

ROLLON®
BY TIMKEN

Clean Room System



ONE series**> ONE series description**

Fig. 1

The ONE series actuators are belt driven linear actuators specifically designed for Clean Room applications.

The ONE series reduces particle contamination using a specially designed straight seal that isolates the internals of the actuator from the environment. In addition to particle containment, the ONE series can support a vacuum pump (up to 0,8 bar) to remove and transport contaminants from the interior of the actuator to filtration sites. The 2 vacuum ports are located on the drive and idle head.

All internal components of the ONE series actuators are designed to minimize particle release. Component materials are limited to stainless steel. Where stainless steel is not an option, special treatments are used to ensure low particle release.

Special lubrications designed for use in cleanroom environments are used for all bearings and linear rails.

> The components

Extruded bodies

The anodized aluminum extrusions used for the bodies of the Rollon ONE series linear units were designed and manufactured in cooperation with a leading company in this field to obtain the right combination of high mechanical strength and reduced weight. Aluminum alloy 6060 is used (see physical-chemical characteristics below). The dimensional tolerances comply with EN 755-9 standard.

Driving belt

We are using selected high quality polyurethane timing belts, AT profile, manufactured by leading companies in this field.

Carriage

The carriage of the Rollon ONE series linear units are made entirely of anodized aluminum. Each carriage has mounting holes fitted with stainless steel thread inserts. Rollon offers multiple carriages to accommodate a vast array of applications. The unique design of the carriage allows for the sealing strip to pass through the carriage.

Sealing strip

Rollon ONE series linear units are equipped with a polyurethane sealing strip to prevent particles generated inside the unit to go outside. The sealing strip runs the length of the body and is kept in position by micro-bearings located within the carriage. This minimizes frictional resistance as the strip passes through the carriage while providing maximum protection.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurities
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
$\frac{\text{kg}}{\text{dm}^3}$	$\frac{\text{kN}}{\text{mm}^2}$	$\frac{10^{-6}}{\text{K}}$	$\frac{\text{W}}{\text{m} \cdot \text{K}}$	$\frac{\text{J}}{\text{kg} \cdot \text{K}}$	$\Omega \cdot \text{m} \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 2

Mechanical characteristics

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

Tab. 3

> The linear motion system

Vacuum system

The ONE series actuator has specific connection ports on the drive and the idle end of the unit to connect a vacuum system. The vacuum quality must be evaluated case by case, but Rollon has had success with 0,8 bar on a ONE 80 with a stroke of 1.000 mm up to 4.000 mm.

Selected mechanical components

ONE Series is assembled with select high-quality components. Only Stainless Steel (AISI 303, AISI 440C) is used for bearings, linear guides, shafts, pulleys, and other metallic components. Where it is impossible to use Stainless Steel, Rollon provides a special treatment tested under severe conditions and under particle generation.

Lubrication

ONE Series is equipped with "innovate and hi-tech linear guides" that feature special ball cages to maintain spacing. This feature supports a long-term maintenance and a low particle generation if combined with special lubricant, specifically developed and adopted for Clean Room applications.

Range

ONE Series is now available in 3 different sizes, for multi axes combinations:

- ONE 50
- ONE 65
- ONE 80
- ONE 110

Maximum stroke is 6.000 mm, except ONE 50 where the maximum stroke is 3.700 mm.

For technical details and load capacities, please refer to next pages.

