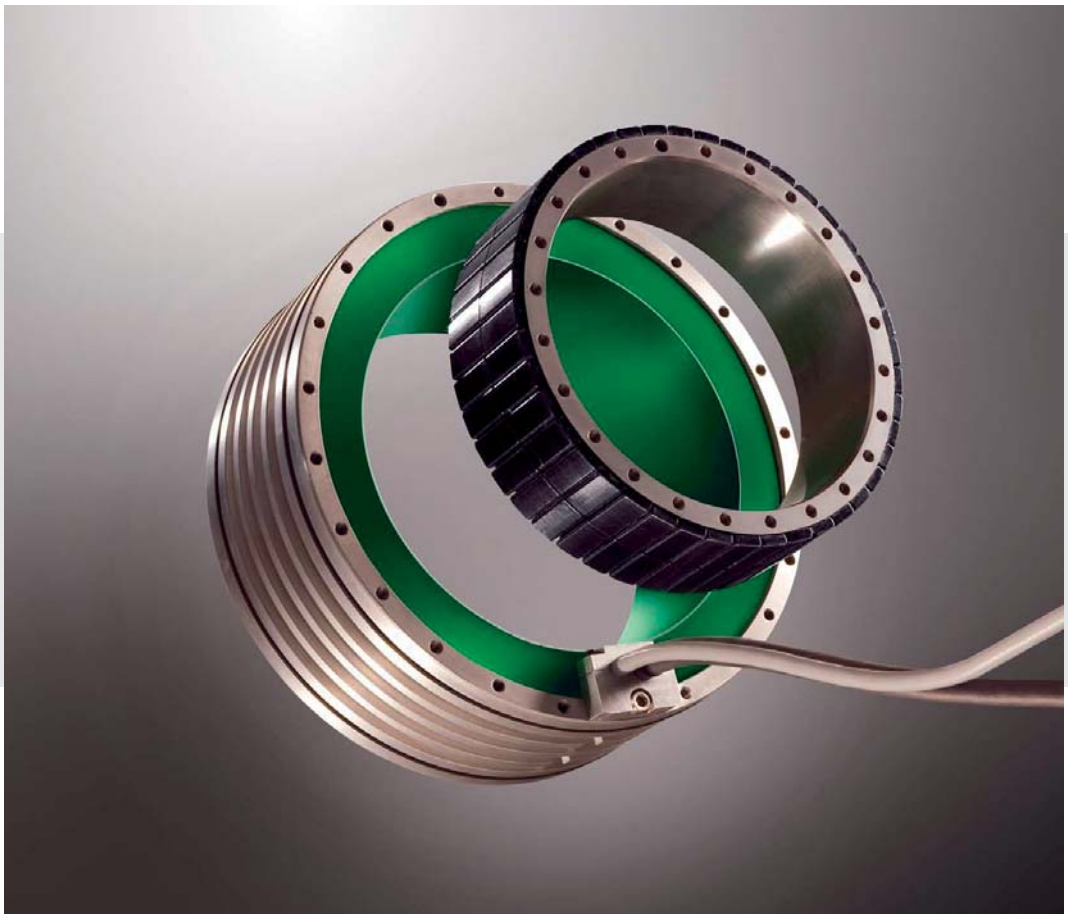
TECHNAI®

TEAM

DIRECT-DRIVE MOTION TECHNOLOGY



Range of Torque Motors

MK-C series

REV. 10/09

1. NEW RANGE OF TORQUE MOTORS: MK-C series

This new range was presented for the first time during the EMO 2007 in Hannover.

The definition "Torque Motors" is here used to identify a range of elements consisting of a Rotor + Stator.

The System integrator will enable to develop the mechanical project of the rotary machine axis according to its own original specifications. As a result the electromagnetic component (Torque Motor) will be integrated in a custom-built mechanism to create a new "Direct Drive System".

The specific advantages of the Torque Motors range are the following:
- **Industrialized Design**
- **Defined configuration**
- **Interchangeable dimensions with other standards available on the market**
- **Excellent performance, high reliability and efficiency**
- **Low maintenance**

With this new product range, Technai Team turns toward the most competitive market looking for electromagnetic components to implement direct drive solutions for rotary axes, offering state-of-the-art technology for essential and standardized configuration.

The MK-C Range (internal rotor configuration) is available in two axial dimensions:
- **MK-CI**
- **MK-CIC**

MK-CIC range has a smaller "Le" axial dimension compared to MK-CI.

The MK-C range commercial targets are:
- **Excellent quality at competitive prices.**
- **Strict adherence to production deadlines.**
- **Prompt delivery.**

Technai Team is structured to manage all the manufacturing stages. Manual skills, high quality components and advanced technology are merged into the process to determine the reliability of our products. The quality of Technai Team is complying with UNI EN ISO 9001:2000 Certification.

The MK-C motors series presented here completes the manufacturing range offered by Technai Team, with the aim to supply customized solutions to the Customers requirements.
Technai Team has a strong engineering structure dedicated to application projects management. Mechanical and electromagnetic planning dedicated to Customer Service and Technical Support.

- Analysis of specifics.
- Dynamic and physical dimensional requirements.
- Preliminary project, mechanical and electromagnetic execution.
- Prototype manufacturing and certification.

Technai Team is offering all these activities to support any application projects.

From the Idea to the "prototype performance" Certification

This is our slogan that has always characterized and identified the activity of Technai Team.

2. INTRODUCTION TO THE DIRECT-DRIVE TECHNOLOGY

"Torque motors" are applied to rotary axes as **"Linear motors" are applied to straight axes.** Both are the expression of the technology named Direct-Drive.

The Direct-Drive principle is quite simple: the electric servomotor generates the mechanical energy which is used for driving the payload.

The fundamental difference when compared to conventional systems is the absence of any mechanical means for motion transmission, e.g., gearboxes, couplings or drive belts.

Speed, Torque and Power of the Direct-Drive systems are intrinsic features of the electromagnetic project of the motor which determine its physical size, as well as the quality and the dynamics of the motion depend on the electronic regulation system and the feedback loop quality of the measuring system.

Every Direct-Drive system solution for rotary axes will implement a new form of servomotor, where its electromagnetic component "merges" with the mechanical project of the subgroup on the machine for which the rotary axis is used.

3. ADVENTAGES OF THE DIRECT-DRIVE TECHNOLOGY COMPARED TO CONVENTIONAL SOLUTIONS

Elimination of the mechanical gearboxes:
The system will be considerably simplified in its mechanical structure, obtaining a high reliability and consistency both to the performance and precision.

- The absence of the gearbox will allow to overcome all issues involved such as: friction, wear and motion's cyclic faults.
- Better performance and energy efficiency
- The Direct-Drive systems simplify the mechanical complexity by reducing the number of components and assembly costs.
- The simplified and symmetric structure of the Direct-Drive systems facilitates the manufacture of the structure of any adjacent machines.
- Cost reduction and superior performance will be achieved as a result.

4. THE ELECTRONIC REGULATION PREVAILS AND SETS THE QUALITY OF THE SYSTEM

The Direct-Drive systems implement some functions through the electronic regulation which in the past were linked to the mechanical construction. Herein we highlight some of the basic features of the servo-systems with direct transmission compared to conventional systems using a gearbox. The field of evaluation for these considerations focuses particularly on the applications for the axes of the machine tools. As a matter of fact, this field requires a very high performance and precision target. Therefore it constitutes an excellent reference point of evaluation also related to other fields, generally less sophisticated, meaning minor precision requirements.

DIRECT-DRIVE SYSTEMS

GEARBOX SYSTEMS

APPLICATION WITH PREVAILING DYNAMIC CYCLE

Static and dynamic rigidity are functions which are exclusively delegated to the electronic regulation.

The measuring system (feedback encoder) establishes an insurmountable limit of resolution and positioning accuracy.
The electronic regulation "perceives" the mechanic-structural resonance as a limiting border to which it must adequate itself. However, it is quite easy to reach final quality levels decisively higher.

The most sophisticated regulating algorithms of the control electronics are decisive for the determination of final high-level results as to resolution/accuracy.
(typical targets: [degrees] resolution 10^{-6} and positioning window:10^{-5}).

The performance of the dynamic cycle is determined by two fundamental factors:

- Drive torque;
- Inertia moment of the rotary masses.

The only precaution is not to underestimate the residual frictions of the system, such as:

- Friction from rolling bearings;
- Any possible friction from rotary hydraulic distributors.

The "calculation model" is simple, linear and without any surprise. The formulas of the dynamics of circular motion are applied with excellent reliability.

In the application field of the prevailing dynamic cycles, the Direct-Drive systems express the maximum quality gap as to conventional systems.

The mechanical qualities of the gearbox prevail, when the dynamic behavior of the servo-system is defined.

Quality and regularity of the motion are bound by the quality of the gearbox. Backlashes, variable frictions and the geometrical quality of the execution prevail over the measuring resolution.
The electronic regulation ends here and uniforms itself to what the mechanical transmission is able to offer.

In this case the final result is conditioned by the mechanical system. It is not of great importance to have a very sophisticated electronics.
The goals which can be reached in the best hypothesis are as follows [degrees]:
resolutions 10^{-5} and positioning windows 10^{-4}.

The performance of the dynamic cycle is heavily influenced by non-linear physical variables:

- Variable friction and performance depending on speed, type of lubrication, etc.
- Backlashes and elasticity of the gearboxes.
- Regulation stability compromised by elastic couplings between different inertias suitable for causing dynamic instability of the system at low frequency.

The "calculation model" is problematic and complex. Very often one must be satisfied with the results obtained by the operative testing of the system.

The applications with very high dynamic cycles put into evidence all the limits of the solution using a gearbox.

DIRECT-DRIVE SYSTEMS

GEARBOX SYSTEMS

APPLICATIONS SUBJECT TO RELEVANT TORQUE DISTURBANCES

A "torque disturbance" is understood as the forces that act by contrasting the programmed axis motion. An example are the cutting forces which are generated on a milling machine. The "torque disturbance" is characterized as to the ***force value*** [N] and to the ***frequency*** [Hz] - ***(Rigidity = Force/Flexion)***

The performances of dynamic rigidity, as understood as stability to the "torque disturbance" of a Direct-Drive system, are obtained by summing two fundamental quantities:

Active rigidity + Inertial rigidity.

The ***active rigidity*** is obtained by regulating the reply of the velocity ring with a through-passing band higher than the frequency of the disturbance coming from the milling.
Therefore, the servo-controlled system will be able to act in real time by opposing the drive torque to the cutting disturbances.

The faster the reaction of the Speed loop is, the lower the flexion (and therefore the higher the active rigidity) will be.

The ***inertial rigidity*** is exclusively derived from the intrinsic inertia of the rotary mass:
the higher the inertia is, the lower the value of induced acceleration to the axis will be. Therefore, its motion will be less and such to facilitate the (active) regulated reply of the controlled axis.

The "global dynamic rigidity" of the system will be the sum of these two results, that means: Active (regulated) rigidity + Inertial rigidity (physical one of the mass).

The quality of the dynamic rigidity is excellent, provided that both elements are well balanced. Any application, which requires a high level of compromise between trajectory precision and low/medium operation forces, obtains a substantial advantage (for example High Speed Cutting).

The ***"global dynamic rigidity"*** of a system using a gearbox have the same factors, however these assume a different weight.

The Inertial rigidity has a predominant importance.
To the intrinsic inertia of the mass of the axis and of the useful load, the reflex inertia of any of the rotary elements is summed up, reconverted by the ratio of the gearbox speed which forms the kinematic chain.

To this factor sometimes the irreversibility of the motion, as a consequence of the low performance and/or of the high reduction ratio, is added.
The positive side of this aspect is as follows:

- Physical containment of the amplitude of the flexion to heavy impulsive loads
- High overloading with mechanical reaction to the force of disturbance.

Normally, the active rigidity due to the regulation of the servomotor has a secondary validity, since it is "screened" both by the low performance and by the irreversibility of the motion.

Very high values of "global dynamic rigidity" can be reached easily. The systems using a gearbox are still valid for heavy-duty jobs. However, the quality will be much "rougher".

5. OPERATION SAFETY AND QUALITY STANDARDS OF TECHNAI TORQUE MOTORS

All motors manufactured by TECHNAI Team correspond to high standards of execution, where particular care has been given to the electric insulation and the winding protection.
Each single motor is subject to accurate tests and measuring steps during the entire manufacturing process (slot insulation, arrangement of windings, electric connections, impregnation and final encapsulation using epoxy resin). The entire manufacturing process is kept under control in each single step. During each acceptance test a document will be issued to ensure the complete traceability of each motor built by us.

Phase-ground insulation test + Surge test

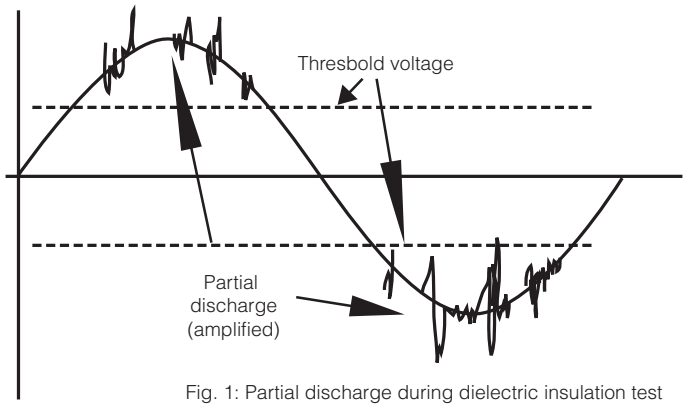


Fig. 1: Partial discharge during dielectric insulation test

Our factory is provided with a sophisticated computerized test-bench, which is well beyond the normal rigidity and insulation tests prescribed by the standards in force. Here in the following, a trace of the advanced testing procedures foreseen by our quality standards is shown:
Microsurges or partial discharge test:
This is used for testing the execution of the motor by putting into evidence any faults, such as winding out of their slots, wires touching metal parts, faults between one spire and another.
Figure 1 shows a motor which presents such faults. Any partial microcharges (microsurge or partial discharge) which deviate from the sinusoidal curve become evident.
The lower the number and the value of the detected microsurges is, the higher the technical quality of the motor will be.

PDIV test (Partial Discharge Inception Voltage):

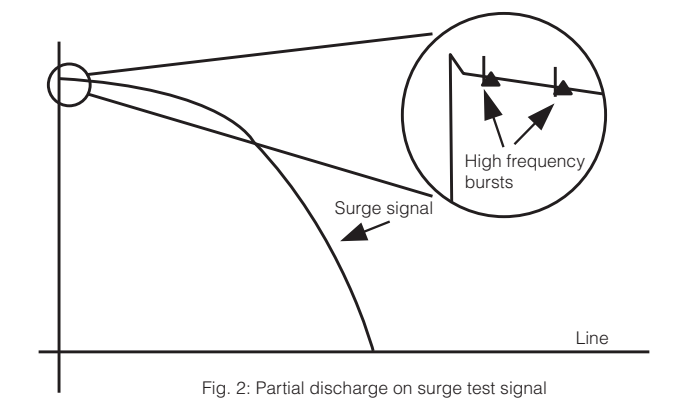


Fig. 2: Partial discharge on surge test signal

This allows to evaluate the quality of the insulating materials between the winding "phases". The insulating materials may present faults such as different types of micro-cavities caused during the manufacturing process and also metal splinters. These faults may cause local concentrations in the electric field thus exceeding the limit value of the field and causing consequently the phenomenon of Partial Discharges. The term "Partial Discharge" depends on the fact that this phenomenon occurs on microscopic level thus involving only a part of the existing dielectric between the parts under voltage. These discharges will damage the dielectric material and are liable for the aging of material and consequently for the reduction of the motor's lifetime. Measuring of partial discharges gives a valid means for checking the state of electric insulation. This allows detecting of faults which sooner or later may cause breakage of the dielectric. The **PDIV** test allows to program the peak voltage to be applied between the windings and the mass or to the ends of windings. The system checks for each single pulse applied whether in the stator any partial discharges will take place or not. The lower the value of the detected microsurges is, the higher the technical quality of the motor will be.
This TEST (PDIV) is particularly suitable for those motors that for their final application will be powered through a frequency inverter, which is typical for the entire range of servomotors and therefore also for Torque motors.

Phenomenon of creating Voltage spikes

The appearance of high voltage spikes represents a real risk which all servomotors controlled by an inverter are subject to. It can be easily understood that the origin of such phenomenon is external to the motor. This motor can only be protected as a preventive measure against the appearance of this potentially deleterious phenomenon.
The care dedicated by Technai during testing to ensure best conditions of motor protection and testing has already been explained before. However, it has already been placed into evidence that particular operation conditions of the complex drive system may cause voltage spikes which might even exceed 1500-2000 Vpk. Due to these voltage spikes there might be partial discharges and therefore the risk of a considerable reduction of the motor's lifetime, even causing the clean breakage of the insulation.

The factors which contribute to increase the probability of this deleterious phenomenon are as follows:

- ✓ Intrinsic quality of the inverter project (some frequency inverters turn out to be particularly critical)
- ✓ Power cables of high length and screened: the difference of impedance between the cable and the statoric winding may cause the appearance of voltage resonance.
- ✓ High number of power drive modules using a common supply unit on the DC bus
- ✓ High voltage of DC bus having a regenerative circuit.

Prevention and protection of the motor against surges

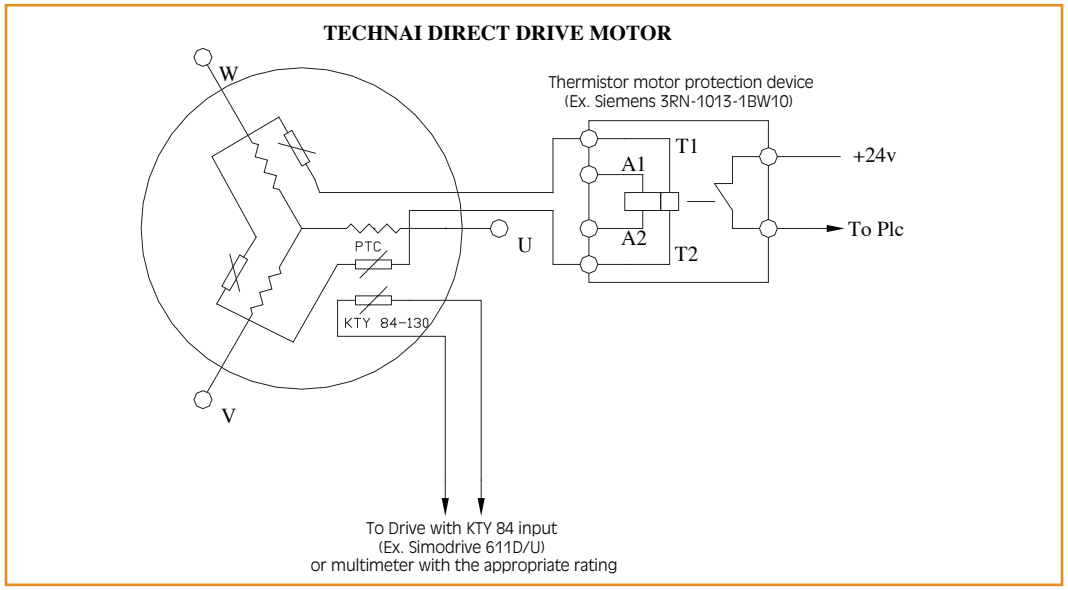
The rule to be respected for safeguarding against such phenomenon will be the execution of a measuring test to be carried out completely under operation conditions so to reduce the values within the following data:
Measuring of peaks of voltage gradient **dV/dt**:

- **Measuring between one phase and another: 900+10% Vpeak max. and dV/dt ≤ 700V/µs**
- **Measuring between one phase and the mass: 900+10% Vpeak max. (Positive peak)**

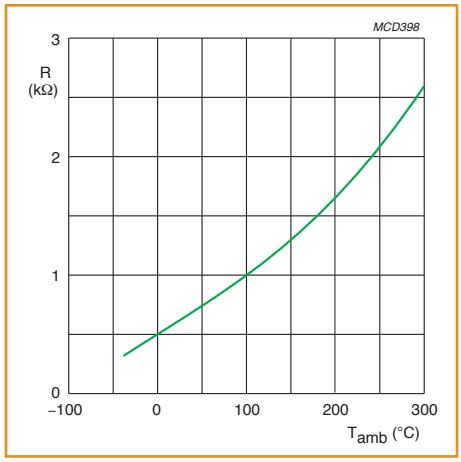
On request, the Technai technical service is able to carry out this acceptance test and to support the customers by choosing the appropriate kits/filters adequately developed for setting the system into the tolerance values foreseen.
A list of such kits/filters combined with each single torque motor of the MK-C series is shown in this catalogue (see page 75).

6. THERMAL PROTECTION AND THERMAL PROBE FITTED INTO THE WINDINGS

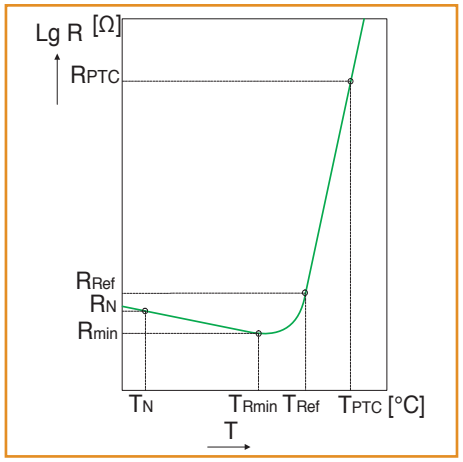
The thermal protection is the only strategy valid for protecting the motor!
The DIRECT DRIVE motor from TECHNAI is provided with two types of thermal probe.
The **PTC** thermal probe is the predominant one to be used for protecting the motor against overtemperatures.
If the **PTC** temperature probe intervenes, the drive must be rapidly disabled so that the converter of the drive does not continue supplying any current to the stator. This condition of thermal load is caused by electric current required by the closed-circuit control and may damage seriously the stator.
The thermal probe **KTY 84-130** supplies an analog signal proportional to the temperature.
In a system with a symmetric current charge in the three-phase coils it supplies information about the medium temperature value of the motor.
The motor temperature can be displayed if necessary using the signal coming from a **KTY 84-130** sensor. In this particular case, according to the type and application of the machine, an alarm signal may be used when the motor temperature is between 100°C and 110°C. This alarm signal can be used for reducing the power input to the motor.
The temperature probe **KTY 84-130** evaluates only the temperature between **two stator phases**.
However, the phases in a synchronous motor have different load levels according to the operation mode. Therefore, in specific cases there might be phases with a higher temperature than the one indicated.



Characteristic curve of KTY 84-130



Characteristic curve of PTC probe

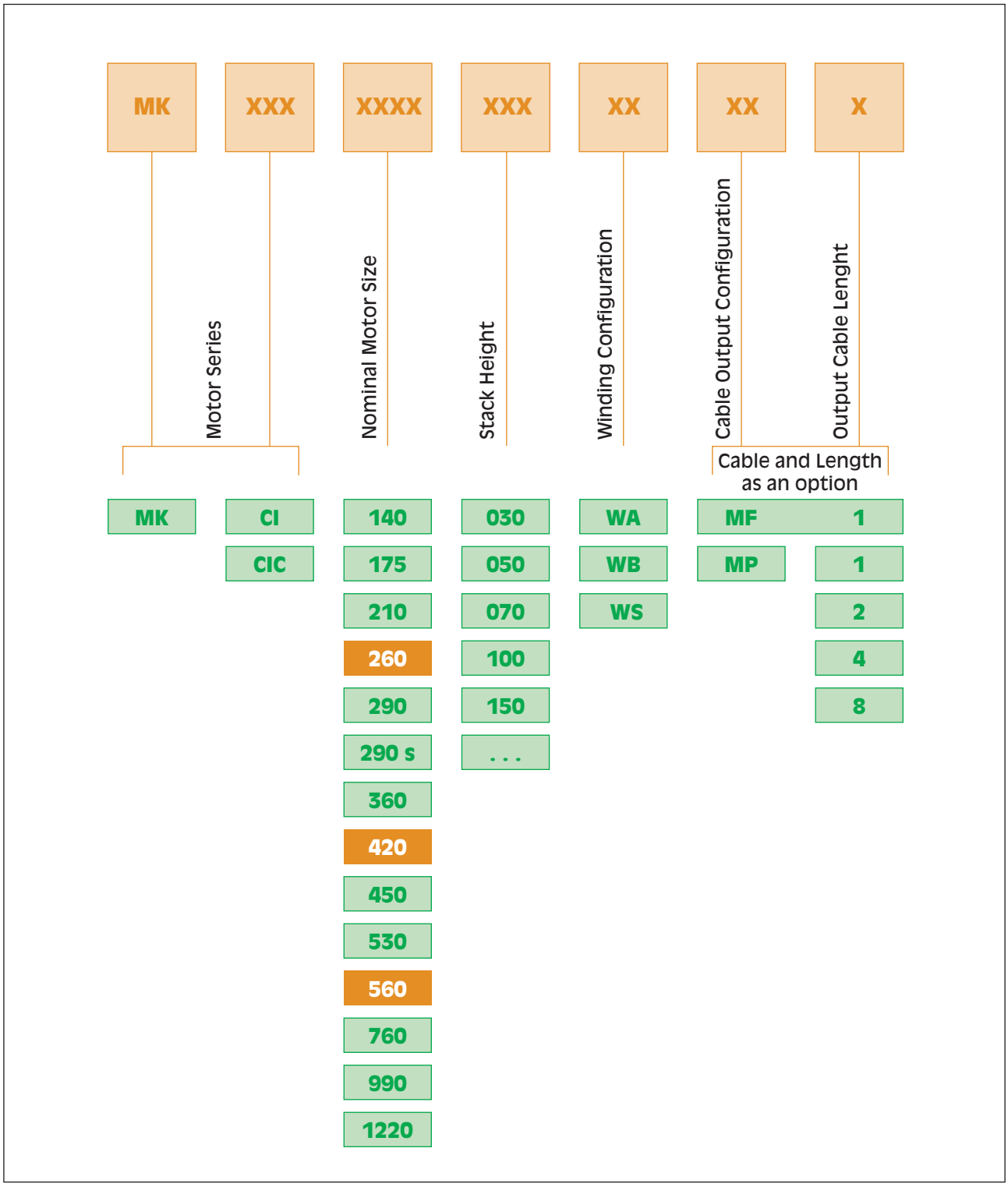


Torque Motor Mk-C
Configuration with the rotor inside of the Stator

Code	ø outer dia. of Stator	Stator height	Rotor height	Cont. torque (Liq. cooling Dt100)	Cont. torque (Air cooling Dt100)	Peak torque	Max speed at Ipk at 600 Vdc	Max speed at Iwc at 600 Vdc	Max speed at Iac at 600 Vdc	pag
Symbol				**Twc**	**Tac**	**Tpk**	**Npk**	**Nwc**	**Nac**	
Unit	**mm**	**mm**	**mm**	**Nm**	**Nm**	**Nm**	**RPM**	**RPM**	**RPM**	
MK-CI 140-030 WA	160	70	30	19,2	8,6	38	700	1000	1000	11
MK-CI 140-050 WA	160	90	50	33,2	14,6	63	370	850	1000	11
MK-CI 140-070 WA	160	110	70	46	19,8	89	450	900	1000	11
MK-CI 140-100 WA	160	140	100	65	27,6	126	240	600	750	11
MK-CI 140-150 WA	160	190	150	98,6	42	190	50	360	490	11
MK-CI 175-030 WA	198	80	30	37	17	72	750	1550	1850	14
MK-CI 175-030 WB	198	80	30	37	17	72	2000	3800	4300	15
MK-CI 175-050 WA	198	100	50	64	29	120	450	850	1100	14
MK-CI 175-050 WB	198	100	50	64	29	120	1200	2100	2600	15
MK-CI 175-070 WA	198	120	70	91	40	168	320	620	750	14
MK-CI 175-070 WB	198	120	70	91	40	168	850	1550	1850	15
MK-CI 175-100 WA	198	150	100	135	57	240	200	400	525	14
MK-CI 175-100 WB	198	150	100	135	58	240	600	1050	1300	15
MK-CI 175-150 WA	198	200	150	209	89	360	130	300	410	14
MK-CI 175-150 WB	198	200	150	205	87	362	360	660	850	15
MK-CI 210-030 WA	230	70	30	68	27	135	350	750	1000	18
MK-CI 210-030 WB	230	70	30	68	26	135	800	1700	2100	19
MK-CI 210-050 WA	230	90	50	118	45	224	175	440	600	18
MK-CI 210-050 WB	230	90	50	118	45	224	520	1000	1250	19
MK-CI 210-070 WA	230	110	70	165	63	310	80	280	400	18
MK-CI 210-070 WB	230	110	70	165	63	312	350	670	900	19
MK-CI 210-100 WA	230	140	100	241	85	442	165	420	560	18
MK-CI 210-100 WB	230	140	100	240	87	447	260	560	760	19
MK-CI 210-150 WA	230	190	150	368	133	660	80	240	360	18
MK-CI 210-150 WB	230	190	150	365	132	670	150	360	475	19
MK-CI 260-30 WA	280	70	30	87	37	130	530	710	930	23
MK-CI 260-50 WA	280	90	50	144	62	218	285	420	550	23
MK-CI 260-70 WA	280	110	70	201	83	305	185	285	390	23
MK-CI 260-100 WA	280	140	100	288	114	431	100	180	265	23
MK-CI 260-150 WA	280	190	150	402	163	647	95	180	265	23
MK-CI 290-030 WA	310	70	30	134	59	260	330	660	760	26
MK-CI 290S-030 WA	310	70	30	134	59	260	330	660	760	26
MK-CI 290-030 WB	310	70	30	134	54	260	750	1430	1700	27
MK-CI 290S-030 WB	310	70	30	134	54	260	750	1430	1700	27
MK-CI 290-050 WA	310	90	50	227	96	433	180	370	460	26
MK-CI 290S-050 WA	310	90	50	227	96	433	180	370	460	26
MK-CI 290-050 WB	310	90	50	227	96	432	450	850	960	27
MK-CI 290S-050 WB	310	90	50	227	96	432	450	850	960	27
MK-CI 290-070 WA	310	110	70	322	132	646	130	310	390	26
MK-CI 290S-070 WA	310	110	70	322	132	646	130	310	390	26
MK-CI 290-070 WB	310	110	70	320	132	606	300	575	700	27
MK-CI 290S-070 WB	310	110	70	320	132	606	300	575	700	27
MK-CI 290-100 WA	310	140	100	455	186	868	40	170	230	26
MK-CI 290S-100 WA	310	140	100	455	186	868	40	170	230	26
MK-CI 290-100 WB	310	140	100	460	181	868	200	380	490	27
MK-CI 290S-100 WB	310	140	100	460	181	868	200	380	490	27
MK-CI 290-150 WA	310	190	150	695	275	1290	10	85	130	26
MK-CI 290S-150 WA	310	190	150	695	275	1290	10	85	130	26
MK-CI 290-150 WB	310	190	150	695	272	1290	110	250	310	27
MK-CI 290S-150 WB	310	190	150	695	272	1290	110	250	310	27
MK-CI 360-030 WA	385	90	30	239	112	428	110	250	340	32
MK-CI 360-030 WB	385	90	30	248	112	430	250	520	730	33
MK-CI 360-050 WA	385	110	50	415	175	724	50	140	190	32
MK-CIC 360-050 WA	385	90	50	415	175	724	50	140	190	36

