



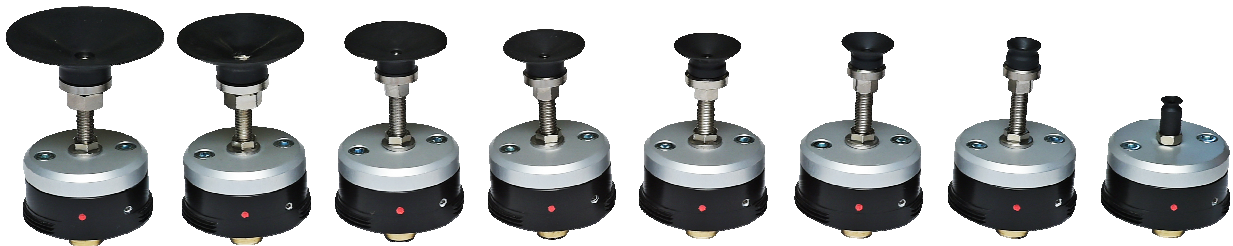
Suction gripper USER MANUAL

Preface

A suction gripper is a simple yet effective gripper for handling of items. By having the atmospheric pressure applied to the surface of an item and the pressure removed inside the suction gripper a clamping force is generated.

There are many advantages using a suction gripper:

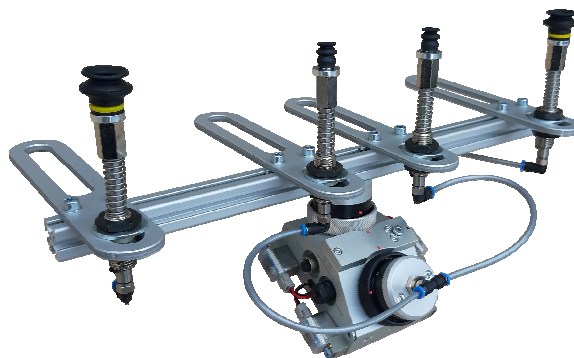
- Enormously selection of different types from many sources.
- Low cost
- No adjustments
- Grip directly on item surface. (no space needed for gripper fingers)
- Items can be placed close together.
- Gently handling yet very powerful.



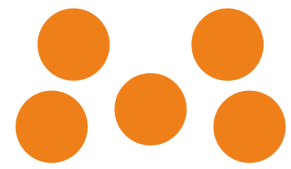
Suction grippers Ø50 Ø40 Ø30 Ø25 Ø20 Ø16 Ø10 Ø6 [mm]



Suction gripper cross 4xØ50



Suction gripper with two individual groups



Vacuum generation

The Toolbase uses an industrial standard venturi pump delivering 85% vacuum and a flow of 6 l/min.

Feedback

The ToolBase measures the pressure inside the suction gripper. When the pressure is below a predefined level the ToolBase signals back to the robots an item is grapped.

Pick & Place timing:

This venturi principle of vacuum generation is way faster than electrical motor based vacuum pumps therefore the reaction time is typically a few milliseconds in comparison to the 300 milliseconds or more to what motor based pump uses.

Also at place the ToolBase is fast as a release blow is generated directly into the suction cup. In comparison many electrical suction grippers only releases to neutral pressure resulting in a long delay before the robot can move away after a place.

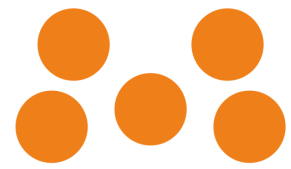
CASE: Timing cost:

A robot cell handles 1 item every 1 minute for one year at a cell cost of \$100/hour and a vacuum/release generation time of 0,5 second the year cost is: \$7300

Typical electrical vacuum gripper cost: $(365 * 24 * 60 * 0.5) * (\$100 / (60*60)) = \$7300$

Typical venturi vacuum gripper cost: $(365 * 24 * 60 * 0.1) * (\$100 / (60*60)) = \$1460$

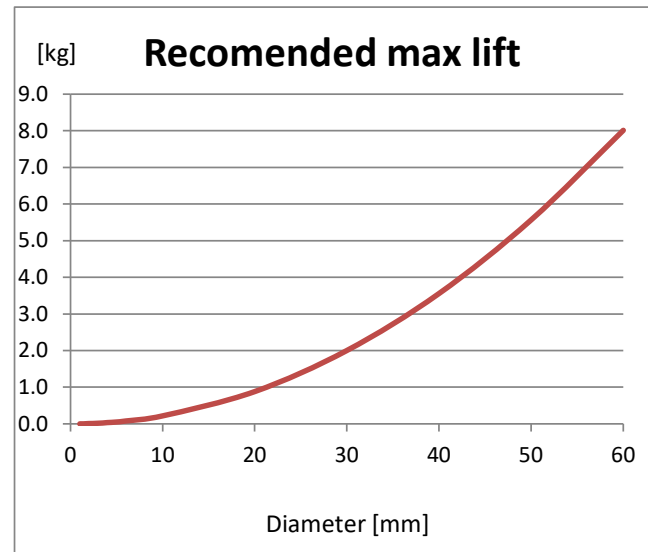
Yearly savings: $\$7300 - \$1460 = \$5840$

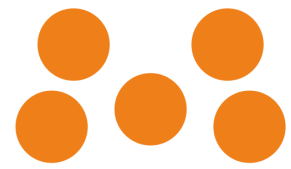


Lifting capacity

Vacuum level 0.85
Safety factor 3

Cup size [mm]	Cup area [cm ²]	Theoretical lift [kg]	Recommended lift [kg]
1	0.008	0.007	0.002
2	0.031	0.027	0.009
4	0.126	0.107	0.036
6	0.283	0.240	0.080
10	0.785	0.668	0.223
20	3.14	2.67	0.890
30	7.07	6.01	2.00
40	12.6	10.7	3.56
50	19.6	16.7	5.56
60	28.3	24.0	8.01





Important message.



The suction gripper is part of a partly completed machinery. A risk assessment is required for each usage.

It is the responsibility of the robot integrator to make the risk assessment and that all safety requirements and local regulations are complied with.

Pneumatic gripping technology relies on stable electrical and compressed air supply. If supply is discontinued including control signals a picked item might drop.

Protect the suction gripper from damaging chemical and physical effects including but not limited to: Corrosive substances, solvents, extreme temperatures, radioactive radiation, extreme magnetic fields, small objects as powder/dirt, extreme mechanical vibrations, electrical currents and discharge.

Newer user a damaged gripper

Refer also to ToolBase manual.

Contact

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