Instruction Manual

AMAZONE

AMASCAN⁺

On-Board Computer



MG 2458 BAG 0066.1 01.14 Printed in Germany

Please read this operating manual before first commissioning. Keep it in a safe place for future use!



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1. Details about the **AMASCAN**⁺

1.1 Range of application

The computer is a display-, controlling and monitoring device for Precision Airplanters.

The micro computer is provided with a memory and a lithium battery. All entered and determined values are stored , even if the on-board power supply is switched off.

AMASCAN⁺ is suitable for Airplanters **ED 02** with max. 12 sowing units.

1.2 Manufacturer

AMAZONEN-WERKE

H. DREYER GmbH & Co. KG

Postfach 51, D-49202 Hasbergen-Gaste

1.3 Conformity declaration

The calculator fulfils the EMV-guide line 89/336/EC.

1.4 Details when making enquiries and ordering.

When ordering spare parts indicate the serialnumber of the computer.



1.5 Identification

Type plate on the on-board computer.



The type plate is of documentary value and may not be changed or disguised!

1.6 Declined use of the machine

The computer has exclusively be designed for the usual operation for agricultural machinery as a display, monitoring and controlling device in combination with the **AMAZONE** Airplanter ED.

The **computer** is a display- and monitoring device which has been designed for the common use in agriculture.

Any use other than that stipulated above is no longer regarded as designed use. The manufacturer does not accept any responsibility for damage resulting from this. Therefore, the operator himself will carry the full risk.

Under "designed use" the operator must adhere to the manufacturer's prescribed operation, maintenance and repair conditions, and exclusively use **original AMAZONE spare parts.**

The implements may only be operated, maintained and repaired by such persons who have been made acquainted with it and who have been advised about the dangers.

All applicable accident prevention advice as well as any further generally accepted safety-, working-, medical- and road traffic rules should be adhered to.

AMAZONE machines have been manufactured with great care, however, even in case of designed use, certain deviations from the seed rate of even a total failure cannot totally be excluded. These deviations may be caused e.g. by:

- Blocking or bridging (e.g. by foreign particles, bag residue, etc.).
- Wear of wearing parts (e.g. singling discs . . .).
- Wear of wearing parts (e.g. singling discs . . .).
- Incorrect drive RPM and travelling speed.
- Incorrect setting of the machine (incorrect mounting).

Therefore, check before any use and also during operation your machine for the proper function and sufficient seed rate accuracy.

Claims regarding damage not having occurred on the **AMAZONE** Airplanter itself would be rejected. This also applies to damage due to sowing errors. Modifications made to the **AMAZONE** Airplanter by the owner/user may result in consecutive damage and the manufacturer does not accept liability for such damage.

2. Safety

This instruction manual contains basic advice which must be adhered to when mounting, operating and maintaining the machine. Ensure that this instruction manual has been read by the user/operator before starting to operate the device and that it is made readily available at all times to the user.

Please strictly observe and adhere to all safety advice given in this instruction manual.

2.1 Dangers when not adhering to safety advice

Not adhering to the safety advice given

- may result in endangering the user or other persons, the environment and/or the machine itself.
- may result in the loss of any claim for damages.

Not paying attention to the safety advice may cause the following risks:

- Danger for persons by not secured operational range.
- Failure of important functions of the machine.
- Failures of prescribed measures for maintenance and repair.
- Danger for persons by mechanical or chemical affects.
- Dangers to persons or to the environment by leaking hydraulic oil.

2.2 Qualification of operator

The machine may only be operated, maintained and repaired by persons, who are acquainted with it and have been informed of the relevant dangers.

2.3 Symbols in this instruction manuals

2.3.1 General danger symbol

The safety advice in this operation manual which may lead to a danger of persons when not being observed, are identified with the general danger symbol (DIN 4844 W9).

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2.3.2 Attention symbol

The safety advice in this operation manual which may cause dangers for the machine and it's function when not being adhered to, are identified with the attention symbol.



2.3.3 Hint symbol

Hints regarding machine's specific functions, which have to be adhered to for a faultless function of the machine are identified with the hint symbol.