Code	ø outer dia. of Stator	Stator height	Rotor height	Cont. torque (Liq. cooling Dt100)	Cont. torque (Air cooling Dt100)	Peak torque	Max speed at Ipk at 600 Vdc	Max speed at Iwc at 600 Vdc	Max speed at Iac at 600 Vdc	pag
Symbol				Twc	Tac	Tpk	Npk	Nwc	Nac	
Unit	mm	mm	mm	Nm	Nm	Nm	RPM	RPM	RPM	
MK-CI 360-050 WB	385	110	50	428	178	724	220	480	660	33
MK-CIC 360-050 WB	385	90	50	428	178	1013	220	480	660	37
MK-CI 360-070 WA	385	130	70	587	249	1013	100	200	290	32
MK-CIC 360-070 WA	385	110	70	587	249	1013	100	200	290	36
MK-CI 360-070 WB	385	130	70	584	247	1013	170	340	460	33
MK-CIC 360-070 WB	385	110	70	584	247	1448	170	340	460	37
MK-CI 360-100 WA	385	160	100	821	341	1447	50	140	200	32
MK-CI 360-100 WB	385	160	100	821	335	2173	140	290	390	33
MK-CI 360-150 WA	385	210	150	1240	504	2120	65	145	210	32
MK-CI 360-150 WB	385	210	150	1262	513	430	120	240	340	33
MK-CI 420-030 WA	455	90	30	283	128	725	70	145	220	41
MK-CI 420-050 WA	455	110	50	482	209	980	60	125	185	41
MK-CI 420-070 WA	455	130	70	691	290	1410	77	138	200	41
MK-CI 420-100 WA	455	160	100	995	412	2110	44	90	138	41
MK-CI 420-150 WA	455	210	150	1458	585	731	44	90	138	41
MK-CI 450-030 WA	485	90	30	397	180	732	145	300	400	44
MK-CI 450-030 WB	485	70	30	402	181	1219	325	625	800	45
MK-CI 450-050 WA	485	110	50	670	290	1221	70	180	240	44
MK-CIC 450-050 WA	485	90	50	670	290	1219	70	180	240	48
MK-CI 450-050 WB	485	110	50	679	293	1221	200	380	470	45
MK-CIC 450-050 WB	485	90	70	679	293	1707	200	380	470	49
MK-CI 450-070 WA	485	130	70	938	403	1712	55	120	170	44
MK-CIC 450-070 WA	485	110	50	938	403	1707	55	120	170	48
MK-CI 450-070 WB	485	130	70	950	404	1712	120	260	340	45
MK-CIC 450-070 WB	485	110	70	950	404	2439	120	260	340	49
MK-CI 450-100 WA	485	160	100	1355	570	2445	20	80	110	44
MK-CI 450-100 WB	485	140	100	1355	570	3647	85	170	230	45
MK-CI 450-150 WA	485	210	150	2119	831	3647	55	110	160	44
MK-CI 450-150 WB	485	190	150	2109	827	1080	125	230	310	45
MK-CI 530-030 WA	565	90	30	557	251	1715	75	170	235	53
MK-CI 530-050 WA	565	110	50	924	420	1715	40	100	140	53
MK-CIC 530-050 WA	565	90	50	924	420	2455	40	100	140	56
MK-CI 530-070 WA	565	130	70	1424	580	2455	25	65	95	53
MK-CIC 530-070 WA	565	110	70	1424	580	3600	25	65	95	56
MK-CI 530-100 WA	565	160	100	2076	817	5400	45	100	145	53
MK-CI 530-150 WA	565	210	150	3050	1200	1143	25	65	95	53
MK-CI 560-30 WA	600	60	30	609	280	1925	75	175	240	59
MK-CI 560-50 WA	600	110	50	1022	465	2664	34	100	140	59
MK-CI 560-70 WA	600	130	70	1459	670	3800	29	87	120	59
MK-CI 560-100 WA	600	160	100	2084	897	5690	32	65	100	59
MK-CI 560-150 WA	600	210	150	2980	1360	2300	8	52	75	59
MK-CI 760-030 WA	795	110	30	1272	615	3770	23	62	93	63
MK-CI 760-050 WA	795	130	50	2076	995	5500	13	41	63	63
MK-CI 760-070 WA	795	150	70	3100	1350	7688	10	33	53	63
MK-CI 760-100 WA	795	180	100	4500	1841	11480	12	35	57	63
MK-CI 760-150 WA	795	230	150	6550	2800	4023	7	26	42	63
MK-CI 990-030 WA	1030	110	30	2124	1068	6700	31	74	105	67
MK-CI 990-050 WA	1030	130	50	3622	1724	9390	17	43	63	67
MK-CI 990-070 WA	1030	150	70	5095	2372	13400	9	29	44	67
MK-CI 990-100 WA	1030	180	100	7490	3290	20000	13	33	49	67
MK-CI 990-150 WA	1030	230	150	11200	4884	6280	5	20	32	67
MK-CI 1220-030 WA	1260	110	30	3377	1680	10470	18	45	67	71
MK-CI 1220-050 WA	1260	130	50	5670	2715	14570	9	26	40	71
MK-CI 1220-070 WA	1260	150	70	7691	3627	20850	7	23	35	71
MK-CI 1220-100 WA	1260	180	100	11811	5228	31290	9	23	36	71
MK-CI 1220-150 WA	1260	230	150	17300	7350	13240	3	14	23	71

Ordering Code



Example: **MK CI 990 070 WA MP 1**

Integration of new intermediate sizes

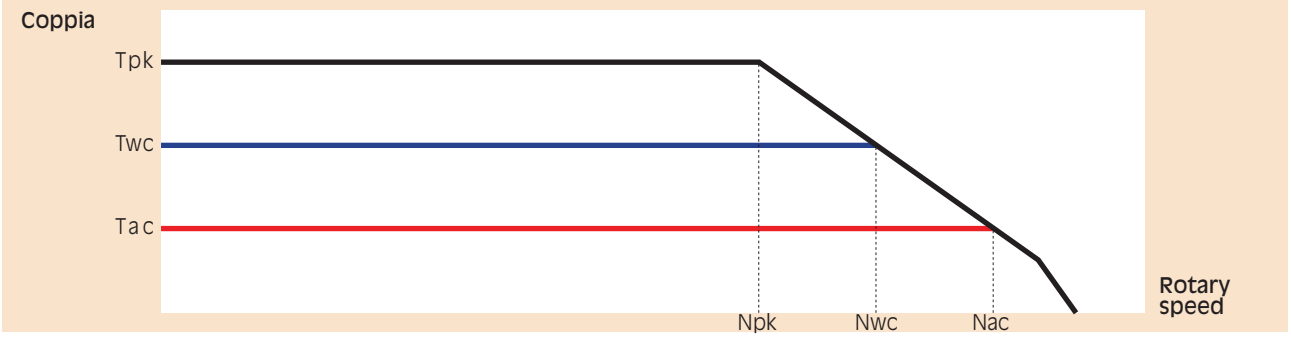
CIC — CIC Model – A Technai exclusive

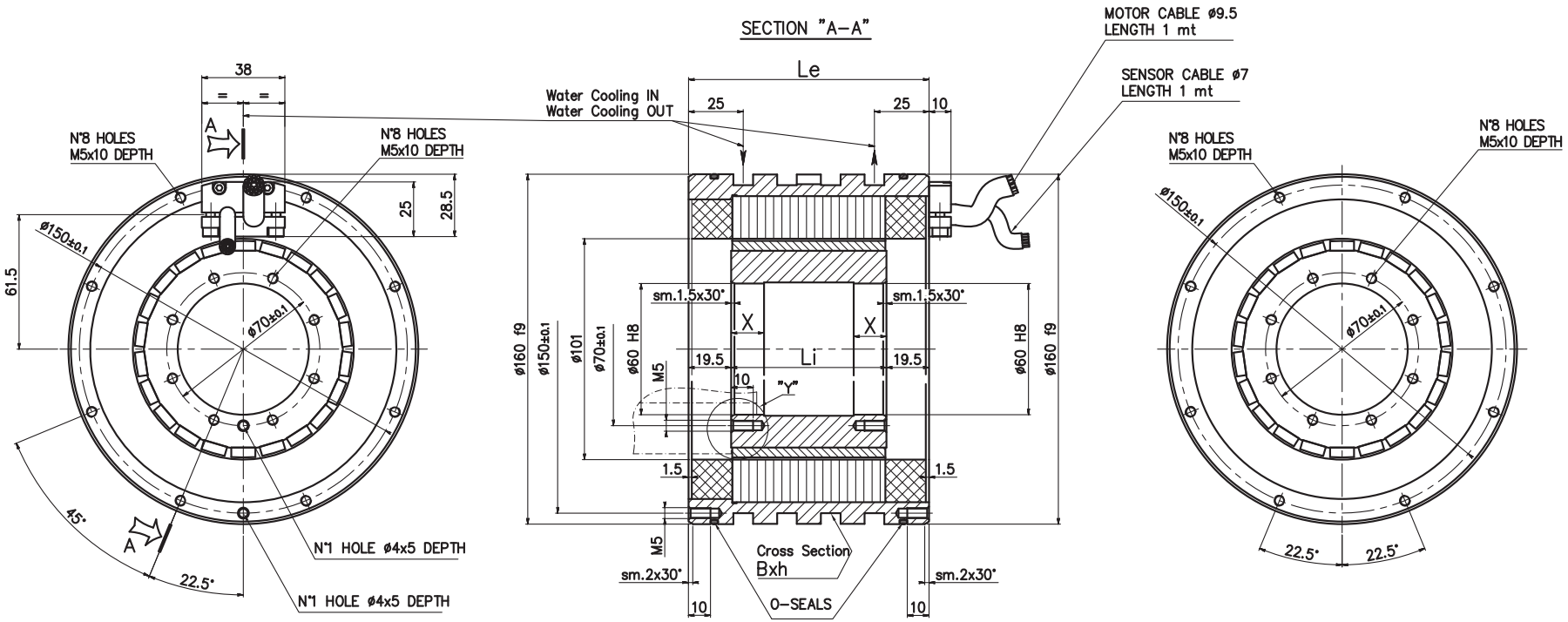
WS — Special winding configuration according with Technai technical department

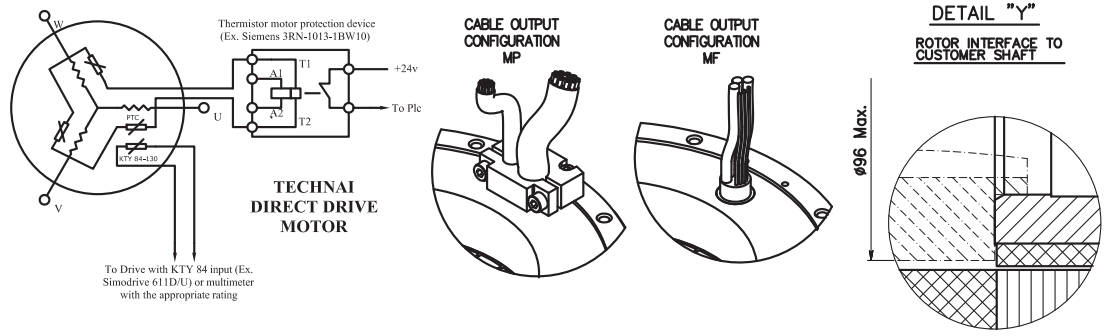
. . . — Greater heights are available on request

Motor Specifications TECHNAI MK-CI 140 WA

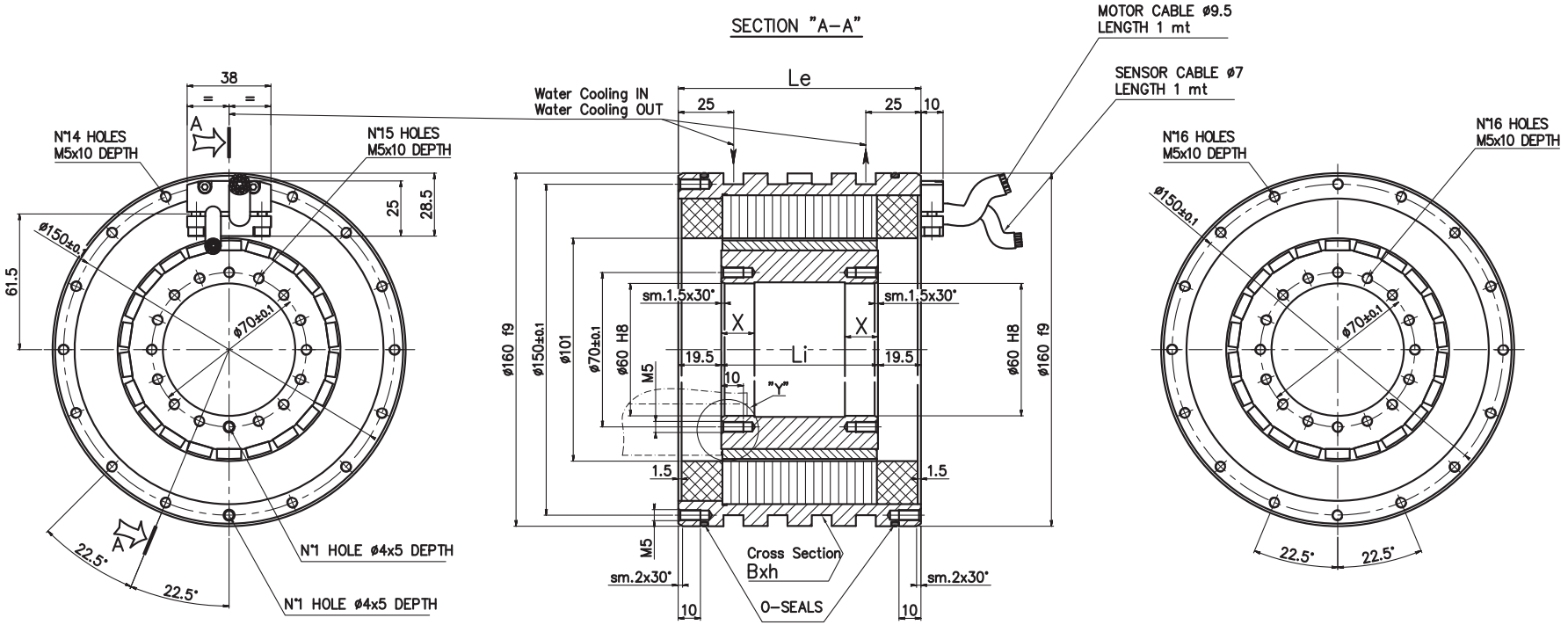
Motor Specifications	Symbol	Unit	MK-CI 140-030 WA	MK-CI 140-050 WA	MK-CI 140-070 WA	MK-CI 140-100 WA	MK-CI 140-150 WA
Number of pole	P		22	22	22	22	22
Peak Torque	Tpk	Nm	38	63	89	126	190
Continuos Torque (Water Cooling Dt100)	Twc	Nm	19,2	33,2	46	65	98,6
Continuos Torque (Air Cooling Dt100)	Tac	Nm	8,6	14,6	19,8	27,6	42
Stall Torque (Water Cooling)	Tswc	Nm	14,7	25,4	35,2	49,6	75,3
Stall Torque (Air Cooling)	Tsac	Nm	6,6	11,1	15,2	21	32
Ripple Torque (Cogging Torque)	Tr	Nm	0,2	0,35	0,5	0,6	0,75
Power Loss at Twc	Pwc	KW	0,7	1	1,2	1,45	1,9
Power Loss at Tac	Pac	KW	0,125	0,17	0,2	0,25	0,35
Termal Resistance Water Cooling	RthWc	K/W	0,153	0,1	0,09	0,07	0,054
Termal Resistance Air Cooling	RthAc	K/W	0,82	0,617	0,497	0,39	0,3
Torque Constant	Kt	Nm/A	3,3	5,6	5,4	7,8	11,7
Back EMF Constant	Ke	V/1000 Rpm	202	337	329	470	705
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	700	370	450	240	50
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	1000	850	900	600	360
Maximum Speed at Iac at 600 Vdc	Nac	RPM	1000	1000	1000	750	490
Winding Resistance (Phase to Phase)	R20	Ω	8,7	11,3	7,3	9,4	12,9
Winding Inductance (Phase to Phase)	L	mH	21,7	30	20	27,9	41,2
Peak Current	Ipk	Arms	16,5	16,3	23,5	23,4	23,4
Continuos Current (Water Cooling Dt100)	Iwc	Arms	6,1	6,2	8,6	8,5	8,5
Continuos Current (Air Cooling Dt100)	Iac	Arms	2,6	2,6	3,7	3,6	3,6
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	4,7	4,7	6,6	6,5	6,5
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	2	2	2,8	2,75	2,75
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	70	90	110	140	190
Outer Diameter of Stator		mm	160	160	160	160	160

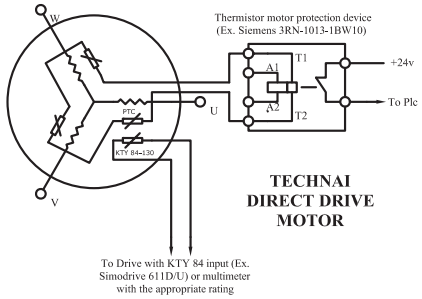


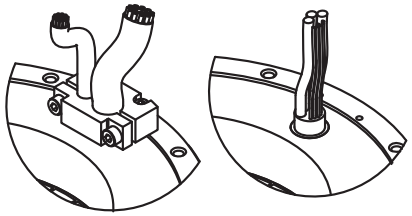


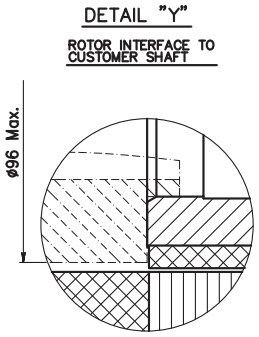


TYPE MK-CI 140		030	050	070
STATOR LENGHT	Le	70	90	110
ROTOR LENGHT	Li	31	51	71
CENTRING LENGHT	X	10	15	15
COOLING GROOVE WIDTH	B	8	8	9
COOLING GROOVE WIDTH	h	5	5	5
COOLING GROVE	No	2	4	4





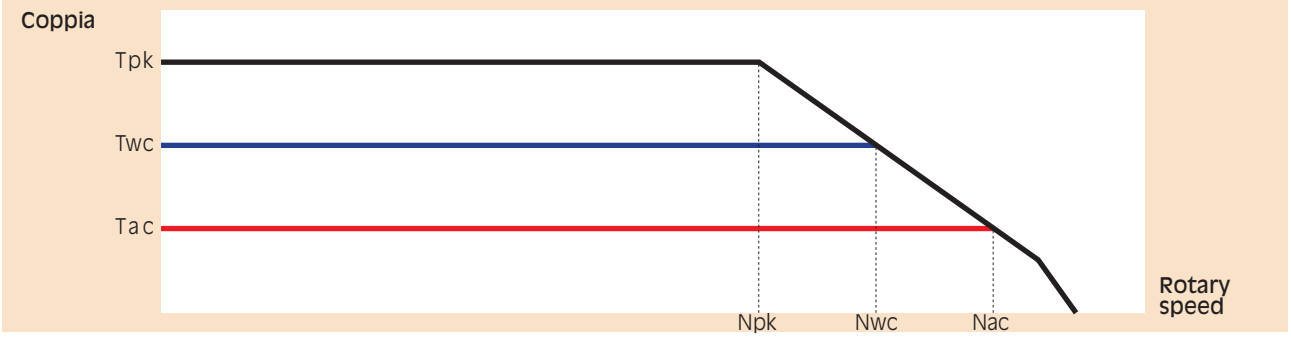




TYPE MK-CI 140		100	150	
STATOR LENGHT	Le	140	190	
ROTOR LENGHT	Li	101	151	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	9	
COOLING GROOVE WIDTH	h	5	5	
COOLING GROVE	No	8	8	

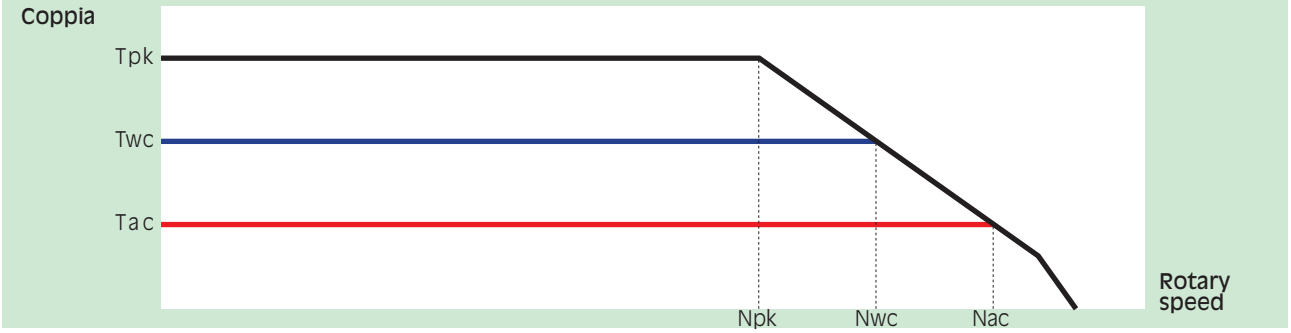
Motor Specifications TECHNAI MK-CI 175 WA

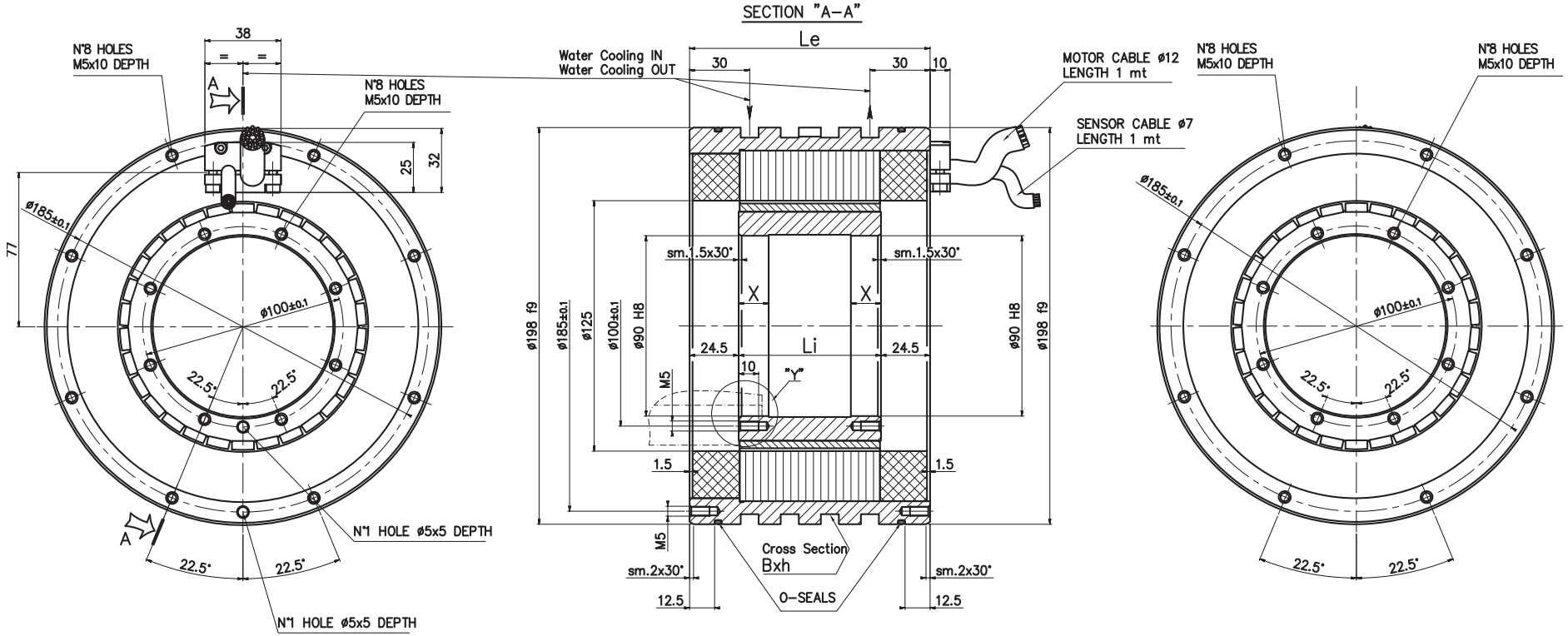
Motor Specifications	Symbol	Unit	MK-CI 175-030 WA	MK-CI 175-050 WA	MK-CI 175-070 WA	MK-CI 175-100 WA	MK-CI 175-150 WA
Number of pole	P		30	30	30	30	30
Peak Torque	Tpk	Nm	72	120	168	240	360
Continuos Torque (Water Cooling Dt100)	Twc	Nm	37	64	91	135	209
Continuos Torque (Air Cooling Dt100)	Tac	Nm	17	29	40	57	89
Stall Torque (Water Cooling)	Tswc	Nm	28	49	70	103	160
Stall Torque (Air Cooling)	Tsac	Nm	13	22	31	44	68
Ripple Torque (Cogging Torque)	Tr	Nm	2,5	4	5	7	10
Power Loss at Twc	Pwc	KW	0,75	1	1,35	1,9	2,6
Power Loss at Tac	Pac	KW	0,16	0,22	0,27	0,35	0,46
Termal Resistance Water Cooling	RthWc	K/W	0,133	0,094	0,073	0,054	0,039
Termal Resistance Air Cooling	RthAc	K/W	0,604	0,464	0,377	0,294	0,215
Torque Constant	Kt	Nm/A	3,2	5,94	8,31	11,9	15,3
Back EMF Constant	Ke	V/1000 Rpm	214	360	502	717	922
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	750	450	320	200	130
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	1550	850	620	400	300
Maximum Speed at Iac at 600 Vdc	Nac	RPM	1850	1100	750	525	410
Winding Resistance (Phase to Phase)	R20	Ω	3,6	4,2	5,2	6,6	6,2
Winding Inductance (Phase to Phase)	L	mH	11,3	18	24,7	35	38
Peak Current	Ipk	Arms	29	29	29	29	33,7
Continuos Current (Water Cooling Dt100)	Iwc	Arms	10,6	11	11,2	11,6	14,2
Continuos Current (Air Cooling Dt100)	Iac	Arms	5	5	5	5	6
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	8,1	8,4	8,5	8,9	10,8
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	3,8	3,8	3,8	3,8	4,5
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	80	100	120	150	200
Outer Diameter of Stator		mm	198	198	198	198	198

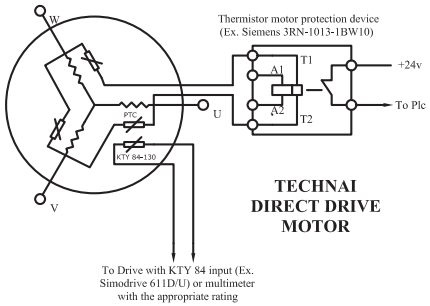


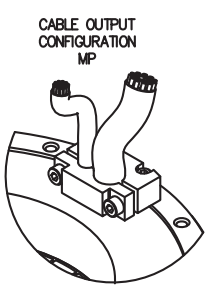
Motor Specifications TECHNAI MK-CI 175 WB

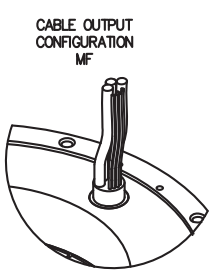
Motor Specifications	Symbol	Unit	MK-CI 175-030 WB	MK-CI 175-050 WB	MK-CI 175-070 WB	MK-CI 175-100 WB	MK-CI 175-150 WB
Number of pole	P		30	30	30	30	30
Peak Torque	Tpk	Nm	72	120	168	240	362
Continuos Torque (Water Cooling Dt100)	Twc	Nm	37	64	91	135	205
Continuos Torque (Air Cooling Dt100)	Tac	Nm	17	29	40	58	87
Stall Torque (Water Cooling)	Tswc	Nm	28	49	70	103	156
Stall Torque (Air Cooling)	Tsac	Nm	13	22	31	44	67
Ripple Torque (Cogging Torque)	Tr	Nm	2,5	4	5	7	10
Power Loss at Twc	Pwc	KW	0,75	1	1,35	1,9	2,65
Power Loss at Tac	Pac	KW	0,16	0,22	0,27	0,35	0,47
Termal Resistance Water Cooling	RthWc	K/W	0,133	0,094	0,073	0,054	0,039
Termal Resistance Air Cooling	RthAc	K/W	0,604	0,464	0,377	0,294	0,215
Torque Constant	Kt	Nm/A	1,52	2,54	3,6	5,1	7,6
Back EMF Constant	Ke	V/1000 Rpm	92	154	215	308	461
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	2000	1200	850	600	360
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	3800	2100	1550	1050	660
Maximum Speed at Iac at 600 Vdc	Nac	RPM	4300	2600	1850	1300	850
Winding Resistance (Phase to Phase)	R20	Ω	0,6	0,76	0,95	1,21	1,7
Winding Inductance (Phase to Phase)	L	mH	2,1	3,3	4,6	6,4	9,5
Peak Current	Ipk	Arms	67,7	67,7	67,7	67,7	68
Continuos Current (Water Cooling Dt100)	Iwc	Arms	24,8	25,7	26,2	27,2	27,6
Continuos Current (Air Cooling Dt100)	Iac	Arms	11,6	11,6	11,6	11,6	11,7
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	18,9	19,7	20	20,7	21,1
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	8,9	8,9	8,9	8,9	8,9
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	80	100	120	150	200
Outer Diameter of Stator		mm	198	198	198	198	198

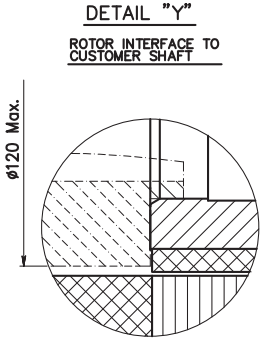




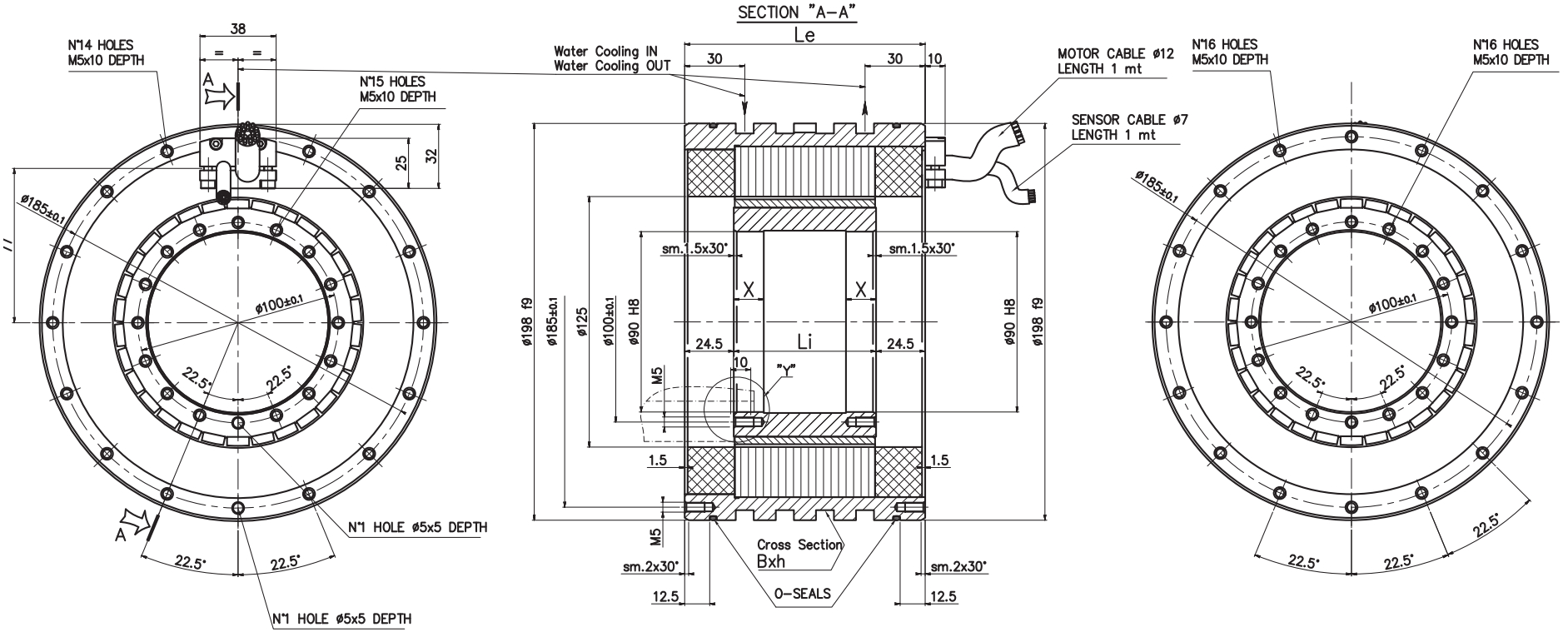


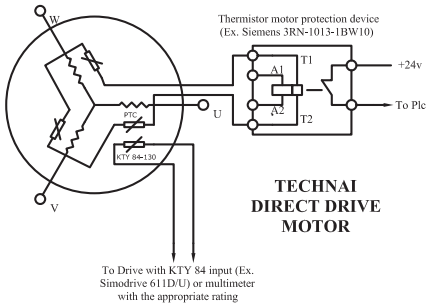


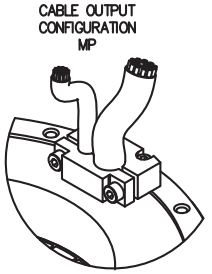


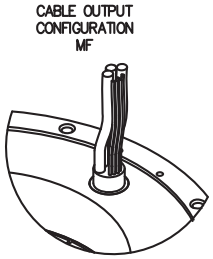


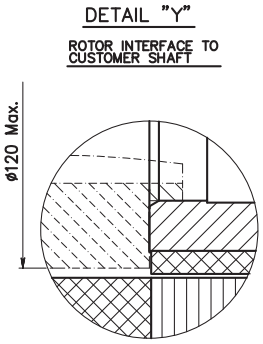
TYPE MK-CI 175		030	050	070
STATOR LENGHT	Le	80	100	120
ROTOR LENGHT	Li	31	51	71
CENTRING LENGHT	X	10	15	15
COOLING GROOVE WIDTH	B	8	8	9
COOLING GROOVE WIDTH	h	5	5	5
COOLING GROVE	No	2	4	4







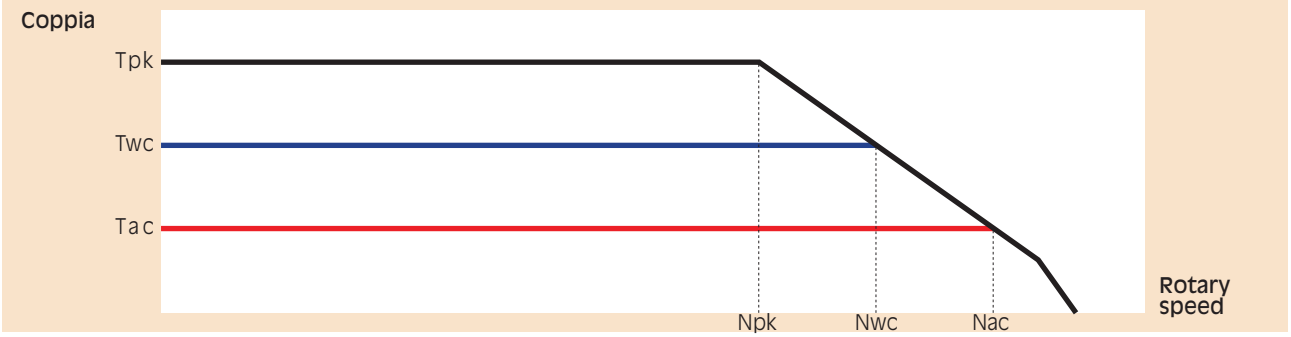




TYPE MK-CI 175		100	150	
STATOR LENGHT	Le	150	200	
ROTOR LENGHT	Li	101	151	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	9	
COOLING GROOVE WIDTH	h	5	5	
COOLING GROVE	No	8	8	

