



TABLE OF CONTENTS

1. GENERAL INFORMATION	p. 2
1.1 Symbols used	p. 4
2. IDENTIFICATION	p. 5
2.1 Manufacturer	p. 5
2.2 Angle head	p. 5
3. GENERAL DESCRIPTION	p. 6
3.1 Intended use	р. 7
3.2 Improper use	p. 7
4. SAFETY RULES	p. 8
5. TECHNICAL SPECIFICATIONS	p. 9
6. PACKING-HANDLING-STORAGE	p. 10
6.1 Receiving/Unpacking	p. 10
6.2 Storage	p. 11
7. CONNECTION TO THE MACHINE	p. 12
7.1 Stop-block	p. 12
7.2 Connection to the cooling system	p. 14
8. ADJUSTMENT	p. 15
8.1 Taper DIN69871-MAS403-ANSI B5.50-HSK	p. 15
8.2 TA series angle head adjustments	p. 17
8.3 TAV series head adjustments	p. 18
8.4 Precautions when fitting the head to the machine	p. 19
9. USE	p. 18
9.1 Installing tools on the head	p. 19
9.2 Placement into service	p. 20
10. MAINTENANCE	p. 20
10.1 Cleaning	p. 20
10.2 Lubrication	p. 20
10.3 Troubleshooting	p. 21
10.4 Scrapping	p. 21
11. SPARE PARTS	p. 22
12. WARRANTY	p. 22
13. DECLARATION OF INCORPORATION	p. 23
14 OMG PRODUCTS	n 21



Congratulations for having chosen an **O.M.G. S.r.I.** angle head series '**TA-CP**'. The aim of these operating instructions is to help you become acquainted with your angle head unit. We advise you read them and keep them for future reference.

The angle heads manufactured by us are fully warranted in terms of selected materials, operating precision and sizing as well as high standards for the greater strength of parts under stress.

GENERAL NOTES





To ensure top product performance over time, the following points are most important:

- Correct installation.
- Maintenance and careful product use.
- Read this manual carefully before proceeding to set up and use the angle head.
- This manual was written to provide you with full information on technical considerations, installation, adjustment, use and maintenance of the angle head you have purchased. Please keep it in a suitable place where it will not be altered or damaged.
- Should you need any further details, please contact our after-sales service.
- The contents of this manual conforms to directive 2006/42/EC.



 Details and drawings are shown by way of example only. The manufacturer reserves the right to make changes without prior notice. O.M.G. S.r.I. protects the copyrights of this manual according to applicable legislation.



When selecting machine coupling always check compatibility with indicated performance.



The TA must be fitted on a machine with adequate protections and in conformity with directive $2006/42/\,\text{CE}$.



1.1 SYMBOLS USED

SYMBOL	MEANING	REMARKS	
į	DANGER	All the operations marked by this symbol must be performed with the utmost care as regards the safety norms detailed in chapter 4.	
1	IMPORTANT	All the operations marked by this symbol must be performed with the utmost care. Failure to comply with these norms could cause damage and faults to the angle head. This symbol also identifies operations requiring the special attention of the reader.	
<i>S</i>	ADJUSTMENT	All operations marked by this symbol must be	
3	- OPERATIONS	carried out by persons trained to perform jobs on mechanical component parts.	
		· ·	
	CONNECTOR	Type of connector available for machine connection.	
	DRILLING	Maximum drilling capacity of angle head.	
	TAPPING	Maximum tapping capacity of angle head.	
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	RATIO	Angle head in-out ratio.	
RPM	SPEED	Maximum exiting speed of angle head, in rpm.	
Kg	WEIGHT	Weight of angle head, in kg.	
	ROTATION	Rotation direction.	
	PRESSURE	Maximum pressure of the coolant in bar.	



