

# YouBot Detailed Specifications

From youBot wiki

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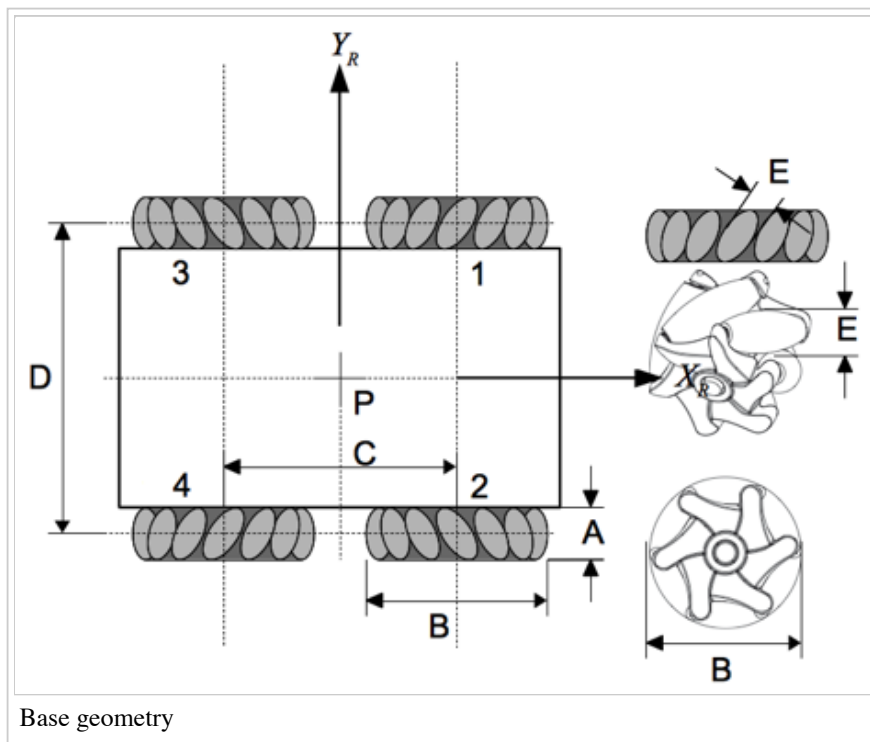
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## Base

### General Info

- Overall Weight : ~20 kg
- Permissible Payload : 20 kg
- Overall Length : 580 mm
- Overall Width : 380 mm
- Overall Height : 140 mm
- Minimum velocity : 0.01 m/s
- Maximum velocity: 0.8 m/s
- Power supply: 24 V
- Communication: EtherCad

### Detailed base geometry



$A = 74,87 \text{ mm}$   $B = 100 \text{ mm}$   $C = 471 \text{ mm}$   $D = 300,46 \text{ mm}$   $E = 28 \text{ mm}$  (max diameter of the roll )

- Ground Clearance : 20 mm

You can also have a look at the base configuration files of the youBot driver here ([https://github.com/youbot/youbot\\_driver/blob/master/config/youbot-base.cfg](https://github.com/youbot/youbot_driver/blob/master/config/youbot-base.cfg)).

