



# DATASHEET

LIFT100

v1.1

# 1. Datasheet

## 1.1. Lift100

General Properties		Minimum	Typical	Maximum	Unit
Allowed torque between the Lift100 and the robot	Static (Lift100 is not moving)	-	-	3400	[Nm]
	Dynamic (Lift100 is moving)	-	-	1900	[Nm]
Payload		0	-	100	[kg]
		0	-	220	[lb]
Height above floor		730	-	1630	[mm]
		28.74	-	64.17	[inch]
Stroke of the Lift100		0	-	900	[mm]
		0	-	35.43	[inch]
Lift100 speed		10	-	100	[mm/s]
		0.34	-	3.39	[in/s]
Positioning accuracy *		-	+/- 3	-	[mm]
		-	+/- 0.12	-	[inch]
Positioning repeatability *		-	+/- 0.5	-	[mm]
		-	+/- 0.02	-	[inch]
Noise level **		-	-	75	[dB(A)] <sub>Leq</sub>
		-	-	78	[dB(A)] <sub>Max</sub>
Duty cycle ***		0	-	100	[%]
Weight		86			[kg]
		189.6			[lb]
Dimensions [L x W x D]		730 x 325 x 492	-	1630 x 325 x 492	[mm]
		28.74 x 12.8 x 19.37	-	64.17 x 12.8 x 19.37	[inch]
Storage temperature		0	-	60	[°C]
		32	-	140	[°F]
IP Classification		IP54			

\* Along the driven axis.

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

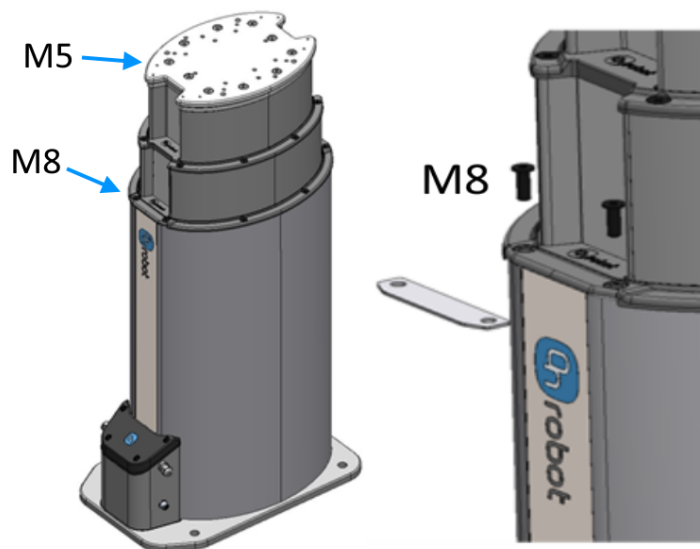
\*\*\* For more information on the duty cycle, see the [Operational Limits](#) section.

Operating Conditions	Minimum	Typical	Maximum	Unit
Power supply	90	-	264	[V]
Current consumption	0	-	10.2	[A]

Operating Conditions	Minimum	Typical	Maximum	Unit
Frequency	47	-	63	[Hz]
Operating temperature	0 32	- -	50 122	[°C] [°F]
Relative humidity (non-condensing)	0	-	95	[%]
Calculated operation life	1 000 000	-	-	[cycles]

### Interface for Mounting an Energy Chain

The Lift100 has been designed with a mechanical interface to mount an energy chain. The brackets for the energy chain can be mounted on the screw holes M5 and M8 shown below. For the bottom holes (M8), the plate can be removed to install the energy chain bracket.



### Noise Level

The noise level of the Lift100 depends on the speed and the stroke position. Higher speed and stroke increase the noise. The noise level also depends on the surroundings and other equipment.

To measure the Lift100'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 Lift100 was bolted to the floor and had a 74 kg robot mounted.
- The test ran 4 cycles, full stroke up and down, 100 % speed and with no pause in between the cycles.
- The noise measurement equipment was located in 2 m distance away from the Lift100.

The test concludes that the average measured noise level was 75 dB(A)<sub>Leq</sub> and the maximum noise level was 78 dB(A)<sub>Max</sub> which is below the maximum allowed noise level of (80 dB(A)).

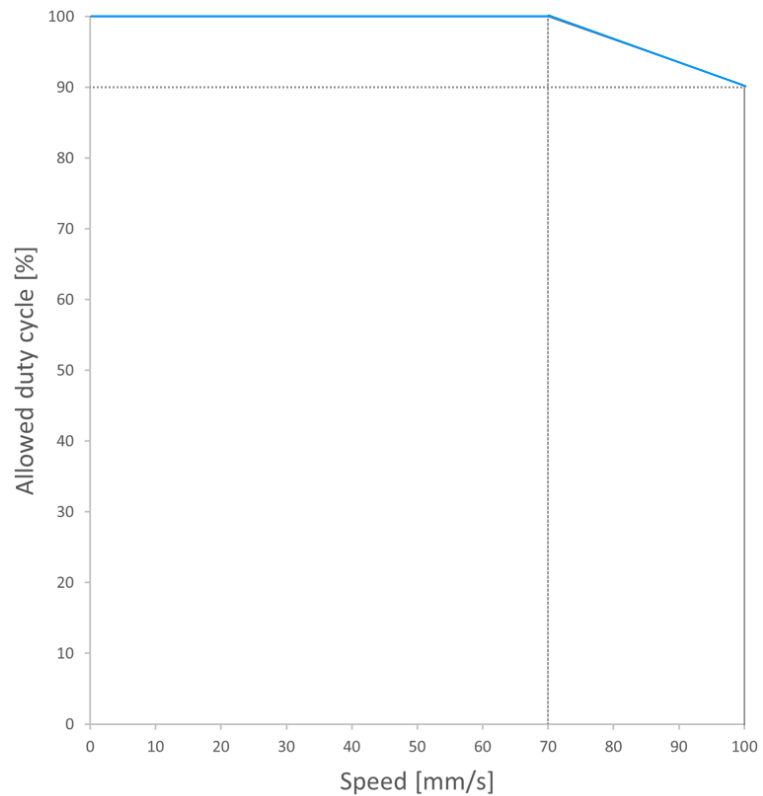
The Lift100 will run about 5-15 % of the time in a normal palletizing application, which means that the average noise level will decrease significantly.

