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# igus® data sheet

## drygear® Apiro®



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## General properties

- Modular gearbox system with tribologically optimised plastic materials
- Worm gears
- Rack gears
- Lift/push drive
- Bevel gear
- Motor drive or manual drive
- Modules can be connected in various ways
- INI kit available for all options
- Application temperature: +5°C to +50°C
- Suitable for splash water applications
- Lightweight
- Lubrication-free
- Cost-effective
- Long service life

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### ... modular gearbox system

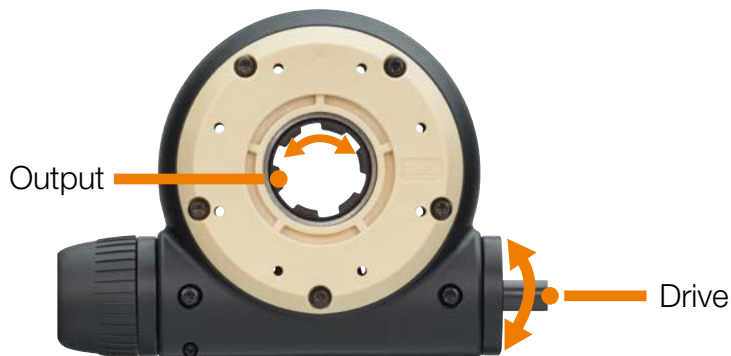
Worm gear <b>RL-A10</b>	Page 3
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## Worm gear



### ... technical data

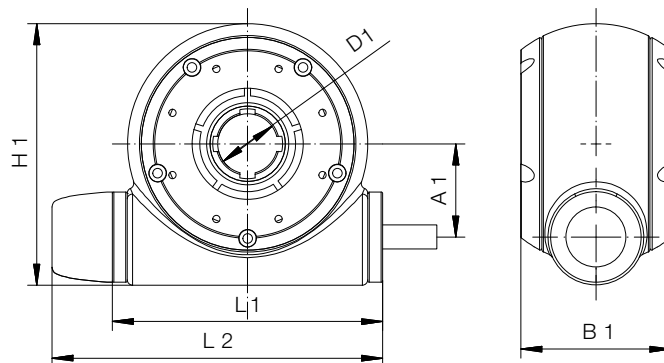
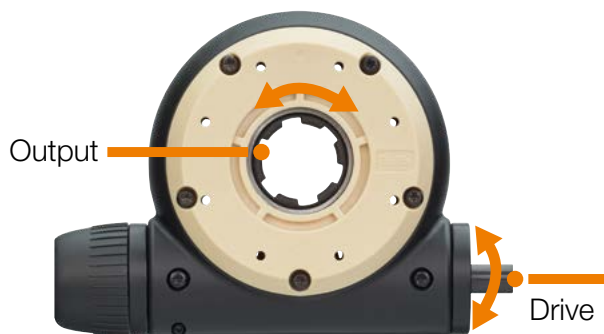
Shaft diameter (D2)	8mm
Axis distance (A1)	31mm
Backlash	< 0.5°

### ... available transmission ratios

Transmission	4:1	8:1	32:1	64:1
Self-locking	X	X	(✓)	✓
Output torque	2.5 Nm	2.5 Nm	2.5 Nm	1.5 Nm
Rated speed	80rpm	60rpm	20rpm	10rpm
Breaking moment	20Nm	20Nm	20Nm	10Nm
Maximum axial load	250N	250N	250N	250N
Backlash (unloaded)	< 0.5°	< 0.5°	< 0.5°	< 0.5°

Other transmission ratios are also available: 3:1, 16:1  
Service life at rated speed and nominal torque is at least 1,000,000 cycles

