

ROLLON®
BY TIMKEN

Actuator System Line

Seventh Axis



General catalogue
English

Interactive catalogs
on: www.rollon.com



New Seventh Axis

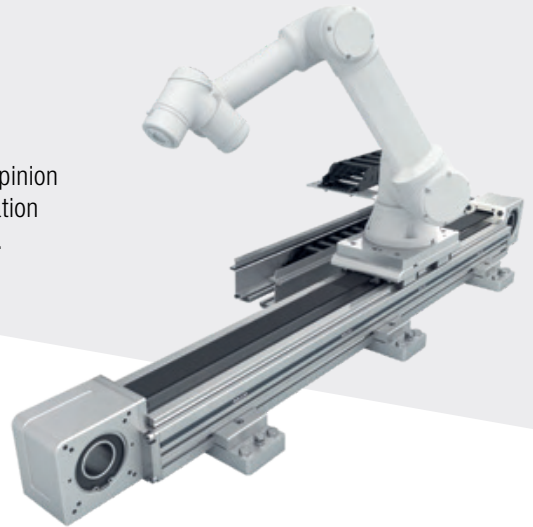
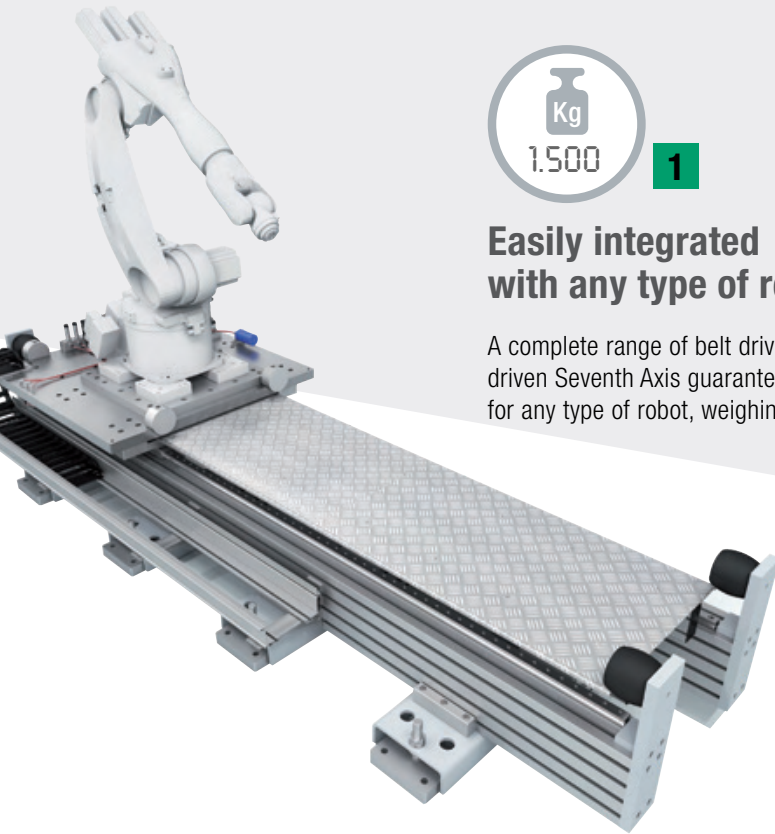
Improve your robots' productivity by extending their operating range. Seventh axis can move any type of robot weighing up to 1500 kg over long distances with a high range of dynamics. Discover the **8 main advantages**.



1

Easily integrated with any type of robot

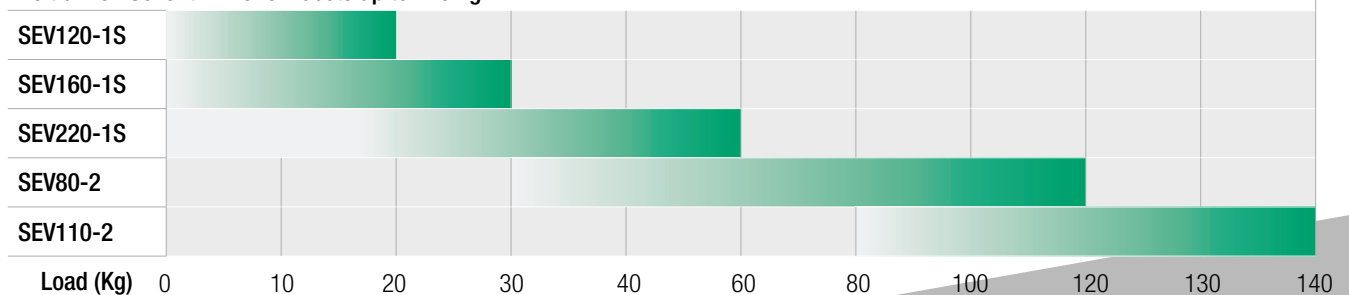
A complete range of belt driven and rack and pinion driven Seventh Axis guarantees simple integration for any type of robot, weighing up to 1500 Kg.



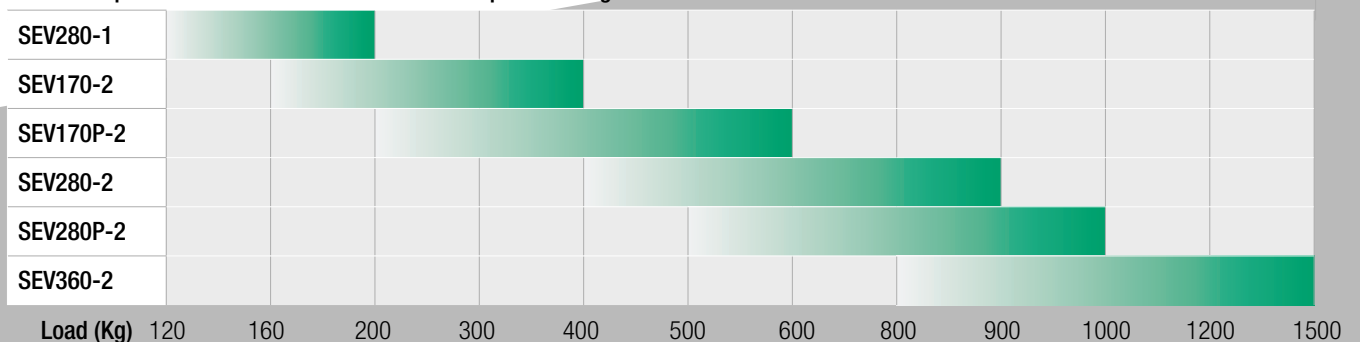
LOAD CAPACITY ACCORDING TO DYNAMICS

Reported data must be verified according to the application. For more information, please contact our technical department.

Belt driven Seventh Axis for robots up to 140 kg



Rack and pinion driven Seventh Axis for robots up to 1500 kg














Lower load - Higher dynamics

Higher load - Lower dynamics

ROBOT EXAMPLES ACCORDING TO DIFFERENT SIZES

Robot examples mentioned are indicative and refer to floor mounted version. For a correct choice and sizing of the axis please contact our technical department.

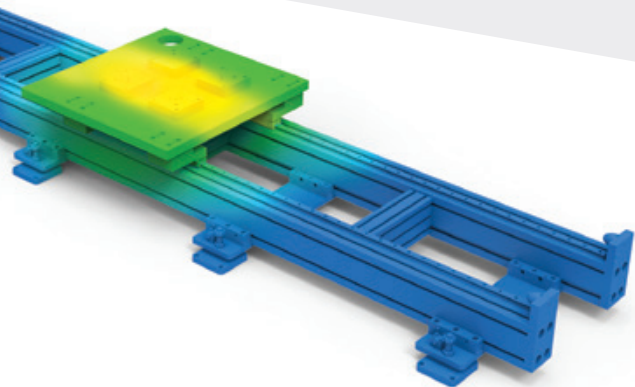
| Seventh Axis | | Robot examples | | | |
|--------------|---|---------------------------|---|--------------|-------------|
| Series | Driving System | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV120-1S |  | DENSO UNIVERSAL ROBOTS | VP-6242 UR3 | 2.5 3 | 15 11 |
| SEV160-1S |  | ABB | IRB 1100 ; IRB 120 | 3-4 | 21-25 |
| | | DOOSAN | M0609 | 6 | 17 |
| | | EPSON | Prosix C3 | 3 | 27 |
| | | KASSOW ROBOTS | KR810; KR1205 | 3-10 | 23.5-25 |
| | | KAWASAKI | RS03N; MC004N | 3-4 | 20-25 |
| | | KUKA | KR 3 R540; LBR iiwa 7 R800; LBR iiwa 7 R820 | 3-14 | 22-29 |
| | | NACHI | Nachi MZ04; Nachi MZ07 | 4-7 | 26-30 |
| | | OMRON | TM5-700; TM5-900 | 4-6 | 21.8-22.6 |
| | | STÄUBLI | TX2-40 | 2 | 29 |
| | | UNIVERSAL ROBOTS | UR5 | 5 | 21 |
| SEV220-1S |  | YASKAWA | MH3F | 3 | 27 |
| | | DOOSAN | M0617; M1013; M1509 | 6-15 | 24-32 |
| | | FANUC | CR-4ia; CR-7ia; CRX-10ia; CR-14ia/L; LR Mate 200id; LR Mate 200id/4S; LR Mate 200id/14L | 4-14 | 17-53 |
| | | KASSOW ROBOTS | KR1018 | 18 | 34 |
| | | KUKA | KR 6 R700-2; KR 6 R900-2; KR 10 R1100-2 | 6-10 | 53-55 |
| | | NACHI | Nachi MZ03EL | 10 | 47 |
| | | STÄUBLI | TX2-60 | 4.5 | 51 |
| | | UNIVERSAL ROBOTS | UR10; UR10e; UR16e | 10-16 | 31.5-33.5 |
| | | YASKAWA | HC10; GP7; GP8 | 7-10 | 32-47 |
| SEV80-2 |  | KASSOW ROBOTS | KR1410; KR1805 | 5-10 | 35-38 |
| | | KAWASAKI | RS003N; RS005N; RS005L; RS007N; RS007L | 3-7 | 20-37 |
| | | KUKA | Agilus Serie KR3; KR6; KR10 | 3-10 | 26-57 |
| | | MITSUBISHI | RV-2FR; RV-2FRL; RV-4FR; RV-4FRL; RV-7FR; RV-7FRL; RV-7FRL | 3-7 | 19-130 |
| | | NACHI | MZ07-01; MZ07L-01; MZ07P-01; MZ07LP-01; | 7 | 30-32 |
| | | STÄUBLI | TX2-40; TX2-60; TX2-60L | 2-4.5 | 29-53 |
| | | UNIVERSAL ROBOTS | UR3/3e; UR5/5e; UR10/10e; UR16e | 3-16 | 11-34 |
| | | YASKAWA | GP7; GP8 | 7-8 | 32-34 |
| SEV110-2 |  | ABB | IRB 1300; IRB 1300; IRB 1300; IRB 140 | 7-11 | 74.5-78.5 |
| | | DENSO | VP-6083 | 6 | 82 |
| | | MITSUBISHI | RV-13F; RV-20F | 13-20 | 120-137 |
| | | STÄUBLI | TX2-90 | 7 | 111 |
| | | YASKAWA | SIA20D | 20 | 120 |
| SEV280-1 |  | COMAU | Racer 7-1.0; Racer-7-1.4; SIX-6-1.4 | 6-7 | 160-180 |
| | | FANUC | ARC Mate 100iC/12; M-10iA/10M; M-10iA/12; M-10iD 12 | 10-12 | 130-145 |
| | | KAWASAKI | RS010N; RS006L | 6-10 | 150 |
| | | KUKA | KR6 – KR10 CYBERTECH nano; KR6 – KR8 CYBERTECH ARC nano | 6-10 | 145-180 |
| | | MITSUBISHI | RV13FR(-L); RV20FR | 13-20 | 120-130 |
| | | NACHI | NB04; NV06; | 10 | 160-170 |
| | | STÄUBLI | TP80; TX2-90; TX2-90L; TX2-90XL | 7-14 | 111-119 |
| | | YASKAWA | MH12/-F; GP12 | 12 | 130-150 |
| SEV170-2 |  | ABB | IRB 1600; IRB 1660iD; IRB 2600-12/-20; IRB 2600iD-8/-15; | 4-20 | 250-284 |
| | | FANUC | M-20iA; M-20iA/20M; ARC Mate 120C; M-20iB/25; M-20iB/25C; M-20iA/35M | 20-25 | 210-250 |
| | | KAWASAKI | RS020N; RS010L | 10-20 | 230 |
| | | KUKA | KR CYBERTECH / KR CYBERTECH arc | 8-22 | 250-270 |
| | | NACHI | MC10L; MC20; MR20-02; MR20L-01; NB04L; NV06L | 10-20 | 220-280 |
| | | STÄUBLI | RX160; RX160HD; RX160L; | 14-20 | 248-250 |
| SEV170P-2 |  | YASKAWA | GP25; GP25-12; HP20F/-RD 2 | 12-25 | 250-268 |
| | | ABB | IRB 2400; IRB 4600; IRB 6620LX; | 10-150 | 380-610 |
| | | COMAU | NS-12-1.85; NS-16-1.65; NJ-16-3.1; NJ-40-2.5; NJ-60-2.2 | 12-60 | 333-680 |
| | | FANUC | M-710 all types | 12-70 | 410-570 |
| | | KAWASAKI | RS030N; RS050N; RS080N; RS15X | 30-80 | 555 |
| SEV280-2 |  | NACHI | MC35-01; MC50-01; MC70-01 | 35-70 | 640 |
| | | ABB | IRB460 | 110 | 925 |
| | | FANUC | M-710 all types | 12-70 | 410-570 |
| SEV280P-2 |  | KUKA | KR 30 and KR 60 - all types | 16-60 | 600-700 |
| | | ABB | IRB460, IRB6620 | 110-150 | 900-925 |
| | | COMAU | NJ130 2.6 | 130 | 1050 |
| | | FANUC | R2000 100FH, 125L, 165F, 165FH, 165R | 100-165 | 1090-1360 |
| | | KUKA | KR 120, 150, 180 | 120-180 | 677-1093 |
| SEV360-2 |  | STÄUBLI | TX200L | 80 | 1000 |
| | | FANUC | M900ib/360; R2000ic/210L; R2000ic/270F | 210-360 | 1320-1540 |
| | | KUKA | KR 210, 240, 270, 300 | 210-300 | 1068-1154 |

**2**

High stiffness with low weight

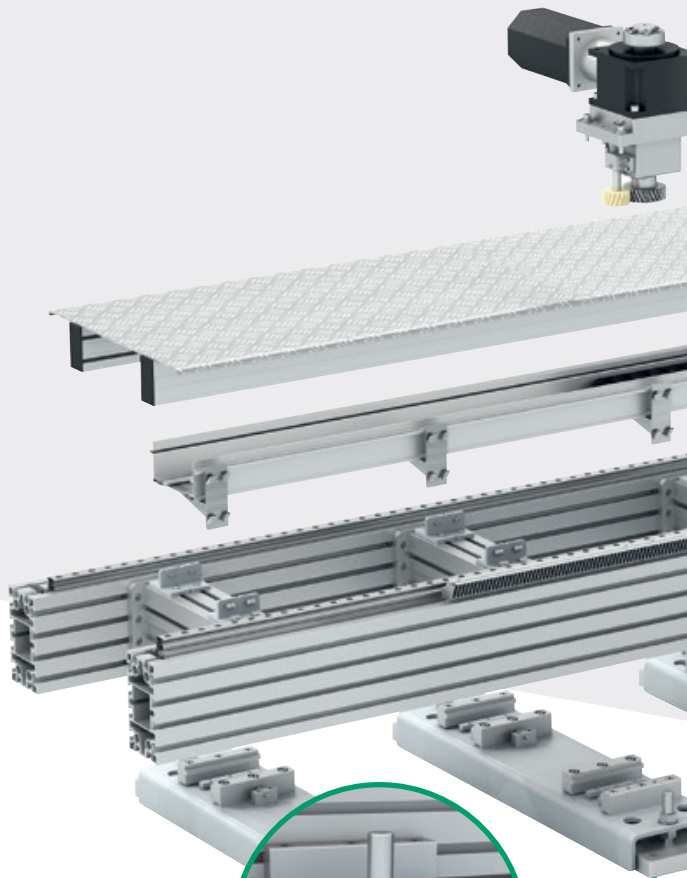
The highly engineered combination of rails, steel connecting crosspieces, and aluminum profiles extruded with elaborate geometries, allows high stiffness and low weight.

Thanks to its lightness and strength, Seventh Axis operates smoothly even in applications that require wall or ceiling mounting.

**3**

Simplified mounting and alignment

Due to adjustable leveling systems integrated into the rigid, factory-aligned cross-members.

**4**

Potentially infinite strokes

Rack and pinion driven sizes can reach potentially infinite strokes thanks to jointable, self-centring inserts.

**5**

Protection for every work environment

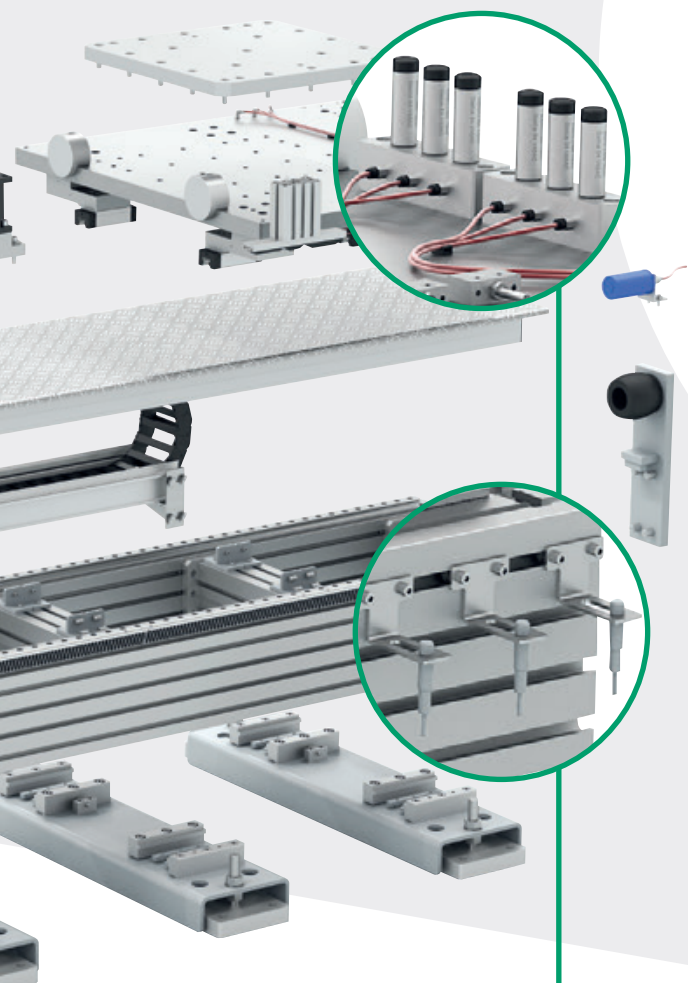
Different protection options are available according to the size of Seventh Axis, to make it reliable in dirty environments:

- Belt driven Seventh Axis can feature a polyurethane sealing strip to protect the internal components.
- Rack and pinion driven Seventh Axis can be configured with three types of cover: simple, partial or total.



The best-performing series PLUS

Featuring larger linear rails to move larger robots with the same axis size, saving space on the factory layout.



6

High quality components

Designed with carefully selected high quality components: hardened racks with helical teeth, rails with recirculating rollers and planetary or hypoid bevel gearboxes.



7

Full range of accessories

Ready to use solution supplied with standard cable carrier, gearbox and lubrication systems.

Optionals available for the most demanding applications, like heavy duty cable carrier, proximity sensor holders and cams and programmable lubrication system.



8

Reliability backed by our experience

Seventh Axis was created from 40 years of expertise in designing and producing linear motion systems.

Seventh Axis

Technical Features



| Reference | | Linear guides | | Drive | | Anticorrosion option available | Protection | |
|--------------|---------------|---------------|-------|-------|------|--------------------------------|---------------|--------|
| Family | Product | Rollers | Balls | Rack | Belt | | Sealing Strip | Simple |
| Seventh Axis | SEV120-1S | | | | | | | ✓ |
| | SEV160-1S | | | | | | | ✓ |
| | SEV220-1S | | | | | | | ✓ |
| | SEV80-2 | | | | | | ✓ | |
| | SEV110-2 | | | | | | ✓ | |
| | SEV280-1 | | | | | | | ✓ |
| | SEV170-2 | | | | | | | ✓ |
| | SEV170P-2 | | | | | | | ✓ |
| | SEV280-2 | | | | | | | ✓ |
| | SEV280P-2 | | | | | | | ✓ |
| | SEV360-2 | | | | | | | ✓ |

The data shown must be verified on the basis of the application.

