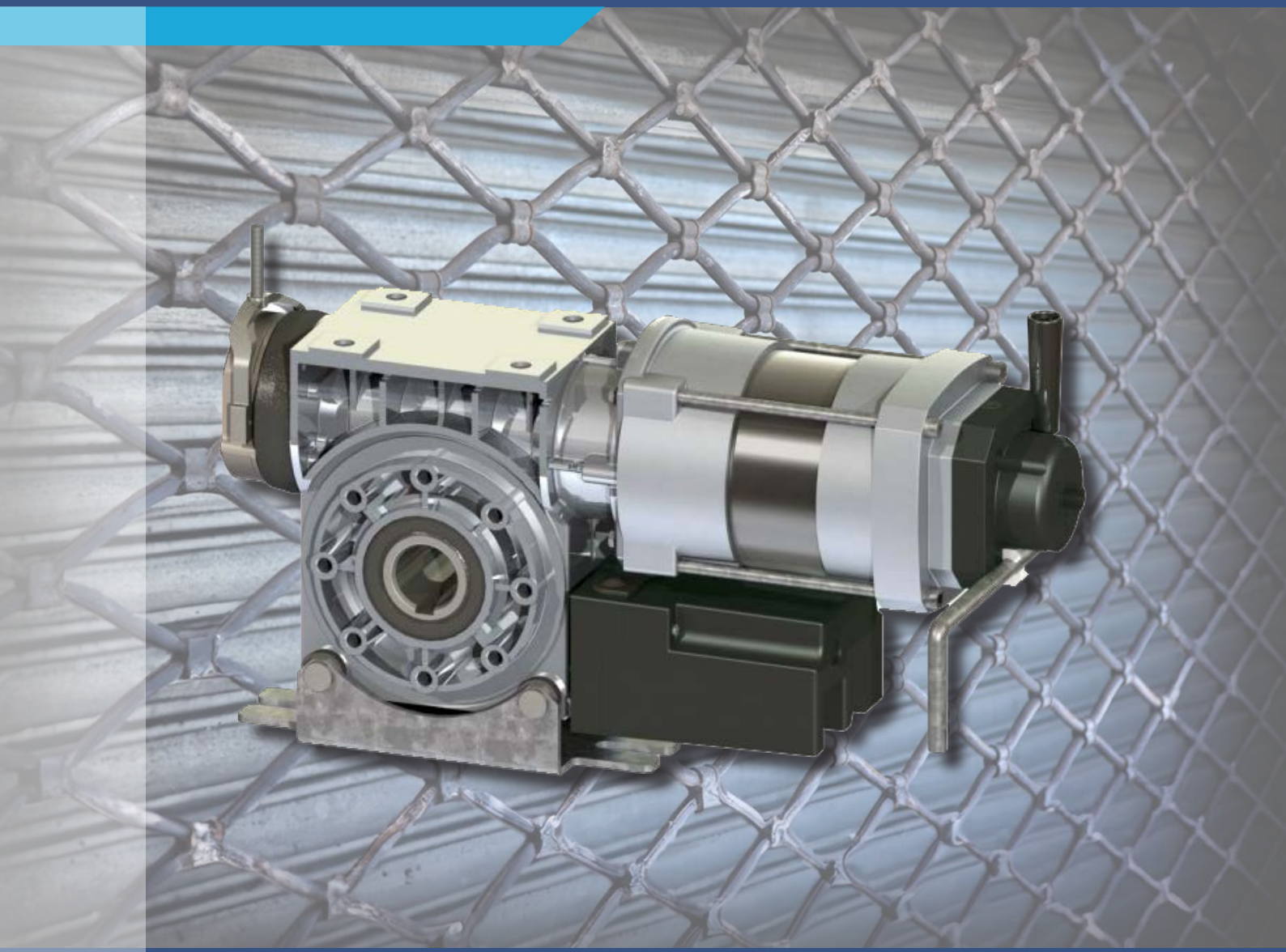
tornado
Drives – made to measure

INDUSTRIAL DOOR OPERATORS

Rolling Door Operators



RDA series

- QUICK AND EASY INSTALLATION
- FITTED FOR ALL TYPES OF ROLLING DOORS AND GRILLES.
- COMES WITH INTEGRATED MAINTENANCE-FREE ANTI-DROP SAFEGUARD.

