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S-SMART series

S-SMART series description

Fig. 36

S-SMART

The S-SMART series linear units were designed to meet the vertical motion requirements in gantry applications or for applications where the aluminum profile must be moving and the carriage must be fixed.

The self-supporting extruded and anodized aluminum structure is available in three sizes. Since it is a rigid system, it is ideal for a "Z" axis in a 3-axis system by using a linear guide rail.

In addition, the S-SMART series has been specifically designed and configured to be easily assembled with the R-SMART series by using a simple bracket.

The components

Extruded profile

The anodized aluminum extrusions used for the bodies of the Rollon SMART 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. The anodized aluminum alloy 6060 used (see physical chemical characteristics below for further information) was extruded with dimensional tolerances complying with EN 755-9 standards.

Driving belt

The Rollon SMART series linear units use steel reinforced polyurethane drive belts with AT pitch. 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 SMART series linear units is made entirely of anodized aluminum. The dimensions vary depending on the type.

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. 64

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	70	23.8	200	880-900	33	600-655

Tab. 65

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
250	200	10	75

Tab. 66

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications. Rollon SMART System series systems feature a linear motion system with ball bearing guides:

Performance characteristics:

- The ball bearing guides with high load capacity are mounted in a dedicated seat on the aluminum body.
- The carriage of the linear unit is assembled on pre-loaded ball bearing blocks that enables the carriage to withstand loading in the four main directions.
- The ball bearing carriages of the SP versions are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
- The blocks have seals on both sides and, when necessary, an additional scraper can be fitted for very dusty conditions.

The linear motion system described above offers:

- High speed and acceleration
- High load capacity
- High permissible bending moments
- Low friction
- Long life
- Low noise

S-SMART section

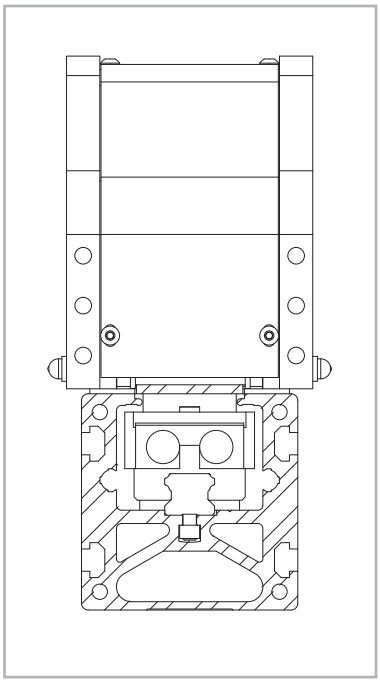
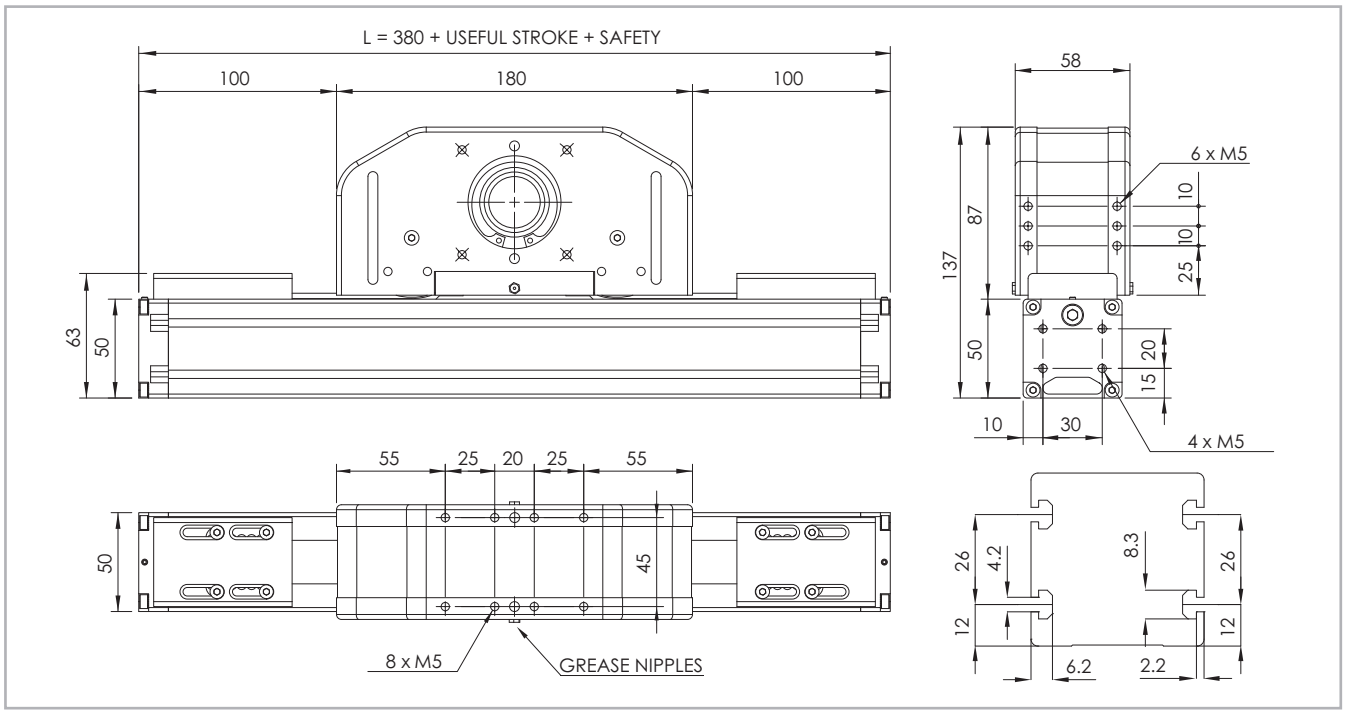


