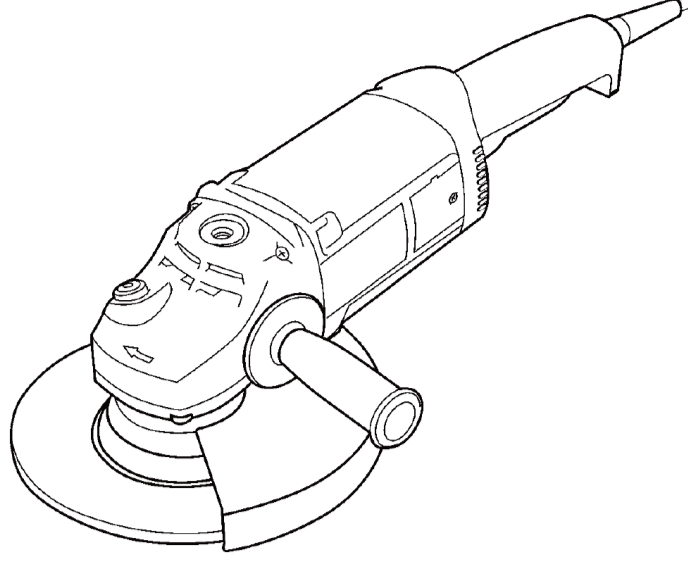


OPERATING MANUAL

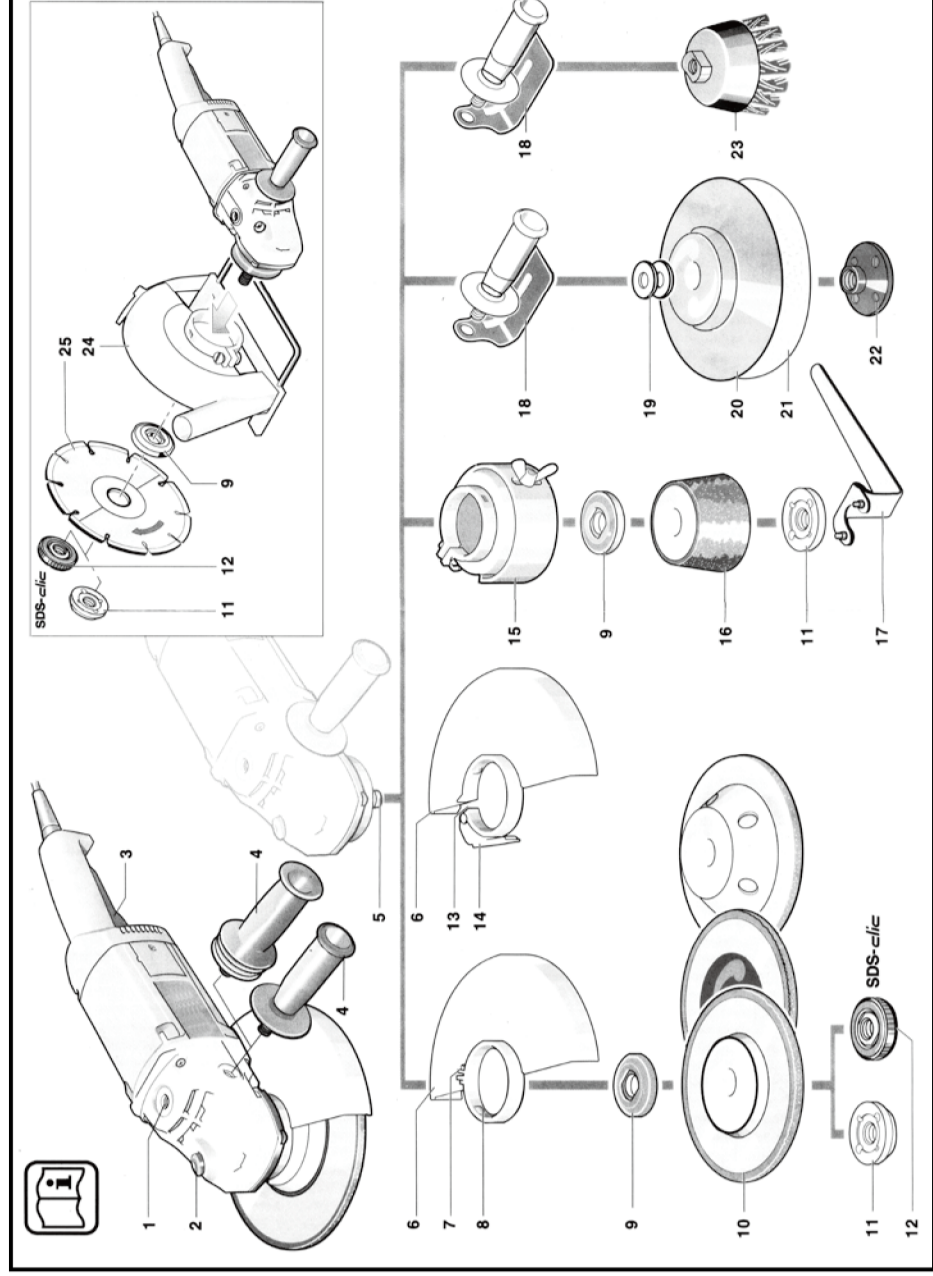
Angle Grinder



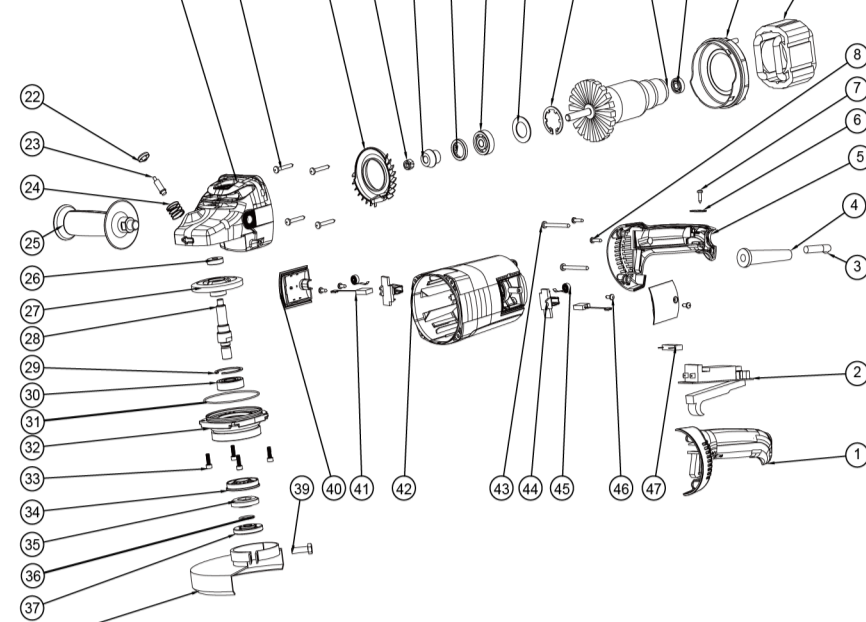
GWS20-180
GWS20-230



Read through carefully and understand these instructions before use.



- 1 -



Item	Part Name	Item	Part Name
1	Left Handle	25	Auxiliary Handle
2	Switch	26	Bearing 608
3	Cord	27	Gear
4	Cord Guard	28	Spindle
5	Right Handle	29	Piston Pin 40
6	Clamping Nut	30	Bearing 8203
7	Screw M4x16	31	O-Ring
8	Screw M4x20	32	Gear Cover
9	End Cap Assy	33	Hexagon Screw M4x16
10	Lower Ring	34	Dustproof Ring
11	Ball Bearing 608	35	Inner Flange
12	Rotor Assy	36	Outer Flange
13	Flange Pin	37	Outer Flange
14	Stator Pin	38	Washer Cover
15	Ball Bearing 6300	39	Hexagon Screw M4x25
16	Oil-Proof Ring	40	Brush Cap
17	Pinion	41	Carbon Brush
18	Hexagon Screw M10	42	Front Housing
19	Fan Guard	43	Screw M4x5
20	Screw M4x5	44	Brush Holder
21	Housing	45	Current Spring
22	Pushing Button	46	Screw M4x13
23	Lock Pin	47	Capacitor
24	Spring	47	Capacitor

Flap disc

The flap disc (accessory) can be used for working on curved surfaces and profiles (contour sanding). Flap discs have a considerably higher service life than sanding sheets, a lower noise level and lower sanding temperatures.

Cutting



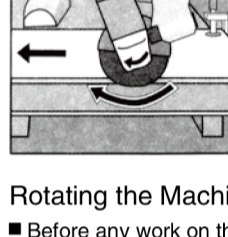
When cutting, do not press, tilt or oscillate. Gently slide it forward with a speed adapted to the material being worked on. Do not brake cutting discs that are slowing down to a stop by using side pressure.



The cutting direction is very important. The machine must always work opposite to the direction of rotation. Therefore, never move the machine in the other direction! Otherwise, there is the danger of it being pushed uncontrolled out of the cut.