## Operational Limits

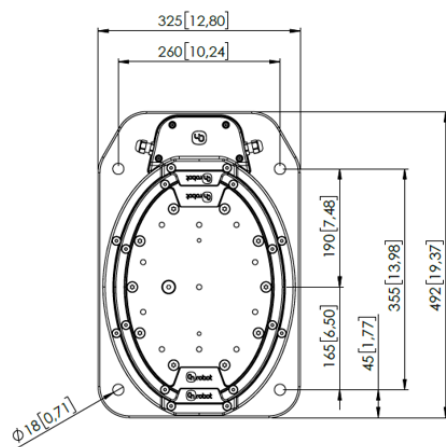
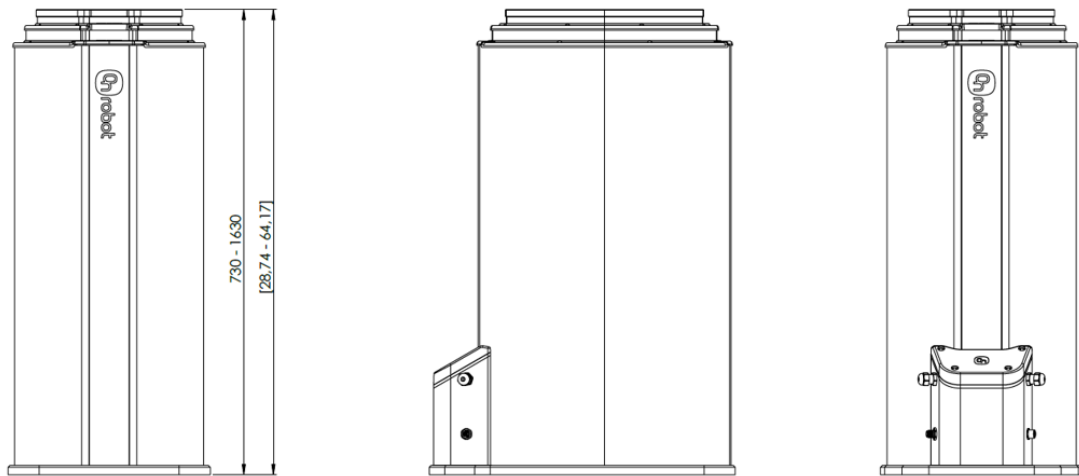
At speeds above 70 mm/s a reduced duty cycle is required. Above 70 mm/s the Lift100 can run continuously for maximum 10 minutes.

The graph shows that at 100 mm/s speed, 90% of the time is the running phase and 10% of the time is the pause.

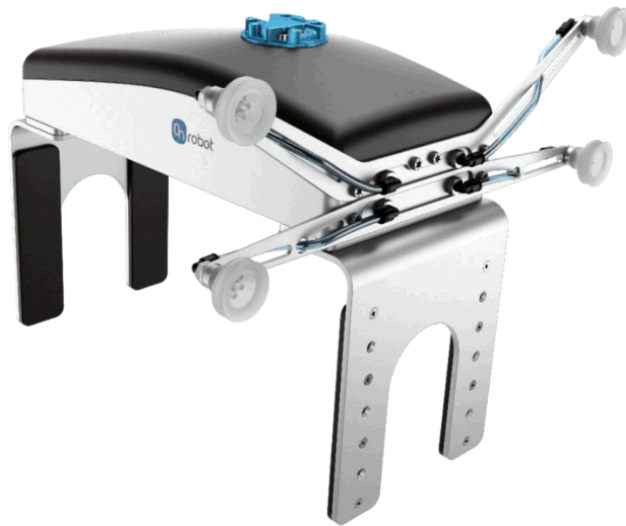
Within the period of 10 minutes of continuous running at 100 mm/s speed, a total of a one-minute pause is required.



## 1.2. Lift100



All dimensions are in mm and [inches].



# DATASHEET

2FGP20

v1.2

# 1. Datasheet

## 1.1. 2FGP20

Finger Grip Properties		Minimum	Typical	Maximum	Unit
Payload		-	-	20	[kg]
		-	-	44.1	[lb]
Total stroke		-	260		[mm]
		-	10.24		[inch]
Grip width range <sup>(1)</sup>		170	-	430	[mm]
		6.69	-	16.93	[inch]
Gripping repeatability		-	+/- 0.5	-	[mm]
		-	+/- 0.0197	-	[inch]
Gripping force <sup>(2)</sup>		80	-	400	[N]
Gripping force tolerance		-	-	+/- 30	[N]
Gripping speed <sup>(3)</sup>		16	-	180	[mm/s]
Gripping time (including brake activation)		-	600	-	[ms]
Noise level <sup>(4)</sup>	Finger gripper	-	-	58 63	[dB(A)] <sub>Leq</sub> [dB(A)] <sub>Max</sub>
	Vacuum gripper	-	-	72 74	[dB(A)] <sub>Leq</sub> [dB(A)] <sub>Max</sub>
Hold workpiece in case of power loss?		Yes			
Motor		Integrated, electric BLDC			

<sup>(1)</sup> When pads are mounted, the minimum value is 158 mm and the maximum value is 418 mm.

