ODS – ORIGA DRIVE SYSTEM
Moving the future.

ORIGA – simply the first

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Parker

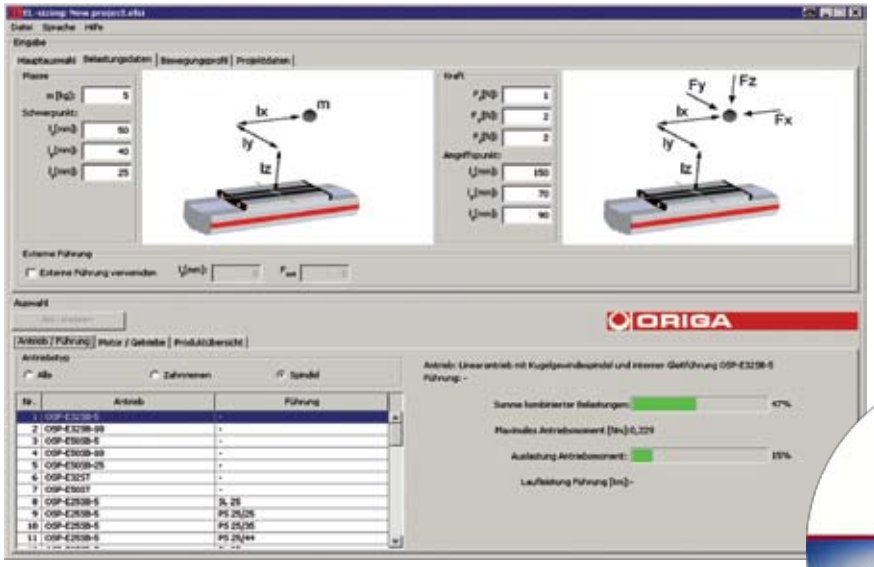
ORIGA

ENGINEERING YOUR SUCCESS.

EL Sizing

The dimensioning program for electric linear drives

Available on CD-Rom or as a download



Coming soon for ODS – ORIGA DRIVE SYSTEM

ORIGA DRIVE SYSTEM

ODS series

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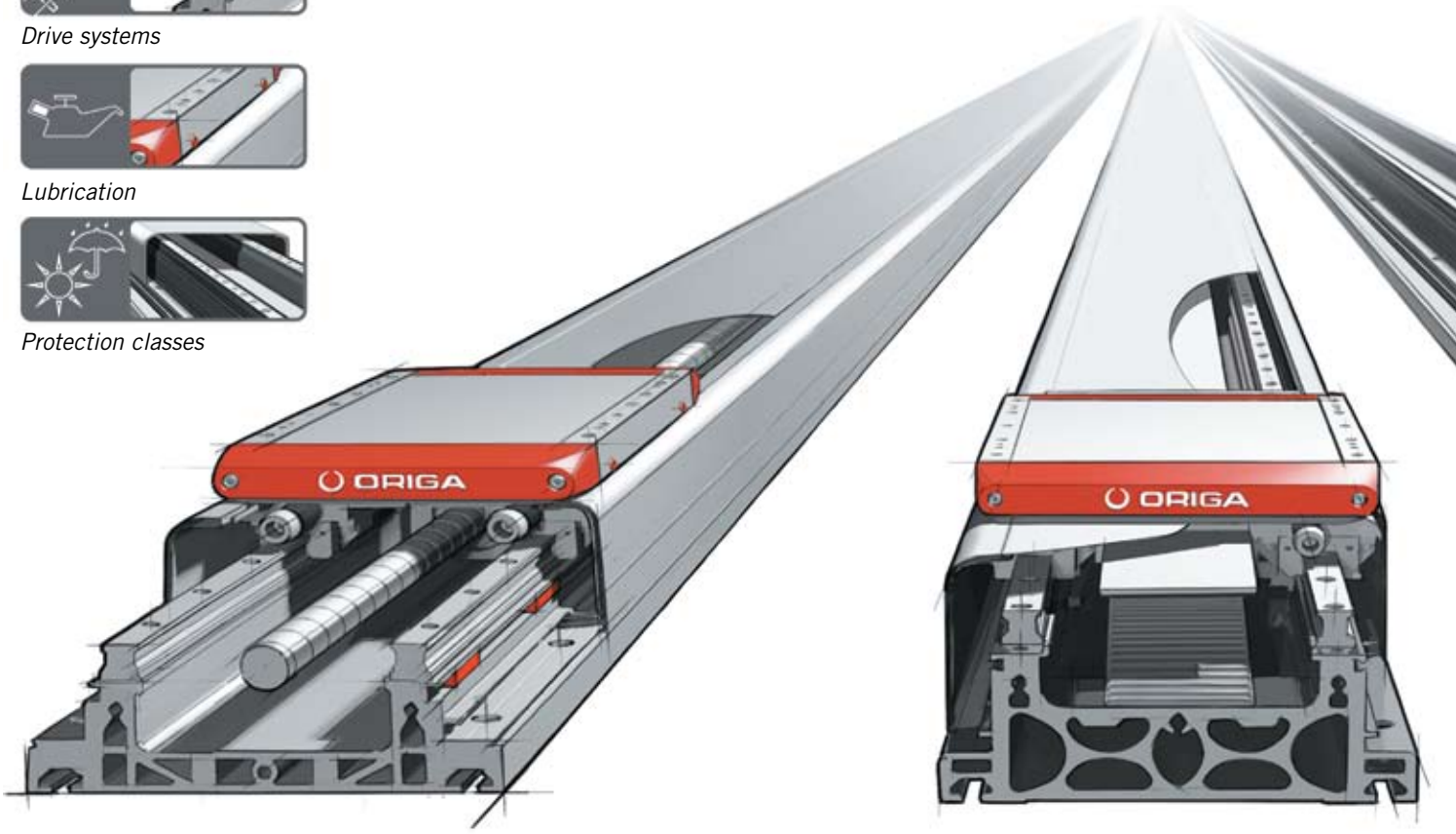
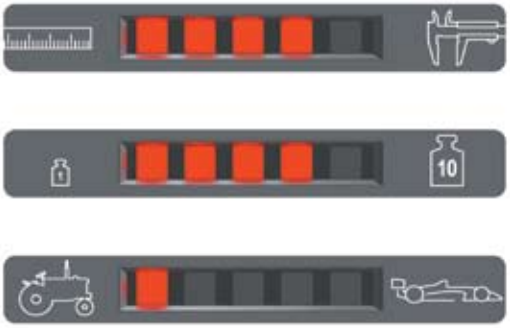
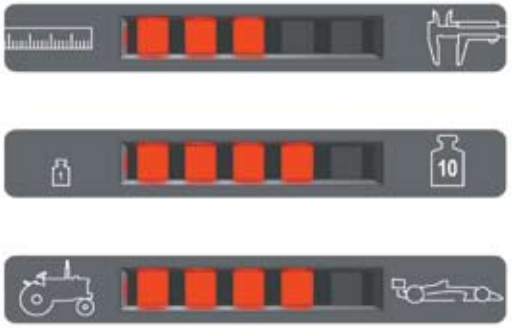




