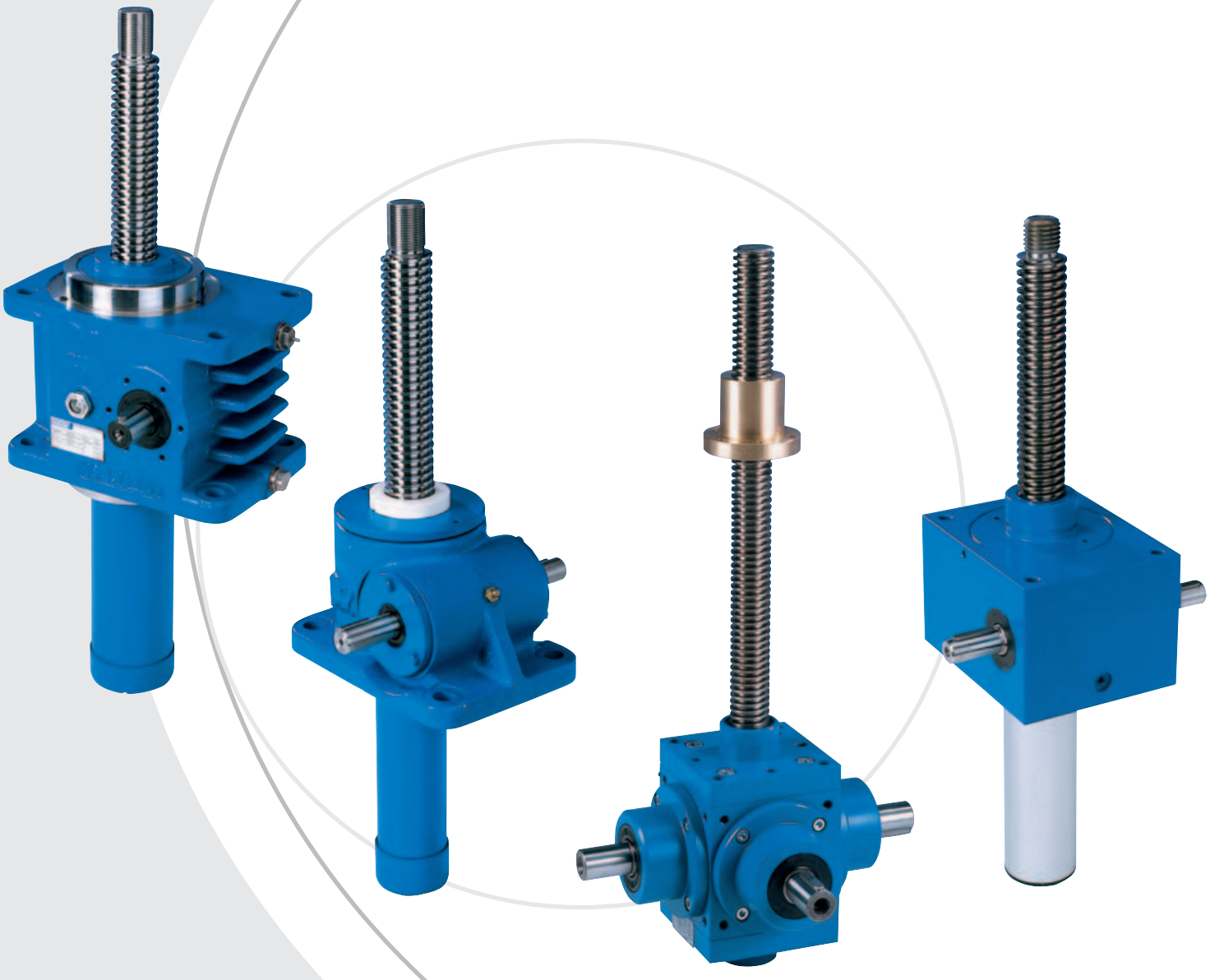
PFAFF silberblau antriebstechnik



Actuator Technics

ALLTEC antriebstechnik

Vision

The Idea.

Every step forward begins with the initial spark of an idea. Our inspiration in this case was the idea of "lift, turn and move", by which we apply a whole new way of thinking to these processes – to the benefit of our customers. This involves the freedom to move in any direction, regardless of the type of load being handled, and ample all-round support for those operating the system.

Clear thinking.

The jump from inspiration to working model will not work without a structured step-by-step approach, and our in-house think-tank ensures that we always have at our disposal processes and developments that are based on solid research – along with properly-analyzed results. This allows us to obtain new advantages and improve on those that already exist.

Innovation.

We carry out in-house all product innovation and development for immediate application, and systematically supplement and bundle together further market know-how under the umbrella of the Pfaff-silberblau group of companies. This helps ensure that customers are always offered an innovative, continuously expanding range of products.

Imprint:
Creative design and implementation:
Müller's Büro, Augsburg, Germany

Design:
publicity – Gruppe für Gestaltung,
Augsburg, Germany

Photography:
Weiss Photo Studio, Gersthofen, Germany

Typesetting:
Satz und Grafik Partner GmbH,
Augsburg, Germany

Printing:
ADV – Augsburger Druck- und
Verlagshaus, Augsburg, Germany

This brochure includes
archive pictures for
illustrative purposes.

We reserve the right to make technical amendments and/or improvements. The color(s) of items shown may vary from those actually supplied.

Competence meets competence

Motion meets technology

In the fast-moving drive engineering market, the pronounced tendency to blur the line that separates mechanical and electrical systems is giving rise to a whole new set of challenges, which are bound to have a lasting influence on our industry at both a domestic and – above all – international level. This change requires a new type of cooperation, which must be fit to face up to these challenges and meet new requirements. Pfaff-silberblau and ALLTEC Antriebstechnik, as the latest new member of the Pfaff-silberblau group of companies, can now offer future-oriented, bundled sets of drive systems. Classic Pfaff-silberblau elements, along with the wide range of products offered by the specialist in octahedral screw jacks, worm gears and linear drive units, are now available under one roof. Our single-minded objective is to expand the frontiers of drive engineering – on a worldwide basis.

Experience meets innovation

There are two stages to every innovation process: first the creation of a solid technological basis, followed by delivery of the advance in question. In the case of ALLTEC Antriebstechnik and Pfaff-silberblau, two further stages are added: reliability and flexibility – in order to react promptly to each situation. There is now seamless integration throughout our product range of screw jacks, quick-lifting jacks, worm gears, mechanical linear systems and drive systems – plus their corresponding accessories. Specialists in mechanical engineering, industrial machine and plant construction, and the supply of factory equipment all place maximum trust in the highly competitive quality of Pfaff-silberblau products, as do in-house maintenance and servicing departments.

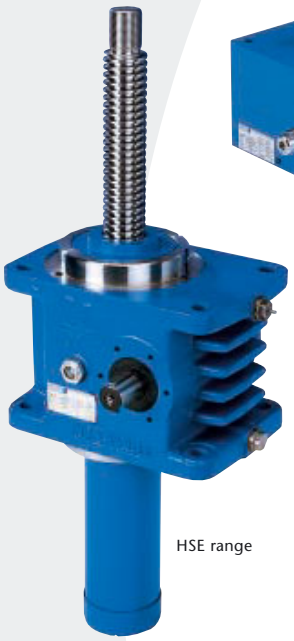
Quality meets service

Interchangeable drive-system elements increase quality and provide for ease of servicing, which in turn results in improved operating safety. Pfaff-silberblau and ALLTEC Antriebstechnik represent reliability to the power of two. From consulting, mutually reinforcing experience and engineering services to improved onsite and field service, the user can only profit from the synergies that this alliance offers in the areas of maintenance, servicing, installation, billing, legal conformity and so on – such is the increased convenience that our trouble-free operating procedures deliver.

Extract from our catalogue

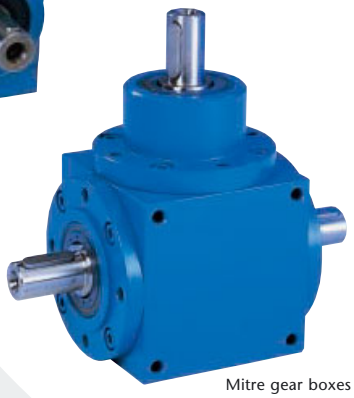
SHE range

Merkur range



HSE range

SHG range



Mitre gear boxes

Standard worm gear screw jacks
SHE and octahedral **MERKUR** elements
for standard applications

HSE high performance
worm gear screw jacks
for highly-demanding dynamic applications

SHG quick-lifting screw jacks
for extremely high-speed lifting operations

Special lifting elements
configured to customer-specific requirements

Mitre gear boxes

Accessories for lifting elements
and jacking systems

Special configurations

Couplings

Motors

Controls

High flexible shafts

Swivel plates

Lifting screw protective covers

Pillow blocks

Limit switches

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

Overview of section

Contents

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

Contents

Contents

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

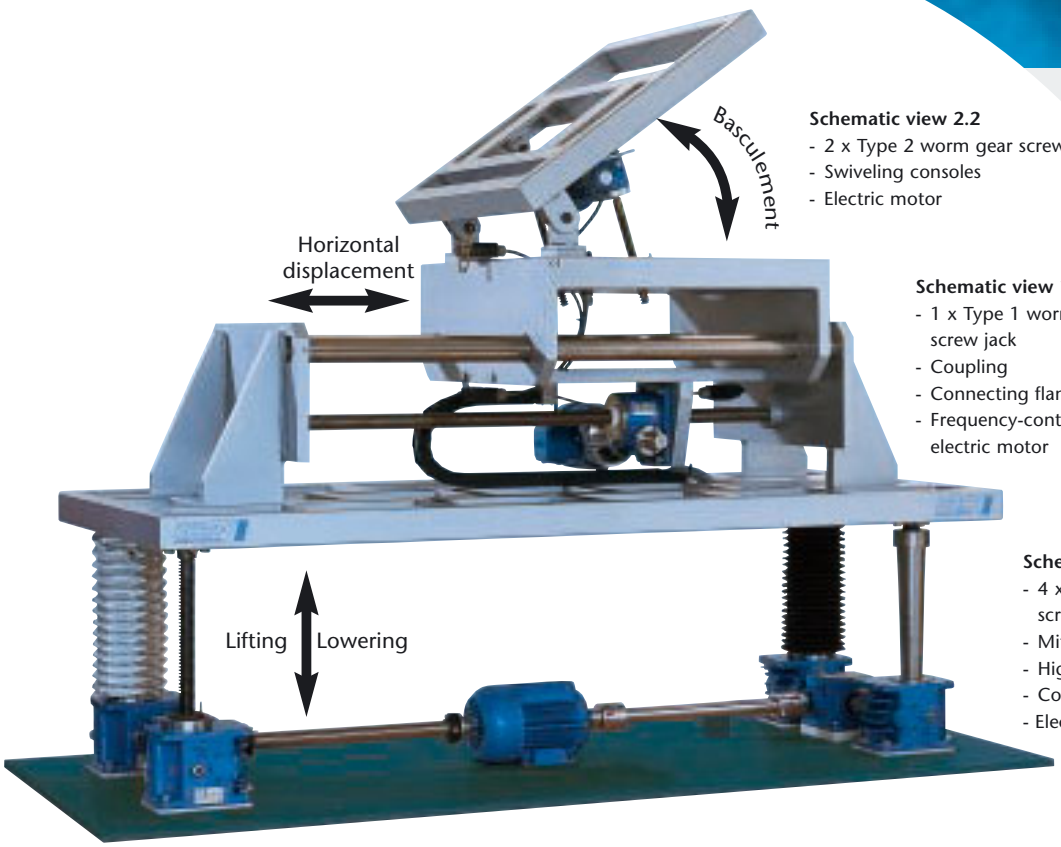
Contents

Contents

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

Three-axis functioning model

1



Schematic view 2.2
- 2 x Type 2 worm gear screw jacks
- Swiveling consoles
- Electric motor

Schematic view 1.1
- 1 x Type 1 worm gear screw jack
- Coupling
- Connecting flange
- Frequency-controlled electric motor

Schematic view 4.1
- 4 x Type 1 worm gear screw jacks
- Mitre gear boxes
- High flexible shafts
- Couplings
- Electric motor

Pfaff-silberblau-StarVars

2D ▷▷CAD 3D

Pfaff-silberblau-StarVars CAD application program on CD-ROM

Pfaff-StarVars is the powerful tool for system builders, which allows you to plan drive systems and design new components.

The CAD catalogue gives you on-screen access to the geometric data of all products supplied by Pfaff-silberblau Antriebstechnik – with 2-D or 3-D views – via Internet or on CD ROM.

The CD ROM is compatible with Windows (Win 95 onwards) and AutoCad LT or AutoCad, along with numerous other systems via standard file-exchange formats. Data output is via Windows Notepad, AutoCAD or as universal DXF files. StarVars also allows you to use standard parts or product data in construction drawings or documentation and evaluate the data so produced for such items as component lists, quotations or orders.

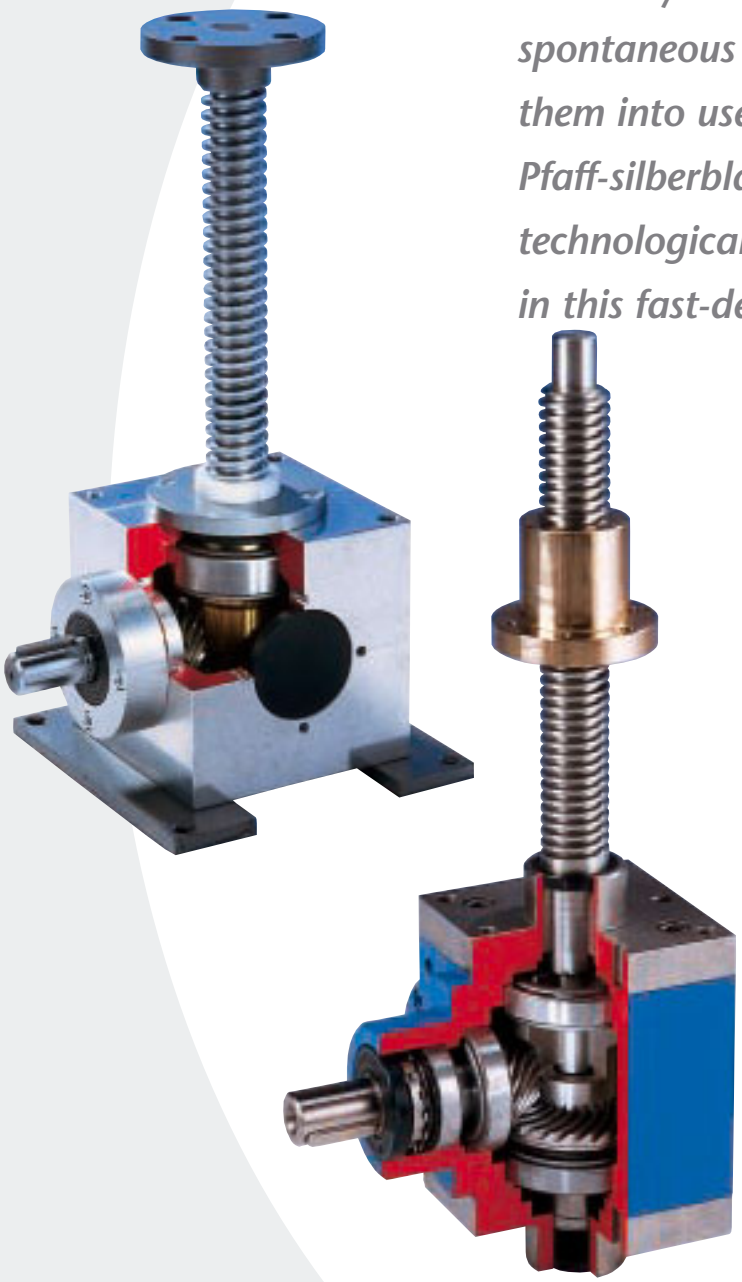
www.modularis.de/catalogs/pfaff-silberblau

1

Useful information

Improving on existing trends in order to shape the future.

Flexibility is the number-one requirement where a spontaneous ability to spot trends and conver them into useful developments is concerned. And Pfaff-silberblau makes full use of its international technological expertise to set its own benchmarks in this fast-developing market.



In the specific field of drive engineering, increased automation and ease of operation are in tune with the ever-greater importance given to the precise control and monitoring of lifting, lowering, feed and swivel mechanisms. Areas such as miniaturization, controlled automation, intelligent drive systems and sensor technology, technology transfer and combination, and integrated and mechatronic systems have gained major-development status, or have even turned into real applications. Given that mechanical engineering, machine-tool technology, rail and road technology, etc. are in a state of constant ongoing development, Pfaff-silberblau also offers electromechanical drive-system elements and complete drive-system solutions designed for universal application.

This catalogue contains all the data required for carrying out an informed selection from the widest-possible range of different worm gear screw jacks. Discover answers to your own specific task-requirements, along with solutions designed to turn your product into a successful and high-quality overall concept. If you are also interested in recommended special solutions for "Linear actuator technics, Linear motion precision screws and Linear motion devices", please ask for the appropriate additional catalogues. Do not hesitate to contact us if you have any query.

Phone + 49 (0) 8 21 / 78 01 - 320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

Drive system layout

We can supply precise, reliably configured jacking drive units, dumb-bell shafts, mitre gear boxes, motors, etc. that conform both to current industrial-machine legislation and standards and to your exact function requirements.

Engineering

Your proposals become our objectives where project planning and construction support for special individual configuration and calculation methods conforming to VBG14 and GUV 16.15.3 are concerned. Ask your technical adviser about our construction support services.

Controls

Demand reliability and clear thinking: Whether you are looking for positioning controls that function via frequency-regulated individual drive systems for SLAVE-MASTER operation, or controls for universal applications and operating conditions – we supply the support you need.

Service

Customer satisfaction always occupies the head of our "to do" list, which is why we supply you with full support during the installation process, while helping to ensure that everything conforms to VBG 14 (UVV 14) and that the jacking systems and components are all duly certified.

Delivery dates you can rely on

Time is too valuable to be wasted on waiting for late deliveries, so you can rely on our promised delivery times – regardless of whether you have ordered standard jacking elements, modified units or series-produced special configurations. Just try us out.

Installation of lifting system with bellows-type casing for approx. 9 m of lift.
Manufacturer's illustration
MAN Technologie AG

1.2 Construction measures

1

The wide range of possible applications for our drive systems reveals their great versatility – which is increased even further if we add in our customized solutions. Whatever operating task needs performing, whatever function you require – we can supply the right standard, modified or special solution, successfully combining off-the-peg elements into totally task-specific answers to your specifications. Just contact your technical adviser and draw up a draft solution for your particular task in hand.

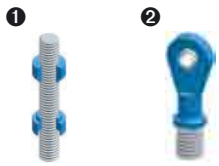
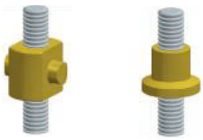
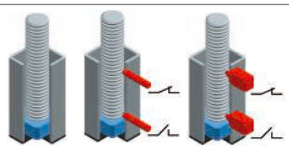
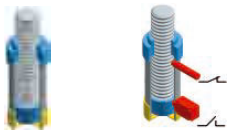
1.2.1 Specifications/Solution system

In order to point you quickly in the right direction, we have organized all applications into a standard format in terms of tasks performed and solutions provided.

Your task specification
- Jacking-system requirements
- Special configuration factors and observations

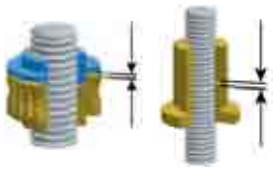
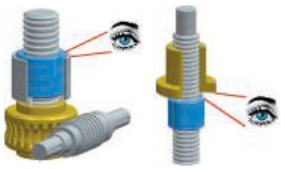
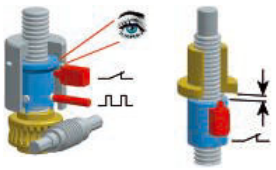
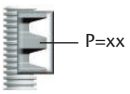
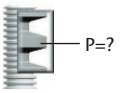
Our solution
- Suggested solutions and recommendations

1.2.2 Construction

Your task specification	Symbol	Our solution
• No onsite guidance possible • Lateral stresses cannot be ruled out • Counter-forces produced by swiveling motion		**Second guide ring/Per coupling head** ❶ increases stability and prevents non-permitted edge compression on the female thread ❷ articulated spindle mounting
		**Movable travelling nut mounting** Take articulated or spherical nut support into account **Note:** **Lateral stresses should be avoided, as they drastically reduce the service life of the supporting nut**
• Worm gear screw jack as single drive unit without onsite guidance • No onsite anti-turn device available • With/Without lift-limiting system		**Anti-turn device** Standard system using rectangular tube or special configuration with feather key (for low lifting forces)
• Mechanical runout prevention system required • With/Without lift-limiting system		**Mechanical limiting system, configuration type 1** Spindle nose with mechanical end-stop for emergency limiting. Protection tube with fitted limit switches
• Swiveling/Tipping movements provided by worm gear screw jack elements • With/Without lift-limiting system		**Swivel-lug configuration** Secure drive elements at two points using moveable mountings. This can be done using a two-sided head (IV) or coupling head. The moment of flexion resulting from the swiveling motion should be minimized as much as possible by means of low-friction articulations.

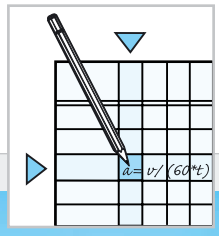
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

1.2 Construction measures

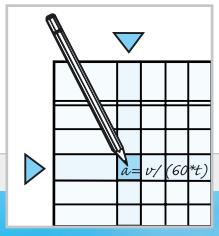
Your task specification	Symbol	Our solution
• Requirement for constantly-balanced axial play in trapezoidal thread		**Configuration with adjustable play** Special configuration with pre-tightened twin nuts, axial play can be readjusted via housing cover. Special configuration with pre-tightened twin travelling nuts. Axial play can be readjusted **Note: Only applies to load reversal (tension and compression load). No readjustment is required if ball screws are used**
• Requirement for increased operating safety • To limit material damage in event of nut breaking		**Short safety nut** Supporting nut with short safety nut for visual wear monitoring. **Note: Monitoring is only possible in one load direction at once**
• Requirement for personal safety measures and/or conformity to VBG 14 accident-prevention standards (persons under raised load/working platforms) • Or configuration conforming to VBG 70 standards for stages and broadcasting studios		**Long safety nut** In the case of worm gear screw jacks used on theatre stages (VBG 70), lifting platforms (VBG 14) or jacking systems that might affect personal safety, lifting elements are designed according to current regulations, and include such items as anti-drop systems (self-locking spindles and/or mechanical safety brakes as part of the drive system). The function of the synchronizing device is guaranteed, when required, by additional components.
• Large lifting capacity with small installation space		**Telescopic configuration** Right-/Left-hand spindle system requires – with large lift stroke – only half the length of protection tube (stroke x 0.5+approx. 30 mm)
• Large lifting lengths and low loss of grip with minimal lifting force		**Reinforced spindle** for configuration type 2, possible under certain circumstances for configuration type 1
• No accidental lowering of load while unit is shut down		**Single-threaded trapezoidal spindles Tr** with self-locking system (e.g.: Tr40x7)
• High lifting capacity for same spindle diameter		**Buttress-thread spindle S**
• High lifting speed required • Viable alternative to recirculating-ball spindles		**Multi-thread trapezoidal spindles Tr** • Efficiency rating (Tr> 50%) (e.g.: 2-threaded spindle Tr40x14P7) • **No self-locking system –> motor brake always required**
• Movement-operated self-locking • No motor brake required		**Single-threaded trapezoidal spindle with special lead dimensions** * No additional motor brake required (e.g.: Tr40x5)
• High lifting speed required • Minimal amount of axial play (≤ 0.03mm) • High lead accuracy P300 ≤ 0.05mm • Minimal friction required		**Ball screw spindle KU** or PL planetary roller spindle • Efficiency rating η_{Ku} ≈90% η_{Pl}≈65% • **No self-locking system –> motor brake always required**

1.2 Construction measures

Your task specification	Symbol	Our solution
• Positioning • Hodometry		**Shaft encoder installation** Available as option for all common makes Fitted directly to worm gear screw jack - Angle encoder/Incremental transducer SSI absolute-value transmitter or DP Profibus
• Available installation space is limited		**Hollow shaft** Motor installation via sleeve shaft and IEC flange
• Motor should be directly attached to lifting element		**Motor mounting flanges**
• Components are required to perform swiveling movements		**Swivel mounting bases** complete with bearing seats **Swivel plate**
• Active protection against dust, dirt or moisture required		**Spindle protection** Flexible protection boots Spring-steel spirals
• Variable structural attachment methods desired		**Spindle heads** Head I = plain head Head II = flange plate Head III = threaded head Head IV = rod-type head Head GK = fork-type head Option = joint head
• Manual operation and/or manual emergency actuation required		**Hand wheel** Only advisable for emergency use or for reduced number of lifting movements Conforming to DIN 950, compatible with the corresponding worm screw jack, supplied ready-drilled and slotted



Contents



2.1 List of formulae

Abbr.	Designation	Measuring unit	Formula
$\varphi^{(\bullet)}$	Lead angle Self-locking during shutdown*: 2,4° < φ ≥ 4,5° Movement-operated self-locking: φ < 2,4° No self-locking: φ > 4,5°	°	$\varphi=\arctan[P_h/(d_2*\pi)]$
η_{Anl}	Jacking system efficiency rating		
η_{HE}	Worm gear screw jack efficiency rating		
a	Acceleration	m/s^2	a =v / (60*t)
As	Number of load cycle		
C	Dynamic load capacity	kN	
C_o	Static load capacity	kN	
d_2	Pitch diameter	mm	
ED	Duty ratio	%/hr	ED = [lift*As/(60*v)]*100%
F_{dyn}	Dynamic axial force (= lifting force)	kN	
F_{stat}	Static axial force (= retention force)	kN	
HU	Lift/Rotation	mm	$HU= P_h / i$
i	Transmission ratio		
Lh	Service life	h	$Lh=(C/F_{dyn})^3*10^6/(n_2*60)$
n_1	Speed of drive motor	min^{-1}	
n_2	Output speed	min^{-2}	$n_2 = n1 / i$
P	Power rating	kW	$P= F_{dyn} * v / (60*\eta)$
Ph	Spindle pitch	mm	
pv-value	Surface compression x running speed	N/mm^2 * m/min	
p_{zul}	Permitted surface compression	N/mm^2	
t	Time	s	
T_1	Driving torque	Nm	$T_1 = P*9550 / n_1$
T_2	Output torque (= spindle torque)	Nm	
T_A	Starting torque	Nm	$T_A \sim T_1 * 1,3$
v	Lifting speed	m/min	$v = n_1 * Ph / i$

(•) Vibrations and optimized sliding properties may affect the self-locking system. If in doubt, use a motor brake

Index

HE _____ Worm gear screw jack
Anl _____ Jacking system
Ku _____ Ball-screw spindle
Tr _____ Trapezoidal spindle
zul _____ permissible

Configuration conforming to VBG 14

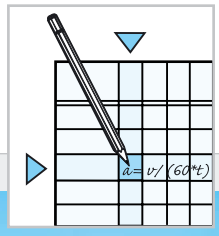
Lead angle:

φ < 2,4° ⇨ No motor brake required
2,4°< φ > 4,5° ⇨ Motor with single braking torque
φ > 4,5° ⇨ Two independent braking systems

Standards for theatre stages and broadcasting studios VBG70 (GUV 16.15.3)

Similar to configuration conforming to VBG 14, although spindle self-locking is not an absolute requirement if all torque-transmitting components are designed to withstand twice the rated load.

Phone +49 (0) 821 / 7801-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



2.2 Suggestions for installation

2.2.1 Vertical installation

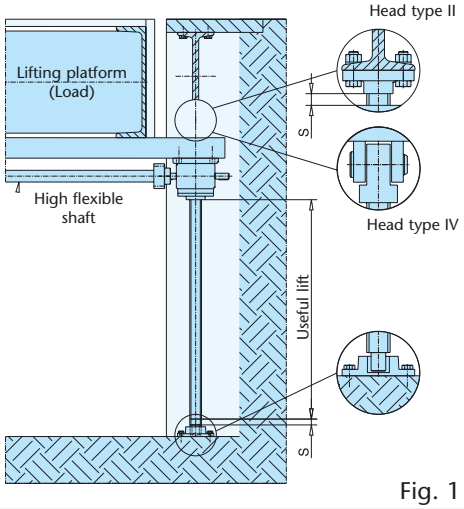


Fig. 1

Recommended arrangement for large lifting strokes and long spindles

Tension force

Design: Configuration type 1
With climbing screw jacks (without protection tube)

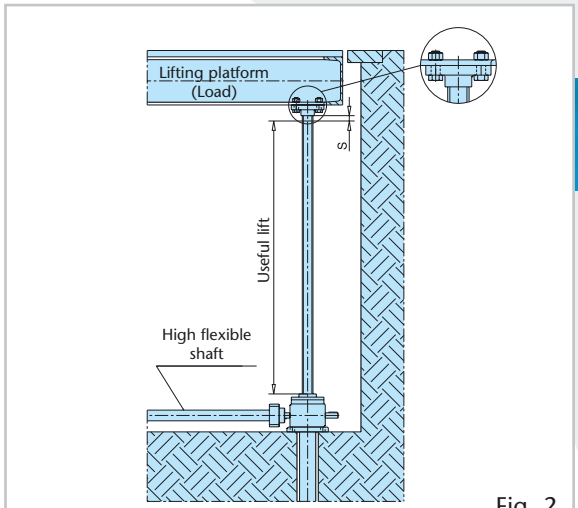


Fig. 2

Compression-loaded spindle without lateral guides

Dimensioning of spindle according to Euler case no. 1

Design: Configuration type 1
With lifting spindle and protection tube

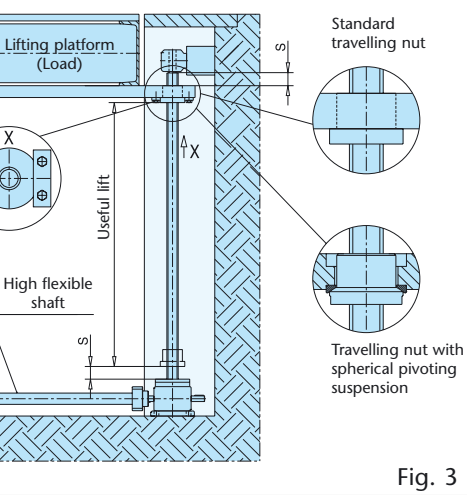


Fig. 3

Arrangement with compression-loaded spindle possible, with or without additional guides

Dimensioning of spindle according to Euler case no. 3 and critical spindle turning speed

Design: Configuration type 2
With turning spindle and travelling nut

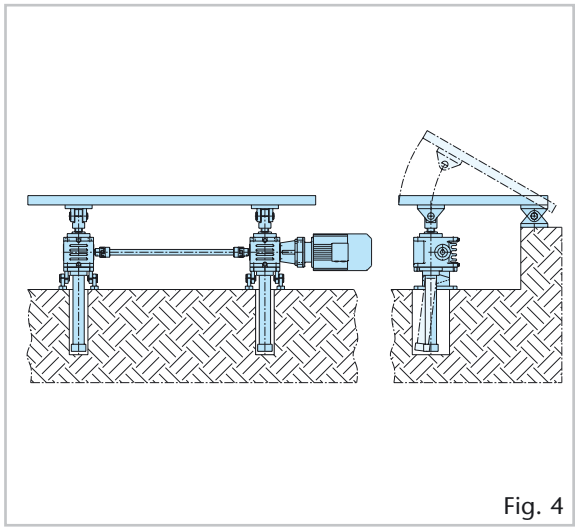


Fig. 4

Swiveling movements require articulated mounting

Dimensioning of spindle according to Euler case no. 2

Design: Configuration type 1
With lifting spindle, two guide rings and protection tube

S = safety clearance
See section 7 "Accessories" for details of all required add-on items (connecting flange, Swivel mounting bases, etc.).

2.2 Suggestions for installation

2.2.2 Horizontal installation

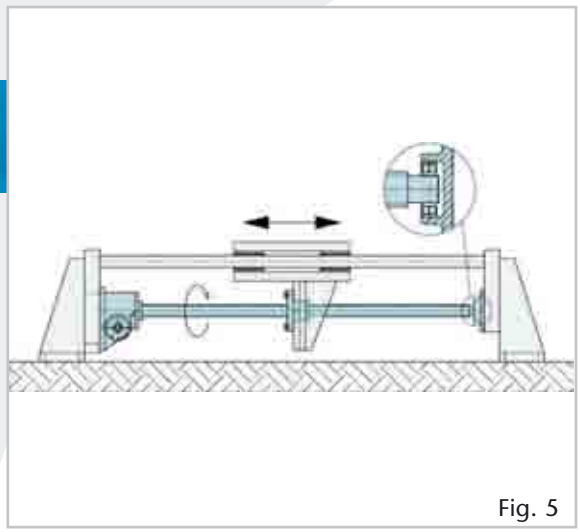


Fig. 5

Arrangement with compression- and tension-force-loaded spindle
With guides supplied onsite

Dimensioning of spindle according to Euler case no. 3 and critical spindle turning speed

With spindles pre-adjusted to tension load ⇨
Dimensioning according to critical speed only
Design: Configuration type 2
With turning spindle and travelling nut

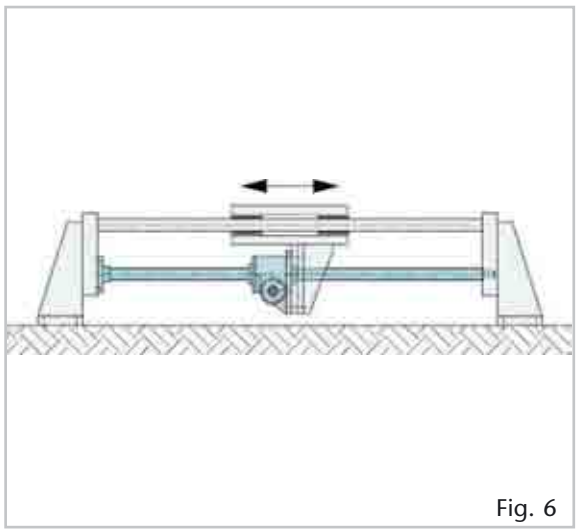
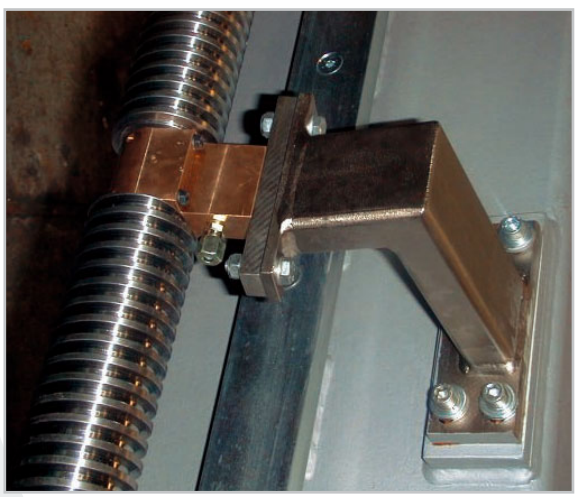


Fig. 6

Arrangement with compression- and tension-force-loaded spindle
With guides supplied onsite

Dimensioning of spindle according to Euler case no. 2, if spindle retaining force is insufficient. Otherwise, apply Euler case no. 3

Design: Configuration type 1
With retained spindle and linear traversing drive axle



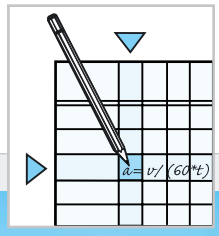
Intermediate bearing-support of a 12m spindle Fig. 7

Standard once-piece spindles can be made in lengths of up to 6m (3m for spindles made of rust-free material). Longer spindles are supplied in sections to make installation onsite easier.

Special travelling nut Fig. 8

If critical spindle speed is exceeded (only applies to configuration type 2 = turning spindle), the spindles must be adequately supported. This requires the use of our specially-supplied intermediate bearings and travelling nuts (see photos).

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



2.3 Service life L_{HE}

The design and construction of Pfaff-silberblau worm gear screw and quick-lifting jacks are based on our long years of experience in the field and they will deliver a long service life if the instructions in the operating manual are observed.

Spindle		Gearing layout	Bearing layout
Tr and S spindle	**Ku spindle**	**N or L**	**Thrust and radial bearings**
– These values are for guidance only, as exact calculation is not possible – Decisive layout factors are surface compression and running speed (pv-value, p_{zul}) – Guaranteed relubrication – Optimum installation	– Calculation: $L_h=(C/F_{dyn})^3*10^6/(n_2*60)$	**Worm-drive gearing:** – SHE standard worm-screw jack and approximate MERKUR values according to DIN3996-D – In the case of HSE high-performance worm gear screw jack, according to DIN 3996-C, **bevel-gear tooth configuration:** – SHG quick-lifting screw jacks, L_h = fatigue strength	– Calculations according to DIN and/or data supplied by the bearing manufacturer

2

The maximum-load values given in the catalogue data (tables of settings) are based on an approximate minimum service life of 500 operating hours.

2.4 Guidelines for use

2.4.1 Dirt protection

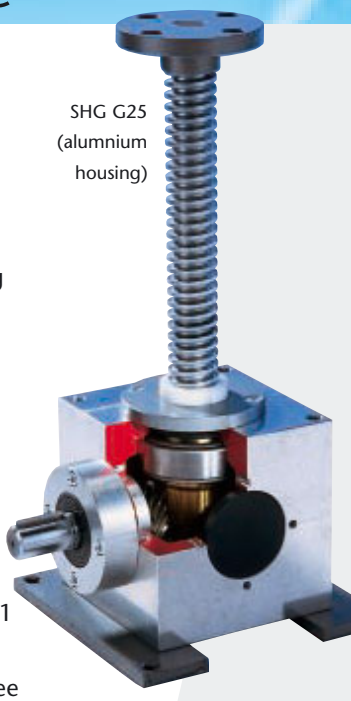
– Series-supplied leakproofing of all ranges by means of rotary lip seals fitted to drive shafts
– Enclosed housing configuration on HSE und SHG ranges using additional seals
– Fitting of sleeve to protect spindle in configuration type 1

Optional lifting screw protective covers:
– Flexible protection boots made of various materials to prevent entry of dirt and for outdoor use (waterproofing)
– Spring-steel spirals for use in extreme conditions (flying swarf, welding sparks)

Custom configurations:
Special configurations, e.g. for use under water or at high temperatures, are available on request

Surface coating for all other sizes:
– SHE and HSE housing with series-applied primer coat
– Merkur and SHG with phosphate-coated housing

Optional corrosion protection for special configurations:
All ranges
Can be supplied with special coatings
· Spindles and spindle heads made of material 1.4305, 1.4301, 1.4571 are available
· Worm-drive shafts made of rust-free material can be supplied
SHE range available in all-rust-free material configuration



SHG G25 (alumnium housing)

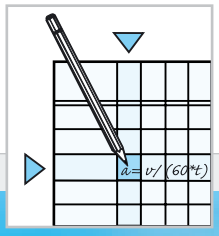
2.4.2 Corrosion protection

Corrosion-protected aluminium housing fitted to the following ranges:

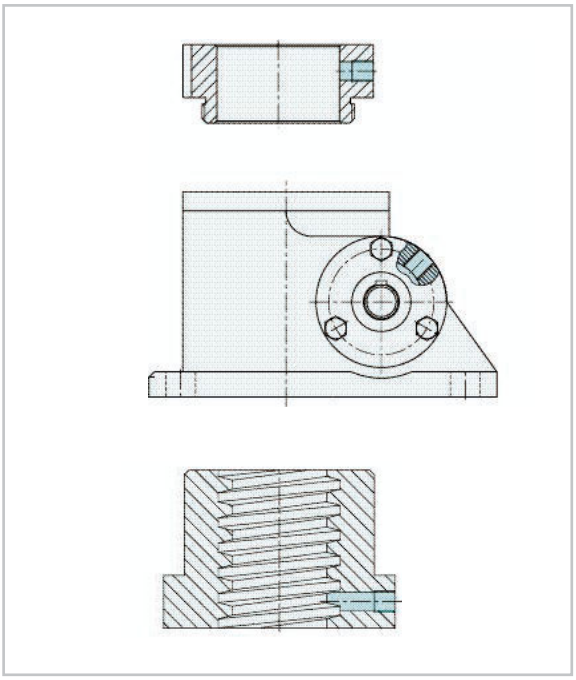
SHE	Size 0.5 and 1
Merkur	Size M0, M1 and M2
HSE	Size 31 and 36
SHG	Size G15 and G25

Corrosion-protection provided by surface coatings:

All ranges
· Tuffrided spindles (salt-bath nitrided)
· Hard-chrome plated drive tappets



2.4 Guidelines for use



2.4.3 Items requiring regular lubrication

If access to the spindle itself or the lubrication points on the housing is difficult, we recommend the use of a central lubrication system or automatic lubricant dispenser. (see section 7.8). Our components can be supplied with the necessary screw-in connections for this purpose.

2.4.3.1 SHE and Merkur

Configuration	Lubrication point
Type 1	guide ring, protection tube, housing (gearing layout)
Type 2	travelling nut, housing (gearing layout)

2.4.3.2 HSE and SHG

Configuration	Lubrication point
Type 1	guide ring, protection tube,
Type 2	travelling nut

2.5 Ambient temperatures

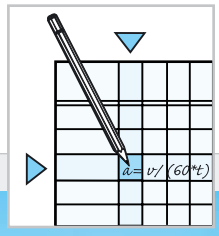
Standard
-10°C +40°C

T< -10°C
- Special lubricants, min. -30°C
- Special materials (on request)

Note:
Please take our reduced performance or ED values into account if temperatures deviate from the standards given

+40 °C <T≤ 80 °C
- Special lubricants, max. +80 °C
- Special measures T > 80°C (on request)

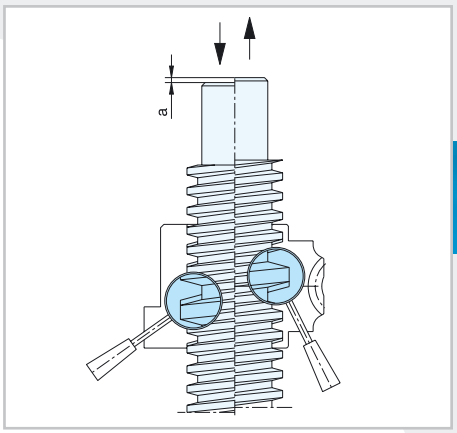
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



2.6 Precision ratings

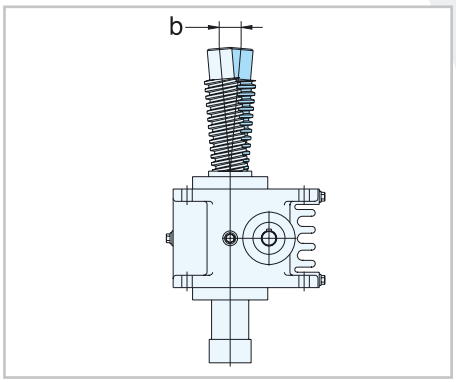
2.6.1 Axial play „a"

Axial play has no influence on positioning accuracy in the case of application of one-side load compression, as the flanks of the screw thread provide support.



Trapezoidal or buttress-thread spindle	Ball-screw spindle
Standard 0.1 mm ≤ a ≤ 0.3 mm, depending on size	Single flange nut a ≤ 0.05 mm
Modified configuration: Axial play a according to customer requirements, but min. 0.05 mm	Initial tension depending on size of ball 0.01 mm ≤ a ≤ 0.03 mm
Custom configuration: Axial play can be readjusted	Pre-stressed twin nut a ≤ 0.01 mm

2.6.2 Lateral play „b"



Standard

Lateral play „b" occurs only in the case of type 1, as a result of play between the guide ring and the outer diameter of the spindle. It totals about 0.2 mm and gives rise to linear fluctuation „b" that varies with lifting-length. The amount of play „b" can be reduced by means of the second guide ring.

Special design

2nd Guide ring with reduced play and additionally-ground spindle material.

2.6.3 Tooth profile play

Worm-drive gearing

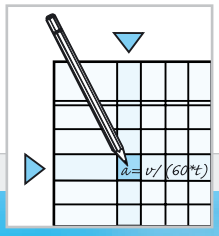
The tooth profile play (when new) of 0.1 – 0.3 mm varies, according to the size of the unit or amount of axle clearance, with the rate of wear

Bevel-gear tooth configuration

Tooth profile play of 0.05 – 0.1 mm kept constant throughout service life of unit.

2.6.4 Spindle pitch errors

Trapezoidal thread conforming to DIN 103 T1; buttress thread conforming to DIN 513		Ball thread conforming to DIN 68051T3
Whirl-thread spindle (standard) ± 0,05 mm		**Whirl-thread spindle (standard)** Tolerance classification T7; P300 = 0,052 mm
Wrapped spindle ± 0,1 mm		Ground spindle; tolerance classification T1-5; P300 = 0,006 - 0,023 mm
		Wrapped spindle; P300 = ± 0,1 mm



2.7 Special areas of application

2

Under water

In explosion-hazard areas

In radiation-contaminated areas

Worm gear screw jacks and lifting jacks in **special design**

- Special sealing with non-toxic lubricants
- Corrosion-protection (rust-free materials)
- Travelling nuts made of self-lubricating material

Use of approved electrical components, such as motors, Limit switches, compression-resistant sealed brake units conforming to the corresponding fire/explosion-prevention standards and temperature classification

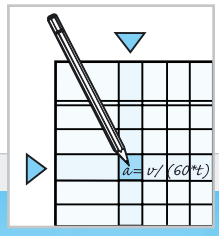
e.g. use of approved materials **with inspection certificate pursuant to DIN EN 10204 2.2-3.1 B-3.1 C**

- Greasing with radiation-resistant lubricants
- Earthquake-protected configuration

We count on many years of experience in the area of special applications for linear actuator technics, and can offer the following services:

- Project planning
- Construction support
- Material testing and certification
- Supervision of installation procedures and initial start-up
- Project-related documentation

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



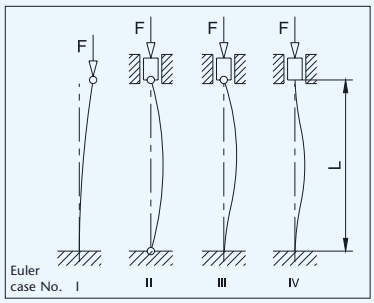
2.8 Layout of worm gear screw jacks

2.8.1 Flow diagram

Axial force [kN]
F_{dyn} load displacement
F_{stat} load at standstill
(retention force)
Lifting speed v [m/min]
Lifting travel [mm]
Establishment of configuration
(type1 or type2)

Dimensioning of spindle according to load direction

Compression force



Screw diamter as displayedin chapter 3.3.2
Note: A hardened screw diameter can be used for type 2 jacks (rotating spindles)

Tension force

Determine load factor ED [%/hr]; determine power rating P [kW] (see form collection in section 2.1)

Technical information
See section 3

For example:
Efficiency ratings and performance tables

Advance selection depends on performance limits of lifting device and diameter of spindle.
Tables of settings, section 3.3.1

Are additional conditions to be observed?

Extraordinary operating conditions
Collision/Impact
Lateral loads
Load factor > 20%/hr
Standards to be observed,
e.g. VBG14 (elevating platforms),
VBG70 (theatre stages and broadcasting studios)

Yes

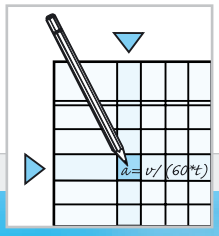
Check
according to section
1.2 Construction measures
2 Project planning

or consult our drive-system specialists

Hotline:
Phone +49 (0) 821/7801-320
antriebstechnik@pfaff-silberblau.de

No

Selected gear size can be applied



2.8 Layout of worm gear screw jacks

2.8.2 Example

Single drive unit with motor

Required axial force F_{dyn} — 20 kN
Required lifting speed v — 1,9 m/min
Required stroke — 1200 mm
Selected configuration — See section 3.1

Guides fitted onsite — Yes ⇨ Euler case no. 3
Load cycle/hour — 10
Travel per load cycle — 1200 mm
Configuration type 1 (lifting spindle)

Spindle	from bend diagram	Tr 50x9	
Pre-selection of worm gear screw jack	Section 3.3.1	HSE 63	
Required drive performance	1,74 kW	Performance limit according to table of settings, sect. 3.3.1	Perf < p_{zul} = 2,3 kW
Duty ration	13%/hr	For formula, see sect. 2.1	ED_{vorh} < ED_{zul} = 20%/hr
Selected motor	2,2 kW, 1500 min^{-1}		
Selected size HSE 63 in order			

2.8.3 Manual operation for lifting elements

Manual operation

N-transmission
T1 = higher
Lift/Rotation = larger

Take possible drive torque T1 and/or manual force into account.
(values based on past experience: approx. 150 to max. 200 N)
No ED check required

L-transmission
T1 = lower
Lift/Rotation = less

2.8.4 Motor drive for lifting elements

Motor drive

Observe the max. permitted drive capacity of the lifting element. See section 3.3.1

Observe the max. permitted load factor. See section 3.3.1

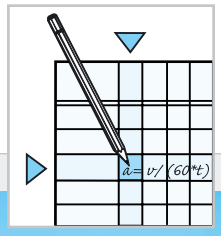
Observe the additional friction coefficients of the guide elements, etc.

Take the type of motor (three-phase, DC, hydraulic, etc.) into account with respect to start-up characteristics, impact coefficient and so on

Motor designs:

Required starting torque	**T_A ~ 1,3 x T_N**
Fast lifting speeds, e.g. servo-drive system	⇨ Inertial mass and acceleration time are decisive factors where configuration is concerned

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



2.8 Layout of worm gear screw jacks

2.8.5 Adjustment and stopping accuracy

The level of displacement accuracy depends mainly on the precision of the spindle (see section 2.6). Positioning accuracy is influenced, in the case of motor-actuated units, by the electrical control and regulating system, the control system of the brakes, and by the adjustment precision of the limit switches.

IMPORTANT: DO NOT allow motor-actuated components to collide with fixed end-limit stops.

2.9 Permitted operating settings

2.9.1 General points

Lateral force on spindle
F_s

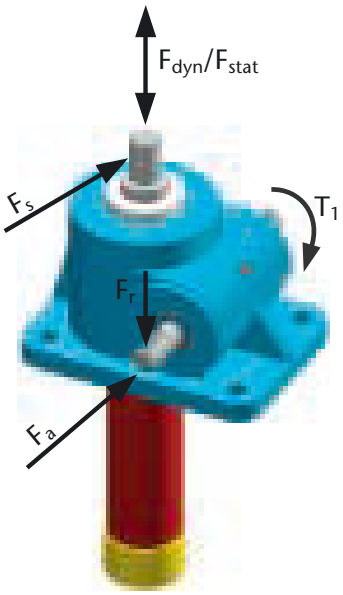
For details of permitted values, see diagrams in section 3.3.8

Drive capacity
$P_{HE} < p_{zul}$

$P_{HE} = F_{dyn}*v/(60*\eta_{HE})$
For calculation details, see section 2.1 Standard layout with 20% ED/hour and 20°C, or 10% ED/hour and 20°C

Driving torque
$T_1 < T_{zul}$

$T_1 = P_{HE}*9550/n_1$
For calculation details, see section 2.1



Dynamic and static Compression/tension load
F_{dyn}/F_{stat}

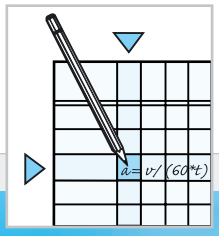
Configuration according to table of settings section 3.3.1 and/or bend diagrams in section 3.3.2

Axial load on drive shaft
F_a

No axial loads permitted.
(This factor should also be taken into account when fitting couplings and high flexible shafts)

Radial load on drive shaft
F_r

For details of permitted values, see section 3.3.9



2.9 Permitted operating settings

2.9.2 Operating factors

2.9.2.1 SHE standard worm gear screw jack

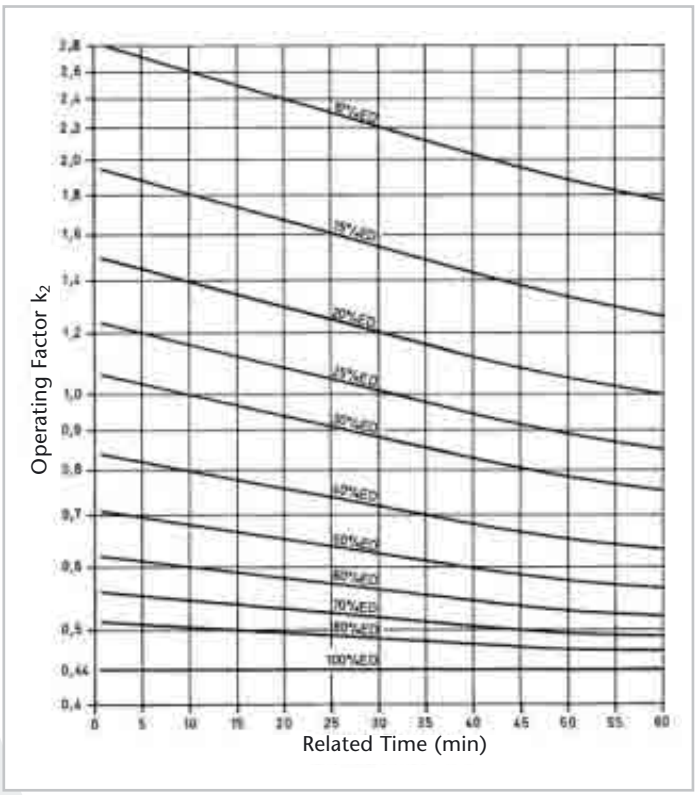
Reduction of ED relative to ambient temperature

Ambient temperature [°C]		50°	60°	70°	80°
in the case of lifting elements (SHE and Merkur)					
Maximum permitted operating time	%/hr	18	15	10	5
	%/10 min	36	30	20	10
CAUTION: Maximum operating temperature HE = 80°C					

2.9.2.2 HSE high performance worm gear screw jack

Size HSE	31	36	50	63	80
Power factor k_1 [kW]	0,40	0,64	1,0	1,62	2,43

Size HSE	100	125	140	200	
Power factor k_1 [kW]	3,30	5,41	7,50	13,30	



Power factor k_1

Power factor k_1 is the lost energy (quantity of heat) that can be dissipated with ED 20%/hr and 20°C ambient temperature of HSE without an outside cooling system. The steady-state temperature in this case is 80°C.

$$p_{zul} = k_1 * k_2 * k_3 / (1 - \eta_{HE})$$

Activation factor k_2

The activation factor k_2 is the correction value used to increase or decrease the permitted drive capacity Pzul with a deviation of 20% ED/hr. At 20% ED/hr. or 30% ED/10 min is k_2=1.

If the operating time deviates from the established setting, k_2 can be determined using the diagram shown here.

Temperature factor k_3

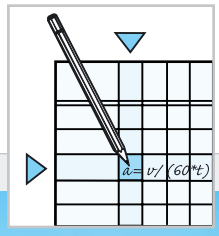
At normal temperatures of 20°C, this factor is 1.

In the event of fluctuating ambient temperatures (=q), this factor is calculated as follows:

$$k_3 = \frac{80 - \vartheta}{80}$$

Power factors k_1, k_2 and k_3 apply specifically to HSE high performance worm screw jacks. They must not be applied to standard worm gear screw jacks, Merkur systems or quick-lifting units.

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



2.10 Jacking systems

2.10.1 Flow diagram

Overall force [Fges] of the system [kN]
Lifting speed
Select schematic drive-system layout (section 2.11)
Number and arrangement of HE units, type of motor, high flexible shafts, mitre gear boxes, couplings

$$P_{Anl} = \frac{Fges^* \nu}{60^* \eta_{HE}{}^* \eta_{Anl}}$$

$$T_{Anl} = \frac{P_{Anl}^* 9550}{n_1}$$

η_{Anl} ~ 0,8
η_{HE} as shown in section 3.3.1 or 3.3.5

*Factor for unequal load distribution = 1,3
Observe the maximum drive torque on drive shaft HE

$$P_{HE} = \frac{P_{Anl}^* 1,3}{\text{Number of HE units}}$$

Check screw-jack as show in section 2.9

Determine type of motor according to P_{Anl}, Turning speed, with / without brake, torque T_A

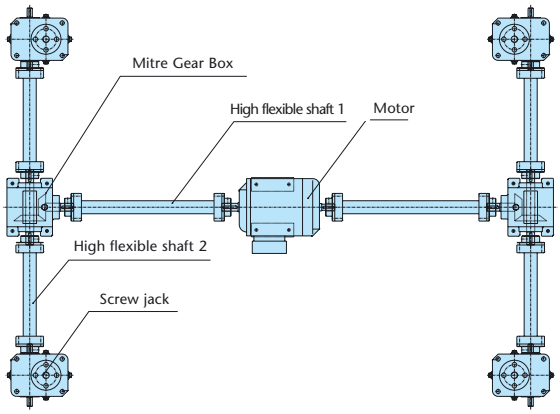
If non-self-locking jacking systems are in operation, fit the motor with a spring-actuated safety brake.

Configure mitre gear boxes, couplings, high flexible shafts (according to torque and turning speed)

T_{Anl} = minimum rated torque of motor
Starting torque
T_A ~ T_{Anl}* 1,3

2.10.2 Example

Technical specifications:
F_{ges} = 60 kN (dyn. and stat.)
v = 1,9 m/min
ED = 20%/hr
Schematic view 4.1
Three-phase motor
Mitre gear box i=1:1



F_{HE} = 60 kN/4*1.3	Pre-selection of screw jack according to	⇨ HSE 63, Tr50x9,
F_{HE} = 19,5 kN	Section 2.8	η_{HE} = 0,311; P_{HE} = 2,0 kW, η_{Anl} ~ 0,8
P_{Anl} = 7,63 kW	⇨ motor selection 7,5 kW, n_1 = 1500 min^{-1}	⇨ motor 132 M/4
T_{Anl} = 49Nm	⇨ T_{Keg} = 25 Nm, i = 1:1 (section 4.0)	⇨ mitre gear box K 11.13
	T_{GW1} = 25 Nm, n_1 = 1500 min^{-1}; max. observe length according to n_{krit} (section 6.0)	⇨ high flexible shaft ZR 24/28
	T_{GW2} = 12,5 Nm, n_1 = 1500 min^{-1}; max. observe length according to n_{krit} (section 6.0)	⇨ high flexible shaft ZR 24/28

2.11 Schematic drive system layout

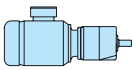
Symboles


Screw jack


High flexible shaft

Coupling


Standard motor


Spur gear motor


Pillow block


Mitre Gear Box


IEC flange


- Worm gear motor
- Bevel gear motor

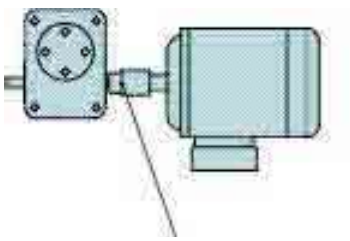
Pfaff-silberblau worm gear screw jacks and quick-lifting units can be used together, as either single drive units (see section 2.11.1) or multi-spindle units (see section 2.11.2). Multi-spindle drive units with mechanical synchronization are driven by a single motor, which makes them impervious to unequal load distribution and its negative effects on the synchronization of the lifting elements. Multi-spindle units with electrical synchronization are distinguished by their low requirements in terms of mechanical connecting elements (and therefore lack of running noise), but they do require more sophisticated Controls. Precise configuration of the drive motors, in conjunction with a master-slave layout, produces the correspondingly exact synchronization of the drive systems.
Once you have decided on the best layout for your needs, you can establish which mitre gear boxes, couplings and dumb-bell shafts are to be fitted. The fitting of pillow blocks can multiply the speed-dependent length of the dumb-bell shafts.

Note:
If fast-lifting jacks are in use, correct configuration can eliminate the need for mitre gear boxes.

2.11.1 Single drive unit

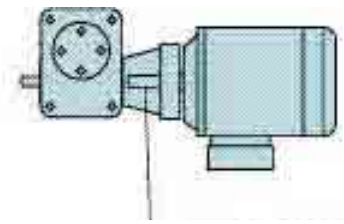
Worm gear screw jack – coupling – motor in configuration B3 (base-mounted)

Schematic view 1.1



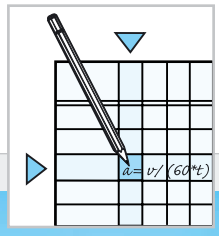
With coupling

Worm gear screw jack – coupling – IEC flange in configuration B14 or B5 (IEC flange-mounted)



With IEC flange and coupling

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



2.11 Schematic drive system layout

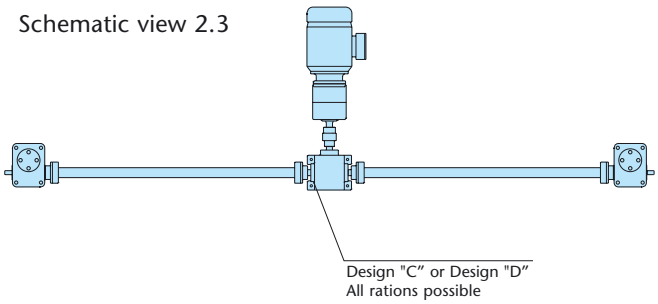
2.11.2 Multi-spindle drive unit

2.11.2.1 Mechanically synchronized

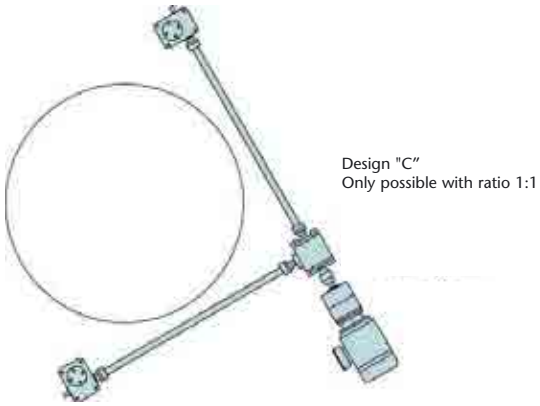
Schematic view 2.1

Schematic view 2.2

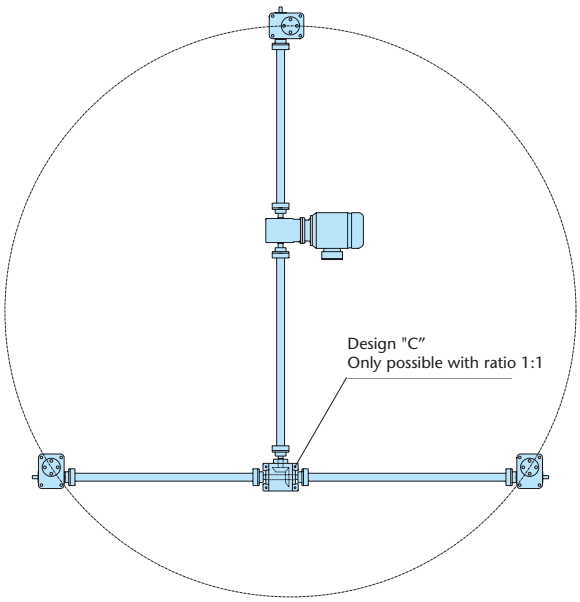
Schematic view 2.3



Schematic view 2.4



Schematic view 3.1

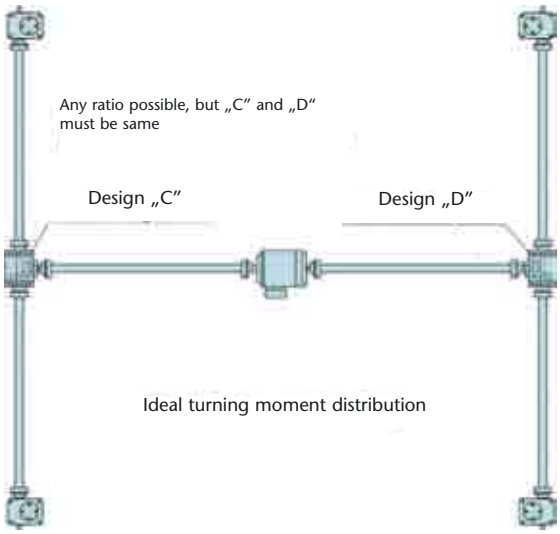


Schematic view 3.2

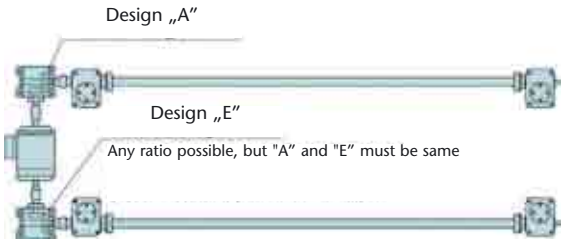
Schematic view 3.3

2.11 Schematic drive system layout

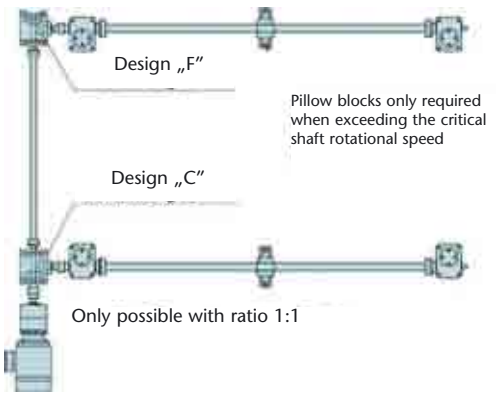
Schematic view 4.1



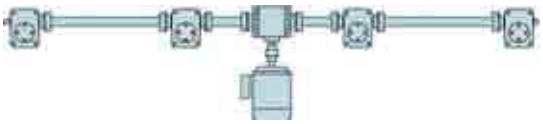
Schematic view 4.2



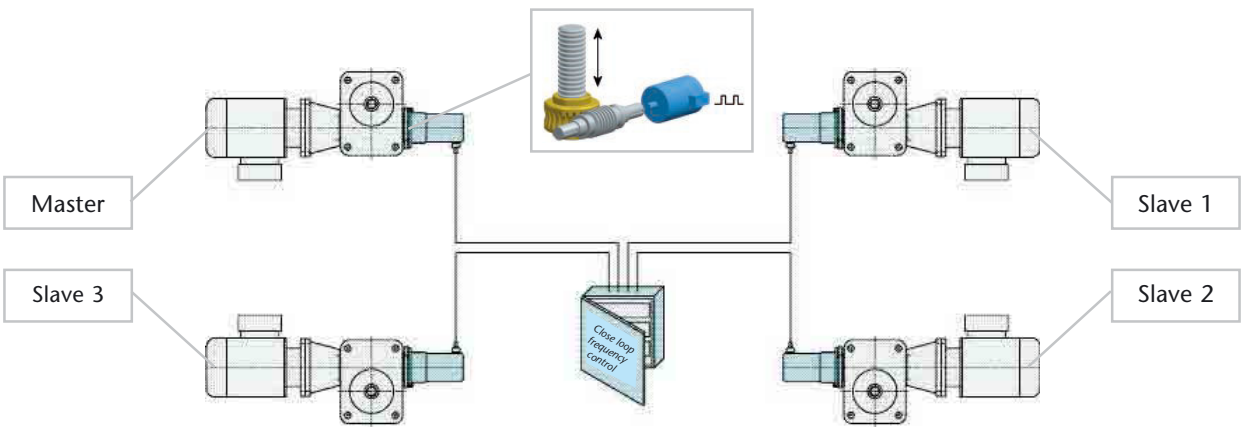
Schematic view 4.3



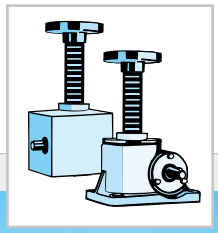
Schematic view 4.5



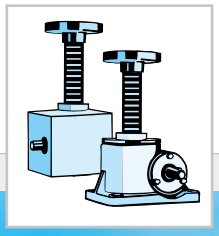
2.11.2.2 Electrically synchronized



Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



Contents



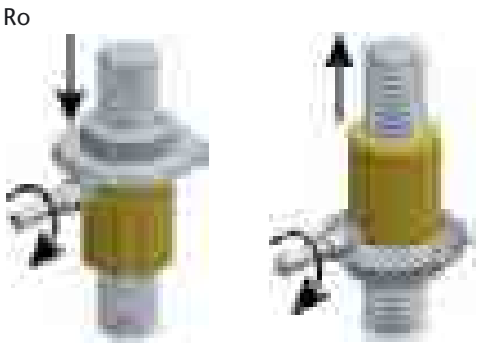
3.1 Configuration type 1 - Configuration type 2

Type 1: Axial lifting spindle; female thread integrated into worm gear

Worm gear screw jacks SHE/HSE/Merkur

Drive is provided by the worm-drive shaft acting on the worm gear with female thread. Lifting movement is provided by the spindle anti-turn device (supplied with unit or added onsite).

Type 1: Axial lifting spindle; female thread integrated into bevel gear



Quick lifting bevel gear screw jack SHG

Drive is provided by the driving pinion acting on the bevel gear with female thread. Lifting movement is provided by the spindle anti-turn device (supplied with unit or added onsite). The alignment of the bevel gear (Ro or Ru) determines the direction of rotation.
(Ro = wheel up / Ru = wheel down)

Type 2: Rotating spindle; female thread in travelling nut outside the transmission housing

Worm gear screw jacks SHE/HSE/Merkur

Drive is provided by the worm-drive shaft acting on the worm gear. Rotating movement is provided by the positive engagement of the spindle in the worm gear. Lifting movement is provided by the travelling nut anti-turn device fitted onsite.

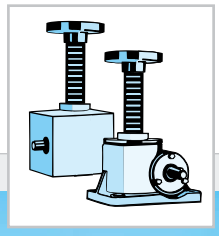
Type 2: Rotating spindle; female thread in travelling nut outside the transmission housing

Quick lifting bevel gear screw jack SHG

Drive is provided by the driving pinion acting on the bevel gear. Rotating movement is provided by the positive engagement of the spindle in the bevel gear. Lifting movement is provided by the traveling nut anti-turn device fitted onsite. The alignment of the bevel gear (Ro = wheel up / Ru = wheel down) determines the direction of rotation (see type 1).