# **IDENTIFICATION**

## 2.1 MANUFACTURER IDENTIFICATION

O.M.G. S.r.I. Via 8 Marzo n°1 42025 Cavriago (Reggio Emilia) Italy

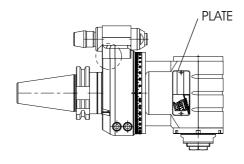


Tel. +39-0522941627 Fax. +39-0522941951

Website: www.omgnet.it E-mail: omg@omgnet.it

## 2.2 ANGLE HEAD IDENTIFICATION

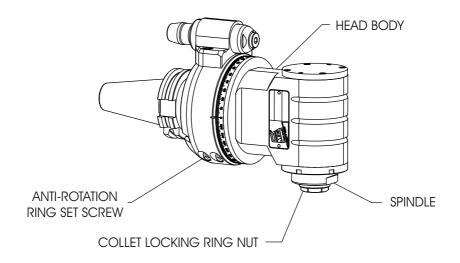
The angle head has one or two plates marked with the serial number, which must be provided to our technical department when requesting information and technical specifications.

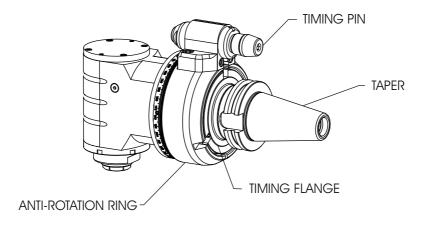




# DESCRIZIONE GENERALE

The O.M.G. S.r.I. angle heads series TA consist of:





 $\underline{\text{N.B.}}$  This figure is intended as an example, only.



## 3.1 INTENDED USE

- Our angle heads have been designed and made to carry out drilling, spotfacing and tapping operations.
- The envisaged operating specifications are those shown in Chapter 5 "Technical Specifications".

## 3.2 FORBIDDEN USE

Our angle heads cannot perform mechanical operations the parameters of which exceed the technical specifications of the angle head itself.



Our angle heads haven't been designed for the use in the environments with potentially explosive atmosphere.



All other uses different from intended use shall be deemed unauthorised.



O.M.G. S.r.I. cannot accept any liability for injury to persons or damage to things or to the angle head caused by improper machine use.



# SAFETY NORMS



**IMPORTANT!** Carefully follow the instructions indicated in this manual. The manufacturer cannot accept any liability for failure to comply with these instructions.



During machining, always use means of personal protection. All machining operations must be performed in compliance with the safety regulations in force at the place of work.



Use the head in the environments with sufficient light.



Never use the spindle speeder for purposes other than those indicated.



Never stop the spindle speeder by means of the spindle or tool.



Never clean, lubricate or service the machine while this is running



During the work the head can exceed the 60°C; use means of personal protection when is necessary handle the Angle Head.

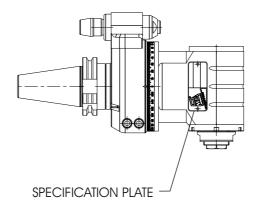


# **TECHNICAL SPECIFICATIONS**

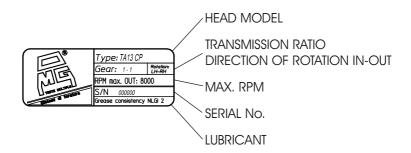
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Every TA-series angle head is equipped with a plate that lists the basic technical specifications of the head.

The following is a detailed illustration of a sample plate.



The noise of the head is less than 80 dB.





**NOTE:** see the O.M.G. general catalogue for dimensions, specifications and accessories not listed above.



# PACKAGING - HANDLING -STORING

## 6.1 RECEIPT / UNPACKING

The angle head as supplied is packed in cardboard boxes with impactabsorbing material inside. It is protected from impacts and dirt, and is coated with a corrosion inhibitor. When the head is received, check that the contents of the packages match what is listed on the order and that no damage has occurred during transport. In addition to the angle head, the following items should be contained in the packages:

- la standard stop-block, if a special anti-rotation device for your machine is not part of the order
- this manual



In the event of evident faults being found, do not use the angle head, but immediately notify the manufacturer.



Packaging must be disposed of according to local waste disposal regulations.

It is recommended to use proper lifting equipment for handling. If you can't move it with the hand, lifting belts are recommended. Take always care that the angle head is balanced before lift it.

See the weight indicated in chapter "Technical specifications".