Tornado Antriebstechnik GmbH | Subject to Modifications
www.tornado-drives.com

MADE IN GERMANY

Rolling Door Operators

- RDA operators are designed to operate non counterbalanced rolling doors and grilles
- RDA is slid on the barrel shaft and may serve directly as a bearing for the door shaft
- Can be installed horizontally or vertically and provide with four gearbox sizes (2,3,4,6)
- Mounted quickly and securely using the supplied pendular foot
- Output torque from 140 Nm to 2000 Nm in 400 V, 3-phase, 230 V, 3-phase
- The maintenance-free safety catch device, which is independent of position and speed, is integrated in the gearbox

Special configurations

On demand it is possible to adjust our operators to meet higher requirements (i.e. UL/CSA- or IEC- Certification, higher duty ratio) with the mounting of special motors. We also offer increased protection for the operators for harsh and corrosive environment (i.e. outdoor, coastal, cold storage)

Limit switch

The door position is monitored by a separate directly integrated camshaft, with an internal limit ratio of 10:1, 15:1, 20:1 or 40:1. All operators can be supplied with two different limit switch systems:

- Cam Switch
- Digital Encoder (single-turn, multi-turn)

Emergency Operation

In order to maneuver the door even in case of a power failure, all operators come with an emergency hand system. If the operator is equipped with a DC-brake, ensure that the release lever is not pushed manually during the manual operation.

Choose between the following manual overrides:

- Haul Chain Mechanism (KE)
- Haul Chain Mechanism (KM) for Heavy duty doors
- Short Hand Crank (KU)

Plug-in connections

All connections are pluggable and reverse polarity protected. Using push-in fittings, we guarantee a quick and easy mounting

Brake

All Tornado gearboxes can be equipped with a spring-applied brake (holding brake) or an electromagnetic brake (working current brake). The brake can be fitted on the gearbox or motor side, depending on requirements.

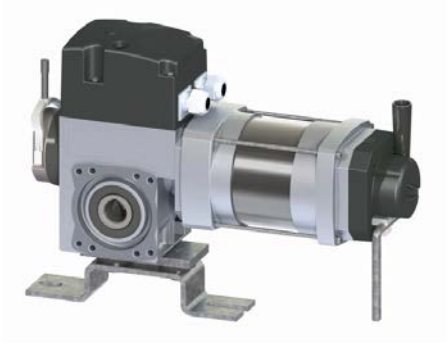
- Spring-applied brake:

- Braking torque from 2Nm to 40Nm
- Brake voltage 24V/DC or 205V/DC
- Designed for 100% duty cycle
- Protection class IP54 or IP65
- With or without manual release
- Brake rectifier (on request)
- Preset air gap (on request)
- UL/CSA version (on request)
- Noise-damped versions (on request)

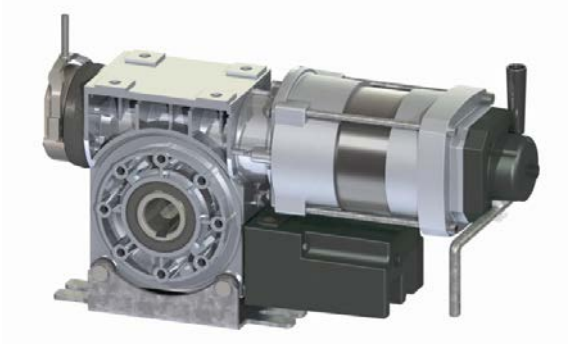
- Electromagnetic brake:

- Braking torque 7.5Nm or 15Nm
- Brake voltage 24V/DC or 205V/DC
- Designed for 100% duty cycle
- Protection class IP44
- Brake rectifier (on request).

