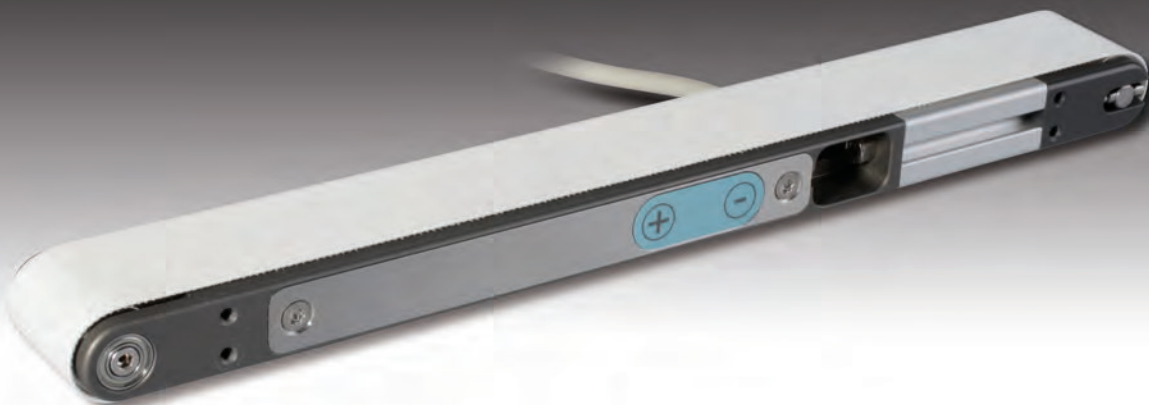


**vetter**  
Kleinförderbänder

## FR-20-40

conveyor with  
**internal drive**

- body height 20 mm
- body width 40 mm
- center distance from 300 mm



### advantages:

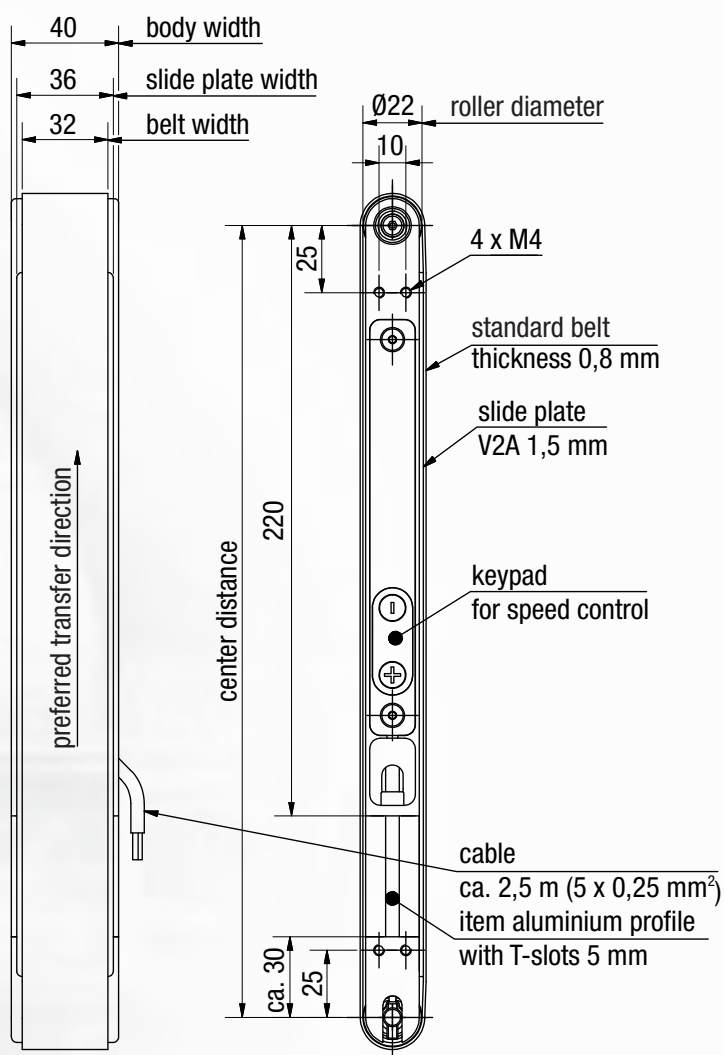
- internal drive
  - no disturbing contours
  - simple construction and simple integration into existing systems
  - simple installation
- use of item-aluminium profiles
- use of high-quality materials: stainless steel and aluminium
- large selection of transport belts
- customised solutions available upon request
- 24 V low voltage
  - no special safety precautions required
- good serviceability: conveyors integrated into existing automation systems can be easily disassembled
- state-of-the-art drive technology
  - EC motor (brushless motor)
  - electronic speed controller integrated, speed setting by integrated keypad or external analog signal (0-10 V DC)
  - low power consumption with high transport capacity