## Worm gear with hollow shaft



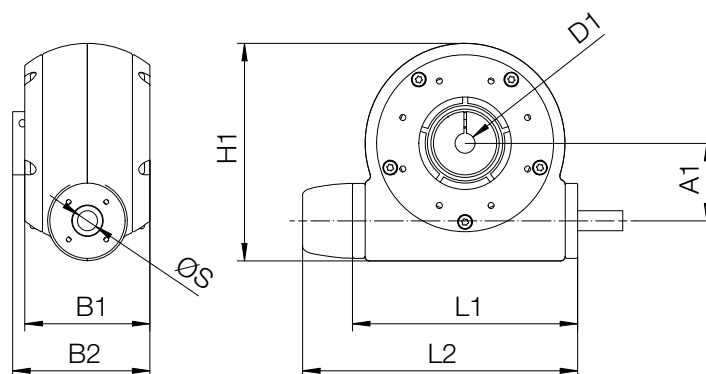
### ... available transmission ratios

Part No.	RL-A10.0105	RL-A10.0104	RL-A10.0106	RL-A10.0107
Transmission	4:1	8:1	32:1	64:1

### ... dimensions

L1	L2	H1	B1	D1	D2	A1
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
90	110	87	50	20	8	31

## Worm gear with coupling



### ... available transmission ratios

D1 = 8mm	RL-A10.0117	RL-A10.0200	RL-A10.0118	RL-A10.0119
D1 = 12mm	RL-A10.0220	RL-A10.0207	RL-A10.0204	RL-A10.0203
Transmission	4:1	8:1	32:1	64:1
Breaking moment*	20Nm	20Nm	20Nm	10Nm

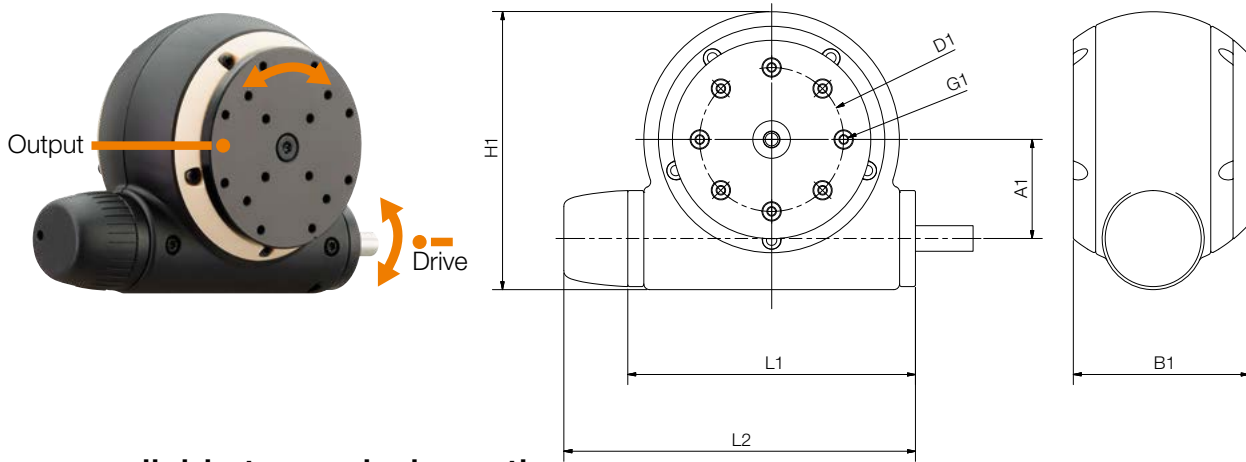
### ... dimensions

L1	L2	H1	B1	B2	D1	A1	Weight
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g]
90	110	87	50	55	8	31	240

\*Slipping of the coupling as of 10Nm. Gearboxes thus protected against mechanical failure.

