Drive, Assembly and Handling Products

Linear Actuators ■ Modular Units for Assembly & Handling ■ Assembly Tables

ROEMHELD
HILMA ▪ STARK
Carr Lane Roemheld Mfg. Co.

OUR STORY

Carr Lane Roemheld Mfg. Co.

In 1982 an independent joint venture was established to marry the proven product expertise of Roemheld with the marketing know-how and distribution network of Carr Lane Manufacturing. This partnership now offers to the American manufacturer the complete benefits of the finest in international assembly and handling, as well as power workholding, combined with the best in local service and support.

After initial tests by many companies, both small and large, the word had spread confirming the quality and reliability obtained when using Roemheld products.

We invite you to review this catalog in depth and to call us with any questions about your applications. We at Carr Lane Roemheld welcome the opportunity to help you manufacture your quality product in the most productive way possible — with the world's most dependable assembly and handling equipment.

Carr Lane MANUFACTURING CO.

Founded in 1952 in St. Louis, Missouri by Earl E. Walker to make standardized tooling components, Carr Lane Manufacturing has grown, through constant innovation, to become the foremost supplier to the American Machine Tool Industry. Now the most complete line available, Carr Lane Manufacturing offers Jig and Fixture Components, Toggle Clamps, Hoist Rings, Alignment Pins, Drill Bushings, Spring Plungers, and Modular Fixturing. Setting the standard for American Tool Engineers, Carr Lane Manufacturing's catalog is recognized as the manufacturing engineer's tooling reference.

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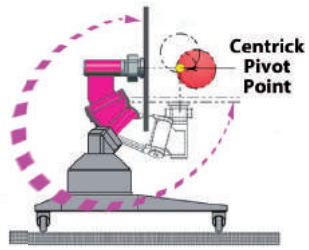
Drawing upon a centuries-old tradition of German craftsmanship, metalworking was already well established in Laubach, Germany when the Romheld family began to manage operations in 1870. Development of the hydraulic workholding components began in the early 1960's and soon grew to dominate the European market.

Today, Roemheld GmbH is by far the world leader in this productivity-enhancing technology, offering a tremendous range of types and sizes of superior design and the highest quality.

WE CAN HANDLE YOUR ASSEMBLY!

Increase Productivity In Your Assembly Area!

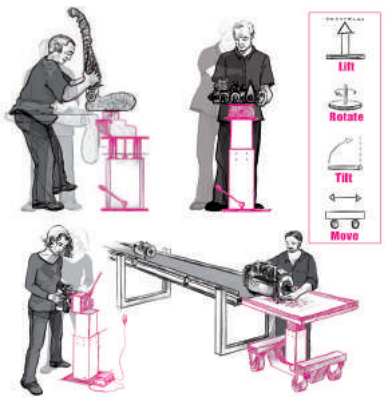


Centrick Workpiece Positioner For Heavy Loads

Assembles products up to 4,400 lbs, tilts up to 90° and rotates 360°. Centrick is quiet, requires just 230 V and little space.

Linear Actuators

Control, adjust and move with your choice of electric or hydraulic linear actuators.



Modular Units

Combine units for safe, efficient handling. Achieve rotating, tilting and lifting of workpieces, and use with carts, floor modules, plates, clamps, or adjustable tables.

View assembly products at:
www.roemheld-usa.com

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Fenton, MO 63026
(636) 386-8022

INNOVATIVE CLAMPING SOLUTIONS

Power Workholding For CNC Machining

The highest quality power workholding systems to help you remain competitive in today's manufacturing environment.

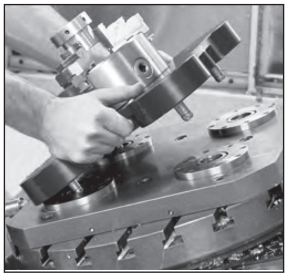
Swing Clamps

Work Supports

Power Sources

Compact Clamps and Cylinders

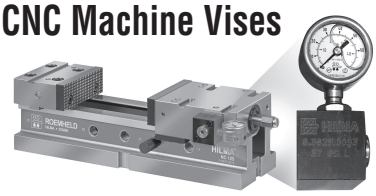
Zero Point Mounting

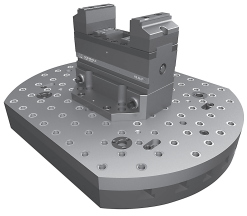


Valves, Fittings & Accessories

Concentric Clamping Elements

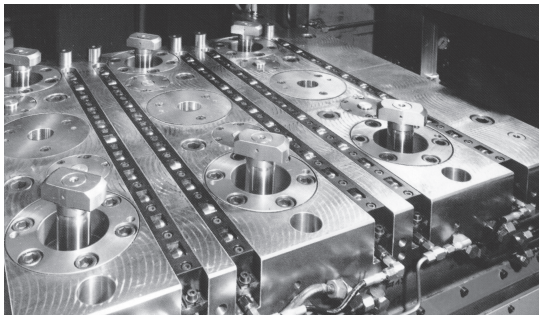
CNC Machine Vises



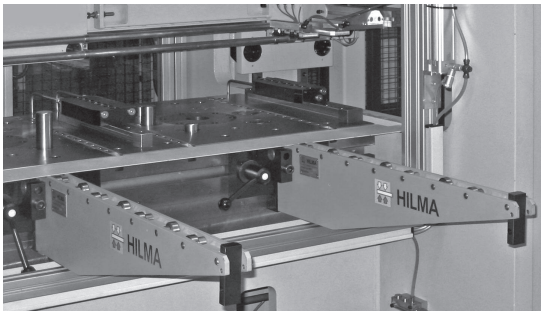


5-Axis Quick-Change Vises

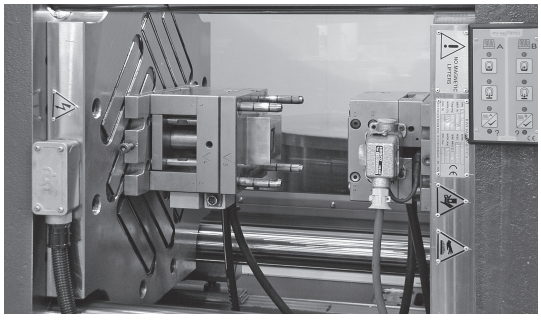
For More Information On Our Supporting Product Lines, Visit carrlaneroemheld.com.



Quick Die Change



Die Handling



Quick Mold Change for Plastics

Quick Mold Change for Rubber

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Subject to change.

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CARR LANE ROEMHELD GUARANTEE OF QUALITY

Carr Lane Roemheld components are carefully designed, manufactured, inspected, and individually tested prior to shipment. In the unlikely case you find a defect in materials or workmanship within 12 months after receipt, we will promptly repair or replace the component, in accordance with our Limited Warranty below. Our liability is limited to replacement of the part and this warranty does not apply to altered or misapplied products.

Limited Warranty

Seller warrants that the product described herein will be free from defects in material and workmanship. If any failure to conform to this warranty be found within six (6) months, from date of receipt of the product by Buyer, and Seller is given immediate notification thereof, Seller, upon being satisfied of the existence of such nonconformity, will correct the same by replacement of the defective product or making suitable repairs. If the Seller is unable to correct such nonconformity by replacement of the product or making suitable repairs, whether due to the nature of such nonconformity, the use made by the Buyer of the product, or for any other reason, it will return to Buyer the price set forth herein, or where appropriate, the unit price for such number or quantity of products as shall have such nonconformity which Seller is unable to correct, upon Seller's receipt of the nonconforming product f.o.b. its plant; provided, however, no product shall be returned to Seller without its express written consent; and provided further that such receipt of any nonconforming product will not be required where it is no longer possible for Buyer to return the same to Seller. In no event shall Seller be liable to Buyer, either directly or by way of contribution or indemnity, for direct, special, incidental or consequential damages such as, but not limited to, property damage, loss of profit, damages based on loss of use of the product, or damages for cover, whether the claim for any such damages be based on warranty, express or implied, contract, tort, or otherwise. THE FOREGOING IS SELLER'S SOLE WARRANTY WITH RESPECT TO THE PRODUCT. SELLER MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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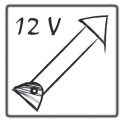
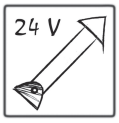
Linear Actuators **pp. 4-20**

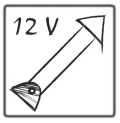
Control, adjust and move with your choice of electric (12 VDC or 24 VDC) or hydraulic linear actuators.

Case Study, p. 20

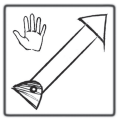


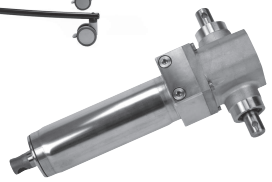


RA 600
Data Sheet L1.101, p. 10-12



RA 60K
Data Sheet L4.202, p. 13-15





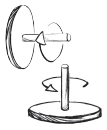
RH 1250
Data Sheet L7.101, p. 16-19

Modular Units **pp. 21-85**

Combine these modules in numerous ways to meet your assembly and handling needs.

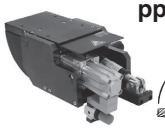
Case Study, pp. 91-92

pp. 26-30 **Rotating Module Horizontal Axis**
Rotate your workpiece about the horizontal axis via manual, hand lever, or hydromechanical operation. A 4 x 90˚ indexable version is available. Maximum weight is 200 kg (450 lbs). Data sheet: M1.101.



pp. 31-33 **Rotating Module, Electric, Horizontal or Vertical Axis**
Rotate your workpiece from 0˚ to 90˚ via electric operation. Versions for horizontal or vertical rotation. Maximum weight is 600 kg (1,350 lbs). Data sheet: M1.201.

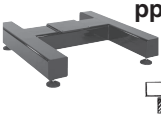
pp. 34-36 **Rotating Module Vertical Axis**
Rotate your workpiece about the vertical axis via manual or hydromechanical operation. Standard version is indexable 4 x 90˚. Special index angles available upon request. Maximum weight is 600 kg (1,350 lbs). Data sheet: M1.301.



pp. 37-40 **Tilting Module**
Tilt or swivel your workpiece from 0˚ to 90˚ via manual or electric operation. Maximum weight is 100 kg (225 lbs). Data sheets: M2.101, M2.201.

pp. 41-60 **Lifting Modules**
Precison lifting and lowering of your workpiece. Electric and self-contained hydraulic versions. Electric versions can be synchronized. Telescoping versions available too. Maximum weight is 100 - 600 kg (225 – 1,350 lbs). Maximum stroke is 200 - 1000 mm (7.87" – 39.4"). Data sheets: M4.005, M4.101, M4.202, M4.203, M4.301, M4.401, M4.402, M4.501.

pp. 61-62 **Cart Modules**
Heavy duty carts are designed to interface and move individual modules or modular combinations, with or without their workpiece. All carts are equipped with a parking brake. Data sheet: M5.101.



pp. 63-64 **Floor Modules**
Heavy duty floor modules come equipped with leveling feet and you can mount one or more individual modules on the same base. Data sheet: M6.101.

pp. 65-84 **Accessories**
Base Plates, Flange Plates, Table Plates Adaptor Plates, Clamping Modules, Power Supply Units, Hand Panels & Foot Switches Data sheets: M8.100, M8.110, M8.120, M8.130, M8.131, M8.200, M8.201, M8.203, M8.300, M8.301, M8.302.

Workbench **p. 85**

Workbench with electrical height adjustment used for manual workstations. Users can adjust to optimum ergonomic working height in production areas. Data sheet M9.9101.

Centrick **pp. 86-90**

A three-dimensional workpiece positioner for heavy load assembly. Products up to 4,000 lbs can be tilted 90° and rotated 360°. Centrick is the latest sought out innovation of assembly products that will help reduce down time and prevent accidents. Data sheet: M9.201.

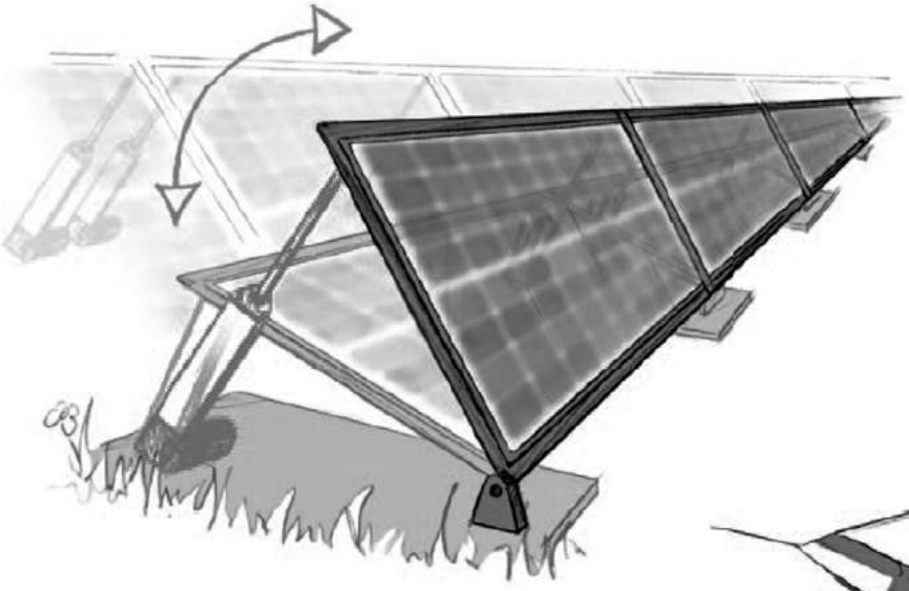
Electro-mechanical linear actuators

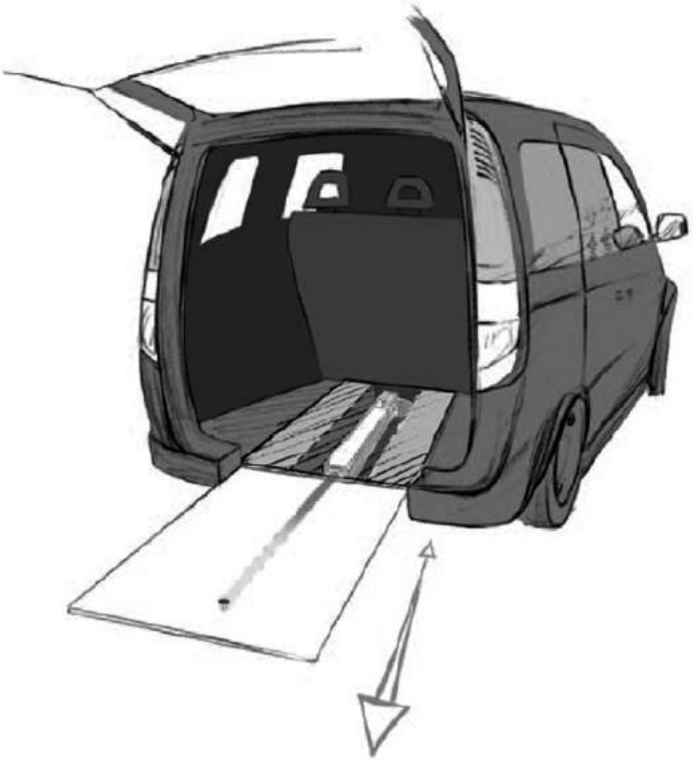
Line	RA 600	RA 60 K
		
Data sheet	**L 1.101**	**L 4.202**
Supply and control voltage	24 VDC	12 VDC
Max. push force	1,000 I 2,000 I 4,000 I 6,000 N	300 I 600 N
Max. pull force	80% of the max. push force	100% of the max. push force
Static retention force	125% of the max. push force	200 I 600 N
Strokes	100 I 150 I 200 I 300 I 400 I 500 I 600 mm	100 I 150 I 200 mm
Speed	37 … 8.5 mm/s (idle running) 29 … 5 mm/s (loaded)	28 … 16 mm/s (idle running) 18 … 7 mm/s (loaded)
Current consumption	5 I 5.5 I 6 I 7 A	3.5 I 4 A
Installation length (retracted)	310 … 850 mm	270 … 370 mm
Mounting position	any	any
Admissible ambient temperature [°C]	– 20° to + 70 °C	– 20° to + 70 °C
Resistant to	corrosion, cleaning agents and disinfectants	corrosion, diesel, oil, cleaning agents, fertilizers and salts
Fixation	2 fork eyes Ø 12 mm (Ø 10 mm with accessory bearing sleeve)	2 fork eyes Ø 10 mm
Drive	DC motor with worm gearbox and spindle drive	DC motor with planetary gear and spindle drive
Versions	with limit switches or with incremental stroke measuring system	with limit switches or with absolute stroke measuring system
Control	with accessory control module or via external 24 VDC control	via external 12 VDC control or via bus interface (option)
Electric connection	3.0 m cable with plug-type connector	1.5 m cable with wire end
Code class	IP66 or IP69K	IP69K
Max. duty cycle:	15% [max. 1.5 min. ON]	15% [max. 1.5 min. ON]
Material		
Housing	polyamide, black, glass fibre reinforced	polyamide, black, glass fibre reinforced
Guiding tube	anodized aluminium	aluminium, anodized and powder coated
Pushing rod	stainless steel	stainless steel
Accessories		
Control modules	for 1, 2, 3 or 4 linear actuators	no
Foot switch or hand panel	yes	no
Electric connection	plug	plug-type connector set
Bearing sleeve	inner Ø 10 mm	no
Versions on request		
Supply and control voltage	12 VDC version	24 VDC version
Bus systems	LIN or CAN bus	LIN or CAN bus
Absolute stroke measuring system (up to 200 mm stroke)	on request	standard
Reinforcement for high vibration load	on request	-
Especially protected against corrosion	on request	standard

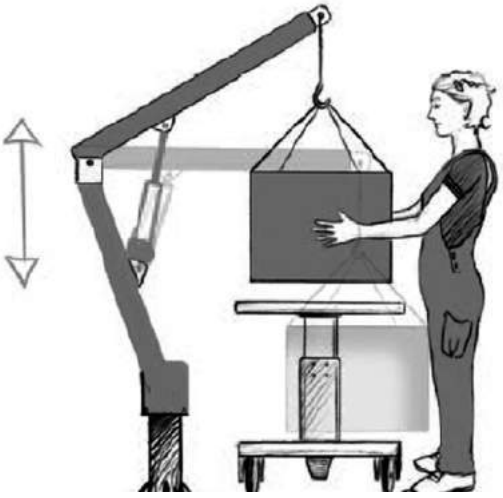
Synchronization: RA linear actuators can also be operated with synchronization control.
For this purpose, they must be equipped with a stroke measuring system.

Hydro-mechanical linear actuators

Line	RH 1250
	
Data sheet	L 7.101
Operation (extend and retract)	manually with a foot pedal or hand lever
Max. push force	4,500 I 6,500 I 9,500 I 12,500 N
Max. pull force	pull forces cannot be generated
Strokes	80 I 140 I 200 I 250 mm
Pump strokes to extend per 100 mm stroke	7 … 22
Maximum torque for pumping	160 … 120 Nm
Force required to retract	at least 100 N
Descent speed	4.5 ±1 s / 100 mm stroke
Installation length (retracted)	192 … 431 mm
Mounting positions	2 (dependent on the operating direction of the lever)
Admissible ambient temperature [°C]	+ 10° to + 40 °C
Resistant to	corrosion, cleaning agents and disinfectants up to +70 °C
Valve technology	with speed control and pressure relief valve
Mounting variants	centring pivot at the housing Ø 38 mm fork or flange mounting Ø 12.1 mm (up to a lifting force of 6.500 N)
Fixation on the plunger	bore hole Ø 12.1 mm
Operating shaft	self-resetting Ø 18 f8 mm with bore hole Ø 6 H12 mm perpendicular or parallel to the plunger or undrilled
Material	
Housing	aluminium
Plunger	steel, corrosion resistant, chromium plated
Operating shaft	stainless steel
Lacquering	unlacquered or lacquered in traffic white I white aluminium I black I light gray I agate gray
Accessories	
Foot pedal or hand lever	with bore hole Ø 18 mm F7 or undrilled
Bearing block	for centring pivot Ø 38 mm
Pedal cover (black)	for user-specific lever or as spare part
Versions on request	
Strokes	in increments of 50 mm up to 600 mm (up to lifting force of 6,500 N)
Plunger	with thread M8 at the front face
Lacquering colour	as per customer specification
Descent actuation	descent actuation by pushing or turning
Descent speeds	as per customer specification
Versions for MRI applications	with low residual magnetism
Customer-specific linear actuators	as per customer specification







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RA linear actuators – electric operation easy made

In industry, processes and operating procedures are nowadays more and more often electrically operated. For the required adjustments of the devices and equipments often linear actuators are used.

With RA linear actuators electrical operations can be realised in a simple and efficient way.
RA linear actuators are complete functional units, in compact housings, that are supplied and controlled with 24 V direct current. Thus they can be easily integrated in electric controls or operated by pushing a button.

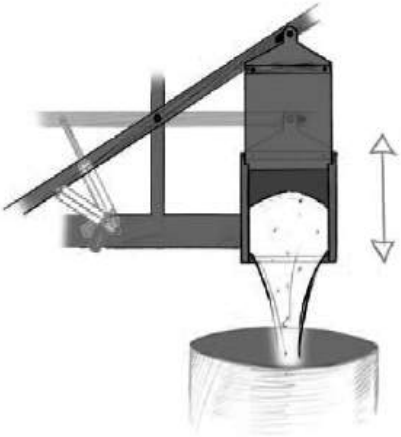
Movement between the two end positions is triggered by voltage switching. Defined intermediate positions are controlled by means of an integrated stroke measuring system.

Open and close windows and dormer windows

Open and close in buildings RA linear actuators for hardly accessible windows and dormer windows.

The operation is optionally be made by pushing a button by an operator or automatically controlled by sensors, which record the solar radiation and temperature.

Actuate lids for bulk materials.



When taking bulk materials, RA linear actuators actuate the heavy opening lids of silos or containers, either directly or by a lever mechanism.

The default quantity determined by the weight is exactly met by the precise opening and closing of the lids.

Position container

In work and assembly processes, freight and storage containers are positioned with RA linear actuators so that loads can be loaded and unloaded without any efforts.

Employees are optimally supported and motivated.
Handling processes can be executed quicker and more effectively.

As a result, the production throughput and therewith the productivity are increased.

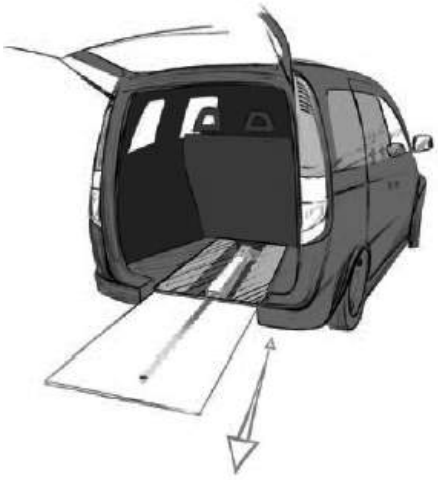
RA linear actuators – with almost unlimited application possibilities

Based on their easy control and its high performance, the application possibilities of RA linear actuators are manifold.

From easy adjustment of components as lids or levers and control tasks during adjusting processes of all sorts up to lifting and moving of heavy loads – the RA linear actuators reliably serve their purpose. Independently, if used in heated inner rooms or outdoors under difficult environmental conditions.

RA linear actuators also can bear vibrations and shocks, so that they are also ideal for the use in vehicles. They can be used for the adjustment of loading devices of road vehicles or for the operation of heavy work facilities of agricultural machines and construction vehicles.

Extend and retract vehicle ramps



With road vehicles, ramps or loading devices can be powerful and quietly put into the desired position by the RA linear actuator.

Without effort, loading edges and steps are overcome.

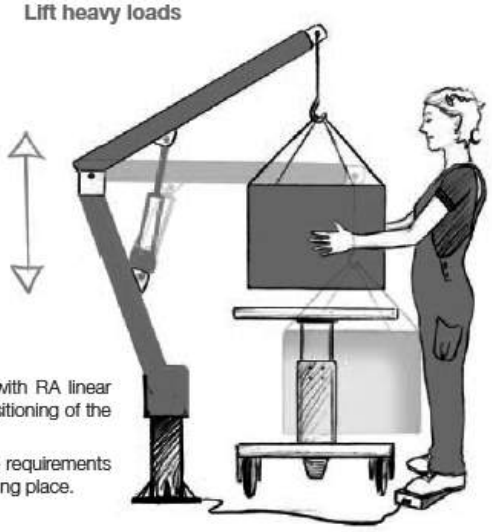
Standard vehicles become vehicles for the transport of disabled persons.
Delivery vans can be loaded comfortably with roll vehicles.

Control pipeline fittings

In ventilation and pipe systems in chemistry or water engineering pipeline fittings are actuated by RA linear actuators.

The fittings are opened and closed by remote control or throughput quantities will be determined by the opening angle of the valve flaps according to the requirements.

Lift heavy loads



At the working place heavy loads can be easily lifted and provided with RA linear actuators. The operation by foot switches allows the operator exact positioning of the load with both hands.

For the use in lifting and handling devices, RA linear actuators meet the requirements of sensitive action. They contribute to the ergonomic design of the working place.

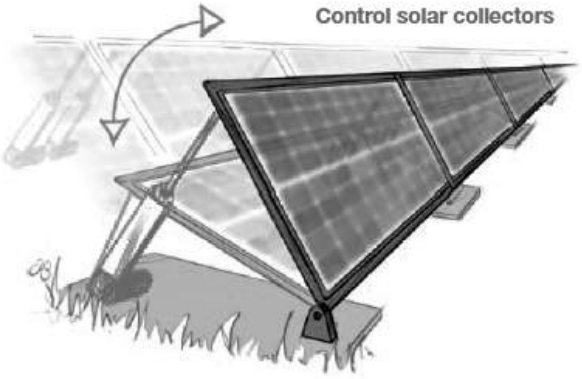
RA linear actuators – sturdy, powerful and precise

Due to their simple and sturdy design RA linear actuators are a popular actuator in the drive technology. Corrosion and weather resistance as well as perfect protection against direct water exposure as per code class IP69K belong to their performance features as well as freedom from maintenance.

RA linear actuators can equally be used in applications, where only small forces are required, as well as for tasks that require high forces. RA linear actuators are available with maximal forces up to 6,000 N, that can be used as push force or pull force.

Whether RA linear actuators are only extended and retracted between the final positions, or if specific intermediate positions have to be controlled, the desired positions are always precisely reached.

Control solar collectors

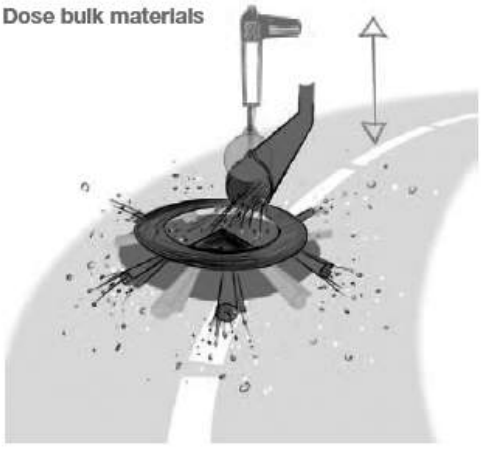


In solar systems with tracking, RA linear actuators control the sun collectors.

Sun collectors, mostly operated in a network, are steadily tracked to the stand of the sun in order to make the sun energy maximally usable.

So sun collectors are operated with optimum efficiency and the energy efficiency is increased.

Dose bulk materials

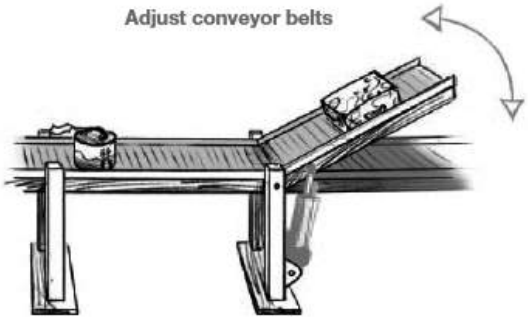


In land and communal vehicles RA linear actuators are used as actuators for the supply of fertilizers or road salt.

In dependence of the soil conditions or the vehicle speed, the required spread amount is exactly adjusted to the specific requirements.

Minimal output quantities guarantee that raw materials are used as efficiently as possible.

Adjust conveyor belts



In conveyor belt systems, the individual conveyor belt segments are directed with RA linear actuators to the desired transfer planes.

The exact control of the required heights guarantees a shock-free and smooth transport of the goods – even with different weights and centres of gravity of the material to be conveyed.

Linear Actuators RA 600
Max. lifting force 1,000 and 6,000 N, stroke from 100 to 600 mm, version with limit switches or stroke measuring system

Application
Linear actuators RA 600 are used for electrically-operated adjustments and as actuating elements in applications with control-oriented demands in short-time service.
The actuators are suited for manifold industrial applications, indoors and outdoors.

Principal use
- Machine tool building
- Food machines
- Building services engineering
- Conveyor and dosing technology
- Chemical industry
- Solar technology
- Renewable energy generation

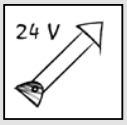
Fixing and installation
The linear actuators RA 600 have two fork eyes with Ø 12 mm for the connection of user's constructions.
It has to be considered that the linear actuator has to be mounted protected against torsion. The pushing rod must be installed without any side loads.
The connecting construction has to be designed so that no forced conditions act on the pushing rod.
The electrical connection is made by coded plug-type connectors.

Advantages
- High operating safety by self-locking spindle drive
- High static retention force
- Sturdy design by high-quality drive components
- Resistant against corrosion and disinfectants
- Press and splash water protection as per code class IP69K (optional)
- Reliable even with rough environmental conditions
- Compact design
- Mounting position: any
- Maintenance free
- Industrial design

Description
Linear actuators RA 600 consist of a 24 V DC direct current drive, whose drive energy is transferred over a worm gear and a spindle lifting gear to the pushing rod.
The self-locking spindle lifting gear stops the actuator in case of power failure and maintains it safely in the reached position.
Features of the sturdy design are the generous dimensioning of the actuator and the solid design of the housing.
Alternative to code class IP66 also a press and splash water protection as per code class IP69K is available as an option.
Linear actuators RA 600 are protected against corrosion and function without any troubles also in rough operating and environmental conditions. Since they are maintenance-free, this is guaranteed permanently.
The version with limit switches is equipped with 2 sensors, that prevent an unintentional movement to the mechanical stroke ends and thus the overload of the mechanics.
The version with stroke measuring system allows the realisation of control-oriented applications and the operation of several linear actuators in synchronism.
The stroke ends are freely definable by means of the digital signal.

Operation
Linear actuators RA 600 can optionally be operated by hand panel or foot switch and supply units of the accessory programme as per data sheet M 8.200 with touch control or by an external control with 24 V output.
The version with stroke measuring system delivers the user incremental signals of the stroke measuring system.

Linear actuators RA 600 - 24 V DC



Part-no. I6-XX-XX-2-X-XS1A

Technical characteristics

Max. push force:	1.000 - 6.000 N
Max. pull force	80% of the push force
Stroke:	100 up to 600 mm
Max. duty cycle:	15%
Code class:	IP66 or IP69K

Operational modes
- Touch control with supply unit and hand panel or foot switch (as per data sheet M 8.200)
- Control by external 24 V DC control

Electrical interface
Plug-type connector 24 V DC

Mechanical interface
2 fork eyes Ø 12 mm
(Ø 10 mm with accessory bearing sleeve)

Accessories
- Bearing sleeve Ø 12 / Ø 10 mm
- Foot switch and hand panel as per data sheet M 8.200
- electrical supply units for 1, 2, 3 or 4 linear actuators as per data sheet M 8.200
- Plug

Material

Cylinder body:	polyamide, black, glass fibre reinforced
Guiding tube:	aluminium, naturally anodised
Pushing rod:	stainless steel

Important notes!
The linear actuators RA 600 are resistant against corrosion, detergents and disinfectants. The admissible environmental temperature is –20° up to +70 °C

Available variants
Linear actuators RA 600 are optionally available in the variants:
- **12 V supply voltage**
- **Absolute stroke measuring system (up to 200 mm stroke)**
- **Reinforced for high vibration load**
- **Especially protected against corrosion**
- **LIN-BUS control**

Description

The version with limit switches has 2 integrated Hall-effect sensors, which automatically switch off the motor brake as soon as the upper or lower stroke end position is obtained.
This guarantees that the linear actuator does not mechanically push against the stop. At the plug-type connector of this version the pins 3 and 4 have to be connected to 24 VDC. By changing the polarity, switching over from retracting to extending is effected.

Current consumption

As a function of the load the current consumption amounts linearly up to 6 A at nominal load. For a safe power supply, a supply current of at least 8 A is required.

Static retention force

The static retention force can exceed the maximum lifting force by up to 25%.

Technical characteristics

Force [N]	Velocity Idle running [mm/s]	loaded [mm/s]	Current consumpt. [Ampere]	Duty cycle [max 1.5 min.]
1000	37	29	6	max. 15 %
2000	21	18	5	max. 15 %
4000	11	7	5.5	max. 15 %
6000	8.5	5	7	max. 15 %

Stroke [mm]	L [mm]	L + stroke [mm]	Weight [kg]
100	310	410	3.2
150	360	510	3.6
200	410	610	4.0
300	510	810	4.5
400	650	1050	5.0
500	750	1250	5.7
600	850	1450	6.4

Note: Linear actuators RA 600 with a stroke of 400 mm or more are equipped with an enlarged guiding length.

Code for part numbers

Bestell-Nr. **I6-XX-XX-2-X-ES1A**

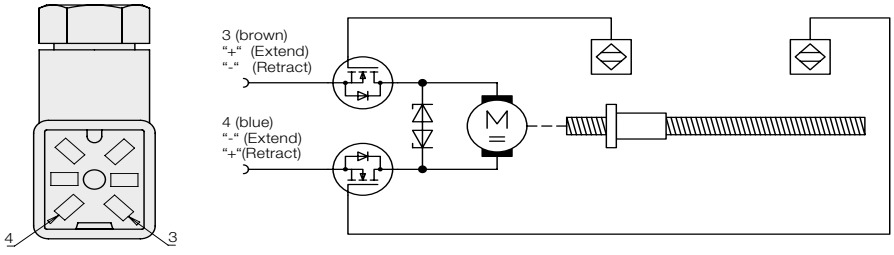
Maximum lifting force
(Push force)
01 = 1,000 N
02 = 2,000 N
04 = 4,000 N
06 = 6,000 N

Stroke
10 = 100 mm
15 = 150 mm
20 = 200 mm
30 = 300 mm
40 = 400 mm
50 = 500 mm
60 = 600 mm

Code class
B = IP66
C = IP69K

Variant 12 V available on request.

Circuit diagram and connection of plug-type connector for RA 600 with stroke end disconnection



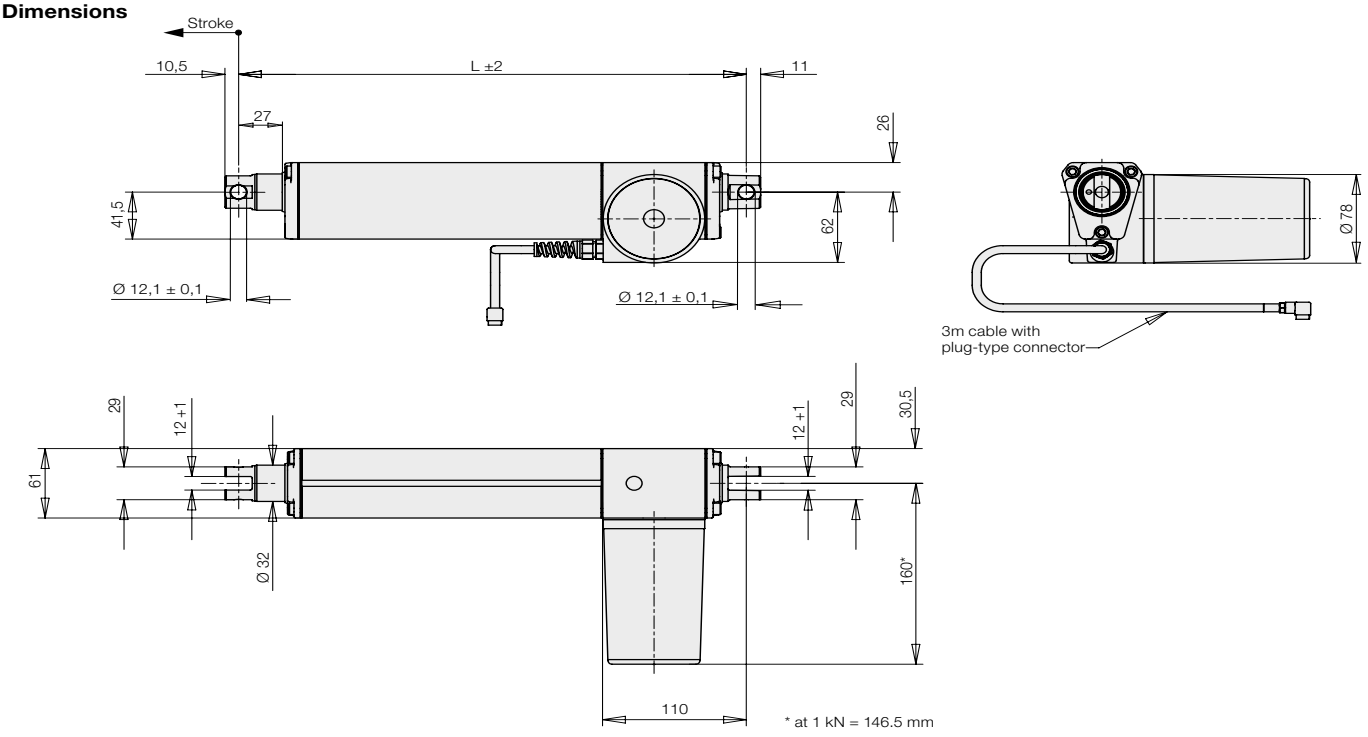
Important notes!

Only RA 600 with incremental stroke measuring system can be operated in synchronism!
If the supply unit (see next page) is not used, the user has to provide a current limitation of 10 A.

Accessories

See next page.

Dimensions



Description

The stroke of linear actuators is transmitted by potential-free square wave signals, which are generated by the rotating spindle, to an external control.

An additional reference point, that initialises the stroke measuring system, is in the retracted stroke end position. This reference point can also be used to switch off the retracted stroke end position.

With the incremental stroke measuring system control-oriented applications and the compound of several linear actuators in synchronism can be realised.

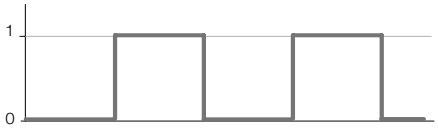
Due to the incremental acquisition of the position, faults of linearity are excluded.