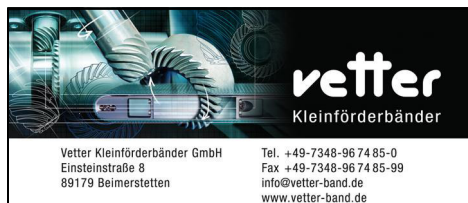
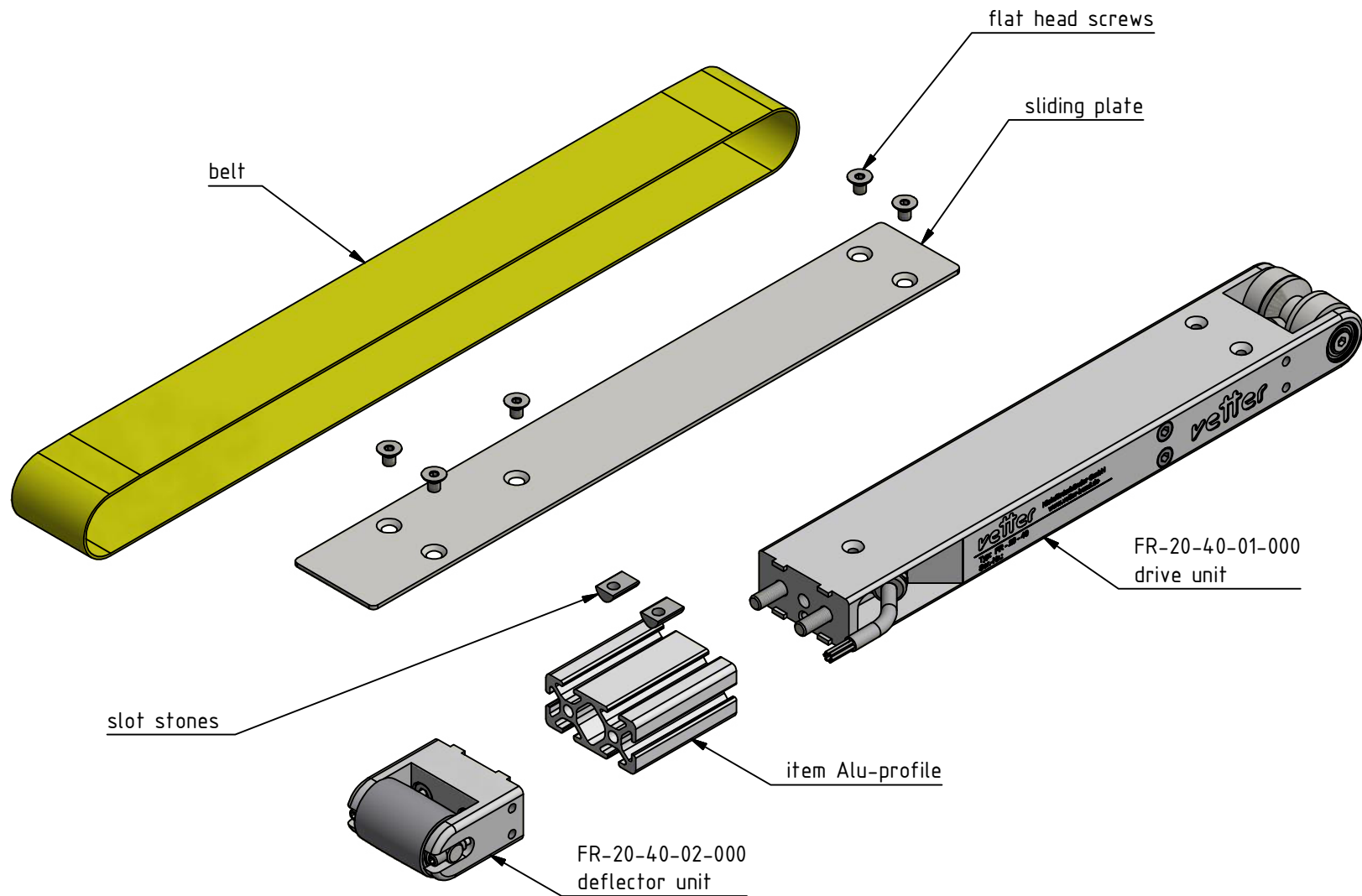
**technical data:**

