

TR

FIXED-STATION ROTARY INDEXING TABLES | TR ROTARY INDEXING RING TABLE



Additional indexing plates are not included in the standard delivery scope. They are calculated separately as per your details.

TR ROTARY INDEXING RING TABLE: NEW APPLICATION POSSIBILITIES

THE TR FULL SOLUTION

Tailor-made electrical accessories. Control card, electronic contactor or frequency converter.



OR RATHER A HEAVY DUTY ROTARY TABLE?

Our user programmable CR heavy duty rotary table range is available for heavy loads.





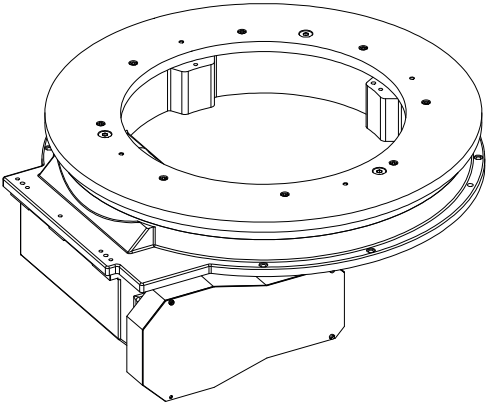
Kugler-Womako produces machines for print finishing and the stationery industry. Something genuinely new in the paper industry: rather than standard linear transfer systems, the TR 750 rotary indexing ring table is used.

Rotary indexing ring table with very large central opening, extremely flat design and high parts accuracy. The ring-shaped design allows extra free design space. The rotating aluminium ring can be adjusted to your specifications in terms of diameter and thickness.

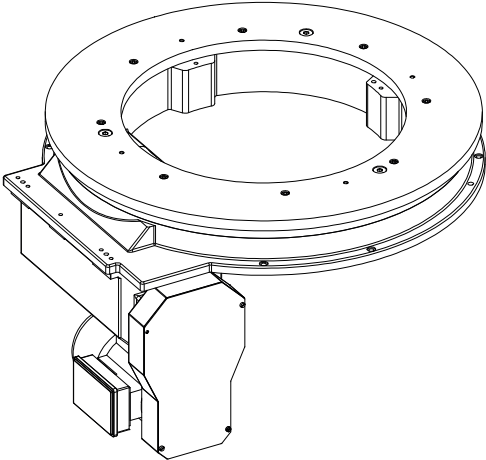
ADVANTAGES

- Ring-shaped rotary indexing table with very large central opening
- High level of parts accuracy through locking on the outer edges
- Highly dynamic with smooth acceleration
- Flat, compact design – compatible with our tried and tested machines
- Four sizes
- Available as a user-programmable NR version (please also see the “Freely programmable rotary tables” section)
- Simplest control system, identical to our TC rotary indexing tables
- Excellent price-performance
- Appealing design

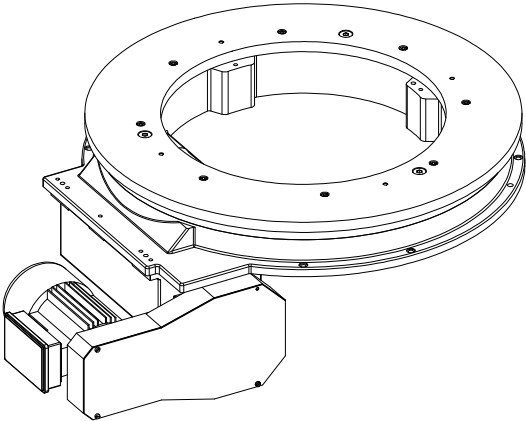
VERSIONS: DRIVE POSITION



DRIVE HOUSING INSIDE/DP 1

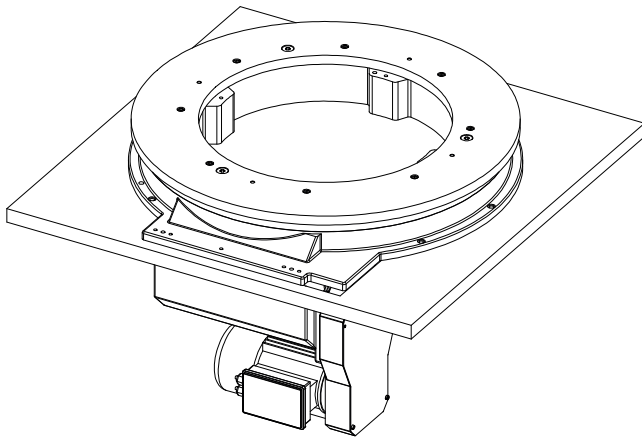


DRIVE HOUSING BELOW /DP 2

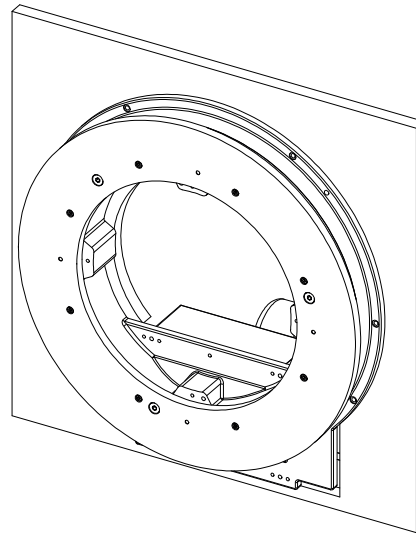


DRIVE HOUSING OUTSIDE/DP 3

VERSIONS: MOUNTING POSITION



STANDARD / MP 1



VERTICAL DRIVE AT BASE / MP 2
(only possible for model TR0750A)

GENERAL INFORMATION ON THE MODEL RANGE

- TR rotary indexing tables can be operated clockwise, anti-clockwise and also in reversing mode.
- The TR rotary indexing rings are “lubricated for life”!
- All TR rotary indexing tables are equipped with asynchronous brake motors. The size of the motors is optimally matched to the respective rotary indexing table configuration, so the drive can never damage the rotary indexing ring.
- The maximum switching frequency is up to 120 cycles per minute, depending on the system’s mass moment of inertia and the angle of rotation.
- Note on indexing times (TC 120-TC 500): The actual measured rotation time (from the start signal to the electrical inposition signal) comprises the calculated rotation motion time given in the tables and type-related delays. Electrical signal processing times, as well as setting up and optimising the ideal start position represent an important part.