Rotating the Machine Head

Before any work on the machine itself, pull the power plug.



The machine head can be rotated in 90° steps with respect to the machine housing. By doing this, the On/Off switch can be brought to a better position for special working situations, e.g. for cutting guide 24/ cutting grinder stand 26 (accessory) or for left-handed persons. Unscrew the four screws completely. Rotate the machine head carefully and without removing it from the housing bring it to its new position. Screw in the screws again and tighten.

Maintenance and Cleaning

Before any work on the machine itself, pull the power plug.

For safe and proper working, always keep the machine and the ventilation slots clean. Under extreme working conditions, conductive dust can accumulate in the interior of the machine when working with metals, which can impair the protective insulation of the machine. Therefore, in such cases it is recommended that stationary dust extraction equipment be used as well as the frequent blowing out of the ventilation slots and the installation of a residual current device (RCD). Should the machine fail in spite of careful manufacturing and testing, its repair should be carried out by our power tools authorized service agent. For all correspondence and spare parts orders, always include the 10-digit part number of the machine!

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IMPORTANT SAFETY INSTRUCTIONS

WARNING: When using electric tools, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and personal injury, including the following:

READ ALL INSTRUCTIONS:

- KEEP WORK AREA CLEAN. Cluttered areas and benches invite injuries.
- CONSIDER WORK AREA ENVIRONMENT. Don't use power tools in damp or wet locations. Keep work area well lit. Don't expose power tools to rain. Don't use tools in presence of flammable liquids or gases.
- KEEP CHILDREN AWAY. All visitors should be kept away from work area. Don't let visitors contact tool or extension cord.
- STORE IDLE TOOLS. When not in use, tools should be stored in dry, and high or locked-up place-out of reach of children.
- DON'T FORCE TOOL. It will do the job better and safer at the rate for which it was intended.
- USE HIGH TOOL. Don't force small tool or attachment to do the job of heavy-duty tool. Don't use tool for purpose not intended.
- WEAR PROPERLY. Don't wear loose clothing or jewelry, they can be caught in moving parts. Rubber gloves and non-skid footwear are recommended when working on doors. Wear protective hair covering to contain long hair.
- USE SAFETY GLASSES. Also use face or dust mask if cutting operations dusty. DON'T ABUSE CORD. Never carry tool by cord or yank it to disconnect from receptacle. Keep cord cord from heat, oil, and sharp edges.
- SECURE WORK. Use clamps or a vise to hold work. It's safer than using your hand and it frees both hands to operate tool.
- DON'T OVERREACH. Keep proper footing and balance at all times.
- MAINTAIN TOOLS WITH CARE. Keep tools sharp and clean for better and safer performance. Follow instructions for lubricating and changing accessories. Inspect tool cords periodically and if damaged, have repaired by authorized service facility. Inspect extension cords periodically and replace if damaged. Keep handles dry, clean, and free from oil and grease.
- DISCONNECT TOOLS. When not in use, before servicing, and when changing accessories, such as blades, bits, cutters.
- REMOVE ADJUSTING KEYS AND WRENCHES. From habit of checking to see that keys and adjusting wrenches are removed from tools before turning on.

- 2 -

- AVOID UNINTENTIONAL STARTING. Don't carry plugged-in tool with finger on switch. Be sure switch is OFF when plugging in.
- OUTDOOR USE EXTENSION CORDS. When tool is used outdoors, use only extension cords intended for use outdoors and so marked.
- STAY ALERT. Watch what you are doing, use common sense. Don't operate tool when you are tired.
- CHECK DAMAGED PARTS. Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated elsewhere in this instruction manual. Have defective switches replaced by authorized service center. Don't use tool if switch does not turn it on and off.
- GUARD AGAINST ELECTRIC SHOCK. Prevent body contact with grounded surfaces. For example, pipes, radiators, ranges, refrigerator enclosures.
- PROPER GROUNDING. This tool should be grounded while in use to protect the operator from electric shock.
- EXTENSION CORDS. Use only three-wire extension cords which have three-prong grounding-type plugs and three-pole receptacles which accept the tool's plug. Replace or repair damaged or worn cord immediately.

VOLTAGE WARNING: Before connecting the tool to a power source (receptacle, outlet, etc.), be sure the voltage supplied is the same as that specified on the nameplate of the tool. A power source with voltage greater than that specified for the tool can result in SERIOUS INJURY to the user—as well as damage to the tool. If in doubt, DO NOT PLUG IN THE TOOL. Using a power source with voltage less than the nameplate rating is harmful to the motor.

