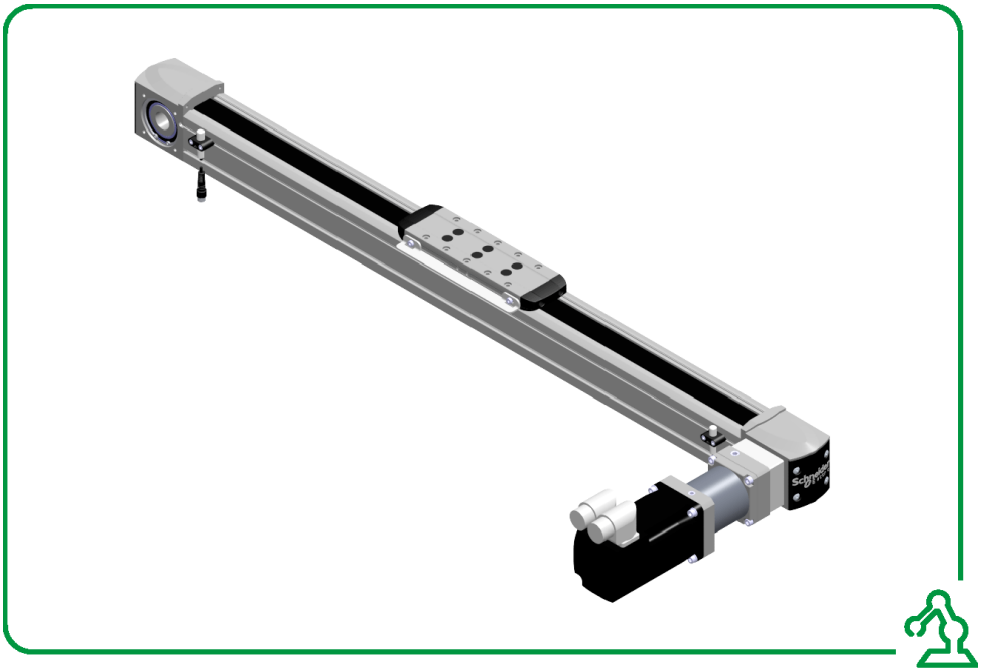
Lexium PAS4•B-Series

Portal Axes with Internal Guide and Toothed Belt Hardware Guide

(Original Document)

12/2018



EIO0000003627.00

www.schneider-electric.com

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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Safety Information

Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

At a Glance

Document Scope

This manual is to help you use the capabilities of the axis safely and properly.

Follow the instructions within this manual to help:

- Reduce risks
- Reduce repair costs and downtime of the axis
- Increase the service life of the axis
- Increase reliability of the axis

Validity Note

The technical characteristics of the devices described in the present document also appear online. To access the information online:

Step	Action
1	Go to the Schneider Electric home page *www.schneider-electric.com*.
2	In the **Search** box type the reference of a product or the name of a product range. ● Do not include blank spaces in the reference or product range. ● To get information on grouping similar modules, use asterisks (*).
3	If you entered a reference, go to the **Product Datasheets** search results and click on the reference that interests you. If you entered the name of a product range, go to the **Product Ranges** search results and click on the product range that interests you.
4	If more than one reference appears in the **Products** search results, click on the reference that interests you.
5	Depending on the size of your screen, you may need to scroll down to see the data sheet.
6	To save or print a data sheet as a .pdf file, click **Download XXX product datasheet**.

The characteristics that are presented in the present document should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the document and online information, use the online information as your reference.

For product compliance and environmental information (RoHS, REACH, PEP, EOLI, etc.), go to *www.schneider-electric.com/green-premium*.

Product Related Information

The equipment described herein must be used in accordance with the application-specific risk analysis that you are to perform along with verification of all applicable standards. Pay attention in conforming to any safety information, different electrical requirements, and normative standards that would apply to your application of the information contained in the present manual and the manuals for associated equipment.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires.
- Place a "Do Not Turn On" or equivalent hazard label on all power switches and lock them in the non-energized position.
- Wait 15 minutes to allow the residual energy of the DC bus capacitors to discharge.
- Measure the voltage on the DC bus with a properly rated voltage sensing device and verify that the voltage is less than 42.4 Vdc.
- Do not assume that the DC bus is voltage-free when the DC bus LED is off.
- Block the carriage to prevent rotation prior to performing any type of work on the drive system.
- Do not create a short-circuit across the DC bus terminals or the DC bus capacitors.
- Replace and secure all covers, accessories, hardware, cables, and wires and confirm that a proper ground connection exists before applying power to the unit.
- Use only the specified voltage when operating this equipment and any associated products.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Perform a hazard and risk analysis to determine the appropriate safety integrity level, and any other safety requirements, for your specific application based on all the applicable standards.
- Ensure that the hazard and risk analysis is conducted and respected according to EN/ISO 12100 during the design of your machine.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop, power outage and restart.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines.[1]
- Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(1) for additional information, refer to NEMA ICS 1.1 (latest edition), “Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control” and to NEMA ICS 7.1 (latest edition), “Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable Speed Drive Systems” or their equivalent governing your particular location.

Terminology Derived from Standards

The technical terms, terminology, symbols and the corresponding descriptions in this manual, or that appear in or on the products themselves, are generally derived from the terms or definitions of international standards.

In the area of functional safety systems, drives and general automation, this may include, but is not limited to, terms such as *safety*, *safety function*, *safe state*, *fault*, *fault reset*, *malfunction*, *failure*, *error*, *error message*, *dangerous*, etc.

Among others, these standards include:

Standard	Description
IEC 61131-2:2007	Programmable controllers, part 2: Equipment requirements and tests.
ISO 13849-1:2015	Safety of machinery: Safety related parts of control systems. General principles for design.
EN 61496-1:2013	Safety of machinery: Electro-sensitive protective equipment. Part 1: General requirements and tests.
ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 60204-1:2006	Safety of machinery - Electrical equipment of machines - Part 1: General requirements

Standard	Description
ISO 14119:2013	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection
ISO 13850:2015	Safety of machinery - Emergency stop - Principles for design
IEC 62061:2005	Safety of machinery - Functional safety of safety-related electrical, electronic, and electronic programmable control systems
IEC 61508-1:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: General requirements.
IEC 61508-2:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: Requirements for electrical/electronic/programmable electronic safety-related systems.
IEC 61508-3:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: Software requirements.
IEC 61784-3:2016	Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses - General rules and profile definitions.
2006/42/EC	Machinery Directive
2014/30/EU	Electromagnetic Compatibility Directive
2014/35/EU	Low Voltage Directive

In addition, terms used in the present document may tangentially be used as they are derived from other standards such as:

Standard	Description
IEC 60034 series	Rotating electrical machines
IEC 61800 series	Adjustable speed electrical power drive systems
IEC 61158 series	Digital data communications for measurement and control – Fieldbus for use in industrial control systems

Finally, the term *zone of operation* may be used in conjunction with the description of specific hazards, and is defined as it is for a *hazard zone* or *danger zone* in the *Machinery Directive* (*2006/42/EC*) and *ISO 12100:2010*.

NOTE: The aforementioned standards may or may not apply to the specific products cited in the present documentation. For more information concerning the individual standards applicable to the products described herein, see the characteristics tables for those product references.

Figures

Unless otherwise stated, the different sizes of the Lexium PAS4•B-Series are represented in the figures by the Lexium PAS42BB axis.

Dual Dimensions

Dimensions are indicated in metric system and U.S. customary units system. The U.S. dimensions are given in parentheses, for example 8.4 mm (0.33 in).

NOTE: The given values in parentheses are rounded and for reference only.

Chapter 1
Specific Safety Information

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Proper Use	16
Qualification of Personnel	19
Residual Risks	20

Proper Use

Overview

This section contains information regarding the operation of the Lexium PAS4•B-Series. Qualified personnel *(see page 19)* working with the axis must read and observe this information. The axis was built in compliance with the recognized technical safety regulations.

Installation

The axis is intended to be installed in a machine or assembled with other components to build up a machine or system.

Provide for Protective Measures

Before installing the axis, provide appropriate protective devices in compliance with local and national standards. Do not commission components without appropriate protective devices. After installation, commissioning, or repair, test the protective devices used.

Perform a risk evaluation concerning the specific use before operating the axis and take appropriate security measures.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Ensure that a risk assessment is conducted and respected according to EN/ISO 12100 during the design of your machine.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

If circumstances occur that affect the safety or cause changes to the operating behavior of the axis, then immediately shut down the axis and contact your local Schneider Electric service representative.

Use Original Equipment Only

Use only the accessories and mounting parts specified in the documentation and only third-party devices or components that have been expressly approved by Schneider Electric. Only modify the axis in the manner intended and described in this documentation, and other documentation concerning any other associated equipment.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Only use software and hardware components approved by Schneider Electric for use with this equipment.
- Update your application program every time you change the physical hardware configuration.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Misuse

The axis is not suitable for the manipulation of living organisms or explosive materials, nor is it suitable for impact movement.

Incompatible Environments

The components must not be used in the following environments:

- Hazardous (explosive) atmospheres
- Mobile, movable, or floating systems
- Life support systems
- Domestic appliances
- Underground
- Highly saline environments (refer to *Technical Data* *(see page 41)* for materials used)
- Environments with increased radioactive radiation
- Wash-down areas (food or pharmaceutical industry)
- High-hygienic areas
- Oily surroundings (only if optional a cover strip is used)
- Vacuum

This equipment has been designed to operate outside of any hazardous location. Only install this equipment in zones known to be free of a hazardous atmosphere.

⚠ DANGER

POTENTIAL FOR EXPLOSION

Install and use this equipment in non-hazardous locations only.

Failure to follow these instructions will result in death or serious injury.

Installation and Operating Conditions

Only use the components in accordance with the installation and operating conditions described in this documentation. The operating conditions at the installation location must be inspected and maintained in accordance with the required technical data (performance data and ambient conditions). Commissioning is prohibited until the usable machine or system in which the axis is installed is in accordance to the applicable local regulations and standards.

Service Life

The forces and torques (Fy, Fz, Mx, Mz, My) are calculated for an expected service life of 30,000 km (18,641 mi). This period

- shortens with increasing load and dynamic or
- extends with decreasing load and dynamic.

For an application-specific calculation of the service life of the axis, refer to *Service Life* *(see page 103)*.

Compatibility with Foreign Substances

The axis has been tested for compatibility with foreign substances according to the latest knowledge. However, it is impossible to follow up on all further developments of all substances such as lubricants, cleaning agents, or solvents. Therefore, you must perform a compatibility test before using new substances.

The magnetic strips for fastening the cover strips (optional equipment) are glued. The glue is not completely resistant to environments containing oil or solvents.

NOTICE
INOPERABLE EQUIPMENT Perform tests to verify if the cover strip is appropriate for the respective environment before installing axes with cover strip in environments containing oil or solvents. **Failure to follow these instructions can result in equipment damage.**

Qualification of Personnel

Target Audience for This Manual

This documentation is intended for users having the following knowledge:

- Advanced knowledge in mechanical engineering
- Advanced knowledge in electrical engineering
- Qualified person
- System engineer
- Knowledge of the axis control system, its installation and operation, as well as the construction of the machine/application in which it is intended

Qualified Person

Electrical and mechanical equipment must be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and the installation, and has received safety training to recognize and avoid the hazards involved.

The qualified personnel must be able to detect possible hazards that may arise from parametrization, changing parameter values and generally from mechanical, electrical, or electronic equipment. The qualified personnel must be familiar with the standards, provisions, and regulations for the prevention of industrial accidents, which they must observe when working on the drive system.

Residual Risks

Overview

Risks arising from the axis have been reduced. However a residual risk remains since the axis is moved and operated with electrical voltage and electrical currents.

If activities involve residual risks, a safety message is made at the appropriate points. This includes potential hazards that may arise, their possible consequences, and describes preventive measures to avoid the hazards.

Electrical Parts

To operate the equipment described herein automated, you must necessarily have a drive and motor connected. As a system, residual risks exist and you must account for them in your risk analysis of your application. For more information, consult your drive and motor documentation.

⚠ ⚠ DANGER

ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires except under the specific conditions specified in the appropriate hardware guide for this equipment.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Operate electrical components only with a connected protective ground (earth) cable.
- After the installation, verify the secure connection of the protective ground (earth) cable to all electrical devices to ensure that connection complies with the connection diagram.
- Before enabling the device, cover the live components to prevent contact.
- Do not touch the electrical connection points of the components when the module is energized.
- Provide protection against indirect contact (EN 50178).
- Insulate the unused conductors on both ends of the motor cable.

Failure to follow these instructions will result in death or serious injury.

Emergency Stop

The axis mechanics are not supplied with external brakes nor an emergency stop switch to engage any external brakes. However, the optional motor can be supplied with an internal holding brake (depending on the motor reference).

For more information about the motor, note the motor reference on the type plate and refer to the corresponding motor manual.

⚠ WARNING

ENTRAPMENT BY AXIS MECHANICS

- Provide means for ensuring that the motors can be put into a voltage-free state with any internal holding brake or external service brake released.
- Make available those means such that the axis mechanics can be manually moved by a single person within reach of the zone of operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The opening of the motor holding brakes may cause the axis to sag.

⚠ WARNING

SAGGING OF THE AXIS

Ensure that release of the motor brakes poses no additional risks in the zone of operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Mounted in vertical or tilted position, the axis can move unexpectedly.

⚠ WARNING

MOVING PARTS OF THE AXIS

Ensure that releasing the brake poses no additional risks in the zone of operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: Provide separation devices for all infeed energies. It must be possible to secure the separation devices in de-energized position, for example, by locking.

Electrical Parts

To operate the equipment described herein automated, you must necessarily have a drive and motor connected. As a system, residual risks exist and you must account for them in your risk analysis of your application. For more information, consult your drive and motor documentation.

⚠⚠ DANGER

ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires except under the specific conditions specified in the appropriate hardware guide for this equipment.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Operate electrical components only with a connected protective ground (earth) cable.
- After the installation, verify the secure connection of the protective ground (earth) cable to all electrical devices to ensure that connection complies with the connection diagram.
- Before enabling the device, cover the live components to prevent contact.
- Do not touch the electrical connection points of the components when the module is energized.
- Provide protection against indirect contact (EN 50178).
- Insulate the unused conductors on both ends of the motor cable.

Failure to follow these instructions will result in death or serious injury.

Assembly and Handling

⚠ WARNING

CRUSHING, SHEARING, CUTTING AND HITTING DURING HANDLING

- Observe the general construction and safety regulations for handling and assembly.
- Use appropriate mounting and transport equipment and use appropriate tools.
- Prevent clamping and crushing by taking appropriate precautions.
- Cover edges and angles to protect against cutting damage.
- Wear suitable protective clothing (for example, protective goggles, protective boots, protective gloves).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Axis Motion

Parts of the mechanics can move at high speeds. In such cases, the payload weight, additionally installed tools, and shifts in the center of gravity of the moving parts contribute to the total energy of the forces generated.

Motion sequences can occur when operating with axis mechanics, which allow operational staff to make misjudgments. For safety considerations (according to EN ISO 13849-1), consider the controller and the brakes as non-safety-related elements. Ensure that necessary protective measures are implemented.

The safety standards and directives for the respective country where the equipment is in use define which protective measures are appropriate. Additionally, the system engineer who is responsible for the integration of the axis mechanics must evaluate which measures have to be taken.

NOTE: The configuration of the axis mechanics, the Tool Center Point (TCP) velocity, as well as the additional payload have an effect on the total energy, which can potentially be a source of damage and injury.

⚠ WARNING

CRUSHING, SHEARING, CUTTING AND IMPACT INJURY

- The axis must be operated only within an enclosure.
- Open or enter the enclosure for cleaning and maintenance purposes only.
- Design the enclosure such that it withstands an impact by the axis and that it resists ejected parts from escaping the zone of operation.
- Design the enclosure such that the axis is safely deactivated as soon as a person enters the zone of operation of the axis.
- All barriers, protective doors, contact mats, light barriers, and so on, must be configured correctly and enabled whenever the axis mechanics are under power.
- Define the clearance distance to the zone of operation of the axis such that operational staff do not have access to, nor can be enclosed in, the axis mechanics zone of operation.
- Design the enclosure to account for the maximum possible travel paths of the axis; that is, the maximum path until the hardware safety system limits as well as the additional run-on paths, in case of a power interruption.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

BREAKDOWN OF THE INTERNAL MOTOR HOLDING BRAKE

- Do not consider the internal motor holding brake to be a functional safety device.
- Take into account a possible breakdown of the internal motor holding brake during your safety analysis.
- Take into account that the internal motor holding brake of the axis only withstands a limited number of brake operations.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

LEAVING THE PLANNED TRAJECTORY OF THE AXIS MECHANICS

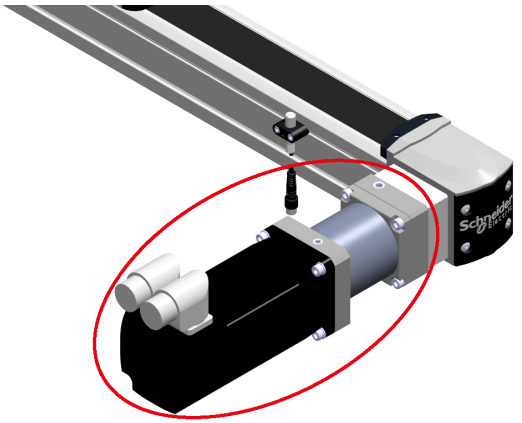
- Use the buffering of the 24 Vdc supply (UPS) in order to enable a controlled stop of the mechanics in accordance with stop category 1 by making use of the stored residual mechanical and electrical energy.
- If the power supply of the control system fails, the axis mechanics leave the planned trajectory in an uncontrolled manner whether the motor has a brake or not.
- Ideally use a synchronous stop on the path to avoid collisions with obstacles.
- Observe the extension of the run-on path during the safety considerations.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Hot Surfaces

The motor, gearbox, and adaptation materials of the axis may exceed 70 °C (158 °F).

The following graphic presents the hot surfaces on the axis.



⚠ WARNING

HOT SURFACES

- Avoid unprotected contact with hot surfaces.
- Do not allow flammable or heat-sensitive parts in the immediate vicinity of hot surfaces.
- Verify that the heat dissipation is sufficient by performing a test run under maximum load conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Noise Protection

The noise level of the mechanics depends on the basic cycle and the payload, as well as on further application-specific accessory parts. Be aware of the fact that noise emissions multiply when several mechanics are in use at the same time. If noise emissions reach a value of more than 70 dBA, wear ear protectors.

⚠ CAUTION

NOISE EMISSIONS OF THE AXIS MECHANICS

- Wear ear protectors in accordance with the locally applicable regulations.
- Attach a sign on the axis mechanics if the noise emissions reach an excessive value.

Failure to follow these instructions can result in injury or equipment damage.

NOTE: Attach the following symbol where it can easily be seen on the axis mechanics.



Emissions

Some small amount of grease emissions are to be expected over time. However, excessive grease emissions on or at the gearbox may be an indication of a damaged axis.

NOTICE

INOPERABLE EQUIPMENT INDICATED BY GEARBOX GREASE EMISSIONS

- Verify the mechanics before, during, and after use.
- Shut down the mechanics immediately if grease emissions appear on the axis mechanics.

Failure to follow these instructions can result in equipment damage.

Hazardous Movements

There can be different sources of hazardous movements:

- No, or incorrect, calibration of the drive
- Wiring or cabling errors
- Errors in the application program

- Component errors
- Error in the measured value and signal transmitter

NOTE: Provide for personal safety by primary equipment monitoring or measures. Do not rely only on the internal monitoring of the drive components. Adapt the monitoring or other arrangements and measures to the specific conditions of the installation in accordance with a hazard and risk analysis.

⚠ DANGER

UNAVAILABLE OR INADEQUATE PROTECTION DEVICE(S)

- Prevent entry to a zone of operation with, for example, protective fencing, mesh guards, protective coverings, or light barriers.
- Dimension the protective devices properly and do not remove or modify them.
- Do not make any modifications that can degrade, incapacitate, or in any way invalidate protection devices.
- Bring the drives and the motors they control to a stop before accessing the drives or entering the zone of operation.
- Protect existing workstations and operating terminals against unauthorized operation.
- Position emergency stop switches so that they are easily accessible and can be reached quickly.
- Validate the functionality of emergency stop equipment before start-up and during maintenance periods.
- Prevent unintentional start-up by disconnecting the power connection of the drives using the emergency stop circuit or using an appropriate lock-out tag-out sequence.
- Validate the system and installation before the initial start-up.
- Avoid operating high-frequency, remote control, and radio devices close to the system electronics and their feed lines.
- Perform, if necessary, a special electromagnetic compatibility (EMC) verification of the system.

Failure to follow these instructions will result in death or serious injury.

Drive systems may perform unanticipated movements because of incorrect wiring, incorrect settings, incorrect data, or other errors.

⚠ WARNING

UNINTENDED MOVEMENT OR MACHINE OPERATION

- Carefully install the wiring in accordance with EMC standards.
- Do not operate the axis with undetermined settings and data.
- Perform comprehensive commissioning tests that include verification of configuration settings and data that determine position and movement.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Hanging Loads

The axis is capable of suspending heavy loads.

⚠ WARNING

FALLING LOADS

Keep hands and feet from under loads that are suspended.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Attachments or Modifications

If different products are transported by the axis mechanics, then the product pickup must be consequently modified. For this reason, it is possible to build different product pickups (tool mounting) onto the carriage. In doing so, ensure that the articulation movement is not restricted and/or that no motion errors can result from the modifications. Attachments and rebuilds may not influence the operation of the protective devices in any way and all EMERGENCY STOP buttons must be accessible and operational all the time.

⚠ WARNING

UNINTENDED MACHINE OPERATION

- Do not drill into or modify the axis.
- Do not modify cable set.
- Do not modify components of movable mechanics.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Options for Moving the Axis Without Drive Energy

The axis mechanics are not equipped with an enclosure (see UL 1740).

NOTE: Take appropriate security measures concerning the specific use before operating the axis.

⚠ WARNING

SAGGING OF THE AXIS

Ensure that release of the motor brakes poses no additional risks in the zone of operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

If you have to move the complete carriage manually, perform the following steps:

Step	Action
1	Put the axis into a torque-free state.

Step	Action
2	Manually hold the carriage in position.
3	Open the motor brakes. **NOTE:** The function for opening the brakes as well as for torque-free switching of the motors is not included within the scope of supply. Implement the same as a component part of the design of the electrical equipment.
4	Manually move the carriage. **NOTE:** A greater force could be necessary because the motor and gearbox may pose resistance to movement.
5	Close the brakes.

Chapter 2
System Overview

What Is in This Chapter?

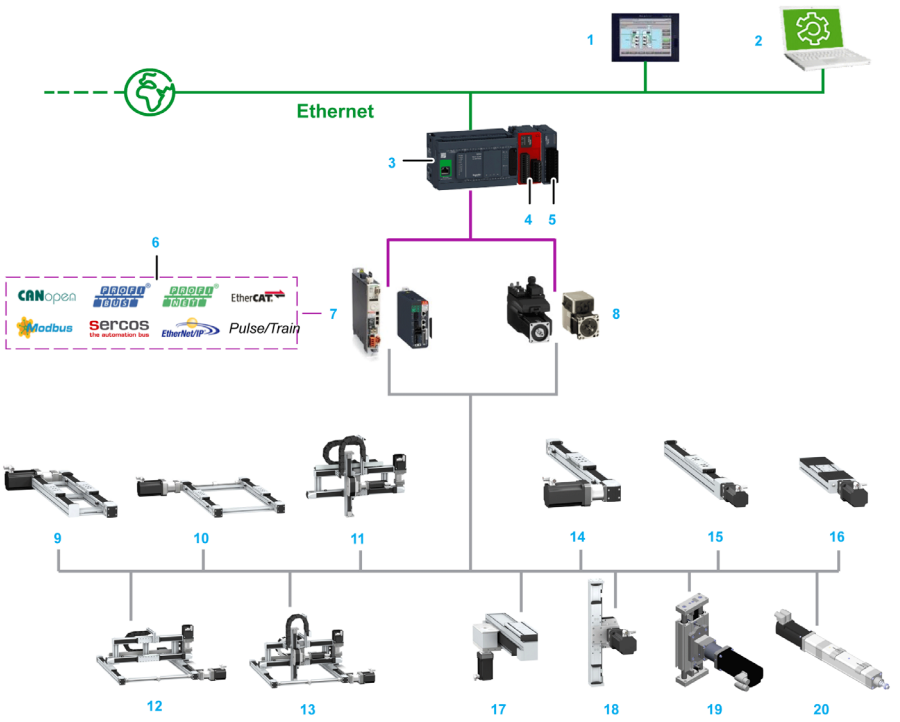
This chapter contains the following topics:

Topic	Page
System Architecture	30
Product Overview of Lexium PAS4•B-Series	32
Type Code for Lexium PAS4•B-Series	35
Type Plate	39

System Architecture

Overview

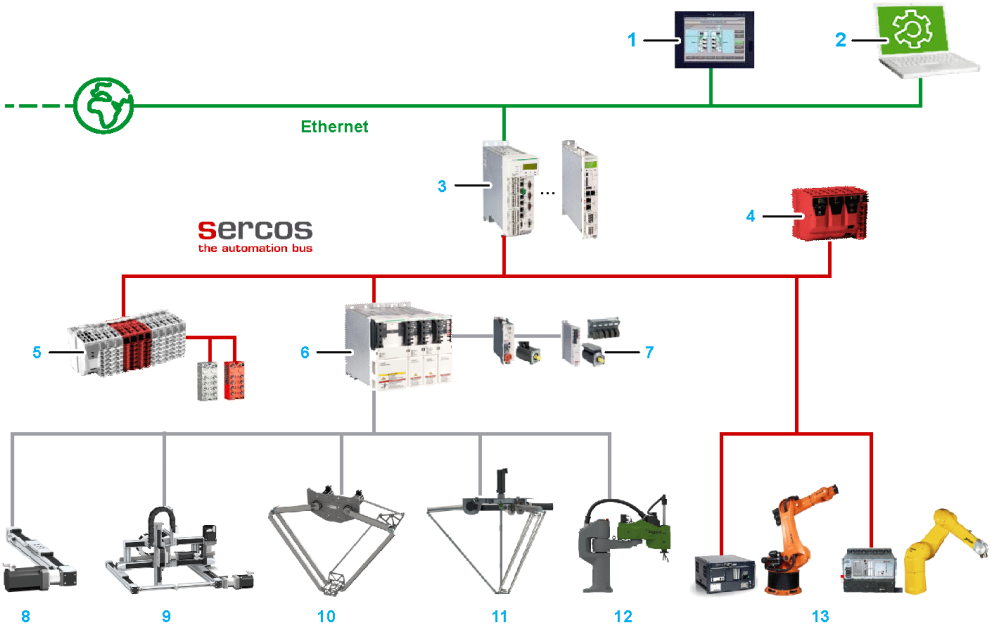
The control system consists of several components, depending on its application. The following graphic presents an example of a control system.



1 Magelis HMI
2 SoMachine Motion / EcoStruxure Machine Expert
3 Logic/Motion Controller
4 Safety Module
5 I/O Module
6 Communication interfaces
7 Drives
8 Integrated Drives
9 Lexium MAXH-Series
10 Lexium MAXS-Series
11 Lexium MAXP-Series
12 Lexium MAXR•2-Series
13 Lexium MAXR•3-Series
14 Lexium PAS4•B-Series
15 Lexium PAS4•S-Series
16 Lexium TAS4-Series
17 Lexium CAS2-Series
18 Lexium CAS4-Series
19 Lexium CAR4-Series
20 Lexium EAC1-Series

For more information about the several components, refer to the corresponding documentation at www.schneider-electric.com.

The following graphic presents an example of a PacDrive 3 system.



1 Magelis HMI
2 SoMachine Motion / EcoStruxure Machine Expert
3 Motion Controller
4 Safety Controller
5 I/O
6 Drives
7 Motors
8 Single Axes (PAS, TAS, CAS, CAR, EAC)
9 Multi-Axis Systems (MAXH, MAXS, MAXP, MAXR)
10 Delta-2 Robots (T-Series)
11 Delta-3 Robots (P-Series)
12 SCARA Robots (S-Series)
13 Articulated Robots

For more information about the several components, refer to the corresponding documentation at www.schneider-electric.com.

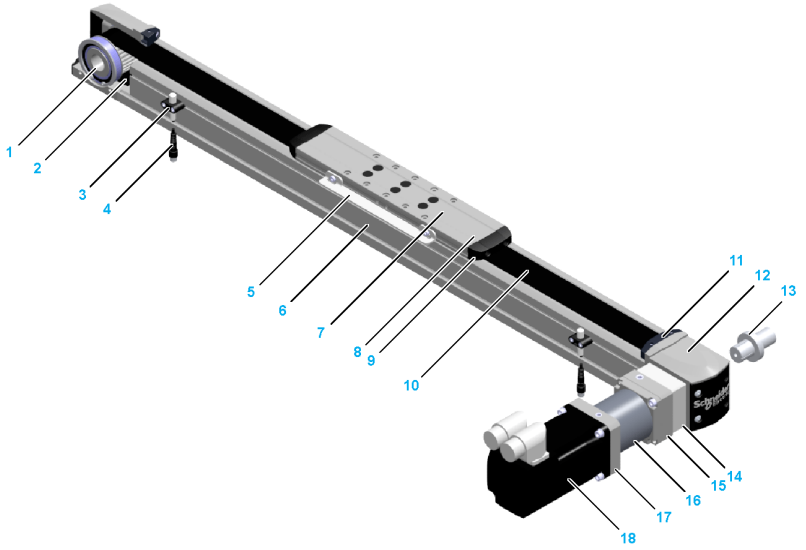
Product Overview of Lexium PAS4•B-Series

General Description of the Lexium PAS4•B-Series

The Lexium PAS4•B-Series is a portal axis which can operate forward and backward in one dimension. The axis is based on an axis body and a toothed belt driven carriage. It can be equipped with up to three carriages for moving multiple or long loads.

Depending on the size of the particular axis, the Lexium PAS4•B-Series is equipped with a roller guide or with a recirculating ball bearing guide.

Components Overview



1 Toothed belt pulley
2 Toothed belt
3 Sensor holder (optional equipment)
4 Sensor with cable and connector (optional equipment)
5 Contact plate (optional equipment)
6 Axis body
7 Carriage
8 Strip deflector (optional equipment)
9 Rubber buffer
10 Cover strip (optional equipment)
11 Cover strip clamp (optional equipment)
12 End block
13 Shaft extension (optional equipment)
14 Coupling housing including coupling (optional equipment)
15 Gearbox adaptation (optional equipment)
16 Gearbox (optional equipment)
17 Motor adaptation (optional equipment)
18 Motor (optional equipment)

Characteristics of Lexium PAS4•B-Series

The axis provides the following features and options:

- Different stroke lengths are available per mm.
- Mounting threads with counterbores for locating dowels at the carriage for reproducible mounting of the payload.
- Grease nipples at the side of the carriage for external lubrication.
- Easy integration into systems and machines due to axis bodies with T-slots.
- Sensors adjustable in T-slots.
- Motor mounting via compact coupling system.
- The cover strip and the wiper in the carriage further help to keep pollution, chips, dust, and foreign objects away from the linear guide inside the axis.
- Motor mounting possible at four sides, can be changed at any later point in time.
- Options
  - Antistatic toothed belt
  - Increased corrosion resistance *(see page 44)*
  - Cover strip and wiper in the carriage
  - Distribution of the payload to up to three carriages
  - Carriage available in various lengths
  - Sensors as normally open contacts / normally closed contacts and NPN/PNP version
  - Different motors and gearboxes

Types of Mechanical Drive Elements

All sizes of the Lexium PAS4•B-Series are available with a toothed belt (Lexium PAS4•B-Series) or without a drive for use as support axis (Lexium PAS4•H versions). For a detailed name description of the Lexium PAS4•B-Series, refer to *Type Code* *(see page 35)*.

Types of Linear Guides

Two elements to guide the carriage are available for the Lexium PAS4•B-Series. The following table presents the particular axis and the corresponding type of linear guide. For a detailed name description of the Lexium PAS4•B-Series, refer to *Type Code* *(see page 35)*.

Roller Guide	Recirculating Ball Bearing Guide
Lexium PAS41BR	–
Lexium PAS41HR	–
Lexium PAS42BR	Lexium PAS42BB
Lexium PAS42HR	Lexium PAS42HB
Lexium PAS43BR	Lexium PAS43BB
Lexium PAS43HR	Lexium PAS43HB
–	Lexium PAS44BB
–	Lexium PAS44HB

Mounting Options for Motor and/or Gearbox

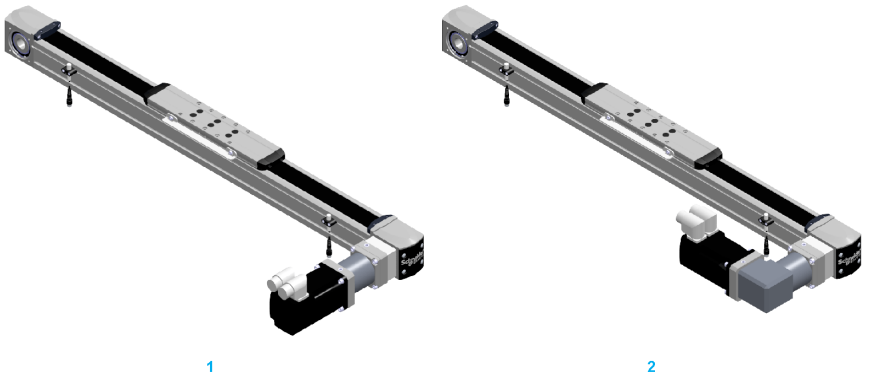
The following graphic presents the mounting options for motor and/or gearbox for the Lexium PAS4•B-Series.



1 With mounted motor and/or gearbox on right-hand side
2 With mounted motor and/or gearbox on left-hand side
3 Without mounted motor or gearbox (hollow shaft at both ends)
4 Support axis (without drive facility)

Mounting Direction for Motor and Gearbox

The following graphic presents the possible mounting positions of the motor and gearbox combinations. The motor or the gearbox is coupled by using a preloaded elastomer coupling.



1 Straight mounted
2 Mounted with angle gearbox, rotatable 4 x 90°

Type Code for Lexium PAS4•B-Series

Overview

To find your appropriate axis information, refer to the type plate *(see page 39)* located on the axis.

	Type				Size	Characteristics													
Digit:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Example:	P	A	S	4	2	B	B	M	1	0	0	0	A	1	B	A	X	X	X	L

Product designation
PA Portal axis

Variant
S Single

Model range
4 Series 4

Size (axis body cross-section)
1 40 x 40 mm (1.57 x 1.57 in)
2 60 x 60 mm (2.36 x 2.36 in)
3 80 x 80 mm (3.15 x 3.15 in)
4 110 x 110 mm (4.3 x 4.3 in)

Type of mechanical drive element
B Toothed belt
H Support axis (without drive)

Type of guide
B Recirculating ball bearing guide (for size 2, 3, 4)
R Roller guide (for size 1, 2, 3)

Feed per revolution
M 84 mm/rev (3.3 in/rev) (for size 1)
M 155 mm/rev (6.1 in/rev) (for size 2)
M 205 mm/rev (8 in/rev) (for size 3)
M 264 mm/rev (10.4 in/rev) (for size 4)
N Support axis (without drive)

Stroke(1)
•••• State the length in mm

Sensors(2)
A Two PNP sensors as normally closed contacts, not connected
C Two PNP sensors as normally open contacts, not connected
E Two NPN sensors as normally closed contacts, not connected
G Two NPN sensors as normally open contacts, not connected
N Without sensors, without contact plate

Type of carriage (all driven)
1 Type 1 (only for size 2, 3, 4)
2 Type 2
4 Type 4

Axis options
A Antistatic toothed belt, without cover strip
L Antistatic toothed belt, with cover strip
B With cover strip
C Increased corrosion resistance, without cover strip
E Increased corrosion resistance, antistatic toothed belt, without cover strip
N Without options

Quantity of carriages(3)
A One carriage
B Two carriages
C Three carriages

Distance between two carriages(4)
••• State the distance in mm
XXX One carriage only

Mounting options for motor and/or gearbox(5)
H Without mounted motor or gearbox (hollow shaft at both ends)
R With mounted motor and/or gearbox fixed on right-hand side
L With mounted motor and/or gearbox fixed on left-hand side
N Support axis (without drive)

(1) For the minimum and maximum stroke per size, refer to the mechanical data of the axis *(see page 46)*.
(2) Supplied with a 0.1 m (3.9 in) cable equipped with an M8 connector. For other sensor extension cable lengths, refer to *Sensor Extension Cables (see page 217)*.
(3) Only carriages of the same type can be used. All carriages are driven. For more carriages, contact your local Schneider Electric service representative.
(4) For the minimum distance between two carriages, refer to the respective dimensional drawing of the axis in *Mechanical Data (see page 46)*.
(5) For further information, refer to *Mounting Options for Motor and/or Gearbox (see page 34)*.

		Characteristics							
Digit:		21	22	23	24	25	26	27	…
Example: PAS4 2 B B M 1000 A 1 B A XXX L /		2	1	G	0	H	5	0	+ …
Motor and/or gearbox configuration[6]									
1	Motor only								
2	Motor and gearbox								
3	Gearbox only								
4	Without motor, without gearbox, with adaption material (select motor/gearbox type)								
X	Without motor, without gearbox								
Gearbox interface									
0G	Straight planetary gearbox – PLE 40								
1G	Straight planetary gearbox – PLE 60								
3G	Straight planetary gearbox – PLE 80								
5G	Straight planetary gearbox – PLE 120								
0A	Angular planetary gearbox – WPLE 40								
1A	Angular planetary gearbox – WPLE 60								
3A	Angular planetary gearbox – WPLE 80								
5A	Angular planetary gearbox – WPLE 120								
YY	Third-party gearbox without mounting by Schneider Electric (gearbox drawing required)								
ZZ	Third-party gearbox with mounting by Schneider Electric (gearbox must be provided)								
XX	Without gearbox								
Gearbox orientation[6][7]									
0	90°								
3	0°								
6	270°								
9	180°								
X	Without gearbox								
Motor interface									
V8	Stepper motors BRS 368								
V9	Stepper motors BRS 397, 39A								
V0	Stepper motors BRS 39B								
V1	Stepper motors BRS 3AC, 3AD								
I6	Integrated drive with stepper motor ILS•• 571, 572								
I7	Integrated drive with stepper motor ILS•• 573								
I9	Integrated drive with stepper motor ILS•• 851, 852								
I8	Integrated drive with stepper motor ILS•• 853								
E7	Integrated drive with brushless DC motor ILE•• 66 with spur wheel gear								
A6	Integrated drive with servo motor ILA•• 57								
H0	Servo motors BSH/SH3 0401, 0402								
H5	Servo motors BSH/SH3 055								
H7	Servo motors BSH/BMH/MH3/SH3/ILM 0701, 0702								
H8	Servo motors BSH/BMH/MH3/SH3/ILM 0703								
H1	Servo motors BSH/BMH/MH3/SH3/ILM 1001, 1002, 1003								
H4	Servo motors BSH 1004								
H2	Servo motors BSH/BMH/MH3/SH3/ILM 1401, 1402, 1403, 1404								
C1	Servo motors BCH2•B A5, 01								
C2	Servo motors BCH2•D 02, 04								
C3	Servo motors BCH2•F 04								
C4	Servo motors BCH2•F 07								
C5	Servo motors BCH2•H 10, 20								
C6	Servo motors BCH2•M 08								
C7	Servo motors BCH2•M 03, 05, 06, 10, 09, 15, 20								
C8	Servo motors BCH2•R 20, 30, 35, 45								
YY	Third-party motor without mounting by Schneider Electric (motor drawing required)								
ZZ	Third-party motor with mounting by Schneider Electric (motor drawing required; motor must be provided)								
XX	Without motor								
Motor orientation[6][7] with reference to motor connection									
0	90°								
3	0°								
6	270°								
9	180°								
X	Without motor								
Planetary gearbox gear ratio and motor reference									
State the planetary gearbox gear ratio and the complete motor reference at the end of the reference, in plain text.									
Example: PLE60 3:1 + BMH 0702P01A2A									

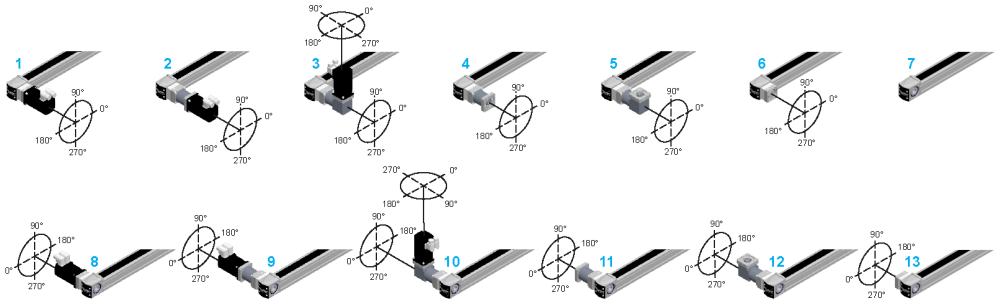
(6) For further information, refer to *Motor and/or Gearbox Orientation and Configuration* *(see page 38)*.

