

## TOOL-MATE ARTICULATED ARMS

### **PURCHASING GUIDE**

Manageable, compact, strong and ergonomic, Tool-mate articulated arms withstand a reaction torque of 150 to 2000 Nm.



## *General characteristics*

Tool-mate balanced articulated arms have been designed and developed to neutralize the reaction torque produced by tools (e.g. screwers and tapping machines), in cases when it is not possible or practical to do this with other devices such as reaction bars. When used in industrial assembly it is manageable and powerful, and assures clamping repeatability and excellent operator ergonomics.

Tool-mate's flexibility enables it to optimize and satisfy a wide range of requirements.

The standard range foresees three sizes: size 1 for applications up to 150Nm, size 2 for applications up to 250Nm, sizes 3 for applications up to 1000Nm and sizes 5 up to 2000Nm.

All the articulated arms can be used with different types of wrists that permit optimal clamping.

These wrists have been designed and developed to guarantee correct use and positioning of the tool when screwing.

To calibrate the articulated arms simply answer the questions in this manual; the modular structure of the arm's components allows for great flexibility.

When use of an accessory is required select one which assures correct use and positioning of the tool when screwing.

## *Presentation*

The basic configuration of Tool-mate articulated arms comprises the following items: boom column, boom, zipper-arm, arm, brake and wrist. The articulated arm's balancing potential varies according to how these items are set up.

MATERIAL:	RAL Burnished and painted steel
ROTATION AXES:	Vertical and horizontal, supported by radial-axial bearing
BALANCING UNITS:	Pneumatic cylinder fed by a pneumatic safety circuit.
WRISTS:	The standard versions of the wrist are infinite. <b><i>The wrist</i></b> is the tool which assures correct use and positioning of the tool for horizontal and/or vertical screwing.
COLUMN:	To fix the arm one may choose a floor column, wall support, or predisposed connection to elevated rails.
ROTATION AXES BLOCK:	To block the rotation axes of the arms, when necessary, brakes are used to ensure secure clamping; these enable blocking of the axis on which the rotation is taking place.