Fig. 37

S-SMART 50 SP

S-SMART 50 SP Dimensions



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

Fig. 38

Technical data

	Type
	S-SMART 50 SP
Max. useful stroke length [mm]	1000
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	4.0
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]	2
Zero travel weight [kg]	5.7
Weight for 100 mm useful stroke [kg]	0.4
Starting torque [Nm]	0.25
Rail size [mm]	12 mini

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

Tab. 67

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]
S-SMART 50 SP	0.025	0.031	0.056

Tab. 68

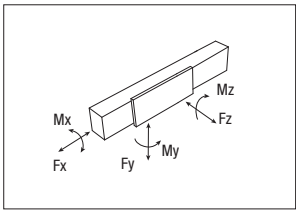
Driving belt

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]
S-SMART 50 SP	22 AT 5	22	0.072

Tab. 69

Belt length (mm) = L + 30



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.
S-SMART 50 SP	809	508	7060	6350	7060	46.2	233	233

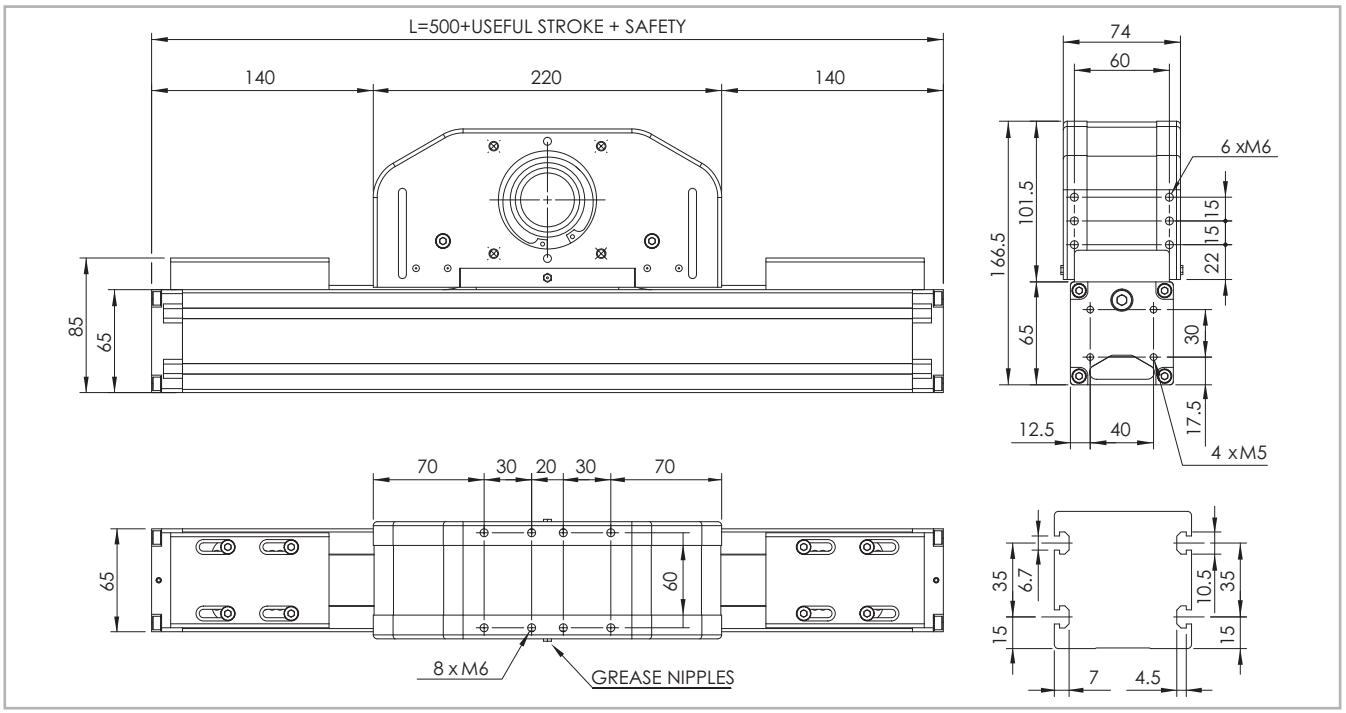
See verification under static load and lifetime on page SL-2 and SL-3

F_x in the table represents the maximum capacity of the toothed belt. For the application, the limit of transmittable torque of the shrink disk must be considered too (see page SS-40)

Tab. 70

S-SMART 65 SP

S-SMART 65 SP Dimensions



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

Fig. 39

Technical data

	Type
	S-SMART 65 SP
Max. useful stroke length [mm]	1500
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	4.0
Max. acceleration [m/s^2]	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]	3.6
Zero travel weight [kg]	7.3
Weight for 100 mm useful stroke [kg]	0.6
Starting torque [Nm]	0.60
Rail size [mm]	15

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

Tab. 71

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]
S-SMART 65 SP	0.060	0.086	0.146

Tab. 72

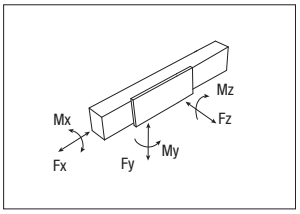
Driving belt

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]
S-SMART 65 SP	32 AT 5	32	0.105

Tab. 73

Belt length (mm) = L + 35



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.
S-SMART 65 SP	1344	960	25400	19720	25400	240	1008	1008

