

# MILLIBAR

MANUAL TOOL CHANGER

Fast, easy tool changes

Ideal for High-Mix/  
Low-Volume  
Production  
Environments



**UNIVERSAL ROBOTS+**  
Certified



# MILLIBAR

## MANUAL TOOL CHANGER

### + Collaborative Robots

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# Better Together

Without any tools, quickly switch from camera calibration to an adaptive gripper to a vacuum gripper...just release the locking lever and slide a new tool into place.

**Even if your facility has a variety of robots, the Millibar Tool Changer Ecosystem allows tools to be moved between robots.**

Have tooling designed for a Fanuc, Kuka or other brand and you would like the flexibility to use those tools with your Universal Robot? **Problem solved!** Millibar Tool Changers provide a common platform, and in most instances, your existing tools will not require any redesign.

**Simply bolt and go.**





## Fast and easy tool changes

Operators can quickly switch tools by releasing the locking lever and sliding a new tool into place.

Each assembly requires:

**1**

### the robot side

Choose a low-profile, lightweight design or a utility version with electrical and pneumatic pass through.



**2**

### the tool side

Choose from a variety of pre-engineered tool plates, modify your own blank plate, or have Millibar customize a tool plate for your tooling.



**1 + 2**

## robot side + tool side

This two-part solution unlocks the true potential of your robots and end-of-arm tools.

Part Number Example	<b>1</b> the robot side	+	<b>2</b> the tool side	= Complete Assembly
	MTC-UR3510		MTC-UR	MTC-UR3510-UR

**One robot with many tools | One tool with many robots**

1

the robot side

For applications where space is limited and air and electric pass-through are not required

# MILLIBAR

MANUAL TOOL CHANGER

## LOW PROFILE SERIES



The Low Profile tool changer adds just 21mm (.83") to the height of the wrist of the robot and, weighing just .3 kg, has a minimal impact on payload.

Choose from 3 common ISO patterns to connect to a variety of robot wrists without any additional plates.



ISO 9409-1-50-4-M6  
Fits all UR models



ISO 9409-1-40-4-M6



ISO 9409-1-31.5-4-M5

2

the tool side

Mount tools directly to Millibar's pre-engineered tool plates. Eliminate conversion plates, save space and deploy faster. See pages 8-9 for full Low Profile Series tool side details.



1

the robot side

For applications that require electric and air (vacuum) pass-through to the end-of-arm tool

# MILLIBAR

MANUAL TOOL CHANGER

## UTILITY SERIES



The Utility Series provides dual-channel pneumatic pass-through to control double acting cylinders and grippers. Pass line pressure air for venturi vacuum grippers and part release. Pass 24 VDC signals from sensors and switches on your EOAT back to the robot controller via the 8 Pin M8 threaded male connector that connects to the 8 Pin connector on the UR wrist.

Choose from 3 common ISO mounting patterns to mount to a variety of robot wrists.



ISO 9409-1-50-4-M6  
Fits all UR models



ISO 9409-1-40-4-M6  
Air/ Vacuum Pass-Through Only



ISO 9409-1-31.5-4-M5  
Air/ Vacuum Pass-Through Only

2

the tool side

Mount tools directly to Millibar's pre-engineered tool plates. Eliminate conversion plates, save space and deploy faster. See pages 12-13 for full Utility Series tool side details.



1

the robot side **LOW PROFILE SERIES**

For applications where space is limited and air and electric pass-through are not required.

See pages 8-9 for full Low Profile Series tool side details.

