

Operating instructions

MAB 425



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Foreword

Foreword

With the purchase of this machine you have decided in favour of a quality product whose engineering and sturdiness have been designed to meet the high demands of day-to-day professional use.

Read all the information contained here to familiarise yourself quickly with the machine and to be able to make full use of its functions.

This machine will serve you for many years to come if you handle and treat it properly.

Instructions for use

These operating instructions form an integral part of the Magnetic Core Drilling Machine MAB 425 (hereinafter referred to as "machine") and contains important information for the commissioning, safety, intended use and care of the machine.

The operating instructions must be kept near the machine at all times. They must be read and observed by all persons entrusted with operation, troubleshooting and/or cleaning of the machine.

Keep these operating instructions in a safe place and pass them on with the machine to any future owners.

Copyright

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Structure of the safety warnings

The following warnings are used in the present operating instructions:

DANGER

A warning of this category draws attention to an impending dangerous situation.

If the dangerous situation is not avoided, it may lead to serious injury or even death.

- ▶ Follow the instructions in this warning to avoid the danger of serious injury or even death.

WARNING

A warning of this category draws attention to a potentially dangerous situation.

If the dangerous situation is not avoided, it may lead to injuries.

- ▶ Follow the instructions in this warning to avoid the risk of injury.

CAUTION

A warning of this category draws attention to potential material damage.

If the situation is not avoided, it may lead to material damage.

- ▶ Follow the instructions in this warning to avoid material damage.

NOTE

- ▶ A note draws attention to additional information that simplifies the use of the machine.

Instructions for use

Intended use

The machine is intended solely for drilling operations in magnetic and non-magnetic metals within the limits specified in the technical data.

Use in any other or further way is not considered an intended use.

WARNING

Danger from use for other than the intended purpose!

If not used for its intended purpose and/or used in any other way, the machine may be or become a source of danger.

- ▶ Use the machine only for its intended purpose.
- ▶ Observe the procedures described in these operating instructions.

No claims of any kind will be accepted for damage or injury resulting from use of the machine for other than its intended purpose.

The risk has to be borne solely by the machine owner.

NOTE

- ▶ If used commercially, pay attention to compliance with the accident prevention regulations and the Safety at Work Ordinance.

Liability disclaimer

All technical information, data and instructions for commissioning, operation and care of the machine contained in these operating instructions represent the latest status at the time of printing.

The manufacturer assumes no liability for damage or injury resulting from failure to observe the operating instructions, use for other than the intended purpose, unprofessional repairs, unauthorised modifications or use of non-approved spare parts and accessories, tools and lubricants.

Safety

 CAUTION

When using electrical tools, the following fundamental precautions must be taken to protect against electric shock and the risk of injury and fire!

Fundamental safety precautions

- Do not use the machine in flammable or potentially explosive environments.
- Persons who due to their physical, mental or motor response abilities are unable to operate the machine safely may only use the machine under supervision or instruction by a responsible person.
- Persons with heart pacemakers or other medical implants must not use this machine.
- Children must not be allowed to use the machine.
- Inspect the machine for visible signs of damage before use. Do not use a visibly damaged machine.
- Before beginning work, check the condition of the safety chain and the function of the switches on the machine.
- Repairs to the mains cable may only be carried out by a qualified electrician.
- Repairs to the machine may only be carried out by an authorised workshop or by the works after-sales service. Unqualified repairs can lead to considerable danger for the user.
- Repairs to the machine during the warranty period may only be carried out by a service centre authorised by the manufacturer, as otherwise the warranty will be voided.
- Defective parts may only be replaced with original spare parts. Only these parts guarantee that the safety requirements are satisfied.

- Do not leave the machine unsupervised during operation.
- Store the machine in a dry, temperate location out of the reach of children.
- Do not leave the machine standing outdoors and do not expose it to moisture.
- Make sure that your work area is sufficiently lit (>300 Lux).
- Do not use low power machines for heavy working.
- Make sure that your workplace is clean.
- Keep the machine clean, dry and free of oil and grease.
- Follow the instructions on lubricating and cooling the tool.

Electric shock hazard

DANGER

Danger to life by electric shock!

Contact with live wires or components could lead to serious injury or even death!