Supply units as per page M 8.200 treat the actuators and the user's connecting construction with care due to a special control and thus contribute to the increase of the service life.

Technical characteristics

See page 2.

Resolution of the stroke measuring system



Stroke [mm]

1 kN: 0.75 mm stroke = 1 edge to edge distance
2 kN: 0.75 mm stroke = 1 edge to edge distance
4 kN: 0.5 mm stroke = 1 edge to edge distance
6 kN: 0.375 mm stroke = 1 edge to edge distance

Code for part numbers

Part-no. I6-XX-XX-2-X-IS1A

Maximum lifting force
(Push force)

01 = 1,000 N
02 = 2,000 N
04 = 4,000 N
06 = 6,000 N

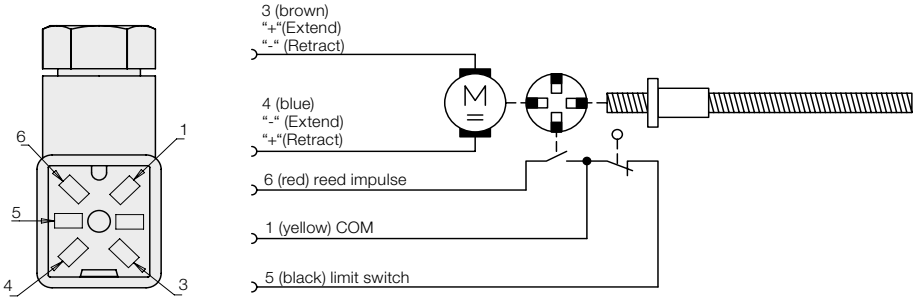
Stroke

10 = 100 mm
15 = 150 mm
20 = 200 mm
30 = 300 mm
40 = 400 mm
50 = 500 mm
60 = 600 mm

Code class

B = IP66
C = IP69K

Circuit diagram and connection of plug-type connector for RA 600 with stroke measuring system



Dimensions

See page 2.

Important notes!

The stroke end positions must not be loaded mechanically. An approach in creep speed or switching off 3 mm before reaching the stroke end positions is required. For supply units with synchronization control this is met by the programmed soft stop function.

The positioning accuracy with touch control amounts to ± 2 mm, depending on the operator and the load.

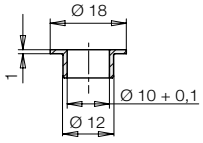
Place task with higher demands on the positioning accuracy can be realised with special controls.

Therewith place accuracies can be realised within the size range of the resolution of the stroke measuring system.

In addition, there is the possibility to store temporarily up to 3 positions for reproducible approach.

Accessories

• Bearing sleeve for fork eye
DU bushing Ø12 / Ø10
Part-no. 3301-936



Electrical accessories

See data sheet M 8.200

• Foot switch
for touch control up–down
with connecting cable 3.0 m
Part-no. 3823-038

• Hand panel
for touch control up–down
with connecting cable 1.6 m
Part-no. 3823-025

• Supply unit
with control
for one linear actuator
Part-no. 3821-246

• Mains cable 230 VAC
with earthing type plug for supply units

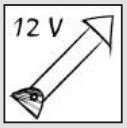
Mains cable smooth, 3.0 m
Part-no. 3823-040

• Plug
for user's control
with 5 solded strands and blade receptacles
Part-no. 3823-048

Linear actuators RH 60 K
Max. lifting force 300 to 600 N, stroke 100 to 200 mm version with limit switches or stroke measuring system

Advantages
- Compact design
- Outstanding durability
- Variable mounting position
- Maintenance free
- Code class IP69K (Cleaning with high-pressure cleaner possible)
- Solid pushing rod guide

Linear actuators RA 60 K – 12 V DC



Part no.: F2-XX-XX-1-C-XS3A

Technical data

Max. push force:	300 to 600 N
Max. pull force:	100 % of the push force
Stroke:	100 to 200 mm
Max. duty cycle:	15 %
Code class:	IP69K

Operations
- Control by external 12 V DC control
- Optional control by BUS interface

Electrical interface
Cable wires 0.34 mm² 12 V DC

Mechanical interface
2 fork eyes Ø 10 mm

Accessories
- Kit of plug-type connector
- Bus control

Application
Linear actuators RA 60 K are used for electrically-operated proportioning tasks or as actuating element in applications with control-oriented demands in short-time service.
The range of application is versatile:
The version for mobile applications was developed especially for the rough outdoor use and under corrosive environment influences.

Principal use
- Agricultural and forest technology
- Mobile automotive engineering
- Conveyor and dosing technology
- Municipal technology

Fixing and installation
The linear actuators RA 60 K have two fork eyes with Ø 10 mm for the connection of user's constructions.
It has to be considered that the linear actuator has to be mounted protected against torsion.
The pushing rod must be installed without any side loads. The connecting construction has to be designed so that no forced conditions act on the pushing rod.
The electric connection is made alternatively by the plug-type connector available as accessory or directly to a terminal strip in the control box by means of the cable wires.

Description
Linear actuators RA 60 K consist of a 12 VDC direct current drive, whose drive energy is transferred over a planetary gear and a spindle stroke actuator to the pushing rod.
The generated lifting force is available as push and pull force. The sturdy design with code class IP 69 k guarantees a trouble-free function also in rough operating conditions.
Linear actuators RA 60 K are maintenance free and can be operated with a duty cycle of up to 15 %.
The version with limit switches is equipped with 2 sensors, that prevent an unintentional movement to the mechanical stroke ends and thus the overload of the mechanics.
The end positions of the RA 60 K with stroke measuring system are definable by the signal of the stroke measuring system.

Operation
Linear actuators RA 60 K are supplied and operated with 12 V board supply of the vehicle electronics.
The version with stroke measuring system provides the absolute position values of the actuator to the control. Referencing is not required.
RA 60 K *mobile* can be integrated on request into existing bus systems and controlled by LIN or CAN bus.
Please contact us.

Material

Body:	polyamide, black, glass fibre reinforced
Guiding tube:	aluminium, anodized and powder coated
Pushing rod:	stainless steel

Important notes!
The linear actuators RA60 K are resistant against corrosion, diesel, oil, detergents, fertilizers and salts.
The admissible environmental temperature is -20° up to +70 .
Cleaning with high-pressure cleaner is admissible.
We recommend to install the cable ends or plug-type connectors protected against the environmental conditions to avoid penetration of humidity and premature corrosion.

Description
The version with limit switches has 2 integrated sensors, which automatically switch off the motor as soon as the upper or lower stroke end position is obtained.
This guarantees that the linear actuator does not mechanically push against the stop.
The wires brown and white of this version are to be connected to 12 V DC. By changing the polarity, switching over from retracting to extending is effected.

Current consumption
As a function of the load the current consumption amounts lineraly up to 4.5 A at nominal load. For a safe power supply, a supply current of at least 6 A is required.

Technical data

Force	Speed Idle running	Speed loaded	Current cons.	Duty cycle
[N]	[mm/s]	[mm/s]	[A]	[max. 1.5 min.]
300	28	18	3.5	max. 15 %
600	16	7	4	max. 15 %

Stroke	L	L + stroke	Weight
[mm]	[mm]	[mm]	[kg]
100	270	370	1.0
150	320	470	1.1
200	370	570	1.2

Code class
IP69K (exception: cable end)

Static retention force
200 N at lifting force 300 N
600 N at lifting force 600 N
Since the actuators are designed without holding brake, the piston rod can be displaced in case of higher loads or vibrations and the actuator has to be readjusted, if necessary.

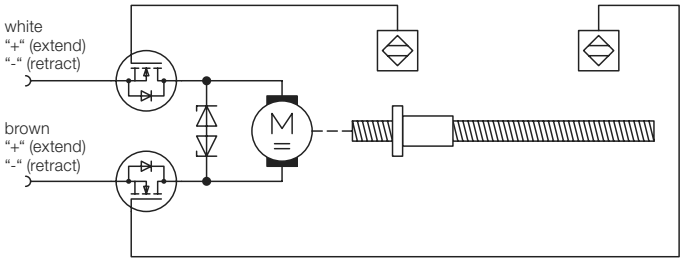
Code for part numbers
Part no. **F2-XX-XX-1-C-ES3A**

Maximum lifting force
(push force)
03 = 300 N
06 = 600 N

Stroke
10 = 100 mm
15 = 150 mm
20 = 200 mm

Variant 24 V available on request.

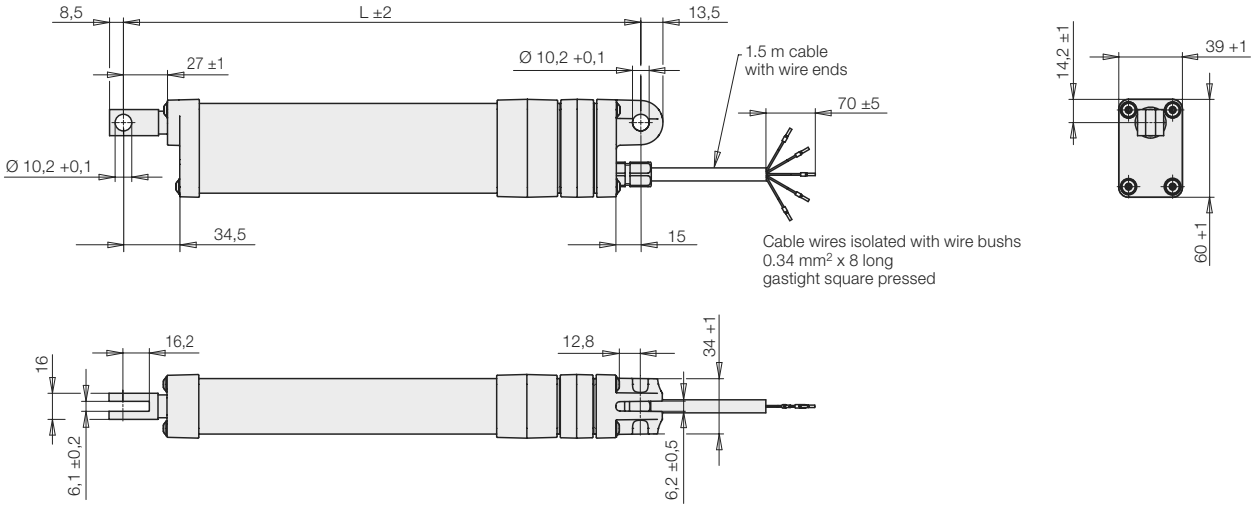
Circuit diagram and configuration of cables for RA 60 K with stroke end disconnection



Important notes!
Only RA 60 K with stroke measuring system can be operated synchronously!
The user has to provide a current limitation of 5.5 A.
In the case of a blockade, the control has to provide for a switching off of the power supply at the latest after 10 second to prevent an overload of the actuator.

Accessories
See next page.

Dimensions



Description
The version with absolute stroke measuring system is equipped with a linear potentiometer. A slider at the pushing rod produces a signal at the potentiometer, that is proportional to the position of the pushing rod. This signal can easily be evaluated by a priority control and is permanently available. Referencing is not required. Due to the direct connection of the absolute stroke measuring system to the pushing rod, one gets a precise stroke information with slight backlash. With the stroke measuring system control-oriented applications and the compound of several linear actuators in synchronism can be realised.

Technical data
See previous page.

Data - stroke measuring system

Connecting resistance	5 k Ω
Linearity	±1%

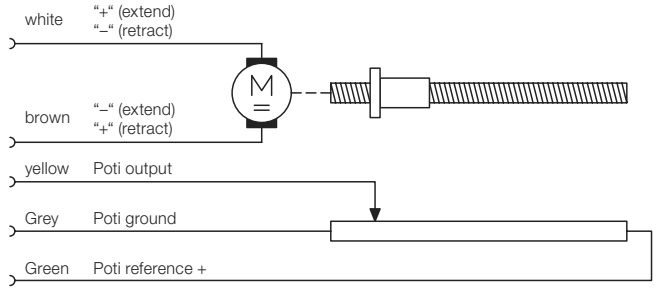
Connection according to the principle of a voltage divider to a stable reference supply point with max. 12 V.

Code for part numbers
Part no. **F2-XX-XX-1-C-AS3A**

Maximum lifting force
(push force)
03 = 300 N
06 = 600 N

Stroke
10 = 100 mm
15 = 150 mm
20 = 200 mm

Circuit diagram and configuration of cables for RA 60 K with stroke measuring system



Dimensions
See previous page.

Important notes!
The stroke end positions must not be loaded mechanically. An approach in creep speed or switching off 2 mm before reaching the end positions is required.

Accessories

• Kit of plug-type connector Superseal 5 Pol

Complete kit consisting of plugs and bushing with seals.
For crimping of the plug contacts, the user has to remove the wire bushs of the cable.
The bushing is suited for wire diameters of 0.75 mm^2 to 1.5 mm^2.

Part no. 3823-088

• Bus control

The optionally available bus board especially adapted to the customer's requirements offer beside the bus control further advantages such as
– Motor brake function
– Soft start
– Current limitation
– Excess-current release
– Limitation of duty cycle
– Function release blockade
– Error message

Linear actuators RH 1250
Max. lifting force 4.5 to 12.5 N, stroke 80 to 250 mm manual-hydraulic version

Advantages
- High operating safety by speed limiting valve and pressure relief valve
- Optional descent actuation by pushing or turning
- Optional fork or flange mounting
- Precise plunger guide
- Independent of external power supply
- No obligatory tests as per electrical safety regulations
- Compact design
- Single-lever operation
- Maintenance free
- Resistant against disinfectants
- Different lacquerings as an option

Application
Linear actuators RH 1250 are universally used as manually-operated actuators for linear movements.

Principal use
- Height adjustment of hospital and nursing beds as well as mobile nursing chairs
- Height adjustment of patient transporters and therapy couches
- Adjustment of examination and care chairs as well as childbirth beds
- Height adjustment of instrument tables
- Actuator for lifting modules and lifting tables

Description
Linear actuators RH 1250 are manually operated, hermetically sealed, hydro-mechanical actuators for linear adjusting procedures.
The compact design contains the pump piston and the valve technology. Also the oil reservoir and the plunger cylinder are integrated.
The hydraulic transmission in connection with the manual operation allows a good dosage of very high forces.
Important for that are also the mechanics with minimum clearance as well as the sensitive responding valves with exactly defined switching points.
In principle only push forces can be generated.

Fixing and installation
The linear actuators RH 1250 have 1 location hole Ø 12.1 mm in the plunger and 2 centring pivots Ø 38 mm for the connection of user's constructions.
The user's construction must exclude side loads and forced conditions.
The centring pivots Ø 38 mm are unlacquered.
There are two different operating directions of the pump lever: clockwise and counterclockwise operation of the pump lever, depending on the user's construction.

Operation
The plunger rod is extended by reversible rotation of approx. 40° by an operating lever at the operating shaft.
The recommended lever length is approx. 300 mm.
To retract the plunger cylinder, the operating shaft has to be turned to the opposite direction by approx. 10°. The operating shaft returns automatically.

Linear actuators RH 1250 manually operated

Part no.: M8-XX-XX-X-A-X-L-X-X

Technical data

Max. push force:	4,500 – 12,500 N
Stroke:	80 – 250 mm

Operations
- Foot pedal or hand lever

Mechanical interface
Plunger eye Ø 12 mm
Centring pivot Ø 38 mm
Optional extra: Fork or flange mounting

Accessories
- Foot pedal
- Hand lever
- Bearing blocks

Material

Body:	Aluminium
Operating shaft:	Steel, corrosion resistant
Plunger:	Steel, corrosion resistant

Important notes!
The linear actuators RH 1250 are resistant against corrosion, detergents and disinfectants up to +70 °C.
The admissible operating temperature is 10° up to 40 °C.
To retract the plunger of the linear actuator a push load of at least 100 N is required.

Functioning

All versions of the RH 1250 are operated with an operating lever, that is pinned at the operating shaft.
The integrated flow control valve provides for an uniform descent speed in all load conditions.
Due to the possibility to get a drilled operating shaft, the actuator can quickly be installed and put into operation.

It has to be considered that the user's construction always acts with push force onto the actuator.
The actuator has a high safety against overload. In the case of overload it is not possible to continue pumping the actuator, but descent is possible. The operator has to make sure that the actuator is not overloaded.

Technical data

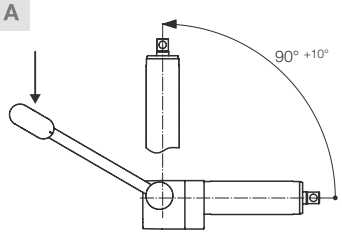
Lifting force	Pump strokes	Required pump torque	v Descent	Release torque Descent	Release angle Descent
[N]	[per 100 mm]	[Nm/full load]	[s/100 mm]	[Nm/full load]	[°]
4500	7±1	160	4.5±1	10	2 – 10
6500	9±1	160	4.5±1	11	2 – 10
9500	13±1	160	4.5±1	15	2 – 10
12500	22±1	120	4.5±1	17	2 – 10

Important notes!

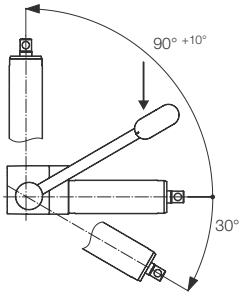
The indicated torques are the maximum torques required for operation.
The return torque of the operating shaft for the pump stroke is max. 6 Nm. The return torque of the operating shaft for the descent is max. 2 Nm. The indicated return torques mus not be exceeded by the user's constructions of the operating lever. Otherwise, it could be possible that the operating lever will not be moved back to the off-position or an unintentional descent of the actuator could occur.

Admissible mounting positions for operating direction

A



D



Available on request:

- Stroke lengths up to 600 mm in gradations of 50 mm (up to lifting force 6,500 N)
- Descent actuation by pushing
  Variant for emergency adjustment in hospital beds. By pushing the descent bolt, additionally mounted at the actuator, the plunger can be safely pushed in. The descent bolt returns automatically.
- Descent actuation by turning
  Variant for emergency adjustment in hospital beds. By rotating a descent shaft, additionally mounted at the actuator, the plunger can be safely retracted.
  The descent actuation by turning does not return automatically.
- Front-side thread M8 in the plunger
- Versions with low residual magnetism for MRT applications
- Other descent speeds
- Other colours
- Customised special actuators

Code for part numbers

Part no. M8-XX-XX-X-A-X-L-X-X

Maximum lifting force (push force)
04 = 4,500 N
06 = 6,500 N
09 = 9,500 N
12 = 12,500 N

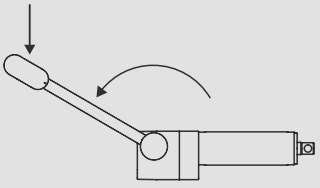
Stroke
08 = 80 mm
14 = 140 mm
20 = 200 mm
25 = 250 mm

Bore hole operating shaft
1 = perpendicular to the plunger Ø 6 mm (see drawing page 3)
2 = parallel to the plunger Ø 6 mm
3 = without bore hole

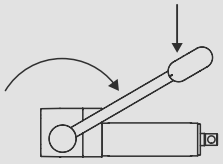
Fixation (page 3)
S = Standard
G = Fork (up to 6,500 N lifting force)
F = Flange (up to 6,500 N lifting force)

Colour
1 = unlacquered
2 = RAL 9016 traffic white
3 = RAL 9006 white aluminium
4 = RAL 9005 black
5 = RAL 7035 light grey
6 = RAL 7038 agate grey

Operating direction
A = pump lever counterclockwise



D = pump lever clockwise



The RH 1250 is available in different mounting variants.
Besides the standard mounting with centring pivot Ø 38 mm mounted at the housing, the RH 1250 can be deliverd with fork mounting or flange mounting.

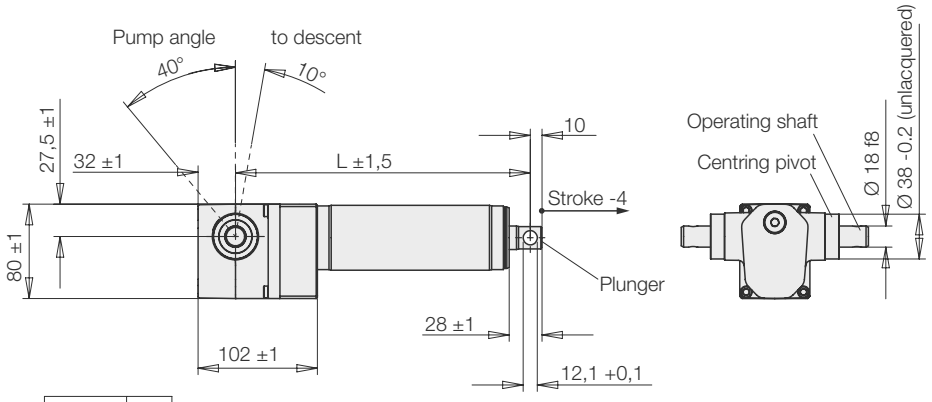
Part no. **M8-XX-XX-X-A-X-L-X-X**

Mounting
S = Standard
G = Fork
F = Flange

Standard

The standard version of the actuator is located by forks or eyes in the user's construction at the centring pivots Ø 38 mm and is secured with a bolt Ø 12 mm. It has to be considered that the user's construction always acts with push force onto the actuator.

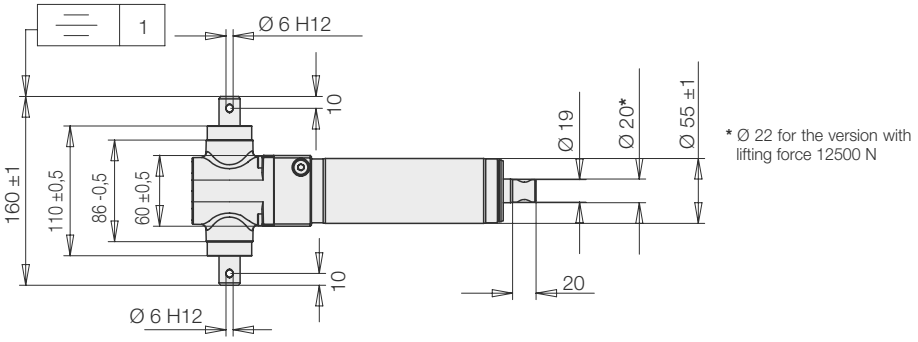
Stroke [mm]	L [mm]	L + stroke [mm]	Weight [kg]
80	192	272	2.2
140	252	392	3
200	312	512	3.5
250	362	612	4



Fork**

For easy mounting by means of flange and bolt.

Stroke [mm]	L1 [mm]	L1 + stroke [mm]	Weight [kg]
80	256	336	2.2
140	316	456	3
200	376	576	3.5
250	426	676	4

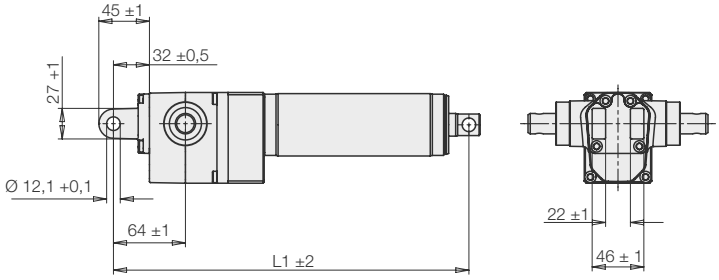


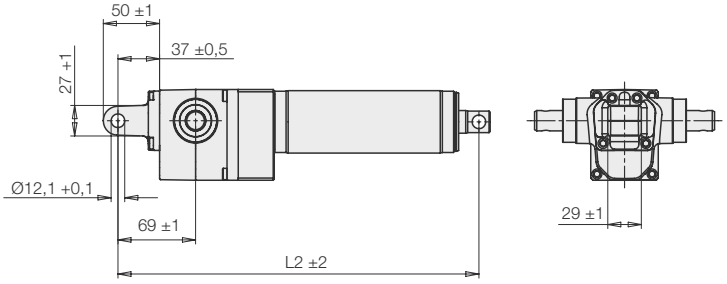
* Ø 22 for the version with lifting force 12500 N

Flange**

Often selected variant for example in therapy couches. Integration of the actuator in a steel structure by means of fork and bolt.

Stroke [mm]	L2 [mm]	L2 + stroke [mm]	Weight [kg]
80	261	341	2.2
140	321	461	3
200	381	581	3.5
250	431	681	4



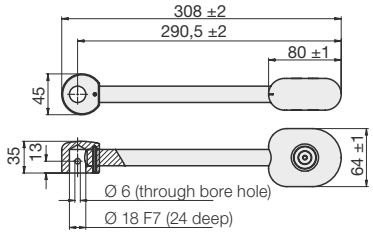


****** Fork and flange mounting up to a lifting force of 6.500 N available.
Forks and flanges have drafts.

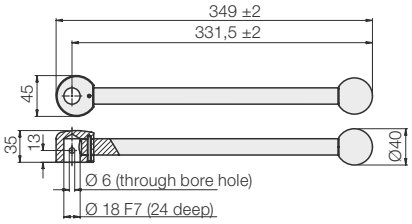
Important note!
To avoid an overload of the actuator, external stops are to be provided for the operating elements in order to limit the pump angle to 40°. Also for extensions with far-off levers supports for torque compensation have to be provided.

Accessories

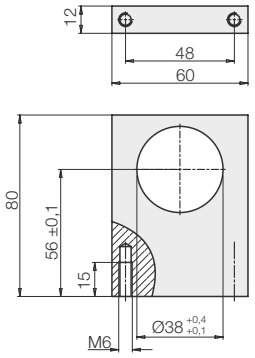
• Foot pedal
Pre-drilled for the arrangement of 90° to the shaft bore hole
Part no. 0990-180



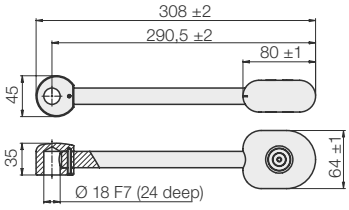
• Hand lever
Pre-drilled for the arrangement of 90° to the shaft bore hole
Part no. 0990-182



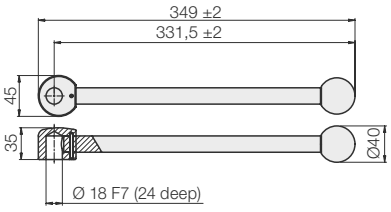
• Bearing block
For location of the RH 1250 at the bearing eyes Ø 38
2 off are required
Part-no. 3537-289



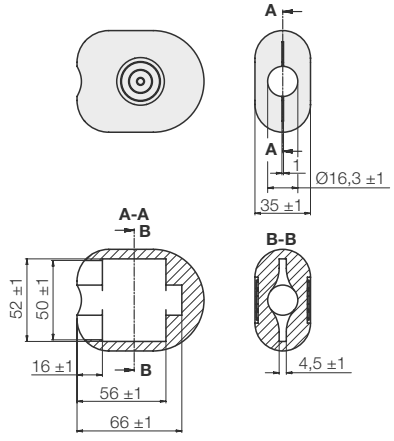
• Foot pedal
Without bore hole for application-specific arrangement.
Part no. 0990-181



• Hand lever
Without bore hole for application-specific arrangement.
Part no. 0990-183



• Pedal cover, black
For application-specific lever or as spare part
Part-no. 3549-002



Important notes
The RH 1250 is not suitable for pull load. If the plunger will be loaded by pulling, air can be pulled into the hydraulic system and this can lead to malfunctions. This can be eliminated by repeated extension and retraction of the actuator.

Linear Actuators Provide Upgraded Quality to Activity Chair, at Lower Price

Challenge: *Rifton Equipment designed, and brought to market, a new seating system called the Activity Chair. One of the required features was a base that allowed height adjustment with a 225-lb client in the chair. This was accomplished by use of a foot-operated hydraulic pump. The previous supplier provided a pump that functioned well, but when it proved costly, was reluctant to work with Rifton to economize. Rifton felt it was important to reduce costs on the chair where possible.*

Solution: *Rifton turned to linear actuators from Carr Lane Roemheld. After acquiring samples, and submitting them to an exhaustive validation/testing process, Rifton determined that the new product was actually an upgrade in quality on several fronts.*

Carr Lane Roemheld saved Rifton a significant amount of money, and provided some minor design modifications to meet their requirements, including custom packaging specifications.

Need for cost control, while retaining quality

Rifton's new Activity Chair is designed for feeding, speech therapy, active learning, and for clients with sensory processing challenges. "One of the required features was a base that allowed height adjustment with a 225-lb client in the chair," said Kirk Wareham, Rifton's Director of Product Design. This was accomplished by use of a foot-operated hydraulic pump. While the pump from the original supplier functioned well, it was quite costly. "We felt it was only responsible to reduce our costs where possible, and ask for a price reduction commensurate with the dramatically rising sales of the Activity Chair," said Wareham about the original supplier. "Also, since we are able to pay our bills promptly we typically request, and are typically granted, an early-pay discount. Communication is vital to a thriving and mutually beneficial relationship, and we were disappointed to find that the supplier would not even entertain a discussion on either point. There were also some minor quality issues.

An additional driver of the project was the hope to reduce the amount of inventory being held in our warehouse."

Carr Lane Roemheld's linear actuators fit the bill

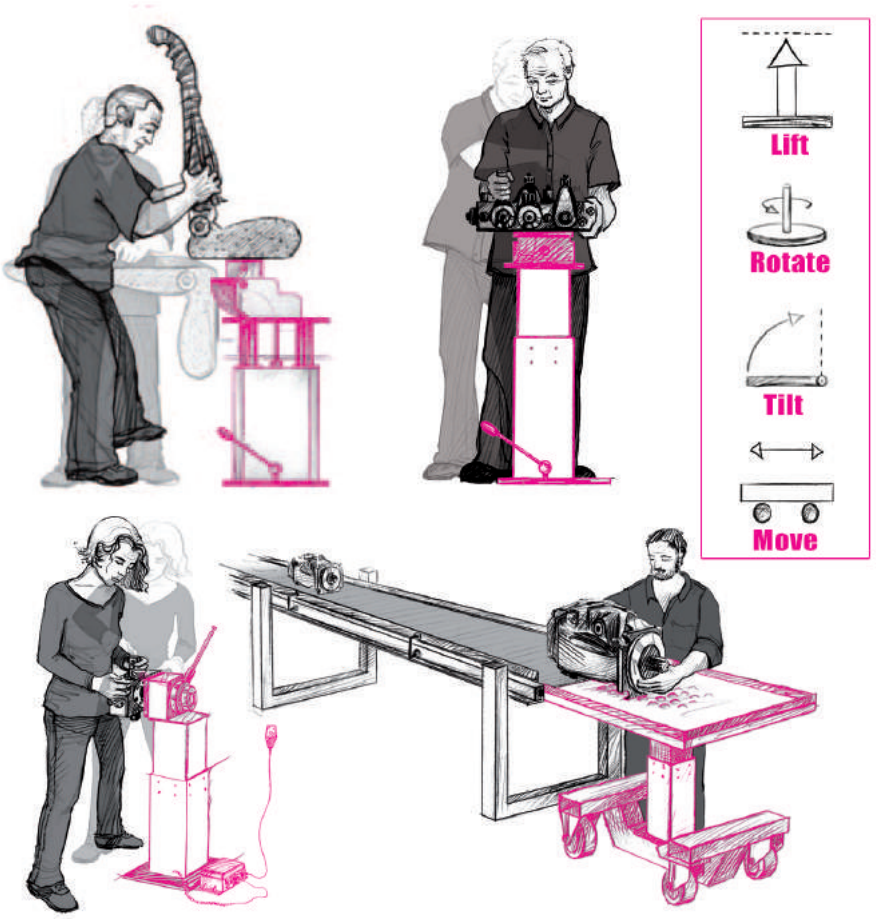
Rifton then researched others in the field, and found that linear actuators from Carr Lane Roemheld were comparable to the original design. "After acquiring samples, and submitting them to an exhaustive validation/testing process, we determined that the new product was actually an upgrade on several fronts," said Wareham. "Prior to making a final decision, we then paid a visit to the Carr Lane Roemheld facility in Fenton, Missouri, in the hopes of establishing a strong and long-term relationship."

A linear actuator from Carr Lane Roemheld was built in to the base of the chair to allow height adjustment. The chair is designed for ease in therapy, feeding and other activities, with a client weight up to 225 lbs.

Wareham continued to find benefits to the new partnership. "Carr Lane Roemheld offered a price that would save us a significant amount of money. They also made some minor design modifications to meet our requirements, including custom packaging specifications. Our designers felt that the Carr Lane Roemheld pump was actually an upgrade in quality. Because Carr Lane Roemheld agreed to hold stock for us, and to deliver on a one-week lead time, we were able to reduce our inventory by over $100,000. We also received a visit from an engineer from the manufacturing plant in Germany, to review quality expectations and design features; this was very helpful. Carr Lane Roemheld also offered us an early-pay discount. Although there was a minor problem with the first order, they stood behind their product and resolved the issue for us in a timely fashion."

The bottom line? "I would certainly highly recommend Carr Lane Roemheld as a valued supplier to any business," Wareham said.

Versatile Modular Units For Assembly and Handling



Modular Units Enhance Productivity in Assembly Operations

- Combine our modular units to Lift, Tilt, Rotate or Move your assembly
- Easily move your assembly to optimal position to increase productivity and reduce fatigue
- Preset positions for long runs or adjustable locations for flexibility

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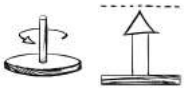
Modular Units
Application and combination examples

Lifting module operated by foot pedal with rotating module vertical axis

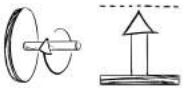


Here a complex hydraulic subassembly requires access to 5 sides during the installation of its components.

The employee can rotate the workpiece 360˚ in both directions about the vertical axis of this rotating module. Now the employee can select the most ergonomic position via manual or electric operation. Model versions with indexing are available too; standard index angles are 45˚, 60˚, 90˚, 120˚.

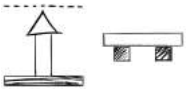
The appropriate working height is adjusted by the foot pedal of the self-contained hydraulic lifting module.

Lifting module operated by hand pendant with rotating module horizontal axis



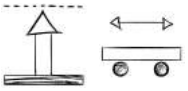
Multi-shift organizations know that every shift change also ushers in the change of each and every employee's size and ability. Modular combinations adapt to such changes and this one is composed of two modules: electric lift and horizontal-axis rotating. The electric lifting module effortlessly adjusts to an employee's height via a hand or foot push-button pendant. The horizontal-axis rotating module does just what its name implies; it spins a workpiece about its horizontal axis. It has 360˚ of rotation in both directions. Push or pull your workpiece to rotate the version without indexing or automatically index to your next position using the hand-lever or foot-pedal versions.

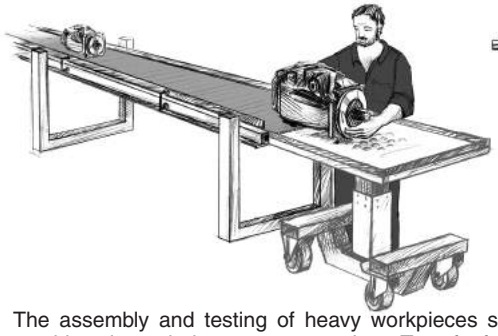
Electrically operated lifting module in sync



Assembly of truck axles is carried out by two employees at the same time. Components are installed and fastened from above as well as from both ends. The working height is adjusted via a foot pendant that controls two synchronized electric lifting modules. The synchronized lifts guarantee a level work surface throughout the entire stroke. The lifting modules are mounted to a floor module to improve stability.

Lifting module operated by hand pendant with rotating module horizontal axis





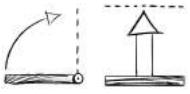
The assembly and testing of heavy workpieces such as axial piston machines is carried out at many stations. Transfer from station to station is made easy by fastening a tabletop plate to a hydraulic lift module that is mounted on top of a cart module.

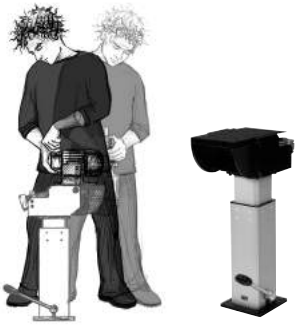
Applying the brake on the cart module locks the unit in place. The operator can easily raise or lower the tabletop by pumping the foot pedal of the hydraulic lifting module.

Lifting module operated by foot pedal with tilting module and rotating module vertical axis

Optimum assembly of car seats requires the ability to quickly and easily move the seat into different positions. This modular combination allows the employee to raise, lower, rotate and tilt the seat. The tilting module is equipped with a pneumatic balancer that counteracts almost all of the tilting torques. This means very little force is required of the employee to tilt heavy objects.

Lifting module operated by foot pedal with tilting module





Here the employee is carrying out the final assembly of an electric motor followed by a series of tests.

The working height is adjusted by the foot pedal of the hydraulic lifting module. The tilting module mounted on top of the lifting module allows the employee to tilt the motor back and forth by 90˚. The integrated pneumatic-counterbalance feature makes tilting the motor a nearly effortless task.

The *modulog* module principle

All *modulog* modules in the program summary can be used individually, since they are independent functional units.
In addition, all modules which are in one column on top of each other can be combined to multi-functional units.

Modules

Rotating module - horizontal axis

The rotating module horizontal axis effects a rotatory movement around the horizontal axis of the workpiece. Rotation of the workpiece is made manually either directly at the workpiece or by means of an operation, for example a hand lever at the rotating module. Indexing of the rotational position is 4 x 90°. Alternatively models with electric drive are available.

Tilting module

The tilting module effects a rotatory, reversible swivel movement around a defined axis between the final positions 0° and 90°. Tilting of a workpiece is made manually, the weight of the workpiece will be balanced. Indexing of the final positions is 0° and 90°.
Alternatively models with electric drive are available.

Rotating module - vertical axis

The rotating module vertical axis effects a rotatory movement around the vertical axis of the workpiece. Rotation of the workpiece is made directly at the workpiece. Indexing of the rotational position is 4 x 90°. Alternatively models with electric drive are available.

Lifting modules

Lifting modules effect a guided, translational movement in the vertical axis.
The lifting movement is effected power-supported by a hydraulic or electrical actuator against the weight of the workpiece to be moved.
The lowering movement is a defined lowering by use of the weight.

Cart modules

Cart modules offer the possibility to displace manually individual modules or module combinations with workpieces.
All cart modules are equipped with a parking brake.

Floor modules

Floor modules compensate unevennesses of the floor place and guarantee a high stability.
The offer includes two versions with one or two mounting plates for mounting of other *modulog* modules.

Operations

manual

Modules marked with this symbol are operated by hand. Operation is effected directly at the workpiece or at the assembly fixture.

Hand lever

Operation of the module is made by means of a hand lever acting directly at the cinematics.