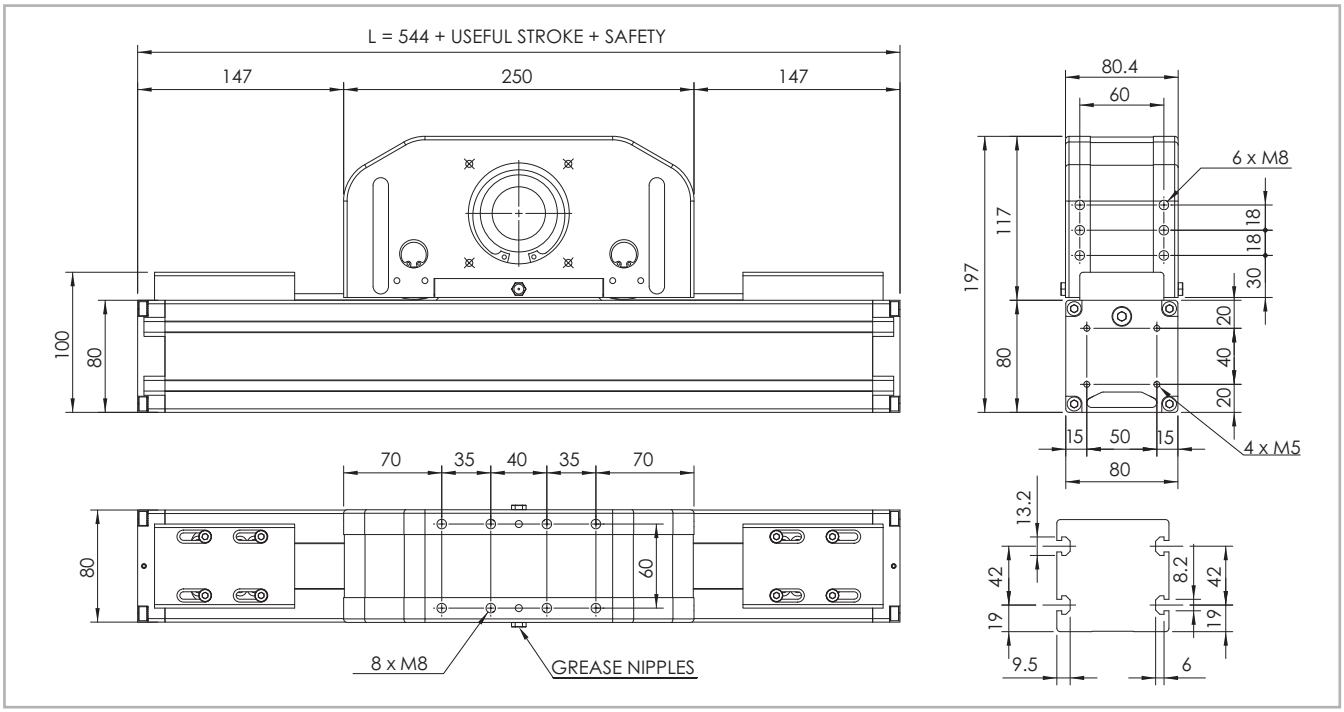
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 74

F_x in the table represents the maximum capacity of the toothed belt. For the application, the limit of transmittable torque of the shrink disk must be considered too (see page SS-40)

S-SMART 80 SP

S-SMART 80 SP Dimensions



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

Fig. 40

Technical data

	Type
	S-SMART 80 SP
Max. useful stroke length [mm]	2000
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	4.0
Max. acceleration [m/s²]	50
Type of belt	32 AT 10
Type of pulley	Z 21
Pulley pitch diameter [mm]	66.85
Carriage displacement per pulley turn [mm]	210
Carriage weight [kg]	6.3
Zero travel weight [kg]	12.6
Weight for 100 mm useful stroke [kg]	1
Starting torque [Nm]	1.65
Rail size [mm]	20

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

Tab. 75

Moments of inertia of the aluminum body

Type	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
S-SMART 80 SP	0.136	0.195	0.331

Tab. 76

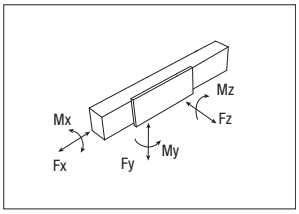
Driving belt

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]
