

Technical Data Summary TK 85

Extremely thin ring motor - only 20.5 mm radial

Applications:

Small spindles, wrist joints, laser cutting

limited flux controllability

	Symbol	TK85-50-01	TK85-100-01	TK85-140-01	Units
Reference data (winding independent)					
Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	2,80	6,40	9,90	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	5,15	12,00	19,00	Nmrms
Peak torque, S6 10% 1)	Tpk	7,97	18,21	28,18	Nmrms
Maximum torque 3)	Tul	19	38	53	Nm
Maximum structural speed	Pn	2000	2000	2000	rad/sec
Critical flux control torque 4)	Pf	22	45	64	Nm
Motor constant	Tw	0,59	0,97	1,23	Nm/sqrt(W)
Pole number	PN	10	10	10	
Connection		Y	Y	Y	
Physical data (winding independent)					
Rotor inertia	Jm	0,300	0,600	0,840	mkgm ²
Acceleration at maximum torque	apk	26563	30358	33543	rad/s ²
Outer diameter	Dout	85	85	85	mm
Rotor hole diameter	Din	44	44	44	mm
Overall stator length	Stkout	82	132	172	mm
Stack length	Stk	50	100	140	mm
Stator mass	Msta	0,93	1,71	2,4	kg
Rotor mass	Mrot	0,38	0,76	1,06	kg
Insulation		Class H - F	Class H - F	Class H - F	
Protection		IP 00	IP 00	IP 00	
Thermal data (winding independent)					
Thermal imp. assumed for cond. Cooling 1)	Rthc	0,767	0,500	0,360	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,250	0,120	0,086	K/W
Thermal capacity	Cth	391	718	1.008	J/K
Thermal time constant cond cooling 1)	Tc	300	359	363	sec
Thermal time constant, water cooled 2)	Tw	98	86	87	sec
Loss at Tnc	LOc	87	174	260	W
Loss at Tnw	LOW	290	578	977	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	0,8	1,7	2,8	lit/min
Treshold of built-in PTC	PTCt	130	130	130	oC
Electrical data (winding dependent)					
Nominal speed (knee speed) 5)	wn	628	628	628	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	3,2	7,3	12	kW
Back E.M.F. between phases	Ke	0,58	0,58	0,58	Vs
Torque constant	Kt	1,00	1,00	1,00	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	-0,09	-0,09	%/oC
Winding resistance, 20oC	Rw	4,40	1,60	1,00	Ohm
Winding inductance	Lw	6,00	3,00	2,10	mH
Nominal current, zero speed 1)	In0	2,79	6,37	9,85	Arms
Nominal current, zero speed, 2)	In	5,40	12,57	19,91	Arms
Maximum current 3)	Ipk	23,64	47,28	66,20	Arms
Frequency	fn	500	500	500	Hz
Efficiency at rated power 6)	n	0,92	0,93	0,92	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of motor
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120 C,
- 3) Torque at which magnetic saturation prevents further overloading with any
- 4) Knee torque corresponding to unlimited constant power operation
- 5) Limit of constant torque operation with 400 Vac supply

Technical Data Summary TK 106

Medium power medium tube motors

Applications:

