

**LINEAR GUIDES**

# CONTENTS

IN TRODUCTION	2-7		AG...M – MOTORISABLE GUIDES	38	
	CI SYSTEM	8-9		AG...M LAT –SIDE ASSEMBLY	39
	AS SYSTEM	10-11		AG SYSTEM WITH RACK	40
	AV6 SYSTEM	12-13		GUIDES WITH SCREWS	41-43
	AD SYSTEM	14-15		BOPARDS SCREW	44-45
	AV SYSTEM	16-17		MODULAR GUIDE AL	46-51
	AG SYSTEM	18-19		MOTORIZABLE GUIDES WEIGHTS	52-53
	WHEELS	20-22		PROFILES AND GUIDES JOINT	54
	TROLLEYS	23-25		BELLOW BOOTS	55
	CURVILI NEAR SYSTEM	26-27		SUPPORT PROFILES	56
ORDERING CODES FOR MOTORIZABLE GUIDES			FASTENING ELEMENTS	57	
	AK... – MOTORISABLE GUIDES	29-31		SHAFTS AND FLANGES	58
	AD...M – MOTORISABLE GUIDES	32-33	ASSEMBLY INSTRUCTONS	59-61	
	AV...M – MOTORISABLE GUIDES	34-35	SAMPLE APPLICATONS	62-73	
	AD...M LAT – SIDEASSEMBLY	36-37	SAMPLE APPLICATIONS	74-76	

## INTRODUCTION TO LINEAR GUIDE WITH WHEELS

CTS linear wheel guides can be used in all fields of application. These systems operate dry, which means they do not require lubrication between the track and the wheels (which already have internal lubrication like normal bearings). For that reason, they are particularly suitable in dusty environments or places where constant maintenance is difficult. They are especially indicated for applications where it is important not to contaminate the final product, such as the textile, paper and food industries, where the system can be made entirely of stainless steel.

### WORK ENVIRONMENT

The work environment determines which kind of wheels to use.

The standard supply consists of ZZ wheels with dust guards that protect internal components from the intrusion of large particles. Wheels with a 2RS hermetic seal can be used in case of powder-sized particles. If humidity or liquids are present also, the "inox 2RS" stainless steel (AISI 440) watertight version of the wheels can be fitted.

In very aggressive environments where even stainless steel can be corroded, wheels can be made with an external polymer coating. Load capacities are obviously lower but this version is an economic alternative for applications with light loads and chemically aggressive environments.

### WORKING TEMPERATURE

The type of lubricant used with a polymer cage fitted inside the wheels has temperature limits of  $-20^{\circ}\text{C} + 80^{\circ}\text{C}$ .

For different temperatures, it is possible to produce special wheels, which can have modified limits of up to  $-70^{\circ}\text{C} + 300^{\circ}\text{C}$

### SPEED OF THE WHEEL SYSTEMS

The speed of a wheel system must always be in proportion to the weight of the load to be handled, its position on the carriage and the level of precision in positioning required. Bearing in mind that every application has peculiarities that require study in each case, the prudential limits can be quantified as follows

speed = 3 m/s acceleration/deceleration = 7 m/s<sup>2</sup>

We have produced systems that travel at much higher speeds, but please contact us regarding systems with these specifications.

### PRELOADING ECCENTRIC WHEELS

First, ensure that the concentric wheels are completely tightened in accordance with the torque values shown in the tables of the wheel data.

The preload is adjusted by gradually rotating the pin of the eccentric wheels (one clockwise and the other anticlockwise, after first tightening the nut slightly to create a little resistance to the natural tendency to unscrew loose) using an Allen key until the two steel bars of the guide are tight between the two sets of wheels on the two sides, without play and with light preload.

Then, it is necessary to check the correct preload of both eccentric wheels as follows: holding the guide tightly, rotate the external ring manually. The wheel must run along the guide with some friction, but not enough to put up excessive resistance. If the wheel cannot rotate, the preload must be reduced by adjusting its registration.

The utmost care must be taken in applying the preload, as an excessive preload can damage the wheel or cause excessive wear and shorter lifespan.

### SIZING THE WHEELS

Any force or weight acting on a carriage with grooved wheels resolves into an axial and a radial component. The correct wheel size is determined by checking that both values are within the maximum values shown in the catalogue.

The next step is to check the duration of the wheels over time.

These calculations are done by the CTS technical department, which offers clients their knowledge and experience in dealing with a vast range of applications. All the information that we need is listed in the sizing questionnaire at the end of the catalogue.

### IMPORTANT DIFFERENCES BETWEEN WHEEL GUIDES AND BALL BEARING GUIDES

The wheel guides run without lubricant. They can work in dusty environments and have a sliding force which can be modified at any time by adjusting the preload of the eccentric wheels.

A stainless steel version is available for humid environments.

In combined axis systems, the use of cylindrical wheels makes it possible to correct errors in parallelism.

Ball bearing guides have the advantage of being very compact and rigid, but they do require constant lubrication (and the lubricant may contaminate the product or retain dirt).

The sliding friction, which is greater compared to the wheel system, cannot be modified during use.

A stainless steel version is not available.

In combined systems, errors in parallelism are not permissible.

### CHOOSING THE GUIDES

On the subject of the various sizes of wheel guides in the catalogue, there are "screwed" versions (D10, D20, G20) and compact versions (V6, V10, V20, CI series). The screwed guides can be joined together using male/female joints so that rails longer than 6 m can be made while the compact guides cannot be joined and the maximum length is 6 m.

The continuous anchoring of the bars on the aluminium profile in the compact guides gives better parallelism between the bars compared to the screwed guides which instead are anchored on the basis of the wheelbase S shown in the various tables.

It is advisable to use screwed guides when the guide is fitted upside down with the load suspended and when there are heavy loads swinging. In these cases, the number of screws can be increased to strengthen the hold of the steel bars on the aluminium profile thus reducing the wheelbase S.

All guides with double bars have a predetermined wheelbase. If it is necessary to increase or reduce this wheelbase, the single S10-S20 guides can be used. The wheels with 120° grooves can also be used on a hexagonal bar. This is useful when a low cost system is required and where there are chemical agents that can corrode aluminium. In this case, an AISI304 or AISI316 stainless steel bar can be used. Since the wheel runs on two surfaces instead of two points, as with the round bar, the reactive forces to the load are distributed over a larger surface and therefore it is not necessary to subject the hexagonal bar to heat treatment.

#### CHOICE OF THE TYPE OF TRANSMISSION

We are able to supply guides with toothed belts, chains, racks, or with trapezoidal or ball screws. The characteristics and limits of each type are listed below to facilitate the work of the designers:

##### Toothed belt

The steel cables of the belts are coated with polyurethane with temperature limits  $-20^{\circ}\text{C}$  and  $+70^{\circ}\text{C}$ . As regards the length, it is advisable not to exceed 6 m of guide rail. Longer systems reaching 7-8 m are possible, but it is necessary to fit another belt-tensioner to the carriage as the eccentric pin fitted inside the tail pulley is cannot sufficiently tighten such a long belt correctly. In terms of speed, this is the best solution when speeds from 1 to 3 m/s are desired.

##### Chain

Chains are used mainly on hoisting systems or when the working temperature exceeds the upper working temperature limit of the belt. In these cases, 2 additional chain tighteners are fitted to the carriage, and when the movement is horizontal a polyzene profile is placed between the chain and the aluminium profile to prevent damage caused by slipping.

##### Rack with straight teeth

This is used when it is necessary to build tracks to accommodate strokes longer than 6 m, for applications with high working temperatures and when movement takes place in a small space.

The maximum working speed is 1 m/s but it is advisable not to exceed 0.8 m/s

##### Trapezoidal and ball screws

The maximum length advisable is 3 m. The trapezoidal screw is generally used for slow manual movements when high precision positioning is not required or when it is necessary to have the guarantee that the movement is irreversible with the guide still. The ball screw is used exclusively for electrically driven movement and offers higher working speeds and greater precision in positioning. However, the lower internal friction makes it reversible, and therefore it is advisable to use a self-braking motor especially for vertical movement.

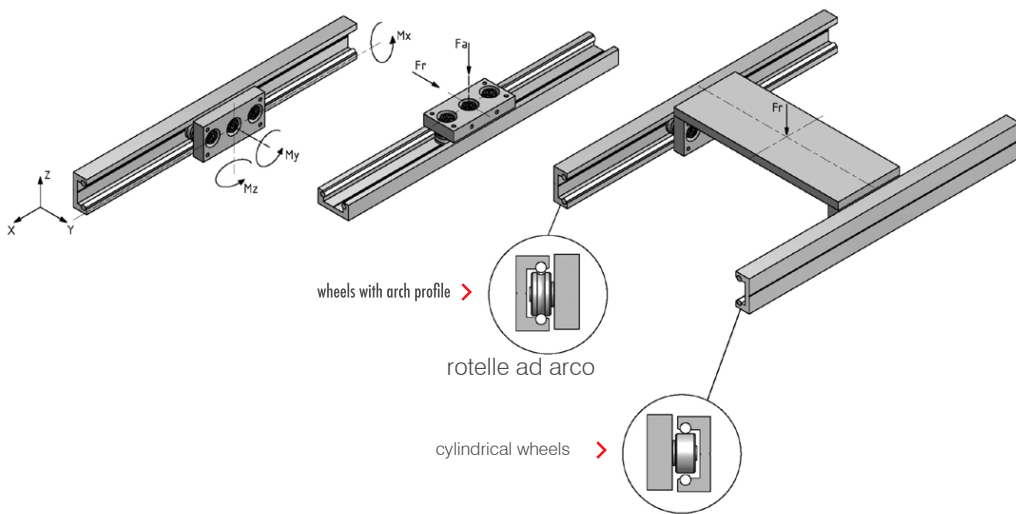
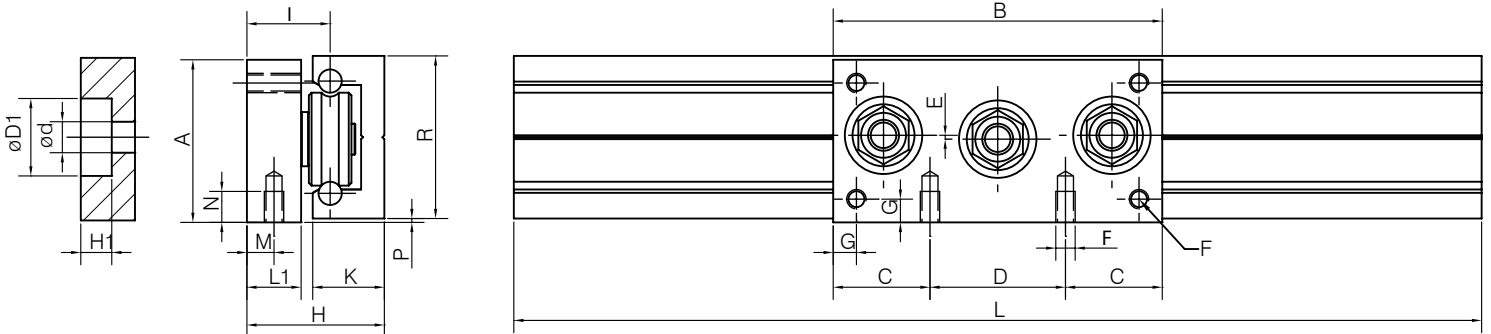
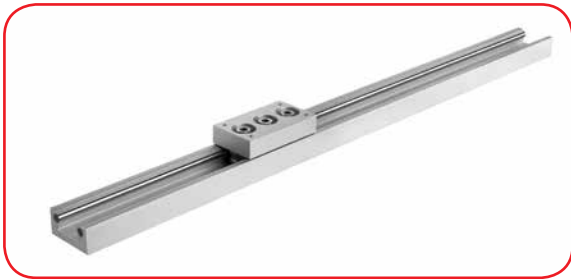
As regards speed, it should be borne in mind that a longer screw reduces the maximum speed proportionately. Diagrams showing the relationship between guide length and maximum speed have been included in the pages concerning the screw guides.

##### Examples of application sectors

A list of some sectors where wheel guides are regularly used is given below:

- machinery for the textile industry
- packaging machinery (bottlers, canning machines, palletizing machines and depalletizing machines)
- machinery for the food industry
- machinery for working wood, plastic and marble (cutting machinery, beading machines, drilling and milling equipment, ...)
- machines for plasma cutting, laser cutting and waterjet
- equipment for sandblasting, high pressure washing and painting
- automated welding systems
- galvanising systems for handling baskets in the tanks
- production of equipment for special effects in television advertising

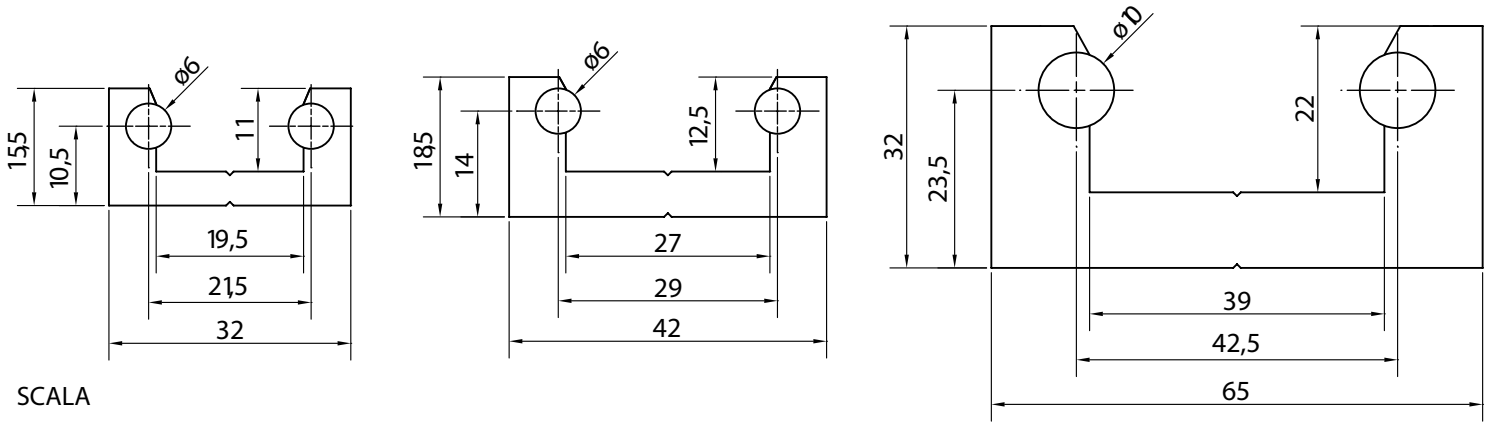
# CI SYSTEM



Type	A	B	C	D	D1	dH10	E	F	G	H	H 1	I	K	L1	M	N	P	R	Lmax
CI 32-17	32	65	20,5	24	16	5	0,5	M4	4	28,5	6	18	15,5	11	5,5	6	0,5	32	6000
CI 42-24	42	85	25	35	20	8	1	M5	6	35,5	8	21,5	18,5	14	7	8	1	42	6000
CI 65-35	65	115	27,5	60	26	10	1,2	M6	10	57,5	14	34	32	24	14	10	1,2	65	6000

Type	Components				Load (N)					Double Fr (N)*
	Guide	Trolley Weight (g)	Wheels		Single					
					Mx (Nm)	My (Nm)	Mz (Nm)	Fa (N)	Fr (N)*	
CI 32-17 C	CI 32	MI 32	88	C5/17 – E5/17	3,5	10	5,8	320	1020	2040
CI 42-24	CI 42	MI 42	227	C8/24 – E8/24	7,6	26	15	510	1740	3480
CI 65-35	CI 65	MI 65	745	C10/35 – E10/35	26	78	45	1200	4000	8000

\*Radial load is applied only on the 2 concentric wheels



SCALA

Type	Weight (kg/m)	Moment of inertia LX (cm <sup>4</sup> )	LY (cm <sup>4</sup> )
CI32	1,08	3,66	0,61
CI42	1,52	9,61	1,31
CI65	4,15	62,60	10,33

CI series linear unit born by the need of a linear unit with wheels reduced dimensions that can be used where there are problems of space or when the load is little and light. For loads bigger or bulky can be used two linear unit in parallel taking care to release the force on the two concentric wheels (see the mounting example).

Making so the load is resting on 4 wheels The body is always in anodised aluminium where two steel bars hardened, ground and chromium-plated are mounted and upset

A little line shows the middle of the profile and the point where to do the drilling for the mounting at the structure.

The linear unit, that are supplying at the length required by the customer, have the maximum length of 6 metre.

The trolleys, made in anodised aluminium, are complete of holes for the mounting of the equipment to move and they are with 3 wheels, two concentric at the two extremities and one eccentric central to eliminate the clearance.

All the wheels of this linear unit are in 2RS version. On request may be supplied the system with wheels and bars in stainless steel.

## HOW TO ORDER THE "CI" SYSTEM

### WHOLE SYSTEM

System	Type	Lenght
CI	32-17	L=

Guide + Trolley + Wheels

### COMPONENTS

Guide	Type	Lenght
CI	32	L=

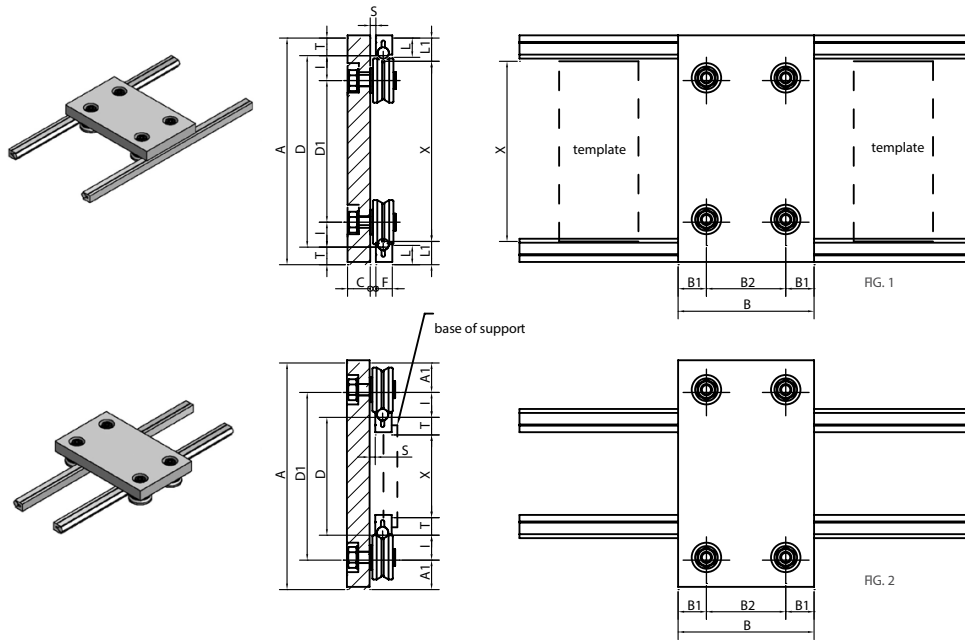
Lenght
L=

Wheel
C5/17 - E5/17

**AS SYSTEM**



**Teknik Çizim / Technical Drawing**



**Guide S10**

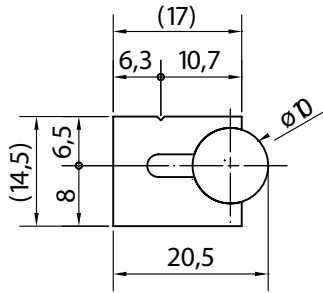
Type	Wheels								Minimum dimensions			
		I	T	C	F	L1	S*	B	B1	B2	A1	
AS 106	C106 + E106	14,5	15,5	10	14,5	17	20,5	1,5	51	12	27	12
AS 208	C208 + E208	18	15,5	15	14,5	17	20,5	2,5	67	16	35	16
AS 208 R	C208R + E208R	18	15,5	20	14,5	17	20,5	2,5	67	16	35	16
AS 210	C210 + E210	22	15,5	20	14,5	17	20,5	5	77	17,5	40	20

**Guide S20**

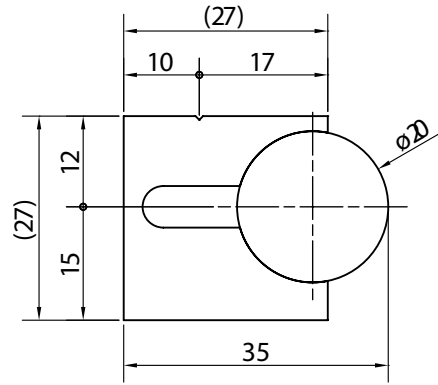
Type	Wheels								Minimum dimensions			
		I	T	C	F	L1	S*	B	B1	B2	A1	
AS 312	C312 + E312	28	25	20	27	35	1	91	22	47	22	
AS 316	C316 + E316	28	25	25	27	35	6,5	91	22	47	22	
AS 416	C416 + E416	35	25	25	27	35	6,5	123	30	63	30	
AS 416 R	C416R + E416R	35	25	25	27	35	6,5	123	30	63	30	
AS 420	C420 + E420	35	25	25	27	35	6,5	123	30	63	30	

\* Minimum distance: it can be increased by inserting shimming washers between trolley and wheel

**S10**



**S20**



**SCALE**

Guide	Weight [kg/m]	Moment of inertia	
		LX (cm <sup>4</sup> ) L	LY (cm <sup>4</sup> )
S10	1,1	0,8	0,44
S20	3,3	6,98	4,63

In the "AS" system, values A;D;D1 can only be determined once you have established the required X value. This system is useful when the centre-to-centre distance D between the guides is to be increased or decreased, or when you want a clear space between the guides. Use of this system entails carefully aligning the guides parallel, which can be done with the aid of templates (simple metal parallelepipeds) to be used when making holes and tightening screws (fig. 1), or by milling two marks at the desired distance (fig. 2). This system can be used with bars fitted either on the inside (fig. 1) or on the outside (fig. 2).

**HOW TO ORDER THE "AS" SYSTEM**

Since this system is highly sectional its components must be ordered separately as follows

**COMPONENTS**

Guide	Type	Lenght
S	10	L=

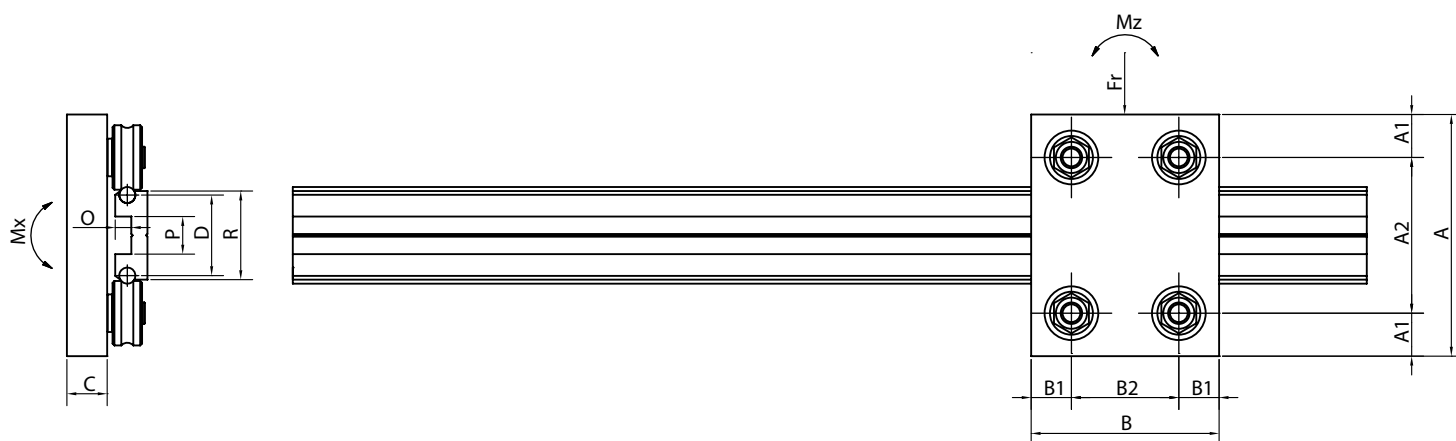
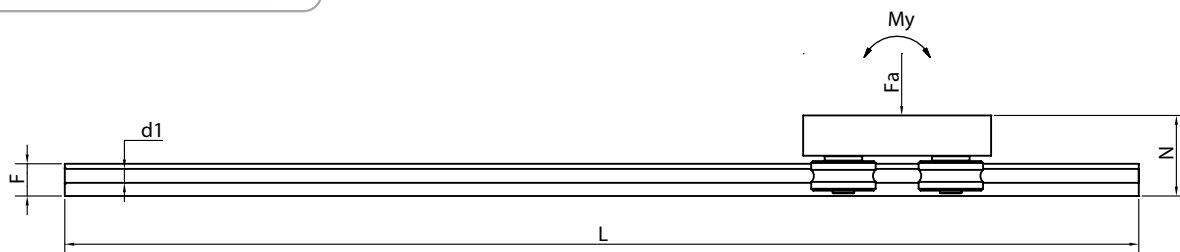
Trolley	Material
M312	AL

Wheel
C312 - E312

\*only for standard model (see page 23-25)



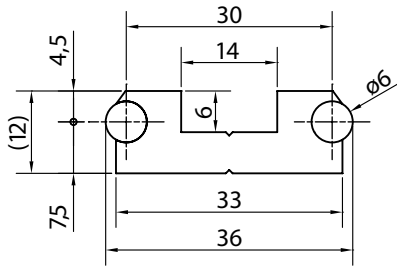
## AV6 SYSTEM



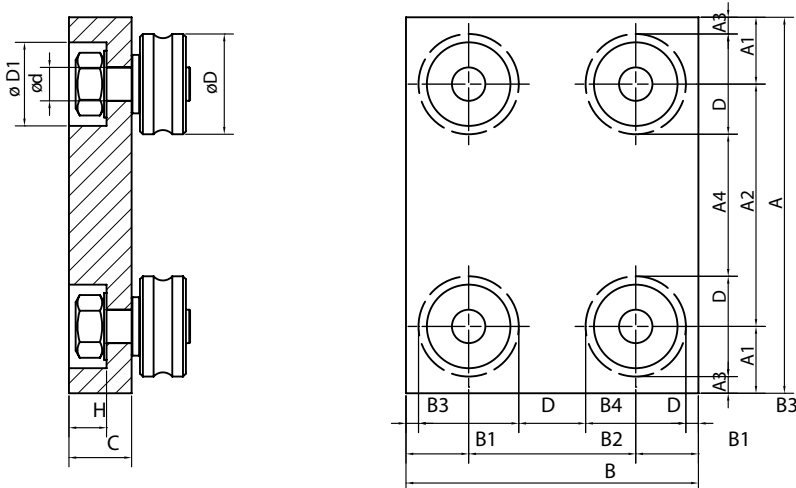
Type	A	A1	A2	B	B1	B2	C	D	F	L max	d1	N	O	P	R
AV605	80	14,5	51	60	14,5	31	12	30	12	6000	6	26,5	6	14	33
AV608	90	16	58	70	15	40	15	30	12	6000	6	30	6	14	33

Type	Guide	Trolley	Wheels	Fa (N)	Fr (N)	Mx (Nm)	My (Nm)	Mz (Nm)
AV605	V6	M605	C5/17 + E5/17	424	1020	7,42	6,57	15,81
AV608	V6	M608	C8/24 + E8/24	680	1740	11,9	13,6	64,80

The AV6 system consists of two tempered and rectified steel bars  $\varnothing 6$  h7, housed in an aluminum profile and secured in place by rolling which deforms the top part of the profile. The AV6 system was created to provide a small product with the stability of a carriage on four wheels. A thin line indicating where to drill holes for anchoring the structure runs along the entire length of the centre line. The guides are supplied already cut to the length requested, up to a maximum length of 6000 mm. The system is supplied complete with carriages, concentric and eccentric wheels. The system is to be installed by the customer so that any further work necessary can be done.



Guide	Weight (kg/m)	Moment of inertia	
		LX (cm <sup>4</sup> )	LY (cm <sup>4</sup> )
V6	1,15	3,71	0,35

**TROLLEY**


Type	A	A1	A2	A3*	A4*	B	B1	B2	B3*	B4*	C	dH10	D	D1	H	Weight (kg)	
																Ac	Al
M605	80	14,5	51	6	34	60	14,5	31	6	14	12	5	17	16	7	0,40	0,14
M608	90	16	58	4	34	70	15	40	3	16	15	8	24	20	9	0,63	0,22

\*Values given as an approximate guide and varying depending on eccentric adjustment

The trolleys, always in stock, are suited to most applications. If a trolley has to be manufactured specially, we can build one per customer specifications or if the customer wants to build it himself, we can supply just the guide and wheels.

**WHOLE SYSTEM**

System	Type	Lenght
AV	605	L=

Guide + Trolley + Wheels

**COMPONENTS**

Type	Lenght
V6	L=

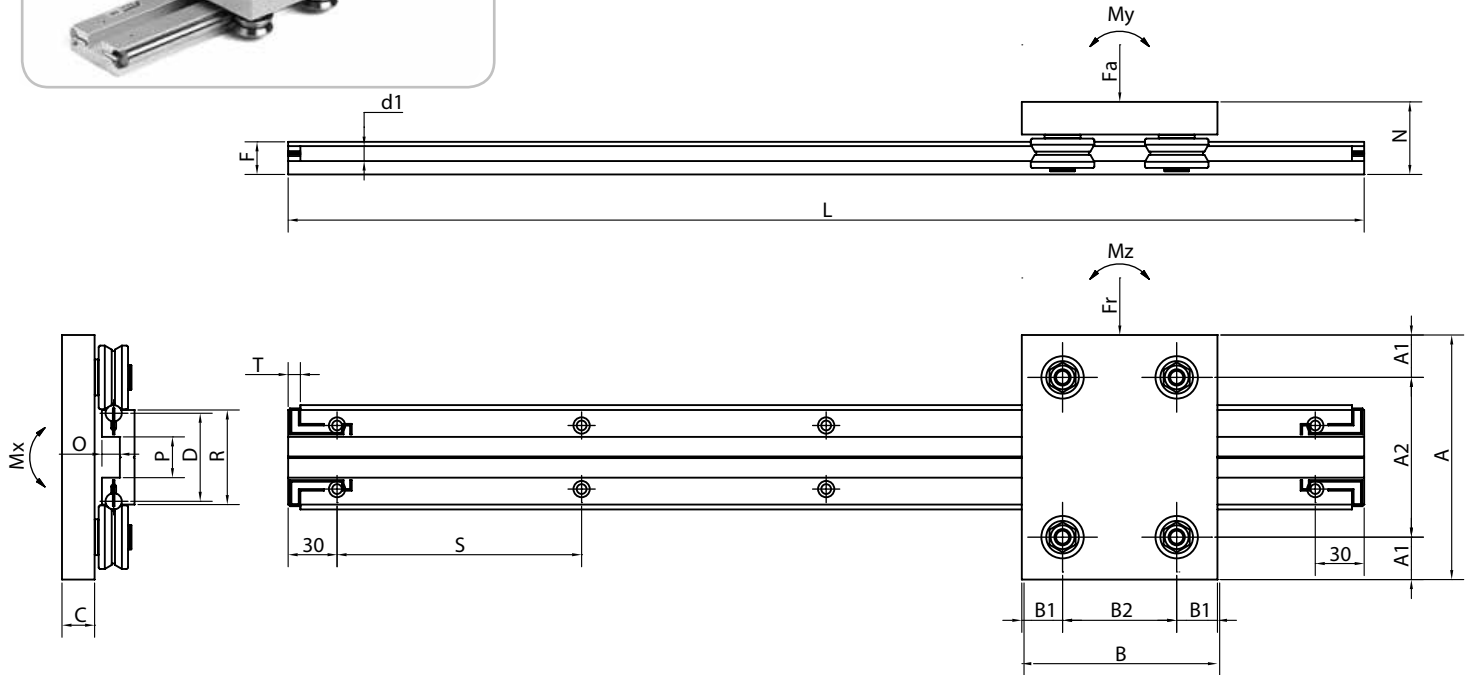
Trolley	Material
M 605	AL

Wheel
C5/17 - E5/17

AL = aluminium

AL = steel

## AD SYSTEM



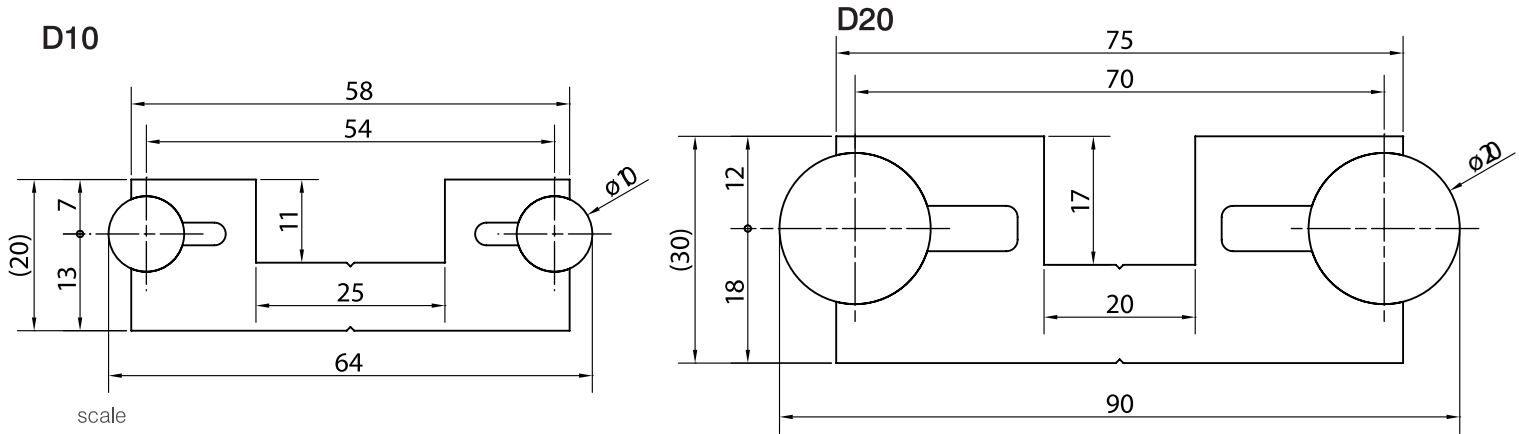
Type	A	A1	A2	B	B1	B2	C	D	F	L/max	d1	N	P	O	R	S	T
AD 106	120	18,5	83	80	19,5	41	10	54	20	6000	10	31	25	11	58	150	7,5
AD 208	140	25	90	120	25	70	15	54	20	6000	10	37	25	11	58	150	7,5
AD 208 R	140	25	90	120	25	70	20	54	20	6000	10	42	25	11	58	150	7,5
AD 210	150	26	98	120	25	70	20	54	20	6000	10	44	25	11	58	150	7,5
AD 312	180	27	126	150	30	90	20	70	30	6000	20	51	20	17	58	300	5
AD 316	180	27	126	150	30	90	25	70	30	6000	20	61,5	20	17	75	300	5
AD 416	200	30	140	180	40	100	25	70	30	6000	20	61,5	20	17	75	300	5
AD 416 R	200	30	140	180	40	100	25	70	30	6000	20	61,5	20	17	75	300	5
AD 420	200	30	140	180	40	100	25	70	30	6000	20	61,5	20	17	75	300	5

### Guide D10

Type	Components		Load				
	Trolley	Wheels	$F_a$ (N)	$F_r$ (N)	$M_x$ (Nm)	$M_y$ (Nm)	$M_z$ (Nm)
AD 106	M106	C106 + E106	800	400	37,8	24,6	12,3
AD 208	M208	C208 + E208	1600	2000	49,6	56	70
AD 208 R	M208R	C208R + E208R	2400	2600	74,4	84	91
AD 210	M210	C210 + E210	2400	2600	79,2	84	91

### Guide D20

Type	Components		Load				
	Trolley	Wheels	$F_a$ (N)	$F_r$ (N)	$M_x$ (Nm)	$M_y$ (Nm)	$M_z$ (Nm)
AD 312	M312	C312 + E312	3200	3200	139,2	144	144
AD 316	M316	C316 + E316	6400	7000	278,4	288	315
AD 416	M416	C416 + E416	6400	7000	278,4	320	350
AD 416 R	M416	C416R + E416R	17200	8600	748,2	860	430
AD 420	M420	C420 + E420	20000	15700	870	1000	785



Guide	Weight (kg/m)	Moment of inertia	
		LX (cm <sup>4</sup> )	LY (cm <sup>4</sup> )
D10	3,15	33,51	2,88
D20	8,61	134,59	14,89

Two steel bars, hardened, ground with a tolerance of h6, and chromium-plated, are stiffened and held parallel by an aluminium profile. Running along the middle for the entire length is a slim ruler indicating where holes must be made for fastening the bars to the frame. Guides are supplied cut to the requested size, up to 6000 mm in length. For greater lengths, the system is expandable (see page 54) The screws locking the bars in place are positioned with the axis 30 mm from the heads with centre-to-centre distance S. Where lengths are not an exact multiple of S(+60), head centre-to-centre distances S are varied as we deem most appropriate, or according to any customer specifications.