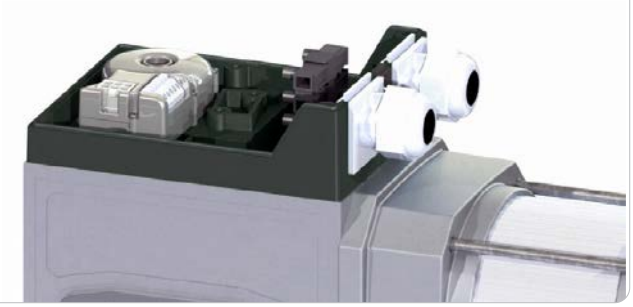
Gearbox size 2



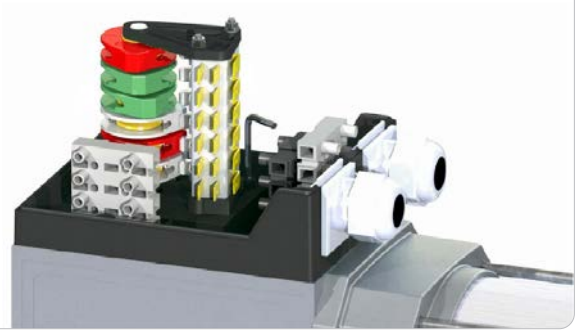
Gearbox size 4



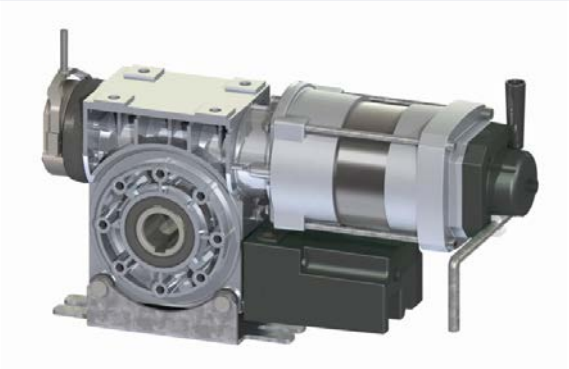
Digital Encoder



Cam Switch

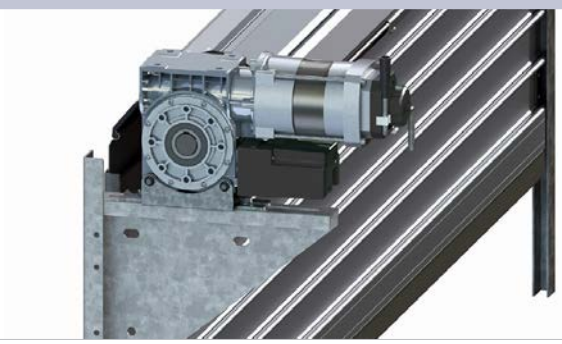


Short Hand Crank (KU)



Haul Chain Mechanism (KE)

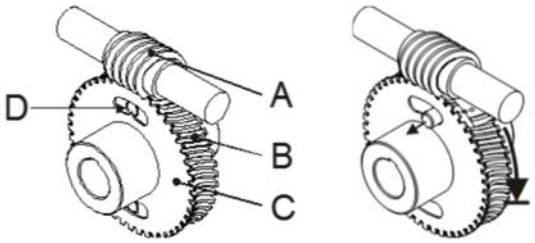
Bracket Type WK



Anti-Drop Safeguard

In accordance with the EN 12604 all RDA operators are equipped with an integrated locking device, which works independent of position and speed.

