



DATASHEET

2FGP20 FORK

v1.0

1. Datasheet

1.1. 2FGP20 Fork

Fork Kit Grip Properties		Minimum	Typical	Maximum	Unit
Payload		- -	- -	16 35.2	[kg] [lb]
Total stroke	Fork	- -	- -	260 10.24	[mm] [inch]
	Clamp	- -	- -	218 8.58	[mm] [inch]
Box height gripping range ⁽¹⁾		100 3.93	-	450 17.71	[mm] [inch]
Gripping repeatability		- -	+/- 0.5 +/- 0.020	- -	[mm] [inch]
Moving speed	Fork	16	-	180	[mm/s]
	Clamp	-	-	350	[mm/s]
Force	Fork moving	-	-	300	[N]
	Clamp gripping	10	-	40	[N]
Noise level ⁽²⁾		-	-	58 63	[dB(A)] _{Leq} [dB(A)] _{Max}
Hold workpiece in case of power loss?		Yes			
Gripper tilt angle		-	-	15	[degrees]
Motor		Integrated, electric BLDC			

⁽¹⁾ More info in table [Box gripping range](#). Custom forks and/or top clamp can extend the range.

⁽²⁾ For more information, see the [Noise level](#) section.

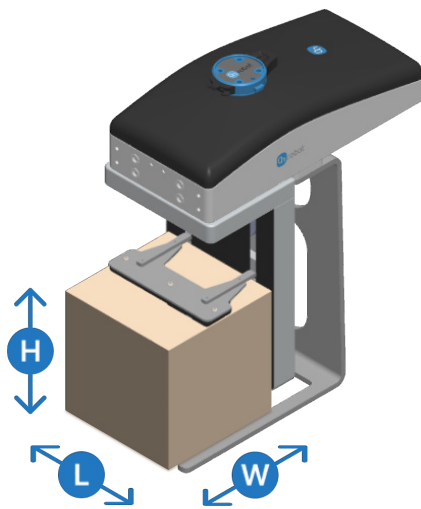
Box gripping range

At least 60% of the box must be supported by the fork. For larger dimensions, custom forks can be used.

For boxes smaller than 100 mm in height or 120 mm in width, a custom top clamp can be used.

Fork type	Height (H) Min - Max	Width (W) Min - Max	Length (L) Min	Unit
Narrow short	100 - 300 3.94 - 11.81	120 - 400 4.72 - 15.75	200 7.87	[mm] [inch]

Fork type	Height (H) Min - Max	Width (W) Min - Max	Length (L) Min	Unit
Wide short	100 - 300 3.94 - 11.81	120 - 400 4.72 - 15.75	468 18.42	[mm] [inch]
Narrow long	250 - 450 9.84 - 17.71	120 - 400 4.72 - 15.75	200 7.87	[mm] [inch]
Wide long	250 - 450 9.84 - 17.71	120 - 400 4.72 - 15.75	468 18.42	[mm] [inch]



Vacuum grip properties	Minimum	Typical	Maximum	Unit
Vacuum	5 - 0.05 1.5	- - -	60 - 0.607 17.96	[%Vacuum] [Bar] [inHg]
Air flow	0		12	[L/min]
Payload (with delivered attachments)		- -	2.5 5.51	[kg] [lb]
Vacuum cups	1		4	[pcs]
Gripping time (measured with vacuum target 40 %)		0.25		[s]
Release time		0.4		[s]
Noise level ⁽¹⁾	-	-	72 74	[dB(A)] _{Leq} [dB(A)] _{Max}
Vacuum pump	Integrated, electric BLDC			
Dust filters	Integrated 50 µm, field replaceable			

⁽¹⁾ For more information, see the [Noise level](#) section.

General properties	Minimum	Typical	Maximum	Unit
Storage temperature	0 32	- -	60 140	[°C] [°F]
IP Classification	54			
Dimensions [L x W x H] ⁽¹⁾	473 x 188 x 504 18.6 x 7.4 x 18.82			[mm] [inch]
Weight	8.5 18.74			[kg] [lb]

⁽¹⁾ Dimensions shown are for the narrow short fork without a vacuum bracket. With a vacuum bracket, the width increases to 450 mm [17,72 inches].

Operating Conditions	Minimum	Typical	Maximum	Unit
Power supply	20	24	25	[V]
Current consumption	-	-	2000	[mA]
Operating temperature (gripper and vacuum cups)	5 41	- -	50 122	[°C] [°F]
Relative humidity (non-condensing)	0	-	95	[%]

Warranty: 3 years or 3.000.000 cycles, whichever comes first, as per the official warranty terms set out in the Partner Agreement. One operating cycle is defined as one complete grip and release sequence, equivalent to 6,000,000 open or close movements.