<sup>(2)</sup> See [Force vs Current Graph](#)

<sup>(3)</sup> At 6 mm stroke and 150 N. The typical value is 900 ms at 20 mm and 200 N.

<sup>(4)</sup> For more information, see the [Noise level](#) section.

Vacuum grip properties		Minimum	Typical	Maximum	Unit
Vacuum		5	-	60	[%Vacuum]
		- 0.05	-	- 0.607	[Bar]
		1.5	-	17.95	[inHg]
Air flow		0		12	[L/min]
Payload (with delivered attachments)			-	2.5	[kg]
			-	5.51	[lb]
Vacuum cups		1		4	[pcs]
Gripping time (measured with vacuum target 40 %)			0.25		[s]

Vacuum grip properties	Minimum	Typical	Maximum	Unit
Release time		0.4		[s]
Vacuum pump	Integrated, electric BLDC			
Dust filters	Integrated 50 µm, field replaceable			

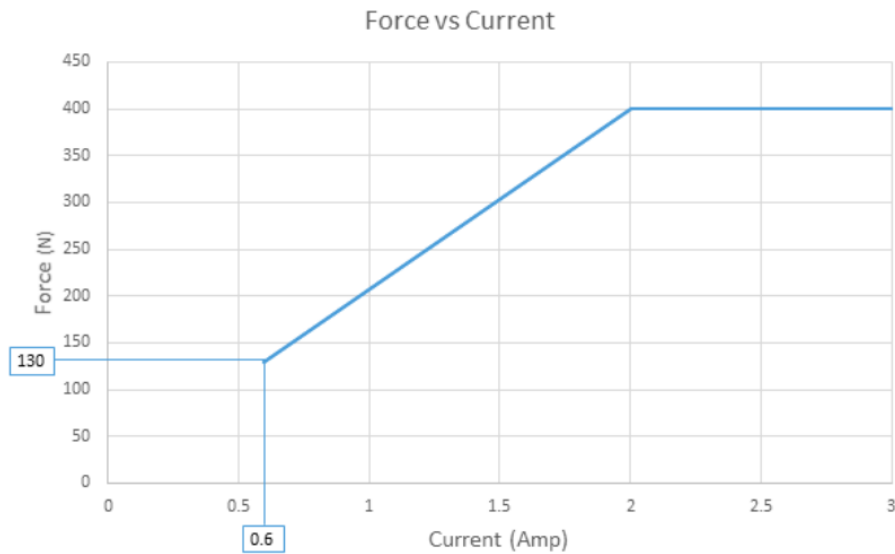
General properties	Minimum	Typical	Maximum	Unit
Storage temperature	0	-	60	[°C]
	32	-	140	[°F]
IP Classification	54			
Dimensions [L x W x D]	400 x 121.6 x 188			[mm]
	15.75 x 4.79 x 7.4			[inch]

Gripper combination	Base unit	Standard fingers including four pads	Vacuum equipment	KLT Finger set	Total weight	Unit
Base unit with Standard fingers including all pads	3.7	1.37	-	-	5.07	[kg]
	8.16	3.02			11.18	[lb]
Base unit with Standard fingers including all pads and all vacuum equipment	3.7	1.37	0.27	-	5.34	[kg]
	8.16	3.02	0.60		11.77	[lb]
Base unit with KLT Finger set	3.7	-	-	0.43	4.13	[kg]
	8.16			0.95	9.11	[lb]
Base unit with KLT Finger set and all vacuum equipment	3.7	-	0.27	0.43	4.4	[kg]
	8.16		0.60	0.95	9.7	[lb]
Base unit with custom fingers	3.7	-	-	-	User defined	[kg]
	8.16					[lb]

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



### Force vs Current Graph



### 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.

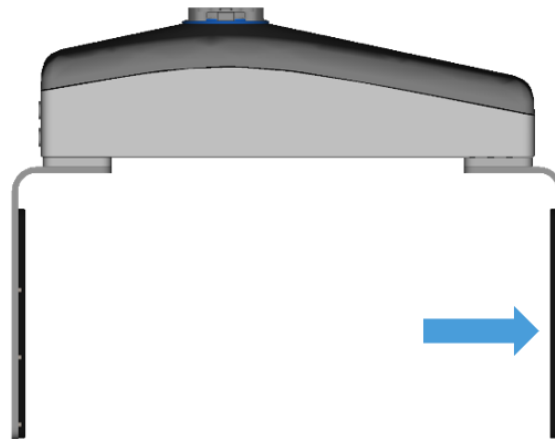
The test setup was the following:

- 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)<sub>Leq</sub> for the finger gripper and 72 dB(A)<sub>Leq</sub> for the vacuum. The maximum noise level was measured below 63 dB(A)<sub>Max</sub> for the finger gripper and 74 dB(A)<sub>Max</sub> 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.

