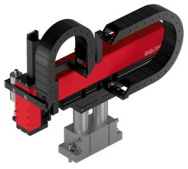
Assembly and operating instructions

EPS Handling Systems (electrical)


EPS mini YZ


EPS midi YZ


EPS maxi YZ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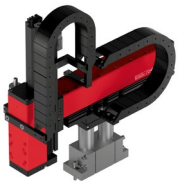
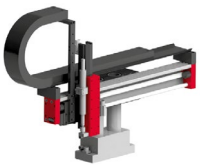
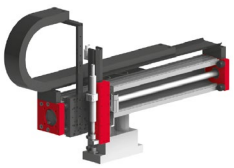

EPS tera YZ


EPS mini XZ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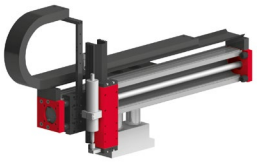
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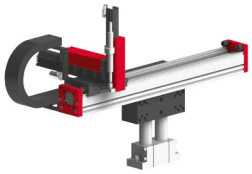
EPS mini XYZ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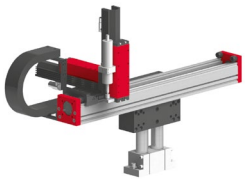
EPS maxi XYZ


EPS mini gantry XXYZ


EPS midi gantry XXYZ


EPS maxi gantry XXYZ


EPS mini gantry s


EPS midi gantry s


EPS maxi gantry s


EPS mini gantry h


EPS midi gantry h


EPS maxi gantry h

Translation of the Original Assembly Instructions EN

Dear Customer,

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

These assembly and operating instructions contain all essential information you need about your product. Our aim is to provide the required information as concisely and clearly as possible. If, however, you still have any questions on the contents or suggestions, please do not hesitate to contact us. We are always grateful for any feedback.

Our team will also be glad to answer any further question you may have regarding the EPS handling system or other options.

We wish you every success with our products!

With kind regards

Your Afag team

© Subject to modifications

The EPS handling systems have been designed by Afag according to the state of the art. Due to the constant technical development and improvement of our products, we reserve the right to make technical changes at any time.

Updates of our documentations

Unlike the printed documents, our digital instructions manuals, product data sheets and catalogues are being continuously updated on our website.

Please keep in mind that the digital documents on our website are always the latest versions.

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Table of contents

1 General 7

1.1 Contents and purpose of these assembly instructions 7
1.2 Explanation of symbols 7
1.3 Additional symbols 8
1.4 Applicable documents 9
1.5 Warranty 9
1.6 Liability 9

2 Safety instructions 10

2.1 General 10
2.2 Intended use 10
2.3 Foreseeable misuse 10
2.4 Obligations of the operator and the personnel 11
2.4.1 Observe the assembly instructions 11
2.4.2 Obligations of the operating company 11
2.4.3 Obligations of the personnel 12
2.5 Personnel requirements 12
2.5.1 Personnel qualification 12
2.6 Personal protective equipment (PPE) 13
2.7 Changes and modifications 13
2.8 General hazards / residual risks 14
2.8.1 General hazards at the workplace 14
2.8.2 Danger due to electricity 14
2.8.3 Danger due to strong magnetic fields 15
2.8.4 Danger due to pneumatics 15
2.8.5 Danger due to high temperatures 15
2.8.6 Mechanical hazards 15

3 Technical data 16

3.1 EPS System mini YZ 16
3.1.1 Dimensioned drawing EPS mini YZ 16
3.1.2 Technical data EPS mini YZ 17
3.1.3 Module loads EPS mini YZ 18
3.2 EPS System midi YZ 19
3.2.1 Dimensioned drawing EPS midi YZ 19
3.2.2 Technical data EPS midi YZ 20
3.2.3 Module loads EPS midi YZ 21
3.3 EPS System maxi YZ 22
3.3.1 Dimensioned drawing EPS maxi YZ 22
3.3.2 Technical data EPS maxi YZ 23
3.3.3 Module loads EPS maxi YZ 24
3.4 EPS System giga YZ 25
3.4.1 Dimensioned drawing EPS giga YZ 25

3.4.2 Technical data EPS giga YZ 26
3.4.3 Module loads EPS giga YZ 27
3.5 EPS System tera YZ 28
3.5.1 Dimensioned drawing EPS tera YZ 28
3.5.2 Technical data EPS tera YZ 29
3.5.3 Module loads EPS tera YZ 30
3.6 EPS System mini XZ 31
3.6.1 Dimensioned drawing EPS mini XZ 31
3.6.2 Technical data EPS mini XZ 32
3.6.3 Module loads EPS mini XZ 33
3.7 EPS System midi XZ 34
3.7.1 Dimensioned drawing EPS midi XZ 34
3.7.2 Technical data EPS midi XZ 35
3.7.3 Module loads EPS midi XZ 36
3.8 EPS System maxi XZ 37
3.8.1 Dimensioned drawing EPS maxi XZ 37
3.8.2 Technical data EPS maxi XZ 38
3.8.3 Module loads EPS maxi XZ 39
3.9 EPS System mini XYZ 40
3.9.1 Dimensioned drawing EPS mini XYZ 40
3.9.2 Technical data EPS mini XYZ 41
3.9.3 Module loads EPS mini XYZ 42
3.10 EPS System midi XYZ 43
3.10.1 Dimensioned drawing EPS midi XYZ 43
3.10.2 Technical data EPS midi XYZ 44
3.10.3 Module loads EPS midi XYZ 45
3.11 EPS System maxi XYZ 46
3.11.1 Dimensioned drawing EPS maxi XYZ 46
3.11.2 Technical data EPS maxi XYZ 47
3.11.3 Module loads EPS maxi XYZ 48
3.12 EPS mini gantry XXYZ 49
3.12.1 Dimensioned drawing EPS mini gantry XXYZ 49
3.12.2 Technical data EPS mini gantry XXYZ 50
3.12.3 Module loads EPS mini gantry XXYZ 51
3.13 EPS midi gantry XXYZ 52
3.13.1 Dimensioned drawing EPS midi gantry XXYZ 52
3.13.2 Technical data EPS midi gantry XXYZ 53
3.13.3 Module loads EPS midi gantry XXYZ 54
3.14 EPS maxy gantry XXYZ 55
3.14.1 Dimensioned drawing EPS maxi gantry XXYZ 55
3.14.2 Technical data EPS maxi XYZ 56
3.14.3 Module loads EPS maxi gantry XXYZ 57
3.15 EPS mini gantry s 58
3.15.1 Dimensioned drawing EPS mini gantry s 58

3.15.2 Technical data EPS mini gantry s 59
3.15.3 Module loads EPS mini gantry s 60
3.16 EPS midi gantry s 61
3.16.1 Dimensioned drawing EPS midi gantry s 61
3.16.2 Technical data EPS midi gantry s 62
3.16.3 Module loads EPS midi gantry s 63
3.17 EPS maxi gantry s 64
3.17.1 Dimensioned drawing EPS maxi gantry s 64
3.17.2 Technical data EPS maxi gantry s 65
3.17.3 Module loads EPS maxi gantry s 66
3.18 EPS mini gantry h 67
3.18.1 Dimensioned drawing EPS mini gantry h 67
3.18.2 Technical data EPS mini gantry h 68
3.18.3 Module loads EPS mini gantry h 69
3.19 EPS midi gantry h 70
3.19.1 Dimensioned drawing EPS midi gantry h 70
3.19.2 Technical data EPS midi gantry h 71
3.19.3 Module loads EPS midi gantry h 72
3.20 EPS maxi gantry h 73
3.20.1 Dimensioned drawing EPS maxi gantry h 73
3.20.2 Technical data EPS maxi gantry h 74
3.20.3 Module loads EPS maxi gantry h 75
3.21 Overview of power supplies 76

4 Transport, packaging and storage 77
4.1 Safety instructions for transport 77
4.2 Transport 77
4.3 Packaging 77
4.4 Storage 78

5 Installation, assembly and setting 79
5.1 Safety instructions for installation and assembly 79
5.2 Required mounting material 80
5.3 Weight compensation 81
5.3.1 Weight compensation with MagSpring 81
5.3.2 Weight compensation with pneumatic cylinder 81
5.4 Interfaces of the axis controllers 81
5.4.1 Axis controller C11xx 82
5.4.2 Axis controller C12xx 83
5.4.3 Axis controller E12xx 85
5.5 Pin assignment and electrical connection data of the motors 87
5.6 Connector assignment encoder on the controller 88
5.7 Connector strip 89

6 Commissioning 90
6.1 Safety instructions for commissioning 90

6.2 Preparatory activities for commissioning 91
6.3 Commissioning of the modules 91
6.4 Settings 92
6.4.1 Set speeds on electric axes 92
6.4.2 Teaching the positions on electric axes 96
6.4.3 Adjusting damping and speeds on pneumatic modules 97
6.4.4 External position measuring system 97

7 Fault elimination 99
7.1 Safety instructions for troubleshooting 99
7.2 Fault causes and remedy 99

8 Maintenance and repair 100
8.1 General notes 100
8.2 Safety instructions for Maintenance and Repair 100
8.3 Maintenance activities and maintenance intervals 101
8.3.1 Overview of the maintenance points 101
8.3.2 Further maintenance 101
8.4 Spare parts 102
8.4.1 Motor cable - Designation - Axes - Controller - Application 102
8.4.2 Motor cable 103
8.4.3 Servo controller 104
8.4.4 Position measuring system 104
8.4.5 MagSpring 105

9 Decommissioning and disposal 106
9.1 Safety instructions for decommissioning and disposal 106
9.2 Decommissioning 106
9.3 Disposal 106

10 Declaration of incorporation 107

1 General

1.1 Contents and purpose of these assembly instructions

These assembly instructions contain important information on assembly, commissioning, functioning and maintenance of the EPS handling system to ensure safe and efficient handling and operation.

Consistent compliance with these assembly instructions will ensure:

- permanent operational reliability of the EPS handling system,
- optimal functioning of the EPS handling system,
- timely detection and elimination of defects (thereby reducing maintenance and repair costs),
- Extension of the service life of the EPS handling system.

The illustrations in this manual shall provide you with a basic understanding of the module and may vary from the actual design of your module.

1.2 Explanation of symbols

The safety notes are marked by a pictogram and a signal word. The safety notes describe the extent of the hazard.

DANGER

Danger!

This safety note indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Warning!

This safety note points out a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Caution!

This safety note points out a potentially dangerous situation which, if not avoided, can result in minor or slight injuries.

NOTICE

This safety note points out a potentially dangerous situation which, if not avoided, can cause substantial damage to property and the environment.

This note contains important additional information as well as useful tips for safe, efficient and trouble-free operation of the EPS handling system.

Further warning signs:

Where applicable, the following standardised symbols are used in this manual to point out the various potential health risks.

	Warning - Dangerous electrical voltage.
	Warning: hot surfaces can cause burns upon contact.
	Warning - Risk of hand and finger injury due to uncontrolled movements of components.
	Warning - Magnetic field
	Warning - back injury due to heavy lifting.
	Warning - Risk of injury as a result of parts being flung out!
	Warning -high noise levels

1.3 Additional symbols

In these assembly instructions the following symbols are used to highlight instructions, results, references, etc.

Symbol	Description
1.	Instructions (steps ...)
⇨	Results of actions
➲	References to sections
■	Enumerations not ordered

1.4 Applicable documents

Each EPS handling system is accompanied by a safety information sheet. This information sheet must be read carefully by every person who carries out work on and with the EPS handling system.

Please also observe the installation instructions for the integrated modules!

1.5 Warranty

The warranty terms for Afag handling components and handling systems are the following:

- 24 months from initial operation and up to a maximum of 27 months from delivery.
- Wear parts are excluded from the warranty (The customer is entitled to a product free of defects. *This does also apply to defective accessories and wear parts. Normal wear and tear are excluded from the warranty.*

The warranty covers the replacement or repair of defective Afag parts. Further claims are excluded.

The warranty shall expire in the following cases:

- Improper use of the handling system.
- Non-observance of the instructions regarding assembly, commissioning, operation and maintenance of the module.
- Improper assembly, commissioning, operation and maintenance.
- Repairs and design changes carried out without prior technical instructions of Afag.
- Removing the serial number from the product.
- Using the EPS handling system without shock absorbers or with defective shock absorbers
- Inadequate checking of wear parts.
- Non-observance of the EC Machinery Directive, the Accident Prevention Regulations, the Standards of the German Electrotechnology Association (VDE) and these safety and assembly instructions.
- Disasters caused by foreign bodies and force majeure.

1.6 Liability

No changes shall be made to the EPS handling system unless described in this instructions manual or approved in writing by Afag.

Afag accepts no liability for unauthorized changes or improper assembly, installation, commissioning, operation, maintenance or repair work.

2 Safety instructions

2.1 General

This chapter provides an overview of all important safety aspects to ensure safe and proper use of the EPS handling system and optimal protection of personnel.

Safe handling and trouble-free operation of the EPS handling system requires knowledge of the basic safety regulations.

Every person carrying out installation, commissioning, maintenance work or operating the EPS handling system must have read and understood the complete user manual, especially the chapter on safety instructions.

Beyond this, there are rules and regulations regarding accident prevention that are applicable to the place of installation which must be observed.

Improper use may result in danger to life and limb of the user or third parties or in damage to the automation system or other material assets.

Failure to follow the directions and safety instructions given in this instructions manual may result in serious hazards.

2.2 Intended use

EPS handling systems are designed for use in automation systems and are used exclusively for moving workpieces.

The pneumatic modules are exclusively intended for operation by means of compressed air (4-7 bar). The electric axes are designed exclusively for operation with original LinMot components (controller, cables...).

EPS handling systems may only be used in the ambient and operating conditions defined for these modules (➲Chapter 3 Technical data).

Any use beyond the described purpose is considered to be not in accordance with the intended use.

The intended use of the module also includes:

- observance of all instructions given in this instructions manual.
- compliance with the inspection and maintenance work and the specifications in the data sheets,
- using only original spare parts.

2.3 Foreseeable misuse

Any use other than or beyond the intended use described above is considered a misuse of the EPS handling system.

Especially the following use is considered a misuse:

- Use to move parts for which the EPS handling system is not designed.
- Use in unsuitable ambient and operating conditions.

WARNING

Risk of injury if the module is not used as intended!

The improper use of the EPS handling system poses a potential hazard to the personnel.

- The EPS handling system may only be used in a technically perfect condition in accordance with its intended use and the instructions in this manual as well as in compliance with the safety requirements!
- Any malfunctions, particularly those that could impair safety, must be eliminated immediately!

Risks can occur if the system is not used as intended. In the event of damages caused by improper use the following shall apply:

- the operating company shall be solely responsible for such damage, and
- AFAG does not accept any liability for damage caused by improper use.

2.4 Obligations of the operator and the personnel

2.4.1 Observe the assembly instructions

A basic prerequisite for safe and proper handling of the EPS handling system is a good knowledge of the basic safety instructions.

These assembly instructions, in particular the safety instructions contained therein, must be observed by all persons working with the EPS handling system.

2.4.2 Obligations of the operating company

In addition to the safety instructions given in this manual, the operating company must comply with the safety, accident prevention and environmental protection regulations valid for the field of application of the EPS handling system.

The operating company is required to use only personnel who:

- have the necessary professional qualifications and experience,
- are familiar with the basic rules regarding occupational safety and accident prevention,
- have been instructed in the correct handling of the EPS,
- have read and understood these assembly instructions.

The operating company is also required to:

- monitor on an ongoing basis that the personnel work safely considering any potential hazard involved and the assembly instructions are observed,
- ensure that the assembly instructions are always kept at hand at the installation in which the system are mounted,
- observe and communicate universally applicable laws and regulations regarding accident prevention and environmental protection,
- provide the necessary personal protective equipment (e.g. protective gloves) and instruct the personnel to wear it.

2.4.3 Obligations of the personnel

All personnel working with the rotary modules are required to:

- read and observe these assembly instructions, especially the chapter on safety,
- observe the occupational safety and accident prevention regulations,
- observe all safety and warning signs on the EPS handling system,
- refrain from any activity that might compromise safety and health.

In addition, the personnel must wear the personal protective equipment required for carrying out their work. (➲Chapter 2.6).

2.5 Personnel requirements

2.5.1 Personnel qualification

The activities described in the assembly instructions require specific requisites at the level of professional qualifications of the personnel.

Personnel not having the required qualification will not be able to asses the risks that may arise from the use of the EPS handling system thus exposing himself and others to the risk of serious injury. Therefore, only qualified personnel may be permitted to carry out the described activities on the EPS handling system.

Persons whose ability to react is restricted due to the intake of medication or the like must not interact with the EPS handling system.

These installation instructions are intended for skilled personnel (installers, system integrators, maintenance personnel, technicians), electricians and operating personnel.

The following is a description of the professional skills (qualifications) required for carrying out the different activities:

Qualified personnel:
Qualified personnel with appropriate training who are qualified due to their special know-how and fully familiar with the machine and who have been given instructions on how to carry out the task entrusted to them safely.

Qualified electrician:
Persons who have obtained their electrical qualifications through appropriate professional training and complementary courses that enables them to identify risks and prevent possible hazards resulting from electricity.

Operator (trained personnel):
Authorized persons who due to their specialized professional training, expertise and experience are capable of identifying risks and preventing possible hazards arising from the use of the machine.

2.6 Personal protective equipment (PPE)

The personal protective equipment serves to protect the personnel from hazards affecting their safety and health at work.

When working on/with the EPS handling system, the personnel must wear the personal protective equipment assigned by the safety officer of the operating company or as required by safety regulations. In addition, the personnel is required to:

- wear the personal protective equipment provided by the operating company (employer),
- check the personal protective equipment for proper condition, and
- immediately notify the person responsible on site of any defects found on the personal protective equipment.

Personal protective equipment and the respective mandatory signs:

	*Protective clothing* is a close-fitting clothing specifically designed to protect personnel from hazards during work.
	*Protective gloves* are specifically designed to protect the personnel against hand injuries (such as cuts, abrasion, burns).
	*Safety shoes* are specifically designed to protect the personnel against foot injuries from crushing, falling objects or slipping on slippery surfaces.
	Hearing protectors are required to protect the personnel against excessive noise levels to prevent noise-induced hearing loss.

2.7 Changes and modifications

No changes may be made to the EPS handling system which have not been described in these assembly instructions or approved in writing by Afag.

Afag accepts no liability for unauthorised changes or improper assembly, installation, commissioning, maintenance or repair work.

2.8 General hazards / residual risks

Despite the safe design of the EPS system and the technical protective measures taken, there still remain residual risks that cannot be avoided and which present a non-obvious residual risk when operating the EPS handling system.

Observe the safety instructions in this chapter and in the other sections of this manual to avoid damage to property and dangerous situations for the personnel.

2.8.1 General hazards at the workplace

The EPS system has been built according to the state-of-the-art and the applicable health and safety requirements. However, improper use of the EPS system may expose the personnel to the following hazards:

- danger to life and limb of the operator or third parties,
- on the EPS system itself,
- property damage.

Always keep the assembly instructions ready at hand at the workplace! Please, also observe:

- the general and local regulations on accident prevention and environmental protection,
- the safety information sheet for the EPS system.

CAUTION

Risk of injuries due to uncontrolled parts movements!

Incorrect control of the drives can trigger dangerous movements and cause personal injury or damage to property.

- Only qualified personnel may work with or on the EPS handling system.
- Only operate the EPS system with functioning monitoring systems!

2.8.2 Danger due to electricity

DANGER

Danger! Risk of electric shock!

If work on electrical components is required, ensure that the work is carried out properly, failure to do so will cause serious or fatal injuries.

- Work on the machine's electrical equipment may only be performed by skilled electrician or trained personnel under the supervision of a skilled electrician in accordance with all relevant electrical regulations.

2.8.3 Danger due to strong magnetic fields

DANGER

Danger due to strong magnetic fields.

Due to the strong magnetic fields, electronic devices such as pacemakers can be disturbed or their function impaired.

- Persons with a pacemaker must keep a safety distance of at least 50 cm. This must be ensured by means of a protective fence.
- Provide the EPS system with appropriate warnings.
- The personnel must be instructed accordingly.

2.8.4 Danger due to pneumatics

WARNING

Risks by the pneumatic system!

If work on electrical components is required, ensure that the work is carried out properly, failure to do so will cause serious or fatal injuries.

- Work on the machine's electrical equipment may only be performed by skilled electrician or trained personnel under the supervision of a skilled electrician in accordance with all relevant electrical regulations.

2.8.5 Danger due to high temperatures

CAUTION

Personal injury caused by hot surfaces.

During continuous operation of the EPS handling system, the surface heats up.

- Avoid direct contact if the system has been in operation.
- Before touching hot surfaces without protective gloves, make sure that they have cooled down to ambient temperature or wear suitable protective equipment (gloves, long clothing ...).

2.8.6 Mechanical hazards

CAUTION

Danger of injury by moving components!

Limbs can be injured (bruises, contusions, broken bones) when reaching into the displacement range of moving components!

- Work on and with the EPS handling system may only be carried out by qualified personnel.
- Never reach into the system during normal operation!
- Fit a suitable protective fence to avoid encroachment on the driving area.

3 Technical data

3.1 EPS System mini YZ

3.1.1 Dimensioned drawing EPS mini YZ

Type	L
ES20-50-SL	191.5 mm
ES20-100-SL	285 mm
ES20-200	365 mm
ES20-300	495 mm

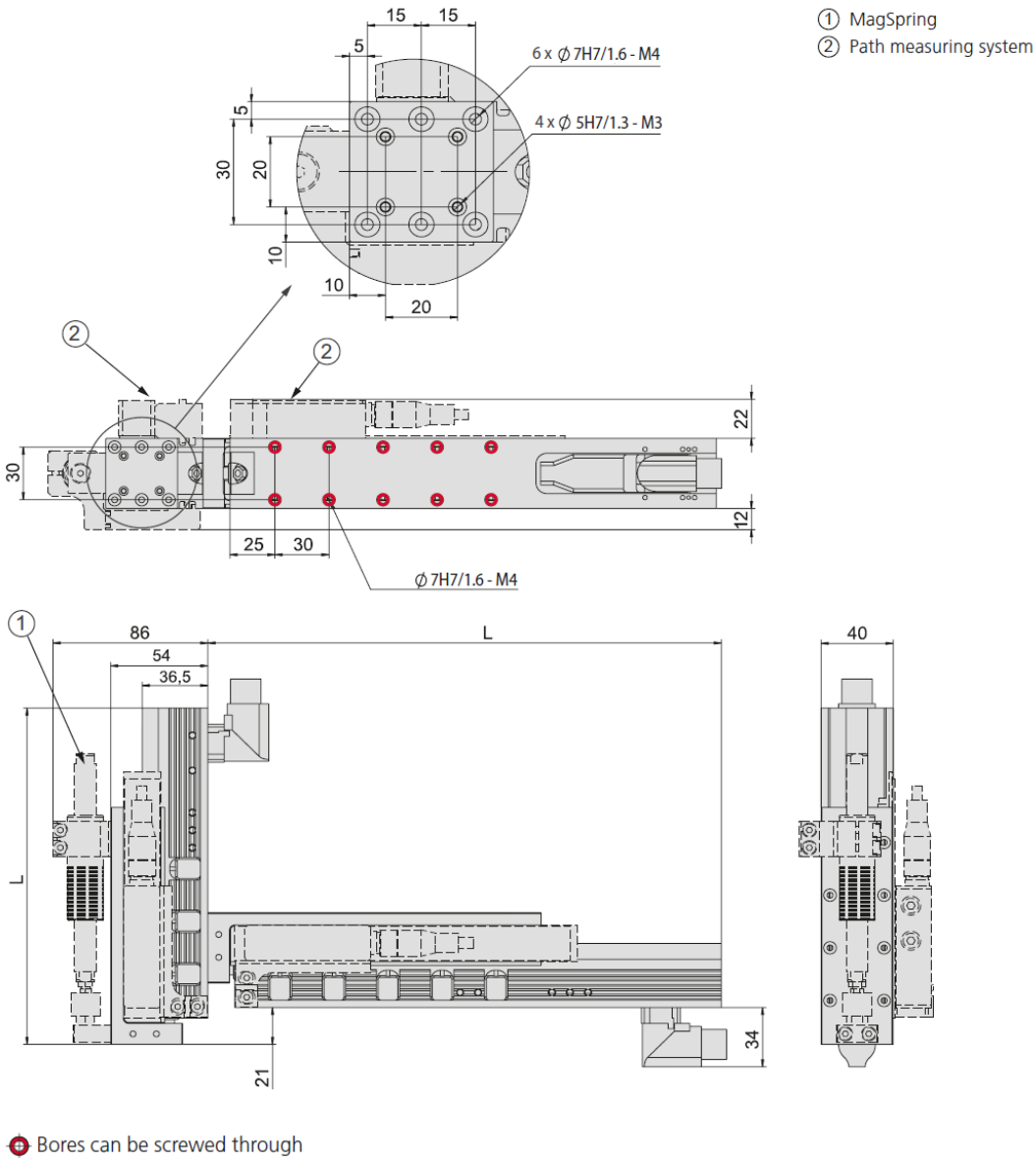


Fig. 1 Dimensioned drawing EPS mini YZ

3.1.2 Technical data EPS mini YZ

EPS mini YZ	
Order number	**50444428**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	Y-axis	
Axis	ES20	ES20
Stroke horizontal	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Type	Z-axis	
Axis	ES20	ES20
Stroke vertical	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Included in the delivery *
- 2x Ø 5h6 Centring sleeves
- 4x Ø 7h6 Centring sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised

Accessories
(Catalogue HT accessories)
- Console
- Valve block

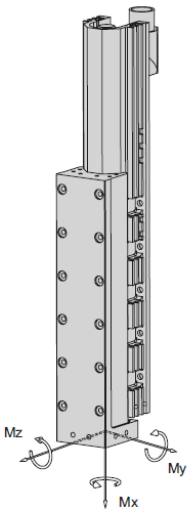
(Catalogue HT components linear)
- Path measuring system

(Catalog HT components gripping/rotating)
- Rotary modules
- Gripper modules

* Deviations possible depending on installed peripherals

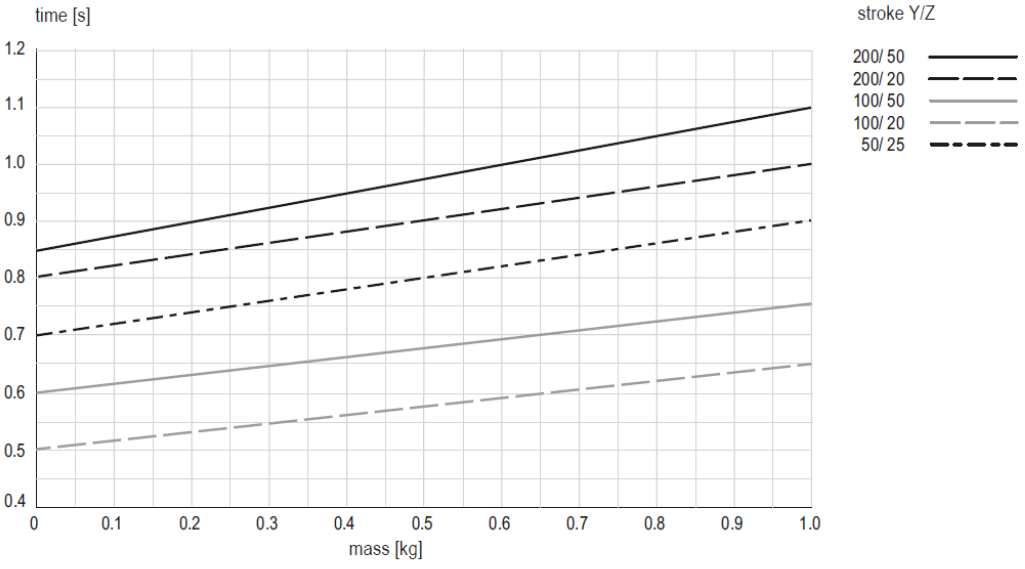
3.1.3 Module loads EPS mini YZ

Type	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)				
Stroke Y / Stroke Z	50 mm	100 mm	200 mm	300 mm
50 mm	3 kg	3 kg	2 kg	1 kg
100 mm	3 kg	2 kg	1 kg	0.5 kg
200 mm	2 kg	1 kg	-	-
300 mm	1 kg	-	-	-

Cycle times EPS mini YZ for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick-and-Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.2 EPS System midi YZ

3.2.1 Dimensioned drawing EPS midi YZ

Type	L
ES20-050-SL	191.5 mm
ES20-100-SL	285 mm
ES20-200	365 mm
ES20-300	495 mm

Type	B
ES30-050-SL	288 mm
ES30-100-SL	328 mm
ES30-100	328 mm
ES30-200-SL	428 mm
ES30-200	428 mm
ES30-300	528 mm
ES30-400	628 mm
ES30-500	728 mm