Noise Level

The noise level of the 2FGP20 depends on whether the finger or vacuum gripping part is used. Vacuum gripping noise depends on the set vacuum level and whether an object is picked up or not. Higher speed and stroke increase the noise. The noise level also depends on the surroundings and other equipment.

To measure the 2FGP20's noise level, a test has been carried out by an external company.

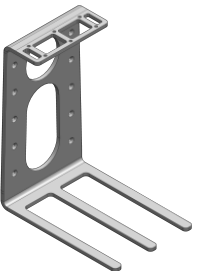
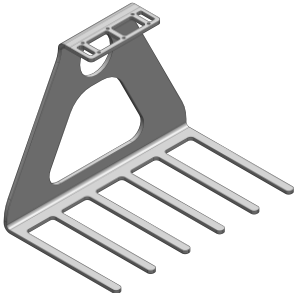
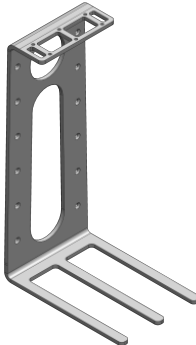
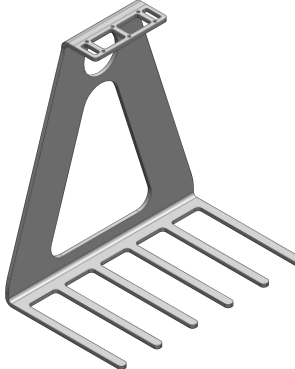
The test setup was the following:

- The test took place in a normal indoor production area.
- The finger gripping test ran 4 cycles full stroke, 100 % speed and with no pause in between the cycles.
- The vacuum gripping test was made with fully activated pump and with no pause.
- The noise measurement equipment was located in 1 m distance away from the 2FGP20.

The test concludes that the average measured noise level was below 58 dB(A)_{Leq} for the finger gripper and 72 dB(A)_{Leq} for the vacuum. The maximum noise level was measured below 63 dB(A)_{Max} for the finger gripper and 74 dB(A)_{Max} for the vacuum, which is below the maximum allowed noise level of (80 dB(A)). The 2FGP20 will not run continuously in an application which means that the average noise level will decrease significantly.

Forks

Four OnRobot forks are available. See the Maintenance section for item numbers and delivery contents, and the Mechanical Dimensions section for dimensions.

Narrow short	Wide short	Narrow long	Wide long
			

Custom Forks

The available fork fingers can handle boxes up to 450 mm in height and 400 mm in width. For larger boxes, a customized fork finger is recommended.

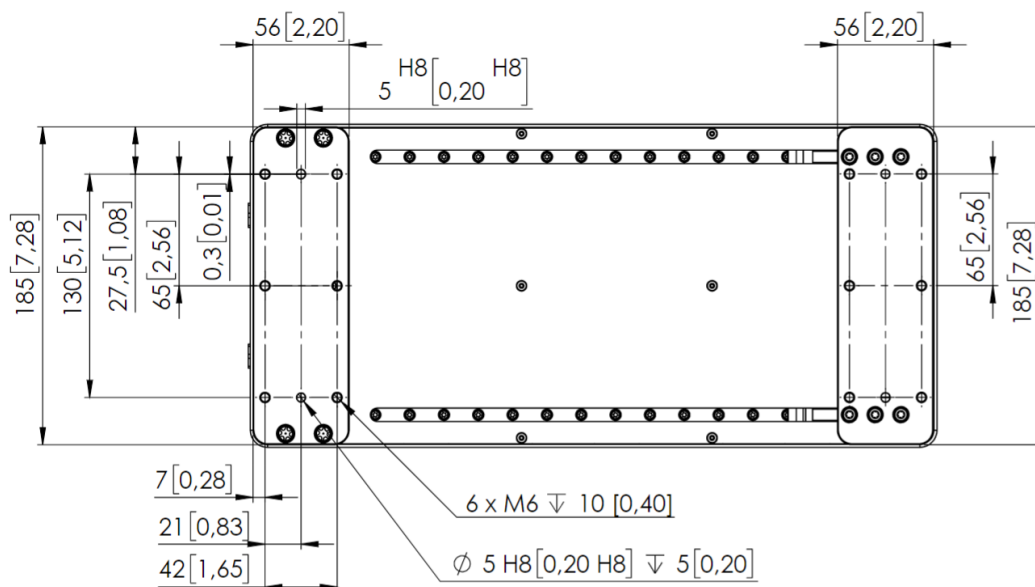


WARNING:

Observe ISO/TR 20218-1 and ISO/TS 15066 so custom fork fingers are not sharp or create pinching hazards in the gripping areas.