(7) Adapter plate orientation with reference to the setscrew.

If you have questions concerning the type code, contact your local Schneider Electric service representative.

Motor and/or Gearbox Orientation and Configuration

The following graphic presents the possible motor and/or gearbox orientation and configuration for the Lexium PAS4•B-Series.



1 PAS4•B••••••••••••R/1XXX•••
2 PAS4•B••••••••••••R/2•G••••
3 PAS4•B••••••••••••R/2•A••••
4 PAS4•B••••••••••••R/3•G•XXX
5 PAS4•B••••••••••••R/3•A•XXX
6 PAS4•B••••••••••••R/4XXX•••
7 PAS4•B••••••••••••H/XXXXXXX
8 PAS4•B••••••••••••L/1XXX•••
9 PAS4•B••••••••••••L/2•G••••
10 PAS4•B••••••••••••L/2•A••••
11 PAS4•B••••••••••••L/3•G•XXX
12 PAS4•B••••••••••••L/3•A•XXX
13 PAS4•B••••••••••••L/4XXX•••

For a detailed name description of the Lexium PAS4•B-Series, refer to *Type Code* *(see page 35)*.

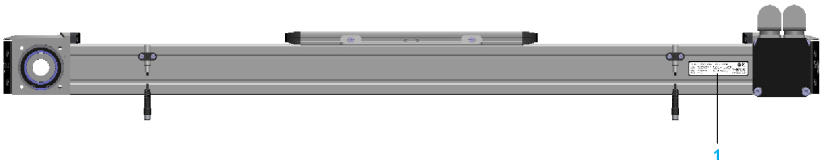
Designation of Customized Version

In the case of a customized version, the type code contains one or several dollar signs "$".
Example: PAS42BBM1000A$BAXXXL / 2 1G 0 H5 0

If you have questions concerning customized versions, contact your local Schneider Electric service representative.

Type Plate

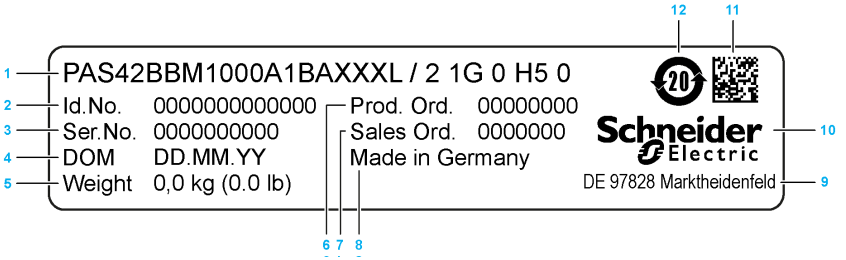
Position of the Type Plate



1 Type plate

Description of the Type Plate

The type plate contains the following data:



1 Device name*
2 Identification number
3 Serial number
4 Date of manufacture
5 Weight of the axis
6 Product order number
7 Sales order number
8 Country of origin
9 Production site
10 Schneider Electric logo
11 Data matrix code
12 RoHS mark

***** For detailed information about the meaning of the particular digits, refer to *Type Code* *(see page 35)*.

Chapter 3
Technical Data

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
3.1	Ambient Conditions	42
3.2	Mechanical Data of Lexium PAS4•B-Series	46
3.3	Design of the Axis Frame	101
3.4	Service Life	103

Section 3.1
Ambient Conditions

Ambient Conditions

Overview

Procedure	Parameter	Unit	Value
Operation	**Class 3K3, 3Z12, 3Z2, 3B2, 3C1, 3M6** (according to IEC/EN 60721-3-3)(1)		
	Ambient temperature	°C (°F)	+5…+55 (+41…+131)(2)
	Condensation	–	prohibited
	Formation of ice	–	prohibited
	Relative humidity	%	5…85
Transport	**Set of class combinations IE21** (according to IEC/EN 60721-3-2)(3)		
	Ambient temperature	°C (°F)	-25…+60 (-13…+140)
	Condensation	–	prohibited
	Precipitation	–	prohibited
	Formation of ice	–	prohibited
	Other liquid	–	prohibited
	Wetness	–	prohibited
	Relative humidity	%	< 75

(1) All parameters conform to the specified class except for the ambient temperature which is limited by other components of the system.
(2) Power reduction with motors at ambient temperatures exceeding +40 °C (104 °F). For more information, contact your local Schneider Electric service representative.
(3) All parameters conform to the specified class except for the relative humidity which is limited by other components of the system.
(4) Higher temperatures can cause damage to the superficial structure. Lower temperatures increase the stiffness and reduce the service life of the toothed belt.
(5) Storing the toothed belt at a relative humidity of maximum 50% helps to avoid a reduced service life of the toothed belt.

Procedure	Parameter	Unit	Value
Long-term storage in transport packaging	**Class 1K3** (according to IEC/EN 60721-3-1)		
	Ambient temperature	°C (°F)	+5…+30 (+41…+86)(4)
	Condensation	–	prohibited
	Precipitation	–	prohibited
	Formation of ice	–	prohibited
	Other liquid	–	prohibited
	Wetness	–	prohibited
	Relative humidity	%	5…95(5)
	Maximum storage period	years	2

(1) All parameters conform to the specified class except for the ambient temperature which is limited by other components of the system.
(2) Power reduction with motors at ambient temperatures exceeding +40 °C (104 °F). For more information, contact your local Schneider Electric service representative.
(3) All parameters conform to the specified class except for the relative humidity which is limited by other components of the system.
(4) Higher temperatures can cause damage to the superficial structure. Lower temperatures increase the stiffness and reduce the service life of the toothed belt.
(5) Storing the toothed belt at a relative humidity of maximum 50% helps to avoid a reduced service life of the toothed belt.

Ambient conditions apply with motor and gearbox. For further information, refer to the corresponding motor or gearbox manual.

For further information about storage conditions, refer to *Transport and Storage* *(see page 107)*.

Information About Increased Corrosion Resistance

Increased corrosion resistance does not imply corrosion resistance under any ambient condition. For further information, refer to *Incompatible Environments* *(see page 17)*.

NOTE: Coated materials loose their increased corrosion resistance if the coating is damaged or worn.

Component		Without an increased corrosion resistance	With an increased corrosion resistance
Axis body		Aluminum, anodized	
Ball bearing seals		Nitrile Butadiene Rubber (NBR)	
Carriage		Aluminum, anodized	
Circlips		Steel, galvanized	
Clamping claws		Aluminum, anodized	
Clamping hub		Aluminum, not anodized	
Contact plate		Stainless steel	
Cover end blocks		Polyoxymethylene (POM)	
Cover strip		Steel, not stainless, Teflon-coated	
Cover strip clamps	Housings	Polyphenylene sulfide	
	Clamping plates	Stainless steel	
Elastomer spider		Polyurethane (PUR)	
End blocks		Aluminum, die-cast, not anodized	
Expanding hub		Aluminum, not anodized; cone stainless steel	
Gearbox and motor adaptations		Aluminum, not anodized	
Grease nipples		Stainless steel	
Locating dowels		Stainless steel	
Recirculating ball bearing guide	Guide rail	Steel	Armoloy-coated
	Guide carriages	Steel	
Roller guide	Guide rods	Steel	Stainless steel
	Rollers	Steel	Stainless steel
Rubber buffers		Styrene Butadiene Rubber (SBR)	
Screws		Steel, galvanized	
Sensors		Brass, nickel-plated	
Sensor cables		Polyurethane (PUR)	
Sensor holders		Polyoxymethylene (POM)	
Shaft extension		Aluminum, not anodized; cone stainless steel	
Slot nuts		Steel, galvanized	

Component		Without an increased corrosion resistance	With an increased corrosion resistance
Strip deflectors	Housings	Aluminum, anodized	
	Deflection units	Polyamide (PA)	
	Brushes	Polyamide (PA)	
Toothed belt	Belt	Polyurethane (PUR)	
	Fibres	Polyamide (PA)	
	Tension members	Steel, galvanized	
Toothed belt, antistatic	Belt	Polyurethane (PUR)	
	Fibres	Polyamide (PA), conductive	
	Tension members	Steel, galvanized	
Toothed belt pulleys	Toothed belt pulleys	Aluminum	
	Flanged wheels	Steel, galvanized	
	Ball bearings	Steel	Stainless steel
Toothed belt tensioners		Stainless steel	

Section 3.2
Mechanical Data of Lexium PAS4•B-Series

What Is in This Section?

This section contains the following topics:

Topic	Page
Lexium PAS41BR and Lexium PAS41HR	47
Lexium PAS42B and Lexium PAS42H	57
Lexium PAS43B and Lexium PAS43H	74
Lexium PAS44BB and Lexium PAS44HB	91

Lexium PAS41BR and Lexium PAS41HR

Overview

Here you will find the following information:

- Mechanical data of Lexium PAS41BR *(see page 47)*
- Mechanical data of Lexium PAS41HR *(see page 49)*
- Characteristic curves of Lexium PAS41BR *(see page 50)*
- Dimensional drawing of Lexium PAS41BR *(see page 55)*

Mechanical Data of Lexium PAS41BR

NOTE: The maximum forces and torques are calculated to a service life of 30,000 km (18,641 mi) and can be exceeded. For an application-specific calculation of the service life of the axis, refer to *Service Life (see page 103)*.

Parameter	Unit	Value for Lexium PAS41BR			
		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip
Toothed belt	–	15HTD3 width: 15 mm (0.59 in), profile: HTD, pitch 3 mm (0.118 in)			
Type of guide	–	Roller guide			
Carriage length	mm (in)	200 (7.9)	297 (11.7)	280 (11)	377 (14.8)
Feed constant	mm/rev (in/rev)	84 (3.3)			
Effective diameter toothed belt pulley	mm (in)	26.738 (1.05)			
Maximum feed force Fx_{max} (1)	N (lbf)	300 (67)			
Maximum velocity (2)	m/s (ft/s)	8 (26)			
Maximum acceleration (2)	m/s^2 (ft/s^2)	20 (66)			
Maximum drive torque M_{max} (1)	Nm (lbf–in)	4 (35.4)			

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

Parameter	Unit	Value for Lexium PAS41BR			
		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip
Breakaway torque 0-stroke axis	Nm (lbf–in)	0.3 (2.66)			
Breakaway torque per additional carriage	Nm (lbf–in)	0.1 (0.89)			
Moment of inertia 0-stroke axis	$kg \cdot cm^2$ ($lb \cdot in^2$)	1.0 (0.34)	1.2 (0.41)	1.2 (0.41)	1.4 (0.48)
Moment of inertia per additional carriage	$kg \cdot cm^2$ ($lb \cdot in^2$)	0.8 (0.273)	1.0 (0.34)	1.0 (0.41)	1.2 (0.41)
Moment of inertia per m (in) of stroke	$kg \cdot cm^2$ ($lb \cdot in^2$)	0.1 (0.034)			
Moment of inertia per kg (lb) payload	$kg \cdot cm^2$ ($lb \cdot in^2$)	1.8 (0.62)			
Maximum force Fy(1)	Nm (lbf–in)	660 (148)			
Maximum force Fz(1)	Nm (lbf–in)	430 (97)			
Maximum torque carriage Mx(1)	Nm (lbf–in)	5 (44)			
Maximum torque carriage My(1)	Nm (lbf–in)	11 (97)		28 (248)	
Maximum torque carriage Mz(1)	Nm (lbf–in)	17 (150)		43 (381)	
Mass 0-stroke axis	kg (lb)	1.6 (3.5)	2 (4.4)	1.9 (4.2)	2.3 (5.1)
Mass per additional carriage (with axis body)	kg (lb)	0.9 (2.0)	1.3 (2.87)	1.2 (2.65)	1.6 (3.5)
Mass per m (in) of stroke	kg (lb)	2.25 (5)			

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

Parameter	Unit	Value for Lexium PAS41BR			
		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip
Moving mass carriage	kg (lb)	0.5 (1.1)	0.6 (1.32)	0.6 (1.32)	0.7 (1.54)
Maximum stroke(3)	mm (in)	3000 (118)	2880 (113)	2920 (115)	2800 (110)
Minimum stroke(4)	mm (in)	125 (4.9)			
Position repeatability(2)	mm (in)	+/- 0.05 (+/- 0.00197)			

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

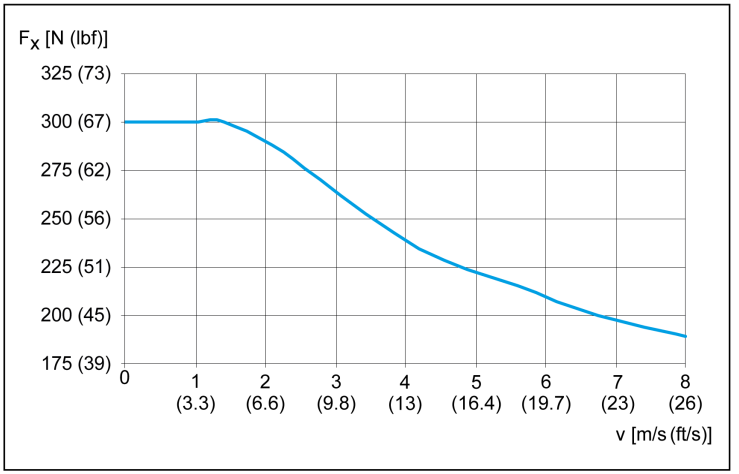
Mechanical Data of Lexium PAS41HR

Parameter	Unit	Value for Lexium PAS41HR			
		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip
Breakaway force	N (lbf)	5 (1.12)			
Breakaway force per additional carriage	N (lbf)	5 (1.12)			
Mass 0-stroke axis	kg (lb)	1.1 (2.43)	1.5 (3.3)	1.4 (3.1)	1.8 (4)

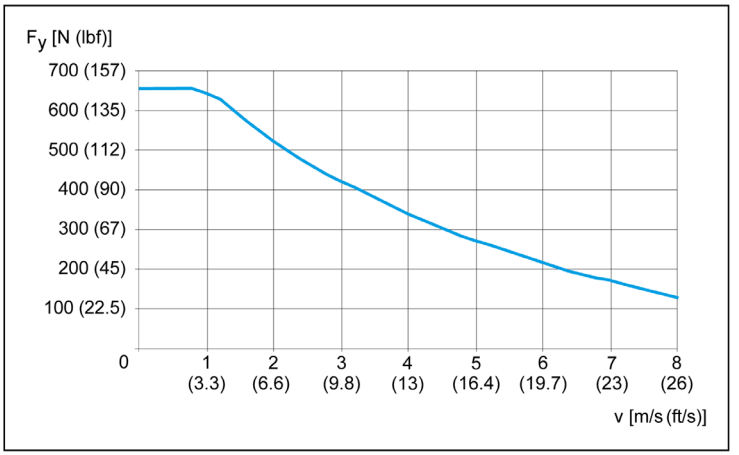
For further data (if applicable), refer to Lexium PAS41BR.

Characteristic Curves of Lexium PAS41BR

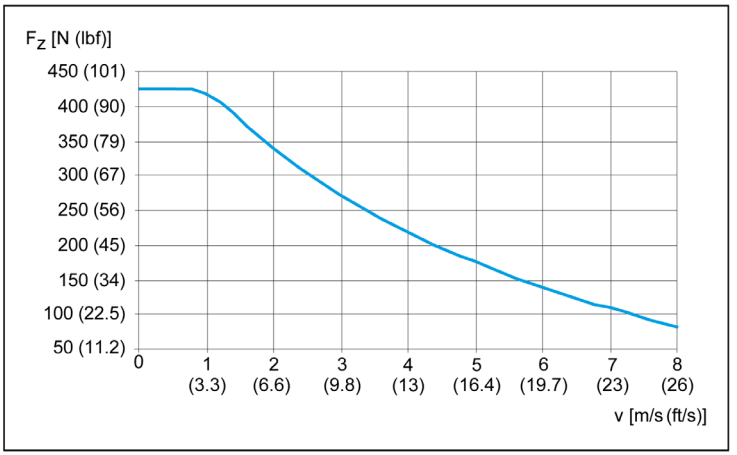
Maximum feed force Fx_{max}



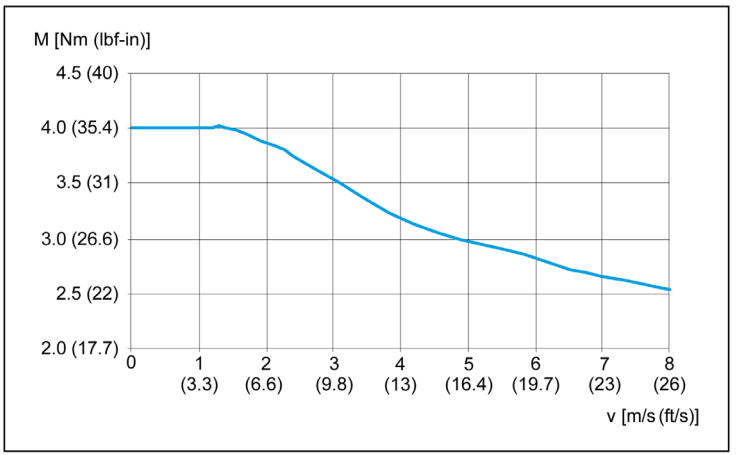
Maximum force Fy



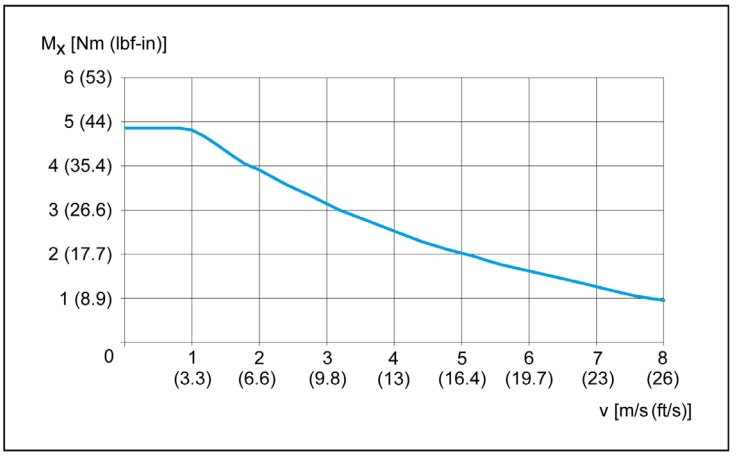
Maximum force Fz



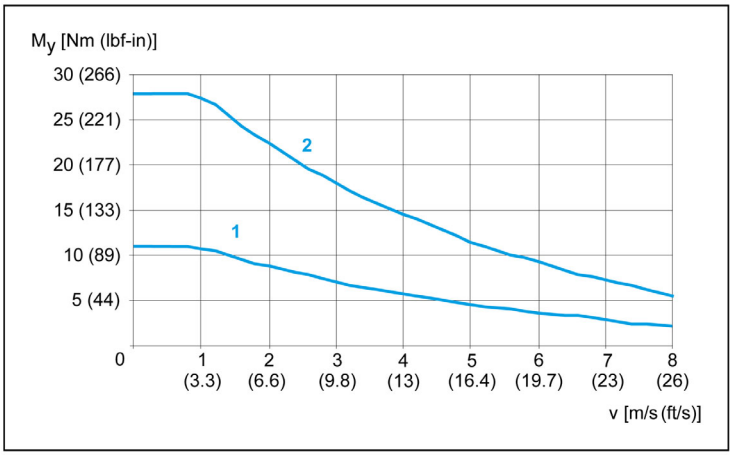
Maximum drive torque M_{max}



Maximum torque carriage Mx

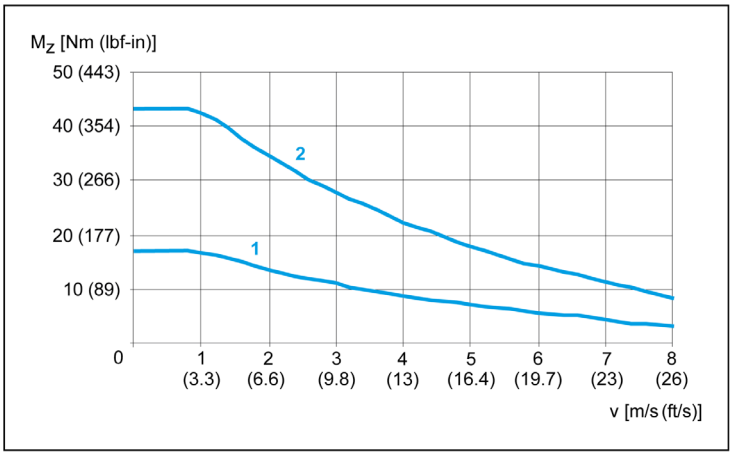


Maximum torque carriage My



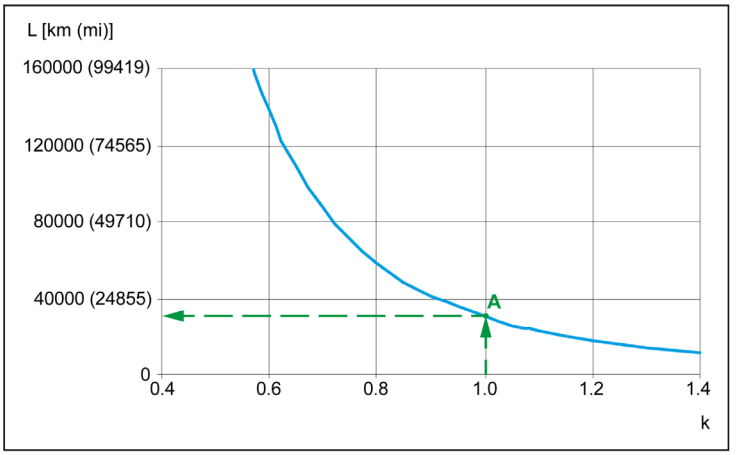
1 Carriage type 2
2 Carriage type 4

Maximum torque carriage Mz



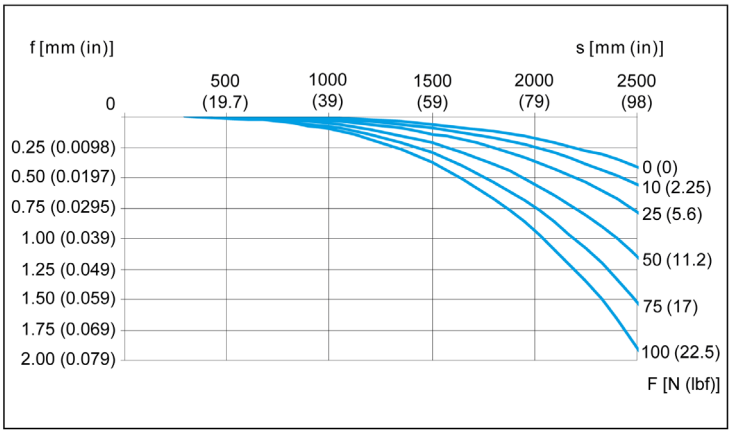
1 Carriage type 2
2 Carriage type 4

Service life

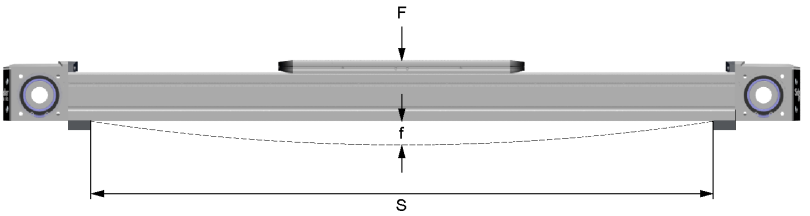


A The forces and torques (Fy, Fz, Mx, Mz, My) are calculated for an expected service life of 30,000 km (18,641 mi). This is shown with k factor equal 1.0 in the graphic.

Maximum deflection

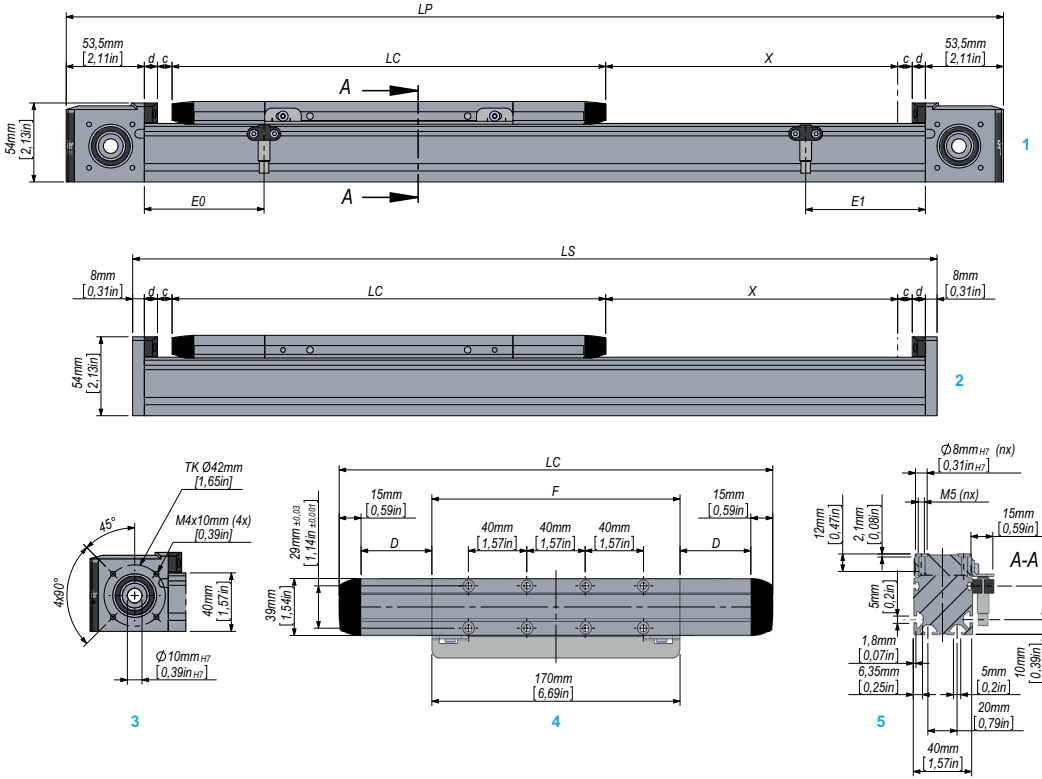


In order to limit deflection of the axis at long strokes, the axis must be supported. The diagram presents the deflection f [mm (in)] of the axis with respect to the support distance S [mm (in)] and the acting force F [N (lbf)]. Excessive deflection reduces the service life of the axis.



NOTE: The graphics presents the deflection of the axis body with firmly clamped supporting points.

Dimensional Drawing of Lexium PAS41BR



1 Portal axis
2 Support axis
3 End block
4 Carriage type 2 (type 4 has more tapped holes for mounting)
5 Section of axis

Parameter	Dim-ension	Unit	Lexium PAS41BR			
			Carriage type 2		Carriage type 4	
			without cover strip	with cover strip	without cover strip	with cover strip
Total length of portal axis(1)	LP	mm (in)	327 + X (13 + X)	442 + X (17.4 + X)	407 + X (16 + X)	522 + X (20.6 + X)
Total length of support axis	LS	mm (in)	236 + X (9.3 + X)	351 + X (13.8 + X)	316 + X (12.4 + X)	431 + X (17 + X)
Stroke	X	–	See technical data			
Carriage length	LC	mm (in)	200 (7.9)	297 (11.7)	280 (11)	377 (14.8)
Profile length of carriage	F	mm (in)	170 (6.7)		250 (9.8)	
Number of tapped holes for mounting(2)	n	–	8		12	
Distance between tapped holes	–	mm (in)	40 +/- 0.03 (1.57 +/- 0.00118)		40 +/- 0.03 (1.57 +/- 0.00118)	
Sensor position at drive end	E0	mm (in)	25 (0.98)	82 (3.2)	25 (0.98)	82 (3.2)
Sensor position opposite drive end	E1	mm (in)	25 (0.98)	82 (3.2)	105 (4.1)	162 (6.4)
Stroke reserve up to mechanical stop	c	mm (in)	10 (0.39)			
Length of cover strip clamp	d	mm (in)	–	9 (0.354)	–	9 (0.354)
Deflection of cover strip	D	mm (in)	–	48.5 (1.9)	–	48.5 (1.9)
Minimum distance between two carriages	–	mm (in)	35 (1.38)	90 (3.54)	35 (1.38)	90 (3.54)

(1) For a axis with more than one carriage, add the carriage length (LC) and the distance between the carriages for each additional carriage.
(2) Prepared for locating dowels. For suitable locating dowels, refer to *Replacement Equipment* *(see page 207)*.

Lexium PAS42B and Lexium PAS42H

Overview

Here you will find the following information:

- Mechanical data of Lexium PAS42BR *(see page 57)*
- Mechanical data of Lexium PAS42HR *(see page 59)*
- Characteristic curves of Lexium PAS42BR *(see page 60)*
- Mechanical data of Lexium PAS42BB *(see page 64)*
- Mechanical data of Lexium PAS42HB *(see page 67)*
- Characteristic curves of Lexium PAS42BB *(see page 67)*
- Dimensional drawing of Lexium PAS42B *(see page 72)*

Mechanical Data of Lexium PAS42BR

NOTE: The maximum forces and torques are calculated to a service life of 30,000 km (18,641 mi) and can be exceeded. For an application-specific calculation of the service life of the axis, refer to *Service Life (see page 103)*.

Parameter	Unit	Value for Lexium PAS42BR					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Toothed belt	–	25HTD5 width: 25 mm (0.98 in), profile: HTD, pitch: 5 mm (0.197 in)					
Type of guide	–	Roller guide					
Carriage length	mm (in)	206 (8.1)	303 (12)	266 (10.5)	363 (14.3)	386 (15.2)	483 (19)
Feed constant	mm/rev (in/rev)	155 (6.1)					
Effective diameter toothed belt pulley	mm (in)	49.338 (1942)					
Maximum feed force Fx_{max} (1)	N (lbf)	800 (180)					
Maximum velocity (2)	m/s (ft/s)	8 (26)					

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

Parameter	Unit	Value for Lexium PAS42BR					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Maximum acceleration(2)	m/s^2 (ft/s^2)	20 (66)					
Maximum drive torque M_{max}(1)	Nm (lbf–in)	20 (177)					
Breakaway torque 0-stroke axis	Nm (lbf–in)	1.2 (10.6)					
Breakaway torque per additional carriage	Nm (lbf–in)	0.2 (1.77)					
Moment of inertia 0-stroke axis	$kg·cm^2$ ($lb·in^2$)	7.7 (2.63)	8.8 (3)	9.0 (3.1)	10.1 (3.5)	11.8 (4)	12.9 (4.4)
Moment of inertia per additional carriage	$kg·cm^2$ ($lb·in^2$)	5.4 (1.85)	6.5 (2.2)	6.8 (2.32)	7.9 (2.7)	9.6 (3.3)	10.7 (3.66)
Moment of inertia per m (in) of stroke	$kg·cm^2$ ($lb·in^2$)	1.2 (0.41)					
Moment of inertia per kg (lb) payload	$kg·cm^2$ ($lb·in^2$)	6.1 (2.1)					
Maximum force Fy(1)	Nm (lbf–in)	660 (5841)					
Maximum force Fz(1)	Nm (lbf–in)	430 (3806)					
Maximum torque carriage Mx(1)	Nm (lbf–in)	9 (80)					
Maximum torque carriage My(1)	Nm (lbf–in)	18 (159)		31 (274)		56 (496)	
Maximum torque carriage Mz(1)	Nm (lbf–in)	28 (248)		48 (425)		87 (425)	
Mass 0-stroke axis	kg (lb)	3.9 (8.6)	4.7 (10.4)	4.4 (10.4)	5.2 (11.5)	5.4 (12)	6.2 (13.7)

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

Parameter	Unit	Value for Lexium PAS42BR					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Mass per additional carriage (with axis body)	kg (lb)	1.9 (4.2)	2.5 (5.5)	2.4 (5.3)	3.0 (6.6)	3.3 (7.3)	3.9 (8.6)
Mass per m (in) of stroke	kg (lb)	4.6 (10.1)					
Moving mass carriage	kg (lb)	0.9 (2)	1.1 (2.43)	1.2 (2.65)	1.3 (2.87)	1.6 (3.5)	1.8 (4)
Maximum stroke(3)	mm (in)	5660 (223)	5540 (218)	5600 (220)	5480 (216)	5480 (216)	5360 (211)
Minimum stroke(4)	mm (in)	130 (5.1)					
Position repeatability(2)	mm (in)	+/- 0.05 (0.00197)					

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

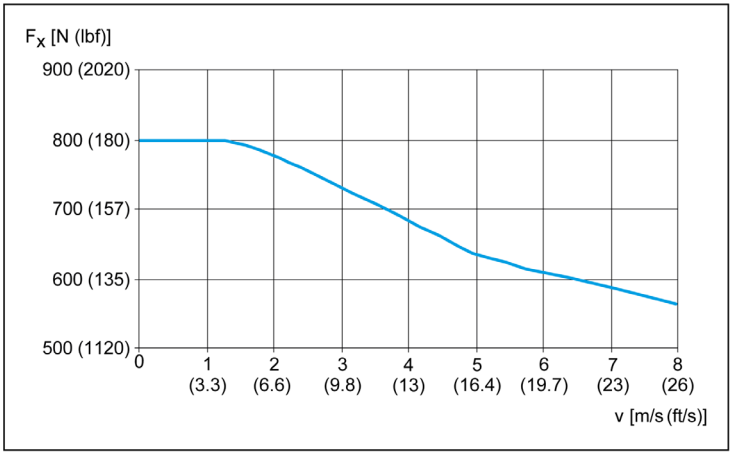
Mechanical Data of Lexium PAS42HR

Parameter	Unit	Value for Lexium PAS42HR					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Breakaway force	N (lbf)	8 (1.8)					
Breakaway force per additional carriage	N (lbf)	8 (1.8)					
Mass 0-stroke axis	kg (lb)	2.4 (5.3)	3.1 (3.8)	2.9 (6.4)	3.6 (8)	3.9 (8.6)	4.6 (10.1)

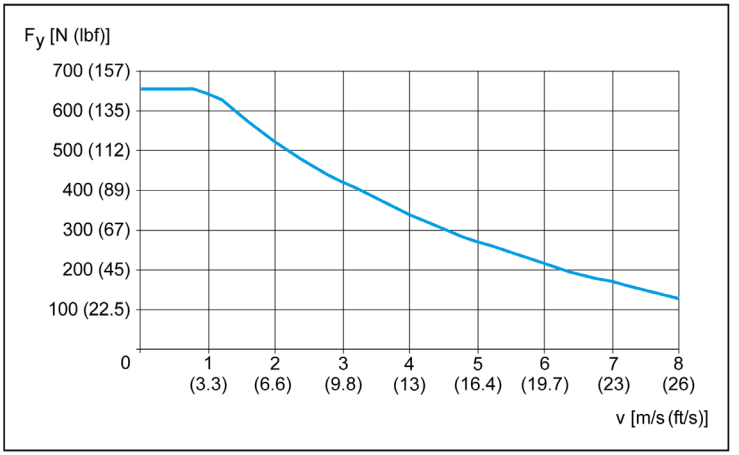
For further data (if applicable), refer to Lexium PAS42BR.

Characteristic Curves of Lexium PAS42BR

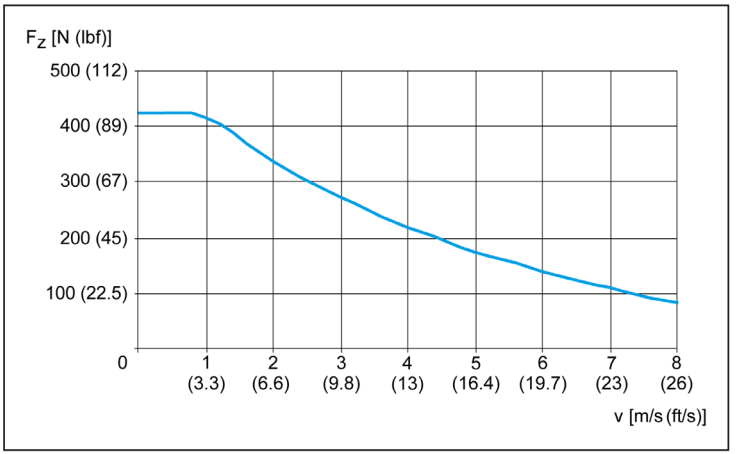
Maximum feed force Fx_{max}



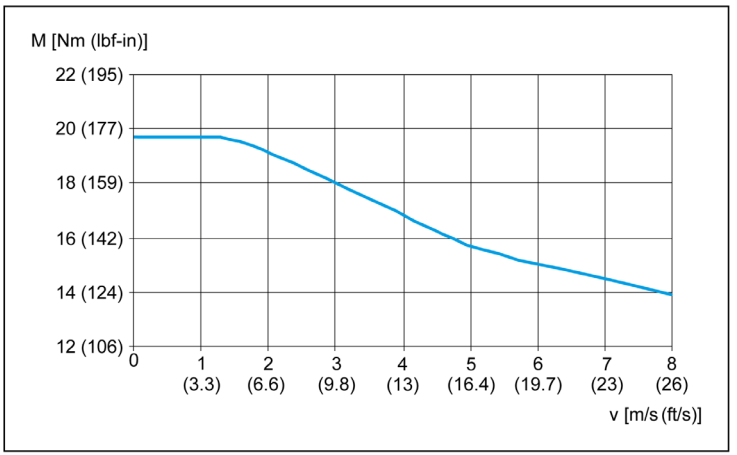
Maximum force Fy



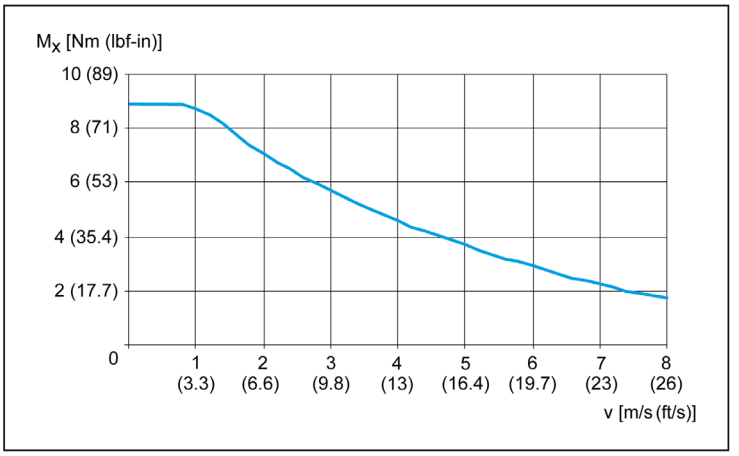
Maximum force Fz



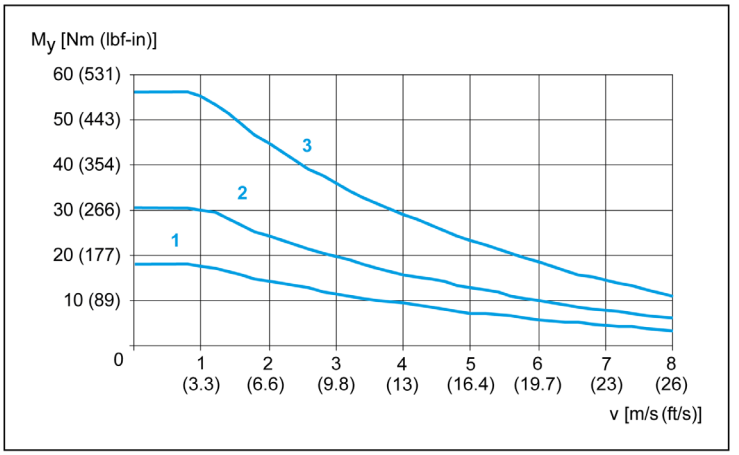
Maximum drive torque M_{max}



Maximum torque carriage Mx

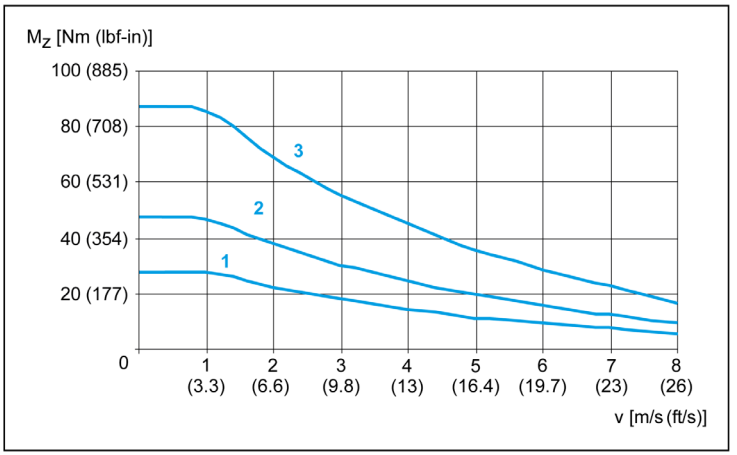


Maximum torque carriage My



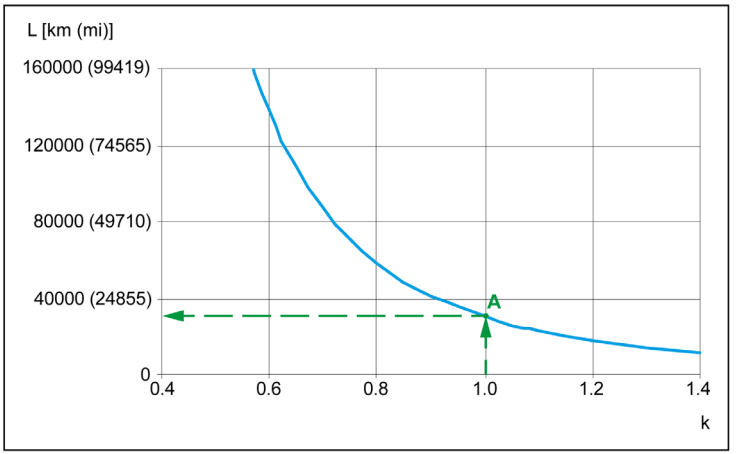
1 Carriage type 1
2 Carriage type 2
3 Carriage type 4

Maximum torque carriage Mz



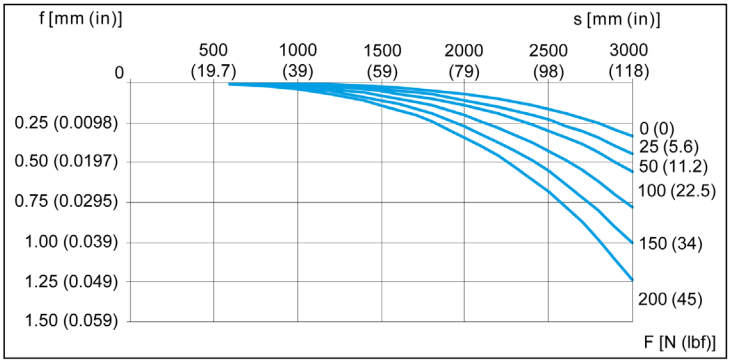
1 Carriage type 1
2 Carriage type 2
3 Carriage type 4

Service life

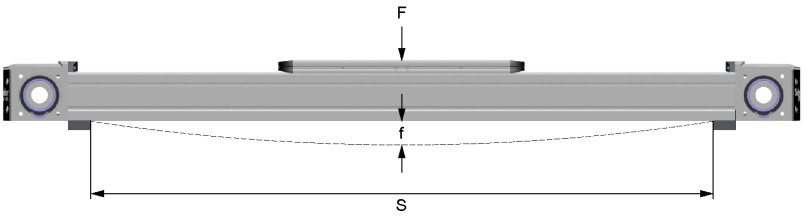


A The forces and torques (Fy, Fz, Mx, Mz, My) are calculated for an expected service life of 30,000 km (18,641 mi). This is shown with k factor equal 1.0 in the graphic.

