

Assembly and Operating Manual

Pneumatic weight compensator



Translation of the original assembly instructions

Dear customer,

Thank you for choosing our products and for your confidence in our company!

This Assembly and Operating Manual contains all the essential information regarding your product. We've done our best to present the information as clearly and concisely as possible. If you have questions or suggestions, however, please don't hesitate to contact us. Your feedback is appreciated.

Our team is always available to answer any questions you may have about this product or other Afag solutions.

We wish you every success with the integration of our devices in your machines or systems!

Sincerely,

Your Afag team

Subject to technical modifications

The pneumatic weight compensation system from Afag Engineering GmbH was designed in accordance with the state of the art. We reserve the right to make technical changes for the purpose of continuously further developing and improving our products.

Updates to our documentation



The manuals, product data sheets and catalogs published on our website are periodically updated.

Please note that these digital informational materials are therefore always more up-to-date than their print versions.

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1 General

1.1 Contents and purpose of this assembly manual

This assembly manual contains assembly, start-up, functionality and maintenance information which is essential for the safe and efficient use of the pneumatic weight compensation system (GWA.)

The consistent application of the information and instructions in this assembly manual is intended to achieve the following:

- long-term operational safety of the GWA
- optimal functionality of the GWA
- early identification and rectification of defects
- extension of the service life of the GWA

The figures in this manual are intended for basic comprehension and can deviate from the actual design.

1.2 Symbol definition

The safety instructions in this assembly manual are marked with a pictogram and a signal word. The safety instructions indicate the severity of the hazard.

DANGER



Danger!

This notice indicates an immediately dangerous situation that can cause serious or fatal injuries if it is not prevented.

WARNING



Warning!

This notice indicates a potentially dangerous situation that can cause serious or fatal injuries if it is not prevented.

CAUTION



Caution!

This notice indicates a potentially dangerous situation that can cause minor injuries if it is not prevented.

NOTE




This notice indicates a potential hazard that can cause damage to property and the environment if it is not prevented.



This notice contains useful tips and information on the safe and correct use of the GWA.

Other warning symbols:

If necessary, the assembly manual also utilizes the following standardized symbols to indicate various types of hazards.

	Warning – high voltage.
	Warning – pneumatic energy.
	Warning – dangerous movements potentially resulting in hand injuries.

1.3 Additional indicators

The documentation uses the following graphics to indicate instructions, results, references, etc.

Graphic	Meaning
1.	Instruction (steps...)
⇒	Results of instructions
↪	References to sections
■	Lists without sequence

1.4 Referenced documents

In addition to the assembly manual, the following documents must be observed and are referred to in the assembly manual:

- General Terms and Conditions
- Catalog data sheet of the purchased GWA

This documentation is available at www.afag.com.

1.5 Warranty

The Afag pneumatic weight compensation system is protected under warranty for:

- 24 months from commissioning.
- Parts in contact with the workpiece and wear parts are excluded from the warranty.

The warranty covers the replacement and repair of faulty Afag parts. All other claims are excluded.

Note: The customer is entitled to a defect-free product. This likewise applies to accessories and wear parts, if defective. Normal wear is excluded from the warranty.

The warranty shall be void in the following cases:

- Improper use.
- Failure to observe the assembly manual with regard to assembly, start-up, operation and maintenance as well as environmental and operating conditions.
- Improper assembly, start-up, operation and maintenance.
- Unauthorized repairs, structural modifications without prior instruction by Afag Engineering GmbH.
- Removal of the product serial number.
- Use of a faulty weight compensation system.
- Failure to observe the EC Machinery Directive, the Accident Prevention Regulation (UVV), the VDE-Directive or the safety and assembly instructions.

1.6 Liability

The weight compensation system may not be modified in any way, except as instructed in the assembly manual or with written approval from Afag Engineering GmbH.

Afag Engineering GmbH cannot be held liable in case of improper modifications or improper assembly, installation, start-up (operation,) maintenance or repairs.

2 Basic safety instructions

2.1 General

This section provides an overview of all the key safety issues to consider in order to safely and correctly operate the weight compensation system (GWA.)



Failure to observe the instructions and safety information in this manual can pose hazards.

2.2 Intended use

The GWA was designed and tested in accordance with the safety standards and regulations for pneumatic measuring instruments (➡for operating pressure, see Sect. 7.2.2.) The GWA is intended for use with weights of up to approx. 20 kg.

The GWA is designed for industrial and industry-related applications and for installation in systems.



When using the GWA in safety-related applications, always observe and comply with the national and international laws, requirements (e.g. Machinery Directive, DIN EN ISO 13849-2) with the corresponding standards, the trade association rules and the applicable international regulations.



Intended use also includes the following:

- compliance with all instructions in these assembly instructions,
- compliance with the technical specifications (➡Technical Specifications,)
- the exclusive use of original spare parts.

2.3 Foreseeable misuse

"Misuse" is defined as any use of the GWA which extends beyond its intended purpose.



The clamping element of the GWA should never be used as a brake. Dynamic loads can destroy the component and impair functionality. If subjected to dynamic loads, the GWA must be function-tested regularly and replaced if necessary.



In case of damage resulting from improper use,

- the operating company shall be solely responsible,
- and Afag cannot be held liable.

2.4 Obligations of the operating company and of the personnel

2.4.1 Observing the assembly manual

In order to use the weight compensator safely and correctly, the user must be familiar with the basic safety information.



Any and all persons working with the GWA must observe the assembly manual and especially the safety information included therein.

2.4.2 Obligations of the operating company

In addition to the safety information in this manual, the operating company of the GWA is also required to observe the safety, accident prevention and environmental regulations applicable to the GWA's area of application.