Note: standard configuration = right-handed spindle; axial movement (direction) turning direction of drive shaft

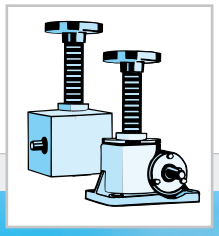
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



Application

Fig.: Egypt-Air Works photo: MERO-Airporttechnik

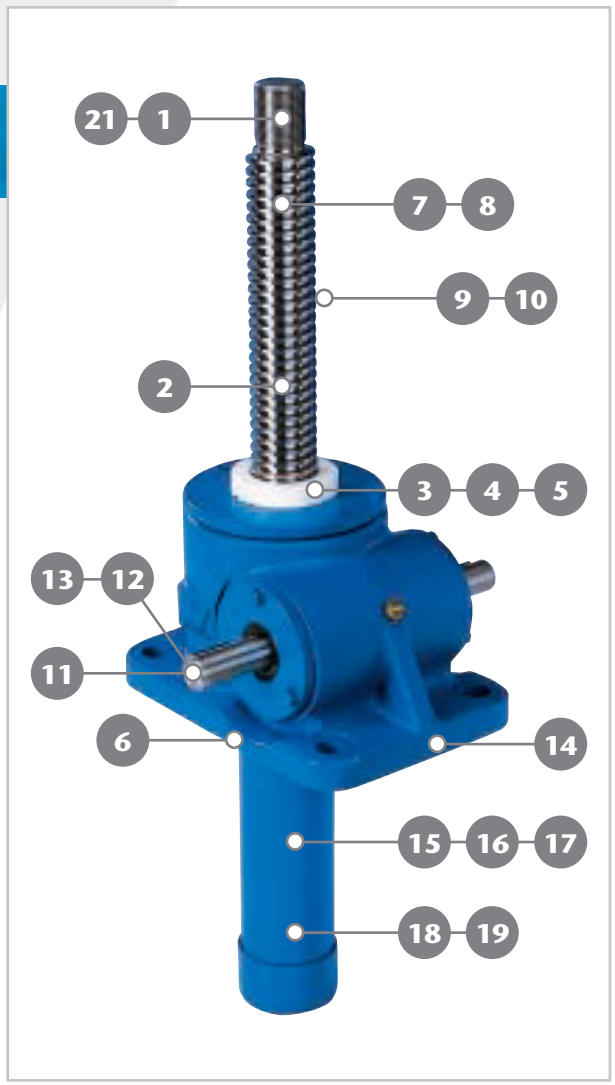
HSE high-performance worm gear screw jacks (Type 1) with long safety nut conforming to VBG 14 – used for adjusting the height of aircraft maintenance platforms



3.2 Structural configurations

3.2.1 SHE range type 1

Type 1 (lifting spindle) - robust construction for low-to-medium lifting speeds

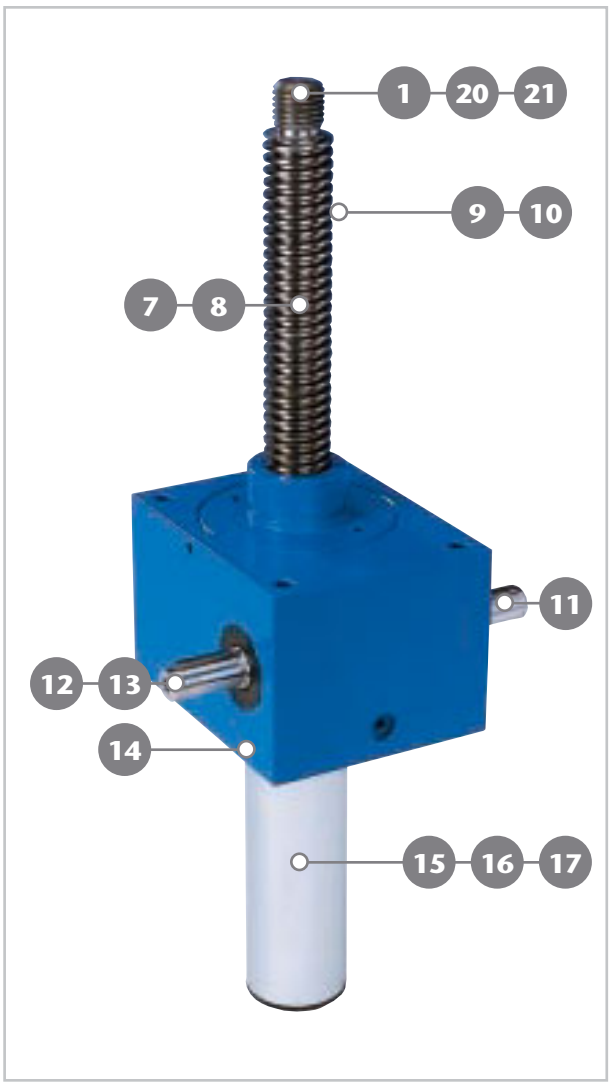


Kits supplied:
14 different sizes
with lifting capacities ranging from 5 kN to 2000 kN
Drive-motor speeds of up to 1500 rpm

- Self-locking trapezoidal spindle
- Grease-lubricated configuration
- Worm gear pairs in two ratio steps
  (normal "N" and slow "L")
- The worm-drive shaft is case-hardened and ground

3.2.2 Merkur range type 1

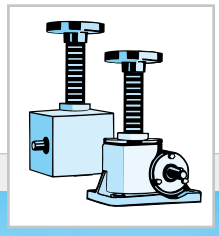
Type 1 (lifting spindle) – alternative to SHE and lifting elements of octahedral design



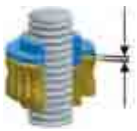
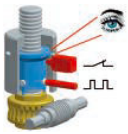
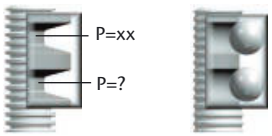
Kits supplied:
9 different sizes
with lifting capacities ranging from 2.5 kN to 500 kN
Drive-motor speeds of up to 1500 rpm

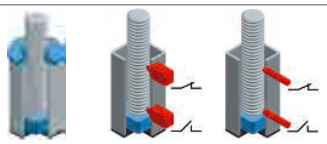
- All-round configuration permits easy alignment
- Conforms to European manufacturers' standards
  for spindle lifting elements of octahedral design
- Self-locking trapezoidal spindle
- Grease-lubricated configuration
- Worm gear pairs in two ratio steps
  (normal "N" and slow "L")

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



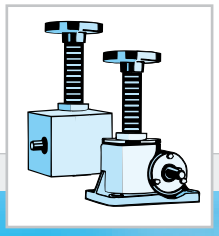
3.2 Structural configurations

No.	Symbol	SHE range type 1	Merkur range type 1
1		●	●
2		○	
3		○	
4		○	
5		○	
6		○	
7		●	●
8		○	○
9		○	
10		○	○
11		○	○

No.	Symbol	SHE range type 1	Merkur range type 1
12		○	○
13		○	○
14		○	○
15		○	○
16		○	●
17		○	○
18		○	
19		○	
20			●
21		○	○

● SHE and Merkur of standard configuration

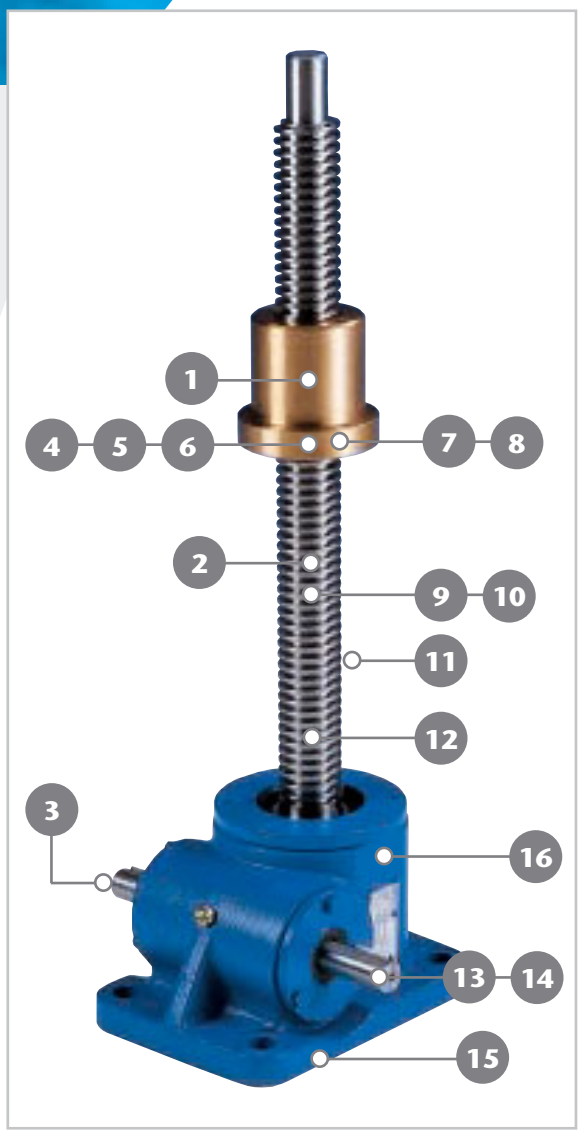
○ Options and accessories:



3.2 Structural configurations

3.2.3 SHE range type 2

Type 2 (rotating spindle) – robust construction for low-to-medium lifting speeds

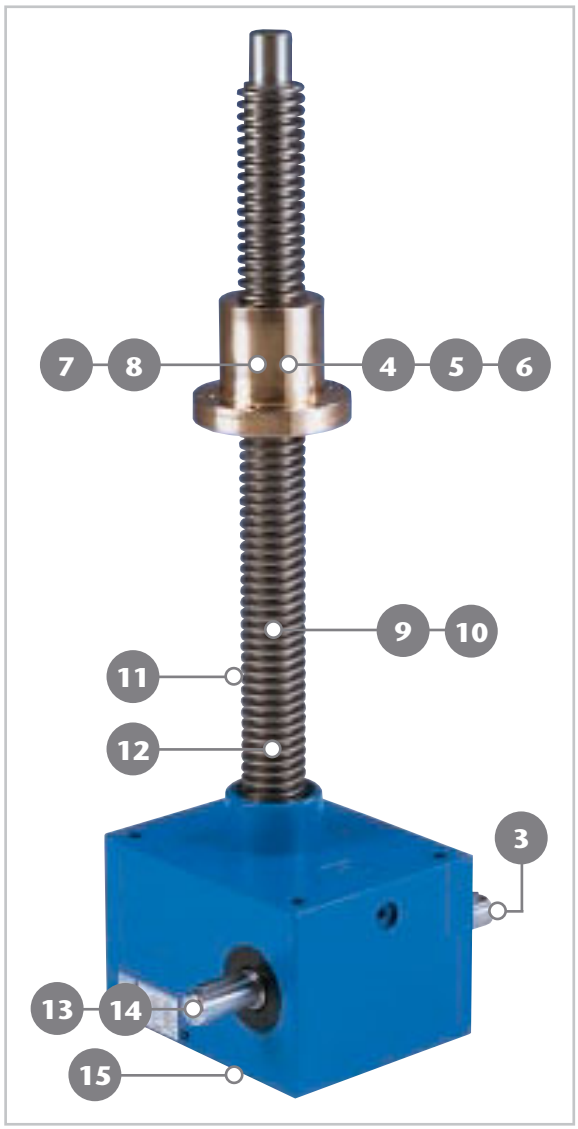


Kits supplied:
14 different sizes
with lifting capacities ranging from 5 kN to 2000 kN
Drive-motor speeds of up to 1500 rpm

- Self-locking trapezoidal spindle
- Grease-lubricated configuration
- Worm gear pairs in two ratio steps (normal "N" and slow "L")
- The worm-drive shaft is case-hardened and ground

3.2.4 Merkur range type 2

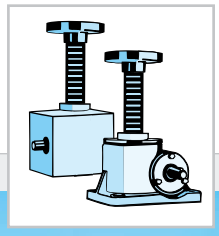
Type 2 (rotating spindle) – alternative to SHE and lifting elements of octahedral design



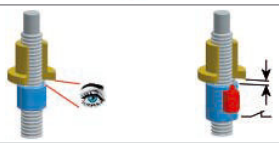
Kits supplied:
9 different sizes
with lifting capacities ranging from 2.5 kN to 500 kN
Drive-motor speeds of up to 1500 rpm

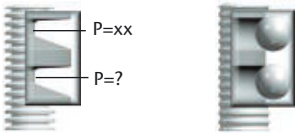
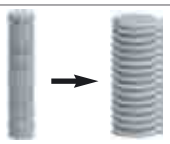
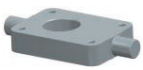
- All-round configuration permits easy alignment
- Equivalent to European manufacturers' standards for spindle lifting elements of octahedral design
- Self-locking trapezoidal spindle
- Grease-lubricated configuration
- Worm gear pairs in two ratio steps (normal "N" and slow "L")

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



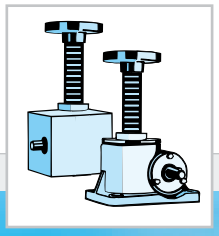
3.2 Structural configurations

No.	Symbol	SHE range type 2	Merkur range type 2
1		○	
2		●	●
3		○	○
4		●	●
5		○	○
6		○	○
7		○	○
8		○	○

No.	Symbol	SHE range type 2	Merkur range type 2
9		○	
10		○	○
11		○	○
12		○	○
13		○	○
14		○	○
15		○	○
16		○	

● SHE and Merkur of standard configuration

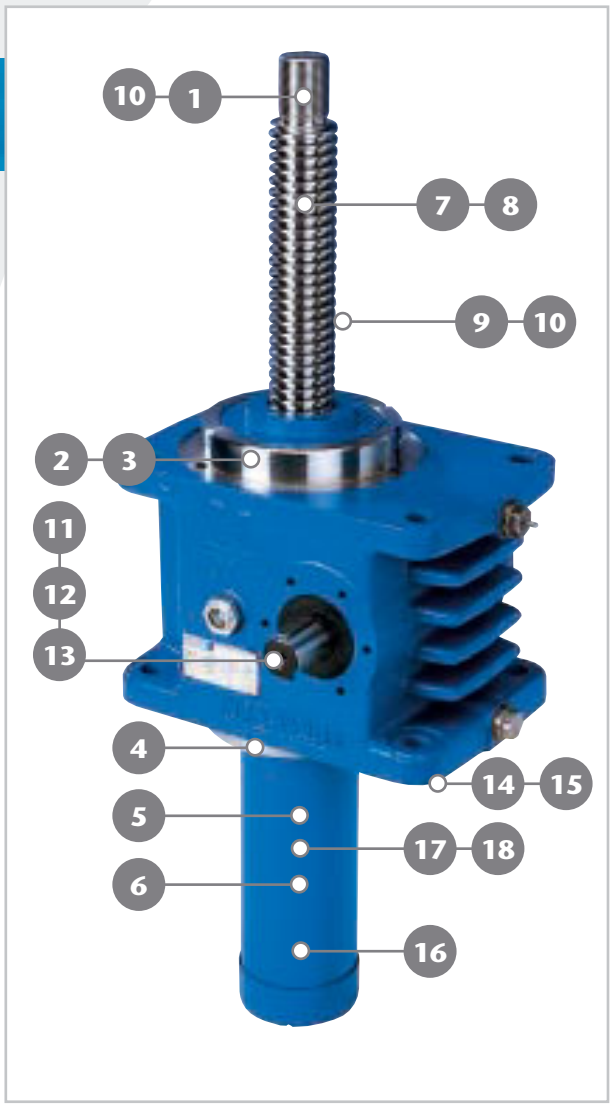
○ Options and accessories:



3.2 Structural configurations

3.2.5 HSE range typ 1

Type 1 (lifting spindle) – patented gearing construction with distributed heat zones for medium and high lifting speeds

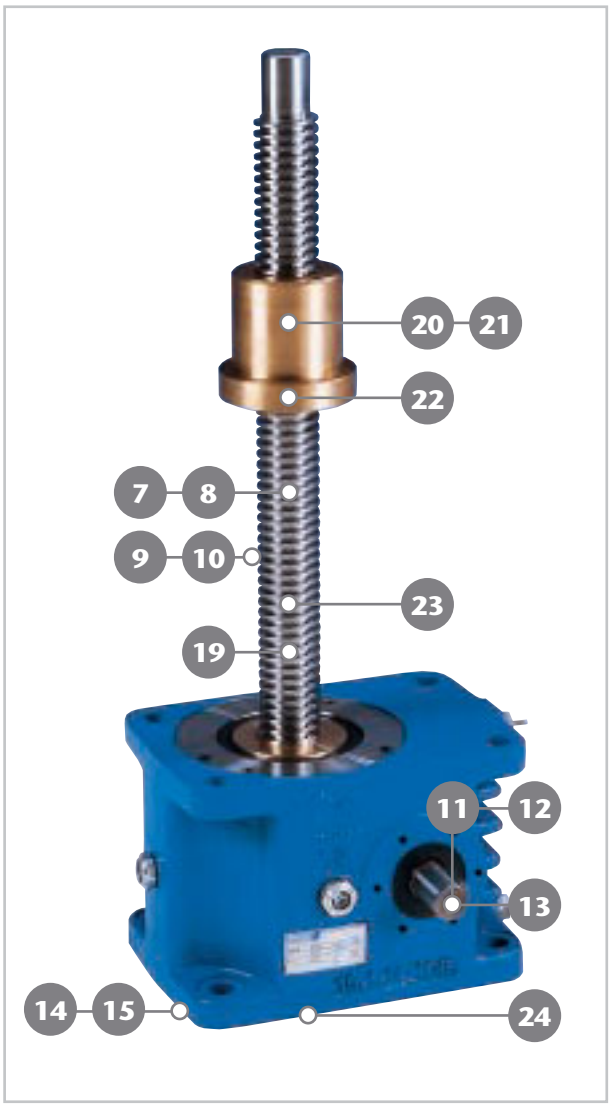


Kits supplied:
9 different sizes
with lifting capacities ranging from 5 kN to 1000 kN
Drive-motor speeds of up to 3000 rpm

- Self-locking trapezoidal spindle
- Separate lubricating circuits, Tr spindle with grease lubrication and worm gears with oil splash lubrication
- Worm gear pairs in two ratio steps
  Depending on requirements: (normal "N" and slow "L")
- The worm-drive shaft is case-hardened and ground

3.2.6 HSE range typ 2

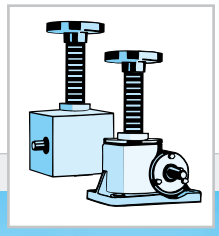
Type 2 (rotating spindle)



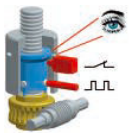
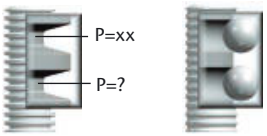
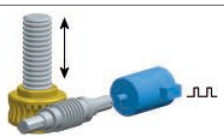
Kits supplied:
9 different sizes
with lifting capacities ranging from 5 kN to 1000 kN
Drive-motor speeds of up to 3000 rpm

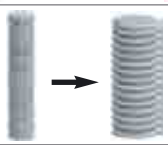
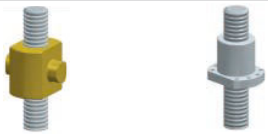
- Self-locking trapezoidal spindle
- Separate lubricating circuits, Tr spindle with grease lubrication and worm-gears with oil splash lubrication
- Worm gear pairs in two ratio steps
  Depending on requirements: (normal "N" and slow "L")
- The worm-drive shaft is case-hardened and ground

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

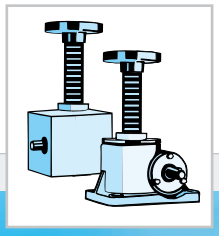


3.2 Structural configurations

No.	Symbol	HSE range type 1	HSE range type 2
1		●	
2		○	
3		○	
4		●	
5		○	
6		●	
7		●	●
8		○	○
9		○	○
10		○	○
11		○	○
12		○	○

No.	Symbol	HSE range type 1	HSE range type 2
13		○	○
14		○	○
15		○	○
16		○	
17		○	
18		○	
19			○
20			○
21			○
22			○
23			○
24			○

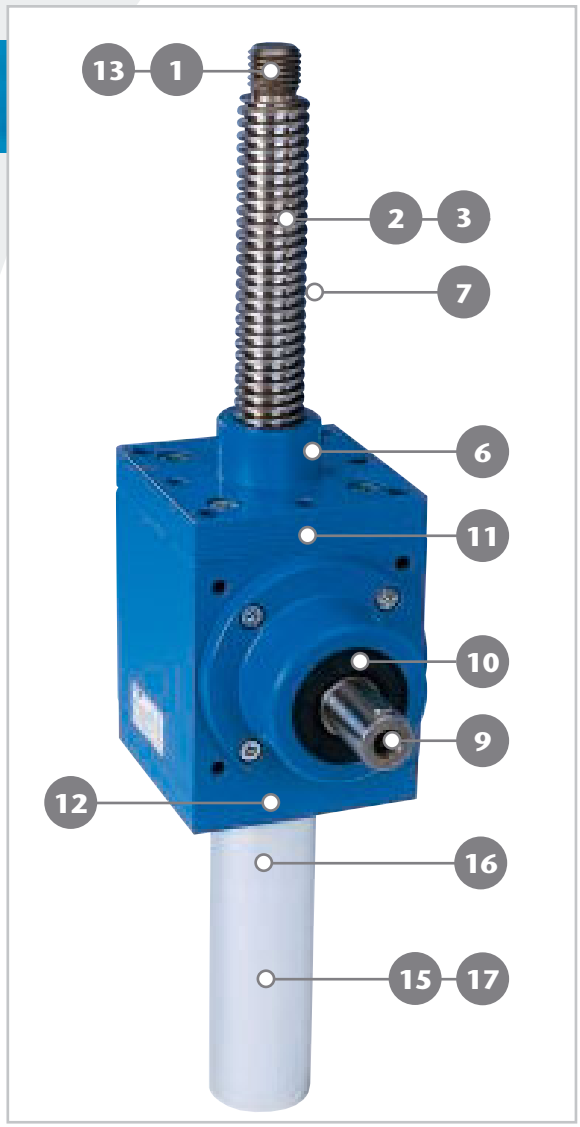
● HSE type1 and type 2 of standard configuration ○ Options and accessories:



3.2 Structural configurations

3.2.7 SHG range type 1

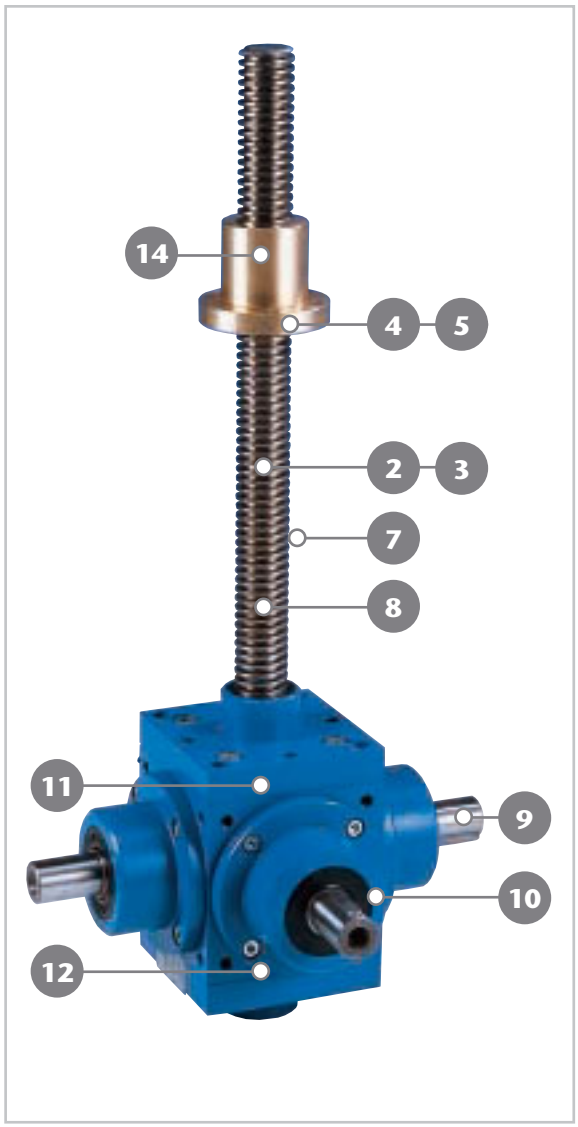
Type 1 (lifting spindle)
Spiral mitre gear boxes permit high lifting speeds
- high efficient rating and long service life



Kits supplied:
4 different sizes
with lifting capacities ranging from 15 kN to 90 kN
Lifting speeds up to 19 m/min
Drive-motor speeds of up to 3000 rpm
- Self-locking trapezoidal spindle
- Separate lubricating circuits, Tr spindle with grease lubrication and bevel-gears with oil splash lubrication
- Bevel-gears in two ratio steps
  Depending on requirements (2:1 and 3:1)
- Teeth are case-hardened and ground

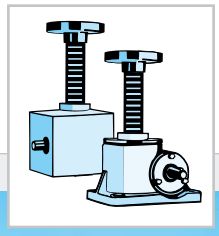
3.2.8 SHG range type 2

Type 2 (rotating spindle)
Spiral mitre gear boxes permit high lifting speeds
- high efficient rating and long service life

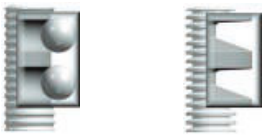
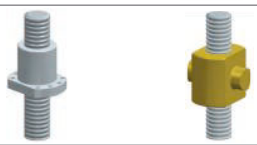


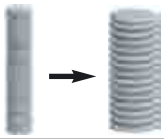
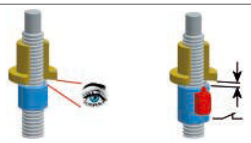
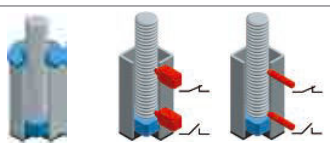
Kits supplied:
4 different sizes
with lifting capacities ranging from 15 kN to 90 kN
Lifting speeds up to 19 m/min
Drive-motor speeds of up to 3000 rpm
- Self-locking trapezoidal spindle
- Separate lubricating circuits, Tr spindle with grease lubrication and bevel-gears with oil splash lubrication
- Bevel-gears in two ratio steps
  Depending on requirements (2:1 and 3:1)
- Teeth are case-hardened and ground

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

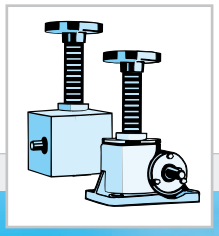


3.2 Structural configurations

No.	Symbol	SHG range type 1	SHG range type 2
1		●	
2		●	●
3		○	○
4			○
5			○
6		○ G25 only	
7		○	○

No.	Symbol	SHG range type 1	SHG range type 2
8			○
9		○	○
10		●	●
11		●	●
12		●	●
13		○	
14			○
15		○	
16		●	
17		○	

● SHG of standard configuration
○ Options and accessories

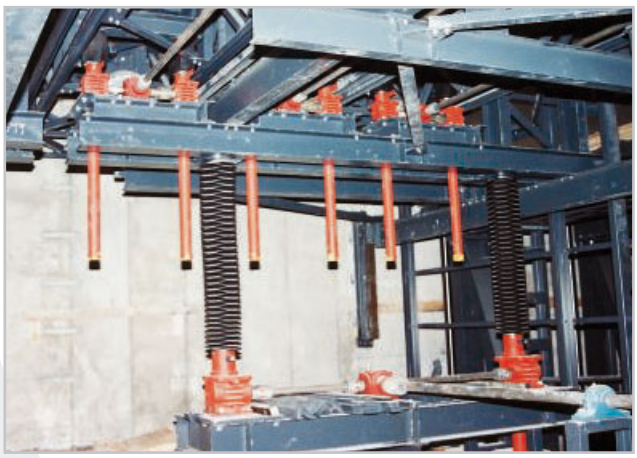


Worm gear screw jacks

Application

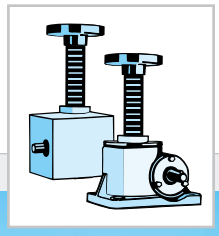
3

Illustrations: Theatre in Aarau/Switzerland

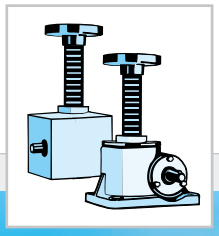


High-performance spindle lifting systems compliant with VBG 70 for adjusting the height of hall platforms

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



Contents



3.3 Technical information

3.3.1 Table of settings

3.3.1.1 Worm gear screw jacks SHE

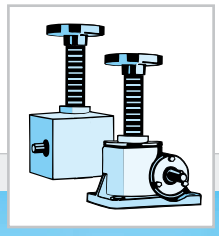
Size		0,5	1	2	2,5	5	10	15
Max. lifting force	[kN]	5	10	20	25	50	100	150
Max. tension load	[kN]	5	10	19	25	50	99	99
Spindle Tr[1)]		18x6	22x5	26x6,28	30x6	40x7	58x12	60x12
Ratio N		10:1	5:1	6:1	6:1	6:1	7 2/3:1	7 2/3:1
Amount of lift per revolution for ratio N	[mm/per rev.]	0,60	1,0	1,047	1,0	1,167	1,565	1,50
Ratio L		20:1	20:1	24:1	24:1	24:1	24:1	24:1
Amount of lift per revolution for ratio L	[mm/per rev.]	0,30	0,25	0,262	0,25	0,292	0,50	0,50
Max. drive capacity [2)] at 20°C Ambient temp. and 20 % ED/hr	[kW]	0,17	0,35	0,5	0,65	1,15	2,7	2,7
Max. drive capacity 2) at 20°C Ambient temp. and 10 % ED/hr	[kW]	0,25	0,55	0,75	0,9	1,65	3,85	3,85
Overall efficiency of ratio L	[%]	31	29	31	27	24	27	27
Rendement total Rapport L	[%]	24	20	18	19	16	17	17
Spindle efficiency rating	[%]	54	43	45	40	36,5	40,5	39,5
Torque, capacity, turning-speed at 20 % ED/hr and 20°C		See performance tables 3.3.3.1						
Spindle torque at max. lifting power	[Nm]	8,8	18,4	44	60	153	468	702
Max. permitted drive-shaft torque	[Nm]	12	29,4	36	46,5	92	195	195
Max. permitted spindle length with compression load		see bend diagrams 3.3.2						
Housing material	[mm]	G-AlSiCu4		GGG 60				
Weight without screw jack and protection tube	[kg]	1,2	2,5	7,3	7,3	16,2	25	25
Spindle weight per 100 mm of lift	[kg]	0,14	0,23	0,32	0,45	0,82	1,67	1,79
Amounts of lubricant in transmission	[kg]	0,05	0,1	0,15	0,2	0,35	0,9	0,9
Mass moment of inertia [3)] N-ratio Type 1	[kg cm^2]	0,095	0,383	0,651	0,780	2,234	5,256	5,256
Mass moment of inertia [3)] N-ratio Type 2	[kg cm^2]	0,100	0,390	0,657	0,792	2,273	5,356	5,356
Mass moment of inertia [3)] L-ratio Type 1	[kg cm^2]	0,089	0,269	0,459	0,558	1,696	4,081	4,081
Mass moment of inertia [3)] L-ratio Type 2	[kg cm^2]	0,089	0,275	0,460	0,558	1,699	4,091	4,091

[1)] Also applies to Ku spindle, see section 3.3.7

[2)] Max. permitted values for type 1 and Tr spindle. **Higher values are possible when using type 2 or Ku spindles.**

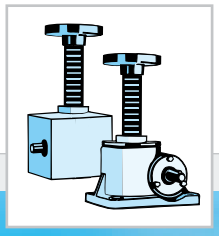
[3)] referring to 100 mm spindle length

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.3 Technical information

20	25	35	50	75	100	150	200	Size
200	250	350	500	750	1000	1500	2000	Max. lifting force
166	250	350	500	750	1000	1500	-	Max. tension load
65x12	90x16	100x16	120x16	140x20	160x20	190x24	220x28	Spindle Tr[1]
8:1	10 2/3:1	10 2/3:1	10 2/3:1	12:1	12:1	19:1	17,5:1	Ratio N
1,50	1,50	1,50	1,50	1,667	1,667	1,263	1,60	Amount of lift per revolution for ratio N
24:1	32:1	32:1	32:1	36:1	36:1	-		Ratio L
0,5	0,5	0,5	0,5	0,556	0,556	-		Amount of lift per revolution for ratio L
3,8	5,0	6,0	7,4	9,0	12,5	18,5	on request	Max. drive capacity [2] at 20°C Ambient temp. and 20 % ED/hr
5,4	7,2	8,6	10,4	12,6	17,5	26	on request	Max. drive capacity [2] at 20°C Ambient temp. and 10 % ED/hr
24	22	21	15	18	15	15	17,5	Overall efficiency of ratio N
17	15	14	10	12	9	-	-	Overall efficiency of ratio L
37,5	36,5	34	30	31,6	28,5	28,8	29	Spindle efficiency rating
See performance tables 3.3.3.1								Torque, capacity, turning-speed at 20 % ED/hr and 20°C
1009	1725	2600	4235	7550	11115	19850	30700	Spindle torque at max. lifting power
280	480	705	840	2660	2660	4260	on request	Max. permitted drive-shaft torque
see bend diagrams 3.3.2								Max. permitted spindle length with compression load
GGG 60			GS 52	GGG 60	GS 52			Housing material
36	70,5	87	176	ca. 350	538	850	ca. 1000	Weight without screw jack and protection tube
2,15	4,15	5,2	7,7	10,0	13,82	19,6	26,2	Spindle weight per 100 mm of lift
2	1,3	2,5	4,0		10,0	10,0	on request	Amounts of lubricant in transmission
11,93	23,42	55,80	108,8	318,0	428,5	on request	on request	Mass moment of inertia [3] N-ratio Type 1
12,08	23,74	56,30	109,9	325,2	431,3	on request	on request	Mass moment of inertia [3] N-ratio Type 2
9,427	19,59	44,08	88,37	275,6	346,0	sur demande	sur demande	Mass moment of inertia [3] L-ratio Type 1
9,444	19,62	44,13	88,49	279,4	346,3	on request	on request	Mass moment of inertia [3] L-ratio Type 2



3.3 Technical information

3.3.1.2 Worm gear screw jacks Merkur

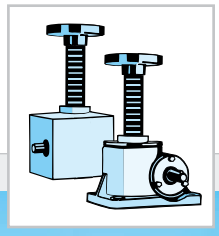
Size		M0	M1	M2	M3	M4	M5	M6	M7	M8
Max. lifting force	[kN]	2,5	5	10	25	50	150	250	350	500
Max. tension load	[kN]	2,5	5	10	25	50	100	250	350	500
Spindle Tr[1)]		14x4	18x4	20x4	30x6	40x7	60x9	80x10	100x10	120x14
Ratio N		4:1	4:1	4:1	6:1	7:1	9:1	10:1	10:1	14:1
Amount of lift per revolution for ratio N	[mm/per rev.]	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Ratio L		16:1	16:1	16:1	24:1	28:1	36:1	40:1	40:1	56:1
Amount of lift per revolution for ratio L	[mm/per rev.]	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25
Max. drive capacity [2)] at 20°C Ambient temp. and 20 % ED/hr	[kW]	0,18	0,3	0,5	1,2	2,3	5,1	10	15	22
Max. drive capacity [2)] at 20°C Ambient temp. and 10 % ED/hr	[kW]	0,25	0,42	0,7	1,7	3,2	7,1	14	21	30
Overall efficiency of ratio N	[%]	34	30	28	27	25	19	19	15	15
Overall efficiency of ratio L	[%]	24	23	21	19	18	14	14	11	11
Spindle efficiency rating	[%]	49	42,5	40	40	36,5	32,5	29	24	28
Torque, capacity, turning-speed at 20 % ED/hr and 20°C		see performance tables 3.3.3.2								
Spindle torque at max. lifting power	[Nm]	3,2	7,5	16	60	153	437	1390	2312	4100
Max. permitted drive-shaft torque	[Nm]	1,5	3,4	7,1	18	38	93	240	340	570
Max. permitted spindle length with compression load	[mm]	see bend diagrams 3.3.2								
Housing material		Al-Leg			GG			GGG		
Weight without screw jack and protection tube	[kg]	0,6	1,2	2,1	6	17	32	57	85	160
Spindle weight per 100 mm of lift	[kg]	0,1	0,35	0,45	0,7	1,2	2	4,2	6,6	10,3
Amounts of lubricant in transmission	[kg]	0,03	0,08	0,14	0,24	0,8	1,1	2,0	2,7	3,2
Mass moment of inertia [3)] N-ratio Type 1	[kg cm^2]	0,070	0,122	0,160	0,780	1,917	3,412	16,04	49,12	96,27
Mass moment of inertia [3)] N-ratio Type 2	[kg cm^2]	0,069	0,126	0,165	0,794	1,952	3,741	17,58	52,45	103,39
Mass moment of inertia [3)] L-ratio Type 1	[kg cm^2]	0,045	0,088	0,115	0,558	1,371	2,628	12,35	37,05	72,62
Mass moment of inertia [3)] L-ratio Type 2	[kg cm^2]	0,050	0,091	0,119	0,552	1,381	2,647	12,44	37,37	73,15

1) Also applies to Ku spindle, see section 3.3.7

2) Max. permitted values for type 1 and Tr spindle.
Higher values are possible when using type 2 or Ku spindles.

3) referring to 100 mm spindle length

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.3 Technical information

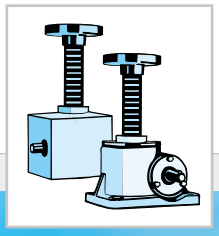
3.3.1.3 High performance worm gear screw jacks HSE

Size		31	36	50	63	80	100	125	140	200
Max. lifting force	[kN]	5	10	25	50	100	200	350	500	1000
Max. tension load	[kN]	5	10	25	50	100	178	350	500	1000
Spindle Tr[1)]		18x4	22x5	40x8	50x9	60x12	70x12	100x16	120x16	160x20
Ratio N		4:1	5:1	6:1	7:1	8:1	8:1	10 2/3:1	10 2/3:1	13 1/3:1
Amount of lift per revolution for ratio N	[mm/per rev.]	1,0	1,0	1,33	1,28	1,5	1,5	1,5	1,5	1,5
Ratio L		16:1	20:1	24:1	28:1	32:1	32:1	32:1	32:1	40:1
Amount of lift per revolution for ratio L	[mm/per rev.]	0,25	0,25	0,33	0,32	0,375	0,375	0,5	0,5	0,5
Max. drive capacity [2)] at 20°C Ambient temp. and 20 % ED/hr	[kW]	0,60	0,90	1,5	2,3	3,6	4,8	7,7	10,2	17,9
Max. drive capacity [2)] at 20°C Ambient temp. and 10 % ED/hr	[kW]	1,0	1,5	2,6	4,0	6,3	8,4	13,5	17,9	31
Overall efficiency of ratio N	[%]	see efficiency ratings tables 3.3.5.3								
Overall efficiency of ratio L	[%]									
Spindle efficiency rating	[%]	42,5	43	40	36,5	39,5	35,5	34	30	28,5
Torque, capacity, turning-speed at 20 % ED/hr and 20°C		see performance tables 3.3.3.3								
Spindle torque at max. lifting power	[Nm]	7,4	18,4	80	190	478	1060	2600	4235	11115
Max. permitted drive-shaft torque	[Nm]	12,6	29,4	48,7	168	398	705	975	1640	4260
Max. permitted spindle length with compression load	[mm]	see bend diagrams 3.3.2								
Housing material		AlSi 12		GGG 50						
Weight without screw jack and protection tube	[kg]	2,0	4,0	13	25	47	74	145	335	870
Spindle weight per 100 mm of lift	[kg]	0,16	0,23	0,82	1,3	1,79	2,52	5,2	7,7	13,82
Amounts of lubricant in transmission	[kg]	0,07	0,15	0,4	0,9	1,5	2,1	5,0	10	15,5
Mass moment of inertia [3)] N-ratio Type 1	[kg cm^2]	0,237	0,466	1,247	3,100	11,97	30,11	60,76	95,51	
Mass moment of inertia [3)] N-ratio Type 2	[kg cm^2]	0,270	0,513	1,364	3,378	13,05	32,21	65,76	106,2	
Mass moment of inertia [3)] L-ratio Type 1	[kg cm^2]	0,150	0,204	0,638	1,804	8,13	20,91	44,88	64,93	
Mass moment of inertia [3)] L-ratio Type 2	[kg cm^2]	0,153	0,207	0,645	1,822	8,20	21,04	45,43	66,12	

[1)] Also applies to Ku spindle, see section 3.3.7

[2)] Max. permitted values for type 1 and Tr spindle.
Higher values are possible when using type 2 or Ku spindles.

[3)] referring to 100 mm spindle length



3.3 Technical information

3.3.1.4 Quick-lifting screw jacks SHG

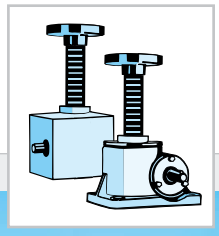
Size		G 15	G 25	G 50	G 90
Max. lifting force	[kN]	15	25	50	90
Max. tension load	[kN]	15	25	50	90
Spindle Tr[1]		24x5	35x8	40x7	60x9
Ratio N		2:1			
Amount of lift per revolution for ratio N	[mm/U]	2,5	4	3,5	4,5
Ratio L		3:1			
Amount of lift per revolution for ratio L	[mm/U]	1,66	2,67	2,33	3
Max. drive capacity [2] at 20°C Ambient temp. and 20 % ED/hr	[kW]	1,0	1,5	2,4	8,9
Max. drive capacity [2] at 20°C Ambient temp. and 10 % ED/hr	[kW]	1,3	2,6	3,8	13
Spindle efficiency rating	[%]	41	43	37	33
Torque, capacity, turning-speed at 20 % ED/hr and 20°C		see performance tables 3.3.3.4			
Spindle torque at max. lifting power	[Nm]	29,4	73,2	123,4	398,5
Max. permitted drive-shaft torque	[Nm]	50	125	175	1600
Max. permitted spindle length with compression load	[mm]	see bend diagrams			
Housing material		GG	AlSi10Mg	GG	
Weight without screw jack and protection tube	[kg]	9	13,5	23	85
Spindle weight per 100 mm of lift	[kg]	0,8	0,59	1,5	2,5
Amounts of lubricant in transmission	[kg]	0,15	0,9	0,6	3,5
Mass moment of inertia [3] N-ratio Type 1	[kg cm^2]	1,058	6,63	22,44	181,28
Mass moment of inertia [3] N-ratio Type 2	[kg cm^2]	1,079	6,79	22,89	184,92
Mass moment of inertia [3] L-ratio Type 1	[kg cm^2]	0,677	3,60	7,248	123,79
Mass moment of inertia [3] L-ratio Type 2	[kg cm^2]	0,691	3,67	7,393	126,28

[1] Also applies to Ku spindle, see section 3.3.7

[2] Max. permitted values for type 1 and Tr spindle.
Higher values are possible when using type 2 or Ku spindles.

[3] referring to 100 mm spindle length

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

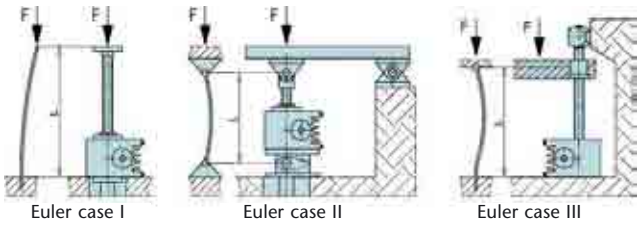


3.3 Technical information

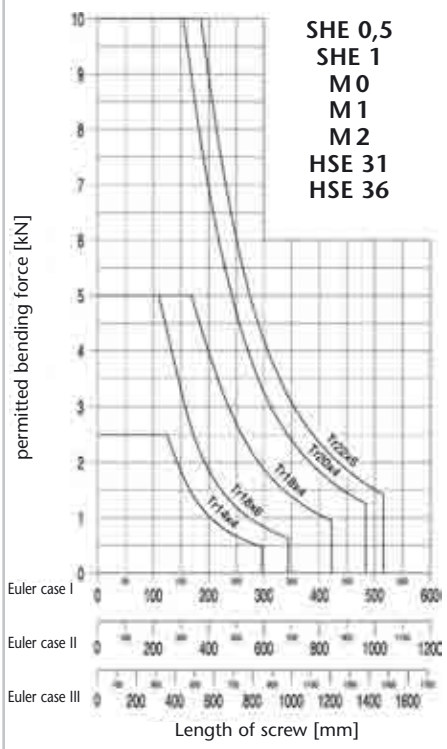
3.3.2 Permitted buckling force

Spindle dimensioning of the screw jack elements with compression force

The permitted buckling force for trapezoidal and ball-screw spindles can be verified using the following bend diagrams.



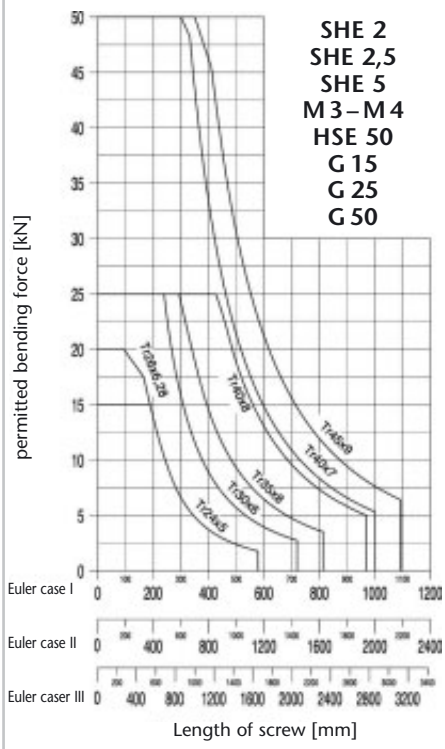
The various installation factors are ordered by Euler value



Bend diagrams:

Tr14x4	Tr18x6
Tr18x4	Tr20x4
Tr22x5	

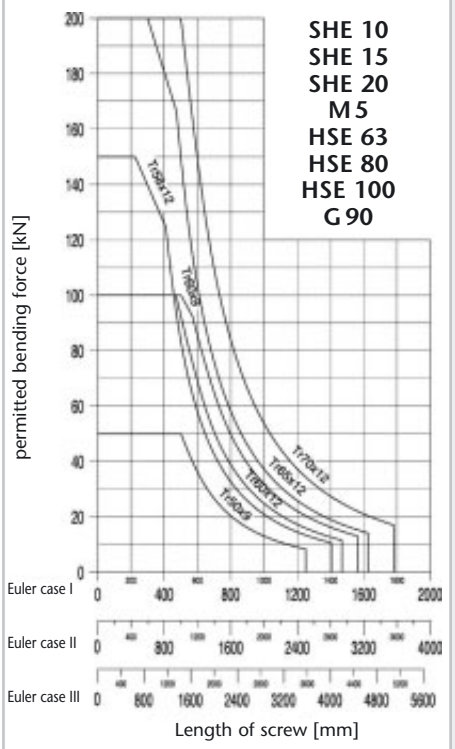
Security for:
Compression range S = 4
Tetmajer S = 4...5 increasing



Bend diagrams:

Tr24x5	Tr26x6,28
Tr30x6	Tr35x8
Tr40x7	Tr40x8
Tr45x8	

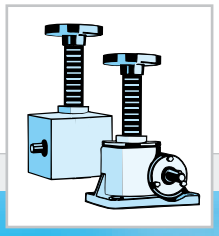
Security for:
Compression range S = 4
Tetmajer S = 4...6 increasing
Euler range S = 5



Bend diagrams:

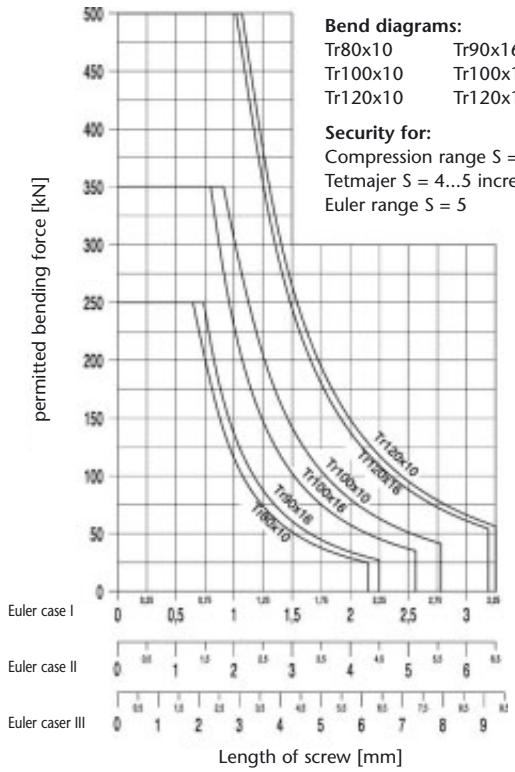
Tr50x9	Tr58x12
Tr60x9	Tr60x12
Tr65x12	Tr70x12

Security for:
Compression range S = 4
Tetmajer S = 4...6 increasing
Euler range S = 5



3.3 Technical information

SHE 25 / SHE 35 / SHE 50 / HSE 125 / HSE 140 / M 6 / M 7 / M 8

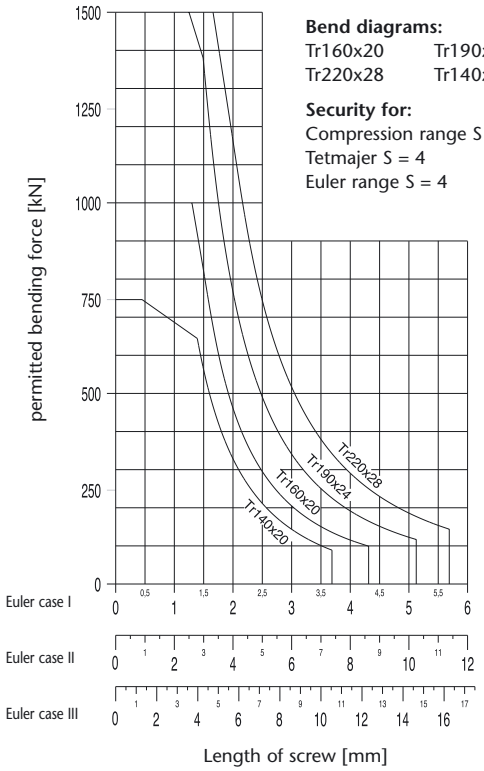


Bend diagrams:

Tr80x10	Tr90x16
Tr100x10	Tr100x10
Tr120x10	Tr120x16

Security for:
Compression range S = 4
Tetmajer S = 4...5 increasing
Euler range S = 5

SHE 75 / SHE 100 / SHE 150 / SHE 200 / HSE 200

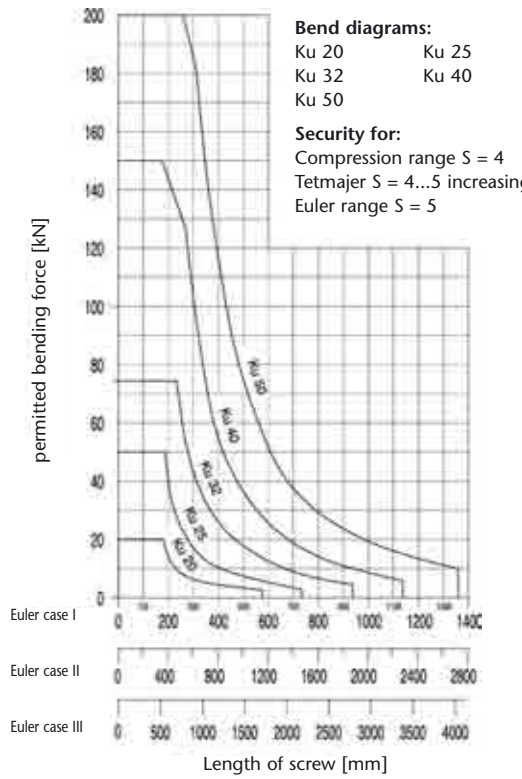


Bend diagrams:

Tr160x20	Tr190x24
Tr220x28	Tr140x20

Security for:
Compression range S = 4
Tetmajer S = 4
Euler range S = 4

Ball-screw spindle

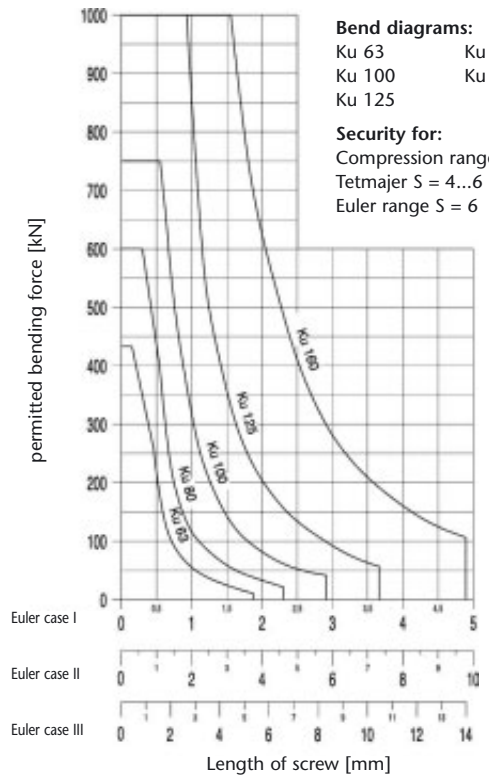


Bend diagrams:

Ku 20	Ku 25
Ku 32	Ku 40
Ku 50	

Security for:
Compression range S = 4
Tetmajer S = 4...5 increasing
Euler range S = 5

Ball-screw spindle

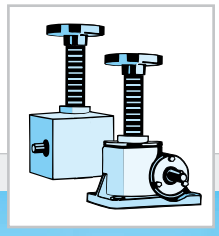


Bend diagrams:

Ku 63	Ku 80
Ku 100	Ku 160
Ku 125	

Security for:
Compression range S = 4
Tetmajer S = 4...6 increasing
Euler range S = 6

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.3 Technical information

3.3.3 Performance tables (lifting elements with Tr spindle)

3.3.3.1 SHE range

Turning speed, power requirement and permitted lifting speed for ratio N and L with single-threaded, lifting (Type 1) trapezoidal spindle. All performance data are expressed in terms of dynamic lifting force. With load factors of <10%/hr or configuration with rotating spindle (Type 2), the maximum permitted drive capacities can be increased. Please consult our drive-system specialists if this is the case.

SHE 0.5 spindle Tr 18x6

n [1/min]	Lifting speed [m/min.]		F=5 [kN]				F=4 [kN]				F=3 [kN]				F=2,5 [kN]				F=2 [kN]				F=1,5 [kN]				F=1 [kN]			
	N	L	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	0,90	0,450	1,54	0,24	0,99	0,16	1,23	0,19	0,80	0,13	0,92	0,15	0,60	0,10	0,77	0,12	0,50	0,1	0,62	0,1	0,40	0,1	0,46	0,1	0,30	0,1	0,31	0,1	0,20	0,1
1000	0,60	0,300	1,54	0,16	0,99	0,1	1,23	0,13	0,80	0,1	0,92	0,1	0,60	0,1	0,77	0,1	0,50	0,1	0,62	0,1	0,40	0,1	0,46	0,1	0,30	0,1	0,31	0,1	0,20	0,1
750	0,45	0,225	1,54	0,12	0,99	0,1	1,23	0,1	0,80	0,1	0,92	0,1	0,60	0,1	0,77	0,1	0,50	0,1	0,62	0,1	0,40	0,1	0,46	0,1	0,30	0,1	0,31	0,1	0,20	0,1
600	0,36	0,180	1,54	0,1	0,99	0,1	1,23	0,1	0,80	0,1	0,92	0,1	0,60	0,1	0,77	0,1	0,50	0,1	0,62	0,1	0,40	0,1	0,46	0,1	0,30	0,1	0,31	0,1	0,20	0,1
500	0,30	0,150	1,54	0,1	0,99	0,1	1,23	0,1	0,80	0,1	0,92	0,1	0,60	0,1	0,77	0,1	0,50	0,1	0,62	0,1	0,40	0,1	0,46	0,1	0,30	0,1	0,31	0,1	0,20	0,1
300	0,18	0,090	1,54	0,1	0,99	0,1	1,23	0,1	0,80	0,1	0,92	0,1	0,60	0,1	0,77	0,1	0,50	0,1	0,62	0,1	0,40	0,1	0,46	0,1	0,30	0,1	0,31	0,1	0,20	0,1
100	0,06	0,030	1,54	0,1	0,99	0,1	1,23	0,1	0,80	0,1	0,92	0,1	0,60	0,1	0,77	0,1	0,50	0,1	0,62	0,1	0,40	0,1	0,46	0,1	0,30	0,1	0,31	0,1	0,20	0,1
50	0,03	0,015	1,54	0,1	0,99	0,1	1,23	0,1	0,80	0,1	0,92	0,1	0,60	0,1	0,77	0,1	0,50	0,1	0,62	0,1	0,40	0,1	0,46	0,1	0,30	0,1	0,31	0,1	0,20	0,1

SHE 1 spindle Tr 22x5

n [1/min]	Lifting speed [m/min.]		F=10 [kN]				F=8 [kN]				F=6 [kN]				F=4 [kN]				F=3 [kN]				F=2 [kN]				F=1 [kN]			
	N	L	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	1,50	0,375	5,5	0,86	2,0	0,31	4,4	0,69	1,6	0,25	3,3	0,52	1,2	0,19	2,2	0,34	0,8	0,13	1,6	0,26	0,6	0,1	1,1	0,2	0,4	0,1	0,5	0,1	0,2	0,1
1000	1,00	0,250	5,5	0,57	2,0	0,21	4,4	0,46	1,6	0,17	3,3	0,34	1,2	0,13	2,2	0,23	0,8	0,1	1,6	0,17	0,6	0,1	1,1	0,1	0,4	0,1	0,5	0,1	0,2	0,1
750	0,75	0,188	5,5	0,43	2,0	0,16	4,4	0,34	1,6	0,13	3,3	0,26	1,2	0,1	2,2	0,17	0,8	0,1	1,6	0,13	0,6	0,1	1,1	0,1	0,4	0,1	0,5	0,1	0,2	0,1
600	0,60	0,150	5,5	0,34	2,0	0,13	4,4	0,28	1,6	0,1	3,3	0,21	1,2	0,1	2,2	0,14	0,8	0,1	1,6	0,1	0,6	0,1	1,1	0,1	0,4	0,1	0,5	0,1	0,2	0,1
500	0,50	0,125	5,5	0,29	2,0	0,1	4,4	0,23	1,6	0,1	3,3	0,17	1,2	0,1	2,2	0,11	0,8	0,1	1,6	0,1	0,6	0,1	1,1	0,1	0,4	0,1	0,5	0,1	0,2	0,1
300	0,30	0,075	5,5	0,17	2,0	0,1	4,4	0,14	1,6	0,1	3,3	0,10	1,2	0,1	2,2	0,1	0,8	0,1	1,6	0,1	0,6	0,1	1,1	0,1	0,4	0,1	0,5	0,1	0,2	0,1
100	0,10	0,025	5,5	0,1	2,0	0,1	4,4	0,1	1,6	0,1	3,3	0,10	1,2	0,1	2,2	0,1	0,8	0,1	1,6	0,1	0,6	0,1	1,1	0,1	0,4	0,1	0,5	0,1	0,2	0,1
50	0,05	0,013	5,5	0,1	2,0	0,1	4,4	0,1	1,6	0,1	3,3	0,10	1,2	0,1	2,2	0,1	0,8	0,1	1,6	0,1	0,6	0,1	1,1	0,1	0,4	0,1	0,5	0,1	0,2	0,1

SHE 2 spindle Tr 26x6.28

n [1/min]	Lifting speed [m/min.]		F=20 [kN]				F=15 [kN]				F=10 [kN]				F=8 [kN]				F=6 [kN]				F=4 [kN]				F=2 [kN]			
	N	L	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	1,57	0,393	10,75	1,7	4,63	0,7	8,06	1,3	3,47	0,5	5,37	0,8	2,31	0,4	4,30	0,7	1,85	0,3	3,22	0,5	1,39	0,2	2,15	0,3	0,93	0,1	1,07	0,2	0,46	0,1
1000	1,05	0,262	10,75	1,1	4,63	0,5	8,06	0,8	3,47	0,4	5,37	0,6	2,31	0,2	4,30	0,5	1,85	0,2	3,22	0,3	1,39	0,1	2,15	0,2	0,93	0,1	1,07	0,1	0,46	0,1
750	0,79	0,196	10,75	0,8	4,63	0,4	8,06	0,6	3,47	0,3	5,37	0,4	2,31	0,2	4,30	0,3	1,85	0,1	3,22	0,3	1,39	0,1	2,15	0,2	0,93	0,1	1,07	0,1	0,46	0,1
600	0,63	0,157	10,75	0,7	4,63	0,3	8,06	0,5	3,47	0,2	5,37	0,3	2,31	0,1	4,30	0,3	1,85	0,1	3,22	0,2	1,39	0,1	2,15	0,1	0,93	0,1	1,07	0,1	0,46	0,1
500	0,52	0,131	10,75	0,6	4,63	0,2	8,06	0,4	3,47	0,2	5,37	0,3	2,31	0,1	4,30	0,2	1,85	0,1	3,22	0,2	1,39	0,1	2,15	0,1	0,93	0,1	1,07	0,1	0,46	0,1
300	0,31	0,079	10,75	0,3	4,63	0,1	8,06	0,3	3,47	0,1	5,37	0,2	2,31	0,1	4,30	0,1	1,85	0,1	3,22	0,1	1,39	0,1	2,15	0,1	0,93	0,1	1,07	0,1	0,46	0,1
100	0,10	0,026	10,75	0,1	4,63	0,1	8,06	0,1	3,47	0,1	5,37	0,1	2,31	0,1	4,30	0,1	1,85	0,1	3,22	0,1	1,39	0,1	2,15	0,1	0,93	0,1	1,07	0,1	0,46	0,1
50	0,05	0,013	10,75	0,1	4,63	0,1	8,06	0,1	3,47	0,1	5,37	0,1	2,31	0,1	4,30	0,1	1,85	0,1	3,22	0,1	1,39	0,1	2,15	0,1	0,93	0,1	1,07	0,1	0,46	0,1

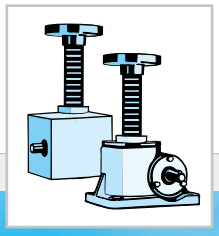
SHE 2.5 spindle Tr 30x6

n [1/min]	Lifting speed [m/min.]		F=25 [kN]				F=20 [kN]				F=15 [kN]				F=10 [kN]				F=5 [kN]				F=2,5 [kN]				F=1 [kN]			
	N	L	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	1,50	0,375	14,7	2,31	5,2	0,82	11,8	1,85	4,2	0,66	8,8	1,39	3,1	0,49	5,9	0,93	2,1	0,33	2,9	0,46	1,0	0,2	1,5	0,2	0,5	0,1	0,6	0,1	0,2	0,1
1000	1,00	0,250	14,7	1,54	5,2	0,55	11,8	1,23	4,2	0,44	8,8	0,93	3,1	0,33	5,9	0,62	2,1	0,22	2,9	0,31	1,0	0,1	1,5	0,2	0,5	0,1	0,6	0,1	0,2	0,1
750	0,75	0,188	14,7	1,16	5,2	0,41	11,8	0,93	4,2	0,33	8,8	0,69	3,1	0,25	5,9	0,46	2,1	0,16	2,9	0,23	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1
600	0,60	0,150	14,7	0,93	5,2	0,33	11,8	0,74	4,2	0,26	8,8	0,56	3,1	0,20	5,9	0,37	2,1	0,13	2,9	0,19	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1
500	0,50	0,125	14,7	0,77	5,2	0,27	11,8	0,62	4,2	0,22	8,8	0,46	3,1	0,16	5,9	0,31	2,1	0,1	2,9	0,15	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1
300	0,30	0,075	14,7	0,46	5,2	0,16	11,8	0,37	4,2	0,13	8,8	0,28	3,1	0,10	5,9	0,19	2,1	0,1	2,9	0,10	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1
100	0,10	0,025	14,7	0,15	5,2	0,10	11,8	0,12	4,2	0,1	8,8	0,10	3,1	0,1	5,9	0,10	2,1	0,1	2,9	0,1	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1
50	0,05	0,013	14,7	0,10	5,2	0,1	11,8	0,1	4,2	0,1	8,8	0,1	3,1	0,1	5,9	0,1	2,1	0,1	2,9	0,1	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1

20% ED / 1hr or 30% ED / 10min. and ambient temperature 20°C and ambient temp. 20°C

static only (dynamic not permitted)

10% ED/1hr and ambient temperature 20°C



3.3 Technical information

SHE 5 spindle Tr 40x7

n [1/min]	Lifting speed [m/min.]		F=50 [kN]				F=40 [kN]				F=30 [kN]				F=20 [kN]				F=10 [kN]				F=5 [kN]				F=3 [kN]			
			N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	1,75	0,438	38,7	6,08	14,5	2,28	30,9	4,86	11,6	1,82	23,2	3,65	8,7	1,37	15,5	2,43	5,8	0,91	7,7	1,22	2,9	0,5	3,9	0,6	1,5	0,2	1,9	0,3	0,7	0,2
1000	1,17	0,292	38,7	4,05	14,5	1,52	30,9	3,24	11,6	1,22	23,2	2,43	8,7	0,91	15,5	1,62	5,8	0,61	7,7	0,81	2,9	0,3	3,9	0,4	1,5	0,2	1,9	0,2	0,7	0,1
750	0,88	0,219	38,7	3,04	14,5	1,14	30,9	2,43	11,6	0,91	23,2	1,82	8,7	0,68	15,5	1,22	5,8	0,46	7,7	0,61	2,9	0,2	3,9	0,3	1,5	0,1	1,9	0,2	0,7	0,1
600	0,70	0,175	38,7	2,43	14,5	0,91	30,9	1,94	11,6	0,73	23,2	1,46	8,7	0,55	15,5	0,97	5,8	0,36	7,7	0,49	2,9	0,2	3,9	0,2	1,5	0,1	1,9	0,1	0,7	0,1
500	0,58	0,146	38,7	2,03	14,5	0,76	30,9	1,62	11,6	0,61	23,2	1,22	8,7	0,46	15,5	0,81	5,8	0,30	7,7	0,41	2,9	0,2	3,9	0,2	1,5	0,1	1,9	0,1	0,7	0,1
300	0,35	0,088	38,7	1,22	14,5	0,46	30,9	0,97	11,6	0,36	23,2	0,73	8,7	0,27	15,5	0,49	5,8	0,18	7,7	0,24	2,9	0,1	3,9	0,1	1,5	0,1	1,9	0,1	0,7	0,1
100	0,12	0,029	38,7	0,41	14,5	0,15	30,9	0,32	11,6	0,12	23,2	0,24	8,7	0,10	15,5	0,16	5,8	0,10	7,7	0,10	2,9	0,1	3,9	0,1	1,5	0,1	1,9	0,1	0,7	0,1
50	0,06	0,015	38,7	0,20	14,5	0,10	30,9	0,16	11,6	0,1	23,2	0,1	8,7	0,1	15,5	0,1	5,8	0,1	7,7	0,1	2,9	0,1	3,9	0,1	1,5	0,1	1,9	0,1	0,7	0,1

SHE 10 spindle Tr 58x12

n [1/min]	Lifting speed [m/min.]		F=100 [kN]				F=80 [kN]				F=60 [kN]				F=40 [kN]				F=20 [kN]				F=10 [kN]				F=5 [kN]			
			N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	2,35	0,750	92,3	14,5	46,8	7,4	73,8	11,6	37,5	5,9	55,4	8,7	28,1	4,4	36,9	5,8	18,7	2,9	18,5	2,9	9,4	1,5	9,2	1,4	4,7	0,7	4,6	0,7	2,3	0,4
1000	1,57	0,500	92,3	9,7	46,8	4,9	73,8	7,7	37,5	3,9	55,4	5,8	28,1	2,9	36,9	3,9	18,7	2,0	18,5	1,9	9,4	1,0	9,2	1,0	4,7	0,5	4,6	0,5	2,3	0,2
750	1,17	0,375	92,3	7,2	46,8	3,7	73,8	5,8	37,5	2,9	55,4	4,3	28,1	2,2	36,9	2,9	18,7	1,5	18,5	1,4	9,4	0,7	9,2	0,7	4,7	0,4	4,6	0,4	2,3	0,2
600	0,94	0,300	92,3	5,8	46,8	2,9	73,8	4,6	37,5	2,4	55,4	3,5	28,1	1,8	36,9	2,3	18,7	1,2	18,5	1,2	9,4	0,6	9,2	0,6	4,7	0,3	4,6	0,3	2,3	0,1
500	0,78	0,250	92,3	4,8	46,8	2,5	73,8	3,9	37,5	2,0	55,4	2,9	28,1	1,5	36,9	1,9	18,7	1,0	18,5	1,0	9,4	0,5	9,2	0,5	4,7	0,2	4,6	0,2	2,3	0,1
300	0,47	0,150	92,3	2,9	46,8	1,5	73,8	2,3	37,5	1,2	55,4	1,7	28,1	0,9	36,9	1,2	18,7	0,6	18,5	0,6	9,4	0,3	9,2	0,3	4,7	0,1	4,6	0,1	2,3	0,1
100	0,16	0,050	92,3	1,0	46,8	0,5	73,8	0,8	37,5	0,4	55,4	0,6	28,1	0,3	36,9	0,4	18,7	0,2	18,5	0,2	9,4	0,1	9,2	0,1	4,7	0,1	4,6	0,1	2,3	0,1
50	0,08	0,025	92,3	0,5	46,8	0,2	73,8	0,4	37,5	0,2	55,4	0,3	28,1	0,1	36,9	0,2	18,7	0,1	18,5	0,1	9,4	0,1	9,2	0,1	4,7	0,1	4,6	0,1	2,3	0,1

SHE 15 spindle Tr 60x12

n [1/min]	Lifting speed [m/min.]		F=150 [kN]				F=100 [kN]				F=80 [kN]				F=60 [kN]				F=40 [kN]				F=20 [kN]				F=10 [kN]			
			N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	2,35	0,750	138,4	21,7	70,2	11,0	92,3	14,5	46,8	7,4	73,8	11,6	37,5	5,9	55,4	8,7	28,1	4,4	36,9	5,8	18,7	2,9	18,5	2,9	9,4	1,5	9,2	1,4	4,7	0,4
1000	1,57	0,500	138,4	14,5	70,2	7,4	92,3	9,7	46,8	4,9	73,8	7,7	37,5	3,9	55,4	5,8	28,1	2,9	36,9	3,9	18,7	2,0	18,5	1,9	9,4	1,0	9,2	1,0	4,7	0,2
750	1,17	0,375	138,4	10,9	70,2	5,5	92,3	7,2	46,8	3,7	73,8	5,8	37,5	2,9	55,4	4,3	28,1	2,2	36,9	2,9	18,7	1,5	18,5	1,4	9,4	0,7	9,2	0,7	4,7	0,2
600	0,94	0,300	138,4	8,7	70,2	4,4	92,3	5,8	46,8	2,9	73,8	4,6	37,5	2,4	55,4	3,5	28,1	1,8	36,9	2,3	18,7	1,2	18,5	1,2	9,4	0,6	9,2	0,6	4,7	0,1
500	0,78	0,250	138,4	7,2	70,2	3,7	92,3	4,8	46,8	2,5	73,8	3,9	37,5	2,0	55,4	2,9	28,1	1,5	36,9	1,9	18,7	1,0	18,5	1,0	9,4	0,5	9,2	0,5	4,7	0,1
300	0,47	0,150	138,4	4,3	70,2	2,2	92,3	2,9	46,8	1,5	73,8	2,3	37,5	1,2	55,4	1,7	28,1	0,9	36,9	1,2	18,7	0,6	18,5	0,6	9,4	0,3	9,2	0,3	4,7	0,1
100	0,16	0,050	138,4	1,4	70,2	0,7	92,3	1,0	46,8	0,5	73,8	0,8	37,5	0,4	55,4	0,6	28,1	0,3	36,9	0,4	18,7	0,2	18,5	0,2	9,4	0,1	9,2	0,1	4,7	0,1
50	0,08	0,025	138,4	0,7	70,2	0,4	92,3	0,5	46,8	0,2	73,8	0,4	37,5	0,2	55,4	0,3	28,1	0,1	36,9	0,2	18,7	0,1	18,5	0,1	9,4	0,1	9,2	0,1	4,7	0,1

SHE 20 spindle Tr 65x12

n [1/min]	Lifting speed [m/min.]		F=200 [kN]				F=160 [kN]				F=120 [kN]				F=100 [kN]				F=75 [kN]				F=50 [kN]				F=25 [kN]			
			N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	2,25	0,750	199,0	31,3	93,6	14,7	159,2	25,0	74,9	11,8	119,4	18,8	56,2	8,8	99,5	15,6	46,8	7,4	74,6	11,7	35,1	5,5	49,7	7,8	23,4	3,7	24,9	3,9	11,7	1,8
1000	1,50	0,500	199,0	20,8	93,6	9,8	159,2	16,7	74,9	7,8	119,4	12,5	56,2	5,9	99,5	10,4	46,8	4,9	74,6	7,8	35,1	3,7	49,7	5,2	23,4	2,5	24,9	2,6	11,7	1,2
750	1,13	0,375	199,0	15,6	93,6	7,4	159,2	12,5	74,9	5,9	119,4	9,4	56,2	4,4	99,5	7,8	46,8	3,7	74,6	5,9	35,1	2,8	49,7	3,9	23,4	1,8	24,9	2,0	11,7	0,9
600	0,90	0,300	199,0	12,5	93,6	5,9	159,2	10,0	74,9	4,7	119,4	7,5	56,2	3,5	99,5	6,3	46,8	2,9	74,6	4,7	35,1	2,2	49,7	3,1	23,4	1,5	24,9	1,6	11,7	0,7
500	0,75	0,250	199,0	10,4	93,6	4,9	159,2	8,3	74,9	3,9	119,4	6,3	56,2	2,9	99,5	5,2	46,8	2,5	74,6	3,9	35,1	1,8	49,7	2,6	23,4	1,2	24,9	1,3	11,7	0,6
300	0,45	0,150	199,0	6,3	93,6	2,9	159,2	5,0	74,9	2,4	119,4	3,8	56,2	1,8	99,5	3,1	46,8	1,5	74,6	2,3	35,1	1,1	49,7	1,6	23,4	0,7	24,9	0,8	11,7	0,4
100	0,15	0,050	199,0	2,1	93,6	1,0	159,2	1,7	74,9	0,8	119,4	1,3	56,2	0,6	99,5	1,0	46,8	0,5	74,6	0,8	35,1	0,4	49,7	0,5	23,4	0,2	24,9	0,3	11,7	0,1
50	0,08	0,025	199,0	1,0	93,6	0,5	159,2	0,8	74,9	0,4	119,4	0,6	56,2	0,3	99,5	0,5	46,8	0,2	74,6	0,4	35,1	0,2	49,7	0,3	23,4	0,1	24,9	0,1	11,7	0,1

SHE 25 spindle Tr 90x16

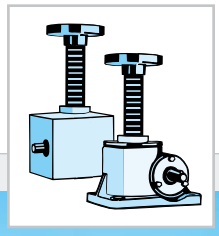
n [1/min]	Lifting speed [m/min.]		F=250 [kN]				F=200 [kN]				F=160 [kN]				F=120 [kN]				F=100 [kN]				F=75 [kN]				F=50 [kN]			
			N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	1,50	0,500	271,3	28,4	132,6	13,9	217,0	22,7	106,1	11,1	173,6	18,2	84,9	8,9	130,2	13,6	63,7	6,7	108,5	11,4	53,1	5,6	81,4	8,5	39,8	4,2	54,3	5,7	26,5	2,8
750	1,13	0,375	271,3	21,3	132,6	10,4	217,0	17,0	106,1	8,3	173,6	13,6	84,9	6,7	130,2	10,2	63,7	5,0	108,5	8,5	53,1	4,2	81,4	6,4	39,8	3,1	54,3	4,3	26,5	2,1
600	0,90	0,300	271,3	17,0	132,6	8,3	217,0	13,6	106,1	6,7	173,6	10,9	84,9	5,3	130,2	8,2	63,7	4,0	108,5	6,8	53,1	3,3	81,4	5,1	39,8	2,5	54,3	3,4	26,5	1,7
500	0,75	0,250	271,3	14,2	132,6	6,9	217,0	11,4	106,1	5,6	173,6	9,1	84,9	4,4	130,2	6,8	63,7	3,3	108,5	5,7	53,1	2,8	81,4	4,3	39,8	2,1	54,3	2,8	26,5	1,4
300	0,45	0,150	271,3	8,5	132,6	4,2	217,0	6,8	106,1	3,3	173,6	5,5	84,9	2,7	130,2	4,1	63,7	2,0	108,5	3,4	53,1	1,7	81,4	2,6	39,8	1,3	54,3	1,7	26,5	0,8
100	0,15	0,050	271,3	2,8	132,6	1,4	217,0	2,3	106,1	1,1	173,6	1,8	84,9	0,9	130,2	1,4	63,7	0,7	108,5	1,1	53,1	0,6	81,4	0,9	39,8	0,4	54,3	0,6	26,5	0,3
50	0,08	0,025	271,3	1,4	132,6	0,7	217,0	1,1	106,1	0,6	173,6	0,9	84,9	0,4	130,2	0,7	63,7	0,3	108,5	0,6	53,1	0,3	81,4	0,4	39,8	0,2	54,3	0,3	26,5	0,1

20% ED / 1hr or 30% ED / 10min. and ambient temperature 20°C and ambient temp. 20°C

static only (dynamic not permitted)

10% ED/1hr and ambient temperature 20°C

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.3 Technical information

SHE 35 spindle Tr 100x16

n	Lifting speed	F=350 [kN]				F=300 [kN]				F=250 [kN]				F=200 [kN]				F=150 [kN]				F=100 [kN]				F=50 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	1,50	0,500	397,9	41,7	199,0	20,8	341,1	35,7	170,5	17,9	284,2	29,8	142,1	14,9	227,4	23,8	113,7	11,9	170,5	17,9	85,3	8,9	113,7	11,9	56,8	6,0	56,8	6,0	28,4	3,0
750	1,13	0,375	397,9	31,3	199,0	15,6	341,1	26,8	170,5	13,4	284,2	22,3	142,1	11,2	227,4	17,9	113,7	8,9	170,5	13,4	85,3	6,7	113,7	8,9	56,8	4,5	56,8	4,5	28,4	2,2
600	0,90	0,300	397,9	25,0	199,0	12,5	341,1	21,4	170,5	10,7	284,2	17,9	142,1	8,9	227,4	14,3	113,7	7,1	170,5	10,7	85,3	5,4	113,7	7,1	56,8	3,6	56,8	3,6	28,4	1,8
500	0,75	0,250	397,9	20,8	199,0	10,4	341,1	17,9	170,5	8,9	284,2	14,9	142,1	7,4	227,4	11,9	113,7	6,0	170,5	8,9	85,3	4,5	113,7	6,0	56,8	3,0	56,8	3,0	28,4	1,5
300	0,45	0,150	397,9	12,5	199,0	6,3	341,1	10,7	170,5	5,4	284,2	8,9	142,1	4,5	227,4	7,1	113,7	3,6	170,5	5,4	85,3	2,7	113,7	3,6	56,8	1,8	56,8	1,8	28,4	0,9
100	0,15	0,050	397,9	4,2	199,0	2,1	341,1	3,6	170,5	1,8	284,2	3,0	142,1	1,5	227,4	2,4	113,7	1,2	170,5	1,8	85,3	0,9	113,7	1,2	56,8	0,6	56,8	0,6	28,4	0,3
50	0,08	0,025	397,9	2,1	199,0	1,0	341,1	1,8	170,5	0,9	284,2	1,5	142,1	0,7	227,4	1,2	113,7	0,6	170,5	0,9	85,3	0,4	113,7	0,6	56,8	0,3	56,8	0,3	28,4	0,1

SHE 50 spindle Tr 120x16

n	Lifting speed	F=500 [kN]				F=400 [kN]				F=300 [kN]				F=200 [kN]				F=150 [kN]				F=100 [kN]				F=50 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	1,500	0,500	796	84	398	42	637	67	318	34	478	50	239	25	318	34	159	17	239	25	119	13	159	17	80	8,4	80	8,4	40	4,2
750	1,125	0,375	796	63	398	32	637	50	318	25	478	38	239	19	318	25	159	13	239	19	119	9,4	159	13	80	6,3	80	6,3	40	3,2
500	0,750	0,250	796	42	398	21	637	34	318	17	478	25	239	13	318	17	159	8,4	239	13	119	6,3	159	8,4	80	4,2	80	4,2	40	2,1
400	0,600	0,200	796	34	398	17	637	27	318	14	478	20	239	10	318	14	159	6,7	239	10	119	5	159	6,7	80	3,4	80	3,4	40	1,7
300	0,450	0,150	796	25	398	13	637	20	318	10	478	15	239	7,5	318	10	159	5	239	7,5	119	3,8	159	5	80	2,5	80	2,5	40	1,3
200	0,300	0,100	796	17	398	8,4	637	14	318	6,7	478	10	239	5	318	6,7	159	3,4	239	5	119	2,5	159	3,4	80	1,7	80	1,7	40	0,9
100	0,150	0,050	796	8,4	398	4,2	637	6,7	318	3,4	478	5	239	2,5	318	3,4	159	1,7	239	2,5	119	1,3	159	1,7	80	0,9	80	0,9	40	0,5
50	0,075	0,025	796	4,2	398	2,1	637	3,4	318	1,7	478	2,5	239	1,3	318	1,7	159	0,9	239	1,3	119	0,7	159	0,9	80	0,5	80	0,5	40	0,5

SHE 75 spindle Tr 140x20

n	Lifting speed	F=750 [kN]				F=500 [kN]				F=400 [kN]				F=300 [kN]				F=200 [kN]				F=100 [kN]				F=50 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	1,667		1110	116			737	77			590	62			442	46			295	31			147	15			74	7,7		
750	1,250		1110	87			737	58			590	46			442	35			295	23			147	12			74	5,8		
500	0,833		1110	58			737	39			590	31			442	23			295	15			147	7,7			74	3,9		
400	0,667		1110	46			737	31			590	25			442	19			295	12			147	6,2			74	3,1		
300	0,500		1110	35			737	23			590	19			442	14			295	9,3			147	4,6			74	2,3		
200	0,333		1110	23			737	15			590	12			442	9,3			295	6,2			147	3,1			74	1,5		
100	0,167		1110	12			737	7,7			590	6,2			442	4,6			295	3,1			147	1,5			74	0,8		
50	0,083		1110	5,8			737	3,9			590	3,1			442	2,3			295	1,5			147	0,8			74	0,4		

SHE 100 spindle Tr 160x20

n	Vitesse de levage	F=1000 [kN]				F=800 [kN]				F=600 [kN]				F=400 [kN]				F=200 [kN]				F=100 [kN]				F=50 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	1,667	0,556	1770	185	983	103	1420	148	786	83	1060	112	590	62	707	74	393	42	354	37	197	21	177	19	99	11	88	9,3	49	5,2
750	1,250	0,417	1770	139	983	78	1420	112	786	62	1060	84	590	47	707	56	393	31	354	28	197	16	177	14	99	7,8	88	7	49	3,9
500	0,833	0,278	1770	93	983	52	1420	74	786	42	1060	56	590	31	707	37	393	21	354	19	197	11	177	9,3	99	5,2	88	4,6	49	2,6
400	0,667	0,222	1770	74	983	42	1420	60	786	33	1060	45	590	25	707	30	393	17	354	15	197	8,3	177	7,5	99	4,2	88	3,7	49	2,1
300	0,500	0,167	1770	56	983	31	1420	45	786	25	1060	34	590	19	707	23	393	13	354	11	197	6,2	177	5,6	99	3,1	88	2,8	49	1,6
200	0,333	0,111	1770	37	983	21	1420	30	786	17	1060	23	590	13	707	15	393	8,3	354	7,4	197	4,2	177	3,7	99	2,1	88	1,9	49	1,1
100	0,167	0,056	1770	19	983	11	1420	15	786	8,3	1060	11	590	6,2	707	7,4	393	4,2	354	3,7	197	2,1	177	1,9	99	1,1	88	1	49	0,5
50	0,083	0,028	1770	9,3	983	5,2	1420	7,4	786	4,2	1060	5,6	590	3,1	707	3,7	393	2,1	354	1,9	197	1,1	177	1	99	0,6	88	0,5	49	0,5

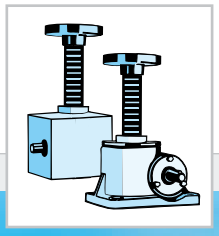
SHE 150 spindle Tr 190x24

n	Lifting speed	F=1500 [kN]				F=1250 [kN]				F=1000 [kN]				F=750 [kN]				F=500 [kN]				F=250 [kN]				F=100 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	1,263		2010	211			1680	175			1340	140			1010	105			670	70			335	35			134	14		
750	0,947		2010	158			1680	132			1340	105			1010	79			670	53			335	26			134	11		
500	0,632		2010	105			1680	88			1340	70			1010	53			670	35			335	18			134	7		
400	0,505		2010	84			1680	70			1340	56			1010	42			670	28			335	14			134	5,6		
300	0,379		2010	63			1680	53			1340	42			1010	32			670	21			335	11			134	4,2		
200	0,253		2010	42			1680	35			1340	28			1010	21			670	14			335	7			134	2,8		
100	0,126		2010	21			1680	18			1340	14			1010	11			670	7			335	3,5			134	1,4		
50	0,063		2010	11			1680	8,8			1340	7			1010	5,3			670	3,5			335	1,8			134	0,7		

20% ED / 1hr or 30% ED / 10min. and ambient temperature 20°C and ambient temp. 20°C

static only (dynamic not permitted)

10% ED/1hr and ambient temperature 20°C



3.3 Technical information

SHE 200 spindle Tr 220x28

n [1/min]	Lifting speed [m/min.] N	L	F=2000 [kN] N Nm	kW	L Nm	kW	F=1500 [kN] N Nm	kW	L Nm	kW	F=1000 [kN] N Nm	kW	L Nm	kW	F=750 [kN] N Nm	kW	L Nm	kW	F=500 [kN] N Nm	kW	L Nm	kW	F=250 [kN] N Nm	kW	L Nm	kW	F=100 [kN] N Nm	kW	L Nm	kW
1000																														
750																														
600																														
500															on request															
300																														
100																														
50																														

3.3.3.2 Merkur range

Turning speed, power requirement and permitted lifting speed for ratio N and L with single-threaded, lifting (Type 1) trapezoidal spindle. All performance data are expressed in terms of dynamic lifting force.

With load factors of <10%/hr or configuration with rotating spindle (Type 2), the maximum permitted drive capacities can be increased. Please consult our drive-system specialists if this is the case.