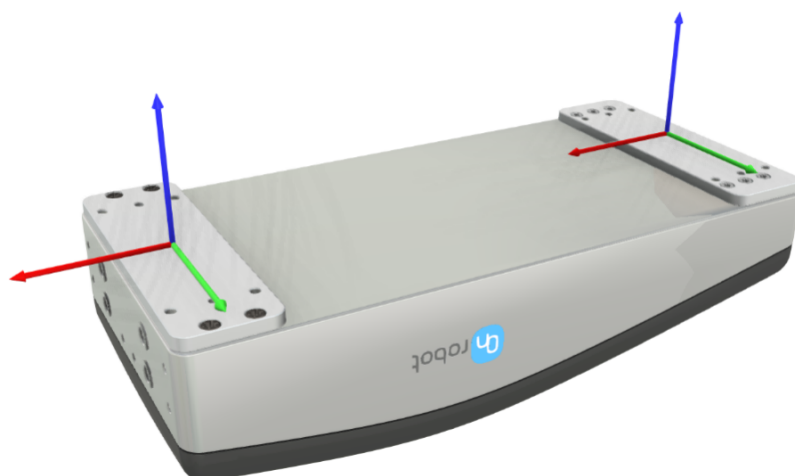
By increasing the fork finger height, the allowed torque might be reduced as shown in the **Moments in the finger base** section.

If custom fork fingers are required, they can be made to fit the gripper according to the dimensions (mm) [inch] shown below. Use M6x16mm threads tightened to 3 Nm to attach the fork finger.



Moments in the finger base

A maximum moment 80 Nm is allowed on each direction of the finger base.

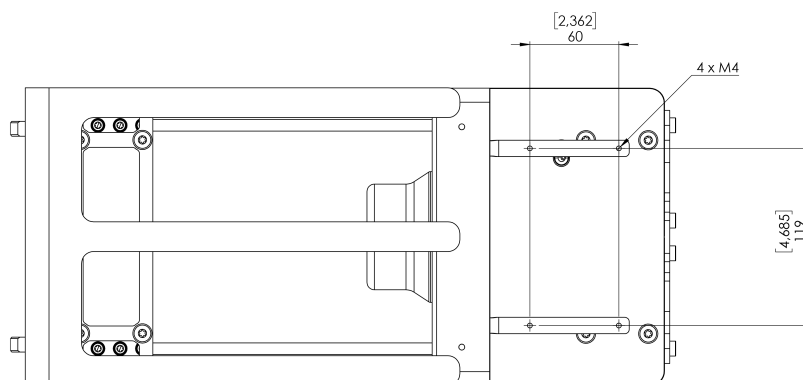


Custom Top clamp

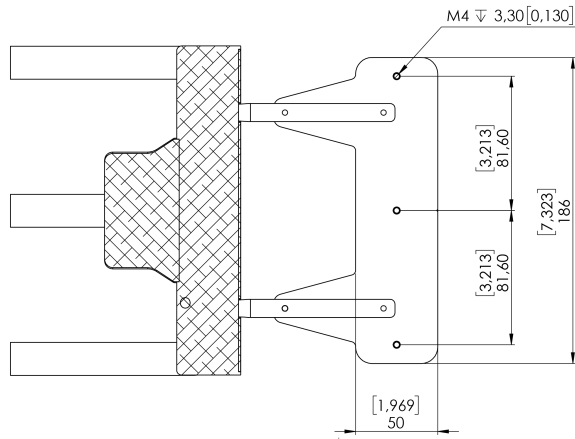
The available top clamp can handle boxes with a minimum height of 100 mm and width of 120 mm. For smaller boxes, a customized top clamp is recommended.



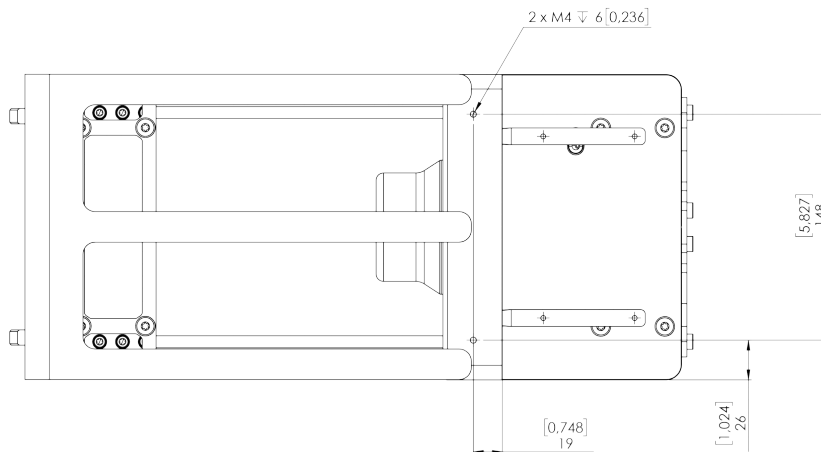
If a custom plate is required, it can be designed to fit the gripper using the dimensions (mm) [inch] shown below. Attach the plate using M4 × 8 mm threads tightened to 1 Nm.