The operating company undertakes to:

- restrict the use of the GWA to persons having the required professional qualifications and experience,
- ensure that the personnel are familiar with the basic occupational safety and accident prevention regulations,
- ensure that the assembly manual is always kept at hand near the equipment in which the GWA has been installed.

2.4.3 Obligations of the personnel

All persons tasked with working with the GWA undertake to:

- read and observe this assembly manual and the chapter on safety,
- use the GWA as intended,
- observe the occupational safety and accident prevention requirements,
- abstain from any and all working methods which would impair the functionality and operational safety of the GWA.

2.5 Personnel requirements

2.5.1 Qualifications of the personnel

Installation, start-up, maintenance and removal should only be performed by qualified professionals.

Skilled technician:




The skilled technician is capable of performing the required tasks while independently identifying potential dangers and avoiding hazards, based on their professional education, training and/or experience, as well as their knowledge of the applicable standards and regulations.

2.6 Personal protective equipment (PPE)

To the extent required based on the task or on rules and regulations, personnel must wear the designated personal protective equipment when working with the GWA. The personnel is also required:

- to observe the industrial safety regulations and comply with applicable safety and accident prevention regulations,
- to use the provided "personal protective equipment" (PPE) as intended,
- to regularly check the condition of the PPE and
- immediately report any PPE defects to the supervisor at the place of use.

Explanation of mandatory signs for PPE:

	<p><i>Protective work clothing</i> refers to close-fitting, closed protective clothing designed to protect the personnel during work activities.</p>
	<p><i>Protective gloves</i> protect the hands from abrasions, punctures and burns on hot surfaces.</p>
	<p><i>Safety shoes</i> protect the feet from crushing injuries and falling parts and prevent the wearer from sliding on slippery floors.</p>

2.7 Alterations and modifications

Altering, modifying or reworking the GWA can impair its functionality and safety or cause damage to it.

Afag Engineering GmbH cannot be held liable in case of unauthorized modifications or improper assembly, installation, start-up (operation,) maintenance or repairs.



Do not make any changes or alterations to the GWA without first consulting with Afag Engineering GmbH and obtaining prior written approval.

2.8 Basic dangers/residual risks

This section describes the residual risks which remain as unavoidable, non-obvious residual risks inherent to the use of the GWA, despite its safe design and despite the designated technical safety devices.

To prevent property damage and to avoid endangering the personnel, observe the safety information provided in this section as well as elsewhere in this manual.

2.8.1 General dangers in the workplace

CAUTION



Danger – do not use the GWA in an unsuitable environment!

Inappropriate environmental and operating conditions can pose hazards which could potentially result in injuries and damage to property and/or reduce the service life of the GWA.

- Ensure that the GWA is only used within its designated operating parameters (➔ Technical Specifications).
-

2.8.2 Hazards due to high temperatures

WARNING



Risk of injury due to hot surfaces!

In case of continuous operation, the surface of the clamping element heats up (up to 60°C.)

- Before touching hot surfaces without protective gloves, check to make sure that they have cooled down to room temperature.
-

2.8.3 Hazards from electrical energy

WARNING



Risk of electric shock!

Incorrectly executed work on electrical components can result in severe or lethal injuries.

- Any electrical work required should only be performed by a qualified electrician or instructed persons working under the direction and supervision of a qualified electrician in accordance with recognized rules of electrical safety.
-

3 Technical specifications

3.1 Weight compensator

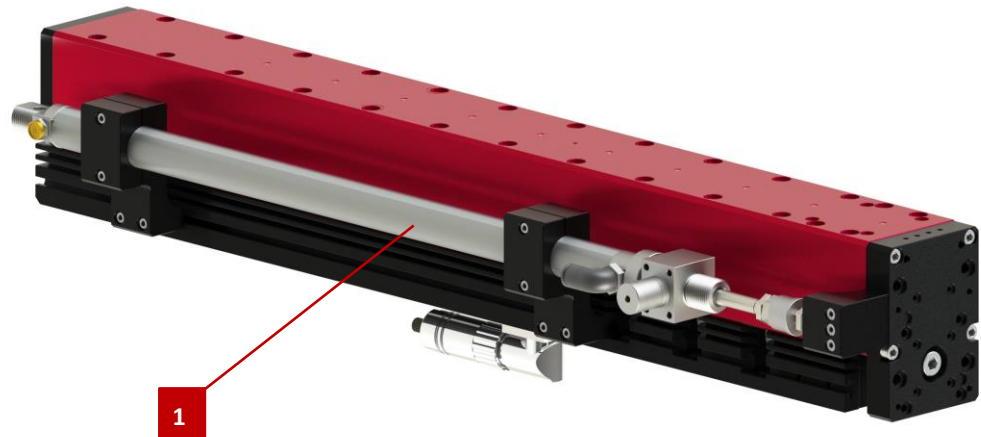


Fig. 1 Pneumatic weight compensator (installed on the side)

3.2 Technical specifications

Pneumatic weight compensator	
Cylinder connection	Ø 10 mm
Clamping element	Ø 6 mm
Installed position	vertical: side or front
Weight (total)	see 6.4
Operating pressure	see 7.2.2
Operating temperature	0-80 °C
Storage temperature range	-10 °C - +40 °C

4 Transportation, packaging and storage

4.1 Safety instructions

Incorrect transport can lead to damage.


NOTE

Risk of damage due to incorrect transport!

The GWA must be handled with care during transport.

- Use caution when receiving package units upon delivery and when transporting the equipment within the factory.
- Observe symbols on the packaging.
- Observe transport instructions.



The safety information in  Section 2 "Basic safety instructions" of this assembly manual also must be observed.

4.2 Weight compensator scope of delivery

Quantity	Designation
1 pc.	Weight compensator
1 x	Holder
1 x	Compensation element
	Fastening screw
1 x	Compressed air connection
Optional:	Mounting kit with pressure vessel, valves, pressure regulator

4.3 Transport

Upon receipt, check the weight compensator for potential transport damage, and report any visible damage right away. We cannot be held liable for damage resulting from inappropriate transport.