Additional couplings with shaft diameters of 4mm to 10mm are also available

## Worm gear with turntable



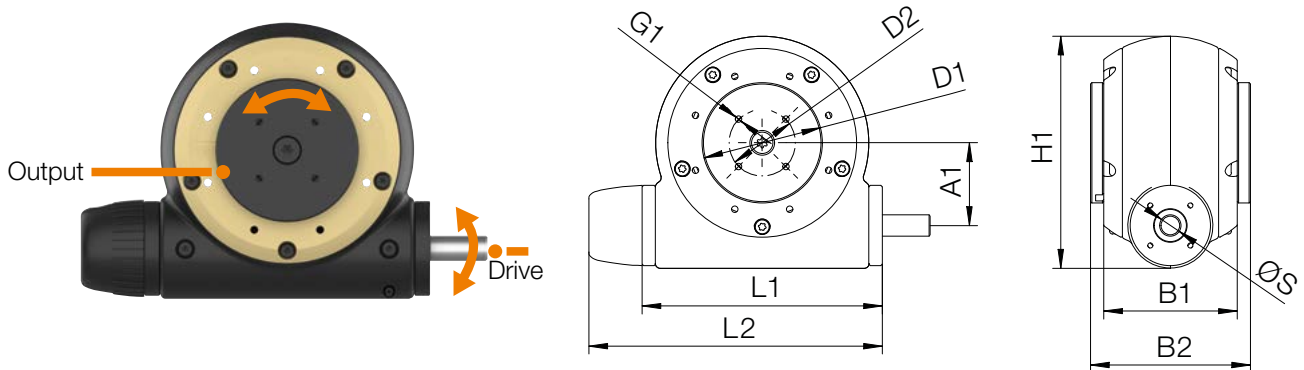
### ... available transmission ratios

Part No.	RL-A10.0138	RL-A10.0170	RL-A10.0114	RL-A10.0139
Transmission	4:1	8:1	32:1	64:1

### ... dimensions

L1	L2	H1	B1	D1	D2	A1	G1	Weight
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g]
90	110	87	55	45	8	31	M3	240

## Worm gear with turntable on both sides



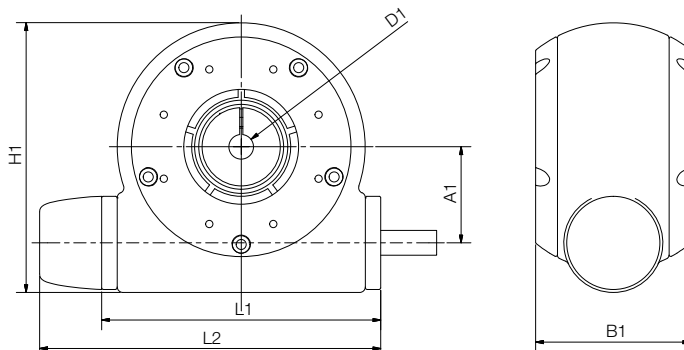
### ... available transmission ratios

Part No.	RL-A10.0209	RL-A10.0206	RL-A10.0210	RL-A10.0211
Transmission	4:1	8:1	32:1	64:1

### ... dimensions

L1	L2	H1	B1	B2	D1	D2	A1	G1	Ø S	Weight
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g]
90	110	87	50	60	45	25	31	M3	8	280

## Worm gear can be connected to drylin<sup>®</sup> linear axes



### ... available transmission ratios

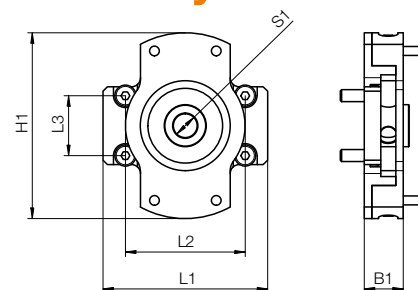
Part No.	RL-A10.0182	RL-A10.0183	RL-A10.0184	RL-A10.0185
Transmission	4:1	8:1	32:1	64:1

### ... dimensions

L1	L2	H1	B1	A1	Ø S	Ø T	Weight
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g]
90	110	87	50	31	8	14*	248

