ROLLON®
BY TIMKEN

Uniline System

A-Series

Uniline A series

Uniline A series description

Fig. 1

Uniline is a family of ready-to-install linear actuators. They consist of internal Compact Rail roller sliders and steel-reinforced polyurethane belts in a rigid aluminum profile. Longitudinal seals enclose the system. This arrangement provides the best protection for the actuator from soiling and damage. In the A series, the fixed bearing rail (T-rail) is mounted horizontally in the aluminum profile. Versions with long (L) or double (D) sliders in one axis are possible.

The most important characteristics:

- Compact design
- Protected internal linear guides
- High traversing speeds
- Grease-free operation possible (depending on the application. For further information, please contact our Application Engineering department)
- High versatility
- Long strokes
- Versions with long or multiple sliders available in one linear axis

Preferred areas of application:

- Handling and automation
- Multi-axis gantries
- Packaging machines
- Cutting machines
- Displaceable panels
- Painting installations
- Welding robots
- Special machines

Technical data:

- Available sizes [mm]:
  Type A: 40, 55, 75
- Length and stroke tolerances:
  For strokes <1 m: +0 mm to +10 mm (+0 in to 0.4 in)
  For strokes >1 m: +0 mm to +15 mm (+0 in to 0.59 in)

The components

Extruded profile

The anodized 6060 aluminum alloy extrusion used for the profile of the Rollon Uniline A series linear units were designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. (see physical-chemical characteristics below). The dimensional tolerances comply with EN 755-9 standard.

Driving belt

The Rollon Uniline A series linear units use steel reinforced polyurethane drive belts with RPP pitch and parabolic profiles. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Carriage

The carriage of the Rollon Uniline A series linear units are made entirely of anodized aluminum. Each carriage has mounting T-slots for the connection to the moving element (size 40 has threded holes). Rollon offers multiple carriages to accommodate a vast array of applications.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 1

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 2

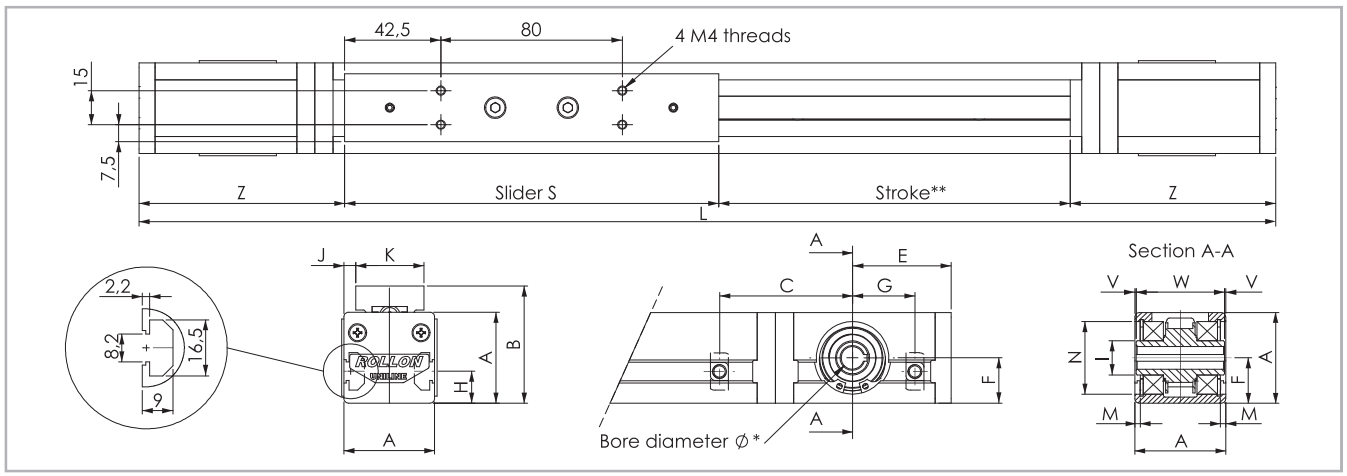
Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 3

A40

A40 system

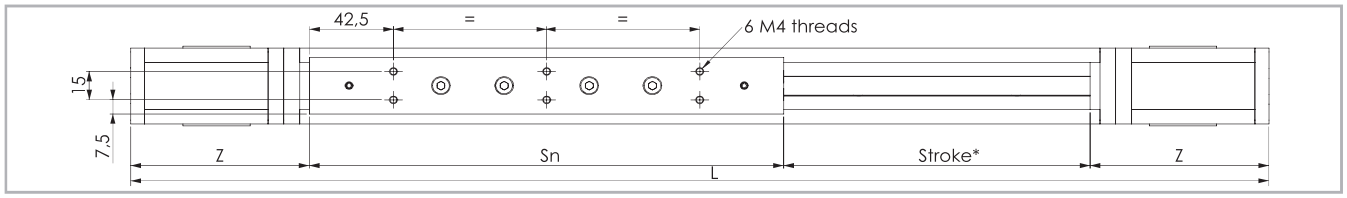


* For information on the motor connection bores, see ordering key. ** The length of the safety stroke is provided on request according to the customer's specific requirements. Fig. 2

