

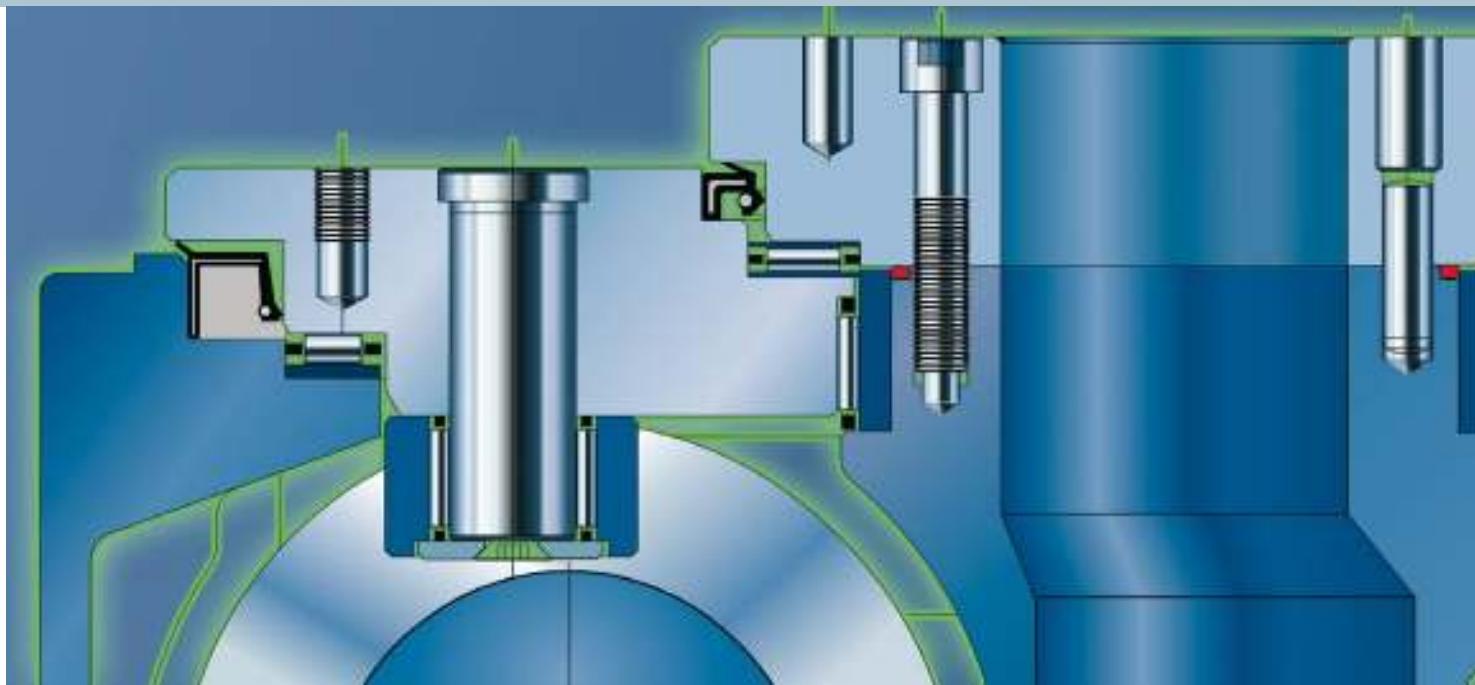
Technology that inspires



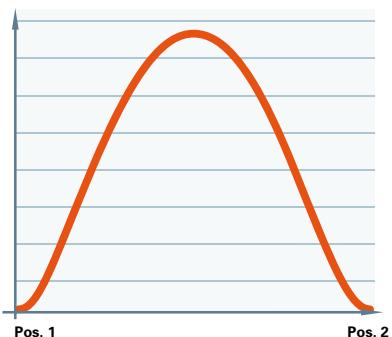
Electromechanical rotary indexing tables TC-T



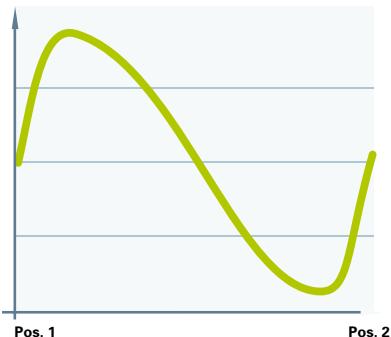
Technology that inspires



■ *V Speed gradient*



■ *a Acceleration gradient*



The modified curved path of the cam allows for a very smooth and harmonic motion.

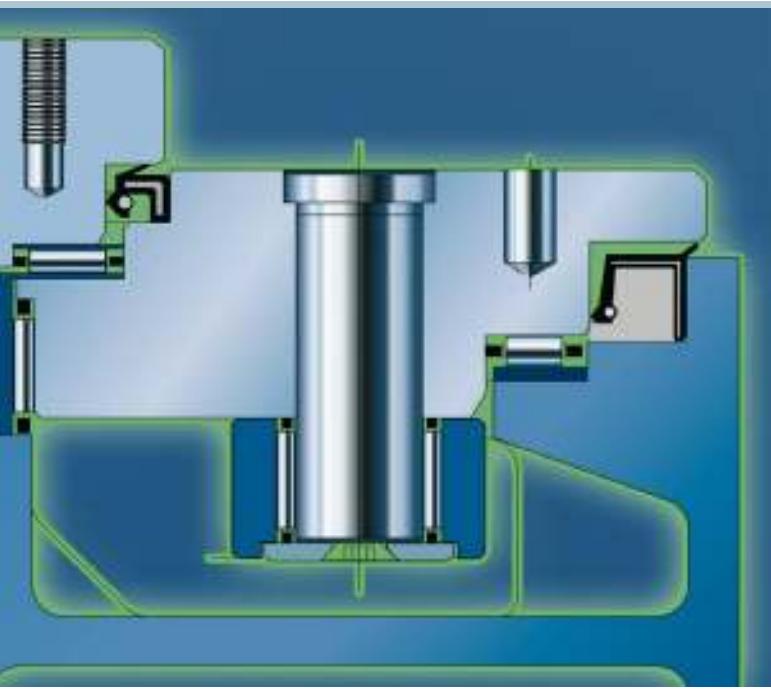
This ensures long life and the shortest possible indexing times.



The customer can rotate the drive 90° downwards, if required.



According to your drawing we manufacture high-precision AlMg4,5Mn plates (anodised upon request) and steel plates (nickel-plated upon request). All your equipment can be supplied from one source including a test report.



Please download the selected rotary indexing table from www.weiss-gmbh.de (in 2D or 3D) directly into your CAD drawing. This will ensure you are using the latest model.

Advantages at a glance

- Strong stationary centre section
- Large centre boring
- Specially designed oil and dust seals
- Precision heavy-duty needle roller bearings.
- Cam followers with needle roller bearings
- Housing made of cast iron
- Rotating section with hardened bearing surface and untreated top surface to enable drilling/tapping
- 20 % faster
- EPS electronic overload protection
- EWR electronic wear reduction



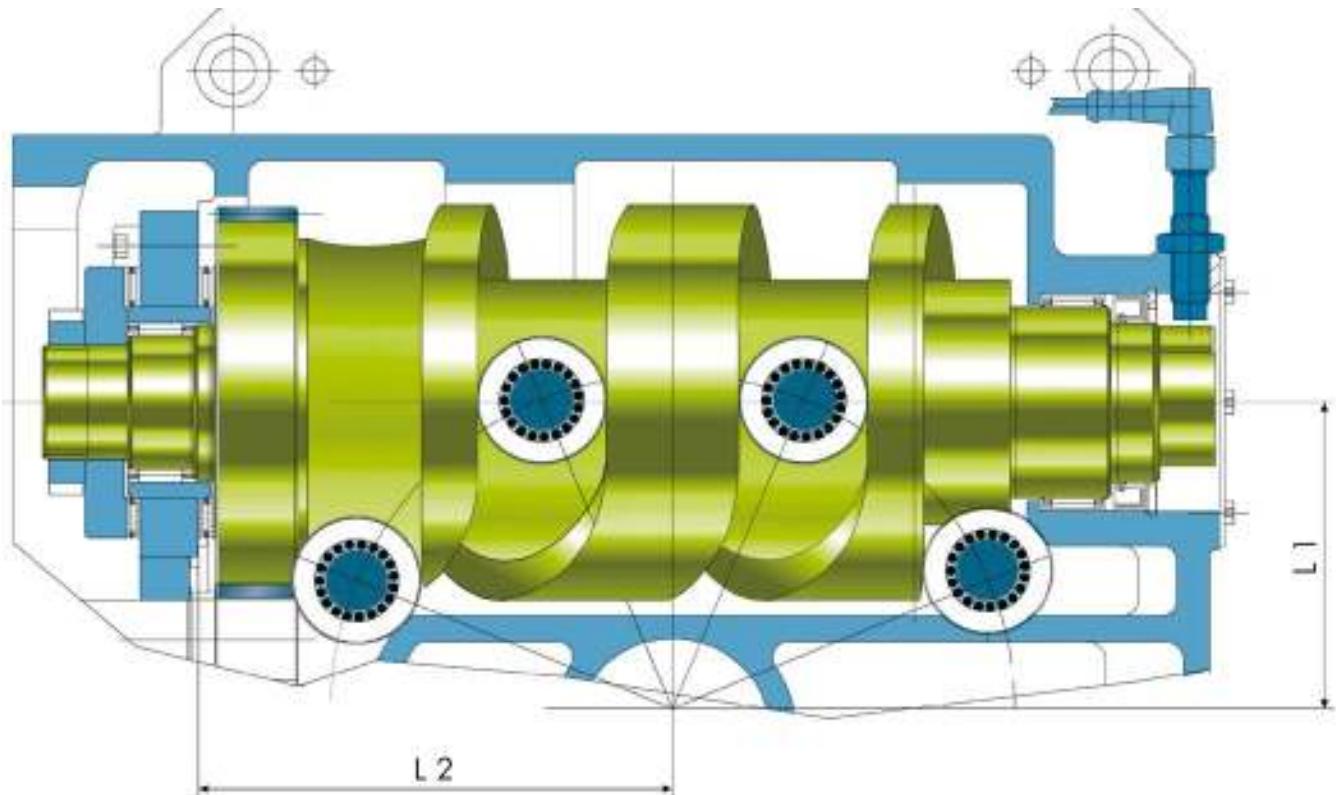
For selecting ring-type rotary indexing tables, please refer to the "Electromechanical indexing rings TR/NR" brochure.



By using our control card under normal conditions, the service life of the brake increases by 3 times (EWR).

We offer tailor-made electrical components, e.g. control cards, electronic contactors or frequency inverters. Please contact your representative for further information.

4 years guarantee *



1st reason

Wear and tear

We do not use any friction bearings, all bearings are antifrictional, running in oil. Our plate cam followers are fitted with needle roller bearings, this ensures that we can guarantee full precision, even after 30 million indexing motions.

2nd reason

Sophisticated construction

We manufacture our drive cam followers as large as possible, this ensures that we use the total length of the cam.

For example on our 6-station unit we have 3 or 4 followers engaged with the cam at the same time, these followers are evenly distributed between the acceleration and deceleration forces.

3rd reason

Thermal expansion

Our cam consists of highly tempered, surface hardened steel and our housing is cast iron. The coefficient of thermal expansion is the same for steel and cast iron. When the housing expands due to the thermal influences, the cam centre - the area where positioning takes place - remains in exactly the same position due to the cam expanding by the same amount. This is different with aluminium housings, which are partly used by our competitors. In these circumstances the housing expands more than the cam. This results in the plate turning and noticeably leaving its original position!

Example: TC 320 T L1 = 96 mm L2 = 145,5 mm $\Delta T = 20^\circ\text{C}$

A plate diameter of 1200 mm with an aluminium housing and a temperature difference of 20°C would register a counter clockwise positional variation of 0.182 mm on the circumference.



Design, production, installation and sales all have one common goal: to supply you with a rotary indexing table with the highest precision that keeps on running and running and running ...

4th reason

Crash / Emergency stop safety

The performance of our drive motors are proportioned to suit the size of table, number of stations and the indexing time. Adjustments can also be made to suit our customers special requirements.

Too little performance will result in large acceleration values during the deceleration of the dial plate. Too much performance in the case of a crash results in breakage or loss of precision. A sensible selection of drive performance ensures that the rotary indexing table will survive a crash without major damage. In order to avoid possible mechanical damage of the indexer during re-start after an e-stop, which occurred during index we recommend using our frequency inverter - controller combination. This soft start device allows the indexer to creep slowly from the indexing phase into dwell without overloading barrel cam, cam followers and bearings.

5th reason

Electronic accessories / electronic wear compensation

If our rotary indexing table control is used the brake wear is minimised or compensated completely.

The rotary indexing table is therefore completely maintenance and wear-free throughout its service life.

6th reason

No overloading / long life

The following tables list the exact calculations of the permissible load factors for our indexers. These calculations include a safety factor to ensure years of reliable performance during multiple shift applications. If you have an application which requires a higher load bearing capacity than the standard values, then please contact us.

7th reason

EPS – electronic overload protection (optional)

Our additional electronically adjustable overload protection device will react within 4 ms.

8th reason

Our attitude

Our customer service representatives are looking forward to helping you.

