tornado
Drives – made to measure

INDUSTRIAL DOOR OPERATORS

High-Speed Door Operators

VDA series

- QUICK AND EASY INSTALLATION
- FITTED FOR ALL TYPES OF HIGH-SPEED ROLLING DOORS, GRILLES AS WELL AS LIGHT AND HEAVY PVC DOORS
- COMES WITH INTEGRATED MAINTENANCE-FREE ANTI-DROP SAFEGUARD.

Tornado Antriebstechnik GmbH | Subject to Modifications
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MADE IN GERMANY

High Speed Door Operators

- VDA operators are designed to operate non counterbalanced fast-acting rolling doors or vertical folding doors
- VDA 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 30 Nm to 750 Nm
- Output speed from up to 290rpm in 400 V, 3-phase, 230 V, 3-phase 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 equipped with three different limit switch systems:

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

Emergency Operation

In order to maneuver the door even in case of a power failure, all operators come with a 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).

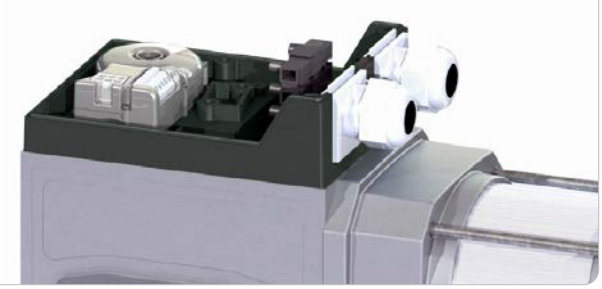
Control Panel

To increase lifetime and safety of the operators, we recommend the use of a frequency converter control. Thus the load on the gear components is reduced. Further it enables better speed control and drive regulation for starting and stopping.

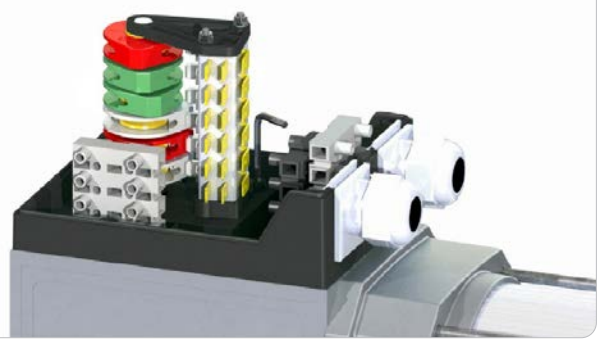
Gearbox size 2

Gearbox size 4

Digital Encoder



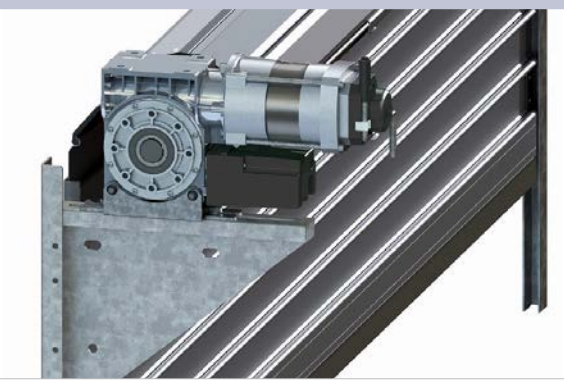
Cam Switch



Short Hand Crank (KU)

Haul Chain Mechanism (KE)

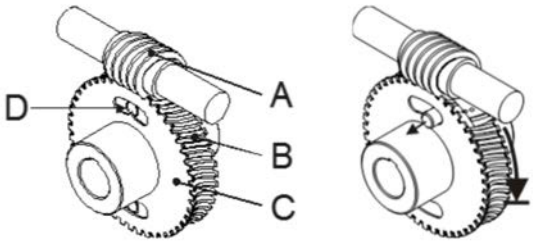
Bracket Type WK



Anti-Drop Safeguard

In accordance with the EN 12604 all VDA 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]									
	100	**130**	**160**	**190**	**220**	**250**	**270**	**300**	**350**	**400**
v @ n2=240 min^{-1} [cm/s]	126	163	201	239	276	314	339	377	440	503
v @ n2=190 min^{-1} [cm/s]	99	129	159	189	219	249	269	298	348	398
v @ n2=142 min^{-1} [cm/s]	74	97	119	141	164	186	201	223	260	297
v @ n2=134 min^{-1} [cm/s]	70	91	112	133	154	175	189	210	246	281
v @ n2=130 min^{-1} [cm/s]	68	88	109	129	150	170	184	204	238	272
v @ n2=120 min^{-1} [cm/s]	63	82	101	119	138	157	170	188	220	251
v @ n2=94 min^{-1} [cm/s]	49	64	79	94	108	123	133	148	172	197
v @ n2=93 min^{-1} [cm/s]	49	63	78	93	107	122	131	146	170	195
v @ n2=70 min^{-1} [cm/s]	37	48	59	70	81	92	99	110	128	147
v @ n2=64 min^{-1} [cm/s]	34	44	54	64	74	84	90	101	117	134
v @ n2=60 min^{-1} [cm/s]	31	41	50	60	69	79	85	94	110	126
v @ n2=46 min^{-1} [cm/s]	24	31	39	46	53	60	65	72	84	96
v @ n2=33 min^{-1} [cm/s]	17	22	28	33	38	43	47	52	60	69