2.4 Safety advice for retrofitting electric and electronic devices and/or components

The function of the implements' electronic components and parts may be affected by the electricmagnetic transmittance of other devices. Such affects may endanger people when the following safety advice will not be adhered to:

When retrofitting electric and electronic devices and/or components to the implement with connection to the on-board electric circuit, the user must ensure by himself that the installation will not cause any disturbance to the tractor electronic or other components.

Special attention must be paid that the retrofitted electric and electronic parts correspond to the EMV-guide 89/336/EC in the relevant valid edition and that they bear the CE-sign.

For retrofitting mobile communication systems (e.g. radio, telephone) the following requirements must be fulfilled:

- Only install devices which have officially been authorised in your country.
- Firmly install the device.

The use of portable or mobile devices inside the tractor cab is only permissible with a connection to a firmly installed external antenna..

2.5 Safety advice for repair work



Before carrying out any repair work on the electric system or arc welding on the tractor or the mounted implement, disconnect all connections of devices.



3. Fitting instructions

3.1 Console and computer

Fit basic console (Fig. 1/2) special option) within reach and sight to the right hand of the operator; it must be free of vibrations and electrically conductive inside the tractor cab. The distance from a radio transmitter and an antenna should at least be 1 m.

The **retainer** (Fig. 1/1) is pushed on to the tube of the console. (Fig. 1/2).

The optimum viewing angle of the display is between 45° and 90° seen from below. Bring into the desired position by swivelling the console.

3.2 Battery connection lead

- Connection with AMASCAN⁺ (Fig. 1/3).
- Connection with electric sowing unit on/off isolation.(Fig. 1/4).

For this, machines with electric sowing unit on/off require a separate power supply from the tractor battery

The power supply is **12 V** and should be taken directly from the battery or from the 12 V-starter. Carefully lay the **cable** and shorten if necessary. Fit the ring tongue for the earth cable (blue) and the wire end bushing for the + cable (brown) with appropriate pliers. The wire end bushing for the + cable is located in the connecting clamp of the fuse holder.

brown = + 12 Volt

blue = mass

3.3 Connection of the implement

The airplanter ED mounted to the tractor is connected via one/two implement plugs (Fig. 1/5).

Via the 39 pole implement plug "Electric" the computer receives information about the sensors and part section control switches.







4. Description of product **AMASCAN**⁺

AMASCAN⁺ is a display- and monitoring- device for Airplanters ED with up to 12 sowing units maximum..

The computer has been equipped with a memory and a lithium battery. All entered and determined values are stored, even if the on-board power supply is switched off. At the next switching on all data are available again.

AMASCAN⁺ (Fig. 2/...) consists of:

1. AMASCAN⁺

AMASCAN⁺ is installed on the tractor within view of the tractor operator on a mounting bracket and a console (2).

- Console battery power supply cable. Connect the battery power supply cable with the tractor battery.
- 3. Opto sensor. Each sowing unit is provided with an opto sensor.
- 4. Movement sensor (Sensor X) for travelled distance and area monitoring. This sensor simultaneously gives the reference signal for the operational situation (implement in operation "yes" (ja) / "no" (nein). The sensor fitted to the setting gearbox is transmitting impulses (Imp./100m), as soon as the gearbox input shaft is driven by the ground wheels.
- Implement plug with 39-pole multiple plug.
 AMASCAN⁺ is connected to the connecting unit of the ED with the aid of the implement plug.
- Cable-tree-system AMASCAN⁺ for 12 rows in maximum incl. movement sensor.
- Fertiliser hopper monitoring consisting of two filling level indicators and metering shaft monitoring (for visual and audible alarm signals via the AMASCAN⁺).
- 8. Option: Cable harness system for electric unit on/off.
- 9. Blind coupling: Required for continual row reduction, e.g. from 8 rows with sunflowers down to 6 rows on maize.







AMASCAN⁺ and its functions:

Function monitoring of the individual sowing units.

- After having dropped from the singling disc and passed the opto sensor (Fig. 3/3) (infrared light barrier), every individual seed grain creates an impulse which monitors the sowing units.
- The currently counted number of seed grains is extrapolated to seed grains/ha, shown on the display and compared with the pre-determined rated value.
- In cases where the required sowing rate fluctuates, above or below, by more than 15 % an audible alarm sounds and the arrow above the warning triangle symbol flashes Simultaneously the number of the defect unit is shown on the display with the actual value (seed grains/ha)/1000. Aggregates mit dem Istwert (Körner/ha)/1000.
- Determination of the worked area per task in [ha].
- Determination of the worked total area, e. g. per season in [ha].
- Display of the current area efficiency in [ha/h].
- Determination of the time of operation in [h].
- Display of the travelled distance in [km].
- Display of the actual forward speed in [km/h].







