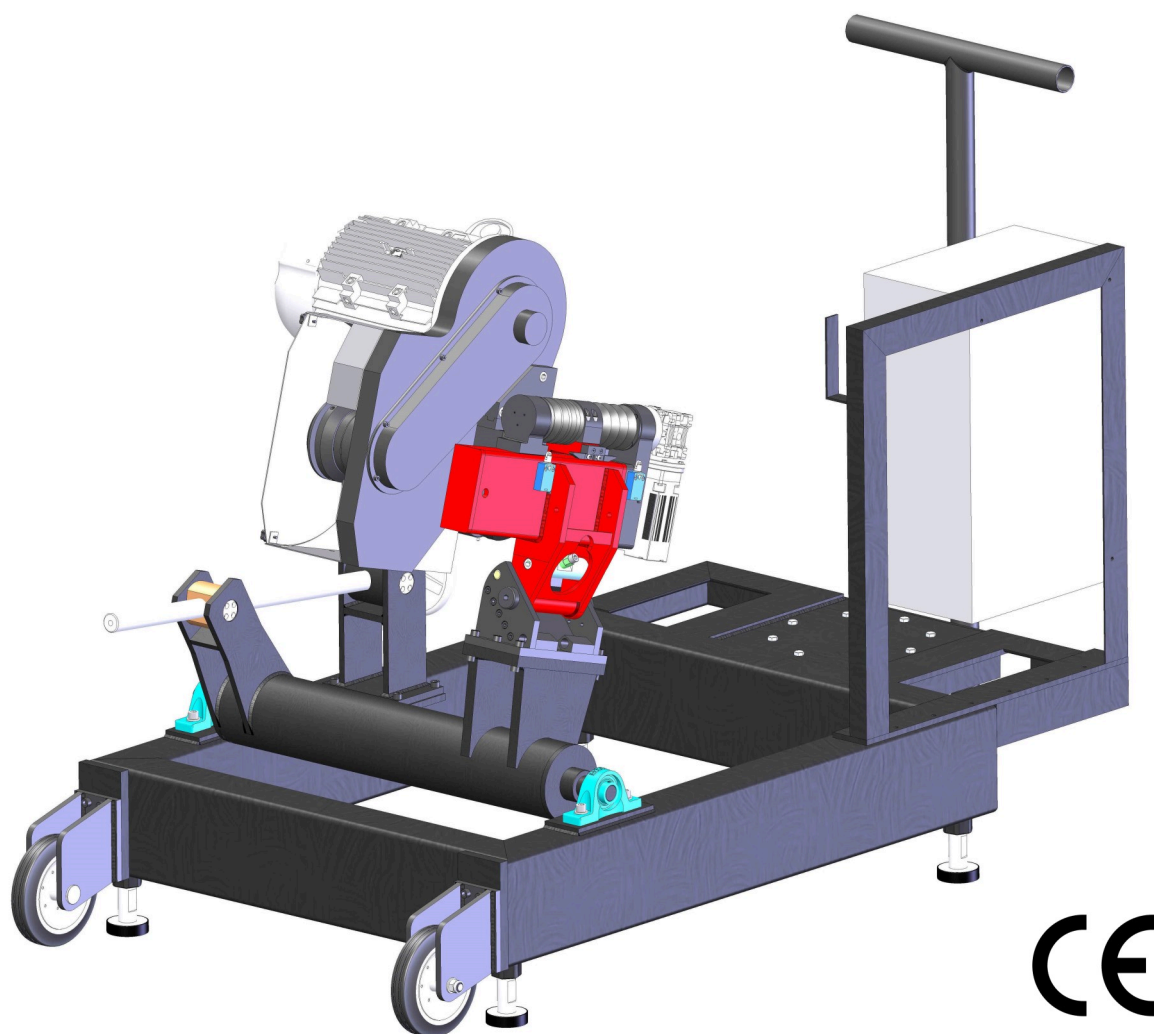




# INSTRUCTION MANUAL

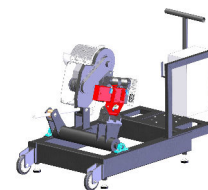


## ELECTRONIC GRINDER G400



# GRINDER G400

Original Instructions Rev.01-2017 in compliance with the § 1.7.4 of the Machines Directive 2006/42/CE



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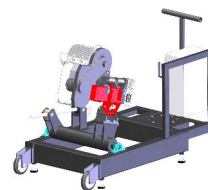
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# GRINDER G400

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## **PRELIMINARY INFORMATION**

This Manual is supplied together with the machine it makes reference to. The customer may apply for further copies to **G.B.C. Industrial Tools S.p.a.** Our company owns the copyright of this document and any partial or complete copy or distribution to natural persons or to corporate bodies is strictly forbidden unless our prior approval to do so is obtained. **G.B.C. Industrial Tools S.p.a.** informs its customers that any operation carried out on the machines which is not prescribed in this manual entails the automatic invalidation of the warranty. **G.B.C. Industrial Tools S.p.a.** recommends to contact the Maintenance Service in Cazzago San Martino– Italy prior to proceed with any modification on the machine.

You are invited to scrupulously adhere to the information written on the identification tag.

For any further information you are invited to contact us at the telephone number or email below:

**Tel. +39 - 030 -7451154**  
**email: sales@gbcspa.com**

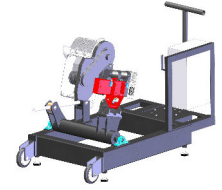
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## **WARRANTY GENERAL CLAUSES**

**G.B.C. Industrial Tools S.p.a.** guarantees the reliability of the machine and its conformity to the specifications herewith reported. The warranty covers the machine in its whole for a time period of one year from the shipment date (ref. Delivery Note) for any flaw not imputable to the user.

The parts subject to wear are excluded from the warranty at sole discretion of **G.B.C. Industrial Tools S.p.a.**

In case of any operational malfunction arising during the warranty period, **G.B.C. Industrial Tools S.p.a.**

And its Maintenance Service, hereinafter called **MSS**, will remedy this inconvenient free of charge, both for handwork and for eventual replaced parts, except when the malfunction is directly or indirectly imputable to misuse or alteration. In any case the machine must not be disassembled or altered before the shipment. The warranty is valid only when the warranty document is duly signed by **G.B.C. Industrial Tools S.p.a.** and by a G.B.C. official distributor connected with the **MSS** maintenance service.

The shipment of the defective material must be performed within 8 (eight) days from the notification of the defect and/or the claim and/or the request of technical assistance. On the contrary the warranty will be void. **G.B.C. Industrial Tools S.p.A.** and **MSS** obligations will cover the defect resolution, the general maintenance and the inspection of the parts subject of the claim only. The component replacement is at **G.B.C. Industrial Tools S.p.A.** discretion only. The shipment costs from and to the **MSS** as well as the direct and indirect costs rising from repair of the product are at user's charge. Any warranty repair or extraordinary repair must be executed by **G.B.C. Industrial Tools S.p.A.** and **MSS**, otherwise the warranty will be void.