If a custom pad is required, it can be designed to fit the gripper using the dimensions (mm) [inch] shown below. Attach the pad using M4 × 6 mm screws tightened to 1 N/m.



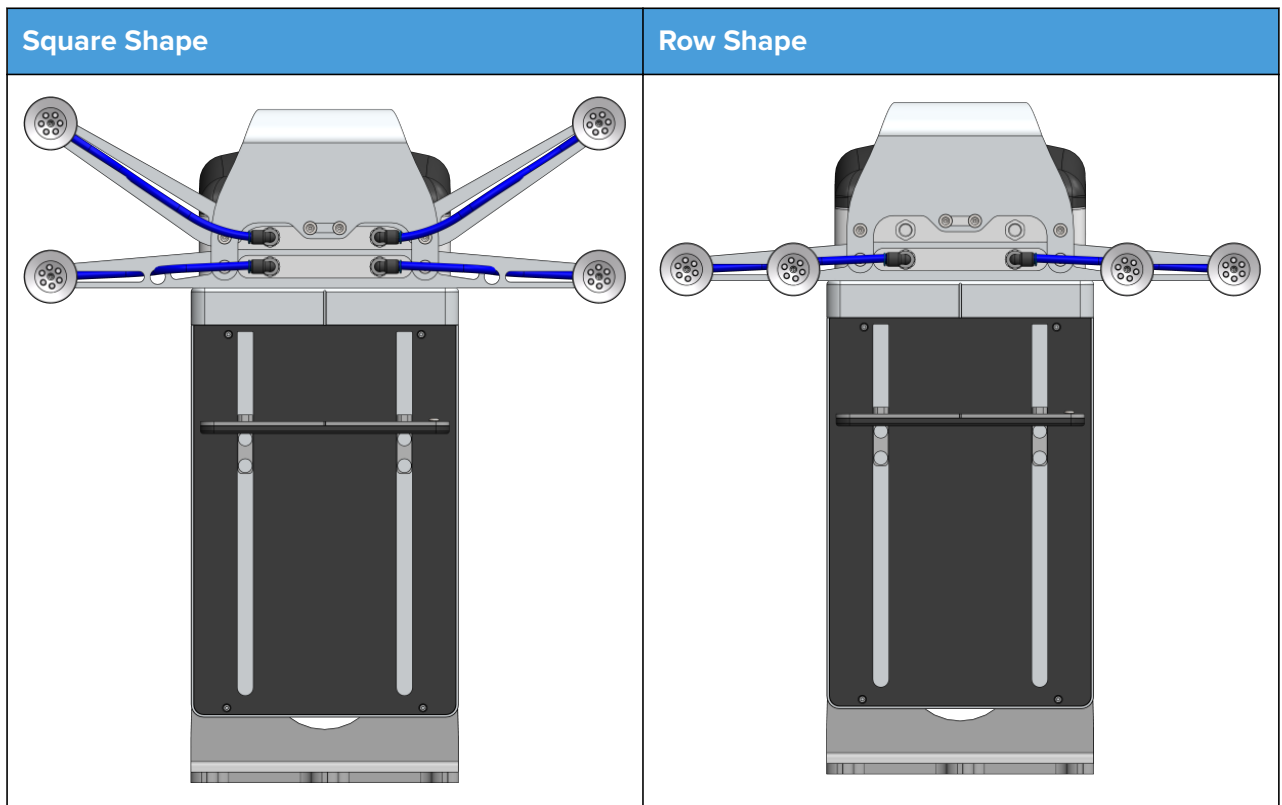
A part can be attached to close the gap between the Release Plate and Fork Finger. It can be made to fit the gripper according to the dimensions (mm) [inch] shown below. Use M4x6mm threads to attach the part.



Vacuum cups

The vacuum solution has been designed to handle interlayer sheets and similar items. The two most common configurations with the delivered bracket and vacuum cups are shown below.

Square Shape	Row Shape
Better for cardboard interlayer sheets or multiple layer paper	Better for paper or similar interlayer sheets