S-SMART 80 SP	32 AT 10	32	0.186

Tab. 77

Belt length (mm) = L + 50



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.
S-SMART 80 SP	2523	1672	55400	44400	55400	700	4044	4044

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

F_x in the table represents the maximum capacity of the toothed belt. For the application, the limit of transmittable torque of the shrink disk must be considered too (see page SS-40)

Tab. 78

Lubrication

SP linear units with ball bearing guides

The ball bearing carriages of the SP versions are fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment of these in the circuits.
This system guarantees a long interval between maintenances: SP version: every 2000 Km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

S-SMART

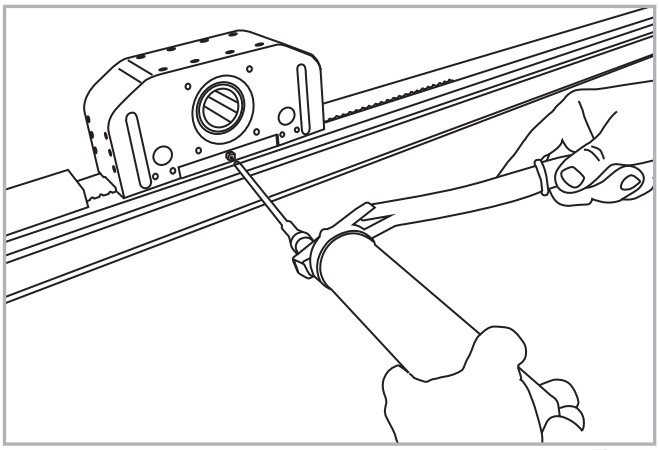


Fig. 41

- Insert the tip of the grease gun into the specific grease blocks.
- Type of lubricant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or hostile environmental conditions, lubrication should be applied out more frequently.
  Contact Rollon for further advice