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]									
		100	130	160	190	220	250	270	300	350	400
VDA-30	[kg]	48	37	30	25	22	19	18	16	13	12
VDA-35	[kg]	51	40	33	28	24	21	20	18	15	13
VDA-40	[kg]	59	46	33	28	24	21	20	18	15	13
VDA-45	[kg]	66	52	43	36	31	28	26	23	20	17
VDA-48	[kg]	71	55	46	39	34	30	27	25	21	19
VDA-65	[kg]	96	75	62	53	46	40	37	34	29	25
VDA-75	[kg]	111	87	71	61	53	47	43	39	33	29
VDA-80	[kg]	126	99	81	69	60	53	49	44	38	33
VDA-85	[kg]	118	93	76	65	56	50	46	42	36	31
VDA-90	[kg]	133	104	86	73	63	56	52	47	40	35
VDA-95	[kg]	140	110	91	77	64	59	55	49	43	37
VDA-100	[kg]	148	116	95	81	70	62	58	52	45	39
VDA-120	[kg]	177	139	115	97	85	75	69	63	54	47
VDA-125	[kg]	185	145	119	101	88	78	72	65	56	49
VDA-150	[kg]	222	174	143	122	106	94	87	78	67	59
VDA-155	[kg]	229	180	148	126	109	97	90	81	70	61
VDA-180	[kg]	266	209	172	146	127	112	104	94	81	71
VDA-210	[kg]	311	244	201	171	148	131	122	110	95	83
VDA-230	[kg]	341	267	220	187	163	144	133	121	104	91
VDA-350	[kg]	518	407	335	285	248	219	203	184	158	139
VDA-480	[kg]	711	559	460	391	340	301	279	252	217	190
VDA-750	[kg]	1112	873	719	611	531	470	436	394	339	298

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 Size	Staring Torque	Nominal Torque	Output Speed	20Limit capacity[2]	FV Approuval N° TOR-FV	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]	i_{Stw}	TOR-FV	D [mm]	U [V]	P [kW]		I_N [A]	L_1 [mm]		IP	m [kg]
VDA-30.120 [1]	2	30	25	120	15	5/083	25	3~230 3~400	0.37	MD	2.6 1.5	264	KU KE	54	12
VDA-40.120 [4]	2	40	34	120	15	5/083	25	3~230 3~400	0.55	MD	3.54 2.0	264	KU KE	54	13
VDA-48.94 [1]	2	48	34	94	15	5/083	25	3~230 3~400	0.55	MD	3.54 2.0	264	KU KE	54	13
VDA-65.64 [1]	2	65	45	64	20	5/083	25	3~230 3~400	0.55	MD	3.54 2.0	264	KU KE	54	13
VDA-65.142 [1]	2	65	60	142	20	5/083	25	3~230 3~400	1.0	MD	5.2 3.0	277	KU KE	54	16
VDA-75.120 [1]	2	75	65	120	20	5/083	25	3~230 3~400	1.0	MD	5.2 3.0	277	KU KE	54	16
VDA-85.94 [1]	2	85	75	94	20	5/083	25	3~230 3~400	1.0	MD	5.2 3.0	277	KU KE	54	16
VDA-120.64 [1]	2	120	100	64	20	5/083	25	3~230 3~400	1.0	MD	5.2 3.0	277	KU KE	54	16
VDA-90.120 [1]	3	90	80	120	20	18/186	30	3~230 3~400	1.5	MD	6.6 3.8	320	KU KE	54	25
VDA-120.70 [1]	3	120	100	70	20	18/186	30	3~230 3~400	1.5	MD	6.6 3.8	320	KU KE	54	25
VDA-125.94 [1]	3	125	115	94	20	18/186	30	3~230 3~400	1.5	MD	6.6 3.8	320	KU KE	54	25
VDA-155.70 [1]	3	155	145	70	20	18/186	30	3~230 3~400	1.5	MD	6.6 3.8	320	KU KE	54	25
VDA-85.134 [1]	4	85	75	134	20	7/119	40	3~230 3~400	1.5	MD	6.6 3.8	328	KU KE	54	29
VDA-125.134 [1]	4	125	115	134	20	7/119	40	3~230 3~400	2.2	MD	9.2 5.3	356	KU KE	54	33
VDA-150.134 [1]	4	150	130	134	20	7/119	40	3~230 3~400	2.2	MD	9.2 5.3	356	KU KE	54	33
VDA-180.93 [1]	4	180	160	93	20	7/119	40	3~230 3~400	2.2	MD	9.2 5.3	356	KU KE	54	33
VDA-230.70 [1]	4	230	200	70	20	7/119	40	3~230 3~400	2.2	MD	9.2 5.3	356	KU KE	54	33
VDA-350.46 [1]	4	350	290	46	20	7/119	40	3~230 3~400	2.2	MD	9.2 5.3	356	KU KE	54	33