*1 The total repeatability of the system depends on the gearbox. If the gearbox is ordered with the axis, our Technical Department can provide the total precision value.

| | | Size | Number of profiles | Maximum speed [m/s] | Maximum acceleration [m/s²] | Repeatability [mm] | Maximum stroke [mm] |
|---------|-------|---------|--------------------|---------------------|-----------------------------|----------------------|---------------------|
| Partial | Total | | | | | | |
| | | 120x65 | 1 | 2 | 4 | ± 0.05 ^{*1} | 6000 |
| | | 160x90 | 1 | 2 | 4 | ± 0.05 ^{*1} | 6000 |
| | | 220x100 | 1 | 2 | 4 | ± 0.05 ^{*1} | 5750 |
| | | 80x80 | 2 | 2 | 4 | ± 0.05 | 5750 |
| | | 110x110 | 2 | 2 | 4 | ± 0.05 | 5750 |
| | | 170x280 | 1 | 2 | 4 | ± 0.05 | ∞ |
| √ | √ | 170x120 | 2 | 2 | 4 | ± 0.05 | ∞ |
| √ | √ | 170x120 | 2 | 2 | 4 | ± 0.05 | ∞ |
| √ | √ | 280x170 | 2 | 2 | 2 | ± 0.05 | ∞ |
| √ | √ | 280x170 | 2 | 2 | 2 | ± 0.05 | ∞ |
| √ | √ | 360x200 | 2 | 2 | 2 | ± 0.05 | ∞ |

> Seventh Axis



Technical features

1 SEV series - Belt driven

| | |
|--|-------|
| Seventh Axis for robots up to 140 Kg | SV-2 |
| The components, The linear motion system | SV-3 |
| SEV 120-1S | SV-4 |
| SEV 160-1S | SV-6 |
| SEV 220-1S | SV-8 |
| SEV 80-2 | SV-10 |
| SEV 110-2 | SV-12 |

2 SEV series - Rack and pinion driven

| | |
|--|-------|
| Seventh Axis for robots up to 1500 Kg | SV-14 |
| The components, The linear motion system | SV-15 |
| SEV 280-1 | SV-16 |
| SEV 170-2 | SV-18 |
| SEV 170P-2 | SV-20 |
| SEV 280-2 | SV-22 |
| SEV 280P-2 | SV-24 |
| SEV 360-2 | SV-26 |

3 Accessories

| | |
|----------------------------------|-------|
| Cable carrier, Sensors and cames | SV-28 |
| T-Nuts, Robot connecting plate | SV-29 |

4 Technical instructions

| | |
|--|-------|
| Standard lengths and joint profiles | SV-33 |
| Mounting options, Anchoring the Seventh Axis | SV-34 |
| Leveling feet | SV-35 |
| Protection options for rack and pinion driven Seventh Axis | SV-36 |
| Gearboxes | SV-37 |
| Lubrication of the rack and pinion driving system, Lubrication of the blocks | SV-38 |
| Profile specifications | SV-39 |
| Ordering key | SV-41 |
| Warning and legal notes | SV-42 |

SEV series - Belt driven



> Seventh Axis for robots up to 140 Kg



Fig. 1

Belt driven Seventh Axis is designed to extend the working area of smaller industrial robots, with weight around 10 - 140 Kg or payload around 2 - 20 Kg. It is the best choice to improve the robot's productivity in applications such as small machine tool feeding, pick and place and assembly operations in different industrial sectors.

Seventh Axis is made of one or two self-supporting extruded aluminum profiles joined together by means of rigid connecting crosspieces. It is available in different sizes: 120-1S, 160-1S, 220-1S and 80-2, 110-2. The aluminum profiles are resistant to corrosion, and are extruded to make highly elaborate geometries that guarantee a high moment of inertia and a low weight. Thanks to its lightness and high rigidity, Seventh Axis operates smoothly even in applications that require wall or ceiling mounting.

The thrust force is transmitted by a steel reinforced polyurethane belt. The carriage runs on two parallel linear guides with four self-lubricated recirculating ball bearing blocks, positioned to support the carriage and all incident loads and moments. The polyurethane belt eliminates the need to lubricate the driving system.

The main advantages of Seventh Axis are:

- Suitable for all the smaller industrial robots (eg. weight up to 140 Kg or payload up to 20 Kg)
- Five different sizes.
- High quality components and competitive performances.
- Easy and quick assembly.
- Customizations possible, please contact our technical department.

> The components

Extruded aluminum bodies

Seventh Axis is created using extruded and anodized Rollon profiles, designed and manufactured to optimize weight while maintaining mechanical strength. The dimensional tolerances comply with UNI EN 755-9.

Driving belt

Seventh Axis features a steel reinforced polyurethane drive belt with AT pitch. This belt is ideal due to its high load transmission characteristics and compact size. Used in conjunction with backlashfree pulleys, smooth alternating motion can be achieved. Optimization of the maximum belt width / body dimension ratio enables to achieve high speed while maintaining low levels of noise and wear. The provision of guidance for the belt within the body causes it to run central on the pulley, thereby ensuring long service life.

Carriage

The carriage of the Seventh Axis is made of anodized aluminum. A dedicated connecting plate allows to assemble the robot on the carriage. The plate is customized to accommodate the different kinds of robots.

Protection

Seventh Axis size 80-2 and 110-2 are equipped with a polyurethane sealing strip to protect all of the internal components from dust, contaminants, and other foreign objects. The sealing strip runs the length of the body and is kept in position by micro-bearings located within the carriage. This minimizes frictional resistance as the strip passes through the carriage while providing maximum protection.

Gearbox

Pg. SV-37 lists the gearbox types suggested for the axis in floor mounted configuration and their assembly kit. To use other gearboxes, or for vertical mounting orientation, please contact our Technical Department.

> The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

SEV series with ball bearings guides

- Two ball bearing guides with high load capacity are mounted in a dedicated seat inside or outside the body.
- The carriage is assembled on four pre-loaded ball bearing blocks.
- The ball bearing blocks enable the carriage to withstand loading in the main directions.
- The blocks have seals on both sides and, if necessary, an additional scraper can be fitted for very dusty conditions.
- Lubrication reservoirs (pockets) installed on the front of the ball bearing blocks supply the right amount of grease, thus promoting long maintenance interval.

The linear motion system described offers:

- High speed and acceleration
- High load capacity
- High bending permissible moments
- Low friction
- Long lifetime
- Low maintenance (depending on application)
- Low noise

> SEV 120-1S

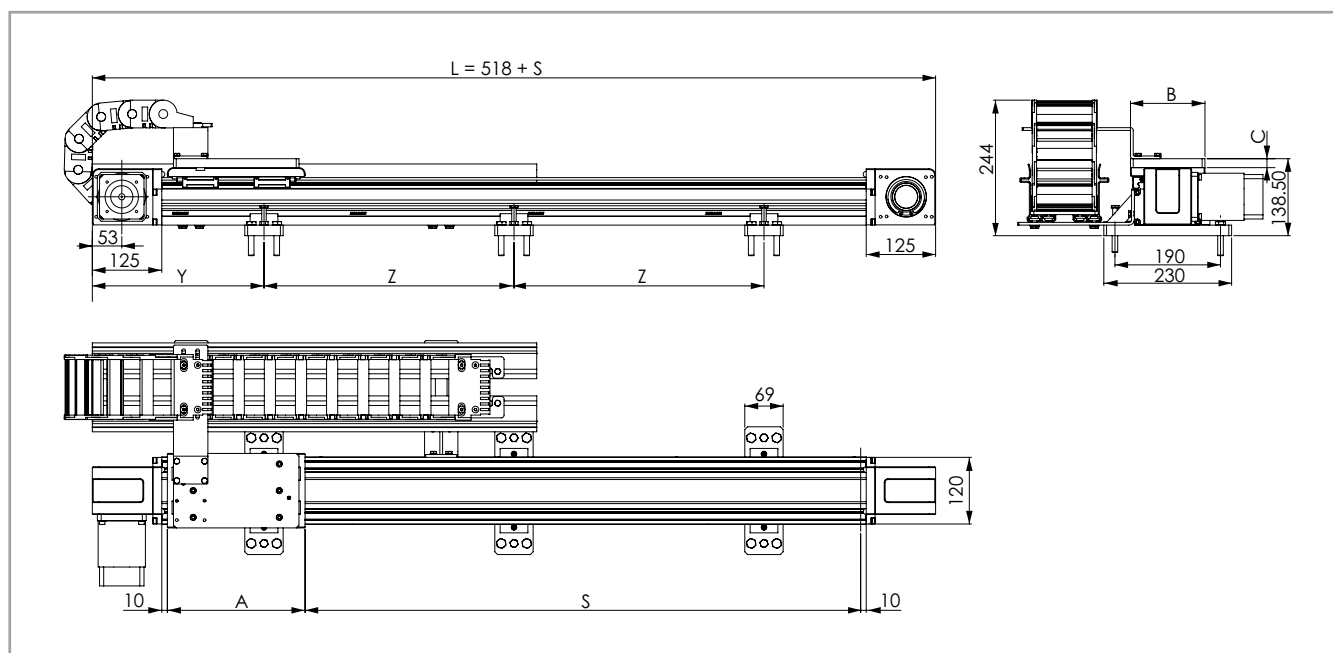


Fig. 2

Examples of robots

| Type | Size | Robot examples | | | |
|------|--------|------------------|---------|--------------|-------------|
| | | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV | 120-1S | DENSO | VP-6242 | 2.5 | 15 |
| | | UNIVERSAL ROBOTS | UR3 | 3 | 11 |

Robot examples mentioned are approximate and refer to floor mounted version. For a correct choice and size of the robot please contact our technical department.

Tab. 1

Technical data

| Type | Size | Max speed [m/s] | Max acceleration [m/s ²] | Repeatability* [mm] | Rail size [mm] |
|------|--------|-----------------|--------------------------------------|---------------------|----------------|
| SEV | 120-1S | 2 | 4 | ± 0.05 | 15 |

* The total repeatability of the system depends on the gearbox. If the gearbox is ordered with the axis, our Technical Department can provide the total precision value.

Tab. 2

Belt specifications

| Type | Size | Belt type | Belt width [mm] | Belt weight [Kg/m] | Pulley pitch diameter [mm] | Carriage displacement per pulley turn [mm] |
|------|--------|-----------|-----------------|--------------------|----------------------------|--|
| SEV | 120-1S | 40 AT10 | 40 | 0.23 | 66.84 | 210 |

Tab. 3

Axis dimensions

| Type | Size | Stroke S [mm] | Profile length P [mm] | Total length L [mm] | Levelling feet | | | Weight [kg] |
|------|--------|---------------------|-----------------------------|---------------------------|----------------|-----------|-----------|----------------|
| | | | | | Nb. of feet | Y [mm] | Z [mm] | |
| SEV | 120-1S | 250 | 518 | 768 | 2 | 184 | 400 | 27 |
| | | 500 | 768 | 1018 | 2 | 284 | 450 | 32 |
| | | 750 | 1018 | 1268 | 3 | 184 | 450 | 37 |
| | | 1000 | 1268 | 1518 | 3 | 309 | 450 | 42 |
| | | 1250 | 1518 | 1768 | 4 | 209 | 450 | 49 |
| | | 1500 | 1768 | 2018 | 5 | 209 | 400 | 56 |
| | | 1750 | 2018 | 2268 | 5 | 234 | 450 | 61 |
| | | 2000 | 2268 | 2518 | 6 | 259 | 400 | 68 |
| | | 2250 | 2518 | 2768 | 6 | 259 | 450 | 73 |
| | | 2500 | 2768 | 3018 | 7 | 309 | 400 | 79 |
| | | 2750 | 3018 | 3268 | 7 | 284 | 450 | 84 |
| | | 3000 | 3268 | 3518 | 8 | 184 | 450 | 91 |
| | | 3250 | 3518 | 3768 | 8 | 309 | 450 | 96 |
| | | 3500 | 3768 | 4018 | 9 | 209 | 450 | 103 |
| | | 3750 | 4018 | 4268 | 9 | 334 | 450 | 108 |
| | | 4000 | 4268 | 4518 | 10 | 234 | 450 | 114 |
| | | 4250 | 4518 | 4768 | 12 | 184 | 400 | 122 |
| | | 4500 | 4768 | 5018 | 11 | 259 | 450 | 126 |
| | | 4750 | 5018 | 5268 | 13 | 234 | 400 | 134 |
| | | 5000 | 5268 | 5518 | 12 | 284 | 450 | 138 |
| | | 5250 | 5518 | 5768 | 13 | 184 | 450 | 143 |
| | | 5500 | 5768 | 6018 | 13 | 309 | 450 | 149 |
| | | 5750 | 6018 | 6268 | 14 | 209 | 450 | 155 |
| | | 6000 | 6518 | 6268 | 14 | 334 | 450 | 160 |

Tab. 4

Carriage dimensions

| Type | Size | A [mm] | B [mm] | C [mm] | Weight [Kg] |
|------|--------|-----------|-----------|-----------|----------------|
| SEV | 120-1S | 248 | 134 | 16 | 5 |

Tab. 5

> SEV 160-1S

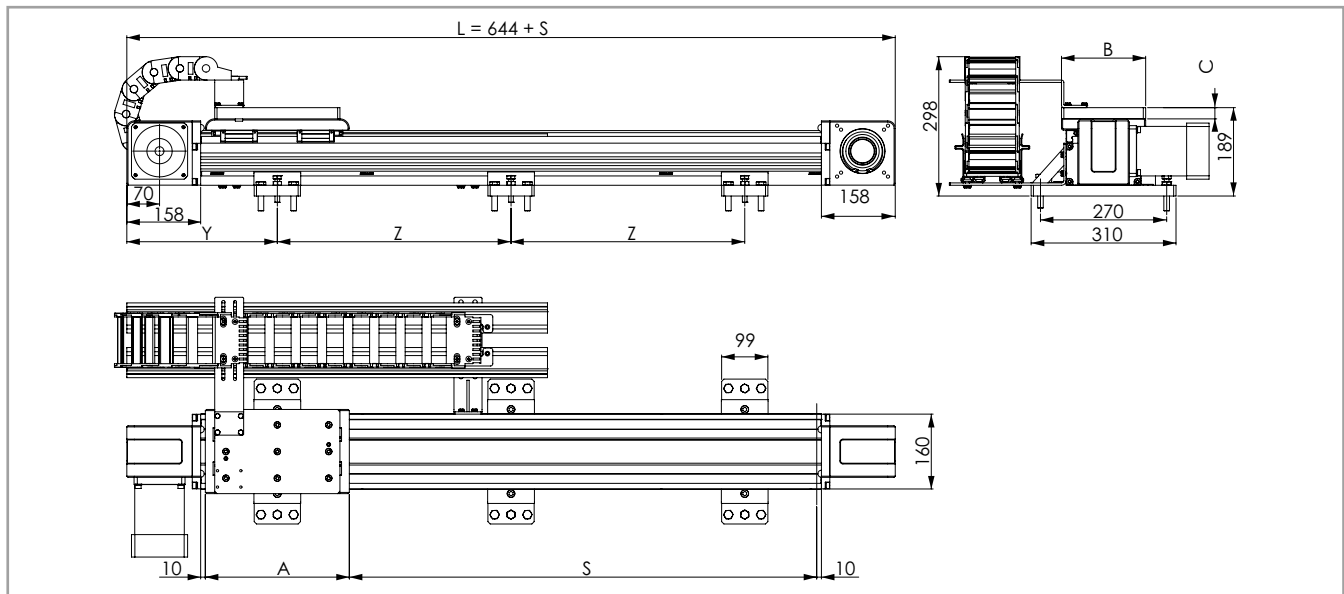


Fig. 3

Examples of robots

| Type | Size | Robot examples | | | |
|------|--------|------------------|---|--------------|-------------|
| | | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV | 160-1S | ABB | IRB 1100 ; IRB 120 | 3-4 | 21-25 |
| | | DOOSAN | M0609 | 6 | 17 |
| | | EPSON | Prosix C3 | 3 | 27 |
| | | KASSOW ROBOTS | KR810; KR1205 | 3-10 | 23.5-25 |
| | | KAWASAKI | RS03N; MC004N | 3-4 | 20-25 |
| | | KUKA | KR 3 R540; LBR iiwa 7 R800; LBR iiwa 7 R820 | 3-14 | 22-29 |
| | | NACHI | Nachi MZ04; Nachi MZ07 | 4-7 | 26-30 |
| | | OMRON | TM5-700; TM5-900 | 4-6 | 21.8-22.6 |
| | | STÄUBLI | TX2-40 | 2 | 29 |
| | | UNIVERSAL ROBOTS | UR5 | 5 | 21 |
| | | YASKAWA | MH3F | 3 | 27 |

Robot examples mentioned are approximate and refer to floor mounted version. For a correct choice and size of the robot please contact our technical department.

Tab. 6

Technical data

| Type | Size | Max speed [m/s] | Max acceleration [m/s ²] | Repeatability* [mm] | Rail size [mm] |
|------|--------|-----------------|--------------------------------------|---------------------|----------------|
| SEV | 160-1S | 2 | 4 | ± 0.05 | 20 |

* The total repeatability of the system depends on the gearbox. If the gearbox is ordered with the axis, our Technical Department can provide the total precision value.

Tab. 7

Belt specifications

| Type | Size | Belt type | Belt width [mm] | Belt weight [Kg/m] | Pulley pitch diameter [mm] | Carriage displacement per pulley turn [mm] |
|------|--------|-----------|-----------------|--------------------|----------------------------|--|
| SEV | 160-1S | 50 AT10 | 50 | 0.29 | 85.94 | 270 |

Tab. 8

Axis dimensions

| Type | Size | Stroke S [mm] | Profile length P [mm] | Total length L [mm] | Levelling feet | | | Weight [kg] |
|------|--------|---------------------|-----------------------------|---------------------------|----------------|-----------|-----------|----------------|
| | | | | | Nb. of feet | Y [mm] | Z [mm] | |
| SEV | 160-1S | 250 | 578 | 894 | 2 | 222 | 450 | 44 |
| | | 500 | 828 | 1144 | 2 | 322 | 500 | 49 |
| | | 750 | 1078 | 1394 | 3 | 247 | 450 | 56 |
| | | 1000 | 1328 | 1644 | 3 | 322 | 500 | 61 |
| | | 1250 | 1578 | 1894 | 4 | 272 | 450 | 69 |
| | | 1500 | 1828 | 2144 | 4 | 322 | 500 | 74 |
| | | 1750 | 2078 | 2394 | 5 | 297 | 450 | 81 |
| | | 2000 | 2328 | 2644 | 5 | 322 | 500 | 86 |
| | | 2250 | 2578 | 2894 | 6 | 322 | 450 | 94 |
| | | 2500 | 2828 | 3144 | 6 | 322 | 500 | 98 |
| | | 2750 | 3078 | 3394 | 7 | 347 | 450 | 106 |
| | | 3000 | 3328 | 3644 | 7 | 322 | 500 | 110 |
| | | 3250 | 3578 | 3894 | 8 | 372 | 450 | 119 |
| | | 3500 | 3828 | 4144 | 8 | 322 | 500 | 124 |
| | | 3750 | 4078 | 4394 | 8 | 272 | 550 | 128 |
| | | 4000 | 4328 | 4644 | 9 | 322 | 500 | 135 |
| | | 4250 | 4578 | 4894 | 9 | 247 | 550 | 139 |
| | | 4500 | 4828 | 5144 | 10 | 322 | 500 | 149 |
| | | 4750 | 5078 | 5394 | 10 | 222 | 550 | 153 |
| | | 5000 | 5328 | 5644 | 11 | 322 | 500 | 161 |
| | | 5250 | 5578 | 5894 | 13 | 247 | 450 | 171 |
| | | 5500 | 5828 | 6144 | 12 | 322 | 500 | 174 |
| | | 5750 | 6078 | 6394 | 14 | 272 | 450 | 183 |
| | | 6000 | 6328 | 6644 | 13 | 322 | 500 | 186 |

Tab. 9

Carriage dimensions

| Type | Size | A [mm] | B [mm] | C [mm] | Weight [Kg] |
|------|--------|-----------|-----------|-----------|----------------|
| SEV | 160-1S | 308 | 180 | 24 | 10.3 |

Tab. 10

> SEV 220-1S

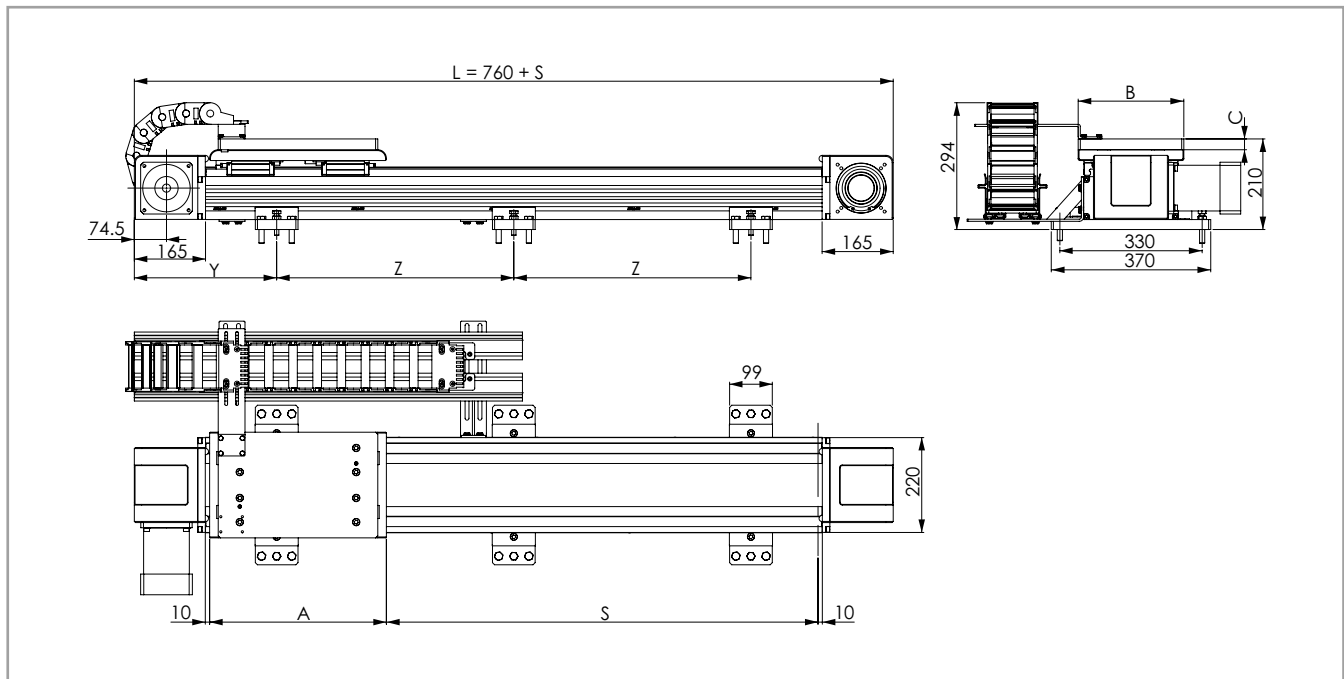


Fig. 4

Examples of robots

| Type | Size | Robot examples | | | |
|------|--------|------------------|---|--------------|-------------|
| | | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV | 220-1S | DOOSAN | M0617; M1013; M1509 | 6-15 | 24-32 |
| | | FANUC | CR-4ia; CR-7ia; CRX-10ia; CR-14ia/L; LR Mate 200id; LR Mate 200id/4S; LR Mate 200id/14L | 4-14 | 17-53 |
| | | KASSOW ROBOTS | KR1018 | 18 | 34 |
| | | KUKA | KR 6 R700-2; KR 6 R900-2; KR 10 R1100-2 | 6-10 | 53-55 |
| | | NACHI | Nachi MZ03EL | 10 | 47 |
| | | STÄUBLI | TX2-60 | 4.5 | 51 |
| | | UNIVERSAL ROBOTS | UR10; UR10e; UR16e | 10-16 | 31.5-33.5 |
| | | YASKAWA | HC10; GP7; GP8 | 7-10 | 32-47 |

Robot examples mentioned are approximate and refer to floor mounted version. For a correct choice and size of the robot please contact our technical department.