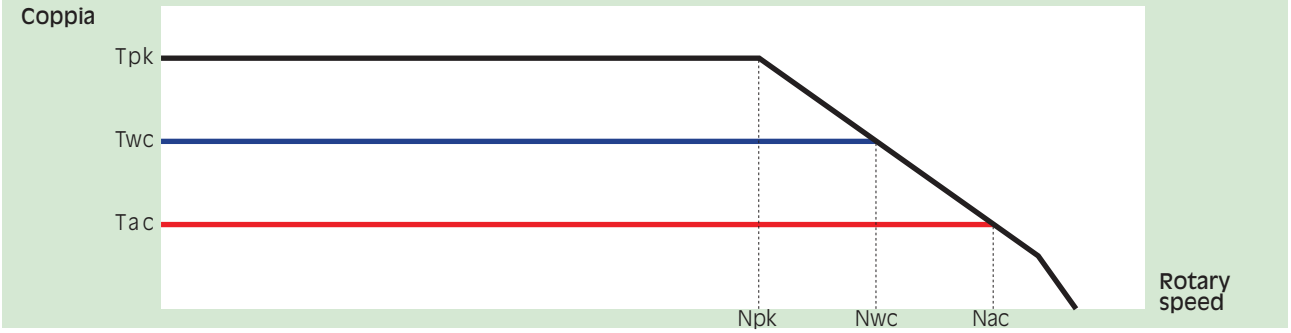
Motor Specifications TECHNAI MK-CI 210 WA

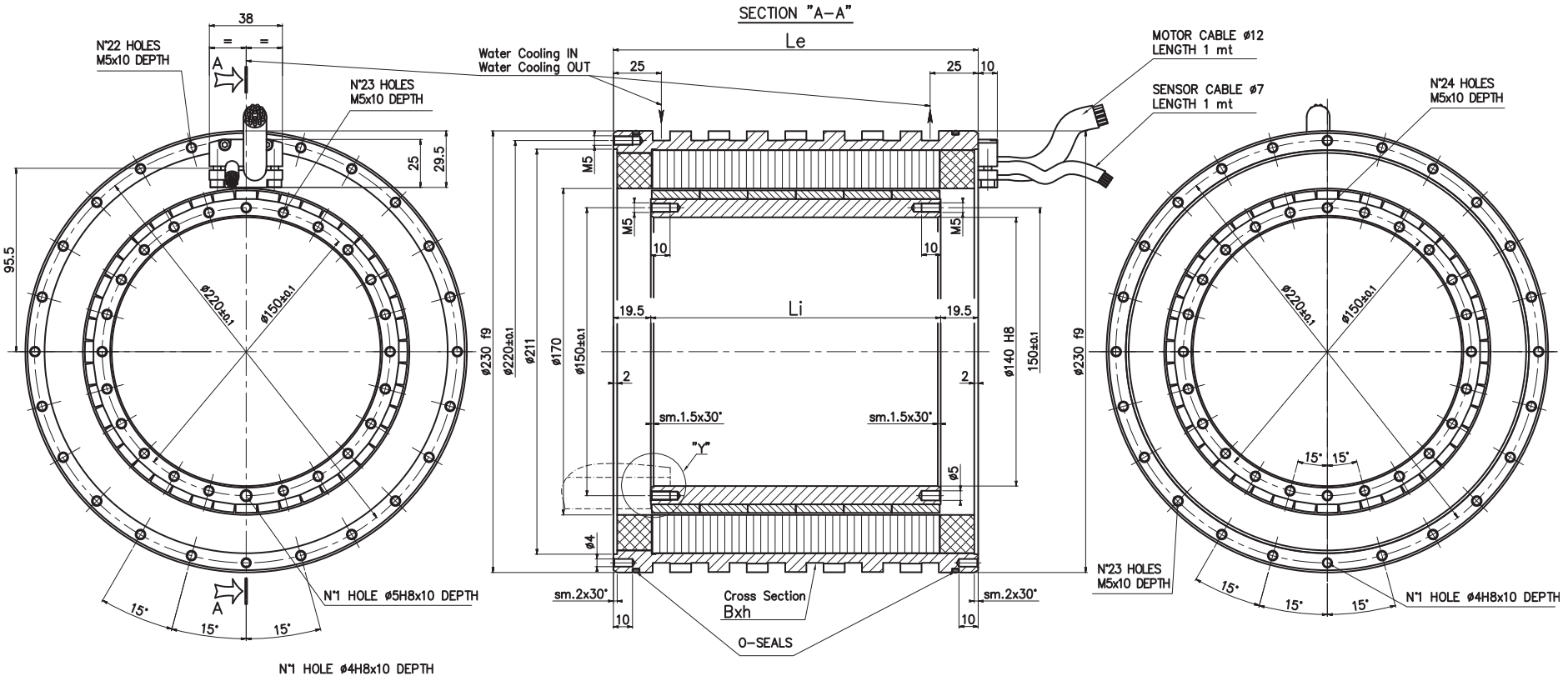
Motor Specifications	Symbol	Unit	MK-CI 210-030 WA	MK-CI 210-050 WA	MK-CI 210-070 WA	MK-CI 210-100 WA	MK-CI 210-150 WA
Number of pole	P		44	44	44	44	44
Peak Torque	Tpk	Nm	135	224	310	442	660
Continuos Torque (Water Cooling Dt100)	Twc	Nm	68	118	165	241	368
Continuos Torque (Air Cooling Dt100)	Tac	Nm	27	45	63	85	133
Stall Torque (Water Cooling)	Tswc	Nm	52	90	126	183	281
Stall Torque (Air Cooling)	Tsac	Nm	20	35	48	65	101
Ripple Torque (Cogging Torque)	Tr	Nm	0,4	0,7	0,9	1,4	2
Power Loss at Twc	Pwc	KW	1,4	2	2,5	3,4	4,9
Power Loss at Tac	Pac	KW	0,2	0,3	0,38	0,45	0,64
Termal Resistance Water Cooling	RthWc	K/W	0,085	0,058	0,045	0,033	0,023
Termal Resistance Air Cooling	RthAc	K/W	0,534	0,398	0,317	0,243	0,175
Torque Constant	Kt	Nm/A	6,2	10,4	14,5	11,33	17
Back EMF Constant	Ke	V/1000 Rpm	382	637	892	695	1030
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	350	175	80	165	80
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	750	440	280	420	240
Maximum Speed at Iac at 600 Vdc	Nac	RPM	1000	600	400	560	360
Winding Resistance (Phase to Phase)	R20	Ω	5,74	7,5	9,34	3,6	4,96
Winding Inductance (Phase to Phase)	L	mH	13,26	21,11	28,8	12,12	17,97
Peak Current	Ipk	Arms	31	30,8	30,6	56	56
Continuos Current (Water Cooling Dt100)	Iwc	Arms	10,92	11,5	11,5	21,4	22
Continuos Current (Air Cooling Dt100)	Iac	Arms	4,24	4,4	4,4	7,6	7,9
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	8,5	8,7	8,8	16,3	16,6
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	3,3	3,3	3,3	5,8	6
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	70	90	110	140	190
Outer Diameter of Stator		mm	230	230	230	230	230

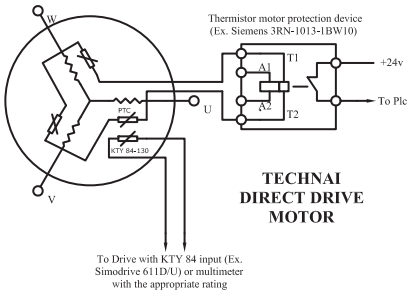


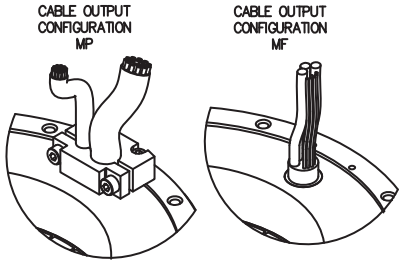
Motor Specifications TECHNAI MK-CI 210 WB

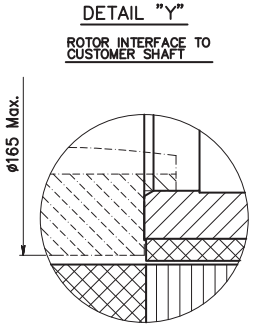
Motor Specifications	Symbol	Unit	MK-CI 210-030 WB	MK-CI 210-050 WB	MK-CI 210-070 WB	MK-CI 210-100 WB	MK-CI 210-150 WB
Number of pole	P		44	44	44	44	44
Peak Torque	Tpk	Nm	135	224	312	447	670
Continuos Torque (Water Cooling Dt100)	Twc	Nm	68	118	165	240	365
Continuos Torque (Air Cooling Dt100)	Tac	Nm	26	45	63	87	132
Stall Torque (Water Cooling)	Tswc	Nm	51	90	126	183	281
Stall Torque (Air Cooling)	Tsac	Nm	20	35	48	66	101
Ripple Torque (Cogging Torque)	Tr	Nm	0,4	0,7	0,9	1,3	2
Power Loss at Twc	Pwc	KW	1,42	2	2,5	3,4	4,9
Power Loss at Tac	Pac	KW	0,22	0,3	0,38	0,45	0,64
Termal Resistance Water Cooling	RthWc	K/W	0,085	0,058	0,045	0,033	0,023
Termal Resistance Air Cooling	RthAc	K/W	0,534	0,398	0,317	0,243	0,175
Torque Constant	Kt	Nm/A	3,12	5,2	7,3	8,5	12,8
Back EMF Constant	Ke	V/1000 Rpm	191	318	446	521	787
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	800	520	350	260	150
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	1700	1000	670	560	360
Maximum Speed at Iac at 600 Vdc	Nac	RPM	2100	1250	900	760	475
Winding Resistance (Phase to Phase)	R20	Ω	1,43	1,88	2,34	2,03	2,8
Winding Inductance (Phase to Phase)	L	mH	3,11	5,3	7,3	6,82	12,8
Peak Current	Ipk	Arms	62,5	62	61,4	75,5	75
Continuos Current (Water Cooling Dt100)	Iwc	Arms	22	23	22,8	28,3	28,9
Continuos Current (Air Cooling Dt100)	Iac	Arms	8,5	8,8	8,8	10,3	10,5
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	16,6	17,5	17,4	21,6	22
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	6,5	6,7	6,7	7,9	8
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	70	90	110	140	190
Outer Diameter of Stator		mm	230	230	230	230	230







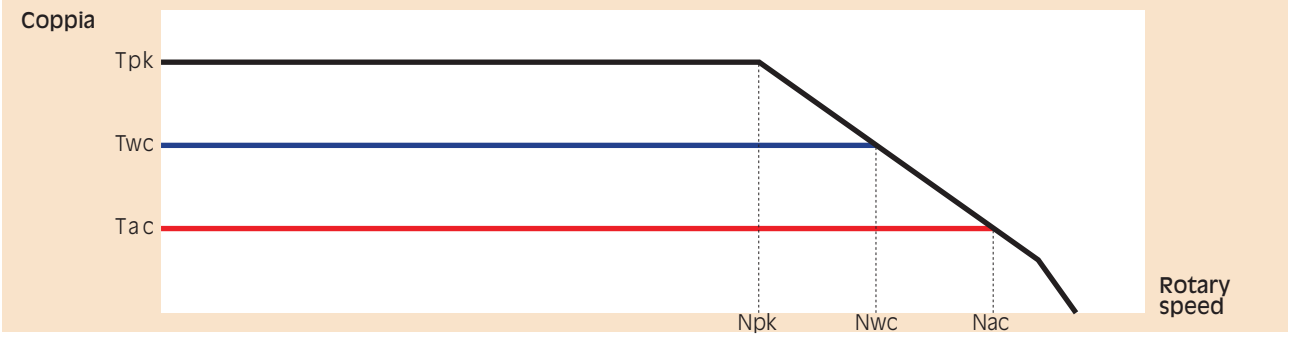


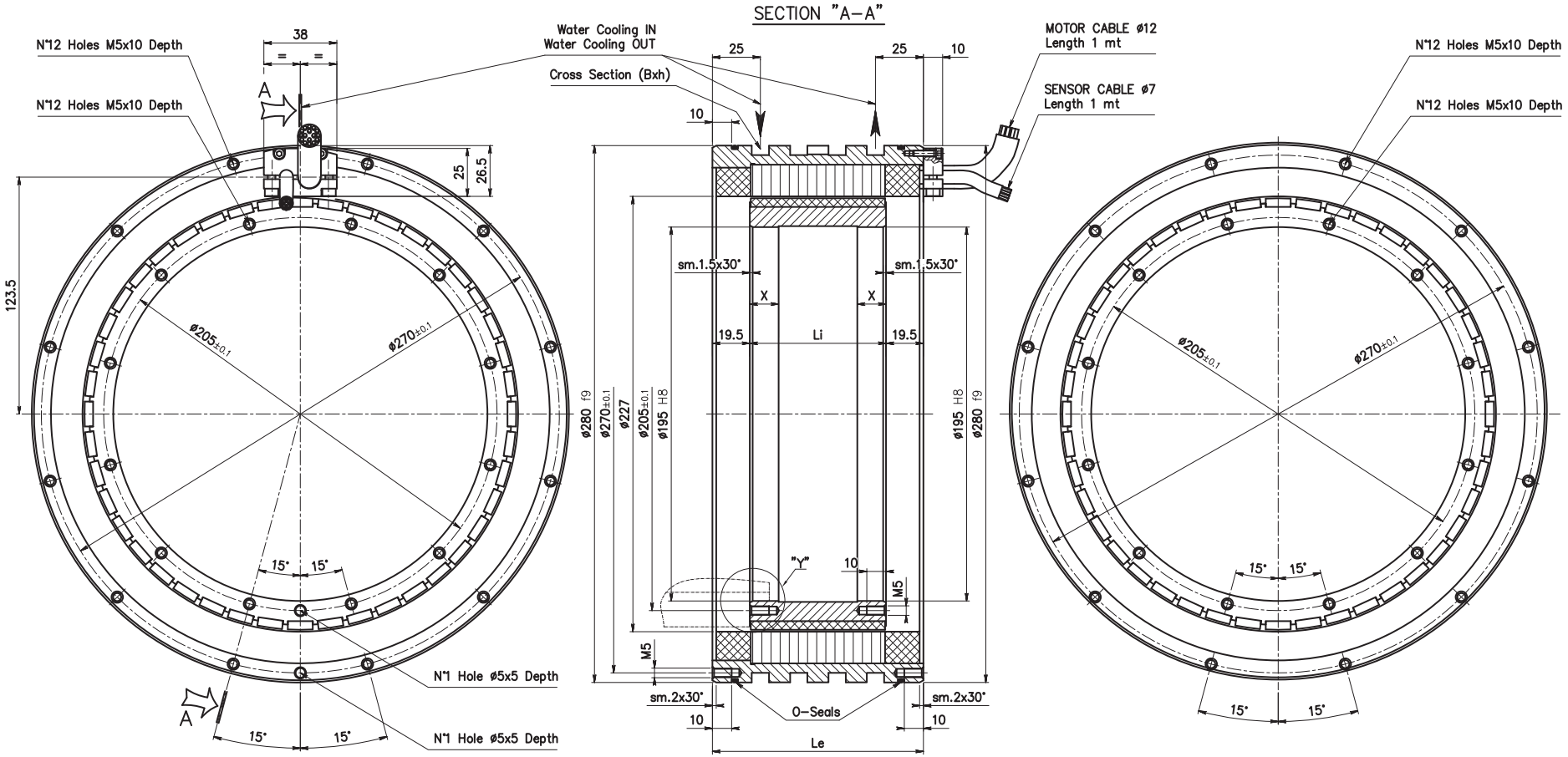


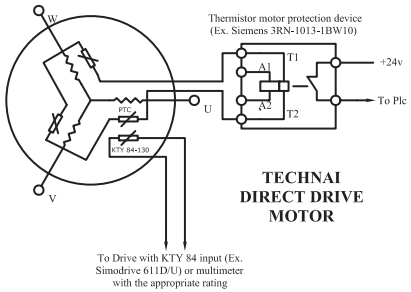
TYPE MK-CI 210		030	050	070	100	150
STATOR LENGHT	Le	70	90	110	140	190
ROTOR LENGHT	Li	31	51	71	101	151
CENTRING LENGHT	X	10	15	15	15	15
COOLING GROOVE WIDTH	B	8	8	9	8	9
COOLING GROOVE WIDTH	h	5	5	5	5	5
COOLING GROVE	No	2	4	4	8	8

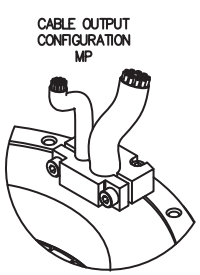
Motor Specifications TECHNAI MK-CI 260 WA

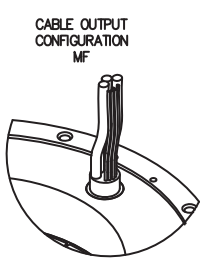
Motor Specifications	Symbol	Unit	MK-CI 260-030 WA	MK-CI 260-050 WA	MK-CI 260-070 WA	MK-CI 260-100 WA	MK-CI 260-150 WA
Number of pole	P		44	44	44	44	44
Peak Torque	Tpk	Nm	130	218	305	431	647
Continuos Torque (Water Cooling Dt100)	Twc	Nm	87	144	201	288	402
Continuos Torque (Air Cooling Dt100)	Tac	Nm	37	62	83	114	163
Stall Torque (Water Cooling)	Tswc	Nm	66,6	110	153	220	307
Stall Torque (Air Cooling)	Tsac	Nm	28	46	63	87	125
Ripple Torque (Cogging Torque)	Tr	Nm	0,8	1	1,5	2,1	3
Power Loss at Twc	Pwc	KW	2	2,5	3	3,8	5,2
Power Loss at Tac	Pac	KW	0,35	0,43	0,52	0,6	0,85
Termal Resistance Water Cooling	RthWc	K/W	0,049	0,041	0,034	0,026	0,019
Termal Resistance Air Cooling	RthAc	K/W	0,271	0,232	0,2	0,17	0,12
Torque Constant	Kt	Nm/A	6,4	10,6	15	21,3	21,3
Back EMF Constant	Ke	V/1000 Rpm	384	640	901	1288	1288
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	530	285	185	100	95
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	710	420	285	180	180
Maximum Speed at Iac at 600 Vdc	Nac	RPM	930	550	390	265	265
Winding Resistance (Phase to Phase)	R20	Ω	4,5	5,85	7,2	9,2	6,5
Winding Inductance (Phase to Phase)	L	mH	9,9	15,4	21	29,2	19,1
Peak Current	Ipk	Arms	23	23	23	23	34
Continuos Current (Water Cooling Dt100)	Iwc	Arms	14,5	14,2	14,2	14,1	19,6
Continuos Current (Air Cooling Dt100)	Iac	Arms	6,1	5,9	5,8	5,6	8
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	11	10,8	10,8	10,7	15
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	4,6	4,5	4,4	4,3	6,1
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	70	90	110	140	190
Outer Diameter of Stator		mm	280	280	280	280	280

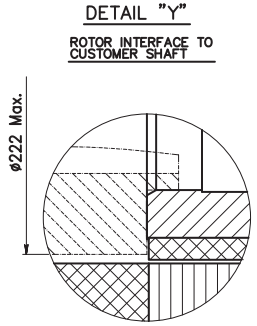




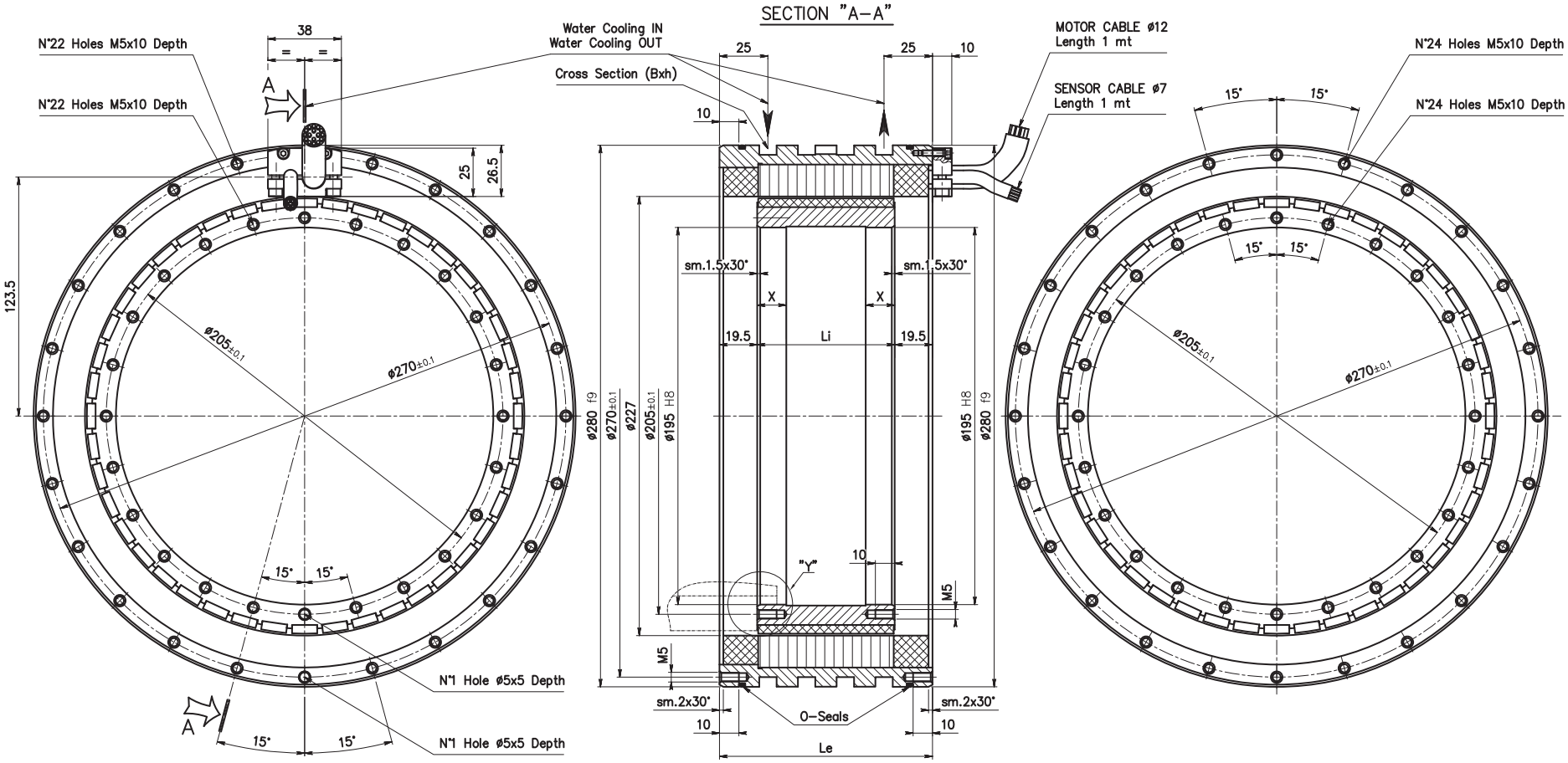


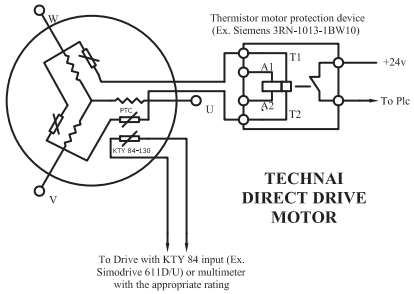


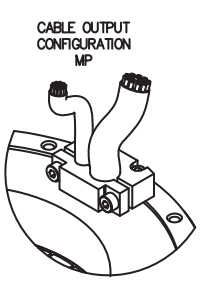


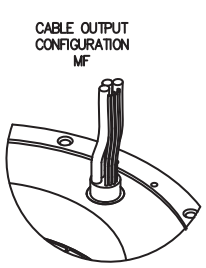


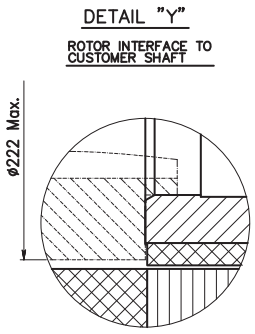
TYPE MK-CI 260		030	050	070
STATOR LENGHT	Le	70	90	110
ROTOR LENGHT	Li	31	51	71
CENTRING LENGHT	X	10	15	15
COOLING GROOVE WIDTH	B	8	8	9
COOLING GROOVE WIDTH	h	5	5	5
COOLING GROVE	No	2	4	4







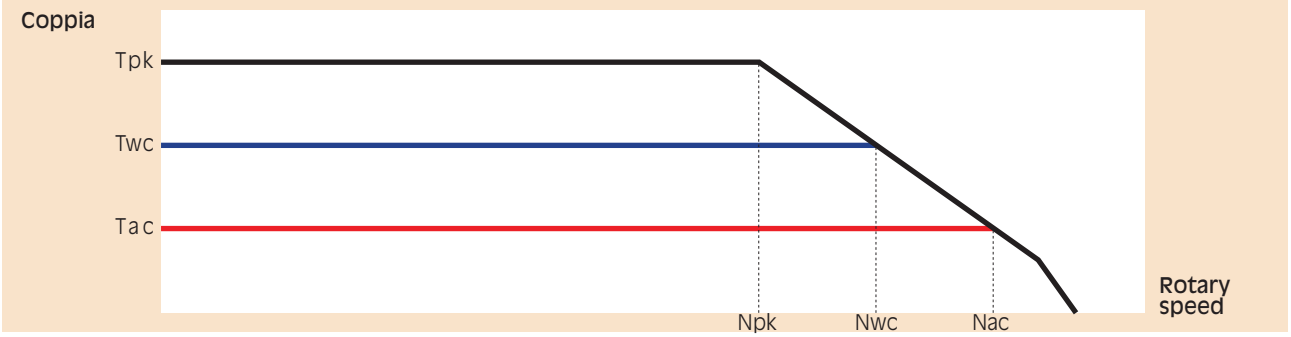




TYPE MK-CI 260		100	150	
STATOR LENGHT	Le	140	190	
ROTOR LENGHT	Li	101	151	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	9	
COOLING GROOVE WIDTH	h	5	5	
COOLING GROVE	No	8	8	

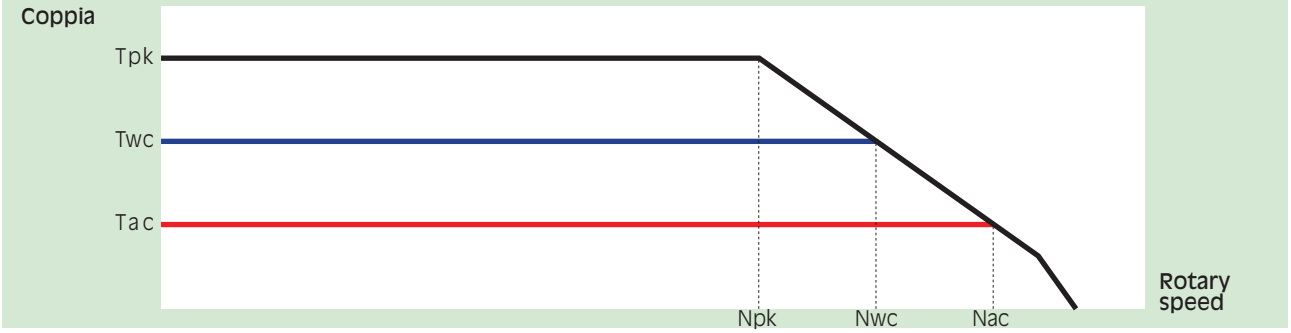
Motor Specifications TECHNAI MK-CI 290 WA - MK-CI 290 S WA

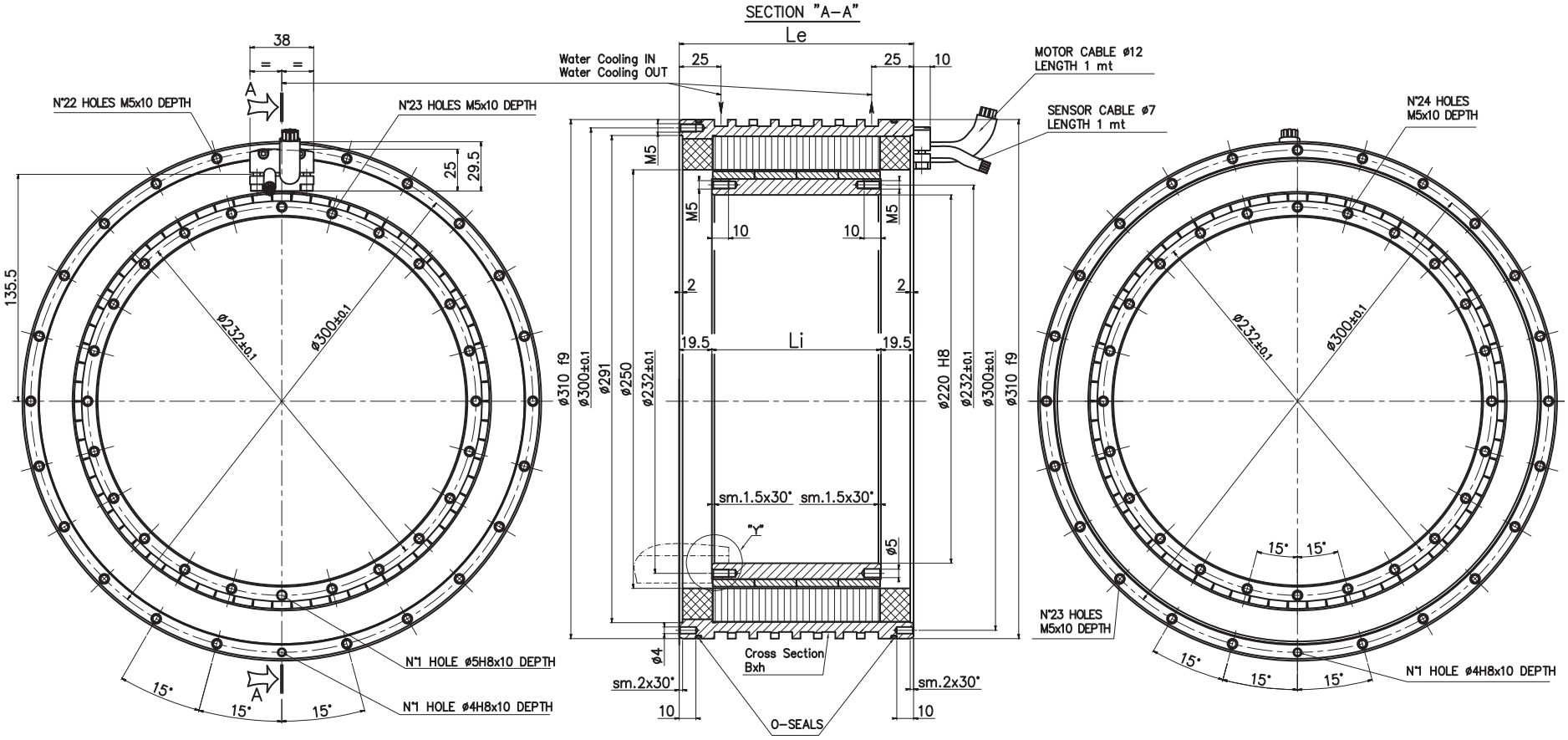
Motor Specifications	Symbol	Unit	MK-CI 290-030 WA	MK-CI 290-050 WA	MK-CI 290-070 WA	MK-CI 290-100 WA	MK-CI 290-150 WA
Number of pole	P		66	66	66	66	66
Peak Torque	Tpk	Nm	260	433	646	868	1290
Continuos Torque (Water Cooling Dt100)	Twc	Nm	134	227	322	455	695
Continuos Torque (Air Cooling Dt100)	Tac	Nm	59	96	132	186	275
Stall Torque (Water Cooling)	Tswc	Nm	102	173	246	347	530
Stall Torque (Air Cooling)	Tsac	Nm	45	73	101	141	210
Ripple Torque (Cogging Torque)	Tr	Nm	1,2	2	2,8	4	6
Power Loss at Twc	Pwc	KW	1,7	2,35	3	4,1	5,7
Power Loss at Tac	Pac	KW	0,35	0,45	0,55	0,7	0,95
Termal Resistance Water Cooling	RthWc	K/W	0,067	0,047	0,037	0,027	0,019
Termal Resistance Air Cooling	RthAc	K/W	0,314	0,264	0,215	0,169	0,124
Torque Constant	Kt	Nm/A	8,06	13,5	15,9	27,1	40,6
Back EMF Constant	Ke	V/1000 Rpm	494	827	975	1661	2492
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	330	180	130	40	10
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	660	370	310	170	85
Maximum Speed at Iac at 600 Vdc	Nac	RPM	760	460	390	230	130
Winding Resistance (Phase to Phase)	R20	Ω	2,9	3,9	3,44	6,5	9,1
Winding Inductance (Phase to Phase)	L	mH	6,8	10,8	10,5	20,8	31
Peak Current	Ipk	Arms	46	46	58	46	45,6
Continuos Current (Water Cooling Dt100)	Iwc	Arms	16,9	17	20,5	17	17,3
Continuos Current (Air Cooling Dt100)	Iac	Arms	7,5	7,4	8,5	7,1	7
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	12,9	12,9	15,7	13	13,22
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	5,7	5,6	6,5	5,4	5,4
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	70	90	110	140	190
Outer Diameter of Stator		mm	310	310	310	310	310