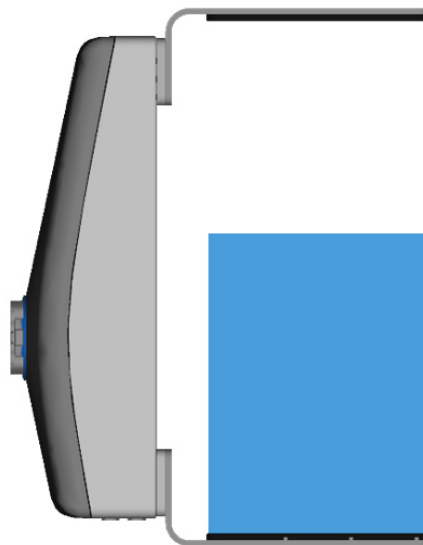
### Force Sensor

The gripper has a force sensor in the moving finger as shown in the figure below.



Consider the presence of the force sensor when the workpiece is aligned by using the fingers of the gripper or when the workpiece is picked sideways since the gravity can affect the force measurement.

If the workpiece is picked sideways, make sure to orient the gripper with the moving finger on top, as shown in the image below. Also ensure that the bottom finger makes contact with the workpiece before the top finger.

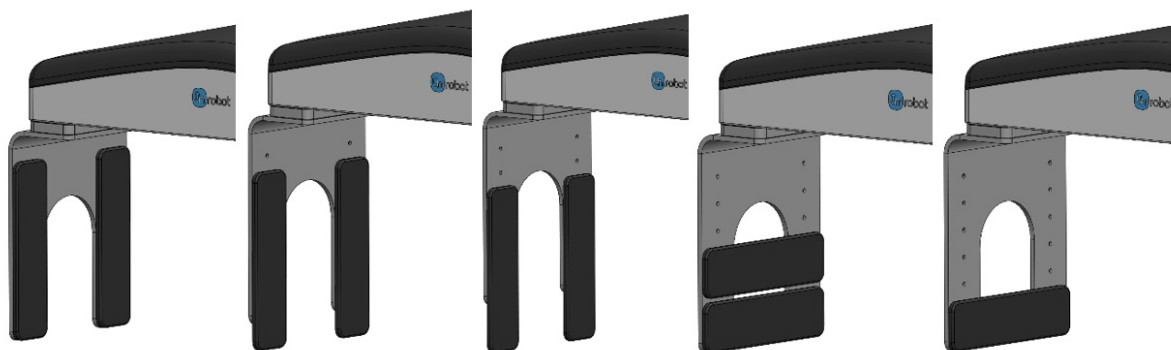


### Finger pads

Four finger pads are provided with the gripper and can be mounted in different configurations to achieve the best grip for your workpiece.



Some examples of how the pads can be mounted are shown below.



The pads are made of aluminum with a cover of silicone. The maximum force (equally distributed in the blue area of the images below) that can be applied to the finger pads is shown in the table below.

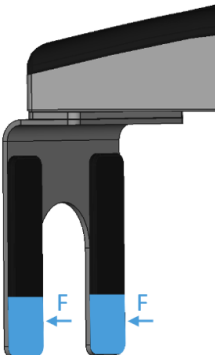
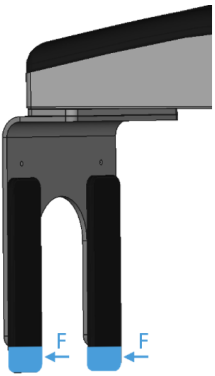
Illustration	Pad position	Maximum force (N)
	0	400
	1	300

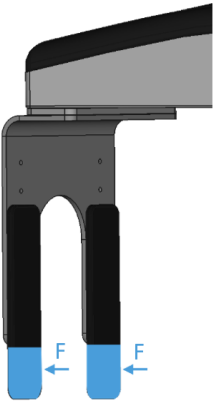
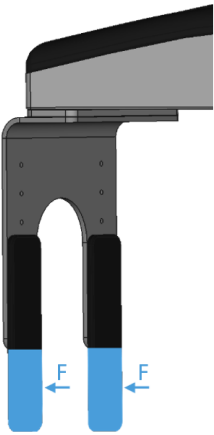
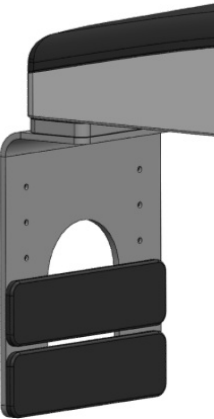
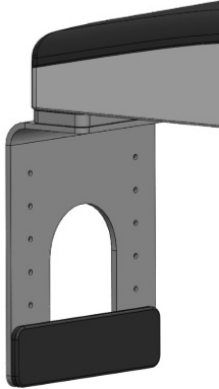
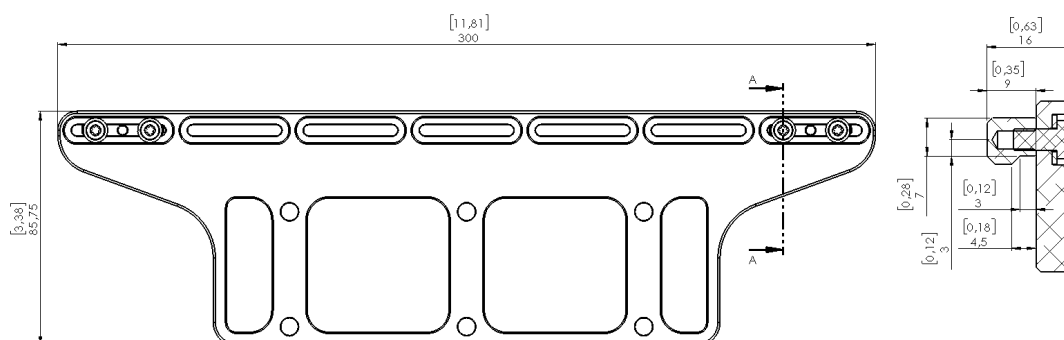
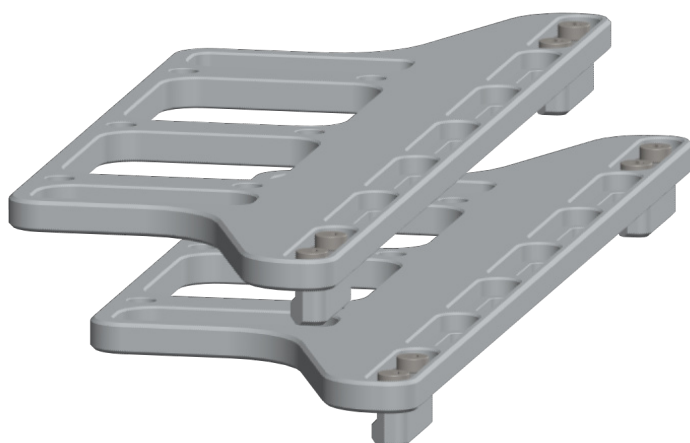
Illustration	Pad position	Maximum force (N)
	2	200
	3	100
	4	400