ONE SP section

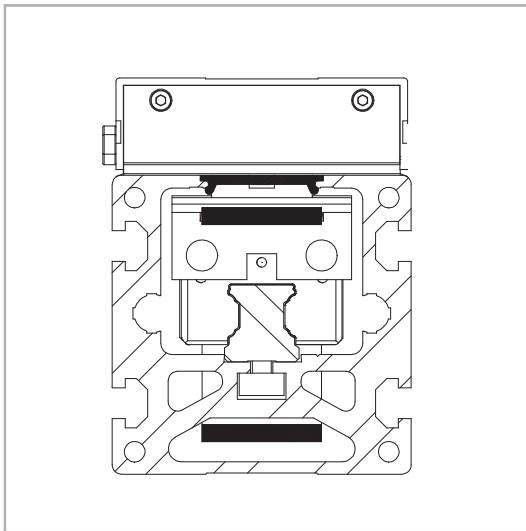
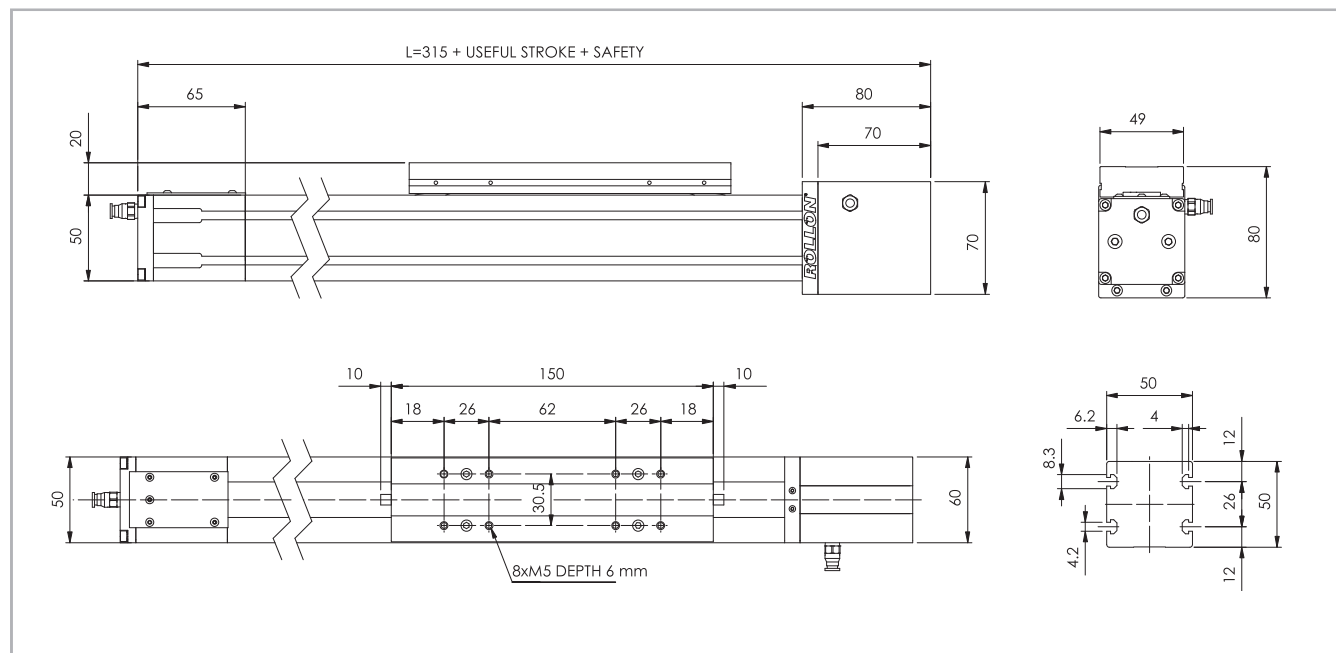


Fig. 2

> ONE 50

ONE 50 Dimension



For further details please visit our website www.rollon.com and download the related DXF files.

Fig. 3

Technical data

	Type
	ONE 50
Max. useful stroke length [mm]	3700
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	4
Max. acceleration [m/s ²]	50
Type of belt	22 AT 5
Type of pulley	Z 23
Pulley pitch diameter [mm]	36,61
Carriage displacement per pulley turn [mm]	115
Carriage weight [kg]	0.4
Zero travel weight [kg]	1.8
Weight for 100 mm useful stroke [kg]	0.4
Starting torque [Nm]	0.4
Moment of inertia of pulleys [g mm ²]	19810
Rail size [mm]	12 mini