Type	A [mm]	B [mm]	C* [mm]	E [mm]	F [mm]	G* [mm]	H [mm]	I [mm]	J [mm]	K [mm]	M [mm]	N [mm]	S [mm]	V [mm]	W [mm]	Z [mm]	Stroke** [mm]
A40	40	51.5	57	43.5	20	26	14	Ø 14,9	5	30	2.3	Ø 32	165	0.5	39	91.5	1900

* For the position of the T-nuts when using our motor adapter plates, see pg. US-11ff
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 9 Tab. 4

A40L with long slider

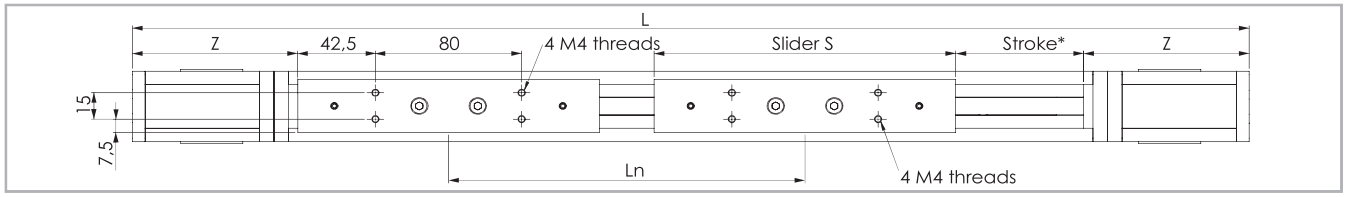


* The length of the safety stroke is provided on request according to the customer's specific requirements. Fig. 3

Type	S_{min} [mm]	S_{max} [mm]	Sn [mm]	Z [mm]	Stroke* [mm]
A40L	240	400	$Sn = S_{min} + n \cdot 10$	91.5	1660

* Maximum stroke for a single-piece guiding rail and a maximum slider plate length S_{max}
For longer strokes, see tab. 9 Tab. 5

A40D with double slider



* The length of the safety stroke is provided on request according to the customer's specific requirements. Fig. 4

Type	S [mm]	L_{min} [mm]	L_{max} ** [mm]	Ln [mm]	Z [mm]	Stroke* [mm]
A40D	165	235	1900	$Ln = L_{min} + n \cdot 5$	91.5	1660

* Maximum stroke for a single-piece guiding rail and a minimum slider plate distance L_{min}
** Maximum distance L_{max} between the centres of slider plates at a stroke of 0 mm
For longer strokes, see tab. 9 Tab. 6

Load ratings, moments and characteristic data

A40

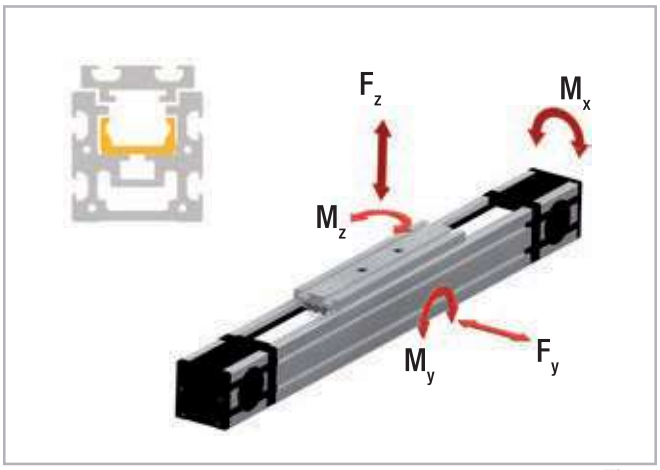


Fig. 5

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
A40	10RPP5	10	0.041

Tab. 7

Belt length (mm) = 2 x L - 168 Standard slider

Belt length (mm) = 2 x L - S_n-3 Long slider

Belt length (mm) = 2 x L - L_n - 168 Double slider

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
A40	1530	820	300	2.8	5.6	13.1
A40-L	3060	1640	600	5.6	22 to 70	61 to 192
A40-D	3060	1640	600	5.6	70 to 570	193 to 1558

