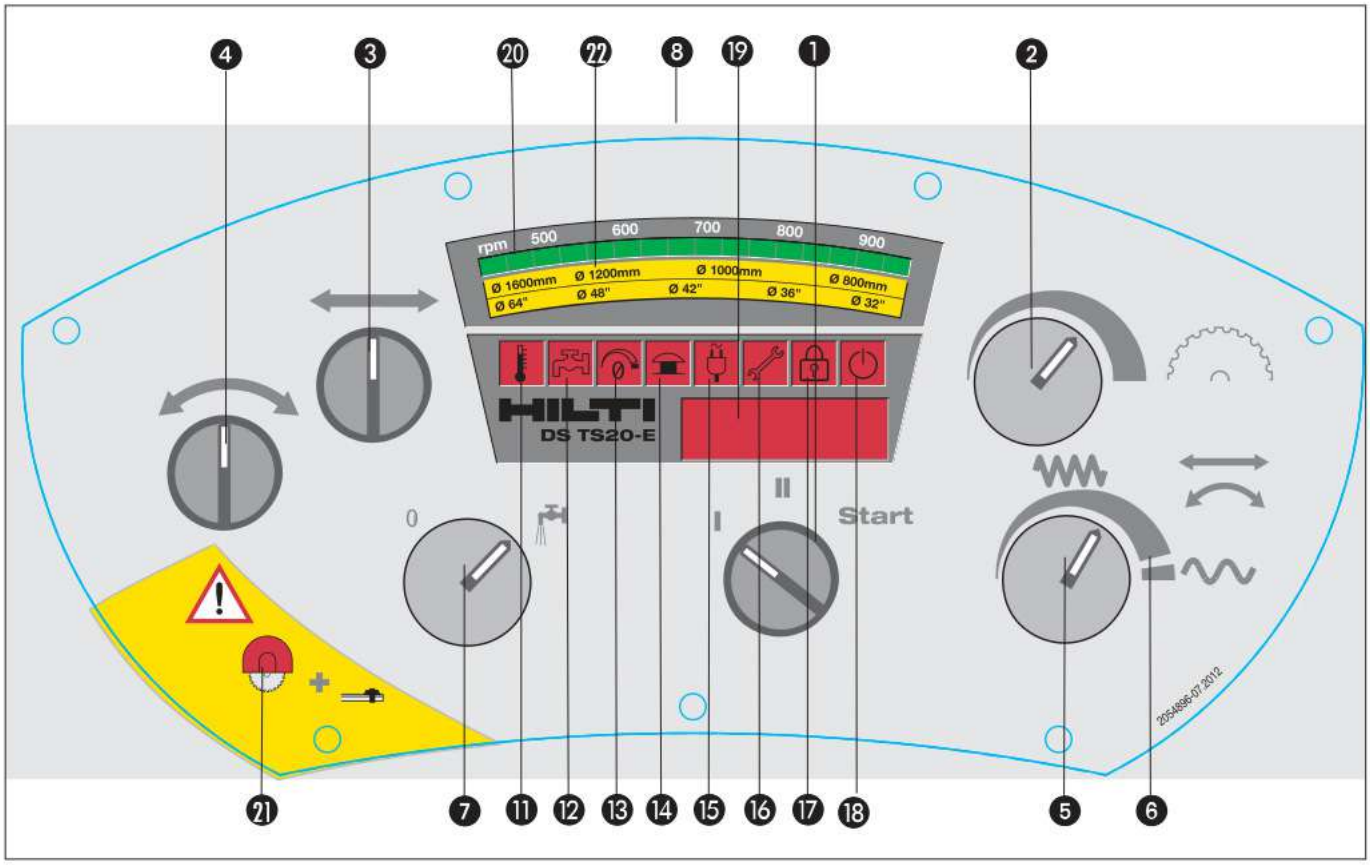
8. Operation

8.1 Checks before beginning sawing

1. On-site preparations must be completed (supports, water collection, etc.).
2. The power unit must be positioned outside the danger zones. The areas in front of and behind the object where sawing is to take place are danger zones and must be secured and cordoned off. No persons may remain in a danger zone.
3. The power cable and water supply must be connected to the power unit. The power supply must be earthed / grounded and equipped with a ground fault circuit breaker. The water supply must be within the permitted pressure range.
4. The rail supports and rails must be aligned and fastened correctly, with all screws and nuts tightened securely.
5. The saw head must be mounted correctly and the locking levers engaged. Move the locking levers back and forward slightly to check that they are engaged correctly.
6. The power and control cables and water hoses must be laid out, connected correctly and the locking sleeves engaged.
7. The saw blade must be mounted in the correct direction of rotation and the mounting screw at the saw blade flange (or six countersunk screws for flush cutting) tightened securely.
8. The blade guard and end stop must be fitted securely.
9. The remote control unit and control cable must be connected.
10. The emergency stop button on the remote control unit must be disengaged and reset.
11. All control knobs on the remote control unit must be in the “Off” or “Neutral” position.
12. The operator should be wearing the remote control unit (using the shoulder strap).
13. The “Ready” indicators on the power unit and remote control unit must light.
14. The safety precautions must be observed.

8.2 Description of the remote control unit



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No.	Description	Function
❶	Saw blade drive motor on / off	Starting blade drive: Turn to START (switch returns to position II when released) Position II = saw blade drive running Position I = saw blade drive "Off"
❷	Saw blade speed	Infinite (stepless) speed regulation – display position ⓴.
❸	Direction of advance	Selects direction of advance of the saw on the rail.
❹	Direction of plunge movement	Selects direction of saw blade plunge movement.
❺	Speed regulation for controls 3 and 4	Manual and / or automatic advance or plunge movement-display position ⓳.
❻	Rapid movement for control 5	For rapid advance and plunge movement when saw blade drive is switched off.
