



HOVER TRANSPORT SYSTEMS

ORIGINAL INSTALLATION MANUAL

DIY AIR CASTER SYSTEM

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1. INTRODUCTION

Congratulations with the purchase of your DIY air caster system at Hover Transport Systems!

Before operating this equipment, please thoroughly read this manual to ensure safe and successful installation of the DIY air caster system in your own machine/ device.

Operators should not operate the complete system prior to training, using the operating manual of the final assembled machine/ device. Make sure they understand the risks of moving heavy loads and follow the safety recommendations, instructions and warnings in that manual.

All information in this manual remains property of Hover Transport Systems and may not be used (other than for the benefit of operating the system), copied, duplicated or disclosed or handed to a third party without our prior written permission.

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1.1 SYMBOLS



Dangerous, make sure to follow these safety instructions!



Useful tip

1.2 OPERATING ENVIRONMENT

The DIY air caster system is designed to be used in a certain environment.

1.2.1 AIR SUPPLY REQUIREMENTS

The air supply system needs to produce enough flow (air volume) against sufficient pressure in order to run the system properly. We recommend a minimum inlet air pressure of 6 bar (87 psi) and a maximum of 10 bar (145 psi).

Air consumption numbers can be found in the specification sheets of the product pages in the appendixes and on our website. Total capacity of the air system is a result of compressor capacity and air buffer tank(s).

The air from the compressor must be sufficiently dried and filtered. The air caster system is an open system so liquids and debris will eventually come out. When the air supply system doesn't meet these requirements, it will result in higher wear or malfunction.

1.2.2 SURFACE REQUIREMENTS

Air casters need to build up pressure between the air chamber and the floor. Therefore, the surface needs to be non-porous and have a smooth finish. Most facilities have a machine trowelled concrete floor, that will work perfectly. The table on the left shows roughly what surfaces will and will not work. A rougher, more porous surface will result in more air consumption.

The flatness of the floor has an impact on how the air casters perform. The maximum height deviation is set out against a

MATERIALS

Epoxy coated concrete:	✓
Plastic & steel sheet material:	✓
Machine troweled concrete:	✓
Manual troweled concrete:	✗
Asphalt:	✗

LENGT (M)	ΔHEIGHT (MM)
0,1	1
1	3
5	9
10	12
15	15

certain horizontal length. When the maximum height is exceeded (see table on the left), the air casters will not work properly.

The levelness doesn't affect the performance, but is a safety matter. When the floor is too steep, objects may start to move on their own, because the air casters make the object hover above the floor.

Small, superficial cracks in the floor are no problem. Cracks need to be filled when they are so deep that air can pass through. This is also the case with expansion joints. The gaps need to be filled first and then sealed with polyurethane sealing material.

Metal, linoleum (without texture) or plastic sheets can be placed over the floor when it doesn't meet the above-mentioned requirements. This is a temporary solution to make it fit for air caster transport. Note that the thickness of this material shouldn't be more than 1 mm (0,4"). When thicker material is used, a small ramp must be constructed by sanding the sides of the material or fixing them to the floor with a thin tape.

1.2.3 TEMPERATURE REQUIREMENTS

The system is designed to work within a temperature range between -10°C and 60°C (14°F – 140°F). Outside this range the system will wear faster or fail to operate.

We can use different materials to withstand a higher maximum temperature. Please contact Hover Transport Systems if there is a need for this.

1.2.4 FLUIDS AND DEBRIS

Make sure that the transportation path is free of production debris and abrasive chemicals such as cutting oil and hydraulic fluid.

1.3 THE EQUIPMENT

1.3.1 UNBOXING



Immediately on arrival, inspect if the packaging is damaged during transportation. If the package is damaged and the products inside as well, contact Hover Transport Systems and make pictures of how the goods have arrived at your facility.

Open the packaging carefully to not damage the system and especially the air caster bladders. Don't use a knife or other sharp objects to open the packaging.

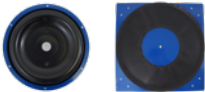
When a case is ordered together with the DIY system, check if this case is damaged during transportation.