Generally, there are no restrictions with regard to environmental conditions, provided that the weight compensator is adequately protected by appropriate product and shipping packaging in accordance with its specifications, as indicated in the product data sheet.

4.4 Packaging

The weight compensator is packaged as appropriate. Remove the packaging just before installation (store packaging for future use, since it provides optimal protection during transport.)

General symbols for package units

Symbol	Note	Explanation
	This side up	The package unit should always be transported, transferred and stored with the arrow pointing up at all times.
	Fragile	Goods with this label should be handled with care and never dropped or strapped.
	Keep dry	The package units must be protected from moisture and kept dry (stored covered up.)

NOTE

Risk of damage if item falls out during unpacking!

The weight compensator is packed in its original packaging. If handled incorrectly, the weight compensator can fall out during unpacking and be damaged as a result.

- Unpack weight compensator with care.

4.5 Storage

The total storage time of the weight compensator should be kept as short as possible. When storing the GWA, observe the following:

- Do not store the GWA out of doors or expose it to the elements.
- Avoid direct UV radiation and artificial light with a high rate of UV emission.
- Protect from direct radiation from heat sources (such as heating units.)
- Avoid mechanical vibrations and shocks.
- The storage space must be dry and free from dust.
- Protect GWA from dirt, dust and corrosion.
- Ambient temperature of the storage space: 10°C ... 40 °C.
- Avoid rapid changes of temperature.
- Relative humidity: < 75%, avoid condensation.

5 Design and description

This section provides an overview of the design and function of the weight compensator.

5.1 Design of the weight compensator

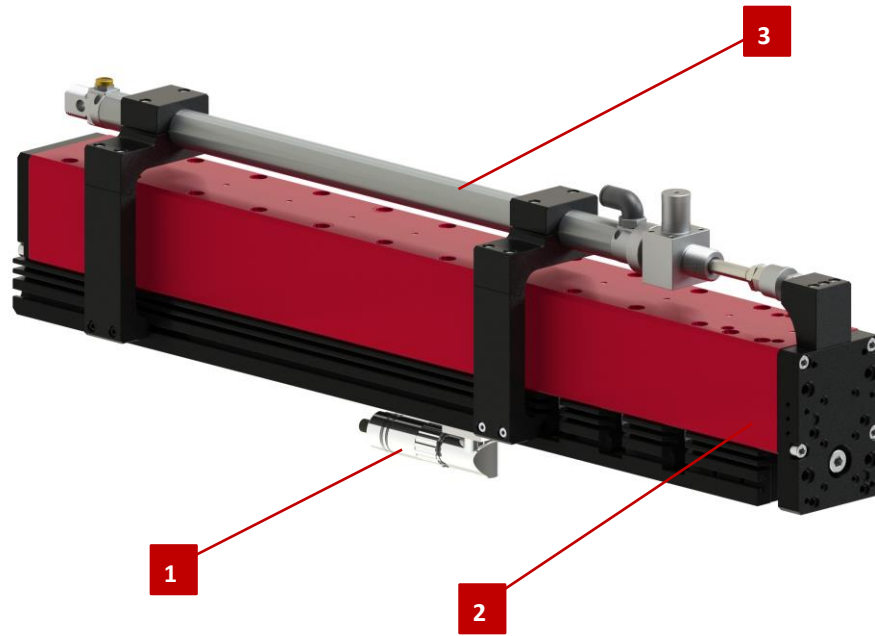


Fig. 2 Design of the weight compensator (example image)

1. Electrical connection
2. Linear module
3. Weight compensator

5.2 Product description

The weight compensator is used for mass compensation. It is intended to hold the system axis which is exposed to gravity (vertical axis) in position during an emergency stop or in the event of a power failure.

To prevent the axis from falling, the weight compensator is equipped with a clamping element. This element is pneumatically controlled and holds the axis in position when the electricity is cut off.

The weight compensator is designed for forces of up to 200 N (at 5 bar.) It can perform strokes of up to 500 mm.

The weight compensator is intended for installation in a machine or system for industrial and industry-related applications.

5.3 Functional description

To balance the weight installed on the vertical axis, a certain pressure must be applied to the cylinder. When at a standstill, the motor only needs to generate a small current in order to hold the axis in position. This gives the motor enough time to cool down.

The clamping element also prevents the axis from falling when the electricity is cut off or during an E-STOP.

5.4 Installation versions

The weight compensator can be attached to the components from the side or from the front.