M 0 spindle Tr 14x4

n [1/min]	Lifting speed [m/min.] N	L	F=2,5 [kN] N Nm	kW	L Nm	kW	F=2 [kN] N Nm	kW	L Nm	kW	F=1,5 [kN] N Nm	kW	L Nm	kW	F=1 [kN] N Nm	kW	L Nm	kW	F=0,75 [kN] N Nm	kW	L Nm	kW	F=0,5 [kN] N Nm	kW	L Nm	kW	F=0,25 [kN] N Nm	kW	L Nm	kW
1500	1,50	0,375	1,2	0,18	0,4	0,1	0,9	0,15	0,3	0,1	0,7	0,1	0,2	0,1	0,5	0,1	0,2	0,1	0,4	0,1	0,1	0,1	0,2	0,1	0,1	0,1	0,1	0,1	0,0	0,1
1000	1,00	0,250	1,2	0,12	0,4	0,1	0,9	0,10	0,3	0,1	0,7	0,1	0,2	0,1	0,5	0,1	0,2	0,1	0,4	0,1	0,1	0,1	0,2	0,1	0,1	0,1	0,1	0,1	0,0	0,1
750	0,75	0,188	1,2	0,10	0,4	0,1	0,9	0,1	0,3	0,1	0,7	0,1	0,2	0,1	0,5	0,1	0,2	0,1	0,4	0,1	0,1	0,1	0,2	0,1	0,1	0,1	0,1	0,1	0,0	0,1
600	0,60	0,150	1,2	0,1	0,4	0,1	0,9	0,1	0,3	0,1	0,7	0,1	0,2	0,1	0,5	0,1	0,2	0,1	0,4	0,1	0,1	0,1	0,2	0,1	0,1	0,1	0,1	0,1	0,0	0,1
500	0,50	0,125	1,2	0,1	0,4	0,1	0,9	0,1	0,3	0,1	0,7	0,1	0,2	0,1	0,5	0,1	0,2	0,1	0,4	0,1	0,1	0,1	0,2	0,1	0,1	0,1	0,1	0,1	0,0	0,1
300	0,30	0,075	1,2	0,1	0,4	0,1	0,9	0,1	0,3	0,1	0,7	0,1	0,2	0,1	0,5	0,1	0,2	0,1	0,4	0,1	0,1	0,1	0,2	0,1	0,1	0,1	0,1	0,1	0,0	0,1
100	0,10	0,025	1,2	0,1	0,4	0,1	0,9	0,1	0,3	0,1	0,7	0,1	0,2	0,1	0,5	0,1	0,2	0,1	0,4	0,1	0,1	0,1	0,2	0,1	0,1	0,1	0,1	0,1	0,0	0,1
50	0,05	0,013	1,2	0,1	0,4	0,1	0,9	0,1	0,3	0,1	0,7	0,1	0,2	0,1	0,5	0,1	0,2	0,1	0,4	0,1	0,1	0,1	0,2	0,1	0,1	0,1	0,1	0,1	0,0	0,1

M 1 spindle Tr 18x4

n [1/min]	Lifting speed [m/min.] N	L	F=5 [kN] N Nm	kW	L Nm	kW	F=4 [kN] N Nm	kW	L Nm	kW	F=3 [kN] N Nm	kW	L Nm	kW	F=2,5 [kN] N Nm	kW	L Nm	kW	F=2 [kN] N Nm	kW	L Nm	kW	F=1,5 [kN] N Nm	kW	L Nm	kW	F=1 [kN] N Nm	kW	L Nm	kW
1500	1,50	0,375	2,7	0,42	0,9	0,1	2,1	0,33	0,7	0,1	1,6	0,25	0,5	0,1	1,3	0,21	0,4	0,1	1,1	0,20	0,3	0,1	0,8	0,1	0,3	0,1	0,5	0,1	0,2	0,1
1000	1,00	0,250	2,7	0,28	0,9	0,1	2,1	0,22	0,7	0,1	1,6	0,17	0,5	0,1	1,3	0,14	0,4	0,1	1,1	0,10	0,3	0,1	0,8	0,1	0,3	0,1	0,5	0,1	0,2	0,1
750	0,75	0,188	2,7	0,21	0,9	0,1	2,1	0,17	0,7	0,1	1,6	0,13	0,5	0,1	1,3	0,10	0,4	0,1	1,1	0,1	0,3	0,1	0,8	0,1	0,3	0,1	0,5	0,1	0,2	0,1
600	0,60	0,150	2,7	0,17	0,9	0,1	2,1	0,13	0,7	0,1	1,6	0,10	0,5	0,1	1,3	0,1	0,4	0,1	1,1	0,1	0,3	0,1	0,8	0,1	0,3	0,1	0,5	0,1	0,2	0,1
500	0,50	0,125	2,7	0,14	0,9	0,1	2,1	0,1	0,7	0,1	1,6	0,1	0,5	0,1	1,3	0,1	0,4	0,1	1,1	0,1	0,3	0,1	0,8	0,1	0,3	0,1	0,5	0,1	0,2	0,1
300	0,30	0,075	2,7	0,1	0,9	0,1	2,1	0,1	0,7	0,1	1,6	0,1	0,5	0,1	1,3	0,1	0,4	0,1	1,1	0,1	0,3	0,1	0,8	0,1	0,3	0,1	0,5	0,1	0,2	0,1
100	0,10	0,025	2,7	0,1	0,9	0,1	2,1	0,1	0,7	0,1	1,6	0,1	0,5	0,1	1,3	0,1	0,4	0,1	1,1	0,1	0,3	0,1	0,8	0,1	0,3	0,1	0,5	0,1	0,2	0,1
50	0,05	0,013	2,7	0,1	0,9	0,1	2,1	0,1	0,7	0,1	1,6	0,1	0,5	0,1	1,3	0,1	0,4	0,1	1,1	0,1	0,3	0,1	0,8	0,1	0,3	0,1	0,5	0,1	0,2	0,1

M 2 spindle Tr 20x4

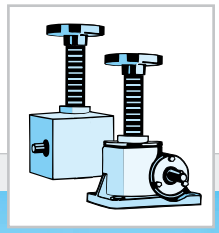
n [1/min]	Lifting speed [m/min.] N	L	F=10 [kN] N Nm	kW	L Nm	kW	F=8 [kN] N Nm	kW	L Nm	kW	F=6 [kN] N Nm	kW	L Nm	kW	F=4 [kN] N Nm	kW	L Nm	kW	F=3 [kN] N Nm	kW	L Nm	kW	F=2 [kN] N Nm	kW	L Nm	kW	F=1 [kN] N Nm	kW	L Nm	kW
1500	1,50	0,375	5,7	0,89	1,9	0,30	4,5	0,71	1,5	0,24	3,4	0,54	1,1	0,18	2,3	0,36	0,8	0,1	1,7	0,27	0,6	0,1	1,1	0,20	0,4	0,1	0,6	0,1	0,2	0,1
1000	1,00	0,250	5,7	0,60	1,9	0,20	4,5	0,48	1,5	0,16	3,4	0,36	1,1	0,12	2,3	0,24	0,8	0,1	1,7	0,18	0,6	0,1	1,1	0,10	0,4	0,1	0,6	0,1	0,2	0,1
750	0,75	0,188	5,7	0,45	1,9	0,15	4,5	0,36	1,5	0,12	3,4	0,27	1,1	0,1	2,3	0,18	0,8	0,1	1,7	0,13	0,6	0,1	1,1	0,1	0,4	0,1	0,6	0,1	0,2	0,1
600	0,60	0,150	5,7	0,36	1,9	0,12	4,5	0,29	1,5	0,10	3,4	0,21	1,1	0,1	2,3	0,14	0,8	0,1	1,7	0,1	0,6	0,1	1,1	0,1	0,4	0,1	0,6	0,1	0,2	0,1
500	0,50	0,125	5,7	0,30	1,9	0,1	4,5	0,24	1,5	0,1	3,4	0,18	1,1	0,1	2,3	0,12	0,8	0,1	1,7	0,1	0,6	0,1	1,1	0,1	0,4	0,1	0,6	0,1	0,2	0,1
300	0,30	0,075	5,7	0,18	1,9	0,1	4,5	0,14	1,5	0,1	3,4	0,11	1,1	0,1	2,3	0,10	0,8	0,1	1,7	0,1	0,6	0,1	1,1	0,1	0,4	0,1	0,6	0,1	0,2	0,1
100	0,10	0,025	5,7	0,10	1,9	0,1	4,5	0,1	1,5	0,1	3,4	0,1	1,1	0,1	2,3	0,1	0,8	0,1	1,7	0,1	0,6	0,1	1,1	0,1	0,4	0,1	0,6	0,1	0,2	0,1
50	0,05	0,013	5,7	0,1	1,9	0,1	4,5	0,1	1,5	0,1	3,4	0,1	1,1	0,1	2,3	0,1	0,8	0,1	1,7	0,1	0,6	0,1	1,1	0,1	0,4	0,1	0,6	0,1	0,2	0,1

20% ED / 1hr or 30% ED / 10min. and ambient temperature 20°C and ambient temp. 20°C

static only (dynamic not permitted)

10% ED/1hr and ambient temperature 20°C

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.3 Technical information

M 3 spindle Tr 30x6

n	Lifting speed	F=25 [kN]				F=20 [kN]				F=15 [kN]				F=10 [kN]				F=5 [kN]				F=2,5 [kN]				F=1 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	1,50	0,375	14,7	2,31	5,2	0,82	11,8	1,85	4,2	0,66	8,8	1,39	3,1	0,49	5,9	0,93	2,1	0,33	2,9	0,46	1,0	0,2	1,5	0,2	0,5	0,1	0,6	0,1	0,2	0,1
1000	1,00	0,250	14,7	1,54	5,2	0,55	11,8	1,23	4,2	0,44	8,8	0,93	3,1	0,33	5,9	0,62	2,1	0,22	2,9	0,31	1,0	0,1	1,5	0,2	0,5	0,1	0,6	0,1	0,2	0,1
750	0,75	0,188	14,7	1,16	5,2	0,41	11,8	0,93	4,2	0,33	8,8	0,69	3,1	0,25	5,9	0,46	2,1	0,16	2,9	0,23	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1
600	0,60	0,150	14,7	0,93	5,2	0,33	11,8	0,74	4,2	0,26	8,8	0,56	3,1	0,20	5,9	0,37	2,1	0,13	2,9	0,19	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1
500	0,50	0,125	14,7	0,77	5,2	0,27	11,8	0,62	4,2	0,22	8,8	0,46	3,1	0,16	5,9	0,31	2,1	0,11	2,9	0,15	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1
300	0,30	0,075	14,7	0,46	5,2	0,16	11,8	0,37	4,2	0,13	8,8	0,28	3,1	0,10	5,9	0,19	2,1	0,1	2,9	0,10	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1
100	0,10	0,025	14,7	0,15	5,2	0,10	11,8	0,12	4,2	0,1	8,8	0,10	3,1	0,1	5,9	0,10	2,1	0,1	2,9	0,1	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1
50	0,05	0,013	14,7	0,10	5,2	0,1	11,8	0,1	4,2	0,1	8,8	0,1	3,1	0,1	5,9	0,1	2,1	0,1	2,9	0,1	1,0	0,1	1,5	0,1	0,5	0,1	0,6	0,1	0,2	0,1

M 4 spindle 40x7

n	Lifting speed	F=50 [kN]				F=40 [kN]				F=30 [kN]				F=20 [kN]				F=10 [kN]				F=5 [kN]				F=2,5 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	1,50	0,375	31,8	5,0	11,1	1,7	25,5	4,0	8,8	1,4	19,1	3,0	6,6	1,0	12,7	2,0	4,4	0,7	6,4	1,0	2,2	0,3	3,2	0,5	1,1	0,2	1,6	0,3	0,6	0,1
1000	1,00	0,250	31,8	3,3	11,1	1,2	25,5	2,7	8,8	0,9	19,1	2,0	6,6	0,7	12,7	1,3	4,4	0,5	6,4	0,7	2,2	0,2	3,2	0,3	1,1	0,1	1,6	0,2	0,6	0,1
750	0,75	0,188	31,8	2,5	11,1	0,9	25,5	2,0	8,8	0,7	19,1	1,5	6,6	0,5	12,7	1,0	4,4	0,35	6,4	0,5	2,2	0,2	3,2	0,3	1,1	0,1	1,6	0,1	0,6	0,1
600	0,60	0,150	31,8	2,0	11,1	0,7	25,5	1,6	8,8	0,6	19,1	1,2	6,6	0,4	12,7	0,8	4,4	0,3	6,4	0,4	2,2	0,1	3,2	0,2	1,1	0,1	1,6	0,1	0,6	0,1
500	0,50	0,125	31,8	1,7	11,1	0,6	25,5	1,3	8,8	0,5	19,1	1,0	6,6	0,3	12,7	0,7	4,4	0,2	6,4	0,3	2,2	0,1	3,2	0,2	1,1	0,1	1,6	0,1	0,6	0,1
300	0,30	0,075	31,8	1,0	11,1	0,3	25,5	0,8	8,8	0,3	19,1	0,6	6,6	0,2	12,7	0,4	4,4	0,1	6,4	0,2	2,2	0,1	3,2	0,1	1,1	0,1	1,6	0,1	0,6	0,1
100	0,10	0,025	31,8	0,3	11,1	0,1	25,5	0,3	8,8	0,1	19,1	0,2	6,6	0,1	12,7	0,1	4,4	0,1	6,4	0,1	2,2	0,1	3,2	0,1	1,1	0,1	1,6	0,1	0,6	0,1
50	0,05	0,013	31,8	0,2	11,1	0,1	25,5	0,1	8,8	0,1	19,1	0,1	6,6	0,1	12,7	0,1	4,4	0,1	6,4	0,1	2,2	0,1	3,2	0,1	1,1	0,1	1,6	0,1	0,6	0,1

M 5 spindle Tr 60x9

n	Lifting speed	F=150 [kN]				F=100 [kN]				F=80 [kN]				F=60 [kN]				F=40 [kN]				F=20 [kN]				F=10 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	1,50	0,375	125,7	19,7	42,6	6,7	83,8	13,2	28,4	4,5	67,0	10,5	22,7	3,6	50,3	7,9	17,1	2,7	33,5	5,3	11,4	1,8	16,8	2,6	5,7	0,9	8,4	1,3	2,8	0,4
1000	1,00	0,250	125,7	13,2	42,6	4,5	83,8	8,8	28,4	3,0	67,0	7,0	22,7	2,4	50,3	5,3	17,1	1,8	33,5	3,5	11,4	1,2	16,8	1,8	5,7	0,6	8,4	0,9	2,8	0,3
750	0,75	0,188	125,7	9,9	42,6	3,3	83,8	6,6	28,4	2,2	67,0	5,3	22,7	1,8	50,3	3,9	17,1	1,3	33,5	2,6	11,4	0,9	16,8	1,3	5,7	0,4	8,4	0,7	2,8	0,2
600	0,60	0,150	125,7	7,9	42,6	2,7	83,8	5,3	28,4	1,8	67,0	4,2	22,7	1,4	50,3	3,2	17,1	1,1	33,5	2,1	11,4	0,7	16,8	1,1	5,7	0,4	8,4	0,5	2,8	0,2
500	0,50	0,125	125,7	6,6	42,6	2,2	83,8	4,4	28,4	1,5	67,0	3,5	22,7	1,2	50,3	2,6	17,1	0,9	33,5	1,8	11,4	0,6	16,8	0,9	5,7	0,3	8,4	0,4	2,8	0,1
300	0,30	0,075	125,7	3,9	42,6	1,3	83,8	2,6	28,4	0,9	67,0	2,1	22,7	0,7	50,3	1,6	17,1	0,5	33,5	1,1	11,4	0,4	16,8	0,5	5,7	0,2	8,4	0,3	2,8	0,1
100	0,10	0,025	125,7	1,3	42,6	0,4	83,8	0,9	28,4	0,3	67,0	0,7	22,7	0,2	50,3	0,5	17,1	0,2	33,5	0,4	11,4	0,1	16,8	0,2	5,7	0,1	8,4	0,1	2,8	0,1
50	0,05	0,013	125,7	0,7	42,6	0,2	83,8	0,4	28,4	0,1	67,0	0,4	22,7	0,1	50,3	0,3	17,1	0,1	33,5	0,2	11,4	0,1	16,8	0,1	5,7	0,1	8,4	0,1	2,8	0,1

M 6 spindle Tr 80x10

n	Lifting speed	F=250 [kN]				F=200 [kN]				F=150 [kN]				F=100 [kN]				F=80 [kN]				F=60 [kN]				F=40 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	1,50	0,375	209,4	32,9	71,1	11,2	167,5	26,3	56,8	8,9	125,7	19,7	42,6	6,7	83,8	13,2	28,4	4,5	67,0	10,5	22,7	3,6	50,3	7,9	17,1	2,7	33,5	5,3	11,4	1,8
1000	1,00	0,250	209,4	21,9	71,1	7,4	167,5	17,5	56,8	6,0	125,7	13,2	42,6	4,5	83,8	8,8	28,4	3,0	67,0	7,0	22,7	2,4	50,3	5,3	17,1	1,8	33,5	3,5	11,4	1,2
750	0,75	0,188	209,4	16,4	71,1	5,6	167,5	13,2	56,8	4,5	125,7	9,9	42,6	3,3	83,8	6,6	28,4	2,2	67,0	5,3	22,7	1,8	50,3	3,9	17,1	1,3	33,5	2,6	11,4	0,9
600	0,60	0,150	209,4	13,2	71,1	4,5	167,5	10,5	56,8	3,6	125,7	7,9	42,6	2,7	83,8	5,3	28,4	1,8	67,0	4,2	22,7	1,4	50,3	3,2	17,1	1,1	33,5	2,1	11,4	0,7
500	0,50	0,125	209,4	11,0	71,1	3,7	167,5	8,8	56,8	3,0	125,7	6,6	42,6	2,2	83,8	4,4	28,4	1,5	67,0	3,5	22,7	1,2	50,3	2,6	17,1	0,9	33,5	1,8	11,4	0,6
300	0,30	0,075	209,4	6,6	71,1	2,2	167,5	5,3	56,8	1,8	125,7	3,9	42,6	1,3	83,8	2,6	28,4	0,9	67,0	2,1	22,7	0,7	50,3	1,6	17,1	0,5	33,5	1,1	11,4	0,4
100	0,10	0,025	209,4	2,2	71,1	0,7	167,5	1,8	56,8	0,6	125,7	1,3	42,6	0,4	83,8	0,9	28,4	0,3	67,0	0,7	22,7	0,2	50,3	0,5	17,1	0,2	33,5	0,4	11,4	0,1
50	0,05	0,013	209,4	1,1	71,1	0,4	167,5	0,9	56,8	0,3	125,7	0,7	42,6	0,2	83,8	0,4	28,4	0,1	67,0	0,4	22,7	0,1	50,3	0,3	17,1	0,1	33,5	0,2	11,4	0,1

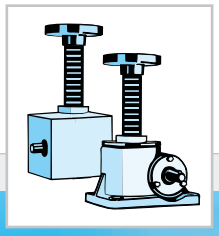
M 7 spindle Tr 100x10

n	Lifting speed	F=350 [kN]				F=300 [kN]				F=250 [kN]				F=200 [kN]				F=150 [kN]				F=100 [kN]				F=50 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	1,50	0,375	371,4	58,3	126,6	19,9	318,3	50,0	108,5	17,0	265,3	41,7	90,4	14,2	212,2	33,3	72,3	11,4	159,2	25,0	54,3	8,5	106,1	16,7	36,2	5,7	53,1	8,3	18,1	2,8
1000	1,00	0,250	371,4	38,9	126,6	13,3	318,3	33,3	108,5	11,4	265,3	27,8	90,4	9,5	212,2	22,2	72,3	7,6	159,2	16,7	54,3	5,7	106,1	11,1	36,2	3,8	53,1	5,6	18,1	1,9
750	0,75	0,188	371,4	29,2	126,6	9,9	318,3	25,0	108,5	8,5	265,3	20,8	90,4	7,1	212,2	16,7	72,3	5,7	159,2	12,5	54,3	4,3	106,1	8,3	36,2	2,8	53,1	4,2	18,1	1,4
600	0,60	0,150	371,4	23,3	126,6	8,0	318,3	20,0	108,5	6,8	265,3	16,7	90,4	5,7	212,2	13,3	72,3	4,5	159,2	10,0	54,3	3,4	106,1	6,7	36,2	2,3	53,1	3,3	18,1	1,1
500	0,50	0,125	371,4	19,4	126,6	6,6	318,3	16,7	108,5	5,7	265,3	13,9	90,4	4,7	212,2	11,1	72,3	3,8	159,2	8,3	54,3	2,8	106,1	5,6	36,2	1,9	53,1	2,8	18,1	0,9
300	0,30	0,075	371,4	11,7	126,6	4,0	318,3	10,0	108,5	3,4	265,3	8,3	90,4	2,8	212,2	6,7	72,3	2,3	159,2	5,0	54,3	1,7	106,1	3,3	36,2	1,1	53,1	1,7	18,1	0,6
100	0,10	0,025	371,4	3,9	126,6	1,3	318,3	3,3	108,5	1,1	265,3	2,8	90,4	0,9	212,2	2,2	72,3	0,8	159,2	1,7	54,3	0,6	106,1	1,1	36,2	0,4	53,1	0,6	18,1	0,2
50	0,05	0,013	371,4	1,9	126,6	0,7	318,3	1,7	108,5	0,6	265,3	1,4	90,4	0,5	212,2	1,1	72,3	0,4	159,2	0,8	54,3	0,3	106,1	0,6	36,2	0,2	53,1	0,3	18,1	0,1

20% ED / 1hr or 30% ED / 10min. and ambient temperature 20°C and ambient temp. 20°C

static only (dynamic not permitted)

10% ED/1hr and ambient temperature 20°C



3.3 Technical information

M 8 spindle Tr 120x14

n [1/min]	Lifting speed [m/min.]		F=500 [kN]				F=400 [kN]				F=300 [kN]				F=200 [kN]				F=150 [kN]				F=100 [kN]				F=50 [kN]			
	N	L	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	1,00	0,250	531	55,6	181	18,9	424	44,4	145	15,2	318	33,3	108	11,4	212	22,2	72	7,6	159	16,7	54	5,7	106	11,1	36	3,8	53	5,6	18	1,9
750	0,75	0,188	531	41,7	181	14,2	424	33,3	145	11,4	318	25,0	108	8,5	212	16,7	72	5,7	159	12,5	54	4,3	106	8,3	36	2,8	53	4,2	18	1,4
600	0,60	0,150	531	33,3	181	11,4	424	26,7	145	9,1	318	20,0	108	6,8	212	13,3	72	4,5	159	10,0	54	3,4	106	6,7	36	2,3	53	3,3	18	1,1
500	0,50	0,125	531	27,8	181	9,5	424	22,2	145	7,6	318	16,7	108	5,7	212	11,1	72	3,8	159	8,3	54	2,8	106	5,6	36	1,9	53	2,8	18	0,9
300	0,30	0,075	531	16,7	181	5,7	424	13,3	145	4,5	318	10,0	108	3,4	212	6,7	72	2,3	159	5,0	54	1,7	106	3,3	36	1,1	53	1,7	18	0,6
100	0,10	0,025	531	5,6	181	1,9	424	4,4	145	1,5	318	3,3	108	1,1	212	2,2	72	0,8	159	1,7	54	0,6	106	1,1	36	0,4	53	0,6	18	0,2
50	0,05	0,013	531	2,8	181	0,9	424	2,2	145	0,8	318	1,7	108	0,6	212	1,1	72	0,4	159	0,8	54	0,3	106	0,6	36	0,2	53	0,3	18	0,1

3.3.3.3 HSE range

Turning speed, power requirement and permitted lifting speed for ratio N and L with single-threaded, lifting (Type 1) trapezoidal spindle. All performance data are expressed in terms of dynamic lifting force. With load factors of <10%/hr or configuration with rotating spindle (Type 2), the maximum permitted drive capacities can be increased. Please consult our drive-system specialists if this is the case.

HSE 31 spindle Tr 18x4

n [1/min]	Lifting speed [m/min.]		F=5 [kN]				F=4,5 [kN]				F=4 [kN]				F=3,5 [kN]				F=3 [kN]				F=2 [kN]				F=1 [kN]			
	N	L	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	3,0	0,750	2,3	0,7	0,8	0,3	2,0	0,7	0,7	0,2	1,8	0,6	0,6	0,2	1,6	0,5	0,5	0,2	1,4	0,5	0,5	0,2	0,9	0,3	0,3	0,1	0,5	0,2	0,2	0,1
2500	2,5	0,625	2,3	0,6	0,8	0,2	2,0	0,6	0,7	0,2	1,8	0,5	0,6	0,2	1,6	0,4	0,5	0,2	1,4	0,4	0,5	0,1	0,9	0,3	0,3	0,1	0,5	0,2	0,2	0,1
2000	2,0	0,500	2,3	0,5	0,8	0,2	2,1	0,5	0,7	0,2	1,9	0,4	0,6	0,2	1,6	0,4	0,6	0,1	1,4	0,3	0,5	0,1	0,9	0,2	0,3	0,1	0,5	0,1	0,2	0,1
1500	1,5	0,375	2,3	0,4	0,8	0,2	2,1	0,4	0,7	0,2	1,9	0,3	0,7	0,1	1,6	0,3	0,6	0,1	1,4	0,2	0,5	0,1	0,9	0,2	0,3	0,1	0,5	0,1	0,2	0,1
1000	1,0	0,250	2,4	0,3	0,9	0,1	2,1	0,3	0,8	0,1	1,9	0,2	0,7	0,1	1,7	0,2	0,6	0,1	1,4	0,2	0,5	0,1	1,0	0,1	0,4	0,1	0,5	0,1	0,2	0,1
750	0,75	0,188	2,4	0,2	0,9	0,1	2,2	0,2	0,8	0,1	1,9	0,2	0,7	0,1	1,7	0,2	0,6	0,1	1,5	0,1	0,6	0,1	1,0	0,1	0,4	0,1	0,5	0,1	0,2	0,1
500	0,50	0,125	2,5	0,2	1,0	0,1	2,2	0,1	0,9	0,1	2,0	0,1	0,8	0,1	1,7	0,1	0,7	0,1	1,5	0,1	0,6	0,1	1,0	0,1	0,4	0,1	0,5	0,1	0,2	0,1
300	0,30	0,075	2,5	0,1	1,0	0,1	2,3	0,1	0,9	0,1	2,0	0,1	0,8	0,1	1,8	0,1	0,7	0,1	1,5	0,1	0,6	0,1	1,0	0,1	0,4	0,1	0,5	0,1	0,2	0,1
100	0,10	0,025	2,6	0,1	1,1	0,1	2,4	0,1	1,0	0,1	2,1	0,1	0,9	0,1	1,9	0,1	0,8	0,1	1,6	0,1	0,7	0,1	1,1	0,1	0,5	0,1	0,5	0,1	0,2	0,1
50	0,05	0,013	2,7	0,1	1,1	0,1	2,4	0,1	1,0	0,1	2,1	0,1	0,9	0,1	1,9	0,1	0,8	0,1	1,6	0,1	0,7	0,1	1,1	0,1	0,5	0,1	0,5	0,1	0,2	0,1

HSE 36 spindle Tr 22x5

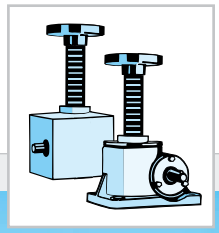
n [1/min]	Lifting speed [m/min.]		F=10 [kN]				F=9 [kN]				F=8 [kN]				F=7 [kN]				F=6 [kN]				F=4 [kN]				F=2 [kN]			
	N	L	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	3,0	0,750	4,4	1,4	1,5	0,5	4,0	1,3	1,3	0,4	3,5	1,1	1,2	0,4	3,1	1,0	1,0	0,4	2,7	0,9	0,9	0,3	1,8	0,6	0,6	0,2	0,9	0,3	0,3	0,1
2500	2,5	0,625	4,4	1,2	1,5	0,4	4,0	1,1	1,3	0,4	3,5	1,0	1,2	0,3	3,1	0,8	1,0	0,3	2,7	0,7	0,9	0,3	1,8	0,5	0,6	0,2	0,9	0,3	0,3	0,1
2000	2,0	0,500	4,5	1,0	1,5	0,3	4,0	0,9	1,4	0,3	3,6	0,8	1,2	0,3	3,1	0,7	1,1	0,3	2,7	0,6	0,9	0,2	1,8	0,4	0,6	0,2	0,9	0,2	0,3	0,1
1500	1,5	0,375	4,5	0,7	1,6	0,3	4,1	0,7	1,4	0,3	3,6	0,6	1,3	0,2	3,2	0,5	1,1	0,2	2,7	0,5	1,0	0,2	1,8	0,3	0,6	0,1	0,9	0,2	0,3	0,1
1000	1,0	0,250	4,6	0,5	1,7	0,2	4,2	0,5	1,5	0,2	3,7	0,4	1,3	0,2	3,3	0,4	1,2	0,2	2,8	0,3	1,0	0,1	1,9	0,2	0,7	0,1	0,9	0,1	0,3	0,1
750	0,75	0,188	4,7	0,4	1,7	0,2	4,3	0,4	1,6	0,2	3,8	0,3	1,4	0,1	3,3	0,3	1,2	0,1	2,8	0,2	1,0	0,1	1,9	0,2	0,7	0,1	1,0	0,1	0,4	0,1
500	0,50	0,125	4,9	0,3	1,8	0,1	4,4	0,3	1,7	0,1	3,9	0,2	1,5	0,1	3,4	0,2	1,3	0,1	2,9	0,2	1,1	0,1	2,0	0,1	0,7	0,1	1,0	0,1	0,4	0,1
300	0,30	0,075	5,0	0,2	2,0	0,1	4,5	0,2	1,8	0,1	4,0	0,2	1,6	0,1	3,5	0,1	1,4	0,1	3,0	0,1	1,2	0,1	2,0	0,1	0,8	0,1	1,0	0,1	0,4	0,1
100	0,10	0,025	5,2	0,1	2,1	0,1	4,7	0,1	1,9	0,1	4,2	0,1	1,7	0,1	3,7	0,1	1,5	0,1	3,1	0,1	1,3	0,1	2,1	0,1	0,9	0,1	1,1	0,1	0,4	0,1
50	0,05	0,013	5,3	0,1	2,2	0,1	4,8	0,1	2,0	0,1	4,3	0,1	1,8	0,1	3,7	0,1	1,6	0,1	3,2	0,1	1,3	0,1	2,1	0,1	0,9	0,1	1,1	0,1	0,4	0,1

20% ED / 1hr or 30% ED / 10min. and ambient temperature 20°C and ambient temp. 20°C

static only (dynamic not permitted)

10% ED/1hr and ambient temperature 20°C

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.3 Technical information

HSE 50 spindle Tr 40x8

n	Lifting speed	F=25 [kN]				F=22,5 [kN]				F=20,00 [kN]				F=17,5 [kN]				F=15 [kN]				F=10 [kN]				F=5 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	4,00	1,000	15,4	4,8	4,9	1,5	13,8	4,3	4,4	1,4	12,3	3,9	3,9	1,2	10,8	3,4	3,4	1,1	9,2	2,9	2,9	0,9	6,2	1,9	2,0	0,6	3,1	1,0	1,0	0,3
2500	3,33	0,833	15,5	4,1	5,0	1,3	13,9	3,6	4,5	1,2	12,4	3,2	4,0	1,0	10,8	2,8	3,5	0,9	9,3	2,4	3,0	0,8	6,2	1,6	2,0	0,5	3,1	0,8	1,0	0,3
2000	2,67	0,667	15,6	3,3	5,1	1,1	14,0	2,9	4,6	1,0	12,5	2,6	4,1	0,8	10,9	2,3	3,5	0,7	9,4	2,0	3,0	0,6	6,2	1,3	2,0	0,4	3,1	0,7	1,0	0,2
1500	2,00	0,500	15,8	2,5	5,2	0,8	14,2	2,2	4,7	0,7	12,6	2,0	4,2	0,7	11,1	1,7	3,7	0,6	9,5	1,5	3,1	0,5	6,3	1,0	2,1	0,3	3,2	0,5	1,0	0,2
1000	1,33	0,333	16,1	1,7	5,5	0,6	14,5	1,5	5,0	0,5	12,9	1,4	4,4	0,5	11,3	1,2	3,9	0,4	9,7	1,0	3,3	0,3	6,5	0,7	2,2	0,2	3,2	0,3	1,1	0,1
750	1,00	0,250	16,4	1,3	5,8	0,5	14,8	1,2	5,2	0,4	13,1	1,0	4,6	0,4	11,5	0,9	4,1	0,3	9,9	0,8	3,5	0,3	6,6	0,5	2,3	0,2	3,3	0,3	1,2	0,1
500	0,67	0,167	16,8	0,9	6,2	0,3	15,2	0,8	5,6	0,3	13,5	0,7	4,9	0,3	11,8	0,6	4,3	0,2	10,1	0,5	3,7	0,2	6,7	0,3	2,5	0,1	3,4	0,2	1,2	0,1
300	0,40	0,100	17,4	0,5	6,6	0,2	15,7	0,5	6,0	0,2	13,9	0,4	5,3	0,2	12,2	0,4	4,6	0,1	10,4	0,3	4,0	0,1	7,0	0,2	2,7	0,1	3,5	0,1	1,3	0,1
100	0,13	0,033	18,4	0,2	7,5	0,1	16,5	0,2	6,7	0,1	14,7	0,1	6,0	0,1	12,9	0,1	5,2	0,1	11,0	0,1	4,5	0,1	7,3	0,1	3,0	0,1	3,7	0,1	1,5	0,1
50	0,07	0,017	18,7	0,1	7,7	0,1	16,9	0,1	6,9	0,1	15,0	0,1	6,2	0,1	13,1	0,1	5,4	0,1	11,2	0,1	4,6	0,1	7,5	0,1	3,1	0,1	3,7	0,1	1,5	0,1

HSE 63 spindle Tr 50x9

n	Lifting speed	F=50 [kN]				F=40 [kN]				F=30 [kN]				F=20 [kN]				F=10 [kN]				F=5 [kN]				F=2,5 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	3,86	0,964	31,5	9,9	10,2	3,2	25,2	7,9	8,1	2,6	18,9	5,9	6,1	1,9	12,6	4,0	4,1	1,3	6,3	2,0	2,0	0,6	3,1	1,0	1,0	0,3	1,6	0,5	0,5	0,2
2500	3,21	0,804	31,7	8,3	10,3	2,7	25,3	6,6	8,3	2,2	19,0	5,0	6,2	1,6	12,7	3,3	4,1	1,1	6,3	1,7	2,1	0,5	3,2	0,8	1,0	0,3	1,6	0,4	0,5	0,1
2000	2,57	0,643	31,9	6,7	10,5	2,2	25,5	5,3	8,4	1,8	19,1	4,0	6,3	1,3	12,7	2,7	4,2	0,9	6,4	1,3	2,1	0,4	3,2	0,7	1,0	0,2	1,6	0,3	0,5	0,1
1500	1,93	0,482	32,3	5,1	10,8	1,7	25,8	4,1	8,7	1,4	19,4	3,0	6,5	1,0	12,9	2,0	4,3	0,7	6,5	1,0	2,2	0,3	3,2	0,5	1,1	0,2	1,6	0,3	0,5	0,1
1000	1,29	0,321	33,0	3,5	11,5	1,2	26,4	2,8	9,2	1,0	19,8	2,1	6,9	0,7	13,2	1,4	4,6	0,5	6,6	0,7	2,3	0,2	3,3	0,3	1,1	0,1	1,7	0,2	0,6	0,1
750	0,96	0,241	33,6	2,6	12,1	0,9	26,9	2,1	9,7	0,8	20,1	1,6	7,2	0,6	13,4	1,1	4,8	0,4	6,7	0,5	2,4	0,2	3,4	0,3	1,2	0,1	1,7	0,1	0,6	0,1
500	0,64	0,161	34,6	1,8	13,0	0,7	27,7	1,4	10,4	0,5	20,8	1,1	7,8	0,4	13,8	0,7	5,2	0,3	6,9	0,4	2,6	0,1	3,5	0,2	1,3	0,1	1,7	0,1	0,7	0,1
300	0,39	0,096	36,1	1,1	14,3	0,4	28,9	0,9	11,4	0,3	21,7	0,7	8,6	0,2	14,4	0,4	5,7	0,2	7,2	0,2	2,9	0,1	3,6	0,1	1,4	0,1	1,8	0,1	0,7	0,1
100	0,13	0,032	38,9	0,4	16,6	0,1	31,1	0,3	13,3	0,1	23,3	0,2	10,0	0,1	15,6	0,2	6,6	0,1	7,8	0,1	3,3	0,1	3,9	0,1	1,7	0,1	1,9	0,1	0,8	0,1
50	0,06	0,016	40,0	0,2	17,5	0,1	32,0	0,2	14,0	0,1	24,0	0,1	10,5	0,1	16,0	0,1	7,0	0,1	8,0	0,1	3,5	0,1	4,0	0,1	1,8	0,1	2,0	0,1	0,9	0,1

HSE 80 spindle Tr 60x12

n	Lifting speed	F=100 [kN]				F=80 [kN]				F=60 [kN]				F=40 [kN]				F=20 [kN]				F=10 [kN]				F=5 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	4,500	1,125	67,7	21,3	21,7	6,8	54,2	17,0	17,3	5,5	40,6	12,8	13,0	4,1	27,1	8,5	8,7	2,7	13,6	4,3	4,3	1,4	6,8	2,2	2,2	0,7	3,4	1,1	1,1	0,4
2500	3,750	0,938	68,0	17,8	21,9	5,8	54,4	14,3	17,5	4,6	40,8	10,7	13,2	3,5	27,2	7,1	8,8	2,3	13,6	3,6	4,4	1,2	6,8	1,8	2,2	0,6	3,4	0,9	1,1	0,3
2000	3,000	0,750	68,4	14,4	22,3	4,7	54,8	11,5	17,9	3,8	41,1	8,6	13,4	2,8	27,4	5,8	9,0	1,9	13,7	2,9	4,5	1,0	6,9	1,5	2,3	0,5	3,4	0,8	1,1	0,3
1500	2,250	0,563	69,2	10,9	23,0	3,6	55,4	8,7	18,4	2,9	41,6	6,5	13,8	2,2	27,7	4,4	9,2	1,5	13,9	2,2	4,6	0,8	6,9	1,1	2,3	0,4	3,5	0,6	1,2	0,2
1000	1,500	0,375	70,7	7,4	24,4	2,6	56,6	5,9	19,5	2,1	42,5	4,5	14,6	1,6	28,3	3,0	9,8	1,1	14,2	1,5	4,9	0,6	7,1	0,8	2,5	0,3	3,6	0,4	1,2	0,2
750	1,125	0,281	72,1	5,7	25,7	2,0	57,7	4,6	20,5	1,6	43,3	3,4	15,4	1,2	28,9	2,3	10,3	0,8	14,4	1,2	5,1	0,4	7,2	0,6	2,6	0,2	3,6	0,3	1,3	0,1
500	0,750	0,188	74,6	3,9	27,9	1,5	59,7	3,1	22,3	1,2	44,8	2,4	16,7	0,9	29,9	1,6	11,2	0,6	14,9	0,8	5,6	0,3	7,5	0,4	2,8	0,2	3,7	0,2	1,4	0,1
300	0,450	0,113	78,3	2,5	31,3	1,0	62,7	2,0	25,0	0,8	47,0	1,5	18,8	0,6	31,4	1,0	12,5	0,4	15,7	0,5	6,3	0,2	7,9	0,3	3,2	0,1	3,9	0,1	1,6	0,1
100	0,150	0,038	86,2	0,9	38,3	0,4	69,0	0,7	30,6	0,3	51,8	0,6	23,0	0,3	34,5	0,4	15,3	0,2	17,3	0,2	7,7	0,1	8,6	0,1	3,8	0,1	4,3	0,1	1,9	0,1
50	0,075	0,019	89,7	0,5	41,3	0,2	71,8	0,4	33,0	0,2	53,8	0,3	24,8	0,2	35,9	0,2	16,5	0,1	18,0	0,1	8,3	0,1	9,0	0,1	4,2	0,1	4,5	0,1	2,1	0,1

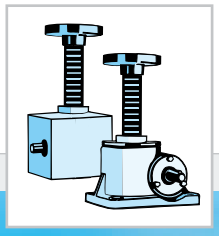
HSE 100 spindle Tr 70x12

n	Lifting speed	F=200 [kN]				F=160 [kN]				F=120 [kN]				F=100 [kN]				F=75 [kN]				F=50 [kN]				F=25 [kN]			
[1/min]	[m/min.]	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
	N	L	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	4,500	1,125	148	46,4	45,9	14,4	118	37,1	36,7	11,6	88,6	27,9	27,6	8,7	73,9	23,2	23,0	7,2	55,4	17,4	17,2	5,4	37,0	11,6	11,5	3,6	18,5	5,8	5,8	1,8
2500	3,750	0,938	148	38,8	46,3	12,1	119	31,1	37,0	9,7	88,9	23,3	27,8	7,3	74,1	19,4	23,2	6,1	55,6	14,6	17,4	4,6	37,1	9,7	11,6	3,0	18,6	4,9	5,8	1,6
2000	3,000	0,750	149	31,2	46,9	9,9	119	25,0	37,5	7,9	89,3	18,7	28,1	5,9	74,4	15,6	23,5	4,9	55,8	11,7	17,6	3,7	37,2	7,8	11,7	2,5	18,6	3,9	5,9	1,3
1500	2,250	0,563	150	23,6	48,0	7,6	120	18,9	38,4	6,0	90,0	14,2	28,8	4,6	75,1	11,8	24,0	3,8	56,3	8,9	18,0	2,9	37,5	5,9	12,0	1,9	18,8	3,0	6,0	1,0
1000	1,500	0,375	153	16,0	50,3	5,3	122	12,8	40,2	4,2	91,6	9,6	30,2	3,2	76,3	8,0	25,2	2,7	57,3	6,0	18,9	2,0	38,2	4,0	12,6	1,3	19,1	2,0	6,3	0,7
750	1,125	0,281	155	12,2	52,6	4,2	124	9,8	42,1	3,3	93,1	7,3	31,6	2,5	77,6	6,1	26,3	2,1	58,2	4,6	19,7	1,6	38,8	3,1	13,2	1,0	19,4	1,6	6,6	0,6
500	0,750	0,188	160	8,4	56,9	3,0	128	6,7	45,5	2,4	96,0	5,1	34,2	1,8	80,0	4,2	28,5	1,5	60,0	3,2	21,4	1,1	40,0	2,1	14,2	0,8	20,0	1,1	7,1	0,4
300	0,450	0,113	168	5,3	63,9	2,0	134	4,2	51,2	1,6	101	3,2	38,4	1,2	83,9	2,7	32,0	1,0	62,9	2,0	24,0	0,8	42,0	1,4	16,0	0,5	21,0	0,7	8,0	0,3
100	0,150	0,038	187	2,0	80,8	0,9	150	1,6	64,6	0,7	112	1,2	48,5	0,6	93,3	1,0	40,4	0,5	70,0	0,8	30,3	0,4	46,7	0,5	20,2	0,2	23,4	0,3	10,1	0,2
50	0,075	0,019	196	1,1	88,9	0,5	157	0,8	71,1	0,4	118	0,6	53,4	0,3	98,0	0,6	44,5	0,3	73,5	0,4	33,4	0,2	49,0	0,3	22,2	0,2	24,5	0,2	11,1	0,2

20% ED / 1hr or 30% ED / 10min. and ambient temperature 20°C and ambient temp. 20°C

static only (dynamic not permitted)

10% ED/1hr and ambient temperature 20°C



3.3 Technical information

HSE 125 spindle Tr 100x16

n [1/min]	Lifting speed [m/min.]		F=350 [kN]				F=300 [kN]				F=250 [kN]				F=200 [kN]				F=150 [kN]				F=100 [kN]				F=50 [kN]			
	N	L	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	4,50	1,50	271	85	106	33	232	73	91	29	194	61	76	24	155	49	61	19	116	37	45	15	78	25	30	9,5	39	13	15	4,8
2500	3,75	1,25	272	71	106	28	233	61	91	24	194	51	76	20	155	41	61	16	117	31	46	12	78	21	30	8,0	39	11	15	4,0
2000	3,00	1,00	273	57	107	23	234	49	92	19	195	41	77	16	156	33	62	13	117	25	46	9,6	78	17	31	6,4	39	8,2	15	3,2
1500	2,25	0,75	275	43	109	17	236	37	93	15	196	31	78	13	157	25	62	9,8	118	19	47	7,4	79	13	31	4,9	39	6,2	16	2,5
1000	1,50	0,50	279	29	113	12	239	25	97	10	199	21	81	8,5	159	17	65	6,8	120	13	49	5,1	80	8,4	32	3,4	40	4,2	16	1,7
750	1,13	0,38	284	23	117	9,2	243	19	100	7,9	203	16	84	6,6	162	13	67	5,3	122	9,6	50	4,0	81	6,4	34	2,7	41	3,2	17	1,4
500	0,75	0,25	292	16	126	6,6	251	13	108	5,7	209	11	90	4,7	167	8,8	72	3,8	126	6,6	54	2,8	84	4,4	36	1,9	42	2,2	18	1,0
300	0,45	0,15	308	10	140	4,4	264	8,3	120	3,8	220	6,9	100	3,2	176	5,6	80	2,6	132	4,2	60	1,9	88	2,8	40	1,3	44	1,4	20	0,7
100	0,15	0,05	349	3,7	178	1,9	299	3,2	153	1,6	250	2,7	127	1,4	200	2,1	102	1,1	150	1,6	77	0,8	100	1,1	51	0,6	50	0,6	26	0,3
50	0,08	0,03	372	2,0	198	1,1	318	1,7	170	0,9	265	1,4	142	0,8	212	1,2	114	0,6	160	0,9	85	0,5	106	0,6	57	0,3	53	0,3	29	0,2

HSE 140 spindle Tr 120x16

n [1/min]	Lifting speed [m/min.]		F=500 [kN]				F=400 [kN]				F=300 [kN]				F=250 [kN]				F=200 [kN]				F=150 [kN]				F=100 [kN]			
	N	L	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	4,50	1,50	438	138	169	53	351	110	135	43	263	83	102	32	219	69	85	27	176	55	68	22	132	42	51	16	88	28	34	11
2500	3,75	1,25	439	115	170	45	352	92	136	36	264	69	102	27	220	58	85	23	176	46	68	18	132	35	51	14	88	23	34	8,9
2000	3,00	1,00	441	93	171	36	353	74	137	29	265	56	103	22	221	46	86	18	177	37	69	15	132	28	52	11	88	19	34	7,2
1500	2,25	0,75	443	70	174	28	355	56	139	22	266	42	104	17	222	35	87	14	177	28	70	11	133	21	52	8,2	89	14	35	5,5
1000	1,50	0,50	449	47	179	19	359	38	143	15	270	29	108	12	225	24	90	9,4	180	19	72	7,5	135	14	54	5,7	90	9,4	36	3,8
750	1,13	0,38	455	36	185	15	364	29	148	12	273	22	111	8,7	228	18	93	7,3	182	15	74	5,8	137	11	56	4,4	91	7,2	37	2,9
500	0,75	0,25	468	25	197	10	374	20	157	8,3	281	15	118	6,2	234	12	99	5,2	187	9,8	79	4,2	141	7,4	59	3,1	94	4,9	40	2,1
300	0,45	0,15	491	16	219	6,9	393	13	175	5,5	295	9,3	131	4,2	246	7,8	109	3,5	197	6,2	88	2,8	148	4,7	66	2,1	98	3,1	44	1,4
100	0,15	0,05	559	5,9	281	3,0	447	4,7	225	2,4	336	3,6	169	1,8	280	3,0	141	1,5	224	2,4	113	1,2	168	1,8	85	0,9	112	1,2	56	0,6
50	0,08	0,03	598	3,2	316	1,7	478	2,5	253	1,4	359	1,9	190	1,0	299	1,6	158	0,9	239	1,3	127	0,7	180	1,0	95	0,5	120	0,7	63	0,4

HSE 200 spindle Tr 160x20

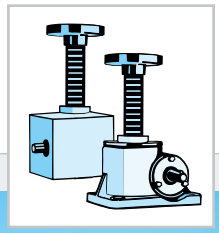
n [1/min]	Lifting speed [m/min.]		F=1000 [kN]				F=800 [kN]				F=600 [kN]				F=400 [kN]				F=200 [kN]				F=100 [kN]				F=50 [kN]			
	N	L	N		L		N		L		N		L		N		L		N		L		N		L		N		L	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	4,50	1,50	905	284	342	108	724	228	274	86	543	171	205	65	362	114	137	43	181	57	69	22	91	29	34	11	46	15	17	5,4
2500	3,75	1,25	906	237	343	90	725	190	274	72	544	143	206	54	362	95	137	36	181	48	69	18	91	24	34	9,0	46	12	17	4,5
2000	3,00	1,00	907	190	344	72	726	152	275	58	545	114	207	44	363	76	138	29	182	38	69	15	91	19	35	7,2	46	10	17	3,6
1500	2,25	0,75	911	143	347	55	729	115	278	44	547	86	208	33	364	58	139	22	182	29	70	11	91	15	35	5,5	46	7,2	18	2,8
1000	1,50	0,50	919	96	354	37	735	77	283	30	551	58	213	23	368	39	142	15	184	19	71	7,5	92	10	36	3,8	46	4,8	18	1,9
750	1,13	0,38	928	73	363	29	742	59	290	23	557	44	218	17	371	29	145	12	186	15	73	5,7	93	7,3	37	2,9	47	3,7	18	1,5
500	0,75	0,25	947	50	381	20	758	40	305	16	569	30	229	12	379	20	153	8,0	190	10	77	4,0	95	5,0	38	2,0	48	2,5	19	1,0
300	0,45	0,15	988	31	419	13	790	25	335	11	593	19	252	7,9	395	13	168	5,3	198	6,3	84	2,7	99	3,1	42	1,4	50	1,6	21	0,7
100	0,15	0,05	1128	12	550	5,8	903	9,5	440	4,7	677	7,1	330	3,5	452	4,8	220	2,3	226	2,4	110	1,2	113	1,2	55	0,6	57	0,6	28	0,3
50	0,08	0,03	1223	6,4	637	3,4	978	5,1	509	2,7	734	3,9	382	2,0	489	2,6	255	1,4	245	1,3	128	0,7	123	0,7	64	0,4	61	0,3	32	0,2

20% ED / 1hr or 30% ED / 10min. and ambient temperature 20°C and ambient temp. 20°C

static only (dynamic not permitted)

10% ED/1hr and ambient temperature 20°C

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.3 Technical information

3.3.3.4 SHG range

Turning speed, power requirement and permitted lifting speed for ratio 2:1 and 3:1 with single-threaded, lifting **(Type 1)** trapezoidal spindle. All performance data are expressed in terms of dynamic lifting force. With load factors of <10%/hr or configuration with rotating spindle **(Type 2)**, the maximum permitted drive capacities can be increased. Please consult our drive-system specialists if this is the case.

G 15 spindle Tr 24x5

n	Lifting speed	F=15 [kN]				F=12,5 [kN]				F=10 [kN]				F=7,5 [kN]				F=5 [kN]				F=2,5 [kN]				F=1 [kN]			
[1/min]	[m/min.]	2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1	
	2:1	3:1	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	7,5	5	16	4,6	12	3,2	14	3,9	10	2,8	11	3,2	8	2,3	8,9	2,6	6,4	1,9	6,5	1,9	5	1,4	4,1	1,2	3,2	1	2,7	0,8	2,3	0,7
2250	5,6	3,75	16	3,5	12	2,4	14	3	10	2,1	11	2,4	8	1,8	8,9	1,9	6,4	1,4	6,5	1,4	5	1,1	4,1	0,9	3,2	0,7	2,7	0,6	2,3	0,5
1500	3,75	2,5	16	2,3	12	1,6	14	2	10	1,4	11	1,6	8	1,2	8,9	1,3	6,4	1	6,5	1	5	0,7	4,1	0,6	3,2	0,5	2,7	0,4	2,3	0,4
1000	2,5	1,67	16	1,6	12	1,1	14	1,3	10	1	11	1,1	8	0,8	8,9	0,9	6,4	0,7	6,5	0,7	5	0,5	4,1	0,4	3,2	0,4	2,7	0,3	2,3	0,3
750	1,88	1,25	16	1,2	12	0,8	14	1	10	0,7	11	0,8	8	0,6	8,9	0,7	6,4	0,5	6,5	0,5	5	0,4	4,1	0,3	3,2	0,3	2,7	0,2	2,3	0,2
500	1,25	0,83	16	0,8	12	0,6	14	0,7	10	0,5	11	0,6	8	0,4	8,9	0,5	6,4	0,3	6,5	0,4	5	0,3	4,1	0,2	3,2	0,2	2,7	0,2	2,3	0,1
250	0,63	0,42	16	0,4	12	0,3	14	0,4	10	0,3	11	0,3	8	0,2	8,9	0,3	6,4	0,2	6,5	0,2	5	0,2	4,1	0,1	3,2	0,1	2,7	0,1	2,3	0,1

G 25 spindle Tr 35x8

n	Lifting speed	F=25 [kN]				F=20 [kN]				F=15 [kN]				F=10 [kN]				F=5 [kN]				F=2,5 [kN]				F=1 [kN]			
[1/min]	[m/min.]	2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1	
	2:1	3:1	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	12	8	40	13	28	8,6	33	10	23	7	25	7,8	18	5,6	18	5,5	13	3,9	10	3,2	8	2,4	7	2	6	1,6	5	1,3	4	1,1
2250	9	6	40	9,4	28	6,5	33	7,7	23	5,4	25	5,9	18	4,2	18	4,2	13	3	10	2,4	8	1,9	7	1,6	6	1,3	5	1	4	0,9
1500	6	4	40	6,3	28	4,4	33	5,2	23	3,6	25	4	18	2,8	18	2,8	13	2,1	10	1,7	8	1,3	7	1,1	6	0,9	5	0,7	4	0,7
1000	4	2,6	40	4,2	28	2,9	33	3,5	23	2,4	25	2,7	18	1,9	18	1,9	13	1,4	10	1,1	8	0,9	7	0,7	6	0,6	5	0,5	4	0,5
750	3	2	40	3	28	2,1	33	2,5	23	1,7	25	1,9	18	1,3	18	1,3	13	0,9	10	0,7	8	0,5	7	0,4	6	0,3	5	0,3	4	0,2
500	2	1,3	40	2	28	1,4	33	1,6	23	1,1	25	1,3	18	0,9	18	0,9	13	0,6	10	0,5	8	0,4	7	0,3	6	0,2	5	0,2	4	0,2
250	1	0,6	40	1,1	28	0,7	33	0,9	23	0,6	25	0,7	18	0,5	18	0,5	13	0,4	10	0,3	8	0,2	7	0,2	6	0,2	5	0,1	4	0,1

G 50 spindle Tr 40x7

n	Lifting speed	F=50 [kN]				F=30 [kN]				F=20 [kN]				F=15 [kN]				F=10 [kN]				F=5 [kN]				F=2,5 [kN]			
[1/min]	[m/min.]	2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1	
	2:1	3:1	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	10,5	7	80	22	54	15	48	14	33	9,3	33	9,3	23	6,4	26	7,1	18	5	18	5	13	3,5	11	2,8	8	2,1	7	1,8	5,2	1,4
2250	7,9	5,25	80	16	54	11	48	10	33	7	33	7	23	4,8	26	5,4	18	3,7	18	3,7	13	2,7	11	2,1	8	1,6	7	1,3	5,2	1,1
1500	5,2	3,5	80	11	54	7,5	48	6,8	33	4,7	33	4,7	23	3,2	26	3,6	18	2,5	18	2,5	13	1,8	11	1,4	8	1,1	7	0,9	5,2	0,7
1000	3,5	2,3	80	7,5	54	5	48	4,6	33	3,1	33	3,1	23	2,2	26	2,4	18	1,7	18	1,7	13	1,2	11	1	8	0,7	7	0,6	5,2	0,5
750	2,6	1,75	80	5	54	3,8	48	3,4	33	2,3	33	2,4	23	1,6	26	1,8	18	1,3	18	1,3	13	0,9	11	0,7	8	0,6	7	0,5	5,2	0,4
500	1,75	1,17	80	3,8	54	2,5	48	2,3	33	1,6	33	1,6	23	1,1	26	1,2	18	0,9	18	0,9	13	0,6	11	0,5	8	0,4	7	0,3	5,2	0,3
250	0,87	0,58	80	1,9	54	1,4	48	1,2	33	0,8	33	0,8	23	0,6	26	0,6	18	0,5	18	0,5	13	0,3	11	0,3	8	0,2	7	0,2	5,2	0,2

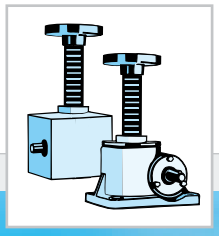
G 90 spindle Tr 60x9

n	Lifting speed	F=90 [kN]				F=75 [kN]				F=50 [kN]				F=25 [kN]				F=10 [kN]				F=5 [kN]				F=2,5 [kN]			
[1/min]	[m/min.]	2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1		2:1		3:1	
	2:1	3:1	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	13,5	9	207	58	140	39	174	49	118	33	119	33	81	22	63	17	44	12	30	7,6	22	5,5	19	4,5	14	3,4	14	2,9	10	2,4
2250	10,1	6,75	207	44	140	29	174	37	118	25	119	25	81	17	63	13	44	8,9	30	5,7	22	4,1	19	3,4	14	2,6	14	2,2	10	1,8
1500	6,75	4,5	207	29	140	20	174	24	118	16	119	16	81	11	63	8,5	44	5,9	30	3,8	22	2,8	19	2,3	14	1,7	14	1,5	10	1,2
1000	4,5	3	207	19	140	13	174	16	118	11	119	11	81	7,5	63	5,7	44	4	30	2,6	22	1,9	19	1,5	14	1,2	14	1	10	0,8
750	3,37	2,25	207	15	140	10	174	12	118	8,2	119	8,2	81	5,6	63	4,3	44	3	30	1,9	22	1,4	19	1,1	14	0,9	14	0,8	10	0,6
500	2,25	1,5	207	9,7	140	6,6	174	8,1	118	5,5	119	5,5	81	3,8	63	2,9	44	2	30	1,3	22	1	19	0,8	14	0,6	14	0,5	10	0,4
250	1,12	0,75	207	4,9	140	3,3	174	4,1	118	2,8	119	2,8	81	1,9	63	1,5	44	1	30	0,7	22	0,5	19	0,4	14	0,3	14	0,3	10	0,2

20% ED / 1hr or 30% ED / 10min. and ambient temperature 20°C and ambient temp. 20°C

static only (dynamic not permitted)

10% ED/1hr and ambient temperature 20°C



3.3 Technical information

3.3.4 Performance tables (lifting elements with Ku spindle)

3.3.4.1 HSE Ku range

Turning speed, power requirement and permitted lifting speed for ratio „N“ with **lifting (Type 1) ball-screw spindle**. All performance data are expressed in terms of dynamic lifting force with 20% ED/hr. Ku spindles with a higher load capacity are possible with configuration type 2.

HSE 36 spindle Ku 20x10; 20x5

n	Lifting speed		F=10 [kN]				F=9 [kN]				F=8 [kN]				F=7 [kN]				F=6 [kN]				F=4 [kN]				F=2 [kN]			
[1/min]	[m/min.]		20x10		20x5		20x10		20x5		20x10		20x5		20x10		20x5		20x10		20x5		20x10		20x5		20x10		20x5	
Ku 20x	10	5	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	6,0	3,0	4,2	1,3	2,1	0,7	3,8	1,2	1,9	0,6	3,4	1,1	1,7	0,5	2,9	0,9	1,5	0,5	2,5	0,8	1,3	0,4	1,7	0,5	0,8	0,3	0,8	0,3	0,1	0,1
2500	5	2,5	4,2	1,1	2,1	0,6	3,8	1	1,9	0,5	3,4	0,9	1,7	0,4	3	0,8	1,5	0,4	2,5	0,7	1,3	0,3	1,7	0,4	0,8	0,2	0,8	0,2	0,1	0,1
2000	4	2,0	4,3	0,9	2,1	0,4	3,8	0,8	1,9	0,4	3,4	0,7	1,7	0,4	3	0,6	1,5	0,3	2,6	0,5	1,3	0,3	1,7	0,4	0,9	0,2	0,9	0,2	0,1	0,1
1500	3	1,5	4,3	0,7	2,2	0,3	3,9	0,6	1,9	0,3	3,5	0,5	1,7	0,3	3	0,5	1,5	0,2	2,6	0,4	1,3	0,2	1,7	0,3	0,9	0,1	0,9	0,1	0,1	0,1
1000	2	1,0	4,4	0,5	2,2	0,2	4	0,4	2	0,2	3,5	0,4	1,8	0,2	3,1	0,3	1,5	0,2	2,7	0,3	1,3	0,1	1,8	0,2	0,9	0,1	0,9	0,1	0,2	0,1
750	1,5	0,75	4,5	0,4	2,2	0,2	4	0,3	2	0,2	3,6	0,3	1,8	0,1	3,1	0,2	1,6	0,1	2,7	0,2	1,3	0,1	1,8	0,1	0,9	0,1	0,9	0,1	0,2	0,1

HSE 50 spindle Ku 32x10; 32x5

n	Lifting speed		F=25 [kN]				F=22,5 [kN]				F=20,0 [kN]				F=17,5 [kN]				F=15 [kN]				F=10 [kN]				F=5 [kN]			
(min^{-1})	[m/min.]		32x10		32x5		32x10		32x5		32x10		32x5		32x10		32x5		32x10		32x5		32x10		32x5		32x10		32x5	
Ku 32x	10	5	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	5,0	2,5	8,5	2,7	4,3	1,4	7,7	2,4	3,8	1,2	6,8	2,1	3,4	1,1	6	1,9	3	1	5,1	1,6	2,6	0,8	3,4	1,1	1,7	0,6	1,7	0,5	0,9	0,3
2500	4,2	2,1	8,6	2,2	4,3	1,1	7,7	2	3,9	1	6,9	1,8	3,4	0,9	6	1,6	3	0,8	5,2	1,3	2,6	0,7	3,4	0,9	1,7	0,5	1,7	0,4	0,9	0,2
2000	3,4	1,7	8,7	1,8	4,3	0,9	7,8	1,6	3,9	0,8	6,9	1,4	3,5	0,7	6,1	1,3	3	0,7	5,2	1,1	2,6	0,6	3,5	0,7	1,7	0,4	1,7	0,4	0,9	0,2
1500	2,4	1,2	8,8	1,4	4,4	0,7	7,9	1,2	3,9	0,6	7	1,1	3,5	0,6	6,1	1	3,1	0,5	5,3	0,8	2,6	0,4	3,5	0,6	1,8	0,3	1,8	0,3	0,9	0,2
1000	1,6	0,8	8,9	0,9	4,5	0,5	8	0,8	4	0,4	7,2	0,7	3,6	0,4	6,3	0,7	3,1	0,4	5,4	0,6	2,7	0,3	3,6	0,4	1,8	0,2	1,8	0,2	0,9	0,1
750	1,2	0,6	9,1	0,7	4,6	0,4	8,2	0,6	4,1	0,3	7,3	0,6	3,6	0,3	6,4	0,5	3,2	0,3	5,5	0,4	2,7	0,2	3,6	0,3	1,8	0,2	1,8	0,1	0,9	0,1

HSE 63 spindle Ku 40x24; 40x10

n	Lifting speed		F=50 [kN]				F=40 [kN]				F=30 [kN]				F=20 [kN]				F=10 [kN]				F=5 [kN]				F=2,5 [kN]			
[1/min]	[m/min.]		40x24		40x10		40x24		40x10		40x24		40x10		40x24		40x10		40x24		40x10		40x24		40x10		40x24		40x10	
Ku 40x	24	10	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	10,3	4,3	35	11	14	4,6	28	8,7	12	3,7	21	6,5	8,7	2,7	14	4,4	5,8	1,8	6,9	2,2	2,9	0,9	3,5	1,1	1,4	0,5	1,7	0,5	0,7	0,3
2500	8,57	3,55	35	9,1	15	3,8	28	7,3	12	3,1	21	5,5	8,7	2,3	14	3,7	5,8	1,5	7	1,8	2,9	0,8	3,5	0,9	1,5	0,4	1,7	0,5	0,7	0,2
2000	6,86	2,85	35	7,4	15	3,1	28	5,9	12	2,5	21	4,4	8,8	1,9	14	2,9	5,9	1,3	7	1,5	2,9	0,6	3,5	0,7	1,5	0,3	1,8	0,4	0,7	0,2
1500	5,14	2,15	36	5,6	15	2,4	28	4,5	12	1,9	21	3,4	8,9	1,4	14	2,2	5,9	1	7,1	1,1	3	0,5	3,6	0,6	1,5	0,3	1,8	0,3	0,7	0,1
1000	3,43	1,45	36	3,8	15	1,6	29	3	12	1,3	22	2,3	9,1	1	15	1,5	6,1	0,7	7,3	0,8	3	0,3	3,6	0,4	1,5	0,2	1,8	0,2	0,8	0,1
750	2,57	1,05	37	2,9	15	1,2	30	2,3	12	1	22	1,7	9,3	0,8	15	1,2	6,2	0,5	7,4	0,6	3,1	0,3	3,7	0,3	1,5	0,1	1,9	0,1	0,8	0,1

HSE 80 spindle Ku 50x24; 63x10

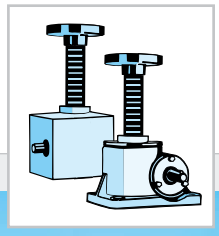
n	Lifting speed		100 [kN]				80 [kN]				60 [kN]				40 [kN]				20 [kN]				10 [kN]				5 [kN]			
[1/min]	[m/min.]		50x24		63x10		50x24		63x10		50x24		63x10		50x24		63x10		50x24		63x10		50x24		63x10		50x24		63x10	
Ku 50/63	24	10	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	9,0	3,7	60	19	25	7,9	48	15	20	6,3	36	11	15	4,7	24	7,5	10	3,1	12	3,8	5	1,6	6	1,9	2,5	0,8	3	0,9	1,3	0,4
2500	7,4	3,1	60	16	25	6,6	48	13	20	5,3	36	9,5	15	4	24	6,3	10	2,6	12	3,2	5	1,3	6	1,6	2,5	0,7	3	0,8	1,3	0,3
2000	6,0	2,5	61	13	25	5,3	48	10	20	4,2	36	7,6	15	3,2	24	5,1	10	2,1	12	2,5	5	1	6,1	1,3	2,5	0,5	3	0,6	1,3	0,3
1500	4,4	1,85	61	9,6	26	4	49	7,7	20	3,2	37	5,8	15	2,4	24	3,8	10	1,6	12	1,9	5,1	0,8	6,1	1	2,6	0,4	3,1	0,5	1,3	0,2
1000	3,0	1,25	62	6,5	26	2,7	50	5,2	21	2,2	37	3,9	16	1,6	25	2,6	10	1,1	12	1,3	5,2	0,5	6,2	0,7	2,6	0,3	3,1	0,3	1,3	0,1
750	2,3	0,95	64	5	27	2,1	51	4	21	1,7	38	3	16	1,3	25	2	11	0,8	13	1	5,3	0,4	6,4	0,5	2,7	0,2	3,2	0,2	1,3	0,1

Service life of ball-screw spindle > 500 hours

static only (dynamic not permitted)

Service life of ball-screw spindle 100 to 500 hours

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.3 Technical information

HSE 100 spindle Ku 63x20; 80x10

n	Lifting speed		F=200 [kN]				F=160 [kN]				F=120 [kN]				F=100 [kN]				F=75 [kN]				F=50 [kN]				F=25 [kN]			
[1/min]	[m/min.]		63x20		80x10		63x20		80x10		63x20		80x10		63x20		80x10		63x20		80x10		63x20		80x10		63x20		80x10	
Ku 63/80	20	10	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	7,5	3,75	98	31	49	15	79	25	39	12	59	19	29	9,3	49	15	25	7,7	37	12	18	5,8	25	7,7	12	3,9	12	3,9	6,1	2
2500	6,2	3,1	99	26	49	13	79	21	39	10	59	16	30	7,8	49	13	25	6,5	37	9,7	19	4,9	25	6,5	12	3,3	12	3,2	6,2	1,6
2000	5,0	2,5	99	21	50	10	79	17	40	8,3	59	13	30	6,3	50	10	25	5,2	37	7,8	19	3,9	25	5,2	12	2,6	12	2,6	6,2	1,3
1500	3,7	1,85	100	16	50	7,9	80	13	40	6,3	60	9,4	30	4,7	50	7,8	25	3,9	37	5,9	19	3	25	3,9	12	2	12	2	6,2	1
1000	2,5	1,25	101	11	51	5,3	81	8,5	41	4,3	61	6,4	30	3,2	51	5,3	25	2,7	38	4	19	2	25	2,7	13	1,4	13	1,3	6,3	0,7
750	1,9	0,95	103	8,1	51	4,1	82	6,5	41	3,3	62	4,9	31	2,5	51	4	26	2	39	3	19	1,5	26	2	13	1	13	1	6,4	0,5

3.3.4.2 Ku range of quick-lifting bevel screw jacks

3

Turning speed, power requirement and permitted lifting speed for ration „N“ **with lifting (Type 1) ball-screw spindle**. All performance data are expressed in terms of dynamic lifting force with 20% ED/hr. Ku spindles with a higher load capacity are possible with configuration type 2.

G 15 spindle Ku 25x5

n	Lifting speede		F=15 [kN]				F=9,5 [kN]				F=7 [kN]				F=5 [kN]				F=3 [kN]				F=2 [kN]				F=1 [kN]			
[1/min]	[m/min.]				25x5				25x5				25x5				25x5				25x5				25x5				25x5	
Ku 25x		5			Nm	kW			Nm	kW			Nm	kW			Nm	kW			Nm	kW			Nm	kW			Nm	kW
3000		7,5			11	3,1			8	2,2			6,2	1,8			5	1,5			4	1,2			3,3	1			2,7	0,8
2500		6,25			11	2,6			8	1,9			6,2	1,5			5	1,2			4	1			3,3	0,8			2,7	0,7
2000		5			11	2,1			8	1,5			6,2	1,2			5	1			4	0,8			3,3	0,7			2,7	0.6
1500		3,75			11	1,6			8	1,1			6,2	0,9			5	0,8			4	0,6			3,3	0,5			2,7	0,4
1000		2,5			11	1,1			8	0,8			6,2	0,6			5	0,5			4	0,4			3,3	0,4			2,7	0,3
750		1,87			11	0,8			8	0,6			6,2	0,5			5	0,4			4	0,3			3,3	0,3			2,7	0,2

G 25 spindle Ku 25x10; 25x5

n	Lifting speed		F=25 [kN]				F=20 [kN]				F=15 [kN]				F=10 [kN]				F=5 [kN]				F=2,5 [kN]				F=1 [kN]			
[1/min]	[m/min.]		25x10		25x5		25x10		25x5		25x10		25x5		25x10		25x5		25x10		25x5		25x10		25x5		25x10		25x5	
Ku 25x	10	5	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	15,0	7,5	25	7,8	14	4,3	21	6,4	12	3,6	16	5	9,5	2,9	12	3,6	7	2,2	7	2,2	5	1,5	5	1,5	3,8	1,2	3,5	1,1	3,1	1
2500	12,5	6,25	25	6,5	14	3,6	21	5,4	12	3,1	16	4,2	9,5	2,5	12	3,1	7	1,9	7	1,9	5	1,3	5	1,3	3,8	1	3,5	1	3,1	0,9
2000	10	5	25	5,3	14	3	21	4,4	12	2,5	16	3,4	9,5	2	12	2,5	7	1,6	7	1,6	5	1,1	5	1,1	3,8	0,9	3,5	0,8	3,1	0,7
1500	7,5	3,75	25	4	14	2,2	21	3,3	12	1,9	16	2,6	9,5	1,5	12	1,9	7	1,2	7	1,2	5	0,8	5	0,8	3,8	0,7	3,5	0,6	3,1	6
1000	5	2,5	25	2,7	14	1,5	21	2,2	12	1,3	16	1,7	9,5	1	12	1,3	7	0,8	7	0,8	5	0,6	5	0,6	3,8	0,5	3,5	0,4	3,1	0,4
750	3,8	1,87	25	1,9	14	1	21	1,5	12	0,8	16	1,2	9,5	0,6	12	0,8	7	0,5	7	0,5	5	0,3	5	0,3	3,8	0,2	3,5	0,2	3,1	0,2

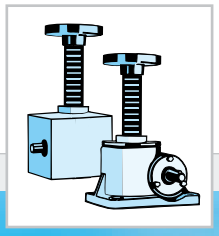
G 50 spindle Ku 32x10; 40x5

n	Lifting speed		F=40 [kN]				F=25 [kN]				F=20 [kN]				F=15 [kN]				F=10 [kN]				F=5 [kN]				F=2,5 [kN]			
[1/min]	[m/min.]		32x10		40x5		32x10		40x5		32x10		40x5		32x10		40x5		32x10		40x5		32x10		40x5		32x10		40x5	
Ku 32/40x	10	5	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
3000	15,0	7,5	48	14	26	7,2	31	8,9	17	4,8	25	7,2	14	3,9	20	5,6	14	3,1	14	3,9	9	2,3	8	2,3	5,6	1,5	5	1,5	4,1	1,1
2500	12,5	6,25	48	12	26	6	31	7,4	17	4	25	6	14	3,3	20	4,7	14	2,6	14	3,3	9	1,9	8	1,9	5,6	1,2	5	1,2	4,1	0,9
2000	10	5	48	9,2	26	4,8	31	5,8	17	3,2	25	4,8	14	2,6	20	3,7	14	2,1	14	2,6	9	1,5	8	1,6	5,6	1	5	1	4,1	0,7
1500	7,5	3,75	48	6,9	26	3,6	31	4,4	17	2,4	25	3,6	14	2	20	2,8	14	1,6	14	2	9	1,2	8	1,2	5,6	0,8	5	0,8	4,1	0,6
1000	5	2,5	48	4,6	26	2,4	31	3	17	1,6	25	2,4	14	1,3	20	1,9	14	1,1	14	1,3	9	0.8	8	0,8	5,6	0,5	5	0,5	4,1	0,4
750	3,8	1,87	48	3,5	26	1,8	31	2,3	17	1,2	25	1,9	14	1	20	1,4	14	0,8	14	1	9	0,6	8	0,6	5,6	0,4	5	0,4	4,1	0,3

G 90 spindle Ku 63x10

n	Lifting speed		F=90 [kN]				F=60 [kN]				F=40 [kN]				F=20 [kN]				F=15 [kN]				F=10 [kN]				F=5 [kN]			
[1/min]	[m/min.]				63x10				63x10				63x10				63x10				63x10				63x10				63x10	
Ku 63x		10			Nm	kW			Nm	kW			Nm	kW			Nm	kW			Nm	kW			Nm	kW			Nm	kW
3000		15			116	32			80	23			55	16			30	8,3			25	6,7			19	4,8			13	3,1
2500		12,5			116	28			80	19			55	13			30	7			25	5,5			19	4			13	2,6
2000		10			116	22			80	15			55	11			30	5,6			25	4,4			19	3,2			13	2
1500		7,5			116	17			80	12			55	8			30	4,2			25	3,3			19	2,4			13	1,5
1000		5			116	11			80	7,5			55	5,1			30	2,8			25	2,2			19	1,6			13	1
750		3,8			116	8,4			80	5,7			55	4			30	2,1			25	1,7			19	1,2			13	0,8

Service life of ball-screw spindle > 500 hours | static only (dynamic not permitted) | Service life of ball-screw spindle 100 to 500 hours



3.3 Technical information

3.3.5 Lifting-element efficiency ratings „η"

Formula: $\eta_{HE} = \eta_G * \eta_{Sp}$

3.3.5.1 SHE range

Overall efficiency ratings η_{HE} of SHE gears and spindles with grease lubrication

Size	0,5	1	2	2,5	5	10	15	20	25	35	50	75	100	150	200
η_{HE}	0,31	0,29	0,31	0,27	0,24	0,27	0,27	0,24	0,22	0,21	0,15	0,18	0,15	0,16	0,175
Size	**0,5 L**	**1 L**	**2 L**	**2,5 L**	**5 L**	**10 L**	**15 L**	**20 L**	**25 L**	**35 L**	**50 L**	**75**	**100 L**	**150 L**	**200 L**
η_{HE}	0,24	0,20	0,18	0,19	0,16	0,17	0,17	0,17	0,15	0,14	0,10	0,12	0,09	-	-

Gear efficiency ratings η_G of SHE gears with grease lubrication (without spindles)

Size	0,5	1	2	2,5	5	10	15	20	25	35	50	75	100	150	200
η_G	0,58	0,68	0,68	0,68	0,66	0,66	0,66	0,64	0,61	0,62	0,5	0,55	0,53	0,56	0,60
Size	**0,5 L**	**1 L**	**2 L**	**2,5 L**	**5 L**	**10 L**	**15 L**	**20 L**	**25 L**	**35 L**	**50 L**	**75 L**	**100 L**	**150 L**	**200 L**
η_G	0,45	0,48	0,41	0,47	0,43	0,42	0,42	0,46	0,41	0,42	0,34	0,35	0,32	-	-

Overall efficiency ratings η_{HE} **of type 2 gears with oil lubrication and spindles with grease lubrication**

Size	1	2	2,5	5	10	15	20	25	35	50	75	100	150	200
Turning speed [rpm]														
1500	0,355	0,319	0,283	0,257	0,290	0,290	0,273	0,262	0,248	0,281	0,235	0,210	0,220	0,234
1000	0,347	0,314	0,279	0,252	0,285	0,285	0,268	0,257	0,243	0,215	0,230	0,206	0,215	0,230
750	0,342	0,311	0,276	0,249	0,282	0,282	0,266	0,253	0,240	0,212	0,225	0,204	0,210	0,225
500	0,334	0,307	0,272	0,245	0,277	0,277	0,262	0,249	0,236	0,208	0,220	0,200	0,205	0,220
300	0,325	0,301	0,267	0,241	0,272	0,272	0,257	0,243	0,231	0,204	0,215	0,196	0,200	0,215
100	0,313	0,290	0,257	0,231	0,261	0,261	0,247	0,233	0,222	0,195	0,210	0,187	0,195	0,210
50	0,309	0,283	0,251	0,225	0,255	0,255	0,242	0,226	0,216	0,190	0,205	0,182	0,188	0,205
Size	**1 L**	**2 L**	**2,5 L**	**5 L**	**10 L**	**15 L**	**20 L**	**25 L**	**35 L**	**50 L**	**75 L**	**100 L**	**150 L**	**200 L**
Turning speed [rpm]														
1500	0,260	0,241	0,214	0,188	0,236	0,236	0,225	0,210	0,204	0,181	0,205	0,176	-	-
1000	0,246	0,232	0,206	0,180	0,227	0,227	0,217	0,200	0,195	0,174	0,200	0,169	-	-
750	0,237	0,227	0,201	0,175	0,222	0,222	0,212	0,194	0,189	0,169	0,195	0,164	-	-
500	0,224	0,219	0,194	0,168	0,215	0,215	0,205	0,187	0,183	0,162	0,190	0,157	-	-
300	0,212	0,210	0,187	0,161	0,207	0,207	0,198	0,179	0,175	0,155	0,182	0,150	-	-
100	0,195	0,194	0,172	0,146	0,191	0,191	0,183	0,164	0,160	0,142	0,175	0,137	-	-
50	0,190	0,185	0,164	0,138	0,183	0,183	0,175	0,155	0,152	0,135	0,168	0,130	-	-

3.3.5.2 Merkur range

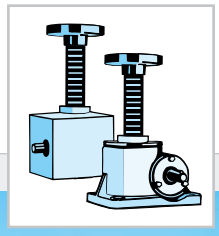
Gear efficiency ratings η_{HE} " of SHE gears and spindles with grease lubrication

Size	M0	M1	M2	M3	M4	M5	M6	M7	M8
η_{HE}	0,34	0,30	0,28	0,27	0,25	0,19	0,19	0,15	0,15
Size	**M0 L**	**M1 L**	**M2 L**	**M3 L**	**M4 L**	**M5 L**	**M6 L**	**M7 L**	**M8 L**
η_{HE}	0,24	0,23	0,21	0,19	0,18	0,14	0,14	0,11	0,11

Gear efficiency ratings η_G of SHE gears with grease lubrication (without spindles)

Size	M0	M1	M2	M3	M4	M5	M6	M7	M8
η_G	0,68	0,71	0,70	0,69	0,69	0,57	0,64	0,61	0,57
Size	**M0 L**	**M1 L**	**M2 L**	**M3 L**	**M4 L**	**M5 L**	**M6 L**	**M7 L**	**M8 L**
η_G	0,47	0,54	0,51	0,48	0,49	0,42	0,47	0,45	0,42

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.3 Technical information

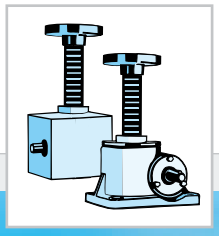
3.3.5.3 HSE range

Overall efficiency ratings η_{He} of HSE gears and spindles

HSE n_1 [min^{-1}]	31	36	50	63	80	100	125	140	200
3000	0,356	0,365	0,345	0,319	0,353	0,324	0,309	0,273	0,264
2500	0,354	0,362	0,343	0,317	0,352	0,323	0,308	0,272	0,264
2000	0,351	0,359	0,340	0,315	0,350	0,321	0,307	0,271	0,263
1500	0,346	0,355	0,336	0,311	0,346	0,319	0,305	0,270	0,262
1000	0,339	0,347	0,329	0,304	0,339	0,314	0,301	0,267	0,260
750	0,334	0,342	0,323	0,299	0,333	0,309	0,296	0,263	0,258
600	0,330	0,337	0,319	0,294	0,328	0,305	0,292	0,260	0,256
500	0,327	0,334	0,315	0,290	0,323	0,301	0,288	0,257	0,253
300	0,319	0,325	0,305	0,278	0,309	0,288	0,275	0,245	0,243
100	0,308	0,313	0,289	0,258	0,282	0,261	0,244	0,218	0,215
50	0,304	0,309	0,283	0,251	0,272	0,249	0,230	0,204	0,199
HSE n_1 [min^{-1}]	**31 L**	**36 L**	**50 L**	**63 L**	**80 L**	**100 L**	**125 L**	**140 L**	**200 L**
3000	0,270	0,280	0,272	0,247	0,277	0,261	0,265	0,236	0,233
2500	0,265	0,275	0,267	0,243	0,274	0,259	0,263	0,235	0,233
2000	0,259	0,269	0,262	0,239	0,270	0,256	0,261	0,233	0,232
1500	0,251	0,260	0,254	0,232	0,262	0,250	0,257	0,230	0,230
1000	0,239	0,246	0,240	0,219	0,248	0,240	0,249	0,224	0,225
750	0,230	0,237	0,229	0,208	0,237	0,230	0,240	0,217	0,221
600	0,223	0,230	0,221	0,200	0,227	0,221	0,233	0,211	0,216
500	0,218	0,224	0,215	0,193	0,219	0,214	0,225	0,205	0,211
300	0,207	0,212	0,200	0,176	0,197	0,191	0,204	0,186	0,193
100	0,191	0,195	0,178	0,151	0,162	0,153	0,162	0,146	0,149
50	0,187	0,190	0,172	0,143	0,151	0,140	0,146	0,131	0,130

Gear efficiency ratings η_G of HSE gears (without spindles)

HSE n_1 [min^{-1}]	31	36	50	63	80	100	125	140	200
3000	0,833	0,842	0,864	0,874	0,884	0,900	0,901	0,908	0,922
2500	0,827	0,835	0,858	0,868	0,880	0,896	0,898	0,905	0,920
2000	0,821	0,828	0,852	0,863	0,877	0,892	0,895	0,902	0,918
1500	0,810	0,819	0,842	0,852	0,867	0,886	0,889	0,898	0,915
1000	0,793	0,801	0,824	0,833	0,849	0,872	0,878	0,888	0,908
750	0,782	0,789	0,809	0,819	0,834	0,859	0,863	0,875	0,901
600	0,772	0,778	0,799	0,805	0,821	0,847	0,851	0,865	0,894
500	0,765	0,771	0,789	0,794	0,809	0,836	0,840	0,855	0,883
300	0,747	0,750	0,764	0,762	0,774	0,800	0,802	0,815	0,849
100	0,721	0,722	0,724	0,707	0,706	0,725	0,711	0,725	0,751
50	0,711	0,713	0,709	0,688	0,681	0,692	0,671	0,679	0,695
HSE n_1 [min^{-1}]	**31 L**	**36 L**	**50 L**	**63 L**	**80 L**	**100 L**	**125 L**	**140 L**	**200 L**
3000	0,632	0,646	0,681	0,677	0,694	0,725	0,773	0,785	0,814
2500	0,619	0,633	0,669	0,666	0,686	0,718	0,767	0,780	0,812
2000	0,606	0,621	0,656	0,655	0,676	0,711	0,761	0,775	0,810
1500	0,587	0,600	0,636	0,636	0,656	0,695	0,749	0,765	0,803
1000	0,559	0,568	0,601	0,600	0,621	0,667	0,726	0,745	0,786
750	0,538	0,547	0,574	0,570	0,594	0,639	0,700	0,722	0,772
600	0,522	0,531	0,553	0,548	0,569	0,614	0,679	0,702	0,754
500	0,510	0,517	0,538	0,529	0,548	0,595	0,656	0,682	0,737
300	0,484	0,489	0,501	0,482	0,493	0,531	0,595	0,619	0,674
100	0,447	0,450	0,446	0,414	0,406	0,425	0,472	0,486	0,520
50	0,438	0,438	0,431	0,392	0,378	0,389	0,426	0,436	0,454



3.3 Technical information

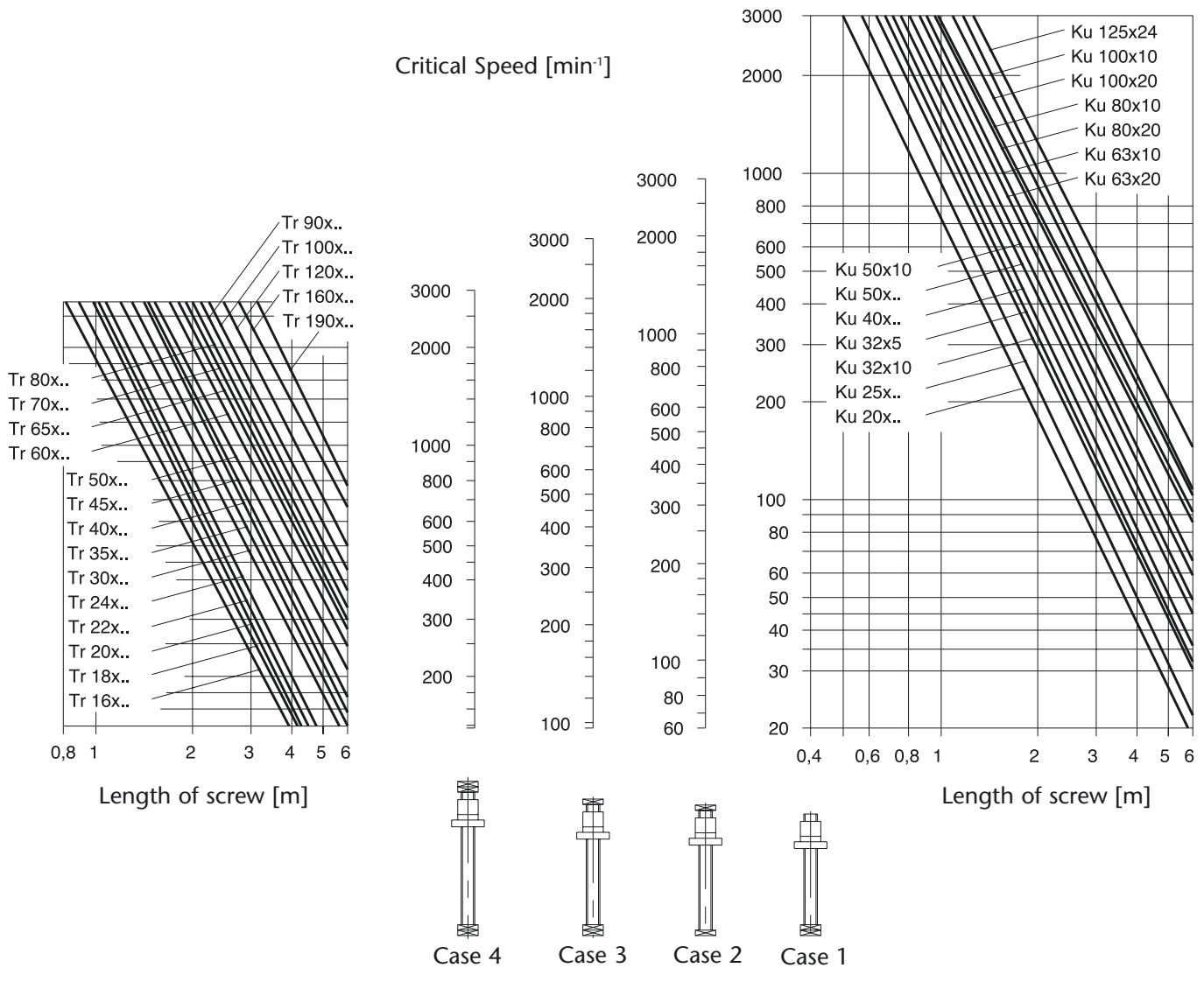
3.3.5.4 Spindle efficiency ratings η_{Sp} (steel/bronze lubricated)

Tr spindle	14x4	18x6	18x4	20x4	22x5	26x6,28	30x6	35x8	40x7
Spindle efficiency rating[%]	49	54	42,5	40	43	45	40	43	36,5
Tr spindle	40x8	50x9	58x12	60x12	60x9	65x12	70x10	70x12	80x10
Spindle efficiency rating[%]	40	37	40,5	39,5	32,5	37,5	31,6	35,5	29
Tr spindle	90x16	100x10	100x16	120x14	120x16	140x20	160x20	190x24	220x28
Spindle efficiency rating[%]	36,5	24	34	28	30	31,6	28,5	28,8	29

3

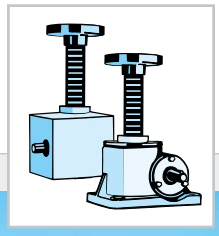
3.3.6 Critical spindle turning speed

The critical turning speed (only configuration type 2) is dependent on the spindle diameter, the spindle length and the spindle bearing (see case 1-4).