Illustration	Pad position	Maximum force (N)
	5	400

### Finger set for KLT boxes

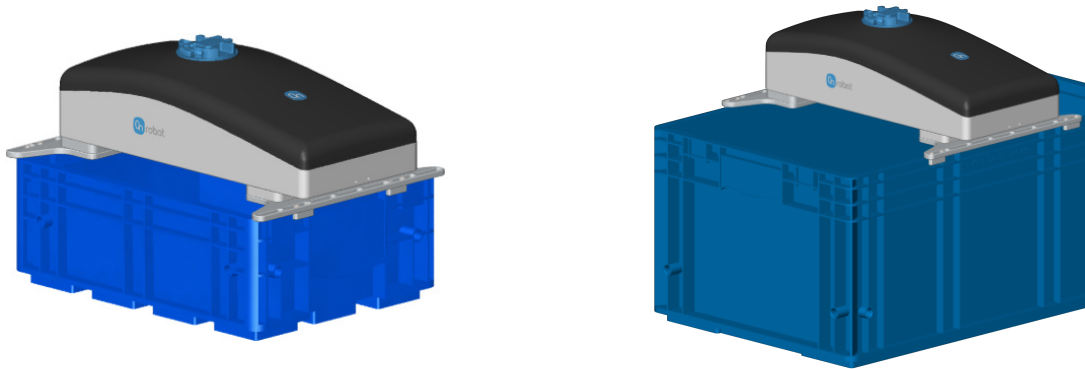
The Finger set for KLT boxes enhances the grip stability for KLT containers and other open box types with groove. The fingertips can be adjusted to the open slots on the large variants of boxes.



These fingers are accessories and need to be purchased separately. To purchase these fingers, please contact the vendor from where the gripper has been purchased.

- 2FGP20 - Finger set for KLT boxes PN 113294

See examples with 400 x 300 mm and 600 x 400 KLT boxes:

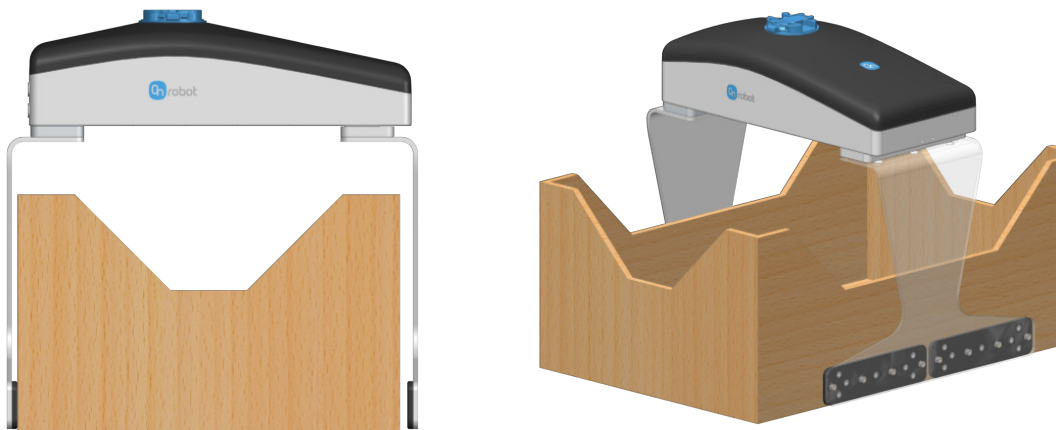


It is recommended to use KLT boxes using the VDA standard 4500. Because of the variance of stiffness in the different KLT boxes, the application needs to be tested in regards to payload and robot speed/acceleration.

