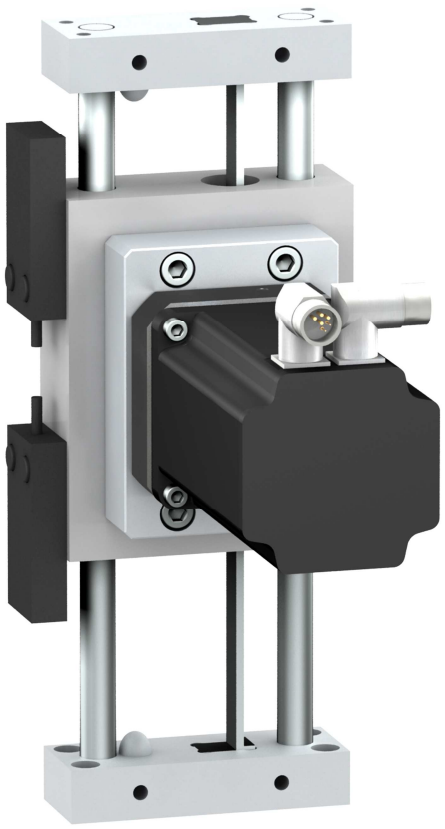
CAS3• Cantilever axes

Lexium Linear Motion
Product Manual

V2.00, 02.2012



www.schneider-electric.com

Schneider Electric

Important information

This manual is part of the product.

Carefully read this manual and observe all instructions.

Keep this manual for future reference.

Hand this manual and all other pertinent product documentation over to all users of the product.

Carefully read and observe all safety instructions and the chapter "Before you begin - safety information".

Some products are not available in all countries. For information on the availability of products, please consult the catalog.

Subject to technical modifications without notice.

All details provided are technical data which do not constitute warranted qualities.

Most of the product designations are registered trademarks of their respective owners, even if this is not explicitly indicated.

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Writing conventions and symbols



This manual is valid for CAS3x standard products. Chapter 1 "Introduction" lists the type code for this product. The type code allows you to identify whether your product is a standard product or a customized version.

The following manuals belong to this product:

- **Product manual of the drive**, describes the technical data, installation, commissioning and the operating modes and functions.
- **Motor manual**, describes the technical characteristics of the motors, including correct installation and commissioning.

Source manuals

The latest versions of the manuals can be downloaded from the at.

http://www.schneider-electric.com

Source CAD drawings

For easier engineering, CAD drawings and product master data are available for download from the Internet at:

http://www.schneider-electric.com

Corrections and suggestions

We always try to further optimize our manuals. We welcome your suggestions and corrections:
Please get in touch with us by e-mail

techcomm@schneider-electric.com.

Work steps

If work steps must be performed consecutively, this sequence of steps is represented as follows:

■ Special prerequisites for the following work steps
► Step 1
□ Specific response to this work step
► Step 2

If a response to a work step is indicated, this allows you to verify that the work step has been performed correctly.

Unless otherwise stated, the individual steps must be performed in the specified sequence.

Making work easier Information on making work easier is highlighted by this symbol:



Sections highlighted this way provide supplementary information on making work easier.

SI units SI units are the original values. Converted units are shown in brackets behind the original value; they may be rounded.

Example:
Minimum conductor cross section: 1.5 mm^2 (AWG 14)

Glossary Explanations of special technical terms and abbreviations.

Index List of keywords with references to the corresponding page numbers.

1. Introduction

1.1 Overview of product properties

The cantilever axis with round bar design are based on specially developed and particularly torsion-resistant aluminium profiles.

The axis body consists of a two rod guide wich provides both low weigth and high rigidity for short strokes.

They excel with the their ability to position heavy loads at changing torques with high feed forces and high accuracy.

1.1.1 Product family

The cantilever axes product family consists of the following sizes:

- CAS30RC (cross section axis body 66x28 mm)
- CAS31BC (cross section axis body 80x30 mm)
- CAS32BC (cross section axis body 100x40 mm)
- CAS33BC (cross section axis body 120x50 mm)
- CAS34BC (cross section axis body 160x50 mm)

The sizes differ in terms of outer dimensions, drive data, payload capacities and maximum strokes.

1.1.2 Features and options of the cantilever axis

The cantilever axis excels with the following features and options:

- high stiffness for short strokes
- low travel weight
- takes up little space
- different strokes lengths available
- anti-corrosion version
- lifetime lubricated
- various possible mounting combinations for easy integration into wider solutions
- load can be fixed to the endplate

1.1.3 Characteristics of the linear guide

Recirculating ball bearing guide

- High acceleration
- High load capacity
- High accuracy
- High torque capacity

1.1.4 Motor mounting

The motor or the gearbox is mounted directly on the drive pinion without featherkey, eliminating any play in the connection as well as the need for additional couplings.

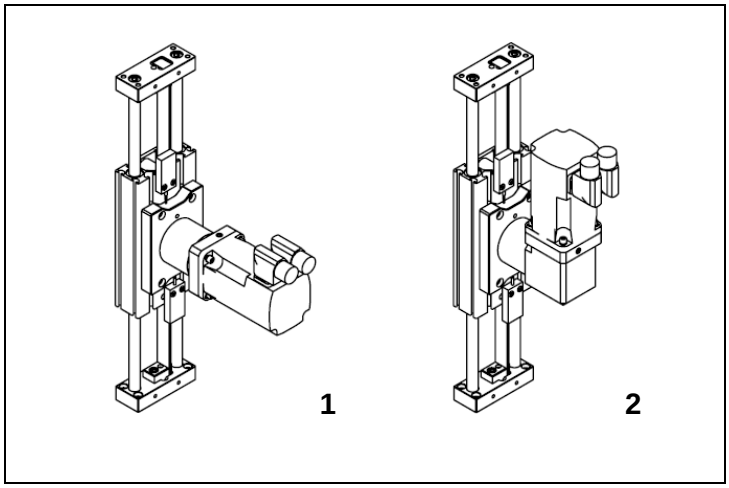


Figure 1.1 Options of motor mounting

(1) Motor mounting straight
(2) Motor mounting with angle gear, rotable 4x 90°

1.2 Product overview

Cantilever axis with Round bar design

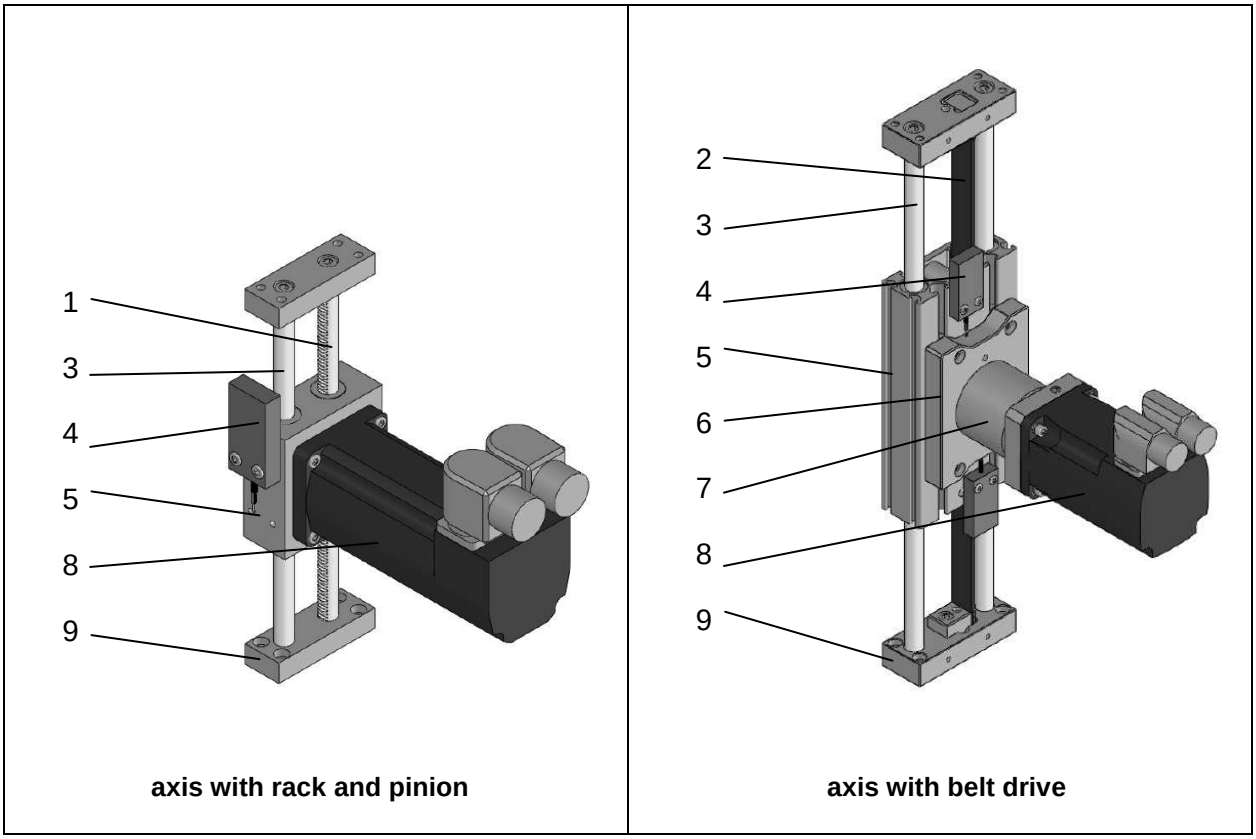


Figure 1.2 Product overview cantilever axes

1. rack
2. thooted belt
3. guide bar
4. sensor
5. axis body
6. flange plate for adaption motor or gear
7. gearbox
8. motor
9. endplate

1.3 Type code

References *(1)*

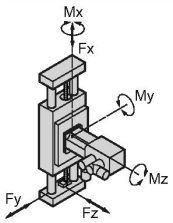
To order a Lexium CAS 3 cantilever axis, complete each reference by replacing the "●" *(2)*:

Example: CAS 3 1 B C M 0200 A 1 C R/… rest of the reference on page 27

		CAS 3	●	●	C	M	●●●●	●	1	●	R	/(2)
Size (profile cross-section)	66 x 28 mm		**0**									/
	80 x 30 mm		**1**									/
	100 x 40 mm		**2**									/
	120 x 50 mm		**3**									/
	160 x 50 mm		**4**									/
Type of drive for mobile axis structure	Rack (for CAS 30)			**R**								/
	Toothed belt (for CAS 31, 32, 33, 34)			**B**								/
Type of guide for mobile axis structure	Ball				**C**							/
Feed per revolution	50 mm/revolution (for CAS 30)					**M**						/
	75 mm/revolution (for CAS 31)					**M**						/
	100 mm/revolution (for CAS 32, 33, 34)					**M**						/
Stroke	Maximum 150 mm (for CAS 30)						**●●●●**					/
	Maximum 200 mm (for CAS 31)						**●●●●**					/
	Maximum 300 mm (for CAS 32)						**●●●●**					/
	Maximum 400 mm (for CAS 33)						**●●●●**					/
	Maximum 500 mm (for CAS 34)						**●●●●**					/
Limit switches	2 sensors with PNP output, NC contact, not connected *(3)*							**A**				/
	2 sensors with PNP output, NC contact, not connected *(4)*							**B**				/
	Without sensors							**N**				/
Type of fixing support *(5)*	Type 1								**1**			/
Options	Anti-corrosion version (only for CAS 31, 32, 33, 34)									**C**		/
	With anti-static toothed belt									**A**		/
	Anti-corrosion version/with anti-static toothed belt (only for CAS 31, 32, 33, 34)									**E**		/
	Without option									**N**		/
Interface for the drive element *(6)*	Drive element fixed on right-hand side										**R**	/

(1) All technical data (characteristics, dimensions, etc.) for Lexium CAS 3 cantilever axes is available on our website www.schneider-electric.com and on the documentation CD-ROM supplied with this catalogue.
(2) For the second part of the reference, see page 27.
(3) Supplied with a 0.2 m cable equipped with an M8 connector.
(4) Supplied with a 5 m cable with flying leads at one end.
(5) Please refer to our website www.schneider-electric.com or the documentation CD-ROM supplied with this catalogue.
(6) Drive element fixed on right-hand side:

CAS 3●●CM●●●●●1●R/…*(2)*



References (continued) *(1)*

To order a Lexium CAS 3 cantilever axis, complete each reference by replacing the "●" *(2)*:

Example: CAS 3 1 B C M 0200 A 1 C R *(2)* /2 1G 0 H7 0 + PLE60 3:1 + BMH 0702P01A2A — **CAS 3 ● ● C M ●●●● ● 1 ● R *(2)*/ ● ●● ● ●● ● + …**

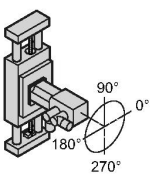
Motor drive configuration *(3)*	Motor only	/	**1**						
	Motor + gearbox	/	**2**						
	Gearbox only	/	**3**						
Gearbox interface	PLE 40 gearboxes	/		**0G**					
	PLE 60 gearboxes	/		**1G**					
	PLE 80 gearboxes	/		**3G**					
	PLE 120 gearboxes	/		**5G**					
	WPLE 40 gearboxes	/		**0A**					
	WPLE 60 gearboxes	/		**1A**					
	WPLE 80 gearboxes	/		**3A**					
	WPLE 120 gearboxes	/		**5A**					
	Other third-party gearboxes not assembled by Schneider Electric (gearbox drawings required)	/		**YY**					
	Other third-party gearboxes assembled by Schneider Electric (gearbox and drawings required)	/		**ZZ**					
	Without gearbox	/		**XX**					
Gearbox orientation *(3)*	0°	/			**3**				
	90°	/			**0**				
	180°	/			**9**				
	270°	/			**6**				
	Without gearbox	/			**X**				
Motor interface	BSH 055● servo motors	/				**H5**			
	BSH 0701, 0702/BMH 0701, 0702 servo motors	/				**H7**			
	BSH 0703/BMH 0703 servo motors	/				**H8**			
	BSH 1001…1003/BMH 1001…1003 servo motors	/				**H1**			
	BSH 1004 servo motors	/				**H4**			
	BSH 1401…1404/BMH 1401…1403 servo motors	/				**H2**			
	Lexium ILS●●571, 572 integrated drives with 3-phase stepper motor	/				**I6**			
	Lexium ILS●●573 integrated drives with 3-phase stepper motor	/				**I7**			
	Lexium ILS●●851, 852 integrated drives with 3-phase stepper motor	/				**I9**			
	Lexium ILS●●853 integrated drives with 3-phase stepper motor	/				**I8**			
	Lexium ILA●●57 integrated drives with AC synchronous servo motor	/				**A6**			
	Lexium ILE●●66 integrated drives with DC brushless motor and gearbox with straight teeth	/				**E7**			
	BRS 368 stepper motors	/				**V8**			
	BRS 397, 39A stepper motors	/				**V9**			
	BRS 39B stepper motors	/				**V0**			
	BRS 3AC, 3AD stepper motors	/				**V1**			
	Third-party motors not assembled by Schneider Electric (motor drawings required)	/				**YY**			
	Third-party motors assembled by Schneider Electric (motor and drawings required)	/				**ZZ**			
	Without motor	/				**XX**			
Motor orientation *(3)*	0°	/					**3**		
	90°	/					**0**		
	180°	/					**9**		
	270°	/					**6**		
	Without motor	/					**X**		
Planetary gearbox gear ratio + 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**							**+**	…

(1) All technical data (characteristics, dimensions, etc.) for Lexium CAS 3 cantilever axes is available on our website www.schneider-electric.com and on the documentation CD-ROM supplied with this catalogue.

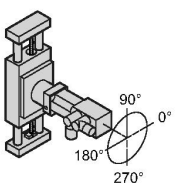
(2) For the first part of the reference, see page 26.

(3) Possible motor drive configurations and orientation (view from motor/gearbox towards the axis or from motor towards the gearbox):

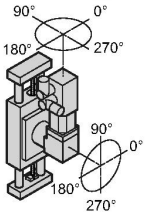
CAS 3●●…*(2)*/1XXX●●●



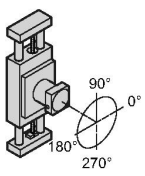
CAS 3●●…*(2)*/2●G●●●●



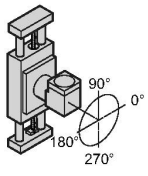
CAS 3●●…*(2)*/2●A●●●●



CAS 3●●…*(2)*/3●G●XXX



CAS 3●●…*(2)*/3●A●XXX



If you have questions concerning the type code, contact your Schneider Electric sales office.