Lifting screw bearing arrangement

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.3 Technical information

3.3.7 Ball screw spindle Ku

Standard dimensions and load capacities for configuration type 1. Other pitches and load capacities on request. Reinforced spindles with other pitches and higher load capacities can be used with configuration type 2.

SHE range

Size	Ku spindle	C_{dyn} [kN]	C_{stat} [kN]
2,5	25 x 5	24,1	49,9
	25 x 10	14,8	27,2
5	32 x 5	27,0	75,1
	32 x 10	16,6	42,4
10	50 x 5	111,5	326,8
	50 x 24	44,2	72,9
15	50 x 5	111,5	326,8
	50 x 24	44,2	72,9
20	50 x 5	111,5	326,8
	50 x 24	44,2	72,9
25	80 x 10	134,6	575,4
	63 x 20	92,1	288,8
35	100 x 10	145,9	735,5
	80 x 20	145,9	735,5
50	125 x 10	157,6	931,5
	100 x 20	304,4	1041
75	on request	on request	on request
100	160 x 20	172,9	1216
	125 x 24	328,1	1601

Merkur range

Size	Ku spindle	C_{dyn} [kN]	C_{stat} [kN]
M 0			
M 1	16 x 5	7	12,7
M 2	20 x 5	8	17
M 3	25 x 5	9,5	22,7
M 4	40 x 5	19	63,5
	40 x 10	30	70
M 5	50 x 10	55	153
M 6	80 x 10	69	260
M 7			
M 8			

$\eta_{sp} \approx 0,9$

HSE range

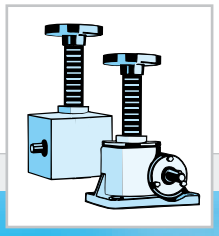
Size	Ku spindle	C_{dyn} [kN]	C_{stat} [kN]
36	20 x 5	19,3	23,1
	20 x 10	11,19	14,5
50	32 x 5	27,0	75,1
	32 x 10	27,0	75,1
63	40 x 10	78,7	170,5
	40 x 24	48,4	85,2
80	63 x 10	136	511
	50 x 24	158	247,3
100	80 x 10	134,6	575,4
	63 x 20	92,1	288,8
125	100 x 20	304,4	1041
	80 x 20	280,5	798,3
140	125 x 10	157,6	931,5
	100 x 20	304,4	1041
200	160 x 20	172,9	1216
	125 x 24	328,1	1601

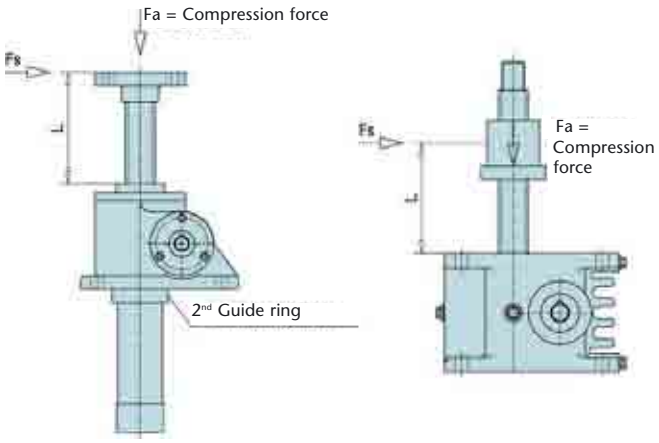
SHG range

Size	Ku spindle	C_{dyn} [kN]	C_{stat} [kN]
G 15	25 x 5	9,5	22,4
G 25	25 x 5	24,1	49,9
	25 x 10	19,7	40,8
G 40	40 x 5	19	63,5
	32 x 10	25,7	56
G 90	63 x 10	60	200

Further Ku spindles on request.
Please ask for a copy!

3.3 Technical information





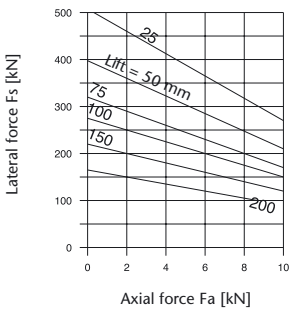
Type 2: Fs permitted in static configuration only

3.3.8 Permitted lateral force on spindle

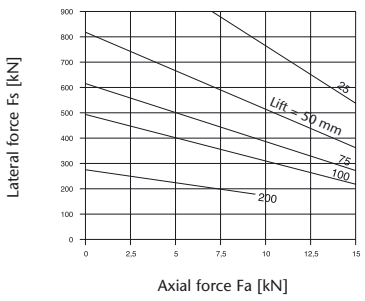
The permitted lateral force (Fs) on the spindle depends on the axial force (Fa). the diameter of the spindle (d) and the length of the spindle L. As compression and buckling force exercise negative influence, these factors were taken into account when determining this permitted lateral force (Fs). The maximum length of the spindle (L) is limited by the value generally used in mechanical engineering applications: "unguided spindle length = 4x free clamping length".

Lateral force on the spindle is only permitted on screw jacks fitted with two guide rings.

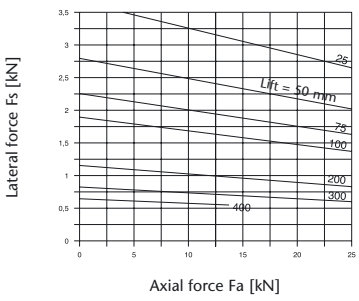
Lateral forces on spindles or travelling nuts exercise a reinforced edge compression on the movement thread, leading to increased wear and a shortened service life.



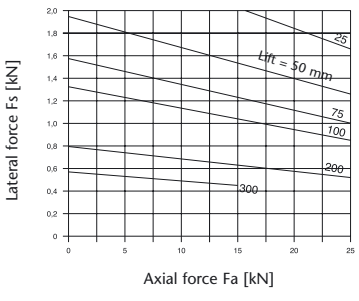
SHE 1, M 2 and HSE 36
(Tr20x4 u. Tr22x5)



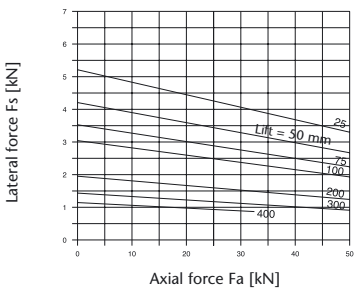
G 15
(Tr24x4)



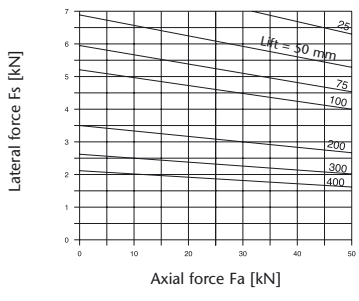
G 25
(Tr35x8)



SHE 2,5, M 3 and HSE 50
(Tr30x6)

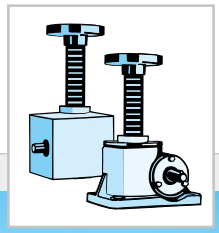


SHE 5, M 4, HSE 50 and G40
(Tr40x7 u. Tr40x8)

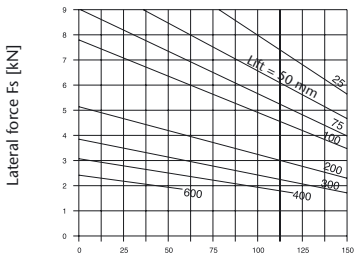


HSE 63
(Tr50x9)

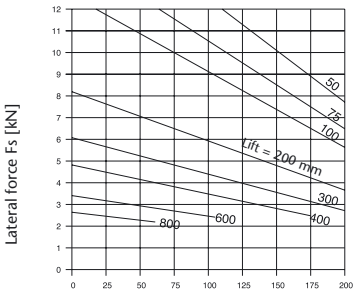
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



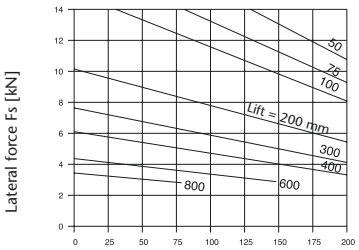
3.3 Technical information



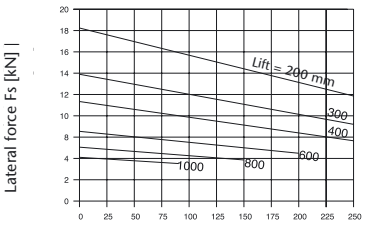
SHE 10/15 and HSE80
(Tr58x12 u. Tr60x12)



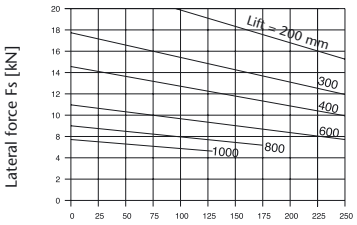
SHE20, M5 and G 90
(Tr65x12 u. Tr60x9)



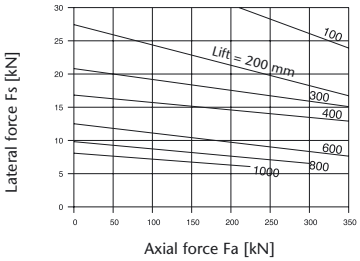
HSE 100 (Tr70x12)



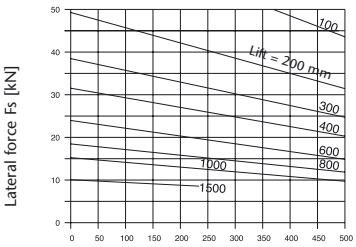
M 6 (Tr80x10)



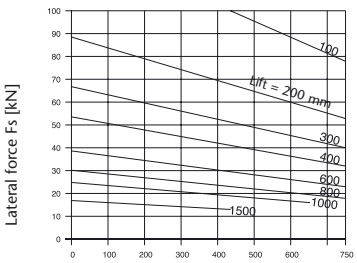
SHE 25 (Tr90x16)



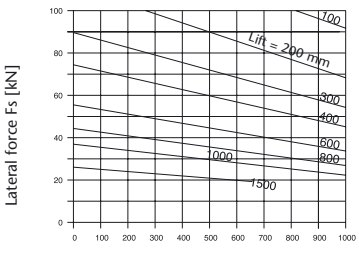
SHE 35, M7 and HSE125
(Tr100x16 u. TR100x10)



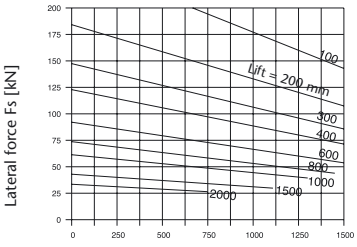
SHE 50, M 8 and HSE140
(Tr120x16 u.Tr120x14)



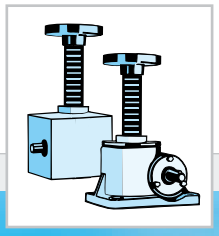
SHE 75
(Tr140x20)



SHE 100 and HSE 200
(Tr160x20)



SHE 150
(Tr190x24)



3.3 Technical information

3.3.9 Permitted radial force on drive system

Toothed and/or chain wheels along with pulley wheels bring radial forces to bear on the drive shaft of the worm gear screw jacks. The maximum permitted value depends on the lifting force and size of the jacking element.
The table is calculated for φ ~ 30° or 330°. This is the least-favorable bearing with respect to application of the lifting force and turning direction.

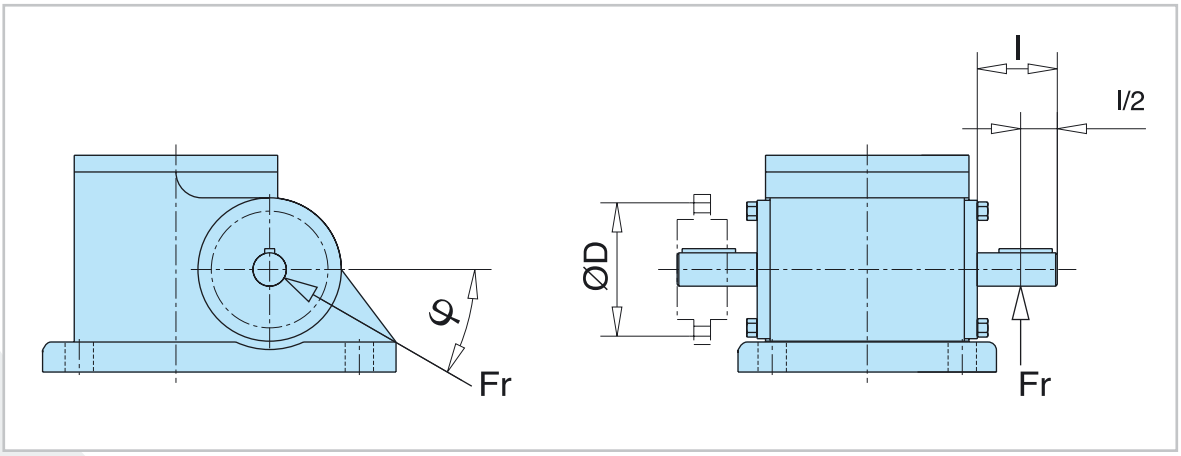
Permitted radial force (Fr) on application of force in l/2

Minimum diameter (D) for toothed wheel or pulleys:

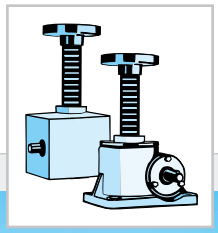
$$Dmin = 19100 \frac{P}{Fr\ max \times n} = \frac{2\ T_A}{Fr\ max} (m)$$

P (kW) = power rating
Fr max (N) = max. radial force (according to table)
n (min^{-1}) = turning speed of drive-shaft
T_A (Nm) = driving torque

	Fr max (N)	at Mt max (Nm)
SHE range		
0,5 / 0,5 L	250	1,9
1 / 1 L	350	5,7
2 / 2 L	300	13
2,5 / 2,5 L	350	18
5 / 5 L	750	44,2
10 / 10 L / 15 / 15 L	1000	108
20 / 20 L	1300	182
25 / 25 L	2000	314
35 / 35 L	2300	398
50 / 50 L	2400	796
100 / 100 L	5100	1415
150	6300	2011
HSE range		
31 / 31 L	200	2,7
36 / 36 L	350	5,3
50 / 50 L	400	14,5
63 / 63 L	900	32,4
80 / 80 L	1500	89,7
100 / 100 L	2000	196
125 / 125 L	2400	372
140 / 140 L	3200	598
200 / 200 L	6300	1223
Merkur range		
M 0	70	1,5
M 1	100	3,4
M 2	200	7,1
M 3	300	18
M 4	500	38
M 5	800	93
M 6	1300	240
M 7	2100	340
M 8	3100	570
SHG range		
G 25	800	40
G 50	1200	97
G 90	1800	199



Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



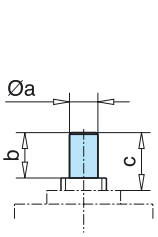
Contents

3.4 SHE range dimension plans

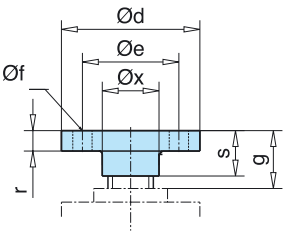
3.4.1 Configuration type 1

3.4.1.1 Standard

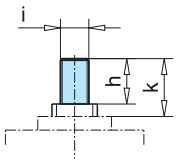
Head type I



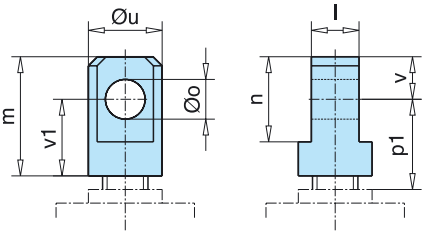
Head type II



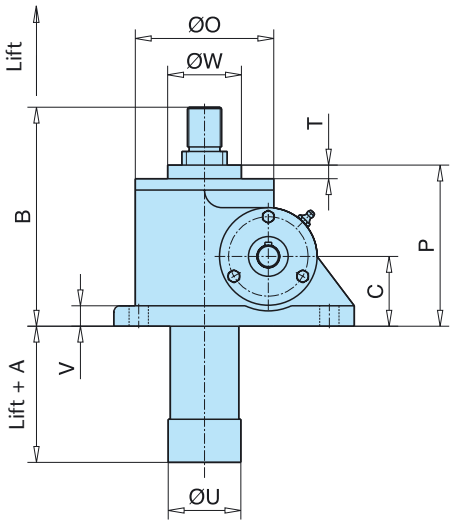
Head type III



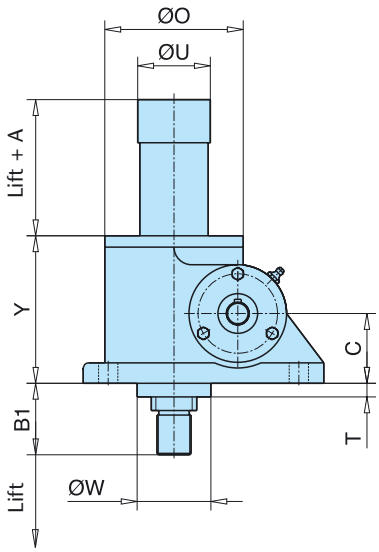
Head type IV



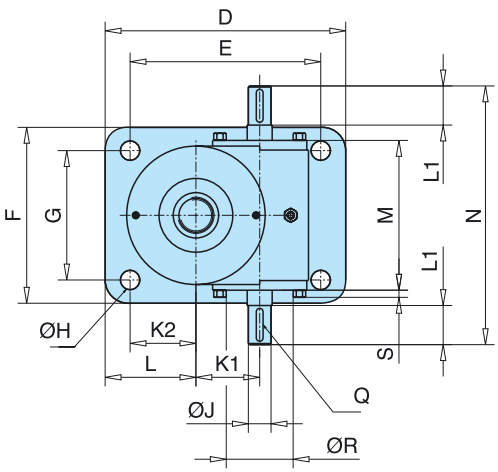
Design "A"



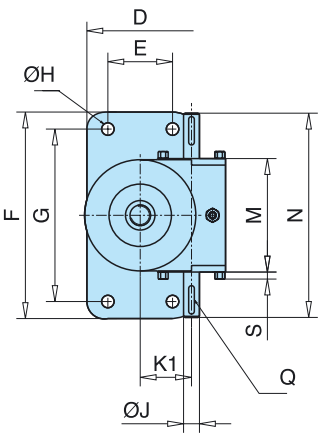
Design "B"



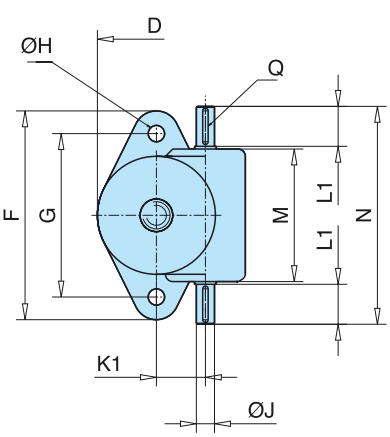
Size 1 and 2.5-35



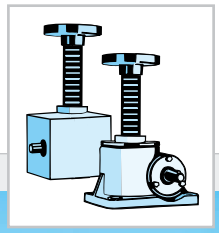
Size 2



Size 0,5

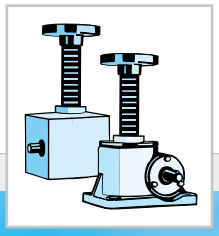


Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



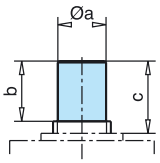
3.4 SHE range dimension plans

Size	0,5	1	2	2,5	5	10	15	20	25	35
Tr spindle	Tr 18x6	Tr 22x5	Tr 26x6,28	Tr 30x6	Tr 40x7	Tr 58x12	Tr 60x12	Tr 65x12	Tr 90x16	Tr 100x16
A	20	-	20	20	20	20	20	20	20	20
B	105,5	124	147,5	150,5	193	230	230	262	317	350
B1	35,5	54	54,5	53,5	63	80	80	86	100	110
C	32	35	44	45	61,5	70	70	87	102	115
D	81,5	150	94	165	212	235	235	295	350	430
E	-	130	57	135	168	190	190	240	280	360
F	115	100	182	120	155	200	200	215	260	280
G	90	80	152	90	114	155	155	160	190	210
Ø H	9	8,5	11	14	17	21	21	28	35	35
Ø J $_{k6}$	10	14	14	16	20	25	25	28	34	38
K 1	27	36	45,2	45,2	56,2	66,8	66,8	72,5	97	120
K 2	-	58	28,5	50	58	63,5	63,5	95	95	135
L	32,5	68	47	65	80	86	86	122,5	130	170
L 1	22	18	-	-	-	52	52	52	60	60
M	73	100	100	110,5	132	172	172	213,5	221	265
N	120	140	180	190	228	280	280	322	355	430
Ø O	65	Vkt 100	98	98	122	150	150	185	205	260
P	75,5	79	101,5	105,5	142	156,5	156,5	182	225	250
Q	3x3x20	5x5x16	5x5x25	5x5x32	6x6x32	8x7x45	8x7x45	8x7x45	10x8x50	10x8x70
Ø R	-	-	41	38	55	55	55	72	80	100
S	-	-	6	5,5	6	7	7	6	10	10
T	5,5	9	8,5	8,5	12	6,5	6,5	6	8	10
V	10	10	14	12	18	16	16	20	25	30
Ø W	36	60	48	48	65	80	80	100	130	150
Ø U	29	40	49	49	64	80	80	87	120	139
Y	70	70	93	97	130	150	150	176	217	240
Head type I										
Ø a $_{k6}$	18h9	15	18	20	25	40	40	50	70	80
b	20	24	30	30	40	50	50	60	63	80
c	30	44	46	45	51	73,5	73,5	80	92	100
Head type II										
Ø d	65	72	98	98	122	150	150	185	205	260
Ø e	45	50	75	75	85	105	105	140	155	200
Ø f	4xø7	4xø9	4xø11	4xø14	4xø17	4xø21	4xø21	4xø26	4xø27	4xø33
r	8	10	12	12	18	20	20	20	25	30
s	20	25	30	30	40	50	50	60	63	80
Ø x	18	30	40	40	50	65	65	90	100	130
g	30	45	46	45	51	73,5	73,5	80	92	100
Head type III										
h	15	24	30	30	39	50	50	60	63	80
i	M 18x1,5	M 16x1,5	M 18x1,5	M 22x1,5	M 30x2	M 40x3	M 40x3	M 50x3	M 70x3	M 80x3
k	30	44	46	45	51	73,5	73,5	80	92	100
Head type IV										
l $_{-0,2}$	20	25	30	30	42	60	60	75	90	105
m	50	60	70	70	105	130	130	150	175	220
n	30	40	50	50	75	100	100	120	140	160
Ø o ^{H8}	15	20	20	25	35	50	50	60	70	80
p1	50	60	61	60	79,5	103,5	103,5	110	134	160
ø u	30	40	48	50	65	90	90	110	130	150
v1	35	40	45	45	67,5	80	80	90	105	140
v	15	20	25	25	37,5	50	50	60	70	80

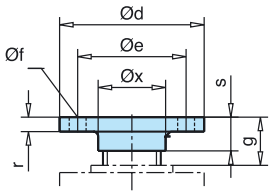


3.4 SHE range dimension plans

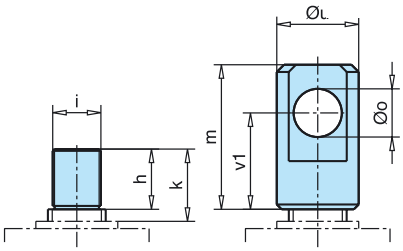
Head type I



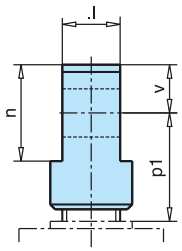
Head type II



Head type III



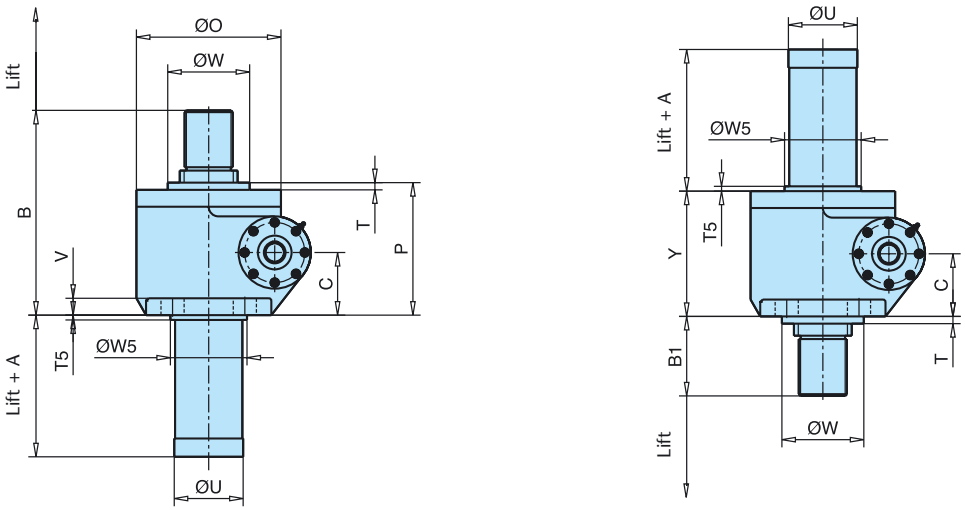
Head type IV



Design "A"

SHE Size 50-75

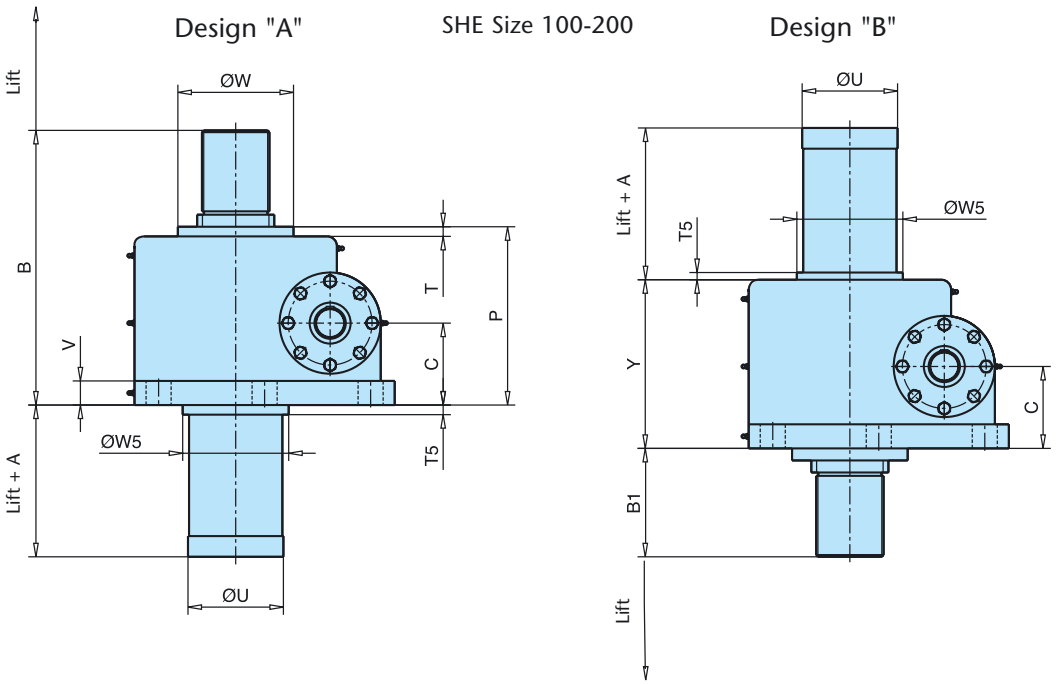
Design "B"



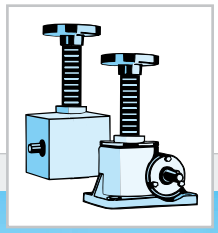
Design "A"

SHE Size 100-200

Design "B"

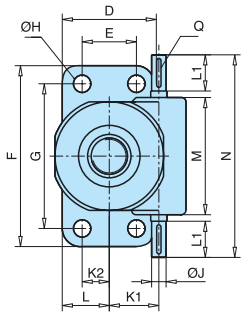


Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

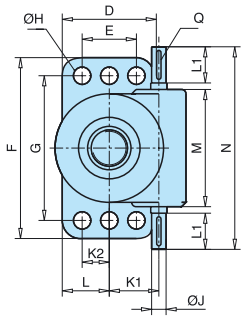


3.4 SHE range dimension plans

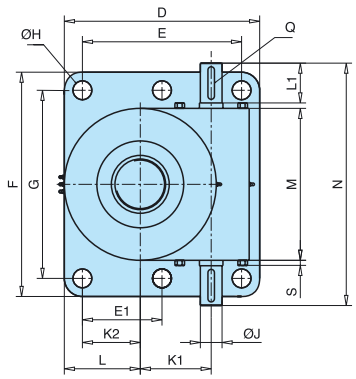
SHE Size 50



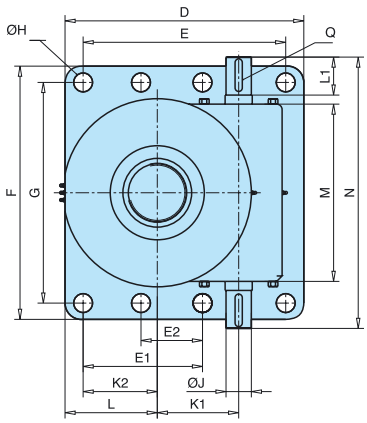
SHE Size 75



SHE Size 100

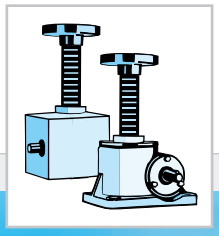


SHE Size 100 and 200



Size	50	75	100	150	200*
Tr spindle	Tr 120x16	Tr140x20	Tr 160x20	Tr 190x24	Tr220x28
A	20	70	65	80	
B	375	445	520	625	
B1	115	135	170	180	
C	130	155	170	194	
D	260	330	540	660	
E	150	225	440	560	
E1	-	-	220	330	
E2	-	-	-	170	
F	500	540	620	700	
G	400	450	520	610	
Ø H	4xØ48	6xØ42	6xØ52	8xØ52	
Ø J	40k6	60 m6	60 m6	70 m6	
K 1	137	160	196	225	
K 2	75	112,5	160	210	
L	130	-	210	255	
L 1	100	110	110	110	
M	324	360	420	490	
N	560	600	670	710	
Ø O	300	375	440	510	
P	275	335	370	445	
Q	12x8x80	18x11x100	18x11x90	20x12x90	
S	15	-	14	-	
T	15	25	25	20	
T5	10	25	20	20	
V	35	40	50	60	
Ø W	170	250	240	300	
Ø W5	159	250	220	245	
Ø U	143	181	198	220	
Y	260	310	350	424	
Head type I					
Ø a k6	100	110	140	160	
b	125	90	175	200	
c	150	110	200	230	
Head type II					
Ø d	300	330	370	400	
Ø e	225	270	280	310	
Ø f	4xØ35	6xØ42	6xØ52	8xØ52	
r	30	40	75	90	
s	70	90	127	150	
Ø x	140	200	200	220	
g	100	110	150	180	
Head type III					
h	125	90	175	200	
i	M 100x5	M 110x6	M 140x6	M 160x6	
k	150	110	200	230	
Head type IV					
l	120-0,2	140-0,2	160-0,3	180-0,3	
m	300	340	360	400	
n	200	220	280	320	
Ø o H8	100	120	140	160	
p1	225	260	245	270	
Ø u	170	200	220	260	
v1	200	240	220	240	

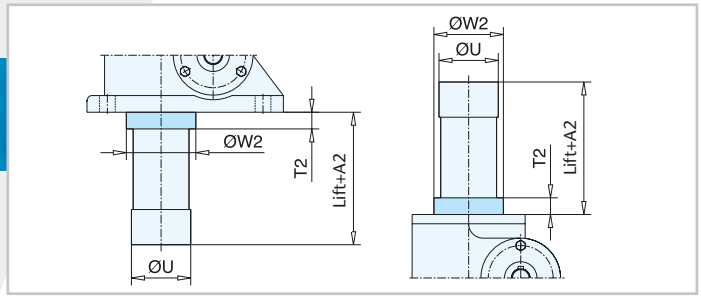
* Dimension plan available on request



3.4 SHE range dimension plans

3.4.1.2 2nd Guide ring

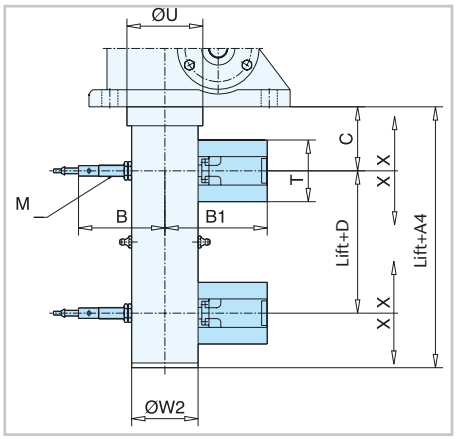
If no guides can be fitted onsite. and counter-forces produced by swiveling motion or lateral forces cannot be ruled out. the SHE unit should be fitted with a 2nd guide ring.



Size	A2	T2	ØW2	ØU
0,5	32	11,5	36	29
1	32	21	60	40
2	44	20	60	49
2,5	40	20	60	49
5	43	18	75	64
10/15	42	18	95	80
20	55	31	100	87
25	65	40	130	120
35	60	40	150	139
50	Standard design with 2nd guide ring			143
75				220
100				198
150				220
200				

3.4.1.3 With added-on stroke-end limit switches

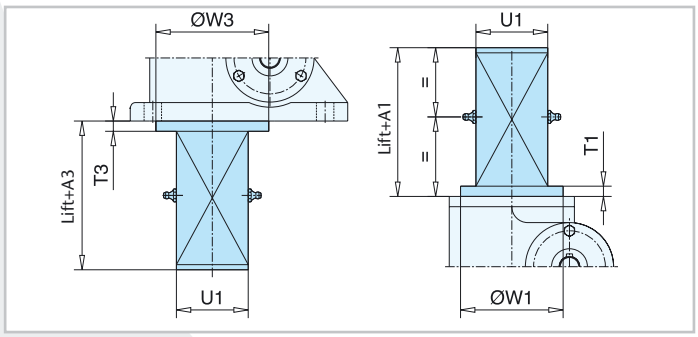
All sizes of unit can be supplied with mechanical or inductive operating limit switches.



Size	A4	B	B1	C	D	T	M	ØU	ØW2	X
1	130	86	*	55	20	*	12x1	60	33,7	±10
2	160	92	100	60	20	58	12x1	60	44,5	±10
2,5	170	100	106	65	25	58	12x1	70	60,3	±10
5	175	107	115	70	25	58	12x1	95	76,1	±10
10	185	114	122	75	30	58	12x1	110	88,9	±10
15	185	114	122	75	30	58	12x1	110	88,9	±10
20	200	131	130	80	40	68	18x1	125	114,3	±10
25	225	141	137	90	50	68	18x1	150	133	±10
35	on request									
50										
100										
150										
200										

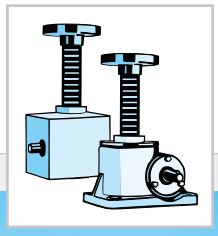
3.4.1.4 Anti-turn device V

The spindle must be prevented from twisting in order to ensure correct linear movement. This measure can be provided onsite. or by means of an anti-turn device fitted to the SHE unit using a rectangular tube.



Size	A3	T3	ØW3	A1	T1	ØW1	U1
0,5	65	9	52	60	-	-	30 x30
1	94	21	60	85	-	-	30 x30
2	85	8	65	77	-	-	40x40
2,5	85	8	70	77	-	-	50x50
5	95	10	110	85	-	-	70x70
10/15	115	15	130	100	-	-	90x90
20	120	20	160	100	-	-	110x110
25	130	20	180	110	-	-	120x120
35	135	20	200	115	-	-	140x140
50	158	15	240	158	15	240	180x180
75	160	20	300	160	20	300	220x220
100	185	20	300	180	15	300	225x225
150	210	20	380	210	20	380	260x260
200							

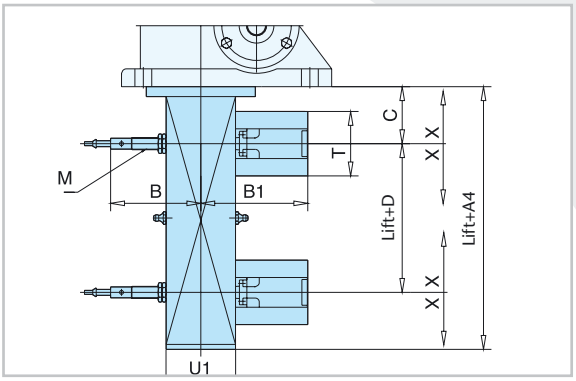
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



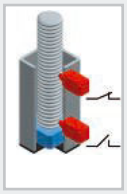
3.4 SHE range dimension plans

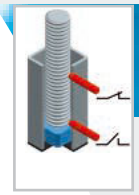
3.4.1.5 Anti-turn device Vm/Vi with added-on stroke-end limit switches

Size	A4	B	B1	C	D	T	M	U1	X
0,5	on request								
1									
2	130	90	100	60	20	58	12x1	40x40x2	± 10
2,5	130	95	105	60	25	58	12x1	50x50x2	± 10
5	130	102	109	55	25	58	12x1	70x70x5	± 10
10/15	155	111	116	80	30	58	12x1	90x90x6	± 10
20	180	130	131	80	40	68	18x1	110x110x5	± 10
25	210	145	145	90	50	68	18x1	140x140x6	± 10
35	on request								
50									
75									
100									
150									
200									



Ind. proximity switch Vi	Mechanical limit switch Vm
See section on accessories for details of technical data and dimension plans	





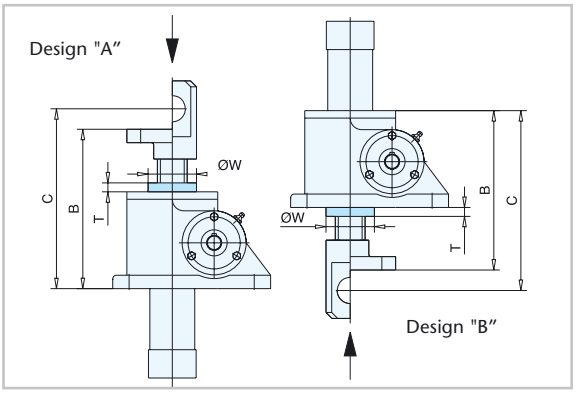
All sizes of unit can be supplied with mechanical or inductive operating Limit switches.

3.4.1.6 SHE with short safety nut

Take up the axial strain if the main nut breaks. This considerably increases the operating safety of the drive elements. The safety nut, can also be used to carry out a precise check for wear on the main nut, as the clearance between these two nuts changes according to the amount of wear. In the case of worm gear screw jacks with short safety nut, the direction of main stress (tension and compression force) and the installation point should be taken into account, as only a correctly fitted safety nut is capable of taking up the load.

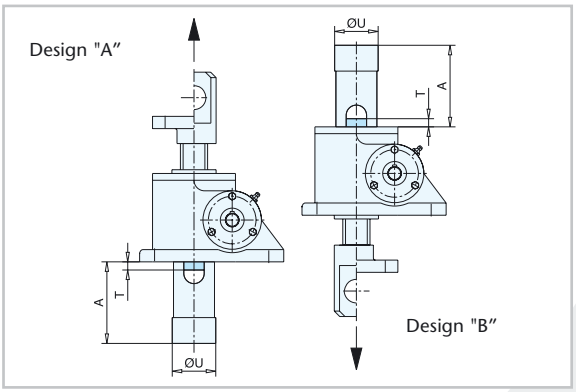
SHE type 1, compression force

Size	B	C	T [1]	ØW
1	on request			
2	147,5	162,5	2	45
2,5	150,5	165,5	2	45
5	193	220,5	2	55
10	230	260	3	76
15	230	260	3	76
20	262	292	3	86
25	317	359	3,5	112
35	355	415	15	138
50; 75; 100; 150 and 200 on request				

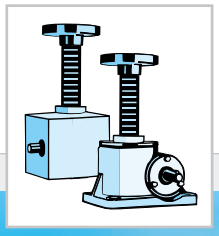


SHE type 1, tension force

Size	A	T [1]	ØU
1	on request		
2	lift + 20	2	61
2,5	lift + 20	2	61
5	lift + 40	2	81
10	lift + 20	3	93
15	lift + 20	3	93
20	lift + 20	3	119
25	lift + 20	3,5	145
35	lift + 45	4	173
50; 75; 100; 150 and 200 on request			



1) When new; repair of supporting and safety nut required at "setting T = 0"



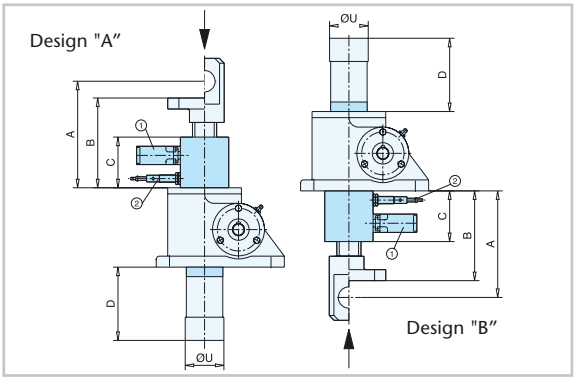
3.4 SHE range dimension plans

3.4.1.7 With long safety nut (VBG 70 or VBG 14)

In the case of worm gear screw jacks used on theatre stages (VBG 70), lifting platforms (VBG 14) or jacking systems that might affect personal safety, lifting elements are designed according to current regulations, and include such items as anti-drop systems (self-locking spindles and/or mechanical safety brakes as part of the drive system). The function of the synchronizing device is guaranteed, when required, by additional components.

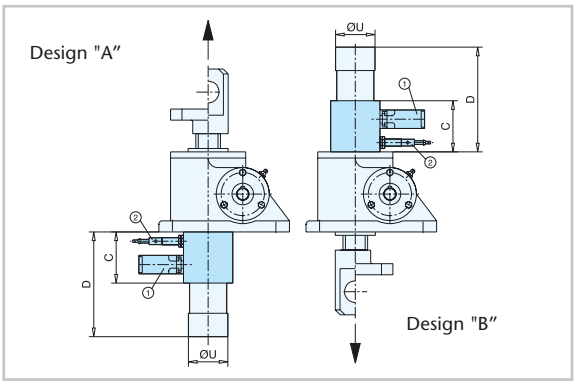
3

SHE type 1, compression force



Size	A	B	C	D	ØU
1	on request				
2					
2,5	140	125	80	Lift + 60	65
5	161,5	134	83	Lift + 70	65
10	201,5	171,5	98	Lift + 70	83
15	201,5	171,5	98	Lift + 70	83
20	201	171	91	Lift + 70	115
25	264	222	130	Lift + 83	160
35; 50; 75; 100; 150 and 200 on request					

SHE type 1, tension force

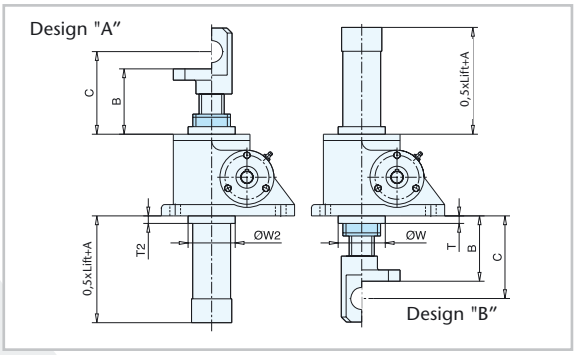


Size	A	B	C	D	ØU
Dimension plans available on request					

Ind. proximity switch (1)	Mechanical limit switch (2)
See section on accessories for details of technical data and dimension plans	

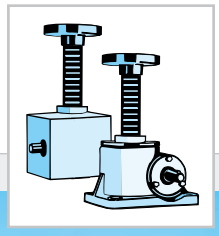
3.4.1.8 SHE in telescopic configuration

Worm gear screw jacks in telescopic configuration permit long lifting distances in reduced spaces.



Size	Spindle	A	B	C	ØW	T	ØW1	T1
2,5/0,5	on request							
5/1	Tr20x5LH Tr40x5RH	15	63	85	-	-	110	10
10/2	Tr26x6LH Tr58x6RH	35	72	87	135	26	85	17,5
10/2,5	Tr30x6LH Tr58x6RH	35	72	87	135	26	85	17,5
20/5	Tr40x7LH Tr72x7RH	33	90	117,5	120	32	116	12
25/10	Tr55x8LH Tr90x8RH	33	90	120	130	41	-	-
50/10	Tr58x12LH Tr110x12RH	35	160	130	200	15	200	15

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

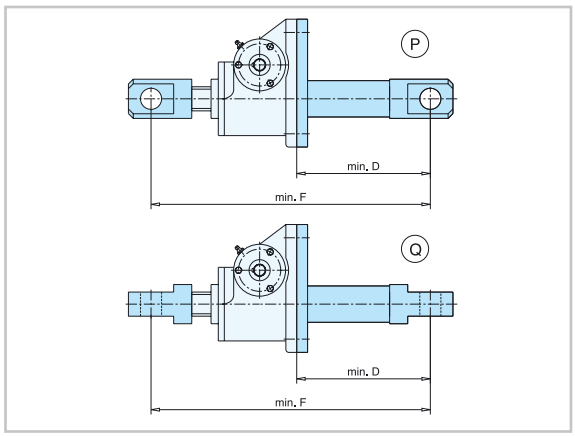


3.4 SHE range dimension plans

3.4.1.9 SHE in swiveling configuration

In order to allow worm gear screw jacks to carry out swiveling and tipping movements, the drive elements must be secured at two points and permitted to move. This can be done using a two-sided head (IV) or coupling head. The moment of flexion resulting from the swiveling motion should be minimized as much as possible by means of low-friction articulations.

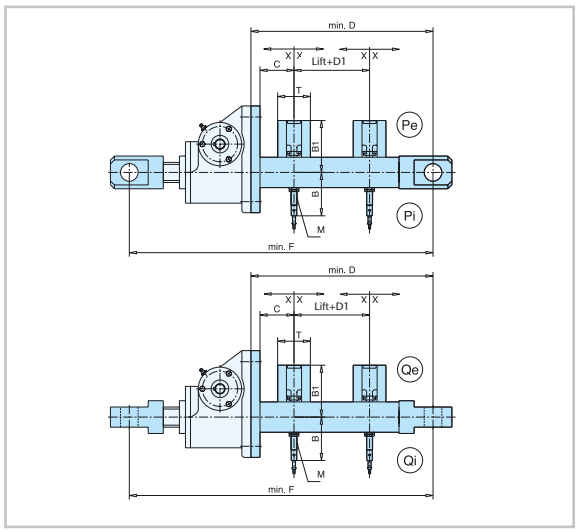
	With end-limit stop		Without end-limit stop	
Size	D	F	D	F
1	on request			
2	lift +90	lift +252,5	lift +70	lift +232,5
2,5	lift +110	lift +275,5	lift +90	lift +255,5
5	lift +138	lift +360	lift +113	lift +335
10	lift +155	lift +415	lift +125	lift +385
15	lift +155	lift +415	lift +125	lift +385
20	lift +175	lift +467	lift +135	lift +427
25	lift +200	lift +559	lift +150	lift +509
35	on request			
50				
100				
150				



3.4.1.10 SHE in swiveling configuration with added-on stroke-end limit switches

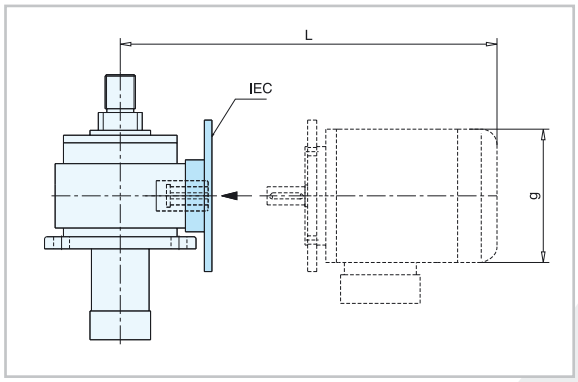
All sizes of unit can be supplied with mechanical or inductive operating limit switches

Size	B	B1	C	D	D1	F	M	T	X
0,5	on request								
1									
2									
2,5	91	100	48	175	25	340,5	12x1	58	± 10
5	103	80	48	203	20	424,5	12x1	58	± 10
10/15	106	115	48	228	30	488	12x1	58	± 10
20; 25; 35; 50; 75 and 100 on request									



3.4.1.11 SHE with hollow shaft and motor

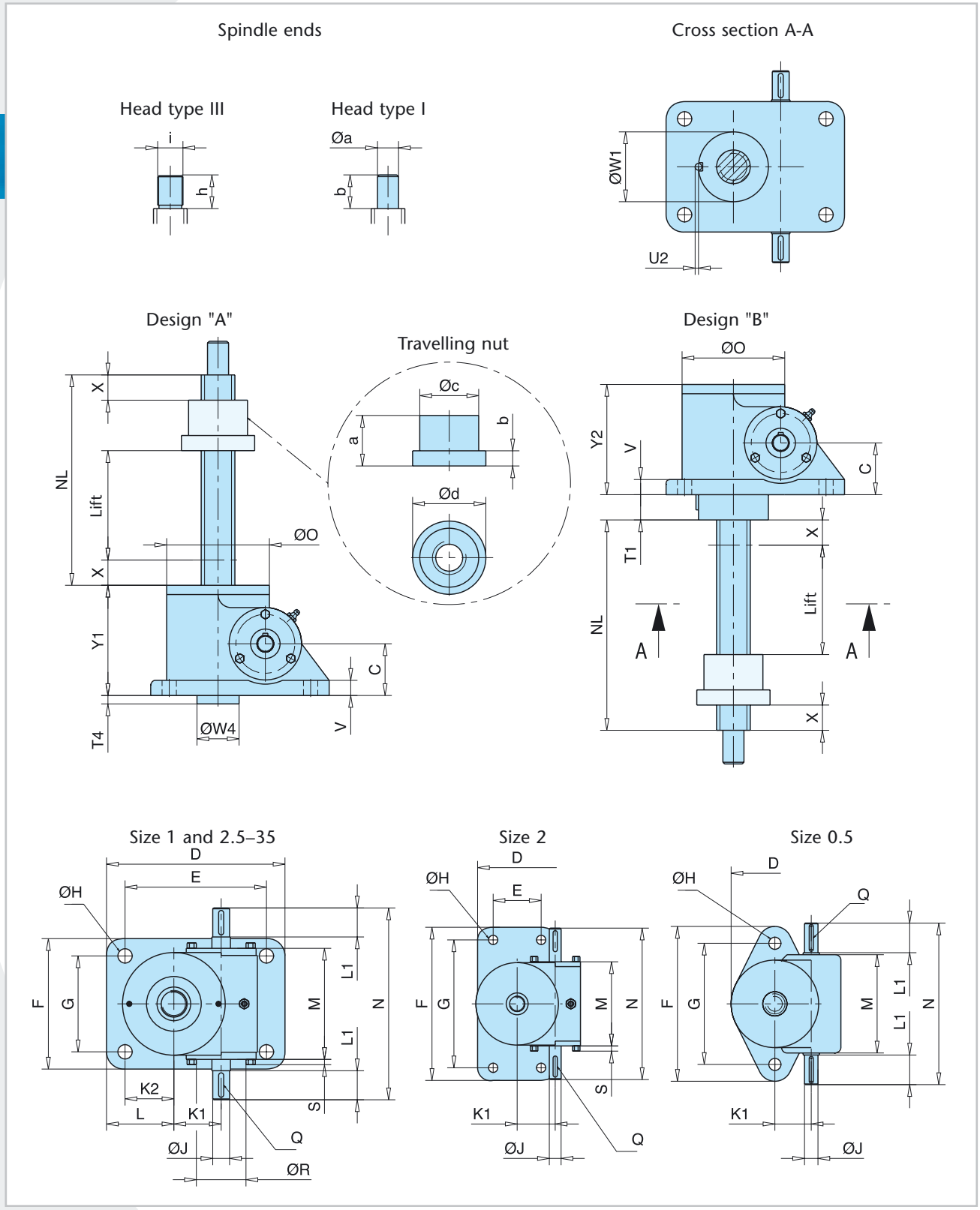
Size	IEC flange	Motor-Type	Øg	L
2,5	on request			
5				
10				
20				
25				



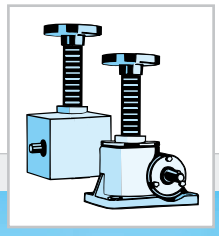
3.4 SHE range dimension plans

3.4.2 Configuration type 2

3.4.2.1 Standard



Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

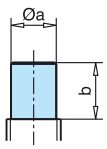


3.4 SHE range dimension plans

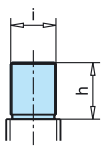
Size	0,5	1	2	2,5	5	10	15	20	25	35
Spindle	Tr 18x6	Tr 22x5	Tr 26x6,28	Tr 30x6	Tr 40x7	Tr 58x12	Tr 60x12	Tr 65x12	Tr 90x16	Tr 100x16
C	32	35	44	45	61,5	70	70	87	102	115
D	81,5	150	94	165	212	235	235	295	350	430
E	-	130	57	135	168	190	190	240	280	360
F	115	100	182	120	155	200	200	215	260	280
G	90	80	152	90	114	155	155	160	190	210
ø H	9	8,5	11	14	17	21	21	28	35	35
ø J $_{k6}$	10	14	14	16	20	25	25	28	34	38
K 1	27	36	45,2	45,2	56,2	66,8	66,8	72,5	97	120
K 2	-	58	28,5	50	58	63,5	63,5	95	95	135
L	32,5	68	47	65	80	86	86	122,5	130	170
L 1	22	18	-	-	-	52	52	52	60	80
M	73	100	100	110,5	132	172	172	213,5	221	265
N	120	140	180	190	228	280	280	322	355	430
NL	lift+72	lift+80	lift+80	lift+85	lift+100	lift+125	lift+125	lift+150	lift+170	lift+205
ø O	65	Vkt 100	98	98	122	150	150	185	205	260
Q	3x3x20	5x5x16	5x5x25	5x5x32	6x6x32	8x7x45	8x7x45	8x7x45	10x8x50	10x8x70
ø R	-	-	41	38	55	55	55	72	80	100
S	-	-	6	5,5	6	7	7	6	10	10
T 1	18,5	9	24	26,5	30	34	34	39	52	45
T 4	0	9	0	0	0	0	0	0	0	15
U 2	2,5	0	2	3	3	1	1	3	3	4
V	10	10	14	12	18	16	16	20	25	30
ø W 1	45	60	60	68	83	110	110	140	160	180
ø W 4	0	60	0	0	0	0	0	0	0	150
Safety X	20	20	20	20	20	25	25	25	25	30
Y 1	74	79	95	100	131	160	160	194	226	250
Y 2	70	79	93	97	131	150	150	181	211	250
Travelling nut										
a	32	40	40	45	60	75	75	100	120	145
b	10	12	18	15	18	25	25	30	35	35
ø c $_{h9}$	40	45	50	50	70	90	90	90	130	150
ø d	50	65	76	80	87	110	110	120	155	190
Head I										
ø a $_{k6}$	10	15	18	20	25	40	40	50	70	80
b	20	24	30	30	40	50	50	60	80	80
Head III										
h	20	24	30	30	39	50	50	60	80	80
i	M 10	M 16x1,5	M 18x1,5	M 22x1,5	M 30x2	M 40x3	M 40x3	M 50x3	M 70x3	M 80x3

3.4 SHE range dimension plans

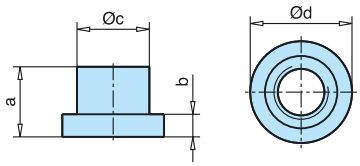
Head type I



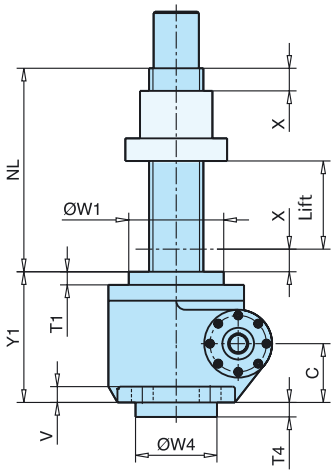
Head type III



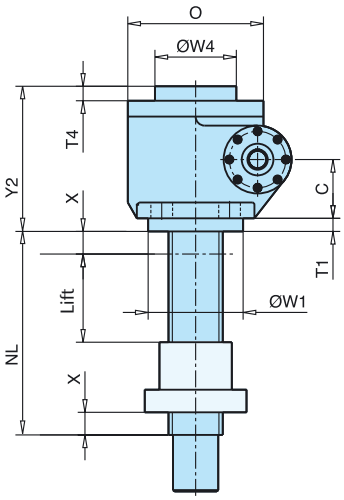
Travelling nut



Design "A"
SHE Size 50

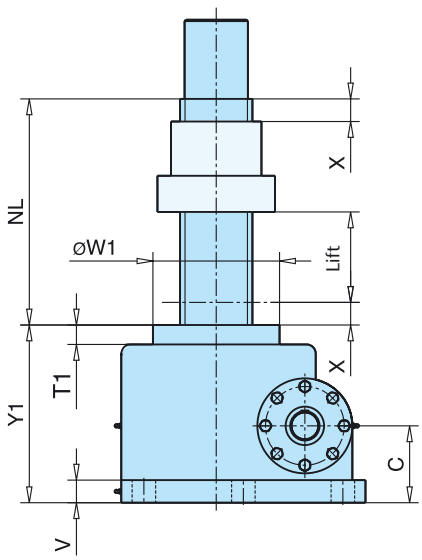


Design "B"
SHE Size 75

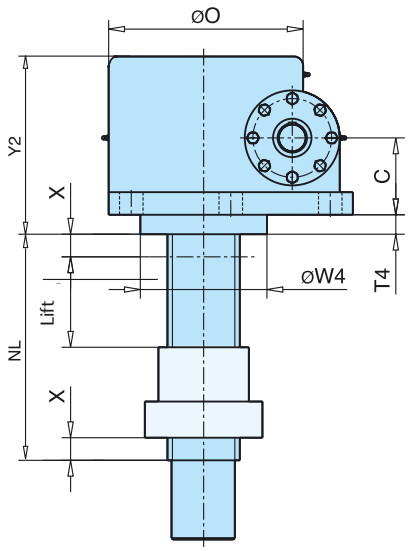


Design "A"

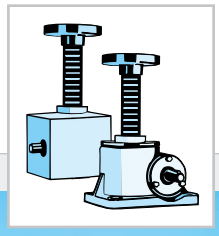
SHE Size 100-200



Design "B"

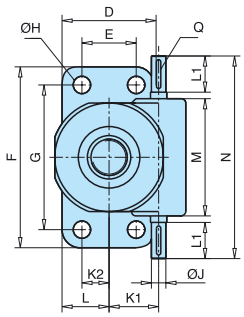


Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

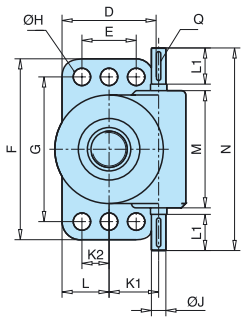


3.4 SHE range dimension plans

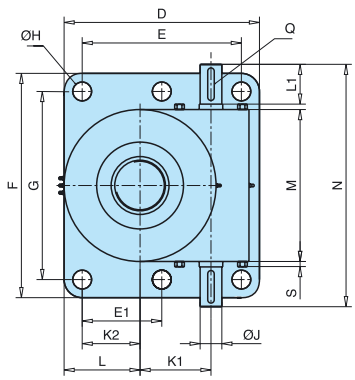
SHE Size 50



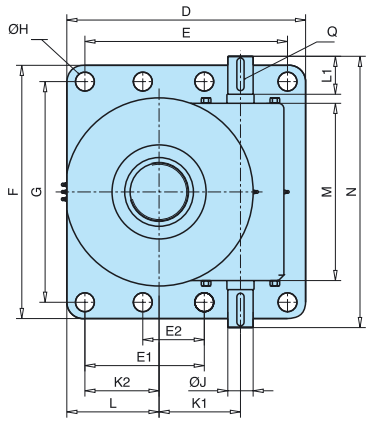
SHE Size 75



SHE Size 100

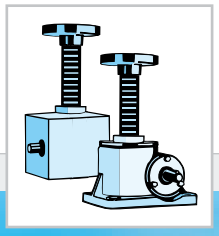


SHE Size 150 and 200



Size	50	75*	100	150	200*
Spindle	Tr 120x16	Tr 140x20	Tr 160x20	Tr 190x24	Tr 220x28
C	130		170	194	
D	260		540	660	
E	150		440	560	
E1			220	330	
E2			-	170	
F	500		620	700	
G	400		520	610	
ø H	48		52	52	
ø J $_{k6}$	40		60	70	
K 1	137		196	225	
K 2	75		160	210	
L	130		210	255	
L 1	100		110	110	
M	324		420	490	
N	560		670	710	
NL	lift+255		lift+300	lift+340	
Vkt O	300				
ØO			420	510	
Q	12x8x80		18x11x90	20x12x90	
Ø R	-				
S	-		14	-	
T 1	29		33	40	
T 4	32		43	50	
V	35		50	60	
Ø W 1	210		280	340	
Ø W 4	180		-	-	
Safety X	50		50	50	
Y 1	289		383	465	
Y 2	289		393	475	
Travelling nut					
a	155		200	240	
b	50		80	90	
ø c $_{h9}$	160		200	240	
ø d	225		260	300	
Head I					
ø a $_{k6}$	100		140	160	
b	125		175	200	
Head III					
h	125		175	200	
i	M 100x5		M 140x6	M 160x6	

* Dimension plan available on request

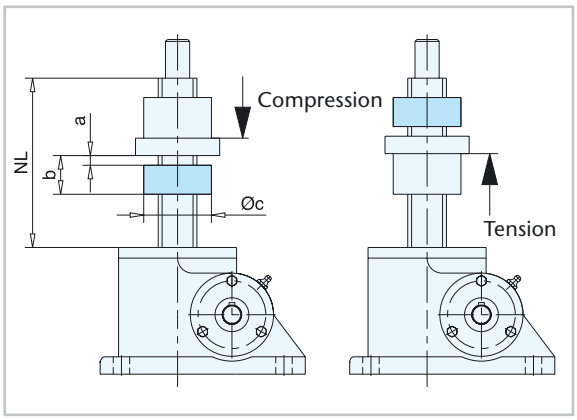


3.4 SHE range dimension plans

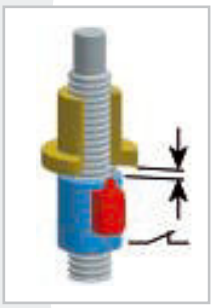
3.4.2.2 SHE type 2 – short safety nut

Take up the axial strain if the main nut breaks. This considerably increases the operating safety of the drive elements. The safety nut can also be used to carry out a precise check for wear on the main nut, as the clearance between these two nuts changes according to the amount of wear. In the case of worm gear screw jacks with short safety nut, the direction of main stress (tension and compression force) and the installation point should be taken into account, as only a correctly fitted safety nut is capable of taking up the load.

SHE type 2, compression and tension force



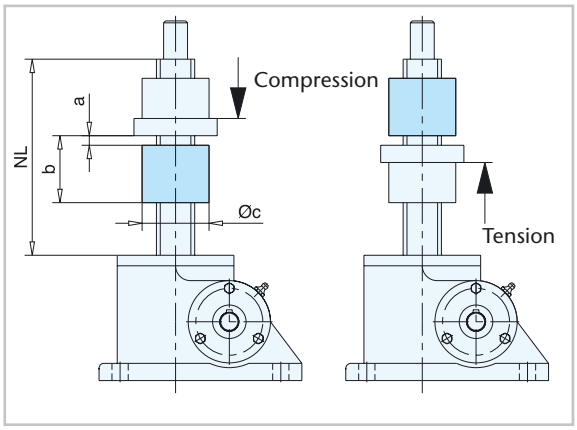
Size	a[1)]	b	Øc	NL
1	5	25	45	lift+105
2	10	35	50	lift+115
2,5	10	35	50	lift+120
5	10	40	70	lift+140
10	10	60	90	lift+185
15	10	60	90	lift+185
20	10	60	90	lift+210
25	15	80	130	lift+250
35	15	80	150	lift+285
50	15	80	160	lift+335
75	on request			
100	15	95	200	lift+395
150	20	120	240	lift+460
200	on request			



3.4.2.3 With long safety nut (VBG 70 or VBG 14)

In the case of worm gear screw jacks used on theatre stages (VBG 70), lifting platforms (VBG 14) or jacking systems that might affect personal safety. lifting elements are designed according to current regulations, and include such items as anti-drop systems (self-locking spindles and/or mechanical safety brakes as part of the drive system). The function of the synchronizing device is guaranteed, when required by, additional components.

SHE BA 2, compression and tension force



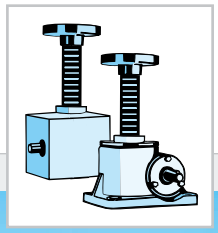
Size	a[1)]	b	Øc	NL
1	5	45	45	lift+125
2	10	50	50	lift+130
2,5	10	55	50	lift+140
5	10	70	70	lift+170
10	10	85	90	lift+210
15	10	85	90	lift+210
20	10	110	90	lift+260
25	15	135	130	lift+305
35	15	160	150	lift+365
50	15	170	160	lift+425
75	on request			
100	15	215	200	lift+515
150	20	260	240	lift+600
200	on request			

[1)] When new; repair of supporting and safety nut required when "setting a = 0"

See section 3.8 for details of further travelling nut configurations
- Travelling nut with trunnion
- Ku spindle with single flange nut
- Travelling nut with keyed surface
- Travelling nut with spherical support

Mechanical limit switch
See section on accessories for details of technical data and dimension plans

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



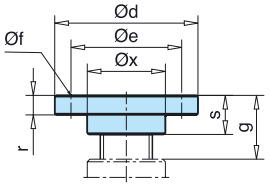
Contents

3.5 Merkur range dimension plans

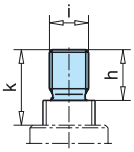
3.5.1 Type 1

3.5.1.1 Standard

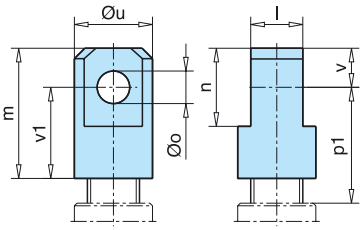
Head type I



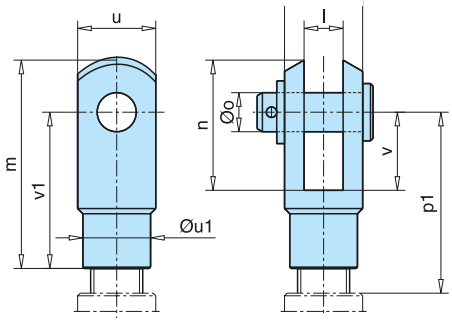
Head type III

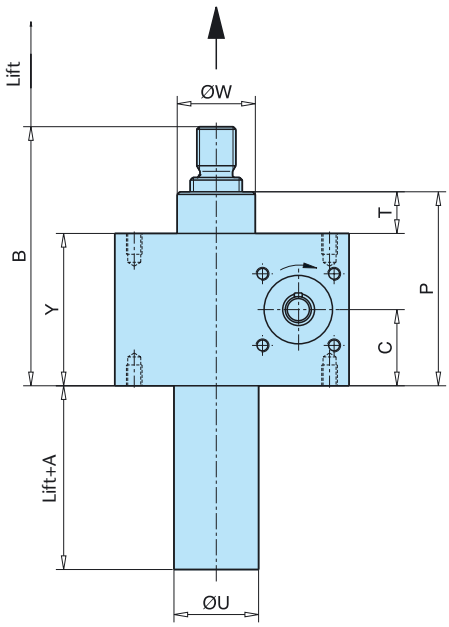


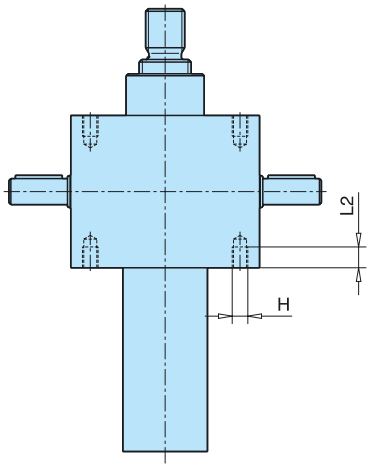
Head type IV

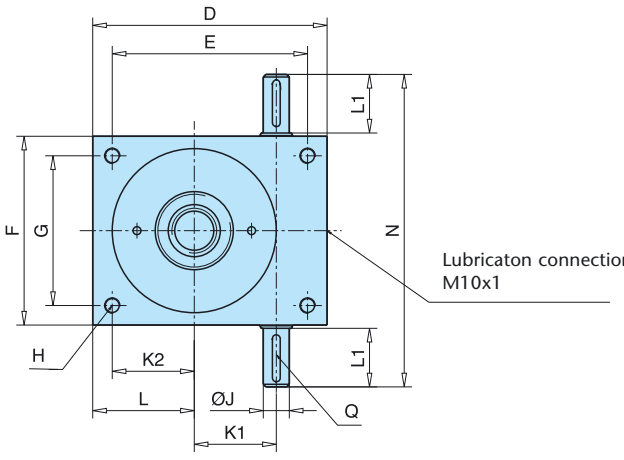


Head type GK

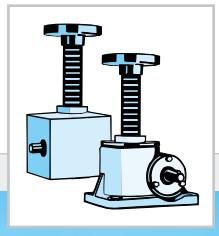








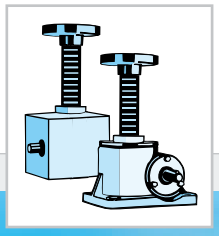
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.5 Merkur range dimension plans

Size	M 0	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8
Tr spindle	Tr 14x4	Tr 18x4	Tr 20x4	Tr 30x6	Tr 40x7	Tr60x9	Tr80x10	Tr100x10	Tr120x14
A	20	20	30	30	45	55	55	65	90
B	77	97 (110)	120 (124)	132	182	255	275	360	466
C	25	31	37,5	41	58,5	80	82,5	110	133
D	60	80	100	130	180	200	240	290	360
E	48	60	78	106	150	166	190	230	290
F	50	72	85	105	145	165	220	250	300
G	38	52	63	81	115	131	170	190	230
H	M6	M8	M8	M10	M12	M20	M30	M36	M42
ø J $_{k6}$	9	10	14	16	20	25	30	35	48
K 1	20	25	32	45	63	71	80	100	135
K 2	16	21	29	42	63	66	75	95	115
L	22	31	40	54	78	83	100	125	150
L 1	20	22,5	25,5	43	45	65	65	63	97,5
L 2	12	13	15	15	16	30	45	54	80
N	92	120	140	195	240	300	355	380	500
P	62	74 (87)	93 (97)	105	149	200	205	270	326
Q	3x3x14	3x3x18	5x5x20	5x5x36	6x6x36	8x7x56	8x7x56	10x8x56	14x9x90
T	12	12 (25)	18 (22)	23	32	40	40	50	60
ø U	28	32	40	50	65	90	125	150	180
ø W	26	30 (48)	38,7 (57)	46	60	85	120	145	170
Y	50	62	75	82	117	160	165	220	266
Head II									
ø d	50	65	80	90	110	150	220	260	310
ø e	40	48	60	67	85	117	170	205	240
ø f	4xØ7	4xØ9	4xØ11	4xØ11	4xØ13	4xØ17	4xØ25	4xØ32	4xØ38
g	19	24	28	28	34	57	72	92	142
s	16	20	21	23	30	50	60	80	120
r	6	7	8	10	15	20	30	40	40
ø x	26	30	40	46	60	85	120	145	170
Head III									
h	12	19	20	22	29	48	58	78	118
i	M8	M12	M14	M20	M30	M36	M64x3	M72x3	M100x3
k	15	23	27	27	33	55	70	90	140
Head IV									
l $_{h10}$	12	15	20	30	35	40	80	110	120
m	40	55	63	78	100	130	155	220	330
n	20	30	36	45	60	66	110	170	230
ø o ^{H8}	8	10	12	16	20	22	60	80	90
p1	33	44	52	58	74	104	117	147	222
ø u	25	30	40	45	60	85	120	160	170
v	10	15	18	25	30	33	50	85	130
v1	30	40	45	53	70	97	105	135	200
Head GK									
l $_{H10}$	8	12	14	20	30	36	-	-	-
m	42	61	72	105	160	188	-	-	-
n	26	37	44	65	100	116	-	-	-
ø o ^{H8}	8	12	14	20	30	35	-	-	-
p1	35	52	63,5	85	124	151	-	-	-
u	16	24	27	40	60	70	-	-	-
ø u1	14	20	24,5	34	52	60	-	-	-
v	16	24	28	40	60	72	-	-	-
v1	32	48	56	80	120	144	-	-	-

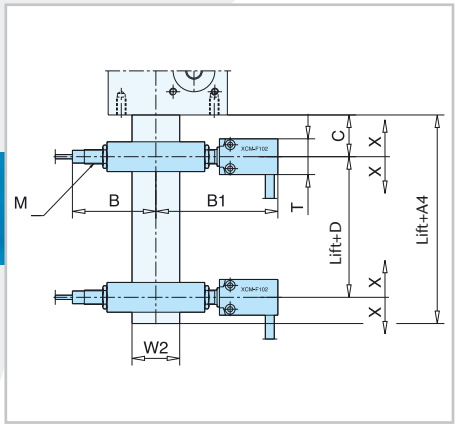
( ) values in brackets only for special configuration with Ku spindle



3.5 Merkur range dimension plans

3.5.1.2 2nd Guide ring 2FR

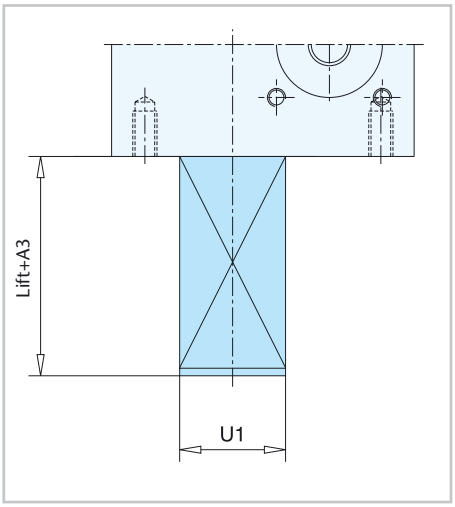
With all sizes of the Merkur standard range



3.5.1.3 With added-on stroke-end limit switches

All sizes of unit can be supplied with mechanical or inductive operating limit switches

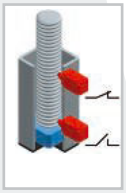
Size	A4	B	B1	C	D	T	M	W2
M 0	80	64	94	30	15	25	M12x1	28
M 1	80	66	96	30	15	25	M12x1	32
M 2	85	70	100	35	18	25	M12x1	40
M 3	100	75	105	39	20	25	M12x1	50
M 4	100	83	113	50	16	25	M12x1	65
M 5	110	95	125	58	16	25	M12x1	90
M 6								
M 7	on request							
M 8								

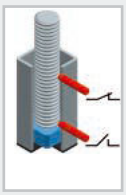


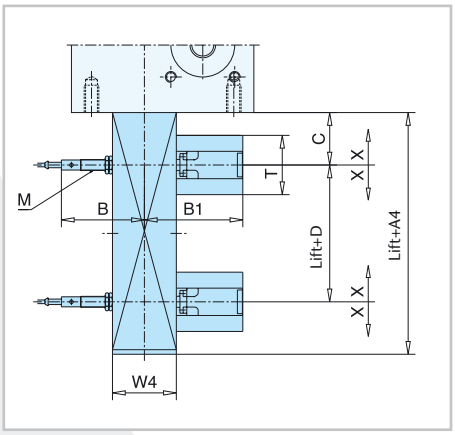
3.5.1.4 Anti-turn device V

The spindle must be prevented from twisting in order to ensure correct linear movement. This measure can be provided onsite, or by means of an anti-turn device fitted to the Merkur unit using a rectangular tube.