**FR-20-40**

with internal drive

standard center distances in mm (short term delivery)	speed m/min	load on conveyer N	supply voltage	transport belt
300	2-8	5	24 V DC	1E/PW 02, white (FDA, antistatic)
350	0,7-3	15		
400	speed controller integrated			other types upon request
450				
500				
600				
700				
800				
900				
1000				
other center distances upon request				





Designation: Conveyor with internal drive

Drawing number: FR-20-40

General tolerances DIN ISO 2768-mK

	Date	Name
Subscribed	13.03.2015	Administrator
Controlled	13.03.2015	Melanie Ochs

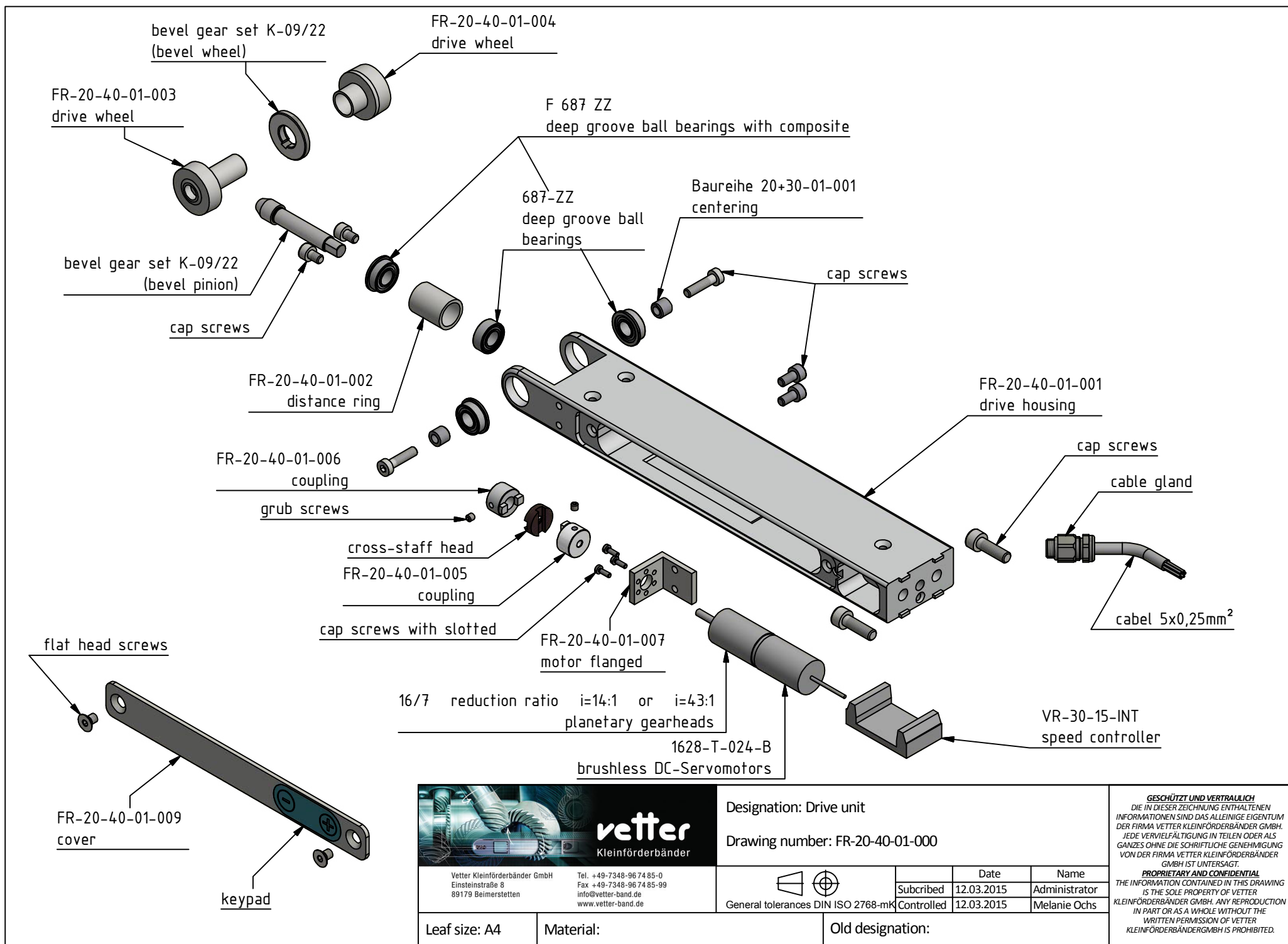
Leaf size: A4

Material:

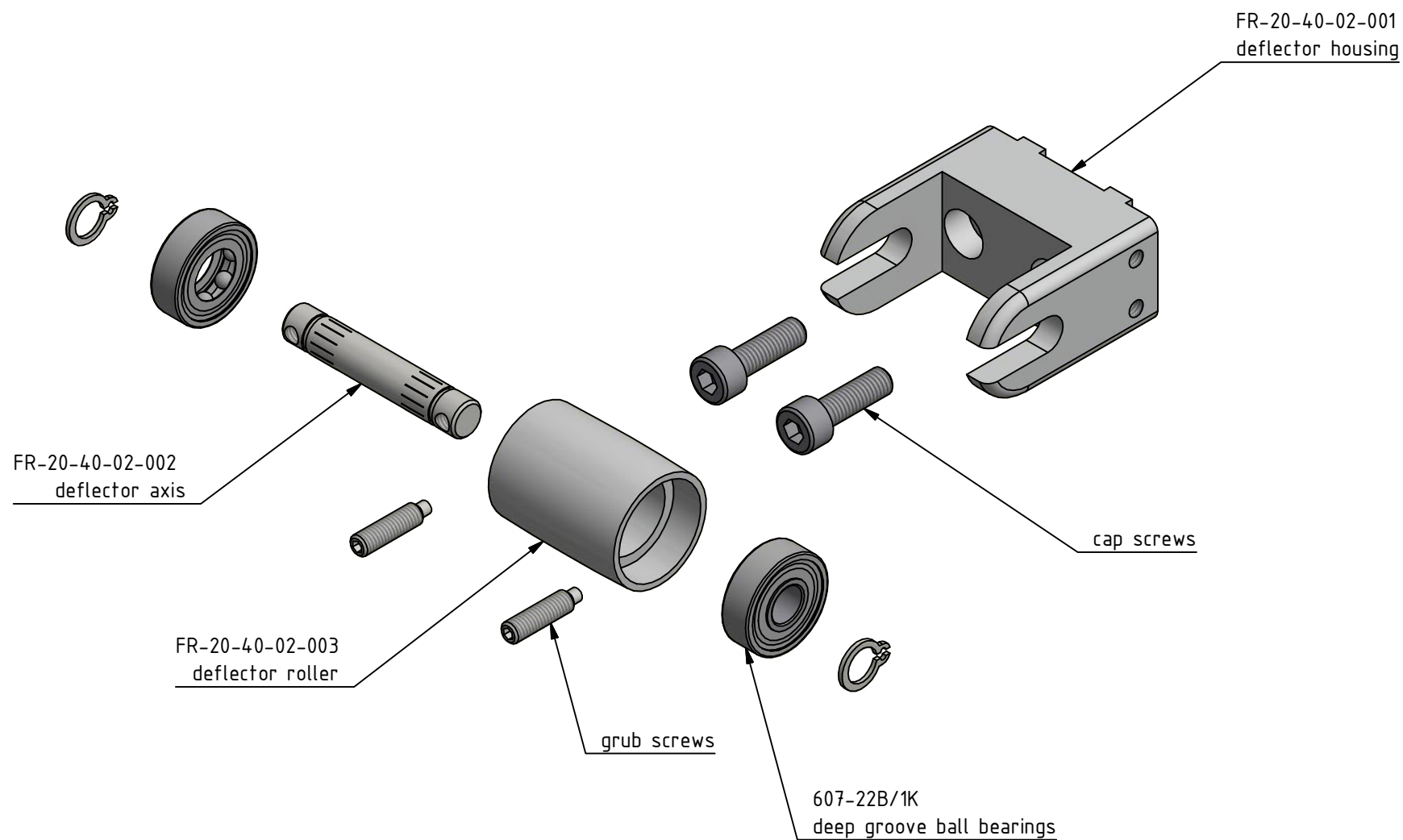
Old designation:

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DIE IN DIESER ZEICHNUNG ENTHALTENEN  
INFORMATIONEN SIND DAS ALLEINIGE EIGENTUM  
DER FIRMA VETTER KLEINFÖRDERBÄNDER GMBH.  
JEDE VERVIELFÄLTIGUNG IN TEILEN ODER ALS  
GANZES OHNE DIE SCHRIFTLICHE GENEHMIGUNG  
VON DER FIRMA VETTER KLEINFÖRDERBÄNDER  
GMBH IST UNTERSAGT.