TC 120G

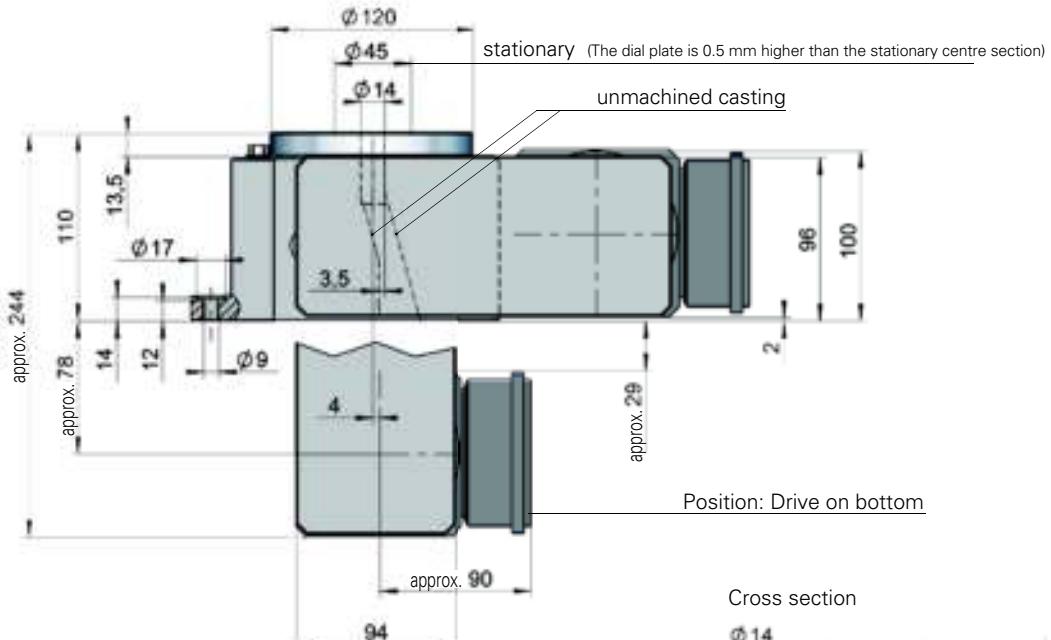


Technical data TC 120G

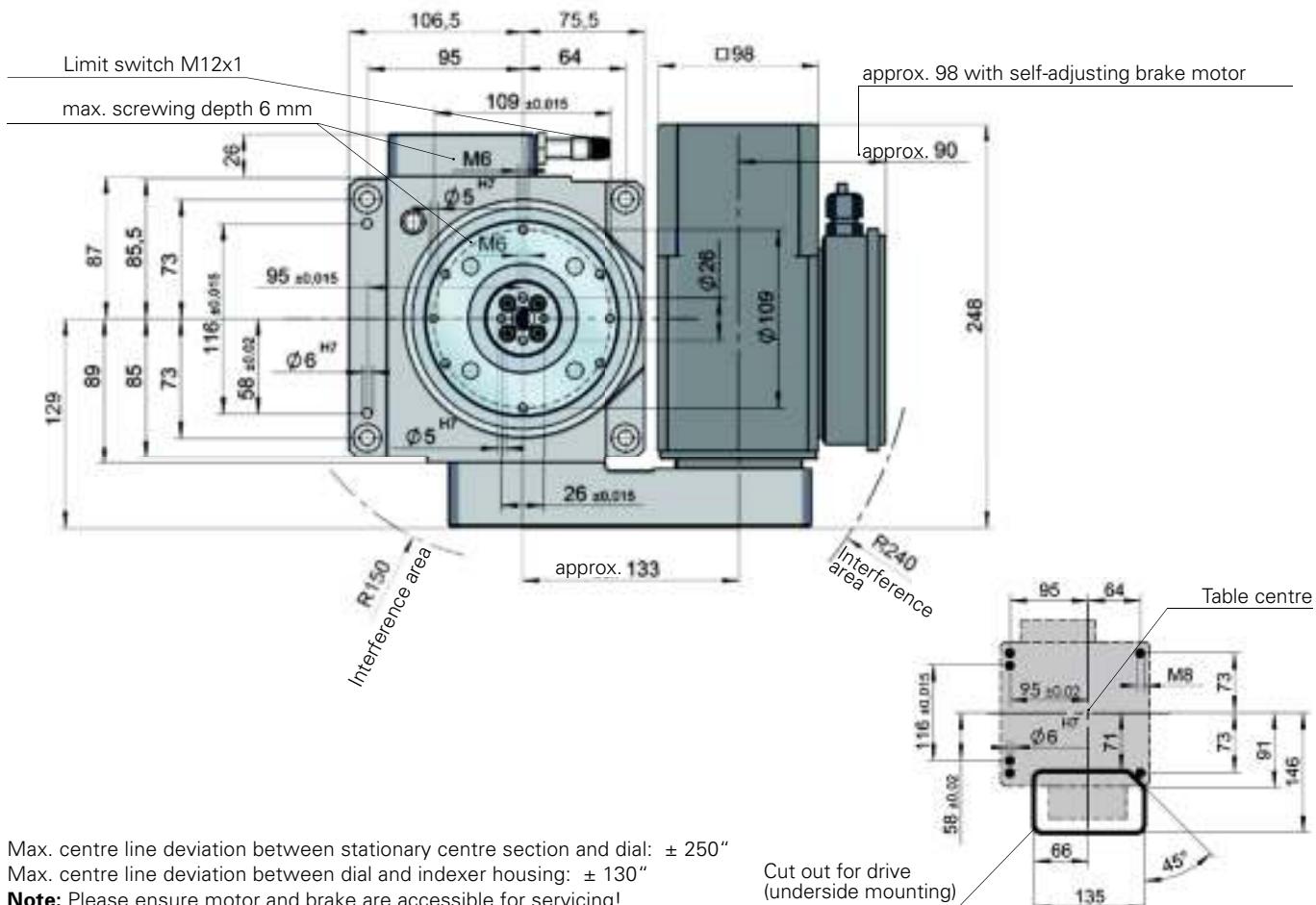
Tool plate diameter:	Recommended up to 600 mm
Dial diameter:	120 mm
Direction of rotation:	Clockwise - counter clockwise or reciprocating
Indexings:	2, 4, 5, 6, 8, 10, 12, 16, 20, special increments upon request
Cycle frequency:	Up to 200 cpm, depending on inertia loading and number of stops
Voltage:	230 / 400 V 50 Hz, special voltages upon request
Drive motor:	0.045 - 0.12 kW
Weight:	22 kg
Mounting position:	See page 39 (it is possible to fix this unit from the top surface - if required, please request a drawing)
Indexing precision:	Indexing 2-10: $\pm 45''$ indexing 12-20: $\pm 55''$ (in degree seconds) Higher indexing precision upon request
Indexing precision in radian measurement:	(at $\varnothing 120$ mm) indexing 2-10: ± 0.013 mm indexing 12-20: ± 0.016 mm
Repeatability:	(at $\varnothing 120$ mm) 0.02 mm
Max. flatness of dial plate:	(at $\varnothing 120$ mm) 0.02 mm
Max. run out:	0.02 mm
Max. parallelism of rotating plate surface to bottom housing surface:	(at $\varnothing 120$ mm) 0.04 mm

TC 120G Dimensions

Technology that inspires



If you require subsequent drilling work on the indexing table, please request information on permissible drilling depths. The illustrated rotating plate position corresponds to the basic position of the rotary indexing table (Position when delivered).



TC 120G

Load table (In the case of higher loads, please ask us for advice.)

Step	a	b	c	d	e	f	g
Indexing							
2 J_{max}	–	–	0,06	0,10	0,15	0,23	0,38
t_s	–	–	0,41	0,51	0,63	0,78	0,99
4 J_{max}	0,10	0,19	0,28	0,42	0,66	1,00	1,63
t_s	0,24	0,31	0,37	0,46	0,57	0,70	0,89
5 J_{max}	0,16	0,33	0,47	0,71	1,05	1,69	2,75
t_s	0,24	0,31	0,37	0,46	0,57	0,70	0,89
6 J_{max}	0,23	0,39	0,57	0,86	1,34	2,03	3,30
t_s	0,24	0,31	0,37	0,46	0,57	0,70	0,89
8 J_{max}	0,41	0,85	1,21	1,83	2,69	4,34	7,05
t_s	0,24	0,31	0,37	0,46	0,57	0,70	0,89
10 J_{max}	0,57	0,93	1,33	2,01	3,15	4,76	7,73
t_s	0,24	0,31	0,37	0,46	0,57	0,70	0,89
12 J_{max}	–	–	–	0,47	0,67	1,12	1,82
t_s	–	–	–	0,22	0,27	0,34	0,43
16 J_{max}	–	–	–	0,55	0,86	1,31	2,13
t_s	–	–	–	0,22	0,27	0,34	0,43
20 J_{max}	–	–	–	0,86	1,35	2,05	3,32
t_s	–	–	–	0,22	0,27	0,34	0,43

J = max admissible mass inertia loading (kgm^2) t_s = cycle time (sec.) The time from signal "start" to message "indexer locked" is approx. 80 - 130 ms longer than the above cycle time, the exact time will depend on the motor, the speed of PLC and the optimization settings (see page 34). EF - control system for brake wear reduction recommended

Load data (for the stationary centre section)

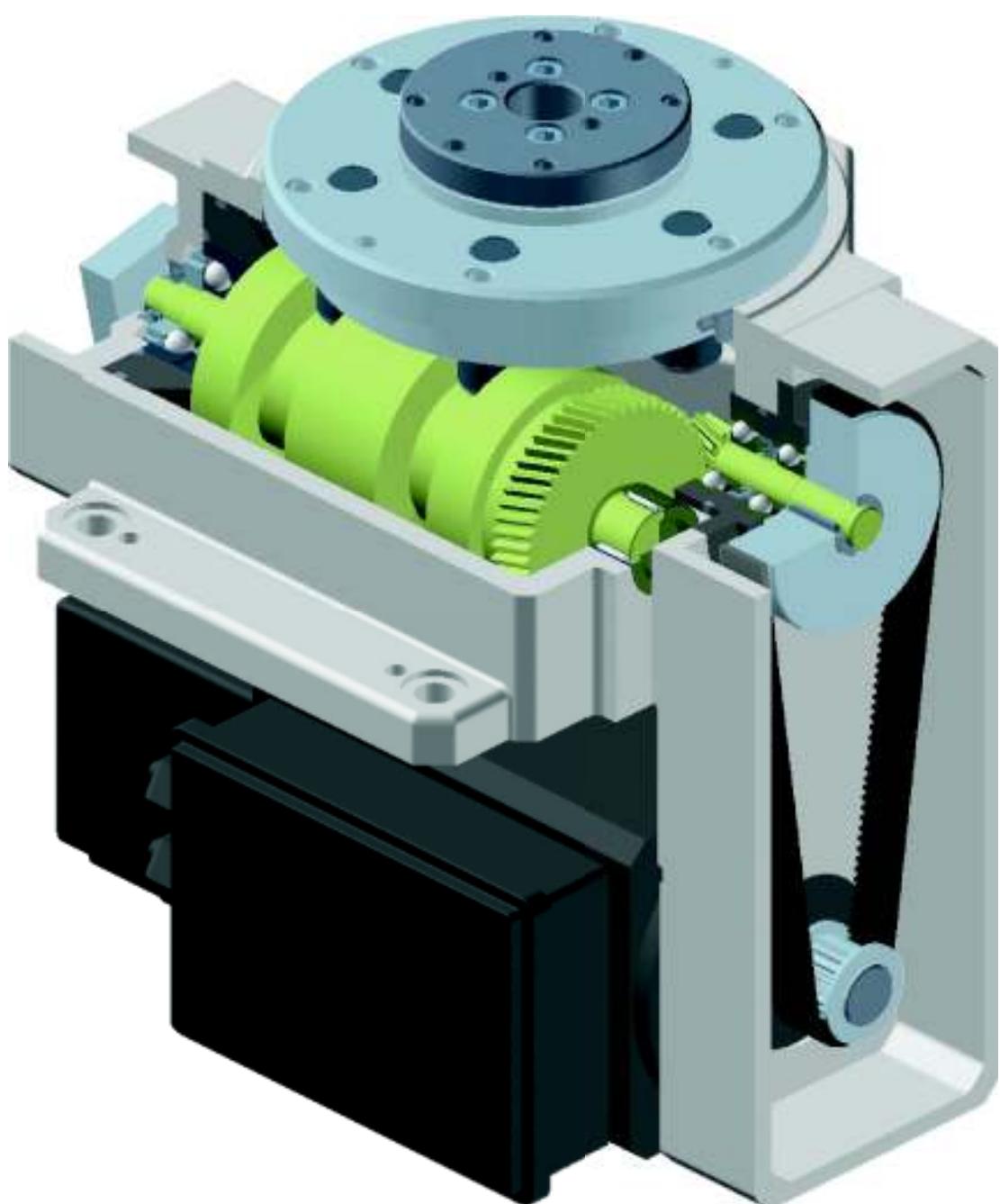
		
perm. tilting moment acting on the centre section 150 Nm	perm. force acting vertically on the centre section 3000 N	perm. tangential moment acting on the centre section 120 Nm
perm. radial force acting on the centre section 2000 N		

Load data (for the rotary indexing dial plate)

		
perm. tilting moment acting on the locked dial plate 200 Nm	perm. operating force (acting vertically on the locked dial plate within the normal Ø) 3300 N	perm. tangential moment acting on the locked dial plate 120 Nm
perm. radial force acting on the locked dial plate 2000 N		

TC 120G

Technology that inspires



TC 150T

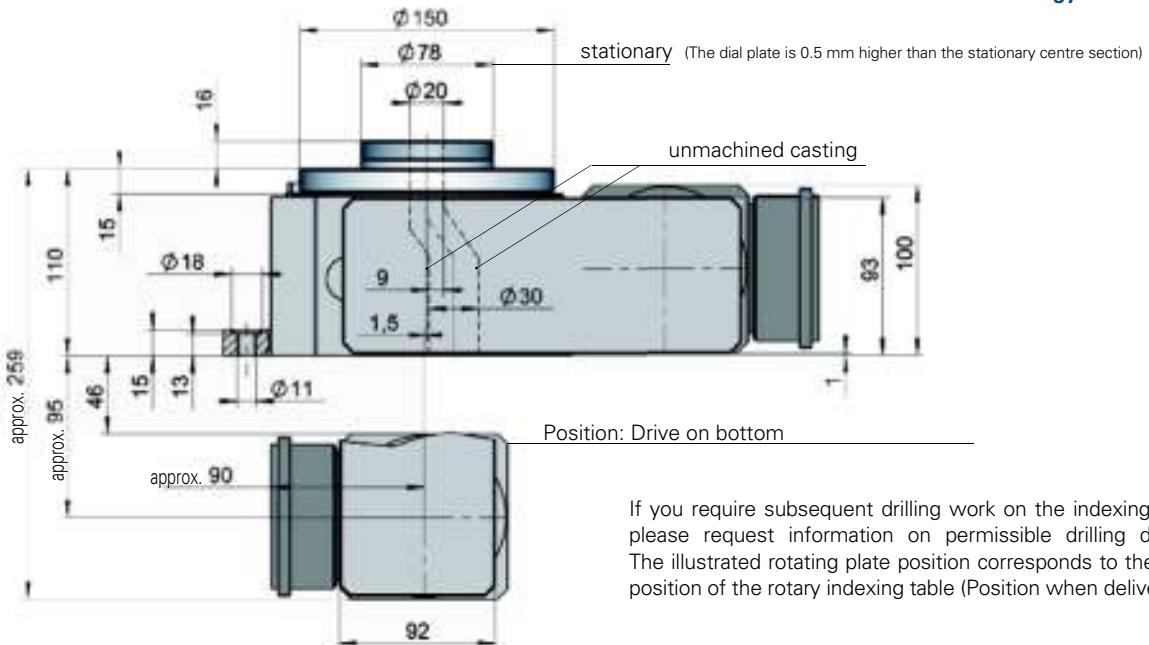


Technical data TC 150T

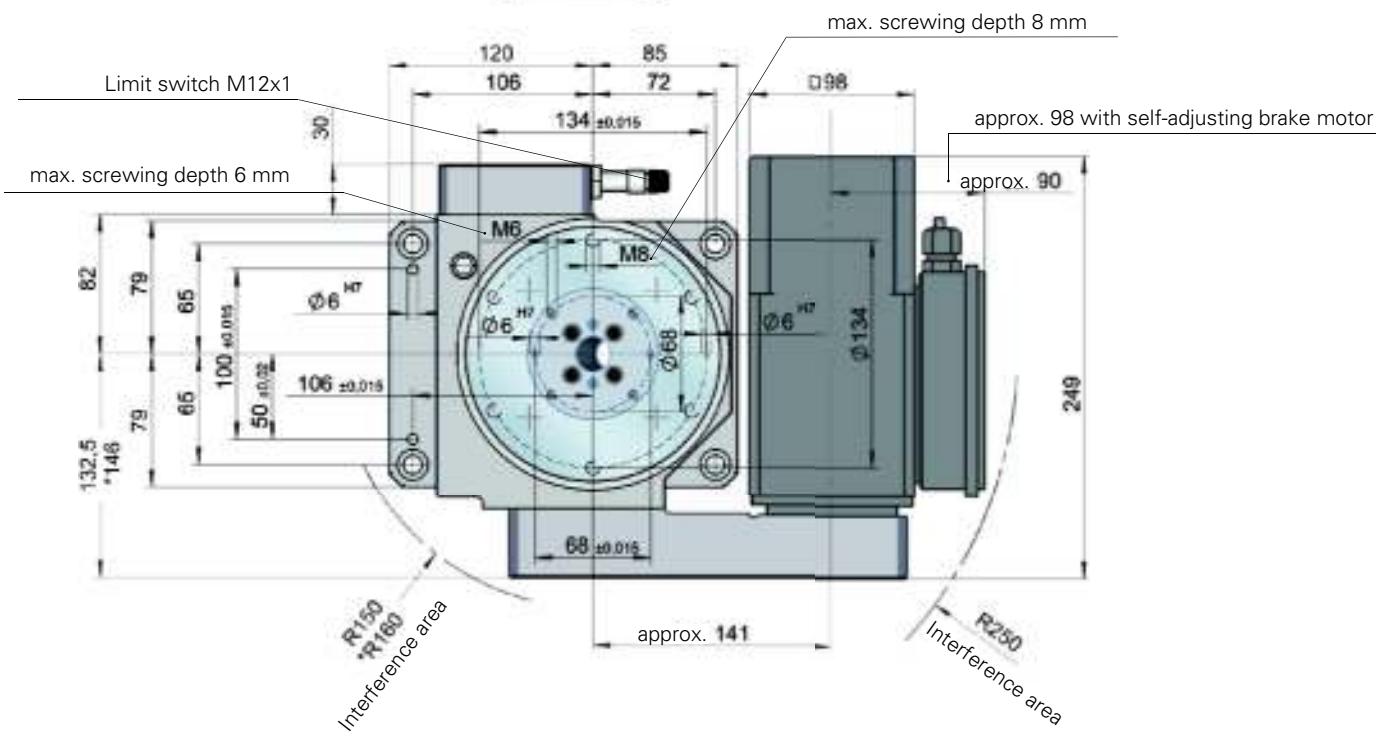
Tool plate diameter:	Recommended up to 800 mm
Dial diameter:	150 mm
Direction of rotation:	Clockwise - counter clockwise or reciprocating
Indexings:	2, 3, 4, 6, 8, 10, 12, 16, 20, special increments upon request
Cycle frequency:	Up to 210 cpm, depending on inertia loading and number of stops
Voltage:	230 / 400 V 50 Hz, special voltages upon request
Drive motor:	0.045 - 0.12 kW
Weight:	23 kg
Mounting position:	See page 39
Indexing precision:	Indexing 2-12: $\pm 30''$ indexing 16-24: $\pm 45''$ (in degree seconds) Higher indexing precision upon request
Indexing precision in radian measurement:	(at Ø 150 mm) indexing 2-12: ± 0.011 mm indexing 16-24: ± 0.016 mm
Repeatability:	(at Ø 150 mm) 0.01 mm
Max. flatness of dial plate:	(at Ø 150 mm) 0.01 mm
Max. run out:	0.01 mm
Max. parallelism of rotating plate surface to bottom housing surface:	(at Ø 150 mm) 0.03 mm
tooling plate clearance hole:	Ø 80 mm (min)

TC 150T Dimensions

Technology that inspires



If you require subsequent drilling work on the indexing table, please request information on permissible drilling depths. The illustrated rotating plate position corresponds to the basic position of the rotary indexing table (Position when delivered).