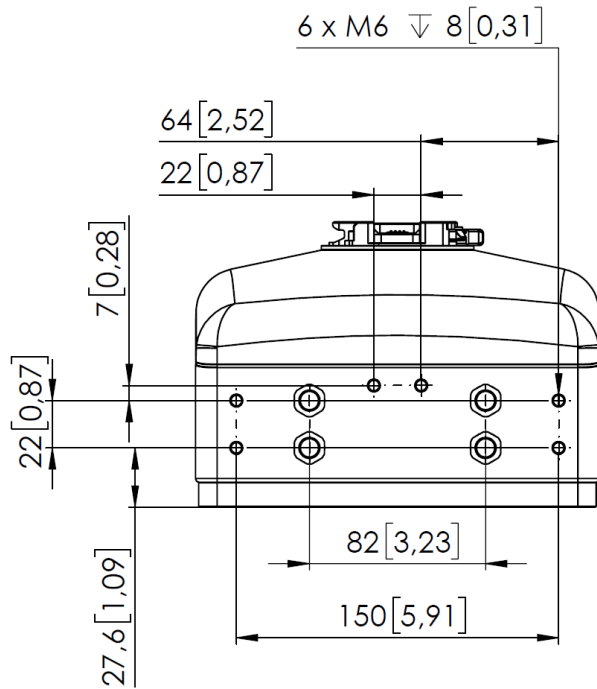
The provided tube length is adequate for the Square Shape. For using the Row Shape, please cut two of the tubes to 83 mm length.

**NOTE:**

It is important to always use the four air sources together.

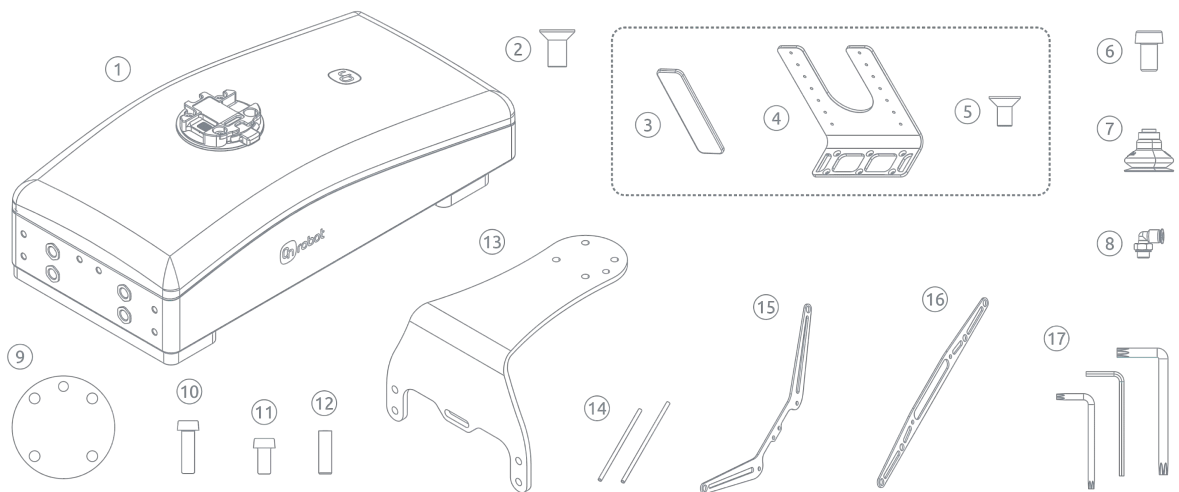
Custom Vacuum Bracket

If a custom bracket is required, it can be made to fit the gripper according to the dimensions (mm) [inch] shown below. Use M6x6mm screws to attach the fingers.