Size	A3	U1
M 1	32	35x35
M 2	46	40x40
M 3	46	50x50
M 4	65	65x65
M 5	75	90x90
M 6		
M 7	on request	
M 8		





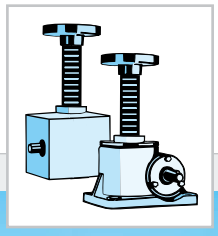


3.5.1.5 Anti-turn device Vm/Vi with added-on stroke limit switches

All sizes of unit can be supplied with mechanical or inductive operating limit switches.

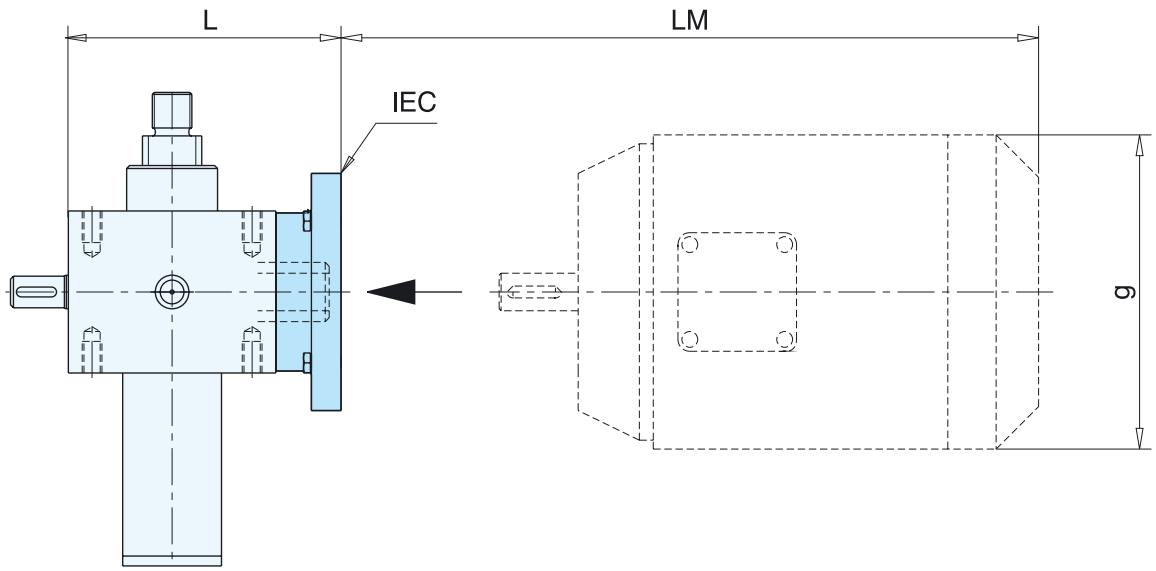
Size	A4	B	B1	C	D	T	M	W4	X
M 1	80	66	96	30	15	25	12x1	35x35	±10
M 2	85	70	100	35	18	25	12x1	40x40	±10
M 3	100	75	105	39	20	25	12x1	50x50	±10
M 4	100	83	113	50	16	25	12x1	65x65	±10
M 5	110	95	125	58	16	25	12x1	90x90	±10
M 6									
M 7	on request								
M 8									

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.5 Merkur range dimension plans

3.5.1.6 MERKUR with hollow shaft and motor



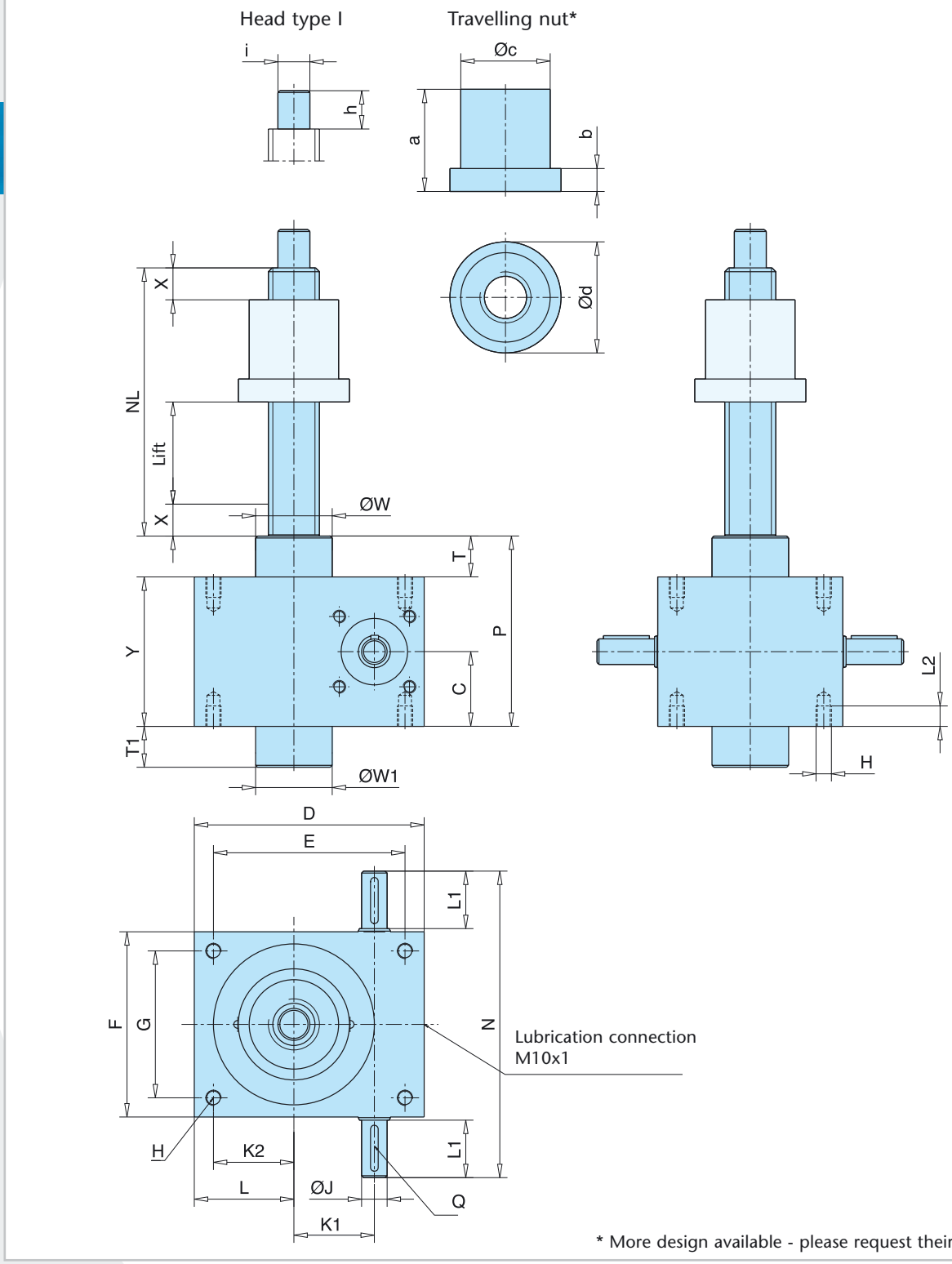
Size	Motor type	IEC flange			Motor shaft	L	LM[1] (approx.)	g
		Øa1	Øb1	Øe1				
M 0	56	80	50	65	Ø9x20	74	167	108
M 0	63	90	60	75	Ø11x23	74	190	126
M 1	63	90	60	75	Ø11x23	100	190	126
M 1	71	105	70	85	Ø14x30	100	213	142
M 2	63	90	60	75	Ø11x23	118	190	126
M 2	71	105	70	85	Ø14x30	118	213	142
M 2	80	120	80	100	Ø19x40	118	233	159
M 3	71	105	70	85	Ø14x30	138	213	142
M 3	80	120	80	100	Ø19x40	138	233	159
M 4	80	120	80	100	Ø19x40	193	233	159
M 4	90	140	95	115	Ø24x50	193	280	179
M 4	100	160	110	130	Ø28x60	193	308	200
M 5	80	120	80	100	Ø19x40	213	233	159
M 5	90	140	95	115	Ø24x50	213	280	179
M 5	112	160	110	130	Ø28x60	213	328	222
M 6								
M 7					on request			
M 8								

[1] Without a brake

3.5 Merkur range dimension plans

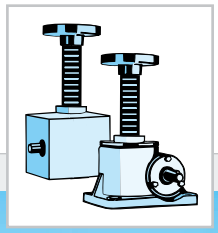
3.5.2 Type 2

3.5.2.1 Standard



* More design available - please request their dimensions

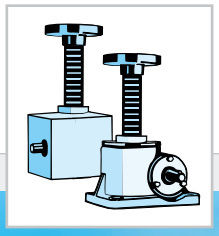
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.5 Merkur range dimension plans

Size	M 0	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8
Spindle	Tr 14x4	Tr 18x4	Tr 20x4	Tr 30x6	Tr 40x7	Tr60x9	Tr80x10	Tr100x10	Tr120x14
C	25	31	37,5	41	58,5	80	82,5	110	133
D	60	80	100	130	180	200	240	290	360
E	48	60	78	106	150	166	190	230	290
F	50	72	85	105	145	165	220	250	300
G	38	52	63	81	115	131	170	190	230
H	M 6	M 8	M 8	M 10	M 12	M 20	M 30	M 36	M 42
ø J_{k6}	9	10	14	16	20	25	30	35	48
K 1	20	25	32	45	63	71	80	100	135
K 2	16	21	29	42	63	66	75	95	115
L	22	31	40	54	78	83	100	125	150
L 1	20	22,5	25,5	43	45	65	65	63	97,5
L 2	12	13	15	15	16	30	45	54	80
N	92	120	140	195	240	300	355	380	500
NL	lift + 52	lift + 56	lift + 70	lift + 85	lift + 110	lift + 125	lift + 170	lift + 195	lift + 215
P	62	74	93	105	149	200	205	270	326
Q	3x3x14	3x3x18	5x5x20	5x5x36	6x6x36	8x7x56	8x7x56	10x8x56	14x9x90
T	12	12	18	23	32	40	40	50	60
T1[1)]	12	12	18	--	32	40	40	50	60
ø W	26	30	38,7	46	60	85	120	145	170
ø W1[1)]	26	30	38,7	--	60	85	120	145	170
Safety X	10	12	15	20	25	25	25	25	30
Y	50	62	75	82	117	160	165	220	266
Travelling nut									
a	32	32	40	45	60	75	120	145	155
b	10	10	12	15	18	25	35	35	50
ø c_{h9}	40	40	45	50	70	90	130	150	160
ø d	50	50	65	80	87	110	155	190	225
Head I									
ø i_{k6}	8	12	15	20	25	40	60	80	95
h	12	15	20	25	30	45	75	100	120

[1)] Bearing neck can be dispensed with if required



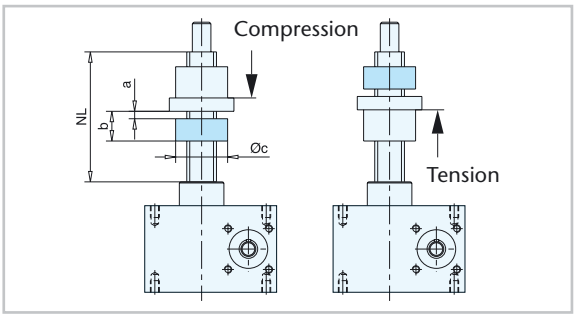
3.5 Merkur range dimension plans

3.5.2.2 MERKUR – short safety nut

Take up the axial strain if the main nut breaks. This considerably increases the operating safety of the drive elements. The safety nut can also be used to carry out a precise check for wear on the main nut, as the clearance between these two nuts changes according to the amount of wear. In the case of worm gear screw jacks with short safety nut, the direction of main stress (tension and compression force) and the installation point should be taken into account, as only a correctly fitted safety nut is capable of taking up the load.

3

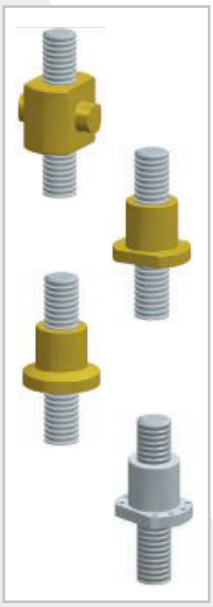
MERKUR type 2, compression and tension force



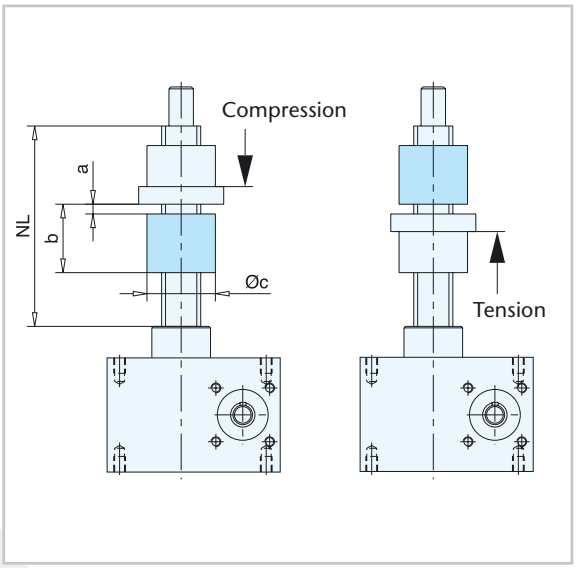
Size	NL	a[1)]	b	Øc
M 0	on request			
M 1				
M 2	lift+95	5	25	45
M 3	lift+120	10	35	50
M 4	lift+150	10	40	70
M 5	lift+185	10	60	90
M 6	lift+250	15	80	130
M 7	lift+275	15	80	150
M 8	on request			

3.5.2.3 With long safety nut (GUV 16.4.5 or VBG 14)

In the case of worm gear screw jacks used on theatre stages (VBG 16.4.5), lifting platforms (VBG 14) or jacking systems that might affect personal safety, lifting elements are designed according to current regulations, and include such items as anti-drop systems (self-locking spindles and/or mechanical safety brakes as part of the drive system). The function of the synchronizing device is guaranteed, when required, by additional components.



MERKUR type 2, compression and tension force



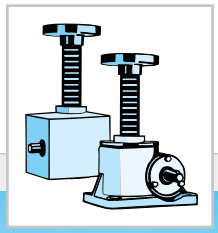
Size	NL	a[1)]	b	Øc
M 0	on request			
M 1				
M 2	lift+115	5	45	45
M 3	lift+140	10	55	50
M 4	lift+180	10	70	70
M 5	lift+210	10	85	90
M 6	lift+305	15	135	130
M 7	lift+355	15	160	150
M 8	on request			

[1)] When new; repair of supporting and safety nut required at "setting a = 0"

See section 3.8 for details of further travelling nut configurations

- Travelling nut with trunnion
- Ku spindle with single flange nut
- Travelling nut with keyed surface
- Travelling nut with spherical support

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



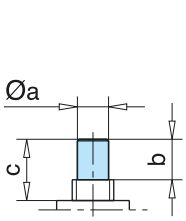
3.6 HSE range dimension plans

3.6 HSE range dimension plans

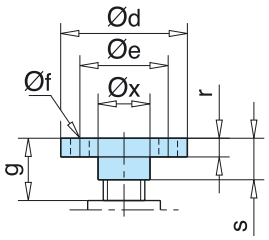
3.6.1 Type 1

3.6.1.1 Standard

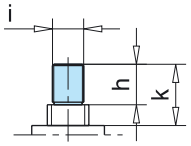
Head type I



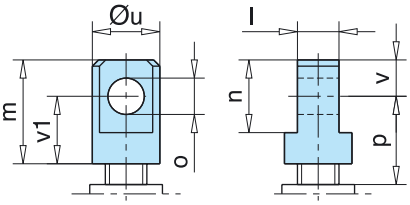
Head type II

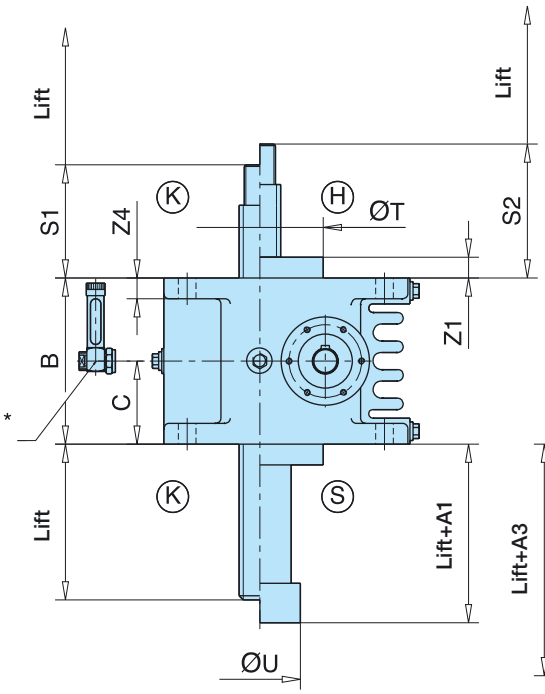


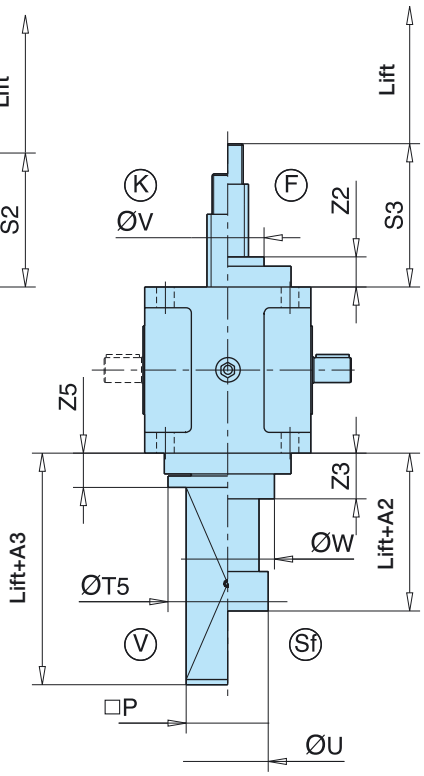
Head type III

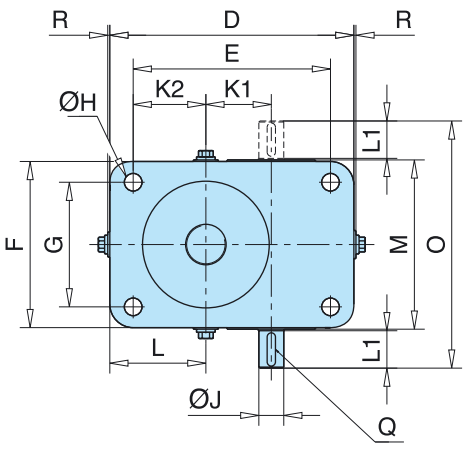


Head type IV





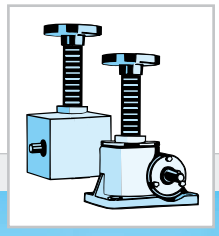




Versions possibles:

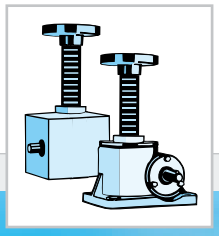
K ——— Short cover
H ——— High cover
F ——— Guide ring
S ——— protection tube
Sf ——— protection tube with guide ring
V ——— Anti-turn device
* Oil gauge dimension plan see section 3.6.2 (HSE type 2)

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

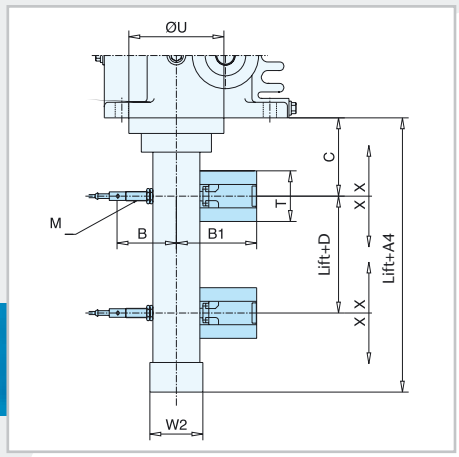


3.6 HSE range dimension plans

Size Spindle	31 Tr 18x4	36 Tr 22x5	50 Tr 40x8	63 Tr 50x9	80 Tr 60x12	100 Tr 70x12	125 Tr100x16	140 Tr 120x16	200 Tr 160x20
A 1	22	22	22	22	22	22	22	22	22
A 2	39	44	46	52	61	71	76	86	101
A 3	98	104	117	123	136	152	154	179	199
B	80	105	130	160	200	230	300	350	450
C	40	52,5	65	80	100	115	150	175	225
D	117	138	175	235	275	330	410	490	680
E	95	110	140	190	220	270	330	390	550
F	80	105	130	160	200	230	300	350	460
G	62	80	100	120	150	175	230	260	330
Ø H	9	9	13	17	21	28	39	46	66
Ø J_{k6}	10	14	16	24	32	38	42	50	70
K 1	31	36	50	63	80	100	125	140	200
K 2	31	40	50	70	75	87,5	110	130	185
L	42	54	67,5	92,5	102,5	117,5	150	180	250
L 1	15	18	28	36	58	58	82	82	105
M	83	108	133	163	204	235	305	355	470
N	86	112	136	166	206	240	310	360	472
O	116	148	192	238	322	356	474	524	682
P	30	40	70	80	80	100	140	180	220
Q	3x3x12	5x5x16	5x5x25	8x7x32	10x8x50	10x8x50	12x8x70	14x9x70	20x12x100
R	3	2	2	2	2	2	5	5	5
S 1	43	45	50	60	70	75	100	120	140
S 2	58	61	68	80	95	105	135	160	190
S 3	66	69	76	89	109	124	154	184	219
Ø T f7	62	72	92	122	152	182	222	262	352
Ø T5	50	-	100	115	130	-	200	260	310
Ø U	28	37	66	82	78	92	136	143	198
Ø V	35	40	60	70	100	125	160	195	240
ØW	45	50	80	100	120	150	180	220	290
Z 1	15	16	18	20	25	30	35	40	50
Z 2	23	24	26	29	39	49	54	64	79
Z 3	29	34	39	44	54	64	74	84	109
Z 4	10	12	15	20	25	28	35	45	60
Z 5	27	-	28	33	40	-	54	63	73
Head I									
Ø a_{k6}	12	15	20	30	40	50	80	95	130
b	17	24	29	39	49	54	79	99	119
c	37	44	49	59	69	74	99	119	139
Head II									
Ø d	62	72	92	122	150	182	222	262	352
Ø e	45	50	65	85	105	135	170	205	270
Ø f	4xø 6,6	4xø 9	4xø 14	4xø 18	4xø 22	6xø 26	8xø 30	8xø 33	8xø 45
g	43	45	50	60	70	75	100	120	140
r	8	10	12	18	20	25	30	35	50
s	18	25	30	40	50	55	80	100	120
Ø x	20	30	35	50	65	85	115	140	185
Head III									
h	17	24	29	39	49	54	79	99	119
i	M 12x1,5	M 16x1,5	M 20x1,5	M 30x2	M 42x3	M 56x3	M 80x3	M 100x4	M 140x4
k	37	44	49	59	69	74	99	119	139
Head IV									
l - 0,2	20	25	30	40	60	75	100	120	160
m	50	60	70	100	130	150	230	300	360
n	30	40	50	70	100	120	160	200	280
Ø o^{H8}	15	20	25	35	50	60	80	100	140
p	55	60	65	85	100	110	170	220	240
Ø u	30	40	50	65	90	110	140	170	220
v	15	20	25	35	50	60	80	100	140
v_1	35	40	45	65	80	90	150	200	220

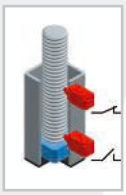


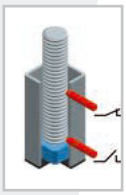
3.6 HSE range dimension plans

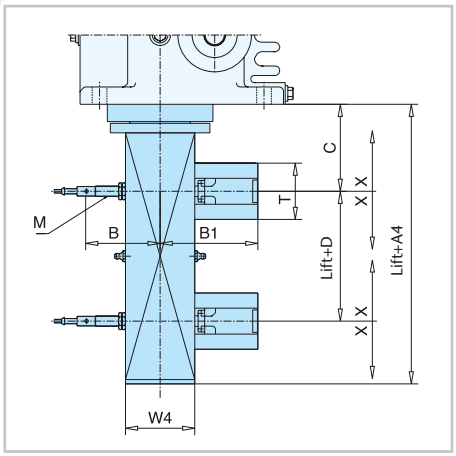


3.6.1.2 Configuration Sf with added-on stroke-end limit switches

Size	A4	B	B1	C	D	T	M	ØU	W2	X
31	*on request									
36	140	86	*	70	12	*	12x1	72	42	±10
50	175	97	105	82	20	58	12x1	92	66	±10
63	180	106	110	88	25	58	12x1	122	82	±10
80	220	114	120	100	40	58	12x1	152	96	±10
100	on request									
125										
140										
200										

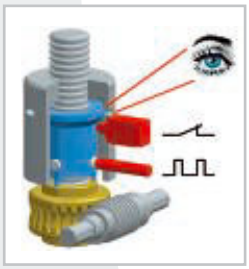






3.6.1.3 Anti-turn device Vm/Vi with added-on stroke-end limit switches

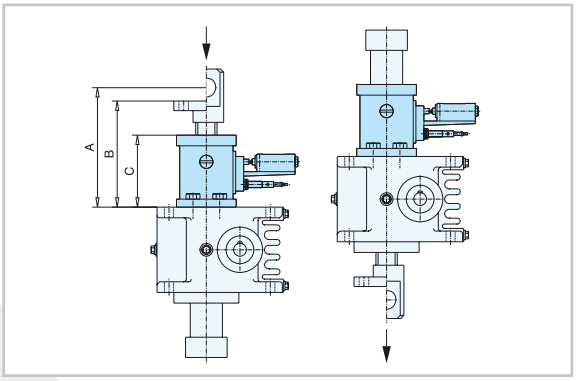
Size	A4	B	B1	C	D	T	M	W4	X
31	on request								
36									
50	140	102	110	75	20	58	12x1	70x70	±10
63	150	107	115	80	25	58	12x1	80x80	±10
80	170	112	117	85	40	58	12x1	90x90	±10
100	on request								
125									
140									
200									



3.6.1.4 With long safety nut (VBG 70 or VBG 14)

In the case of worm gear screw jacks used on theatre stages (VBG 70), lifting platforms (VBG 14) or jacking systems that might affect personal safety, lifting elements are designed according to current regulations, and include such items as anti-drop systems (self-locking spindles and/or mechanical safety brakes as part of the drive system). The function of the synchronizing device is guaranteed, when required, by additional components.

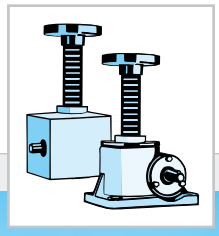
HSE type 1, compression and tension force



Size	A	B	C
31	on request		
36			
50			
63	220	195	135
80	270	240	170
100	330	295	220
125	360	290	190
140	on request		
200			

Ind. proximity switch	Mechanical limit switch
See section on accessories for details of technical data and dimension plans	

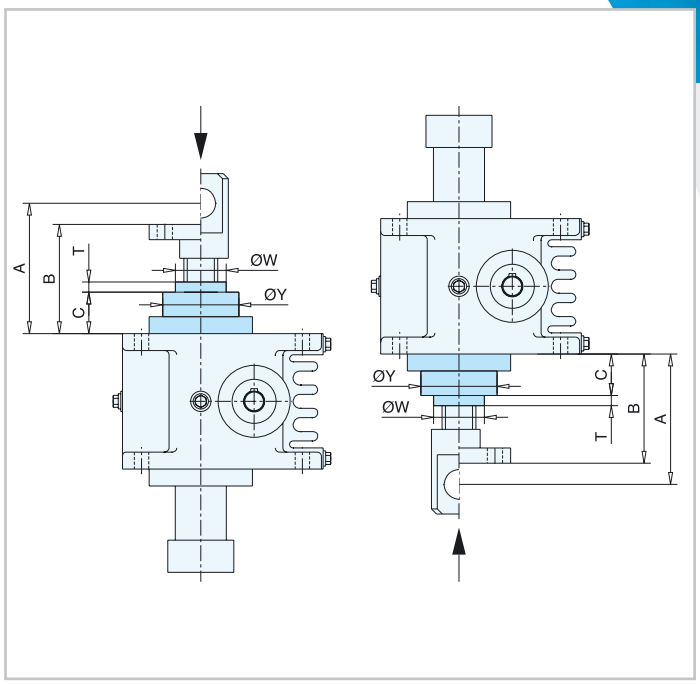
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.6 HSE range dimension plans

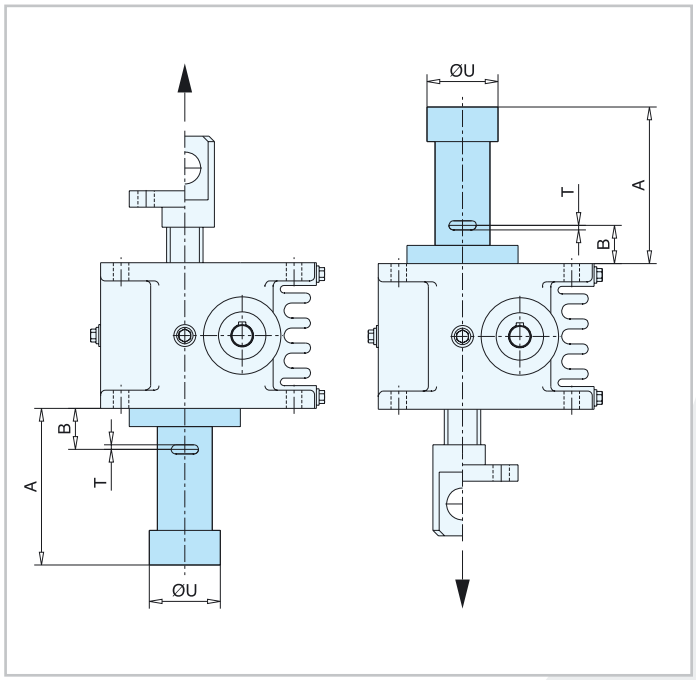
3.6.1.5 HSE type 1 – short safety nut

Takes up the axial strain if the main nut breaks. This considerably increases the operating safety of the drive elements. The safety nut can also be used to carry out a precise check for wear on the main nut, as the clearance between these two nuts changes according to the amount of wear. In the case of worm gear screw jacks with short safety nut, the direction of main stress (tension and compression force) and the installation point should be taken into account, as only a correctly fitted safety nut is capable of taking up the load.



HSE type 1, compression force

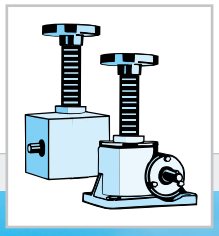
Size	A	B	C	T[1)]	ØY	ØW
31	80	63	24	1	50	30
36	85	70	24	1	55	35
50	100	85	43,5	1,5	85	60
63	125	100	48,5	1,5	105	70
80	160	130	57	3	125	90
100	170	135	57	3	155	110
125	250	180	76	4	190	140
140	300	200	76	4	230	170
200	335	235	90	5	300	240



HSE type 1, tension force

Size	A	B	T[1)]	ØU
31	lift+67	25	1	47
36	lift+67	25	1	56
50	lift+77	35	1,5	80
63	lift+82	40	1,5	92
80	lift+102	60	3	107
100	lift+102	60	3	132
125	lift+122	80	4	158
140	lift+122	80	4	198
200	lift+137	95	5	272

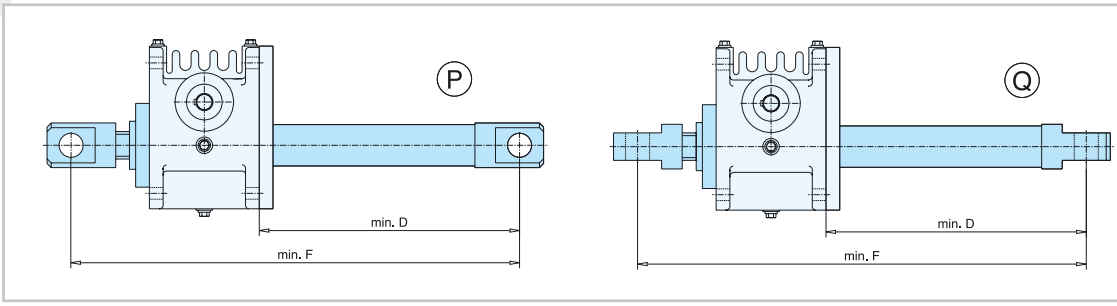
[1)] When new; repair of supporting and safety nut required at "setting T = 0"



3.6 HSE range dimension plans

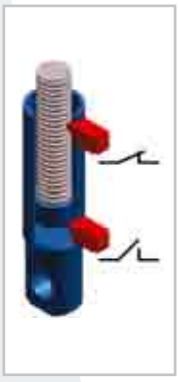
3.6.1.6 HSE type 1 in swiveling configuration

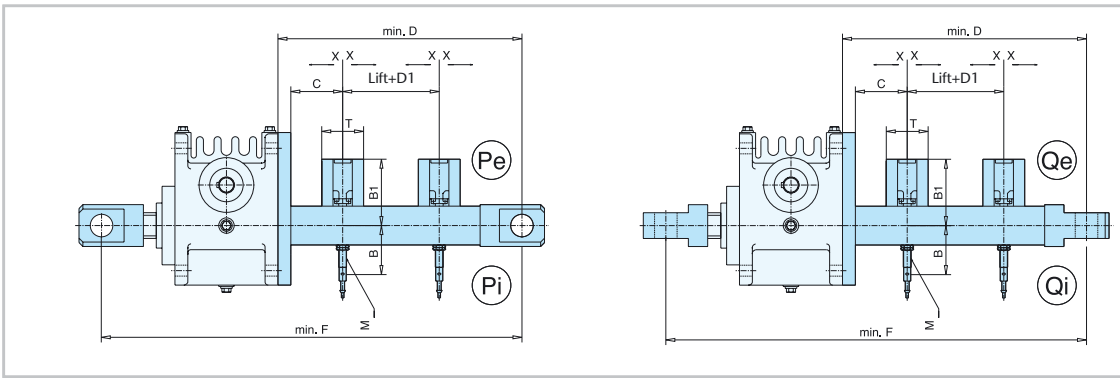
In order to allow worm gear screw jacks to carry out swiveling and tipping movements, the drive elements must be secured at two points and permitted to move. This can be done using a two-sided head (IV) or coupling head. HSE type 1 in swivel configuration.



	With end-limit stop		Without end-limit stop	
Size	D	F	D	F
31	on request			
36	lift +114	lift +303	lift +102	lift +291
50	lift +140	lift +361	lift +120	lift +341
63	lift +180	lift +454	lift +155	lift +429
80	lift +195	lift +534	lift +155	lift +494
100	on request			
125				
140				
200				

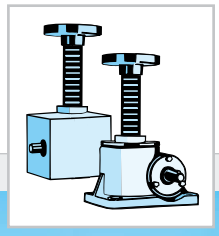
3.6.1.7 HSE type 1 in swivel configuration with added-on stroke-end limit switches





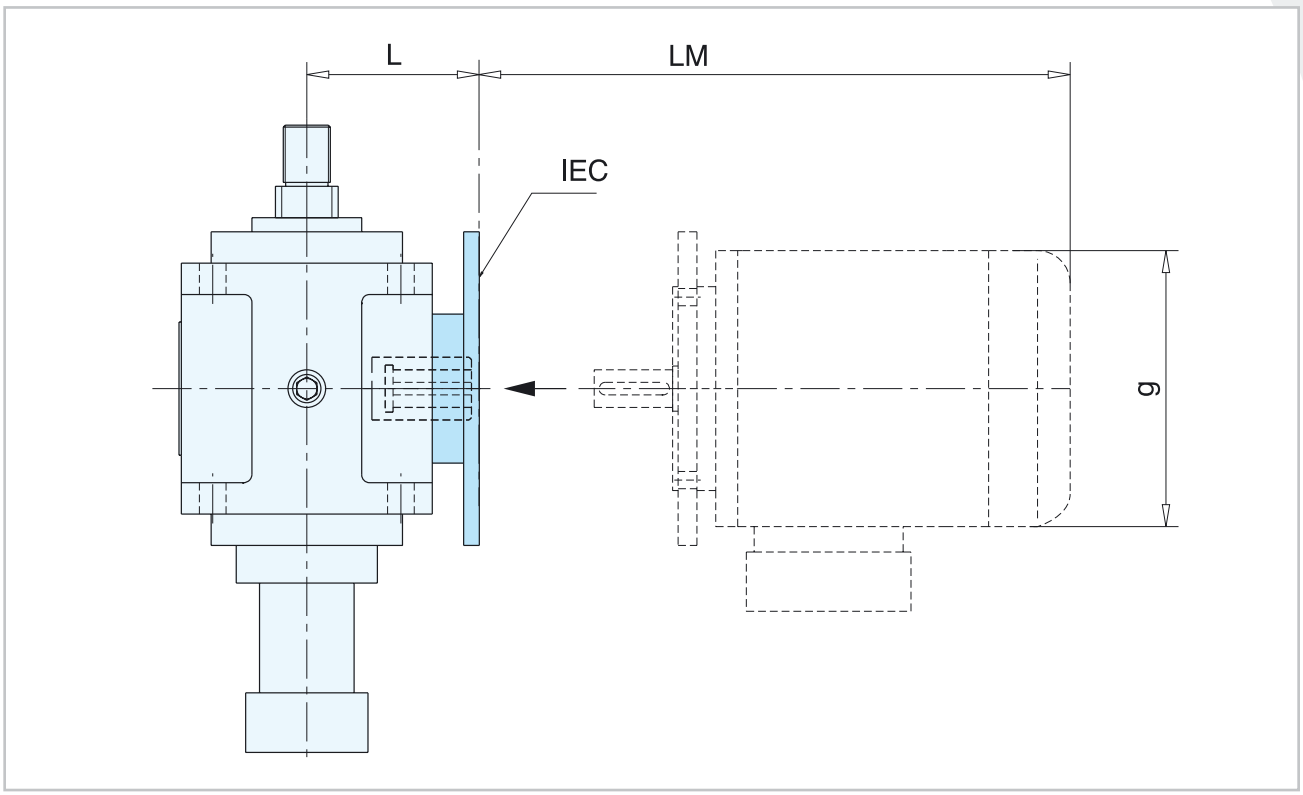
Size	B	B1	C	D	D1	F	M	T	X
31	on request								
36	86	93	50	155	12	344	12x1	58	± 10
50	97	105	50	175	20	396	12x1	58	± 10
63	106	110	50	205	25	479	12x1	58	± 10
80	114	120	50	250	40	589	12x1	58	± 10
100	on request								
125									
140									
200									

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



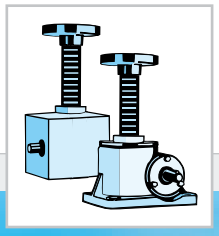
3.6 HSE range dimension plans

3.6.1.8 HSE with hollow shaft and motor



Size	Motor type	IEC flange			Motor shaft	L	LM[1] (approx.)	g
		Øa1	Øb1	Øe1				
31								
36								
50	71	160	110	130	Ø14 x 30	76,5	212	138
63	80	160	110	130	Ø19 x 40	111,5	233	156
63	90	140	95	115	Ø24 x 50	111,5	275	176
80	80	160	110	130	Ø19 x 40	132	233	156
80	90	160	110	130	Ø24 x 50	132	275	176
80	100	160	110	130	Ø28 x 60	132	306	198
80	112	160	110	130	Ø28 x 60	132	322	220
100								
125					on request			
140								
200								

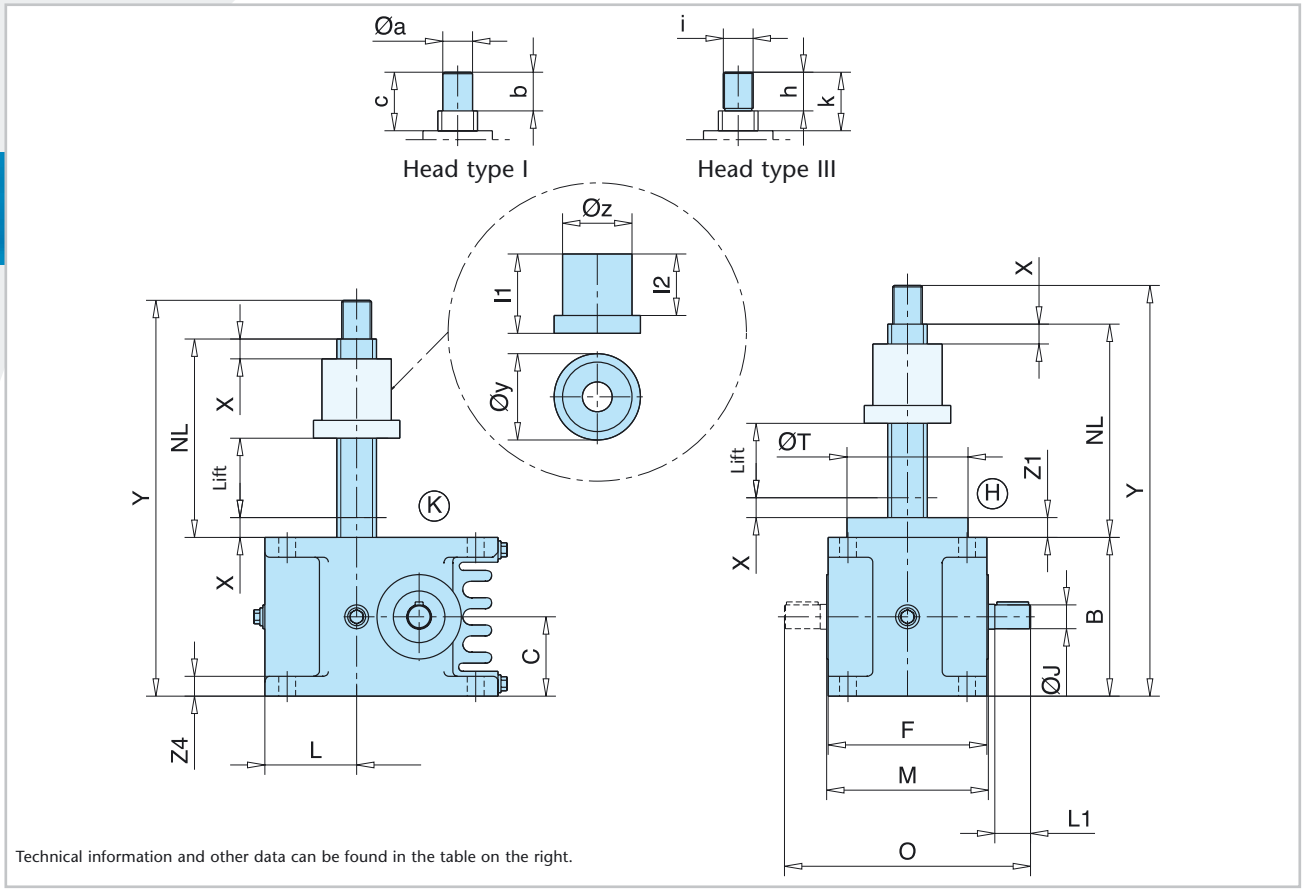
[1] Without a brake



3.6 HSE range dimension plans

3.6.2 Type 2

3.6.2.1 Standard

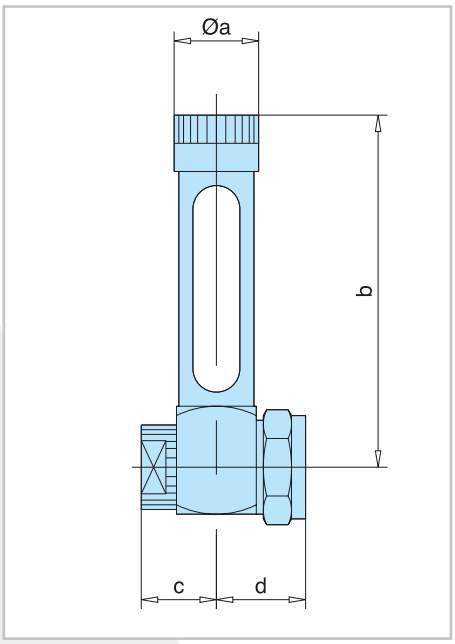


Technical information and other data can be found in the table on the right.

Possible configurations:

K _____ Short cover

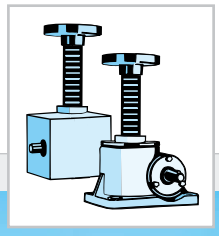
H _____ High cover



Dimension table for oil gauge type 1 and type 2

Size	31	36	50	63	80	100	125	140	200
Øa	These sizes are equipped with oil sight-glasses				18	18	18	18	18
b					80	100	125	150	200
c					19	19	22	22	22
d					18	18	18	18	18

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.6 HSE range dimension plans

Size	31	36	50	63	80	100	125	140	200
Spindle	Tr 18x4	Tr 22x5	Tr 40x8	Tr 50x9	Tr 60x12	Tr 70x12	Tr100x16	Tr 120x16	Tr 160x20
B	80	105	130	160	200	230	300	350	450
C	40	52,5	65	80	100	115	150	175	225
F	80	105	130	160	200	230	300	350	460
ØJ $_{k6}$	10	14	16	24	32	38	42	50	70
L	42	54	67,5	92,5	102,5	117,5	150	180	250
L1	15	18	28	36	58	58	82	82	105
M	83	108	133	163	204	235	305	355	470
Nl config. "K"	lift+85	lift+95	lift+120	lift+140	lift+170	lift+170	lift+200	lift+220	lift+260
Nl config. "H"	lift+100	lift+111	lift+138	lift+160	lift+195	lift+200	lift+235	lift+260	lift+310
O	116	148	192	238	322	356	474	524	682
Q	3x3x12	5x5x16	5x5x25	8x7x32	10x8x50	10x8x50	12x8x70	14x9x70	20x12x100
ØT	62	72	92	122	152	182	222	262	352
Safety X	20	20	20	20	20	20	20	20	20
Y	NL+97	NL+129	NL+169	NL+199	NL+249	NL+284	Nl+379	NL+449	NL+569
Z1	15	16	18	20	25	30	35	40	50
Z4	10	12	15	20	25	28	35	45	60
Travelling nut									
l1	45	55	80	100	130	130	160	180	220
l2	35	43	62	78	105	100	115	130	140
Øy	50	65	87	105	110	120	190	225	260
Øz h9	40	45	70	80	90	90	150	160	200
Head I									
Ø a k6	12	15	30	40	40	50	80	95	130
b	17	24	39	49	49	54	79	99	119
c	37	44	59	69	69	74	99	119	139
Head III									
h	17	24	39	49	49	54	79	99	119
i	M 12x1,5	M 16x1,5	M 30x2	M 42x3	M 42x3	M 56x3	M 80x3	M 100x4	M 140x4
k	37	44	59	69	69	74	99	119	139

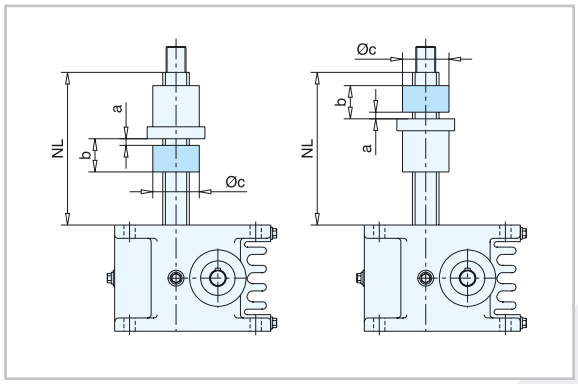
3.6.2.2 HSE type 2 – short safety nut

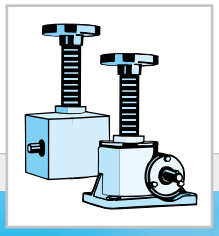
Takes up the axial strain if the main nut breaks. This considerably increases the operating safety of the drive elements. The safety nut can also be used to carry out a precise check for wear on the main nut, as the clearance between these two nuts changes according to the amount of wear. In the case of worm gear screw jacks with short safety nut, the direction of main stress (tension and compression force) and the installation point should be taken into account, as only a correctly fitted safety nut is capable of taking up the load.

HSE type 2, compression and tension force

Size	a[1)]	b	Øc	NL	
				config. K	config. H
31	5	25	40	lift+110	lift+125
36	10	35	45	lift+130	lift+146
50	10	50	70	lift+170	lift+188
63	10	60	80	lift+200	lift+220
80	10	70	90	lift+240	lift+265
100	10	70	100	lift+240	lift+270
125	15	95	150	lift+295	lift+330
140	15	95	160	lift+315	lift+355
200	15	115	200	lift+375	lift+425

[1)] When new; repair of supporting and safety nut required at "setting T = 0"

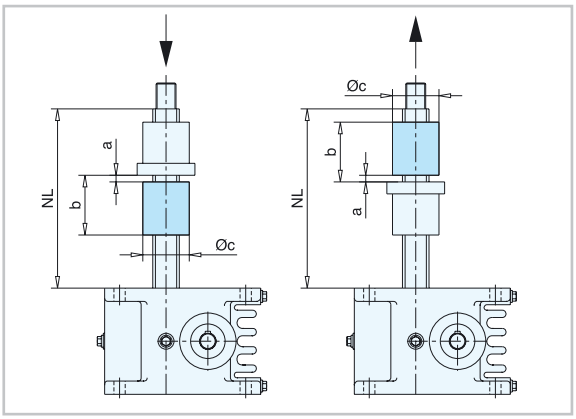




3.6 HSE range dimension plans

3.6.2.3 HSE type 2 – long safety nut

In the case of worm gear screw jacks used on theatre stages (VBG 70), lifting platforms (VBG 14) or jacking systems that might affect personal safety, lifting elements are designed according to current regulations, and include such items as anti-drop systems (self-locking spindles and/or mechanical safety brakes as part of the drive system). The function of the synchronizing device is guaranteed, when required, by additional components.

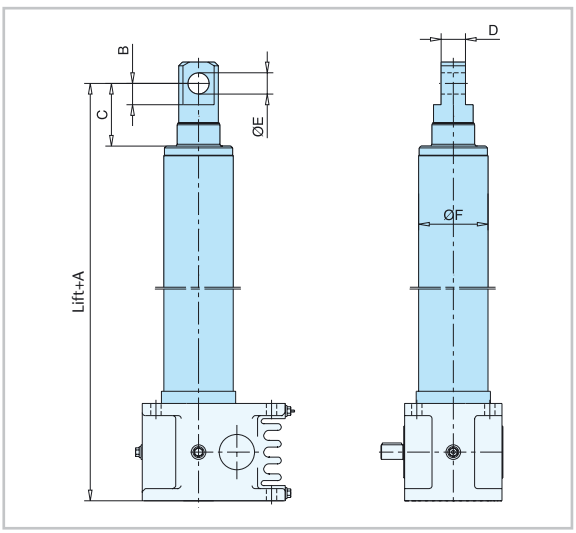


HSE type 2, compression and tension force

Size	a[1)]	b	Øc	NL	
				config. K	config. H
31	5	50	40	lift+135	lift+150
36	10	65	45	lift+160	lift+176
50	10	90	70	lift+210	lift+228
63	10	110	80	lift+250	lift+270
80	10	140	90	lift+310	lift+335
100	10	140	100	lift+310	lift+340
125	15	175	150	lift+375	lift+410
140	15	195	160	lift+415	lift+455
200	15	235	200	lift+495	lift+545

[1)] When new: Repair of supporting and safety nut required when "setting a = 0"

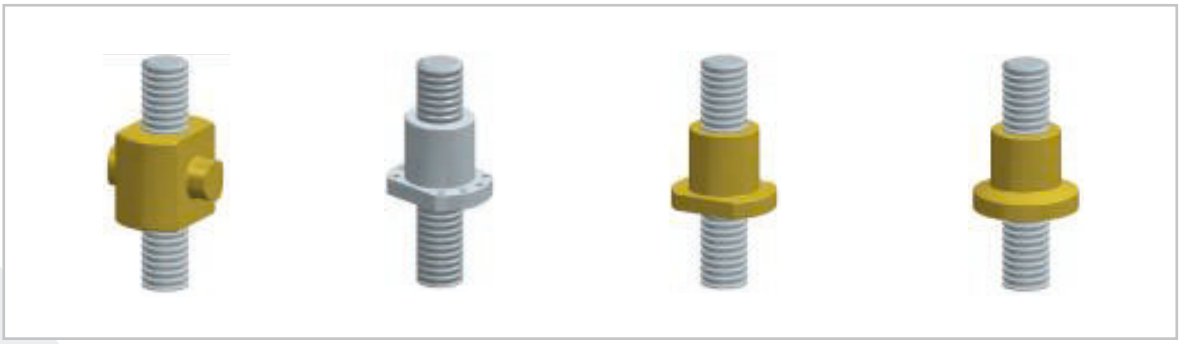
3.6.2.4 HSE type 2 in ELA configuration



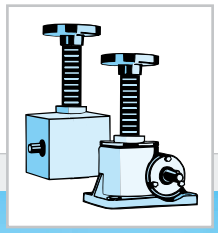
Size	A	B	C	D	ØE	ØF
31	on request					
36						
50	380	25	67	30	25	100
63	480	35	103	40	35	130
80	640	60	115	75	60	170
100						
125						
140						
200						

See section 3.8 for details of further travelling nut configurations

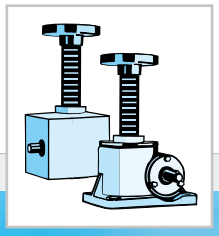
- Travelling nut with trunnion
- Ku spindle with single flange nut
- Travelling nut with keyed surface
- Travelling nut with spherical support



Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



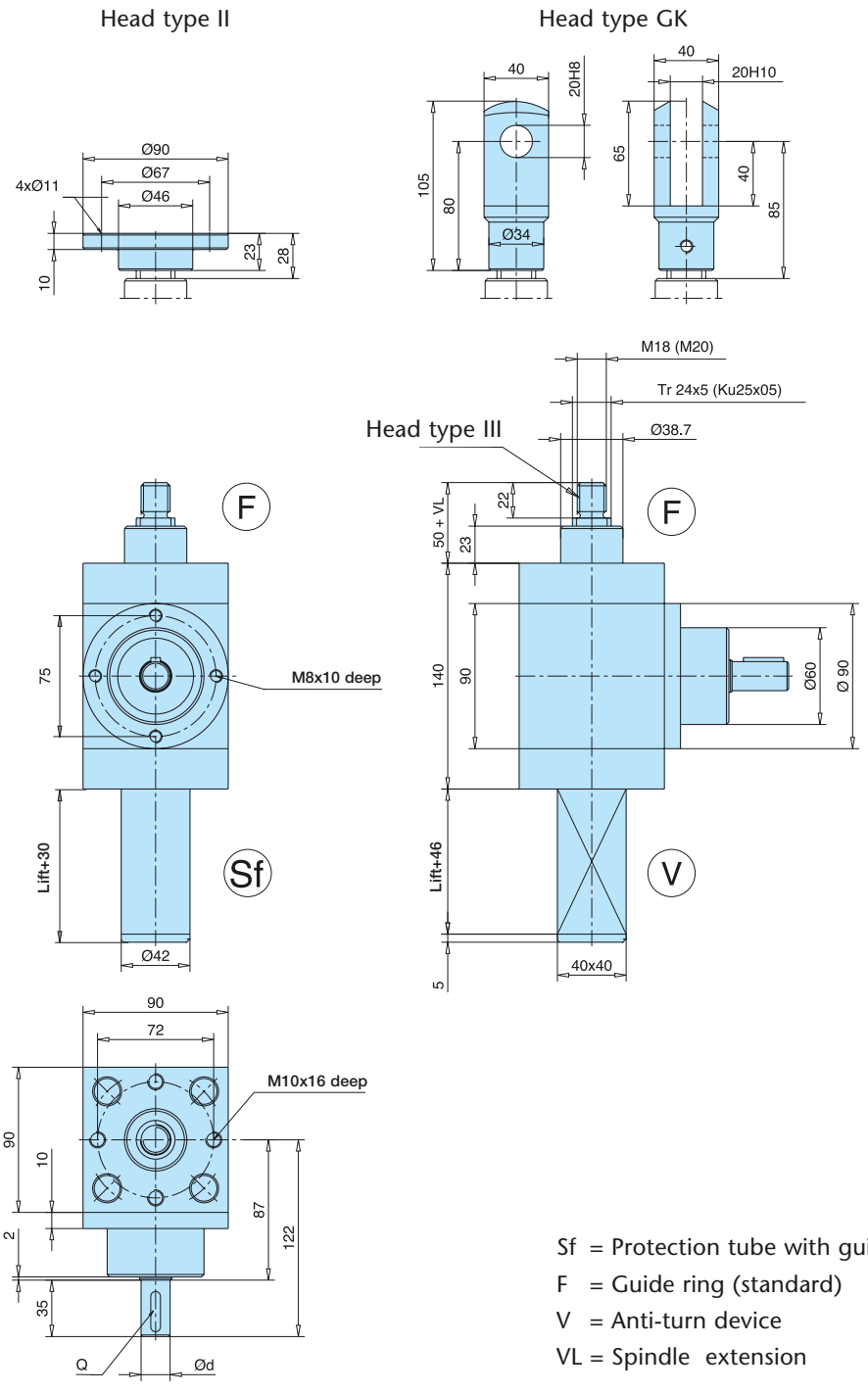
Contents



3.7 SHG range dimension plans

3.7.1 Type 1

3.7.1.1 Size G 15

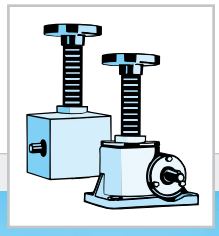


Sf = Protection tube with guide ring
F = Guide ring (standard)
V = Anti-turn device
VL = Spindle extension

( ) values in brackets apply for configuration with Ku spindle

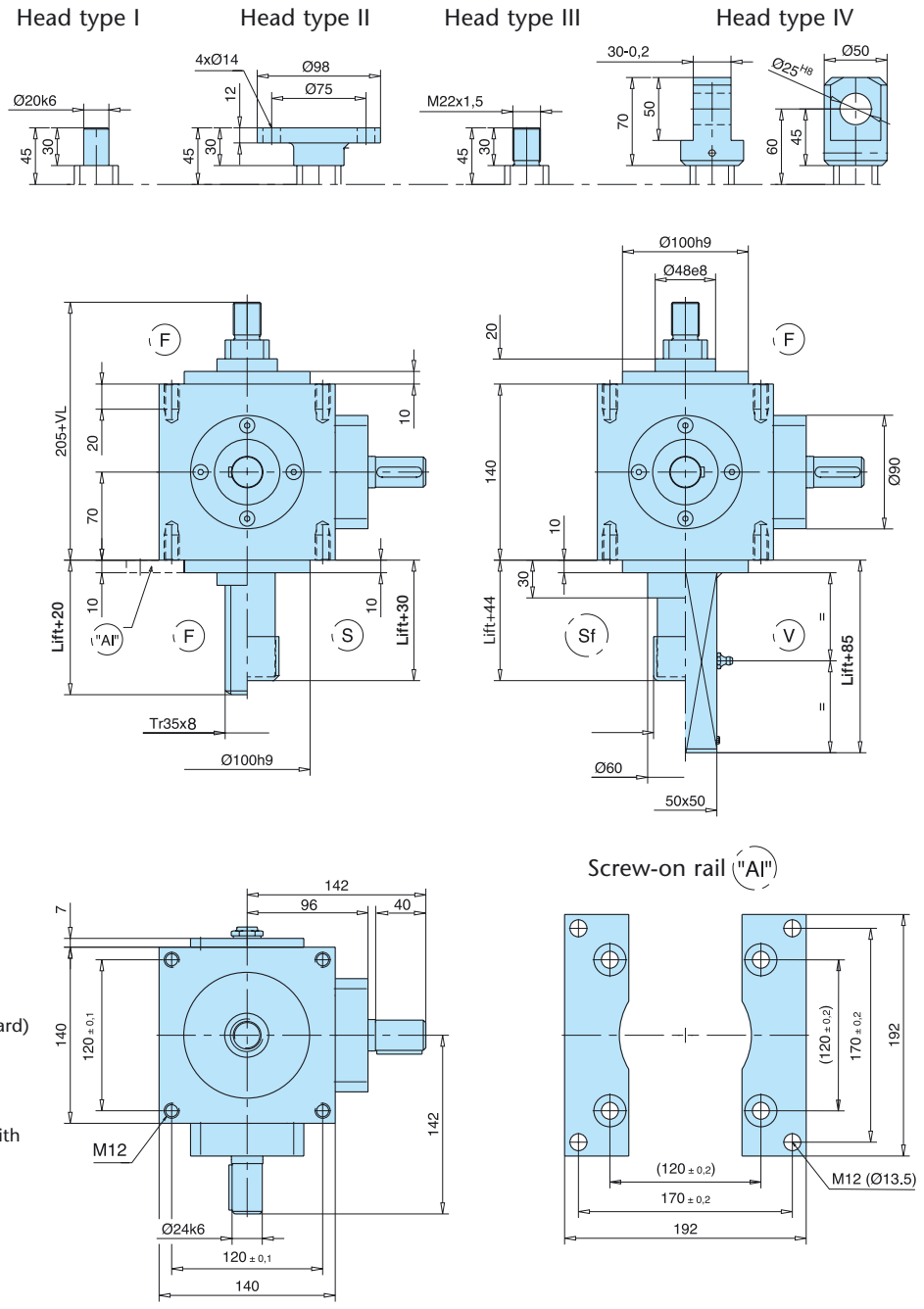
Ratio	Ød j6	Q (DIN 6885)
2:1	18	A 6x6x25
3:1	12	A 4x4x25

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.7 SHG range dimension plans

3.7.1.2 Size G 25

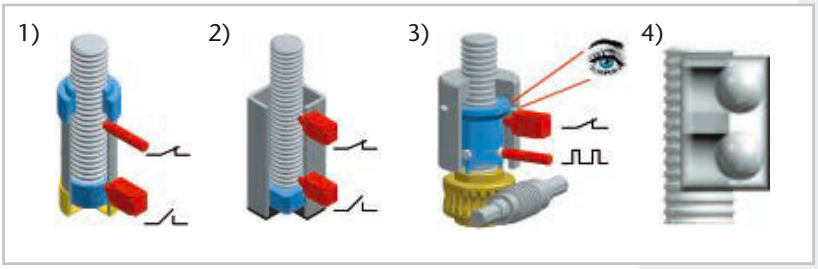


F = Guide ring (standard)
S = Protection tube
V = Anti-turn device
Sf = Protection tube with guide ring
Al = With screw-on rail
VL = Spindle extension

Options:

Dimension plans of the options available on request

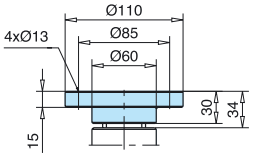
1) Stroke shutoff
2) Anti-turn device with stroke shutoff
3) Long safety nut (VBG 14)
4) Ball-screw spindle



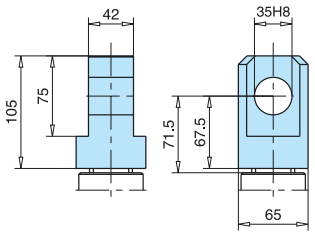
3.7 SHG range dimension plans

3.7.1.3 Size G 50

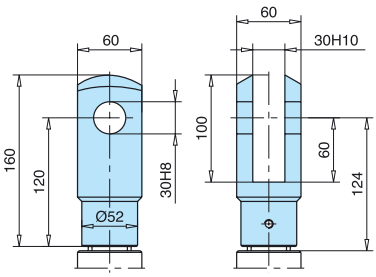
Head type II

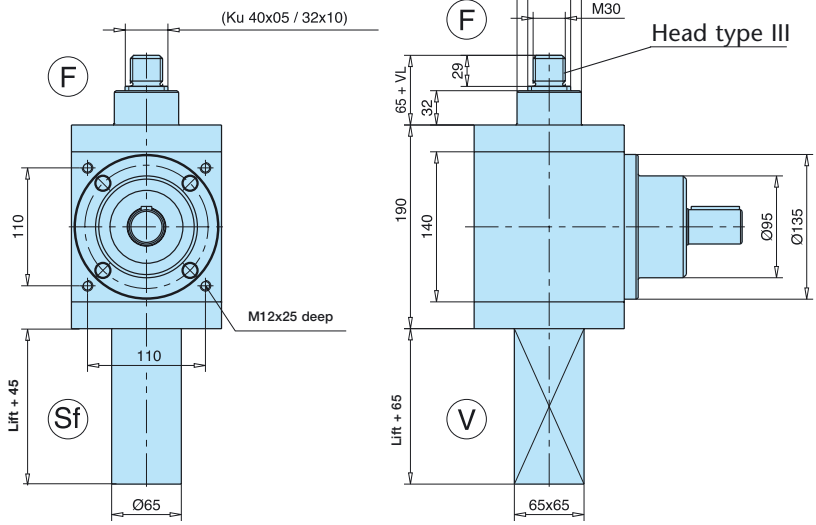


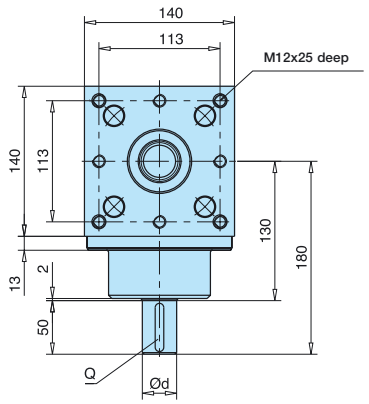
Head type IV



Head type GK



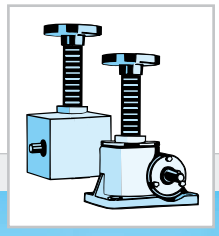




Sf = Protection tube with guide ring
F = Guide ring (standard)
V = Anti-turn device
VL = Spindle extension

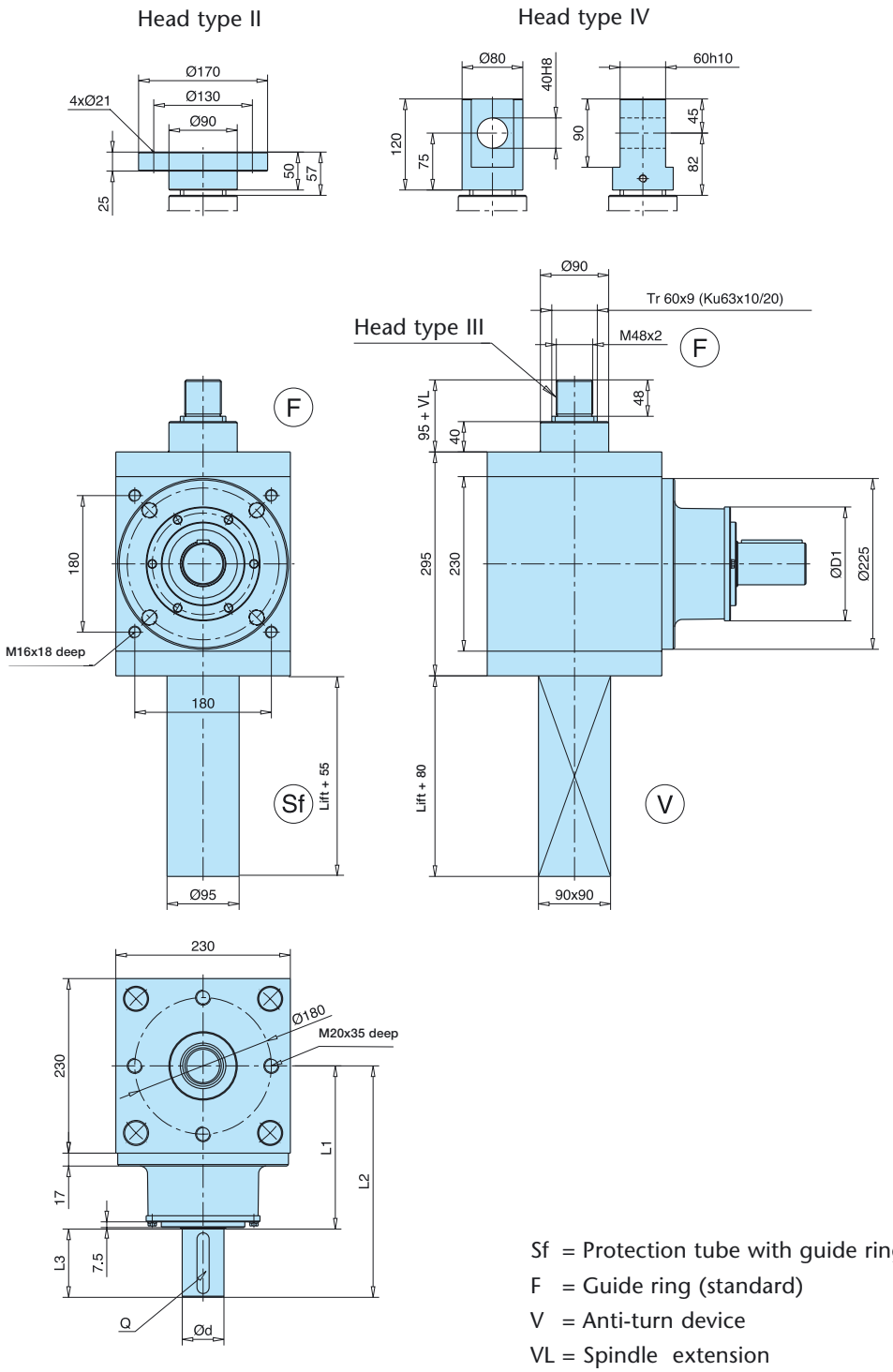
Ratio	Ød j6	Q (DIN 6885)
2:1	32	A 10x8x45
3:1	28	A 8x7x45

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.7 SHG range dimension plans

3.7.1.4 Size G 90



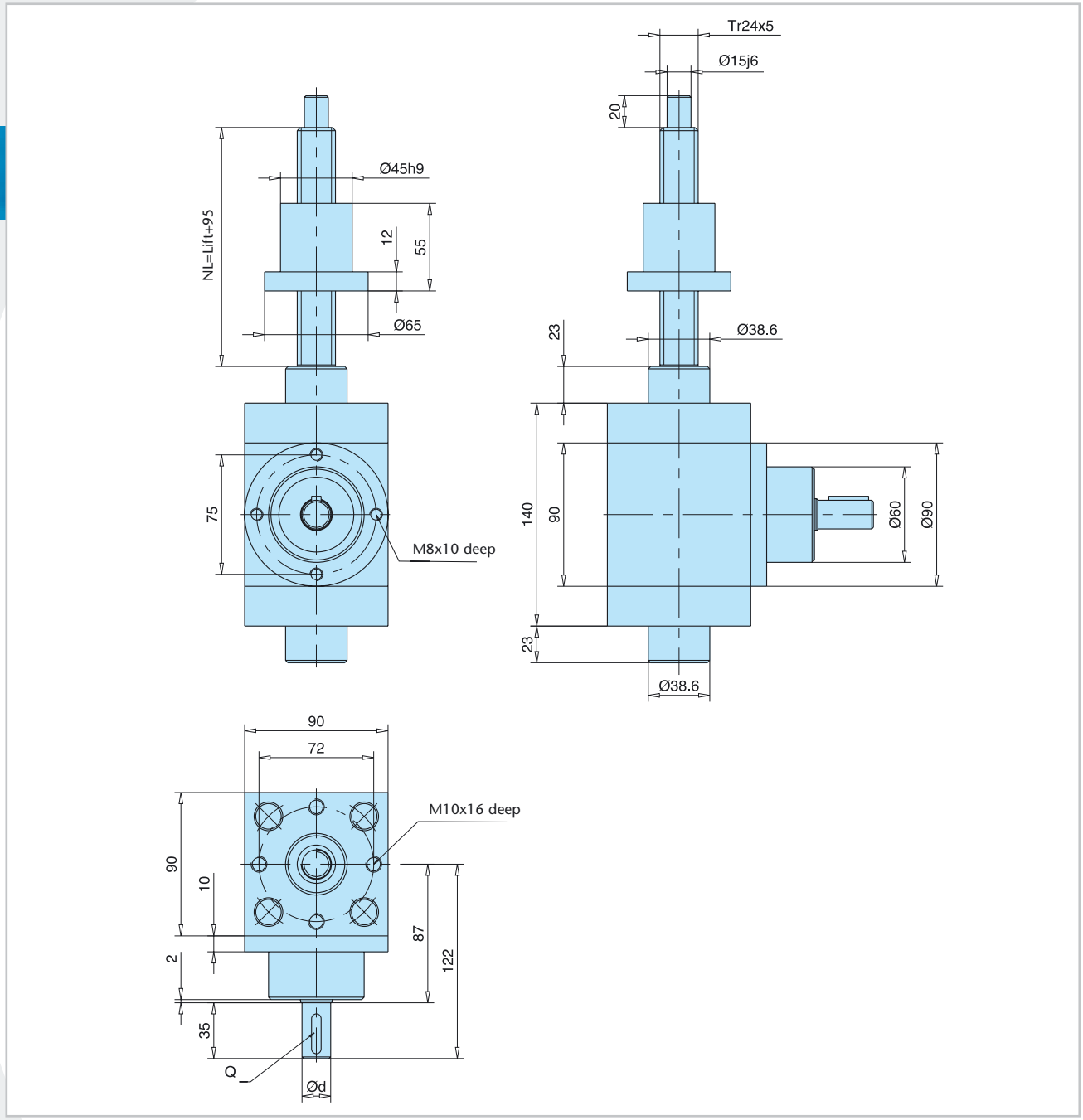
Sf = Protection tube with guide ring
F = Guide ring (standard)
V = Anti-turn device
VL = Spindle extension

Ratio	Ød j6	ØD1	L1	L2	L3	Q (DIN 6885)
2:1	55	150	215	305	90	A 16x10x80
3:1	40	120	230	310	80	A 12x8x60

3.7 SHG range dimension plans

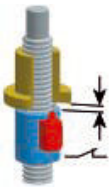
3.7.2 Type 2

3.7.2.1 Size G 15



1) 

2) 

3) 

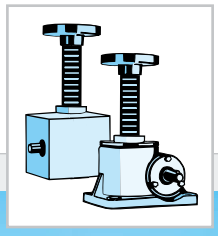
Options:

Dimension plans of the options available on request

1) Ball-screw spindle
   Flange nut (see section 3.8.2)
2) Short safety nut
3) Long safety nut