Tab. 11

Technical data

| Type | Size | Max speed [m/s] | Max acceleration [m/s ²] | Repeatability* [mm] | Rail size [mm] |
|------|--------|-----------------|--------------------------------------|---------------------|----------------|
| SEV | 220-1S | 2 | 4 | ± 0.05 | 25 |

* The total repeatability of the system depends on the gearbox. If the gearbox is ordered with the axis, our Technical Department can provide the total precision value. Tab. 12

Belt specifications

| Type | Size | Belt type | Belt width [mm] | Belt weight [Kg/m] | Pulley pitch diameter [mm] | Carriage displacement per pulley turn [mm] |
|------|--------|-----------|-----------------|--------------------|----------------------------|--|
| SEV | 220-1S | 100 AT10 | 100 | 0.58 | 79.58 | 320 |

Tab. 13

Axis dimensions

| Type | Size | Stroke S [mm] | Profile length P [mm] | Total length L [mm] | Levelling feet | | | Weight [kg] |
|------|--------|---------------------|-----------------------------|---------------------------|----------------|-----------|-----------|----------------|
| | | | | | Nb. of feet | Y [mm] | Z [mm] | |
| SEV | 220-1S | 250 | 680 | 1010 | 2 | 230 | 550 | 68 |
| | | 500 | 930 | 1260 | 2 | 355 | 550 | 75 |
| | | 750 | 1180 | 1510 | 3 | 255 | 500 | 84 |
| | | 1000 | 1430 | 1760 | 3 | 330 | 550 | 91 |
| | | 1250 | 1680 | 2010 | 4 | 255 | 500 | 100 |
| | | 1500 | 1930 | 2260 | 4 | 305 | 550 | 107 |
| | | 1750 | 2180 | 2510 | 4 | 430 | 550 | 114 |
| | | 2000 | 2430 | 2760 | 5 | 280 | 550 | 123 |
| | | 2250 | 2680 | 3010 | 5 | 405 | 550 | 129 |
| | | 2500 | 2930 | 3260 | 6 | 255 | 550 | 139 |
| | | 2750 | 3180 | 3510 | 6 | 380 | 550 | 146 |
| | | 3000 | 3430 | 3760 | 7 | 230 | 550 | 155 |
| | | 3250 | 3680 | 4010 | 7 | 355 | 550 | 161 |
| | | 3500 | 3930 | 4260 | 8 | 380 | 500 | 171 |
| | | 3750 | 4180 | 4510 | 8 | 330 | 550 | 178 |
| | | 4000 | 4430 | 4760 | 9 | 380 | 500 | 187 |
| | | 4250 | 4680 | 5010 | 9 | 305 | 550 | 194 |
| | | 4500 | 4930 | 5260 | 9 | 430 | 550 | 202 |
| | | 4750 | 5180 | 5510 | 10 | 280 | 550 | 210 |
| | | 5000 | 5430 | 5760 | 10 | 405 | 550 | 217 |
| | | 5250 | 5680 | 6010 | 11 | 255 | 550 | 225 |
| | | 5500 | 5930 | 6260 | 11 | 380 | 550 | 233 |
| | | 5750 | 6180 | 6510 | 12 | 230 | 550 | 242 |

Tab. 14

Carriage dimensions

| Type | Size | A [mm] | B [mm] | C [mm] | Weight [Kg] |
|------|--------|-----------|-----------|-----------|----------------|
| SEV | 220-1S | 410 | 245 | 25 | 19.5 |

Tab. 15

> SEV 80-2

Anticorrosion
version available

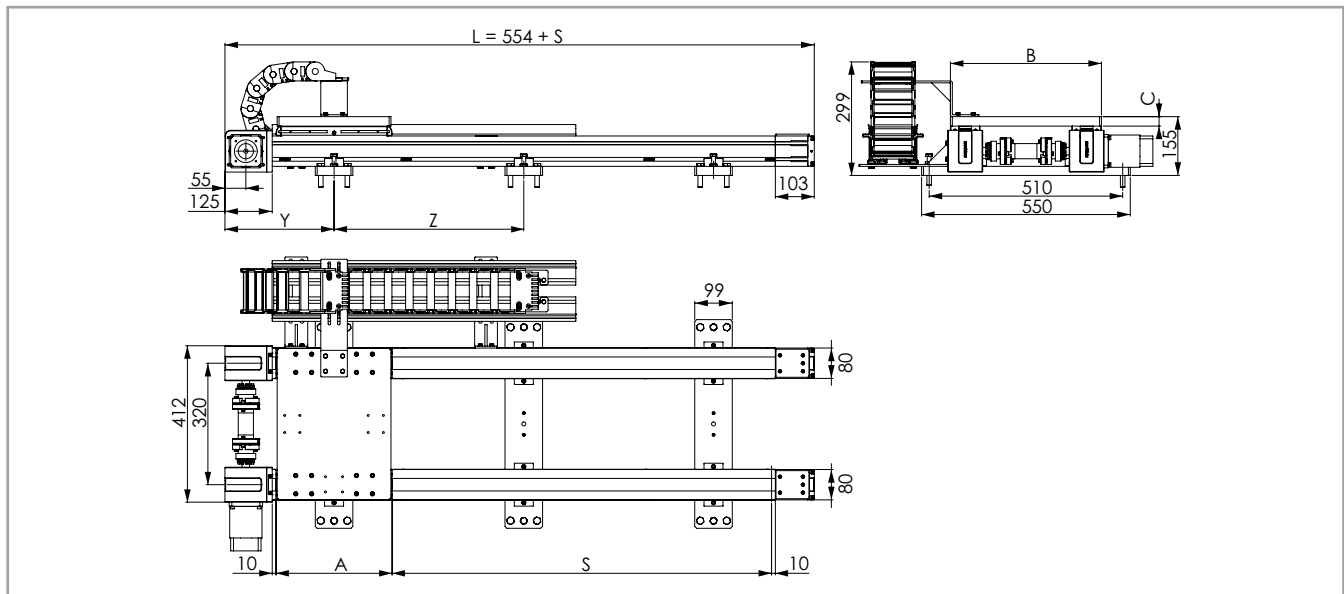


Fig. 5

Examples of robots

| Type | Size | Robot examples | | | |
|------|------|------------------|---|--------------|-------------|
| | | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV | 80-2 | KASSOW ROBOTS | KR1410; KR1805 | 5-10 | 35-38 |
| | | KAWASAKI | RS003N; RS005N; RS005L; RS007N; RS007L | 3-7 | 20-37 |
| | | KUKA | Agilus Serie KR3; KR6; KR10 | 3-10 | 26-57 |
| | | MITSUBISHI | RV-2FR; RV-2FRL; RV-4FR; RV-4FRL; RV-7FR; RV-7FRL; RV-7FRLL | 3-7 | 19-130 |
| | | NACHI | MZ07-01; MZ07L-01; MZ07P-01; MZ07LP-01; | 7 | 30-32 |
| | | STÄUBLI | TX2-40; TX2-60; TX2-60L | 2-4.5 | 29-53 |
| | | UNIVERSAL ROBOTS | UR3/3e; UR5/5e; UR10/10e; UR16e | 3-16 | 11-34 |
| | | YASKAWA | GP7; GP8 | 7-8 | 32-34 |

Robot examples mentioned are approximate and refer to floor mounted version. For a correct choice and size of the robot please contact our technical department.

Tab. 16

Technical data

| Type | Size | Max speed [m/s] | Max acceleration [m/s ²] | Repeatability* [mm] | Rail size [mm] |
|------|------|-----------------|--------------------------------------|---------------------|----------------|
| SEV | 80-2 | 2 | 4 | ± 0.05 | 20 |

* The total repeatability of the system depends on the gearbox. If the gearbox is ordered with the axis, our Technical Department can provide the total precision value.

Tab. 17

Belt specifications*

| Type | Size | Belt type | Belt width [mm] | Belt weight [Kg/m] | Pulley pitch diameter [mm] | Carriage displacement per pulley turn [mm] |
|------|------|-----------|-----------------|--------------------|----------------------------|--|
| SEV | 80-2 | 32 AT 10 | 32 | 0.185 | 60.48 | 190 |

* SEV80-2 features two identical belts, one in each linear axis. The data shown refers to the single belt.

Tab. 18

Axis dimensions

| Type | Size | Stroke S [mm] | Profile length P [mm] | Total length L [mm] | Levelling feet | | | Weight [kg] |
|------|------|---------------------|-----------------------------|---------------------------|----------------|-----------|-----------|----------------|
| | | | | | Nb. of feet | Y [mm] | Z [mm] | |
| SEV | 80-2 | 250 | 576 | 804 | 2 | 188 | 450 | 50 |
| | | 500 | 826 | 1054 | 2 | 288 | 500 | 55 |
| | | 750 | 1076 | 1304 | 3 | 213 | 450 | 65 |
| | | 1000 | 1326 | 1554 | 3 | 288 | 500 | 71 |
| | | 1250 | 1576 | 1804 | 4 | 238 | 450 | 81 |
| | | 1500 | 1826 | 2054 | 4 | 288 | 500 | 86 |
| | | 1750 | 2076 | 2304 | 5 | 263 | 450 | 96 |
| | | 2000 | 2326 | 2554 | 5 | 288 | 500 | 101 |
| | | 2250 | 2576 | 2804 | 5 | 353 | 530 | 107 |
| | | 2500 | 2826 | 3054 | 6 | 288 | 500 | 117 |
| | | 2750 | 3076 | 3304 | 6 | 338 | 530 | 123 |
| | | 3000 | 3326 | 3554 | 7 | 288 | 500 | 132 |
| | | 3250 | 3576 | 3804 | 7 | 323 | 530 | 137 |
| | | 3500 | 3826 | 4054 | 8 | 288 | 500 | 148 |
| | | 3750 | 4076 | 4304 | 8 | 308 | 530 | 154 |
| | | 4000 | 4326 | 4554 | 9 | 288 | 500 | 163 |
| | | 4250 | 4576 | 4804 | 9 | 293 | 530 | 168 |
| | | 4500 | 4826 | 5054 | 10 | 288 | 500 | 179 |
| | | 4750 | 5076 | 5304 | 10 | 278 | 530 | 185 |
| | | 5000 | 5326 | 5554 | 11 | 288 | 500 | 194 |
| | | 5250 | 5576 | 5804 | 11 | 263 | 530 | 200 |
| | | 5500 | 5826 | 6054 | 12 | 288 | 500 | 210 |
| | | 5750 | 6076 | 6304 | 12 | 248 | 530 | 216 |

Tab. 19

Carriage dimensions

| Type | Size | A [mm] | B [mm] | C [mm] | Weight [Kg] |
|------|------|-----------|-----------|-----------|----------------|
| SEV | 80-2 | 306 | 398 | 25 | 15.3 |

Tab. 20

> SEV 110-2

Anticorrosion
version available

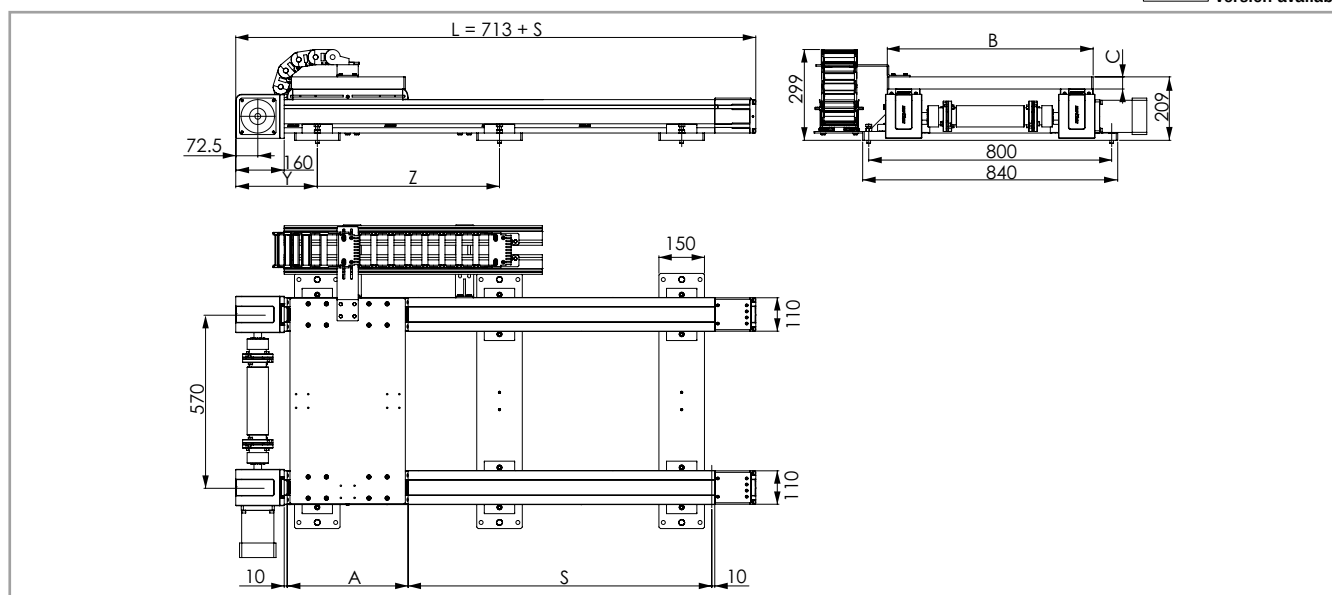


Fig. 6

Examples of robots

| Type | Size | Robot examples | | | |
|------|-------|----------------|---------------------------------------|--------------|-------------|
| | | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV | 110-2 | ABB | IRB 1300; IRB 1300; IRB 1300; IRB 140 | 7-11 | 74.5-78.5 |
| | | DENSO | VP-6083 | 6 | 82 |
| | | MITSUBISHI | RV-13F; RV-20F | 13-20 | 120-137 |
| | | STÄUBLI | TX2-90 | 7 | 111 |
| | | YASKAWA | SIA20D | 20 | 120 |

Robot examples mentioned are approximate and refer to floor mounted version. For a correct choice and size of the robot please contact our technical department.

Tab. 21

Technical data

| Type | Size | Max speed [m/s] | Max acceleration [m/s ²] | Repeatability* [mm] | Rail size [mm] |
|------|-------|-----------------|--------------------------------------|---------------------|----------------|
| SEV | 110-2 | 2 | 4 | ± 0.05 | 25 |

* The total repeatability of the system depends on the gearbox. If the gearbox is ordered with the axis, our Technical Department can provide the total precision value. Tab. 22

Belt specifications*

| Type | Size | Belt type | Belt width [mm] | Belt weight [Kg/m] | Pulley pitch diameter [mm] | Carriage displacement per pulley turn [mm] |
|------|-------|-----------|-----------------|--------------------|----------------------------|--|
| SEV | 110-2 | 50 AT10 | 50 | 0.29 | 85.94 | 270 |

* SEV110-2 features two identical belts, one in each linear axis. The data shown refers to the single belt.

Tab. 23

Axis dimensions

| Type | Size | Stroke S [mm] | Profile length P [mm] | Total length L [mm] | Levelling feet | | | Weight [kg] |
|------|-------|---------------------|-----------------------------|---------------------------|----------------|-----------|-----------|----------------|
| | | | | | Nb. of feet | Y [mm] | Z [mm] | |
| SEV | 110-2 | 250 | 668 | 963 | 2 | 269 | 450 | 122 |
| | | 500 | 918 | 1213 | 2 | 294 | 650 | 130 |
| | | 750 | 1168 | 1463 | 2 | 419 | 650 | 137 |
| | | 1000 | 1418 | 1713 | 3 | 269 | 600 | 155 |
| | | 1250 | 1668 | 1963 | 3 | 344 | 650 | 163 |
| | | 1500 | 1918 | 2213 | 3 | 469 | 650 | 172 |
| | | 1750 | 2168 | 2463 | 4 | 269 | 650 | 189 |
| | | 2000 | 2418 | 2713 | 4 | 394 | 650 | 197 |
| | | 2250 | 2668 | 2963 | 5 | 294 | 600 | 215 |
| | | 2500 | 2918 | 3213 | 5 | 319 | 650 | 222 |
| | | 2750 | 3168 | 3463 | 5 | 444 | 650 | 230 |
| | | 3000 | 3418 | 3713 | 6 | 244 | 650 | 248 |
| | | 3250 | 3668 | 3963 | 6 | 369 | 650 | 256 |
| | | 3500 | 3918 | 4213 | 7 | 319 | 600 | 274 |
| | | 3750 | 4168 | 4463 | 7 | 294 | 650 | 282 |
| | | 4000 | 4418 | 4713 | 7 | 419 | 650 | 290 |
| | | 4250 | 4668 | 4963 | 8 | 394 | 600 | 308 |
| | | 4500 | 4918 | 5213 | 8 | 344 | 650 | 316 |
| | | 4750 | 5168 | 5463 | 8 | 469 | 650 | 325 |
| | | 5000 | 5418 | 5713 | 9 | 269 | 650 | 342 |
| | | 5250 | 5668 | 5963 | 9 | 394 | 650 | 350 |
| | | 5500 | 5918 | 6213 | 10 | 419 | 600 | 368 |
| | | 5750 | 6168 | 6463 | 10 | 319 | 650 | 376 |

Tab. 24

Carriage dimensions

| Type | Size | A [mm] | B [mm] | C [mm] | Weight [Kg] |
|------|-------|-----------|-----------|-----------|----------------|
| SEV | 110-2 | 398 | 678 | 40 | 42.2 |

Tab. 25

SEV series - Rack and pinion driven



> Seventh Axis for robots up to 1500 Kg

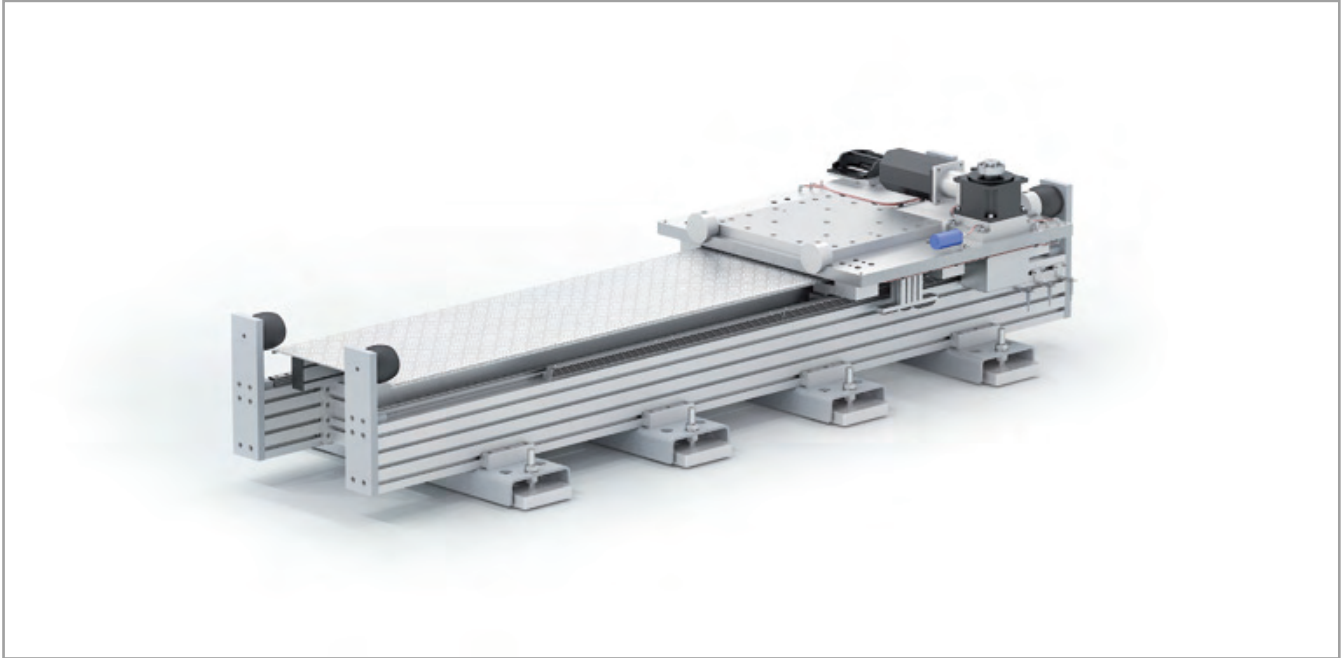


Fig. 7

Rack and pinion driven Seventh Axis is designed to extend the operating range of every robot up to 1500 kg. From the feeding of industrial machines in the production lines to painting or welding applications in the automotive or metal sheet industry, it improves the productivity of the robots by increasing their range of motion.