Screw drive

The solution for precise path and position control for medium loads



Toothed belt drive

The solution for fast path and position control for medium loads

VE SYSTEM

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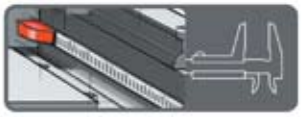
Position detection

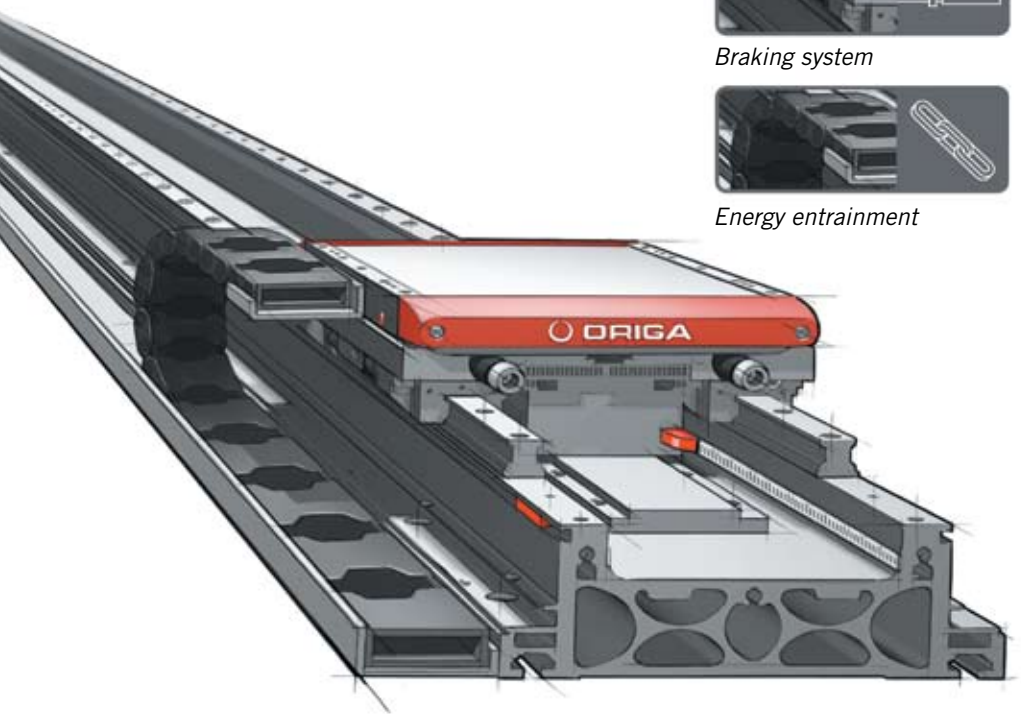
Impact protection



Displacement measurement

Braking system

Energy entrainment



Linear drive

The solution for fast travel with the greatest possible dynamics and precision

ORIGA DRIVE SYSTEM

Profile designs
- Basic profile for assembling directly to the machine base
- Reinforced profile for self-supporting assembly

Fastening systems
- Integrated T-slots for attaching from below
- Standard or customized hole pattern for attaching from above

Drive systems
- Plain bearing guide
- Roller guide
- Recirculating ball bearing guide

Lubrication
- Lubrication via externally accessible lubricating nipples

Protection classes
- Without cover: IP20
- With cover: IP54

Position detection
- Integrated, adjustable position switch for end positions and referencing

Impact protection
- Integrated shock absorbers for both end positions

Displacement measurement
- Contact-free, incremental displacement measuring system

Braking system
- Holding brake can be implemented for horizontal and vertical movements

Energy guidance
- Directly attachable energy guidance chain

ORIGA DRIVE SYSTEM

ODS series

Carrier profiles

Sizes:
145, 175, 225 mm

Designs

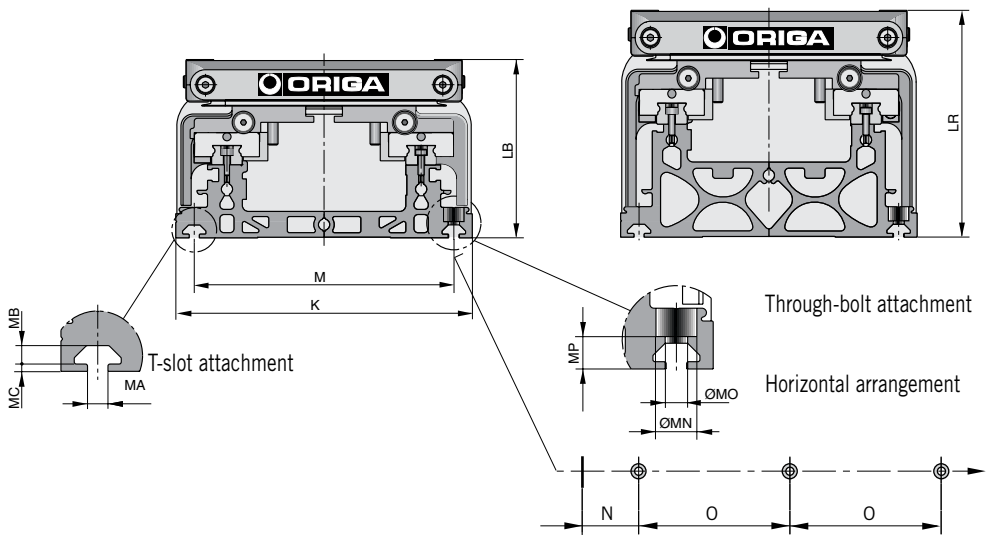
– Basic

– Reinforced

The ODS linear drive system can be equipped with a basic or reinforced carrier profile as standard. The basic carrier profile is suitable for fitting directly to a machine base that has a corresponding support surface. The reinforced carrier profile, on the other hand, is the preferred choice for self-supporting portal constructions or for use in conjunction with a base surface offering limited support.