Always perform unloading, handling and installation operations in conformity with safety regulations in force at the place of work.



## 6.2 STORING

In the event of having to store the product, proceed as follows:

- Clean away any machining residues.
- Protect the ground parts with a film of grease and/or anticorrosion protective liquids.
- Store in cool and dry premises at temperatures between -5°C and +40°C.
- Protect the angle head against dirt and dust.
- If storage continues for over six months, the lubricating grease is best replaced before machine re-use (see chapter 10.2).
- Clean the coolant pipes.



# MACHINE CONNECTIONS





All the operations regarding installation, connection and registration of the head have to be executed by skilled workers.

Depending on type of purchased angle head, it may be too heavy to be manually lifted.

In such case, lifting belts are recommended.

See weight stated in chapter "Technical Features".

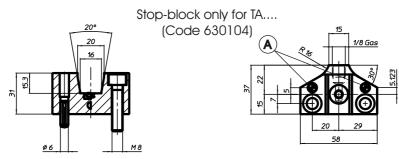


Take always care that the angle head is balanced before lift it.



Make sure the machine on which the head is to be fitted is equipped with adequate protections and is in conformity with directive 2006/42/ CE.

## 7.1 STOP-BLOCK

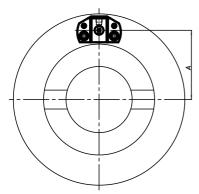


A stop-block is supplied with the angle head when your machine tool does not require a special anti-rotation pin.

The two holes **A** for the Ø6 mm pins on the stop-block are drilled to Ø5.75 mm. To mount the stop-block, proceed as follows:

- Find a position that is free from obstructions to fit the stop-block to the spindle on the machine.
- Drill two M8 holes in the spindle flange and use two screws to mount the stopblock.
- Drill two Ø5.75 mm pilot holes for the pins on the spindle flange. Use holes **A** on the stop-block as guides.
- Bore the holes to Ø6 mm and insert the pins.

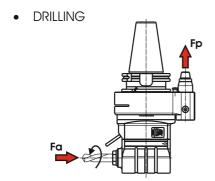




Distance **A** for mounting the stop-block varies with the size of the taper. For size 40 and HSK63 tapers, the distance is 65 mm. For size 50, HSK80 and HSK100 tapers, the distance is 80mm.

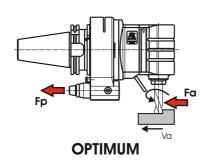


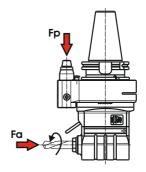
When permitted by your application, place the anti-rotation pin in such a way that it opposes the force generated during machining. This will result in maximum stiffness and, as a result, the highest performance from the angle head.



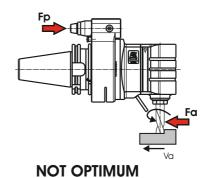
### **OPTIMUM**

MILLING





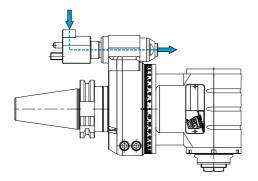
### **NOT OPTIMUM**





## 7.2 CONNECTION TO THE COOLANT UNIT

Series TA-CP angle heads are equipped to receive liquid coolant from the stopblock through a 1/8 Gas inlet. The liquid coolant flows through internal channels and exits the head through a 1/8 Gas outlet at the rear of the anti-rotation pin, where a tube can be connected to carry the liquid to the tool. The pressure of the liquid coolant should not exceed 4-5 bars.





The customer is responsible for the cost of manufacturing and connecting the coolant tube.



O.M.G S.r.l. is not responsible for injury, property damage or damage to the angle head that is caused by a connection which does not comply with the instructions contained in this manual.

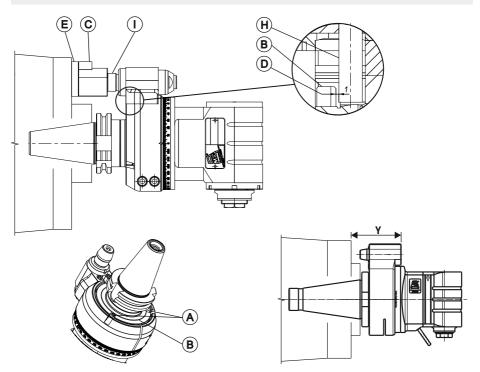


# ADJUSTMENT



All the operations regarding installation, connection and registration of the head have to be executed by skilled workers.

