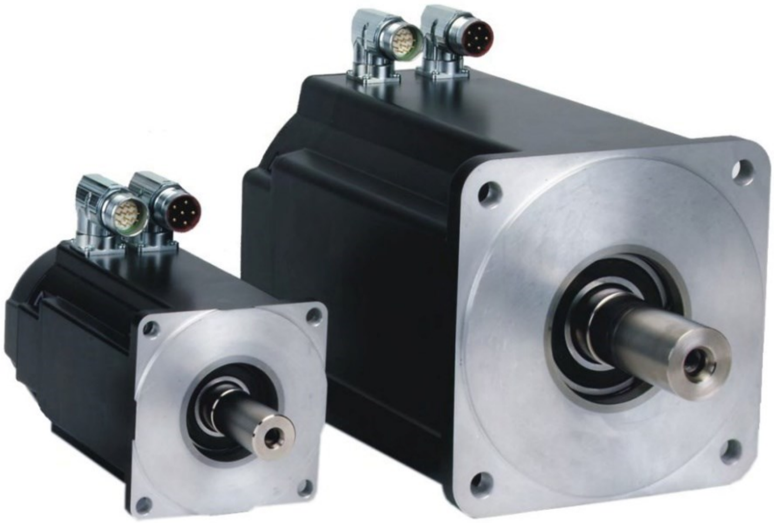
Installation and User Manual
GFK-3169D
Mar 2022

PACMotion™ Rotary Servo Motors

INSTALLATION AND USER MANUAL



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Warnings and Caution Notes as Used in this Publication

⚠ WARNING

Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.

In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

⚠ CAUTION

Caution notices are used where equipment might be damaged if care is not taken.

Note: Notes merely call attention to information that is especially significant to understanding and operating the equipment.

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Contents

Section 1: Introduction

1.1 Document Revisions

Revision		Remarks
D	Mar 2022	• Updated technical data for IC830M7 without fan specifications in Section 7.5. • Removed erroneous technical data for IC830M2 and IC830M4 (75 VAC) in Sections 7.2 and 7.3.
C	Mar 2021	• Updated Dimension Drawings in Section 8.
B	Oct 2020	• Updated Mechanical Data in Section 7: Technical Data • Added Technical data for IC830M72R in Section 7: Technical Data • Updated Documentation Titles
A	Sep 2020	Initial Release

1.2 About this manual

This manual provides the technical descriptions and adjustments available for the Rotary Servo Motors (PSR) series of synchronous servomotors. The motors are operated in drive systems together with Emerson servo amplifiers. Please observe the entire system documentation, consisting of:

Instructions manual for the servo amplifier:

- EtherCAT
- Online help of the amplifier's setup software
- Regional accessories manual
- Technical description of the PSR series of motors

1.3 Related Documentation

Description of Manual	GFK Number
PACMotion Servo Drives Installation and User Manual	GFK-3168
PACMotion Rotary Servo Motors Installation and User Manual	GFK-3169
PACMotion Servos Accessories Guide	GFK-3173
PACMotion Servos Secure Deployment Guide	GFK-3177

1.4 Safety

This section helps you to recognize and avoid dangers to people and objects.

1.4.1 You should pay attention to this

Specialist staff required!

Only properly qualified personnel are permitted to perform such tasks as transport, assembly, setup and maintenance. Qualified specialist staff are persons who are familiar with the transport, installation, assembly, commissioning and operation of motors and who bring their relevant minimum qualifications to bear on their duties:

- Transport: only by personnel with knowledge of handling electrostatically sensitive components
- Mechanical Installation: only by mechanically qualified personnel.
- Electrical Installation: only by electrically qualified personnel.
- Setup: only by qualified personnel with extensive knowledge of electrical engineering and drive technology
- The qualified personnel must know and observe IEC 60364 / IEC 60664 and national accident prevention regulations.

Read the documentation!

Read the available documentation before installation and commissioning. Improper handling of the motor can cause harm to people or damage to property. The operator must therefore ensure that all persons entrusted to work on the motor have read and understood the manual and that the safety notices in this manual are observed.

Pay attention to the technical data!

Adhere to the technical data and the specifications on connection conditions (rating plate and documentation). If permissible voltage values or current values are exceeded, the motors can be damaged, for example by overheating.

Perform a risk assessment!

The manufacturer of the machine must generate a risk assessment for the machine, and take appropriate measures to ensure that unforeseen movements cannot cause injury or damage to any person or property. Additional requirements on specialist staff may also result from the risk assessment.

Secure the key!

Remove any fitted key (if present) from the shaft before letting the motor run without coupled load, to avoid the dangerous results of the key being thrown out by centrifugal forces. When delivered, the key is protected with a plastic cap.

Hot surface!

The surfaces of the motors can be very hot in operation, according to their protection category. Risk of minor burns! The surface temperature can exceed 100°C.

Measure the temperature, and wait until the motor has cooled down below 40°C before touching it.

Earthing! High voltages!

It is vital that you ensure that the motor housing is safely earthed to the PE (protective earth) busbar in the switch cabinet. Risk of electric shock. Without low-resistance earthing no personal protection can be guaranteed and there is a risk of death from electric shock.

Not having optical displays does not guarantee an absence of voltage. Power connections may carry voltage even if the motor shaft is not rotating.

- Do not unplug any connectors during operation. There is a risk of death or severe injury from touching exposed contacts. Power connections may be live even when the motor shaft is not rotating. This can cause flashovers with resulting injuries to persons and damage to the contacts.
- After disconnecting the servo amplifier from the supply voltage, wait several minutes before touching any components which are normally live (e.g. contacts, screw connections) or opening any connections.
- The capacitors in the servo amplifier can still carry a dangerous voltage several minutes after switching off the supply voltages. To be quite safe, measure the DC-link voltage and wait until the voltage has fallen below 60 V.

Secure hanging loads!

- Built-in holding brakes do not ensure functional safety!
- Hanging loads (vertical axes) require an additional, external mechanical brake to ensure personnel safety.

Use as directed

- The PSR series of synchronous servomotors is designed especially for drives for industrial robots, machine tools, textile and packing machinery and similar with high requirements for dynamics.
- The user is only permitted to operate the motors under the ambient conditions which are defined in this documentation.
- The PSR series of motors is **exclusively** intended to be driven by servo amplifiers under speed and/or torque control.
- The motors are installed as components in electrical apparatus or machines and can only be commissioned and put into operation as integral components of such apparatus or machines.
- The thermal sensor which is integrated in the motor windings must be observed and evaluated.
- The holding brakes are designed as standstill brakes and are not suited for repeated operational braking.
- The conformity of the servo system to the standards mentioned in the CE Declaration of Conformity is only guaranteed when the components (servo amplifier, motor, cables etc.) that are used have been supplied by Emerson.

Prohibited use

- The use of the **Standard** Motors is prohibited
    - directly on mains supply networks,
    - in areas where there is a risk of explosions,
    - in contact with food and beverage,
    - in environments with caustic and/or electrically conducting acids, bases, oils, vapors, dusts.

- Commissioning the motor is prohibited if the machine in which it was installed
    - does not meet the requirements of the EC Machinery Directive,
    - does not comply with the EMC Directive,
    - does not comply with the Low Voltage Directive.
- Built-in holding brakes without further equipment must not be used to ensure functional safety.

Handling

Transport

- Climate category 2K3 according to IEC 60721-3-2, EN61800-2
- Temperature: -25 - +70 °C, max. 20 K/HR change
- Humidity: rel. humidity 5% - 95% , no condensation
- Only by qualified personnel in the manufacturer's original recyclable packaging
- Avoid shocks, especially to the shaft end
- If the packaging is damaged, check the motor for visible damage. Inform the carrier and, if appropriate, the manufacturer.

Packaging

- Cardboard packing with Instapak® foam cushion.

Motor type	Packing	Max. stacking height
IC830M2	Cardboard	10
IC830M4	Cardboard	6
IC830M6	Cardboard	1
IC830M7	Cardboard	1

Storage

- Climate category 1K4 according to IEC 60721-3-1, EN61800-2
- Storage temperature: - 25 - +55°C, max. variation 20K/hr.
- Humidity: rel. humidity 5% - 95%, no condensation
- Store only in the manufacturer's original recyclable packaging
- Max. stacking height: see table in chapter "Packaging"
- Storage time: unlimited
- Maintenance / Cleaning
- Maintenance and cleaning only by qualified personnel
- The ball bearings should be replaced after 20,000 hours of operation under rated conditions (by the manufacturer).

- Check the motor for bearing noise every 2500 operating hours, respectively each year. If any noises are heard, stop the operation of the motor, the bearings must be replaced (by the manufacturer).
- Opening the motor invalidates the warranty.
- If the housing is dirty, clean housing with Isopropanol or similar, do not immerse or spray.

1.5 Package

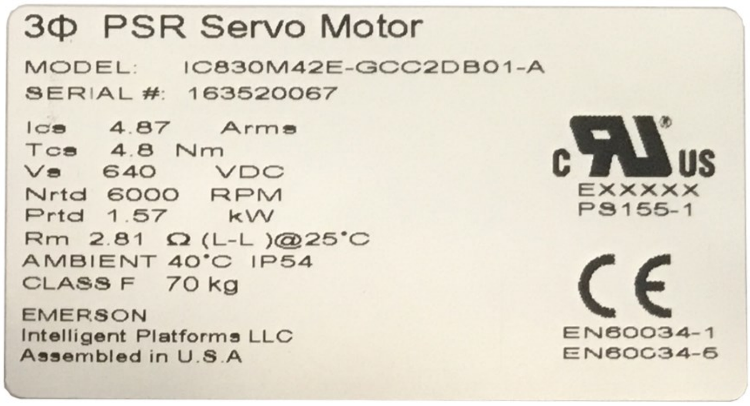
1.5.1 Delivery package

- Motor from the PSR series
- Product manual (multi language) printed, one per delivery

1.5.2 Nameplate

With standard motors the nameplate is adhesive on the housing side. With washdown motors the nameplate is engraved on the housing side, an additional nameplate is added to every motor package.

Figure 1: Nameplate

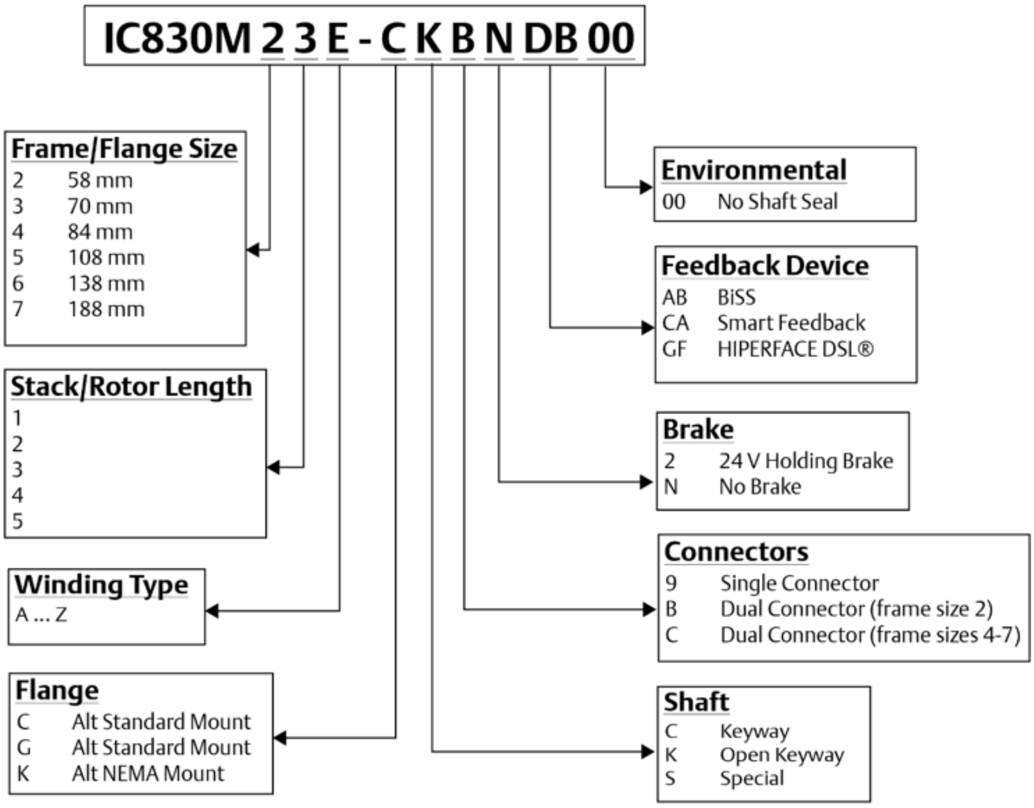


Legend	Description
MODEL	motor type
Ics	I0rms (standstill current)
Tcs	M0 (standstill torque)
Vs	Un (DC bus link voltage)
Nrtd	nn (rated speed @ Un)
Prtd	Pn (rated power)
Rm	R25 (winding resistance @ 25°)
SERIAL	serial no.
AMBIENT	maximum ambient temp.

Year of manufacturing is coded in the serial number: the first two digits of the serial number are the year of manufacturing, e.g. "17" means 2017.

1.5.3 Model number description

Figure 2: Model Number Description



Section 2: Technical Description

2.1 General technical data

2.1.1 Ambient temperature (at rated values)

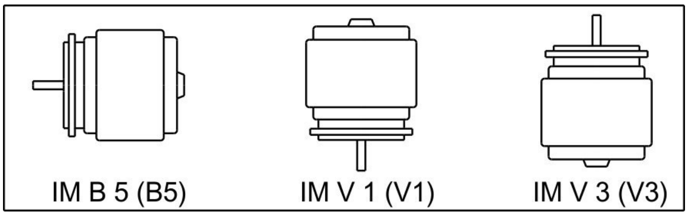
- Permissible humidity (at rated values) Power derating (currents and torques)
- 5 - +40°C for site altitude up to 1000m amsl
- It is vital to consult our applications department for ambient temperatures above 40°C and encapsulated mounting of the motors.
- 95% rel. humidity, no condensation
- 1%/K in range 40°C - 50°C up to 1000m amsl for site altitude above 1000m amsl and 40°C 6% up to 2000m amsl
- 17% up to 3000m amsl 30% up to 4000m amsl 55% up to 5000m amsl
- No derating for site altitudes above 1000m amsl with temperature reduction of 10K / 1000m
- Ball-bearing life ≥ 20,000 operating hours

Note: Technical data for every motor type can be found in chapter "Technical Data" from (Section 7: Technical Data).

2.1.2 Style

The basic style for the IC830M motors is style IM B5 according to EN 60034-7.

Figure 3: IC830M motors



2.1.3 Flange

IEC flange accuracy according to DIN 42955. Tolerances of shaft extension run-out and of mounting flanges for rotating electrical machines.

Code	Flange
K	NEMA ICS 16 Metric Flange
C	NEMA ICS 16 Metric Flange
D	IEC 60072 Flange
G	IEC 60072 Flange
E	NEMA ICS 16 Metric Flange
B	NEMA ICS 16 Metric Flange

2.1.4 Protection class

Standard Motor	Connector Option	Shaft Seal	Protection class
IC830M2 - IC830M7	9, B, C, H	without	IP54

2.1.5 Insulation material class

The motors come up to insulation material class F according to IEC 60085 (UL1446 class F).

2.1.6 Surface

The motors are coated with polyester powder coating in matte black. This finish is not resistant against solvents (e.g. trichlorethylene, nitro-thinners, or similar).

2.1.7 Shaft end, A-side

Power transmission is made through the cylindrical shaft end A, fit k6 (IC830M1: h7) to EN 50347, with a locking thread but **without a fitted keyway**.

Motors are also available with keyway and inserted key according to DIN 6885. The shaft with keyway is balanced with short (half) key.

Bearing life is calculated with 20.000 operating hours.

Order code	Shaft end	Available for
C	Keyway, closed	IC830M2...7
K	Keyway, open	IC830M4...7

2.1.8 Radial force

If the motors drive via pinions or toothed belts, then high radial forces will occur. The permissible values at the end of the shaft may be read from the diagrams in chapter "Drawings" from (*Section 8: Dimension Drawings*). The maximum values at rated speed you will find at the technical data from (➔ # 169). Power take-off from the middle of the free end of the shaft allows a 10% increase in F_R.

2.1.9 Axial force

When assembling pinions or wheels to the axis and use of e.g. angular gearheads axial forces arise. The maximum values at rated speed are found in the technical data.

2.1.10 Coupling

Double-coned collets have proved to be ideal zero-backlash coupling devices, combined, if required, with metal bellows couplings.

2.1.11 Vibration class

The motors are made to vibration class A according to EN 60034-14. For a speed range of 600-3600 rpm and a shaft center between 56-132 mm, this means that the actual value of the permitted vibration severity is 1.6 mm/s.

Velocity [rpm]	max. rel. Vibration Displacement [µm]	max. Run-out [µm]
<= 1800	90	23
> 1800	65	16

2.1.12 Wiring technology

Connectors

Descriptions of the available connectors: (➔ # 12). Connector pinout: from (➔ # 205).

Wire cross sections

Power Cable, Combi Cable

Combi cables contain 4 power lines and 2 additional lines for motor holding brake control.