Assembly is left to the purchaser so that he can perform any necessary additional machining. In some applications where the load hangs over the side, a screwing torque may be generated on the bars causing them to slowly slide in their housings. To prevent this sliding, all D10- D20-G20 guides are fitted with a mechanical stop at each bar head. The steel bars, unless otherwise specified by the customer, are always supplied shorter than the aluminium profile by a value of two times T so that the "bar stops" can be fitted.

## HOW TO ORDER THE "AD" SYSTEM

### WHOLE SYSTEM

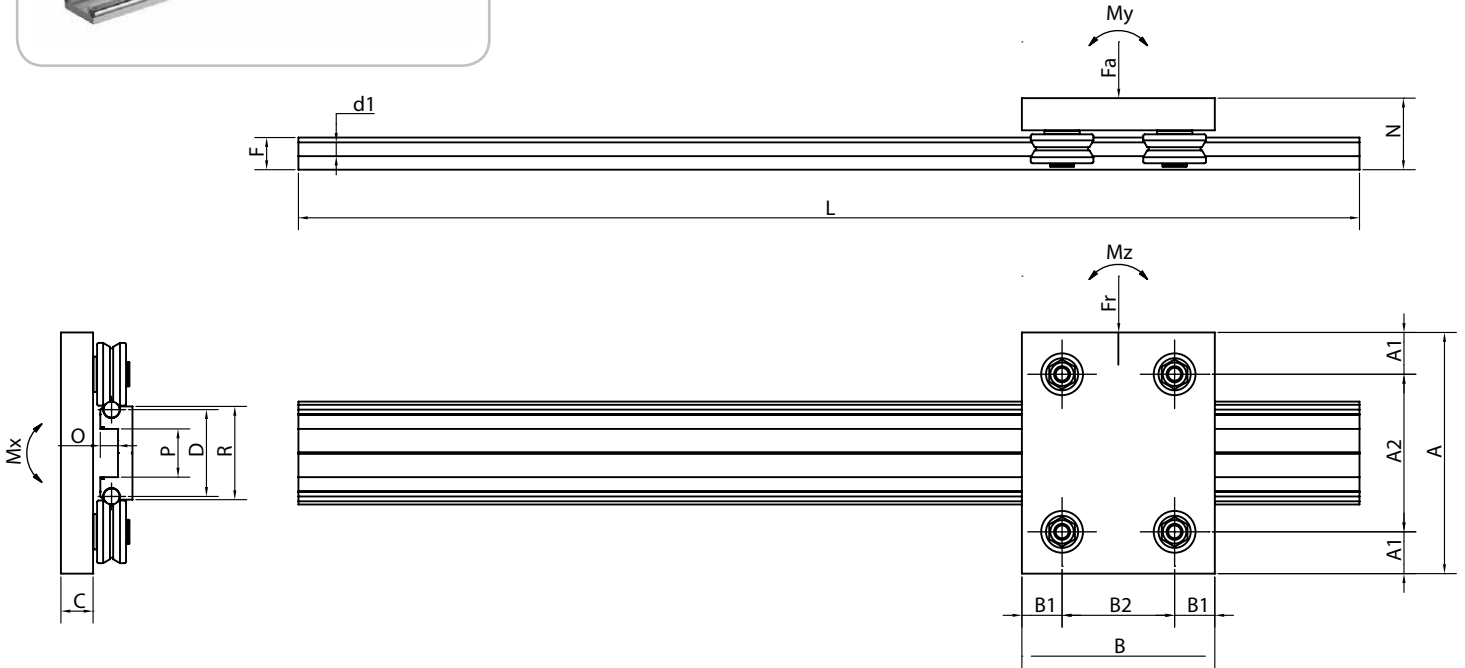
system	type	Lenght	Guide + Trolley + Wheels
AD	210	L=	

### COMPONENTS

type	Lenght	trolley	Material	Wheel
D10	L=	M 210	AL	C210 - E210

1) al =aluminum  
ac= steel

**AV SYSTEM**



Type	A	A1	A2	B	B1	B2	C	D	F	L/max	d1	N	P	O	R
AV 106	120	18,5	83	80	19,5	41	10	54	20	6000	10	31	30	11	58
AV 208	140	25	90	120	25	70	15	54	20	6000	10	37	30	11	58
AV 208 R	140	25	90	120	25	70	20	54	20	6000	10	42	30	11	58
AV 210	150	26	98	120	25	70	20	54	20	6000	10	44	30	11	58
AV 312	180	27	126	150	30	90	20	70	30	6000	20	51	35	17	58
AV 316	180	27	126	150	30	90	25	70	30	6000	20	61,5	35	17	75
AV 416	200	30	140	180	40	100	25	70	30	6000	20	61,5	35	17	75
AV 416 R	200	30	140	180	40	100	25	70	30	6000	20	61,5	35	17	75
AV 420	200	30	140	180	40	100	25	70	30	6000	20	61,5	35	17	75

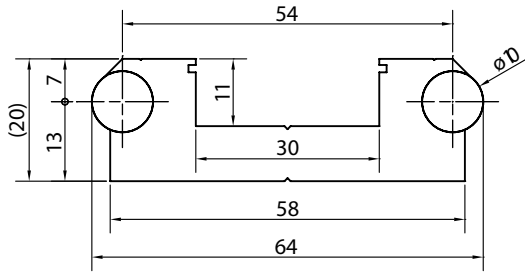
**Guide V10**

Type	Components		Load				
	Trolley	Wheels	Fa (N)	Fr (N)	Mx (Nm)	My (Nm)	Mz (Nm)
AV 106	M106	C106 + E106	800	400	37,8	24,6	12,3
AV 208	M208	C208 + E208	1600	2000	49,6	56	70
AV 208 R	M208R	C208R + E208R	2400	2600	74,4	84	91
AV 210	M210	C210 + E210	2400	2600	79,2	84	91

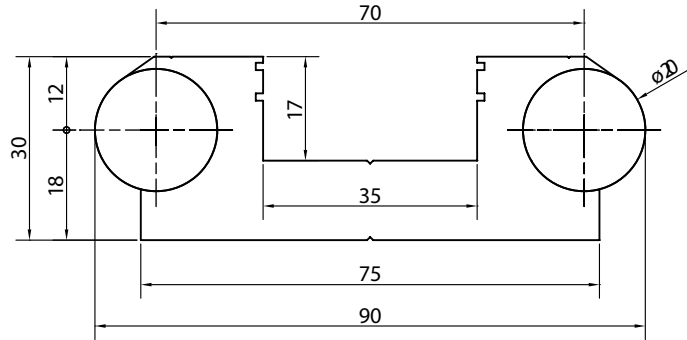
**Guide D20**

Type	Components		Load				
	Trolley	Wheels	Fa (N)	Fr (N)	Mx (Nm)	My (Nm)	Mz (Nm)
AV 312	M312	C312 + E312	3200	3200	139,2	144	144
AV 316	M316	C316 + E316	6400	7000	278,4	288	315
AV 416	M416	C416 + E416	6400	7000	278,4	320	350
AV 416 R	M416	C416R + E416R	17200	8600	748,2	860	430
AV 420	M420	C420 + E420	20000	15700	870	1000	785

### V10



### V20



Guide		LX( cm <sup>4</sup> )	LY( cm <sup>4</sup> )
V10	3,08	33,03	2,63
V20	8,20	134,61	12,88

The AV system differs from the AD system in the way in which the steel bars are anchored, and the dimension of the slot O x P. The development of a special profile has made it possible to eliminate the anchoring screws and the steel bars are secured by rolling. The bars are anchored correctly through deforming the top part of the profile and following certain procedures. In the V20 guide, a special bi-component adhesive is also used which ensures that the steel bars are held securely under heavy loads. Running along the middle for the entire length is a slim ruler indicating where holes must be made for fastening the bars to the frame. Guides are supplied cut to the requested size, up to 6,000 mm in length. The AV system is not expandable. The system comes complete with trolleys concentric and eccentric wheels. Assembly is left to the purchaser so that he can perform any necessary additional machining.

## HOW TO ORDER THE "AV" SYSTEM

### WHOLE SYSTEM

System	Type	Lenght
AV	312	L=

Guidet+rolley + Wheels

### COMPONENTS

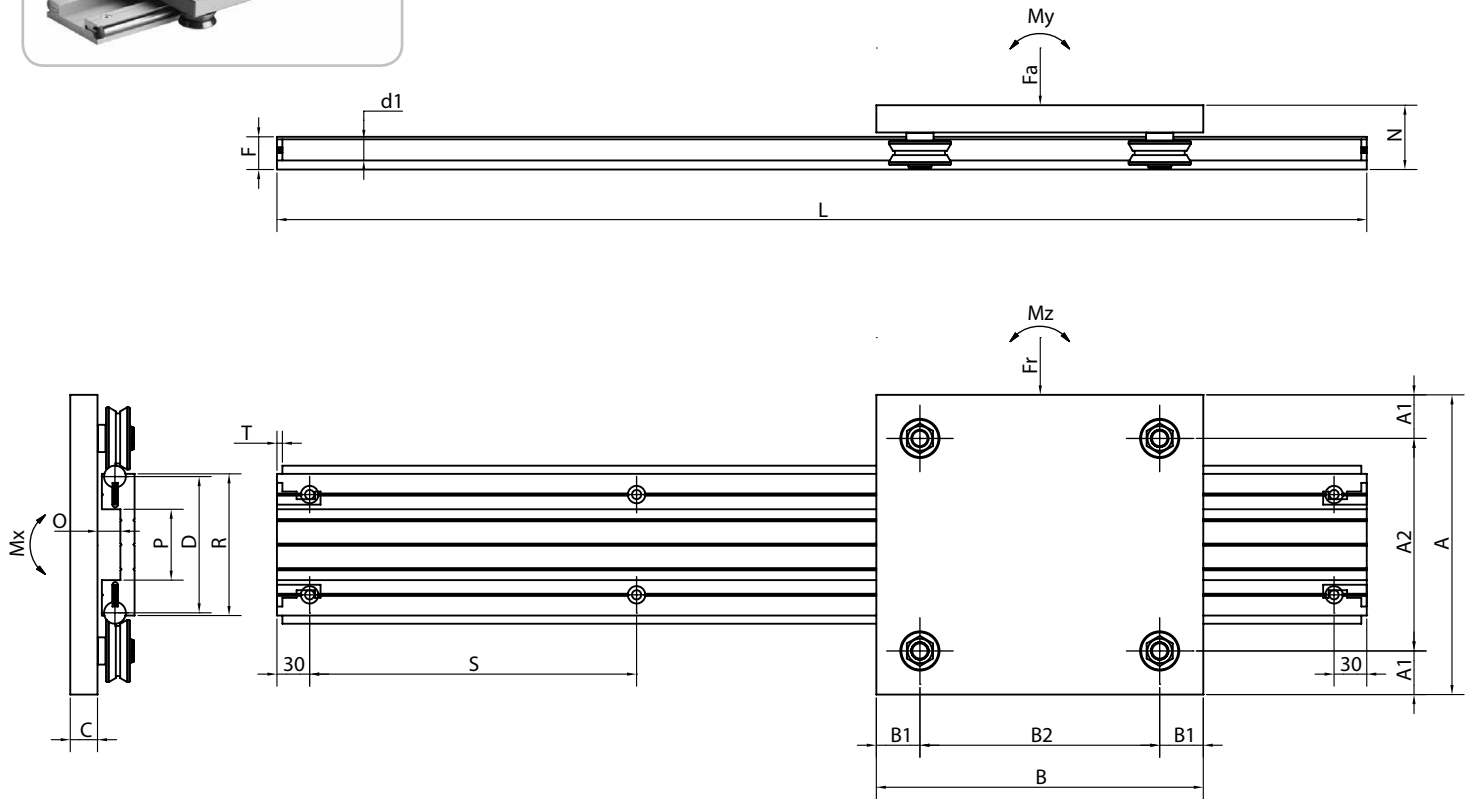
Guide	Type	Lenght
V	20	L=

Trolley	Material
M312	AL

Wheel
C312 - E312

1)al = aluminum  
ac= steel

**AG SYSTEM**



Type	A	A1	A2	B	B1	B2	C	D	F	L/max	d1	N	P	O	R	S	T
AG 416																	
AG 416 R	275	40	195	300	40	220	25	125	30	6000	20	61,5	65	17	130	300	5
AG 420																	

**Guide G20**

Type	COMPONENTS			LOAD				
	Trolley	Wheels		Fa (N)	Fr (N)	Mx (Nm)	My (Nm)	Mz (Nm)
AG 416	M416 275x300	C416 + E416		6400	7000	454,4	704	770
AG 416 R	M416 275x300	C416R + E416R		17200	8600	1221,2	1892	946
AG 420	M420 275x300 C	C420 + E420		20000	15700	1420	2200	1727





## WHEELS SERIES AD-AG-AS-AV

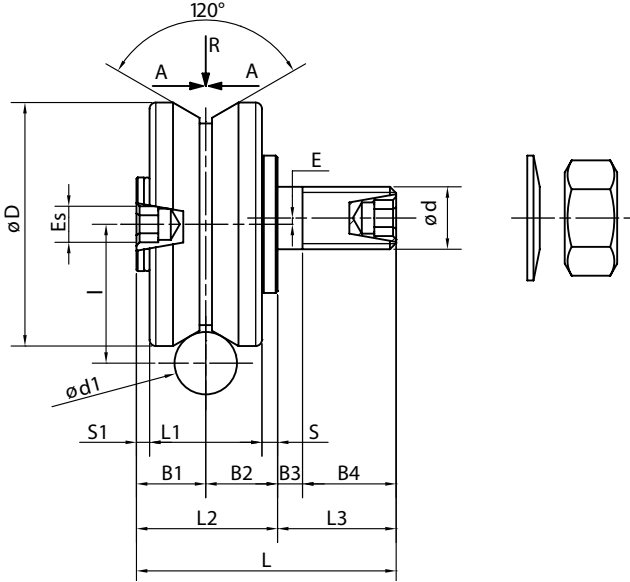


FIG.1

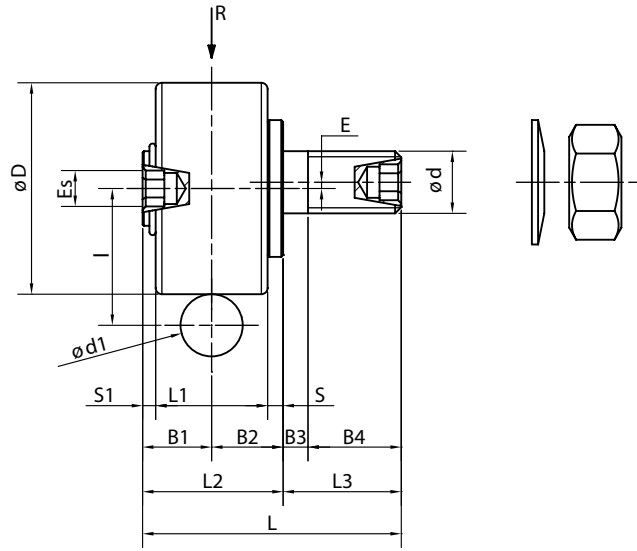


FIG.2

### GROOVED WHEELS FIG.1

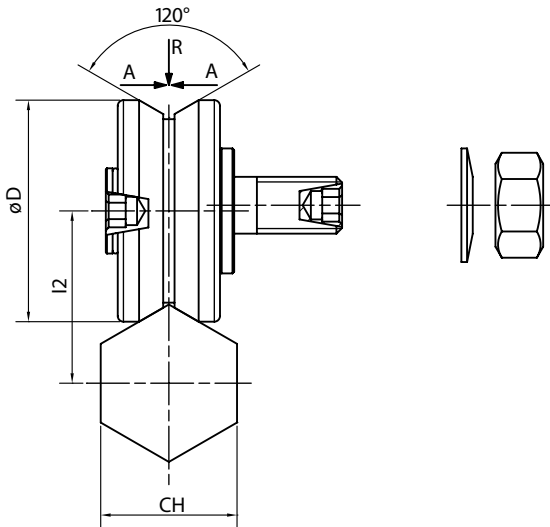
Type	Guide	Dimensions																Loads				
		D	d	d1	d1	L1	L2	L3	L	B1	B2	B3	B4	E	Es	I	S	S1	A(N)	R(N)	Weight	Tightening torque
C106	S10/D10	22	M6	10	10-14	11	14,5	9,5	24	6,5	8	2,5	7	1	2,5	14,5	2,5	1	300	300	30	8
E106	V10																					
C208	S10/D10	30	M8	10	6-17	14	18	14	32	9	9	4,5	9,5	1	3	18	2	2	400	1000	65	15-18
E208	V10																					
C208 R	S10/D10	30	M10	10	6-17	14	18	19	37	9	9	4	15	1	5	18	2	2	600	1300	75	25-30
E208 R	V10																					
C210	S10/D10	39	M10	10	6-18	18	22,5	19	41,5	11	11,5	4	15	1	5	22	2,5	2	600	1300	150	25-30
E210	V10																					
C312	S20/D20	40	M12	20	6-22	18	24	19	43	11	13	4	15	1,5	5	28	4	2	800	1600	165	30-35
E312	V20/G20																					
C316	S20/D20	40	M16	20	6-22	18	30	24	54	11	19	10	14	1,5	8	28	10	2	1600	3500	210	80-100
E316	V20/G20																					
C416	S20/D20	57	M16	20	10-30	22	33,5	24	57,5	14,5	19	10	14	1,5	8	35	8	3,5	1600	3500	415	80-100
E416	V20/G20																					
C416 R	S20/D20	58	M16	20	14-34	25	31,5	24	55,5	12,5	19	10	14	1,5	8	35	6,5	-	4300	4300	430	80-100
E416 R	V20/G20																					
C420	S20/D20	57	M20	20	10-30	22	33,5	24	57,5	14,5	19	10	14	1,5	8	35	8	3,5	5000	7850	490	80-100
E420	V20/G20																					

### CYLINDRICAL WHEELS FIG.2

Type	Guide	Dimensions																Loads				
		D	d	d1	L1	L2	L3	L	B1	B2	B3	B4	E	Es	I	S	S1	A(N)	R(N)	Weight	Tightening torque	
CC210	S10/D10	34	M10	10	10-14	22,5	19	41,5	11	11,5	4	15	1	5	22	2,5	2	-	1300	150	150	25-30
EC210	V10																					
CC312	S20/D20	36	M12	20	6-17	24	19	43	11	13	4	15	1,5	5	28	4	2	-	1600	190	190	30-35
EC312	V20/G20																					
CC316	S20/D20	36	M16	20	6-17	30	24	54	11	13	10	14	1,5	8	28	10	2	-	3500	240	240	80-100
EC316	V20/G20																					
CC416	S20/D20	50	M16	20	6-18	33,5	24	57,5	14,5	13	10	14	1,5	8	35	8	3,5	-	3500	480	480	80-100
EC416	V20/G20																					
CC420	S20/D20	50	M20	20	6-22	33,5	24	57,5	14,5	19	10	14	1,5	8	35	8	3,5	-	7850	530	530	80-100
EC420	V20/G20																					

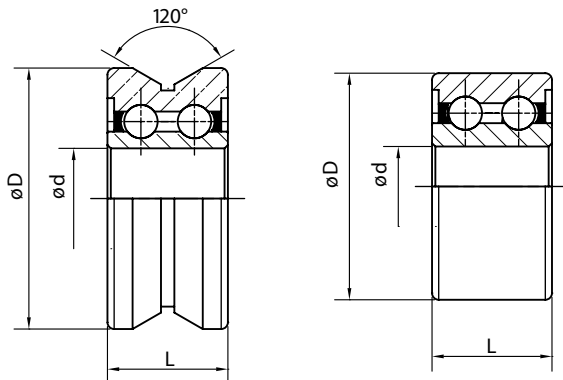
\*Maximum torque for tightening the nut

## WHEELS ON HEXAGONAL BAR



Type	Dimensions					Loads		Weight
	D	12	CH	CH <sub>min</sub>	CH <sub>max</sub>	A(N)	R(N)	
C208 E208	30	23,3	19	-	-	400	1000	65
C208R E208R	30	23,3	19	-	-	600	1300	75
C210 E210	39	30,3	24	-	-	600	1300	150
C312 E312	40	30,3	24	-	-	800	1600	165
C316 E316	40	33,8	30	24	36	1600	3500	210
C416 E416	57	41	30	-	36	1600	3500	415
C420 E420	57	41	30	-	36	5000	7850	490

## WHEELS WITHOUT BOLT



Type	Dimensions			Loads		Weight
	D	d	L	C(N)	Co(N)	
C106 SP	22	7	11	3400	1200	20
C208 SP	30	10	14	6400	2700	45
C210 SP	39	15	18	11500	7500	95
C312 SP	40	15	18	11500	7500	100
C416 SP	57	20	22	18000	10000	255

### Cylindrical Wheels

CC210 SP	34	12	18	11500	7500	80
CC312 SP	36	15	18	11500	7500	90
CC416 SP	50	20	22	18000	10000	220

Our systems run on grooved wheels with an idler pin. Each wheel size is produced with a concentric and eccentric pin.

Concentric wheels enable to achieve parallelism between the trolley and guide, whilst eccentric ones eliminate play and the system can be preloaded to achieve smoother or more rigid sliding depending on application demands.

The 120° groove on the outer race ensures that the load is distributed over the two points of the guide at all times meaning each trolley slides smoothly along its guide. The pin features a recessed hex at both ends so that the preload can be adjusted from whichever side is most convenient.

All the wheels are available: ZZ with dust covers, 2RS watertight and 2RS stainless steel.

The but and Belleville washer are supplied as standard issue. The latter, apart from acting as a washer, also prevents unscrewing.

For improved unscrewing protection, the regular nut can be replaced with a locknut.

## WHEELS SERIES CI -AV6

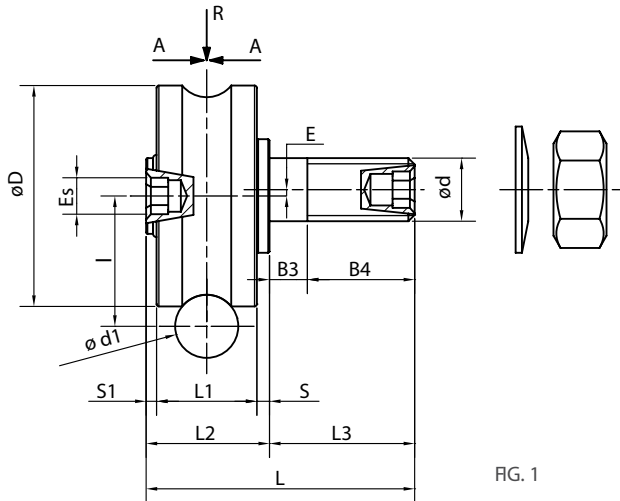


FIG. 1

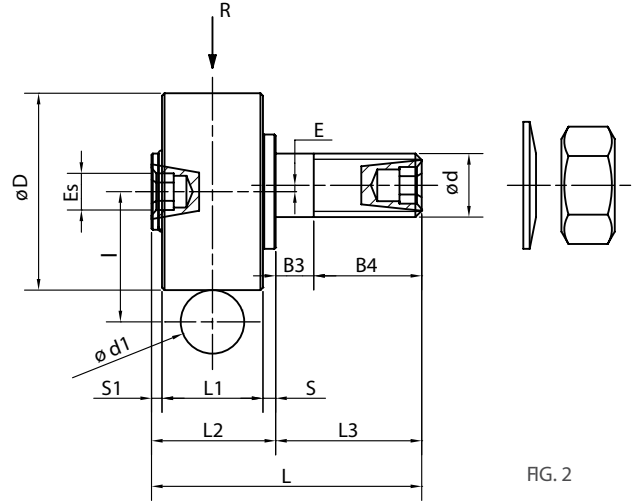


FIG. 2

### WHEELS WITH ARC FIG.1

type	Guide	DIMENSIONS														LOADS		Weight(g)	Tightening torque (Nm)
		D	d	d1	L1	L2	L3	L	B3	B4	E	Es	I	S	S1	A(n)	R (n)		
C5/17 E5/17	Cl32 V6	17	M5	6	8	12	10,5	22,5	4	6,5	1	2,5	10,5	3	1	106	510	15	6,5
C8/24 E8/24	Cl42 V6	24	M8	6	11	14	13	27	6	7	1	3	14	2	1	170	870	40	15-18
C10/35 E10/35	Cl65	35	M10	10	16	20,2	23	43,2	11	12	1	5	20,65	2	2,2	400	2000	115	25-30

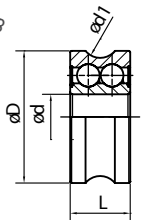
\*Maximum torque for tightening the nut

### CYLINDRICAL WHEELS FIG.2

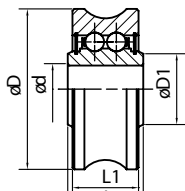
type	Guide	DIMENSIONS														LOADS		Weight(g)	Tightening torque (Nm)
		D	d	d1	L1	L2	L3	L	B3	B4	E	Es	I	S	S1	A(N)	R (N)		
CC5/17 EC5/17	Cl32 V6	15	M5	6	8	12	10,5	22,5	4	6,5	1	2,5	10,5	3	1	---	510	15	6,5
CC8/24 EC 8/24	Cl42 V6	22	M8	6	11	14	13	27	6	7	1	3	14	2	1	---	870	40	15-18
CC10/35 EC10/35	Cl65	31	M10	10	16	20,2	23	43,2	11	12	1	5	20,65	2	2,2	---	2000	115	25-30

### WHEELS WITHOUT BOLT

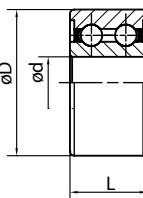
C8/24 P  
C10/35 P



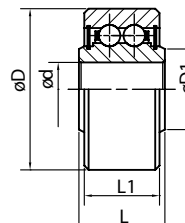
C5/17 P



C8/24 P  
C10/35 P



C5/17 P

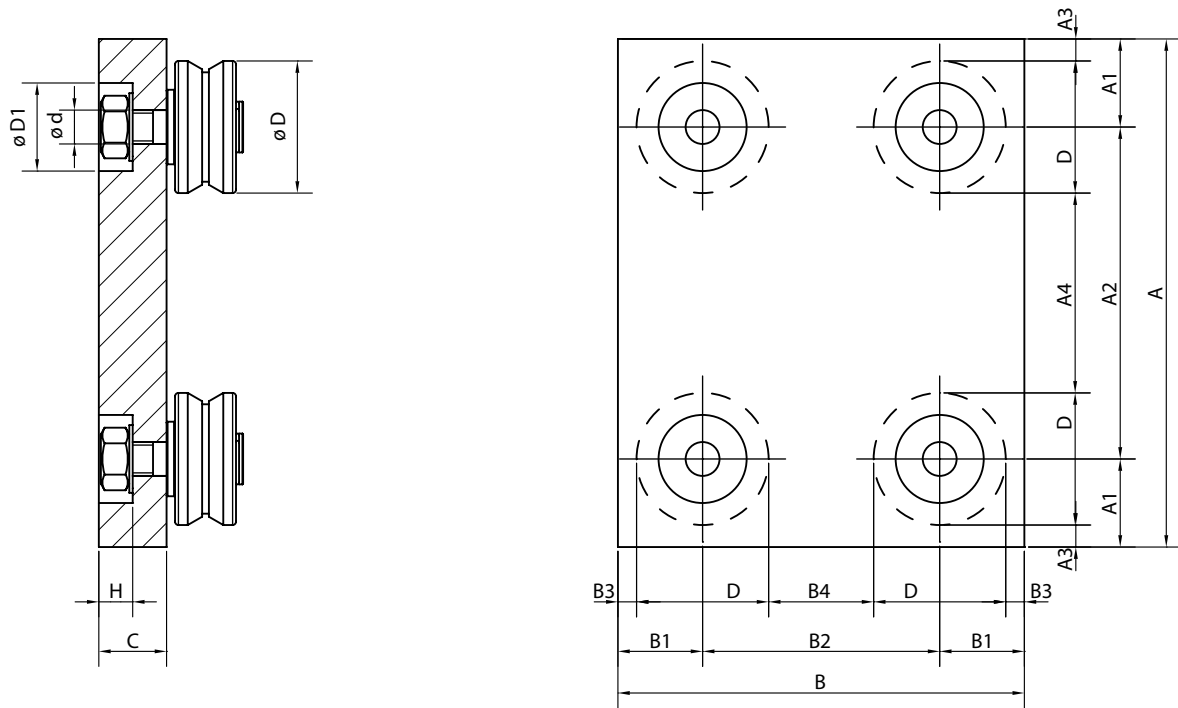


#### WHEELS WITH ARC

type	DIMENSIONS						LOADS		Weight (g)
	D	D1	d	L	L1	d1	C (N)	Co(N)	
C5/17 S P	17	7,5	5	8	7	6	1270	890	8
C8/24 S P	24	-	8	11	-	6	3670	2280	25
C10/35 S P	35	-	12	16	-	10	8500	5100	70

#### CYLINDRICAL WHEELS

type	DIMENSIONS						LOADS		Weight (g)
	D	D1	d	L	L1	d1	C (N)	Co(N)	
CC5/17 S P	15	7,5	5	8	7	-	1270	890	8
CC8/24 S P	22	-	8	11	-	-	3670	2280	25
CC10/35 S P	31	-	12	16	-	-	8500	5100	70

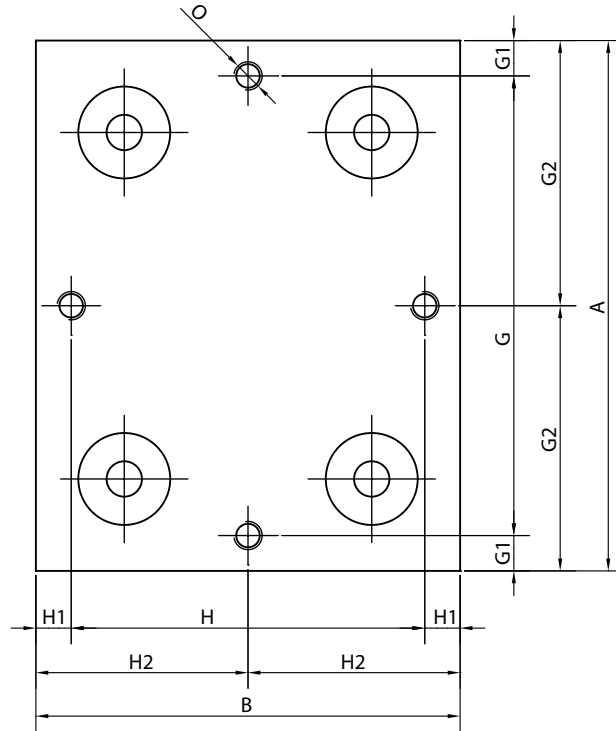
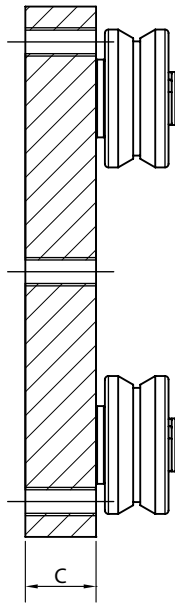


type	DIMENSIONS															WEIGHT (KG)	
	A	A1	A2	A3*	A4*	B	B1	B2	B3*	B4* C	d H10	D	D1 H	Ac	Al		
M106	120	18,5	83	7,5	61	80	19,5	41	8,5	19	10	6	22	16	6	0,7	0,25
M208	140	25	90	10	60	120	25	70	10	40	15	8	30	20	8	1,9	0,6
M208R	140	25	90	10	60	120	25	70	10	40	20	10	30	26	10	2,2	0,7
M210	150	26	98	6,5	59	120	25	70	5,5	31	20	10	39	26	10	2,5	0,9
M312	180	27	126	7	86	150	30	90	10,5	49	20	12	40	30	12	3,8	1,3
M316	180	27	126	7	86	150	30	90	10,5	49	25	16	40	36	12	4,8	1,6
M416	200	30	140	1,5	83	180	40	100	11,5	43	25	16	57	36	12	7	2,6
M420	200	30	140	1,5	83	180	40	100	11,5	43	25	20	57	44	12	7	2,6
M416 275x300	275	40	195	11,5	138	300	40	220	11,5	163	25	16	57	36	12	15,7	5,4
M420 275x300	275	40	195	11,5	138	300	40	220	11,5	163	25	20	57	44	12	15,7	5,4

MINIMUM DIMENSIONS FOR SPECIAL TROLLEYS																	
M106	107	12	83	1	61	51	12	27	1	5	10	6	22	16	6	-	-
M208	122	16	90	1	60	67	16	35	1	5	15	8	30	20	8	-	-
M208R	122	16	90	1	60	67	16	35	1	5	20	10	30	26	10	-	-
M210	138	20	98	1	60	77	17,5	40	1	5	20	10	39	26	10	-	-
M312	164	22	126	1	86	91	22	47	1	5	20	12	40	30	12	-	-
M316	164	22	126	1	86	91	22	47	1	5	25	16	40	36	12	-	-
M416	200	30	140	1	83	123	30	63	1	5	25	16	57	36	12	-	-
M420	200	30	140	1	83	123	30	63	1	5	25	20	57	44	12	-	-

\* Values given as an approximate guide and varying depending on eccentric adjustment

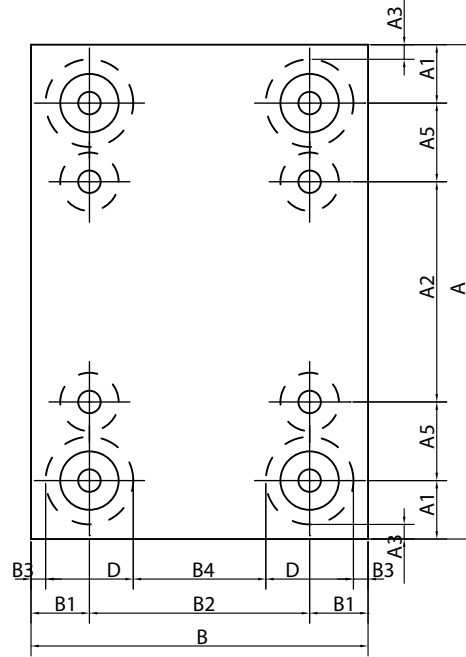
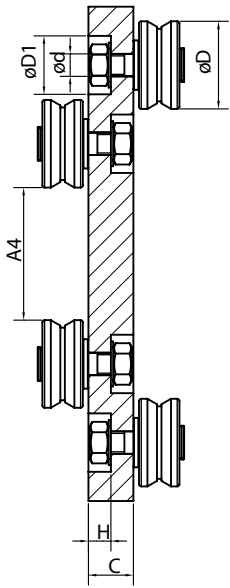
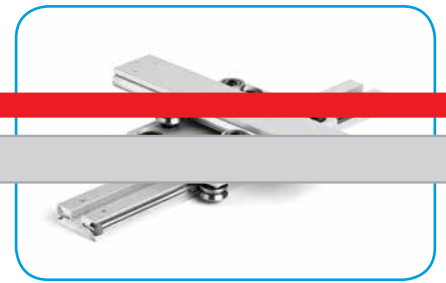
## TROLLEYS WITH HOLES SERIE AD-AV



type	Dimensions										Weight (KG)	
	A	B	C	G	G1	G2	H	H1	H2	O	Ac	Al
MF106	120	80	10	100	10	60	60	10	40	M6	0,7	0,25
MF208	140	120	15	120	10	70	100	10	60	M8	1,9	0,6
MF208R	140	120	20	120	10	70	100	10	60	M8	2,2	0,7
MF210	150	120	20	130	10	75	100	10	60	M8	2,5	0,9
MF312	180	150	20	160	10	90	130	10	75	M8	3,8	1,3
MF316	180	150	25	160	10	90	130	10	75	M8	4,8	1,8
MF416	200	180	25	180	10	100	160	10	90	M8	7	2,6
MF420	200	180	25	180	10	100	160	10	90	M8	7	2,6

The trolleys, always in stock, are suited to most applications. If a trolley has to be manufactured specially, we can build one per customer specifications or if the customer wants to build it himself, we can supply just the guide and wheels. To make the designer's job easier when it comes to calculations, the table given features the minimum possible dimensions. Trolley stability can be further improved by increasing value B2 accordingly.