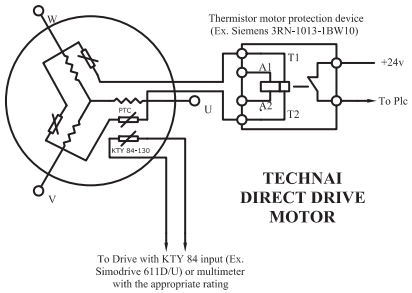


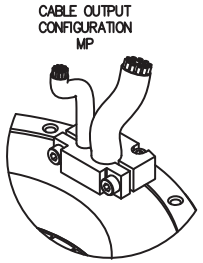
Motor Specifications TECHNAI MK-CI 290 WB - MK-CI 290 S WB

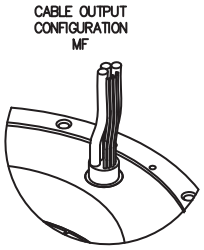
Motor Specifications	Symbol	Unit	MK-CI 290-030 WB	MK-CI 290-050 WB	MK-CI 290-070 WB	MK-CI 290-100 WB	MK-CI 290-150 WB
Number of pole	P		66	66	66	66	66
Peak Torque	Tpk	Nm	260	432	606	868	1290
Continuos Torque (Water Cooling Dt100)	Twc	Nm	134	227	320	460	695
Continuos Torque (Air Cooling Dt100)	Tac	Nm	54	96	132	181	272
Stall Torque (Water Cooling)	Tswc	Nm	102	173	244	351	531
Stall Torque (Air Cooling)	Tsac	Nm	41	73	101	138	207
Ripple Torque (Cogging Torque)	Tr	Nm	1	1,7	2,8	4	6,1
Power Loss at Twc	Pwc	KW	1,7	2,35	3	4,1	5,7
Power Loss at Tac	Pac	KW	0,35	0,45	0,55	0,7	0,95
Termal Resistance Water Cooling	RthWc	K/W	0,067	0,047	0,037	0,027	0,019
Termal Resistance Air Cooling	RthAc	K/W	0,314	0,264	0,215	0,169	0,124
Torque Constant	Kt	Nm/A	3,7	6,75	9,5	13,55	20,3
Back EMF Constant	Ke	V/1000 Rpm	227	413	579	830	1246
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	750	450	300	200	110
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	1430	850	575	380	250
Maximum Speed at Iac at 600 Vdc	Nac	RPM	1700	960	700	490	310
Winding Resistance (Phase to Phase)	R20	Ω	0,72	1	1,2	1,62	2,27
Winding Inductance (Phase to Phase)	L	mH	1,7	2,7	3,7	5,2	7,7
Peak Current	Ipk	Arms	92	92	92	92	91,3
Continuos Current (Water Cooling Dt100)	Iwc	Arms	33,5	34,2	34,3	35	34,7
Continuos Current (Air Cooling Dt100)	Iac	Arms	15	14,5	14,6	13,8	13,8
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	25,5	26	26,2	26,7	26,5
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	11,5	11,1	11,1	10,5	10,5
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	70	90	110	140	190
Outer Diameter of Stator		mm	310	310	310	310	310

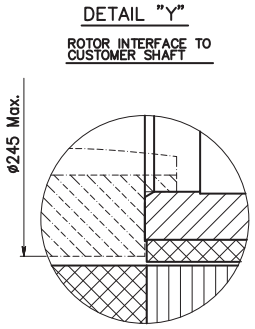




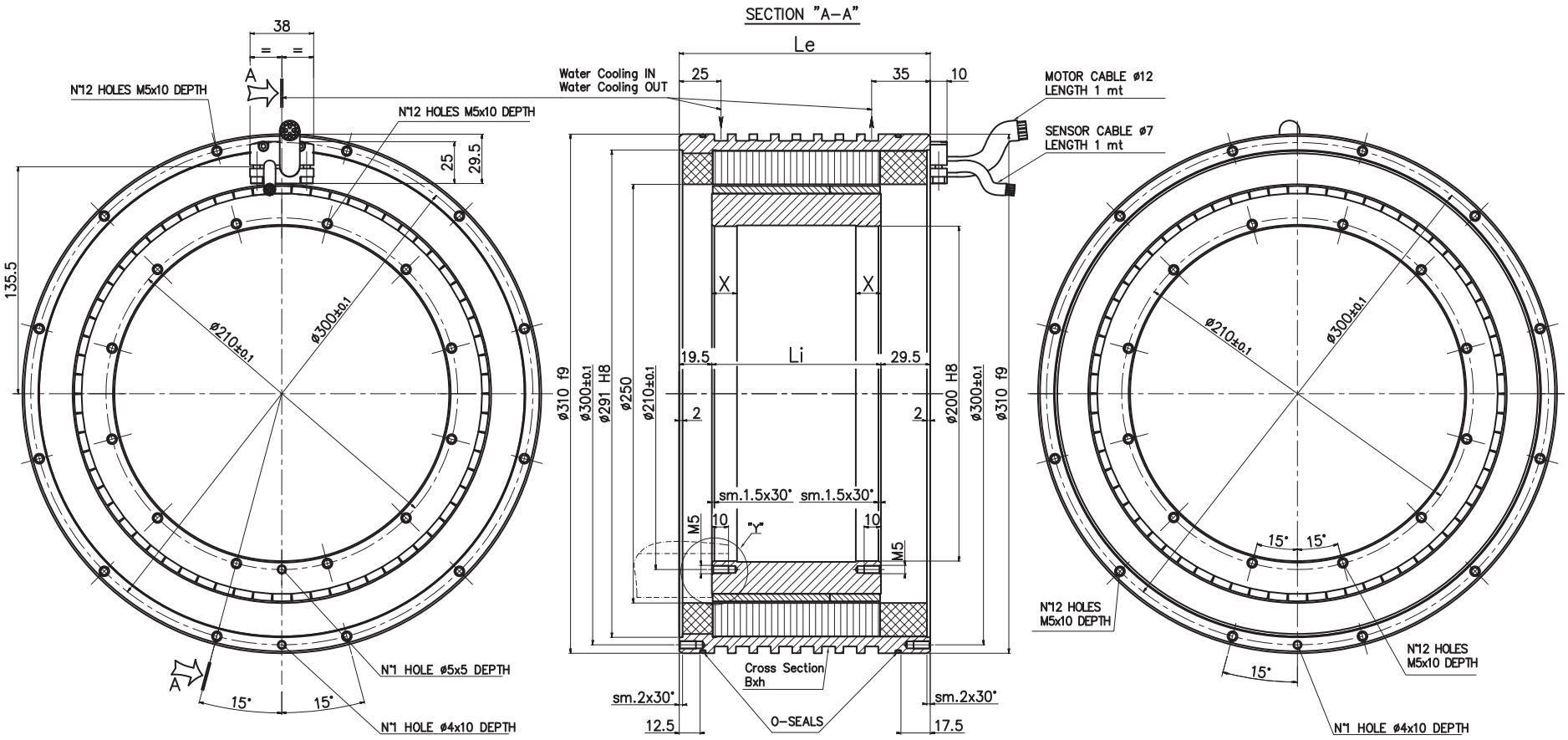


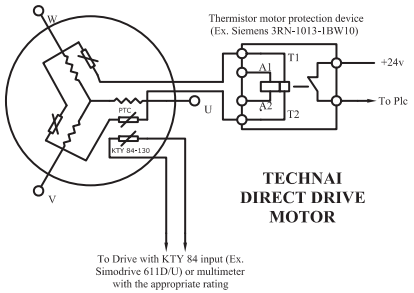


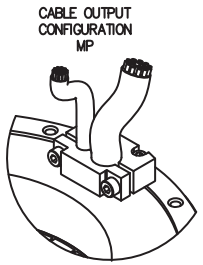


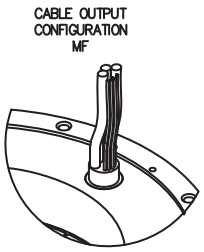


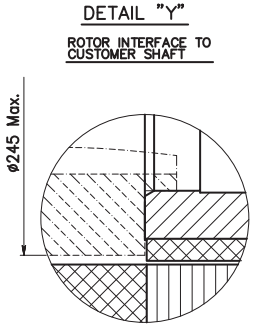
TYPE MK-CI 290		030	050	070	100	150
STATOR LENGHT	Le	70	90	110	140	190
ROTOR LENGHT	Li	31	51	71	101	151
CENTRING LENGHT	X	10	15	15	15	15
COOLING GROOVE WIDTH	B	8	8	9	8	9
COOLING GROOVE WIDTH	h	4	4	4	4	4
COOLING GROVE	No	2	4	4	8	8



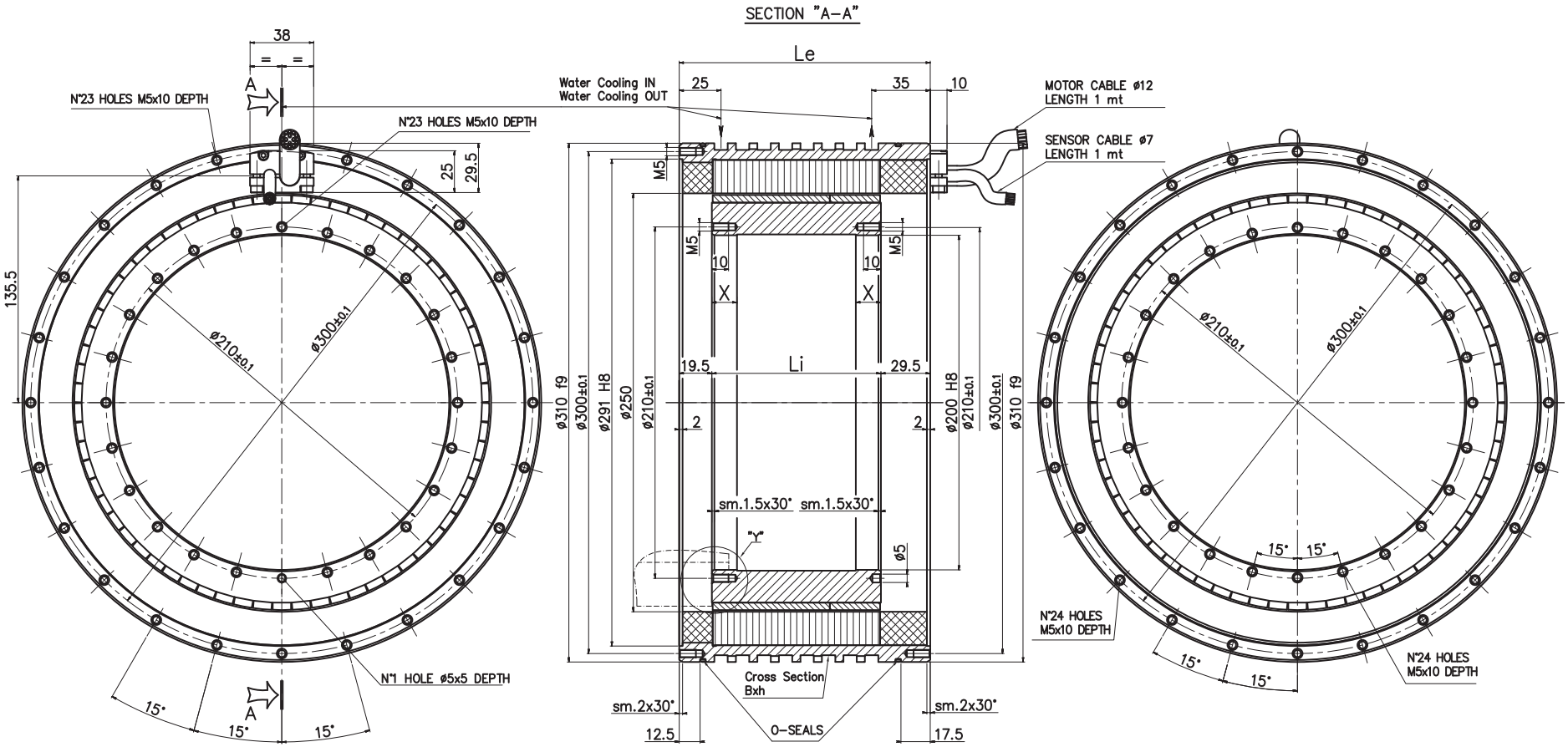


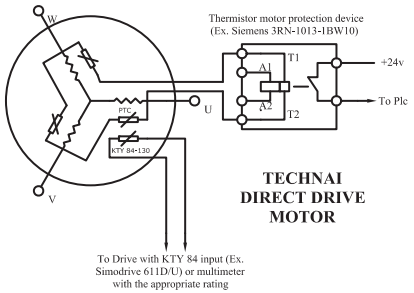


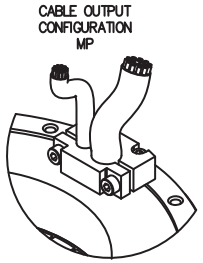


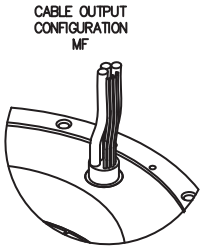


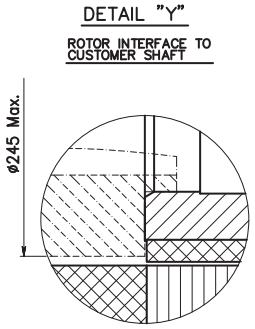
TYPE MK-CI 290S		030	050	070
STATOR LENGHT	Le	80	100	120
ROTOR LENGHT	Li	31	51	71
CENTRING LENGHT	X	10	15	15
COOLING GROOVE WIDTH	B	8	8	9
COOLING GROOVE WIDTH	h	4	4	4
COOLING GROVE	No	2	4	4







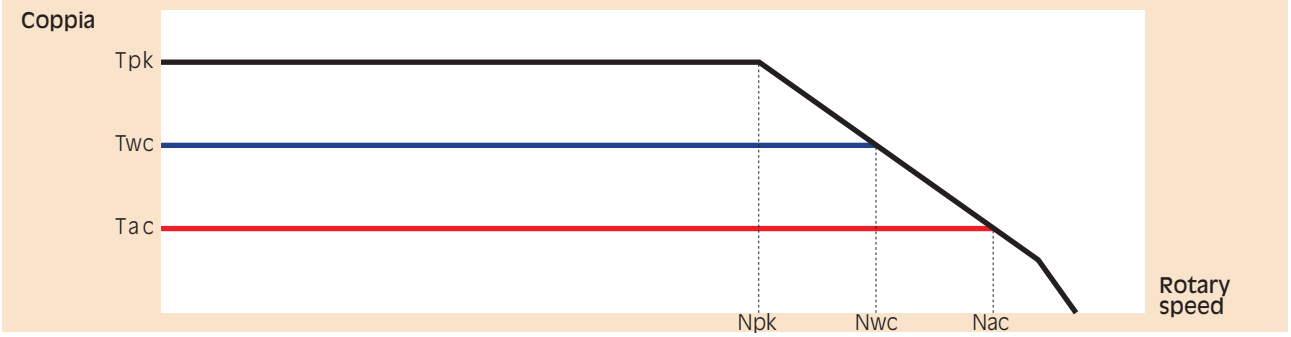




TYPE MK-CI 290 S		100	150	
STATOR LENGHT	Le	150	200	
ROTOR LENGHT	Li	101	151	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	9	
COOLING GROOVE WIDTH	h	4	4	
COOLING GROVE	No	8	8	

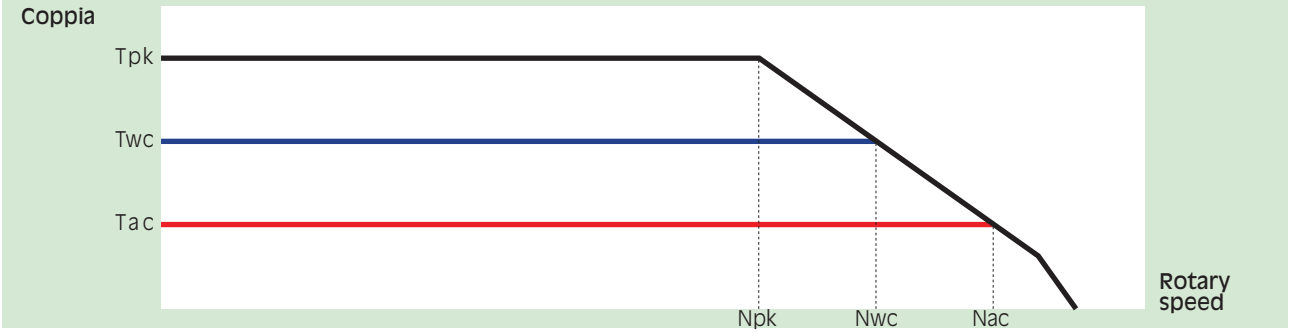
Motor Specifications TECHNAI MK-CI 360 WA

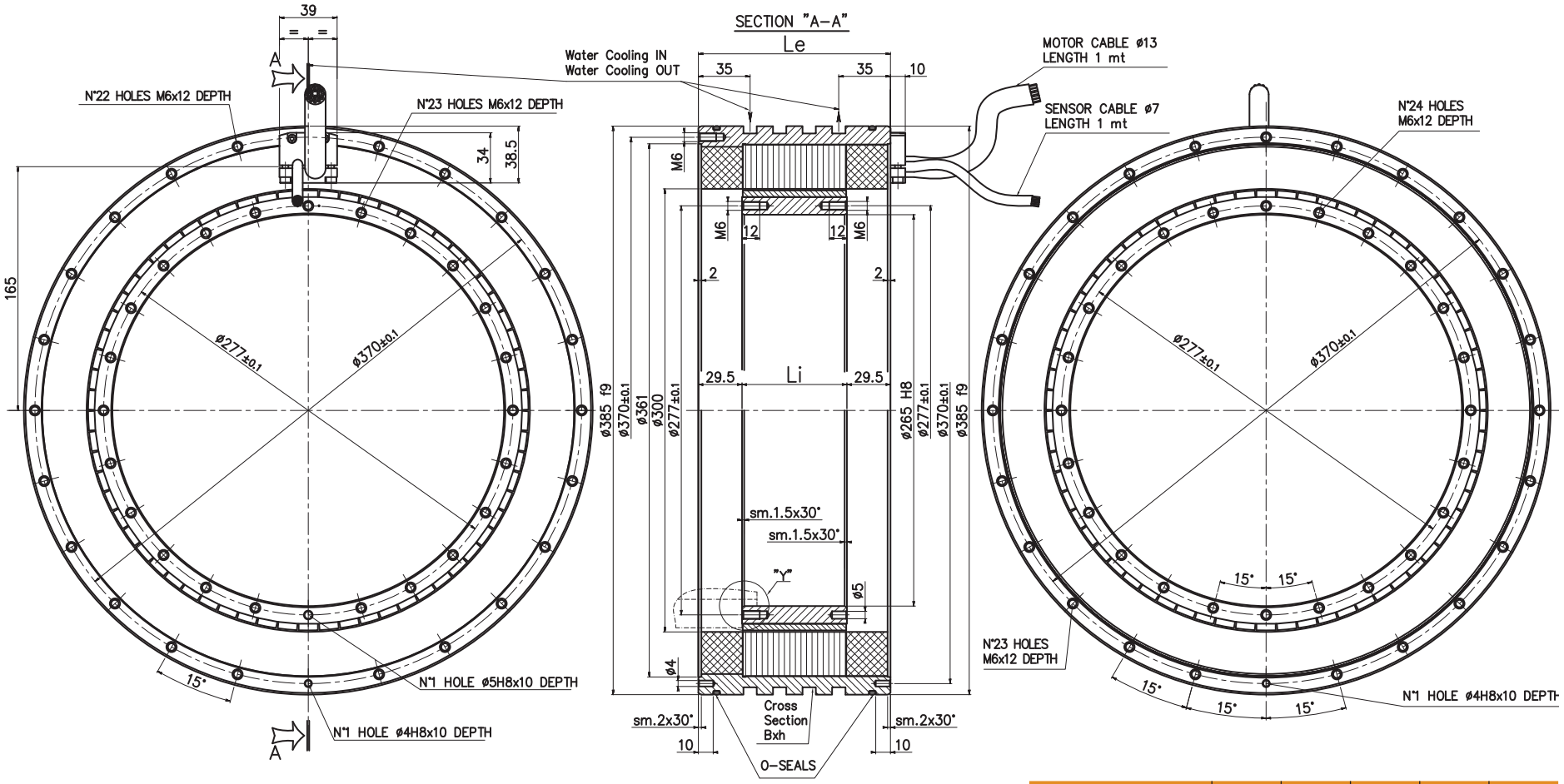
Motor Specifications	Symbol	Unit	MK-CI 360-030 WA	MK-CI 360-050 WA	MK-CI 360-070 WA	MK-CI 360-100 WA	MK-CI 360-150 WA
Number of pole	P		66	66	66	66	66
Peak Torque	Tpk	Nm	428	724	1013	1448	2173
Continuos Torque (Water Cooling Dt100)	Twc	Nm	239	415	587	821	1240
Continuos Torque (Air Cooling Dt100)	Tac	Nm	112	175	249	341	504
Stall Torque (Water Cooling)	Tswc	Nm	182	317	472	657	986
Stall Torque (Air Cooling)	Tsac	Nm	85	134	190	261	386
Ripple Torque (Cogging Torque)	Tr	Nm	1	1,8	2,5	3,6	5,4
Power Loss at Twc	Pwc	KW	1,9	2,8	3,65	5	7
Power Loss at Tac	Pac	KW	0,45	0,5	0,62	0,8	1,1
Termal Resistance Water Cooling	RthWc	K/W	0,052	0,036	0,028	0,020	0,013
Termal Resistance Air Cooling	RthAc	K/W	0,251	0,196	0,161	0,128	0,094
Torque Constant	Kt	Nm/A	18	30	21,3	30,5	29,1
Back EMF Constant	Ke	V/1000 Rpm	1110	1850	1313	1876	1797
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	110	50	100	50	65
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	250	140	200	140	145
Maximum Speed at Iac at 600 Vdc	Nac	RPM	340	190	290	200	210
Winding Resistance (Phase to Phase)	R20	Ω	5,05	6,8	2	2,9	1,65
Winding Inductance (Phase to Phase)	L	mH	26,1	42	21,3	20,8	12,6
Peak Current	Ipk	Arms	36,8	35	73,5	73,5	115
Continuos Current (Water Cooling Dt100)	Iwc	Arms	13,5	14	29,4	28,6	45
Continuos Current (Air Cooling Dt100)	Iac	Arms	6,4	6	12	11,6	18
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	10,3	10,7	22,4	21,8	34,3
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	4,9	4,6	9,2	8,9	13,6
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	90	110	130	160	210
Outer Diameter of Stator		mm	385	385	385	385	385

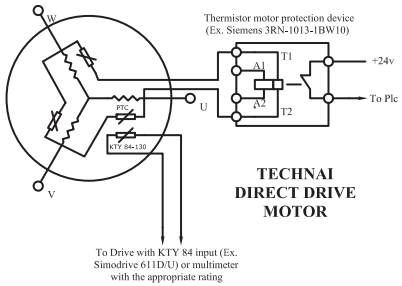


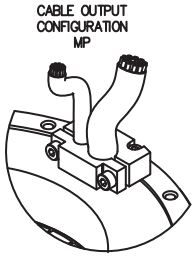
Motor Specifications TECHNAI MK-CI 360 WB

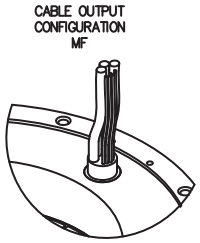
Motor Specifications	Symbol	Unit	MK-CI 360-030 WB	MK-CI 360-050 WB	MK-CI 360-070 WB	MK-CI 360-100 WB	MK-CI 360-150 WB
Number of pole	P		66	66	66	66	66
Peak Torque	Tpk	Nm	430	724	1013	1447	2120
Continuos Torque (Water Cooling Dt100)	Twc	Nm	248	428	584	821	1262
Continuos Torque (Air Cooling Dt100)	Tac	Nm	112	178	247	335	513
Stall Torque (Water Cooling)	Tswc	Nm	189	324	468	657	1014
Stall Torque (Air Cooling)	Tsac	Nm	85	137	190	257	394
Ripple Torque (Cogging Torque)	Tr	Nm	1	1,8	2,5	3,6	5,4
Power Loss at Twc	Pwc	KW	2,1	2,75	3,65	5	7
Power Loss at Tac	Pac	KW	0,45	0,5	0,62	0,8	1,1
Termal Resistance Water Cooling	RthWc	K/W	0,052	0,036	0,028	0,020	0,013
Termal Resistance Air Cooling	RthAc	K/W	0,251	0,196	0,161	0,128	0,094
Torque Constant	Kt	Nm/A	8,9	9,8	13,6	16	19
Back EMF Constant	Ke	V/1000 Rpm	547	599	839	990	1172
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	250	220	170	140	120
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	520	480	340	290	240
Maximum Speed at Iac at 600 Vdc	Nac	RPM	730	660	460	390	340
Winding Resistance (Phase to Phase)	R20	Ω	1,24	0,66	0,83	0,81	0,67
Winding Inductance (Phase to Phase)	L	mH	6,3	5,05	6	5,8	5,37
Peak Current	Ipk	Arms	75	116	116	140	173
Continuos Current (Water Cooling Dt100)	Iwc	Arms	28,3	44,5	45,6	55	71
Continuos Current (Air Cooling Dt100)	Iac	Arms	13	19	19	21,6	28
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	21,6	34	35	41,5	54
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	9,9	14,5	14,5	16,5	21,5
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	90	110	130	160	210
Outer Diameter of Stator		mm	385	385	385	385	385

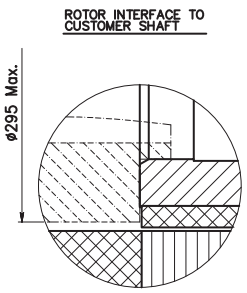








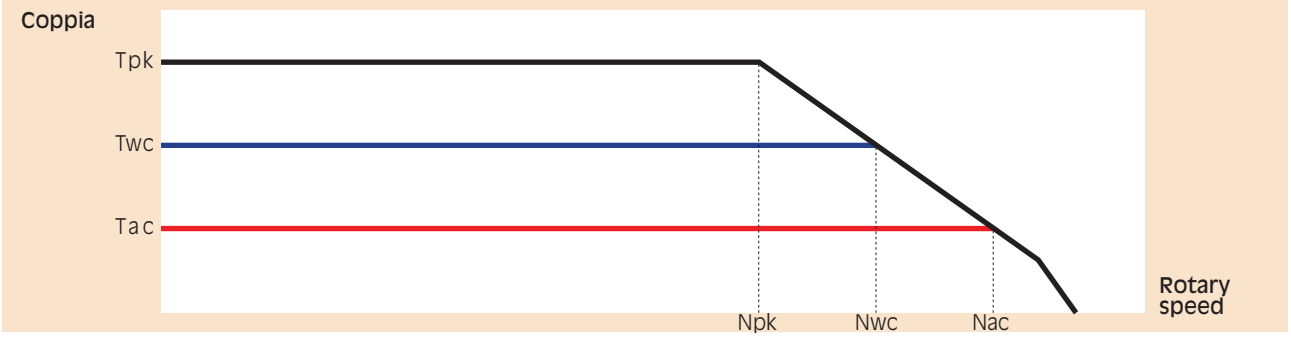




TYPE MK-CI 360		030	050	070	100	150
STATOR LENGHT	Le	90	110	130	160	210
ROTOR LENGHT	Li	31	51	71	101	151
CENTRING LENGHT	X	10	15	15	15	15
COOLING GROOVE WIDTH	B	8	8	9	8	9
COOLING GROOVE WIDTH	h	5	5	5	5	5
COOLING GROVE	No	2	4	4	8	8

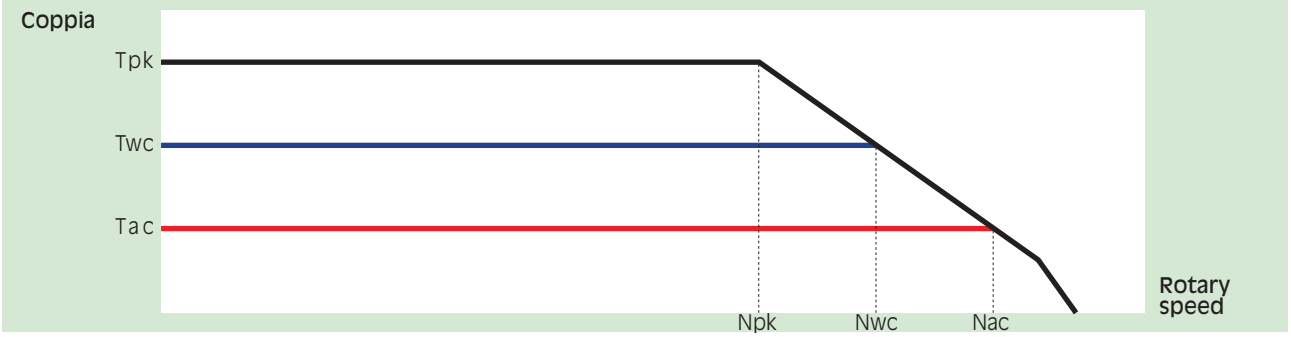
Motor Specifications TECHNAI MK-CIC 360 WA

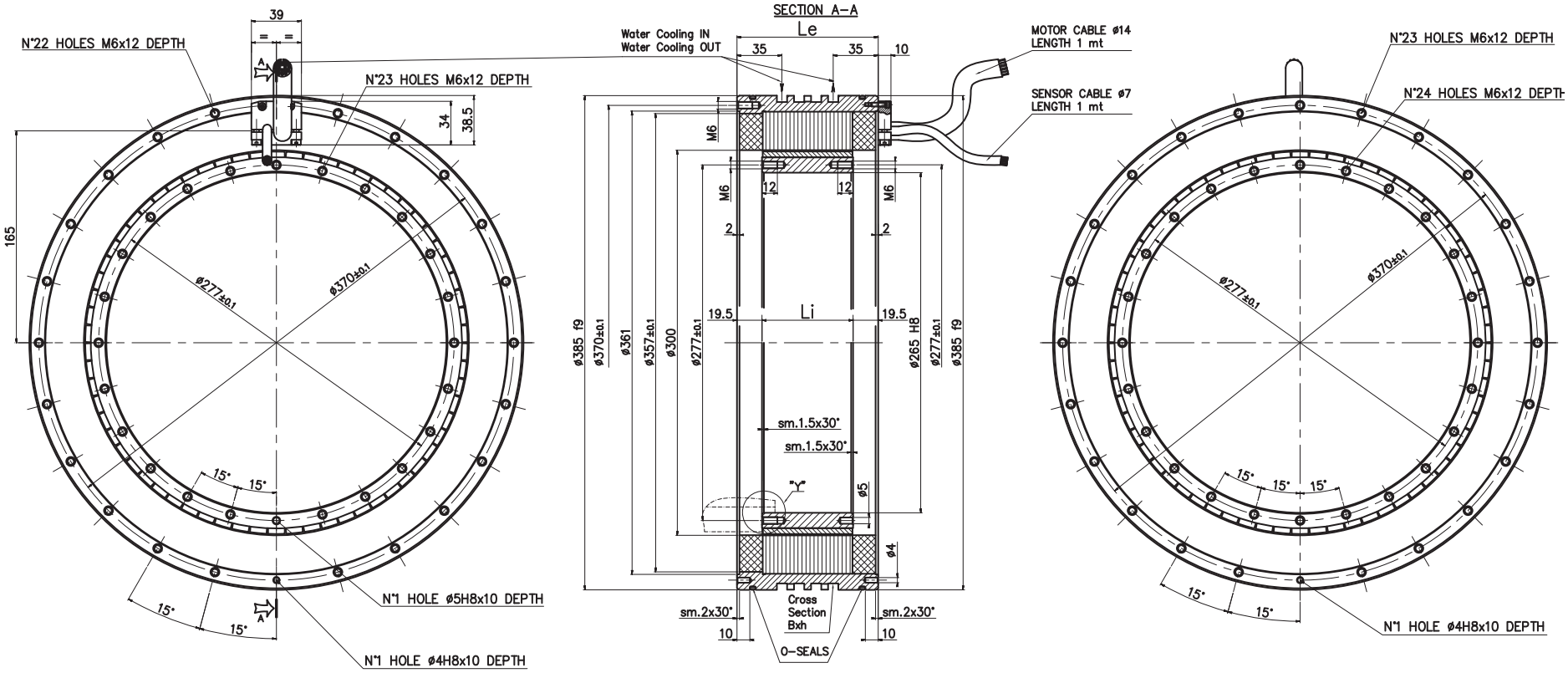
Motor Specifications	Symbol	Unit	MK-CIC 360-050 WA	MK-CIC 360-070 WA			
Number of pole	P		66	66			
Peak Torque	Tpk	Nm	724	1013			
Continuos Torque (Water Cooling Dt100)	Twc	Nm	415	587			
Continuos Torque (Air Cooling Dt100)	Tac	Nm	175	249			
Stall Torque (Water Cooling)	Tswc	Nm	317	472			
Stall Torque (Air Cooling)	Tsac	Nm	134	190			
Ripple Torque (Cogging Torque)	Tr	Nm	1,8	2,5			
Power Loss at Twc	Pwc	KW	2,8	3,65			
Power Loss at Tac	Pac	KW	0,5	0,62			
Termal Resistance Water Cooling	RthWc	K/W	0,036	0,028			
Termal Resistance Air Cooling	RthAc	K/W	0,196	0,161			
Torque Constant	Kt	Nm/A	30	21,3			
Back EMF Constant	Ke	V/1000 Rpm	1850	1313			
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	50	100			
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	140	200			
Maximum Speed at Iac at 600 Vdc	Nac	RPM	190	290			
Winding Resistance (Phase to Phase)	R20	Ω	6,8	2			
Winding Inductance (Phase to Phase)	L	mH	42	21,3			
Peak Current	Ipk	Arms	35	73,5			
Continuos Current (Water Cooling Dt100)	Iwc	Arms	14	29,4			
Continuos Current (Air Cooling Dt100)	Iac	Arms	6	12			
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	10,7	22,4			
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	4,6	9,2			
Maximum Winding Temperature		°C	130	130			
Height of Rotor		mm	50	70			
Height of Stator		mm	90	110			
Outer Diameter of Stator		mm	385	385			

