

# **DFG500-2**

## **Twin Speed Diamond Floor Grinder Operating Manual**

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The SPE product range is subject to amendment and improvement as a result of on going research



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**DFG500 - 2**  
Operating Manual

## **DFG500 Twin Speed Diamond Floor Grinder**

### **OPERATING MANUAL**

This manual covers to the best of our knowledge the operation and maintenance of the **DFG 500 - 2** diamond floor grinder. Before operation of the equipment the manual should be read and understood by the operator. The safety regulations must be followed at all times. Service of electrical and hydraulic components should be carried out by authorised personnel. Failure to follow these instructions could result in damage to the machine and/or serious personal injury or death.

#### **WARNING**

Failure to follow these instructions may result in serious personal injury or death. SPE disclaims all responsibility for damage to persons or objects arising as a consequence of incorrect handling of the machine and failure to inspect the machine for damage or other faults that may influence the operation prior to starting work.

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## STARTING WORK

### BEFORE STARTING WORK CHECK SET UP OF THE MACHINE AND GRINDING PLATES HAS BEEN COMPLETED.

1. Ensure the power supply is correct.  
DFG 500 - this should be a 380/415v 32 amp supply from the mains or generated with a minimum of 20 kva on 50 cycles.
2. DFG 500 - the plug on the machine is a 380/415v 32 amp red plug.
3. After connecting the machine to the power supply, turn the red isolator switch to the On position red light will illuminate on the electric panel. To check that the 3 phase power supply is phased to suit the machine, press the raise and lower buttons on the handle bar. If the machine works correctly on the buttons the supply is phased to suit the machine. If not 2 of the 3 phases must be reversed – see page 5.
4. Raise the machine high enough to gain access to the dust skirt, slacken the screws thus ensuring the skirt is free to move up and down as required.
5. Lower the machine on to the grinding plates and make sure the jockey wheels are free moving and off the floor surface.
6. It is vital that the machine should grind the floor along the same plane (**Incorrect set-up will result in uneven diamond wear, deep grinding marks, vibration and damage to flexible couplings that support the heads**).
7. Set the machine down on the floor to be prepared and check the level of the floor with a spirit level. Place the spirit level on the front side of the machine and adjust the rear wheel height using the black hand wheel until the level of the machine is the same as the level of the floor. Then lock the hand wheel.
8. Fit the dust skirt to the correct height, approx 0.5mm clear of the floor and tighten up set screws.
9. Lift the floor grinder up on to the jockey wheels using the raise button on handlebar. Examine grinding plates for any damage and check allen screws bolts are tight – see page 2 changing grinding plate for torque settings. Connect vacuum hose or water supply to control dust. **WARNING – DO NOT ALLOW WATER TO MAKE CONTACT WITH ANY ELECTRICAL COMPONENTS.** The floor grinder is now ready to commence work.
10. Start both motors up by pressing the start buttons one at a time and allow the machine to run for approximately 30 seconds.
11. Lower the machine on to the floor whilst moving the machine either forwards or backwards. Try to grind the surface in a figure of eight pattern for best finish.
12. When lifting machine to cease grinding the heads should be lifted off the floor slowly with the dust extraction still operating in order to allow the dust to clear from the work area.
13. If the operator has any difficulty whilst operating the machine press the red stop button located at the back of the machine.

**NEVER ALLOW THE MACHINE TO REMAIN STATIONARY WHILST THE PLATES ARE ROTATING AND IN CONTACT WITH THE SURFACE.**

**NEVER CHANGE SPEED SETTING WHILST MACHINE IS IN USE – SEE PAGE 5**



## CHANGING GRINDING PLATES

1. Make sure heads have stopped rotating, lift the DFG off the floor to its maximum height.
  2. Disconnect from power supply.
  3. Tilt the machine backwards on to its handles. The machine must be secured and supported.
  4. Make sure the grinding plate is cool to the touch.
  5. Use an 8mm Allen key to undo the countersunk screws securing the diamond plate to the flexible couplings.
  6. Remove grinding plate and replace.
  7. Ensure grinding plates are seated to coupling correctly prior to tightening counter sunk screws diagonally to a maximum torque of 75Nm.
  8. Lower the machine back to an upright position.
  9. Reconnect to the power supply.
  10. Two equally worn heads must be fitted as a pair.
  11. Set the machine level to floor, see starting work.
- CHECK FOR CORRECT WEAR RATE AFTER QUARTER OF AN HOUR AND AGAIN AT HALF AN HOUR INTERVAL. - THIS WILL GIVE AN IDEA OF WEAR RATE  
**SEE SPECIFICATION SHEET FOR AVAILABLE PLATES – SEE PAGES 7-8**
12. Adjust machine level as the plate reduces through wear.