Direct drive lathes

Multiaxis joints

Speed up to 10000 rpm, 50-500 Nm

No flux control

	Symbol	TK 106-45-01	TK 106-90	TK 106-180-	Units
Reference data (winding independent)					
Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	3,6	8,5	16,6	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	6,8	16,0	33,0	Nmrms
Peak torque, S6 10% 1)	Tpk	10	24	47	Nmrms
Maximum torque 3)	Tul	32	65	110	Nm
Maximum structural speed	Pn	1000	1000	1000	rad/sec
Critical flux control torque 4)	Pf	34	70	141	Nm
Motor constant	Tw	0,91	1,49	2,18	Nm/sqrt(W)
Pole number	PN	12	12	12	
Connection		Y	Y	Y	
Physical data (winding independent)					
Rotor inertia	Jm	0,80	1,45	2,7	mkqm ²
Acceleration at maximum torque	apk	12807	16684	17498	rad/s ²
Outer diameter	Dout	106	106	106	mm
Rotor hole diameter	Din	65	65	65	mm
Overall stator length	Stkout	83	128	218	mm
Stack length	Stk	45	90	180	mm
Stator mass	Msta	1,4	2,3	4,3	kg
Rotor mass	Mrot	0,5	1	2	kg
Insulation		Class H - F	Class H - F	Class H - F	
Protection		IP 00	IP 00	IP 00	
Thermal data (winding independent)					
Thermal imp. assumed for cond. Cooling 1)	Rthc	0,890	0,447	0,250	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,228	0,110	0,057	K/W
Thermal capacity	Cth	588	966	1.806	J/K
Thermal time constant cond cooling 1)	Tc	523	432	452	sec
Thermal time constant, water cooled 2)	Tw	134	106	103	sec
Loss at Tnc	L0c	55	111	198	W
Loss at Tnw	L0w	197	394	789	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	0,6	1,1	2,3	lit/min
Threshold of built-in PTC	PTCt	130	130	130	oC
Electrical data (winding dependent)					
Nominal speed (knee speed) 5)	wn	538,57	537,39	537,15	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	3,66	8,60	17,73	kW
Back E.M.F. between phases	Ke	0,65	0,65	0,65	Vs
Torque constant	Kt	1,13	1,13	1,13	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	-0,09	-0,09	%/oC
Winding resistance, 20oC	Rw	2,30	0,86	0,40	Ohm
Winding inductance	Lw	4,10	2,00	1,00	mH
Nominal current, zero speed 1)	In0	3,20	7,55	14,74	Arms
Nominal current, zero speed, 2)	In	6,36	14,96	30,85	Arms
Maximum current 3)	Ipk	35,53	72,17	122,13	Arms
Frequency	fn	515	513	513	Hz
Efficiency at rated power 6)	n	0,95	0,96	0,96	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of motor
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120 C,
- 3) Torque at which magnetic saturation prevents further overloading with any
- 4) Knee torque corresponding to unlimited constant power operation
- 5) Limit of constant torque operation with 400 Vac supply

Technical Data Summary TK 164

High power medium speed spindle motors

Applications:

Direct drive lathes

Swiss type lathes

Speed up to 5000 rpm, 40-200 Nm

Short duty constant power

	Symbol	TK 164-60-04	TK 164-110-03	TK 164-250-09	Units
Reference data (winding independent)					
Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	19	40	106	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	37	80	209	Nmrms
Peak torque, S6 10% 1)	Tpk	54	114	302	Nmrms
Maximum torque 3)	Tul	93	171	389	Nm
Maximum structural speed	Pn	500	500	500	rad/sec
Critical flux control torque 4)	Pf	86	157	366	Nm
Motor constant	Tw	2,33	3,63	6,31	Nm/sqrt(W)
Pole number	PN	12	12	12	
Connection		Y	Y	Y	
Physical data (winding independent)					
Rotor inertia	Jm	4,30	7,30	16	mkgm ²
Acceleration at maximum torque	apk	12576	15595	18855	rad/s ²
Outer diameter	Dout	164	164	164	mm
Rotor hole diameter	Din	96	96	96	mm
Overall stator length	Stkout	102	152	292	mm
Stack length	Stk	60	110	250	mm
Stator mass	Msta	4,8	8	17	kg
Rotor mass	Mrot	1,3	2,4	5,5	kg
Insulation		Class H - F	Class H - F	Class H - F	
Protection		IP 00	IP 00	IP 00	
Thermal data (winding independent)					
Thermal imp. assumed for cond. Cooling 1)	Rthc	0,390	0,214	0,093	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,092	0,050	0,021	K/W
Thermal capacity	Cth	2.016	3.360	7.140	J/K
Thermal time constant cond cooling 1)	Tc	786	719	664	sec
Thermal time constant, water cooled 2)	Tw	185	168	150	sec
Loss at Tnc	LOc	267	491	1.120	W
Loss at Tnw	LOw	1.030	1.880	4.380	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	3,0	5,4	12,6	lit/min
Treshold of built-in PTC	PTCt	130	130	130	oC
Electrical data (winding dependent)					
Nominal speed (knee speed) 5)	wn	173,29	173,99	52,40	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	6,41	13,92	10,95	kW
Back E.M.F. between phases	Ke	1,80	1,76	5,13	Vs
Torque constant	Kt	3,13	3,05	8,89	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	-0,09	-0,09	%/oC
Winding resistance, 20oC	Rw	2,69	1,06	2,98	Ohm
Winding inductance	Lw	12,63	6,58	24,00	mH
Nominal current, zero speed 1)	In0	6,08	13,12	11,92	Arms
Nominal current, zero speed, 2)	In	12,46	27,62	24,74	Arms
Maximum current 3)	l _{pk}	37,19	70,12	54,69	Arms
Frequency	fn	166	166	50	Hz
Efficiency at rated power 6)	n	0,86	0,88	0,71	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120
- 3) Torque at which magnetic saturation prevents further overloading
- 4) Knee torque corresponding to unlimited constant power operation
- 5) Limit of constant torque operation with 400 Vac supply