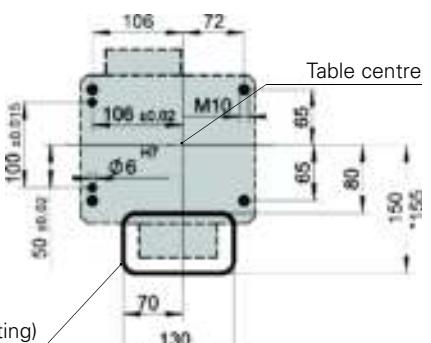


* only for indexing step h - j

Max. centre line deviation between stationary centre section and dial: $\pm 180''$
Max. centre line deviation between dial and indexer housing: $\pm 120''$

Note: Please ensure motor and brake are accessible for servicing!

Cut out for drive
(underside mounting)



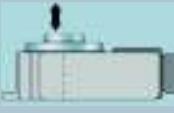
TC 150T

Load table (In the case of higher loads, please ask us for advice.)

Stage		a	b	c	d	e	f	g	h	i	j
Indexing											
2	J _{max}	–	–	0,09	0,14	0,23	0,35	0,58	1,18	1,93	4,18
	t _s	–	–	0,43	0,53	0,66	0,81	1,03	1,47	1,88	2,76
3	J _{max}	–	–	0,14	0,22	0,35	0,53	0,87	1,78	2,90	6,28
	t _s	–	–	0,43	0,53	0,66	0,81	1,03	1,47	1,88	2,76
4	J _{max}	0,11	0,23	0,37	0,56	0,75	1,35	2,17	4,47	7,28	15,75
	t _s	0,25	0,32	0,39	0,47	0,59	0,73	0,93	1,33	1,69	2,49
6	J _{max}	0,26	0,53	0,76	1,15	1,69	2,73	4,43	9,05	14,72	31,80
	t _s	0,25	0,32	0,39	0,47	0,59	0,73	0,93	1,33	1,69	2,49
8	J _{max}	0,46	0,96	1,62	2,46	3,02	5,61	8,71	19,31	31,40	67,90
	t _s	0,25	0,32	0,39	0,47	0,59	0,73	0,93	1,33	1,69	2,49
10	J _{max}	0,72	1,42	2,03	3,08	4,72	7,28	11,83	24,10	39,30	84,90
	t _s	0,25	0,32	0,39	0,47	0,59	0,73	0,93	1,33	1,69	2,49
12	J _{max}	1,04	1,70	2,44	3,69	5,78	8,74	14,19	29,00	47,10	102
	t _s	0,25	0,32	0,39	0,47	0,59	0,73	0,93	1,33	1,69	2,49
16	J _{max}	–	–	0,55	0,84	1,32	2,00	3,25	6,64	10,80	23,40
	t _s	–	–	0,19	0,23	0,29	0,35	0,45	0,64	0,81	1,20
20	J _{max}	–	–	0,69	1,05	1,65	2,50	4,06	8,30	13,50	29,20
	t _s	–	–	0,19	0,23	0,29	0,35	0,45	0,64	0,81	1,20
24	J _{max}	–	–	0,83	1,27	1,98	3,00	4,88	9,97	16,21	35,10
	t _s	–	–	0,19	0,23	0,29	0,35	0,45	0,64	0,81	1,20

J = max admissible mass inertia loading (kgm^2) t_s = cycle time (sec.) The time from signal "start" to message "indexer locked" is approx. 80 - 130 ms longer than the above cycle time, the exact time will depend on the motor, the speed of PLC and the optimization settings (see page 34). EF - control system for brake wear reduction recommended

Load data (for the stationary centre section)

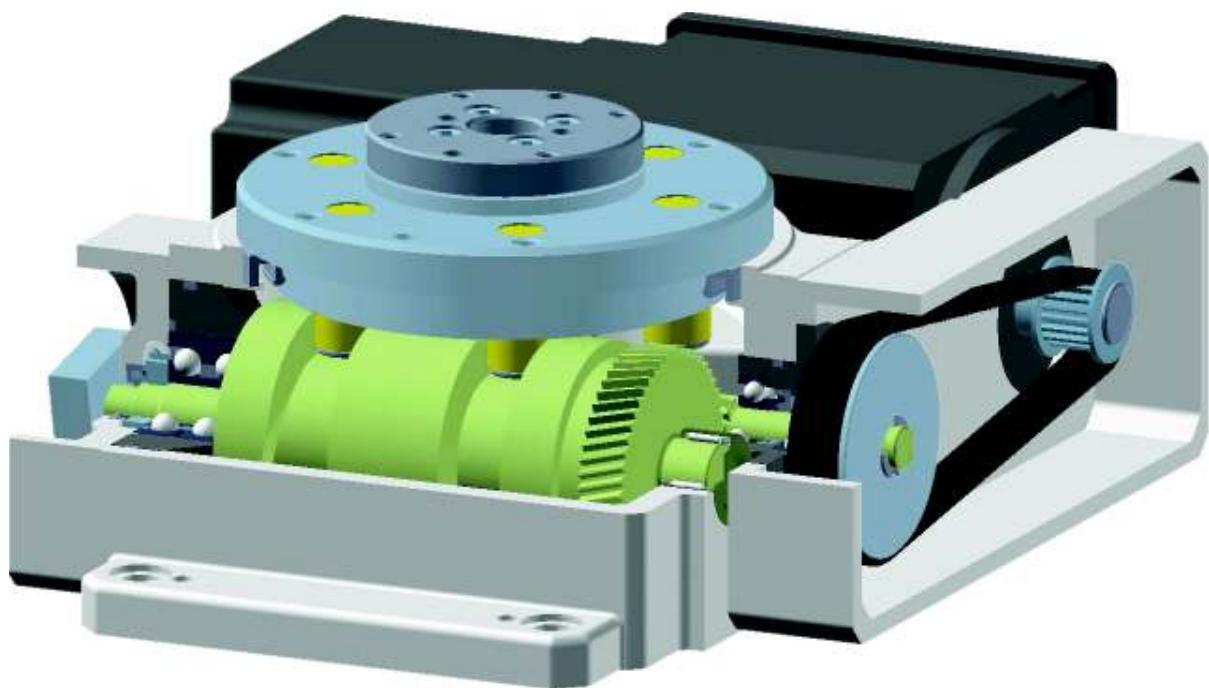
		
perm. tilting moment acting on the centre section 200 Nm	perm. force acting vertically on the centre section 3500 N	perm. tangential moment acting on the centre section 150 Nm
perm. radial force acting on the centre section 2500 N		

Load data (for the rotary indexing dial plate)

		
perm. tilting moment acting on the locked dial plate 500 Nm	perm. operating force (acting vertically on the locked dial plate within the normal Ø) 5500 N 16500 N*	perm. tangential moment acting on the locked dial plate 150 Nm
perm. radial force acting on the locked dial plate 6000 N		

TC 150T

Technology that inspires



TC 220T

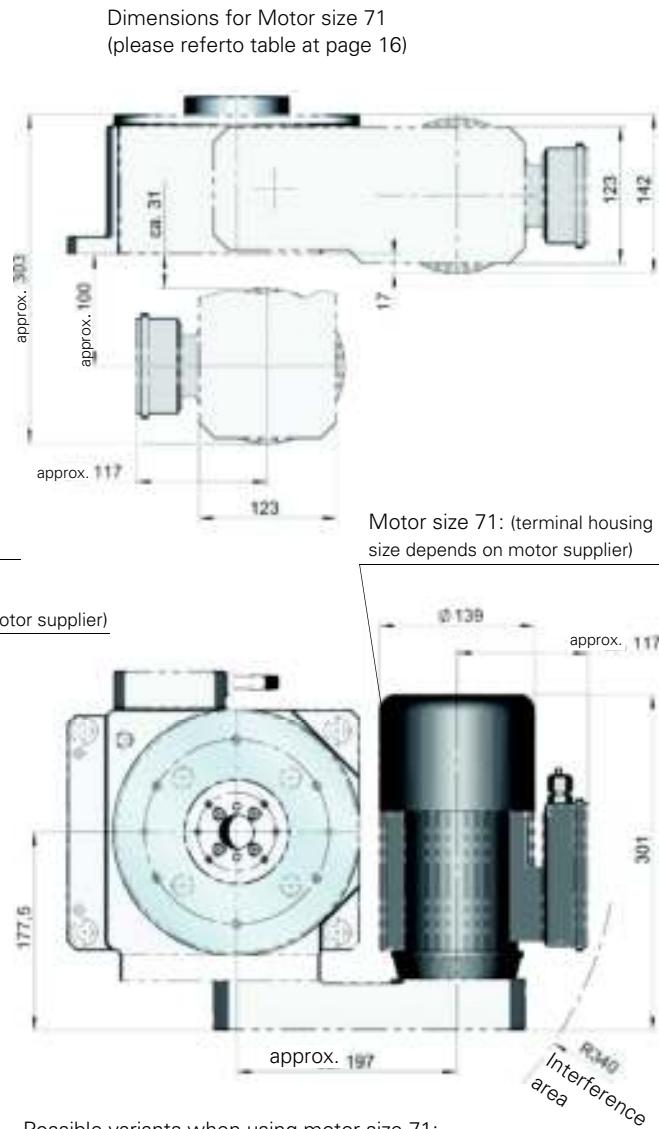
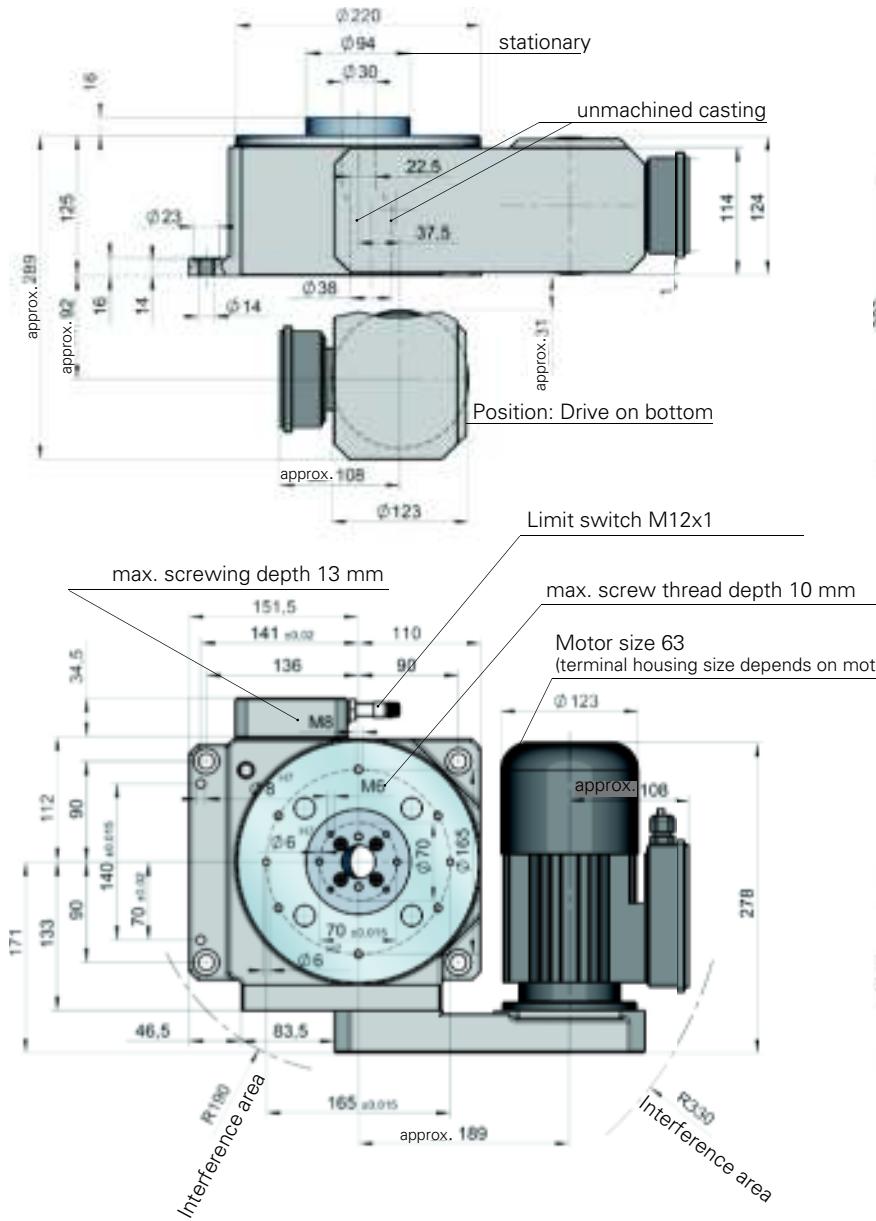


Technical data TC 220T

Tool plate diameter:	Recommended up to 1100 mm
Dial diameter:	220 mm
Direction of rotation:	Clockwise - counter clockwise or reciprocating
Indexings:	2, 3, 4, 6, 8, 10, 12, 16, 20, 24, 30, 36, special increments upon request
Cycle frequency:	Up to 220 cpm, depending on inertia loading and number of stops
Voltage:	230 / 400 V 50 Hz, special voltages upon request
Drive motor:	0.06 - 1.1 kW
Weight:	44 kg
Mounting position:	See page 39
Indexing precision:	Indexing 2-12: $\pm 20''$. Indexing 16-24: $\pm 30''$. Indexing 30-36: $\pm 40''$ (in degree seconds) Higher indexing precision upon request
Indexing precision in radian measurement:	(at Ø 220 mm) Indexing 2-12: ± 0.011 mm. Indexing 16-24: ± 0.016 mm. Indexing 30-36: ± 0.021 mm
Repeatability:	(at Ø 220 mm) 0.01 mm
Max. flatness of dial plate:	(at Ø 220 mm) 0.01 mm
Max. run out:	0.01 mm
Max. parallelism of rotating plate surface to bottom housing surface:	(at Ø 220 mm) 0.03 mm
tooling plate clearance hole:	Ø 96 mm (min)

TC 220T Dimensions

Technology that inspires



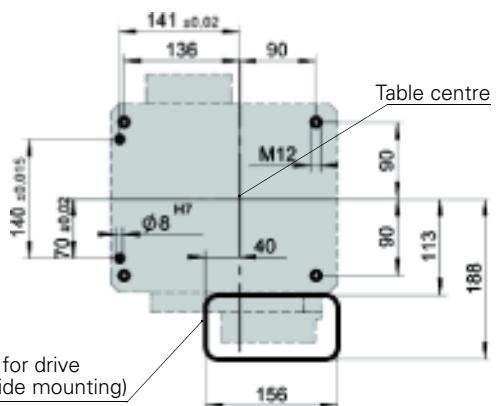
Possible variants when using motor size 71:

- Belt drive lateral with raised support for indexer housing
- Belt drive on bottom

If you require subsequent drilling work on the indexing table, please request information on permissible drilling depths. The illustrated rotating plate position corresponds to the basic position of the rotary indexing table (Position when delivered).

Max. centre line deviation between stationary centre section and dial: $\pm 150''$
Max. centre line deviation between dial and indexer housing: $\pm 100''$

Note: Please ensure motor and brake are accessible for servicing!



TC 220T

Load table (In the case of higher loads, please ask us for advice.)