## 8.1 TAPER DIN69871-MAS403-ANSI B5.50- HSK





If your angle head is equipped with a specific anti-rotation device for your machine tool, read points 1-7-8 only.

If your head has the standard anti-rotation device, the stop-block must first be mounted as described in par. 7.1. Then, proceed as follows:

- 1. Loosen screws **A** to free flange **B** that maintains the timing between taper and anti-rotation pin.
- 2. Install the head on the machine, but do not insert the anti-rotation pin into



the stop-block C.

- 3. Measure distance Y.
- 4. If **Y** is consistent with the value on the table, go to point 5. If not, either place a spacer **E** between the stop block and the spindle on the machine, or mill the stop block.

TA07-CP / TA10-CP	Y=79.5
TA13-CP / TA16-CP	Y=85

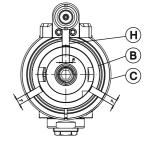


The customer is responsible for the cost of manufacturing spacer E or milling the stop block.

- 5. Align anti-rotation pin I with stop block **C**. Loosen the M8 set screws on the stop block to enable the block to adapt to the anti-rotation pin. Tighten the M8 screws. The angle head must be free from radial play.
- 6. Check the head and make sure it rotates freely.
- 7. Execute the "start machine spindle" command (for example, M19) on the numeric control system.
- 8. Adjust the angle of timing flange B to allow timing device H to be inserted into its seat after the head is removed from the machine. Insert two DIN6885 8x7 tabs into the milled areas in anti-rotation ring C and rotate timing flange B to insert the tabs into the flange. At this point, flange B is adjusted, and screws A can be tightened to a torque of 5 Nm.
- 9. Remove the DIN6885 tabs from their seat.



Timing flange B has three milled areas, but only two are 7 mm in size. Remember this when the DIN6885 8x7 tabs are inserted.



10. Remove the angle head from the machine and position it in the tool magazine. Rotate the tool magazine and check that the angle head is free from interference during rotation.



#### FOR BEST PERFORMANCE, REMEMBER THAT:

1. The anti-rotation pin must be positioned in the direction opposite from the direction of machining.

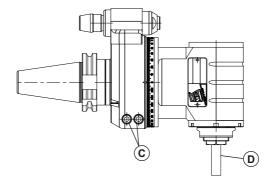


## 8.2 ANGULAR ADJUSTMENTS



#### ANGULAR ADJUSTMENT OF HEAD BODY - ANTI-ROTATION DEVICE

- Obtain a magnetic base with comparator and place in on the bed of the machine.
- 2. Loosen screws C.
- 3. Insert pin **D** into the spindle on the head.
- 4. Using the comparator, align pin **D** with the desired axis. To accomplish this, rotate the body of the head by hand.
- 5. Tighten screws C to the specified torque.





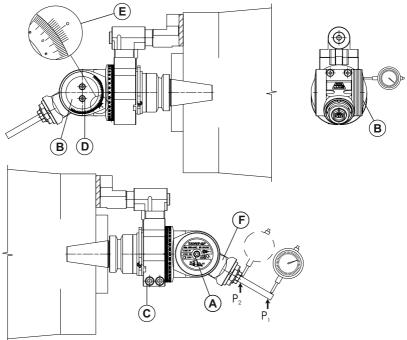
**NOTE:** if angular alignment is imperfect, negative forces will be generated on the components of the head, which could be irreversibly damaged, and tools may break.



## 8.3 TAV SERIES HEAD ADJUSTMENTS

#### ANGULAR ADJUSTMENT OF THE HEAD BODY/ANTI-ROTATING DEVICE

- 1. Acquire a magnetic base complete with comparator and position this on the machine table.
- 2. Loosen screw C (see para. 8.2).
- 3. By means of the comparator, align table **B** with the axis of the hole to be made by moving the machine axis of axes. Manually turn the head body until perfect parallelism is achieved with the working axis.
- 4. Tighten screw **C** (see para. 8.2).