In case of exceeding wear, the teeth of the brass worm wheel (B) may collapse and allow the wheel to turn underneath the steel worm shaft (A). The pilot wheel (C) remains unaffected. Due to the relative rotation of the two wheels a set of hardened lock-bolts (D) are released and will immediately and permanently block the gearbox.



The values in this table may not be exceeded even in frequency controlled operation	max. Operating Speed	max. Torque
TOR-FV 5/083 (Size 2)	100 min^{-1}	200 Nm
	200 min^{-1}	100 Nm
TOR-FV 18/186 (Size 3)	150 min^{-1}	300 Nm
TOR-FV 7/119 (Size 4)	95 min^{-1}	750 Nm
	210 min^{-1}	300 Nm
TOR-FV 6/111 (Size 6)	30 min^{-1}	1 554 Nm
	120 min^{-1}	1 118 Nm

The permissible loads of walls, brackets and fasteners must not be exceeded even at maximum interception moment.

Selecting the right operator

To select the right operator following parameters are necessary: the diameter of the winding shaft, the weight and the thickness of the door leaf. The median coil-diameter is required because the coil-diameter increases due to the rolling-up of the gate and hence the speed is not constant. The values from the table are therefore only for guidance.

Using this data the appropriate operator could be determined from the following tables:

Table Curtain Speed (v)

	Tube-Diameter / Median Coil-Diameter[1] [mm]								
	130	**160**	**190**	**220**	**250**	**270**	**300**	**350**	**400**
v @ n2=18 min^{-1} [cm/s]	12	15	18	21	24	25	28	33	38
v @ n2=14 min^{-1} [cm/s]	10	12	14	16	18	20	22	26	29
v @ n2=13 min^{-1} [cm/s]	9	11	13	15	17	18	20	24	27
v @ n2=11 min^{-1} [cm/s]	7	9	11	13	14	16	17	20	23
v @ n2=10 min^{-1} [cm/s]	7	8	10	12	13	14	16	18	21
v @ n2=9 min^{-1} [cm/s]	6	8	9	10	12	13	14	16	19

1) The median coil-diameter results from the initial roll diameter + slat thickness and the diameter of the fully rolled-up door (to be taken from the coil-diameter table of the profile supplier); e.g. roll diameter Ø 160 mm, slat thickness 20 mm, coil-diameter upper end position Ø 400 mm -> median coil-diameter (160 + 20 + 400) : 2 = 290 mm

Table Lifting Force

The values in the table take into account 20% safety reserve. With stacking doors or unfavourable winding conditions (e.g. door height greater than width of the door, unfavourable inlet, extra gaskets, double- profiles) are indicated to reduce the lifting forces by about another 20%. A assumed door slat thickness of 20 mm was already considered.

Operator Type		Tube-Diameter / Median Coil-Diameter[1]) [mm]								
		130	160	190	220	250	270	300	350	400
RDA-140	[kg]	175	142	120	103	91	84	76	65	57
RDA-180	[kg]	225	183	154	133	117	108	97	83	73
RDA-300	[kg]	376	305	257	222	195	181	163	139	122
RDA-450	[kg]	564	458	386	333	293	271	244	209	183
RDA-550	[kg]	690	560	472	407	358	332	299	256	224
RDA-650	[kg]	815	662	557	481	424	392	353	302	265
RDA-750	[kg]	940	764	643	556	489	453	407	349	305
RDA-1000	[kg]	1254	1019	858	741	652	604	543	465	407
RDA-1400	[kg]	1756	1427	1201	1037	913	845	761	652	570
RDA-2000	[kg]	2509	2038	1716	1482	1304	1208	1087	931	815

1) The median coil-diameter results from the initial roll diameter + slat thickness and the diameter of the fully rolled-up door (to be taken from the coil-diameter table of the profile supplier), e.g. roll diameter Ø 160 mm, slat thickness 20 mm, coil-diameter upper end position Ø 400 mm -> median coil-diameter (160 + 20 + 400) : 2 = 290 mm