Designation customized version

In the case of a customized version, the type code contains one or several dollar signs "$".

Example: CAS32BCM0100A1NR/2 1A 0 I7 0

FContact your machine vendor if you have questions concerning customized versions.

1.4 Declaration of Incorporation

DECLARATION OF INCORPORATION

SCHNEIDER ELECTRIC MOTION
DEUTSCHLAND GmbH
Breslauer Str. 7
77933 Lahr

For partly completed machinery as per Machinery Directive 2006/42/EC

We hereby declare that the product listed below in the version distributed by us is partly completed machinery and satisfies the provisions of the Directive by application of the following standards. The relevant technical documentation as per Annex VII, part B, has been compiled. Please observe the safety instructions in our technical documentation.

Designation:	Cantilever axis with toothed belt drive
Type:	CAS30x, CAS31x, CAS32x, CAS33x, CAS34x
Product number:	71xx xxxx xxx
Applied harmonized standards, especially	EN ISO 12100-1:2003-11 Safety of machinery Basic concepts, principles for design Part 1: Basic terminology, methodology EN ISO 12100-2:2003-11 Safety of machinery Basic concepts, principles for design Part 2: Technical principles and specifications
Applied national standards and technical specifications, especially	Product documentation

We undertake to transmit, in electronic form, in response to a request by the national authorities relevant information on the partly completed machinery.

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

Company stamp: Schneider Electric Motion Deutschland GmbH
Postfach 11 80 · D-77901 Lahr
Breslauer Str. 7 · D-77933 Lahr

Date/Signature: 23 February 2011

Name/Department: Björn Hagemann/R & D

2. Before you begin - safety information

2.1 Qualification of personnel

Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation are authorized to work on and with this product. In addition, these persons must have received safety training to recognize and avoid hazards involved. These persons must have sufficient technical training, knowledge and experience and be able to foresee and detect potential hazards that may be caused by using the product, by changing the settings and by the mechanical, electrical and electronic equipment of the entire system in which the product is used.

All persons working on and with the product must be fully familiar with all applicable standards, directives, and accident prevention regulations when performing such work.

2.2 Intended use

This product is a linear axis and intended for industrial use according to this manual.

The product may only be used in compliance with all applicable safety regulations and directives, the specified requirements and the technical data.

Prior to using the product, you must perform a risk assessment in view of the planned application. Based on the results, the appropriate safety measures must be implemented.

Since the product is used as a component in an entire system, you must ensure the safety of persons by means of the design of this entire system (for example, machine design).

Operate the product only with the specified cables and accessories. use only genuine accessories and spare parts.

The product must NEVER be operated in explosive atmospheres (hazardous locations, Ex areas).

Any use other than the use explicitly permitted is prohibited and can result in hazards.

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel.

2.3 Hazard categories

Safety instructions to the user are highlighted by safety alert symbols in the manual. In addition, labels with symbols and/or instructions are attached to the product that alert you to potential hazards.

Depending on the seriousness of the hazard, the safety instructions are divided into 4 hazard categories

⚠ DANGER

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

⚠ WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, **can result** in death, serious injury, or equipment damage.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, **can result** in injury or equipment damage.

CAUTION

CAUTION used without the safety alert symbol, is used to address practices not related to personal injury (e.g. **can result** in equipment damage).

2.4 Basic informations

⚠ DANGER

ELECTRIC SHOCK

High voltages at the motor connection may occur unexpectedly.

- Verify that no voltage is present (this includes the DC bus) prior to taking up work on the drive system.
- AC voltage can couple voltage to unused conductors in the motor cable. Insulate both ends of unused conductors in the motor cable.
- The motor generates voltage when the shaft is rotated. Prior to performing any type of work on the drive system, block the motor shaft to prevent rotation.

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

⚠ WARNING

GREAT MASS OR FALLING PARTS

- Consider the mass of the parts when mounting them. It may be necessary to use a crane.
- Mount the parts in such a way (tightening torque, securing screws) that they cannot come loose even in the case of fast acceleration or continuous vibration.
- Take into consideration that axes installed in vertical or tilted positions may move unexpectedly.

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

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

1) For USA: 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".

2.5 Standards and terminology

Technical terms, terminology and the corresponding descriptions in this manual are intended to use the terms or definitions of the pertinent standards.

In the area of drive systems, this includes, but is not limited to, terms such as "safety function", "safe state", "fault", "fault reset", "failure", "error", "error message", "warning", "warning message", etc.

Among others, these standards include:

- IEC 61800 series: "Adjustable speed electrical power drive systems"
- IEC 61158 series: "Industrial communication networks - Fieldbus specifications "
- IEC 61784 series: "Industrial communication networks- Profiles"
- IEC 61508 series: "Functional safety of electrical/electronic/pro-programmable electronic safety-related systems"

Also see the glossary at the end of this manual.

3. Technical Data

See chapter 9 "Glossary" for definitions and explanations of terms.

3.1 Ambient conditions

Ambient temperature during operation

Temperature	[℃]	0 … +50

Ambient conditions transportation and storage

The environment during transportation and storage must be dry and free from dust. The maximum vibration and shock load must be within the specified limits.

Temperature	[℃]	-25 … +70

Relative humidity

The following relative humidity is permissible during operation.

Relative humidity		As per IEC60721-3-3, Class 3K3, no condensation

Installation altitude

Installation altitude above sea level for linear axis without motor	[m]	<1500

Schutzart

Degree of protection		IP 20

Vacuum

Operation in vacuum is not permissible.

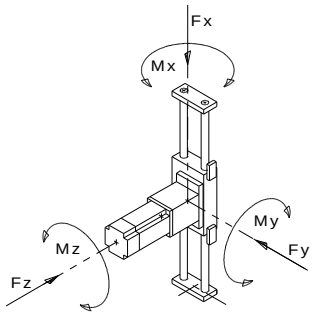
Lubricants and lubrications

See chapters 8.4."Maintenance"

3.2 CAS30RC

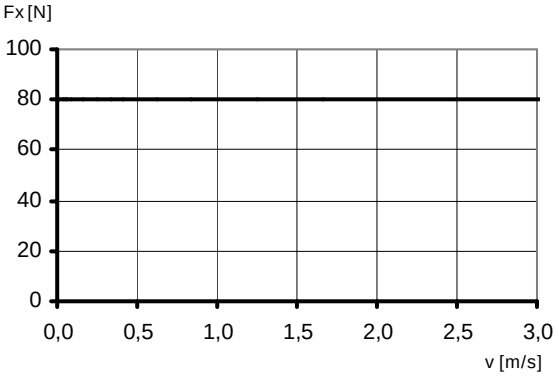
Technical data cantilever axis		CAS30RC
Drive element		Rack modul 0,636
Guide type		Round bar (W10)
Payload	kg	1
Carriage type		**Typ3**
Carriage length	mm	70
Feed constant	mm/rev.	50
Effective diameter toothed belt pulleyl	mm	15,915
Maximum feed force Fxmax 1)	N	80
Maximum velocity 2)	m/s	3
Maximum acceleration 2)	m/s^2	20
Maximum driving torque Mmax 1)	Nm	0,6
Breakaway tourque 0 stroke axis	Nm	0,10
Moment of inertia 0 stroke axis	$kgcm^2$	0,3
Moment of inertia per 1 m of stroke	$kgcm^2/m$	0,8
Moment of inertia per 1 kg of payload	$kgcm^2/kg$	0,65
Maximum force Fydynmax 1)	N	160
Maximum force Fzdynmax 1)	N	130
Maximum torque Mydynmax 1)	Nm	2,8
Maximum torque Mzdynmax 1)	Nm	3,5
Maximum torque Mxdynmax 1)	Nm	1,9
Mass 0 stroke axis	kg	0,6
Mass per 1 m of stroke	kg/m	1,3
Moving mass cantilever	kg	0,4
Maximum stroke 3)	mm	150
Minimum stroke 4)	mm	8
Repeatability 2)	mm	± 0,05
Diameter motor shaft	mm	6 … 10
Load rating linear guide Cstat	N	520 / 590
Load rating linear guide Cdyn	N	
Service life 5)	km	15000

1) The maximum permissible dynamic forces and torques decrease at increasing velocities (see characteristic curves)
2) Load- and stroke-dependent
3) Please inquire for greater stroke
4) Minimum stroke required for lubrication of the linear guide
5) Forces and torques relate to the service life

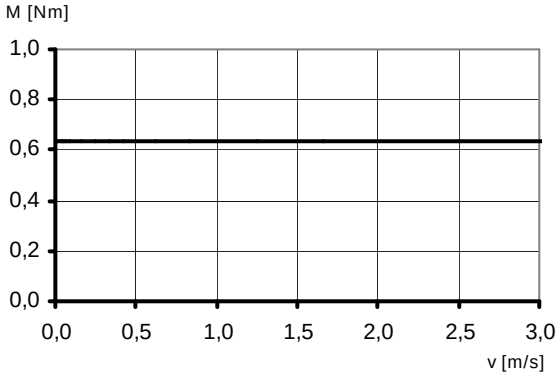


Characteristic curves CAS30RC

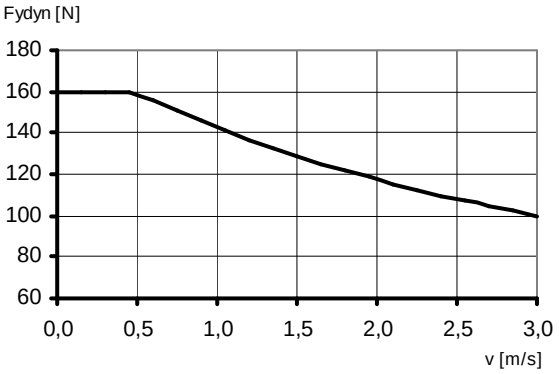
Max. feed force Fx



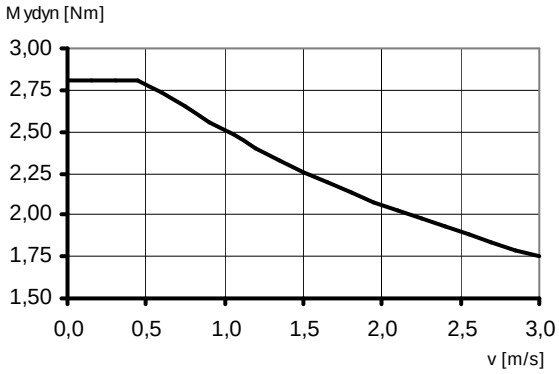
Max. driving torque M_{max}



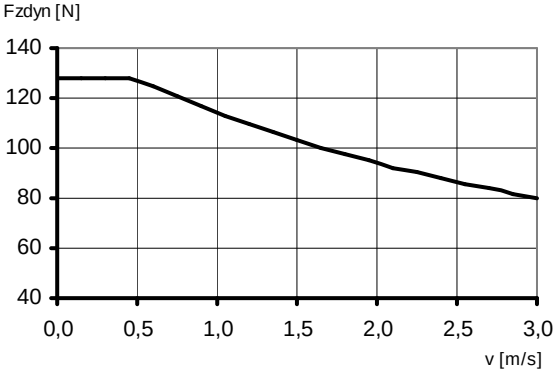
Max. force Fy_{dynmax}



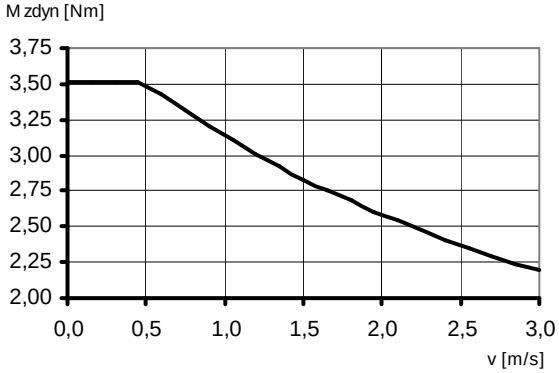
Max. torque carriage My_{dynmax}



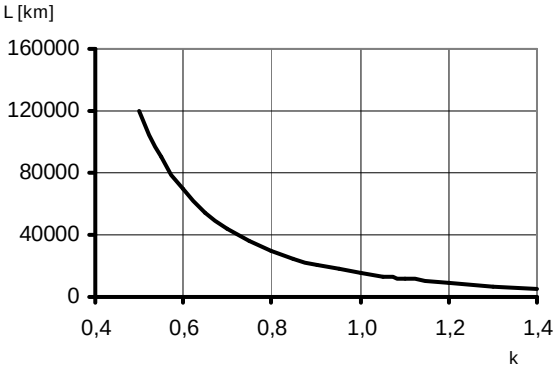
Max. force Fz_{dynmax}



Max. torque carriage Mz_{dynmax}



Service life



Max. torque carriage Mx_{dynmax}

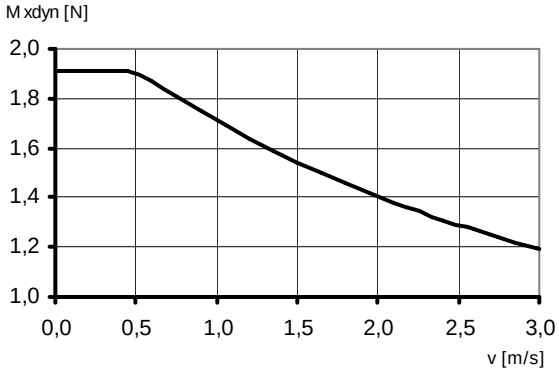
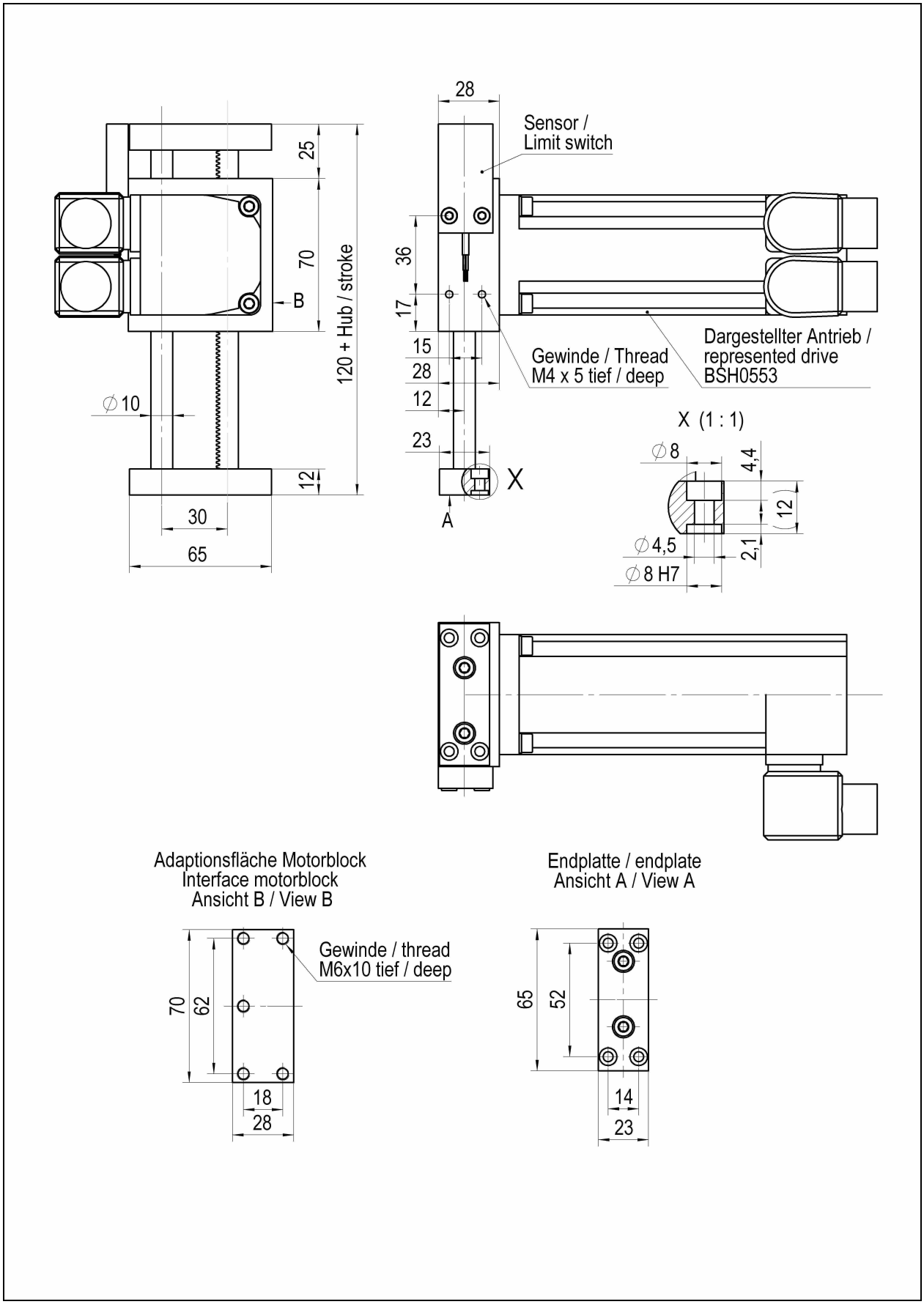