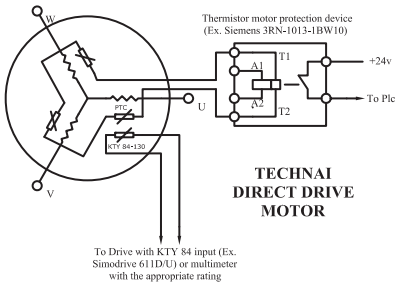


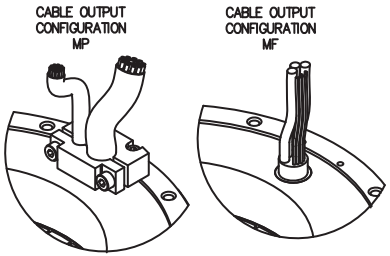
Motor Specifications TECHNAI MK-CIC 360 WB

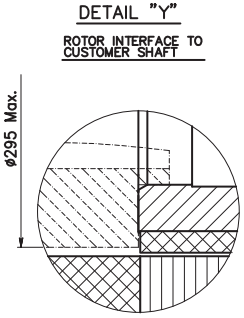
Motor Specifications	Symbol	Unit	MK-CIC 360-050 WB	MK-CIC 360-070 WB			
Number of pole	P		66	66			
Peak Torque	Tpk	Nm	724	1013			
Continuos Torque (Water Cooling Dt100)	Twc	Nm	428	584			
Continuos Torque (Air Cooling Dt100)	Tac	Nm	178	247			
Stall Torque (Water Cooling)	Tswc	Nm	324	468			
Stall Torque (Air Cooling)	Tsac	Nm	137	190			
Ripple Torque (Cogging Torque)	Tr	Nm	1,8	2,5			
Power Loss at Twc	Pwc	KW	2,75	3,65			
Power Loss at Tac	Pac	KW	0,5	0,62			
Termal Resistance Water Cooling	RthWc	K/W	0,036	0,028			
Termal Resistance Air Cooling	RthAc	K/W	0,196	0,161			
Torque Constant	Kt	Nm/A	9,8	13,6			
Back EMF Constant	Ke	V/1000 Rpm	599	839			
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	220	170			
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	480	340			
Maximum Speed at Iac at 600 Vdc	Nac	RPM	660	460			
Winding Resistance (Phase to Phase)	R20	Ω	0,66	0,83			
Winding Inductance (Phase to Phase)	L	mH	5,05	6			
Peak Current	Ipk	Arms	116	116			
Continuos Current (Water Cooling Dt100)	Iwc	Arms	44,5	45,6			
Continuos Current (Air Cooling Dt100)	Iac	Arms	19	19			
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	34	35			
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	14,5	14,5			
Maximum Winding Temperature		°C	130	130			
Height of Rotor		mm	50	70			
Height of Stator		mm	90	110			
Outer Diameter of Stator		mm	385	385			







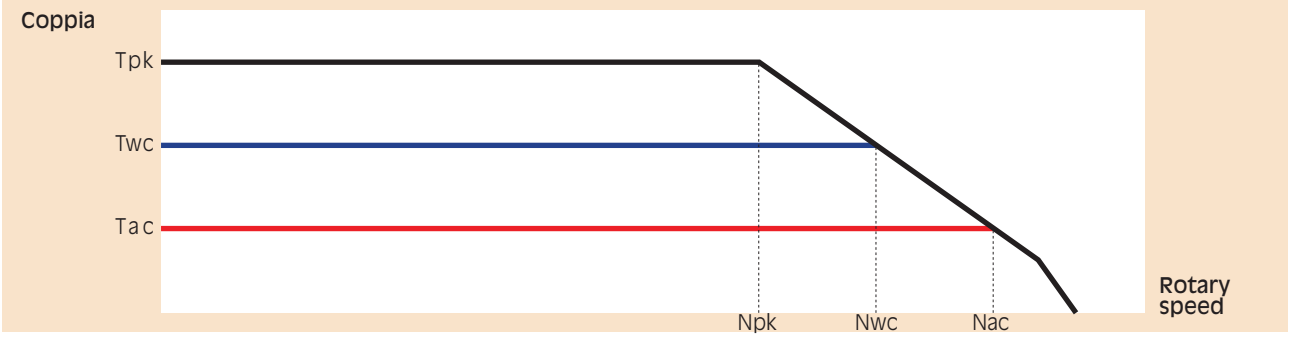


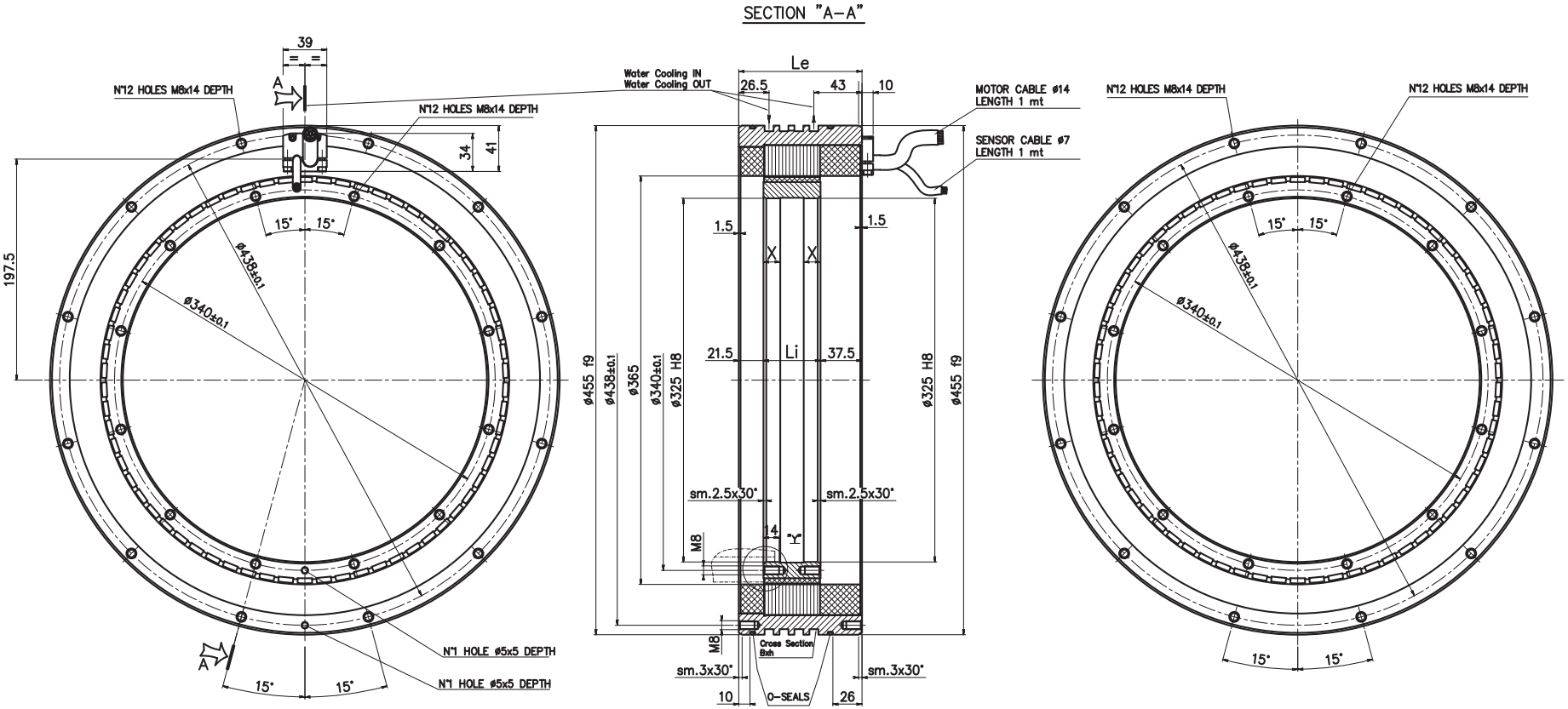


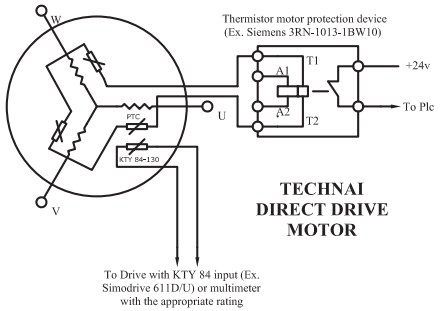
TYPE MK-CIC 360		050	070	
STATOR LENGHT	Le	90	110	
ROTOR LENGHT	Li	51	71	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	8	
COOLING GROOVE WIDTH	h	5	5	
COOLING GROVE	No	2	4	

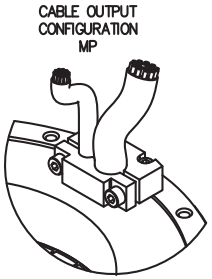
Motor Specifications TECHNAI MK-CI 420 WA

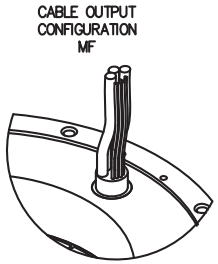
Motor Specifications	Symbol	Unit	MK-CI 420-030 WA	MK-CI 420-050 WA	MK-CI 420-070 WA	MK-CI 420-100 WA	MK-CI 420-150 WA
Number of pole	P		66	66	66	66	66
Peak Torque	Tpk	Nm	430	725	980	1410	2110
Continuos Torque (Water Cooling Dt100)	Twc	Nm	283	482	691	995	1458
Continuos Torque (Air Cooling Dt100)	Tac	Nm	128,5	209	290	412	585
Stall Torque (Water Cooling)	Tswc	Nm	216	368	527	760	1113
Stall Torque (Air Cooling)	Tsac	Nm	121	160	223	315	447
Ripple Torque (Cogging Torque)	Tr	Nm	3	5	7	8,7	13
Power Loss at Twc	Pwc	KW	2,7	3,7	4,7	6	8,5
Power Loss at Tac	Pac	KW	0,5	0,65	0,75	0,95	1,25
Termal Resistance Water Cooling	RthWc	K/W	0,036	0,026	0,021	0,017	0,012
Termal Resistance Air Cooling	RthAc	K/W	0,17	0,15	0,013	0,108	0,08
Torque Constant	Kt	Nm/A	24	29,5	28	40	40
Back EMF Constant	Ke	V/1000 Rpm	1450	1772	1692	2417	2417
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	70	60	77	44	44
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	145	125	138	90	90
Maximum Speed at Iac at 600 Vdc	Nac	RPM	220	185	200	138	138
Winding Resistance (Phase to Phase)	R20	Ω	8,3	5,8	3,2	4,2	2,7
Winding Inductance (Phase to Phase)	L	mH	37,9	32,2	20,4	28,7	18,8
Peak Current	Ipk	Arms	26	35,5	50,5	50,5	75,7
Continuos Current (Water Cooling Dt100)	Iwc	Arms	12,6	17,6	26,5	26,5	39
Continuos Current (Air Cooling Dt100)	Iac	Arms	5,6	7,5	10,7	10,5	14,9
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	9,6	13,4	20,2	20,2	29,7
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	4,3	5,7	8,1	8	11,4
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	90	110	130	160	210
Outer Diameter of Stator		mm	455	455	455	455	455

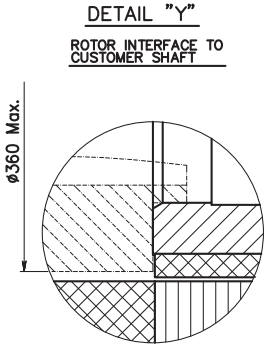




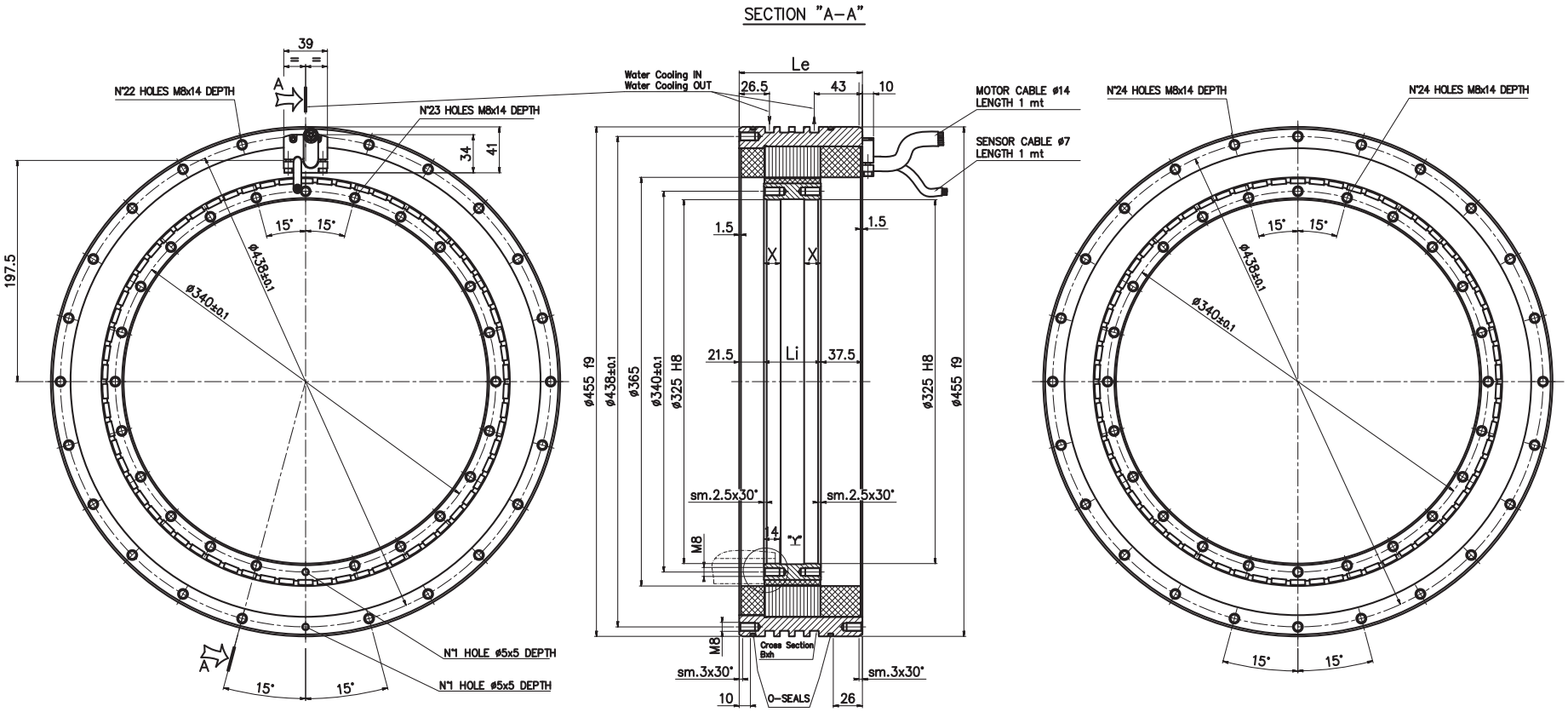


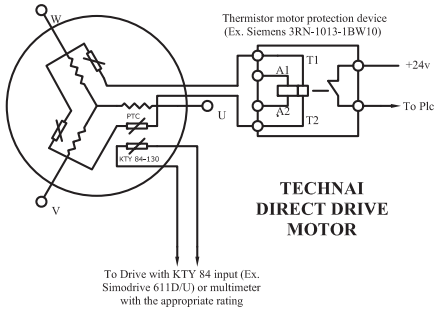


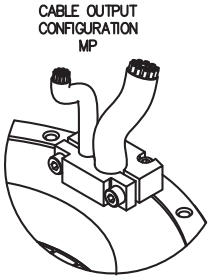


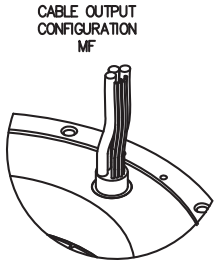


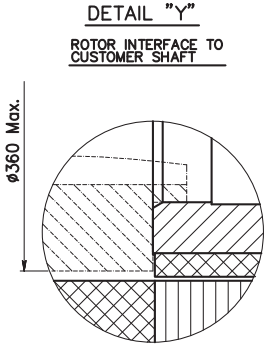
TYPE MK-CI 420		030	050	070
STATOR LENGHT	Le	90	110	130
ROTOR LENGHT	Li	31	51	71
CENTRING LENGHT	X	10	15	15
COOLING GROOVE WIDTH	B	8	8	9
COOLING GROOVE WIDTH	h	5	5	5
COOLING GROVE	No	2	4	4







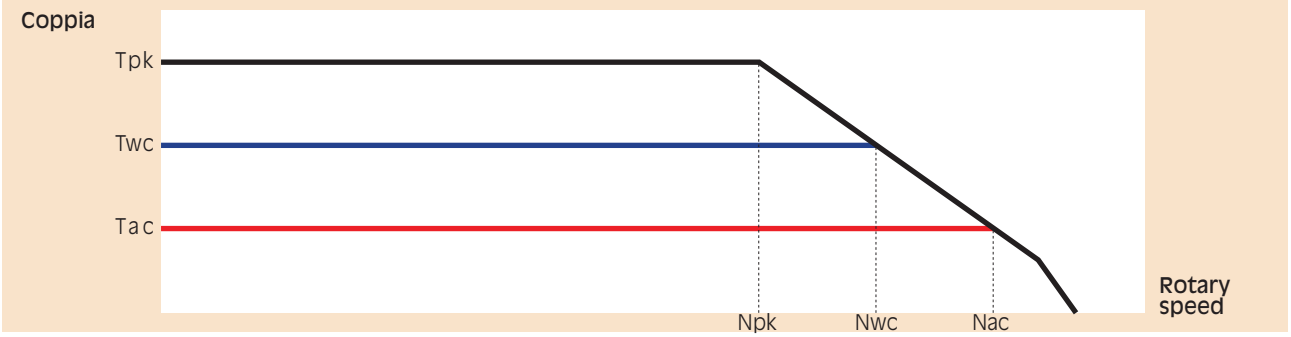




TYPE MK-CI 420		100	150	
STATOR LENGHT	Le	160	210	
ROTOR LENGHT	Li	101	151	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	9	
COOLING GROOVE WIDTH	h	5	5	
COOLING GROVE	No	8	8	

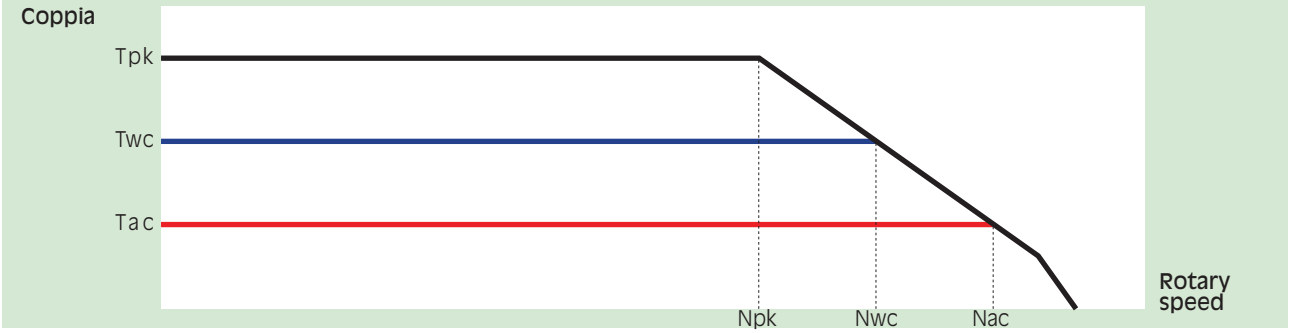
Motor Specifications TECHNAI MK-CI 450 WA

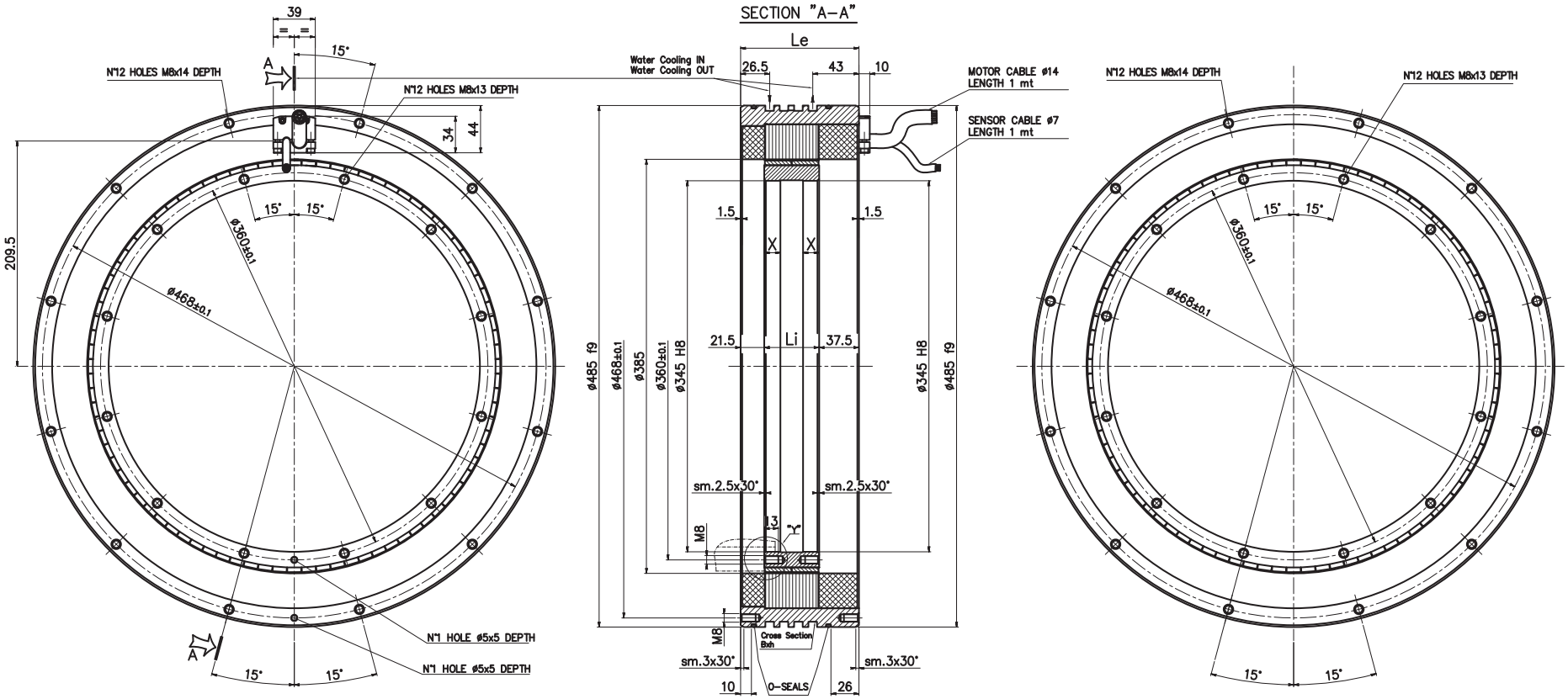
Motor Specifications	Symbol	Unit	MK-CI 450-030 WA	MK-CI 450-050 WA	MK-CI 450-070 WA	MK-CI 450-100 WA	MK-CI 450 -150 WA
Number of pole	P		88	88	88	88	88
Peak Torque	Tpk	Nm	731	1219	1707	2439	3647
Continuos Torque (Water Cooling Dt100)	Twc	Nm	397	670	938	1355	2119
Continuos Torque (Air Cooling Dt100)	Tac	Nm	180	290	403	570	831
Stall Torque (Water Cooling)	Tswc	Nm	312	528	739	1070	1682
Stall Torque (Air Cooling)	Tsac	Nm	138	222	308	437	636
Ripple Torque (Cogging Torque)	Tr	Nm	4,1	7	10	14	21
Power Loss at Twc	Pwc	KW	2,6	3,6	4,6	6,2	9,1
Power Loss at Tac	Pac	KW	0,53	0,7	0,85	1,1	1,4
Termal Resistance Water Cooling	RthWc	K/W	0,040	0,028	0,022	0,016	0,011
Termal Resistance Air Cooling	RthAc	K/W	0,196	0,154	0,127	0,101	0,075
Torque Constant	Kt	Nm/A	15,63	26,06	36,5	52,12	38
Back EMF Constant	Ke	V/1000 Rpm	963	1606	2248	3212	2340
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	145	70	55	20	55
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	300	180	120	80	110
Maximum Speed at Iac at 600 Vdc	Nac	RPM	400	240	170	110	160
Winding Resistance (Phase to Phase)	R20	Ω	1,77	2,4	3	4	1,25
Winding Inductance (Phase to Phase)	L	mH	15,63	13,8	18,91	26,7	9,4
Peak Current	Ipk	Arms	68	68	68	68	138
Continuos Current (Water Cooling Dt100)	Iwc	Arms	26,5	27	26,8	27,3	57
Continuos Current (Air Cooling Dt100)	Iac	Arms	11,9	11,5	11,4	11,3	22,8
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	20,3	20,5	20,5	20,8	44,8
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	9	8,8	8,7	8,6	17,3
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	90	110	130	160	210
Outer Diameter of Stator		mm	485	485	485	485	485

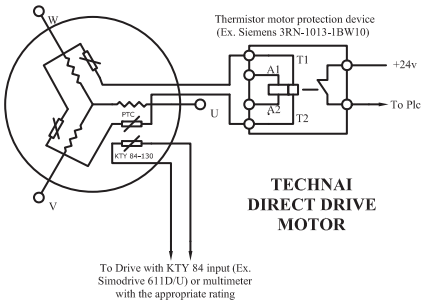


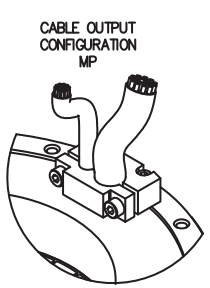
Motor Specifications TECHNAI MK-CI 450 WB

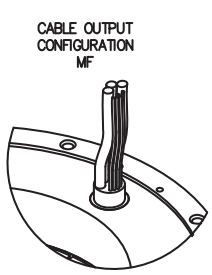
Motor Specifications	Symbol	Unit	MK-CI 450-030 WB	MK-CI 450-050 WB	MK-CI 450-070 WB	MK-CI 450-100 WB	MK-CI 450-150 WB
Number of pole	P		88	88	88	88	88
Peak Torque	Tpk	Nm	732	1221	1712	2445	3647
Continuos Torque (Water Cooling Dt100)	Twc	Nm	402	679	950	1355	2109
Continuos Torque (Air Cooling Dt100)	Tac	Nm	181	293	404	570	827
Stall Torque (Water Cooling)	Tswc	Nm	317	536	749	1070	1673
Stall Torque (Air Cooling)	Tsac	Nm	139	224	309	437	633
Ripple Torque (Cogging Torque)	Tr	Nm	4,1	7	10	14	21
Power Loss at Twc	Pwc	KW	2,6	3,6	4,6	6,2	9,1
Power Loss at Tac	Pac	KW	0,53	0,7	0,85	1,1	1,4
Termal Resistance Water Cooling	RthWc	K/W	0,040	0,028	0,022	0,016	0,011
Termal Resistance Air Cooling	RthAc	K/W	0,196	0,154	0,127	0,101	0,075
Torque Constant	Kt	Nm/A	8,04	13,4	18,76	26,8	20,1
Back EMF Constant	Ke	V/1000 Rpm	495	826	1156	1652	1239
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	325	200	120	85	125
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	625	380	260	170	230
Maximum Speed at Iac at 600 Vdc	Nac	RPM	800	470	340	230	310
Winding Resistance (Phase to Phase)	R20	Ω	0,45	0,61	0,8	1	0,36
Winding Inductance (Phase to Phase)	L	mH	2,26	3,7	5	7	2,7
Peak Current	Ipk	Arms	131	131	131	131	260
Continuos Current (Water Cooling Dt100)	Iwc	Arms	52,5	53	53	53	110,5
Continuos Current (Air Cooling Dt100)	Iac	Arms	23,4	22,6	22,3	22	43
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	40	40,5	40,5	40,5	84,2
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	17,8	17,3	17,1	16,8	32,5
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	70	90	110	140	190
Outer Diameter of Stator		mm	485	485	485	485	485

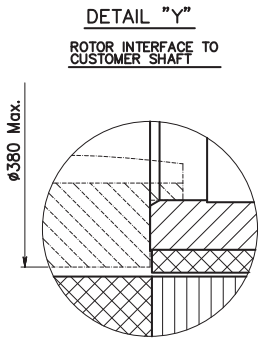




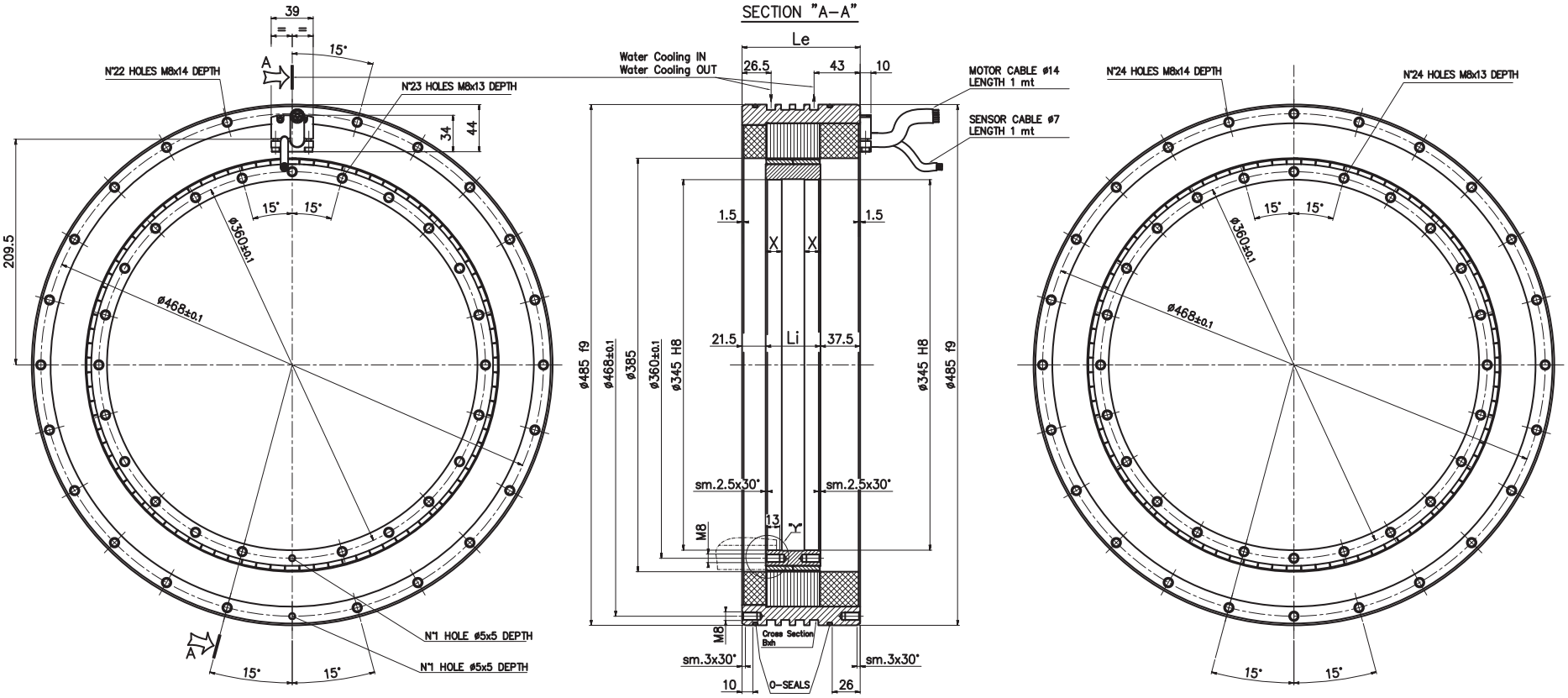


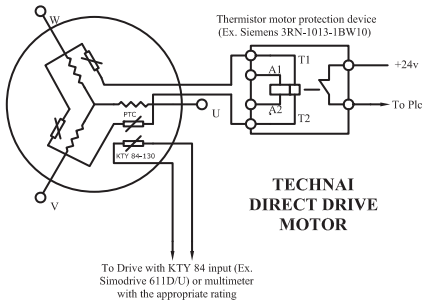


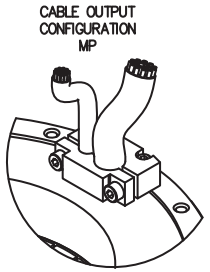


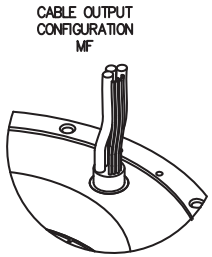


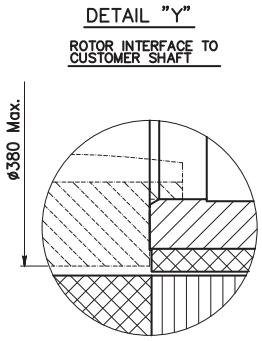
TYPE MK-CI 450		030	050	070
STATOR LENGHT	Le	90	110	130
ROTOR LENGHT	Li	31	51	71
CENTRING LENGHT	X	10	15	15
COOLING GROOVE WIDTH	B	8	8	9
COOLING GROOVE WIDTH	h	5	5	5
COOLING GROVE	No	2	4	4