A) Side installation position

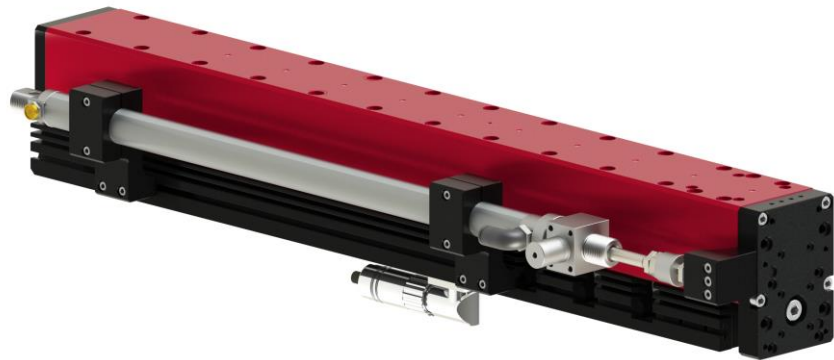


Fig. 3 Side installation position

B) Front installation position

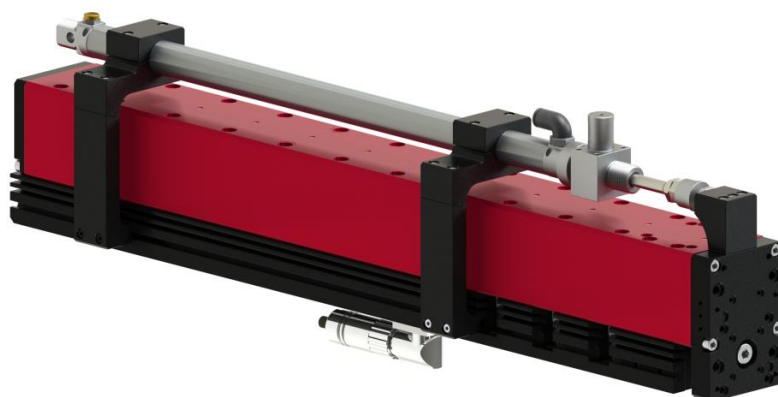


Fig. 4 Front installation position

6 Assembly and connection

This section contains information and safety instructions for correctly assembling and connecting the weight compensator.

NOTE

We cannot be held liable for damage resulting from the inappropriate assembly of the GWA by the operating company.

6.1 Safety instructions

CAUTION



Risk of injury by pneumatic components!

Risk of injury by pressurized system components.

- Before assembly, installation and maintenance work, switch off and lock out compressed air supply.

NOTE

Risk of damage to the GWA due to inappropriate assembly!

- Incorrect assembly can result in damage to the force measuring unit.
- The GWA should only be installed by qualified personnel.
- Observe the assembly manual and especially the following information on installation and assembly.

6.2 Assembly and pneumatic connection

6.2.1 Notes on assembly

When installing the cylinder, proceed with caution so as to avoid damaging the cylinder tube and piston. Pay special attention to:

- permissible load limits



permissible torque of the lock nuts on the external thread!

Preventing the piston rod from becoming mechanically hyperstatic

To prevent the piston rod from becoming mechanically hyperstatic in conjunction with an external guide, use one of the following methods:



A rigid coupler will reduce the cylinder's service life and impair its functionality.

6.2.2 Assembly accessories

NOTE

Risk of damage to the damping piston!

Using throttle choke valves with an excessively long screw-in length can cause damage to the damping piston.

- Select throttle choke valves with an appropriate screw-in length.

In case of position sensing with proximity switches:

- use proximity switches with mounting kit.

6.2.1 Pneumatic connection diagram

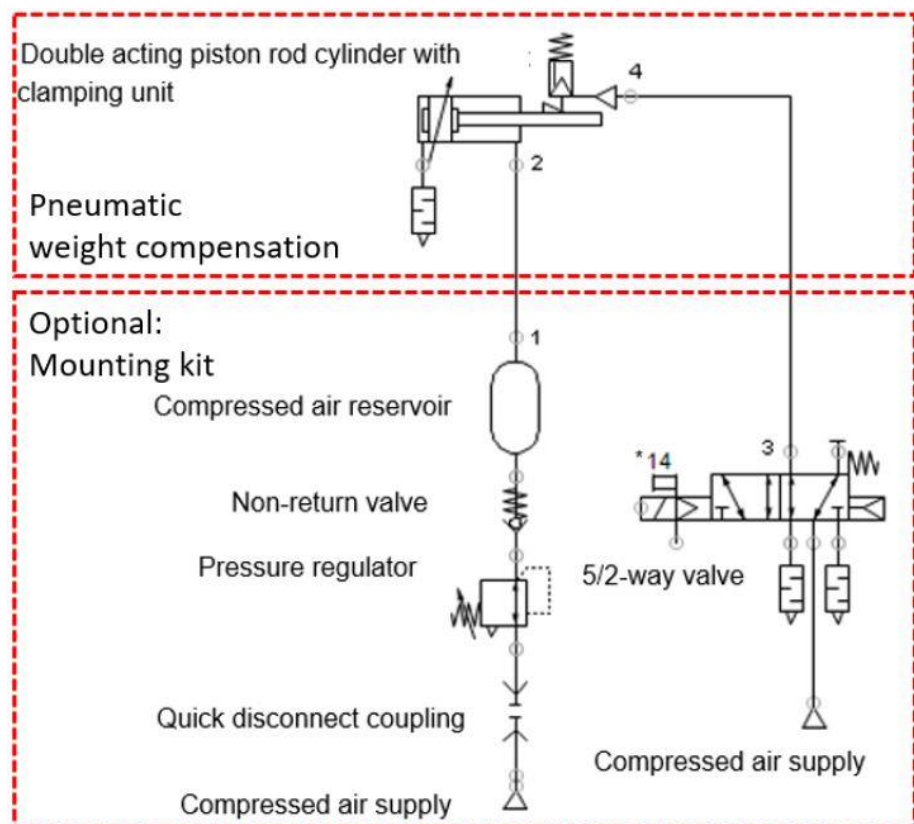


Fig. 5 Connection diagram of the GWA



If an optional mounting kit is selected, the interface acts as the quick-release coupling. In this case, the following accessories are required:

- size 4 coupler socket from Festo (KD4-...).
- 10 mm pneumatic hose for connecting the pressure regulating valve to the accumulator and the accumulator to the cylinder.



The electrical power is connected at the 5/2 directional control valve [digital output (X4.3)] of the regulator. This ensures that if the regulator loses power, the axis will remain in position.