Seventh Axis is made of one or two self-supporting extruded aluminum AL 6060 T6 profiles joined together by means of rigid connecting crosspieces. It is available in different sizes: 280-1, 170-2, 170P-2, 280-2, 280P-2 and 360-2. The aluminum profiles are resistant to corrosion, and are extruded to make highly elaborate geometries that guarantee the greatest moment of inertia and the least weight possible. Thanks to its lightness and high rigidity, Seventh Axis operates smoothly even in applications that require wall or ceiling mounting.

The rack and pinion transmission allows to withstand heavy loads and to reach potentially infinite strokes. The carriage runs on two parallel recirculating roller linear guides with six blocks (eight for sizes 170P-2 and 280P-2) positioned to support it and all incident loads and moments. The blocks can be lubricated with an automatic system.

The main advantages of Seventh Axis are:

- Suitable for every robot up to 1500 kg.
- Six different sizes.
- Three lubrication options to reduce and simplify maintenance.
- Three types of covers to protect the axis.
- High quality components and competitive performances.
- Easy and quick assembly.
- Potentially infinite strokes achievable.
- Customizations possible, please contact our technical department.

> The components

Extruded aluminum bodies

Seventh Axis is created using extruded and anodized Rollon profiles, designed and manufactured to optimize weight while maintaining mechanical strength. The dimensional tolerances comply with UNI EN 755-9.

Rack and pinion

The steel racks are hardened and ground (Q6), have helical teeth for higher load capacity and low noise and are available with three different modules: m3, m4 and m5. Racks are assembled with pinions made of hardened steel. For more information on the driving system lubrication see pg. SV-38).

Carriage

The carriage of the Seventh Axis is made of anodized aluminum and its dimensions may vary according to the sizes and the type of protection chosen. A dedicated connecting plate allows to assemble the robot on the carriage. The plate is customized to accommodate the different kinds of robots.

Protection

Rack and pinion driven Seventh Axis can be equipped with three different level of protection to cover the driving system and the linear motion components against contaminants. For more information see pg. SV-36.

Gearbox

Each size of Seventh Axis is available with a pre-selected gearbox (see pg. SV-37, tab. 69).

> The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

SEV series with recirculating roller guides

Two recirculating roller guides with high load capacity are mounted in two dedicated seats on the outer sides of the body.

- Two recirculating roller guides with high load capacity are mounted in two dedicated seats on the outer sides of the body.
- By using rollers, which are less subject to deformation, the guides achieve very high rigidity.
- The carriage is assembled on six pre-loaded blocks (eight for sizes 170P-2 and 280P-2).
- The rolling elements configuration enable the carriage to withstand loading in the main directions.
- The blocks have seals on both sides and, if necessary, an additional scraper can be fitted for very dusty conditions.

The linear motion system described offers:

- High speed and acceleration
- High load capacity
- High bending permissible moments
- Low friction
- Long lifetime
- Low maintenance (depending on application)
- Low noise

> SEV 280-1

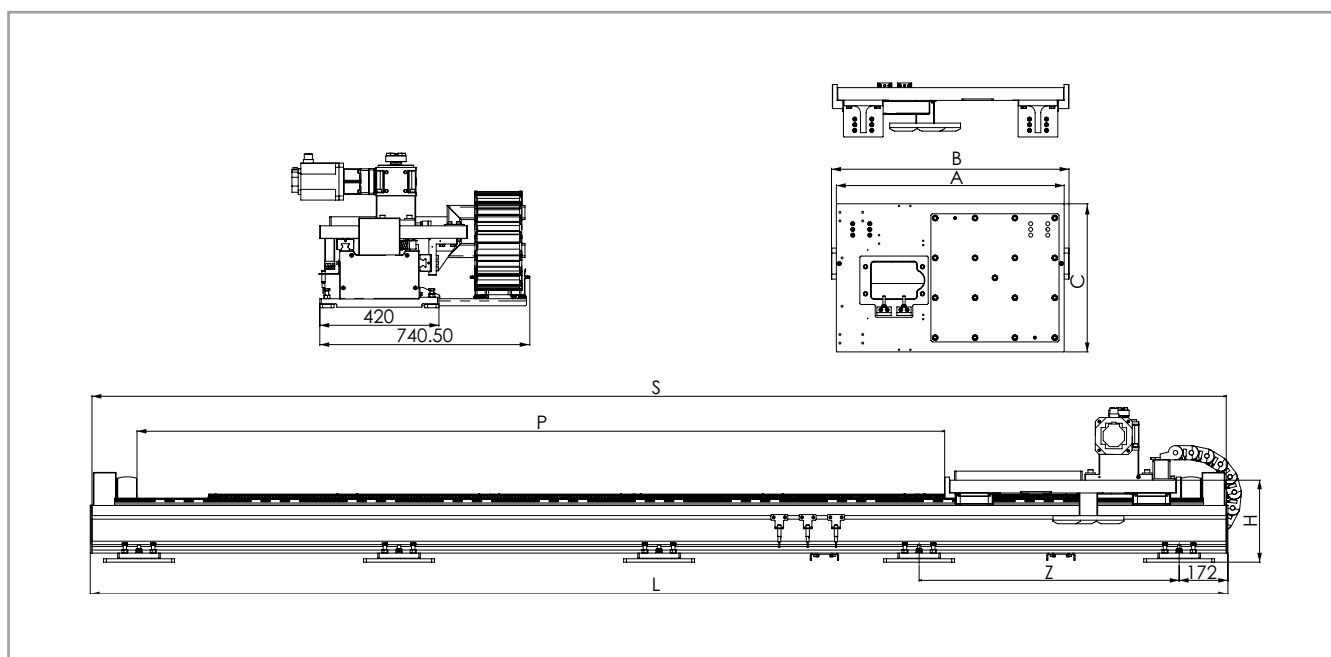


Fig. 8

Examples of robots

| Type | Size | Robot examples | | | |
|------|-------|----------------|---|--------------|-------------|
| | | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV | 280-1 | COMAU | Racer 7-1.0; Racer-7-1.4; SIX-6-1.4 | 6-7 | 160-180 |
| | | FANUC | ARC Mate 100iC/12; M-10iA/10M; M-10iA/12; M-10iD 12 | 10-12 | 130-145 |
| | | KAWASAKI | RS010N; RS006L | 6-10 | 150 |
| | | KUKA | KR6 – KR10 CYBERTECH nano; KR6 – KR8 CYBERTECH ARC nano | 6-10 | 145-180 |
| | | MITSUBISHI | RV13FR(-L); RV20FR | 13-20 | 120-130 |
| | | NACHI | NB04; NV06; | 10 | 160-170 |
| | | STÄUBLI | TP80; TX2-90; TX2-90L; TX2-90XL | 7-14 | 111-119 |
| | | YASKAWA | MH12/-F; GP12 | 12 | 130-150 |

Robot examples mentioned are approximate and refer to floor mounted version. For a correct choice and size of the robot please contact our technical department.

Tab. 26

Technical data

| Type | Size | Max speed [m/s] | Max acceleration [m/s ²] | Repeatability [mm] | Rail size [mm] |
|------|-------|-----------------|--------------------------------------|--------------------|----------------|
| SEV | 280-1 | 2 | 4 | ± 0.05 | 30 |

Tab. 27

Rack specifications

| Type | Size | Rack | | | Pinion | | |
|------|-------|--------|---------|-------------------------------------|--------|--------|----------------------------|
| | | Module | Quality | Type | Module | Ø [mm] | Stroke per revolution [mm] |
| SEV | 280-1 | m3 | Q6 | Helical teeth, hardenend and ground | m3 | 89.13 | 280 |

Tab. 28

Axis dimensions

| Type | Size | Stroke* ¹ S [mm] | Profile length P [mm] | Total length L [mm] | Height* ² H [mm] | Weight [Kg] |
|------|-------|--------------------------------|--------------------------|------------------------|--------------------------------|----------------|
| SEV | 280-1 | 848 | 2000 | 2012 | 289 | 300 |
| | | 1348 | 2500 | 2512 | | 330 |
| | | 1848 | 3000 | 3012 | | 331 |
| | | 2348 | 3500 | 3512 | | 407 |
| | | 2848 | 4000 | 4012 | | 453 |
| | | 3348 | 4500 | 4512 | | 484 |
| | | 3848 | 5000 | 5012 | | 530 |
| | | 4348 | 5500 | 5512 | | 560 |
| | | 4848 | 6000 | 6012 | | 607 |

*¹ Longer strokes can be made by joining profiles (see pg. SV-33).

*² Dimension H refers from the lower surface of the adjustable foot, in fully upwards position, to the top of the carriage.
The height of the robot connecting plate must be added (see pg. SV-29)

Tab. 29

Carriage dimensions

| Type | Size | A [mm] | B [mm] | C [mm] | Weight* [Kg] |
|------|-------|-----------|-----------|-----------|-----------------|
| SEV | 280-1 | 800 | 834 | 520 | 131 |

* Including gearbox

Tab. 30

Levelling feet

| Type | Size | Stroke S [mm] | Nb. of feet | Z [mm] |
|------|-------|------------------|----------------|-----------|
| SEV | 280-1 | 858 | 3.00 | 834 |
| | | 1358 | 3.00 | 1084 |
| | | 1858 | 4.00 | 889.3 |
| | | 2358 | 4.00 | 1056 |
| | | 2858 | 5.00 | 917 |
| | | 3358 | 5.00 | 1042 |
| | | 3858 | 6.00 | 933.6 |
| | | 4358 | 6.00 | 1033.6 |
| | | 4858 | 7.00 | 944.6 |

Tab. 31

> SEV 170-2

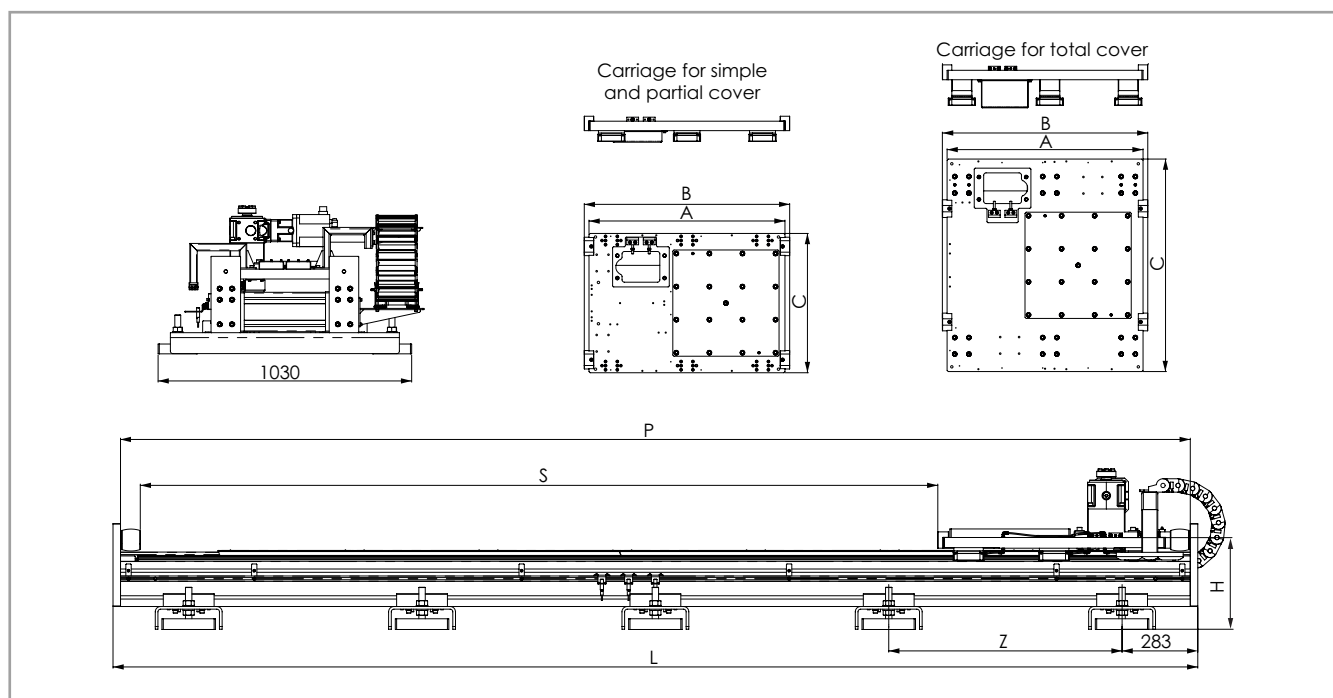


Fig. 9

Examples of robots

| Type | Size | Robot examples | | | |
|------|-------|----------------|--|--------------|-------------|
| | | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV | 170-2 | ABB | IRB 1600; IRB 1660ID; IRB 2600-12/-20; IRB 2600ID-8/-15; | 4-20 | 250-284 |
| | | FANUC | M-20iA; M-20iA/20M; ARC Mate 120C; M-20iB/25; M-20iB/25C; M-20iA/35M | 20-25 | 210-250 |
| | | KAWASAKI | RS020N; RS010L | 10-20 | 230 |
| | | KUKA | KR CYBERTECH / KR CYBERTECH arc | 8-22 | 250-270 |
| | | NACHI | MC10L; MC20; MR20-02; MR20L-01; NB04L; NV06L | 10-20 | 220-280 |
| | | STÄUBLI | RX160; RX160HD; RX160L; | 14-20 | 248-250 |
| | | YASKAWA | GP25; GP25-12; HP20F/-RD 2 | 12-25 | 250-258 |

Robot examples mentioned are approximate and refer to floor mounted version. For a correct choice and size of the robot please contact our technical department.

Tab. 32

Technical data

| Type | Size | Max speed [m/s] | Max acceleration [m/s ²] | Repeatability [mm] | Rail size [mm] |
|------|-------|-----------------|--------------------------------------|--------------------|----------------|
| SEV | 170-2 | 2 | 4 | ± 0.05 | 25 |

Tab. 33

Rack specifications

| Type | Size | Rack | | | Pinion | | |
|------|-------|--------|---------|-------------------------------------|--------|--------|----------------------------|
| | | Module | Quality | Type | Module | Ø [mm] | Stroke per revolution [mm] |
| SEV | 170-2 | m3 | Q6 | Helical teeth, hardenend and ground | m3 | 89.13 | 280 |

Tab. 34

Axis dimensions

| Type | Size | Stroke* ¹ S [mm] | Profile length P [mm] | Total length L [mm] | Height* ² H [mm] | | Weight [Kg] | |
|------|-------|--------------------------------|--------------------------|------------------------|--------------------------------|-------------|-----------------------------|-------------|
| | | | | | Simple and partial cover | Total cover | Simple and partial cover | Total cover |
| SEV | 170-2 | 982 | 2000 | 2056 | 344 | 387 | 470 | 560 |
| | | 1482 | 2500 | 2556 | | | 500 | 595 |
| | | 1982 | 3000 | 3056 | | | 592 | 673 |
| | | 2482 | 3500 | 3556 | | | 624 | 729 |
| | | 2982 | 4000 | 4056 | | | 714 | 823 |
| | | 3482 | 4500 | 4556 | | | 745 | 863 |
| | | 3982 | 5000 | 5056 | | | 836 | 959 |
| | | 4482 | 5500 | 5556 | | | 867 | 996 |
| | | 4982 | 6000 | 6056 | | | 964 | 1092 |

*¹ Longer strokes can be made by joining profiles (see pg. SV-33).

*² Dimension H refers from the lower surface of the adjustable foot, in fully upwards position, to the top of the carriage.
The height of the robot connecting plate must be added (see pg. SV-29)

Tab. 35

Carriage dimensions

| Type | Size | A [mm] | B [mm] | C [mm] | | Weight* [Kg] | |
|------|-------|-----------|-----------|-----------------------------|-------------|-----------------------------|-------------|
| | | | | Simple and partial cover | Total cover | Simple and partial cover | Total cover |
| SEV | 170-2 | 830 | 870 | 590 | 900 | 132 | 196 |

* Including gearbox

Tab. 36

Levelling feet

| Type | Size | Stroke S [mm] | Nb. of feet | Z [mm] |
|------|-------|------------------|----------------|-----------|
| SEV | 170-2 | 982 | 3.00 | 745 |
| | | 1482 | 3.00 | 995 |
| | | 1982 | 4.00 | 830 |
| | | 2482 | 4.00 | 996.7 |
| | | 2982 | 5.00 | 872.5 |
| | | 3482 | 5.00 | 997.5 |
| | | 3982 | 6.00 | 898 |
| | | 4482 | 6.00 | 998 |
| | | 4982 | 7.00 | 915 |

Tab. 37

> SEV 170P-2

Optimized sizing
with larger linear rails

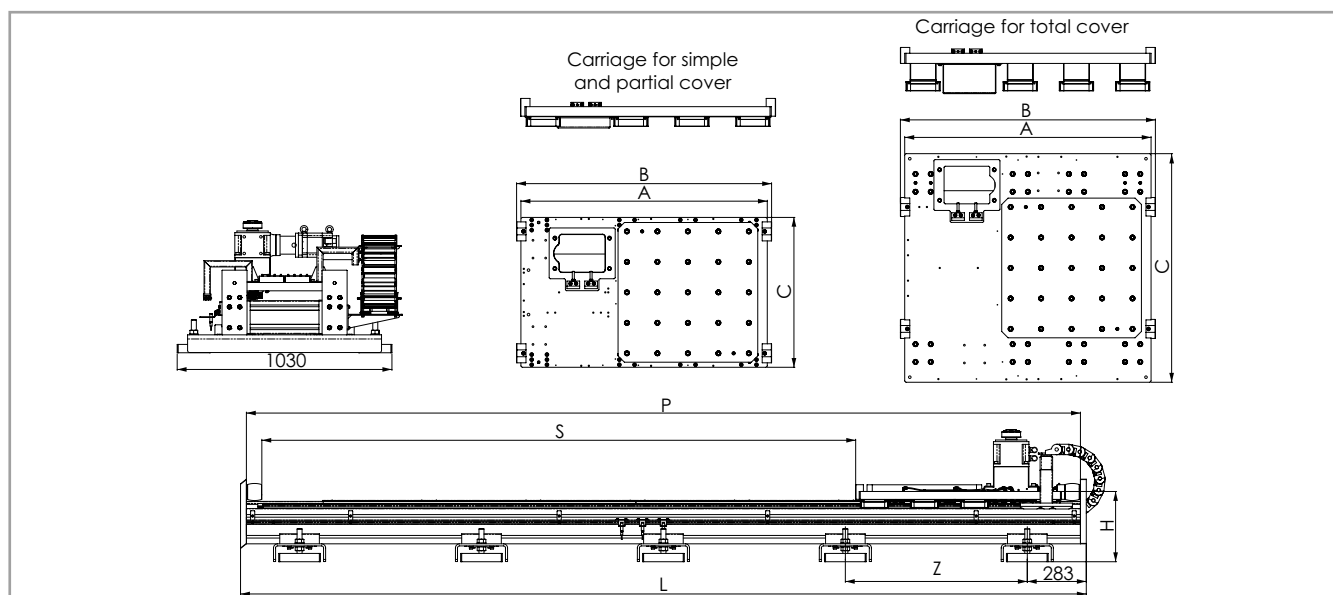


Fig. 10

Examples of robots

| Type | Size | Robot examples | | | |
|------|--------|----------------|---|--------------|-------------|
| | | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV | 170P-2 | ABB | IRB 2400; IRB 4600; IRB 6620LX; | 10-150 | 380-610 |
| | | COMAU | NS-12-1.85; NS-16-1.65; NJ-16-3.1; NJ-40-2.5; NJ-60-2.2 | 12-60 | 333-680 |
| | | FANUC | M-710 all types | 12-70 | 410-570 |
| | | KAWASAKI | RS030N; RS050N; RS080N; RS15X | 30-80 | 555 |
| | | NACHI | MC35-01; MC50-01; MC70-01 | 35-70 | 640 |

Robot examples mentioned are approximate and refer to floor mounted version. For a correct choice and size of the robot please contact our technical department.