Cross Section		Current Carrying Capacity	Remarks
(4x1)	(4x1+(2x0.75))	0A < I0rms ≤ 10.1A	The brackets (...) show the shielding. Current carrying capacity acc. to EN60204-1:2006 Table 6, Column B2
(4x1.5)	(4x1.5+(2x0.75))	10.1A < I0rms ≤ 13.1A	
(4x2.5)	(4x2.5+(2x1))	13.1A < I0rms ≤ 17.4A	
(4x4)	(4x4+(2x1))	17.4A < I0rms ≤ 23A	
(4x6)	(4x6+(2x1))	23A < I0rms ≤ 30A	
(4x10)	(4x10+(2x1.5))	30A < I0rms ≤ 40A	
(4x16)	(4x16+(2x1.5))	40A < I0rms ≤ 54A	
(4x25)	(4x25+(2x1.5))	54A < I0rms ≤ 70A	

Feedback Cable

Type	Cross Section	Remarks
Encoder	(7x2x0.25)	BiSS, HIPERFACE DSL®

Hybrid Cable

Type	Cross Section	Remarks
SFD3/ DSL	(4x1.0+(2x0.34)+(2x0.75))	4 power lines & 2 brake lines & 2 signal lines for **SFD3/DSL**
SFD3/DSL	(4x1.5+(2x0.34)+(2x0.75))	
SFD3/DSL	(4x2.5+(2x0.34)+(2x1.0))	
SFD3/DSL	(4x4+(2x0.34)+(2x1.0))	

Holding brake

All motors are optionally available with a holding brake. A spring applied brake (24V DC) is integrated into the motors. When this brake is de-energized it blocks the rotor.

Secure hanging loads!

If there is a suspended load (vertical axes), the motor's holding brake is released, and, at the same time, the servo drive does not produce any output, the load may fall down! Risk of injury exists for the personnel operating the machine.

The user should consider required local safety standards in the case of hanging loads (vertical axes) and the need to insure personnel safety by using additional safety measures for hazard avoidance.

Note: The holding brakes are designed as standstill brakes and are not suited for repeated operational braking. In the case of frequent, operational braking, premature wear and failure of the holding brake is to be expected.

The motor length increases when a holding brake is mounted.

The holding brake can be controlled directly by the servo amplifier (no personal safety !), the winding is suppressed in the servo amplifier — additional circuitry is not required (see instruction manual of the servo amplifier). If the holding brake is not controlled directly by the servo drive, an additional wiring (e.g. varistor) is required. Consult our support department.

Brake data are listed in chapter "Technical Data Brakes" from (Section 7.7, Technical Data Brakes) .

Fan for IC830M7

For the IC830M7 model size, an add-on kit for forced ventilation is available. The integrated fan enables up to 30% more power output for the IC830M7 motors. Assembly instructions for the fan kit is contained within the scope of delivery of the add-on kit.

The fan housing can be mounted either with both the supplied brackets and spacers or with the brackets only. The choice of mounting method depends on the application. If strong vibrations are expected, you should use both brackets and spacers. Motors with integrated brakes require the longs spacers.

Figure 4: IC830M7

Note: Make sure, that free air flow is available for the fan. Keep a space of at least 25 mm behind the fan guard.

The motors become dirty considerably faster due to forced convection. Dirt deposits lead to falling cooling capacity and can put the motors at risk. Dust may burn in case of overheating. So clean the air duct, the fan, and the motor at regular intervals.

By adding a fan, the mounting dimensions of IC830M7 motors increase.

In case of IC830M7 motors with connector option "C", winding "Q" and forced ventilation you must limit the motor current to 23,5 A for connector protection.

You can find technical information on IC830M7 motors with fans (Section 7.6 Technical Data IC830M7 with fan).

You can find the dimensional drawing for IC830M7 motors with fans on (Section 8.4, *Dimensions/Radial Forces IC830M7 (KK flanges)*).

Section 3: Mechanical Installation

Note: Dimension drawings can be found in chapter "Dimension Drawings".

3.1 Important Notes

Note: Only qualified staff with knowledge of mechanical engineering are permitted to assemble the motor.

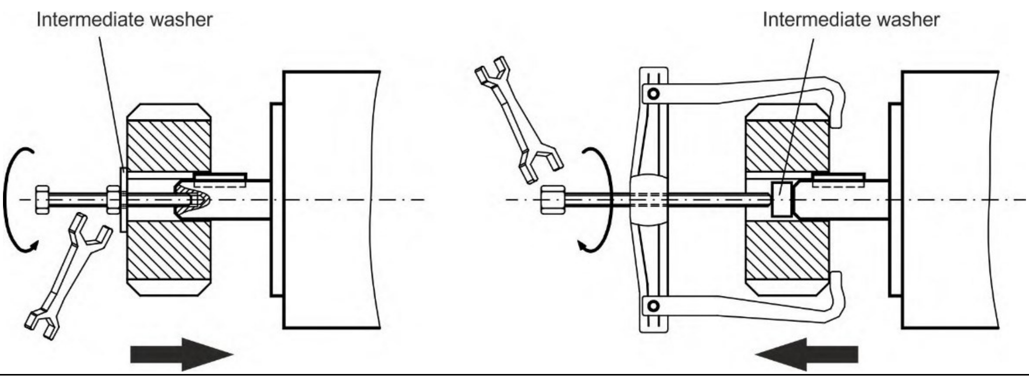
Protect the motor from unacceptable stresses. During transport and handling no components must be damaged.

The site must be free of conductive and aggressive material. For V3-mounting (shaft end upwards), make sure that no liquids can enter the bearings. If an encapsulated assembly is required, please consult Emerson beforehand.

Ensure an unhindered ventilation of the motors and observe the permissible ambient and flange temperatures. For ambient temperatures above 40°C please consult our applications department beforehand. Ensure that there is adequate heat transfer in the surroundings and the motor flange.

Motor flange and shaft are especially vulnerable during storage and assembly - so avoid brute force. It is important to use the locking thread which is provided to tighten up coup- lings, gear wheels or pulley wheels and warm up the drive components, where possible. Blows or the use of force will lead to damage to the bearings and the shaft.

Figure 5: Intermediate Washer



- Wherever possible, use only backlash-free, frictionally-locking collets or couplings. Ensure correct alignment of the couplings. A displacement will cause unacceptable vibration and the destruction of the bearings and the coupling.
- In all cases, do not create a mechanically constrained motor shaft mounting by using a rigid coupling with additional external bearings (e.g. in a gearbox).
- Take note of the no. of motor poles and the no. of resolver poles (if applicable), and ensure that the correct setting is made in the servo amplifier which is used. An incorrect setting can lead to the destruction of the motor, especially with small motors.
- Avoid axial loads on the motor shaft, as far as possible. Axial loading significantly shortens the life of the motor.
- Check the compliance to the permitted radial and axial forces F_R and F_A. When you use a toothed belt drive, the minimal permitted diameter of the pinion
- e.g. follows from the equation: $d_{min} \geq (M_0/F_R)*2$

Section 4: Electrical Installation

Note: Pinout for the connector can be found in chapter "Connector Pinout". Pinout of the servo amplifier's end can be found in the instructions manual of the servo amplifier.

4.1 Important notes

Note: Only staff qualified and trained in electrical engineering are allowed to wire up the motor.

4.1.1 Dangerous voltage!

Always make sure that the motors are de-energized during assembly and wiring, i.e. no voltage may be switched on for any piece of equipment which is to be connected.

There is a risk of death or severe injury from touching exposed contacts. Ensure that the switch cabinet remains turned off (barrier, warning signs etc.). The individual voltages will only be turned on again during setup.

Never undo the electrical connections to the motor while it is energized. Risk of electric shock! In unfavorable circumstances, electric arcs can arise causing harm to people and damaging contacts.

A dangerous voltage, resulting from residual charge, can be still present on the capacitors up to 10 minutes after switch-off of the mains supply. Even when the motor is not rotating, control and power leads may be live.

Measure the DC-link voltage and wait until it has fallen below 60V.

The ground symbol ⏚, which you will find in the wiring diagrams, indicates that you must provide an electrical connection, with as large a surface area as possible, between the unit indicated and the mounting plate in the switch cabinet. This connection is to suppress HF interference and must not be confused with the PE (protective earth) symbol ⏚ (protective measure to EN 60204).

To wire up the motor, use the wiring diagrams in the Installation and Setup Instructions of the servo amplifier which is used.

4.2 Guide for electrical installation

- Check that the servo amplifier and motor match each other. Compare the rated voltage and rated current of the unit. Carry out the wiring according to the wiring diagram in the instructions manual of the servo amplifier. The connections to the motor are shown in chapter "Connector Pinout".
- Install all cables carrying a heavy current with an adequate cross-section, as per

EN 60204. The recommended cross-section can be found in the Technical data.

Note: In case of long motor cables (>25m) and dependent on the type of the used servo amplifier a motor choke (3YL or 3YLN) must be switched into the motor cable (see instructions manual of the servo amplifier and accessory manual).

- Ensure that there is proper earthing of the servo amplifier and the motor. Use correct earthing and EMC-shielding according to the instructions manual of the servo amplifier which is used. Earth the mounting plate and motor casing.
- If a motor power cable is used which includes integral brake control leads, then these brake control leads must be shielded. The shielding must be connected at both ends (see instructions manual of the servo amplifier).

- Cabling:
  - Route power cables as separately as possible from control cables
  - Connect the feedback device.
  - Connect the motor cables, install motor chokes (if applicable) close to the amplifier
  - Connect shields to shielding terminals or EMC connectors at both ends
  - Connect the holding brake, if used
  - Connect shielding at both ends.
- Connect up all shielding via a wide surface-area contact (low impedance) and metallized connector housings or EMC-cable glands.

4.2.1 Capacity

Motor cable: less than 150 pF/m Resolver cable: less than 120 pF/m

4.3 Connection of the motors with preassembled cables

- Carry out the wiring in accordance with the valid standards and regulations.
- Only use Emerson preassembled shielded cables for the resolver and power connections.
- Incorrectly installed shielding leads to EMC interference and has an adverse effect on system function.
- The maximum cable length is defined in the instructions manual of the used servo amplifier.
- For a detailed description of configured cables, please refer to the accessories manual.

Section 5: Setup

5.1 Important notes

Note: Only specialist personnel with extensive knowledge in the areas of electrical engineering / drive technology are allowed to commission the drive unit of servo amplifier and motor.

5.2 Hot surface!

The surface temperature of the motor can exceed 100 ° C in operation. Danger of light burns!

- Check (measure) the temperature of the motor.
- Wait until the motor has cooled down below 40 °C before touching it.

5.3 High voltages!

Deadly voltages can occur, up to 900 V. Risk of electric shock! Check that all live connection points are safe against accidental contact.

Never undo the electrical connections to the motor when it is live. Risk of electric shock! The residual charge in the capacitors of the drive can produce dangerous voltages up to 10 minutes after the mains supply has been switched off.

Even when the motor is not rotating, control and power leads may be live.

- Measure the DC-link voltage and wait until it has fallen below 60 V.

5.3.1 Secure unplanned movements!

The drive performing unplanned movements during commissioning cannot be ruled out.

- Make sure that, even if the drive starts to move unintentionally, no danger can result for personnel or machinery.
- The measures you must take in this regard for your task are based on the risk assessment of the application.

5.3.2 Guide for setup

The procedure for setup is described as an example. A different method may be appropriate or necessary, depending on the application of the equipment.

1. Check the assembly and orientation of the motor.
2. Check the drive components (clutch, gear unit, belt pulley) for the correct seating and setting (observe the permissible radial and axial forces).
3. Check the wiring and connections to the motor and the servo amplifier. Check that the earthing is correct.
4. Test the function of the holding brake, if used. (apply 24 V, brake must be released).
5. Check whether the rotor of the motor revolves freely (release the brake, if necessary). Listen for grinding noises.
6. Check that all the required measures against accidental contact with live and moving parts have been carried out.
7. Carry out any further tests which are specifically required for your system.
8. Now commission the drive according to the setup instructions for the servo amplifier.
9. In multi-axis systems, individually commission each drive unit (amplifier and motor).

Section 6: Troubleshooting

The following table is to be seen as a “First Aid” box. There can be a large number of different reasons for a fault, depending on the particular conditions in your system. The fault causes described below are mostly those which directly influence the motor. Peculiarities which show up in the control loop behavior can usually be traced back to an error in the parameterization of the servo amplifier. The documentation for the servo amplifier and the setup software provides information on these matters.

For multi-axis systems there may be further hidden reasons for faults.

Fault	Possible cause	Measures to remove the cause of the fault
Motor doesn’t rotate	- Servoamplifier not enabled - Break in setpoint lead - Motor phases in wrong sequence - Brake not released - Drive is mechanically blocked	- Supply ENABLE signal - Check setpoint lead - Correct the phase sequence - Check brake controls - Check mechanism
Motor runs away	- Motor phases in wrong sequence	- Correct the phase sequence
Motor oscillates	- Break in the shielding of the resolver cable amplifier gain too high	- Replace resolver cable use motor default values
Error message: brake	- Short-circuit in the supply voltage lead to the motor holding brake - Faulty motor holding brake	- Remove the short-circuit - Replace motor
Error message: output stage fault	- Motor cable has short-circuit or earth short - Motor has short-circuit or earth short	- Replace cable - Replace motor
Error message: resolver	- Resolver connector is not properly plugged in - Break in resolver cable, cable crushed or similar	- Check connector - Check cables
Error message: motor tem-perature	- Motor thermosensor has switched - Loose resolver connector or break in resolver cable	- Wait until the motor has cooled down. Then investigate why the motor becomes so hot. - Check connector, replace resolver cable if necessary
Brake does not grip	- Required holding torque too high - Brake faulty - Motor shaft axially overloaded	- Check the dimensioning - Replace motor - Check the axial load, reduce it. Replace motor, since the bear- ings have been damaged

Section 7: Technical Data

All data valid for 40°C environmental temperature and 100K overtemperature of the winding. Determination of nominal dates with constant temperature of adapter flange of 65°C. The data can have a tolerance of +/- 10%.

7.1 Definition of Terms for Technical Data

All data valid for 40°C environmental temperature and 100K overtemperature of the winding. Determination of nominal data with constant temperature of adapter flange of 65°C. The data can have a tolerance of +/- 10%.

Standstill torque M_0 [Nm]

The standstill torque can be maintained indefinitely at a speed 0<n<100 rpm and rated ambient conditions.

Rated torque M_n [Nm]

The rated torque is produced when the motor is drawing the rated current at the rated speed. The rated torque can be produced indefinitely at the rated speed in continuous operation (S1).

Standstill current I_{0rms} [A]

The standstill current is the effective sinusoidal current which the motor draws at 0<n<100 rpm to produce the standstill torque.

Peak current (pulse current) I0max [A]

The peak current (effective sinusoidal value) is several times the rated current depending on the motor winding. The actual value is determined by the peak current of the drive which is used.

Torque constant K_{Trms} [Nm/A]

The torque constant defines how much torque in Nm is produced by the motor with 1A r.m.s. current. The relationship is M=I x K_T (up to I = 2 x I_0).

Voltage constant K_{Erms} [mV/min-1]

The voltage constant defines the induced motor EMF, as an effective sinusoidal value between two terminals, per 1000 rpm. Measured at 25°C.

Rotor moment of inertia J [kgcm²]

The constant J is a measure of the acceleration capability of the motor. For instance, at I_0 the acceleration time t_b from 0 to 3000 rpm is given as:

$$t_b\left[s\right] = \frac{3000 \bullet 2\pi}{M_0 \bullet 60s} \bullet \frac{m^2}{10^4 \bullet cm^2} \bullet J$$ with M_0 in Nm and J in kgcm²

Thermal time constant tth [min]

The constant t_{th} defines the time for the cold motor, under a load of I_0, to heat up to an over- temperature of 0.63 x 105 Kelvin. This temperature rise happens in a much shorter time when the motor is loaded with the peak current.

Release delay time tBRH [ms] / Engage delay time tBRL [ms] of the brake

These constants define the response times of the holding brake when operated with the rated voltage from the servo amplifier.