OPTIONS

- Possible installation location: vertical rotary axis with output flange at the top
- Custom installation location, only possible for the TR0750A: horizontal rotary axis with cam housing at the base
- Sizes TR0750A to TR1500A can optionally be equipped with a DRIVE-CLiQ absolute encoder.
- In connection with the new 2.1 version of the EF2 control system software, the rotary encoder offers the following options:
 - » Cam switching mechanism: 16 user-programmable electronic cams allow early triggering of process actuators or help reduce the cycle time with load-ing/unloading axes
 - » Segment detection: The index of the current nest is reflected in the locking position on the fieldbus or, where applicable, digital I/Os. This eliminates the need for retrofit equipment to determine the current position of the component nests on the rotating plate.
- Standard colour: RAL7035 (other colours available on request)

TR 750A



GENERAL INFORMATION

· Maximum recommended equipment diameter D_{tp} : approximately 1500 mm

TECHNICAL DATA

U	Voltage (custom voltages available on request):	230 / 400 V
f	Frequency:	50 Hz
	Indexing precision:	36 arcsec ($\pm 18''$)
A_r	Axial run-out of the drive flange:	(at \varnothing 635 mm) 0.05 mm
A_r	Axial run-out, including the rotary ring:	(at \varnothing 750 mm) 0.07 mm
C_r	Concentricity of the output flange:	0.03 mm
P	Parallelism between the output flange and screw-on surface of the housing:	0.05 mm
m	Total weight, including motor:	230 kg

The values stated for axial run-out and concentricity can only be achieved with precise mounting surfaces.

LOAD DATA (for the output flange)

T_{2 stat}	Static torque:	2500 Nm
M_{2T dyn}	Permitted dynamic tilting moment:	750 Nm
F_{2A dyn}	Permitted dynamic axial force:	7000 N
F_{2R dyn}	Permitted dynamic radial force:	7000 N

Combined loads and permitted process forces only after inspection by WEISS.

LOAD TABLE 50 Hz (On request: higher loads / custom indexing and switching times for 60 Hz mains frequency)

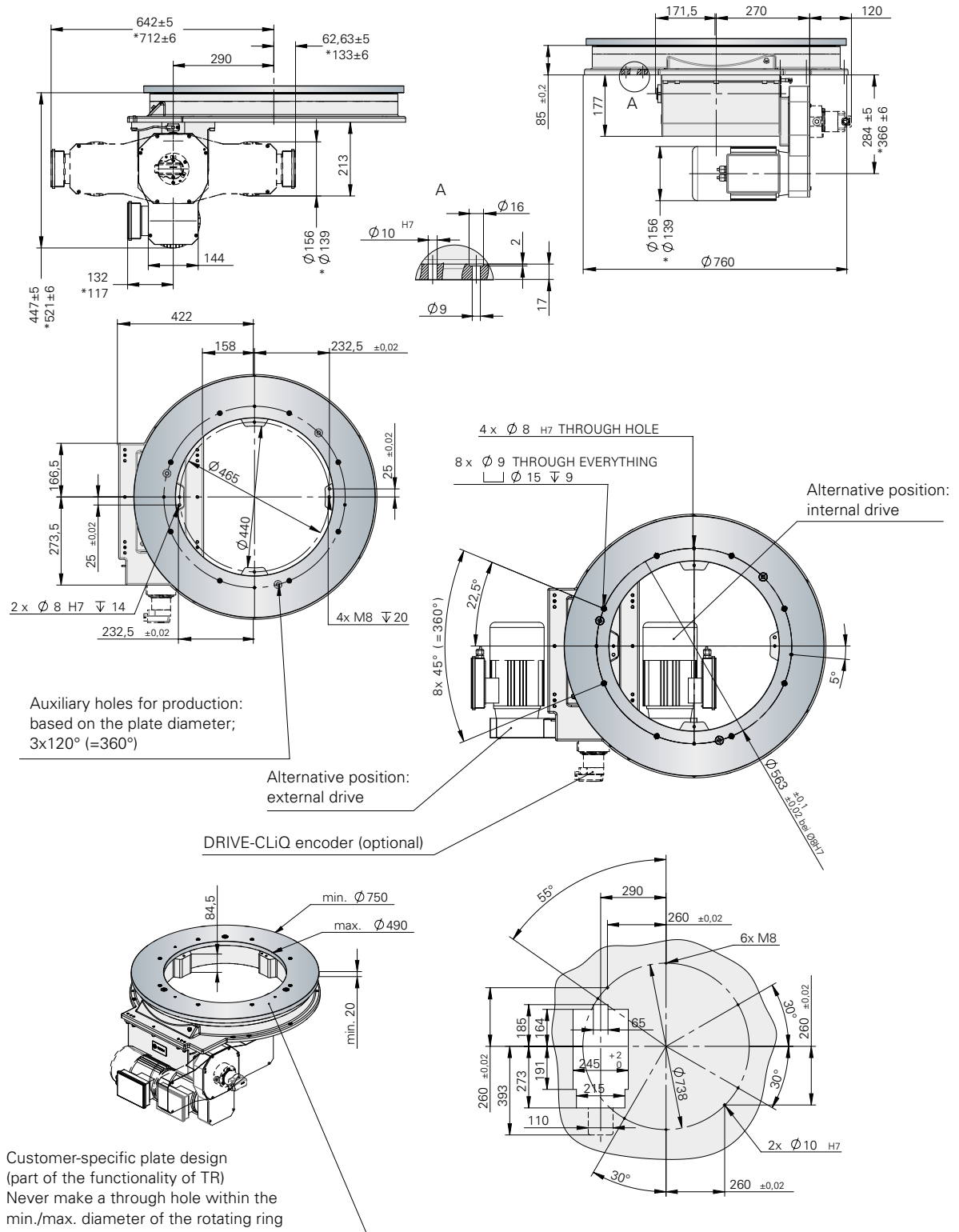
Indexing	Speed level	2-stage								
		s	a	b	c	d	e	f	g	h
4	J_{2 Max}	-	7	14	22	37	59	87	220	325
	t _i	-	0.42	0.53	0.66	0.81	1.01	1.26	1.94	2.48
6	J_{2 Max}	-	12	22	36	57	90	144	345	560
	t _i	-	0.42	0.53	0.66	0.81	1.01	1.26	1.94	2.48
8	J_{2 Max}	-	19 *	31	49	78	120	195	460	750
	t _i	-	0.42 *	0.53	0.66	0.81	1.01	1.26	1.94	2.48
10	J_{2 Max}	-	31 *	50	79	125	190	305	720	1170
	t _i	-	0.40 *	0.50	0.62	0.77	0.96	1.20	1.85	2.35
12	J_{2 Max}	18 *	45 *	72	112	175	270	425	1015	1650
	t _i	0.27 *	0.40 *	0.50	0.62	0.77	0.96	1.20	1.85	2.35
16	J_{2 Max}	20 *	57 *	90	140	190	335	530	1260	2045
	t _i	0.26 *	0.39 *	0.48	0.60	0.74	0.92	1.16	1.78	2.27
20	J_{2 Max}	29 *	72 *	115	175	275	420	665	1575	2560
	t _i	0.26 *	0.39 *	0.48	0.60	0.74	0.92	1.16	1.78	2.27
24	J_v	35 *	85 *	135	210	330	505	800	1890	3070
	t _i	0.26 *	0.39 *	0.48	0.60	0.74	0.92	1.16	1.78	2.27
30	J_{2 Max}	35 *	110 *	170	265	410	635	1000	2365	3840
	t _i	0.26 *	0.39 *	0.48	0.60	0.74	0.92	1.16	1.78	2.27