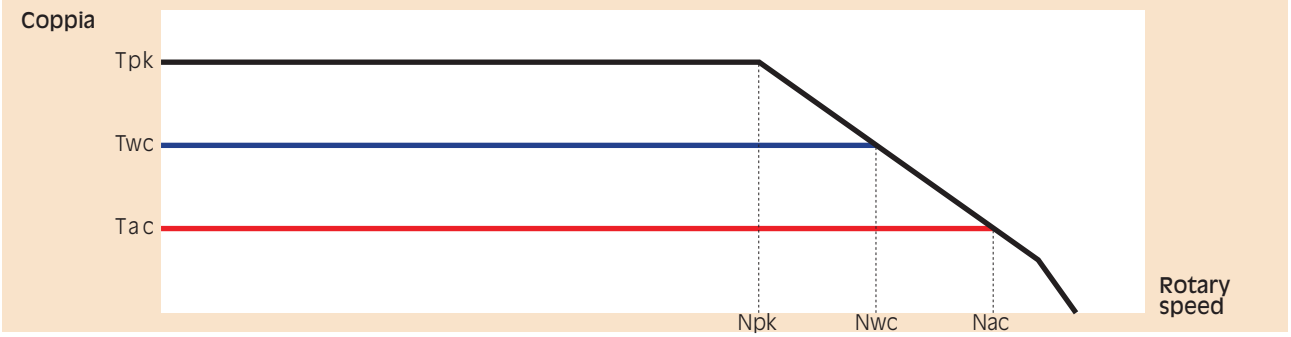




TYPE MK-CI 450		100	150	
STATOR LENGHT	Le	160	210	
ROTOR LENGHT	Li	101	151	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	9	
COOLING GROOVE WIDTH	h	5	5	
COOLING GROVE	No	8	8	

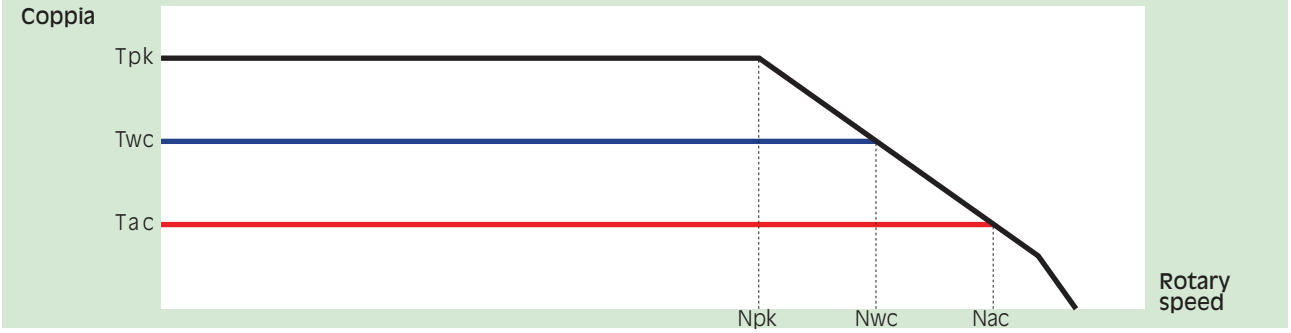
Motor Specifications TECHNAI MK-CIC 450 WA

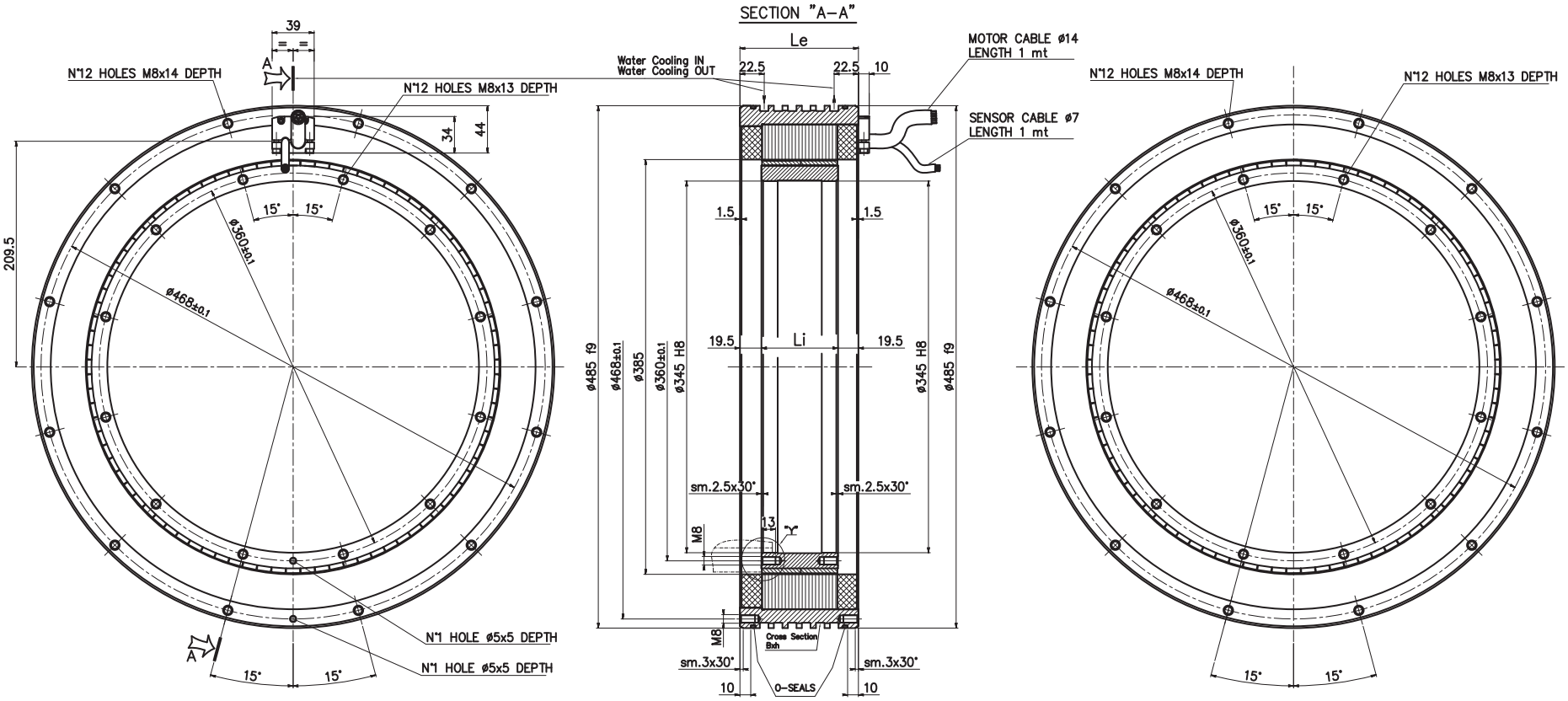
Motor Specifications	Symbol	Unit	MK-CIC 450-050 WA	MK-CIC 450-070 WA			
Number of pole	P		88	88			
Peak Torque	Tpk	Nm	1219	1707			
Continuos Torque (Water Cooling Dt100)	Twc	Nm	670	938			
Continuos Torque (Air Cooling Dt100)	Tac	Nm	290	403			
Stall Torque (Water Cooling)	Tswc	Nm	528	739			
Stall Torque (Air Cooling)	Tsac	Nm	222	308			
Ripple Torque (Cogging Torque)	Tr	Nm	7	10			
Power Loss at Twc	Pwc	KW	3,6	4,6			
Power Loss at Tac	Pac	KW	0,7	0,85			
Termal Resistance Water Cooling	RthWc	K/W	0,028	0,022			
Termal Resistance Air Cooling	RthAc	K/W	0,154	0,127			
Torque Constant	Kt	Nm/A	26,06	36,5			
Back EMF Constant	Ke	V/1000 Rpm	1606	2248			
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	70	55			
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	180	120			
Maximum Speed at Iac at 600 Vdc	Nac	RPM	240	170			
Winding Resistance (Phase to Phase)	R20	Ω	2,4	3			
Winding Inductance (Phase to Phase)	L	mH	13,8	18,91			
Peak Current	Ipk	Arms	68	68			
Continuos Current (Water Cooling Dt100)	Iwc	Arms	27	26,8			
Continuos Current (Air Cooling Dt100)	Iac	Arms	11,5	11,4			
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	20,5	20,5			
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	8,8	8,7			
Maximum Winding Temperature		°C	130	130			
Height of Rotor		mm	50	70			
Height of Stator		mm	90	110			
Outer Diameter of Stator		mm	485	485			

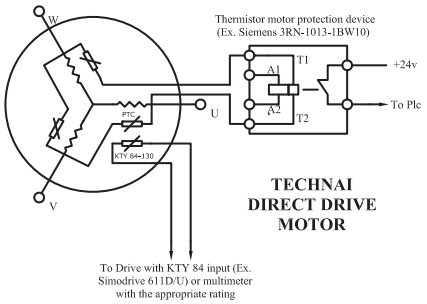


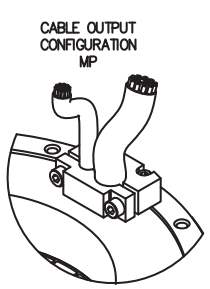
Motor Specifications TECHNAI MK-CIC 450 WB

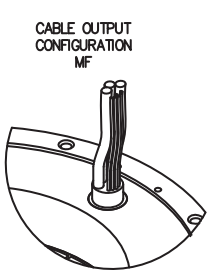
Motor Specifications	Symbol	Unit	MK-CIC 450-050 WB	MK-CIC 450-070 WB			
Number of pole	P		88	88			
Peak Torque	Tpk	Nm	1221	1712			
Continuos Torque (Water Cooling Dt100)	Twc	Nm	679	950			
Continuos Torque (Air Cooling Dt100)	Tac	Nm	293	404			
Stall Torque (Water Cooling)	Tswc	Nm	536	749			
Stall Torque (Air Cooling)	Tsac	Nm	224	309			
Ripple Torque (Cogging Torque)	Tr	Nm	7	10			
Power Loss at Twc	Pwc	KW	3,6	4,6			
Power Loss at Tac	Pac	KW	0,7	0,85			
Termal Resistance Water Cooling	RthWc	K/W	0,028	0,022			
Termal Resistance Air Cooling	RthAc	K/W	0,154	0,127			
Torque Constant	Kt	Nm/A	13,4	18,76			
Back EMF Constant	Ke	V/1000 Rpm	826	1156			
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	200	120			
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	380	260			
Maximum Speed at Iac at 600 Vdc	Nac	RPM	470	340			
Winding Resistance (Phase to Phase)	R20	Ω	0,61	0,8			
Winding Inductance (Phase to Phase)	L	mH	3,7	5			
Peak Current	Ipk	Arms	131	131			
Continuos Current (Water Cooling Dt100)	Iwc	Arms	53	53			
Continuos Current (Air Cooling Dt100)	Iac	Arms	22,6	22,3			
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	40,5	40,5			
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	17,3	17,1			
Maximum Winding Temperature		°C	130	130			
Height of Rotor		mm	50	70			
Height of Stator		mm	90	110			
Outer Diameter of Stator		mm	485	485			

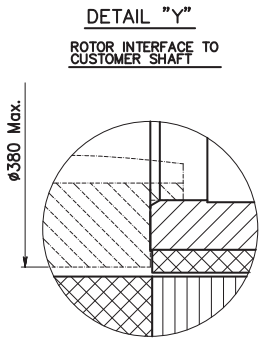








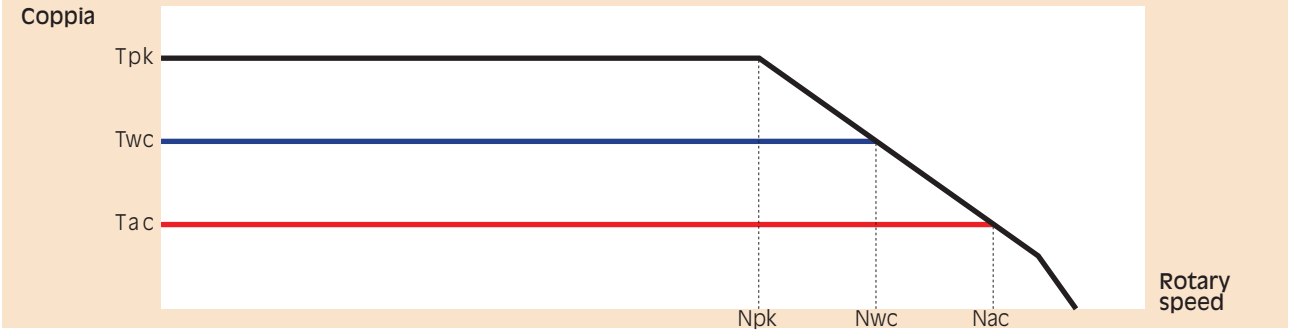


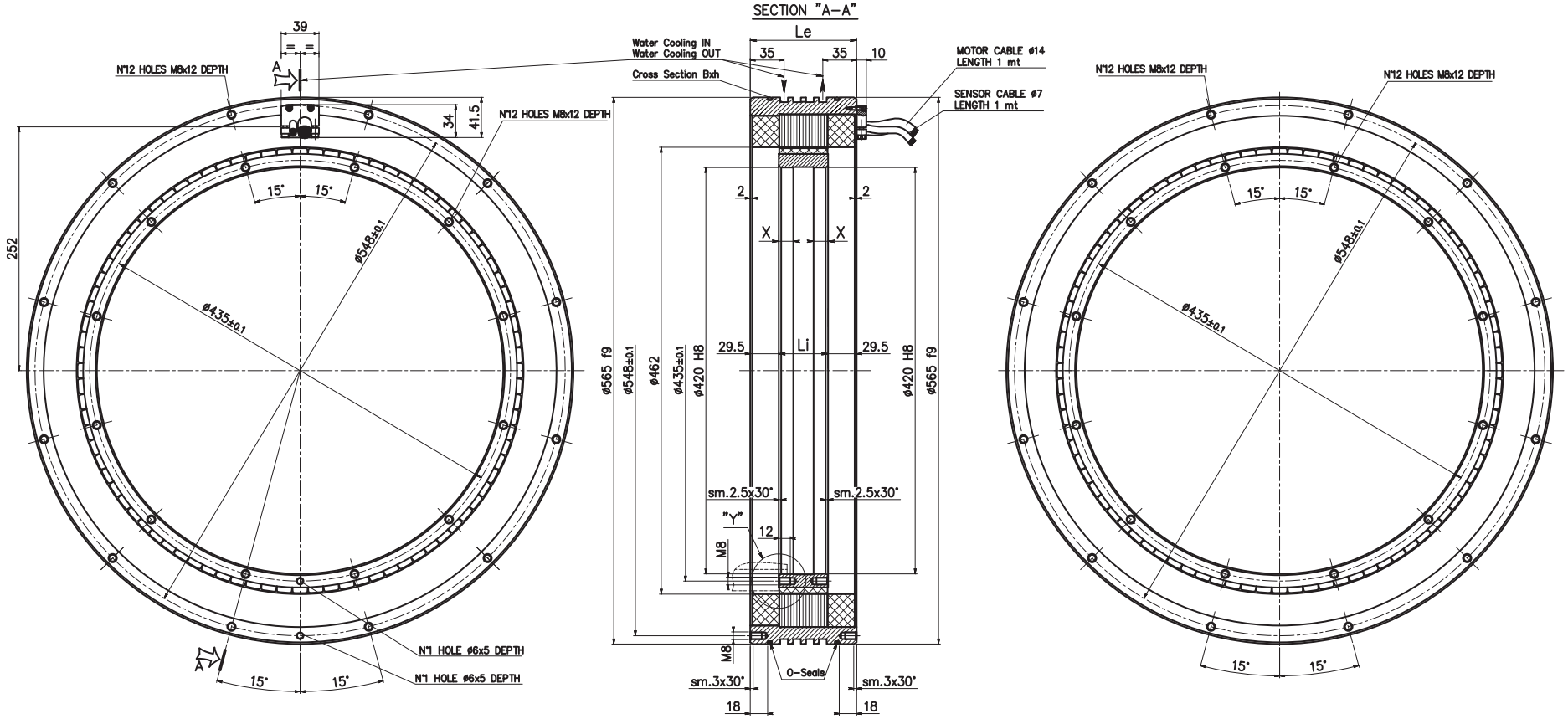


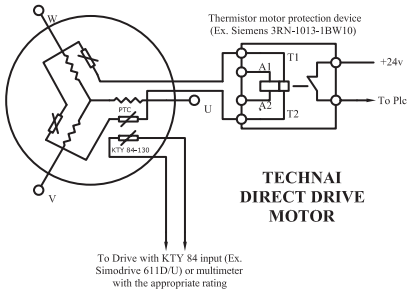
TYPE MK-CIC 450		050	070	
STATOR LENGHT	Le	90	110	
ROTOR LENGHT	Li	51	71	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	8	
COOLING GROOVE WIDTH	h	5	5	
COOLING GROVE	No	4	6	

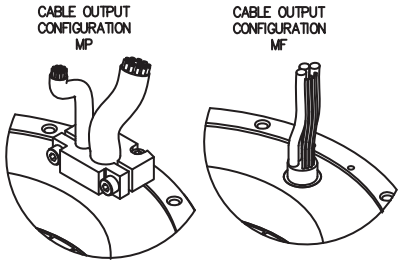
Motor Specifications TECHNAI MK-CI 530 WA

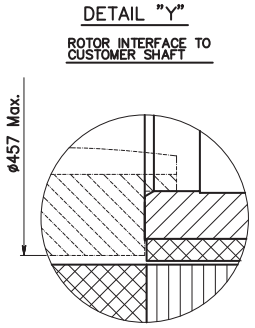
Motor Specifications	Symbol	Unit	MK-CI 530-030 WA	MK-CI 530-050 WA	MK-CI 530-070 WA	MK-CI 530-100 WA	MK-CI 530 -150 WA
Number of pole	P		88	88	88	88	88
Peak Torque	Tpk	Nm	1080	1715	2455	3600	5400
Continuos Torque (Water Cooling Dt100)	Twc	Nm	557	924	1424	2076	3050
Continuos Torque (Air Cooling Dt100)	Tac	Nm	251	420	580	817	1200
Stall Torque (Water Cooling)	Tswc	Nm	425	705	1087	1385	2330
Stall Torque (Air Cooling)	Tsac	Nm	192	321	443	624	917
Ripple Torque (Cogging Torque)	Tr	Nm	4	9	12	15	20
Power Loss at Twc	Pwc	KW	2,8	3,7	5,3	7	9
Power Loss at Tac	Pac	KW	0,6	0,75	0,9	1,1	1,5
Termal Resistance Water Cooling	RthWc	K/W	0,036	0,025	0,019	0,014	0,011
Termal Resistance Air Cooling	RthAc	K/W	0,168	0,133	0,11	0,088	0,06
Torque Constant	Kt	Nm/A	23,7	39,5	55,2	39,5	59,2
Back EMF Constant	Ke	V/1000 Rpm	1431	2386	3340	2386	3579
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	75	40	25	45	25
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	170	100	65	100	65
Maximum Speed at Iac at 600 Vdc	Nac	RPM	235	140	95	145	95
Winding Resistance (Phase to Phase)	R20	Ω	2,2	2,8	3,5	1,1	1,5
Winding Inductance (Phase to Phase)	L	mH	15,6	25	34	12	17,8
Peak Current	Ipk	Arms	65	63	65	131	131
Continuos Current (Water Cooling Dt100)	Iwc	Arms	24,8	24,5	27	55	54
Continuos Current (Air Cooling Dt100)	Iac	Arms	11,5	11,3	11	22	21,5
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	18,9	18,7	20,5	42	41
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	8,8	8,6	8,4	17	16
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	90	110	130	160	210
Outer Diameter of Stator		mm	565	565	565	565	565



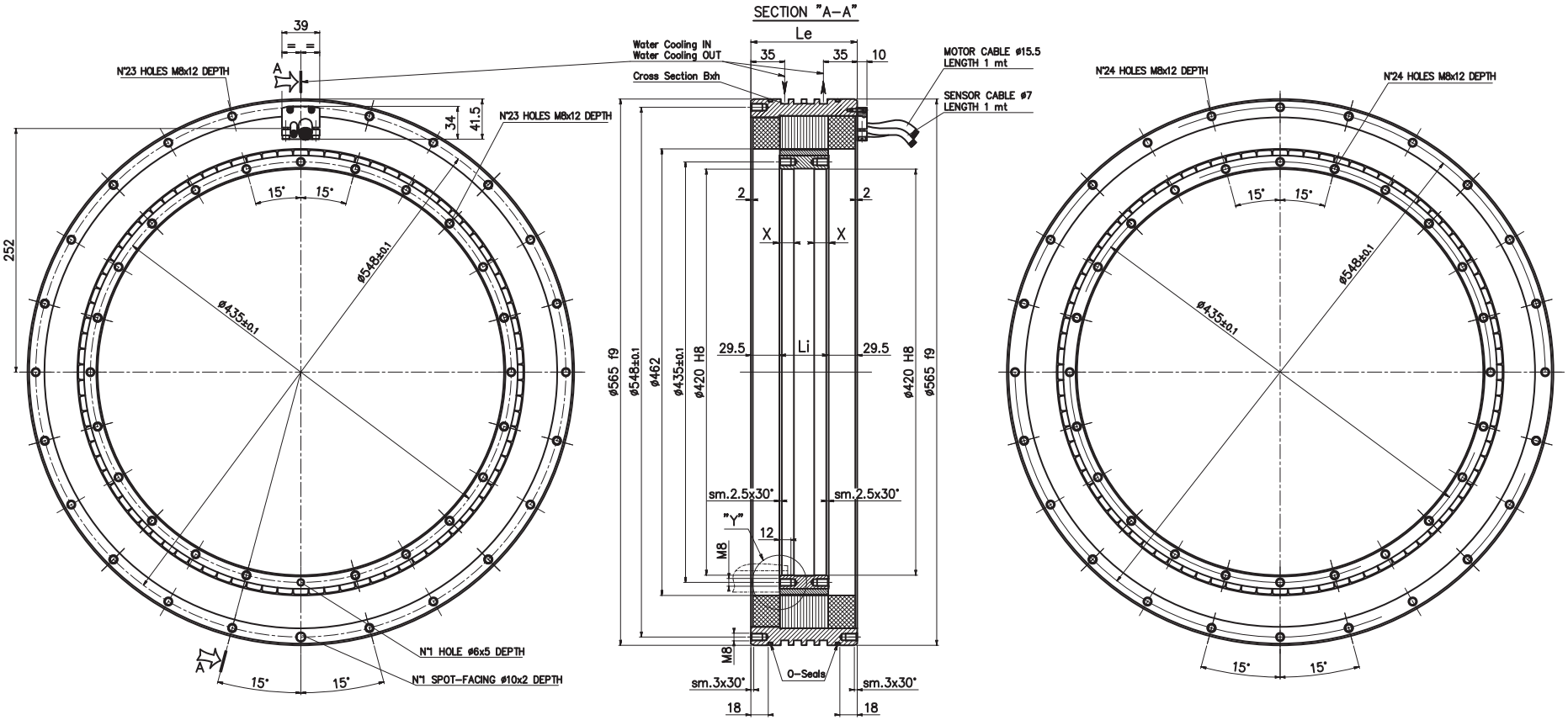


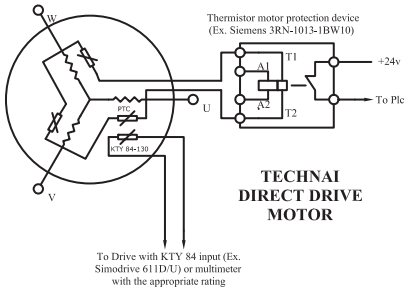


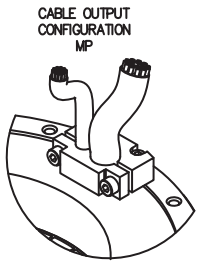


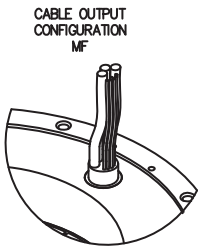


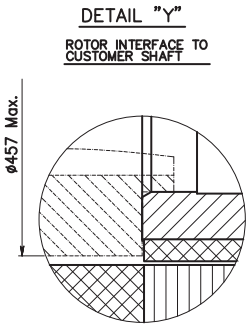
TYPE MK-CI 530		030	050	070
STATOR LENGHT	Le	90	110	130
ROTOR LENGHT	Li	31	51	71
CENTRING LENGHT	X	10	15	15
COOLING GROOVE WIDTH	B	8	8	9
COOLING GROOVE WIDTH	h	5	5	5
COOLING GROVE	No	2	4	4







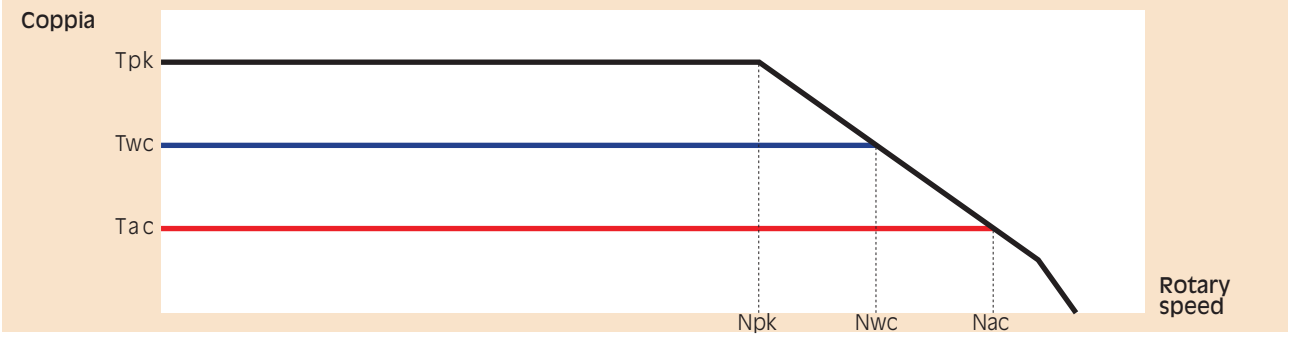


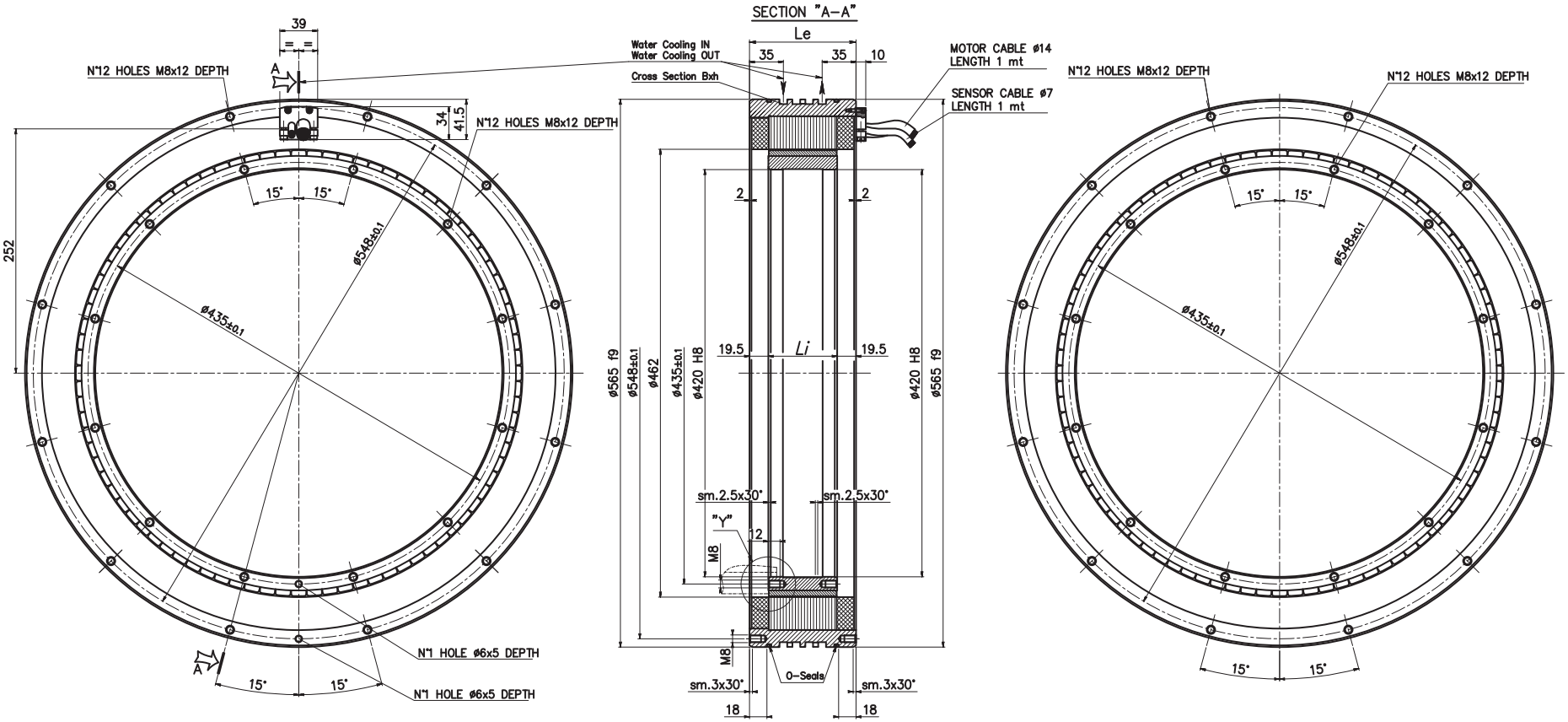


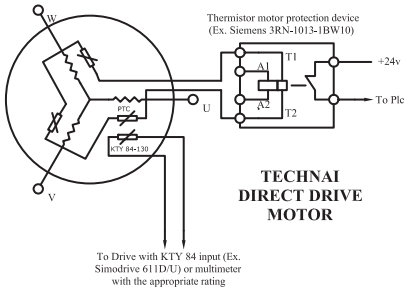
TYPE MK-CI 530		100	150	
STATOR LENGHT	Le	160	210	
ROTOR LENGHT	Li	101	151	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	9	
COOLING GROOVE WIDTH	h	5	5	
COOLING GROVE	No	8	8	

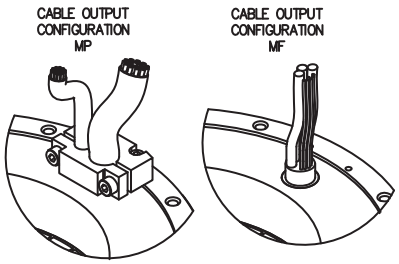
Motor Specifications TECHNAI MK-CIC 530 WA

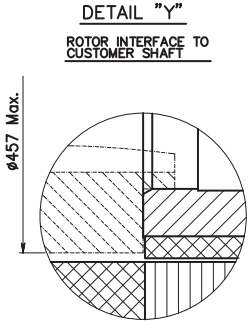
Motor Specifications	Symbol	Unit	MK-CIC 530-050 WA	MK-CIC 530-070 WA			
Number of pole	P		88	88			
Peak Torque	Tpk	Nm	1715	2455			
Continuos Torque (Water Cooling Dt100)	Twc	Nm	924	1424			
Continuos Torque (Air Cooling Dt100)	Tac	Nm	420	580			
Stall Torque (Water Cooling)	Tswc	Nm	705	1087			
Stall Torque (Air Cooling)	Tsac	Nm	321	443			
Ripple Torque (Cogging Torque)	Tr	Nm	9	12			
Power Loss at Twc	Pwc	KW	3,7	5,3			
Power Loss at Tac	Pac	KW	0,75	0,9			
Termal Resistance Water Cooling	RthWc	K/W	0,025	0,019			
Termal Resistance Air Cooling	RthAc	K/W	0,133	0,11			
Torque Constant	Kt	Nm/A	39,5	55,2			
Back EMF Constant	Ke	V/1000 Rpm	2386	3340			
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	40	25			
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	100	65			
Maximum Speed at Iac at 600 Vdc	Nac	RPM	140	95			
Winding Resistance (Phase to Phase)	R20	Ω	2,8	3,5			
Winding Inductance (Phase to Phase)	L	mH	25	34			
Peak Current	Ipk	Arms	63	65			
Continuos Current (Water Cooling Dt100)	Iwc	Arms	24,5	27			
Continuos Current (Air Cooling Dt100)	Iac	Arms	11,3	11			
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	18,7	20,5			
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	8,6	8,4			
Maximum Winding Temperature		°C	130	130			
Height of Rotor		mm	50	70			
Height of Stator		mm	90	110			
Outer Diameter of Stator		mm	565	565			