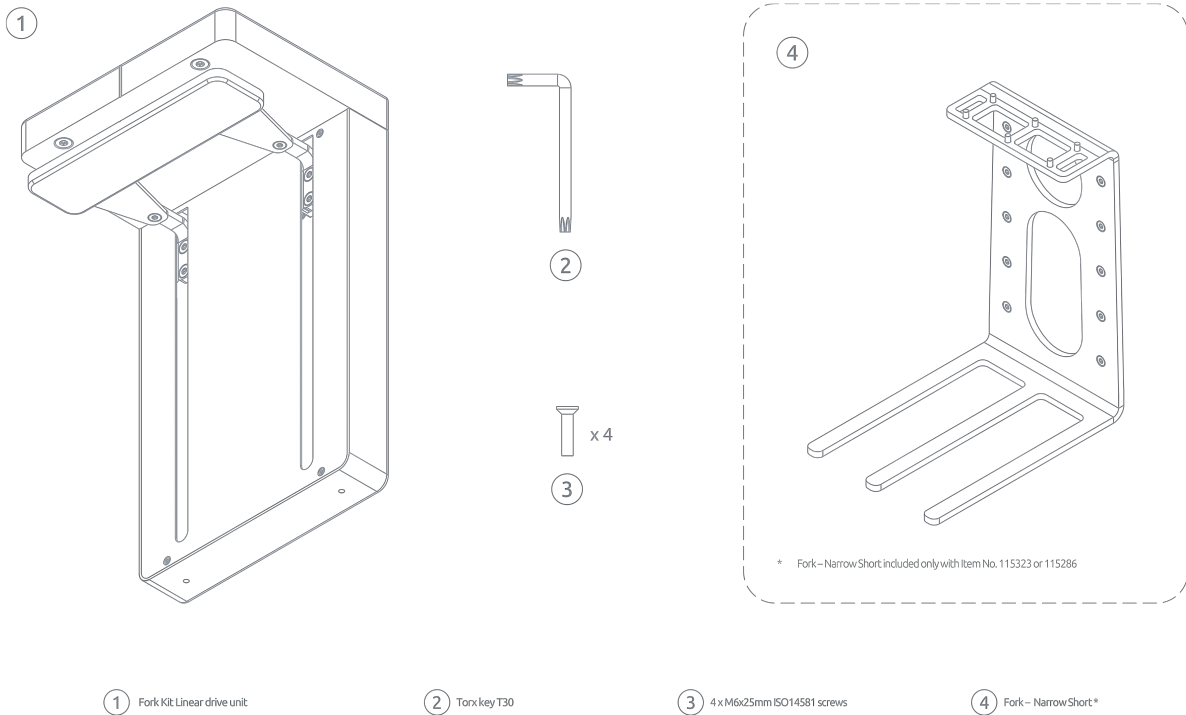
1.2. 2FGP20 Fork box content

2FGP20



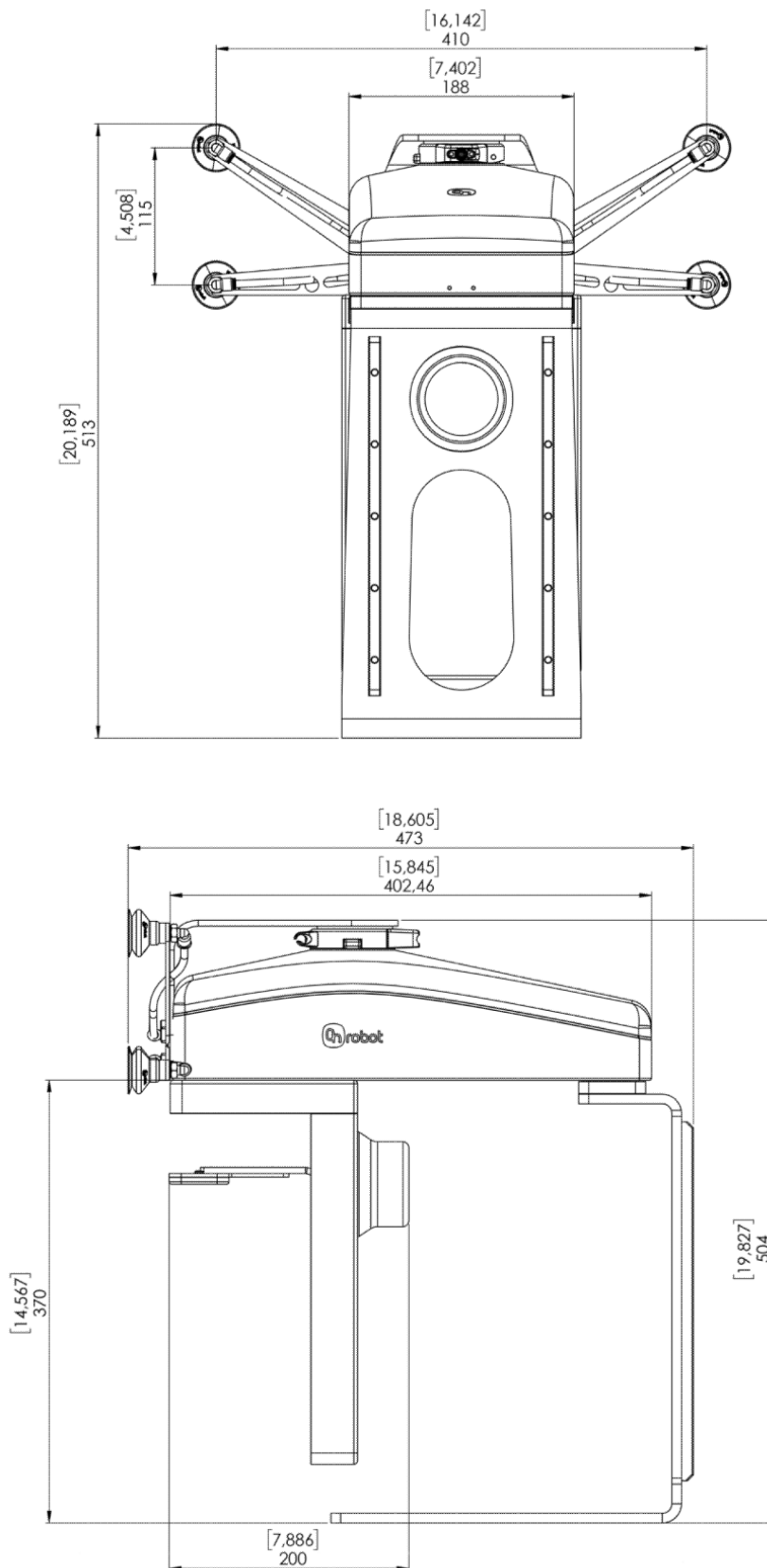
- | | | | | |
|-------------------------------|---|-----------------------------|--|--------------------------------|
| ① 2FGP20 Base Unit | ② 12 x M6x12mm Screw | ③ 4 x Finger Pad Premounted | ④ 2 x 2FGP20 Finger | ⑤ 16 x M4x8mm screw Premounted |
| ⑥ 6 x M6x10mm screw | ⑦ 4 x Suction Cup Ø40 | ⑧ 8 x Angled Fitting | ⑨ Distance plate | ⑩ 4 x M6x20mm screw |
| ⑪ 6 x M6x12mm screw | ⑫ Ø6h8x20mm Pin | ⑬ Reinforcement Bracket | ⑭ 2 x Vacuum Tube L = 160
2 x Vacuum Tube L = 180 | ⑮ Suction cup bracket V-Shape |
| ⑯ Suction cup bracket I-Shape | ⑰ Torx T30 key Hex key 3 mm
 Torx T20 key | | | |