U_N

Rated mains voltage

U_n

DC-Bus link voltage. = $U_n = \sqrt{2} * U_N$

7.2 Technical Data IC830M2

U_N	Data	Symbol [Unit]	IC830M			
			21C	22E	23E	24F
Electrical data						
	Standstill torque for ΔT winding = 100K	M_0 [Nm]	0.48	0.87	1.6	1.42
	Standstill current for ΔT winding = 100K	I_{0rms} [A]	1.58	2.73	2.78	3.89
	Standstill torque for ΔT winding = 60K	M_0 [Nm]	0.38	0.69	0.93	1.14
	max. Mains voltage	U_N [VAC]	480			
120 VAC	Rated speed	n_n [rpm]	2500	3500	2500	3000
	Rated torque	M_n [Nm]	0.46	0.81	1.10	1.33
	Rated power	P_n [kW]	0.12	0.30	0.29	0.42
240 VAC	Rated speed	n_n [rpm]	8000	8000	6500	8000
	Rated torque	M_n [Nm]	0.39	0.70	0.98	1.12
	Rated power	P_n [kW]	0.32	0.59	0.67	0.94
400 VAC	Rated speed	n_n [rpm]	—	—	—	—
	Rated torque	M_n [Nm]	—	—	—	—
	Rated power	P_n [kW]	—	—	—	—
480 VAC	Rated speed	n_n [rpm]	—	—	—	—
	Rated torque	M_n [Nm]	—	—	—	—
	Rated power	P_n [kW]	—	—	—	—
	Peak current	I_{0max} [A]	7.9	13.7	13.9	19.5
	Peak torque	M_{0max} [Nm]	1.65	3.15	4.45	5.61
	Torque constant	K_{Trms} [Nm/A]	0.30	0.32	0.42	0.36
	Voltage constant	K_{Erms} [mVmin]	19.5	20.4	27	23.4
	Winding resistance line-line	R_{25} [Ω]	13.00	5.22	5.44	2.94
	Winding inductance line-line	L [mH]	19.0	9.7	11.1	6.2
Mechanical data						
	Rotor moment of inertia	J [kgcm²]	0.11	0.16	0.22	0.27
	Pole number	-	6	6	6	6
	Static friction torque	M_R [Nm]	0.002	0.005	0.007	0.01
	Thermal time constant	t_{TH} [min]	8	9	10	11
	Weight standard	G [kg]	0.82	1.1	1.38	1.66
	Radial load permitted	F_R [N]	see page (➜ # 193)			
	Axial load permitted	F_A [N]	see page (➜ # 193)			
Power cable acc. EN60204-1:2006 Table 6, Column B2						
	Minimum Cross Section	mm²	1			

7.3 Technical Data IC830M4

UN	Data	Symbol [Unit]	IC830M 41E	42E	42G	42H	43G	43K
Electrical data								
	Standstill torque for ΔT winding = 100K*	M_0 [Nm]	2.02	3.42	3.53	3.54	4.80	4.90
	Standstill current for ΔT winding = 100K	I_{0rms} [A]	2.85	2.74	4.80	6.0	4.87	9.60
	Standstill torque for ΔT winding = 60K*	M_0 [Nm]	1.62	2.74	2.82	2.83	3.84	3.92
	max. Mains voltage	U_N [VAC]	480					
120 VAC	Rated speed	n_n [rpm]	1200	—	—	2000	—	2500
	Rated torque	M_n [Nm]	1.94	—	—	3.03	—	4.08
	Rated power	P_n [kW]	0.24	—	—	0.67	—	1.07
240 VAC	Rated speed	n_n [rpm]	3000	1800	3500	4500	2500	6000
	Rated torque	M_n [Nm]	1.82	3.12	2.90	2.72	4.00	2.62
	Rated power	P_n [kW]	0.57	0.59	1.06	1.28	1.05	1.65
400 VAC	Rated speed	n_n [rpm]	6000	3500	6000	—	5000	—
	Rated torque	M_n [Nm]	1.58	2.81	2.35	—	3.01	—
	Rated power	P_n [kW]	0.99	1.03	1.48	—	1.58	—
480 VAC	Rated speed	n_n [rpm]	6000	4000	—	—	6000	—
	Rated torque	M_n [Nm]	1.58	2.72	—	—	2.57	—
	Rated power	P_n [kW]	0.99	1.14	—	—	1.61	—
	Peak current	I_{0max} [A]	14.3	13.7	24	30	24.4	48
	Peak torque	M_{0max} [Nm]	7.15	13.01	13.24	13.34	18.8	19
	Torque constant	K_{Trms} [Nm/A]	0.71	1.26	0.74	0.59	0.99	0.52
	Voltage constant	K_{Erms} [mVmin]	45.6	80.9	47.5	38.3	63.9	33.2
	Winding resistance line-line	R_{25} [Ω]	6.02	7.78	2.51	1.65	2.61	0.74
	Winding inductance line-line	L [mH]	18.4	26.8	9.2	6.0	10.8	2.9
Mechanical data								
	Rotor moment of inertia	J [kgcm²]	0.81	1.45			2.09	
	Pole number	-	10	10			10	
	Static friction torque	M_R [Nm]	0.014	0.026			0.038	
	Thermal time constant	t_{TH} [min]	13	17			20	
	Weight standard	G [kg]	2.44	3.39			4.35	
	Radial load permitted	F_R [N]	See page (➔ # 196)					
	Axial load permitted	F_A [N]	See page (➔ # 196)					
Power cable acc. EN60204-1:2006 Table 6, Column B2								
	Minimum cross section	mm²	1					

7.4 Technical Data IC830M6

UN	Data	Symbol [Unit]	IC830M 62H	62K	62L	62M	63L	63M
Electrical data								
	Standstill torque for ΔT winding = 100K	M_0 [Nm]	11.9	12.2	12.2	12.2	16.8	17.0
	Standstill current for ΔT winding = 100K	I_{0rms} [A]	5.4	9.6	9.6	13.4	9.9	13.8
	Standstill torque for ΔT winding = 60K	M_0 [Nm]	9.5	9.8	9.8	9.8	13.4	13.6
	max. Mains voltage	U_N [VAC]	480					
240 VAC	Rated speed	n_n [rpm]	1000	2000	2000	3000	1500	2000
	Rated torque	M_n [Nm]	11.2	10.4	10.4	9.50	14.9	14.3
	Rated power	P_n [kW]	1.17	2.18	2.18	2.98	2.34	2.99
400 VAC	Rated speed	n_n [rpm]	2000	3500	3500	6000	3000	4000
	Rated torque	M_n [Nm]	10.2	9.0	9.00	5.70	12.9	11.3
	Rated power	P_n [kW]	2.14	3.30	3.30	3.58	4.05	4.73
480 VAC	Rated speed	n_n [rpm]	2400	4500	4500	—	3500	4500
	Rated torque	M_n [Nm]	9.9	9.0	8.0	—	12.0	10.5
	Rated power	P_n [kW]	2.49	3.77	3.77	—	4.40	4.95
	Peak current	I_{0max} [A]	27.1	48.0	60	67	59.4	69
	Peak torque	M_{0max} [Nm]	40.8	41.2	41.1	41.2	55.4	59.8
	Torque constant	K_{Trms} [Nm/A]	2.2	1.28	1.28	0.91	1.71	1.24
	Voltage constant	K_{Erms} [mVmin]	142.1	82.1	82.1	58.8	110.0	79.9
	Winding resistance line-line	R_{25} [Ω]	3.3	1.08	1.08	0.57	1.14	0.61
	Winding inductance line-line	L [mH]	25.4	8.5	8.5	4.4	9.3	4.9
Mechanical data								
	Rotor moment of inertia	J [kgcm²]	17				24	
	Pole number	-	10				10	
	Static friction torque	M_R [Nm]	0.05				0.1	
	Thermal time constant	t_{TH} [min]	20				25	
	Weight standard	G [kg]	8.9				11.1	
	Radial load permitted	F_R [N]	see page (➜ # 198)					
	Axial load permitted	F_A [N]	see page (➜ # 198)					
Power cable acc. EN60204-1:2006 Table 6, Column B2								
	Minimum cross section	mm²	1				2.5	4

7.5 Technical Data IC830M7 without fan

U_N	Data	Symbol [Unit]	IC830M 72L	72P	72Q	72R	73P	73Q	74Q
Electrical data									
	Standstill torque for ΔT winding = 100K*	M_0 [Nm]**	30.0	29.4	29.5	29.8	41.6	41.5	52.2
	Standstill current for ΔT winding = 100K	I_{0rms} [A]**	11.5	18.7	23.5	33.1	19.5	24.5	26.1
	Standstill torque for ΔT winding = 60K*	M_0 [Nm]**	23.8	23.5	23.6	23.8	33.3	33.2	41.8
	max. Mains voltage	U_N [VAC]	480						
120 VAC	Rated speed	n_n [rpm]	-	-	-	1500	-	-	-
	Rated torque*	M_n [Nm]	-	-	-	25.1	-	-	-
	Rated power	P_n [kW]	-	-	-	3.94	-	-	-
240 VAC	Rated speed	n_n [rpm]	-	1800	2000	3250	1300	1500	1300
	Rated torque*	M_n [Nm]	-	23.8	23.2	19.4	34.7	33.4	41.9
	Rated power	P_n [kW]	-	4.49	4.86	6.6	4.72	5.25	5.71
400 VAC	Rated speed	n_n [rpm]	1800	3000	4000	-	2400	3000	2500
	Rated torque*	M_n [Nm]	24.3	20.1	16.3	-	28.5	25.2	31.5
	Rated power	P_n [kW]	4.58	6.31	6.83	-	7.16	7.92	8.25
480 VAC	Rated speed	n_n [rpm]	2000	3500	4500	-	2800	3500	3000
	Rated torque*	M_n [Nm]	23.6	18.2	14.1	-	26.3	22	27.3
	Rated power	P_n [kW]	4.94	6.67	6.65	-	7.71	8.07	8.58
	Peak current	I_{0max} [A]	34.5	56.1	70.5	99.3	58.5	73.5	78.3
	Peak torque	M_{0max} [Nm]	118.9	117.6	117.5	79.2	111	168.5	168
	Torque constant	K_{Trms} [Nm/A]	2.6	1.58	1.30	0.9	2.13	1.70	2.00
	Voltage constant	K_{Erms} [mVmin]	168.5	102	81.2	58.3	137	109	129
	Winding resistance line-line	R_{25} [Ω]	0.92	0.35	0.26	0.12	0.38	0.27	0.26
	Winding inductance line-line	L [mH]	13.6	5.0	3.2	1.63	5.9	3.7	3.8
Mechanical data									
	Rotor moment of inertia	J [kgcm²]	65				92		120
	Pole number	-	10				10		10
	Static friction torque	M_R [Nm]	0.16				0.24		0.33
	Thermal time constant	t_{TH} [min]	46				53		60
	Weight standard	G [kg]	19.7				26.7		33.6
	Radial load permitted	F_R [N]	see page (➔ # 199)						
	Axial load permitted	F_A [N]	see page (➔ # 199)						
Power cable acc. EN60204-1:2006 Table 6, Column B2									
	Minimum cross section	mm²	-	4	6		4	6	6

7.6 Technical Data IC830M7 with fan

UN	Data	Symbol [Unit]	IC830M 72P	IC830M 72Q
Electrical data				
	Standstill torque for ΔT winding = 100K*	M_0 [Nm]**	38.2	38.3
	Standstill current for ΔT winding = 100K	I_{0rms} [A]**	24.3	30.5
	Standstill torque for ΔT winding = 60K*	M_0 [Nm]**	30.6	30.6
	max. Mains voltage	U_N [V]	480	
240 VAC	Rated speed	n_n [rpm]	1800	2000
	Rated torque*	M_n [Nm]	30.9	30.7
	Rated power	P_n [kW]	5.83	6.43
400 VAC	Rated speed	n_n [rpm]	3000	4000
	Rated torque*	M_n [Nm]	26.1	21.6
	Rated power	P_n [kW]	8.20	9.05
480 VAC	Rated speed	n_n [rpm]	3500	4500
	Rated torque*	M_n [Nm]	23.7	18.7
	Rated power	P_n [kW]	8.69	8.82
	Peak current	I_{0max} [A]	56.1	70.5
	Peak torque	M_{0max} [Nm]	78.5	78.4
	Torque constant	K_{Trms} [Nm/A]	1.58	1.30
	Voltage constant	K_{Erms} [mVmin]	102	81.2
	Winding resistance line-line	R_{25} [Ω]	0.35	0.26
	Winding inductance line-line	L [mH]	5.0	3.2
Mechanical data				
	Rotor moment of inertia	J [kgcm²]	65	
	Pole number	-	10	
	Static friction torque	M_R [Nm]	0.16	
	Thermal time constant	t_{TH} [min]	46	
	Weight	G [kg]	19.7	
	Radial load permitted	F_R [N]	see page (➔ # 200)	
	Axial load permitted	F_A [N]	see page (➔ # 200)	
Power cable acc. EN60204-1:2006 Table 6, Column B2				
	Minimum cross section	mm²	1.5 2.5	6 10

Fan data

Operating voltage	U_{FAN} [VDC]	24 ± 10 %		Operating current	I_{FAN} [mA]	270
Electrical power	P_{FAN} [W]	6.5		Weight of the FAN kit	G_{FAN} [kg]	2.5
Cable outer diameter	[mm]	4 to 6		Clamping range terminals	[mm²]	0.33 to 4

A 10 mm cable bushing is built into the fan housing. Connection cable is not part of delivery.

UN	Data	Symbol [Unit]	IC830M		
			73P	73Q	74Q
Electrical data					
	Standstill torque for ΔT winding = 100K*	M_0 [Nm]**	52.2	53.9	67.8
	Standstill current for ΔT winding = 100K	$I0_{rms}$ [A]**	24.5	31.9	34.0
	Standstill torque for ΔT winding = 60K*	M_0 [Nm]**	41.8	43.1	54.2
	max. Mains voltage	U_N [VAC]	480		
240 VAC	Rated speed	n_n [rpm]	1300	1500	1300
	Rated torque*	M_n [Nm]	45.1	43.9	55.3
	Rated power	P_n [kW]	6.14	6.9	7.53
400 VAC	Rated speed	n_n [rpm]	2400	3000	2500
	Rated torque*	M_n [Nm]	37.1	33.2	41.6
	Rated power	P_n [kW]	9.33	10.43	10.89
480 VAC	Rated speed	n_n [rpm]	2800	3500	3000
	Rated torque*	M_n [Nm]	34.2	28.9	36.0
	Rated power	P_n [kW]	10.02	10.60	11.31
	Peak current	I_{0max} [A]	58.6	73.5	78.3
	Peak torque	M_{0max} [Nm]	111	111	141
	Torque constant	K_{Trms} [Nm/A]	2.13	1.70	2.00
	Voltage constant	K_{Erms} [mVmin]	137	109	129
	Winding resistance line-line	R_{25} [Ω]	0.38	0.27	0.26
	Winding inductance line-line	L [mH]	5.9	3.7	3.8
Mechanical data					
	Rotor moment of inertia	J [kgcm²]	92		120
	Pole number	-	10		10
	Static friction torque	M_R [Nm]	0.24		0.33
	Thermal time constant	t_{TH} [min]	53		60
	Weight	G [kg]	26.7		33.6
	Radial load permitted	F_R [N]	see page (➔ # 200)		
	Axial load permitted	F_A [N]	see page (➔ # 200)		
Power cable acc. EN60204-1:2006 Table 6, Column B2					
	Minimum cross section	mm²	6	10	10

Fan data

Operating voltage	U_{FAN} [VDC]	24 ± 10 %		Operating current	I_{FAN} [mA]	270
Electrical power	P_{FAN} [W]	6.5		Weight of the FAN kit	G_{FAN} [kg]	2.5
Cable outer diameter	[mm]	4 to 6		Clamping range terminals	[mm²]	0.33 to 4

A 10 mm cable bushing is built into the fan housing. Connection cable is not part of delivery.

7.7 Technical Data Brakes

FAILSAFE, HOLDING BRAKE

The holding brake is designed to provide static holding torque to the motor shaft with the brake coil de-energized. The brake must first be released (coil energized) prior to commanding motor rotation as determined by its drop- out time. The brake is intended for holding or "parking" of a stationary motor. It is not intended for dynamic braking. There should be absolutely no motion of the rotor when power is removed from the brake coil.

It may be used for a limited number of emergency stop conditions, however such use will eventually cause wear, leading to eventual malfunction of the brake. Number of emergency stops strongly depends on applied load.

Contact Emerson for proper calculation of energy That needs to be absorbed during emergency stops in application.

Contamination of the motor internal compartment by oil or other foreign materials will result in failure of the brake. Check the suitability of motor sealing for the working environment.

Motor Family	-	IC830M2	IC830M4	IC830M6	IC830M7	Notes
Nominal Operating Voltage	*VDC ±10%*	24				
Minimum Dry Static Torque, 120°C	*Nm*	1.42	5.3	25.0	53.0	*1*
Maximum Speed	*rpm*	8000	6000	4750	4000	
Maximum Acceleration	*rad/s²*	84500	37000	6800	5800	*11,12*
Coil Resistance, 25°C	*Ω ±7%*	68.5	45.2	22.4	16.2	
Maximum Release Voltage (New Brake)	*VDC*	18				*2,14*
Minimum Re-Engage Voltage (New Brake)	*VDC*	≥1,5				*3,14*
Current @24V, 25°C	*ADC*	0.35	0.53	1.07	1.48	*10*
Maximum Release Current (New Brake), 25°C	*ADC*	0.26	0.40	0.80	1.11	*14*
Power Consumption @24V, 25°C	*Watt ±7%*	8.4	12.8	25.7	35.6	
Response (Engage/Closing) Time	*ms*	36	30	40	70	*6,8,9*
Release (Opening) Time	*ms*	45	75	155	170	*6,7*
Response Time w/ PSD	*ms*	36	40	55	75	*17*
Total Torque Rise Time w/ PSD	*ms*	65	115	240	290	*17,18*
Maximum Backlash	*deg.*	1.01	0.81	0.51	0.44	*4,5,12*
Typical Backlash	*deg.*	0.46	0.37	0.24	0.20	*4,5,12*
Friction Disc Inertia	*kg.cm²*	0.014	0.090	0.717	2.460	
Weight	*kg*	0.27	0.63	2.00	2.90	
B_{10d}	-	20,000,000		15,000,000		*13,15*
Temperature Range	*°C*	+5 °C to 120 °C				
Minimum Number of Springs	-	6	6	12	12	*15,16*

Notes:

Note 1: Minimum Dry Static Torque - max. torque that can be applied to a brake without the risk of slipping.

Note 2: Maximum Release Voltage - value of voltage where the brake is 100% OPEN. The brake is mounted inside of the motor.

Note 3: Minimum Re-Engage Voltage - value of voltage where the brake is 100% CLOSED. The brake is mounted inside of the motor.

Note 4: Backlash - amount of clearance, or free rotation, from a point based in one direction to a point in the opposite direction with torque applied, between the drive connection of the brake to the motor shaft. 25% of the rated torque of the brake can be applied during the backlash measurement.

Note 5: Maximum Backlash is calculated using worst-case tolerancing, and typical backlash is calculated using statistical tolerancing.

Note 6: Release and response times measured on standalone brakes connected to hard switching power supply.

Note 7: Brake release time, the time for the brake to release when the power is applied to the brake, is consistent regardless of how the brake is switched.

Note 8: Brake response time, the time taken for the brake to engage when the power is removed and circuit contains any form of arc suppression, is increased.

Note 9: Removing the DC voltage to the brake by a clean cut in the brake supply at the brake connection, will pro- duce the fastest possible brake engagement.

Note 10: Current of the brake is calculated from nominal voltage and nominal resistance at 25°C

Note 11: Acceleration calculated from maximum acceleration of Emerson IC830M motor with the brake without external load.

Note 12: Brake is able to perform 50.000.000 reverse cycles with maximum acceleration and backlash up to 0.8°.

Note 13: B_{10d} is number of operations where 10% of the sample would fail to danger.

Note 14: New brake - brake mounted in the motor without previous usage. Parameters could be influenced by number of emergency stops absorbed by brake during lifetime.