## WET GRINDING

When grinding wet a hose is connected to the water tap on the side of the machine where an adjustment handle for the water supply is mounted. The water is ejected forward under the grinding plate.

When grinding wet the machine should still not be allowed to stop moving whilst the plates are in contact with the surface

**WARNING: DO NOT ALLOW WATER TO MAKE CONTACT WITH ANY ELECTRICAL COMPONENTS**

## WEIGHTS

It is recommended that the ballast weights are removed at the commencement of grinding and ONLY ADDED if an increased pressure is needed on the surface.



## MAINTENANCE

### AFTER USE:

- Clean the machine to remove all build up of dust and surface residue. If using a hose pipe or pressure washer take care that water is not directed onto electrical components and switches.  
(Note: Motors and switches are not waterproof)
- Ensure the height adjustment thread is cleaned and then lightly oiled. Periodically it should be removed and the female, threaded section cleaned out and oiled to maintain a light, smooth height adjustment.
- The drive belts will give a long and trouble free operating life if basic procedures are followed. The drive belts are tensioned by sliding the motor along the adjusting slots. It is important that the drive belt is not over tensioned. Serious damage could be caused to the drive shaft, drive shaft bearings and drive motor if the belt is excessively tight.
- All components should be checked daily for tightness and the drive belts for tension weekly.
- The flexible drive couplings that support the grinding heads should be checked on a weekly basis, the couplings should be firm without excessive movement.
- Any excess vibration due to uneven headwear should result in the heads being changed to eliminate damage to couplings and bearing assembly support units.



## SAFETY

Only trained operatives should be allowed to work the **DFG500** range of floor grinders.

Note: It is possible that the noise level produced by the Diamond Floor Grinder could exceed 90dbA. Appropriate PPE must be worn and the equipment must be used in line with guidelines laid down by the Health & Safety Executive.

Never leave the DFG500 unattended whilst in use. Always stop the motors and lift the heads of the machine prior to leaving the machine.

Always ensure that all power leads and hoses are disconnected before attempting to service the machine. Never tip the machine backwards until the grinding plates have stopped rotating and the machine has been isolated at main supply.

Noise and vibration will occur at various levels dependent on the attachments and work being completed. SPE have assessments conducted under test conditions detailed in the operating manual, see page 19. However, it is recommended that additional tests are taken on site to provide the operator with accurate information on using the equipment within the guidelines laid down by the Health & Safety Executive.

### NOTE:

- 1. NEVER OPERATE THE DIAMOND FLOOR GRINDER WITHOUT BELT GUARDS FITTED**
- 2. NEVER OPERATE THE DIAMOND FLOOR GRINDER OUTDOORS IN WET CONDITIONS AS THE ELECTRICAL COMPONENTS ARE NOT WATERPROOF**



## REVERSING PHASES

If the machine does not raise or lower correctly on the buttons on the handle bar, the power supply is phased incorrectly for the machine. Disconnect power cable and reverse phases as shown on page overleaf.

Reconnect power cable and retest. If the phases have not reversed and machine does not work correctly, seek advice of qualified electrician.

## TWIN SPEED OPERATION





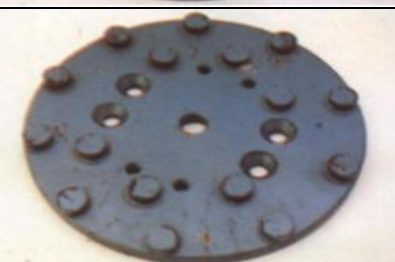
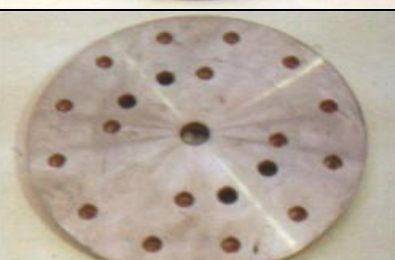
The DFG500-2 is fitted with a switch located on the electric panel allowing a high and low speed grinding option. The high speed setting is recommended for the majority of applications such as concrete grinding and coating/adhesive removal. The slow speed setting is recommended for polishing applications using the polymer diamond system.

The speed setting must be selected prior to starting the grinding heads.