Stage	b	c	d	e	f	g	h	i	j	k	l	
Indexing												
2	J _{max}	–	–	0,15	0,34	0,57	0,73	1,15	1,70	2,77	6,59	8,80
	t _s	–	–	0,35	0,50	0,60	0,67	0,84	1,02	1,30	1,99	2,30
3	J _{max}	–	0,18	0,30	0,62	0,92	1,16	1,83	2,68	4,37	10,36	13,82
	t _s	–	0,29	0,35	0,50	0,60	0,67	0,84	1,02	1,30	1,99	2,30
4	J _{max}	0,12 (0,19)	0,24 (0,37)	0,46 (0,69)	1,34 (1,97)	2,38 (3,50)	3,36 (4,61)	6,60	8,36	17,13	31,50	48,50
	t _s	0,22	0,26	0,32	0,45	0,54	0,61	0,76	0,92	1,17	1,80	2,07
6	J _{max}	0,31 (0,48)	0,58 (0,87)	1,06 (1,59)	3,05 (4,46)	5,40 (7,45)	7,60	14,64	18,84	26,00	70,90	109
	t _s	0,22	0,26	0,32	0,45	0,54	0,61	0,76	0,92	1,17	1,80	2,07
8	J _{max}	0,58 (0,87)	1,06 (1,58)	1,92 (2,85)	5,44 (6,92)	9,63 (10,22)	12,82	19,05	29,20	46,20	112	150
	t _s	0,22	0,26	0,32	0,45	0,54	0,61	0,76	0,92	1,17	1,80	2,07
10	J _{max}	0,92 (1,37)	1,67 (2,48)	3,01 (4,24)	8,48 (8,4)	12,40	15,23	24,30	35,50	57,60	136	182
	t _s	0,22	0,26	0,32	0,45	0,54	0,61	0,76	0,92	1,17	1,80	2,07
12	J _{max}	1,34 (1,96)	2,41 (2,90)	4,29	10,19	14,89	15,73	24,60	35,80	58,20	138	183
	t _s	0,22	0,26	0,32	0,45	0,54	0,61	0,76	0,92	1,17	1,80	2,07
16	J _{max}	–	–	–	2,00	2,94	3,69	5,79	8,45	13,73	32,50	43,30
	t _s	–	–	–	0,22	0,26	0,29	0,37	0,44	0,56	0,86	1,00
20	J _{max}	–	–	–	3,05	4,47	5,62	8,80	12,83	20,80	49,30	65,80
	t _s	–	–	–	0,22	0,26	0,29	0,37	0,44	0,56	0,86	1,00
24	J _{max}	–	–	–	3,67	5,37	6,75	10,56	15,40	25,00	59,20	78,90
	t _s	–	–	–	0,22	0,26	0,29	0,37	0,44	0,56	0,86	1,00
30	J _{max}	–	–	–	–	–	3,59	5,63	8,21	13,35	31,60	42,20
	t _s	–	–	–	–	–	0,19	0,24	0,29	0,37	0,57	0,65
36	J _{max}	–	–	–	–	–	4,32	6,76	9,89	16,03	37,90	50,60
	t _s	–	–	–	–	–	0,19	0,24	0,29	0,37	0,57	0,65

J = max admissible mass inertia loading (kgm²) t_s = cycle time (sec.) The time from signal "start" to message "indexer locked" is approx. 80 - 130 ms longer than the above cycle time, the exact time will depend on the motor, the speed of PLC and the optimization settings (see page 34). EF - control system for brake wear reduction recommended

Load data (for the stationary centre section)

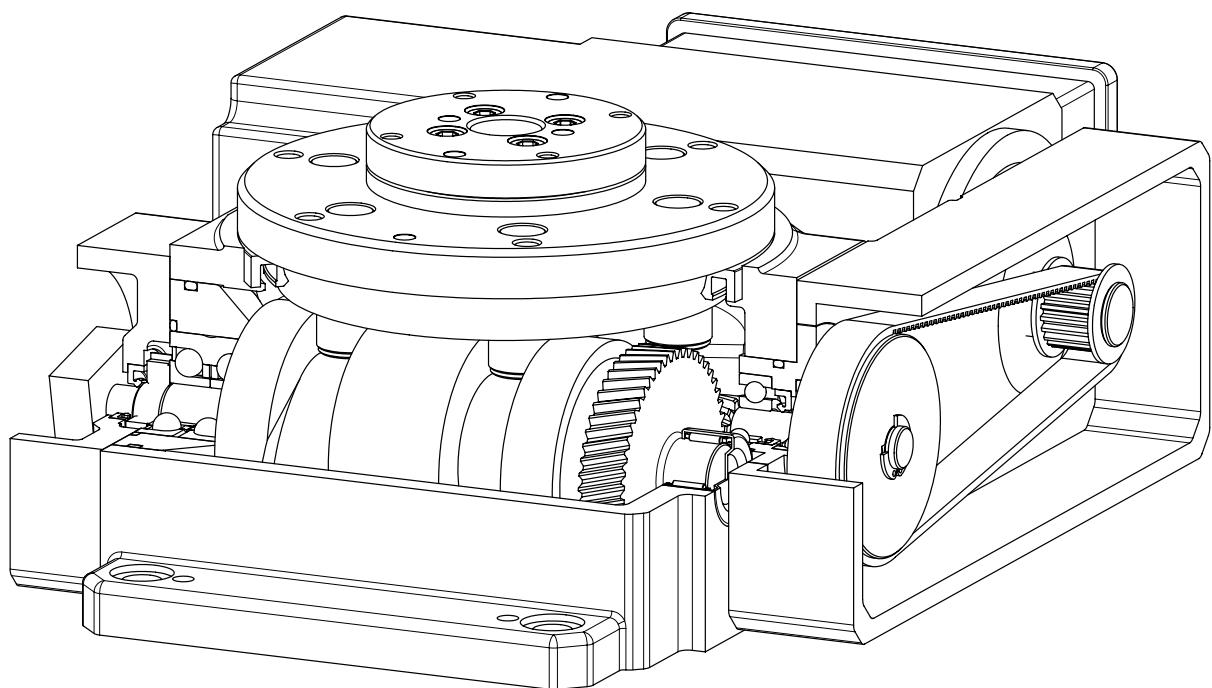
		
perm. tilting moment acting on the centre section 300 Nm	perm. force acting vertically on the centre section 5000 N	perm. tangential moment acting on the centre section 200 Nm
perm. radial force acting on the centre section 4000 N		

Load data (for the rotary indexing dial plate)

		
perm. tilting moment acting on the locked dial plate 700 Nm 2100 Nm*	perm. operating force (acting vertically on the locked dial plate within the normal Ø) 7500 N 22500 N*	perm. tangential moment acting on the locked dial plate 200 Nm
perm. radial force acting on the locked dial plate 8000 N		

TC 220T

Technology that inspires



TC 320T

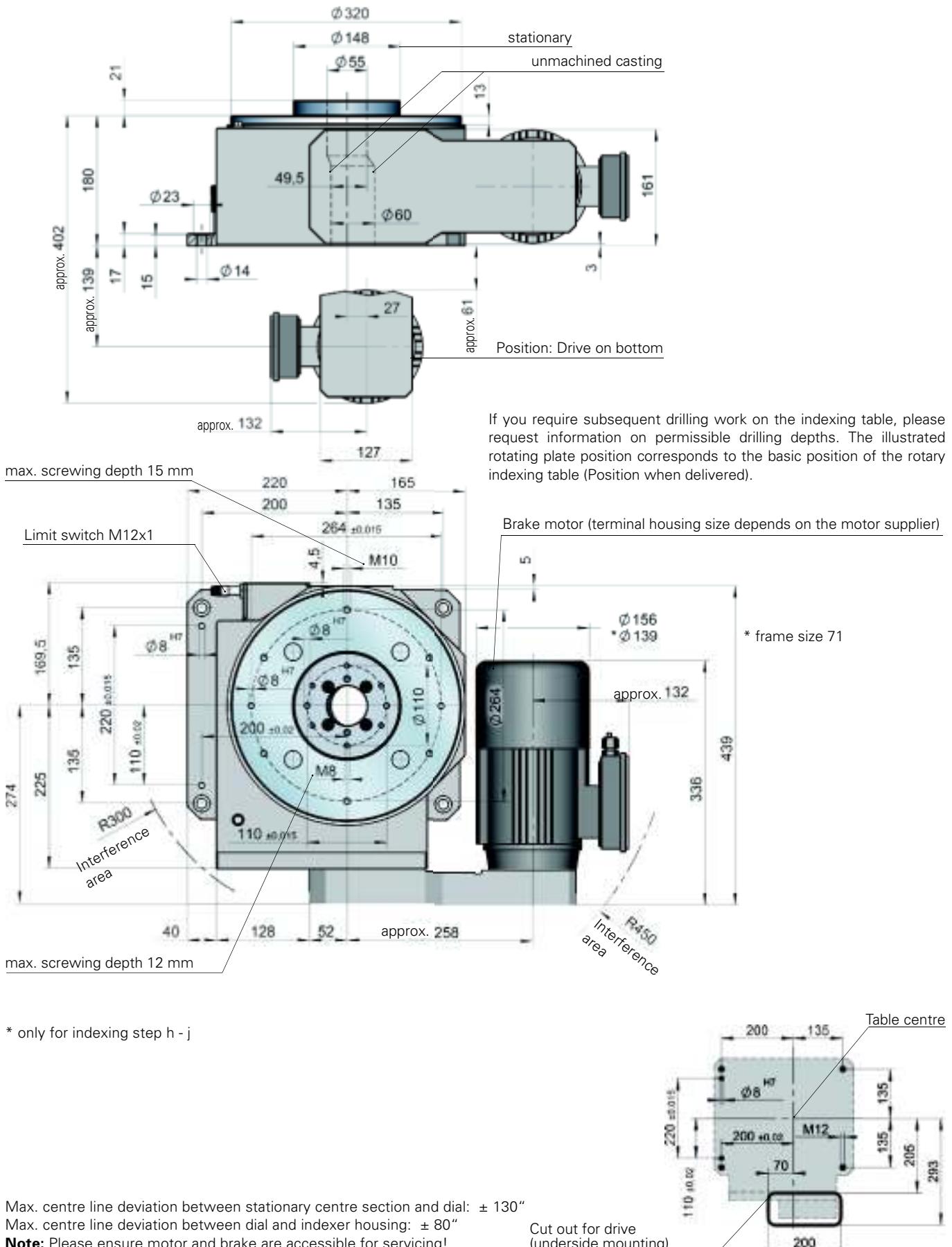


Technical data TC 320T

Tool plate diameter:	Recommended up to 1400 mm
Dial diameter:	320 mm
Direction of rotation:	Clockwise - counter clockwise or reciprocating
Indexings:	2, 3, 4, 6, 8, 10, 12, 16, 20, 24, 30, 36, special increments upon request
Cycle frequency:	Up to 200 cpm, depending on inertia loading and number of stops
Voltage:	230 / 400 V 50 Hz, special voltages upon request
Drive motor:	0.12 - 1.1 kW
Weight:	112 kg
Mounting position:	See page 39
Indexing precision:	Indexing 2-12: $\pm 20''$. Indexing 16-24: $\pm 30''$. Indexing 30-36: $\pm 35''$ (in degree seconds) Higher indexing precision upon request
Indexing precision in radian measurement:	(at Ø 320 mm) Indexing 2-12: ± 0.016 mm. Indexing 16-24: ± 0.023 mm. Indexing 30-36: ± 0.027 mm
Repeatability:	(at Ø 320 mm) 0.01 mm
Max. flatness of dial plate:	(at Ø 320 mm) 0.01 mm
Max. run out:	0.01 mm
Max. parallelism of rotating plate surface to bottom housing surface:	(at Ø 320 mm) 0.03 mm
tooling plate clearance hole:	Ø 150 mm (min)

TC 320T Dimensions

Technology that inspires



TC 320T

Load table (In the case of higher loads, please ask us for advice.)

Stage		a	b	c	d	e	f	g	h	i	j	k	l	m	n	
Indexing																
2	J _{max}	–	–	–	–	2,67	3,39	4,05	5,85	8,29	14,11	20,30	32,40	52,70	69,80	
	t _s	–	–	–	–	0,61	0,69	0,75	0,89	1,06	1,37	1,64	2,07	2,64	3,04	
3	J _{max}	–	–	–	3,30	4,10	5,19	6,17	8,88	12,53	21,30	30,60	48,70	79,20	105	
	t _s	–	–	–	0,54	0,61	0,69	0,75	0,89	1,06	1,37	1,64	2,07	2,64	3,04	
4	J _{max}	2,95	4,59	5,46	6,91	8,92	11,22	13,32	19,05	26,8	45,30	65,00	103	163	222	
	t _s	0,36	0,42	0,45	0,51	0,57	0,64	0,70	0,83	0,99	1,28	1,53	1,93	2,46	2,83	
6	J _{max}	6,89	9,49	11,25	14,16	18,23	22,90	27,10	38,70	54,40	91,80	132	209	340	450	
	t _s	0,36	0,42	0,45	0,51	0,57	0,64	0,70	0,83	0,99	1,28	1,53	1,93	2,46	2,83	
8	J _{max}	12,40	18,97	24,20	30,40	39,10	47,90	58,10	82,80	116	196	281	438	652	959	
	t _s	0,36	0,42	0,45	0,51	0,57	0,64	0,70	0,83	0,99	1,28	1,53	1,93	2,46	2,83	
10	J _{max}	17,19	22,80	27,00	33,90	43,60	54,60	64,70	92,10	129	218	313	497	807	1068	
	t _s	0,35	0,40	0,44	0,49	0,55	0,62	0,67	0,80	0,95	1,24	1,48	1,87	2,38	2,73	
12	J _{max}	20,70	27,40	32,40	40,70	52,30	65,60	77,60	111	155	262	375	597	969	1281	
	t _s	0,35	0,40	0,44	0,49	0,55	0,62	0,67	0,80	0,95	1,24	1,48	1,87	2,38	2,73	
16	J _{max}	–	–	–	8,15	10,52	13,23	15,69	22,40	31,50	53,30	76,50	122	198	261	
	t _s	–	–	–	0,22	0,25	0,28	0,30	0,36	0,42	0,55	0,66	0,83	1,06	1,21	
20	J _{max}	–	–	–	12,29	15,84	19,88	23,60	33,60	47,30	79,80	114	182	296	391	
	t _s	–	–	–	0,22	0,25	0,28	0,30	0,36	0,42	0,55	0,66	0,83	1,06	1,21	
24	J _{max}	–	–	–	–	17,24	21,60	25,60	36,60	51,40	86,80	124	198	322	425	
	t _s	–	–	–	–	0,25	0,28	0,30	0,36	0,42	0,55	0,66	0,83	1,06	1,21	
30	J _{max}	–	–	–	–	–	–	–	14,16	20,20	28,50	48,10	69,10	110	179	236
	t _s	–	–	–	–	–	–	–	0,20	0,24	0,28	0,37	0,44	0,55	0,70	0,81
36	J _{max}	–	–	–	–	–	–	–	17,03	24,30	34,20	57,80	82,90	132	214	283
	t _s	–	–	–	–	–	–	–	0,20	0,24	0,28	0,37	0,44	0,55	0,70	0,81

J = max admissible mass inertia loading (kgm²) t_s = cycle time (sec.) The time from signal "start" to message "indexer locked" is approx. 80 - 130 ms longer than the above cycle time, the exact time will depend on the motor, the speed of PLC and the optimization settings (see page 34). EF - control system for brake wear reduction recommended

Load data (for the stationary centre section)

	perm. tilting moment acting on the centre section	1800 Nm
	perm. force acting vertically on the centre section	18000 N
	perm. tangential moment acting on the centre section	800 Nm

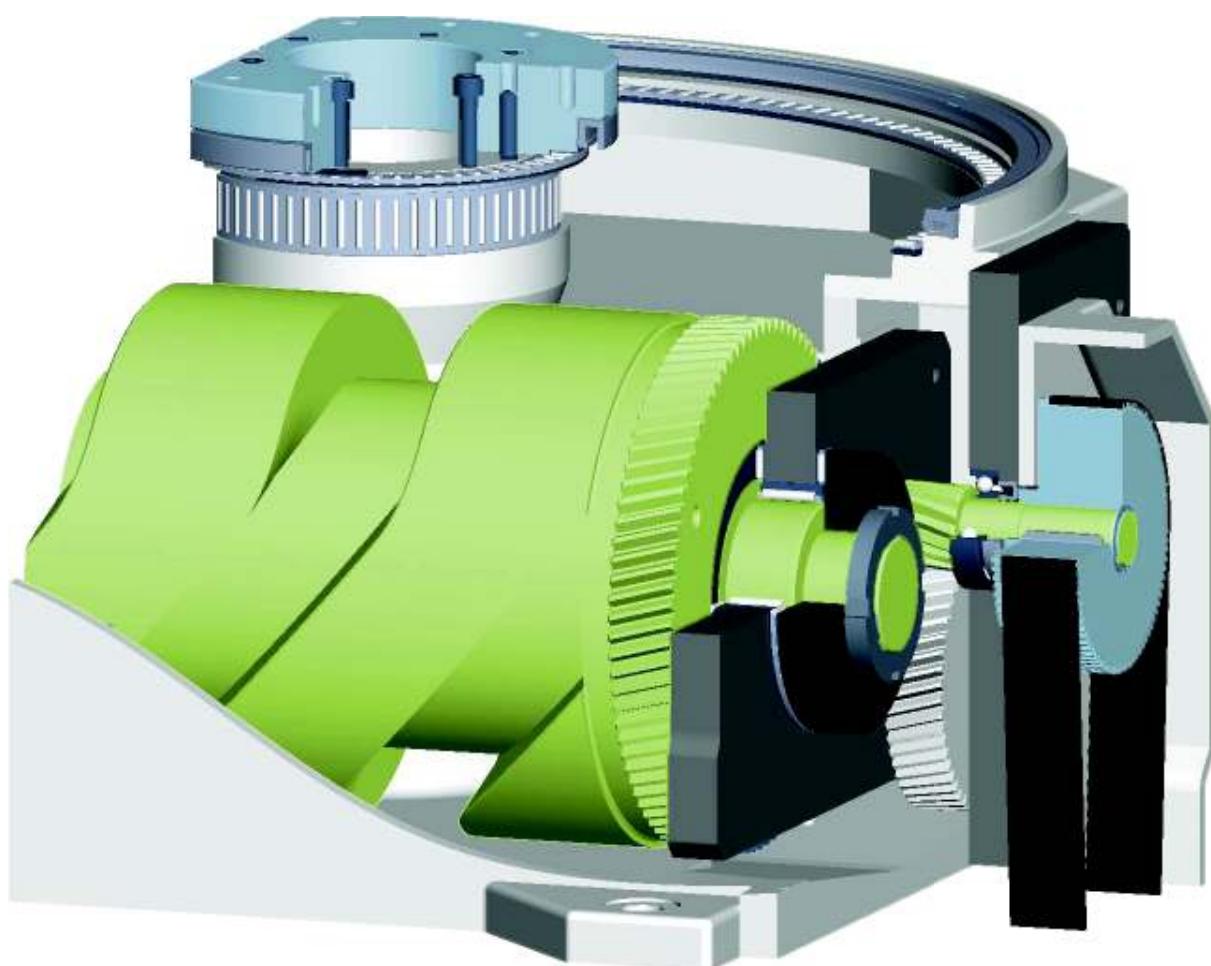
Load data (for the rotary indexing dial plate)

	perm. tilting moment acting on the locked dial plate	2250 Nm 6750 Nm*
	perm. radial force acting on the locked dial plate	15000 N