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 4

Moments of inertia of the aluminum body

Type	I_x [10 ⁷ mm ⁴]	I_y [10 ⁷ mm ⁴]	I_p [10 ⁷ mm ⁴]
ONE 50	0.025	0.031	0.056

Tab. 5

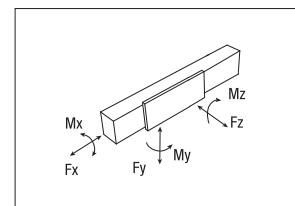
Driving belt

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]
ONE 50	22 AT 5	22	0.072

Tab. 6

Belt length (mm) = 2 x L - 130



Load capacity

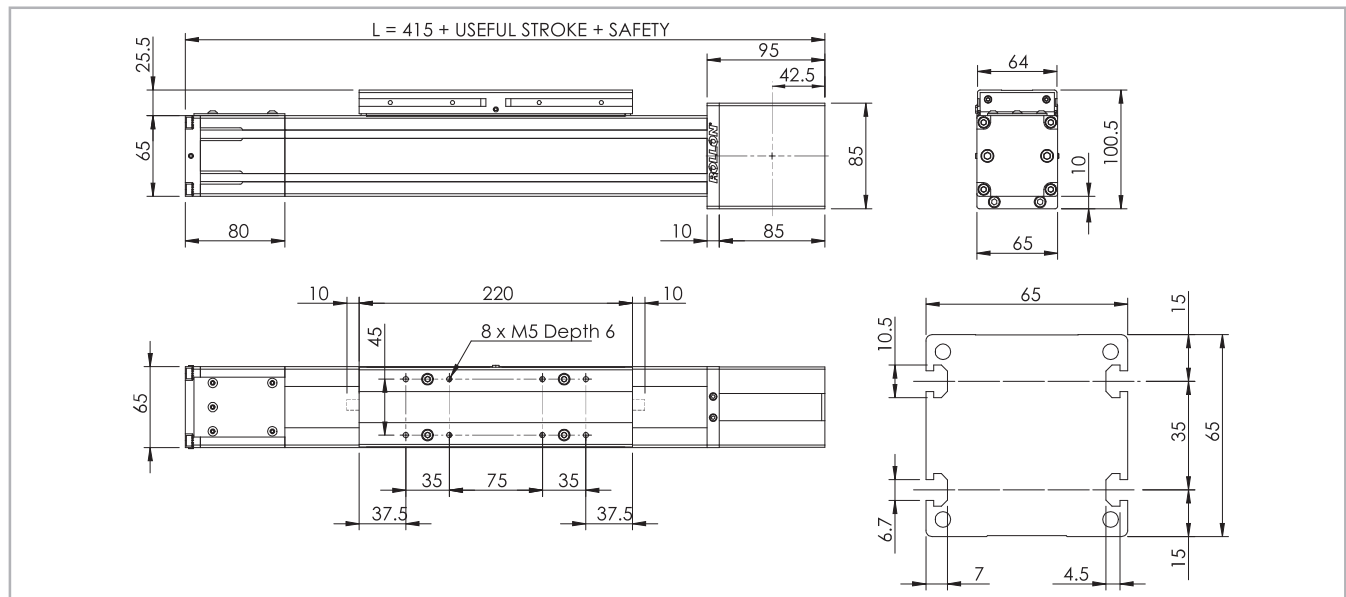
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
ONE 50	809	508	7060	6350	7060	46.2	233	233

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 7

> ONE 65

ONE 65 Dimension



For further details please visit our website www.rollon.com and download the related DXF files.

Fig. 4

Technical data

	Type
	ONE 65
Max. useful stroke length [mm]	6000
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	32 AT 5
Type of pulley	Z 32
Pulley pitch diameter [mm]	50.93
Carriage displacement per pulley turn [mm]	160
Carriage weight [kg]	1.1
Zero travel weight [kg]	3.5
Weight for 100 mm useful stroke [kg]	0.6
Starting torque [Nm]	1.5
Moment of inertia of pulleys [g mm²]	117200
Rail size [mm]	15

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 8

Moments of inertia of the aluminum body

Type	I_x [10 ⁷ mm ⁴]	I_y [10 ⁷ mm ⁴]	I_p [10 ⁷ mm ⁴]
ONE 65	0.060	0.086	0.146

Tab. 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]
ONE 65	32 AT 5	32	0.105