Maximum deflection



In order to limit deflection of the axis at long strokes, the axis must be supported. The diagram presents the deflection f [mm (in)] of the axis with respect to the support distance S [mm (in)] and the acting force F [N (lbf)]. Excessive deflection reduces the service life of the axis.



NOTE: The graphics presents the deflection of the axis body with firmly clamped supporting points.

Mechanical Data of Lexium PAS42BB

NOTE: The maximum forces and torques are calculated to a service life of 20,000 km (12,427 mi) and can be exceeded. For an application-specific calculation of the service life of the axis, refer to *Service Life* *(see page 103)*.

Parameter	Unit	Value for Lexium PAS42BB					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Toothed belt	–	25HTD5 width: 25 mm (0.98 in), profile: HTD, pitch: 5 mm (0.197 in)					
Type of guide	–	Recirculating ball bearing guide					
Carriage length	mm (in)	206 (8.1)	303 (12)	266 (10.5)	363 (14.3)	386 (15.2)	483 (19)
Feed constant	mm/rev (in/rev)	155 (6.1)					
Effective diameter toothed belt pulley	mm (in)	49.338 (1942)					
Maximum feed force Fx_{max} (1)	N (lbf)	800 (180)					
Maximum velocity (2)	m/s (ft/s)	5 (16.4)					
Maximum acceleration (2)	m/s^2 (ft/s^2)	50 (164)					
Maximum drive torque M_{max} (1)	Nm (lbf–in)	20 (177)					
Breakaway torque 0-stroke axis	Nm (lbf–in)	1.8 (16)					
Breakaway torque per additional carriage	Nm (lbf–in)	0.8 (7.1)					
Moment of inertia 0-stroke axis	$kg{\cdot}cm^2$ ($lb{\cdot}in^2$)	8.5 (2.9)	9.6 (3.3)	9.5 (3.25)	10.6 (3.6)	11.8 (4)	12.9 (4.4)
Moment of inertia per additional carriage	$kg{\cdot}cm^2$ ($lb{\cdot}in^2$)	6.2 (2.1)	7.3 (2.5)	7.3 (2.5)	8.4 (2.87)	9.6 (3.3)	10.7 (3.66)
Moment of inertia per m (in) of stroke	$kg{\cdot}cm^2$ ($lb{\cdot}in^2$)	1.2 (0.41)					
Moment of inertia per kg (lb) payload	$kg{\cdot}cm^2$ ($lb{\cdot}in^2$)	6.1 (2.1)					

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

Parameter	Unit	Value for Lexium PAS42BB					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Maximum force Fy(1)	Nm (lbf–in)	2810 (28471)					
Maximum force Fz(1)	Nm (lbf–in)	2810 (28471)					
Maximum torque carriage Mx(1)	Nm (lbf–in)	19 (168)					
Maximum torque carriage My(1)	Nm (lbf–in)	74 (655)		194 (1717)		362 (3204)	
Maximum torque carriage Mz(1)	Nm (lbf–in)	74 (655)		194 (1717)		362 (3204)	
Mass 0-stroke axis	kg (lb)	4.3 (9.5)	5.2 (11.5)	4.8 (10.6)	5.7 (12.6)	5.8 (12.8)	6.7 (14.8)
Mass per additional carriage (with axis body)	kg (lb)	2.2 (4.85)	2.9 (6.4)	2.7 (6)	3.4 (7.5)	3.7 (8.2)	4.4 (8.2)
Mass per m (in) of stroke	kg (lb)	5.6 (12.3)					
Moving mass carriage	kg (lb)	1.0 (2.2)	1.2 (2.65)	1.2 (2.65)	1.4 (3.1)	1.6 (3.5)	1.8 (4)
Maximum stroke(3)	mm (in)	5660 (223)	5540 (218)	5600 (220)	5480 (216)	5480 (216)	5360 (211)
Minimum stroke(4)	mm (in)	9 (0.354)					
Position repeatability(2)	mm (in)	+/- 0.05 (0.00197)					

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

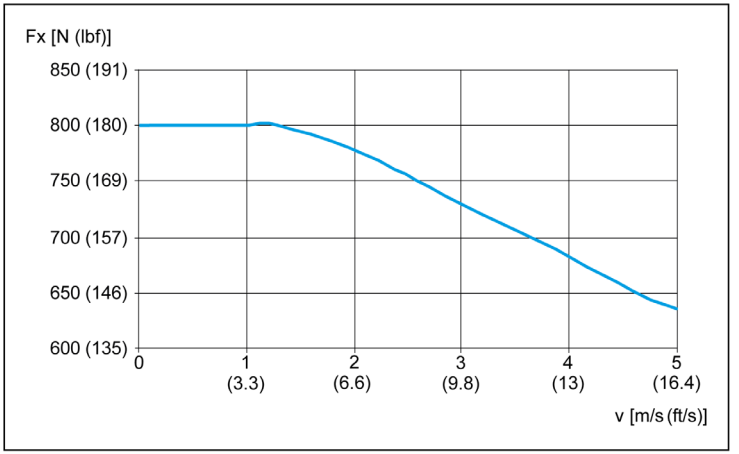
Mechanical Data of Lexium PAS42HB

Parameter	Unit	Value for Lexium PAS42HB					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Breakaway force	N (lbf)	30 (6.7)					
Breakaway force per additional carriage	N (lbf)	30 (6.7)					
Mass 0-stroke axis	kg (lb)	2.8 (6.2)	3.6 (8)	3.3 (7.3)	4.1 (9.1)	4.3 (9.5)	5.1 (11.2)

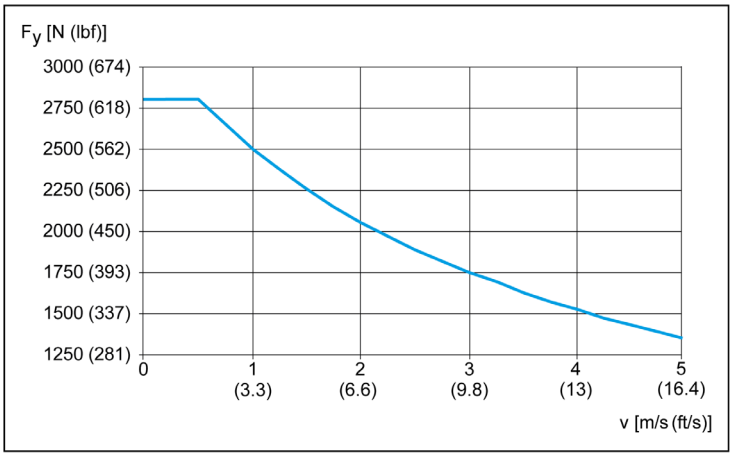
For further data (if applicable), refer to Lexium PAS42BB.

Characteristic Curves of Lexium PAS42BB

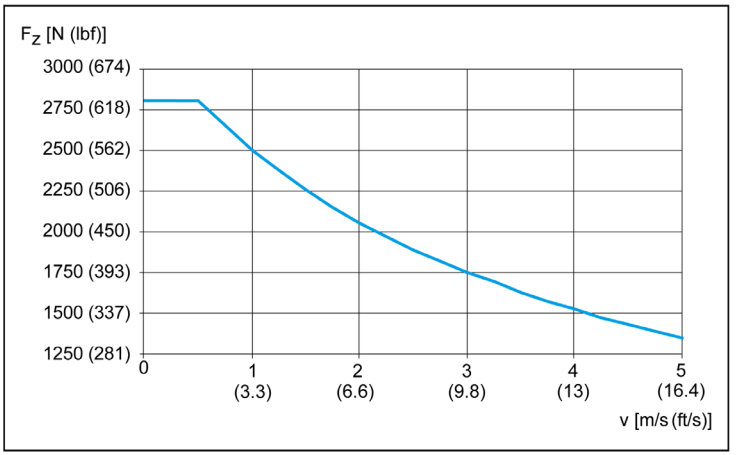
Maximum feed force Fx_{max}



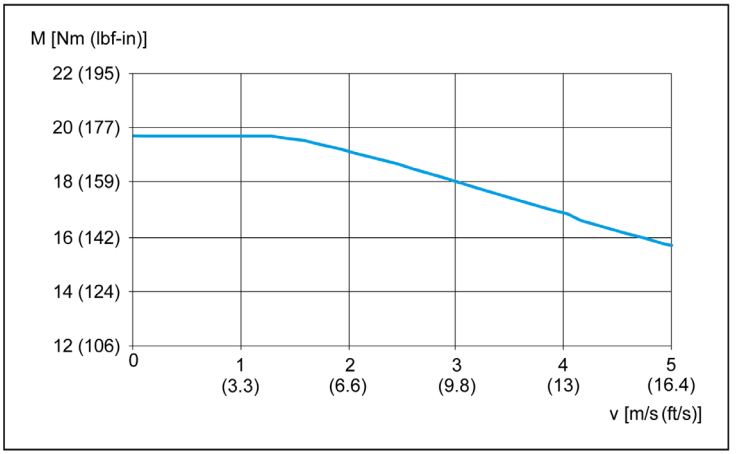
Maximum force Fy



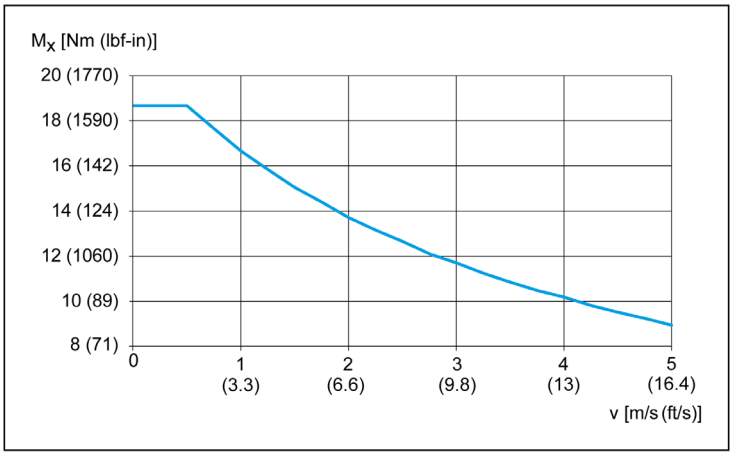
Maximum force Fz



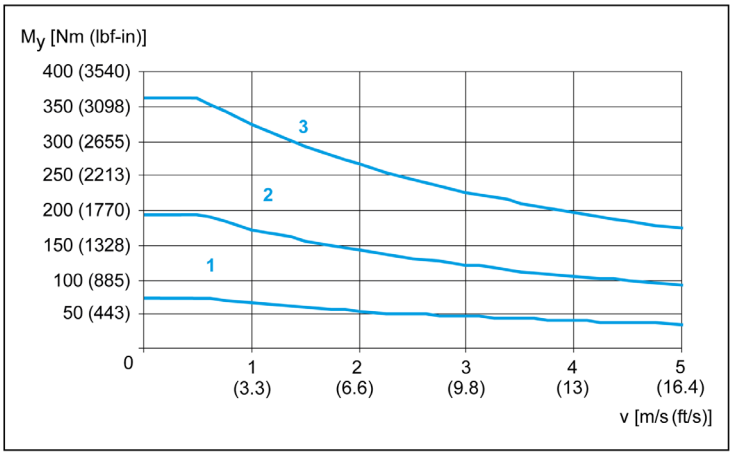
Maximum drive torque M_{max}



Maximum torque carriage Mx

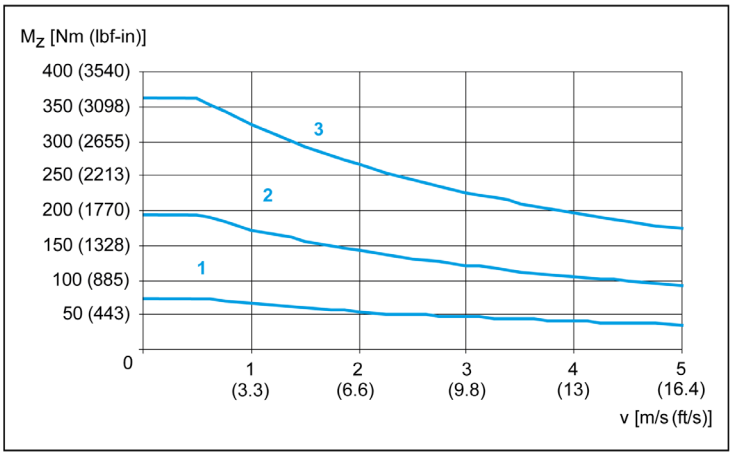


Maximum torque carriage My



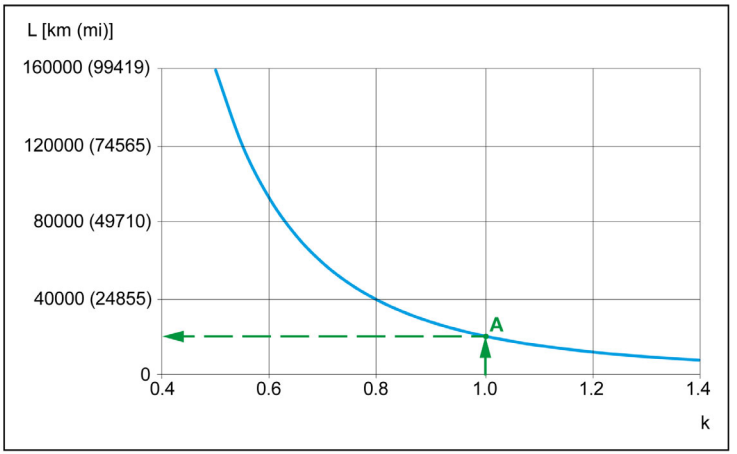
1 Carriage type 1
2 Carriage type 2
3 Carriage type 4

Maximum torque carriage Mz



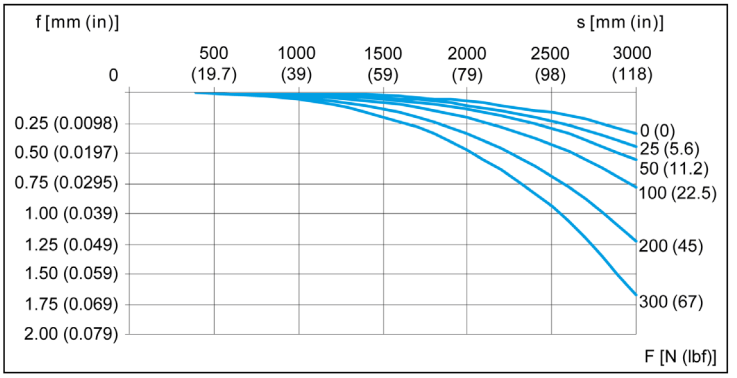
1 Carriage type 1
2 Carriage type 2
3 Carriage type 4

Service life

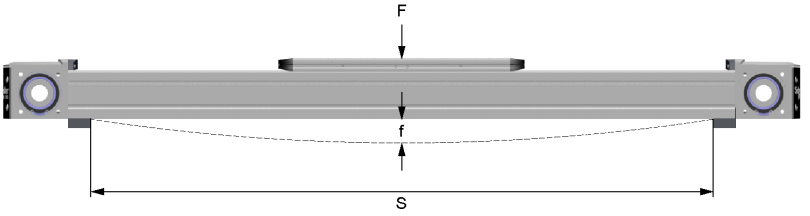


A The forces and torques (Fy, Fz, Mx, Mz, My) are calculated for an expected service life of 20,000 km (12,427 mi). This is shown with k factor equal 1.0 in the graphic.

Maximum deflection

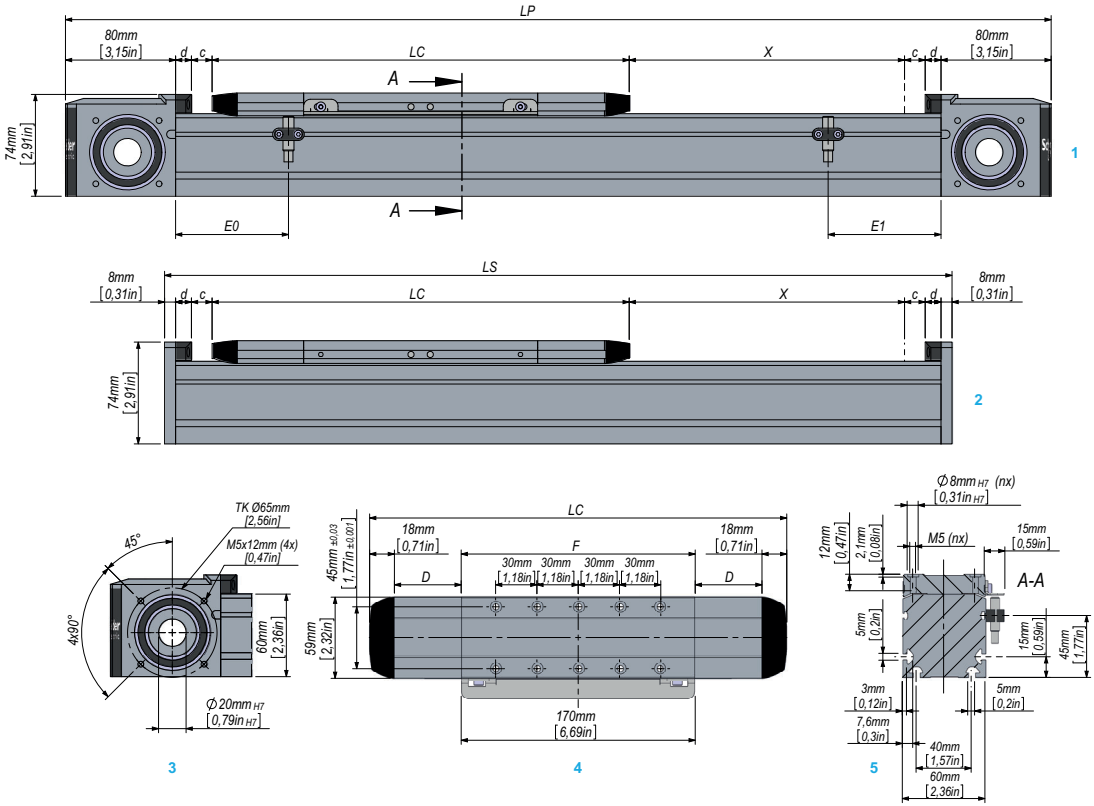


In order to limit deflection of the axis at long strokes, the axis must be supported. The diagram presents the deflection f [mm (in)] of the axis with respect to the support distance S [mm (in)] and the acting force F [N (lbf)]. Excessive deflection reduces the service life of the axis.



NOTE: The graphics presents the deflection of the axis body with firmly clamped supporting points.

Dimensional Drawing of Lexium PAS42B



1 Portal axis
2 Support axis
3 End block
4 Carriage type 1 (types 2 and 4 have more tapped holes for mounting)
5 Section of axis

Parameter	Dimension	Unit	Value for Lexium PAS42B and Lexium PAS42H					
			Carriage type 1		Carriage type 2		Carriage type 4	
			without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Total length of portal axis(1)	LP	mm (in)	396 + X (15.6 + X)	516 + X (20.3 + X)	456 + X (18 + X)	576 + X (22.7 + X)	576 + X (22.7 + X)	696 + X (27.4 + X)
Total length of support axis	LS	mm (in)	252 + X (10 + X)	372 + X (14.6 + X)	312 + X (12.3 + X)	432 + X (17 + X)	432 + X (17 + X)	552 + X (21.7 + X)
Stroke	X	–	See technical data					
Carriage length	LC	mm (in)	206 (8.1)	303 (12)	266 (10.5)	363 (14.3)	386 (15.2)	483 (19)
Profile length of carriage	F	mm (in)	170 (6.7)		230 (9)		350 (13.8)	
Number of tapped holes for mounting(2)	n	–	10		14		22	
Distance between tapped holes		mm (in)	30 +/- 0.03 (1.18 +/- 0.00118)		30 +/- 0.03 (1.18 +/- 0.00118)		30 +/- 0.03 (1.18 +/- 0.00118)	
Sensor position at drive end	E0	mm (in)	33 (1.3)	93 (3.66)	33 (1.3)	93 (3.66)	33 (1.3)	93 (3.66)
Sensor position opposite drive end	E1	mm (in)	33 (1.3)	93 (3.66)	93 (3.66)	153 (6)	213 (8.4)	273 (10.7)
Stroke reserve up to mechanical stop	c	mm (in)	15 (0.59)					
Length of cover strip clamp	d	mm (in)	–	11.5 (0.45)	–	11.5 (0.45)	–	11.5 (0.45)
Deflection of cover strip	D	mm (in)	–	48.5 (1.9)	–	48.5 (1.9)	–	48.5 (1.9)
Minimum distance between two carriages	–	mm (in)	40 (1.57)	90 (3.54)	40 (1.57)	90 (3.54)	40 (1.57)	90 (3.54)

(1) For a axis with more than one carriage, add the carriage length (LC) and the distance between the carriages for each additional carriage.
(2) Prepared for locating dowels. For suitable locating dowels, refer to *Replacement Equipment* *(see page 207)*.

Lexium PAS43B and Lexium PAS43H

Overview

Here you will find the following information:

- Mechanical data of Lexium PAS43BR *(see page 74)*
- Mechanical data of Lexium PAS43HR *(see page 76)*
- Characteristic curves of Lexium PAS43BR *(see page 77)*
- Mechanical data of Lexium PAS43BB *(see page 81)*
- Mechanical data of Lexium PAS43HB *(see page 84)*
- Characteristic curves of Lexium PAS43BB *(see page 84)*
- Dimensional drawing of Lexium PAS43B *(see page 89)*

Mechanical Data of Lexium PAS43BR

NOTE: The maximum forces and torques are calculated to a service life of 30,000 km (18,641 mi) and can be exceeded. For an application-specific calculation of the service life of the axis, refer to *Service Life* *(see page 103)*.

Parameter	Unit	Value for Lexium PAS43BR					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Toothed belt	–	30HTD5 width: 30 mm (1.18 in), profile: HTD, pitch 5 mm (0.197 in)					
Type of guide	–	Roller guide					
Carriage length	mm (in)	244 (9.6)	364 (14.3)	314 (12.4)	434 (17)	454 (18)	574 (22.6)
Feed constant	mm/rev (in/rev)	205 (8)					
Effective diameter toothed belt pulley	mm (in)	65.254 (2.57)					
Maximum feed force Fx_{max} (1)	N (lbf)	1100 (247)					
Maximum velocity (2)	m/s (ft/s)	8 (26)					

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

Parameter	Unit	Value for Lexium PAS43BR					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Maximum acceleration(2)	m/s^2 (ft/s^2)	20 (66)					
Maximum drive torque M_{max}(1)	Nm (lbf–in)	36 (319)					
Breakaway torque 0-stroke axis	Nm (lbf–in)	2.5 (22)					
Breakaway torque per additional carriage	Nm (lbf–in)	0.3 (2.66)					
Moment of inertia 0-stroke axis	$kg·cm^2$ ($lb·in^2$)	29.3 (10)	33.7 (11.5)	34.1 (11.7)	38.5 (13)	43.7 (15)	48.1 (16.4)
Moment of inertia per additional carriage	$kg·cm^2$ ($lb·in^2$)	20.1 (6.9)	24.4 (8.3)	24.9 (8.5)	29.2 (10)	34.6 (11.8)	38.9 (13.3)
Moment of inertia per m (in) of stroke	$kg·cm^2$ ($lb·in^2$)	2.5 (0.85)					
Moment of inertia per kg (lb) payload	$kg·cm^2$ ($lb·in^2$)	10.7 (3.66)					
Maximum force Fy(1)	Nm (lbf–in)	1760 (395.66)					
Maximum force Fz(1)	Nm (lbf–in)	1040 (233.80)					
Maximum torque carriage Mx(1)	Nm (lbf–in)	29 (257)					
Maximum torque carriage My(1)	Nm (lbf–in)	51 (451)		87 (770)		160 (1434)	
Maximum torque carriage Mz(1)	Nm (lbf–in)	86 (761)		148 (1310)		271 (2399)	
Mass 0-stroke axis	kg (lb)	8.9 (19.6)	10.6 (23.4)	9.9 (22)	11.6 (25.6)	11.9 (26)	13.6 (30)

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

Parameter	Unit	Value for Lexium PAS43BR					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Mass per additional carriage (with axis body)	kg (lb)	3.8 (8.4)	5.2 (11.5)	4.8 (10.6)	6.2 (13.7)	6.8 (15)	8.2 (18)
Mass per m (in) of stroke	kg (lb)	8 (17.6)					
Moving mass carriage	kg (lb)	1.9 (4.2)	2.3 (5.1)	2.4 (5.3)	2.8 (6.2)	3.3 (7.3)	3.7 (8.2)
Maximum stroke(3)	mm (in)	5600 (220)	5450 (215)	5530 (218)	5380 (208)	5390 (212)	5240 (206)
Minimum stroke(4)	mm (in)	175 (6.9)					
Position repeatability(2)	mm (in)	+/- 0.05 (0.00197)					

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

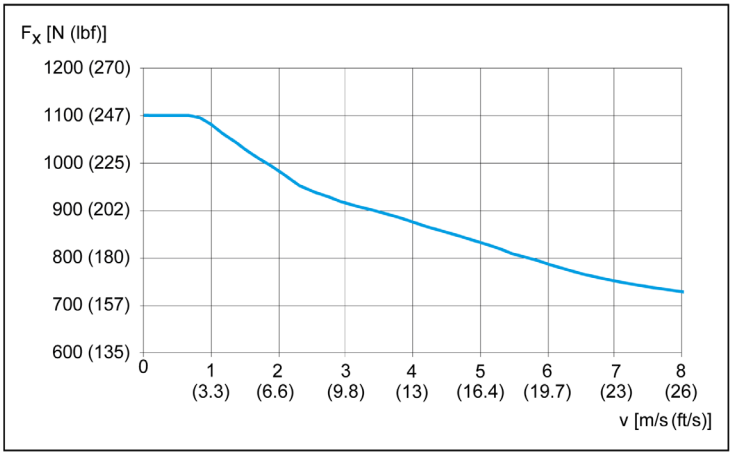
Mechanical Data of Lexium PAS43HR

Parameter	Unit	Value for Lexium PAS43HR					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Breakaway force	N (lbf)	10 (2.25)					
Breakaway force per additional carriage	N (lbf)	10 (2.25)					
Mass 0-stroke axis	kg (lb)	5 (11)	6.7 (14.8)	6 (13.2)	7.7 (17)	8 (17.6)	9.7 (21.4)

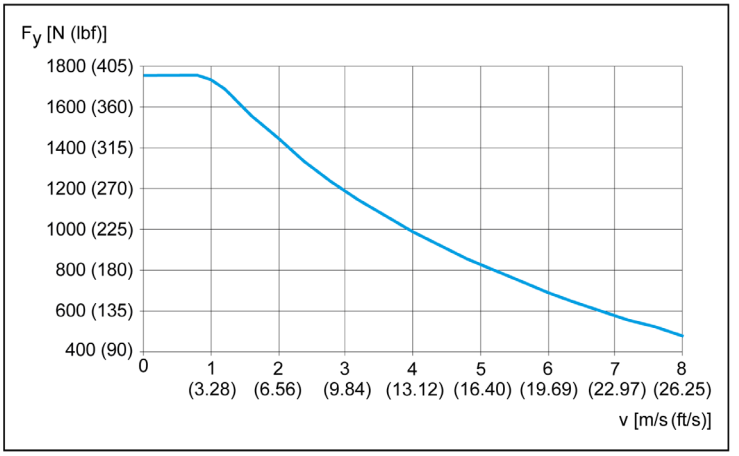
For further data (if applicable), refer to Lexium PAS43BR.

Characteristic Curves of Lexium PAS43BR

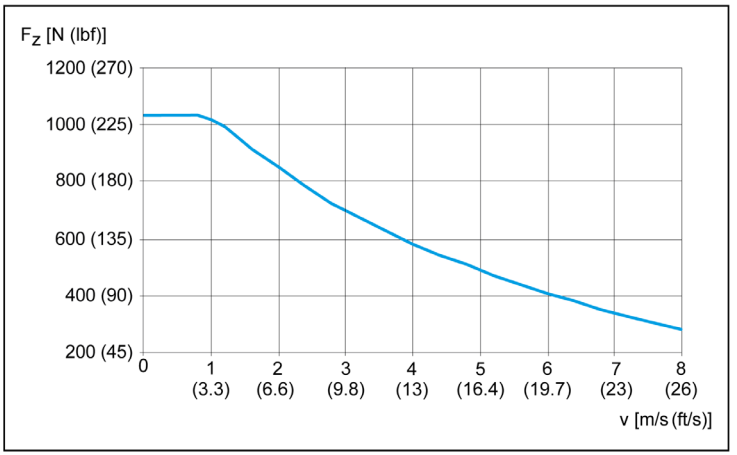
Maximum feed force Fx_{max}



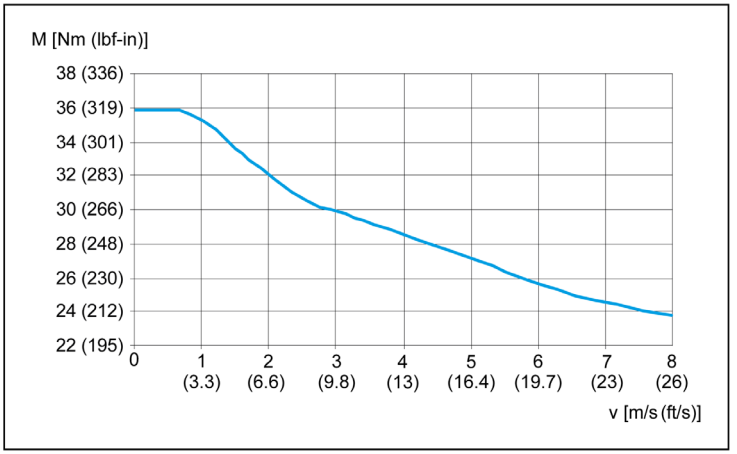
Maximum force Fy



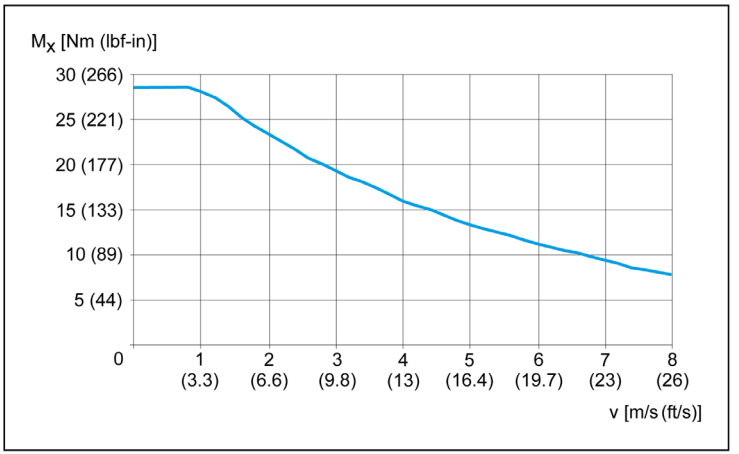
Maximum force Fz



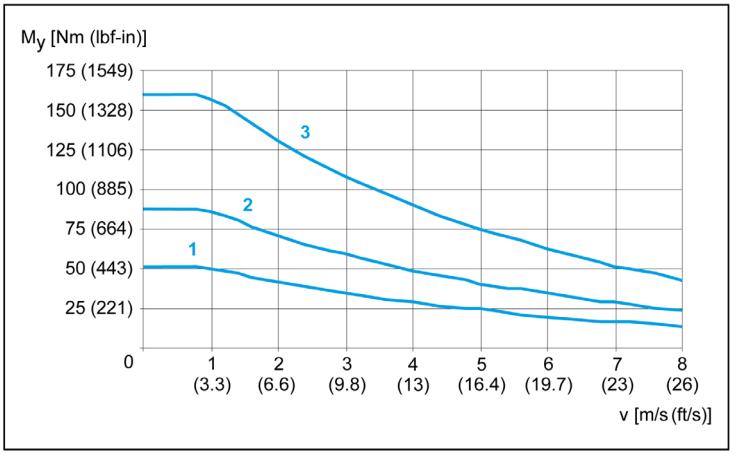
Maximum drive torque M_{max}



Maximum torque carriage Mx

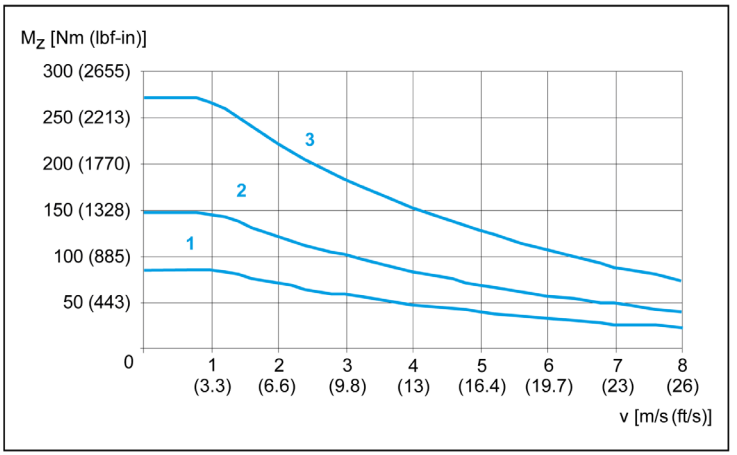


Maximum torque carriage My



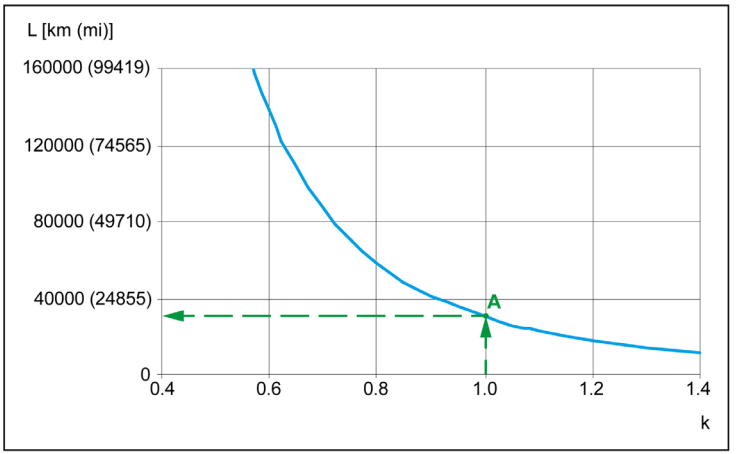
1 Carriage type 1
2 Carriage type 2
3 Carriage type 4

Maximum torque carriage Mz



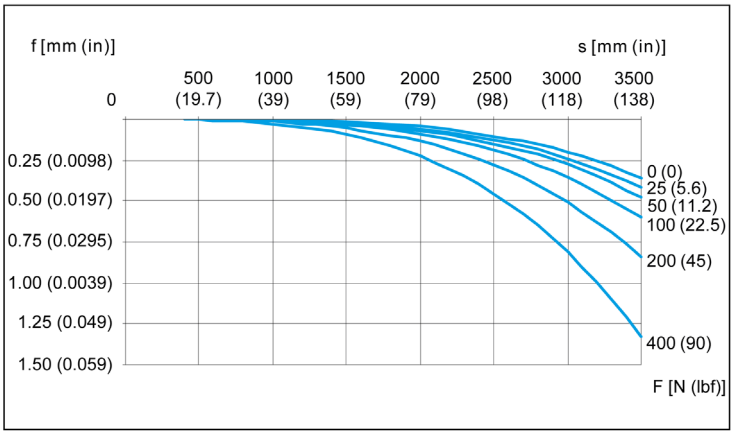
1 Carriage type 1
2 Carriage type 2
3 Carriage type 4

Service life

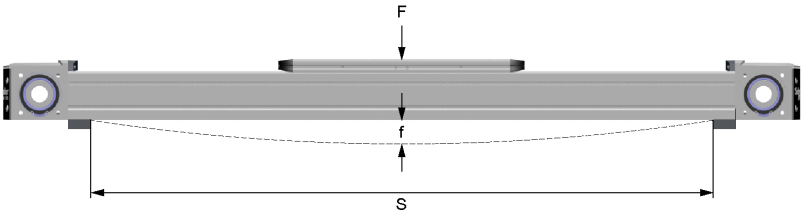


A The forces and torques (Fy, Fz, Mx, Mz, My) are calculated for an expected service life of 30,000 km (18,641 mi). This is shown with k factor equal 1.0 in the graphic.