J_{2 Max} = max admissible mass inertia loading (kgm²) **t_i** = cycle time (sec.) Depending on motor size, electronics and time optimisation settings, the cycle time measured from the start signal to the electric position indication is approx. 80 - 130 ms longer than the value specified in the table (see also the note on page 17).

*EF2 - Control recommended to minimise brake wear (see page 48).

DIMENSIONS

The position shown for the output flange with rotary ring corresponds to the home position (delivery state). The additional rotating ring is not included in the standard delivery scope and is subject to an extra charge. It is calculated separately as per your details.



* Dimensions for motor BG 71 (2-stage)

TR 1100A



GENERAL INFORMATION

· Maximum recommended equipment diameter D_{tp} : approximately 2200 mm

TECHNICAL DATA

U	Voltage (custom voltages available on request):	230 / 400 V
f	Frequency:	50 Hz
	Indexing precision:	36 arcsec ($\pm 18''$)
A_r	Axial run-out of the drive flange:	(at \varnothing 945 mm) 0.06 mm
A_r	Axial run-out, including the rotary ring:	(at \varnothing 1100 mm) 0.07 mm
C_r	Concentricity of the output flange:	0.04 mm
P	Parallelism between the output flange and screw-on surface of the housing:	0.06 mm
m	Total weight, including motor:	310 kg

The values stated for axial run-out and concentricity can only be achieved with precise mounting surfaces.

LOAD DATA (for the output flange)

T_{2 stat}	Static torque:	3500 Nm
M_{2T dyn}	Permitted dynamic tilting moment:	2500 Nm
F_{2A dyn}	Permitted dynamic axial force:	12000 N
F_{2R dyn}	Permitted dynamic radial force:	12000 N

Combined loads and permitted process forces only after inspection by WEISS.

LOAD TABLE 50 Hz (On request: higher loads / custom indexing and switching times for 60 Hz mains frequency)