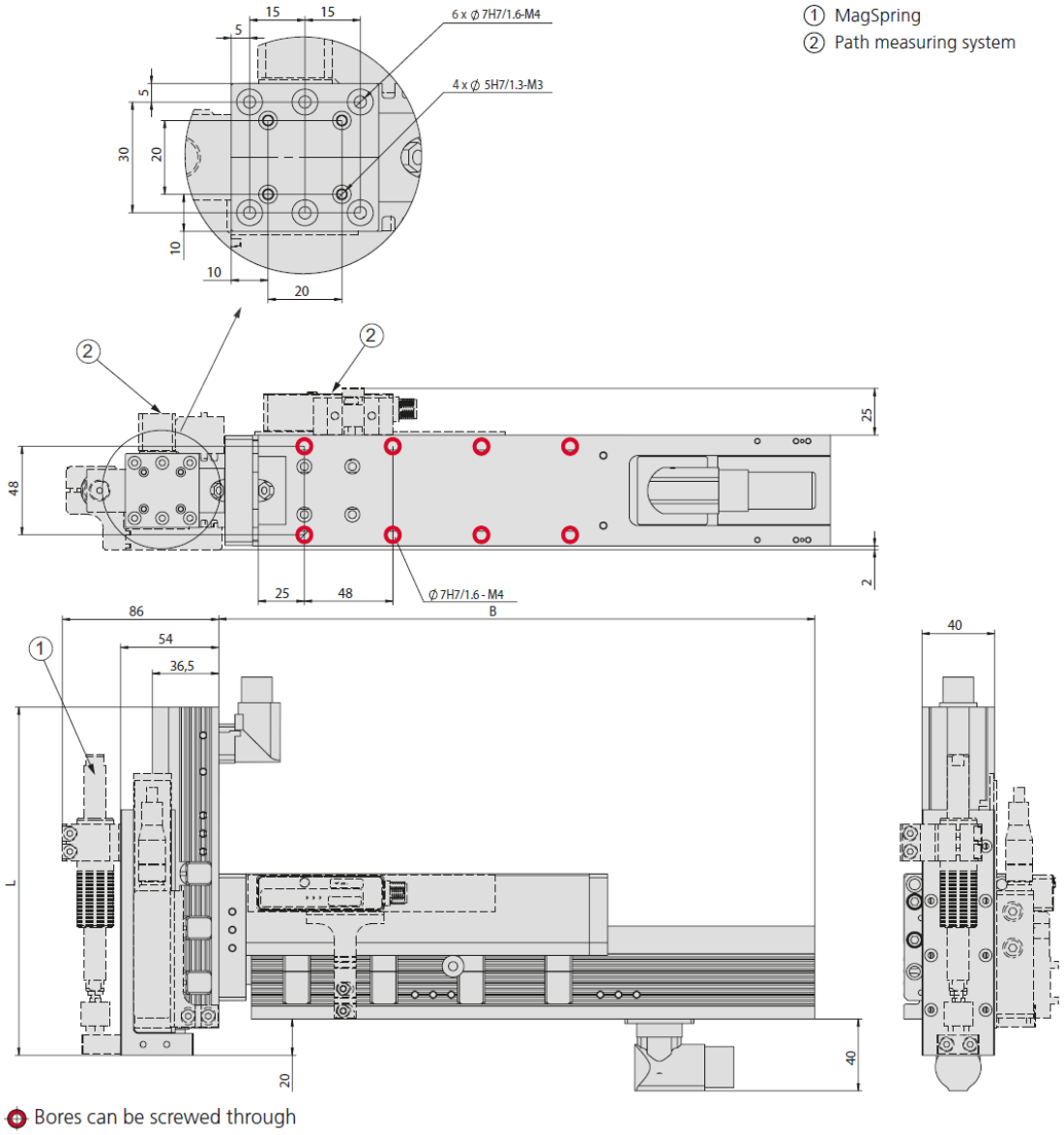


Fig. 2 Dimensioned drawing EPS midi YZ

3.2.2 Technical data EPS midi YZ

EPS midi YZ	
Order number	**50444429**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	Y-axis
Axis	ES30
Stroke horizontal	50, 100, 200, 300, 400, 500 mm
Maximum speed	3.2 m/s
Peak force	255 N
Permanent force	51 N

Type	Z-axis	
Axis	ES20	ES20
Stroke vertical	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Included in the delivery *
- 2x Ø 5h6 Centring Sleeves
- 2x Ø 7h6 Centring Sleeves
- 2x Ø 9h7 Centring Sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised

Accessories
(Catalogue HT accessories)
- Console
- Valve block

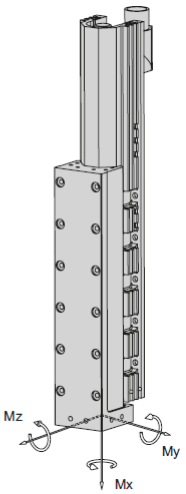
(Catalogue HT components linear)
- Path measuring system

(Catalogue HT components gripping/rotating)
- Rotary module
- Gripper module

* Deviations possible depending on installed peripherals

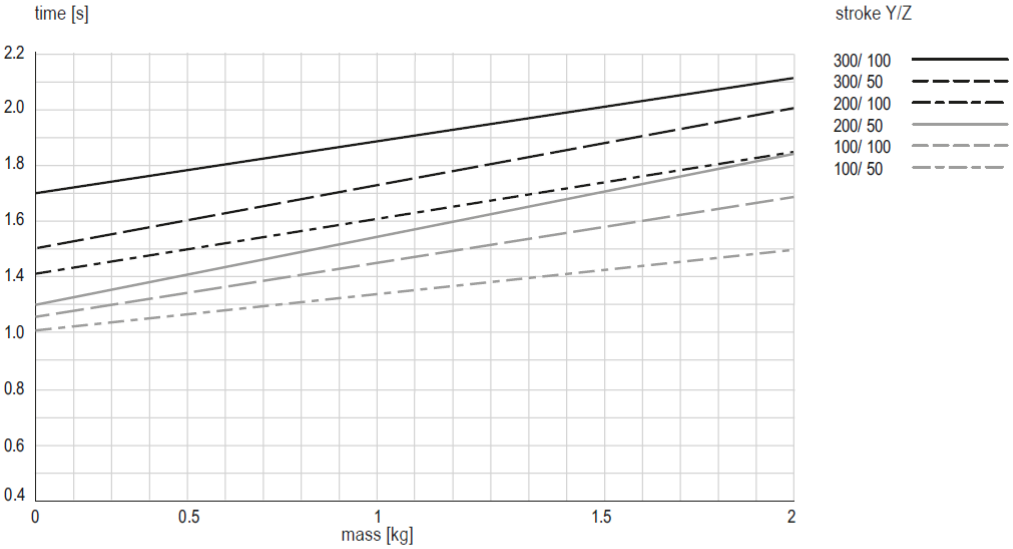
3.2.3 Module loads EPS midi YZ

Type	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)						
Stroke Y / Stroke Z	50 mm	100 mm	200 mm	300 mm	400 mm	500 mm
50 mm	3 kg	5 kg	5 kg	4 kg	3 kg	2 kg
100 mm	5 kg	5 kg	4 kg	3 kg	2 kg	1 kg
200 mm	5 kg	4 kg	3 kg	2 kg	1 kg	0.5 kg
300 mm	4 kg	3 kg	2 kg	1 kg	0.5 kg	0.5 kg

Cycle times EPS midi YZ for Pick & Place



Times including 2 x 100 ms gripping time

Comment:
The values in the chart correspond to a Pick-and-Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.3 EPS System maxi YZ

3.3.1 Dimensioned drawing EPS maxi YZ

Type	L
ES30-050-SL	288 mm
ES30-100-SL	328 mm
ES30-100	328 mm
ES30-200-SL	428 mm
ES30-200	428 mm
ES30-300	528 mm
ES30-400	628 mm
ES30-500	728 mm

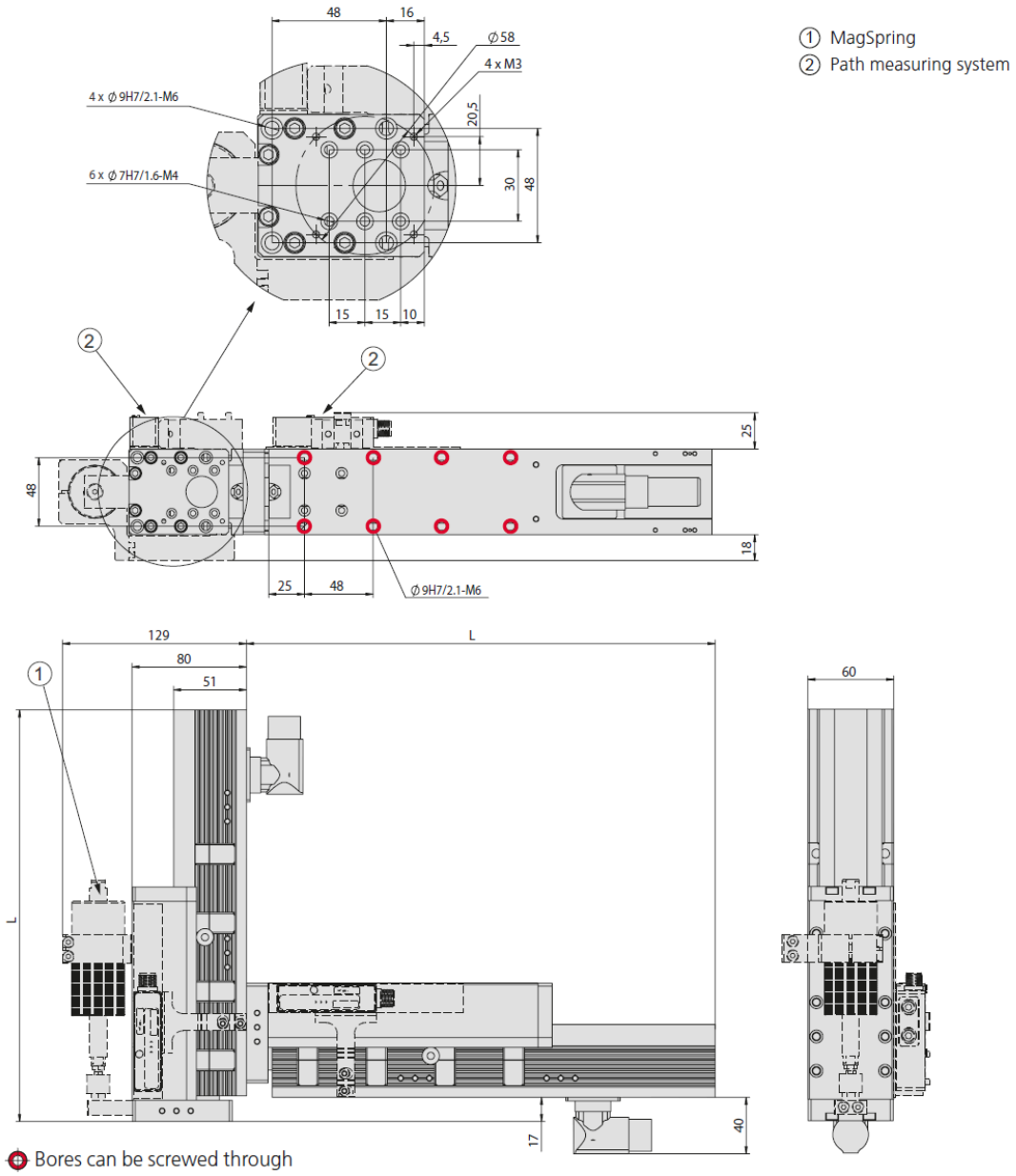


Fig. 3 Dimensioned drawing EPS maxi YZ

3.3.2 Technical data EPS maxi YZ

EPS maxi YZ	
Order number	**50444430**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	Y-axis
Axis	ES30
Stroke horizontal	50, 100, 200, 300, 400, 500 mm
Maximum speed	3.2 m/s
Peak force	255 N
Permanent force	51 N

Type	Z-axis
Axis	ES30
Stroke vertical	50, 100, 200, 300, 400, 500 mm
Maximum speed	3.2 m/s
Peak force	255 N
Permanent force	51 N

Included in the delivery *
- 2x Ø 7h6 Centring sleeves
- 4x Ø 9h7 Centring sleeves
- MagSpring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised

Accessories
(Catalogue HT accessories)
- Console
- Valve block

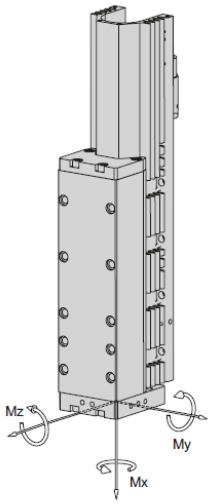
(Catalogue HT components linear)
- Path measuring system

(Catalogue HT components gripping/rotating)
- Rotary modules
- Grpper modules

* Deviations possible depending on installed peripherals

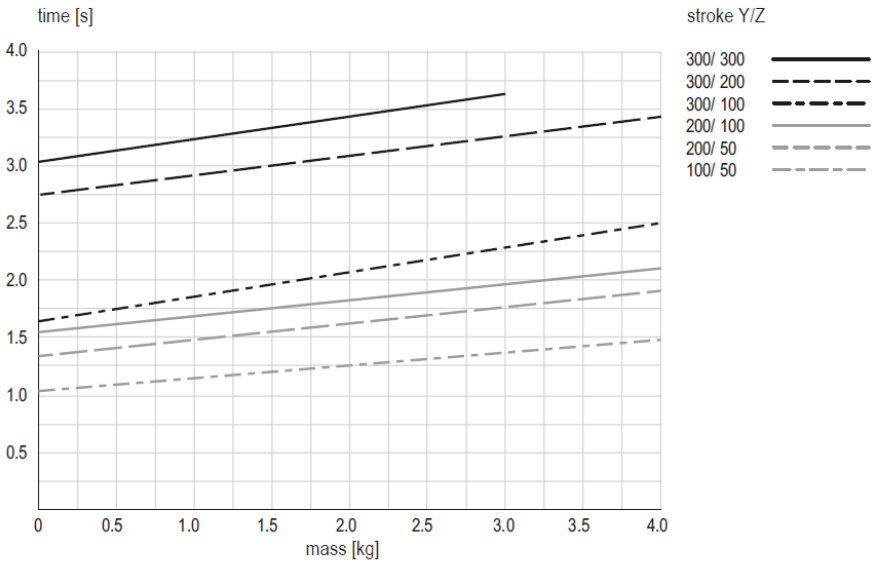
3.3.3 Module loads EPS maxi YZ

Type	ES30-SL	ES30
Dynamic torque Mx	30 Nm	30 Nm
Dynamic torque My	40 Nm	80 Nm
Dynamic torque Mz	40 Nm	80 Nm



Payload (centric)						
Stroke Y / Stroke Z	50 mm	100 mm	200 mm	300 mm	400 mm	500 mm
50 mm	8 kg	7 kg	6 kg	5 kg	4 kg	3 kg
100 mm	7 kg	6 kg	5 kg	4 kg	3 kg	2 kg
200 mm	6 kg	5 kg	4 kg	3 kg	2 kg	1 kg
300 mm	5 kg	4 kg	3 kg	2 kg	1 kg	0.5 kg
400 mm	4 kg	3 kg	2 kg	1 kg	0.5 kg	-
500 mm	3 kg	2 kg	1 kg	0.5 kg	-	-

Cycle times EPS maxi YZ for Pick & Place



Times including 2 x 100 ms gripping time

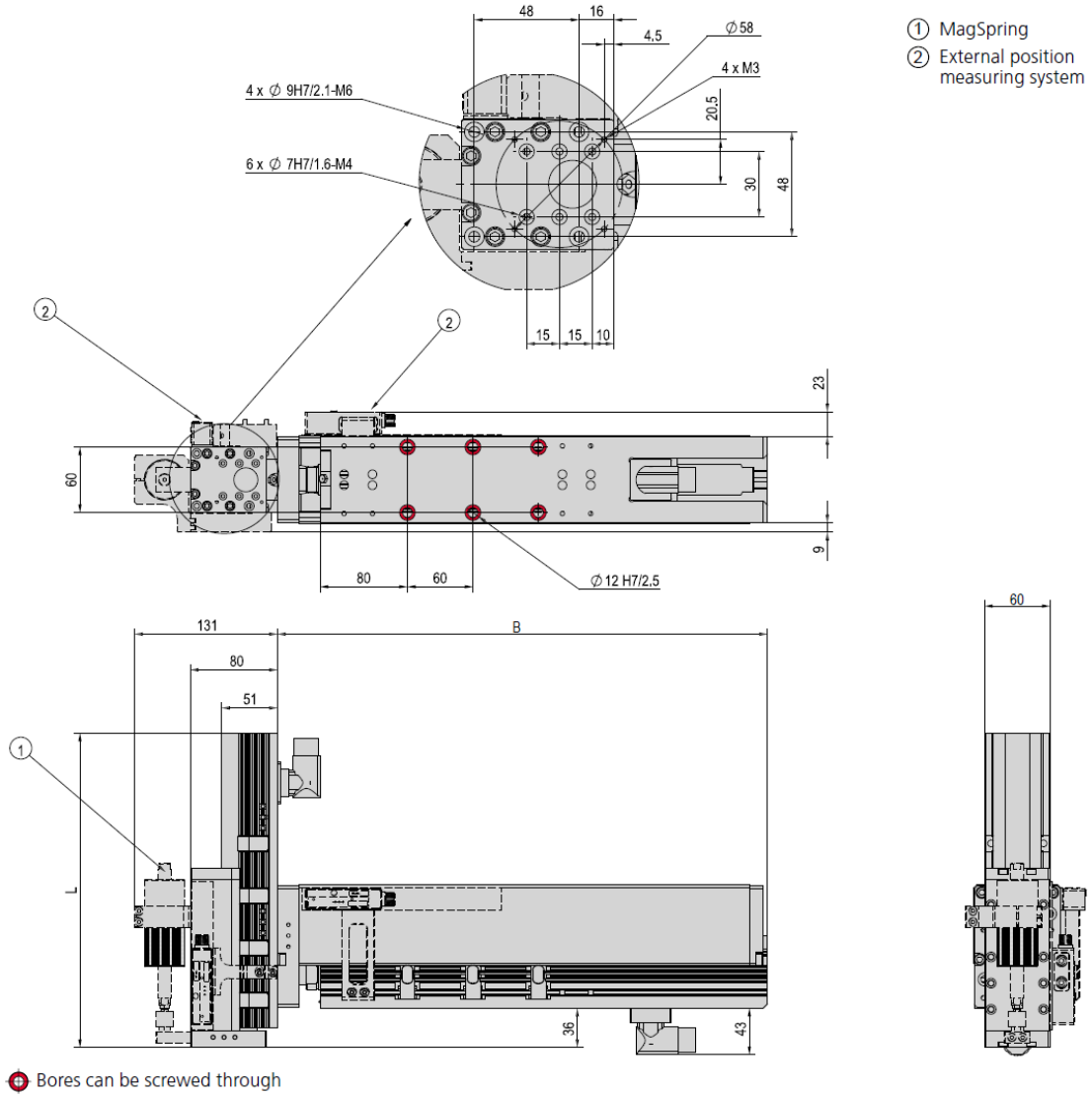
Comment:
The values in the chart correspond to a Pick & Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.4 EPS System giga YZ

3.4.1 Dimensioned drawing EPS giga YZ

Type	L
ES30-50-SL	288 mm
ES30-100-SL	328 mm
ES30-100	328 mm
ES30-200-SL	428 mm
ES30-200	428 mm
ES30-300	528 mm
ES30-400	628 mm
ES30-500	728 mm

Type	B
ES40-100-SL	442 mm
ES40-100	449 mm
ES40-100-HP-SL	532 mm
ES40-100-HP	532 mm
ES40-200	549 mm
ES40-200-HP	652 mm
ES40-300	649 mm
ES40-300-HP	742 mm
ES40-400	749 mm
ES40-400-HP	832 mm
ES40-500	908 mm
ES40-500-HP	952 mm



① MagSpring
② External position measuring system

Fig. 4 Dimensioned drawing EPS giga YZ

3.4.2 Technical data EPS giga YZ

EPS giga YZ	
Order number	**50494324**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 - 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	Y-axis	
Axis	ES40	ES40-HP
Stroke horizontal	100, 200, 300, 400, 500 mm	100, 200, 300, 400, 500 mm
Maximum speed	3 m/s	2 m/s
Peak force	550 N	1024 N
Permanent force	145 N	203 N

Type	Z-axis
Axis	ES30
Stroke horizontal	50, 100, 200, 300, 400, 500 mm
Maximum speed	3.2 m/s
Peak force	255 N
Permanent force	51 N

Included in the delivery *
- 2x Ø7x3 centring sleeves
- 2x Ø9x4 centring sleeves
- 2x Ø12x4.8 centring sleeves
- Mass compensation
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised

Accessories
- Console
- Valve block

(Catalogue HT components linear)
- External position measuring system

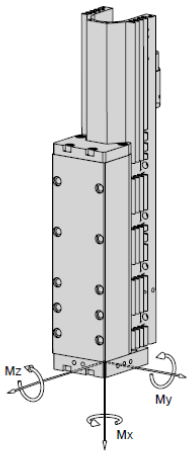
(Catalogue HT components gripping/rotating)
- Rotary modules
- Gripper modules

* Deviations possible depending on installed peripherals

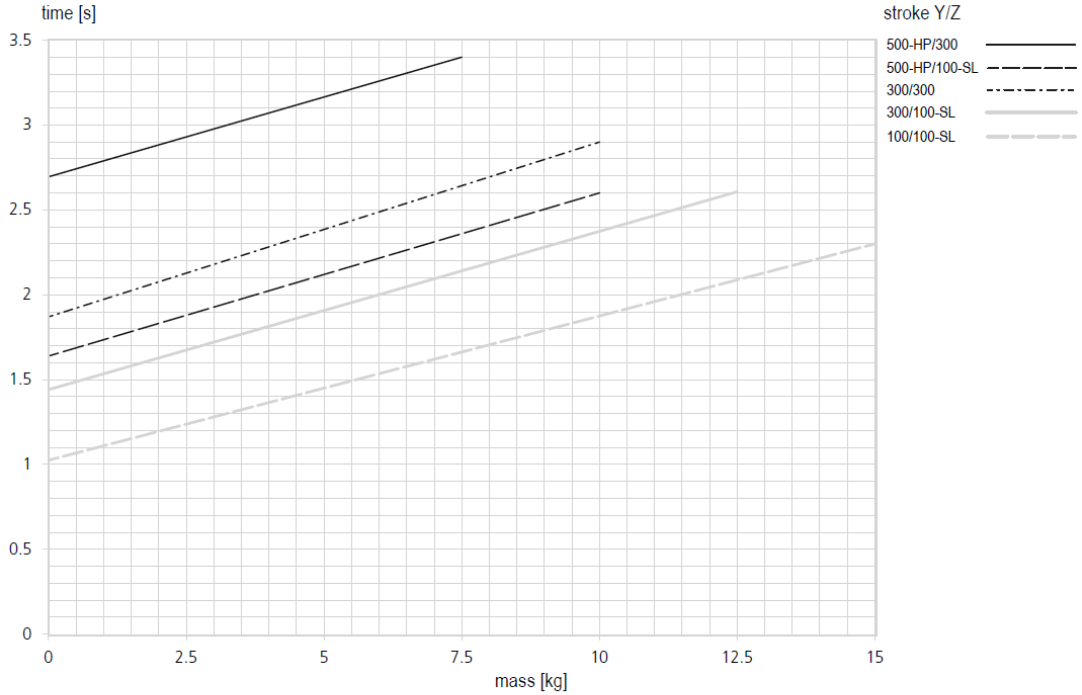
3.4.3 Module loads EPS giga YZ

Type	ES30-SL	ES30
Max. dynamic torque Mx	30 Nm	30 Nm
Max. dynamic torque My	40 Nm	80 Nm
Max. dynamic torque Mz	40 Nm	80 Nm

Payload (centric)					
Stroke Y / Stroke Z	100 mm	200 mm	300 mm	400 mm	500 mm
50 mm	15 kg	15 kg	12.5 kg	10 kg	9 kg
100 mm	15 kg	15 kg	12.5 kg	10 kg	9 kg
200 mm	15 kg	12.5 kg	10 kg	9 kg	8 kg
300 mm	12.5 kg	10 kg	9 kg	8 kg	7.5 kg
400 mm	10 kg	9 kg	8 kg	7.5 kg	5 kg
500 mm	9 kg	8 kg	7.5 kg	5 kg	3 kg



Cycle times EPS giga YZ for Pick & Place



Times including 2 x 100 ms gripping time

Comment:
The values in the chart correspond to a Pick & Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.5 EPS System tera YZ

3.5.1 Dimensioned drawing EPS tera YZ

Type	L
ES40-100-SL	442 mm
ES40-100	449 mm
ES40-100-HP-SL	532 mm
ES40-100-HP	532 mm
ES40-200	549 mm
ES40-200-HP	652 mm
ES40-300	649 mm
ES40-300-HP	742 mm
ES40-400	749 mm
ES40-400-HP	832 mm
ES40-500	908 mm
ES40-500-HP	952 mm

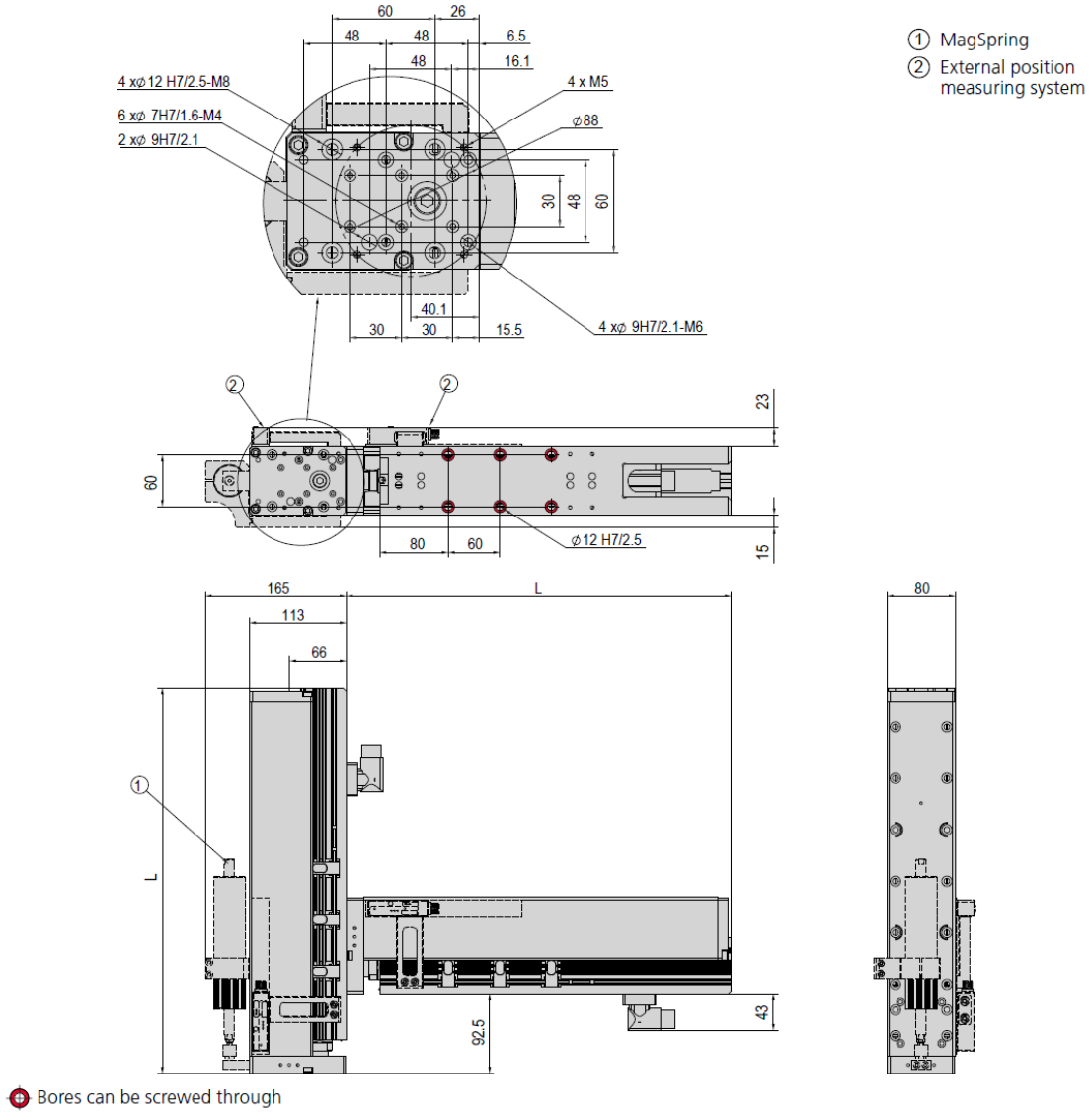
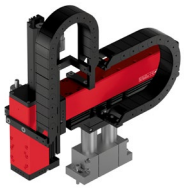


Fig. 5 Dimensioned drawing EPS tera YZ

3.5.2 Technical data EPS tera YZ



EPS tera YZ	
Order number	**50494325**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 - 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	Y-axis	
Axis	ES40	ES40-HP
Stroke horizontal	100, 200, 300, 400, 500 mm	100, 200, 300, 400, 500 mm
Maximum speed	3 m/s	2 m/s
Peak force	550 N	1024 N
Permanent force	145 N	203 N

Type	Z-axis	
Axis	ES40	ES40-HP
Stroke horizontal	100, 200, 300, 400, 500 mm	100, 200, 300, 400, 500 mm
Maximum speed	3 m/s	2 m/s
Peak force	550 N	1024 N
Permanent force	145 N	203 N

Included in the delivery *
- 2x Ø7x3 centring sleeves
- 2x Ø9x4 centring sleeves
- 4x Ø12x4.8 centring sleeves
- Mass compensation
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised

Accessories
- Console
- Valve block

(Catalogue HT components linear)
- External position measuring system

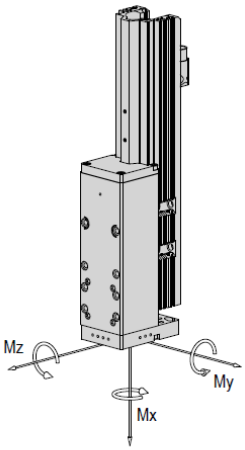
(Catalogue HT components gripping/rotating)
- Rotary modules
- Gripper modules

* Deviations possible depending on installed peripherals

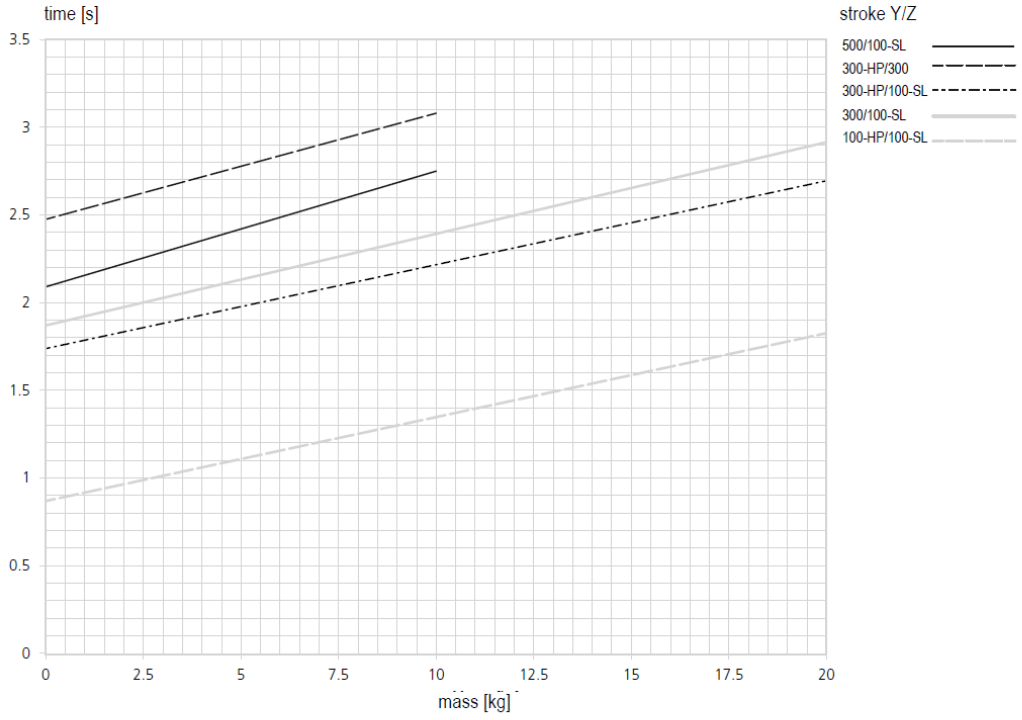
3.5.3 Module loads EPS tera YZ

Type	ES40-SL	ES40
Max. dynamic torque Mx	35 Nm	45 Nm
Max. dynamic torque My	80 Nm	180 Nm
Max. dynamic torque Mz	80 Nm	180 Nm