Maximum deflection



In order to limit deflection of the axis at long strokes, the axis must be supported. The diagram presents the deflection f [mm (in)] of the axis with respect to the support distance S [mm (in)] and the acting force F [N (lbf)]. Excessive deflection reduces the service life of the axis.



NOTE: The graphics presents the deflection of the axis body with firmly clamped supporting points.

Mechanical Data of Lexium PAS43BB

NOTE: The maximum forces and torques are calculated to a service life of 30,000 km (18,641 mi) and can be exceeded. For an application-specific calculation of the service life of the axis, refer to *Service Life* *(see page 103)*.

Parameter	Unit	Value for Lexium PAS43BB					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Toothed belt	–	30HTD5 width: 30 mm (1.18 in), profile: HTD, pitch 5 mm (0.197 in)					
Type of guide	–	Recirculating ball bearing guide					
Carriage length	mm (in)	244 (9.6)	364 (14.3)	314 (12.4)	434 (17)	454 (18)	574 (22.6)
Feed constant	mm/rev (in/rev)	205 (8)					
Effective diameter toothed belt pulley	mm (in)	65.254 (2.57)					
Maximum feed force Fx_{max} (1)	N (lbf)	1100 (247)					
Maximum velocity (2)	m/s (ft/s)	5 (16.4)					
Maximum acceleration (2)	m/s^2 (ft/s^2)	50 (164)					
Maximum drive torque M_{max} (1)	Nm (lbf–in)	36 (319)					
Breakaway torque 0-stroke axis	Nm (lbf–in)	3.5 (31)					
Breakaway torque per additional carriage	Nm (lbf–in)	1.3 (11.5)					
Moment of inertia 0-stroke axis	$kg \cdot cm^2$ ($lb \cdot in^2$)	31.1 (10.6)	35.5 (12.1)	35.1 (12)	39.5 (13.5)	43.5 (15)	47.9 (16.4)
Moment of inertia per additional carriage	$kg \cdot cm^2$ ($lb \cdot in^2$)	21.9 (7.5)	26.2 (9)	25.9 (8.9)	30.2 (10.3)	34.3 (11.7)	38.6 (13.2)
Moment of inertia per m (in) of stroke	$kg \cdot cm^2$ ($lb \cdot in^2$)	2.5 (0.85)					
Moment of inertia per kg (lb) payload	$kg \cdot cm^2$ ($lb \cdot in^2$)	10.7 (3.66)					

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

Parameter	Unit	Value for Lexium PAS43BB					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Maximum force Fy(1)	Nm (lbf–in)	4410 (991.41)					
Maximum force Fz(1)	Nm (lbf–in)	4410 (991.41)					
Maximum torque carriage Mx(1)	Nm (lbf–in)	42 (372)					
Maximum torque carriage My(1)	Nm (lbf–in)	162 (1416)		379 (3354)		687 (6080)	
Maximum torque carriage Mz(1)	Nm (lbf–in)	162 (1434)		379 (3354)		687 (6080)	
Mass 0-stroke axis	kg (lb)	9.9 (21.8)	11.8 (26)	10.7 (23.6)	12.6 (28)	12.7 (28)	14.6 (32)
Mass per additional carriage (with axis body)	kg (lb)	4.3 (9.5)	5.9 (13)	5.4 (12)	7 (15.4)	7.5 (16.5)	9.1 (20)
Mass per m (in) of stroke	kg (lb)	9.5 (21)					
Moving mass carriage	kg (lb)	2.1 (4.6)	2.5 (5.5)	2.5 (5.5)	2.9 (6.4)	3.2 (7)	3.7 (8.2)
Maximum stroke(3)	mm (in)	5600 (220)	5450 (215)	5530 (218)	5380 (212)	5390 (212)	5240 (206)
Minimum stroke(4)	mm (in)	11 (0.43)					
Position repeatability(2)	mm (in)	+/- 0.05 (0.00197)					

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

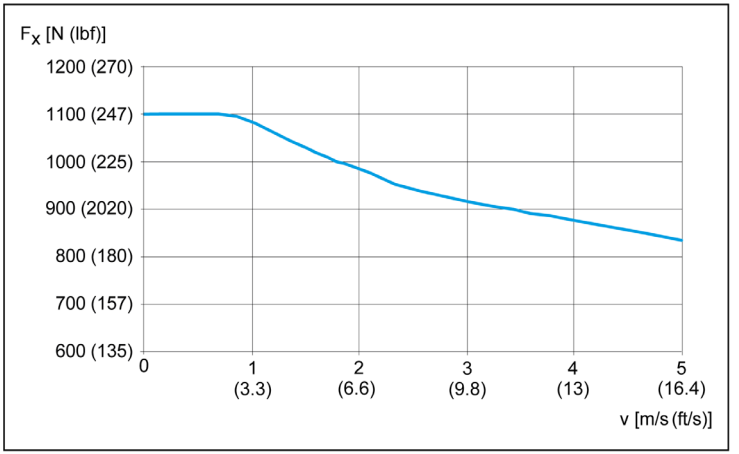
Mechanical Data of Lexium PAS43HB

Parameter	Unit	Value for Lexium PAS43HB					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Breakaway force	N (lbf)	40 (9)					
Breakaway force per additional carriage	N (lbf)	40 (9)					
Mass 0-stroke axis	kg (lb)	5.6 (12.3)	7.5 (16.5)	6.6 (14.6)	8.5 (18.7)	8.7 (19)	10.6 (23.4)

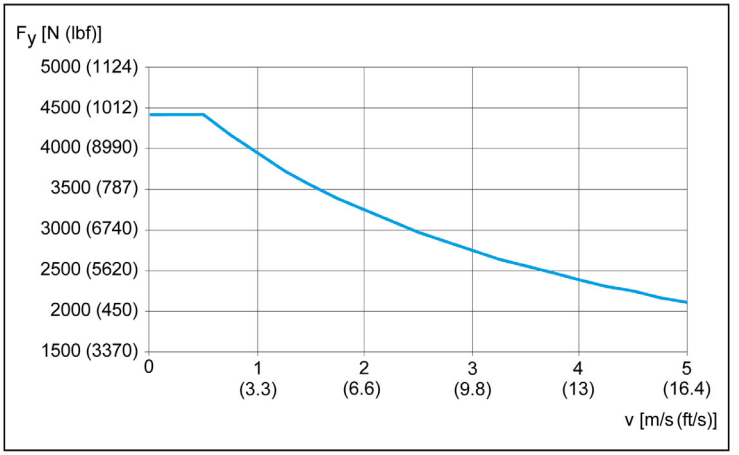
For further data (if applicable), refer to Lexium PAS43BB.

Characteristic Curves of Lexium PAS43BB

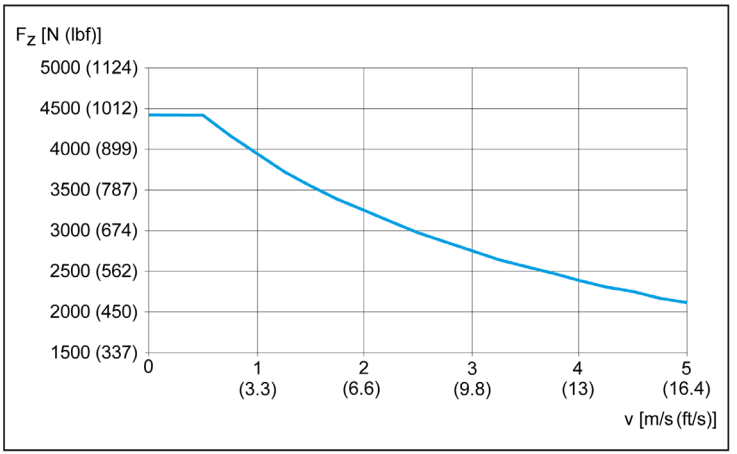
Maximum feed force Fx_{max}



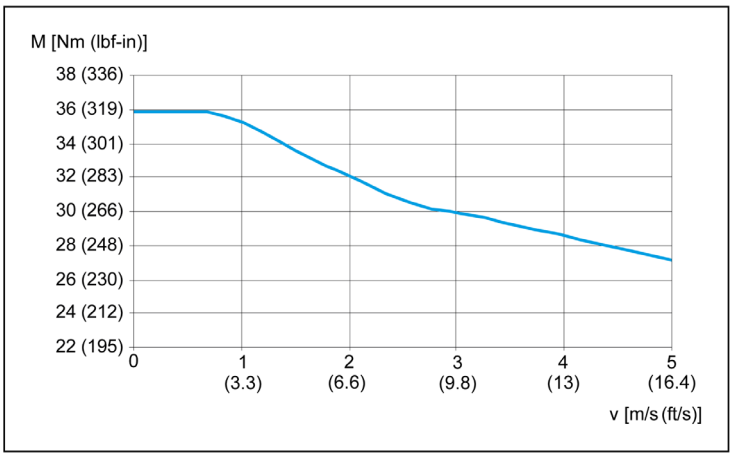
Maximum force Fy



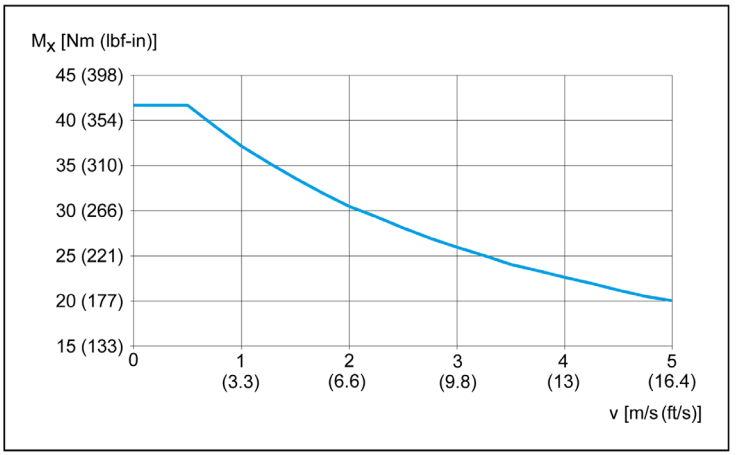
Maximum force Fz



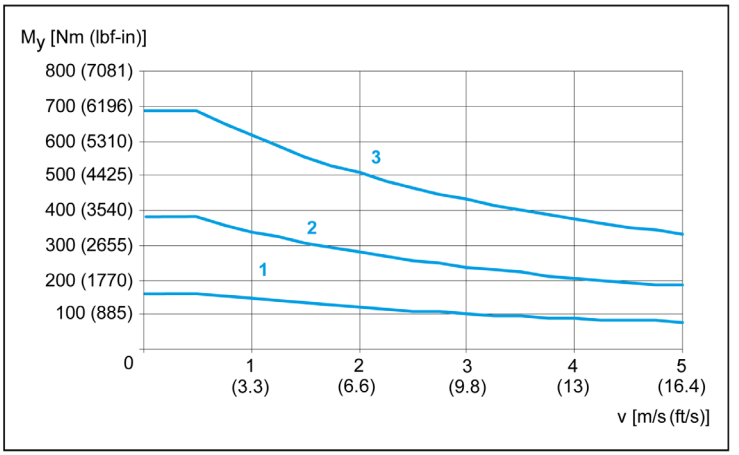
Maximum drive torque M_{max}



Maximum torque carriage Mx

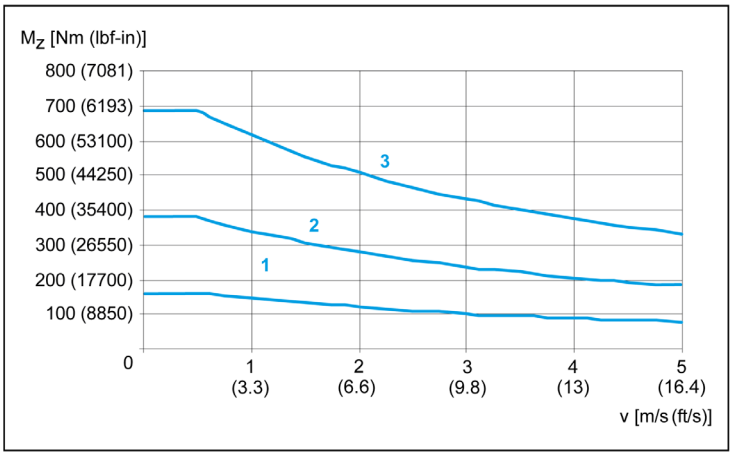


Maximum torque carriage My



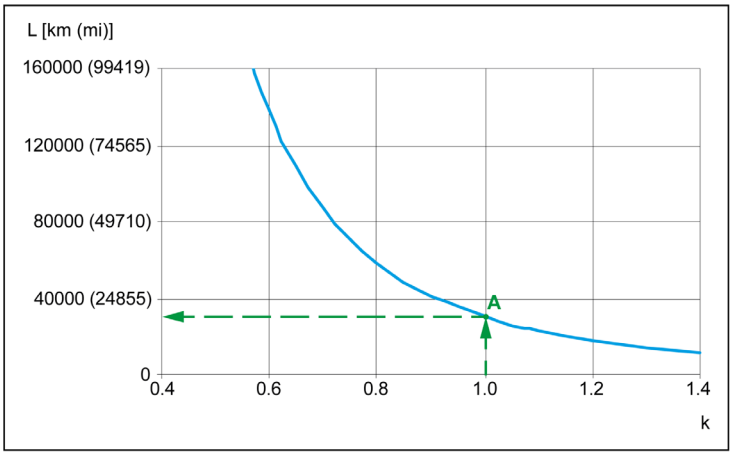
1 Carriage type 1
2 Carriage type 2
3 Carriage type 4

Maximum torque carriage Mz



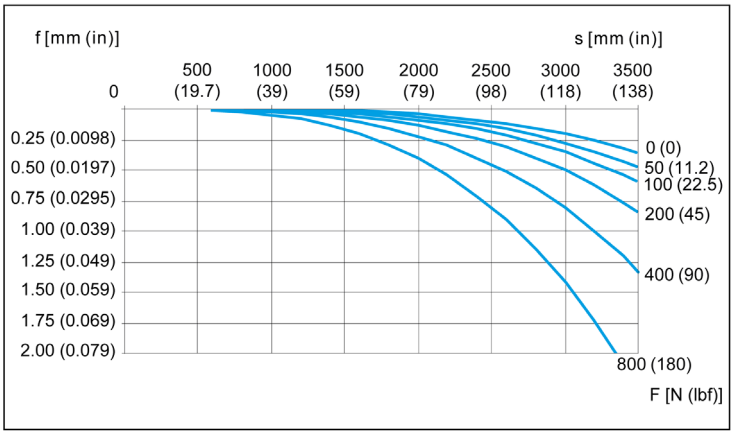
1 Carriage type 1
2 Carriage type 2
3 Carriage type 4

Service life

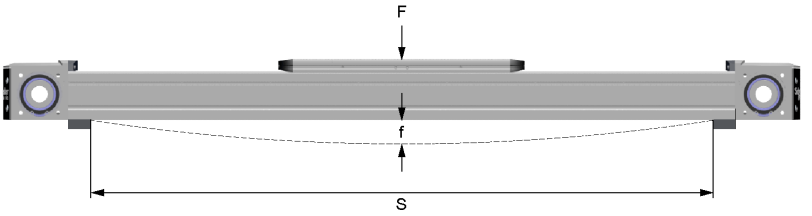


A The forces and torques (Fy, Fz, Mx, Mz, My) are calculated for an expected service life of 30,000 km (18,641 mi). This is shown with k factor equal 1.0 in the graphic.

Maximum deflection

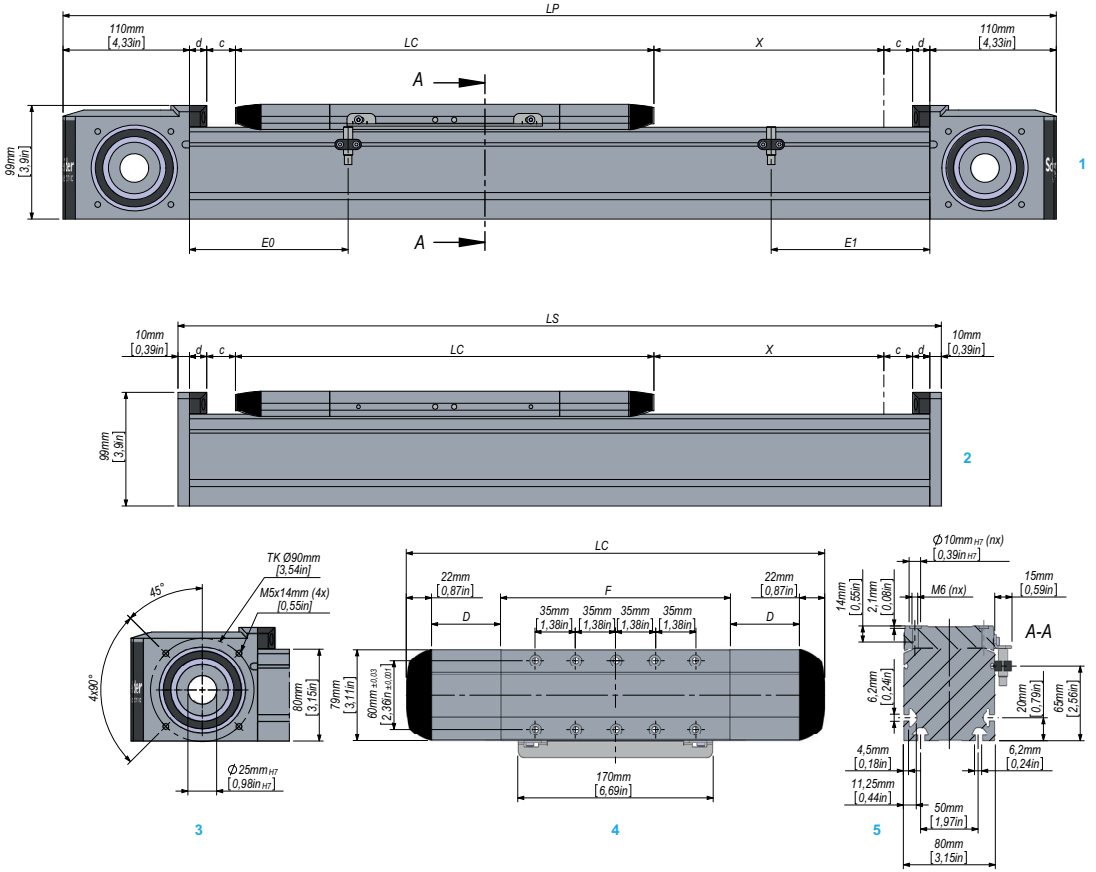


In order to limit deflection of the axis at long strokes, the axis must be supported. The diagram presents the deflection f [mm (in)] of the axis with respect to the support distance S [mm (in)] and the acting force F [N (lbf)]. Excessive deflection reduces the service life of the axis.



NOTE: The graphics presents the deflection of the axis body with firmly clamped supporting points.

Dimensional Drawing of Lexium PAS43B



1 Portal axis
2 Support axis
3 End block
4 Carriage type 1 (types 2 and 4 have more tapped holes for mounting)
5 Section of axis

Parameter	Dimension	Unit	Value for Lexium PAS43B and Lexium PAS43H					
			Carriage type 1		Carriage type 2		Carriage type 4	
			without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Total length of portal axis(1)	LP	mm (in)	514 + X (20.2 + X)	664 + X (26 + X)	584 + X (23 + X)	734 + X (29 + X)	724 + X (28.5 + X)	874 + X (34.4 + X)
Total length of support axis	LS	mm (in)	314 + X (12.4 + X)	464 + X (18.3 + X)	384 + X (15 + X)	534 + X (21 + X)	524 + X (20.6 + X)	674 + X (26.5 + X)
Stroke	X	–	See technical data					
Carriage length	LC	mm (in)	244 (9.6)	364 (14.3)	314 (12.4)	434 (17)	454 (18)	574 (22.6)
Profile length of carriage	F	mm (in)	200 (7.9)		270 (10.6)		410 (16)	
Number of tapped holes for mounting(2)	n	–	10		14		22	
Distance between tapped holes	–	mm (in)	35 +/- 0.03 (1.38 +/- 0.00118)		35 +/- 0.03 (1.38 +/- 0.00118)		35 +/- 0.03 (1.38 +/- 0.00118)	
Sensor position at drive end	E0	mm (in)	63 (2.48)	138 (5.43)	63 (2.48)	138 (5.43)	63 (2.48)	138 (5.43)
Sensor position opposite drive end	E1	mm (in)	63 (2.48)	138 (5.43)	133 (5.24)	208 (8.19)	273 (10.75)	348 (13.70)
Stroke reserve up to mechanical stop	c	mm (in)	25 (0.98)					
Length of cover strip clamp	d	mm (in)	–	15 (0.59)	–	15 (0.59)	–	15 (0.59)
Deflection of cover strip	D	mm (in)	–	60 (2.36)	–	60 (2.36)	–	60 (2.36)
Minimum distance between two carriages	–	mm (in)	45 (1.77)	110 (4.3)	45 (1.77)	110 (4.3)	45 (1.77)	110 (4.3)

(1) For a axis with more than one carriage, add the carriage length (LC) and the distance between the carriages for each additional carriage.
(2) Prepared for locating dowels. For suitable locating dowels, refer to *Replacement Equipment* *(see page 207)*.

Lexium PAS44BB and Lexium PAS44HB

Overview

Here you will find the following information:

- Mechanical data of Lexium PAS44BB *(see page 91)*
- Mechanical data of Lexium PAS44HB *(see page 93)*
- Characteristic curves of Lexium PAS44BB *(see page 94)*
- Dimensional drawing of Lexium PAS44BB *(see page 99)*

Mechanical Data of Lexium PAS44BB

NOTE: The maximum forces and torques are calculated to a service life of 30,000 km (18,641 mi) and can be exceeded. For an application-specific calculation of the service life of the axis, refer to *Service Life* *(see page 103)*.

Parameter	Unit	Value for Lexium PAS44BB					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Toothed belt	–	50HTD8 width: 50 mm (1.97 in), profile: HTD, pitch 8 mm (0.315 in)					
Type of guide	–	Recirculating ball bearing guide					
Carriage length	mm (in)	310 (12.2)	470 (18.5)	400 (15.7)	560 (22)	580 (23)	740 (29)
Feed constant	mm/rev (in/rev)	264 (10.4)					
Effective diameter toothed belt pulley	mm (in)	84.034 (3.3)					
Maximum feed force Fx_{max} (1)	N (lbf)	2600 (585)					
Maximum velocity (2)	m/s (ft/s)	5 (16.4)					
Maximum acceleration (2)	m/s^2 (ft/s^2)	50 (164)					
Maximum drive torque M_{max} (1)	Nm (lbf–in)	110 (974)					

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

Parameter	Unit	Value for Lexium PAS44BB					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Breakaway torque 0-stroke axis	Nm (lbf–in)	4.5 (40)					
Breakaway torque per additional carriage	Nm (lbf–in)	2.1 (18.6)					
Moment of inertia 0-stroke axis	$kg \cdot cm^2$ ($lb \cdot in^2$)	105.1 (36)	121.2 (41.4)	120.9 (41)	137 (47)	153.1 (52)	169.2 (58)
Moment of inertia per additional carriage	$kg \cdot cm^2$ ($lb \cdot in^2$)	73.5 (25)	89.6 (30.6)	89.3 (30.5)	105.4 (36)	121.5 (41.5)	137.6 (47)
Moment of inertia per m (in) of stroke	$kg \cdot cm^2$ ($lb \cdot in^2$)	11.2 (3.8)					
Moment of inertia per kg (lb) payload	$kg \cdot cm^2$ ($lb \cdot in^2$)	17.7 (6)					
Maximum force Fy(1)	Nm (lbf–in)	6270 (1410)					
Maximum force Fz(1)	Nm (lbf–in)	6270 (1410)					
Maximum torque carriage Mx(1)	Nm (lbf–in)	68 (602)					
Maximum torque carriage My(1)	Nm (lbf–in)	256 (2266)		655 (5797)		1209 (10701)	
Maximum torque carriage Mz(1)	Nm (lbf–in)	256 (2266)		655 (5797)		1209 (10701)	
Mass 0-stroke axis	kg (lb)	21 (46)	25.4 (56)	23.4 (52)	27.8 (61)	28.1 (62)	32.5 (72)
Mass per additional carriage (with axis body)	kg (lb)	9.3 (20.5)	12.9 (28.4)	11.7 (26)	15.3 (34)	16.5 (36.4)	20.1 (44)
Mass per m (in) of stroke	kg (lb)	16.9 (37)					

(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table.
(2) Depending on load and stroke.
(3) For information about greater strokes, contact your local Schneider Electric representative.
(4) Required for lubrication of the linear guide.

Parameter	Unit	Value for Lexium PAS44BB					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Moving mass carriage	kg (lb)	4.2 (9.3)	5.1 (11.2)	5.1 (11.2)	6 (13.2)	6.9 (15.2)	7.8 (17.2)
Maximum stroke(3)	mm (in)	5510 (217)	5310 (209)	5420 (213)	5220 (206)	5240 (206)	5040 (198)
Minimum stroke(4)	mm (in)	13 (0.51)					
Position repeatability(2)	mm (in)	+/- 0.0 (0.00197)					
(1) Maximum permissible forces and torques decrease at increasing velocities. Refer to the characteristic curves following this table. **(2)** Depending on load and stroke. **(3)** For information about greater strokes, contact your local Schneider Electric representative. **(4)** Required for lubrication of the linear guide.							

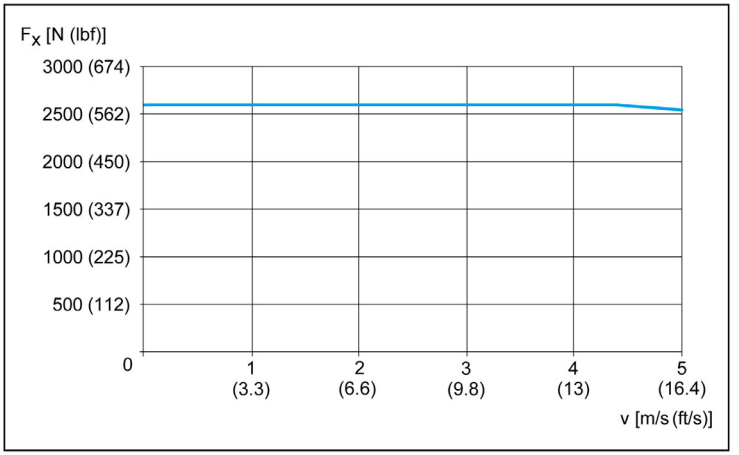
Mechanical Data of Lexium PAS44HB

Parameter	Unit	Value for Lexium PAS44HB					
		Carriage type 1		Carriage type 2		Carriage type 4	
		without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Breakaway force	N (lbf)	50 (11.2)					
Breakaway force per additional carriage	N (lbf)	50 (11.2)					
Mass 0-stroke axis	kg (lb)	12.8 (28)	17.1 (38)	15.2 (33.5)	19.5 (9451)	20 (44)	24.3 (54)

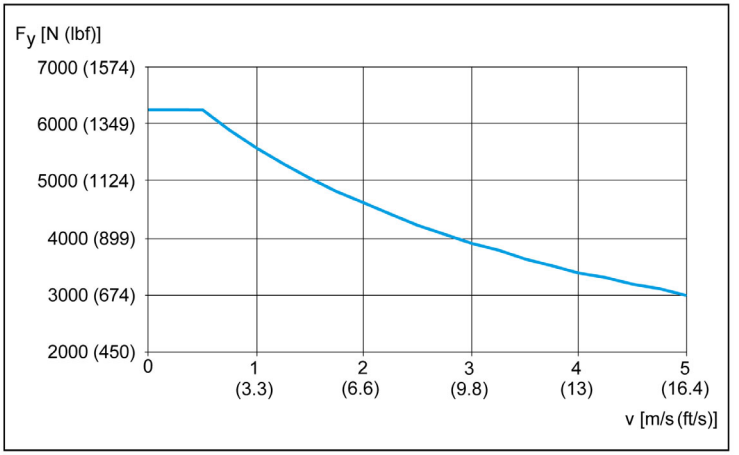
For further data (if applicable), refer to Lexium PAS44BB.

Characteristic Curves of Lexium PAS44BB

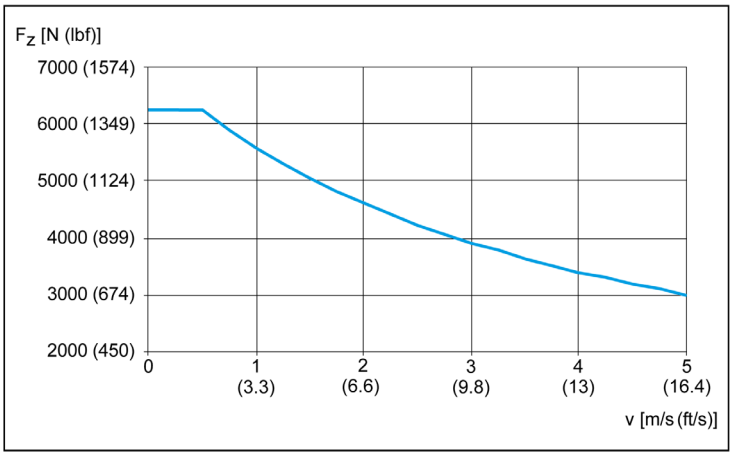
Maximum feed force Fx_{max}



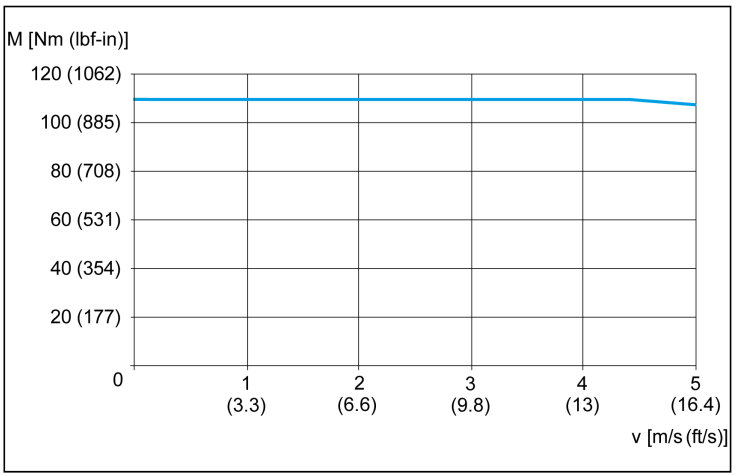
Maximum force carriage Fy



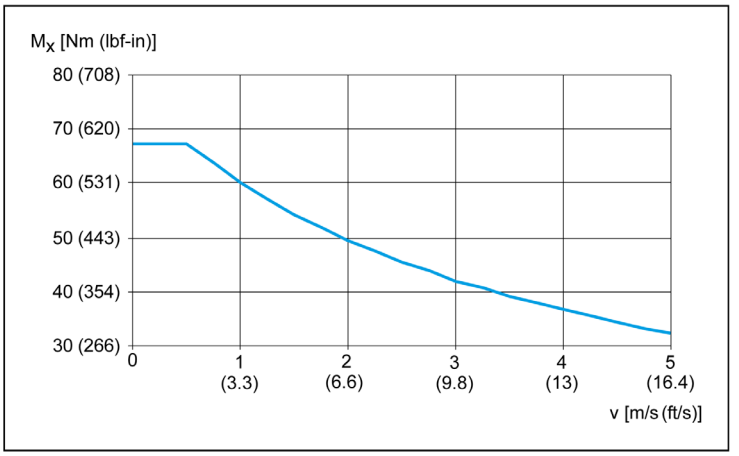
Maximum force Fz



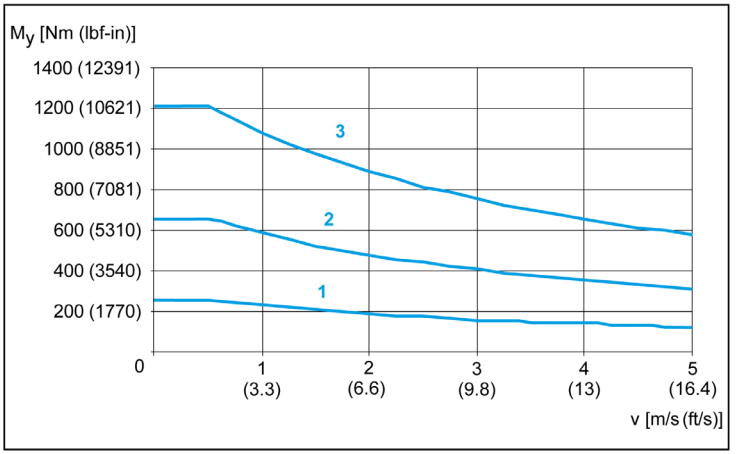
Maximum drive torque M_{max}



Maximum torque carriage Mx

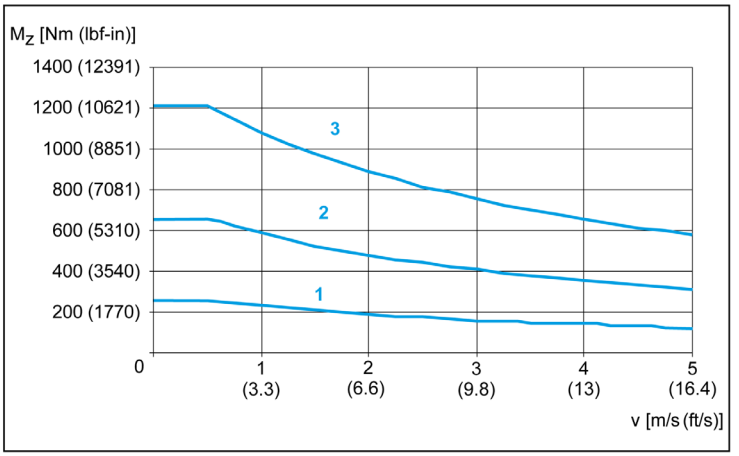


Maximum torque carriage My



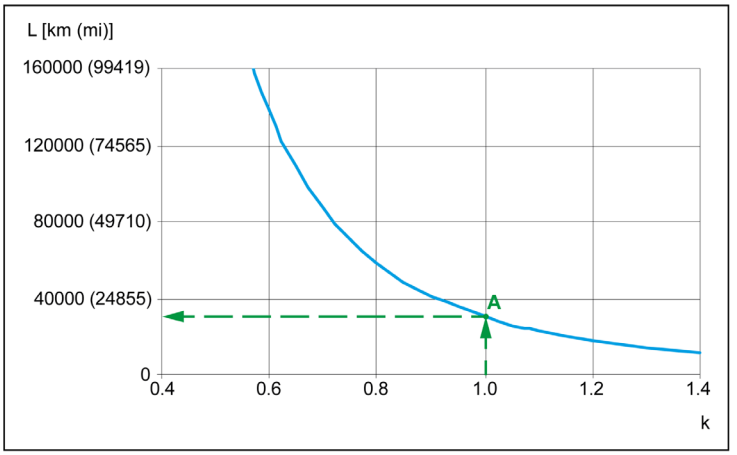
1 Carriage type 1
2 Carriage type 2
4 Carriage type 4

Maximum torque carriage Mz



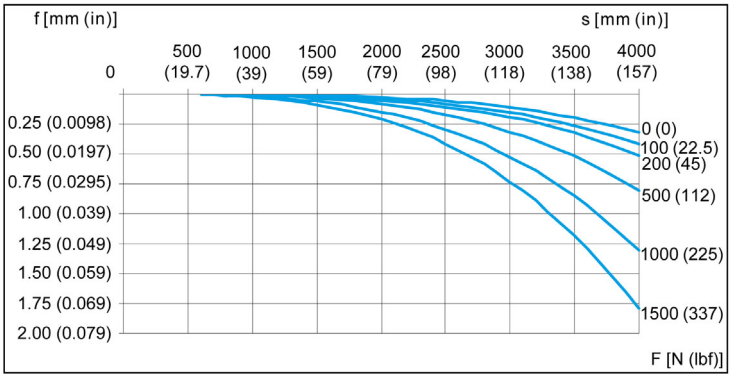
1 Carriage type 1
2 Carriage type 2
4 Carriage type 4

Service life

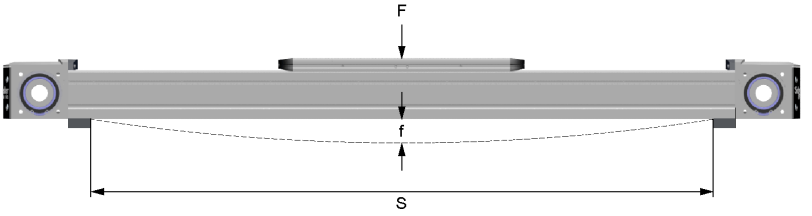


A The forces and torques (Fy, Fz, Mx, Mz, My) are calculated for an expected service life of 30,000 km (18,641 mi). This is shown with k factor equal 1.0 in the graphic.

Maximum deflection

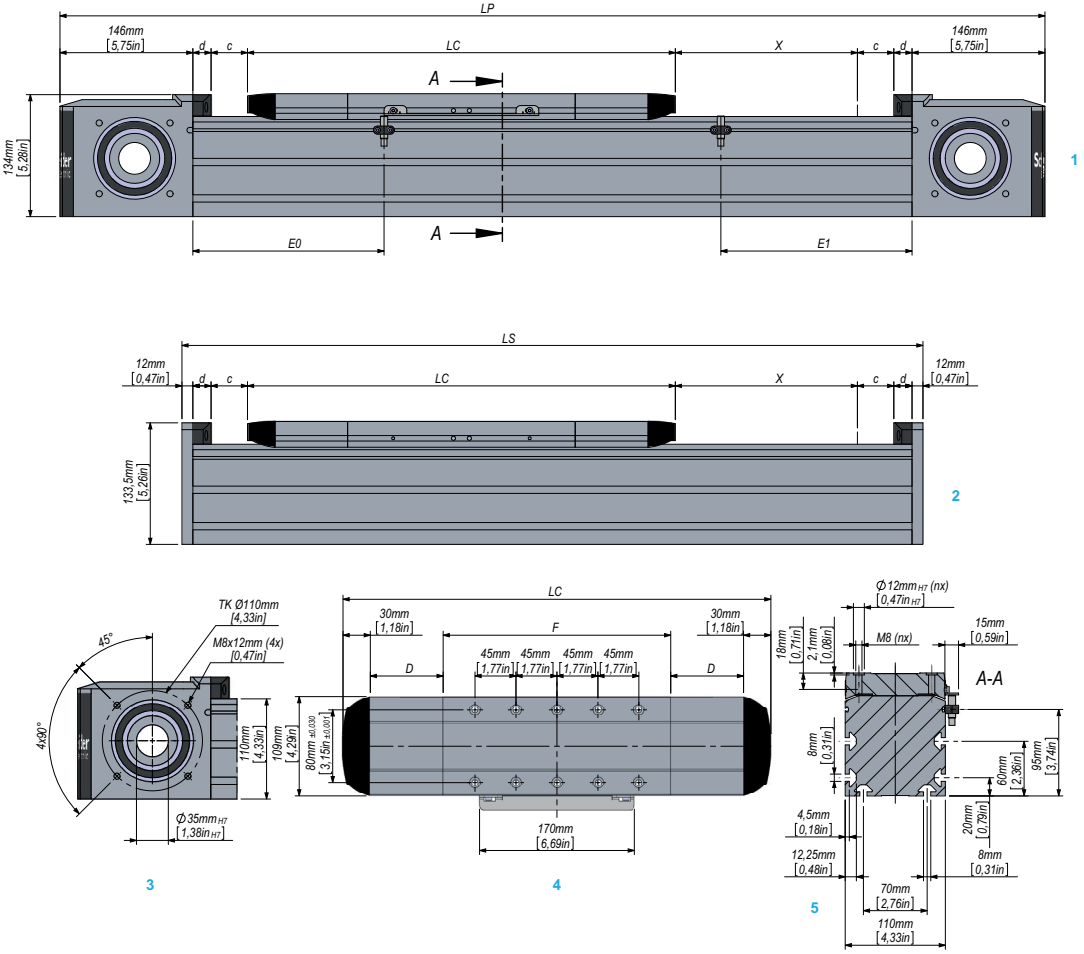


In order to limit deflection of the axis at long strokes, the axis must be supported. The diagram presents the deflection f [mm (in)] of the axis with respect to the support distance S [mm (in)] and the acting force F [N (lbf)]. Excessive deflection reduces the service life of the axis.