Technical Data Summary TK 170

High power - speed spindle motors

Applications:

High speed machining centres

Speed up to 25,000 rpm, 30-100 kW

Water cooled constant power controllability

	Symbol	TK 170-60-0.6	TK 170-112-0.6	Units
Reference data (winding independent)				
Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	14	26	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	32	63	Nmrms
Peak torque, S6 10% 1)	Tpk	40	74	Nmrms
Maximum torque 3)	Tul	78	117	Nm
Maximum structural speed	Pn	3000	3000	rad/sec
Critical flux control torque 4)	Pf	67	118	Nm
Motor constant	Tw	1,74	2,70	Nm/sqrt(W)
Pole number	PN	4	4	
Connection		Y	Y	
Physical data (winding independent)				
Rotor inertia	Jm	5	8	mkgm ²
Acceleration at maximum torque	apk	7662	9135	rad/s ²
Outer diameter	Dout	170	170	mm
Rotor hole diameter	Din	65	65	mm
Overall stator length	Stkout	145	197	mm
Stack length	Stk	60	112	mm
Stator mass	Msta	9,5	13,5	kg
Rotor mass	Mrot	2,4	3,9	kg
Insulation		Class H - F	Class H - F	
Protection		IP 00	IP 00	
Thermal data (winding independent)				
Thermal imp. assumed for cond. Cooling 1)	Rthc	0,380	0,250	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,067	0,040	K/W
Thermal capacity	Cth	3.990	5.670	J/K
Thermal time constant cond cooling 1)	Tc	1.516	1.418	sec
Thermal time constant, water cooled 2)	Tw	267	227	sec
Loss at Tnc	LOc	248	378	W
Loss at Tnw	LOW	1.250	2.096	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	7,2	12,0	lit/min
Threshold of built-in PTC	PTCt	130	130	oC
Electrical data (winding dependent)				
Nominal speed (knee speed) 5)	wn	860	842	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	27,52	53,05	kW
Back E.M.F. between phases	Ke	0,38	0,38	Vs
Torque constant	Kt	0,65	0,65	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	-0,09	%/oC
Winding resistance, 20oC	Rw	0,21	0,09	Ohm
Winding inductance	Lw	2,10	1,20	mH
Nominal current, zero speed 1)	In0	21,50	39,92	Arms
Nominal current, zero speed, 2)	In	51,72	101,83	Arms
Maximum current 3)	Ipk	149,71	224,57	Arms
Frequency	fn	274	268	Hz
Efficiency at rated power 6)	n	0,96	0,96	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of motor
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120 C,
- 3) Torque at which magnetic saturation prevents further overloading with any
- 4) Knee torque corresponding to unlimited constant power operation
- 5) Limit of constant torque operation with 400 Vac supply

Technical Data Summary TK 240

High power medium speed spindle motors

Applications:

Direct drive lathes

Large milling spindles

Speed up to 5000 rpm, 50-500 Nm

Water cooled constant power controllability

	Symbol	TK 240-60-04	TK 240-140-04	TK 240-240-04	Units
Reference data (winding independent)					
Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	41	96	202	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	96	226	477	Nmrms
Peak torque, S6 10% 1)	Tpk	117	273	575	Nmrms
Maximum torque 3)	Tul	252	505	865	Nm
Maximum structural speed	Pn	1000	1000	1000	rad/sec
Critical flux control torque 4)	Pf	172	343	573	Nm
Motor constant	Tw	4,74	7,86	10,97	Nm/sqrt(W)
Pole number	PN	16	16	16	
Connection		Y	Y	Y	
Physical data (winding independent)					
Rotor inertia	Jm	20	37	60	mkgm ²
Acceleration at maximum torque	apk	5834	7384	9582	rad/s ²
Outer diameter	Dout	240	240	240	mm
Rotor hole diameter	Din	150	150	150	mm
Overall stator length	Stkout	108	178	278	mm
Stack length	Stk	70	140	240	mm
Stator mass	Msta	12	21	33	kg
Rotor mass	Mrot	2,7	5,2	8,5	kg
Insulation		Class H - F	Class H - F	Class H - F	
Protection		IP 00	IP 00	IP 00	
Thermal data (winding independent)					
Thermal imp. assumed for cond. Cooling 1)	Rthc	0,220	0,113	0,067	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,038	0,019	0,011	K/W
Thermal capacity	Cth	5.040	8.820	13.860	J/K
Thermal time constant cond cooling 1)	Tc	1.109	997	929	sec
Thermal time constant, water cooled 2)	Tw	194	168	152	sec
Loss at Tnc	L0c	290	583	1.327	W
Loss at Tnw	L0w	1.398	2.800	3.740	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	4,0	8,0	10,7	lit/min
Threshold of built-in PTC	PTCt	130	130	130	oC
Electrical data (winding dependent)					
Nominal speed (knee speed) 5)	wn	118,52	113,80	104,44	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	11,38	25,72	49,82	kW
Back E.M.F. between phases	Ke	2,53	2,54	2,53	Vs
Torque constant	Kt	4,38	4,40	4,39	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	-0,09	-0,09	%/oC
Winding resistance, 20oC	Rw	1,28	0,47	0,24	Ohm
Winding inductance	Lw	9,30	4,70	2,80	mH
Nominal current, zero speed 1)	In0	9,36	21,82	46,04	Arms
Nominal current, zero speed, 2)	In	23,06	54,07	114,45	Arms
Maximum current 3)	Ipk	71,88	143,49	246,45	Arms
Frequency	fn	151	145	133	Hz
Efficiency at rated power 6)	n	0,89	0,90	0,93	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of motor
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120
- 3) Torque at which magnetic saturation prevents further overloading with
- 4) Knee torque corresponding to unlimited constant power operation
- 5) Limit of constant torque operation with 400 Vac supply