Basic carrier profile

Reinforced carrier profile



Dimensions Table – Support Profiles

Type	K	LB	LR	M	MA	MB	MC	ØMN	ØMO	MP	N	O
ODS-145	145.0	88.0	112.0	127.0	5.0	4.55	1.8	10.0	5.5	8.0	on request	80.0
ODS-175	175.0	111.5	134.5	150.0	6.2	6.75	3.0	11.0	6.6	14.0		120.0
ODS-225	225.0	125.0	153.0	195.0	8.0	8.00	4.5	15.0	9.0	15.5		120.0

Dimensions in mm

ORIGA DRIVE SYSTEM

ODS series

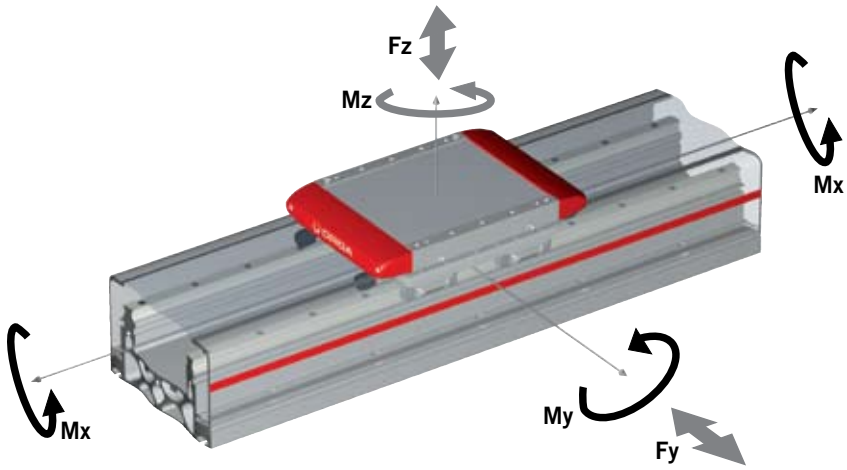
Recirculating ball bearing guide

Sizes:
145, 175, 225 mm

Load requirements for guides and installation size.

The occurring loads, forces and torque moments depend on the application. The mass of the construction attached to the linear drive carriage has a center of gravity. This mass creates static forces (F = m · g) and torque moments (M = m · g · l). Additional dynamic moments (M = m · a · l) arise in dependence of the acceleration during travel. Care should be taken when selecting suitable guides that the permissible sum of loads does not exceed 1.

Loads, forces and torque moments



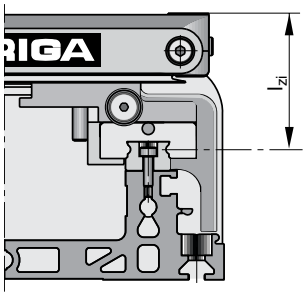
Combined loads

The maximum permissible load for linear drives subject to simultaneous multiple loads, forces and torque moments are calculated using the formula below. Maximum permissible loads must not be exceeded.

$$L = \frac{Fy}{Fy_{(max)}} + \frac{Fz}{Fz_{(max)}} + \frac{Mx}{Mx_{(max)}} + \frac{My}{My_{(max)}} + \frac{Mz}{Mz_{(max)}} \leq 1$$

The sum of all loads must under no circumstance be > 1.

Internal lift arm l_{zi}



Dimensions l_{zi}

Type	l_{zi}
ODS-145	45.0
ODS-175	56.0
ODS-225	63.0

Maximum permissible load based on a service life of 8000 km

Design		Standard (1 carriage as standard)			Tandem (2 carriage as standard)		
Type		ODS-145S	ODS-175S	ODS-225S	ODS-145S	ODS-175S	ODS-225S
Max. permissible force							
Fz 8000 Fy 8000	[N]	3000	5000	10,000	4500	7500	15,000
Max. torque moment							
Mx 8000	[Nm]	150	300	950	225	450	1425
My 8000	[Nm]	150	300	950	225	450	1425
Mz 8000	[Nm]	150	300	950	225	450	1425

Dimensions in mm

ORIGA DRIVE SYSTEM

ODS-...S series

Ball screw drive

Drive specifications

Sizes:
145, 175, 225 mm

Weights on request

Load values – ODS-145S series

Specification	Symbol	Unit	Comments		
Incline		[mm]	5	10	16
Max. speed	$v_{max.}$	[m/s]	0.25	0.50	0.80
Max. acceleration	$a_{max.}$	[m/s²]	10.0		
Max. force and torque	FA1000	[N]	2200	1600	1800
	$M_{max.}$1000	[Nm]	2.5	3.5	5.7
	FA8000	[N]	1100	840	900
	$M_{max.}$8000	[Nm]	1.6	2.2	3.2
Idling torque	M_0	[Nm]	0.6	0.7	0.7
Repeat accuracy		[mm]	± 0.02		
Max. order stroke		[mm]	2000		