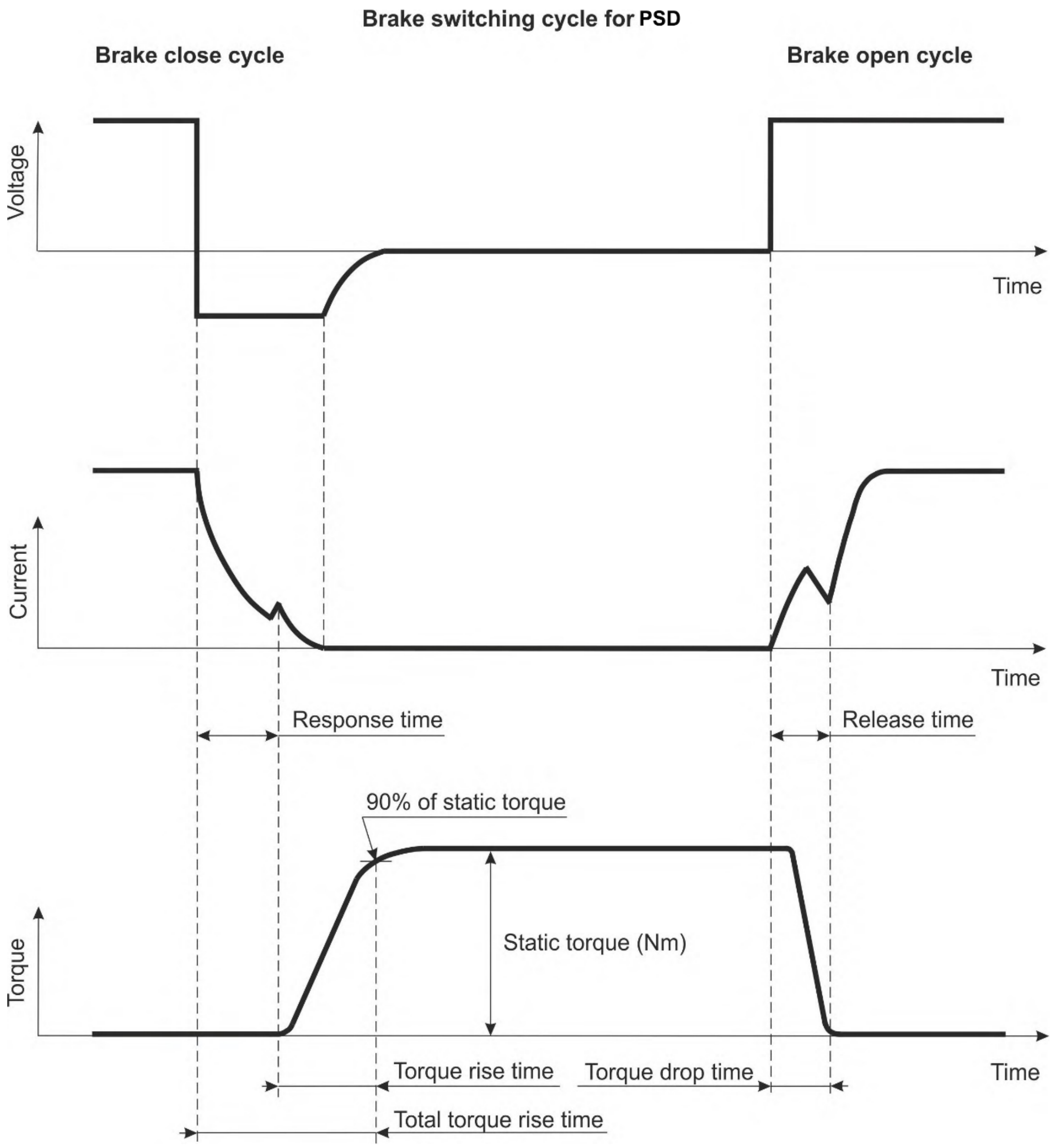
Note 15: 'B10d' and 'Number of Springs' is specific to IC830M motors with brakes that are labeled 'Made in Czech Republic'. Please contact Emerson for all other inquiries.

Note 16: Please contact Emerson for detailed specification and all other inquiries.

Note 17: Response times measured on standalone brakes connected to Emerson PSD drive. Response time of the brake measured with a diode and a transistor in power supply circuit.

Note 18: Total time needed to achieve 90% of static torque (see graphs below). Vertical load application setup requires using the PSD or alternative drive manufacturers total torque rise time.

Figure 6: Brake Switching Cycle for PSD

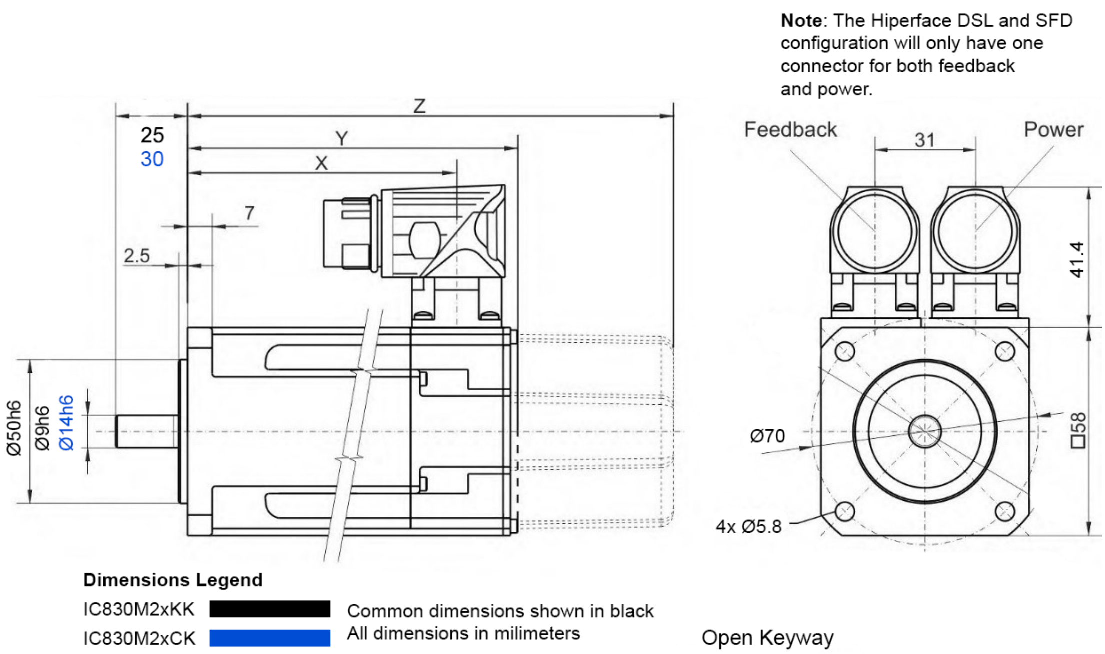


Section 8: Dimension Drawings

8.1 Dimensions/Radial Forces IC830M2 (KK/CK Flanges)

Dimensions with SpeedTec Ready connectors

Figure 7: Radial/axial forces at shaft end



Model	X	SFD/BISS		Hiperface DSL	
		Y (No Brake)	Z (Brake)	Y (No Brake)	Z (Brake)
IC830M21	76.1	95.4	129.5	113.4	147.1
IC830M22	95.1	114.4	148.5	132.4	166.1
IC830M23	114.1	133.4	167.5	151.4	185.1
IC830M24	133.1	152.4	186.5	170.4	204.1

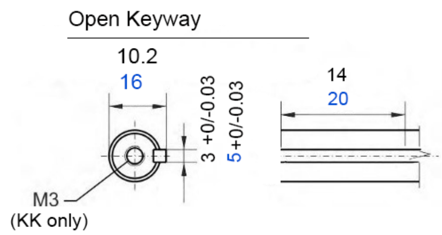
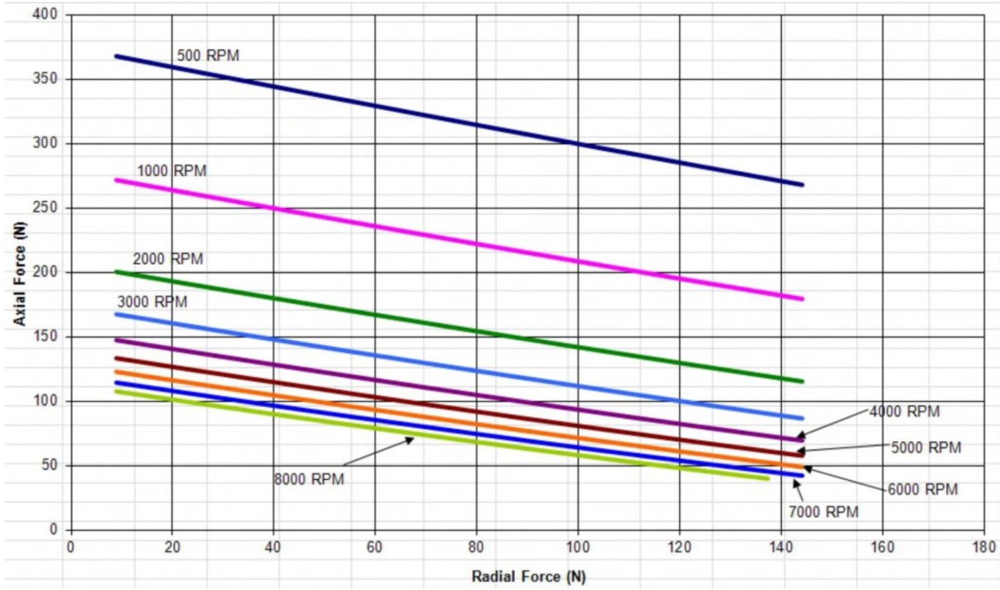
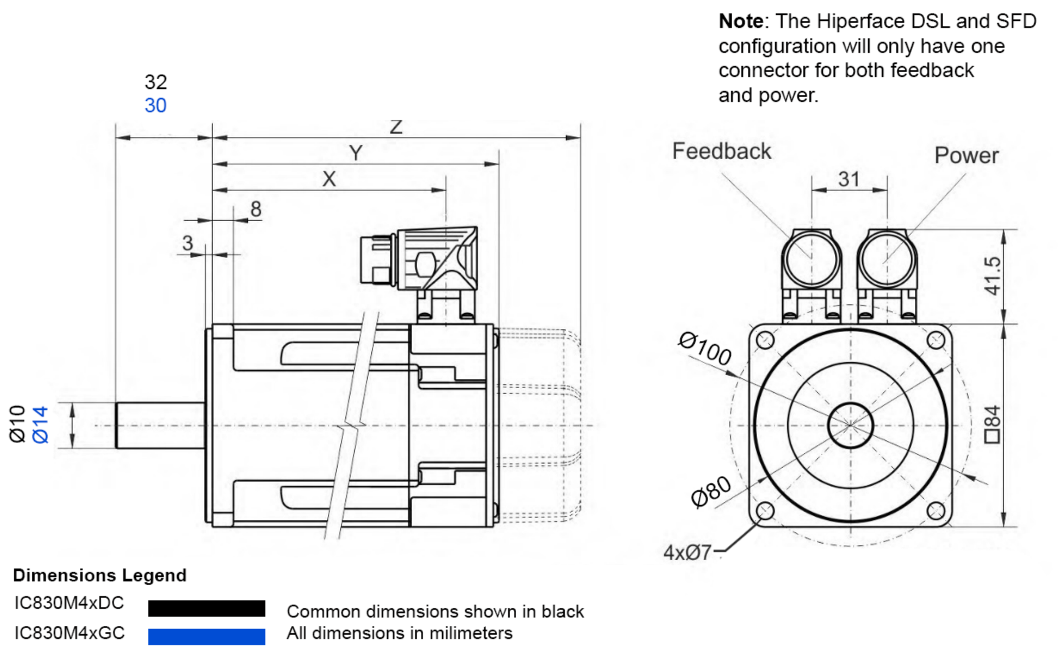


Figure 8: Radial/axial forces at shaft end


400
350
300
250
200
150
100
50
0
Axial Force (N)
0
20
40
60
80
100
120
140
160
180
Radial Force (N)
500 RPM
1000 RPM
2000 RPM
3000 RPM
4000 RPM
5000 RPM
6000 RPM
7000 RPM
8000 RPM

8.2 Dimensions/Radial Forces for IC830M4 (DC/GC Flanges)

Figure 9: Dimensions with SpeedTec Ready connectors



Model	X	SFD/BISS		Hiperface DSL	
		Y (No Brake)	Z (Brake)	Y (No Brake)	Z (Brake)
IC830M41	96.4	118.8	152.3	136.8	170.3
IC830M42	125.4	147.8	181.3	165.8	199.3
IC830M43	154.4	176.8	210.3	194.8	228.3
IC830M44	183.4	205.8	239.3	223.8	257.3

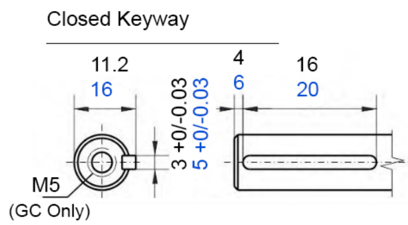
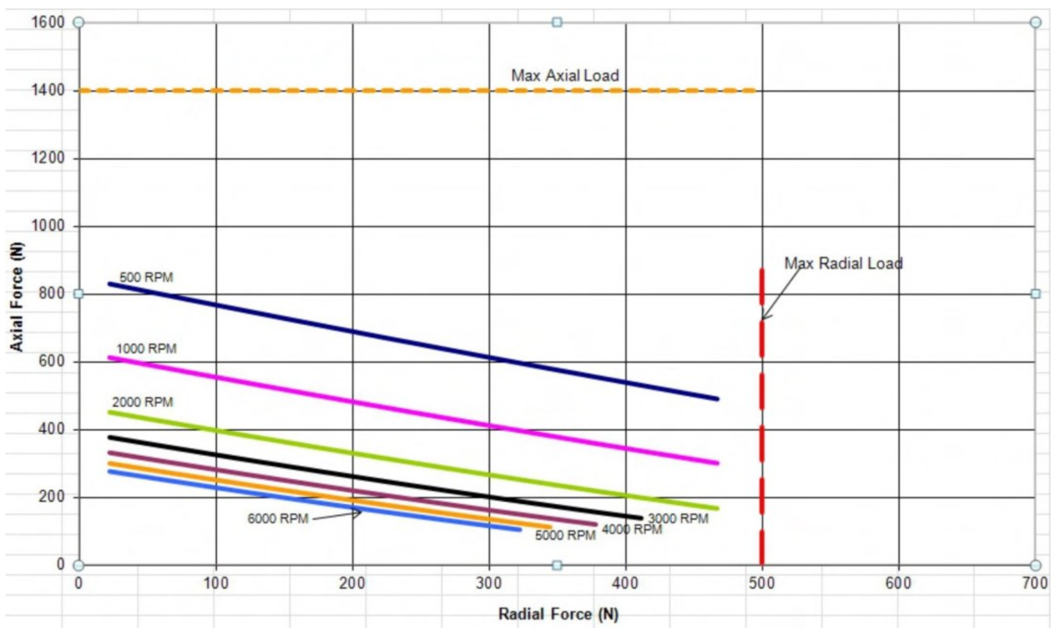


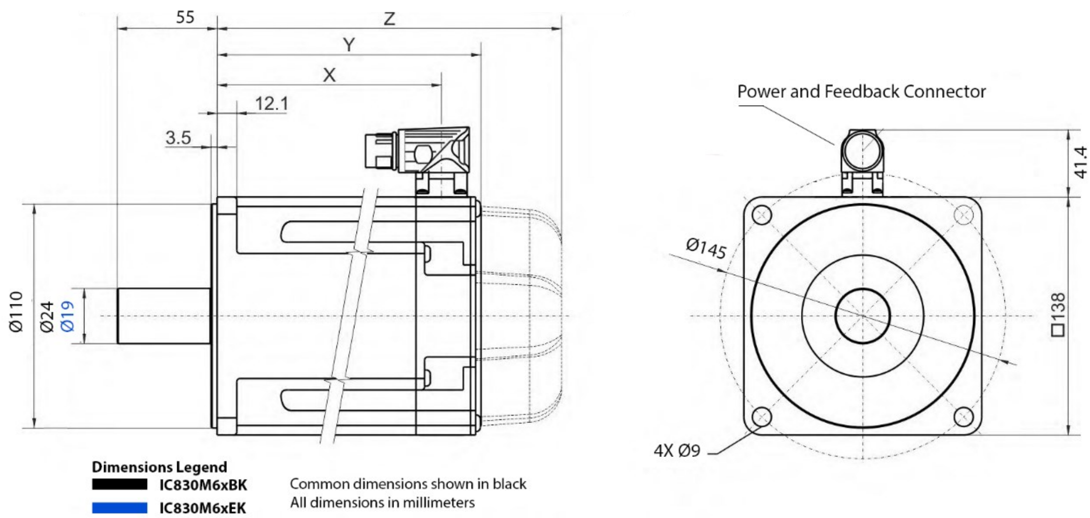
Figure 10: Radial/axial forces at shaft end



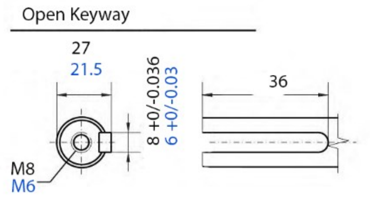
8.3 Dimensions/Radial Forces for IC830M6