Technical Data Summary TK 270

Highpeak torque ring motor

Applications:

Direct drive rotary tables

Indexers for transfers

Water cooled constant power controllability

	Symbol	TK 270-40-07	TK 270-80-08	TK 270-120-12	Units
Reference data (winding independent)					
Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	43	107	170	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	95	254	382	Nmrms
Peak torque, S6 10% 1)	Tpk	122	305	484	Nmrms
Maximum torque 3)	Tul	188	376	565	Nm
Maximum structural speed	Pn	400	200	200	rad/sec
Critical flux control torque 4)	Pf	142	297	427	Nm
Motor constant	Tw	5,28	9,35	12,01	Nm/sqrt(W)
Pole number	PN	24	24	24	
Connection		Y	Y	Y	
Physical data (winding independent)					
Rotor inertia	Jm	21	38	53	mkgm ²
Acceleration at maximum torque	apk	5828	8014	9129	rad/s ²
Outer diameter	Dout	270	270	270	mm
Rotor hole diameter	Din	180	180	180	mm
Overall stator length	Stkout	78	118	158	mm
Stack length	Stk	40	80	120	mm
Stator mass	Msta	8,8	16,3	22,8	kg
Rotor mass	Mrot	1,9	3,6	5,2	kg
Insulation		Class H - F	Class H - F	Class H - F	
Protection		IP 00	IP 00	IP 00	
Thermal data (winding independent)					
Thermal imp. assumed for cond. Cooling 1)	Rthc	0,360	0,178	0,119	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,066	0,031	0,021	K/W
Thermal capacity	Cth	3.696	6.846	9.576	J/K
Thermal time constant cond cooling 1)	Tc	1.331	1.219	1.140	sec
Thermal time constant, water cooled 2)	Tw	244	212	201	sec
Loss at Tnc	LOc	246	496	740	W
Loss at Tnw	LOW	1.200	2.570	3.740	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	3,4	7,4	10,7	lit/min
Threshold of built-in PTC	PTCt	130	130	130	oC
Electrical data (winding dependent)					
Nominal speed (knee speed) 5)	wn	66,38	51,93	34,17	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	6,31	13,19	13,05	kW
Back E.M.F. between phases	Ke	4,21	4,92	7,16	Vs
Torque constant	Kt	7,29	8,53	12,40	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	-0,09	-0,09	%/oC
Winding resistance, 20oC	Rw	2,87	1,25	1,60	Ohm
Winding inductance	Lw	20,76	13,61	20,00	mH
Nominal current, zero speed 1)	In0	5,89	12,55	13,71	Arms
Nominal current, zero speed, 2)	In	13,71	31,36	32,42	Arms
Maximum current 3)	lpk	32,21	55,13	56,95	Arms
Frequency	fn	127	99	65	Hz
Efficiency at rated power 6)	n	0,84	0,84	0,78	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of motor
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120 C,
- 3) Torque at which magnetic saturation prevents further overloading with any
- 4) Knee torque corresponding to unlimited constant power operation
- 5) Limit of constant torque operation with 400 Vac supply

Technical Data Summary TK 370

Highpeak torque ring motor

Applications:

Direct drive rotary tables

Indexers for transfers

Water cooled constant power controllability

	Symbol	TK 370-70-25	TK370-140-35	TK370-210-45	Units
Reference data (winding independent)					
Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	195	384	673	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	507	861	1600	Nmrms
Peak torque, S6 10% 1)	Tpk	555	1093	1915	Nmrms
Maximum torque 3)	Tul	692	1384	2076	Nm
Maximum structural speed	Pn	200	200	200	rad/sec
Critical flux control torque 4)	Pf	538	916	1621	Nm
Motor constant	Tw	14,64	20,73	29,43	Nm/sqrt(W)
Pole number	PN	40	40	40	
Connection		Y	Y	Y	
Physical data (winding independent)					
Rotor inertia	Jm	111	186	311	mkgm ²
Acceleration at maximum torque	apk	5000	5876	6159	rad/s ²
Outer diameter	Dout	370	370	370	mm
Rotor hole diameter	Din	280	280	280	mm
Overall stator length	Stkout	108	178	248	mm
Stack length	Stk	70	140	210	mm
Stator mass	Msta	20	33	57	kg
Rotor mass	Mrot	5	10	15	kg
Insulation		Class H - F	Class H - F	Class H - F	
Protection		IP 00	IP 00	IP 00	
Thermal data (winding independent)					
Thermal imp. assumed for cond. Cooling 1)	Rthc	0,140	0,061	0,048	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,017	0,013	0,008	K/W
Thermal capacity	Cth	8.400	13.860	23.940	J/K
Thermal time constant cond cooling 1)	Tc	1.176	845	1.149	sec
Thermal time constant, water cooled 2)	Tw	143	180	192	sec
Loss at Tnc	LOc	669	1.256	1.933	W
Loss at Tnw	LOW	4.800	6.300	10.975	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	13,8	18,1	31,5	lit/min
Threshold of built-in PTC	PTCt	130	130	130	oC
Electrical data (winding dependent)					
Nominal speed (knee speed) 5)	wn	14,65	10,47	7,37	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	7,43	9,02	11,79	kW
Back E.M.F. between phases	Ke	14,85	20,10	26,40	Vs
Torque constant	Kt	25,72	34,81	45,73	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	-0,09	-0,09	%/oC
Winding resistance, 20oC	Rw	4,63	4,23	3,62	Ohm
Winding inductance	Lw	40,96	44,10	43,00	mH
Nominal current, zero speed 1)	In0	7,58	11,03	14,72	Arms
Nominal current, zero speed, 2)	In	20,75	26,03	36,83	Arms
Maximum current 3)	Ipk	33,63	49,69	56,75	Arms
Frequency	fn	47	33	23	Hz
Efficiency at rated power 6)	n	0,61	0,59	0,52	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of motor
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120 C,
- 3) Torque at which magnetic saturation prevents further overloading with any
- 4) Knee torque corresponding to unlimited constant power operation
- 5) Limit of constant torque operation with 400 Vac supply

Technical Data Summary TK 450

Highpeak torque ring motor with spindle drive

Applications:

Direct drive rotary tables

Indexers for transfers

Water cooled constant power controllability

	Symbol	TK 450-60-40	TK 450-120-40	TK 450-240-40	Units
Reference data (winding independent)					
Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	232	530	1152	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	585	1407	3057	Nmrms
Peak torque, S6 10% 1)	Tpk	660	1508	3279	Nmrms
Maximum torque 3)	Tul	1004	2008	4016	Nm
Maximum structural speed	Pn	200	200	200	rad/sec
Critical flux control torque 4)	Pf	618	1227	2465	Nm
Motor constant	Tw	12,67	20,37	31,37	Nm/sqrt(W)
Pole number	PN	48	48	48	
Connection		Y	Y	Y	
Physical data (winding independent)					
Rotor inertia	Jm	170	309	586	mkqm ²
Acceleration at maximum torque	apk	3884	4882	5595	rad/s ²
Outer diameter	Dout	450	450	450	mm
Rotor hole diameter	Din	340	340	340	mm
Overall stator length	Stkout	98	158	278	mm
Stack length	Stk	60	120	240	mm
Stator mass	Msta	18,2	48	89	kg
Rotor mass	Mrot	5,25	10,5	21	kg
Insulation		Class H - F	Class H - F	Class H - F	
Protection		IP 00	IP 00	IP 00	
Thermal data (winding independent)					
Thermal imp. assumed for cond. Cooling 1)	Rthc	0,138	0,061	0,036	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,019	0,010	0,005	K/W
Thermal capacity	Cth	7.644	20.160	37.380	J/K
Thermal time constant cond cooling 1)	Tc	1.055	1.230	1.346	sec
Thermal time constant, water cooled 2)	Tw	145	198	183	sec
Loss at Tnc	L0c	506	1.012	2.024	W
Loss at Tnw	L0w	3.564	7.193	14.250	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	10,2	20,6	40,9	lit/min
Threshold of built-in PTC	PTCt	130	130	130	oC
Electrical data (winding dependent)					
Nominal speed (knee speed) 5)	wn	8,73	8,16	7,95	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	5,11	11,49	24,31	kW
Back E.M.F. between phases	Ke	24,20	24,15	24,20	Vs
Torque constant	Kt	41,92	41,83	41,92	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	-0,09	-0,09	%/oC
Winding resistance, 20oC	Rw	7,30	2,81	1,19	Ohm
Winding inductance	Lw	79,00	39,60	19,80	mH
Nominal current, zero speed 1)	In0	5,53	12,67	27,48	Arms
Nominal current, zero speed, 2)	In	14,69	35,41	76,77	Arms
Maximum current 3)	Ipk	29,94	60,01	119,76	Arms
Frequency	fn	33	31	30	Hz
Efficiency at rated power 6)	n	0,59	0,61	0,63	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of motor surface, ambient temp. 40 C, copper
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120 C,
- 3) Torque at which magnetic saturation prevents further overloading with any duty factor
- 4) Knee torque corresponding to unlimited constant power
- 5) Limit of constant torque operation with 400 Vac supply