1.3.2 THE CONTENTS

Once the packaging is opened, inspect the contents to verify the proper quantity, size and model numbers.

If there are any shortcomings or damaged components, please contact Hover Transport Systems immediately.

A standard DIY air caster system should include the following:



- 4 or 6 air casters *



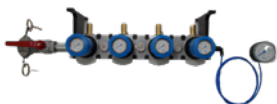
- 4 or 6 centre support plates



- 4 or 6 air couplings that have the correct fitting for the air caster type and a hose socket for connecting the air hoses



- 4 or 6 bolts for connection to machine/ device



- 1 air control unit assembly with either 4 or 6 air outlets with:
 - 4/6 Air couplings
 - 4/6 Air regulators with integrated manometers
 - 1 Meter air hose
 - 1 Manometer with all necessary couplings
 - 2 Mounting brackets
 - 1 Air inlet camlock coupling with a ball valve



- 1 Installation manual

*The air caster dimensions can be found in the specification sheets in Appendix I

**Lengths can be derived from the type number. Type number breakdown is explained in paragraph 1.3.3

1.3.3 HTS TYPE NUMBER BREAKDOWN

We use two methods for identifying our complete product portfolio.

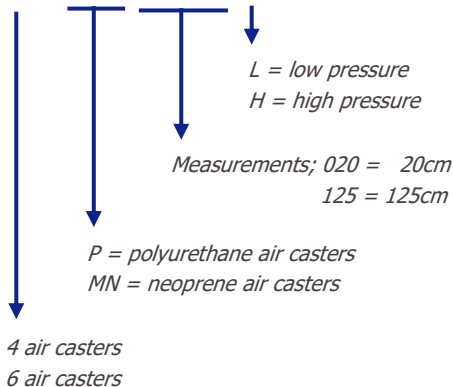
The first one is the **HTS type number**. This is the method that describes the functional product with its measurements, performance and other specifications.

The second one is the S(tock) K(eeping) U(nits) code. These **SKU codes** are unique and contain all product information such as materials used, air hose lengths and other specific options.

First, we will describe the HTS type number for our DIY air caster system:



DSx-xxxxxxx



Example DIY air caster system: DS4-P20L

- *DIY system*
- *4 air casters*
- *Polyurethane air casters*
- *20 cm*
- *Low pressure*

1.3.4 BREAKDOWN SKU CODE

When re-ordering a specific product, it is best to use the SKU code because this code contains all necessary information regarding the product. This way the exact product can be ordered with the right materials and options.

Find the breakdown for the SKU codes of our DIY air caster systems below:



0.0.0.0.0000.000.0

air casters = 1
air caster systems = 2
air caster parts = 3

modular system = 1
DIY system = 2

4 air casters
6 air casters

0 = no transport case
1 = transport case

1 = 10m air supply hose
2 = 20m air supply hose
4 = 40m air supply hose

35 = 3&5m interconnect hoses
57 = 5&7m interconnect hoses
71 = 7&10m interconnect hoses

Air caster type description

L = low pressure
H = high pressure

Measurements; 020 = 20cm
125 = 125cm

1 = NM (neoprene)
2 = P (polyurethane)

Example air caster: x.x.1.x.090H.xxx.x = NM90H air casters (HTS type number)

(Measurements and details can be found in Appendix I)

Example DIY air caster system: 2.2.2.4.020L.000.0

- Air caster system
- DIY System
- P20L air casters (polyurethane 20cm, low pressure)
- 4 Pieces of air casters
- Not in use

- *Not in use*
- *Not in use*

2. PREPARATION & INSTALLATION

2.1.1 SAFETY INSTRUCTIONS BEFORE INSTALLATION



Inspect each component before every move and check on missing parts or damage. Also check the state of the air bearing bladders. If they are worn so far that the threads are visible through the rubber or if there are holes in material at certain places, replace the bladder with a new one.

Also check if all the bolts on the air casters are still tight. If not, please tighten them with a force of 3Nm.

Check if all hoses and fittings are free of debris, are in good condition and are properly fixed.