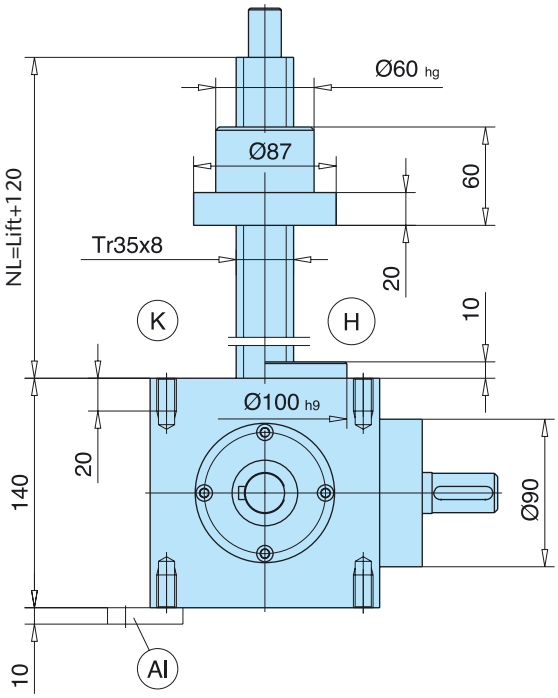
Ratio	Ød j6	Q (DIN 6885)
2:1	18	A 6x6x25
3:1	12	A 4x4x25

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

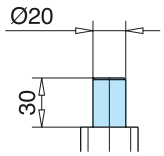


3.7 SHG range dimension plans

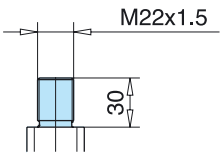
3.7.2.2 Size G 25

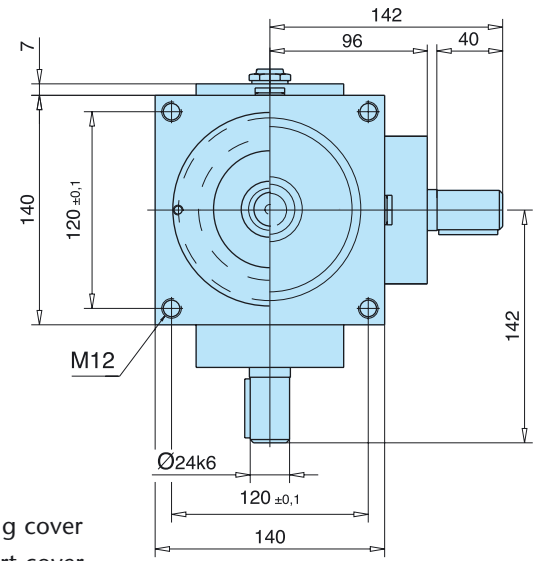


Head type I

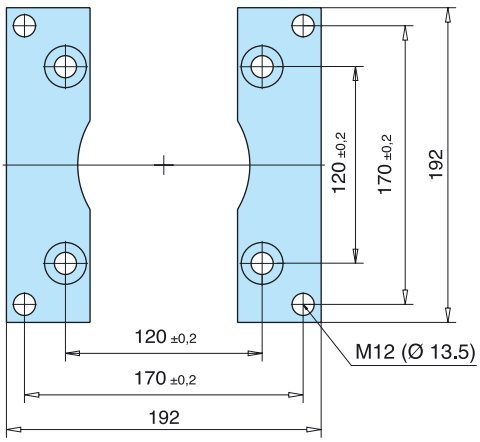


Head type III





Screw-on rail (AI)

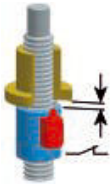


H = Long cover
K = Short cover
AI = With screw-on rail

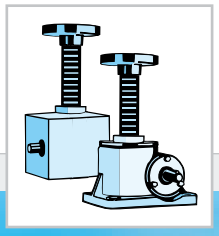
1)

2)

3)

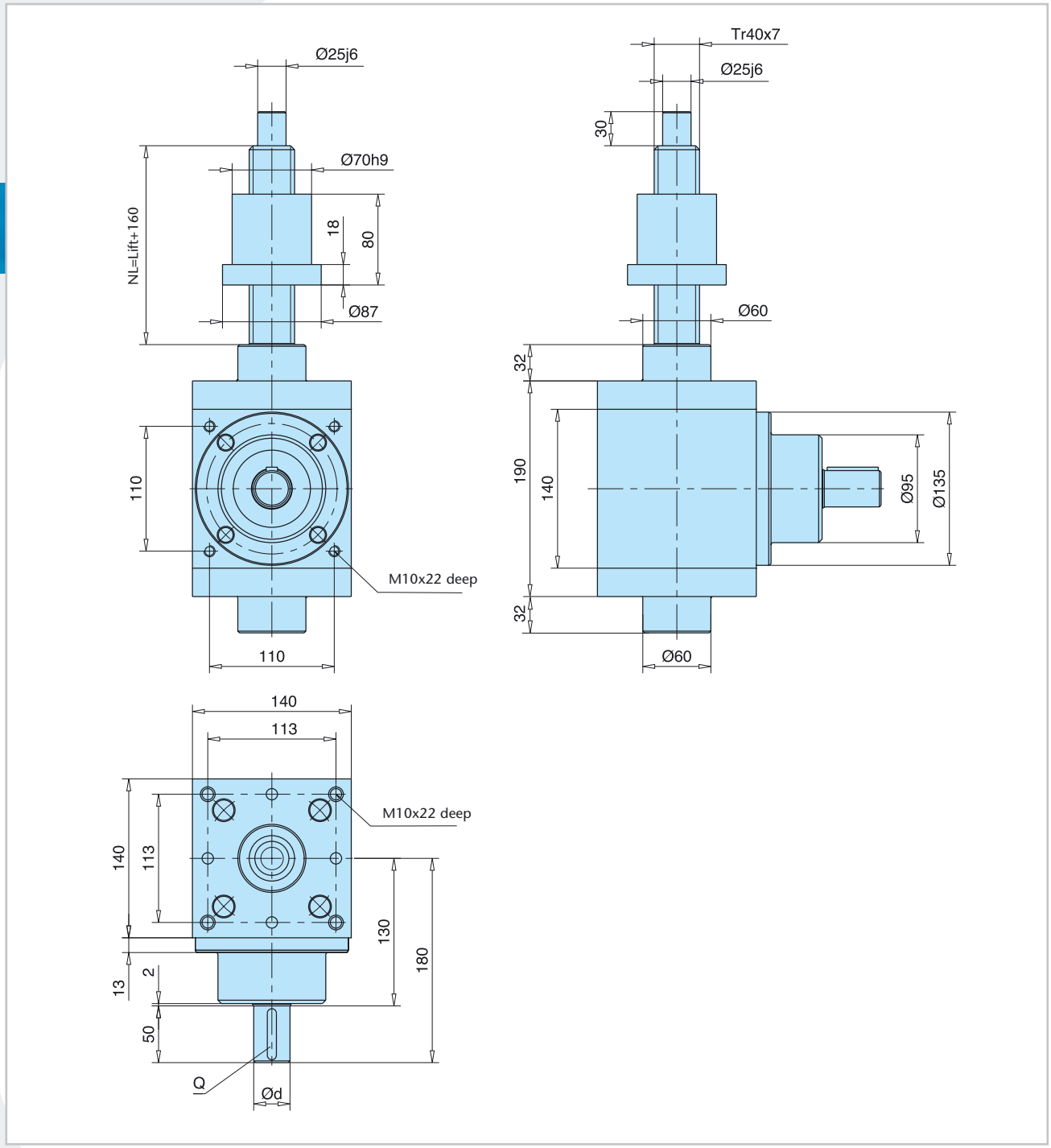


Options:
Dimension plans of the options available on request
1) Ball-screw spindle
(flange nut, see section 3.8.2)
2) Short safety nut
3) Long safety nut

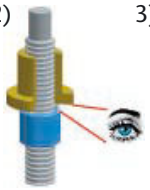


3.7 SHG range dimension plans

3.7.2.3 Size G 50



1) 

2) 

3) 

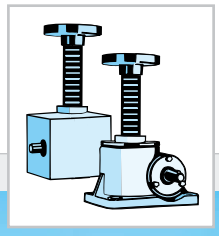
Options:

Dimension plans of the options available on request

1) Ball-screw spindle (flange nut, see section 3.8.2)
2) Short safety nut
3) Long safety nut

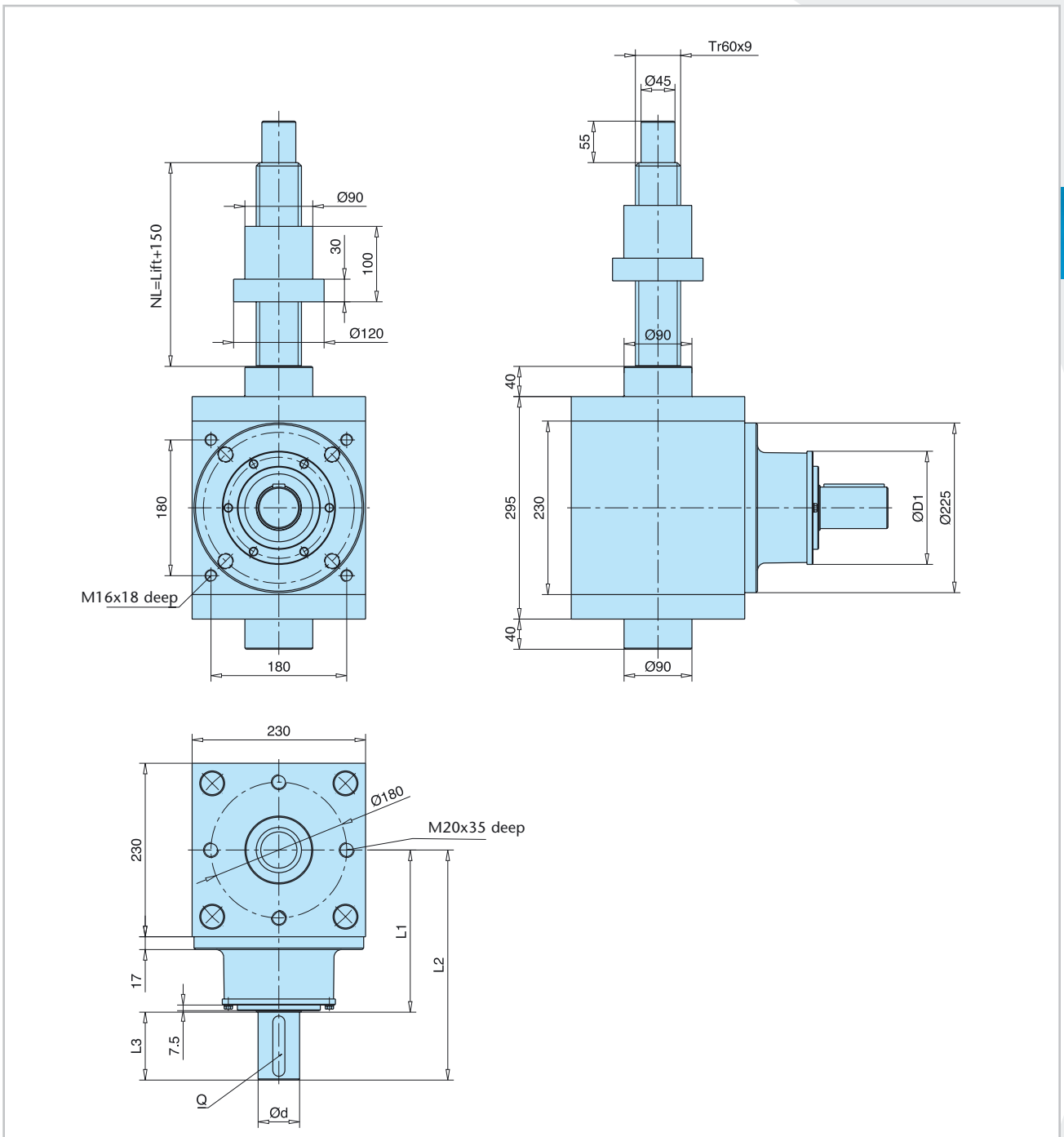
Ratio	Ød j6	Q (DIN 6885)
2:1	32	A 10x8x45
3:1	28	A 8x7x45

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

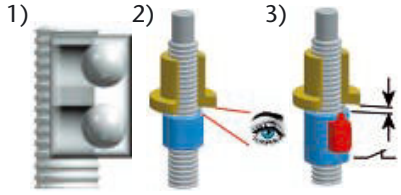


3.7 SHG range dimension plans

3.7.2.4 Size G 90



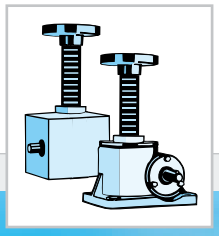
Ratio	Ød j6	ØD1	L1	L2	L3	Q (DIN 6885)
2:1	55	150	215	305	90	A 16x10x80
3:1	40	120	230	310	80	A 12x8x60



Options

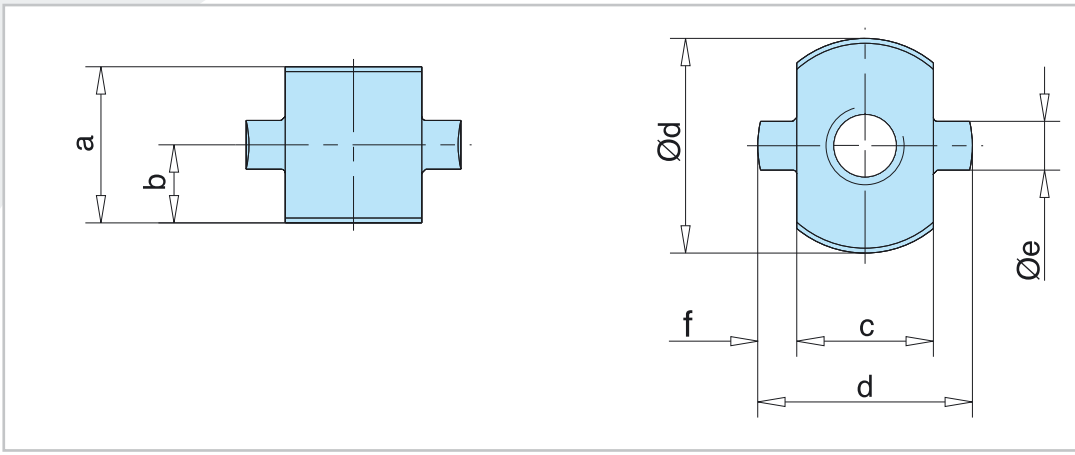
Dimension plans of the options available on request

1) Ball-screw spindle (flange nut, see section 3.8.2)
2) Short safety nut
3) Long safety nut



3.8 Special travelling nuts dimension plans

3.8.1 LWZ Travelling nut with trunnion



3

3.8.1.1 SHE range

Size	a	b	c	Ød	Øe	f
0,5	45	22,5	35	50	14	7,5
1	50	25	40	60	18	10
2,5	60	30	50	80	25	15
5	70	35	62	95	35	16,5
10/15	120	60	80	130	50	25
20	120	60	92	150	65	29
25	145	72,5	120	190	75	35
35	on request					
50						

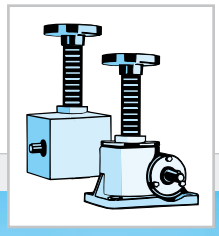
3.8.1.2 Merkur range

Size	a	b	c	Ød	Øe	f
M 1	45	22,5	35	50	14	7,5
M 2	50	25	40	60	18	10
M 3	60	30	50	80	25	15
M 4	70	35	62	95	35	16,5
M 5	120	60	80	130	50	25
M 6	120	60	92	150	65	29

3.8.1.3 HSE range

Size	a	b	c	Ød	Øe	f
31	45	22,5	35	50	14	7,5
36	50	25	40	60	18	10
50	60	30	50	80	25	15
63	70	35	62	95	35	16,5
80	120	60	80	130	50	25
100	120	60	92	150	65	29
125	on request					
140						

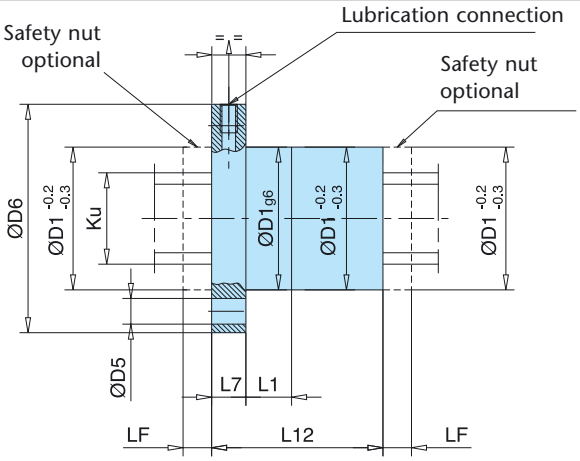
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



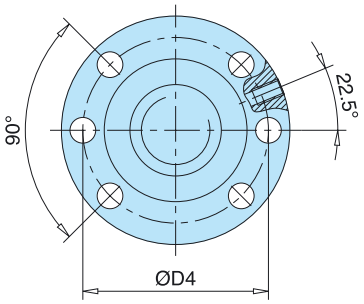
3.8 Special travelling nuts dimension plans

3.8.2 EFM single flange nut for Ku spindle

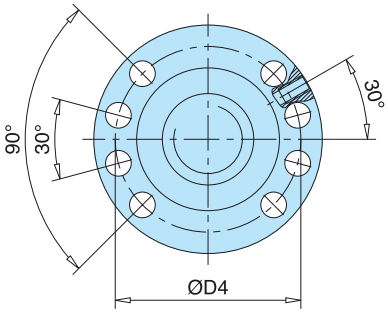
for all ranges



Drill pattern 1

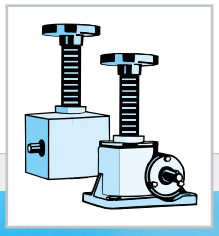


Drill pattern 2



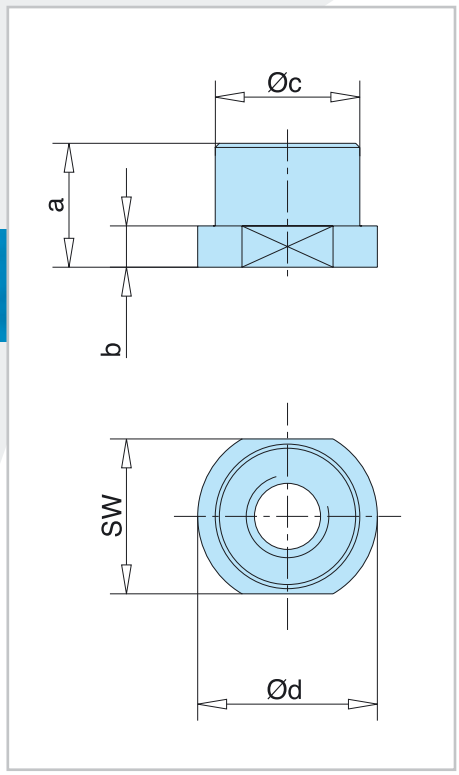
Size	Load capacities		Nut dimensions									Drill pattern
d0 x P - Dw - i	C_{dyn} [kN]	C_{stat} [kN]	D1	D4	D5	D6	L1	L7	L12	S	Catch nut	LF
20 x 5RH - 3,5 - 4	22,7	42,6	36	47	6,6	58	10	10	43	M6	1	15
20 x 10RH - 3,5 - 2	14,0	21,3	36	47	6,6	58	10	10	26	M6	1	20
25 x 5RH - 3,5 - 4	24,2	54,8	40	51	6,6	62	10	10	43	M6	1	15
25 x 10RH - 3,5 - 3	19,8	41,1	40	51	6,6	62	16	10	59	M6	1	20
32 x 5RH - 3,5 - 5	30,8	91,4	50	65	9	80	10	12	50	M6	1	15
32 x 10RH - 5 - 3	36,6	74,5	50	65	9	80	16	12	40	M6	1	25
40 x 10RH - 7 - 4	79,2	170,5	63	78	9	93	16	14	76	M8x1	2	30
40 x 20RH - 7 - 2	48,7	85,3	63	78	9	93	17	14	51	M8x1	2	50
50 x 10RH - 7 - 6	112,1	328,8	75	93	11	110	16	16	101	M8x1	2	30
50 x 20RH - 12,7 - 3	158,0	244,8	85	103	11	120	16	16	117	M8x1	2	50
50 x 24RH - 12,7 - 3	158,0	244,8	85	103	11	120	18	16	92	M8x1	2	55
63 x 10RH - 7 - 6	122,8	438,2	90	108	11	125	16	18	103	M8x1	2	30
63 x 20RH - 12,7 - 3	173,5	333,2	95	115	13,5	135	25	20	121	M8x1	2	35
80 x 10RH - 7 - 6	135,0	584,5	105	125	13,5	145	16	20	105	M8x1	2	30
80 x 20RH - 12,7 - 5	282,0	800,7	125	145	13,5	165	25	25	170	M8x1	2	50
100 x 10RH - 7 - 6	146,2	749,9	125	145	13,5	165	16	22	107	M8x1	2	30
100 x 20RH - 12,7 - 6	336,6	1203,1	150	176	17,5	202	25	30	195	M8x1	2	60
125 x 10RH - 7 - 6	157,9	952,6	150	170	13,5	190	25	25	110	M8x1	2	40
125 x 24RH - 12,7 - 6	373,9	1622,2	170	196	17,5	222	25	40	235	M8x1	2	60
160 x 20RH - 15 - 6	522	2476	on request									

Further Ku nuts on request



3.8 Special travelling nuts dimension plans

3.8.3 LSF Travelling nut with flat surface



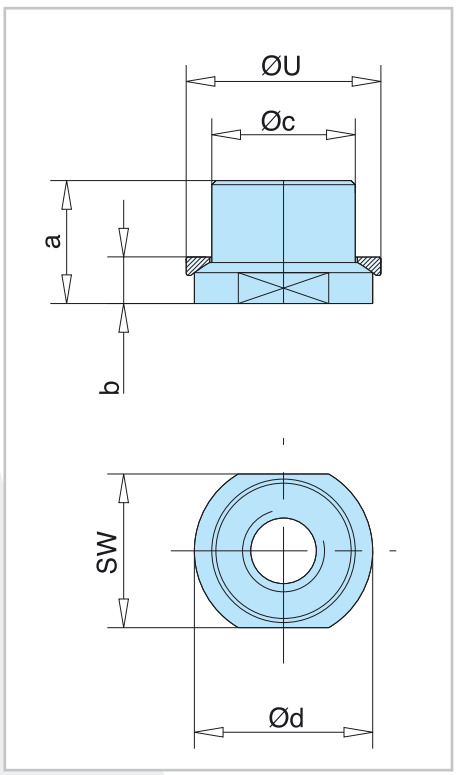
3.8.3.1 SHE / Merkur M range

Size		a	b	Øc	Ød	SW
0,5	M1	32	10	40	50	44
1	M2	40	12	45	65	50
2,5	M3	45	16	50	80	62
5	M4	60	18	70	87	75
10/15	M5	75	25	90	110	95
20	-	100	30	90	120	100
25	M6	120	35	130	155	135
35	M7	145	35	150	190	160
50	M8	155	50	160	225	180

3.8.3.2 HSE range

Size	a	b	Øc	Ød	SW
31	45	12	40	50	44
36	55	15	45	65	50
50	80	18	70	87	75
63	100	22	80	105	85
80	130	30	90	110	95
100	130	30	90	120	100
125	160	45	150	190	160
140	180	50	160	225	180

3.8.4 LSA Travelling nut with spherical support



3.8.4.1 SHE range

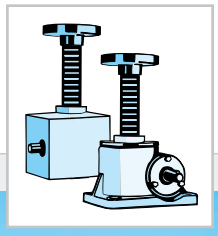
Size	a	b	Øc	Ød	ØU	SW
0,5	32	10	40	50	55	44
1	40	12	45	65	65	50
2,5	45	16	50	80	82	62
5	60	18	70	87	95	75
10/15	75	25	90	110	120	95
20	100	30	90	120	120	100
25	120	35	130	155	175	135
35	145	35	150	190	195	160
50	155	50	160	225	220	180

3.8.4.2 HSE range

Size	a	b	Øc	Ød	ØU	SW
31	45	12	40	50	55	44
36	55	15	45	65	65	50
50	80	18	70	87	95	75
63	100	22	80	105	110	85
80	130	30	90	110	120	95
100	130	30	90	120	120	100
125	160	45	150	190	195	160
140	180	50	160	225	220	180

More designs available - please request their dimensions!

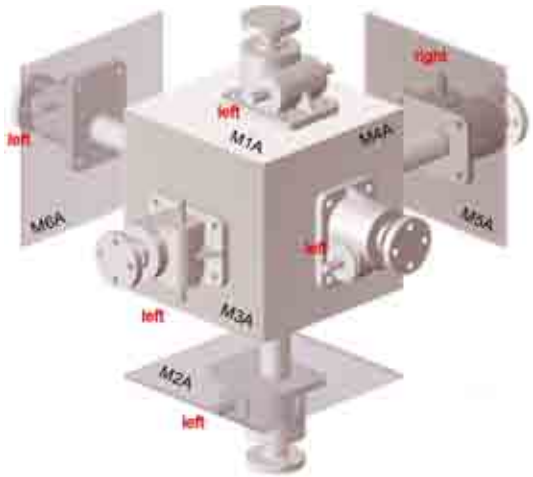
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



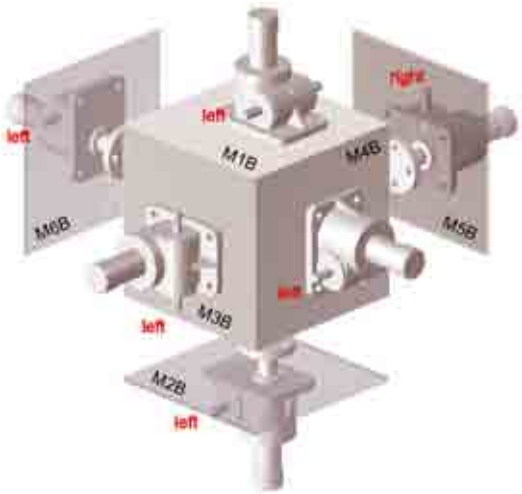
3.9 Installation locations, shaft/attachment side

3.9.1 SHE range

Design A

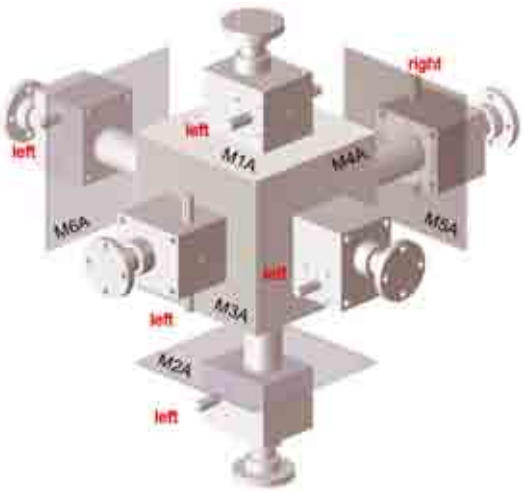


Design B

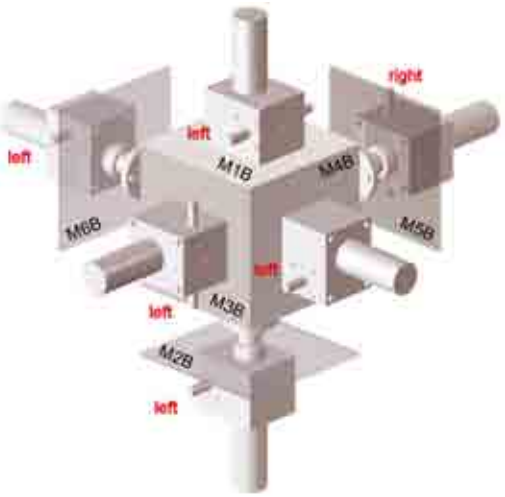


3.9.2 Merkur range

Design A



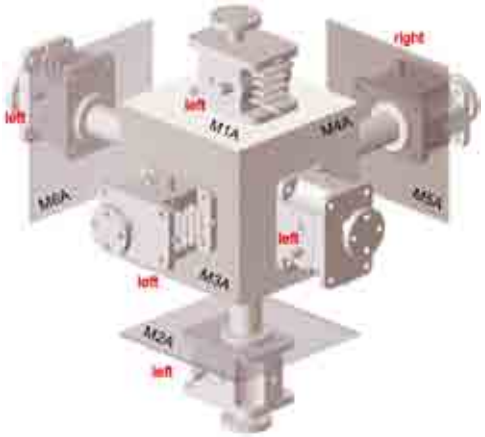
Design B



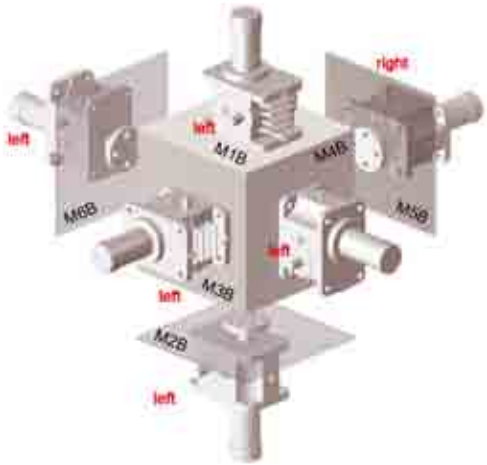
3.9 Installation locations, shaft/attachment side

3.9.3 HSE range

Design A

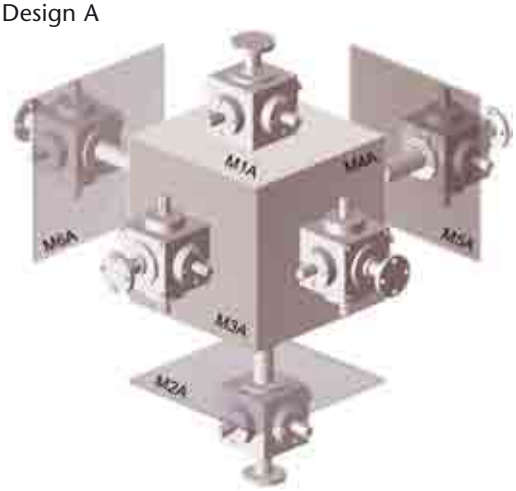


Design B

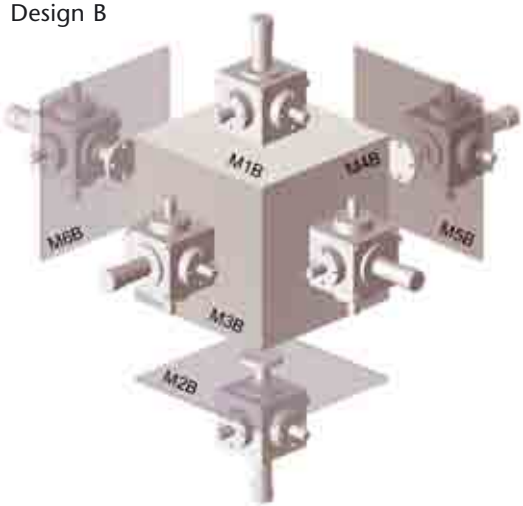


3.9.4 SHG range

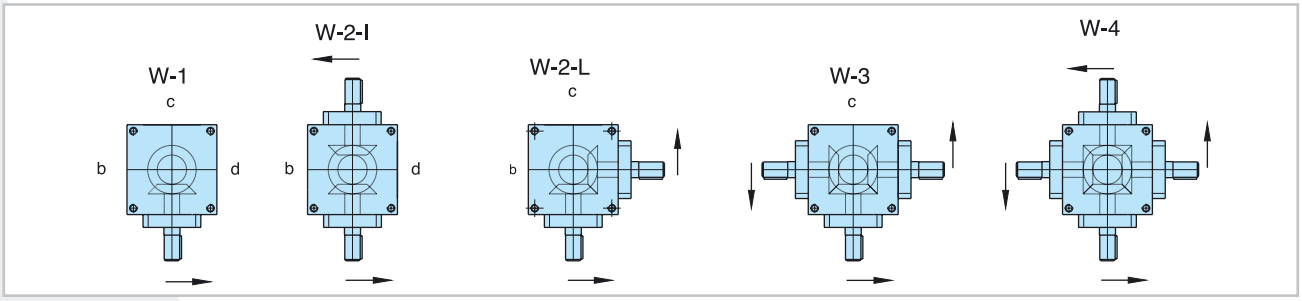
Design A



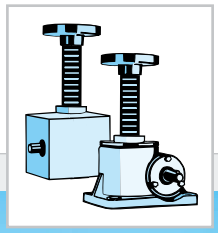
Design B



Shaft layout/Position of the oil fittings (b/c/d)



Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



3.10 Ordering details

3.10.1 SHE range

1 2 3 4 5 6 7 8 9 10 11 12 13

S H E - □□ - □ - □ - □□□ - □□ - □□□□ - □□□□ - □ - □□ □□□ X □□ - □ - □□□ - ...

1	**Range**	SHE	
2	**Size**	0,5 / 1 / 2 / 2,5 / 5 / 10 15 / 20 / 25 / 35 / 50 75 / 100 / 150 / 200	
3	**Configuration type**	1 / 2	
4	**Layout**	A / B	
5	**Installation location**	M1A / M1B / M2A / M2B M3A / M3B / M4A / M4B M5A / M5B / M6A / M6B	
6	**Head** [configuration type 1]	I / II / III / IV	
	[configuration type 2]	I / III	
7	**Lift**	Lift (mm)	
8	**VL** [Type 1]	VL (mm)	
	NL [Type 2]	NL (mm)	
9	**Ratio**	N / L	
10	**Spindle**	Tr (DxP) / Ku (DxP)	
11	**Drive shaft**	b (bothsides)	
12	**Option** [Type 1]	2FR (2nd Guide ring)	
	[Type 2]	V 2FR (2nd Guide ring)	
13	**Further options**	V (Anti-turn device) according to specification, description or drawing (see section 3.4)	

3.10.2 Merkur range

1 2 3 4 5 6 7 8 9 10 11

M E R K U R - □□ - □ - □□ - □□ - □□ - □□□□ - □□□□ - □ - □□ □□□ X □□ - □ - ...

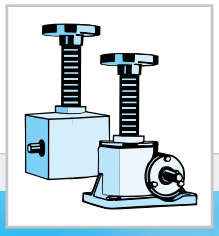
1	**Range**	Merkur	
2	**Size**	M0 / M1 / M2 / M3 / M4 M5 / M6 / M7 / M8	
3	**Configuration type**	1 / 2	
4	**Installation location**	M1A / M1B / M2A / M2B M3A / M3B / M4A / M4B M5A / M5B / M6A / M6B	
5	**Head** [configuration type 1]	II / III / IV / GK	
	[configuration type 2]	I	
6	**Lift**	Lift (mm)	
7	**VL** [Type 1]	VL (mm)	
	NL [Type 2]	NL (mm)	
8	**Ratio**	N / L	
9	**Spindle**	Tr (DxP) / Ku (DxP)	
10	**Drive shaft**	b (bothsides)	
11	**Options**	Options according to specification, description or drawing (see section 3.5)	

3.10.3 HSE range

1 2 3 4 5 6 7 8 9 10 11 12 13

H S E - □□ □ - □ - □□ □ - □□ - □ - □□ □ - □□ - □□□□ - □□□□ - □ - □□ □□□ X □□ - □ - ...

1	**Range**	HSE	
2	**Size**	31 / 36 / 50 / 63 / 80 100 / 125 / 140 / 200	
3	**Configuration type**	1 / 2	
4	**Layout of spindle end**		
	[Type 1]	K / H / F	
	[Type 2]	K / H	
5	**Layout of protection tube end**		
	[Type 1]	K / H / S / Sf / V	
	[Type 2]	K / H	
6	**Installation location**	M1A / M1B / M2A / M2B M3A / M3B / M4A / M4B M5A / M5B / M6A / M6B	
7	**Head** [configuration type 1]	I / II / III / IV	
	[configuration type 2]	I / III	
8	**Lift**	Lift (mm)	
9	**VL** [Type 1]	VL (mm)	
	NL [Type 2]	NL (mm)	
10	**Ratio**	N / L	
11	**Spindle**	Tr (DxP) / Ku (DxP)	
12	**Drive shaft** (see section 3.9.3)	**r** (right) **l** (left) **b** (bothsides)	
13	**Options**	according to specification, description or drawing (see section 3.6)	



3.10 Ordering details

3.10.4 SHG range

3.10.4.1 Size G15 / G50 / G90

1 2 3 4 5 6 7 8 9 10 11 12 13 14

SHG-G□□-□-□-□□□-□□□-□□-□□□□-□□□□-□:□-□□ □□□X□□-□□-□□-…

1 **Range** — SHG
2 **Size** — G15 / G50 / G90
3 **Configuration type** — 1 / 2
4 **Layout of spindle end**
[Type 1] — F
[Type 2] — F
5 **Layout of protection tube end**
[Type 1] — Sf / V
[Type 2] — F
6 **Installation location** — M1A / M1B / M2A / M2B M3A / M3B / M4A / M4B M5A / M5B / M6A / M6B
7 **Head**
[G15 Type 1] — II / III / GK
[G50 Type 1] — II / III / IV / GK
[G90 Type 1] — II / III / IV
[Type 2] — I
8 **Lift** — Lift (mm)
9 **VL** [Type 1] — VL (mm)
NL [Type 2] — NL (mm)
10 **Ratio** — 2:1 / 3:1
11 **Spindle** — Tr (DxP) / Ku (DxP)
12 **Shaft layout** — W1b / W1c / W1d W2Ib / W2Id / W2Lc W2Ld / W3d / W4
13 **Wheel layout** — Ru / Ro Ru / Ro (with multi-spindle systems check for unidirectional movement of the lifting spindle/travelling nut! (see section 3.1)
14 **Further options** — according to specification, description or drawing (see section 3.7)

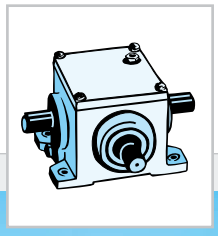
3.10.4.2 Size G25

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

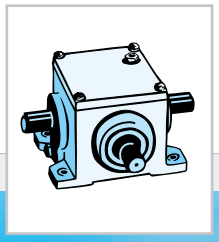
SHG-G□□-□-□-□-□□-□□□-□□-□□□□-□□□□-□:□-□□ □□□X□□-□□□□-□□-□□-…

1 **Range** — SHG
2 **Size** — G25
3 **Configuration type** — 1 / 2
4 **Layout of spindle end**
[type 1] — F
[type 2] — K / H
5 **Layout of protection tube end**
[type 1] — F / S / Sf / V
[type 2] — K
6 **Installation location** — M1A / M1B / M2A / M2B M3A / M3B / M4A / M4B M5A / M5B / M6A / M6B
7 **Head** [type 1] — I / II / III / IV
[type 2] — I / III
8 **Lift** — Lift (mm)
9 **VL** [Type 1] — VL (mm)
NL [Type 2] — NL (mm)
10 **Ratio** — 2:1 / 3:1
11 **Spindle** — Tr (DxP) / Ku (DxP)
12 **Shaft layout** — W1b / W1c / W1d W2Ib / W2Id / W2Lc W2Ld / W3d / W4
13 **Wheel layout** — Ru / Ro (with multi-spindle systems check for uni-directional movement of the lifting spindle/ travelling nut! (see section 3.1)
14 **Option(s)** — AI (screw-on rails)
15 **Further options** — according to specification, description or drawing (see section 3.7)

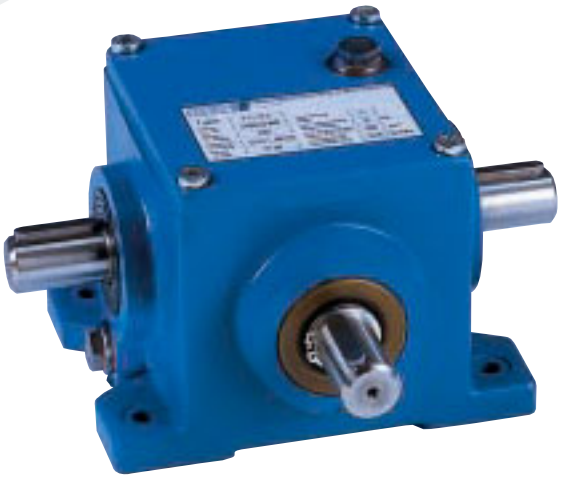
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



Contents

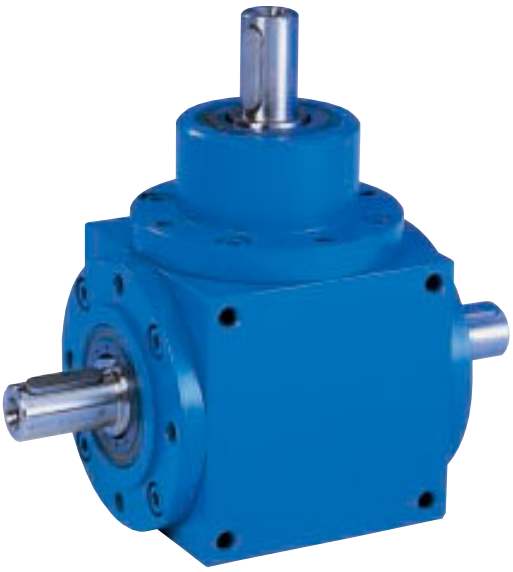


4.1 Structural configurations



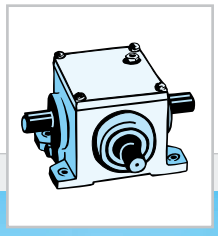
K ..13 range

NORMA range



KA and KV range

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



4.1 Structural configurations

4.1.1 K...13 range

5 sizes — K05.13 to K60.13
Max. output torque — up to 700 Nm
Ratios — 1:1, 2:1, 3:1
K60.13 — 1:1, 1,5:1, 2:1, 3:1, 4:1 et 5:1

– For multi-spindle jacking units adjusted to the axle height of our worm gear screw jacks
– Efficient design, with cast-on base strips
– Cast housing with primer-coated surface

4.1.2 NORMA range

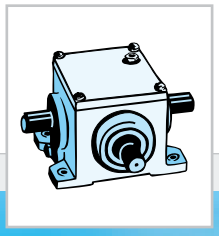
5 sizes — M0 to M4
Max. output torque — up to 60 Nm
Ratios — 1:1

– Hardened, paired, lapped helical tooth pattern
– With axle-height adjusted to match the worm gear screw jacks in the Merkur range
– Cube-shaped, all-round machined symmetrical housing with fixing holes
– Al-anodized housing
– Operating direction can changed by turning the transmission
– Lubricated for life and therefore maintenance-free

4.1.3 KA und KV range

9 sizes — KA 1 to KA 35 and KV 90 to KV 550
Max. output torque — up to 8500 Nm
Ratios — 1:1, 1,5:1, 2:1, 3:1, 4:1 5:1 et 6:1

– Hardened, paired, lapped helical tooth pattern
– Cube-shaped, all-round machined symmetrical housing
– All-round fixing holes
– Base strips available as accessories
– Configuration available with power takeoff-side hollow shaft
– Configuration available with drive-side hollow shaft and IEC flange (rectangular flange available on request)
– Cast housing with primer-coated surface
– Corrosion-resistant configuration available (single components up to entire transmission system can be supplied in "all stainless-steel" configuration")
– Can be used unchanged or with faster ratio (up to i = 2:1)



4.2 Project planning

4.2.1 Technical information

Drive system type	Max. output torque T_{zul} [Nm]		Thermal load limit P_{Grenz} [kW] (at 20% ED/hr and 20°C)	Possible ratios	Type of gearing design	Housing material	Average oil filling capacity [l]	Drive system weight (with oil filling) [kg]
K 0,5.13	i	T_{Betr} [Nm]	2	1 : 1 2 : 1 3 : 1	Straight gearing design	G- AlSiCu 4	0,1	1
	1 : 1	2,6						
	2 : 1	3,7						
	3 : 1	3,5						
K 5.13	Table 4.2.3.1		4,5	1 : 1		GG- 20	0,2	5,3
K 11.13	Table 4.2.3.1		8,5	2 : 1		GG- 20	0,5	8
K 25.13	Table 4.2.3.1		16	3 : 1		GG- 20	1	24
K 60.13	Table 4.2.3.1		43	1 : 1 1,5 : 1 2 : 1 3 : 1 4 : 1 5 : 1		GG- 25	2,0	55
Norma M 0	Table 4.2.3.2		0,5	1 :1	Helical gear teeth	AlCuMgPb F37	Formax-Service life lubrification	0,52
Norma M 1	Table 4.2.3.2		2,5					1,1
Norma M 2	Table 4.2.3.2		4,8					2,0
Norma M 3	Table 4.2.3.2		6,3					3,95
Norma M 4	Table 4.2.3.2		10					6,8
KA 1	Table 4.2.3.3		2,5	1 : 1		GG- 25	0,1	2
KA 5	Table 4.2.3.3		8	1,5 : 1			0,2	6
KA 9	Table 4.2.3.3		11,5	2 : 1			0,3	10
KA 18	Table 4.2.3.3		20	3 : 1			0,4	20
KA 35	Table 4.2.3.3		28	4 : 1			1,0	32
KV 90	Table 4.2.3.3		56	5 : 1			2,5	70
KV 120	Table 4.2.3.3		79	6 : 1			5,0	100
KV 260	Table 4.2.3.3		126				13,5	200
KV 550	Table 4.2.3.3		155				30	400

4.2.2 Design

Ratio design: The values shown in the table apply to 20% ED/hr and 20°C ambient temperature. In the event of fluctuating operating conditions, the permitted power and torque ratings must be established using the operating factors f1, f2, f3, f4 and f5.

$$T_{Betr} = T_{N2} \times f_1 \times f_2 \times f_3$$
$$P_{Betr} = P_N \times f_1 \times f_2 \times f_3$$
$$P_{therm} = P_N \times f_1 / f_4 / f_5$$

T_{N2} [Nm] = rated drive torque
P_N [kW] = rated drive capacity

Ratio selection according to:

operating performance
$P_{Betr} < p_{zul}$ according to tables 4.2.3
or operating torque
$T_{Betr} < T_{zul}$ according to tables 4.2.3
and therm. Power rating
$P_{therm} < P_{Grenz}$ according to table 4.2.1

Operating factor f_1 (start-up factor)
$f_1 = 1,0$ Operation with or without light impact
$f_1 = 1,25$ Operation with medium-strength impact
$f_1 = 1,4$ Operation with strong impact

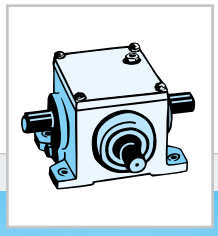
Operating factor f_2 (connecting frequency)
$f_2 = 1,0$ up to 20 start-ups per hour
$f_2 = 1,1$ up to 60 start-ups per hour
$f_2 = 1,4$ up to 200 start-ups per hour

Operating factor f_3 (serviceable life)
$f_3 = 0,8$ up to two hours per day
$f_3 = 1,0$ up to eight hours per day
$f_3 = 1,25$ over eight hours per day

Operating factor f_4 (operating time)
$f_4 = 1,0$ at 20% ED/hr
$f_4 = 0,85$ at 40% ED/hr
$f_4 = 0,75$ at 60% ED/hr
$f_4 = 0,65$ at 80% ED/hr
$f_4 = 0,55$ at 100% ED/hr

Operating factor f_5 (operating time)
$f_5 = 1,0$ at 20°C.
$f_5 = 0,75$ at 40°C.
$f_5 = 0,6$ at 50°C.
$f_5 = 0,5$ at 60°C.
$f_5 = 0,2$ at 70°C.

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



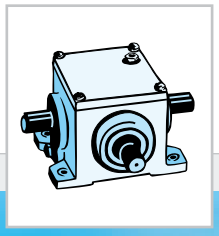
4.2.3 Performance tables

4.2.3.1 Mitre gear boxes K 5.13- K60.13

Speed of drive motor n_1 [min^{-1}]	Output speed n_2 [min^{-1}]	K5.13		K11.13		K25.13		K60.13	
		P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]
Ratio 1:1									
50	50	0,2	42	0,4	75	1,2	230	3,7	700
250	250	1,0	38	1,8	69	5,3	202	15,2	580
500	500	1,9	36	3,2	61	10,0	191	26,2	500
750	750	3,0	38	4,8	61	14,0	178	34,6	440
1000	1000	3,7	35	6,0	57	17,5	167	42,9	410
1500	1500	4,3	27	8,2	52	26,0	166	55,0	350
3000	3000	8,0	25	15,0	48	40,0	127	69,1	220
Ratio 1,5:1									
50	33,33	-	-	-	-	-	-	2,4	700
250	166,67	-	-	-	-	-	-	10,6	610
500	333,33	-	-	-	-	-	-	18,9	540
750	500	-	-	-	-	-	-	25,9	495
1000	666,67	-	-	-	-	-	-	32,8	470
1500	1000	-	-	-	-	-	-	43,0	410
3000	2000	-	-	-	-	-	-	62,8	300
Ratio 2:1									
50	25	0,1	48	0,2	82	0,7	250	1,8	700
250	125	0,6	48	1,1	80	3,2	244	8,4	640
500	250	1,1	42	1,8	69	5,5	210	15,2	580
750	375	1,6	41	2,6	66	7,5	191	20,7	526
1000	500	2,0	38	3,3	63	9,8	187	26,2	500
1500	750	3,3	42	4,8	61	14,0	178	35,3	450
3000	1500	4,5	29	8,5	54	26,0	166	55,0	350
Ratio 3:1									
50	16,67	0,1	48	0,2	90	0,5	260	0,9	500
250	83,33	0,4	48	0,8	87	2,2	252	4,0	460
500	166,67	0,8	48	1,3	74	4,1	235	7,3	420
750	250	1,2	44	1,8	69	5,7	218	9,95	380
1000	333,33	1,6	44	2,4	69	6,6	189	12,6	360
1500	500	2,2	42	3,4	65	10,0	191	16,2	310
3000	1000	3,9	37	6,1	58	18,0	172	25,1	240
Ratio 4:1									
50	12,5	-	-	-	-	-	-	0,6	480
250	62,5	-	-	-	-	-	-	2,8	430
500	125	-	-	-	-	-	-	5,3	400
750	187,5	-	-	-	-	-	-	7,4	375
1000	250	-	-	-	-	-	-	9,4	360
1500	375	-	-	-	-	-	-	12,6	320
3000	750	-	-	-	-	-	-	18,9	240
Ratio 5:1									
50	10	-	-	-	-	-	-	0,5	520
250	50	-	-	-	-	-	-	2,5	480
500	100	-	-	-	-	-	-	4,7	450
750	150	-	-	-	-	-	-	6,6	420
1000	200	-	-	-	-	-	-	8,4	400
1500	300	-	-	-	-	-	-	11,6	370

4.2.3.2 Mitre gear boxes NORMA

Speed of drive motor n_1 [min^{-1}]	Output speed n_2 [min^{-1}]	NORMA M0		NORMA M1		NORMA M2		NORMA M3		NORMA M4	
		P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]
Ratio 1:1											
50	50	0,03	4,7	0,09	18	0,17	34	0,28	52	0,32	54
250	250	0,1	3,4	0,47	18	0,62	21	0,85	38	1,3	50
500	500	0,19	2,9	0,89	17	0,95	19	1,44	33	2,5	48
1000	1000	0,28	2,6	1,68	16	1,98	17	3,00	28	4,60	44
1500	1500	0,36	2,4	2,2	14	2,45	16	3,90	25	6,00	39
2000	2000	0,47	2,2	2,5	12	2,84	15	4,98	23	7,2	36
3000	3000	0,63	2,0	3,1	10	3,4	14	6,54	20	9,0	31

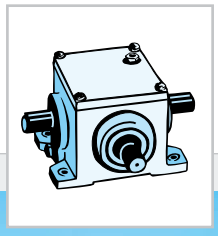


4.2 Project planning

4.2.3.3 Mitre gear boxes KA 1-KA 35

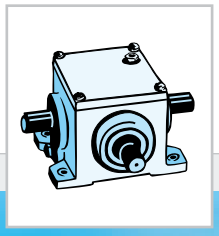
Speed of drive motor n_1 [min^{-1}]	Output speed n_2 [min^{-1}]	KA 1		KA 5		KA 9		KA 18		KA 35	
		P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]
Ratio 1:1											
50	50	0,09	18	0,26	50	0,68	130	1,05	200	1,68	320
250	250	0,47	18	1,28	49	3,14	120	4,71	180	7,85	300
500	500	0,89	17	2,41	46	5,76	110	8,90	170	14,14	270
1000	1000	1,68	16	4,4	42	9,42	90	15,71	150	23,04	220
1500	1500	2,2	14	5,81	37	12,88	82	20,42	130	28,27	180
2000	2000	2,51	12	6,91	33	12,29	73	25,13	120	35,60	170
3000	3000	3,14	10	8,8	28	18,85	60	28,27	90	40,84	130
Ratio 1,5:1											
50	33,33	0,06	18	0,17	50	0,45	130	0,70	200	1,12	320
250	166,67	0,31	18	0,86	49	2,09	120	3,32	190	5,41	310
500	333,33	0,59	17	1,68	48	3,84	110	6,28	180	10,12	290
1000	666,67	1,12	16	3,07	44	6,98	100	11,17	160	18,15	260
1500	1000	1,57	15	4,19	40	9,42	90	15,71	150	23,04	220
2000	1333,33	1,95	14	5,31	38	11,87	85	19,55	140	27,92	200
3000	2000	2,51	12	6,91	33	15,29	73	25,13	120	35,60	170
Ratio 2:1											
50	25	0,05	18	0,13	50	0,34	130	0,52	200	0,84	320
250	125	0,24	18	0,64	49	1,64	125	2,49	190	4,06	310
500	250	0,47	18	1,26	48	3,14	120	4,71	180	7,85	300
1000	500	0,89	17	2,36	45	5,76	110	8,90	170	14,14	270
1500	750	1,26	16	3,38	43	7,85	100	12,57	160	19,63	250
2000	1000	1,57	15	4,19	40	9,42	90	15,71	150	23,04	220
3000	1500	2,2	14	5,81	37	12,88	82	20,42	130	28,27	180
Ratio 3:1											
50	16,67	0,03	16	0,07	40	0,17	95	0,31	175	0,51	290
250	83,33	0,13	15	0,34	39	0.77	88	1,48	170	2,27	260
500	166,67	0,26	15	0,66	38	1,47	84	2,79	160	4,19	240
1000	333,33	0,49	14	1,29	37	2,62	75	5,24	150	6,98	200
1500	500	0,68	13	1,83	35	3,51	67	6,81	130	9,42	180
2000	666,67	0,84	12	2,23	32	4,54	65	8,38	120	11,87	170
3000	1000	1,15	11	2,93	28	5,45	52	10,47	100	15,71	150
Ratio 4:1											
50	12,5	-	-	0,05	38	0,12	95	0,23	175	0,37	280
250	62,5	-	-	0,25	38	0,60	92	1,11	170	1.77	270
500	125	-	-	0,48	37	1,15	88	2,16	165	3,14	240
1000	250	-	-	0,92	35	2,09	80	3,93	150	5,50	210
1500	375	-	-	1,34	34	2,91	74	5,50	140	7,46	190
2000	500	-	-	1,62	31	3,56	68	6,81	130	9,16	175
3000	750	-	-	2,28	29	4,71	60	7,85	100	12,57	160
Ratio 5:1											
50	10	-	-	0,04	38	0,10	95	0,18	175	0,27	260
250	50	-	-	0,19	37	0,48	92	0,89	170	1,31	250
500	100	-	-	0,37	35	0,92	88	1,68	160	2,41	230
1000	200	-	-	0,69	33	1,68	80	2,93	140	4,19	200
1500	300	-	-	0,94	30	2,29	73	3,77	120	5,81	185
2000	400	-	-	1,17	28	2,85	68	4,61	110	7,54	180
3000	600	-	-	1,70	27	3,77	60	6,28	100	10,05	160
Ratio 6:1											
50	8,33	-	-	0,03	32	0,06	74	0,14	160	0,18	210
250	41,67	-	-	0,14	31	0,31	70	0,65	150	0,87	200
500	83,33	-	-	0,26	30	0,60	69	1,22	140	1,66	190
1000	166,67	-	-	0,51	29	1,19	68	2,27	130	3,23	185
1500	250	-	-	0,73	28	1,68	64	3,14	120	4,45	170
2000	333,33	-	-	0,94	27	2,09	60	3,84	110	5,58	160
3000	500	-	-	1,36	26	2,72	52	4,97	95	7,85	150

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



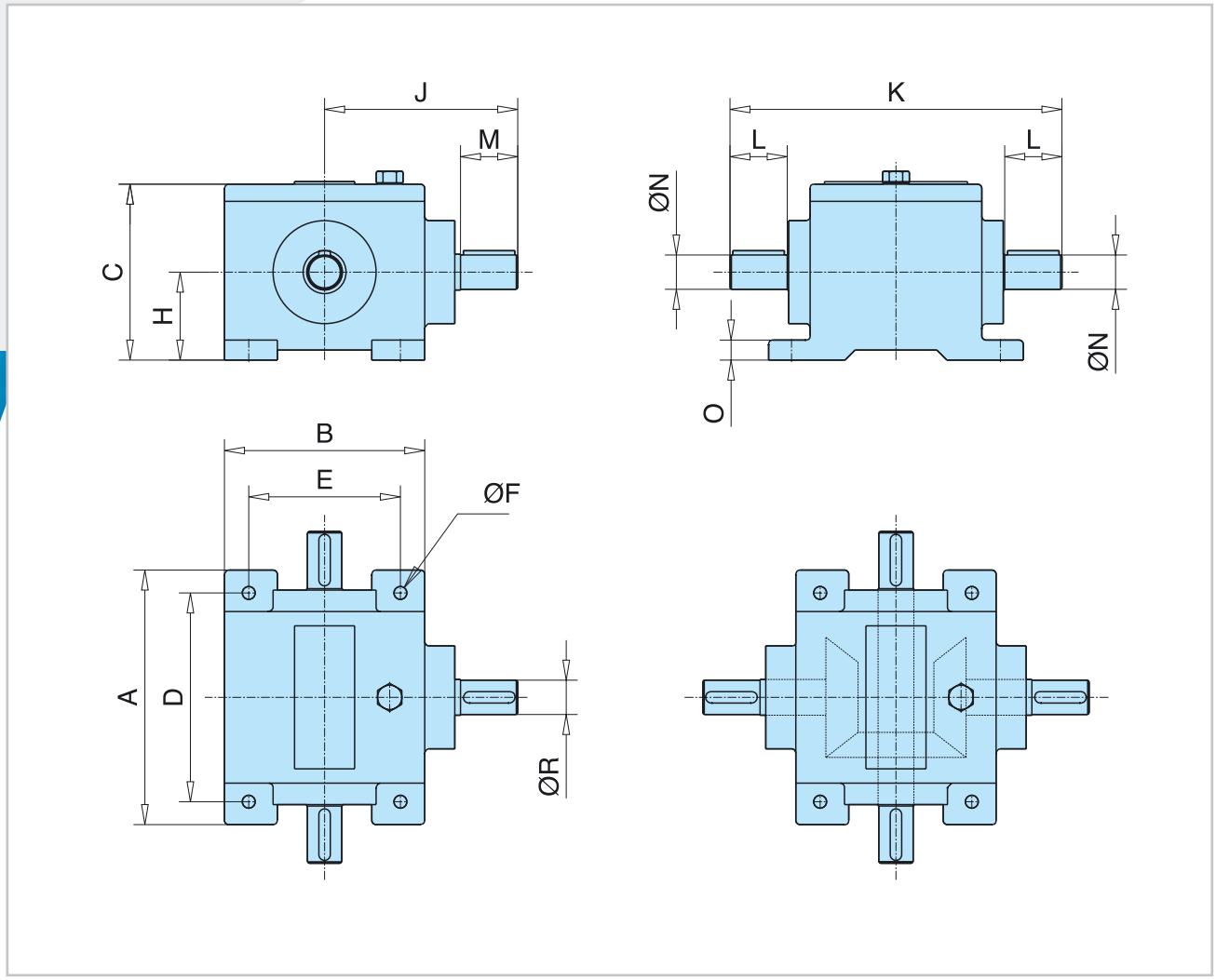
4.2.3.4 Mitre gear boxes KV 90-KV 550

Speed of drive motor n_1 [min^{-1}]	Output speed n_2 [min^{-1}]	KV 90		KV 120		KV 260		KV 550	
		P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]	P_1 [kW]	T_2 [Nm]
Ratio 1:1									
50	50	6,54	1250	9,16	1750	23,04	4400	40,84	7800
250	250	24,87	950	36,65	1400	89,01	3400	154,45	5900
500	500	41,88	800	62,83	1200	146,60	2800	261,78	5000
1000	1000	67,02	640	94,24	900	198,95	1900	418,85	4000
1500	1500	81,68	520	116,23	740	251,31	1600	549,74	3400
2000	2000	92,15	440	127,75	610	-	-	-	-
3000	3000	100.52	320	138,22	440	-	-	-	-
Ratio 1,5:1									
50	33,33	4,54	1300	6,28	1800	15,71	4500	27,92	8000
250	166,67	19,20	1100	26,18	1500	64,57	3700	113,44	6500
500	333,33	31,41	900	45,38	1300	108,20	3100	188,48	5400
1000	666,67	52,36	750	76,79	1100	181,50	2600	328,10	4700
1500	1000	67,02	640	94,24	900	198,95	1900	418,85	4000
2000	1333,33	79,58	570	110,30	790	237,35	1700	516,58	3700
3000	2000	92,15	440	127,75	610	-	-	-	-
Ratio 2:1									
50	25	3,40	1300	4,71	1800	12,04	4600	21,47	8200
250	125	15,71	1200	20,94	1600	51,05	3900	90,31	6900
500	250	24,87	950	36,65	1400	89,01	3400	154,45	5900
1000	500	41,88	800	62,83	1200	146,60	2800	261,78	5000
1500	750	54,97	700	78,53	1000	188,48	2400	353,40	4500
2000	1000	67,02	640	94,24	900	198,95	1900	418,85	4000
3000	1500	81,68	520	116,23	740	251,31	1600	549,74	3500
Ratio 3:1									
50	16,67	1,52	870	2,97	1700	7,33	4200	14,83	8200
250	83,33	7,07	810	12,22	1400	32,29	3700	63,70	7300
500	166,67	13,09	750	21,82	1250	55,85	3200	109,95	6300
1000	333,33	21,64	620	34,21	980	90,75	2600	184,99	5300
1500	500	27,25	530	43,98	840	115,18	2200	240,84	4600
2000	666,67	33,51	480	53,05	760	132,64	1900	293,19	4200
3000	1000	40,84	390	62,83	600	178,01	1700	366,49	3500
Ratio 4:1									
50	12,5	1,26	960	2,09	1600	3,93	3000	11,13	8500
250	62,5	5,56	850	9,82	1500	18,32	2800	51,05	7800
500	125	10,21	780	17,67	1350	32,72	2500	91,62	7000
1000	250	17,28	660	30,10	1150	54,97	2100	159,69	6100
1500	375	23,17	590	38,48	980	74,61	1900	223,82	5700
2000	500	27,23	520	45,55	870	94,24	1800	261,78	5000
3000	750	33,77	430	54,97	700	125,65	1600	337,70	4300
Ratio 5:1									
50	10	1,02	970	1,57	1500	3,35	3200	7,54	7200
250	50	4,71	900	7,33	1400	15,18	2900	33,51	6400
500	100	8,48	810	13,61	1300	25,13	2400	60,73	5800
1000	200	14,66	700	23,04	1100	39,79	1900	104,71	5800
1500	300	19,48	620	29,84	950	53,40	1700	135,08	4300
2000	400	23,46	560	35,60	850	67,02	1600	159,16	3800
3000	600	31,41	500	46,49	740	81,68	1300	201,05	3200
Ratio 6:1									
50	8,33	0,53	610	0,87	1000	1,83	2100	5,41	6200
250	41,67	2,62	600	4,28	980	8,73	2000	25,31	5800
500	83,33	5,06	580	7,68	880	15,71	1800	45,38	5200
1000	166,67	9,25	530	13,61	780	29,67	1700	80,28	4600
1500	250	12,57	480	17,80	680	39,27	1500	104,71	4000
2000	333,33	15,01	430	20,94	600	48,87	1400	132,64	3800
3000	500	18,85	360	26,18	500	57,59	1100	167,54	3200



4.3 Dimension plans

4.3.1 K ..13 range



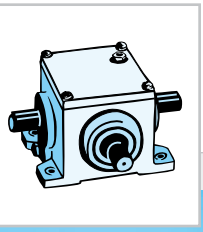
Only the most recent dimension plans are binding

Size	K 0,5.13	K 5.13	K 11.13	K 25.13	K 60.13*			
Ratio	1:1, 2:1, 3:1	1:1, 2:1, 3:1	1:1, 2:1, 3:1	1:1, 2:1, 3:1	1:1, 1,5:1, 2:1	3:1	4:1	5:1
A	105	135	178	230	300	300	300	300
B	64	110	140	230	210	210	210	210
C	64	105	123	152	202	202	202	202
D	84,5	110	146	195	270	270	270	270
E	50	85	106	195	170	170	170	170
F	6,5	9	9	11	13	13	13	13
H	32	52,5	61,5	70	102	102	102	102
J	64	110	135	223	273	261	261	248
K	114	170	232	356	406	406	406	406
L	15,5	28	40	80	80	80	80	80
M	15,5	30	40	80	80	68	68	55
ØN	10_{j6}	16_{k6}	24_{k6}	30_{k6}	42_{j6}	42_{j6}	42_{j6}	42_{j6}
O	8	12	14	15	15	15	15	15
ØR	10_{j6}	16_{k6}	24_{k6}	30_{k6}	42_{j6}	35_{j6}	35_{j6}	28_{j6}

Feather keys and grooves: DIN 6885 Page 1.

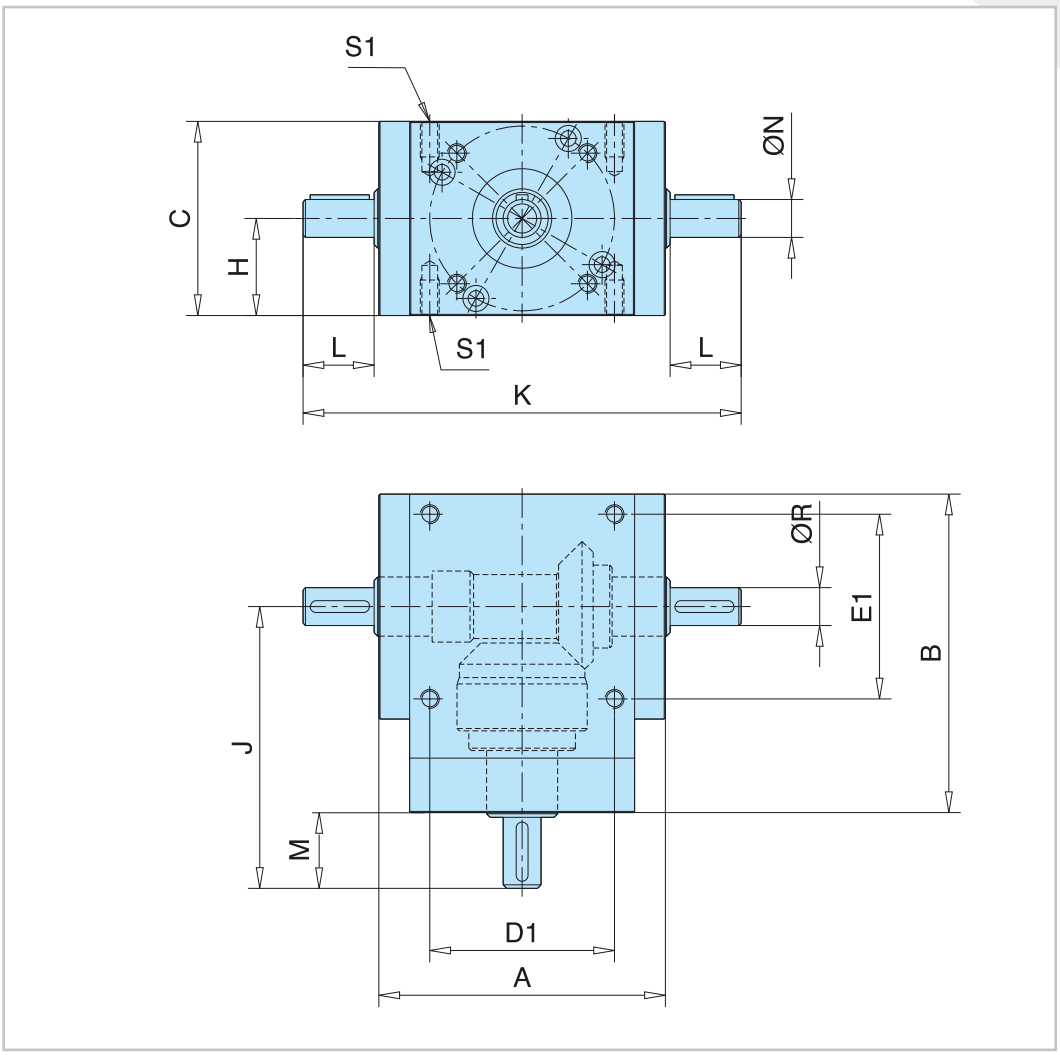
* New generation

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



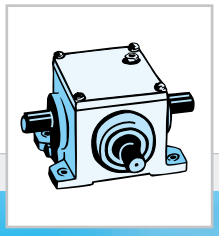
4.3 Dimension plans

4.3.2 NORMA range

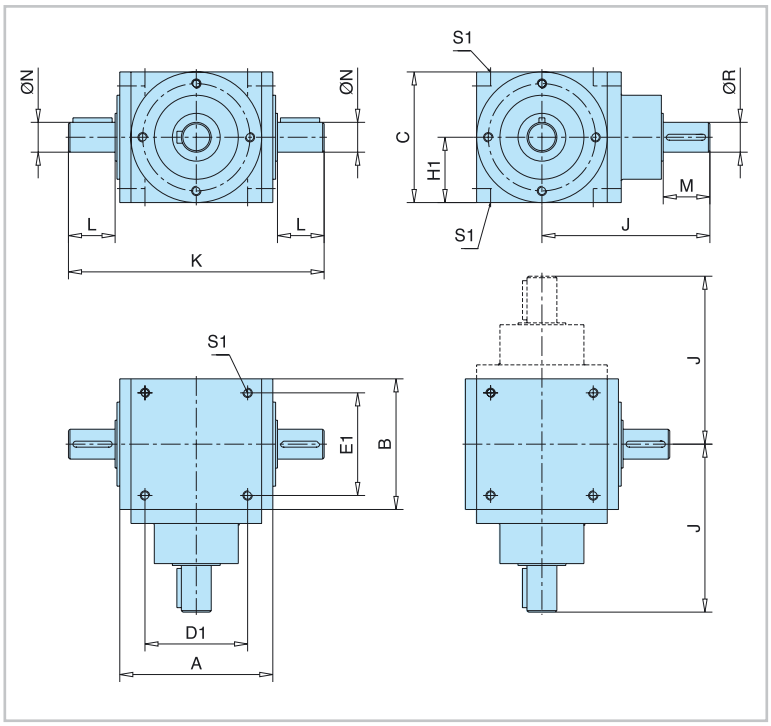


Only the most recent dimension plans are binding

Size	M0	M1	M2	M3	M4
Ratio	**1:1**	**1:1**	**1:1**	**1:1**	**1:1**
A	70	98	98	121	121
B	72	104	104	134,5	134,5
C	50	62	75	82	117
$D1^{\pm 0,2}$	$38^{\pm 0,1}$	$60^{\pm 0,2}$	$60^{\pm 0,2}$	$78^{\pm 0,2}$	$78^{\pm 0,2}$
$E1^{\pm 0,2}$	$38^{\pm 0,1}$	$60^{\pm 0,2}$	$60^{\pm 0,2}$	$78^{\pm 0,2}$	$78^{\pm 0,2}$
H	25	31	37,5	41	58,5
J	66	86	91	119	129
K	110	142	152	185	205
L	19	21	26	30	40
M	19	21	26	30	40
$ØN_{j6}$	9_{j6}	10_{j6}	14_{j6}	16_{j6}	20_{j6}
$ØR_{j6}$	9_{j6}	10_{j6}	14_{j6}	16_{j6}	20_{j6}
S1	M6-13 deep	M6-13 deep	M8-15 deep	M8-15 deep	M10-16 deep



4.3 Dimension plans



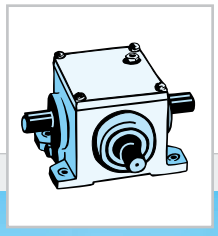
4.3.3 KA and KV range

Only the most recent dimension plans are binding

Size	KA 1				KA 5			
Ratio	1:1 / 1,5:1 / 2:1	3:1	4:1	5:1 / 6:1	1:1 / 1,5:1 / 2:1	3:1	4:1	5:1 / 6:1
A	84	84	-	-	110	110	110	110
B	65	65	-	-	90	90	90	90
C	65	65	-	-	90	90	90	90
$D1^{\pm 0,2}$	45	45	-	-	70	70	70	70
$E1^{\pm 0,2}$	45	45	-	-	70	70	70	70
H1	32,5	32,5	-	-	45	45	45	45
J	100	100	-	-	122	122	132	132
K	144	144	-	-	190	190	190	190
L	26	26	-	-	35	35	35	35
M	26	26	-	-	35	35	35	35
$ØN_{j6}$	12	12	-	-	18	18	18	18
$ØR_{j6}$	12	12	-	-	18	12	12	12
S1	M 6x12	M 6x12	-	-	M 8x16	M 8x16	M 8x16	M 8x16

Size	KA 9				KA 18			
Ratio	1:1 / 1,5:1 / 2:1	3:1	4:1	5:1 / 6:1	1:1 / 1,5:1 / 2:1	3:1	4:1	5:1 / 6:1
A	144	144	144	144	164	164	164	164
B	120	120	120	120	140	140	140	140
C	120	120	120	120	140	140	140	140
$D1^{\pm 0,2}$	100	100	100	100	110	110	110	110
$E1^{\pm 0,2}$	100	100	100	100	110	110	110	110
H1	60	60	60	60	70	70	70	70
J	162	162	172	162	180	180	195	195
K	244	244	244	244	274	274	274	274
L	45	45	45	45	50	50	50	50
M	45	45	45	35	50	50	50	50
$ØN_{j6}$	25	25	25	25	32	32	32	32
$ØR_{j6}$	25	20	20	15	32	28	24	24
S1	M 10x20	M 10x20	M 10x20	M 10x20	M 10x20	M 10x20	M 10x20	M 10x20

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



4.3 Dimension plans

Only the most recent dimension plans are binding

Size	KA 35				KV 90			
Ratio	1:1 / 1,5:1 / 2:1	3:1	4:1	5:1 / 6:1	1:1 / 1,5:1 / 2:1	3:1	4:1	5:1 / 6:1
A	190	190	190	190	264	264	264	264
B	160	160	160	160	230	230	230	230
C	160	160	160	160	230	230	230	230
$D1^{\pm 0,2}$	120	120	120	120	180	180	180	180
$E1^{\pm 0,2}$	120	120	120	120	180	180	180	180
H1	80	80	80	80	115	115	115	115
J	212	212	232	232	305	310	310	300
K	320	320	320	320	460	460	460	454
L	60	60	60	60	90	90	90	90
M	60	60	60	60	90	80	80	70
$ØN^{j6}$	35	35	35	35	55	55	55	55
$ØR^{j6}$	35	28	24	24	55	40	40	35
S1	M 12x24	M 12x24	M 12x24	M 12x24	M 16x32	M 16x32	M 16x32	M 16x32

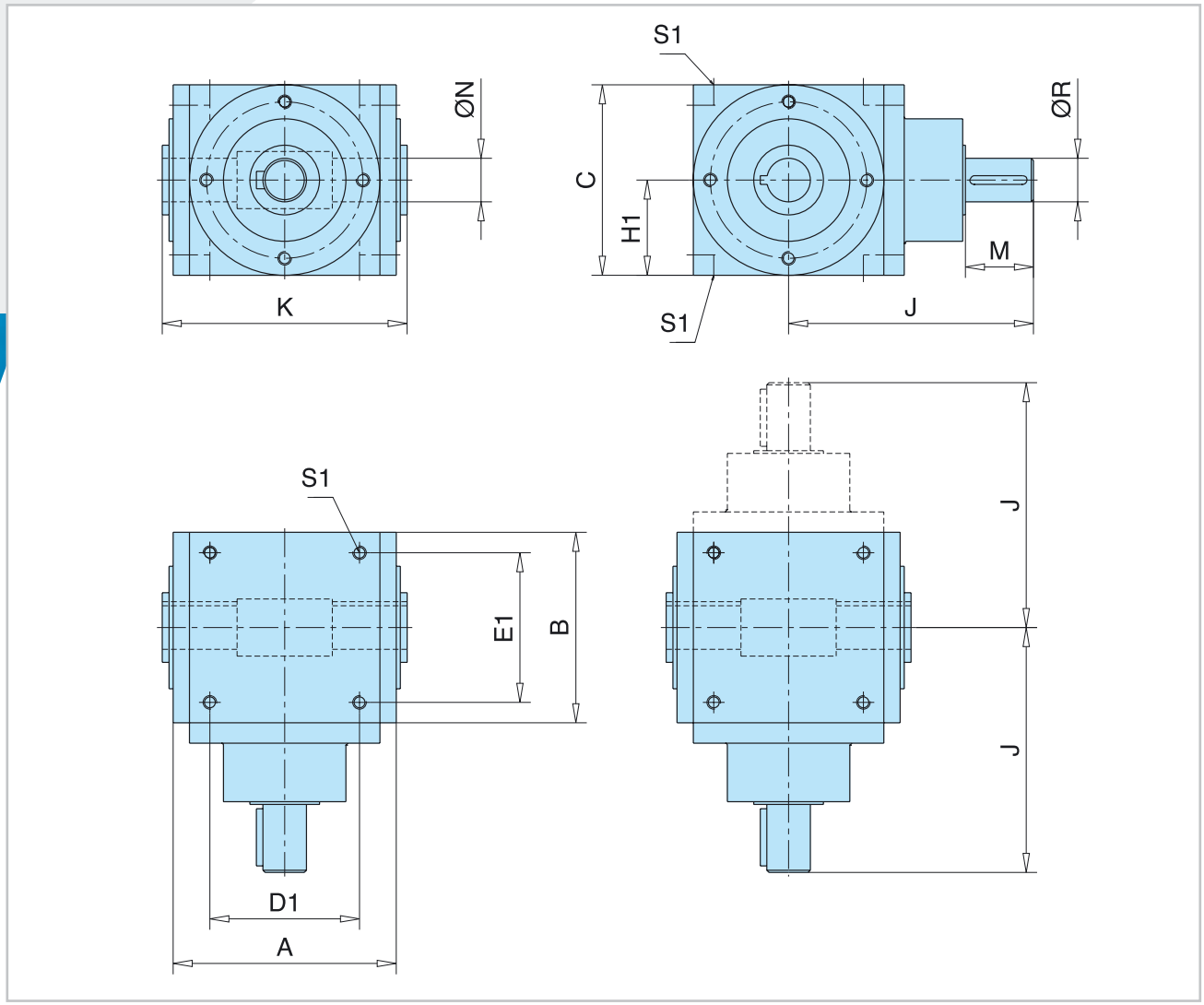
Size	KV 120				KV 260			
Ratio	1:1 / 1,5:1 2:1	3:1	4:1	5:1 / 6:1	1:1 / 1,5:1 2:1	3:1	4:1	5:1 / 6:1
A	300	300	300	300	402	402	402	402
B	260	260	260	260	350	350	350	350
C	260	260	260	260	350	350	350	350
$D1^{\pm 0,2}$	220	220	220	220	285	285	285	285
$E1^{\pm 0,2}$	220	220	220	220	285	285	285	285
H1	130	130	130	130	175	175	175	175
J	380	360	360	360	570	540	540	510
K	570	570	570	570	820	820	820	820
L	110	110	110	110	170	170	170	170
M	110	90	90	90	170	140	140	110
$ØN_{j6}$	60	60	60	60	80	80	80	80
$ØR_{j6}$	60	50	50	45	80	65	65	55
S1	M 16x32	M 16x32	M 16x32	M 16x32	M 20x40	M 20x40	M 20x40	M 20x40

Size	KV 550				
Ratio	1:1/1,5:1 | 2:1	3:1	4:1 | 5:1		6:1
A	490	490	490		490
B	450	450	450		450
C	450	450	450		450
$D1^{\pm 0,2}$	360	360	360		360
$E1^{\pm 0,2}$	360	360	360		360
H1	225	225	225		225
J	600 | 570	540	540		530
K	940	940	940		940
L	150	150	150		150
M	150	120	120		110
$ØN_{j6}$	90	90	90		90
$ØR_{j6}$	90	75	70		60
S1	M 20x40	M 20x40	M 20x40		M 20x40

Shaft adapters: j6
Shaft center holes: DIN 332 Page 2.
Feather keys and grooves: DIN 6885 Page 1.