Any ordinary maintenance performed by the customer/user or by any service centre not recognized or approved by **G.B.C. Industrial Tools S.p.A.** will not be refunded and will make the warranty void. The warranty is not valid for cases not listed in this certificate or for damage caused by a misuse of materials, power supply, negligence, unauthorized modifications, atmospheric events, acts of vandalism, incautious handling and/or transport, use of non original **G.B.C. Industrial Tools S.p.A.** parts and damage for causes not specified by **G.B.C. Industrial Tools S.p.A.** and for which **G.B.C. Industrial Tools S.p.A.** declines any responsibility. **G.B.C. Industrial Tools S.p.A.** reserves the right to modify and to improve its products without any obligation to modify equipment and components already supplied. Nobody is authorized to modify the conditions herewith contained or to issue any on behalf of **G.B.C. Industrial Tools S.p.A.** The claim terms for defects and/or damages in the material or of the ordered quantities, are those prescribed by the Civil Code; the goods acceptance entails the buyer to automatically accept the above mentioned warranty clauses.

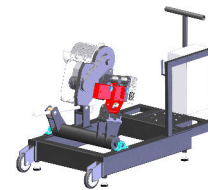
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## **INTENDED USE OF THE MACHINE**

**THE GRINDER G400 MUST BE USED ONLY BY OPERATORS WHO HAVE RECEIVED AN APPROPRIATE TRAINING**

**PROPERLY TRAINED PERSONNEL RULES OUT THE POSSIBILITY OF MISUSE OF THE UNIT**

The grinder G400 represents a revolutionary method of executing grinding processes in the boiler industry granting the following advantages:

- Sensible reduction of the working time in comparison with the existing manual grinders;
- High material removal rate
- No thermal alteration on the welding area
- Consistency of the groove
- Vibrations free
- Requires only one operator
- Improvement of the working conditions and safety of the operator.
- Sensible reduction of injury risks ( flying shrapnels, tendinitis and distortions, stress fractures) deriving from an extended use of angle grinders.

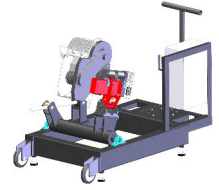
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## **SAFETY PRESCRIPTIONS**

- Read ALL the following regulations and instructions;
- Ensure that the foreman that is using the machine is fully aware of all the regulations and instructions and that is qualified to operate the unit.
- Strictly attain to the indications and the international symbols portrayed in the present manual;
- Do not perform technical maintenance while the machine is plugged to the power source.
- Before every use ensure that the connection to the power source is in compliance with the specifications provided by the G.B.C. manual.

The authorized operator should not in any case disregard the basic safety regulation such as:

- Using gloves and goggles (safety gear supplied by the company responsible for the site or for the building)
- To properly illuminate the working area;
- Ensure you are operating in an area which grants free movements (at least 2 metres around the operator);
- Do not replace the control system and do not replace worn parts with non-genuine GBC parts
- Do not use water jets on the machine;
- Do not get near the machine while it is running.

G.B.C. Industrial Tools S.p.A. recommends that for any particular case not mentioned in this manual, the manufacturer's authorization is necessary

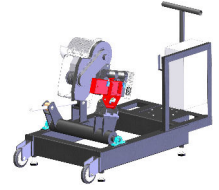
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## **SPECIFIC SAFETY PRESCRIPTIONS**

- WEAR PROTECTIVE EYEWEAR AGAINST ULTRAVIOLET RAYS
- WEAR HEARING PROTECTIONS
- WEAR A FACE SHIELD FOR SPARKS AND FUMES
- The unit must carry a tag indicating the maximum speed of the grinding disc (65 m/s) which shall always be inferior to the speed sustainable by the grinding disc itself as specified by the manufacturer ( 80 m/s)
- The protection around the grinding disc must cover at least 2/3 of the disc surface

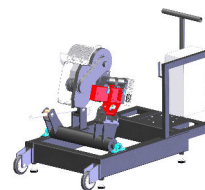
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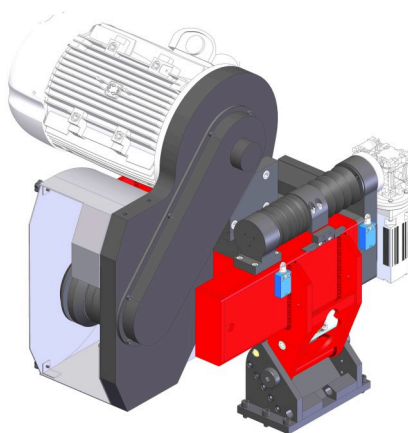


## **MACHINE STANDARD CONFIGURATION**

The machine is supplied with:

- Control Panel
- Wired Control
- 80-120mm Hook Wrench
- 8mm Allen Key
- 24mm Socket Wrench
- 24mm Open End Wrench
- 17mm Socket Wrench
- 6mm Allen Key
- 13mm Open End Wrench
- Instruction Manual
- Drawing of machine

**G400**



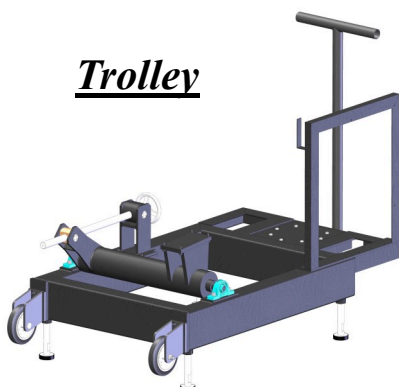
**Control Panel**



**Wired Control**



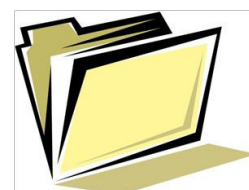
**Trolley**



**Tools**



**Instruction Manual**



**G.B.C. Industrial Tools S.p.A.**

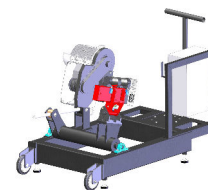
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## **TECHNICAL FEATURES**

FEATURES AND PERFORMANCES	UNIT MEASURE	VALUES	NOTES
Power Supply Tension	(V)	400	-
Main Motor Power	(KW)	9	-
Push Motor Power	(KW)	0.37	-
Horizontal Motor Power	(KW)	0.37	-
Total Power	(KW)	10	-
Head Horizontal Stroke	(mm)	160	-
Head Push Stroke	(mm)	140	-
Grinding Disc Speed	(RPM)	3200	-
Grinding Disc Maximum diameter	(mm)	410	-
Grinding Disc Flange Seat	(mm)	60	-
Grinding Disc Allowed Thickness	(mm)	8÷10 12÷14÷16	-
Grinding Disc Peripheral Speed	(m/s)	65	With Intact Grinding Disc
Head Rotation Left-Right	(°)	5	With Intact Grinding Disc
Head Lateral Tilt	(°)	5	On the Left Side
Head Tilt on Trolley	(°)	0÷45	Head Installed on the Trolley
Gouging Depth	(mm)	0÷120	With Intact Grinding Disc
Gouging Force	(N)	150	
Rotation Speed of the Positioners min/max	(mm/min)	500÷2000	Optimal Speed between 1000 and 2000
Grinding Disc Productivity (Carbon Steel)	Kg/min	0.080	In Optimal Conditions
Constant Noise at 2mt from the Grinding Disc Noise Peak at 2mt from the Grinding Wheel	(dB A) (dB B)	80÷85 110÷120	See the Note on the Next Page
Weight of the Head	(Kg)	180	
Weight of the Head + Trolley (Complete Unit)	(Kg)	500	