With a view to tailoring solutions to reflect customer needs as closely as possible at all times, we saw fit to supply the same type of trolleys with holes bored into them ready for fitting any counterplates. Furthermore, special holes and machining can also be performed per your specifications.



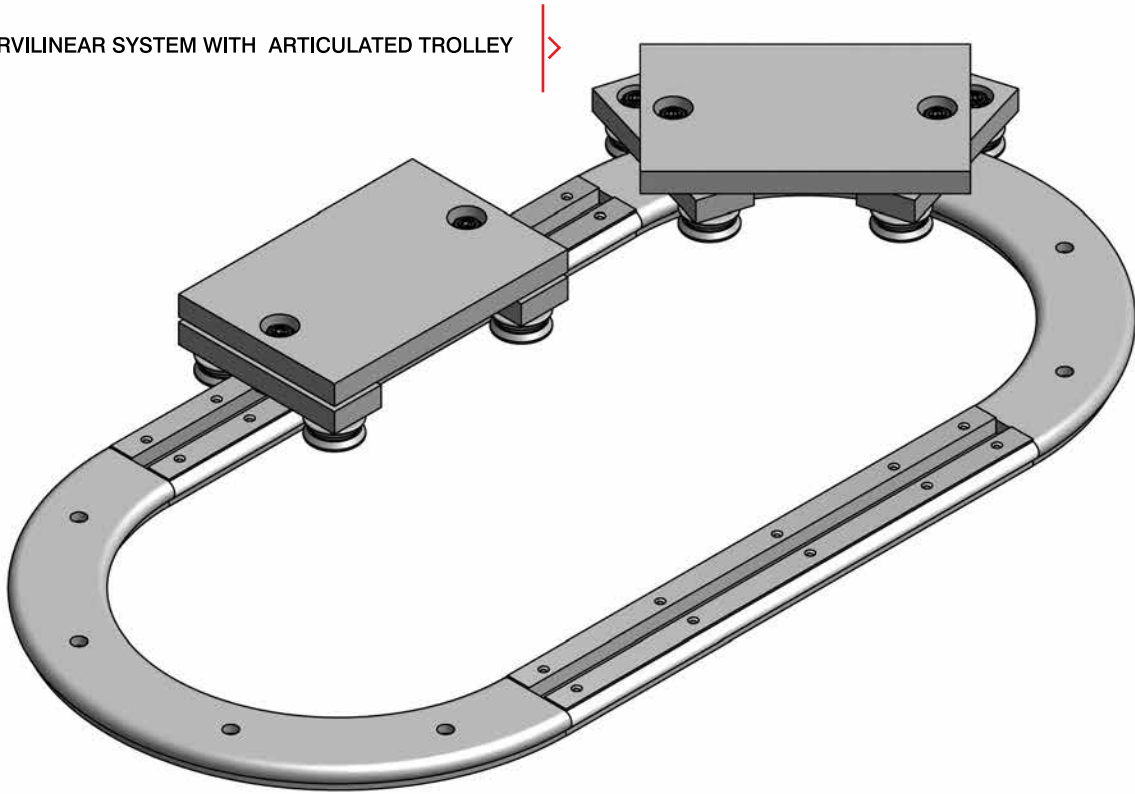
type	Dimensions																Weight (KG)	
	A	A1	A2	A3*	A4*	A5	B	B1	B2	B3*	B4*	C	d H10	D	D1	H	Ac	Al
MC106	165	18,5	83	7,5	61	22,5	120	18,5	83	8,5	61	10	6	22	16	6	1,4	0,5
MC 208	200	25	90	10	60	30	140	25	90	10	60	15	8	30	20	8	3,2	1
MC208R	200	25	90	10	60	30	140	25	90	10	60	20	10	30	26	10	4	1,4
MC210	220	25	98	5,5	59	36	150	26	98	6,5	59	20	10	39	26	10	4,6	1,7
MC312	250	22	126	2	86	40	180	27	126	7	86	20	12	40	30	12	6,3	2,2
MC316	250	22	126	2	86	40	180	27	126	7	86	25	16	40	36	12	7,9	2,8
MC416	320	40	140	11,5	83	50	200	30	140	1,5	83	25	16	57	36	12	12,5	4,6
MC420	320	40	140	11,5	83	50	200	30	140	1,5	83	25	20	57	44	12	12,5	4,6

\*Values given as an approximate guide and varying depending on eccentric adjustment

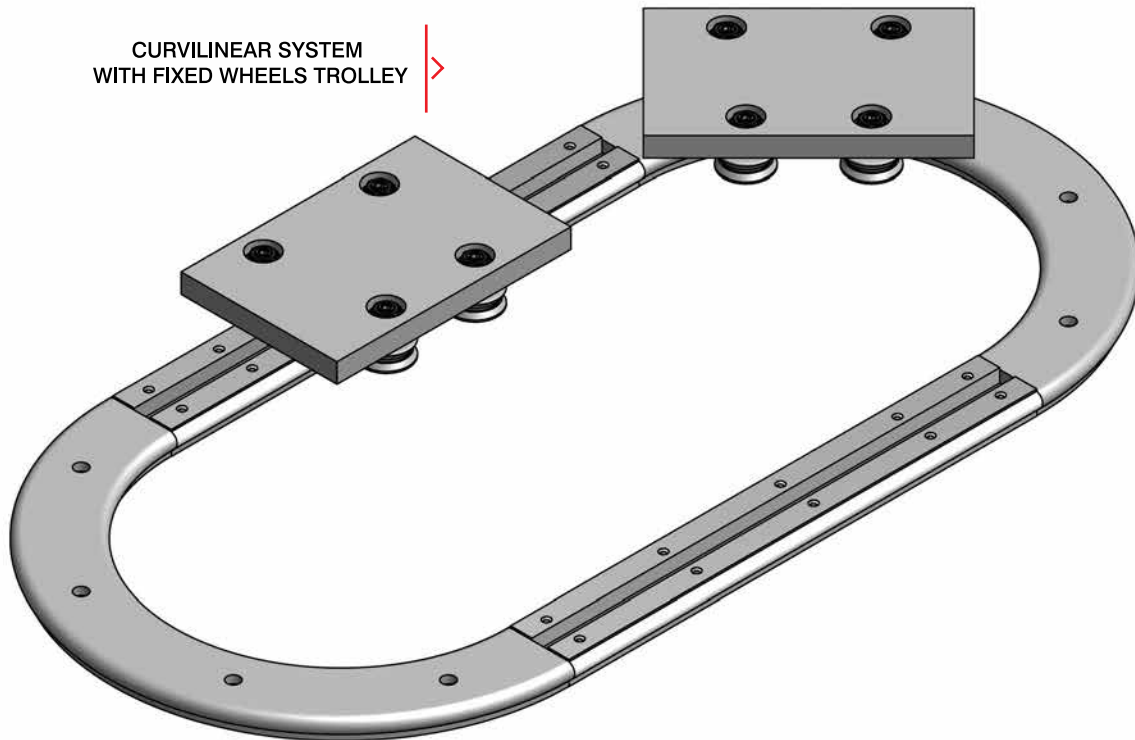
Cross trolleys enable loads to be moved along two axes using only standard components. As with the other trolleys, we can build special cross versions per customer specifications for assembly on reduction units, pneumatic cylinders, trapezoid screws etc..

**CURVILINEAR SYSTEM**

CURVILINEAR SYSTEM WITH ARTICULATED TROLLEY



CURVILINEAR SYSTEM WITH FIXED WHEELS TROLLEY



Our guides can also be used to produce curvilinear stretches or closed loops.

Sliding is achieved with special trolleys produced with the wheel axle converging in so that the wheels run freely on both straight stretches and around bends. An added bonus is its rather small size, whilst costs are not excessive.

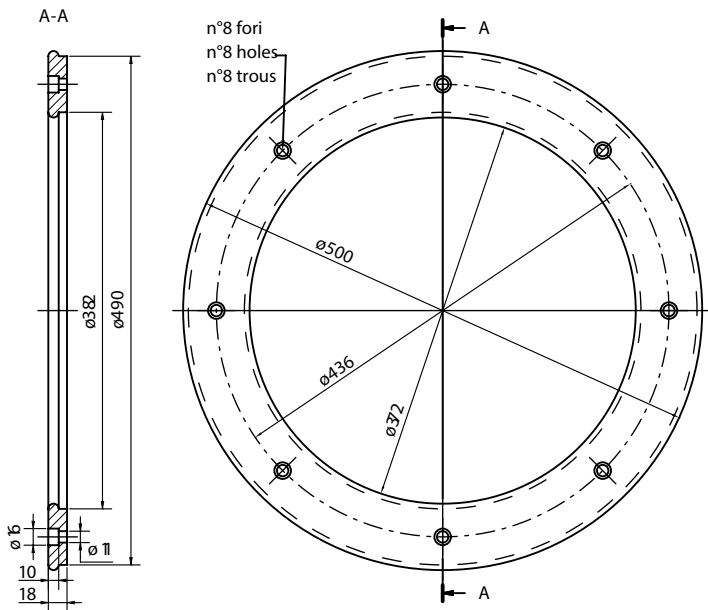
Since there is end play when passing from straight stretches to bends, the use of these trolleys is recommended where good precision is required when moving along the straight axis and when the curved part is only used to change direction. Should the application call for good precision along straight stretches and smooth sliding around the bend with a smaller amount of end play, articulated trolleys must be used. Dimensions are greater and costs slightly higher than a trolley with fixed wheels.

In addition, there are greater limitations on loads since the two central pins which act as the articulated joint have to bear the whole weight. Nonetheless, this all works in the favour of stability when passing from straight stretches to bends. Double bends are also possible using this kind of trolley.

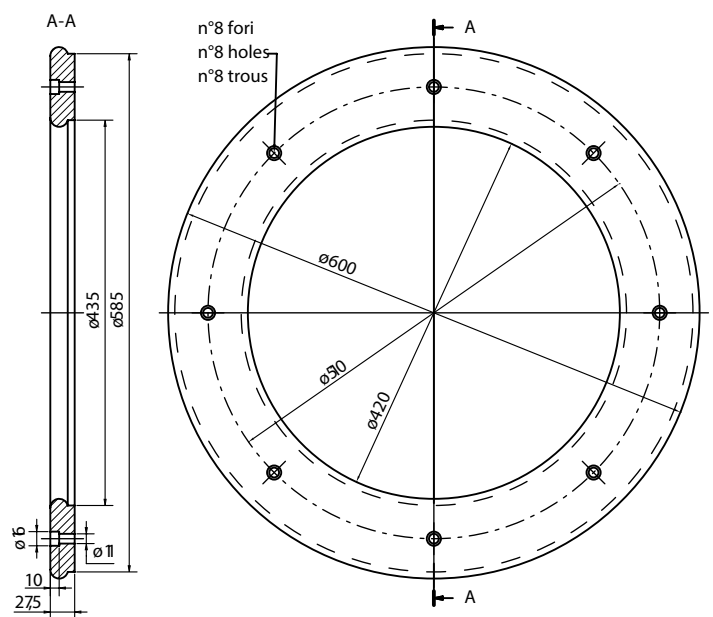
The coupling between the straight guide and the curved guide is achieved by setting the two end to end, both of which come supplied cut at a right angle. It is up to the customer, during machine assembly, to ensure movement is uninterrupted by aligning the two lengths properly.

The curved guide can be supplied as a complete 360° loop; in two 180° parts to create an oval circuit; or in four 90° parts to create a rectangular or square circuit.

D10-Ø500



D20-Ø600





## MOTORIZABLE GUIDES : HOW TO ORDER

### BELT GUIDES

Page	System	Type		ø drive head bore	Lenght
29 - 31	AK	208 R		/14	L=
32 - 34 - 38	AD/AV/AG	312	M	/18	L=
36 - 39	AD/AG	416	M LAT	/25	L=
46 - 51	AL	6060		/12	L=

### RACK GUIDES

Page	System	Type		ø drive head bore	Lenght
40	AG	416	CR	/18	L=

### SCREW GUIDES

Page	System	Type		Screw type	Lenght
41	NL	208		TR	L=
	H	20W		RC 2005	L=



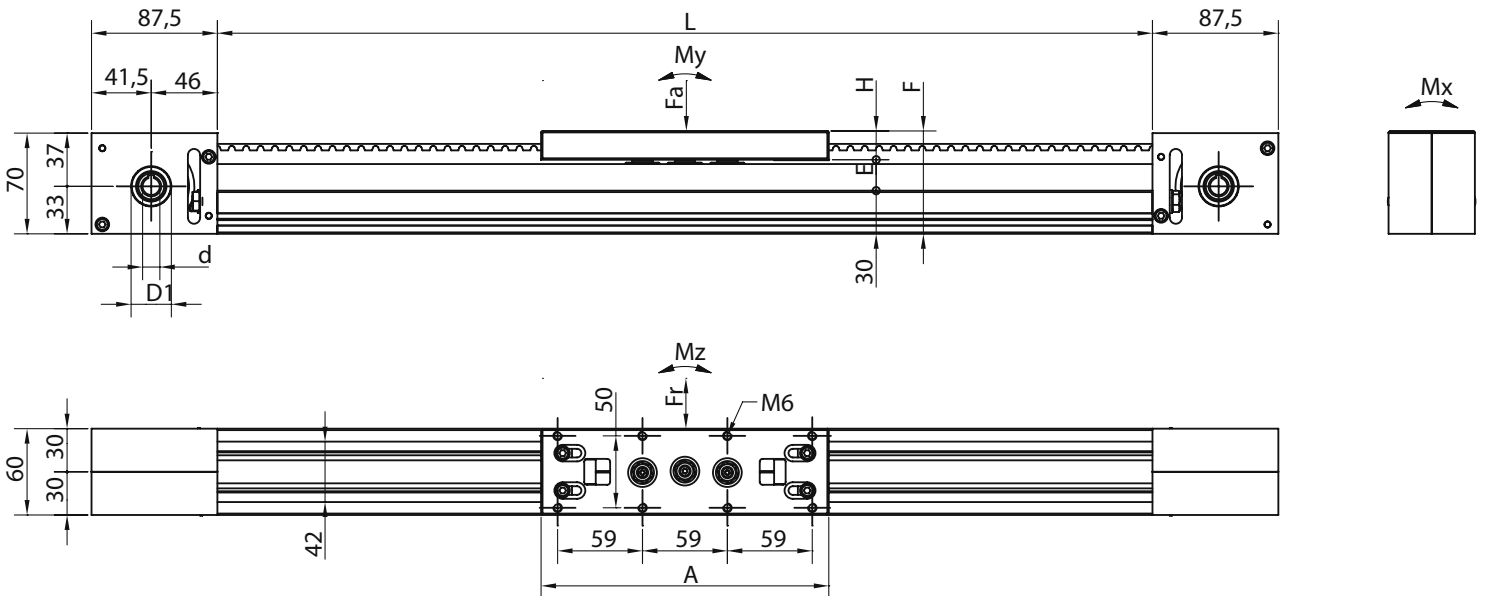
Version with guide and trolley with wheels type CI 42 (pag.8-9). Extremely compact and suitable for light load centered on the trolley.  
Also available in stainless steel



Version with guide and trolley with wheels type CI 42 (pag.8-9). Extremely compact and suitable for light load centered on the trolley.  
Also available in stainless steel



Version with recirculating ball guide. Extremely compact and suitable to the mounting of cantilevered loads due to its stiffness.  
It needs a steady lubrication

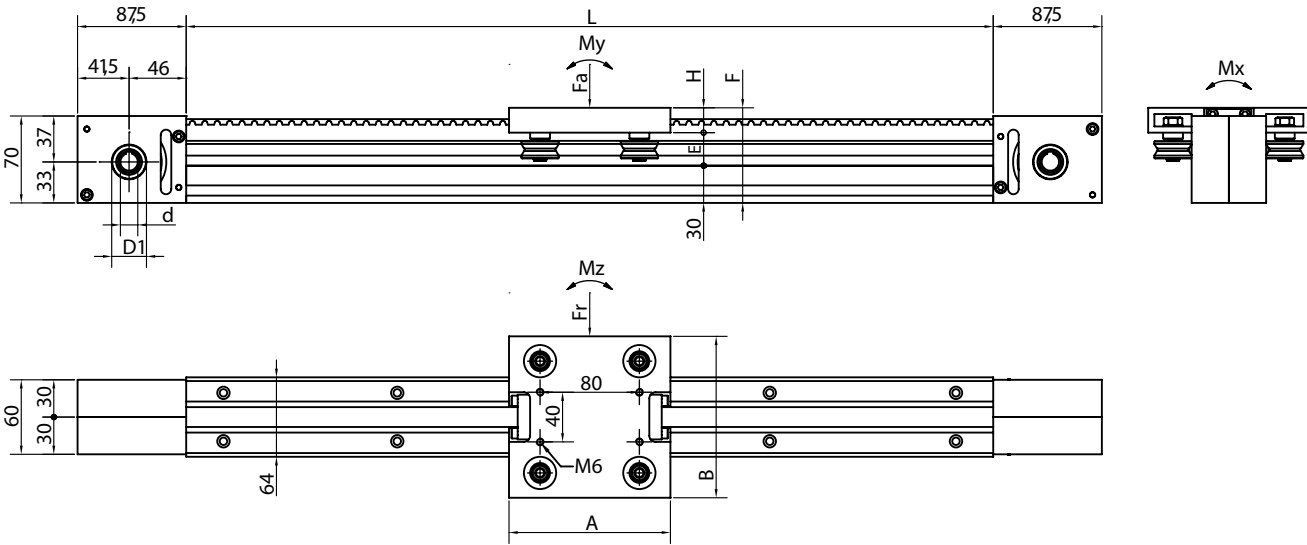


Type	A	D1	E	H	F	d	Cinghia - Belt - Courroie AT 10/16		Trolley Loads					Longit. development	Pulley
							Tensile strenght	Ultimate strenght	Fa (N)	Fr* (N)	M x (Nm)	M y (Nm)	M z (Nm)		
AK42	200	28	21,5	20	71,5	Ø 12 Ø 14	2190 N	7480 N	510	1740	7,6	15	26	180 mm	Z=18 Ø =57,3mm

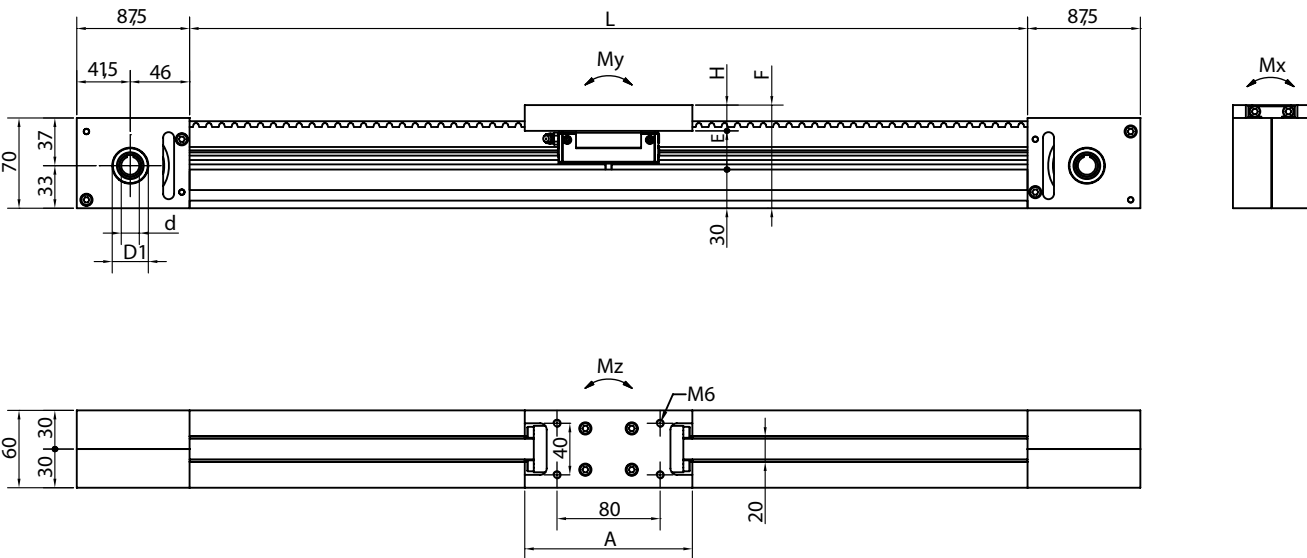
\*Radial load is applied only on the 2 concentric wheels

**MOTORISABLE GUIDES**

Order code :28



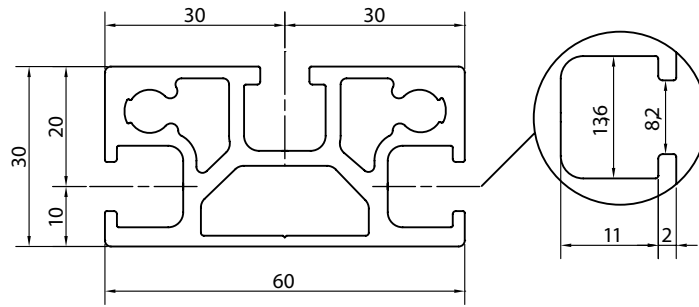
Type	A	D1	E	H	F	d <sub>H7</sub>	BELT 10/16		TROLLEY LOADS					Longit. development	Pulley	
							Tensile strenght	Ultimate strenght	Fa(N)	Fr(N)	Mx (Nm)	My (Nm)	Mz (Nm)			
AK208R	130	130	28	26,6	20	76,6	∅ 12 ∅ 14	2190 N	7480 N	1600	2000	74,4	84	91	180 mm	Z=18 ∅=57,3



Type	A	D1	E	H	F	d <sub>H7</sub>	BELT 10/16		Static load	TROLLEY		Longit. development	Pulley
							Tensile strenght	Ultimate strenght		Static moments	My-Mz (Nm)		
AKR20	130	28	30	20	80	Q12 Q14	2190 N	7480 N	1600 N	380 Nm	270 Nm	180mm	Z=18 ∅=57,3

**MOTORISABLE GUIDES**

SECTION AND CONNECTION

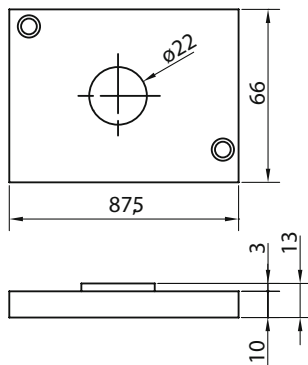


Type	Moment of inertia		Section modulus		Weight (kg/m)
	Lx (cm <sup>4</sup> )	Ly (cm <sup>4</sup> )	Wx (cm <sup>3</sup> )	Wy (cm <sup>3</sup> )	
30x60	7	24,8	2,33	5,51	1,83

The basic structure of the AK range of guides consists of an extruded anodised aluminium section, measuring 30x60 with Lmax 6 m

The two 'T' slots formed in the sides can be used to anchor the entire linear guide using special fixing brackets. The slots can also be used for plates with M5, M6 and M8 holes.

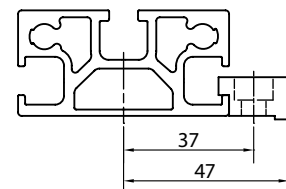
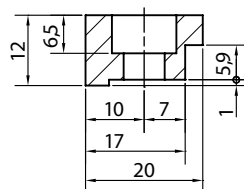
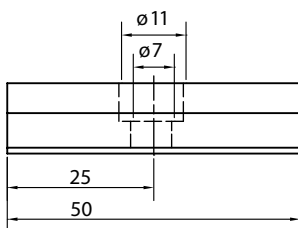
**GEARBOX FLANGE**

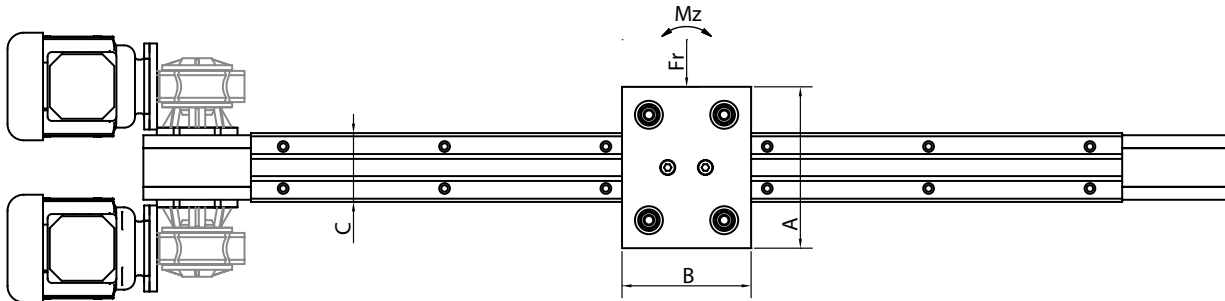
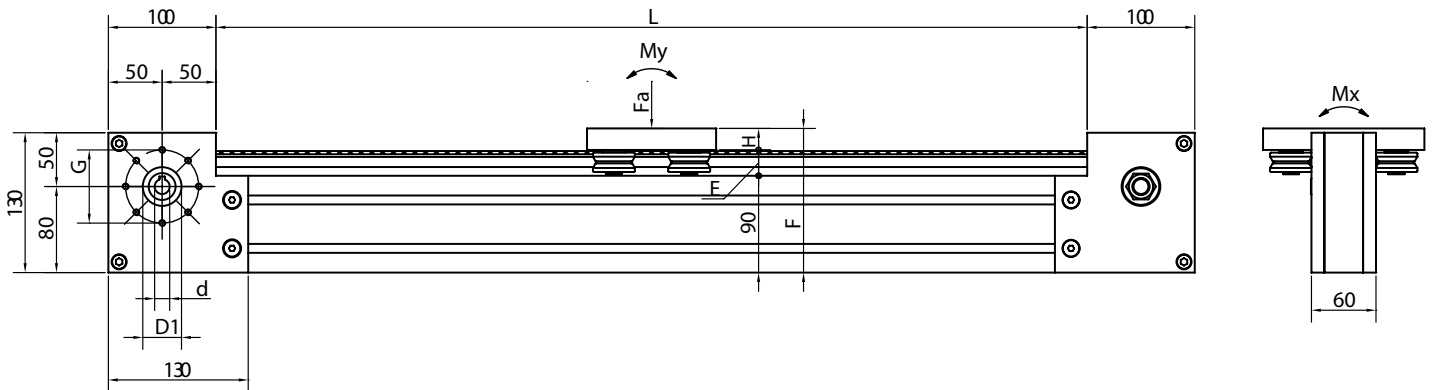
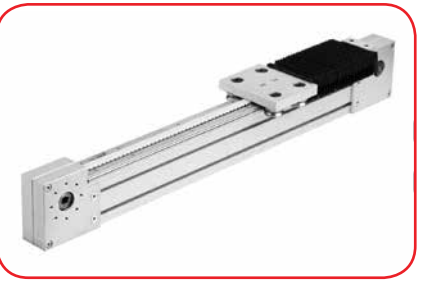


BRAND		
Bonfiglioli	VF30-F	MVF44-F
Motovario	NMRV30-FA	NMRV40-FA
Varvel	MRT28-F	MRT40-F
Tramec	XC30-F1	XC 40-F1

For any other brand or different size please contact technical offic.

**FIXING ELEMENTS**





Tipo type Modelo	a	B	c	E	H	F	supplied ready for Bonfiglioli reduction unit			
							d <sub>tr</sub>	d1	G	serie -type série
AD210M	150	120	64	24	20	134				
AD312M	180	150	90	31	20	141				
AD316M	180	150	90	36,5	25	151,5	ø14	36	8 M6 x ø68	MV30/F
AD416M	200	180	90	36,5	25	151,5	ø18	36	4 M6 x ø87	MV44/F
AD416RM	200	180	90	36,5	25	151,5	ø19	36	8 M6 x ø68	
AD420M	200	180	90	36,5	25	151,5				

BELT			TROLLEY						
Type	Type	Tensile strenght	Fa (N)	Fr (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Longit. development	pulley
AD210M	AT10/16	2190N	2400	2600	79,2	84	91	200 mm* Z=20 Ø=63,66 mm	
AD312M			3200	3200	139,2	144	144		
AD316M			6400	7000	278,4	288	315		
AD416M			6400	7000	278,4	320	350		
AD416RM			17200	8600	748,2	860	430		
AD420M			20000	15700	870	1000	785		

Tensioning range = 14 mm  
1 pulley revolution = 200 mm

With a series of standardised components, a motorizable guide can be produced as long as you want, up to 6 metres in a single piece, or even longer if lengths are joined together as illustrated on page 54. The driving head in anodised aluminium comes ready to accommodate a worm reduction unit with DC or AC motor.

Other types of reduction units (epicyclical, coaxial...) can also be used on either the right or left side using the same fittings, this time employing an adapting flange.

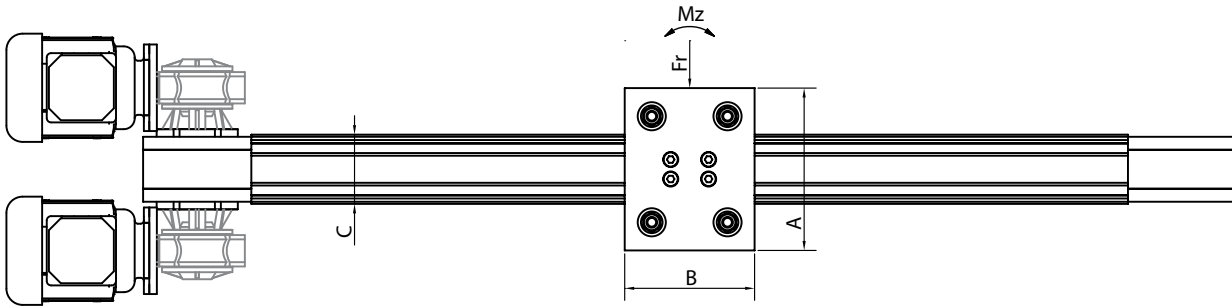
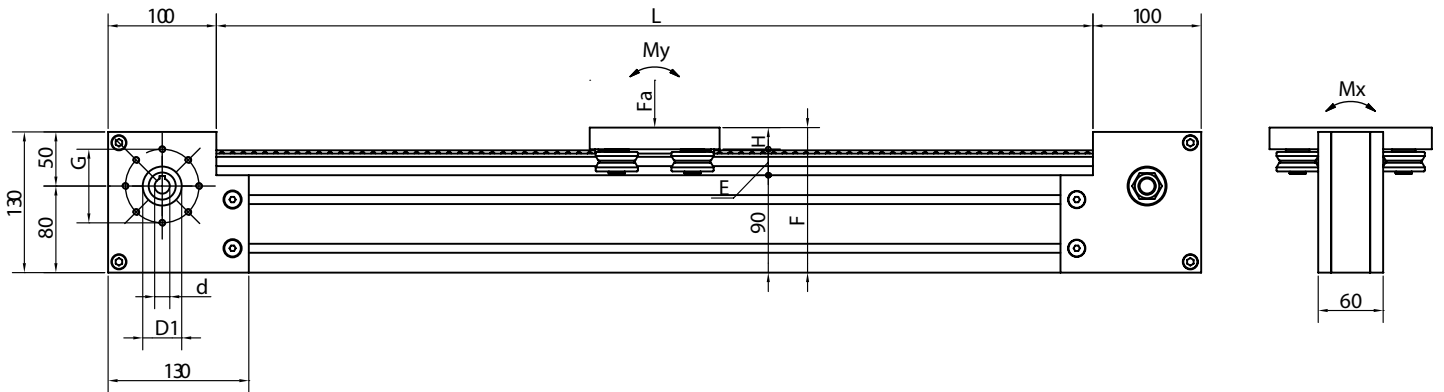
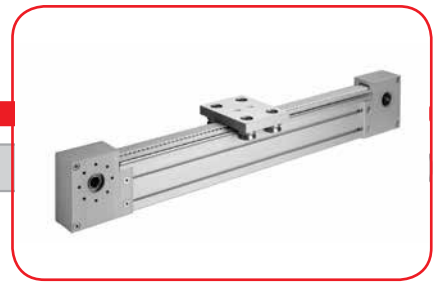
The driven head of the positive drive belt comes with a pulley rotating on an eccentric pin which can be used to tension the belt.

The positive drive belt AT10/16 has a metric pitch (10 mm) and features slim metal cords inside providing it with remarkable elongation strength.

The grooved support profile (45x90), apart from making the frame very sturdy, features a recess to accommodate the running belt, along with no less than five grooves that can be used for securing it to the frame on three sides, or for applying limit switches/stops, sensors etc..

The trolley, whether a standard model or customdesigned, comes with a steel bar with teeth at either end for fastening the two ends of the belt.

All aluminium components are anodised in a natural aluminium colour. Where the guides are liable to be subjected to oxidising agents stainless steel wheels can be mounted on standard hardened chromium-plated bars or bars and wheels both in stainless steel.



Type	A	B	C	E	H	F	applied ready for Bonfiglioli reduction unit			
							d <sub>H7</sub>	D1	G	type
AV210M	150	120	64	24	20	134				
AV312M	180	150	90	31	20	141	ø14	36	8 M6 x ø68	MV30/F
AV316M	180	150	90	36,5	25	151,5	ø18	36	4 M6 x ø87	MV44/F
AV416M	200	180	90	36,5	25	151,5	ø19	36	8 M6 x ø68	
AV416RM	200	180	90	36,5	25	151,5	ø25	44	4 M8 x ø90	MV49/F
AV420M	200	180	90	36,5	25	151,5				

Type	BELT			ROLLEY					Longit. development	pulley
	type	Tensile strength	Ultimate strength	Fa (N)	Fr (N)	Mx (Nm)	My (Nm)	Mz (Nm)		
AV210M				2400	2600	79,2	84	91		
AV312M				3200	3200	139,2	144	144		
AV316M				6400	7000	278,4	288	315		
AV416M	AT10/25	3660N	12450N	6400	7000	278,4	320	350	200 mm*	Z=20 Ø=63,66 mm
AV416RM				17200	8600	748,2	860	430		
AV420M				20000	15700	870	1000	785		

Tensioning range = 14mm  
 \* 1 pulley revolution = 200 mm

**WHEELS SERIES AD-AG-AS-AV**

With a series of standardised components, a motorizable guide can be produced as long as you want, up to 6 metres.