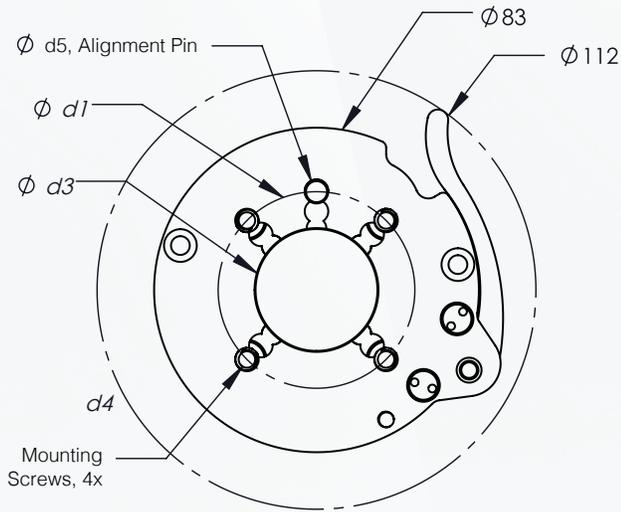
MTC-UR3510 Series - for all Universal Robot models			
	Complete Assembly P/N	Description	Weight - kg
	MTC-UR3510-UR	Manual Tool Changer with MTC-UR Tool Plate	0.41
	MTC-UR3510-BP	Manual Tool Changer with MTC-BP Tool Plate	0.33
	MTC-UR3510-M6	Manual Tool Changer with MTC-M6 Tool Plate	0.32
	MTC-UR3510-M8	Manual Tool Changer with MTC-M8 Tool Plate	0.31
	MTC-UR3510-FG	Manual Tool Changer with MTC-FG Tool Plate	0.32
	MTC-UR3510-40	Manual Tool Changer with MTC-40 Tool Plate	0.39
	MTC-UR3510-315	Manual Tool Changer with MTC-315 Tool Plate	0.39
<b>MTC-UR3510 Series</b> ISO 9409-1-50-4-M6	Part Number Example	$\textcircled{1}$ the robot side + $\textcircled{2}$ the tool side = Complete Assembly MTC-UR3510 MTC-UR MTC-UR3510-UR	

MTC-40 Series			
	Complete Assembly P/N	Description	Weight - kg
	MTC-40-UR	Manual Tool Changer with MTC-UR Tool Plate	0.41
	MTC-40-BP	Manual Tool Changer with MTC-BP Tool Plate	0.33
	MTC-40-M6	Manual Tool Changer with MTC-M6 Tool Plate	0.32
	MTC-40-M8	Manual Tool Changer with MTC-M8 Tool Plate	0.31
	MTC-40-FG	Manual Tool Changer with MTC-FG Tool Plate	0.32
	MTC-40-40	Manual Tool Changer with MTC-40 Tool Plate	0.39
	MTC-40-315	Manual Tool Changer with MTC-315 Tool Plate	0.39
<b>MTC-40 Series</b> ISO 9409-1-40-4-M6	Part Number Example	$\textcircled{1}$ the robot side + $\textcircled{2}$ the tool side = Complete Assembly MTC-40 MTC-UR MTC-40-UR	

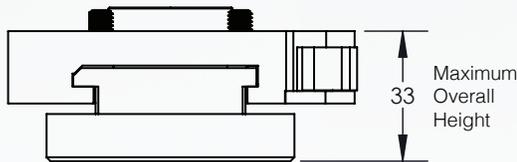
MTC-315 Series			
	Complete Assembly P/N	Description	Weight - kg
	MTC-315-UR	Manual Tool Changer with MTC-UR Tool Plate	0.40
	MTC-315-BP	Manual Tool Changer with MTC-BP Tool Plate	0.32
	MTC-315-M6	Manual Tool Changer with MTC-M6 Tool Plate	0.31
	MTC-315-M8	Manual Tool Changer with MTC-M8 Tool Plate	0.30
	MTC-315-FG	Manual Tool Changer with MTC-FG Tool Plate	0.31
	MTC-315-40	Manual Tool Changer with MTC-40 Tool Plate	0.38
	MTC-315-315	Manual Tool Changer with MTC-315 Tool Plate	0.38
<b>MTC-315 Series</b> ISO 9409-1-31.5-4-M5	Part Number Example	$\textcircled{1}$ the robot side + $\textcircled{2}$ the tool side = Complete Assembly MTC-315 MTC-UR MTC-315-UR	



LOW PROFILE SERIES - MECHANICAL INTERFACE



Payload: 50 kg  
 Repeatability: +/- .05mm  
 Materials of construction: Stainless steel, Aluminum

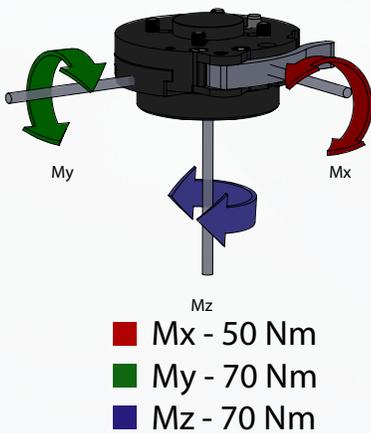


All tool changers shipped with alignment pin and mounting screws.

