GOUDSMIT
MAGNETIC SYSTEMS

User manual (EN)

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www.goudsmit-magnetics.nl

MagVacu® Combi Gripper TPMV

GENERAL

- The data published in this manual are based on the most recent information. They are published subject to changes at a later date. For further info, please contact Goudsmit Magnetic Systems B.V.:
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- The "General Conditions for the Supply and Erection of Mechanical, Electrical and Electronic Products (SE 01)", published by Orgalime in Brussels in September 2001 apply to this product.
- The guarantee on your Combi Gripper will be void if it is opened, if basic changes are made to it without permission or if the Combi Gripper is used injudiciously, wrongly or for purposes other than for the gripping of products with the help of magnetic and/or vacuum force.

SAFETY

- The magnet generates a strong magnetic field. Be aware that ferromagnetic parts that enter the magnetic field can be suddenly forcefully attracted.
- People with a pacemaker are not allowed to be present within the magnetic field (radius of at least 0.5 m) of the Combi Gripper.
- Credit cards, chip cards, screens, watches, etc. can be damaged irreparably if they are present within the magnetic field (radius of at least 0.5 m).
- The Combi Gripper has a safety protection and is not allowed to be opened, not even to carry out repairs!
- The Combi Gripper is used for hoisting loads. Danger is always present when transporting hoisted loads!
- Falling loads can cause danger to people passing below. Adopt protective measures and ensure that there are proper instructions and operating rules. Never pass below a hoisted load.
- To the best of our knowledge, permanent magnetic radiation does not endanger health.

ADVANTAGES

The Combi Gripper offers many advantages:

- Double strength, therefore ferromagnetic products can be handled with double safety.
- Also perforated products can be handled with the help of the magnet system.
- Also non-ferromagnetic products such as aluminium and stainless steel can be handled with the vacuum system.
- A Combi Gripper is available for any plate thickness to be handled.
- It is possible to lift thin plates (temporarily) one by one by means of only vacuum force.
- Antislip magnetic work surface due to wear resistant PUR-Profile.
- With the application of a permanent magnet system, the Combi Gripper needs no electricity.

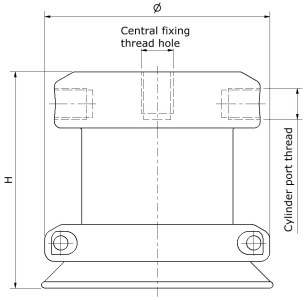
TECHNICAL DATA

Temperatures: Suited for ambient temperatures of -20 to +40°C.
Noise: The noise pressure level of the Combi Gripper is less than 70 dB.
Vibration: The vibration generated by the Combi Gripper is negligible.
Air pressure: Maximum 6 bar (see over for recommended connection pressures).
Hoisting strength: See Table 1. The hoisting strength for different plate thicknesses is stated.

Type code	ØxH [mm]	Central fixing thread hole	Cylinder port thread	Weight [kg]	Steel plate thickness [mm]	Magnet force [N]	Vacuum force [N]	Combined force [N]
TPMV040024	42x37	M8	M5	0,08	≥0,5	20	70	90
TPMV040028	42x57	M8	M5	0,10	≥1,0	35	70	100
TPMV070024	72x51	M10	G1/8"	0,32	≥1,5	135	260	370
TPMV070026	72x67	M10	G1/8"	0,36	≥2,0	170	260	400
TPMV070028	72x84	M10	G1/8"	0,38	≥2,5	200	260	440
TPMV100024	100x48	M10	G1/8"	0,56	≥1,0	205	540	600
TPMV100028	100x65	M10	G1/8"	0,68	≥2,5	370	540	760

Table 1: Data Combi Grippers

Information table
Weight: Own weight.
Steel plate thickness: appropriate steel plate thickness, with magnet force lifting only 1 plate.
Magnet force: Magnet strength with specified steel plate thickness.
Vacuum force: vacuum strength with a flat plate with a vacuum pressure of -0.7 bar.
Combined force: combined strength without safety factor.



The given magnet strengths are for ideal circumstances.
Factors that may reduce these strengths are:

- Air fissure between plate and magnet (also an isolator such as e.g. a paint layer can work like an air fissure).
- Contact surface: both plate and magnet must be as dry, smooth, clean, and level as possible, without cracks, rust or burrs or flash.
- Plate thickness: in the case of a thin plate, the magnet has less hoisting strength.
- Perforation degree: in the case of a perforated plate the hoisting strength is reduced.
- Bending: in the case of a plate bending there is a "peeling effect", resulting in a great reduction of the magnet strength.
- Temperature: a higher temperature reduces the hoisting strength.
- Material for hoisting: see Table 2 for reference:

material	hoist str. (%)
St 37 (0,1-0,3% C)	100
non-alloys (0.4-0.5%C)	90
alloys F-522	80-90
AISI 430 magnetic st. steel	50
cast iron	45-60
AISI 304 st. steel / nickel	0-10
Brass, aluminium, copper, etc.	0

Table 2: Relative magnet strengths with various materials

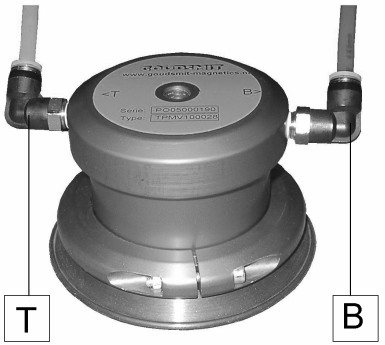
Also the given vacuum strengths can be (negatively) influenced; in particular by the roughness and flatness of a plate.

MAINTENANCE

Depending on using circumstances, vacuum pad and bottom lid should have to be checked once a week, or at least once a month on pollution and wear.