### Custom fingers

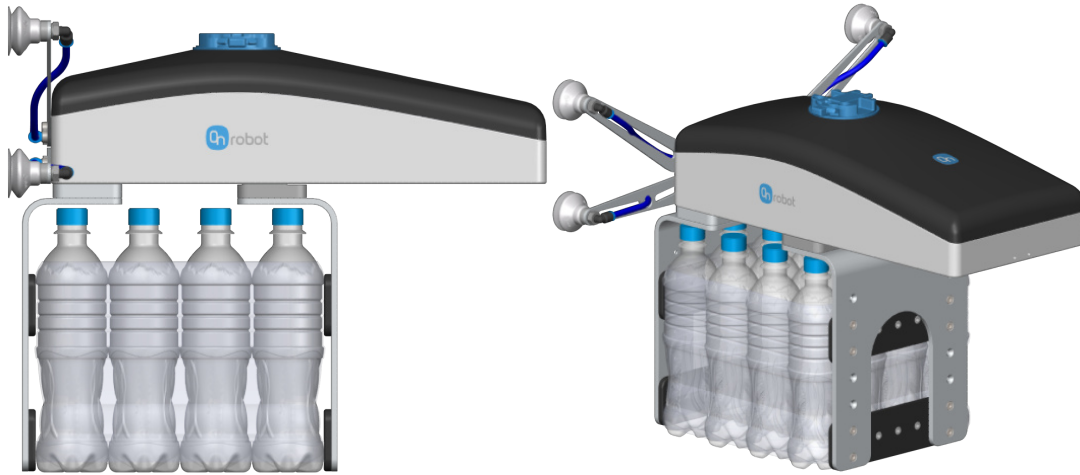
The standard fingers provided with the gripper have a height of 220 mm. For workpieces taller than 220 mm, it is recommended to customize the fingers.

An example is shown in the picture below where the pressure is recommended to be applied at the bottom of the workpiece. To achieve this, custom longer fingers are used, and the fingerpads are attached horizontally. This is the best way to get a firm grip.

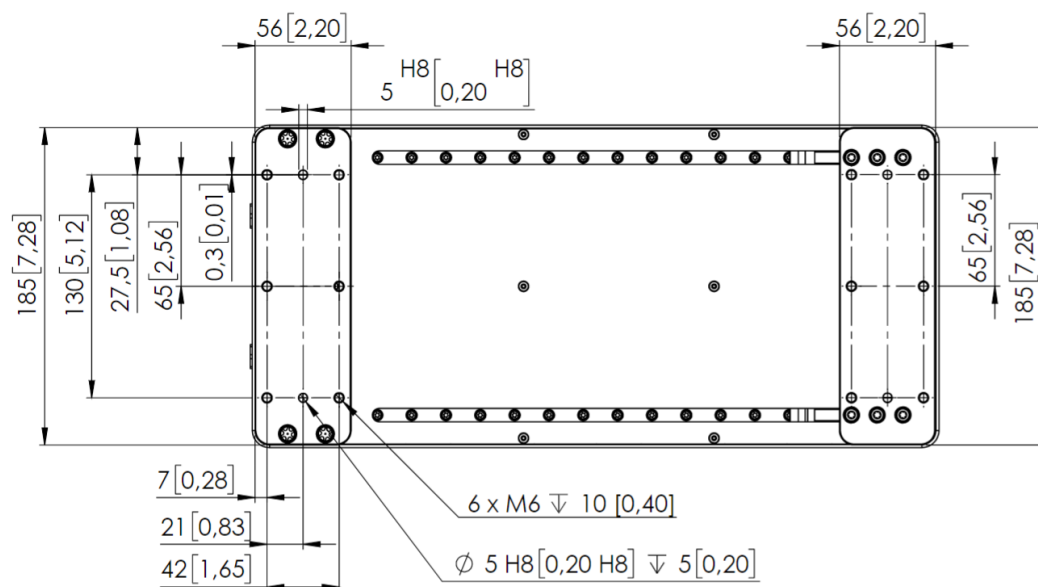


By increasing the finger height, the allowed torque might be reduced as shown in the [Moments in the finger base](#) section.

Another example is shown in the image below for picking wrapped foil bottles. For this workpiece type, it is recommended to mount the pads horizontally to have as many contact points as possible. By doing so, the applied force can be increased and a firmer grip is achieved. Place the pads as close to the bottom of the workpiece as possible, so the workpiece structure is stronger and can resist more force.

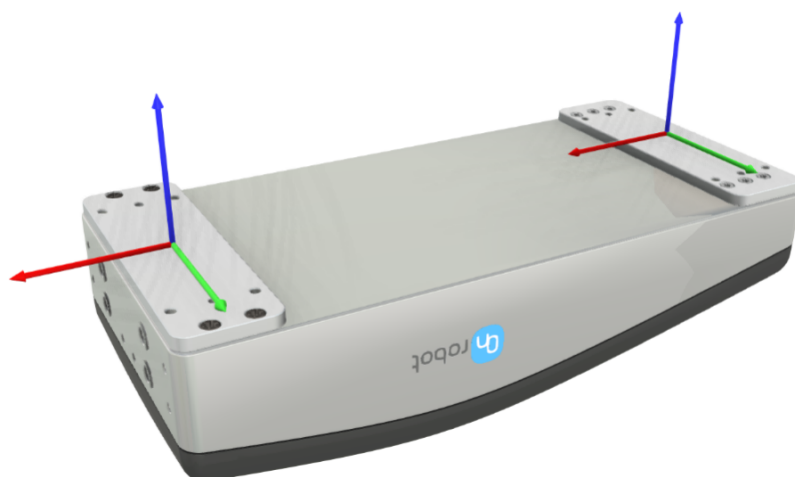


If custom fingers are required, they can be made to fit the gripper according to the dimensions (mm) [inch] shown below. Use M6x10mm screws to attach the fingers.