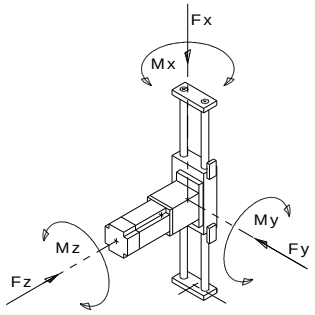
Figure 3.1 Dimensional drawings CAS30RC



3.3 CAS31BC

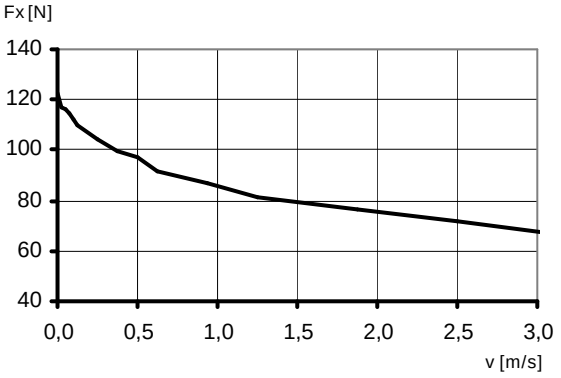
Technical data cantilever axis		CAS31BC
Drive element		Thoothed belt b10T5
Guide type		Round bar (W10)
Payload	kg	3
Carriage type		**Typ3**
Carriage length	mm	100
Feed constant	mm/rev.	75
Effective diameter toothed belt pulleyl	mm	23,873
Maximum feed force Fxmax 1)	N	125
Maximum velocity 2)	m/s	3
Maximum acceleration 2)	m/s^2	20
Maximum driving torque Mmax 1)	Nm	1,5
Breakaway tourque 0 stroke axis	Nm	0,15
Moment of inertia 0 stroke axis	$kgcm^2$	0,9
Moment of inertia per 1 m of stroke	$kgcm^2/m$	1,8
Moment of inertia per 1 kg of payload	$kgcm^2/kg$	1,45
Maximum force Fydynmax 1)	N	210
Maximum force Fzdynmax 1)	N	180
Maximum torque Mydynmax 1)	Nm	6,7
Maximum torque Mzdynmax 1)	Nm	7,8
Maximum torque Mxdynmax 1)	Nm	5,1
Mass 0 stroke axis	kg	1,0
Mass per 1 m of stroke	kg/m	1,3
Moving mass cantilever	kg	0,6
Maximum stroke 3)	mm	200
Minimum stroke 4)	mm	8
Repeatability 2)	mm	± 0,05
Diameter motor shaft	mm	6,35 … 14
Load rating linear guide Cstat	N	520 / 590
Load rating linear guide Cdyn	N	
Service life 5)	km	15000

1) The maximum permissible dynamic forces and torques decrease at increasing velocities (see characteristic curves)
2) Load- and stroke-dependent
3) Please inquire for greater stroke
4) Minimum stroke required for lubrication of the linear guide
5) Forces and torques relate to the service life

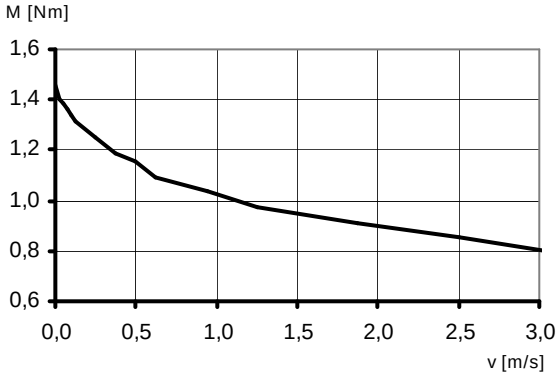


Characteristic curves CAS31BC

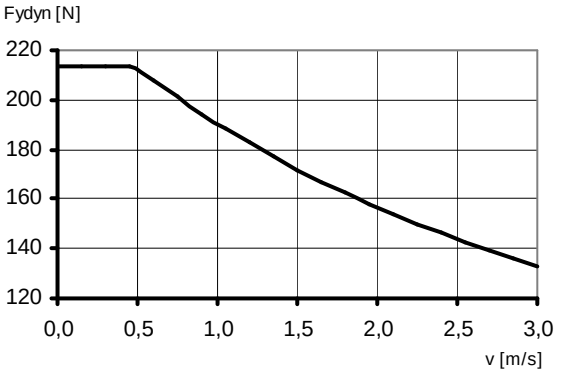
Max. feed force Fx



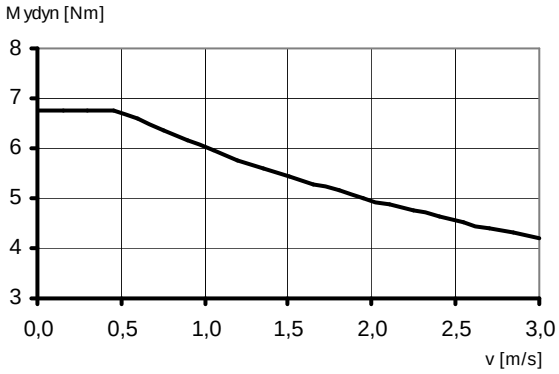
Max. driving torque M_{max}



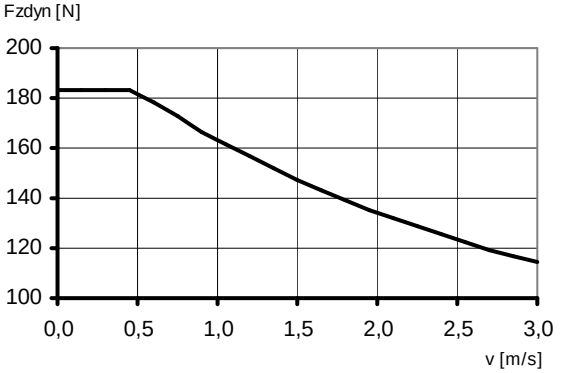
Max. force Fy_{dynmax}



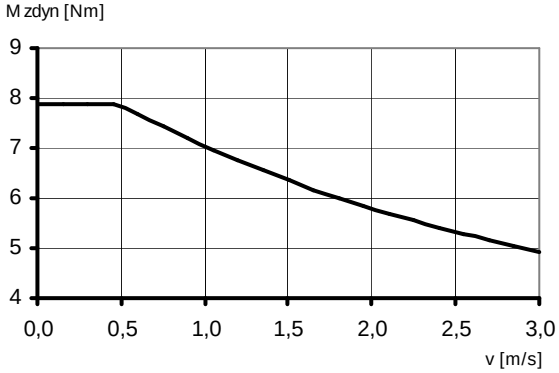
Max. torque carriage My_{dynmax}



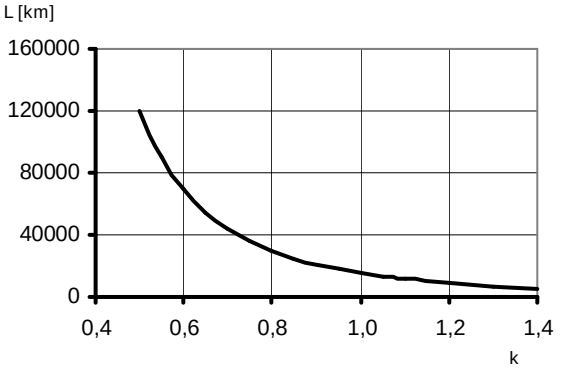
Max. force Fz_{dynmax}



Max. torque carriage Mz_{dynmax}



Service life



Max. torque carriage Mx_{dynmax}

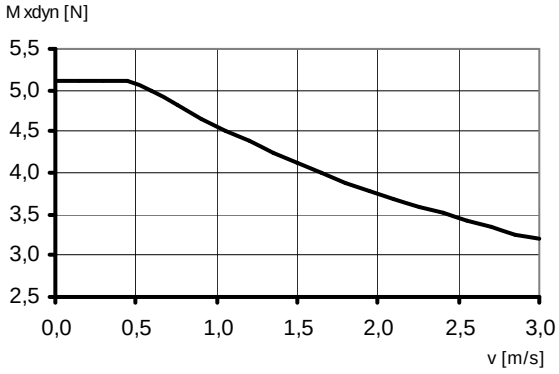
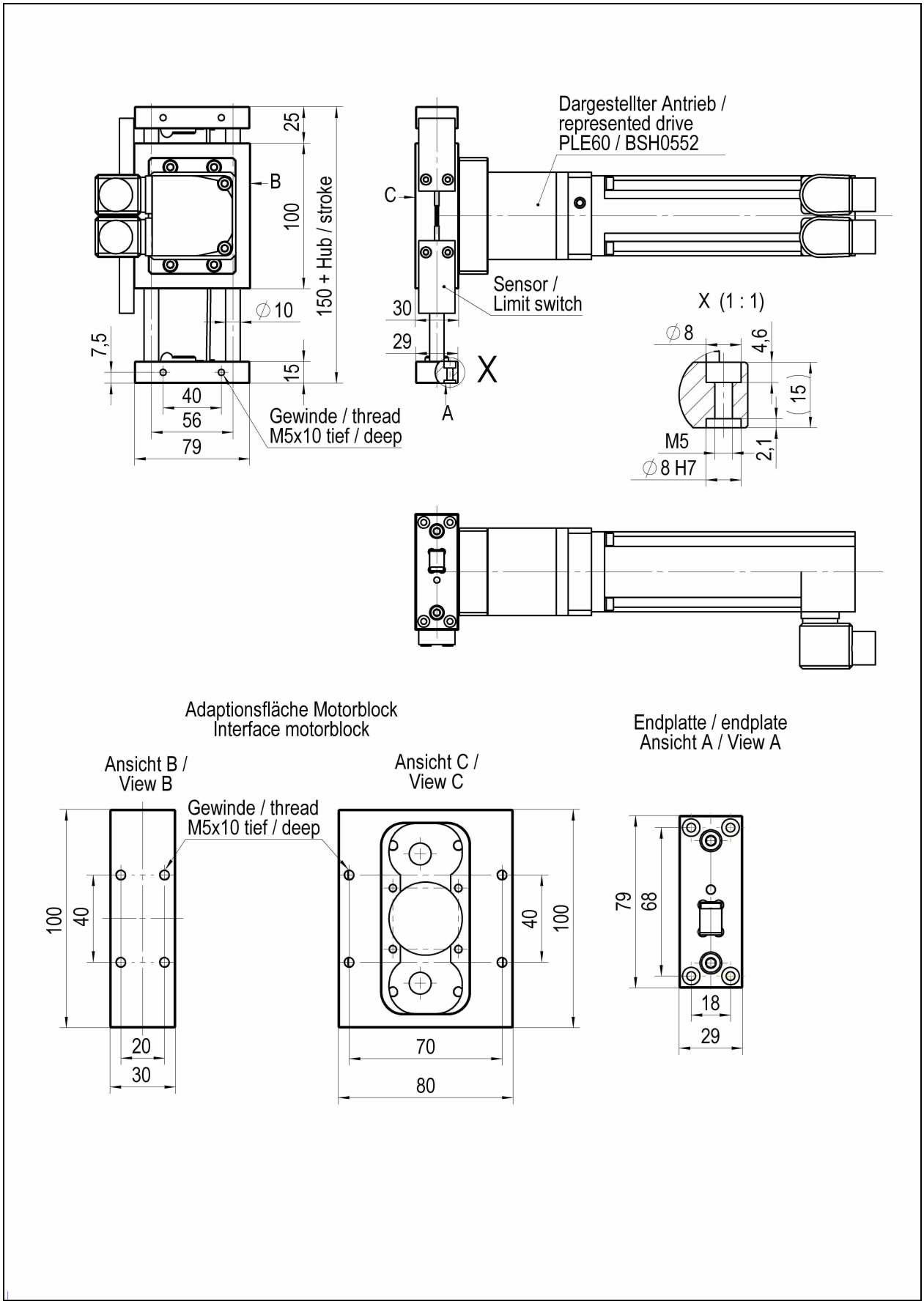


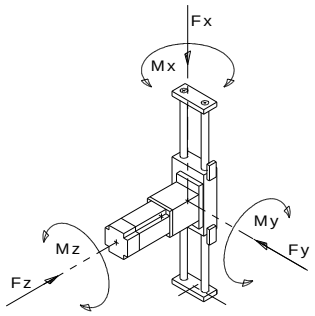
Figure 3.2 Dimensional drawings CAS31BC



3.4 CAS32BC

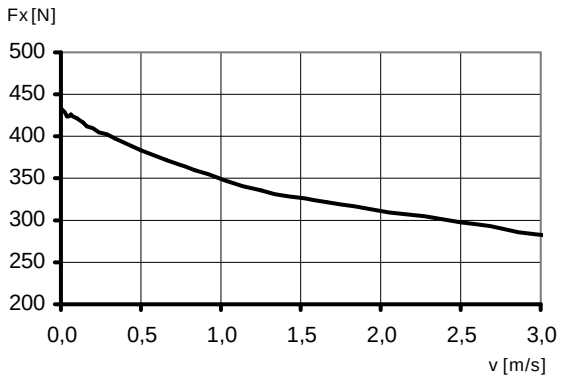
Technical data cantilever axis		CAS32BC
Drive element		Thoothed belt b20AT5
Guide type		Round bar (W14)
Payload	kg	5
Carriage type		**Typ3**
Carriage length	mm	200
Feed constant	mm/rev.	100
Effective diameter toothed belt pulleyl	mm	31,831
Maximum feed force Fxmax 1)	N	435
Maximum velocity 2)	m/s	3
Maximum acceleration 2)	m/s^2	20
Maximum driving torque Mmax 1)	Nm	7,0
Breakaway tourque 0 stroke axis	Nm	0,30
Moment of inertia 0 stroke axis	$kgcm^2$	4,8
Moment of inertia per 1 m of stroke	$kgcm^2/m$	6,3
Moment of inertia per 1 kg of payload	$kgcm^2/kg$	2,55
Maximum force Fydynmax 1)	N	290
Maximum force Fzdynmax 1)	N	250
Maximum torque Mydynmax 1)	Nm	21
Maximum torque Mzdynmax 1)	Nm	25
Maximum torque Mxdynmax 1)	Nm	9
Mass 0 stroke axis	kg	2,8
Mass per 1 m of stroke	kg/m	2,5
Moving mass cantilever	kg	1,7
Maximum stroke 3)	mm	300
Minimum stroke 4)	mm	10
Repeatability 2)	mm	± 0,05
Diameter motor shaft	mm	12 … 20
Load rating linear guide Cstat	N	760 / 830
Load rating linear guide Cdyn	N	
Service life 5)	km	15000

1) The maximum permissible dynamic forces and torques decrease at increasing velocities (see characteristic curves)
2) Load- and stroke-dependent
3) Please inquire for greater stroke
4) Minimum stroke required for lubrication of the linear guide
5) Forces and torques relate to the service life