Payload (centric)					
Stroke Y / Stroke Z	100 mm	200 mm	300 mm	400 mm	500 mm
100 mm	20 kg	20 kg	15 kg	12.5 kg	10 kg
200 mm	20 kg	15 kg	12.5 kg	10 kg	9 kg
300 mm	15 kg	12.5 kg	10 kg	9 kg	8 kg
400 mm	12.5 kg	10 kg	9 kg	8 kg	5 kg
500 mm	10 kg	9 kg	8 kg	5 kg	3 kg



Cycle times EPS tera YZ for Pick & Place



Times including 2 x 100 ms gripping time

Comment:
The values in the chart correspond to a Pick & Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.6 EPS System mini XZ

3.6.1 Dimensioned drawing EPS mini XZ

Type	A
PEL20-060	374 mm
PEL20-130	444 mm
PEL20-190	504 mm
PEL20-290	604 mm
PEL20-470	784 mm
PEL20-560	874 mm

Type	A
PEL20-080-SL	314 mm
PEL20-140-SL	374 mm
PEL20-210-SL	444 mm
PEL20-270-SL	504 mm
PEL20-370-SL	604 mm
PEL20-550-SL	784 mm
PEL20-640-SL	874 mm

Type	B
ES20-50-SL	191.5 mm
ES20-100-SL	285 mm
ES20-200	365 mm
ES20-300	495 mm

① MagSpring
② Path measuring system

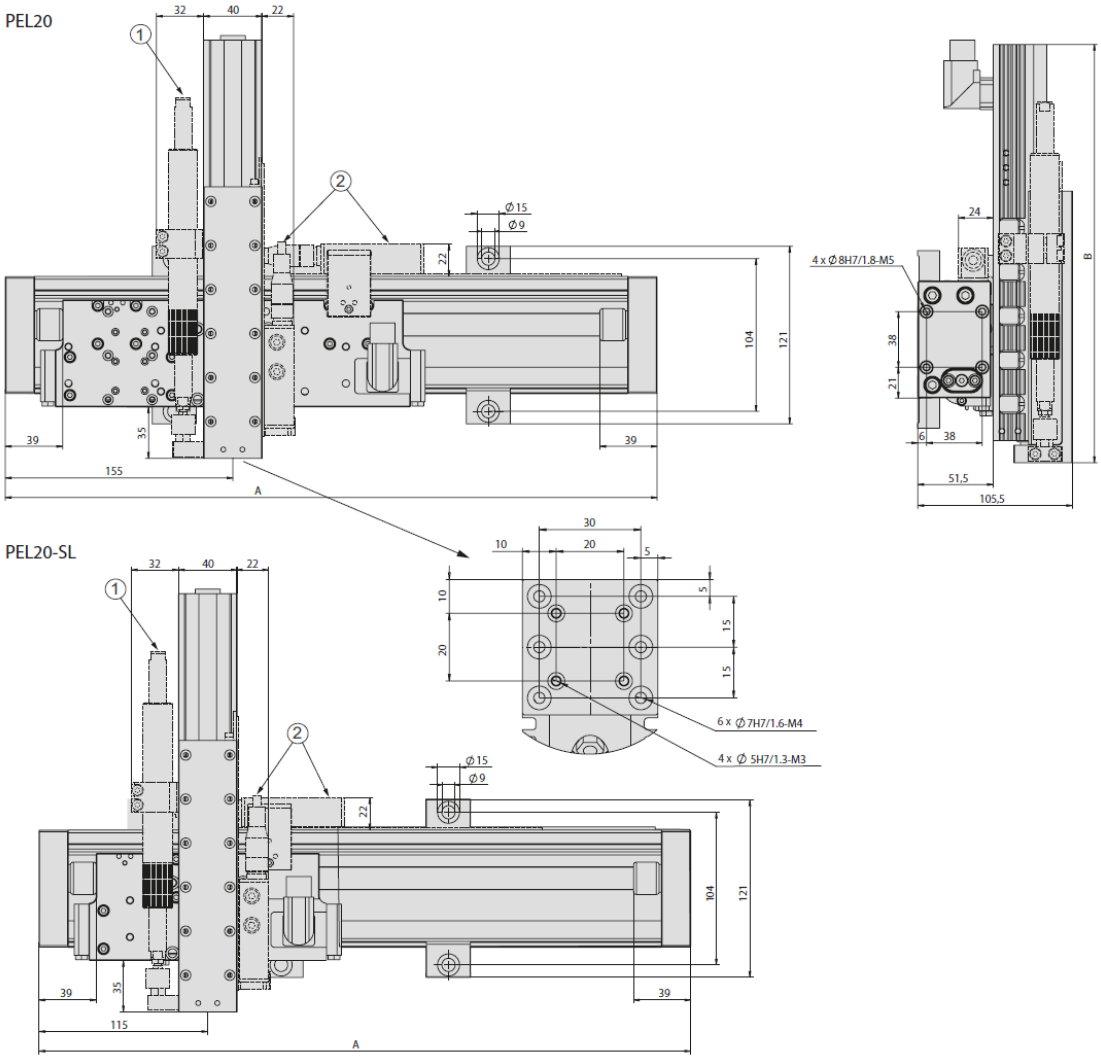
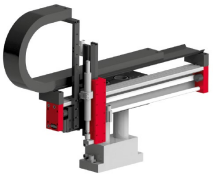


Fig. 6 Dimensioned drawing EPS mini XZ

3.6.2 Technical data EPS mini XZ



EPS mini XZ	
Order number	**50444431**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis	
Axis	PEL20-SL	PEL20
Stroke horizontal	80, 140, 210, 270, 370, 550, 640 mm	60, 130, 190, 290, 470, 560 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Type	Z-axis	
Axis	ES20	ES20
Stroke vertical	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Included in the delivery *
- 2x Ø 5h6 Centring sleeves
- 2x Ø 7h6 Centring sleeves
- 2x Ø 9h7 Centring sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised

Accessories
(Catalogue HT accessories)
- Console
- Valve block

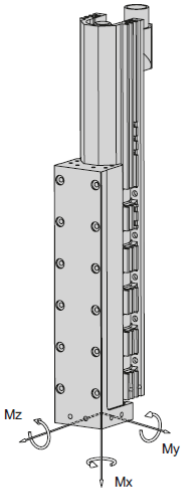
(Catalogue HT components linear)
- Path measuring system

(Catalogue HT components grpping/rotating)
- Rotary module
- Gripper module

* Deviations possible depending on installed peripherals

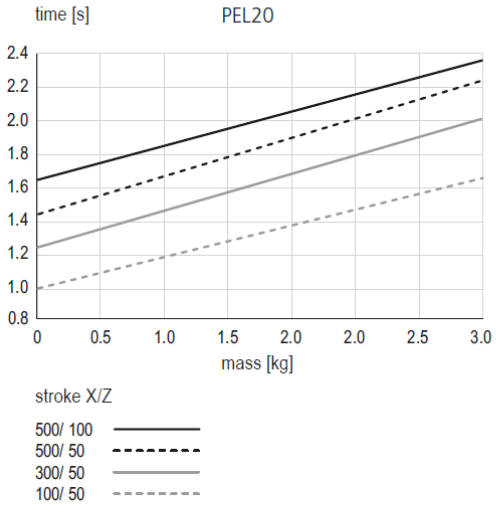
3.6.3 Module loads EPS mini XZ

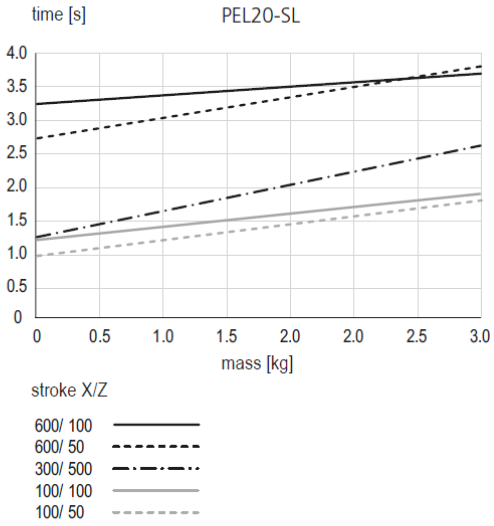
Type	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)	
Stroke X	up to 640 mm
Stroke Z	
50 mm	3 kg
100 mm	2 kg
200 mm	1 kg

Cycle times EPS mini XZ for Pick & Place





Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick & Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded..

3.7 EPS System midi XZ

3.7.1 Dimensioned drawing EPS midi XZ

Type	A	C	L
PDL30-X-D19	40 mm	134 mm	X + 270 mm
PDL30-X-D20	50 mm	144 mm	X + 290 mm
PDL40-X-D27	49 mm	169 mm	X + 340 mm
PDL40-X-D28	64 mm	182 mm	X + 370 mm
PDL40-X-HP-D27	49 mm	229 mm	X + 460 mm
PDL40-X-HP-D28	64 mm	242 mm	X + 490 mm

Type	B
ES20-50-SL	191.5 mm
ES20-100-SL	285 mm
ES20-200	365 mm
ES20-300	495 mm

① MagSpring
② Path measuring system
X Stroke of the X-axis

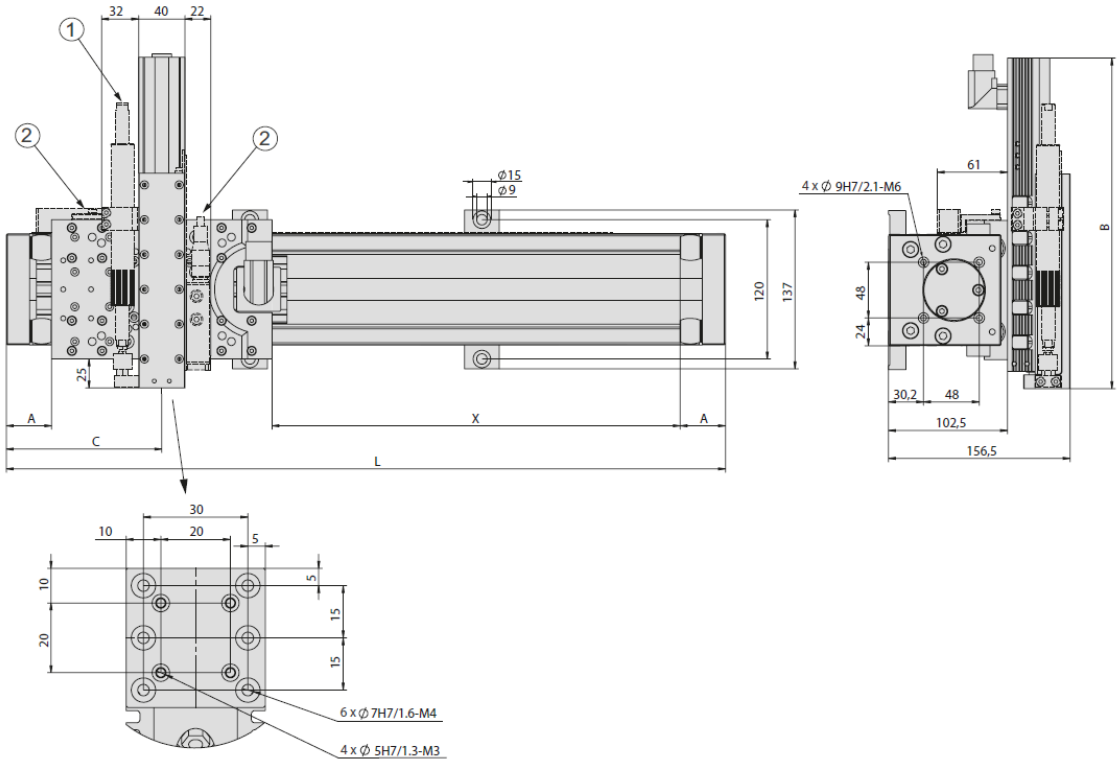
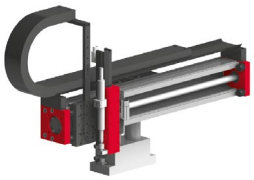


Fig. 7 Dimensioned drawing EPS midi XZ

3.7.2 Technical data EPS midi XZ



EPS midi XZ	
Order number	**50444432**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis		
Axis	PDL30	PDL40	PDL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130, 1330 mm	170, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	110, 160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Z-axis	
Axis	ES20	ES20
Stroke vertical	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Included in the delivery *
- 2x Ø 5h6 Centring sleeves
- 2x Ø 7h6 Centring sleeves
- 2x Ø 9h7 Centring sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised

Accessories
(Catalogue HT accessories)
- Console
- Valve block

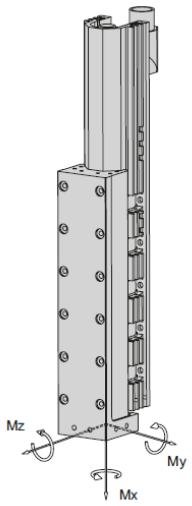
(Catalogue HT components linear)
- Path measuring system

(Catalog HT components gripping/rotating)
- Rotary module
- Gipper module

* Deviations possible depending on installed peripherals

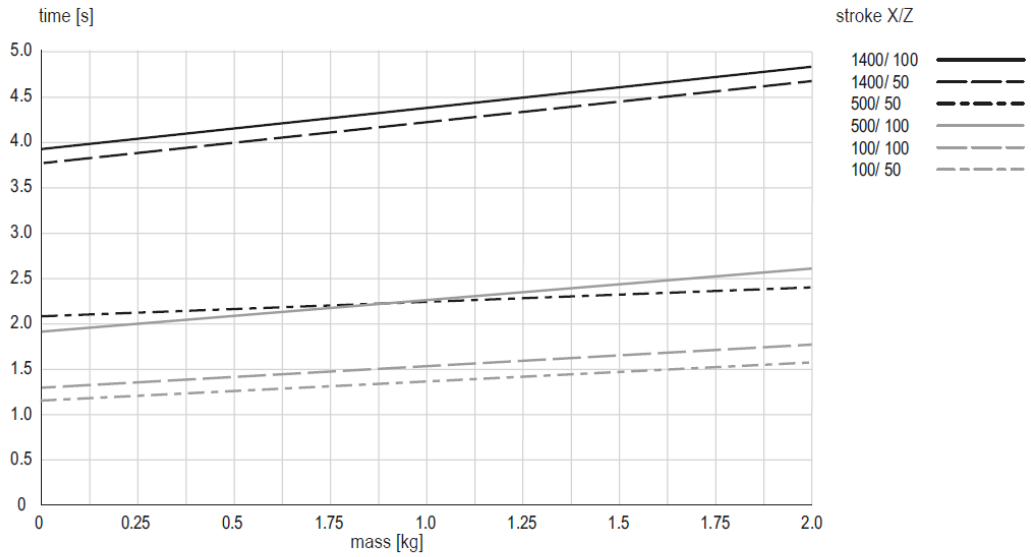
3.7.3 Module loads EPS midi XZ

Type	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)	
Stroke X	up to 1660 mm
Stroke Z	
50 mm	3 kg
100 mm	2.5 kg
200 mm	2 kg
300 mm	1.5 kg

Cycle times EPS midi XZ for Pick & Place



imes including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick & Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded..

3.8 EPS System maxi XZ

3.8.1 Dimensioned drawing EPS maxi XZ

Type	A	C	L
PDL30-X-D19	40 mm	134 mm	X + 270 mm
PDL30-X-D20	50 mm	144 mm	X + 290 mm
PDL40-X-D27	49 mm	169 mm	X + 340 mm
PDL40-X-D28	64 mm	182 mm	X + 370 mm
PDL40-X-HP-D27	49 mm	229 mm	X + 460 mm
PDL40-X-HP-D28	64 mm	242 mm	X + 490 mm

Type	B
ES30-50-SL	288 mm
ES30-100-SL	328 mm
ES30-100	328 mm
ES30-200-SL	428 mm
ES30-200	428 mm
ES30-300	528 mm
ES30-400	628 mm
ES30-500	728 mm

① MagSpring
② Path measuring system
X Stroke of the X-axis

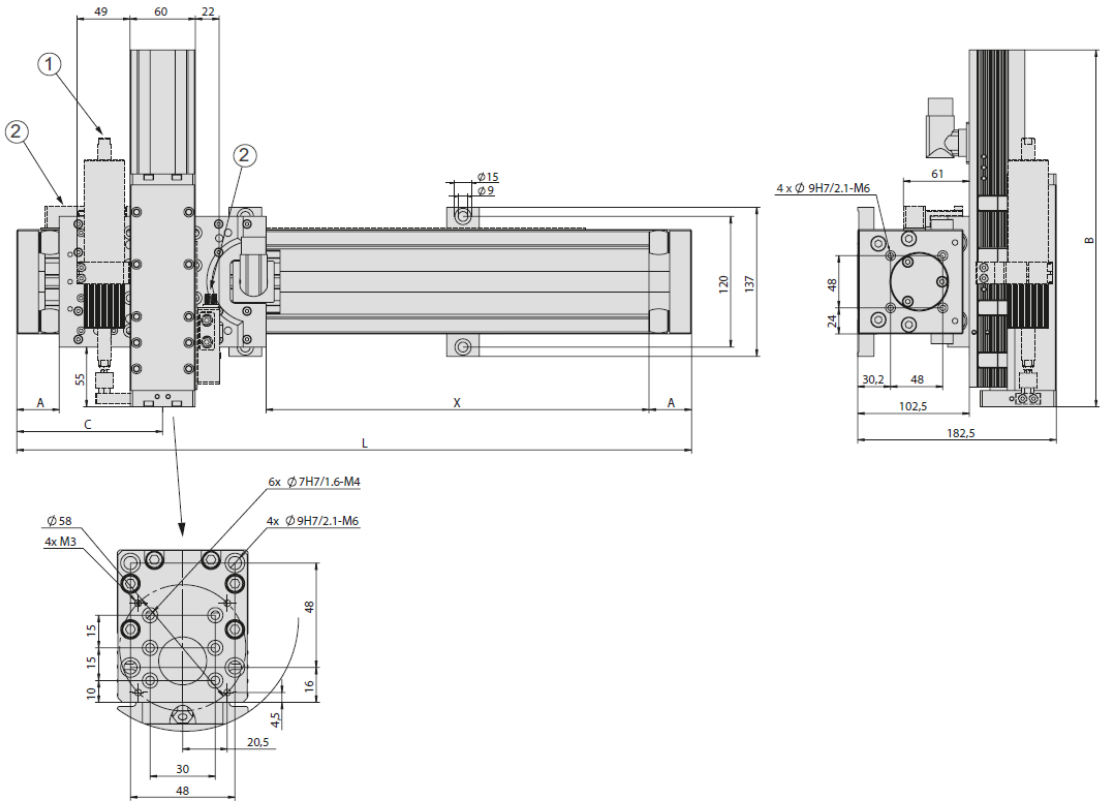
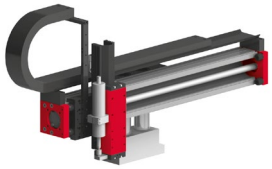


Fig. 8 Dimensioned drawing EPS maxi XZ

3.8.2 Technical data EPS maxi XZ



EPS maxi XZ	
Order number	**50444433**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis		
Axis	PDL30	PDL40	PDL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130, 1330 mm	170, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	110, 160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Z-axis
Axis	ES30
Stroke vertical	50, 100, 200, 300, 400, 500 mm
Maximum speed	3.2 m/s
Peak force	255 N
Permanent force	51 N

Included in the delivery *
- 2x Ø 7h6 Centring sleeves
- 4x Ø 9h7 Centring sleeves
- MagSpring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised

Accessories
(Catalogue HT accessories)
- Console
- Valve block

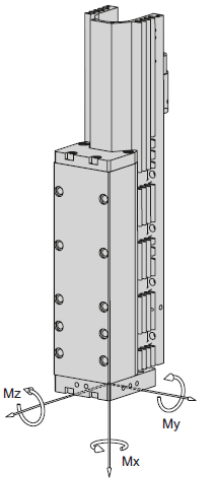
(Catalogue HT components linear)
- Path measuring system

(Catalogue HT components gripping/rotating)
- Rotary modules
- Gripper modules

* Deviations possible depending on installed peripherals

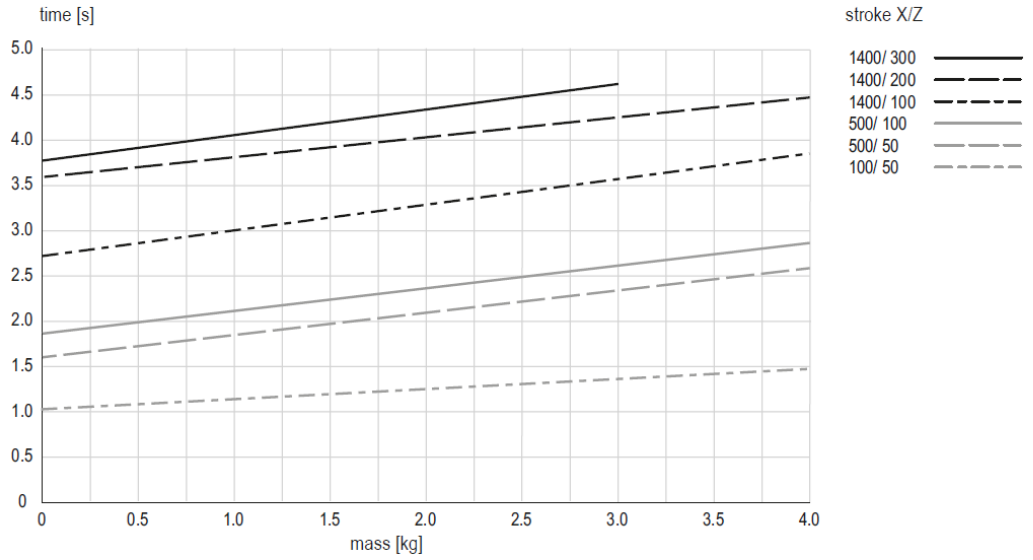
3.8.3 Module loads EPS maxi XZ

Type	ES30-SL	ES30
Dynamic torque Mx	30 Nm	30 Nm
Dynamic torque My	40 Nm	80 Nm
Dynamic torque Mz	40 Nm	80 Nm



Payload (centric)	
Stroke X	up to 1660 mm
Stroke Z	
50 mm	8 kg
100 mm	7 kg
200 mm	6 kg
300 mm	5 kg
400 mm	4 kg
500 mm	3 kg

Cycle times EPS maxi XZ for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick & Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.9 EPS System mini XYZ

3.9.1 Dimensioned drawing EPS mini XYZ

Type	A
PEL20-060	374 mm
PEL20-130	444 mm
PEL20-190	504 mm
PEL20-290	604 mm
PEL20-470	784 mm
PEL20-560	874 mm

Type	A
PEL20-080-SL	314 mm
PEL20-140-SL	374 mm
PEL20-210-SL	444 mm
PEL20-270-SL	504 mm
PEL20-370-SL	604 mm
PEL20-550-SL	784 mm
PEL20-640-SL	874 mm

Type	B, C
ES20-50-SL	191.5 mm
ES20-100-SL	285 mm
ES20-200	365 mm
ES20-300	495 mm

① MagSpring
② Path measuring system
③ Auxiliary surface (not suitable for assembly)

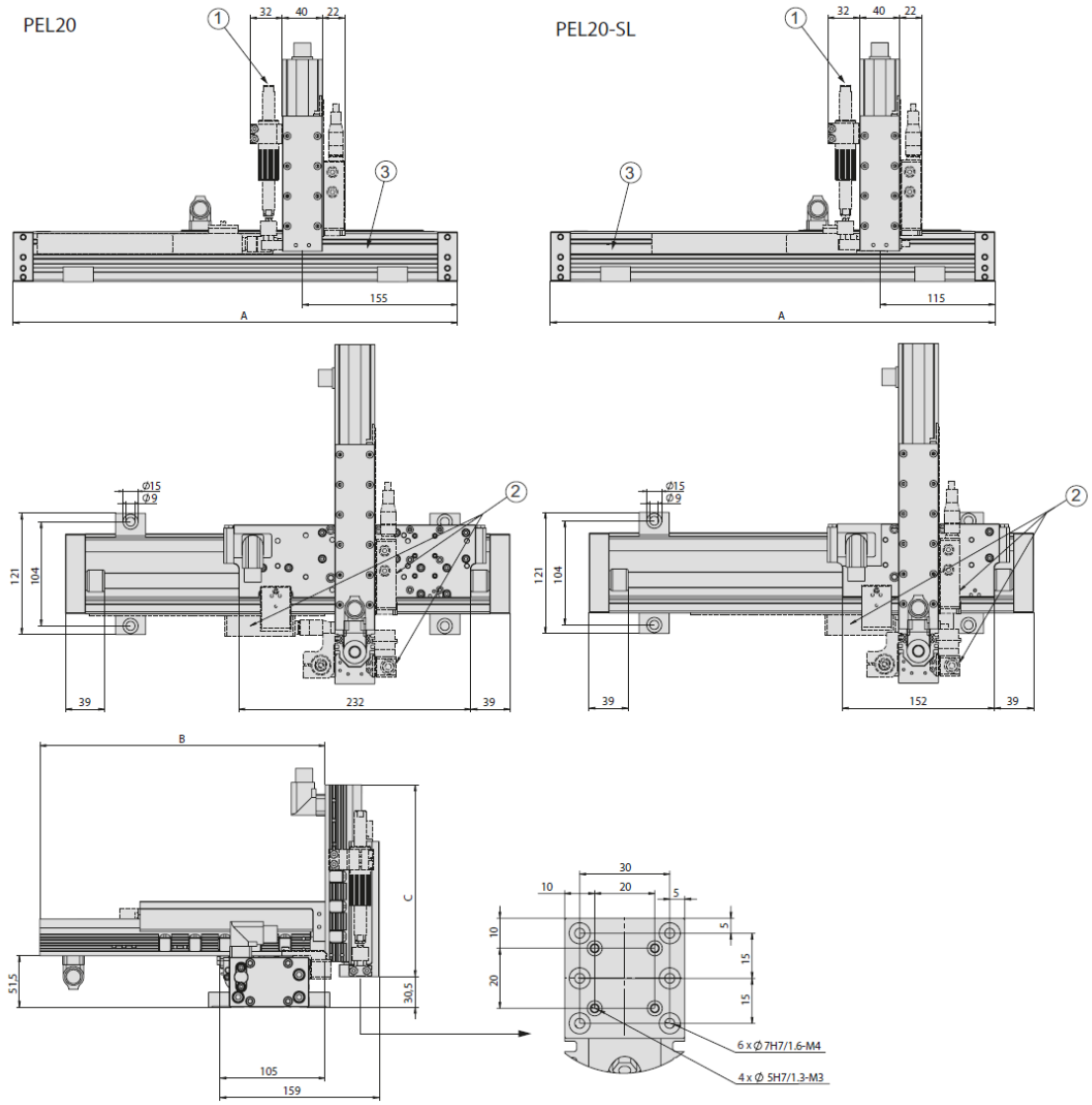


Fig. 9 Dimensioned drawing EPS mini XYZ

3.9.2 Technical data EPS mini XYZ

EPS mini XYZ	
Order number	**50444434**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis	
Axis	PEL20-SL	PEL20
Stroke horizontal	80, 140, 210, 270, 370, 550, 640 mm	60, 130, 190, 290, 470, 560 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Type	Y-axis	
Axis	ES20	ES20
Stroke horizontal	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Type	Z-axis	
Axis	ES20	ES20
Stroke vertical	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Included in the delivery *
- 2x Ø 5h6 Centring sleeves
- 2x Ø 7h6 Centring sleeves
- 2x Ø 9h7 Centring sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised

Accessories
(Catalogue HT accessories)
- Console
- Valve block

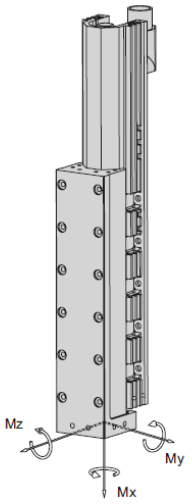
(Catalogue HT components linear)
- Path measuring system

(Catalog HT components gripping/rotating)
- Rotary module
- Gripper module

* Deviations possible depending on installed peripherals

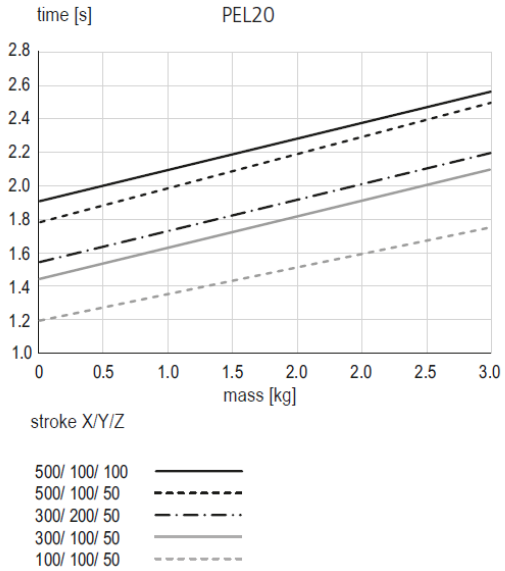
3.9.3 Module loads EPS mini XYZ

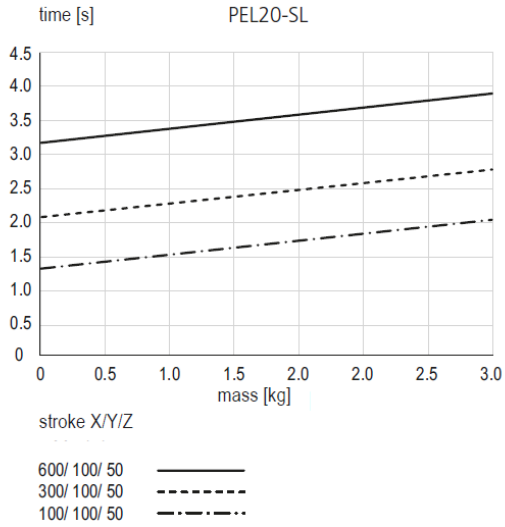
Type	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)			
Stroke Y	50 mm	100 mm	200 mm
Stroke Z			
50 mm	3 kg	2 kg	1 kg
100 mm	2 kg	1 kg	0.5 kg
200 mm	1 kg	0.5 kg	-