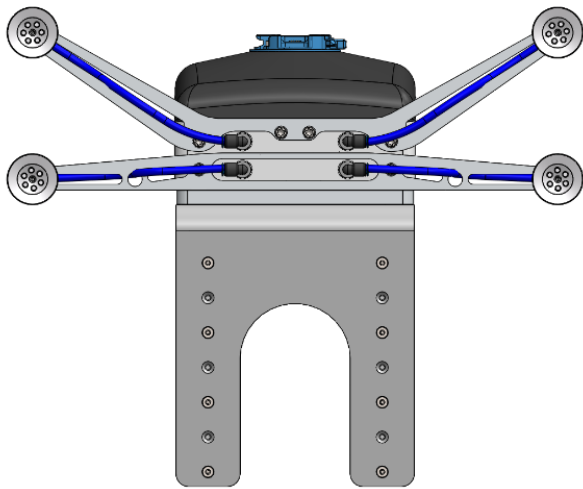
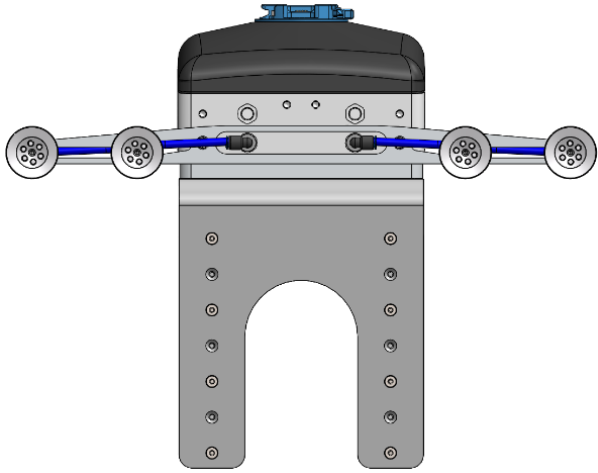
### Moments in the finger base

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



### Vacuum cups

The vacuum solution has been designed to handle slip 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 slip sheets or multiple layer paper	Better for paper or similar slip 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.