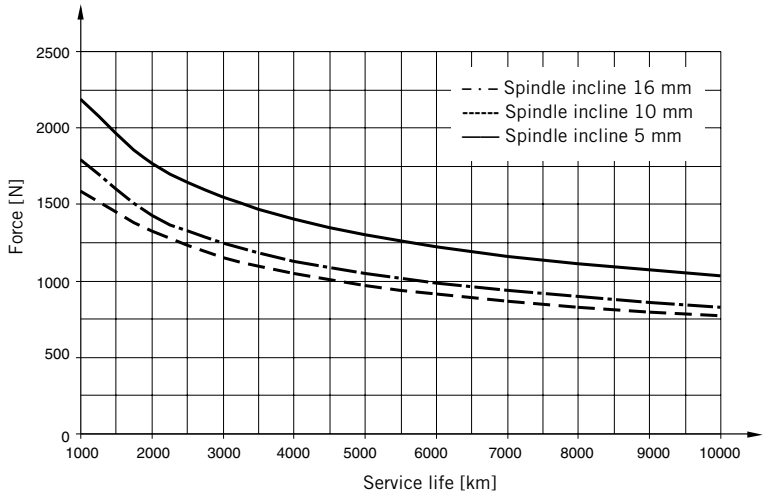
Load values – ODS-175S series

Specification	Symbol	Unit	Comments		
Incline		[mm]	5	10	20
Max. speed	$v_{max.}$	[m/s]	0.25	0.50	1.00
Max. acceleration	$a_{max.}$	[m/s²]	10.0		
Max. force and torque	FA1000	[N]	2900	3400	3300
	$M_{max.}$1000	[Nm]	3.2	6.7	12.3
	FA8000	[N]	1300	1700	1650
	$M_{max.}$8000	[Nm]	1.8	3.7	6.6
Idling torque	M_0	[Nm]	0.7	0.8	0.9
Repeat accuracy		[mm]	± 0.02		
Max. order stroke		[mm]	2500		

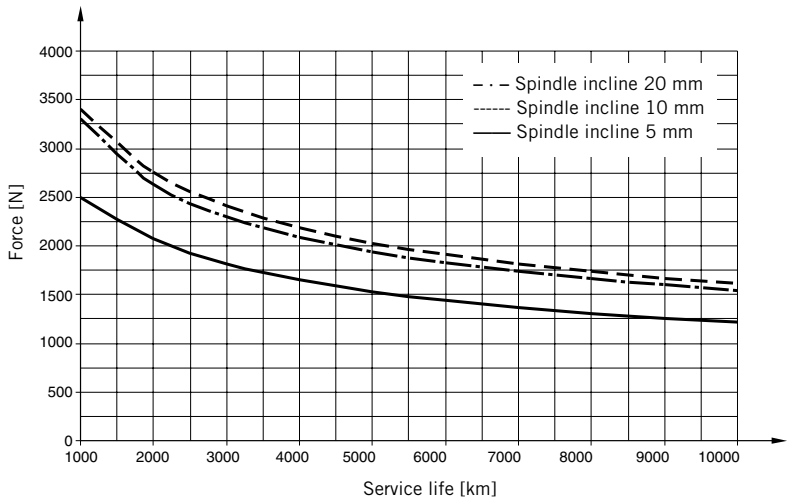
Load values – ODS-225S series

Specification	Symbol	Unit	Comments		
Incline		[mm]	5	10	25
Max. speed	$v_{max.}$	[m/s]	0.25	0.50	1.25
Max. acceleration	$a_{max.}$	[m/s²]	10.0		
Max. force and torque	FA1000	[N]	3500	4700	5000
	$M_{max.}$1000	[Nm]	3.8	9.0	22.6
	FA8000	[N]	1300	2400	2600
	$M_{max.}$8000	[Nm]	1.9	5.1	12.2
Idling torque	M_0	[Nm]	0.8	0.9	1.0
Repeat accuracy		[mm]	± 0.02		
Max. order stroke		[mm]	3200		

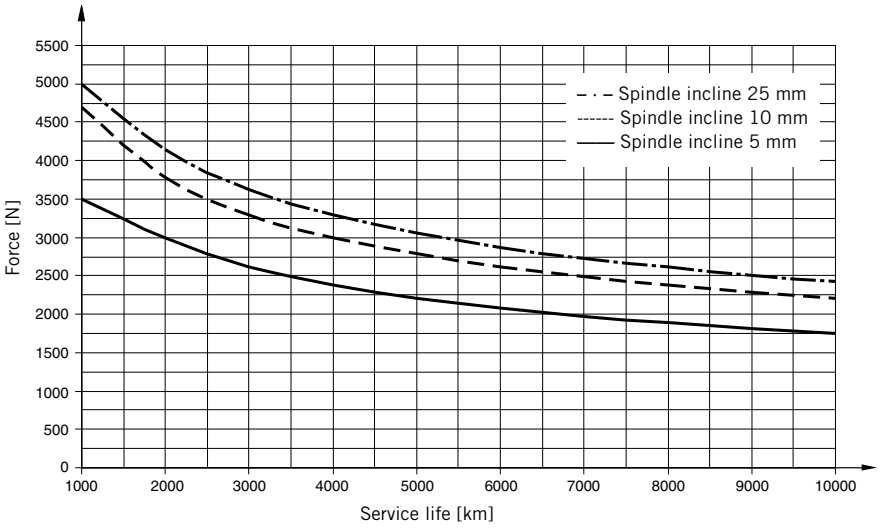
Service life subject to force – ODS-145S series



Service life subject to force – ODS-175S series



Service life subject to force – ODS-225S series



Dimensions in mm

ORIGA DRIVE SYSTEM

ODS-...S series

Ball screw drive

Service life

Sizes:
145, 175, 225 mm

Service life expectancy depends on the application's required force. An increase in force will reduce service life.