#### Approximate adjustment of angle head:

- 1. Loosen screws A and D.
- 2. Turn the spindle holder **F** until index **E** is on the angle you require. The graduated scale **E** has a 10' precision.
- 3. Tighten screws **A** and **D**.





#### Precision adjustment of the angle head:

#### If you have a presetting for tools:

- 1. Fit an object in the head spindle which, reflecting on the viewer, can help you determine the angle required (e.g., the tool, a pin, etc.).
- 2. Position the head on the presetting.
- 3. Adjust the angle by turning the spindle holder.
- 4. Tighten screws **A** and **D**.

#### If you do not have a presetting for tools:

- Acquire a magnetic base complete with comparator and position this on the machine table.
- Calculate two points (e.g. 30 mm apart) one starting point and one end point we shall call P1 and P2 respectively. These correspond to the work angle to be covered by the head.
- 3. Position the head on the machine spindle.
- 4. Set the comparator zero corresponding to point P1.
- 5. Move the machine to point **P2** and check the comparator. Repeat points 4 and 5 until the comparator zero condition has been found.
- 7. Tighten screws **A** and **D**.

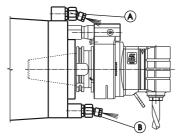


<u>IMPORTANT</u>: before starting up the angle head, check the direction of machine rotation to ensure the tool turns in the correct cutting direction.



**NOTE:** if the angular alignment is not perfect, this will generate negative forces on the head components which could be permanently damaged, besides causing tool breakage.

## 8.4 MACHINE REGOLATIONS



When it is impossible to take the coolant directly from the machine, via the stop-block, to the nozzle on the head, make sure that the coolant nozzles on the machine do not send the coolant to the angle head like nozzle **A** but reaches the tool like nozzle **B**.



<u>IMPORTANT</u>: Do not convey the coolant directly against the angle head to avoid all chances of the coolant penetrating it.



O.M.G. S.r.l. is not responsible for any kind of damage/injury occurred to things/persons or to TAS head due to an adjustment not in accordance with instructions submitted.



# USE



Before starting the machine, carefully read the safety instructions in chapter 4.

Fit the Angle Head on the machine and adjust correctly (see chapter 8). After fitting the tools (see para. 9.1), the machine can be used.



<u>IMPORTANT</u>: before starting the Angle Head, check the direction of rotation of the machine spindle so the tool turns in the right cutting direction.



First of all check if there are all screws for the connection to the machine and the necessary tools. Then check the correct clamping of the above mentioned screws. The wrong clamping can cause serious risks to personal safety and cause breaking and damages to persons and nearly equipments.



If you hear a strange noise or vibrations on starting the machine, interrupt operation and contact our Technical Department.



Any use other than that intended is to be deemed unauthorised.



O.M.G. S.r.I. is not responsible for any kind of damage/injury occurred to things/persons or to Angle Head due to improper protection devices.



After mounting the Angle Headr, inertia variation of the machine may increase the time stop of parts in movement, axis, spindles, etc. Carefully evaluate all risks during working operations and emergency situations.



After installation of the head check again the machine safety devices and all risks concerning use. Regulate such devices, when necessary, by skilled workers.

O.M.G. S.r.I. cannot accept any liability for injury to persons or damage to things or to the Angle Head caused by improper machine use.



While working the head may exceed 60°C.

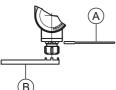


## 9.1 FITTING TOOLS



In the case of angle heads with collet spindles, the collet must be fitted first on the ring nut, making sure it enters the puller; next tighten the ring nut on the angle head spindle.

On some angle heads, on the bottom of the spindle, there is a screw to adjust the height of the tool.



Angle heads with external collet ring nut: tighten the collet lock ring using the special spanner **B**, holding the spindle still with spanner **A**, positioned in the housings on the spindle.