\*A suitable reducing sleeve for the lead screw of your drylin<sup>®</sup> axis is included when you order the corresponding adapter kit

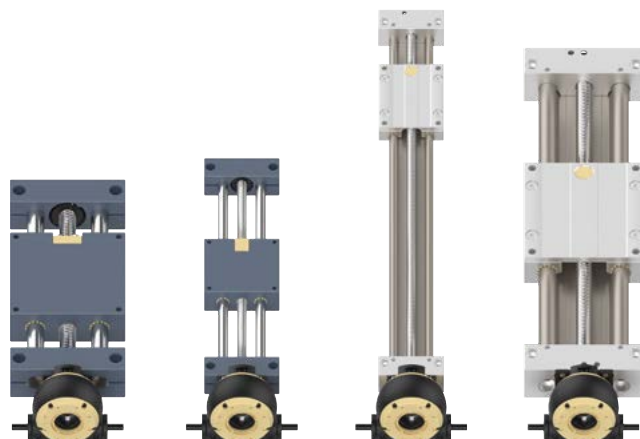
## Accessories Adapter Apiro<sup>®</sup> connection to drylin<sup>®</sup> axes



### ... dimensions

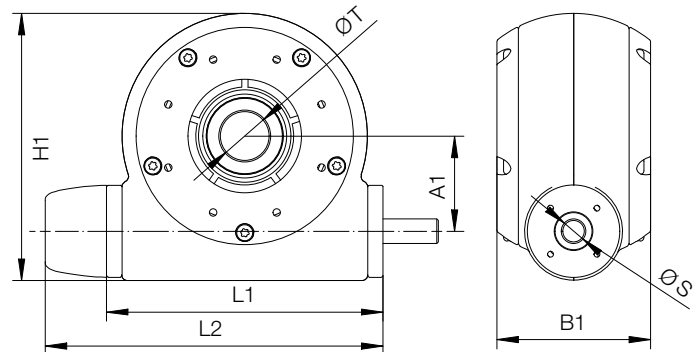
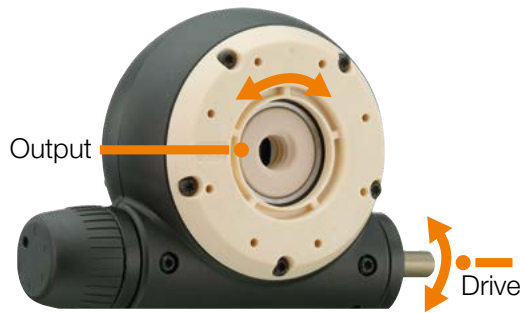
L1	L2	L3	B1	H1	D2	Ø S
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
65	48	36	13	62	12	12

### ... suitable drylin<sup>®</sup> axes



drylin <sup>®</sup> axis	
SLW-10xx (aluminium shaft end support)	RL-A54.0114
SLW-10xx (zinc shaft end support)	RL-A54.0121
SLW-1660	RL-A54.0116
SLW-BB-2080	RL-A54.0117
SLW-BB-25120	RL-A54.0118
SHT-12	RL-A54.0114
SHT-20	RL-A54.0115
SHT-BB-20	RL-A54.0117
SHT-30	RL-A54.0116
SHT-BB-30	RL-A54.0118

## Worm gear with nut for dryspin<sup>®</sup> lead screws



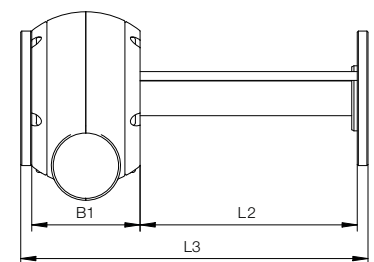
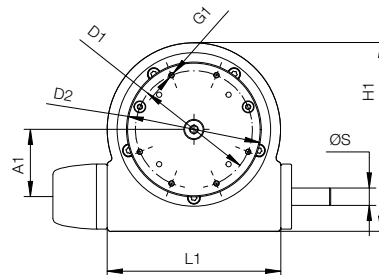
### ... available transmission ratios