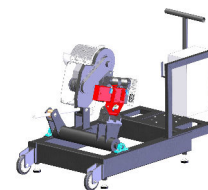
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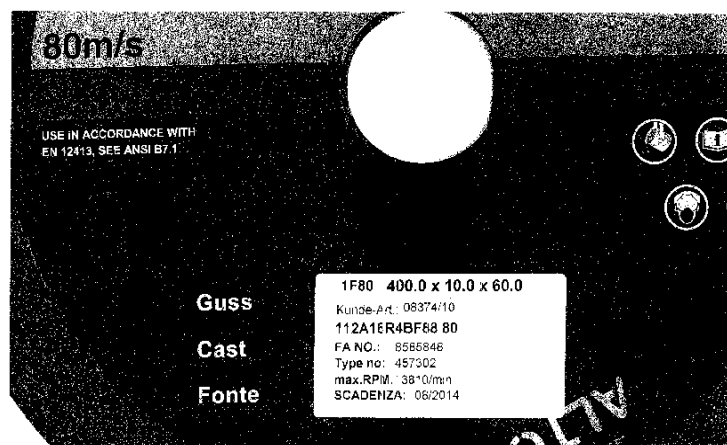
## NOTE:

G.B.C. Industrial Tools S.p.A, declares that every machine is tested on steels commonly user in mechanical and metal work fabrication with 50mm wall thickness. The figures listed in the above chart, are detected by a phonometer certified by an acoustic calibrator mod. DELTA HOM HD 9102 certified by LAT (former SIT) N. SIT 03229/09 and we confirm such figures are in compliance with the regulation EN 60745.

Therefore according to the evaluation of the environmental risk of the workplace, regulated by the Law Decree.81/08 and following variations, actuating the directive2003/10/CE, according to the Art. 190 of the above mentioned Decree, the staff responsible of the G400 must be formed and educated in renard to the above said regulation , and must be equipped with the (DPI) and acoustic control upon request of the worker, when deemed opportune by the doctor in charge.

## **GRINDING DISC SPECIFICATIONS**

### EXAMPLE OF A GRINDING DISC IDENTIFICATION TAG



### **THE ABRASIVE DISC MUST HAVE THE FOLLOWING FEATURES:**

Max. Ø 410

Thickness: 8 ÷ 16 mm

Flange Seat : Ø60

RPM max.3810/min

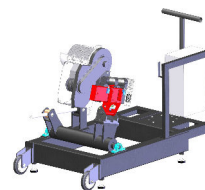
Max.80m/s

Reference Code: EN 12413 ÷ ANSI B7.1

**Expiry Date and binder features are clearly stated on the abrasive wheel.**

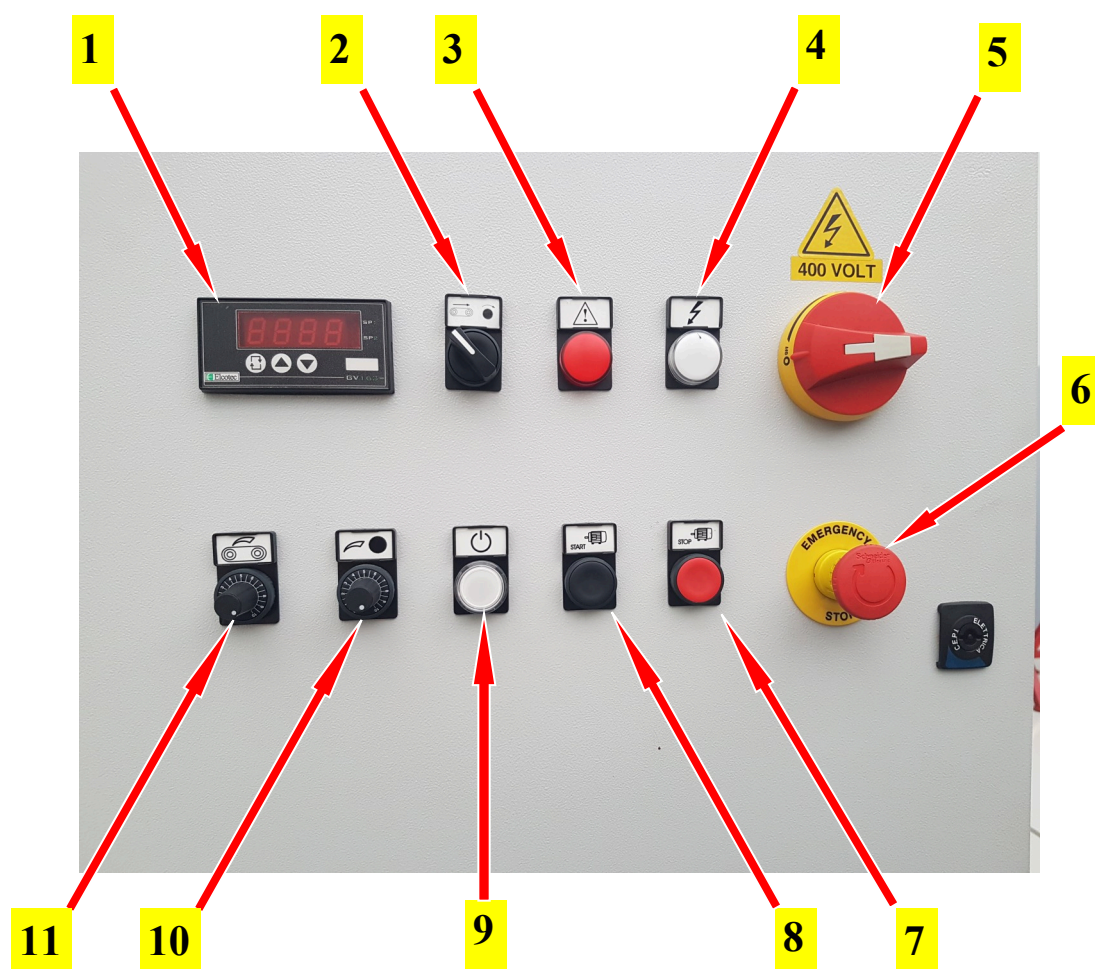
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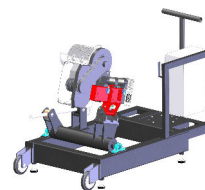
## **CONTROL PANEL FUNCTIONS**

- 1 - Absorption Digital Display
- 2 - Switch Grinding Wheel / Grinding Tape
- 3 - Circuit Breaker Indicator
- 4 - Tension Indicator
- 5 - ON-OFF General Switch
- 6 - Emergency Stop
- 7 - Grinding Wheel Motor STOP
- 8 - Grinding Wheel Motor START
- 9 - Cycle Start
- 10 - Grinding Disc Absorption Adjustment
- 11 - Grinding Tape Absorption Adjustment