Angle heads with internal collet ring nut: tighten the collet lock ring using the special spanner B, holding the spindle still with spanner A positioned in the housings on the opposite side of the spindle.



**Recommended value of ring nut torque wrench setting (Nm):** the type of ring nut fitted depends on the angle head model (see "Technical specifications").

Nut	Ø [mm]	Torque [Nm]
ER 11AS	1.0-2.9	8 (10)
	3.0-7.0	24 (30)
ER 16AC	1.0	8 (10)
	1.5-3.5	20 (25)
	4.0-10.0	40 (50)
ER 20AC	1.0	24 (30)
	1.5-13.0	52 (65)
ER 25AC	1.5-3.5	24 (30)
	4.0-4.5	56 (70)
	5.0-17.0	80 (100)
ER 32AC	2.0-2.5	24 (30)
	3.0-22.0	104 (130)
ER 8M	1.0-5.0	6 (7.5)
ER 11M	1.0-2.9	8 (10)
	3.0-7.0	16 (20)
ER 16M	1.0	12 (15)
	1.5-10.0	24 (30)

ER 20M	1.0	16 (20)
	1.5-13.0	28 (35)
ER 25M	1.5-3.5	24 (30)
	4.0-17.0	32 (40)

Nut	Ø [mm]	Torque [Nm]
ER 16MS	1.0	12 (15)
	1.5-10	20 (25)
ER 20UM	1.0	16 (20)
	1.5-6.5	32 (40)
	7.0-13.0	80 (100)
ER 25UM	1.0-3.5	24 (30)
	4.0-4.5	56 (70)
	5.0-7.5	80 (100)
	8.0-17.0	104 (130)
ER 32UM	2.0-2.5	24 (30)
	3.0-22.0	136 (170)
ER 40UM	3.0-26.0	176 (220)
ER 50UM	6.0-36.0	240 (300)

Note: the value in brackets indicates  $\max$  torque wrench setting.



When clamping the tool, always lock the spindle with key **A**. If not, internal head's components may be damaged.



## 9.2 PLACEMENT INTO SERVICE

Before using the angle head for the first time, or if it has not been used for a long time, break it in by performing the steps at 20% of maximum speed, while making sure the temperature of its body does not exceed 60°C. If it does, stop the angle head, let it cool down and resume the break-in process from the step immediately preceding the point of interruption.



lin case of unusual noise or vibrations during starting operations, stop working and contact our Technical Dept.

# MAINTENANCE

10



Maintenance operations must be performed with the machine at a standstill and disconnected from the power supply by skilled personnel

## 10.1 CLEANING



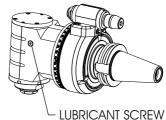
Periodically clean the head and remove any machining residues and drain the coolant liquid from the pipes.

## 10.2 LUBRICATION



Our angle heads are supplied with long-life lubricant. During the first

few hours of operation, some of the lubricant may leak out because an excess quantity was poured into the body of the head or into its labyrinth seals. Every 300 hours of operation, add around 10 g. of type NLGI2 grease. Use the lubricant screw on the body.





After 2000 hours of operation or every 12 months, we recommend changing the grease in the angle head. For this procedure, we recommend that you send the head to O.M.G. S.r.I..



The above lubrication interval is suited for standard use. The interval may vary if the head is put to heavy-duty use or remains idle in the warehouse for extended periods of time..



During machining, the temperature of the head may exceed  $70\,^{\circ}$ C for a few minutes. If this occurs, decrease the rotation speed of the head or reduce the load being placed on it. If you have any questions or problems, contact our Technical Department.



Lubricants are strong pollutants. Do not dispose of them (or of the materials they have come in contact with) into the environment. Instead, have them disposed of by specialised companies.

## 10.3 TROUBLESHOOTING



In case of faulty operation, refer to the following table. In case the fault continues, contact the manufacturer.

FAULT	POSSIBLE CAUSE	REMEDY
Tool rotation not concentric	Collet wrongly fitted in ring nut, dirt in collet or housing	See para. 9.1
Drilling tool broken	The tool is turning in the wrong direction	See para. 9

## 10.4 SCRAPPING

In case the head has to be decommissioned, the various components must be scrapped (the head must be made inoperative) and disposed of through authorised channels.