For the calculation of the allowed moments, please observe pages SL-5ff

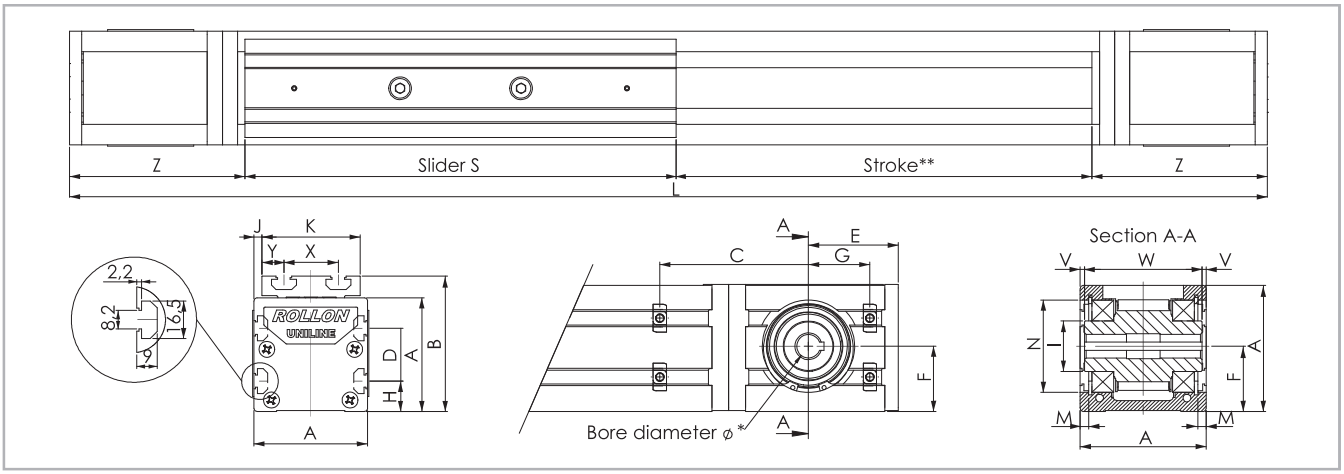
Tab. 8

Technical data	Type
	A40
Standard belt tension [N]	160
Moment at no load [Nm]	0.14
Max. traversing speed [m/s]	3
Max. acceleration [m/s²]	10
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	TLV18
Slider type	CS18 spec.
Moment of inertia ly [cm⁴]	12
Moment of inertia lz [cm⁴]	13.6
Pitch diameter of pulley [m]	0.02706
Moment of inertia of each pulley [gmm²]	5055
Stroke per shaft revolution [mm]	85
Mass of slider [g]	220
Weight with zero stroke [g]	1459
Weight with 1 m stroke [g]	3465
Max. stroke [mm]	3500
Working temperature	from -20 °C to + 80 °C

Tab. 9

A55

A55 system

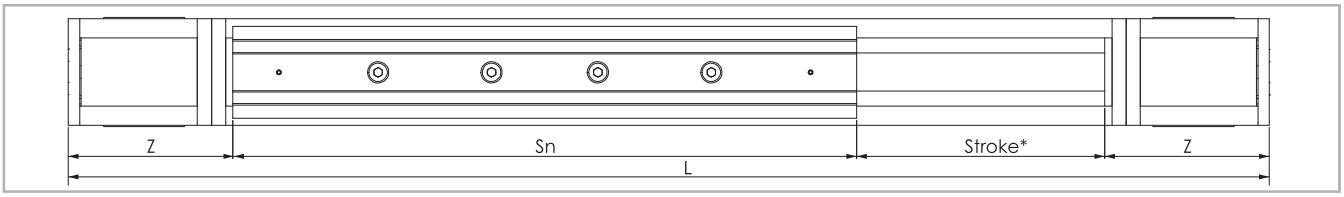


* For information on the motor connection bores, see ordering key. ** The length of the safety stroke is provided on request according to the customer's specific requirements. Fig. 6

Type	A [mm]	B [mm]	C* [mm]	D [mm]	E [mm]	F [mm]	G* [mm]	H [mm]	I [mm]	J [mm]	K [mm]	M [mm]	N [mm]	S [mm]	X [mm]	Y [mm]	V [mm]	W [mm]	Z [mm]	Stroke** [mm]
A55	55	71	67.5	25	50.5	27.5	32.5	15	Ø 24.9	1.5	52	2.35	Ø 47	200	28	12	0.5	54	108	3070

* For the position of the T-nuts when using our motor adapter plates, see pg. US-11ff
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 15 Tab. 10

A55L with long slider

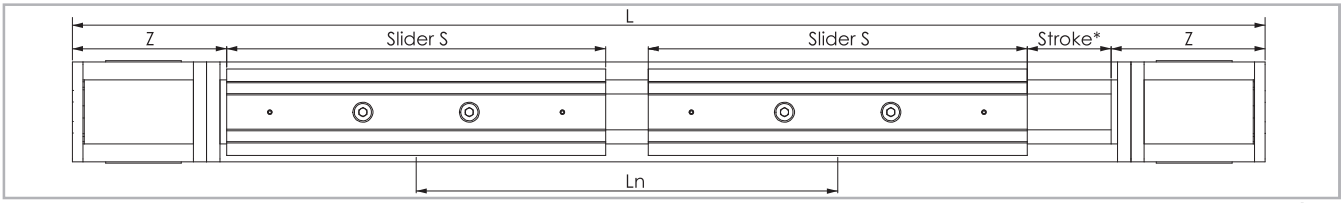


* The length of the safety stroke is provided on request according to the customer's specific requirements. Fig. 7

Type	S_{min} [mm]	S_{max} [mm]	Sn [mm]	Z [mm]	Stroke* [mm]
A055-L	310	500	$Sn = S_{min} + n \cdot 10$	108	2770

* Maximum stroke for a single-piece guiding rail and a maximum slider plate length S_{max}
For longer strokes, see tab. 15 Tab. 11

A55D with double slider



* The length of the safety stroke is provided on request according to the customer's specific requirements. Fig. 8

Type	S [mm]	L_{min} [mm]	L_{max} ** [mm]	Ln [mm]	Z [mm]	Stroke* [mm]
A55D	200	300	3070	$Ln = L_{min} + n \cdot 5$	108	2770