❼	Cooling water on / off	Controls cooling water supply to saw blade. Water flows when not under power.
❽	Emergency stop switch	Press in an emergency! Leave pressed in when setting up or changing blades etc. Turn knob in direction of arrow to release – display position ⓮.
❾	Reset switch for emergency stop	Reset must be pressed after releasing the emergency stop button ❽ – display position ⓲.
⓫	Overheating cut-out	Lights when the machine has switched itself off due to overheating.
⓬	Temperature warning	Lights when cooling is inadequate.
⓭	Zero position error	Lights when one or more knobs are not in the zero or neutral position when switching on.
⓮	Emergency stop indicator	Lights when the emergency stop button is pressed or when not reset.
⓯	Fault in electric supply	Lights when a phase is missing, voltage is too low or too high or out of synchronization.
⓰	Service indicator	Lights when servicing is due (end of service interval). Servicing should be carried out by Hilti.
⓱	Theft protection	Not active.
⓲	Emergency of indicator	Lights when the emergency stop has not been reset – switch ❾.

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⑲	Operating hours counter	After switching on, the following information is displayed: power unit firmware version (Exx), saw head firmware version, operating hours and total saw head operating hours.
	Power indicator	The actual power input is displayed during operation of the saw (in %).
	Supply voltage	During operation, turn starting switch ① to "Start" (voltage is displayed).
	Fault indicator	The code displayed can help to localize a possible fault (e.g. Er01).
⑳	Speed indicator	Can be adjusted by the knob at position ②.
㉑	Warning	Operation of the saw without blade guard and end stops fitted is not permissible!
㉒	Recommended speed range	

NOTE

To read the mains input voltage while the saw is in operation (only 3x400V version), proceed as follows:
1. Turn the starting switch ① to the "Start" position and hold it there.
2. The voltage reading is shown in the display ⑲ in volts.

To read the mains input voltage while the saw is stationary (only 3x400V version), proceed as follows:
1. Turn the starting switch ① to the "I" position.
2. Set the saw blade speed control knob ② to the maximum speed position.
3. Turn the starting switch ① to the "Start" position and hold it there.
4. The voltage reading is shown in the display ⑲ in volts.