Technical Data Summary TK 570

High peak torque ring motor

Applications:

Direct drive rotary tables with turning ability

Indexers for transfers, DD Capstan drive

Water cooled constant power controllability

Symbol TK 570-50-50 TK 570-100-65 TK570-200-65 TK570-300-55 Units

Reference data (winding independent)

	Symbol	TK 570-50-50	TK 570-100-65	TK570-200-65	TK570-300-55	Units
Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	419	750	1600	2440	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	988	1800	3740	5670	Nmrms
Peak torque, S6 10% 1)	Tpk	1192	2135	4554	6944	Nmrms
Maximum torque 3)	Tul	1450	2900	5800	8700	Nm
Maximum structural speed	Pn	200	200	200	200	rad/sec
Critical flux control torque 4)	Pf	1011	2178	4050	6281	Nm
Motor constant	Tw	20,11	25,46	38,27	48,06	Nm/sqrt(W)
Pole number	PN	64	64	64	64	
Connection		Y	Y	Y	Y	

Physical data (winding independent)

	Symbol	TK 570-50-50	TK 570-100-65	TK570-200-65	TK570-300-55	Units
Rotor inertia	Jm	420	790	1420	2050	mkqm ²
Acceleration at maximum torque	apk	2839	2702	3207	3387	rad/s ²
Outer diameter	Dout	570	570	570	570	mm
Rotor hole diameter	Din	480	480	480	480	mm
Overall stator length	Stkout	98	148	248	348	mm
Stack length	Stk	50	100	200	300	mm
Stator mass	Msta	30	45	84	122	kg
Rotor mass	Mrot	6	11	22	33	kg
Insulation		Class H - F	Class H - F	Class H - F	Class H - F	
Protection		IP 00	IP 00	IP 00	IP 00	

Thermal data (winding independent)

	Symbol	TK 570-50-50	TK 570-100-65	TK570-200-65	TK570-300-55	Units
Thermal imp. assumed for cond. Cooling 1)	Rthc	0,117	0,066	0,033	0,022	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,021	0,010	0,006	0,004	K/W
Thermal capacity	Cth	12.600	18.900	35.280	51.240	J/K
Thermal time constant cond cooling 1)	Tc	1.474	1.247	1.164	1.127	sec
Thermal time constant, water cooled 2)	Tw	265	189	194	190	sec
Loss at Tnc	L0c	706	1.400	2.820	4.220	W
Loss at Tnw	L0w	3.933	8.100	15.600	22.800	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	11,3	23,2	44,7	65,4	lit/min
Threshold of built-in PTC	PTCt	130	130	130	130	oC

Electrical data (winding dependent)