Transmission	4:1	32:1	64:1
TR16x2	RL-A10.0190	RL-A10.0191	RL-A10.0192
Self-locking	✓	✓	✓
Feed rate	0.5	0.06	0.03
DS12x5	RL-A10.0196	RL-A10.0197	RL-A10.0198
Self-locking	X	✓	✓
Feed rate	1.25	0.16	0.08
DS10x25	RL-A10.0193	RL-A10.0194	RL-A10.0195
Self-locking	X	(✓)	✓
Feed rate	6.25	0.78	0.39

### ... dimensions

L1	L2	H1	B1	A1	Ø S	Weight
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g]
90	110	87	50	31	8	230

## Lift/push drive



### ... technical data

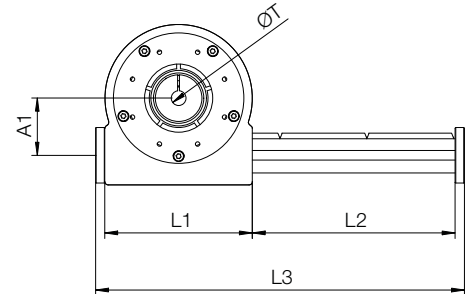
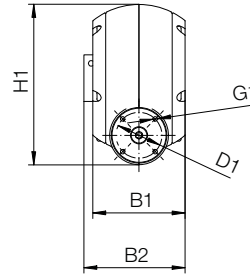
Part number	RL-A18.0101.x*
Max. dynamic load	250N
Max. speed	5mm/sec
Feed rate	0.5mm/revolution
Stroke	10 - 250mm
Self-locking	Yes

### ... dimensions

L1	L2	L3	B1	H1	Ø S	G1	D1	D2	Weight (100mm stroke)
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g]
80	10-250	70-310	50	87	8	M3	27	62	560

\*Stroke in mm

## Rack gear standard version



### ... technical data

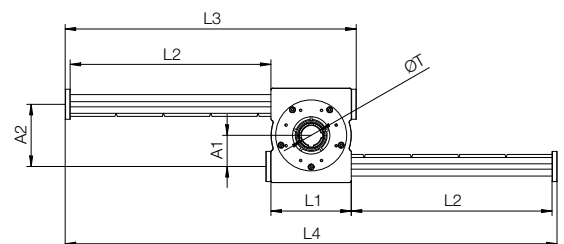
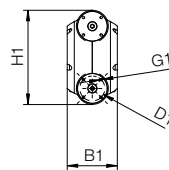
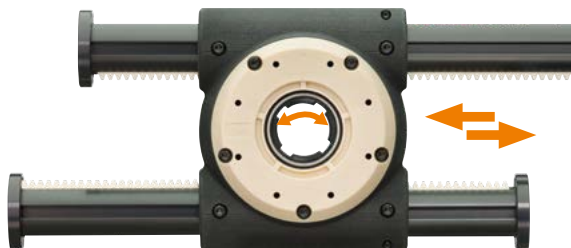
Profile diameter	20mm
Axis distance (A1)	31mm
Weight	300 - 760g
Max. speed	500mm/sec
Feed rate per rotation	125.66mm
load	50N
Stroke	60 - 1,050mm

### ... dimensions

Part No.	ØT [mm]	B1 [mm]	B2 [mm]	H1 [mm]	D1 [mm]	G1
RL-A14.0107.X	20	50	-	87	25	M3
RL-A14.0109.X	8	50	55	87	25	M3
RL-A14.0114.X	12	50	55	87	25	M3