*strengthened version on demand

TC 320T Dimensions

Technology that inspires



TC 500T

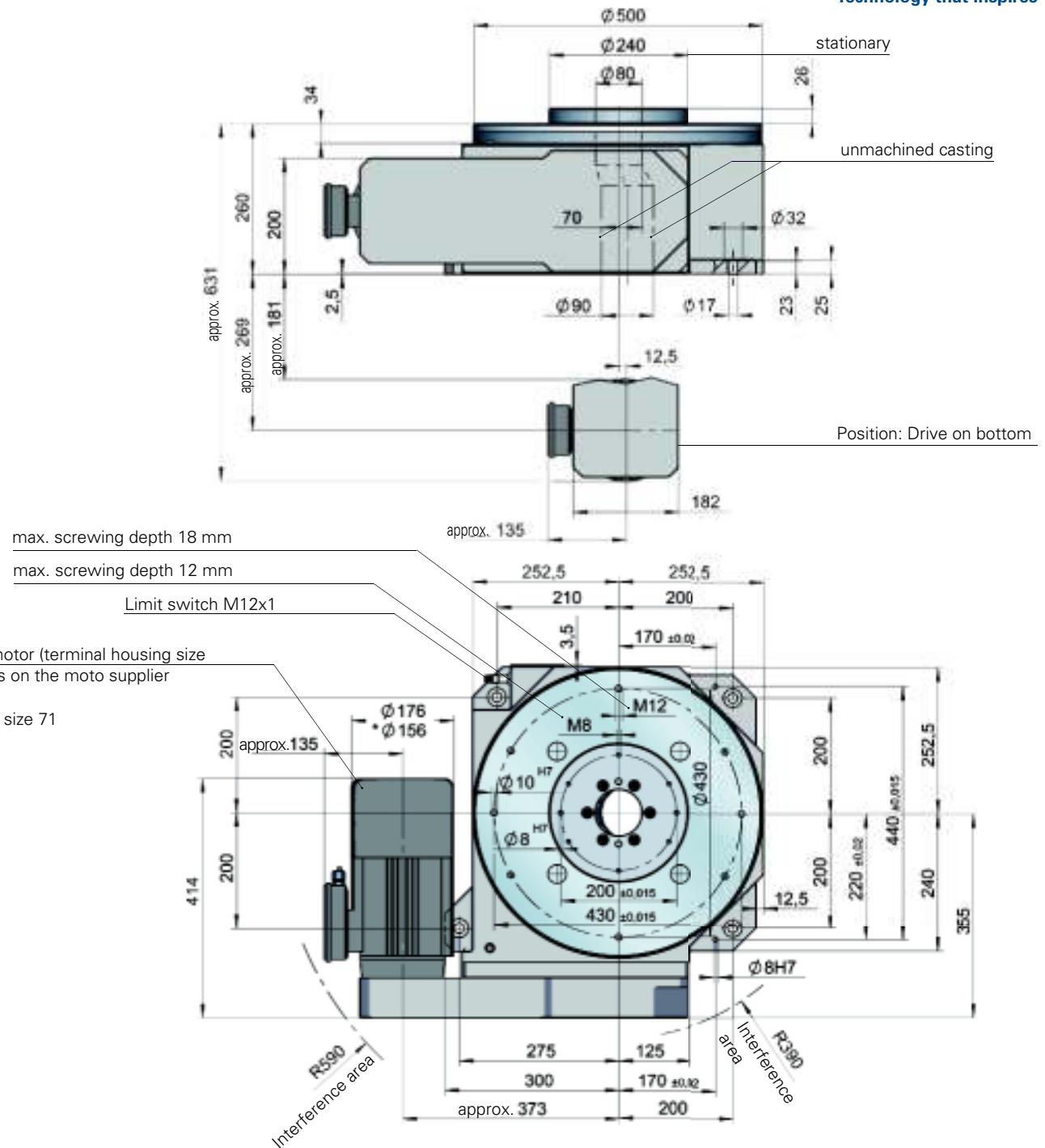


Technical data TC 500T

Tool plate diameter:	Recommended up to 2000 mm
Dial diameter:	500 mm
Direction of rotation:	Clockwise - counter clockwise or reciprocating
Indexings:	2, 3, 4, 6, 8, 10, 12, 16, 20, 24, 30, 36, 48, special increments upon request
Cycle frequency:	Up to 180 cpm, depending on inertia loading and number of stops
Voltage:	230 / 400 V 50 Hz, special voltages upon request
Drive motor:	0.15 - 2.2 kW
Weight:	305 kg
Mounting position:	See page 39
Indexing precision:	Indexing 2-12: $\pm 15''$. Indexing 16-48: $\pm 20''$ (in degree seconds) Higher indexing precision upon request
Indexing precision in radian measurement:	(at Ø 500 mm) Indexing 2-12: ± 0.018 mm. Indexing 16-48: ± 0.024 mm
Repeatability:	(at Ø 500 mm) 0.015 mm
Max. flatness of dial plate:	(at Ø 500 mm) 0.015 mm
Max. run out:	0.015 mm
Max. parallelism of rotating plate surface to bottom housing surface:	(at Ø 500 mm) 0.03 mm
tooling plate clearance hole:	Ø 242 mm (min)

TC 500T Dimensions

Technology that inspires



If you require subsequent drilling work on the indexing table, please request information on permissible drilling depths. The illustrated rotating plate position corresponds to the basic position of the rotary indexing table (Position when delivered).

Max. centre line deviation between stationary centre section and dial: $\pm 75''$
Max. centre line deviation between dial and indexer housing: $\pm 55''$

Note: Please ensure motor and brake are accessible for servicing!

TC 500T

Load table (In the case of higher loads, please ask us for advice.)

Stage		a	b	c	d	e	f	g	h	i	j	k	l	m	n
Indexing															
2	J _{max}	–	–	4,80	8,90	11,20	15,90	20,70	29,50	44,50	71,70	117	150	175	303
	t _s	–	–	0,68	0,79	0,87	1,02	1,16	1,36	1,66	2,10	2,67	3,02	3,26	4,28
3	J _{max}	–	–	7,80	10,90	13,70	19,30	25,00	35,50	53,50	86,00	141	180	210	363
	t _s	–	–	0,68	0,79	0,87	1,02	1,16	1,36	1,66	2,10	2,67	3,02	3,26	4,28
4	J _{max}	7,10	10,10	16,00	22,00	27,10	37,80	48,60	68,40	102	164	267	340	397	686
	t _s	0,43	0,50	0,61	0,71	0,79	0,92	1,04	1,23	1,50	1,89	2,41	2,72	2,93	3,85
6	J _{max}	14,70	22,20	33,80	46,00	56,30	77,90	99,70	140	208	332	540	689	804	1389
	t _s	0,43	0,50	0,61	0,71	0,79	0,92	1,04	1,23	1,50	1,89	2,41	2,72	2,93	3,85
8	J _{max}	34,20	47,40	71,30	96,40	118	162	207	290	431	687	1116	1423	1660	2866
	t _s	0,43	0,50	0,61	0,71	0,79	0,92	1,04	1,23	1,50	1,89	2,41	2,72	2,93	3,85
10	J _{max}	43,10	59,70	89,50	121	148	203	259	362	540	859	1395	1779	2075	3582
	t _s	0,43	0,50	0,61	0,71	0,79	0,92	1,04	1,23	1,50	1,89	2,41	2,72	2,93	3,85
12	J _{max}	52	71,90	108	145	177	244	312	435	648	1031	1674	2135	2490	4299
	t _s	0,43	0,50	0,61	0,71	0,79	0,92	1,04	1,23	1,50	1,89	2,41	2,72	2,93	3,85
16	J _{max}	–	–	19,80	27,20	33,50	46,50	59,70	83,90	125	200	326	416	486	839
	t _s	–	–	0,27	0,32	0,35	0,41	0,46	0,55	0,67	0,84	1,07	1,21	1,30	1,71
20	J _{max}	–	–	31,80	43,40	53,10	73,50	94,20	132	197	314	510	651	760	1312
	t _s	–	–	0,27	0,32	0,35	0,41	0,46	0,55	0,67	0,84	1,07	1,21	1,30	1,71
24	J _{max}	–	–	38,50	52,40	64,10	88,50	113	159	237	377	613	782	912	1575
	t _s	–	–	0,27	0,32	0,35	0,41	0,46	0,55	0,67	0,84	1,07	1,21	1,30	1,71
30	J _{max}	–	–	–	–	34,90	48,50	62,30	87,40	131	209	340	434	506	874
	t _s	–	–	–	–	0,23	0,27	0,31	0,36	0,44	0,56	0,71	0,80	0,87	1,14
36	J _{max}	–	–	–	–	34,20	47,60	61,10	85,80	128	205	333	425	496	858
	t _s	–	–	–	–	0,23	0,27	0,31	0,36	0,44	0,56	0,71	0,80	0,87	1,14
48	J _{max}	–	–	–	–	46,20	64,00	81,90	115	172	274	445	568	662	1144
	t _s	–	–	–	–	0,23	0,27	0,31	0,36	0,44	0,56	0,71	0,80	0,87	1,14

J = max admissible mass inertia loading (kgm²) t_s = cycle time (sec.) The time from signal "start" to message "indexer locked" is approx. 80 - 130 ms longer than the above cycle time, the exact time will depend on the motor, the speed of PLC and the optimization settings (see page 34). EF - control system for brake wear reduction recommended

Load data (for the stationary centre section)

	perm. tilting moment acting on the centre section	2500 Nm
	perm. force acting vertically on the centre section	25000 N
	perm. tangential moment acting on the centre section	1100 Nm

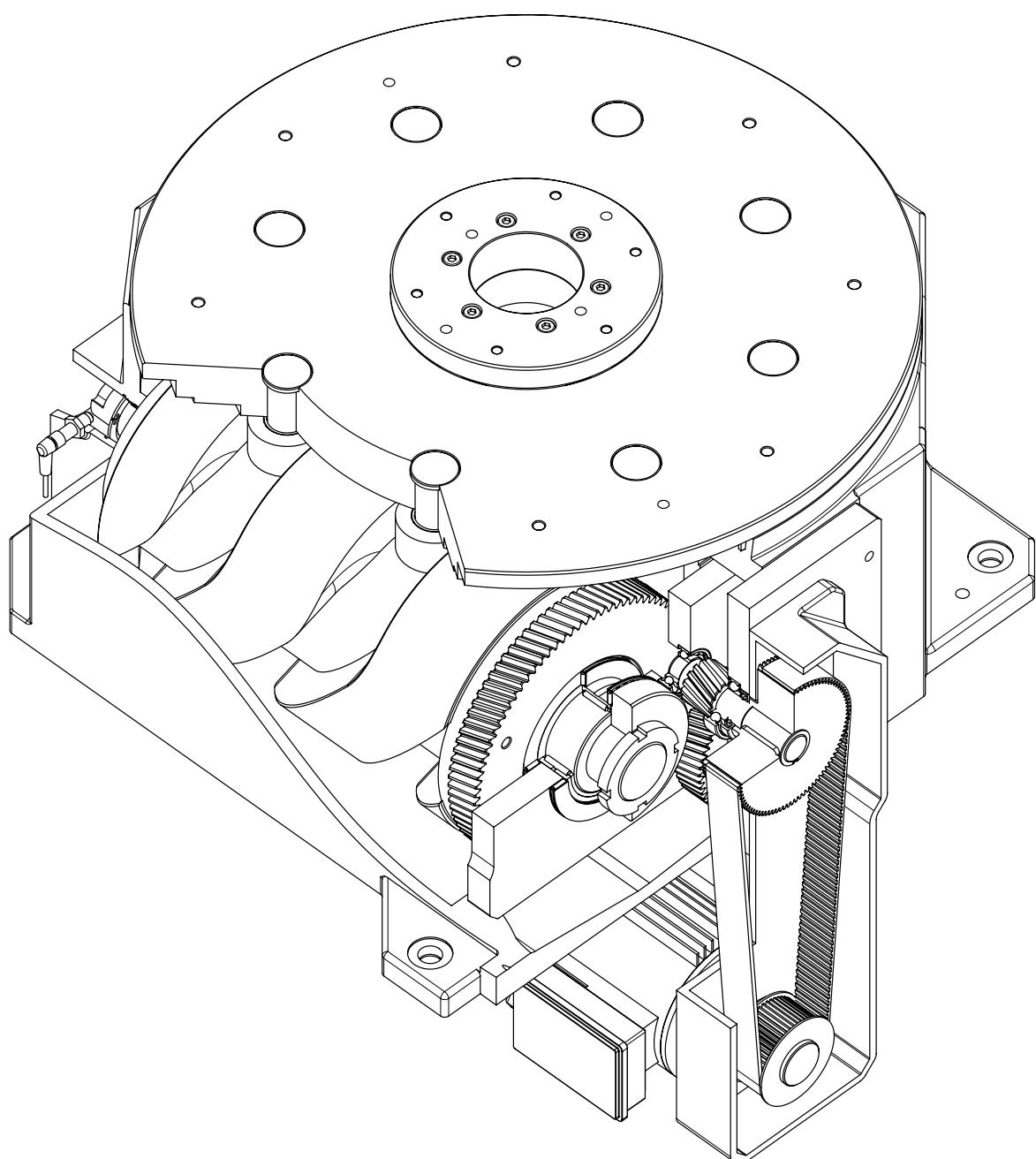
Load data (for the rotary indexing dial plate)

	perm. tilting moment acting on the locked dial plate	6000 Nm 18000 Nm*
	perm. radial force acting on the locked dial plate	25000 N

*strengthened version on demand

TC 500T

Technology that inspires



TC 700T

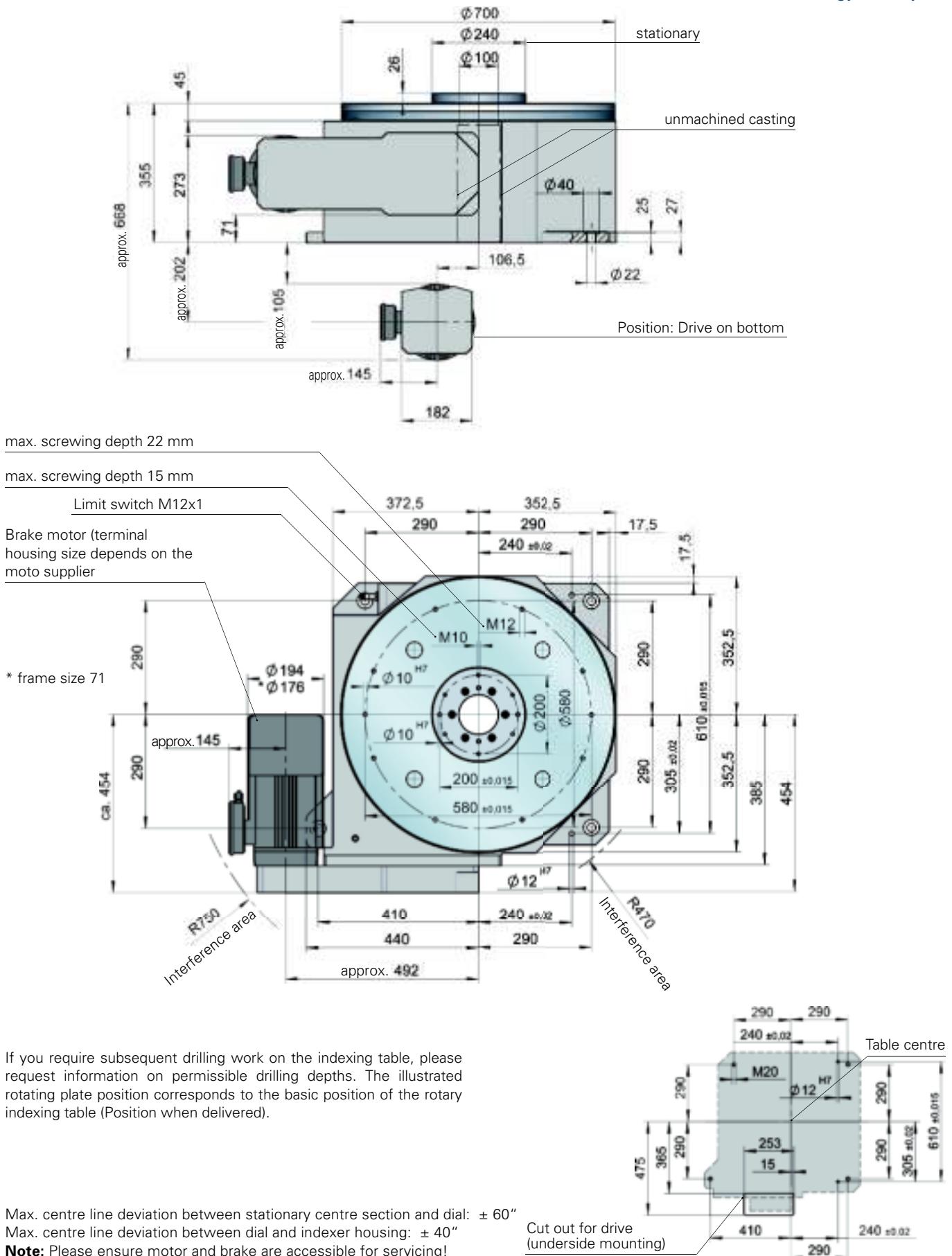


Technical data TC 700T

Tool plate diameter:	Recommended up to 3000 mm
Dial diameter:	700 mm
Direction of rotation:	Clockwise - counter clockwise or reciprocating
Indexings:	2, 3, 4, 6, 8, 10, 12, 16, 20, 24, 30, 36, 48, 60, special increments upon request
Cycle frequency:	Up to 120 cpm, depending on inertia loading and number of stops
Voltage:	230 / 400 V 50 Hz, special voltages upon request
Drive motor:	0.37 - 3 kW, frame size 80/90/100
Weight:	660 kg
Mounting position:	See page 39
Indexing precision:	Indexing 2-12: $\pm 12''$. Indexing 16-60: $\pm 16''$ (in degree seconds) Higher indexing precision upon request
Indexing precision in radian measurement:	(at Ø 700 mm) Indexing 2-12: ± 0.021 mm. Indexing 16-60: ± 0.027 mm
Repeatability:	(at Ø 700 mm) 0.015 mm
Max. flatness of dial plate:	(at Ø 700 mm) 0.015 mm
Max. run out:	0.015 mm
Max. parallelism of rotating plate surface to bottom housing surface:	(at Ø 700 mm) 0.03 mm
tooling plate clearance hole:	Ø 242 mm (min)

TC 700T Dimensions

Technology that inspires



TC 700T

Load table (In the case of higher loads, please ask us for advice.)