ORIGA DRIVE SYSTEM

ODS-...S series

Ball screw drive

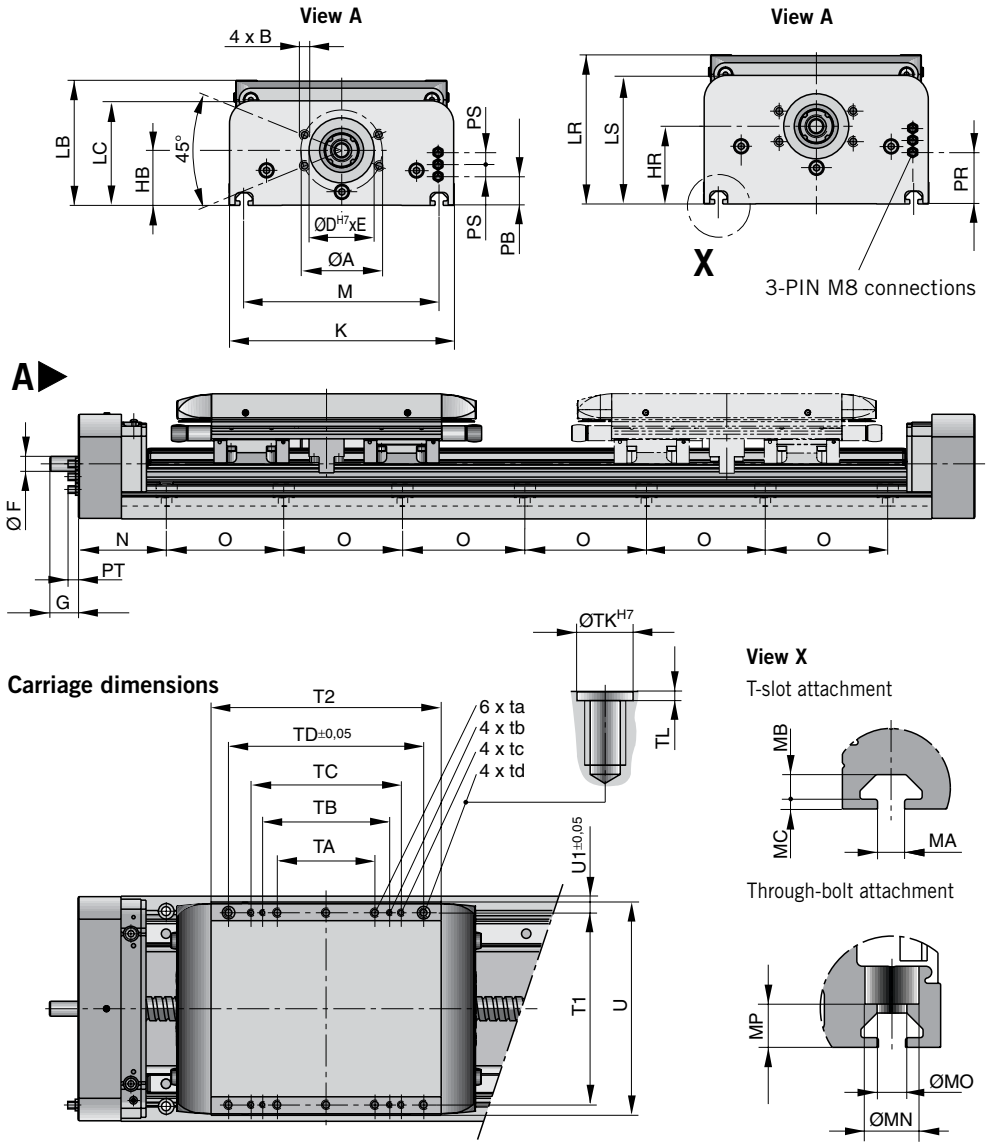
Dimensions

Sizes:
145, 175, 225 mm

Basic dimensions of carrier profile

Basic design

Reinforced design



Carriage dimensions

View X

T-slot attachment

Through-bolt attachment

Dimensions Table – Basic Dimensions

Type	ØA	B	ØD^{H7}	E	F	G	HB	HR	K	LB	LC	LR	LS
ODS-145	51	M6	39	4.5	10	23.5	36.0	60.0	145.0	88.0	72.0	112.0	96.0
ODS-175	72	M8	54	2.5	12	27.5	44.2	67.2	175.0	111.5	93.2	134.5	116.2
ODS-225	80	M8	64	2.5	15	28.5	55.0	83.0	225.0	125.0	104.5	153.0	133.5

Type	M	MA	MB	MC	ØMN	ØMO	MP	N	O	PB	PR	PS	PT
ODS-145	127.0	5.0	4.55	1.8	10.0	5.5	8.0	on request	80.0	18.0	42.0	12.0	9.0
ODS-175	150.0	6.2	6.75	3.0	11.0	6.6	14.0		120.0	28.0	51.0	12.0	9.0
ODS-225	195.0	8.0	8.00	4.5	15.0	9.0	15.5		120.0	29.0	57.0	12.0	9.0

Dimensions Table – Standard Carriage

Type	T1	T2	TA	ta	TB	tb	TC	tc	TD	td	ØTK	TL	U	U1
ODS-145	120	155	35	M5 x 12	–	–	87	M5 x 12	127	M5 x 12	7	1.5	135	12.5
ODS-175	150	170	70	M6 x 12	–	–	127	M5 x 10	150	M6 x 12	9	1.5	165	12.5
ODS-225	192	230	97.5	M8 x 16	127	M5 x 10	150	M6 x 12	195	M8 x 16	12	1.5	210	16.5