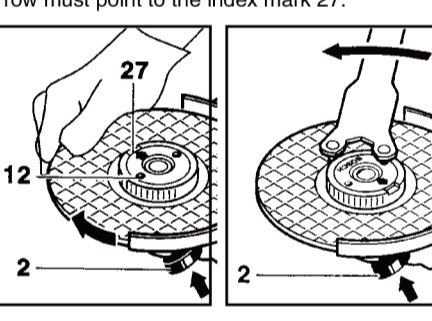
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Grinding cup

When working with grinding cups, use a special protective hood for the grinding cup.

The grinding cup 16 should protrude from the protective hood 15 only as far and as long as absolutely necessary to perform the work. Reset the protective hood 15 to this distance. For mounting, see the illustration page. Screw on the clamping nut 12 and tighten with the suitable offset two-pin spanner 17.

Quick Clamping Nut SDS-clc
The quick clamping nut 12 (accessory) can be used instead of the clamping nut 11. Grinding tools can be mounted without using tools. The quick clamping nut 12 may be used only for roughing and cutting discs. Use only a flawless, undamaged quick clamping nut 12. When screwing on, take care that the printed side does not point to the grinding disc. The arrow must point to the index mark 27.



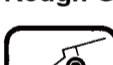
Lock the grinder spindle with the spindle locking button 2. Tighten the quick clamping nut by forcefully turning the grinding disc clockwise. A properly tightened and undamaged quick clamping nut can be loosened by turning the knurled ring counter-clockwise. Never loosen a tightened quick clamping nut with pliers. Instead, use a two-hole spanner. Insert the two-hole spanner as shown in the illustration.

Test run!
Check the grinding tool before use. The grinding tool must be flawlessly mounted and be able to rotate freely. Perform a test run of at least 30 seconds without load. Do not use damaged or vibrating grinding tools.

Operation Instructions

- Clamp down the workpiece if it does not stay in place owing to its own weight.
- Do not load the machine so heavily that it comes to a standstill.
- Since roughing and cutting discs become very hot while working, do not touch them until they have cooled.

Rough Grinding



The best roughing results can be achieved with a 30° to 40° approach angle. Move the machine back and forth with moderate pressure in this manner, the work piece will not overheat, will not discolor and no ridges will be formed.

Never use a cutting disc for roughing.

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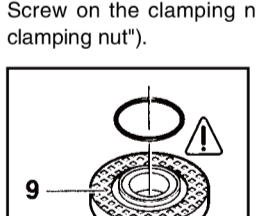
Clean the grinder spindle and parts to be mounted. For clamping and loosening the grinding tools, lock the grinder spindle 5 with the spindle locking button 2.

Activate the spindle locking button 2 only when the grinder spindle is at a standstill!

Roughing/Cutting Disc

Pay attention to the dimensions of the grinding disc. The mounting hole diameter must fit the mounting flange 9 without play. Do not use reducer pieces or adapters. When using a diamond cutting disc, take care that the direction of rotation arrow on the diamond cutting disc and direction of rotation of the machine (direction of rotation arrow on the machine head) agree.

For mounting, see the illustration page. Screw on the clamping nut 11 and tighten with the two-hole spanner (see Section "Quick clamping nut").



An O-ring (Plastic part) is inserted in the retainer mounting flange 9 around the spigot.

If the O-ring is missing or damaged, it will have to be replaced before the retainer mounting flange 9 is mounted.

After mounting the grinding tool but before switching it on, check that the grinding tool is correctly mounted and that it can turn freely.

Depending the application and if necessary, remove the protective hood 6 and mount the hand protector 18. Place the special retainer mounting flange 9 and the flap disc on the grinder spindle 5. Screw on the clamping nut 11 and tighten with the two-pin spanner.

Rubber Sanding Plate 20

Depending the application and if necessary, remove the protective hood 6 and mount the hand protector 18. Prior to mounting the rubber sanding plate 20, place the 2 spacing discs 19 onto the grinding spindle. For mounting, see the illustration page.

Screw on the round nut 22 and tighten with the two-pin spanner.

Cup Brush 23/Disc brush

Depending the application and if necessary, remove the protective hood 6 and mount the hand protector 18. The grinding tool must be screwed onto the grinder 5 until it rests firmly against the grinder spindle flange at the end of the spindle threads. Tighten with an open-ended spanner.