X: Stroke lengths according to the additional table on page 9

## Rack gear Double rack



### ... technical data

Part No.	RL-A15.0100.X
Feed rate per rotation	125.66mm
Stroke	720mm

X: Stroke lengths according to the additional table on page 9

### ... dimensions

L1 [mm]	L3 [mm]	L4 [mm]	A1 [mm]	A2 [mm]	D1 [mm]	B1 [mm]	H1 [mm]	Ø T [mm]	Weight [g]
80	810	1,530	31	65	25	50	94	20	1,005

... dimensions

	Stroke [mm]	L1 [mm]	L3 [mm]	RL-A14.0107.X [g]	RL-A14.0109.X [g]	RL-A16.0102.X [g]	RL-A15.0100.X [g]
RL-A14.01XX.3	60	80	150	255	270	290	330
RL-A14.01XX.4	110	80	200	280	295	315	380
RL-A14.01XX.5	155	80	245	305	320	340	430
RL-A14.01XX.6	200	80	290	330	345	365	480
RL-A14.01XX.7	250	80	340	355	370	390	530
RL-A14.01XX.8	295	80	385	380	395	415	580
RL-A14.01XX.9	345	80	435	405	420	440	630
RL-A14.01XX.10	390	80	480	430	445	465	680
RL-A14.01XX.11	440	80	530	455	470	490	730
RL-A14.01XX.12	485	80	575	480	495	515	780
RL-A14.01XX.13	530	80	620	505	520	540	830
RL-A14.01XX.14	580	80	670	530	545	565	880
RL-A14.01XX.15	625	80	715	555	570	590	930
RL-A14.01XX.16	675	80	765	580	595	615	980
RL-A14.01XX.17	720	80	810	605	620	640	1,030
RL-A14.01XX.18	770	80	860	630	645	665	1,080
RL-A14.01XX.19	815	80	905	655	670	690	1,130
RL-A14.01XX.20	860	80	950	680	695	715	1,180
RL-A14.01XX.21	910	80	1,000	705	720	740	1,230
RL-A14.01XX.22	955	80	1,045	730	745	765	1,280
RL-A14.01XX.23	1,005	80	1,095	755	770	790	1,330
RL-A14.01XX.24	1,050	80	1,140	780	795	815	1,380

Motor kit DC motors for worm gear



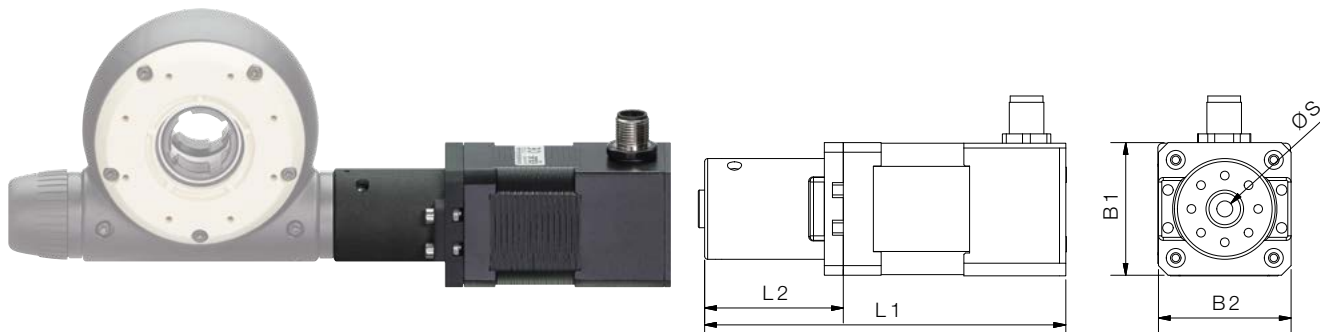
... technical data

Part No.	RL-A51.0114
Nominal current	0.9A
Nominal voltage	24 - 48V DC
Torque	0.5Nm