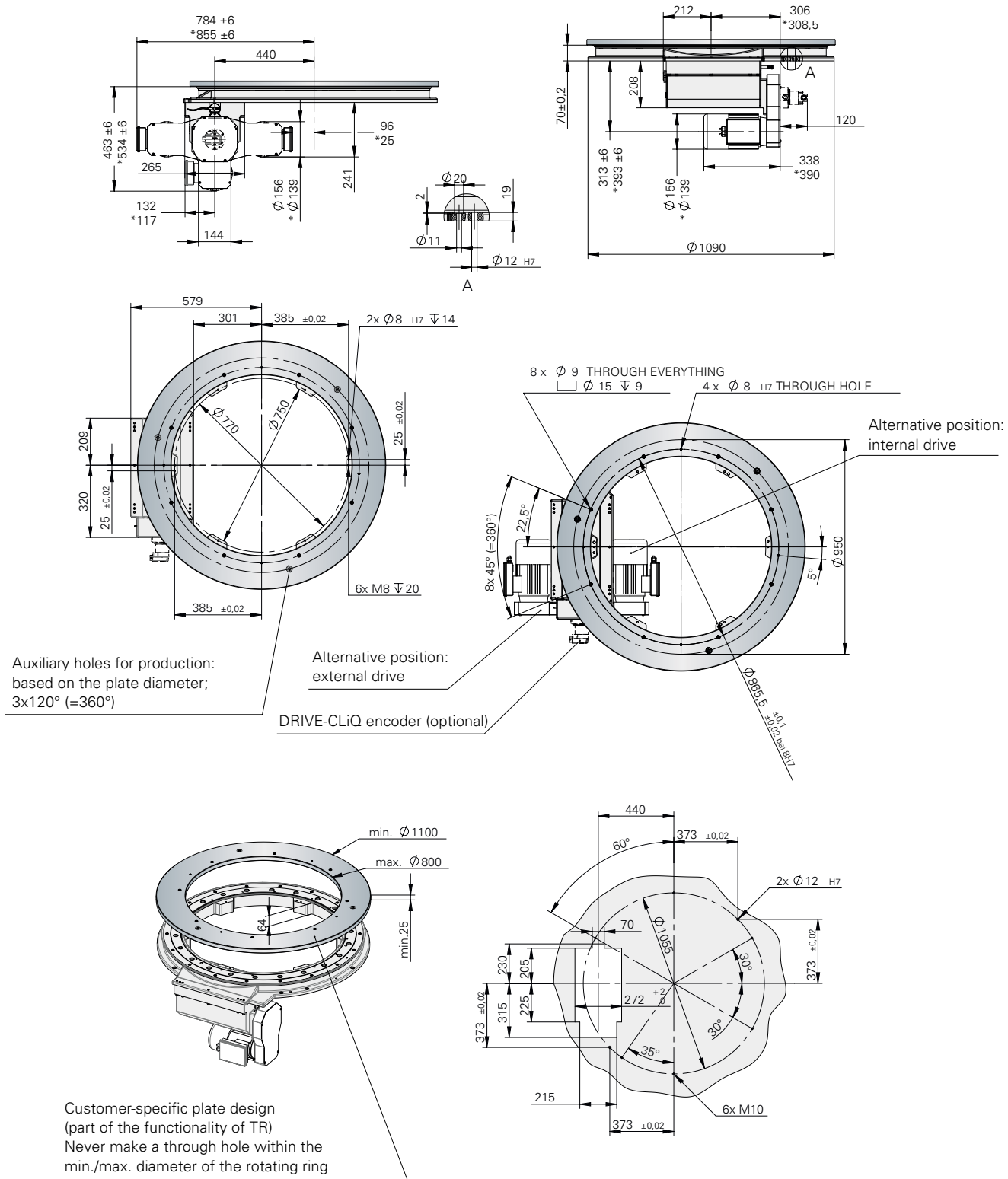
Indexing	Speed level	Speed level							2-stage		
		s	a	b	c	d	e	f	g	h	i
4	J_{2 Max}	-	-	11	19	41	57	60	180	295	445
	t _i	-	-	0.53	0.59	0.82	0.90	1.15	1.41	2.16	2.75
6	J_{2 Max}	-	13	34	43	92	114	190	290	675	1010
	t _i	-	0.42	0.53	0.59	0.82	0.90	1.15	1.41	2.16	2.75
8	J_{2 Max}	-	26 *	48	61	126	155	255	385	925	1510
	t _i	-	0.42 *	0.53	0.59	0.82	0.90	1.15	1.41	2.16	2.75
10	J_{2 Max}	-	35 *	62	78	160	195	325	485	1160	1890
	t _i	-	0.39 *	0.51	0.56	0.78	0.86	1.09	1.33	2.05	2.61
12	J_{2 Max}	21 *	62 *	116	143	260	350	495	860	2045	3325
	t _i	0.29	0.39 *	0.51	0.56	0.78	0.86	1.09	1.33	2.05	2.61
16	J_{2 Max}	38 *	86 *	146	180	355	435	715	1070	2540	4125
	t _i	0.28 *	0.38 *	0.49	0.54	0.75	0.83	1.05	1.29	1.98	2.52
20	J_{2 Max}	57 *	109 *	185	225	450	550	895	1340	3175	5160
	t _i	0.28 *	0.38 *	0.49	0.54	0.75	0.83	1.05	1.29	1.98	2.52
24	J_v	65 *	135 *	225	275	540	660	1075	1605	3810	6190
	t _i	0.28 *	0.38 *	0.49	0.54	0.75	0.83	1.05	1.29	1.98	2.52
30	J_{2 Max}	90 *	170 *	280	345	675	825	1345	2010	4765	7740
	t _i	0.28 *	0.38 *	0.49	0.54	0.75	0.83	1.05	1.29	1.98	2.52
36	J_{2 Max}	110 *	205 *	340	415	815	995	1620	2415	5720	9290
	t _i	0.28 *	0.38 *	0.49	0.54	0.75	0.83	1.05	1.29	1.98	2.52

J_{2 Max} = max admissible mass inertia loading (kgm²) **t_i** = cycle time (sec.) Depending on motor size, electronics and time optimisation settings, the cycle time measured from the start signal to the electric position indication is approx. 80 - 130 ms longer than the value specified in the table.

*EF2 - Control recommended to minimise brake wear (see page 48).

DIMENSIONS

The position shown for the output flange with rotary ring corresponds to the home position (delivery state). The additional rotating ring is not included in the standard delivery scope and is subject to an extra charge. It is calculated separately as per your details.



* Dimensions for motor BG 71 (2-stage)

TR 1500A



GENERAL INFORMATION

· Maximum recommended equipment diameter D_{tp} : approximately 3000 mm

TECHNICAL DATA

U	Voltage (custom voltages available on request):	230 / 400 V
f	Frequency:	50 Hz
	Indexing precision:	30 arcsec ($\pm 15''$)
A_r	Axial run-out of the drive flange:	(at $\varnothing 1275$ mm) 0.08 mm
A_r	Axial run-out, including the rotary ring:	(at $\varnothing 1500$ mm) 0.1 mm
C_r	Concentricity of the output flange:	0.04 mm
P	Parallelism between the output flange and screw-on surface of the housing:	0.08 mm
m	Total weight, including motor:	400 kg

The values stated for axial run-out and concentricity can only be achieved with precise mounting surfaces.