Stage	s	a	b	c	d	e	f	g	h	i	j	k	l	
Indexing														
2	J _{max}	-	9	19	35	50	87	118	162	248	394	644	972	1683
	t _s	-	0,69	0,81	0,98	1,14	1,46	1,69	1,96	2,40	3,01	3,84	4,70	6,18
3	J _{max}	-	24	36	56	79	134	181	247	375	595	970	1461	2528
	t _s	-	0,69	0,81	0,98	1,14	1,46	1,69	1,96	2,40	3,01	3,84	4,70	6,18
4	J _{max}	20	36	62	115	163	268	361	489	739	1167	1862	2858	4938
	t _s	0,53	0,62	0,73	0,88	1,03	1,31	1,52	1,76	2,16	2,71	3,45	4,23	5,56
6	J _{max}	53	90	149	233	324	532	713	964	1453	2290	3722	5596	9664
	t _s	0,53	0,62	0,73	0,88	1,03	1,31	1,52	1,76	2,16	2,71	3,45	4,23	5,56
8	J _{max}	101	166	270	484	684	1118	1496	2020	3039	4786	7469	11682	20167
	t _s	0,53	0,62	0,73	0,88	1,03	1,31	1,52	1,76	2,16	2,71	3,45	4,23	5,56
10	J _{max}	161	263	412	606	838	1367	1829	2469	3714	5848	9496	14272	24638
	t _s	0,53	0,62	0,73	0,88	1,03	1,31	1,52	1,76	2,16	2,71	3,45	4,23	5,56
12	J _{max}	236	360	496	729	1007	1642	2196	2964	4458	7019	11396	17128	29567
	t _s	0,53	0,62	0,73	0,88	1,03	1,31	1,52	1,76	2,16	2,71	3,45	4,23	5,56
16	J _{max}	-	-	-	-	195	323	433	587	886	1398	2274	3420	5908
	t _s	-	-	-	-	0,46	0,58	0,67	0,78	0,96	1,20	1,53	1,88	2,47
20	J _{max}	-	-	-	-	302	496	666	900	1356	2139	3476	5226	9026
	t _s	-	-	-	-	0,46	0,58	0,67	0,78	0,96	1,20	1,53	1,88	2,47
24	J _{max}	-	-	-	-	364	597	800	1082	1629	2568	4172	6273	10832
	t _s	-	-	-	-	0,46	0,58	0,67	0,78	0,96	1,20	1,53	1,88	2,47
30	J _{max}	-	-	-	-	-	179	241	328	497	786	1280	1927	3332
	t _s	-	-	-	-	-	0,39	0,45	0,52	0,64	0,80	1,02	1,25	1,65
36	J _{max}	-	-	-	-	-	216	291	395	598	945	1538	2314	4000
	t _s	-	-	-	-	-	0,39	0,45	0,52	0,64	0,80	1,02	1,25	1,65
48	J _{max}	-	-	-	-	-	291	391	529	799	1262	2053	3088	5336
	t _s	-	-	-	-	-	0,39	0,45	0,52	0,64	0,80	1,02	1,25	1,65
60	J _{max}	-	-	-	-	-	250	337	457	690	1090	1774	2670	4613
	t _s	-	-	-	-	-	0,39	0,45	0,52	0,64	0,80	1,02	1,25	1,65

J = max admissible mass inertia loading (kgm²) t_s = cycle time (sec.) The time from signal "start" to message "indexer locked" is approx. 80 - 130 ms longer than the above cycle time, the exact time will depend on the motor, the speed of PLC and the optimization settings (see page 34). EF - control system for brake wear reduction recommended

Load data (for the stationary centre section)

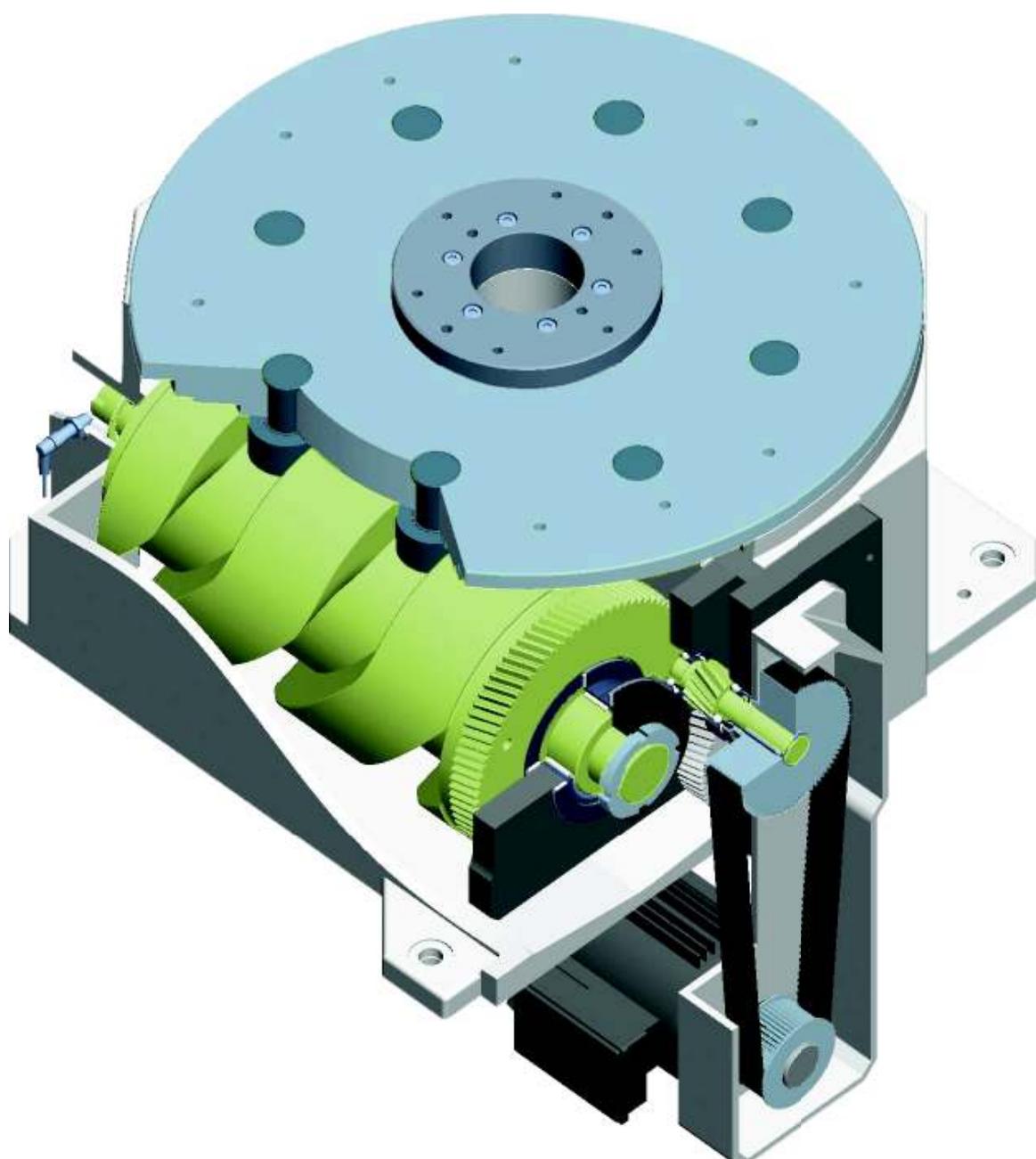
	perm. tilting moment acting on the centre section 3000 Nm 5000 Nm*		perm. force acting vertically on the centre section 30000 N 40000 N*		perm. tangential moment acting on the centre section 1400 Nm
perm. radial force acting on the centre section 17000 N					

Load data (for the rotary indexing dial plate)

	perm. tilting moment acting on the locked dial plate 10000 Nm 30000 Nm*		perm. operating force (acting vertically on the locked dial plate within the normal Ø) 40000 N 120000 N*		perm. tangential moment acting on the locked dial plate 1700 Nm
perm. radial force acting on the locked dial plate 30000 N					*strengthened version on demand

TC 700T

Technology that inspires



TC 1000T

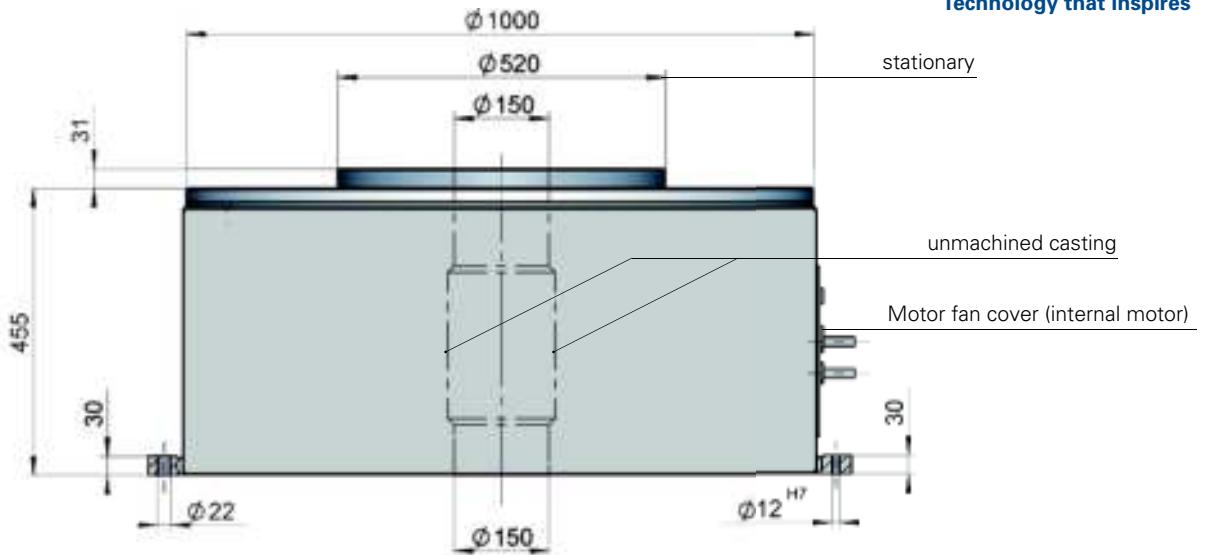


Technical data TC 1000T

Tool plate diameter:	Recommended up to 5000 mm
Dial diameter:	1000 mm
Direction of rotation:	Clockwise - counter clockwise or reciprocating
Indexings:	2, 3, 4, 6, 8, 10, 12, 16, 20, 24, 32, special increments upon request
Cycle frequency:	Up to 60 cpm, depending on inertia loading and number of stops
Voltage:	230 / 400 V 50 Hz, special voltages upon request
Drive motor:	0.55 - 3.0 kW, frame size 90
Weight:	1530 kg
Mounting position:	See page 39
Indexing precision:	Indexing 2-20: $\pm 12''$. Indexing 24-32: $\pm 16''$ (in degree seconds) Higher indexing precision upon request
Indexing precision in radian measurement:	(at Ø 1000 mm) Indexing 2-20: ± 0.029 mm. Indexing 24-32: ± 0.039 mm
Repeatability:	(at Ø 1000 mm) 0.03 mm
Max. flatness of dial plate:	(at Ø 1000 mm) 0.03 mm
Max. run out:	0.03 mm
Max. parallelism of rotating plate surface to bottom housing surface:	(at Ø 1000 mm) 0.05 mm
tooling plate clearance hole:	Ø 522 mm (min)

TC 1000T Dimensions

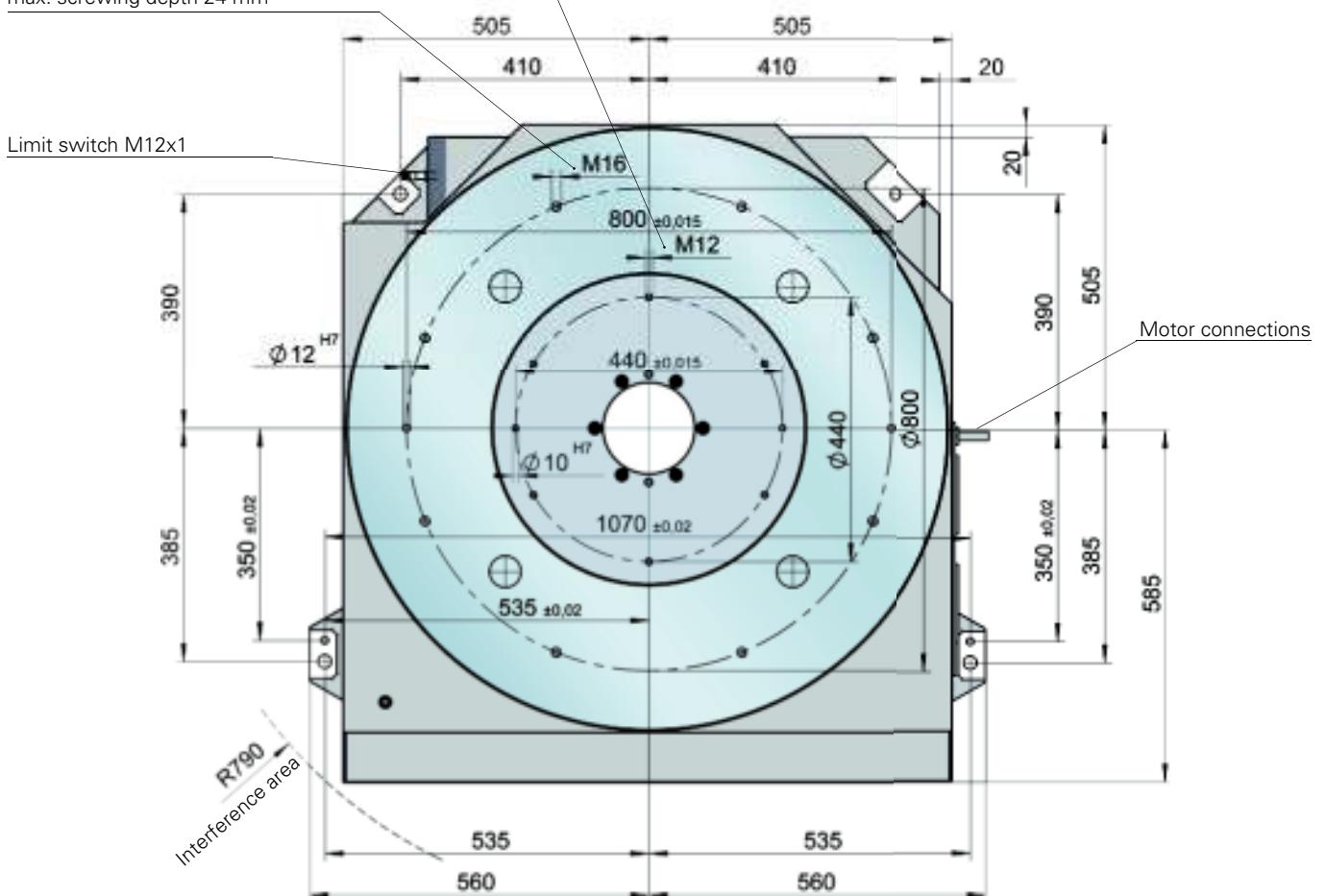
Technology that inspires



max. screwing depth 15 mm

If you require subsequent drilling work on the indexing table, please request information on permissible drilling depths. The illustrated rotating plate position corresponds to the basic position of the rotary indexing table (Position when delivered).

max. screwing depth 24 mm



Centre line deviation between stationary centre section and dial plate: $\pm 45''$

Centre line deviation between dial plate and indexer housing: $\pm 35''$

Note: Please ensure motor and brake are accessible for servicing!