The AV... M system is fitted with the same components as the AD ...M system, but is not expandable.

Using AV... series guides instead of AD ... series guides makes it possible to fit a wider belt.

The driving head in anodised aluminium comes ready to accommodate a worm reduction unit with DC or AC motor.

Other types of reduction units (epicyclical, coaxial...) can also be used on either the right or left side using the same fittings, this time employing an adapting flange.

The driven head of the positive drive belt comes with a pulley rotating on an eccentric pin which can be used to tension the belt.

The positive drive belt AT10/25 has a metric pitch (10 mm) and features slim metal cords inside providing it with remarkable elongation strength.

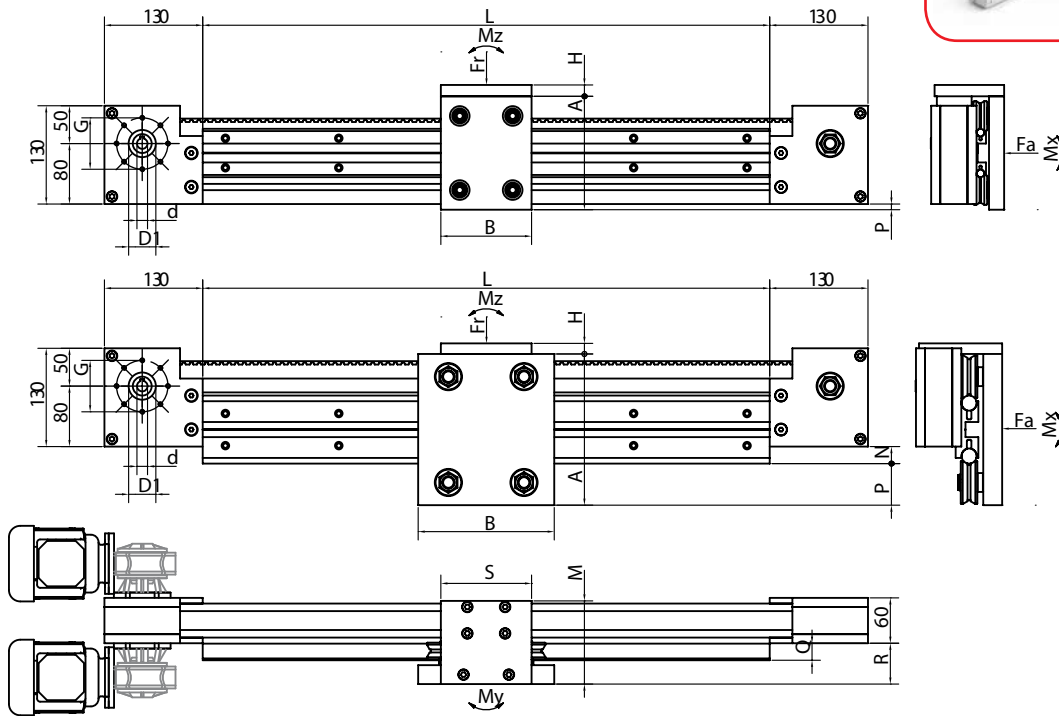
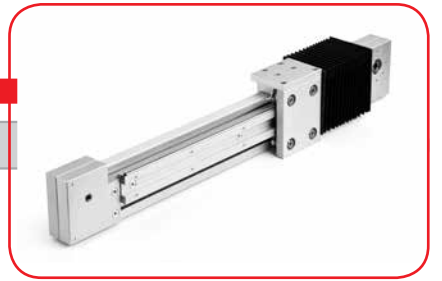
The grooved support profile (45x90), apart from making the frame very sturdy, features a recess to accommodate the running belt, along with no less than five grooves that can be used for securing it to the frame on three sides, or for applying limit switches/stops, sensors etc..

The trolley, whether a standard model or customdesigned, comes with a steel bar with teeth at either end for fastening the two ends of the belt.

All aluminium components are anodised in a natural aluminium colour. Where the guides are liable to be subjected to oxidising agents, nickel-plated, watertight wheels or stainless steel bars and wheels can be fitted on hardened chromium-plated bars.



**SIDE ASSEMBLY : AD...M LAT**

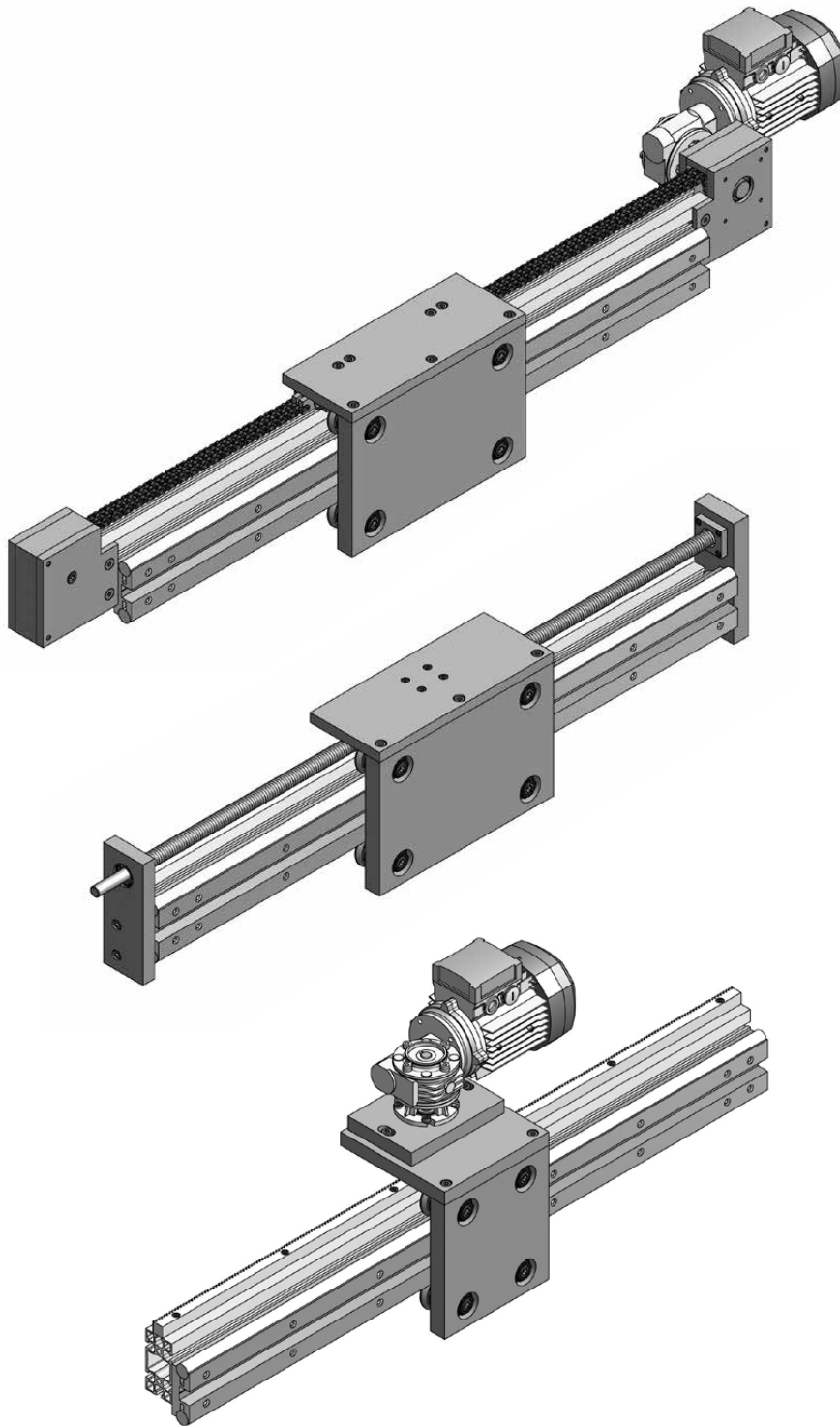


type	A	B	H	M	N	P	Q	R	S	Supplied ready for Bonfiglioli reduction unit			
										d <sub>H7</sub>	D1	G	type
AD210M LAT	150	120	15	92	-	7,5	12,5	36,5	120				
AD312M LAT	180	150	15	100	22,5	45	22,5	43,5	120				
AD316M LAT	180	150	15	110	22,5	45	22,5	54	120	ø14	36	8 M6 x ø68	MVF30/ F
AD416M LAT	200	180	14	110	22,5	55	22,5	54	120	ø18	36	4 M6 x ø87	MVF44/ F
AD416RM LAT	200	180	14	110	22,5	55	22,5	54	120	ø19	36	8 M6 x ø68	
AD420M LAT	200	180	14	110	22,5	55	22,5	54	120	ø25	44	4 M8 x ø90	MVF49/ F

type	BELT			TROLLEY					Longit. development	Pulley
	type	tensile strength	Ultimate strength	Fa (N)	Fr (N)	Mx (Nm)	My (Nm)	Mz (Nm)		
AD210M LAT				2400	2600	79,2	84	91		
AD312M LAT				3200	3200	139,2	144	144		
AD316M LAT				6400	7000	278,4	288	315		
AD416M LAT	AT10/25	3660N	12450N	6400	7000	278,4	320	350	200 mm*	Z=20 Ø=63,66 mm
AD416RM LAT				17200	8600	748,2	860	430		
AD420M LAT				20000	15700	870	1000	785		

Tensioning range=14mm  
 \*1 pulley revolution = 200 mm

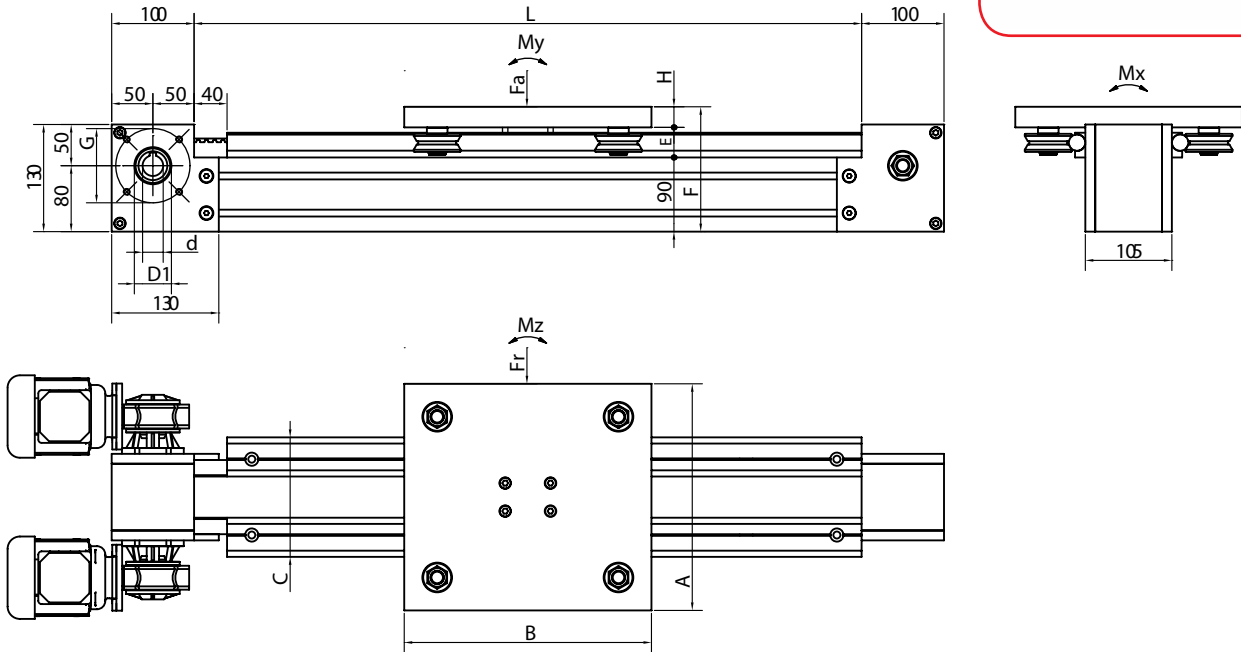
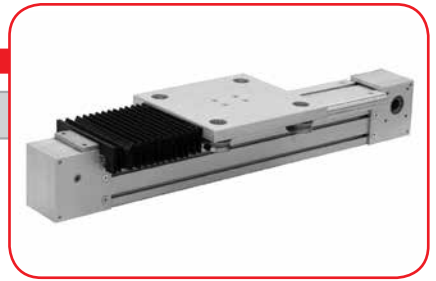
Unless otherwise specified by the customer, during the order phase, the driving head will be fitted on the left as illustrated.



Side fitting lends itself well to use with other drive systems such as chain, ball or trapezoidal screw and rack.  
The three drawings above show some applications.

**MOTORISABLE GUIDES**

Order code . 28



type	A	B	C	D1	E	H	F	Supplied ready for Bonfiglioli reduction unit		
AG416M								$d_{H7}$	G	type
AG416RM	275	300	145	44	36,5	25	151,5	$\phi 25$	4 M8 x $\phi 90$	MVF49/ F
AG420M										

Type	Type	Tensile strength	Ultimate strength	Fa (N)	Fr (N)	Mx (Nm)	My (Nm)	Mz (Nm)	Longit. development	Pulley
AG416M				6400	7000	454,4	704	770		
AG416RM	AT10/50	8050N	27400N	17200	8600	1221,2	1892	946	200 mm*	Z=20 $\phi=63,66$ mm
AG420M				20000	15700	1420	2200	1727		

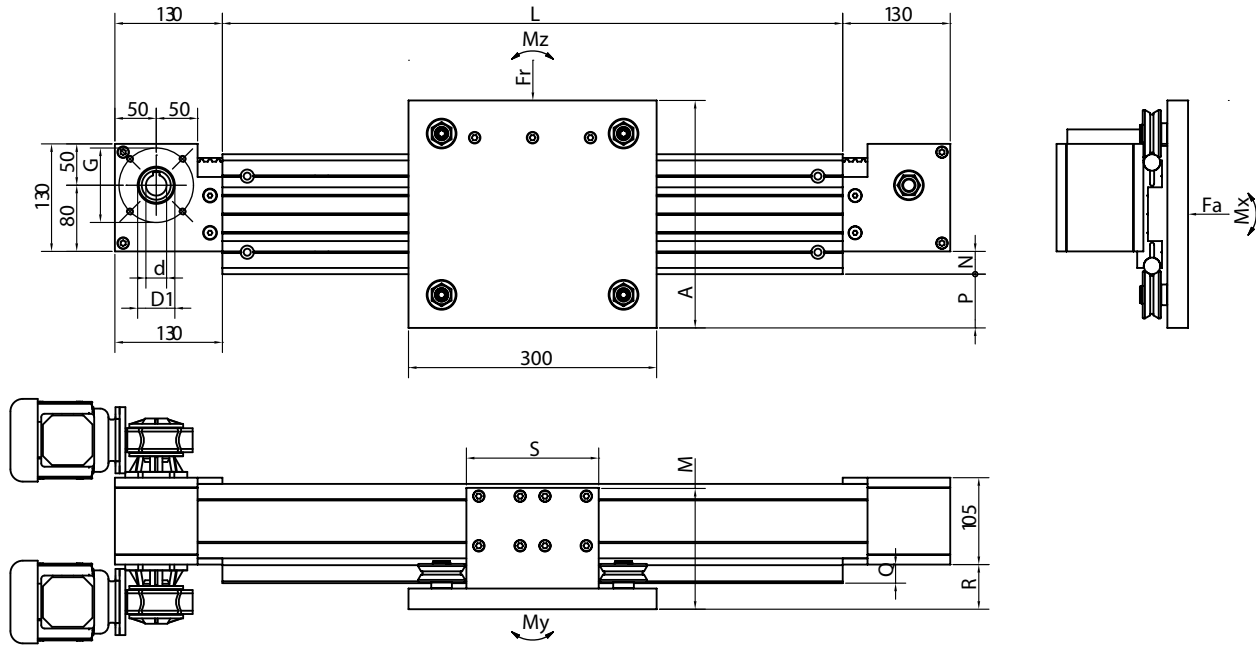
Tensioning range = 14 mm  
1 pulley revolution = 200 mm

Assembling the G20 guide on the 90x90 profile results in these motorisable guides. The advantage is that the support beam is more robust, the guide and trolley larger and more stable, and belt AT10/50 can be used. All elements are controlled by a reduction unit with a suitable output, such as MVF49/F or even MVF63/F where needs so dictate.

However, a space of 40 mm must be left between the head of the guide and the driving headpiece in order to prevent the guide interfering with the reduction unit's flange.

To determine value L depending on travel, you must add the length of the trolley plus 40 mm to said travel.

**SIDE ASSEMBLY : AG...M LAT**



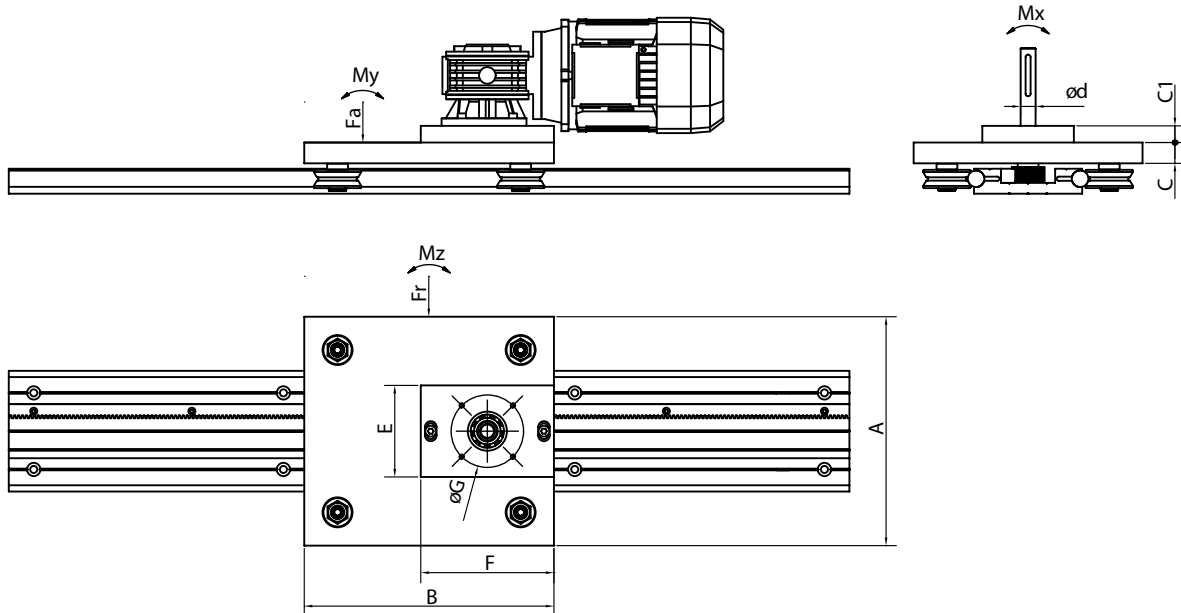
Type	A	B	D1	M	N	P	Q	R	S	Supplied ready for Bonfiglioli reduction unit		
										d <sub>H7</sub>	G	Type
AG416M LAT												
AG416RM LAT	275	300	44	146	27,5	65	22,5	54	160	ø25	4 M8 x ø90	MVF49/F
AG420M LAT												

Type	BELT			Fa(N)	Fr(N)	Mx(Nm)	My(Nm)	Mz(Nm)	Longit. development	Pulley
	Type	Tensile strength	Ultimate strength							
AG416M LAT				6400	7000	454,4	454,4	770		
AG416RM LAT	AT10/50	8050 N	27400 N	17200	8600	1221,2	1221,2	946	200 mm*	Z=20 Ø=63,66 mm
AG420M LAT				20000	15700	1420	1420	1727		

Tensioning range = 14mm  
 1 pulley revolution = 200 mm

Unless otherwise specified by the customer, during the order phase, the driving head will be fitted on the left as illustrated.

## GUIDE WITH RACK : AG...CR



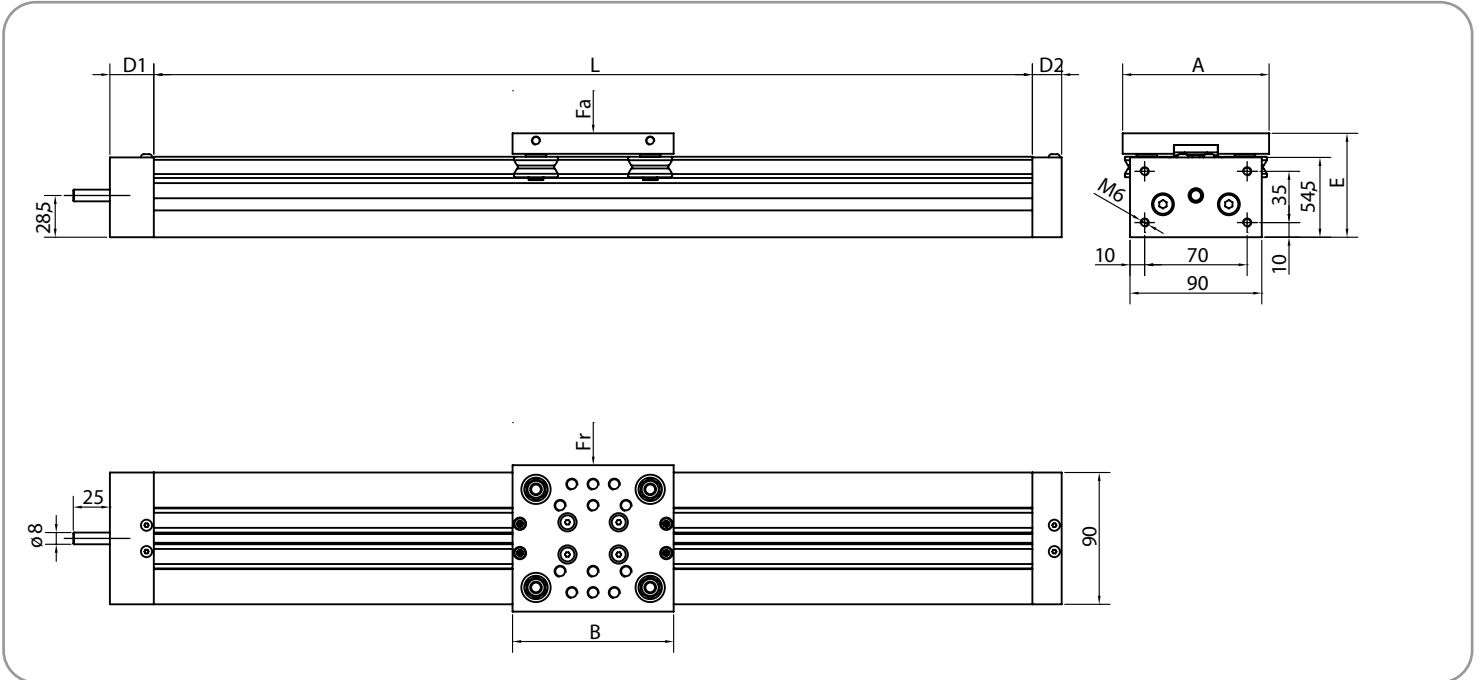
Type	A	B	C	C1	Supplied ready for Bonfiglioli reduction unit				
					d <sub>H7</sub>	E	F	G	Type
AG416CR	275	300	25	20	ø18	110	160	4 M6 x ø87	MVF44/F
AG416RCR					ø25	120	190	4 M8 x ø90	MVF49/F
AG420CR									

Type	Pignone - Rack/Sprocket		Fa(N)	Fr(N)	Trolley Loads			Longit. development
	Module	Teeth number			Mx (Nm)	My (Nm)	Mz (Nm)	
AG416CR	1,5	24	6400	7000	454,4	704	770	113 mm*
AG416RCR			17200	8600	1221,2	1892	946	
AG420CR			20000	15700	1420	2200	1727	

1 sprocket revolution = 113 mm

By adding a rack, pinion and flange carrying the reduction unit, the AG system can be motorised simply and cheaply. The largest pinion that can be fitted is a z=24, m=1.5 model, which is welded directly onto the shaft for connecting the standard-issue reduction unit supplied. The slots on the flange used to attach the reduction unit enable play between the pinion and rack to be adjusted. Once the right position is found, simply tighten the screws to secure the elements in place. This system is suitable whenever very long guides are to be created, measuring over 6 metres.

**GUIDES WITH SCREW :NL**



**WITH TRAPEZOIDAL SCREW**

Type	a	B	d1	d2	E	LOADS	
						Fa (N)	Fr (N)
NL106TR	88	110	15	10	69	400	400
NL208TR	100	110	15	10	71	800	800

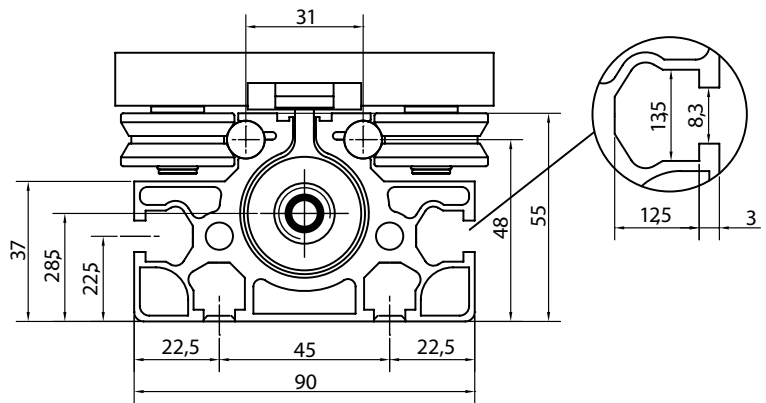
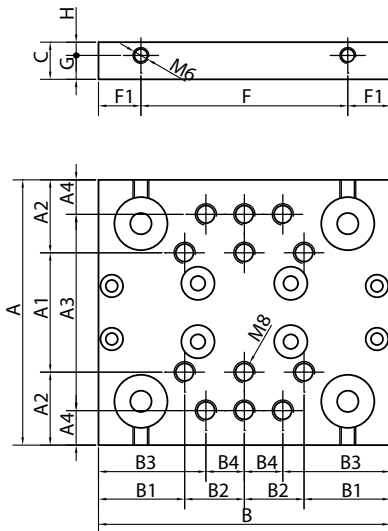
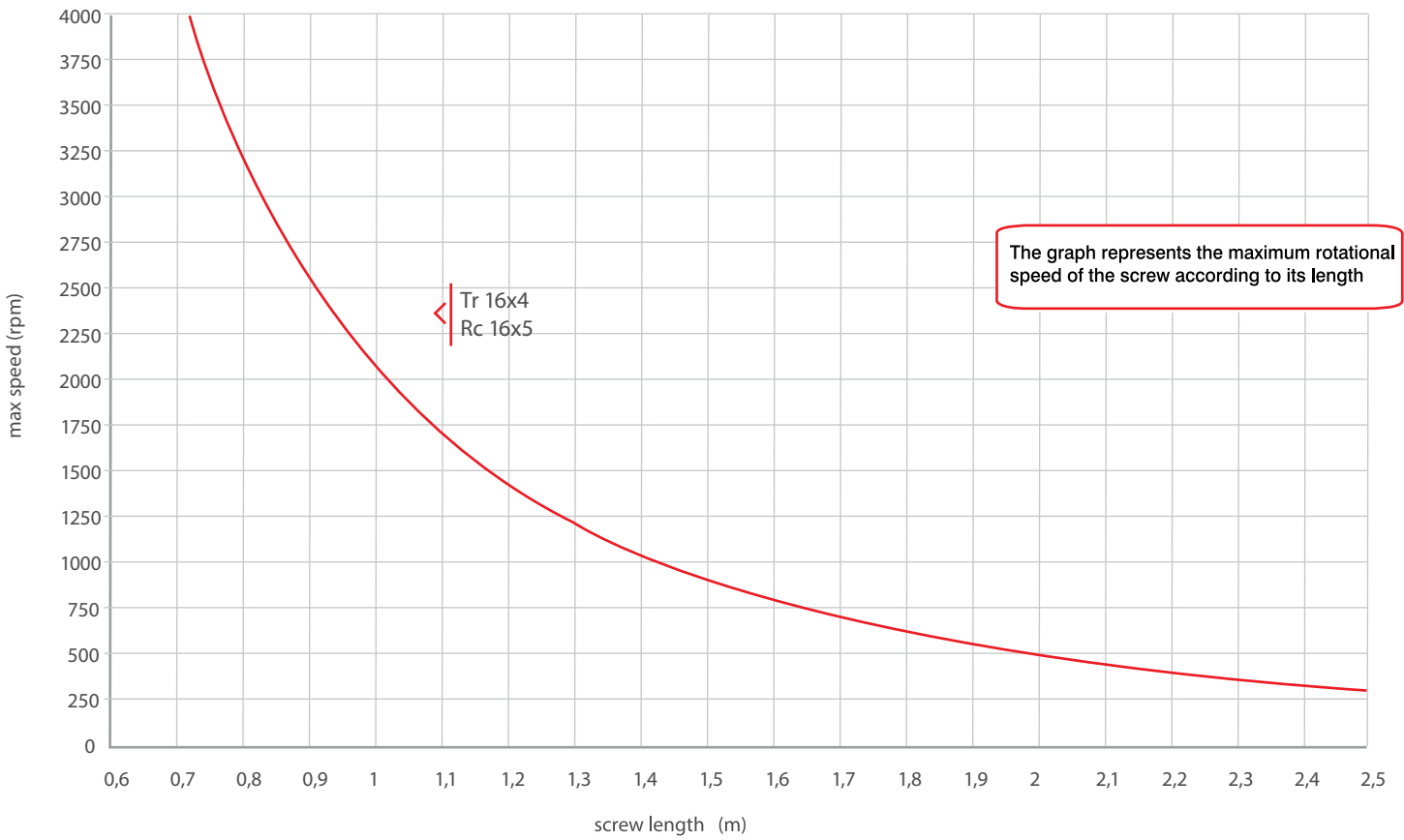
Trapezoidal screw	Advance per revolution	L max	Precision	Max load spindle
16 x 4	4 mm	2000 mm	+/- 0,1 mm	2100 N

**WITH BALL SCREW**

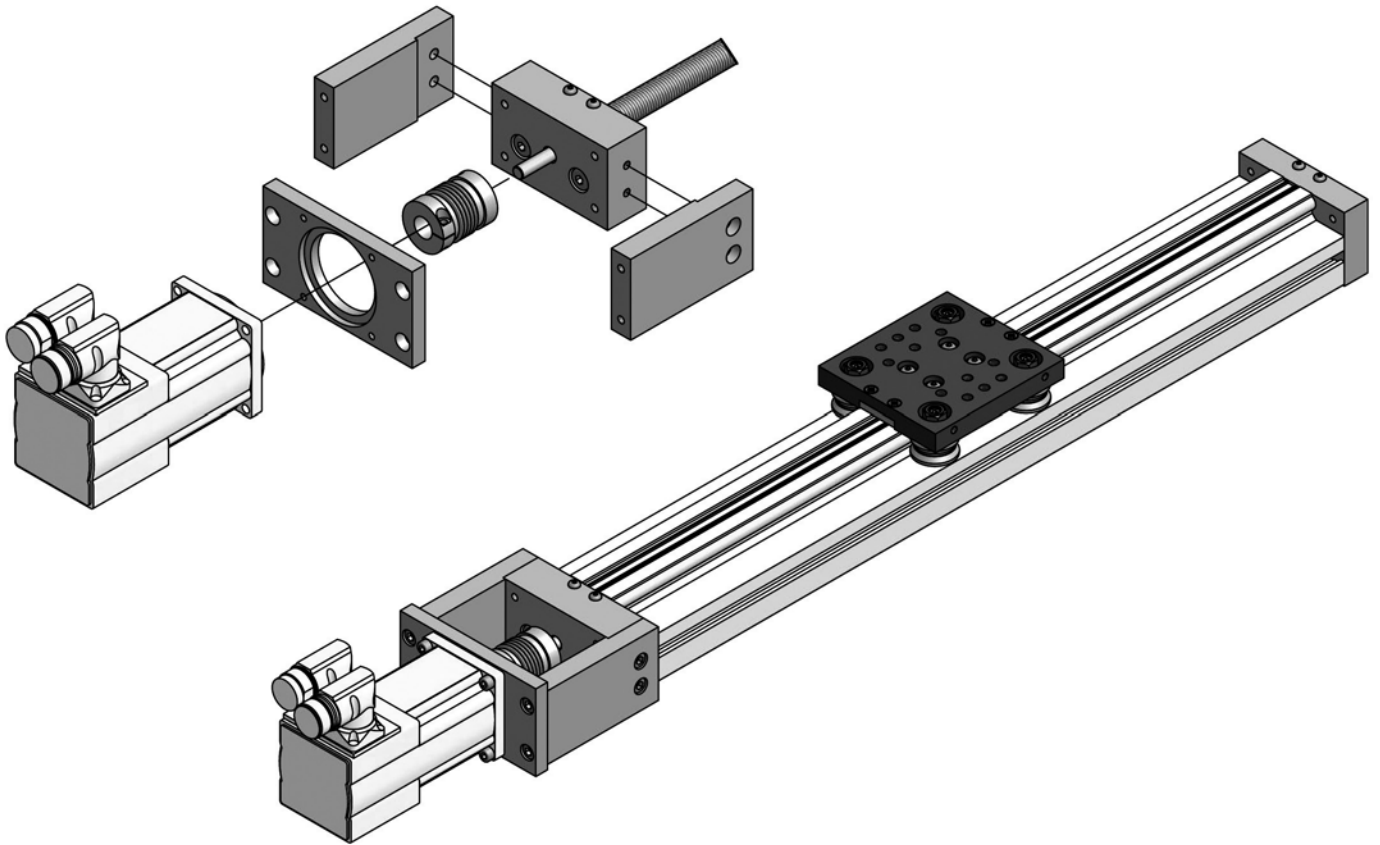
Type	a	B	d1	d2	E	LOADS	
						Fa (N)	Fr (N)
NL106RC	88	110	30	20	69	400	400
NL208RC	100	110	30	20	71	800	800

Ball screw	Advance per revolution	L max	Precision	Max load spindle
16 x 5	5 mm	2000 mm	+/- 0,05 mm	7000 N

**GUIDES WITH SCREW**



type	a a	1 a	2	a3	a4	B	B1	B2	B3	B4	c	F	F1	G	H
NL106RC	88	45	21,5	74	7	110	32,5	22,5	40,5	14,5	13	---	---	---	---
NL208TR	100	45	27,5	74	13	110	32,5	22,5	40,5	14,5	14	78	16	9	5
NL208RC															



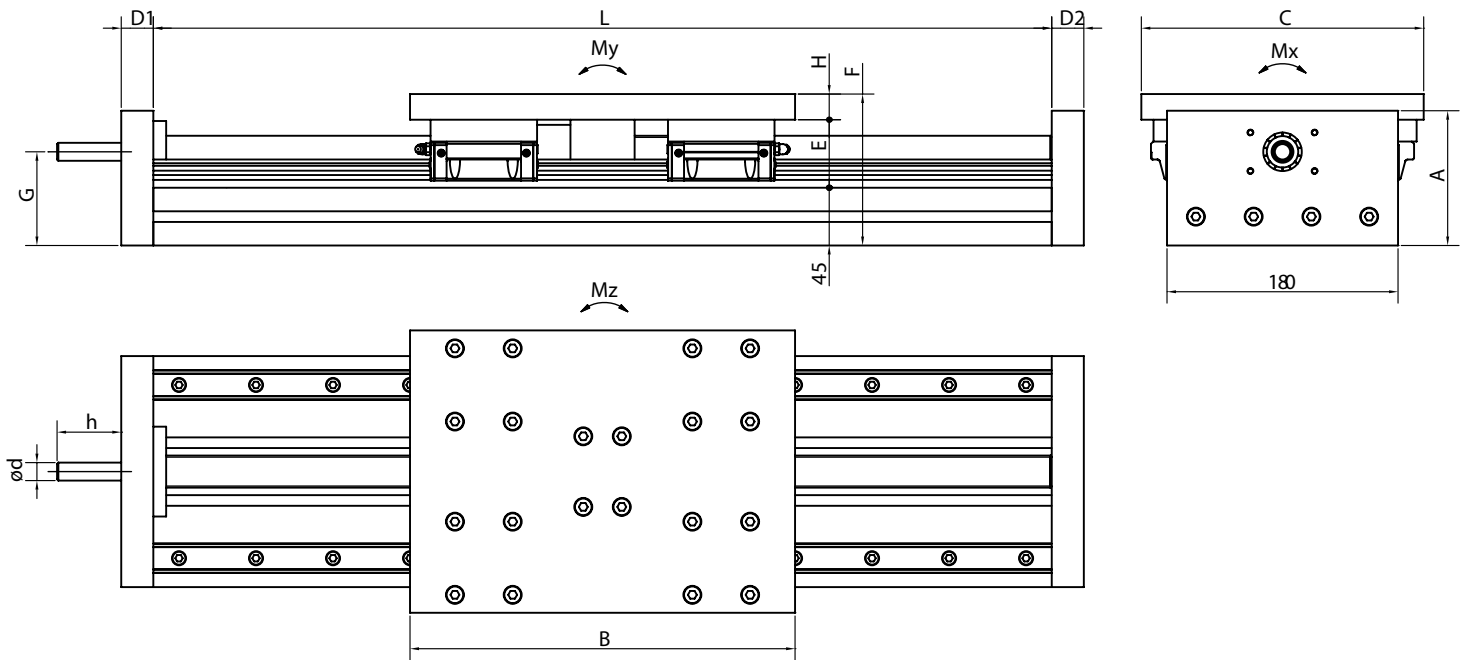
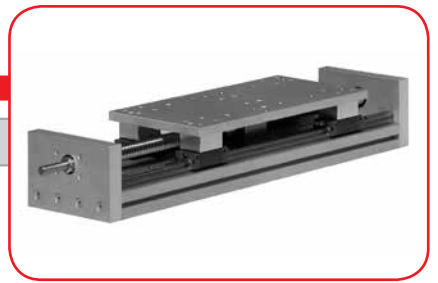
The NL guide system has been specially designed to allow light loads to be handled with a screw solution. Being compact, its application proves advantageous whenever the distance to be covered is quite small. The use of the trapezoid screw was mainly meant for slow or manual positioning, whilst the one using a ball screw has been designed for fast and motorized handling. Both rotate inside the profiled section and are protected by a stainless steel band placed at the top of the profiled. Strips in a magnetic material are instead responsible for protecting them from dirt and dust, whilst still assuring constant contact between the profile and stainless steel band.