NOTE: The graphics presents the deflection of the axis body with firmly clamped supporting points.

Dimensional Drawing of Lexium PAS44BB



1 Portal axis
2 Support axis
3 End block
4 Carriage type 1 (types 2 and 4 have more tapped holes for mounting)
5 Section of axis

Parameter	Dimension	Unit	Lexium PAS44BB					
			Carriage type 1		Carriage type 2		Carriage type 4	
			without cover strip	with cover strip	without cover strip	with cover strip	without cover strip	with cover strip
Total length of portal axis(1)	LP	mm (in)	682 + X (27 + X)	882 + X (35 + X)	772 + X (30.4 + X)	972 + X (38 + X)	952 + X (37.5 + X)	1152 + X (45 + X)
Total length of support axis	LS	mm (in)	414 + X (16.3 + X)	614 + X (24 + X)	504 + X (20 + X)	704 + X (27.7 + X)	684 + X (27 + X)	884 + X (35 + X)
Stroke	X	mm (in)	See technical data					
Carriage length	LC	mm (in)	310 (12.2)	470 (18.5)	400 (15.7)	560 (22)	580 (23)	740 (29)
Profile length of carriage	F	mm (in)	250 (9.8)		340 (13.4)		520 (20.5)	
Number of tapped holes for mounting(2)	n	–	10		14		22	
Distance between tapped holes	–	mm (in)	45 +/- 0.03 (1.77 +/- 0.00118)		45 +/- 0.03 (1.77 +/- 0.00118)		45 +/- 0.03 (1.77 +/- 0.00118)	
Sensor position at drive end	E0	mm (in)	110 (4.3)	210 (8.3)	110 (4.3)	210 (8.3)	110 (4.3)	210 (8.3)
Sensor position opposite drive end	E1	mm (in)	110 (4.3)	210 (8.3)	200 (7.9)	300 (11.8)	380 (15)	480 (19)
Stroke reserve up to mechanical stop	c	mm (in)	40 (1.57)					
Length of cover strip clamp	d	mm (in)	–	20 (0.79)	–	20 (0.79)	–	20 (0.79)
Deflection of cover strip	D	mm (in)	–	80 (3.15)	–	80 (3.15)	–	80 (3.15)
Minimum distance between two carriages	–	mm (in)	55 (2.17)	135 (2.17)	55 (2.17)	135 (5.3)	55 (2.17)	135 (5.3)

(1) For a axis with more than one carriage, add the carriage length (LC) and the distance between the carriages for each additional carriage.
(2) Prepared for locating dowels. For suitable locating dowels, refer to *Replacement Equipment* *(see page 207)*.

Section 3.3
Design of the Axis Frame

Design of the Axis Frame

System Requirements

The Lexium PAS4•B-Series is designed for horizontal installation particularly, but can also be mounted in other orientations. For special applications, contact your local Schneider Electric service representative.

- Take into account the mass of the axis that may act as a load, depending on the mounting position (vertical / tilted).
- Use only the axis body to mount the axis to the frame and ensure that the carriage is clear of any other parts and do not interfere with the operation of the machine.

The precision of the axis in the application is also determined by the frame. Deformations of the frame cause imprecisions on the Tool Center Point (TCP).

General Requirements Regarding the Frame

The frame must not only withstand permanently the forces and torques described below, but also have sufficient stiffness so that the deformations and vibrations which occur do not lead to any major deviations on the TCP. Ensure a sufficient transverse bracing in the frame.

Note the forces and torques to be taken up by the frame during normal operation:

- Consider that forces and torques operating the frame change when you modify the stroke length.
- The configuration of the axis mechanism, the speed, the acceleration, as well as the connected payload, affect the total energy, and may possibly cause damage.

NOTE: Fasten the axis with screws of property class 8.8 or greater. For more information, refer to the respective dimensional drawing in *Mechanical Data* *(see page 46)*.

⚠ WARNING

CRUSHING, SHEARING, CUTTING AND IMPACT INJURY

- The axis must be operated only within an enclosure.
- Open or enter the enclosure for cleaning and maintenance purposes only.
- Design the enclosure such that it withstands an impact by the axis and that it resists ejected parts from escaping the zone of operation.
- Design the enclosure such that the axis is safely deactivated as soon as a person enters the zone of operation of the axis.
- All barriers, protective doors, contact mats, light barriers, and so on, must be configured correctly and enabled whenever the axis mechanics are under power.
- Define the clearance distance to the zone of operation of the axis such that operational staff do not have access to, nor can be enclosed in, the axis mechanics zone of operation.
- Design the enclosure to account for the maximum possible travel paths of the axis; that is, the maximum path until the hardware safety system limits as well as the additional run-on paths, in case of a power interruption.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Interference Contours in the Enclosure

Depending on the axis type, a sufficient freedom of movement of the moving parts must be ensured during the construction of the axis enclosure. Take into account the required space for the movement of the corresponding axis.

For more information, refer to the respective dimensional drawing in *Mechanical Data* *(see page 46)*.

For detailed information about the interference areas caused by axis motions, refer to the 3D-CAD data on the Schneider Electric homepage (*www.schneider-electric.com*) or contact your local Schneider Electric service representative.

Section 3.4
Service Life

Service Life

Presentation

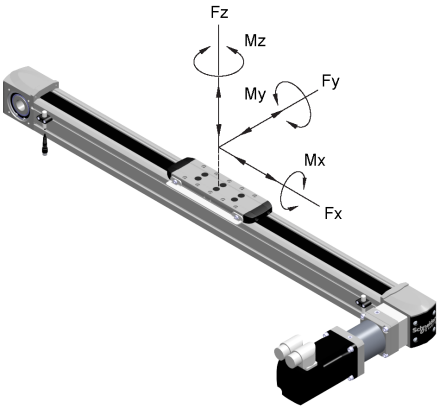
The service life of the linear guide of the axis is a function of the mean forces and torques that act in the system. If they act simultaneously, the load factor k can be calculated with the following formula:

$$\frac{Fy}{Fymax} + \frac{Fz}{Fzmax} + \frac{Mx}{Mxmax} + \frac{My}{Mymax} + \frac{Mz}{Mzmax} = k$$

The application-specific load values are entered in the numerator.

The denominator contains the maximum forces and torques of the axis. These forces and torques decrease at increasing velocities. For more information, refer to the respective characteristic curves of the forces and torques for the axis in *Mechanical Data* *(see page 46)*.

The following graphic presents the acting forces and torques on the axis.



The service life of the axis can be approximated by using the respective service life characteristic curve and the load factor k. Refer to *Mechanical Data* *(see page 46)* for the respective characteristic curve.

Chapter 4
Transport and Commissioning

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
4.1	Transport and Unpacking	106
4.2	Mechanical Installation	110
4.3	Electrical Installation	115
4.4	Initial Start-Up	117
4.5	Mounting the Payload	122

Section 4.1
Transport and Unpacking

What Is in This Section?

This section contains the following topics:

Topic	Page
Transport and Storage	107
Unpacking	108

Transport and Storage

Transport

The Lexium PAS4•B-Series must be handled with care. Shocks and impacts may damage the axis. Damage may lead to reduced running accuracy, reduced service life, or to inoperable equipment.

The axis is pre-assembled before transport.

The axis is transported in a wooden box or a cardboard box. The respective box dimensions vary according to the dimensions of the axis and the order quantity.

For detailed information about transport conditions, refer to *Ambient Conditions* *(see page 42)*.

Storage

The Lexium PAS4•B-Series can be stored inside the packaging or unpacked. In both cases, ensure that it is stored in a sheltered and dry place. Avoid humidity which can have corrosive effects on the axis.

NOTE: When stored unpacked, the axis needs to be on a level surface.

For detailed information about storage conditions, refer to *Ambient Conditions* *(see page 42)*.

Unpacking

Overview

Before you start to unpack and position the axis, pay special attention to the accident prevention regulations and the safety regulations.

⚠ WARNING

CRUSHING, SHEARING, CUTTING AND HITTING DURING HANDLING

- Observe the general construction and safety regulations for handling and assembly.
- Use appropriate mounting and transport equipment and use appropriate tools.
- Prevent clamping and crushing by taking appropriate precautions.
- Cover edges and angles to protect against cutting damage.
- Wear suitable protective clothing (for example, protective goggles, protective boots, protective gloves).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

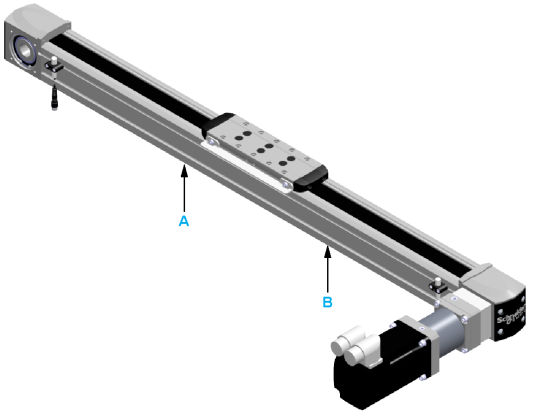
FALLING HEAVY LOAD

- If a motor and/or gearbox is mounted to the axis, simultaneously lift with one hand the axis and with the other hand the motor.
- Do not lift the axis only at the motor and/or gearbox.
- Use a suitable crane or other suitable lifting gear for mounting the axis if this is required by the mass of the product.

Failure to follow these instructions can result in injury or equipment damage.

Unpacking

Step	Action
1	Transport the axis in its packaging as close as possible to the installation site.
2	In case of a wooden box, unscrew the bolts on the lid of the box. In case of a cardboard box, open the box with appropriate tools.
3	Verify the axis for transport damage.

Step	Action
4	Lift up the axis at points A and B and remove the cardboard box or wooden box. The distance between the end block and point A and between the end block and point B must be one fourth of the total length of the axis. If an axis with a mounted motor and/or gearbox is lifted, points A and B are to be moved to balance the load. **NOTE:** ● Support the motor and/or gearbox when lifting the axis. ● Do not lift the axis at the motor and/or gearbox only. 

NOTE: In case of any transport damages, contact your local Schneider Electric service representative.

Section 4.2
Mechanical Installation

What Is in This Section?

This section contains the following topics:

Topic	Page
Information About Installation	111
Mounting the Axis	112

Information About Installation

Overview

Proceed with care during the following steps in order to help to prevent the following points:

- Injuries and material damage
- Incorrect installation and programming of components
- Incorrect operation of components
- Use of non-authorized cables or modified components

For further Information, refer to *Specific Safety Information* *(see page 15)*.

Accessibility for Servicing

When installing the axis, the motor, the gearbox, and the sensors, then consider that these components may have to be accessed for servicing.

Standard Tightening Torques

The following tightening torques apply to mounting the payload and fastening slot nuts, clamping claws, contact plate, motor, gearbox, and adaption material with hex socket screws.

Thread	Hex key size in mm (in)	Maximum tightening torque in Nm (lbf-in)
M3	2.5 (0.098)	1.1 (9.7)
M4	3 (0.118)	2.5 (22)
M5	4 (0.157)	5 (44)
M6	5 (0.197)	8.5 (75)
M8	6 (0.236)	21 (186)
M10	8 (0.315)	42 (372)
M12	10 (0.39)	70 (620)

Special tightening torques apply, for example, for mounting sensors or elastomer couplings. These special tightening torques are stated at the respective steps.

Mounting the Axis

Overview

To install the axis to the installation surface, either use clamping claws (lateral fastening) or slot nuts (bottom or lateral fastening) for the T-Slots at the axis body.

If the lateral T-slots are used for installation, the sensor cable cannot be routed in the T-slots.

For information about appropriate clamping claws and slot nuts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

⚠ WARNING

GREAT MASS OR FALLING PARTS

- Use a suitable crane or other suitable lifting gear for mounting the axis if this is required by the mass of the product.
- Use the necessary personal protective equipment (for example, safety shoes, safety glasses and protective gloves).
- Mount the axis in such a way (tightening torque, securing screws) that parts cannot come loose, even in the case of shocks and vibration.
- Take all necessary measures to avoid unanticipated movements of the axis mounted in vertical or tilted positions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

INCORRECT INSTALLATION

- If motors with a cross section greater than the cross section of the axis body are used, the axis must be supported or the installation surface must be cut out as required.
- The greater the load or the demands on the running accuracy, the shorter the distance that must be between the slot nuts or the clamping claws.
- Do not mount the axis at the end blocks.

Failure to follow these instructions can result in equipment damage.

Running Accuracy

The length of the axis can have an impact on the running accuracy. A long axis may bend more easily, which can cause a reduced running accuracy. When installing the axis, ensure that the axis has full contact to the installation surface.

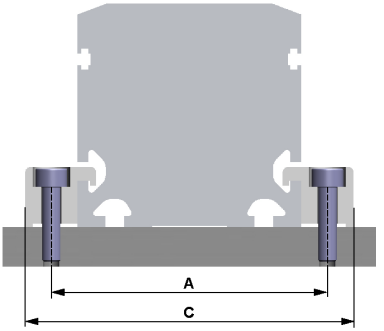
The end blocks protrude beyond the axis body at the ends. The end blocks must not be the only parts supported by the installation surface.

Dimensions for Mounting

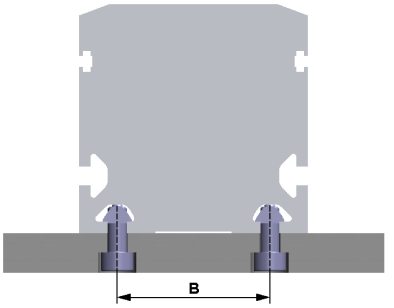
The axis body of the Lexium PAS4•B-Series is an extruded aluminum profile.The axis can be mounted to a frame by using appropriate clamping claws or slot nuts for the T-slots at the axis body.

The T-Slots are located on:

- Both sides of the axis body
- Bottom side of the axis body



1



2

1 Fastening with clamping claws
2 Fastening with slot nuts

When installing the axis, take into account the tapped hole distance for the slot nuts or screws.

The following table presents the tapped hole distance and appropriate screws:

Description	Parameter	Unit	Value			
			PAS41	PAS42	PAS43	PAS44
Tapped hole distance(1)	A	mm (in)	54 (2.13)	74 (2.9)	96 (3.8)	130 (5.1)
	B		20 (0.79)	40 (1.57)	50 (1.97)	70 (2.76)
Clamping claw width	C		68 (2.7)	88 (3.46)	112 (4.4)	150 (5.9)
Slot nut type	–		5 (0.197)	5 (0.197)	6 (0.236)	8 (0.315)
Screw – ISO 4762	–	–	M5	M5	M6	M6 / M8
(1) For further information, refer to the respective dimensional drawing in *Mechanical Data* *(see page 46)*.						

NOTE: For PAS42 / PAS43: The T-Slots on the bottom side of the axis body are not symmetrical.

The following table presents the maximum distances per side at medium loads for mounting the axis with clamping claws or slot nuts:

Fastening material	Unit	Value			
		PAS41	PAS42	PAS43	PAS44
Clamping claws	mm (in)	400 (15.7)	600 (23.6)	800 (31.5)	1000 (39)
Slot nuts		400 (15.7)	600 (23.6)	800 (31.5)	1000 (39)

NOTE: The greater the load or the demands on the running accuracy, the shorter the distance that must be between the slot nuts or the clamping claws.

Prerequisites

You need the following tools to mount the axis:
- Set of hex keys
- Torque wrench with a set of hexagon sockets
- Dial gauge

NOTE: Do not use ball head hex keys. Excessive torque may cause the ball head to break away. A broken ball head makes the removal of the screw difficult.

For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Mounting the Axis

NOTE: When mounting the axis, keep in mind that it may have to be accessed for maintenance.

Step	Action
1	Ensure that the planarity of the installation surface does not exceed 0.1 mm/m (0.0012 in/ft).
2	Carefully position the axis on its installation surface.
3	Tighten the fastening screws of the clamping claws or slot nuts with a low tightening torque.
4	Provide a reference plane alongside the axis body.
5	Place a dial gauge onto the carriage.
6	Move the carriage and record the deviation regarding the reference plane over the entire stroke.
7	Correct the deviations by lateral alignment of the axis and by tightening the screws appropriately. **NOTE:** Observe the standard tightening torques *(see page 111)*.

Section 4.3
Electrical Installation

Electrical Installation

Cabling the Axis

Step	Action
1	Connect the motor. For details about connecting the motor, refer to the corresponding motor manual.
2	If applicable, connect the sensors. For details about sensor connections, refer to *Technical Data of the Sensors* *(see page 139)*.
3	Verify for a correct routing and fixing of the cables to prevent any collision of cables and moving parts.

⚠ ⚠ DANGER

LOOSE WIRING OR CABLING CAUSES ELECTRIC SHOCK

Tighten wiring or cabling connections in conformance with the torque specifications.

Failure to follow these instructions will result in death or serious injury.

Grounding the Axis

The following components of the axis have to be grounded:

- Motor (for more information about grounding the motor, refer to the corresponding motor manual)
- All costumer attachments

Bolt ground cables to the ground connections at the axis (symbol IEC 60417 - 5019).

NOTE: When grounding the axis, use cables that respect the local standards that are in vigor, for example, cables that conform to NEC 70 / NFPA 79 in the USA.

⚠ ⚠ DANGER

ELECTRIC SHOCK DUE TO IMPROPER GROUNDING

- Ground axis components in accordance with local, regional and/or national standards and regulations at a single, central point.
- Verify whether the motor is connected to the central ground.

Failure to follow these instructions will result in death or serious injury.

Multipoint grounding is permissible if connections are made to an equipotential ground plane-dimensioned to help avoid cable shield damage in the event of power system short-circuit currents.

Section 4.4
Initial Start-Up

What Is in This Section?

This section contains the following topics:

Topic	Page
Verifying the Installation	118
Start-Up	120

Verifying the Installation

Overview

Verify that the axis is installed correctly. For more information, refer to *Specific Safety Information* *(see page 15)*.

Pay special attention to:

- Properly bolted mechanical parts.
- Installation and wiring of the axis. Make sure that the mains connection and the 24 V connection are wired correctly.
- Connection of all protective ground (earth) cables.
- Use of correct fuses.
- Isolation of all unused cable ends.
- Installation and connection of all cables and connectors.
- Installation of sensors.
- Function of sensors as required.
- Unobstructed movement of the carriage with the contact plate for the sensors along the entire travel length.

⚠ ⚠ DANGER

ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires except under the specific conditions specified in the appropriate hardware guide for this equipment.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Operate electrical components only with a connected protective ground (earth) cable.
- After the installation, verify the secure connection of the protective ground (earth) cable to all electrical devices to ensure that connection complies with the connection diagram.
- Before enabling the device, cover the live components to prevent contact.
- Do not touch the electrical connection points of the components when the module is energized.
- Provide protection against indirect contact (EN 50178).
- Insulate the unused conductors on both ends of the motor cable.

Failure to follow these instructions will result in death or serious injury.

⚠ ⚠ DANGER

LOOSE WIRING OR CABLING CAUSES ELECTRIC SHOCK

Tighten wiring or cabling connections in conformance with the torque specifications.

Failure to follow these instructions will result in death or serious injury.

⚠ ⚠ DANGER

ELECTRIC SHOCK DUE TO IMPROPER GROUNDING

- Ground axis components in accordance with local, regional and/or national standards and regulations at a single, central point.
- Verify whether the motor is connected to the central ground.

Failure to follow these instructions will result in death or serious injury.

Multipoint grounding is permissible if connections are made to an equipotential ground plane dimensioned to help avoid cable shield damage in the event of power system short-circuit currents.

Start-Up

Overview

When the axis is operated for the first time, there is a risk of unintended equipment operation caused by possible wiring errors or unsuitable parameters.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Verify that the axis is properly fastened so it cannot come loose even in the case of fast acceleration.
- Take all necessary measures to ensure that the moving parts of the axis cannot move in an unanticipated way.
- Verify that emergency stop equipment is operational and within reach of the zone of operation.
- Verify that the system is free and ready for the movement before starting the system.
- Run initial tests at reduced velocity.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

If the motor power supply is disabled unintentionally, for example as a result of power outage, errors or functions, the motor is no longer decelerated in a controlled way.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Verify that movements without braking effect cannot cause injuries or equipment damage.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The motor, gearbox, and adaptation materials of the axis may exceed 70 °C (158 °F) during operation.

⚠ WARNING

HOT SURFACES

- Avoid unprotected contact with hot surfaces.
- Do not allow flammable or heat-sensitive parts in the immediate vicinity of hot surfaces.
- Verify that the heat dissipation is sufficient by performing a test run under maximum load conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

For further information, refer to *Hot Surfaces (see page 24)*.

NOTE: Perform a start-up in case of an already configured axis when it is used under modified operating conditions. For more information, refer to *Specific Safety Information* *(see page 15)*.

Commissioning Procedure

Step	Action
1	Verify the installation. For more information, refer to *Verifying the Installation* *(see page 118)*.
2	Comply with the instructions provided in the manual of the motor and/or gearbox used and in the manual of the drives used.
3	Verify that the loads conform to the appropriate, specified forces and torques for the axis and the machine it contains before operating the axis.
4	Limit the maximum torque of the motor in accordance with the maximum drive torque of the axis.
5	Verify the function of the sensors. The integrated LED must indicate the switching state correctly.
6	Verify the distance between the sensors and the mechanical stops. The movement must be stopped by the sensors before reaching a mechanical stop.
7	Perform initial tests at reduced velocity. During these tests, verify that the controller responds without any error or warning message to the signals of the sensors in both directions of movement. **NOTE:** Consider that the forward movement is stopped on a trigger signal of the forward overtravelling sensor and conversely.
8	Verify that the ambient conditions conform to the appropriate, specified environments for the axis and the machine it contains. For details, refer to *Ambient Conditions* *(see page 42)*.

NOTE: The maximum permissible dynamic forces and torques decrease with increasing velocities. For more information, refer to the respective characteristic curves in *Mechanical Data* *(see page 46)*.

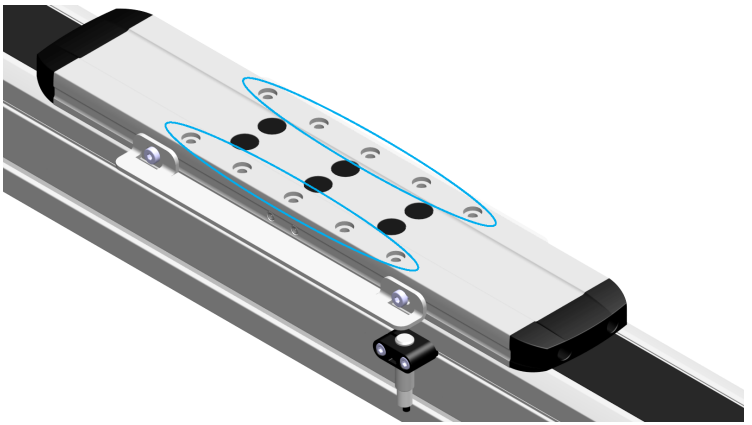
Section 4.5
Mounting the Payload

Mounting the Payload

Overview

To fasten the payload, fastening threads are provided at the carriage.

Each thread has a counterbore for a locating dowel for reproducible mounting of the payload. For a section view of the carriage, refer to the dimensional drawing of the corresponding axis in *Mechanical Data* *(see page 46)*.



For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Installation Parameters

The following table presents the installation parameters for mounting the payload to the carriage:

Description	Unit	Value			
		PAS41	PAS42	PAS43	PAS44
Thread size	–	M5	M5	M6	M8
Total depth (thread and counterbore for locating dowel)	mm (in)	12 (0.47)	12 (0.47)	14 (0.55)	18 (0.71)
Counterbore diameter for locating dowel	mm (in)	8 H7 (0.315)	8 H7 (0.315)	10 H7 (0.39)	12 H7 (0.47)
NOTE: For more information, refer to the respective dimensional drawing in *Mechanical Data* *(see page 46)*.					

Chapter 5
Optional Equipment

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
5.1	Motor and Gearbox	124
5.2	Sensors	138
5.3	Shaft Extension	147
5.4	Cover Strip	149

Section 5.1
Motor and Gearbox

What Is in This Section?

This section contains the following topics:

Topic	Page
Technical Data of Motor and Gearbox	125
Mounting the Motor and/or Gearbox	126

Technical Data of Motor and Gearbox

Overview

For more information about the motor, note the motor reference on the type plate *(see page 39)* and refer to the corresponding motor manual.

For more information about the gearbox, note the gearbox reference on the type plate *(see page 39)* and refer to the corresponding gearbox manual.

Mounting the Motor and/or Gearbox

Overview

Optionally, the axis is supplied with a pre-installed Schneider Electric motor and/or a gearbox.

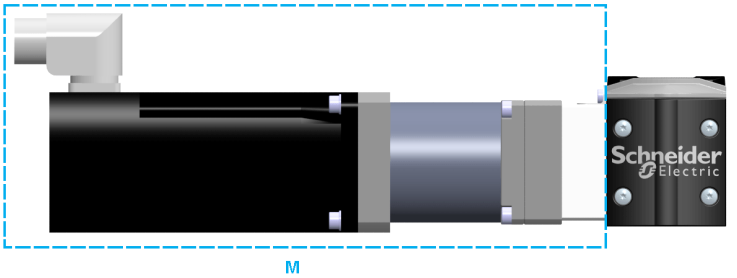
Mounting Position of Motor and Gearbox

In case of a new motor or gearbox, you can mount the new motor or gearbox to either side of the two end blocks. The motor and the gearbox can be mounted in different arrangements (turned in increments of 4 x 90°). For further information, refer to *Motor and/or Gearbox Orientation and Configuration* *(see page 38)*.

NOTE: The maximum mass of the installed parts is limited by the torque at the end block.

Maximum Mass

The mass of the motor and/or gearbox which can be mounted to the end block is limited.



M Mass at end block

The maximum mass of a motor and/or gearbox which can be mounted to the end block depends on the size of the corresponding axis. The following table presents the maximum permissible masses of a mounted motor and/or gearbox:

Parameter	Unit	Value			
		PAS41B	PAS42B	PAS43B	PAS44B
Maximum permissible mass	kg (lb)	4 (8.8)	15 (33)	25 (44)	40 (88)

⚠ WARNING

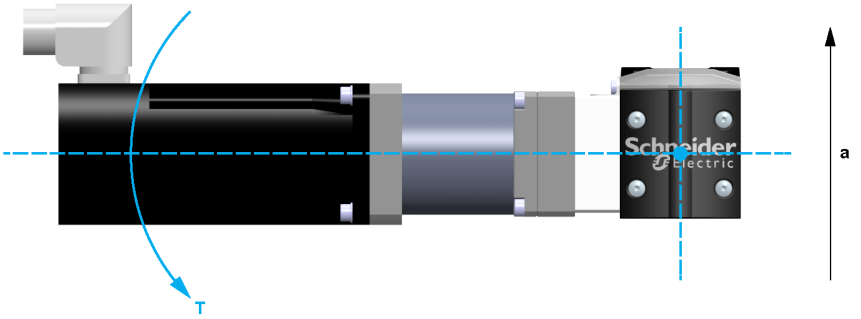
UNINTENDED EQUIPMENT OPERATION

Do not exceed the maximum permissible mass at the end block.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Maximum Torque

A mounted motor and/or gearbox causes a static overturning torque at the end block. In case of a lateral acceleration of the complete axis, the mounted motor and/or gearbox cause an additional dynamic overturning torque. The total of the static and dynamic overturning torque is limited by the maximum overturning torque of the end block



T Torque at the end block
a Lateral acceleration of the axis

The following table presents the maximum permissible torques of the mounted motor and/or gearbox at the end block:

Parameter	Unit	Value			
		PAS41B	PAS42B	PAS43B	PAS44B
Maximum permissible torque (total of static and dynamic)	Nm (lbf-in)	14 (124)	85 (752)	170 (1505)	360 (3186)

NOTE: The total of the static and dynamic torques must not exceed the maximum permissible torque at the end block.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Do not exceed the maximum permissible torque at the end block.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Third-Party Motors and Gearboxes

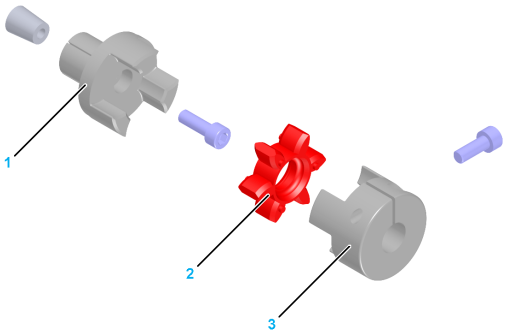
When choosing a third-party motor, take special care that the maximum drive torque is not exceeded. Otherwise the axis could be damaged or rendered inoperable.

⚠ WARNING
UNINTENDED MOVEMENTS Observe the maximum permissible drive torque of the corresponding motor. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

⚠ WARNING
FALLING HEAVY LOAD Observe the limitations for the maximum permissible mass and the maximum permissible torque of the mounted motor and/or gearbox. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

Coupling Assemblies for Motor and Gearbox Mounting

A coupling assembly is required to mount a motor or a gearbox to the axis. It consists of the following components:



1 Expanding hub
2 Elastomer spider
3 Clamping hub

Prerequisites

You need the following tools to mount the motor and/or the gearbox:

- Torque wrench with a set of hexagon sockets
- Caliper gauge (for distance measurement)

NOTE: Do not use ball head hex keys. Excessive torque may cause the ball head to break away. A broken ball head makes the removal of the screw difficult.

For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Procedure Overview

Perform the following procedures to mount the motor and/or the gearbox:

- Preparing the mounting of motor and gearbox *(see page 129)*
- Mounting the elastomer coupling *(see page 130)*
- Mounting the motor only *(see page 133)*
- Mounting the gearbox only *(see page 135)*
- Mounting the motor to the gearbox *(see page 137)*

Preparing the Mounting of Motor and Gearbox

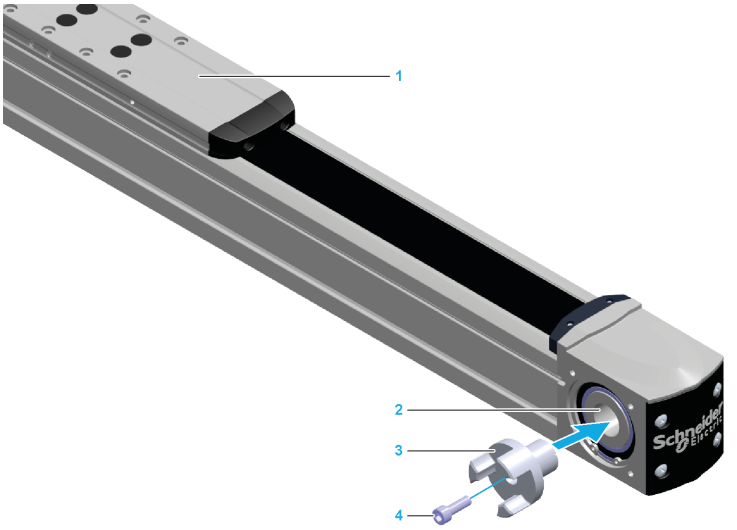
Step	Action
1	Clean all parts.
2	Inspect all parts for damage.

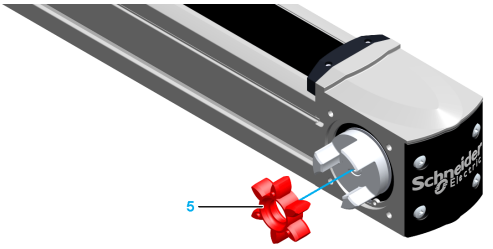
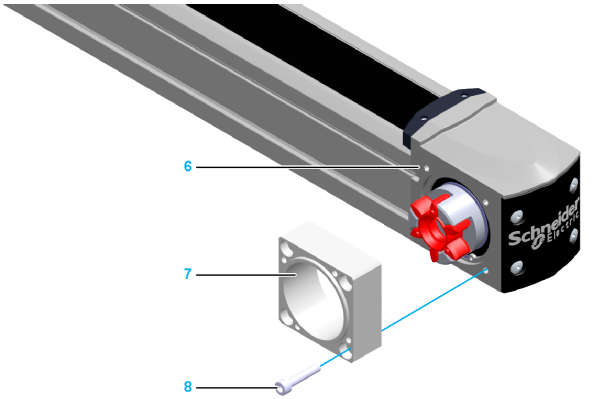
NOTE: Polluted or damaged parts may cause run-out which has an adverse effect on the service life of the axis.

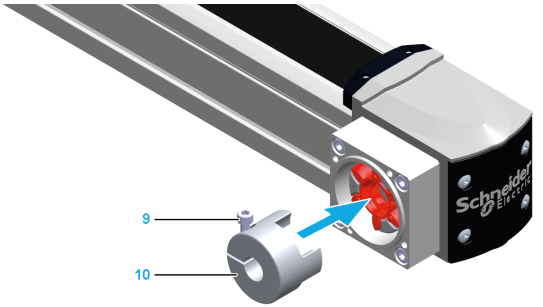
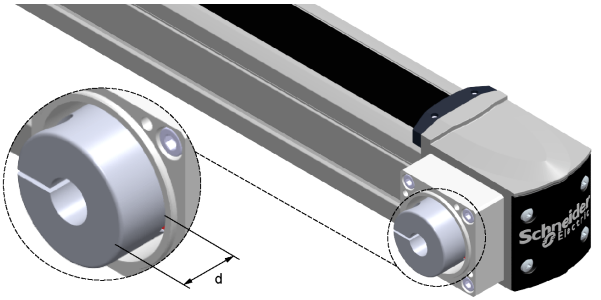
NOTICE
UNINTENDED EQUIPMENT OPERATION ● Replace any damaged parts immediately. ● Clean all parts before assembly and use. **Failure to follow these instructions can result in equipment damage.**

Mounting the Elastomer Coupling

If possible, position the axis such that the top of the carriage points upwards during installation.

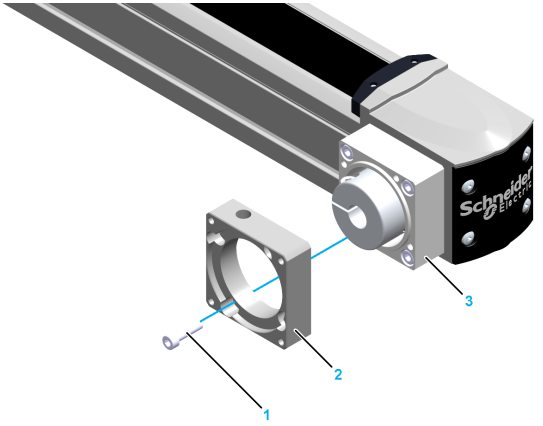
Step	Action
1	Manually move the carriage (1) into end position. 
2	Fit the expanding hub (3) into the hollow shaft of the toothed belt pulley (2). Verify that there is no clearance between the expanding hub and the toothed belt pulley such that the surfaces are flush.
3	Tighten the screw (4) of the expanding hub. Tightening torque: ● For PAS41: 2.9 Nm (25.7 lbf-in) ● For PAS42: 10 Nm (89 lbf-in) ● For PAS43: 25 Nm (221 lbf-in) ● For PAS44: 49 Nm (434 lbf-in) **NOTE:** As long as the toothed belt is installed correctly and the carriage is at the end position, the toothed belt pulley does not rotate further. For detailed information about toothed belt installation, refer to *Mounting the Toothed Belt* *(see page 191)*.

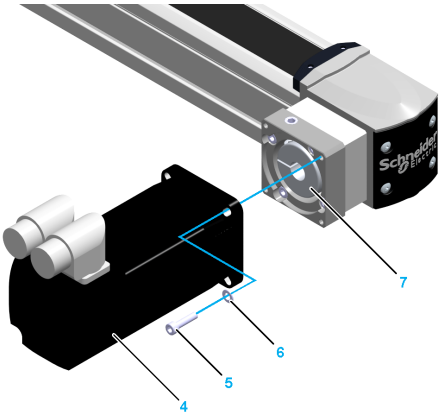
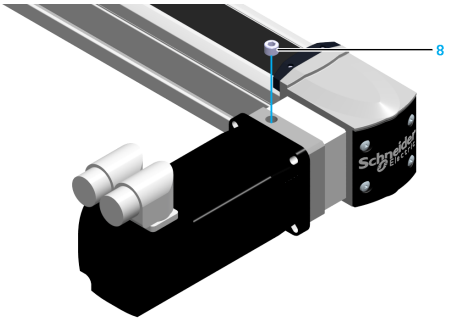
Step	Action
4	Fit the elastomer spider (5) into the expanding hub.  **NOTE:** ● If the elastomer spider can be inserted too easily (without preloading), it must be replaced. ● Slightly greasing the elastomer spider facilitates the fitting process. Use only mineral oilbased lubricants without additives or silicon-based lubricants.
5	Fasten the coupling housing (7) to the end block (6) with the four screws (8). Use the standard tightening torque *(see page 111)*. Verify that there is no clearance between the coupling housing and the end block such that the surfaces are flush.  **NOTE:** Greasing every centering collar provides easier dismounting. Use only mineral oil-based lubricants without additives or silicon-based lubricants.

Step	Action
6	Fit the clamping hub (10) into the elastomer spider. 
7	Verify that the orientation of the clamping screw (9) is the same as the orientation of the motor or gearbox. For further information, refer to *Motor and/or Gearbox Orientation and Configuration* *(see page 38)*.
8	Verify the dimension d of the clamping hub. Measure the dimension from the top of the clamping hub to the collar of the coupling housing. Dimension d: ● For PAS41: 8 mm (0.315 in) ● For PAS42: 13 mm (0.51 in) ● For PAS43 / PAS44: 14 mm (0.55 in) 

Mounting the Motor Only

If possible, position the axis such that the top of the carriage points upwards during installation.

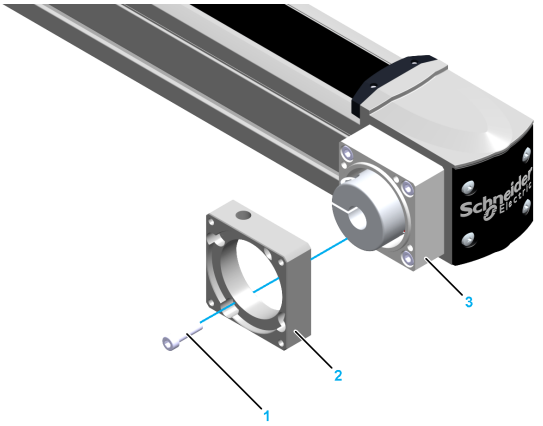
Step	Action
1	Fasten the motor adapter plate (2) to the coupling housing (3) with the four screws (1). Use the standard tightening torque *(see page 111)*. Verify that: ● There is no clearance between the motor adapter plate and the coupling housing such that the surfaces are flush. ● The orientation is the same as the orientation of the motor or gearbox. For further information, refer to *Motor and/or Gearbox Orientation and Configuration (see page 38)*.  **NOTE:** Greasing every centering collar provides easier dismounting. Use only mineral oil-based lubricants without additives or silicon-based lubricants.