Always use the following personal protective equipment: safety glasses, helmet, safety shoes and ear plugs when necessary.

Compressed air



Be cautious with the use of compressed air. All air connections (hoses, couplings and other connections) need to be fastened properly and the safety connectors need to be installed in the right way to prevent them from loosening and causing injuries. Never exceed the maximum pressure that is mentioned on the identification plate. And never disconnect a pressurized air hose!

The noise can be harmful to your hearing when it is not used properly. When air hoses or connections are loose or the air casters aren't placed under the load properly, the noise level could go up.

No complete machine/ device

This delivery is not a complete machine/ device. The manufacturer of the complete machine has the responsibility of the complete system and will also deliver the final Operation & Maintenance Manual that needs to be read and applied during use.

This Installation Manual applies to the original delivery from Hover Transport Systems. Any alterations that will be made to the original equipment will ensure that this installation manual and its certificates are no longer valid.

2.1.2 INSTALLATION

Inspect each component before every move and check on missing parts or damage. Also check the state of the air bearing bladders. If they are worn so far that the threads are visible through the rubber or there are holes in the material at certain places, replace the bladder with a new one.

Follow these installation instructions closely and execute them in the order as described below.

Properly fix all pneumatic connectors by using thread seal tape. The system is delivered without permanently fixed air connectors, so the system can be easily installed into your machine. A dangerous situation can occur when pneumatic connectors aren't fixed properly.

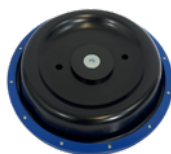


I. Install the air casters

Use at least a 3 air casters configuration to create a stable support situation. 4 pieces are recommended for a more stable and safer situation!

Make sure that the maximum capacity in weight and pressure of each individual air caster is never exceeded! Look at the individual load points and what their weight is. The total capacity can be less or equal to the total weight of the object, but when the load is not distributed evenly the maximum weight of one air caster can still be exceeded!

Place the support plate on top of the air caster and insert the bolt as shown in the picture below.



Insert the air coupling and use thread seal tape to properly fix it as shown in the picture below. Or make sure that your machine's/ device's air outlet is placed exactly above the inlet of the air caster so no air can escape between air caster and machine/ device.



Then fasten the bolt until the air caster is properly fixed to the machine/ device.

II. Install the air control unit

Mount the air control unit to the machine/ device using the mounting brackets, see picture below.



Make sure that there is enough space for the air inlet and air outlet hoses.

Mount the manometer to the machine/ device and insert the blue air hose in the elbow connectors to properly secure them. See picture below.



III. Connect the interconnect air hoses

Cut the interconnect air hoses (not included in this system) to the correct length. Connect the hoses to the couplings of the air casters and make sure they are fixed properly, using clamps. If they are not connected properly, they can get disconnected and a dangerous situation can occur. Specific air connectors can also be made for your own machine/ device, but make sure they are



properly fixed and the air outlet is exactly above the air inlet of the air caster and no air can escape between air caster and the connector.



Connect the other end of the hose to the air control unit in the same way as described above. Make sure that there are no sharp bends, this can affect the airflow to the air casters.

IV. Connect the air supply hose



Finally connect the air supply hose from your machine/ device to the air inlet coupling. Make sure that the air supply is closed off completely!



Connect the coupling to the camlock coupling of the air control unit and make sure that the safety pins are inserted properly, see picture below.



The DIY system is now completely installed in your machine/ device!

3. OPERATION

3.1.1 SAFETY INSTRUCTIONS BEFORE OPERATION

At Hover Transport Systems we have made the greatest effort to inform our customers as fully and correctly as possible about the dangers that might occur during the installation of our products/ systems. We have done so by enclosing this Installation Manual in the delivery of our products/ systems. You are ultimately responsible for complying with these regulations and instructions yourself. The purchaser/ user is obliged that these regulations and instructions are familiar and will be followed by all personnel installing this product/ system.



Read this manual thoroughly before installing the product/ system and precisely follow all instructions and be aware of all safety measurements.