Foot pedal

Operation of the module is made hydraulically by pumping on a foot pedal.
Defined lowering by lifting the foot pedal.

Hand panel

Operation of the module is made electrically by means of a hand panel touching the buttons "up" and "down". The module is supplied and controlled via a connecting cable by an electrical supply unit. Also the hand panel is connected to the electrical supply unit.

Foot switch

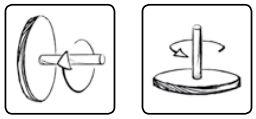
Operation of the module is made electrically by means of a foot panel touching the buttons "up" and "down". The module is supplied and controlled via a connecting cable by an electrical supply unit. Also the foot panel is connected to the electrical supply unit.

Maximum load

For each module the maximum load is indicated in kg. The load may also be eccentrically, since the modules are in the position to compensate load moments.
Information on the exact admissible load moments is indicated on the corresponding data sheets.
As a rule, the load limits and the potential combinations of modules are determined by the maximum occurring torques.

The *modulog* module programme for handling technology

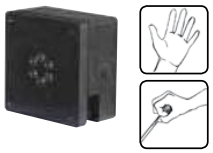
Rotating modules



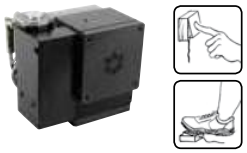
horizontal

200 kg

800 Nm

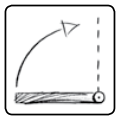


Data sheet M 1.101



Data sheet M 1.201

Tilting modules



KMB 100

100 kg

500 Nm

Data sheet M 2.101

Lifting modules

Basic

100 kg

100 Nm

200 to 600 mm stroke
Data sheet M 4.101

Shop Floor Telescope

100–200 kg

500 Nm

300 to 1,000 mm stroke
Data sheet M 4.202

Range

100–200 kg

500 Nm

440 to 940 mm stroke
Data sheet M 4.203

Cart modules

WMS 200

200 kg

Data sheet M 5.101

WMS 600

600 kg

Data sheet M 5.101

Floor modules

FMS 600

600 kg

for one lifting module
Data sheet M 6.101

FMD 800

800 kg

for two lifting modules
Data sheet M 6.201

Clamping modules

Clamping modules mechanical

Data sheet M 8.300

Clamping modules hydraulic

Data sheet M 8.301

Quick-change mounting plate

Data sheet M 8.302

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vertical

600 kg

800 Nm

Data sheet M 1.301

Data sheet M 1.201

KMB 100

100 kg

230 Nm

ROEMHELD Information M012

Shop-Floor

100-600 kg

500 Nm

200 to 600 mm stroke
Data sheet M 4.301

Strong

600 kg

800 Nm

200 to 400 mm stroke
Data sheet M 4.401

Solid

400-600 kg

1000 Nm

200 to 400 mm stroke
Data sheet M 4.402

Twin-Strong

400-600 kg

2000 Nm

200 to 400 mm stroke
Data sheet M 4.501

Electrical accessories

Control modules

Data sheet M 8.200

Power supply for mobile systems with battery

Data sheet M 8.201

Electrical operating elements

Data sheet M 8.203

Plates

Base plates

Data sheet M 8.100

Adaptor plates

Data sheet M 8.110 / M 8.120

Table plates

Data sheet M 8.130 / M 8.131

Rotating Module - Horizontal Axis DMH 200
Max. load 2,000 N
manual operation

Advantages
- Rotating in both directions
- Safe indexing
- Rotating and indexing possible by one-hand operation
- Compact device
- Sturdy design for industrial assembly
- Allows ergonomic working
- Safe and quick handling in assembly processes
- 4 function variants
- Easily combinable with other *modulog* modules

Application
Rotating module for universal use in assembly and handling processes in the industry.

Principal use
- Gear assembly
- Motor assembly
- Pump construction
- Turning operations during product transfer

Material

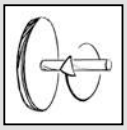
Body:	steel, black oxide
Rotating plate:	steel, black oxide
Indexing mechanism:	steel, hardened
Bearing:	steel, hardened

Description
The rotating module - horizontal axis DMH is a double supported rotation axis that can compensate high axial and radial forces. The angle of rotation in both directions is 360°. Due to special bearings it is insensitive to shocks and thrusts.
The design of the rotating module allows its integration in applications with light as well as with heavy loads.
When using the rotating module in assembly processes, component parts can be rotated rationally, quickly and safely and can be assembled ergonomically from all sides.
The rotating module is equipped with an optional indexing (see page 3 to 5 of this series).

Mounting
To fix *modulog* modules or components of the user, the rotating module has a 140 x 140 *modulog* interface in the flange plate and the body.
In addition, at the bottom of the body 4 fixing threads are provided to allow vertical mounting of the rotating module.
As accessory for the vertical mounting onto other *modulog* modules an adaptor plate with an 140 x 140 *modulog* interface is available.
As accessory for individual fixing holes a round flange plate without 140 x 140 interface is available.

Operation
The basic version of the rotating modules does not have any operating elements.
The rotating operation is manually effected at the workpiece or at the assembly fixture. Alternatively, versions with hand lever are available.
The indexing is operated by a hand lever of the rotating module or a separate hand lever or foot pedal.

modulog
Rotating module – horizontal axis DMH 200



Part-no. 650X-0X-XX-X-X

Technical characteristics

Max. load:	2,000 N
Max. torque:	
axial:	800 Nm
radial:	800 Nm
Angle of rotation:	360°

Operations
- Manual
- Hand lever

Indexing
Operation with
- Hand lever
- Foot pedal

Combinable with the modules
- Tilting module KMB 100 as per data sheet M 2.101

- Rotating module – vertical axis DMV 600 as per data sheet M 1.301

- Lifting module as per data sheet M 4.XXX

***modulog* interfaces**
- Flange plate: 140 x 140 - M10
- Body: 140 x 140 - Ø 10.5 mm

Accessories
- Adaptor plates as per data sheet M 8.110
- Flange plate as per data sheet M 8.120

Version without indexing
manual operation

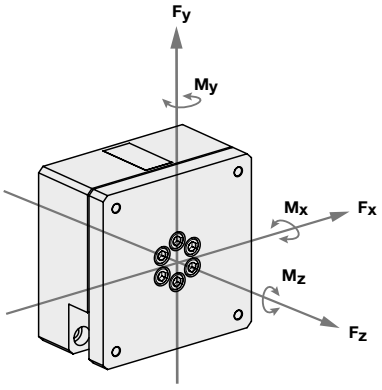
Description
The rotating module - horizontal axis DMH 200 does not have an indexing in its basic version. The rotating operation is manually effected at the workpiece or at the assembly fixture.

Part-no. **6505-02-36-O**

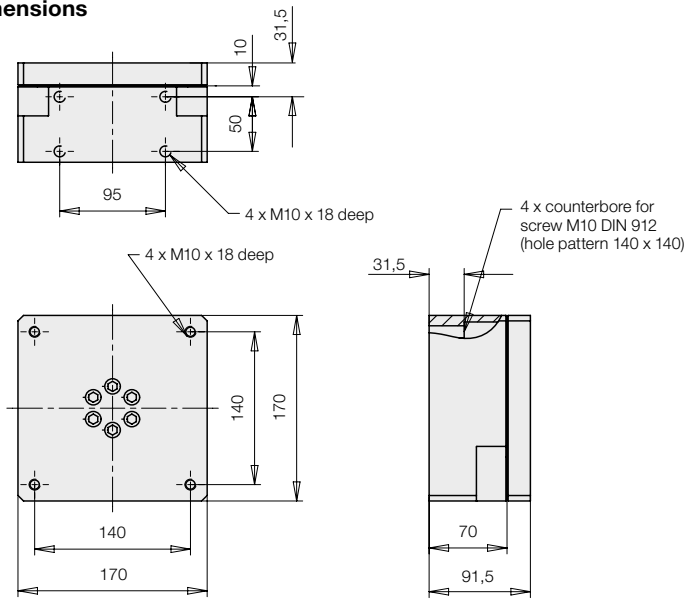
Technical characteristics

Operation:	manual at the component part
Angle of rotation:	360°
Direction of rotation:	both directions
Indexing:	without
Weight:	14 kg

Maximum admissible load



Dimensions



Maximum admissible forces:
F_x = ± 2,000 N
F_y = ± 2,000 N
F_z = ± 1,000 N

Maximum admissible torques
Total $M_{x/y}$ = 800 Nm
M_z: only relevant for version with indexing (see page 3 to 6 of this series)

In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position the indicated maximum torques may occur.
The forces and torques have to be considered by the operator. During the rotating motion only 50 % of the maximum values are admitted.

Accessories

• Adaptor plate
for vertical mounting
of the rotating module
Part-no. 6311-326
See data sheet M 8.110

• Flange plate
round for individual fixing holes
Part-no. 6311-400
See data sheet M 8.120

Important notes!
The fixing screws M10 are not included in our delivery.
The rotating module is designed for applications within closed rooms.

Automatic indexing
operation with hand lever

Description
The rotating module - horizontal axis DMH 200 with automatic indexing is a compact and functional unit.
Rotating as well as indexing are ergonomically operated by one hand lever only.

Operation
To rotate the component part the hand lever is operated in any direction.
Every 90° indexing of the position is made automatically. Engagement and disengagement of the indexing is also effected automatically.
The off-position of the hand lever can be engaged in steps of 90°, so that for every rotation the desired off-position can be adjusted.
The standard indexing and engagement positions of the hand lever are set to 4 x 90°.

Part-no. **6505-01-36-M**

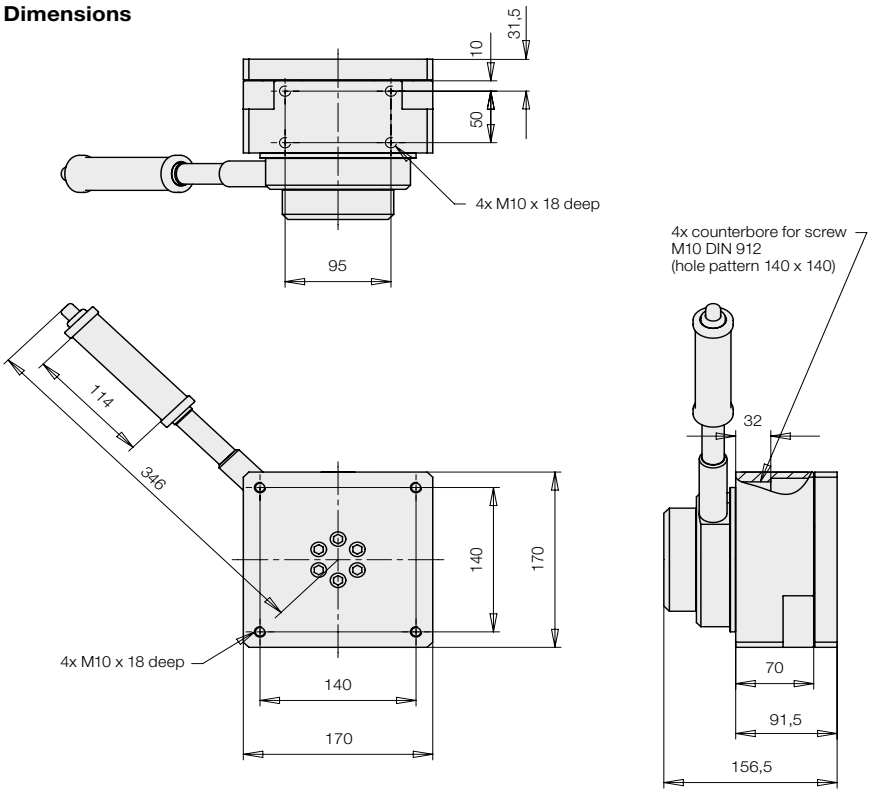
Technical characteristics

Operation:	with hand lever
Angle of rotation:	360°
Direction of rotation:	both directions
Indexing:	mechanical, automatic Operation with hand lever Indexing positions 4 x 90° Positioning precision < ±1°
Weight:	19 kg

Maximum admissible load
According to the version without indexing (see previous page).

Maximum admissible torque around the rotation axis M_Z
The maximum torque around the rotation axis of the rotating module M_Z in engaged mode is **250 Nm**.
The maximum torque to rotate the workpiece must not exceed **15 Nm**.
The module may only be moved in a controlled way to the indexing positions. If the indexing bolt engages in full motion, the module will be dynamically overloaded.

Dimensions



Application example

Rotating module DMH 200, with adaptor plate vertically mounted on a lifting module.

Accessories
• Adaptor plate
for vertical mounting of the rotating module of the rotating module
Part-no. 6311-326
See data sheet M 8.110

• Flange plate
round for individual fixing holes
Part-no. 6311-400
See data sheet M 8.120

Important notes!
In case of vertical mounting of the rotating module - for example on a lifting module - it has to be considered that the hand lever can only be rotated by max. 270° in such applications.
The fixing screws M10 are not included in our delivery. (Recommended property class 10.9)
The rotating module is designed for applications within closed rooms.

Actively operated indexing operation with hand lever

Description
The rotating module - horizontal axis DMH 200 with actively operated indexing is a compact and functional unit.
Rotating as well as indexing are ergonomically operated by one hand lever only.

Operation
To unlock the indexing position the hand lever has to be tilted in axial direction by approx. 10° to get connected by form fit with the rotating module.
The component part can only be rotated in any direction by means of the hand lever. Only after safe locking in the desired position the hand lever is free again and the workpiece locked with the housing by form fit.
The off-position of the hand lever can be engaged in steps of 90°, so that for every rotation the desired off-position can be adjusted.
The standard indexing and engagement positions of the hand lever are set to 4 x 90°.

Part-no. **6505-02-36-M**

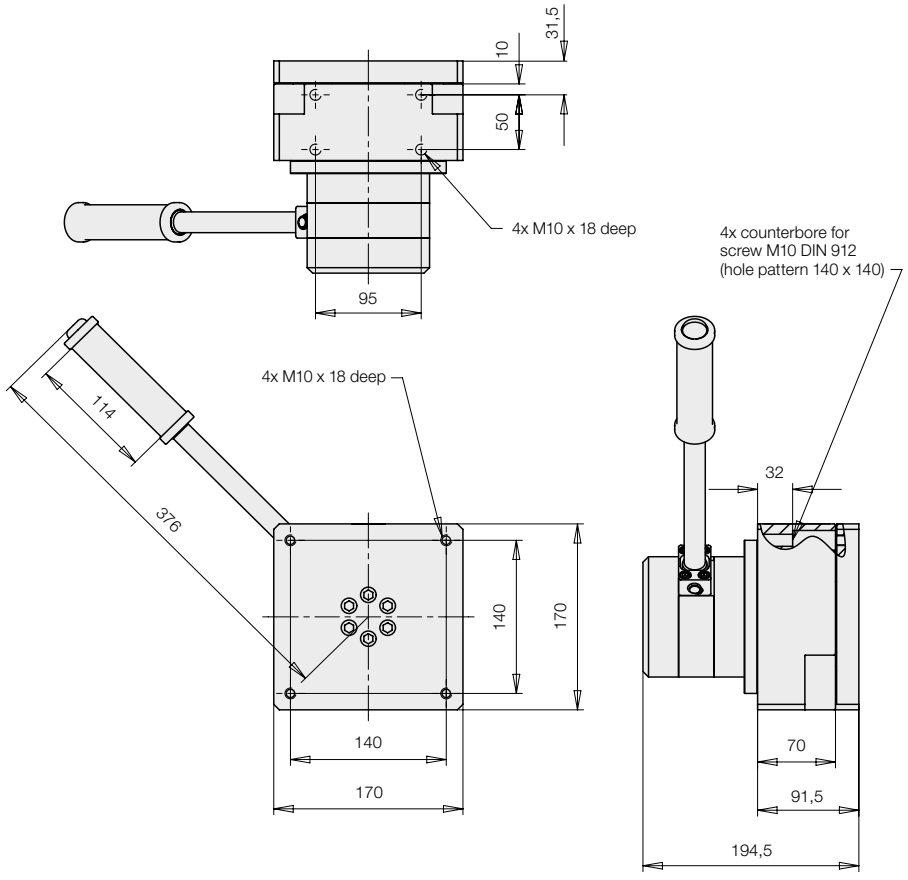
Technical characteristics

Operation:	with hand lever
Angle of rotation:	360°
Direction of rotation:	both directions
Indexing:	mechanical, actively operated with hand lever Indexing positions 4 x 90° Positioning precision < ±1°
Weight:	19 kg

Maximum admissible load
According to the version without indexing (see page 2 of this series).

Maximum admissible torque around the rotation axis M_Z
The maximum torque around the rotation axis of the rotating module M_Z in engaged mode is **500 Nm**.
The maximum torque to rotate the workpiece must not exceed **20 Nm** due to ergonomic reasons.
The module may only be moved in a controlled way to the indexing positions. If the indexing bolt engages in full motion, the module will be dynamically overloaded.

Dimensions

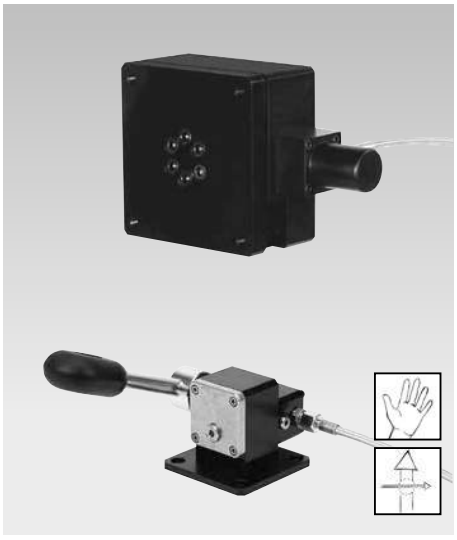


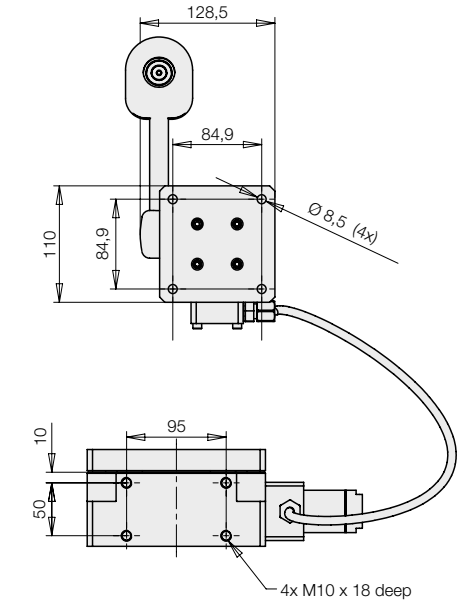
Accessories
• Adaptor plate
for vertical mounting of the rotating module of the rotating module
Part-no. 6311-326
See data sheet M 8.110

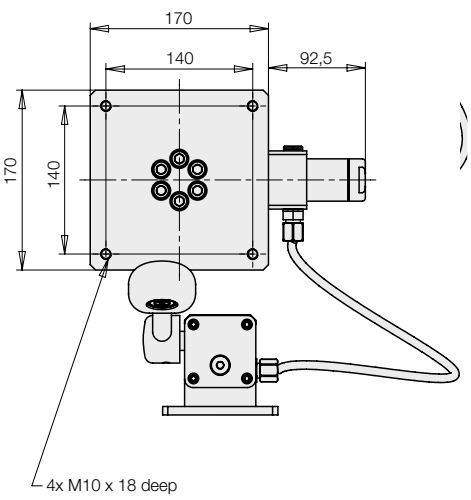
• Flange plate
round for individual fixing holes
Part-no. 6311-400
See data sheet M 8.120

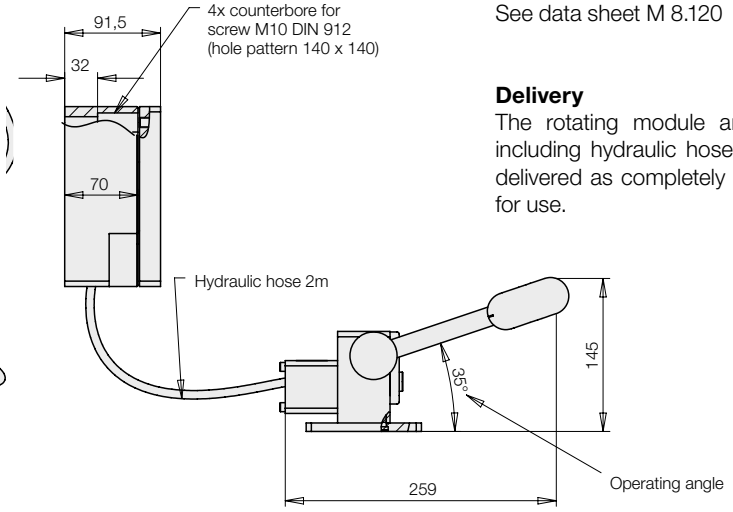
Important notes!
In case of vertical mounting of the rotating module - for example on a lifting module - it has to be considered that the hand lever can only be rotated by max. 270° in such applications.
The fixing screws M10 are not included in our delivery (recommended property class 10.9).
The rotating module is designed for applications within closed rooms.

Indexing with foot pedal
manual operation









Description
The rotating module - vertical axis DMH 200 with indexing with foot pedal is a compact and functional unit.
It consists of a basic module with integrated indexing mechanism and an operating unit with foot pedal, connected by a 2 m long hydraulic hose.
This flexible connection allows the individual placement of the operating unit at the most favourable ergonomic position.
The rotating operation is manually effected at the workpiece or at the assembly fixture.

Operation of the indexing
By operating the foot pedal by 35° downwards the index is released and the workpiece or the fixture can be rotated.
If the foot pedal is not operated, the index bolt engages automatically into the next indexing position.
The operation with a foot pedal guarantees that the operator always has both hands free.
The standard indexing positions are set to 8 x 45°, 6 x 60°, 4 x 90° and 3 x 120°. Other angles are available on request.

Important notes!
The fixing screws M10 are not included in our delivery (recommended property class 10.9).

The rotating module is designed for applications within closed rooms.
The module may only be moved in a controlled way to the indexing positions. If the indexing bolt engages in full motion, the module will be dynamically overloaded.

Code for part numbers
Part-no.: 6508-02-XX-O-I

Engagement position
45 = 8 x 45°
60 = 6 x 60°
36 = 4 x 90°
12 = 3 x 120°

Technical characteristics

Operation:	manual at the component part
Angle of rotation:	360°
Direction of rotation:	both directions
Indexing:	hydromechanical Operation with foot pedal
Weight:	25 kg

Maximum admissible torque around the rotation axis M_Z
The maximum torque around the rotation axis of the rotating module M_Z in engaged mode is **800 Nm**.
In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position the indicated maximum torques may occur.
The forces and torques have to be considered by the operator. During the rotating motion only 50% of the maximum values are admitted.

Accessories
• Adaptor plate
for vertical mounting
of the rotating module
Part-no. 6311-326
See data sheet M 8.110

• Flange plate
round for individual fixing holes
Part-no. 6311-400
See data sheet M 8.120

Delivery
The rotating module and the indexing unit including hydraulic hose and hydraulic oil are delivered as completely assembled unit ready for use.

Carr Lane Roemheld Mfg. Co.
Sales — Phone (636) 386-8022 Fax (636) 386-8034
Engineering — Phone 1-800-827-2526 Web **roemheld-usa.com**

Rotating Module DMHe 200 / DMVe 600 Electrically operated

Max. load 2,000 N, max. torque 120 Nm

Advantages

- Versions for horizontal or vertical axis of rotation
- Rotating in both directions
- Auto stop
- Low-backlash gear
- Self-locking in any position
- Compact design
- Sturdy design
- Convertible
- Ergonomic working
- Safe and quick handling in assembly processes
- Long service life
- Checked in compliance with DIN EN 1570 with quadruple static overload

Principal use

- Assembly of automotive parts
- Motor assembly
- Gear assembly
- Pump construction

Operation

The module is operated with touch control by means of an optionally available hand panel or foot switch with two push-buttons. It can safely stop in every angular position. An automatic stop is preset at all 90° positions.
The zero position of the automatic stop can be preset to any position by pushing both push-buttons.

Description

Rotating modules are used in assembly and handling processes to transform electrical energy into a rotating movement.
When using the rotating module, component parts can be rotated rationally, quickly and safely and can be assembled ergonomically from all sides.
The strongly reduced worm gear allows high holding torques in standstill.

The double-bearing drive shaft compensates high axial and radial forces.

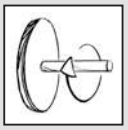
The rotating module is designed for a long service life. The electronically commutated DC motor is virtually wear-free.

The mechanical components and sealing elements are designed for 1,000,000 indexing cycles within the indicated load limits.

The rotating modules – horizontal axis and vertical axis are nearly identical in construction, thus the axis alignment can be retrofitted for different applications.

modulog rotating modules electrically operated

- horizontal axis DMHe 200



Part no. 6508-02-36-E

Max. load: 2,000 N

– vertical DMVe 600

Part no. 6509-10-36-E

Max. load: 6,000 N

Technical data

Angle of rotation:	360°
Max. torque:	120 Nm
Max. holding torque	350 Nm
Max. torque:	800 Nm
Rotation:	any
index:	90° standard optionally 45°/60°/180°

Operations

- Foot switch
- Hand panel

Combinable with the modules

Lifting modules

• Shop Floor Telescope:	as per data sheet M 4.202
• Range:	as per data sheet M 4.203
• Shop-Floor:	as per data sheet M 4.301
• Strong:	as per data sheet M 4.401
• Solid:	as per data sheet M 4.402

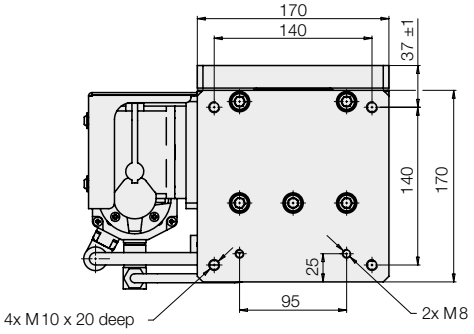
***modulog* interfaces**

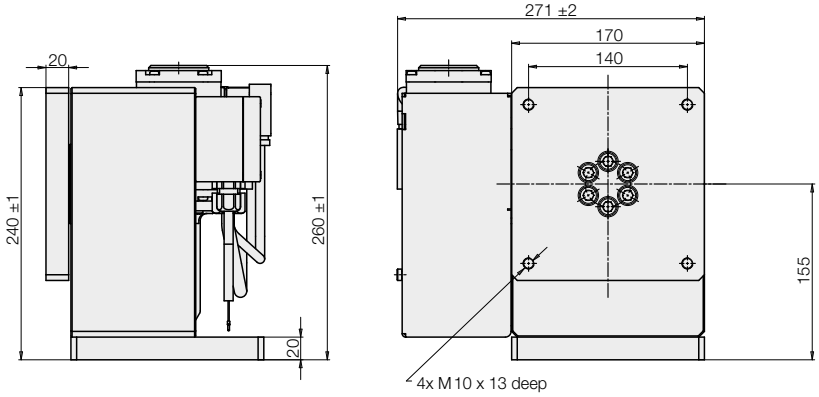
• Flange plate:	140 x 140 - M10
• Body:	140 x 140 - M10

Accessories

• Switching power supply	**Part no. 6863-020**
• Hand panel	as per data sheet M 8.203
• Foot switch	as per data sheet M 8.203

Dimensions





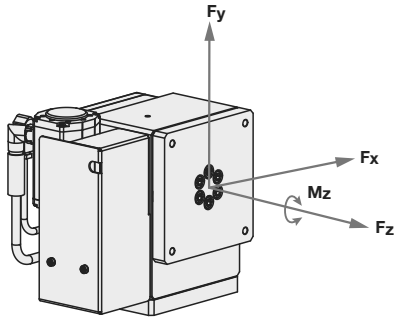
Part no. 6508-02-36-E

Technical data

Max. total F_X/F_Y	[N]	2,000
Max. F_Z	[N]	1,000
Max. driving torque M_Z	[Nm]	120
Max. holding torque M_Z	[Nm]	350
Max. total of all torques $M_X/M_Y/M_Z$	**[Nm]**	**800**
Max. cycle time (ED)		25 %, 60 s On
Code class		IP 54
Current consumption	[A]	6 … 16
Max. admissible current consumption	[A]	20
Supply voltage	[V DC]	24 – 30

Adjust the speed of rotation by trimming potentiometer 2.5 to 7.5 rpm.
Adjust the indexing angles 45, 60, 90 and 180 degree by trimming potentiometer.
Adjust the soft stops by trimming potentiometer.

Maximum admissible load



Maximum admissible forces:
F_X = ± 2,000 N
F_Y = ± 2,000 N
F_Z = ± 1,000 N

Maximum admissible torques:
M_X or M_Y = 800 Nm
M_Z = 350 Nm (in standstill)

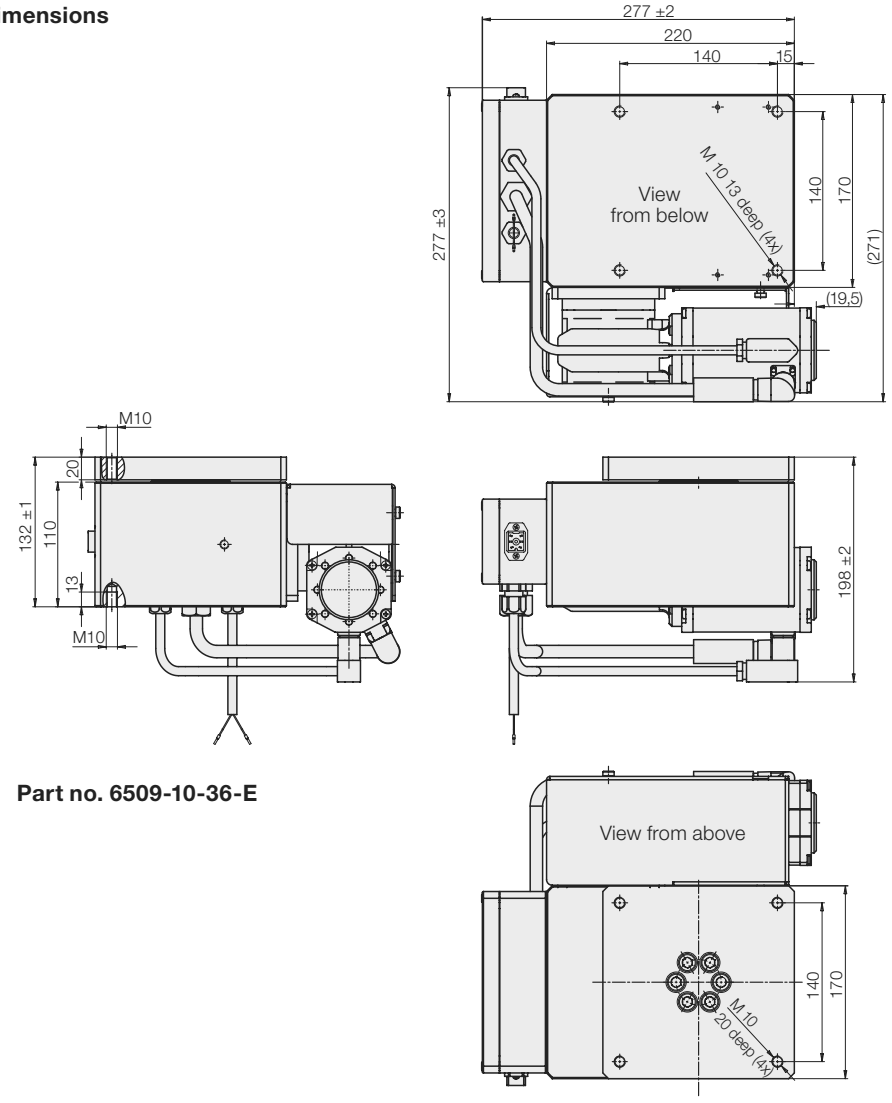
The total of all occurring forces or torques must not exceed the highest single value.

The rotating module is checked in compliance with DIN EN 1570 with quadruple static overload.

Installation

The rotating module has a *modulog* interface 140 x 140 mm and can be mounted by 4 screws M10 onto a fixture or another module.
The power supply is made by the separately available switching power supply.
An electronic control is integrated.

Dimensions



Part no. 6509-10-36-E

Technical data

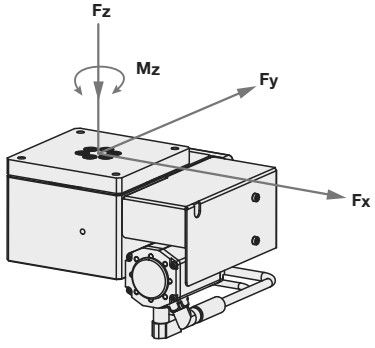
Max. total F_X/F_Y	[N]	2,000
Max. F_Z	[N]	6,000
Max. driving torque M_Z	[Nm]	120
Max. holding torque M_Z	[Nm]	350
Max. total of all torques $M_X/M_Y/M_Z$	**[Nm]**	**800**
Max. cycle time (ED)		25 %, 60 s On
Code class		IP 54
Current consumption	[A]	6…16
Max. admissible current consumption	[A]	20
Supply voltage	[V DC]	24–30

Adjust the speed of rotation by trimming potentiometer 2.5 to 7.5 rpm.

Adjust the indexing angles 45, 60, 90 and 180 degree by trimming potentiometer.

Adjust the soft stops by trimming potentiometer.

Maximum admissible load



Maximum admissible forces:
F_X = ± 2,000 N
F_Y = ± 2,000 N
F_Z = + 6,000 N

Maximum admissible torques
M_X or M_Y = 800 Nm
M_Z = 350 Nm (in standstill)

The total of all occurring forces or torques must not exceed the highest single value.

The rotating module is checked in compliance with DIN EN 1570 with quadruple static overload.

Installation

The rotating module has a *modulog* interface 140x140 mm and can be mounted by 4 screws M10 onto a fixture or another module. The power supply is made by the separately available switching power supply.
An electronic control is integrated.
When mounting onto a flat surface an elevation of the module has to be provided because of protruding components.

Rotating Module - Vertical Axis DMV 200
Max. load 6,000 N
manual operation

Advantages
- Rotating in both directions
- Safe indexing
- Compact device
- Sturdy design for industrial assembly
- Allows ergonomic working
- Safe and quick handling in assembly processes
- Easily combinable with other *modulog* modules

Application
Highly-stressable rotating module for universal use in assembly and handling processes in the industry.

Principal use
- Assembly of car seats
- Motor assembly
- Plant construction
- Construction of power units

Material

Body:	steel, black oxide
Rotating plate:	steel, black oxide
Indexing mechanism:	steel, hardened
Bearing:	PTFE

Mounting
To fix *modulog* modules or components of the user, the rotating module has a 140 x 140 *modulog* interface in the flange plate and the body.
As accessory for individual fixing holes a round flange plate without 140 x 140 interface is available.

Description
The rotating module - horizontal axis DMV is a plain bearing rotation axis that can compensate high axial and radial forces. The angle of rotation in both directions is 360°.
Due to special bearings it is insensitive to shocks and thrusts.
The design of the rotating module allows its integration in applications with light as well as with heavy loads.
When using the rotating module in assembly processes, component parts can be rotated rationally, quickly and safely and can be assembled ergonomically from all sides.
The rotating module is equipped with an optional indexing (see page 3 of this series).

Operation
The basic version of the rotating modules does not have any operating elements.
The rotating operation is manually effected at the workpiece or at the assembly fixture.
The indexing is operated by a foot pedal.

modulog
Rotating module – vertical axis DMV 600
Part-no. 650X-10-XX-O-X

Technical characteristics

Max. load:	6,000 N
Max. torque:	
axial:	800 Nm
radial:	800 Nm
Angle of rotation:	360°

Operations
- Manual

Indexing
Operation with
- Foot pedal

Combinable with the modules
- Rotating module – horizontal axis DMH 200 as per data sheet M 1.101

- Tilting module KMB 100 as per data sheet M 2.101

- Lifting module as per data sheet M 4.XXX

modulog interfaces
- Flange plate: 140 x 140 - M10
- Body: 140 x 140 - Ø 10.5 mm

Accessories
- Flange plate as per data sheet M 8.120

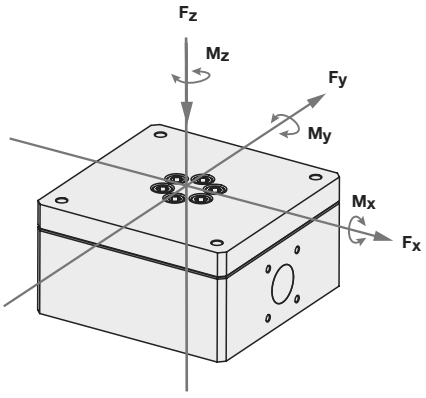
Description
The rotating module - vertical axis DMV 600 does not have an indexing in its basic version. The rotating operation is manually effected at the workpiece or at the assembly fixture.

Part-no.: **6506-10-36-O**

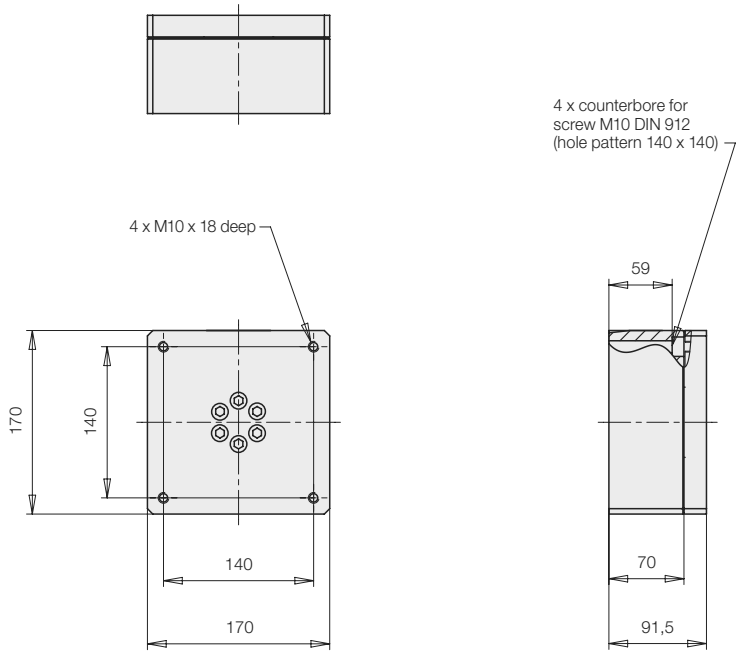
Technical characteristics

Operation:	manual at the component part
Angle of rotation:	360°
Direction of rotation:	both directions
Indexing:	without
Weight:	15 kg

Maximum admissible load



Dimensions



Maximum admissible forces:
F_x = ± 2,000 N
F_y = ± 2,000 N
F_z = + 6,000 N

Maximum admissible torques
Total $M_{x/y}$ = 800 Nm
M_z: only for type with indexing (see next page)

In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position the indicated maximum torques may occur.
The forces and torques have to be considered by the operator. During the rotating motion only 50 % of the maximum values are admitted.