CONNECTIONS

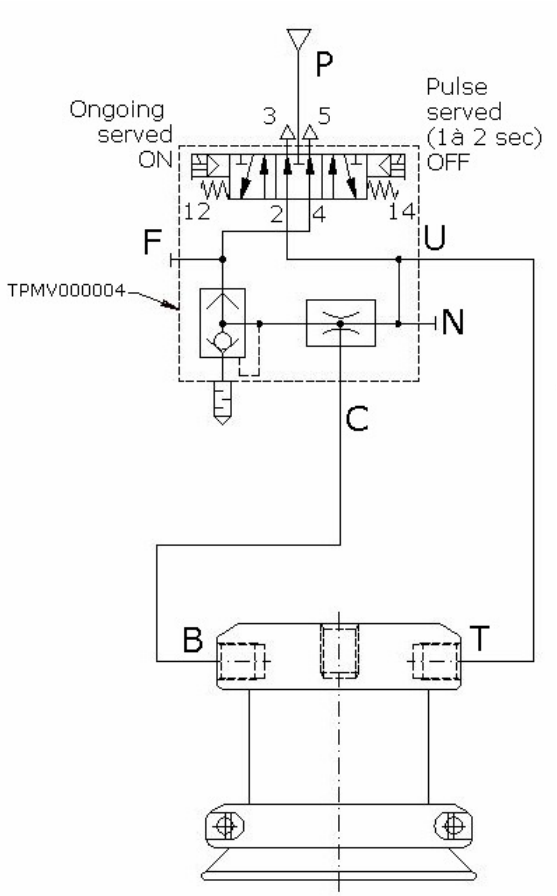
By connecting two compressed air tubes (connections 'T' and 'B') the Combi Gripper can be switched on and off. Connection 'T' (Top) switches on the magnet force, connection 'B' (Bottom) switches it off. Also, via connection 'B' the vacuum force is created.
The Combi Gripper itself operates bistably: the most recent switching order is maintained.
If you have your own vacuum connection, the Combi Gripper can be operated with only a 5/3-valve, if you do not have one you can use the Goudsmit vacuum blow off valve (TPMV000004) with integrated vacuum venturi. On the reverse side the pneumatic diagrams of 3 possible connections are given.



Pneumatic diagram Standard situation

In this situation the vacuum connection is created by means of a Goudsmit vacuum blow off valve (TPMV000004, see box).

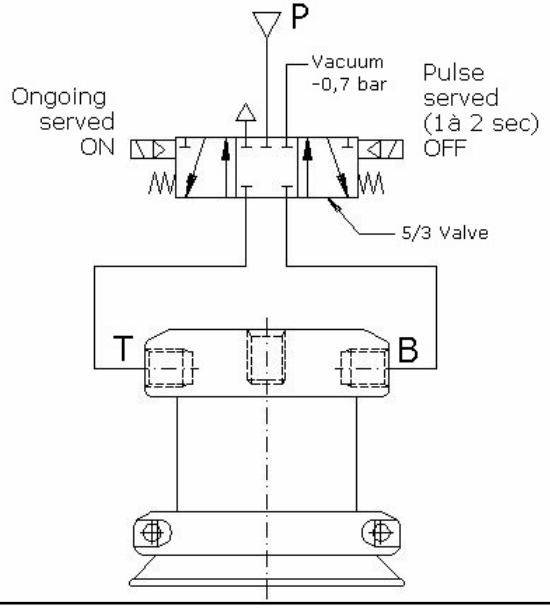
- Compressed air connection: 5.5 bar
- Realised vacuum pressure: -0,7 bar



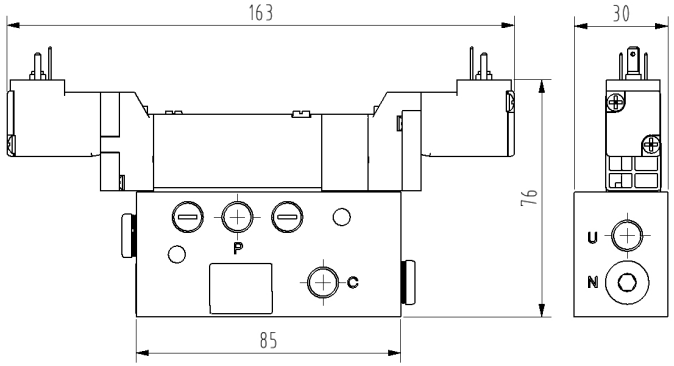
Pneumatic diagram Alternative 1

If you already have a vacuum connection (-0.7 bar) you can opt for this connection with 5/3-valve.

- Compressed air connection: 4 bar
- Vacuum connection: -0.7 bar



Goudsmit vacuum blow off valve TPMV000004



Technical data:
Maximum connection pressure (P): 6 bar.
Optimal connection pressure (P): 5.5 bar.
Realised vacuum pressure (C): -0.7 bar (with P 5.5 bar).
Air consumption (in 'on' position): 11.5 l/min.
Dimensions: Connection P, C and U: G⅛".
Electric current: 24V DC.
Temperatures: suited to ambient temperatures of -5 to +50°C.

Pneumatic diagram Alternative 2

If you want to use (temporarily) only the vacuum force (with no magnet force, therefore), the following connection is possible.
In this case, the magnet force is 'switched off' for a moment when the 3/2-valve is switched on at the same time as the 5/3-valve. As soon as the 3/2-valve is switched off, the magnet force comes into operation.
This is handy for example for using a Combi Gripper to lift also thinner plates (than those referred to in table 1) one by one from a stack.
Also in this case the vacuum connection is created by means of a Goudsmit vacuum blow off valve (TPMV000004).

- Compressed air connection: 5,5 bar
- Realised vacuum pressure: -0,7 bar