This DIY air caster system is not a complete transport system. It contains some parts that need to be installed in a machine or device in order to create a complete transport system. Because this delivery is not a complete system, we will not deliver an operating & maintenance manual. And therefore we will also not provide the operating instructions. We will explain the individual operation of the parts provided in the next paragraph.



Please follow the operating & maintenance instructions that are provided with the complete machine/ device itself. We are not liable for the operation of the complete machine/ device.

3.1.2 OPERATING INSTRUCTIONS OF THE PARTS

Air casters



The air casters are designed to work on a specific pressure range. Never exceed the maximum air pressure that is marked on the identification plate on the back of the air casters!

Slowly increase the pressure of the regulators in the air control unit to fill the air caster with air. First the air will fill up the bladder and lift the load. Secondly the air will gradually escape underneath the air caster and make the assembly hover above the floor. Stop increasing the air pressure when the load can be moved without the sound of the air casters scraping the floor. In this case all air casters are floating and there will be no wear of the air caster bladders because they aren't touching the floor. Make sure to stop and move the object in a controlled way!



The manufacturer of the complete machine/ device needs to install an emergency valve to shut down the air supply when there is an unsafe situation. He also needs to make sure that there is no access to the sides of the air casters where limbs can get trapped between the floor and the air caster. And that all air connectors are fixed properly.

Air control unit

Operating the air control unit is easy. The manufacturer of the complete machine/ device needs to make sure that all components are installed and fixed properly. When this is the case, start by closing all air regulators. First pull the the blue rotary knob towards you to enable it to change the air pressure.

Then turn them counter clockwise until they cannot be turned any further. Do this with all regulators. Secondly open the main air supply valve.

Now start the sequence described above to activate the air casters by turning the rotary knobs clockwise to increase the pressure.

4. MAINTENANCE

The only parts that need maintenance are the air casters. When they are continuously used, we advise a weekly visual inspection of the black bladders and if the screws are not loose. With less frequent use we recommend to inspect them before every move.

When the bladders are worn so far that the threads (fabric) are visible or if there are holes in the material at certain places, replace the bladder with a new one.

When the bladders are dirty, clean them by using regular soap and (warm) water. Never use sandpaper or abrasive cleaning agents. These can damage the bladders.

5. REPAIR

When the bladders are worn out, they can be replaced by new replacement parts. The replacement part types can be found on our website/ webshop. Look up the type of air caster you are using and click on the "Spare Parts" button. This will lead you directly to the right spare part for your air caster.

6. WARRANTY

Hover Transport Systems warrants to client that the products will be free of defects in material and workmanship appearing within 12 months from the date of shipment; provided the goods are used for the purpose intended and are maintained, handled, serviced and operated in accordance with the written instructions and manuals supplied by Hover Transport Systems or the manufacturer of the goods.

If a warranty defect arises, Hover Transport Systems will, at its option, repair or replace the defective goods or refund the purchase price thereof. Such repair, replacement or refund shall be the sole liability of Hover Transport Systems and the sole remedy of client with respect to the defective goods. Hover Transport Systems will not be liable to remove defective parts or material, or install replacement parts or material, or to pay for the same. In no event shall any warranty claims be made more than twelve (12) months after delivery of the purchased goods.

Hover Transport Systems shall have no responsibility to repair, replace or issue refunds for the goods damaged as a result of (a) inadequate installation, handling, operation or maintenance of the goods (including without limitation, the installation, handling, operation or maintenance of the goods contrary to written instructions and/or recommendations of Hover Transport Systems), or (b) acts of client or third parties, acts of God or Nature, modification, misapplication, abuse, or other similar events.

Unless expressly warranted in Hover Transport Systems' order confirmation, Hover Transport Systems makes no warranty that the goods comply with applicable law, regulations or specifications in any jurisdiction in which the products may be sold, marketed or used. Any governmental or other approvals necessary in connection with the resale, marketing, distribution or use of the goods shall be the sole responsibility of client.

This warranty is provided in lieu of all other express or implied warranties; and Hover Transport Systems specifically disclaims any and all implied warranties of merchantability or fitness for a particular purpose. No agent, distributor or employee of Hover Transport Systems has authority to extend the scope of this warranty or make any other representation, promise or warranty with respect to the goods.