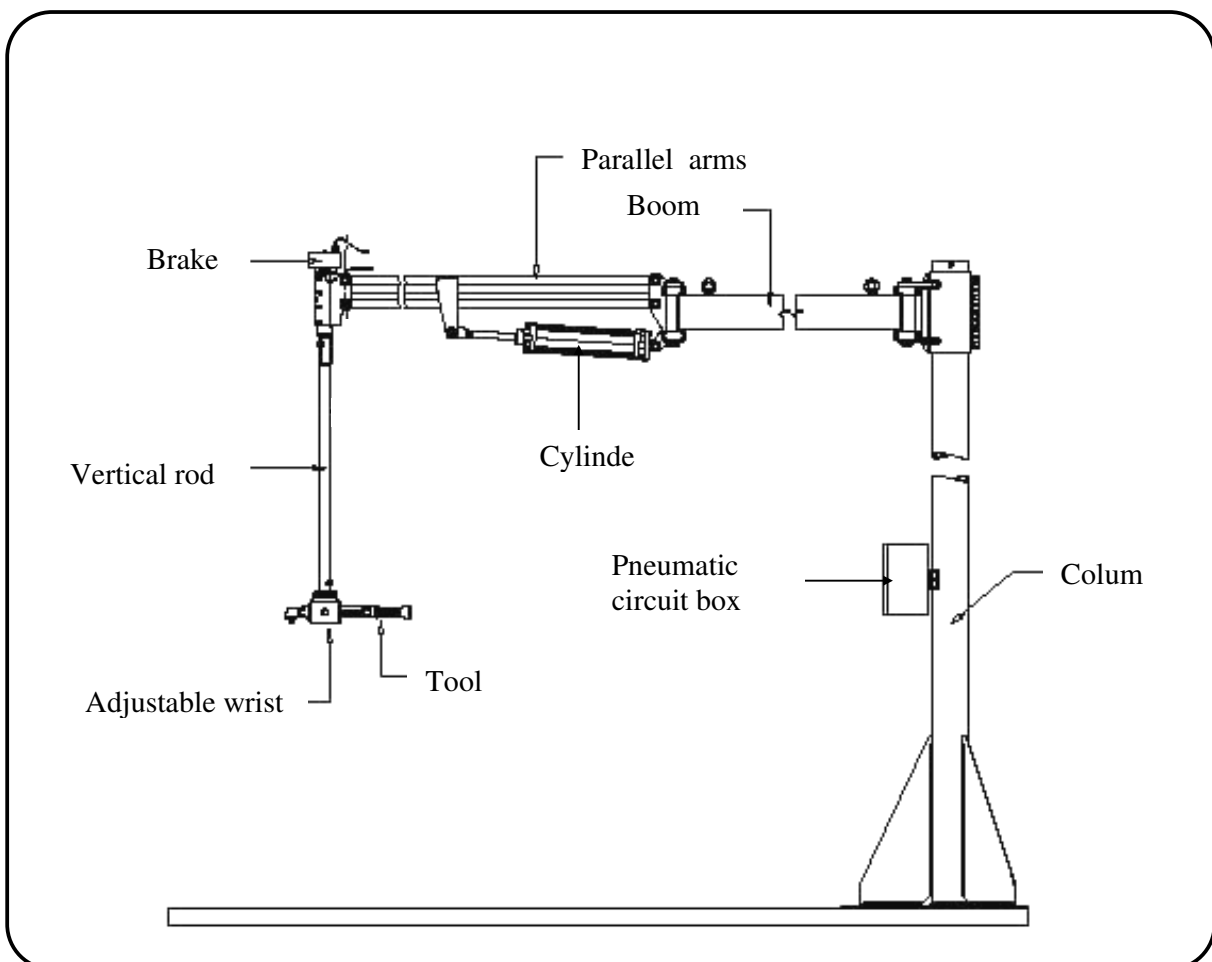
## *Safety*

The machine and its pneumatic circuit conforms to the safety standards set out in machine directives and are CE certified. These requirements ensure safe installation and maintenance. The brakes used are supplied with protective casing and an inductive electric safety sensor (which prevents starting up of the tool when brakes are not in place), ensuring safe clamping.

## *Details*

1. Applicant data
2. Appliance details: maximum weight, torque and energy source.
3. Select the different positions the tool is to be used in.
4. Check whether the rotation axes need brakes
5. Specify the required type of fixture for the arm.
6. Adjust the length of the arm according to the torque it has to withstand, and the length of the parts which make up the arm.
7. Check the arm's balancing capacity on the chart
8. Select the equipment

## *Technical details*



## *1. Applicant data*

Name of Firm.....

Mr/Ms .....

Address .....

City .....

Country .....

e-mail address .....

Phone ..... Fax .....

N° order .....

Delivery required .....

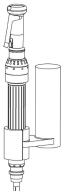
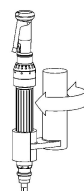
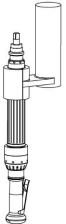
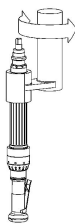
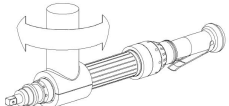
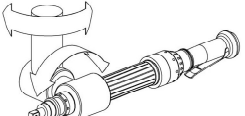
Date .....