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

Special configurations

Adjusted operators with special motors to meet higher requirements, i.e. UL/CSA - Certification or higher duty ratio / power output.

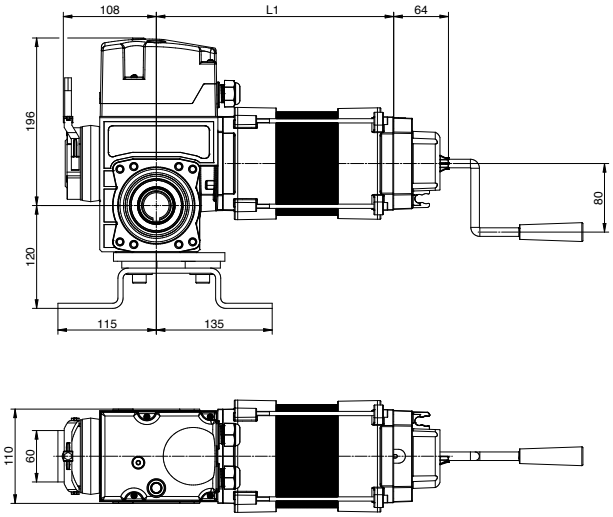
Antriebstype Operator Type	Gearbox Siz	Staring Torque	Nominal Torque	Output Speed	Approval N° TOR-FV	Limit capacity[2]	Hollowshaft Diameter[3]	Operating Voltage (50 Hz)	Motor Output	Motor Duty Cycle[4]	Nominal Current 230 / 400 V	See Drawing / Length L_1	Type of manual operation	Protection Category	Weight
		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]
VDA-40.240	2	40	35	240	5/083	15	25	3~230 3~400	1.1	HD	4.3 2.6	368	KU KE	54	19
VDA-45.190	2	50	45	190	5/083	15	25	3~230 3~400	1.5	HD	4.3 2.6	368	KU KE	54	19
VDA-80.130	2	80	60	130	5/083	15	25	3~230 3~400	1.1	HD	4.3 2.6	368	KU KE	54	19
VDA-100.60	2	100	80	60	5/083	15	25	3~230 3~400	1.1	HD	4.3 2.6	368	KU KE	54	19
VDA-210.134[1]	4	210	180	70	7/119	20	40	3~230 3~400	3.0	MD	11.9 7.2	408	KU KE	54	45
VDA-480.46[1]	4	480	390	46	7/119	20	40	3~230 3~400	3.0	MD	11.9 7.2	408	KU KE	54	45
VDA-750.33[1]	6	750	620	33	6/111	20	55	3~230 3~400	4.0	MD	15.2 9.2	440	KU KM	54	60

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

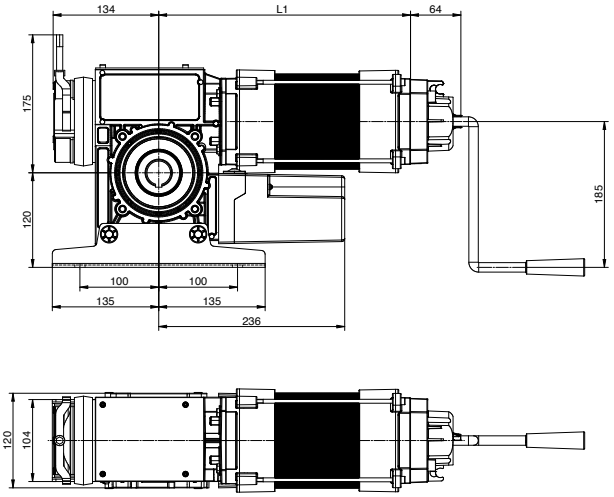
The following illustrations show all relevant dimensions of our operator series. Refer to the table of technical data for the assignment of the sketches and for dimension L1.