	Symbol	TK 570-50-50	TK 570-100-65	TK570-200-65	TK570-300-55	Units
Nominal speed (knee speed) 5)	wn	7,55	5,60	5,86	7,00	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	7,46	10,07	21,93	39,71	kW
Back E.M.F. between phases	Ke	29,00	37,71	36,00	31,70	Vs
Torque constant	Kt	50,23	65,32	62,35	54,91	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	-0,09	-0,09	-0,09	%/oC
Winding resistance, 20oC	Rw	4,16	4,39	1,77	0,87	Ohm
Winding inductance	Lw	52,00	40,82	20,00	10,00	mH
Nominal current, zero speed 1)	In0	8,34	11,48	25,66	44,44	Arms
Nominal current, zero speed, 2)	In	20,70	29,01	63,14	108,70	Arms
Maximum current 3)	lpk	36,08	55,49	116,27	198,07	Arms
Frequency	fn	38	29	30	36	Hz
Efficiency at rated power 6)	n	0,65	0,55	0,58	0,64	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of motor surface, ambient temp. 40 C, copper temperature 120 C
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120 C,
- 3) Torque at which magnetic saturation prevents further overloading with any duty factor
- 4) Knee torque corresponding to unlimited constant power operation
- 5) Limit of constant torque operation with 400 Vac supply

Technical Data Summary TK 795

Highpeak torque ring motor

Applications:

Direct drive rotary tables with turning/milling ability

Rotary tables for glass forming

Water cooled constant power controllability

Vertical lathes

Extruders and forging presses

	Symbol	TK 795-140-70	TK 795-330-80	Units
Reference data (winding independent)				
Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	3665	8231	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	5900	14630	Nmrms
Peak torque, S6 10% 1)	Tpk	8862	21975	Nmrms
Maximum torque 3)	Tul	9500	25000	Nm
Maximum structural speed	Pn	100	100	rad/sec
Motor constant	Tw	70,35	122,94	Nm/sqrt(W)
Pole number	PN	60	60	
Connection		Y	Y	
Physical data (winding independent)				
Rotor inertia	Jm	3300	7600	mkgm ²
Acceleration at maximum torque	apk	2686	2892	rad/s ²
Outer diameter	Dout	795	795	mm
	Dag	690	690	mm
Rotor hole diameter	Din	660	660	mm
Overall stator length	Stkout	200	390	mm
Stack length	Stk	140	330	mm
Stator mass	Msta	119	263	kg
Rotor mass	Mrot	26	63	kg
Insulation		Class C-H	Class C-H	
Protection		IP 00	IP 00	
Thermal data (winding independent)				
Thermal imp. assumed for cond. Cooling 1)	Rthc	0,023	0,014	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,007	0,003	K/W
Thermal capacity	Cth	49.980	110.460	J/K
Thermal time constant cond cooling 1)	Tc	1.150	1.546	sec
Thermal time constant, water cooled 2)	Tw	335	309	sec
Loss at Tnc	L0c	3.900	6.400	W
Loss at Tnw	L0w	12.055	24.700	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	34,6	70,8	lit/min
Treshold of built-in PTC	PTCt	130	130	oC
Electrical data (winding dependent)				
Nominal speed (knee speed) 5)	wn	6,22	5,86	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	36,71	85,80	kW
Back E.M.F. between phases	Ke	42,50	46,00	Vs
Torque constant	Kt	73,61	79,67	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	-0,09	%/oC
Winding resistance, 20oC	Rw	0,73	0,28	Ohm
Winding inductance	Lw	13,90	6,50	mH
Nominal current, zero speed 1)	In0	49,79	103,31	Arms
Nominal current, zero speed, 2)	In	84,37	193,29	Arms
Maximum current 3)	Ipk	161,32	392,22	Arms
Frequency	fn	30	28	Hz
Efficiency at rated power 6)	n	0,75	0,78	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of motor surface, ambient temp. 40 C, copper temperature 120 C
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120 C,
- 3) Torque at which magnetic saturation prevents further overloading with any duty factor
- 4) Knee torque corresponding to unlimited constant power operation
- 5) Limit of constant torque operation with 400 Vac supply

Technical Data Summary TK 1150

Highpeak torque large ring motor

Applications:

Vertical lathes with milling ability, large rotary tables

Indexers for transfers and glass forming

Extruders, bending and forging machines

DD generator for wind and mini hydro power

Constant power control 1:10 range

Symbol TK 1150-250-110 Units

Reference data (winding independent)

Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	16900	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	26251	Nmrms
Peak torque, S6 10% 1)	Tpk	39431	Nmrms
Maximum torque 3)	Tul	45000	Nm
Maximum structural speed	Pn	80	rad/sec
Motor constant	Tw	225,85	Nm/sqrt(W)
Pole number	PN	72	
Connection		Y	

Physical data (winding independent)

Rotor inertia	Jm	21000	mkgm ²
Acceleration at maximum torque	apk	1878	rad/s ²
Outer diameter	Dout	1150	mm
	Dag	990	mm
Rotor hole diameter	Din	920	mm
Overall stator length	Stkout	310	mm
Stack length	Stk	250	mm
Stator mass	Msta	508	kg
Rotor mass	Mrot	88	kg
Insulation		Class C-H	
Protection		IP 00	