## 2. Tool details

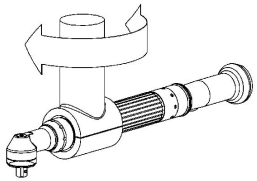


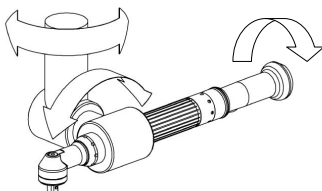
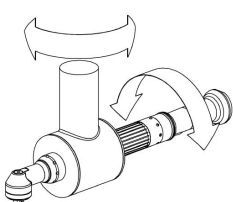
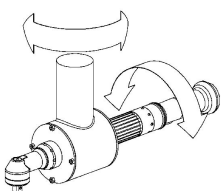


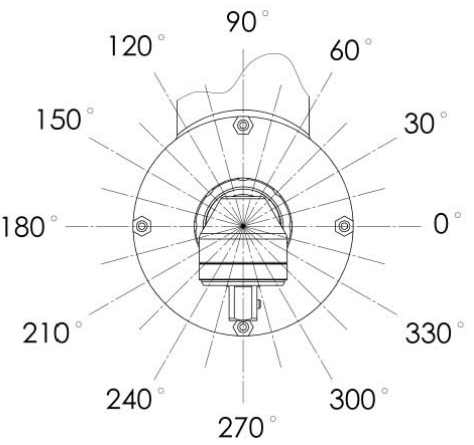
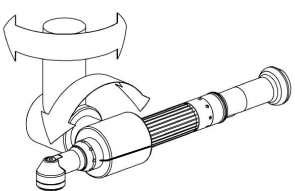
Model  .....	Max. tool torque ( Nm)  .....	Weight( Kg.)  .....	Pneumatic <input type="checkbox"/>  Electric <input type="checkbox"/>
Max. screwing torque (Nm) .....			

## 3. Guide to choice of wrists

### 3.1 Fixed or rotating wrists for straight tools

Fixed or rotating?		Comments
<input type="checkbox"/> <b>Fixed</b>  	<input type="checkbox"/> <b>Rotating</b>  	<div style="border: 1px solid black; height: 100px;"></div>
<input type="checkbox"/> <b>Fixed</b>  	<input type="checkbox"/> <b>Rotating</b>  	<div style="border: 1px solid black; height: 100px;"></div>
<input type="checkbox"/> <b>Rotating</b>  	<input type="checkbox"/> <b>perpendicular axis releasable from tool body</b>  	<div style="border: 1px solid black; height: 100px;"></div>

## 3.2 Rotating wrists for angled tools

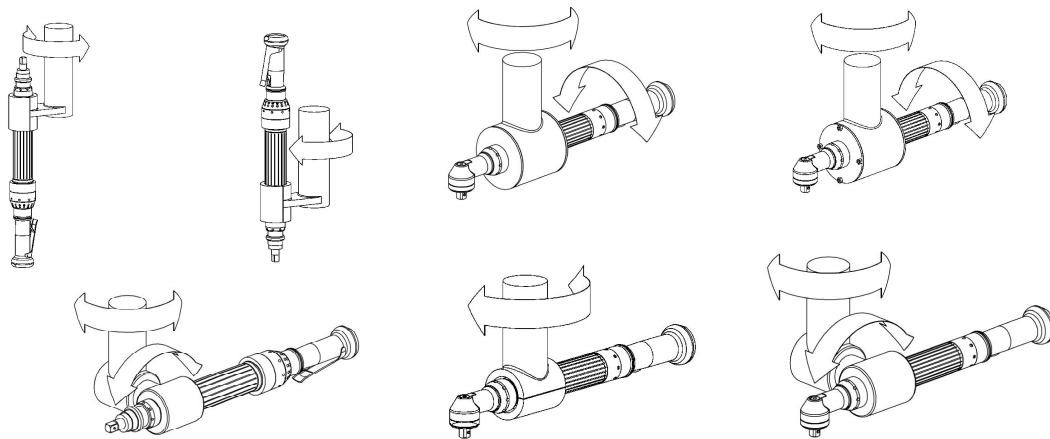
<input type="checkbox"/> <b>fixed tool body axis</b> 	 	<input type="checkbox"/> <b>perpendicular axis releasable from rotating tool body</b> 								
<input type="checkbox"/> <b>rotating tool body axis</b> 										
<input type="checkbox"/> <b>rotating tool body axis , blockable in different positions</b> 	 	<p><b>Choose the required angles of the tool for clamping and note them in the table at the side.</b></p> <div style="display: flex; align-items: center; justify-content: center;">  <table border="1" style="margin-left: 20px;"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table> </div>								
<input type="checkbox"/> <b>perpendicular axis releasable from tool body</b> 										