When the Airplanter is in operational position the following data are shown on the 6-digit display (Fig. 4/1):

- right hand the current number [seed grains/ha]/1000 (Fig. 4/2).
- on the left hand side (Fig. 4/3) the display (figures 1, 2, 3 etc.) changes automatically after 5 seconds. The number of the actually monitored sowing unit is shown.
- the vertical arrow (Fig. 4/4) and the flicking circle below (Fig. 4/5), as soon as the movement sensor (Sensor "X") is transmitting impulses to the AMASCAN⁺.

If the computer recognises a defect on one of the sowing units or a deviation from the pre-set rated value, the arrow above the warning triangle symbol flicks. At the same time the number of the defect sowing unit (e.g. 3) with its current value (e.g. 96) seed grains/ha)/1000 is shown on the display and an audible alarm sounds (honking).

A row of 12 numbered indicator lights is located below the display. Each indicator light relates to a sowing unit.

Sowing unit switched on:

- Indicator light shows as green.

Sowing unit switched off:

- Indicator light does not show.

Sowing unit (drive or monitoring) is switched off:

Indicator lights show as red.



Seen in travelling direction the sowing units are numbered from the left hand outer side to the right hand outer side. That means, seen in travelling direction, the sowing unit on the left hand outer side bears the number 1, etc

Display in case of a defect sowing unit









The key pad (Fig. 5) are divided into the following areas:

- Blue = Function keys (display of the determined data).
- Yellow = Input keys (entering the machine data).
- Orange = On/off.
 - Control keys (monitoring function to switch on or off one or several units for a short time).



Fig. 5

Keypad layout

Key	Function	Key	Function
1/0	AMASCAN ⁺ on/off.	I	Pre-selection switching on/off sowing units beginning at the r.h. outer side.
ha Σha	 Display of the covered area [ha] after having entering the "start function" Display of the covered total area in [ha] 		Pre-selection switching on/off sowing units beginning at the l.h. outer side.
Ha/h	Display area efficiency in [ha/h]		Complete reset the switching off of the sowing units.
km	Display of the travelled distance in [km] after having entered the "start function"	Service	Checking the monitoring function
km/h	Display of the operational speed in [km/h]	+	Input key for increasing the displayed value
	Working width in [m] – display and enter- ing		Input key for reducing the displayed value
	Entering the number of sowing units		Key used to confirm all entries
limp. 100m	Imp/100 m – display and entering (directly or via the calibration procedure)	C	Correction key
<u>K/ha</u> 1000 (100 %)	Rated value seed grains/ha)/1000] display and entering	(t) (t)	Start function



5. Putting to operation

 Plug the implement plug of the Airplanter ED, mounted to the tractor, on to AMASCAN⁺.

Before starting to operate check the implement specific data by pressing the corresponding keys in the mentioned order or enter newly:

- 1. Switch on **AMASCAN**⁺.
- Check distance sensor calibration value "Imp./100m" and correct if necessary (by direct entering the calibration of the movement sensor).
- 3. Check the working width [m] and correct if necessary.
- 4. Enter the rated value for the application rate [(seed grains/ha)/1000].
- 5. Check the number of sowing units and correct if necessary
- 6. Release start function and start sowing operation.

5.1 Operating procedure and description of the keypad

Before starting operation AMASCAN+ requires the implement specific data (values):





By the first pressing on one of the keys the display jumps by one position into the desired direction.



5.1.1 Operating sequence

1. AMASCAN⁺ on/off switching

By pressing key **AMASCAN⁺** is switched on and off.

When switched on the calculator tests itself. Then automatically the function is dialled which was displayed before the calculator had been switched off.

In case of a fault in the electronic system, the device shows::

- HALP 00 or HALP 88

In this case return the computer for repair.



Whenever the supply voltage drops to below 10 volts, e. g. when starting the tractor, the computer automatically switches off. It has to be switched on again as described above.

2. Calibrating the distance sensor

For determining the actual forward speed **AMASCAN**⁺ requires the value "Imp./100m", which sensor "X" releases to **AMASCAN**⁺ when driving down a calibration distance of 100 m.