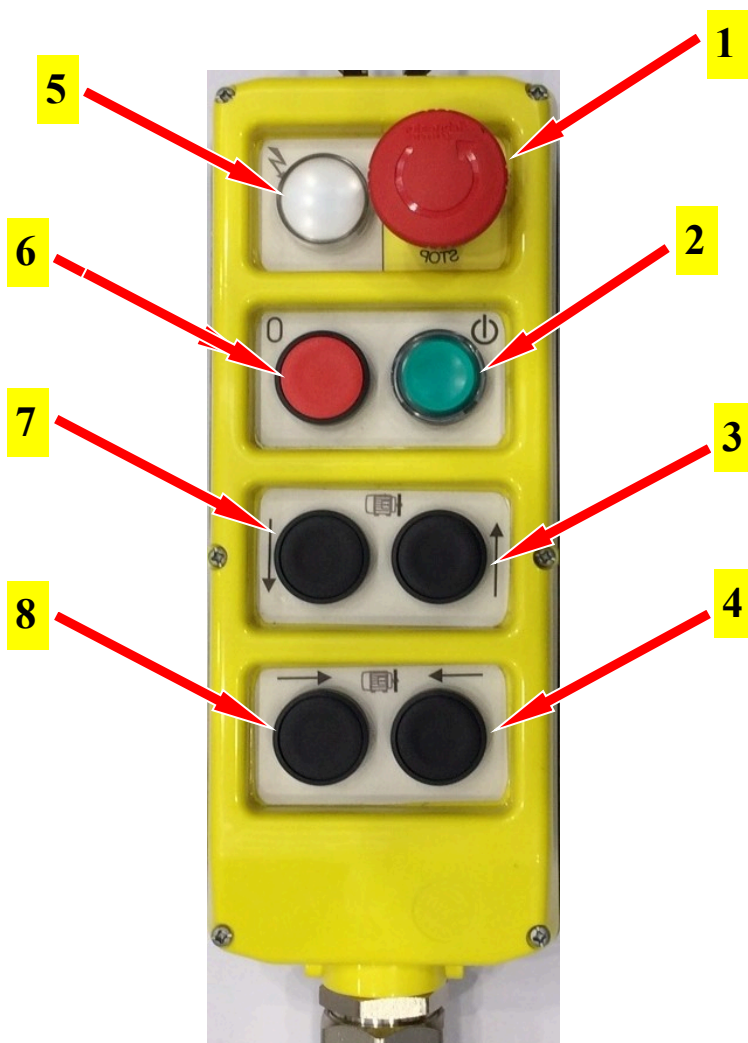
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## WIRED CONTROL FUNCTIONS:

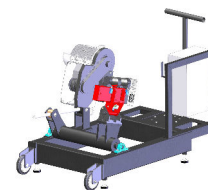
- 1– Emergency Stop
- 2– Grinding Disc Motor START
- 3– Head Feeding
- 4– Head Left Translation
- 5– Tension Indicator
- 6– Grinding Disc Motor STOP
- 7– Head Return
- 8– Head Right Translation



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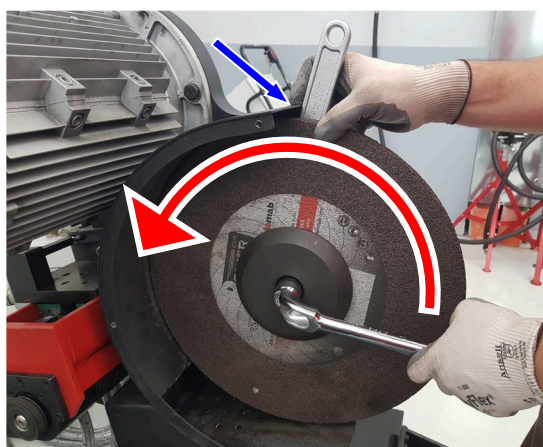


## **GRINDING DISC MOUNTING AND REMOVAL**

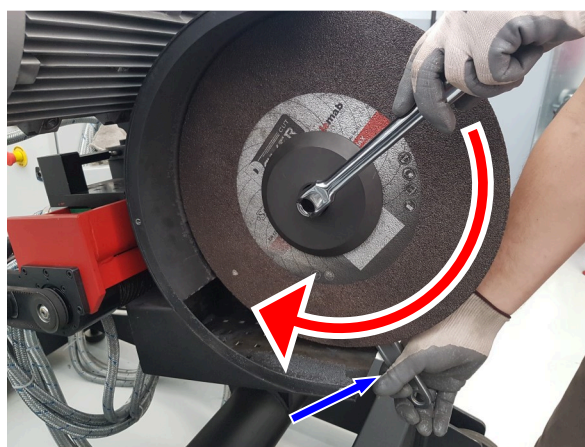
The replacement of the grinding disc and the replacement of the rubber wheel (for the grinding tape) are operations that require the same procedure which is described below:

- Insert the hexagonal tubular wrench in the flange seat and engage the grinding disc locking nut. At the same time use the hook wrench on the flange back plate on the opposite side to hold it in place.
- Turn the nut and remove the flange.
- Replace the grinding disc, reposition the flange and the nut and use the hexagonal tubular wrench to secure the parts in place again using the hook wrench to hold the back plate on the opposite side.
- Due to the allowed manufacturing tolerances you may note that the grinding disc might slightly in and out of the center line. This phenomena tends to fade away after about 10 minutes of usage therefore during this limited period of time the machine will have to work on light workload
- Replace the grinding wheel when its diameter is reduced to less than 275mm.

Wrenches Positioning for the grinding disc REMOVAL procedure



Wrenches Positioning for the grinding disc MOUNTING procedure



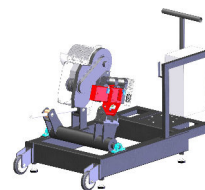
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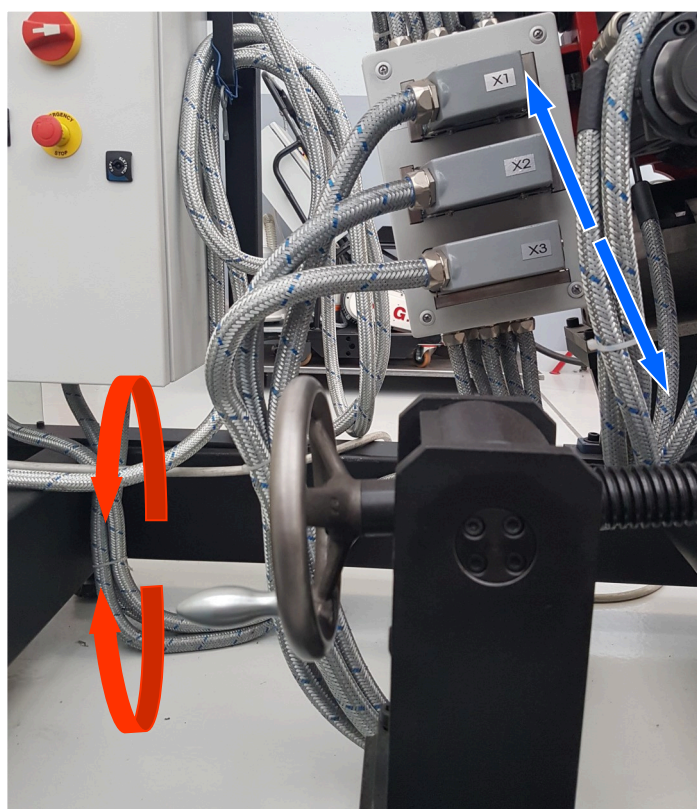
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## **HEAD TILT ADJUSTMENT**

The head tilt adjustment is achieved by rotating the handwheel in one way or another. This will cause the head to tilt accordingly.