4.3 Dimension plans

4.3.4 KA...H and KV...H range with power takeoff hollow shaft

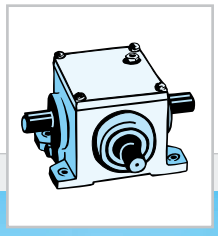


Only the most recent dimension plans are binding

Size	KA 5 H	KA 9 H	KA 18 H	KA 35 H	KV 90 H	KV 120 H	KV 260 H	KV 550 H
A	110	144	164	190	280	300	402	490
B	90	120	140	160	230	260	350	450
C	90	120	140	160	230	260	350	450
$D1^{\pm 0,2}$	70	100	110	120	180	220	285	360
$E1^{\pm 0,2}$	70	100	110	120	180	220	285	360
H1	45	60	70	80	115	130	175	225
J	Dependent on transmission, see section 4.3.3 for dimensions							
K	124	160	180	206	300	350	480	705
M	Dependent on transmission, see section 4.3.3 for dimensions							
$ØN^{H7}$	18	25	32	35	55	60	80	100
$ØR_{j6}$	Dependent on transmission, see section 4.3.3 for dimensions							
S1	M 8x16	M 10x20	M 10x20	M 12x24	M 16x32	M 16x32	M 20x40	M 20x40

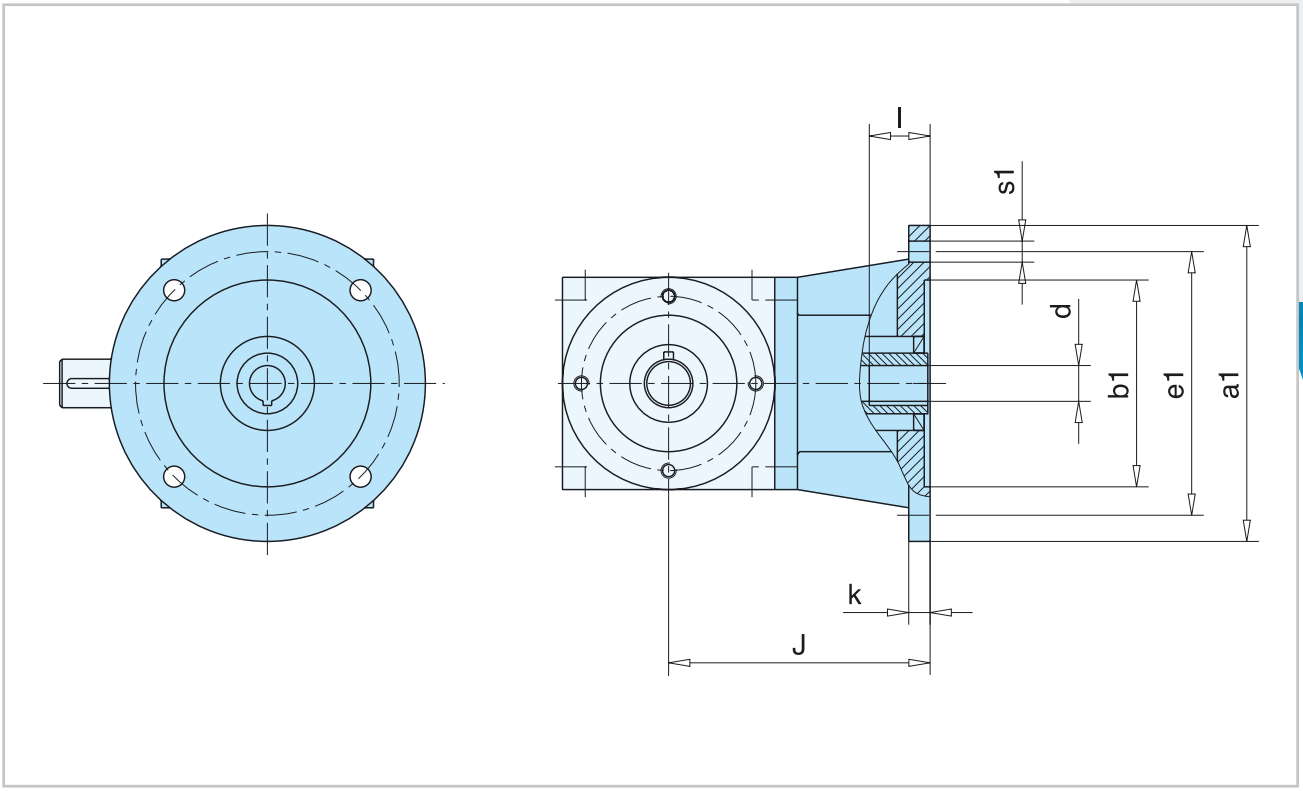
Shaft center holes: DIN 332, Page 2, feather keys and grooves: DIN 6885 Page 1.

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



4.3 Dimension plans

4.3.5 KA...FH and KV...FH range with power take-off hollow shaft and motor flange



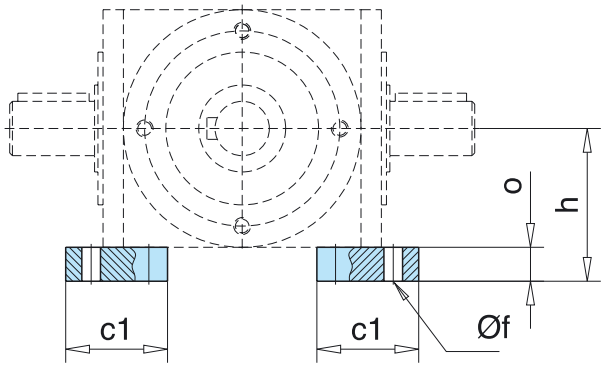
Only the most recent dimension plans are binding

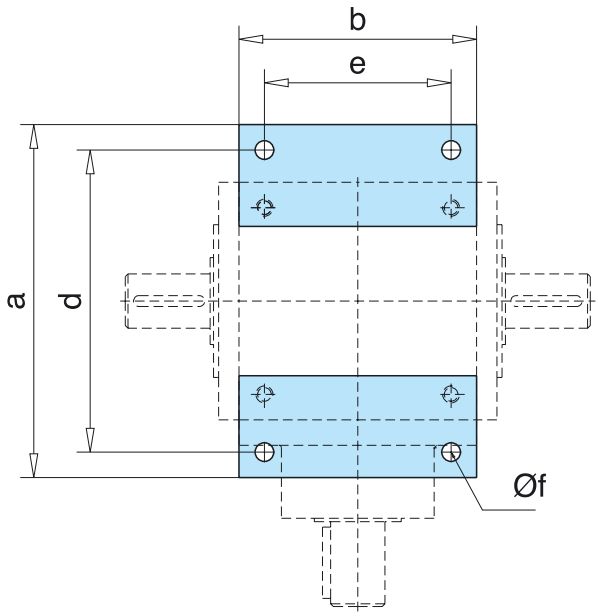
Size	Motor type	IEC flange			hollow shaft	Flange dimensions		
		Øa1	Øb1	Øe1	Ød x l	J	k	s1
KA 1 FH	63	120	80	100	Ø11x23	90	10	4xØ7
	71	105	70	85	Ø14x30			4xØ7
KA 5 FH	71	140	95	115		110	12	4xØ9
	80	120	80	100	Ø19x40			4xØ7
		160	110	130				4xØ9
KA 9 FH	80	160	110	130		135	15	4xØ9
	90L / S	140	95	115	Ø24x50			4xØ9
		160	110	130				4xØ9
		200	130	165				4xØ11
KA 18 FH	90L / S	160	110	130		170	15	4xØ9
		200	130	165				4xØ11
	100L	250	180	215	Ø28x60			4xØ14
KA35 FH	90 L / S	200	130	165	Ø24x50	190	18	4xØ11
	100L	250	180	215	Ø28x60			4xØ14
	112M							
KV 90 FH	132 S / M	300	230	265	Ø38x85	270	20	4xØ13
	160 M / L	350	250	300	Ø42x115			4xØ18
	180 M / L	350	250	300	Ø48x115			4xØ18
	200 L	400	300	350	Ø55x115			4xØ18
KV 120 FH		on request						

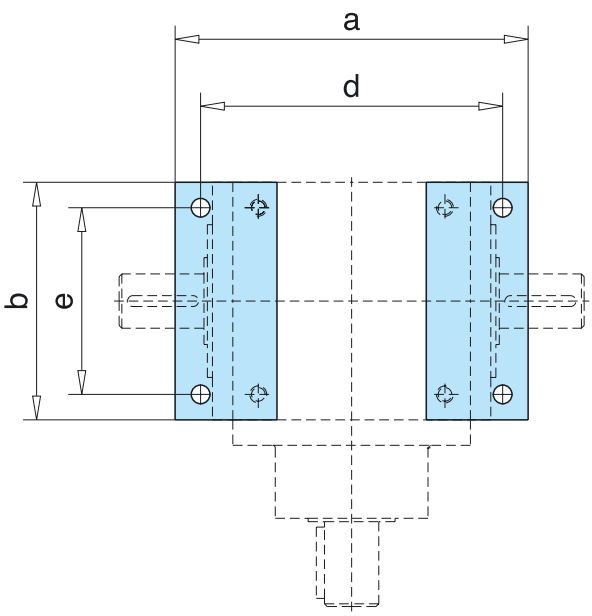
Non-listed dimensions can be found under the respective gear type in section 4.3.3 or 4.3.4

4.3 Dimension plans

4.3.6 AL screw-on strips for KA and KV range

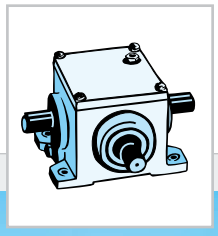






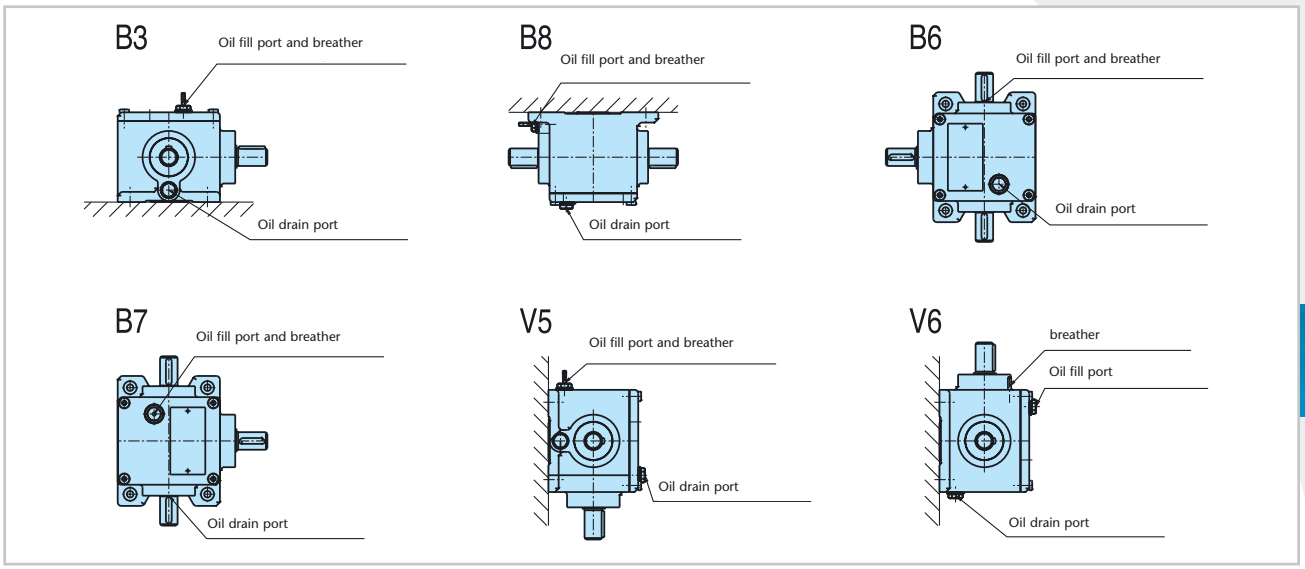
Size	KA1	KA 5	KA 9	KA 18	KA 35	KV 90	KV 120	KV 260	KV 550
a	100	140	190	210	250	340	380	490	590
b-0,5	84	90	120	140	160	230	260	350	450
c1	35	45	55	60	80	100	100	130	140
$d^{\pm 0,2}$	85	125	168	190	215	295	335	440	540
e	70	72	100	110	134	190	220	285	360
Øf	6,6	9,0	11	11	14	18	18	22	22
h	44,5	57	75	90	105	145	165	210	255
o	12	12	15	20	25	30	35	35	30

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

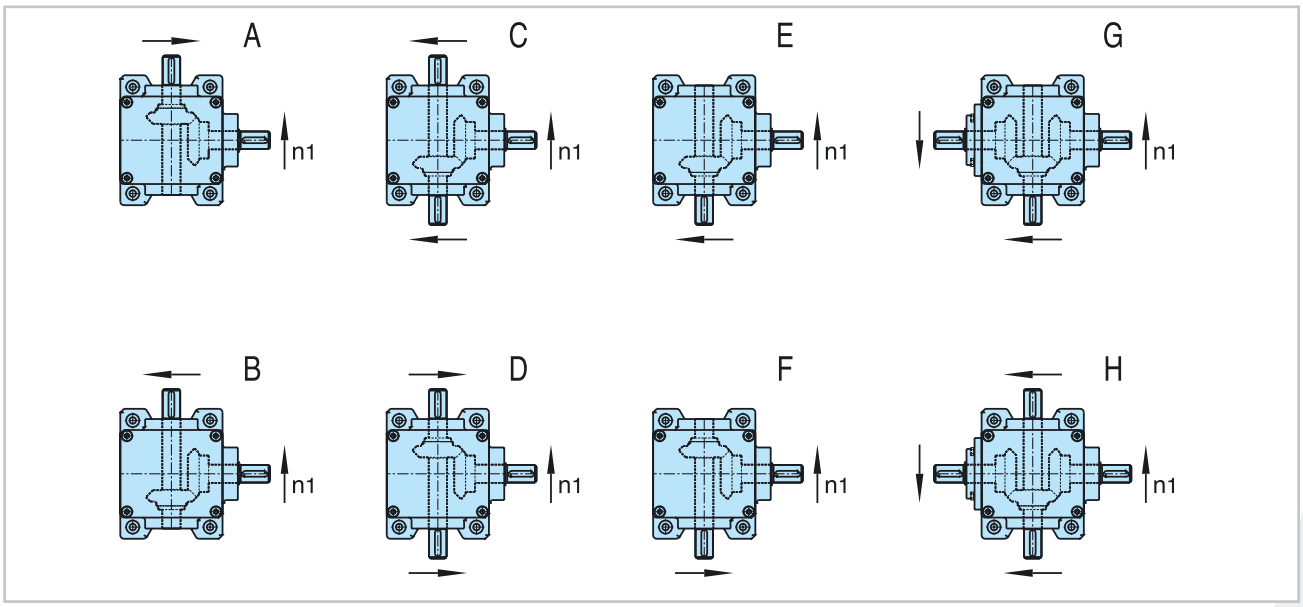


4.4.1 Mounting positions K...13

To process orders correctly we need to know the installation location and configuration of the bevel-gear drive system in addition to the type of gear and ratio.



4.4.2 Configurations K...13



4.4.3 Order code K...13

Ordering designation:

1 - 2 - 3 - 4 - 5

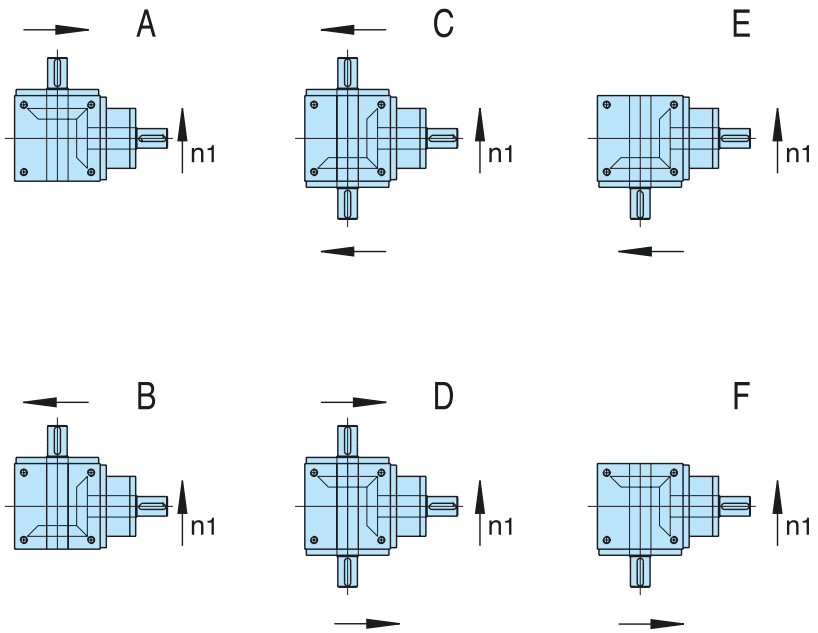
K□□.13-□:□-□-□□-□□□□

Example: **K25.13-2:1-C-B6-1000**

1. Product designation/size: e.g. **K25.13**,
2. Ratio: 1:1; 2:1; 3:1
   (for K60.13 **1:1; 1,5:1; 2:1; 3:1; 4:1; 5;1**)
3. Design: **A; B; C; D; E; F; G; H** see K.13 configurations
4. Installation location
5. Drive speed n_1

4.5 Ordering details NORMA

4.5.1 Configurations NORMA



NORMA mitre gear boxes are available in the configurations illustrated. NORMA mitre gear boxes are absolutely symmetrical and equipped with identical fixing holes on all sides; this means that they can be installed and/or turned into any position.

4.5.2 Order code NORMA

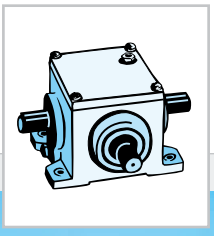
Ordering designation:

1	- 2	- 3	- 4	- 5
NORMA M ■	-1:1-	■	-0-	0

1. Product designation/size: e.g. **NORMA M3**,
2. Ratio: **1:1**
3. Design: **A; B; C; D; E; F** (see Norma configurations)
4. Tolerance class: **0**= Torsional play max. 15 angular minutes
5. Lubrication: **0** = FORMAX service life lubrication

Example: **NORMA M3-1:1-D-0-0**

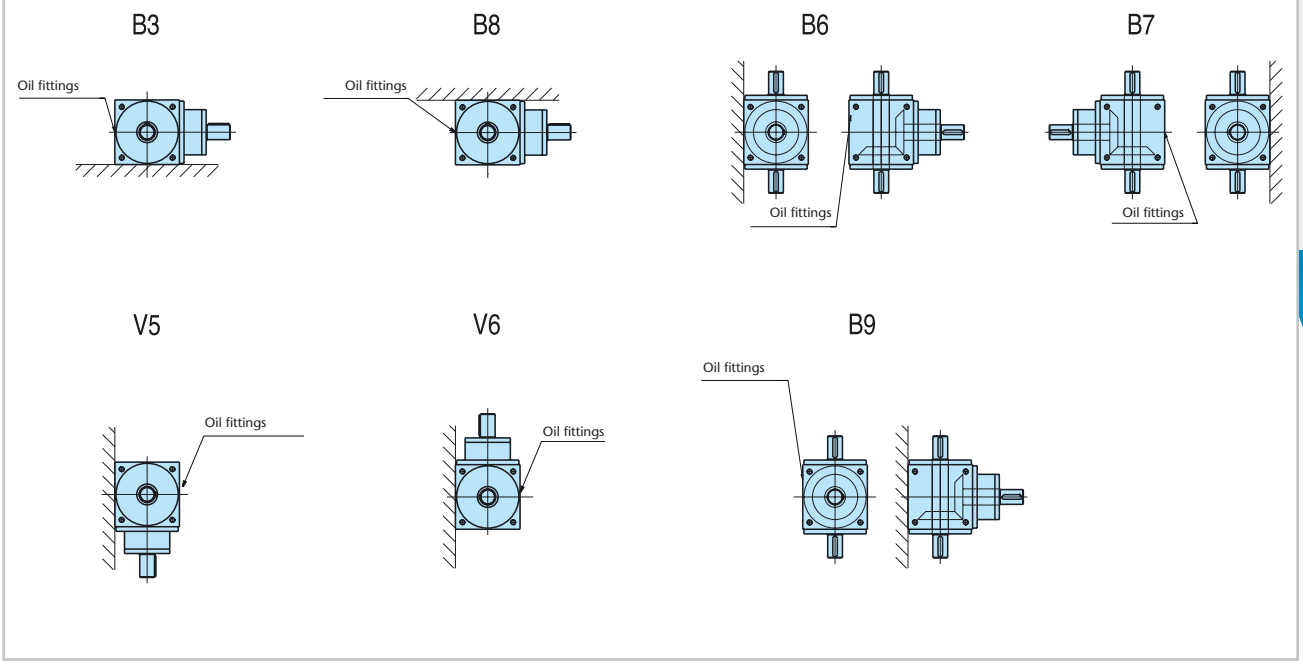
Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



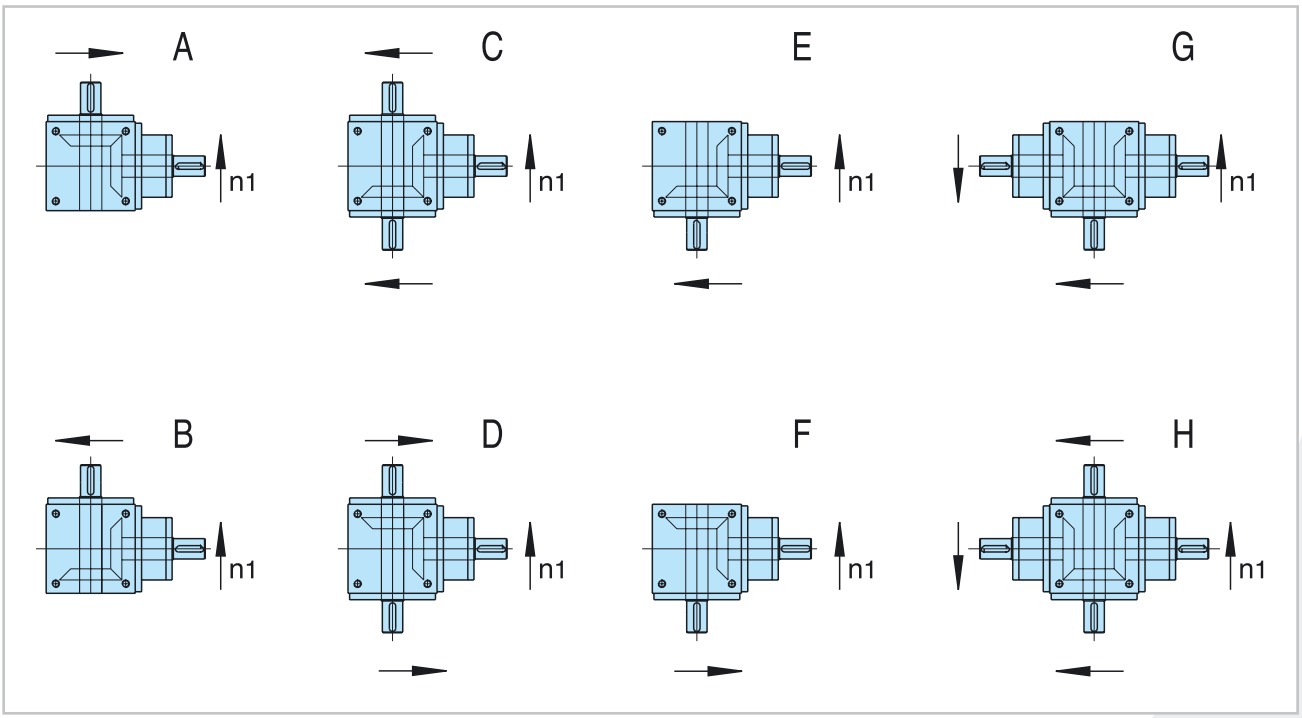
4.6 Ordering details for KA and KV

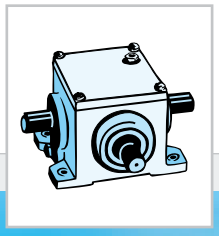
4.6.1 Mounting positions KA and KV range

To process orders correctly we need to know the installation location and configuration of the mitre gear boxes in addition to the type of gear and ratio.



4.6.2 Configurations KA and KV range





4.6 Ordering details for KA and KV

4.6.3 Order code KA and KV

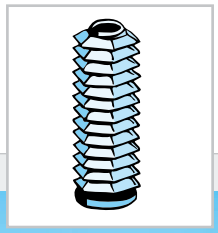
Ordering designation

	1	-	2	-	3	-	4	-	5	-	6	-	7	-	8
K	□ □ □ □	-	□	:	□	-	□	-	□ □	**-0-**	□ □	-	□ □ □ □	-	□ □

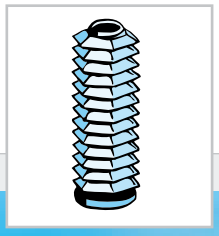
Example: **KV260-3:1-C-0-B3-500**

1. Product designation/size: e.g. **KV 120, KA 9**
2. Ratio: **1:1; 1,5:1; 2:1; 3:1; 4:1; 5:1; 6:1**
3. Design: **A; B; C; D; E; F; G; H** see KA, KV configurations
4. **L** shaft configuration = through-shaft,
   H = power take-off hollow shaft;
   FH = Flange with drive-side hollow shaft
5. Tolerance class: **0** = Torsional play max. 15 angular minutes
6. Mounting position, see KA and KV mounting positions
7. Power take-off speed n_2
8. Option screw-on rail: **AL**

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

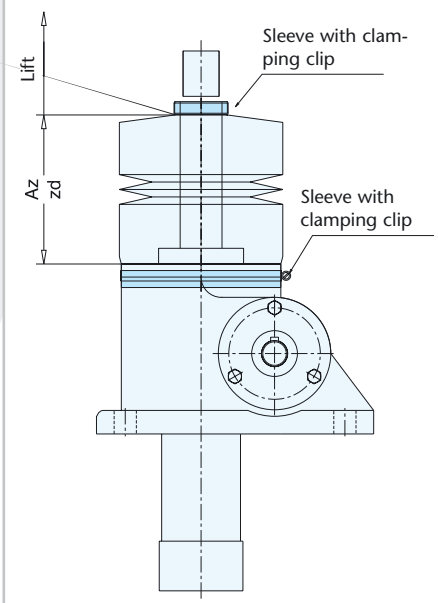


Contents



5.1 FB Flexible protection boots

Fig.1



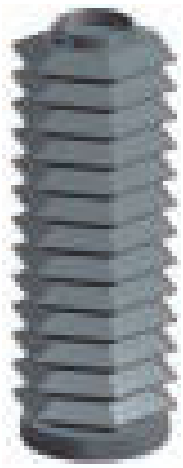
Pfaff-silberblau worm gear screw jacks must be protected with bellows if they are to be used in circumstances where there is a danger of dirt entering the unit or damage or injury occurring. Several types of bellows configuration, in different materials, are available according to requirements

5.1.1 General points

In the standard configuration, flexible protection boots made of material PN-100 or PN-200 are used. They are secured at both ends with galvanized metal collars (Fig. 1). Stainless steel collars (V2A) can also be supplied on request.

In the case of extension limits Az > 1000mm, the flexible protection boots are fitted with limiting devices,
which prevent over-expansion of the individual bellows segments.

If they are arranged in a tilted or horizontal position, the flexible protection boots must be fitted (from a stroke-length of 400mm onwards) with support rings in order to prevent them engaging with the threads.



Ordercode:

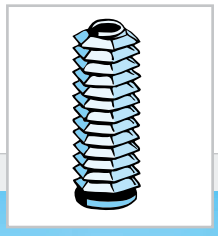
PN-□□□-□□□/□□□□-Ø□□□□/ Ø□□□□-□□□x□□□/□□□x□□□

material - zd / Az - outer Ø/ inner Ø - sleeve / sleeve

Material	Layout	Temperature range °C	Dustproof	Waterproof	Oil-resistant	Chemical resistant	Spark resistant	zd/lift
PN-100*	Polygonal folding	-15° to 70°	●	●	●2	-	-	0,12
PN-200	Polygonal folding	-15° to 100°	●	●	●	○	-	0,15
PN-300	Couture ronde	-15° to 100°	●	○	○	-	-	0,20
PN-CSM-Rubber sheeting	Round	-28° to 110°	●	●	○	-	-	on request
PN-CR-Rubber fabric	Round	-38° to 100°	●	●	●	●1	-	on request
PN-ALU-Glass fiber	Sewn around	-20° to 200°	●	-	-	-	●	on request

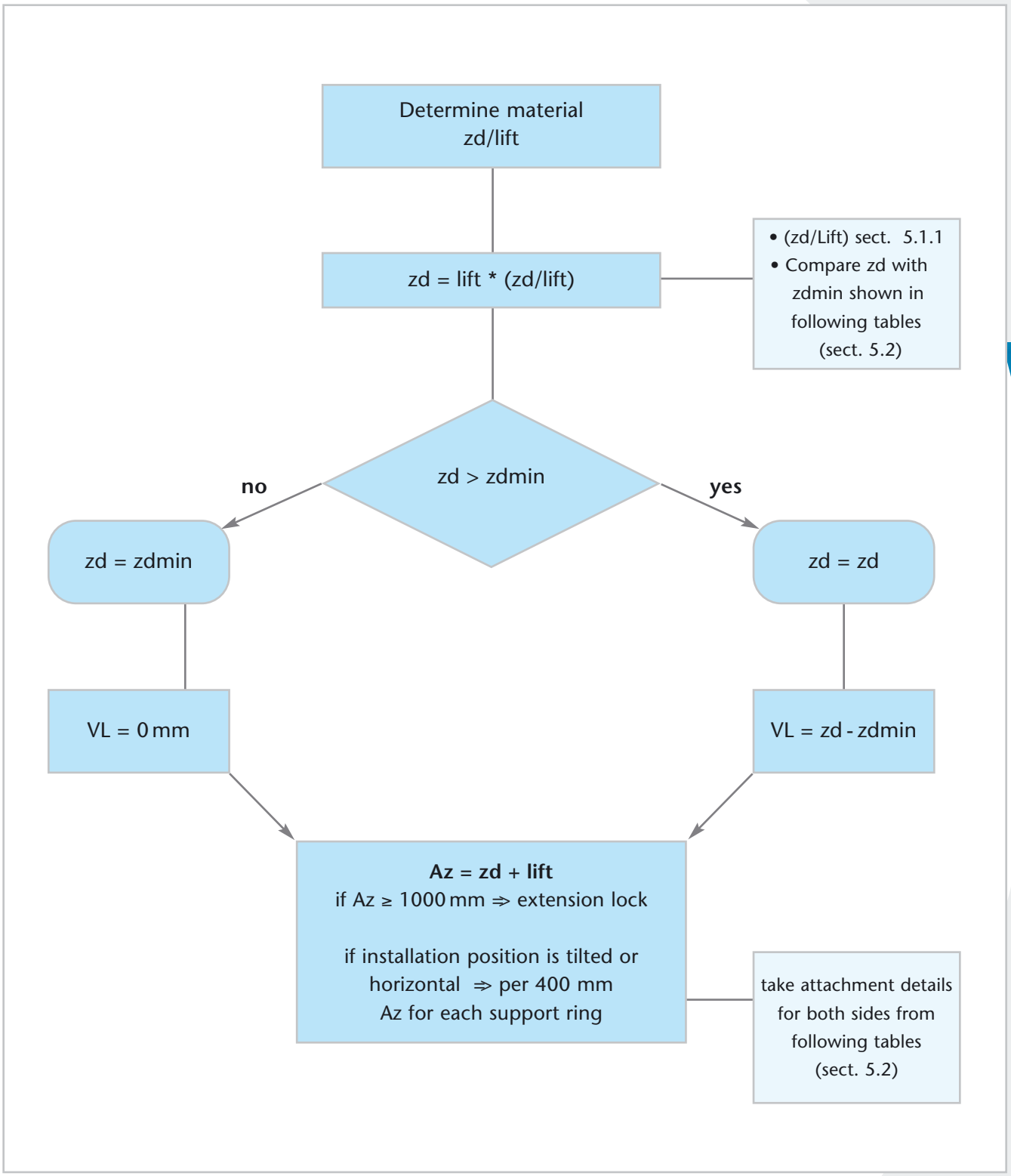
*** Standard** ○-only conditional ●-resistant ● 1 only if coated with Teflon ● 2 with synth. oil, with inner coating only

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

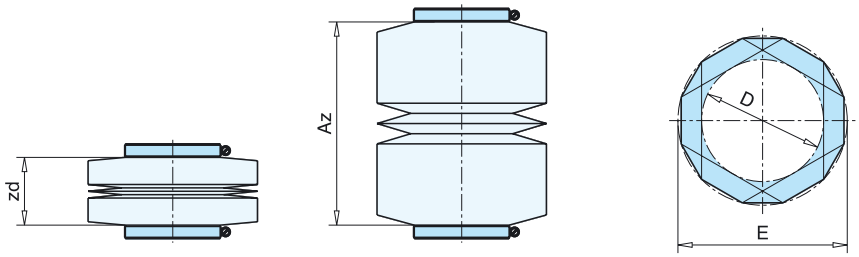


5.1 FB Flexible protection boots

5.1.2 Configuration

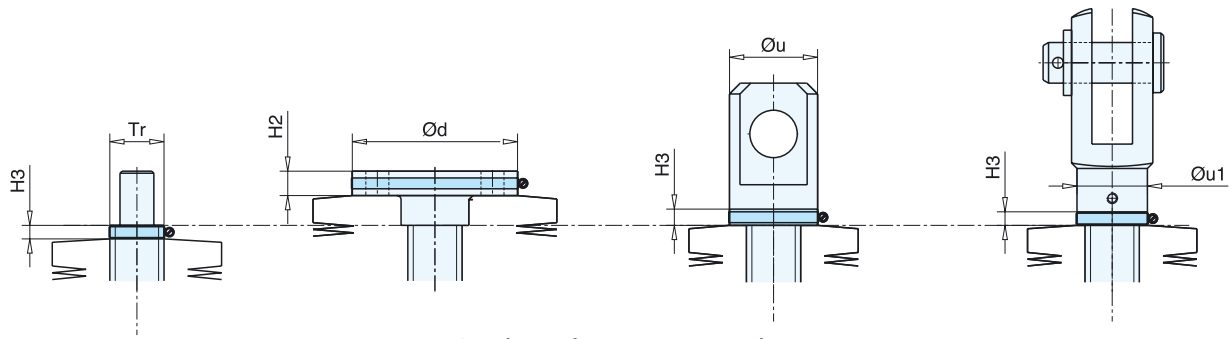


5.2 Dimensions, configuration type 1

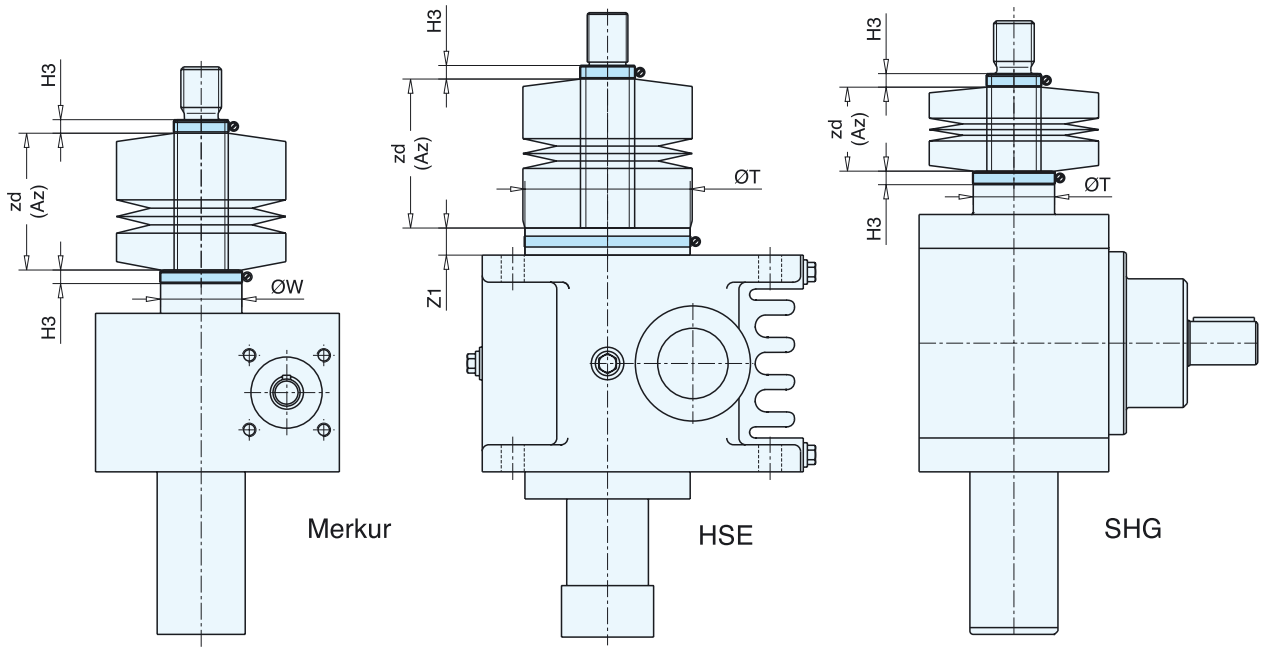


Protection boot fasteners - head area

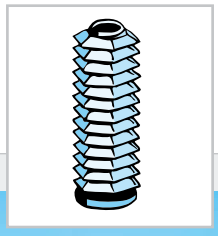
Head type I and III | Head type II | Head type IV | Head type GK



Protection boot fasteners - gear box area



Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



5.2 Dimensions, configuration type 1

5.2.1 Merkur range

Merkur		M0	M1	M2	M3	M4	M5	M6	M7	M8
Housing connection:										
Housing	ØW	26	30(48)	39(57)	46	60	85	120	145	170
	H	12	12	12	12	12	12	15	15	15
Spindle head										
Head II	Ød	50	65	80	90	110	150	220	260	310
	H2	12	12	12	12	15	20	30	30	30
Head I/III	*ØTr	14	18	20	30	40	60	70	100	120
Head IV	Øu	25	30	40	45	60	85	120	160	170
	H3	12	12	12	12	12	12	15	15	15
Head GK	Øu1	14	20	25	34	52	60	-	-	-
	H3	12	12	12	12	12	12	-	-	-
Minimum Zd_{min}										
Head II		7	12	16	16	19	37	42	52	102
Head I/III		0	0	0	0	0	0	0	0	0
Head IV-Gk		3	4	7	5	4	7	12	12	22
Flexible protection boots inner and outer diameter (material PN 100 and PN 200)										
Head II	D	63	63	100	100	120	150	220	260	310
	E	105	105	140	140	180	210	280	320	370
Head	D	38	38	45	63	100	100	120	200	200
I-III-IV-GK	E	75	75	85	105	140	140	180	260	260

( ) value in brackets for configuration with Ku spindle, *for Ku spindle –connection head I-III = Ku-Ø

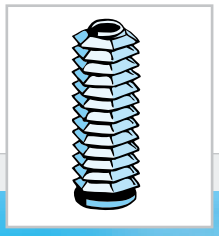
5.2.2 HSE and SHG range

HSE		31	36	50	63	80	100	125	140	200
Housing connection:										
Housing	ØT	62	72	92	122	152	182	222	262	352
	H	15	16	18	20	25	25	25	25	25
Spindle head										
Head II	Ød	62	72	92	122	150	182	222	262	185
	H2	12	12	12	18	20	20	25	30	30
Head I/III	ØTr	18	22	40	50	60	70	100	120	160
Head IV-	Øu	30	40	50	65	90	110	140	170	220
Head GK	Øu1									
	H3	12	12	12	12	15	15	20	20	20
Minimum Zd_{min} with H configuration										
Head II		31	33	38	42	50	50	70	85	20
Head I / III		8	8	10	10	5	5	5	5	0
Head IV		20	20	20	20	20	20	20	20	20
Minimum Zd_{min} with F configuration										
Head II		39	41	46	51	64	69	89	109	49
Head I / III		16	16	18	19	19	24	24	29	29
Head IV		28	28	28	29	34	39	39	44	49
Head GK										
Flexible protection boots inner and outer diameter (material PN 100 and PN 200)										
Head II	D	63	63	100	120	150	185	260	300	300
	E	105	105	140	180	210	245	320	360	360
Head	D	38	38	63	75	110	130	150	200	245
I-III-IV-GK	E	75	75	105	125	150	185	210	260	295

( ) value in brackets for configuration with Ku spindle

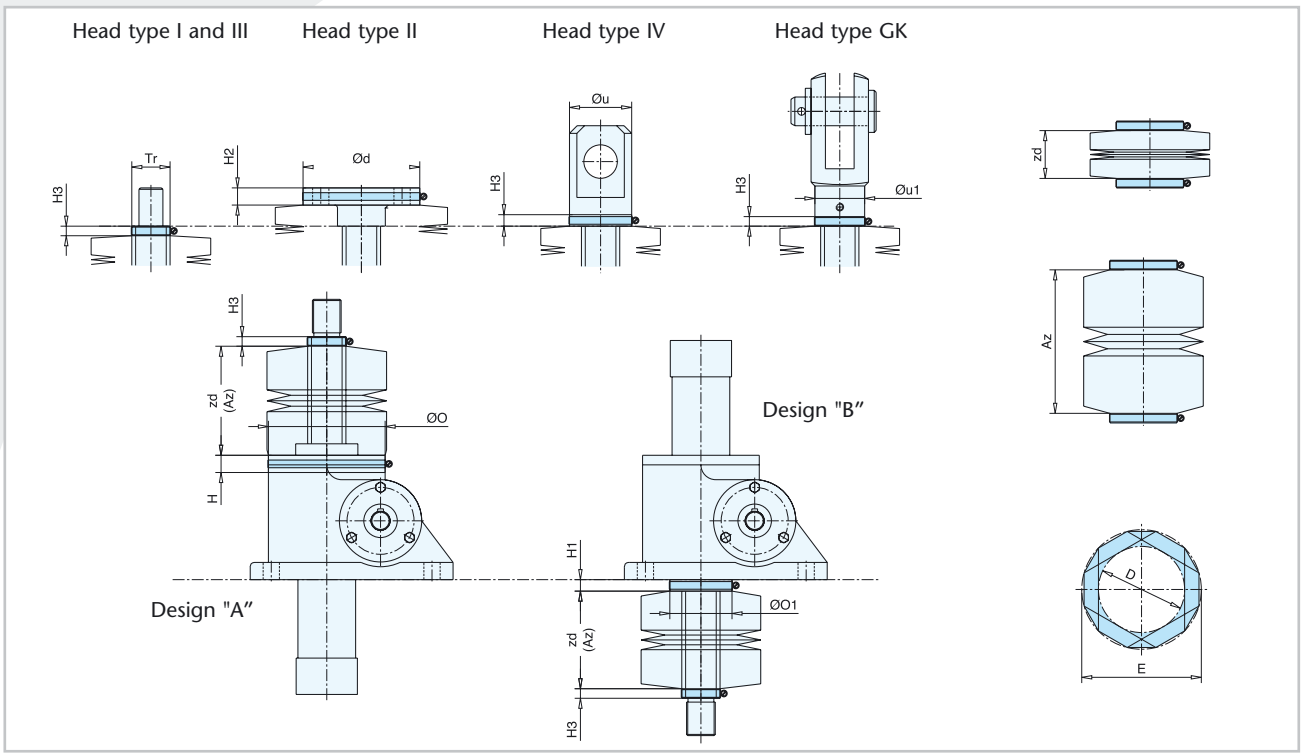
SHG		G15	G25	G50	G90
Housing connection:					
Housing	ØT	39	100	60	90
	H	12	12	15	15
Spindle head					
Head II	Ød	90	98	110	170
	H2	12	12	15	25
Head I/III	ØTr	24	35	40	60
	(ØKu)	(25)	-	(40/32)	(63)
Head IV-	Øu	-	50	65	80
Head GK	Øu1	34	-	52	-
	H3	12	12	15	15
Minimum Zd_{min} with H configuration					
Head II		-	33	-	-
Head I / II		-	3	-	-
Head IV		-	15	-	-
Minimum Zd_{min} with F configuration					
Head II		16	43	19	32
Head I / II		0	13	0	0
Head IV		-	25	4	7
Head GK		5	-	4	-
Flexible protection boots inner and outer diameter (Material PN 100 und PN 200)					
Head II	D	100	120	120	185
	E	140	180	180	245
Head	D	63	75	110	110
I-III-IV-GK	E	105	125	150	150

( ) value in brackets for configuration with Ku spindle



5.2 Dimensions, configuration type 1

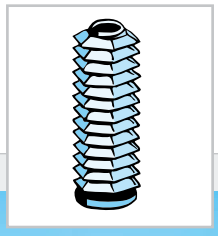
5.2.3 SHE range, design A and B, all mounting positions



SHE		0,5	1	2	2,5	5	10	15	20	25	35	50	75	100	150	200*
Housing connection design A																
Housing	ØO	65	60	98	98	122	150	150	185	205	260	170	250	240	300	
	H			12					15						20	
Housing connection design B																
Housing	ØO1	36	60	48	48	65	80	80	100	130	150	170	250	240	300	
	H1					12						15			20	
Spindle head																
Head II	Ød	65	72	98	98	122	150	150	185	205	260	300	200	200	220	
	H2	12	12	12	12	18	20	20	25	25	25	30	30	30	30	
Head I/III	ØTr	18	22	26	30	40	58	58	65	90	100	120	140	160	190	
Head IV	Øu	30	40	48	50	65	90	90	110	130	150	170	200	220	260	
	H3			12					15						20	
Minimum Zd_{min} design A																
Head II		24	33	42	42	45	60	60	66	75	80	70	20	25	30	
Head I/III		4	8	12	12	11	15	15	11	22	15	10	0	5	10	
Head IV		20	20	24	24	24	30	30	26	37	30	25	20	25	30	
Minimum Zd_{min} design B																
Head II		12	30	30	30	39	48	48	54	63	68	70	20	20	30	
Head I/III		0	5	0	0	0	3	3	0	10	3	10	0	0	10	
Head IV		8	17	12	12	12	18	18	14	25	18	25	20	20	30	
Flexible protection boot dimensions (material PN 100 and PN 200)																
Head II	D	63	75	100	100	120	150	150	185	200	260	300	300	300	310	
	E	105	125	140	140	180	210	210	245	260	320	360	360	360	370	
Head I-III-IV	D	38	45	63	63	75	110	110	130	150	150	200	245	245	280	
	E	75	85	105	105	125	150	150	185	210	210	260	295	295	340	

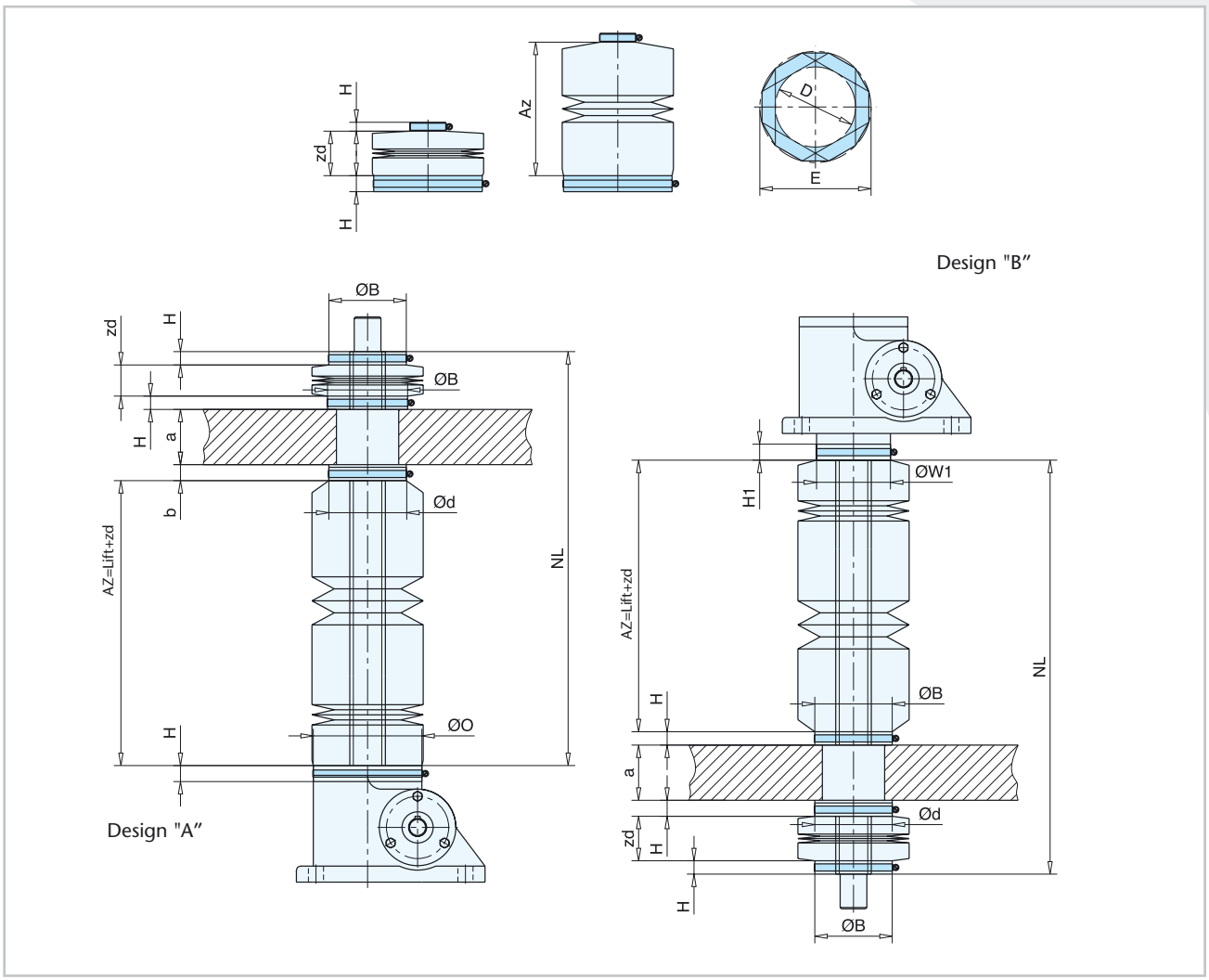
* Flexible protection boots for SHE 200 on request

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



5.3 Dimensions, configuration type 2

5.3.1 SHE range, design A and B, all mounting positions

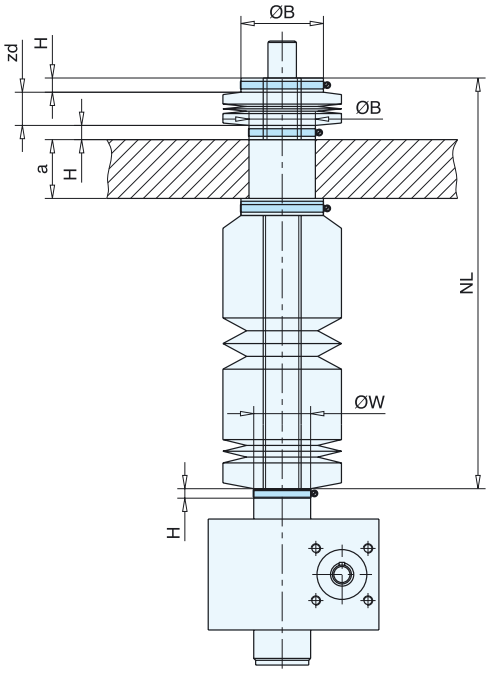


SHE	0,5	1	2	2,5	5	10	15	20	25	35	50	75*	100	150	200*
Connecting dimensions: Housing design A															
ØO	65	60	98	98	122	150	150	185	205	260	170		240	300	
H	12	12	12	12	12	15	15	15	15	15	15		20	20	
Connecting dimensions: Housing design B															
ØW1	45	60	60	68	83	110	110	140	160	180	210		280	340	
H1	12	12	12	12	12	15	15	15	15	15	20		20	20	
Travelling nut connection															
Ød	50	65	76	80	87	110	110	120	155	190	225		260	300	
b	12	12	12	12	12	15	15	15	15	15	20		20	20	
Onsite connection															
ØB	50	65	80	80	87	110	110	120	155	190	225		260	300	
H	12	15	15	15	15	15	15	15	15	15	25		20	20	
Flexible protection boot dimensions (material PN 100 and PN 200)															
ØD	38	38	63	63	75	110	110	130	150	150	200		245	280	
ØE	75	75	105	105	125	150	150	185	210	210	260		295	360	

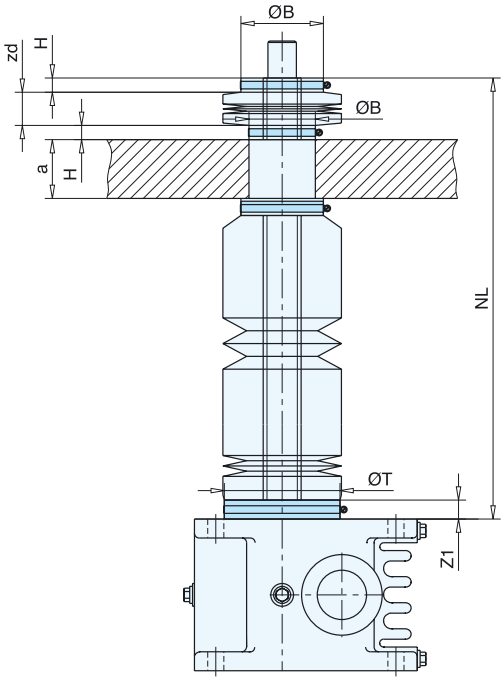
* Dimensions on request

5.3 Dimensions, configuration type 2

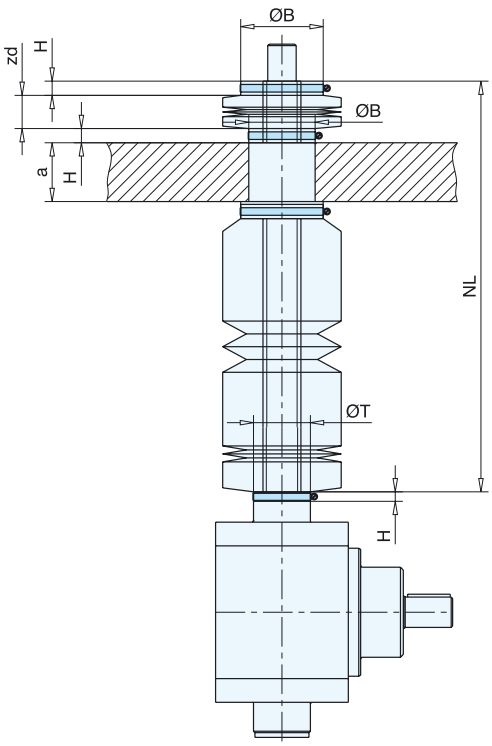
5.3.2 MERKUR M, HSE and SHG range



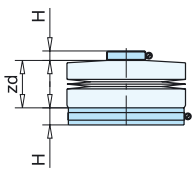
Merkur

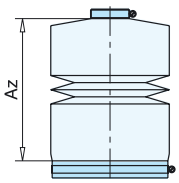


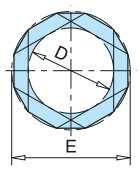
HSE



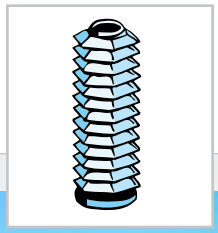
SHG







Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



5.3 Dimensions, configuration type 2

5.3.2.1 Merkur M range

Merkur	M0	M1	M2	M3	M4	M5	M6	M7	M8
Connecting dimensions: Housing									
ØW	26	30	39	46	60	85	120	145	170
H	12	12	12	12	12	12	15	15	15
Travelling nut connection									
Ød	50	50	65	80	87	110	155	190	225
b	12	12	12	15	18	25	25	25	25
Onsite connection									
ØB	50	50	65	80	87	110	155	190	225
H	12	12	15	15	15	15	25	25	25
Flexible protection boot dimensions (material PN 100 and PN 200)									
D	38	38	38	63	75	110	150	150	200
E	75	75	75	105	125	150	210	210	260

5.3.2.2 HSE range

HSE	31	36	50	63	80	100	125	140	200
Connecting dimensions: Housing									
ØT	62	72	92	122	152	182	222	262	352
Z1	15	16	18	20	25	25	25	25	25
Travelling nut connection									
Øy	50	65	87	105	110	120	190	225	260
H	12	15	18	18	15	15	15	25	25
Onsite connection									
ØB	50	65	87	105	110	120	190	225	260
H	12	15	15	15	15	15	15	25	25
Flexible protection boot dimensions (material PN 100 and PN 200)									
D	38	38	75	110	110	130	150	200	245
E	75	75	125	150	150	185	210	260	294

5.3.2.3 SHG range

SHG	G15	G25	G50	G90
Connecting dimensions: Housing				
ØT	39	100	60	90
H	12	12	15	15
Travelling nut connection				
Ød	65	87	87	120
b	12	15	15	15
Onsite connection				
ØB	65	87	87	120
H	12	15	15	15
Flexible protection boot dimensions (material PN 100 and PN 200)				
D	63	75	75	130
E	105	125	125	185

Note:
Construction dimension NL can be calculated by the adding up the individual dimensions.

5.4 FS Telescopic spring steel protection devices

The use of "FS" spring-steel spirals is recommended in extreme operating conditions (e.g. flying swarf, welding sparks).

5.4.1 General points

Material:

Spring-steel spirals can be supplied in blue-polished steel (standard) or stainless steel.

Fitting:

Can be fitted in any location (see illustration)

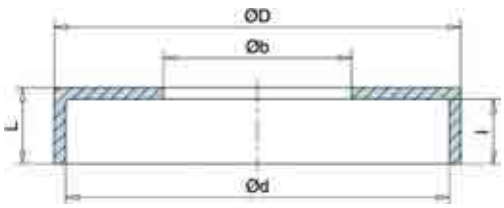
Note:

FS spirals are self-cleaning when installed in a vertical position (with large diameter pointing upwards). FS spirals should however still be cleaned at regular intervals and treated with special wet-spray oil

5.4.2 Configuration

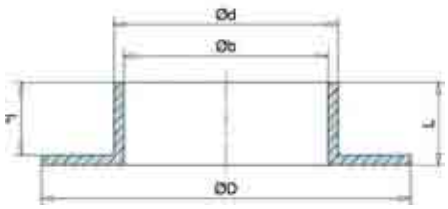
Details of the correct dimensions for FS spirals, along with those of the required centering and guide flanges (ZF – FF,) can be obtained on request.

5



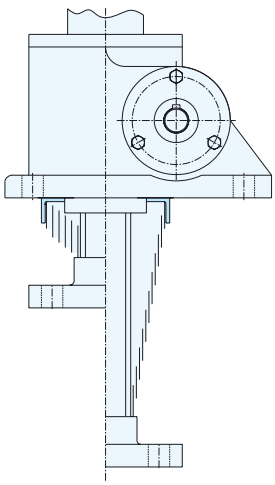
ZF __-__-__-__-__-__-

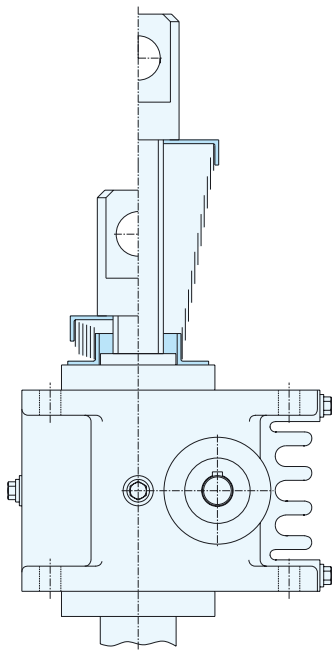
Order code ZF:D – L – d – l – b - material



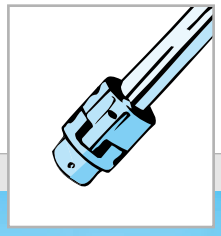
FF __-__-__-__-__-__-

Order code FF:D – L – d – l – b - material

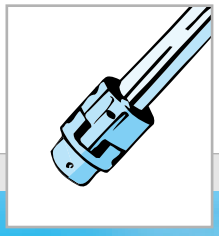




Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



Contents



6.1 Flexible couplings

The impact- and vibration-absorbing effect of flexible couplings helps protect the screw-jack elements and mitre gear boxes, along with the motors.

6.1.1 R range

They also even out small, angular, radial and axial shaft displacements – which makes them preferable to rigid couplings or shaft couplings.

6.1.1.1 Technical information

Size R	Rated torque T_N [Nm] 92° Shore	95° Shore	98° Shore	Max. angle displacement [°]	Torsional angle T_N	Max. axial movement [mm]	Max. radial movement [mm]	Mass inertia moments[1] J [kgm²]	Material[2]	Weight[3] (kg) Layout a/a	b/b
14	7		12	1,2°	6,4°	1,0	0,17	$5{,}60 \times 10^{-6}$	Al-H	0,14	0,14
19/24	10		17	1,2°		1,2	0,20	$1{,}03 \times 10^{-6}$	Alu	0,32	0,36
24/28	35		60	0,9°	3,2°	1,4	0,22	$4{,}30 \times 10^{-4}$	or	0,60	0,72
28/38	95		160	0,9°		1,5	0,25	$9{,}80 \times 10^{-4}$	St	0,97	1,33
38/45	190		325	1,0°		1,8	0,28	$96{,}5 \times 10^{-4}$		2,08	2,46
42/55	265		450	1,0°		2,0	0,32	$0{,}35 \times 10^{-2}$		3,21	3,93
48/60	310		525	1,1°		2,1	0,36	$1{,}06 \times 10^{-2}$	Alu	4,41	5,19
55/70	375		625	1,1°	3,2°	2,2	0,38	$2{,}03 \times 10^{-2}$	or	6,64	8,10
65/75	425	940	-	1,2°		2,6	0,42	$3{,}80 \times 10^{-2}$	St	10,13	11,65
75/90	975	1465	-	1,2°		3,0	0,48	$8{,}20 \times 10^{-2}$		16,03	19,43
90/100	2400	3600	-	1,2°		3,4	0,50	$23{,}8 \times 10^{-2}$		27,50	31,70

Color coding

Various crown gears:

92°	Shore	yellow
95/98°	Shore	red

Operating temperature:

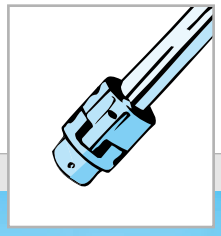
–40 to 90°C
(up to 120° for brief periods)

Design:

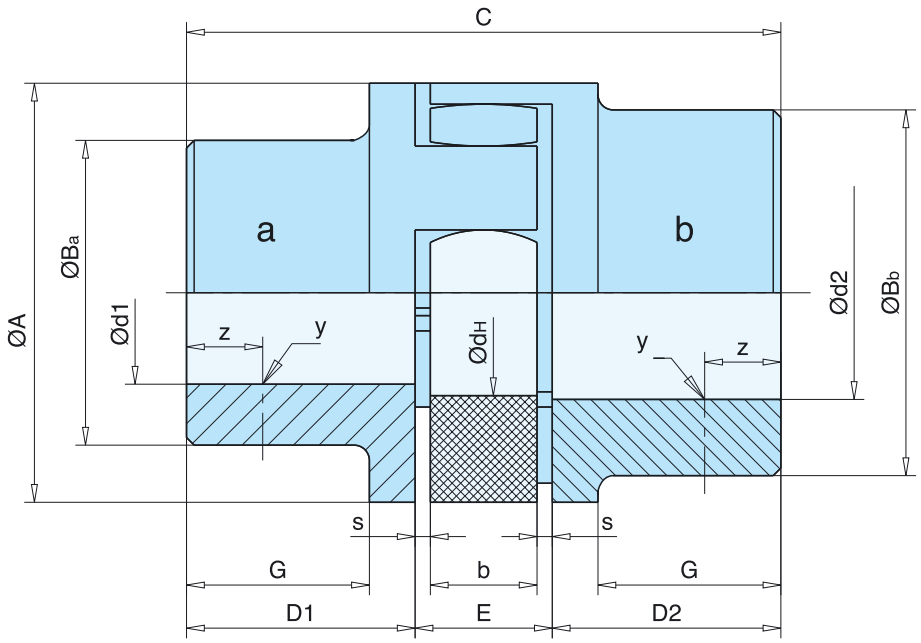
The rated torque (T_N) of the couplings – with impact factor S[4]) taken into account – must be at least equal to the system torque (T_{Anl}·) to be transferred

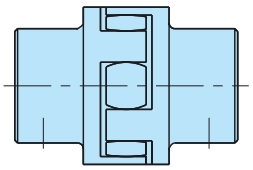
$$T_N \geq T_{ANL} * S$$

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

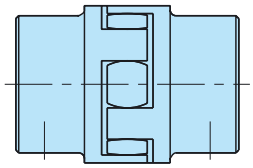


6.1.1.2 Dimension plan





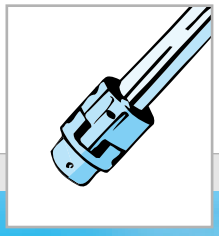
Design « aa »



Design « bb »

Size R	Ready-drilled holes ØdH7[5] Hub a Ød1 min	Hub a Ød1 max	Hub b Ød2 min	Hub b Ød2 max	ØA	ØBa	ØBb	C	D1[6] and D2[6]	E	s	b	G	ØdH	y	z
14	-	-	6	14	30	30	-	35	11	13	1,5	10	-	10	M4	~5
19/24	6	19	6	24	40	32	40	66	25	16	2	12	20	18	M5	10
24/28	8	24	8	28	55	40	48	78	30	18	2	14	24	27	M5	10
28/38	10	28	10	38	65	48	65	90	35	20	2,5	15	28	30	M6	15
38/45	12	38	38	45	80	66	77	114	45	24	3	18	37	38	M8	15
42/55	14	42	42	55	95	75	94	126	50	26	3	20	40	46	M8	20
48/60	15	48	48	60	105	85	102	140	56	28	3,5	21	45	51	M8	20
55/70	20	55	55	70	120	98	120	160	65	30	4	22	52	60	M10	20
65/75	22	65	65	75	135	115	135	185	75	35	4,5	26	61	68	M10	20
75/90	30	75	75	90	160	135	160	210	85	40	5	30	69	80	M10	25
90/100	40	90	90	100	200	160	180	245	100	45	5,5	34	81	100	M12	25

1) Values for steel hubs b-b und max. ready-drilled hole without grooves.
This value is reduced by an approximate factor of 3 for ALU
2) A cloupling in material GG or St should be selected for use with hardened drive-shafts.
(Sizes R19/24 – R48/60 also in stainless steel 1.4571)
3) Weight for gray cast iron material, approx. 60% lower in the case of aluminium
4) Impact coefficient S = 2 for use with three-phase motors
5) Feather key grooves are configured to DIN 6885/1 standards
6) Special hub length available on request



6.2 Flexible overload coupling (safety coupling)

Flexible overload coupling limit the drive torque (lifting force) of the jacking system, thus protecting the mechanism from overloads and malfunctions in the event of the drive system becoming blocked.

6.2.1 MKR range

Torque is transferred via wear-resistant, oil-proof and temperature-protected friction linings, which are held in place by means of disc springs. **MKR** (R = friction linings). Friction linings are also available in rust-free configuration for outdoor use.

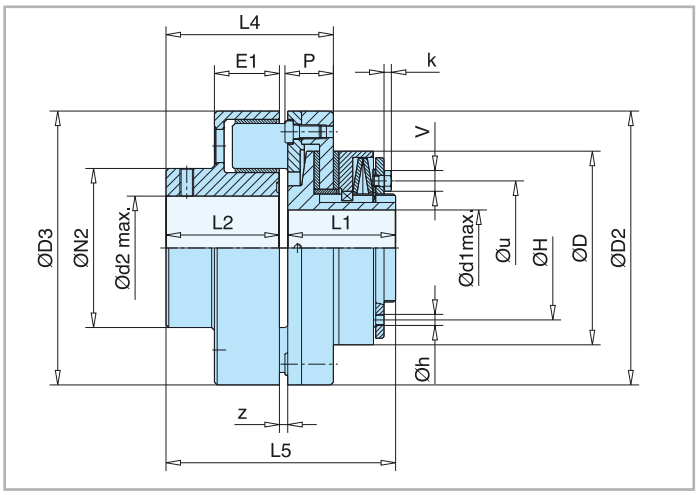
6.2.1.1 Technical information

Size	Torque limit for overload Type MKR 1 [Nm]	Type MKR 2 [Nm]	Turning speed n max [min^{-1}]	Weight pre-drilled [kg]
0	2- 10	10- 20	7000	1,3
01	6- 30	30- 60	6500	3,0
1	14- 70	70- 130	5600	3,2
2	26- 130	130- 250	4300	6,5
3	50- 250	250- 550	3300	10,1
4	110- 550	550- 1100	2700	19,5
5	140- 700	700- 1400	2200	23,4

Design:

The controlling torque of the overload coupling is factory-adjusted, with reference to starting torque T_A to 1.4 times the torque to be transferred (TN).

6.2.1.2 Dimension plan



Size	ØD	ØD3	ØD2	Ød1$_{min}$	Ød1$_{max}$	Ød2$_{min}$	Ød2$_{max}$	E1	G	H
0	45	80	80	7	20[1)]	11	30	23	M4	37
01	58	105	105	12	22	11	42	32	[2)]	46
1	68	105	105	12	25	11	42	32	[2)]	50
2	88	135	135	15	35	13	60	36	[3)]	67
3	115	160	160	19	45	25	60	38	[4)]	84
4	140	198	198	25	55	30	75	47	M8	104
5	170	198	198	30	65	50	75	47	M8	125

Size	Øh	k	L1	L5	L4	P	L2	ØN2	z	Øu	v
0	3	[5)]	33	66	52	18	30	50$_{h11}$	4	37	2[5)]
01	5	0,3[5)]	45	91	68	22	42	65$_{h11}$	4	46	2,5[5)]
1	5	1,3[5)]	52	98	69	23	42	65$_{h11}$	4	50	3[5)]
2	6	3	57	116	86	27	55	85$_{h11}$	4	67	10
3	6	5,5	68	128	91	31	55	90	6	84	13
4	7	5,5	78	165	122	35	82	115	6	97	13
5	8	5,5	92	179	127	40	82	115	6	109	13

1) up to Ø19 groove according to DIN 6885-1, over Ø19 groove according to DIN 6885-3

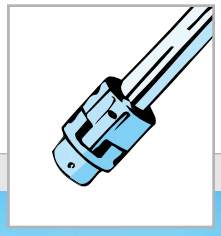
2) up to Ø12 -M4, over Ø12 up to Ø17 -M5, over Ø17 –M6

3) up to Ø17 -M5, over Ø17 –M6

4) up to Ø22 –M6, over Ø22 –M8

5) Countersunk screw with hexagon socket DIN 7991

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



6.2.2 MKD and MKG range with electrical shutoff

The use of sliding/static friction-free construction means that slipping moment remains virtually constant throughout the service life of the unit. If an overload occurs, the transmission limit switch activates to shut down the system, thus avoiding mechanical wear on the safety clutch.

The safety coupling with electrical shutoff is available with the configurations **MKD** (D = ratchet configuration) and **MKG** (G = locked configuration).

6.2.2.1 Technical information

- The ratchet coupling **MKD** locks in the event of an overload, pushing out the switching rod. During the locking procedure, the torque is considerably less than the pre-adjusted torque limit. The system re-engages automatically.
- The locked coupling **MKG** is mechanically locked so that the switching rod is activated in the event of an overload, thus bringing about an obligatory electrical shutdown. This constructive blocking produces a mechanical limit and an increase in torque. The system re-engages automatically.

Size	Torque limit for overload coupling [Nm]						Turning speed nmax n_{max} [min^{-1}]				Weight [kg]
	MKD 1	MKD 2	MKD 3	MKG 1	MKG 2	MKG 3	MKD 1/2	MKD 3	MKG 1/2	MKG 3	
0	2,5- 5	5-10	10-20	5-10	10-20	20-40	4300	2150	6500	4300	1,5
1	6- 12	12-25	25-50	12-25	25-50	50-100	2880	1440	4300	2880	3,8
2	12-25	25-50	50-100	25-50	50-100	100-200	2360	1180	3580	2360	4,8
3	25-50	50-100	100-200	50-100	100-200	200-400	2000	1000	3000	2000	9,2
4	50-100	100-200	200-400	100-200	200-400	400-800	1660	830	2500	1660	14,8
5	87-175	175-350	350-700	175-350	350-700	700-1400	1360	680	2050	1360	27

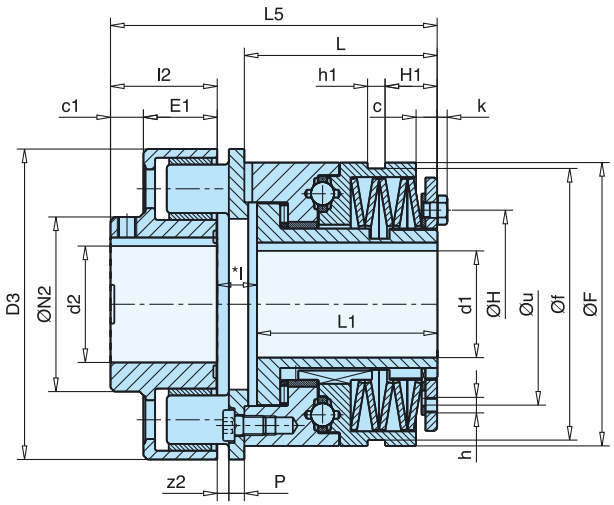
Limit switch in light-alloy housing:

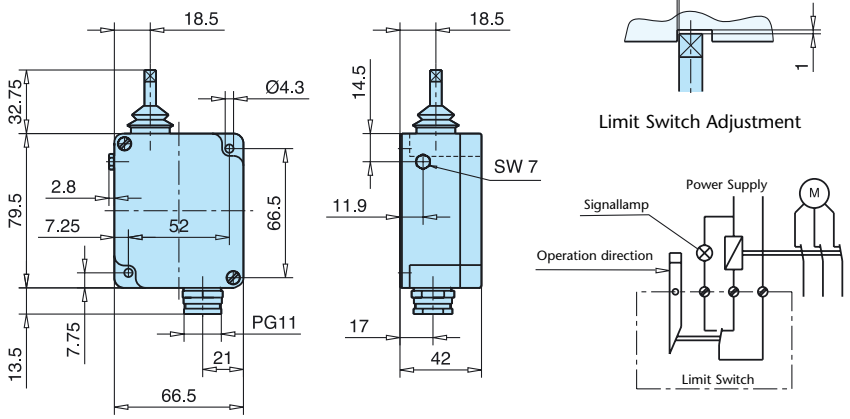
Contact load:	250 V~/15 A
	25 V / 6 A
Protection rating:	IP 54
Temperature range:	-10°C jusqu'à +85°C

Design:
The controlling torque of the safety overload coupling is factory-adjusted, with reference to starting torque T_A to 1.4 times the torque to be transferred (TN).

6.2 Flexible overload coupling (safety coupling)

6.2.2.2 Dimension plan



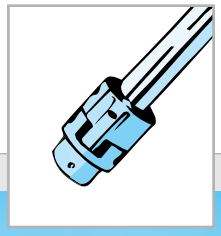


Size	Ød1$_{min}$	Ød1$_{max}$	d2$_{min}$	d2$_{max}$	ØD$_3$	c	C$_1$	E1	ØF	Øf	ØH	H1	Øh
0	8	20 [1]	11	30	80	5,5	7	23	55	50	37	7,5	3
1	11	25 [2]	11	42	105	7	10	32	82	72	50	12	5
2	15	35	11	42	105	7	10	32	100	90	67	14	6
3	19	45	13	60	135	10	19	36	120	112	84	21	6
4	25	55	25	60	160	11	17	38	146	140	97	27	7
5	30	65	30	75	198	12	35	47	176	170	109	33	8

Size	h1	k	L	L5	l	l2	ØN2	P	u	v	z2	Switching-rod lift in the event of an overload [mm]	
												MKD	MKG
0	9	-	34,5	89,5	25	30	50	17	37	2[3]	4	1,4	1,5
1	9	1,3[3]	48	116	26	42	65	18	50	3[3]	4	2,3	2
2	9	3	56	125	27	42	65	18	67	10	4	2,6	2,5
3	9	5,5	73	159	31	55	85	22	84	13	4	2,6	2,5
4	9	5,5	93	168,5	20,5	55	90	8	104	13	6	3,7	3
5	9	5,5	107	211,5	22,5	82	115	10	125	13	6	4,6	4

[1] Over Ø16 groove according to DIN 6885-3 [2] Over Ø22 groove according to DIN 6885-3 [3] Countersunk screw with hexagon socket DIN 7991

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



6.3 High flexible shafts

High flexible shafts are used to link individual drive-system elements to the centrally-driven jacking system as a whole. They dampen vibrations and impacts, even out axial, radial and angular displacements and can be used at up to critical speed without pillow blocks (see speed-length diagram).
The fitting of pillow blocks allows the shaft-length (L) to be doubled or further multiplied, although a limit of 6 m is imposed with single-component configuration due to the standard lengths of tube normally available.
Four different configurations are available for various speed ranges and requirements

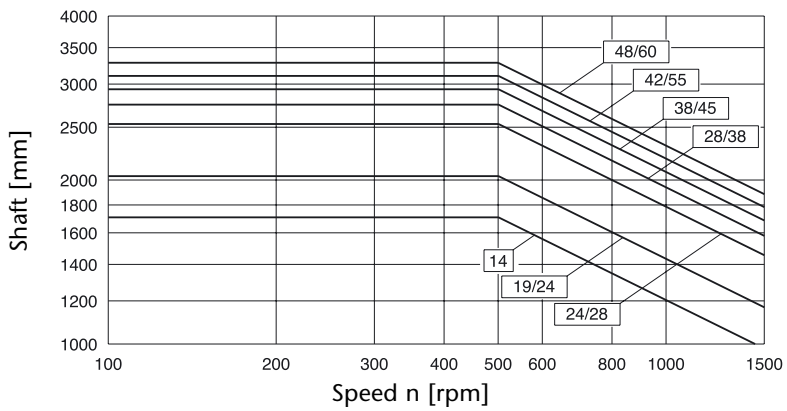
6.3.1 ZR range

6.3.1.1 Technical information

Size ZR	Rated torque T_N [1)] [Nm]	Locking screw Starting torque T[Nm]	Locking screw M1	Axial displacement [mm]	Max. angle displacement	Mass moments of inertia [kgm²] for 2 hubs	Mass moments of inertia [kgm²] for 1m tube length	Weight [kg] for 2 hubs	Weight [kg] for 1 m tube length	In this case suitable pillow blocks
14	6	1,3	M3	1,0	0,9°	$0,1317x10^{-4}$	$0,218x10^{-4}$	0,1	0,6	–
19/24	24	10	M6	1,2	0,9°	$0,8278x10^{-4}$	$0,932x10^{-4}$	0,3	1,3	SN 505
24/28	30	10	M6	1,4	0,9°	$8,830x10^{-4}$	$4,414x10^{-4}$	1,5	2,0	SN 507
28/38	70	25	M8	1,5	0,9°	$20,05x10^{-4}$	$7,431x10^{-4}$	2,7	3,1	SN 508
38/45	130	49	M10	1,8	1,0°	$20,15x10^{-4}$	$11,59x10^{-4}$	3,0	3,6	SN 509
42/55	150	49	M10	2,0	1,0°	$47,86x10^{-4}$	$17,07x10^{-4}$	5,0	4,1	SN 510
48/60	245	86	M12	2,1	1,1°	$74,68x10^{-4}$	$24,06x10^{-4}$	6,5	4,6	SN 511

[1)] These rated torque settings are suitable for operation with light impact. If impacts are heavy, an impact factor of 1.4 must be taken into account.