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Fax +49-7348-96 74 85-99  
info@vetter-band.de  
www.vetter-band.de

Designation: Deflector unit

Drawing number: FR-20-40-02-000

General tolerances DIN ISO 2768-mK



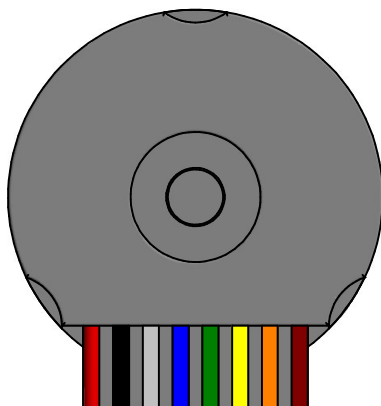
	Date	Name
Subscribed	11.08.2014	Administrator
Controlled	11.08.2014	Melanie Ochs

Leaf size: A4

Material:

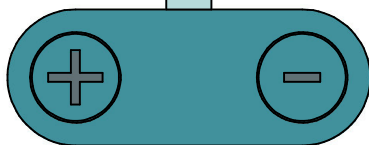
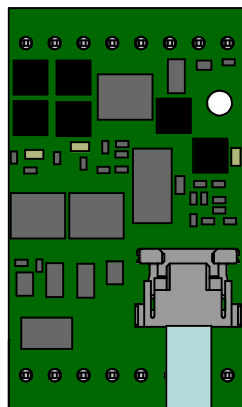
Old designation:

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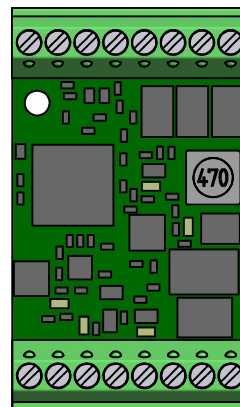
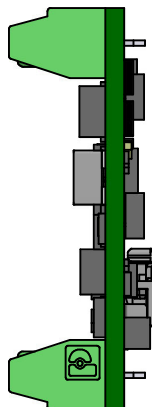


# 1628-T-024 B brushless DC-Servomotor

- 1 U<sub>DD</sub> (+5V)
- 2 GND
- 3 Hallsensor C
- 4 Hallsensor B
- 5 Hallsensor A
- 6 Phase C
- 7 Phase B
- 8 Phase A



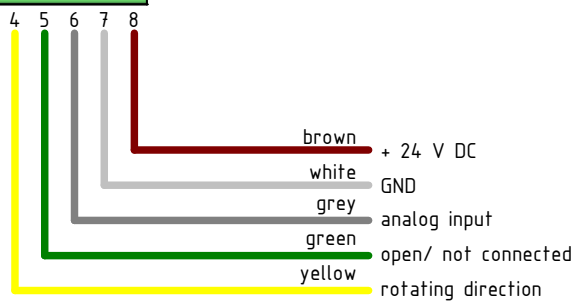
keypad



## VR-30-15-INT speed control circuit board

- |           |                      |
|-----------|----------------------|
| 1 Phase 1 | 1 RS485 A            |
| 2 Phase 2 | 2 RS485 B            |
| 3 Phase 3 | 3 GND                |
| 4 Hall 1  | 4 rotating direction |
| 5 Hall 2  | 5 GND                |
| 6 Hall 3  | 6 speed              |
| 7 GND     | 7 GND                |
| 8 5V      | 8 24V                |

1 2 3  
preprogramming  
Vetter Kleinförderbänder



Anschlußkabel	Funktion	Anmerkungen
brown	Up + 24 VDC	Power supply elektronik
white	GND	Masse
grey	speed	<u>analog signale 0-10 V DC</u> If controller is set to „analog-signal-speed-control“-mode (see „Attention“): analog signal determines speed of conveyor (0 V: lowest speed, 10 V: full Speed) –  <u>keypad (manuell)</u> < 5 V DC or GND: is start > 5 V DC: is stop  <u>Attention</u> Press membrane keys „+“ and „-“ simultaneously for at least 4 s to switch from „analog-signal-speed-control“ to „mebrane-key-Speed-control“
yellow	rotating direction	connected to > +5 V to +24V: preferred transport direction connected to > GND or open: opposite transport direction
green	open/ not connected	

#### membrane key/ analog signal

Pressing mebrane key „+“ and „-“ simultaneously for at least 4 s sets controller from „analog-signal-speed-control“ to „mebrane-key-speed-control“.  
 Pressing mebrane key „+“ or „-“ once changes the transport speed in steps of 3%.

#### overvoltage

If the power supply exceeds a voltage of more than 30 V the controller is stopped.  
 The controller starts again if the voltage drops below 30 V.

#### overcurrent

If the current of the motor exceeds 0,4 A it is stopped automatically. This is to avoid a conveyor overload.  
**Attention:** For a restart power supply has to be disconnected and connected again!