**N.B. It is advisable that the head tilt does not exceed 10°÷45° and possibly that the head axis is lined up with the workpiece to be worked.**



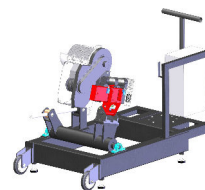
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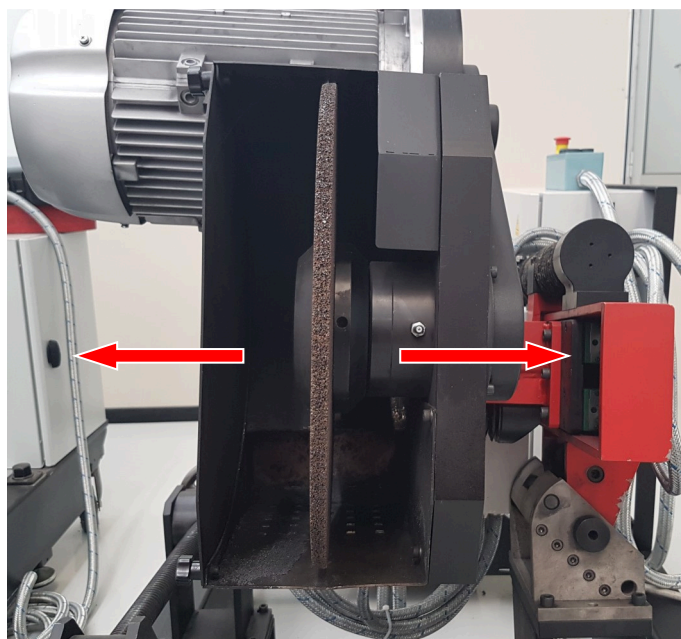
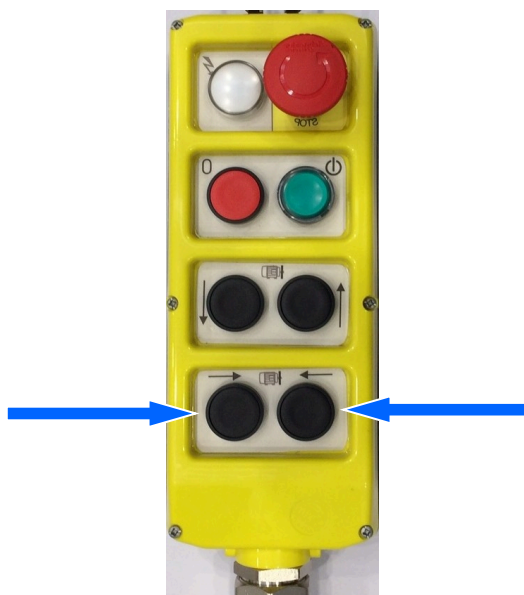
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## **HEAD HORIZONTAL TRAVEL**

The head of the G400 can be translated on the horizontal axis by pushing the buttons indicated by the arrows below.

N.B. The stroke of the head is  $0 \div 160\text{mm}$  ( $0 \div 6 \frac{5}{16}''$ )



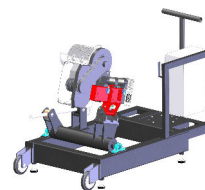
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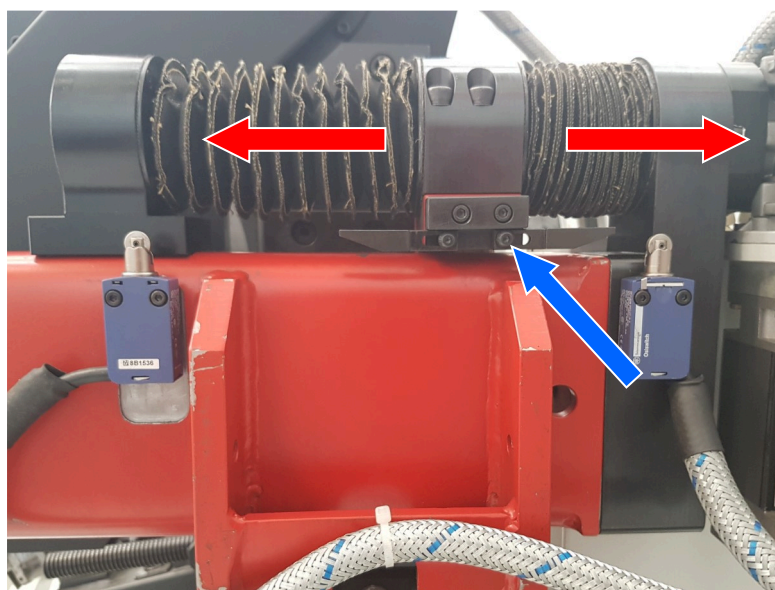
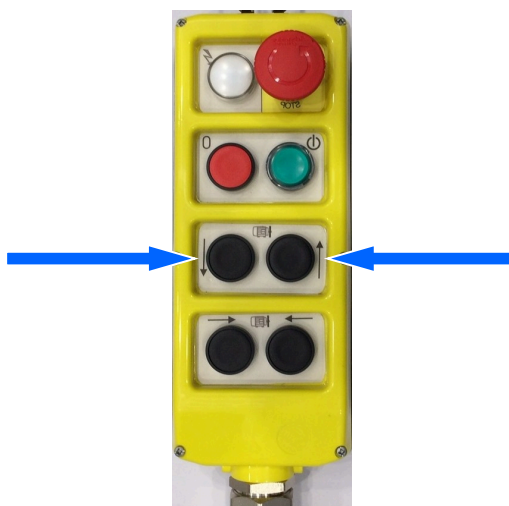
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## **HEAD PERPENDICULAR TRAVEL**

The head of the G400 can be translated on the perpendicular axis (moved towards or away from the workpiece) by pushing the buttons indicated by the arrows below..

N.B. The stroke of the head is  $0 \div 140\text{mm}$  ( $0 \div 5 \frac{1}{2}''$ )



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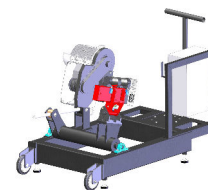
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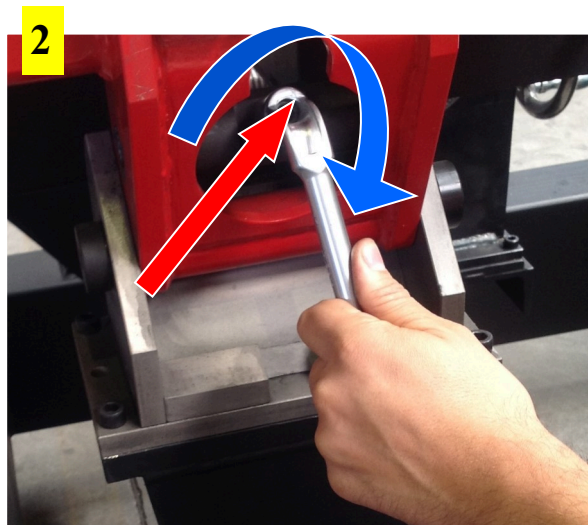
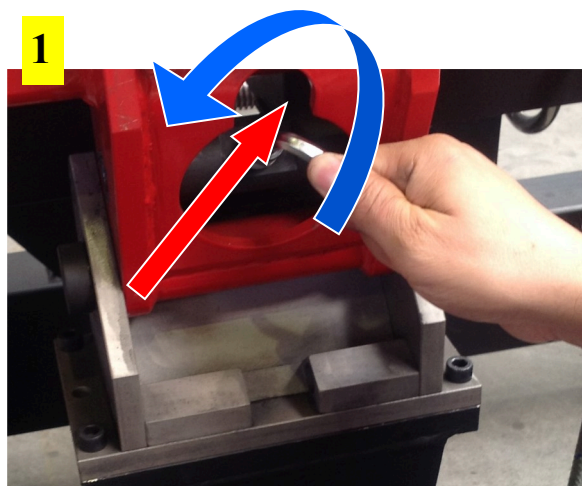


## **HEAD TILTING FOR BACK GOUGING**

The procedure described below is the correct one to perform a perfect groove back gouging:

- 1) Using the Allen key supplied with the machine, loose the screw that locks the joint as shown in the picture below.
- 2) Use the socket wrench supplied with the machine and rotate the threaded pin in the direction indicated by the arrow until you reach the desired tilting.