Tab. 10

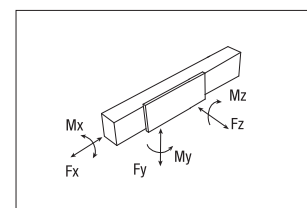
Belt length (mm) = 2 x L - 180

Load capacity

Type	F_x [N]		F_y [N]		F_z [N]		M_x [Nm]		M_y [Nm]		M_z [Nm]	
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.	Stat.	Stat.	Stat.	Stat.
ONE 65	1344	883	48400	22541	48400	320	1376	1376				

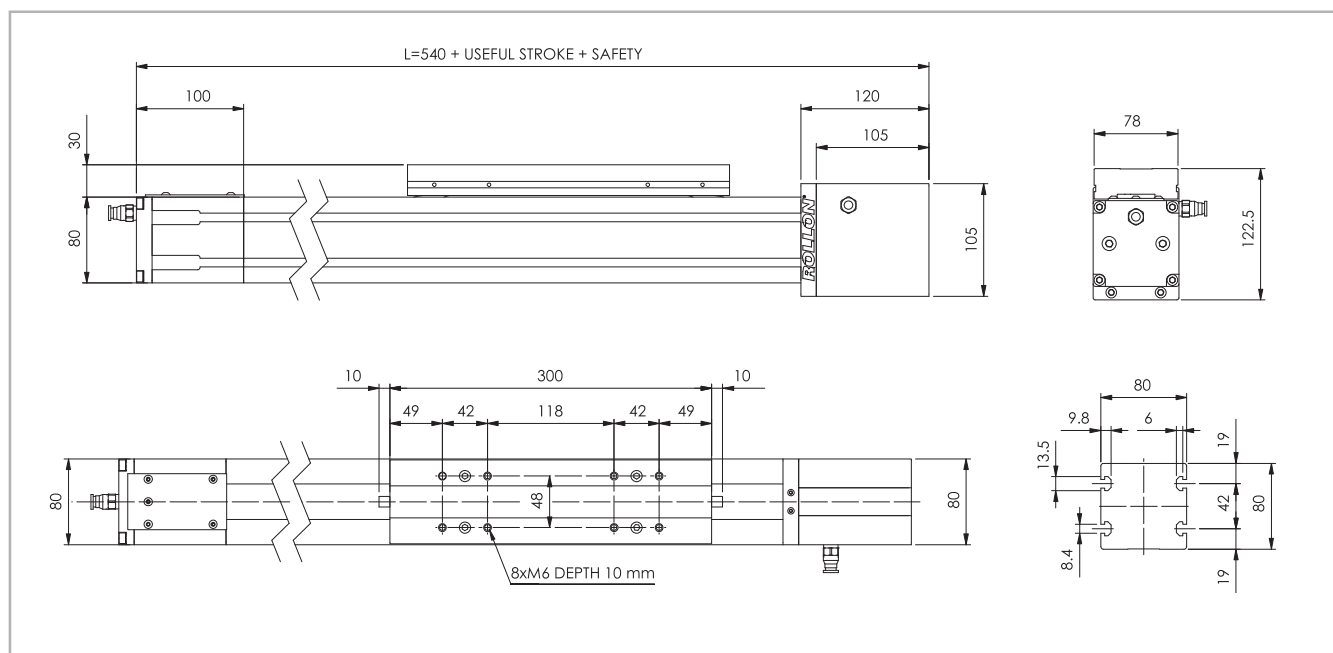
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 11



> ONE 80

ONE 80 Dimension



For further details please visit our website www.rollon.com and download the related DXF files.