Accessories
• Flange plate
round for individual fixing holes
Part-no. 6311-400
See data sheet M 8.120

Important notes!
The fixing screws M10 are not included in our delivery. (Recommended property class min. 8.8)
The rotating module is designed for applications within closed rooms.

Version with indexing manual operation

Description
The rotating module - vertical axis DMV 600 with pedal-operated indexing is a compact and functional unit.
It consists of a basic module with integrated indexing mechanism and an operating unit with foot pedal, connected by a 2 m long hydraulic hose.
This flexible connection allows the individual placement of the operating unit at the most favourable ergonomic position.
The rotating operation is manually effected at the workpiece or at the assembly fixture.

Operation of the indexing
By operating the foot pedal by 35° downwards the index is released and the workpiece or the fixture can be rotated.
If the foot pedal is not operated, the index bolt engages automatically by spring force into the next indexing position. Release of the index is made by means of the sturdy hydraulics.
The operation with a foot pedal guarantees that the operator always has both hands free.
The standard indexing positions are set to 8 x 45°, 6 x 60°, 4 x 90° and 3 x 120°.
Other angles are available on request.

Code for part numbers
Part-no.: **6509-10-XX-O-I**

Engagement position
45 = 8 x 45°
60 = 6 x 60°
36 = 4 x 90°
12 = 3 x 120°

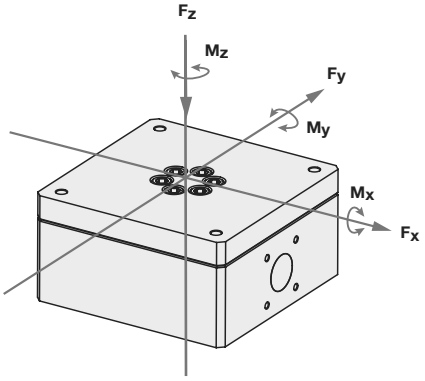
Technical characteristics

Operation:	manual at the component part
Angle of rotation:	360°
Direction of rotation:	both directions
Indexing:	hydromechanical Operation with foot pedal
Weight:	25 kg

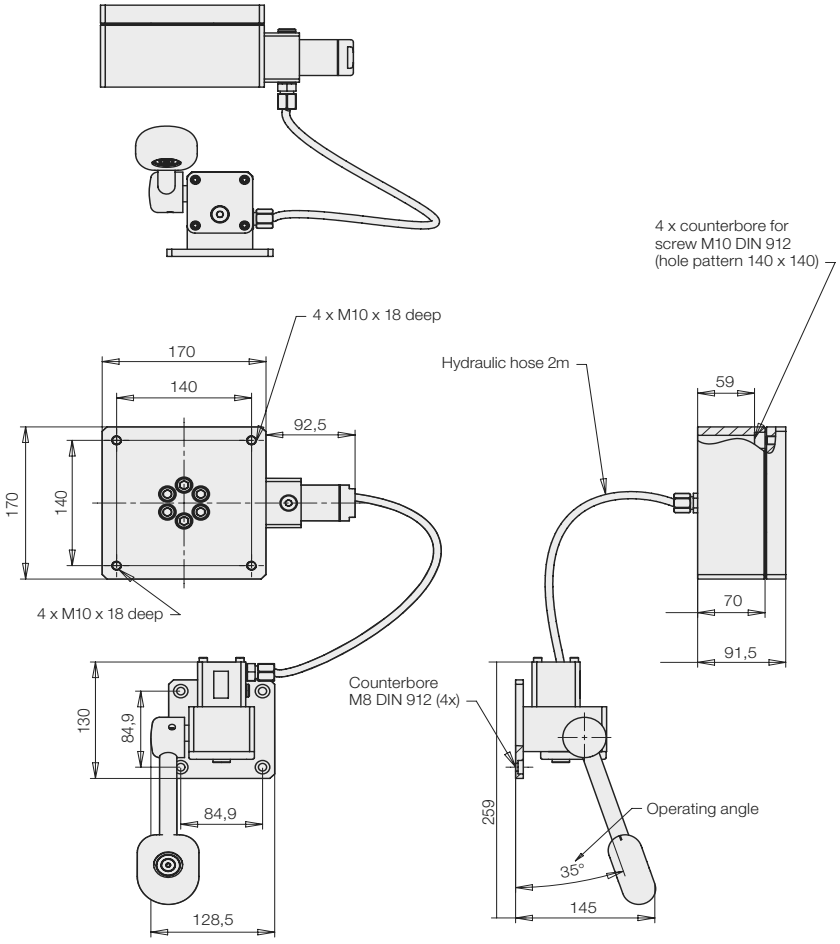
Delivery
The rotating module and the indexing unit including hydraulic hose and hydraulic oil are delivered as completely assembled unit ready for use.

Important notes!
The fixing screws M10 are not included in our delivery.
The rotating module is designed for applications within closed rooms.
The module may only be moved in a controlled way to the indexing positions. If the indexing bolt engages in full motion, the module will be dynamically overloaded.

Maximum admissible load



Dimensions



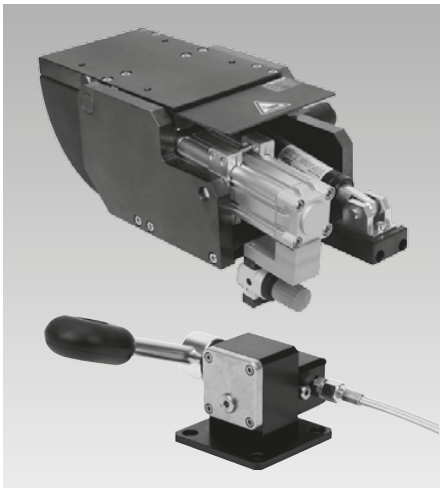
Maximum admissible forces:
F_X = ± 2,000 N
F_Y = ± 2,000 N
F_Z = + 6,000 N

Maximum admissible torques
Total $M_{X/Y}$ = 800 Nm

Maximum admissible torque around the rotation axis M_Z
The maximum torque around the rotation axis of the rotating module M_Z in engaged mode is **800 Nm**.
In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position the indicated maximum torques may occur.
The forces and torques have to be considered by the operator. During the rotating motion only 50% of the maximum values are admitted.

Accessories
• Flange plate
round for individual fixing holes
Part-no. 6311-400
See data sheet M 8.120

Tilting Module KMB 100
Max. load 1,000 N, load balanced manual operation



Advantages
- Easy tilting and fixing of components in angle positions 0° and 90°
- Compensation of the tilting torques by pneumatic balancer and brake cylinder
- Locking of individual tilting positions 0°/90°
- High load potential
- Suitable for table mounting
- Good accessibility from all sides
- Optimised ergonomics
- Easily combinable with other *modulog* modules

Application
Tilting module for universal use in assembly and handling processes in the industry.

Principal use
- Assembly of car seats
- Motor assembly
- Plant construction
- Construction of power units

Material
Body:	steel, black oxide
Rotating plate:	steel, black oxide
Body balancer:	aluminium
Body indexing:	aluminium
Indexing mechanism:	steel, hardened

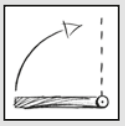
Fixation
To fix *modulog* modules or components of the user, the tilting module has a 140 x 140 interface in the flange plate and the body.

Important notes
The pneumatic balancer requires compressed air supply.

Description
The tilting module KMB 100 with pedal-operated indexing offers the possibility of easy manual tilting of heavy components by ±90° and their reliable fixing.
The tilting module is equipped with a pneumatic balancer that compensates almost completely generated torques during tilting. Therefore only little forces are required for tilting of the component part.
The balancer is adapted to the weight of the component part by a pneumatic pressure reducing valve.
The operating unit of the indexing is connected by a 2 m long hydraulic hose to the tilting module.
This flexible connection allows the individual placement of the operating unit at the most favourable ergonomic position.
The standard indexing positions are set to 0° and 90°. Other engagement positions are available on request (e.g. 0, 30, 45, 60 and 90 degrees).
The tilting module is equipped with a hydraulic brake for maximum operating safety.

Operation
The tilting module does not have any operating elements. The tilting operation is effected manually directly at the component part or at the assembly fixture.
The indexing is operated by a foot pedal. By operating the foot pedal by 35° the index is released and the component part or the fixture can be tilted.
If the foot pedal is not operated, the index bolt engages automatically into the next indexing position.
The operation with a foot pedal guarantees that the operator always has both hands free.

modulog Tilting module



Part-no. 6507-01-90-OIL

Technical data
Max. load:	1,000 N
Max. torque:	500 Nm
Max. balanceable torque:	180 Nm

Operation
- Manual

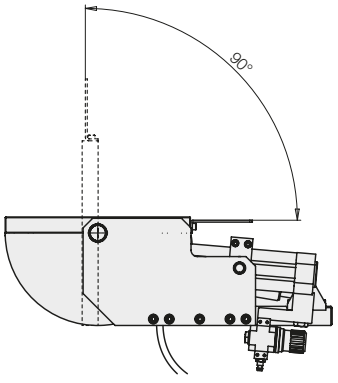
Indexing
Indexing angle: 0 / 90°
Operation by pedal

Combinable with the modules
- Rotating module - vertical axis DMV 1000 as per data sheet M 3.101

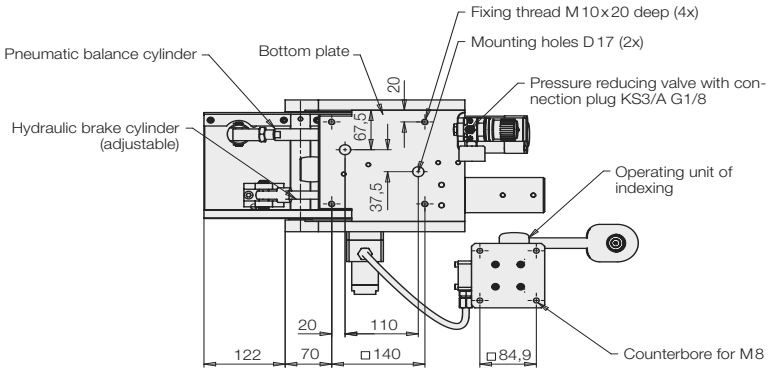
- Lifting modules as per data sheet M 4.XXX

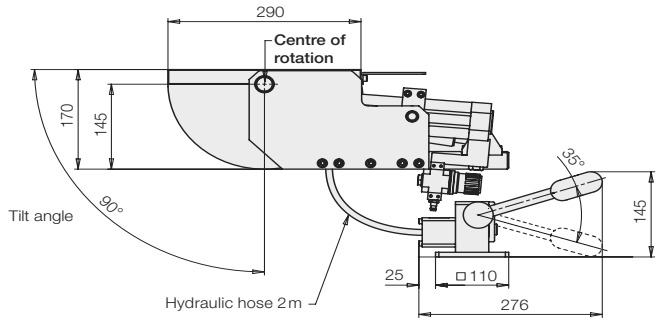
modulog interfaces
- Flange plate 140 x 140 - M10
- Body: 140 x 140 - Ø 10.5 mm

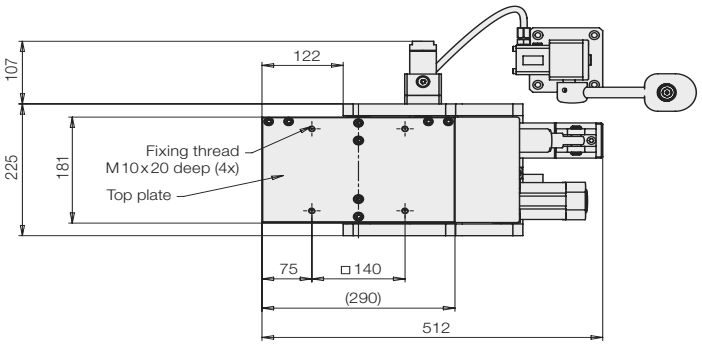
Functional principle



Dimensions





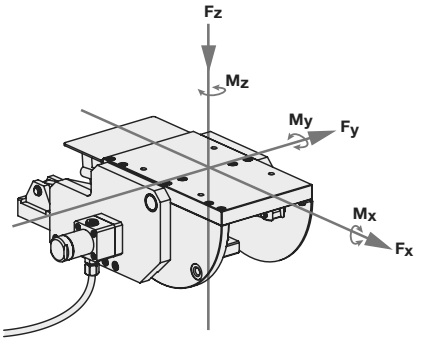


Part-no. **6507-01-90-OIL**

Technical data

Operation:	manual
Tilting angle:	0° and 90°
Balancer:	pneumatic, max. balanceable torque 180 Nm (with regard to the centre of rotation) compressed air 0 to 10 bar (adjusting range)
Indexing:	hydro-mechanical, operation with foot pedal indexing positions 0° / 90° positioning precision < ±1°
Weight:	55 kg

Maximum admissible load



Maximum admissible forces:

Fx = ± 1,000 N

Fy = ± 1,000 N

Fz = + 1,000 N

Maximum admissible torques

Mx or **Mz** = 500 Nm

My = 500 Nm (for the engaged mode)

My = 180 Nm (for the engaged mode)

The total of all occurring forces or torques must not exceed the highest single value.

Application example

Tilting module KMB 100 – mounted on lifting module Shop-Floor

Delivery

The tilting module and the indexing unit are delivered as a completely assembled unit ready for use.

Important notes

The adjusted compensation weight or torque is always effective. Therefore the tilting module must only be loaded and unloaded in horizontal position. In tilted position, unlocking must not be made without load.

For the pneumatic connection a compressed air coupling ND 7.2 is recommended.

The fixing screws M10 are not included in our delivery.

The tilting module is designed for applications within closed rooms.

Balanceable torque

The pneumatic balancer can balance torques up to 180 Nm.

The torque, which will be balanced, depends on the existing pneumatic pressure that can be adjusted at the pneumatic pressure reducing valve of the balancer.
Range of adjustment: 0 to 10 bar

Tilting module KME 100
max. load 1,000 N, electrical operation

M2.201
Issue 10-16 E

Advantages
- Easy tilting and fixing of components in angle positions 0° and 90°
- Holds self-locking in any intermediate position
- High load potential
- Good accessibility from all sides
- Easily combinable with other *modulog* modules
- Ergonomic working conditions
- Safe and quick working

Application
Tilting module for universal use in assembly and handling processes in the industry.

Principal use
- Assembly of car seats
- Motor assembly
- Plant construction
- Construction of power units

Fixing and installation
For fixing of *modulog* modules or other components of the user, the tilting module has an interface 140 x 140 at the base plate and the tilting clamping surface.

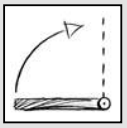
Mains cable 5 x 1.5 mm²
To be connected by the customer to the terminal strip in the control module (mains cable is not included in our delivery).

Operation
Tilting is made in touch control with hand panel or foot switch. After releasing the hand panel or foot switch, the tilting movement will be stopped immediately.

Description
The electric tilting module is equipped with a worm gear motor and offers the possibility to tilt components by up to 90° and to hold them in position in non-actuated mode. The desired position is approached by pressing a hand panel or foot switch in touch control.
When the push-button is released, the tilting module stops in any desired position.
The tilting module is automatically stopped by sensors in the positions 0° and 90°.
With the electric tilting module, assembly processes can be realised quickly and efficiently. Ergonomic working conditions are fulfilled.

Available on request:
Tilting position 0, 30, 60 and 90 degrees.
Tilting position 0, 30, 45, 60 and 90 degrees.
Tilting position 0, 45 and 90 degrees.

modulog
Tilting module



Part no. 6400-752

Technical data
Max. load:	1,000 N
Max. torque:	230 Nm

in relation to the rotating axis

Operation
- Foot switch
- Hand panel

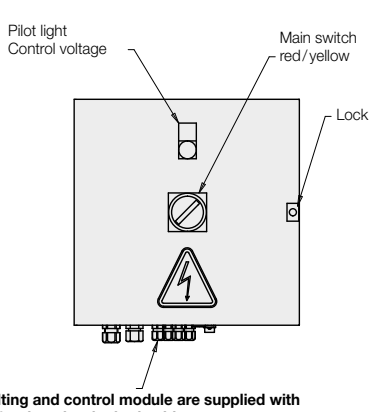
Combinable with the modules
- Rotating module – vertical axis DMV 600 as per data sheet M 1.301

- Lifting modules as per data sheet M 4.XXX

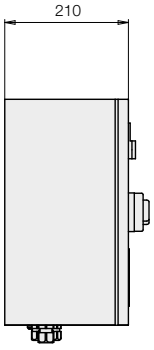
modulog interfaces
- Flange plate: 140 x 140 - M10
- Body: 140 x 140 - Ø 10.5 mm

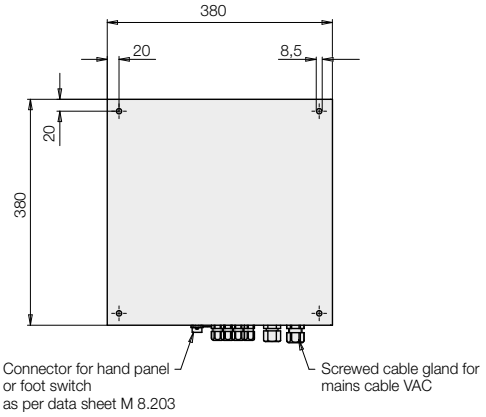
Accessories
- Electrical operating elements as per data sheet M 8.203

Control module 6862-717
included in our delivery

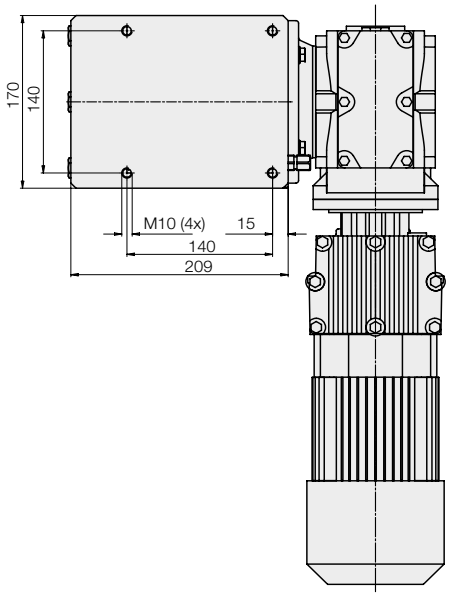


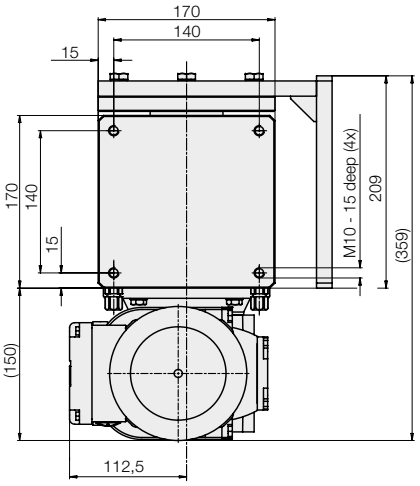
Tilting and control module are supplied with a 3 m long hard-wired cable.

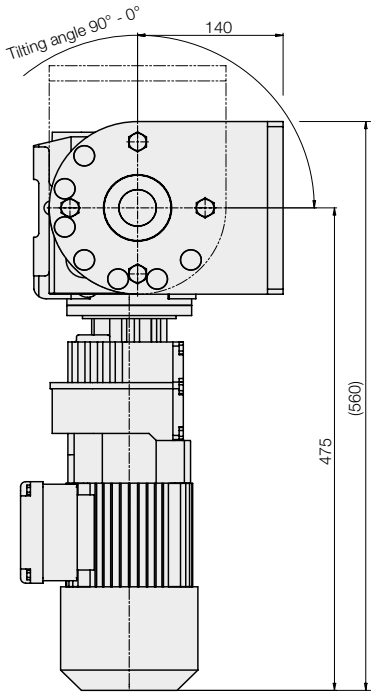




Dimensions





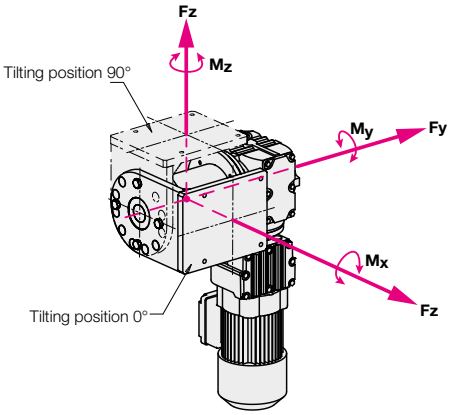


Part no. 6400-752

Technical data

Operation	Switching contact or foot switch or hand panel
Tilting angle	0° to 90°
Supply voltage	230 V, 50 Hz
Code class	IP 54
Max. rotation speed	4.5 min^{-1}

Maximum admissible load



Maximum admissible forces

Fx = ± 1,000 N
Fy = ± 1,000 N
Fz = ± 1,000 N

Maximum admissible torques

Mx = 100 Nm
My = 230 Nm
Mz = 100 Nm

The total of all occurring forces or torques must not exceed the highest single value.

Delivery

The electrical tilting modules are delivered with control module ready for connection. Electrical operating elements are available as accessories.

Important notes!

The electrical tilting module is designed for applications within closed rooms.

Operation of Electrical Lifting Modules in Synchronism
Remarks for application

Application example: table plate with two lifting modules in synchronism

Synchronization

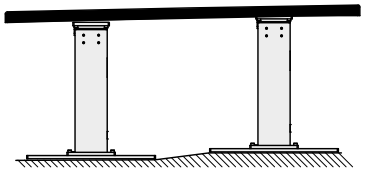
When operating two or more electrical lifting modules in synchronism, the following guidelines are to be observed:

- **Compensation of basic heights**
- **Parallel alignment**
- **Version with fixed and floating bearing**
- **Uniform load distribution**

Compensation of basic heights

When lifting modules are operated in synchronism, the top plates of the lifting modules must have the same height in retracted position.

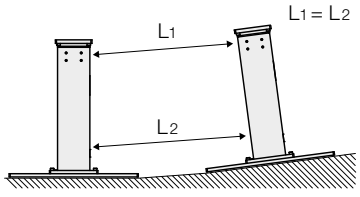
The differences in height of the customer's connecting construction are for example due to uneven floors or manufacturing tolerances must be compensated.



A flatness of the top plates of maximally 0.20 mm is required.

Parallel alignment

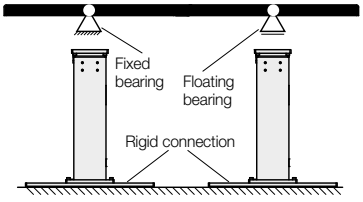
The lifting modules must be arranged parallel to each other, otherwise the guide of the lifting modules can be damaged by the resulting forces.



A parallelism of the lifting modules of maximally 0.50 mm is required.

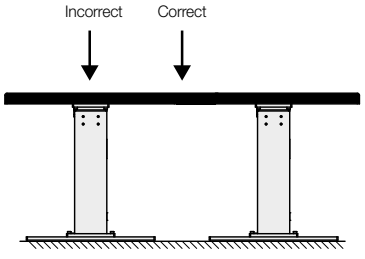
Version with fixed and floating bearing

When operating several lifting modules in synchronism, in practice, there are constantly small height differences between the individual lifting units which are recognized as control deviation from the synchronization control and are compensated.
This is the reason why lifting modules must not be firmly connected to the rigid connecting construction. Thus, the connection must be made with spherical bearings or elastic elements.
This is the only way to ensure that no tension will be produced when moving the lifting modules. The connection must be protected against the introduction of tensile and shearing forces.



Uniform load distribution

An unequal load distribution can cause an overload of the lifting modules.
The admissible lifting force of each lifting module must not be exceeded.



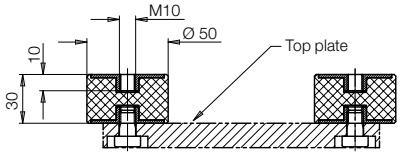
Achievable lifting forces

The achievable lifting force of several lifting modules in synchronism is not the sum of the lifting force of all individual lifting modules but smaller by a factor.
This is a result of the influences of the connecting construction and the interaction between the lifting modules.
In practice, the following correction factors have proven to be successful having regard to the above guidelines:

- 4 lifting modules
  max. lifting force = 4 x max. lifting force of the individual module x 0.6
- 3 lifting modules
  max. lifting force = 3 x max. lifting force of the individual module x 0.7
- 2 lifting modules
  max. lifting force = 2 x max. lifting force of the individual module x 0.8

Accessories

1 set of compensating elements consisting of:
4 off buffer, Ø 50 x 30 mm long
4 off socket head cap screw, M10 x 16
Part no. 0891-885



Note:

The compensating elements must only be subject to compressive load and not to tensile load!

Lifting Module Basic
Max. lifting force 1,000 N, stroke from 200 to 600 mm, manual-hydraulic version

M4.101

Issue 5-16 E

Advantages

- Elegant and slim design
- Optimised ergonomics
- Simple operation
- No coupling stroke required
- Working in ergonomically optimum height

modulog
Lifting module

Part no. 8910-01-X0-H

Technical characteristics

Max. lifting force: 1,000 N
Max. torque: 100 Nm
Stroke: 200 up to 600 mm

Operations

- Foot pedal

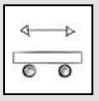
Kombinierbar mit den Modulen

- Rotating module - horizontal axis DMH 200 as per data sheet M 1.101

- Tilting module KMB 100 as per data sheet M 2.101

- Rotating module - vertical axis DMV 600 as per data sheet M 1.301

- Cart modules WMS as per data sheet M 5.101



- Floor modules FMS as per data sheet M 6.101

***modulog* interfaces**

- Top plate: 140 x 140 - Ø 10.5 mm
- Bottom plate 200 x 200 - Ø 10.5 mm

Accessories

- Base and adaptor plates as per data sheet M 8.100 and M 8.110
- Table plates as per data sheet M 8.130

Application

Lifting module for ergonomic design of working places.

Principal use

- Industrial assembly working places
- Height adjustment of assembly working places in workshops
- Maintenance works
- Assembly fixtures
- Adjusting systems in supply processes of mid-sized objects
- Handling systems for product packing and transfer

Description

The stroke movement is obtained by a hydraulic linear unit with single-lever actuation with oil being pumped by means of a piston pump into a plunger cylinder.

For lowering the oil returns by the weight of the load from the cylinder back to the reservoir.

The lifting units are ideal for height adjustment of tables, demonstration objects and similar equipments as well as for medical treatment equipments.

Fixing and installation

For fixing of *modulog* modules or other components of the user at the top plate the lifting module has an interface 140 x 140.

For fixing of *modulog* modules at the bottom plate the lifting module has an interface 200 x 200.

If the lifting module has to be fixed on a flat level floor, 4 screws M10 of property class 10.9 as well as heavy-duty plugs have to be used.

For increased stability also a base plate, which can be delivered as accessory, can be fixed at the bottom plate.

Operation

To lift the load, the foot pedal has to be depressed by approx. 45° several times. The pedal returns to its off-position by means of a return spring.

For a stroke of 100 mm 8 pump motions are required.

To descend the load, the foot pedal has to be moved upwards by approx. 10°.

Material

Lifting profile:	aluminium, naturally anodised
Top and bottom plate	aluminium, black anodised

Carr Lane Roemheld Mfg. Co.
Sales — Phone (636) 386-8022 Fax (636) 386-8034
Engineering — Phone 1-800-827-2526 Web **roemheld-usa.com**

Technical characteristics

Stroke [mm]	A [mm]	A+Stroke [mm]	Weight [kg]
200	420	620	9.5
300	520	820	10
400	620	1020	11.5
500	720	1220	13
600	820	1420	14.5

Important notes!

To descend the lifting module a minimum load of approx. 200 N is required.
The lifting module must only be pressure loaded. The centre of gravity should be within the traverse of the fixing screws.
If the centre of gravity is outside, the dowelled joint with the floor has to be dimensioned correspondingly. In such cases it is recommended to use a larger base plate.

In case of eccentric load of more than 250 mm, the column cannot descend automatically because of too high friction forces.

The lifting module is designed for applications within closed rooms.

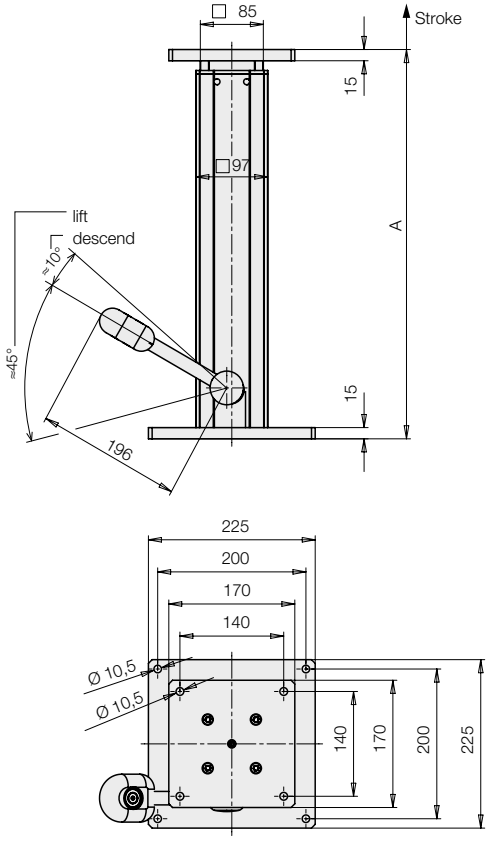
Code for part numbers

Part no. 8910-01-X0-H

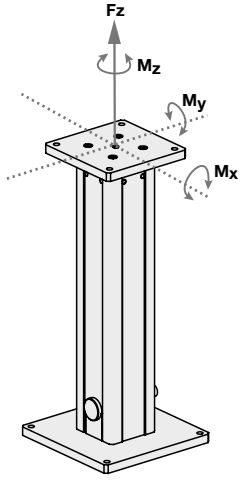
Stroke

2 = 200 mm
3 = 300 mm
4 = 400 mm
5 = 500 mm
6 = 600 mm

Dimensions



Maximum lifting force and maximum admissible torque load



Maximum lifting force Fz: 1,000 N

Maximum torque load:

Total Mx/y: 100 Nm

Mz: 50 Nm

In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position the indicated maximum torques may occur.
The forces and torques have to be considered by the operator. During the lifting motion only 50% of the maximum values are admitted.

Accessories

Base plate for increased stability
Part no.: 6311-412
See data sheet M 8.100

Lifting Module Shop-Floor Telescope

Max. lifting force 1,000 and 2,000 N, stroke from 300 to 600 mm, manual-hydraulic and electro-mechanical version

M 4.202

Issue 9-16 E

Advantages

- Low basic height
- Large strokes
- Simple and intuitive operation
- Working in ergonomically optimum height
- Sturdy industrial design
- Increase of quality in manufacturing and assembly processes
- Short amortisation time
- Increase of assembly throughput and productivity
- High level of safety against static overloads
- Checked in compliance with DIN EN 1570 with quadruple static overload

Application

Lifting module for workshop applications in the industry.

Principal use

- Industrial assembly working places
- Height adjustment of assembly working places in workshops
- Service
- Assembly fixtures
- Adjusting systems in supply processes of mid-sized objects
- Handling systems for product packing and transfer

Description

The lifting module Shop-Floor Telescope is particularly suitable for lifting and lowering assembly fixtures, working tables and demonstration objects in industrial applications as well as for medical treatment equipments in medical applications.

In general, lifting modules are used as base unit of devices for controlled lifting and lowering of loads or for height adjustment only. This version excels particularly by the low base height and the very high strokes.

Fixing and installation

For fixing of *modulog* modules or other components of the user at the top plate the lifting module has an interface 140 x 140.

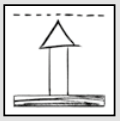
For fixing of modulog modules at the bottom plate the lifting module has an interface 200 x 200. This plate can also be used to fix the lifting module on a flat level floor. For fixing 4 screws M10 of property class 10.9 as well as heavy-duty plugs are to be used.

For increased stability also a base plate, which can be delivered as accessory, can be fixed at the bottom plate.

Material

Lifting profile:	aluminium, naturally anodised
Top and bottom plate:	aluminium, black anodised

modulog Lifting module



Part no. 8918-0X-X0-X

Technical data

Max. lifting force:	1,000, 2,000 N
Max. bending moment:	500 Nm
Stroke:	300 to 1,000 mm

Operations

- Foot pedal
- Foot switch
- Hand panel



Combinable with the modules

- Rotating modules – horizontal axis
  DMH 200 as per data sheet M 1.101,
  DMHe 200 as per data sheet M 1.201

- Tilting modules
  KMB 100 as per data sheet M 2.101
  KME 100 as per data sheet M 2.201

- Rotating modules – vertical axis
  DMV 600 as per data sheet M 1.301,
  DMVe 600 as per data sheet M 1.201

- Cart modules
  WMS
  as per data sheet M 5.101

- Floor modules
  FMS as per data sheet M 6.101
  FMD as per data sheet M 6.201

modulog interfaces

- Top plate: 140 x 140 - Ø 10.5 mm
- Bottom plate: 200 x 200 - Ø 10.5 mm

Accessories

- Electronic control modules for 1, 2, 3 or 4 lifting modules as per data sheet M 8.200
- Control modules with battery holder as per data sheet M 8.201
- Electrical operating elements, lines and connectors as per data sheet M 8.203
- Base and adaptor plates as per data sheet M 8.100 and M 8.110
- Table plates as per data sheet M 8.130 and M 8.131

Manual-hydraulic version
operation with foot pedal

Description

The stroke movement is obtained by a hydraulic linear unit with single-lever actuation with oil being pumped by means of a piston pump into a plunger cylinder.

During retraction the oil returns due to the weight of the load from the cylinder back to the reservoir. A defined speed reduction is effected, independent of the load.

The manual-hydraulic variant is particularly sturdy and durable. This variant meets high safety demands and withstands jerking and knocking loads in applications.

According to the application 2 different force levels can be selected. The number of pump strokes depends on the force level.

Code for part numbers

Part no. **8918-0X-X0-H**

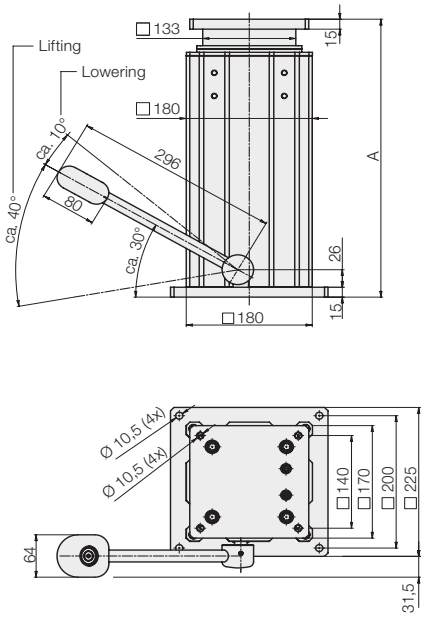
Maximum lifting force

1 = 1,000 N
2 = 2,000 N

Stroke

3 = 300 mm
4 = 400 mm
6 = 600 mm
8 = 800 mm
10 = 1,000 mm

Dimensions



Accessories

Base plate for increased stability
See data sheet M 8.100

Operation

To lift the load, the foot pedal has to be depressed by approx. 40° several times. The pedal returns to its off-position by means of a return spring.

To lower the load, the foot pedal has to be moved upwards by approx. 10°.

Stroke	A	A + stroke	Weight
[mm]	[mm]	[mm]	[kg]
300	420	720	15
400	470	870	20
600	570	1,170	25
800	670	1,470	30
1,000	770	1,770	35

Lifting force	Pump strokes per 100 mm	Descent speed
[N]		[mm/s]
1,000	2.2	approx. 90
2,000	3.5	approx. 60

Important notes!

To descend the lifting module a minimum load of approx. 200 N is required.

The lifting module must only be pressure loaded. The centre of gravity should be within the traverse of the fixing screws. If the centre of gravity is outside, the dowelled joint with the floor has to be dimensioned correspondingly.

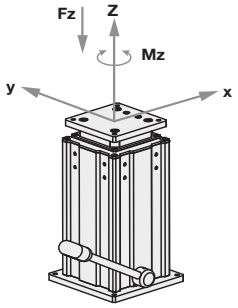
In such cases it is recommended to use a larger base plate.

In case of eccentric load of more than 250 mm, the column cannot descend automatically because of too high friction forces.

The lifting module is designed for applications within closed rooms.

The hydro-manual lifting drive can not be oper-ated with synchronization control.

Maximum lifting force and maximum admissible torque load



Maximum lifting force F_Z
Alternatively 1,000 N, 2,000 N

Maximum torque load:

Total $M_X/_Y$: 500 Nm
M_Z: 300 Nm

In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position the indicated maximum torques may occur.

The forces and torques have to be considered by the operator. **During the lifting motion only 50 % of the maximum values are admitted.**

Electro-mechanical version
Operation with foot switch or hand panel

Description
The lifting motion is generated by an electric motor with a spindle lifting gear.
The electrically operated variant is particularly suitable for positioning and adjusting tasks of working tables as well as for material supply and transport.
They excel by a smooth running.

Operation
Lifting and lowering with hand panels or foot switches as per data sheet M 8.203 is triggered by touch control. After release of the push-button, the motion will be immediately stopped. The hand panel with memory function allows to store 5 positions, which can be approached via corresponding via corresponding position push-buttons. (for detailed description see data sheet M 8.203)

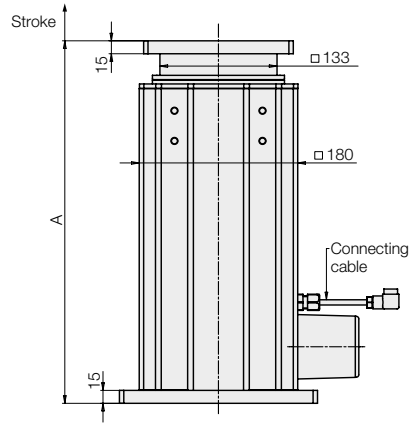
Synchronization
Up to 4 lifting modules can be operated with synchronization control by a corresponding control module.
For example complete lifting platforms can be designed.
For operation with synchronization control, only lifting modules with code letter G are suitable.
Control units with synchronization control for 2, 3, or 4 lifting modules are available.