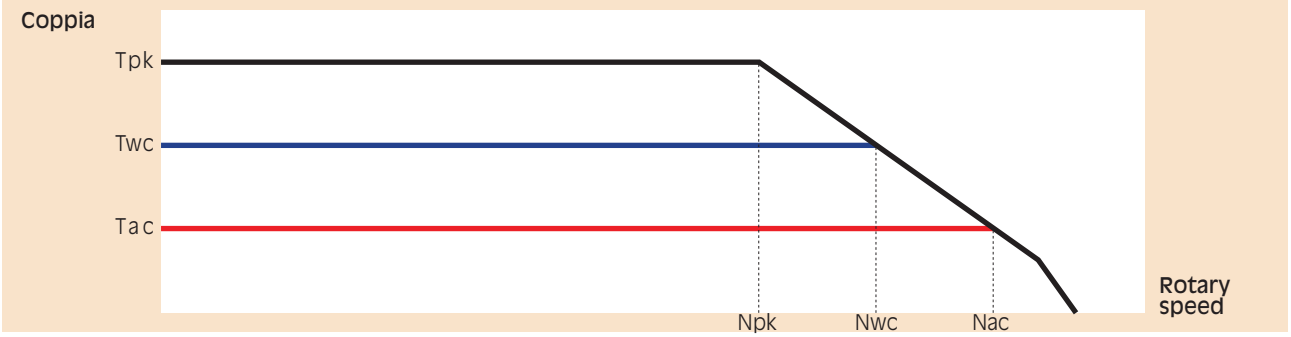


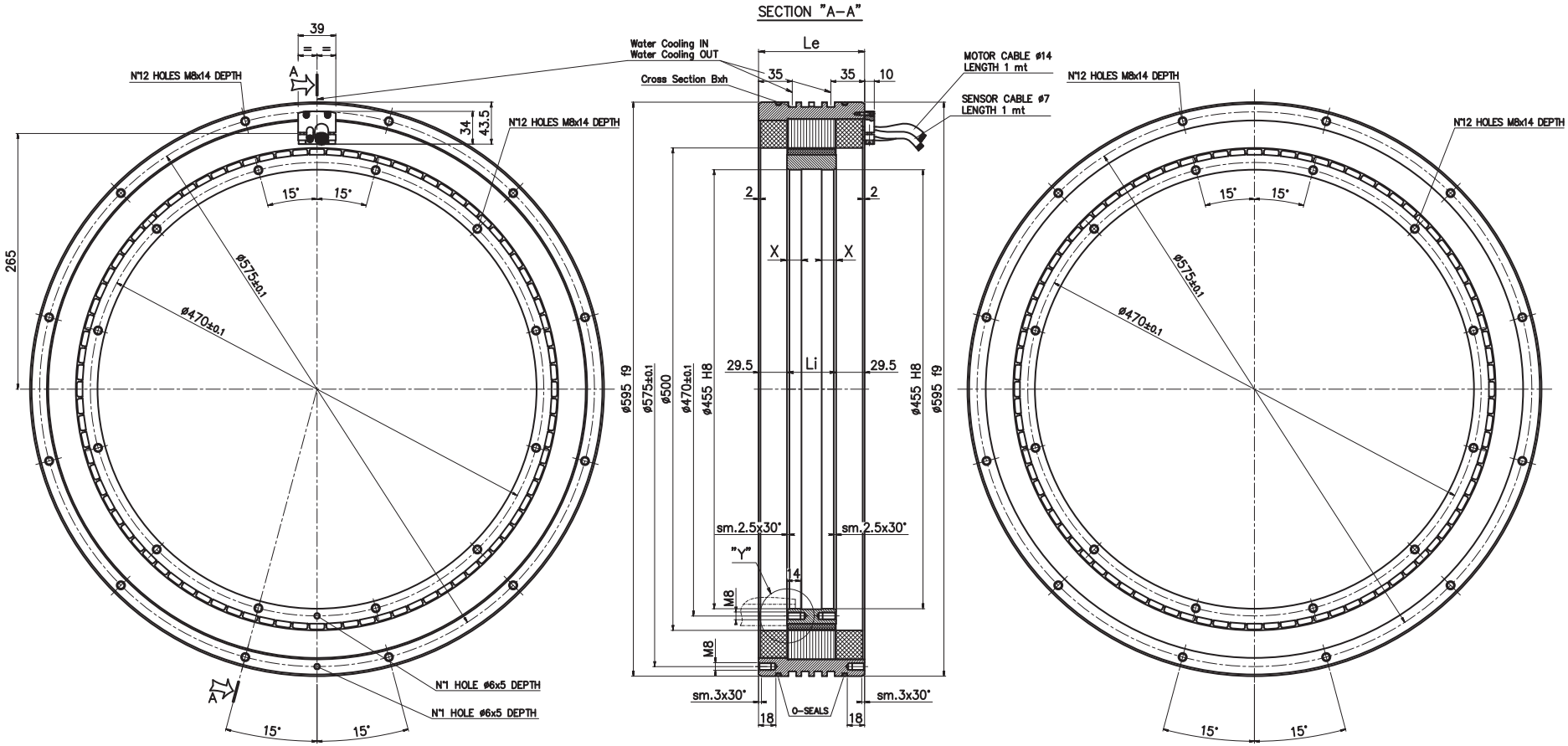


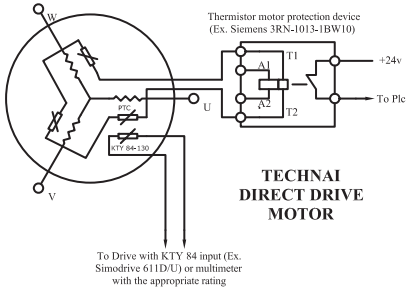
TYPE MK-CIC 530		050	070	
STATOR LENGHT	Le	90	110	
ROTOR LENGHT	Li	51	71	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	8	
COOLING GROOVE WIDTH	h	5	5	
COOLING GROVE	No	2	4	

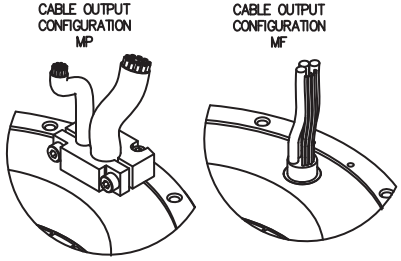
Motor Specifications TECHNAI MK-CI 560 WA

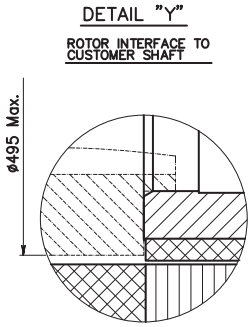
Motor Specifications	Symbol	Unit	MK-CI 560-030 WA	MK-CI 560-050 WA	MK-CI 560-070 WA	MK-CI 560-100 WA	MK-CI 560-150 WA
Number of pole	P		88	88	88	88	88
Peak Torque	Tpk	Nm	1143	1925	2664	3800	5690
Continuos Torque (Water Cooling Dt100)	Twc	Nm	609	1022	1459	2084	2980
Continuos Torque (Air Cooling Dt100)	Tac	Nm	280	465	670	897	1360
Stall Torque (Water Cooling)	Tswc	Nm	465	781	1113	1591	2275
Stall Torque (Air Cooling)	Tsac	Nm	214	355	512	685	1036
Ripple Torque (Cogging Torque)	Tr	Nm	8	12	17	24	35
Power Loss at Twc	Pwc	KW	4	5	6,4	8,3	10,5
Power Loss at Tac	Pac	KW	0,8	1	1,3	1,7	2,2
Termal Resistance Water Cooling	RthWc	K/W	0,024	0,019	0,015	0,012	0,010
Termal Resistance Air Cooling	RthAc	K/W	0,1	0,08	0,073	0,064	0,046
Torque Constant	Kt	Nm/A	23,7	39,5	45,8	55,8	71,6
Back EMF Constant	Ke	V/1000 Rpm	1429	2382	2765	3370	4327
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	75	34	29	32	8
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	175	100	87	65	52
Maximum Speed at Iac at 600 Vdc	Nac	RPM	240	140	120	100	75
Winding Resistance (Phase to Phase)	R20	Ω	2,6	3,4	2,85	2,6	2,7
Winding Inductance (Phase to Phase)	L	mH	12	18,7	17,5	17,9	19,6
Peak Current	Ipk	Arms	70	70	83,5	99	114
Continuos Current (Water Cooling Dt100)	Iwc	Arms	26,9	26,9	33	39	43
Continuos Current (Air Cooling Dt100)	Iac	Arms	12	12	14,9	16,7	20
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	20,5	20,5	25,1	29,7	33
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	9,2	9,2	11,4	12,7	14,9
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	90	110	130	160	210
Outer Diameter of Stator		mm	595	595	595	595	595



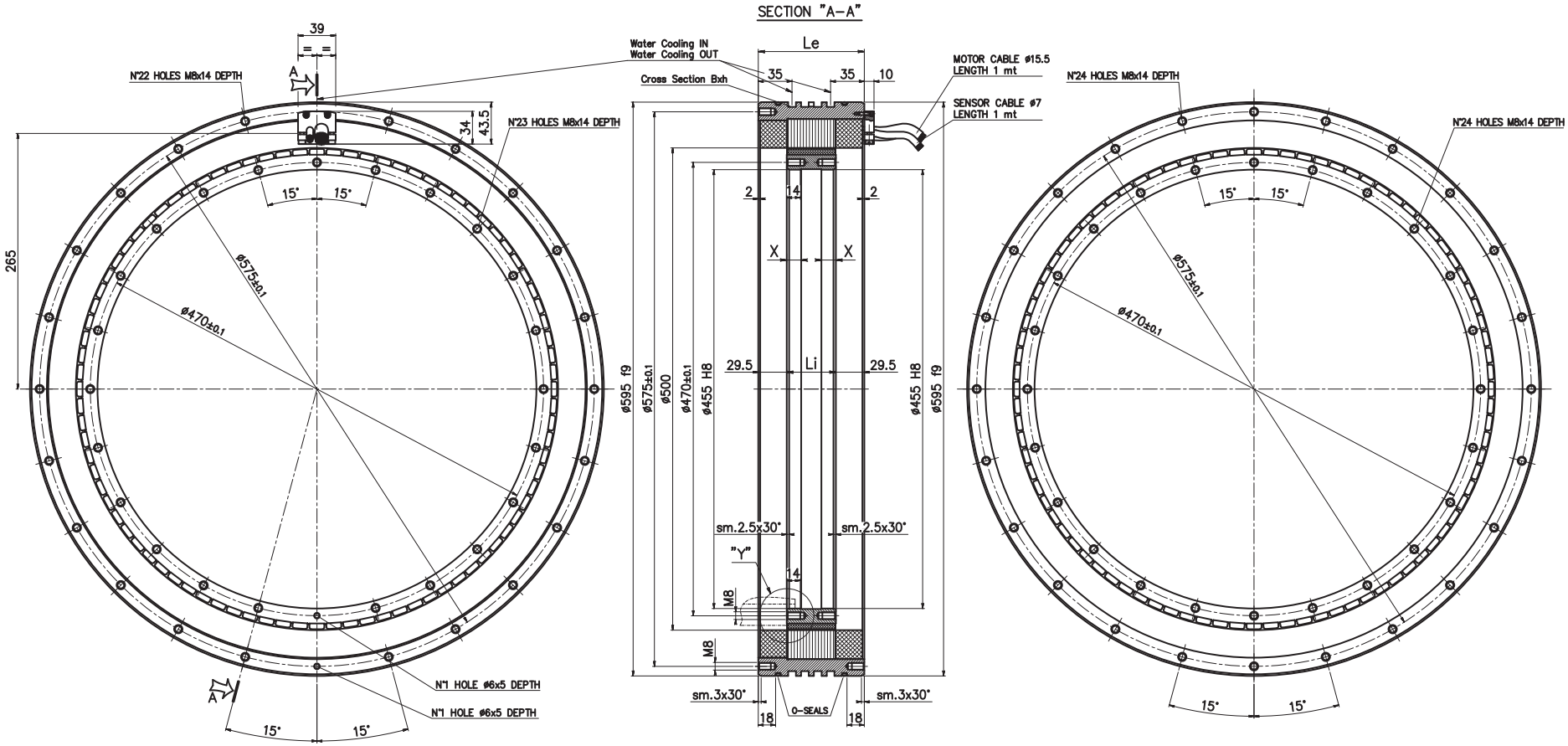


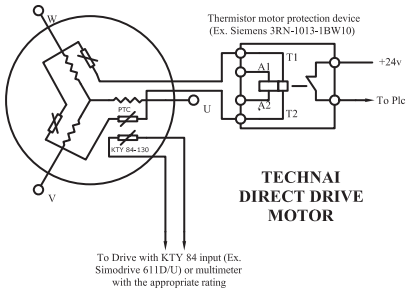


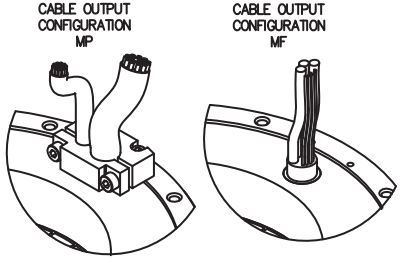


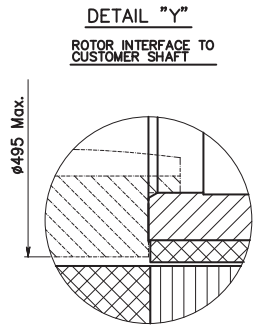


TYPE MK-CI 560		030	050	070
STATOR LENGHT	Le	90	110	130
ROTOR LENGHT	Li	31	51	71
CENTRING LENGHT	X	10	15	15
COOLING GROOVE WIDTH	B	8	8	9
COOLING GROOVE WIDTH	h	5	5	5
COOLING GROVE	No	2	4	4





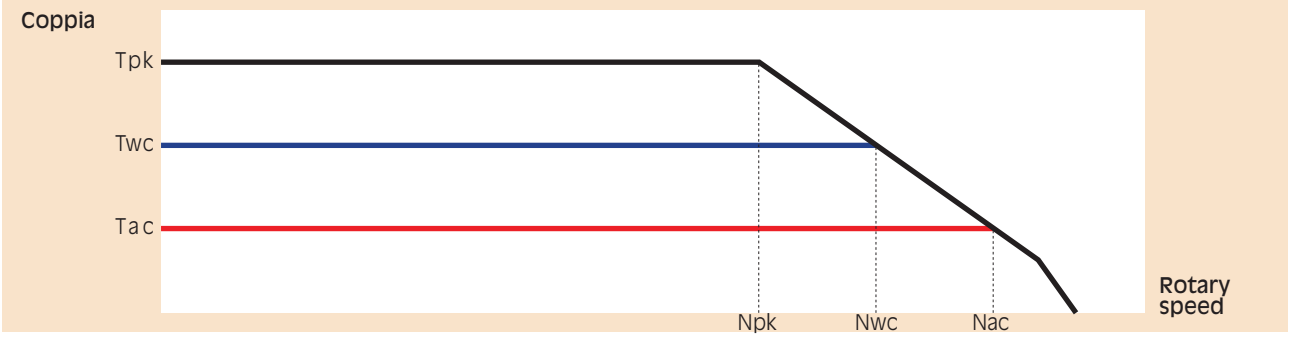


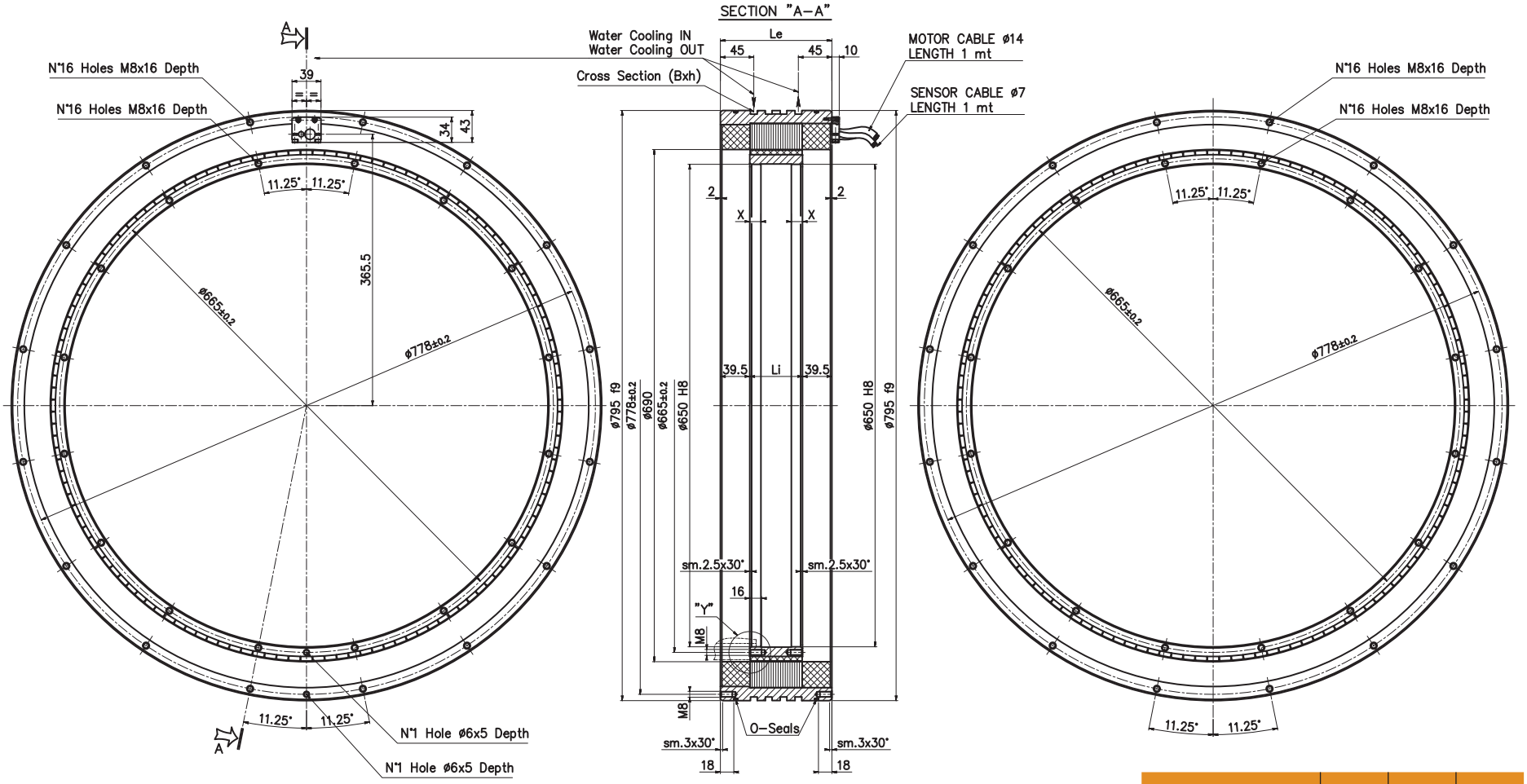


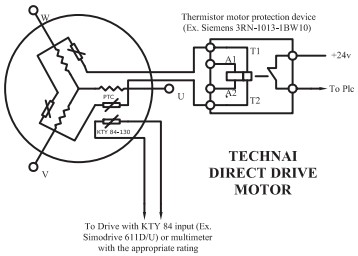
TYPE MK-CI 560		100	150	
STATOR LENGHT	Le	160	210	
ROTOR LENGHT	Li	101	151	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	9	
COOLING GROOVE WIDTH	h	5	5	
COOLING GROVE	No	8	8	

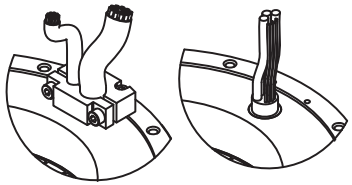
Motor Specifications TECHNAI MK-CI 760 WA

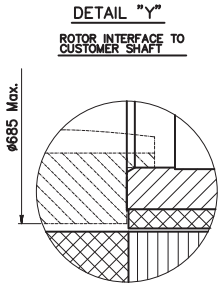
Motor Specifications	Symbol	Unit	MK-CI 760-030 WA	MK-CI 760-050 WA	MK-CI 760-070 WA	MK-CI 760-100 WA	MK-CI 760 -150 WA
Number of pole	P		132	132	132	132	132
Peak Torque	Tpk	Nm	2300	3770	5500	7688	11480
Continuos Torque (Water Cooling Dt100)	Twc	Nm	1272	2076	3100	4500	6550
Continuos Torque (Air Cooling Dt100)	Tac	Nm	615	995	1350	1841	2800
Stall Torque (Water Cooling)	Tswc	Nm	970	1585	2370	3435	5000
Stall Torque (Air Cooling)	Tsac	Nm	470	760	1030	1405	2140
Ripple Torque (Cogging Torque)	Tr	Nm	11	18	25	35	53
Power Loss at Twc	Pwc	KW	4,4	5,6	7,5	11	13,5
Power Loss at Tac	Pac	KW	1	1,2	1,4	1,8	2,4
Termal Resistance Water Cooling	RthWc	K/W	0,023	0,017	0,013	0,009	0,007
Termal Resistance Air Cooling	RthAc	K/W	0,104	0,084	0,07	0,057	0,043
Torque Constant	Kt	Nm/A	55,1	81,6	97,2	94	122,5
Back EMF Constant	Ke	V/1000 Rpm	3331	4935	5872	5675	7401
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	23	13	10	12	7
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	62	41	33	35	26
Maximum Speed at Iac at 600 Vdc	Nac	RPM	93	63	53	57	42
Winding Resistance (Phase to Phase)	R20	Ω	3,5	3,6	3,1	1,95	1,96
Winding Inductance (Phase to Phase)	L	mH	29,2	37,1	36,8	23,8	26,8
Peak Current	Ipk	Arms	60	67	81,5	118	135
Continuos Current (Water Cooling Dt100)	Iwc	Arms	24,5	27	34	51	56,6
Continuos Current (Air Cooling Dt100)	Iac	Arms	11,5	12,5	14,5	20,5	23,5
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	18,8	20,5	25,9	38,9	43,2
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	8,8	9,6	11	15,7	17,9
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	110	130	150	180	230
Outer Diameter of Stator		mm	795	795	795	795	795



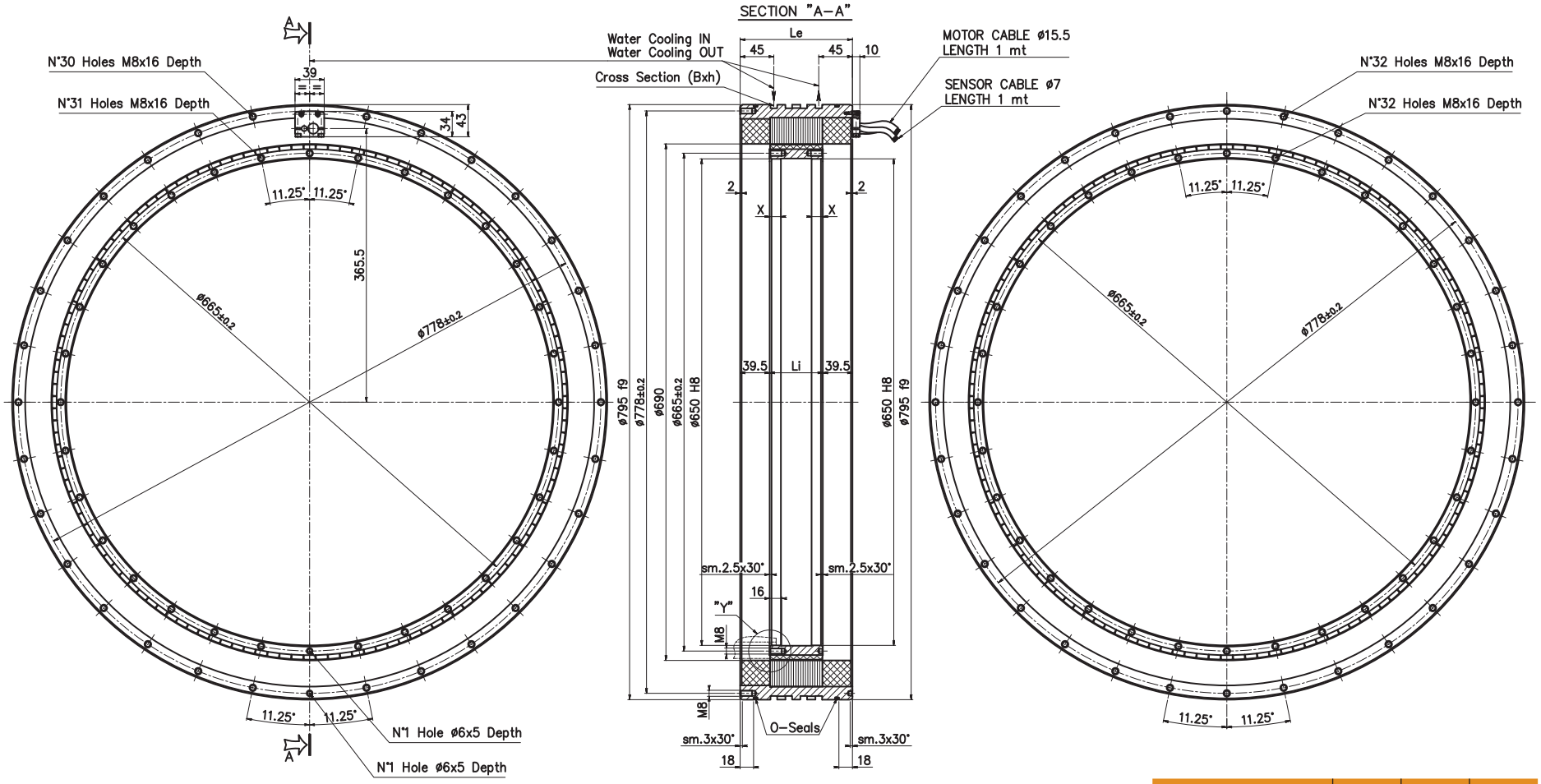


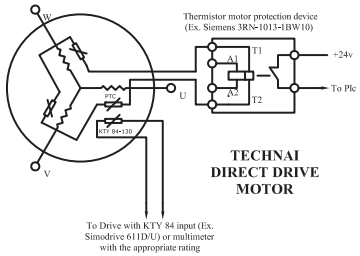


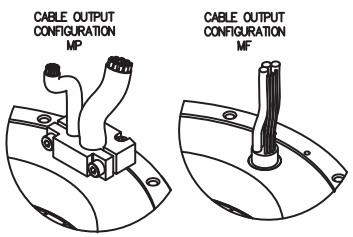


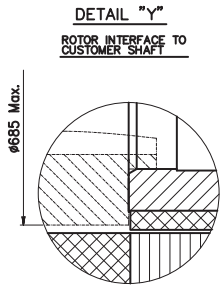


TYPE MK-CI 760		030	050	070
STATOR LENGHT	Le	110	130	150
ROTOR LENGHT	Li	31	51	71
CENTRING LENGHT	X	10	15	15
COOLING GROOVE WIDTH	B	8	8	9
COOLING GROOVE WIDTH	h	5	5	5
COOLING GROVE	No	2	4	4





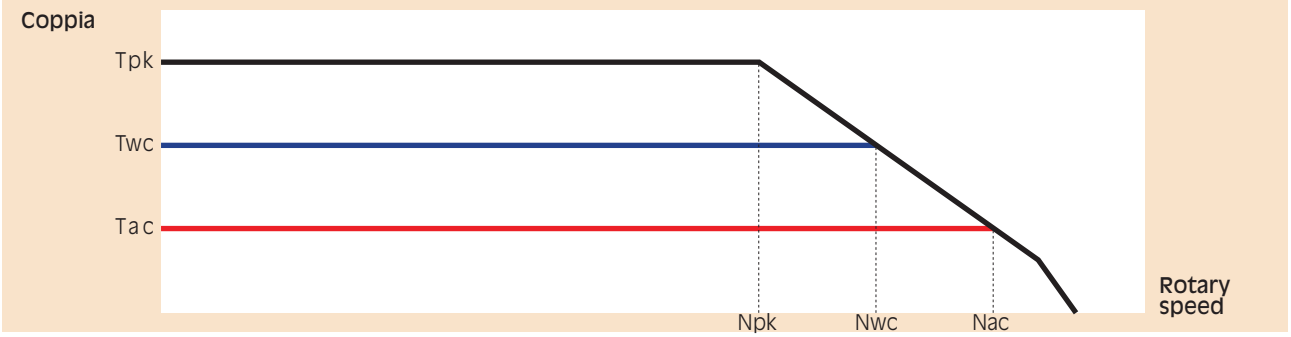


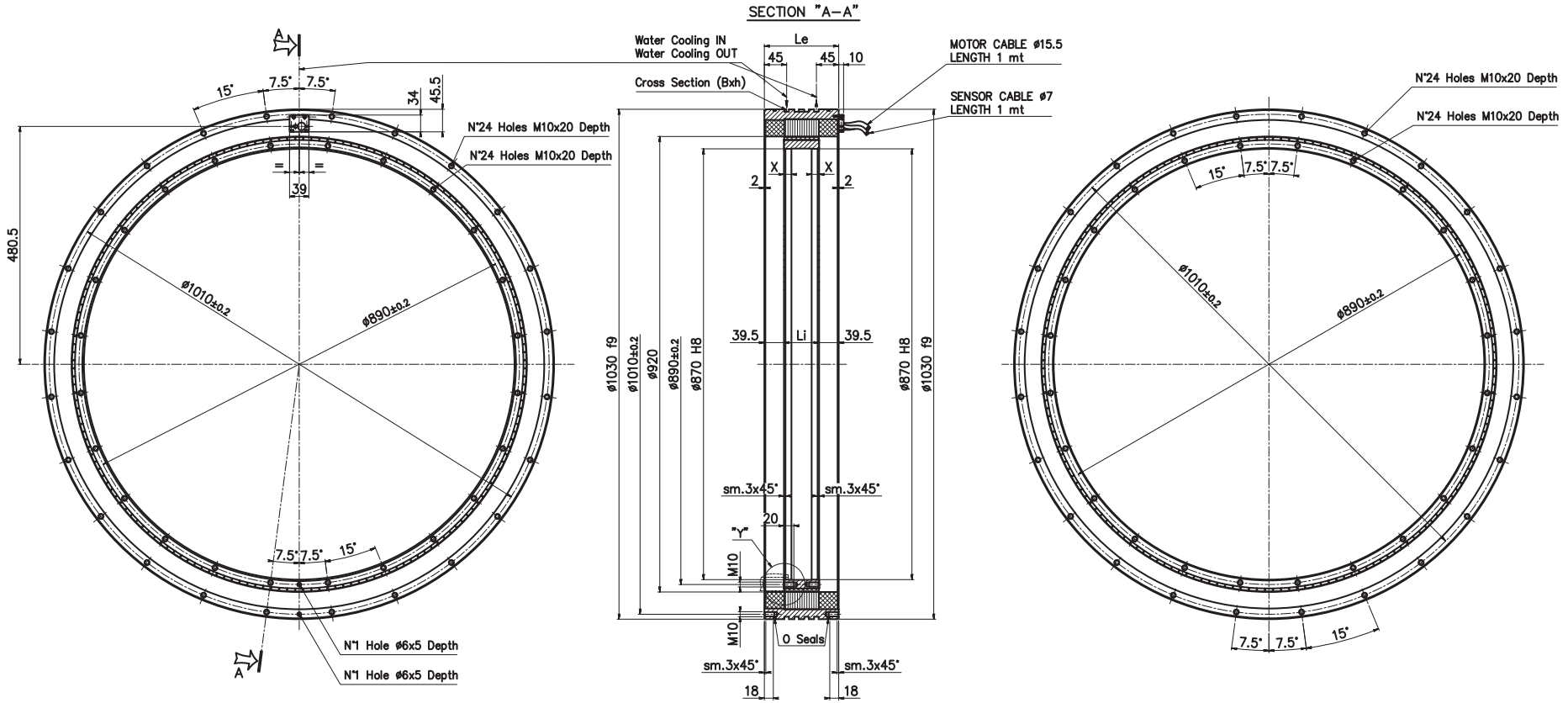


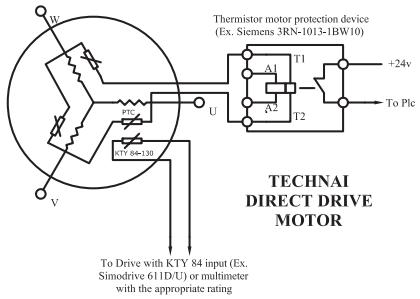
TYPE MK-CI 760		100	150	
STATOR LENGHT	Le	180	230	
ROTOR LENGHT	Li	101	151	
CENTRING LENGHT	X	15	15	
COOLING GROOVE WIDTH	B	8	9	
COOLING GROOVE WIDTH	h	5	5	
COOLING GROVE	No	8	8	

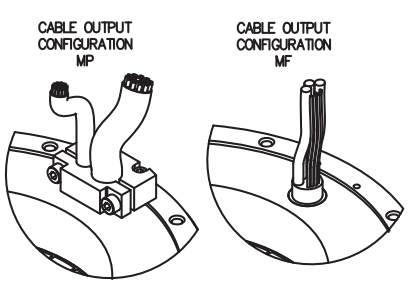
Motor Specifications TECHNAI MK-CI 990 WA