Fig. 5

Technical data

	Type
	ONE 80
Max. useful stroke length [mm]	6000
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	5
Max. acceleration [m/s ²]	50
Type of belt	32 AT 10
Type of pulley	Z 19
Pulley pitch diameter [mm]	60.48
Carriage displacement per pulley turn [mm]	190
Carriage weight [kg]	2.7
Zero travel weight [kg]	10.5
Weight for 100 mm useful stroke [kg]	1
Starting torque [Nm]	2.2
Moment of inertia of pulleys [g mm ²]	388075
Rail size [mm]	20

*1) Positioning repeatability is dependant on the type of transmission used

Tab. 12

Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
ONE 80	2258	1306	76800	35399	76800	722	5606	5606

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 15

Moments of inertia of the aluminum body

Type	I_x [10 ⁷ mm ⁴]	I_y [10 ⁷ mm ⁴]	I_z [10 ⁷ mm ⁴]
ONE 80	0.136	0.195	0.331

Tab. 13

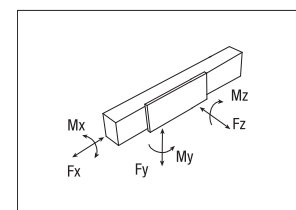
Driving belt

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]
ONE 80	32 AT 10	32	0.185

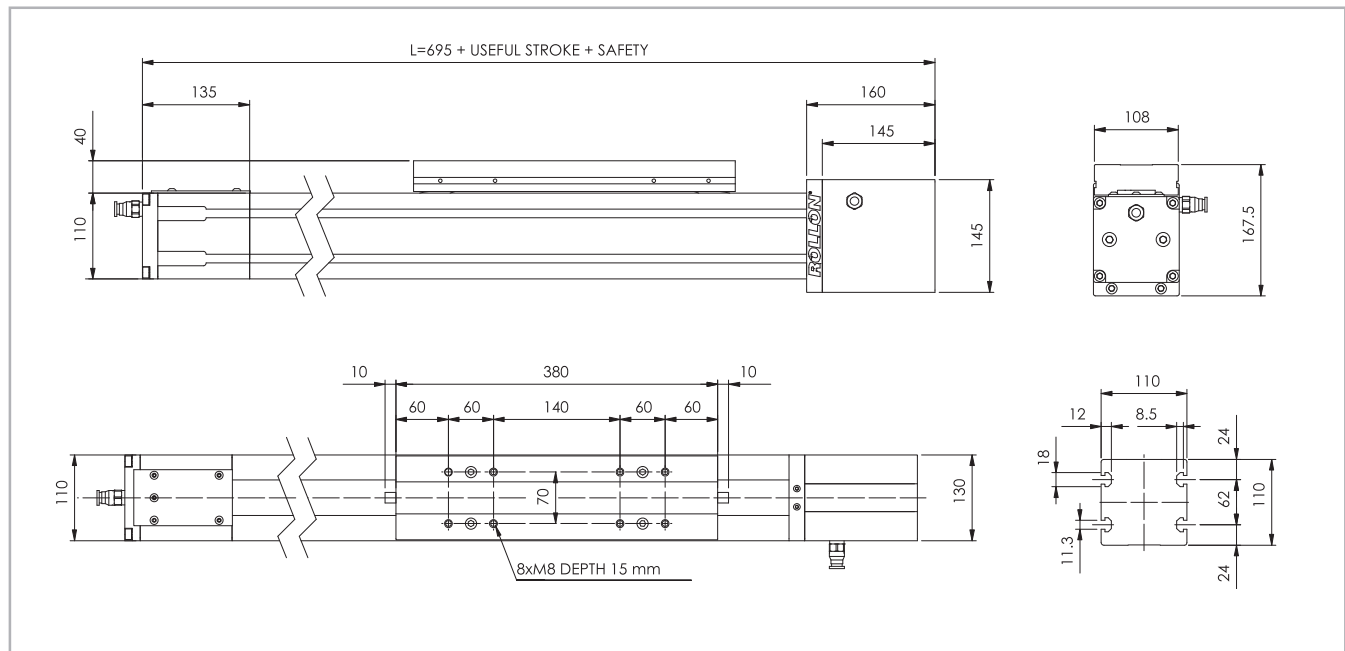
Tab. 14

Belt length (mm) = $2 \times L - 230$



> ONE 110

ONE 110 Dimension



For further details please visit our website www.rollon.com and download the related DXF files.