The procedure described below can be used to reverse the positions of the switch controlling direction of advance:
1. Turn the starting switch ① to the "I" position.
2. Set the advance speed control knob ⑤ to the zero position.
3. Set the saw blade speed control knob ② to the maximum speed position.
4. Operate the direction of movement control switch ③ or ④.
5. Turn the starting switch ① to the "Start" position and hold it there.
6. When reversal of control direction has been successful, "L__R" is shown in the display ⑲.

8.3 Operating the saw

1. Use the plunge ④ and advance ③ controls and the speed regulation knob ⑤ to move the saw head along the rail to where the cut is to be started and then return all switches / knobs to the "Neutral" or "Zero" position. For rapid movement, turn the speed regulation knob ⑤ to the right, beyond the pressure point ⑥, as far as it will go.
2. Switch on the cooling water ⑦.
3. Switch on the saw blade drive ① and then use the speed control ② to set the desired speed (please observe recommended speeds). Wait until the blade runs up to speed.
4. Select the direction of plunge movement ④ and advance speed ⑤ and then bring the blade slowly to the desired cutting depth (cut into the concrete). Set the plunge movement ④ and speed regulator ⑤ back to the "Neutral" or "Zero" position when the desired depth has been reached.
5. Select the direction of longitudinal advance ③ and the desired speed ⑤, e.g. 100%. Make the initial cut at reduced power (60%).
6. At the end of the cut, turn the speed control ⑤ to the "Zero" position and switch off the longitudinal advance ③.
7. Repeat steps 4 to 6 until the desired depth is reached.

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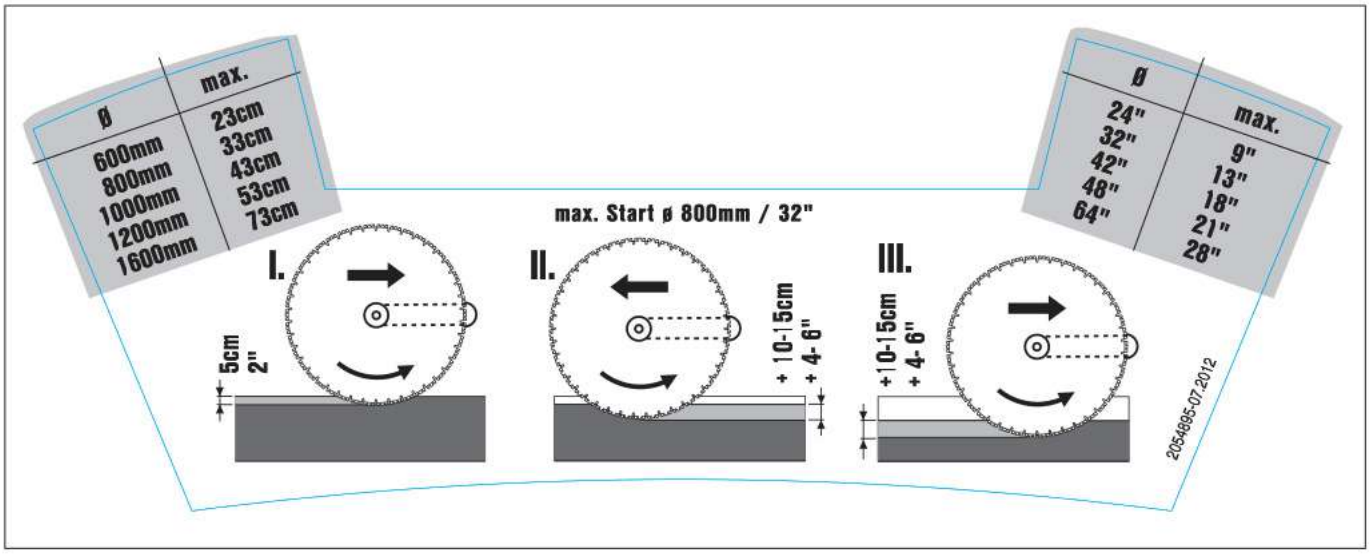
8. Once the cut has been completed or the maximum depth reached, use the plunge movement direction control ❹ to lift the saw blade out of the kerf while the blade is still rotating, bringing the saw and saw arm to the 90° position.
9. Subsequently turn all switches / knobs (advance direction, advance speed, blade speed, water supply and starting switch) back the "Neutral" or "Zero" position and then press the emergency stop button.
10. If necessary, fit a larger diameter saw blade (max. 1600 mm dia.) and repeat the procedure.