Tab. 38

Technical data

| Type | Size | Max speed [m/s] | Max acceleration [m/s ²] | Repeatability [mm] | Rail size [mm] |
|------|--------|-----------------|--------------------------------------|--------------------|----------------|
| SEV | 170P-2 | 2 | 4 | ± 0.05 | 30 |

Tab. 39

Rack specifications

| Type | Size | Rack | | | Pinion | | |
|------|--------|--------|---------|------------------------------------|--------|--------|----------------------------|
| | | Module | Quality | Type | Module | Ø [mm] | Stroke per revolution [mm] |
| SEV | 170P-2 | m3 | Q6 | Helical teeth, hardened and ground | m3 | 89.13 | 280 |

Tab. 40

Axis dimensions

| Type | Size | Stroke* ¹ S [mm] | Profile length P [mm] | Total length L [mm] | Height* ² H [mm] | | Weight [Kg] | |
|------|--------|--------------------------------|--------------------------|------------------------|--------------------------------|-------------|-----------------------------|-------------|
| | | | | | Simple and partial cover | Total cover | Simple and partial cover | Total cover |
| SEV | 170P-2 | 848 | 2000 | 2056 | 337 | 407 | 516 | 635 |
| | | 1348 | 2500 | 2556 | | | 548 | 670 |
| | | 1848 | 3000 | 3056 | | | 660 | 766 |
| | | 2348 | 3500 | 3556 | | | 676 | 808 |
| | | 2848 | 4000 | 4056 | | | 763 | 904 |
| | | 3348 | 4500 | 4556 | | | 796 | 941 |
| | | 3848 | 5000 | 5056 | | | 888 | 1041 |
| | | 4348 | 5500 | 5556 | | | 924 | 1078 |
| | | 4848 | 6000 | 6056 | | | 1012 | 1177 |

*¹ Longer strokes can be made by joining profiles (see pg. SV-33).

*² Dimension H refers from the lower surface of the adjustable foot, in fully upwards position, to the top of the carriage.
The height of the robot connecting plate must be added (see pg. SV-29)

Tab. 41

Carriage dimensions

| Type | Size | A [mm] | B [mm] | C [mm] | | Weight* [Kg] | |
|------|--------|-----------|-----------|-----------------------------|-------------|-----------------------------|-------------|
| | | | | Simple and partial cover | Total cover | Simple and partial cover | Total cover |
| SEV | 170P-2 | 970 | 1004 | 590 | 900 | 176 | 267 |

* Including gearbox

Tab. 42

Levelling feet

| Type | Size | Stroke S [mm] | Nb. of feet | Z [mm] |
|------|--------|------------------|----------------|-----------|
| SEV | 170P-2 | 848 | 3.00 | 745.0 |
| | | 1348 | 3.00 | 995.0 |
| | | 1848 | 4.00 | 830.0 |
| | | 2348 | 4.00 | 996.7 |
| | | 2848 | 5.00 | 872.5 |
| | | 3348 | 5.00 | 997.5 |
| | | 3848 | 6.00 | 898.0 |
| | | 5348 | 6.00 | 998.0 |
| | | 4848 | 7.00 | 915.0 |

Tab. 43

> SEV 280-2

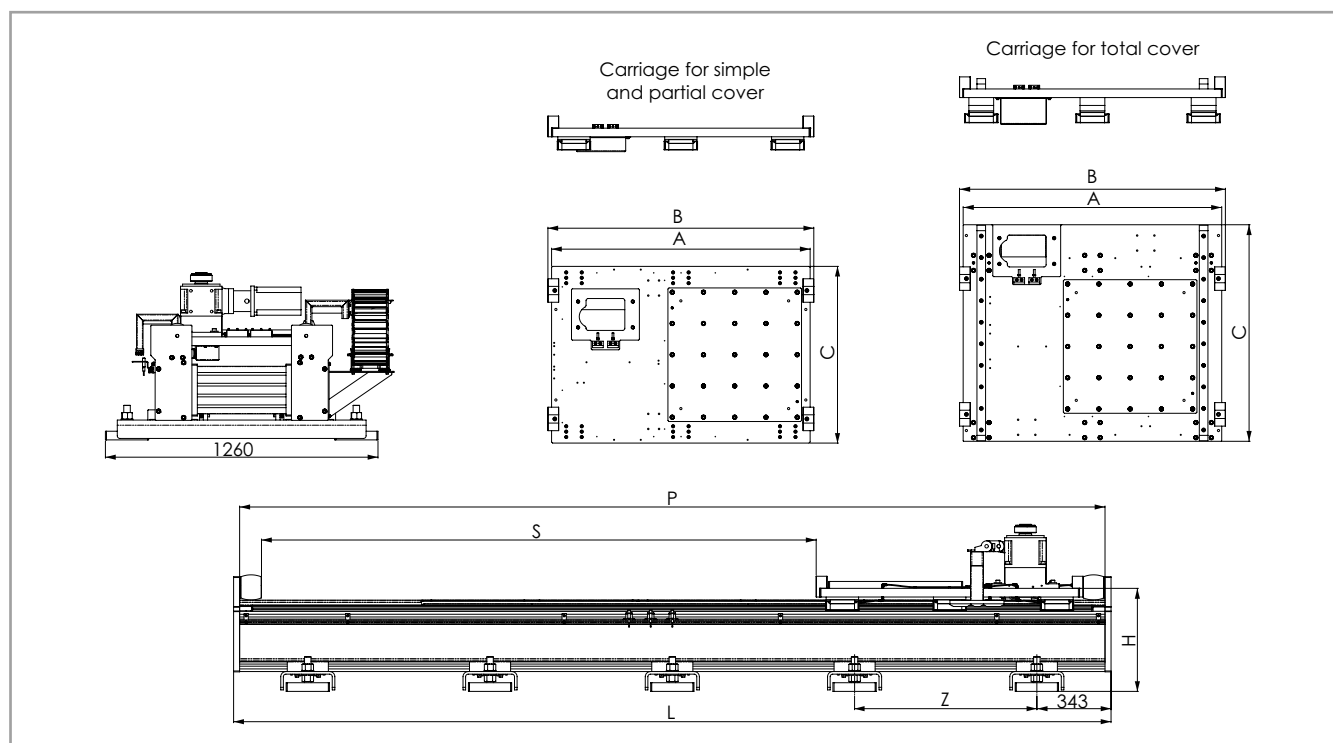


Fig. 11

Examples of robots

| Type | Size | Robot examples | | | |
|------|-------|----------------|-----------------------------|--------------|-------------|
| | | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV | 280-2 | ABB | IRB460 | 110 | 925 |
| | | FANUC | M-710 all types | 12-70 | 410-570 |
| | | KUKA | KR 30 and KR 60 - all types | 16-60 | 600-700 |

Robot examples mentioned are approximate and refer to floor mounted version. For a correct choice and size of the robot please contact our technical department.

Tab. 44

Technical data

| Type | Size | Max speed [m/s] | Max acceleration [m/s ²] | Repeatability [mm] | Rail size [mm] |
|------|-------|-----------------|--------------------------------------|--------------------|----------------|
| SEV | 280-2 | 2 | 4 | ± 0.05 | 35 |

Tab. 45

Rack specifications

| Type | Size | Rack | | | Pinion | | |
|------|-------|--------|---------|-------------------------------------|--------|--------|----------------------------|
| | | Module | Quality | Type | Module | Ø [mm] | Stroke per revolution [mm] |
| SEV | 280-2 | m4 | Q6 | Helical teeth, hardenend and ground | m4 | 76.39 | 240 |

Tab. 46

Axis dimensions

| Type | Size | Stroke ^{*1} S [mm] | Profile length P [mm] | Total length L [mm] | Height ^{*2} H [mm] | | Weight [Kg] | |
|------|-------|--------------------------------|--------------------------|------------------------|--------------------------------|-------------|-----------------------------|-------------|
| | | | | | Simple and partial cover | Total cover | Simple and partial cover | Total cover |
| SEV | 280-2 | 564 | 2000 | 2056 | 476 | 532 | 827 | 972 |
| | | 1064 | 2500 | 2556 | | | 883 | 1037 |
| | | 1564 | 3000 | 3056 | | | 1024 | 1192 |
| | | 2064 | 3500 | 3556 | | | 1092 | 1262 |
| | | 2564 | 4000 | 4056 | | | 1232 | 1418 |
| | | 3064 | 4500 | 4556 | | | 1297 | 1488 |
| | | 3564 | 5000 | 5056 | | | 1438 | 1644 |
| | | 4064 | 5500 | 5556 | | | 1506 | 1724 |
| | | 4564 | 6000 | 6056 | | | 1646 | 1882 |

*1 Longer strokes can be made by joining profiles (see pg. SV-33).

*2 Dimension H refers from the lower surface of the adjustable foot, in fully upwards position, to the top of the carriage.
The height of the robot connecting plate must be added (see pg. SV-29)

Tab. 47

Carriage dimensions

| Type | Size | A [mm] | B [mm] | C [mm] | | Weight* [Kg] | |
|------|-------|-----------|-----------|-----------------------------|-------------|-----------------------------|-------------|
| | | | | Simple and partial cover | Total cover | Simple and partial cover | Total cover |
| SEV | 280-2 | 1200 | 1234 | 820 | 1005 | 257 | 355 |

* Including gearbox

Tab. 48

Levelling feet

| Type | Size | Stroke S [mm] | Nb. of feet | Z [mm] |
|------|-------|------------------|----------------|-----------|
| SEV | 280-2 | 564 | 3.00 | 685.0 |
| | | 1064 | 3.00 | 935.0 |
| | | 1564 | 4.00 | 790.0 |
| | | 2064 | 4.00 | 956.7 |
| | | 2564 | 5.00 | 842.5 |
| | | 3064 | 5.00 | 967.5 |
| | | 3564 | 6.00 | 874.0 |
| | | 4064 | 6.00 | 974.0 |
| | | 4564 | 7.00 | 895.0 |

Tab. 49

> SEV 280P-2

Optimized sizing
with larger linear rails

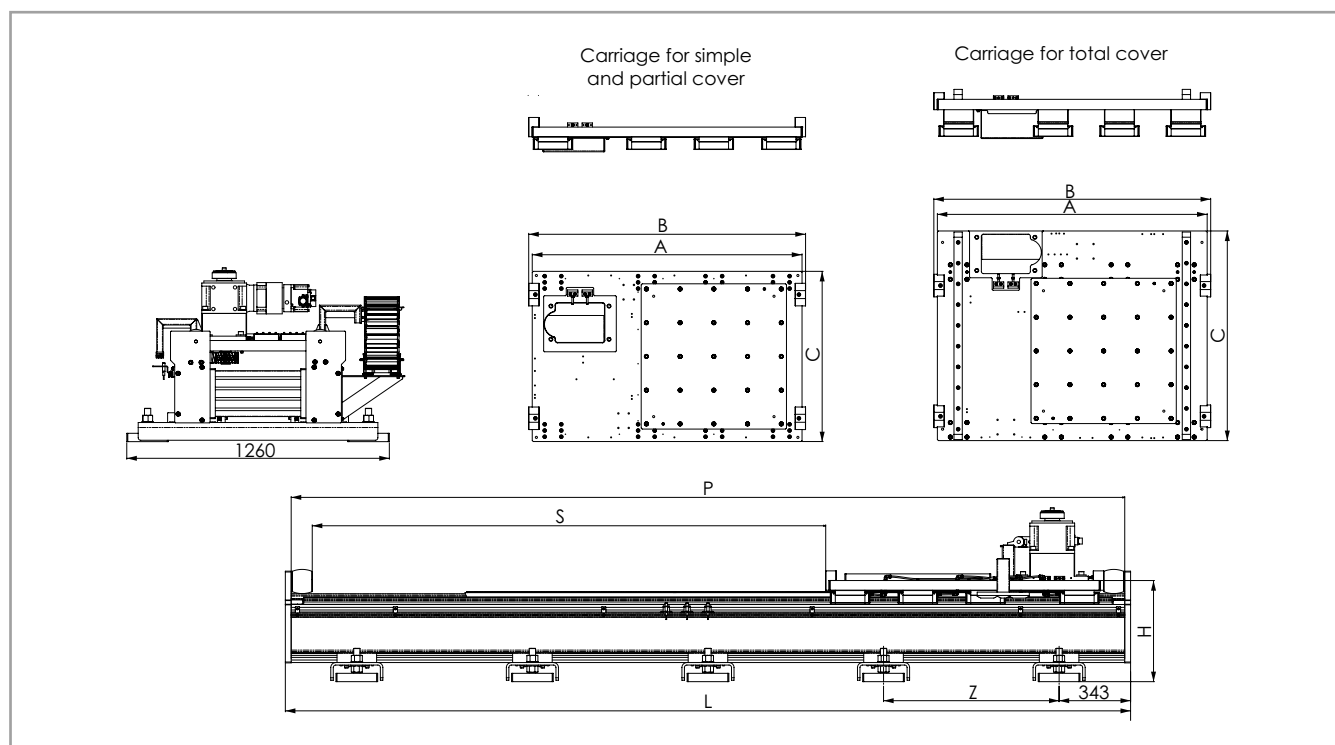


Fig. 12

Examples of robots

| Type | Size | Robot examples | | | |
|------|--------|----------------|--------------------------------------|--------------|-------------|
| | | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV | 280P-2 | ABB | IRB460, IRB6620 | 110-150 | 900-925 |
| | | COMAU | NJ130 2.6 | 130 | 1050 |
| | | FANUC | R2000 100FH, 125L, 165F, 165FH, 165R | 100-165 | 1090-1360 |
| | | KUKA | KR 120, 150, 180 | 120-180 | 677-1093 |
| | | STAUBLI | TX200L | 80 | 1000 |

Robot examples mentioned are approximate and refer to floor mounted version. For a correct choice and size of the robot please contact our technical department.

Tab. 50

Technical data

| Type | Size | Max speed [m/s] | Max acceleration [m/s ²] | Repeatability [mm] | Rail size [mm] |
|------|--------|-----------------|--------------------------------------|--------------------|----------------|
| SEV | 280P-2 | 2 | 4 | ± 0.05 | 45 |

Tab. 51

Rack specifications

| Type | Size | Rack | | | Pinion | | |
|------|--------|--------|---------|------------------------------------|--------|--------|----------------------------|
| | | Module | Quality | Type | Module | Ø [mm] | Stroke per revolution [mm] |
| SEV | 280P-2 | m5 | Q6 | Helical teeth, hardened and ground | m5 | 127.32 | 400 |

Tab. 52

Axis dimensions

| Type | Size | Stroke* ¹ S [mm] | Profile length P [mm] | Total length L [mm] | Height* ² H [mm] | | Weight [Kg] | |
|------|--------|--------------------------------|--------------------------|------------------------|--------------------------------|-------------|-----------------------------|-------------|
| | | | | | Simple and partial cover | Total cover | Simple and partial cover | Total cover |
| SEV | 280P-2 | 464 | 2000 | 2056 | 485 | 556 | 912 | 1117 |
| | | 964 | 2500 | 2556 | | | 984 | 1197 |
| | | 1464 | 3000 | 3056 | | | 1130 | 1362 |
| | | 1964 | 3500 | 3556 | | | 1205 | 1439 |
| | | 2464 | 4000 | 4056 | | | 1349 | 1603 |
| | | 2964 | 4500 | 4556 | | | 1421 | 1680 |
| | | 3464 | 5000 | 5056 | | | 1567 | 1842 |
| | | 3964 | 5500 | 5556 | | | 1641 | 1921 |
| | | 4464 | 6000 | 6056 | | | 1785 | 2083 |

*¹ Longer strokes can be made by joining profiles (see pg. SV-33).

*² Dimension H refers from the lower surface of the adjustable foot, in fully upwards position, to the top of the carriage.
The height of the robot connecting plate must be added (see pg. SV-29)

Tab. 53

Carriage dimensions

| Type | Size | A [mm] | B [mm] | C [mm] | | Weight* [Kg] | |
|------|--------|-----------|-----------|-----------------------------|-------------|-----------------------------|-------------|
| | | | | Simple and partial cover | Total cover | Simple and partial cover | Total cover |
| SEV | 280P-2 | 1300 | 1334 | 820 | 1005 | 341 | 487 |

* Including gearbox

Tab. 54

Levelling feet

| Type | Size | Stroke S [mm] | Nb. of feet | Z [mm] |
|------|--------|------------------|----------------|-----------|
| SEV | 280P-2 | 464 | 3.00 | 685.0 |
| | | 964 | 3.00 | 935.0 |
| | | 1464 | 4.00 | 790.0 |
| | | 1964 | 4.00 | 956.7 |
| | | 2464 | 5.00 | 842.5 |
| | | 2964 | 5.00 | 967.5 |
| | | 3464 | 6.00 | 874.0 |
| | | 3964 | 6.00 | 974.0 |
| | | 4464 | 7.00 | 895.0 |

Tab. 55

> SEV 360-2

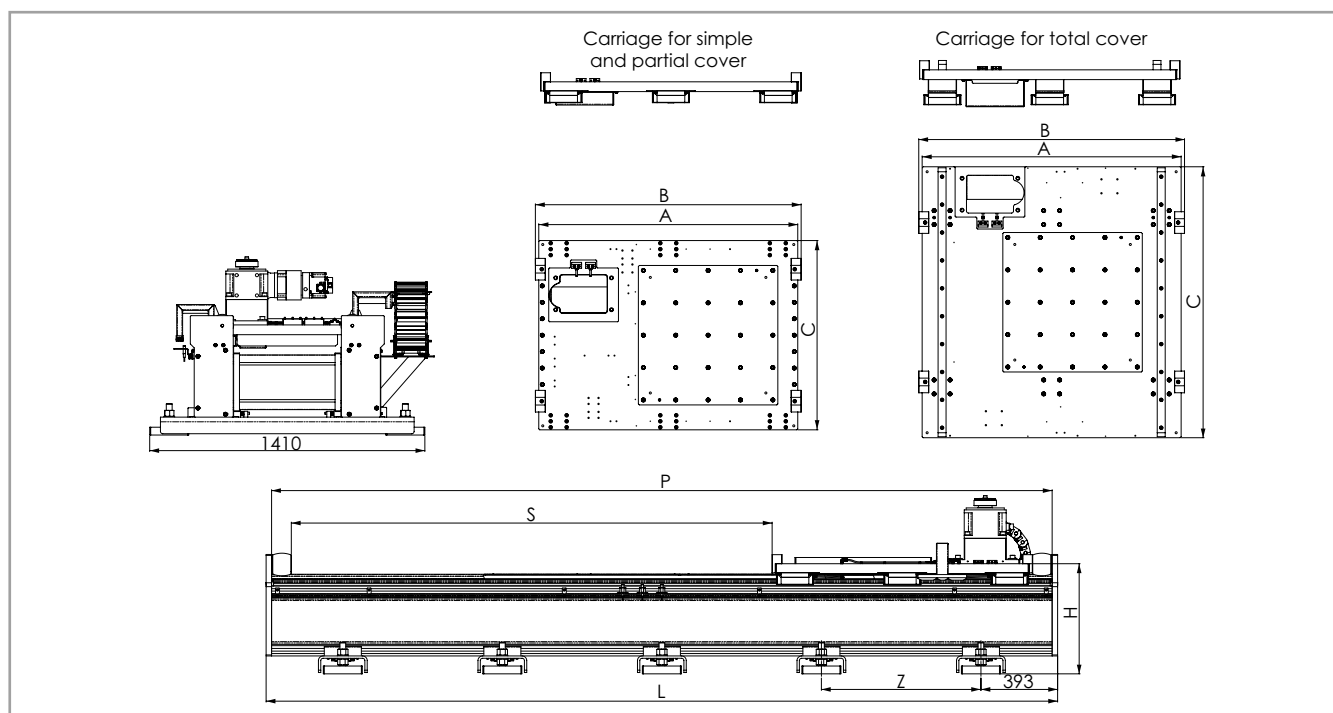


Fig. 13

Examples of robots

| Type | Size | Robot examples | | | |
|------|-------|----------------|--|--------------|-------------|
| | | Brand | Model | Payload [Kg] | Weight [Kg] |
| SEV | 360-2 | FANUC | M900ib/360; R2000ic/210L; R2000ic/270F | 210-360 | 1320-1540 |
| | | KUKA | KR 210, 240, 270, 300 | 210-300 | 1068-1154 |

Robot examples mentioned are approximate and refer to floor mounted version. For a correct choice and size of the robot please contact our technical department.

Tab. 56

Technical data

| Type | Size | Max speed [m/s] | Max acceleration [m/s ²] | Repeatability [mm] | Rail size [mm] |
|------|-------|-----------------|--------------------------------------|--------------------|----------------|
| SEV | 360-2 | 2 | 4 | ± 0.05 | 45 |

Tab. 57

Rack specifications

| Type | Size | Rack | | | Pinion | | |
|------|-------|--------|---------|-------------------------------------|--------|--------|----------------------------|
| | | Module | Quality | Type | Module | Ø [mm] | Stroke per revolution [mm] |
| SEV | 360-2 | m5 | Q6 | Helical teeth, hardenend and ground | m5 | 127.32 | 400 |

Tab. 58

Axis dimensions

| Type | Size | Stroke* ¹ S [mm] | Profile length P [mm] | Total length L [mm] | Height* ² H [mm] | | Weight [Kg] | |
|------|-------|--------------------------------|--------------------------|------------------------|--------------------------------|-------------|-----------------------------|-------------|
| | | | | | Simple and partial cover | Total cover | Simple and partial cover | Total cover |
| SEV | 360-2 | 464 | 2000 | 2056 | 564 | 636 | 1152 | 1343 |
| | | 964 | 2500 | 2556 | | | 1242 | 1441 |
| | | 1464 | 3000 | 3056 | | | 1433 | 1641 |
| | | 1964 | 3500 | 3556 | | | 1526 | 17436 |
| | | 2464 | 4000 | 4056 | | | 1715 | 1939 |
| | | 2964 | 4500 | 4556 | | | 1806 | 2040 |
| | | 3464 | 5000 | 5056 | | | 1996 | 2237 |
| | | 3964 | 5500 | 5556 | | | 2089 | 2335 |
| | | 4464 | 6000 | 6056 | | | 2278 | 2535 |

*¹ Longer strokes can be made by joining profiles (see pg. SV-33).