Fig. 6

Technical data

	Type
	ONE 110
Max. useful stroke length [mm]	6000
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	5
Max. acceleration [m/s²]	50
Type of belt	50 AT 10
Type of pulley	Z 27
Pulley pitch diameter [mm]	85.94
Carriage displacement per pulley turn [mm]	270
Carriage weight [kg]	5.6
Zero travel weight [kg]	22.5
Weight for 100 mm useful stroke [kg]	1.4
Starting torque [Nm]	3.5
Moment of inertia of pulleys [g mm²]	$2.193 \cdot 10^6$
Rail size [mm]	25

*1) Positioning repeatability is dependant on the type of transmission used

Tab. 16

Moments of inertia of the aluminum body

Type	I_x [10 ⁷ mm ⁴]	I_y [10 ⁷ mm ⁴]	I_p [10 ⁷ mm ⁴]
ONE 110	0.446	0.609	1.054

Tab. 17

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]
ONE 110	50 AT 10	50	0.290

Tab. 18

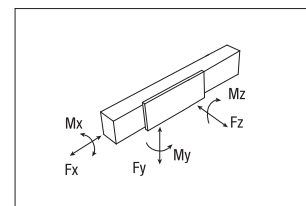
Belt length (mm) = $2 \times L - 290$

Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
ONE 110	4980	3300	104800	50321	104800	1126	10532	10532

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 19



> Planetary gears

Assembly to the right or to the left of the driving head

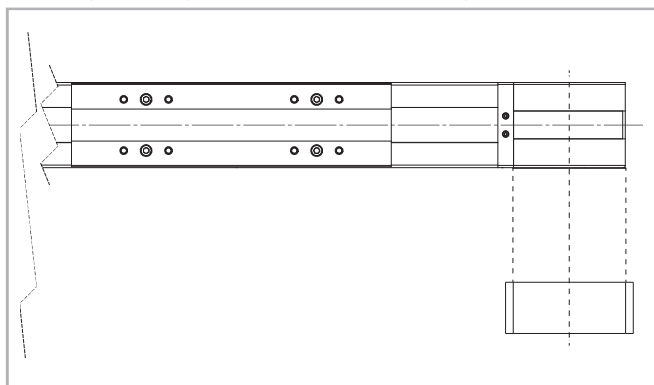
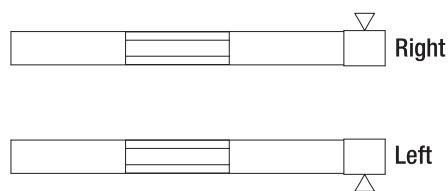


Fig. 7

The series ONE linear units can be fitted with several different drive systems. In each case, the driving pulley is attached to the reduction gearshaft by means of a tapered coupling to ensure high accuracy over a long period of time.

Versions with planetary gears

Planetary gears are used for highly dynamic robot, automation and handling applications involving stressing cycles and with high level precision requirements. Standard models are available with clearance from 3' to 15' and with a reduction ratio from 1:3 to 1:1000. For assembly of non-standard planetary gear, contact our offices.