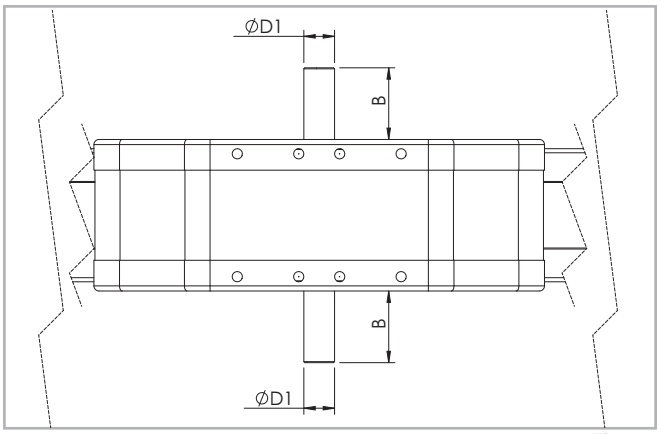
Quantity of lubricant necessary for re-lubrication of each block:

Type	Quantity of Grease (cm^3)
S-SMART 50	0.5
S-SMART 65	0.2
S-SMART 80	0.5

Tab. 79

Simple shafts

AS type simple shafts



Position of the simple shaft can be to the right or to the left of the drive head. Fig. 42

This head configuration is obtained by utilizing an assembly kit delivered as a separate accessory item.
Shaft can be installed on the left or right side of the drive head as decided by the customer.

Units (mm)

Applicable to unit	Shaft type	B	D1	AS Assembly kit code
S-SMART 50	AS 12	26	12h7	G000652
S-SMART 65	AS 15	35	15h7	G000851
S-SMART 80	AS 20	40	20h7	G000828

Tab. 80

Hollow shaft

Hollow shaft type AC - Standard supply

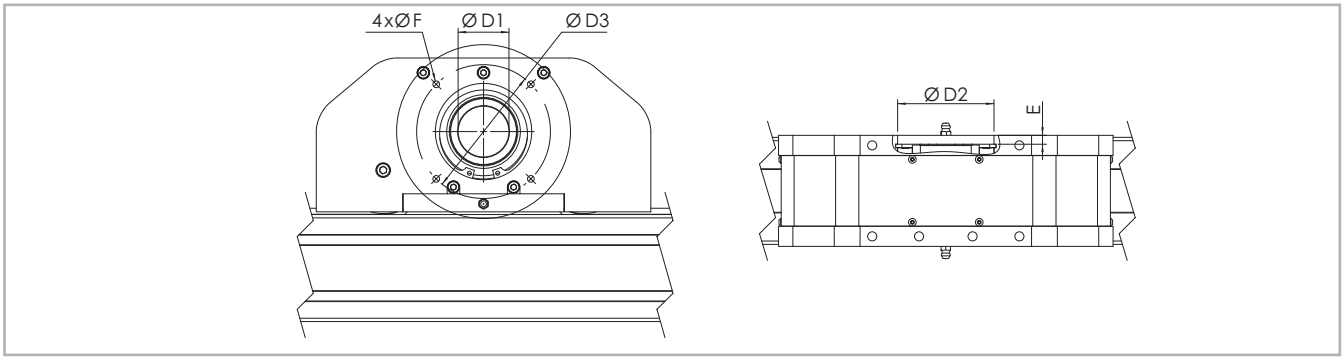


Fig. 43

Units (mm)

Applicable to unit	Shaft type	D1	D2	D3	E	F	Drive head code
S-SMART 50	AC 26	26H7	47	75	2.5	M5	2YA
S-SMART 65	AC 34	34H7	62	96	2.5	M6	2YA
S-SMART 80	AC 41	41H7	72	100	5	M6	2ZA