**DO NOT CHANGE SPEED SETTING DURING USE AS THIS MAY CAUSE SERIOUS DAMAGE TO ELECTRICAL COMPONENTS.**



## Accessories

	Part No	Description	Application
	<b>6401</b>	Economy grade 250mm 10 segment (blue)	Economical removal of most types of adhesives and surface contaminants. Excellent for using on rougher surfaces as a first grind. Can be used wet or dry.
	<b>6402</b>	Super Aggressive 250mm 10 segment (red)	Designed for the removal of S/L and epoxy coatings in a commercially viable way. Can be used for the majority of aggressive grinding applications and will give extended wear on heads. Can be used wet or dry.
	<b>6403</b>	Standard Grade 250mm 16 segment (blue)	Removal and grinding of most types of concrete floor in preparing for follow on coatings. General all purpose head for most grinding works. Can be used wet or dry.
	<b>6404</b>	High performance 250mm 20 segment (blue)	Fast removal and grinding of most types of plain and painted concrete floors. Will key floors for coatings, removal of high spots, lip edges etc. Suitable for first and second stage grinding to terrazzo and aggregated seamless floors. Can be used wet or dry.
	<b>6405</b>	Button head 250mm 16 segment (blue)	For the removal of the thicker adhesive on sand / cement screed whether open or closed. Will cope with large volume areas in a cost effective manner. To be used with softer elastomeric and thin film coatings.
	<b>6408</b>	Polymer diamond backing plate	Backing drive plate for the polymer diamond system. Takes 16 polymer button inserts.

	<p>6420 6409 6410 6411 6412 6413 6414</p>	<p>GREEN ULTRA COARSE 16no BLACK EXTRA COARSE 16no BROWN COARSE 16no RED MEDIUM 16no YELLOW FINE 16no WHITE EXTRA FINE 16no BLUE ULTRA FINE 16no</p>	<p>Polymer diamond system to be used only on the DFG 500 twin speed (slow speed option) for second stage grinding and polishing of terrazzo, stone and marble etc. The buttons fit securely into the aluminium backing plate. Wet use only.</p>
	<p>6422 6423</p>	<p>COARSE STEEL POLYMER 16No MEDIUM STEEL POLYMER 16No</p>	<p>Steel polymer diamond system to be used on DFG 500 twin speed (slow speed option). For second stage grinding and finishing of cementitious, polyurethane and epoxy based terrazzo, terrazzo tiles and concrete flooring. Provides rapid action and long life. Wet use only.</p>
	<p>6403C</p>	<p>Fine grit 250mm 16 segment (purple)</p>	<p>Finishing and polishing of cementitious polyurathane, epoxy based terrazzo, terrazzo tiles and decorative aggregated concrete flooring. Can be used wet or dry.</p>
	<p>6415</p>	<p>Carborundum grinding and wire brush block holder drive plate.</p>	<p>Drive plate for the carborundum grinding blocks and wire brush blocks.</p>
	<p>6416 6417 6418</p>	<p>Carborundum grinding blocks Fine Medium Coarse</p>	<p>For economical polishing and grinding removal of high spots, over watered slabs, rain damaged slabs, lip edges etc.</p>
	<p>6419 6421</p>	<p>16 gauge round wire block Spring steel block</p>	<p>General scarifying, removal of rubber carpet backing, grease and oil build-up without damage to substrate.</p>



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# **Spare Parts Breakdown**



## DFG500 TWIN SPEED

### ELECTRICAL COMPONENTS

QTY	DESCRIPTION	SPE PART NO
1	Panel	SP58017
1	Back Panel	SP55817
7	Contactor	-
1	Aux Switch	SPLADN40
2	Overload	SPLRD12
2	Overload	SPLRD16
1	Stop Switch	SPZB4BZ102
2	Start Switch	SPZB4BZ101
2	Start Button	SPZB4BA3
1	Stop Button	SPZB4BS44
1	Lens	SPZB4BV04
1	Panel Lamp	SPZB4BV5
2	Switch Box	SPXALBO1
4	Contact Switches	SPXENL1111
2	Start Button	SPZA2BA3
2	Trip	SPC60HD316
1	Trip	SPC60HD304
1	Trip	SPC60HC202
2	Glands	-
3	Brass Bushes	-
1	Coupler	-
4	Glands	9258/200
1	Glands	-
1	Isolator	SPFWA4/3C
1	Transformer	5020A
1	32amp 5Pin Phase Rev. surface Plug	SP630PH
4	Bobbins	9245/500
1	700/400 R.P.M. Sticker	-
2	Conversion Kit	-
1	Two Speed Switch	-
1	N/O X N/C Contact Block	-
1	N/O Contact	-
1	N/C Contact	-