## Base Actuator

For detailed info, refer to the #Actuator\_Data

## Wheels

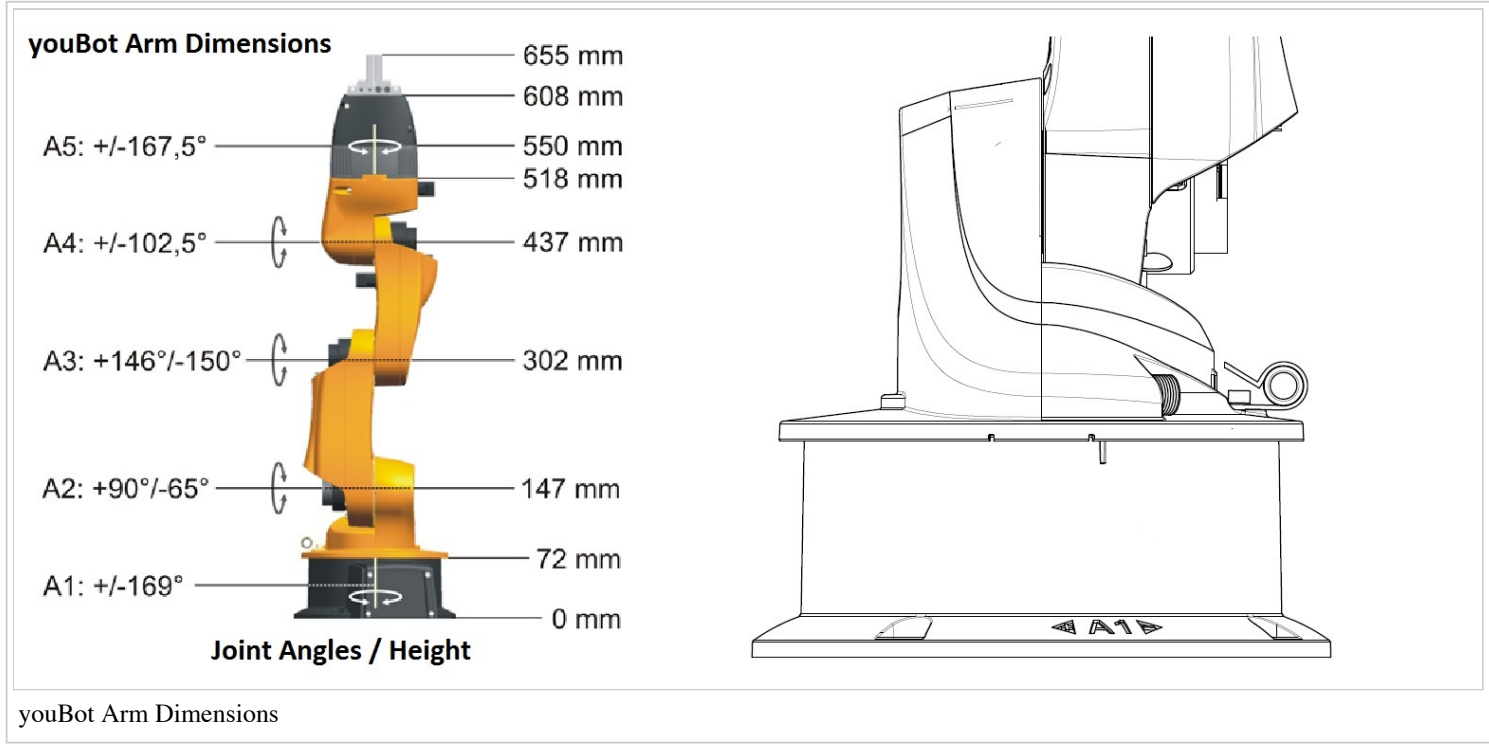
- Type : Omni-directional
- Number of wheels : 4
- Diameter : 47,5 mm