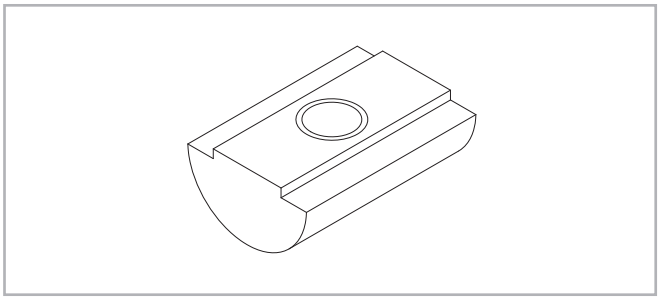
Tab. 81

An (optional) connection flange is required to fit the standard reduction units selected by Rollon.
For further information contact our offices.

Accessories

The ball bearing guide linear drive system of Rollon SMART System series linear units enables them to support loads in any direction. They can therefore be installed in any position.
To install the SMART System series units, we recommend use of one of the systems indicated below:

T-nuts



Steel nuts to be used in the slots of the body. Fig. 44

Units (mm)

	Hole	Length	Code Rollon
S-SMART 50	M4	8	1001046
S-SMART 65	M5	10	1000627
S-SMART 80	M6	13	1000043

Tab. 82

Proximity

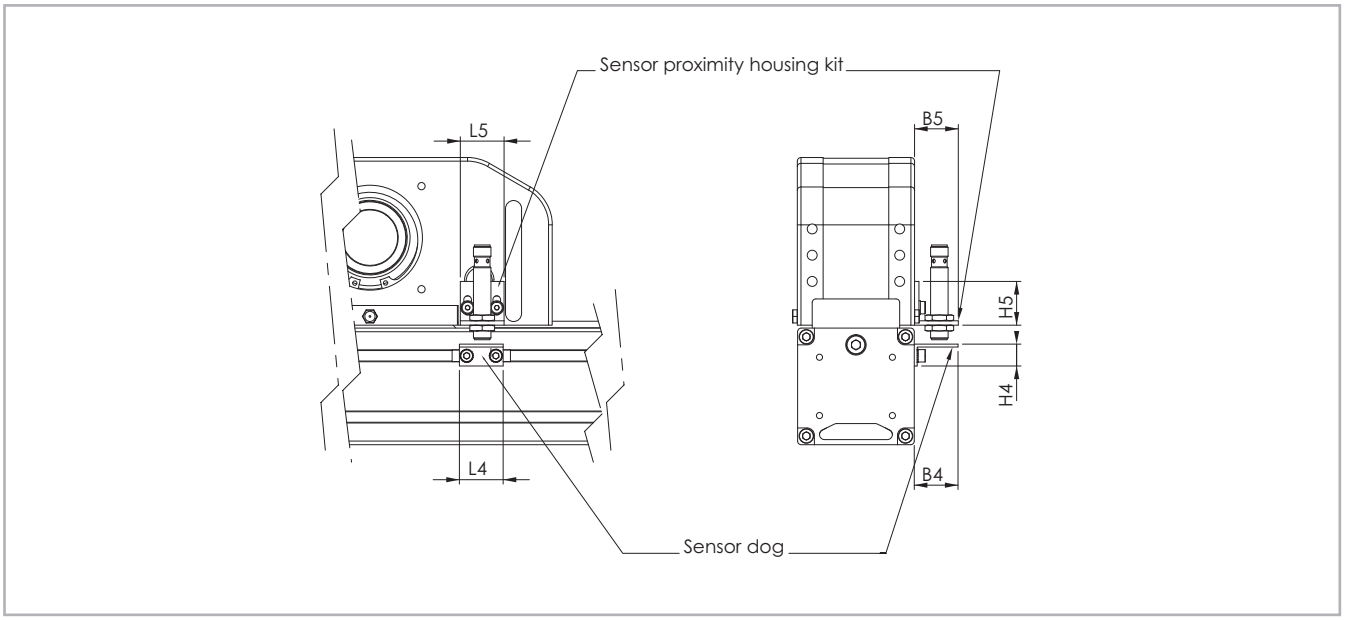


Fig. 45

Proximity switch holder

Aluminum block equipped with T-nuts for fixing

Proximity switch runner

Iron plate mounted on the carriage used for the proximity operation

Units (mm)