There are two possibilities to enter the calibration value "Imp./100m":

- The value "Imp./100m" is known and dialled via the keypad.
- The value "Imp./100m" is unknown and should be determined by driving down a calibration distance.

As the calibration value "Imp./100m" depends soil, we recommend that you always newly determine this value by driving down a calibration distance, in case of heavily deviating types of soil.

a) The calibration value "Imp./100 m" is known:



Press key with the tractor stopped.

- Dial the known calibration value "Imp./100m" via the keys • or • .



Once again press key to check the stored calibration value. Now the dialled calibration value should appear on the display.

In case of deviations between

- the sown application rate and the actually covered area
- the covered area determined by **AMASCAN**⁺ and the actually covered area

newly determine the calibration value by driving down a 100 m calibration distance (please refer to item b).

b) The value "Imp./100 m" is unknown:

Accurately measure out in the field a calibration distance of 100 m. Mark the starting- and ending point of the calibration distance.



 Bring tractor to start position and Airplanter ED into operational position (if necessary, lift the sowing units to interrupt the drive of the sowing units).

- Press key keep pressed and simultane-

Accurately drive down the calibration distance from the starting to the ending point (when starting the counter returns to "0"). The display shows the currently determined impulses.



When driving down the calibration distance, do not press any key.



Display during calibrating



- Stop after 100 m. Now the number of determined impulses is shown on the display.
- Press key to store the displayed, determined calibration value (Imp./100 m).

Display of the determined calibration value



- Once more press key to check the stored calibration value. Now, the determined calibration value (Imp./100 m) should appear on the display.
- Enter the determined calibration value into tabel 11.2 eintragen.

Tabel 11.2: Soil related calibration value "Imp./100m"

Type of soil	Imp./100m
Soft soil	
Medium heavy soil	
Hard soil	

3. Working width

For determining the operated area requires information about the working width. The working width should be entered as follows:

- Press key drücken.
- Via the keys \checkmark or \checkmark dial the desired working width [m] on the display, e. g. "3.00" for 3 m working width.

Display working width



4. Application rate



Enter the value for the desired application rate whilst the tractor is not moving.

seed grains per

95.000

30 holes.

Example:

Desired:

hectare Row spacing R: 0,75 m

Singling disc:

Determined seed grain spacing a: 14,04 cm

(please refer to chapter. 7.5)

Singling disc used: 30 holes

- Take from the gearbox setting table a seed grain spacing nearest to the determined seed grain spacing whereby you have to bear in mind the holes in the singling discs.
- seed grain spacing found in the table a: 13,9 cm
- In the "review table seed grains / ha singling disc 30 holes" find the seed grain spacing 13,9 cm. Read off this line underneath row spacing R = 75 cm the number of 95923 seed grains/ha (95923 seed grains/ha corresponds to 96000 seed grains/ha).
 - Press key (100 %)



- Via the key for v dial the desired application rate [(seed grains/ha)/1000] on the display, e. g. "96" for 96000 seed grains/ha.

Display of the desired application rate



value. On the display then the figure "96" should appear.

- 5. Entering the number of sowing units
 - The entered value must not exceed the figure "12" (12 sowing units in maximum).

Press key drücken.

- Via the keys \checkmark or \checkmark dial the figure for the number of sowing units on the display (e.g. "6" for 6 sowing units).

Display number of sowing units



6. Starting the sowing procedure

Before starting operation, actuate the "start function"

Then the implement is ready for operation. For this

- press key keep it pressed and simultaneously press key .





5.2 Sowing operation

Display "operation"



Explanation for the display "operation"

The vertical arrow is shown when the implement is in operational position. During travel the circle below must flick. That means that the sensor for storing the covered area and the travelled distance is transmitting impulses to **AMASCAN**⁺.

3:

This display (figures 1, 2, 3 etc.) automatically changes after 5 seconds. The number of the current monitored sowing unit id displayed.

: **96**

During the sowing operation the display shows the actual seed rate, e. g. "96" for 96000 seed grains/ha.



If the actual seed rate deviates by 15 % an audible signal sounds. An arrow appears above the sowing unit symbol and the sowing unit with the incorrect seed rate is displayed.