8.4 Guidelines and guide values

1. The initial or guide cut

The initial cut is also known as the guide cut. This cut should always be made with the saw arm in the trailing position. Depending on the material being cut (hard, soft or masonry) the guide cut should be made to a depth of between 4 and 5 cm. The guide cut should always be made at reduced power (e.g. 60%). This prevents the blade wandering off course and ensures a straight cut.

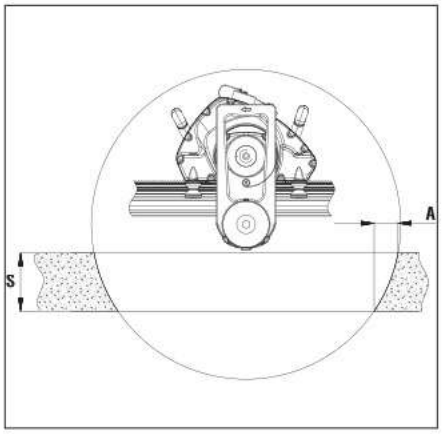


2. Subsequent cuts

After the guide cut has been made, sawing can continue with the saw arm in either the trailing position (pulling the blade) or leading position (pushing the blade). The depth of subsequent cuts again depends greatly on the material, but may be between 10 and 15 cm. These cuts can be made at full (100%) power.

8.5 Remaining cutting distances with the DS TS20-E saw head

S [cm]	A [cm] ∅ 700 mm	∅ 800 mm	∅ 900 mm	∅ 1000 mm	∅ 1200 mm	∅ 1600 mm
20	12.4	10.2	8.7	7.6	6.2	4.5
25	21.0	15.9	13.2	11.4	9.0	6.5
30		25.1	19.4	16.3	12.6	8.9
35			29.3	22.9	17.1	11.8
40				33.5	22.8	15.2
45					30.3	19.3
50					42.1	23.9



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8.6 Dismantling the saw system

1. Pivot the saw arm to the 90° position. Switch the machine off, disconnect the cables and fit the protective caps to the plugs and sockets.
2. Disconnect the water hose from the saw head and clean the blade guard, saw head and rail system.
3. Remove and clean the blade guard and saw blade.
4. Remove the saw head from the rail and clean these parts.
5. Disconnect the cables and water hose from the power unit and fit the protective caps to the plugs and sockets.
6. Clean the cables and hoses, roll them up and attach them securely to the transport trolley.
7. Stow the saw head, rail system parts, blade guard and accessories securely on the transport trolley.

CAUTION

- To avoid the possibility of damage, always switch off at the main switch before disconnecting the power cable.
- To avoid damage when temperatures below freezing are expected, the cooling system must be fully drained by blowing out with the pump provided.

9. Care and maintenance

9.1 Cleaning

1. Disconnect the system from the electric supply.
2. Clean the entire set of equipment after finishing work or before long breaks between periods of use.
3. Do not allow dirt and slurry to dry out and adhere to the parts.
4. When cleaning, pay particular attention to the operating surfaces, threads, connectors, toothed sections, points of contact between moving parts, operating controls and safety or operating information plates.
5. Fit the protective caps to all plugs and connectors.
6. Clean the power unit, remote control unit, and cable with a damp cloth.
7. Use a medium-hard brush and water to clean the saw head, rails, blade guard system and transport trolley.

CAUTION

- Do not use high pressure cleaning systems to clean the power unit, saw head, remote control unit or cables. Water finding its way into these parts may cause malfunctions and damage to the equipment.
- If concrete formwork parting agent or oil is used on the equipment (to help prevent concrete adhering to it) take care to ensure that the product used contains no solvents.
- Products containing solvents may attack and damage the seals or other parts of the casing.

To avoid damage when temperatures below freezing are expected, the cooling system must be fully drained by blowing out with the pump provided.