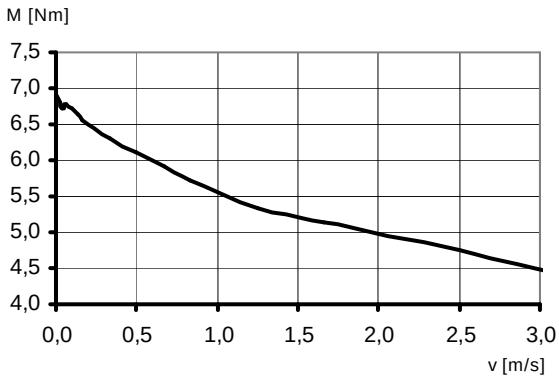


Characteristic curves CAS32BC

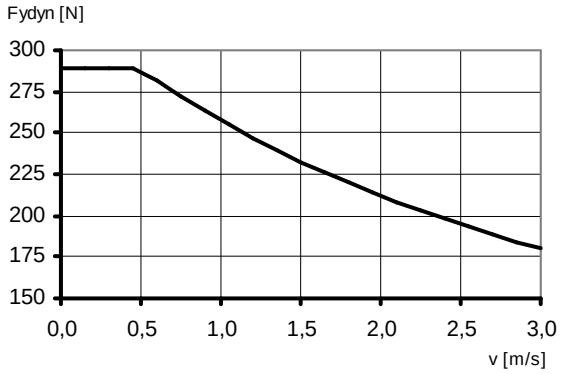
Max. feed force Fx



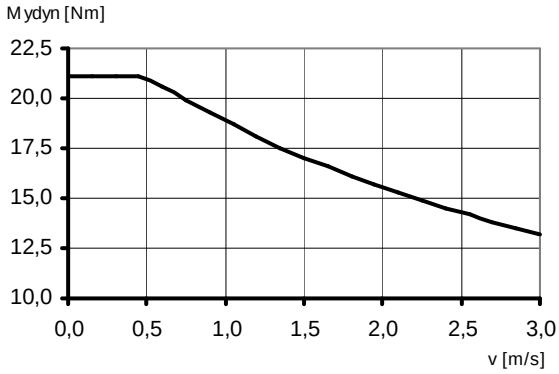
Max. driving torque M_{max}



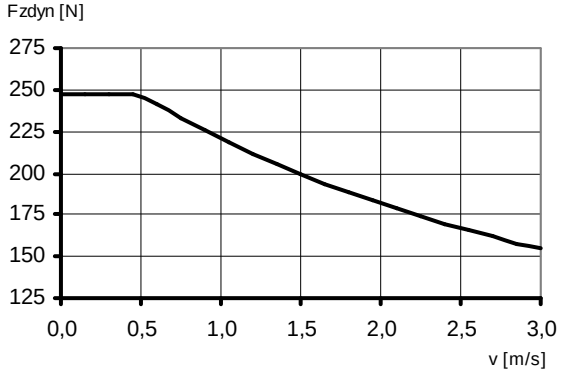
Max. force Fy_{dynmax}



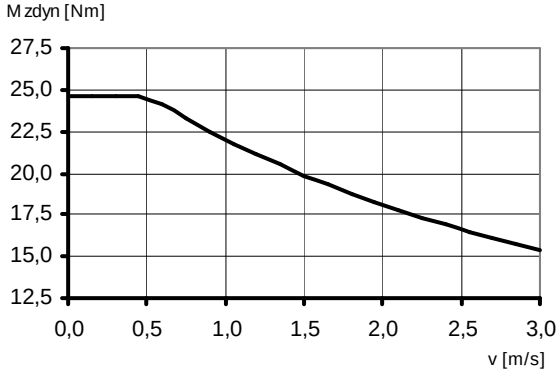
Max. torque carriage My_{dynmax}



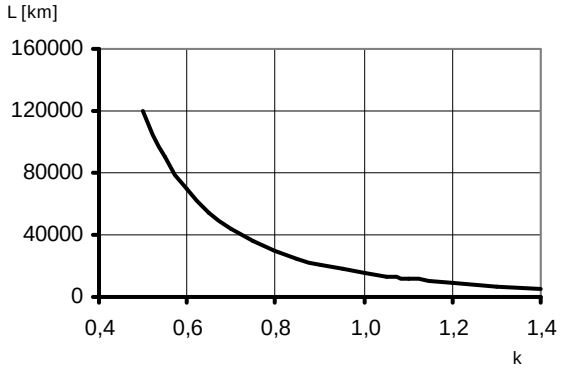
Max. force Fz_{dynmax}



Max. torque carriage Mz_{dynmax}



Service life



Max. torque carriage Mx_{dynmax}

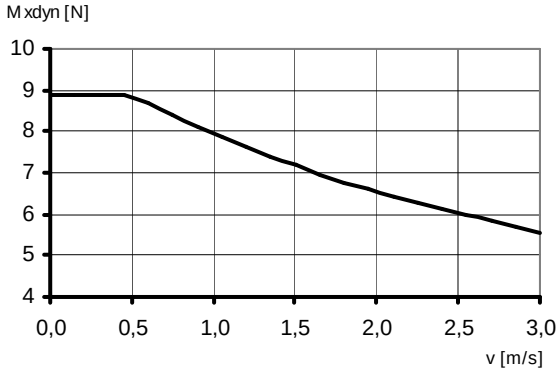
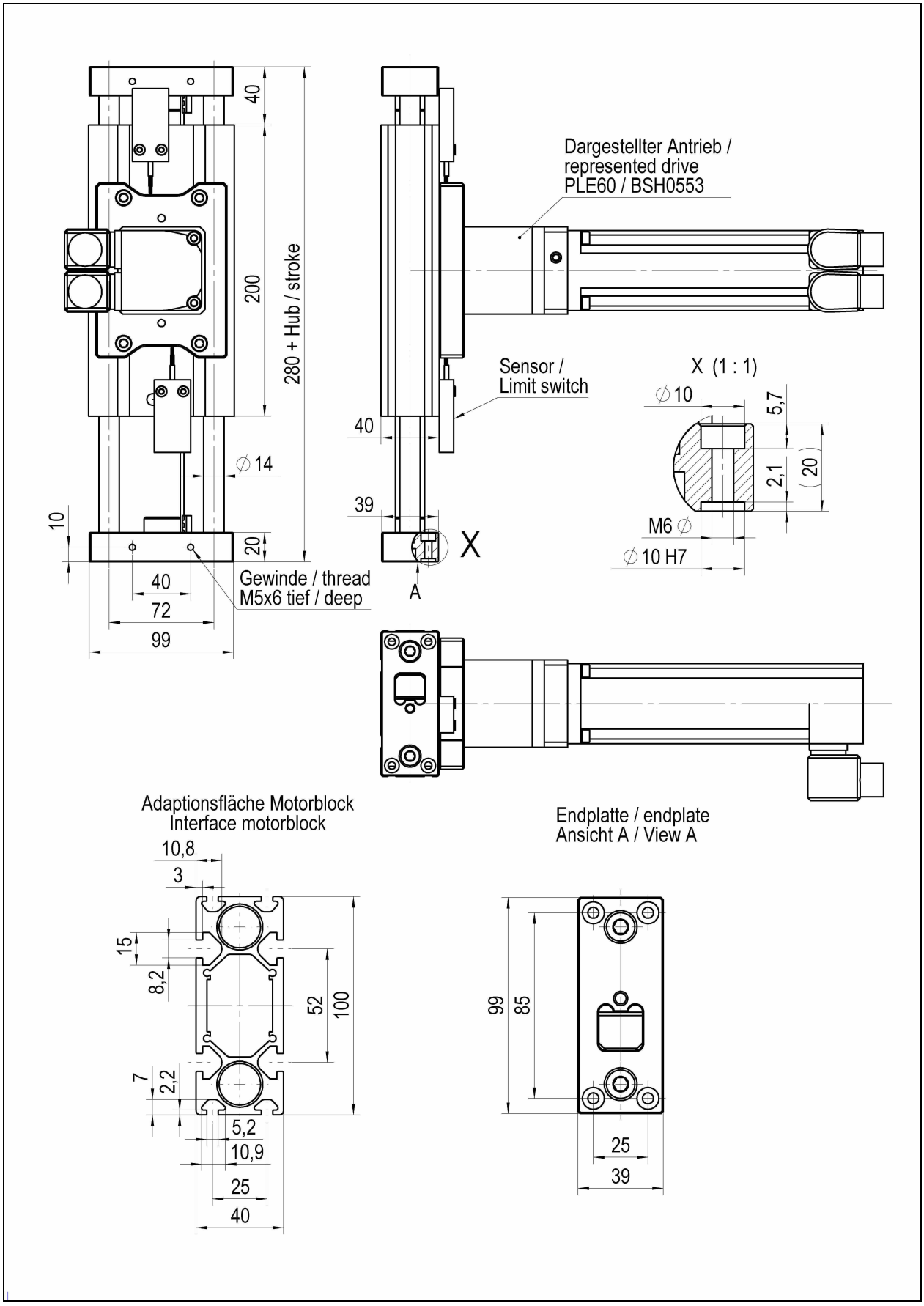


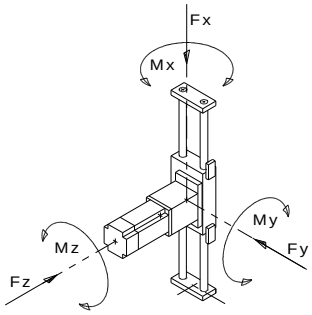
Figure 3.3 Dimensional drawings CAS32BC



3.5 CAS33BC

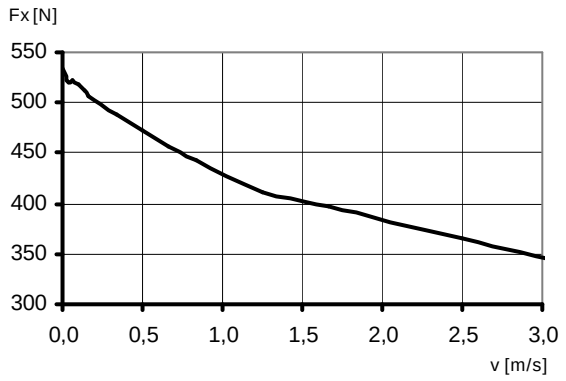
Technical data cantilever axis		CAS33BC
Drive element		Thoothed belt b25AT5
Guide type		Round bar (W20)
Payload	kg	10
Carriage type		**Typ3**
Carriage length	mm	200
Feed constant	mm/rev.	100
Effective diameter toothed belt pulleyl	mm	31,831
Maximum feed force Fxmax 1)	N	535
Maximum velocity 2)	m/s	3
Maximum acceleration 2)	m/s^2	20
Maximum driving torque Mmax 1)	Nm	8,5
Breakaway tourque 0 stroke axis	Nm	0,45
Moment of inertia 0 stroke axis	$kgcm^2$	9,1
Moment of inertia per 1 m of stroke	$kgcm^2/m$	12,6
Moment of inertia per 1 kg of payload	$kgcm^2/kg$	2,55
Maximum force Fydynmax 1)	N	460
Maximum force Fzdynmax 1)	N	400
Maximum torque Mydynmax 1)	Nm	34
Maximum torque Mzdynmax 1)	Nm	39
Maximum torque Mxdynmax 1)	Nm	16
Mass 0 stroke axis	kg	4,4
Mass per 1 m of stroke	kg/m	5,0
Moving mass cantilever	kg	3,2
Maximum stroke 3)	mm	400
Minimum stroke 4)	mm	12
Repeatability 2)	mm	± 0,05
Diameter motor shaft	mm	12 … 20
Load rating linear guide Cstat	N	1010 / 1170
Load rating linear guide Cdyn	N	
Service life 5)	km	15000

1) The maximum permissible dynamic forces and torques decrease at increasing velocities (see characteristic curves)
2) Load- and stroke-dependent
3) Please inquire for greater stroke
4) Minimum stroke required for lubrication of the linear guide
5) Forces and torques relate to the service life