6.2.2 Accumulator (accessories: optional mounting kit without control valve)

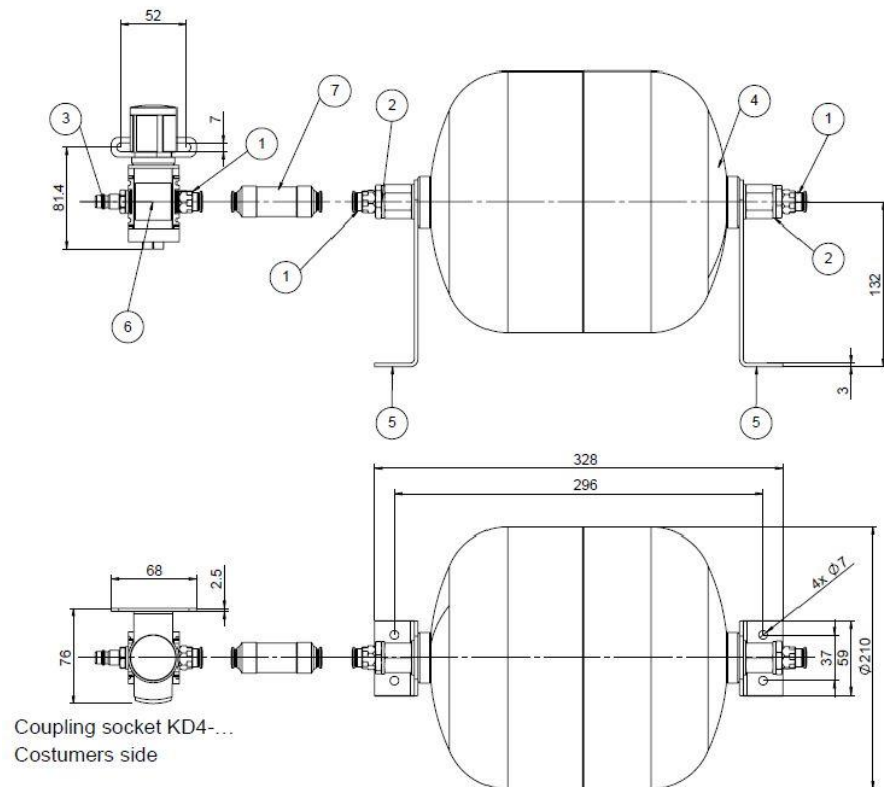


Fig. 6 Overview of the accumulator

- | | |
|------------------------|--------------------------------------|
| 1. Plug-type union | 5. Compressed air accumulator holder |
| 2. Double nipple | 6. Pressure regulator |
| 3. Coupler plug | 7. Non-return valve |
| 4. Compressed air tank | |



- When selecting the accumulator, make sure that it is not too small. Otherwise, if the cylinder leaks, the axis could potentially fall.
- As a standard, Afag offers the compressed air accumulator with a 7 liter capacity.
- The accumulator can also be provided by the customer

6.2.3 Setting dimension of the cylinder

When fitting the weight compensator, make sure that the $80 \text{ mm} \pm 2 \text{ mm}$ dimension is observed. This ensures that the cylinder will not collide with the end position damper.

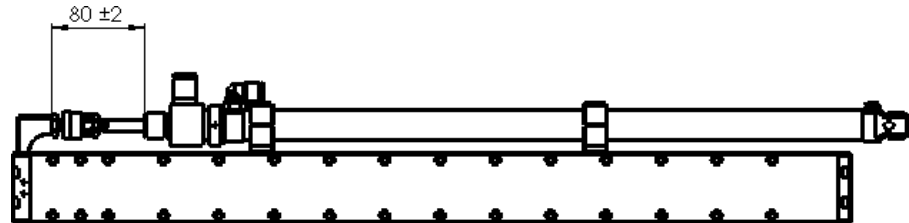


Fig. 7 Setting dimension of the cylinder

6.2.4 Hose dimensions

NOTE

Axis can fall if diameter is too small!

If the diameter is too small and the hose is too long, the axis cannot reliably be prevented from falling in the event of a cylinder leak!

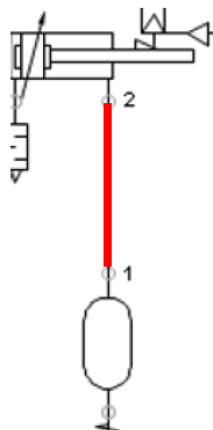
- Select hoses with the correct dimensions!



Minimum values were defined/verified in tests along the following parameters:

- DSNU-25-550-PPV-KP, ES40-500 vertical, side installation, accumulator: 7 liters, operating pressure: 2.5 bar, cylinder leak: 10 liters/min.

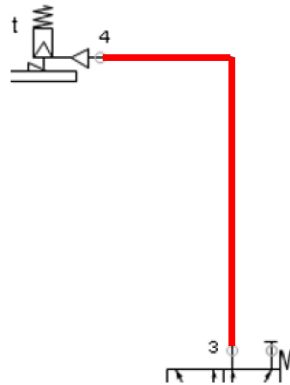
Hose from accumulator to cylinder (1 -2)



Outside diameter: 10 mm

Hose length: min. 5 m

Hose from valve to clamping element (3 -4)



Outside diameter: 6 mm

Hose length: max. 5 m

6.3 Electrical connection

CAUTION



Using the clamping element incorrectly is dangerous!

Dynamic holding forces can damage the component or lead to total failure.

- Do not use the clamping element as a brake!

NOTE

Risk of property damage in the event of a power failure or E-stop!

To ensure that the clamping element closes and holds the axis in position in the event of a power failure or emergency stop, the 5/2 directional control valve on the regulator must be connected to the X4.3 digital output.

6.3.1 Settings on the regulator

1. Define output X4.3 as the brake output

The screenshot shows the 'Brake (Output)' configuration window in LinMot-Talk 6.7. The 'Name' field is set to 'Brake (Output)'. The 'Value' is 'On' and 'Raw Data' is '0008h'. The 'Value...' field is set to '10'. The 'UF' field is also set to '10'. The 'Ctrl Word' list includes various control words, with 'Ctrl Word: /Abort (Input)' selected.