Dimensions in mm

Dimensions dependent on order stroke

S = Safety distance J_s = Standard carriage J_l = Long carriage

ORIGA DRIVE SYSTEM

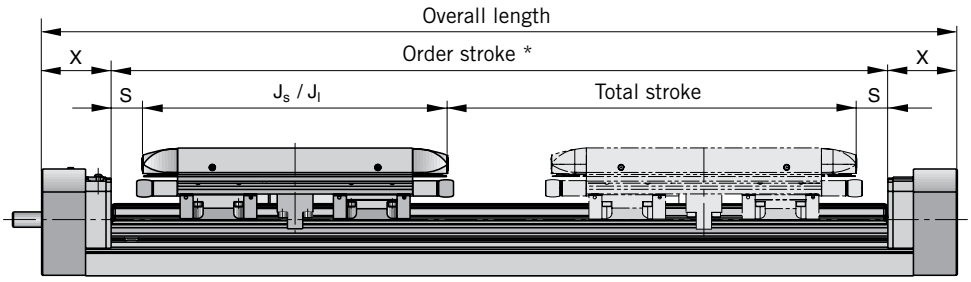
ODS-...S series

Ball screw drive

order stroke

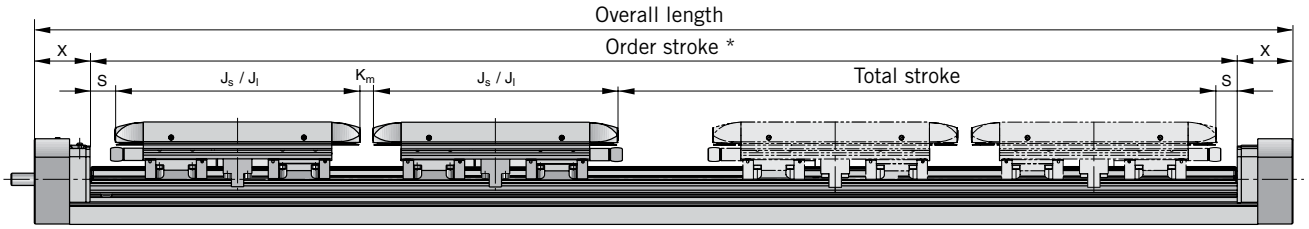
Sizes:
145, 175, 225 mm

Standard design with one carriage



* Order stroke = required travel distance + carriage (J_s/J_l) + 2 x safety distance (S)

Tandem design with two carriages



* Order stroke = required travel distance + 2 x carriages (J_s/J_l) + K_m + 2 x safety distance (S)

Dimensions Table for Order Stroke Dimensions

Type	J_s	J_l	X
ODS-145	230	–	50
ODS-175	250	–	58
ODS-225	310	–	68

Dimensions in mm

ORIGA DRIVE SYSTEM

ODS-...S series

Product key	ODS	–	S3	0	B	05	P	0	-	0000	-	0	0	0	0	0	0	0

Type / size of drive	
S3	Ball screw drive / size 145
S5	Ball screw drive / size 175
S7	Ball screw drive / size 225

Profile version / mounting system	
0	basic profile / T-Nut
1	basic profile / T-Nut and standard bores
2	basic profile / T-Nut and individuall bores
5	reinforced profile / T-Nut
6	reinforced profile / T-Nut and standard bores
7	reinforced profile / T-Nut and individuall bores

Guide system	
B	Recirculating ball bearing guide

Pitch	
05	5 mm (for sizes 145, 175 and 225)
10	10 mm (for sizes 145, 175 and 225)
16	16 mm (for size 145)
20	20 mm (for size 175)
25	25 mm (for size 225)

Drive shaft	
P	Plain shaft
K	Keyway

Carriage	
0	Standard
1	Tandem

Order stroke	
0000	4 digits input in cm

Protection class	
0	IP class 20
1	IP class 54 with outer cover

Impact protection	
0	without
D	Damper

Magnetic end position switch	
0	without
1	2pc. Reed, RST-K, NC, internal
4	2pc. PNP, EST-K, internal
5	2pc. Reed, RST-S, NC, M8 plug, external
8	2pc. PNP, EST-S, M8 plug, external

Referenzschalter	
0	without
2	1pc. Reed, RST-K, NO, internal
4	1pc. PNP, EST-K, internal
6	1pc. Reed, RST-S, NO, M8 plug, external
8	1pc. PNP, EST-S, M8 plug, external

Wegmessystem	
0	without
1	SFI +

Design – IP20 protection class

ORIGA DRIVE SYSTEM

ODS series

Protection class

Designs:
IP20 – without cover
IP54 – with cover

ODS was developed for various operating conditions. The basic ODS design has an IP20 protection class. ODS can be equipped with a cover to correspond to an IP54 protection class if a higher rating is required.

Design – IP54 protection class

ORIGA DRIVE SYSTEM

ODS series

Position detection

Magnetic switch set for:

– End positions

– Reference

Magnetic switch sets, for instance in the end positions, are required to electronically detect the carriage position. They can also be used to select the reference position.

Magnets built in as standard provide contactless sensing. A yellow LED indicates the operating status.

The possible speed of the load-bearing element or carriage must take the minimum response time of downstream devices into account. Contact travel is considered accordingly in the calculations.

$$\text{Minimum response time} = \frac{\text{Contact travel}}{\text{Overrun speed}}$$

* Please observe the surface temperature and self-heating action of the drive in relation to the temperature ranges of magnetic switch sets.

Specifications

Description	Symbol	Unit	Comments	
Output function				
Switch output			Reed	PNP / NPN
Output function			NC (opener) NO (closer)	NO (closer)
Connection type			2-core	3-core
Protective circuit			Pin 1 = + V (br) Pin 3 = Signal (bl)	Pin 1 = + V (br) Pin 3 = 0 V (bl) Pin 4 = Signal (sw/we)
Display			LED yellow	LED yellow
Electrical properties				
Operating voltage	U_n	V	10–30 AC/DC	10–30 DC
Voltage drop	U_d	V	≤ 3	≤ 2
Permanent current	I_n	mA	≤ 100	≤ 100
Current consumption	I_{on}	mA	–	≤ 10
Switching capacity	P_s	W	≤ 6 peak	–
Switchable capacity	C_s	nF	100 (100Ω, 24VDC)	100 (100Ω, 24VDC)
Switching frequency	f_s	Hz	≤ 400	≤ 5000
Switching time (On/Off)	t_{IO}	ms	≤ 2	≤ 2
Sensitivity		mT	2–4	2–4
Switch-point accuracy		mm	≤ 0.2	≤ 0.2
Hysteresis		mm	≤ 1.5	≤ 1.5
EMV			EN 60947-5-2	EN 60947-5-2
Service life			35 million cycles	unlimited
Short-circuit protection			–	Yes
Reverse polarity protection			Yes	Yes
Mechanical properties				
Connection cable			PUR, black	PUR, black
Cable cross-section		mm^2	2 x 0.14	3 x 0.14
Connector plug			M8, 3-pole	M8, 3-pole
Housing			Plastic, red, PA66 + PA6I	Plastic, red, PA66 + PA6I
Weight	m	g	10	10
Ambient conditions				
Protection class (EN 60529)			IP 67	IP 67
Temperature range *	ΔT	°C	-25 to +80	-25 to +75 (10–30V) -25 to +80 (10–28V)
Vibration (EN 60068-2-6)		G	15 (11 ms, 10–55 Hz, 1 mm)	15 (11 ms, 10–55 Hz, 1 mm)
Shock (EN 60068-2-27)		G	50 (11 ms)	50 (11 ms)
Permanent shock (EN 60068-2-29)		G	30 (11 ms, 1000 shocks)	30 (11 ms, 1000 shocks)

ORIGA DRIVE SYSTEM

ODS series

Position detection

Magnetic switch sets for:

– End positions

– Reference

RST-S

The RST-S type makes low-impact contact via a mechanical reed switch encapsulated in glass.