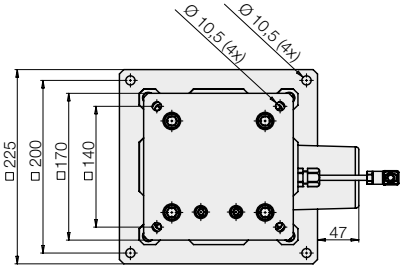
Code for part numbers
Part no. **8918-0X-X0-X**

Maximum lifting force
1 = 1,000 N (only for variant **E + B**)
2 = 2,000 N

Stroke
3 = 300 mm
4 = 400 mm
6 = 600 mm
8 = 800 mm
10 = 1,000 mm

Electronics
E = integrated stroke end disconnection (not suitable for synchronization control) with coiled connecting cable, 1.5 m
G = with incremental stroke measuring system (suitable for synchronization control) with smooth connecting cable, 2.5 m
I = with incremental stroke measuring system (suitable for memory function) with smooth connecting cable, 2.5 m
B = with incremental stroke measuring system (suitable for memory function and battery mode) with smooth connecting cable, 0.3 m

Dimensions




Technical data

Electric connection	Plug
Duty cycle	15 % ED
Code class	IP 54
Control voltage	24 V DC

Variant E, I and B

Lifting force	Lifting speed (load-dependent)	Current consumption (load dependent)
[N]	[mm/s]	[A]
1,000	32…28	7
2,000	18…16	6

Variant G

Lifting force	Lifting speed (load-dependent)	Current consumption (load dependent)
[N]	[mm/s]	[A]
2,000	18…16	6

Delivery
The lifting modules are delivered ready for connection. The connecting cable from the lifting module to the control module is included in the delivery. Operating elements as well as control modules and mains cables can be ordered separately as an accessory.

Electrical accessories required for a functional system:
- Control module as per data sheet M 8.200 or
- Control module with battery holder as per data sheet M 8.201
- Hand panels, foot switch and mains cable as per data sheet M 8.203

Accessories
Base plate for increased stability as per data sheet M 8.100

Important notes!
– Maximum admissible torque load as per manual-hydraulic version (see page 2) .
– The maximum pull force of the electro-mechanical version is 80 % of the push force!

Lifting Module Range
Max. lifting force 6,000 N, stroke from 440 to 940 mm, electro-mechanical telescope version

Advantages
- Low basic height
- Good accessibility
- Very high flexibility
- Improved productivity
- Simple integration
- Optimised ergonomics
- Simple operation

Application
Double telescopic lifting module for workshop applications in the industry.

Principal use
- Automation
- Drive technology, gears box assembly
- Couplings, cardan shafts
- Compressors, pumps, hydraulic elements
- Industrial fittings
- Materials-handling technology
- Automotive industry and their suppliers
- Mechanical engineering
- Building and agricultural machines
- Electronics

Fixing and installation
For fixing of modulog modules or other components of the user at the top plate, the lifting module has an interface 140 x 140.
The bottom plate with double interface 200 x 200 is used to fix the lifting module on the flat level floor.
For fixing, 6 screws M10 of property class 10.9 as well as heavy-duty plugs are to be used.
For increased stability, a base plate, which can be mounted to the bottom plate, is available as accessory. Fixing on the floor is made by means of the base plate.

Description
The drive of the telescopic lifting module Range consists of a 230 V A.C. motor and a spindle drive with trapezoidal spindle.
A motor brake in combination with the trapezoidal spindle guarantees safe holding of the driven position.
The telescopic guide unit consists of a precise aluminium profile section with a pre-stressed plain bearing with low friction and without clearance for exact positioning.
The compact construction with low height and small width guarantees an unhindered accessibility to the workpiece from all sides.
Mechanical and electric interfaces can be easily integrated in the process of automation.

Operation
The operation is made by hand panel or foot switch or alternatively by a primary electric control.
Lifting and lowering is triggered by push-buttons with touch control contact. After release of the push-button, the motion will be immediately stopped.

Material
Lifting profile:	aluminium, naturally anodised
Top and bottom plate:	aluminium, black anodised
Protection cap:	steel, black-lacquered

modulog Lifting module

Part no. 8924-02-XX-E

Technical data
Max. lifting force:	2,000 N
Max. torque:	500 Nm
Stroke:	440 to 940 mm

Operations
- Foot switch
- Hand panel

Combinable with the modules
- Rotating module – horizontal axis
  DMH 200 as per data sheet M 1.101,
  DMHe 200 as per data sheet M 1.201

- Rotating module – vertical axis
  DMV 600 as per data sheet M 1.301,
  DMVe 600 as per data sheet M 1.201

- Tilting modules
  KMB 100 as per data sheet M 2.101
  KME 100 as per data sheet M 2.201

modulog interfaces
- Top plate: 140 x 140 - Ø 10.5 mm
- Bottom plate: 200 x 200 - Ø 10.5 mm

Accessories
- Electrical operating elements
  as per data sheet M 8.203
- Mains cable 230 VAC
  see page 2
- Base and adaptor plates
  as per data sheet M 8.100 and M 8.110
- Table plates
  as per data sheet M 8.130 and M 8.131

Technical data

Lifting speed	70 mm/s
Electric connection	1/PE (230 VAC/50 Hz)
Rating	0.75 kW
Control voltage	24 VDC
Duty cycle	20 % ED
Code class	IP 54

Stroke [mm]	A [mm]	A + stroke [mm]	Weight [kg]
440	470	910	73
540	520	1060	77
740	620	1360	84
940	720	1660	91

Important notes

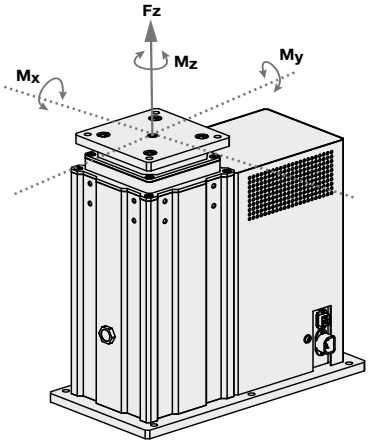
The lifting module must only be pressure loaded. The centre of gravity should be within the traverse of the fixing screws.
If the centre of gravity is outside, the dowelled joint with the floor has to be dimensioned correspondingly. In such cases it is recommended to use a larger base plate.
The lifting module is designed for applications within closed rooms. Not suitable for applications with impact load or vibration.

Code for part numbers

Part no. **8924-02-XX-E**

Stroke
44 = 440 mm
54 = 540 mm
74 = 740 mm
94 = 940 mm

Maximum lifting force and maximum admissible torque load

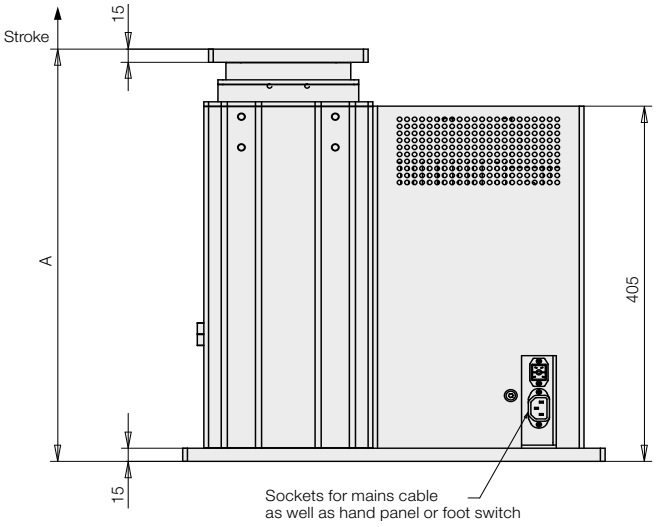


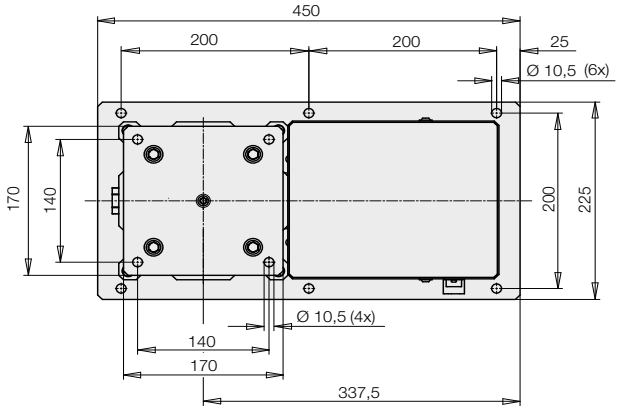
Maximum lifting force F_Z: 2,000 N

Maximum torque load
Total $M_{X/Y}$: 500 Nm
M_Z: 300 Nm

In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position the indicated maximum torques may occur.
The forces and torques have to be considered by the operator.
During the lifting motion only 50 % of the maximum values are admitted.

Dimensions





Delivery

The lifting modules are delivered ready for connection. Electrical operating elements and mains cables can be ordered separately as an accessory.

Electrical accessories required for a functional system:

- Hand panels and foot switch as per data sheet M 8.203
- Mains cable 230 VAC
  Mains cable, smooth with earthing type plug, 3 m
  Part no. 3829-202

Accessories

Base plate for increased stability
as per data sheet M 8.100

Lifting Module Shop Floor

Max. lifting force 1,000 to 6,000 N, stroke from 200 to 600 mm, manual-hydraulic and electro-mechanical version

M 4.301

Issue 10-16 E

Advantages

- Simple and intuitive operation
- Working in ergonomically optimum height
- Sturdy industrial design
- Increase of quality in manufacturing and assembly processes
- Short amortisation time
- Increase of assembly throughput and productivity
- High level of safety against static overloads

Application

Lifting module for workshop and assembly applications in the industry.

Principal use

- Industrial assembly working places
- Height adjustment of assembly working places in workshops
- Service
- Assembly fixtures
- Adjusting systems in supply processes of mid-sized objects
- Handling systems for product packing and transfer

Description

The lifting module Shop-Floor is particularly suitable for lifting and lowering assembly fixtures, working tables and demonstration objects in industrial applications as well as for medical treatment equipments in medical applications.

In general, lifting modules are used as a base unit of devices for controlled lifting and lowering of loads or for height adjustment only.

Fixing and installation

For fixing of *modulog* modules or other components of the user at the top plate the lifting module has an interface 140 x 140.

For fixing of modulog modules at the bottom plate the lifting module has an interface 200 x 200. This plate can also be used to fix the lifting module on a flat level floor. For fixing 4 screws M10 of property class 10.9 as well as heavy-duty plugs are to be used.

For increased stability, a base plate (separately available as an accessory) can be fixed to the bottom plate.

Material

Lifting profile:	aluminium, naturally anodised
Top and bottom plate:	aluminium, black anodised

modulog
Lifting module

Part no. 8915-0X-X0-X

Technical data

Max. lifting force:	1,000 up to 6,000 N
Max. bending moment:	500 Nm
Stroke:	200 to 600 mm

Operation

- Foot pedal
- Foot switch
- Hand panel



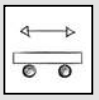
Combinable with the modules

- Rotating modules – horizontal axis
  DMH 200 as per data sheet M 1.101,
  DMHe 200 as per data sheet M 1.201

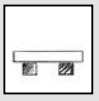
- Tilting modules
  KMB 100 as per data sheet M 2.101
  KME 100 as per data sheet M 2.201

- Rotating modules – vertical axis
  DMV 600 as per data sheet M 1.301,
  DMVe 600 as per data sheet M 1.201

- Cart modules
  WMS as per data sheet M 5.101



- Floor modules
  FMS as per data sheet M 6.101
  FMD as per data sheet M 6.201



modulog interfaces

- Top plate: 140 x 140 - Ø 10.5 mm
- Bottom plate: 200 x 200 - Ø 10.5 mm

Accessories

- Electronic control modules for 1, 2, 3 or 4 lifting modules as per data sheet M 8.200
- Control modules with battery holder as per data sheet M 8.201
- Electrical operating elements, lines and connectors as per data sheet M 8.203
- Base and adaptor plates as per data sheet M 8.100 and M 8.110
- Table plates as per data sheet M 8.130 and M 8.131

Manual-hydraulic version
operation with foot pedal

Description

The stroke movement is obtained by a hydraulic lifting drive with single-lever actuation, with oil being pumped by means of a piston pump into a plunger cylinder.
During retraction the oil returns due to the weight of the load from the cylinder back to the reservoir. A defined speed reduction is effected, independent of the load.
The manual-hydraulic variant is particularly sturdy and durable. This variant meets high safety demands and withstands jerking and knocking loads in applications.
According to the application 3 different force levels can be selected. The number of pump strokes depends on the force level.

Operation

To lift the load, the foot pedal has to be depressed by approx. 40° several times. The pedal returns to its off-position by means of a return spring.
To lower the load, the foot pedal has to be moved upwards by approx. 10°.

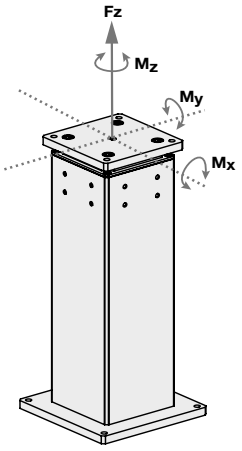
Code for part numbers

Part no. **8915-0X-X0-H**

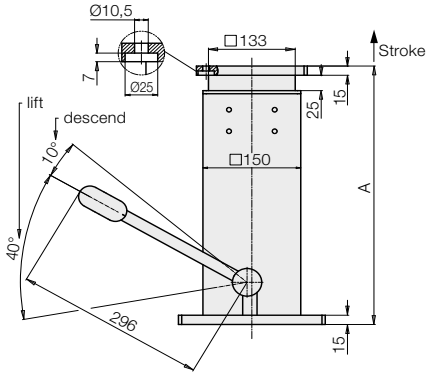
Maximum lifting force
2 = 2,000 N
4 = 4,000 N
6 = 6,000 N

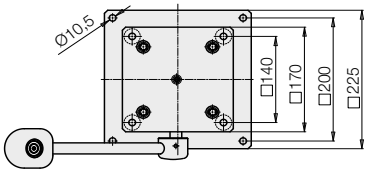
Stroke
2 = 200 mm
3 = 300 mm
4 = 400 mm
5 = 500 mm
6 = 600 mm

Maximum lifting force and maximum admissible torque load



Dimensions





Stroke	A	A + stroke	Weight
[mm]	[mm]	[mm]	[kg]
200	420	620	15
300	520	820	20
400	620	1,020	25
500	720	1,220	30
600	820	1,420	35

Lifting force	Pump strokes	Descent speed
[N]	per 100 mm	[mm/s]
2,000	5	approx. 45
4,000	7	approx. 22
6,000	9	approx. 22

Maximum lifting force F_Z

Optionally 2,000 N, 4,000 N or 6,000 N (1,000 N only for the electro-mechanical version)

Maximum torque load:

Total $M_X/_Y$: 500 Nm
M_Z: 300 Nm

In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position the indicated maximum torques may occur.
The forces and torques have to be considered by the operator. **During the lifting motion only 50 % of the maximum values are admitted.**

Accessories

- Base plate for increased stability as per data sheet M 8.100

Important notes!

To descend the lifting module a minimum load of approx. 200 N is required.

The lifting module must only be pressure loaded. The centre of gravity should be within the traverse of the fixing screws. If the centre of gravity is outside, the dowelled joint with the floor has to be dimensioned correspondingly. In such cases it is recommended to use a larger base plate.

In case of eccentric load of more than 250 mm, the column cannot descend automatically because of too high friction forces.

The lifting module is designed for applications within closed rooms.

The hydro-manual lift drive can not be operated with synchronization control.

Description

The lifting motion is generated by an electric motor with a spindle lifting gear.

The electrically operated variant is particularly suitable for positioning and adjusting tasks of working tables as well as for material supply and transport.

They excel by a smooth running.

Operation

Lifting and lowering with hand panels or foot switches as per data sheet M 8.203 is triggered by touch control. After release of the push-button, the motion will be immediately stopped. The hand panel with memory function allows to store 5 positions, which can be approached via corresponding via corresponding position push-buttons.
(for detailed description see data sheet M 8.203)

Synchronization

Up to 4 lifting modules can be operated with synchronization control by a corresponding control module.
For example complete lifting platforms can be designed.
For operation with synchronization control, only lifting modules with code letter G are suitable.
Control units with synchronization control for 2, 3, or 4 lifting modules are available.

Technical data

Electric connection	Plug
Duty cycle	15 % ED
Code class	IP 54
Control voltage	24 V DC

Variant E, I and B

Lifting force	Lifting speed (load-dependent)	Current consumption (load dependent)
[N]	[mm/s]	[A]
1,000	32 … 28	7
2,000	18 … 16	6
4,000	10 … 8	6
6,000	7 … 5	7.5

Variant G

Lifting force	Lifting speed (load-dependent)	Current consumption (load dependent)
[N]	[mm/s]	[A]
2,000	18 … 16	6
4,000	8 … 6	4.5
6,000	6 … 4	5.5

Code for part numbers

Part no. **8915-0X-X0-X**

Maximum lifting force
1 = 1,000 N (only for variant **E + B**)
2 = 2,000 N
4 = 4,000 N
6 = 6,000 N

Stroke
2 = 200 mm
3 = 300 mm
4 = 400 mm
5 = 500 mm
6 = 600 mm

Electronics
E = integrated stroke end disconnection
(not suitable for synchronization control)
with coiled connecting cable, 1.5 m
G = with incremental stroke measuring system
(suitable for synchronization control)
with smooth connecting cable, 2.5 m
I = with incremental stroke measuring system
(suitable for memory function)
with smooth connecting cable, 2.5 m
B = with incremental stroke measuring system
(suitable for memory function and battery mode)
with smooth connecting cable, 0.3 m

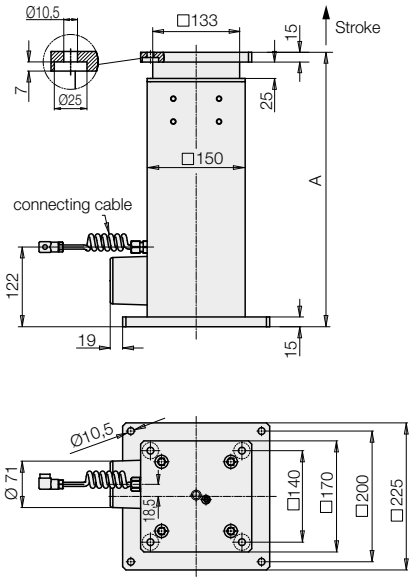
Delivery

The lifting modules are delivered ready for connection. The connecting cable from the lifting module to the control module is included in the delivery. Operating elements as well as control modules and mains cables can be ordered separately as an accessory.

Electrical accessories required for a functional system:

- Control module as per data sheet M 8.200
  or
- Control module with battery holder
  as per data sheet M 8.201
- Hand panels, foot switch and mains cable
  as per data sheet M 8.203

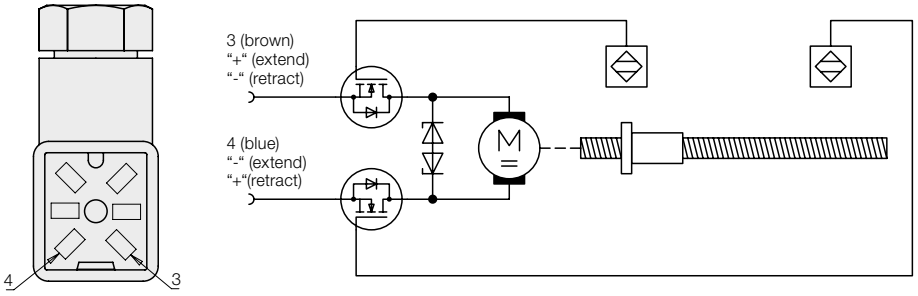
Dimensions



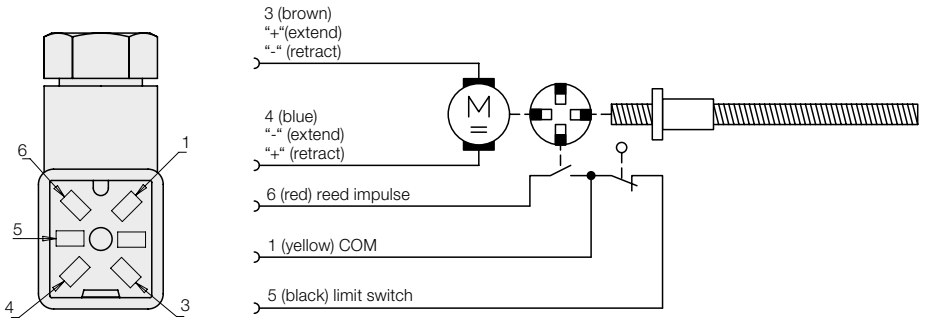
Accessories

- Base plate for increased stability
  as per data sheet M 8.100

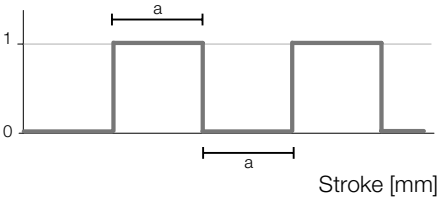
Circuit diagram and connection
plug-type connectors for lifting modules with stroke end disconnection (with last digit E)



Circuit diagram and connection
plug-type connectors for lifting modules with incremental stroke measuring system (with last digit I, B and G)



Resolution of the incremental stroke measuring system



1 kN: a = 0.75 mm stroke
2 kN: a = 0.75 mm stroke
4 kN: a = 0.5 mm stroke
6 kN: a = 0.375 mm stroke

Lifting Module Strong

Max. lifting force 6,000 N, stroke from 200 to 400 mm, manual-hydraulic and electro-mechanical version

Advantages

- Lifting force up to 6,000 N
- High load by steel guiding profile with high section modulus
- Rigid guiding system without clearance
- Sturdy and tough
- Compact design
- Ergonomic design
- Safe and precise handling

Application

Lifting modules for high demands in the industrial assembly.

Principal use

- Industrial production plants
- Automotive industry
- Assembly of car seats
- Drive technology, axes, cardan shafts
- Compressors, hydraulic elements, pumps
- Turbines, motors, gearbox construction
- Applications with frequent load changes

Fixing and installation

For fixing of *modulog* modules or other components of the user at the top plate the lifting module has an interface 140 x 140.

For fixing of *modulog* modules at the bottom plate the lifting module has an interface 200 x 200. This plate can also be used to fix the lifting module on a flat level floor. For fixing 4 screws M10 of property class 10.9 as well as heavy-duty plugs are to be used.

For increased stability also a base plate, which can be delivered as accessory, can be fixed at the bottom plate.

Description

The lifting module Strong has a high-tensile cylinder tube profile with chromium-plated surfaces. The high precision of the tube profile enables a guiding system without clearance and perfect smooth running.

The guiding profile is protected against rotary motion by a key connection with minimum clearance.

The guiding system works without fat and oil lubrication. High-quality materials for plain bearings are used.

Characteristic are applications with indifferent, dynamically swelling rotating motions and shock motions.

Material

Guiding system, top and base plates are made of steel. Materials for plain bearings are made on the base of polymers.

modulog Lifting module

Part no. 8919-06-X0-X

Technical data

Max. lifting force:	6,000 N
Max. bending moment:	800 Nm
Stroke:	200 to 400 mm

Operations

- Foot pedal
- Foot switch
- Hand panel



Combinable with the modules

- Rotating modules – horizontal axis
  DMH 200 as per data sheet M 1.101,
  DMHe 200 as per data sheet M 1.201

- Tilting modules
  KMB 100 as per data sheet M 2.101
  KME 100 as per data sheet M 2.201

- Rotating modules – vertical axis
  DMV 600 as per data sheet M 1.301,
  DMVe 600 as per data sheet M 1.201

- Cart modules
  WMS as per data sheet M 5.101

- Floor modules
  FMS as per data sheet M 6.101

modulog interfaces

• Top plate:	140 x 140 - Ø 10.5 mm
• Bottom plate:	200 x 200 - Ø 10.5 mm

Accessories

- Electronic control modules
  for 1, 2, 3 or 4 lifting modules
  as per data sheet M 8.200
- Control modules with battery holder
  as per data sheet M 8.201
- Electrical operating elements,
  lines and connectors
  as per data sheet M 8.203
- Base and adaptor plates
  as per data sheet M 8.100 and M 8.110
- Table plates
  as per data sheet M 8.130 and M 8.131

Manual-hydraulic version
operation with foot pedal

Description

The stroke movement is obtained by a hydraulic lifting jack with single-lever actuation, with oil being pumped by means of a piston pump into a plunger cylinder.

During retraction the oil returns due to the weight of the load from the cylinder back to the reservoir. A defined speed reduction is effected.

The manual-hydraulic version is particularly sturdy and durable. This variant meets high safety demands and withstands jerking and knocking loads in applications.

Code for part numbers

Part-no. **8919-06-X0-H**

Stroke

2 = 200 mm
3 = 300 mm
4 = 400 mm

Operation

To lift the load, the foot pedal has to be depressed by approx. 40° several times. The pedal returns to its off-position by means of a return spring.

To lower the load, the foot pedal has to be moved upwards by approx. 10°.

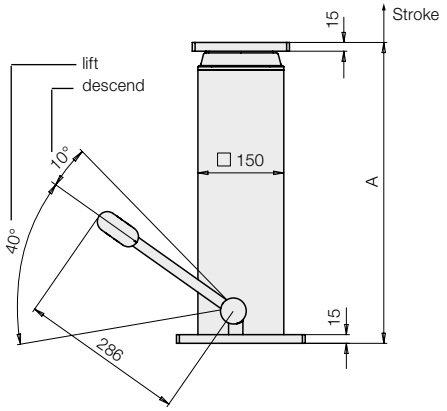
Per 100 mm stroke 10 pump motions are required.

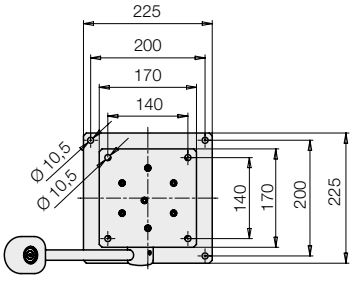
Descent speed approx. 25 mm/sec.

Technical characteristics

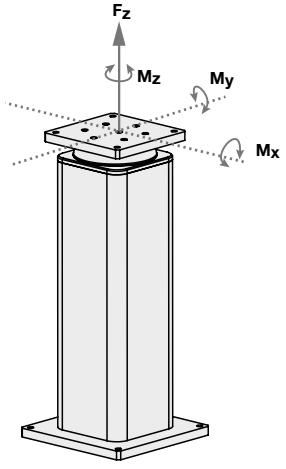
Stroke	A	A + stroke	Weight
[mm]	[mm]	[mm]	[kg]
200	520	720	50
300	620	920	55
400	720	1,120	60

Dimensions





Maximum lifting force and maximum admissible torque load



Maximum lifting force F_z: 6,000 N

Maximum torque load:

Total $M_{x/y}$: 800 Nm
M_z: 400 Nm

In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position the indicated maximum torques may occur.
The forces and torques have to be considered by the operator.
During the lifting motion only 50 % of the maximum values are admitted.

Accessories

Base plate for increased stability
Part-no. 6311-412
See data sheet M 8.100

Important notes!

To descend the lifting module a minimum load of approx. 100 N is required. The lifting module must only be pressure loaded. The centre of gravity should be within the traverse of the fixing screws. If the centre of gravity is outside, the dowelled joint with the floor has to be dimensioned correspondingly. In such cases it is recommended to use a larger base plate.

In case of eccentric load of more than 250 mm, the column cannot descend automatically because of too high friction forces.

The lifting module is designed for applications within closed rooms.

Description

The lifting motion is generated by an electric motor with a spindle lifting gear.

The electrically operated variant is particularly suitable for positioning and adjusting tasks of working tables as well as for material supply and transport.

They excel by a smooth running.

Operation

Lifting and lowering with hand panels or foot switches as per data sheet M 8.203 is triggered by touch control. After release of the push-button, the motion will be immediately stopped.
The hand panel with memory function allows to store 5 positions, which can be approached via corresponding position push-buttons. (for detailed description see data sheet M 8.203)

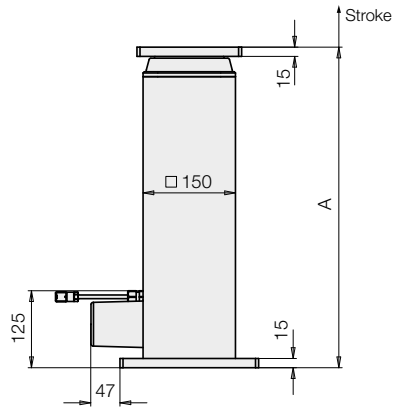
Code for part numbers

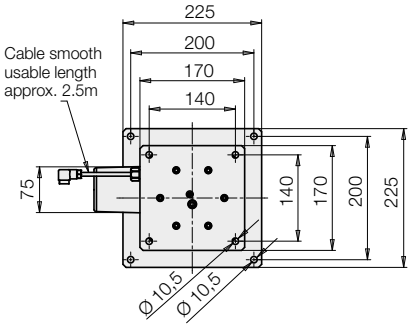
Part no. **8919-06-X0-X**

Stroke
2 = 200 mm
3 = 300 mm
4 = 400 mm

Electronics
E = integrated stroke end disconnection (not suitable for synchronization control) with coiled connecting cable, 1.5 m
G = with incremental stroke measuring system (suitable for synchronization control) with smooth connecting cable, 2.5 m
I = with incremental stroke measuring system (suitable for memory function) with smooth connecting cable, 2.5 m
B = with incremental stroke measuring system (suitable for memory function and battery mode) with smooth connecting cable, 0.3 m

Dimensions





Synchronization

Up to 4 lifting modules can be operated with synchronization control by a corresponding control module.
For example, complete lifting platforms can be designed.
For operation with synchronization control, only lifting modules with code letter G are suitable.
Control units with synchronization control for 2, 3, or 4 lifting modules are available.

Important notes!

- Maximum admissible torque load as per manual-hydraulic version (see page 2) .
- The maximum pull force of the electro-mechanical version is 80 % of the push force!

Technical data

Maximum lifting force Fz	6,000 N
Lifting speed (load-dependent)	
Electronics **E I B**	7...5 mm/s
Electronics **G**	6...4 mm/s
Electric connection	Plug
Duty cycle	15 % ED
Code class	IP 54
Control voltage	24 VDC
(Power input	200 W)
Current consumption	max. 8 A

Delivery

The lifting modules are delivered ready for connection. The connecting cable from the lifting module to the control module is included in the delivery. Operating elements as well as control modules and mains cables can be ordered separately as an accessory.

Electrical accessories required for a functional system:

- Control module as per data sheet M 8.200 or
- Control module with battery holder as per data sheet M 8.201
- Hand panels, foot switch and mains cable as per data sheet M 8.203

Accessories

Base plate for increased stability as per data sheet M 8.100

Lifting Module Solid

Max. lifting force 4,000 N, stroke from 200 to 600 mm, manual-hydraulic version

Advantages

- Lifting force up to 6,000 N
- Displacement with low friction is also given with high torque load
- High load by roller guiding element with high section modulus
- Sturdy and tough
- Compact design
- Safe and precise handling
- Checked in compliance with DIN EN 1570 with quadruple static overload
- Better working with lower load
- Integrated stop for pedal

Application

Lifting modules for high demands on performance and service life in the industrial assembly.

Principal use

- Ergonomic design of working places
- Industrial production plants
- Automotive industry
- Assembly of car seats
- Assembly of drive components, axes and cardan shafts
- Assembly of compressors, hydraulic components and pumps
- Assembly of turbines, motors and gear boxes
- Applications with frequent load changes

Fixing and installation

For fixing of *modulog* modules or other components of the user at the top plate, the lifting module has an interface 140 x 140 and 200 x 200.

For fixing of *modulog* modules at the bottom plate, the lifting module has an interface 200 x 200. This plate can also be used to fix the lifting module on a flat level floor. For fixing, screws M10 of property class 10.9 as well as heavy-duty plugs are to be used.

For increased stability, a base plate, which can be mounted to the bottom plate, is available as accessory. Fixing on the floor is made by means of the base plate.

Description

The lifting module has an integrated roller guiding element. This allows a backlash-free guiding system with very good smooth running and the introduction of high moments into the lifting module.

The guiding system is lifetime lubricated. To obtain high robustness, all components are made of high-quality materials. Characteristic are applications with indifferent, dynamically swelling rotating motions and shock motions.

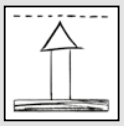
Material

All essential elements are made of steel to obtain a high robustness.

Variants

Drive variants with brushless electric motor 48 VDC or hydraulic cylinder can be realised on request as per customer's specifications. Service life and lifting speed is perfect for cycle-related assemblies.

modulog Lifting module



Part no. 8926-0X-X0-H

Technical data

Max. lifting force:	4,000 N; 6,000 N
Max. bending moment:	1,000 Nm
Stroke:	200 to 400 mm

Operations

- Pedal

Combinable with the modules

- Rotating modules – horizontal axis
  DMH 200 as per data sheet M 1.101,
  DMHe 200 as per data sheet M 1.201

- Tilting modules
  KMB 100 as per data sheet M 2.101
  KME 100 as per data sheet M 2.201

- Rotating modules – vertical axis
  DMV 600 as per data sheet M 1.301,
  DMVe 600 as per data sheet M 1.201

- Cart modules
  WMS as per data sheet M 5.101

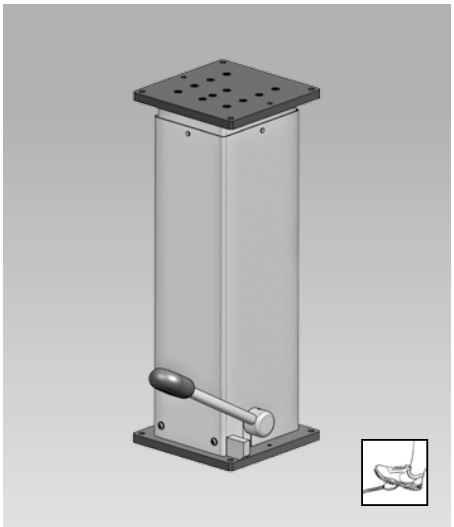
- Floor modules
  FMS as per data sheet M 6.101

modulog interfaces

• Top plate:	140 x 140 – M10
	200 x 200 – Ø 10.5 mm
• Bottom plate:	200 x 200 - Ø 10.5 mm

Accessories

- Base and adaptor plates
  as per data sheet M 8.100 and M 8.110
- Table plates
  as per data sheet M 8.130



Description

The stroke movement is obtained by a manual-hydraulic lifting drive with single-lever actuation, with oil being pumped by means of a piston pump into a plunger cylinder.

During retraction, the oil returns due to the weight of the load from the cylinder back to the reservoir. A defined speed control is effected.

The manual-hydraulic version is particularly sturdy and durable. This variant meets high safety demands and withstands jerking and knocking loads in applications.

Code for part numbers

Part no. **8926-0X-X0-H**

Maximum lifting force

4 = 4,000 N
6 = 6,000 N

Stroke

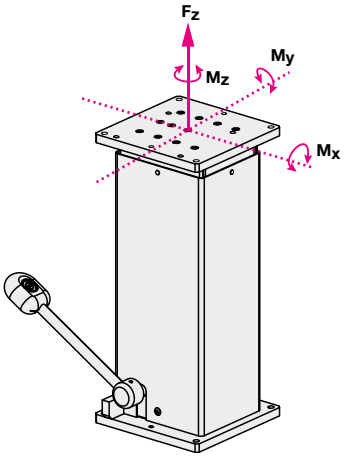
2 = 200 mm
3 = 300 mm
4 = 400 mm

Operation

To lift the load, the foot pedal has to be depressed by approx. 40° several times. The pedal returns to its off-position by means of a return spring.

To lower the load, the foot pedal has to be moved upwards by approx. 10°.

Maximum lifting force and maximum admissible torque load



Maximum lifting force F_Z:
Alternatively 4,000 N or 6,000 N

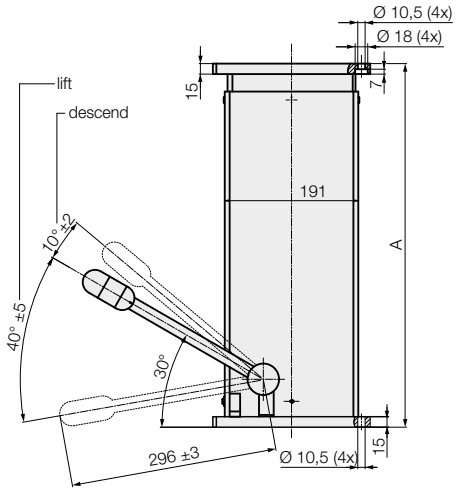
Maximum torque load:

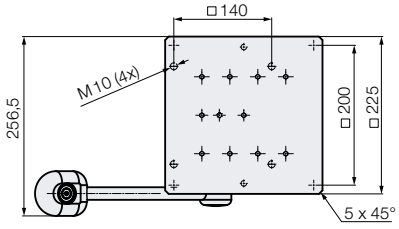
Total $M_{x/y}$:	1,000 Nm
M_Z:	1,000 Nm

In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position, the indicated maximum torques may occur.

The forces and torques have to be considered by the operator. **During the lifting motion, only 50 % of the maximum values are admitted.**

Dimensions





Technical data

Stroke [mm]	A [mm]	A + stroke [mm]	Weight [kg]
200	420	620	56
300	520	820	64
400	620	1,020	73

Lifting force [N]	Pump strokes per 100 mm	Descent speed [mm/s]
4,000	7	approx. 22
6,000	9	approx. 22

Important notes!

To descend the lifting module, a minimum load of approx. 200 N is required.

The lifting module must only be pressure loaded. The centre of gravity should be within the traverse of the fixing screws. If the centre of gravity is outside, the dowelled joint with the floor has to be dimensioned correspondingly. In such cases it is recommended to use a larger base plate.

In case of eccentric load of more than 250 mm, the column cannot descend automatically because of too high friction forces.

The lifting module is designed for applications within closed rooms.

The hydro-manual lifting drive can not be operated with synchronization control.

Accessories

Base plate for increased stability
as per data sheet M 8.100

Lifting Module Twin-Strong

Max. lifting force 4,000 and 6,000 N, stroke from 200 to 400 mm, manual-hydraulic and electro-mechanical version

M4.501

Issue 10-16 E

Advantages

- Lifting force up to 6,000 N
- Extreme load due to double steel guides
- Very high section modulus
- Rigid guiding system without clearance
- Sturdy and tough
- Compact design
- Modular standard design, easy to combine
- Less load on the operator due to ergonomic design
- Safe and precise handling
- Safety factor 2.0 against static overload

Application

Lifting module for extreme loads.