- 7 -

- When working with stone, always hold it firmly with both hands and make sure you are in a secure standing position.
- Secure the workpiece. Clamping devices or a vise will hold the workpiece in place better than the hand.
- Always direct the cable to the rear away from the machine.
- Always switch the machine off and wait until it has come to a standstill before plugging it in.
- In case of mains failure or when the main plug is pulled, unlock the On/Off switch immediately and turn it to the off position. This prevents uncontrolled restarting.
- The machine itself should only be used for dry cutting/grinding.
- When working with the machine, always mount the auxiliary handle 4.
- Hold electric tools by their insulated handles whenever they could possibly touch a hidden wire or their own cords.
- Touching a "live" wire can transfer the voltage to the exposed metal parts of the tool and give the operator an electric shock.
- Use appropriate detectors to determine if utility lines are hidden in the work area or call the local utility company for assistance.
- Contact with electric lines can lead to fire and electric shock. Damaging a gas line can lead to explosion. Penetrating a water line causes property damage or may cause an electric shock.
- The protective hood 6 must be mounted when working with roughing or cutting discs. When working with the rubber sanding plate 20 or with the cup brush 23/disc brush/flap disc, we recommend you to mount the hand protector 18 (accessory).
- When working with stone, use a vacuum cleaner for removing dust. The vacuum cleaner must be approved for removing masonry dust. When cutting stone, use the cutting guide.
- Don't work with materials containing asbestos.
- Use only grinding tools whose allowable speed is at least as high as the idling speed of the machine.
- Check grinding tools before use. The grinding tool must be properly mounted and turn freely. Perform a test run for at least 30 seconds without load. Do not use damaged, out-of-round or vibrating grinding tools.
- Protect the grinding wheel from impact, shock and grease.
- Apply the machine to the workpiece only when switched on.
- Keep hands away from rotating tools.
- Pay attention to the direction of rotation. Always hold the machine so that sparks and grinding dust fly away from the body.
- Flying sparks are produced when grinding metal, so make sure that no persons are endangered. Because of a possible fire hazard, no combustible materials should be nearby (spark flying zone).
- Be careful when cutting grooves, e.g. in load-carrying walls: See the information on statics.
- Blocking the cutting disc leads to a strong jerking reaction of the machine. If this happens, switch off the machine immediately.
- Pay attention to the dimensions of the grinding disc. The mounting hole diameter must fit the mounting flange 9 without play. Do not use reducer pieces or adapters.
- Never use cutting discs for rough grinding. Do not exert any lateral pressure on the cutting discs.
- Observe the manufacturer's instructions regarding mounting and use of grinding tools.
- Caution! The grinding wheel keeps running after the machine has been switched off.
- Do not tighten the machine in a vise.
- Never allow children to use the machine.
- Our can only guarantee a flawless functioning of the machine if the original accessories intended for it are used.

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Mounting the protective devices

- Before any work on the machine itself, pull the power plug.
- The protective hood 6 must be mounted when working with roughing or cutting discs.

Protective hood with clamping screw
The coded projection 8 on the protective hood 6 ensures that a hood that fits a specific machine can be mounted on it. Loosen the clamping screw 7, if necessary.

Place the protective hood 6 with coded projection 8 into the coded groove on the spindle collar of the machine head and rotate to the required position (working position).

The closed side of the protective hood 6 must always point towards the operator. Tighten clamping screw 7.

Protective hood with quick clamp
The protective hood is preadjusted to the diameter of the spindle collar. If required, the tightening tension of the clamping bracket can be changed by tightening or loosening the adjustment screw 13. Always ensure that the protective hood 6 sits tightly on the spindle collar. Open the clamping lever 14.

Place the protective hood 6 with coded projection 8 into the coded groove on the spindle collar of the machine head and rotate to the required position (working position). To fasten the protective hood 6, close the clamping lever 14.

The closed side of the protective hood 6 must always point towards the operator.

Auxiliary Handle
When working with the machine, always mount the auxiliary handle 4. Depending on the chosen working method, screw the auxiliary handle 4 into the head of the machine.

Auxiliary handle with vibration absorption
The vibration-dampening auxiliary handle reduces vibrations, making its operation safer and more comfortable.

Do not make any alterations to the auxiliary handle. Do not continue to use an auxiliary handle if it is damaged.

Hand protector

When working with the rubber sanding plate 20 or with the cup brush 23/disc brush/flap disc, we recommend you to mount the hand protector 18 (accessory). The hand protector 18 is fastened with auxiliary handle 4.

Mounting the Grinding Tools

- Before any work on the machine itself, pull the power plug.
- Use only grinding tools whose allowable speed is at least as high as the idling speed of the machine.

Since roughing and cutting discs become very hot while working, do not touch them until they have cooled.

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