EST-S

The EST-S type protects against reverse polarity and makes non-impact and wear-free contact via an electronic switch. The output is protected against short circuiting and resistant to shocks and vibrations.

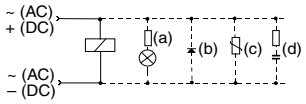
RST-S and EST-S magnetic switch sets

Electrical service life, protection measures

Magnetic switch sets are sensitive to excessive voltage loads and inductions. Their service life is greatly reduced by high switching frequencies with inductive loads such as relays, magnetic valves or stroke magnets.

Ohmic and capacitive loads with a high switching current such as light bulbs, should have protective resistance connected in series with the load. The same applies to long lengths of cable. Load peaks (transients) occur when switching inductive loads such as relays, magnetic valves and stroke magnets, and should be suppressed by means of protective diodes, RC circuits or varistors.

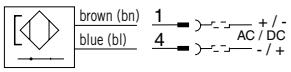
Connection examples:
Load with protective circuits
(a) Series resistor to the light bulb
(b) Free-wheeling diode to inductivity
(c) Varistor to inductivity
(d) RC member to inductivity



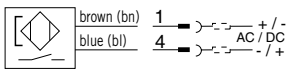
External protective circuits for Type EST are not usually required.

Electrical connection type RST-S

Opener

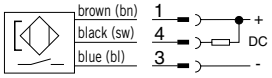


Closer

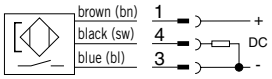


Electrical connection type EST-S

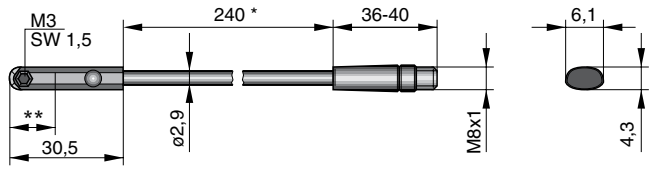
NPN



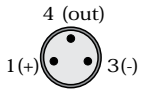
PNP



Dimensions – RST-S and EST-SS

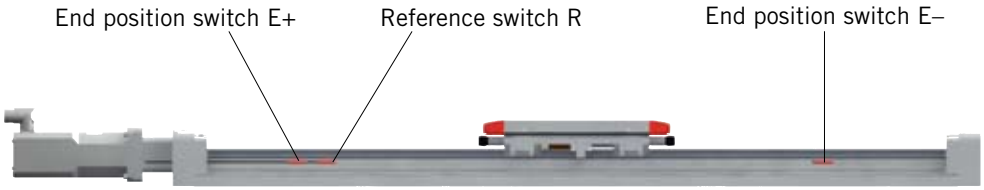


* ± 6 mm
** switching point: Type RST-S opener 14 mm
Type RST-S closer 12.3 mm
Type EST-S closer 8.1 mm



PIN configuration (top view) in accordance with DIN EN 50044

Magnet switch set designations



Connecting cable suitable for cable chain	
KL3186	M8 connector, 5m cable
KL3217	M8 connector, 10m cable
KL3216	M8 connector, 15m cable

ORIGA DRIVE SYSTEM

ODS series

Impact protection

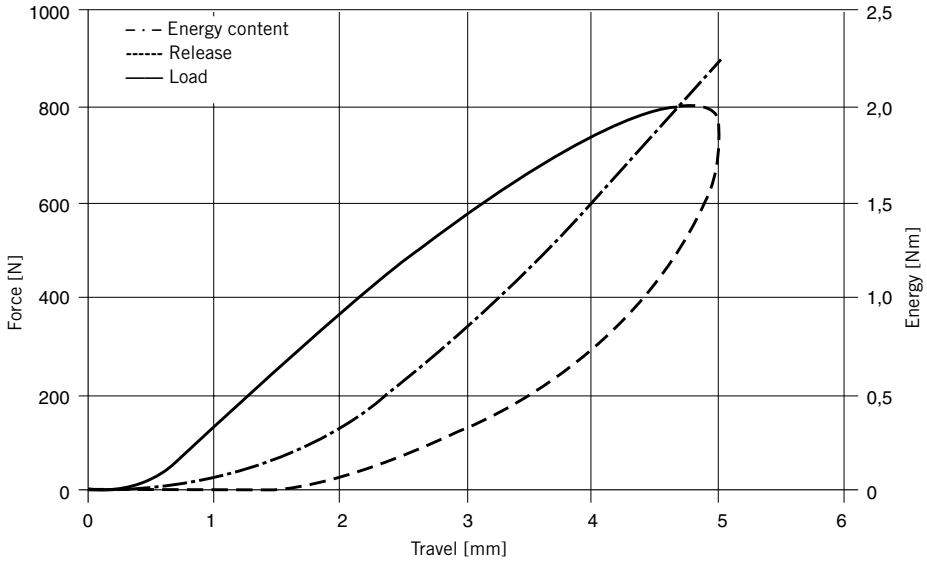
ODS can be equipped with impact protection. The mounted structure shock absorbers can compensate the energy released by unintentional impact and afford protection against mechanical damage.

Two structure shock absorbers are fitted to each side of the carriage prior to delivery.