Shaft with centering

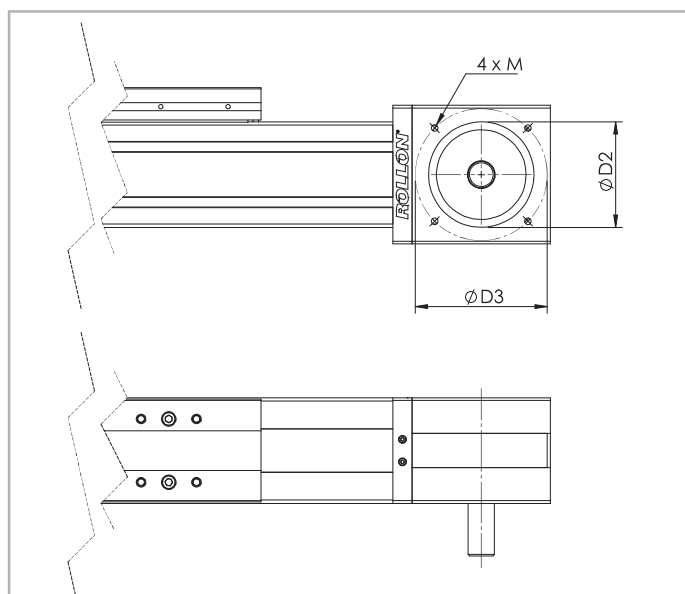


Fig. 8

Unit	Shaft type	D2	D3	M	Head code AS left	Head code AS right
ONE 50	AS 12	55	70	M5	VB	VA
ONE 65	AS 15	60	85	M6	VB	VA
ONE 80	AS 20	80	100	M6	VB	VA
ONE 110	AS 25	110	130/160	M8	VB	VA

Tab. 20

> Accessories

Fixing by brackets

The linear motion systems used for the Rollon series ONE linear units enables them to support loads in any direction. They can therefore be installed in any position.

To install the units, we recommend the use of the dedicated T-Slots in the extruded bodies as shown below.

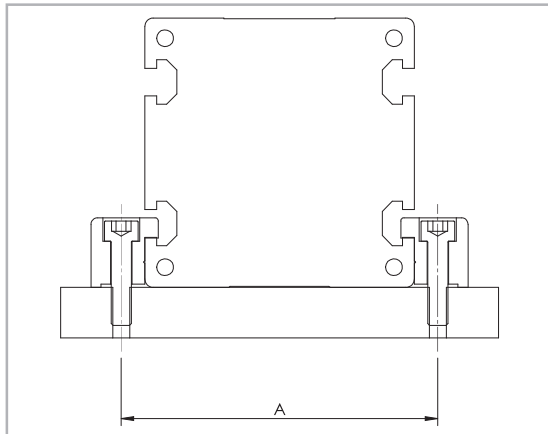


Fig. 9

Unit	A (mm)
ONE 50	62
ONE 65	77
ONE 80	94
ONE 110	130

Tab. 21

Warning:

Do not fix the linear units through the drive ends.

Fixing brackets

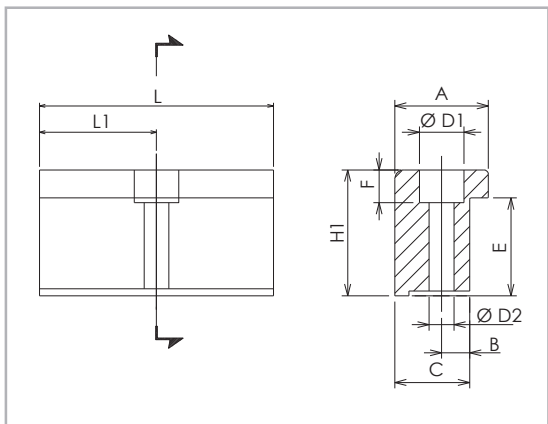


Fig. 10

Dimensions (mm)

Unit	A	H1	B	C	E	F	D1	D2	L	L1	Code
ONE 50	20	14	6	16	10	6	10	5.5	35	17.5	1000958
ONE 65	20	17.5	6	16	11.5	6	9.4	5.3	50	25	1001490
ONE 80	20	20.7	7	16	14.7	7	11	6.4	50	25	1001491
ONE 110	36.5	28.5	10	31	18.5	11.5	16.5	10.5	100	50	1001233

Tab. 22

Fixing bracket

Anodized aluminum block for fixing the linear units through the side T-Slots of the body.