Tool Changer Series	"d1"	"d3"	"d4"	"d5"
	Bolt Circle Diameter	Alignment Disc Diameter	Mounting Screws	Alignment Pin Diameter
MTC-UR3510	50	31.5	M6x1.0	6
MTC-40	40	25	M6x1.0	6
MTC-315	31.5	20	M5x.8	5

All dimensions in millimeters

Moment Loads



Moment of Inertia Values

Values based on MTC-UR3510-UR, which is the tool changer with the most mass.

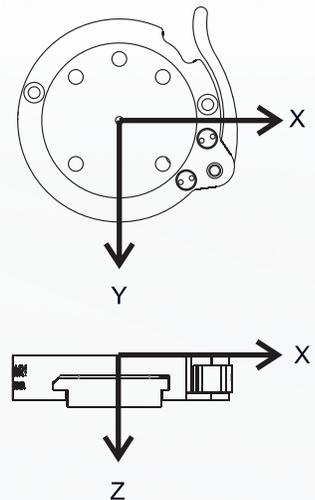
Center of mass: (mm)

X = 4.26  
 Y = 0.60  
 Z = 12.93

Moments of inertia: (kg \* mm<sup>2</sup>)

Taken at the output coordinate system.

$I_{xx} = 257.42$	$I_{xy} = 2.71$	$I_{xz} = 15.78$
$I_{yx} = 2.71$	$I_{yy} = 303.04$	$I_{yz} = 3.57$
$I_{zx} = 15.78$	$I_{zy} = 3.57$	$I_{zz} = 363.07$



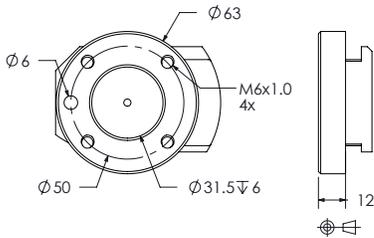
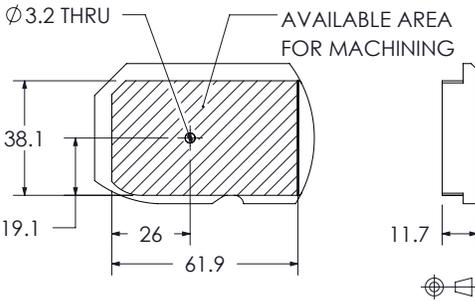
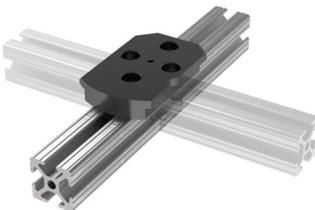
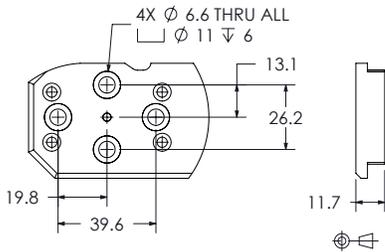
The coordinate system used to calculate the moment of inertia and center of mass of the tool changer

# 2

the tool side **LOW PROFILE SERIES** Easy end effector design with pre-engineered components from Millibar.

**MTC TOOL PLATES** All of the tool plates shown below are compatible with any MTC Robot Side shown on page 6 (MTC-UR3510, MTC-40, MTC315).

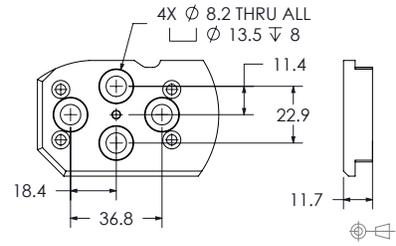
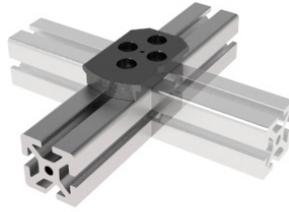
Tool Plate Only P/N:	Description
MTC-UR	Tool Plate with ISO 9409-1-50-4-M6 Mounting Pattern, Replicates UR Wrist Geometry
MTC-BP	Tool Plate, Blank for custom modification
MTC-M6	Tool Plate accepts 4 M6 SHCS. Ideal for use with aluminum profiles that accept 6mm or 1/4" fasteners
MTC-M8	Tool Plate accepts 4 M8 SHCS. Ideal for use with aluminum profiles that accept 8mm or 5/16" fasteners
MTC-FG	Tool Plate accepts 4 M4 SHCS for use with FlexiGrip foam vacuum grippers
MTC-STYLUS-6	Tool Plate with 6" Stylus for external camera-robot calibration and locating hole centers
MTC-40	Tool Plate with ISO 9409-1-40-4-M6 Mounting Pattern
MTC-315	Tool Plate with ISO 9409-1-31.5-4-M5 Mounting Pattern