## Arm

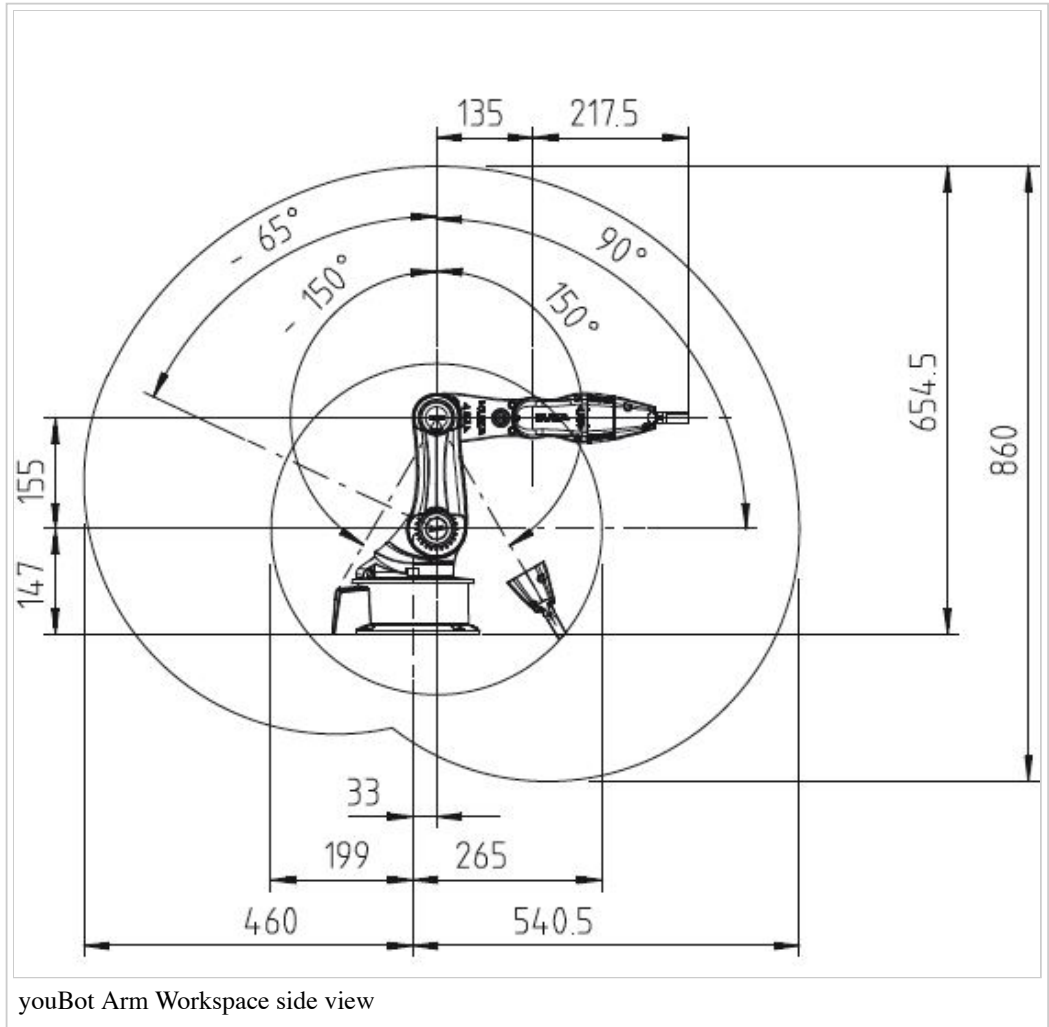
### General Info

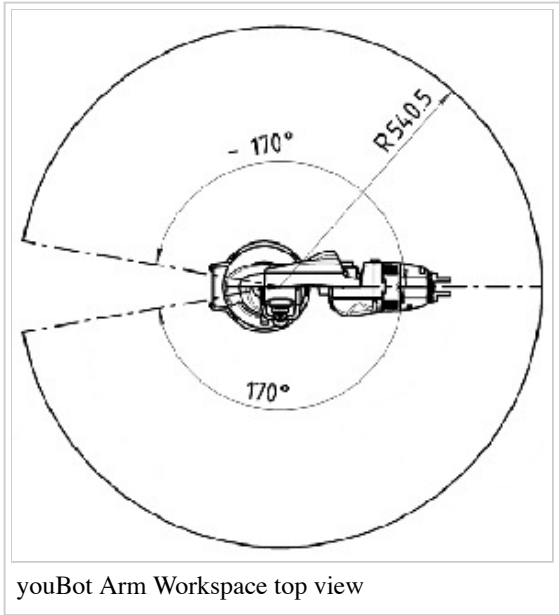
- No. of Axis : 5
- Height : 655 mm
- Work envelope : 0.513 m<sup>2</sup>
- Weight : 5.3 kg
- Payload : 0.5 kg
- Structure : Magnesium Cast
- Position repeatability : 1 mm
- Communication : EtherCAT
- Voltage connection : 24V DC
- Drive train power limitable to : 80 W
- Axis Speed : 90 deg/s
- Encoders threshold: 1.000 Hz