# Brushless DC-Servomotors

2,6 mNm

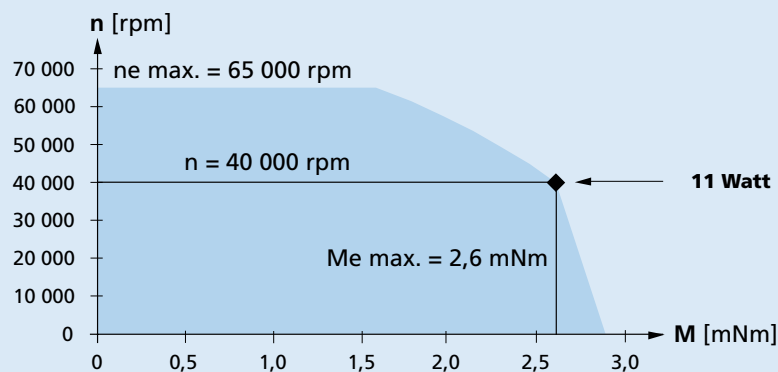
For combination with  
Gearheads:  
16/7  
Encoders:  
IE2-1024  
Drive Electronics:  
Speed Controller, Motion Controller

## Series 1628 ... B

	1628 T	012 B	024 B	
1 Nominal voltage	$U_N$	12	24	Volt
2 Terminal resistance, phase-phase	$R$	4,3	15,1	$\Omega$
3 Output power <sup>1)</sup>	$P_{2 \text{ max.}}$	10	11	W
4 Efficiency	$\eta_{\text{max.}}$	68	68	%
5 No-load speed	$n_o$	28 650	29 900	rpm
6 No-load current (with shaft $\varnothing$ 1,5 mm)	$I_o$	0,098	0,052	A
7 Stall torque	$M_H$	11	12	mNm
8 Friction torque, static	$C_o$	0,15	0,15	mNm
9 Friction torque, dynamic	$C_v$	$8,0 \cdot 10^{-6}$	$8,0 \cdot 10^{-6}$	mNm/rpm
10 Speed constant	$k_n$	2 474	1 287	rpm/V
11 Back-EMF constant	$k_E$	0,404	0,777	mV/rpm
12 Torque constant	$k_M$	3,86	7,42	mNm/A
13 Current constant	$k_i$	0,259	0,135	A/mNm
14 Slope of n-M curve	$\Delta n / \Delta M$	2 737	2 610	rpm/mNm
15 Terminal inductance, phase-phase	$L$	141	525	$\mu\text{H}$
16 Mechanical time constant	$\tau_m$	15	14	ms
17 Rotor inertia	$J$	0,54	0,54	gcm <sup>2</sup>
18 Angular acceleration	$\alpha_{\text{max.}}$	198	217	$\cdot 10^3 \text{ rad/s}^2$
19 Thermal resistance	$R_{th 1} / R_{th 2}$	7,8 / 30,1		K/W
20 Thermal time constant	$\tau_{w1} / \tau_{w2}$	8 / 379		s
21 Operating temperature range		- 30 ... +125		°C
22 Shaft bearings		ball bearings, preloaded		
23 Shaft load max.:				
– radial at 3 000/20 000 rpm (4,5 mm from mounting flange)		17 / 10		N
– axial at 3 000/20 000 rpm (push-on only)		10 / 6		N
– axial at standstill (push-on only)		20		N
24 Shaft play:				
– radial	$\leq$	0,015		mm
– axial	$=$	0		mm
25 Housing material		aluminium, black anodized		
26 Weight		31		g
27 Direction of rotation		electronically reversible		
<b>Recommended values - mathematically independent of each other</b>				
28 Speed up to <sup>2)</sup>	$n_{e \text{ max.}}$	65 000	65 000	rpm
29 Torque up to <sup>1) 2)</sup>	$M_{e \text{ max.}}$	2,5	2,6	mNm
30 Current up to <sup>1) 2)</sup>	$I_{e \text{ max.}}$	0,77	0,41	A