LOAD DATA (for the output flange)

T_{2 stat}	Static torque:	5000 Nm
M_{2T dyn}	Permitted dynamic tilting moment:	3200 Nm
F_{2A dyn}	Permitted dynamic axial force:	16000 N
F_{2R dyn}	Permitted dynamic radial force:	16000 N

Combined loads and permitted process forces only after inspection by WEISS.

LOAD TABLE 50 Hz (On request: higher loads / custom indexing and switching times for 60 Hz mains frequency)

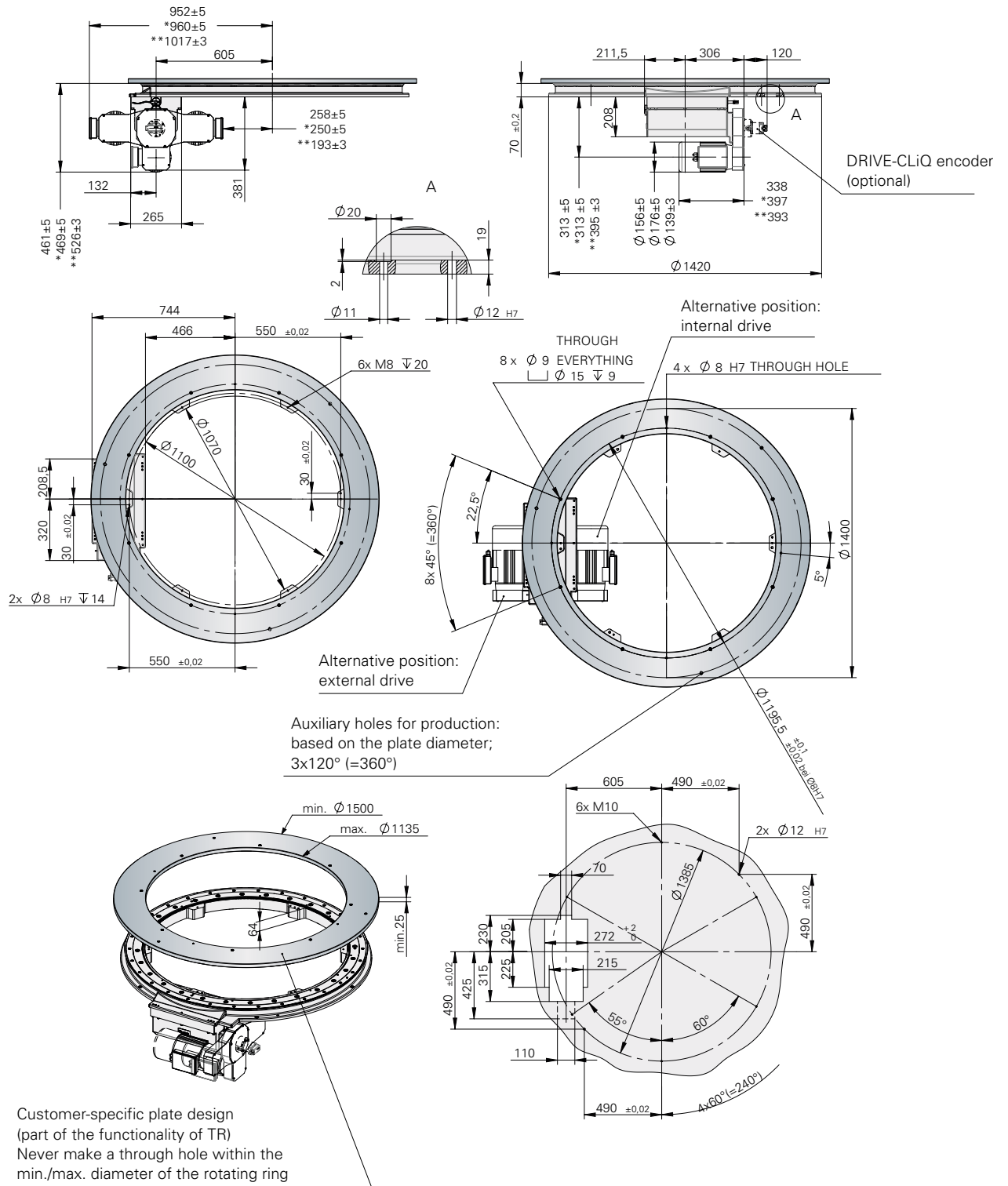
Indexing	Speed level	2-stufig									
		s	a	b	c	d	e	f	g	h	i
8	J_{2 Max}	-	-	57	74	163	203	342	520	1258	1792
	t _i	-	-	0.53	0.59	0.82	0.90	1.15	1.41	2.16	2.75
10	J_{2 Max}	-	48	100	127	265	330	545	825	1975	2395
	t _i	-	0.39	0.51	0.56	0.78	0.86	1.09	1.33	2.05	2.61
12	J_{2 Max}	-	75 *	149	185	380	470	775	1165	2785	3330
	t _i	-	0.39 *	0.51	0.56	0.78	0.86	1.09	1.33	2.05	2.61
16	J_{2 Max}	43	108 *	190	235	480	590	965	1440	3460	5325
	t _i	0.28	0.38 *	0.49	0.54	0.75	0.83	1.05	1.29	1.98	2.52
20	J_{2 Max}	69 *	140 *	243	301	605	740	1215	1820	4330	7040
	t _i	0.28 *	0.38 *	0.49	0.54	0.75	0.83	1.05	1.29	1.98	2.52
24	J_{2 Max}	87 *	172 *	295	365	730	890	1460	2185	5200	8455
	t _i	0.28 *	0.38 *	0.49	0.54	0.75	0.83	1.05	1.29	1.98	2.52
30	J_{2 Max}	114 *	221 *	375	460	915	1120	1830	2740	6505	10570
	t _i	0.28 *	0.38 *	0.49	0.54	0.75	0.83	1.05	1.29	1.98	2.52
36	J_v	141 *	270 *	455	560	1105	1350	2200	3290	7810	12690
	t _i	0.28 *	0.38 *	0.49	0.54	0.75	0.83	1.05	1.29	1.98	2.52
48	J_{2 Max}	324 *	600 *	995	1215	2375	2900	4720	7045	16685	27095
	t _i	0.28 *	0.38 *	0.49	0.54	0.75	0.83	1.05	1.29	1.98	2.52

J_{2 Max} = max admissible mass inertia loading (kgm²) **t_i** = cycle time (sec.) Depending on motor size, electronics and time optimisation settings, the cycle time measured from the start signal to the electric position indication is approx. 80 - 130 ms longer than the value specified in the table.