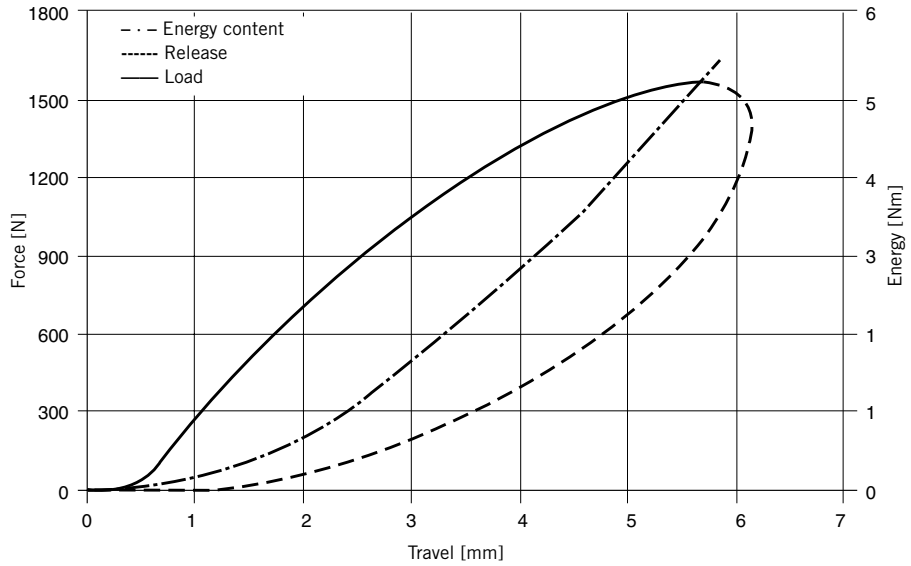
Shock absorbers for impact protection

Type	Shock absorber	Energy absorption (Nm/stroke)	Maximum stroke (mm)
ODS-145	TA12-5	3.0	5.0
ODS-175	TA17-7	8.5	7.0
ODS-225	TA17-7	8.5	7.0

Distance-force and energy-distance characteristic curve (dynamic) – for Type ODS-145



Distance-force and energy-distance characteristic curve (dynamic) – for Type ODS-175, ODS-225



Dimensions in mm

Specifications

Specifications	Unit	Comments
Type		21210
Output function		
Resolution	mm	0.1
Pole length of measuring tape	mm	5
Max. speed	m/s	10
Repeat accuracy		± 1 increment
Distance sensor/measuring tape	mm	≤ 4
Sensor head incline		≤ 5°
Potential lateral deviation	mm	≤ ± 1.5
Switch output		PNP
Electrical characteristics		
Operating voltage U_b	V DC	18–30
Voltage drop	V	≤ 2
Permanent current per output	mA	≤ 20
Current consumption at U_b = 24 V, activated, no load	mA	≤ 50
Short-circuit protection		Yes
Reverse polarity protection		Yes
Protection against inductive switch-off peaks		Yes
Turn-on pulse suppression		Yes
EMV		
Electro-static discharge	kV	6, B, in accordance with EN 61000-4-2
Electro-magnetic field	V/m	10, A, in accordance with EN 61000-4-3
Rapid Transient Burst (signal connections)	kV	1, B, in accordance with EN 61000-4-4
Rapid Transient Burst (DC connections)	kV	2, B, in accordance with EN 61000-4-4
Surge voltage strength (signal connections)	kV	1, B, in accordance with EN 61000-4-5
Surge voltage strength (DC-connections)	kV	0.5, B, in accordance with EN 61000-4-5
HF conducted	V	10, A, in accordance with EN 61000-4-6
Magnetic field at 50 Hz	A/m	30, A, in accordance with EN 61000-4-8
Interference transmission		in accordance with EN 61000-6-4
Emitted interference transmission		in accordance with EN 55011, Group 1, A
Mechanical specifications		
Housing		Aluminum
Cable length	m	5.0 – cast-on, open-ended
Cable cross-section	mm^2	4 x 0.14
Cable design		PUR, black
Bending radius	mm	≥ 36
Weight (mass)	kg	approx. 0.165
Ambient conditions/shock resistance		
Protection class	IP	67 in accordance with EN60529
Ambient temperature range	°C	-25 to +80
Broadband noise in accordance with EN 60068-2-64	g	5, 5 Hz to 2 kHz, 0.5 h per axis
Vibration in accordance with EN 60068-2-6	g	12, 10 Hz to 2 kHz, 2 mm, 5 h per axis
Shock in accordance with EN 60068-2-27	g	100, 6 ms, 50 shocks per axis
Permanent shocks in accordance with EN 60068-2-29	g	5, 2 ms, 8000 shocks per axis

ORIGA DRIVE SYSTEM

ODS series

Displacement measuring system

SFI-plus model

The contact-free magnetic displacement measuring system provides a standard resolution of 0.1 mm (higher resolutions available on request). The position of the stationary or moving carriage is detected directly and processed by the corresponding controller (e.g. SPS, PC) on the basis of incremental signals.

ORIGA DRIVE SYSTEM

ODS series

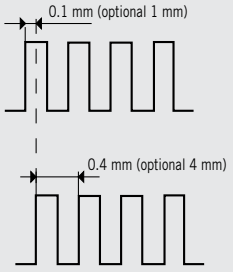
Displacement measuring system

SFI-plus model

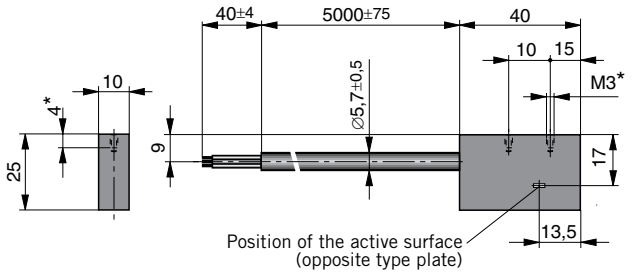
Sensing head

The sensing head transmits two pulsed counting signals (Phase A and B) with phases offset by 90° and a resolution of 0.4 mm (optional: 4 mm). The resolution can be increased to 0.1 mm (optional: 1 mm) through edge evaluation. The counting direction results automatically from the phase displacement of the counting signals.

Signal course – sensing head output

Ua = Ue	Phase B	Ua1	0°	
	Phase A	Ua2	90°	

Dimensions – sensing head



* Screw-in depth max. 4 mm

Electrical connection

Color	Description
bn = brown	+ DC
bl = blue	– DC
sw = black	Phase A
ws = white	Phase B

Dimensions in mm

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