When sowing rape, the application rate can not be determined nor can it be

indicated due to the fine grain. An audible alarm sounds and the arrow above the warning triangle flashes.

Monitoring the fertiliser hopper (Option):

A "fertiliser hopper" alarm signal (triangle flashes above the fertiliser hopper symbol and a signal sounds for 5 seconds) if:

- fertiliser hopper level falls below preset minimum quantity.
- fertiliser hopper metering shaft does not rotate.

fertiliser hopper indicator failure





Description of the function keys

, km/h . Ha/h km Σha the

Via the function keys (1, 2, 1), (1, 2, 2), (1, 2,

By pressing one of the following function keys the desired value (e.g. 9.50 for 9,5 km/h) will appear for approx. 5 Sekunden.

Display after the function key km/h has been pressed



On the lower edge of the display the arrow points towards the symbol of the currently pressed function key. Thereafter, the computer automatically switches back to the "operational display".

1. Part area after having actuated the "start function"

After having pressed the key (Σ_{ha}) the covered area in [ha] is displayed (e.g. 10.5110 for 10,5110 ha), which had been covered after having actuated the "start function".



Only the covered area is determined at which the Airplanter is in operational position.

Display after having pressed key "ha"



2. Total area, e. g. one season

After having pressed key $(\Sigma_{ha})^{\Sigma_{ha}}$ the **covered total** area is displayed in [ha] (e.g. 1051.0 for 1051 ha).

Display after having pressed key " Σ ha"



3. Area efficiency

After pressing key the current area efficiency is displayed in [ha/h] (e.g. 1.800 for 1,8 ha/h).

Display after having pressed key "ha/h"



4. Travelled distance

After pressing key the distance [km] is displayed (e.g. 4.8000 for 4,8 km), which has been travelled after having actuated the "start function"..

Display after having pressed key "km"





5. Operational speed

After pressing key the actual operational speed is displayed [km/h] (e.g. 6.500 for 6,5 km/h).

Display after having pressed key "km/h"

¢				•	3	•	5	0	
1 <u>2</u>	na 2 ha	ha/h	k	n/h		7	Service	$\overline{\mathbb{A}}$	-



- 5.3 Switching on and off or monitoring the on/off switching of the individual sowing units during sowing operation
- Before the individual sowing units can be isolated the distance sensor must receive impulses (i.e a few metres should be driven with the machine in work).
- Ś

Sowing units with solenoid can be switched off.

On sowing units without solenoid only the monitoring is switched off.



Via the white control keys , and the switching on and off (or the monitoring function) of the individual sowing units can be switched during operation.

or

Press once key or to pre-select from which side (l.h. / r.h.) the individual sowing units should be switched off. The display shows the side by a flashing minus.

With the minus key the sowing units can be switched off by each one key pressure, starting from the outer side.

With the plus key the sowing units can be switched on, starting from the inner side.

Display after isolating sowing units 1 & 2 from the left:



Indicator lights 1 and 2 show as red!

After pressing key all sowing units are switched on again and the operational display appears again.

All sowing units are automatically switched on again if the **AMASCAN**⁺ realises an interruption of the operational position, i. e. the movement sensor does not send impulses any more. This is the case, e.g. when the machine is raised ad the headlands, however also when it is stopped in the field.



5.4 Permanent switching off (of switching off the monitoring) of individual sowing units

Besides the switching of the sowing units from outside towards the inner side any desired sowing unit can additionally be switched off for a lasting time.

()

This setting remains existing beyond switching off and on the **AMASCAN**⁺ and the lifting.



The setting is deleted via key . Then all sowing units are switched on again.

To allow a check of the permanent switching off, the disengaged rows are still monitored in the operational display (The seed rate must be 0).

Press key "Number of sowing units / permanent"

for 5 seconds until the display



appears.

The left hand figure indicates the sowing unit [1 for sowing unit on the outermost left hand side].

With the keys (1- switching off) and (0switching on) the right hand figure can be changed.

- 1 = Sowing permanently switched off (of monitoring switched off)
- 0 = Sowing unit permanently switched on (or monitoring switched on)

Press key ,enter and switch on/off the next sowing unit.

All sowing units must be switched on or off consecutively.

After the entering for the last sowing unit has be confirmed the following information is shown.