	B4	B5	L4	L5	H4	H5	For proximity	Sensor dog code	Sensor proximity housing code
S-SMART 50	30	30	30	30	15	30	Ø8 / Ø12	G000835	G000834 / G001408
S-SMART 65	30	30	30	30	15	30	Ø8 / Ø12	G000836	G000834 / G001408
S-SMART 80	30	30	30	30	15	30	Ø8 / Ø12	G000837	G000834 / G001408

Tab. 83

Assembly kits

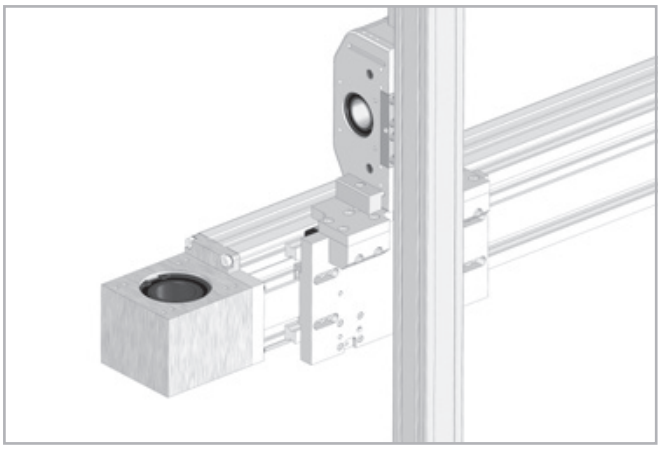


Fig. 46

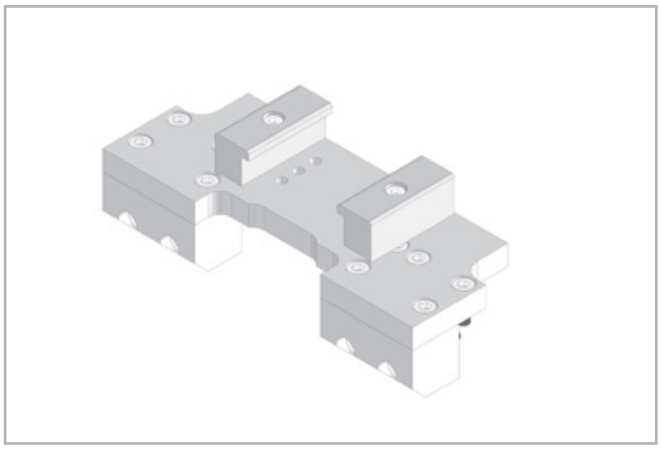
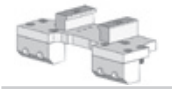
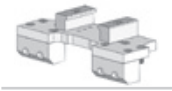


Fig. 47

While ordering two units for Y-Z assembly key has to be specified that they work together in order to drill the trolleys for the assembly of the kit.

Actuator combination Y-Z		Kit Code
	S-SMART 50 on E-SMART 50	G000647
	S-SMART 50 on R-SMART 120	G000910
	S-SMART 65 on E-SMART 50	G000654
	S-SMART 65 on E-SMART 80	G000677
	S-SMART 65 on R-SMART 120	G000911
	S-SMART 65 on R-SMART 160	G000912
	S-SMART 80 on E-SMART 80	G000653
	S-SMART 80 on E-SMART 100	G000688
	S-SMART 80 on R-SMART 120	G000990
	S-SMART 80 on R-SMART 160	G000913