Gearbox Size 2



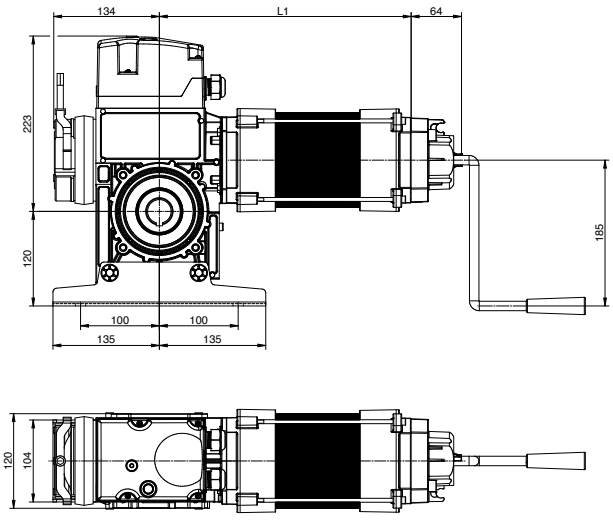
Gearbox Size 3

Bottom encoder case

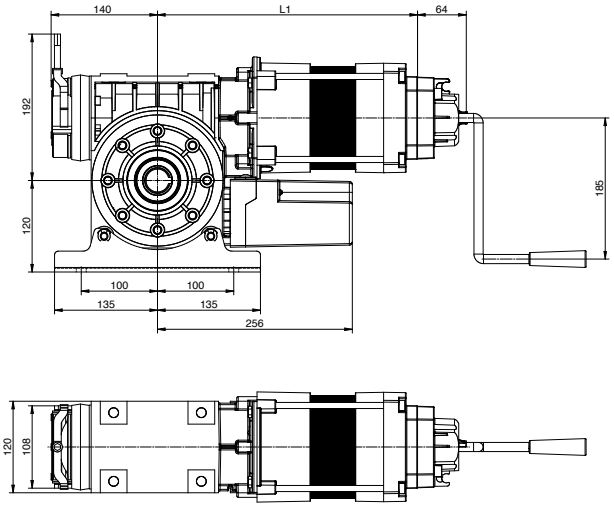


Gearbox Size 3

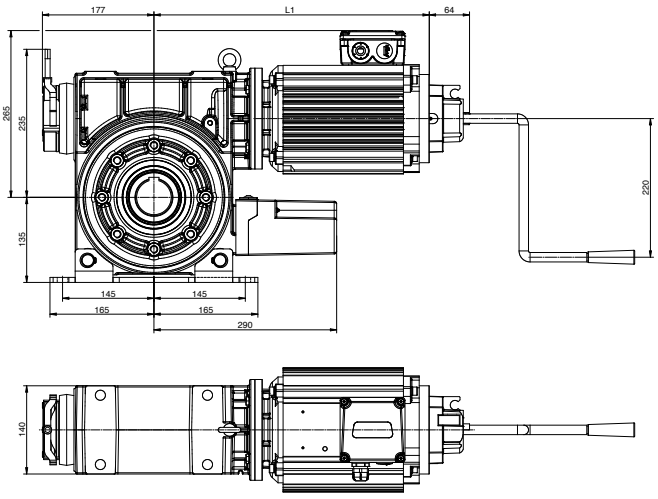
Top encoder case



Gearbox Size 4



Gearbox Size 6

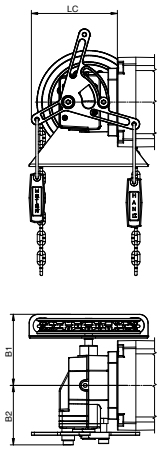


Dimensions of Manual Override

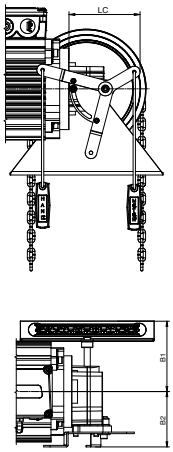
Gearbox Size	Crank Length	Crank-Radius	Length Chain drive	Width Chain-Side	Width Clutch-Side
	L_K [mm]	R_K [mm]	L_C [mm]	B_1 [mm]	B_2 [mm]
2	230	80	137	114	95
3	230	185	137	114	95
4	230	185	137	114	95
6	340	220	122	138	108

Manual Override

Manual operation KE

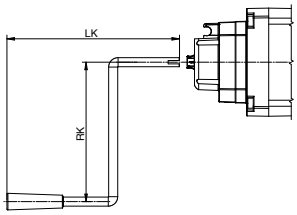


Manual operation KM

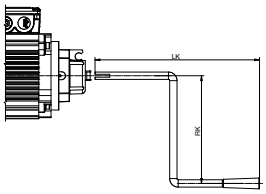


Manual operation KU

Size 4



Size 6



Accessories

Complete your high speed door operator with our wide range of accessories and control panels to a customized automation package. Find more information in our special catalogs

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Electronic Accessories

Control Panels (Relay)

Control Panels (VFD)

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

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