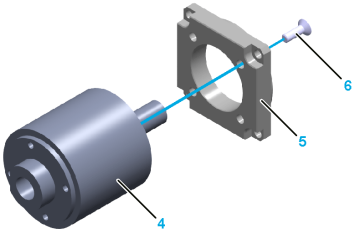
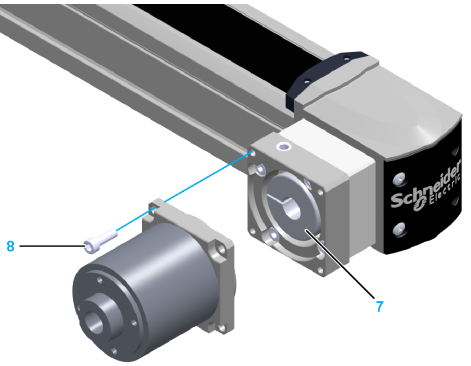
Step	Action
2	Fit the motor (4) into the clamping hub (7) and to the motor adapter plate and secure the motor from falling. Verify that there is no clearance between the motor and the motor adapter plate such that the surfaces are flush.  **NOTE:** Greasing every centering collar provides easier dismounting. Use only mineral oil-based lubricants without additives or silicon-based lubricants.
3	Fasten the motor with the four screws (5) and washers (6). Use the standard tightening torque *(see page 111)*.
4	Remove the setscrew (8) at the motor adapter plate. 
5	Tighten the screw of the clamping hub through the hole. Tightening torque: ● For PAS41: 1.9 Nm (16.8 lbf-in) ● For PAS42 / PAS43: 14 Nm (124 lbf-in) ● For PAS44: 35 Nm (310 lbf-in)

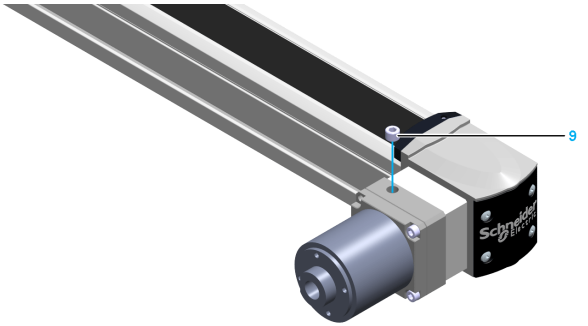
Step	Action
6	Insert the setscrew into the motor adapter plate and tighten it. Tightening torque: 4 Nm (35.4 lbf-in)

Mounting the Gearbox Only

A flange plate is required if the gearbox does not have its own flange. If possible, position the axis such that the top of the carriage points upwards during installation.

Step	Action
1	Fasten the motor adapter plate (2) to the coupling housing (3) with the four screws (1). Use the standard tightening torque *(see page 111)*. Verify that: ● There is no clearance between the motor adapter plate and the coupling housing such that the surfaces are flush. ● The standard orientation of the setcrews is upwards. For further information, refer to *Motor and/or Gearbox Orientation and Configuration* *(see page 38)*. 

Step	Action
2	Fasten the flange plate (5) to the gearbox (4) with the four screws (6). Use the standard tightening torque *(see page 111)*. Verify that there is no clearance between the flange plate and the gearbox such that the surfaces are flush.  **NOTE:** Greasing every centering collar provides easier dismounting. Use only mineral oil-based lubricants without additives or silicon-based lubricants.
3	Fit the flange plate complete with gearbox into the clamping hub (7) and to the motor adapter plate and secure the gearbox from falling. Verify that there is no clearance between the motor and the motor adapter plate such that the surfaces are flush.  **NOTE:** Greasing every centering collar provides easier dismounting. Use only mineral oil-based lubricants without additives or silicon-based lubricants.
4	Fasten the flange plate complete with gearbox with the four screws (8). Use the standard tightening torque *(see page 111)*.

Step	Action
5	Remove the setscrew (9) at the motor adapter plate. 
6	Tighten the screw of the clamping hub through the hole. Tightening torque: ● For PAS41: 1.9 Nm (16.8 lbf-in) ● For PAS42 / PAS43: 14 Nm (124 lbf-in) ● For PAS44: 35 Nm (310 lbf-in)
7	Insert the setscrew into the motor adapter plate and tighten the setscrew. Tightening torque: 4 Nm (35.4 lbf-in)

Mounting the Motor to the Gearbox

NOTICE
DISTORTION OF MOTOR AND GEARBOX Only fasten motor and gearbox with all components at the same ambient temperature. **Failure to follow these instructions can result in equipment damage.**

NOTE: If possible, fasten the motor to the gearbox in vertical position for easier mounting.

For more information about installing the motor to the gearbox, refer to the corresponding gearbox manual.

Section 5.2
Sensors

What Is in This Section?

This section contains the following topics:

Topic	Page
Technical Data of the Sensors	139
Mounting the Sensors	141

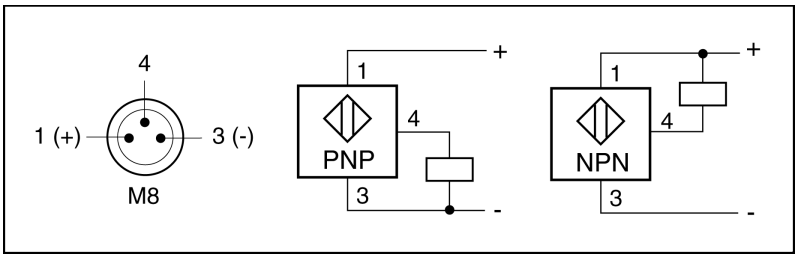
Technical Data of the Sensors

Technical Data of the Sensors

Parameter	Unit	Description
Model	–	Cylindrical thread M8 x 1
Actuation type	–	Inductive
Approvals	–	CE
Electrical connection (Polyurethane cable with M8 connector)	mm (in)	100 (3.9)
Nominal switching distance s_n (in the case of aluminum)	mm (in)	0.5 (0.0197)
Hysteresis	–	1 to 15% of the real switching distance
Degree of protection as per IEC 60529	–	IP67
Temperature for storage	°C (°F)	-40…+85 (-40…+185)
Temperature for operation	°C (°F)	-25…+70 (-13…+158)
Housing material	–	Nickel-plates brass
Cable material	–	PUR, 3 x 0.12 mm^2
Function indicator output	–	Yellow LED
Function indicator supply voltage	–	No
Supply voltage (PELV)	Vdc	12…24 with reverse polarity protection
Supply voltage (including residual ripple)	Vdc	10…36
Switching current (overload and short-circuit protection)	mA	< 200
Voltage drop, output conducting	V	< 2
No-load current	mA	< 10
Maximum switching frequency	Hz	5,000
Switch-on time	ms	< 0.1
Switch-off time	ms	< 0.1

Connection Details – Sensors

The optional sensors are equipped with an M8 x 1 connector. The following graphic presents the connection assignment of the sensors.



Pin	Description	Color
1	PELV supply voltage (+)	BN (brown)
3	PELV supply voltage (-)	BU (blue)
4	Output	BK (black)

The maximum cable length is 100 mm (3.9 in). For suitable extension cables with various lengths, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Mounting the Sensors

Overview

The use of sensors can provide some protection against hazards (for example, collision with mechanical stop caused by incorrect reference values).

For the functionality of the inductive sensors, a contact plate must be mounted to the carriage. Fastening threads are located at both sides of the carriage.

⚠ WARNING

LOSS OF CONTROL

- Ensure that sensors are installed if your application, based on your risk assessment, requires sensors.
- Verify correct connection of the sensors.
- Verify that the sensors are sufficiently distant from the mechanical stop to allow an adequate stopping distance.
- Verify correct parameterization and function of the sensors.

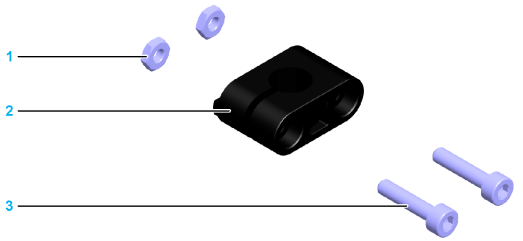
Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: If possible, use normally closed contacts as sensors so that a wire break can be signaled as an error.

Fastening Material for Sensor Mounting

A sensor is mounted to the axis body by using a sensor holder. The axis body provides a T-slot for the sensor holder. This T-slot has cutouts at both end blocks for inserting the fastening nuts. In addition, the sensor holder has cams at both sides to keep the sensor from turning in the T-slot.

The following graphic presents the components of a sensor holder:



1 Fastening nuts*
2 Sensor holder
3 Hex socket screw

***** For fastening the sensor in the sensor holder and the sensor holder in the T-Slot.

Prerequisites

You need the following tools to mount the sensors:

- Feeler gauge
- Torque wrench with hexagon socket

For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Procedure Overview

Perform the following procedures for each sensor to be replaced:

- Preparing the mounting of the sensor *(see page 141)*
- Mounting the contact plate *(see page 143)*
- Mounting the sensor holder *(see page 144)*
- Mounting the sensor to the sensor holder *(see page 144)*

Preparing the Mounting of the Sensor

Step	Action
1	Verify the sensor for correct type and function.
2	Verify that your controller and your interface are suitable for the sensor.
3	Clean all parts.
4	Inspect all parts for damage.

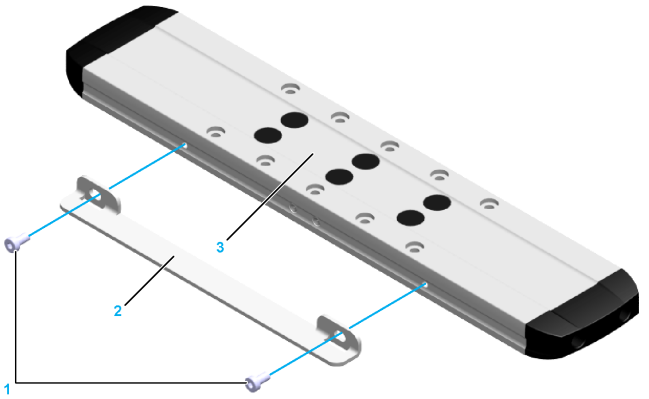
NOTICE

UNINTENDED EQUIPMENT OPERATION

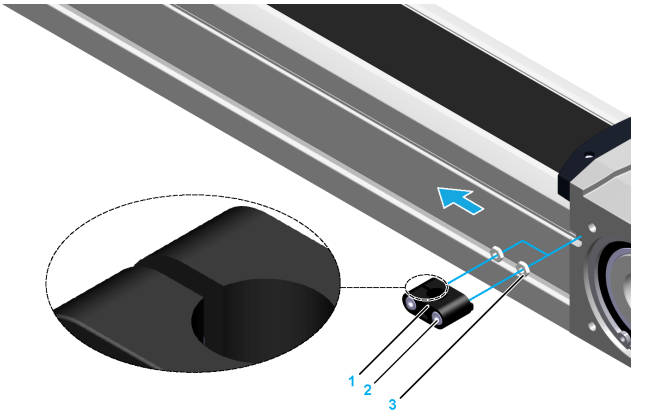
- Replace any damaged parts immediately.
- Clean all parts before assembly and use.

Failure to follow these instructions can result in equipment damage.

Mounting the Contact Plate

Step	Action
1	Fasten the contact plate (2) to the carriage (3) with the two screws (1). Use the standard tightening torque *(see page 111)*. **NOTE:** ● Align the contact plate level with the carriage to have the same switching distance on both sides. ● Mount the contact plate to the side of the carriage that is easily accessible for service. 

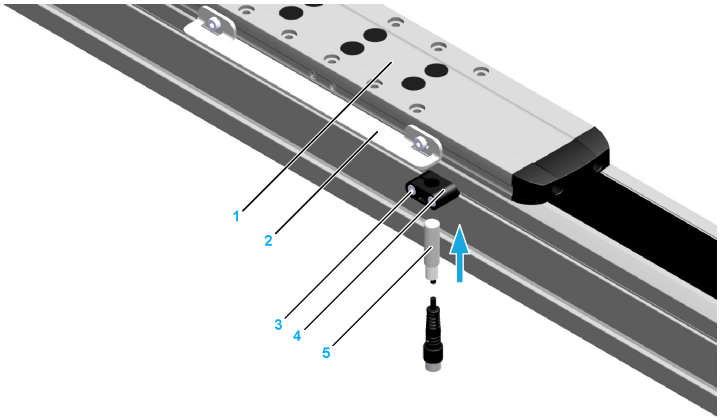
Mounting the Sensor Holder

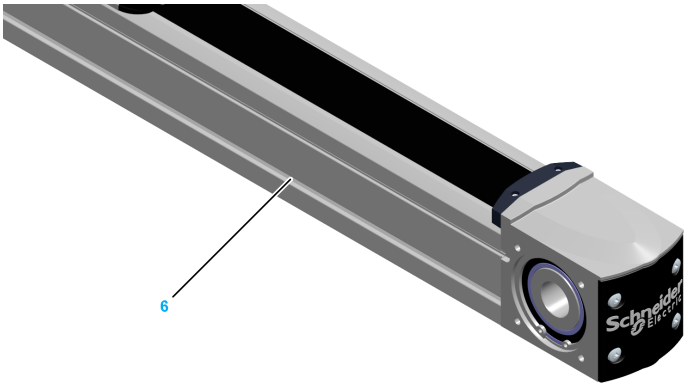
Step	Action
1	Slide each nut (3) into the T-slot at the cutout.  **NOTE:** The slot of the sensor holder should point to the carriage.
2	Position the sensor holder (1) with the two screws at the nuts. Leave the two screws loose.
3	Slide the senor holder to the sensor position and tighten screw (2). For further information, refer to the dimensional drawing of the respective axis in *Mechanical Data* *(see page 46)*. Tightening torque: 0.3 Nm (2.66 lbf-in).

Mounting the Sensor to the Sensor Holder

Before you mount the sensor, be aware of the switching distance:

NOTE: Since the sensor operates inductively, the switching surface must have a specific distance from the contact plate. This *switching distance* is 0.5 +/- 0.1 mm (0.00197 +/- 0.00039 in).

Step	Action
1	Move the carriage (1) until the contact plate (2) is above the sensor holder (4). 
2	Slide the sensor (5) through the sensor holder opening until the switching distance s is obtained. Use a feeler gauge to measure the switching distance.
3	Tighten screw (3) to fix the sensor. Tightening torque: 0.3 Nm (2.66 lbf-in).
4	Verify the correct switching distance with the feeler gauge.

Step	Action
5	Route the sensor cable in the T-slot (6).  **NOTE:** ● The T-slot can hold up to three sensor cables. For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*. ● If the lateral T-slots are used for the installation of the axis, the sensor cable cannot be completely routed in the T-slots.

Section 5.3
Shaft Extension

Mounting the Shaft Extension

Overview

A shaft extension can be mounted to either side of the two end blocks and used for example to couple an external encoder.

Prerequisites

You need the following tools to mount a shaft extension:
- Soft-faced hammer
- Torque wrench with a set of hexagon sockets

For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Procedure Overview

Perform the following steps at both ends of the carriage and at both ends of the axis to mount the shaft extension:
- Preparing the mounting of the shaft extension *(see page 147)*
- Mounting the shaft extension *(see page 148)*

Preparing the Mounting of the Shaft Extension

Step	Action
1	Clean all parts.
2	Inspect all parts for damage.

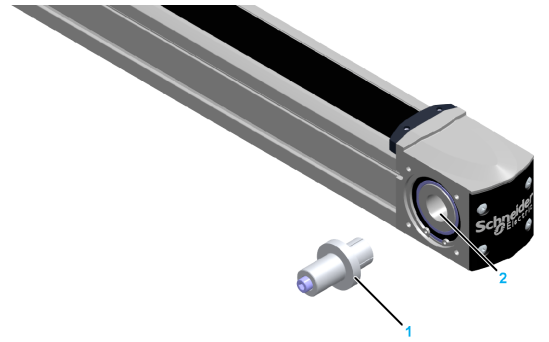
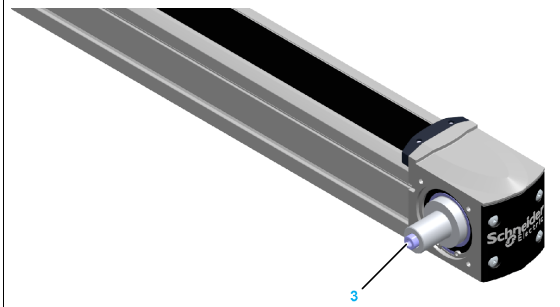
NOTICE

UNINTENDED EQUIPMENT OPERATION

- Replace any damaged parts immediately.
- Clean all parts before assembly and use.

Failure to follow these instructions can result in equipment damage.

Mounting the Shaft Extension

Step	Action
1	Fit the shaft extension (1) into the hollow shaft of the toothed belt pulley (2). Verify that there is no clearance between the shaft extension and the toothed belt pulley such that the surfaces are flush.  **NOTE:** To completely fit the shaft extension, you may have to tap the shaft extension at the last 2 mm (0.079 in) slightly with a soft-faced hammer (**not** on the screw head).
2	Tighten the screw (3) of the shaft extension. Tightening torque: ● For PAS41: 2.9 Nm (25.7 lbf-in) ● For PAS42: 10 Nm (89 lbf-in) ● For PAS43: 25 Nm (221 lbf-in) ● For PAS44: 49 Nm (434 lbf-in)  **NOTE:** As long as the toothed belt is installed correctly and the carriage is at the end position, the toothed belt pulley does not rotate further. For detailed information about toothed belt installation, refer to *Mounting the Toothed Belt (see page 191)*.

Section 5.4
Cover Strip

Mounting the Cover Strip

Overview

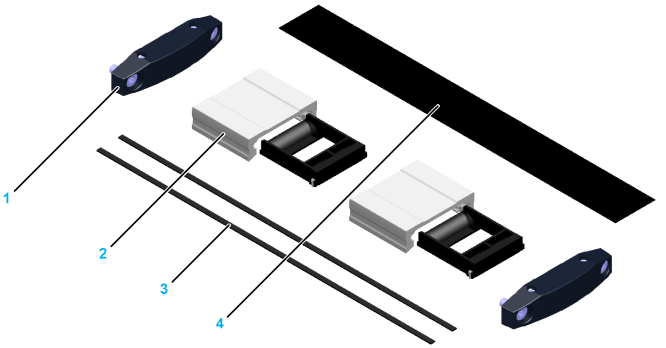
When the cover strip is cut to length, the edges may be sharp.

⚠ WARNING
SHARP EDGES Wear protective gloves when cutting and installing the cover strip. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

NOTE: When the cover strip is mounted, the stroke of the axis decreases.

Mounting Parts for the Cover Strip

A set for mounting the cover strip consists of the following components:



1 Cover strip clamps
2 Strip deflectors
3 Magnetic strips
4 Cover strip

Prerequisites

You need the following tools to remove the cover strip:

- Scissors
- Torque wrench with a set of hexagon sockets
- Metal shears

NOTE: Do not use ball head hex keys. Excessive torque may cause the ball head to break away. A broken ball head makes the removal of the screw difficult.

For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Procedure Overview

Perform the following procedures at both ends of the carriage and at both ends of the axis to mount the cover strip:

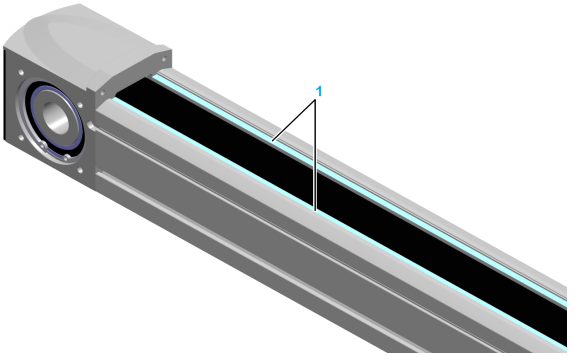
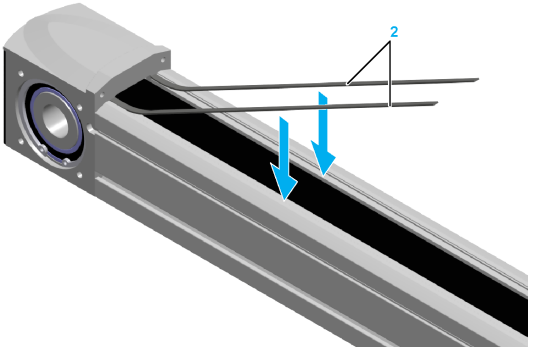
- Preparing the mounting of the cover strip *(see page 150)*
- Fastening the magnetic strips *(see page 151)*
- Mounting the cover strip *(see page 152)*
- Testing movements *(see page 155)*

Preparing the Mounting of the Cover Strip

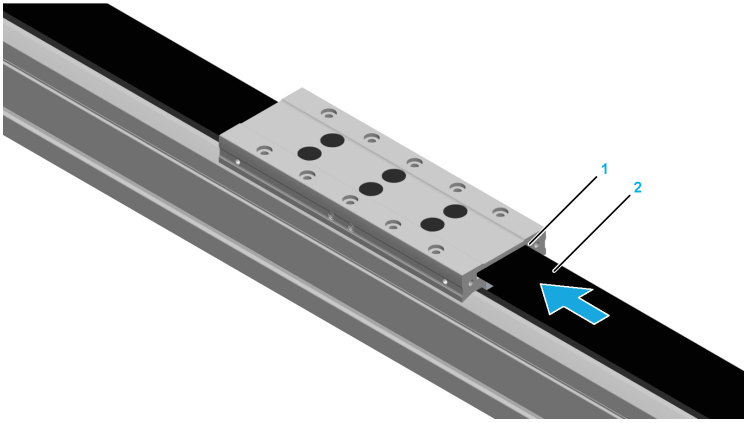
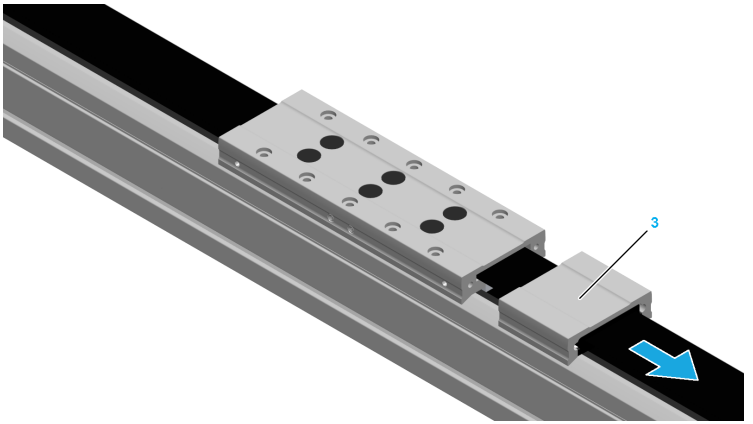
Step	Action
1	Clean all parts.
2	Inspect all parts for damage.

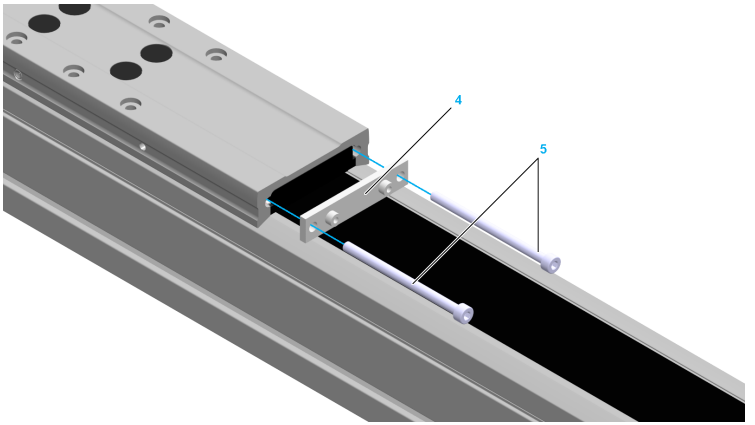
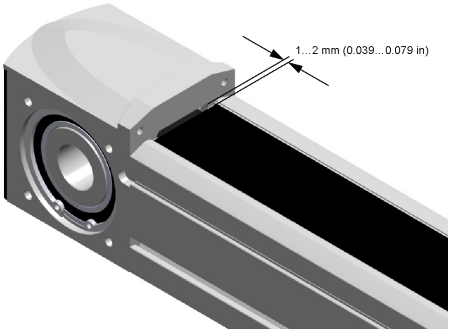
NOTICE
UNINTENDED EQUIPMENT OPERATION ● Replace any damaged parts immediately. ● Clean all parts before assembly and use. **Failure to follow these instructions can result in equipment damage.**

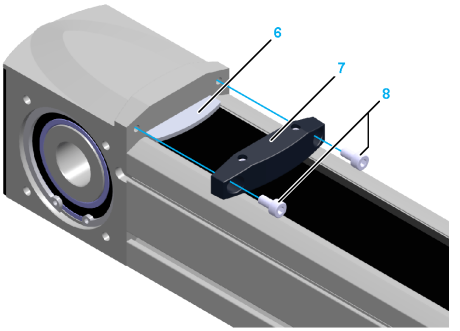
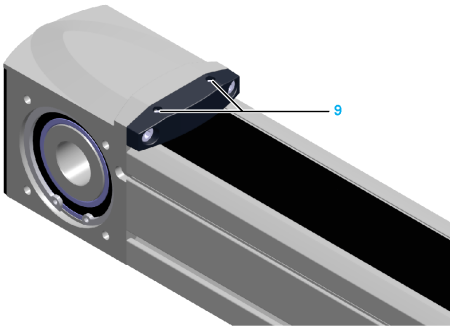
Fastening the Magnetic Strips

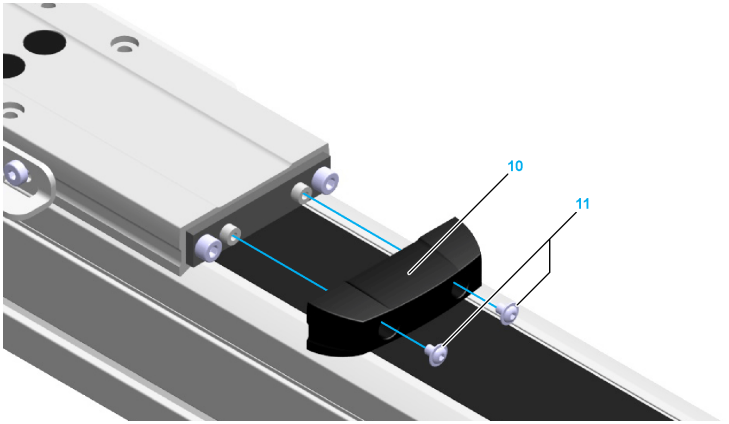
Step	Action
1	Clean the mounting surfaces of the magnetic strips at the axis body (1) such that they are free of grease. 
2	Place the magnetic strips along the axis body and cut them with the scissors to the same length as the axis body.
3	Peel off the film of the magnetic strips (2) and fasten them with the glued side onto the mounting side of the axis body.  **NOTE:** Allow the adhesive to cure for 24 hours.

Mounting the Cover Strip

Step	Action
1	Guide the cover strip (2) through the guide channel inside the carriage (1). 
2	Guide the cover strip through the strip deflectors (3) at both sides of the carriage. 

Step	Action
3	Fasten the strip deflector and the holding plate (4) to the carriage with the two screws (5) at both sides of the carriage. Use the standard tightening torque *(see page 111)*. Verify that there is no clearance between the carriage, the strip deflectors, and the holding plates such that the surfaces are flush. 
4	Place the cover strip from one of the two end blocks at a distance of 1…2 mm (0.04…0.08 in). Verify that there is no clearance between the cover strip and the magnetic strips such that the surfaces are flush. 

Step	Action
5	Fit the clamping plate (6) into place. 
6	Fasten the cover strip clamp (7) to the end block with the two screws (8). Verify that there is no clearance between the cover strip clamp and the end block such that the surfaces are flush Tightening torque: ● For PAS41: 0.6 Nm (5.3 lbf-in) ● For PAS42: 1 Nm (8.9 lbf-in) ● For PAS43: 1.5 Nm (13.3 lbf-in) ● For PAS44: 3 Nm (26.6 lbf-in)
7	Tighten the two setscrews (9) of the cover strip clamp. Tightening torque: ● For PAS41: 0.2 Nm (0.0079 lbf-in) ● For PAS42: 0.3 Nm (0.0118 lbf-in) ● For PAS43: 0.4 Nm (0.0157 lbf-in) ● For PAS44: 0.5 Nm (0.0197 lbf-in) 
8	Cut the cover strip at the other end with the metal shear to length such that the distance between the cover strip and the second end block is also 1…2 mm (0.04…0.08 in).
9	Repeat steps 5, 6 and 7 for the second end block.

Step	Action
10	Fasten the rubber buffers (10) to the holding plates at both sides of the carriage with the two screws (11). Verify that there is no clearance between the rubber buffers and the holding plates such that the surfaces are flush. Tightening torque: ● For PAS41: 1.1 Nm (9.7 lbf-in) ● For PAS42: 1.1 Nm (9.7 lbf-in) ● For PAS43: 2.5 Nm (22 lbf-in) ● For PAS44: 2.5 Nm (22 lbf-in) 

Testing Movements

Step	Action
1	Run initial tests at reduced velocity.
2	Verify proper function of the cover strip.

Chapter 6
Maintenance and Repair

What Is in This Chapter?

This chapter contains the following sections:

Section	Topic	Page
6.1	Maintenance, Repair, and Cleaning	158
6.2	Replacing Parts	167
6.3	Lubrication	198

Section 6.1
Maintenance, Repair, and Cleaning

What Is in This Section?

This section contains the following topics:

Topic	Page
General Information About Maintenance, Repair, and Cleaning	159
Maintenance Plan	161
Maintaining the Toothed Belt	163
Maintaining the Motor	163
Maintaining the Gearbox	163
Cleaning	164
Repairing After Collisions	165

General Information About Maintenance, Repair, and Cleaning

Overview

The use and application of the information contained herein require expertise in the design and programming of automated control systems. Only you, the user, machine builder or integrator, can be aware of all the conditions and factors present during installation and setup, operation, repair, and maintenance of the machine or process.

You must also consider any applicable standards and/or regulations with respect to grounding of all equipment. Verify compliance with any safety information, different electrical requirements, and normative standards that apply to your machine or process in the use of this equipment.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires.
- Place a "Do Not Turn On" or equivalent hazard label on all power switches and lock them in the non-energized position.
- Wait 15 minutes to allow the residual energy of the DC bus capacitors to discharge.
- Measure the voltage on the DC bus with a properly rated voltage sensing device and verify that the voltage is less than 42.4 Vdc.
- Do not assume that the DC bus is voltage-free when the DC bus LED is off.
- Block the carriage to prevent rotation prior to performing any type of work on the drive system.
- Do not create a short-circuit across the DC bus terminals or the DC bus capacitors.
- Replace and secure all covers, accessories, hardware, cables, and wires and confirm that a proper ground connection exists before applying power to the unit.
- Use only the specified voltage when operating this equipment and any associated products.

Failure to follow these instructions will result in death or serious injury.

Poor maintenance can lead to premature wear, or even present potential safety hazards for production or maintenance operators.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Develop and follow a maintenance plan and associated protocols adapted to the requirements of your application and equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: Remove the part or the tool mounted on the axis during maintenance operations if necessary.

Servicing

In case of issues which cannot be resolved, contact your local Schneider Electric service representative with the following information:

- Type plate information (type, identification number, serial number, DOM)
- Detailed description of the issue
- Previous and associated circumstances

Maintenance Plan

Overview

The maintenance intervals may have to be adapted to the greatly varying service lives depending on the application.

For procedures to replace the different parts, refer to *Replacing Parts* *(see page 167)*.

Maintenance Schedule

Perform the following maintenance tasks only once:

Date	Action
Two months after the date of manufacturing (DOM)	• Verify the axis by visual inspection for any damage or missing parts *(see page 165)*. Especially moving parts and parts at risk for collisions such as carriage, contact plate, toothed belt, toothed belt tensioner, ball bearing of the toothed belt pulley, cover strip, cover strip clamp or mounting elements. • Verify the tension of toothed belt and adjust it *(see page 163)*, if necessary.

Perform the following maintenance tasks within the stated intervals:

Interval	Action
Every 400 hours of operation or every month	• Clean the axis *(see page 164)*, if necessary. • Lubricate the guide system *(see page 198)*, if necessary.
Every 1,000 hours of operation or every three months	For PAS4•BR / PAS4•HR: • Clean the axis *(see page 164)*. • Lubricate the roller guide *(see page 200)*

Interval	Action
Every 2,000 hours of operation or every six months	• Clean the axis *(see page 164)*. • Verify the toothed belt abrasion *(see page 165)* and replace it *(see page 185)*, if necessary. • Verify the tension of toothed belt and adjust it *(see page 163)*, if necessary. • Verify the axis by visual inspection for any damage or missing parts *(see page 165)*. Especially moving parts and parts at risk for collisions such as carriage, contact plate, toothed belt, toothed belt tensioner, ball bearing of the toothed belt pulley, cover strip, cover strip clamp or mounting elements. • Verify the sensors for functionality. • Verify the guide system for unusual noises. If unusual noises occur, refer to *Troubleshooting (see page 223)*. • Verify all parts for bolted connections. • For PAS4•BB / PAS4•HB: lubricate the recirculating ball bearing guide *(see page 202)* • For PAS4•BR / PAS4•HR: lubricate the roller guide *(see page 200)*
Annually or after an uncontrolled stop (stop category 0)	• Verify the brake function during operations. For further information, refer to the corresponding motor manual of the optionally pre-installed Schneider Electric motor.
Every 20,000 hours of operation	• Replace the optionally pre-installed Schneider Electric motor *(see page 172)*.
Every 30,000 hours of operation	• Replace the optionally pre-installed Schneider Electric gearbox *(see page 172)*.
Every four years after the date of manufacturing (DOM)	• Replace the toothed belt as a precautionary measure *(see page 185)*. • Suggestion: Replace the toothed belt pulleys *(see page 196)* when replacing the toothed belt.

NOTE: The gearbox (optional equipment) and the ball bearings are lubricated for life.

Maintaining the Toothed Belt

Overview

Verify and replace the toothed belt periodically.

Replace the toothed belt according to the maintenance schedule *(see page 161)* or earlier if it shows signs of excessive wear.

When maintaining the toothed belt, note the following facts:

- If the axis is not mounted in a horizontal orientation, verify that the belt is unloaded (payload is disassembled) in order to verify the correct toothed belt tension. While the toothed belt is installed, you can measure the toothed belt tension only by vibration measurement *(see page 185)*.
- The toothed belt tension must be so high that the belt is still tensioned under maximum operating load.
- If the toothed belt tension is not high enough, this may lead to skipping. If the toothed belt tension is too high, this increases the load on the bearings and reduces the service life of the toothed belt.
- Due to pitch and rigidity tolerances of the toothed belt, the newly adjusted toothed belt tension may differ from the originally adjusted toothed belt tension.

Maintaining the Motor

Overview

For information about maintaining the motor, note the motor reference on the type plate *(see page 39)* and refer to the corresponding motor manual.

Maintaining the Gearbox

Overview

For information about maintaining the gearbox, note the gearbox reference on the type plate *(see page 39)* and refer to the corresponding gearbox manual.

Cleaning

Overview

The linear guide is located inside the axis body and it is covered.

Care must be taken with cleaning products as some active agents may have deleterious effects on the material of the axis.

NOTICE
CORROSION CAUSED BY CLEANING AGENTS ● Carry out a compatibility test in relation to the cleaning agent and the component affected before using a cleaning agent. ● Do not use alkaline detergent in the interior of the mechanics. ● Do not use any chloride-containing cleaning agents. ● Do not use any sulphuric acid containing detergent. **Failure to follow these instructions can result in equipment damage.**

For more information about the material properties of the axis, refer to *Information About Increased Corrosion Resistance* *(see page 44)* or contact your local Schneider Electric service representative.

Cleaning the Axis

The axis must be inspected, large particles and dirt must be removed from the surface, and the axis must be cleaned at regular intervals *(see page 161)*. When cleaning the axis, note the following:

- Do not use compressed air for cleaning.
- The anodized surface only has a limited resistance to alkaline cleaning agents. Therefore, use only neutral cleaning agents for cleaning.
- Use only damp, soft, and lint-free cleaning cloths to wipe the surface.

NOTE: Depending on the operating conditions and requirements, verifying and cleaning may be necessary on a more frequent basis.

Cleaning the Cover Strip (Optional Equipment)

The cover strip is teflon coated. The friction causes abrasion on the cover strip.

Remove abrasion dust at regular intervals. For further information, refer to the cleaning intervals in the *Maintenance Plan* *(see page 161)*.

Repairing After Collisions

Overview

Components of the axis may be damaged or destroyed as a result of a collision.

NOTE: After a collision, inspect the mechanical drive elements, the linear guide, and the elastomer coupling for damage according to the instructions in the following sections.

⚠ WARNING

FALLING OR EJECTED PARTS

- Thoroughly inspect all components of the axis and all components attached to the axis, including the motor and the gearbox, for damage after a collision.
- Do not use the axis if any of the components are damaged or suspected to be damaged.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Verifying the Components

Step	Action
1	Verify components for completeness. If any components are missing, locate the same and remove them from the surrounding machinery.
2	Replace damaged or missing components.

Verifying the Toothed Belt

Step	Action
1	Verify the toothed belt by a visual inspection for damaged teeth and abrasion. To perform a visual inspection, maybe it is necessary to remove the toothed belt *(see page 185)*.

NOTE: A damaged toothed belt must be replaced. For detailed information, refer to *Replacing the Toothed Belt* *(see page 185)*.

Verifying the Linear Guide

The linear guide consists of the carriage and the roller guide or the recirculating ball bearing guide.

Step	Action
1	Inspect the carriage for backlash. If the carriage has backlash, the preload has been modified or the linear guide is worn out. For further information, contact your local Schneider Electric service representative.
2	Remove the toothed belt *(see page 185)*.
3	Verify the roller guide or recirculating ball bearing guide by a visual inspection for damage.

Step	Action
4	Manually move the carriage (without toothed belt) and inspect for irregular noise or vibration. Irregular noise or vibration indicates a deformation in the linear guide. Deformation causes rapid wear.

NOTE: Damaged parts of the linear guide must be replaced. Contact your local Schneider Electric service representative.

Verifying the Elastomer Coupling (Optional Equipment)

Step	Action
1	Remove the motor and/or the gearbox as described in *Replacing the Motor and Gearbox* *(see page 172)*.
2	Verify the elastomer coupling by a visual inspection for damage.

NOTE: A damaged elastomer coupling must be replaced. For detailed information, refer to *Replacing the Elastomer Coupling* *(see page 185)*.

Verifying the Cover Strip (Optional Equipment)

Step	Action
1	Verify the cover strip by a visual inspection for damage.

NOTE: A damaged cover strip must be replaced. For detailed information, refer to *Replacing the Cover Strip* *(see page 182)*.

Other Repairs

In case of other repairs beyond those described in the present document, contact your local Schneider Electric service representative.

Section 6.2
Replacing Parts

What Is in This Section?

This section contains the following topics:

Topic	Page
Information About Replacing Parts	168
Replacing the Entire Axis	170
Replacing the Sensors (Optional Equipment)	171
Replacing the Motor or Gearbox (Optional Equipment)	172
Replacing the Elastomer Coupling (Optional Equipment)	177
Replacing the Shaft Extension (Optional Equipment)	180
Replacing the Cover Strip (Optional Equipment)	182
Replacing the Toothed Belt	185
Replacing the Toothed Belt Pulley	196

Information About Replacing Parts

Overview

The use and application of the information contained herein require expertise in the design and programming of automated control systems. Only you, the user, machine builder or integrator, can be aware of all the conditions and factors present during installation and setup, operation, repair, and maintenance of the machine or process.

You must also consider any applicable standards and/or regulations with respect to grounding of all equipment. Verify compliance with any safety information, different electrical requirements, and normative standards that apply to your machine or process in the use of this equipment.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires.
- Place a "Do Not Turn On" or equivalent hazard label on all power switches and lock them in the non-energized position.
- Wait 15 minutes to allow the residual energy of the DC bus capacitors to discharge.
- Measure the voltage on the DC bus with a properly rated voltage sensing device and verify that the voltage is less than 42.4 Vdc.
- Do not assume that the DC bus is voltage-free when the DC bus LED is off.
- Block the carriage to prevent rotation prior to performing any type of work on the drive system.
- Do not create a short-circuit across the DC bus terminals or the DC bus capacitors.
- Replace and secure all covers, accessories, hardware, cables, and wires and confirm that a proper ground connection exists before applying power to the unit.
- Use only the specified voltage when operating this equipment and any associated products.

Failure to follow these instructions will result in death or serious injury.

The axis heats up significantly when subjected to heavy loads and/or high performances.

The motor, gearbox, and adaptation materials of the axis may exceed 70 °C (158 °F) during operation.

⚠ WARNING

HOT SURFACES

- Avoid unprotected contact with hot surfaces.
- Do not allow flammable or heat-sensitive parts in the immediate vicinity of hot surfaces.
- Verify that the heat dissipation is sufficient by performing a test run under maximum load conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

For further information, refer to *Hot Surfaces* *(see page 24)*.

Replacing the Entire Axis

Replacing the Entire Axis

Step	Action
1	Remove the axis from the frame.
2	Mount the new axis as described in *Mounting the* Axis *(see page 112)*.
3	Verify the installation *(see page 118)* and start up *(see page 120)*.