Tab. 84

Adapter flange for gearbox assembly

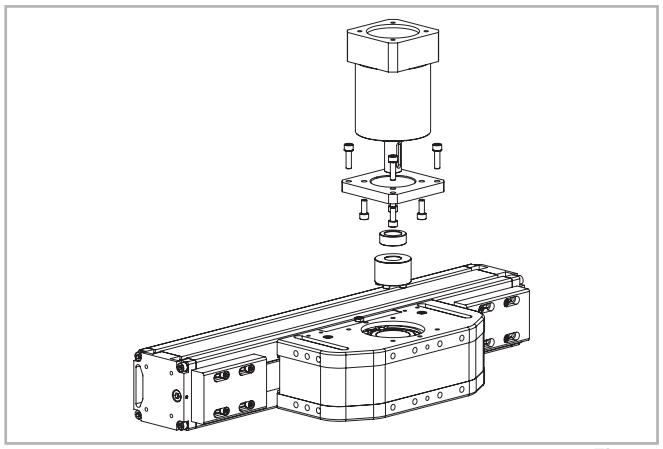


Fig. 48

Assembly kit includes: shrink disk; adapter plate; fixing hardware

Unit	Gearbox type (not included)	Kit Code
S-SMART 50	MP060	G000566
	LC050; PE2; LP050	G001444
S-SMART 65	MP080	G000529
	MP060; PLE060	G000531
	SW030	G000748
	PE3; LP070; LC070	G000530
S-SMART 80	P3	G000824
	MP080	G000826
	LC090; MPV01; LP090; PE4	G000827
	PLE080	G000884
	SP060; PLN070	G000829
	SW040	G000866
	SW050	G000895

Tab. 85

For other gearbox type ask Rollon

Single shrink disc

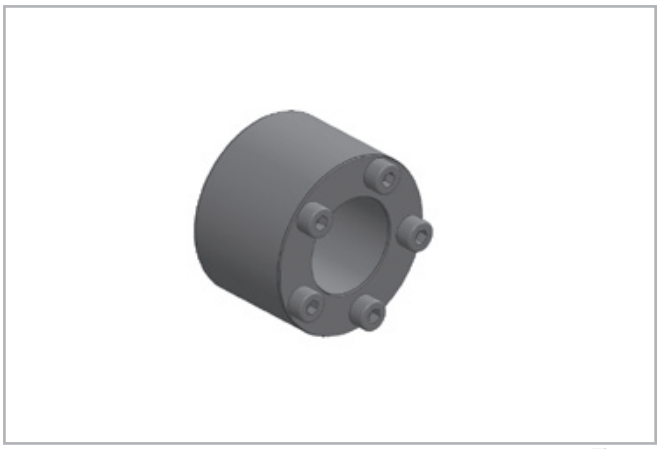


Fig. 49

Codes on the table below refer to a shink disc ordered as single element.

Unit type	Hollow shaft [mm]	Shrink disc dxD [mm]	Transmittable torque* [Nm]	Shrink disc code
S-SMART 50	26	14x26	36	6005740
S-SMART 65	34	14x34	64	6005737
		16x34	73	6005738
		19x34	87	6005739
S-SMART 80	41	19x41	150	6005734
		22x41	174	6005735
		25x41	198	6005736

* Transmittable torque in the table represents the maximum capacity of the shrink disk. For the application, the limit of F_x must be considered too.

Tab. 86

Ordering key

Identification codes for the S-SMART linear unit

F	08 05 = 50 06 = 65 08 = 80	2ZA	1300	1A 1A=SP
				Linear motion system *see pg. SS-32*
			L=total length of the unit	
		Drive head code *see pg. SS-37*		
	Linear unit type *see from pg. SS-33 to pg. SS-35*			
Linear unit series S-SMART *see pg. SS-30*				

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

Configure Actuator

Multiaxis systems

Rollon now offers a set of components, including brackets and plates, to enable multiaxis units to be built.
In addition to the standard elements, Rollon can supply plates for special applications.

Application examples:

One axis system

A - X Axis: E-SMART

Two parallel axis system

B - Linear units: 2 E-SMART
Connection kit: Parallel Kit

Two axis Y-Z system

C - Linear units: Y Axis 1 R-SMART - Z Axis 1 S-SMART
Connection kit: Connection plate Kit for S-SMART (Z axis) on R-SMART (Y axis).

Three axis X-Y-Z system

D - Linear units: X Axis 2 E-SMART - Y Axis 1 R-SMART - Z Axis 1 S-SMART
Connection kit: 2 fixing brackets Kit for 2 R-SMART (Y axis) on 2 E-SMART (X axis). Connection plate Kit for S-SMART (Z axis) on 2 R-SMART (Y axis). Parallel Kit