* Maximum stroke for a single-piece guiding rail and a minimum slider plate distance L_{min}
** Maximum distance L_{max} between the centres of slider plates at a stroke of 0 mm
For longer strokes, see tab. 15 Tab. 12

Load ratings, moments and characteristic data

A55

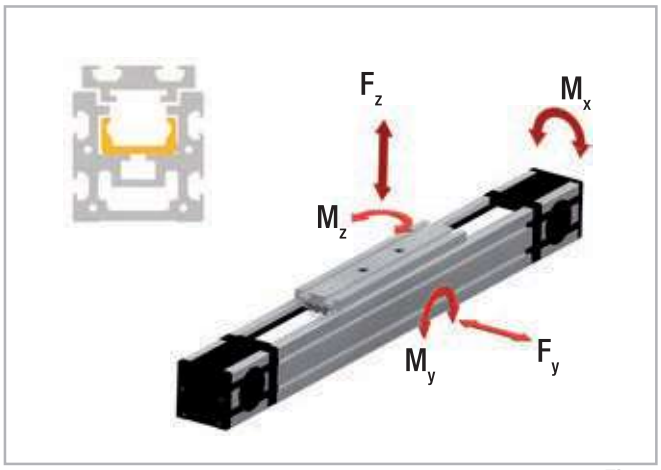


Fig. 9

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
A55	18RPP5	18	0.074

Tab. 13

Belt length (mm) = 2 x L - 182 Standard slider

Belt length (mm) = 2 x L - S_n+18 Long slider

Belt length (mm) = 2 x L - L_n - 182 Double slider

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
A55	4260	2175	750	11.5	21.7	54.4
A55-L	8520	4350	1500	23	82 to 225	239 to 652
A55-D	8520	4350	1500	23	225 to 2302	652 to 6677

For the calculation of the allowed moments, please observe pages SL-5ff

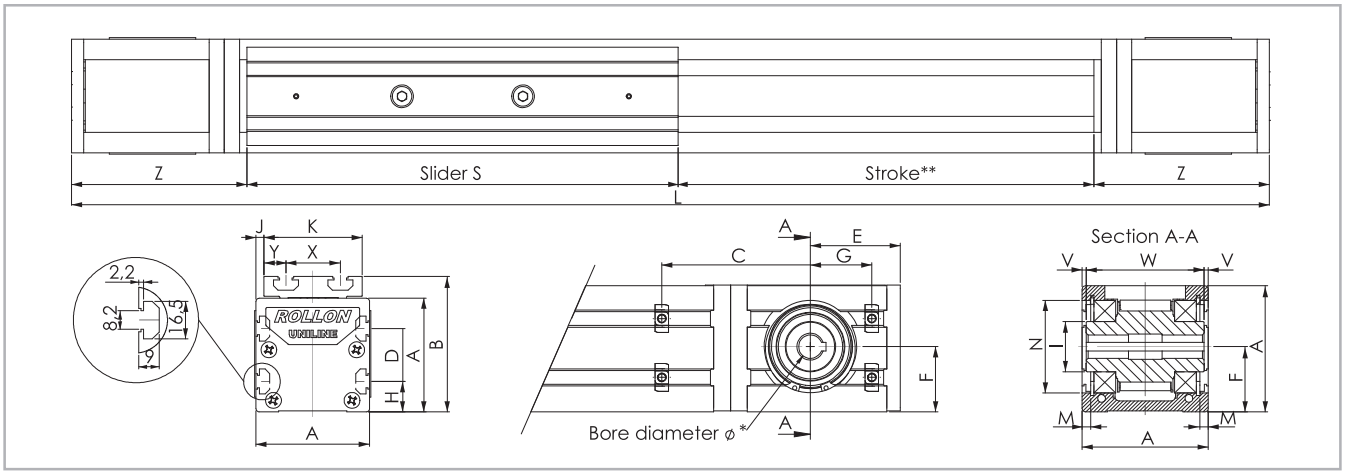
Tab. 14

Technical data	Type
	A55
Standard belt tension [N]	220
Moment at no load [Nm]	0.22
Max. traversing speed [m/s]	5
Max. acceleration [m/s²]	15
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	TLV28
Slider type	CS28 spec.
Moment of inertia Iy [cm⁴]	34.6
Moment of inertia Iz [cm⁴]	41.7
Pitch diameter of pulley [m]	0.04138
Moment of inertia of each pulley [gmm²]	45633
Stroke per shaft revolution [mm]	130
Mass of slider [g]	475
Weight with zero stroke [g]	2897
Weight with 1 m stroke [g]	4505
Max. stroke [mm]	5500
Working temperature	from -20 °C to + 80 °C

Tab. 15

A75

A75 system

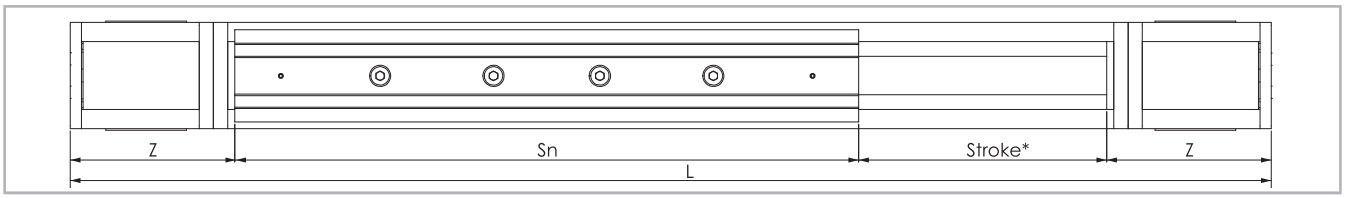


* For information on the motor connection bores, see ordering key. ** The length of the safety stroke is provided on request according to the customer's specific requirements. Fig. 10