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## SPECIFICATION SHEET

<b>Type</b>	DFG 500 Electric
<b>Part number</b>	DFG 500-2
<b>Power output</b>	2 x 4.5 kw on high speed 2 x 3.2 kw on slow speed
<b>Voltage</b>	380/415
<b>Cycles</b>	50
<b>Head speed r.p.m.</b>	700/1400
<b>Engine/motor speed r.p.m.</b>	1400/2800
<b>Machine dimensions (mm)</b>	
<b>Length</b>	1400
<b>Width</b>	725
<b>Height</b>	1100
<b>Weight (kg)</b>	300
<b>Ballast weight (kg)</b>	2 x 20
<b>Hydraulic oil</b>	HM46
<b>Tank capacity</b>	3.5 litres

## ELECTRICAL REQUIREMENTS

<b>Machine</b>	<b>Volts</b>	<b>Plug size</b>	<b>Cable size (mm)</b>	<b>Max Cable Length</b>	<b>Transformer</b>	<b>Generator</b>
DFG 500-2	380/415	32 amp 5 pin	4.0 4 core	75 metres	-	20 kva

## RECORD OF NOISE AND VIBRATION ASSESSMENT

Manufacturer: SPE  
 Type: Diamond Floor Grinder  
 Model No. DFG500-2 Electric  
 Operation : Concrete floor surface  
 Inserted Tool: 2 Diamond Grinding Plates  
 Running Conditions: 1400 rpm  
 HAV Note: Acoustic Associates

### HAND-ARM VIBRATION

#### Frequency Weighted Energy Equivalent Accelerations ( $a_{h,w}$ )

Measurement Position	Acceleration ( $m/s^2$ )			
	X axis	Y axis	Z axis	Vector Sum
Handle	1.31	1.14	1.31	2.18

### NOISE LEVELS

#### Sound Power Level ( $L_{WA}$ )

$L_{WA}$ at Octave Band Centre Frequency (Hz)								Sound Power Level $L_{WA}$
63	125	250	500	1000	2000	4000	8000	
61.5	80.6	88.4	94.3	93.3	92.2	85.9	73.9	98.8

#### Operator's Ear

$L_{Aeq,T}$ at Octave Band Centre Frequency (Hz)								Overall Level ( $L_{Aeq,T}$ )	$L_{Peak}$ dB(C)
63	125	250	500	1000	2000	4000	8000		
46.2	66.3	76.1	81.8	81.2	75	68.5	56.6	85.6	101





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## WARRANTY

The standard warranty period of this equipment is **12 months** from the despatch date in accordance with the company Conditions of Sale (copy attached).

<i>Warranty start date:</i>	<b>As despatch date</b>
<i>Model:</i>	<b>DFG 500-2</b>
<i>Serial no:</i>	
<i>Customer name:</i>	
<i>Customer Address:</i>	

<i>Manufacturer:</i>	<b>SPE International Ltd</b>
	<b>Honeyholes Lane</b>
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<i>Web site:</i>	<b>www.spe-int.com</b>

<i>Distributor:</i>	
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## DECLARATION OF CONFORMITY

WE  
**SPE INTERNATIONAL LTD**

OF  
Honeyholes Lane  
Dunholme  
Lincoln  
LN2 3SU

**DECLARE** that under our sole responsibility for the supply/manufacture of the product

(Description/name)            **DFG 500 Floor Grinder**

(Model/type)                 **DFG 500 - 2**

to which this declaration relates is in conformity with the following standards and other normative documents following the provisions of Directive 2006/42/EC.

A handwritten signature in black ink, appearing to read 'B. Jacklin', is positioned above the printed name.

.....  
Brian Jacklin – Technical Manager  
SPE INTERNATIONAL LTD





## CONDITIONS OF SALE

## DFG500 - 2 Operating Manual

The quotation overleaf and any order placed following such quotation are subject to the following conditions of sale in which SPE International Limited is referred to as the "Company".