Cycle times EPS mini XYZ for Pick & Place





Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick & Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.10 EPS System midi XYZ

3.10.1 Dimensioned drawing EPS midi XYZ

Type	A	C	L
PDL30-X-D19	40 mm	134 mm	X + 270 mm
PDL30-X-D20	50 mm	144 mm	X + 290 mm
PDL40-X-D27	49 mm	169 mm	X + 340 mm
PDL40-X-D28	64 mm	182 mm	X + 370 mm
PDL40-X-HP-D27	49 mm	229 mm	X + 460 mm
PDL40-X-HP-D28	64 mm	242 mm	X + 490 mm

Type	B	C
ES30-50-SL	288 mm	
ES30-100-SL	328 mm	
ES30-100	328 mm	
ES30-200-SL	428 mm	
ES30-200	428 mm	
ES30-300	528 mm	
ES30-400	628 mm	
ES30-500	728 mm	
ES20-50-SL		191.5 mm
ES20-100-SL		285 mm
ES20-200		365 mm
ES20-300		495 mm

① MagSpring
② Path measurement system
X Stroke of the X-axis

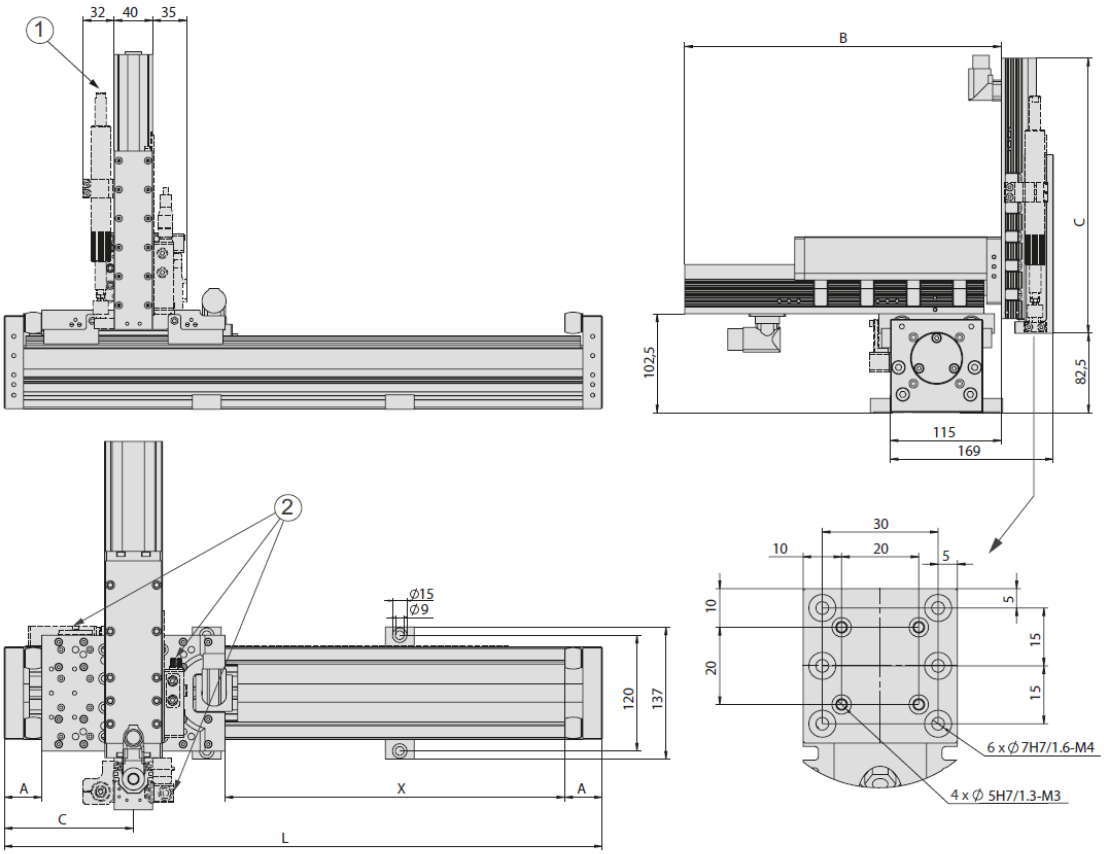
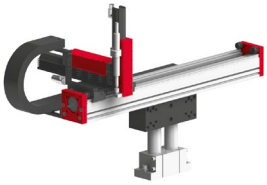


Fig. 10 Dimensioned drawing EPS midi XYZ

3.10.2 Technical data EPS midi XYZ



EPS midi XYZ	
Order number	**50444435**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measurement (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis		
Axis	PDL30	PDL40	PDL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130, 1330 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	110, 160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 540 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Y-axis
Axis	ES30
Stroke horizontal	50, 100, 200, 300, 400, 500 mm
Maximum speed	3.2 m/s
Peak force	255 N
Permanent force	51 N

Type	Z-axis	
Axis	ES20	ES20
Stroke vertical	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Included in the delivery *
- 2x Ø 5h6 Centring sleeves
- 2x Ø 7h6 Centring sleeves
- 2x Ø 9h7 Centring sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised

Accessories
(Catalogue HT accessories)
- Console
- Valve block

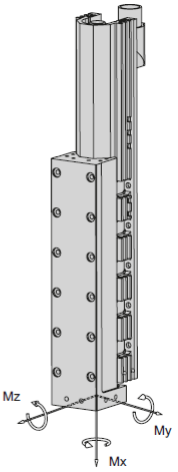
(Catalogue HT components linear)
- Path measuring system

(Catalogue HT components gripping/rotating)
- Rotary module
- Gripper module

* Deviations possible depending on installed peripherals

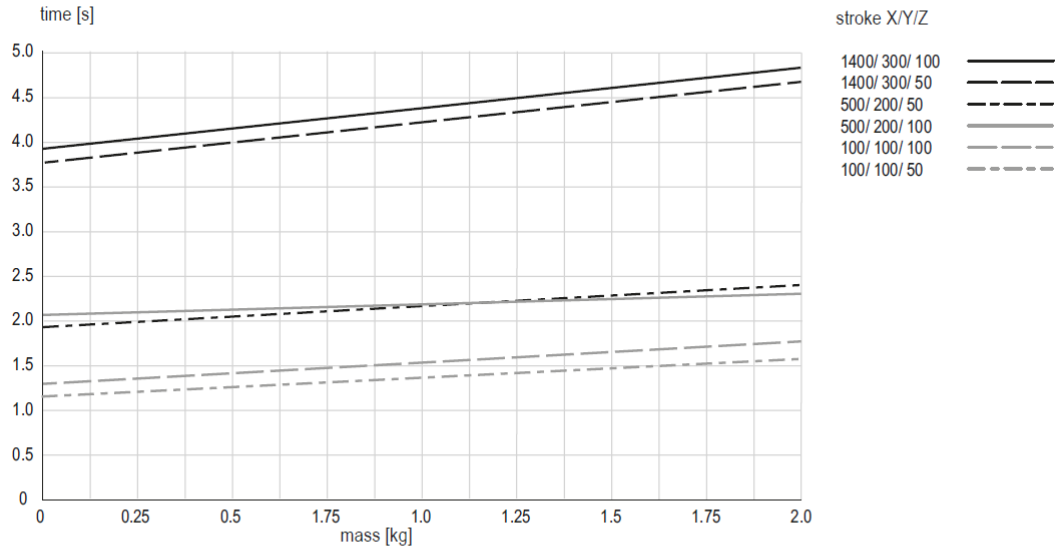
3.10.3 Module loads EPS midi XYZ

Type	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)						
Stroke Y	50 mm	100 mm	200 mm	300 mm	400 mm	500 mm
Stroke Z						
50 mm	4 kg	3 kg	2 kg	1 kg	0.5 kg	0.5 kg
100 mm	3 kg	2 kg	1 kg	0.5 kg	-	-
200 mm	2 kg	1 kg	0.5 kg	-	-	-
300 mm	1 kg	0.5 kg	-	-	-	-

Cycle times EPS midi XYZ for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick & Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.11 EPS System maxi XYZ

3.11.1 Dimensioned drawing EPS maxi XYZ

Type	A	C	L
PDL30-X-D19	40 mm	134 mm	X + 270 mm
PDL30-X-D20	50 mm	144 mm	X + 290 mm
PDL40-X-D27	49 mm	169 mm	X + 340 mm
PDL40-X-D28	64 mm	182 mm	X + 370 mm
PDL40-X-HP-D27	49 mm	229 mm	X + 460 mm
PDL40-X-HP-D28	64 mm	242 mm	X + 490 mm

Type	B
ES30-50-SL	288 mm
ES30-100-SL	328 mm
ES30-100	328 mm
ES30-200-SL	428 mm
ES30-200	428 mm
ES30-300	528 mm
ES30-400	628 mm
ES30-500	728 mm

① MagSpring
② Path measuring system
X Stroke of the X-axis

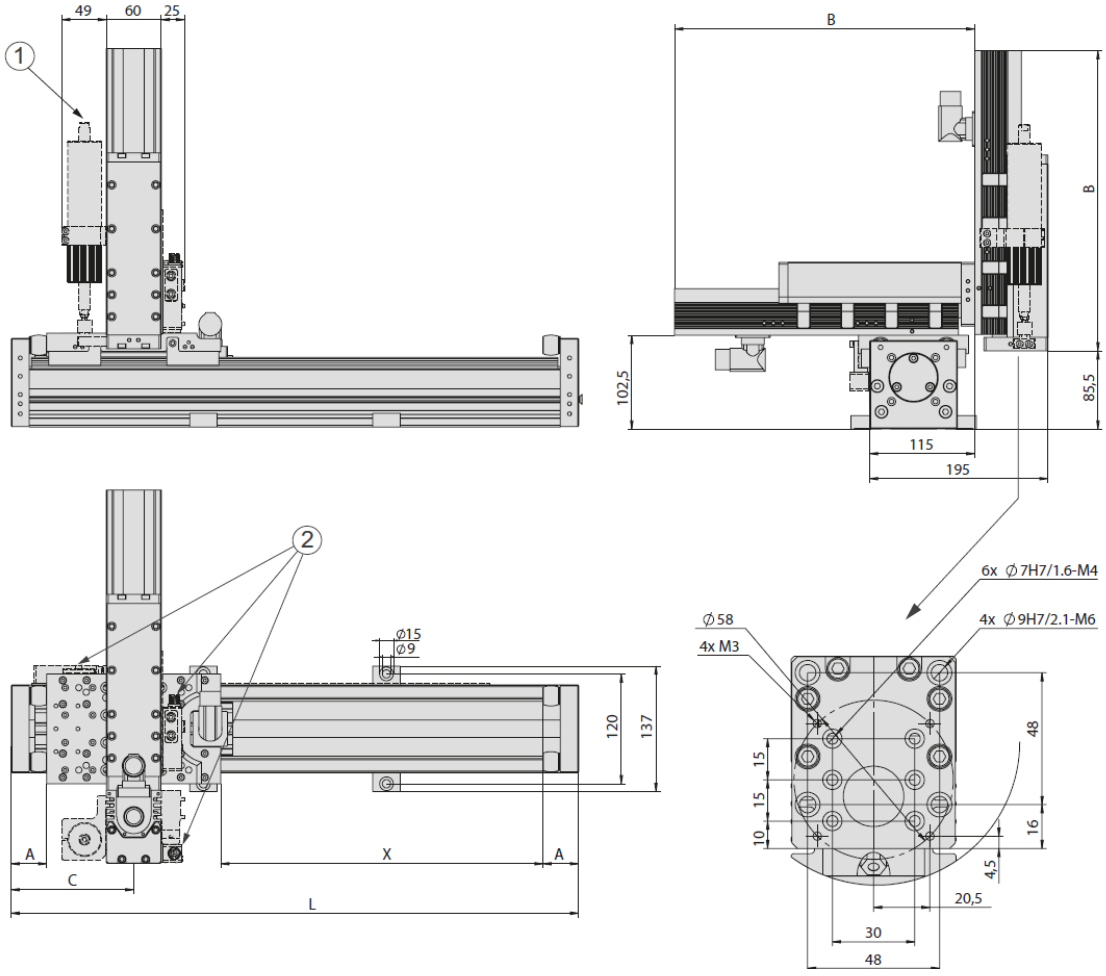
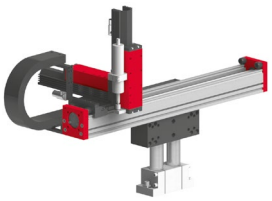


Fig. 11 Dimensioned drawing EPS maxi XYZ

3.11.2 Technical data EPS maxi XYZ



EPS maxi XYZ	
Order number	**50444436**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis		
Axis	PDL30	PDL40	PDL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130, 1330 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	110, 160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Y-axis
Axis	ES30
Stroke horizontal	50, 100, 200, 300, 400, 500 mm
Maximum speed	3.2 m/s
Peak force	255 N
Permanent force	51 N

Type	Z-axis
Axis	ES30
Stroke vertical	50, 100, 200, 300, 400, 500 mm
Maximum speed	3.2 m/s
Peak force	255 N
Permanent force	51 N

Included in the delivery *
- 2x Ø 7h6 Centring sleeves
- 4x Ø 9h7 Centring sleeves
- MagSpring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised

Accessories
(Catalogue HT accessories)
- Console
- Valve block

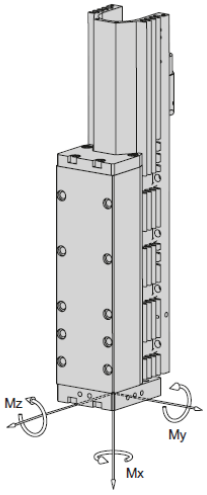
(Catalogue HT components linear)
- Path measuring system

(Catalogue HT components gripping/rotating)
- Rotary modules
- Gripper modules

* Deviations possible depending on installed peripherals

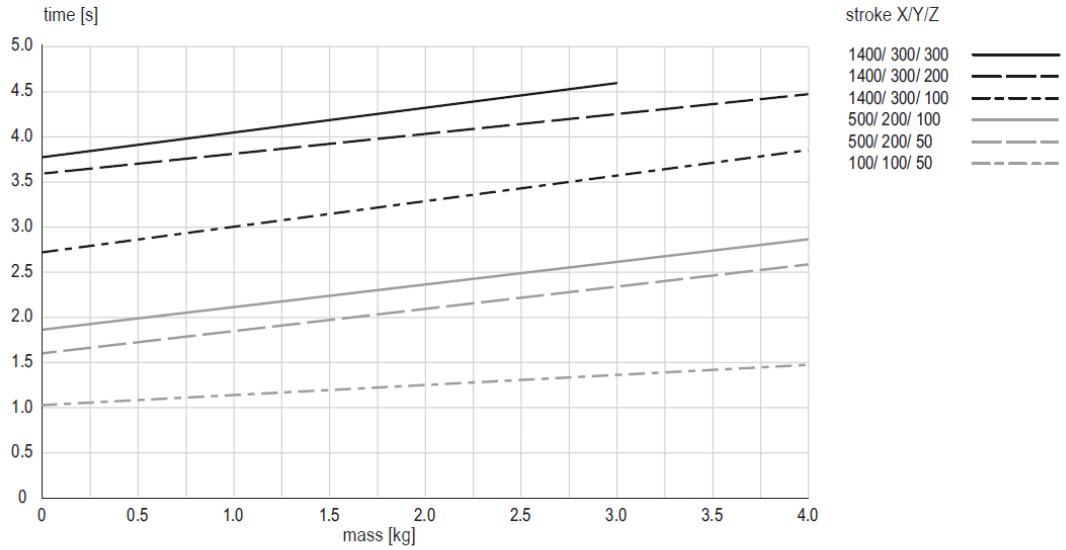
3.11.3 Module loads EPS maxi XYZ

Type	ES30-SL	ES30
Dynamic torque Mx	30 Nm	30 Nm
Dynamic torque My	40 Nm	80 Nm
Dynamic torque Mz	40 Nm	80 Nm



Payload (centric)						
Stroke horizontal (Y) Stroke vertical (Z)	50 mm	100 mm	200 mm	300 mm	400 mm	500 mm
50 mm	5 kg	4 kg	3 kg	2 kg	1 kg	0.5 kg
100 mm	4 kg	3 kg	2 kg	1 kg	0.5 kg	-
200 mm	3 kg	2 kg	1 kg	0.5 kg	-	-
300 mm	2 kg	1 kg	0.5 kg	-	-	-
400 mm	1 kg	0.5 kg	-	-	-	-
500 mm	0.5 kg	-	-	-	-	-

Cycle times EPS maxi XYZ for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick & Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.12 EPS mini gantry XXYZ

3.12.1 Dimensioned drawing EPS mini gantry XXYZ

Type	A	B	E	G
PEL20-X-SL	X + 234 mm	A + 61 mm	114 mm	
PEL20-X	X + 314 mm	A + 61 mm	155 mm	
ES20-50-SL				192 mm
ES20-100-SL				285 mm
ES20-200				365 mm
ES20-300				495 mm

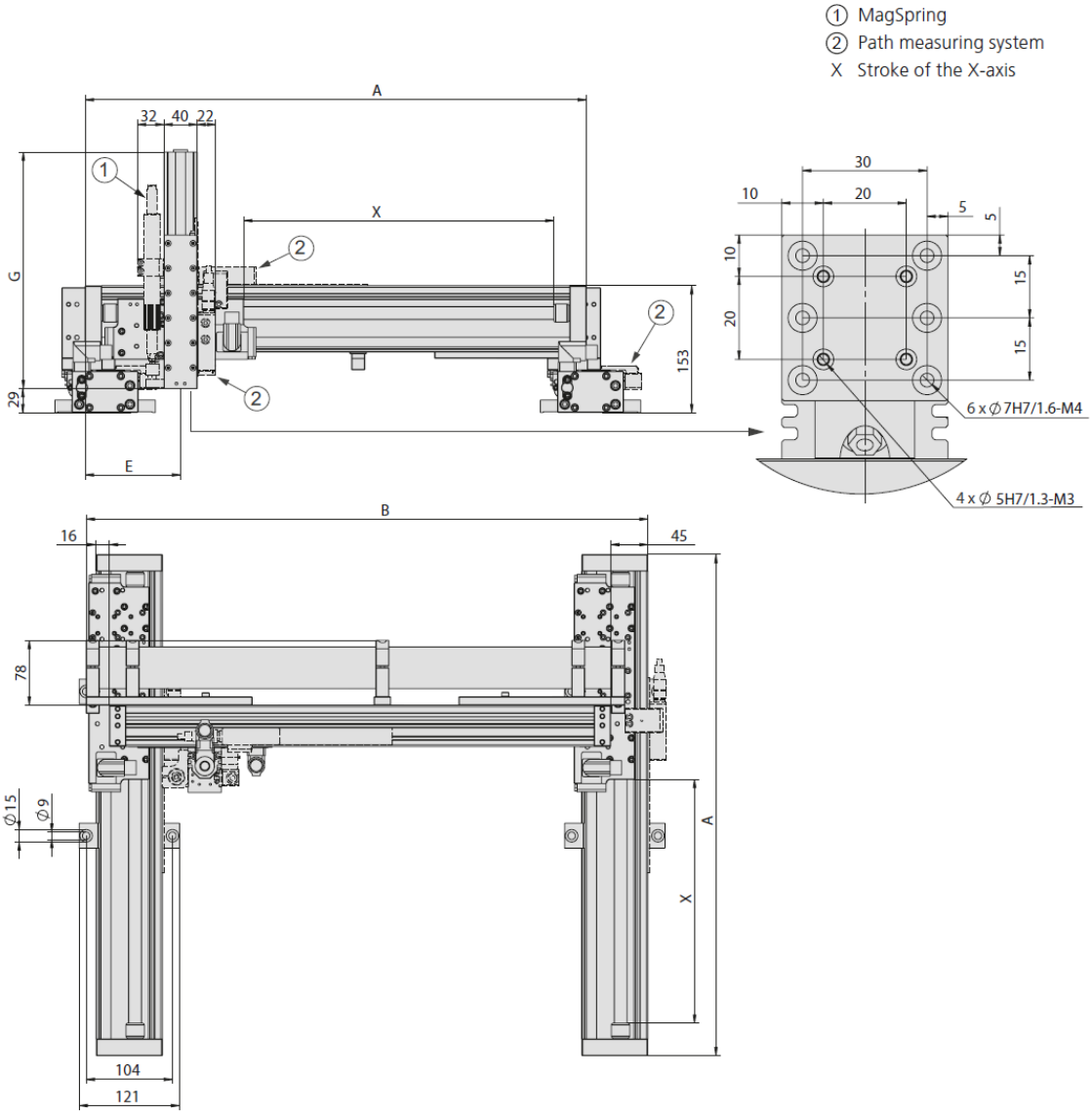
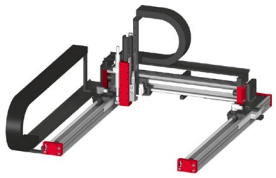


Fig. 12 Dimensioned drawing EPS mini gantry XXYZ

3.12.2 Technical data EPS mini gantry XXYZ



EPS mini gantry XXYZ	
Order number	**50444425**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis
Axis	PEL20
Stroke horizontal	60, 130, 190, 290, 470, 560 mm
Maximum speed	4.8 m/s
Peak force	137 N
Permanent force	31 N

Type	Y-axis	
Axis	PEL20-SL	PEL20
Stroke horizontal	80, 140, 210, 270, 550, 640 mm	60, 130, 190, 290, 470, 560 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Type	Z-axis	
Axis	ES20	ES20
Stroke vertical	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Included in the delivery *
- 2x Ø 5h6 Centring sleeves
- 2x Ø 7h6 Centring sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised
- Gantry bracing
- Attachment blocs

* Deviations possible depending on installed peripherals

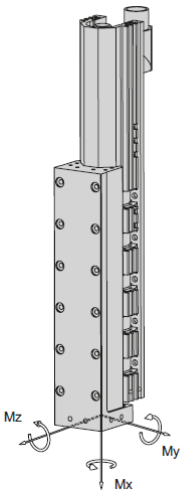
Accessories
(Catalogue HT accessories)
- Valve block

(Catalogue HT components linear)
- Path measuring system

(Catalog HT components gripping/rotating)
- Rotary module
- Gripper module

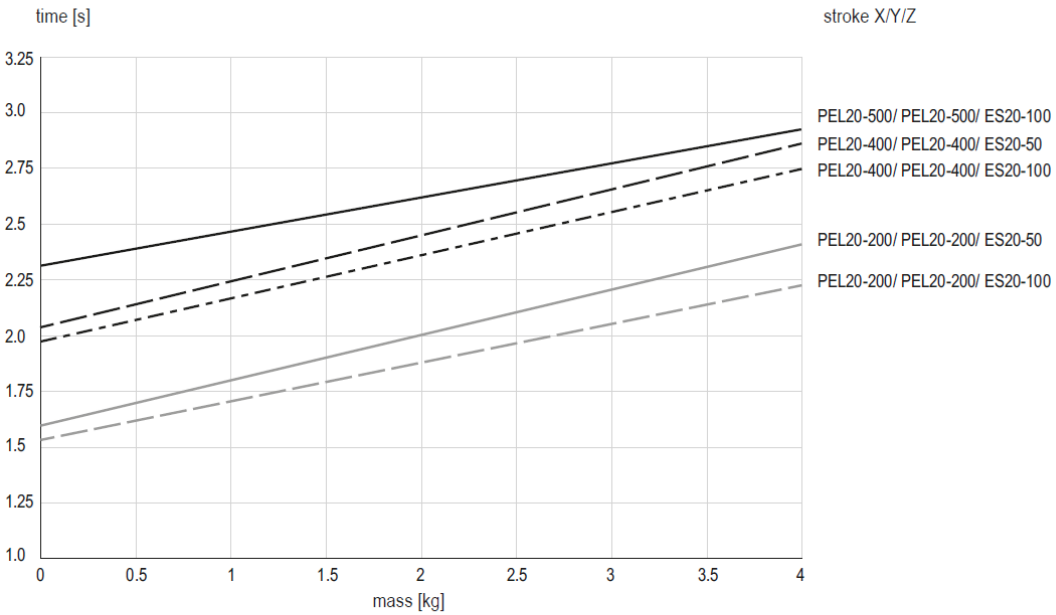
3.12.3 Module loads EPS mini gantry XXYZ

Type	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)			
Stroke Y Stroke Z	60 - 270 mm	290 - 370 mm	470 - 640 mm
50 mm	4 kg	4 kg	3 kg
100 mm	4 kg	3 kg	2 kg
200 mm	3 kg	2 kg	1 kg

Cycle times EPS mini gantry XXYZ for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick-and-Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.13 EPS midi gantry XXYZ

3.13.1 Dimensioned drawing EPS midi gantry XXYZ

Type	B	C	D	E	F
PDL30-Y-D19	Y + 270 mm	134 mm	40 mm	134 mm	B + 150 mm
PDL30-Y-D20	Y + 290 mm	144 mm	50 mm	144 mm	B + 150 mm
PDL40-Y-D27	Y + 340 mm	143 mm	49 mm	169 mm	B + 150 mm
PDL40-Y-D28	Y + 370 mm	158 mm	64 mm	182 mm	B + 150 mm
PDL40-Y-HP-D27	Y + 460 mm	202 mm	49 mm	230 mm	B + 150 mm
PDL40-Y-HP- D28	Y + 490 mm	215 mm	64 mm	242 mm	B + 150 mm

Type	A	D
PEL30-X-D19-L/R	40 mm	X + 270 mm
PEL30-X-D20-L/R	50 mm	X + 290 mm
PEL40-X-D27-L/R	49 mm	X + 340 mm
PEL40-X-D28-L/R	64 mm	X + 370 mm
PEL40-X-HP-D27-L/R	49 mm	X + 460 mm
PEL40-X-HP-D28-L/R	64 mm	X + 490 mm

Type	G
ES20-50-SL	192 mm
ES20-100-SL	285 mm
ES20-200	365 mm
ES20-300	490 mm

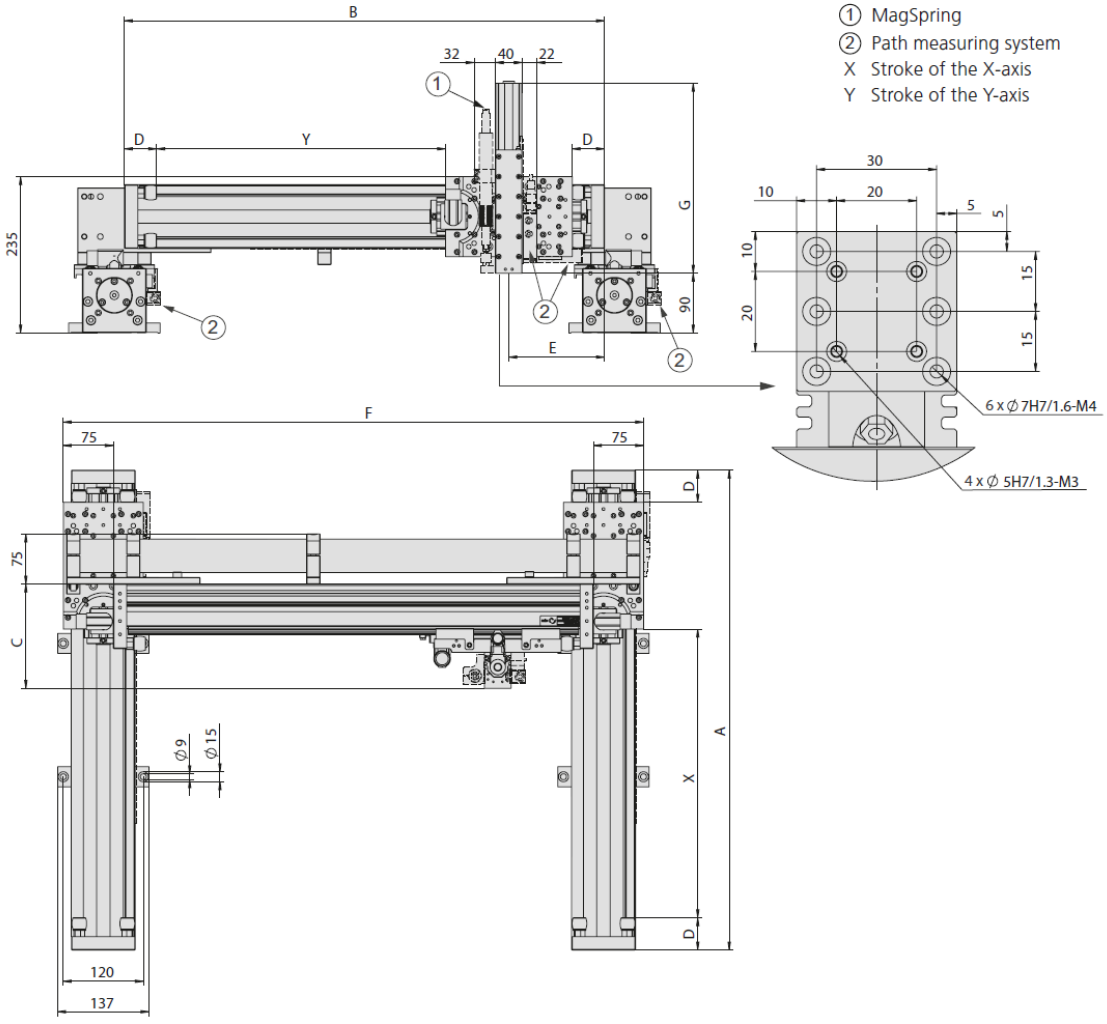


Fig. 13 Dimensioned drawing EPS midi gantry XXYZ

3.13.2 Technical data EPS midi gantry XXYZ

EPS midi gantry XXYZ	
Order number	**50444426**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis		
Axis	PEL30	PEL40	PEL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130, 1330 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	110, 160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Y-axis		
Axis	PDL30	PDL40	PDL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130, 1330 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	110, 160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Z-axis	
Axis	ES20	ES20
Stroke vertical	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Included in the delivery *