Principal use

- Industrial production with difficult application conditions
- Automotive industry
- Assembly of car seats
- Drive technology, axes, cardan shafts
- Compressors, hydraulic elements, pumps
- Turbines, motors, gearbox construction
- Applications with frequent load changes and high torque loads

Description

The lifting module Twin-Strong has two high-tensile cylinder tube profiles with chromium-plated surfaces. The design with solid profiles allows a stable guiding system with perfect smooth running. The high precision of the profiles permits a guiding system without clearance and perfect smooth running.
The guiding system works without fat and oil lubrication. High-quality materials for plain bearings are used.
Characteristic are applications with indifferent, dynamically swelling rotating motions and shock motions.

Fixing and installation

For fixing of *modulog* modules or other components of the user at the top plate, the lifting module has a triple interface 140 x 140.
For fixing of the lifting module on a flat level floor, the lifting module has a double interface 200 x 200. For fixing, 6 screws M10 of property class 10.9 as well as heavy-duty plugs are to be used.

Material

Double guiding system, top and base plates are made of steel. Materials for plain bearings are made on the base of polymers.

modulog Lifting module

Part no. 8914-06-X0-X

Technical data

Max. lifting force:	4.000, 6.000 N
Max. torque:	2,000 Nm
Stroke:	200 to 400 mm

Operations

- Foot pedal
- Foot switch
- Hand panel



Combinable with the modules

- Rotating modules – horizontal axis
  DMH 200 as per data sheet M 1.101,
  DMHe 200 as per data sheet M 1.201

- Tilting modules
  KMB 100 as per data sheet M 2.101
  KME 100 as per data sheet M 2.201

- Rotating modules – vertical axis
  DMV 600 as per data sheet M 1.301,
  DMVe 600 as per data sheet M 1.201

modulog interfaces

- Top plate: 140 x 140 - Ø 10.5 mm
- Bottom plate 200 x 200 - Ø 10.5 mm

Accessories

- Electronic control modules
  for 1, 2, 3 or 4 lifting modules
  as per data sheet M 8.200
- Control modules with battery holder
  as per data sheet M 8.201
- Electrical operating elements,
  lines and connectors
  as per data sheet M 8.203
- Base and adaptor plates
  as per data sheet M 8.100 and M 8.110
- Table plates
  as per data sheet M 8.130 and M 8.131

Description

The stroke movement is obtained by a hydraulic lifting jack with single-lever actuation, with oil being pumped by means of a piston pump into a plunger cylinder.

During retraction the oil returns due to the weight of the load from the cylinder back to the reservoir. A defined speed reduction is effected.

The manual-hydraulic variant is particularly sturdy and durable. This variant meets high safety demands and withstands jerking and knocking loads in applications.

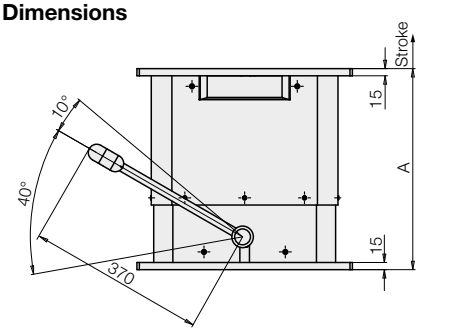
Code for part numbers

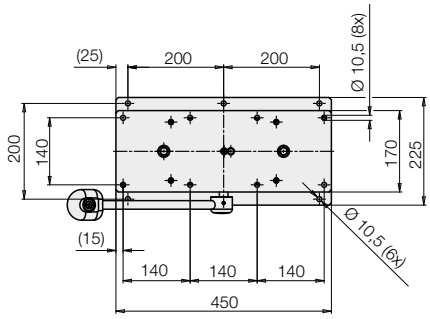
Part no. **8914-0X-X0-H**

Maximum lifting force
- 4 = 4,000 N
- 6 = 6,000 N

Stroke
- **2** = 200 mm
- **3** = 300 mm
- **4** = 400 mm

Dimensions





Accessories

Base plate for increased stability as per data sheet M 8.100

Operation

To lift the load, the foot pedal has to be depressed by approx. 40° several times. The pedal returns to its off-position by means of a return spring.

To lower the load, the foot pedal has to be moved upwards by approx. 10°.

Technical data

Stroke [mm]	A [mm]	A + stroke [mm]	Weight [kg]
200	420	620	95
300	520	820	100
400	620	1020	105

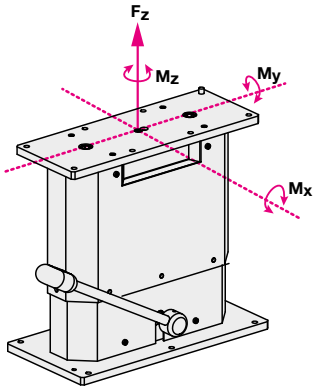
Lifting force [N]	Pump strokes per 100 mm	Descent speed [mm/s]
4,000	7	approx. 22
6,000	9	approx. 22

Important notes!

To descend the lifting module a minimum load of approx. 200 N is required.
The lifting module must only be pressure loaded. The centre of gravity should be within the traverse of the fixing screws. If the centre of gravity is outside, the dowelled joint with the floor has to be dimensioned correspondingly. In such cases it is recommended to use a larger base plate.
In case of eccentric load of more than 250 mm, the column cannot descend automatically because of too high friction forces.

The lifting module is designed for applications within closed rooms.

Maximum lifting force and maximum admissible torque load



Maximum torque load:
Mx: 2000 Nm or **My**: 1200 Nm
Mz: 600 Nm

In the case of eccentric loads, it is recommended to compensate these by counterweights. In off-position, the indicated maximum torques may occur.
The forces and torques have to be considered by the operator. **During the lifting motion, only 50 % of the maximum values are admitted.**

Description

The lifting motion is generated by an electric motor with a self-locking spindle lifting gear.
The electrically operated variant is particularly suitable for positioning and adjusting tasks of working tables as well as for material supply and transport.
They excel by a smooth running.

Operation

Lifting and lowering with hand panels or foot switches as per data sheet M 8.203 is triggered by touch control. After release of the push-button, the motion will be immediately stopped.
The hand panel with memory function allows to store 5 positions, which can be approached via corresponding position push-buttons. (for detailed description see data sheet M 8.203)

Code for part numbers

Part no. **8914-0X-X0-X**

Maximum lifting force
4 = 4,000 N
6 = 6,000 N

Stroke
2 = 200 mm
3 = 300 mm
4 = 400 mm

Electronics
E = integrated stroke end disconnection (not suitable for synchronization control) with coiled connecting cable, 1.5 m
G = with incremental stroke measuring system (suitable for synchronization control) with smooth connecting cable, 2.5 m
I = with incremental stroke measuring system (suitable for memory function) with smooth connecting cable, 2.5 m

Technical data

Electric connection	Plug
Duty cycle	15 % ED
Code class	IP 54
Control voltage	24 V DC

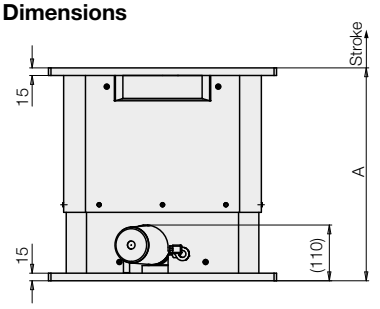
Variante E and I

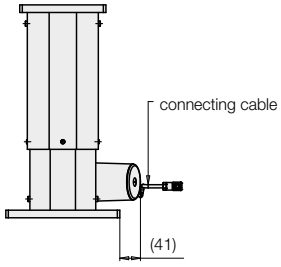
Lifting force	Lifting speed (load-dependent)	Current consumption (load dependent)
[N]	[mm/s]	[A]
4,000	10…8	6
6,000	7…5	7.5

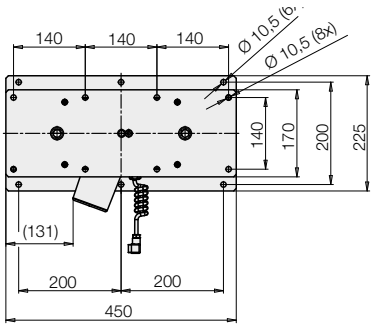
Variant G

Lifting force	Lifting speed (load-dependent)	Current consumption (load dependent)
[N]	[mm/s]	[A]
4,000	8…6	4.5
6,000	6…4	5.5

Dimensions







Accessory

Base plate for increased stability
as per data sheet M 8.100

Synchronization

Up to 4 lifting modules can be operated with synchronization control by a corresponding control module.
For example complete lifting platforms can be designed.
For operation with synchronization control, only lifting modules with code letter G are suitable.
Control units with synchronization control for 2, 3, or 4 lifting modules are available.

Important notes!

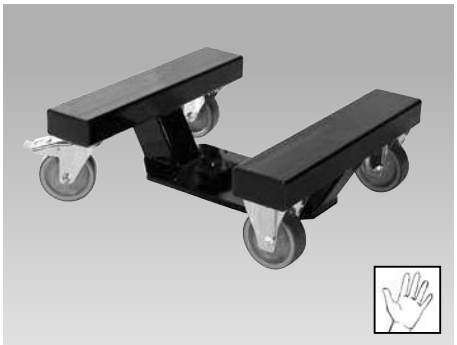
- Maximum admissible torque load as per manual-hydraulic version (see page 2) .
- The maximum pull force of the electro-mechanical version is 80 % of the push force!

Delivery

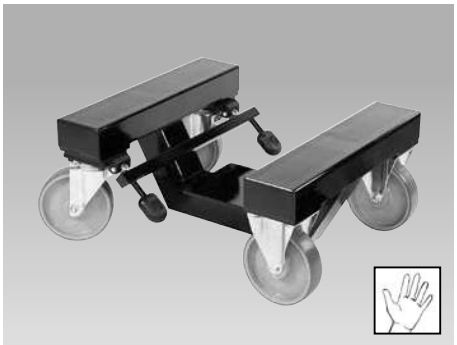
The lifting modules are delivered ready for connection. The connecting cable from the lifting module to the control module is included in the delivery. Operating elements as well as control modules and mains cables can be ordered separately as an accessory.

Electrical accessories required for a functional system:

- Control module as per data sheet M 8.200
  or
- Control module with battery holder as per data sheet M 8.201
  (no fixing possibility at the lifting module)
- Hand panels, foot switch and mains cable as per data sheet M 8.203



WMS 200: maximum load 2,000 N



WMS 600: maximum load 6,000 N

Application

Cart modules for the transport of devices, assembly fixtures or testing devices within the production.
Cart modules in combination with lifting modules are avantageously used in assembly or production processes, if components have to be transported to working places with different working heights.
Lifting carts can also be used as working surface. The lifting carts with the components will be pushed to the individual working places and adjusted to the optimum ergonomic working height, loading and unloading of the components is not required.

Principal use

- Material supply
- Production plants
- Test area for quality assurance
- Logistics
- Movable working stations

Advantages

- Suitable for workshop setups
- Easily combinable with modulog lifting modules
- Easy transport of heavy components or fixtures
- Low driving resistance even with high loads
- Parking brakes with foot pedal operation at both sides
- Fixed rollers and steering rollers
- Good accessibility
- Optimised ergonomics
- Simple operation

Description

The cart modules WMS are offered for two different loads. For the cart module WMS 200 the maximum admissible load is 2,000 N and for WMS 600 the maximum load is 6,000 N.
The cart modules WMS consist of a welded sturdy steel frame with two fixed rollers and two steering rollers, which are equipped with a parking brake.
the parking brakes of WMS 200 are individually operated. In version WMS 600 the brakes are coupled and can be operated from both sides by means of a foot pedal.
In the centre of the steel frame there is a mounting plate. This plate is used for fixation of lifting modules.
Alternatively workshop setups can be mounted at the steel frame.

Material

Frame: steel, black-lacquered
Tires: PUR

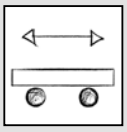
Mounting

For mounting of *modulog* modules or other componets the cart modules have in the centre of the steel frame an interface 200 x 200.
As accessory an adaptor plate is available to mount workshop setups and *modulog* modules with interface 140 x 140.
To combine lifting carts, appropriate table plates with handles are available as accessory.

Important notes

To move the cart module the user has to provide handles.
The cart modules may only be moved at walking pace.

modulog
Cart module WMS



Part-no. 8900-0X-01-O

Technical characteristics

Max. load
WMS 200: 2,000 N
WMS 600: 6,000 N

Operations

- Manual

Combinable with the modules

- Lifting modules as per data sheet M 4.XXX

modulog interface

- 200 x 200 - M10

Accessories

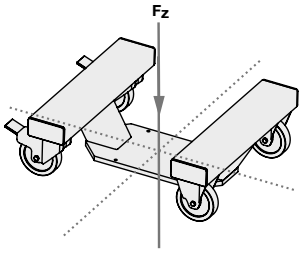
- Adaptor plates as per data sheet M 8.110
- Table plates as per data sheet M 8.130

Application example

Lifting cart – combined by cart module WMS 600, lifting module Shop-Floor and a table plate.

Maximum admissible load Fz

WMS 200: F_Z = 2,000 N
WMS 600: F_Z = 6,000 N



Part-no.:

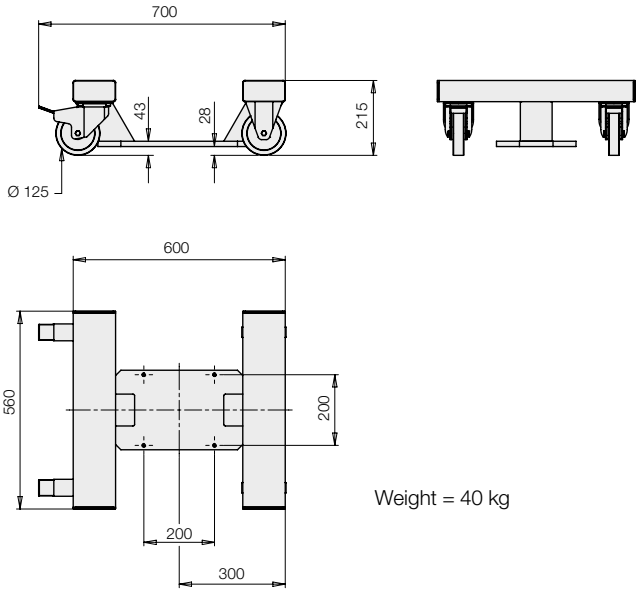
WMS 200: 8900-02-01-O
WMS 600: 8900-06-01-O

Important note

Due to stability reasons, only center load of the cart modules is admitted.
For cart modules with special dimensions and larger base are available as special versions, please enquire.

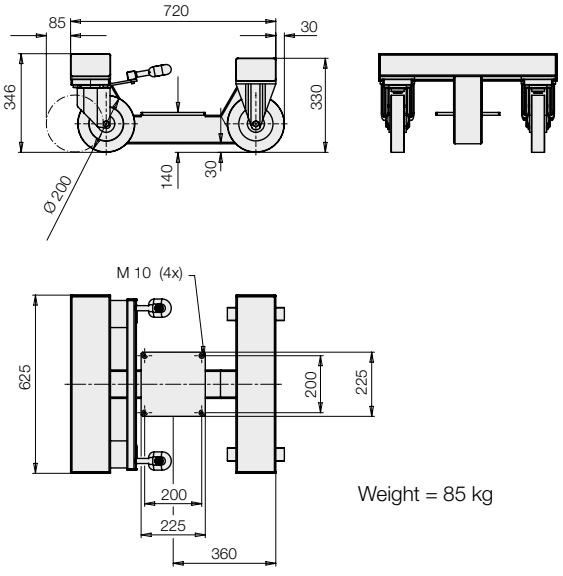
Dimensions

WMS 200



Weight = 40 kg

WMS 600



Weight = 85 kg

Accessories

- **Adaptor plate 140 - 200**
  to fix modulog modules with 140 x 140 mm user interface
  Part-no. 6311-417

See data sheet M 8.110

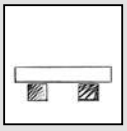
- **Table plates made of wood or steel**

See data sheet M 8.130

Floor Module FMS
Max. load 6,000 N, with one modulog interface

Advantages:
- Stable steel construction with high load capacity
- Height-adjustable feet
- Solid and upright position even on uneven floors
- Good accessibility
- Suitable for workshop setups
- Suitable as base frame for working tables
- *modulog* interface

modulog Floor module FMS



Part no. 8901-06-01-O

Technical data
Max. load: 6,000 N

Combinable with the modules
- Lifting modules as per data sheet M 4.XXX

***modulog* interface**
- 200 x 200 - M10

Accessories
- Table plates as per data sheet M 8.130

Application
Floor modules for use as base frame for height-adjustable working places.
Working stations or height-adjustable working tables can be easily realised with floor modules combined with lifting units.
Floor modules are a stable base that can be adapted to uneven floors for further setups with high stability.

Description
The floor module FMS consists of a welded, stable steel frame with four height-adjustable feet.
The adjustable feet have a steel thread and are equipped with a stable spherical cap.
In the centre of the steel frame a mounting plate with a modulog interface 200 x 200 is fixed. This plate is used to fix modulog modules.
Alternatively workshop setups can be mounted onto the steel frame.

Principal use
- Production plants
- Test area for quality assurance
- Height-adjustable standing working places
- Height-adjustable working tables

Installation
The floor module with adjustable feet has to be adjusted so that all sides are supported on the floor.
Afterwards the adjustable feet have to be locked by lock nuts.

Material
Frame: steel, black-lacquered

Application example

Floor module FMS 600 with mounted electrical lifting module Shop-Floor.

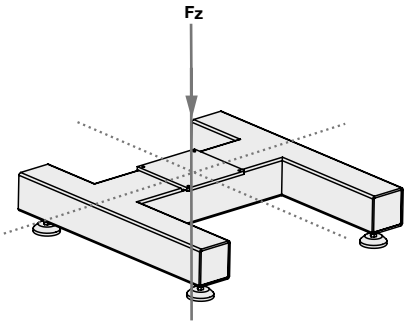
Important notes
When installing the floor module pay attention to a stable floor.
Protruding loads have to be avoided as this may cause instability.

Mounting
For mounting of modulog modules or other components the floor module has in the centre of the steel frame an interface 200 x 200.
As accessory an adaptor plate is available to mount modulog modules with interface 140 x 140.
To combine working tables appropriate table plates with handles are available as accessory.

Maximum admissible load Fz

Due to stability reasons, only symmetrical load is admitted for the floor module.

Maximum admissible load Fz = 6,000 N



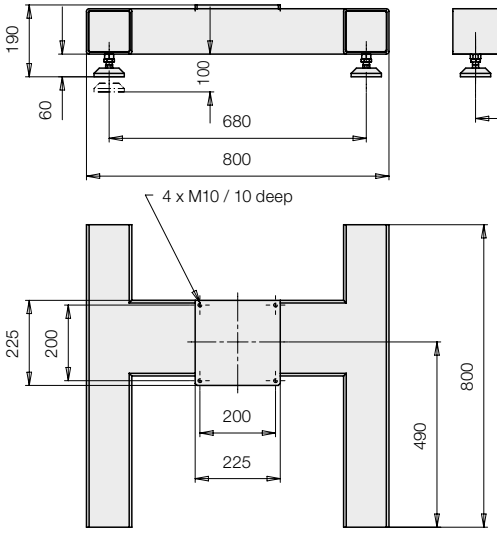
Part no. 8901-06-01-O

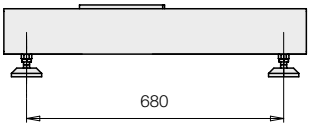
Accessories
• Adaptor plate 140 - 200
to mount modulog modules with interface 140 x 140
Part no. 6311-417
See data sheet M 8.110

• Table plates made of wood or steel
See data sheet M 8.130

Spare part
• Adjustable foot
Part no. 6351-568

Dimensions





Weight = 50 kg

Base plate 500 x 500 mm

Advantages
- *modulog* interface
- Increased stability
- Installation possible on many sub-floors
- Simple mounting

Application
Base plates are primarily used with lifting modules.
They are screwed to the lifting module and the floor to get a larger support surface and an increased stability of the lifting module.
The use of base plates is especially recommended for uneven sub-floors and high moment loads.

modulog
Base plate

Part-no. 631X-XXX

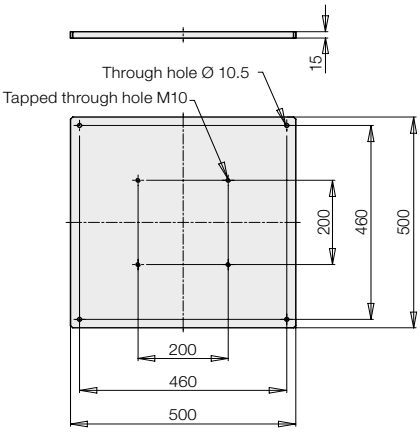
Combinable with the module
- Lifting modules as per data sheet M 4.XXX

modulog interface
- 200 x 200 - M10

Material
Steel, black oxide

Important note!
The fixing screws M10 are not included in our delivery.

Base plate 500 x 500 mm
with simple interface 200 x 200
Part-no.: 6311-412

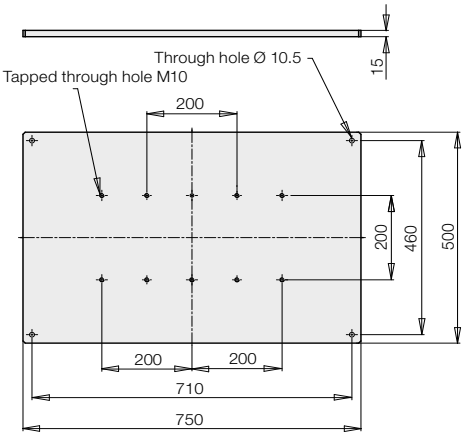


For lifting modules:
- Basic
- Shop-Floor
- Strong

Application example

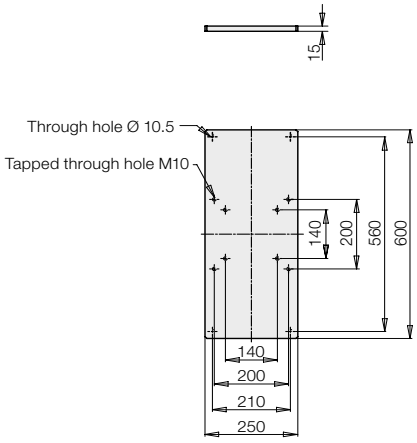
Lifting module Shop-Floor with base plate

Base plate 750 x 500 mm
with simple and double interface 200 x 200
Part-no.: 6311-460



For lifting modules:
- Basic
- Range
- Shop-Floor
- Strong
- Twin-Strong
- Shop-Floor Teleskop

Base plate 600 x 250 mm
with simple interface 200 x 200
Part-no.: 6312-161



For lifting modules:
- Basic
- Shop-Floor

Adaptor plate DMH 140

Advantages

- *modulog* interface
- Simple vertical mounting of the rotating module - horizontal axis DMH
- Easy mounting
- Standard plate

Application

The adaptor plate DMH 140 allows vertical mounting of the rotating module - horizontal axis DMH 200 on modules with a modulog interface 140 x 140.

Material

steel, black oxide

Note

The fixing screws M10 are not included in our delivery.

modulog
Adaptor plate
for rotating modules DMH 200
Part no. 6311-326

***modulog* interface**
• 140 x 140 mm – M10

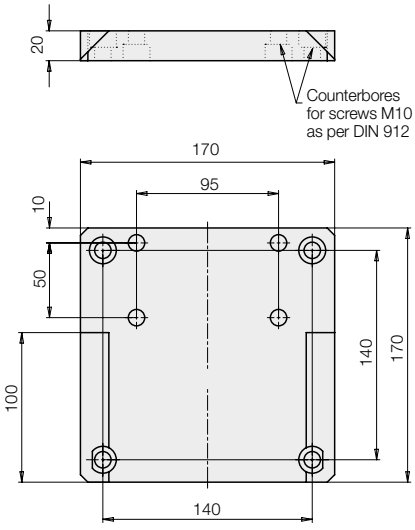
Mounting scheme - example

Rotating module - horizontal axis DMH with interface
95 x 50 mm – M10

Adaptor plate **DMH 140**

Lifting module
with top plate interface
140 x 140 – Ø 10.5 mm

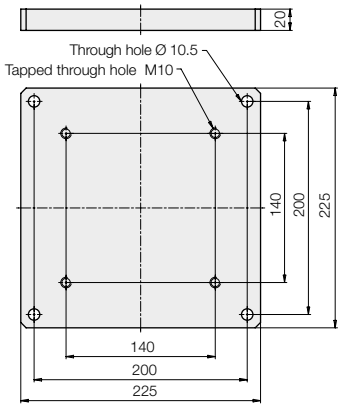
Dimensions



Application example

Rotating module - horizontal axis DMH 200 vertically mounted on a lifting module Shop-Floor

Adaptor plate 140 – 200



Advantages
- Simple mounting of *modulog* modules with different interfaces
- Easy mounting
- Standard plate

Application
By means of the adaptor plate 140 – 200 modules with a 140 x 140 mm *modulog* interface can be mounted onto a 200 x 200 mm *modulog* interface.
For example a rotating module - vertical axis on a cart or floor module.

Material
steel, black oxide

Note
The fixing screws M10 are not included in our delivery.

modulog
Adaptor plate
Interface 140 to 200
Part no. 6311-417

***modulog* interface**
- 140 x 140 mm – M10
- 200 x 200 mm – Ø 10.5 mm

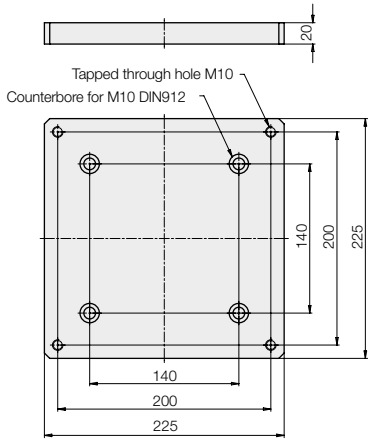
Mounting scheme - example

Rotating module - vertical axis DMV with interface
140 x 140 mm – M10.5

Adaptor plate **140 – 200**

Cart module WMS with interface
200 x 200 – M10

Adaptor plate 200 – 140



Advantages
- Simple mounting of *modulog* modules with different interfaces
- Easy mounting
- Standard plate

Application
By means of the adaptor plate 200 – 140 modules with a 200 x 200 mm *modulog* interface can be mounted onto a 140 x 140 mm *modulog* interface.
For example a lifting module on a rotating module - vertical axis.

Material
steel, black oxide

Note
The fixing screws M10 are not included in our delivery.

modulog
Adaptor plate
Interface 200 to 140
Part no. 6311-423

***modulog* interface**
- 200 x 200 mm – M10
- 140 x 140 mm – Ø 10.5 mm

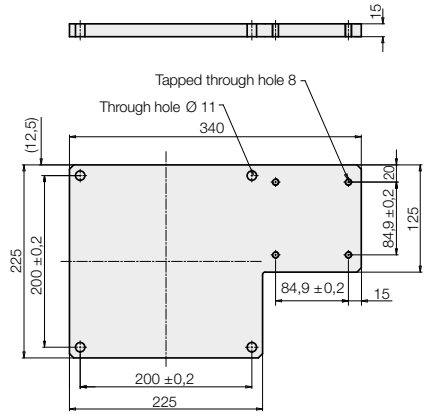
Mounting scheme - example

Lifting module with base plate interface
200 x 200 mm – Ø 10.5

Adaptor plate **200 – 140**

Rotating module - vertical axis DMV with interface
140 x 50 mm – M10

Adaptor plate 6312-748



Advantages
- Easy installation of indexing with foot pedal
- Easy mounting
- Standard plate

Application
The indexing mechanism of the rotating modules can be fixed on the floor with the adaptor plate 6312-748. With the adaptor plate, all foot pedals for rotating and tilting modules such as per data sheet M1.101 can be quickly and safely fixed.
The application is optimised for cart modules below the base plate of lifting modules.

Material
aluminium, black anodised

Note
The fixing screws M8 are not included in our delivery.

modulog
Adaptor plate
Pedal-operated indexing
Part no. 6312-748

***modulog* interface**
- 200 x 200 mm – Ø 10.5 mm

Flange Plate
for *modulog* rotating modules

Flange plate Ø 170 mm

Advantages:

- Individual design for fixing of component parts
- Simple mounting
- Standard plate

Application

The flange plate can be used instead of the *modulog* flange plate of the rotating modules - horizontal axis DMH and rotating modules - vertical axis DMV.

Compared with the *modulog* flange plate, this plate does not have an 140 x 140 *modulog* interface.

This plate offers the possibility to design individual fixing for component parts. Specific bore patterns or other provisions for the location of component parts or fixtures can be provided by the user.

The flange plate can be easily exchanged against the *modulog* flange plate.

modulog
Flange plate

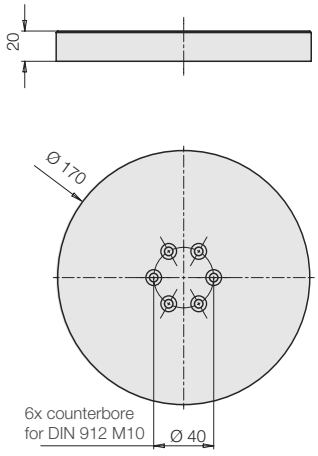
Part-no. 6311-400

Combinable with the modules

- Rotating module – horizontal axis DMH 200 as per data sheet M 1.101

- Rotating module – vertical axis DMV 1000 as per data sheet M 3.101

Dimensions



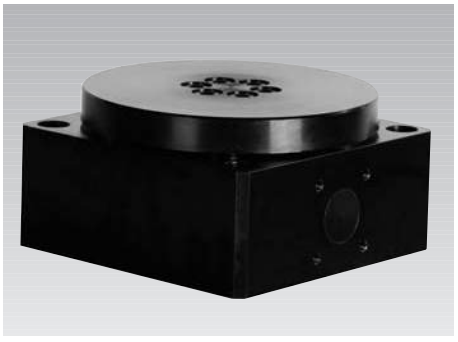
Material

Steel, black oxide

Note

Fixing of the flange plate at the rotating module is made by the available screws M10 of the rotating module.

Application example



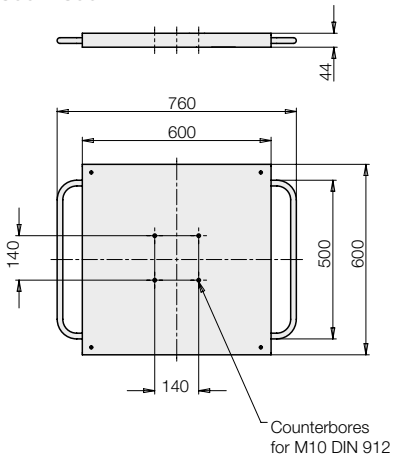
Rotating module - vertical axis DMV 1000 with flange plate Ø 170

Table Plate with one modulog interface
with or without handles

M8.130

Issue 5-16 E

Steel table plate with 2 handles – 600 x 600 mm



Application

Table plate with two handles for example to move the lifting carts.

Principal use

- Workpiece carriers
- Height-adjustable working tables
- Assembly carts
- Rotatable assembly working plates

Advantages

- Very stable version
- Integrated sturdy handles
- *modulog* interface

Material

Table plate: Stainless steel, bright surface

Handles: Steel profile, welded, black-lacquered

Notes

The fixing screws M10 are completely covered below the steel sheet plate and are not included in our delivery.

Length of the screws = 3 mm + screw-in depth.

modulog Table plate

Part no. 6505-040

Technical data

Maximum load: 6,000 N centric

Combinable with the modules

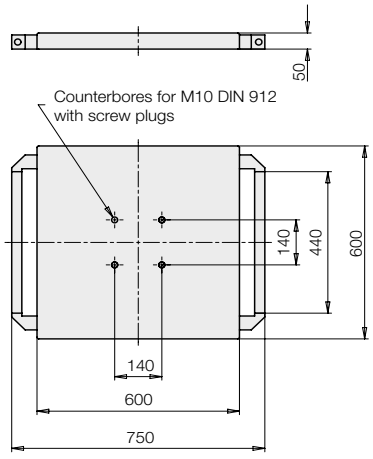
- Rotating module – vertical axis DMV 600 as per data sheet M 1.301

- Lifting modules as per data sheet M 4.XXX

***modulog* interface**

- centric 140 x 140 - Ø 10.5 mm

Wodden table plate with 2 handles – 600 x 600 mm



Application

Table plate with two handles for example to move the lifting carts.

Principal use

- Workpiece carriers
- Height-adjustable working tables
- Assembly carts
- Rotatable assembly working plates

Advantages

- Stable and stylish version
- Integrated sturdy handles
- *modulog* interface

Material

Table plate: Multiplex beech, 50 mm, surface clear coated

Handles: anodized aluminium

Application example

Wooden table plate – mounted on the lifting module Shop-Floor and cart module WMS

modulog Table plate

Part no. 6505-051

Technical data

Maximum load: 2,000 N centric

Combinable with the modules

- Rotating module – vertical axis DMV 600 as per data sheet M 1.301

- Lifting modules as per data sheet M 4.XXX

***modulog* interface**

- centric 140 x 140 - Ø 10.5 mm

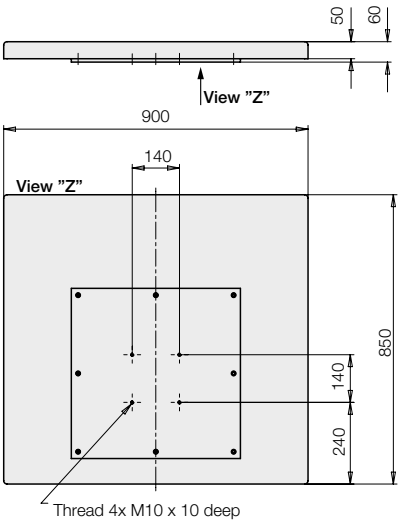
Note

The fixing screws M10 are not included in our delivery.

Length of the screws = 35 mm + screw-in depth.

Screw plugs for the counterbores are included in our delivery.

Wooden table plate with steel strengthening, without handles – 900 x 850 mm



Advantages

- Strengthened and stylish version
- *modulog* interface

Material

Table plate: surface clear coated	Multiplex beech, 50 mm,
Reinforcing plate:	steel lacquered

Note

The fixing screws M10 are not included in our delivery.

modulog
Table plate

Part no. 6505-050

Technical data

Maximum load:	4,000 N centric

Combinable with the modules

- Rotating module – vertical axis DMV 600 as per data sheet M 1.301

- Lifting modules as per data sheet M 4.XXX

***modulog* interface**

- eccentric 140 x 140 mm - M10

Application

Table plate with radiused edges and eccentric *modulog* interface.

Supported by a reinforcing plate made of steel for high loads.

Fields of application are, for example, industrial applications with standing work places.

Principal use

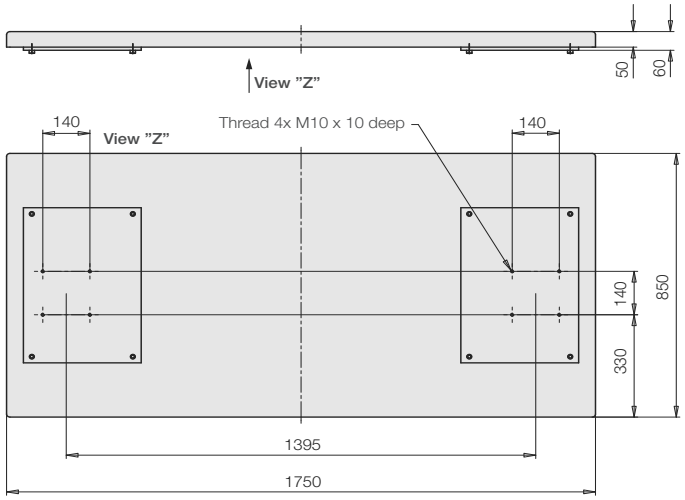
- Ergonomic assembly places
- Height-adjustable working tables

Table plate with two *modulog* interfaces

M 8.131

Issue 9-11 E

Wooden table plate with steel strengthening – 1750 x 850 mm
with reinforcing plates



modulog
Table plate

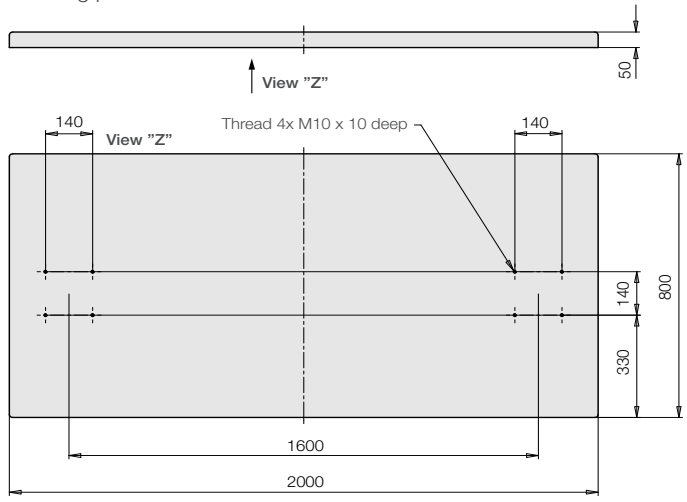
Part-no. 6505-060

Technical characteristics
Maximum load: 4.000 N plane

Combinable with the modules
- Lifting modules as per data sheet M 4.301

***modulog* interfaces**
- eccentric 2 off 140 x 140 mm - M10

Wooden table plate – 2000 x 800 mm
with reinforcing plates



modulog
Table plate

Part-no. 6505-061

Technical characteristics
Maximum load: 3.000 N plane

Combinable with the modules
- Lifting modules as per data sheet M 4.301

***modulog* interfaces**
- eccentric 2 off 140 x 140 mm - M10

Application

Table plate with radiused edges and two eccentric *modulog* interfaces.

Supported by a reinforcing plate made of steel for high loads.

Fields of application are, for example, industrial applications with standing work places.

Principal use
- Ergonomic assembly places
- Height-adjustable working tables

Advantages
- Strengthened and stylish version
- *modulog* interfaces

Material

Table plate:	Multiplex beech, 50 mm, clear coated
Reinforcing plate:	steel lacquered

Note

The fixing screws M10 are not included in our delivery.

Application example

Height-adjustable working tables composed by the table plate 1750 x 850 m, two electrically-operated lifting modules Shop-Floor with supply unit and the floor module FMD 800.

Application
Electronic control module for one *modulog* module and one operating element.

Note
The mains cable 230 VAC for power supply of the control module is not included in our delivery; it can be ordered separately as an accessory.

Material
Body: ABS

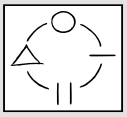
Fixing and installation
The control module is fixed with 4 screws M6 at the external clips. Operating elements, mains cables and lifting modules are connected with plug connections secured by screws to the control module.
Control modules with memory function or synchronization control are equipped with a setting mode that allows the operation of lifting modules with different force levels and stroke lengths with the control.
During the first start up, the setting mode has to be activated by the user. The control automatically adapts itself to the connected lifting module.
The process in detail, see operating manual.