Observe the following safety precautions to avoid electric shocks:

- ▶ Do not open the housing of the machine. Risk of electric shock if live terminals are touched.
- ▶ Never immerse the machine or the plug into water or other liquids.
- ▶ Use only extension leads or cable drums with a cable cross-section of 1.5 mm².
- ▶ Only use extension leads that are approved for the place of work.
- ▶ Check the condition of the extension lead regularly and replace if damaged.
- ▶ Avoid direct body contact with grounded parts (e.g., tubes, radiators, steel girders) to reduce the risk of electric shock in the event of a defect.

Risk of injury

 **WARNING****Improper handling of the machine increases the risk of injury!**

Observe the following safety precautions to avoid injuring yourself and/or others:

- ▶ Operate the machine only with the protective equipment stipulated in these operating instructions (see section **Personal protective equipment**).
- ▶ Remove loose jewellery before beginning work. Wear a hair net if you have long hair.
- ▶ Always switch off the machine before changing tools, performing maintenance or cleaning. Wait until the machine has come to a complete standstill.
- ▶ Always remove the plug from the mains socket before changing tools, cleaning or performing maintenance, in order to avoid unintentional starting of the machine.
- ▶ Do not put your hand into the machine while it is in operation. Remove shavings only when the machine is at a standstill.
- ▶ When working on scaffolding, the operator must be secured with a safety belt as the machine can oscillate dangerously in the event of interruption to the power supply.
- ▶ Check for secure clamping of the electromagnets on the substrate before every use (see section **Preparing**).
- ▶ Secure the machine with the safety chain supplied when working from an inclined or vertical position or during overhead work. The machine could fall down if the magnet is loosened or the power fails.
- ▶ Check that the tool is tightened securely before using (see section **Inserting the tool**).
- ▶ Do not allow the connecting cable to hang over edges (danger of tripping).

Prevention of damage

CAUTION

Potential property damage in case of inexperienced handling of the machine!

Observe the following instructions to avoid property damage:

- ▶ Before connecting the machine, compare the connection data (voltage and frequency) on the rating plate with those of your mains power supply. The data must correspond in order to avoid damage to the machine.
- ▶ Always carry the machine at the handle, not by the connecting lead.
- ▶ Always pull the mains lead out of the plug socket at the plug, not at the mains lead.
- ▶ Do not pinch the connecting lead.
- ▶ Do not expose the connecting lead to heat or chemical liquids.
- ▶ Do not pull the connecting lead across sharp edges or hot surfaces.
- ▶ Lay the connecting lead in such a way that it cannot be caught and wound up in the rotating part of the machine.

Safety installations

Restarting protection

NOTE

- ▶ The machine stops automatically if the magnetic clamp is switched off or in the event of a power failure.

In order to prevent unexpected starting of the machine when the magnetic clamp is switched on again or when the power supply returns after a power failure ("restarting protection"), the machine must be switched on at the ON/OFF switch again.

Magnet indicator

The magnet indicator provides a visual control of the magnet's clamping force.

- Magnet indicator is lit **GREEN**:
The magnet's clamping force satisfies the minimum requirements. Machining can be carried out.
- Magnet indicator is lit **RED**:
Insufficient magnet clamping force. Machining must not be carried out with the machine. This can be the case in the event of insufficient material thickness, uneven surface or due to paint, scale or zinc coatings.

Personal protective equipment

Wear the following protective equipment at all times when working with the machine:

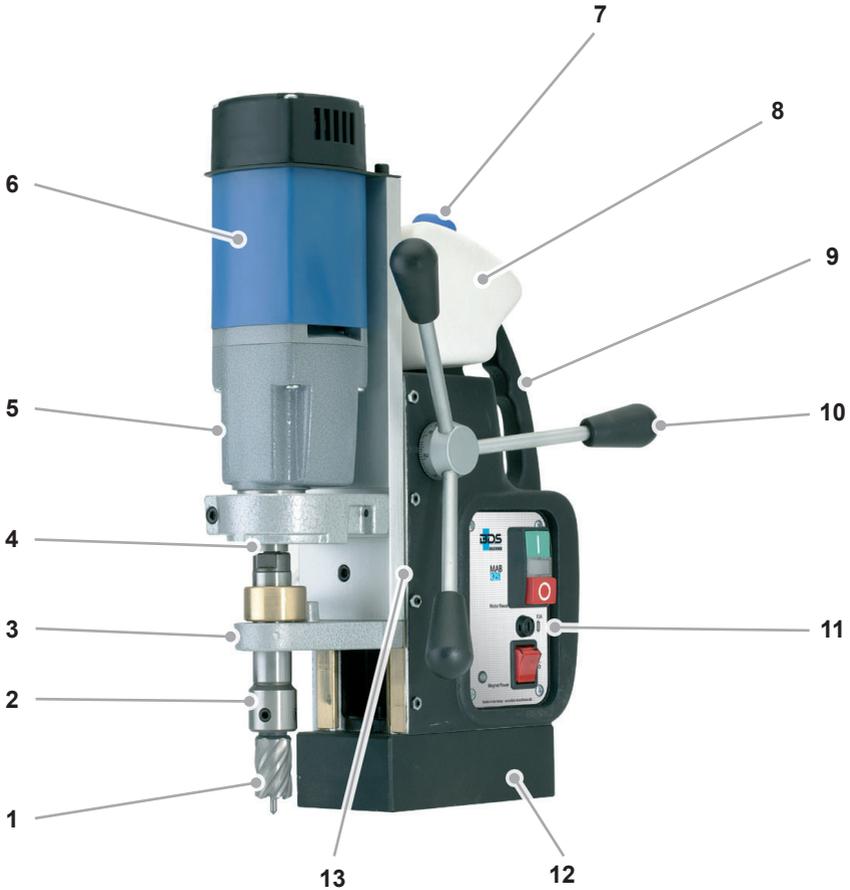
Symbol	Meaning
	Close-fitting work protection clothing with a low tearing resistance
	Goggles to protect the eyes from flying parts and liquids
	Safety shoes to protect the feet from falling objects.
	Working gloves as protection against injury

Wear the following additional protective equipment during special operations:

Symbol	Meaning
	Helmet to protect your head from falling objects
	Ear protectors in areas with noise emissions > 80 db(A)
	Wear a safety belt where there is a danger of falling.

Components/scope of supply

Machine overview



1	Core drill	7	Filler neck for cutting oil
2	Weldon tool mount 19 mm (¾")	8	Cutting oil tank
3	Support strut	9	Handle
4	Motor spindle	10	Hand lever
5	2-speed gearbox with selector	11	Control panel
6	Drive motor	12	Magnetic foot
		13	Machine slide and guide

Components/scope of supply

Accessories



A	Allen key WAF4	Transport case (not illustrated)
B	Ejector pin ZAK 075	
C	Safety chain	Operating instructions / warranty card (not illustrated)

Control panel



21	Motor ON/OFF switch
22	Magnet ON/OFF switch
23	Magnet indicator

Before using for the first time

Transport inspection

The machine is supplied as standard with the components indicated in chapter "Components/scope of supply".

NOTE

- ▶ Inspect the delivery for completeness and obvious signs of damage. Report an incomplete or damaged delivery to your supplier/dealer immediately.

Preparations

This chapter contains important instructions for the necessary preparations before starting work.

Additional safety measures for certain operations

Additional safety precautions must be taken for the following operations with the machine:

Non-horizontal working position

WARNING

Risk of injury from the falling machine.

When working in inclined or vertical position and during overhead work, the machine must be secured to prevent it from falling using the safety chain (C) supplied.

- ▶ Check the safety chain for proper function before every use. A damaged safety chain must not be used. Replace a damaged safety chain immediately.
- ▶ Attach the safety chain in such a way that the machine moves away from the operator in the event of slipping.
- ▶ Lay the safety chain as tightly as possible around the handle of the machine.
- ▶ Check the secure fitting of the safety chain and lock before starting work.
- ▶ Use the protective equipment stipulated in chapter ***Personal protective equipment***.

Work on scaffolding

WARNING

Risk of falling from sudden oscillating movements of the machine.

When working on scaffolding, the machine can make a sudden oscillating movement on starting or in the event of a power failure.

- ▶ Secure the machine with the safety chain (C) supplied.
- ▶ Wear a safety belt to protect yourself from falling.

Check the condition of the substrate

The magnet clamping force is dependent on the condition of the substrate. The clamping force is significantly reduced by paint, zinc and scale coatings and rust.

The substrate must satisfy the following preconditions in order that a sufficient magnet clamping force can be achieved:

- The substrate must be magnetic.
- The clamping surface and the magnetic foot (12) must be clean and grease-free.
- The clamping surface must be completely smooth and level.