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9.2 Maintenance

Parts	Procedure	Daily	Weekly
Rail supports	Check the contact and clamping surfaces, clean if necessary.	●	
	Check the threads for smoothness and ease of operation,clean and grease if necessary.		●
Rails	Check the contact and running surfaces, clean if necessary.	●	
	Check the toothing for damage and wear, replace the rail if necessary.		●
	Check the tapered sleeves, clean and lubricate with oil if necessary.	●	
Blade guard	Check and clean working parts and inside/outside surfaces.	●	
	Check that the guide rollers are free to move and clean or replace the parts if necessary.		●
	Check the condition of the rubber tensioning straps and replace if necessary.	●	
Saw head	Check the locking mechanism for security of engagement, have it repaired if necessary	●	
	Check the guide rollers for ease of operation and excessive play, have them replaced / repaired as necessary.		●
	Check the plug connectors for cleanliness and damage. Blow out with compressed air or have the parts replaced if necessary.	●	
	Check the saw blade mounting flange and mounting screw, clean or replace if necessary.	●	
	Check the saw head for oil or water leakage and have it repaired if necessary.		●
	Check the water flow and replace the mesh filter at the water supply connection if necessary.		●
Power unit	Check the switches and indicator lamps for correct operation and have them replaced if necessary.	●	
	Check the plug connectors for cleanliness and damage. Blow out with compressed air or have the parts replaced if necessary.	●	
	Check the power unit for water leakage and have it repaired if necessary.		●
	Check the water flow and replace the mesh filter at the water supply connection and descale if necessary.		●
Remote control unit	Check the switches and indicator lamps for correct operation. Clean the parts or have them replaced if necessary.	●	
	Check the plug connectors for cleanliness and damage. Blow out with compressed air or have the parts replaced if necessary.	●	
Water hose	Check the couplings for cleanliness, ease of operation and leakage. Clean and lubricate the couplings if necessary (lubricant spray).	●	
	Check the hose for leakage.		●
Cables / plugs	Check the plug connectors for cleanliness, damage and ease of operation. Blow out with compressed air or have the parts replaced if necessary.	●	
	Check the cables for damage and replace them if necessary.	●	
Transport trolley	Check the tyre pressure (2.1 bar or 30 psi).		●
Tool set	Check for completeness.		●

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9.3 Statutory requirements

The electrical and mechanical safety of the saw system and its accessories such as electric extension cables must be checked at the specified intervals in accordance with national regulations.
In countries of the European Union, following the provisions of EN 60204-1, the checks listed below are recommended:

- Measurement of earth / ground conductor resistance (max. 0.3 ohms).
- Instead of the insulation resistance test in accordance with EN 60204-1, leakage current during operation should be measured, as this provides a very quick indication of the possibility of an insulation fault.
- Measurement of earth /ground conductor current (max. 3.5 mA during operation, with the machine placed on an insulated surface).
- Functional and visual check of the emergency stop switch, operating controls, indicator lamps, seals, cables, blade guard and support system in order to detect faults that could present a hazard.

9.4 Service intervals

We recommend that the system is checked at a Hilti service center after every 200 operating hours. This will ensure that the equipment is ready for use when required and help avoid high subsequent costs.

NOTE
The service indicator lights when servicing is necessary.

10. Troubleshooting

10.1 The meaning of error codes and the measures to be taken to remedy faults

The electric wall saw is quipped with a fault diagnosis and error display system that allows the operator to localize faults and, as far as possible, to remedy these without assistance.
While doing so, should it be necessary to enter the danger area, all safety instructions, particularly those listed in Section 5, must be observed.
Should it prove impossible to remedy the fault yourself, you can assist Hilt Service by describing the fault as precisely as possible and by stating the error code displayed by the remote control unit.