Advantages
- Power supply and control in one device
- Plug-in connections for all devices to be connected
- Voltage supply 230 VAC
- Mains connection with shaped plug
- Compact and sturdy version
- Overload protection device

Description
The control module is used for power supply and control of one *modulog* lifting module with one operating element (as per data sheet M 8.203).

Variant
Ergonomically reasonable working heights for persons of different height as well as differently defined, reproducible nominal working heights within an assembly process can be stored with the memory function. **The memory function** allows to store up to five height positions of the lifting module. These can be recalled again and again or newly stored.
Operation is made via a hand panel that allows to store the height positions as well as to call them. Due to safety reasons, a movement is always made by touch control.

modulog
Control module
for 1 *modulog* module
with memory function
Part no. 3821-XXX



Combinable with the modules
- Lifting modules
  as per data sheet M 4.XXX

Part numbers

Control module for 1 module		**Part no.**
with code letter E	230 VAC	**3821-246**
	110 VAC	**3821-246-U**

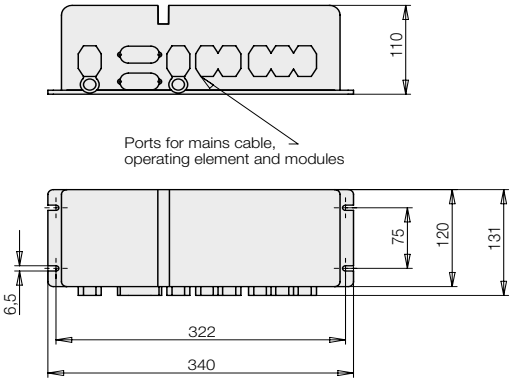
Control module with memory function for 1 module		**Part no.**
with code letter B or I	230 VAC	**3821-415M**
	110 VAC	**3821-415M-U**

Technical data

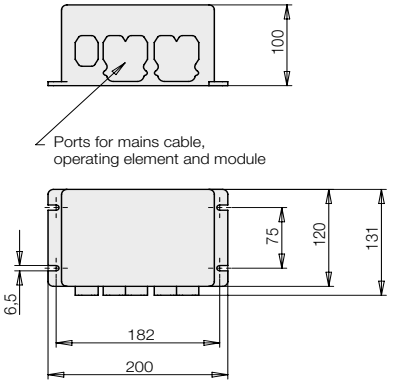
Supply voltage	230 V AC, 50 cycles
Operating voltage	24 V DC
Rating	240 VA
Electronic current limitation	10 A
Duty cycle	15 % – 1.5 min ON
Protection class	II
Code class	IP 66
Electrical connections	Plug connection secured by screw

Required accessories
Electrical operating elements, lines and connectors
as per data sheet M 8.203

Dimensions
For 1 module with memory function



Dimensions
For 1 module



Control modules for 2, 3, or 4 modulog modules with synchronization control — memory function

Application

Electronic control module for 2, 3 or 4 *modulog* modules with synchronization control and one hand panel or foot switch.

Note

The mains cable 230 VAC for power supply of the control module is not included in our delivery; it can be ordered separately as an accessory.

Material

Body: ABS

Fixing and installation

The control module is fixed with screws M6 at the external clips.
Mains cables, operating elements and lifting modules are connected with plug connections secured by screws to the control module.

Advantages

- Power supply and control for 2, 3 or 4 *modulog* modules and one hand panel or foot switch in one device
- Simple start up of installations with modules with synchronization control
- Plug-in connections for all devices to be connected
- Voltage supply 230 V AC
- Simple mains connection with shaped plug
- Compact design and sturdy version

Description

The control module is used for power supply and control of either 2, 3 or 4 *modulog* lifting modules with one operating element.

Accessory

Electrical operating elements, lines and connectors as per data sheet M 8.203

Variants

Control modules with additional connections for external limit switches are available on request.

Important note!

When using lifting modules with synchronization control, the following conditions must be met.

- All lifting units must be arranged parallel to each other and aligned. Especially in case of high loads on the system, considerable friction forces can occur in case of insufficient parallelism due to deformation of the system which can impair their function.
- The load must be located so that a small difference in height of the lifting modules cannot lead to a possible danger of persons or forced conditions between the lifting modules.
- A bearing with longitudinal compensation transverse to the lifting modules (fixed bearing-floating bearing) or an elastic buffer between the lifting modules and the fixtures is recommended.

modulog

Control module

for 2, 3 or
4 *modulog* modules

Part no. 3821-41XX

Combinable with the modules

- Lifting modules as per data sheet M 4.301

Part numbers

Control module	Part no.
for 2 modules with synchronization control **with code letter G**	**3821-416**
for 3 modules with synchronization control **with code letter G**	**3821-417**
for 4 modules with synchronization control **with code letter G**	**3821-418**

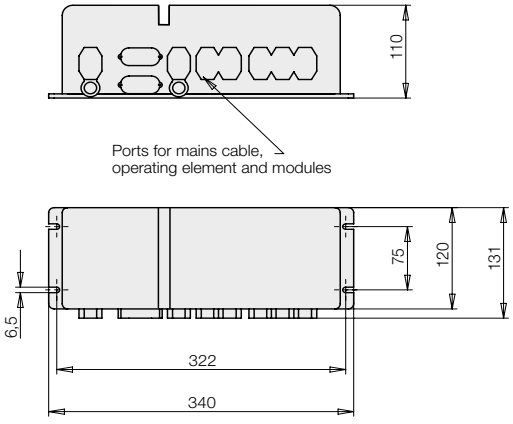
Control module with memory function (5 Pos.)	**Part no.**
for 2 modules with synchronization control **with code letter G**	**3821-416M**
for 3 modules with synchronization control **with code letter G**	**3821-417M**
for 4 modules with synchronization control **with code letter G**	**3821-418M**

Technical data

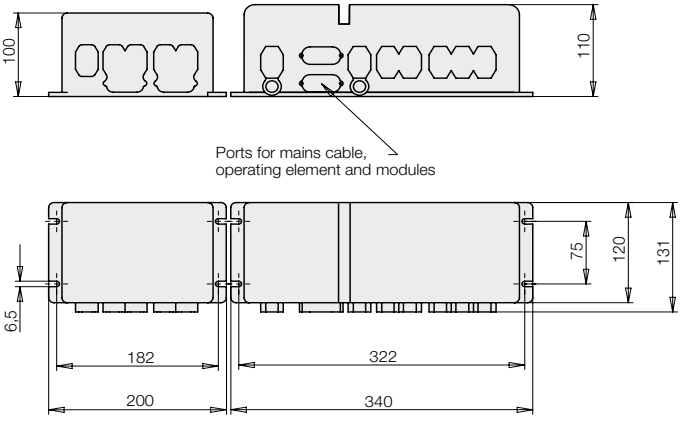
Supply voltage	230 V AC, 50 cycles
Operating voltage	24 V DC
Rating	240/480 VA
Electronic current limitation	depending on the version: 11 A or 22 A
Duty cycle	15 % – 1.5 min ON
Protection class	II
Code class	IP 66
Electrical connections	Plug connection secured by screw

Dimensions

For 2 modules



For 3 or 4 modules



Power Supply for Mobile Systems
Control module with battery holder for modulog modules

M8.201

Issue 9-17 E

Advantages

- Off-grid power supply
- Use in mobile systems
- Compact design
- No downtime
- Fast charging
- High process times by powerful battery
- Long service life
- Ergonomic design
- Safe and precise handling
- Modular system with many possible combinations
- Integrated protection functions
- Protection against deep discharge

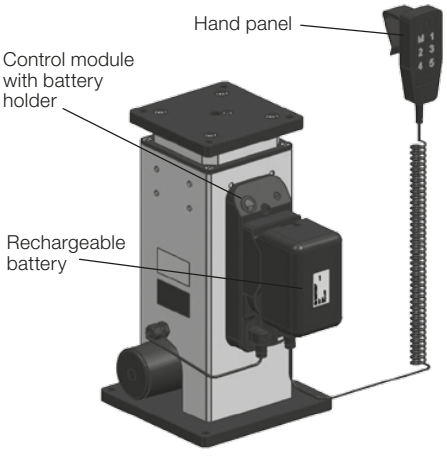
Application

The individual components are used for power supply for mobile systems in industrial assembly. They are suitable for electro-mechanical lifting modules or linear actuators with 24 V.

Fixing and installation

The control module with battery holder can be fixed with two screws M8 to the provided threads in the lifting modules at the outer profiles.
The supply line of the electrical actuator and the operating element are plugged in at the carrier plate of the control module.

Installation example



Description

A system with different individual components allows a network-independent power supply for electrical lifting modules. A rechargeable battery supplies the drive unit with energy. The battery can be recharged by an external quick battery charger.
In order to guarantee working without downtime, it is recommended to have a second rechargeable battery.
Control modules with battery holder for a single module are used to control lifting modules. Various operating elements allow an efficient functionality.

The following items are required for an operational system.

- Rechargeable battery
- Control module with battery holder
- Operating element
- Quick battery charger

Variants

The standard variant offers the functions "up/down" in jog mode.
All variants are intended for use with lifting modules with code letter B or I.
The integrated electronic ensures in combination with the stroke measuring system of the lifting modules a soft start and stop to protect all components.
Also, current limitation and duty cycle limitation help to increase the service life.

Further variants of the control modules with battery holder allow the functions of storable intermediate positions for reproducible approach. On request, the functions synchronization control and individually preset stroke end positions are possible.

modulog

Power supply for mobile systems

Technical data

Voltage	24 V
Capacity	4.5 Ah

Part numbers

Rechargeable battery	**3822-184**
Quick battery charger	**3822-177**
Standard control module	**3821-270**
with memory function	**3821-270M**

Combinable with the modules

- Lifting module – electro-mechanical as per data sheet M 4.202, M 4.301, M 4.401, M 4.501 **with code letter B or I**

- Cart module WMS as per data sheet M 5.101

- Linear actuator – electro-mechanical as per data sheet L 1.101 **with code letter I**
- Electrical operating elements, lines and connectors as per data sheet M 8.203

Material

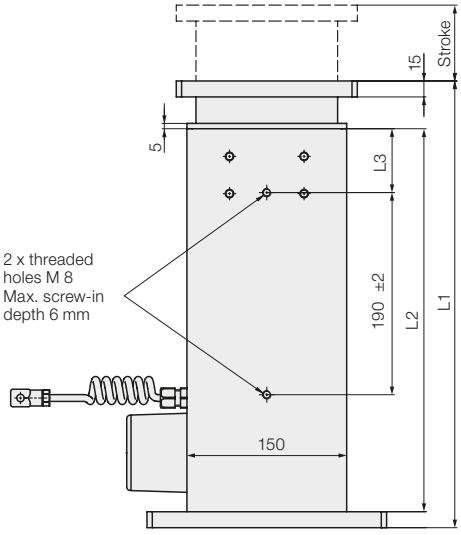
All essential elements are made of shock-resistant plastic to obtain a high robustness.

Control module with battery holder for *modulog* lifting modules

Advantages

- Microprocessor controlled
- Controlled positioning in stroke end positions and memory positions
- Soft start
- Protective functions:
  Electronic current limitation, overcurrent cut-off, detection of blockades, duty cycle limitation
- Charge state warning via LED
- Extensive fault diagnostic
- Fault signalling via flash code

Dimensions



Stroke [mm]	**L1** [mm]	**L2** [mm]	**L3** [mm]
200	420	360	60
300	520	460	135
400	620	560	185
500	720	660	235
600	820	760	285

Fixing and installation

Fixation and installation of the control module can be carried out directly at the lifting module in prepared bore holes.

Description

The control module with battery holder is the key element of the system to which all further components are connected. It is suitable for a lifting module with different force levels / stroke lengths and incremental stroke measuring system. The holder for the rechargeable battery is already integrated in the control module and forms a compact unit for supply and control of the drive module. The control unit in the control module has connections for the lifting module, for one operating element and control signals for optional functions.

Optional functions

The **memory function** allows to store up to five height positions. These can be recalled again and again or newly stored. Thus ergonomically reasonable working heights can be obtained for different persons or different working heights within one assembly process can be determined. Operation is made via an operating panel that allows to store the height positions as well as to call them. Due to safety reasons a movement is always made by touch control.

modulog

Control module with battery holder

for 1 *modulog* module
with incremental stroke measuring system

Part no. **3821-270**

Accessories

- Electrical operating elements, cables and connectors as per data sheet M 8.203

modulog

Control module with battery holder

with memory function

for 1 *modulog* module
with incremental stroke measuring system

Part no. **3821-270M**

Accessories

- Electrical operating elements, cables and connectors as per data sheet M 8.203

Technical data

Operating voltage (battery)	25.2 V
Electronic current limitation	8 A
Duty cycle	15 %, 1.5 min ON
Protection class	III
Code class (in mated condition)	IP 30
Standby current consumption	approx. 7 mA
Electrical connections	Plug connection secured by screw
Weight	approx. 700 g

modulog
Rechargeable battery

Part no. 3822-184

Description

The rechargeable battery is a Li-Ion battery and is used with its 25.2 V and 4500 mAh for ROEMHELD lifting modules as an energy source. The high capacity in a compact housing allows an efficient and flexible use.

Important notes

For charging of the batteries exclusively the quick battery charger part-no. **3822-177** from ROEMHELD may be used.

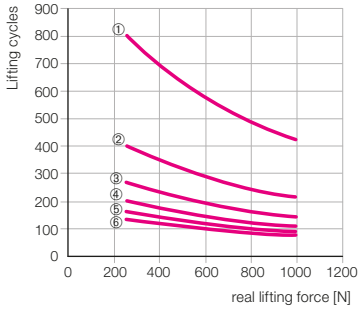
Technical data

Nominal voltage	25.2 V
Nominal capacity	4500 mAh
Charging current	max. 3A
Operating temperature Charging	10 °C … + 40 °C
Operating temperature Discharging	0 °C … + 50 °C
Storage temperature	– 20 °C … + 35 °C
Dimensions (L x W x H)	135 x 85 x 91 mm
Weight	approx. 860 g

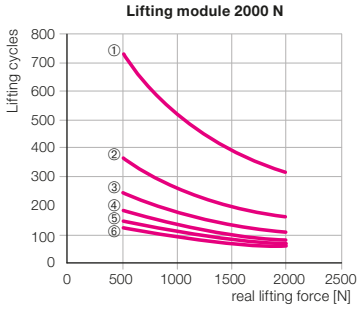
Capacity of the rechargeable battery

Based on the following diagrams, the possible number of cycles with a completely charged battery can roughly be determined.
They are presented as a function of the different force levels and stroke lengths using an individually-operated lifting module as an example.

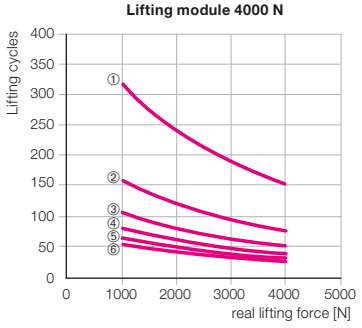
Lifting module 1000 N



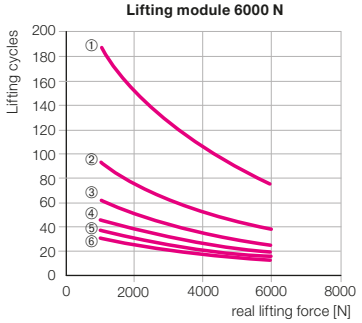
Lifting module 2000 N



Lifting module 4000 N



Lifting module 6000 N



① = 100 mm stroke
② = 200 mm stroke
③ = 300 mm stroke
④ = 400 mm stroke
⑤ = 500 mm stroke
⑥ = 600 mm stroke

modulog
Quick battery charger

Part no. 3822-177

Description

The quick battery charger is used to recharge the rechargeable battery (part-no. **3822-184**).

Technical data

Supply voltage	220 … 240 V ± 10 %
Frequency of the supply voltage	50 … 60 Hz
Output voltage	9.6 … 28.8 V
Charging current	2.9 A ± 10 %
Power limitation	max. 55 … 70 W
Charging time for 4.5 Ah	approx. 2 h
Ambient temperature Storage	– 20 °C … + 60 °C
Ambient temperature Operation	+ 5 °C … + 40 °C
Protection class	II
Code class	IP30
Dimensions (L x W x H)	152 x 86 x 76 mm
Weight	approx. 550 g

Variants

Quick battery charger for use at 100 … 120 V AC 50 … 60 Hz

Part no. 3822-182

Important notes

The battery charger is equipped with a Euro plug. A plug adaptor is country-specific required.

Application
Electrical operating elements for the operation of electrical *modulog* modules.

Advantages
- Comfortable operation
- Flexible positioning in an ergonomically favourable place
- Coiled cable
- Plug secured by screws

Description
The hand panel has two buttons which operate the functions "up" and "down".
At the back of the body there is a hook to hang up the hand panel in an ergonomically favourable place.
The relaxed coiled cable is approx. 0.9 m long and can be pulled up to a length of 1.6 m.

Operation
Push the buttons "up" and "down" with the thumb in touch control mode.
When releasing a push-button the connected module stops immediately.

Material

Body:	Polyamide
Connecting cable:	PUR

modulog
Hand panel
with up/down function
Part no. 3823-025

Combinable with the modules
- Rotating modules as per data sheet M 1.201 and M 3.201
- Control modules as per data sheet M 8.200
- Control module with battery holder as per data sheet M 8.201

Technical data

Dimensions	56 x 130 x 23 mm
Code class	IP 66
Connecting cable	Coiled cable 1.6 m (usable length) with connector

Installation
Voltage supply and control of the hand panel is made by a *modulog* control module.
The hand panel is ready for use after connection of the plug to the control module.

Application
Electrical operating elements for the operation of electrical *modulog* modules with memory function

Description
The hand panel with memory function has two push-buttons "up" and "down" to adjust the lifting modules and 5 programmable buttons for the memory function.
To store a position, the lifting module is moved into the desired position and either the "M" button is operated at the same time with one of the position push-buttons "1–5" or the "M" button and shortly afterwards one of the five position push-buttons.
The stored positions "1–5" can be approached by means of the position push-buttons. The stored positions are durably kept until they are overwritten by a new storage process.

Operation
Push the buttons "up" and "down" or "1–5" with the thumb in touch control mode.

Material

Body:	Polyamide
Connecting cable:	PUR

modulog
Hand panel
with memory function
Part no. 3823-160

Combinable with the modules
- Control modules as per data sheet M 8.200
- Control module with battery holder as per data sheet M 8.201

Technical data

Dimensions	56 x 130 x 23 mm
Code class	IP 66
Connecting cable	Coiled cable 1.9 m (usable length) with connector

Installation
Voltage supply and control of the hand panel is made by a *modulog* control module.
The hand panel is ready for use after connection of the plug to the control module.

Foot switch, lines and connectors for modulog modules

Description
The foot switch is equipped with two push-buttons for the functions "up" and "down".
The bottom side is skid-proof so that also in industrial applications a fixed position can be guaranteed.

Operation
Push the buttons "up" and "down" with the foot in touch control mode.
When releasing a push-button the connected module stops immediately.

Material

Body:	Polyamide
Connecting cable:	PUR

modulog
Foot switch
with up / down function
Part no. 3823-038

Combinable with the modules

- Rotating modules as per data sheet M 1.201 and M 3.201
- Control modules as per data sheet M 8.200
- Control module with battery holder as per data sheet M 8.201

Technical data

Dimensions	109 x 209 x 38 mm
Code class	IP 65
Connecting cable	3 m, smooth with connector

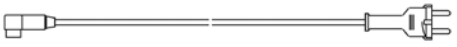
Application
Electrical operating elements for the operation of electrical *modulog* lifting modules.

Installation
Voltage supply and control of the foot switch is made by a *modulog* control module.
The foot switch is ready for use after connection of the plug to the control module.

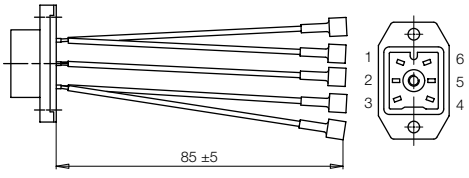
Accessories

Mains cable

Cable version	smooth with shaped plug
Nominal voltage	230 V AC
Length	3 m
Material of isolation	PUR
Part no.	**3823-040**



Device plug 3823-048

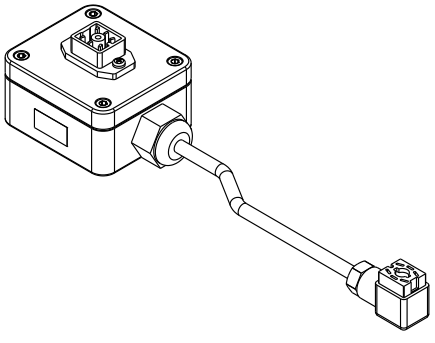


Connector	**Part no.**
Cable socket for self-assembly control ports	**3141-868**
Cable socket for self-assembly power supply	**3141-871**
Device plug for connection of ROEMHELD actuator to user control	**3823-048**

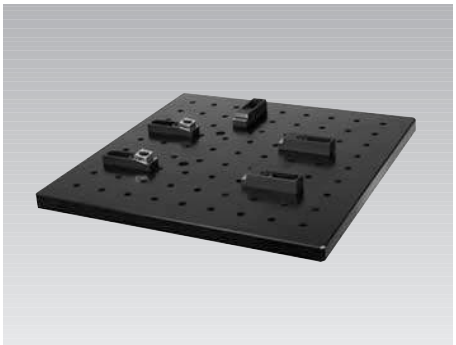
Extension cable

Cable version	smooth	smooth	smooth
Nominal voltage	24 V DC	24 V DC	24 V DC
Length	5 m	8 m	10 m
Material of isolation	PVC	PVC	PVC
Part no.	**3823-175L050**	**3823-175L080**	**3823-175L100**

For the connection of the lifting module to the control or from the operating elements to the control.



Clamping Modules — mechanical
Clamps or swing clamps with universal clamping plate, max. clamping force 6 and 10 kN



Clamping module with clamps

Clamping module with swing clamps

Application
With *modulog* clamping modules workpieces for manual assembly operations are easily and reliably positioned, fixed and clamped.
Thus the fitter can exert forces on the workpiece without displacing it.
The quality of the assembly process will be improved.

Principal use
- Assembly of heavy components
- Assembly of frequently changing components
- Workshop applications
- Clamping during test cycles
- Machining of cylinder heads
- Assembly of electric motors

Advantages
- Quicker and simpler clamping process
- Quick and easy retrofitting
- Optionally clamping module with clamps or swing clamps
- Complete sets including universal clamping plate
- Every point on the universal clamping plate is approachable with the clamping elements
- Easy handling for retrofitting due to universal clamping plate made of aluminium
- Easy fixing of the universal clamping plate on other *modulog* modules by the *modulog* interface

Description
These *modulog* clamping modules are mechanical clamping elements that are offered together with a universal clamping plate as a kit.

Alternatively the clamping modules contain clamps or swing clamps with the corresponding support elements. The universal clamping plate is provided with a grid for mounting of the clamping elements. This allows flexible positioning of the clamping elements for clamping of very different workpieces.

The universal clamping plate is equipped with a 140 x140 *modulog* interface in the centre, so that it can be easily mounted on other *modulog* modules.

Combined with *modulog* lifting or rotating modules the workpiece can be moved to the ergonomically ideal height or rotating position.

Mounting
The clamping modules are screwed onto the grid of the universal clamping plate with socket head cap screws M12. The screws have to be tightened with 80 Nm.

The universal clamping plate can be mounted with 4 socket head cap screws M10 on other *modulog* modules.

modulog
Clamping modules - mechanical

Clamping module with clamps and universal clamping plate
Max. clamping force: 6 kN
Max. clamping stroke: 2 mm
Operation with Allen key
Part-no. **8903-06-05-O**

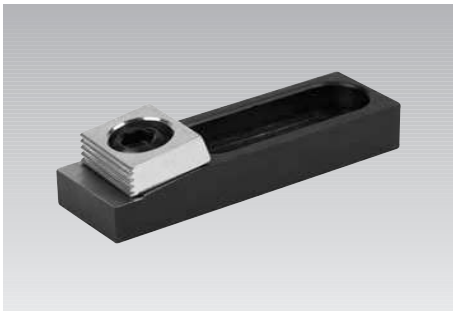
Clamping module with swing clamps and universal clamping plate
Max. clamping force: 10 kN
Max. clamping stroke: 1.5 mm
Operation with hand lever
Part-no. **8902-10-08-M**
Accessory: Height cylinder

Universal clamping plate
with grid 50 mm – M12
with ***modulog* interface**
140 x 140 mm - counterbore for DIN 912 M10

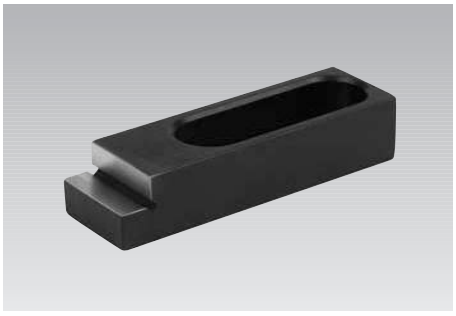
Material
Clamping elements:	steel, partially hardened
Universal clamping plate:	high-tensile aluminium

Important note!
For dimensioning of the clamps it has to be considered if the forces act against a fixed stop or if clamping forces are used by friction.

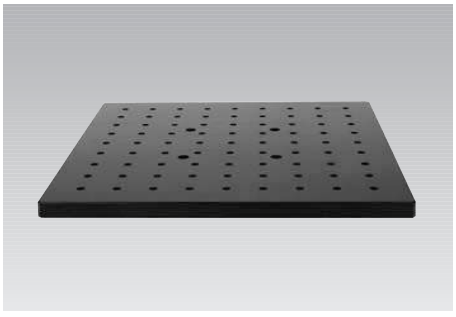
Clamping module with clamps



Clamp 6351-642



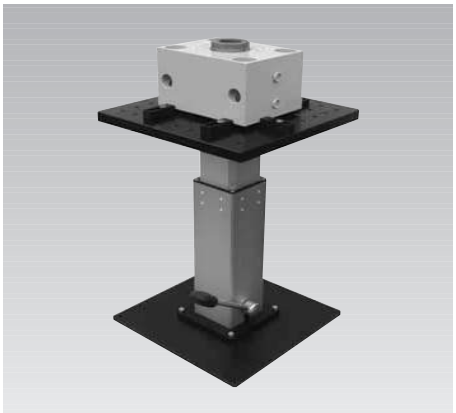
Support element 6351-643



Universal clamping plate 6311-572

Application example

Assembly of a hydraulic cylinder. The universal clamping plate is mounted on a *modulog* lifting module to easily adjust the optimum working height.



Description

This clamping module contains 2 clamps and 3 support elements.
Since the clamps can also be used as supports, all in all 5 support surfaces can be realised.

The support elements are designed so that they can also be used as fixed stops. Thus the workpieces can always be reproducibly clamped in the same positon.

The clamps and support elements excel by their compactness and precise support and stop faces.

Installation

If possible the workpiece has to be clamped so that the highest forces act against the fixed stop.
The workpiece must safely rest on all support surfaces.

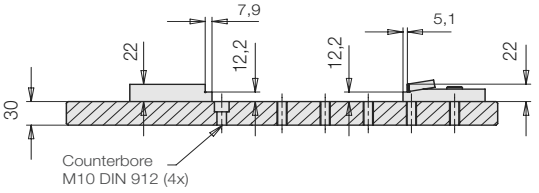
The 2 clamps have to be positioned so that they clamp against the 2 support elements. The 3rd support element can be used as fixed stop across the clamping direction.

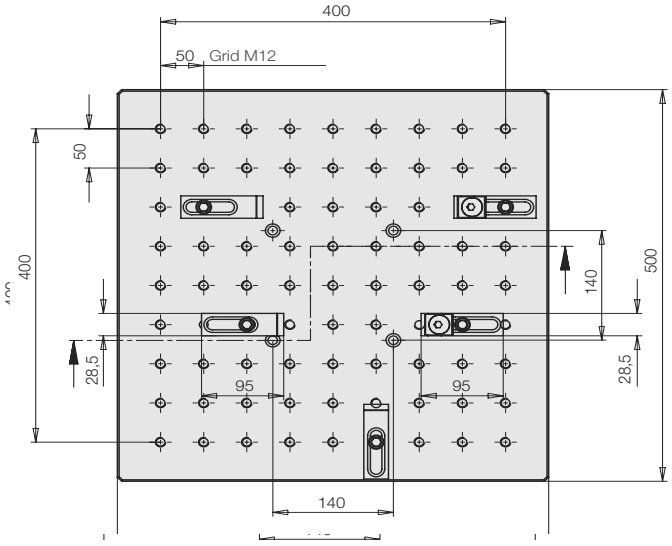
With an Allen key SW 8 the clamping eccentric of the clamps is tightened by approx. 1/4 revolution so that the workpiece is safely clamped against the fixed stop.

Important note!

When mounting, pay attention to the maximum clamping stroke.

Dimensions





Part numbers

Clamping module with clamps **8903-06-05-O**

Delivery:

- 2 off clamps
- 3 off support elements
- 1 off universal clamping plate

Part numbers of individual elements:

Clamp:	**6351-642**
Support element:	**6351-643**
Universal clamping plate:	**6311-572**

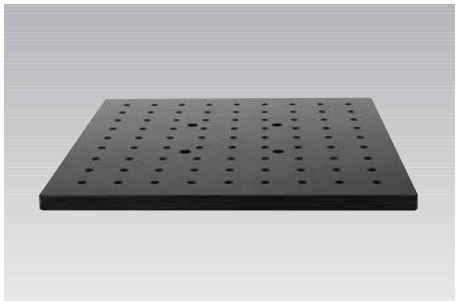
Technical characteristics

Clamping force (per clamp):	[kN]	6
Extraction force (clamping module):	[kN]	approx. 3
Clamping stroke:	[mm]	max. 2
Support height:	[mm]	12.2

Clamping module with swing clamps

Swing clamp 6351-640

Jack screw 6351-641



Universal clamping plate 6311-572

Description

This clamping module contains 4 swing clamps and 4 jack screws.
The height of the clamping points of the swing clamps as well as the support height of the jack screws can be adjusted.
This allows clamping of workpieces with support points in different heights. If the adjusting range is not sufficient, it can be enlarged by means of the accessory height cylinder.

The clamping module with mechanical swing clamps excels by its flexibility and variety.

Installation

First the 4 jack screws are positioned to the appropriate height and then locked with an open-end wrench SW36/SW30.
The workpiece must safely rest on the support surfaces.

The 4 swing clamps have to be positioned so that they clamp against the 4 jack screws. For clamping the clamping arms are manually swung above the clamping points. By operation of the clamping lever the clamping process is effected.

Important note!

When mounting, pay attention to the maximum clamping stroke.

Part numbers

Clamping module with swing clamps **8902-10-08-M**

Delivery:

- 4 off swing clamps
- 4 off jack screws
- 1 off universal clamping plate

Part numbers individual elements:

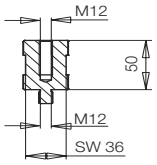
Swing clamp:	**6351-640**
Jack screw:	**6351-641**
Universal clamping plate:	**6311-572**

Technical characteristics

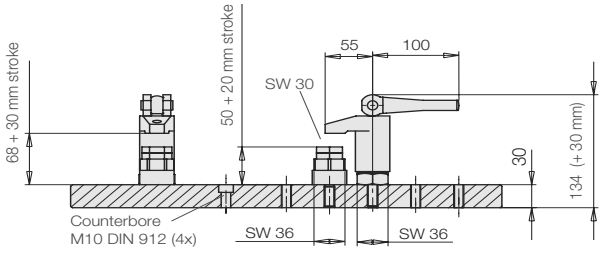
Max. clamping force (per swing clamp):	[kN]	10
Extraction force (clamping module):	[kN]	> 10
Clamping stroke:	[mm]	max. 1.5
Basic height:	[mm]	68 up to 98
Support height:	[mm]	50 up to 70

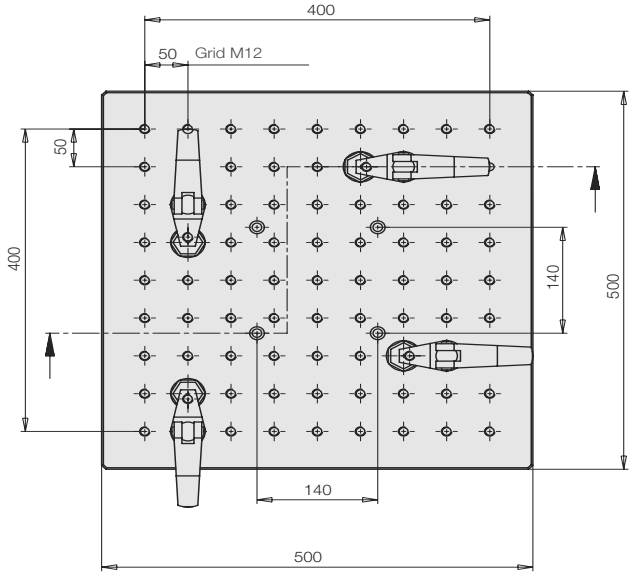
Accessory

Height cylinder 50 mm
Part-number 6311-632



Dimensions



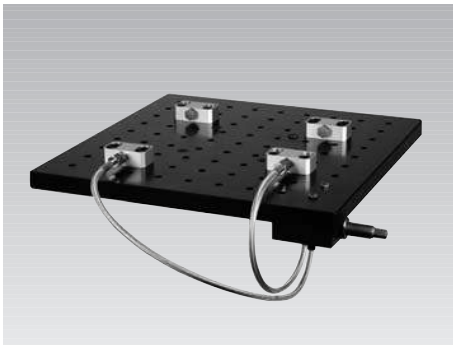


Clamping modules - hydraulic

Hydraulic clamps with universal clamping plate and screw pump, max. clamping force 2.5 kN

M 8.301

Issue 9-08 E



Clamping module with hydraulic clamps

Application

With *modulog* clamping modules workpieces for manual assembly operations are easily and reliably positioned, fixed and clamped.
Thus the fitter can exert forces on the workpiece without displacing it.
The quality of the assembly process will be improved.

Principal use

- Assembly of heavy components
- Assembly of frequently changing components
- Workshop applications
- Clamping during test cycles
- Machining of cylinder heads
- Assembly of electric motors

Mounting

The clamping modules are screwed onto the grid of the universal clamping plate with socket head cap screws M12. The screws have to be tightened with 80 Nm.

The screw pump is fixed with 2 socket head cap screws M8 at the bottom side of the universal clamping plate.

The universal clamping plate can be mounted with 4 socket head cap screws M10 with flat head on other *modulog* modules.

Important note!

For dimensioning of the clamps it has to be distinguished if the forces act against a fixed stop or if clamping forces are used by friction.

Advantages

- Quicker and simpler clamping process
- Uniform, reproducible clamping force by hydraulic clamping
- Quick and easy retrofitting
- Complete sets including universal clamping plate
- Every point on the universal clamping plate is approachable with the clamping elements
- Easy handling for retrofitting due to universal clamping plate made of aluminium
- Easy fixing of the universal clamping plate on other *modulog* modules by the *modulog* interface

Description

The *modulog* clamping module consists of 2 clamping elements, which are connected by hydraulic hoses to a screw pump. For each clamping element a corresponding fixed stop can be positioned on the universal clamping plate.

The universal clamping plate is provided with a grid for mounting of the clamping elements. This allows flexible positioning of the clamping elements for clamping of very different workpieces.

Also the screw pump is fixed on the universal clamping plate.

The universal clamping plate is equipped with a 140 x140 *modulog* interface in the centre, so that it can be easily mounted on other *modulog* modules. Combined with *modulog* lifting or rotating modules the workpiece can be moved to the ergonomically ideal height or rotating position.

The elements are also available as component parts. The kit contains the complete system, filled with hydraulic oil and bleeded, with screw pump kit and clamping elements.

Material

Clamping elements:	high-tensile aluminium, steel, partially hardened
Universal clamping plate:	high-tensile aluminium
Screw pump:	steel

modulog

Clamping modules - hydraulic

Clamping module with hydraulic clamps, universalclamping plate and screw pump

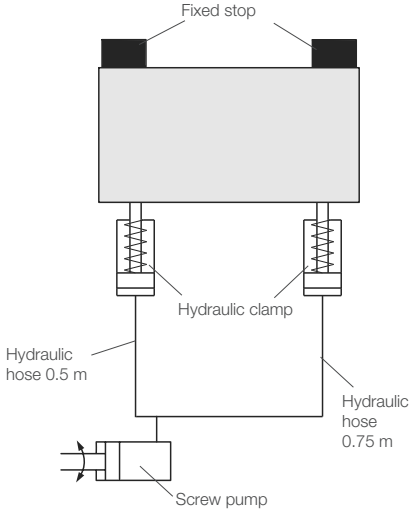
Max. clamping force:	2.5 kN
Max. clamping stroke:	5 mm
Operation with wrench	
Part-no.	**8903-02-04-H**

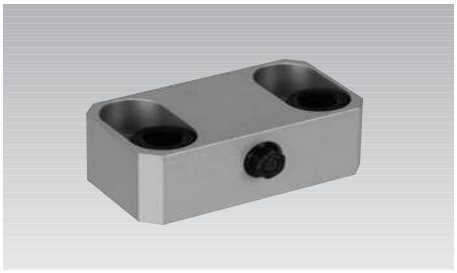
Universal clamping plate
with grid 50 mm – M12
with ***modulog* interface**
140 x 140 mm - counterbore for DIN 912 M10

Screw pump

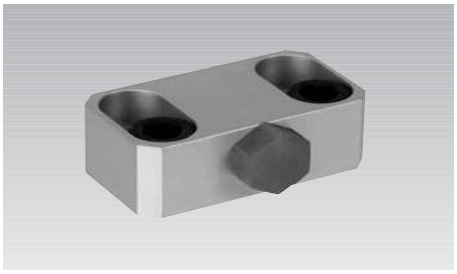
Max. operating pressure:	500 bar
Function:	single acting
Operation with wrench	

Hydraulic circuit diagram

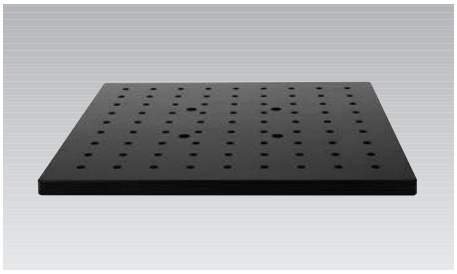




Hydraulic clamp 6505-339



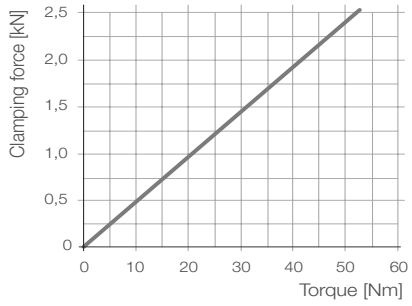
Fixed stop 6505-340



Universal clamping plate 6311-572

Screw pump of the kit 6505-341

Operating torques at the screw pump



Description

This clamping module contains 2 hydraulically-operated hydraulic clamps and 2 fixed stops. Both hydraulic clamps are clamped and unclamped with the screw pump.