NOTE

- ▶ Clean the substrate and the magnetic foot (12) of the machine before use.
- ▶ Remove any unevenness and loose rust from the substrate.
- ▶ CS Unitec offers special holding devices in its range of accessories.

The best clamping effect is obtained on low-carbon steel substrate with a thickness of at least 20 mm.

Steel of low thickness

When drilling in steel of low thickness, an additional steel plate (minimum dimensions 100 x 200 x 20 mm) must be placed under the workpiece. Secure the steel plate to prevent it from falling.

NF metals or workpieces with an uneven surface

A special holding device must be used when drilling in NF metals or in workpieces with an uneven surface.

NOTE

- ▶ CS Unitec offers special clamping devices for tubes and non-magnetic materials in its range of accessories.

Inserting the tool

The machine is equipped with a 19 mm Weldon direct mounting. Depending on the type of tool to be used, corresponding adapters and drill chucks must be employed.

Tool	tool mount to be used
Tools with 19 mm Weldon shank	Insert the tool in the Weldon tool mount (2).
Tools with straight shank	Insert the drill chuck through a ZAP 100 adapter in the tool mount (2).
	Fasten the drill chuck with the diameter 1/2" x 20 directly on the motor spindle (4).

Safety precautions

⚠ WARNING

Risk of injury!

- ▶ Do not use damaged, soiled or worn tools.
- ▶ Carry out tool changes only when the machine is switched off and at a standstill. Remove plug from the mains socket.
- ▶ After inserting, check that the tool is engaged securely.
- ▶ Only use tools, adapter and accessories that match the machine.

Weldon industrial arbor

Weldon tool mounting

Inserting the tool

- ◆ Before mounting, clean the Weldon shank and tool mount (2) of the machine.
- ◆ Check the the lead connection for lubricant.
- ◆ Unscrew the two Allen screws in the tool mount using the Allen key (A) supplied.
- ◆ Insert the tool in the tool mount (2).

NOTE

- ▶ Insert the appropriate ejector pin (B) before inserting a core drill.
- ◆ Tighten the two Allen screws in the tool mount (2) using the Allen key (A) supplied.

⚠ WARNING

Risk of injury from an incorrectly inserted tool!

- ▶ Check the tool stability.

Removing the tool

- ◆ Unscrew the two Allen screws in the tool mount (2) using the Allen key (A) supplied and pull the tool downwards out of the tool mount.



Using the drill chuck in tool mount



A drill chuck can be mounted in the Weldon tool mount (2) through a ZAP 100 adapter.

NOTE

- ▶ It can be used with drill chuck up to 8.5 mm of diameter according to DIN 338. Over the diameter of 8.5 mm, it is suitable for short twist drills according to DIN 1897 only.
- ◆ Fasten the drill chuck on the adapter.
- ◆ Insert the drill chuck with the adapter in the machine as described in the previous chapter.

Using the drill chuck on a motor spindle

In order to be able to use a twist drill above diameter 8.5 mm according to DIN 338, the drill chuck with a $\frac{1}{2}$ " x 20 thread must be screwed directly on the motor spindle (4).

To do this, the machine must be adjusted as follows:

- ◆ Take out the lubricant feed.
- ◆ Fasten the motor spindle (4) with an open-end wrench SW 18 and unscrew the tool mount (3) turning it counter-clockwise.
- ◆ Unscrew the screws at the bottom of the support strut (4) and detach the support strut.
- ◆ Take out the tool mount (2) and the support strut (3).
- ◆ Fasten the drill chuck on the $\frac{1}{2}$ " x 20 thread.

NOTE

- ▶ During the replacement, the support strut should be first fastened on lightly. Fasten the support tightly only after attaching the tool mount and a short activation of the motor.

Operation

Activating/deactivating magnetic clamp

Activating magnetic clamp

CAUTION

- ▶ Switch on the magnetic clamp only when the machine is standing on a magnetic substrate to avoid overheating of the magnet.

- ◆ Turn on switch (22). The indicator light in switch (22) comes on.
- ◆ Check the magnet clamping force at the magnet indicator (23). When the magnet clamping force is sufficient, the MAGNET POWER indicator light (23) is green. If the MAGNET POWER indicator light (23) is red, there is not sufficient magnet clamping force available.

CAUTION

- ▶ The maximum magnet clamping force is only available after switching on the motor.