Name	Value	Raw Data	Value...	UF
None	Off	0000h	***	10
Brake (Output)	On	0008h	***	10
Ctrl Word: Switch On (Input)	Off	0010h	***	10
Ctrl Word: /Quick Stop (Input)	Off	0012h	***	10
Ctrl Word: Enable Operation (Input)	Off	0013h	***	10
Ctrl Word: /Abort (Input)	Off	0014h	***	10
Ctrl Word: /Freeze (Input)	Off	0015h	***	10
Ctrl Word: Go To Position (Input)	Off	0016h	***	10
Ctrl Word: Error Acknowledge (Input)	Off	0017h	***	10
Ctrl Word: Joo Move + (Input)	Off	0018h	***	10

2. Set trigger condition

The screenshot shows the 'Brake Modes' configuration window in LinMot-Talk 6.7. The 'Name' field is set to 'Brake Modes'. The 'Value' is 'True' and 'Raw Data' is '1h'. The 'Value...' field is set to '1'. The 'UPID' field is also set to '1'. The 'Apply Delay Time' is set to '100 ms' and 'Release Delay Time' is set to '300 ms'.

Name	Value	Raw Data	Value...	UPID
Status Word: Operation Enabled	True	1h	***	1
Ctrl Word: /Abort	False	0h	***	1
Quick Stop	True	1h	***	1
Switch On	True	1h	***	1

Name	Value	Raw Data	Value...	UPID
Apply Delay Time	100 ms	03E8h	*** ms	1718h
Release Delay Time	300 ms	06B8h	*** ms	171Ch

6.3.2 Recommended control sequence for emergency stop

The recommended control sequence for an emergency stop is shown below.

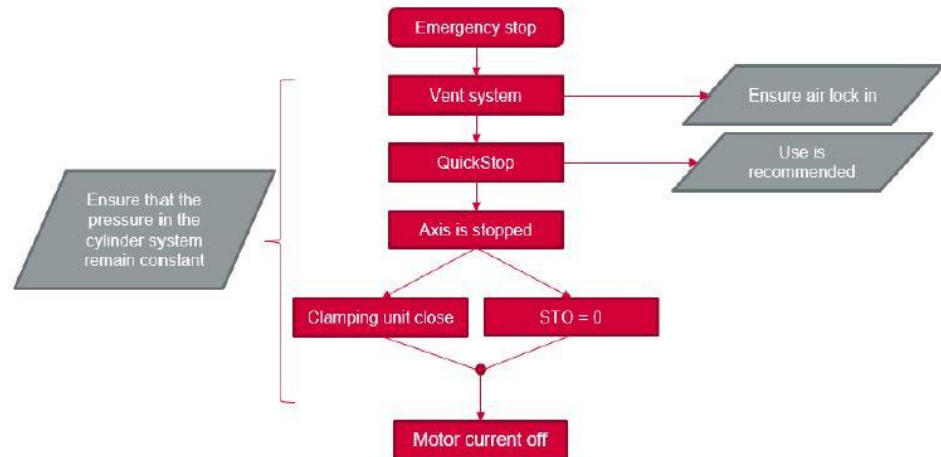


Fig. 8 Recommended control sequence for an E-stop

After an E-stop is actuated, the automation system is usually vented. Make sure that the air in the GWA system remains trapped. It is recommended to use a quick-stop.

During operation, the quick-stop safely slows down the axis down to the 0 m/s speed. Once the axis comes to a stop, the clamping element locks, and the STO (if there is one) switches to 0. The motor is dead.

In the time between the venting of the system and the closing of the clamping element, the pressure in the GWA system should not be allowed to drop. Otherwise, there is a risk that the axis could fall and the clamping element could be damaged by the dynamic movement of the axis.

The time during which the pressure must **remain constant** is determined as follows.

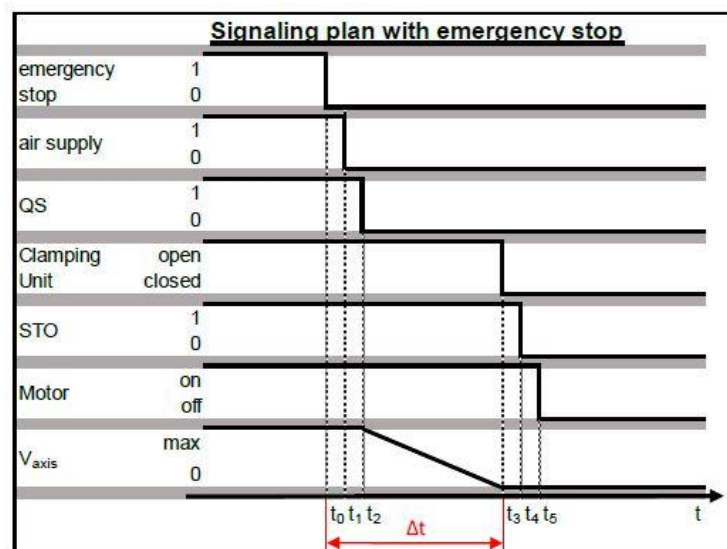


Fig. 9 Signal flow plan during E-stop

NOTE
Dropping of the axis during E-stop!

To prevent the axis from dropping during an E-stop, the air in the system of the GWA is trapped by the check valve.

If this is not ensured, the axis cannot be prevented from dropping.