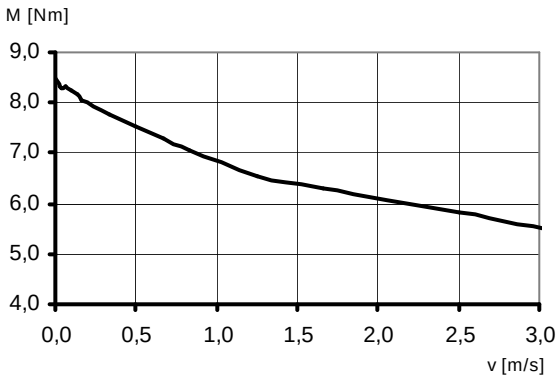


Characteristic curves CAS33BC

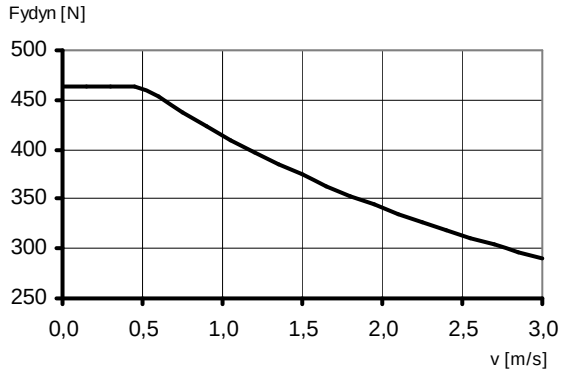
Max. feed force Fx



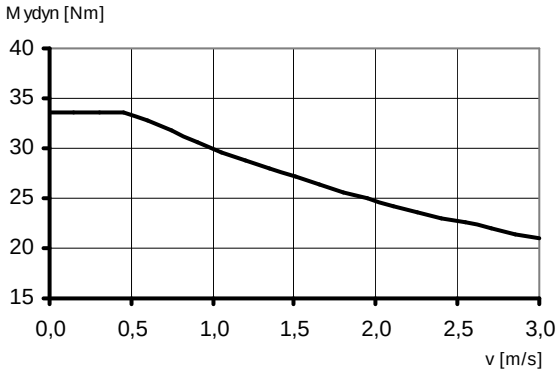
Max. driving torque M_{max}



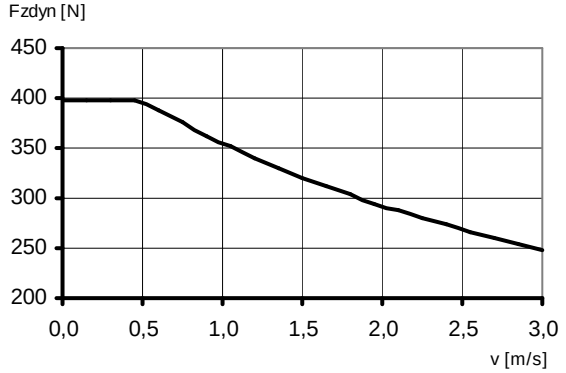
Max. force Fy_{dynmax}



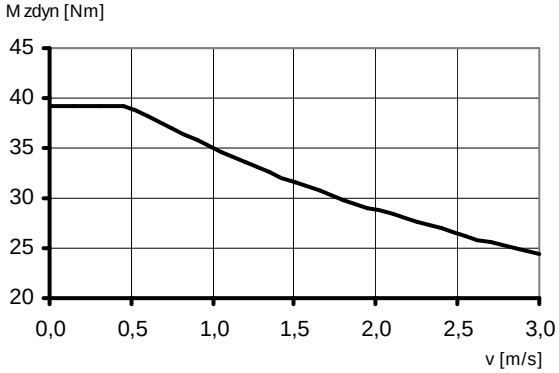
Max. torque carriage My_{dynmax}



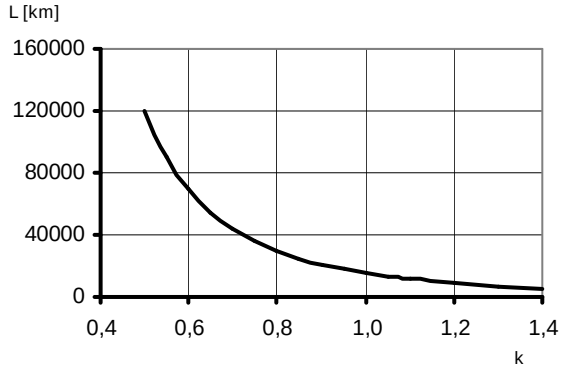
Max. force Fz_{dynmax}



Max. torque carriage Mz_{dynmax}



Service life



Max. torque carriage Mx_{dynmax}

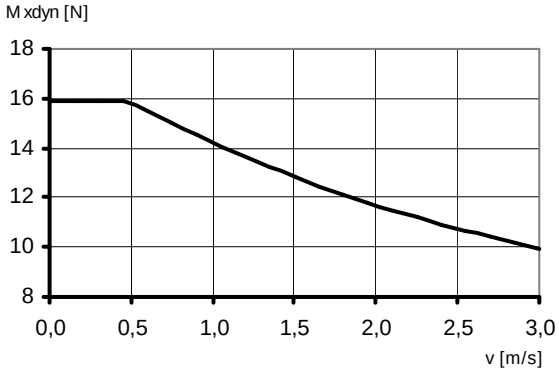
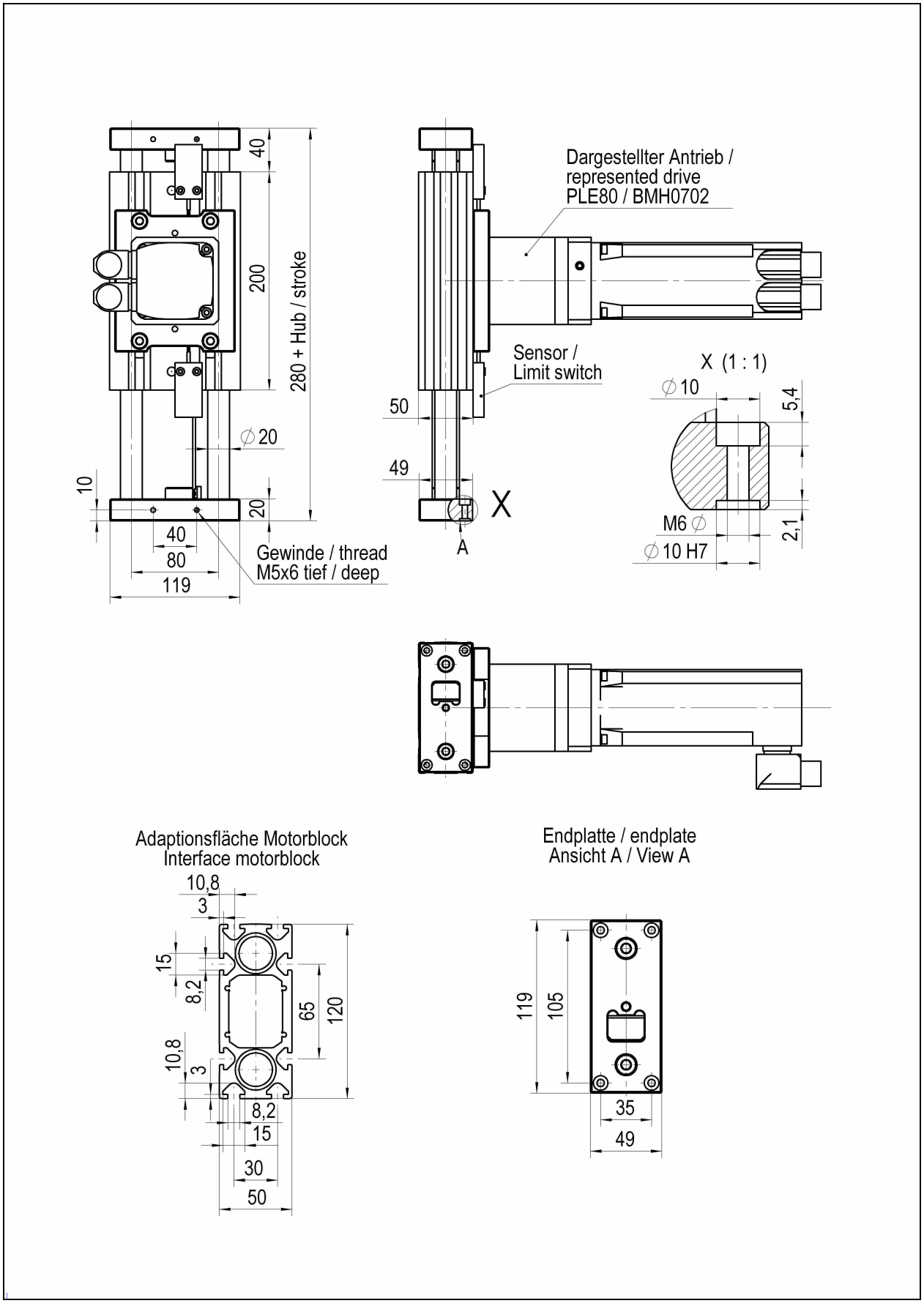


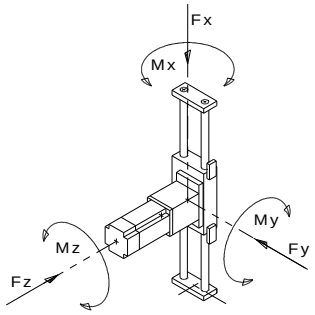
Figure 3.4 Dimensional drawings CAS33BC



3.6 CAS34BC

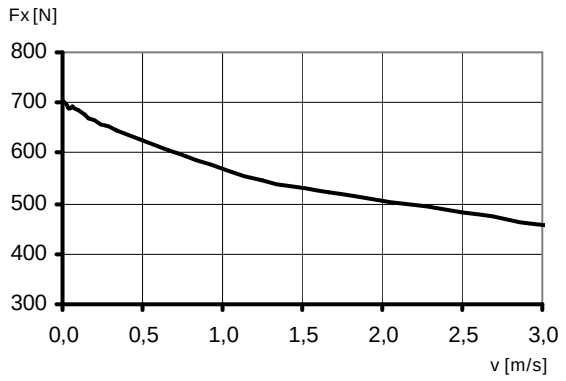
Technical data cantilever axis		CAS34BC
Drive element		Thoothed belt b32AT5
Guide type		Round bar (W25)
Payload	kg	18
Carriage type		**Typ3**
Carriage length	mm	250
Feed constant	mm/rev.	100
Effective diameter toothed belt pulleyl	mm	31,831
Maximum feed force Fxmax 1)	N	705
Maximum velocity 2)	m/s	3
Maximum acceleration 2)	m/s^2	20
Maximum driving torque Mmax 1)	Nm	11,5
Breakaway tourque 0 stroke axis	Nm	0,60
Moment of inertia 0 stroke axis	$kgcm^2$	11,4
Moment of inertia per 1 m of stroke	$kgcm^2/m$	12,2
Moment of inertia per 1 kg of payload	$kgcm^2/kg$	2,55
Maximum force Fydynmax 1)	N	950
Maximum force Fzdynmax 1)	N	820
Maximum torque Mydynmax 1)	Nm	85
Maximum torque Mzdynmax 1)	Nm	100
Maximum torque Mxdynmax 1)	Nm	45
Mass 0 stroke axis	kg	5,9
Mass per 1 m of stroke	kg/m	4,8
Moving mass cantilever	kg	4,0
Maximum stroke 3)	mm	500
Minimum stroke 4)	mm	14
Repeatability 2)	mm	± 0,05
Diameter motor shaft	mm	12 … 20
Load rating linear guide Cstat	N	2130 / 2420
Load rating linear guide Cdyn	N	
Service life 5)	km	15000

1) The maximum permissible dynamic forces and torques decrease at increasing velocities (see characteristic curves)
2) Load- and stroke-dependent
3) Please inquire for greater stroke
4) Minimum stroke required for lubrication of the linear guide
5) Forces and torques relate to the service life

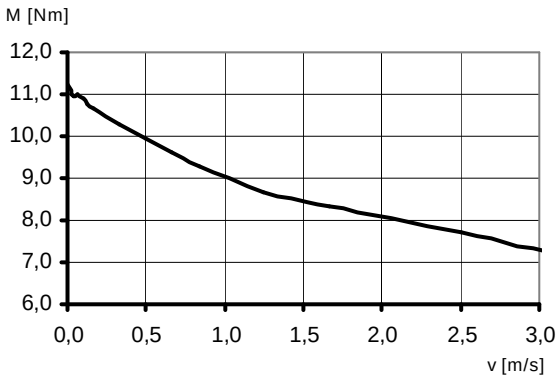


Characteristic curves CAS34BC

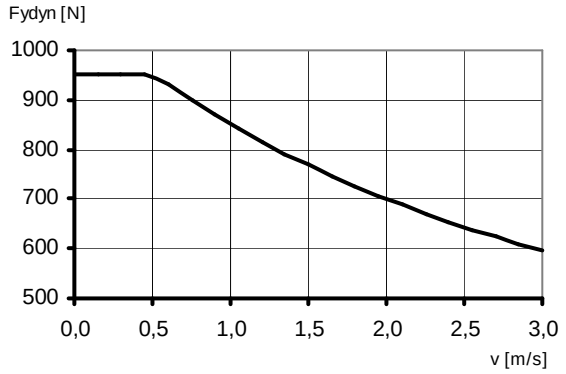
Max. feed force Fx



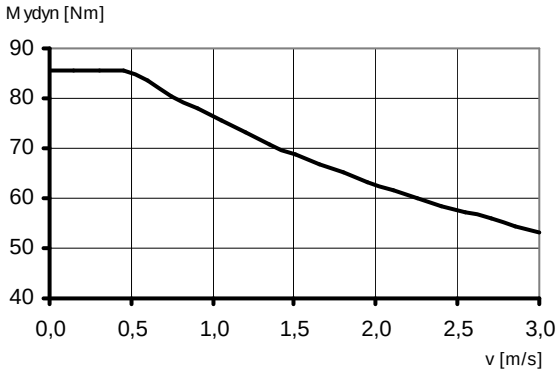
Max. driving torque M_{max}



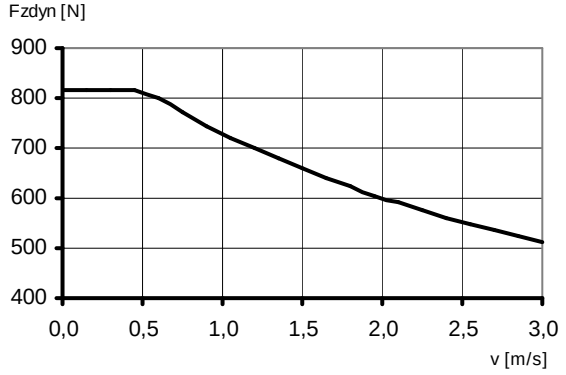
Max. force Fy_{dynmax}



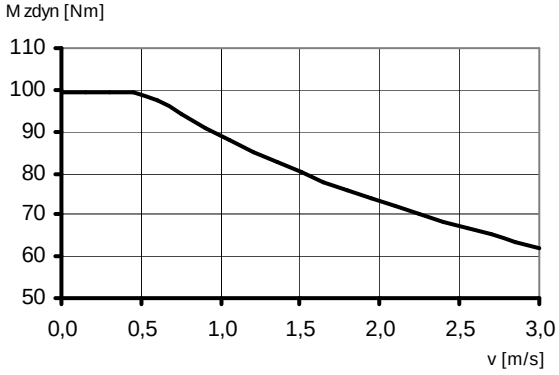
Max. torque carriage My_{dynmax}



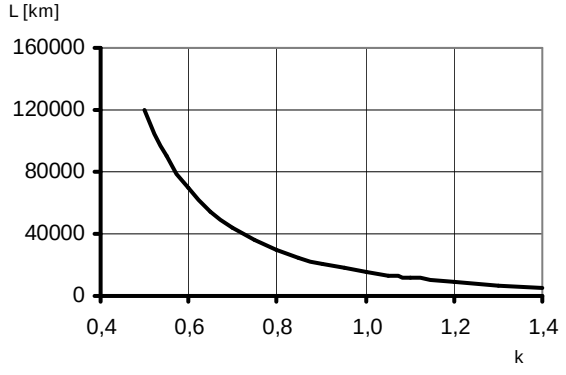
Max. force Fz_{dynmax}



Max. torque carriage Mz_{dynmax}



Service life



Max. torque carriage Mx_{dynmax}

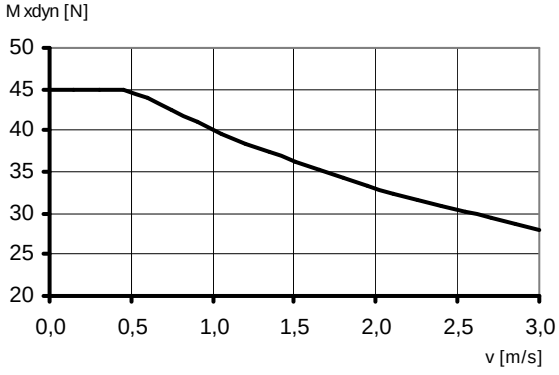
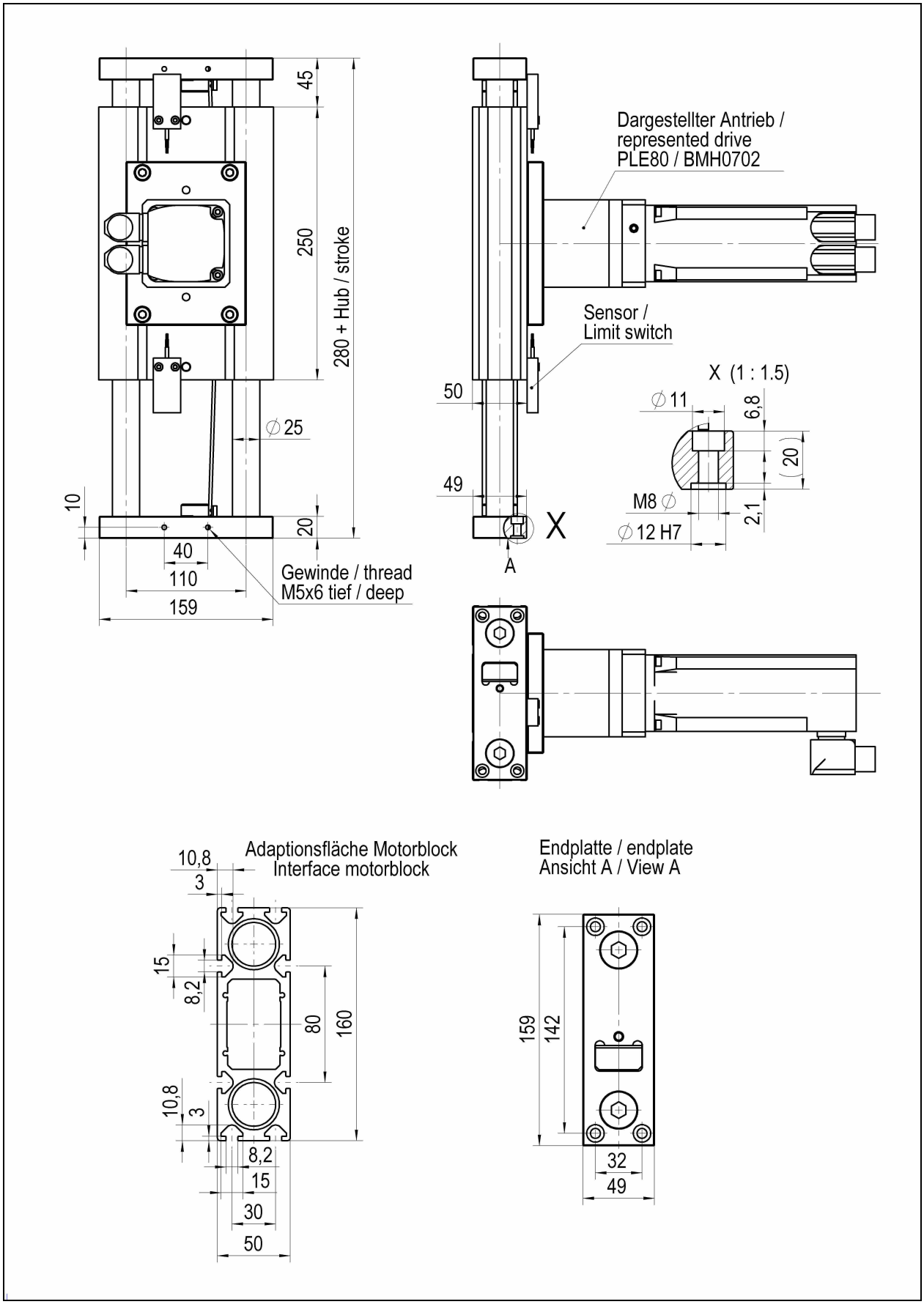


Figure 3.5 Dimensional drawings CAS34BC



3.7 Service life

The service life of the product is a function of the mean forces and torques that act in the system. If multiple forces and torques act simultaneously, use the following formula to calculate the load k.

$$\frac{Fy}{Fy_{dynmax.}} + \frac{Fz}{Fz_{dynmax.}} + \frac{Mx}{Mx_{dynmax.}} + \frac{My}{My_{dynmax.}} + \frac{Mz}{Mz_{dynmax.}} = k$$

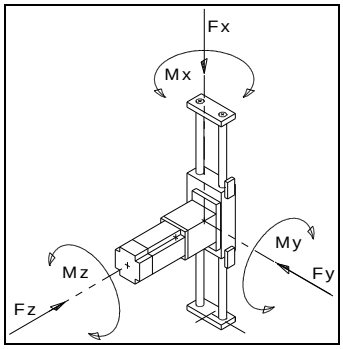


Figure 3.4 Forces and torques

The service life of the axis (in km) can be approximated using the load factor and the service life - load characteristic curve.