8.3.1 (EK/BK Flanges) Single Connector/Brake/No Brake/SFD

Figure 11: Dimensions with SpeedTec Ready connectors

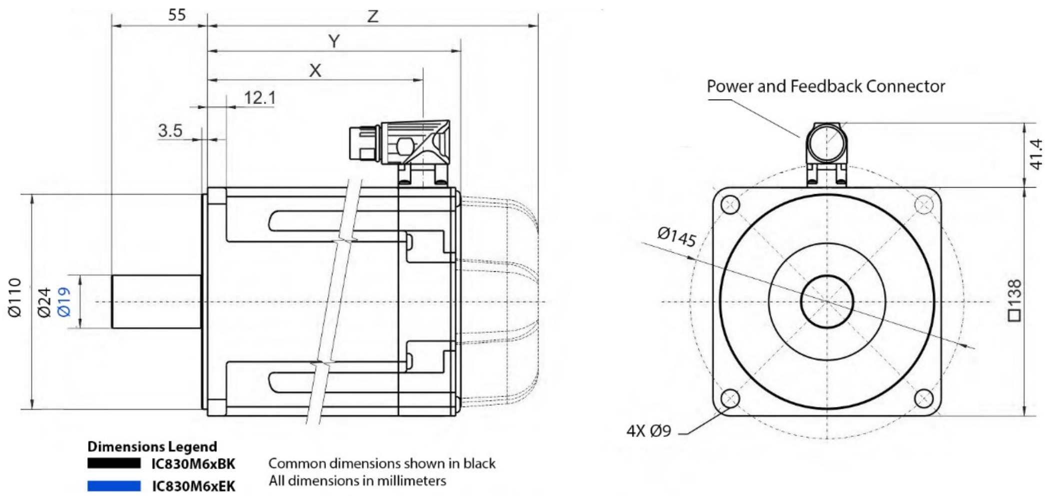


Model	X	SFD	
		Y (No Brake)	Z (Brake)
IC830M62	130.5	153.7	200.7
IC830M63	155.5	178.7	225.7
IC830M64	180.5	203.7	250.7
IC830M65	205.5	228.7	275.7

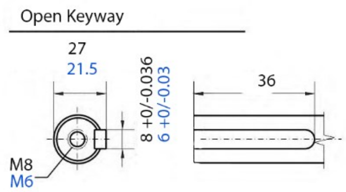


8.3.2 (EK/BK Flanges) Single Connector/Brake/No Brake/DSL

Figure 12: Dimensions with SpeedTec Ready connectors

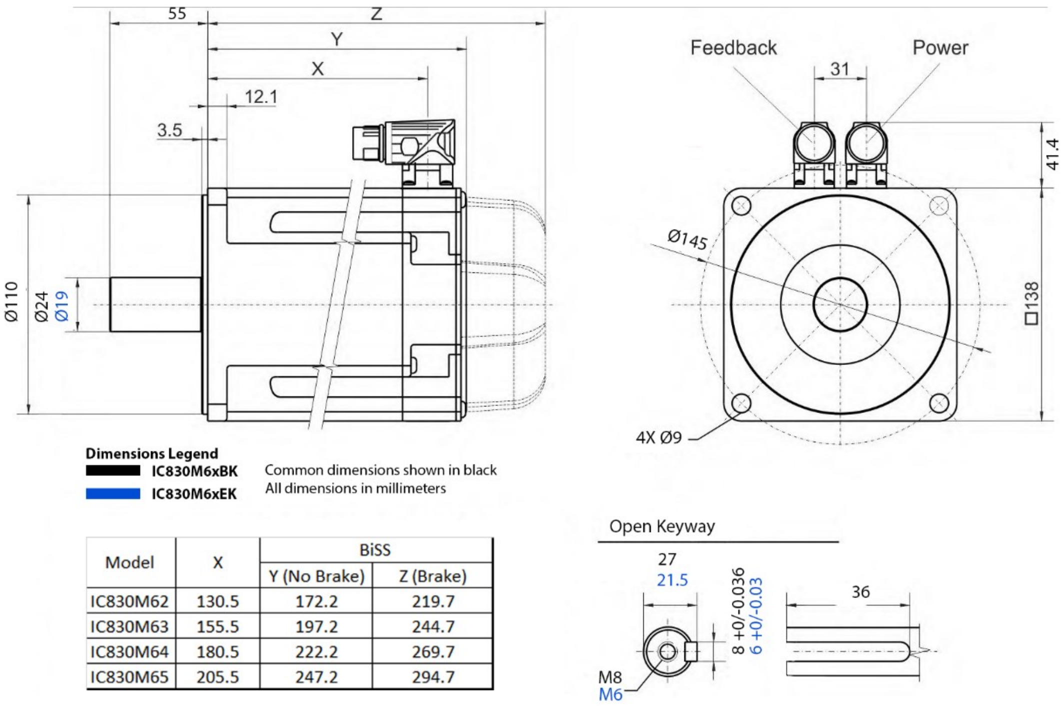


Model	X	Hiperface DSL	
		Y (No Brake)	Z (Brake)
IC830M62	130.5	172.2	219.7
IC830M63	155.5	197.2	244.7
IC830M64	180.5	222.2	269.7
IC830M65	205.5	247.2	294.7



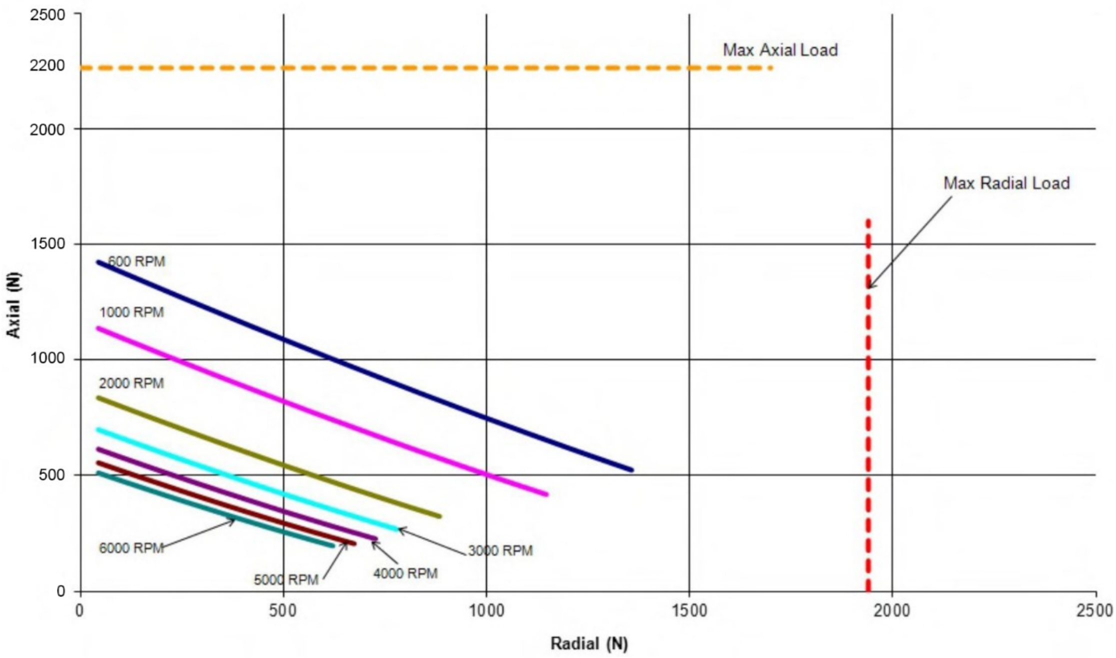
8.3.3 (EK/BK Flanges) Dual Connector/Brake/No Brake/BiSS

Figure 13: Dimensions with SpeedTec Ready connectors



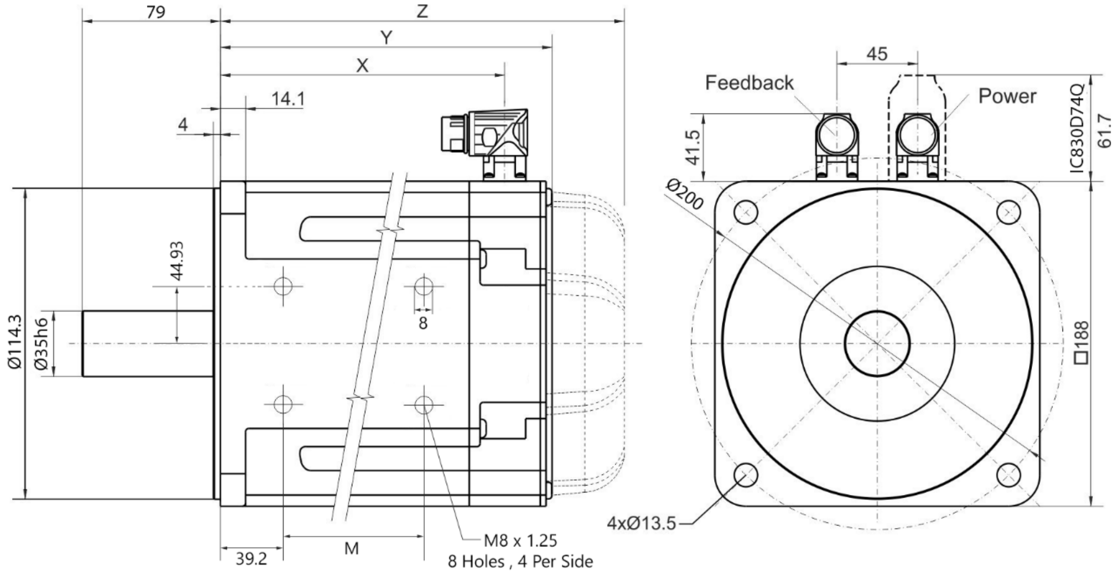
Model	X	BiSS	
		Y (No Brake)	Z (Brake)
IC830M62	130.5	172.2	219.7
IC830M63	155.5	197.2	244.7
IC830M64	180.5	222.2	269.7
IC830M65	205.5	247.2	294.7

Figure 14: Radial/axial forces at shaft end (for all IC830M6 flange types)



8.4 Dimensions/Radial Forces IC830M7 (KK flanges)

Figure 15: Dimensions with SpeedTec-ready connectors (or M40 connector per dotted line visualization)



Model	X	BISS		M
		Y (No Brake	Z (Brake)	
IC830M72	164.5	201.7	253.3	76.2
IC830M73	198.5	235.7	287.3	110.2
IC830M74	232.5	269.7	321.3	144.2

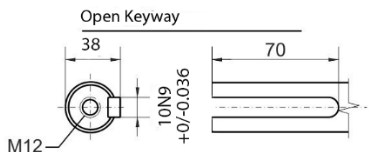
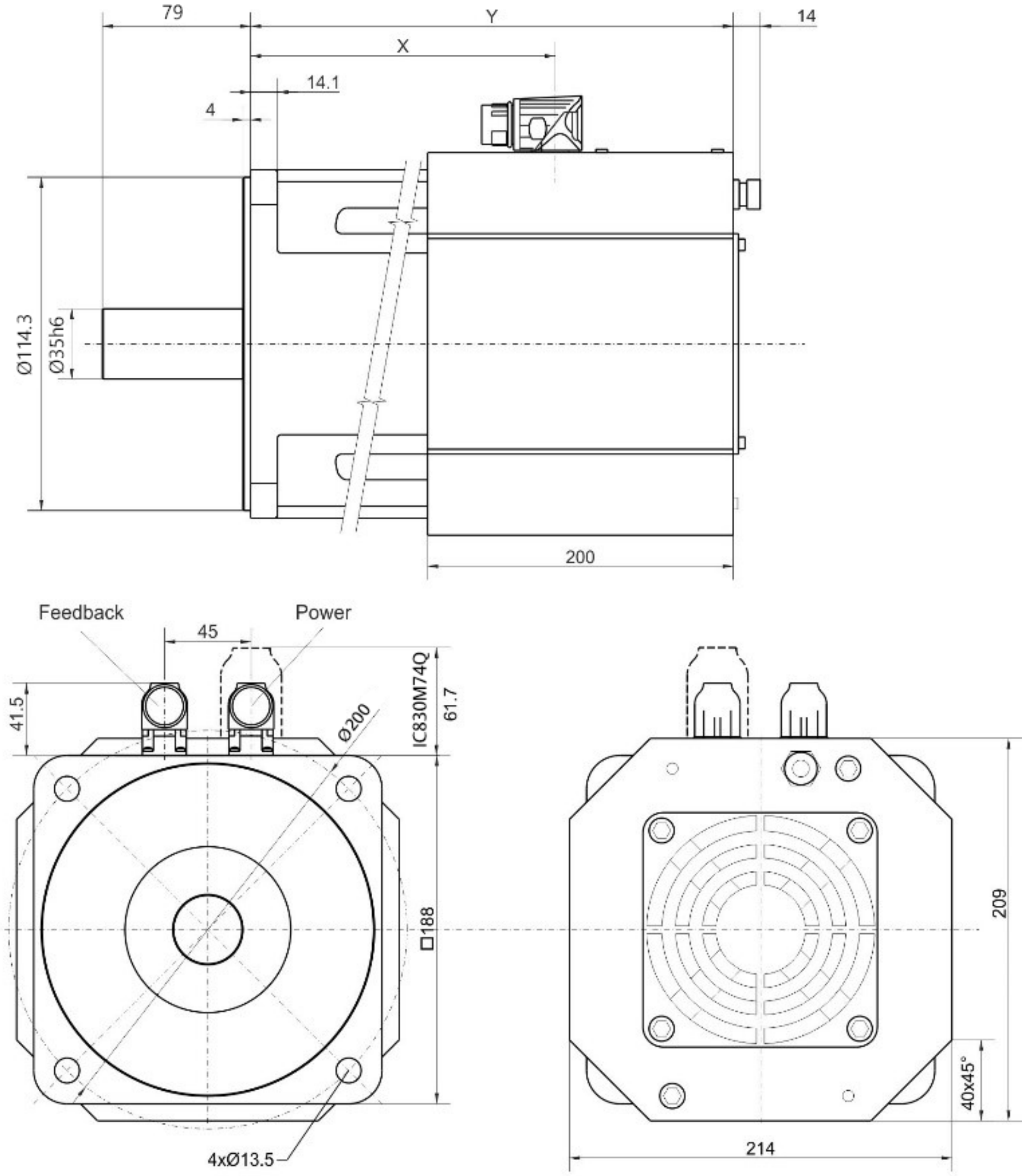


Figure 16:



Model	X	BiSS	
		Y (No Brake)	Z (Brake)
IC830M72	164.5	266	318.5
IC830M73	198.5	300	352.6
IC830M72	232.5	334	386.5

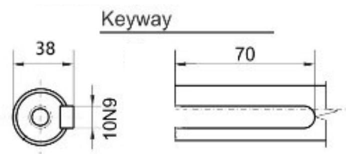
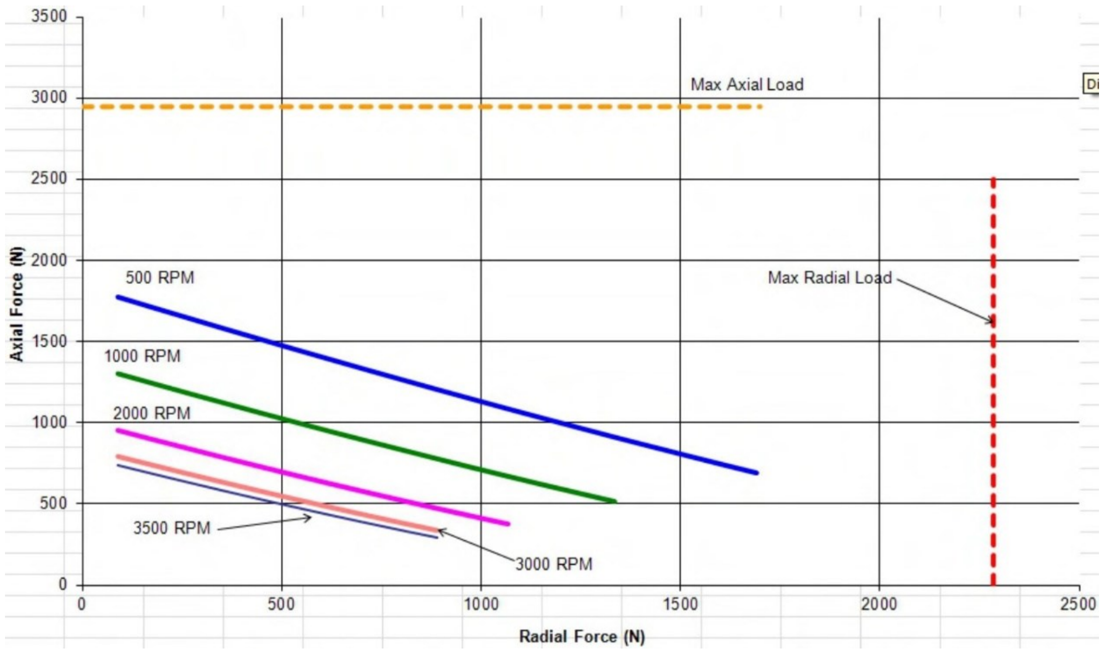


Figure 17: Radial/axial forces at shaft end



Section 9: Motor Speed/Torque Curves

PACMotion Servos offer customers a wide variety of drive and motor combinations to help configure a motion control system. There are several parameters to consider when sizing motors for a motion application; for instance: load, speed, continuous torque, and peak torque. (For more information on these motor ratings, please see Section 7: *Technical Data.)*

The following charts show the intersecting performance of each drive and motor configuration, specifically with regard to speed and torque. The drive current will limit the peak torque in some drive-motor combinations. The following sections should be used as an aid when selecting a motor size. In some instances, a smaller drive may be appropriate when the customer does not need the full performance of a servomotor.

Note: Selecting a correctly sized servo motor for a motion control application is complex. Emerson recommends speaking with an application engineer. Please use the contact information located at the end of this document to reach an Emerson representative.

Note: The PACMotion Servo Selector App is also available to Emerson's customers at the support links located at the end of this document. The App allows customers to simulate their application and select an appropriately-sized servo motor.