Given the complex nature of assembly, the trolley comes with the standard holes already bored into it to make it easier for the customer to fit any counterplates. The profile features four recesses for fastening to the frame, two at the side and two at the bottom, and are exposed by pulling off the aluminium strip covering them.



**BOARDS SCREW :H...W\_RC/TR**

Order code :28



**WITH BALL SCREW**

type	A	B	C	D1	D2	E	F	G	H	h	Ød
H20W_RC2005	105	300	210	25	25	55	120	75	20	40	12
H25W_RC2505	105	300	220	25	25	53	118	73	20	50	14
H25W_RC2510											

**WITH TRAPEZOIDAL SCREW**

type	A	B	C	D1	D2	E	F	G	H	h	Ød
H20W_TR2004	105	300	210	25	25	55	120	80	20	40	12
H25W_TR2505	105	300	220	25	25	53	118	75,5	20	50	14

**SCREW LOAD**

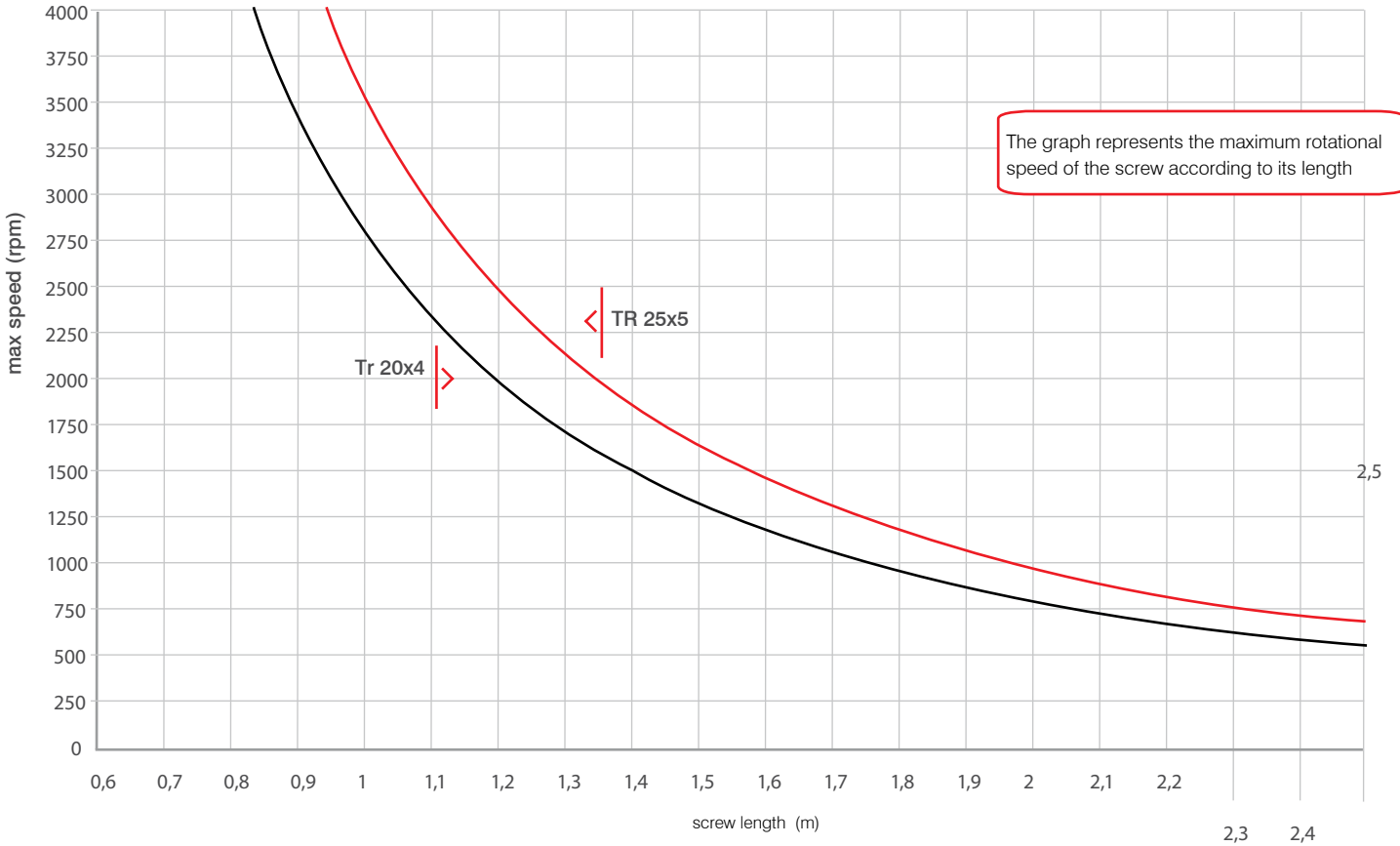
type	Ball screw	Trapezoidal	Advance per revolution	L max	Precision	Static	Dynamic
						Statiques C0 (N)	Dinamique C(N)
H20W_RC2005	20 x 5		5 mm	3000 mm	+/- 0,05 mm	20700	14800
H25W_RC2505	25 x 5		5 mm			33700	20400
H25W_RC2510	25 x 10		10 mm			31800	19900
H20W_TR2004		20x4	4 mm		+/-0,1 mm	-	-
H25W_TR2505		25x5	5 mm			-	-

**LOADS**

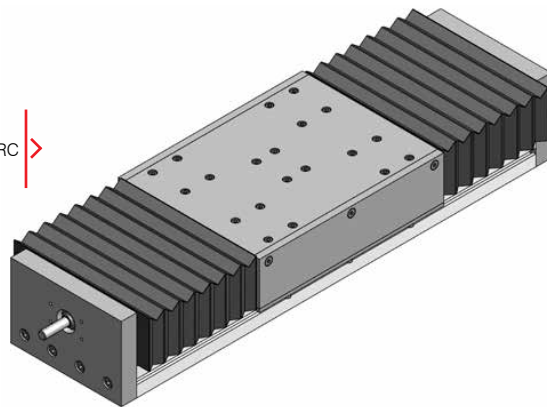
**STATIC MOMENTS**

type	Hiwin Block	N° of block S	Static C0 (N)	Precision C(N)	Mx(Nm)	My(Nm)	Mz(Nm)
H20W_RC2005	HGW-20CC	4	37840	17750	380	270	270
H20W_TR2004							
H25W_RC2505	HGW-25CC	4	56190	26480	640	510	510
H25W_RC2510							
H25W_TR2505							

\* values referred to a single block



EXAMPLE OF BELLOW BOOTS ON GUIDE H..W\_RC



The linear table with screw consists of an aluminum profile 45x180 on which two ball screw guides are fitted. A plate which is usually made of aluminum connects the 4 sliding blocks that slide over it. Movement is provided by a ball screw or by a trapezoidal screw.

Clients can request table lengths up to a maximum of 3 m. When sizing, the speed/length ratio should be taken into account (shown in the diagrams above) to prevent damage to the screw.

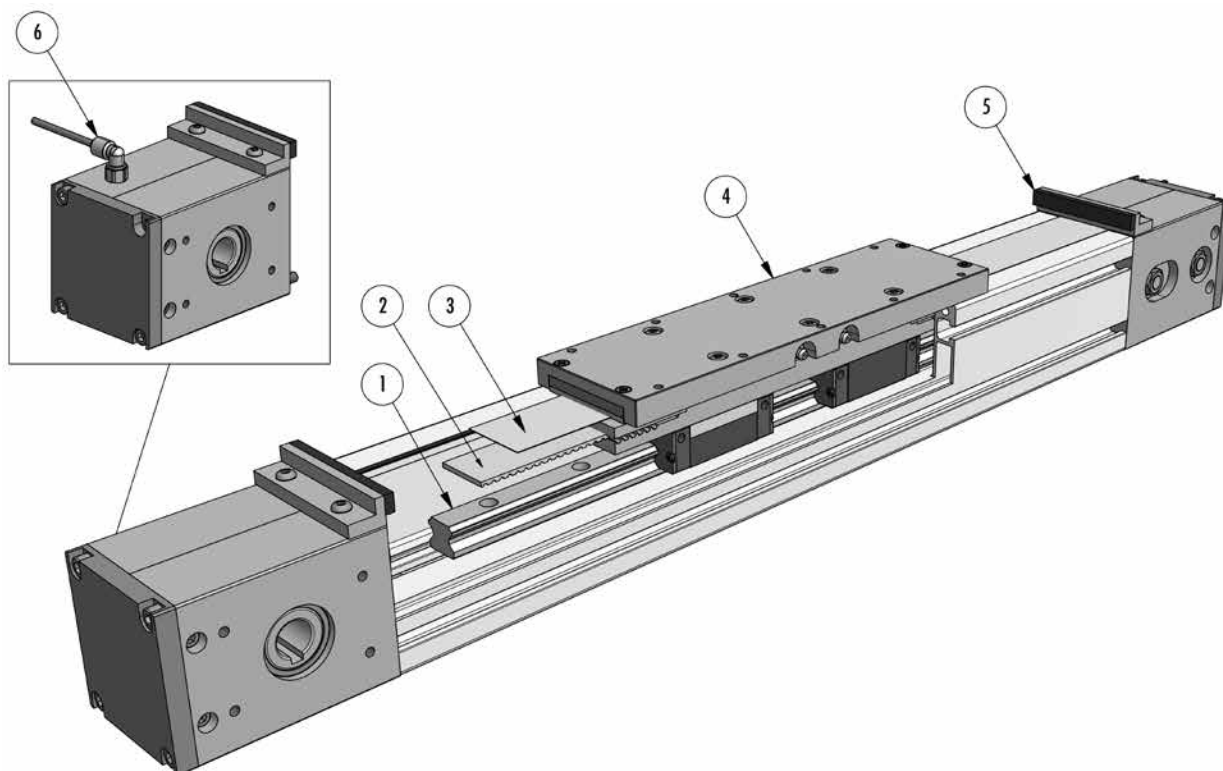
To anchor the tables, T-slots are available with profile 45x180 and the various accessories available in the following pages.

The external environment is protected by flat heat sealed bellows, available on request, and protective casings.

If necessary, tables with characteristics other than those listed here can be made.



Order code



**1- GUIDE**

Steel rail with linear guideways protected inside an anodized aluminum extruded with lateral fixing slots

**2- BELT**

toothed belt AT 5 type with steel wires and polyurethane cover

**3- PROTECTION**

stainless steel strip with magnets for protection of the internal components and front brushes on the trolley

**4- TROLLEY**

anodized aluminum plate with integrated system for guide lubrication

**5 -SAFETY**

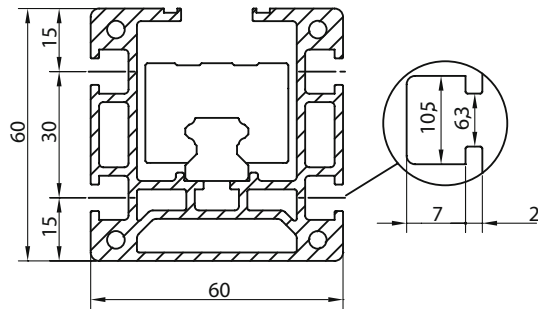
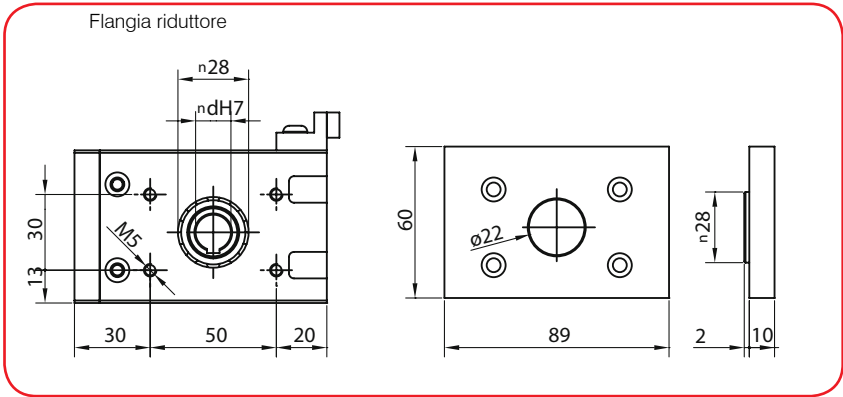
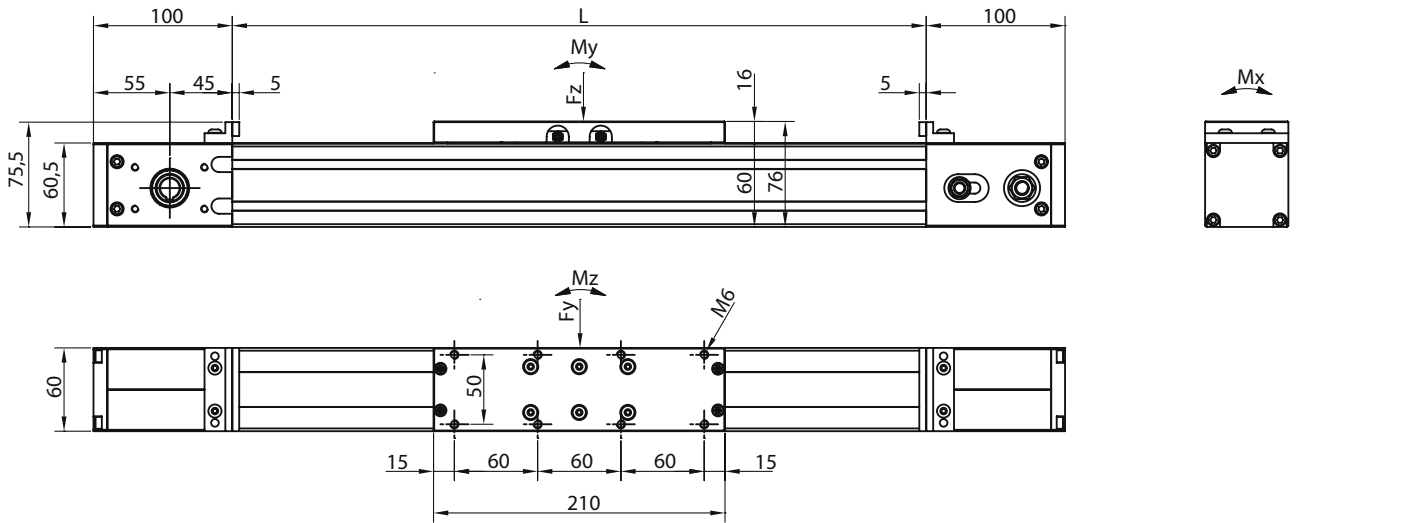
limit blocks with shockproof rubber strip at each guide ends

**6-ACCESSORIES ON DEMAND**

pneumatic fittings G1/8" on the heads for creating an underpressure for avoiding dispersion of particles outside or an overpressure for avoiding the particles entrance

**MODULAR GUIDA**

- Order code :28



**TECHNICAL DETAILS**

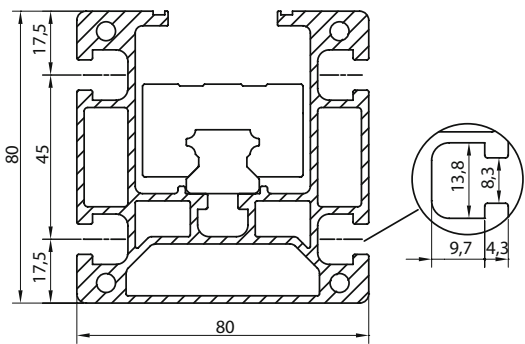
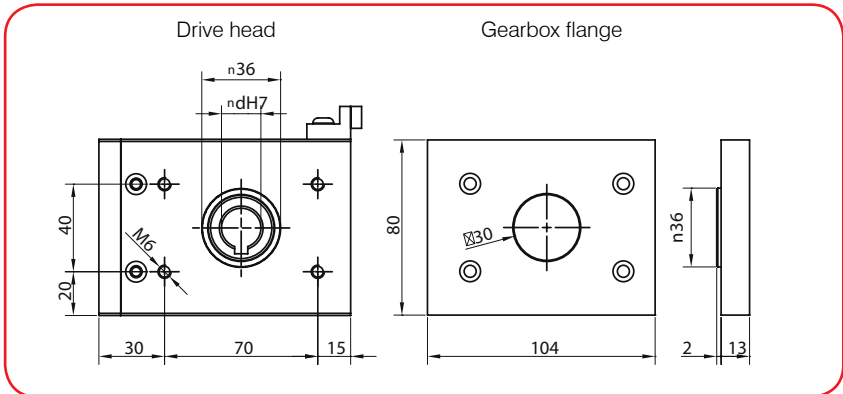
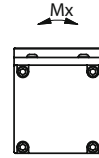
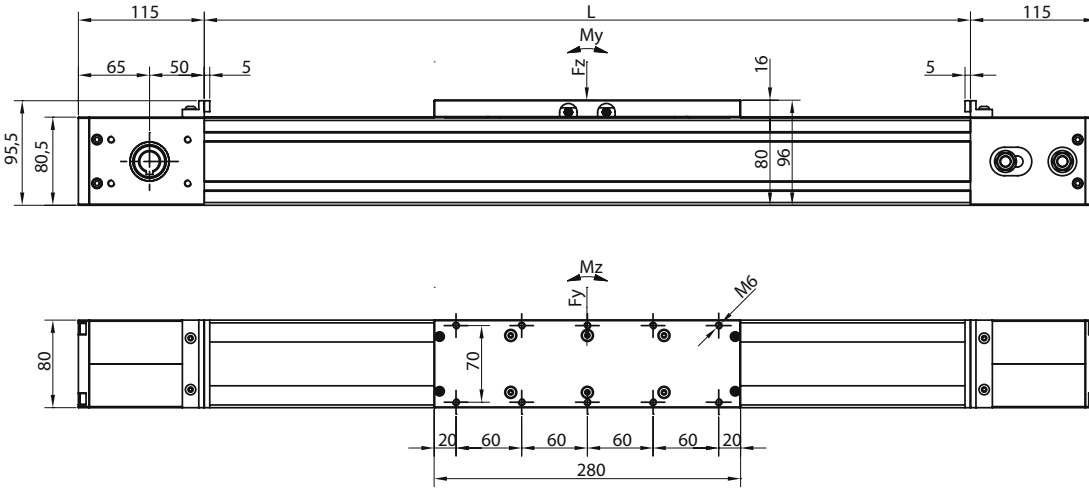
Tensile strength	Ultimate strength	linear development	Fy (N)	Fz (N)	Mx (N)	My (N)	Mz (N)
1715 N	6870 N	140 mm	5062	5062	56	266	266

PROFILE						
Section		moment of inertia		module of resistance		Weight [kg/m]
X [mm]	Y [mm]	Lx [cm4]	Ly [cm4]	Wx [cm4]	Wy [cm4]	
60	60	41.93	46.41	12.58	15.46	2.73

V20/G20	
Max length $L_{max}$	6000 mm
shaft diameter $d^{H7}$	12/14 mm
positioning accuracy	+/- 0.1 mm
Max recommended speed	3 m/s *
Max recommended acceleration	7 m/s <sup>2</sup> *

\*For higher values please contact technical office

**WHEELS SERIES AD-AG-AS-AV**



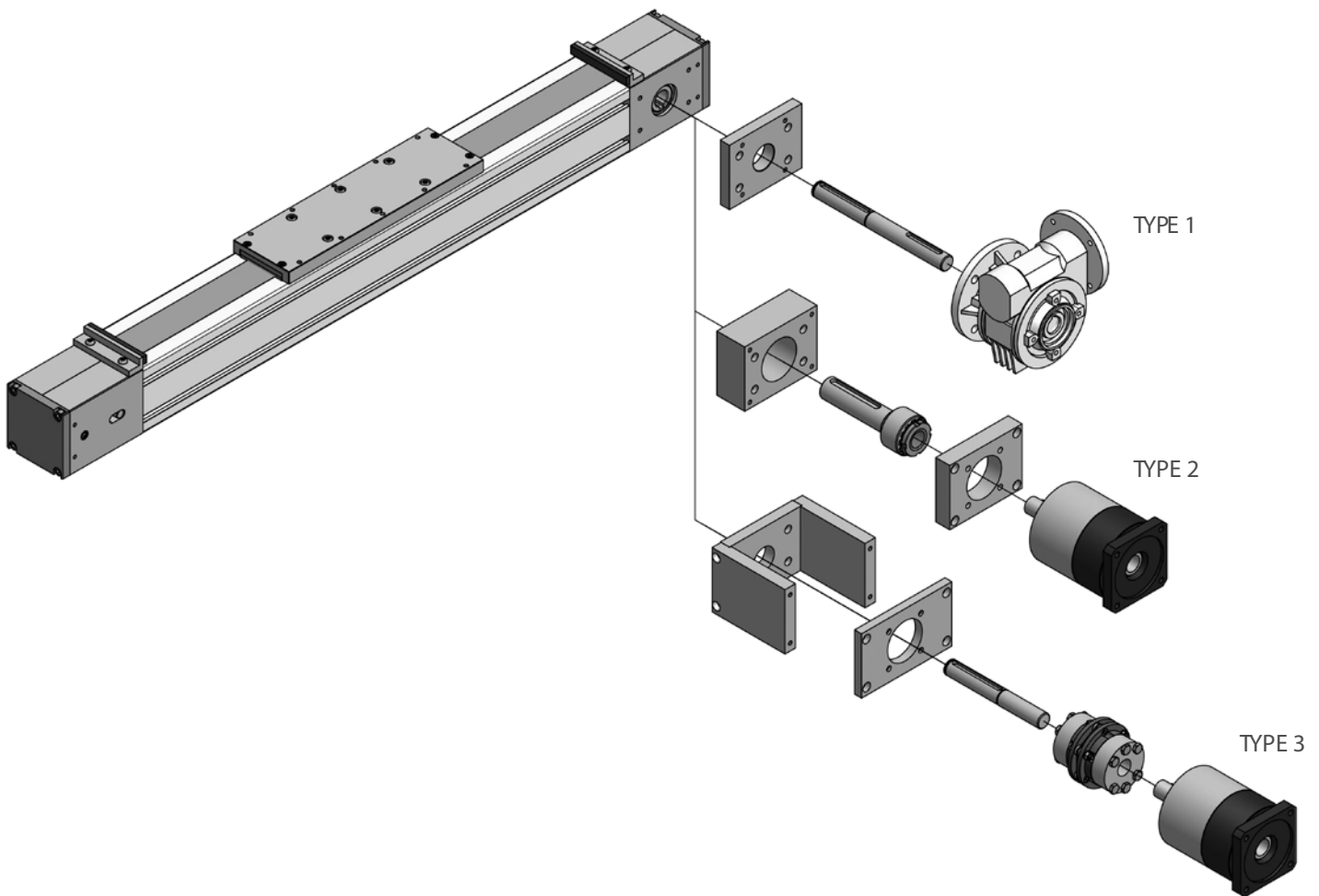
		E: Z=36 Ø=57,3 mm		Trolley Loads				
Tensile strength	Ultimate strength	linear development		Fy (N)	Fz (N)	Mx (N)	My (N)	Mz (N)
2160 N	8655 N	180 mm		7568	7568	121	469	469

PULLEY :Z=36 Ø=57,3 mm						
Section		moment of inertia		module of resistance		Weight [kg/m]
X [mm]	Y [mm]	X [cm4]	Ly [cm4]	Wx [cm4]	Wy [cm4]	
80	80	113.90	126.39	26.67	31.59	4.13

Max length L <sub>max</sub>	6000 mm
Shaft diameter d <sup>H7</sup>	14/18 mm
Positioning accuracy	+/- 0.1 mm
Max recommended speed	3 m/s *
Max recommended acceleration	7 m/s <sup>2</sup> *

\* For higher values please contact technical office

- TYPE 1  
shaft and adapting flange for worm gearbox
- TYPE 2  
shaft with taper lock and adapting flange for planetary gearbox
- TYPE 3  
shaft with central coupling and adapting flange for planetary gearbox (suitable for heavy applications)



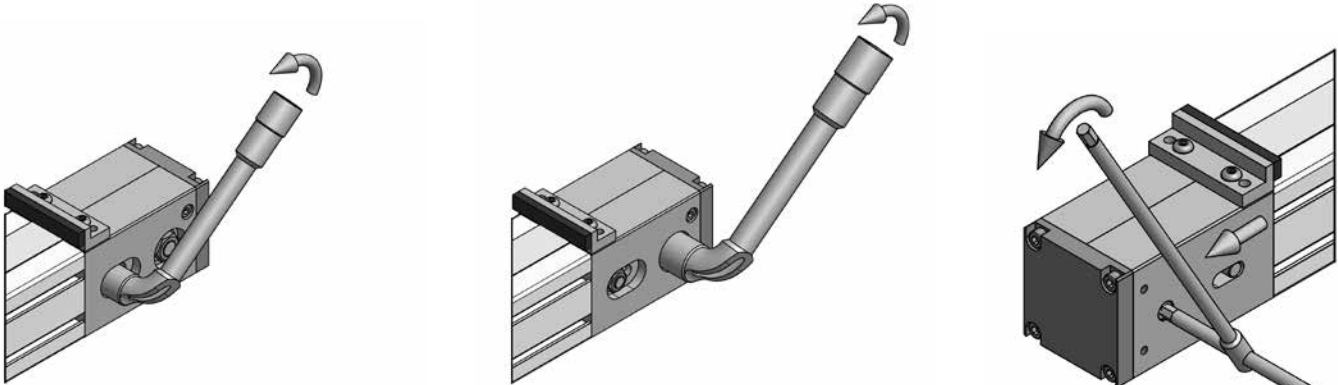
Brand	Type 1		Type 2/3	
	AL6060	AL8080	AL6060	AL8080
Bonfiglioli	MVF30-F	MV30-F / MVF44-F	MP053 / MP 060	MP060 / MP 080
Motovario	NMRV30-FA N	NMRV30-FA / NMRV40-FA		
Varvel	MRT28-F	MRV30-FA / NMRV40-FA		
Tramec	MRT28-F	XC30-F1 / XC 40-F1	EP55-TT / EP75-TT	EP75-TT / EP90-TT
Siboni			RE55 / RE63	RE63 / RE80
apex dynamics			PE50	PE50 / PE70

\* For any other brand or different size please contact technical office

## USE AND MAINTENANCE

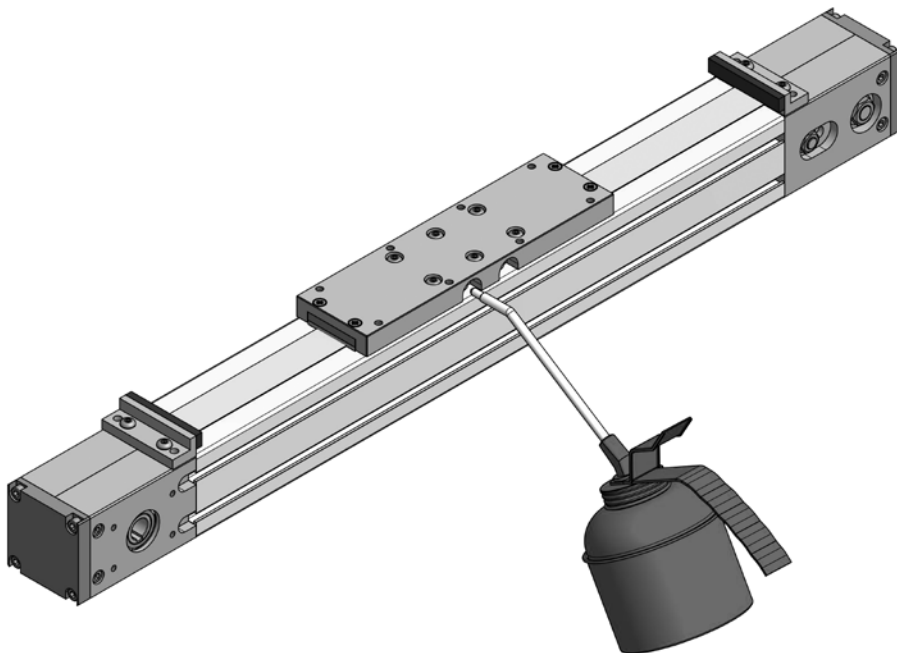
### BELT TENSIONING

1. loosen the pulley nut
2. loosen the eccentric pin nut
3. turn the eccentric pin for tensioning the belt and tighten the nuts



### LUBRICATION

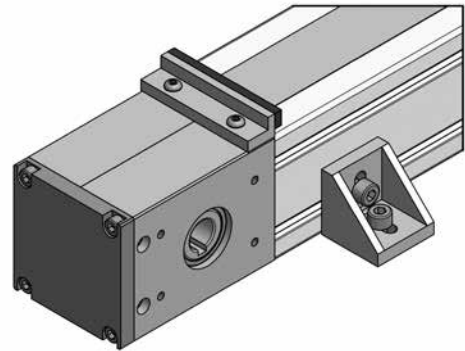
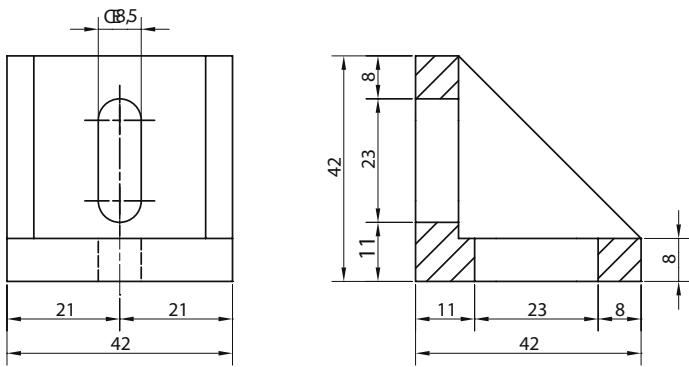
The guide is supplied with the sliders already lubricated with oil. For the further lubrication use the grease nipple placed on the lateral side of the trolley



Brand Type	KLUBER Klueroil GEM 1-150 N	MOBIL Mobilgear 630	FUCHS Gearmaster CLP 320
Working temperature	- 10° C + 80° C		
Suggested lubrication interval	1000 km		
Oil quantity each grese nipple	AL6060	0.8 cm <sup>3</sup>	
	AL8080	1 cm <sup>3</sup>	

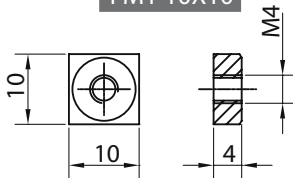
**FASTENING ELEMENTS FOR AL TYPE**

**BRACKET SQ2**

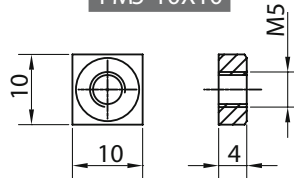


**THREADED NUT for Al6060**

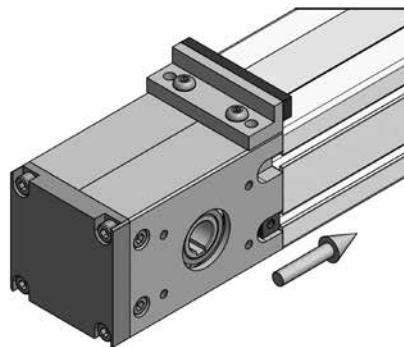
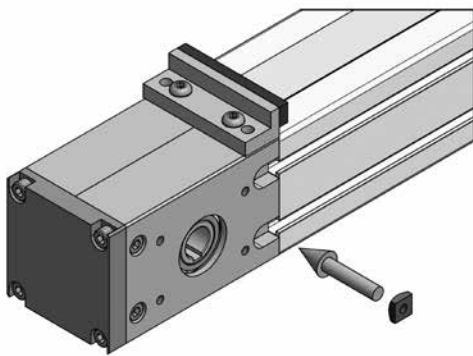
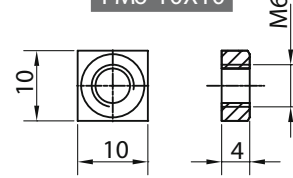
**PM4-10X10**



**PM5-10X10**



**PM6-10X10**

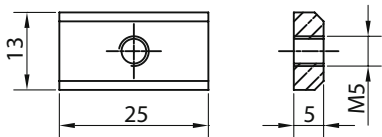


Mounting:

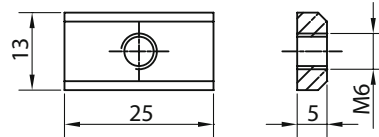
- 1) Insert the nut into the slot on the drive head
- 2) Slide it on the slot on the aluminum profile