Deactivating magnetic clamp

- ◆ Secure the machine at the handle (9) to prevent the machine from slipping off the surface.
- ◆ Turn off switch (22). The indicator light in switch (22) goes out.



Switching machine ON/OFF



- ◆ Turn the machine ON at the ON/OFF switch (21) with the green button (I) and OFF with the red button (O).

NOTE

- ▶ The machine can only be switched on when the magnetic clamp has been switched on.
- ▶ Allow a severely overheated machine to run on at no-load speed for approx. 2 minutes to let it cool down.
- ▶ The machine switches off automatically in the event of a power failure or if the magnetic clamp is switched off.

Selecting the speed range

CAUTION

- ▶ Switch over the gear stages only with the machine at standstill.

The machine has a gearbox with two mechanical gear stages:

Gear stage 1: 430 rpm

Gear stage 2: 760 rpm

- ◆ To select the desired gear stage, set selector lever (5) to stage 1 or 2 with the machine switched off.

NOTE

- ▶ Select the speed range according to the material and drilling diameter.

Drilling with the machine

Drilling with core drills

Proceed as follows when drilling with core drills:

- ◆ Insert the ejector pin (B) into the drill chuck.
- ◆ Insert the drill chuck with the ejector pin as described in chapter ***Inserting the tool***.
- ◆ Position the machine at the working location, align it and switch on the magnetic clamps.
- ◆ Select the appropriate gear and switch on the machine.
- ◆ Direct the drill with the hand lever (10) to the material.

NOTE

Observe the following instructions when drilling with core drills:

- ▶ Drilling with core drills requires no great effort. The drilling process is not accelerated by higher pressure. The drill wears faster and the machine can be overloaded.
- ▶ Use the cooling lubricant system installed on the machine with high-performance cutting oil BDS 5000.
- ▶ The cooling lubricant system cannot be used when working overhead. In this case use the high-performance grease spray ZHS 400. Spray the drill on the inside and outside before drilling. Repeat this procedure when drilling deeper holes.
- ▶ Pay attention to a regular chip discharge. With larger drilling depths, break the chip.

Drilling with twist drills

Proceed as follows when drilling with twist drills:

- ◆ Insert the drill chuck with the ZAP 100 adapter in the tool mount, or mount the drill chuck directly on the operative spindle, as described in chapter *Inserting the tool*.
- ◆ Insert the twist drill in the drill chuck.
- ◆ Position the machine at the working location, align it and switch on the magnetic clamps.
- ◆ Select the appropriate gear and switch on the machine.
- ◆ Direct the drill with the hand lever (10) to the material.

NOTE

Observe the following instructions when drilling with twist drills:

- ▶ Under excessive pressure, the drill can wear out and the machine can be overloaded.
- ▶ In overhead operations, use the ZHS 400 extra strong spray fat. Spray the drill before taking on drilling. Repeat this procedure when drilling deeper holes.
- ▶ Pay attention to a regular chip discharge. With larger drilling depths, break the chip.

Eliminating blockages

 **WARNING**

Danger of cutting by broken tool parts or shavings.

- ▶ Put protective gloves on before starting work.

Blockages caused by a broken tool:

- ◆ Switch off the machine. Remove plug from the mains socket.
- ◆ Use the handle to move the machine slide to the upper position.
- ◆ Replace defective tool. Remove shavings.

Other blockages:

- ◆ Switch the machine off at the motor switch. Leave magnetic clamp switched on.
- ◆ Use the handle to move the machine slide to the upper position.
- ◆ Remove shavings and check tool.

Cleaning

⚠ WARNING

- ▶ Switch off the machine and pull the mains plug out of the plug socket before starting maintenance and cleaning.
- ▶ When using compressed air for cleaning, wear protective goggles and protective gloves and protect other persons in the working area.

CAUTION

- ▶ Never immerse the machine in water or other liquids.

After every use

- ◆ Remove the installed tool.
- ◆ Remove chips and coolant residues.
- ◆ Clean the tool and the tool mounting on the machine.
- ◆ Clean the guide of the machine slide.
- ◆ Return the machine and accessories to the transport case.

Maintenance

 **WARNING**

Danger caused by unqualified repairs!

Unqualified repairs can pose considerable dangers for the user and cause damage to the machine.

- ▶ Repairs to electrical appliances may only be carried out by the works after-sales service or by specialists trained by the manufacturer.