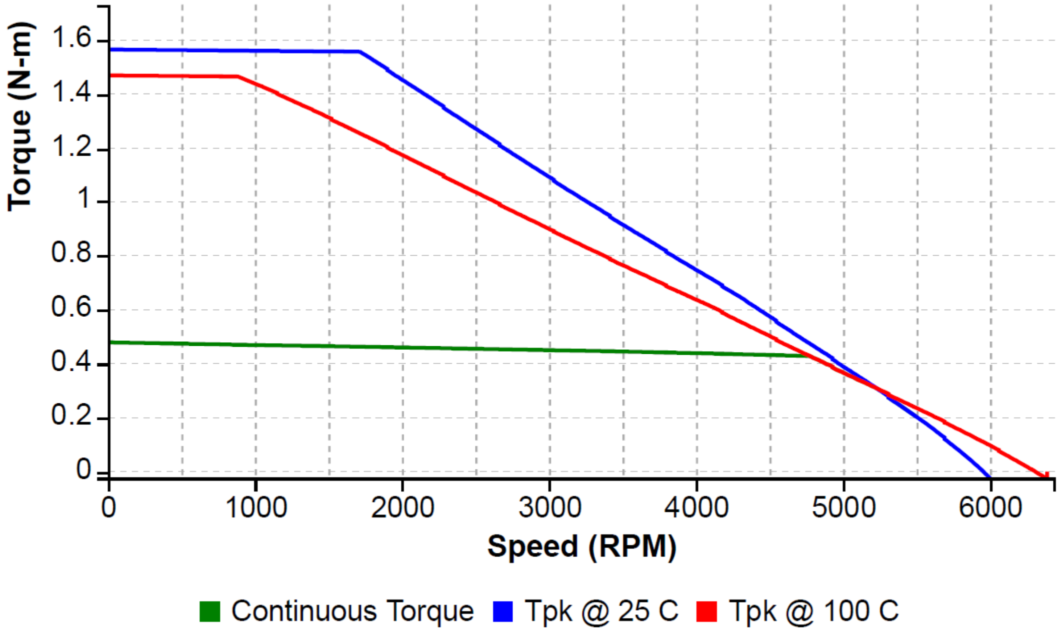
Table 1: Servo Sizing Selection Table

Drive and Motor Configurations	Page Number
IC830M21C through M24F	
IC830M21C with IC830DP00306 at 120 VAC	44
IC830M21C with IC830DP00306 at 240 VAC	45
IC830M22E with IC830DP00306 at 120 VAC	46
IC830M22E with IC830DP00606 at 240 VAC	47
IC830M23E with IC830DP00306 at 120 VAC	47
IC830M23E with IC830DP00606 at 240 VAC	49
IC830M24F with IC830DP00606 at 120 VAC	50
IC830M24F with IC830DP00606 at 240 VAC	51
IC830M41E	
IC830M41E with IC830DP00306 at 120 VAC	52
IC830M41E with IC830DP00606 at 240 VAC	53
IC830M41E with IC830DP00307 at 400 VAC	54
IC830M41E with IC830DP00607 at 400 VAC	55
IC830M41E with IC830DP00307 at 480 VAC	56
IC830M41E with IC830DP00607 at 480 VAC	57

IC830M42E	
IC830M42E with IC830DP00306 at 240 VAC	58
IC830M42E with IC830DP00606 at 240 VAC	59
IC830M42E with IC830DP00307 at 400 VAC	60
IC830M42E with IC830DP00607 at 400 VAC	61
IC830M42E with IC830DP00307 at 480 VAC	62
IC830M42E with IC830DP00607 at 480 VAC	63
IC830M42G	
IC830M42G with IC830DP00606 at 240 VAC	64
IC830M42G with IC830DP01206 at 240 VAC	65
IC830M42G with IC830DP00607 at 400 VAC	66
IC830M42G with IC830DP01207 at 400 VAC	67
IC830M42G with IC830DP00607 at 480 VAC	69
IC830M42G with IC830DP01207 at 480 VAC	69
IC830M42H	
IC830M42H with IC830DP00606 at 120 VAC	70
IC830M42H with IC830DP00606 at 240 VAC	71
IC830M43G	
IC830M43G with IC830DP00606 at 240 VAC	72
IC830M43G with IC830DP01206 at 240 VAC	74
IC830M43G with IC830DP00607 at 400 VAC	75
IC830M43G with IC830DP01207 at 400VAC	76
IC830M43G with IC830DP00607 at 480VAC	77
IC830M43K	
IC830M43K with IC830DP01206 at 240 VAC	78
IC830M43K with IC830DP02406 at 230VAC	79
IC830M62H	
IC830M62H with IC830DP00606 at 230VAC	80
IC830M62H with IC830DP00607 at 400 VAC	81
IC830M62H with IC830DP00607 at 480 VAC	82
IC830M62H with IC830DP02406 at 240 VAC	83
IC830M62K	
IC830M62K with IC830DP02406 at 240 VAC	84
IC830M62K with IC830DP02407 at 400 VAC	85

9.1 IC830M21C with IC830DP00306 at 120 VAC

Figure 18: Speed-torque performance of an IC830M21C motor and an IC830D306 drive at 120 VAC



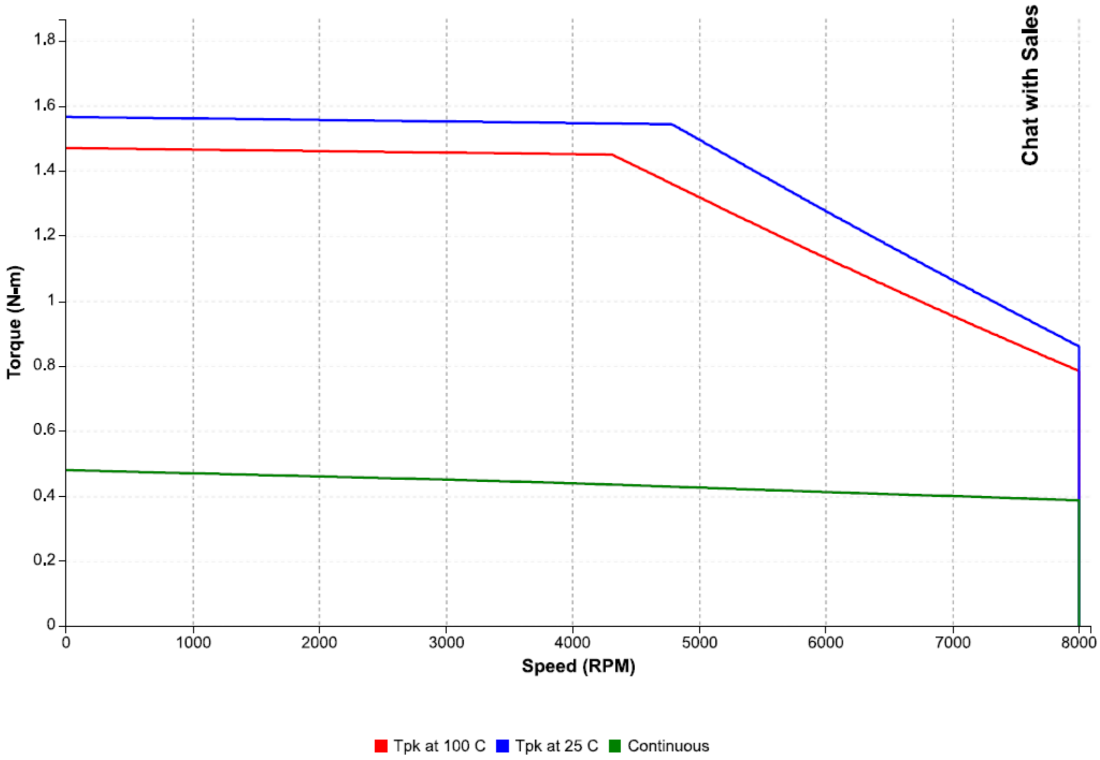
Drive Parameters

Peak Current: 6.3 Arms

Bus Voltage: 160 Vdc

9.2 IC830M21C with IC830DP00306 at 240 VAC

Figure 19: Speed-torque performance of an IC830M21C motor and an IC830D306 drive at 240 VAC



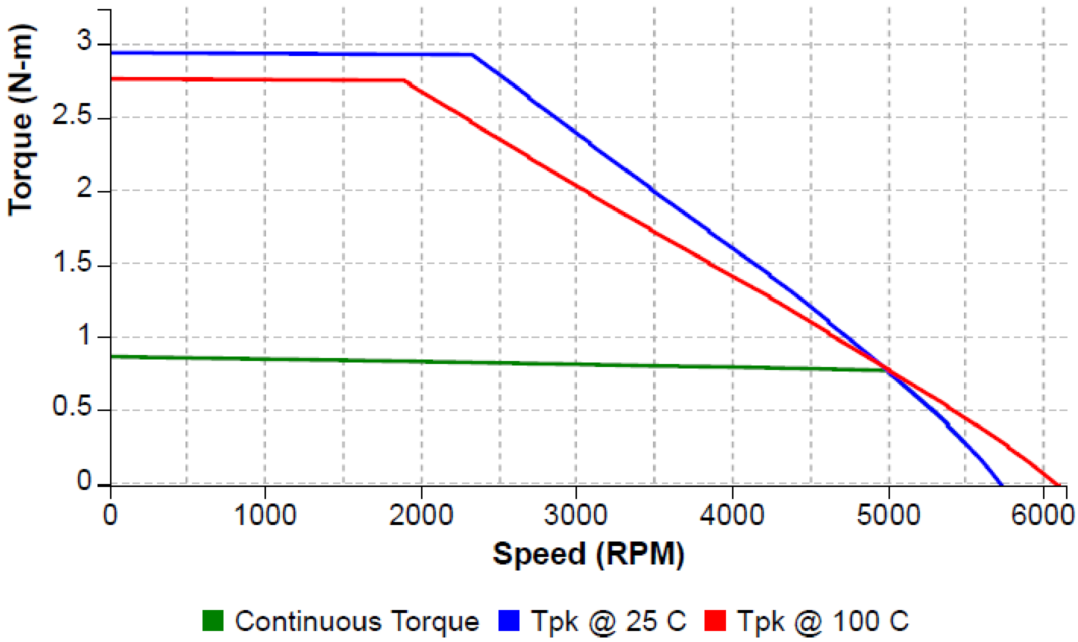
Drive Parameters

Peak Current: 6.3 Arms

Bus Voltage: 325 Vdc

9.3 IC830M22E with IC830DP00306 at 120 VAC

Figure 20: Speed-torque performance of an IC830M22E motor with an IC830DP00306 drive at 240 VAC



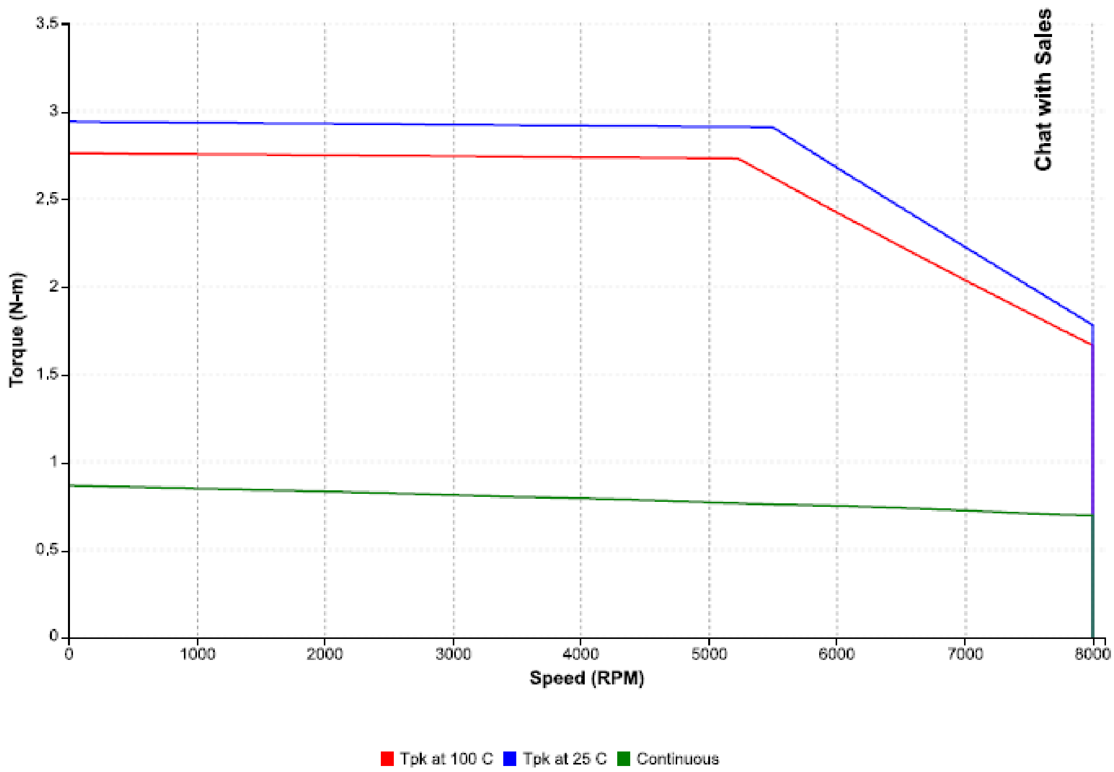
Drive Parameters

Peak Current: 10.90 Arms

Bus Voltage: 160 Vdc

9.4 IC830M22E with IC830DP00606 at 240 VAC

Figure 21: Speed-torque performance of an IC830M22E motor with an IC830DP00606 drive at 240 VAC



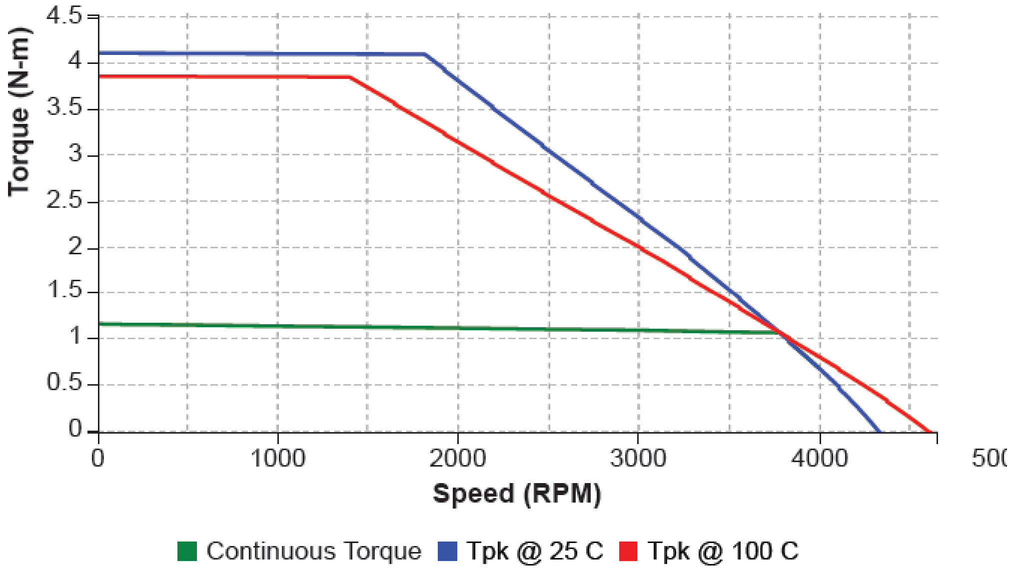
Drive Parameters

Peak Current: 10.9 Arms

Bus Voltage: 325 Vdc

9.5 IC830M23E with IC830DP00306 at 120 VAC

Figure 22: Speed-torque performance of an IC830M23E motor with an IC830DP00306 at 120 VAC



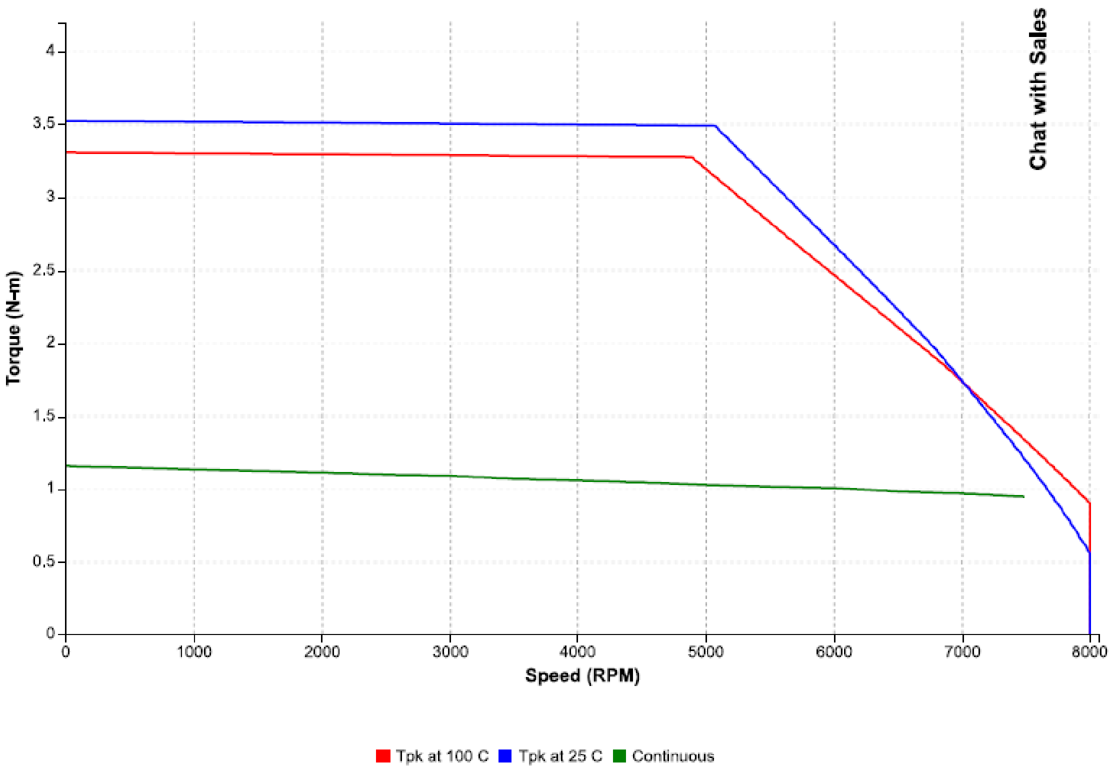
Drive Parameters

Peak Current: 11.10 Arms

Bus Voltage: 160 Vdc

9.6 IC830M23E with IC830DP00606 at 240 VAC

Figure 23: Speed-torque performance of an IC830M23E motor with an IC830DP00306 at 240 VAC