**THREADED NUT for Al8080**

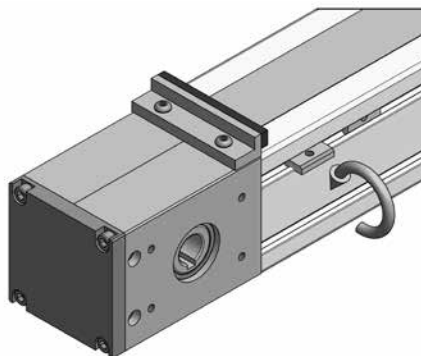
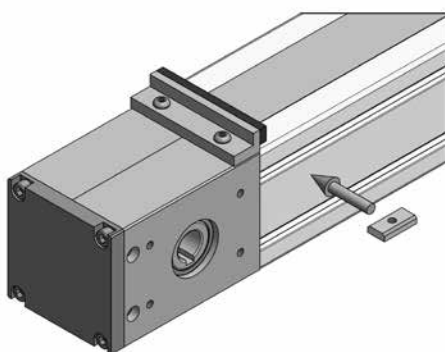
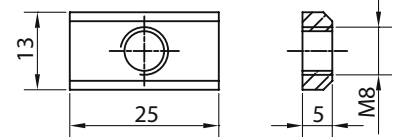
**PM5**



**PM6**



**PM8**



Mounting:

- 1) Insert the nut into the slot on the aluminum profile
- 2) Rotate it on the slot on the aluminum profile



## MOTORISABLE GUIDE WEIGHT

Note: indicative values subjected to variations due to shape and size tolerances

### AK SERIES

	FIXED WEIGHT (KG)			WEIGHT PER METER(KG/M)
	Trolley		Heads	
AK42	0,63	+	2,14	3,53
AK208R	0,95	+	2,14	5,16
AKR20	0,75	+	2,14	4,22

### AD..M SERIES

	FIXED WEIGHT (KG)			WEIGHT PER METER(KG/M)
	Trolley		Heads	
AD210M	1,65	+	3,62	6,64
AD312M	2,19	+	3,62	12,10
AD316M	2,72	+	3,62	12,10
AD416M	4,05	+	3,62	12,10
AD416RM	4,21	+	3,62	12,10
AD420M	4,15	+	3,62	12,10

### AV..M SERIES

	FIXED WEIGHT (KG)			WEIGHT PER METER(KG/M)
	Trolley		Heads	
AV210M	1,73	+	3,67	6,57
AV312M	2,27	+	3,67	11,83
AV316M	2,82	+	3,67	11,83
AV416M	4,16	+	3,67	11,83
AV416RM	4,31	+	3,67	11,83
AV420M	4,25	+	3,67	11,83

### AD..M LAT SERIES

	FIXED WEIGHT (KG)			WEIGHT PER METER(KG/M)
	Trolley		Heads	
AD210M LAT	2,27	+	3,67	6,78
AD312M LAT	2,59	+	3,67	12,24
AD316M LAT	3,12	+	3,67	12,24
AD416M LAT	4,52	+	3,67	12,24
AD416RM LAT	4,67	+	3,67	12,24
AD420M LAT	4,63	+	3,67	12,24

## MOTORISABLE GUIDE WEIGHT

### AG..M SERIES

	FIXED WEIGHT (KG)			WEIGHT PER METER (kg /m)
	Trolley		Heads	
AG416M	7,33	+	5,51	16,47
AG416RM	7,48	+	5,51	16,47
AG420M	7,44	+	5,51	16,47

### AG..M LAT SERIES

	FIXED WEIGHT (KG)			WEIGHT PER METER (kg /m)
	Trolley		Heads	
AG416M LAT	8,73	+	5,51	16,47
AG416RM LAT	8,88	+	5,51	16,47
AG420M LAT	8,84	+	5,51	16,47

### AG..CR SERIES

	FIXED WEIGHT (KG)			WEIGHT PER METER (kg /m)
	Trolley		Heads	
AG416CR	7,74	+	0	12,85
AG420CR	7,89	+	0	12,85
AG420CR	7,86	+	0	12,85

\*Without shaft and gearbox weights

### NL SERIES

	FIXED WEIGHT (KG)			WEIGHT PER METER (kg /m)
	Trolley		Heads	
NL106TR / NL 106RC	0,69	+	0,64	5,94
NL208TR / NL 208RC	0,91	+	0,64	5,94

### H..W SERIES

	FIXED WEIGHT (KG)			WEIGHT PER METER (kg /m)
	Trolley		Heads	
H20W_RC / TR	6,51	+	2,58	12,29
H25W_RC / TR	7,94	+	2,58	15,68

### AL SERIES

	FIXED WEIGHT (KG)			WEIGHT PER METER (kg /m)
	Trolley		Heads	
AL6060	0,93	+	1,67	4,5
AL8080	1,93	+	3,37	7,1

**GUIDE JOINTS**

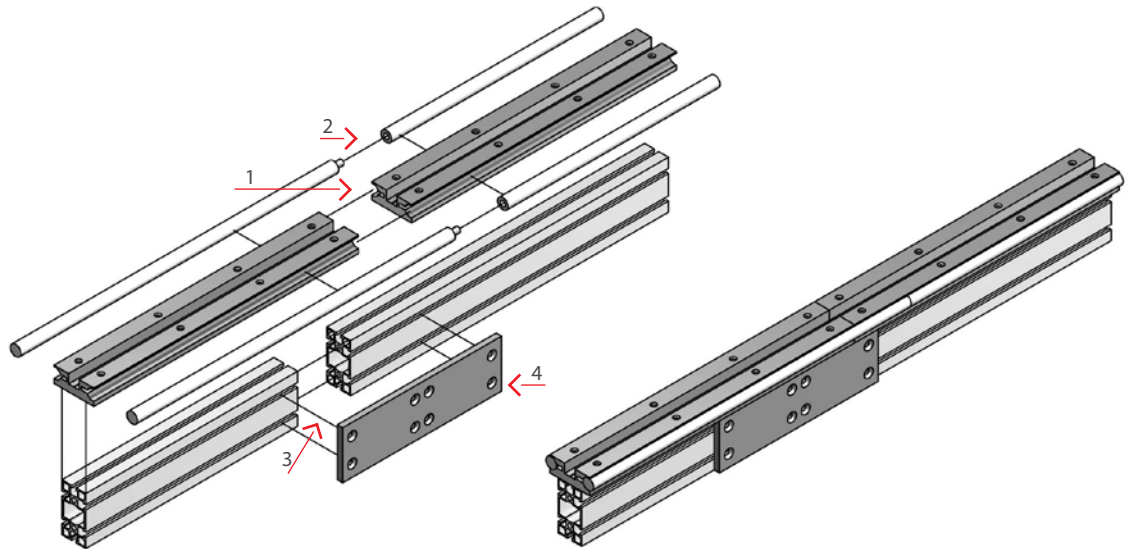
**GUIDE**

1) Guide joint

2) Bar joint

3) Grooved profile joint

4) Cover plate

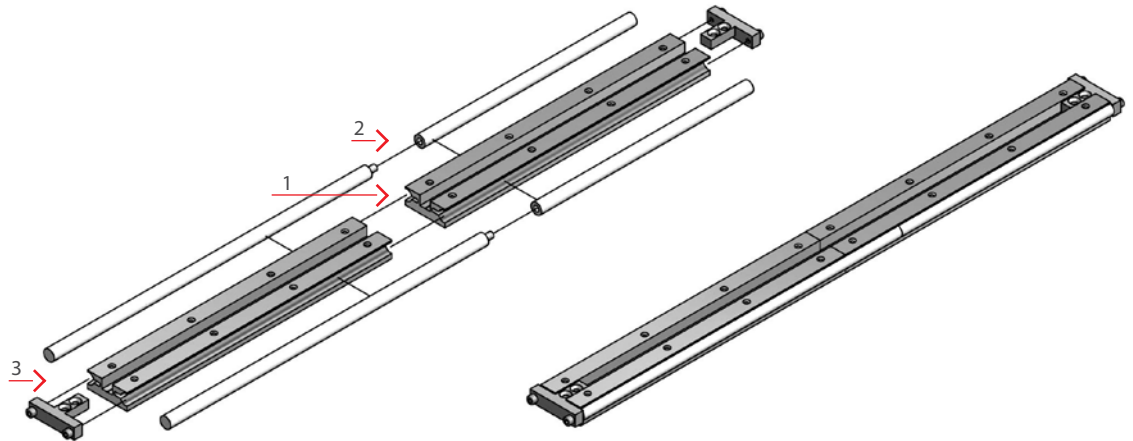


**GUIDE**

1) Guide joint

2) Assemblage de barres

3) Push-bar



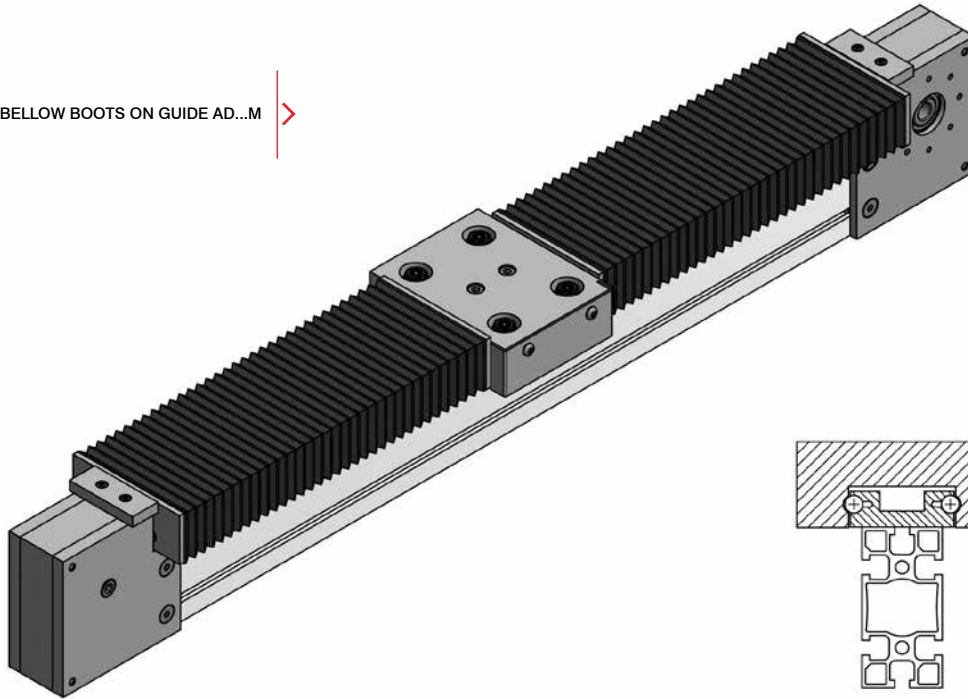
Figures illustrate systems for joining guides over 6m in length. For steel bars, two male lengths are produced extending beyond an aluminium guide, and two female lengths shorter than the other guide, which are then slotted together. In addition, the heads are fitted with pins to make centring shaft-shaft of the guides accurate.

The heads of the bars are not chamfered, though the rough edges formed during cutting are eliminated so that the passage of the wheels over the joint is as smooth as possible.

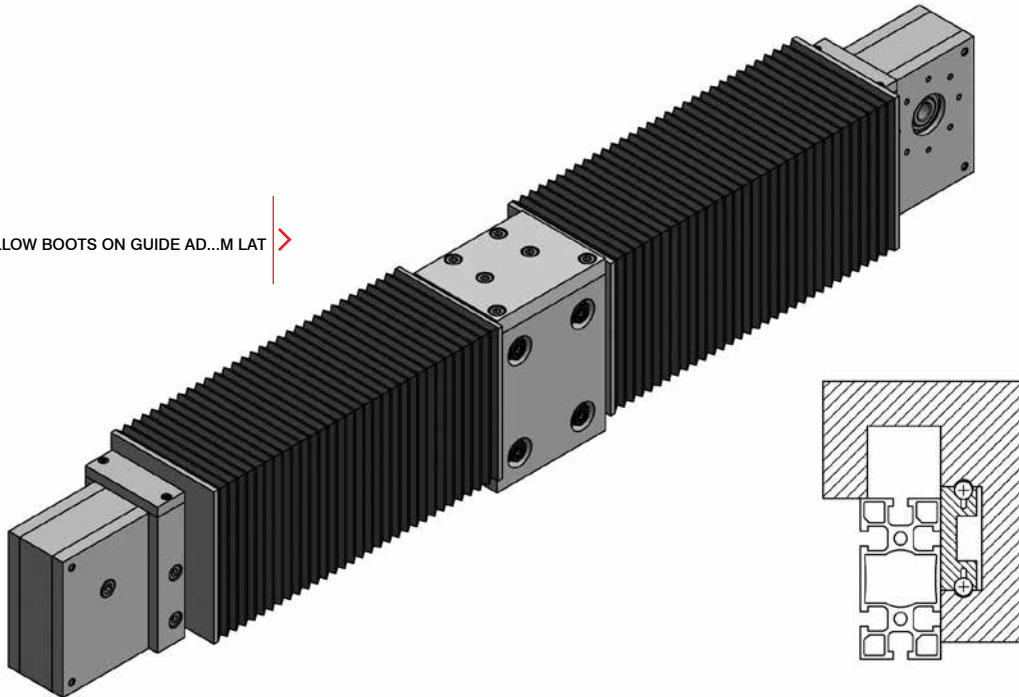
If there is also a support profile to be joined, special "cover plates" are fitted covering the two heads of the profile.

The profiles are cut so that the joint does not occur at the same point as a joint between guides or steel bars.

EXAMPLE OF BELLOW BOOTS ON GUIDE AD...M &gt;



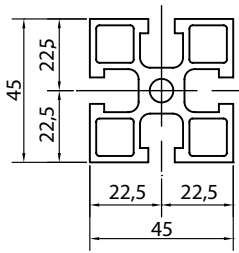
EXAMPLE OF BELLOW BOOTS ON GUIDE AD...M LAT &gt;



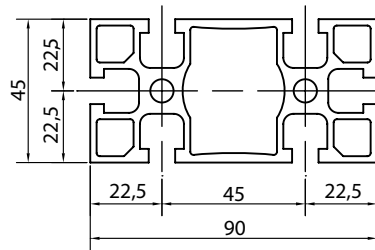
In applications where the guide and belt must be protected from dust, shavings, paint etc., flat heatsealed bellow boots can be fitted, to be fastened on the trolley at one end, and on the headpieces at the other. It goes without saying that the guide will have to be longer to allow for the space taken up by the bellow boots when closed. Bellow boots can also be tailored to customer specifications.

**SUPPORT PROFILES**

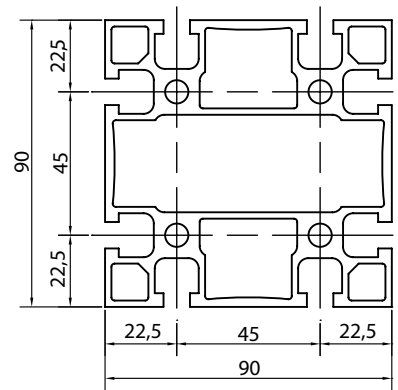
45x45 >



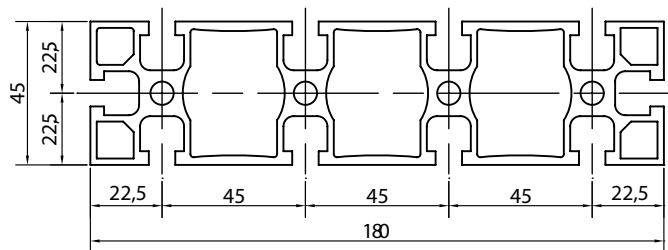
45x90 >



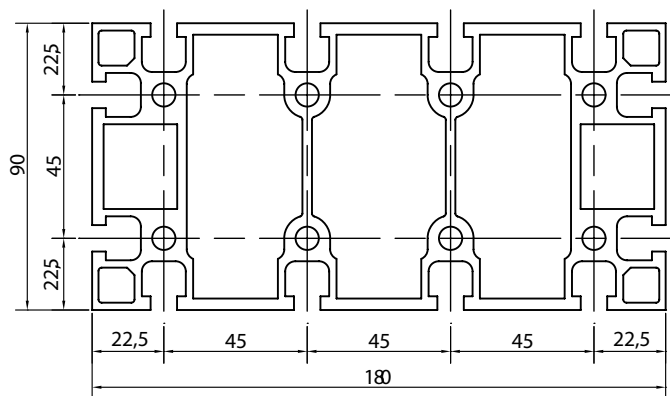
90x90 >



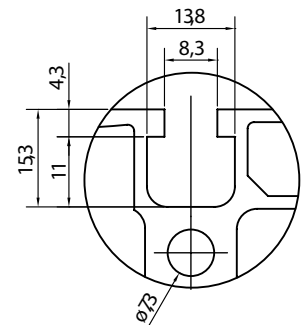
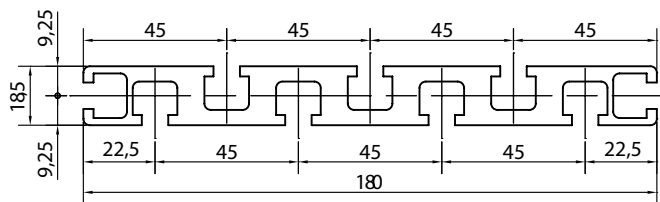
45x180 >



90x180 >



18,5x180 >

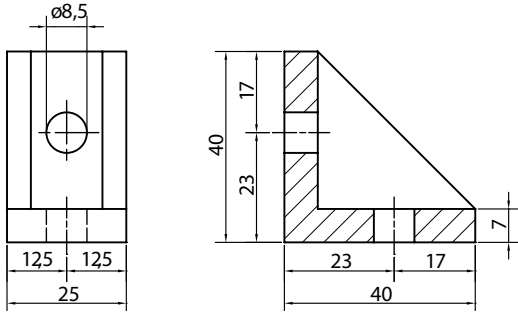


Type	SECTION		MOMENT OF INERTIA		SECTION MODULUS		Weight (kg/m)	lmax (m)
	Y (mm)	X (mm)	Lx (cm <sup>4</sup> )	Ly (cm <sup>4</sup> )	Wx (cm <sup>3</sup> )	Wy (cm <sup>3</sup> )		
45x45	45	45	13,18	13,18	5,86	5,86	1,95	6
45x90	45	90	25,25	98,82	11,22	21,96	3,31	6
18,5x180	18,5	180	6,81	406,7	7,36	45,19	4,6	6
45x180	45	180	49,45	686,99	21,96	76,33	5,93	6
90x90	90	90	173,7	175,8	38,2	38,9	5,09	6
90x180	90	180	354,1	1263,4	77,2	139,4	10,3	6

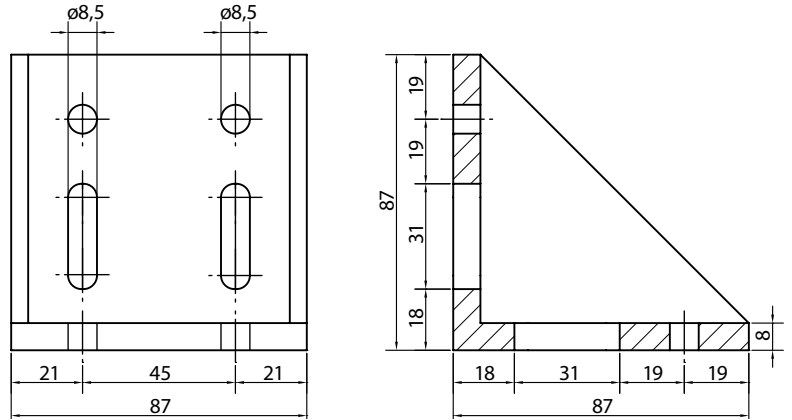
## SUPPORT PROFILES

### BRACKETS

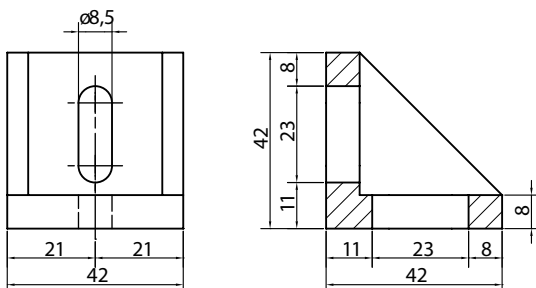
SQ1 (0,04 KG)



SQ3 (0,35 KG)

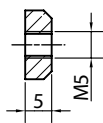
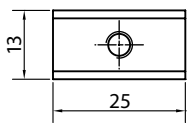


SQ2 (0,06 KG)

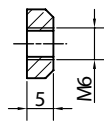
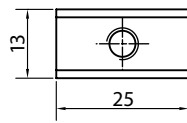


## THREADED NUTS

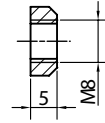
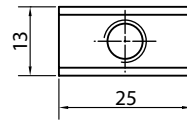
PM5



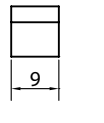
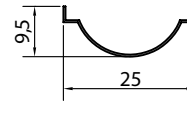
PM6



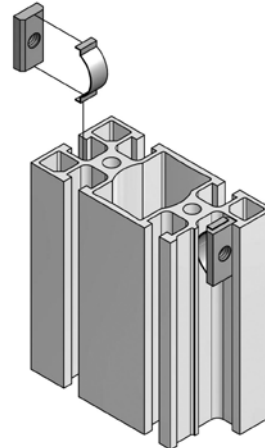
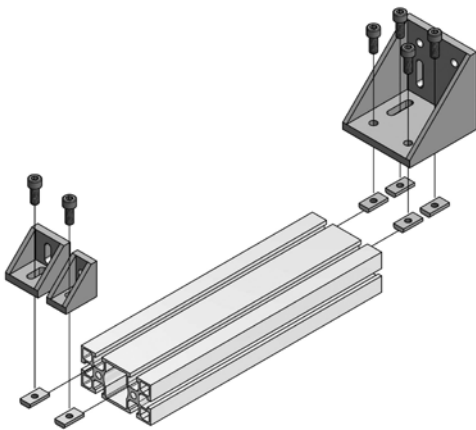
PM8



ML

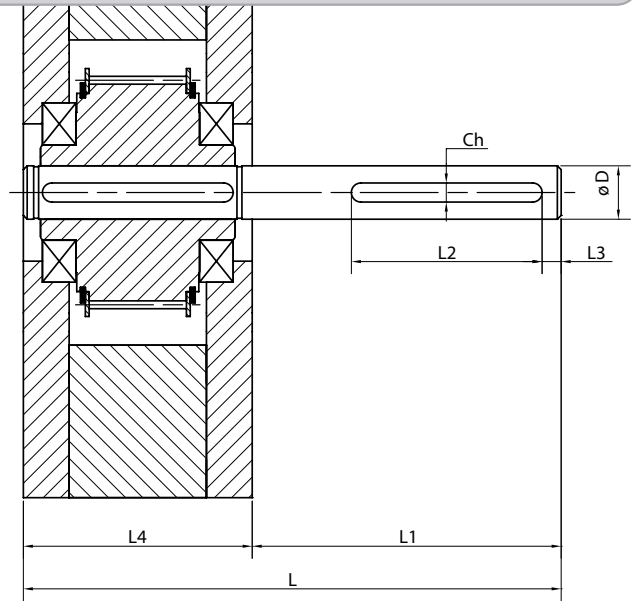
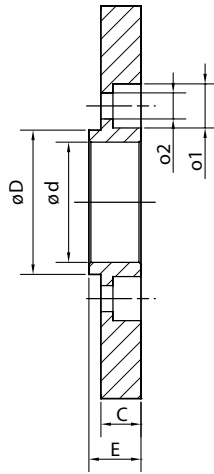
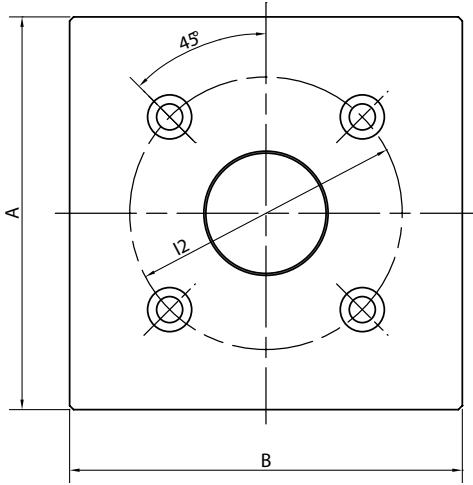


## MOUNTING EXAMPLE



The figures at the top feature a schematic representation of assembly of the available fastening elements. There are three types of brackets. Each comes complete with screws and PM 8 plates for fastening to the profile. The washer is required whenever the plate has to be fitted on a vertical profile. It serves to secure the plate in the desired place, preventing its displacement. The other two plate types are used to fasten limit switches/stops, where necessary

**SHAFT AND FLANGES**



**PREDISPOSITIONS**

Type	A	B	C	D	d	E	l2	o1	o2
Q1	98	98	10	36	30	13	68	11	7
FQ2	130	130	17	44	36	20	90	14	9

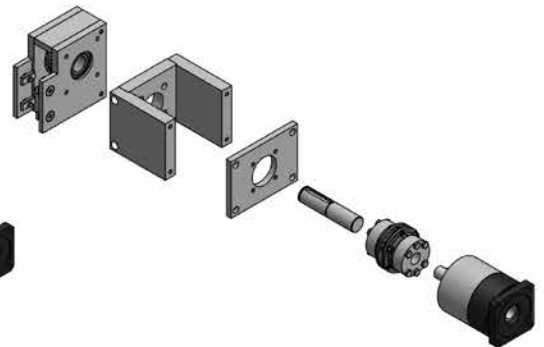
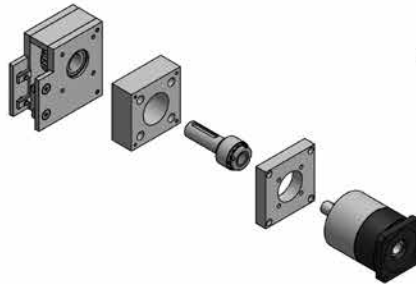
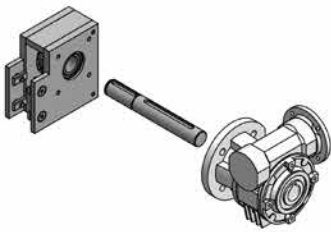
\*For predisposition description see page 49

Type	D h7	Ch	L	L1	L2	L3	L4	Belt
ALB1	14	5x3	141	81	50	5	60	AT10/16
ALB2	18	6x3,5	157	97	50	10	60	AT10/25
ALB3	25	8x4	186	126	100	15	60	AT10/25
ALB4	25	8x4	231	126	100	15	105	AT10/50

TYPE - 1

TYPE - 2

TYPE - 3



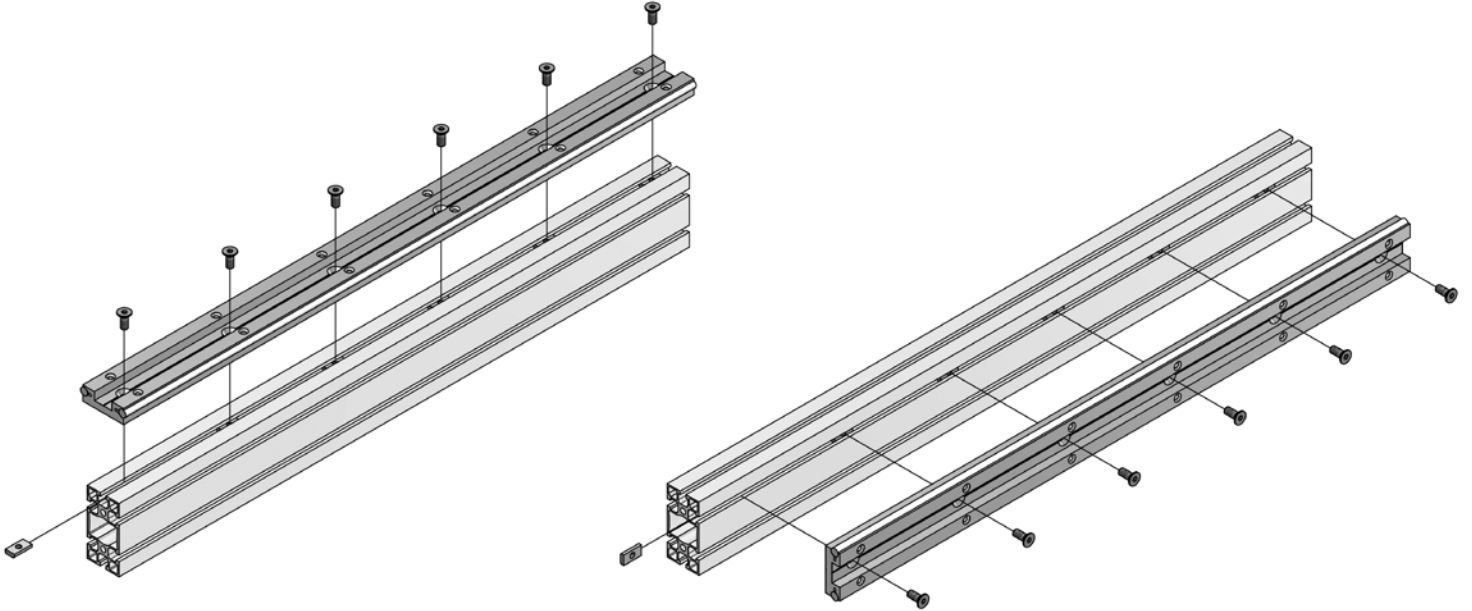
**EXAMPLES**

Brand	Model	Model
Bonfiglioli	mV30-F / mVF44-F / mVF49-F / W63U-F	mp053 / mp060 / mp080
Motovario	NMRV30-FA / NMRV40-FA / NMRV50-FA / NMRV63-FA	
Varvel	MRT28-F / MRT40-F / MRT50-F	
Tramec	XC30-F1 / XC40-F1 / XC50-F1	EP55-TT / EP75-TT / EP90-TT
Siboni		RE55 / RE63 / RE80
apex dynamics		pE50 / pE70

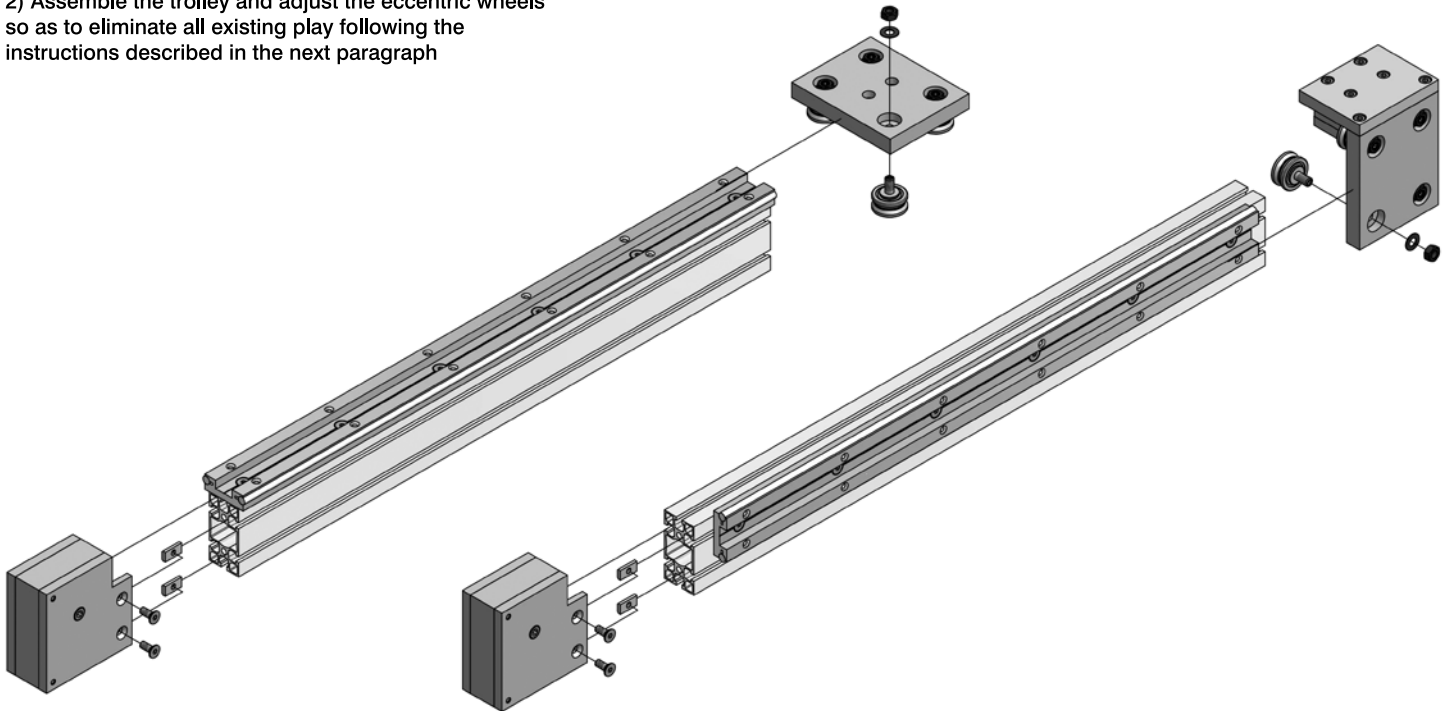
\*For any other brand or different size please contact technical office

**ASSEMBLY INSTRUCTION**

1) Couple the guide to the support profile with M8 screws and suitable blocks



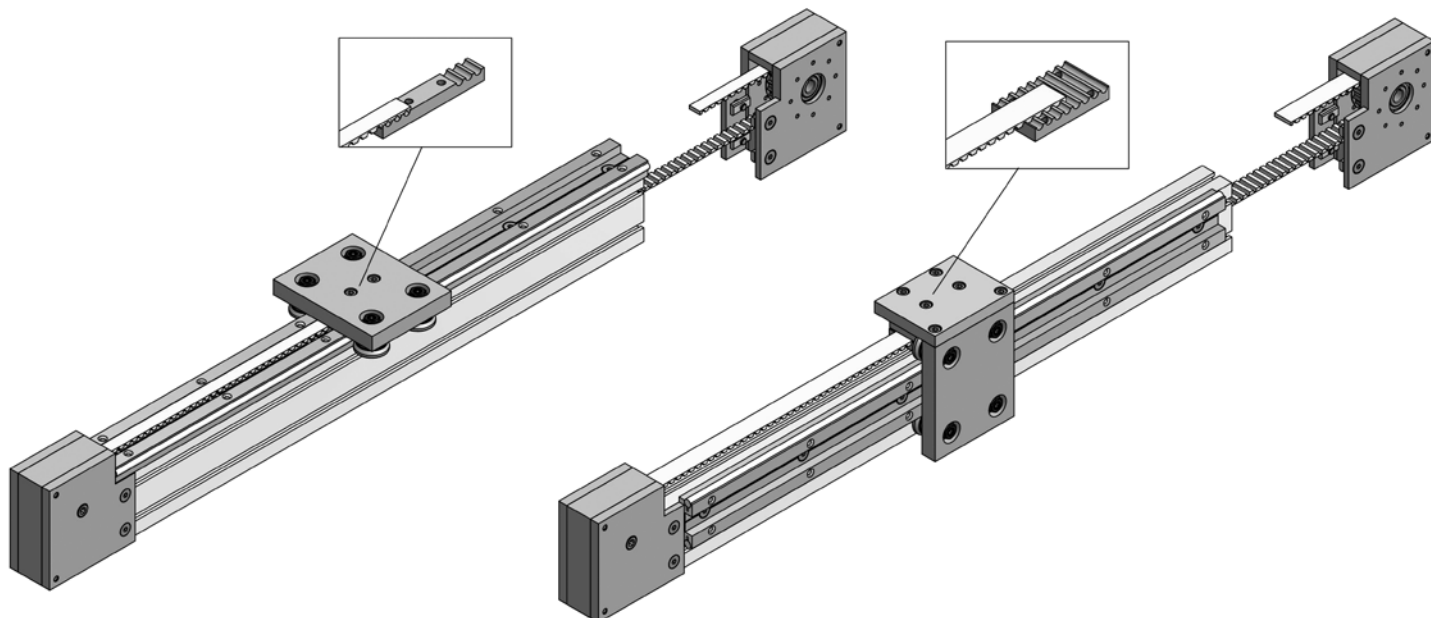
2) Assemble the trolley and adjust the eccentric wheels so as to eliminate all existing play following the instructions described in the next paragraph