- 2x Ø 5h6 Centring sleeves
- 2x Ø 7h6 Centring sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised
- Gantry bracing
- Attachment blocs

* Deviations possible depending on installed peripherals

Accessories

(Catalogue HT accessories)

- Valve block

(Catalogue HT components linear)

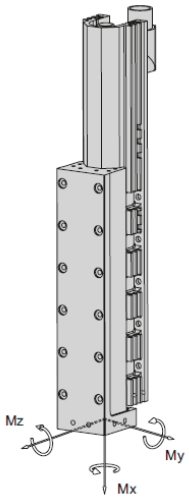
- Path measuring system

(Catalog HT components gripping/rotating)

- Rotary module
- Gripper module

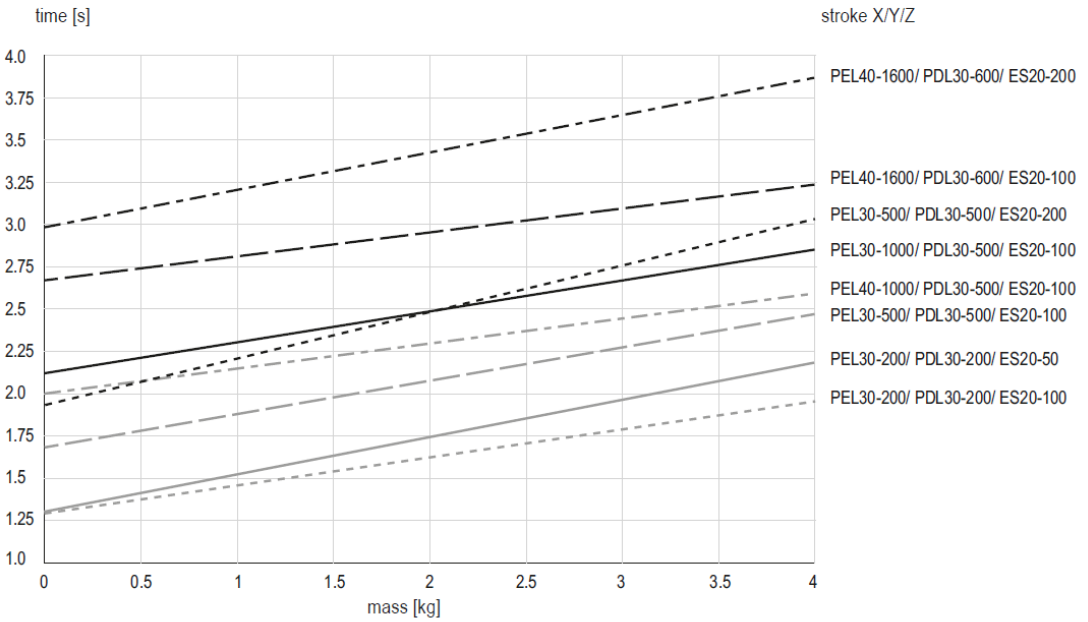
3.13.3 Module loads EPS midi gantry XXYZ

Type	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)	
Stroke Y	up to 1660 mm
Stroke Z	
50 mm	4 kg
100 mm	4 kg
200 mm	3 kg
300 mm	2 kg

Cycle times EPS midi gantry XXYZ for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick-and-Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.14 EPS maxy gantry XXYZ

3.14.1 Dimensioned drawing EPS maxi gantry XXYZ

Type	B	C	D	E	F
PDL30-Y-D19	Y + 270 mm	134 mm	40 mm	134 mm	B + 150 mm
PDL30-Y-D20	Y + 290 mm	144 mm	50 mm	144 mm	B + 150 mm
PDL40-Y-D27	Y + 340 mm	143 mm	49 mm	169 mm	B + 150 mm
PDL40-Y-D28	Y + 370 mm	158 mm	64 mm	182 mm	B + 150 mm
PDL40-Y-HP-D27	Y + 460 mm	202 mm	49 mm	230 mm	B + 150 mm
PDL40-Y-HP- D28	Y + 490 mm	215 mm	64 mm	242 mm	B + 150 mm

Type	A	D
PEL30-X-D19-L/R	40 mm	X + 270 mm
PEL30-X-D20-L/R	50 mm	X + 290 mm
PEL40-X-D27-L/R	49 mm	X + 340 mm
PEL40-X-D28-L/R	64 mm	X + 370 mm
PEL40-X-HP-D27-L/R	49 mm	X + 460 mm
PEL40-X-HP-D28-L/R	64 mm	X + 490 mm

Type	G
ES30-50-SL	288 mm
ES30-100-SL	328 mm
ES30-100	328 mm
ES20-200-SL	428 mm
ES30-200	428 mm
ES30-300	528 mm
ES30-400	628 mm
ES30-500	728 mm

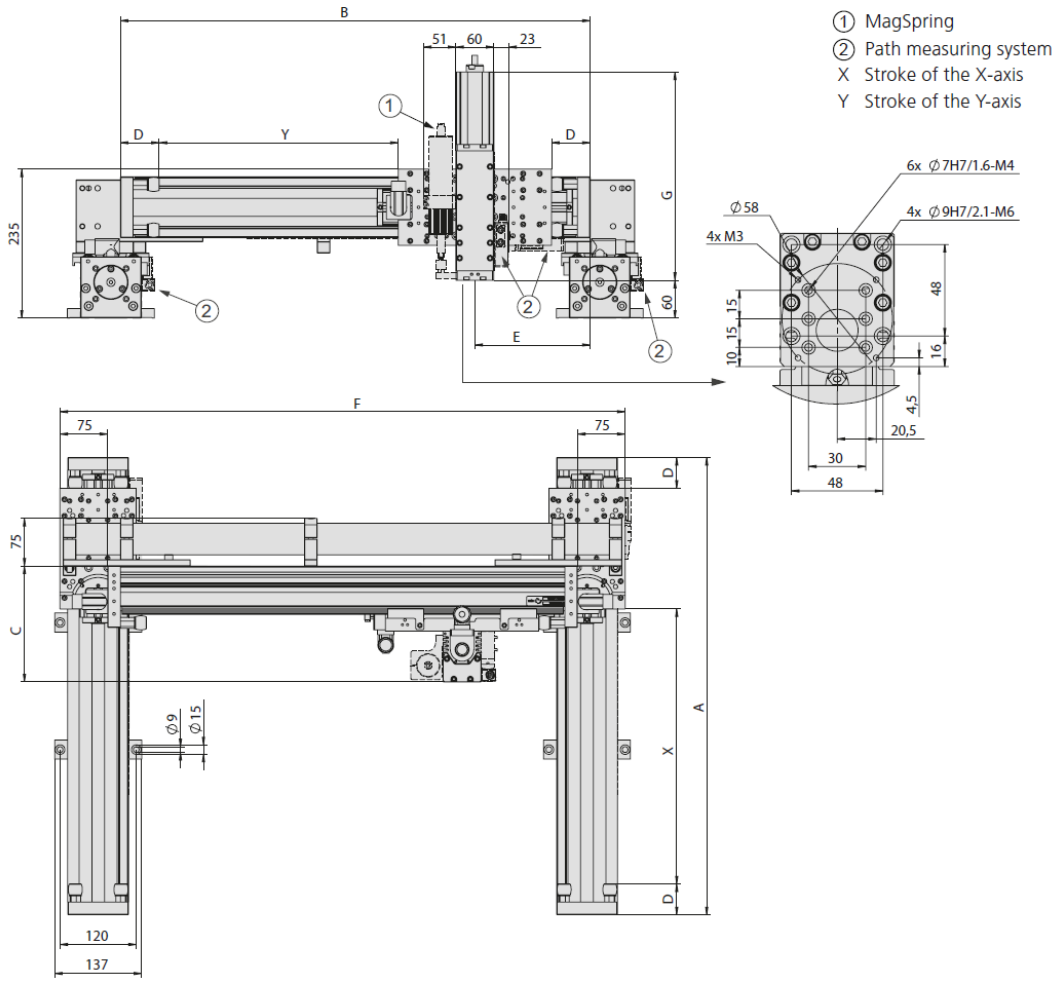


Fig. 14 Dimensioned drawing EPS maxi gantry XXYZ

3.14.2 Technical data EPS maxi XYZ

EPS maxi gantry XXYZ	
Order number	**50444426**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis		
Axis	PEL30	PEL40	PEL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130, 1330 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	110, 160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Y-axis		
Axis	PDL30	PDL40	PDL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130, 1330 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	110, 160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Z-axis
Axis	ES30
Stroke vertical	50, 100, 200, 300, 400, 500 mm
Maximum speed	3.2 m/s
Peak force	255 N
Permanent force	51 N

Included in the delivery *
- 2x Ø 7h6 Centring sleeves
- 2x Ø 9h7 Centring sleeves
- MagSpring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised
- Gantry bracing
- Attachment blocs

Accessories
(Catalogue HT accessories)
- Valve block
- Clamping element

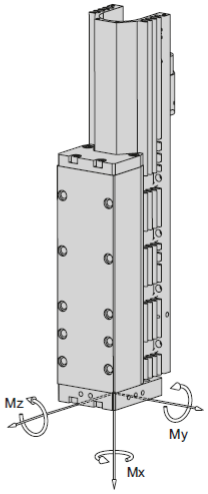
(Catalogue HT components linear)
- Path measuring system

(Catalog HT components gripping/rotating)
- Rotary module
- Gripper module

* Deviations possible depending on installed peripherals

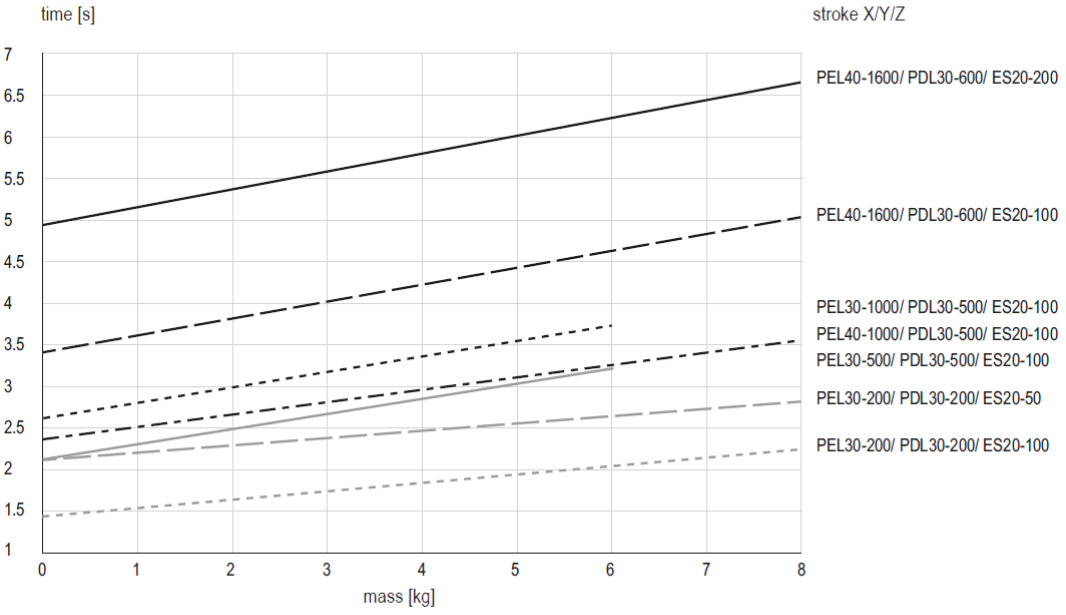
3.14.3 Module loads EPS maxi gantry XXYZ

Type	ES30-SL	ES30
Dynamic torque Mx	30 Nm	30 Nm
Dynamic torque My	40 Nm	80 Nm
Dynamic torque Mz	40 Nm	80 Nm



Payload (centric)	
Stroke Y	up to 1660 mm
Stroke Z	
50 mm	8 kg
100 mm	7 kg
200 mm	5 kg
300 mm	4 kg
400 mm	3 kg
500 mm	2 kg

Cycle times EPS maxi gantry XXYZ for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick-and-Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.15 EPS mini gantry s

3.15.1 Dimensioned drawing EPS mini gantry s

Type	A	B	C	D	E	F	G
PDL30-X-D19	X + 270 mm		109 mm	40 mm			
PDL30-X-D20	X + 290 mm		119 mm	50 mm			
PDL40-X-D27	X + 340 mm		144 mm	49 mm			
PDL40-X-D28	X + 370 mm		159 mm	64 mm			
PDL40-X-HP-D27	X + 460 mm		204 mm	49 mm			
PDL40-X-HP-D28	X + 490 mm		219 mm	64 mm			
PEL20-Y-SL		Y + 234 mm			114 mm	B + 56 mm	
PEL20-Y		Y + 314 mm			155 mm	B + 56 mm	
ES20-50-SL							192 mm
ES20-100-SL							285 mm
ES20-200							365 mm
ES20-300							495 mm

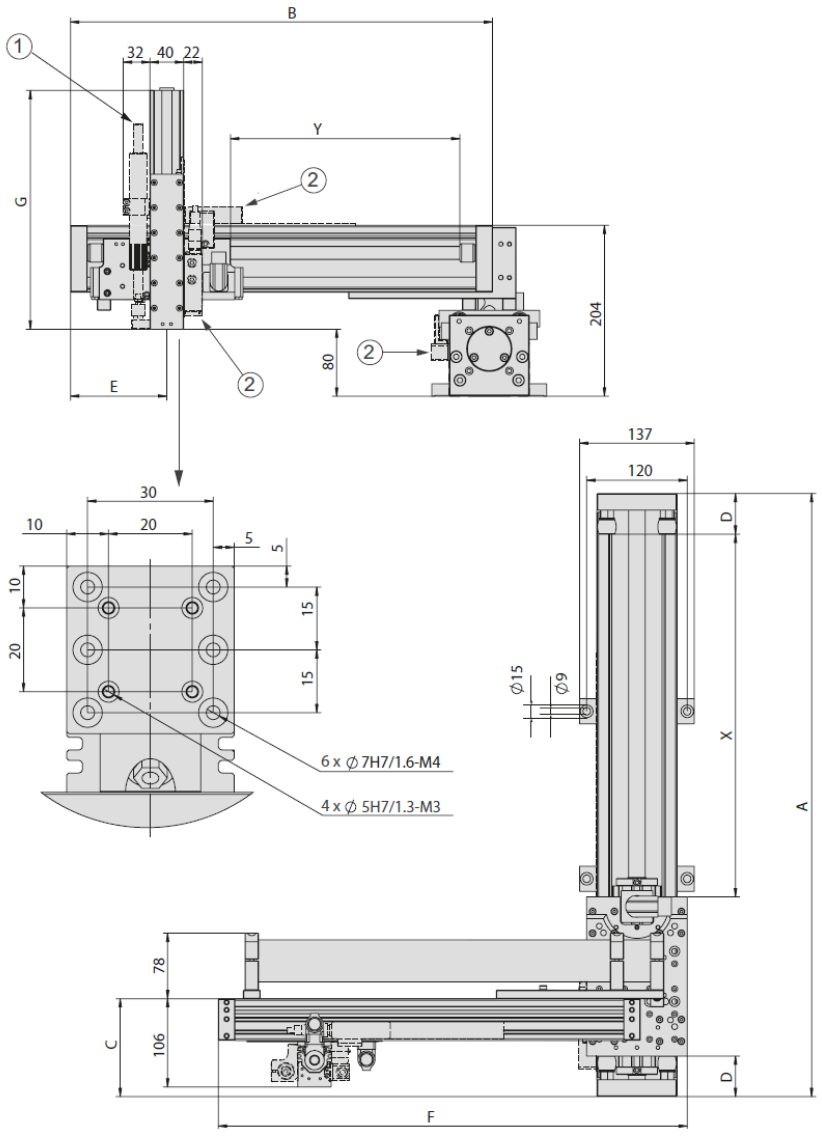


Fig. 15 Dimensioned drawing EPS mini gantry s

3.15.2 Technical data EPS mini gantry s

EPS mini gantry s	
Order number	**50444422**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis		
Axis	PDL30	PDL40	PDL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130, 1330 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Y-axis	
Axis	PEL20-SL	PEL20
Stroke horizontal	80, 140, 210, 270, 370, 550, 640 mm	60, 130, 190, 290, 470, 560 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Type	Z-axis	
Axis	ES20	ES20
Stroke vertical	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Included in the delivery *
- 2x Ø 5h6 Centring sleeves
- 2x Ø 7h6 Centring sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised
- Gantry bracing
- Attachment blocs

Accessories
(Catalogue HT accessories)
- Valve block
- Clamping element

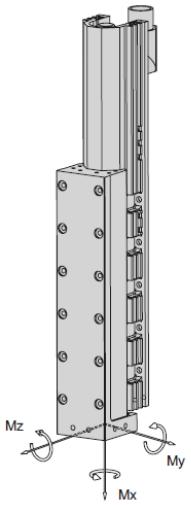
(Catalogue HT components linear)
- Path measuring system

(Catalog HT components gripping/rotating)
- Rotary module
- Gripper module

* Deviations possible depending on installed peripherals

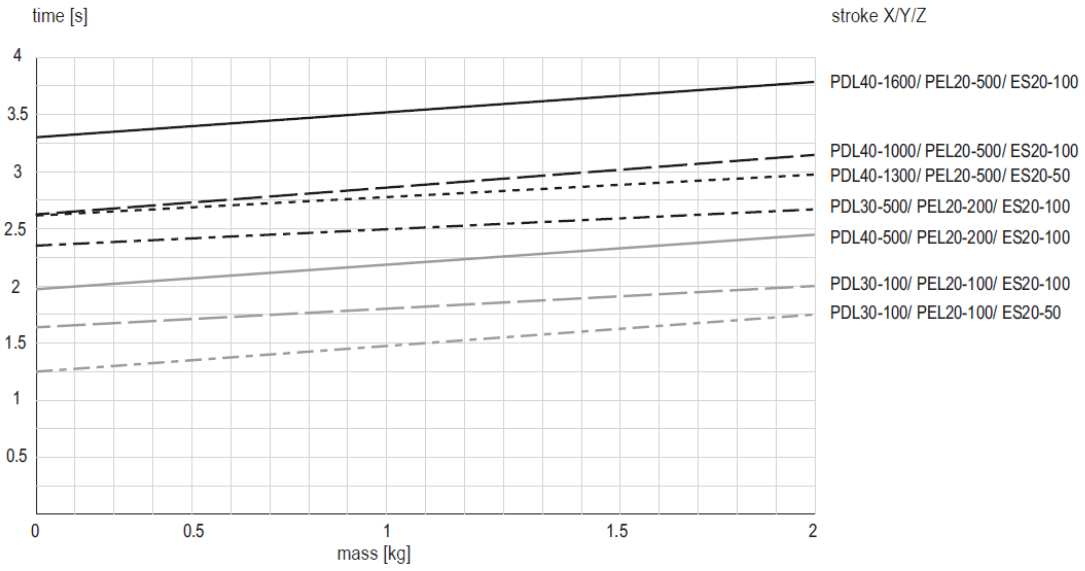
3.15.3 Module loads EPS mini gantry s

Type	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)			
Stroke Y	60 - 270 mm	290 - 370 mm	470 - 640 mm
Stroke Z			
50 mm	4 kg	3 kg	2 kg
100 mm	3 kg	2 kg	1 kg
200 mm	2 kg	1 kg	-
300 mm	1 kg	-	-

Cycle times EPS mini gantry s for Pick & Place



Times including 2 x 100 ms gripping time

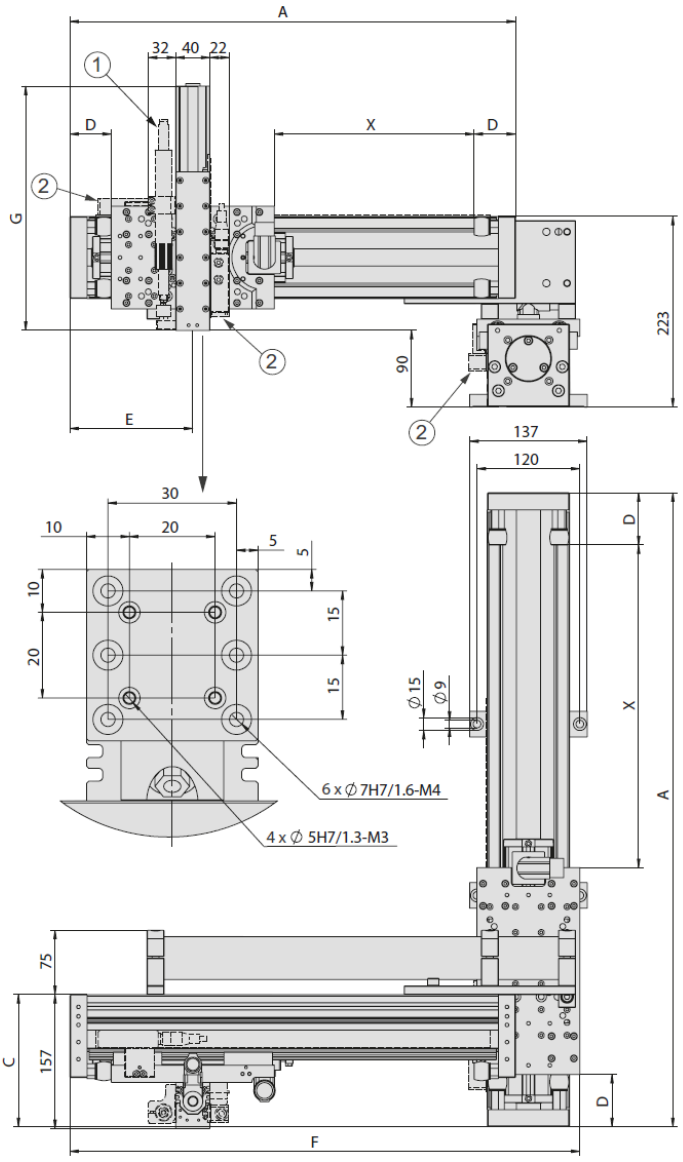
Comment:

The values in the chart correspond to a Pick-and-Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.16 EPS midi gantry s

3.16.1 Dimensioned drawing EPS midi gantry s

Type	A	C	D	E	F	G
PDL30-X-D19	X + 270 mm	134 mm	40 mm	134 mm	A + 75 mm	
PDL30-X-D20	X + 290 mm	144 mm	50 mm	144 mm	A + 75 mm	
PDL40-X-D27	X + 340 mm	143 mm	49 mm	169 mm	A + 75 mm	
PDL40-X-D28	X + 370 mm	158 mm	64 mm	182 mm	A + 75 mm	
PDL40-X-HP-D27	X + 460 mm	202 mm	49 mm	230 mm	A + 75 mm	
PDL40-X-HP-D28	X + 490 mm	215 mm	64 mm	242 mm	A + 75 mm	
ES20-50-SL						192 mm
ES20-100-SL						285 mm
ES20-200						365 mm
ES20-300						495 mm



① MagSpring
② Path measuring system
X Stroke of the X-, Y-axis

Fig. 16 Dimensioned drawing EPS midi gantry s

3.16.2 Technical data EPS midi gantry s

EPS midi gantry s	
Order number	**50444423**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis	
Axis	PDL40	PDL40-HP
Stroke horizontal	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3 m/s	2 m/s
Peak force	550 N	1024 N
Permanent force	145 N	203 N

Type	Y-axis		
Axis	PDL30	PDL40	PDL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580 mm	160, 200, 250, 320, 340, 410, 460, 550 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Z-axis	
Axis	ES20	ES20
Stroke vertical	50 mm	100, 200, 300 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Included in the delivery *
- 2x Ø 5h6 Centring sleeves
- 2x Ø 7h6 Centring sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised
- Gantry bracing
- Attachment blocs

Accessories
(Catalogue HT accessories)
- Valve block
- Clamping element

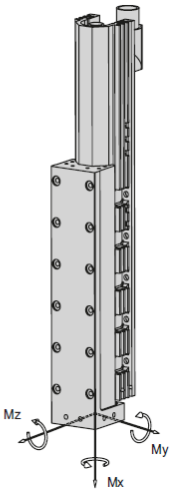
(Catalogue HT components linear)
- Path measuring system

(Catalog HT components gripping/rotating)
- Rotary module
- Gripper module

* Deviations possible depending on installed peripherals

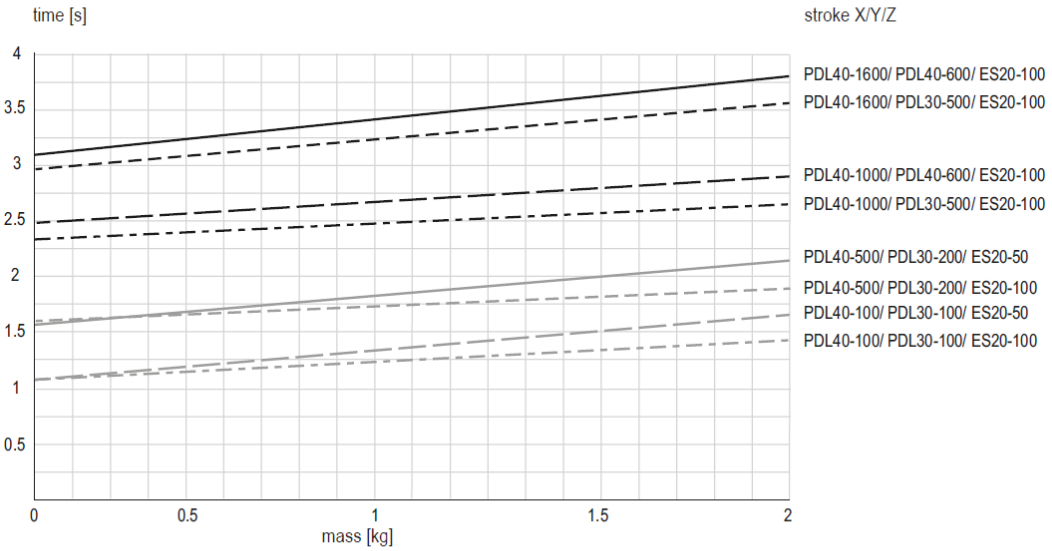
3.16.3 Module loads EPS midi gantry s

Type	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)			
Stroke Y	60 - 230 mm	250 - 430 mm	450 - 630 mm
Stroke Z			
50 mm	4 kg	3 kg	1.5 kg
100 mm	3 kg	2 kg	1 kg
200 mm	2 kg	1 kg	0.5 kg
300 mm	1 kg	0.5 kg	-

Cycle times EPS midi gantry s for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

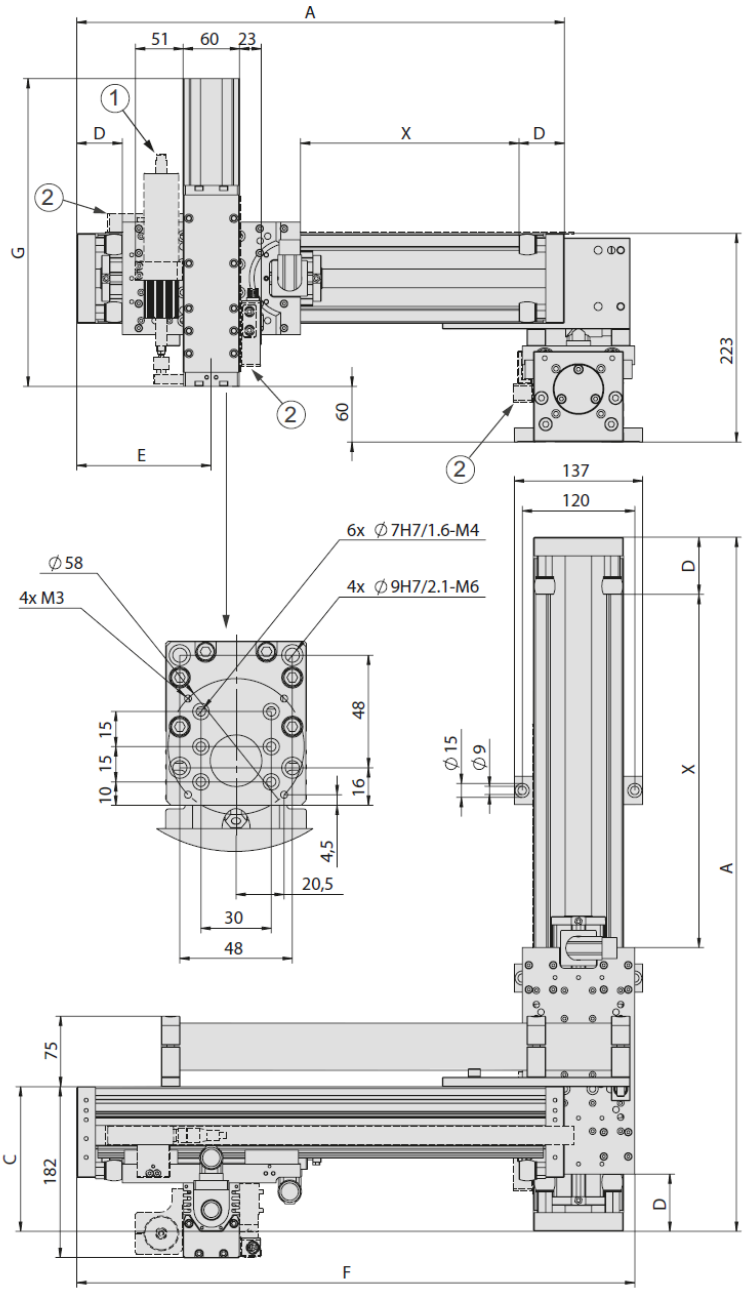
The values in the chart correspond to a Pick-and-Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.17 EPS maxi gantry s

3.17.1 Dimensioned drawing EPS maxi gantry s

Type	A	C	D	E	F
PDL30-X-D19	X + 270 mm	134 mm	40 mm	134 mm	A + 75 mm
PDL30-X-D20	X + 290 mm	144 mm	50 mm	144 mm	A + 75 mm
PDL40-X-D27	X + 340 mm	143 mm	49 mm	169 mm	A + 75 mm
PDL40-X-D28	X + 370 mm	158 mm	64 mm	182 mm	A + 75 mm
PDL40-X-HP-D27	X + 460 mm	202 mm	49 mm	230 mm	A + 75 mm
PDL40-X-HP-D28	X + 490 mm	215 mm	64 mm	242 mm	A + 75 mm