Adjusting the guide of the machine slide

If the guide of the machine slide (13) shows signs of backlash, it must be adjusted. Proceed as follows:

- ◆ Loosen the clamping bolts.
- ◆ Tighten the adjusting screws uniformly.
- ◆ Tighten the clamping bolts again.

Replacing the carbon brushes

Replacement of the carbon brushes may only be carried out by CS Unitec or by an authorised repair workshop. Unauthorised repairs will void the warranty.

After-Sales Service/Service

Should you have any questions about after-sales service or service, please contact CS Unitec. We will be happy to give you the address of your nearest service partner.

Troubleshooting

Faults: causes and remedies

Fault	Possible cause	Remedy
The motor does not start after pressing the ON/OFF switch or stops during operation.	Plug not inserted into socket.	Insert the plug.
	Automatic circuit breaker tripped.	Switch on the automatic circuit breaker again.
	The magnetic clamp is not switched on.	Switch on the magnetic clamp.
The automatic circuit breaker in the electrical distribution board trips.	Too many appliances connected to the same power circuit.	Reduce the number of appliances on the power circuit.
	The machine is defective.	Contact the After-sales Service.
The magnetic clamp does not function.	Magnet not switched on.	Switch on the magnet.
	The surface is not magnetic.	Use a suitable base.
The lubrication system does not function.	No lubricant available.	Top up the lubricant.
	Lubricant tap closed.	Open the lubricant tap.
	Connecting nipple clogged.	Clean the tank and nipple.

NOTE

- If you cannot resolve the problem with the steps described above, please contact the After-Sales Service.

Storage/disposal

Storage

If you do not intend to use the machine for a longer period of time, clean it as described in chapter **Cleaning**. Store the machine and all the accessories in the transport case in a dry, clean and frost-free location.

Disposal

Disposal of the packaging

The packaging protects the machine from transport damage. The packaging materials have been selected according to environmental and waste disposal aspects and can therefore be recycled.



The return of the packaging to the material cycle helps conserve raw materials and reduces the production of waste.

When no longer required, dispose of the packaging materials in accordance with the local regulations in force.

Disposal of the old appliance

Within the European Community, this product must not be disposed of in the domestic refuse.



Dispose of the product in accordance with the EC Directive 2002/96/EC-WEEE (Waste Electrical and Electronic Equipment).

Should you have any questions, please contact your local authority responsible for waste disposal.

Disposal of the lubricant

WARNING

- ▶ Observe the disposal instructions from the lubricant manufacturer.

Annex

Technical data

Model	MAB 425
Dimensions (L x W x H)	292 x 160 x 545 mm
Magnetic foot (L x W)	168 x 84 mm
Net weight approx.	13 kg
Operating voltage	230 VAC / 50 Hz
Power consumption	1050 W
Noise level	87 db(A)
Vibration	0,81 m/s ²
Stroke	168 mm
Core drill, short (30 mm)	dia. 12-35 mm
Twist drill	max. dia. 16 mm
Speed stage 1	430 min ⁻¹
Speed stage 2	760 min ⁻¹
motor spindle thread	½" x 20
Core drill mounting	Weldon 19mm (¾")
Length of the connecting lead:	2.8 m
Protection class	I

EC Declaration of Conformity

Name/address of manufacturer:	BDS Maschinen GmbH Martinstraße 108 D-41063 Mönchengladbach
We hereby declare that the product	
Model:	Magnetic core drilling machine
Type:	MAB 425
conforms to the following relevant regulations: <ul style="list-style-type: none"> ■ EC Directive 2006/42/EC on machinery ■ EU Directive 2004/108/EU on Electromagnetic Compatibility. 	
The following harmonised standards were applied in whole or in part: <ul style="list-style-type: none"> ● DIN EN ISO 12100-1 ● DIN EN ISO 12100-2 ● DIN EN 61029-1 ● DIN EN 61000-3 ● DIN EN 50082-1 ● DIN EN 55014-1 ● DIN EN 55014-2 ● DIN EN 55104 	
Responsible person for documentation according to EC Directive 2006/42/EC - Annex II Pt.A.2. was:	
<hr style="width: 60%; margin: 0 auto;"/> (Surname, forename, position in company of the manufacturer)	
Mönchengladbach, 17th August 2009	 Wolfgang Schröder, Technical Director <hr style="width: 60%; margin: 0 auto;"/> (Legally binding signature of the issuer)

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