## ***4. Rotation axes with brake***

### ***4.1 Wrist vertical rotation axis***

Vertical brake axis “Z” for wrist rotation ☐

The brake on the vertical axis must be used in the following combinations:



### ***4.2 Boom rotation axis***

Boom brake rotation axis ☐

The use of the brake on the rotation axis of the boom element is recommended when fixed to rails (see paragraph 4.1); since without the use of the brake, while clamping, the carriage on which the arm is fixed would become detached, causing danger to the operator and the assembly line.



## 5. *Selecting the type of fixture*

Wall fixture ☐

Floor fixture ☐

Fixture to rails ☐

Specify the type of rail .....

Specify the model of the rail .....

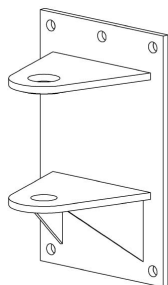
Specify the type and the model of the carriage .....

Specify the centre distance between the rails.....

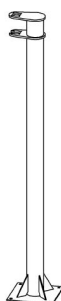
Specify the rails height from the ground .....

Specify the pillar's offset from the center when is necessary .....

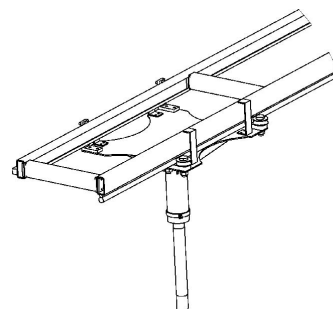
Wall fixture



Floor fixture



Fixture to rail



## 6. Sizing the articulated arm

### 6.1 Arm size 1

*max. working torque up to 150Nm*

Boom element length size 2 (A)	600 <input type="checkbox"/>	800 <input type="checkbox"/>	1000 mm <input type="checkbox"/>
Arm element length size 2 (B)	600 <input type="checkbox"/>	800 <input type="checkbox"/>	1000 mm <input type="checkbox"/>
Minimum height of working position from ground (C) ..... mm			
Maximum height of working position from ground (D) ..... mm			
Height of column (if different from standard ) .....mm			
Colour arm RAL .....			
Colour colum RAL.....			
Colour pneumatic box RAL .....			

## 6.2 Arm size 2

*max. working torque up to 250Nm*

Boom element length size 2 (A)	800 <input type="checkbox"/>	1000 <input type="checkbox"/>	1200 mm <input type="checkbox"/>
Arm element length size 2 (B)	800 <input type="checkbox"/>	1000 <input type="checkbox"/>	1200 mm <input type="checkbox"/>
Minimum height of working position from ground (C) ..... mm			
Maximum height of working position from ground (D) ..... mm			
Height of column (if different from standard ) .....mm			
Colour arm RAL .....			
Colour colum RAL.....			
Colour pneumatic box RAL .....			

### 6.3 Arm sizes 3

*max. working torque up to 1000Nm*

Boom element length size 3 (A)	1000 <input type="checkbox"/>	1250 <input type="checkbox"/>	1500 mm <input type="checkbox"/>
Arm element length size 3 (B)	1000 <input type="checkbox"/>	1250 <input type="checkbox"/>	1500 mm <input type="checkbox"/>
Minimum height of working position from ground (C) ..... mm			
Maximum height of working position from ground (D) ..... mm			
Height of column (if different from standard ) .....mm			
Colour arm RAL .....			
Colour colum RAL.....			
Colour pneumatic box RAL .....			