Type	A [mm]	B [mm]	C* [mm]	D [mm]	E [mm]	F [mm]	G* [mm]	H [mm]	I [mm]	J [mm]	K [mm]	M [mm]	N [mm]	S [mm]	X [mm]	Y [mm]	V [mm]	W [mm]	Z [mm]	Stroke** [mm]
A75	75	90	71.5	35	53.5	38.8	34.5	20	Ø 29.5	5	65	4.85	Ø 55	285	36	14.5	2.3	70.4	116	3420

* For the position of the T-nuts when using our motor adapter plates, see pg. US-11ff
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 21 Tab. 16

A75L with long slider

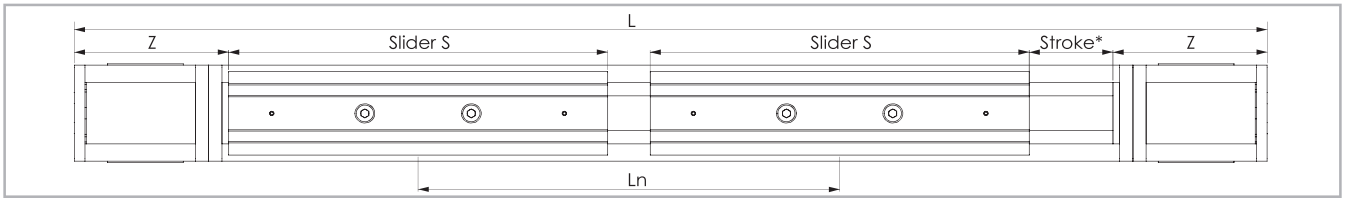


* The length of the safety stroke is provided on request according to the customer's specific requirements. Fig. 11

Type	S_{min} [mm]	S_{max} [mm]	Sn [mm]	Z [mm]	Stroke* [mm]
A75-L	440	700	$Sn = S_{min} + n \cdot 10$	116	3000

* Maximum stroke for a single-piece guiding rail and a maximum slider plate length S_{max}
For longer strokes, see tab. 21 Tab. 17

A75D with double slider



* The length of the safety stroke is provided on request according to the customer's specific requirements. Fig. 12

Type	S [mm]	L_{min} [mm]	L_{max} ** [mm]	Ln [mm]	Z [mm]	Stroke* [mm]
A75D	285	416	3416	$Ln = L_{min} + n \cdot 8$	116	3000

* Maximum stroke for a single-piece guiding rail and a minimum slider plate distance L_{min}
** Maximum distance L_{max} between the centres of slider plates at a stroke of 0 mm
For longer strokes, see tab. 21 Tab. 18

Load ratings, moments and characteristic data

A75

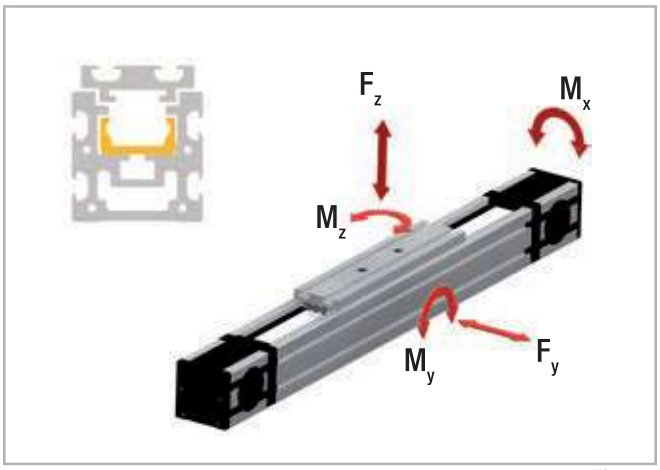


Fig. 13

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
A75	30RPP8	30	0.185

Tab. 19

Belt length (mm) = 2 x L - 213 Standard slider

Belt length (mm) = 2 x L - S_n+72 Long slider

Belt length (mm) = 2 x L - L_n - 213 Double slider

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
A75	12280	5500	1855	43.6	81.5	209
A75-L	24560	11000	3710	87.2	287 to 770	852 to 2282
A75-D	24560	11000	3710	87.2	771 to 6336	2288 to 18788

For the calculation of the allowed moments, please observe pages SL-5ff

Tab. 20

Technical data	Type
	A75
Standard belt tension [N]	800
Moment at no load [Nm]	1.15
Max. traversing speed [m/s]	7
Max. acceleration [m/s²]	15
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	TLV43
Slider type	CS43 spec.
Moment of inertia Iy [cm⁴]	127
Moment of inertia Iz [cm⁴]	172
Pitch diameter of pulley [m]	0.05093
Moment of inertia of each pulley [gmm²]	139969
Stroke per shaft revolution [mm]	160
Mass of slider [g]	1242
Weight with zero stroke [g]	6729
Weight with 1 m stroke [g]	9751
Max. stroke [mm]	7500
Working temperature	from -20 °C to + 80 °C

Tab. 21

Lubrication

The raceways of the guide rails in the Uniline linear axes are prelubricated. To achieve the calculated service life, a lubrication film must always be present between the raceway and the roller. The lubrication film also provides anticorrosion protection to the ground raceways. An approximate value for the lubrication period is every 100 km or every six months. The recommended lubricant is a lithium-based roller bearing grease of medium consistency.