- Left hand: Number of sowing units
- Right hand: Number of sowing unit switched off.
- Sowing unit 3 and 6 permanently switched off: indicator lights 3 and 6 show as red.



5.5 Service-Function

Service-key for checking the function ability of the opto sensors

- After pressing the key service the service function is dialled.
- If now the light barrier on one of the opto sensors is interrupted.
- the computer displays the sowing unit number into which this opto sensor is installed (e.g. "1" for the outer left hand sowing unit) and
 - at the same time a honk signal sounds.

Display after having pressed the key "Service"

)				1	
ha Σ ha	ha/h	km/h	\bigtriangledown	Service	

This display is only shown for about 1 second.



Do not push any firm particles into the sowing coulters. These might damage the opto sensor.



6. Maintenance

6.1 Calculator

The calculator is maintenance-free. During winter store the calculator in a frost-free room and protect it from humidity.

6.2 Sensors

If dirty, clean the opto-sensor with a soft brush.

If the dirt cannot be removed without water, clean the opto sensor with dish water. Dry with a grease-free cloth.

The cleaning applies to the inside of the opto sensor (infrared diode and photo transistors)



Before starting to operate in the season clean the sensors by using dishwater and a soft brush. Dry afterwards.

The movement sensor (sensor $,,X^{\prime\prime}$) is maintenance-free.

6.3 Fault remedy



For searching faults please proceed in the outlined order!

Fault	Cause	Remedy
The calculator cannot be switched on	Wrong poling on the power supply	Check for proper poling
	Power supply interrupted	Check battery connecting lead fuse, binders of the battery and fuses.
	Total failure	Send the calculator to your dealer
The calculator shows HALP 88 or HALP 00	Memory failure	Send the calculator to your dealer
The forward speed is not displayed.	Entering"Impulses/100 m" is missing.	Enter numbers of "Impulses/100 m".
	Sensor "X" does not send impulses to the calculator, the ring in the display does not flick while travelling.	Set the distance between Sensor "X" and impulse disc onto 3 to 4 mm.
		Connect cable properly in the dis- tributor
		black = sw = Signal
		brown = br = +12 Volt
		blue = bl = - mass(earth)
		Sensor "X" is defect, replace.



Fault	Cause	Remedy	
The forward speed is not displayed.	Drive interrupted (chain torn off).	Repair the chain.	
The area is not displayed.	Working width has not been entered.	Enter working width.	
The set application rate is not displayed.	Scraper position has not been set properly.	Re-adjust the scraper position.	
(Display 0 seed grains/ha).	Opto sensor does not send any im-	Seed box is empty.	
	pulses to the calculator.	When sowing rape the determina- tion of the application rate is not possible.	
		Sowing unit is defect. With the aid of the service-key determine the defective sowing unit and proceed as follows:	
		Opto sensors are dirty, clean them thoroughly	
		Check whether the opto sensor or the cable of the connecting unit are defect. Remove the cube plug and apply the adjacent cube plug. If the fault has been remedied, the cable is defect. If the fault has not been remedied, the opto sensor is defect.	
		Connect the cables in the distributor in the appropriate manner	
		green = gn = Signal	
		brown = br = + 12 Volt	
		white = ws = 0 Volt	
		Sensor is defect, replace.	
		Calculator is defect, replace.	
		Distributor is defect, replace.	
The display seed grains/ha heavily deviates.	The opto sensors send uneven impulses to the calculator.	Inaccurate seed placement – re- adjust sowing units properly.	
		Opto sensors are dirty, clean them thoroughly.	
	Cable is broken.	Find out the defective sowing unit. For this remove the relevant cube plug and apply the adjacent cube plug. If the fault has been remedied, the defective sowing unit has been found. If not, proceed in the same way for all sowing units.	
Only 4 sowing units are monitored instead of 8.	"Number of sowing units" has not been entered correctly.	Enter "number of sowing units".	



AMAZONEN-WERKE H. DREYER GmbH & Co. KG

 Postfach
 51 Tel.:
 +
 49 (0)
 5405
 501-0

 D-49202
 Hasbergen-Gaste Telefax:
 +
 49 (0)
 5405
 501-234

 Germany
 e-mail:
 amazone@amazone.de

 http://
 www.amazone.de

Branch factories in: D-27794 Hude • D-04249 Leipzig • F-57602 Forbach • Subsidiaries in England and France

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