*² Dimension H refers from the lower surface of the adjustable foot, in fully upwards position, to the top of the carriage.
The height of the robot connecting plate must be added (see pg. SV-29)

Tab. 59

Carriage dimensions

| Type | Size | A [mm] | B [mm] | C [mm] | | Weight* [Kg] | |
|------|-------|-----------|-----------|-----------------------------|-------------|-----------------------------|-------------|
| | | | | Simple and partial cover | Total cover | Simple and partial cover | Total cover |
| SEV | 360-2 | 1300 | 1334 | 950 | 1360 | 384 | 537 |

* Including gearbox

Tab. 60

Levelling feet

| Type | Size | Stroke S [mm] | Nb. of feet | Z [mm] | |
|------|-------|------------------|----------------|-----------------------------|-------------|
| | | | | Simple and partial cover | Total cover |
| SEV | 360-2 | 464 | 3 | 635.0 | 685.0 |
| | | 964 | 3 | 884.0 | 935.0 |
| | | 1464 | 4 | 756.7 | 790.0 |
| | | 1964 | 4 | 923.3 | 956.7 |
| | | 2462 | 5 | 817.5 | 842.5 |
| | | 2964 | 5 | 942.5 | 967.5 |
| | | 3464 | 8 | 654.0 | 874.0 |
| | | 3964 | 6 | 954.0 | 974.0 |
| | | 4464 | 7 | 878.3 | 895.0 |

Tab. 61

Accessories



> Cable carrier

Seventh Axis features a high stability, low-noise, long service life cable carrier. As standard the cable carrier is available with snap-open along inner or outer radius. On request, a special version for heavy duty applications is available.

Standard cable carrier

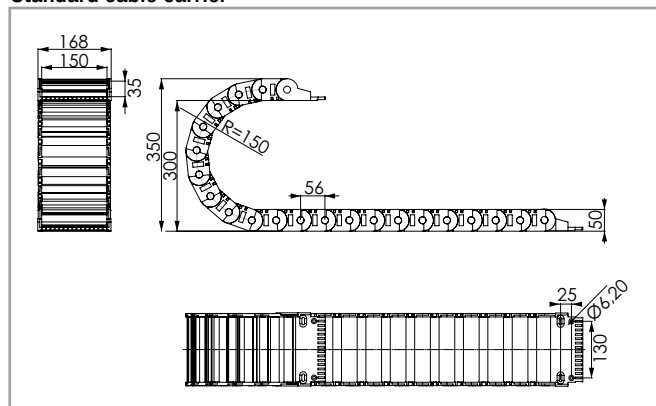


Fig. 14

Heavy duty cable carrier

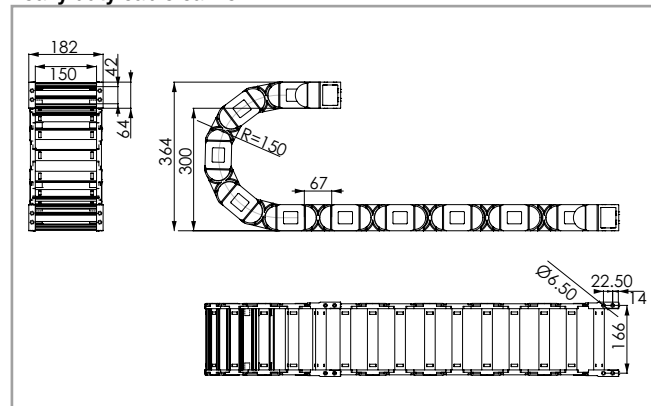


Fig. 15

The cable carrier can be mounted on the left or the right side of the axis, according to the application requirements.

For sizes 80-2 and 110-2 it is also possible to assemble the cable carrier in the center.

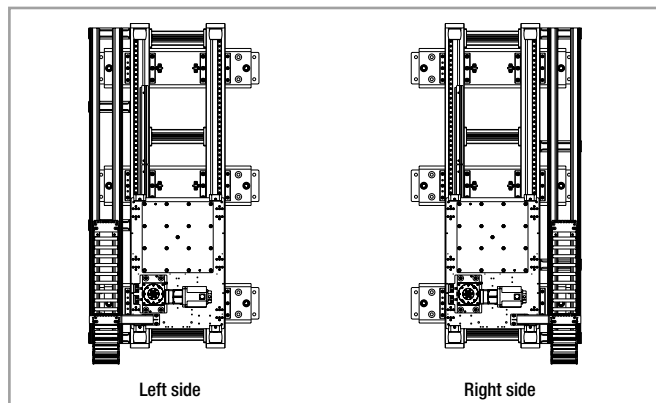


Fig. 16

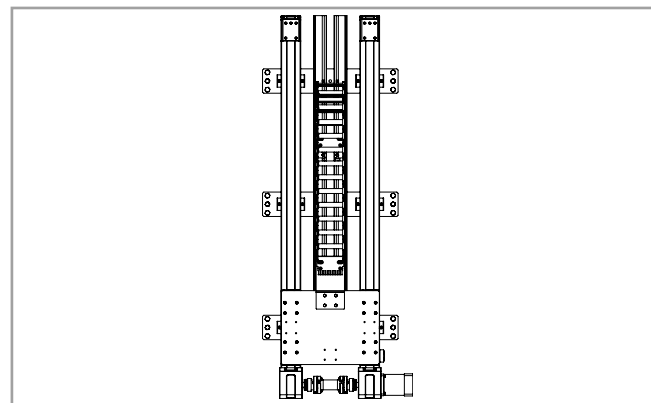


Fig. 17

> Sensors and cams

Proximity sensors holders and cams are available as accessories for all sizes of Seventh Axis. The sensors housing kit is in aluminum and features T-Nuts for fixing on the axis profile. The cams are made of steel, with hardened and ground surface. Proximity sensors are not supplied by Rollon.

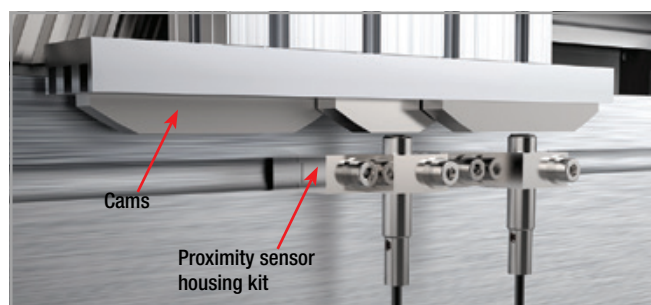


Fig. 18

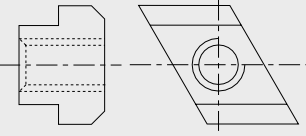
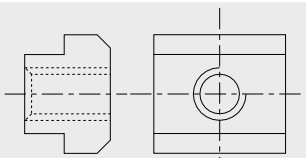
> T-Nuts

Belt driven Seventh Axis

| Type | Size | Hole | Code | Nut type |
|------|--------|------|---------|---|
| SEV | 120-1S | M6 | 6000437 |  |
| | 160-1S | M6 | 6000437 | |
| | 220-1S | M8 | 6001544 | |
| | 80-2 | M6 | 1000043 | |
| | 110-2 | M8 | 1000932 | |

Tab. 62

Rack and pinion driven Seventh Axis

| Type | Size | Hole | Code | Nut type |
|------|---|------|----------|---|
| SEV | 170-2 170-2P 280-2 360-2 280-2P | M5 | 215.1771 |  |
| | | M6 | 215.1772 | |
| | | M8 | 215.1773 | |
| | | M10 | 215.2125 | |
| | | M5 | 215.1768 |  |
| | | M6 | 215.1769 | |
| | | M8 | 215.1770 | |
| | | M10 | 215.2124 | |

Tab. 63

> Robot connecting plate

The robot connecting plate allows to assemble the robot on the carriage of the Seventh Axis and it's customized to perfectly fit the mounting holes on every robot base. For belt driven Seventh Axis the plate dimensions are equal to the carriage (see pg. from pg. SV -4 to SV-13, quotes A,B,C). For rack and pinion driven Seventh Axis the plate is available in steel or aluminum, to be defined according to the robot base and its dimensions are shown in the following figures.

| Type of robot plate | Height [mm] |
|---------------------|-------------|
| Aluminum | 50 |
| Steel | 32 |

Tab. 64

SEV280-1

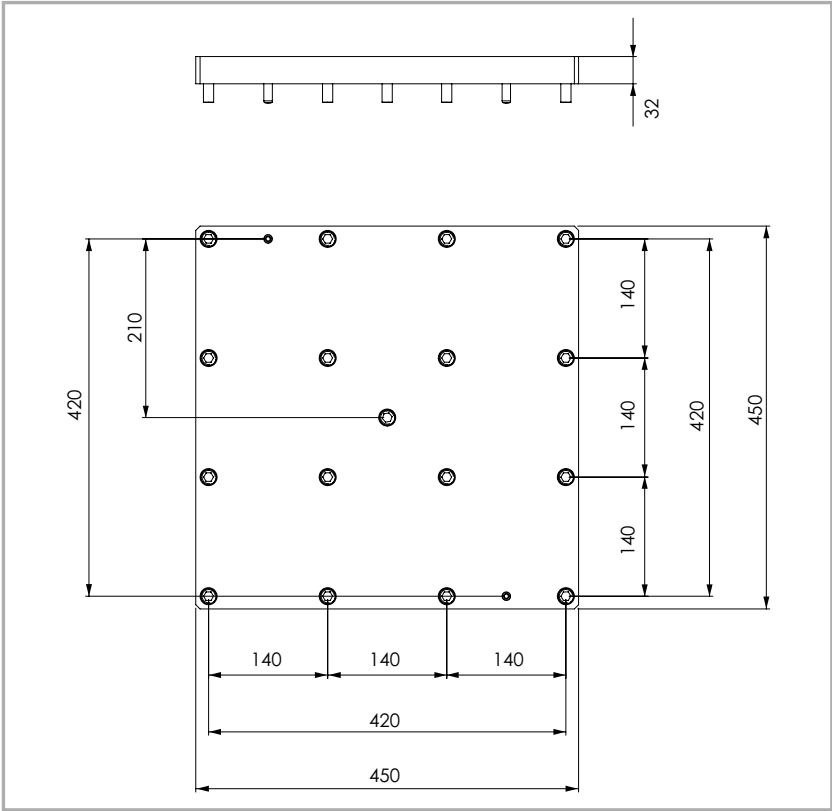


Fig. 19

SEV170-2

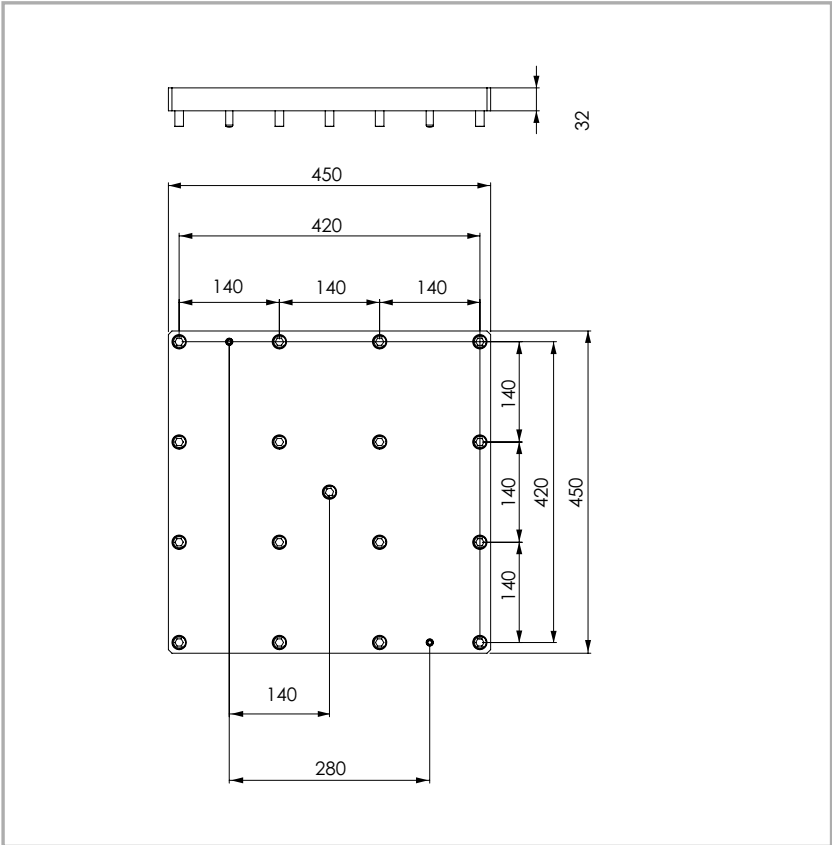


Fig. 20

SEV170P-2

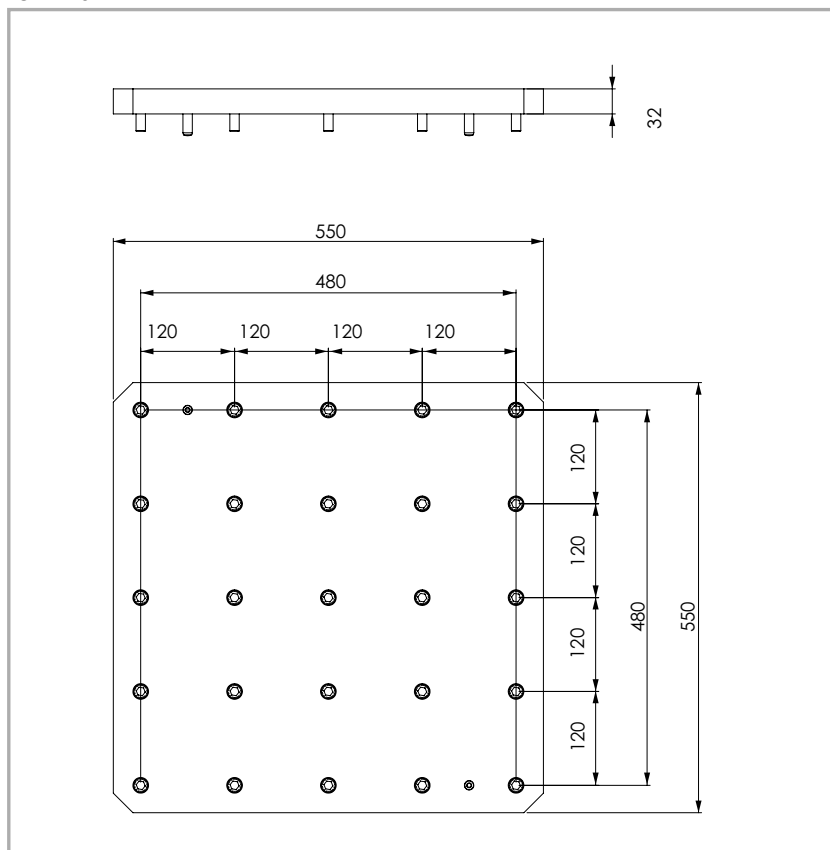


Fig. 21

SEV280-2

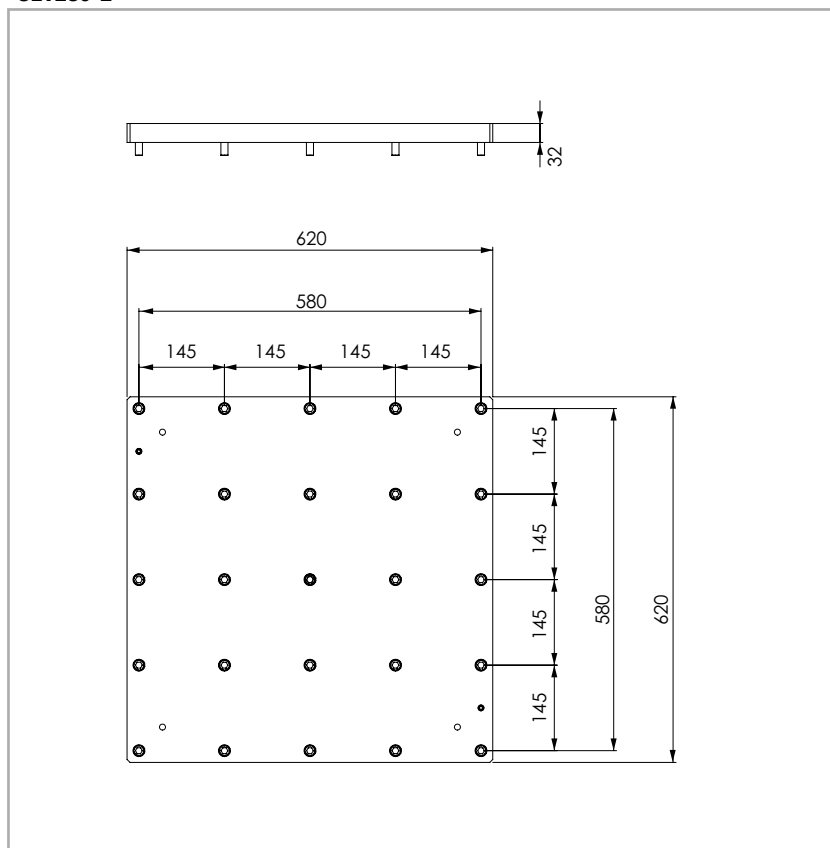


Fig. 22

SEV280P-2

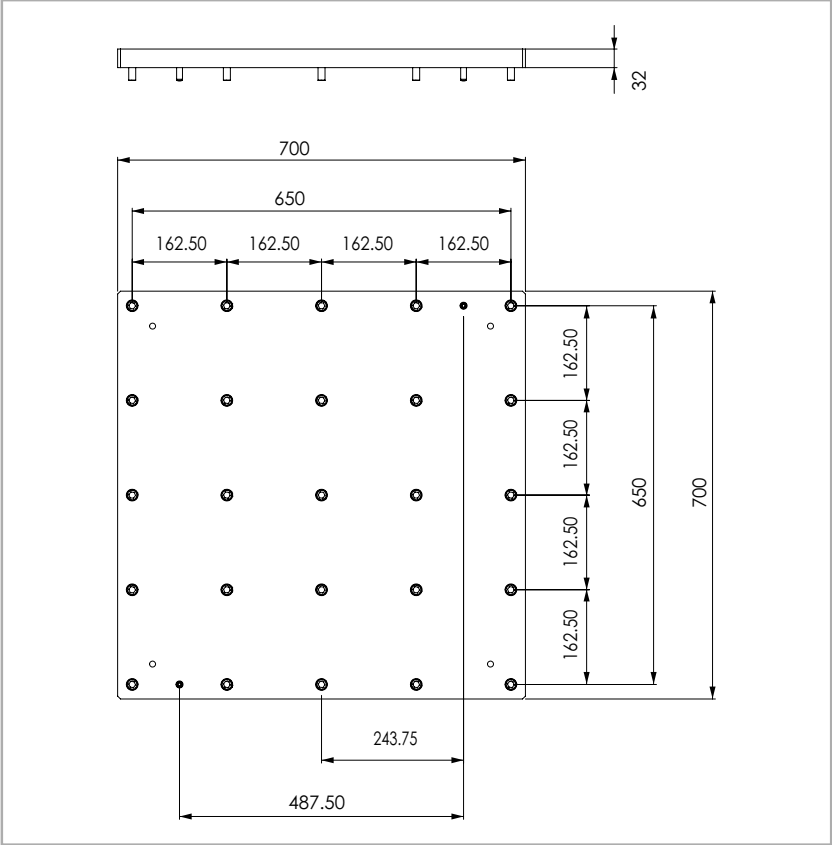


Fig. 23

SEV360-2

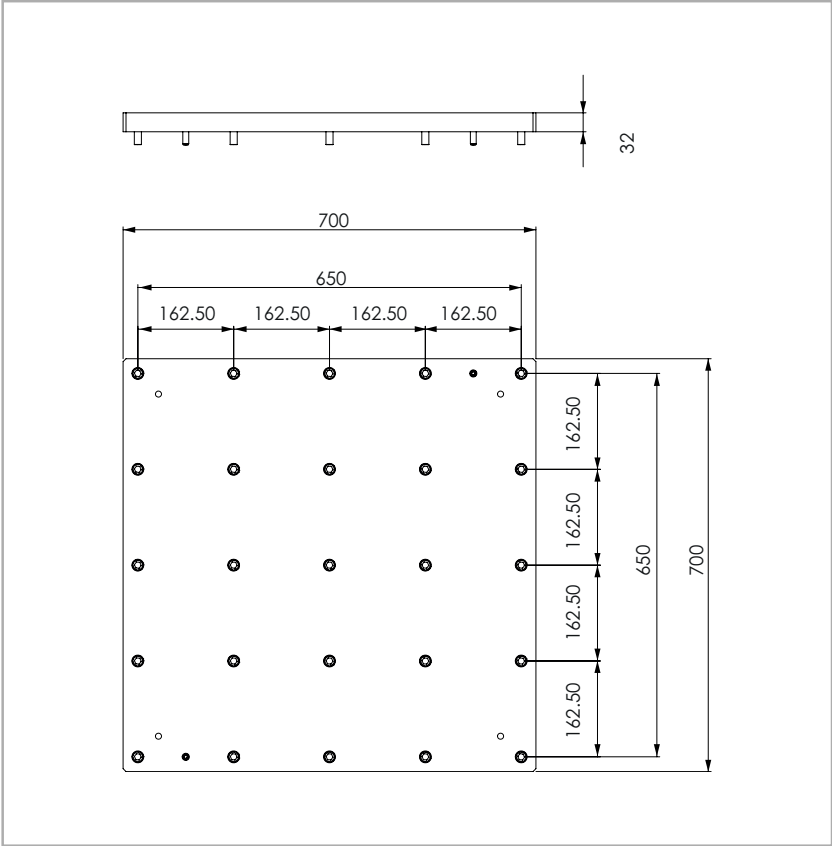


Fig. 24

Technical instructions




> Standard strokes and joint profiles

| Type | Drive | Size | Min. stroke length [mm] | Max. stroke length [mm] | Available standard stroke [mm] |
|------|---|--------|-------------------------|-------------------------|---|
| | Belt | | | | |
| SEV |  | 120-1S | 250 | 6000 | 250-500-750- 1000 - 1250 - 1500 - 1750 - 2000 - 2250 - 2500 - 2750 - 3000 - 3250 - 3500 - 3750 - 4000 - 4250 - 4500 - 4750 - 5000 - 5250 - 5500 - 5750 - 6000* |
| | | 160-1S | | | |
| | | 220-1S | | | |
| | | 80-2 | | | |
| | | 110-2 | | | |

* Available only for size 120-1S and 160-1S

Tab. 65

| Type | Drive | Size | Min. profile length [mm] | Max. profile length [mm] | Available standard profile length [mm] |
|------|---|--------|--------------------------|--------------------------|---|
| | Rack and pinion | | | | |
| SEV |  | 280-1 | 2000 | 6000 | 2000 - 2500 - 3000 - 3500 - 4000 - 4500 - 5000 - 5500 - 6000 |
| | | 170-2 | | | |
| | | 170P-2 | | | |
| | | 280-2 | | | |
| | | 280P-2 | | | |
| | | 360-2 | | | |

Tab. 66

Longer strokes can be achieved for rack and pinion driven Seventh Axis by means of standardized Rollon joints. In this case, it is desirable to use the smallest possible number of joints by choosing pieces in maximum length. Joint profile has two supports plates at joint position.