T-Nuts

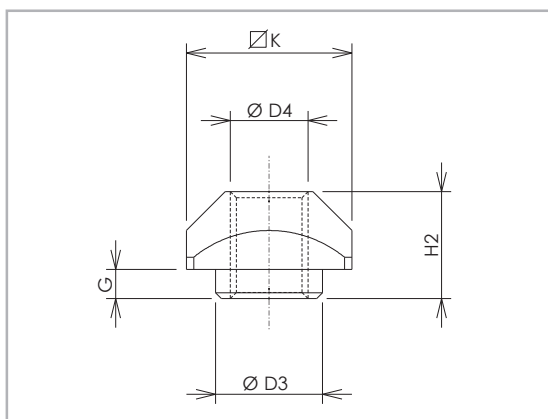


Fig. 11

Dimensions (mm)

Unit	D3	D4	G	H2	K	Code
ONE 50	-	M4	-	3.4	8	1001046
ONE 65	6.7	M5	2.3	6.5	10	1000627
ONE 80	8	M6	3.3	8.3	13	1000043
ONE 110	11	M8	2.8	10.8	17	1000932

Tab. 23

T-nuts

Steel nuts to be used in the slots of the body.

Proximity

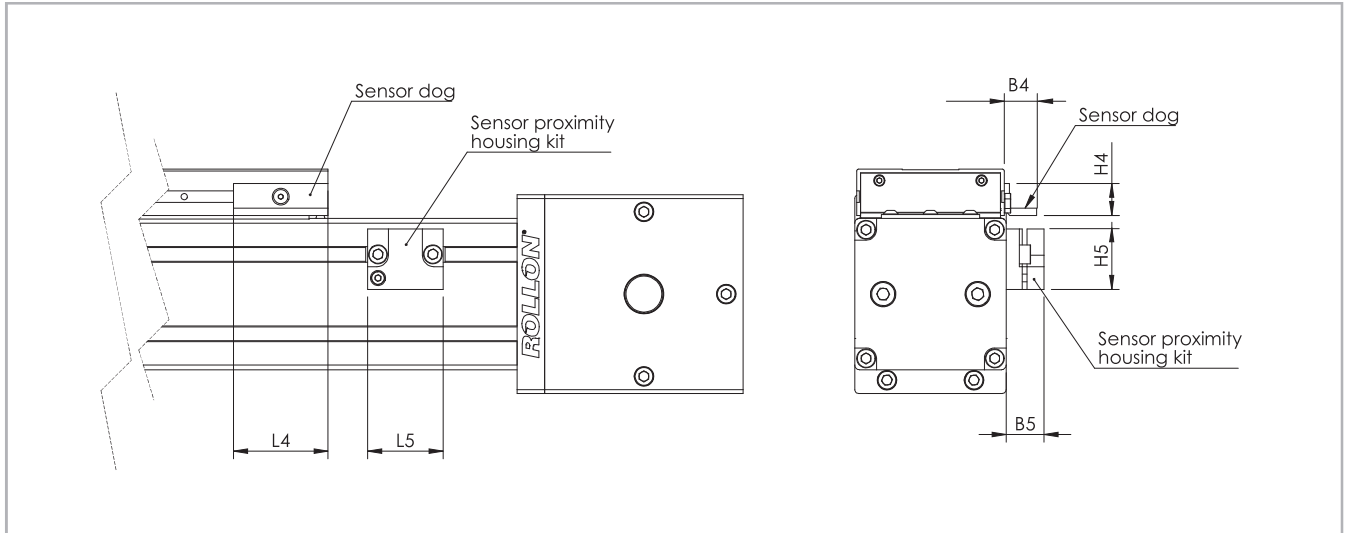


Fig. 12

Sensor proximity housing kit

Red anodized aluminum sensor holder, equipped with T-nuts for fixing onto the profile.

Sensor dog

L-shaped bracket in zinc-plated iron, mounted on the carriage and used for proximity switch operations.

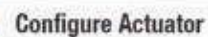
Dimensions (mm)

Unit	B4	B5	L4	L5	H4	H5	For proximity	Sensor dog code	Sensor proximity housing kit code
ONE 50	9.5	14	25	29	11.9	22.5	Ø 8	G000268	G000211
ONE 65	17.2	20	50	40	17	32	Ø 12	G000267	G000212
ONE 80	17.2	20	50	40	17	32	Ø 12	G000267	G000209
ONE 110	17.2	20	50	40	17	32	Ø 12	G000267	G000210

Tab. 24

ONE Series *see pg. CRS-2*

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



Left / right orientation



CRS