<b>MTC-UR</b>	Tool Plate with ISO 9409-1-50-4-M6 Mounting Pattern, Replicates UR Wrist Geometry
	 
<b>MTC-BP</b>	Tool Plate, Blank for custom modification
	 
<b>MTC-M6</b>	Tool Plate accepts 4 M6 SHCS. Ideal for use with aluminum profiles that accept 6mm or 1/4" fasteners
	 

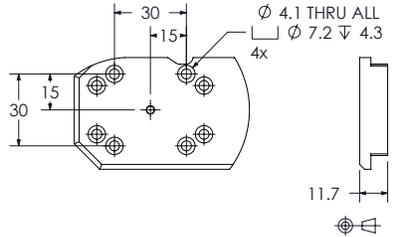


**MTC-M8**

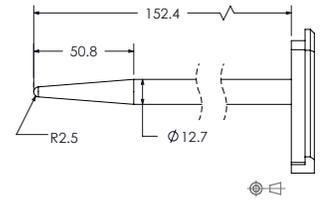
Tool Plate accepts 4 M8 SHCS. Ideal for use with aluminum profiles that accept 8mm or 5/16" fasteners

**MTC-FG**

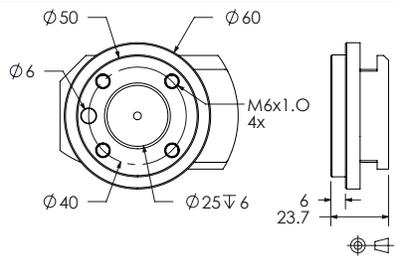
Tool Plate accepts 4 M4 SHCS for use with FlexiGrip foam vacuum grippers

**MTC-STYLUS-6**

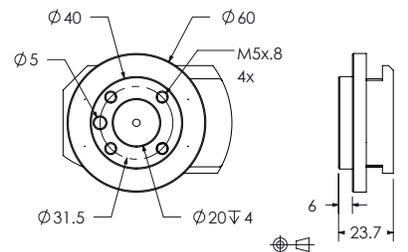
Tool Plate with 6" Stylus for external camera-robot calibration and locating hole centers

**MTC-40**

Tool Plate with ISO 9409-1-40-4-M6 Mounting Pattern

**MTC-315**

Tool Plate with ISO 9409-1-31.5-4-M5 Mounting Pattern



# 1

## the robot side **UTILITY SERIES**

Manual tool changers with pneumatic and electric pass-through for all UR Models.  
Pneumatic pass-through-only for other robot manufacturers.

See pages 12-13 for full Utility Series tool side details.

### MTCAE-UR3510 Series - for all Universal Robot models



**MTCAE-UR3510 Series**  
ISO 9409-1-50-4-M6

Product Number	Description	Weight - kg
MTCAE-UR3510-UR	Manual Tool Changer with MTCAE-UR Tool Plate	0.64
MTCAE-UR3510-BP	Manual Tool Changer with MTCAE-BP Tool Plate	0.55
MTCAE-UR3510-M6	Manual Tool Changer with MTCAE-M6 Tool Plate	0.54
MTCAE-UR3510-M8	Manual Tool Changer with MTCAE-M8 Tool Plate	0.53
MTCAE-UR3510-FG	Manual Tool Changer with MTCAE-FG Tool Plate	0.55
MTCAE-UR3510-40	Manual Tool Changer with MTCAE-40 Tool Plate	0.62
MTCAE-UR3510-315	Manual Tool Changer with MTCAE-315 Tool Plate	0.62

Part Number Example	1 the robot side	+	2 the tool side	=	Complete Assembly
	MTCAE-UR3510		MTCAE-UR		MTCAE-UR3510-UR

### MTCA-40 Series



**MTCA-40 Series**  
ISO 9409-1-40-4-M6

Product Number	Description	Weight - kg
MTCA-40-UR	Manual Tool Changer with MTCA-UR Tool Plate	0.55
MTCA-40-BP	Manual Tool Changer with MTCA-BP Tool Plate	0.46
MTCA-40-M6	Manual Tool Changer with MTCA-M6 Tool Plate,	0.45
MTCA-40-M8	Manual Tool Changer with MTCA-M8 Tool Plate	0.44
MTCA-40-FG	Manual Tool Changer with MTCA-FG Tool Plate	0.46
MTCA-40-40	Manual Tool Changer with MTCA-40 Tool Plate	0.53
MTCA-40-315	Manual Tool Changer with MTCA-315 Tool Plate	0.53