Displayed on remote control		Fault	Possible cause	Recommended measures to remedy fault
No display		No display on power unit or remote control unit	Electric supply not connected or faulty	– Check the electric supply – Check the plug connections – Return the remote control and power unit to Hilti Service
Symbol 11 lights 	Er50 Er51 Er52 Er53	Machine has switched itself off due to overheating	Cooling water insufficient or too warm	– Allow to cool with cooling water flowing / restart – Return the saw head to Hilti Service
Symbol 11 lights 	Er20 Er21	Machine cannot be switched on	Temperature sensor in the saw head is faulty	– Return the saw head to Hilti Service
Symbol 11 lights 	Er89 Er90	Machine cannot be switched on	Temperature sensor in the power unit is faulty	– Return the power unit to Hilti Service
Symbol 12 lights 	Er54 Er55 Er56	Warning before cut–out due to overheating	Cooling water insufficient or too warm – power unit is overheating	– Improve the cooling – Return the power unit to Hilti Service

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Symbol 12 blinks slowly 	Sr60 Sr61	Warning before cut–out due to overheating	Main motor or advance motor is overheating	– Improve the cooling – Observe the application guidelines – Return the saw head to Hilti Service
Symbol 12 blinks rapidly 	Sr60 Sr61	Warning of imminent cut-out due to overheating	Main motor or advance motor is overheating	– Improve the cooling – Observe the application guidelines – Return the saw head to Hilti Service
Symbol 12 blinks slowly 	Sr62 Sr63 Sr64	Warning before cut–out due to overheating	Cooling water insufficient or too warm Ambient temperature too high (Sr64)	– Improve the cooling – Place the power unit in the shade – Return the saw head to Hilti Service
Symbol 12 blinks rapidly 	Sr62 Sr63 Sr64	Warning of imminent cut-out due to overheating	Cooling water insufficient or too warm Ambient temperature too high (Sr64)	– Improve the cooling – Place the power unit in the shade – Return the saw head to Hilti Service
Symbol 13 lights 		Saw blade drive cannot be switched on	One or more control knobs or switches not in the "0" or neutral position	– Return all knobs and switches to the "0" or neutral position and restart
Symbol 13 lights 		Advance movement doesn't function	Longitudinal and plunge advance operated simultaneously	– Operate the advance controls individually
Symbol 13 lights 		Zero position indicator lights as the blade is coming to a standstill	The motor brake has been activated	– None required
Symbol 14 lights 		Machine cannot be switched on	The emergency stop switch is in the pressed-in position	– Release the emergency stop button / restart – Have the fault repaired by Hilti Service
Symbol 14 lights 	Er11	Machine cannot be switched on	Break in the emergency stop / motor cable circuit	– Check the motor cable and plug connections – Return the saw head, motor cable and power unit to Hilti Service
Symbol 15 blinks 	Er44	Machine cannot be switched on or switches itself off	Difference between phases > 10%	– Check the electric supply – Return the power unit to Hilti Service
Symbol 15 lights 	Er42 Er43	Machine cannot be switched on or switches itself off	Electric power is inadequate	– Check the electric supply – Return the power unit to Hilti Service
Symbol 15 blinks slowly 	Sr45 Sr46	Warning that electric power is inadequate	Electric power is inadequate	– Check the electric supply – Return the power unit to Hilti Service
Symbol 16 lights 		No fault	Service interval has been reached	– Return the saw head to Hilti for servicing
Symbol 18 lights 		Machine cannot be switched on	Emergency stop reset button hasn't been pressed	– Press the reset button / restart
Display	Er00	The machine doesn't function	Remote control unit and saw head not compatible with each other	– Check compatibility and replace the remote control unit with one of the correct type – Return remote control and power unit to Hilti Service