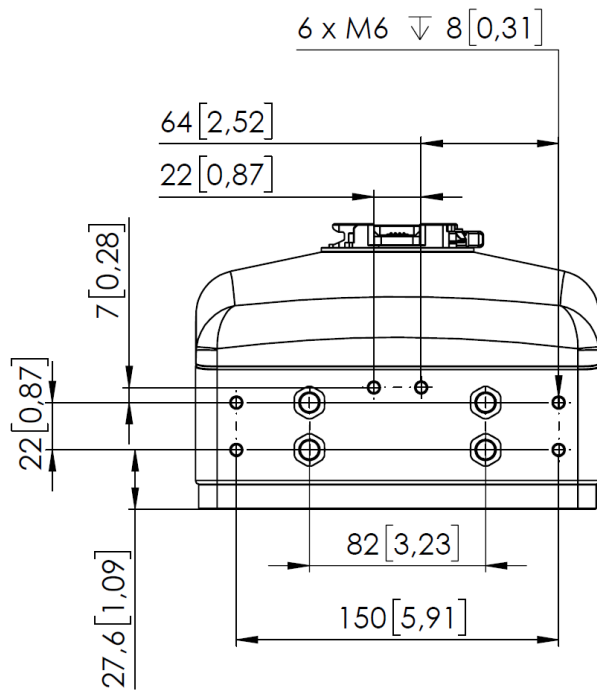
**NOTE:**

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

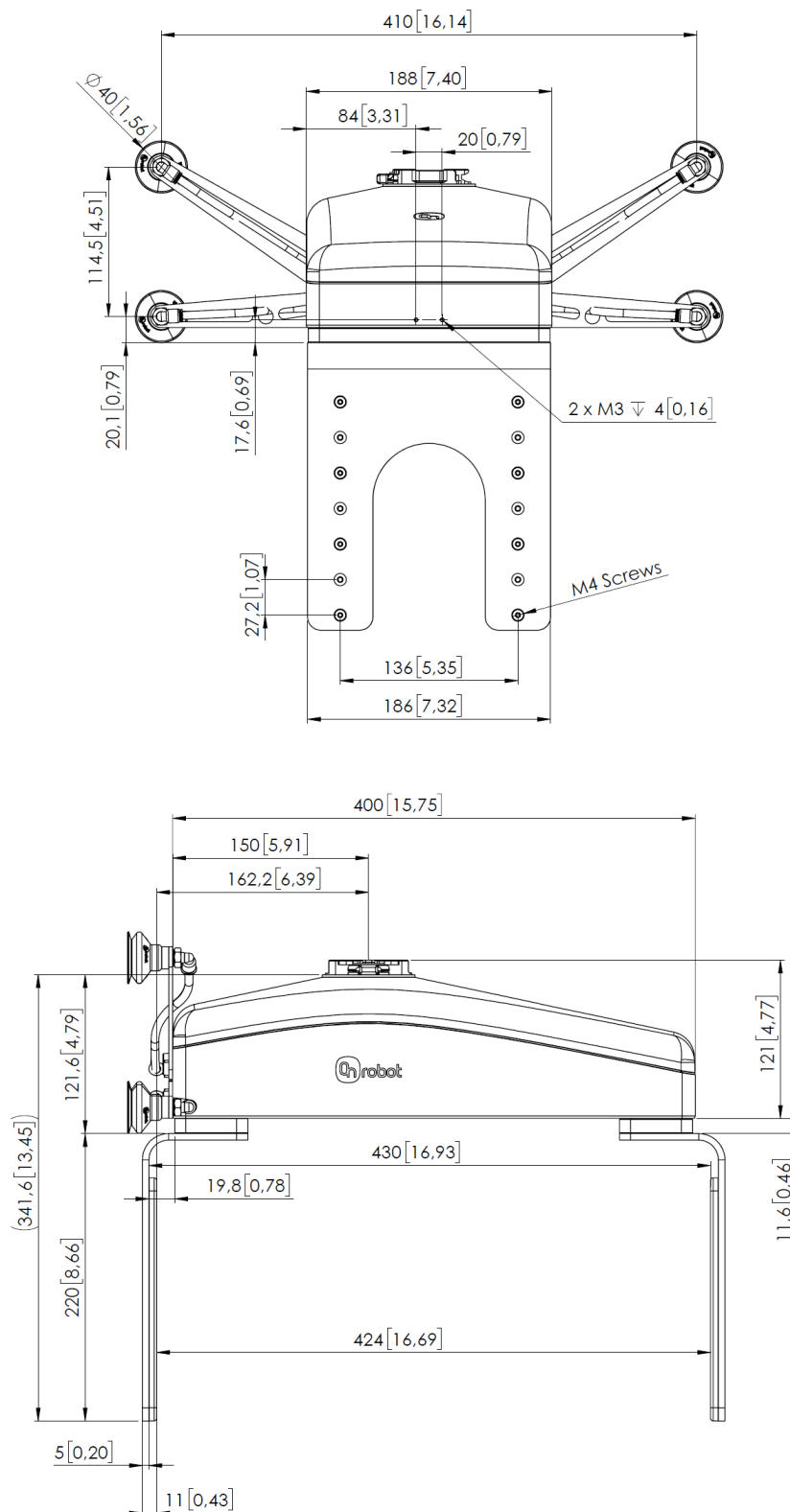


### Custom Vacuum Bracket

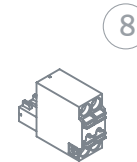
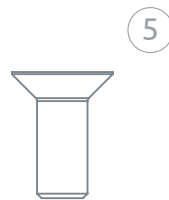
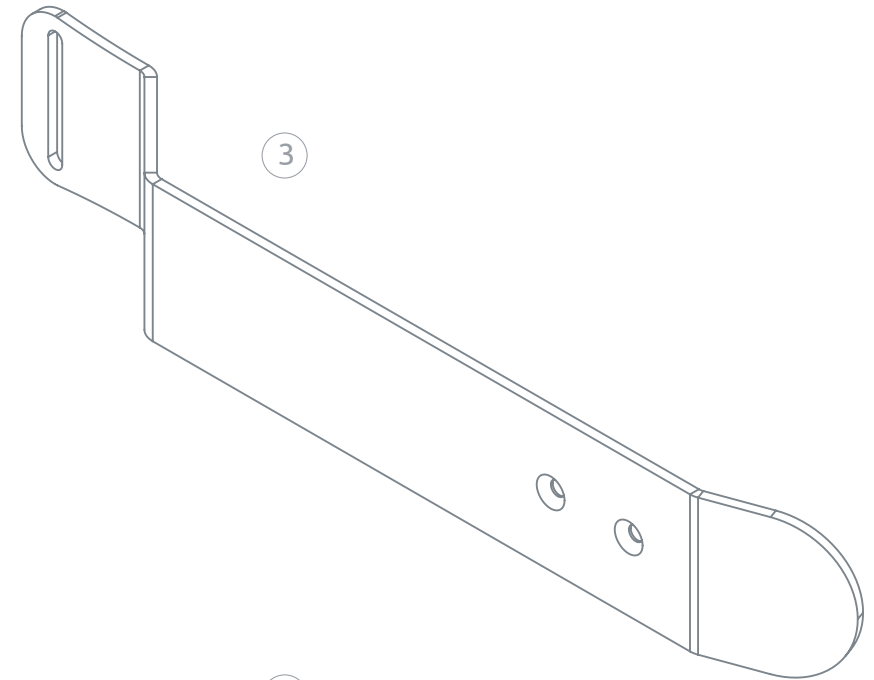
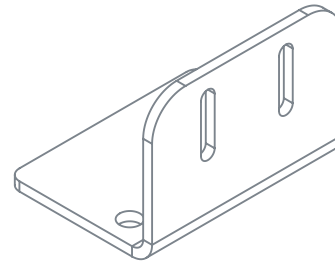
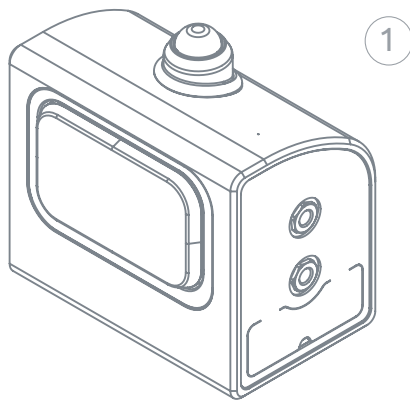
If a custom bracket is required, it can be made to fit the gripper according to the dimensions (mm) [inch] shown below. Use M6x6mm screws to attach the fingers.



## 1.2. 2FGP20



All dimensions are in mm and [inches].



① Sensor Box

② 2 x Angle Bracket

③ Guide Rail

④ 2 x M12x25mm Hex Bolt

⑤ 2 x M12 Countersunk Screw

⑥ 4 x M12 Washer

⑦ 2 x M12 Nut

⑧ Compute Box Terminal Block