Part Number Example	1 the robot side	+	2 the tool side	=	Complete Assembly
	MTCA-40		MTCA-UR		MTCA-40-UR

### MTCA-315 Series



**MTCA-315 Series**  
ISO 9409-1-31.5-4-M5

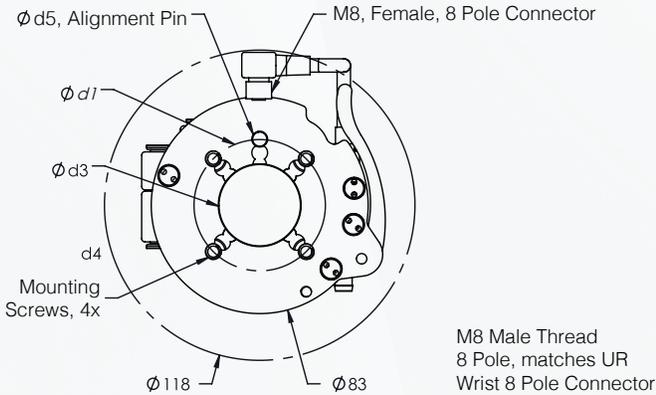
Product Number	Description	Weight - kg
MTCA-315-UR	Manual Tool Changer with MTCA-UR Tool Plate	0.54
MTCA-315-BP	Manual Tool Changer with MTCA-BP Tool Plate	0.45
MTCA-315-M6	Manual Tool Changer with MTCA-M6 Tool Plate,	0.44
MTCA-315-M8	Manual Tool Changer with MTCA-M8 Tool Plate	0.43
MTCA-315-FG	Manual Tool Changer with MTCA-FG Tool Plate	0.45
MTCA-315-40	Manual Tool Changer with MTCA-40 Tool Plate	0.52
MTCA-315-315	Manual Tool Changer with MTCA-315 Tool Plate	0.52

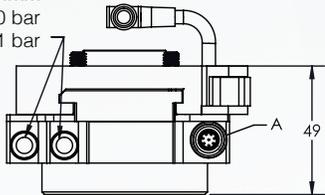
Part Number Example	1 the robot side	+	2 the tool side	=	Complete Assembly
	MTCA-315		MTCA-UR		MTCA-315-UR



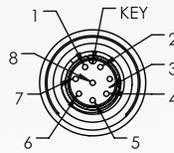
UTILITY SERIES - MECHANICAL INTERFACE



Pneumatic Pass Through  
6mm PTC Fittings, 2X  
Thru Bore - 4mm  
Pressure - 20 bar  
Vacuum - 1 bar



M8 Male Thread  
8 Pole, matches UR  
Wrist 8 Pole Connector



Maximum Overall Height  
49  
Detail A  
Scale 1:1

All tool changers shipped with alignment pin and mounting screws.

Payload: 50 kg  
Repeatability: +/- .05mm  
Materials of construction: Stainless steel  
Aluminum



M8 connector and cable are IP 67 Rated

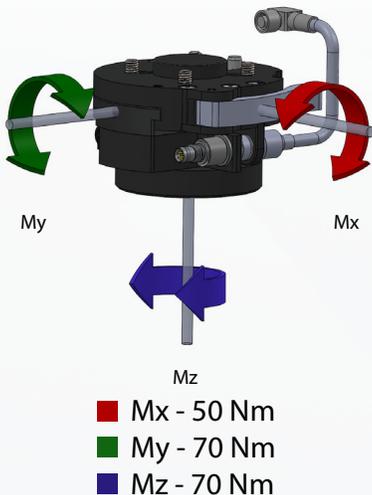
PIN	PURPOSE	RATING
1	ANALOG INPUT	0-10 VDC, 4-20mA
2	ANALOG INPUT	0-10 VDC, 4-20mA
3	DIGITAL INPUT (PNP)	24 V DC
4	DIGITAL INPUT (PNP)	24 V DC
5	POWER	24 V DC, 600mA
6	DIGITAL OUTPUT (NPN)	24 V DC
7	DIGITAL OUTPUT (NPN)	24 V DC
8	POWER	24 V DC, 600 mA

Tool Changer Series

	“d1”	“d3”	“d4”	“d5”
	Bolt Circle Diameter	Alignment Disc Diameter	Mounting Screws	Alignment Pin Diameter
MTCAE-UR3510	50	31.5	M6x1.0	6
MTCA-40	40	25	M6x1.0	6
MTCA-315	31.5	20	M5x.8	5

All dimensions in millimeters

Moment Loads



Moment of Inertia Values

Values based on MTCAE-UR3510-UR, which is the tool changer with the most mass.