*EF2 - Control recommended to minimise brake wear (see page 48).

DIMENSIONS

The position shown for the output flange with rotary ring corresponds to the home position (delivery state). The additional rotating ring is not included in the standard delivery scope and is subject to an extra charge. It is calculated separately as per your details.



* Dimensions for motor BG 90
** Dimensions for motor BG 71 (2-stage)

TR 2200A



GENERAL INFORMATION

· Maximum recommended equipment diameter D_{tp} : approximately 4400 mm

TECHNICAL DATA

U	Voltage (custom voltages available on request):	230 / 400 V
f	Frequency:	50 Hz
	Indexing precision*:	24 arcsec ($\pm 12''$)
A_r	Axial run-out of the drive flange:	(at \varnothing 1990 mm) 0.08 mm
A_r	Axial run-out, including the rotary ring:	(at \varnothing 2200 mm) 0.15 mm
C_r	Concentricity of the output flange:	0.05 mm
P	Parallelism between the output flange and screw-on surface of the housing:	0.08 mm
m	Total weight, including motor:	950 kg

The values stated for axial run-out and concentricity can only be achieved with precise mounting surfaces.

LOAD DATA (for the output flange)

T_{2 stat}	Static torque:	15000 Nm
M_{2T dyn}	Permitted dynamic tilting moment:	4500 Nm
F_{2A dyn}	Permitted dynamic axial force:	30000 N
F_{2R dyn}	Permitted dynamic radial force:	30000 N

Combined loads and permitted process forces only after inspection by WEISS.

LOAD TABLE 50 Hz (On request: higher loads / custom indexing and switching times for 60 Hz mains frequency)

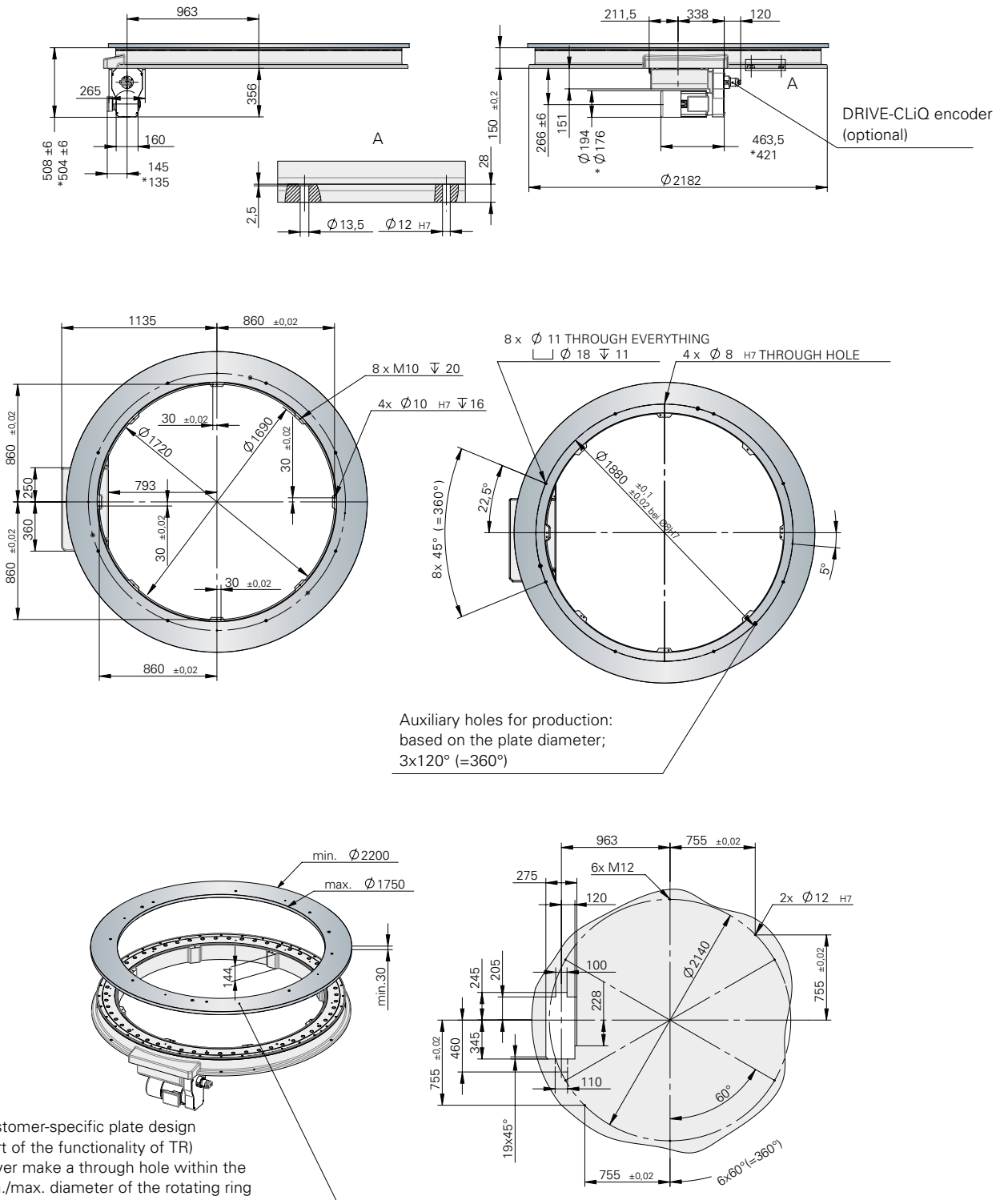
Indexing		Speed level						
		a	b	c	d	e	f	g
14	J_{2 Max}	-	-	-	525	720	1010	2400
	t _i	-	-	-	0.77	0.86	0.97	1.48
16	J_{2 Max}	-	-	420	995	1030	1640	3075
	t _i	-	-	0.62	0.77	0.86	0.97	1.48
18	J_{2 Max}	-	-	600	1325	1370	2140	3955
	t _i	-	-	0.62	0.77	0.86	0.97	1.48
20	J_{2 Max}	-	511	797	1550	1750	2670	4945
	t _i	-	0.50	0.62	0.77	0.86	0.97	1.48
24	J_{2 Max}	-	665	1180	1805	2455	3255	7230
	t _i	-	0.50	0.62	0.77	0.86	0.97	1.48
30	J_{2 Max}	-	707	1245	2010	2580	3420	8240
	t _i	-	0.46	0.57	0.70	0.78	0.89	1.36
36	J_{2 Max}	465	900	1545	2465	3135	4155	9940
	t _i	0.37	0.46	0.57	0.70	0.78	0.89	1.36
48	J_v	762	1281	2140	3370	4165	5625	13335
	t _i	0.37	0.46	0.57	0.70	0.78	0.89	1.36