Replacing the Sensors (Optional Equipment)

Prerequisites

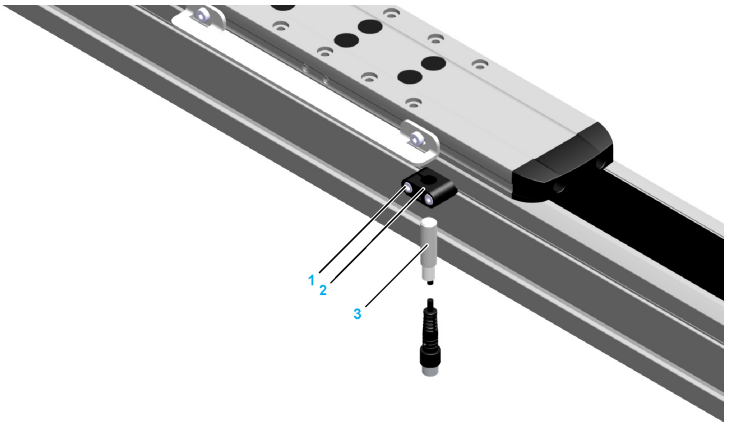
You need the following tools to remove the sensors:

- Set of hex keys

For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Replacing the Sensors

Perform the following steps for each sensor to be replaced:

Step	Action
1	Disconnect the sensor.
2	Loosen the screw (1) at the slotted side of the sensor holder (2) until the sensor (3) can be pulled out from below. 
3	Mount the new sensor as described in *Mounting the Sensors* *(see page 141)*.
4	Connect the new sensor. For further information, refer to *Technical Data of the Sensors* *(see page 139)*.

Replacing the Motor or Gearbox (Optional Equipment)

Overview

The use and application of the information contained herein require expertise in the design and programming of automated control systems. Only you, the user, machine builder or integrator, can be aware of all the conditions and factors present during installation and setup, operation, repair, and maintenance of the machine or process.

You must also consider any applicable standards and/or regulations with respect to grounding of all equipment. Verify compliance with any safety information, different electrical requirements, and normative standards that apply to your machine or process in the use of this equipment.

The optional motor or gearbox of the Lexium PAS4•B-Series is coupled by using a preloaded elastomer coupling.

NOTE: Before dismounting, note the mounting orientation of the motor or gearbox to remount the motor or gearbox in the same orientation.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires.
- Place a "Do Not Turn On" or equivalent hazard label on all power switches and lock them in the non-energized position.
- Wait 15 minutes to allow the residual energy of the DC bus capacitors to discharge.
- Measure the voltage on the DC bus with a properly rated voltage sensing device and verify that the voltage is less than 42.4 Vdc.
- Do not assume that the DC bus is voltage-free when the DC bus LED is off.
- Block the carriage to prevent rotation prior to performing any type of work on the drive system.
- Do not create a short-circuit across the DC bus terminals or the DC bus capacitors.
- Replace and secure all covers, accessories, hardware, cables, and wires and confirm that a proper ground connection exists before applying power to the unit.
- Use only the specified voltage when operating this equipment and any associated products.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

UNINTENDED MOVEMENTS DUE TO DISMOUNTING

Secure the moving parts of the axis mounted in a vertical or tilted position against unexpected movements.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Prerequisites

You need the following tools to remove the motor or gearbox:

- Set of hex keys

NOTE: Do not use ball head hex keys. Excessive torque may cause the ball head to break away. A broken ball head makes the removal of the screw difficult.

For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Procedure Overview

Perform the following procedures to replace the motor and/or gearbox:

- Preparing the replacement of motor and/or gearbox *(see page 173)*
- Replacing the motor only *(see page 173)*
- Replacing the gearbox only *(see page 174)*
- Removing the motor from the gearbox *(see page 176)*

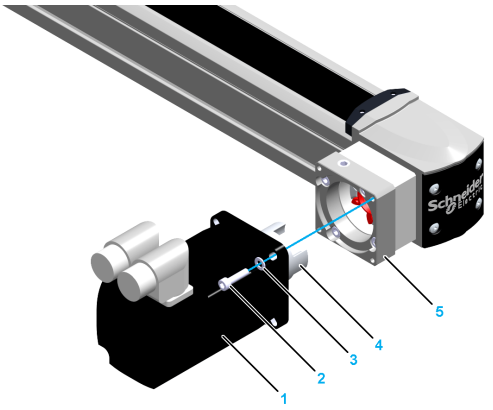
Preparing the Replacement of Motor and/or Gearbox

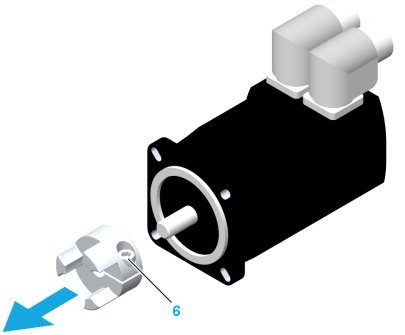
Step	Action
1	Remove or support the payload and the carriage if the axis is tilted or mounted vertically.

Replacing the Motor Only

If possible, position the axis such that the top of the carriage points upwards during installation.

NOTE: If the axis is mounted vertically or tilted, secure the carriage to keep it from falling.

Step	Action
1	Remove the cables of the motor (1). 

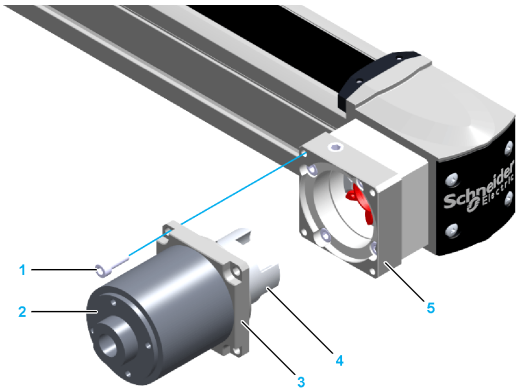
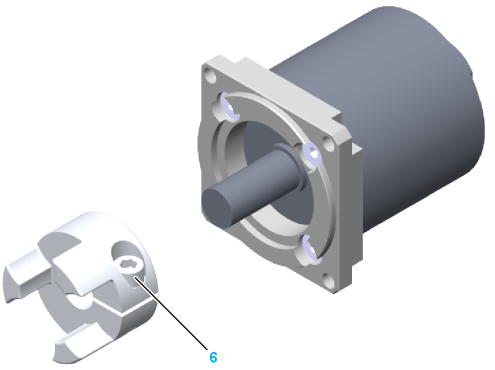
Step	Action
2	Secure the motor to keep it from falling and remove the four screws (2) and the washers (3) by means of which the motor is mounted to the motor adapter plate (5).
3	Pull the motor with mounted clamping hub (4) carefully off the motor adapter plate. **NOTE:** This requires a greater force of up to 450 N (101.16 lbf).
4	Loosen the clamping screw (6) on the clamping hub and withdraw the clamping hub carefully from the motor. 
5	Mount the new motor as described in *Mounting a Motor and Gearbox* *(see page 126)*. **NOTE:** If the shaft dimensions of the new motor differ from the shaft dimensions of the previous motor, use a new appropriate clamping hub. For further information about appropriate clamping hubs, refer to *Replacement Equipment and Accessories* *(see page 207)*.

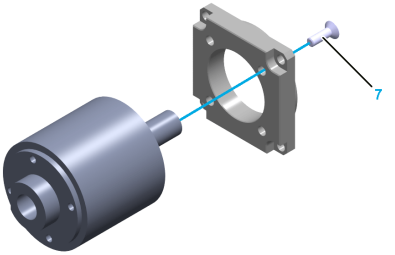
Replacing the Gearbox Only

If possible, position the axis such that the top of the carriage points upwards during installation.

NOTE: If the axis is mounted vertically or tilted, secure the carriage to keep it from falling.

Step	Action
1	Remove the motor from the gearbox if a motor is mounted. For further information about removing the motor, refer to the corresponding gearbox manual.

Step	Action
2	Secure the gearbox (2) to keep it from falling and remove the four screws (1) by means of which the flange plate (3) is mounted to the motor adapter plate (5). 
3	Pull the flange plate with mounted gearbox and clamping hub (4) carefully off the motor adapter plate. **NOTE:** This requires a greater force of up to 450 N (101.16 lbf).
4	Loosen the clamping screw (6) on the clamping hub and withdraw the clamping hub carefully from the gearbox. 

Step	Action
5	In case the new gearbox does not have its own flange, remove the four screws (7) at the flange plate and then remove the flange plate. 
6	Mount the new gearbox as described in *Mounting a Motor and Gearbox* *(see page 126)*. **NOTE:** If the shaft dimensions of the new gearbox differ from the shaft dimensions of the previous gearbox, use a new appropriate clamping hub. For further information about appropriate clamping hubs, refer to *Replacement Equipment and Accessories* *(see page 207)*.

Removing the Motor from the Gearbox

For information about removing the motor from the gearbox, refer to the corresponding gearbox manual.

Replacing the Elastomer Coupling (Optional Equipment)

Prerequisites

You need the following tools to remove the elastomer coupling:

- Set of hex keys
- Soft-faced hammer

NOTE: Do not use ball head hex keys. Excessive torque may cause the ball head to break away. A broken ball head makes the removal of the screw difficult.

For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Procedure Overview

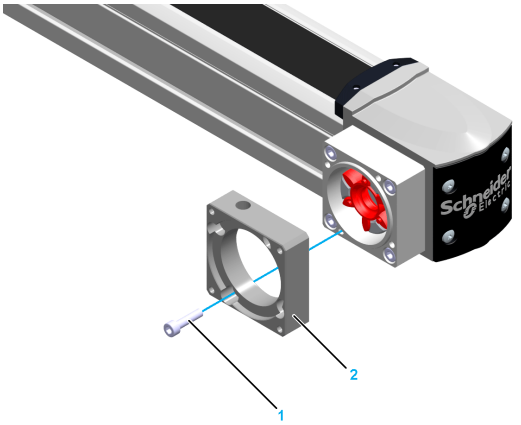
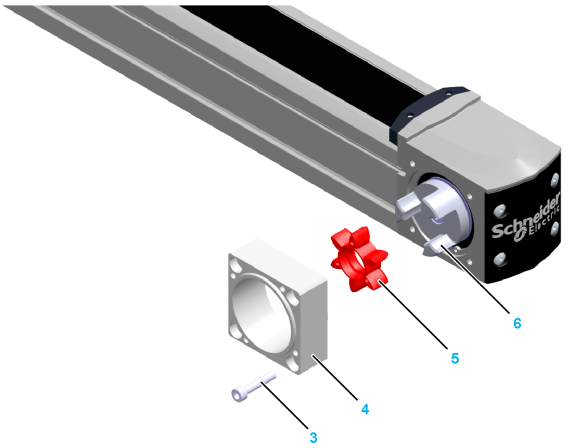
Perform the following procedures to replace the toothed belt:

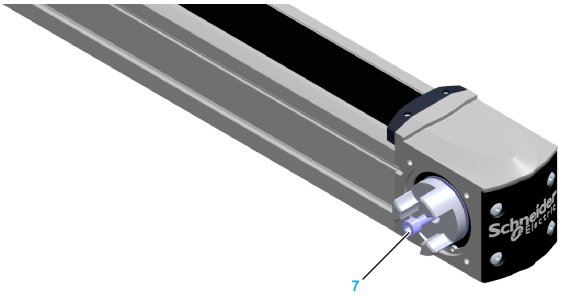
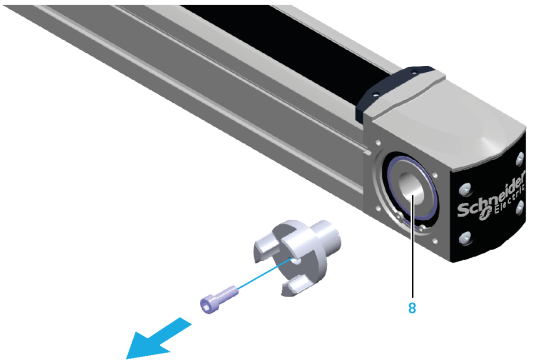
- Preparing the replacement of the elastomer coupling *(see page 177)*
- Replacing the elastomer coupling *(see page 178)*

Preparing the Replacement of the Elastomer Coupling

Step	Action
1	Remove or support the payload and the carriage if the axis is tilted or mounted vertically.
2	Remove the motor or the gearbox as described under *Replacing the Motor or Gearbox* *(see page 172)*.

Replacing the Elastomer Coupling

Step	Action
1	Remove the four screws (1) at the motor adapter plate (2). 
2	Remove the motor adapter plate.
3	Remove the four screws (3) at the coupling housing (4). 
4	Remove the coupling housing.
5	Withdraw the elastomer spider (5) from the expanding hub (6).

Step	Action
6	Loosen the screw (7) on the expanding hub.  **NOTE:** As long as the toothed belt is installed correctly and the carriage is at the end position, the toothed belt pulley does not rotate further. For detailed information about toothed belt installation, refer to *Mounting the Toothed Belt (see page 191)*.
7	Carefully tap on the screw head with a soft-faced hammer so that the cone of the expanding hub comes loose. **NOTE:** If you cannot reach the screw head, use a hex key as extension and tap carefully on the hex key.
8	Pull the expanding hub carefully out of the hollow shaft of the toothed belt pulley (8).  **NOTE:** This may require a considerable force.
9	Mount the new elastomer coupling as well as the motor or the gearbox as described in *Mounting the Motor and Gearbox (see page 126)*.

Replacing the Shaft Extension (Optional Equipment)

Prerequisites

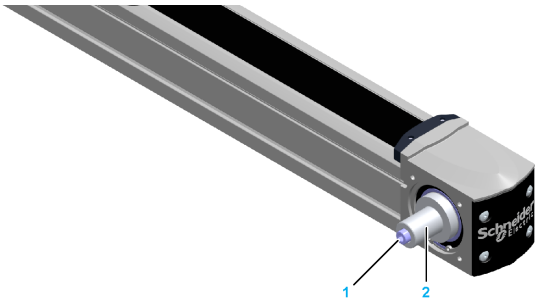
You need the following tools to remove the shaft extension:

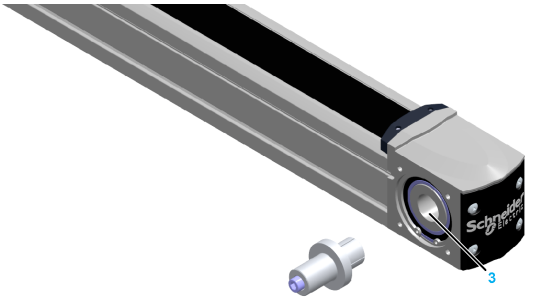
- Set of hex keys
- Soft-faced hammer

NOTE: Do not use ball head hex keys. Excessive torque may cause the ball head to break away. A broken ball head makes the removal of the screw difficult.

For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Replacing the Shaft Extension

Step	Action
1	Loosen the screw (1) at the shaft extension (2).  **NOTE:** As long as the toothed belt is installed correctly and the carriage is at the end position, the toothed belt pulley does not rotate further. For detailed information about toothed belt installation, refer to *Mounting the Toothed Belt* *(see page 191)*.
2	Carefully tap on the screw head with a soft-faced hammer so that the cone of the shaft extension comes loose. **NOTE:** If you cannot reach the screw head, use a hex key as extension and tap carefully on the hex key.

Step	Action
3	Pull the shaft extension carefully out of the hollow shaft of the toothed belt pulley (3).  **NOTE:** This may require a considerable force.
4	Mount the new shaft extension *(see page 147)*.

Replacing the Cover Strip (Optional Equipment)

Overview

When the cover strip is worn, also replace the two strip deflectors at the carriage (deflection with brush).

Prerequisites

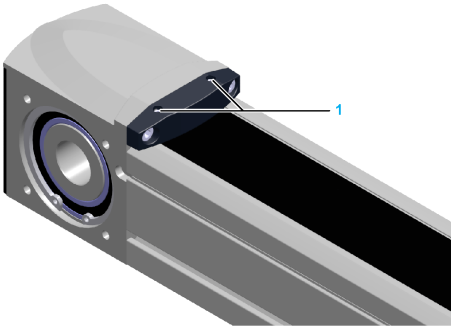
You need the following tools to remove the cover strip:

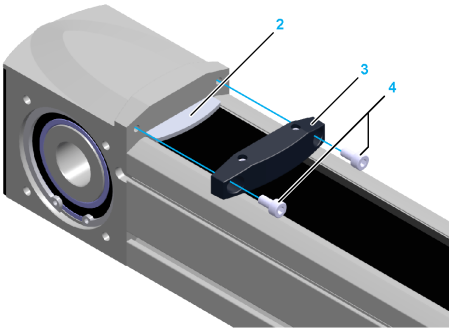
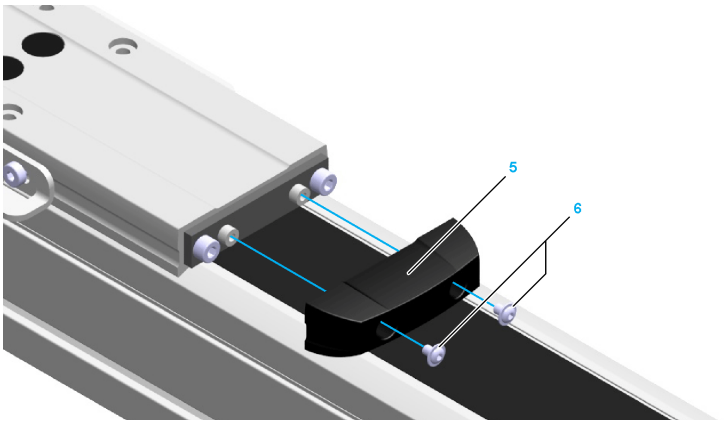
- Set of hex keys

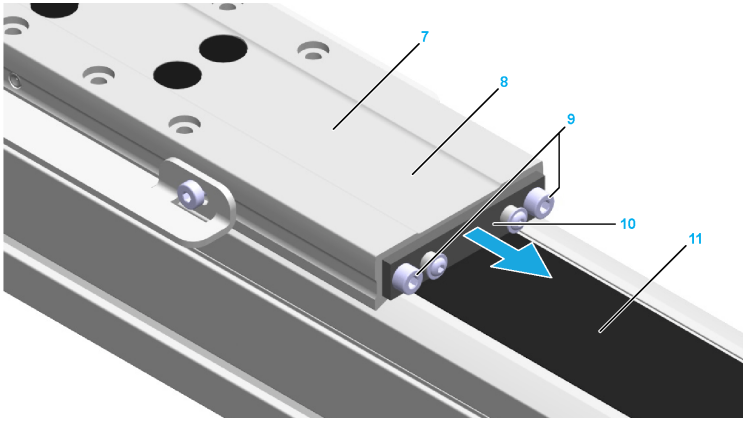
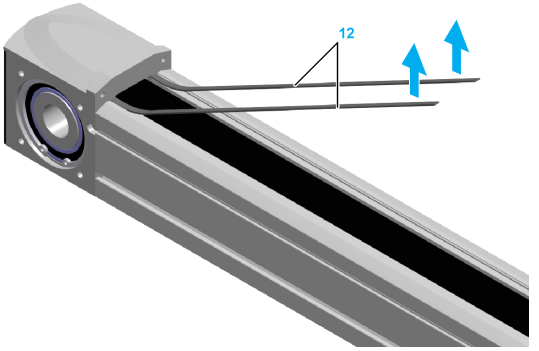
NOTE: Do not use ball head hex keys. Excessive torque may cause the ball head to break away. A broken ball head makes the removal of the screw difficult.

For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Removing the Cover Strip

Step	Action
1	Loosen the two setscrews at the cover strip clamp (1). 

Step	Action
2	Remove the two screws (4) at the cover strip clamp. 
3	Remove the cover strip clamp and the clamping plate (2).
4	Remove the two screws (6) at the rubber buffer (5). 
5	Remove the rubber buffer.

Step	Action
6	Remove the two screws (9) by means of which the holding plate (10) and the strip deflector (8) are mounted to the carriage (7). 
7	Remove the holding plate (10) and the strip deflector.
8	Remove the cover strip (11).
9	Peel off the magnetic strips (12) from the axis body when they are damaged or worn out. 
10	Mount the new cover strip and, if necessary, the new strip deflectors and magnetic strips as described in *Mounting the Cover Strip (see page 149)*.

Replacing the Toothed Belt

Overview

Replacing the toothed belt can cause unanticipated movements.

⚠ WARNING

UNINTENDED MOVEMENTS DUE TO DISMOUNTING

Secure the moving parts of the axes mounted in a vertical or tilted position against unexpected movements.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Prerequisites

You need the following tools to remove the toothed belt:

- Set of hex keys
- Medium strength threadlocker
- Torque wrench with a set of hexagon sockets

NOTE: Do not use ball head hex keys. Excessive torque may cause the ball head to break away. A broken ball head makes the removal of the screw difficult.

To adjust the toothed belt tension, you need a:

- Caliper gauge (for distance measurement) or
- Belt tension meter (for vibration measurement)

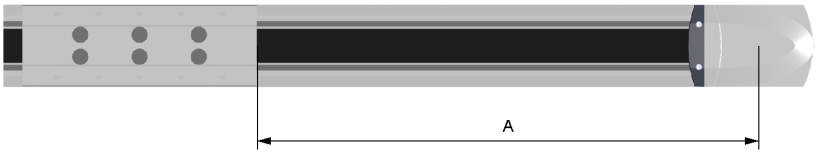
For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Distance and Vibration Measurement

For adjusting the toothed belt tension, you can use either distance measurement or vibration measurement:

- Distance measurement
  The position of the toothed belt tensioner is measured with a caliper gauge. The position of the toothed belt tensioner is used to preload the toothed belt.
- Vibration measurement
  To restore the precise factory-adjusted toothed belt tension, use a belt tension meter for vibration measurement. The factory-adjusted toothed belt tension is presented in the following table. The measured preload values F_V depend on the selectable measuring distance A and the weight of the respective toothed belt.

The measuring distance A is measured:
- From the center of the end block
- To the edge of the carriage



Description	Parameter	Unit	Value			
			PAS41	PAS42	PAS43	PAS44
Toothed belt type	–	–	HTD3	HTD5	HTD5	HTD8
Width	–	mm (in)	15 (0.59)	25 (0.98)	30 (1.18)	50 (1.97)
Pitch	–		3 (0.118)	5 (0.197)	5 (0.197)	8 (0.315)
Weight	–	g/m (lb/ft)	32 (0.0215)	96 (0.065)	118 (0.08)	311 (0.21)
Toothed belt tension	F_v	N (lbf)	145…180 (32.6…40.5)	570…710 (128…160)	670…840 (151…189)	1915…2400 (431…540)

For any questions concerning the vibration measurement, contact your your local Schneider Electric service representative.

Procedure Overview

Perform the following procedures to replace the toothed belt:
- Preparing the replacement of the toothed belt *(see page 186)*
- Removing the toothed belt *(see page 186)*
- Cutting the new toothed belt into length *(see page 190)*
- Mounting the toothed belt *(see page 191)*
- Testing movements *(see page 195)*

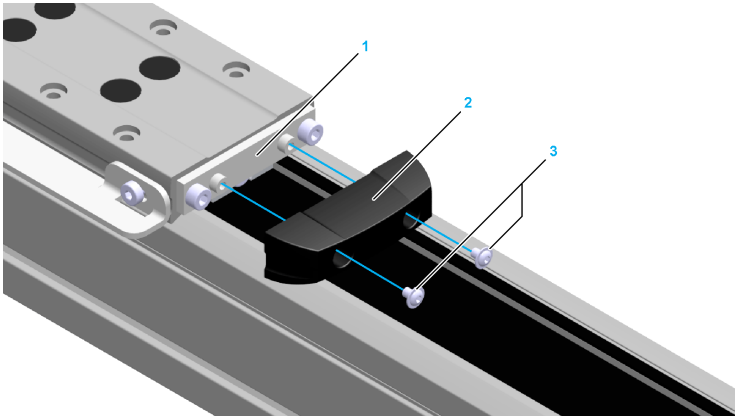
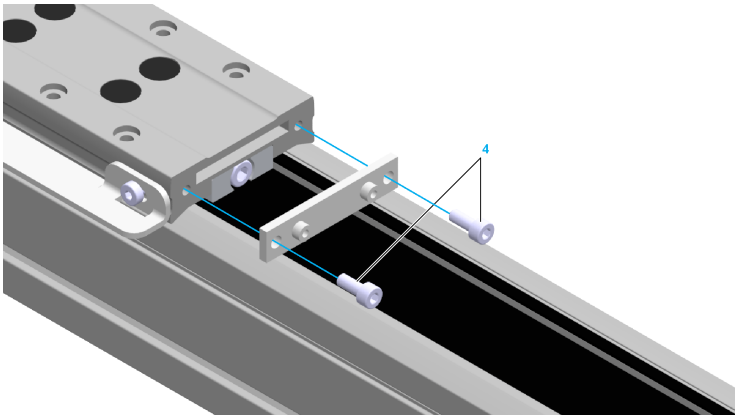
Preparing the Replacement of the Toothed Belt

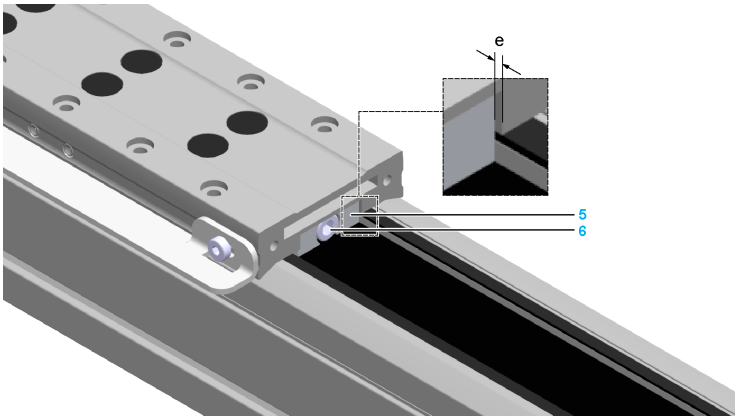
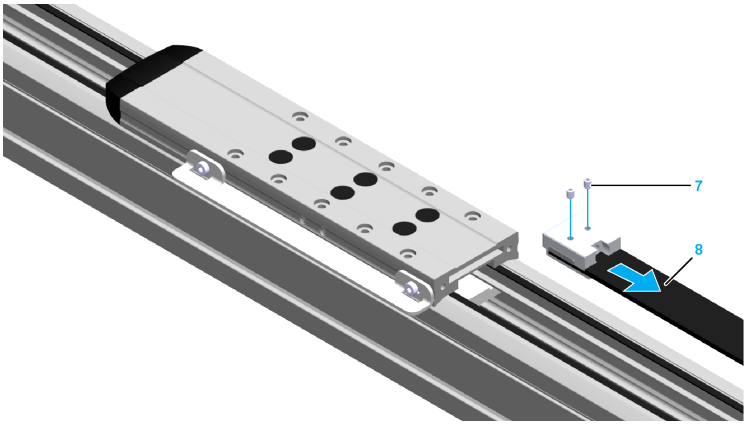
Step	Action
1	Remove or support the payload and the carriage if the axis is tilted or mounted vertically.
2	If installed, remove the cover strip as described in *Replacing the Cover Strip* *(see page 182)*.

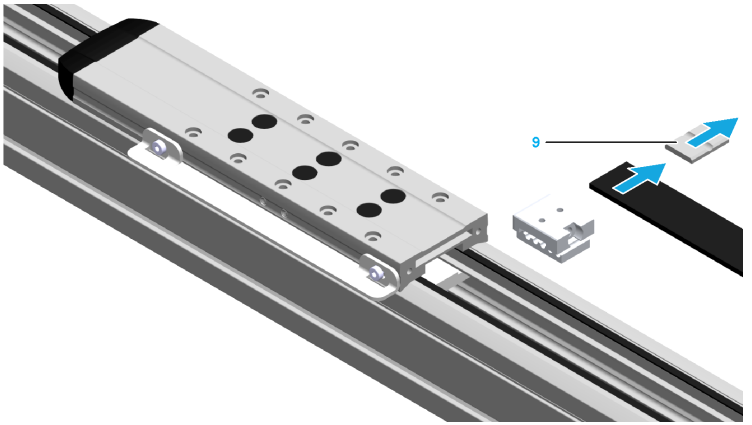
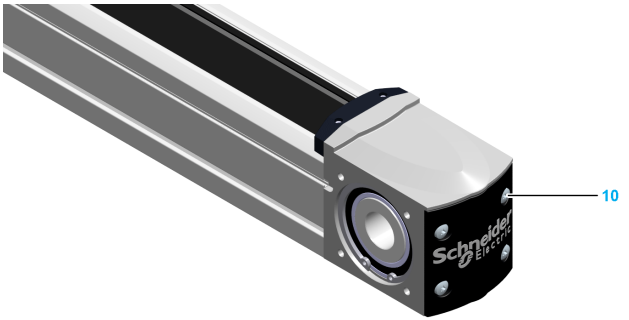
Removing the Toothed Belt

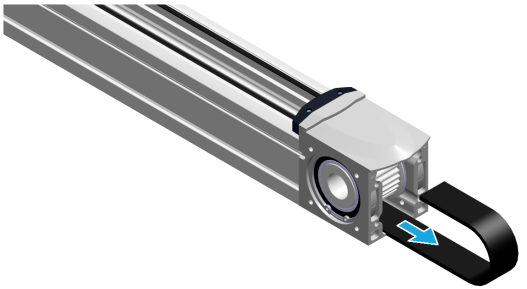
To remove the toothed belt, perform the tasks described below at both ends of the carriage and at both end blocks.

NOTE: If you have already removed the rubber buffers and the strip deflectors due to removing the cover strip, proceed with step 5.

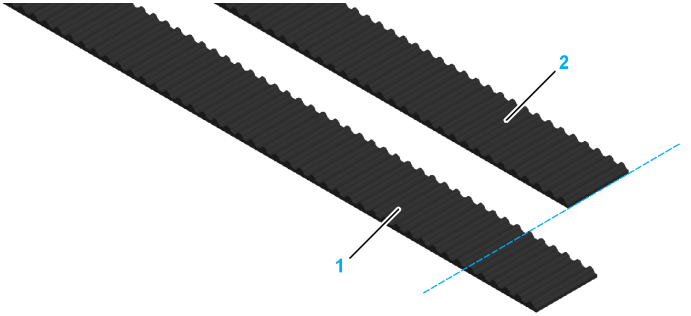
Step	Action
1	Remove the two screws (3) at the rubber buffer (2). 
2	Remove the rubber buffer from the holding plate (1).
3	Remove the two screws (4) and the holding plate from the carriage. 

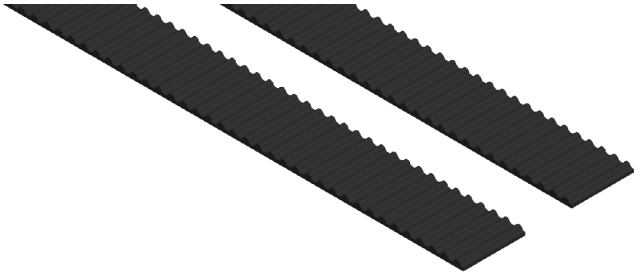
Step	Action
4	When using distance measurement, perform the following step: Measure the position of the toothed belt tensioner (5) with a caliper gauge at both sides of the carriage and note the values. The distance e has to be measured from the front side of the toothed belt tensioner to the front side of the carriage. 
5	Remove the tensioning screw (6) at the toothed belt tensioner.
6	Pull out the toothed belt tensioner along with the toothed belt (8). **NOTE:** This may require a considerable force. 
7	Loosen the two setscrews (7) at the toothed belt tensioner. **NOTE:** This requires a considerable force due to the threadlocker.

Step	Action
8	Slide the toothed belt and the clamping plate (9) to the side out of the toothed belt tensioner. 
9	Remove the four screws at the cover of the end block (10). 
10	Remove the cover.

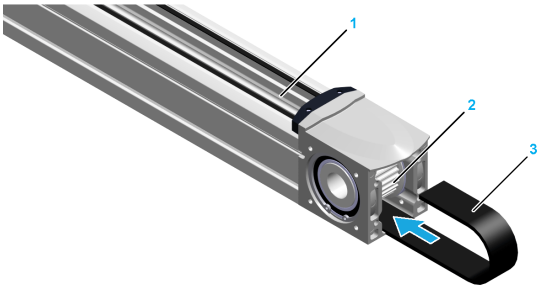
Step	Action
11	Remove the toothed belt. 

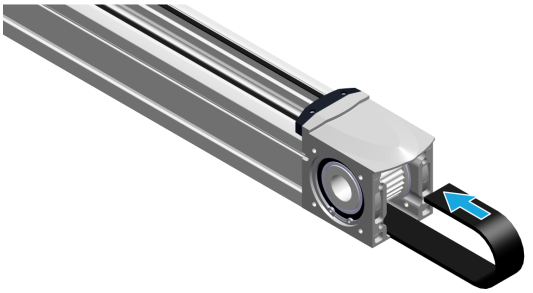
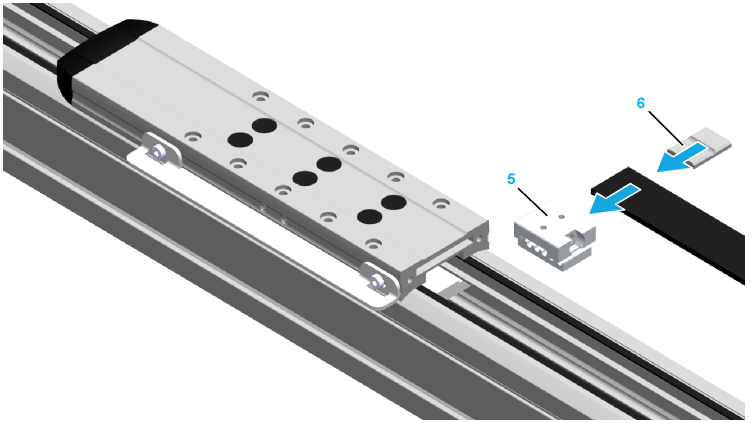
Cutting the New Toothed Belt to Length

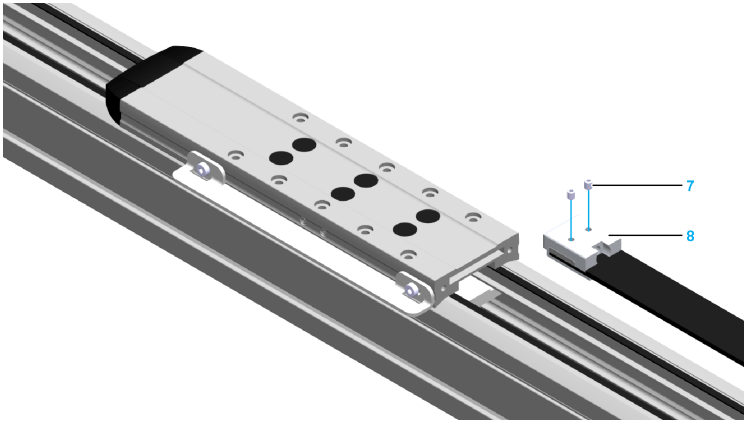
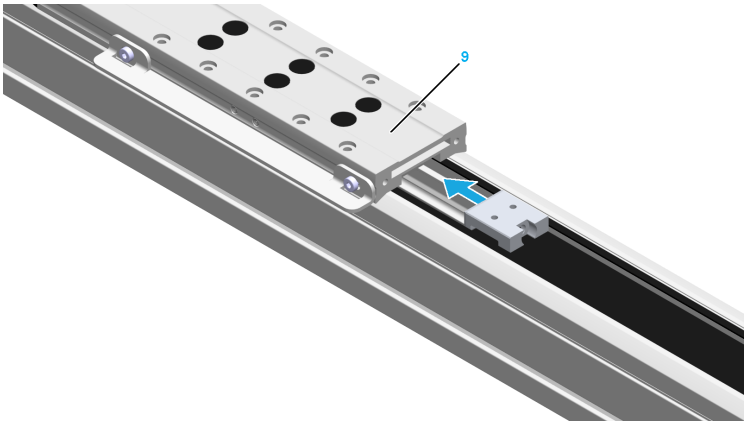
Step	Action
1	Place the new toothed belt (1) and the previous toothed belt (2) next to each other. Align the teeth with each other. 

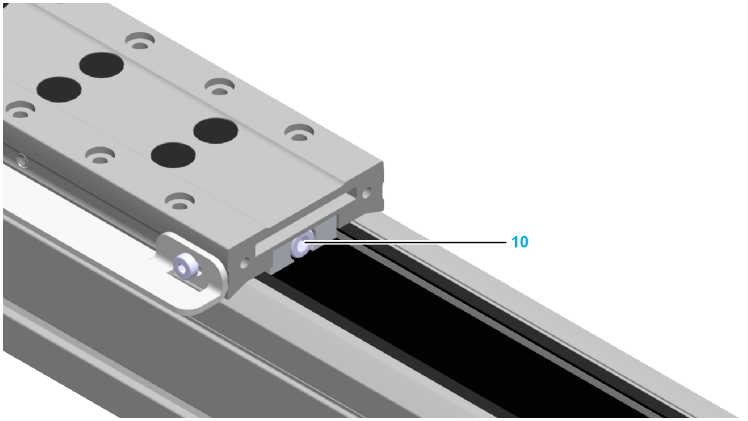
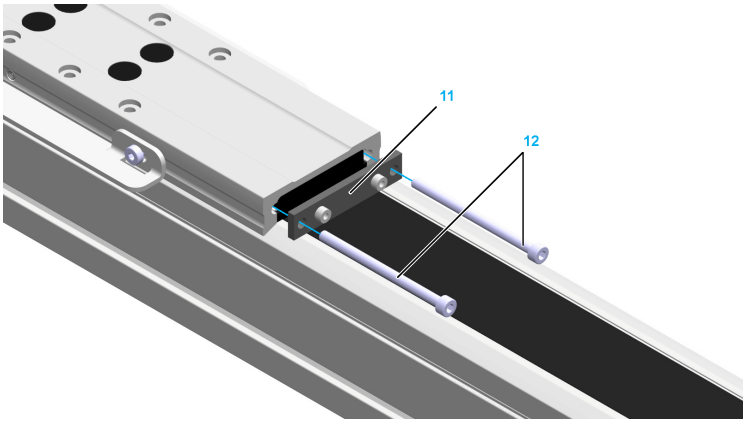
Step	Action
2	Cut the new toothed belt to the same length as the previous toothed belt.  **NOTE:** The number of teeth must be the same.

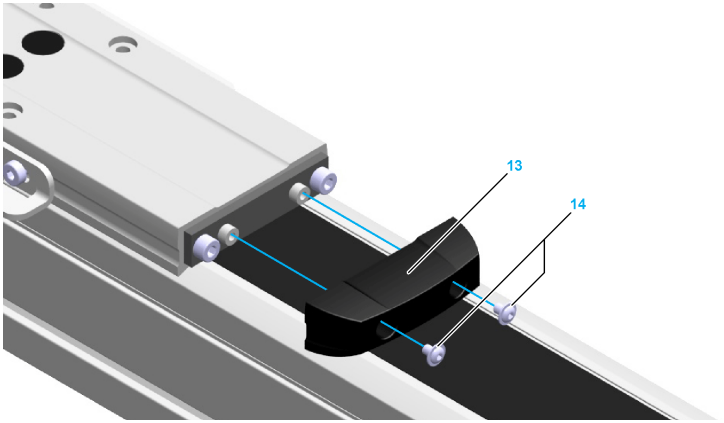
Mounting the Toothed Belt

Step	Action
1	Insert one end of the new toothed belt with up-pointing teeth (3) into an end block below the toothed belt pulley (2). Slide the toothed belt through the axis body (1) until the toothed belt comes out on the other end of the axis. 

Step	Action
2	Insert the other end of the toothed belt into the end block above the toothed belt pulley. 
3	Insert the end of the toothed belt from the side into the toothed belt tensioner (5) so that all five teeth are covered. 
4	Insert the clamping plate (6) with the recess pointing upward from the side into the toothed belt tensioner. **NOTE:** Verify that the toothed belt is inserted symmetrically and the clamping plate is inserted flush into the toothed belt tensioner.