Mass = 0.55 kilograms

Center of mass: (mm)

X = 2.14

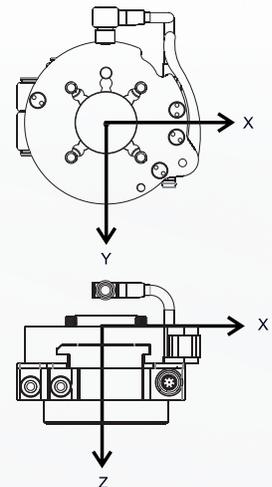
Y = 1.39

Z = 19.62

Moments of inertia: (kg \* mm<sup>2</sup>)

Taken at the output coordinate system.

$I_{xx} = 531.84$	$I_{xy} = 1.80$	$I_{xz} = -1.06$
$I_{yx} = 1.80$	$I_{yy} = 578.53$	$I_{yz} = 26.03$
$I_{zx} = -1.06$	$I_{zy} = 26.03$	$I_{zz} = 476.18$



The coordinate system used to calculate the moment of inertia and center of mass of the tool changer

# 2

**the tool side** **UTILITY SERIES** Tool plates with pneumatic and electric pass-through for all UR Models (MTCAE) and tool plates with pneumatic pass-through only (MTCA) for other robot manufacturers are shown on page 10.

MTCAE includes electrical pass through for use with Universal Robot wrist connector



MTCA does not include electrical pass through



## MTCAE Tool Plates

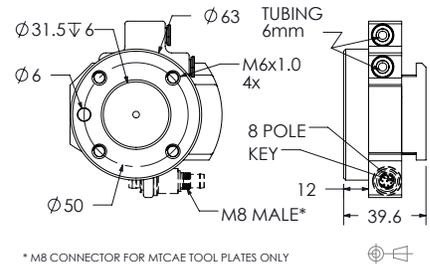
Tool Plate Only P/N:	Description
MTCAE-UR	Tool Plate with ISO 9409-1-50-4-M6 Mounting Pattern, Replicates UR Wrist Geometry
MTCAE-BP	Tool Plate, Blank for custom modification
MTCAE-M6	Tool Plate accepts 4 M6 SHCS. Ideal for use with aluminum profiles that accept 6mm or 1/4" fasteners
MTCAE-M8	Tool Plate accepts 4 M8 SHCS. Ideal for use with aluminum profiles that accept 8mm or 5/16" fasteners
MTCAE-FG	Tool Plate accepts 4 M4 SHCS for use with Joulin FlexiGrip foam vacuum grippers. Screws Included
MTCAE-40	Tool Plate with ISO 9409-1-40-4-M6 Mounting Pattern
MTCAE-315	Tool Plate with ISO 9409-1-31.5-4-M5 Mounting Pattern

## MTCA Tool Plates

Tool Plate Only P/N:	Description
MTCA-UR	Tool Plate with ISO 9409-1-50-4-M6 Mounting Pattern, Replicates UR Wrist Geometry
MTCA-BP	Tool Plate, Blank for custom modification
MTCA-M6	Tool Plate accepts 4 M6 SHCS. Ideal for use with aluminum profiles that accept 6mm or 1/4" fasteners
MTCA-M8	Tool Plate accepts 4 M8 SHCS. Ideal for use with aluminum profiles that accept 8mm or 5/16" fasteners
MTCA-FG	Tool Plate accepts 4 M4 SHCS for use with Joulin FlexiGrip foam vacuum grippers. Screws Included
MTCA-40	Tool Plate with ISO 9409-1-40-4-M6 Mounting Pattern
MTCA-315	Tool Plate with ISO 9409-1-31.5-4-M5 Mounting Pattern