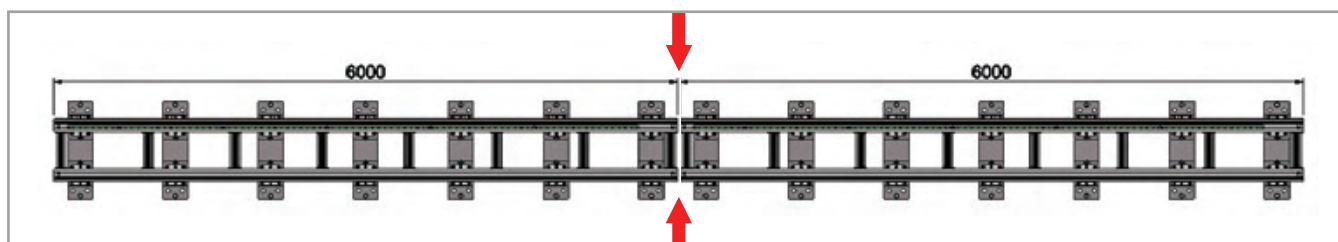


Fig. 25

> Mounting options

All robot examples in the catalog refer to floor mounted version.
For more details on wall and ceiling mounting please contact our technical department.

Floor mount



Fig. 26

Wall mount

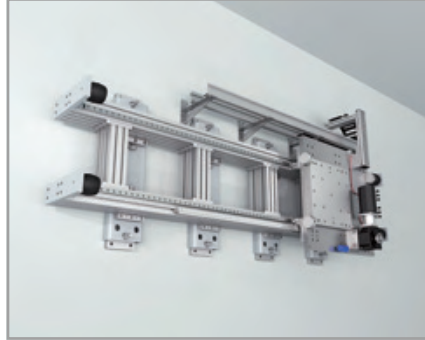


Fig. 27

Ceiling mount



Fig. 28

> Anchoring the Seventh Axis

It is possible to anchor the system to the floor through the fixing holes, either by inserting the different sizes of screws that will have to be anchored in steel bushings inserted into the cement or by using threaded bars with chemical anchor bolts inserted into the cement.

Therefore, make sure that:

If using steel bushings inserted into cement, the embedment length of the anchor screw must be at least 1.5 times the diameter. For correct anchoring of the steel bushings into the cement, follow the directions provided by the bushing manufacturer:

- For M10 screws: $10 \times 1.5 = 15$ mm embedment;
- For M12 screws: $12 \times 1.5 = 18$ mm embedment;
- For M16 screws: $16 \times 1.5 = 24$ mm embedment;
- For M24 screws: $24 \times 1.5 = 36$ mm embedment.

If anchoring with threaded bars, make sure to insert the bar into the cement with a chemical anchor that is at least 9 times its diameter:

- For M10 screws: $10 \times 9 = 90$ mm embedment;
- For M12 screws: $12 \times 9 = 108$ mm embedment;
- For M16 screws: $16 \times 9 = 144$ mm embedment;
- For M24 screws: $24 \times 9 = 216$ mm embedment.

> Leveling feet

SEV series - Belt driven

Prior to placing the axis in the work position all Leveling screws must be set at the end of the stroke. Once the Seventh Axis is in place, the levelling screw can be used to level it and compensate eventual misalignments caused by imprecise mounting surfaces and/or normal misalignment of the support crosspieces. After levelling, the two fixing screws must be blocked.

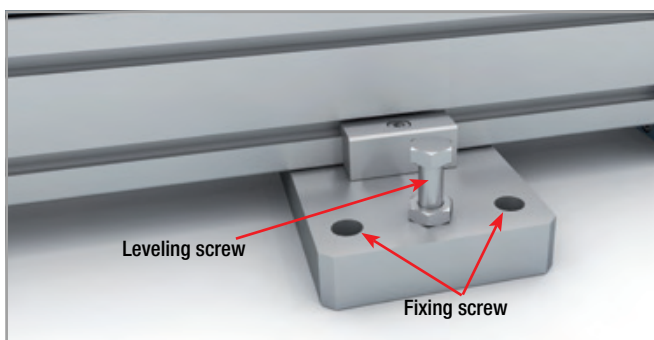


Fig. 29

| Type | Size | Levelling screw | Fixing screws |
|------|--------|-----------------|---------------|
| SEV | 120-1S | M8 | 2 x M10 |
| | 160-1S | M10 | 2 x M12 |
| | 220-1S | M10 | 2 x M12 |
| | 80-2 | M10 | 2 x M12 |
| | 110-2 | M10 | 2 x M12 |

Tab. 67

SEV series - Rack and pinion driven

Once the Seventh Axis is in place, the fixing screws must be tightened. Then, the nuts and counter nuts on the leveling screw can be used to level it and compensate eventual misalignments caused by imprecise mounting surfaces and/or normal misalignment of the support crosspieces. After levelling, all screws must be blocked. To obtain optimal fixing, all holes in the levelling plate must be used.

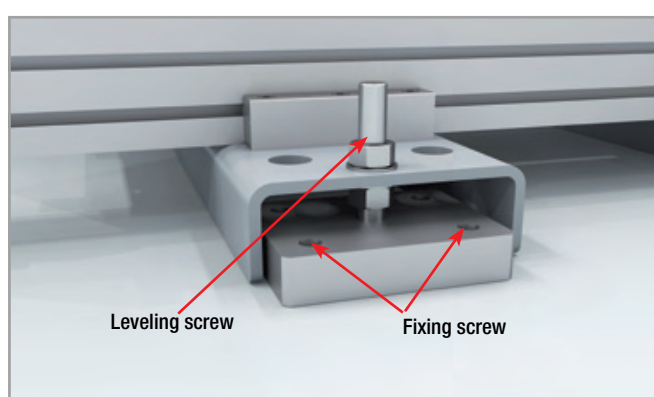


Fig. 30

| Type | Size | Leveling screw | Fixing screws |
|------|--------|----------------|---------------|
| SEV | 280-1 | M12 | 2 x M12 |
| | 170-2 | M24 | 4 x M16 |
| | 170P-2 | M30 | 4 x M16 |
| | 280-2 | M30 | 4 x M24 |
| | 280P-2 | M30 | 4 x M24 |
| | 360-2 | M30 | 4 x M24 |

Tab. 68

> Protection options for rack and pinion driven Seventh Axis

Simple cover - Code S

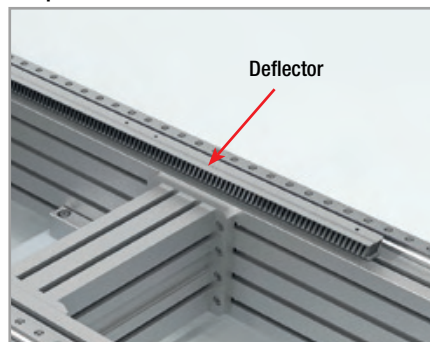


Fig. 31

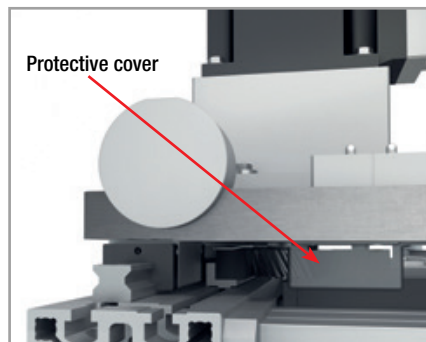


Fig. 32

The teeth of the rack are protected by a deflector and the pinion is mounted inside a protective cover.

Partial cover - Code P

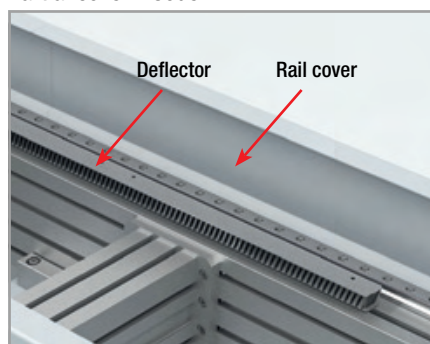


Fig. 33

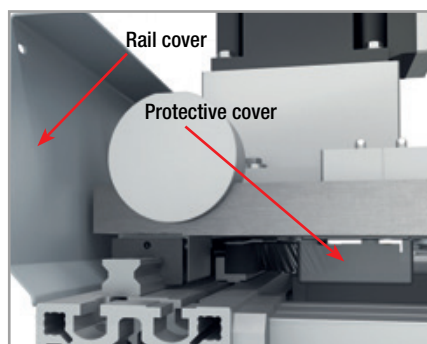


Fig. 34

Rack and pinion are protected as the simple cover version. A dedicated cover for the rails is added to improve operation in dirty environments.

Total cover - Code T

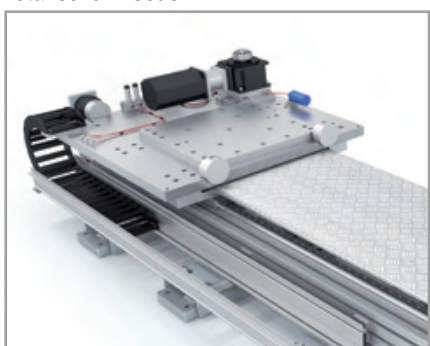


Fig. 35

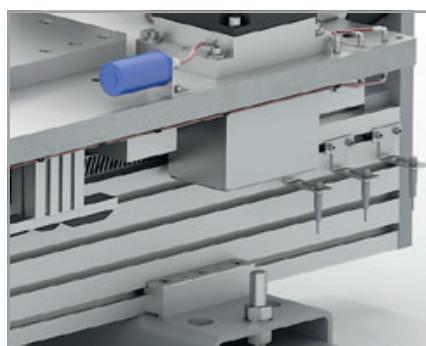


Fig. 36

The teeth of the rack are protected by a deflector and the pinion is mounted inside a protective cover. The combination of a walkable cover and a wider carriage encloses the system and further improves the protection against foreign objects.

> Gearboxes

SEV series - Rack and pinion driven

Each size of rack and pinion Seventh Axis is provided with a pre-selected gearbox. D are hypoid bevel gearboxes, featuring low backlash and a wide range of reduction ratio, ideal for high load applications. Reduction ratio has to be determined in function of the application.

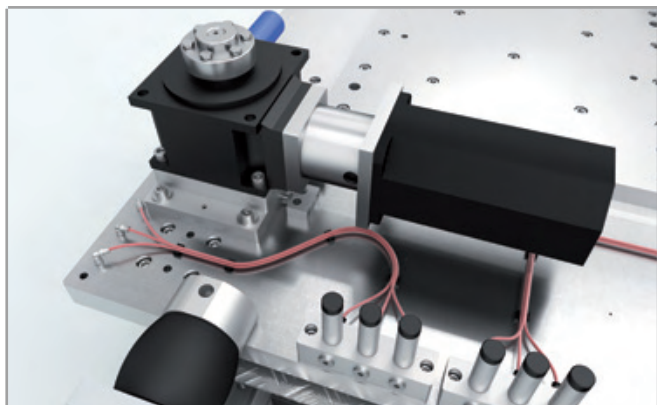


Fig. 37

The Seventh axis is delivered with the gearbox assembled on it.

| Type | Size | Gearbox (included) | Weight [Kg] |
|------|--------|--------------------|-------------|
| SEV | 280-1 | D090 | 9.5 |
| | 170-2 | D090 | 9.5 |
| | 170P-2 | D115 | 15.5 |
| | 280-2 | D130 | 23.5 |
| | 280P-2 | D140 | 32.5 |
| | 360-2 | D140 | 32.5 |

Tab. 69

SEV series - Belt driven

SEV80-2 and SEV110-2 are provided with a pre-selected gearbox. Type MP planetary gearboxes have low backlash and a wide range of reduction ratio. Reduction ratio has to be determined in function of the application.

The Seventh axis is delivered with the gearbox assembled on it.

| Type | Size | Gearbox (included) | Weight [Kg] |
|------|-------|--------------------|-------------|
| SEV | 80-2 | MP080 | 4 |
| | 110-2 | MP130 | 12 |

Tab. 70

On other sizes the gearbox can be installed independently. The table below shows the gearbox types suggested on floor mounted configuration, and the code for their assembly kit. The assembly kit includes: shrink disk; adapter plate; fixing hardware. For further information on the mounting procedure, to use other gearboxes, or for vertical mounting orientation, please contact our Technical Department.

| Type | Size | Gearbox (not included) | Kit code |
|------|--------|---------------------------|----------|
| SEV | 120-1S | P3 | G000824 |
| | | MP080 | G000826 |
| | | LC90; MPV01; NP025S; PE4 | G000827 |
| | | MP105 | G000830 |
| | | PE3; NP015S; LC070 | G001078 |
| | | SP060; PLN070 | G000829 |
| | | SP075; PLN090 | G000859 |
| | | SW040 | G000866 |
| | 160-1S | MP130 | G000482 |
| | | LC120; MPV02; NP035S; PE5 | G000483 |
| | | LC090; NP025S; PE4 | G000525 |
| | | MP105 | G000527 |
| | | SP075; PLN090 | G000526 |
| | | SW050 | G000717 |
| | 220-1S | MP130 | G002785 |
| | | MP105 | G002786 |
| | | LP120; LC120; PE5 | G002787 |
| | | SP100 | G002788 |

Tab. 71

> Lubrication of the rack and pinion driving system

The grease is distributed evenly on the rack through a felt pinion placed at the very side of the driving pinion and fed by a 125 ml grease tank installed in the upper side of the carriage. The grease tank can be regulated to distribute the lubricant over time according to the application requirements (average life ca. 1 year).

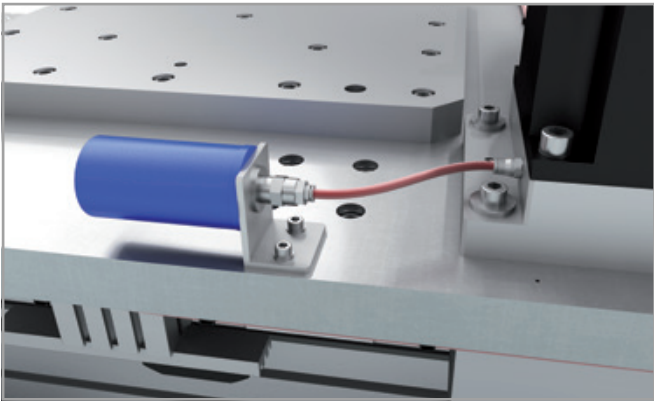


Fig. 38

> Lubrication of the blocks

SEV series - Belt driven

For SEV 120-1S, SEV 160-1S and SEV 220-1S the ball bearing carriages are fitted with a retention cage that eliminates “steel-steel” contact between adjacent revolving parts and prevents misalignment of these in the circuits. This system guarantees a long interval between maintenances: every 2000 km or 1 year of use, based on the value reached first. For SEV 80-2 and SEV 110-2 special lubrication reservoirs are mounted on the front plates of the linear blocks which continuously provide the necessary amount of grease to the ball raceways under load. These lubrication reservoirs considerably reduce the frequency of lubrication of the module. This system guarantees a long interval between maintenances: every 5000 km or 1 year of use, based on the value reached first. Lubrication must be delivered manually, using lithium soap grease of class NLGI 2, through the specific nipples placed on the side of the carriage as shown in the pictures below. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

Quantity of lubricant necessary for re-lubrication of each block:

| Type | Size | Lubricant [cm ³] |
|------|--------|------------------------------|
| SEV | 120-1S | 0.7 |
| | 160-1S | 1.4 |
| | 220-1S | 2.4 |
| | 80-2 | 2.8* |
| | 110-2 | 4.8* |

* Quantity for each carriage

Tab. 72

SEV 80-2, SEV 110-2

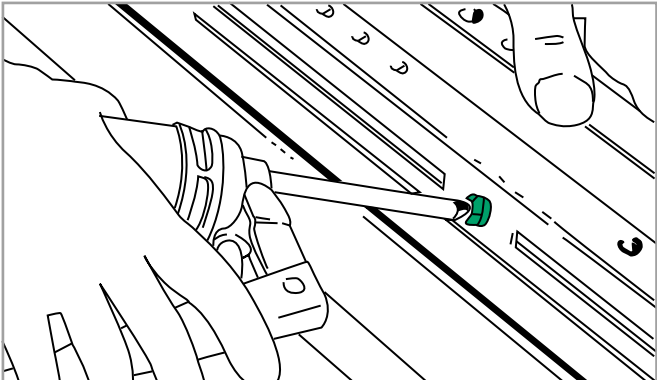


Fig. 39

SEV 120-1S, SEV 160-1S, SEV 220-1S

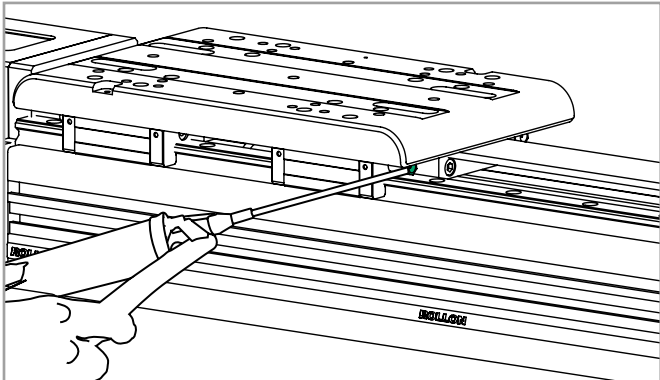


Fig. 40

SEV series - Rack and pinion driven

Lubrication must be applied manually, using grease type Shell Gadus S4 V45AC, through the specific nipples mounted on a distribution kit on the upper side of the carriage. This system guarantees an interval between maintenances of 2000 km or 1 year of use, based on the value reached first. On request, grease can be delivered automatically by means of 15ml tanks, one for each block. The tanks are mounted on a distribution kit and each greasing point is independent from the others. To further reduce the need for maintenance, grease can also be delivered by an automatic battery operated lubricator with a capacity of 250 ml. The lubricator is programmed on its display panel and a special distribution kit feeds the blocks. The lubrication unit also notifies when it's empty or if any inconvenience occurs in one of the lubrication channels.