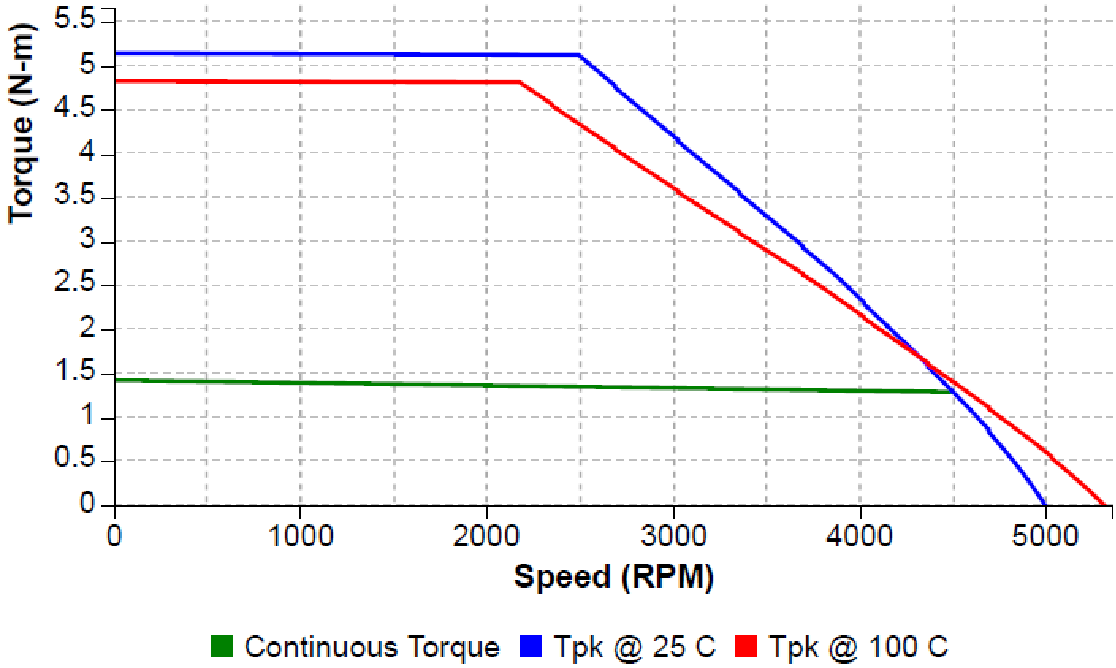
Drive Parameters

Peak Current: 9 Arms

Bus Voltage: 325 Vdc

9.7 IC830M24F with IC830DP00606 at 120 VAC

Figure 24: Speed-torque performance of an IC830M24F motor with an IC830DP00606 drive at 240 VAC



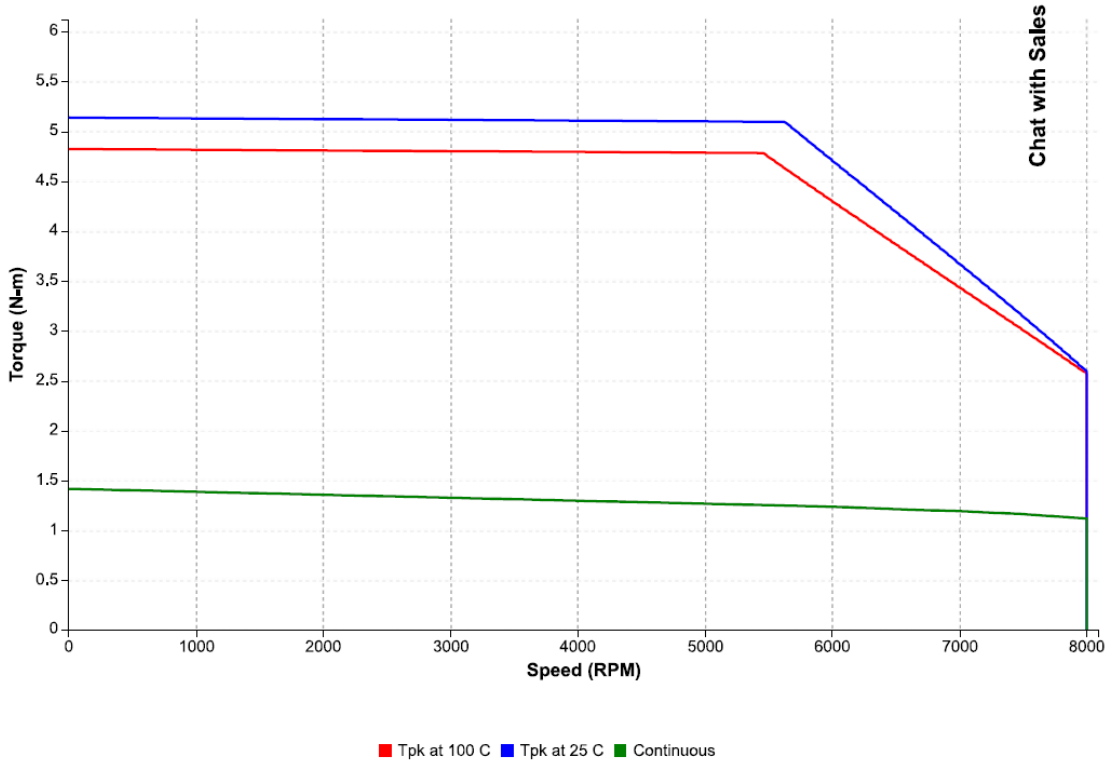
Drive Parameters

Peak Current: 15.60 Arms

Bus Voltage: 160 Vdc

9.8 IC830M24F with IC830DP00606 at 240 VAC

Figure 25: Speed-torque performance of an IC830M24F motor with an IC830DP00606 drive at 240 VAC



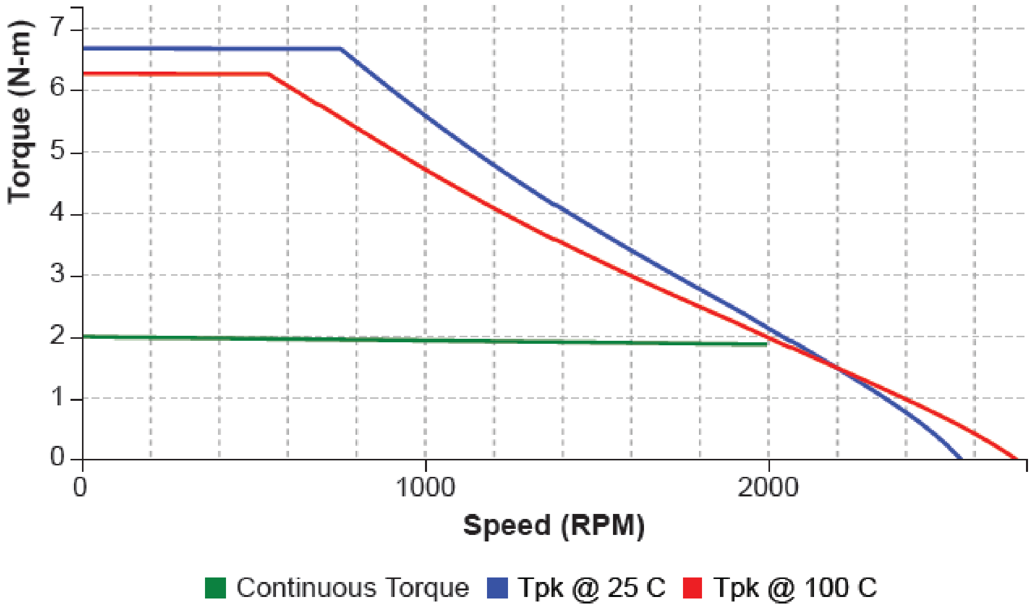
Drive Parameters

Peak Current: 15.6 Arms

Bus Voltage: 325 Vdc

9.9 IC830M41E with IC830DP00306 at 120 VAC

Figure 26: Speed-torque performance of an IC830M41E motor with an IC830DP00306 drive at 240 VAC



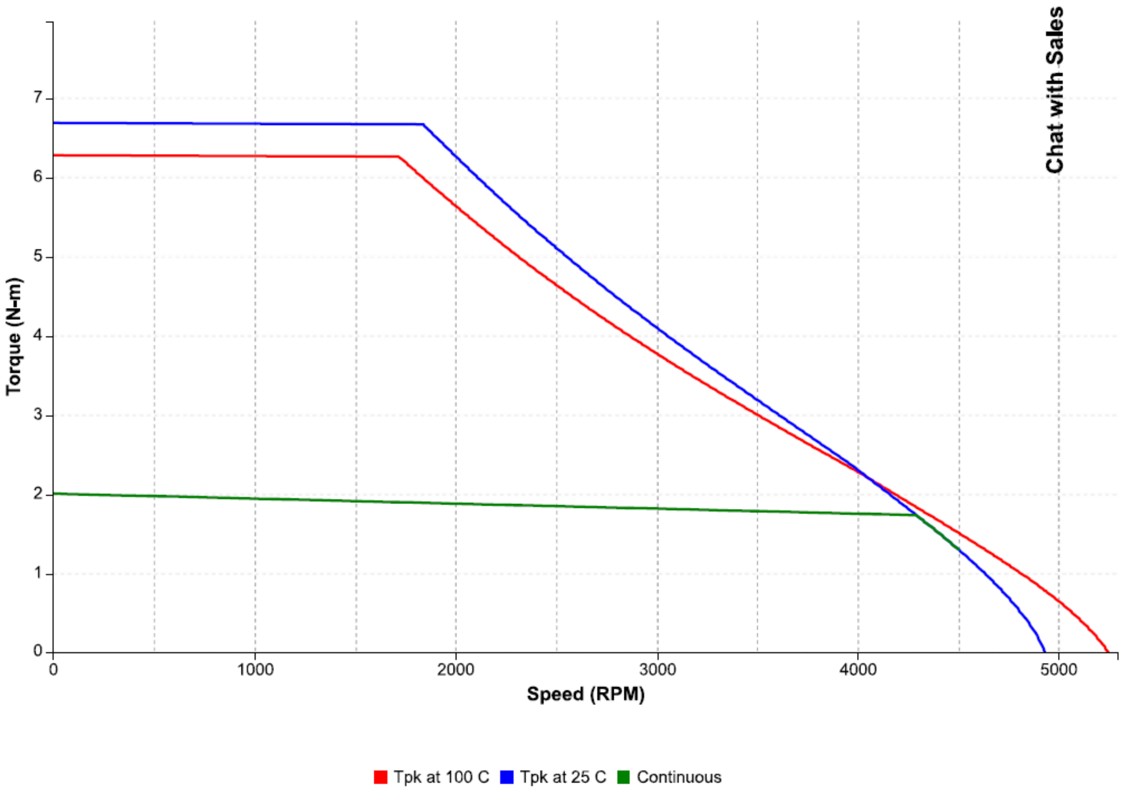
Drive Parameters

Peak Current: 11.4 Arms

Bus Voltage: 160 Vdc

9.10 IC830M41E with IC830DP00606 at 240 VAC

Figure 27: Speed-torque performance of an IC830M41E motor with an IC830DP00606 drive at 240 VAC



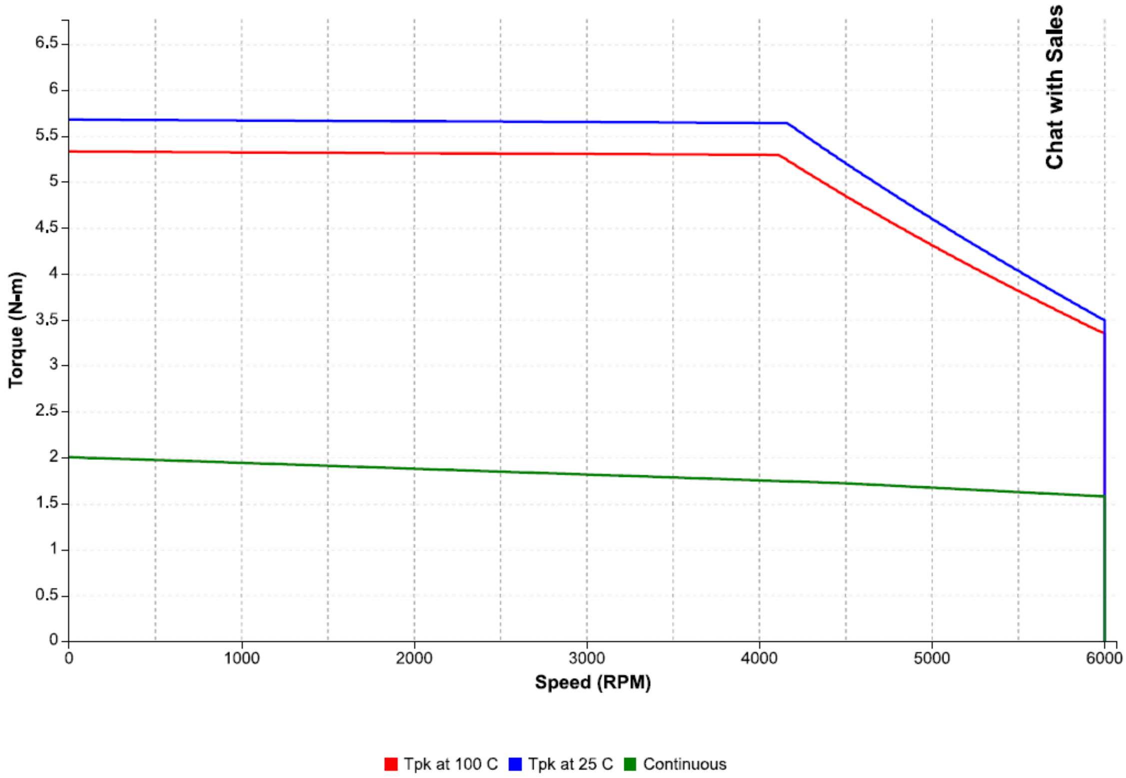
Drive Parameters

Peak Current: 11.4 Arms

Bus Voltage: 325 Vdc

9.11 IC830M41E with IC830DP00307 at 400 VAC

Figure 28: Speed-torque performance of an IC830M41E motor with an IC830DP00307 drive at 400 VAC



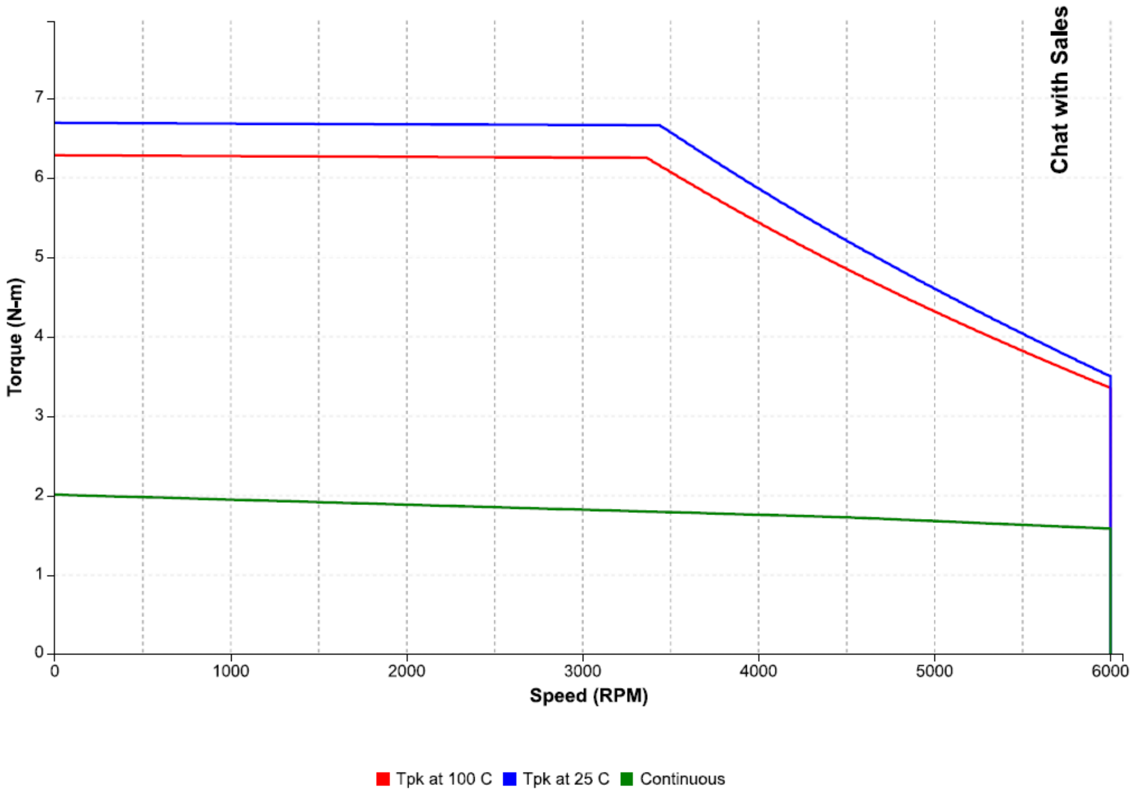
Drive Parameters

Peak Current: 9 Arms

Bus Voltage: 565 Vdc

9.12 IC830M41E with IC830DP00607 at 400 VAC

Figure 29: Speed-torque performance of an IC830M41E motor with an IC830DP00607 drive at 400 VAC