The application-specific load values appear in the numerator.

The numerator contains the maximum permissible forces and torques. These forces and torques decrease at increasing velocities, see characteristic curves in chapter 3

3.8 Positioning accuracy and repeatability

3.8.1 Positioning accuracy

The positioning accuracy describes the positioning deviation of the linear axis that is allowed for a positioning move to a set position.
The positioning accuracy is influenced by the following factors:

- The mechanics – manufacturing tolerances,
- The drive – motor resolution, closed loop circuit,..
- The motion profile – steep deceleration ramps, high speed,.
- Heat – environmental heat, internal friction heat

3.8.2 Repeatability

The repeatability describes the positioning deviation of the linear unit that is allowed for repeat positioning moves to the same position.
The repeatability is influenced by the following factors:

- Load change
- External temperature changes
- Change of the motion profile (deceleration ramp, speed,.)
- Accuracy of the trigger position of the inductive limit switch (signal evaluation)

At steady temperature, speed and load, the repeatability amounts to
+ / -0.05 mm

3.9 Motor

See the motor manual for details on the motor.

4. Installation

⚠ WARNING

GREAT MASS OR FALLING PARTS

- Consider the mass of the parts when mounting them. It may be necessary to use a crane.
- Mount the parts in such a way (tightening torque, securing screws) that they cannot come loose even in the case of fast acceleration or continuous vibration.
- Take into consideration that axes installed in vertical or tilted positions may move unexpectedly.

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

⚠ WARNING

MOTOR WITHOUT BRAKING EFFECT

If power outage, functions or errors cause the power stage to be switched off, the motor is no longer decelerated in a controlled way and may cause damage.

- Verify the mechanical situation.
- If necessary, use a cushioned mechanical stop or a suitable holding brake.

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

⚠ WARNING

HOT SURFACES

The heat sink at the product may heat up to over 100°C (212°F) during operation.

- Avoid contact with the hot heat sink.
- Do not allow flammable or heat-sensitive parts in the immediate vicinity.
- Consider the measures for heat dissipation described.

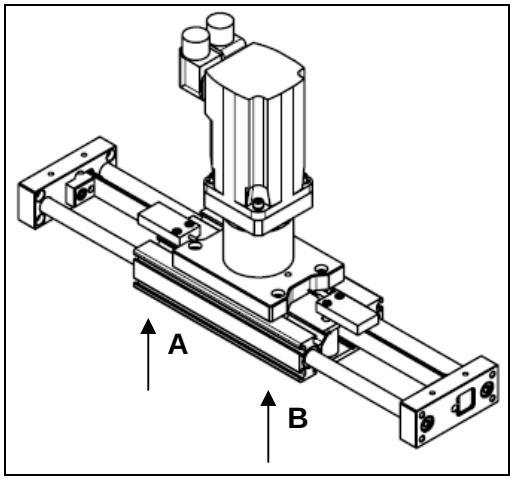
Failure to follow these instructions can result in death or serious injury.

4.1 Preparing installation

The linear axis is a precision product and must be handled with care.
shocks and impacts may damage the guides.
They may lead to reduced running accuracy and reduced service life.
This may cause inaccuracies and even premature failure.

Transport the product in its packaging as close as possible to the installation site. Do not remove the packaging until the product is at the installation site.

The linear axis may only be lifted at points A and B. (see figure)
The motor must not be used to lift the load.



4.2 Mechanical Installation

Accessibility for servicing

When mounting the round bar axes, the motor and the sensors, keep in mind that they may have to be accessed for servicing.

Mounting position

The round bar guides can be installed in any position.

However, all external forces and torques must be within the ranges of permissible values.

4.2.1 Standard tightening torques

The following, generally applicable tightening torques apply to mounting the payload and fastening slot nuts and motor with hex socket screws.

Thread	Wrench size in mm	Maximum tightening torque in Nm (lb in)
M3	2,5	1,1 (9.74)
M4	3	2,5 (22.13)
M5	4	5 (44.25)
M6	5	8,5 (75.23)
M8	6	21 (185.87)
M10	8	42 (371.73)
M12	10	70 (619.55)

Table 4.1 Standard tightening torques for screws, ISO 4762 – 8.8

4.2.2 Mounting the linear axis

The base of the linear axis CAS30 and CAS31 consists of an aluminum body that is manufactured with precise CNC-machines. The axis-body can be mounted to a stable frame by means of several threads, that are located on both sides

The base of the linear axis CAS32, CAS33 and CAS34 consists of an extruded aluminum-precision profile. T-slots are located on the small two sides of the profile. The T-slots offer ideal mounting and integration possibilities.

Only mount the linear axis using the T slots at the axis body.
To do so, use slot nuts.

A selection of suitable slot nuts can be found in chapter 7 "Accessories and spare parts".

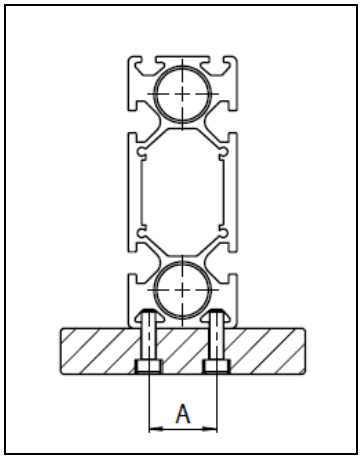


Figure 4.1 Fastening by slot nuts from the small side

Tapped hole distance 1)		CAS32	CAS33	CAS34
A	[mm]	25	30	30
T slot size	[mm]	5	8	8
Screw size		M5	M6 / M8	M6 / M8

1) Tapped hole distance CAS30 und CAS31 see dimensional drawings Chapter 3.2 / 3.3

Note:
- Use at least 4 or 6 fixing points at one side of the body to have a good stability.

4.2.3 Alignment for running accuracy

The run off tolerance of the linear axes depends of the quality of the mounting surface.

Perform the following lateral alignment procedure for running accuracy.

■ The mounting surface must be machined smooth and flat.

► Start by tightening the fastening screws of the slot nut with a low tightening torque.

► Provide a reference plane alongside the linear axis.

► Place a dial gauge onto the endplate.

► Move the carriage and record the deviation with reference to the reference plane over the entire stroke.

► Correct the deviations by lateral alignment of the linear axis and by tightening the screws appropriately.
Observe the standard tightening torques on page 34.

4.2.4 Mounting the motor or gearbox

The motor or the gear box can be mounted in different arrangements (turned in increments of 4 x 90°).

NOTE: Third-party motors:
Note when choosing a motor, that the maximum drive torque of the toothed belt is not exceeded.
The toothed belt could be damaged or destroyed.



Adaptations for straight motor mounting or mounting gear box can be produced on request. Contact. your local sales office.



Unless otherwise specified, the standard tightening torques indicated on page 38 apply.

4.2.5 Mounting the payload

Unless otherwise specified, the standard tightening torques indicated on page 38 apply.

Mounting threads and counterbore for cylinder head bolts according to DIN ISO 7721 (DIN 974) in the endplates allow you to fasten the payload.

For reproducible mounting of the payload, each thread is provided with a counterbore for a locating dowel. See chapter 7 "Accessories and spare parts" for suitable locating dowels.

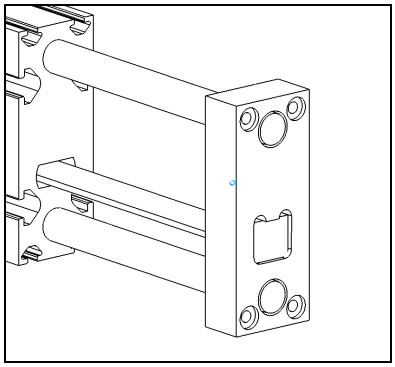


Figure 4.2 End plate

Endplate		CAS30	CAS31	CAS32	CAS33	CAS34
Counterbore DIN ISO 7721	[mm]	M4	M4	M5	M5	M6
Thread	[mm]	---	M5	M6	M6	M8
Depth	[mm]	---	9,6	13,6	13,6	11,4

Table 4.2 End plate

4.3 Electrical installation

4.3.1 Connecting the sensors

The sensors either have a plug M8 x 1 or an open cable end.

The free cable length at the plug exit is 200 mm. At the open cable end, the free cable length is 5000 mm.

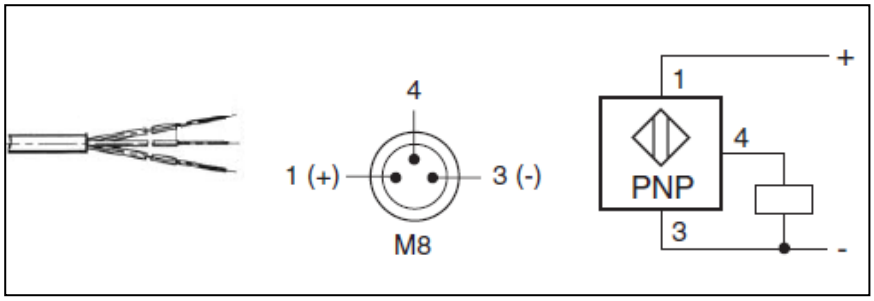


Figure 4.3 Connection assignment sensors PNP/NC (opener)

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

Extension cables are available in various lengths as accessories, see chapter 7 "Accessories and spare parts"

4.3.2 Motor connection

See the motor manual for details on connecting the motor.

4.4 Checking installation

Verify that you have correctly installed the product after having performed the above steps.

- Verify correct mounting and cabling of the product. In particular, check the mains connection and the 24V connection.

Check the following:

- Did you connect all protective ground conductors?
- Do you use correct fuses?
- Did you isolate all unused cable ends?
- Did you properly install and connect all cables and connectors?
- Did you properly install the sensors?
- Do the sensors function as required?
- Are all mechanical parts bolted?

5. Commission

⚠ WARNING

UNEXPECTED MOVEMENT

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

- Verify that that the axis is properly fastened so it cannot come loose even in the case of fast acceleration.
- The carriage of linear axes in vertical or tilted positions may move unexpectedly.
- Verify that a functioning button for emergency stop is within reach.
- Verify that the system is free and ready for the movement before switching it on.
- Run initial tests at reduced velocity.

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

5.1 Commissioning procedure



You must also re-commission an already configured product if you want to use it under changed operating conditions.

- Verify proper installation, see chapter 4.4 "Checking installation".
- For commissioning, note the information provided in the manual of the motor used and the manual of the drive used
- Verify that the actual loads conform to the required and engineering data prior to operating the product.
- Verify the function of the sensors. The integrated LED must indicate the switching state correctly.
- Check the distance between the sensors and the mechanical stops. The movement must be stopped by the sensors before the carriage reaches a mechanical stop.
- Perform initial tests at reduced velocity. During these tests, verify that the controller responds correctly to the sensors in both directions of movement
- Please note that the maximum torque of servo motors is significantly higher than the nominal torque. The maximum torque of the motors must not exceed the permissible torque of the linear axis.

  If necessary the maximum torque must be limited.

  Because of the high feed forces that the linear axis generates in combination with the servo motor, it is likely that the toothed belt is damaged at a high acceleration or at a collision.
- Run the entire motion profile multiple times with low speed to guarantee a safe operation.
- Verify that the ambient conditions and actual loads conform to the required and engineering data. See chapter 3.1 "Ambient conditions".

6. Diagnostics and troubleshooting

6.1 Troubleshooting

Problem	Cause	Troubleshooting
Sensor over traveled	Sensor	Adjust or replace sensors
	Controller	Check controller
Motor load increases, controller switches off because of overload.	Guides under mechanical tension	Contact service
Running inaccuracy and noise of the guides	Damage to the guides, for example by shock or impact to the end plate or round bar guide.	Replace guides, contact service
End plate has backlash and positions inaccurately	Backlash in drive pinion or guides after a collision	Contact service

7. Accessories and spare parts

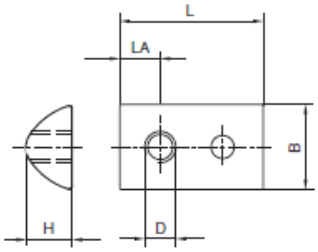
Contact your local sales office if you have questions concerning required spare parts that are not list.

7.1 T-slot nuts

Order data

	Description			Order no.
	The slot nuts are inserted into the T-slots of the axis body to fasten the axis or parts of the axis. Contains 10 piece	**For axis …**	**Slot nut typ**	
		CAS32	5 Steel M5	**VW33MF010T5N5**
		CAS33	8 Steel M6	**VW33MF010T8N6**
			8 Steel M8	**VW33MF010T8N8**
		CAS34	8 Steel M6	**VW33MF010T8N6**
			8 Steel M8	**VW33MF010T8N8**

Dimensional drawings



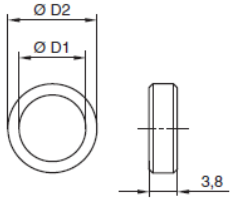
For axis …	Slot nut typ	B	D	H	L	LA
		mm	mm	mm	mm	mm
CAS32	5 Steel M5	8	5	4	11.5	4
CAS33	8 Steel M6	13.8	6	7.3	23	6.5
	8 Steel M8	13.8	8	7.3	23	7.5
CAS34	8 Steel M6	13.8	6	7.3	23	6.5
	8 Steel M8	13.8	8	7.3	23	7.5

7.2 Locating dowels

Order data

	Description		Order no.
	For precise and reproducible mounting of the payload, the locating dowels are inserted into the holes at the carriage. contains 20 piece	**Für Achse…**	
		PAS41 / PAS42	**VW33MF020LD01**
		PAS43	**VW33MF020LD02**
		PAS44	**VW33MF020LD03**

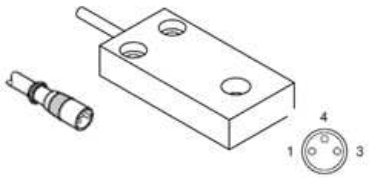
Dimensional drawings

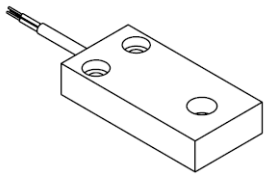


For axis …	D1	D2
	mm	mm
PAS41 / PAS42	5,5	8 h6
PAS43	6,6	10 h6
PAS44	9	12 h6

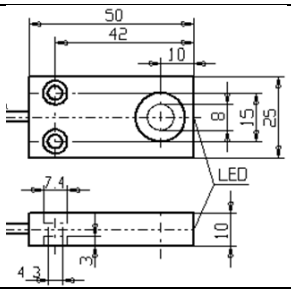
7.3 Sensors

Order data

	Description		Order no.
	With signal state indicator, 200 mm cable and 3-pin M8 circular connector, suitable for all axes. Contains 1 piece	PNP, normally closed contact	**77040004000**

	Description		Order no.
	With signal state indicator, with 5 m cable and second cable end open Contains 1 piece	PNP, normally closed contact	**00052060002**

Dimensional drawings



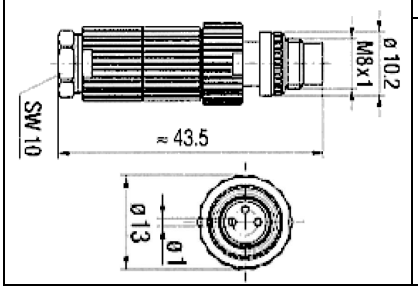
Total length	Wide	Thickness
A	**B**	**C**
[mm]	[mm]	[mm]
50	25	10
See chapter 4.3.1 "Connecting the sensors" for the connection assignment“		