Type	G
ES30-50-SL	288 mm
ES30-100-SL	328 mm
ES30-100	328 mm
ES20-200-SL	428 mm
ES30-200	428 mm
ES30-300	528 mm



① MagSpring
② Path measuring system
X Stroke of the X-, Y-axis

Fig. 17 Dimensioned drawing EPS maxi gantry s

3.17.2 Technical data EPS maxi gantry s

EPS maxi gantry s	
Order number	**50444424**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis	
Axis	PDL40	PDL40-HP
Stroke horizontal	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3 m/s	2 m/s
Peak force	550 N	1024 N
Permanent force	145 N	203 N

Type	Y-axis		
Axis	PDL30	PDL40	PDL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580 mm	160, 200, 250, 320, 340, 410, 460, 550 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Z-axis
Axis	ES30
Stroke vertical	50, 100, 200, 300 mm
Maximum speed	3.2 m/s
Peak force	255 N
Permanent force	51 N

Included in the delivery *

- 2x Ø 7h6 Centring sleeves
- 2x Ø 9h7 Centring sleeves
- MagSpring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised
- Gantry bracing
- Attachment blocs

* Deviations possible depending on installed peripherals

Accessories

(Catalogue HT accessories)

- Valve block
- Clamping element

(Catalogue HT components linear)

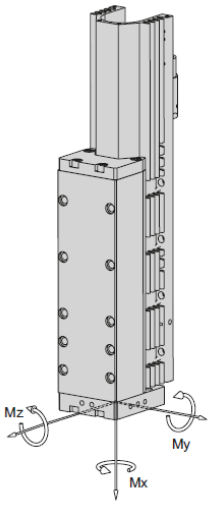
- Path measuring system

(Catalog HT components gripping/rotating)

- Rotary module
- Gripper module

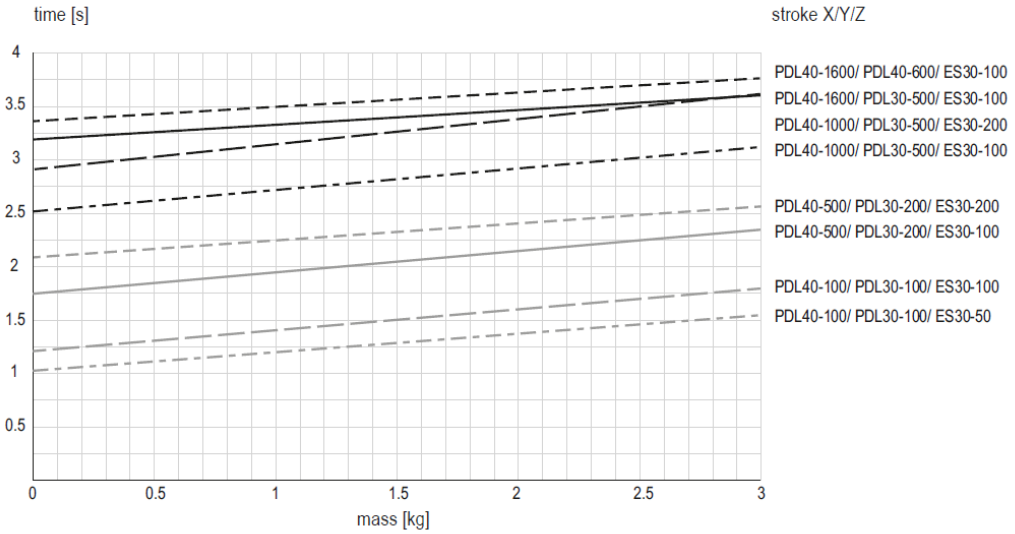
3.17.3 Module loads EPS maxi gantry s

Type	ES30-SL	ES30
Dynamic torque Mx	30 Nm	30 Nm
Dynamic torque My	40 Nm	80 Nm
Dynamic torque Mz	40 Nm	80 Nm



Payload (centric)			
Stroke Y Stroke Z	70 - 230 mm	250 - 430 mm	450 - 630 mm
50 mm	5 kg	4 kg	3 kg
100 mm	4 kg	3 kg	2 kg
200 mm	3 kg	2 kg	1 kg
300 mm	2 kg	1 kg	-

Cycle times EPS maxi gantry s for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick-and-Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.18 EPS mini gantry h

3.18.1 Dimensioned drawing EPS mini gantry h

Type	A	B	C	D	E
PDL30-X-D19	X + 270 mm			40 mm	
PDL30-X-D20	X + 290 mm			50 mm	
PDL40-X-D27	X + 340 mm			49 mm	
PDL40-X-D28	X + 370 mm			64 mm	
PDL40-X-HP-D27	X + 460 mm			49 mm	
PDL40-X-HP-D28	X + 490 mm			64 mm	
PEL20-Y-SL		Y + 234 mm			114 mm
PEL20-Yw		Y + 314 mm			155 mm
ES20-50-SL			192 mm		
ES20-100-SL			285 mm		

① MagSpring
② Path measuring system
X Stroke of the X-axis
Y Stroke of the Y-axis

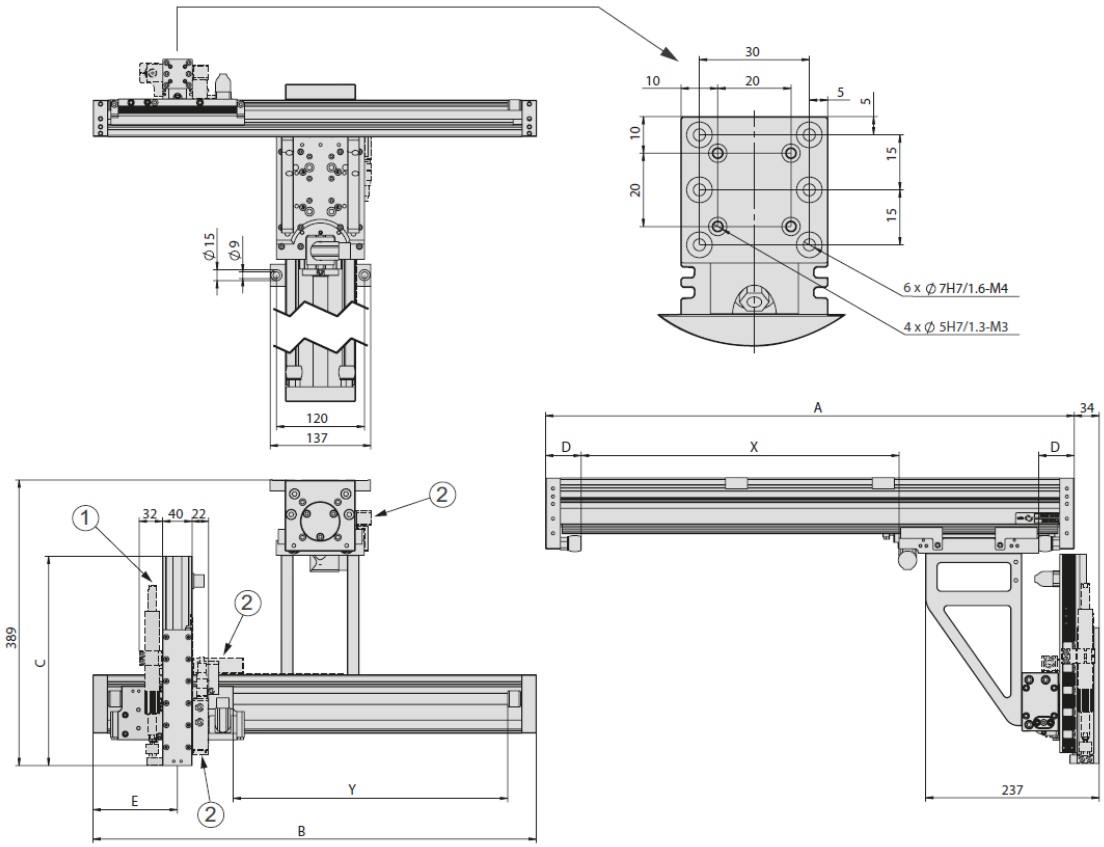


Fig. 18 Dimensioned drawing EPS mini gantry h

3.18.2 Technical data EPS mini gantry h

EPS mini gantry h	
Order number	**50444419**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis	
Axis	PDL30	PDL40
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130, 1330 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm
Maximum speed	3.2 m/s	3 m/s
Peak force	255 N	550 N
Permanent force	51 N	145 N

Type	Y-axis	
Axis	PEL20-SL	PEL20
Stroke horizontal	80, 140, 210, 270, 370, 550, 640 mm	60, 130, 190, 290, 470, 560 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Type	Z-axis	
Axis	ES20	ES20
Stroke vertical	50 mm	100 mm
Maximum speed	6.8 m/s	4.8 m/s
Peak force	67 N	137 N
Permanent force	15 N	31 N

Included in the delivery *
- 2x Ø 5h6 Centring sleeves
- 2x Ø 7h6 Centring sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised
- Gantry bracing
- Attachment blocs

* Deviations possible depending on installed peripherals

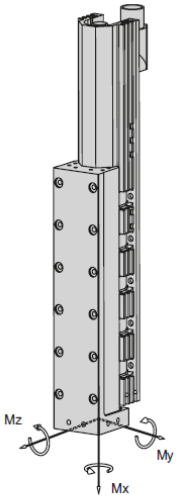
Accessories
(Catalogue HT accessories)
- Valve block
- Clamping element

(Catalogue HT components linear)
- Path measuring system

(Catalog HT components gripping/rotating)
- Rotary module
- Gripper module

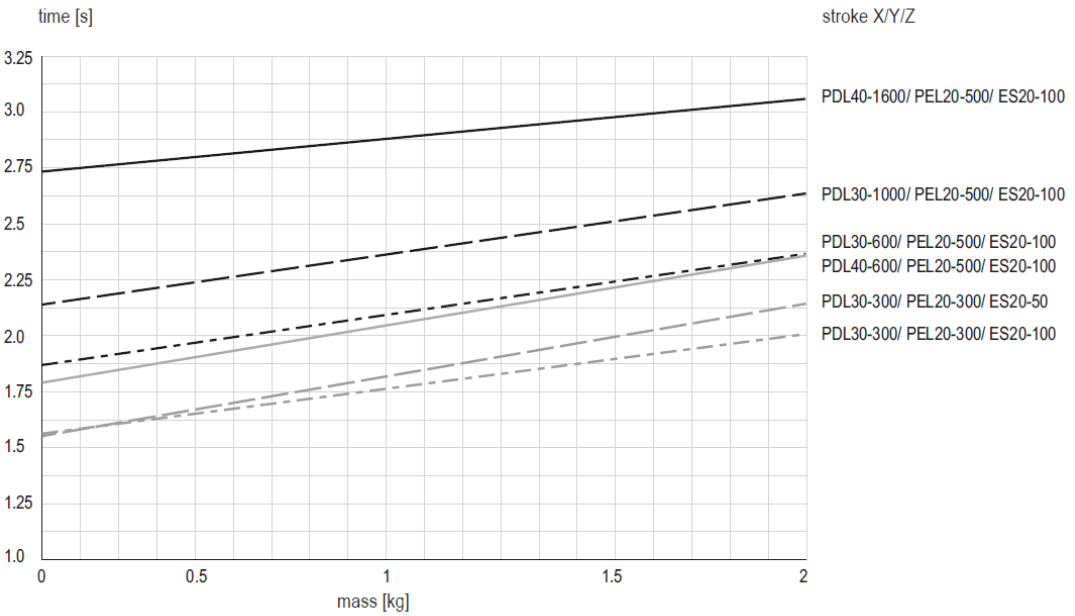
3.18.3 Module loads EPS mini gantry h

Type	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)		
Stroke Y	60 - 370 mm	470 - 640 mm
Stroke Z		
50 mm	4 kg	3 kg
100 mm	3 kg	2 kg

Cycle times EPS mini gantry h for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick-and-Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.19 EPS midi gantry h

3.19.1 Dimensioned drawing EPS midi gantry h

Type	A	C	D	E
PDL40-X-D27	X + 340 mm		49 mm	169 mm
PDL40-X-D28	X + 370 mm		64 mm	182 mm
PDL40-X-HP-D27	X + 460 mm		49 mm	230 mm
PDL40-X-HP-D28	X + 490 mm		64 mm	242 mm
PDL30-X-D19	X + 270 mm		40 mm	134 mm
PDL30-X-D20	X + 290 mm		50 mm	144 mm
ES20-50		192 mm		
ES20-100		285 mm		
ES20-200		365 mm		
ES20-300		495 mm		

① MagSpring
② Path measuring system
X Stroke of the X-, Y-axis

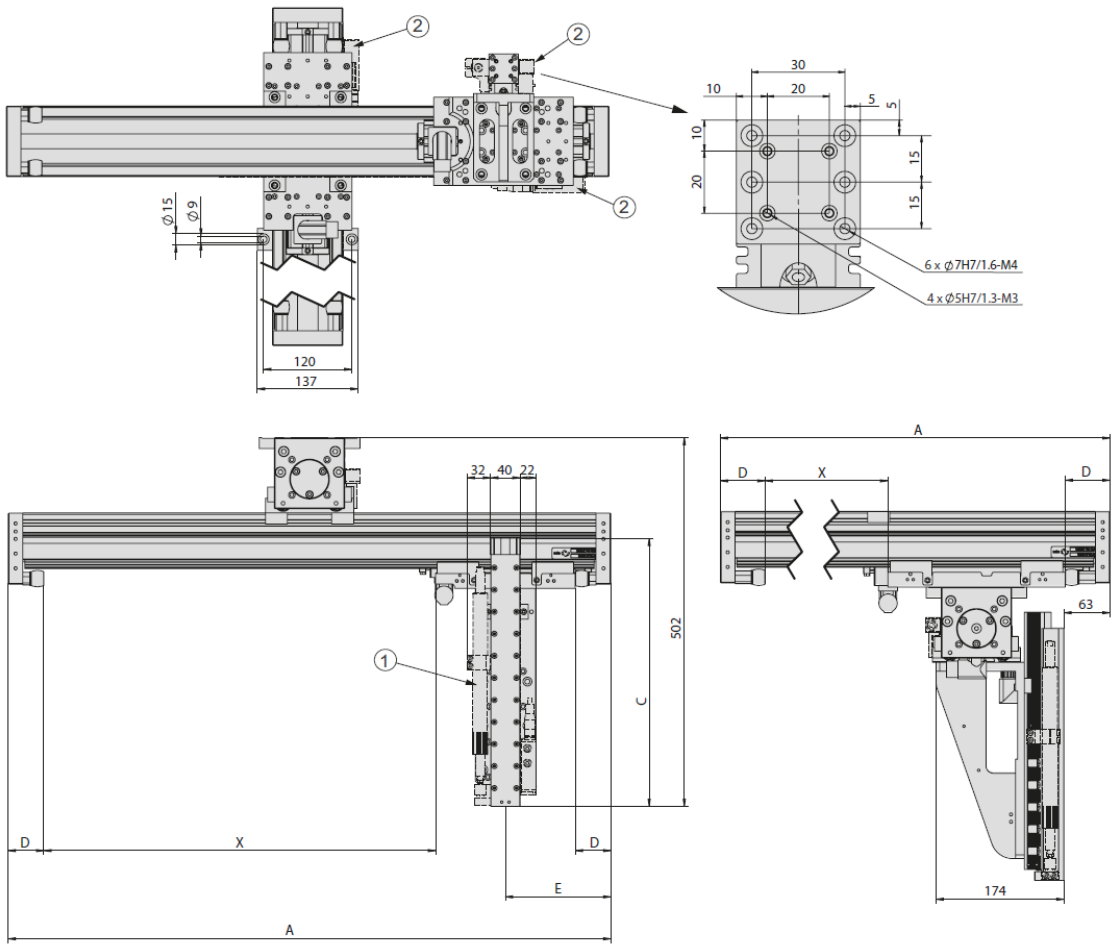


Fig. 19 Dimensioned drawing EPS midi gantry h

3.19.2 Technical data EPS midi gantry h

EPS midi gantry h	
Order number	**50444420**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axis	
Axis	PDL40	PDL40-HP
Stroke horizontal	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3 m/s	2 m/s
Peak force	550 N	1024 N
Permanent force	145 N	203 N

Type	Y-axis		
Axis	PDL30	PDL40	PDL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060 mm	160, 200, 250, 320, 340, 410, 460, 550, 760, 940 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Z-axis			
Axis	ES20	ES20	ES20	ES20
Stroke vertical	50 mm	100 mm	200 mm	300 mm
Maximum speed	6.8 m/s	4.8 m/s	4.8 m/s	4.8 m/s
Peak force	67 N	137 N	137 N	137 N
Permanent force	15 N	31 N	31 N	31 N

Included in the delivery *

- 2x Ø 5h6 Centring sleeves
- 2x Ø 7h6 Centring sleeves
- MagSpring or compensation spring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised
- Gantry bracing
- Attachment blocs

Accessories

(Catalogue HT accessories)

- Valve block
- Clamping element

(Catalogue HT components linear)

- Path measuring system

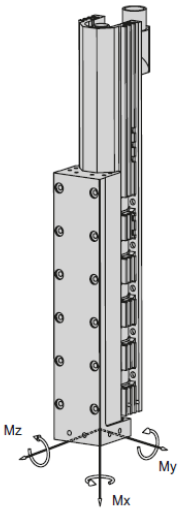
(Catalog HT components gripping/rotating)

- Rotary module
- Gripper module

* Deviations possible depending on installed peripherals

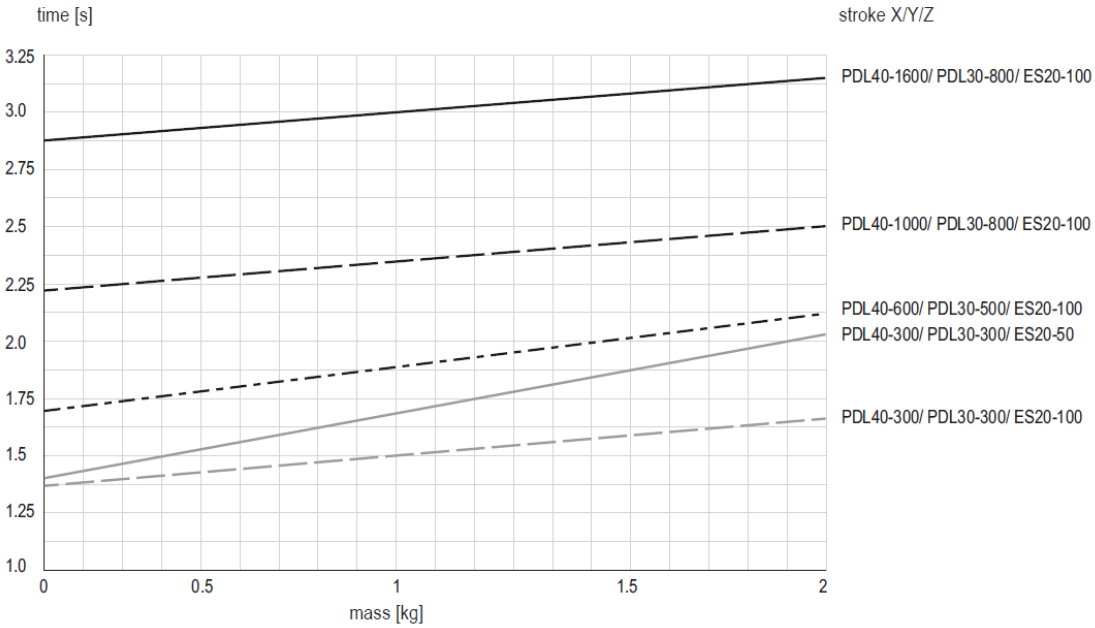
3.19.3 Module loads EPS midi gantry h

Tye	ES20-SL	ES20
Dynamic torque Mx	5 Nm	5 Nm
Dynamic torque My	25 Nm	50 Nm
Dynamic torque Mz	25 Nm	50 Nm



Payload (centric)		
Stroke Y	90 - 630 mm	670 - 1130 mm
Stroke Z		
50 mm	4 kg	3 kg
100 mm	3 kg	2 kg
200 mm	1 kg	0.5 kg
300 mm	0.5 kg	-

Cycle times EPS midi gantry h for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick-and-Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.20 EPS maxi gantry h

3.20.1 Dimensioned drawing EPS maxi gantry h

Type	A	D	E
PDL40-X-D27	X + 340 mm	49 mm	169 mm
PDL40-X-D28	X + 370 mm	64 mm	182 mm
PDL40-X-HP-D27	X + 460 mm	49 mm	230 mm
PDL40-X-HP-D28	X + 490 mm	64 mm	242 mm
PDL30-X-D19	X + 270 mm	40 mm	134 mm
PDL30-X-D20	X + 290 mm	50 mm	144 mm

Type	C
ES30-50-SL	288 mm
ES30-100-SL	328 mm
ES30-100	328 mm
ES30-200-SL	428 mm
ES30-200	428 mm
ES30-300	528 mm

① MagSpring
② Path measuring system
X Stroke of the X-, Y-axis

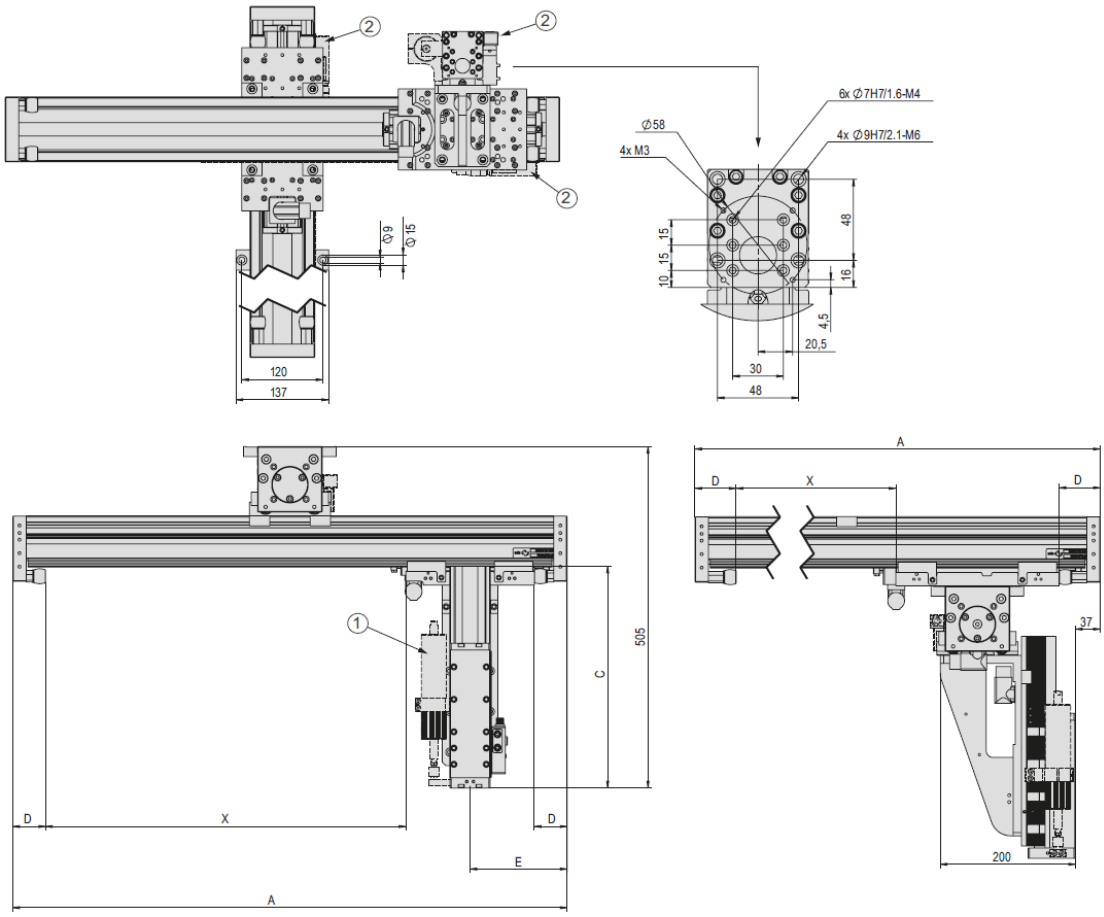


Fig. 20 Dimensioned drawing EPS maxi gantry h

3.20.2 Technical data EPS maxi gantry h

EPS maxi gantry h	
Order number	**50444421**
Drive type	electrical, linear motor
Repeat accuracy	± 0.05 mm
- with external path measuring system (1 µm)	± 0.02 mm
Temperature range	0 ... 50 °C
Control block with 5/3, 5/2 or vacuum units	up to 6 valves

Type	X-axe	
Axis	PDL40	PDL40-HP
Stroke horizontal	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060, 1270, 1480, 1660 mm	160, 200, 250, 320, 340, 410, 460, 550, 760, 940, 1150, 1360, 1540 mm
Maximum speed	3 m/s	2 m/s
Peak force	550 N	1024 N
Permanent force	145 N	203 N

Type	Y-axe		
Axis	PDL30	PDL40	PDL40-HP
Stroke horizontal	90, 130, 150, 230, 250, 330, 350, 430, 450, 530, 550, 630, 650, 730, 930, 1130 mm	70, 160, 170, 230, 280, 320, 370, 440, 460, 530, 580, 670, 880, 1060 mm	160, 200, 250, 320, 340, 410, 460, 550, 760, 940 mm
Maximum speed	3.2 m/s	3 m/s	2 m/s
Peak force	255 N	550 N	1024 N
Permanent force	51 N	145 N	203 N

Type	Z-axe
Axis	ES30
Stroke vertical	50, 100, 200, 300 mm
Maximum speed	3.2 m/s
Peak force	255 N
Permanent force	51 N

Included in the delivery *
- 2x Ø 7h6 Centring sleeves
- 2x Ø 9h7 Centring sleeves
- MagSpring
- Hose or drag chain
- Motor cable
- Completely wired
- Controller parametrised
- Gantry bracing
- Attachment blocs

Accessories
(Catalogue HT accessories)
- Valve block
- Clamping element

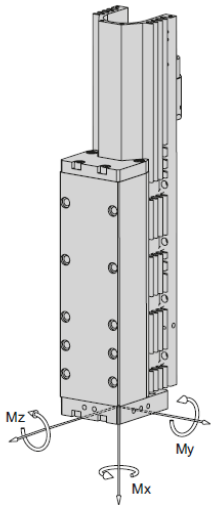
(Catalogue HT components linear)
- Path measuring system

(Catalog HT components gripping/rotating)
- Rotary module
- Gripper module

* Deviations possible depending on installed peripherals

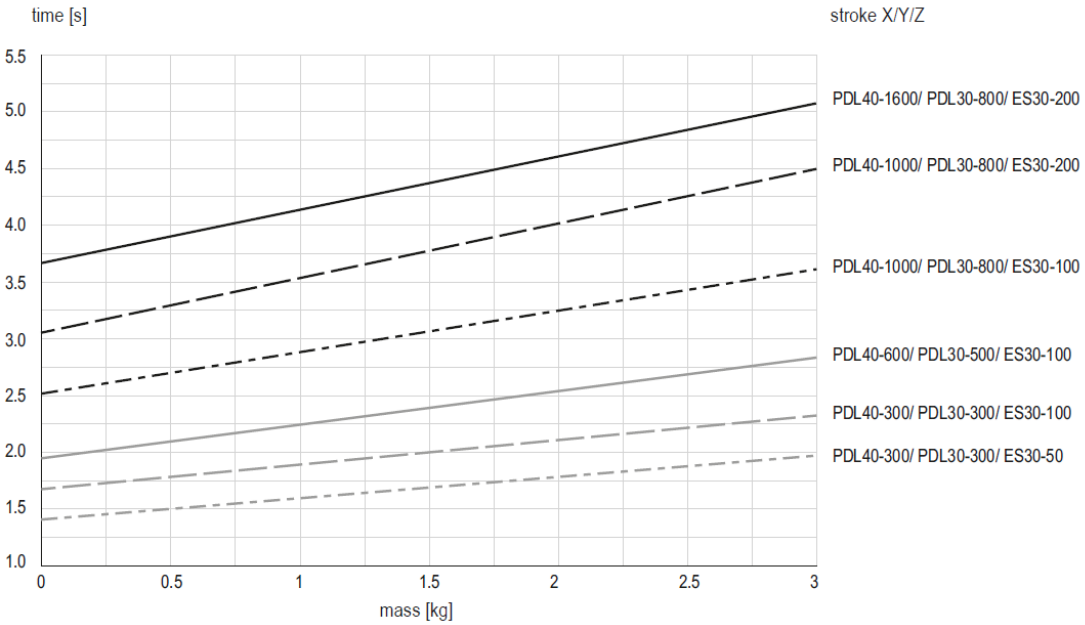
3.20.3 Module loads EPS maxi gantry h

Type	ES30-SL	ES30
Dynamic torque Mx	30 Nm	30 Nm
Dynamic torque My	40 Nm	80 Nm
Dynamic torque Mz	40 Nm	80 Nm



Payload (centric)		
Stroke Y	90 - 630 mm	670 - 1130 mm
Stroke Z		
50 mm	5 kg	3 kg
100 mm	4 kg	2 kg
200 mm	3 kg	1 kg
300 mm	0.5 kg	-

Cycle times EPS maxi gantry h for Pick & Place



Times including 2 x 100 ms gripping time

Comment:

The values in the chart correspond to a Pick-and-Place cycle (6 subsequent movements + 2 × 100 ms gripping time).
The indicated mass is centrically installed at the vertical linear unit. Standstill times of handling permit shorter movement times.
In exceptions, e.g. at eccentric mass or high requirements to accuracy, the value may be exceeded.

3.21 Overview of power supplies

For detailed installation instructions, please refer to the respective installation instructions of the power supply unit used.