J_{2 Max} = max admissible mass inertia loading (kgm²) **t_i** = cycle time (sec.) Depending on motor size, electronics and time optimisation settings, the cycle time measured from the start signal to the electric position indication is approx. 80 - 130 ms longer than the value specified in the table.

*EF2 - Control recommended to minimise brake wear (see page 48).

DIMENSIONS

The shown position of the rotating ring corresponds to the home position (state of delivery) with motor size BG100. Additional indexing plates are not included in the standard delivery scope and are subject to an extra charge. They are calculated separately as per your details.



* Dimensions for motor BG 90

EF2

FIXED-STATION ROTARY INDEXING TABLES | EF2 ROTARY TABLE CONTROL SYSTEM

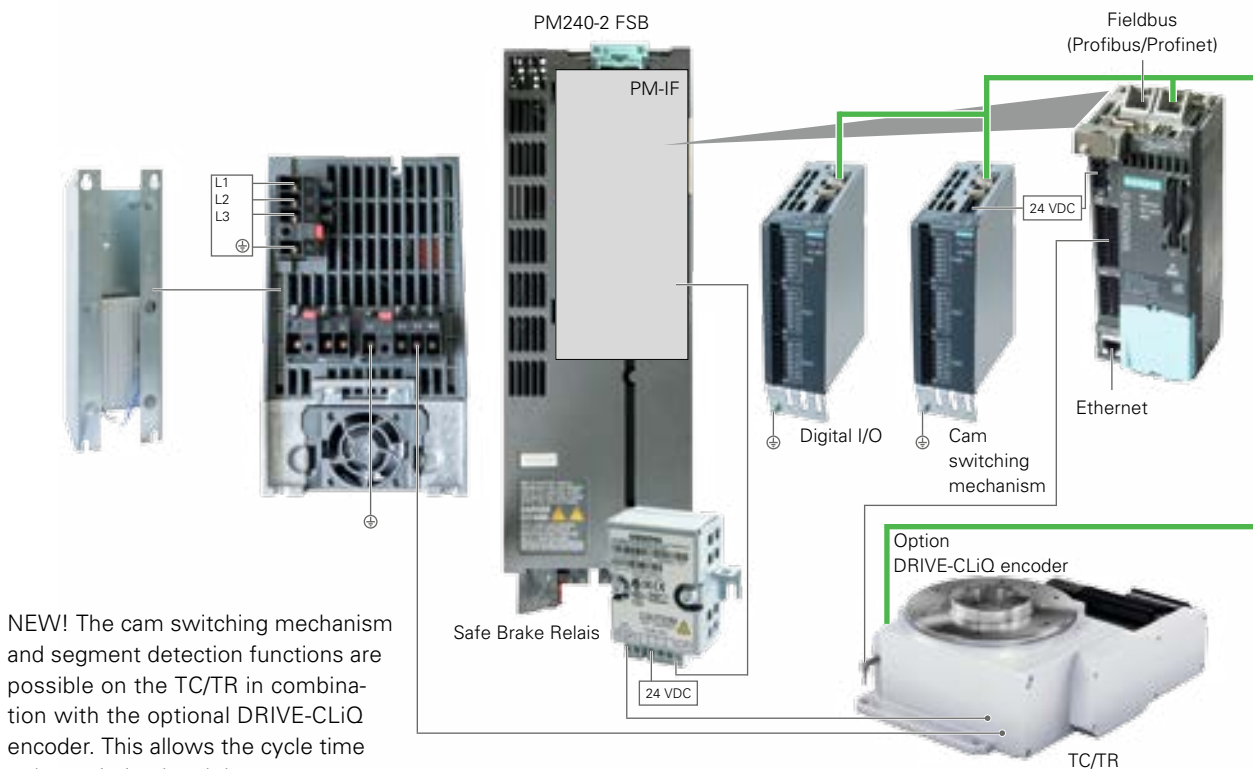
ADVANTAGES

The EF2 rotary table control system enables fast and convenient control of rotary indexing tables of all sizes belonging to the TC and TR series.