... dimensions

L1 [mm]	L2 [mm]	B1 [mm]	B2 [mm]	Ø S [mm]	Weight [g]
129.5	85.5	36	42	8	508.6

## Motor kit stepper motors for worm gear



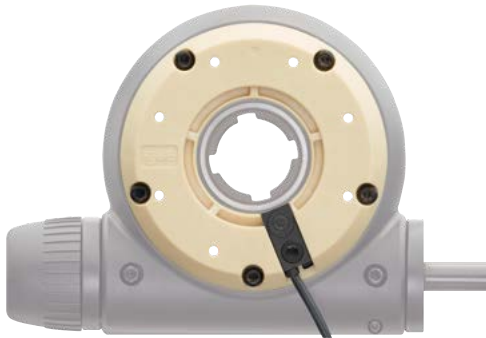
### ... technical data

Part No.	Connection	Weight [g]
RL-A51.0101	NEMA 17 with stranded wire	450
RL-A51.0133	NEMA 17 with stranded wire and encoder	480
RL-A51.0102	NEMA 17 with connector	510
RL-A51.0103	NEMA 17 with connector and encoder	528
RL-A51.0104	NEMA 17 with connector, encoder and brake	660
RL-A51.0105	NEMA 23 with connector	1,200
RL-A51.0115	NEMA 23 with stranded wire	1,156
RL-A51.0140	NEMA 23 with stranded wire and encoder	1,257
RL-A51.0105	NEMA 23 with connector	1,237
RL-A51.0106	NEMA23 with connector and encoder	1,237
RL-A51.0116	NEMA 23 with connector, encoder and brake	1,478

### ... dimensions

Part No.	L1 [mm]	L2 [mm]	B1 [mm]	B2 [mm]	S [mm]
RL-A51.0101	93	44	42	42	8
RL-A51.0102	114	44	42	42	8
RL-A51.0103	114	44	42	42	8
RL-A51.0104	150	44	42	42	8
RL-A51.0105	144	46	56	56	8
RL-A51.0133	105	44	42	42	8
RL-A51.0115	122	76	56	56	8
RL-A51.0140	135	46	56	56	8
RL-A51.0116	184	138	56	56	8

## INI-Kit for worm gear



### ... technical data

Part No.	RL-A52.0100
Connection	M8x1
Switching output	PNP
Switching function	NO (normally open)
Operating voltage	10 ... 30VDC
Rated operational current	100 mA

## INI-Kit for cantilever axis



### ... technical data

Part No.	RL-A52.0101
Connection	M8x1
Switching output	PNP
Switching function	NO (normally open)
Operating voltage	10 ... 30VDC
Rated operational current	100 mA

## Cables

### Motor, INI and encoder cables

#### ... at a glance

- Suitable for energy chains
- Shielded and oil-resistant
- Straight and angled connectors

#### ... motor cables



Flange size: 28mm (NEMA11), 42mm (NEMA17), 56mm (NEMA23), 60mm (NEMA23XL)

Bend radius moved<10m travel: min. 5xd

Part No.	Ø [mm]	Jacket	Type	Length [m]	Connector
DLE904121451-3	5.5	TPE	CF9.INI	3	straight
DLE904121451-5	5.5	TPE	CF9.INI	5	straight
DLE904121451-10	5.5	TPE	CF9.INI	10	straight
DLE904121452-3	5.5	TPE	CF9.INI	3	angled
DLE904121452-5	5.5	TPE	CF9.INI	5	angled
DLE904121452-10	5.5	TPE	CF9.INI	10	angled

#### ... INI cables (brake)



Flange size: 42mm (NEMA17), 56mm (NEMA23), 60mm (NEMA23XL)