<sup>1)</sup> at 40 000 rpm

<sup>2)</sup> thermal resistance  $R_{th 2}$  by 55% reduced



**Recommended area for continuous operation**

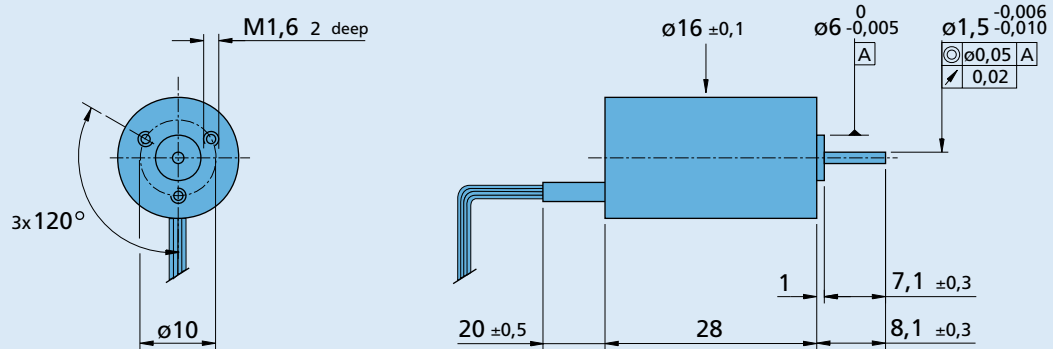


#### Options

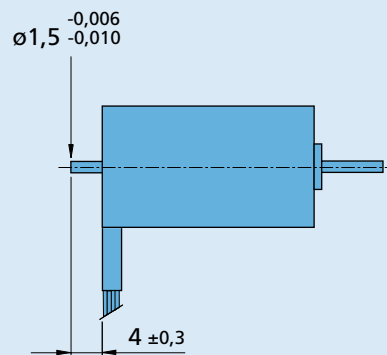
K1000:  
Motors in autoclavable version.

K1155:  
Motors for operation with Motion Controllers  
MCBL 3003 S/C, MCBL 3006 S/C.

#### 1628 T ... B



#### 1628 T ... B - K312 with rear end shaft



#### Cable and connection information

#### Cable

Single wires, material PTFE  
Length 300 mm  $\pm$  15 mm  
8 conductors, AWG 26

#### Connection

Function	Colour
A Hall sensor	green
A Phase	brown
B Hall sensor	blue
B Phase	orange
C Hall sensor	grey
C Phase	yellow
+5V Logical supply	red
GND Logical	black

$\Delta$  Coil winding  $3 \times 120^\circ$

# Planetary Gearheads

0,3 Nm

For combination with  
DC-Micromotors  
Brushless DC-Motors  
Stepper Motors

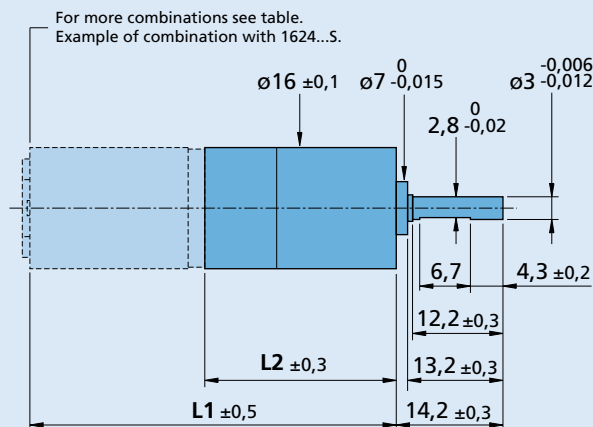
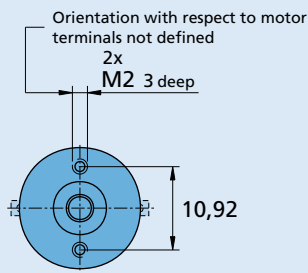
## Series 16/7

	16/7
Housing material	metal
Geartrain material	steel
Recommended max. input speed for:	
– continuous operation	5 000 rpm
Backlash, at no-load	≤ 1 °
Bearings on output shaft	ball bearings, preloaded
Shaft load, max.:	
– radial (6,5 mm from mounting face)	≤ 30 N
– axial	≤ 5 N
Shaft press fit force, max.	≤ 5 N
Shaft play	
– radial (6,5 mm from mounting face)	≤ 0,02 mm
– axial	= 0 mm
Operating temperature range	- 30 ... + 100 °C