Technical data

Model		rectangular
Approvals		CE
Electrical connection (PUR-cable)	[m]	0,2 / 5
Nominal switching distance Sn (in the case of aluminium)	[mm]	1,1 +/-10%
Hysteresis		< 15% of the real switching distance
Degree of protection as per IEC 60529		IP67
Temperature (storage)	[℃]	-25 … +95
Temperature (operation)	[℃]	-25 … +70
Housing material		POM
Cable material		PUR-Kabel HK-SO-Li12y11y-HF
Function indicator output		red LED
Function indicator supply voltage		no
Supply voltage (PELV)	[Vdc]	10 … 30 with reverse polarity protection
Supply voltage (including residual ripple)	[Vdc]	< 15% of 24 VDC
Switching current (overload and short-circuit protection)	[mA]	200
Voltage drop, output conducting	[V]	< 3
No-load current	[mA]	< 10
Maximum switching frequency	[Hz]	1000
Switch-on time	[ms]	< 10
Switch-off time	[ms]	< 10

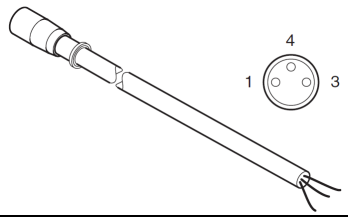
7.4 Sensor connectors

Order data

	Description	Order no.
	sensor connector with 3-pin M8 circular connector Contains 2 piece	**VW3L50200**

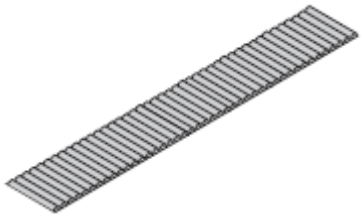
7.5 Sensor extension cable

Order data

	Description		Order no.
	Suitable for drag chain applications; sensor side end 3-pin M8 circular connector, second cable end open Contains 2 piece	5 m	**VW33SBCBGA050**
		10 m	**VW33SBCBGA100**
		20 m	**VW33SBCBGA200**

7.6 Toothed belt

Order data

	Description			Order no.
	**For axis …**	**Length L [mm]**		
	CAS31	L = stroke + 170		**00033550003**
			antistaic	not available
	CAS32	L = stroke + 380		**00033550005**
			antistaic	**00033550016**
	CAS33	L = stroke + 350		**00033550042**
			antistaic	**00033550060**
	CAS34	L = stroke + 400		**00033550006**
			antistaic	**00033550023**

Technical data

Toothed belt	For axis …	Width [mm]	Pitch [mm]	Density [Kg/m]
b10 T5	CAS31	10	5	0,022
b20 AT5	CAS32	20	5	0,068
b25 AT5	CAS33	25	5	0,085
b32 AT5	CAS34	32	5	0,105

8. Service, maintenance and disposal

⚠ WARNING

GREAT MASS OR FALLING PARTS

- Consider the mass of the parts when mounting them. It may be necessary to use a crane.
- Mount the parts in such a way (tightening torque, securing screws) that they cannot come loose even in the case of fast acceleration or continuous vibration.
- Take into consideration that axes installed in vertical or tilted positions may move unexpectedly.

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

8.1 Service address

If you cannot resolve an error yourself please contact your sales office. Have the following details available:

- Nameplate (type, identification number, serial number, DOM, ...)
- Type of error (such as LED flash code or error number)
- Previous and concomitant circumstances
- Your own assumptions concerning the cause of the error

Also include this information if you return the product for inspection or repair.



If you have any questions please contact your sales office. Your sales office staff will be happy to give you the name of a customer service office in your area.

http://www.schneider-electric.com

8.2 Checks after collisions

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

► After a collision, inspect the drive elements, the linear guide and the Connection of the belt pulley for damage according to the instructions in the following chapters

8.2.1 Linear guide

► Perform a visual inspection of the linear guide for damage

► Check for irregular noise or vibration. Irregular noise or vibration indicates a deformation in the linear guide. Deformation will cause rapid wear.



A damaged linear guide must be replaced.
Contact your local sales office.

8.2.2 Toothed belt pully connection

► If deviations of the positions check the connection between the belt pully and drive shaft.
Maybe the adhesive connection is broken.



A broken belt pulley must be replaced.
Contact your local sales office.

8.2.3 Toothed belt

► Perform a visual inspection of the toothed belt for damage to the teeth and abrasion at the sides.
Exchange the toothed belt as described in chapter 8.4 "Maintenance"

NOTE: A damaged toothed belt must be replaced.

8.2.4 Rack

► Perform a visual inspection of the rack for damage to the teeth.

Exchange the toothed belt as described in chapter 8.4 "Maintenance"

NOTE: A damaged rack must be replaced.

8.3 Replacing parts

Only replace the parts described. Any other parts may only be replaced by technicians trained by the manufacturer.

To replace the entire axis, install the new axis as per see chapter 4 "Installation".

Adjust and check the linear axis as per chapter 4.4 "Checking installation" after replacing parts.

8.3.1 Replacing a sensor

⚠ WARNING

LOSS OF CONTROL

If unsuitable sensors are installed, ground faults or line interruptions will be detected as an On state and will cause the function to become inoperable.

- If possible, use normally closed contacts as limit switches so that a wire break can be signaled as an error.

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

You can replace a sensor without changing the position of the sensor holder.



Unless otherwise specified, the standard tightening torques indicated on page 38 apply.

Prerequisites

See chapter 7 "Accessories and spare parts" for suitable spare parts.

You need a set of hex keys and torque wrench with hexagon socket.

8.3.2 Replacing the motor or the gearbox

⚠ WARNING

UNEXPECTED MOVEMENTS DUE TO DISMOUNTING

Dismounting parts can cause unexpected movments.

- In the case of a linear axis installed in a vertical or tilted position, secure the moving parts to keep them from moving unexpectedly.

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

The motor or the gearbox are connected by means of an adhesive bond with the toothed belt pulley. A replacement motor or gearbox can take place only with factory-fitted front toothed belt pulley.



For questions regarding the implementation contact your local sales office.



Unless otherwise specified, the standard tightening torques indicated on page 34 apply.

Prerequisites The motor or the gearbox with matching toothed belt pulley.

You need a set of hex keys and torque wrench with hexagon socket

NOTE: Do not use ball head hex keys. Excessive torque may cause the ball head to tear off. A torn off ball head is difficult to remove from the screw.

8.4 Maintenance

The maintenance intervals for cleaning and lubrication must be adhered to:

► Include the maintenance intervals in your maintenance schedule.

8.4.1 Cleaning

Due to its design, the product is not susceptible to the ingress of contaminants and external objects.

The product must be checked and cleaned at regular intervals.

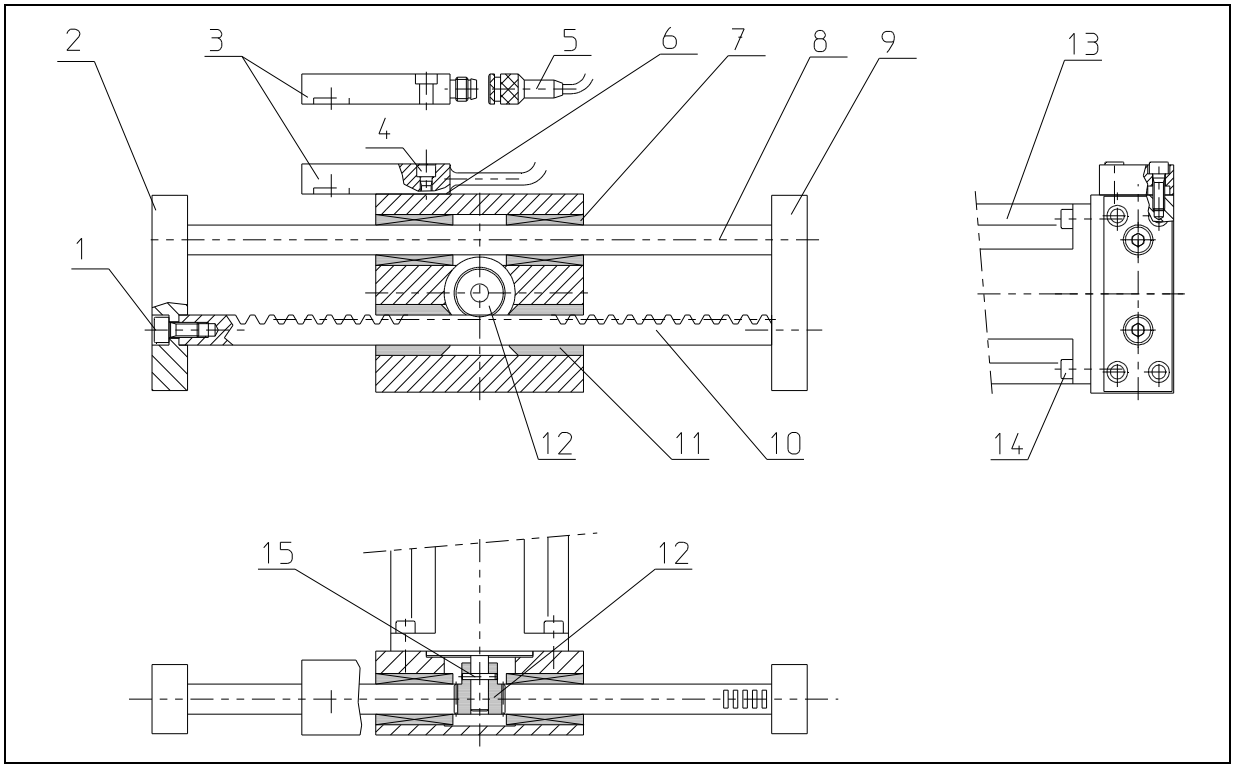
► Do not use compressed air for cleaning.

► Remove large particles and dirt from the surface at regular intervals.

► 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.

8.4.2 Maintenance of CAS30



General

Due to the closed design of the cantilever axis, it is protected against dust and foreign particles. The ball bearings and slide bearings are fitted with sealing rings for additional protection. The utilised drive and guide elements have low maintenance requirements.

Lubrication

The guide rods (8) and the rack (10) are permanently lubricated. A grease reservoir is placed between the ball bearings (7) and linear roll bearings (11). For normal ambient conditions, the guide rod (8) and rack (10) should be cleaned and lubricated with grease **every month** (e.g. Microlube GL 261 or lubrication grease according to DIN 51825 type K 1N-30). If the axis is used in harsh conditions e.g. high speed, short cycle time or impure ambient, we recommend to clean and lubricate the guide rod (8) and the rack (10) **every week** with grease.

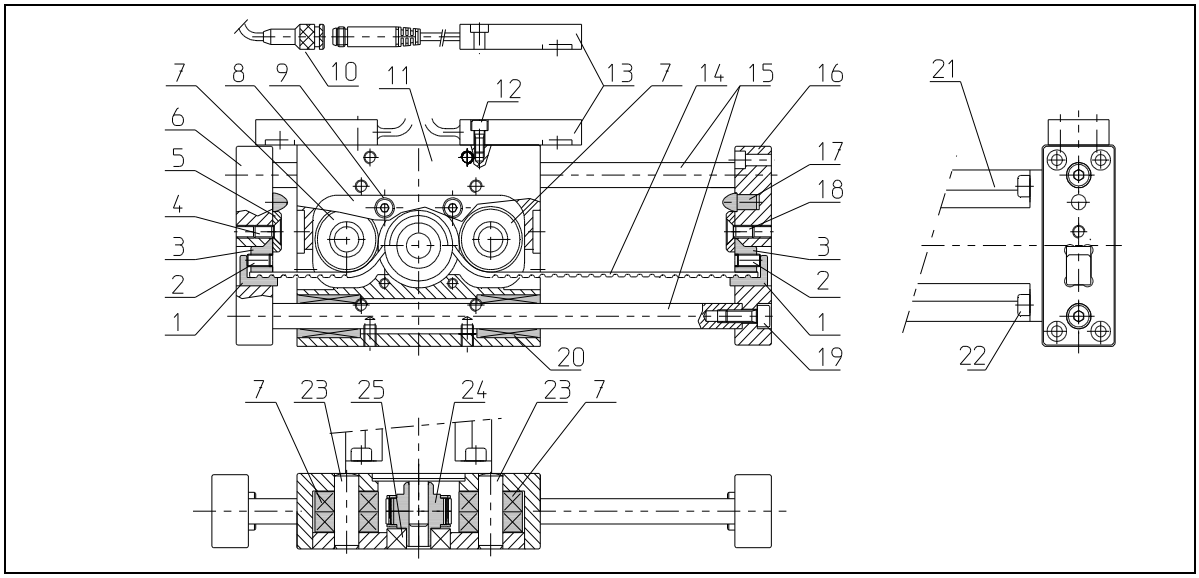
Rack and Pinion

The mounted rack (10) and pinion (12) requires basically low maintenance. Should, in spite of this a rack and pinion change be necessary, the axis must be returned to Schneider electric for a complete service.

Service

In case of spare part orders or service , please advise material and order number (located on axis name plate) of the axis or the axis system.

8.4.3 Maintenance of CAS31



General

Due to the closed design of the cantilever axis, it is protected against dust and foreign particles. The linear roll bearings are fitted with sealing rings for additional protection. The utilised drive and guide elements have low maintenance requirements.

Lubrication

The linear roll bearings (20) are lubricated for life by the factory. For normal ambient conditions, the guide rods (15) should be cleaned and lubricated with grease **every month** (e.g. Microlube GL 261 or lubrication grease according to DIN 51825 type K 1N-30). If the axis is used in harsh conditions e.g. high speed, short cycle time or impure ambient, we recommend to clean the guide rods (15) **every week** and and grease lightly.

Belt Replacement

The timing belt requires basically low maintenance. Should, in spite of this, a belt change be necessary, the following procedure has to be performed:

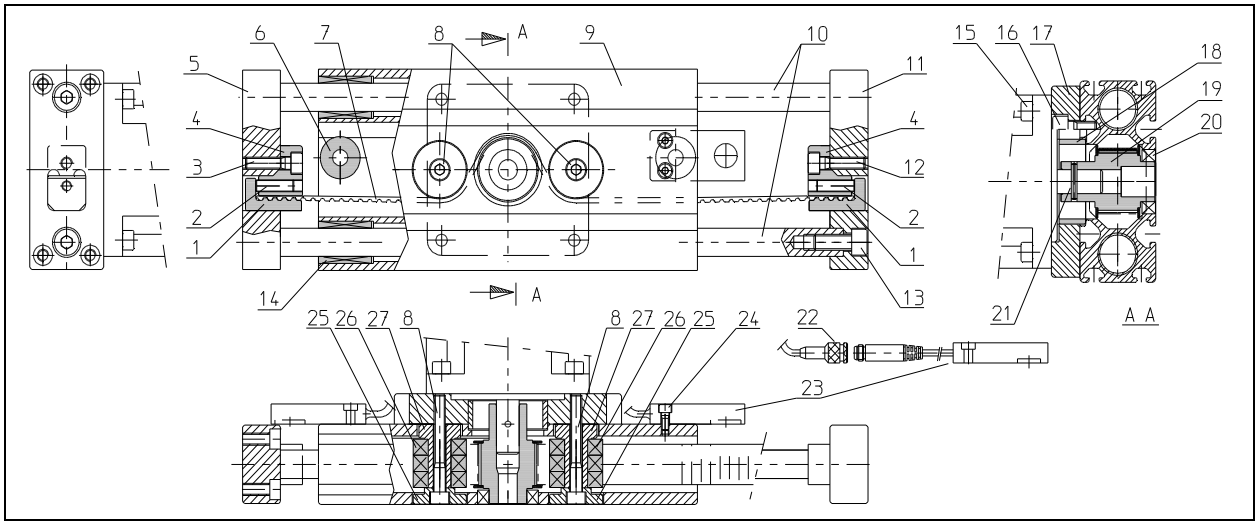
1. Loosen and remove bolts (4, 18). Do not loosen the grubscrews (2)!
2. Remove both bolts (9).
3. Remove cover (8) carefully from motor block (don´t damage bearing).
4. Remove both parts of belt take up (1, 3) from endplates (6, 16).
5. Remove old belt (14).
6. Put in new timing belt (14) with the same number of teeth. Pay attention, that the ends of timing belt are flush with the surface of belt take ups (1, 3).
7. Put the belt take up (1, 3) into the endplates (6, 16) and tighten the bolts (4, 18).
8. Attach cover (8) carefully and fix them. (don´t damage bearing)
9. Control timing belt tension again. Normally it is not necessary to correct the belt tension after replacing it.
10. If the belt tension needs to be adjusted, adjust the tension with the grubscrews (2). The correct timing belt tension is 1‰ of the belt length. Mark the timing belt !.
11. Tension the timing belt with the grubscrews (2). Control timing belt tension again.