Speed-length diagram



Turning-speed range:
n= 1500 rpm

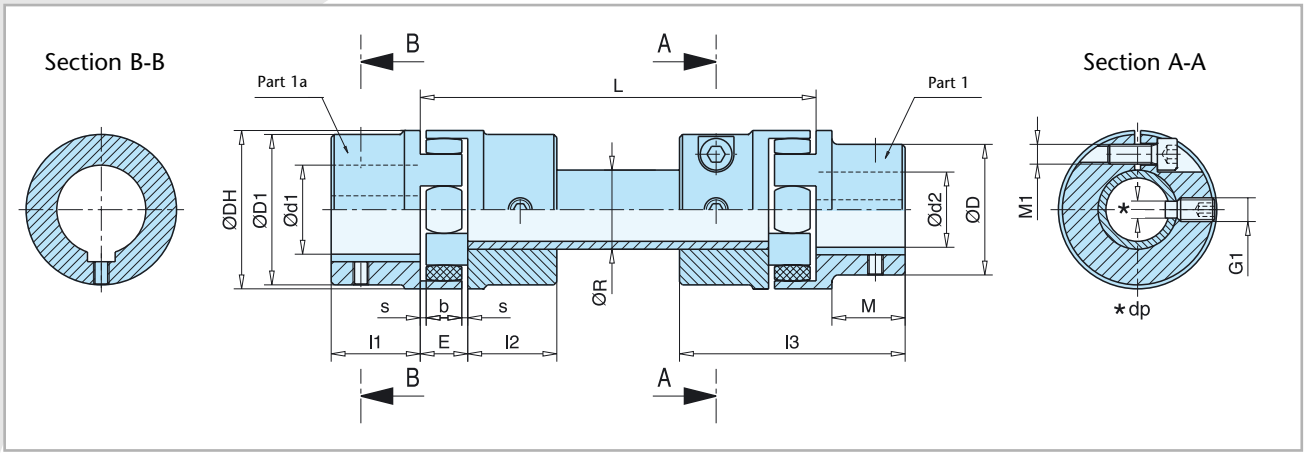
Operating temperature:
– 40 to 90°C
(up to 120° for brief periods)

Design:
The rated torque (T_N) of the ZR shaft – with **impact factor** S[1)] taken into account – must be at least equal to the system torque (T_{Anl}) to be transferred

$$T_N \geq T_{ANL} * S$$

6.3 High flexible shafts

6.3.1.2 Dimension plan



Size ZR	Ready-drilled holes ØdH7 [2] Part 1 min Ød2	Part 1 max Ød2	Part 1a min Ød1	Part 1a max Ød1	ØDH	ØD	ØD1	ØdH	l2	l1 M	s	b	E	l3	ØR	G1	dp
14	-	-	4	14	30	-	30	10,5	11	-	1,5	10	13	35	14x2	M4	2,5
19/24	6	19	19	24	40	32	41	18	25	20	2	12	16	66	20x3	M6	4
24/28	8	24	24	28	55	40	55	27	30	24	2	14	18	78	30x4	M8	5,5
28/38	10	28	28	38	65	48	65	30	35	28	2,5	15	20	90	35x5	M10	7
38/45	12	38	38	45	80	66	77	38	45	37	3	18	24	114	40x4	M12	8,5
42/55	28	42	42	55	95	75	94	46	50	40	3	20	26	126	45x4	M12	8,5
48/60	28	48	48	60	105	85	102	51	56	45	3,5	21	28	140	50x4	M16	12

[2] Feather key groove conforming to DIN 6885/1

6.3.2 G/GX/GZ range

6.3.2.1 Technical information

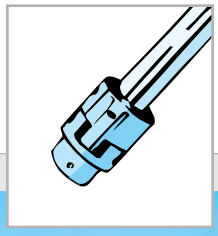
	G range	GX range	GZ range
Turning-speed range	n= 750 rpm	n= 1500 rpm	n= 3000 rpm
Operating temperature	-40 to 90°C (up to 120° for brief periods)	max. 150°C[3]	max. 80°C

Size	Rated torque T_N [Nm][1][3] range G	GX	GZ	Weight [kg] for 2 hubs	for 1m tube	Max. angle displacement G+GZ	GX	Mass moment of inertia [kgm²]	Suitable pillow blocks
1	10	10	10	1,0	1,1	3°	1°	0,00021	SN 507
2	20	30	20	2,2	1,4	3°	1°	0,00052	SN 509
4	40	60	40	3,4	1,6	3°	1°	0,00076	SN 510
8	80	120	80	7,3	2,2	3°	1°	0,00185	SN 513
16	160	240	160	12,4	2,5	3°	1°	0,00297	SN 516
25	250	370	250	19,1	3,1	3°	1°	0,00538	SN 519
30	400	550	400	31,1	4,8	3°	1°	0,0116	SN 522
50	600	-	600	32,1	4,8	3°	1°	0,0116	SN 522
90	900	-	900	58,7	7,6	3°	1°	0,0283	SN 528

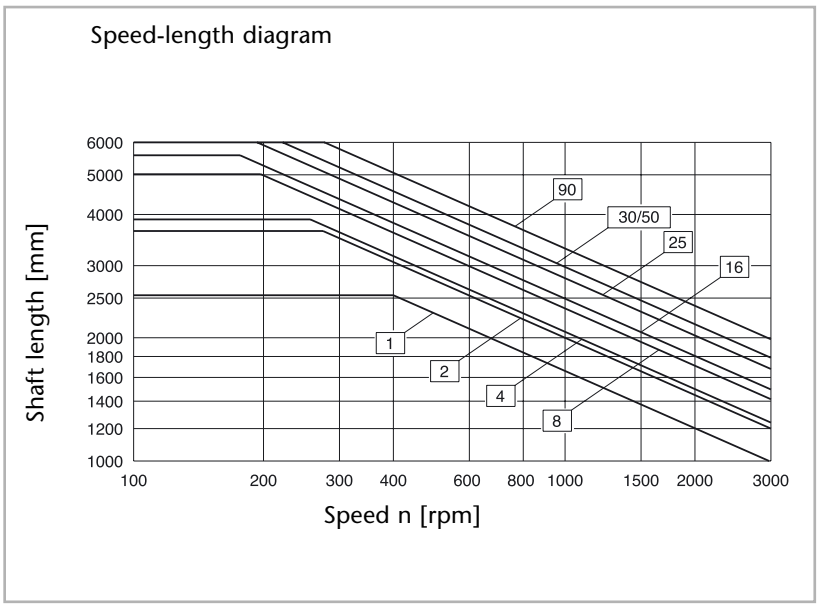
[1] These rated torque settings are suitable for operation with light impact. If impacts are heavy, an impact factor of 1.4 must be taken into account.

[2] From +80°C onwards, rated torque is considerably reduced. Please consult the supplier is this is the case.

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



6.3 High flexible shafts

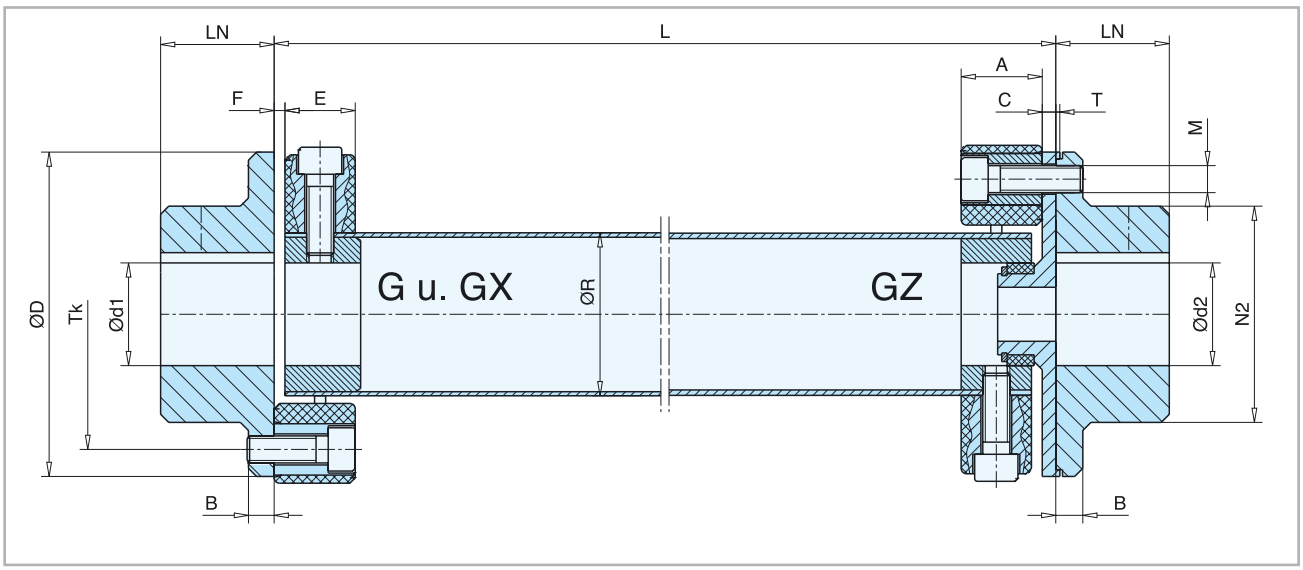


Design:

The rated torque (T_N) of the G/GX/GZ shaft – with impact factor S[1)] taken into acount – must be at least equal to the system torque ($T_{Anl.}$) to be transferred

$$T_N \geq T_{ANL} * S$$

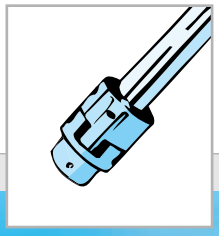
6.3.2.2 Dimension plan



Size	A	B	C	ØD	Pilot hole d	Ready-drilled hole ØH7 D_{max} [2)]	E	F	L_N	$ØN_2$	ØR	T	T_K/M
1	24	7	5	56	8	25	22	2	24	36	30	1,5	Ø44/2xM6
2	24	8	5	85	12	38	20	4	28	55	40	1,5	Ø68/2xM8
4	28	8	5	100	15	45	24	4	30	65	45	1,5	Ø80/3xM8
8	32	10	5	120	18	55	28	4	42	80	60	1,5	Ø100/3xM10
16	42	12	5	150	20	70	36	6	50	100	70	1,5	Ø125/3xM12
25	46	14	5	170	20	85	40	6	55	115	85	1,5	Ø140/3xM14
30	58	16	5	200	25	100	50	8	66	140	100	1,5	Ø165/3xM16
50	58	16	5	200	25	100	50	8	66	140	100	1,5	Ø165/3xM16
90	70	19	5	260	30	110	62	8	80	160	125	2,0	Ø215/3xM20

[1)] These rated torque settings are suitable for operation with light impact. If impacts are heavy, an impact factor of 1.4 must be taken into account.

[2)] Groove conforming to DIN 6885/1.



6.4 Order code

6.4.1 Couplings

1 - 2 - 3 - 4 / 5

■■■-■■/■■-■■■■-■■/■■

1) Range: R / MKR / MKD / MKG
2) Size
3) Torque (applies to MKR / MKD / MKG ranges only)
4) Hub drill-hole d1
5) Hub drill-hole d2

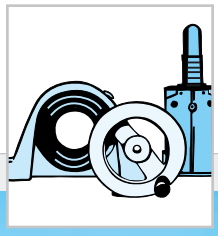
6.4.2 High flexible shafts

1 - 2 - 3 - 4 / 5

■■-■■/■■-■■■■-■■/■■

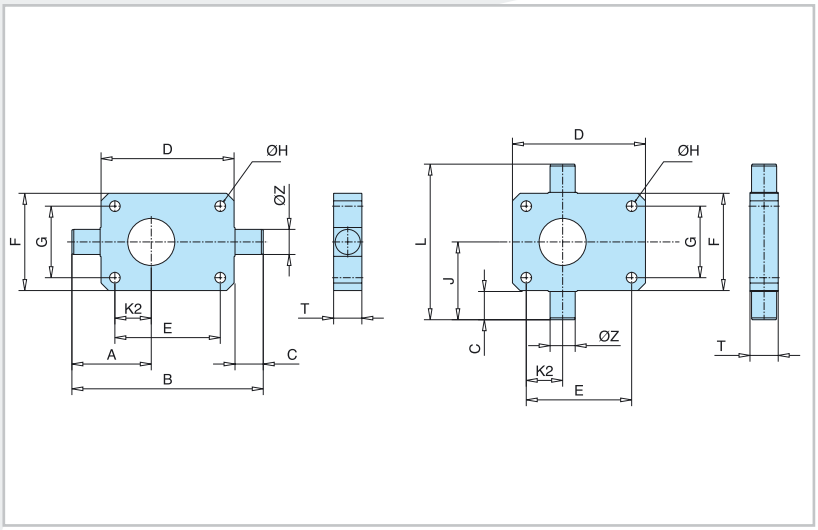
1) Range: G / GX / GZ / ZR
2) Size
3) Length
4) Hub drill-hole d1
5) Hub drill-hole d2

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de

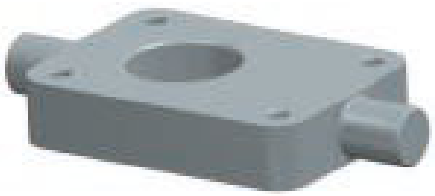


Contents

7.1 Swivel plates



In order to allow worm gear screw jacks to carry out swiveling and tipping movements, the drive elements must be secured at two points and permitted to move. This can be done using swivel plates and a head (IV) or coupling head. The moment of flexion resulting from the swiveling motion should be minimized as much as possible by means of low-friction articulations.



7.1.1 SHE range

Size	A	B	C	D	E	F	G	ØH	K2	T	ØZ	L	J
0,5	on request												
1	95,5	205	25	150	130	100	80	8,5	58	25	20	155	77,5
2	on request												
2,5	102,5	240	35	165	135	120	90	14	50	35	30	195	97,5
5	126,5	305	45	212	168	155	114	17	58	45	40	248	124
10	143,5	350	55	235	190	200	155	21	63,5	55	50	315	157,5
15	143,5	350	55	235	190	200	155	21	63,5	55	50	315	157,5
20	190	430	65	295	240	215	160	28	95	65	60	350	175
25	202,5	495	70	350	280	260	190	35	95	70	65	405	202,5
35 50 75 100 150	on request												

7.1.2 Merkur range

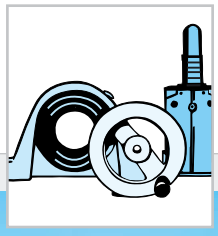
Size	A	B	C	D	E	F	G	ØH	K2	T	ØZ	L	J
0	32	80	10	60	48	50	38	6,6	16	15	10	70	35
1	46	110	15	80	60	72	52	9	21	20	15	102	51
2	60	140	20	100	78	85	63	9	29	25	20	125	62,5
3	74	170	20	130	106	105	81	11	42	30	25	145	72,5
4	108	240	30	180	150	145	115	13,5	63	40	35	205	102,5
5	118	270	35	200	166	165	131	22	66	50	45	235	117,5
6	145	330	45	240	190	220	170	33	75	80	70	310	155
7	185	410	60	290	230	250	190	39	95	90	80	370	185
8	230	520	80	360	290	300	230	45	115	100	90	460	230

7.1.3 HSE range

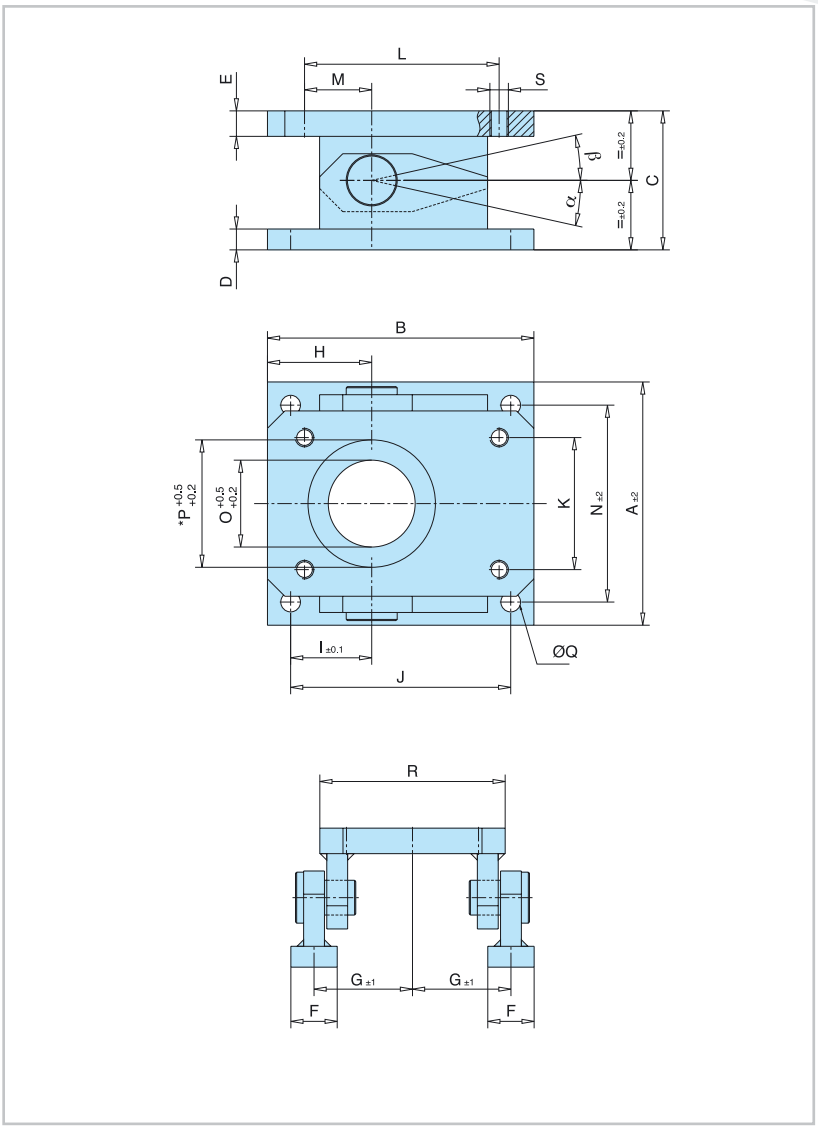
Size	A	B	C	D	E	F	G	ØH	K2	T	ØZ	L	J
31	on request												
36	80	190	25	138	110	105	80	9	40	25	20	157	78,5
50[1)]	105	250	35	175	140	130	100	13	50	35	30	205	102,5
63	140	330	45	235	190	160	120	17	70	45	40	255	127,5
80	160	390	55	275	220	200	150	21	75	55	50	315	157,5
100	185	465	65	330	270	230	175	28	87,5	65	60	365	182,5
125 140 200	on request												

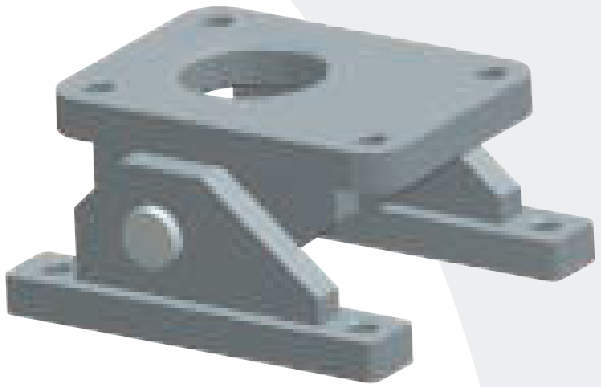
[1)] This size is not available for use in conjunction with an anti-turn device fitted to the screw jack.

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



7.2 Swivel mounting bases





In order to allow worm gear screw jacks to carry out swiveling and tipping movements, the drive elements must be secured at two points and permitted to move. This can be done using a drag bearing arrangement and a head (IV) or coupling head, or by means of a swivel-lug configuration. The lateral force resulting from the swiveling motion should be minimized as much as possible by means of low-friction articulations.

7

Only the most recent dimension plans are binding

Size	Dimension																				
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P*	ØQ	R	S	α°	β°
SHE 1		150									80	130	58		72	72					
HSE 31	140	138	60	10	10	20	60	54	40	110	62	85	31	120	62	62	9	108	M8	26	42
HSE 36		138									80	110	40		72	72					
SHE 2,5	180	170	110	16	20	40	70	65	50	140	90	135	50	140	60	70	14	130	M12	34	45
HSE 50											100	140	50		92	1)					
SHE 5	210	230	120	18	22	40	85	90	70	190	114	168	58	170	75	110	17	160	M16	28	40
HSE 63											120	190	70		122	122					
SHE 10	270	270	150	22	28	50	110	100	75	220	155	190	63,5	220	95	130	21	200	M18	28	45
HSE 80											150	220	75		152	152					
SHE 20	350	340	190	30	33	60	145	130	95	280	160	240	95	290	100	160	26	260	M24	30	45
HSE 100											175	270	87,5		182	182					

Swivel mounting bases for the Merkur range are available on request

*applies to anti-turn device only

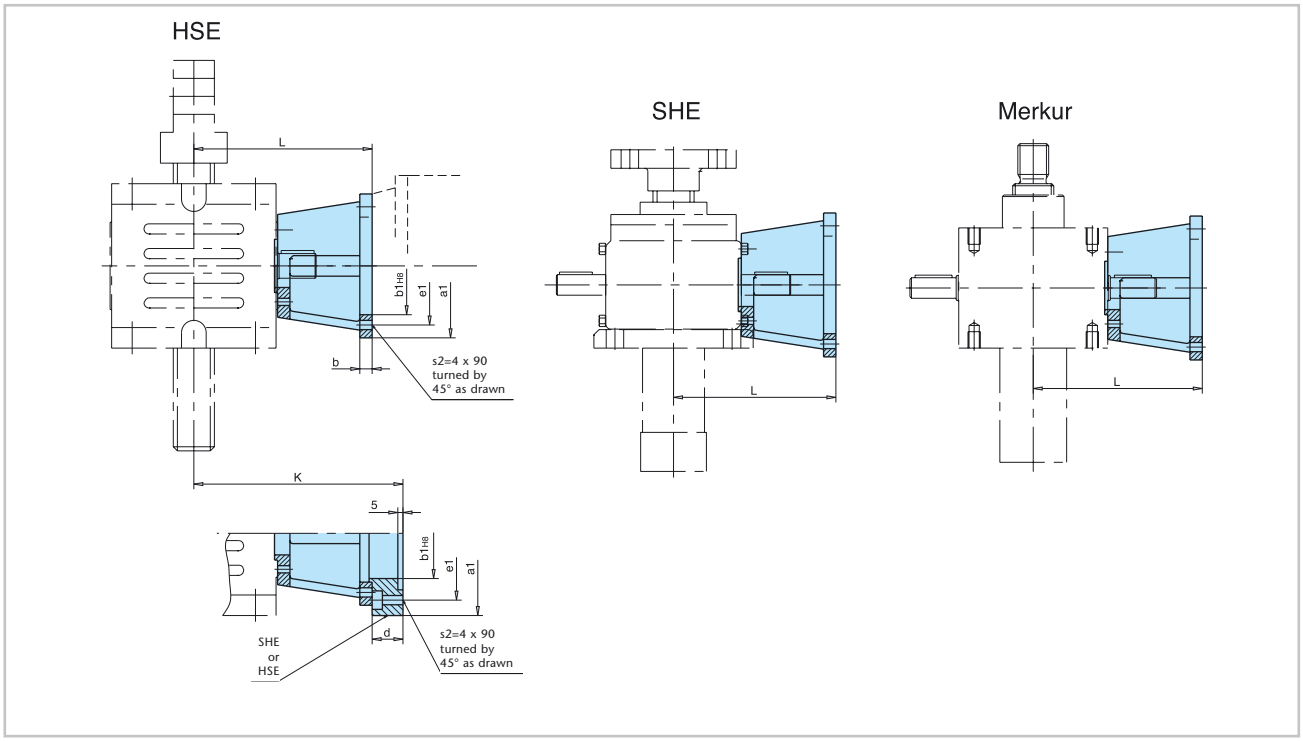
7.3 Motor mounting flanges

The various different operating circumstances of the worm gear screw jacks sometimes call for directly-installed motors. Motor installation can be carried out, with the aid of lantern gears and flexible couplings, provided the weight and dimensions of the two drive elements do not differ too much from each other. Cast mating flanges are available to provide a solution in this case.

If the drive motor is to be supplied and fitted onsite, please provide us with a dimensional drawing showing the connection points. The customer should also determine whether installation on the jacking element should be right- or left-handed (see section 3.9).

In order to simplify procedures, only the lantern gears most often required are shown below.

Please consult the supplier in the event of queries.

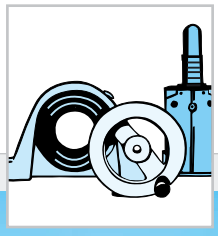


7.3.1 SHE range

Size	Motor type	Flange dimensions Øa1	Øb1	Øe1	Motor shaft	Coupling	Lantern-gear dimensions L	b	K	d	s2
2,5	71	120	80	100	Ø14x30	R19	130	10	-	-	4xØ7
2,5	80	120	80	100	Ø19x40	R19	140	20	-	-	4xØ7
2,5	90	120	80	100	Ø24x50	R19/24	150	30	-	-	4xØ7
2,5	SK 11 EF	120	80	100	Ø20x40	R19/24	140	20	-	-	4xØ7
2,5	SK 02 F	120	80	100	Ø20x40	R19/24	140	20	-	-	4xØ7
2,5	SK 12 F	120	80	100	Ø25x50	R19/24*	150	30	-	-	4xØ7

*-Steel hub

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



7.3 Motor mounting flanges

Size	Motor type	Flange dimensions Øa1	Øb1	Øe1	Motor shaft	Coupling	Lantern-gear dimensions L	b	K	d	s2
5	71	140	95	115	Ø14x30	R 24	168	12	-	-	4xØ9
5	80	140	95	115	Ø19x40	R 24	168	12	-	-	4xØ9
5	90	140	95	115	Ø24x50	R 24	168	12	-	-	4xØ9
5	SK 11 EF	140	95	115	Ø20x40	R 24	168	12	-	-	4xØ9
5	SK 02 F	140	95	115	Ø20x40	R 24	168	12	-	-	4xØ9
5	SK 12 F	140	95	115	Ø25x50	R 24*	168	12	-	-	4xØ9
10/15	80	140	95	115	Ø19x40	R 24/28	186	12	-	-	4xØ9
10/15	90	160	110	130	Ø24x50	R 28	-	-	216	30	4xØ9
10/15	100	160	110	130	Ø28x60	R 28	-	-	216	30	4xØ9
10/15	112	160	110	130	Ø28x60	R 28	-	-	216	30	4xØ9
10/15	SK 11 EF	140	95	115	Ø20x40	R 24/28	186	12	-	-	4xØ9
10/15	SK 02 F	140	95	115	Ø20x40	R 24/28	186	12	-	-	4xØ9
10/15	SK 12 F	160	110	130	Ø25x50	R 28	-	-	216	30	4xØ9
10/15	SK 21 EF	160	110	130	Ø25x50	R 28	-	-	216	30	4xØ9
20	80	160	110	130	Ø19x40	R 28	225	15	-	-	4xØ9
20	90	160	110	130	Ø24x50	R 28	225	15	-	-	4xØ9
20	100	160	110	130	Ø28x60	R 28	225	15	-	-	4xØ9
20	112	160	110	130	Ø28x60	R 28	225	15	-	-	4xØ9
20	SK 02 F	160	110	130	Ø20x40	R 28	225	15	-	-	4xØ9
20	SK 12 F	160	110	130	Ø25x50	R 28	225	15	-	-	4xØ9
20	SK 11 EF	160	110	130	Ø25x50	R 28	225	15	-	-	4xØ9

7.3.2 Merkur range

Dimension plans available on request

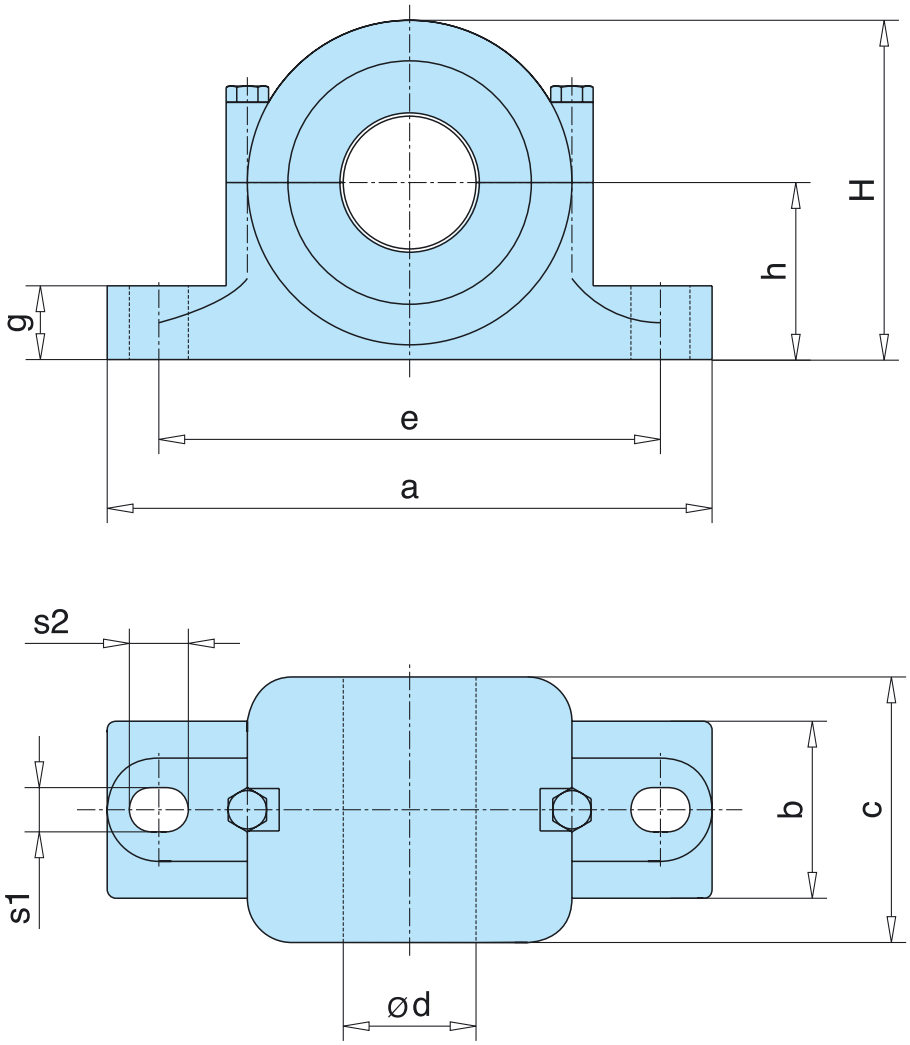
7.3.3 HSE range

Size	Motor type	Flange dimensions Øa1	Øb1	Øe1	Motor shaft	Coupling	Lantern-gear dimensions L	b	K	d	s2
50	63	120	80	100	Ø11x23	R 19	138,5	10	-	-	4xØ7
50	71	120	80	100	Ø14x30	R 19	138,5	10	-	-	4xØ7
50	80	120	80	100	Ø19x40	R 19	148,5	20	-	-	4xØ7
50	90	120	80	100	Ø24x50	R 19/24	158,5	30	-	-	4xØ7
50	SK 11 EF	120	80	100	Ø20x40	R 19/24	148,5	20	-	-	4xØ7
50	SK 02 F	120	80	100	Ø20x40	R 19/24	148,5	20	-	-	4xØ7
50	SK 12 F	120	80	100	Ø25x50	R 19/24*	158,5	30	-	-	4xØ7
63	71	140	95	115	Ø14x30	R 24	173,5	12	-	-	4xØ9
63	80	140	95	115	Ø19x40	R 24	173,5	12	-	-	4xØ9
63	90	140	95	115	Ø24x50	R 24	173,5	12	-	-	4xØ9
63	100	160	110	130	Ø28x60	R 24/28	-	-	203,5	30	4xØ9
63	SK 02 F	140	95	115	Ø20x40	R 24	173,5	12	-	-	4xØ9
63	SK 11 EF	140	95	115	Ø20x40	R 24	173,5	12	-	-	4xØ9
63	SK 12 F	140	95	115	Ø25x50	R 24/28	173,5	12	-	-	4xØ9
63	SK 21 EF	140	95	115	Ø25x50	R 24/28	173,5	12	-	-	4xØ9
80	80	160	110	130	Ø19x40	R 28/38	232	15	-	-	4xØ9
80	90	160	110	130	Ø24x50	R 28/38	232	15	-	-	4xØ9
80	100	160	110	130	Ø28x60	R 38	232	15	-	-	4xØ9
80	112	160	110	130	Ø28x60	R 38	232	15	-	-	4xØ9
80	SK 21 EF	160	110	130	Ø25x50	R 28/38	232	15	-	-	4xØ9
80	SK 12 F	160	110	130	Ø25x50	R 28/38	232	15	-	-	4xØ9
80	SK 22 F	160	110	130	Ø30x60	R 38	232	15	-	-	4xØ9
80	SK 31 EF	160	110	130	Ø30x60	R 38	232	15	-	-	4xØ9

*-Steel hub

Motor lantern gears and mounting flanges can also be supplied to order in special configurations.

7.4 Pillow blocks

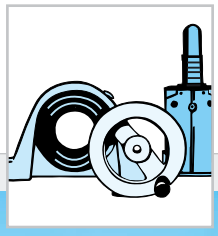


Size	Ød	H	h	e	S1	S2	c	a	b	g	Weight kg
SN 505	20	71	40	130	15	20	67	165	46	19	1,4
SN 506	25	87	50	150	15	20	77	185	52	22	1,9
SN 507	30	92	50	150	15	20	82	185	52	22	2,0
SN 508	35	106	60	170	15	20	85	205	60	25	2,7
SN 509	40	115	60	170	15	20	85	205	60	25	2,9
SN 510	45	112	60	170	15	20	90	205	60	26	2,8
SN 511	50	127	70	210	18	23	95	255	68	28	4,2
SN 512	55	133	70	210	18	23	105	255	70	30	4,9
SN 513	60	148	80	230	18	23	110	275	80	30	6,1
SN 515	65	154	80	230	18	23	115	280	80	30	6,8
SN 516	70	175	95	260	22	27	120	315	90	32	9,3
SN 517	75	181	95	260	22	27	125	320	90	32	9,7
SN 518	80	192	100	290	22	27	145	345	100	35	12,8
SN 520	90	215	112	320	26	32	160	380	110	40	17,0
SN 522	100	239	125	350	26	32	175	410	120	45	18,5
SN 524	110	271	140	350	26	32	185	410	120	45	24,5
SN 528	125	302	150	420	35	42	205	500	150	50	38,0

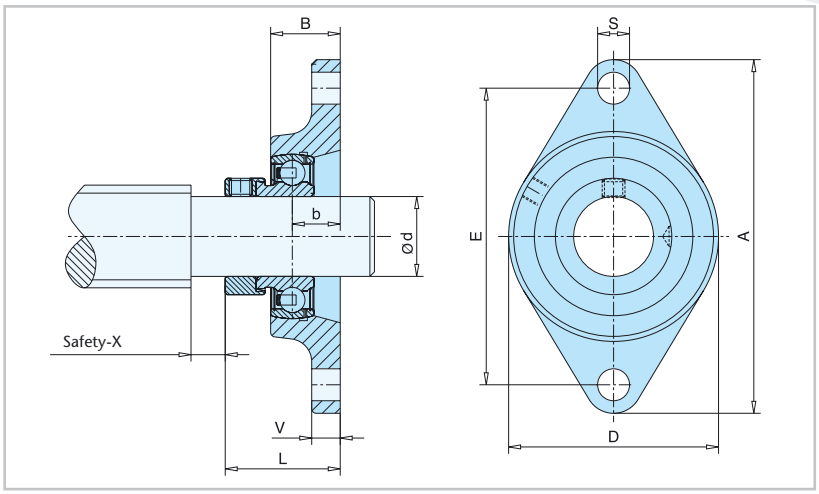
Pfaff-silberblau DIN 736-standard pillow block, complete with rolling bearing with flared hole and adapter sleeve. Housing with DIN 5419-standard two-sided felt gasket. This range of pillow blocks is particularly suitable for intermediate bearing support of high flexible shafts, as the adapter sleeve can be fixed to the outer diameter of the tube.
In order to avoid distortion when more than one pillow block is fitted, only one of these bearings should be configured as a fixed unit.

Ordering designation: SN___-__ (Standard= movable bearing ; F= fixed bearing)

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



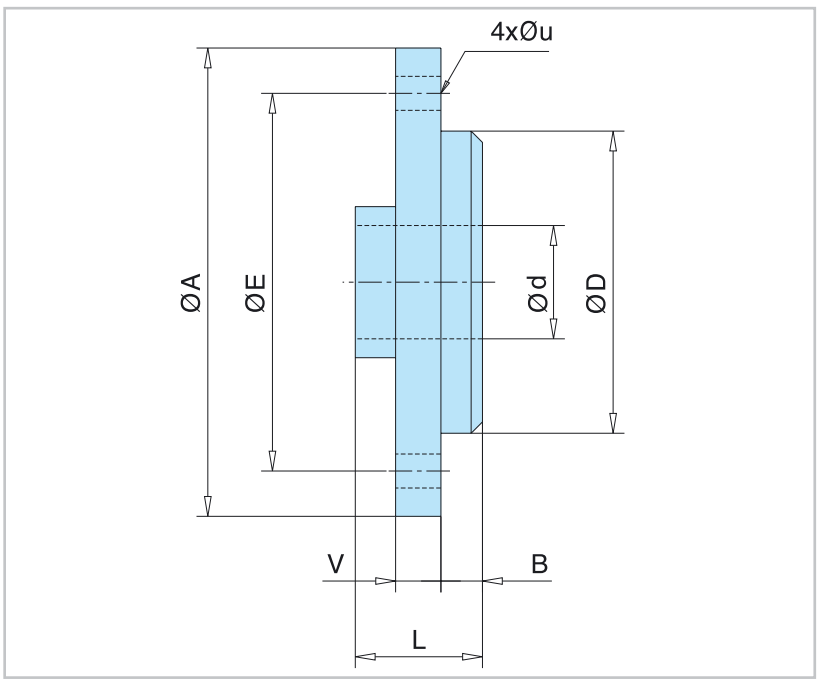
7.5 Flange bearings



Type	Weight	Dimensions in mm								
	kg	Ød	D	B	E	A	V	S	L	b
OWF 20 U	0,6	20	60,5	31,7	90,0,	112,0	10,0	11,5	38,3	20,0
OWF 25 U	0,95	25	70,0	33,3	99,0	124,0	11,0	11,5	39,7	20,0
OWF 30 U	1,1	30	80,0	35,0	117,0	141,5	12,0	11,5	44,0	21,8
OWF 35 U	1,6	35	92,0	37,3	130,0	155,5	12,5	13,5	46,9	21,5
OWF 40 U	2,1	40	105,0	43,0	144,0	171,5	13,0	13,5	54,0	23,8
OWF 45 U	2,6	45	105,0	43,0	148,5	179,5	13,0	13,5	54,0	23,8
OWF 50 U	3,0	50	111,0	47,5	157,0	189,0	16,0	13,5	61,2	28,6
OWF 60 U	3,5	60	140,0	54,0	202,0	238,0	16,0	18,0	74,7	35,0

7.5.1 OWF range

Ordering designation: OWF__



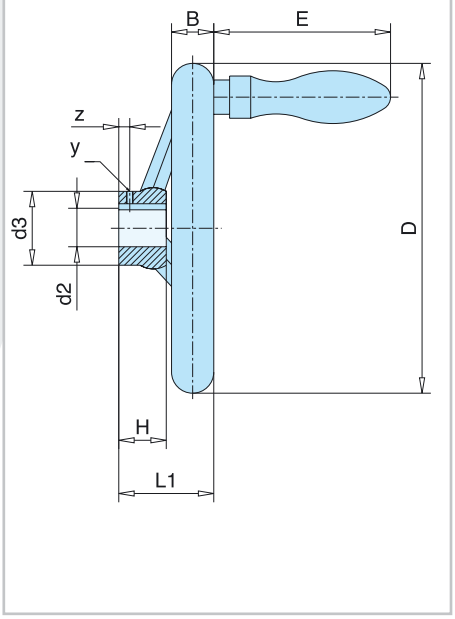
7.5.2 BFC range

The flange bearings in the BFC range are supplied with a centering shoulder to aid alignment onsite. The cylindrical shape of the items in this range also allows the sleeves of the spindle casing to be attached.

Ordering designation: BFC__

Type	Dimensions in mm							
	Ød	ØD h8	B	ØE	ØA	V	Øu	L
BFC 20	20	62	9	78	99	10	9	27,71
BFC 25	25	70	10	90	115	12	9	30,79
BFC 30	30	80	11	100	124	12	9	33,67
BFC 40	40	100	11	120	144	15	11	40,63
BFC 50	50	110	12,5	135	165	16	14	44,69

7.6 Hand wheel



Further designs upon request

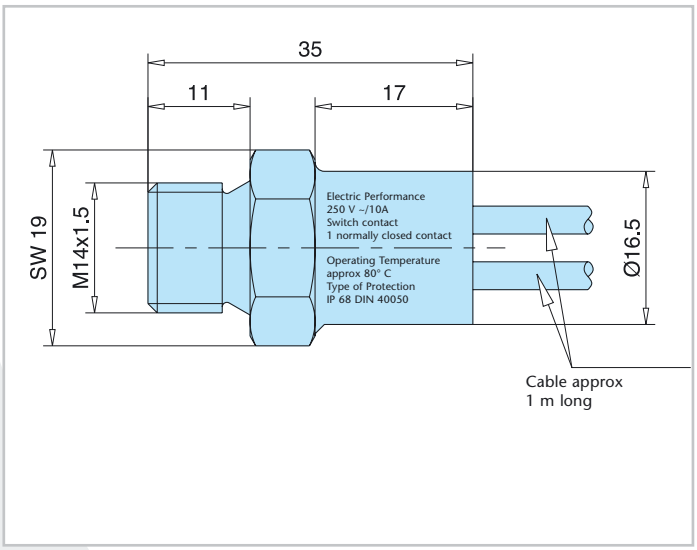
For emergency manual operation or manual adjustment of worm gear screw jacks.
Design: DIN 950-standard hand wheel with rotating knob (DIN 98), made of polished anodized aluminium
Ordering designation: Hand-wheel-____(indicate size, e.g.: HSE31)

Size	ØD	Ød2	Ød3	H	L1	B	L2	z	y
SHE 0,5 HSE 31 M 1	80	10	24	16	29	14	55	6	M 3
SHE 1 HSE 36 M 2	125	14	28	18	36	16	70	9	M 4
SHE 2,5 HSE 50 M 3	160	16	32	20	40	18	70	9	M 4
SHE 5 M 4 HSE 63	225	20 20 24	42	26	48	24	88	9	M 4
SHE 10/15 M 5 HSE 80	280	25 25 32	50	30	53	26	111	10	M 6
SHE 20 M 6 HSE 100	400	28 30 38	65	38	63	32	124	10	M 6

Feather key groove conforming to DIN 6885/1

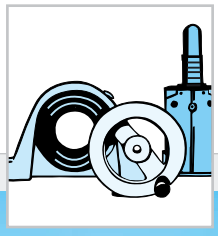
7

7.7 Temperature sensor



The lifting elements only need to overheat on one occasion for damage – and consequent premature wear – to occur to the worm-drive gearing. If overheating cannot be ruled out, or if the lifting element is operating close to its thermal limit, we recommend the use of a thermostatic transmission-monitoring system programmed to shut down the unit whenever it reaches a temperature of about 80°C. These thermostats are supplied separately for reasons of safety and must be fitted to the jacking elements prior to initial start-up.
The illustration shows the most cost-effective configuration for a fixed-temperature thermostat. The triggering or opening temperature is approximately 80 °C. It is suitable for fitting in the housing with grease- or oil-lubricated gearing.

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



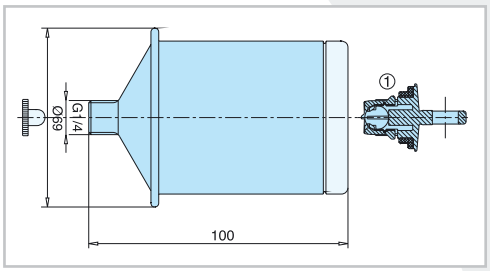
7.8 Lubricators

7.8.1 Automatic lubricant dispenser

Automatic lubricant dispensers filled with high-grade lubricating grease ensure permanent lubrication of the lifting spindles and worm gears for up to 12 months, and are therefore a cost-effective solution for reducing maintenance intervals.

7.8.1.1 Standard range

Technical information:
- Metal housing
- Drive provided by electrochemical reaction
- At 20 °C, running times of 1, 3, 6 and 12 months are possible (the color of the activation screw control ❶ denotes the dispensing time)
- 120 cm^3 volume
- Maximum compression accumulation of 4 bar
- Operating temperatures ranging from 0 °C up to a maximum of +40 °C are possible

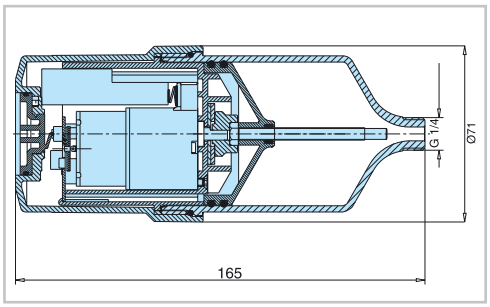


❶ Color	Dispensing time
yellow	1 month
green	3 months
red	6 months
grey	12 months

7.8.1.2 Vario range

The electromechanical operating system of the Vario unit is what makes it a high-precision dispenser. After entering the desired running time and LC unit, apply lubricating grease to the corresponding area. This unit is also fitted with a red- and green-LED function-indicating system.

Technical information:
- Transparent plastic housing
- Electromechanical operating system with set of replaceable batteries
- Running time can be individually set to 1, 3, 6 or 12 months
- LC units of 60 / 120 / 250 cm^3 volume
- Automatic compression-limiting to 5 bar
- Operating temperatures ranging from -10 °C up to a maximum of +50 °C are possible
- LC (Lubrication Canister) units can be replaced on the spot
- Corrosion-resistant, protected from dust and water spray (IP65)



Temperature	Dispensing time
+10 °C	1 week
±0 °C	2 weeks
-10 °C	6 weeks
-20 °C	14 weeks
-25 °C	26 weeks

7.8.1.3 Frost range

The "Frost" dispenser is designed for operation at low temperatures.

Technical information:
- Metal housing
- Drive provided by electrochemical reaction
- Running time depends on temperature (see table)
- 120 cm^3 volume
- Maximum compression accumulation of 4 bar
- Operating temperatures ranging from -25 °C up to a maximum of +10 °C are possible

7.8 Lubricator

7.8.2 Central lubricating systems

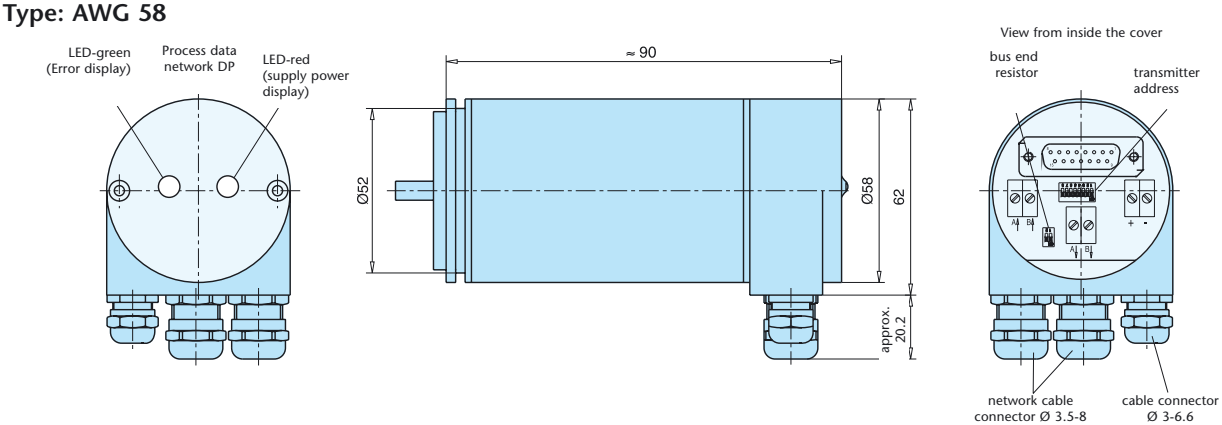
In the case of multi-spindle jacking units, or if access to the spindle elements is difficult, we recommend the use of a motor-actuated central lubricating system. The use of a lubricant tank, circulation pump and force-feed system with progressive distributor allows the required lubricant to be sent precisely to the individual lubrication points.
As each lubricant-distribution system has to be configured to match the pertaining operating conditions, our technician would be pleased to work out a special solution for your needs.

7.9 Shaft encoders

7.9.1 Absolute-value transmitters

For purposes of precise hodometry, positioning or synchronization of individual drive units, absolute-value transmitters can be fitted to the motor or directly to the lifting element.
Technical information and other data can be obtained on request.

Type: AWG 58



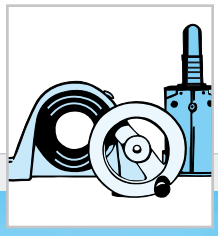
Only the most recent dimension plans are binding

Order code:
AWG 58-___ (DP =Profibus; SSI= serial port)

Note:
Details of other shaft-encoder configurations of various makes can be obtained on request

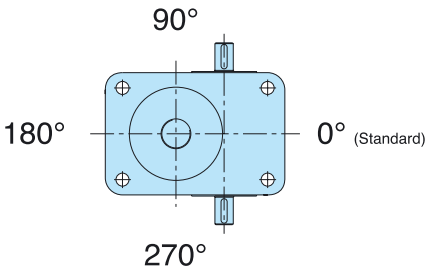
e.g.: mechanical shaft encoders
incremental transducers

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



7.10 Limit switches

Position of limit switches:



Limit switches in encased configuration for normal and emergency shutoff of the spindle lifting elements or on the onsite structure.

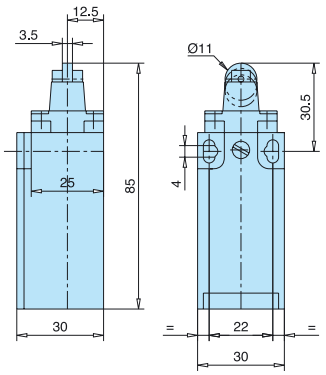
7.10.1 Mechanical limit switches

Technical specifications XCK- _ ___:

Design:	Encased in plastic (or metal)
Ambient temperature:	-40 °C to +70 °C
Protection rating:	IP 65
Line entrance:	PG 11 (PG 13.5)
Short-circuit protection:	10A
Auxiliary switch inserts:	Single-circuit change-over contact open/closed with (without) jumper function and forced opening of break contact

( ) values in brackets apply to XCK-J

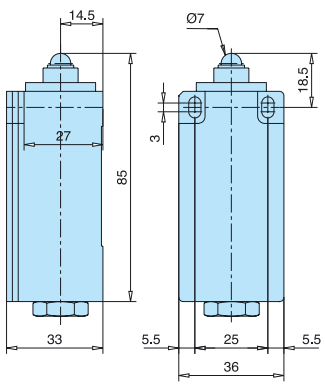
XCK-P 102



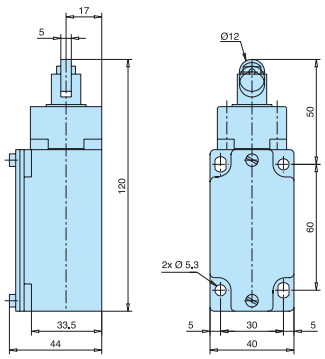
Technical specifications GC SU 1ZW:

Design:	Metal-encased
Ambient temperature:	-30 °C to +80 °C
Protection rating:	IP 65
Line entrance:	PG 11
Short-circuit protection:	10A
Auxiliary switch inserts:	Single-circuit change-over contact open/closed with jumper function and forced opening of break contact

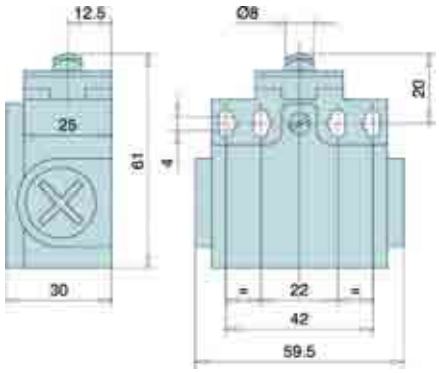
GC SU 1ZW



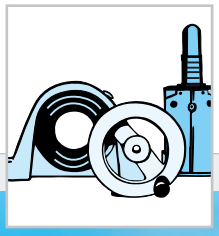
XCK-J 567



XCK-T 110

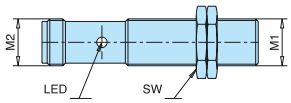


7

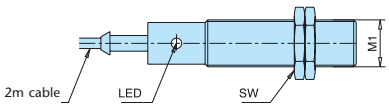


7.10 Limit switches

Design with plug-connection



Design with cable-connection



7.10.2 Inductive limit switches

Can also be used for turning-speed or standstill-monitoring purposes on the worm gear screw jack.

Type	IF 5598	IF 0006	IF 0093
Connection /	plug	PVC cable	PVC cable
Sets of cable sockets	E10216	2m/2x0,5mm²	2m/2x0,5mm²
Operating voltage	10-55V PNP/NPN programm.	20-250VAC opening contact	20...250AC/DC opening contact
Current carrying capacity	300 mA	250 mA	350mA
Protection rating	IP67	IP67	IP67
Ambient temperature	- 25°... + 80°	- 25°... + 80°	- 25°... + 80°
Thread M1/2	M12/M12x1	M12x1	M18x1

The dimension plan and further technical specifications are available on request

7.11 Controls

Pfaff-silberblau can supply both conventional contactor control units and, on request, complete PLC controls.

7.11.1 Contactor control system

For three-phase (~400 V) spindle-drive units conforming to European Directive 98/37/EC

Type H1TM	Motor power rating up to kW
Basic version	2.2
With external wall-mounted pushbutton	2.2
With external pendant switch	2.2
With electrical overload protection	2.2
With external wall-mounted pushbutton and electrical overload protection	2.2
With external pendant switch and electrical overload protection	2.2

Available as optional extra: Motor power rating up to 4 kW

H1TM basic version

- Conforms to industrial standard VDE 0113-1/EC204-1
- Protection rating IP 54
- Housing made of plastic (270 x 220 x 108 mm)
- Operating voltage ~ 400 V 50 Hz
- Control system voltage ~ 42 V 50 Hz
- Motor-protection relay
- "UP/DOWN" pushbutton control
- Signals from the Limit switches can be processed
- Built-in "EMERGENCY OFF" master switch and reversal protection

H1TM with external pushbutton controls and main circuit breaker

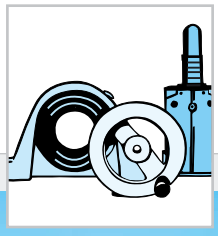
- With wall-mounted "UP/DOWN" and "EMERGENCY OFF" pushbuttons (supplied in separate package) or
- With "UP/DOWN" and "EMERGENCY OFF" pendant switches (incl. 5 m control cable)

H1TM with electronic overload protection

(required for loads of 1000 kg and up)

- With main circuit breaker
- Overload relay
- Key-operated "reset" control
- Fault-warning light

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de



7.12 Electrical monitoring devices

7.12.1 Shutdown monitor

Together with the optional pulse generator fitted to the worm gear screw jack (see section 3 "long safety nut", electrically monitored), it is possible to use a standstill monitor built into the control system to track the movement of the spindle-nut system.

Function

The screw jack system shuts down automatically whenever the value drops below its preset level.

Technical information [1)]

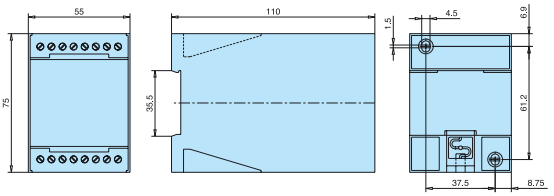
- Target pulse-count achieved by coarse and fine adjustment: 5-25 Imp/min; 20-100 Imp/min
- LED indicators show current switching status
  Start-up bypassing (or delay):
  Available period of 0 to 14 sec. in 2 sec. steps

Dimension plan	Fig. 1
Ordering designation:	AZ 33-B

7.12.2 Rotation monitor

The Rotation monitor DZ 100 (Fig. 1) allows tracking of the linear and rotating movements of the unit, helping prevent imbalanced operation of the individual drive units. As with the standstill monitoring system, the optional pulse generator is also required on the worm gear screw jack.

Fig. 1



Function

The pulse generator on the worm gear screw jack is actuated by means of a trip cam (e.g. fitted to the supporting nut in configuration type 1, and to the spindle in configuration type 2).
The incoming pulse-count is compared to the programmed-in value. If the value drops below or exceeds this preset level, an output relay is activated.
The switching status of the output relay can be used to show operating conditions and for the control of processes.

Technical information [1)]

Setting range:	5...5000 Imp./min
Supply voltage:	24 V DC
Current consumption:	max. 35mA
Signal level at impulse input:	min. 14 V
Start-up bypassing:	infinitely adjustable between 0.5 and 15 sec.
Switching-status indicator by means of LEDs	
Ordering designation:	DZ 34-A

[1)] Technical data-sheet available on request

7.12 Electrical monitoring devices

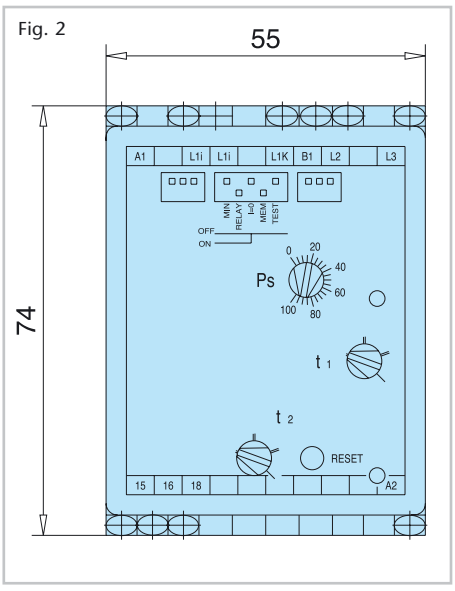
7.12.3 Load monitor

If there is any danger of an overload occurring to the worm gear screw jacks in a jacking system (e.g. due to overrunning of the operating end-limit or an operating malfunction), we recommend the use of mechanical safety couplings (see section 6) or electrical monitoring devices (load monitor, Fig. 2).

Function

The load monitor BU400V 5X determines the current power output of the drive motor. The fine-adjustment feature with respect to the rated current range allows for precise detection and recording of load factors.

Fig. 2

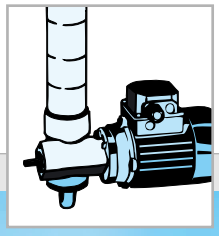


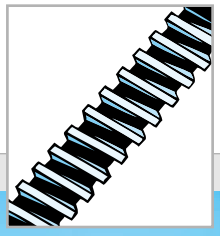
Technical information[1)]

Power element	
to be monitored:	23-6930 W (without current transformer)
Supply voltages:	12-24-42-110-230-400-440 V AC
Distribution voltage:	+ 10 %.. - 15 % UN
Rated consumption:	4 VA
Frequency range:	48-63 Hz
Precision:	
Repeating accuracy:	± 2 %
Setting accuracy:	± 5 % (as % of rated value)
Output:	1 change-over contact for power supply
Amperage range:	1-5 A in steps of 1 A; 5-10 A in one step of 5 A; Current = 0 detection off approx. < 55 of rated value
Protection rating:	IP40 conforming to VDE 0106 and VBG 4
Accessories:	Transformer module TR3-42VAC (please indicate other voltages)
Ordering designation:	BUT400 V/500 V A5 X and TR3-42 VAC

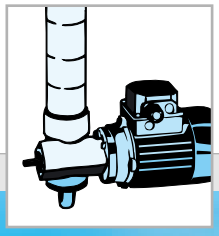
[1)] Technical data-sheet available on request

Phone + 49 (0) 8 21 / 78 01-320 · www.pfaff-silberblau.de · antriebstechnik@pfaff-silberblau.de





Contents



8.1 Electromechanical screw ram ALS /ALSR / WEGA

The **„ALS"** Electromechanical screw ram is designed as a drive system for general use in many areas of mechanical engineering. Available in three sizes, and with a range of modular elements such as:

- Basic „ALS" configuration
- Enclosed „ALSR" configuration

This structural characteristics of this system allow it to be optimally matched to the corresponding requirements. This system is particularly ideal for linear-drive tasks with applications involving a single drive unit.

The **„ALSR"** configuration consists of a shaft-cylinder und shaft-housing construction with a totally enclosed design.
Available in three standard sizes

- Lifting capacity of 25 to 100 kN carrying force
- Lifting speed of 0.5m/min to 10 m/min
- With trapezoidal or ball-screw spindle
- Possibilities with direct motor attachment
- Standard stroke lengths of up to 1.5 m with special lengths also available

Further information on request or
www.modularis.de/catalogs/pfaff-silberblau

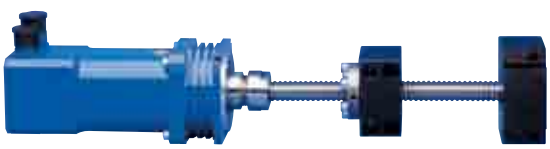
The **WEGA** Electromechanical screw ram is a drive system designed for direct connection to an AC servomotor. This removes the need for a clutch and motor cap. The worm-gear drive is linked to the motor shaft by means of a special clamping element.

The unit is available in four sizes, each with two torque settings.

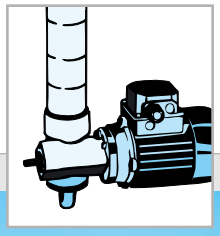
- Torque ranges from 0.36 to 10.7 Nm
- Feed rates from 0 to 2m/sec
- Feed force from 0 to 17 000 N

A wide range of accessories is also available

Further information on request!



Phone + 49 (0) 71 31 / 28 71-0 · www.alltec.de · info@alltec.de



8.2 ELA Electromechanical linear actuators

Electromechanical linear actuators ELA consist of a completely enclosed aluminium housing containing a thrust and guide mechanism, with worm gear pair and thrust bearing, along with a standard-supplied AC/DC motor. ELA units, which can be installed in any position, are fitted with a trapezoidal or circulating-ball spindle. The use of weather-resistant materials in their construction means they are also suitable for outdoor use.

Available in four standard sizes
- Lifting capacity of 2 to 10 kN carrying force
- Stroke lengths of 100 to 800 m

Further information on request or
www.modularis.de/catalogs/pfaff-silberblau

8.3 Electrical linear actuators APUS

APUS:
- Power range from 250 to 4000 N dynamic feed force
- Standard stroke-lengths of 50, 100, 200, and 300 mm
- Speeds of 10 to 35 mm/s
- Operation with 24 V DC motors or 400 V three-phase motors
  Motors are fitted at right angles according to size, parallel to the axis and lengthways.

Further information on request!

8.4 Linear positioners JANUS

The JANUS linear unit consists of a rigid anodized-aluminium profile-section frame with T-grooves provided for attachment purposes. The drive system and guide are integrated into the linear unit.

Three drive systems are available: ball screw, sliding screw drive and synchronous belt drive. Guiding is carried out by means of either roller-guides or rail-guides.

Seven different sizes and feed force ratings of 0 to 18 kN make these units suitable for a wide range of applications.
JANUS linear units are normally configured to include an integrated motor and control unit, according to the tasks performed or specifications desired.

Further information on request!

Linear motion precision screws

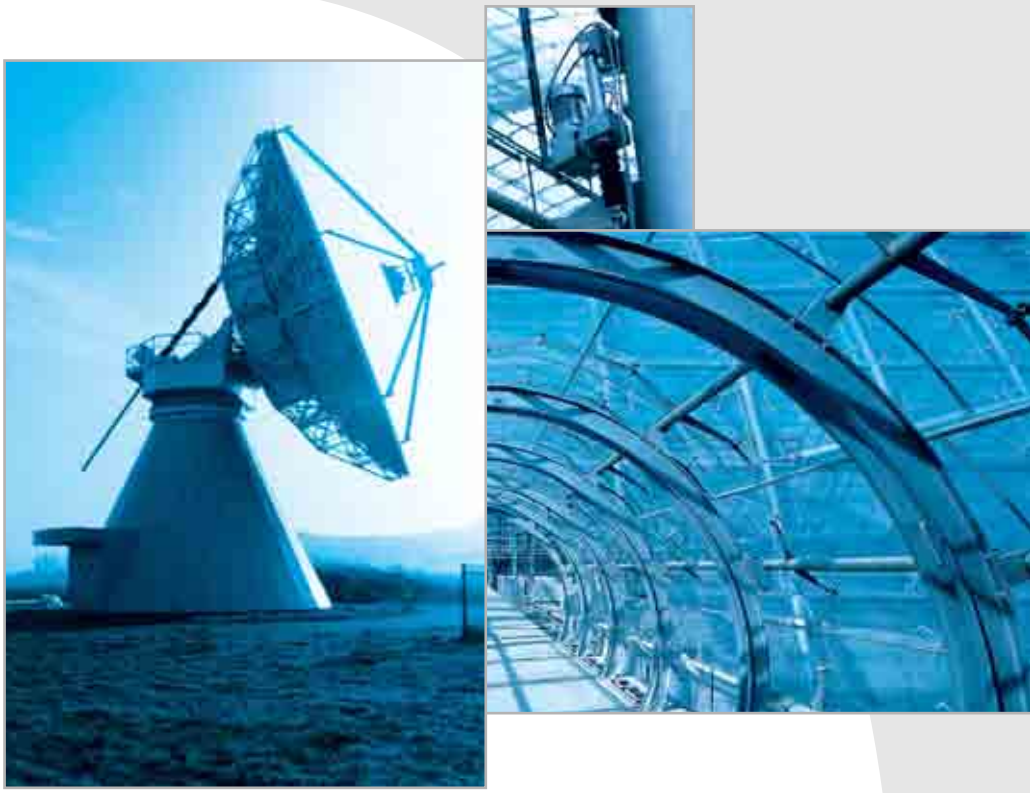
Our **linear motion precision screws** do not just give you the security of an experienced manufacturer – but also offer a way of rising head and shoulders above whatever your competitors have to offer in terms of performance and ideas. A comprehensive standard range of ALLTEC Ø16–50 mm sliding screw drives, Ø12–190 mm trapezoidal screw drives, Ø6–125 mm ball-screw drives and Ø25–60 mm planetary-roller drives saves you the considerable costs that purchasing, construction and storage involve.

9

Phone + 49 (0) 71 31 / 28 71-0 · www.alltec.de · info@alltec.de

Consulting services

In order to ensure that your product is totally compatible with your jacking system or complete turnkey system in terms of the tasks it has to perform, please feel free to take your time at the consulting stage. We feel that consequent success can only be guaranteed if the task specifications are properly designed and fulfilled first. Thinking in advance of what comes later is our idea of a successful partnership. And we call it efficiency. Nothing can take the place of personal contact, which is why our service network is designed to provide just the right short-cuts and continuous dialogue. Just ask us. To arrange a meeting, just send us an e-mail with "consulting" in the subject line.



Maintenance

The cost of regular checks more than offsets the expenses occasioned by possible breakdowns. You decide for yourself the level of coverage you would like your maintenance contract to have. Just one visit is enough to carry out the annual check and any accident-prevention inspection that your local authority may require. Please note that this offer from Pfaff-silberblau DOES NOT apply to systems from other suppliers. Remember: it's never too late to begin to take proper care of your plant equipment.

Spare-parts service

We keep ample stocks of original parts for all product ranges, for both emergency callouts and routine maintenance. This means that all common spares are normally onsite within 24 hours. We do not want you to waste your valuable time. This is why our branches and agents – both in Germany and in other countries worldwide – always ensure that your original Pfaff-silberblau spares reach you in a timely fashion and by the shortest-possible route.

Repair service

Good advice need not be costly. When technical queries arise, a telephone conversation with one of our experienced service engineers is often all it takes to track down the cause and solve the problem in hand. Sometimes just one insider-tip is enough to get everything quickly back on the rails again. In the event of a more serious malfunction occurring, an experienced service engineer present onsite will soon sort out the problem and help ensure that your logistics operations do not suffer any unnecessary delays.

10

Addresses of our dealers

Addresses of our subsidiaries

United Kingdom

Pfaff-silberblau Ltd.
Prenton Way
North Cheshire Trading Estate
Prenton Wirral CH43 3DU
United Kingdom
Phone +44-(0)151-6 09 00 99
Fax +44-(0)151-6 09 08 52
anyone@pfaff-silberblau.co.uk

Austria

Pfaff-silberblau Winden und Hebezeuge Ges.m.b.H.
Aumühlweg 21/1/B 121
2544 Leobersdorf
Austria
Phone +43-(0)2256-8 15 15
Fax +43-(0)2256-8 15 80
pfaff-silberblau@nextra.at

Switzerland

Pfaff-silberblau
Winden und Hebezeuge AG
Furtbachstraße 32
8107 Buchs/ZH
Switzerland
Phone +41-(0)1-8 44 14 66
Fax +41-(0)1-8 44 11 71
pfaff@pfaff-silberblau.ch

Hungary

Pfaff-silberblau Hungária
Csörlök és Emelöeszközök Kft.
Dózsa György u. 84
2220 Vecsés
Hungaria
Phone +36-(0)29-35 64 33
Fax +36-(0)29-35 64 34
pfaff@pfaff-silberblau.hu

Addresses of dealers in Europe

Belgium

ATB S.A.
Basteleusstraat 2
Langeveldpark - Unit 11
1600 Sint-Pieters-Leeuw
Belgium
Phone +32-(0)2-3 34 99 99
Fax +32-(0)2-3 34 99 60
atb.spl@skynet.be

Denmark

Bondy A/S
Industriparken 16-18
2750 Ballerup
Denmark
Phone +45-70-15 14 14
Fax +45-44-64 14 16
info@bondy.dk

Finland

SKS-mekaniikka Oy
Martinkyläntie 50
01721 Vantaa
Finland
Phone +358-(0)9-8 52 66 1
Fax +358-(0)9-8 52 68 24
mekaniikka@sks.fi

France

FOGEX
215, rue Henri Barbusse
95100 Argenteuil
France
Phone +33-(0)1-34 34 46 00
Fax +33-(0)1-34 34 46 01
fogex@magic.fr

The Netherlands

Elsto Aandrijftechniek B.V.
Loosterweg 7
2215 TL Voorhout
Netherlands
Phone +31-(0)252-21 91 23
Fax +31-(0)252-23 16 60
info@elsto.nl

Italy

R.I.S.A.M. s.r.l.
Via Pacini, 2
20131 Milano
Italy
Phone +39-02-2 66 48 46
Fax +39-02-2 66 54 00
risam@libero.it

Norway

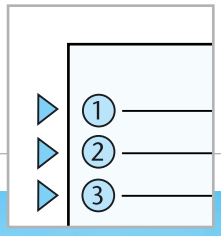
NHS Transmisjoner AS
Sofiemyrveien 6F
1411 Kolbotn
Norway
Telefon +47-66 82 13 00
Telefax +47-66 82 13 01
trond@nhstrans.no

Sweden

Lyftab AB
Mölletofta
264 94 Klippan
Sweden
Phone +46-(0)435-2 23 00
Fax +46-(0)435-2 25 50
info@lyftab.se

Spain

Kwik Way S.L.
Maquinaria Industrial
Provenca, 228
08036 Barcelona
Spain
Phone +34-9-34 54 31 01
Fax +34-9-34 54 28 76
lineta@cambrabcn.es



Pfaff-silberblau Hebezeugfabrik GmbH & Co.
PO Box 102233, 86012 Augsburg, Germany
Derching, Aeussere Industriestrasse 18, 86316 Friedberg, Germany
Phone +49 (0) 821/7801-0, Fax +49 (0) 821/7801-299
Internet: www.pfaff-silberblau.de

Questionnaire

For the operation of Pfaff-silberblau worm gear screw jacks 1kN = 1000N 10N~1kp

Company: _____
Address: _____ Phone: _____
Service: _____ E-mail: _____ Fax: _____
Name: _____

Maximum load is in any case dependent on stroke-height, additional guide measures and required lifting speed. In order to let us offer you the best-possible jacking system for your needs, please provide us with the following details:

In what type of system or machine are the lifting elements being used?

_____

We recommend that you send us a diagram showing how the lifting elements are arranged, indicating their functions and main dimensions, and – if fitted – the position of any additional guide elements.

Number of units: _____
Number of lifting elements per unit: _____
Schematic view no.: _____

Axial strain on the spindles:

Per unit: dynamic _____ kN
static _____ kN
Per spindle: dynamic _____ kN
static _____ kN

Type of load
☐ traction
☐ compression
☐ tension and compression

vibration: ☐ no ☐ yes _____
Impact or collision damage: ☐ no ☐ yes _____

Do not forget to note ALL out-of-the ordinary operating conditions – they may prove to be highly important.
e.g. the presence of sawdust, cement dust, air humidity (in %), stopping accuracy, absence of or insufficient lubrication, etc.

_____
_____
_____

Are any local-authority or professional-association rules to be observed with respect to accident prevention measures (e.g. for the operation of lifting platforms)?

If yes, which ones? _____ Short safety nut/VBG 14/VBG70 (GUV 16.15.3) ☐ yes ☐ no

Lateral strain on the spindles:

Is lateral strain present? ☐ yes ☐ no
If yes, how much strain, and what points does it affect? Please include these details in a drawing.

Desired useful stroke distance: _____ mm

Pfaff-silberblau Hebezeugfabrik GmbH & Co.

Are lateral guides fitted? ☐ yes _____ ☐ no
Desired lifting speed: _____ mm/min.
Ambient temperature: _____ °C
Is the unit to be manually operated or actuated by electric motor? ☐ Manual operation
☐ Motor drive
How are the spindles installed ? ☐ vertically
(see section 3.9 – Installation locations) ☐ horizontally
How often is the unit used?
Stress reversals per hour: _____ Days per week: _____
Hours per day: _____ Distance covered by each stress reversal: _____ mm

Which parts would you like us to supply for the unit?
Screw jacks with axially mobile spindle (configuration type 1): ☐ **yes** ☐ **no**
Range: ☐ SHE ☐ HSE ☐ MERKUR M ☐ SHG G
Design: _____
Head type: ☐ I ☐ II ☐ III ☐ IV ☐ GK (only M range)
(For tension load we recommend II or III)
For each bellows assembly in configuration type 1: ☐ yes ☐ no
Options: _____

Screw jacks with rotating spindle and travelling nut (configuration type 2) ☐ **yes** ☐ **no**
Range: ☐ SHE ☐ HSE ☐ MERKUR M ☐ SHG G
Design: _____
Head type: ☐ yes ☐ no
For every two flexible protection boots in configuration type 2: ☐ yes ☐ no

Mitre gear boxes ☐ **yes** ☐ **no**
Design: _____
Ration: ☐ 1:1 ☐ 1,5:1 ☐ 2:1 ☐ 3:1 ☐ 4:1 ☐ 5:1
Motor ☐ **yes** ☐ **no**
Voltage: _____ V
Frequency: _____ Hz
Protection rating: _____
Connecting flange ☐ **yes** ☐ **no**
High flexible shafts – (indicate clearance distances jacking elements or shaft length ☐ **yes** ☐ **no**
Couplings ☐ **yes** ☐ **no**
Pillow block ☐ **yes** ☐ **no**
Accessories (see section 7)

If lifting elements with ball-screw spindles, multi-thread spindles or quick-lifting screw jacks are to be supplied, please indicate accordingly.

Date _____

Signature/Stamp _____

Distance
1 m = 39.37 in
1 m = 3.281 ft
1 m = 1.094 yd

Area
1 m^2 = 1550 in^2
1 m^2 = 10.76 ft^2
1 m^2 = 1.196 yd^2

Volume
1 m^3 = 61,024 in^3
1 m^3 = 35.31 ft^3
1 m^3 = 1.308 yd^3
1 m^3 = 264.2 USgal
1 m^3 = 220.0 IMPgal
1 m^3 = 1000 l

Velocity
1 m/s = 39.37 in/s
1 m/s = 196.8 ft/min
1 m/s = 2.237 mi/hr

Acceleration
1 m/s^2 = 3.281 ft/s^2

Mass
1 kg = 2.205 lbm
1 long ton = 1016 kg = 2240 lbm
1 metric tonne = 1000 kg = 2205 lbm
1 short ton = 907.2 kg = 2000 lbm

Density
1 kg/m^3 = 0.06243 lbm/ft^3

Force
1 N = 0.2248 lbf
1 kN = 224.8 lbf
1 kN = 0.1004 long ton force
1 kN = 0.1020 metric tonne force
1 kN = 0.1124 short ton force

Pressure
1 Pa = 0.0001450 psia
1 kPa = 0.1450 psia
1 atm = 101.325 kPa = 14.696 psia
1 bar = 100 kPa = 14.504 psia

Torque
1 Nm = 8.851 lb-in
1 Nm = 0.7376 lb-ft

Inertia
1 kgm^2 = 23.73 $lb\text{-}ft^2$

Temperature
°C = (°F-32) ÷ 1.8
°F = °C x 1.8 + 32

Work and Energy
1 J = 0.7376 ft-lb
1 J = 10^7 ergs
1 kJ = 0.9478 Btu
1 kJ = 239.0 cal

Power
1 W = 3.412 Btuh
1 kW = 1.341 hp

Viscosity
1 Ns/m^2 or Pa-s =
10.00 P (Poises) = 1000 cP (centipoises)
1 P = 0.002089 $lb\text{-}s/ft^2$
1 P = 0.06721 lb/ft-s

Flow
1 l/s = 15.85 USgpm
1 l/s = 13.20 IMPgpm
1 l/s = 2.119 cfm
1 m^3/s = 1000 l/s
1 m^3/min = 16.67 l/s
1 m^3/h = 0.2778 l/s