Step	Action
5	Apply a thin layer of medium strength threadlocker to the setscrews (7) at the toothed belt tensioner (8) and tighten the setscrews. Tightening torque: ● For PAS41: 0.1 Nm (0.0039 lbf-in) ● For PAS42: 0.15 Nm (0.0059 lbf-in) ● For PAS43: 0.15 Nm (0.0059 lbf-in) ● For PAS44: 0.3 Nm (0.018 lbf-in) 
6	Insert the toothed belt tensioner with the mounted toothed belt into the carriage (9). 

Step	Action
7	Tension the toothed belt by adjusting the tensioning screws (10) at both ends of the carriage. Use either distance or vibration measurement: ● With distance measurement: tension the tensioning screw with the values noted in *Removing the Toothed Belt (see page 186)*. ● With vibration measurement: tension the tensioning screw until the respective toothed belt tension is reached. 
8	If applicable, mount the strip deflectors and the cover strip. For further information, refer to *Mounting the Cover Strip (see page 149)*.
9	Fasten the holding plate (11) to the carriage with the two screws (12). Verify that there is no clearance between the holding plate and the carriage such that the surfaces are flush. 

Step	Action
10	Fasten the rubber buffer (13) to the holding plate with the two screws (14). Verify that there is no clearance between the rubber buffer and the holding plate such that the surfaces are flush. 

Testing Movements

Step	Action
1	Run initial tests at reduced velocity.
2	Verify the toothed belt tension. For details, refer to *Maintaining the Toothed Belt* *(see page 163)*.
3	Mount the payload.

Replacing the Toothed Belt Pulley

Prerequisites

You need the following tools to remove the toothed belt pulley:

- Set of hex keys

NOTE: Do not use ball head hex keys. Excessive torque may cause the ball head to break away. A broken ball head makes the removal of the screw difficult.

For suitable parts, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Procedure Overview

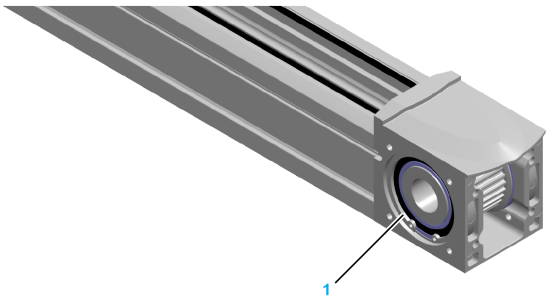
Perform the following procedures to replace the toothed belt pulley:

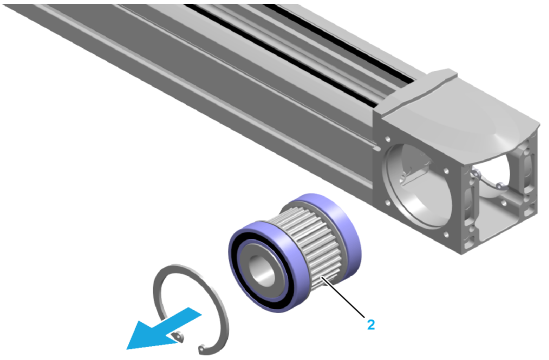
- Preparing the replacement of the toothed belt pulley *(see page 196)*
- Removing the toothed belt pulley *(see page 196)*
- Mounting the toothed belt pulley *(see page 197)*

Preparing the Replacement of the Toothed Belt Pulley

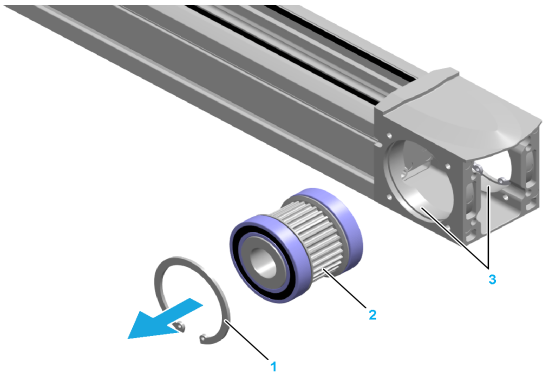
Step	Action
1	Remove the following components depending on the axis configuration: ● Shaft extension *(see page 180)* ● Motor and/or gearbox *(see page 172)* ● Elastomer coupling *(see page 177)*
2	If installed, remove the cover strip and the strip deflectors *(see page 182)*.
3	Remove the toothed belt *(see page 185)*.

Removing the Toothed Belt Pulley

Step	Action
1	Remove the circlip (1) at one side of the end block. 

Step	Action
2	Remove the toothed belt pulley with bearing (2) as a unit. 

Mounting the Toothed Belt Pulley

Step	Action
1	Clean both bearing seats in the end block (3).
2	Insert the new toothed belt pulley with the bearing (2). 
3	Mount the circlip (1).
4	Mount the toothed belt *(see page 185)*.
5	If applicable, mount the cover strip *(see page 182)*.
6	If applicable, mount the shaft extension *(see page 147)*.
7	If applicable, mount the motor and/or gearbox *(see page 126)*.

Section 6.3
Lubrication

What Is in This Section?

This section contains the following topics:

Topic	Page
Information About Lubrication	199
Lubricating a Lexium PAS4•B-Series with Roller Guide	200
Lubricating a Lexium PAS4•B-Series with Recirculating Ball Bearing Guide	202

Information About Lubrication

Overview

Lubricant is consumed continuously during operation of the axis. The axis must be lubricated at regular intervals. Incorrect lubricants may damage the axis.

The axis must be lubricated to allow smooth-running motions during operation.

Insufficient lubrication or incorrect lubricants increase wear and reduce the service life.

NOTICE
INOPERABLE EQUIPMENT Only use the specified type and amount of lubricant. **Failure to follow these instructions can result in equipment damage.**

For lubricating a axis with roller guide, only use Lamora D 220 or alternative lubricants with label CLR220 according to DIN 51517, part 3.

For lubricating a axis with recirculating ball bearing guide, only use Microlube GL 261 or alternative lubricants with label K1N-30 according to DIN 51825.

Note that a small amount of lubricants may leak. For further information, refer to *Emissions (see page 25)*.

NOTE: Always wear protective clothing when working on the system. Repeated and prolonged exposure to the product can cause skin irritation, or sickness if ingested.

⚠ CAUTION
EYE OR SKIN CONTACT WITH, OR INGESTION OF, LUBRICANTS ● In the event of contact with the eyes or the skin, wash the affected areas with plenty of water; if irritation persists, consult a doctor. ● In the event of swallowing, do not provoke vomiting or administer any products orally; consult a doctor as soon as possible. **Failure to follow these instructions can result in injury or equipment damage.**

Lubricating a Lexium PAS4•B-Series with Roller Guide

Overview

The axis is lubricated with oil from a factory-prefilled internal reservoir. The carriage features two lubrication nipples at each side for lubrication. The guide rods of the rollers are lubricated and cleaned by oil-soaked lubrication elements.

The maintenance intervals at normal ambient conditions *(see page 42)* are indicated in the maintenance plan *(see page 161)*.

Shorten the indicated intervals accordingly in severe conditions or at the following influencing factors:

- Dust and dirt particles
- High operating temperatures
- Heavy loads
- Heavy vibration
- Permanent short-distance positioning

Lubrication Amount

Axis	Lubricant	Type	Relubrication volume	Strokes(1)
Lexium PAS41BR	Lamora D 220(2)	Oil	1.25 cm^3 (0.076 in^3)	2.5
Lexium PAS42BR			3 cm^3 (0.183 in^3)	6
Lexium PAS43BR			4.25 cm^3 (0.26 in^3)	8.5

(1) According to the provided lubrication guns by Schneider Electric.
(2) Or alternative lubricants with label CLR220 according to DIN 51517, part 3.

Prerequisites

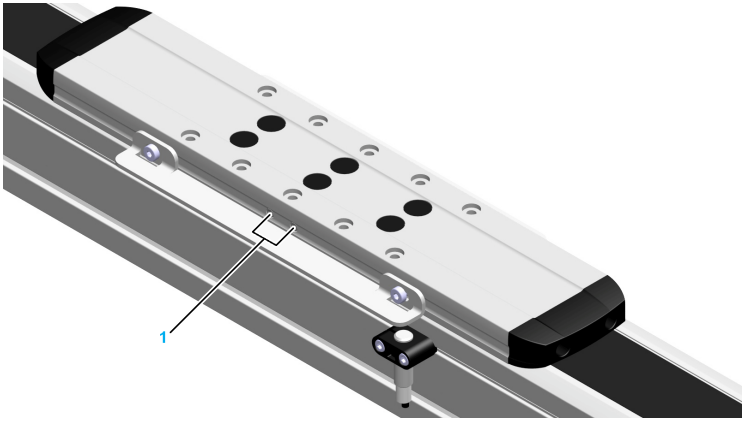
You need the following tools to lubricate a Lexium PAS4•B-Series with roller guide:

- Lubrication gun
- Lubricant

For suitable lubrication equipment, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Lubricating a Lexium PAS4•B-Series with Roller Guide

NOTE: Use the oil lubrication gun for the following steps.

Step	Action
1	Press the nozzle in a right angle against one of the lubrication nipples (1) and inject the specified amount of lubricant. For the correct type and quantity of lubricant, refer to *Lubrication Amount (see page 200)*. **NOTE:** ● When applying the lubricant, you must not exceed a maximum flow rate. Therefore, the minimum injection time of 5 seconds per lubrication gun stroke must be adhered to. ● Wait for at least 10 seconds between the strokes of the oil gun to allow the oil to penetrate the lubrication elements. 
2	Repeat step 1 alternating for the first and the second lubrication nipple at one side of the carriage until you reach the specified number of strokes.

Lubricating a Lexium PAS4•B-Series with Recirculating Ball Bearing Guide

Overview

The axis is lubricated with grease from a factory-prefilled external reservoir. The carriage features two lubrication nipples at each side for lubrication.

The maintenance intervals at normal ambient conditions *(see page 42)* are indicated in the maintenance plan *(see page 161)*.

Shorten the indicated intervals accordingly in severe conditions or at the following influencing factors:

- Dust and dirt particles
- High operating temperatures
- Heavy loads
- Heavy vibration
- Permanent short-distance positioning

Lubrication Amount

axis	Lubricant	Type	Relubrication volume	Strokes(1)
Lexium PAS42BB	Microlube GL 261(2)	Grease	0.25 cm^3 (0.0153 in^3)	0.5
Lexium PAS43BB			0.5 cm^3 (0.0305 in^3)	1
Lexium PAS44BB			1.0 cm^3 (0.061 in^3)	2

(1) According to the provided lubrication guns by Schneider Electric.
(2) Or alternative lubricants with label K1N-30 according to DIN 51825.

Prerequisites

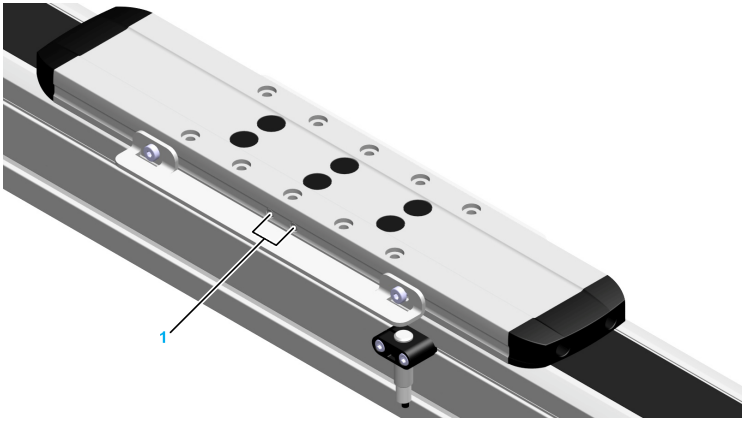
You need the following tools to lubricate a Lexium PAS4•B-Series with recirculating ball bearing guide:

- Lubrication gun
- Lubricant

For suitable lubrication equipment, refer to *Replacement Equipment and Accessories* *(see page 205)*.

Lubricating a Lexium PAS4•B-Series with Recirculating Ball Bearing Guide

NOTE: Use the grease lubrication gun for the following steps.

Step	Action
1	Press the nozzle in a right angle against one of the lubrication nipples (1) and inject the specified amount of lubricant. For the correct type and quantity of lubricant, refer to *Lubrication Amount (see page 200)*. **NOTE:** ● When applying the lubricant, you must not exceed a maximum flow rate. Therefore, the minimum injection time of 3 seconds per lubrication gun stroke must be adhered to. ● Move the carriage between the strokes to distribute the grease into the lubricant reservoirs evenly. 
2	Repeat step 1 alternating for the first and the second lubrication nipple at one side of the carriage until you reach the specified number of strokes.

Chapter 7
Replacement Equipment and Accessories

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Replacement Equipment Inventory	206
Replacement Equipment and Accessories of the Lexium PAS4•B-Series	207

Replacement Equipment Inventory

Overview

Keeping a stock of important components helps ensure that equipment downtime is kept to a minimum. Only exchange devices with identical types to help ensure compatibility.

Indicate the following information on the replacement equipment order, which can be found on the logistic type plate *(see page 39)*:

Parameter	Example value	Position on type plate
Axis type	PAS42BBM1000A1BAXXXL / 2 1G 0 H5 0	First line
Identification number	0073000005672	Id.No.
Serial number	1903003908	Ser.No.

Replacement Equipment Stock for Lexium PAS4•B-Series

When using the axis in a production environment, consider keeping the following replacement equipment packages in stock:

Replacement equipment	Order number	Quantity for axis			
		PAS41	PAS42	PAS43	PAS44
Sensor	(1)	1	1	1	1
Expanding Hub	SPM3MFSC10A14	1	0	0	0
	SPM3MFSC20A20	0	1	0	0
	SPM3MFSC25A30	0	0	1	0
	SPM3MFSC35A36	0	0	0	1
Elastomer spider	SPM3MFR09A018	1	0	0	0
	SPM3MFR14A034	0	1	0	0
	SPM3MFR20A120	0	0	1	0
	SPM3MFR25A320	0	0	0	1
Clamping hub	(2)	1	1	1	1
Toothed belt	(3)	1	1	1	1

(1) Depending on the contact. Refer to *Sensors (see page 216)* for the appropriate order number.
(2) Depending on the axis type. Refer to *Clamping Hubs (see page 209)* for the appropriate order number and to the corresponding motor or gearbox manual for the proper diameter (D1).
(3) Depending on the axis type and the characteristic feature. For the appropriate order number, refer to *Toothed Belt (see page 220)*.

NOTE: If there is an increased requirement on the availability of the axis, keep also an appropriate motor and/or gearbox in stock.

Replacement Equipment and Accessories of the Lexium PAS4•B-Series

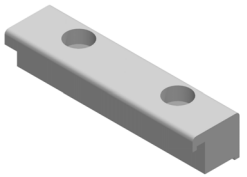
Overview

The following replacement equipment is listed:

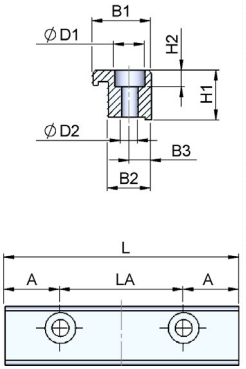
- Clamping claws *(see page 207)*
- Clamping hubs *(see page 209)*
- Contact plate *(see page 210)*
- Cover strips *(see page 211)*
- Cover strip clamps *(see page 211)*
- Elastomer spiders *(see page 211)*
- Expanding hubs *(see page 212)*
- Gearboxes *(see page 213)*
- Locating dowels *(see page 213)*
- Lubrication guns *(see page 214)*
- Magnetic strips *(see page 215)*
- Motors *(see page 215)*
- Nozzle pipes *(see page 215)*
- Rubber buffer *(see page 216)*
- Sensors *(see page 216)*
- Sensor extension cables *(see page 217)*
- Sensor holders *(see page 217)*
- Shaft extensions *(see page 217)*
- Slot nuts *(see page 218)*
- Strip deflectors *(see page 219)*
- T-Slot covers *(see page 219)*
- Toothed belts *(see page 220)*
- Toothed belt pulleys *(see page 222)*

Clamping Claws

Order data

Representation	Description	Axis	Order number
	For mounting the axis body to a mounting surface: ● 10x clamping claw	PAS41	VW33MF10511
		PAS42	VW33MF10512
		PAS43	VW33MF10613
		PAS44	VW33MF10814

Dimensions

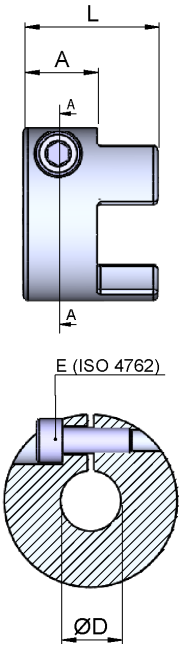
Dimensional drawing	Definition	Symbol	Unit	Axis			
				PAS41	PAS42	PAS43	PAS44
	Dimension	A	mm (in)	18 (0.71)	18 (0.71)	18 (0.71)	18 (0.71)
		B1		18 (0.71)	19 (0.75)	24 (0.94)	28 (1.1)
		B2		14 (0.55)	14 (0.55)	16 (0.63)	20 (0.79)
		B3		7 (0.276)	7 (0.276)	8 (0.315)	10 (0.39)
		D1		10 (0.39)	10 (0.39)	11 (0.43)	15 (0.59)
		D2		5.5 (0.217)	5.5 (0.217)	6.6 (0.26)	9 (0.354)
		H1		11.2 (0.44)	16.2 (0.64)	21.5 (0.85)	22 (0.87)
		H2		5.4 (0.213)	5.4 (0.213)	6.4 (0.25)	12 (0.47)
		L		76 (3)	76 (3)	76 (3)	76 (3)
		LA		40 (1.57)	40 (1.57)	40 (1.57)	40 (1.57)

Clamping Hubs

Order data

Representation	Description	Axis	D1 in mm (in)(1)	Order number
	For mounting attachments to the shaft of the motor or gearbox: ● 1x clamping hub with tensioning screw	PAS41	6.35 (0.25)	SPM3MFCC06A06
			8 (0.315)	SPM3MFCC08A06
			9 (0.354)	SPM3MFCC09A06
			10 (0.39)	SPM3MFCC10A06
			11 (0.43)	SPM3MFCC11A06
			12 (0.47)	SPM3MFCC12A06
			14 (0.55)	SPM3MFCC14A06
		PAS42	6.35 (0.25)	SPM3MFCC06A07
			8 (0.315)	SPM3MFCC08A07
			9 (0.354)	SPM3MFCC09A07
			10 (0.39)	SPM3MFCC10A07
			11 (0.43)	SPM3MFCC11A07
			12 (0.47)	SPM3MFCC12A07
			14 (0.55)	SPM3MFCC14A07
			16 (0.63)	SPM3MFCC16A07
			19 (0.75)	SPM3MFCC19A07
			20 (0.79)	SPM3MFCC20A07
		PAS43	12 (0.47)	SPM3MFCC12A08
			14 (0.55)	SPM3MFCC14A08
			19 (0.75)	SPM3MFCC19A08
			20 (0.79)	SPM3MFCC20A08
			22 (0.87)	SPM3MFCC22A08
			24 (0.94)	SPM3MFCC24A08
			25 (0.98)	SPM3MFCC25A08
		PAS44	12 (0.47)	SPM3MFCC12A09
			14 (0.55)	SPM3MFCC14A09
			19 (0.75)	SPM3MFCC19A09
			20 (0.79)	SPM3MFCC20A09
			22 (0.87)	SPM3MFCC22A09
			24 (0.94)	SPM3MFCC24A09
			25 (0.98)	SPM3MFCC25A09
(1) Refer to dimensional drawing (following table).				

Dimensions

Dimensional drawing	Parameter	Symbol	Unit	Axis			
				PAS41	PAS42	PAS43	PAS44
	Moment of inertia J	–	$kg \cdot cm^2$ ($lb \cdot in^2$)	0.015 (0.0051)	0.15 (0.051)	0.55 (0.188)	1.22 (0.42)
	Tightening torque	–	Nm (lbf-in)	1.9 (16.8)	14 (14)	14 (124)	35 (310)
	Screw ISO 4762	E	–	M3	M6	M6	M8
	Dimension	A	mm (in)	11 (0.43)	17 (0.67)	20 (0.79)	21 (0.83)
		D		(1)			
		L		22 (0.87)	31 (1.22)	36 (1.42)	39 (1.54)
1 See table order data.							

Contact Plate

Order data

Representation	Description	Axis	Order number
	For the functionality of the inductive sensor: ● 1x contact plate ● 2x screw	All	VW33MASP1

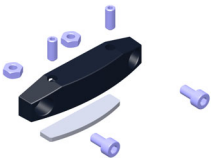
Cover Strips

Order data

Representation	Description	Axis	Length in m (ft)	Order number
	For helping to keep pollution, chips, dust, and foreign objects away from the linear guide inside the axis: ● 1x cover strip	PAS41	3 (9.8)	SPM3MAC22L030
			6 (19.7)	SPM3MAC22L060
		PAS42	3 (9.8)	SPM3MAC36L030
			6 (19.7)	SPM3MAC36L060
		PAS43	3 (9.8)	SPM3MAC45L030
			6 (19.7)	SPM3MAC45L060
		PAS44	3 (9.8)	SPM3MAC65L030
			6 (19.7)	SPM3MAC65L060

Cover Strip Clamps

Order data

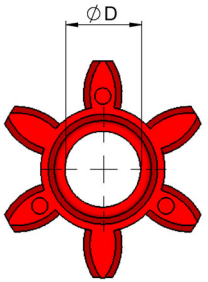
Representation	Description	Axis	Order number
	For fastening the cover strip at the end block: ● 1x cover strip clamp ● 1x clamping plate ● 2x screws ● 2x setscrews ● 2x nuts	PAS41	SPM3MAC1F041
		PAS42	SPM3MAC1F042
		PAS43	SPM3MAC1F043
		PAS44	SPM3MAC1F044

Elastomer Spiders

Order data

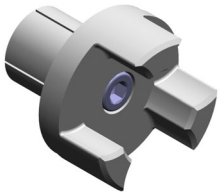
Representation	Description	Axis	Order number
	For decoupling the expanding hub and the clamping hub: ● 1x elastomer spider, red	PAS41	SPM3MFR09A018
		PAS42	SPM3MFR14A034
		PAS43	SPM3MFR20A120
		PAS44	SPM3MFR25A320

Dimensions

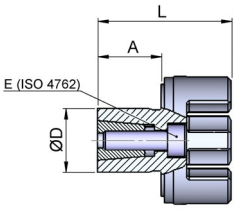
Dimensional drawing	Definition	Symbol	Unit	Axis			
				PAS41	PAS42	PAS43	PAS44
	Moment of inertia	J	kg·cm^2 (lb·in^2)	0.001 (0.00034)	0.013 (0.0044)	0.067 (0.023)	0.150 (0.051)
	Shore hardness	–	SH A	98			
	Color	–	–	Red			
	Dimension	D	mm (in)	9 (0.354)	14 (0.55)	20 (0.79)	25 (0.98)

Expanding Hubs

Order data

Representation	Description	Axis	Order number
	For mounting the motor or gearbox: ● 1x expanding hub with cone and tensioning screw	PAS41	SPM3MFSC10A14
		PAS42	SPM3MFSC20A20
		PAS43	SPM3MFSC25A30
		PAS44	SPM3MFSC35A36

Dimensions

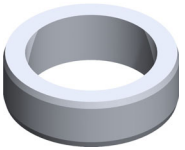
Dimensional drawing	Definition	Symbol	Unit	Axis			
				PAS41	PAS42	PAS43	PAS44
	Moment of inertia	J	$kg \cdot cm^2$ ($lb \cdot in^2$)	0.009 (0.0031)	0.09 (0.031)	0.32 (0.11)	0.77 (0.263)
	Tightening torque	M_t	Nm (lbf-in)	2.9 (25.7)	10 (89)	25 (221)	49 (434)
	Screw ISO 4762	E	–	M4	M6	M8	M10
	Dimension	A	mm (in)	14 (0.55)	20 (0.79)	30 (1.18)	36 (1.42)
		D		10 (0.39)	20 (0.79)	25 (0.98)	35 (1.38)
		L		30 (1.18)	42 (1.65)	54 (2.13)	61.5 (2.4)

Gearboxes

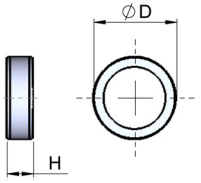
For detailed information about appropriate gearboxes for the axis, contact your local Schneider Electric service representative.

Locating Dowels

Order data

Representation	Description	Axis	Order number
	For precise and reproducible mounting of the payload at the end plates: ● 20x locating dowel	PAS41 / PAS42	VW33MF020LD01
		PAS43	VW33MF020LD02
		PAS44	VW33MF020LD03

Dimensions

Dimensional drawing	Definition	Symbol	Unit	Axis		
				PAS41 / PAS42	PAS43	PAS44
	Dimension	D	mm (in)	5.5 (0.217)	6.6 (0.26)	9 (0.354)
		H		3.8 (0.15)		

Lubrication Guns

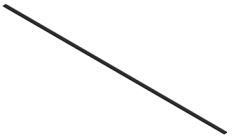
Order data

Representation	Description	Axis	Characteristic feature	Order number
	For lubricating the axis. Volume: 120 cm^3 (7.3 in^3); delivery volume: 0.5 cm^3 (0.03 in^3) / stroke: ● 1x single-hand lubrication gun	PAS42 / PAS43 / PAS44 with recirculating ball bearing guide	Grease	VW33MAP01
		PAS41 / PAS42 / PAS43 with roller guide	Oil	VW33MAP02

NOTE: The single-hand lubrication gun is empty. Furthermore, a nozzle pipe is required for lubrication.

Magnetic Strips

Order data

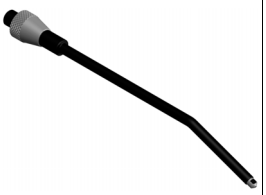
Representation	Description	Axis	Amount	Order number
	For fastening the cover strip: ● magnetic strip, 1 m (39 in) each	PAS41	3	SPM3MAW1S215
			6	SPM3MAW1S230
			12	SPM3MAW1S260
		PAS42	3	SPM3MAW1S415
			6	SPM3MAW1S430
			12	SPM3MAW1S460
		PAS43 PAS44	3	SPM3MAW1S615
			6	SPM3MAW1S630
			12	SPM3MAW1S660

Motors

For detailed information about appropriate motors for the axis, contact your local Schneider Electric service representative.

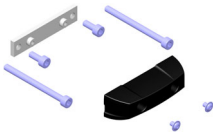
Nozzle Pipes

Order data

Representation	Description	Axis	Characteristic feature	Order number
	For extending the lubrication gun: ● 1x nozzle pipe Suitable for lubrication nipple type D6.	All	Pointed nozzle 90° lateral	VW33MAT01
			Pointed nozzle 20° angled	VW33MAT02

Rubber Buffer

Order data

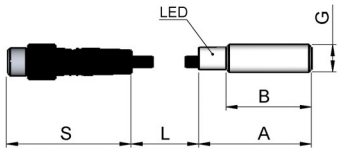
Representation	Description	Axis	Order number
	For reducing the effect of an impact: ● 2x rubber buffer ● 2x holding plate ● 12x screw	PAS41	SPM3MAC1F041
		PAS42	SPM3MAC1F042
		PAS43	SPM3MAC1F043
		PAS44	SPM3MAC1F044

Sensors

Order data

Representation	Description	Axis	Sensor contact type	Order number
	For detecting the end position of the axis: ● 1x sensor	All	PNP, normally closed	XS508B1PBP01M8
			PNP, normally open	XS508B1PAP01M8
			NPN, normally closed	XS508B1NBP01M8
			NPN, normally open	XS508B1NAP01M8

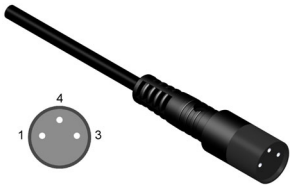
Dimensions

Dimensional drawing	Definition	Symbol	Unit	Axis
				All
	Thread	G	–	M8
	Dimension	A	mm (in)	33 (1.3)
		B		25 (0.98)
		L		100 (3.9)
		S		36.5 (1.44)

NOTE: For the connection assignment, refer to *Connection Details – Sensors* *(see page 140)*.

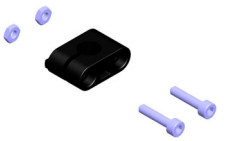
Sensor Extension Cables

Order data

Representation	Description	For sensor contact type	Length in m (ft)	Order number
	For extending the sensor cable: ● 1x sensor extension cable Suitable for energy chain applications; sensor side end 3-pin M8 circular connector, second cable end is open.	PNP and NPN normally closed / PNP and NPN normally open	5 (16.4)	VW32SBCBGA050
			10 (33)	VW32SBCBGA100
			20 (66)	VW32SBCBGA200

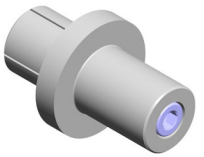
Sensor Holders

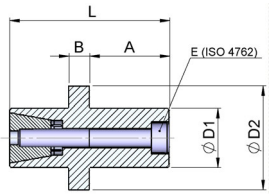
Order data

Representation	Description	Axis	Diameter of the Sensor in mm (in)	Order number
	For mounting sensors to the axis: ● 10x sensor holder	All	8 (0.315)	VW33MF010M8

Shaft Extensions

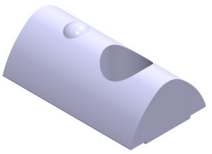
Order data

Representation	Description	Axis	Order number
	For coupling external components, for example, an external encoder: ● 1x shaft extension with cone and tensioning screw	PAS41	VW33MF1S12A12
		PAS42	VW33MF1S27A20
		PAS43	VW33MF1S32A25
		PAS44	VW33MF1S37A32

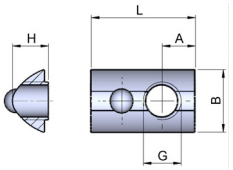
Dimensional drawing	Parameter	Symbol	Unit	Axis			
				PAS41	PAS42	PAS43	PAS44
	Moment of inertia	J	$kg \cdot cm^2$ ($lb \cdot in^2$)	0.002 (0.000683)	0.05 (0.017)	0.16 (0.055)	0.54 (0.185)
	Tightening torque	M_t	Nm (lbf-in)	2.9 (16.8)	10 (89)	25 (221)	49 (434)
	Screw ISO 4762	E	–	M4	M6	M8	M10
	Maximum radial force	F_R	N (lbf)	230 (52)	400 (90)	700 (157)	1300 (292)
	Dimension	A	mm (in)	12 (0.47)	27 (1.06)	32 (1.26)	37 (1.46)
		B		5.5 (0.217)	7 (0.276)	7.5 (0.295)	9 (0.354)
		D1		12 (0.47)	20 (0.79)	25 (0.98)	32 (1.26)
		D2		17 (0.67)	35 (1.38)	45 (1.77)	55 (2.17)
		L		31.5 (1.24)	54 (2.13)	69.5 (2.74)	82 (3.2)

Slot Nuts

Order data

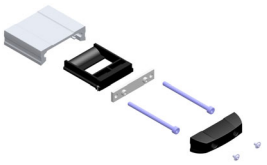
Representation	Description	Axis	Slot nut type	Order number
	For mounting the axis body to a mounting surface or for mounting other parts to the axis: ● 10x slot nut	PAS41 PAS42	5 M5	VW33MF010T5N5
		PAS43	6 M6	VW33MF010T6N6
		PAS44	8 M6	VW33MF010T8N6
			8 M8	VW33MF010T8N8

Dimensions

Dimensional drawing	Definition	Symbol	Unit	Axis			
				PAS41 / PAS42	PAS43	PAS44	
				5 St M5	6 St M6	8 St M6	8 St M8
	Thread	G	–	M5	M6	M6	M8
	Dimension	A	mm (in)	4 (0.157)	5.5 (0.217)	7 (0.276)	7 (0.276)
		B		7.7 (0.303)	10.6 (0.42)	13.2 (0.52)	13.2 (0.52)
		H		4.6 (0.18)	6.4 (0.25)	7.6 (0.3)	7.6 (0.3)
		L		12 (0.47)	17 (0.67)	22 (0.87)	22 (0.87)

Strip Deflectors

Order data

Representation	Description	Axis	Order number
	For deflecting the cover strip at the carriage: ● 1x housing for strip deflector ● 1x deflection unit with brush ● 1x holding plate ● 1x rubber buffer ● 4x screws	PAS41	SPM3MAC1D0041
		PAS42	SPM3MAC2D0042
		PAS43	SPM3MAC3D0043
		PAS44	SPM3MAC4D0044

T-Slot Covers

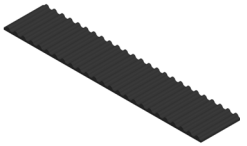
Order data

Representation	Description	Axis	T-slot cover size	Order number
	For covering the T-slot at the axis body: ● 5x T-slot cover, 2 m (79 in) each	PAS41PAS 42	5	VW33MC05B05
		PAS43	6	VW33MC05A06
		PAS44	8	VW33MC05A08

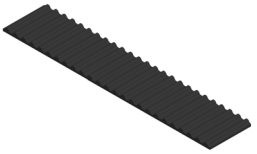
Toothed Belts

Calculation of the required toothed belt length: 2 x total length of axis

Order data

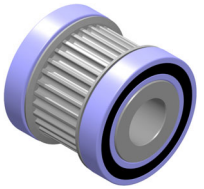
Representation	Description	Axis	Characteristic feature	Order number
	For performing a linear movement of the axis: ● 1x toothed belt	PAS41	Standard Length 1.5 m (4.9 ft)	SPM3MAS15L015
			Standard Length 3 m (9.8 ft)	SPM3MAS15L030
			Standard Length 10 m (33 ft)	SPM3MAS15L100
			Antistatic Length 1.5 m (4.9 ft)	SPM3MAA15L015
			Antistatic Length 3 m (9.8 ft)	SPM3MAA15L030
			Antistatic Length 10 m (33 ft)	SPM3MAA15L100
		PAS42	Standard Length 1.5 m (4.9 ft)	SPM3MAS25L015
			Standard Length 3 m (9.8 ft)	SPM3MAS25L030
			Standard Length 10 m (33 ft)	SPM3MAS25L100
			Antistatic Length 1.5 m (4.9 ft)	SPM3MAA25L015
			Antistatic Length 3 m (9.8 ft)	SPM3MAA25L030
			Antistatic Length 10 m (33 ft)	SPM3MAA25L100

Order data

Representation	Description	Axis	Characteristic feature	Order number
	For performing a linear movement of the axis: ● 1x toothed belt	PAS43	Standard, length 1.5 m (4.9 ft)	SPM3MAS30L015
			Standard, length 3 m (9.8 ft)	SPM3MAS30L030
			Standard, length 10 m (33 ft)	SPM3MAS30L100
			Antistatic, length 1.5 m (4.9 ft)	SPM3MAA30L015
			Antistatic, length 3 m (9.8 ft)	SPM3MAA30L030
			Antistatic, length 10 m (33 ft)	SPM3MAA30L100
		PAS44	Standard, length 1.5 m (4.9 ft)	SPM3MAS50L015
			Standard, length 3 m (9.8 ft)	SPM3MAS50L030
			Standard, length 10 m (33 ft)	SPM3MAS50L100
			Antistatic, length 1.5 m (4.9 ft)	SPM3MAA50L015
			Antistatic, length 3 m (9.8 ft)	SPM3MAA50L030
			Antistatic, length 10 m (33 ft)	SPM3MAA50L100

Toothed Belt Pulleys

Order data

Representation	Description	Axis	Characteristic feature	Order number
	For transmissioning the drive torque to the toothed belt: ● 1x toothed belt pulley with flanges and ball bearings	PAS41	Standard	SPM3MAW1S084
			Increased corrosion resistance	SPM3MAW1C084
		PAS42	Standard	SPM3MAW2S155
			Increased corrosion resistance	SPM3MAW2C155
		PAS43	Standard	SPM3MAW3S205
			Increased corrosion resistance	SPM3MAW3C205
		PAS44	Standard	SPM3MAW4S264
			Increased corrosion resistance	SPM3MAW4C264

Chapter 8
Troubleshooting

Troubleshooting

Overview

Malfunction	Probable cause	Solution
Sensor overtravelled.	Detected sensor error.	Adjust or replace the sensors. For more information, refer to *Replacing the Sensors* *(see page 171)*.
	Detected controller error.	Verify the controller.
Motor load increases, controller switches off because of overload.	Linear guides or toothed belt pulleys under mechanical tension or excessive friction caused by poor lubrication.	Contact your local Schneider Electric service representative.
Noise and vibrations.	Velocity too high.	Reduce velocity.
	Poor lubrication (in the case of noise).	Lubricate, for more information, refer to *Lubrication* *(see page 198)*.
	Carriage has backlash.	Contact your local Schneider Electric service representative.
	Ambient conditions.	Verify ambient conditions *(see page 42)*.
Running inaccuracy and noise of the guides.	Poor lubrication.	Lubricate, for more information, refer to *Lubrication* *(see page 198)*.
	Damage to components of the linear guide, for example by shock or impact on the carriage.	The components of the linear guide must be replaced, contact your local Schneider Electric service representative.
The carriage has backlash and positions inaccurately.	Backlash in guides after a collision.	Contact your local Schneider Electric service representative.
	Worn out or damaged toothed belt or elastomer coupling after a collision.	Replace the toothed belt *(see page 185)* and/or replace the elastomer coupling *(see page 177)*.

Appendices

What Is in This Appendix?

The appendix contains the following chapters:

Chapter	Chapter Name	Page
A	Further Information About the Manufacturer	227
B	Disposal	231

Appendix A
Further Information About the Manufacturer

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Contact Addresses	228
Product Training Courses	229

Contact Addresses

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Additional Contact Addresses

See the homepage for additional contact addresses:

www.schneider-electric.com

Product Training Courses

Product Training Courses

Schneider Electric offers a number of product training courses.

The Schneider Electric training instructors will help you take advantage of the extensive possibilities offered by the system.

See the website (*www.schneider-electric.com*) for further information and the seminar schedule.

Appendix B
Disposal

Disposal

Information About the Disposal of Schneider Electric Products

The Lexium PAS4•B-Series is delivered in a cardboard box or a wooden box. The wooden box is treated according to IPPC-Standard. The cardboard box also comprises films.

NOTE: The components consist of different materials, which cannot be reused and must be disposed of separately. The packaging cannot be returned to the manufacturer.

- Dispose of the packaging in accordance with the relevant local, regional or national regulations.
- Dispose of the packaging at the disposal sites provided for this purpose.
- Dispose of the axis in accordance with the applicable local, regional or national regulations.

NOTE: The axis, motor, and gearbox contain lubricants whose disposal may be subject to local, regional, or national regulations apart from the packaging.

Glossary

A

Axis body

The axis body is a precision aluminum profile.

B

Breakaway torque

The breakaway torque describes the driving torque required to overcome the static friction and that initiates the transition to sliding friction.

D

DOM

Date of manufacturing: the type plate of the axis shows the date of manufacture in the format DD.MM.YY or in the format DD.MM.YYYY. For example: 31.12.18 corresponds to December 31, 2018

F

Feed constant

The feed constant (feed per revolution) is the distance the carriage covers per motor revolution.

L

Linear guide

The linear guide consists of:

- The rollers and the guide rods which comprise the roller guide (PAS4•BR / PAS4•HR).
- The guide carriages and the guide rail which comprise the recirculating ball bearing guide (PAS4•BB / PAS4•HB).

M

Mounting position

The axis can be installed in any desired mounting position. However, all external forces and torques must be within the ranges of permissible values.

P

Portal axis

In the case of a portal axis, the axis body is stationary while the carriage is moving.

Position repeatability

Position repeatability is the accuracy with which it is possible to move to a previous position again under the same conditions. To determine this value, the carriage is moved to the end position from the same direction.

S

Sensor

Inductive proximity sensors are used as sensors for limit switches or reference switches. These sensors have not a safety function.

Service life

The service life is the distance in kilometers (miles) before the first signs of material fatigue can be seen on the guides, the mechanical drive elements and the bearings. Service life specifications (kilometers covered) relate to the nominal values specified in the data sheet. If the nominal values are exceeded, the service life decreases accordingly.

Stroke

Stroke is the maximum travel of the carriage between the switching points of the sensors.

Stroke reserve

The stroke reserve is the distance between a sensor and the mechanical stop.

Support axis

A support axis has linear guides, but no mechanical drive elements. A support axis carries loads that are applied asymmetrically to the carriage and improves the stability and service life of the system.

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