TC 1000T

Load table (In the case of higher loads, please ask us for advice.)

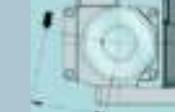
Stage		a	b	c	d	e	f	g	h	i
Indexing										
2	J _{max}	108	164	291	557	857	1327	2251	3403	10360
	t _s	1,28	1,50	1,92	2,57	3,15	3,96	5,04	6,18	10,74
3	J _{max}	182	266	457	856	1306	2077	3397	5124	15560
	t _s	1,28	1,50	1,92	2,57	3,15	3,96	5,04	6,18	10,74
4	J _{max}	406	574	958	1758	2662	4211	6860	10328	31280
	t _s	1,15	1,35	1,73	2,32	2,84	3,56	4,54	5,56	9,67
6	J _{max}	807	1126	1857	3377	5094	8039	13072	19661	55323
	t _s	1,15	1,35	1,73	2,32	2,84	3,56	4,54	5,56	9,67
8	J _{max}	1710	2369	3878	7018	10565	16647	27043	40656	122900
	t _s	1,15	1,35	1,73	2,32	2,84	3,56	4,54	5,56	9,67
10	J _v	2147	2971	4858	8782	13217	20819	33814	50829	153635
	t _s	1,15	1,35	1,73	2,32	2,84	3,56	4,54	5,56	9,67
12	J _{max}	2585	3573	5838	10547	15868	24991	40585	61003	184370
	t _s	1,15	1,35	1,73	2,32	2,84	3,56	4,54	5,56	9,67
16	J _{max}	3459	4778	7797	14076	21170	33334	54127	81351	245840
	t _s	1,15	1,35	1,73	2,32	2,84	3,56	4,54	5,56	9,67
20	J _{max}	601	843	1396	2547	3847	6076	9887	14876	45022
	t _s	0,51	0,60	0,77	1,03	1,26	1,58	2,02	2,47	4,30
24	J _{max}	730	1020	1683	3064	4625	7300	11861	17859	54034
	t _s	0,51	0,60	0,77	1,03	1,26	1,58	2,02	2,47	4,30
32	J _{max}	986	1373	2258	4099	6179	9746	15843	23826	72058
	t _s	0,51	0,60	0,77	1,03	1,26	1,58	2,02	2,47	4,30
36	J _{max}	—	—	1109	2030	3070	4853	7894	11893	36009
	t _s	—	—	0,51	0,69	0,84	1,06	1,34	1,65	2,86
72	J _{max}	—	—	847	1557	2360	3737	6090	9171	27785
	t _s	—	—	0,51	0,69	0,84	1,06	1,34	1,65	2,86

J = max admissible mass inertia loading (kgm²) t_s = cycle time (sec.) The time from signal "start" to message "indexer locked" is approx. 80 - 130 ms longer than the above cycle time, the exact time will depend on the motor, the speed of PLC and the optimization settings (see page 34). EF - control system for brake wear reduction recommended

Load data (for the stationary centre section)

		
perm. tilting moment acting on the centre section 5000 Nm	perm. force acting vertically on the centre section 40000 N	perm. tangential moment acting on the centre section 1800 Nm
perm. radial force acting on the centre section 17000 N		

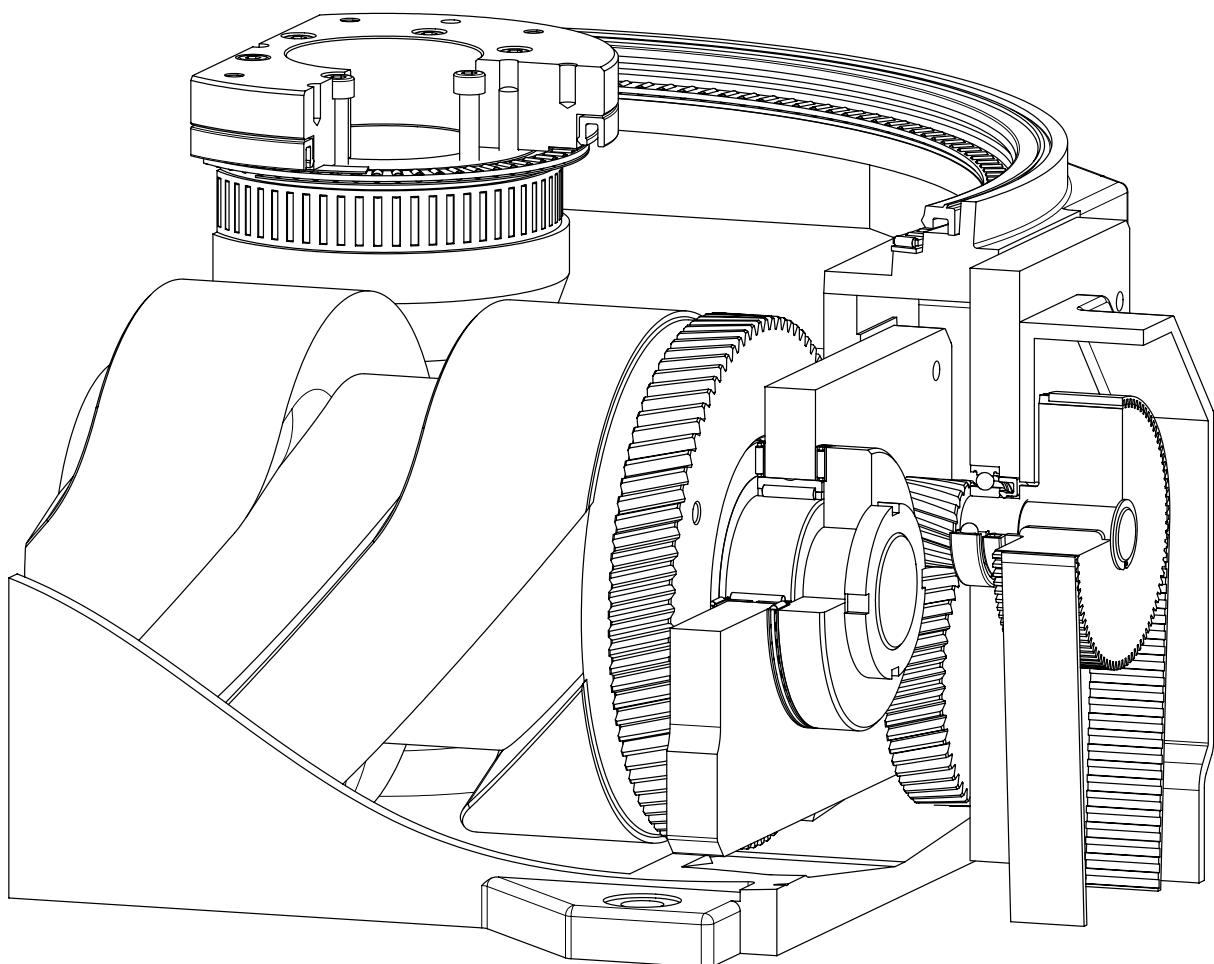
Load data (for the rotary indexing dial plate)

		
perm. tilting moment acting on the locked dial plate 13000 Nm 39000 Nm*	perm. operating force (acting vertically on the locked dial plate within the normal Ø) 80000 N 240000 N*	perm. tangential moment acting on the locked dial plate 2200 Nm
perm. radial force acting on the locked dial plate 45000 N		

*strengthened version on demand

TC 1000T

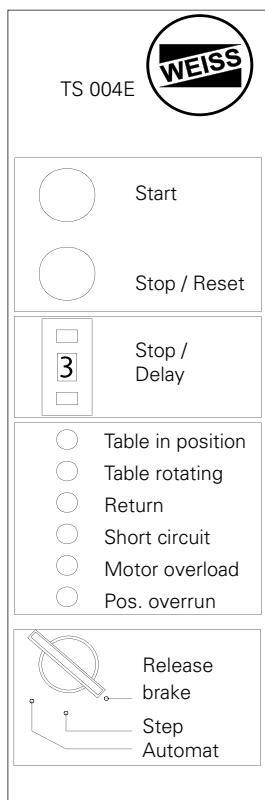
Technology that inspires



Control card TS 004E

Advantages

- User friendly push buttons on front panel.
- Easy to optimize the cycle time of the indexer.
- Various monitor functions help to avoid crashes.
- 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



Tests

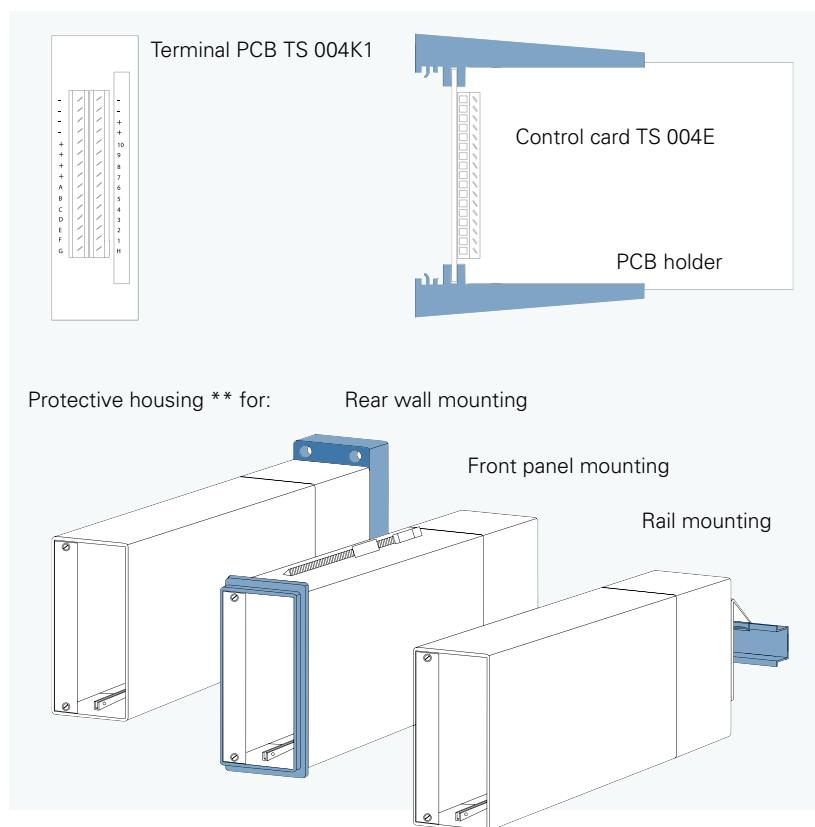
- Interference emissions:
 - EN 5008 1-1
- Interference resistance:
 - EN 50082-2
- Requirements in accordance with EC directive for electromagnetic compatibility (EMC) 89/336/EEC

Installation options

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

Dimensions (L x W x H)

- Control card:
 - Eurocard 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



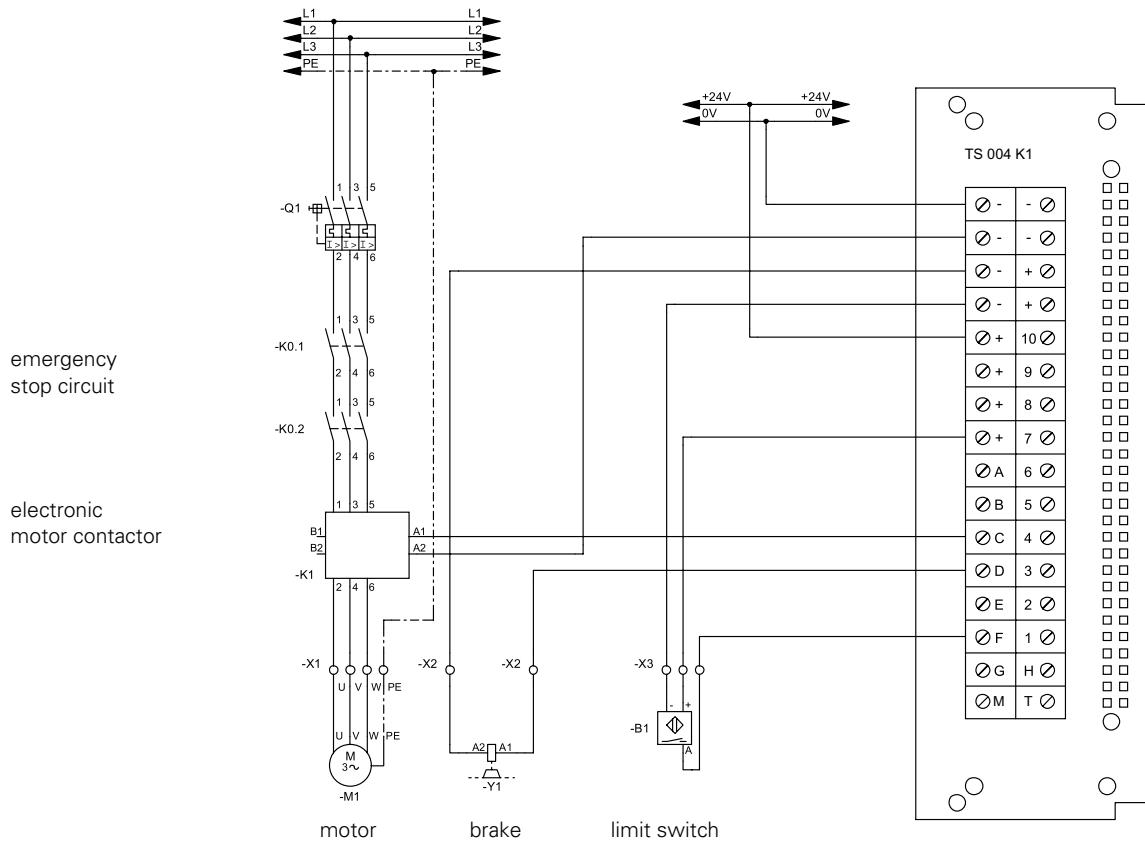
* Note on switching times

The actual measured rotation time (from the start signal to the electrical in-position signal) comprises the calculated rotation motion time given in the tables and type-related delays. An important factor are electrical signal processing times, input filters, mechanical motor idle times and also the setting and optimization of the ideal starting position (please refer to the TC-T operating instructions).

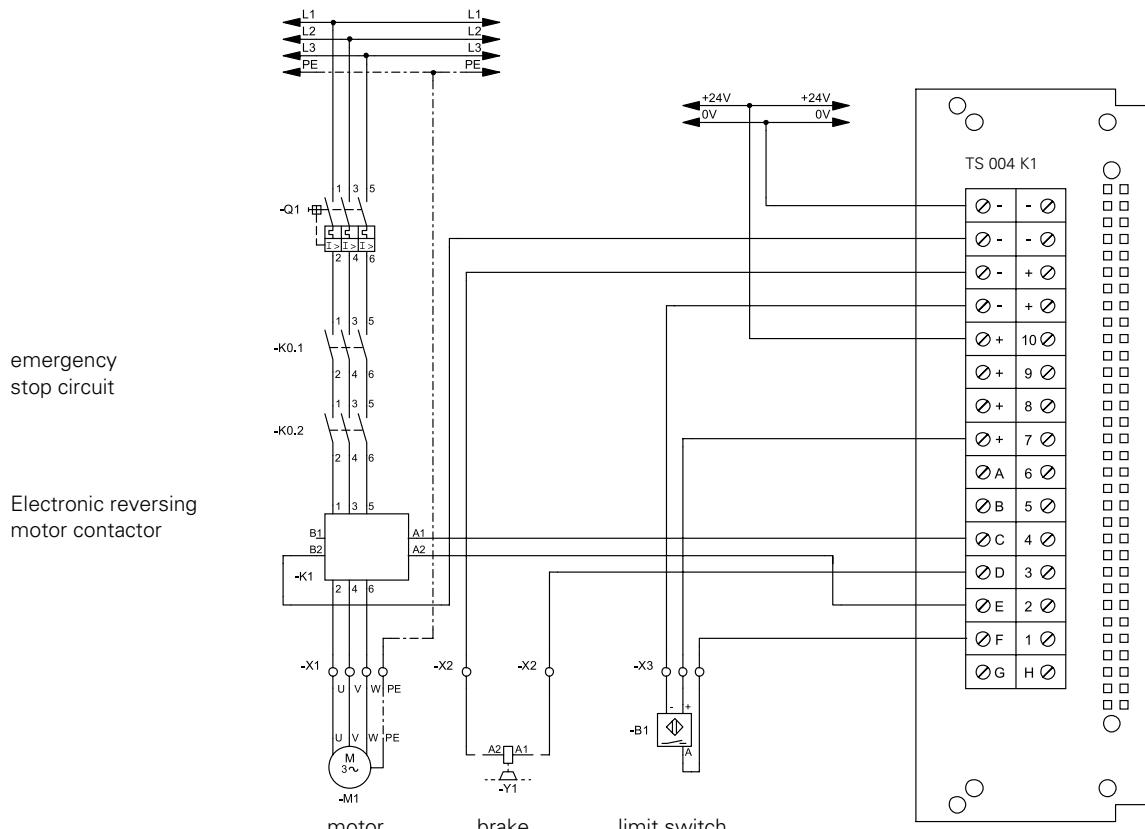
Circuit diagram TS 004E

Brake motor (normal operation)

Technology that inspires



Brake motor (reciprocating operation)



Control card EF xxx-x

Advantages

The controller EF combines the advantages of the TS 004 E with additional features of a modern frequency inverter.