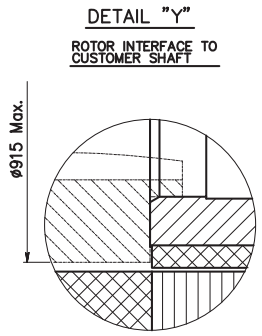
Motor Specifications	Symbol	Unit	MK-CI 990-030 WA	MK-CI 990-050 WA	MK-CI 990-070 WA	MK-CI 990-100 WA	MK-CI 990 -150 WA
Number of pole	P		176	176	176	176	176
Peak Torque	Tpk	Nm	4023	6700	9390	13400	20000
Continuos Torque (Water Cooling Dt100)	Twc	Nm	2124	3622	5095	7490	11200
Continuos Torque (Air Cooling Dt100)	Tac	Nm	1068	1724	2372	3290	4884
Stall Torque (Water Cooling)	Tswc	Nm	1622	2764	3890	5718	8521
Stall Torque (Air Cooling)	Tsac	Nm	815	1316	1777	2514	3728
Ripple Torque (Cogging Torque)	Tr	Nm	13	21	30	43	63
Power Loss at Twc	Pwc	KW	5,6	7,7	9,1	13	17
Power Loss at Tac	Pac	KW	1,4	1,6	1,9	2,3	3,1
Termal Resistance Water Cooling	RthWc	K/W	0,018	0,013	0,010	0,071	0,005
Termal Resistance Air Cooling	RthAc	K/W	0,078	0,064	0,053	0,043	0,032
Torque Constant	Kt	Nm/A	50	83,4	116,8	109	163
Back EMF Constant	Ke	V/1000 Rpm	3025	5041	7058	6576	9863
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	31	17	9	13	5
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	74	43	29	33	20
Maximum Speed at Iac at 600 Vdc	Nac	RPM	105	63	44	49	32
Winding Resistance (Phase to Phase)	R20	Ω	1,28	1,66	2,04	1,1	1,5
Winding Inductance (Phase to Phase)	L	mH	10,25	16,5	22,7	13,6	20,2
Peak Current	Ipk	Arms	116	115,3	115,3	177	176
Continuos Current (Water Cooling Dt100)	Iwc	Arms	45,3	45,9	46	73	72,8
Continuos Current (Air Cooling Dt100)	Iac	Arms	21,9	21,2	20,9	31,2	31,2
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	34,6	35	35,1	56	55,6
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	16,7	16,2	15,9	23,8	23,8
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	110	130	150	180	230
Outer Diameter of Stator		mm	1030	1030	1030	1030	1030



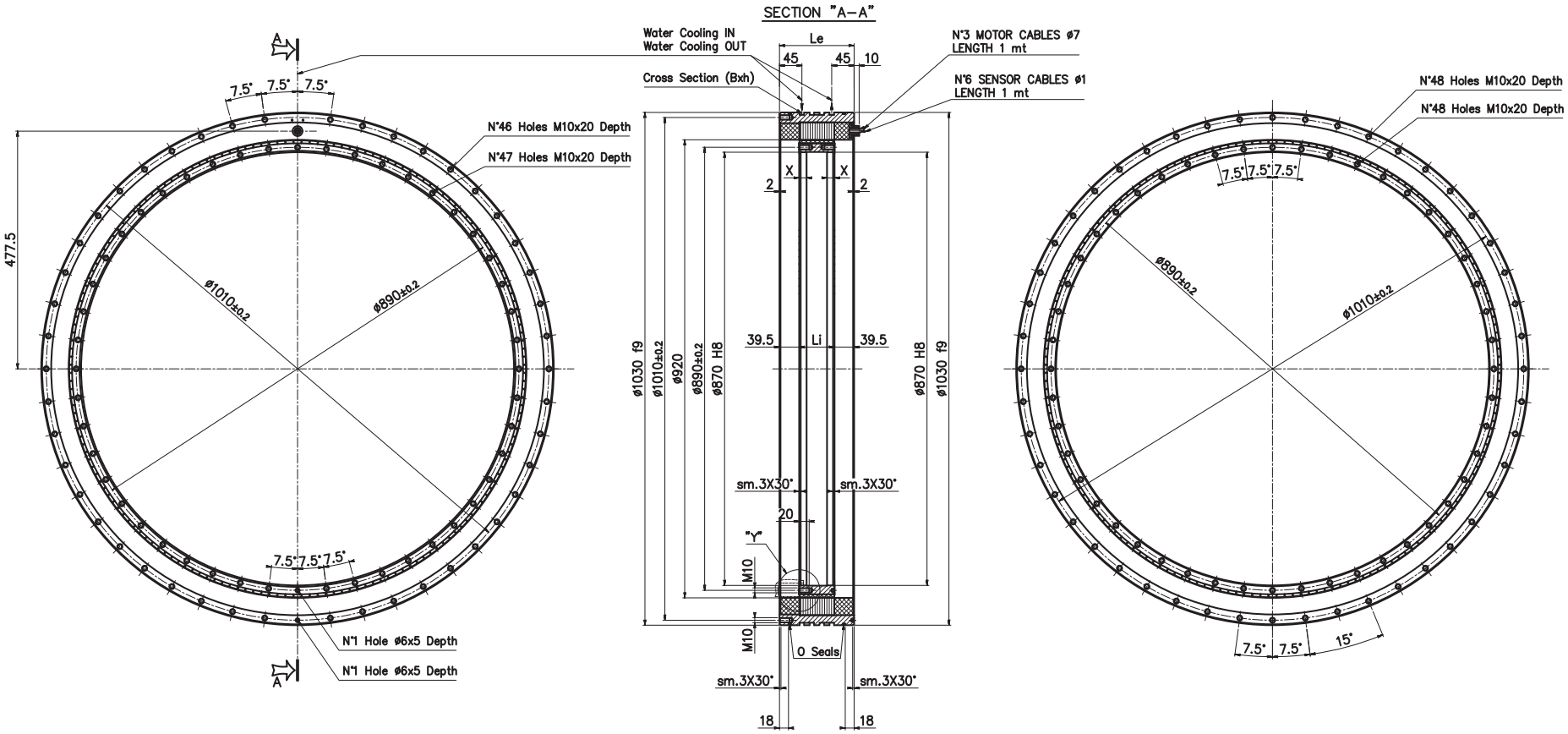


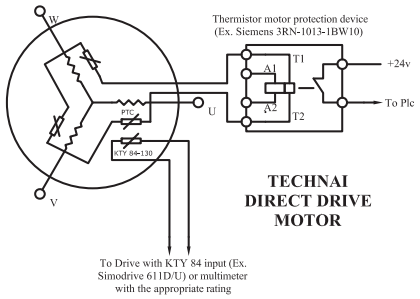


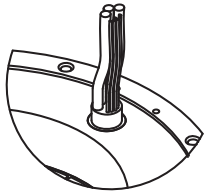


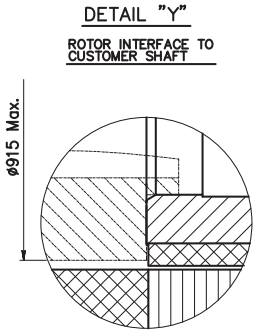


TYPE MK-CI 990		030	050	070	100
STATOR LENGHT	Le	110	130	150	180
ROTOR LENGHT	Li	31	51	71	101
CENTRING LENGHT	X	10	15	15	15
COOLING GROOVE WIDTH	B	8	8	9	8
COOLING GROOVE WIDTH	h	5	5	5	5
COOLING GROVE	No	2	4	4	8





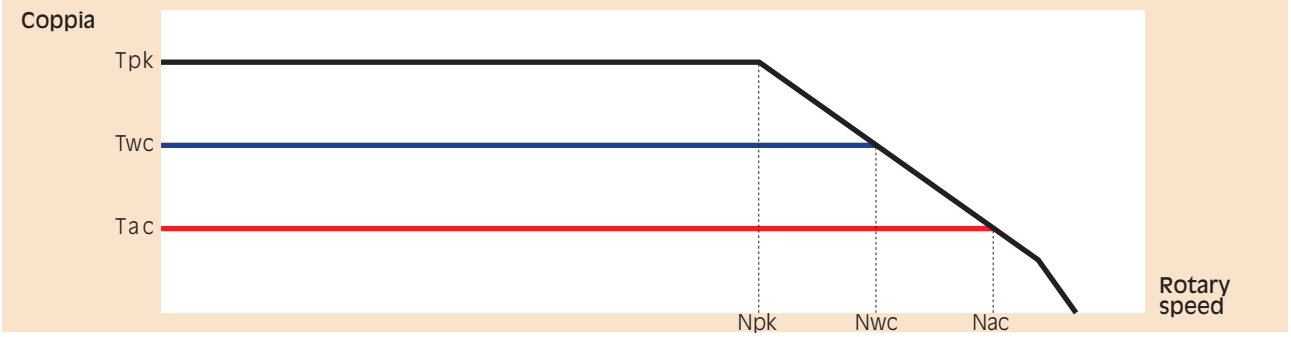


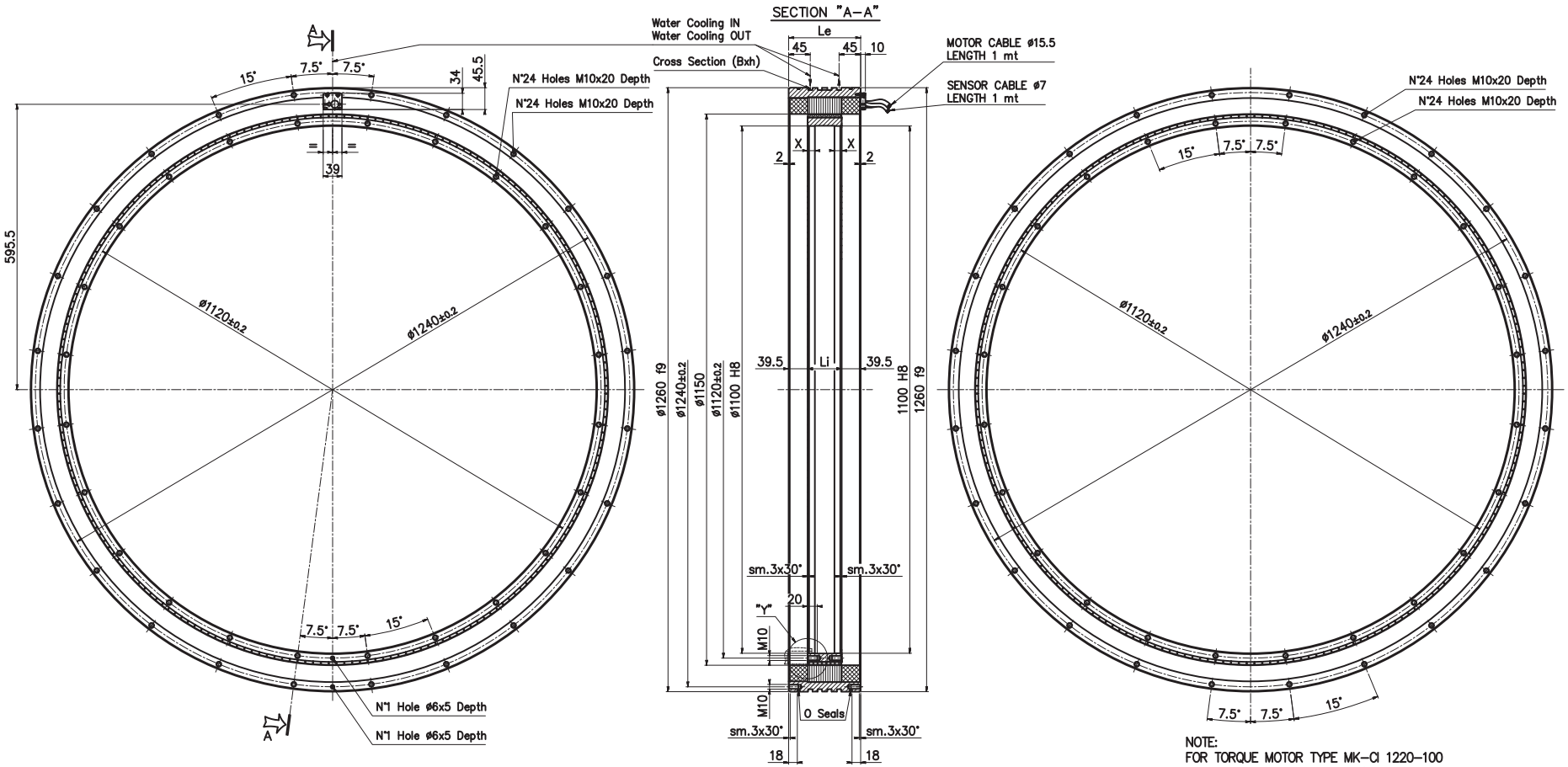


TYPE MK-CI 990		150		
STATOR LENGHT	Le	230		
ROTOR LENGHT	Li	151		
CENTRING LENGHT	X	15		
COOLING GROOVE WIDTH	B	9		
COOLING GROOVE WIDTH	h	5		
COOLING GROVE	No	8		

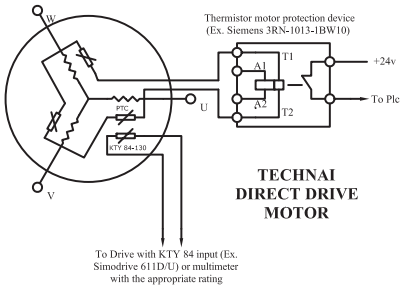
Motor Specifications TECHNAI MK-CI 1220 WA

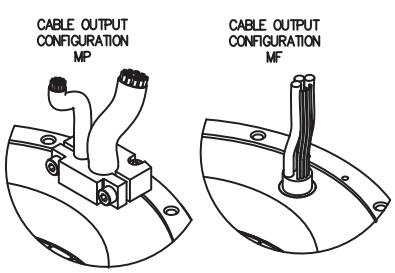
Motor Specifications	Symbol	Unit	MK-CI 1220-030 WA	MK-CI 1220-050 WA	MK-CI 1220-070 WA	MK-CI 1220-100 WA	MK-CI 1220 -150 WA
Number of pole	P		220	220	220	220	220
Peak Torque	Tpk	Nm	6280	10470	14570	20850	31290
Continuos Torque (Water Cooling Dt100)	Twc	Nm	3377	5670	7691	11811	17300
Continuos Torque (Air Cooling Dt100)	Tac	Nm	1680	2715	3627	5228	7350
Stall Torque (Water Cooling)	Tswc	Nm	2578	4328	5871	9016	13240
Stall Torque (Air Cooling)	Tsac	Nm	1280	2073	2769	3991	5608
Ripple Torque (Cogging Torque)	Tr	Nm	25	40	56	80	120
Power Loss at Twc	Pwc	KW	7	9	10,5	16	21
Power Loss at Tac	Pac	KW	1,6	2	2,3	3	3,7
Termal Resistance Water Cooling	RthWc	K/W	0,015	0,01	0,008	0,006	0,004
Termal Resistance Air Cooling	RthAc	K/W	0,064	0,052	0,044	0,035	0,027
Torque Constant	Kt	Nm/A	78	130,3	150,5	147,3	220,9
Back EMF Constant	Ke	V/1000 Rpm	4721	7874	9107	8902	13353
Maximum Speed at Ipk at 600 Vdc	Npk	RPM	18	9	7	9	3
Maximum Speed at Iwc at 600 Vdc	Nwc	RPM	45	26	23	23	14
Maximum Speed at Iac at 600 Vdc	Nac	RPM	67	40	35	36	23
Winding Resistance (Phase to Phase)	R20	Ω	1,5	2	1,72	1	1,4
Winding Inductance (Phase to Phase)	L	mH	13	20,7	19,43	12,8	19
Peak Current	Ipk	Arms	115	115	139	203	203
Continuos Current (Water Cooling Dt100)	Iwc	Arms	46	46	53,8	84,9	82,8
Continuos Current (Air Cooling Dt100)	Iac	Arms	22	21,4	24,8	36,5	34,3
Stall Current at 0 Speed (Water Cooling)	Iswc	Arms	35	35	41	64,8	63,2
Stall Current at 0 Speed (Air Cooling)	Isac	Arms	16,8	16,4	18,9	27,8	26,2
Maximum Winding Temperature		°C	130	130	130	130	130
Height of Rotor		mm	30	50	70	100	150
Height of Stator		mm	110	130	150	180	230
Outer Diameter of Stator		mm	1260	1260	1260	1260	1260

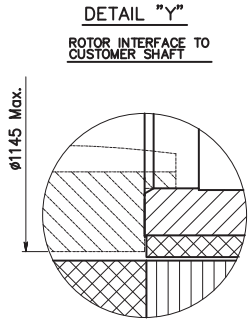




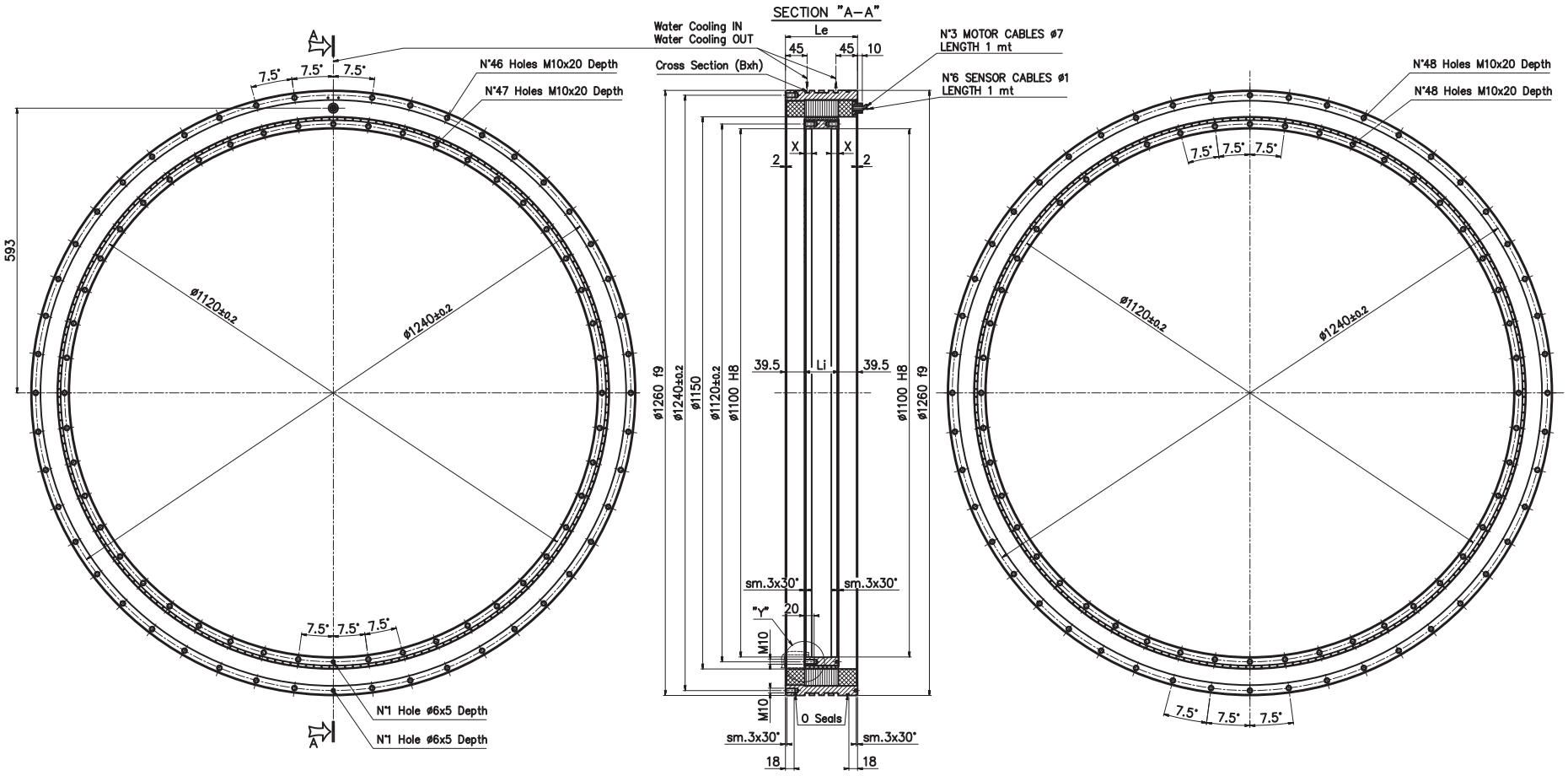
NOTE:
FOR TORQUE MOTOR TYPE MK–CI 1220–100
ONLY CABLE OUTPUT CONFIGURATION MF

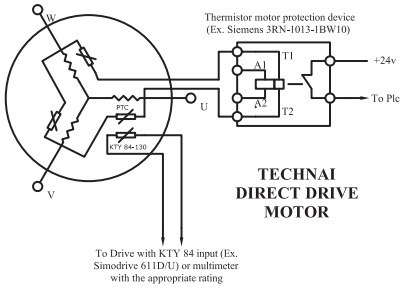


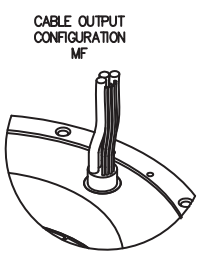


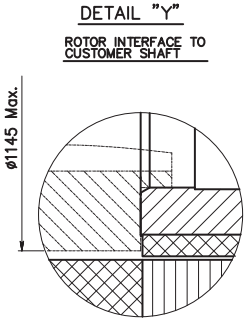


TYPE MK-CI 1220		030	050	070	100
STATOR LENGHT	Le	110	130	150	180
ROTOR LENGHT	Li	31	51	71	101
CENTRING LENGHT	X	10	15	15	15
COOLING GROOVE WIDTH	B	8	8	9	8
COOLING GROOVE WIDTH	h	5	5	5	5
COOLING GROVE	No	2	4	4	8



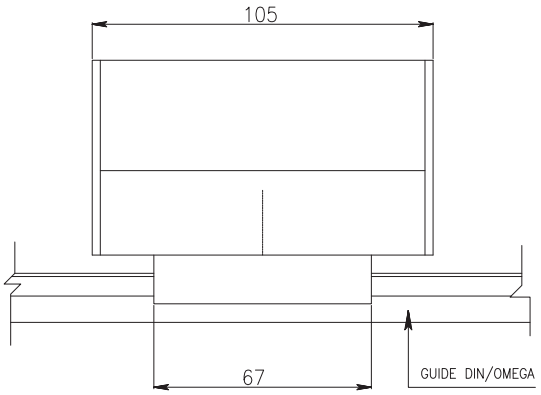


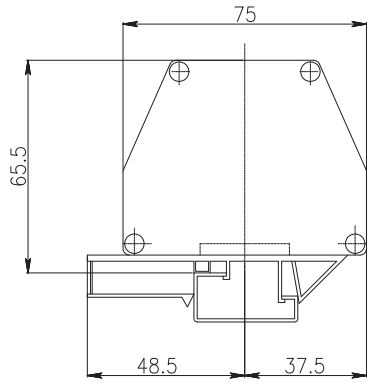


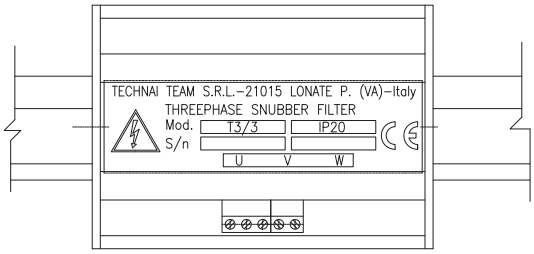


TYPE MK-CI 1220		150		
STATOR LENGHT	Le	230		
ROTOR LENGHT	Li	151		
CENTRING LENGHT	X	15		
COOLING GROOVE WIDTH	B	9		
COOLING GROOVE WIDTH	h	5		
COOLING GROVE	No	8		

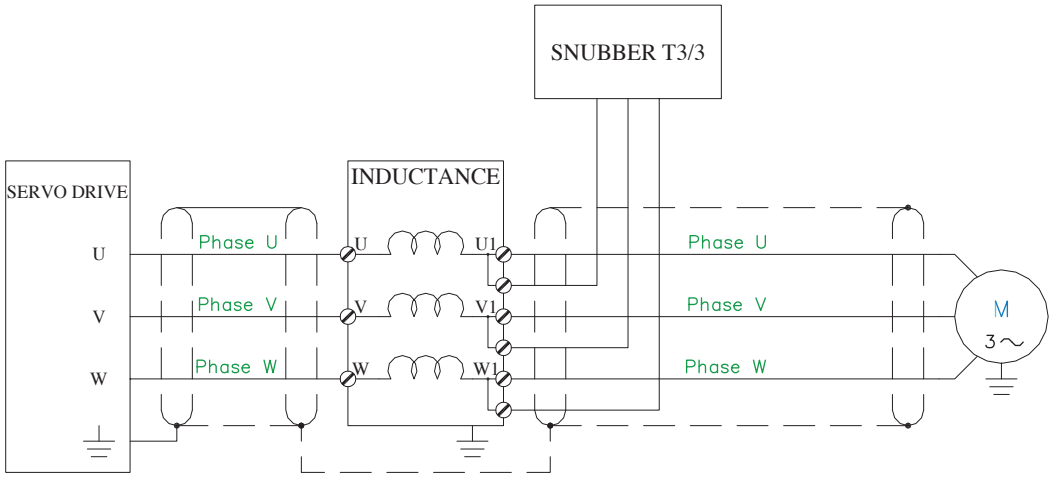
Overvoltage PWM filter suppressor



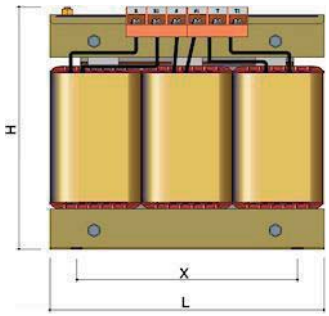


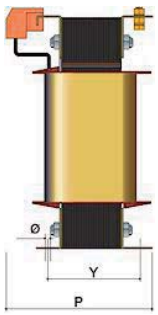


Connection Diagram SNUBBER T3/3



Dimensional features of three-phase inductances





Model	Ind. (mH)	Rated /Peak Current	H (mm)	X (mm)	L (mm)	Y (mm)	P (mm)	Ø (mm)	Weight
CEIN0034-0	0,7	10/20 A	115	75	120	65	90	5,75	3 Kg
CEIN0035-0	0,7	20/40 A	170	112	160	70	110	6,75	4,5 Kg
CEIN0033-0	0,7	40/80 A	180	112	180	100	150	7	8,5 Kg
CEIN0025-0	0,7	60/120 A	200	200	240	110	200	9,75	17 Kg
CEIN0060-0	0,7	100/200 A	210	200	240	150	210	9,75	25 Kg.

dV/dT filter and inductance

for MK-CI WA Motor series

Motor Type	Inductance	Snubber Filter
MK-CI 140-030 WA	CEIN0034-0	CEFI-0009-0
MK-CI 140-050 WA	CEIN0034-0	CEFI-0009-0
MK-CI 140-070 WA	CEIN0034-0	CEFI-0009-0
MK-CI 140-100 WA	CEIN0034-0	CEFI-0009-0
MK-CI 140-150 WA	CEIN0034-0	CEFI-0009-0
MK-CI 175-030 WA	CEIN0034-0	CEFI-0009-0
MK-CI 175-050 WA	CEIN0034-0	CEFI-0009-0
MK-CI 175-070 WA	CEIN0034-0	CEFI-0009-0
MK-CI 175-100 WA	CEIN0034-0	CEFI-0009-0
MK-CI 175-150 WA	CEIN0034-0	CEFI-0009-0
MK-CI 210-030 WA	CEIN0034-0	CEFI-0009-0
MK-CI 210-050 WA	CEIN0034-0	CEFI-0009-0
MK-CI 210-070 WA	CEIN0034-0	CEFI-0009-0
MK-CI 210-100 WA	CEIN0035-0	CEFI-0009-0
MK-CI 210-150 WA	CEIN0035-0	CEFI-0009-0
MK-CI 260-030 WA	CEIN0034-0	CEFI-0009-0
MK-CI 260-050 WA	CEIN0034-0	CEFI-0009-0
MK-CI 260-070 WA	CEIN0034-0	CEFI-0009-0
MK-CI 260-100 WA	CEIN0035-0	CEFI-0009-0
MK-CI 260-150 WA	CEIN0035-0	CEFI-0009-0
MK-CI 290-030 WA	CEIN0035-0	CEFI-0009-0
MK-CI 290-050 WA	CEIN0035-0	CEFI-0009-0
MK-CI 290-070 WA	CEIN0035-0	CEFI-0009-0
MK-CI 290-100 WA	CEIN0035-0	CEFI-0009-0
MK-CI 290-150 WA	CEIN0035-0	CEFI-0009-0
MK-CI 360-030 WA	CEIN0035-0	CEFI-0009-0
MK-CI 360-050 WA	CEIN0035-0	CEFI-0009-0
MK-CI 360-070 WA	CEIN0033-0	CEFI-0009-0
MK-CI 360-100 WA	CEIN0033-0	CEFI-0009-0
MK-CI 360-150 WA	CEIN0033-0	CEFI-0009-0
MK-CIC 360-050 WA	CEIN0035-0	CEFI-0009-0
MK-CIC 360-070 WA	CEIN0033-0	CEFI-0009-0
MK-CI 420-030 WA	CEIN0035-0	CEFI-0009-0
MK-CI 420-050 WA	CEIN0035-0	CEFI-0009-0
MK-CI 420-070 WA	CEIN0033-0	CEFI-0009-0
MK-CI 420-100 WA	CEIN0033-0	CEFI-0009-0
MK-CI 420-150 WA	CEIN0033-0	CEFI-0009-0

Motor Type	Inductance	Snubber Filter
MK-CI 450-030 WA	CEIN0033-0	CEFI-0009-0
MK-CI 450-050 WA	CEIN0033-0	CEFI-0009-0
MK-CI 450-070 WA	CEIN0033-0	CEFI-0009-0
MK-CI 450-100 WA	CEIN0033-0	CEFI-0009-0
MK-CI 450-150 WA	CEIN0025-0	CEFI-0009-0
MK-CIC 450-050 WA	CEIN0033-0	CEFI-0009-0
MK-CIC 450-070 WA	CEIN0033-0	CEFI-0009-0
MK-CI 530-030 WA	CEIN0033-0	CEFI-0009-0
MK-CI 530-050 WA	CEIN0033-0	CEFI-0009-0
MK-CI 530-070 WA	CEIN0033-0	CEFI-0009-0
MK-CI 530-100 WA	CEIN0025-0	CEFI-0009-0
MK-CI 530-150 WA	CEIN0025-0	CEFI-0009-0
MK-CIC 530-050 WA	CEIN0033-0	CEFI-0009-0
MK-CIC 530-070 WA	CEIN0033-0	CEFI-0009-0
MK-CI 560-030 WA	CEIN0033-0	CEFI-0009-0
MK-CI 560-050 WA	CEIN0033-0	CEFI-0009-0
MK-CI 560-070 WA	CEIN0033-0	CEFI-0009-0
MK-CI 560-100 WA	CEIN0033-0	CEFI-0009-0
MK-CI 560-150 WA	CEIN0025-0	CEFI-0009-0
MK-CI 760-030 WA	CEIN0033-0	CEFI-0009-0
MK-CI 760-050 WA	CEIN0033-0	CEFI-0009-0
MK-CI 760-070 WA	CEIN0033-0	CEFI-0009-0
MK-CI 760-100 WA	CEIN0025-0	CEFI-0009-0
MK-CI 760-150 WA	CEIN0025-0	CEFI-0009-0
MK-CI 990-030 WA	CEIN0025-0	CEFI-0009-0
MK-CI 990-050 WA	CEIN0025-0	CEFI-0009-0
MK-CI 990-070 WA	CEIN0025-0	CEFI-0009-0
MK-CI 990-100 WA	CEIN0026-0	CEFI-0009-0
MK-CI 990-150 WA	CEIN0026-0	CEFI-0009-0
MK-CI 1220-030 WA	CEIN0025-0	CEFI-0009-0
MK-CI 1220-050 WA	CEIN0025-0	CEFI-0009-0
MK-CI 1220-070 WA	CEIN0025-0	CEFI-0009-0
MK-CI 1220-100 WA	CEIN0060-0	CEFI-0009-0
MK-CI 1220-150 WA	CEIN0060-0	CEFI-0009-0

for MK-CI WB Motor series

Motor Type	Inductance	Snubber Filter
MK-CI 175-030 WB	CEIN0033-0	CEFI-0009-0
MK-CI 175-050 WB	CEIN0033-0	CEFI-0009-0
MK-CI 175-070 WB	CEIN0033-0	CEFI-0009-0
MK-CI 175-100 WB	CEIN0033-0	CEFI-0009-0
MK-CI 175-150 WB	CEIN0033-0	CEFI-0009-0
MK-CI 210-030 WB	CEIN0035-0	CEFI-0009-0
MK-CI 210-050 WB	CEIN0035-0	CEFI-0009-0
MK-CI 210-070 WB	CEIN0035-0	CEFI-0009-0
MK-CI 210-100 WB	CEIN0033-0	CEFI-0009-0
MK-CI 210-150 WB	CEIN0033-0	CEFI-0009-0
MK-CI 290-030 WB	CEIN0033-0	CEFI-0009-0
MK-CI 290-050 WB	CEIN0033-0	CEFI-0009-0
MK-CI 290-070 WB	CEIN0033-0	CEFI-0009-0
MK-CI 290-100 WB	CEIN0033-0	CEFI-0009-0
MK-CI 290-150 WB	CEIN0033-0	CEFI-0009-0

Motor Type	Inductance	Snubber Filter
MK-CI 360-030 WB	CEIN0033-0	CEFI-0009-0
MK-CI 360-050 WB	CEIN0033-0	CEFI-0009-0
MK-CI 360-070 WB	CEIN0033-0	CEFI-0009-0
MK-CI 360-100 WB	CEIN0025-0	CEFI-0009-0
MK-CI 360-150 WB	CEIN0025-0	CEFI-0009-0
MK-CIC 360-050 WB	CEIN0033-0	CEFI-0009-0
MK-CIC 360-070 WB	CEIN0033-0	CEFI-0009-0
MK-CI 450-030 WB	CEIN0025-0	CEFI-0009-0
MK-CI 450-050 WB	CEIN0025-0	CEFI-0009-0
MK-CI 450-070 WB	CEIN0025-0	CEFI-0009-0
MK-CI 450-100 WB	CEIN0025-0	CEFI-0009-0
MK-CI 450-150 WB	CEIN0025-0	CEFI-0009-0
MK-CIC 450-050 WB	CEIN0025-0	CEFI-0009-0
MK-CIC 450-070 WB	CEIN0025-0	CEFI-0009-0

The data conteined in this catalogue are indicative and could be modified without notice.

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