Technical data

Operator Type	Gearbox Siz	Staring Torque	Nominal Torque	Output Speed	ApprouvalN°TOR-FV	Limit capacity[2])	Hollowshaft Diameter[3])	Operating Voltage (50 Hz)	Motor Output	Motor Duty Cycle[4])	Nominal Current 230 / 400 V	See Drawing / Length L_1	Type of manual operation	Protection Category	Weight
		M_A [Nm]	M_N [Nm]	n_2 [min-1]	TOR-FV	i_{Stw}	D [mm]	U [V]	P [kW]		I_N [A]	L_1 [mm]		IP	m [kg]
RDA-140.18	2	140	115	18	5/083	15	30	3~230 3 ~400	0.55	MD	3.54 2.0	264	KU KE	54	13
RDA-180.14	2	180	160	14	5/083	15	30	3~230 3 ~400	0.5	MD	3.5 2.0	277	KU KE	54	17
RDA-300.13	3	300	250	13	18/186	20	30	3~230 3 ~400	0.8	MD	4,1 2,4	295	KU KE	54	23
RDA-450.14	4	450	430	14	7/119	20	40	3~230 3 ~400	1.5	MD	6.4 3.7	341	KU KE	54	32
RDA-550.11	4	550	450	11	7/119	20	40	3~230 3 ~400	1.5	MD	8.7 5.0	391	KU KE	54	35
RDA-650.13[1])	4	650	550	13	7/119	20	40	3~230 3 ~400	1.5	MD	8.7 5.0	391	KU KE	54	37
RDA-750.10[1])	6	750	650	10	6/111	40	55	3~230 3 ~400	1.5	MD	7.6 4.4	420	KU KM	54	52
RDA-1000.10[1])	6	1000	850	10	6/111	40	55	3~230 3 ~400	2.2	MD	9.2 5.3	437	KU KM	54	55
RDA-1400.9[1])	6	1400	1250	9	6/111	40	55	3~230 3 ~400	2.2	MD	9.2 5.3	542	KU KM	54	65
RDA-2000.10[1])	6	2000	1875	10	21/191	40	55	3~230 3 ~400	3.0	MD	11.2 6.5	542	KU KM	54	70

1) Operator is equipped with DC-brake, neutral connection is required.

2) Limit ratio can be changed on request

3) Hollow shaft diameter can be changed on request

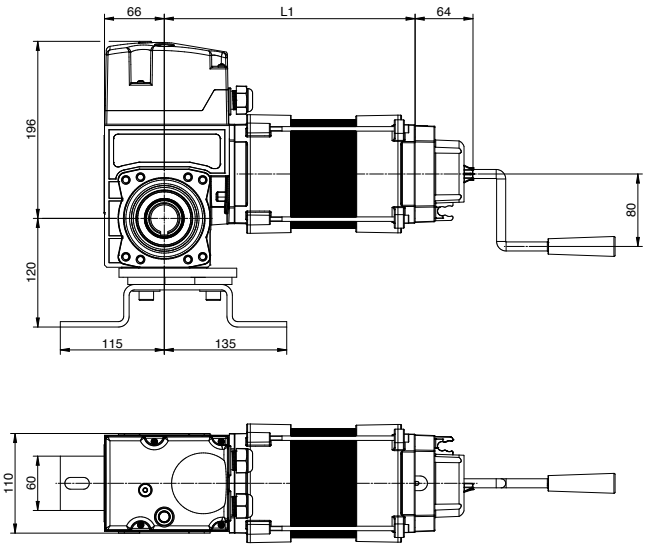
4) Duty Ratio HD available on request.