Bend radius moved<10m travel: min. 5xd

Part No.	Ø [mm]	Jacket	Type	Length [m]	Connectors
DLE904121453-3	4.5	TPE	CF9.INI	3	straight
DLE904121453-5	4.5	TPE	CF9.INI	5	straight
DLE904121453-10	4.5	TPE	CF9.INI	10	straight
DLE904121454-3	4.5	TPE	CF9.INI	3	angled
DLE904121454-5	4.5	TPE	CF9.INI	5	angled
DLE904121454-10	4.5	TPE	CF9.INI	10	angled

#### ... encoder cables



Bend radius moved<10m travel: min. 10xd

Part No.	Ø [mm]	Jacket	Type	Length [m]	Connectors
DLE904121455-3	7mm	PVC	CF240	3m	straight
DLE904121455-5	7mm	PVC	CF240	5m	straight
DLE904121455-10	7mm	PVC	CF240	10m	straight
DLE904121456-3	7mm	PVC	CF240	3m	angled
DLE904121456-5	7mm	PVC	CF240	5m	angled
DLE904121456-10	7mm	PVC	CF240	10m	angled

You can find out more at [www.igus.eu/drylinE-FAQ](http://www.igus.eu/drylinE-FAQ).

## Motor control system D1 dryve



### ... at a glance

- A wide range of automation tasks by simple parameterisation, no programming necessary
- For single axes, line, flat, linear and room linear robots and delta robots
- No software installation or app required
- Use with PC, tablet or smart phone
- Stepper (ST), DC and EC/BLDC motors with up to 21A peak currents and 48V
- Digital inputs/outputs, analogue inputs, CANopen, ModbusTCP (Gateway) for connection to master control systems such as Siemens or Beckhoff

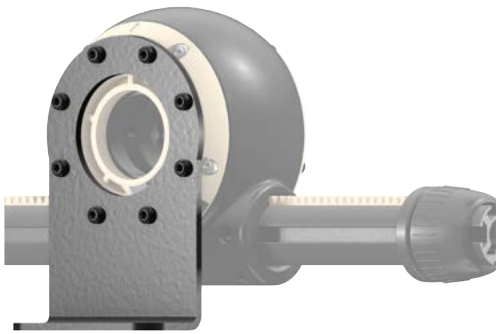
### ... technical data

Voltage supply	12-24V DC logic, 12-48V DC load
Motor type	Stepper, DC, EC/BLDC motor
Power supply	7A nominal current, 21A peak

More information:  
[www.igus.eu/dryve-D1](http://www.igus.eu/dryve-D1)

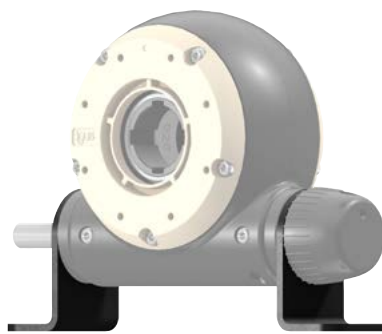
**Vertical assembly  
option**  
Flange

**RL-A54.0100**



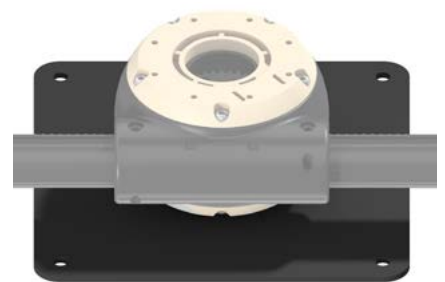
**Axial assembly  
option**  
Bracket set

**RL-A54.0101**



**Horizontal  
assembly option**  
Plate

**RL-A54.0103**



**Profile end cap**

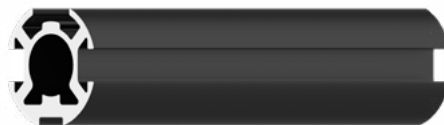
**RL-A200.0103**



**Multi-functional profile  
diameter 20mm**

**RL-A400.0100.X**

X = Length of profile



**Parallel connector**

**RL-A220.0104**



**Slot nut M3**

**RL-A320.0101**



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