6.4 Weight data

Modul [Name]	Stroke [mm]	Totalmass	Moved mass		
		Cylinder [kg]	Axis [kg]	Cylinder [kg]	Total [kg]
ES30-50-SL	50	1,15	1,30	0,25	1,55
ES30-100-SL	100	1,25	1,60	0,30	1,90
ES30-100	100	1,25	1,85	0,30	2,15
ES30-200-SL	200	1,35	2,20	0,35	2,55
ES30-200	200	1,35	2,60	0,35	2,95
ES30-300	300	1,45	3,20	0,40	3,60
ES30-400	400	1,55	3,80	0,45	4,25
ES30-500	500	1,65	4,40	0,50	4,90
ES40-100-SL	100	1,25	3,85	0,30	4,15
ES40-100	100	1,25	5,40	0,30	5,70
ES40-200	200	1,35	6,50	0,35	6,85
ES40-300	300	1,45	7,70	0,40	8,10
ES40-400	400	1,55	9,00	0,45	9,45
ES40-500	500	1,65	10,50	0,50	11,00
ES40-100-SL-HP	100	1,25	4,30	0,30	4,60
ES40-100-HP	100	1,25	5,80	0,30	6,10
ES40-200-HP	200	1,35	7,10	0,35	7,45
ES40-300-HP	300	1,45	8,20	0,40	8,60
ES40-400-HP	400	1,55	9,40	0,45	9,85
ES40-500-HP	500	1,65	11,10	0,50	11,60

Fig. 10 Table of weight data for each component

7 Commissioning

7.1 Safety instructions


NOTE

Important information regarding the use of lubricated compressed air!

GWA operation does not require the use of lubricated compressed air. However, if the GWA is ever operated with oil compressed air, this type of lubrication absolutely must be maintained from then on!

- The oiled compressed air used must meet the requirements of ISO 8573-1:2010 [7.4.4] so as not to impair the proper function of the pneumatic system.



The safety information in  Section 2 "Basic safety instructions" of this assembly manual also must be observed.

7.2 Operating parameters

7.2.1 Maximum permissible speed

NOTE

Excessive speeds can cause damage!

Excessive speeds damage the cylinder and can result in the total failure of the GWA.

- The maximum permissible speed is $V_{\max} = 1.5 \text{ m/s}$!

7.2.2 Operating pressure

To balance the weight installed on the vertical axis, a certain pressure must be applied to the cylinder. When at a standstill, the motor should only need to generate a small amount of power in order to hold the axis in position. This gives the motor time to cool down.

The weight compensator is designed for a moving mass of approx. 20 kg. This allows the linear axis to be moved by an operating pressure of approx. 5 bar.

There are three ways to determine the right pressure:

- Increase the pressure until the axis stops in the de-energized state
- Take the value from the "Operating Pressure as a Function of Moving Mass" diagram below. The total mass hanging from the piston rod counts as the mass.

Diagram: operating pressure as a function of moving mass

- Example: ES30-500; payload 2 kg
- Moving mass = moving axis mass + moving cylinder mass (piston rod + holder) + Payload of moving mass
= 4.4 kg + 0.5 kg + 2 kg = **6.9 kg**
- Based on the diagram, the setting pressure comes to 1.6 bar.

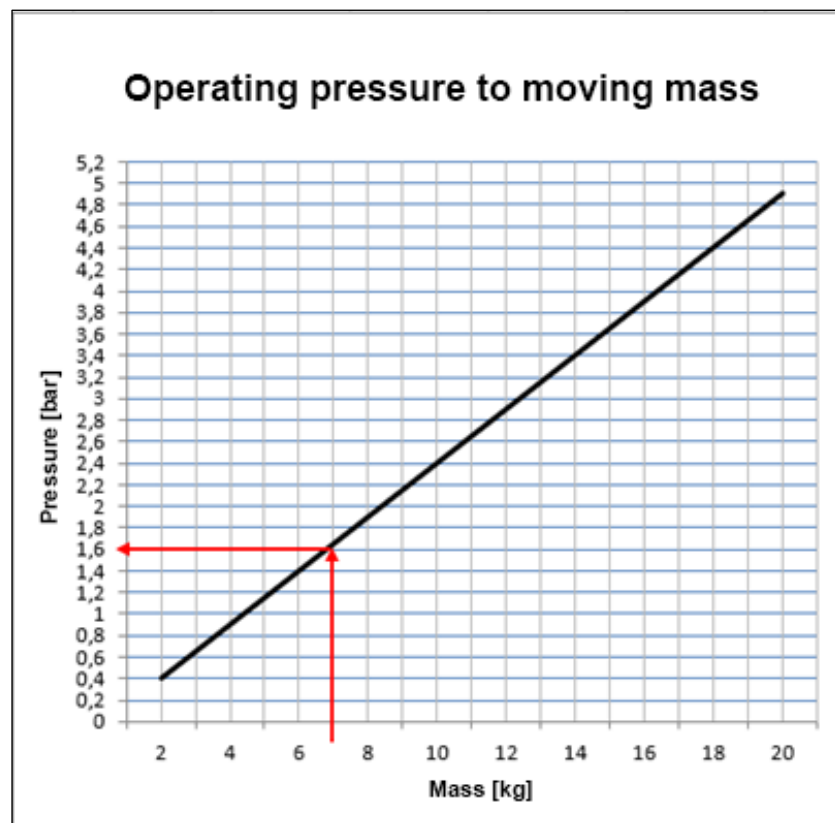


Fig. 11 Diagram: Operating pressure to moving mass

8 Troubleshooting

8.1 Safety instructions



CAUTION

Inadequately performed work can result in injuries!

Inadequately performed troubleshooting work can result in injuries and property damage.

- The operating company must exercise its due diligence and use appropriately trained technicians for troubleshooting.

8.2 What to do in the event of a malfunction

- Immediately shut down the GWA and report the malfunction to the person in charge.
- Do not put the GWA back in operation until the malfunction has been rectified.
- After a malfunction, function-test the GWA.