## 6.4 Arm sizes 5

*max. working torque up to 2000Nm*

Boom element length size 5 (A)	1500 <input type="checkbox"/>	2000 <input type="checkbox"/>	mm
Arm element length size 5 (B)	1500 <input type="checkbox"/>	2000 <input type="checkbox"/>	mm
Minimum height of working position from ground (C) ..... mm			
Maximum height of working position from ground (D) ..... mm			
Height of column (if different from standard ) .....mm			
Colour arm RAL .....			
Colour colum RAL.....			
Colour pneumatic box RAL .....			

## 7. *Balancing Capacity Check*

Pressione massima disponibile nell'impianto ..... Bar

Check that the balancing capacity of the selected arm meets your requirements. The balancing capacity varies according to the length of the arm element. Note that it is also necessary to calculate the weight of any added elements, such as the tool, the wrist, the vertical rod, the brake, etc.

### 7.1 *Balancing Capacity arm size 1 150Nm*

LENGTH OF ARM ELEMENT	BALANCING CAPACITY WITH ONE CYLINDER					
	BARS					
	2	3	4	5	6	7
L. 600 mm	7,5 Kg.	15 Kg.	23 Kg.	32 Kg.	38 Kg.	40 Kg.
L. 800 mm	2 Kg.	7 Kg.	12 Kg.	17 Kg.	24 Kg.	29 Kg.
L. 1000 mm	/ Kg.	5 Kg.	10 Kg.	15 Kg.	22 Kg.	27 Kg.

LENGTH OF ARM ELEMENT	BALANCING CAPACITY WITH TWO CYLINDERS					
	BARS					
	2	3	4	5	6	7
L. 600 mm	14 Kg.	30 Kg.	40 Kg.	40 Kg.	40 Kg.	40 Kg.
L. 800 mm	4 Kg.	14 Kg.	24 Kg.	34 Kg.	40 Kg.	40 Kg.
L. 1000 mm	2 Kg.	12Kg.	22 Kg.	32 Kg.	40 Kg.	40 Kg.

Weights of additional elements:	Vertical rod 40X40 (1000mm)	4,0Kg.
(only indicative)	Fixed wrist	1,5Kg
	Rotating wrist straight tool	2,0Kg.
	Rotating wrist angled tool	6,0Kg.
	Brake 250 Nm	7,5Kg.

## 7.2 *Balancing Capacity arm size 2 250Nm*

LENGTH OF ARM ELEMENT	BALANCING CAPACITY WITH ONE CYLINDER					
	BARS					
	2	3	4	5	6	7
L. 800 mm	/ Kg.	7 Kg.	27 Kg.	38 Kg.	49 Kg.	60 Kg.
L. 1000 mm	/ Kg.	4 Kg.	21 Kg.	29,5 Kg.	37 Kg.	46 Kg.
L. 1200 mm	/ Kg.	2 Kg.	9,5 Kg.	16,5 Kg.	24,5 Kg.	32,5 Kg.

LENGTH OF ARM ELEMENT	BALANCING CAPACITY WITH TWO CYLINDERS					
	BARS					
	2	3	4	5	6	7
L. 800 mm	/ Kg.	14 Kg.	52 Kg.	72 Kg.	60 Kg.	60 Kg.
L. 1000 mm	/ Kg.	8 Kg.	42,5 Kg.	59 Kg.	60 Kg.	60 Kg.
L. 1200 mm	/ Kg.	4 Kg.	19 Kg.	33 Kg.	49 Kg.	60 Kg.

Weights of additional elements:		Vertical rod 40X40 (1000mm)	4,0Kg.
(only indicative)		Fixed wrist	1,5Kg
		Rotating wrist straight tool	2,5Kg.
		Rotating wrist angled tool	6,0Kg.
		Brake 250 Nm	5Kg.