Lubrication of the raceways

Proper lubrication under normal conditions:

- reduces friction
- reduces wear
- reduces stress on the contact faces
- reduces running noise

Lubricants	Thickeners	Temperature range [°C]	Dynamic viscosity [mPas]
Roller bearing grease	Lithium soap	-30 to +170	<4500

Tab. 22

Relubrication of the guide rails

These types of rails have a lubricating conduit on the side of the slider plate through which the lubricant can be applied directly to the raceways. Lubrication can be done in one of two ways:

1. Relubrication using a grease gun:

This is done by inserting the tip of the grease gun into the conduit at the slider plate and injecting the grease inside (see fig. 14). Please note that the grease has to fill the whole conduit in order to lubricate the rail properly; for this reason sufficient grease must be used.

2. Automatic lubrication system:

To connect the unit to an automatic greasing system, use a proper adapter/connector* that attaches to the threaded hole on the side of the trolley. The advantage of this solution is the possibility of rail re-lubrication without machine downtime.

*(Any adapter that may be necessary must be manufactured on site)

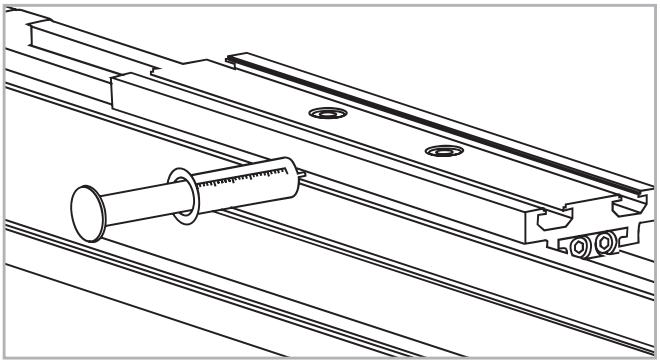


Fig. 14

Cleaning the guide rails

It is always recommended to clean the slider rail prior to any relubrication, in order to remove grease residues. This can be done while performing maintenance work or during a scheduled machine stop.

1. Unscrew the safety screws C (on top of the slider plate) from the belt tensioning device A (see fig. 15).
2. Also completely unscrew the belt tensioning screws B and remove the belt tensioning devices A from their housings.
3. Lift the toothed belt until the guide rails can be seen.
   Important: Ensure that the side seal is not damaged.
4. Clean the rail raceways with a clean and dry cloth. Ensure that all grease and dirt residues from previous work processes are removed. To ensure that the rails are cleaned over their entire length, the slider plate should be moved once over its entire length.
5. Apply a sufficient amount of grease to the raceways.
6. Re-insert the belt tensioning devices A into their housings and mount the belt tensioning screws B. Re-adjust the belt tension (see pg. US-59).
7. Fasten the safety screws C.

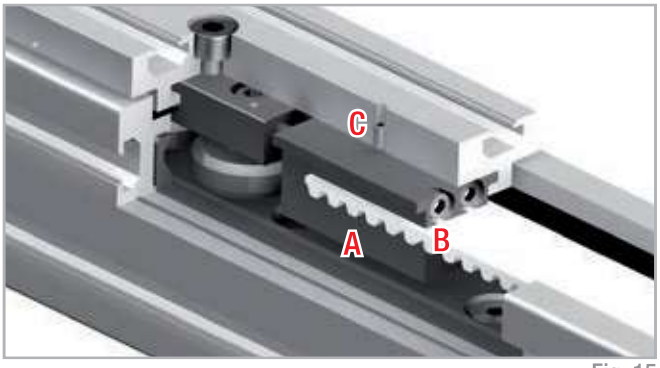


Fig. 15

Accessories

Adapter plates

Standard motor adapter plates AC2

Mounting plates for the most common motors or gearboxes. The connection bores for the motors or gearboxes must be made on site. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

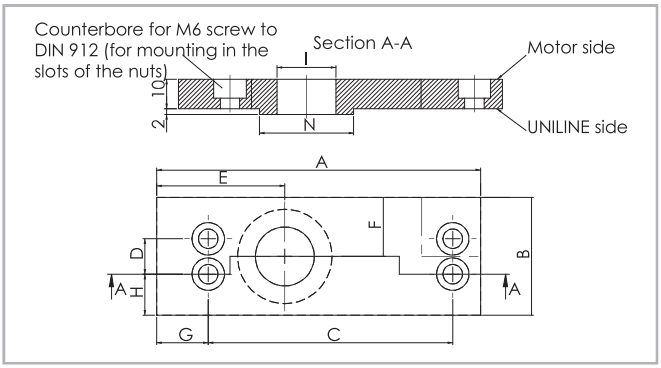


Fig. 16

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	N [mm]
40	110	40	83	12	43.5	20	17.5	14	Ø 20	Ø 32
55	126	55	100	25	50.5	27.5	18	15	Ø 30	Ø 47
75	135	70	106	35	53.5	35	19	17.5	Ø 35	Ø 55