Arm kinematics



Workspace





Arm Actuator

Axis data Range Velocity

axis 1	+/- 169°	90 °/s
axis 2	+ 90°/- 65°	90 °/s
axis 3	+ 146°/ - 151°	90 °/s
axis 4	+/- 102,5°	90 °/s
axis 5	+/- 167,5°	90 °/s

For detailed info, refer to the #Actuator\_Data

You can also have a look at the arm configuration files of the youbot driver here ([https://github.com/youbot/youbot\\_driver/blob/master/config/youbot-manipulator.cfg](https://github.com/youbot/youbot_driver/blob/master/config/youbot-manipulator.cfg)).

Actuator Data

<b>Actuator Data</b>	<b>Joint 1</b>	<b>Joint 2</b>	<b>Joint 3</b>	<b>Joint 4</b>	<b>Joint 5</b>	<b>Wheel</b>
<b>Motor</b>						
Nominal Voltage (V)	24	24	24	24	24	24
Nominal Current (A)	2.32	2.32	2.32	1.07	0.49	2.32
Nominal Torque (mNm)	82.7	82.7	82.7	58.8		82.7
Terminal Inductance (mH)	0.573	0.573	0.573	2.24	7.73	0.573
Terminal Resistance ( $\Omega$ )	0.978	0.978	0.978	4.48	13.7	0.978
Moment of Inertia (kg*mm <sup>2</sup> )	13.5	13.5	13.5	9.25	3.5	13.5
Rated speed (RPM)	5250	5250	5250	2850	2800	5250
Weight (g)	110	110	110	75	46	110
<b>Gearbox</b>						
Reduction Ratio	156	156	100	71	71	26
Moment of Inertia (kg*mm <sup>2</sup> )	0.409	0.409	0.071	0.07	0.07	0.14
Weight (g)						224
<b>Encoder</b>						
Counts per Revolution	4000	4000	4000	4000	4000	4000

## Gripper

- Type : Detachable, 2 fingers
- Gripper stroke : 20 mm
- Gripper range : 70 mm

The TCM-KR-842 is the gripper board for the KUKA youBot arm placed inside the gripper at the upper end of the arm. The main purpose of this board is controlling the two linear stepper motors (connected separately to the board) inside the gripper. These motors move the two gripper fingers. This attached PDF document - which is also shipped with every KUKA youBot - describes the TMCL protocol that is used for the communication by the RS232 interface at the arm.

[http://www.youbot-store.com/media/pdf/tmcm-kr-842\\_firmware\\_manual\\_v100\\_gripperboard.pdf](http://www.youbot-store.com/media/pdf/tmcm-kr-842_firmware_manual_v100_gripperboard.pdf)

## Battery

**Caution:** The battery is in general quite sensitive and should never be left connected when the youBot doesn't work because it slowly discharges. It may eventually results in battery failure.

- Type : Maintenance-free lead acid
- Rechargeable : Yes
- Voltage : 24 V
- Capacity : 5 Ah
- Approximate Runtime of youBot : 90 min

## Internal PC

- Type : Mini-ITX
- CPU : Intel Atom D510 Dual Core 1.66 GHz
- RAM : 2 GB; SO-DDR2-667 200PIN

- Hard Drive : 32 GB SSD
- Ports : 6 x USB 2.0, 1 x VGA, 2 x LAN (1 available)
- DC Input : 12 V

## Motor controller

All used motor controller boards came from TMCM series by Trinamic.

## 3D model

Collada youBot model can be found here

**Attention : All the above data are subject to change and are provided without warranty**

*Corrections, suggestions, and new documentation should be posted to the Forum (<http://www.youbot-store.com/forum/>).*

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