8.3 Table Malfunction causes and remedies

Malfunction	Possible cause	Remedy
Piston rod movement is uneven (cylinder jiggles.)	<ul style="list-style-type: none"> ▪ Lubrication needed ▪ Piston rod is clogged ▪ Insufficient air supply ▪ Pressure is too low ▪ Guide is not parallel to the stroke direction 	<ul style="list-style-type: none"> ▪ Apply lubricant ▪ Clean cylinder Provide cover (after intensive cleaning, apply lubricant) ▪ Keep hose piping short, select appropriate cross-sections Select right pressure Keep pressure constant ▪ Switch volume upstream ▪ Use Flexo coupling as per accessories
Piston does not reach end position	<ul style="list-style-type: none"> ▪ Cylinder tube is damaged ▪ Setting screw of the end position damper is completely closed ▪ Foreign matter in cylinder ▪ Cylinder hits external stop 	<ul style="list-style-type: none"> ▪ Replace cylinder ▪ Open setting screw ▪ Filter compressed air ▪ Readjust limit stopper

9 Maintenance and cleaning

9.1 Important information

Since it is lubricated for life, the GWA is practically maintenance-free. To ensure that the GWA remains in optimal operating condition, clean it regularly and perform the tasks described below.

NOTE

Cylinder leakage!

Due to wear and tear, the cylinder can potentially leak.

Such leakage does not impair the functionality of the GWA, since the necessary air is provided by means of the accumulator and its connection line.

- The pressure on the pressure control valve should be checked at regular intervals and adjusted as required.
-

NOTE

Important information regarding the use of lubricated compressed air!

GWA operation does not require the use of lubricated compressed air. However, if the GWA is ever operated with oil compressed air, this type of lubrication absolutely must be maintained from then on!

- The oiled compressed air used must meet the requirements of ISO 8573-1:2010 as not to impair the proper function of the pneumatic system.
-

9.2 Safety instructions

CAUTION



Risk of injury by pneumatic components!

Risk of injury by pressurized system components.

- Before assembly, installation and maintenance work, switch off and lock out compressed air supply.
-


NOTE

Risk of damage due to improper cleaning of the GWA!

Improper cleaning can damage the GWA.

- Do not use any aggressive cleaning agents.
 - Do not use any hard or pointed objects for cleaning.
-



The safety information in  Section 2 "Basic safety instructions" of this assembly manual also must be observed.

9.3 Cleaning

The weight compensator must be cleaned on a quarterly basis.

Cleaning procedure:

1. Extend the cylinder all the way.
2. Disconnect the axis from the power supply.
3. Vent the cylinder.
4. Clean the clamping unit and the clamping rod with a soft cloth.
5. Oil or grease the piston rod.
 - ⇒ This concludes the cleaning procedure.

9.4 Lubrication

The following lubricating tasks should be performed on a quarterly basis.

To prevent dry running:

1. Apply a thin layer of grease to the surface of the clamping rod.
 - Grease: LUB-KC1 SILICONE-FREE. The lubricant should be invisible except for a slight blurriness from the color of the grease.
 - Apply lubricant using a rag, paint brush or fine-bristled brush.
 - ⇒ The surface of the clamping rod is now lubricated.
2. Remove the connection hose on the cylinder (while depressurized, also refer to safety information.)
3. Spray up to three squirts of silicone-free oil (z.B. NEOVAL OIL MTO300) directly into the cylinder.
 - ⇒ The cylinder is now lubricated.

9.5 Spare parts and repairs

During the warranty period, faulty GWAs can be sent to Afag for warranty repairs.



Damaged GWAs should only be replaced or repaired by Afag. Otherwise, Afag accepts no liability!

10 Removal and disposal

WARNING




Incorrect removal poses a risk of injury!

Incorrectly performed work can result in serious property damage and severe injuries.

- The operating company must exercise its due diligence and use specially qualified technicians for this work.



The safety information in  Section 2 "Basic safety instructions" of this assembly manual also must be observed.

At the end of its service life, the GWA must be properly disposed of. Have the packaging and the GWA disposed of in an environmentally friendly manner, in accordance with the applicable regulations.

Observe the statutory and company rules and regulations.

NOTE

Improper disposal of the GWA poses a danger to the environment!

If improperly disposed of, the GWA can pose hazards which can potentially damage the environment.

- For information on proper disposal, consult with your local authorities.

11 Declaration of Incorporation

Declaration of Incorporation

for partly completed machinery as defined by the Machinery Directive 2006/42/EC, Annex II, 1.B

The manufacturer:

Afag Engineering GmbH, Gewerbestraße 11, D-78739 Hardt

hereby declares that the partly completed machinery:

Product designation:	Pneumatic weight compensator
Type designation:	GWA

complies with the following basic safety and health requirements of the Machinery Directive 2006/42/EC at the time of this declaration: 1.1; 1.1.1; 1.1.2; 1.2.3; 1.2.4.4; 1.3; 1.3.5; 1.3.6; 1.3.7; 1.3.9; 1.4.1; 1.5; 1.5.3; 1.6; 1.6.1; 1.6.3; 1.6.4; 1.7; 1.7.4; 1.7.4.1; 1.7.4.2

Applied harmonized standards, especially:	
EN ISO 12100:2010	Safety of machinery – General principles for design – Risk assessment and risk reduction

Note: Commissioning is prohibited until it has been determined that the machine into which the above mentioned partly completed machine is to be installed complies with the provisions of Machinery Directive 2006/42 / EC.

In response to a duly reasoned request, the manufacturer undertakes to provide the specialized technical documents on the partly completed machinery to national authorities as hard copies or electronic files.

The specialized technical documents were created in accordance with Annex VII Part B of the aforementioned directive.

Representative authorized to compile technical documentation:

Walter Kunz, Afag Engineering GmbH, Gewerbestraße 11, DE-78739 Hardt

City, date: Hardt, 9/15/2021

Walter Kunz

Managing Director

Afag Engineering GmbH

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