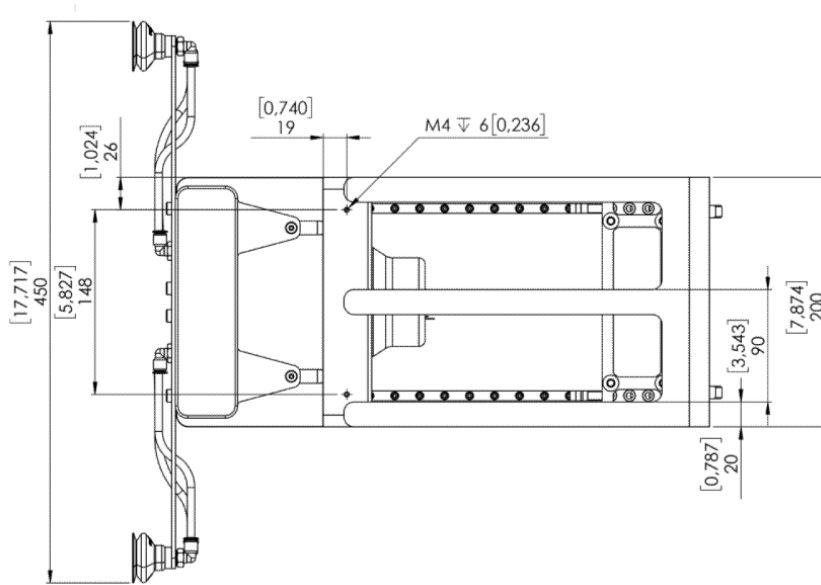
2FGP20 - Fork kit



1.3. 2FGP20 Fork

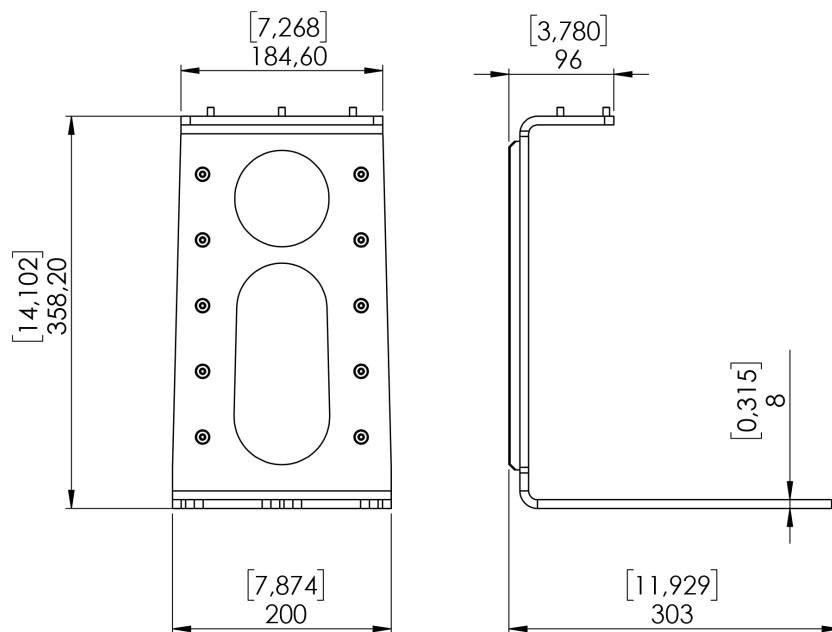
2FGP20 Fork with Narrow short fork





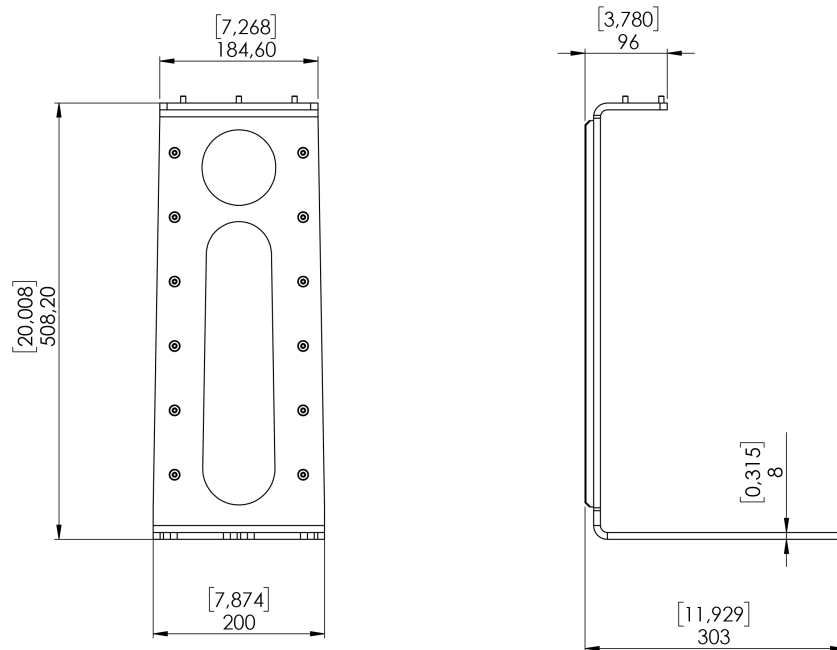
All dimensions are in mm and [inches].

Narrow short fork