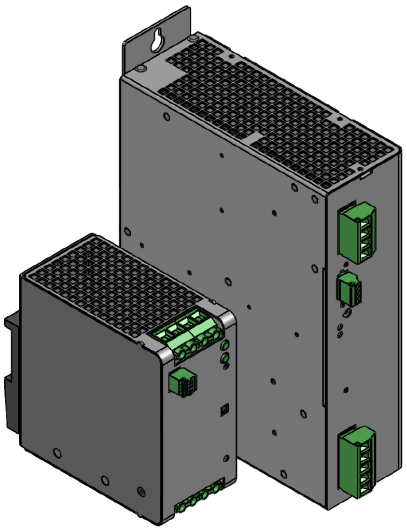


Fig. 21 Power supplies

Technical data	SPH500-7207	SPH1013-7214	NT01-72/1500Multi
Type	primary switched power supply		
Primary voltage	90-132 VAC, 50/60 Hz or 180-264 VAC, 50/60 Hz (automatic switching)	3x340 – 550 VAC, 50/60 Hz	3x230/400/480 VAC, 50/60 Hz
Secondary voltage	54-80 VDC adjustable	54-80 VDC adjustable	72 VDC
Output power	480 W	960 W	1500 W
Power consumption	600 W	1100 W	1500 W
Max. power loss	54 W	91 W	110 W
Peak output current (>0.5 s)	10 A	27 A	50 A
Rated current	240 VAC = 4.5 A, 120 VAC = 9 A	380 VAC = 3.1 A	3x230 VAC = 3.5 A, 400 VAC = 2 A, 480 VAC = 1.7 A
Efficiency	88%	91.5%	85% (at nominal power)
Protect. class	IP 20	IP 20	IP 20
Operating temperature	-25…70 °C	-25…70 °C	0…40 °C
Ground	1 kg	2 kg	17 kg
Dimension (HxWxD)	125x62x121 mm	230x66x177 mm	275x280x165 mm
External fuse	6 A (C, D, K Typ)	16-32 A (C, D, K Type)	8 A (C, D, K Typ)

4 Transport, packaging and storage

4.1 Safety instructions for transport

NOTICE

Risk of damage to property!

EPS systems are precision mechanical devices and can be damaged by incorrect handling.

EPS systems must be packed, transported, unpacked and stored with the necessary care and cleanliness.

Also observe the safety instructions in ➲ chap. 2 „Safety instructions“ in this manual.

4.2 Transport

No liability can be assumed for damages caused by improper installation on the part of the operating company.

The following conditions must be complied with for transport and storage:

- Storage temperature: 0-50 °C
- Relative air humidity: < 90%, non condensing

4.3 Packaging

The EPS system is transported in the Afag transport packaging. If no Afag packaging is used, the EPS system must be packed in such a way that it is protected against shocks and dust.

The packaging materials used are mainly cardboard and paper or PE film. These are materials that can be recycled worldwide.

If the packaging is returned to us carriage paid, Afag will take it back free of charge and dispose of it properly.

NOTICE

Risk to the environment due to incorrect disposal of the packaging material

Environmental damage can be caused by incorrect disposal of the packaging material.

- Dispose of the packaging material in an environmentally sensitive way in accordance with the local environmental regulations.

4.4 Storage

If the EPS systems are stored for an extended period of time, observe the following:

- Store the EPS system in the transport packaging.
- Do not store the servo gripper outdoors or expose it to weather conditions.
- The storage space must be dry and dust free.
- Room temperature of the storage space: 0-50 °C.
- Relative air humidity: < 90% non condensing
- Clean the EPS and protect the blank metal parts against corrosion using the appropriate means.
- Protect the EPS system from dirt and dust.

5 Installation, assembly and setting

The EPS systems are incomplete machines. For safe operation, the system must be integrated into the safety concept of the system in which it is installed.

During normal operation, the user must not interfere with the working area of the EPS system. The user of the EPS system (plant operator) must ensure this by using suitable protective measures (e.g. protective bonnets, safety doors, enclosures, light grids).

The system operator is responsible for the installation of the EPS in a system!

No liability for damages can be assumed for damages caused by improper installation on the part of the operator.

5.1 Safety instructions for installation and assembly

CAUTION

Personal injury caused by hot surfaces!

High surface temperatures (up to 60°C) can occur on the EPS systems. There is a risk of injury and damage to property.

- No temperature-sensitive parts such as cables or electronic components may be in contact with or attached to the EPS system!
- Before touching hot surfaces without protective gloves, make sure they have cooled down to ambient temperature.

CAUTION

Risk of injuries due to uncontrolled parts movements!

When connecting to the control system and during operation of the EPS systems, unpredictable movements may occur and cause injury/property damage.

- Before working on the EPS system, make sure that the control unit is switched off and secured against being switched on again.

Also observe the safety instructions in ➲ chapter 2 „Safety instructions“ in this manual.

5.2 Required mounting material

Depending on the EPS system used, the adapters used and the weights present, different tools and materials must be used. The following table contains recommendations for the use of the appropriate mounting material in each case.

Type	Recommended mounting material
SE20	▪ 2/4x O-ring 2.5x0.62 NBR70 ▪ 4x cylindrical pin DIN 6325 4m6x10 ▪ 6x M4 screw (note screw-in depth)
SE30	▪ 2/4x O-ring 2.5x0.62 NBR70 ▪ 4x cylindrical pin DIN 6325 4m6x10 ▪ 2x Ø 9h6 centring bushing + 4x screw M6x20 ▪ 2x Ø 7h6 centring bushing + 4x screw M4 ▪ 2x Ø 8h6 centring bushing + 4x screw M3
RA-40	▪ 2/4x O-ring 2.5x0.62 NBR70 ▪ 2x centring bushing Ø7x3 ▪ 2x centring bushing Ø5x2.5
ES20	▪ 4x Ø 7h6 centring bushing + 8x screw M4
ES30	▪ 4x Ø 9h6 centring bushing + 4x screw M5
ES40	▪ Centring bushing Ø12x4.8
PEL20	▪ 2x Ø 9h6 centring bushing + 4x screw M6 ▪ 2x Ø 7h6 centring bushing + 4x screw M4 ▪ 2x Ø 5h6 centring bushing + 4x screw M3 ▪ 2x cylindrical pin 5m6 ▪ Mounting block for PEL20 PDL30_PDL40 + M8 screw
PDL30	▪ 2x Ø 9h6 centring bushing + 4x screw M6 ▪ 2x Ø 7h6 centring bushing + 4x screw M4 ▪ 2x Ø 12h6 centring bushing + 4x screw M8 ▪ 2x cylindrical pin 8m6 ▪ Mounting block for PEL20 PDL30_PDL40 + M8 screw
PDL40	▪ 2x Ø 9h6 centring bushing + 4x screw M6 ▪ 2x Ø 7h6 centring bushing + 4x screw M4 ▪ 2x Ø 12h6 centring bushing + 4x screw M8 ▪ 2x cylindrical pin 8m6 ▪ Mounting block for PEL20 PDL30_PDL40 + M8 screw

Only use original LinMot cables to operate the electric axes. The use of other cables can lead to damage or malfunctions!

5.3 Weight compensation

With the EPS system, the weight is balanced via the MagSpring or pneumatically unit (GWA).

Please also observe the installation instructions for the integrated modules!

5.3.1 Weight compensation with MagSpring

The following applies to both installation positions when mounting the MagSpring:

- The thread on the stator and the end of the rotor with 4 spanner flats point downwards.

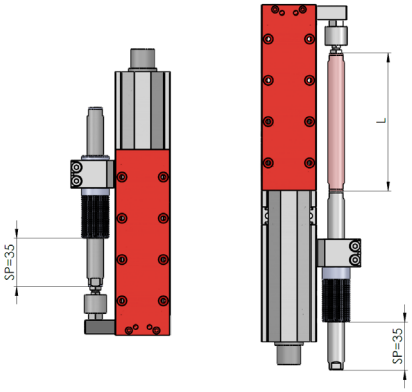


Fig. 22 Normal installation position - Inverted installation position

Normal installation position:

In normal installation position the dimension SP=35 mm is set by clamping the MagSpring stator with the slide fully **retracted**.

Inverted installation position:

With the installation position reversed, the dimension SP=35 mm is set by clamping the MagSpring stator with the slide fully **extended**.

The dimension L of the MagSpring extension depends on the stroke of the module used.

5.3.2 Weight compensation with pneumatic cylinder

Please observe the corresponding assembly instructions for the pneumatic weight compensation (GWA)!

5.4 Interfaces of the axis controllers

This chapter contains brief overviews of the interfaces of the various axis controllers. For further information on installation, please refer to the respective installation instructions. The controllers are pre-configured so that no software adjustment is usually necessary. If adjustments are necessary, please download the software "LinMot-Talk 1100": www.linmot.com.

5.4.1 Axis controller C11xx

Technical data	C1150-EC-XC	C1150-PN-XC	C1150-GP-XC
Logistics supply	24 VDC	24 VDC	24 VDC
Motor power supply	24 - 72 VDC	24 - 72 VDC	24 - 72 VDC
Max. motor output current (at 72 V)	25 A	25 A	25 A
Bus systems Interfaces	EtherCat CANopen DeviceNet RS485/232 Digital I/Os	*Profinet* CANopen DeviceNet RS485/232 Digital I/Os	CANopen DeviceNet RS485/232 Digital I/Os
Max. power consumption	30 W	30 W	30 W
Protect. class	IP 20	IP 20	IP 20
Operating temperature	0 - 40 °C	0 - 40 °C	0 - 40 °C
Ground	1.5 kg	1.5 kg	1.5 kg
Distance between controllers	20 mm left/right 50 mm bottom/top	20 mm left/right 50 mm bottom/top	20 mm left/right 50 mm bottom/top
Fuse protection 72 V supply	16 AT	16 AT	16 AT
Fuse protection 24 V supply	3 AT	3 AT	3 AT

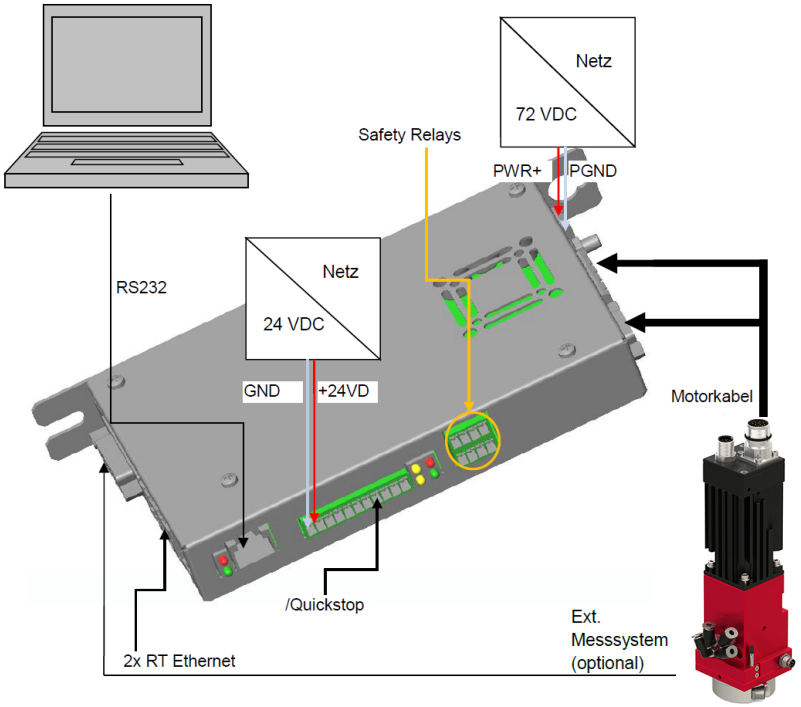


Fig. 23 Axis controller C11xx

Connection	Description
X1 PWR+	Motor power supply +72 VDC
X1 PGND	Motor power supply GND
X2	Motor phases
X3	Motor Signals
X33	Safety relay (optional for -S1 version)
X4.8	Quick stop (except PROFIdrive)
X4.7	Reference sensor (optional)
X4.2	Logic voltage supply +24 VDC
X4.1	Logic voltage supply GND

DANGER

Danger when the safety door is open!

There is a high risk of injury when the safety door is open!

- For the C11xx controller, the safety relay input (X33) must be deactivated or
- the power supply unit (72 V) must be disconnected on the primary side!

5.4.2 Axis controller C12xx

Technical data	C1250-EC-XC	C1250-IP-XC	C1250-PL-XC	C1250-PN-XC
Logistics supply	24 VDC	24 VDC	24 VDC	24 VDC
Motor power supply	24 - 72 VDC	24 - 72 VDC	24 - 72 VDC	24 - 72 VDC
Max. motor output current (at 72 V)	25 A	25 A	25 A	25 A
Bus systems Interfaces	EtherCat CANopen DeviceNet RS485/232 Digital I/Os Master encoder	Ethernet IP CANopen DeviceNet RS485/232 Digital I/Os Master encoder	PowerLink CANopen DeviceNet RS485/232 Digital I/Os Master encoder	Profinet CANopen DeviceNet RS485/232 Digital I/Os Master encoder
Max. power consumption	30 W	30 W	30 W	30 W
Protect. class	IP 20	IP 20	IP 20	IP 20
Operating temperature	0 - 40 °C	0 - 40 °C	0 - 40 °C	0 - 40 °C
Ground	0.7 kg	0.7 kg	0.7 kg	0.7 kg
Distance between controllers	20 mm left/right 50 mm bottom/top	20 mm left/right 50 mm bottom/top	20 mm left/right 50 mm bottom/top	20 mm left/right 50 mm bottom/top
Fuse protection 72 V supply	16 AT	16 AT	16 AT	16 AT
Fuse protection 24 V supply	3 AT	3 AT	3 AT	3 AT

Technical data	C1250-SC-XC	C1250-SE-XC
Logistics supply	24 VDC	24 VDC
Motor power supply	24 - 72 VDC	24 - 72 VDC
Max. motor output current (at 72 V)	25 A	25 A
Bus systems Interfaces	Sercos III CANopen DeviceNet RS485/232 Digital I/Os Master encoder	Sercos over EtherCAT CANopen DeviceNet RS485/232 Digital I/Os Master encoder
Max. power consumption	30 W	30 W
Protect. class	IP 20	IP 20
Operating temperature	0 - 40 °C	0 - 40 °C
Ground	0.7 kg	0.7 kg
Distance between controllers	20 mm left/right 50 mm bottom/top	20 mm left/right 50 mm bottom/top
Fuse protection 72 V Supply	16 AT	16 AT
Fuse protection 24 V supply	3 AT	3 AT

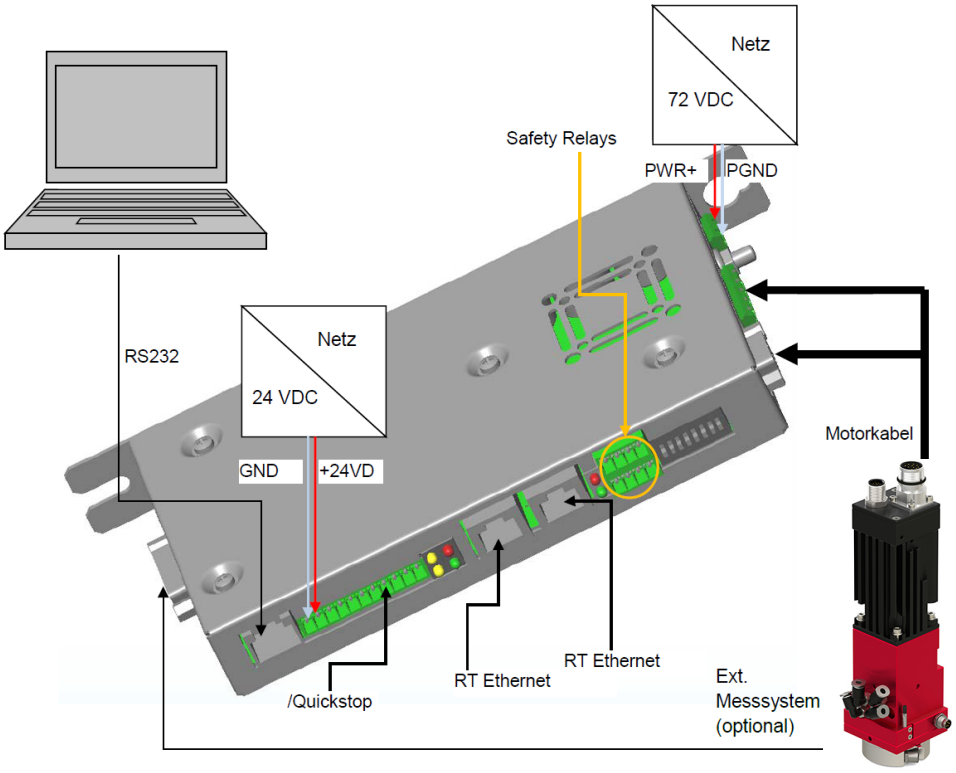


Fig. 24 Axis controller C12xx

Connection	Description
X1 PWR+	Motor power supply +72 VDC
X1 PGND	Motor power supply GND
X2	Motor phases
X3	Motor Signals
X33	Safety relay (optional for -S1 version)
X4.8	Quick stop (except PROFIdrive)
X4.7	Reference sensor (optional)
X4.2	Logic voltage supply +24 VDC
X4.1	Logic voltage supply GND

DANGER

Danger when the safety door is open!

There is a high risk of injury when the safety door is open!

- For the C12xx controller, the safety relay input (X33) must be deactivated or
- the power supply unit (72 V) must be disconnected on the primary side!

5.4.3 Axis controller E12xx

Technical data	E1230-DP-UC	E1250-EC-UC	E1250-PL-UC	E1250-SE-UC
Logistics supply	24 VDC	24 VDC	24 VDC	24 VDC
Motor power supply	24 - 72 VDC	24 - 72 VDC	24 - 72 VDC	24 - 72 VDC
Max. motor output current (at 72 V)	Standard version: 32 A	Standard version: 32 A	Standard version: 32 A	Standard version: 32 A
Bus systems Interfaces	Profibus CANopen DeviceNet RS485/232 Digital I/Os Master encoder	EtherCat CANopen DeviceNet RS485/232 Digital I/Os Master encoder	PowerLink CANopen DeviceNet RS485/232 Digital I/Os Master encoder	Sercos over EtherCAT CANopen DeviceNet RS485/232 Digital I/Os Master encoder
Max. power consumption	30 W	30 W	30 W	30 W
Protect. class	IP 20	IP 20	IP 20	IP 20
Operating temperature	0 - 40 °C	0 - 40 °C	0 - 40 °C	0 - 40 °C
Ground	1 kg	1 kg	1 kg	1 kg
Distance between controllers	20 mm left/right 50 mm bottom/top	20 mm left/right 50 mm bottom/top	20 mm left/right 50 mm bottom/top	20 mm left/right 50 mm bottom/top
Fuse protection 72 V supply	20 AT	20 AT	20 AT	20 AT
Fuse protection 24 V supply	2 AT	2 AT	2 AT	2 AT

Technical data	E1250-IP-UC	E1250-PN-UC	E1250-SC-UC
Logistics supply	24 VDC	24 VDC	24 VDC
Motor power supply	24 - 72 VDC	24 - 72 VDC	24 - 72 VDC
Max. motor output current (at 72 V)	Standard version: 32 A	Standard version: 32 A	Standard version: 32 A
Bus systems Interfaces	Ethernet IP CANopen DeviceNet RS485/232 Digital I/Os Master encoder	Profinet CANopen DeviceNet RS485/232 Digital I/Os Master encoder	Sercos III CANopen DeviceNet RS485/232 Digital I/Os Master encoder
Max. power consumption	30 W	30 W	30 W
Protect. class	IP 20	IP 20	IP 20
Operating temperature	0 - 40 °C	0 - 40 °C	0 - 40 °C
Ground	1 kg	1 kg	1 kg
Distance between controllers	20 mm left/right 50 mm bottom/top	20 mm left/right 50 mm bottom/top	20 mm left/right 50 mm bottom/top
Fuse protection 72 V supply	20 AT	20 AT	20 AT
Fuse protection 24 V supply	2 AT	2 AT	2 AT

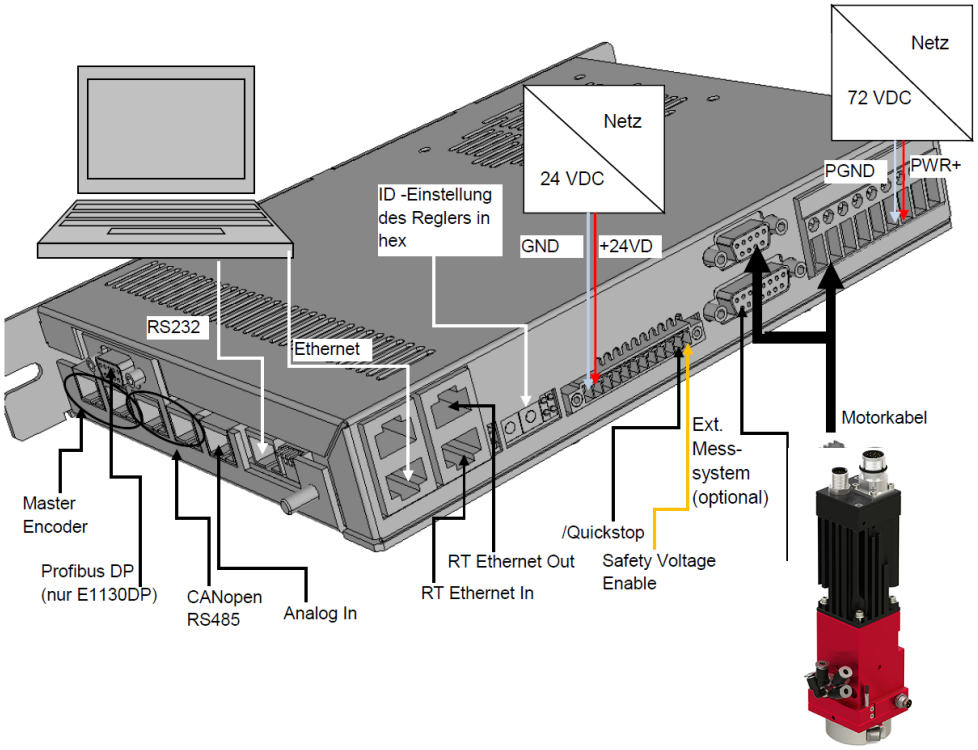


Fig. 25 Axis controller E12xx

Connection	Description
X1 PWR+	Motor power supply +72 VDC
X1 PGND	Motor power supply GND
X2	Motor phases
X3	Motor Signals
X4.12	Safety voltage enable
X4.11	/Quick stop
X4.7	Reference sensor (optional)
X4.2	Logic voltage supply +24 VDC
X4.1	Logic voltage supply GND

DANGER

Danger when the safety door is open!

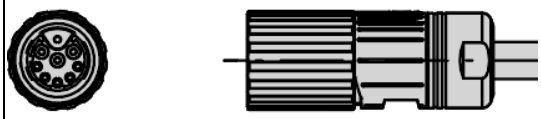
There is a high risk of injury when the safety door is open!

- With the E12xx controller, the power supply unit (72 V) must be safely disconnected on the primary side!

5.5 Pin assignment and electrical connection data of the motors

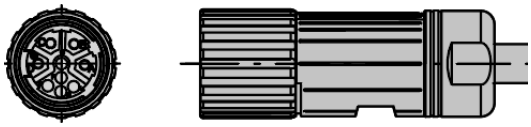
<table>
<tr><th colspan="2">Connector combinations</th></tr>
<tr><td>Connector on the axle</td><td>Connector on the controller</td></tr>
<tr><td>

R connector:



Insert
- Electric slide ES20
- Portal axis PEL20
- Rotary axis SE20

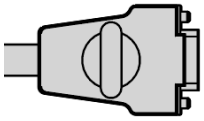
C connector:



Insert
- Electric slide ES30
- Portal axis PEL30
- Portal axis PDL30
- Portal axis PDL40
- Portal axis PDL40-HC
- Rotary axis SE30

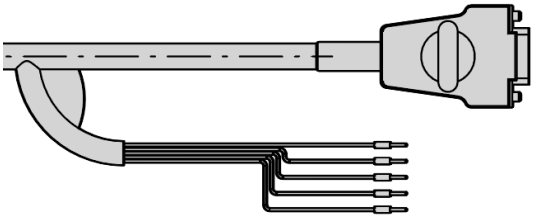
</td><td>

D connector:



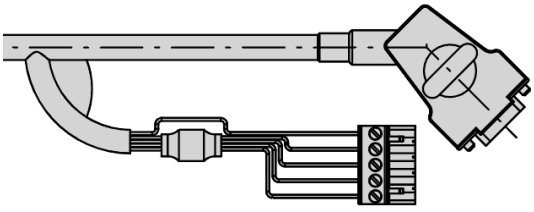
Insert
-

W connector:



Insert
- Controller E12xx UC

Y connector:

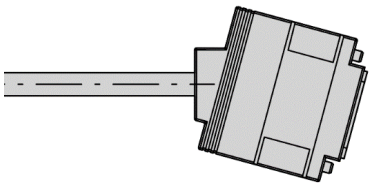


Insert
- Controller C11xx XC
- Controller C12xx XC

</td></tr>
</table>

5.6 Connector assignment encoder on the controller

Controller C1xxx and E12xx series



PIN	Function	Colour
1	+5V	pink
2	A- / sin-	yellow
3	B- / cos-	grey
4	Z- / data -	white
5	GND	red/blue+violet
6	Free	-
7	Free	-
8	Clock-	Green
9	A+ / sin+	Black
10	B+ / cos+	Red
11	Z+ /Data+	blue
12	Free	-
13	Free	-
14	Free	-
15	Clock+	grey/pink
Housing	Screen	outer screen

5.7 Connector strip

- Connector strip STL-4 for 4 sensors 4xM8, 3-pin, 1xM12 12-pin (16520814)
- Connector strip STL-6 for 6 sensors 6xM8, 3-pin, 1xM12 12-pin (16520815)
- Connector strip STL-8 for 8 sensors 8xM8, 3-pin, 1xM12 12-pin (16520685)
- Connector strip STL-10 for 10 sensors 10xM8, 3-pin, 1xM12 12-pin (16520816)

The power strip offers three essential functions:

- Connecting the sensors of the periphery
- Display 24 V supply
- Display of the switching states of the sensors

Suitable:

Angle plug series 768 3-pin M8x1 (16520057)

Connection cable 12-pin angled socket 10m (16520686)

Connection cable 12-pin angled socket 15m (16520833)

Pin assignment of connector strip

Function	Socket 12-pin PIN	Cable
+	1	brown
-	2	blue
X1	3	white
X2	4	green
X3	5	yellow
X4	6	grey
X5	7	pink
X6	8	red
X7	9	black
X8	10	violet
X9	11	grey/pink
X10	12	red/blue

Assignment of the sockets (3-pole)

Function	PIN	Cable
+	1	brown
Signal	4	black
-	3	blue

6 Commissioning

In addition, observe the instructions in the operating manuals of the respective individual modules!

6.1 Safety instructions for commissioning

DANGER

Danger! Risk of electric shock!

If work on electrical components is required, ensure that the work is carried out properly, failure to do so will cause serious or fatal injuries.

- Work on the machine's electrical equipment may only be performed by skilled electrician or trained personnel under the supervision of a skilled electrician in accordance with all relevant electrical regulations.

CAUTION

Danger of injury in the working area of the EPS!

Due to the decentralised control system, the operator of the EPS must not necessarily stand next to the module during operation so that he may not have a complete view of the working area. Persons in the working area may be injured.

- During operation, ensure a good overview of the working area.
- Unauthorised persons are not allowed in the work area.

CAUTION

Risk of injuries due to uncontrolled parts movements!

When the control is switched on, signals from the control can lead to unintentional movements of the EPS system and cause serious injuries or damage to property.

- Before working on the EPS system, make sure that the control unit is switched off and secured against being switched on again.
- Only connect or disconnect the cables when the control unit is switched off.

CAUTION

Risk of injury due to mounted components!

Attachments on the EPS system can be a risk in conjunction with moving parts.

- Take appropriate measures to ensure safe operation!

Also observe the safety instructions in chap. 2 „Safety instructions“ in this manual.

6.2 Preparatory activities for commissioning

Before commissioning, all parameters must be precisely adjusted to the respective application or intended use.

To do this, make the settings on the individual modules as described at ➲ chapter 6.4 "Settings".

To prepare for commissioning proceed as follows:

1. Set the speeds on the electric axes (➲ chapter 6.4.1).
2. Teach positions on electric axes (➲ chapter 6.4.2).
3. Set the damping/speeds on the pneumatic modules (➲ chapter 6.4.3).
4. Set the external position measuring system (➲ chapter 6.4.4).

   ⇨ The preliminary settings for commissioning are completed.

6.3 Commissioning of the modules

Proceed carefully and follow the instructions step by step when commissioning the modules for the first time:

1. Observe the permissible technical values (➲ chapter 3).
   - Payload
   - Movement frequency
   - Momentary load
2. First, make sure that there are no persons or tools in the working area.
3. Perform test run:
   - Start with slow movements,
   - subsequently under normal operating conditions.

   ⇨ Commissioning is completed.

6.4 Settings

CAUTION

Danger of material damage and personal injury due to improperly performed adjustment work!

Improperly carried out activities can result in considerable material damage and serious injury.

- Only use trained specialist personnel to carry out the activities.

The EPS system is a precision mechanical device.

Please proceed with the necessary care and cleanliness during the setting work!

6.4.1 Set speeds on electric axes

The speeds of the electric axes are usually specified by the higher-level control system. For this purpose, there are sample programmes for many common controllers with which the maximum speed, acceleration and the target position can be specified.

These programmes are stored on the CD supplied or can be downloaded from https://www.afag.com/de/service/support-tools/linmot.html .

NOTICE

Risk of damage to property!

Excessive speed or acceleration can cause damage to the unit or peripherals.

- Observe the permissible values!

Table overview of the electric axes

The following tables should serve as a reference for the parameters (speed, acceleration and deceleration).

Please note that the standard parameters depend strongly on the load mass and the mechanical structure and must therefore be adapted to your application!