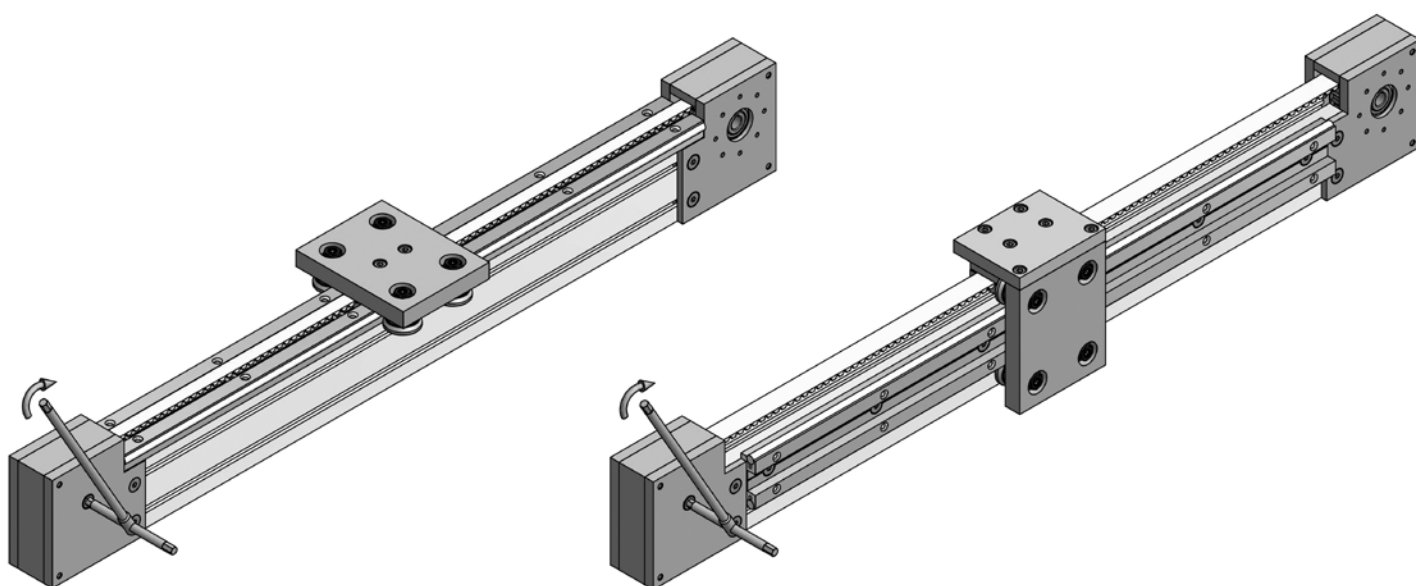
**NOTE:** in case of lateral mounting the wheels with eccentric pin must slide on the lower bar



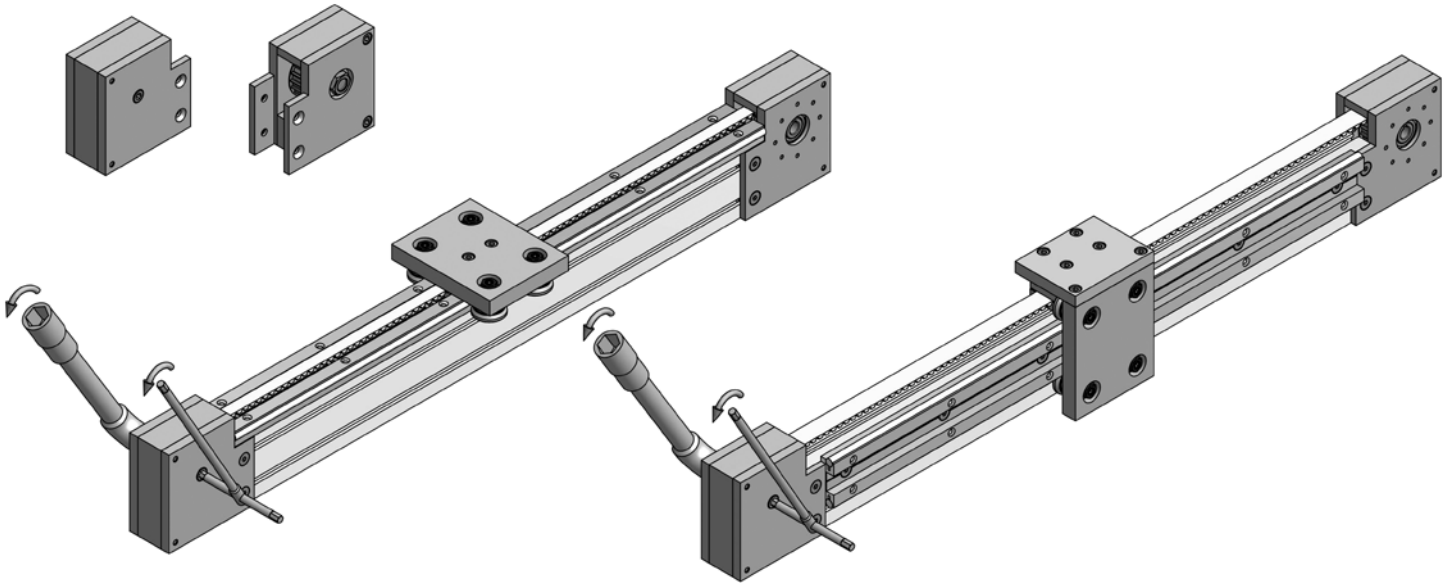
3) Pass one of the belt end through the mounted head, the supporting profile and through the second not mounted head and fix it to the trolley with the toothed plate



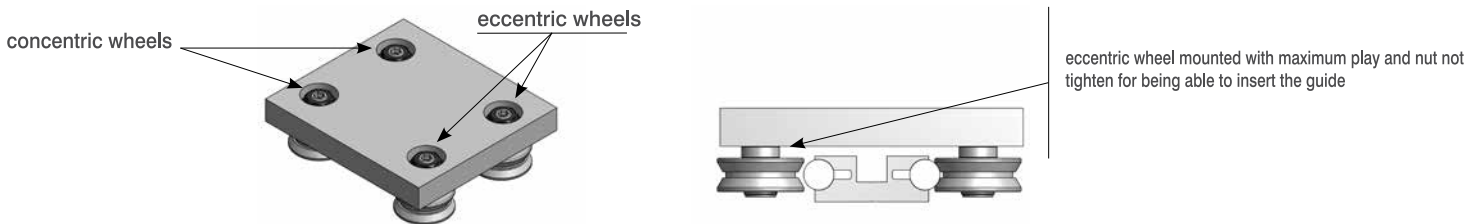
4) Position the eccentric pin of the transmission at the minimum tension, fix the second head and after defining the length fasten the second belt end



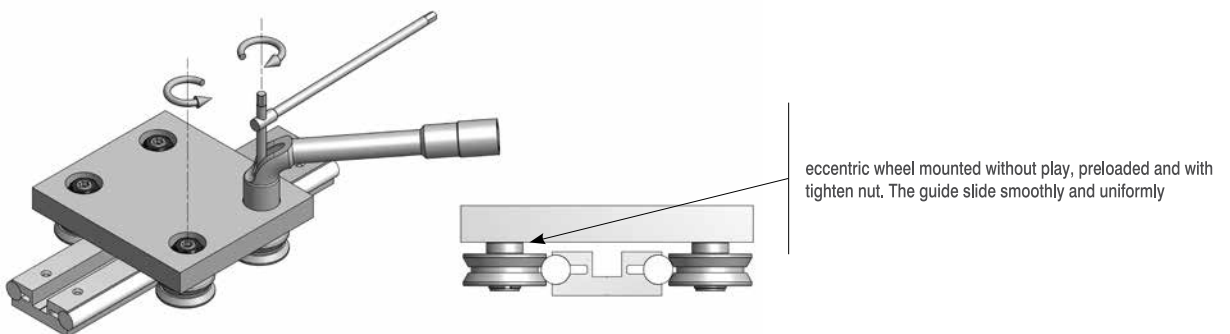
5) After completing the connection adjust the belt tension with the eccentric pin (A) of the drive head and lock it with its nut (B)

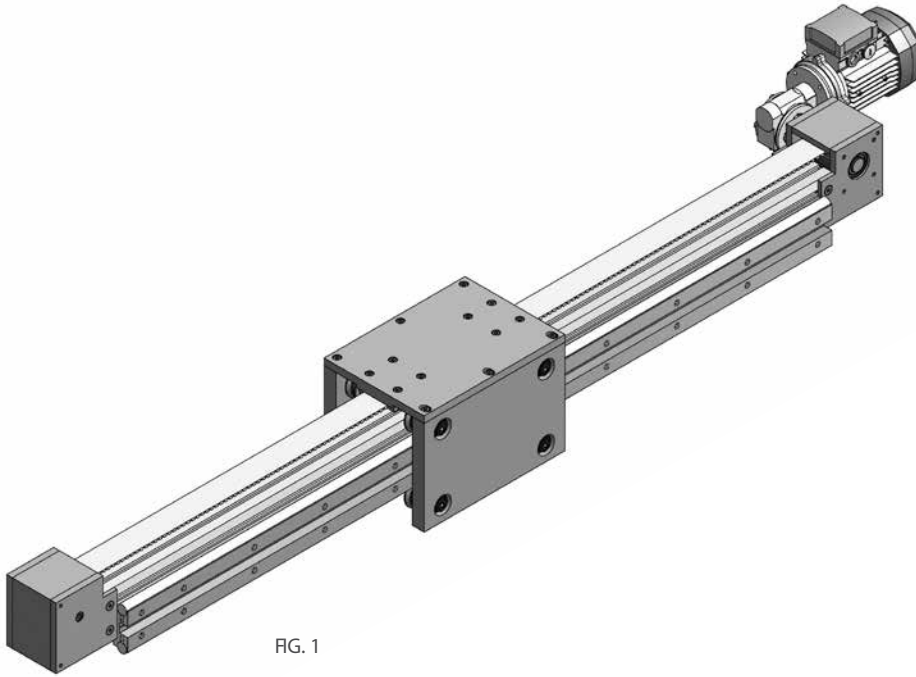


1) Assemble and tighten the concentric wheels (marked with letter C) on one of the two trolleys running sides  
 2) Assemble the two eccentric wheels (marked with letter E) on the opposite side and position it at the point of maximum play with an hexagonal wrench

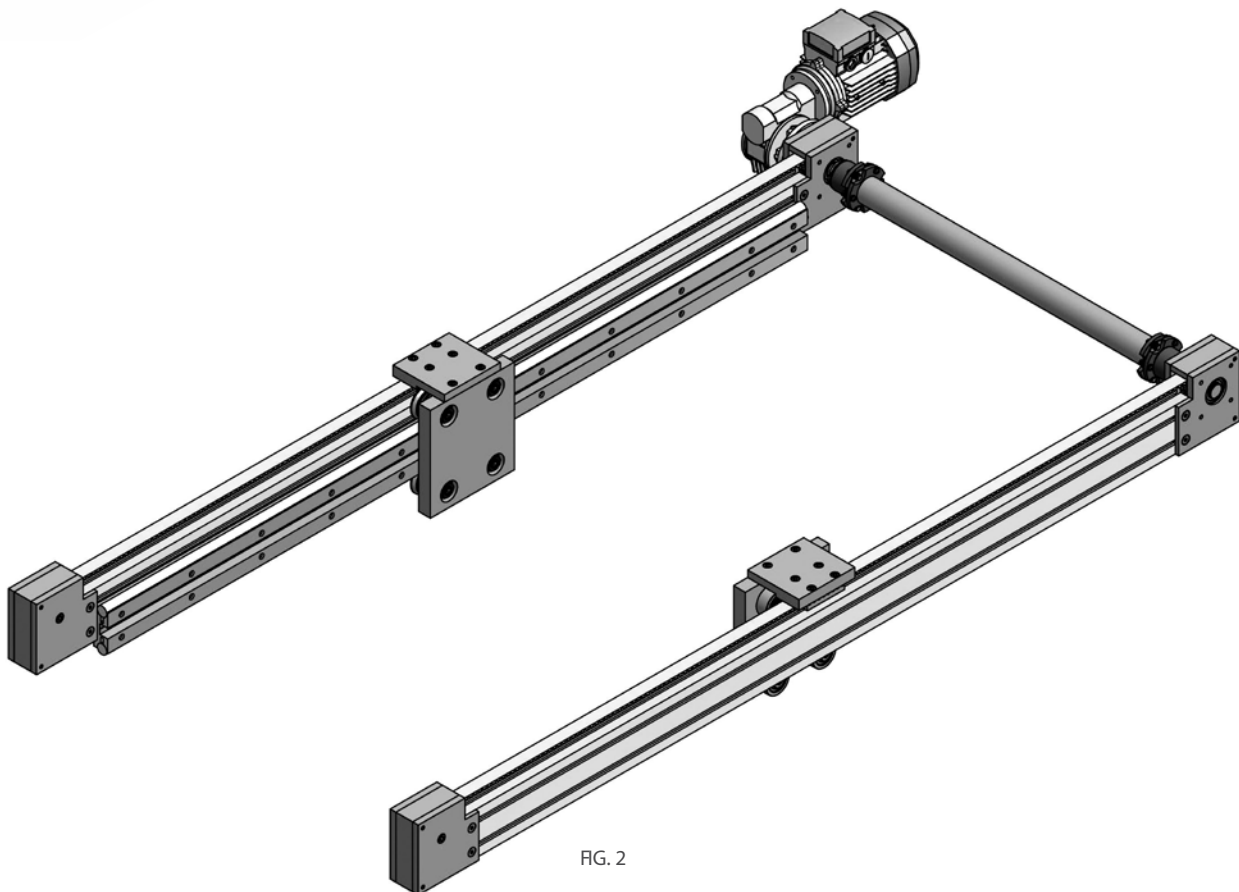


3) Insert the guide into the trolley  
 4) Adjust and tighten the two eccentric wheels so as to eliminate play, giving them the correct preloading (see page 4)





The double guide fitted on a single central profile provides high rigidity and is the perfect solution for those applications which have a lateral overhang load.



When the application calls for two parallel guides, the ideal solution is to use guides fitted at the side so that grooved wheels can be employed to give direction, and the cylindrical wheels to compensate for any lack of parallelism that might have occurred during assembly on the frame

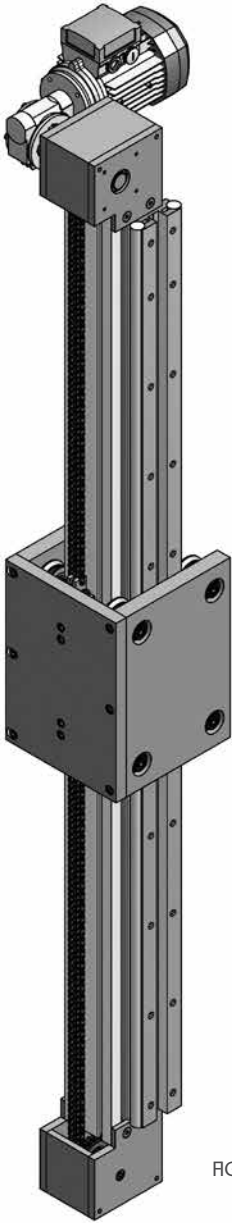


FIG. 1

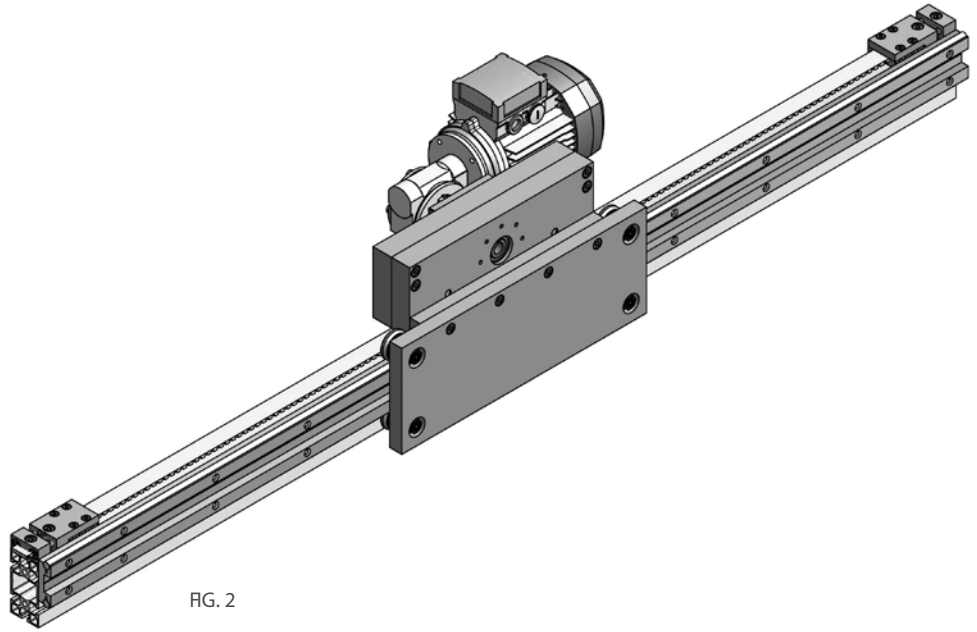
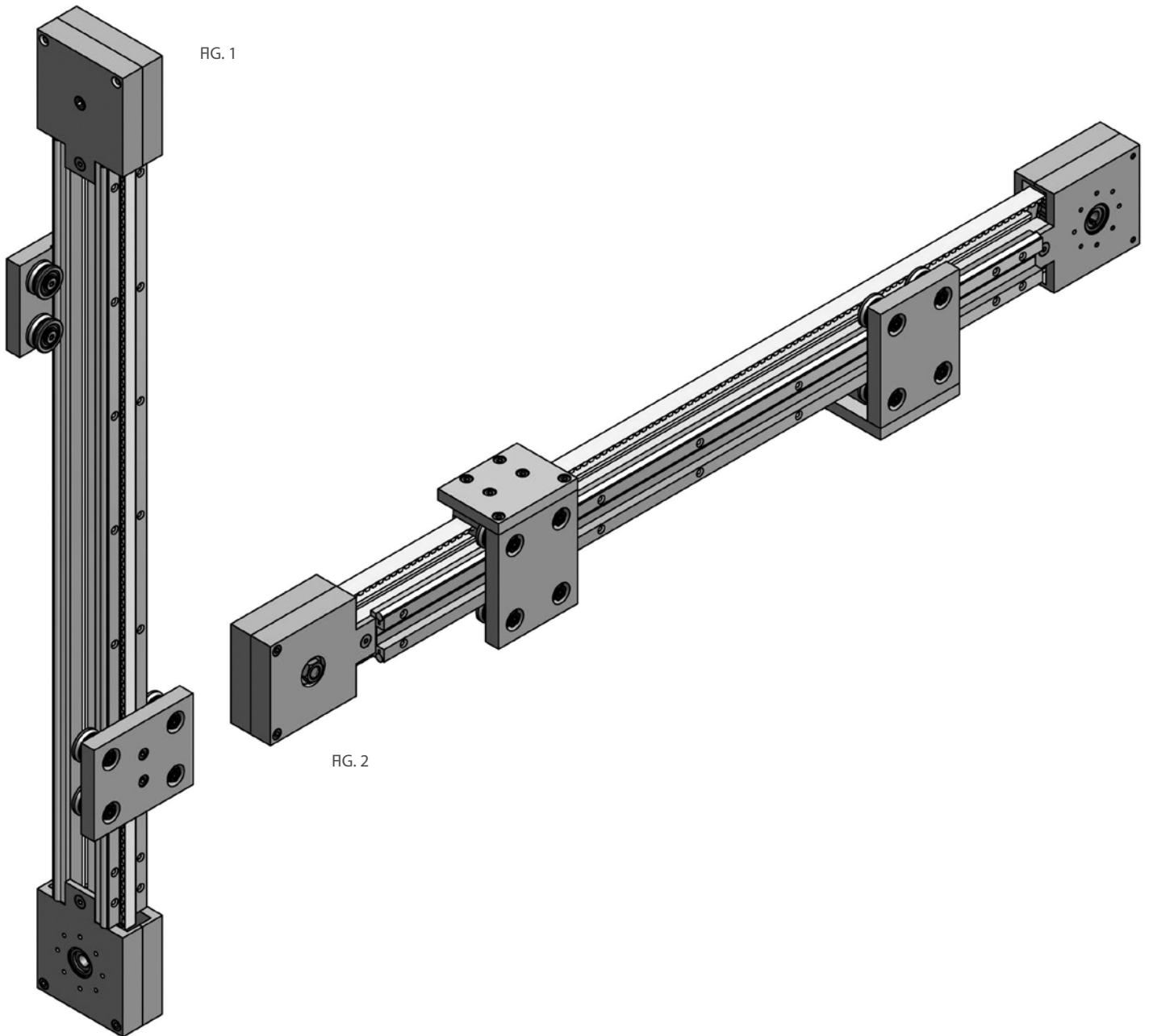


FIG. 2

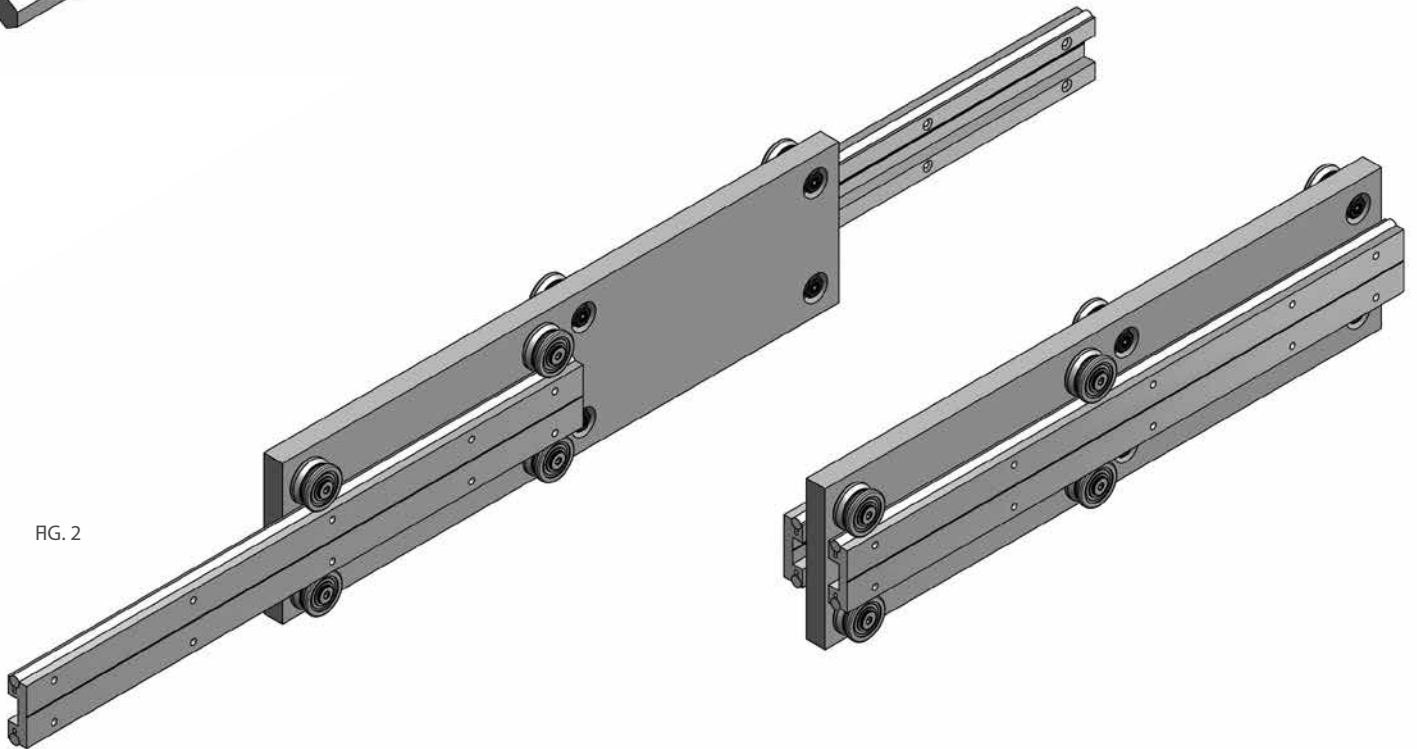
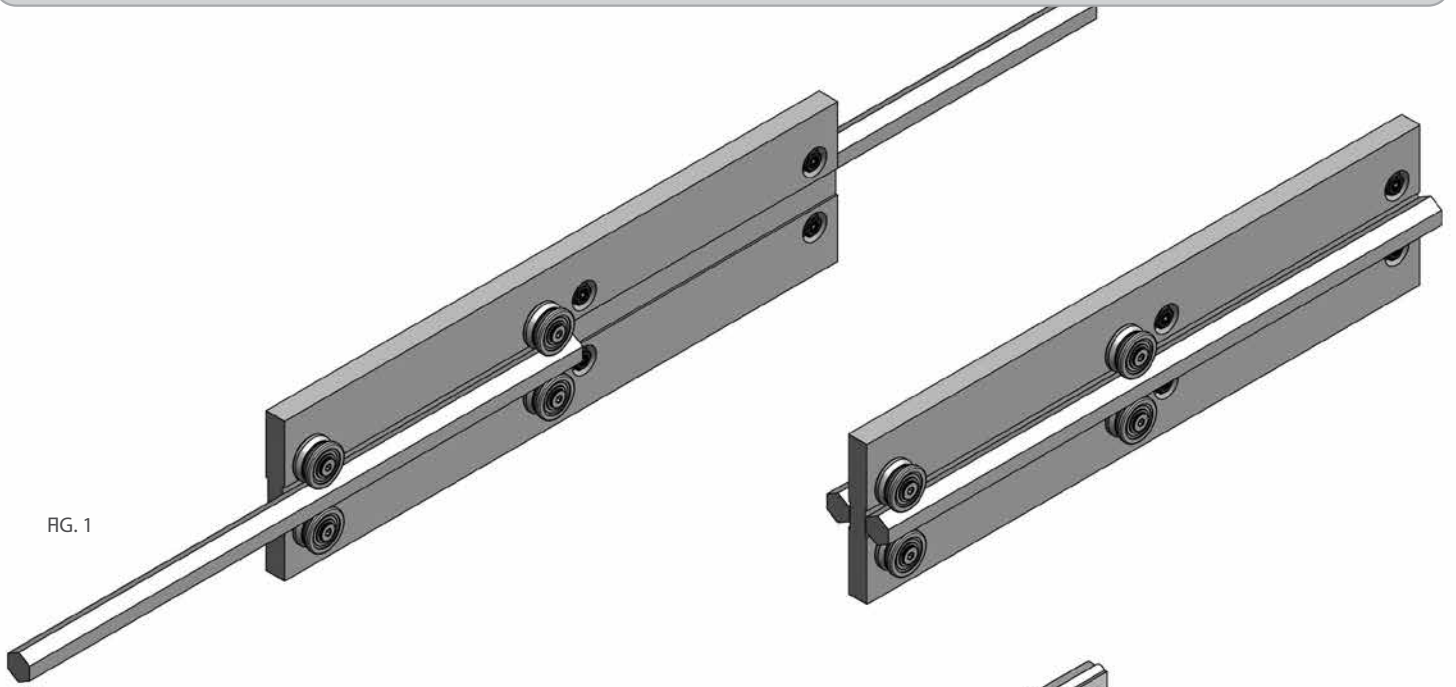
When the application requires a stroke exceeding 6-7 m, a speed equal to or greater than 1 m/s and quiet transmission, a belt is used as if it were rack. The belt is attached at the ends by two tensioners, and turns on a toothed pulley housed in a special head attached directly to the carriage. Rotation of the pulley moves the carriage .

For vertical movement, we propose a solution employing the double 3/8" chain. The double guide keeps the load stable and prevents it from swinging. The special trolleys, longer than the standard ones, are excellent for counteracting the overturning moment, and the cover linking them provides enough space for fastening the structure to be handled.

Using the chain eliminates the risk of teeth being skipped, a problem that may be encountered when using the belt for vertical movement.



Two examples of a reciprocator: using the one illustrated on the left side FIG.1, the two trolleys can be raised and lowered at the same time (a classic application is the use of the counterweight to even out strain on the motor); using the one illustrated on the right side FIG.2, the two trolleys approach and move away from each other simultaneously (useful when wanting to create a gripping system, opening doors, a compactor etc.).



Telescopic guides are the ideal solution for movement in small spaces and where the guide has to be concealed, for example in industrial drawers, or for pulling out equipment for maintenance, or sliding window and door panels

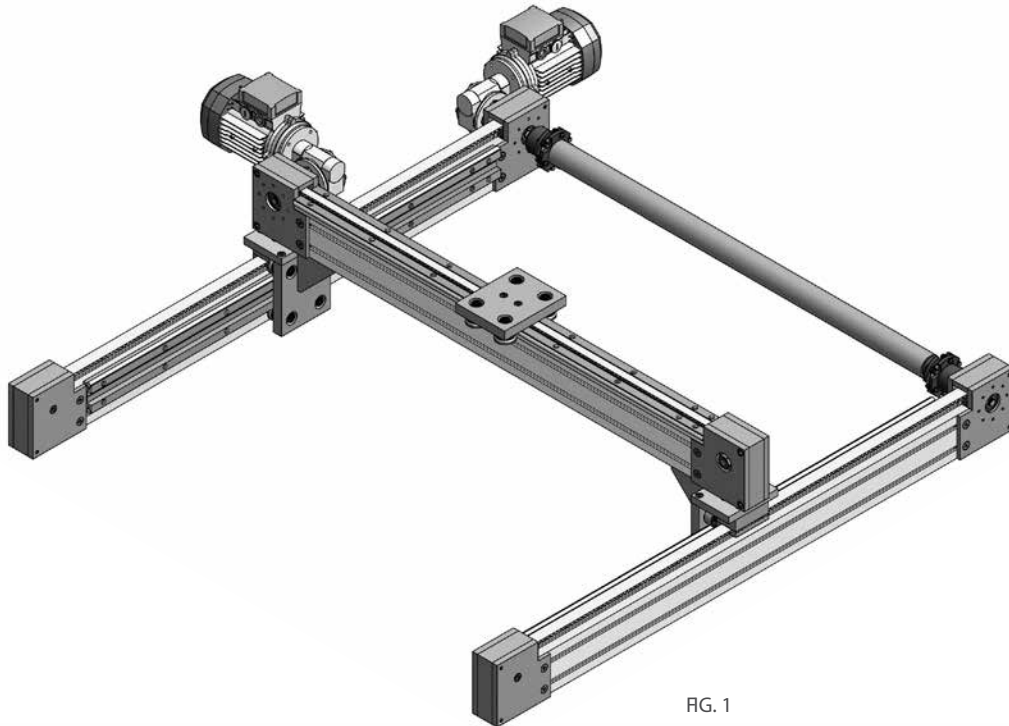


FIG. 1

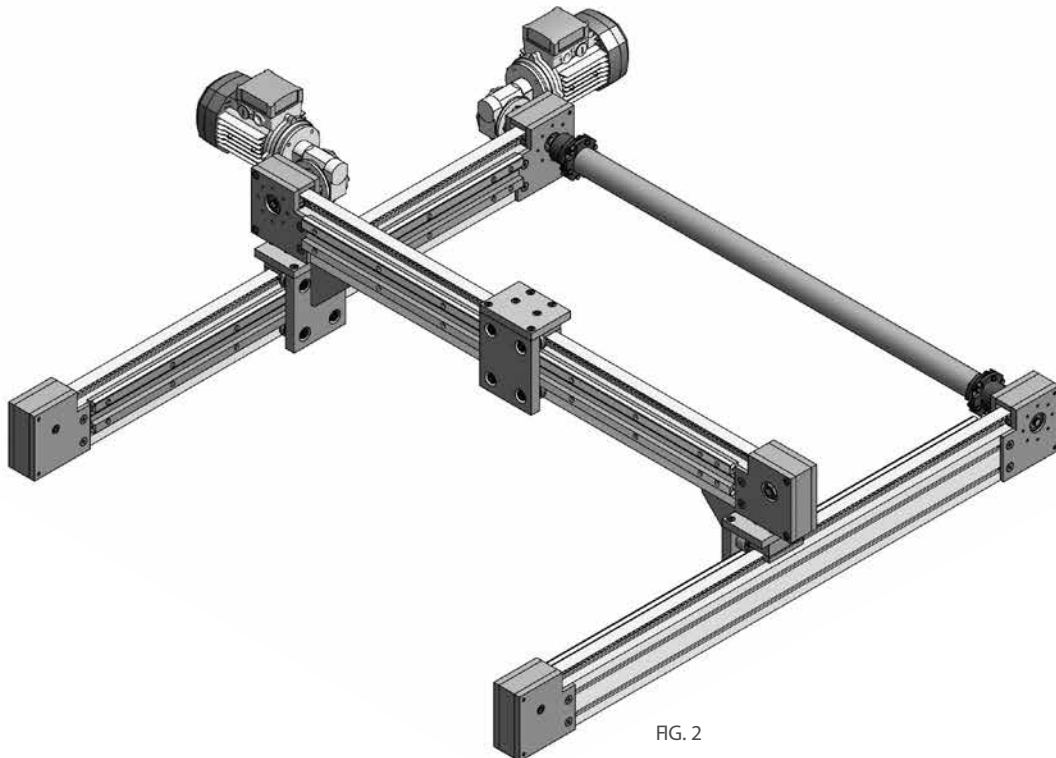


FIG. 2

The two drawings above show the ideal solution for X-Y systems that require long strokes and stable movement. The transverse Y-axis rests on the two X-axis carriages, one of which is fitted with grooved wheels and the other with cylindrical wheels. These facilitate the recovery of any errors in parallelism which may be encountered when installing the structure. The transmission shaft synchronizes the movement.