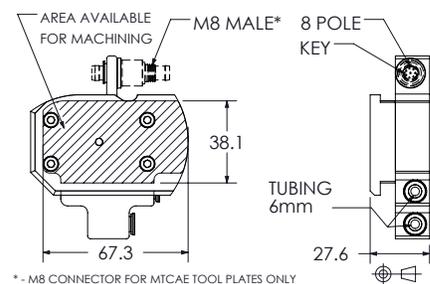
### MTCAE-UR and MTCA-UR

Tool Plate with ISO 9409-1-50-4-M6 Mounting Pattern, Replicates UR Wrist Geometry



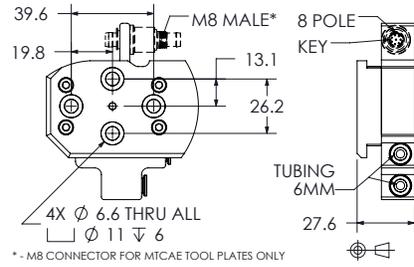
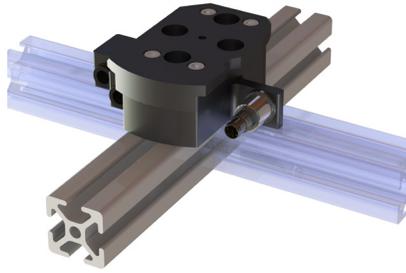
### MTCAE-BP and MTCA-BP

Tool Plate, Blank for custom modification



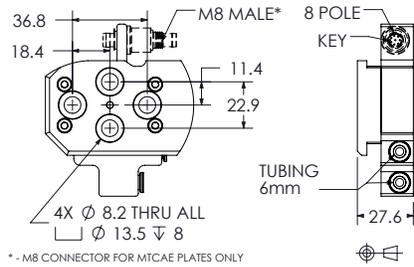
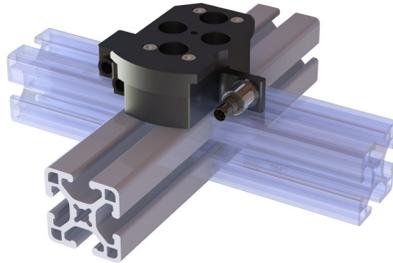
**MTCAE-M6 and MTCA-M6**

Tool Plate accepts 4 M6 SHCS. Ideal for use with aluminum profiles that accept 6mm or 1/4" fasteners



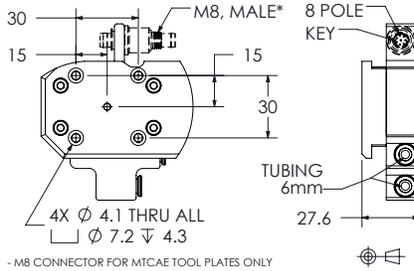
**MTCAE-M8 and MTCA-M8**

Tool Plate accepts 4 M8 SHCS. Ideal for use with aluminum profiles that accept 8mm or 5/16" fasteners



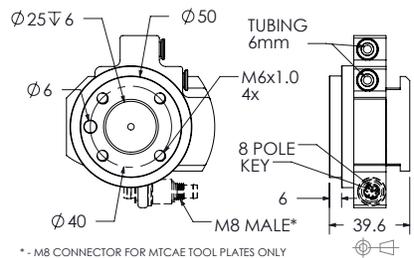
**MTCAE-FG and MTCA-FG**

Tool Plate accepts 4 M4 SHCS for use with Joulin FlexiGrip foam vacuum grippers. Screws Included



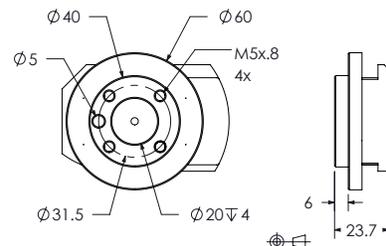
**MTCAE-40 and MTCA-40**

Tool Plate with ISO 9409-1-40-4-M6 Mounting Pattern



**MTCAE-315 and MTCA-315**

Tool Plate with ISO 9409-1-31.5-4-M5 Mounting Pattern



## Millibar Custom End-of-Arm Tools

Millibar lightweight Carbon Fiber end-of-arm tools mean a smaller robot, faster moves and increased production.

Don't see what you need? Let's talk!  
Millibar can deliver end-of-arm tools designed specifically for your project.

# Project to Product

With our in-house 3D printing, lasers and multi axis production equipment, we can mock up a testable solution to prove a concept in a day, if not hours, depending on complexity.

## The process is fast.

Our experience allows us to ask the right questions that lead to your solution. Best of all, the tools are extremely lightweight, rugged and guaranteed to work...or your money back.