### Specifications

Number of gear stages		1	2	3	4	5	6
Continuous torque	mNm	200	300	300	300	300	300
Intermittent torque	mNm	300	450	450	450	450	450
Weight without motor, ca.	g	18	23	28	33	38	43
Efficiency, max.	%	90	80	70	60	55	50
Direction of rotation, drive to output		=	=	=	=	=	=
Reduction ratio <sup>1)</sup> (rounded)		3,71:1	9,7:1 14:1	43:1 66:1	94:1 112:1 134:1 159:1 190:1 246:1	415:1 592:1 989:1 1 526:1	2 608:1 4 365:1 5 647:1
L2 [mm] = length without motor		17,0	21,2	25,3	29,4	33,5	37,6
L1 [mm] = length with motor							
1516T...SR		32,8	37,0	41,1	45,2	49,3	53,4
1524T...SR		40,8	45,0	49,1	53,2	57,3	61,4
1624T...S		40,8	45,0	49,1	53,2	57,3	61,4
1717T...SR		34,0	38,2	42,3	46,4	50,5	54,6
1724T...SR		41,0	45,2	49,3	53,4	57,5	61,6
1727U...C		44,2	48,4	52,5	56,6	60,7	64,8
1524U...BSL		41,2	45,4	49,5	53,6	57,7	61,8
1536U...BSL		53,6	57,8	61,9	66,0	70,1	74,2
1628T...B		45,0	49,2	53,3	57,4	61,5	65,6
AM1524...-55		33,5	37,7	41,8	45,9	50,0	54,1

<sup>1)</sup> The reduction ratios are rounded, the exact values are available on request or at [www.faulhaber.com](http://www.faulhaber.com).



16/7

Bandbezeichnung	Lagenanzahl	Tragseite					Laufseite					Bandstärke	Bandgewicht	Belastung bei 1% Dehnung	Umlenktrömmel	Einschnürrömmel	Dauerbereich	Fertigungsbreite	Eigenschaften
			Material	Farbe	Stärke in mm	Oberfläche	Material	Farbe	Stärke in mm	Oberfläche		mm	kg/qm	N/mm	mm	mm	°C -/+	mm	
<b>STABILOFLEX</b>																			
1 E/PW 02	1		PU	weiß	0,2	matt	PU	natur	0,1	Gewebe		0,8	0,8	5	5	15	30/80	3000	FDA, #, AS
1 E/PW 02 G	1		PU	weiß	0,2	glatt	PU	natur	0,1	Gewebe		0,8	0,9	6	10	30	5/90	2000	FDA, #
1 E/PB 02	1		PU	petrol	0,2	matt	PU	natur	0,1	Gewebe		0,8	0,9	4	10	15	20/80	2000	#
T08/U/HG	1		PU	weiß	0,2	HG	PU	natur	0,1	Gewebe		0,8	0,7	4	3	8	40/60	2000	FDA, #
T04 grün	1		PU	grün	0,2	glatt	PU	natur	0,1	Gewebe		0,6	0,6	4	8	16	20/100	2000	FDA, #
T04 amber	1		PU	amber	0,2	glatt	PU	natur	0,1	Gewebe		0,8	0,9	6	10	30	5/90	2000	FDA, #
1 E/PW 05 STR	1		PU	weiß	0,5	Struktur	PU	natur	0,1	Gewebe		1,3	1,2	5	10	30	5/90	2000	FDA, #, AS
T04 EMB amber	1		PU	amber	0,3	Struktur	PU	natur	0,1	Gewebe		0,7	0,7	4	8	16	20/100	2000	FDA, #
2 E/PW 00	2		PU	weiß	impr.	Gewebe		natur		Gewebe		1,0	1,1	6	10	20	30/90	3000	FDA, #, AS
2 E/PW 02	2		PU	weiß	0,2	matt	PU	natur	0,1	Gewebe		1,3	1,4	8	20	30	30/80	3000	FDA, #, AS
2 E/PW 02 G	2		PU	weiß	0,2	glatt	PU	natur	0,1	Gewebe		1,1	1,3	10	12	35	5/90	2000	FDA, #, AS
2 E/PB 02	2		PU	petrol	0,2	matt	PU	natur	0,1	Gewebe		1,4	1,6	8	30	50	20/80	1900	AS, #
2 E/PG 02	2		PU	grün	0,2	matt	PU	natur	0,1	Gewebe		1,4	1,4	7	12	35	20/100	2000	FDA, #, AS
2 E/PS 02	2		PU	schwarz	0,2	matt	PU	natur	0,1	Gewebe		1,4	1,4	7	12	35	20/100	2000	AS
2 E/PBH 03	2		PU	hellblau	0,3	glatt	PU	hellblau	0,1	Gewebe		1,5	1,6	17	30	50	20/100	3300	FDA, #, AS
3 E/PB 02	3		PU	petrol	0,2	matt	PU	natur	0,1	Gewebe		2,4	2,8	12	80	120	20/60	2000	AS, #
2 E/PW 04 Grip	2		PU	weiß	0,4	Struktur	PU	natur	0,1	Gewebe		2,7	2,5	17	50	75	20/100	1500	FDA, #

Eigenschaften: AS = antistatisch ausgerüstet; FDA = Lebensmitteltauglich; # = öl- und fettbeständig; LN = Laufruhiges Gewebe; SE = schwer entflammbar