- Intuitive, web-based user interface for faster commissioning
- No brake wear, soft start-up from intermediate positions is gentle on gearing
- Increased performance through fully automatic optimisation cycle
- Remote support and remote diagnostics options
- Worldwide use thanks to various mains standards
- Compact hardware (all-in-one)
- Fieldbus connection: Profibus and Profinet
- Interface: Digital I/O
- Integrated SIL2 safety function
- Additional SIL3 measures possible
- Watchdog mechanism



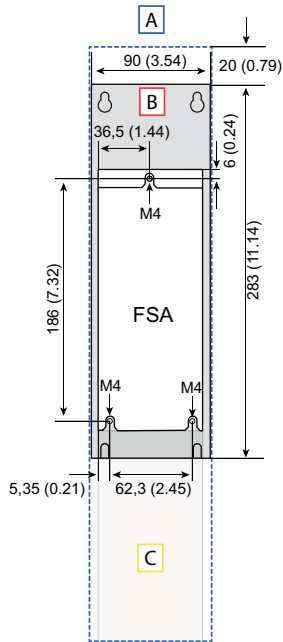
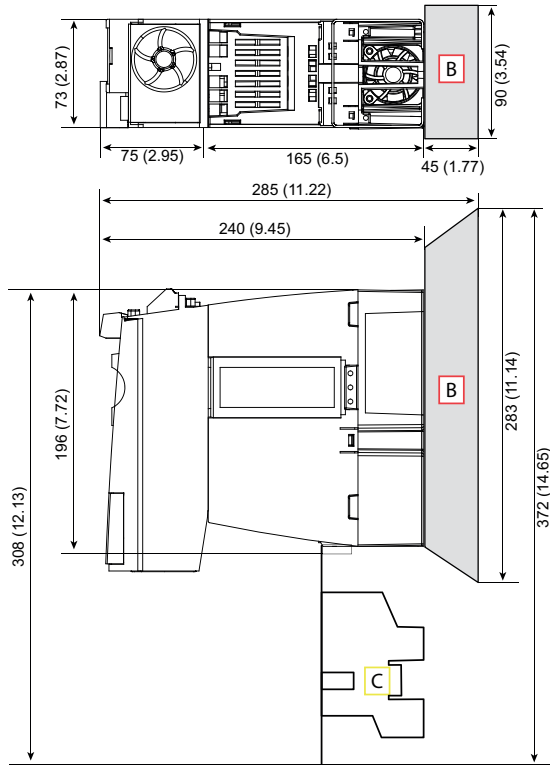
BLOCK DIAGRAM



NEW! The cam switching mechanism and segment detection functions are possible on the TC/TR in combination with the optional DRIVE-CLiQ encoder. This allows the cycle time to be optimised and the current process status in all nests to be reliably detected.

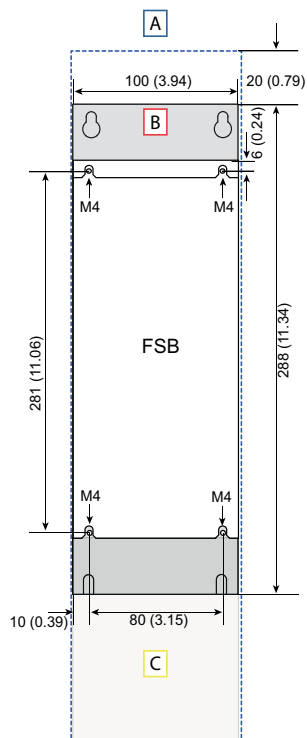
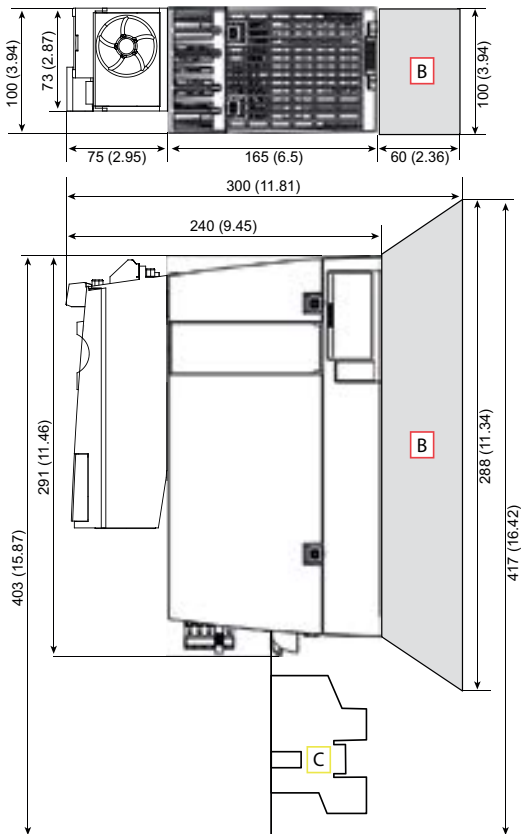
DIMENSIONS

FSA size (EF2037 to EF2220)



A = Ventilation clearance
 B = Brake resistance
 C = Shielding plate

FSB size (EF2300)



A = Ventilation clearance
 B = Brake resistance
 C = Shielding plate

TS

FIXED-STATION ROTARY INDEXING TABLES | TS 004E CONTROL CARD

ADVANTAGES

- Instant start-up thanks to user-friendly push buttons on front panel
- Easy to optimize the cycle time of the indexer
- Motor protection through cycle time monitoring
- Allows failure analysis by telephone
- EWR: Considerable extension of the service life of the brake by reduction of the motor speed before braking



ABMESSUNGEN

- Control card:
 - Europecard 100 x 160 mm
 - Front plate 3HE/8TE
 - Multipoint plug, 64-pin in accordance with DIN 41612 Type B
- PCB holder: 220 x 130 x 50 mm
- Housing for rear wall mounting: 235 x 135 x 67 mm
- Housing for rail mounting: 245 x 135 x 67 mm
- Housing for front panel installation: 235 x 135 x 67 mm
- Installation opening: 136 x 68 mm

INSTALLATION OPTIONS

- In a 19" rack (in conjunction with terminal PCB TS 004 K1)
- In the PCB holder
- In the protective housing

BLOCK DIAGRAM