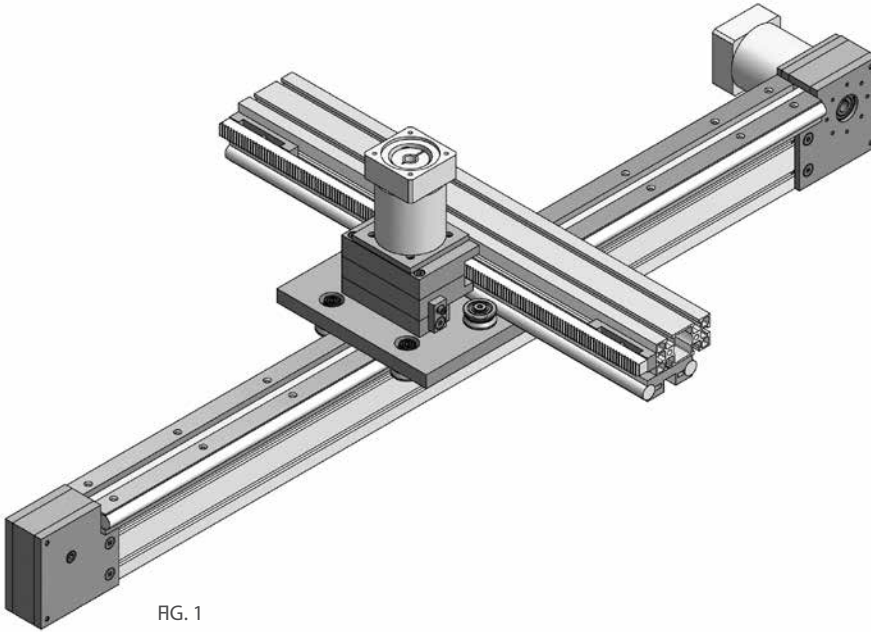


FIG. 1

X-Y movement with concealed transverse Y-axis. This system is particularly suitable in those applications where the Y-axis must leave the work area after the movement has taken place. Use of a rack guarantees small overall dimensions and makes it possible to keep the motor on board the carriage of the X-axis.

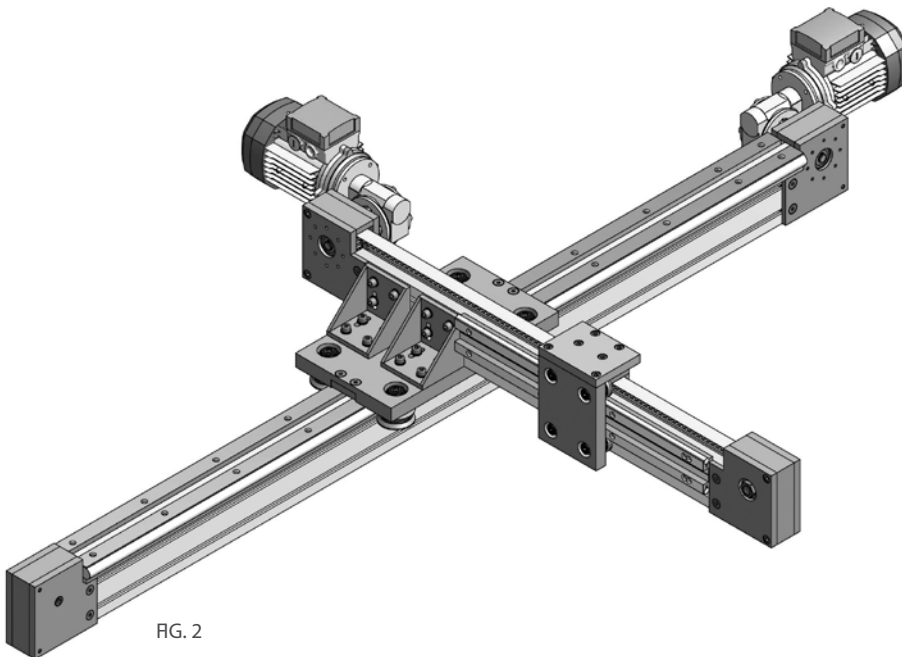


FIG. 2

X-Y movement with fixed Y-axis. Unlike the case above, the Y-axis protrudes on one side and the carriage is the moving element. The use of a belt makes it possible to keep the gear motor offset to one side with the advantage that it partially counterbalances the protrusion of the Y-axis.



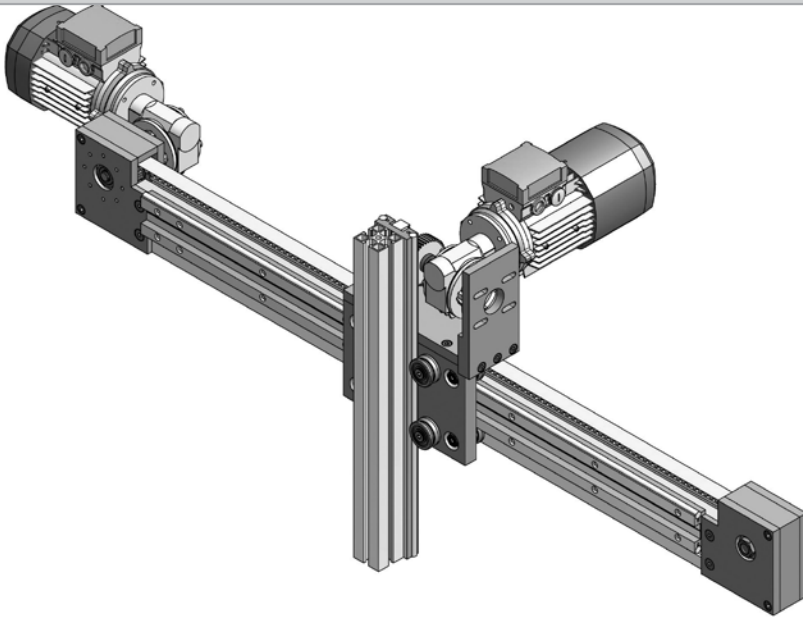


FIG. 1

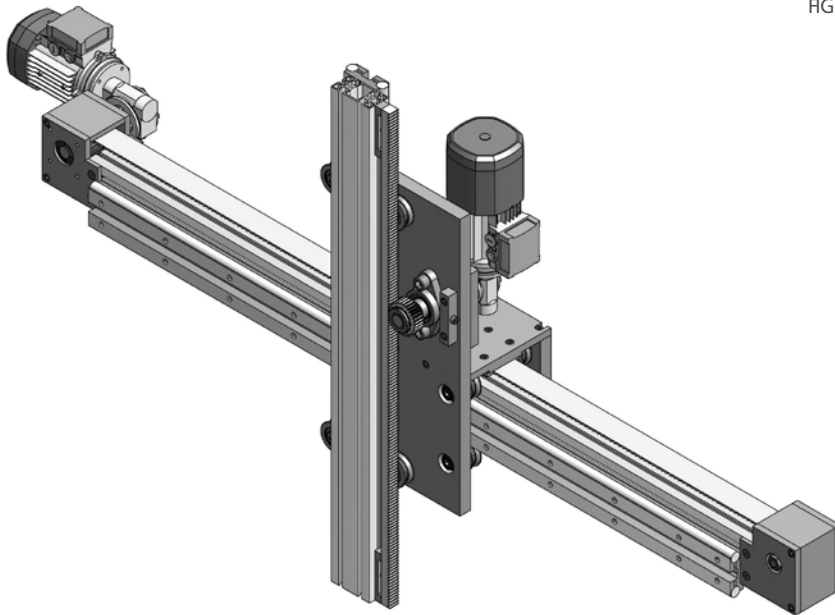


FIG. 2

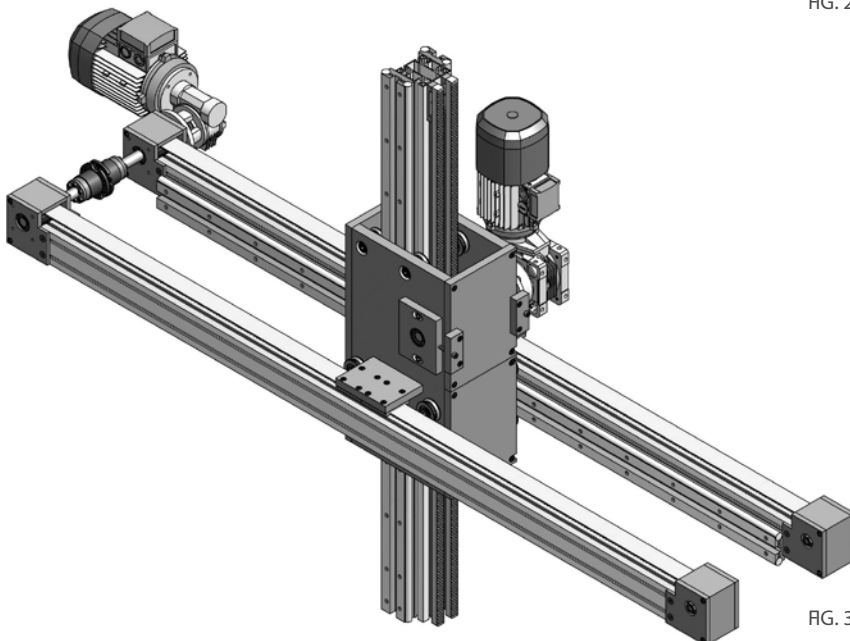


FIG. 3

Three X-Z movement systems.

The horizontal axis is driven by a positive drive belt whilst the vertical one is driven by a rack.

FIG.1: compact system for light loads, houses the rack inside the guide's groove.

FIG.2: system larger and more robust, the rack has been fastened on a grooved profile measuring 45x90, which can also be used to anchor the load to be handled. The cross trolley, larger in size than the standard version, assures vertical sliding greater stability, at the same time allowing us to achieve longer travel.

FIG.3: the two horizontal guides keep the vertical axis centered providing greater rigidity. This is the ideal solution for long vertical strokes with heavy loads.

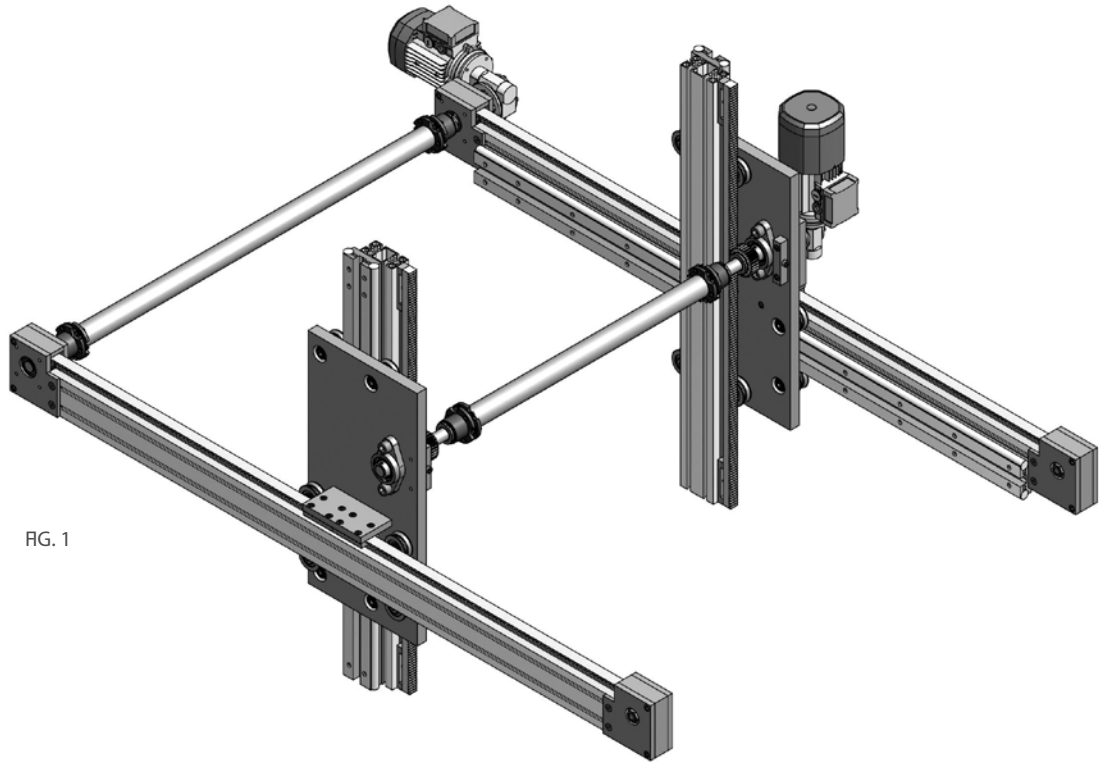


FIG. 1

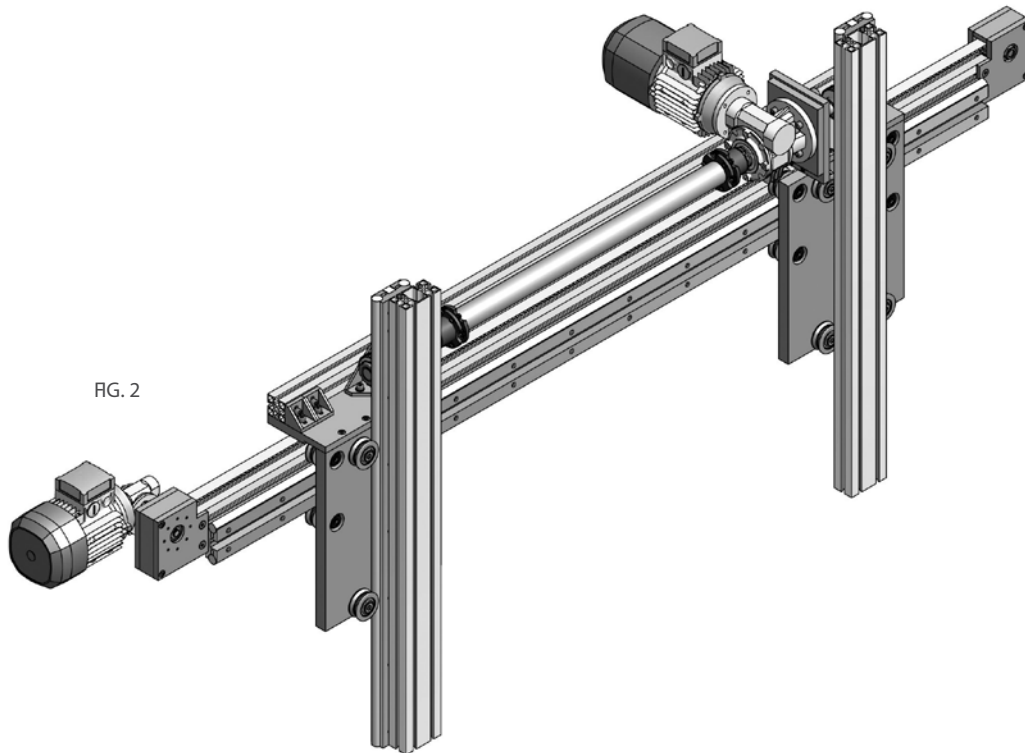


FIG. 2

Two examples of X-Z solutions.  
 The option shown in Fig. 1 is generally used for moving bulky loads where a single vertical axis would make movement unstable.  
 Fig. 2 instead shows an option that is particularly suitable when two objects have to be moved simultaneously to two consecutive work stations, or when long objects such as bars or profiles have to be moved.

This type of movement uses two side guides as supporting columns and a transverse guide on which the object to be moved can be mounted. The object is centered on the two carriages of the vertical axes to reduce the overall dimensions and overhang loads.

It is particularly suitable when it is necessary to automate processes that handle products with large vertical walls such as painting and water jet cleaning, or for handling products in vertical warehouses.

FIG. 1

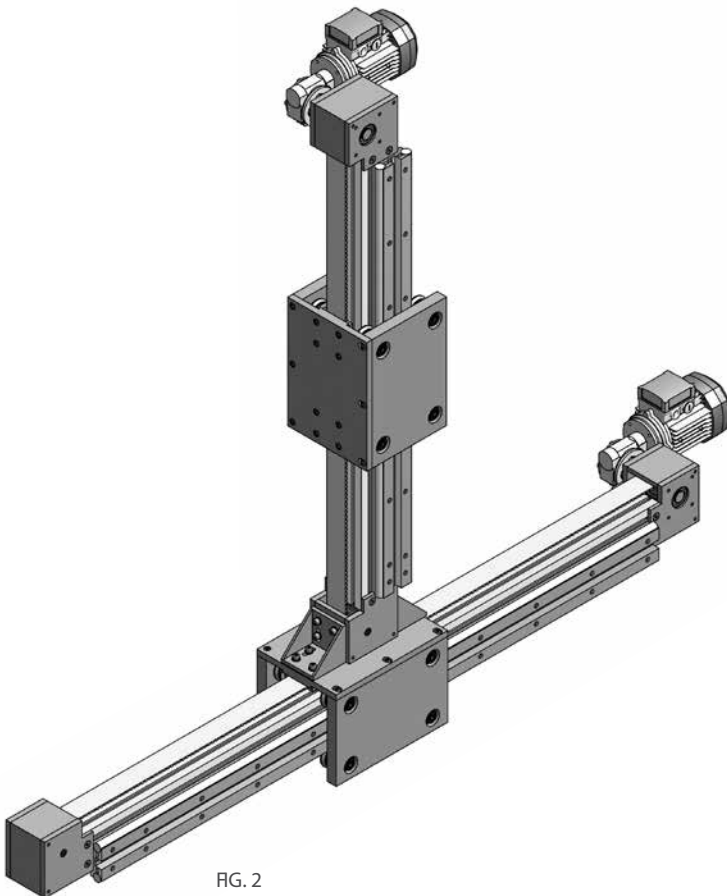
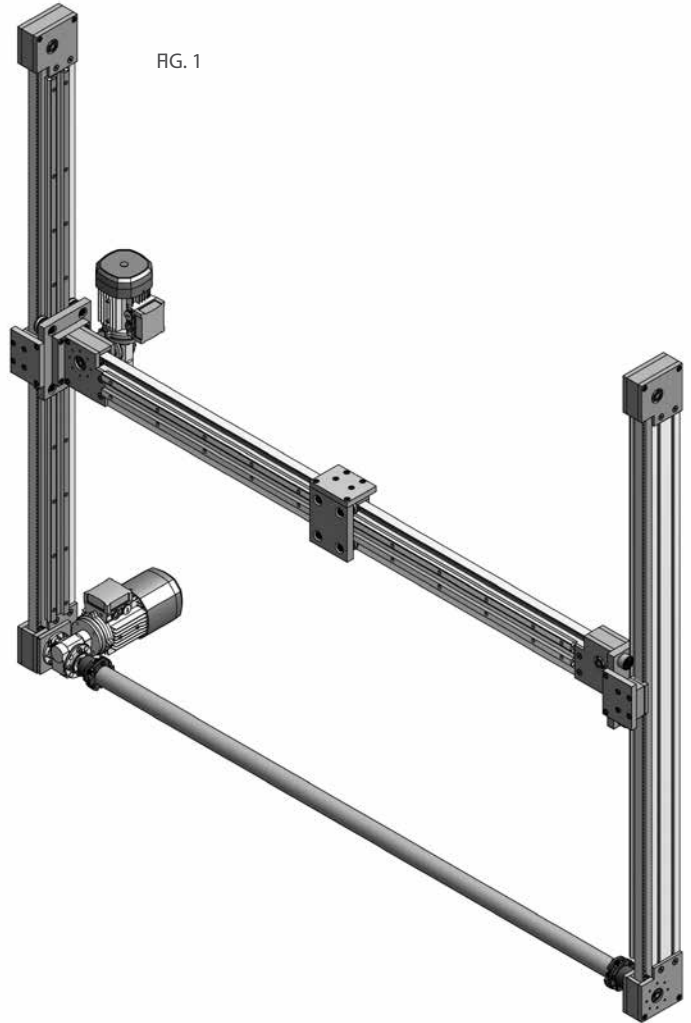


FIG. 2

Another handling solution is shown to the side. In this case, the vertical column rests on the horizontal axis which is fitted with a double guide. Depending on the client's needs, it can be designed with a larger width to increase its stability.

In the case of a very tall vertical axis, reinforcing struts are required

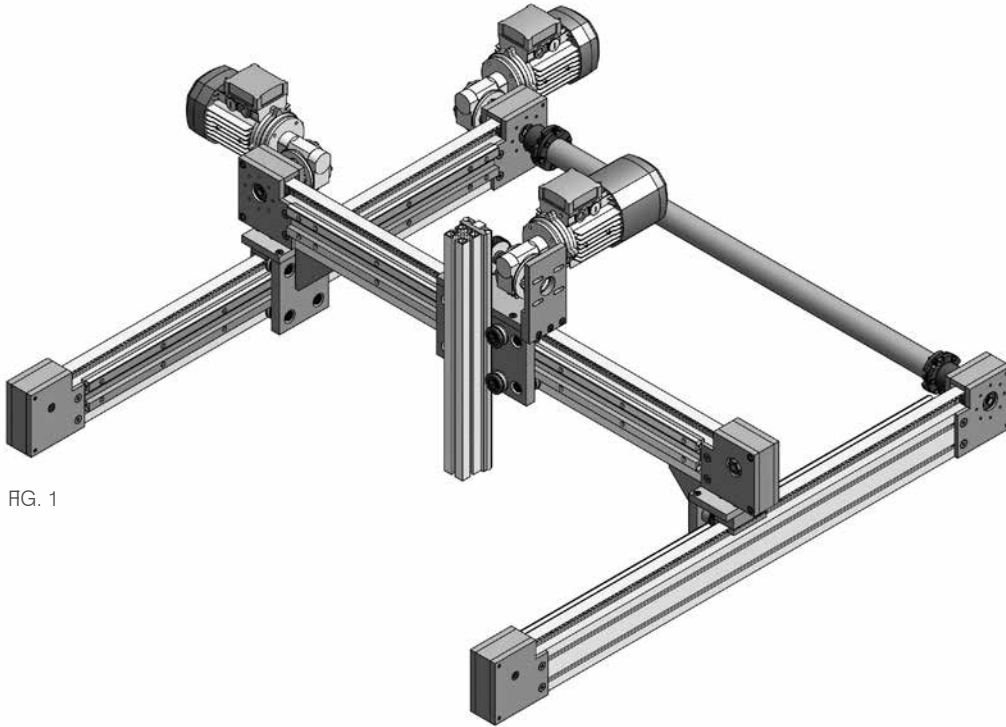
**SAMPLES OF X-Y-Z SYSTEMS**

FIG. 1

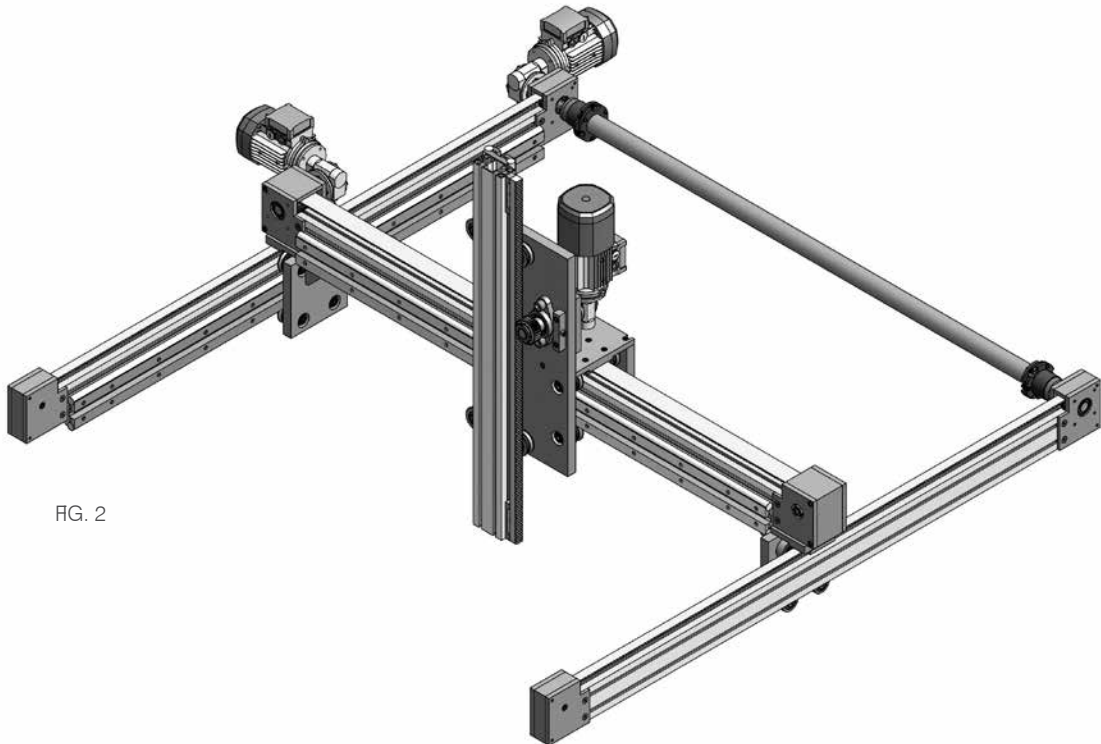


FIG. 2

The two systems illustrated are for movement along 3 axes. The one in the drawing at the top is designed for light loads and short travel, whilst the one at the bottom is made with larger guides for applications calling for greater rigidity and involving heavy loads, long travel and high speeds.

Each system is always designed with attention to the tiniest detail with a view to tailoring solutions to reflect individual customer needs more closely, applying appropriate modifications wherever necessary.

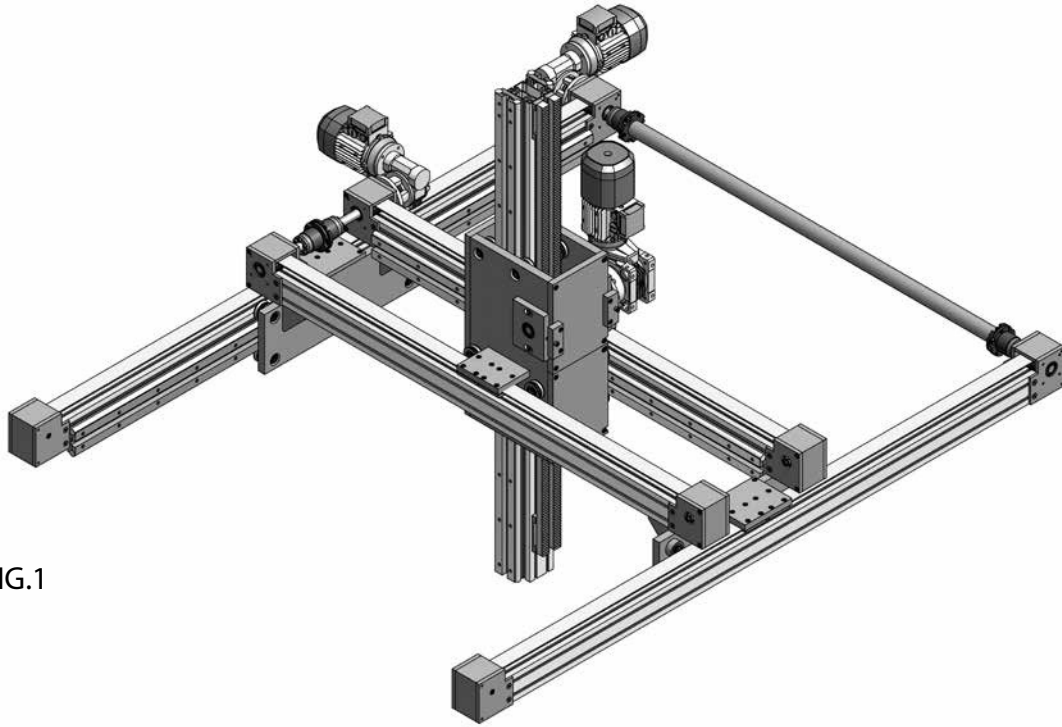


FIG.1

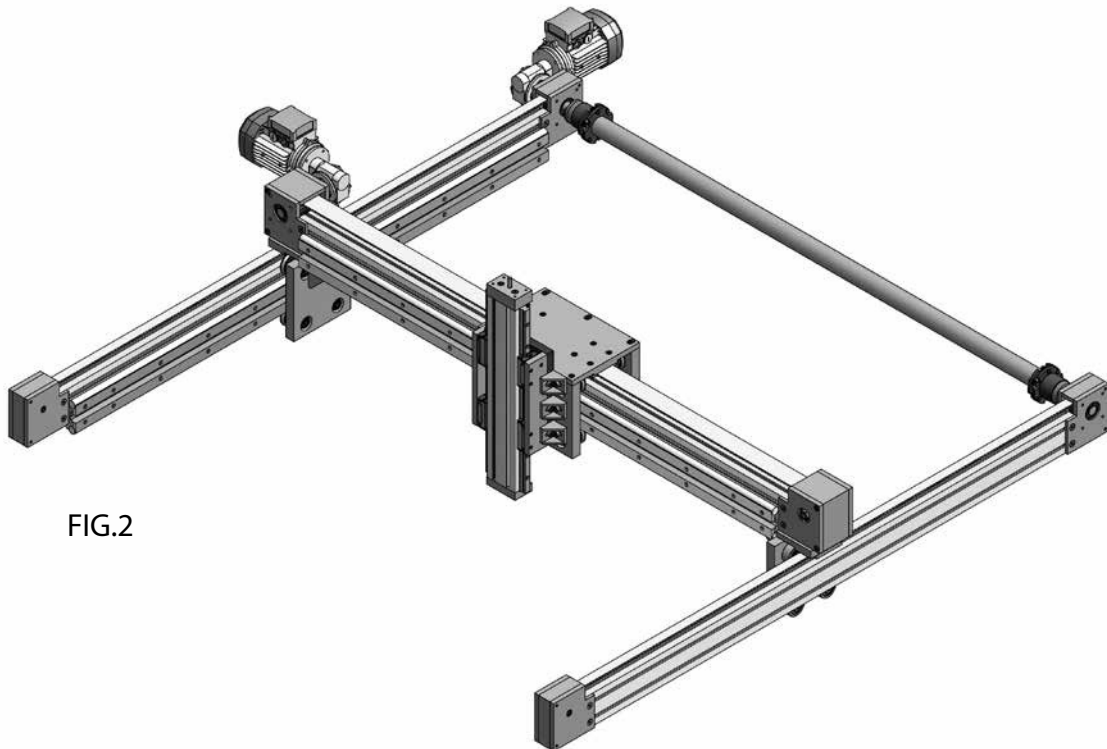


FIG.2

FIG.1 shows a system designed for heavy loads and long vertical strokes. The double rack makes it possible to raise considerable weights while the boxed double carriage keeps the vertical axis well controlled and eliminates oscillations.

FIG.2 shows a solution used extensively in small workplaces. The ball bearing guides on the vertical axis and the double guide on the transverse axis ensure a good level of rigidity and absorption of the vibrations during work processes

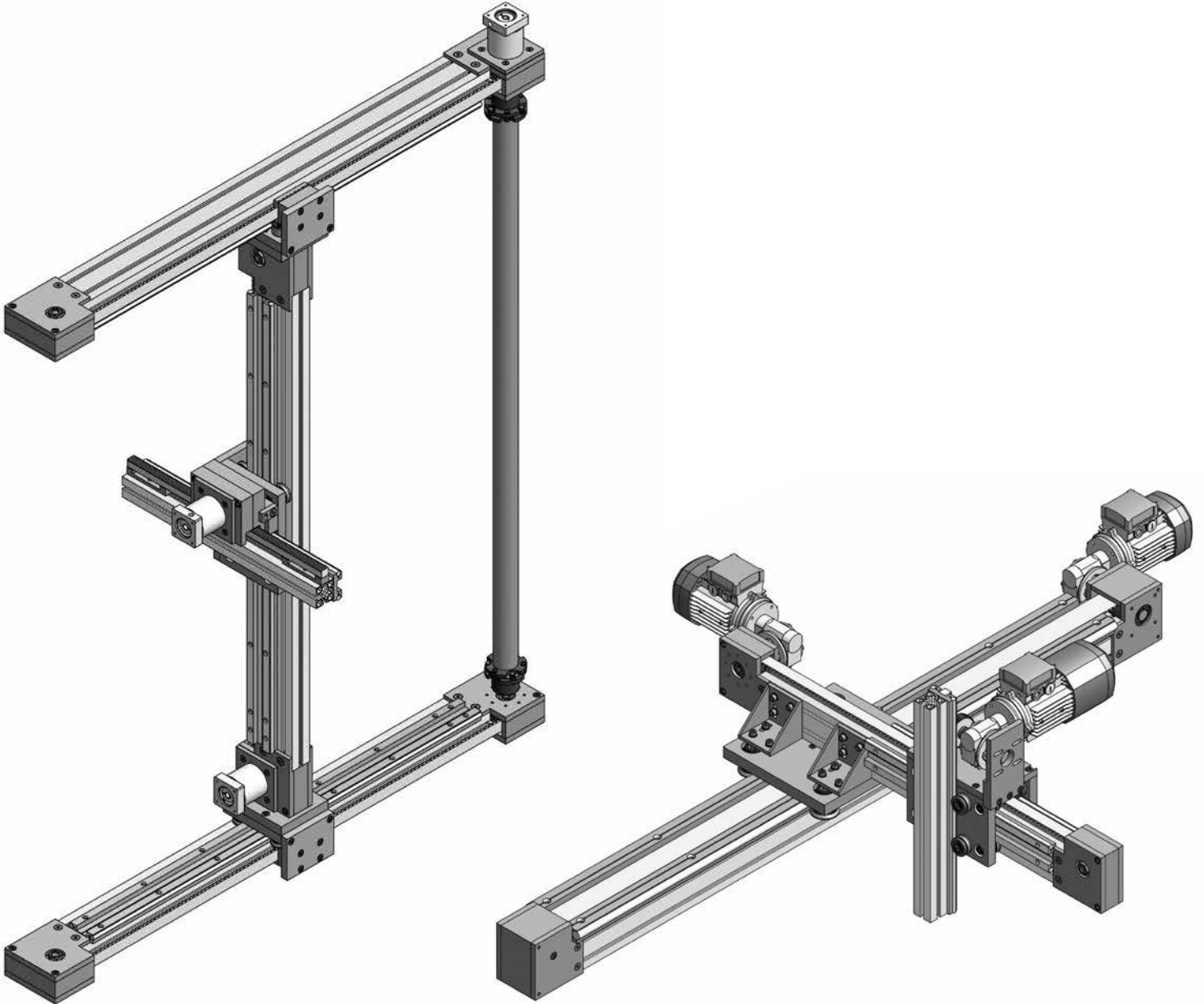


FIG.1 shows an application used extensively for handling products in vertical warehouses. The belts can be replaced with racks depending on the lengths.

FIG.2 This is a cantilever system used when the space available does not permit the use of a classic bridge system. The use of a cantilever means that the loads to be handled must be light.

**QUESTIONNAIRE GUIDE SIZING**

**DATE** \_\_\_\_\_ **SIGNATURE** \_\_\_\_\_

**COMPANY** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**NAME** \_\_\_\_\_  
**TELEPHONE** \_\_\_\_\_  
**FAX** \_\_\_\_\_

**EMPLOYMENT** It is requested a description of the work the guide will have to make with a sketch with the dimensions

**LOAD**

**Extent of the load** \_\_\_\_\_

**Dimensions of the load** \_\_\_\_\_

**Position of the load from the trolley / guide** \_\_\_\_\_

**LOAD**

<b>STROKE</b> _____	<b>mm</b>	<b>STROKE</b> _____	<b>mm</b>	<b>STROKE</b> _____	<b>mm</b>
<b>SPEED</b> _____	<b>m/s</b>	<b>SPEED</b> _____	<b>m/s</b>	<b>SPEED</b> _____	<b>m/s</b>
<b>ACCELERATION</b> _____	<b>m/s<sup>2</sup></b>	<b>ACCELERATION</b> _____	<b>m/s<sup>2</sup></b>	<b>ACCELERATION</b> _____	<b>m/s<sup>2</sup></b>
<b>DECELERATION</b> _____	<b>m/s<sup>2</sup></b>	<b>DECELERATION</b> _____	<b>m/s<sup>2</sup></b>	<b>DECELERATION</b> _____	<b>m/s<sup>2</sup></b>

**Cycle of work in unit of time** \_\_\_\_\_ /minute \_\_\_\_\_ /hour **HEURES DE MARCHÉ PAR JOUR** \_\_\_\_\_

**HEURES DE MARCHÉ PAR SEMAINE** \_\_\_\_\_

**Requested positioning accuracy** \_\_\_\_\_

**REQUESTED OF LIFE**

**HOURS OF WORK**

**KM TRAVELLED**