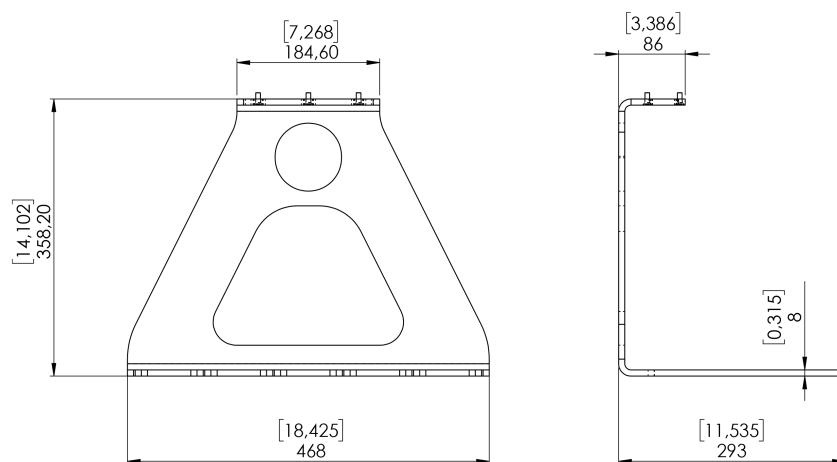
All dimensions are in mm and [inches].

Narrow long fork

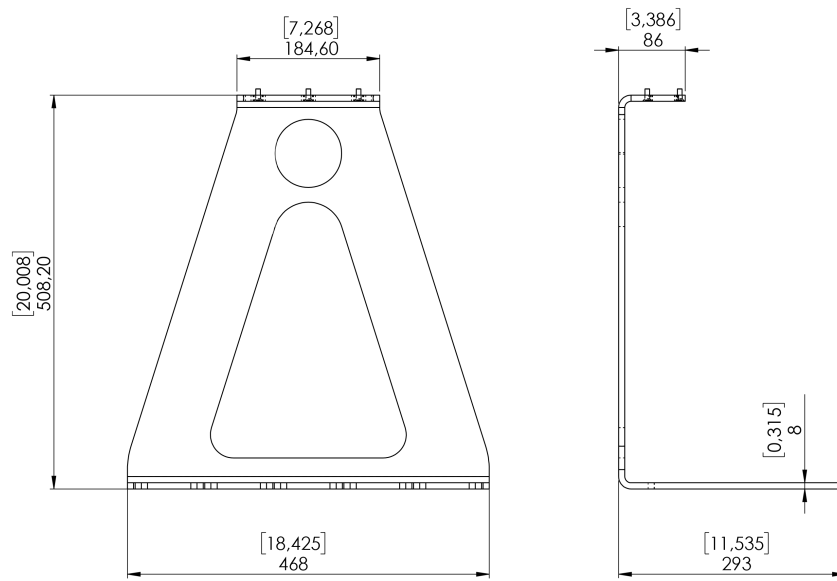


All dimensions are in mm and [inches].

Wide short fork



All dimensions are in mm and [inches].

Wide long fork

All dimensions are in mm and [inches].