Custom vacuum foam gripper with manifold mounted venturi vacuum pump, weight: .24 kg

Handling packaged hypodermic needles for in-the-box packaging



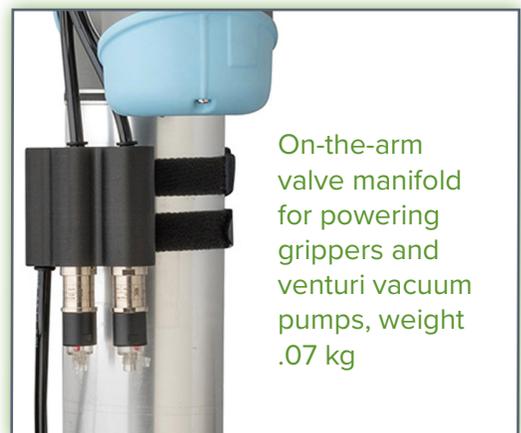
Dual head vacuum gripper for grinding flash from molded silicone parts, weight: .46 kg



Dispenser mount, weight .07 kg



Dual-purpose tool - foam vacuum gripper to grip molded part with raised lettering, "ears" extend into part feature for threading into companion part



On-the-arm valve manifold for powering grippers and venturi vacuum pumps, weight .07 kg



## ACCESSORIES

No piece of the puzzle is missing...whatever is needed to fully install the manual tool changer is available from Millibar.

Part Number	CABLES	
KM83R-PVC-3M-150mm	3 PIN FEMALE x 3 PIN MALE X 150mm	
KM83R-PVC-4M-150mm	4 PIN FEMALE x 4 PIN MALE X 150mm	
KM83R-PVC-5M	3 PIN FEMALE x FLYING LEAD 5 METER	
KM84R-PVC-5M	4 PIN FEMALE x FLYING LEAD 5 METER	
KM83R90-PVC-8M-500mm	8 PIN LB FEMALE X 8 PIN STRAIGHT MALE, 500mm	
KM83R-PVC-8M-150mm	8 PIN FEMALE x 8 PIN MALE, 150 mm	
SPLITTERS		
SF8-8-3-3	8 PIN x 3 PIN/ 3 PIN (ALL FEMALE)	 <div style="display: flex; justify-content: space-around; width: 100%;"> <span>Front</span> <span>Back</span> </div>
SF8-8-3-4	8 PIN x 3 PIN/ 4 PIN (ALL FEMALE)	
SF8-8-8-3	8 PIN x 8 PIN/ 3 PIN (ALL FEMALE)	
SF8-8-8-4	8 PIN x 8 PIN/ 4 PIN (ALL FEMALE)	
FITTINGS		
PLUG6MM	PLUG 6mm	
PTCA-4-6MM	ADAPTER 1/4" x 6mm	
PTCR-6MM-4MM	REDUCER 6mm x 4mm	
PTC6MM-2	PTC 6mm x 1/8" STRAIGHT (fits NPT, G, R)	
PTC6MM-4	PTC 6mm x 1/4" STRAIGHT ((fits NPT, G, R)	
PTC6MM-90-2	PTC 6mm x 1/8" 90 ELBOW SWIVEL (fits NPT, G, R)	
PTC6MM-90-4	PTC 6mm x 1/4" 90 ELBOW SWIVEL (fits NPT, G, R)	
TUBING		
T6MM	6mm OD x 4mm ID POLYURETHANE TUBING	
ON-THE-ARM MANIFOLDS		
A2M-6-2V	DUAL VALVE	 
A2M-6-VSP	VALVE WITH PNP VACUUM SWITCH	
A2M-6-VSN	VALVE WITH NPN VACUUM SWITCH	
REPLACEMENT VALVES		
BV214A-3M-4W	VALVE	
17960-1	VALVE O-RINGS ONLY	

The robot may be 95% of the investment,  
but the end-of-arm tool can be 95% of the headache.

## Let Millibar help.

### Tell Us About Your Manufacturing, Robotic and Material Handling Challenges

- Are you trying to pick up a uniquely shaped object?
- Are you looking at vacuum solutions to improve EOAT and robotic process time?
- Do you need to achieve higher production levels than you have in place today?
- Are you exploring vacuum technology for the first time and need to learn more?

### Re-engineering Legacy Design and Processes

Remove the limitations of yesterday's technology...Millibar will consult to help you find new efficiencies and improve output in your existing systems.

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