*) Temperature range: -5°C ... 40°C

Dimensions

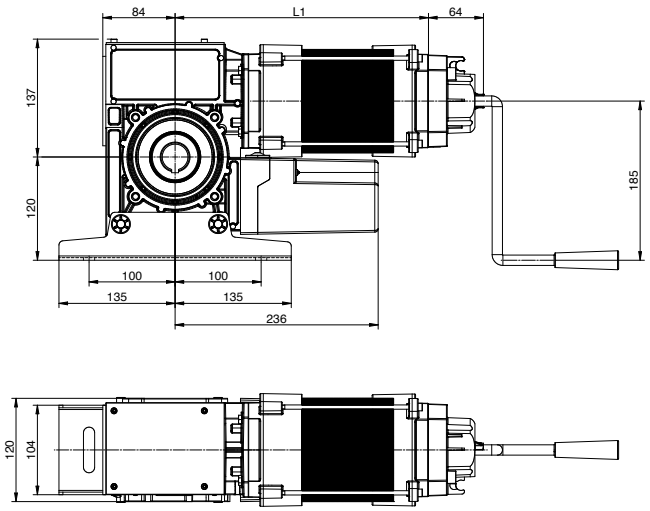
The following illustrations show all relevant dimensions of our operator series. Refer to the table of technical data for the assignment of the sketches and for dimension L1.