Type	Max. speed [m/s]	Max. accel. [m/s²]	Max. delay [m/s²]	Std. speed [m/s]	Std. accel. [m/s²]	Std. delay [m/s²]	Max. pos. [mm]	Min. pos. [mm]
SE20-x-50-x	0.84	30	30	0.84	20	20	∞	∞
SE20-x-30-x	1.7	20	20	1.7	15	15	∞	∞
SE30-x-50-x	0.84	30	30	0.84	20	20	∞	∞
SE30-x-30-x	1.7	20	20	1.7	15	15	∞	∞
RA-40-x-x-50-x-x	0.84	30	30	0.84	20	20	∞	∞
RA-40-x-x-30-x-x	1.7	20	20	1.7	15	15	∞	∞
ES20-50-SL	7.3	120	120	3	15	15	50	0
ES20-100-SL	5.3	80	80	3	10	10	100	0
ES20-200	5.3	60	60	3	10	10	200	0
ES20-300	5.3	40	40	3	10	10	300	0
ES30-050-SL	3.9	80	80	2	15	15	50	0
ES30-100-SL	3.9	80	80	2	15	15	100	0
ES30-100	3.9	80	80	2	15	15	100	0
ES30-200-SL	3.9	80	80	2	15	15	200	0
ES30-200	3.9	80	80	2	15	15	200	0
ES30-300	3.9	80	80	2	15	15	300	0
ES30-400	3.9	80	80	2	15	15	400	0
ES30-500	3.9	80	80	2	15	15	500	0
ES40-100-SL	2	20	80	2	15	15	100	0
ES40-100	2	20	80	2	15	15	100	0
ES40-200	2	20	80	2	15	15	200	0
ES40-300	2	18	80	2	15	15	200	0
ES40-400	2	18	80	2	15	15	300	0
ES40-500	1.8	18	80	2	15	15	400	0

Type	Max. speed [m/s]	Max. accel. [m/s²]	Max. delay [m/s²]	Std. speed [m/s]	Std. accel. [m/s²]	Std. delay [m/s²]	Max. pos. [mm]	Min. pos. [mm]
ES40-100-HP-SL	2	55	80	2	15	15	100	0
ES40-100-HP	2	48	80	2	15	15	100	0
ES40-200-HP	1.8	40	80	2	15	15	200	0
ES40-300-HP	1.8	37	80	2	15	15	200	0
ES40-400-HP	1.8	34	80	2	15	15	300	0
ES40-500-HP	1.7	30	80	2	15	15	400	0
PEL20-080-SL	7.3	120	120	3	15	15	80	0
PEL20-140-SL	7.3	120	120	3	15	15	140	0
PEL20-210-SL	7.3	120	120	3	15	15	210	0
PEL20-270-SL	7.3	120	120	3	15	15	270	0
PEL20-370-SL	7.3	120	120	3	15	15	370	0
PEL20-550-SL	7.3	120	120	3	15	15	550	0
PEL20-640-SL	7.3	120	120	3	15	15	640	0
PEL20-060	5.3	80	80	3	10	10	60	0
PEL20-130	5.3	80	80	3	10	10	130	0
PEL20-190	5.3	80	80	3	10	10	190	0
PEL20-290	5.3	80	80	3	10	10	290	0
PEL20-470	5.3	80	80	3	10	10	470	0
PEL20-560	5.3	80	80	3	10	10	560	0
PDL30-90-D19	3.9	80	80	2	15	15	90	0
PDL30-150-D19	3.9	80	80	2	15	15	150	0
PDL30-250-D19	3.9	80	80	2	15	15	250	0
PDL30-350-D19	3.9	80	80	2	15	15	350	0
PDL30-450-D19	3.9	80	80	2	15	15	450	0
PDL30-550-D19	3.9	80	80	2	15	15	550	0
PDL30-650-D19	3.9	80	80	2	15	15	650	0
PDL30-130-D20	3.9	80	80	2	15	15	130	0
PDL30-230-D20	3.9	80	80	2	15	15	230	0
PDL30-330-D20	3.9	80	80	2	15	15	330	0
PDL30-430-D20	3.9	80	80	2	15	15	430	0
PDL30-530-D20	3.9	80	80	2	15	15	530	0
PDL30-630-D20	3.9	80	80	2	15	15	630	0
PDL30-730-D20	3.9	80	80	2	15	15	730	0
PDL30-930-D20	3.9	80	80	2	15	15	930	0
PDL30-1130-D20	3.9	80	80	2	15	15	1130	0
PDL30-1330-D20	3.9	80	80	2	15	15	1330	0
PDL30-1450-D20	3.9	80	80	2	15	15	1450	0

Type	Max. speed [m/s]	Max. accel. [m/s²]	Max. delay [m/s²]	Std. speed [m/s]	Std. accel. [m/s²]	Std. delay [m/s²]	Max. pos. [mm]	Min. pos. [mm]
PDL40-170-D27	3	80	80	2	15	15	170	0
PDL40-230-D27	3	80	80	2	15	15	230	0
PDL40-320-D27	3	80	80	2	15	15	320	0
PDL40-440-D27	3	80	80	2	15	15	440	0
PDL40-530-D27	3	80	80	2	15	15	530	0
PDL40-70-D28	3	80	80	2	15	15	70	0
PDL40-160-D28	3	80	80	2	15	15	160	0
PDL40-280-D28	3	80	80	2	15	15	280	0
PDL40-370-D28	3	80	80	2	15	15	370	0
PDL40-460-D28	3	80	80	2	15	15	460	0
PDL40-580-D28	3	80	80	2	15	15	580	0
PDL40-670-D28	3	80	80	2	15	15	670	0
PDL40-880-D28	3	80	80	2	15	15	880	0
PDL40-1060-D28	3	80	80	2	15	15	1060	0
PDL40-1270-D28	3	80	80	2	15	15	1270	0
PDL40-1480-D28	3	80	80	2	15	15	1480	0
PDL40-1660-D28	3	80	80	2	15	15	1660	0
PDL40HP-0200-D27	2.1	80	80	1.5	15	15	200	0
PDL40HP-0320-D27	2.1	80	80	1.5	15	15	320	0
PDL40HP-0410-D27	2.1	80	80	1.5	15	15	410	0
PDL40HP-0160-D28	2.1	80	80	1.5	15	15	160	0
PDL40HP-0330-D28	2.1	80	80	1.5	15	15	330	0
PDL40HP-0460-D28	2.1	80	80	1.5	15	15	460	0
PDL40HP-0550-D28	2.1	80	80	1.5	15	15	550	0
PDL40HP-0760-D28	2.1	80	80	1.5	15	15	760	0
PDL40HP-0940-D28	2.1	80	80	1.5	15	15	940	0
PDL40HP-1150-D28	2.1	80	80	1.5	15	15	1150	0
PDL40HP-1360-D28	2.1	80	80	1.5	15	15	1360	0
PDL40HP-1540-D28	2.1	80	80	1.5	15	15	1540	0

6.4.2 Teaching the positions on electric axes

The following three options are available for teaching the positions on the electric axes:

1. Manual shifting

DANGER

Risk of injury due to electric shock!

When working on the electric axles, there is a danger of electric shock!

- With the C1xx0 controller, the safety inputs X33 must be safely disconnected, or the power supply unit (72 V) must be disconnected on the primary side!

Procedure for manual teaching:

1. Reference drive.
2. Push the axles into position by hand.
   - Logistics voltage **ON**, power motors **OFF**.
3. Read out values from the controller for transfer to the pick & place movement.

   ⇨ Manual teaching is completed.

2. Teaching in jog mode

Procedure for manual teaching:

1. Reference drive.
2. Add or subtract value to the current position.
   - Can be programmed via relative command.
3. The existing module for absolute positioning can be converted into a module for relative positioning by changing a variable.

   ⇨ Teaching in jog mode is completed.

3 Set up with reduced speed

Please observe the associated instructions for safely reduced speed (www.afag.com)!

6.4.3 Adjusting damping and speeds on pneumatic modules

NOTICE

Risk of damage to property!

Incorrectly set end-position damping can cause damage to the device or the periphery.

- Observe the notes and permissible values.

Setting the speeds on the pneumatic modules

Notes on the setting:

1. The speeds are usually set by the factory to the required cycle time.
2. The set speed can be changed via throttles at the exhaust air outlets on the control block.
3. If your handling system does not have a control block, the speed can also be regulated by exhaust air throttles.

NOTICE

Danger of material damage in case of incorrect valve actuation!

5/3 directional control valves must not be controlled as impulse valves, as the modules start up against an empty volume in case of low leakage. The module is damaged by the high speed and poor damping.

- Do not control the valves as impulse valves!

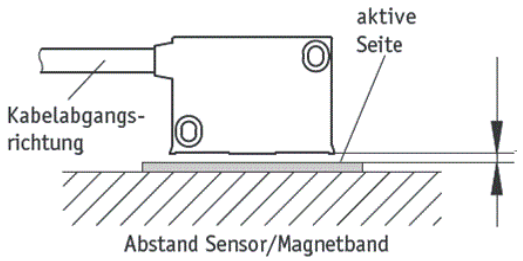
6.4.4 External position measuring system

A) Adjust the distance from the sensor to the belt

Notes on the setting:

1. Mount the sensor parallel to the belt using a feeler gauge.
   - Value for the distance between sensor and belt (see table).

Sensor type	Distance min.	Distance max.	Recommend
MSK1000	0.1mm	0.2mm	0.1mm
MSA501	0.1mm	1.5mm	0.5mm



2. Adjust the distance between the sensor and the belt.
   ⇨ The desired distance is set.

B) Setting the reference point

Setting the reference point is necessary to prevent an index from being detected too early or too late when referencing the axis. This would result in a position shift according to the pole division of the band.

To set the reference point, the distance between the mechanical stop and the index on the magnetic tape must be set to the distance according to the following table:

Sensor type	Distance to be set	Distance min.	Distance max.	Pole division band
MSK1000	0.50mm	0.35mm	0.65	1mm

To set the distance between the mechanical stop and the index on the magnetic tape, proceed as follows:

1. Configure the system as described in the LinMot manual.
   - Set the Home Position to 0 mm.
2. Reference the axis.
3. De-energise the axis by removing the switch ON-bit.
4. Press the axle by hand against the mechanical stop.
5. Adjust the actual position by moving the sensor so that the distance to be set appears with a negative sign.
   - e.g. Home Position = 0 mm -> Actual Position = - 0.5 mm

If the home position is set to a different value, the corresponding offset must be taken into account for all masses:

- e.g. Home Position = 50 mm -> Actual Position = 49.5 mm

If the axis is set to positive Homeing, the distance must be added:

- e.g. Home Position = 500 mm -> Actual Position = 500.5 mm

6. Set new axis reference position.
7. Move the axle to the mechanical end stop so that the current is at maximum.
8. Check setting (e.g. -0.5 mm)
   ⇨ The desired distance is set.

C) Switching distance

The reference sensor of the electrical axes is mounted with a feeler gauge at a distance of 0.1 mm parallel to the switching lug.

7 Fault elimination

7.1 Safety instructions for troubleshooting

DANGER

Danger! Risk of electric shock!

If work on electrical components is required, ensure that the work is carried out properly, failure to do so will cause serious or fatal injuries.

- Work on the machine's electrical equipment may only be performed by skilled electrician or trained personnel under the supervision of a skilled electrician in accordance with all relevant electrical regulations.

WARNING

Danger of injury due to faulty troubleshooting!

Poorly performed troubleshooting work can lead to serious injuries and damage to property.

- Only use trained specialist personnel for troubleshooting.
- All work on the modules must be carried out with the power supply cut off!

WARNING

Risk of injuries due to uncontrolled parts movements!

Signals from the control system can trigger unintentional movements of the EPS, which can cause injury.

- Before starting any work on the EPS, switch off the control unit and secure to prevent it from being switched on.
- Observe the operating instructions of the controller used!

Also observe the safety instructions in ➲ chap. 2 „Safety instructions“ in this manual.

7.2 Fault causes and remedy

In the event of malfunctions that could affect safety, the system must be shut down **immediately** and secured against being switched on again.

The fault must then be eliminated immediately!

8 Maintenance and repair

8.1 General notes

The EPS system is almost maintenance-free. Nevertheless, some maintenance work must be carried out to ensure an optimum operating condition of the EPS.

EPS systems are high-performance devices with very short cycle times. The service life of the units depends mainly on the ambient conditions and maintenance.

It is therefore essential to follow the maintenance instructions for the individual modules!

8.2 Safety instructions for Maintenance and Repair

DANGER

Risk of injury due to electric shock!

If work on electrical components is required, ensure that the work is carried out properly, failure to do so will cause serious or fatal injuries.

- All work on the module must be carried out with the power supply cut off!
- Switch off the power supply and secure it against being switched on again.

DANGER

Risks by the pneumatic system!

If work on electrical components is required, ensure that the work is carried out properly, failure to do so will cause serious or fatal injuries.

- All work on the systems must be carried out with the power supply cut off!
- Switch off the compressed air supply and secure it against being switched on again.

WARNING

Danger of injury due to improper maintenance!

Improperly carried out maintenance activities can cause considerable damage to property and serious injury.

- Only use trained specialist personnel to carry out the activities.
- Always wear personal protective equipment when carrying out maintenance and repair work!

Also observe the safety instructions in ➲ chap. 2 „Safety instructions“ in this manual.

8.3 Maintenance activities and maintenance intervals

- Observe the specified maintenance and care intervals. The intervals refer to a normal operating environment.
- If the system is to be operated in an environment with abrasive dusts or corrosive or aggressive vapours, gases or liquids, the approval of Afag must be obtained in advance.

8.3.1 Overview of the maintenance points

Fig. 26 Maintenance EPS systems (exemplary representation)

No.	Maintenance point	Maintenance work	Interval	System [On/Off]	Remarks
1.	EPS handling system	Cleaning and checking 	As required	[Off]	-
			▪ Clean the servo gripper with a dry, lint-free cloth. - Do not spray the EPS with water, do not use aggressive cleaning agents. - Carry out a visual inspection of the EPS system.		
2.	Pneumatic cylinder weight compensation (if installed)	Check 	As required	[Off]	-
2.	Pneumatic cylinder		▪ If a pneumatic cylinder is used as a weight compensation, check it for leakage once a year.		

8.3.2 Further maintenance

Further maintenance is not required, if the ambient conditions listed below are complied with:

- Clean working area
- No use of splash water
- No abrasion or process dusts
- Environmental conditions as specified in the technical data

8.4 Spare parts

This section lists the spare parts of the standard components. For special assemblies, the order numbers on our delivery note apply.

8.4.1 Motor cable - Designation - Axes - Controller - Application

Designation			Module/axis									Servo control.		Application		
Manufacturer's designation		Afag designation	ES20	SE20	RA-40	PEL20	ES30	SE30	PxL30	PxL40	PxL40-HP	C1xxx	E12xx	Static installation	Dynam. installation	Robot installation
K05-D/R-8	<->	Motor cable-M21-8m-0-0-X	x	x	x	x								**X**		
KS05-D/R-8	<->	Motor cable-M21-8m-0-0-1	x	x	x	x								x	**X**	
KR05-D/R-8	<->	Motor cable-M21-8m-0-0-2	x	x	x	x								x	x	**X**
K05-W/R-8	<->	Motor cable-M20-8m-0-2-X	x	x	x	x							x	**X**		
KS05-W/R-8	<->	Motor cable-M20-8m-0-2-1	x	x	x	x							x	x	**X**	
KR05-W/R-8	<->	Motor cable-M20-8m-0-2-2	x	x	x	x							x	x	x	**X**
K05-Y/R-8	<->	Motor cable-M16-8m-0-1-X	x	x	x	x						x		**X**		
KS05-Y/R-8	<->	Motor cable-M16-8m-0-1-1	x	x	x	x						x		x	**X**	
KR05-Y/R-8	<->	Motor cable-M16-8m-0-1-2	x	x	x	x						x		x	x	**X**
K15-W/C-8	<->	Motor cable-M24-8m-0-2-X					x	x	x	x	X		x	**X**		
KS10-W/C-8	<->	Motor cable-M22-8m-0-2-1					x	x	x	x	x		x	x	**X**	
KR10-W/C-8	<->	Motor cable-M22-8m-0-2-2					x	x	x	x	x		x	x	x	**X**
K15-Y/C-8	<->	Motor cable-M23-8m-0-1-X					x	x	x	x	x	x		**X**		
KS10-Y/C-8	<->	Motor cable-M17-8m-0-1-1					x	x	x	x	x	x		x	**X**	
KR10-Y/C-8	<->	Motor cable-M17-8m-0-1-2					x	x	x	x	x	x		x	x	**X**
KS05-R/R-8	<->	Motor cable extension-M16-8m-0-0-1	x	x	x	x						x	x	**X**	**X**	
KR05-R/R-8	<->	Motor cable extension-M16-8m-0-0-2	x	x	x	x						x	x	x	x	**X**
K15-C/C-8	<->	Motor cable extension-M23-8m-0-0-X					x	x	x	x	x	x	x	**X**		
KS10-C/C-8	<->	Motor cable extension-M17-8m-0-0-1					x	x	x	x	X	x	x	x	**X**	
KR10-C/C-8	<->	Motor cable extension-M17-8m-0-0-2					x	x	x	x	x	x	x	x	x	**X**

Note: **X** = preferred variant; x = application possible

8.4.2 Motor cable

Designation	Article no.
Motor cable-M16-4m-0-1-X	50463073
Motor cable-M16-6m-0-1-X	50463076
Motor cable-M16-8m-0-1-X	50463078
Motor cable-M16-4m-0-1-1	50437168
Motor cable-M16-6m-0-1-1	50437167
Motor cable-M16-8m-0-1-1	50427023
Extension-M16-2m-0-0-1	50450944
Extension-M16-4m-0-0-1	50427026
Extension-M16-6m-0-0-1	50463082
Extension-M16-2m-0-0-2	50463081
Motor cable-M17-4m-0-1-1	50437170
Motor cable-M17-6m-0-1-1	50437169
Motor cable-M17-8m-0-1-1	50427021
Extension-M17-2m-0-0-1	50463084
Extension-M17-4m-0-0-1	50427024
Extension-M17-6m-0-0-1	50463087
Extension-M17-2m-0-0-2	50463085
Extension-M17-4m-0-0-2	50463086
Motor cable-M20-4m-0-2-X	50463088
Motor cable-M20-6m-0-2-X	50463090
Motor cable-M20-8m-0-2-X	50463092
Motor cable-M20-4m-0-2-1	50463089
Motor cable-M20-6m-0-2-1	50463091
Motor cable-M20-8m-0-2-1	50463093
Motor cable-M21-4m-0-0-X	50463094
Motor cable-M21-6m-0-0-X	50463096
Motor cable-M21-8m-0-0-X	50463098
Motor cable-M21-4m-0-0-1	50463095
Motor cable-M21-6m-0-0-1	50463097
Motor cable-M21-8m-0-0-1	50463099
Motor cable-M22-4m-0-2-1	50463100
Motor cable-M22-6m-0-2-1	50463101
Motor cable-M22-8m-0-2-1	50463103
Motor cable-M23-4m-0-1-X	50463104
Motor cable-M23-6m-0-1-X	50463105
Motor cable-M23-8m-0-1-X	50463106
Motor cable-M24-4m-0-2-X	50463107
Motor cable-M24-6m-0-2-X	50463108
Motor cable-M24-8m-0-2-X	50463109

8.4.3 Servo controller

Designation		Article no.
Controller E1250-EC	for EtherCAT	16080243
Controller E1250-PL	for PowerLink	50465787
Controller C1250-SE-XC-1S	For Sercos over EtherCAT	16080409
Controller C1250-SC-XC-1S	for Sercos III	16080417
Controller C1250-PN-XC-1S	for Profinet	16080415
Controller C1250-PL-XC-1S	for PowerLink	16080413
Controller C1250-PD-XC-1S	for Profidrivet	16080763
Controller C1250-LU-XC-1S	for LinUDP	16080741
Controller C1250-IP-XC-1S	for Ethernet IP	16080411
Controller C1250-EC-XC-1S	for EtherCat	16080405
Controller C1200-GP-XC-1S	for General Purpose	16080407
Controller C1150-SE-XC-1S	For Sercos over EtherCAT	16080768
Controller C1150-PN-XC-1S	for Profinet	16080429
Controller C1150-EC-XC-1S	for EtherCat	16080434
Controller C1100-GP-XC-1S	for CANopen	16080432

8.4.4 Position measuring system

Designation	Article no.
External position measuring system ES20 050mm	50427547
External position measuring system ES20 100mm	50427560
External position measuring system ES20 200mm	50427573
External position measuring system ES20 300mm	50427586
External position measuring system ES30 050mm	50429204
External position measuring system ES30 100mm	50429217
External position measuring system ES30 200mm	50429230
External position measuring system ES30 300mm	50429243
External position measuring system ES30 400mm	50429256
External position measuring system ES30 500mm	50429257
External position measuring system ES40 100mm	50470244
External position measuring system ES40 200mm	50470245
External position measuring system ES40 300mm	50470246
External position measuring system ES40 400mm	50470247
External position measuring system ES40 500mm	50470248
External position measuring system PEL20	50472112
External position measuring system PDL30/40	50472113
Encoder cable-G8-10m-0-0-1	50468310
Encoder cable-G18-10m-90-0-1	50468311
Extension-G18-2m-0-0-1	50468312
Extension-G18-5m-0-0-1	50468313
Encoder cable-G19-10m-0-0-1	50468314
Encoder cable-G19-10m-90-0-1	50468315

8.4.5 MagSpring

Designation		Article no.
MagSpring rotor ML01-12x130/80-10	Force 11N/40N for 50 mm stroke	50430383
MagSpring rotor ML01-12x130/80-15	Force 17N/50N for 50 mm stroke	50430384
MagSpring rotor ML01-12x130/80-20	Force 22N/60N for 50 mm stroke	50430385
MagSpring rotor ML01-12x210/160-10	Force 11N/40N for 100 mm stroke	50430386
MagSpring rotor ML01-12x210/160-15	Force 17N/50N for 100 mm stroke	50430387
MagSpring rotor ML01-12x210/160-20	Force 22N/60N for 100 mm stroke	50430388
MagSpring rotor ML01-12x290/240-10	Force 11N/40N for 200 mm stroke	50430389
MagSpring rotor ML01-12x290/240-15	Force 17N/50N for 200 mm stroke	50430390
MagSpring rotor ML01-12x290/240-20	Force 22N/60N for 200 mm stroke	50430391
MagSpring rotor ML01-12x370/320-10	Force 11N/40N for 300 mm stroke	50430392
MagSpring rotor ML01-12x370/320-15	Force 17N/50N for 300 mm stroke	50430393
MagSpring rotor ML01-12x370/320-20	Force 22N/60N for 300 mm stroke	50430395
MagSpring stator MS01-20x60/50	Force 11-22N for 50 mm stroke	50430374
MagSpring stator MS01-20x140/130	Force 11-22N for 100 mm stroke	50430375
MagSpring stator MS01-20x220/210	Force 11-22N for 200 mm stroke	50430376
MagSpring stator MS01-20x300/290	Force 11-22N for 300 mm stroke	50430378
MagSpring stator MS01-37x80/50	Force 40-60N for 50 mm stroke	50430379
MagSpring stator MS01-37x155/125	Force 40-60N for 100 mm stroke	50430380
MagSpring stator MS01-37x230/200	Force 40-60N for 200 mm stroke	50430381
MagSpring stator MS01-37x305/290	Force 40-60N for 300 mm stroke	50430382

9 Decommissioning and disposal

The EPS must be properly dismounted after use and disposed of in an environmentally friendly manner.

9.1 Safety instructions for decommissioning and disposal

WARNING

Risk of injury due to improper decommissioning and disposal!

Improperly carried out activities can result in considerable material damage and serious injury.

- Only use trained specialist personnel to carry out the activities.
- Disconnect the media supply before dismounting the module!
- Only remove the EPS system when the control unit is switched off and secured!

9.2 Decommissioning

If the EPS is not used for a longer period, it must be properly decommissioned and stored as described in chapter 4.4.

9.3 Disposal

The EPS system must be disposed of properly at the end of their service life and the raw materials used must be recycled. Observe the legal regulations and company requirements.

The EPS system must not be disposed of as a complete unit. Dismantle the EPS system and separate the various components according to type of material and dispose of them properly: Information on proper disposal can be obtained from the responsible local authorities.

NOTICE

Risk to the environment due to incorrect disposal of the packaging material of the EPS!

Environmental damage can be caused by improper disposal of the EPS.

- Products that are predominantly made of metal (axles, modules, adapter plates, etc.) must be disposed of according to national law for metal recycling
- Electronic products (regulators, controllers, etc.) must be disposed of in accordance with national legislation on electronic waste.
- Electronic parts, electrical scrap, auxiliary and operating materials must be disposed of by approved specialist companies.

10 Declaration of incorporation

Declaration of incorporation

for partly completed machinery according to the Machinery Directive 2006/42/EC, Annex II, 1.B

The manufacturer hereby declares:

Afag Engineering GmbH, Gewerbestraße 11, DE-78739 Hardt

that the partly completed machine:

Product description	EPS systems
Type:	EPS mini YZ, EPS midi YZ, EPS maxi YZ, EPS giga YZ, EPS tera YZ, EPS mini XZ, EPS midi XZ, EPS maxi XZ, EPS mini XYZ, EPS midi XYZ, EPS maxi XYZ, EPS mini gantry XXYZ, EPS midi gantry XXYZ, EPS maxi gantry XXYZ, EPS mini gantry s, EPS midi gantry s, EPS maxi gantry s, EPS mini gantry h, EPS midi gantry h, EPS maxi gantry s

complies with the following essential health and safety requirements of the Machinery Directive 2006/42/EC at the time of declaration: 1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.4 und 1.5.1.

Harmonised standards applied, in particular:	
2014/30/EU	Electromagnetic Compatibility Directive (EMC)
2014/35/EU	Low Voltage Directive (LVD)
EN ISO 12100:2010	Safety of machinery - General design principles - Risk assessment and risk reduction.
DIN EN 60204-1:2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements

Note: The partly completed machinery must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of Machinery Directive 2006/42/EC.

The manufacturer undertakes to transmit, in response to a reasoned request by the national authorities, relevant technical documentation for the partly completed machinery. The relevant technical documentation was created according to Annex VII, Part B of the above-mentioned Directive.

Authorised representative for compiling the technical documentation:
Walter Kunz, Afag Engineering GmbH, Gewerbestraße 11, DE-78739 Hardt

Place/Date: Hardt, 15.06.2021
Walter Kunz

Managing Director
Afag Engineering GmbH

Index

A

Axes and channels 100

D

Decommissioning 106
Disposal 106

E

Explanation of symbols 7

F

Foreseeable misuse 10

G

Glossary of terms and list of abbreviations 9

I

Instructions 8

O

Obligations and liability 11
Obligations of the operating company 11
Obligations of the personnel 12
Operation 99
Operator 12

P

Packaging 77
Personal protective equipment (PPE) 13
Personnel qualifications 12
Personnel requirements 12
Protective clothing 13
Protective gloves 13

Q

Qualified electrician 12
Qualified personnel 12

R

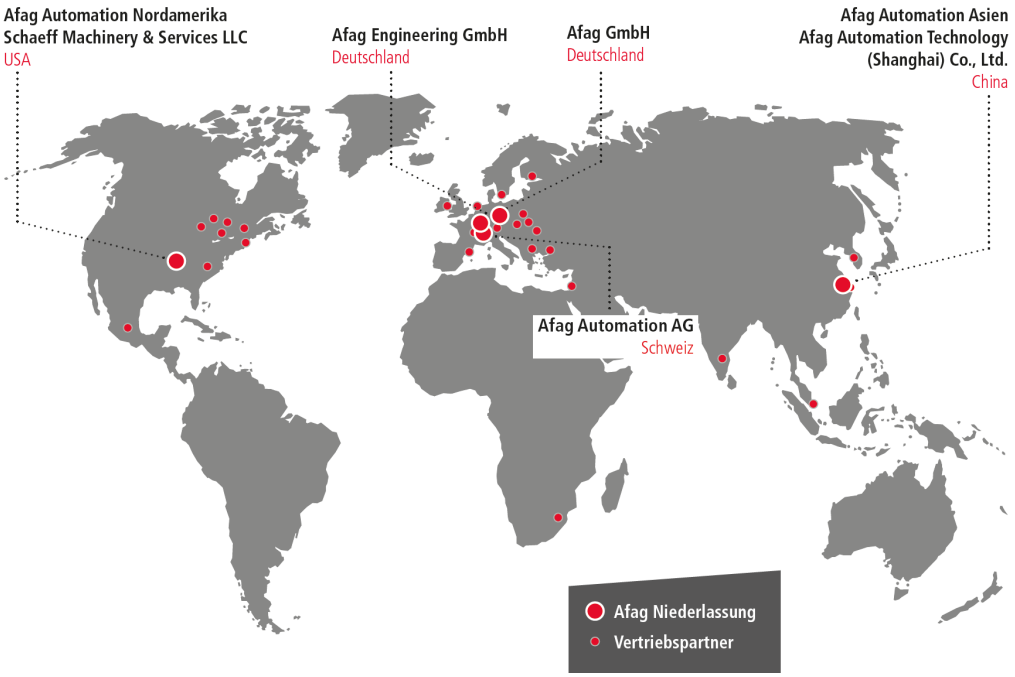
Residual risks 14

S

Safety instructions 10, 100
Safety shoes 13
Storage 78
System error 99

List of figures

Fig. 1 Dimensioned drawing EPS mini YZ 16
Fig. 2 Dimensioned drawing EPS midi YZ 19
Fig. 3 Dimensioned drawing EPS maxi YZ 22
Fig. 4 Dimensioned drawing EPS giga YZ 25
Fig. 5 Dimensioned drawing EPS tera YZ 28
Fig. 6 Dimensioned drawing EPS mini XZ 31
Fig. 7 Dimensioned drawing EPS midi XZ 34
Fig. 8 Dimensioned drawing EPS maxi XZ 37
Fig. 9 Dimensioned drawing EPS mini XYZ 40
Fig. 10 Dimensioned drawing EPS midi XYZ 43
Fig. 11 Dimensioned drawing EPS maxi XYZ 46
Fig. 12 Dimensioned drawing EPS mini gantry XXYZ 49
Fig. 13 Dimensioned drawing EPS midi gantry XXYZ 52
Fig. 14 Dimensioned drawing EPS maxi gantry XXYZ 55
Fig. 15 Dimensioned drawing EPS mini gantry s 58
Fig. 16 Dimensioned drawing EPS midi gantry s 61
Fig. 17 Dimensioned drawing EPS maxi gantry s 64
Fig. 18 Dimensioned drawing EPS mini gantry h 67
Fig. 19 Dimensioned drawing EPS midi gantry h 70
Fig. 20 Dimensioned drawing EPS maxi gantry h 73
Fig. 21 Power supplies 76
Fig. 22 Normal installation position - Inverted installation position 81
Fig. 23 Axis controller C11xx 82
Fig. 24 Axis controller C12xx 84
Fig. 25 Axis controller E12xx 86
Fig. 26 Maintenance EPS systems (exemplary representation) 101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