Quantity of lubricant necessary for re-lubrication of each block:

| Type | Size | Lubricant [cm³] |
|------|--------|-----------------|
| SEV | 280-1 | 5.0 |
| | 170-2 | 3.0 |
| | 170P-2 | 5.0 |
| | 280-2 | 5.9 |
| | 280P-2 | 6.5 |
| | 360-2 | 6.5 |

Tab. 73

Manual lubrication



Fig. 41

Automatic lubrication



Fig. 42

Automatic lubrication with CPU



Fig. 43

> Profile specifications

SEV 120-1S

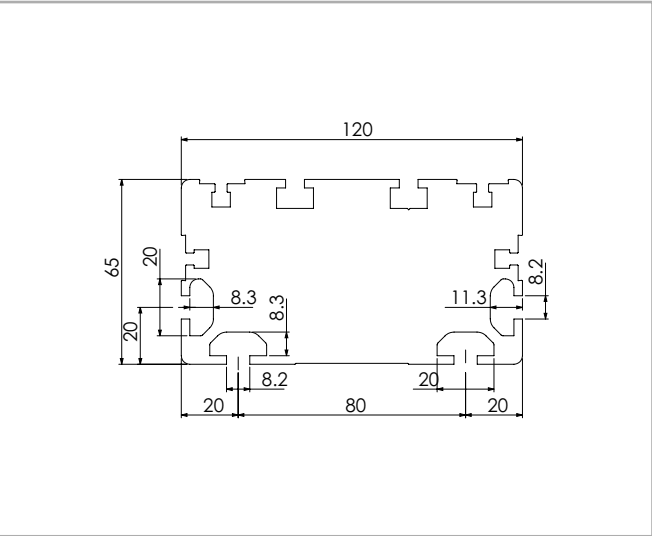


Fig. 44

SEV 160-1S

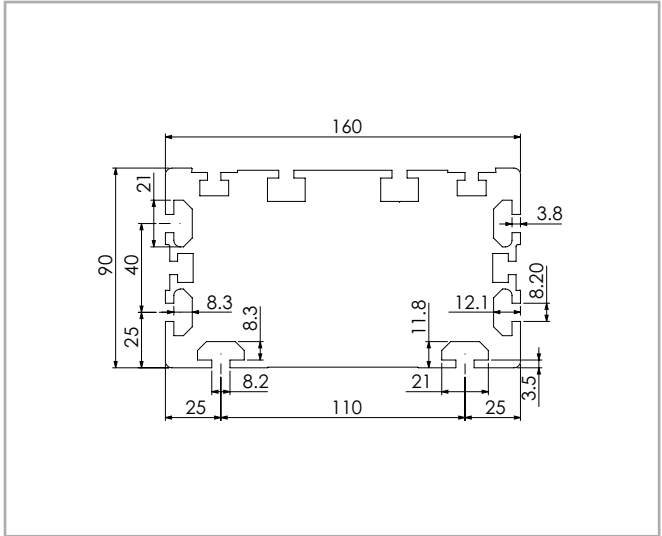


Fig. 45

SEV 220-1S

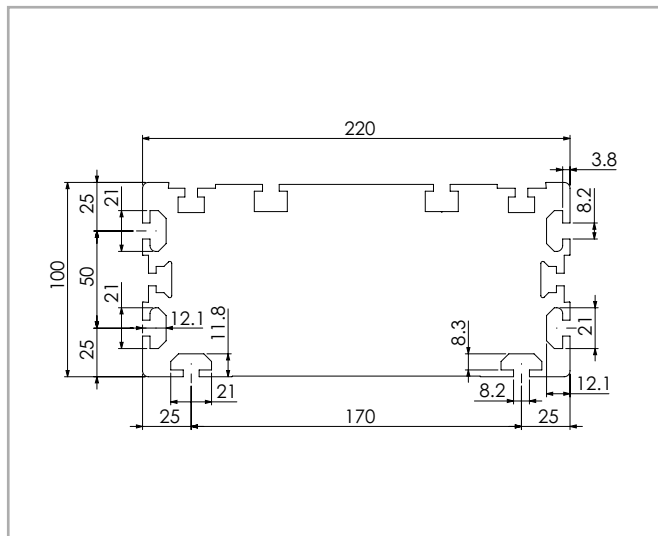


Fig. 46

SEV 80-2

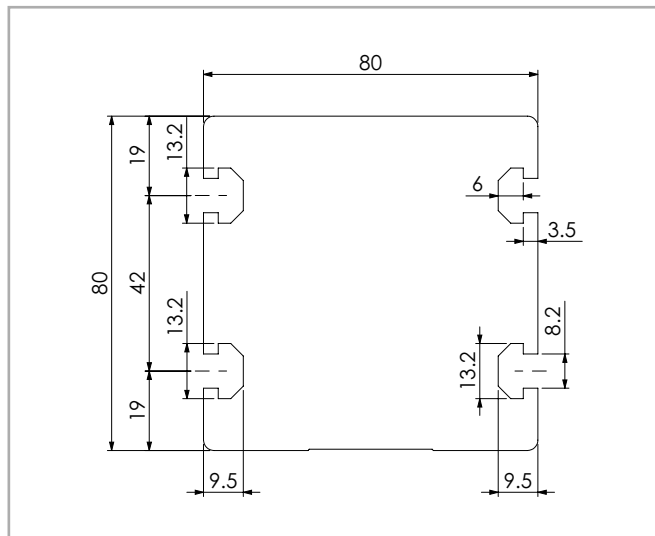


Fig. 47

SEV 110-2

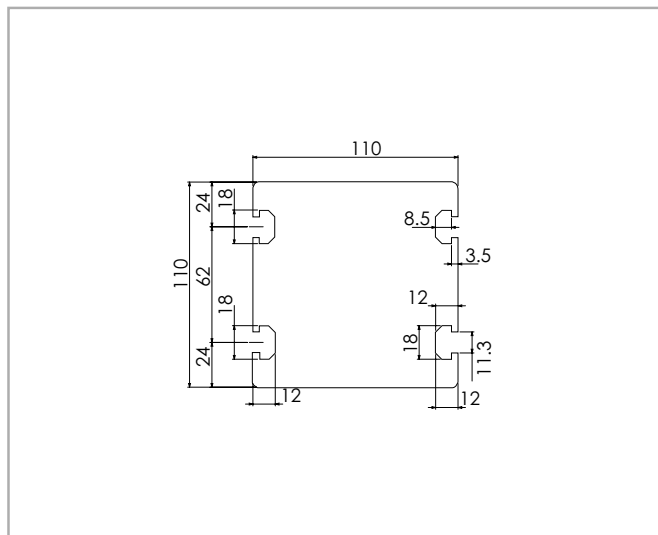


Fig. 48

SEV 280-1, SEV 280-2 and SEV 280P-2

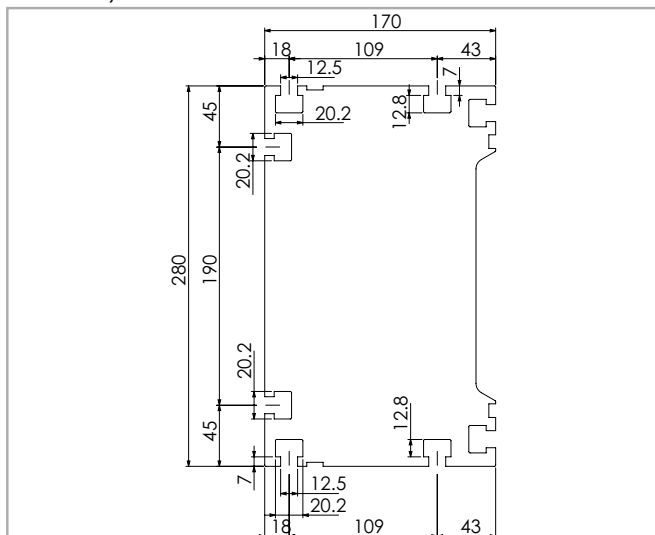


Fig. 49

SEV 170-2 and SEV 170P-2

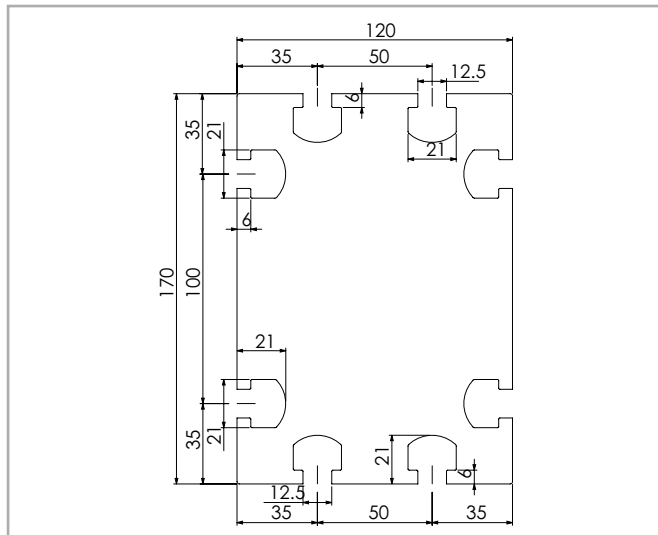


Fig. 50

SEV 360-2

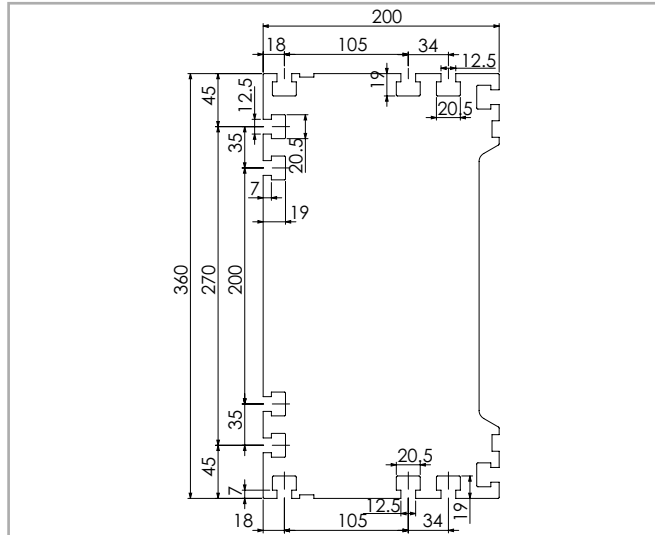


Fig. 51

Ordering key



> SEV series - Belt driven

| | | | | | | | |
|-----|-------|-------|--------|--|--|--|--|
| SEV | 220-1 | -3000 | R L | | | | |
| | | | | Chain <i>see pg. SV-28</i> R = right ; L = left ; C = center (80-2 and 110-2 only) | | | |
| | | | | Length of profiles in mm <i>see pg. SV-4 to SV-13</i> | | | |
| | | | | Size <i>see pg. SV-4 to SV-13</i> | | | |
| | | | | Type <i>see pg. SV-4 to SV-13</i> | | | |

Ordering example: SEV220-1-3000-R.

> SEV series - Rack and pinion driven

| | | | | | | | |
|-----|-------|-------|----|---|--|--|--|
| SEV | 360-2 | -3000 | -P | R L | | | |
| | | | | Chain <i>see pg. SV-28</i> (R = right ; L = left) | | | |
| | | | | Cover type S,P,T <i>see pg. SV-36</i> | | | |
| | | | | Length of profiles in mm <i>see pg. SV-33</i> | | | |
| | | | | Size <i>see pg. SV-16 to SV-27</i> | | | |
| | | | | Type <i>see pg. SV-16 to SV-27</i> | | | |

Ordering example: SEV360-2-3000-PR.

Warnings and legal notes



Before incorporating the partly completed machinery, we recommend consulting this chapter carefully, in addition to the assembly manual supplied with the individual modules. The information contained in this chapter and in the manuals for the individual modules, is provided by highly qualified and certified personnel, possessing adequate competence in incorporating the partly completed machinery.



Precaution in installation and handling operations. Significantly heavy equipment.



When handling the axis or system of axes, always make sure that the support or anchoring surfaces do not leave room for bending.



In order to stabilize the axis or system of axes, before handling it is mandatory to securely block the mobile parts. When moving axes with vertical translation, it is mandatory to use the vertical movement to put all of the axes at the corresponding lower limit switch.



Do not overload. Do not subject to torsion stress.



Do not leave exposed to atmospheric agents.



Before mounting the motor on the gearbox, it is advisable to perform a pre-test of the motor itself, without connection to the gear unit. The testing of this component was not carried out by the manufacturer of the machine. It will therefore be the responsibility of the customer of Rollon to perform the testing of the same, in order to verify its correct operation.



The manufacturer cannot be considered responsible for any consequences derived from improper use or any use other than the purpose the axis or system of axes was designed for, or derived from failure to comply, during incorporation phases, with the rules of Good Technique and with what is indicated in this manual.



Avoid damage. Do not operate with inadequate tools



Warning: moving parts. Do not leave objects on the axis



Special installations: check the depth of the threads on moving elements



Make sure that the system has been installed on a level floor surface.



In use, accurately comply with the specific performance values declared in the catalog or, in particular cases, the load and dynamic performance characteristics requested in the phase prior to design.



For modules or parts of modular systems with vertical movement, it is mandatory to mount self-braking motors to neutralize the risk of the axis dropping.



The images in this manual are to be considered merely an indication and not binding; therefore, the supply received could be different from the images contained in this manual, and Rollon S.p.A has deemed it useful to insert only one example.



Systems supplied by Rollon S.p.A. were not designed/envisaged to operate in ATEX environments.

> Residual risks

- Mechanical risks due to the presence of moving elements.
- Risk of fire resulting from the flammability of the belts used on the axes, for temperatures in excess of 250 °C in contact with the flame.
- The risk of the Z axis dropping during handling and installation operations on the partly completed machinery, before commissioning.
- Risk of the Z axis dropping during maintenance operations in the case of a drop in the electrical power supply voltage.
- Crushing hazard near moving parts with divergent and convergent motion.
- Shearing hazard near moving parts with divergent and convergent motion.
- Cutting and abrasion hazards.

> Basic components



The Partly Completed Machinery shown in this catalog is to be considered a mere supply of simple Cartesian axes and their accessories agreed when the contract is stipulated with the client. The following are therefore to be considered excluded from the contract:

1. Assembly on the client's premises (direct or final)
2. Commissioning on the client's premises (direct or final)
3. Testing on the client's premises (direct or final)

It is therefore understood that the aforementioned operations in points 1., 2., and 3. are not chargeable to Rollon.

Rollon is the supplier of Partly Completed Machinery, the (direct or final) client is responsible for testing and safely checking all equipment which, by definition, cannot be theoretically tested or checked at our facilities where the only movement possible is manual movement (for example: motors or reduction gears, cartesian axes movements that are not manually operated, safety brakes, stopper cylinders, mechanical or induction sensors, decelerators, mechanical limit switches, pneumatic cylinders, etc.). The partly completed machine must not be commissioned until the final machine, in which it is to be incorporated, has been declared compliant, if necessary, with the instructions in Machinery Directive 2006/42/CE.

> Instructions of an environmental nature

Rollon operates with respect for the environment, in order to limit environmental impact. The following is a list of some instructions of an environmental nature for correct management of our supplies. Our products are mainly composed of:

| Material | Details of the supply |
|--------------------------------|---|
| Aluminum alloys | Profiles, plates, various details |
| Steel with various composition | Screws, racks and pinions, and rails |
| Plastic | PA6 – Chains PVC – Covers and sliding block scrapers |
| Rubber of various types | Plugs, seals |
| Lubrication of various types | Used for the lubrication of sliding rails and bearings |
| Rust proof protectione | Rust proof protection oil |
| Wood, polyethylene, cardboard | Transport packaging |

At the end of the product's life cycle, it is therefore possible to recover the various elements, in compliance with current regulations on waste issues.

> Safety warnings for handling and transport

- The manufacturer has paid the utmost attention to packaging to minimize risks related to shipping, handling and transport.
- Transport can be facilitated by shipping certain components dismantled and appropriately protected and packaged.
- Handling (loading and unloading) must be carried out in compliance with information directly provided on the machine, on the packing and in the user manuals.
- Personnel authorized to lift and handle the machine and its components shall possess acquired and acknowledged skills and experience in the specific sector, besides having full control of the lifting devices used.
- During transport and/or storage, temperature shall remain within the allowed limits to avoid irreversible damage to electric and electronic components.
- Handling and transport must be carried out with vehicles presenting adequate loading capacity, and the machines shall be anchored to the established points indicated on the axes.
- DO NOT attempt to bypass handling methods and the established lifting points in any way.
- During handling and if required by the conditions, make use of one or more assistants to receive adequate warnings.
- If the machine has to be moved with vehicles, ensure that they are adequate for the purpose, and perform loading and unloading without risks for the operator and for people directly involved in the process.
- Before transferring the device onto the vehicle, ensure that both the machine and its components are adequately secured, and that their profile does not exceed the maximum bulk allowed. Place the necessary warning signs, if necessary.
- DO NOT perform handling with an inadequate visual field and when there are obstacles along the route to the final location.
- DO NOT allow people to either transit or linger within the range of action when lifting and handling loads.
- Download the axes just near the established location and store them in an environment protected against atmospheric agents.
- Failure to comply with the information provided might entail risks for the safety and health of people, and can cause economic loss.
- The Installation Manager must have the project to organize and monitor all operative phases.
- The Installation Manager shall ensure that the lifting devices and equipment defined during the contract phase are available.
- The Manager of the established location and the Installation Manager shall implement a “safety plan” in compliance with the legislation in force for the workplace.
- The “safety plan” shall take into account all surrounding work-related

activities and the perimeter spaces indicated in the project for the established location.

- Mark and delimit the established location to prevent unauthorized personnel from accessing the installation area.
- The installation site must have adequate environmental conditions (lighting, ventilation, etc.).
- Installation site temperature must be within the maximum and minimum range allowed.
- Ensure that the installation site is protected against atmospheric agents, does not contain corrosive substances and is free of the risk of explosion and/or fire.
- Installation in environments presenting a risk of explosion and/or of fire must ONLY be carried out if the machine has been DECLARED COMPLIANT for such use.
- Check that the established location has been correctly fitted out, as defined during the contract phase and based on indications in the relative project.
- The established location must be fitted out in advance to carry out complete installation in compliance with the defined methods and schedule.

> Note

- Evaluate in advance whether the machine must interact with other production units, and that integration can be implemented correctly, in compliance with standards and without risks.
- The manager shall assign installation and assembly interventions ONLY to authorized technicians with acknowledged know-how.
- State of the art connections to power sources (electric, pneumatic, etc.) must be ensured, in compliance with relevant regulatory and legislative requirements.
- “State of the art” connection, alignment and leveling are essential to avoid additional interventions and to ensure correct machine function.
- Upon completion of the connections, run a general check to ascertain that all interventions have been correctly carried out and compliance with requirements.
- Failure to comply with the information provided might entail risks for the safety and health of people, and can cause economic loss.

> Transport

- Transport, also based on the final destination, can be done with different vehicles.
- Perform transport with suitable devices that have adequate loading capacity.
- Ensure that the machine and its components are adequately anchored to the vehicle.

> Handling and lifting

- Correctly connect the lifting devices to the established points on the packages and/or on the dismantled parts.
- Before handling, read the instructions, especially safety instructions, provided in the installation manual, on the packages and/or on the dismantled parts.
- DO NOT attempt, in any way, to bypass handling methods and the established lifting, moving and handling points of each package and/or dismantled part.
- Slowly lift the package to the minimum necessary height and move it with the utmost caution to avoid dangerous oscillations.
- DO NOT perform handling with an inadequate visual field and when there are obstacles along the route to reach the final location.
- DO NOT allow people to either transit or linger within the range of action when lifting and handling loads.
- Do not stack packages to avoid damaging them, and reduce the risk of sudden and dangerous movements.
- In case of prolonged storage, regularly ensure that there are no variations in the storage conditions of the packages.

> Check axis integrity after shipment

Every shipment is accompanied by a document ("Packing list") with the list and description of the axes.

- Upon receipt check that the material received corresponds to specifications in the delivery note.
- Check that packaging is perfectly intact and, for shipments without packaging, check that each axis is intact.
- In case of damages or missing parts, contact the manufacturer to define the relevant procedures.

Notes 



Are you out of space on your factory layout?
Do you need to manage higher payloads?
Do you need higher speed and acceleration?

Cartesian robots can be the perfect solution for these requirements. Our line of multi-axis solutions works in synergy with anthropomorphic robots to further improve the productivity of your factory automation.

Actuator System Line

Integrated actuators for industrial automation, used in applications in several industrial sectors: automated industrial machinery, precision assembly lines, packaging lines and high speed production lines. The Actuator Line evolves to satisfy the requests of our most discerning clients.



Transfer Press

A circular inset showing a 3D CAD model of a transfer press system. It features a horizontal gantry with multiple parallel actuators and a central vertical mechanism, all mounted on a sturdy frame.

Telescopic Actuator

A circular inset showing a 3D CAD model of a telescopic actuator. It consists of multiple nested horizontal tubes or cylinders, with a red mounting bracket at one end, designed for linear motion.

Multi Gantry

A circular inset showing a 3D CAD model of a multi-gantry system. It features a complex arrangement of horizontal beams and vertical supports, with multiple actuators and end effector mounts, designed for high-capacity material handling.

Multi-Axis Pick and Place

A circular inset showing a 3D CAD model of a multi-axis pick and place system. It includes a vertical column, a horizontal beam, and a complex end effector assembly with multiple joints and sensors, designed for precise material placement.



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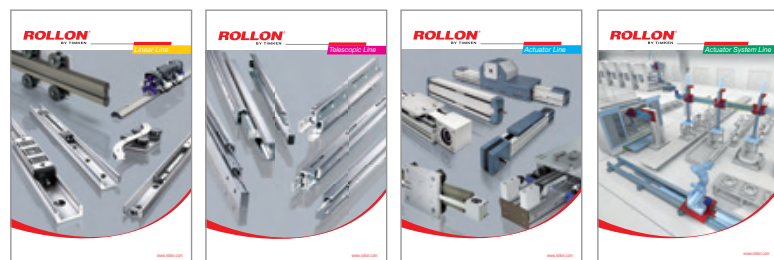
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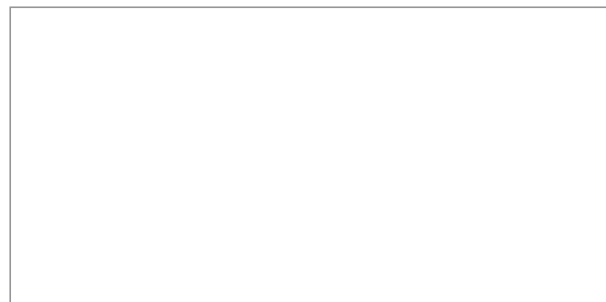
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