7. CE DECLARATION FORM

EC – Declaration of incorporation Ref. EC Machinery Directive 2006/42/EC, Annex II B

We, Hover Transport Systems B.V., declare under our responsibility that the products:

Equipment line	DIY Air Caster Systems
Description	Do It Yourself air caster components to be built in a machine to create an air caster transport device. The delivery contains a certain number of air casters, an air regulator and pneumatic components.
Model	All products with SKU codes 2.2.x.x.xxxx.xxx.x
Name	HTS type numbers DSx-xxxxx
Serial	Will be determined after order/ production
Production year	Since 2019
Manufacturer	Hover Transport Systems B.V.
Address	Den Uitvanck 16B – 5688 XG – Oirschot – The Netherlands

Are provided for incorporation in machines as defined in the EC Machinery Directive 2006/42/EC, annex IIB. All relevant technical documentation is compiled in accordance with part B of Annex VII. All relevant information is available upon request via: info@hovertransportsystems.com.

Reference to harmonized standards:
EN ISO 12100: 2010 Safety of machinery. General principles for design. Risk assessment and risk reduction.

Signed

Name	Dhr. D.H.J. Denissen
Position	Managing Director
Place	Oirschot – The Netherlands
Date	6-july-2020

Signature



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All quotations, orders and agreements are subject to our general terms and conditions, deposited at the Trade Registry in Breda. The most recent version is always applicable. These terms and conditions can be found on our website: www.hovertransportsystems.com/terms

Appendix

I. AIR CASTER SPECIFICATION SHEETS

SPECIFICATION SHEET POLYURETHANE AIR CASTERS



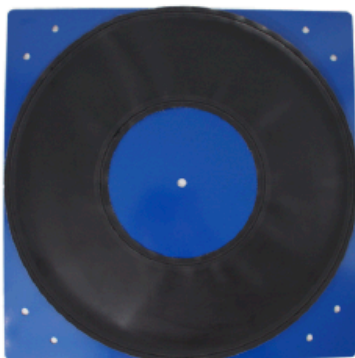
MATERIALS

Backplate: Aluminium 5754
Bladder / Torus: Polyurethane
Support Plate: HPDE or SS316L

POLYURETHANE AIR CASTERS

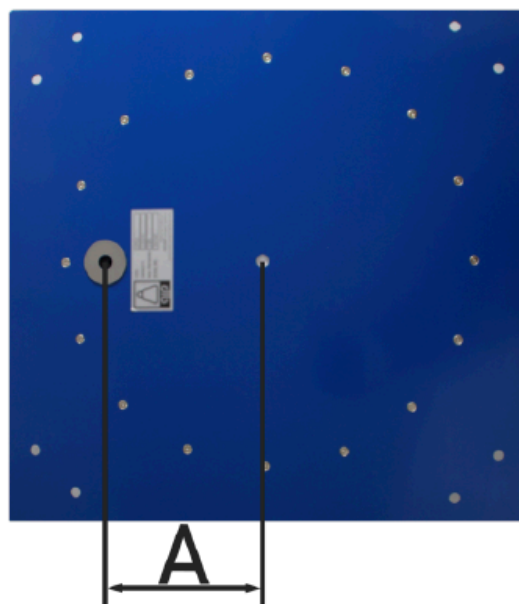
TYPE	CAPACITY	DIMENSIONS	LIFT	WEIGHT	POS. AIR INLET (A)	MOUNTING HOLE	MAX. PRESSURE	AIR CONSUMPTION	AIR INLET
P20L	225 kg	ø200 x 24 mm	8 mm	1,0 kg	40 mm	ø10 mm	1 bar	50 l/min	1/4"
P25L	300 kg	ø250 x 24 mm	9 mm	1,2 kg	65 mm	ø10 mm	1 bar	60 l/min	1/4"
P30L	500 kg	ø300 x 24 mm	10 mm	1,7 kg	90 mm	ø10 mm	1 bar	70 l/min	1/4"
P40L	1.000 kg	ø400 x 22 mm	15 mm	2,7 kg	120 mm	ø10 mm	1 bar	100 l/min	1/4"
P50L	2.000 kg	ø500 x 22 mm	18 mm	4,3 kg	150 mm	ø10 mm	1 bar	200 l/min	1/2"
P20H	450 kg	ø200 x 24 mm	8 mm	1,0 kg	40 mm	ø10 mm	2 bar	70 l/min	1/4"
P25H	600 kg	ø250 x 24 mm	9 mm	1,2 kg	65 mm	ø10 mm	2 bar	85 l/min	1/4"
P30H	1.000 kg	ø300 x 24 mm	10 mm	1,7 kg	90 mm	ø10 mm	2 bar	100 l/min	1/4"
P40H	2.000 kg	ø400 x 22 mm	15 mm	2,7 kg	120 mm	ø10 mm	2 bar	210 l/min	1/4"
P50H	4.000 kg	ø500 x 22 mm	18 mm	4,3 kg	150 mm	ø10 mm	2 bar	360 l/min	1/2"