Thermal data (winding independent)

Thermal imp. assumed for cond. Cooling 1)	Rthc	0,011	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,0035	K/W
Thermal capacity	Cth	213.360	J/K
Thermal time constant cond cooling 1)	Tc	2.347	sec
Thermal time constant, water cooled 2)	Tw	747	sec
Loss at Tnc	L0c	7.760	W
Loss at Tnw	L0w	20.100	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	57,6	lit/min
Treshold of built-in PTC	PTCt	130	oC

Electrical data (winding dependent)

Nominal speed (knee speed) 5)	wn	2,79	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	73,14	kW
Back E.M.F. between phases	Ke	83,90	Vs
Torque constant	Kt	145,32	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	%/oC
Winding resistance, 20oC	Rw	0,28	Ohm
Winding inductance	Lw	14,70	mH
Nominal current, zero speed 1)	In0	116,30	Arms
Nominal current, zero speed, 2)	In	190,15	Arms
Maximum current 3)	lpk	387,08	Arms
Frequency	fn	16	Hz
Efficiency at rated power 6)	n	0,78	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of motor surface, ambient temp. 40 C, copper temperature 120 C
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120 C,
- 3) Torque at which magnetic saturation prevents further overloading with any duty factor
- 4) Knee torque corresponding to unlimited constant power operation
- 5) Limit of constant torque operation with 400 Vac supply

Technical Data Summary TK 1900

Highpeak torque large ring motor

Applications:

Vertical lathes with milling ability, large rotary tables

Indexers for transfers and glass forming

Extruders, bending and forging machines

DD generator for wind and mini hydro power

Constant power control 1:10 range

	Symbol	TK 1900-160-300	Units
Reference data (winding independent)			
Nominal torque, S1,0 speed, conduction+convection cooled IC 418 1)	Tnc	27000	Nmrms
Nominal torque, S1, 0 speed, water cooled 2)	Tnw	36000	Nmrms
Peak torque, S6 10% 1)	Tpk	54075	Nmrms
Maximum torque 3)	Tul	55000	Nm
Maximum structural speed	Pn	30	rad/sec
Motor constant	Tw	368,37	Nm/sqrt(W)
Pole number	PN	84	
Connection		Y	

Physical data (winding independent)			
Rotor inertia	Jm	88000	mkgm ²
Acceleration at maximum torque	apk	614	rad/s ²
Outer diameter	Dout	1900	mm
	Dag	1740	mm
Rotor hole diameter	Din	1650	mm
Overall stator length	Stkout	230	mm
Stack length	Stk	160	mm
Stator mass	Msta	463	kg
Rotor mass	Mrot	116	kg
Insulation		Class C-H	
Protection		IP 00	

Thermal data (winding independent)			
Thermal imp. assumed for cond. Cooling 1)	Rthc	0,011	K/W
Thermal impedance, motor to cooling frame 2)	Rthw	0,0057	K/W
Thermal capacity	Cth	194.460	J/K
Thermal time constant cond cooling 1)	Tc	2.139	sec
Thermal time constant, water cooled 2)	Tw	1.108	sec
Loss at Tnc	L0c	7.800	W
Loss at Tnw	L0w	15.700	W
Coolant flow, 5 C temp rise, 35 C inlet	Cfl	45,0	lit/min
Threshold of built-in PTC	PTCt	130	oC

Electrical data (winding dependent)			
Nominal speed (knee speed) 5)	wn	2,51	rad/sec
Nominal power, water cooling, knee speed 6)	Pnw	90,27	kW
Back E.M.F. between phases	Ke	113,00	Vs
Torque constant	Kt	195,72	Nm/Arms
Temp.coeff. of E.M.F. and Kt	dKe/dT	-0,09	%/oC
Winding resistance, 20oC	Rw	0,19	Ohm
Winding inductance	Lw	11,00	mH
Nominal current, zero speed 1)	In0	137,95	Arms
Nominal current, zero speed, 2)	In	193,62	Arms
Maximum current 3)	Ipk	351,26	Arms
Frequency	fn	17	Hz
Efficiency at rated power 6)	n	0,85	

Definitions:

- 1) Motor assembled in light alloy case with outer surface = 500% of motor surface, ambient temp. 40 C, copper
- 2) Water cooled motor, water inlet temperature = 35 C, copper temp, 120 C,
- 3) Torque at which magnetic saturation prevents further overloading with any duty factor
- 4) Knee torque corresponding to unlimited constant power
- 5) Limit of constant torque operation with 400 Vac supply