1. **Validity of quotation**  
No order received from a customer by the Company shall constitute a contract until accepted in writing by the Company.
2. **Prices**  
Prices quoted by the Company are firm for 30 days only or until previously withdrawn. Unless otherwise stated all prices are exclusive of any applicable Value Added Tax for which the customer shall be additionally liable to the Company.
3. **Delivery**  
Delivery periods and dates are given in good faith but are not the subject of any warranty or condition and time shall not be of the essence of the contract in these respects. No liability will attach to the Company if delivery periods or dates are not met for any reason whatsoever.
4. **Payment**  
Save as may otherwise be agreed in writing the customer shall pay the price in full on or before the estimated delivery date whereupon the Company shall raise a receipted invoice. Each invoice includes an Overdue Account Levy of 5% of the total invoice value inclusive of VAT. Subject to payment in full being made on or before the due date a sum equal to the Overdue Account Levy shall be credited to the customers account with the Company. Until such time as payment in full has been made the Company shall be under no obligation to allow or effect of any goods to the customer.
5. **Warranty**  
The Company warrants that all goods supplied by it will correspond to their specifications and will be free from defects in materials or workmanship for a period of 12 months from the date of delivery. The Company's obligation in the event of a breach of this warranty is limited to the repair or replacement of any defective goods which shall be returned at the cost and expense of the customer to the Company. This warranty is given in lieu of all the other warranty or conditions expressed or implied (whether by statute or otherwise) and is subject to the following conditions:-
  - 5.1 Claims must be notified in writing to the Company within seven days from the date of delivery or (where the defect is not apparent on reasonable inspection) as soon as practicable after discovery of the defect.
  - 5.2 The Company shall be under no liability in respect of any defect in the goods arising from any drawing, design or specification supplied by the customer.
  - 5.3 The Company shall be under no liability if the defect or failure in the reasonable opinion of the Company arises from wilful damage or misuse, negligence by the customer or any third party. Failure to follow the Company instructions, usage of non-recommended parts and materials, alteration or repair of the goods without the prior approval of the Company or non-recommended maintenance.
  - 5.4 The Company shall be under no liability if the price for the goods has not been paid by the due date for payment.
  - 5.5 The above warranty does not extend to:-
    - 5.5.1 Parts, materials or equipment not manufactured by the company in respect of which the customer shall be entitled only to the benefit of any such warranty or guarantee as is given by the manufacturer to the Company.
    - 5.5.2 Any component part of the goods or associated parts coming into contact with abrasive elements or dust within surface Preparation equipment.
    - 5.5.3 Fair wear and tear of moving parts within the goods.
  - 5.6 Except in the case of death or personal injury caused by the Company negligence, the Company shall not be liable for any consequential loss or damage (whether for loss of profit or otherwise) or other claims for consequential compensation.
6. **Carriage**  
Packing, carriage and insurance charges in respect of delivery of the goods to the customer will be charged to the customer at cost to the company.
7. **Damage in Transit**  
The company does not accept any liability for loss or damage to the goods while in transit to the customer.
8. **Risk**  
The risk in the goods shall pass to the customer on delivery to the customer or (if earlier) when possession of the goods is taken by a carrier for delivery to the customer.
9. **Force Majeure**  
The Company shall not be liable to the customer or be deemed to be in breach of any contract with the customer by reason of any delay in performing or any failure to perform any obligation of the Company obligation in relation to the goods if the delay or failure was due to force majeure or to any other cause beyond the Company's reasonable control.
10. **Reservation of Title**  
The goods sold under these conditions shall remain the absolute property of the Company and legal title in the goods shall remain vested in the Company until payment in full of all amounts invoiced or due to the Company in respect of the goods. If the customer shall enter into liquidation have a winding up order made against it or have a Liquidator, receiver, administrator or administrator receiver shall be appointed over its assets, income or any part thereof before the property in the goods has passed in accordance with this condition the Company shall be entitled immediately after giving notice of its intention to repossess any goods to enter upon the premises of the customer with such transport as may be necessary and to repossess any goods to which it has title under this condition. No liquidator, receiver, administrator or administrative receiver of the customer shall have authority to sell goods to which the Company has title without the prior written consent of the Company.
11. **Insolvency of Customer**  
If the customer being a body corporate, shall pass a resolution or suffer an order of the Court to be made for winding – up, or if a Receiver, Administrator or Administrative Receiver shall be appointed or, being an individual or partnership, shall suspend payment, propose or enter into any composition or arrangement with his or their creditors, or have a bankruptcy order made against him or them, then the Company shall have the right, without prejudice to any other contract with the customer, not to proceed further with the contract and shall be entitled to charge for work already carried out ( whether completed or not) and for goods and materials already purchased for the customer such charge to be an immediate debt due from the customer.
12. **Patent Rights, etc**  
The acceptance of a quotation includes the recognition by the customer of the Company under any patents, trademarks, registered designs or other intellectual property rights relating to the goods and the customer undertakes that patent numbers, trademarks or other trade markings on goods supplied shall not be obliterated, altered or defaced.
13. **Applicable Law**  
These conditions shall be governed by and construed in accordance with English law and parties acknowledge and accept the exclusive jurisdiction of the English Courts.