**N.B. The max tilting achievable is 5°**



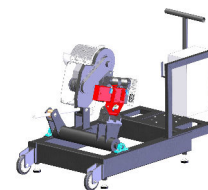
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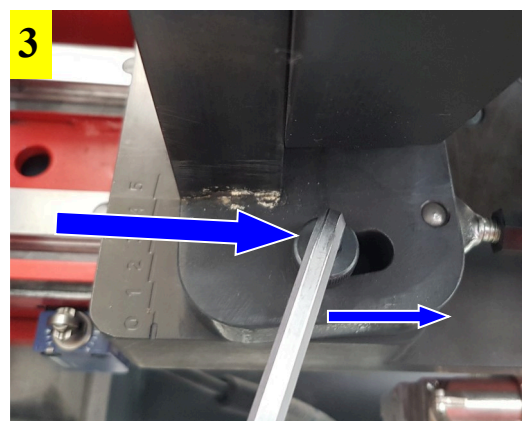
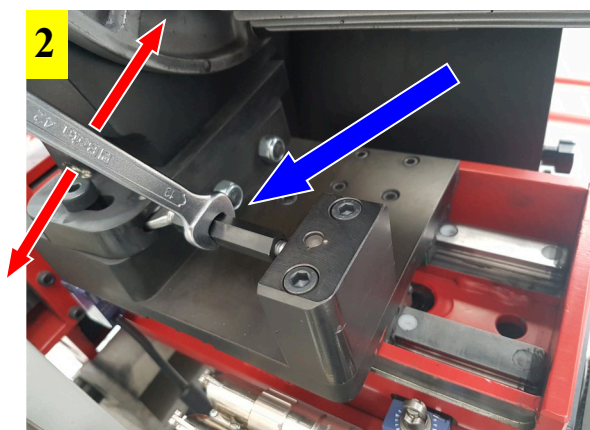
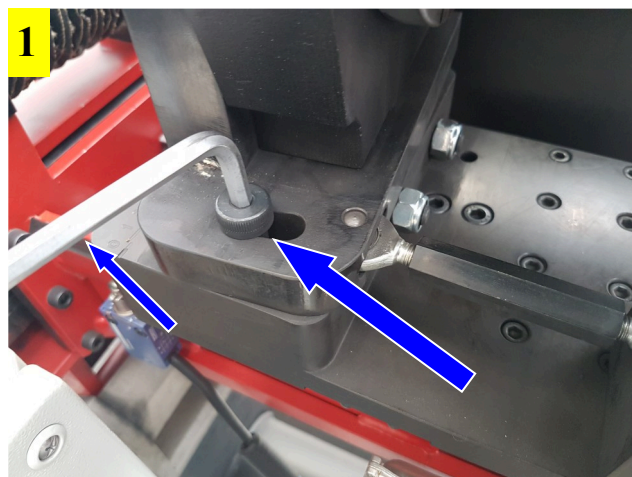
## **LEFT/RIGHT HEAD ROTATION FOR A CORRECT POSITIONING**

During the positioning of the machine it is possible to rotate the head left and right in order to achieve a perfect alignment of the head with the workpiece to back gouge.

The procedure to do so is the following:

- 1) Use the Allen key supplied with the machine loose the screw pointed by the big arrow in the below picture.
- 2) Use the open end wrench supplied with the machine and turn the tie rod in the direction required until the head reaches the desired position.
- 3) Tight the screw to lock the head in position as shown in the picture below.

**N.B. The maximum rotation is + 5° and – 5°**



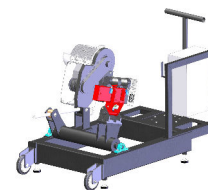
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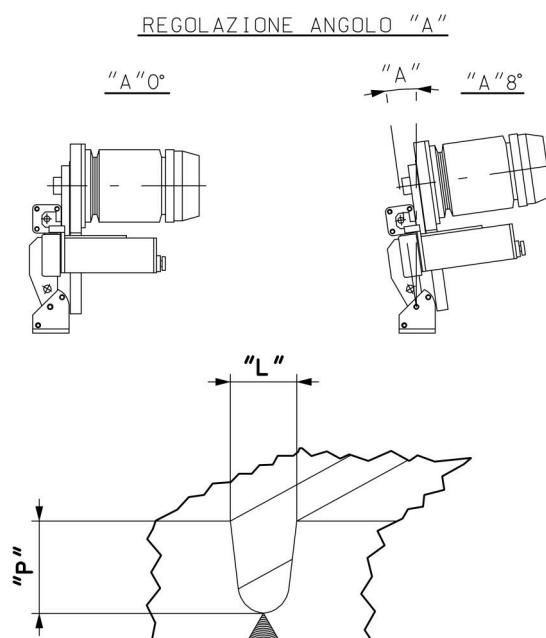


## **GOUGING THE GROOVE**

Back gouging impure welding material between the edges of two parts (generally rolled plates) partially welded together is a typical application for which this machine is devised. For a perfect execution it is absolutely vital that the workpiece rotates without drifting (lateral movements) and if it does you will want to eliminate the problem using some counter rollers on which the edge of the workpiece can lean against having the counter roller to act as an end-stop device or you can find other expedients that grant the same result.

Sometimes the grinding disc is not parallel to the welding groove longitudinal axis you have to gouge and needs therefore to be slightly tilted so that you can achieve a perfect “U-shaped” groove.

The correct degree is defined by specific charts listed in the following pages, in which are listed values in relation to the surface width and the desired depth to achieve. Approximately the value is included between  $3^\circ$  and  $8^\circ$ . In any case it is essential that during the gouging process such angle remains unchanged or that at least it does not increase otherwise this may generate friction between the grinding disc and the walls of the groove.

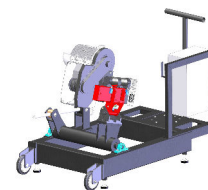


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# GRINDER G400

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Larghezza solco mola ( L ) in funzione della profondità ( P ) e dell'angolo mola ( A )

**SPESORE MOLA**

**T = 8MM**

**SPESORE MOLA**

**T = 10MM**

A ( ° )	P = PROFONDITA' CIANFRINO ( mm )					P = PROFONDITA' CIANFRINO ( mm )				
	10	20	30	40	50	10	20	30	40	50
0,5	8,999308	9,443498143	9,758664	10,01668	10,23324	10,96071	11,41151	11,7368127	11,99492	12,1893
1,0	10,01588	10,8926204	11,52478	12,03858	12,46988	11,95821	12,84164	13,4845418	13,99846	14,40739
1,5	11,03169	12,34091346	13,29001	14,05957	14,70556	12,9548	14,27079	15,2312445	16,00093	16,82437
2,0	12,04665	13,78826707	15,05424	16,07949	16,94013	13,95041	15,69886	16,9767877	18,00218	18,8401
2,5	13,0607	15,23457104	16,81731	18,09818	19,17341	14,94495	17,12573	18,7210385	20,00207	21,05438
3,0	14,07376	16,67971528	18,57911	20,1155	21,40523	15,93835	18,55129	20,4638642	22,00043	23,26707
3,5	15,08575	18,12358977	20,33949	22,13129	23,63541	16,93054	19,97544	22,205132	23,99711	25,47798
4,0	16,09658	19,5660846	22,09833	24,14539	25,8638	17,92145	21,39808	23,9447095	25,99197	27,68695
4,5	17,1062	21,00708996	23,85548	26,15765	28,09022	18,91099	22,81908	25,6824642	27,98485	29,89382
5,0	18,1145	22,44649616	25,61082	28,16792	30,31451	19,89908	24,23835	27,4182638	29,9756	32,09841
5,5	19,12144	23,88419361	27,36421	30,17605	32,53648	20,88567	25,65577	29,1519762	31,96407	34,30056
6,0	20,12691	25,32007287	29,11551	32,18188	34,75598	21,87086	27,07123	30,8834694	33,9501	36,50009
6,5	21,13085	26,75402464	30,8646	34,18526	36,97283	22,85399	28,48464	32,6126116	35,93355	38,69685
7,0	22,13319	28,18593975	32,61134	36,18604	39,18687	23,83558	29,89588	34,3392712	37,91427	40,89066
7,5	23,13384	29,61570921	34,35559	38,18406	41,39792	24,81536	31,30484	36,0633166	39,8921	43,08136
8,0	24,13272	31,04322416	36,09723	40,17918	43,60582	25,79324	32,71142	37,7846168	41,86689	45,26878