- Soft restart after e-stop because of reducing the starting momentum (refer to page 5 - reason 4)
- Reduced speed during start up
- Variable acceleration and deceleration ramps
- No brake wear and tear, brake is activated in e-stop only
- Fine adjustment of index speed up to 50 Hz
- Allows single-phase 230 VAC operation up to 0.25 KW motor power
- The frequency inverter is preprogrammed
- Operation menus in various languages
- Shortest start up
- Motor protection through cycle time monitoring
- Monitoring of operational data
- Allows failure analysis by telephone
- No motor contactor necessary

Tests

- Interference emissions:
 - EN 55011 (radio disturbance characteristics) from 1991
 - Requirements in accordance with EN 50081-2 from 1993
 - Limit value class A in accordance with EN 55011
- Interference resistance:
 - ENV 50140 radio disturbance immunity from 8/93
 - ENV 50141 conducted disturbances induced by radio-frequency fields from 8/93
 - EN 61000-4-2 ESD from 1996
 - EN 61000-4-4 BURST from 1996
 - EN 61000-4-11 voltage variations from 1995
(limit values and requirements in accordance with EN 50082-2 from 1995)
- Insulation resistance:
Over-voltage category III in accordance with VDE 0110
- Type de protection: IP20
- UL listed



Installation dimensions and weights

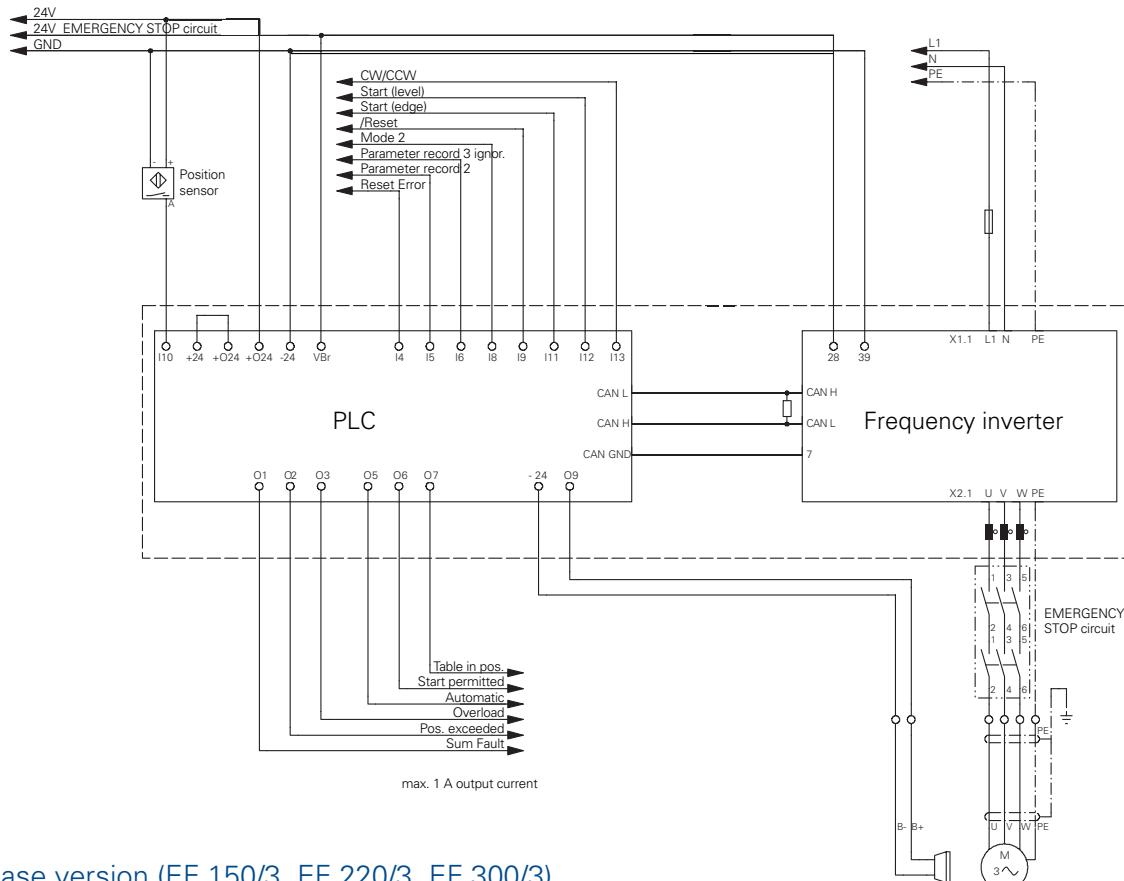
(The devices are supplied on a mounting plate)

Model	EF 037/1-1.0	EF 150/3-1.0	EF 220/3-1.0	EF 300/3-1.0
Width:	160 mm	160 mm	160 mm	200 mm
Length:	250 mm	330 mm	330 mm	345 mm
Depth:	180 mm	180 mm	180 mm	180 mm
Weight:	2.15 kg	3.25 kg	3.25 kg	4.4 kg

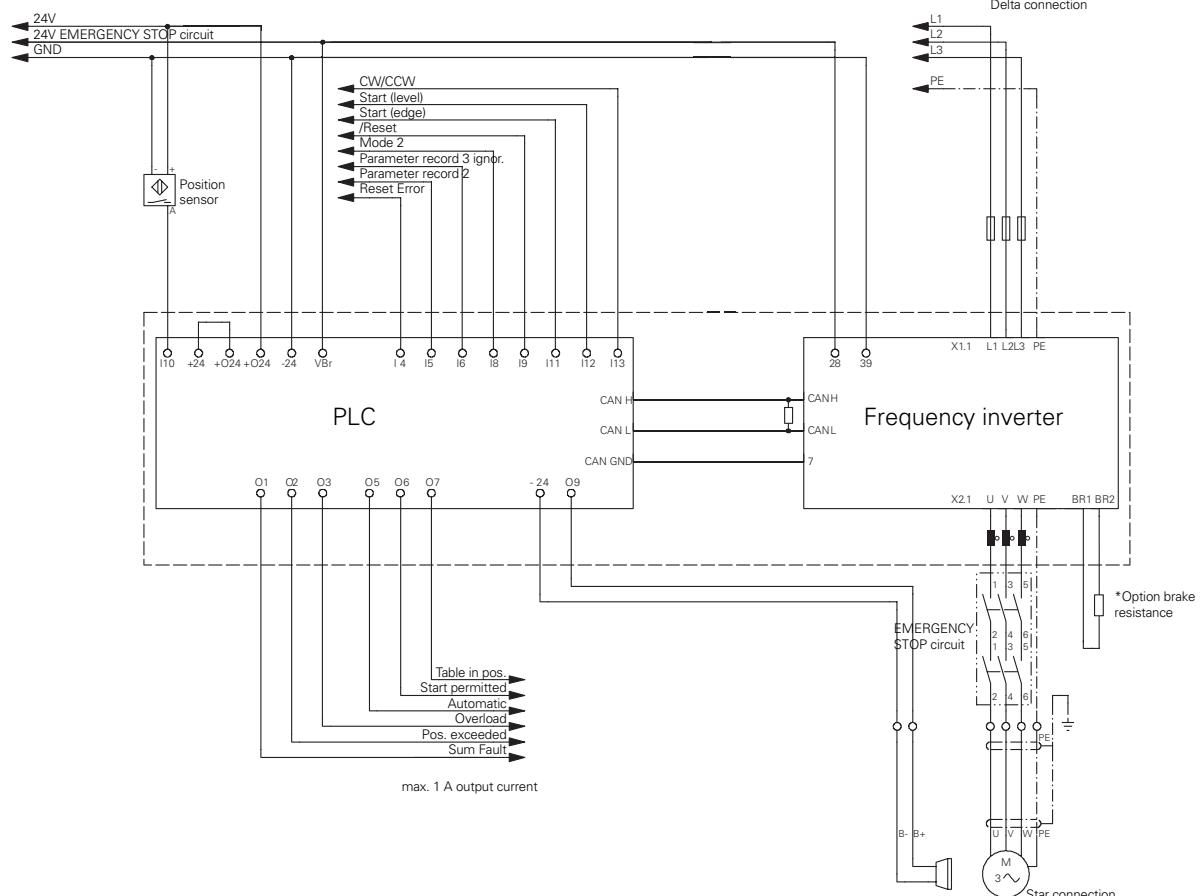
Circuit diagram EF xxx-x

Single phase version (EF 037/1)

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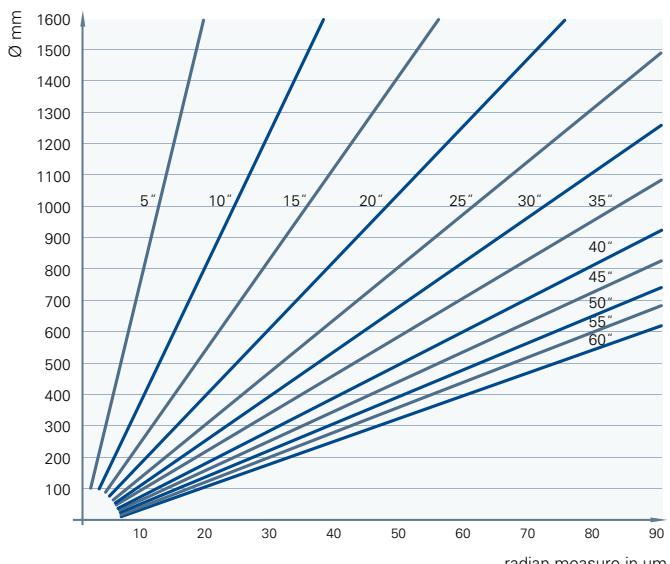


Three-phase version (EF 150/3, EF 220/3, EF 300/3)



Calculation

Indexing precision as a factor of Ø



$$\text{Nominal indexing precision} = \pm \frac{\pi \times D \times T_g}{360 \times 3600}$$

D = Pitch circle diameter

T_g = Brochure precision

If we machine your additional tooling plate, $\pm 3''$ needs to be added to the above value, in order to determine the precise indexing accuracy.

Additional indexing plates

We manufacture additional steel or aluminium indexing plates according to your specification.

The material AlMg4.5F28 is aged for at least 3 months before it is used in production.

Upon request, aluminium plates can be anodized (natural) and steel plates can be nickel plated or finished in colour brown.

For detailed information on additional plates, please refer to our "Electromechanical Indexing Machine Bases" brochure.

Accuracy of circular run out for additional plates

Diameter (mm)	Thickness (mm)	Flatness Quality A (mm)	Flatness Quality B (mm)
≤ 600	≥ 20	0.04	0.10
	< 20	0.06	0.15
≤ 800	≥ 20	0.06	0.15
	< 20	0.07	0.18
≤ 1100	≥ 20	0.07	0.18
	< 20	0.08	0.20
≤ 1400	≥ 25	0.08	0.20
	< 25	0.10	0.25
≤ 1800	≥ 25	0.10	0.25
	< 25	0.20	0.50
≤ 2500	≥ 30	0.15	0.40
	< 30	0.25	0.55



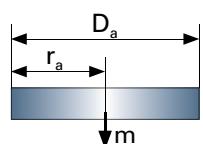
Calculation of the mass inertia momentum

Solid body:

$$J = 0.5 \times r_a^2 \times m_a$$

or

$$J = 0.125 \times m_a \times D_a^2$$



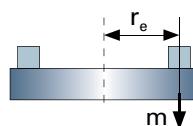
r_a = radius in m

m_a = mass (weight) in kg

D_a = diameter in m

Individual weights (approximation formula):

$$J = 1.1 \times r_e^2 \times m_e \times n$$



r_e = radius in m

m_e = mass (weight) in kg

n = number of fixtures

Machine Dimensioning TC

Request Enclosure of order

Technology that inspires

Dear Customer,

Thank you for your interest in our TC rotary indexing tables. To ensure we supply the correct unit for your application, we kindly ask you to answer the following questions:

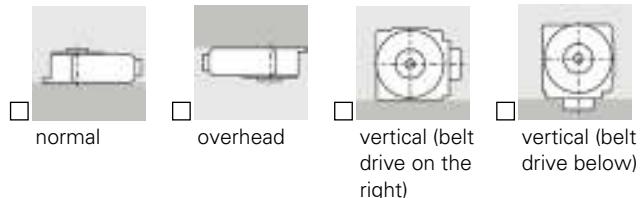
Model

- | | |
|--------------------------------------------------------|-----------------------------------|
| <input type="checkbox"/> TC 120G | <input type="checkbox"/> TC 320T |
| <input type="checkbox"/> TC 150T | <input type="checkbox"/> TC 500T |
| <input type="checkbox"/> TC 220T | <input type="checkbox"/> TC 700T |
| <input type="checkbox"/> TC 220T
with motor size 71 | <input type="checkbox"/> TC 1000T |
| No. of stations _____ | |

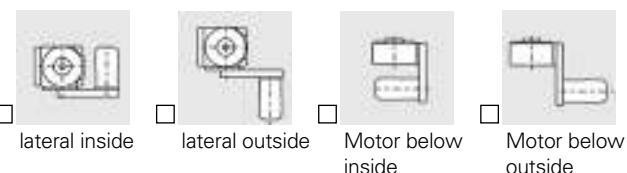
Standard colour

- RAL 7035 (light grey)
 Special colour RAL _____ (extra charge)

Permissible installation positions



Position of the drive motor



Calculation of the mass total mass inertia momentum

The following specifications of the tooling plate are extremely important to establish the shortest possible indexing time of your TC table (calculation according to the formula on page 38):

Additional indexing plate

- Included in offer and delivery Do not supply
Diameter: _____ mm Thickness: _____ mm
Material Al St other

Based on the calculated mass inertia, do you want:

- the shortest possible indexing time

Workpiece and fixture:

- No. of stations: _____
Weight per station _____ kg
Centre of gravity diameter: _____ mm

- a longer indexing time of approx. _____ sec

Electrical data

- Index frequency: _____ Cycles / min*
(at an indexing frequency of more than 50/min we recommend the use of the EF control card)

Drive Motor

- Connection voltage x 400 V / 50 Hz (Standard)
 other: _____ V / _____ Hz

Brake

- Brake voltage 24 V = (recommended)
 other: _____ V

It is recommended to drive the motor with an electronic contactor!

- Electronic contractor
(not necessary with controller EF)
 Electronic reversing contactor
(not necessary with controller EF)

Control

- Controller EF** (frequency inverter)
(included in delivery of TC 700T and TC 1000T)

WEISS Control card TS 004 E

- Terminal PCB for 19" rack
 PCB card holder
 Protective housing for:
 Rear wall mounting
 Front panel mounting
 Rail mounting
 Front door, lockable and transparent
Front panel language for WEISS Control card TS 004 E
 German Italian English
 French Dutch Czech

For technical enquiries

Company: _____

Desired delivery date: _____

Name: _____

Phone: _____ Fax: _____

Department: _____

eMail: _____



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Rotary Indexing Tables TC



Rotary Indexing Rings TR/NR



Numeric Controlled Heavy Duty Indexing Ring CR



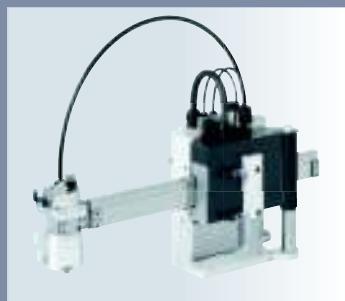
Numeric Controlled Indexing Tables NC



Torque Motor TO Compact model



Torque Motor TO Ring construction



Handling device HP 140



Flexible Assembly Machine Pick-o-Mat



Side loading rotary unit TH



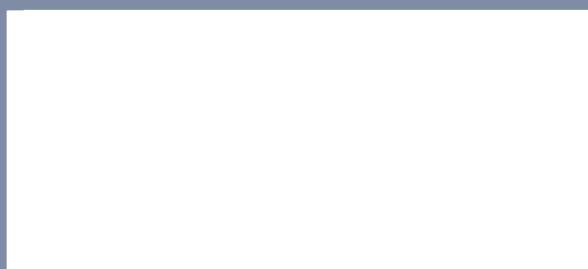
Fast Cycling Linear Assembly System LS 280



Indexing Machine Bases SR/SK



Additional indexing plate



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