### 7.3 *Balancing Capacity arm size 3 1000Nm*

LENGTH OF ARM ELEMENT	BALANCING CAPACITY WITH ONE CYLINDER					
	BARS					
	2	3	4	5	6	7
L. 1000 mm	6,5 Kg.	26 Kg.	39 Kg.	57 Kg.	75 Kg.	80 Kg.
L. 1250 mm	3,5 Kg.	19 Kg.	32 Kg.	48 Kg.	64 Kg.	80 Kg.
L. 1500 mm	1 Kg.	14 Kg.	21 Kg.	34 Kg.	47Kg.	80 Kg.

LENGTH OF ARM ELEMENT	BALANCING CAPACITY WITH TWO CYLINDERS					
	BARS					
	2	3	4	5	6	7
L. 1000 mm	13 Kg.	52 Kg.	78 Kg.	80 Kg.	80 Kg.	80 Kg.
L. 1250 mm	7 Kg.	39 Kg.	64 Kg.	80 Kg.	80 Kg.	80 Kg.
L. 1500 mm	2 Kg.	28 Kg.	42 Kg.	68 Kg.	80 Kg.	80 Kg.

Weights of additional elements: (only indicative)		Vertical rod 40X40 (1000mm)	4,0Kg.
		Vertical rod 50X50 (1000mm)	6,5Kg.
		Fixed wrist	1,5Kg
		Rotating wrist straight tool	2,5Kg.
		Rotating wrist angled tool	6,0Kg.
		Brake 350Nm	11Kg.
		Brake 1000Nm	14Kg.



## 7.4 *Balancing Capacity arm size 5 2000Nm*

LENGTH OF ARM ELEMENT	BALANCING CAPACITY WITH ONE CYLINDER					
	BARS					
	2	3	4	5	6	7
L. 1500 mm	/ Kg.	5 Kg.	20 Kg.	36 Kg.	52 Kg.	68 Kg.
L. 2000 mm	/ Kg.	/ Kg.	6,5 Kg.	18,5 Kg.	30,5 Kg.	42,5Kg.

LENGTH OF ARM ELEMENT	BALANCING CAPACITY WITH TWO CYLINDERS					
	BARS					
	2	3	4	5	6	7
L. 1500 mm	8 Kg.	38 Kg.	72 Kg.	90 Kg.	90 Kg.	90 Kg.
L. 2000 mm	/ Kg.	20 Kg.	45,5 Kg.	68 Kg.	90 Kg.	90 Kg.

Weights of additional elements: Vertical rod 50X50 (1000mm)		7,5Kg.
(only indicative)		
Fixed wrist		4,5Kg
Rotating wrist straight tool		5,0Kg.
Rotating wrist angled tool		6,0Kg.
Brake 1000Nm		32Kg.

## 8. *Selecting the equipment*

Tool control box support ☐

This support has two collars for attaching to the column and two support stirrups for the tool control box.

Socket change support shelf ☐

Specify brand and model to support  
Communicate the dimensions

Printer support shelf ☐

Specify brand and model to support  
Communicate the dimensions

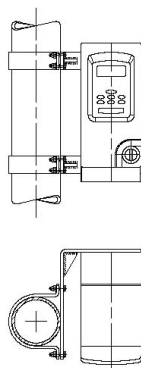
Controller PC support ☐

Specify brand and model to support  
Communicate the dimensions

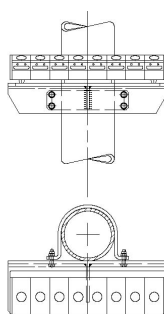
Auxiliary handles support ☐

Specify brand and model to support  
Communicate the dimensions

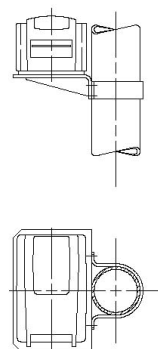
Control box support



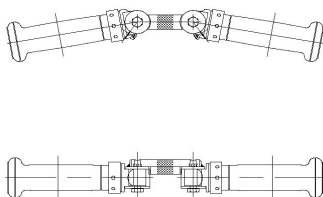
Socket change support shelf



Printer support shelf



Auxiliary handles support



Controller PC support