L = LARGHEZZA SOLCO MOLA

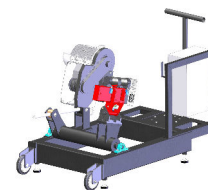
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**Larghezza solco mola ( L ) in funzione della profondità ( P ) e dell'angolo mola ( A )**

**SPESORE MOLA** T = 16MM

**SPESORE MOLA** T = 12MM

A ( ° )	P = PROFONDITA' CIANFRINO ( mm )					P = PROFONDITA' CIANFRINO ( mm )					L = LARGHEZZA SOLCO MOLA				
	10	20	30	40	50	10	20	30	40	50	10	20	30	40	50
0,5	12,91134	13,38338947	13,70581	13,96807	14,15218	16,97215	17,29186	17,6369823	17,90663	18,13218					
1,0	13,88943	14,79498243	15,43479	15,95308	16,34684	17,94673	18,66461	19,3281505	19,85407	20,29445					
1,5	14,86645	16,20544913	17,1626	17,93687	18,54026	18,92412	20,03594	21,0178474	21,8	22,45519					
2,0	15,84235	17,61468219	18,8891	19,91929	20,73227	19,90447	21,40575	22,7059443	23,74426	24,61421					
2,5	16,81704	19,02257432	20,61417	21,9002	22,9227	20,88796	22,77393	24,3923126	25,68672	26,77136					
3,0	17,79045	20,42901836	22,33767	23,87945	25,11138	21,87475	24,14037	26,0768242	27,62723	28,92647					
3,5	18,76251	21,83390724	24,05946	25,85687	27,29816	22,865	25,50498	27,7593506	29,56563	31,07938					
4,0	19,73314	23,23713401	25,77942	27,83233	29,48285	23,85888	26,86765	29,4397638	31,50178	33,22992					
4,5	20,70226	24,63859184	27,49743	29,80567	31,6653	24,85658	28,22826	31,1179359	33,43554	35,37794					
5,0	21,66981	26,03817406	29,21333	31,77674	33,84534	25,85825	29,58674	32,7937392	35,36674	37,52326					
5,5	22,63571	27,43577413	30,92702	33,74539	36,0228	26,86408	30,94295	34,467046	37,29526	39,66572					
6,0	23,59989	28,83128563	32,63835	35,71147	38,19753	27,87426	32,29682	36,137729	39,22094	41,80517					
6,5	24,56227	30,22460236	34,34719	37,67483	40,36934	28,88895	33,64822	37,805661	41,14363	43,94143					
7,0	25,52278	31,61561823	36,05343	39,63533	42,53808	29,90836	34,99707	39,4707151	43,06319	46,07435					
7,5	26,48135	33,00422736	37,75691	41,5928	44,70358	30,93266	36,34324	41,1327645	44,97947	48,20376					
8,0	27,4379	34,39032403	39,45752	43,54712	46,86568	31,96205	37,68666	42,7916826	46,89232	50,3295					

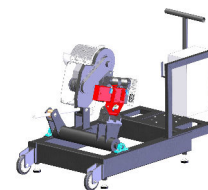
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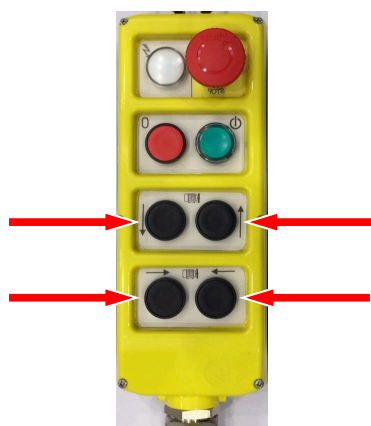
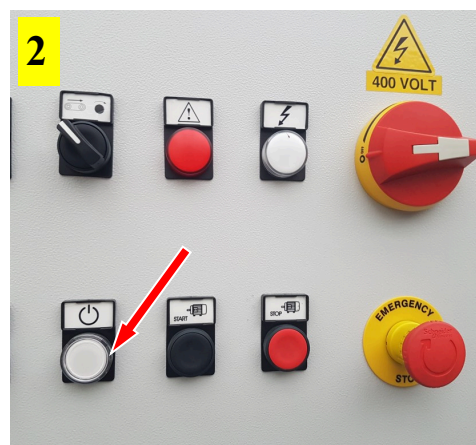
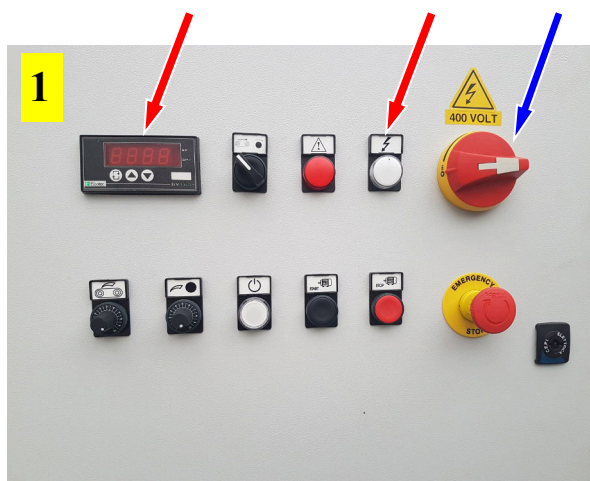
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## **MACHINE START-UP SEQUENCE**

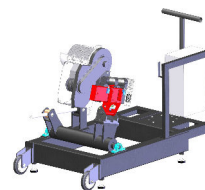
Connect the machine to the power source and proceed as described below:

- 1) Turn “ON” the main power switch. The digital display and the white indicator will turn on.
- 2) Press the white button “Auxiliary ” that will remain turned on.  
( **N.B. If the light does not stay on you will have to invert the electric phase** )
- 3) Set the head in the desired position until the red light turns off.  
( **N.B. The red light off indicates that the head has disengaged the limit switches and therefore has the necessary stroke to move on all axis** ).



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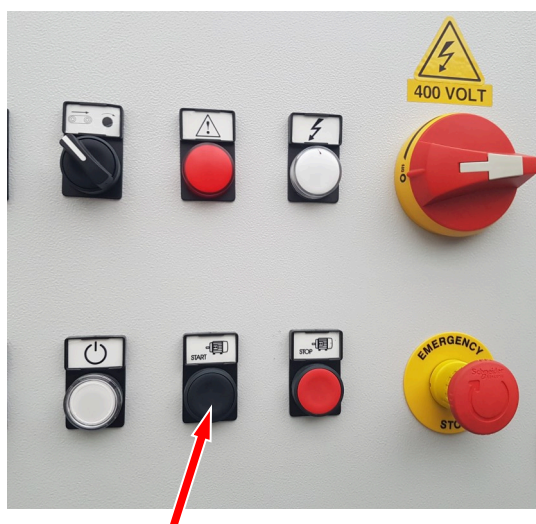
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4) Move the switch on grinding disc mode or on grinding tape mode depending on which of the two you have currently installed on the machine.