Tab. 23

NEMA plates AC1-P

Mounting plates for NEMA motors or gearboxes. These plates are delivered ready-to-mount on the linear axes. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

Size	NEMA Motors / Gearboxes
40	NEMA 23
55	NEMA 34
75	NEMA 42

Tab. 24

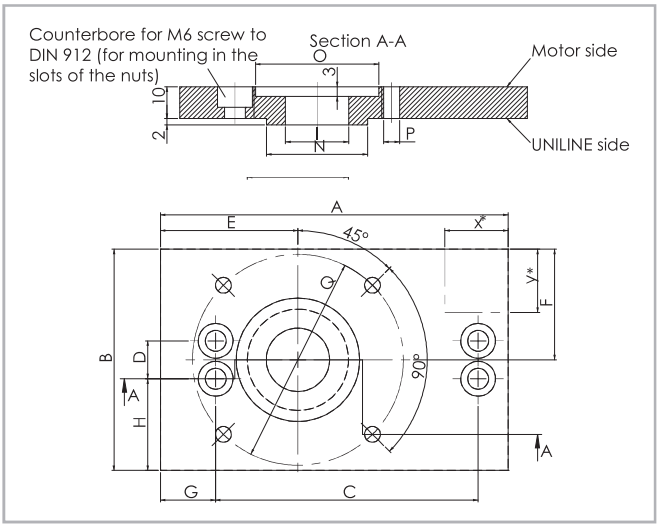


Fig. 17

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	N [mm]	O [mm]	P [mm]	Q [mm]
40	110	70	83	12	43.5	35	17.5	29	20	Ø 32	Ø 39	Ø 5	Ø 66.7
55	126	100	100	25	50.5	50	18	37.5	30	Ø 47	Ø 74	Ø 5.5	Ø 98.4
75	135	120	106	35	53.5	60	19	42.5	35	Ø 55	Ø 57	Ø 7.1	Ø 125.7

Tab. 25

Synchronous use of linear axes in pairs

If two axes are to be used in parallel using a connecting shaft, please specify when ordering, to ensure that the key slots of the pulleys are synchronized.

Fixing brackets APF-2

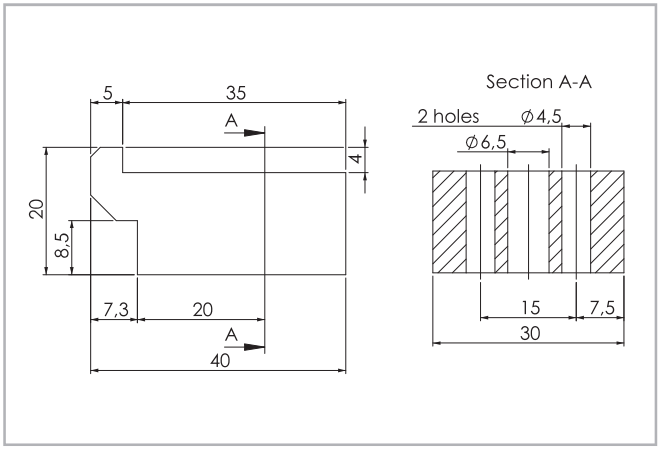


Fig. 18

Fixing clamp for simple mounting of a linear axis on a mounting surface or for connecting two units with or without a connection plate (see pg. US-63).

A spacer* may be necessary.

*(Any spacer that may be necessary must be manufactured on site)

T-nut

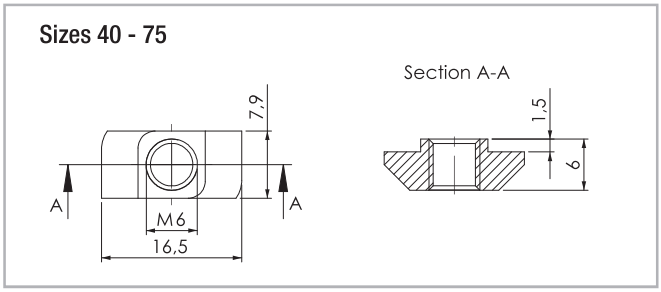


Fig. 19

The maximum tightening torque is 10 Nm.