Gearbox Size 2



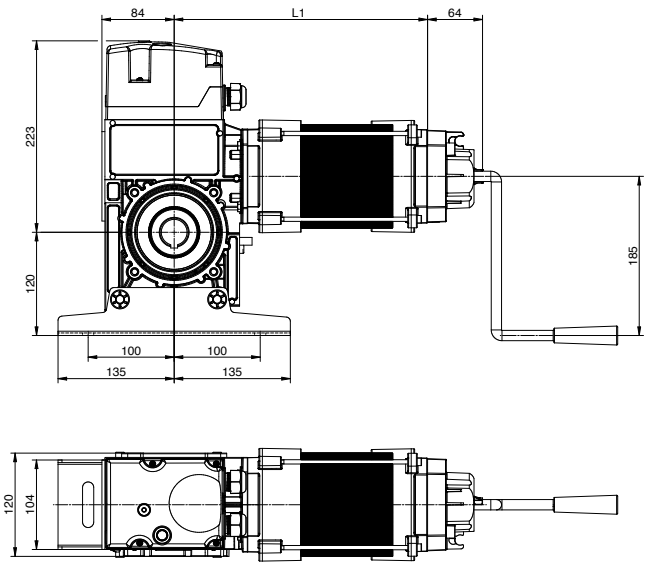
Gearbox Size 3

Bottom encoder case

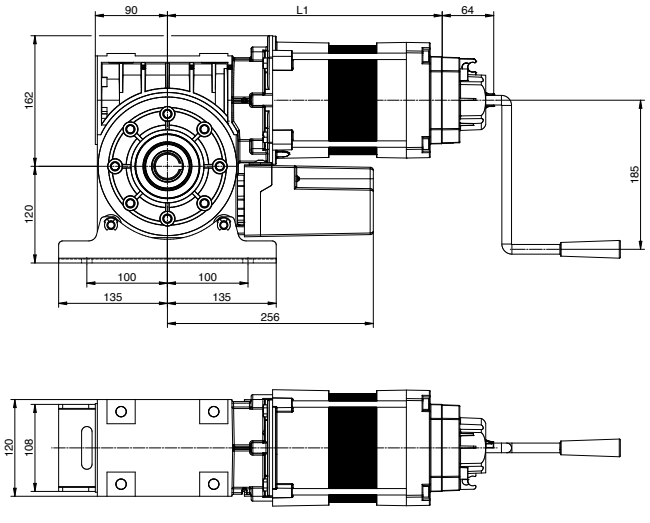


Gearbox Size 3

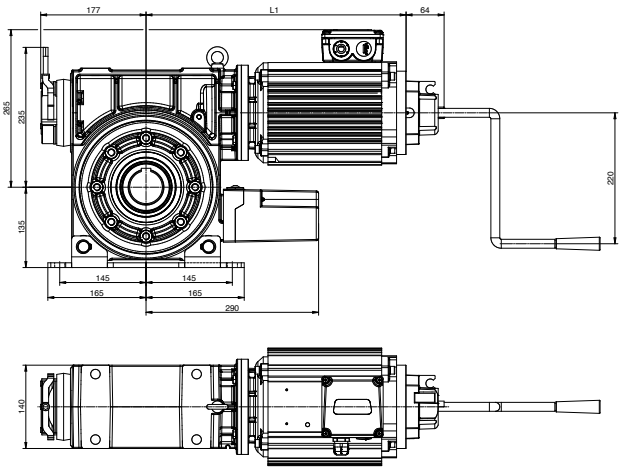
Top encoder case



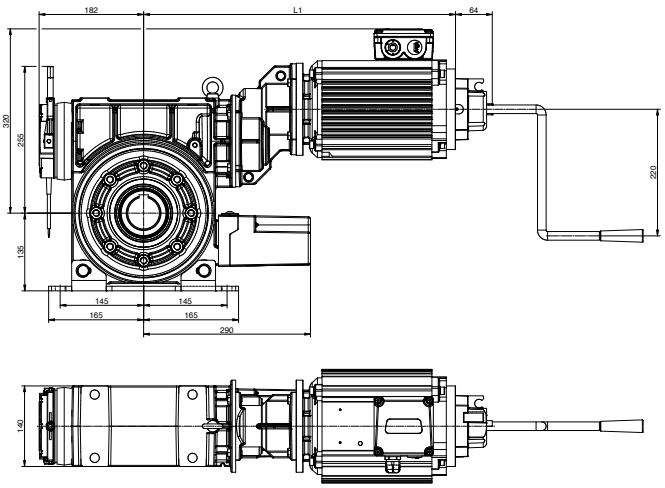
Gearbox Size 4



Gearbox Size 6

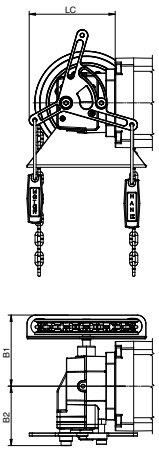


Gearbox Size 6
≥ 1400 Nm

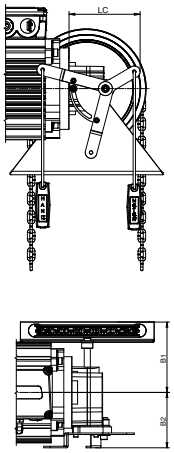


Manual Override

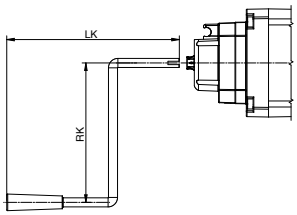
Manual operation KE



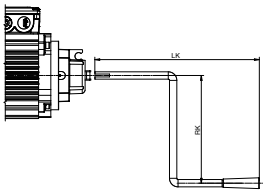
Manual operation KM



Manual operation KU
Size 4



Size 6



Dimensions of Manual Override

Gearbox Size	Crank Length	Crank-Radius	Length Chain drive	Width Chain-Side	Width Clutch-Side
	L_K [mm]	R_K [mm]	L_C [mm]	B_1 [mm]	B_2 [mm]
2	230	80	137	114	95
3	230	185	137	114	95
4	230	185	137	114	95
6	340	220	122	138	108

Accessories

Complete your rolling door operator with our wide range of accessories and controls to a customized automation package.
Find more information in our special catalogs.

Mechanical Accessories

Electronic Accessories

Control Panels (Relay)

Control Panels (VFD)

TORNADO PRODUCTS

- Rolling Door Operators
- Sectional Door Operators
- High-Speed Door Operators
- Chain Wheel Operators
- Sliding Gate Operators
- Control Panels
- Safety Systems
- Accessories