Do not throw the head or any of its component parts away into the environment.



O.M.G. S.r.l. is not responsible for any kind of damage occurred to angle head due to a operations executed by unqualified workers.

# CP 11

## SPARE PARTS

Due to the complexity of the Angle Head, if maintenance is required, it is advisable to ship the spindle speeder to our factory.

Our maintenance personnel will see to servicing it in the shortest possible time. In case of spare parts order it's necessary to proceed as follows:

- Contact O.M.G. S.r.I. to require the exploded view giving always the following information:
  - 1 the type of Angle Head (see the test certificate or plate)
  - 2 serial number stated on the plate

After that fill in the spare parts enquiry form and return it complete with the following information:

- the type of Angle Head (see the test certificate or plate)
- the serial number stated on the plate
- · the number of spare part stated on the drawing
- quantity

# WARRANTY

12

#### 1. DURATION AND START OF WARRANTY

O.M.G. S.r.I. products are guaranteed against material and manufacturing faults. This warranty lasts one year starting on the date of invoicing. During this period, O.M.G. S.r.I. undertakes to repair or replace, at its discretion, any faulty parts, bearing relevant costs as long as the product is sent directly to O.M.G. S.r.I. The transport costs for shipping the product to be repaired shall be borne by the customer. All components removed during repair under warranty shall become the property of O.M.G. S.r.I. All components replaced during the 12 months warranty period shall be covered by the further period of warranty.

#### 2. RESTRICTIONS

The warranty shall not be valid in the case of products damaged by accidents, improper use, repairs or alterations made by persons not authorised by O.M.G. S.r.l..



# DECLARATION OF INCORPORATION

DECLARATION OF INCORPORATION OF 'PARTLY COMPLETED MACHINERY' IN ACCORDANCE TO MACHINERY DIRECTIVE (2006/42/CE AND UPDATED) AND TO MANUFACTURE REGULATION

Manufacturer: O.M.G. S.r.I.

Address: Via 8 Marzo 1 - 42025 Cavriago (RE)

in person of its Chairman of the Board of Directors Mr Catellani Corrado

Declares under his own responsibility that the manufactured 'partly completed machinery' named:

#### **TA-CP Angle Heads**

which this declaration refers to, are in compliance with safety essential requirements of directive 2006/42/CE, which following essential requirements as per attachment 1 are respected and applied:

- from 1.1.2 to 1.1.5
- from 1.2.5 to 1.3.1
- 1.3.4
- 1.3.6
- 1.3.8.1
- 1.4.1

- from 1.5.4 to 1.5.6
- from 1.5.8 to 1.5.9
- 1.5.13
- 1.6.1
- from 1.6.4 to 1.7.4.3

and relevant technical documentation has been issued in accordance with attachment VII B, and to national manufacture regulations of Machinery Directive.

We additionally inform as follows:

- relevant techinical documentation is kept by OMG s.r.l. with headquarters in Via 8 marzo, n°1 42025 Cavriago (RE) Italia, in person of its legal representative, Mr. Catellani Corrado.
- We commit ourselves to supply information referred to the 'partly completed machinery' upon duly justified requests of national authorities. Said commitment includes the methods of trasmission and keeps unprejudiced the manufacturer intellectural property rights of the 'partly completed machinery'.
- The 'parly completed machinery' angle heads connot be put into service until the final machine, in qhich they will be integrated, will be declared in compliance with the here mentioned directive, and any other applicable directive.

Cavriago, 30/05/2018

Chairman of the Board of Directors



# O.M.G. PRODUCTION

O.M.G., leader in the industry, offers a broad and complete range of products including:

- Adjustable-joint multispindle heads
- Angle heads
- Variable-angle heads
- Turret heads
- Variable-axis heads
- Fixed-angle heads
- Spindle speeders
- Fixed centre multispindle heads series MT
- Fixed centre multispindle heads series TC Fixed centre multispindle heads series TC3

Documentation on these units is available from our sales department.





This manual is printed on recycled paper.

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