SPECIFICATION SHEET NEOPRENE AIR CASTERS



MATERIALS

Backplate: Aluminium 5754
Bladder / Torus: Neoprene
Support Plate: HPDE



NEOPRENE AIR CASTERS HTS BACKPLATE

TYPE	CAPACITY	DIMENSIONS	LIFT	WEIGHT 1,5MM	WEIGHT 3MM	POS. AIR INLET (A)	MOUNTING HOLE	MAX. PRESSURE	AIR CONSUMPTION	AIR INLET
NM-20L	500 kg	200 x 200 x 11mm	12 mm	0,5 kg	0,6 kg	40 mm	e10 mm	2 bar	90 l/min	1/4"
NM-30L	1.000 kg	300 x 300 x 11mm	17 mm	1,1 kg	1,4 kg	90 mm	e10 mm	2 bar	200 l/min	1/4"
NM-40L	2.000 kg	400 x 400 x 11mm	26 mm	1,7 kg	2,3 kg	120 mm	e10 mm	2 bar	300 l/min	1/4"
NM-50L	3.500 kg	500 x 500 x 11mm	32 mm	2,9 kg	3,9 kg	150 mm	e10 mm	2 bar	350 l/min	1/2"
NM-70L	6.000 kg	700 x 700 x 11mm	42 mm	5,6 kg	7,3 kg	220 mm	e10 mm	2 bar	430 l/min	3/4"
NM-90L	10.000 kg	900 x 900 x 11mm	52 mm	9,2 kg	12,1 kg	270 mm	e10 mm	2 bar	550 l/min	3/4"
NM-125L	20.000 kg	1.250 x 1.250 x 11mm	75 mm	17,9 kg	23,4 kg	370 mm	e10 mm	2 bar	700 l/min	1"
NM-20H	1.000 kg	200 x 200 x 11mm	12 mm	0,5 kg	0,6 kg	40 mm	e10 mm	4 bar	350 l/min	1/4"
NM-30H	2.000 kg	300 x 300 x 11mm	17 mm	1,1 kg	1,4 kg	90 mm	e10 mm	4 bar	450 l/min	1/4"
NM-40H	4.000 kg	400 x 400 x 11mm	26 mm	1,7 kg	2,3 kg	120 mm	e10 mm	4 bar	510 l/min	1/4"
NM-50H	7.000 kg	500 x 500 x 11mm	32 mm	2,9 kg	3,9 kg	150 mm	e10 mm	4 bar	600 l/min	1/2"
NM-70H	12.000 kg	700 x 700 x 11mm	42 mm	5,6 kg	7,3 kg	220 mm	e10 mm	4 bar	750 l/min	3/4"
NM-90H	20.000 kg	900 x 900 x 11mm	52 mm	9,2 kg	12,2 kg	270 mm	e10 mm	4 bar	1.000 l/min	3/4"
NM-125H	40.000 kg	1.250 x 1.250 x 11mm	75 mm	17,9 kg	23,4 kg	370 mm	e10 mm	4 bar	1.200 l/min	1"