Assembly kits

T-connection plate APC-1

T-connection plate allows two units to be mounted perpendicular to each other (see pg. US-60). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

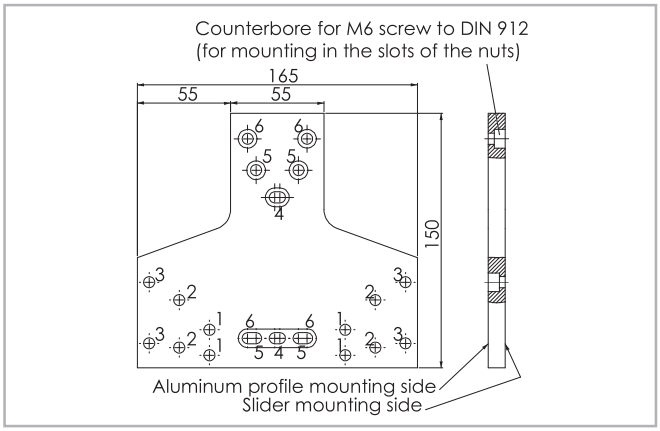


Fig. 20

Note

In case of use of APC-1 plates with E and ED series, please consult Rollon Technical Dpt. In standard there is an interference between U-rail and APC-1 plate. A special version with shorter U-rail at both extremities will be offered.

Size	Fixing holes for the slider	Fixing holes for the profile
40	Holes 1	Holes 4
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 26

Angle connection plate APC-2

allows the right angle mounting of two units. The trolley of one unit can be mounted to the side of the other (see pg. US-61). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting to the linear units.

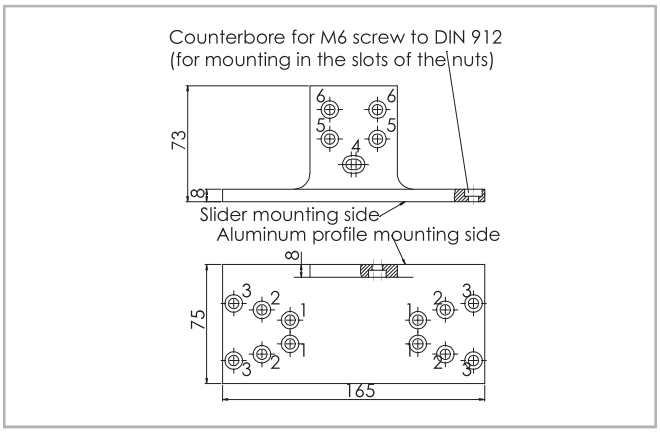


Fig. 21

Size	Fixing holes for the slider	Fixing holes for the profile
40	Holes 1	Holes 4
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 27

X connection plate APC-3

X connection plate for mounting two sliders perpendicular to each other (see pg. US-62). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

Size	Fixing holes for slider 1	Fixing holes for slider 2
40	Holes 1	Holes 4
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 28

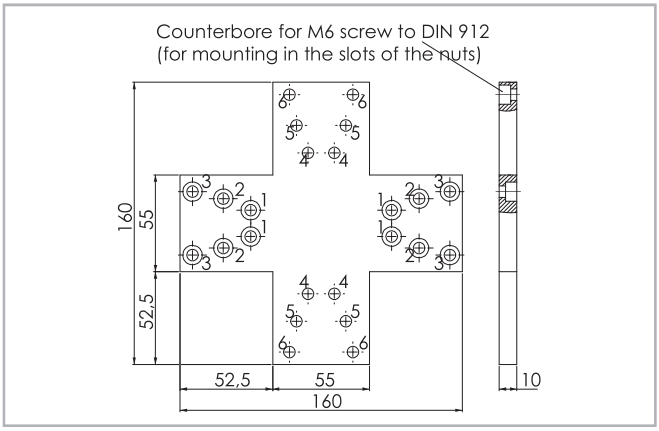


Fig. 22

US

Ordering key

Identification code for Uniline linear unit

U	A	07 04=40 05=55 07=75	1A	1190	1A	D 500	L 350

Indices of long slider plate
see pg. US-4 - US-6 - US-8

Indices of double slider plate, *distance of the centers of slider plates*
see pg. US-4 - US-6 - US-8

Profile/Rail code

L= Total length of the unit

Driving head code

Size *see pg. US-4 - US-6 - US-8*

Type

Uniline prefix

Ordering example: UA 07 1A 1190 1A D 500 L 350

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation

Right

Left

Accessories

Standard motor adapter plate

A	07 04=40 05=55 07=75	AC2
	Size	Standard motor adapter plates *see pg. US-11*
Type		

Ordering example: A07-AC2

NEMA motor adapter plates

A	07 04=40 05=55 07=75	AC1
	Size	NEMA motor adapter plates *see pg. US-11*
Type		

Ordering example: A07-AC1

T-connection plate Order code: APC-,1 s. pg. US-12
Angle connection plate Order code: APC-2, s. pg. US-13
X connection plate Order code: APC-3, s. pg. US-13
Fixing clamp Order code: APF-2, s. pg. US-12

Motor connection bores

	Size			Head code
Hole [Ø]	40	55	75	
Metric [mm] with slot for key	**10G8 / 3js9**	**12G8 / 4js9**	**14G8 / 5js9**	1A
		10G8 / 3js9	16G8 / 5js9	2A
		14G8 / 5js9	19G8 / 6js9	3A
		16G8 / 5js9		4A
Metric [mm] for compression coupling			18	1B
			24	2B
Inch [in] with slot for key	3/8 / 1/8	**1/2 / 1/8**	**5/8 / 3/16**	1P
		3/8 / 1/8		2P
		5/8 / 3/16		3P

Tab. 29

The highlighted connection bores are standard connections

Metric: key seat for keys to DIN 6885 form A

Inch: key seat for keys to BS 46 Part 1: 1958