5) Press the button “Motor Start” . The grinding disc will start and the green indicator on the wired remote control will start blinking.

**4**



**5**



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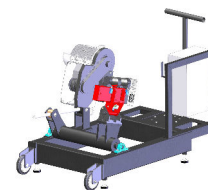
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Now select the desired working mode :

1) **Semi-Auto Mode (The machine controls only the push):**

**Before starting**, select the ampere absorption value by acting on the potentiometer specific to the attachment that is being used.

The absorption value range is different for the attachments:

Disc : 6-15

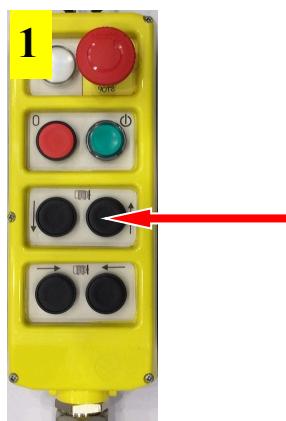
Grinding tape : 5 - 7

**For the first approach it is highly recommended to set the lowest value of the scale in order not to gouge beyond the root weld as this would compromise the entire work-piece. It is therefore recommended to assess any necessary increase during the operations.**

Keep pressed the head feeding button indicated in the picture until the grinding disc touches the workpiece.

Hold the button pressed until the head reaches the maximum workload previously set on the potentiometer and its value stabilizes.

## Ampere Absorption



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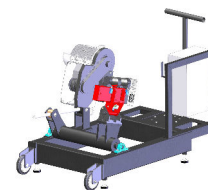
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## 2) Auto Mode (The machine controls the push and the translation):

Keep pressed the head feeding button indicated in the picture until the grinding disc touches the workpiece.

Hold the button pressed until the head reaches the maximum workload previously set on the potentiometer and its value stabilizes.

Hold the button for 3 seconds to memorize this value and the machine will work controlling, and subsequently release the same.

Press the green flashing button, the machine will now work with the thrust and the translation controlled automatically.

**N.B. The push value can always be adjusted by acting on the potentiometer.**

2



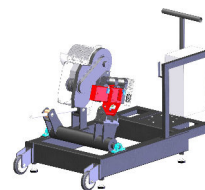
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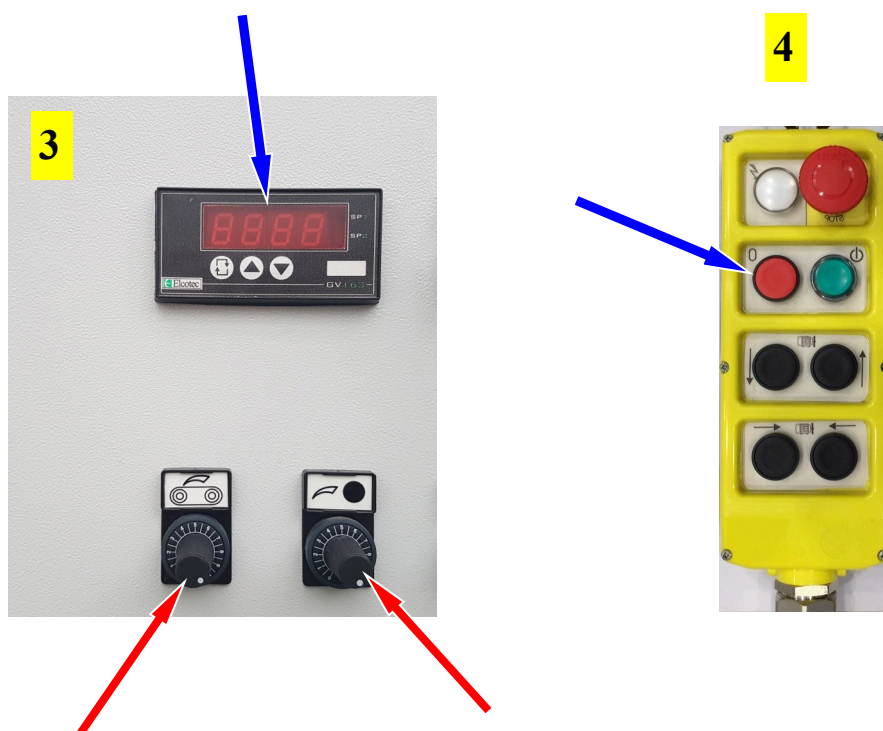
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3) Adjust the push load by acting on the knobs according to the actual use (grinding disc or grinding belt).

**N.B. The push load is shown on the digital display.**

4) Press the red button located on the wired remote control to stop the Auto Mode.



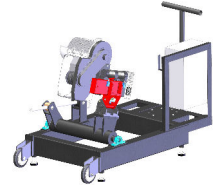
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## **ORDINARE MAINTENANCE**

**N.B. UNPLUG THE UNIT FROM THE ELECTRIC POWER BEFORE PERFORMING ANY OPERATION**

**N.B. Every 200 working hours:** grease the spindle by inserting the tip of the greaser in the grease inlet located on the outer side of the part.

Follow the steps below to carry out this operation safely:

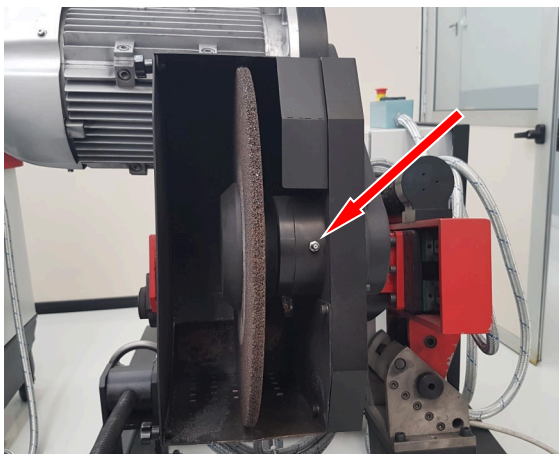
(1) Remove the grinding disc protection, (2) Remove the grinding disc, (3) Grease the part. **Pic.1**

**N.B. Every 300 working hours:** perform a thorough check of the toothed belt.

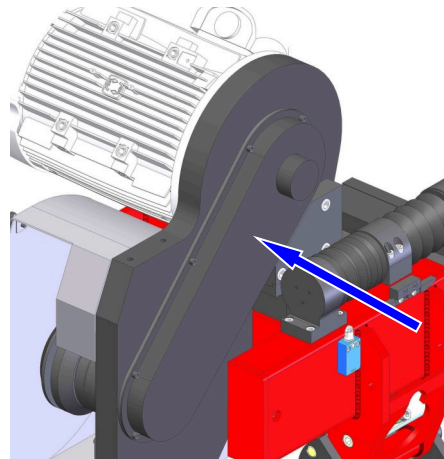
Follow the steps below to carry out this operation safely:

(1) Remove the screws that hold the protection in place, (2) Remove the protection, (3) Check the toothed belt. **FIG.2**

**PIC.1**



**PIC.2**



**Do not interpret the pictures!**

**The Sales and Technical team of G.B.C. is at your disposal for any clarification you may need.**

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