Note: Check and if necessary correct the axis movement positioning after a belt exchange. If during operation, the belt is noisy, a standard PTFE spray can be used in order to reduce the noise.

Service

In case of spare part orders or service, please advise material and order number (located on axis name plate) of the axis or the axis system.

8.4.4 Maintenance of CAS32



General

Because of the closed design of the cantilever axis, it is protected against dust and foreign particles. The ball bearings are protected by strippers against forerign matter. The utilised drive and guide elements have very low maintenance requirements.

Lubrication

The linear roll bearings (14) are lubricated for life by the factory. For normal ambient conditions, the guide rods (10) should be cleaned and lubricated with grease **every month** (e.g. Microlube GL 261 or lubrication grease according to DIN 51825 type K 1N-30). If the axis is used in hard conditions e.g. high speed, short cycle time or impure ambient, we recommend to clean up both guide rods (10) **every week** and grease lightly.

Belt replacement

The timing belt requires basically no maintenance and is wear free. Should, in spite of this, a belt change be necessary, the following procedure has to be performed:

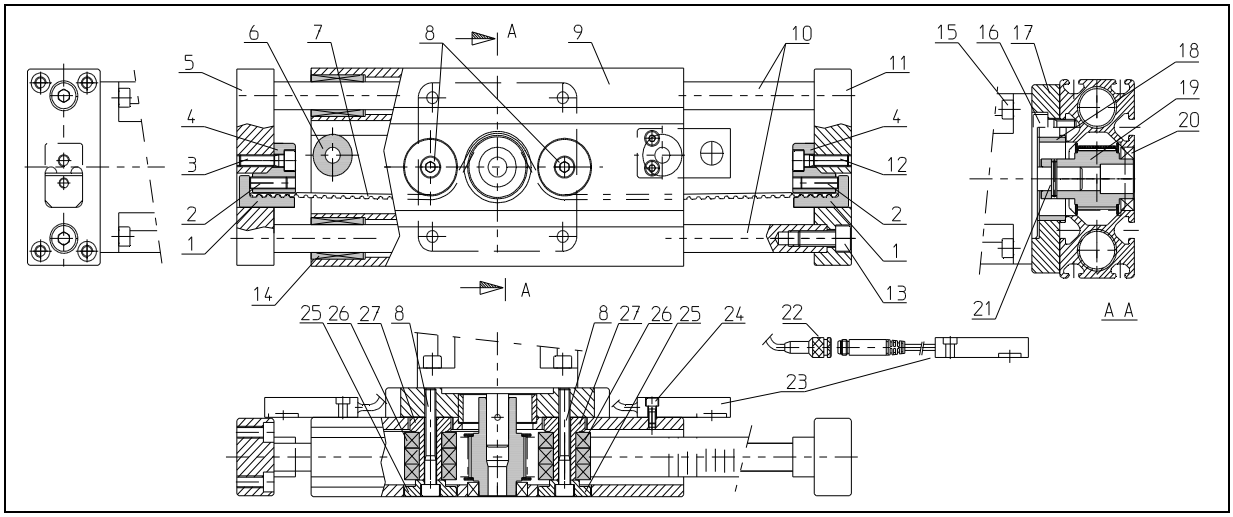
1. Loosen screws (3, 12) and remove it. Setscrews (2) are not loosen !
2. Remove both screws (8). Remove covers (25).
3. Remove both belt pulley (26/27) from motor block.
4. Remove both parts of belt take up (1, 4) from endplates (5, 11).
5. Remove old belt (7).
6. Put in new timing belt (7) with same numbers of teeth.
7. Put the belt pulley (26 / 27) into the motor block.
8. Put in covers (25) and screw down both screws (8).
9. Put the ends of timing belt into the belt take ups (1, 4). Pay attention, that the ends are conclusive to the surface of belt take ups. Put in the belt take ups into the endplates (5, 11) and screw down screws (3, 12).
10. Control timing belt tension again. Normally it is not necessary to correct the belt tension after repalce.
11. In case of not enough belt tension depended of divergence, adjust the tension by the setscrews (2). At first give to the belt less tension. The correct timing belt tension is 1‰ of the belt length. Mark the timing belt !.
12. Tension the timing belt with the grubscrews (2). Control timing belt tension again.

Note: Check and if necessary correct the axis movement positioning after a belt exchange. If during operation, the belt is noisy, a standard PTFE spray can be used in order to reduce the noise.

Service

In case of spare part orders or service, please advise material and order number (located on axis name plate) of the axis or the axis system.

8.4.5 Maintenance of CAS33



General

Due to the closed design of the cantilever axis, it is protected against dust and foreign particles. The linear roll bearings are fitted with sealing rings for additional protection. The utilised drive and guide elements have very low maintenance requirements.

Lubrication

The linear roll bearings (14) are lubricated for life by the factory. For normal ambient conditions, the guide rods (10) should be cleaned and lubricated with grease **every month** (e.g. Microlube GL 261 or lubrication grease according to DIN 51825 type K 1N-30). If the axis is used in harsh conditions e.g. high speed, short cycle time or demanding environmental conditions, we recommend to clean both guide rods (10) **every week** and grease lightly.

Belt Replacement

The timing belt requires basically no maintenance and is wear free. However, should a belt change become necessary, the following procedure has to be performed:

The timing belt requires basically low maintenance. Should, in spite of this, a belt change be necessary, the following procedure has to be performed:

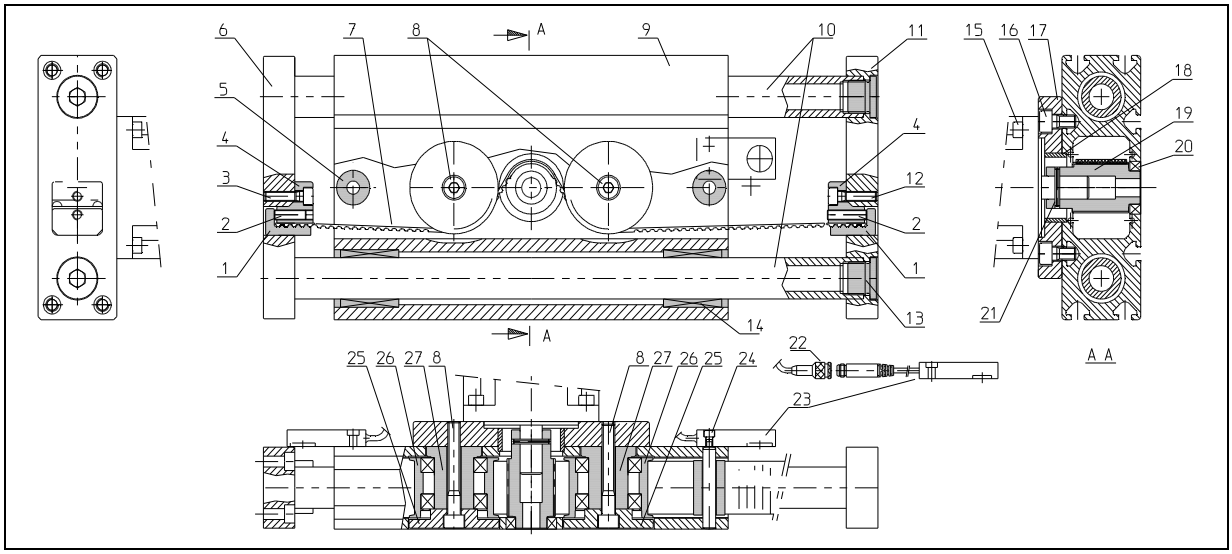
1. Loosen and remove bolts (3, 12). Do not loosen the grubscrews (2)!
2. Remove both bolts (8). Remove cover (25).
3. Remove both pulleys (26/27) from the motor block.
4. Remove both parts of belt take up (1, 4) from endplates (5, 11).
5. Remove old belt (7).
6. Put in new timing belt (7) with the same number of teeth.
7. Put both pulleys (26/27) back into the motor block.
8. Put in the cover discs (25) and tighten both bolts (8)
9. Put the ends of the timing belt flush between the belt take ups (1,4) and the insert them into the end plates (5, 11), and tighten the bolts (3, 12).
10. Control timing belt tension again. Normally it is not necessary to correct the belt tension after replacing it.
11. If the belt tension needs to be adjusted, adjust the tension with the grubscrews (2). The correct timing belt tension is 1‰ of the belt length. Mark the timing belt !.
12. Tension the timing belt with the grubscrews (2). Control timing belt tension again.

Note: Check and if necessary correct the axis movement positioning after a belt exchange. If during operation, the belt is noisy, a standard PTFE spray can be used in order to reduce the noise.

Service

In case of spare part orders or service, please advise material and order number (located on axis name plate) of the axis or the axis system.

8.4.6 Maintenance of CAS34



General

Due to the closed design of the cantilever axis, it is protected against dust and foreign particles. The linear roll bearings are fitted with sealing rings for additional protection. The utilised drive and guide elements have low maintenance requirements.

Lubrication

The linear roll bearings (14) are lubricated for life by the factory. For normal ambient conditions, the guide rods (10) should be cleaned and lubricated with grease **every month** (e.g. Microlube GL 261 or lubrication grease according to DIN 51825 type K 1N-30). If the axis is used in harsh conditions e.g. high speed, short cycle time or impure ambient, we recommend to clean the guide rods (10) **every week** and grease lightly.

Belt Replacement

The timing belt requires basically low maintenance. Should, in spite of this, a belt change be necessary, the following procedure has to be performed:

13. loosen and remove bolts (3, 12). Do not loosen the grubscrews (2)!
14. Remove both bolts (8). Remove cover (25).
15. Remove both pulleys (26/27) from the motor block.
16. Remove both parts of belt take up (1, 4) from endplates (6, 11).
17. Remove old belt (7).
18. Put in new timing belt (7) with the same number of teeth.
19. Put both pulleys (26/27) back into the motor block.
20. Put in the cover discs (25) and tighten both bolts (8)
21. Put the ends of the timing belt flush between the belt take ups (1,4) and the insert them into the end plates (6, 11), and tighten the bolts (3, 12).
22. Control timing belt tension again. Normally it is not necessary to correct the belt tension after replacing it.
23. If the belt tension needs to be adjusted, adjust the tension with the grubscrews (2). The correct timing belt tension is 1‰ of the belt length. Mark the timing belt !.
24. Tension the timing belt with the grubscrews (2). Control timing belt tension again.

Note: Check and if necessary correct the axis movement positioning after a belt exchange. If during operation, the belt is noisy, a standard PTFE spray can be used in order to reduce the noise.

Service

In case of spare part orders or service, please advise material and order number (located on axis name plate) of the axis or the axis system.

8.4.7 Timing belt pre tensioning

Normally the timing belt is maintenance free and factory adjusted with the correct belt tension

Note the following information on tensioning the belt:

- The belt tension must be so high that the belt is still tensioned under maximum operating load.
- If the tension is not high enough, this may lead to jumping. If the belt tension is too high, this increases the load on the bearings and reduces the service life.
- During the first hours of operation, the belt tension decreases. It may be necessary to re-tension the toothed belt.
- Due to pitch and rigidity tolerances of the toothed belt, the newly adjusted belt tension may differ from the originally adjusted belt tension



Contact your local sales office if you have questions concerning the vibration measurement.

8.5 Shipping, storage, disposal

Note the ambient conditions in chapter 3.1

Shipping

The product must be protected against shocks during transportation. If possible, use the original packaging for shipping.

Storage

The product may only be stored in spaces where the specified permis-sible ambient conditions are met.
Protect the product from dust and dirt.

Disposal

The product consists of various materials that can be recycled be and must disposed of separately. Dispose of the product in accordance. with local regulations.

9. Glosssary

9.1 Terms and Abbreviations

See chapter 2.5 "Standards and terminology" for information on the pertinent standards on which many terms are based. Some terms and abbreviations may have specific meanings with regard to the standards.

Axis body The axis body is a aluminum precision profile.

Ball screw drive The ball screw drive converts a rotary movement into a linear
The ball screw drive converts a rotary movement into a linear movement. It consists of a ball screw, a ball nut with the ball recirculating elements and the bearing balls. A ball screw drive has a very high efficiency. It allows for high-precision, stiff feed movements and generates high feed forces at high positioning accuracy and repeatability.

Ball screw pitch The pitch of the ball screw shaft relates to the distance covered by the carriage per revolution of the ball screw. The greater the pitch the higher the maximum velocity.

The following applies to the ball screw pitch:
• High pitch requires high driving torque
• High pitch results in high velocity
• High pitch causes high inaccuracy

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

Buckling stress Buckling is the loss of stability of the ball screw shaft when the maximum buckling is the loss of stability of the ball screw when the maximum permissible thrust forces whose line of application is along the axis of the ball screw axis is exceeded. Excessive buckling stress results in a rapidly increasing deformation and deflection of the ball screw shaft.

Cantilever axis In the case of a cantilever axis, the carriage is stationary while the axis body moves. Portal axes work the other way round.

Critical speed of the ball screw shaft If the critical speed of the ball screw shaft is exceeded, deflection of the ball screw and resonance will occur. This will seriously affect the service life of the ball screw drive. Ball screw supports are installed in longer linear axes to increase the critical speed of the ball screw shaft speed and thus the performance data.

DOM (**D**ate **o**f **m**anufacture). The nameplate of the product shows the date of manufacture in the format DD.MM.YY or in the format DD.MM.YYYY.
Example:
31.12.09 corresponds to December 31, 2009
31.12.2009 corresponds to December 31, 2009

Degree of protection The degree of protection is a standardized specification for electrical equipment that describes the protection against the ingress of foreign objects and water (for example: IP 20).

Direction of rotation Rotation of the motor shaft in a positive or negative direction of rotation. Positive direction of rotation is when the motor shaft rotates clockwise as you look at the end of the protruding motor shaft.

Drive element The drive element of the linear axis is a ball screw drive.

Error class Classification of errors into groups. The different error classes allow for specific responses to errors, for example by severity.

Fatal Error In the case of fatal error, the product is no longer able to control the motor so that the power stage must be immediately disabled.

Fault Fault is a state that can be caused by an error. Further information can be found in the pertinent standards such as IEC 61800-7, ODVA Common Industrial Protocol (CIP).

Fault reset A function used to restore the drive to an operational state after a detected error is cleared by removing the cause of the error so that the error is no longer active.

Feed per revolution The feed per revolution is the distance the carriage covers per motor revolution.

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

Load torque The permissible load torques are calculated based on the service life of the carriage guide. If the load torque exceeds the specified values, the service life of the axis will be reduced.

Modulus of elasticity The modulus of elasticity is used to describe the tendency of a material to deform along an axis when opposing forces are applied along this axis; it is the ratio of tensile strain and tensile stress. The higher the value, the stiffer the material.

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

Portal axis In the case of a portal axis, the axis body is stationary while the carriage moves. Cantilever axes work the other way round.

Positioning accuracy Positioning accuracy is the tolerance between the specified position and actual position.

Recirculating ball bearing The axis axis body absorbs the forces and torques applied at the carriage via the recirculating ball bearing guide. The recirculating ball bearing guide can absorb high forces and torques.

Repeatability Repeatability is the accuracy with which it is possible to move to a previous position again under the same conditions.

Running accuracy Due to the manufacturing process, the extruded aluminium profiles have a certain tolerance in terms in straightness and twist. The tolerances are specified in EN 12020-2. To reach the desired running accuracy, the linear axis must be mounted on a precision-machined surface.

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

Service life The service life is the distance in kilometers before the first signs of material fatigue can be seen on the guides, the 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.

Stiffness Stiffness is a measure of the ability to move and hold with high position accuracy a part to be positioned even when the load changes.

Stroke reserve The stroke reserve is the distance between a limit switch and the mechanical stop.

Stroke Stroke is the maximum travel of the carriage between the switching points of the limit switches.

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

Warning If the term is used outside the context of safety instructions, a warning alerts to a potential problem that was detected by a monitoring function. A warning is not an error and does not cause a transition of the operating state.