The hydraulic clamps excel by their compactness and their simple operation.

Installation and operation

If possible the workpiece has to be clamped so that the highest forces act against the fixed stop. The workpiece must safely rest.

The screw pump is operated with as socket or a wrench SW 13 and thus the workpiece is safely clamped against the 2 fixed stops.

Important notes!

When mounting, pay attention to the maximum clamping stroke.

The maximum clamping force is obtained with maximum operating pressure of the screw pump. The required torque at the screw pump is 53 Nm. (see diagram)

Part numbers

Clamping module with hydraulic clamps **8903-02-04-H**

Delivery:

- 2 off hydraulic clamps
- 2 off fixed stops
- 1 off universal clamping plate
- 1 off screw pump kit including 2 hydraulic hoses with fittings

Part numbers individual elements:

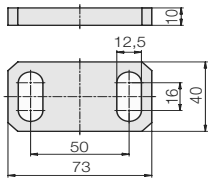
Hydraulic clamp:	**6505-339**
Fixed stop:	**6505-340**
Universal clamping plate:	**6311-572**
Screw pump kit:	**6505-341**

Technical characteristics

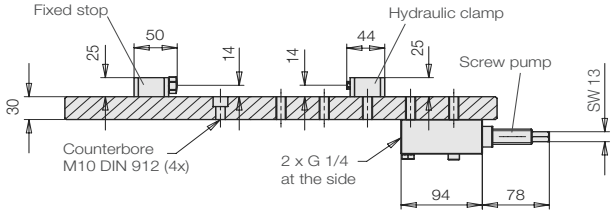
Function:		single acting
Clamping force (per hydraulic clamp):	[kN]	2.5
Clamping stroke:	[mm]	max. 5
Max. operating pressure:	[bar]	500
Hose nominal diameter:		ND 4

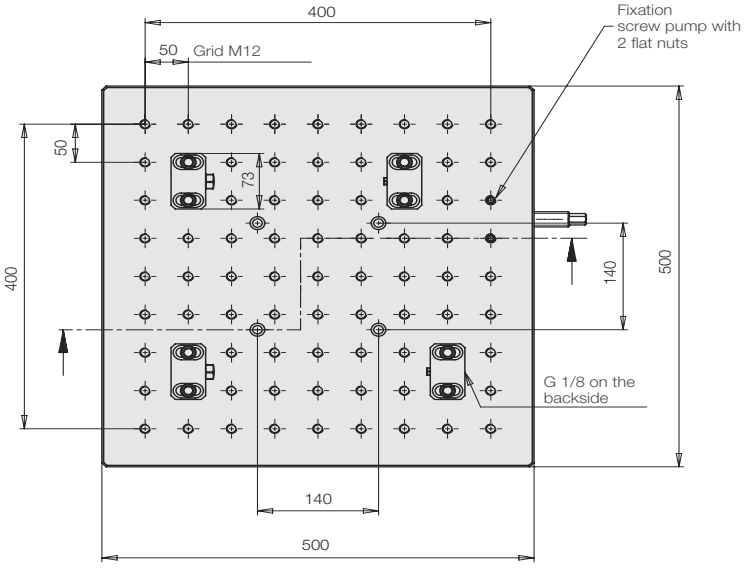
Accessory

Height plate
Part-no. 6311-633



Dimensions





Quick-Change Mounting Plate
With zero point clamping system SPEEDY easy click for modulog interfaces

M8.302

Issue 8-14 E

Advantages

- *modulog* interface
- Workpiece change in seconds by SPEEDY easy click
- Engages immediately without any energy supply!
- Immediate build up of the clamping force 5 kN
- Max. retention force 10 kN
- Pneumatics for unclamping available everywhere
- Radial positioning by locating bolts
- Snapper as a safety against falling out in the changing position

Application

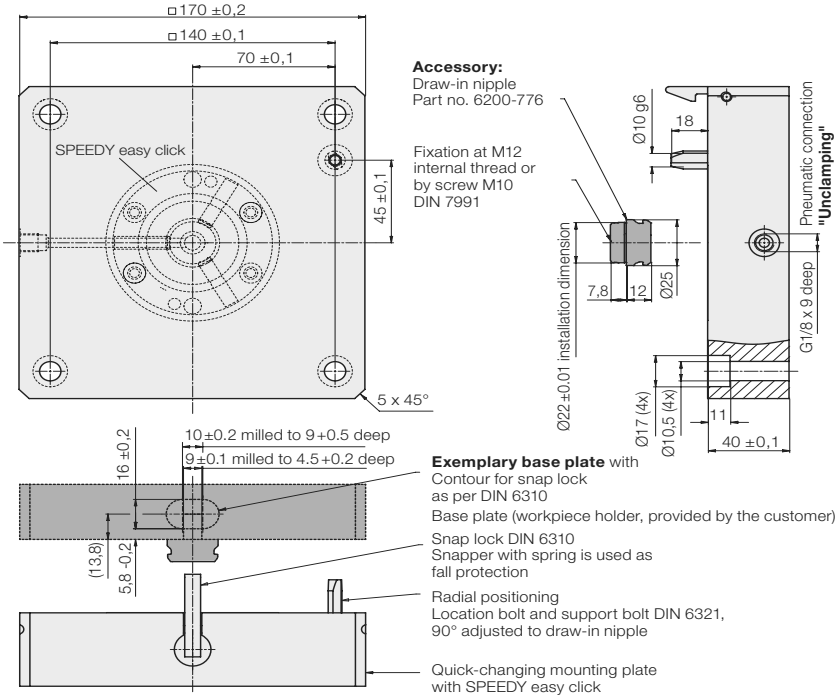
The quick-change mounting plate can be mounted onto all *modulog* modules and devices with interface 140 x 140 mm.
The built-in STARK zero point clamping system SPEEDY easy click allows a very fast workpiece change.
A prerequisite is that the workpieces are mounted on base plates which are equipped with a draw-in nipple for the SPEEDY easy click.

This system is particularly suitable,

- when workpieces must be frequently changed very quickly at the assembly station.
- when different workpieces or parts families are to be routed through one assembly station.
- when workpieces are to be routed through several assembly stations.
- when the workpiece with the required base plate is still manually tradable.

Description

The quick-change mounting plate is designed as adaptor plate with connecting dimensions of the *modulog* interface 140 x 140.
A STARK zero point clamping system SPEEDY easy click is installed in the centre.
This is a fast-closing clamp plate that engages immediately and clamps without energy supply. For unclamping a pneumatic connection is required.
The required draw-in nipple is mounted on the base plate for the workpiece to be clamped. The radial positioning is made by a location bolt. A suitable drill bush is embedded in the base plate. In addition, there is a snapper installed to secure the workpiece against falling out after the pneumatic unclamping of the zero point clamping element.



modulog

Quick-change mounting plate for SPEEDY easy click

Part no. 890301P

Combinable with the modules

- Lifting module Shop Floor as per data sheet M 4.301

- Rotating module with flow power as per data sheet M 1.202

***modulog* interface**

- 140 x 140 - M10

Technical data

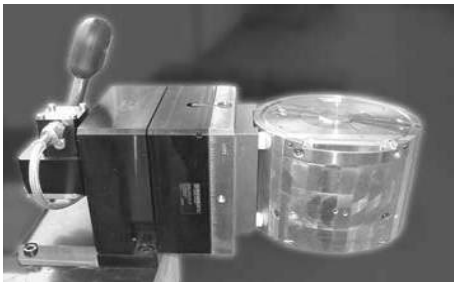
Clamping force (traction) approx.	[kN]	5
Retention force maxi.	[kN]	10
Force to engage approx.	[N]	80
Pneumatic unclamping pressure	[bar]	3 – 8
Clamping time approx.	[s]	0.1
Unclamping time approx.	[s]	0.1
Admissible workpiece weight	[kg]	100
Admissible side load	[kN]	2.5
Admissible radial torque	[Nm]	200
Repeatability	[mm]	0.01
Weight, approx.	[kg]	8.2

Accessories

Draw-in nipple (1 piece)	**6200-776**

Workpiece change

Workpiece engaged



Workbench 2000 x 800 mm
with electrically-operated height adjustment with hand panel

M 8.901

Issue 8-15 E

modulog module combination Workbench 2000 x 800 mm

Part no. 8917-341

Technical data
Max. load: 3,000 N plane

Operation
- Hand panel

consisting of the *modulog* modules

- 2 lifting modules Shop-Floor as per data sheet M 4.301
- 1 table plate 2000 x 800 as per data sheet M 8.131

- 2 base plates as per data sheet M 8.100
- 1 hand panel as per data sheet M 8.203
- 1 electrical control module as per data sheet M 8.200
- 1 mains cable as per data sheet M 8.203

Application
The workbench with electrical height adjustment is used for manual working places. The users can individually adjust their optimum ergonomic working height. They are used in production plants of the industry.

Principal use
- Industrial assembly working places
- Height adjustment of assembly working places in workshops
- Sitting and standing workstation
- Service
- Assembly fixtures
- Handling systems for product packing and transfer

Fixing and installation
For fixing 4 screws M10 of property class 10.9 as well as heavy-duty plugs are to be used.
The floor must be clean and flat.
Protruding loads have to be avoided.

Material

Lifting profile	aluminium, naturally anodised
Top and bottom plate	aluminium, black anodized
Table plate	Multiplex beech
Base plate	steel, black oxide

Advantages:
- Simple and intuitive operation
- Less absence from work due to illness by working at an ergonomically optimum height
- Sturdy industrial design
- Good accessibility
- Very high flexibility
- Increase of quality in manufacturing and assembly processes
- Short amortization time

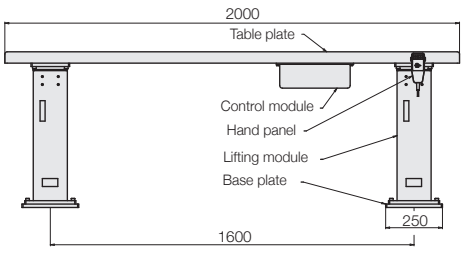
Description
The workbench with height adjustment is particularly suitable for lifting and lowering assembly fixtures, working tables and demonstration objects in industrial applications. The lifting motion is generated by two lifting modules in synchronism with electric motor and spindle lifting gear. They excel by a smooth running.

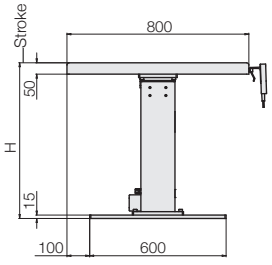
Operation
Lifting and lowering is triggered by push-buttons with touch control contact. After release of the push-button, the motion will be immediately stopped.

on request	Stroke 200 mm	H = 485
	Stroke 300 mm	H = 585
8917-341	Stroke 400 mm	H = 685

Specific dimensions of the table plate and the fixations are available on request.

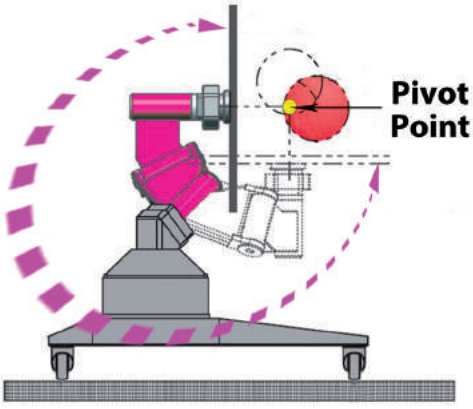
Dimensions





Centrick Multi-Axis Positioner For Heavy Load Assembly

Products up to 4,400 lbs can be tilted 90° and rotated 360°



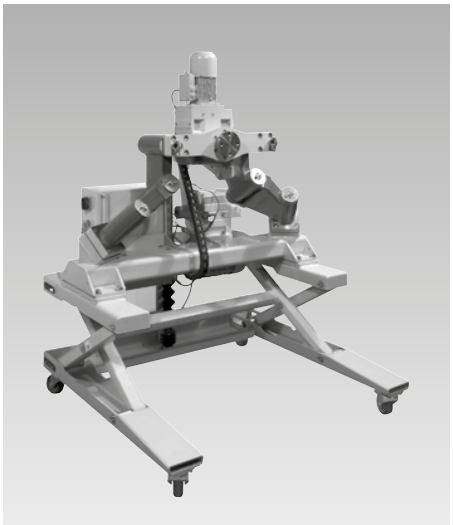
Center of Gravity Is Nearly Stationery

- Ergonomic, space-saving and efficient handling of components
- Low space requirement for easy integration into existing work/assembly areas
- Tilting (0-90°) and turning (360°) of products of any shape
- Movement and positioning of the workpiece near its center of gravity for mobility and security against tipping
- Quiet electric drives (230 V) with very low power consumption
- Holding brakes for maintaining a permanently stable work/assembly position
- Extremely clean operation – no leakage
- Dramatically reduced times for working and assembly

Carr Lane Roemheld Mfg. Co.
Sales — Phone (636) 386-8022 Fax (636) 386-8034
Engineering — Phone 1-800-827-2526 Web **roemheld-usa.com**

Centrick Rotating and Tilting Manipulator

Electrically operated tilting, rotating and lifting of workpieces max. loads 500 and 2000 kg



Application

Centrick manipulators are used for electrically operated tilting, rotating and lifting of heavy workpieces or fixtures in the assembly.
Workpieces or fixtures can be easily placed in the optimum position and working is facilitated.

Typical applications are assembly and welding works on:
- motors
- gears
- vehicle cabs
- chassis components of commercial and rail vehicles
- pumps and compressors

Versions

Two basic versions are available: **A500** and **A2000** for loads up to 500 kg or 2000 kg.
The 90° tilting function is a standard feature, the rotating and lifting function can be optionally selected.

Advantages

- Tilting (0…90°) and rotating (continuously) products of any shape around their centre of gravity!
- Ergonomic, space-saving and efficient handling of the component
- Low space requirement for integration in existing work/assembly areas
- Mobile and tilt resistant by movement and positioning of the workpiece near its centre of gravity
- Lowest drive performance of the low-noise electric drives (230V)
- Stable working/assembly positions by holding brakes
- Very clean operation – no leakages
- Drastic working / assembly time reduction
- Reduction of handling accidents resulting in costly downtimes
- Increased motivation of employees
- Integration in line and cycle assembly processes is possible (Industry 4.0)

Description

Centrick is an innovative manipulator for optimum positioning workpieces in up to 3 axis.

Tilting by 90°

The patented tilting kinematics with virtual centre of rotation is unique. The workpiece centre of gravity remains virtually unchanged in its position during tilting
Thus, tilting is balanced and can be effected with a small power rating in an energy-saving way.
In addition, less work space is required and the stability is increased.
Increased safety at work is the result.

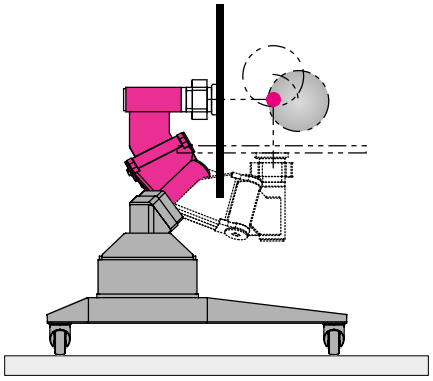
Rotating by 360°

The rotating function enables the continuous rotation of workpieces. Media supply through the rotating plate is available as an option.

Lifting

The version A500 has a compact scissors lifting adjustment with a stroke of 310 mm, the version A2000 is equipped with a stable column lifting adjustment with a stroke of 700 mm.

Tilting function



Centrick changes the workpiece side. The workpiece remains in unchanged position in space, but the assembly side is tilted by 90°.
- high stability
- mobile application on rollers is possible
- less space required
- no compensation stroke required

Adaptation of the working height

Also without lifting function, the basic variants can be delivered with customised basic height.

Operation

Three electrical operating units are available to operate the Centrick:
- two-hand enabling switch with cable
- touch panel (automatic control)
- remote control

Variants

Centrick manipulators are available in many variants as presented on the following pages.
On request, customised adaptations can be carried out.

		A500	A2000
Max. working load	[kg]	500	2000
Rating - rotating and tilting	[kW]	2 x 0.25	1.1 and 0.55
Rating - lifting	[kW]	1.5	2.2
Supply voltage	[VAC]	230	230
Lifting speed	[mm/s]	9.2	11.7
Tilting angle	[°]	0 – 90	0 – 90
Tilting speed	[°/s]	approx. 10	approx. 3.5
Rotation angle	[°]	360 continuously	360 continuously
Rotation speed	[r.p.m.]	approx. 3	approx. 1.5
Positioning accuracy*	[°]	± 1	± 1
Empty weight (without lifting function)	[kg]	350	750
Empty weight (with lifting function)	[kg]	400	on request

* only relevant for version with touch panel (code letter P)

Code for part number of version A A 500

650C A 0 X K - X X X - E X 0 X 0

Centrick

Version A500

Rotation axis
D = 360° continuous rotation (standard)
♦ = 360° continuous rotation, with 10 mm hollow shaft
♦ = without rotation axis, rigid cross beam

Safety equipment
0 = without working place related safety equipment (standard)
A = area scanner in the working area and safety fence on 3 sides
♦ = safety fence on 3 sides

Operating elements
B = cable remote control (standard)
P = touch panel with setting and automatic mode
♦ = radio remote control

Supply voltage
0 = 230 VAC

Height adapter (c)
0 = (standard)
1 = 75 mm
2 = 175 mm
3 = 275 mm
4 = 375 mm

Foot design
F = base frame with adjustable feet
H = base frame with adjustable feet, with scissors lifting table, 300 mm stroke
K = compact: version F rotated by 180° (anchoring to the ground is always required)
R = base frame on rollers Ø 80 mm (standard)
V = base frame on rollers Ø 80 mm, with scissors lifting table, 300 mm Hub

♦ = available on request

Code for part number of version A A 2000

650C B 0 X K - X X X - E 0 0 X 0

Centrick

Version A2000

Rotation axis
M = 360° continuous rotation, with 50 mm hollow shaft (standard)
♦ = without rotation axis, rigid cross beam

Safety equipment
0 = without (standard)
A = area scanner in the working area and safety fence on 3 sides
♦ = safety fence on 3 sides

Operating elements
B = cable remote control (standard)
♦ = touch panel with setting and automatic mode

Supply voltage
0 = 230 VAC
♦ = 400 V / 3 P

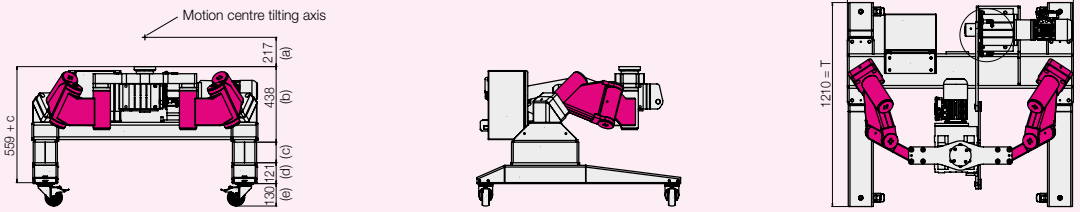
Foot design
F = base frame with adjustable feet (standard)
♦ = base frame mounted on lift mast, 700 mm stroke
♦ = base frame with air cushion
R = base frame on rollers Ø 100 mm

♦ = available on request

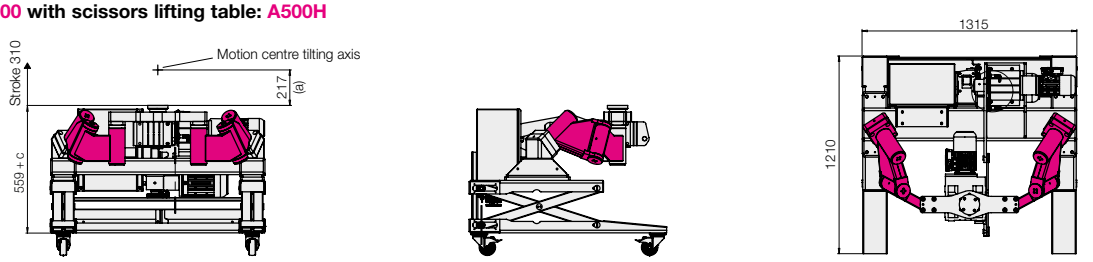
Dimensions

Front view | **Side view** | **Top view**

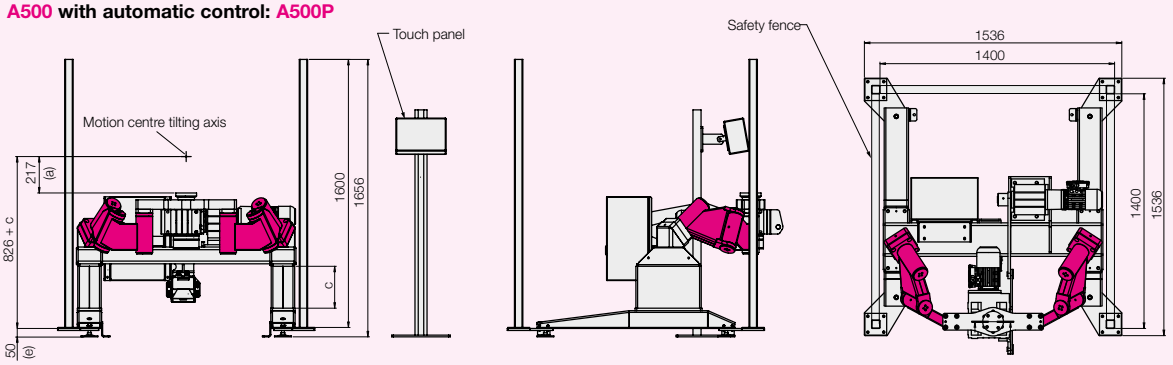
A500



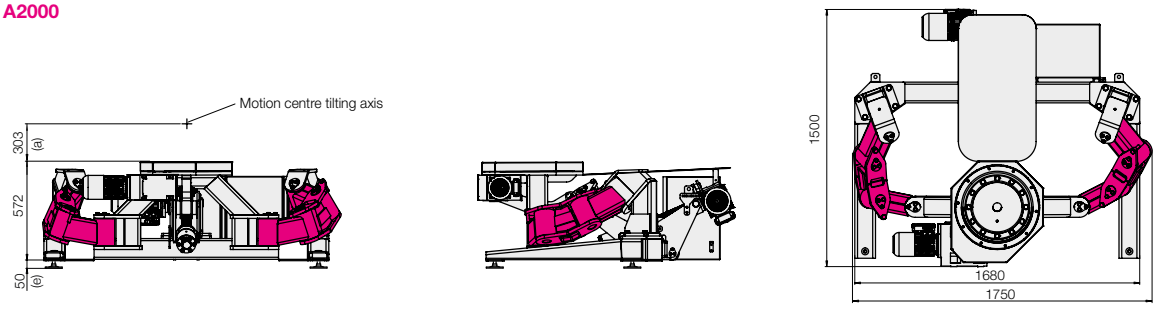
A500 with scissors lifting table: A500H



A500 with automatic control: A500P



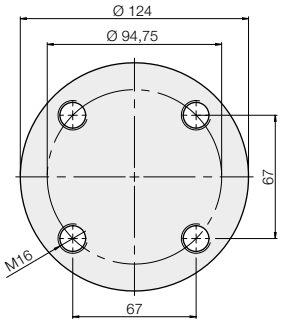
A2000



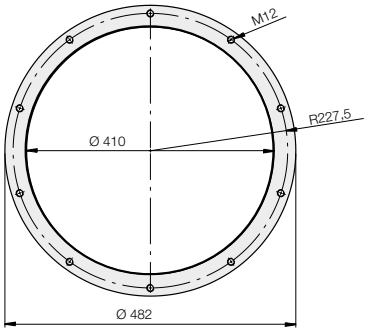
			A500	A500H	A500P	A2000
Exterior dimensions:	(BxT)	[mm]	1315x1210	1315x1210	1536x1536	1750x1500
Tilting radius:	(a)	[mm]	217	217	217	303
Height - core unit:	(b)	[mm]	438	438	438	417
Height - height adapter:	(c)	[mm]	0-375	0-375	0-375	0
Height - foot (base frame):	(d)	[mm]	121	121	121	121
Height - roller or adjustable foot:	(e)	[mm]	roller 130; adjustable foot 50	roller 130; adjustable foot 50	roller 130; adjustable foot 50	roller 130; adjustable foot 50
Basic height - upper edge: Horizontal flange:	Σ (b – e)	[mm]	= Σ (b – e)	= Σ (b – e)	= Σ (b – e)	= Σ (b – e)
Basic height - axle centre: vertically tilted rotation axis:	Σ (a – e)	[mm]	= Σ (a – e)	= Σ (a – e)	= Σ (a – e)	= Σ (a – e)

Diagrams
Application examples

Flange A500

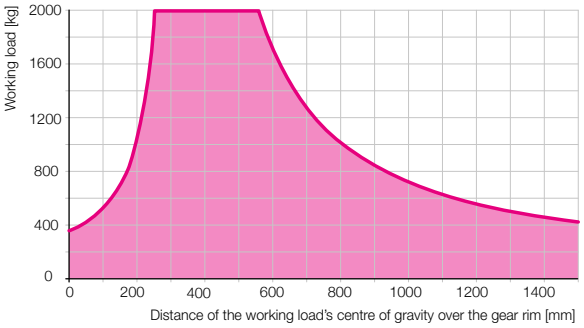


Flange A2000

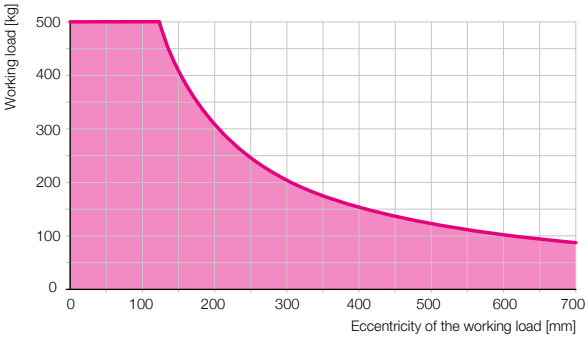


Centrick A500
Admissible working load as a function of the height of the working load's centre of gravity over the connecting flange
Tilting

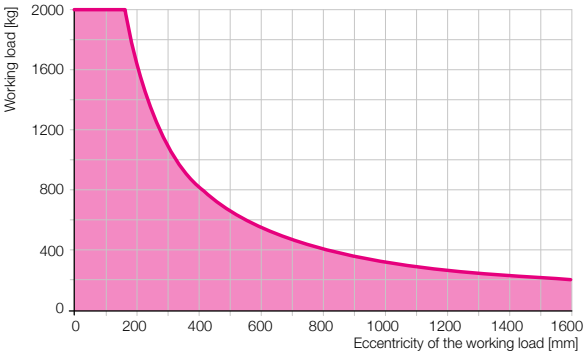
Centrick A2000
Admissible working load as a function of the distance of the working load's centre of gravity over the gear rim
Tilting



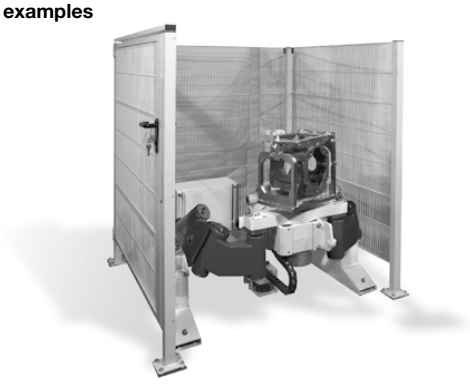
Centrick A500
Maximum admissible eccentricity of the working load with reference to the rotation axis
Rotating

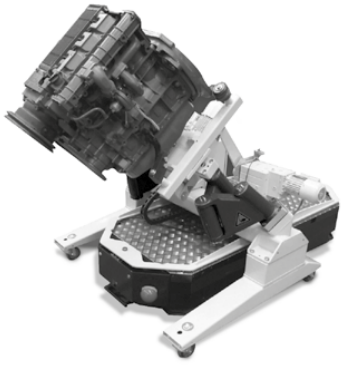


Centrick A2000
Maximum admissible eccentricity of the working load with reference to the rotation axis
Rotating



Application examples





Carr Lane Roemheld In the News...

Modular Units Maximize Ergonomics, Efficiency in Manual Workstations

Challenge: *Thermo Fisher Scientific, a global market leader in laboratory technology, designed new incubators for medical engineering and health research, to cultivate human and animal cells. Target customers were universities, research labs and others in the industry. Preassembly of the incubators required a lot of handling and was physically very demanding, requiring numerous rotations.*

Solution: *The company used Modular Units for Assembly from Carr Lane Roemheld, which can be combined to lift, tilt, rotate or move, with horizontal and vertical rotation, to increase productivity and reduce operator fatigue.*

Ergonomically designed production line

Thermo Fisher Scientific developed an ergonomic production line for the manual assembly of a new series of incubators. Health-conscious workstation design was a top priority, in addition to process and product quality.

The new "Heracell Vios" incubators are for medical engineering and health research, where they are used for cultivating human and animal cells. Target customers are universities, research labs and the medical industry.

"An ergonomic workstation like this is invaluable. It is good for the back, neck, and shoulders and is a noticeable relief. The body feels it immediately."

Thermo Fisher's world headquarters are near Boston, MA, but variations of the incubators were being assembled in the company's plant near Frankfurt, Germany. Apart from two sizes with 42 and 63 gallons of useful space, variations included bactericidal and fungicidal models of copper, incubators with a stainless steel inner, and for different gases and varying sensor technology.

Thermo Fisher's new incubator is the successor of the model "Heracell" of which 75,000 units were sold in 15 years. The new series, launched in September 2014, is distinct in its optimized control behavior, improved protection against contamination and facilitated operation.

Assembly workstations: from prototype to production line

Thermo Fisher Scientific worked with ROEMHELD experts for the new workstations. Headquartered in Laubach, Germany, ROEMHELD (represented in North America by Carr Lane Roemheld of Fenton, Missouri), has provided assembly and handling of laboratory equipment to Thermo Fisher since 2009.

The rotary module has indices which may be released in steps of 45° by two foot switches.

Carr Lane Roemheld's modular units for assembly and handling consist of numerous modules that provide for the optimum and ergonomic positioning of objects for manual assembly. Horizontal and vertical rotation, tilting, lifting, placement and movement are the basic manipulations. The units can be combined into a modular system with application flexibility and variably combinable components for loads from 22 to 1325 lbs. Operation can be either manually on the module directly, or electrically via levers or buttons.

The latest development is a rotary module with media feed-ducts. Among other advantages, these allow for the hydraulic, electrical or pneumatic operation of devices clamped by zero-point clamping systems without complex boring.

The focus is on ergonomics

Technical Head Felix Pergande is very satisfied. "ROEMHELD intensely and dedicatedly responds to our individual requirements. In addition, their products are very reliable and can be configured according to our requirements - we do not have to buy anything ready-made."

Ergonomics were the top priority for the new manual

(continued on next page)

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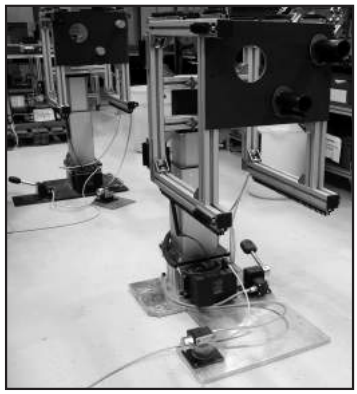
assembly workstation. The earlier incubator series had been assembled on height-adjustable tables, but later units weighing around 40 lbs. had to be moved manually without any auxiliary equipment. “For this reason, preassembly of the inner containers required a lot of handling and was physically more demanding,” says Production Resources Engineer Stefan Kämmerer.

Open to the front, the inside casing is approx. 28 in. high and 18 in. wide for the 42 gallon incubator type, and is manufactured in Thermo Fisher’s own sheet workshop. In one to two shifts as required, 8 of the plant’s 150 employees cover all 5 sides with heater foils, requiring the container to be rotated several times. Apart from this, a sensor and a fixture have to be mounted. The entire process takes about 45 minutes before insulation is attached and the outside casing is assembled over it.



Electronic modules have push-button lift, and rotary modules are operated by two foot switches.

Assembly line with four manual workstations

ROEMHELD designed a line of four assembly workstations, comprised of an electronic Shop-Floor lift module with a stroke of 8 in., which can be lifted and lowered by a pushbutton, and a rotary module. This rotary module is provided with indices which may be released manually in steps of 45°; for this purpose, the fitter can use two foot switches without having to walk around the container. “For efficiency, the fitters had the idea of a second foot switch; this suggestion could rapidly be implemented by ROEMHELD,” Kämmerer recalled. After the design completion of the assembly workstations, he ordered and assembled the ROEMHELD components.

All parties were satisfied with the workstation design. Pergande emphasizes the excellent ergonomics, and sees an evident improvement in product quality: “The clear position fixation and the defined handling by means of the 45° indices noticeably reduced the risk of dents in the container.” According to Pergande, time savings and cost reduction are not high priorities in this design, though both are achieved. He emphasizes that the ergonomic design of the workstations contributes to protecting the employees’ health and that “the absence of an employee costs money, because either we cannot produce or we have to assign a replacement.” As a consequence, less rejects and healthier employees contribute to cost savings and enhance Thermo Fisher’s success as a market leader.

To protect the work surfaces, a clamping device with brushes on bearing surfaces holds inner containers.

The company is now designing other manual workstations using the modular units. Equipment fitter Steffen Hillesheim remarked, “An ergonomic workstation with useful features like this is invaluable. It is good for the back, neck, and shoulders and is a noticeable relief. The body feels it immediately.” The standard interface conception of the modular units allows for the flexible and uncomplicated planning of future workstations, and Hillesheim said it has also helped assembly workstations in complying with the latest occupational health and safety regulations.

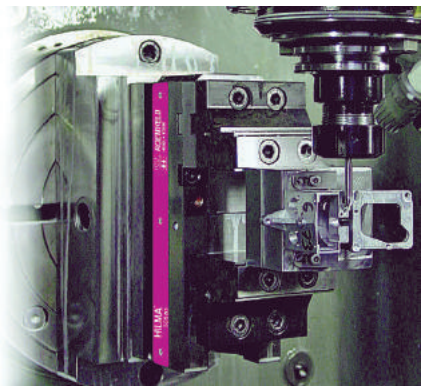
An employee covers five sides with heater foils, so the container has to be rotated several times.

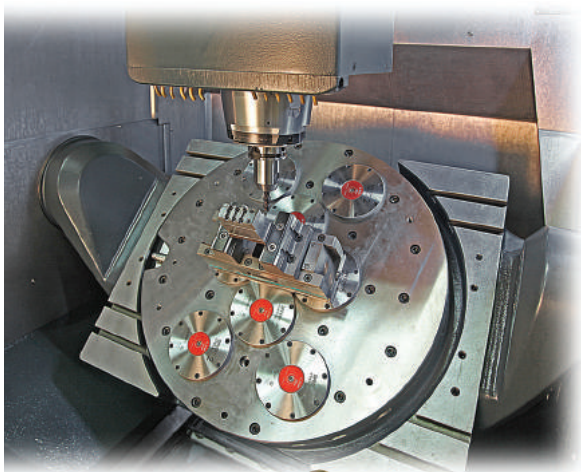
ROEMHELD, represented in North America by Carr Lane Roemheld of Fenton, Missouri, is one of the world’s market and quality leaders for solutions in industrial production, assembly, clamping and drive technology.

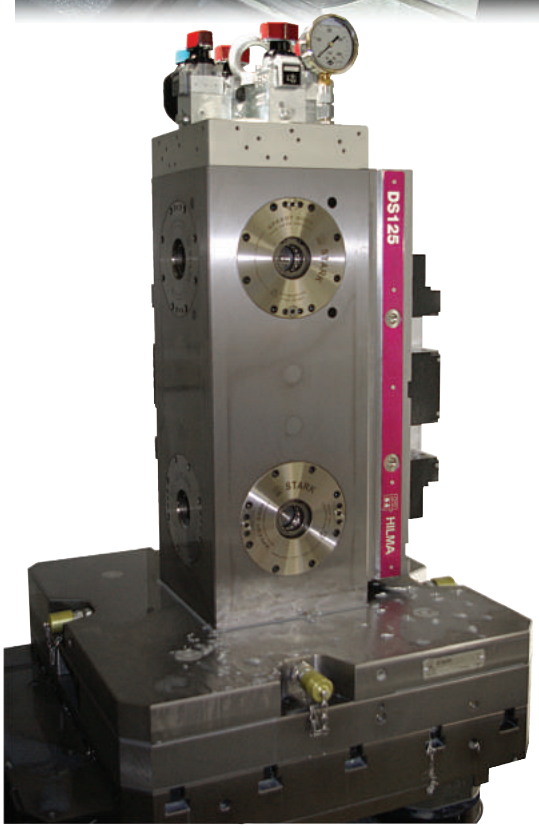
In addition to assembly components, the company also offers a host of power workholding devices, machine vises, and zero point mounting systems for CNC machining, as well as die, mold and tool clamping systems for presses, die casting, injection molding and compression molding machines.

PRECISION MACHINE VISES INCREASE PRODUCTIVITY

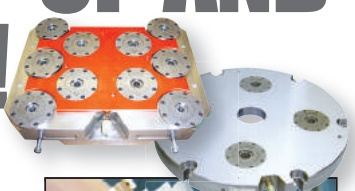
Use in Conjunction with the Zero Point Mounting System for Faster, More Accurate Fixture Set Ups



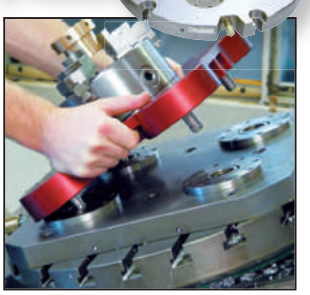




REDUCE SET-UP AND DOWNTIME!



Zero Point Mounting System for Quick Change Fixturing



This comprehensive system utilizes clamping components and insertion nipples, which provide an immediate zero point orientation.

- Reduce set up time by as much as 90% with zero point mounting
- Existing fixtures can be easily adapted
- Highly accurate positioning and repeatability
- Increased productivity
- Fast payback
- Set-up times slashed
- Fixture life extended

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