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Troubleshooting

Display	Er01 Er02	The machine doesn't function correctly	Faulty connection between the remote control and power unit	– Check plug connectors and cable – Replace the remote control unit – Return remote control and power unit to Hilti Service
Display	Er04 Er05 Er06 Er07	The machine doesn't function correctly	Fault in the remote control electronics	– Replace the remote control – Return the remote control to Hilti Service
Display	Er12	Machine cannot be switched on	Break in the connection between the power unit and the saw head	– Check the control cable and plug connections – Return the saw head, control cable and power unit to Hilti Service
Display	Er30	The machine has switched itself off	The slip clutch has been activated as a result of how the saw is being used	– Observe the application guidelines – Return the saw head to Hilti Service
Display	Er33	The machine has switched itself off	Saw used incorrectly - overload Saw blade stuck Short circuit	– Observe the application guidelines – Return the saw head, cable and power unit to Hilti Service
Display	Er35	The machine has switched itself off	Saw used incorrectly Excessive lateral friction Blade segments polished	– Observe the application guidelines – Return the power unit to Hilti Service
Display	Er36	Saw blade cannot rotate	Saw blade stuck	– Release the blade / restart – Return the power unit to Hilti Service
Display	Er40	The machine has switched itself off	Electric supply voltage too high	– Check the electric supply
Display	Er41	The machine has switched itself off	Electric supply voltage too low	– Check the electric supply
Display	Er80	The machine doesn't function correctly	Electronic fault in the power unit	– Return the power unit to Hilti Service
Display	Er81 Er82	The machine doesn't function	Electronic fault in the power unit	– Return the power unit to Hilti Service
Display	Er83 Er84	The machine doesn't function	Electronic fault in the power unit	– Return the power unit to Hilti Service
Display	Er85 Er86 Er87 Er88	Machine cannot be switched on	Contactor K1 or K2 in the power unity is faulty	– Return the power unit to Hilti Service
Display	Er91	The machine doesn't function	Safety loop for emergency stop is faulty	– Replace the remote control – Return power unit to Hilti Service

10.2 Causes of faults with no error code and how they can be remedied

Description of fault	Possible cause	Recommended measures to remedy the fault
Blade wanders off course	Inadequate blade tension	Check the tension / replace the blade
	Saw blade segments have lost cutting power	Check the specification / replace the blade
	No guide cut made or guide cut not straight	Observe instructions and guide values
	Play at the guide rollers	Check the play / replace the rollers or rail
	Rail not securely fastened	Check and improve the fastenings
	Rail distorts (twists)	Install additional rail supports
Low sawing performance	Unsuitable saw blade specification	Check the specification / change to other specification if possible
	Depth of cut too high	Check depth of cut / reduce if possible
	Power setting too low	Check the setting / increase if possible

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The machine is not receiving enough current	Check the setting / increase if possible
Drop in performance due to wandering off course	See "Blade wanders off course"
Drop in performance due to high reinforcement content	Check the reinforcement content / change position of cut if possible
Saw blade speed too high or too low	Check the speed / increase or reduce if possible

10.3 Repairs

CAUTION

- The machine may be operated, serviced and repaired only by authorized personnel who have been trained by Hilti. This personnel must be informed of any special hazards that may be encountered.
- Repairs to electrical components may be carried out only by trained electrical specialists.
- NEVER open the covers on the machine while on a construction site.
- The capacitors in the power unit retain a voltage for approx. 2 minutes after disconnection from the electric supply.

11. Disposal

11.1 Disposal of the machine

Return waste material for recycling

- Machine and packaging must be sorted for environment-friendly recycling.
- Plastic components are marked to facilitate categorized recycling.

Only for EU countries

Disposal of electric tools together with other household waste is not permissible!

In observance of European Directive on waste electrical and electronic equipment and its implementation in accordance with national law, electric tools that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.

11.2 Disposal of drilling and sawing slurry

- With regard to environmental aspects, allowing drilling or sawing slurry to flow directly into rivers, lakes or the sewerage system without suitable pre-treatment is problematical.
- In addition to the following recommended pre-treatment procedures, the applicable national regulations must be observed when disposing of drilling or sawing slurry. Ask the local authorities concerned for further information.

We recommend the following pre-treatment

- Collect the drilling and sawing slurry (e.g. using a suitable industrial vacuum cleaner).
- The fine content of the drilling and sawing slurry should be separated from the water by allowing it to settle (e.g. leave standing for some time or add a coagulation agent).
- Solid material from the drilling and sawing slurry should be deposited at a construction waste
- Water from the drilling and sawing slurry should be neutralized (e.g. by adding a large quantity of water or other neutralization agents) before it is allowed to flow into the sewerage system.

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