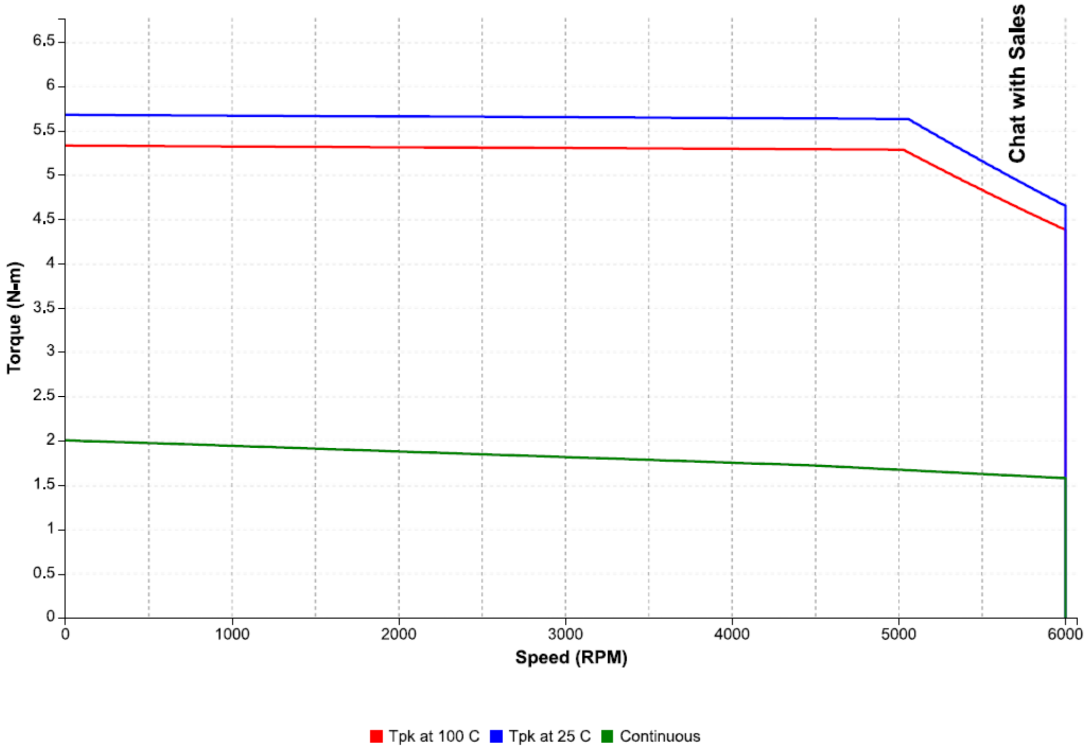
Drive Parameters

Peak Current: 11.4 Arms

Bus Voltage: 565 Vdc

9.13 IC830M41E with IC830DP00307 at 480 VAC

Figure 30: Speed-torque performance of an IC830M41E motor with an IC830DP00307 drive at 480 VAC



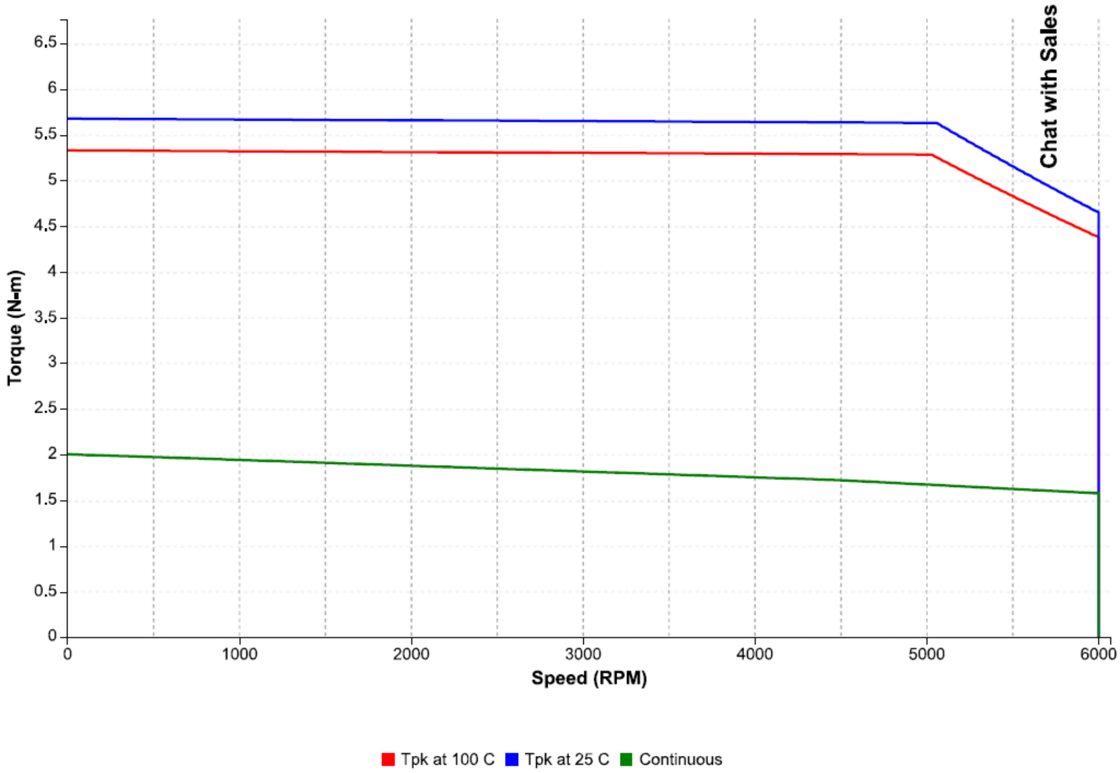
Drive Parameters

Peak Current: 9 Arms

Bus Voltage: 678 Vdc

9.14 IC830M41E with IC830DP00607 at 480 VAC

Figure 31: Speed-torque performance of an IC830M41E motor with an IC830DP00607 drive at 480 VAC



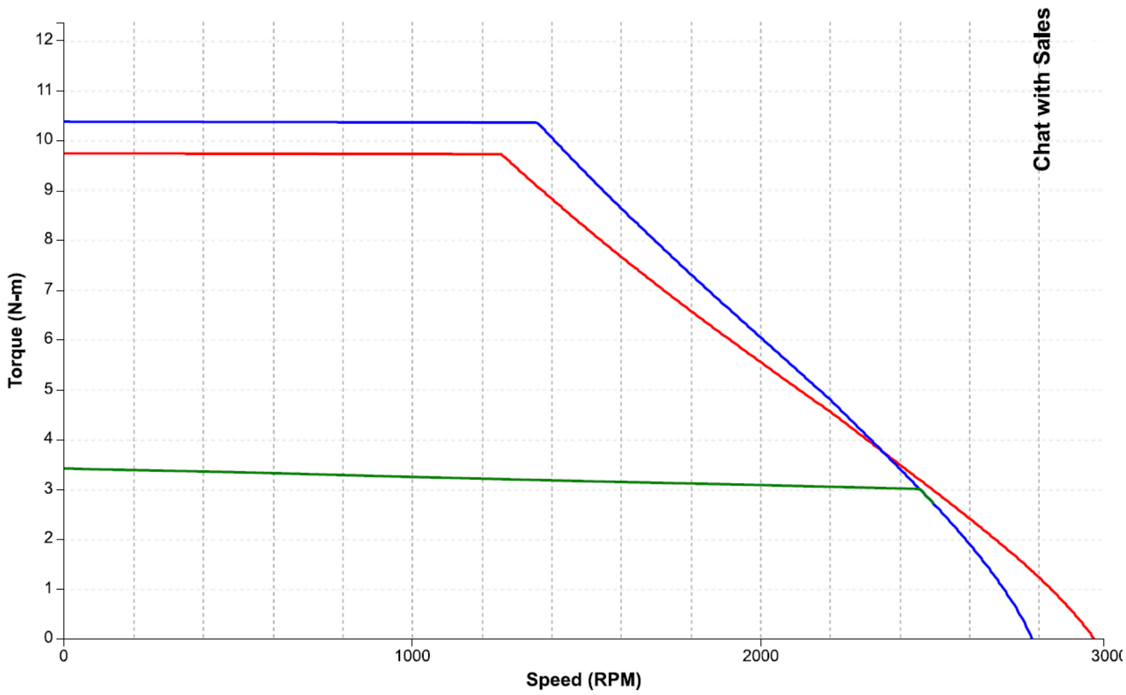
Drive Parameters

Peak Current: 11.4 Arms

Bus Voltage: 678 Vdc

9.15 IC830M42E with IC830DP00306 at 240 VAC

Figure 32: Speed-torque performance of an IC830M42E motor with an IC830DP00306 drive at 240 VAC



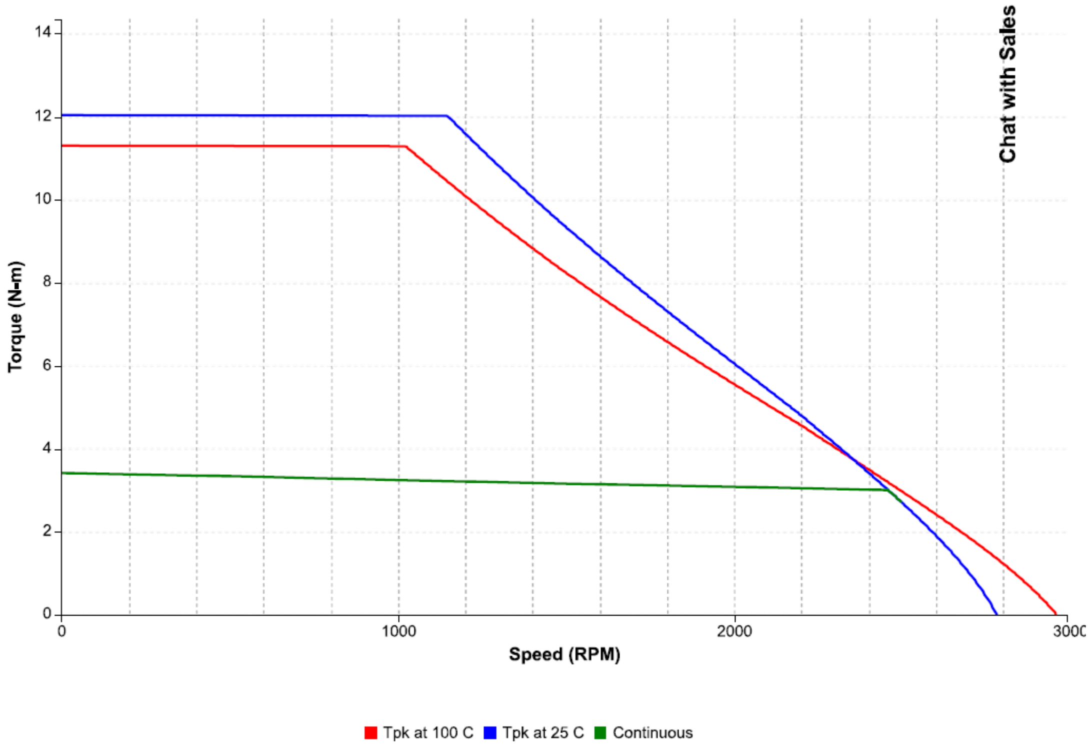
Drive Parameters

Peak Current: 9 Arms

Bus Voltage: 325 Vdc

9.16 IC830M42E with IC830DP00606 at 240 VAC

Figure 33: Speed-torque performance of an IC830M42E motor with an IC830DP00606 drive at 240 VAC



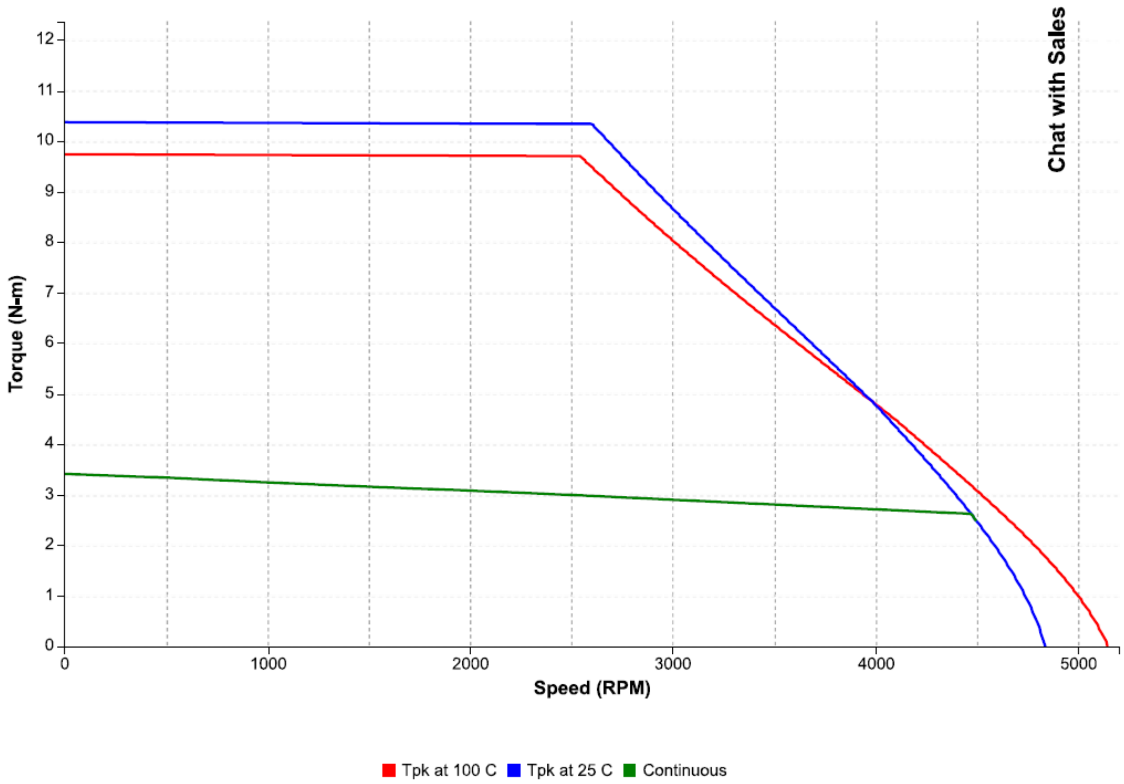
Drive Parameters

Peak Current: 11 Arms

Bus Voltage: 325 Vdc

9.17 IC830M42E with IC830DP00307 at 400 VAC

Figure 34: Speed-torque performance of an IC830M42E motor with an IC830DP00307 drive at 400 VAC



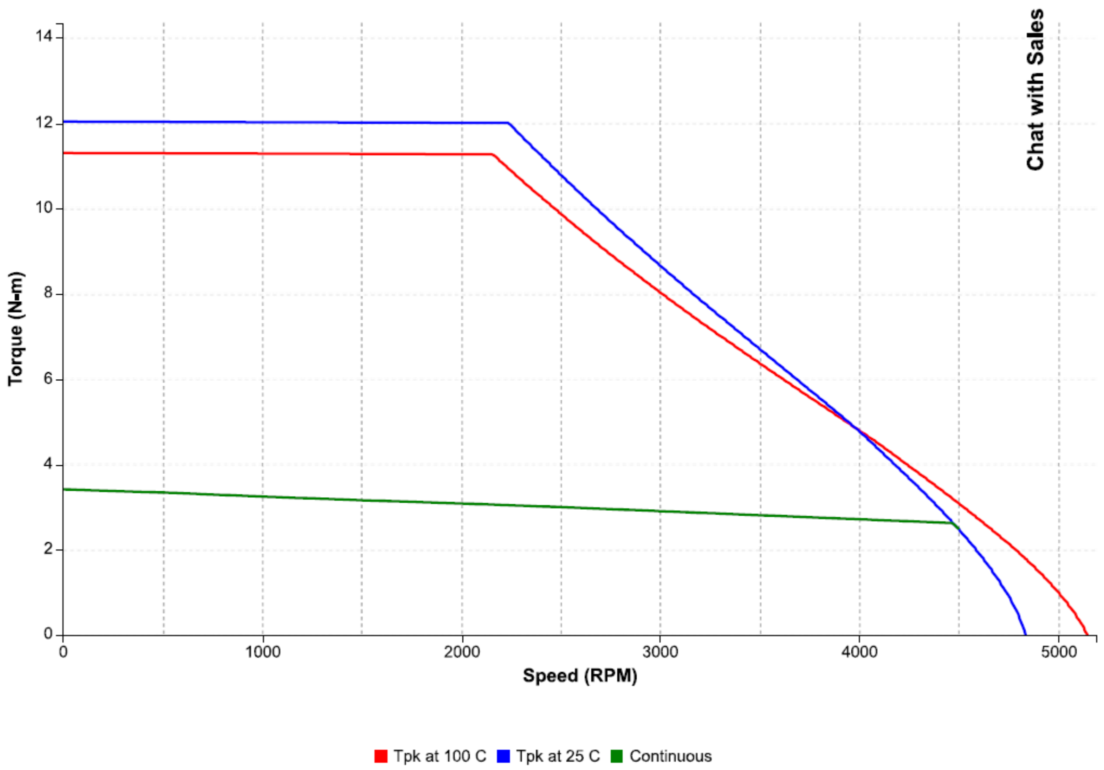
Drive Parameters

Peak Current: 9 Arms

Bus Voltage: 565 Vdc

9.18 IC830M42E with IC830DP00607 at 400 VAC

Figure 35: Speed-torque performance of an IC830M42E motor with an IC830DP00607 drive at 400 VAC



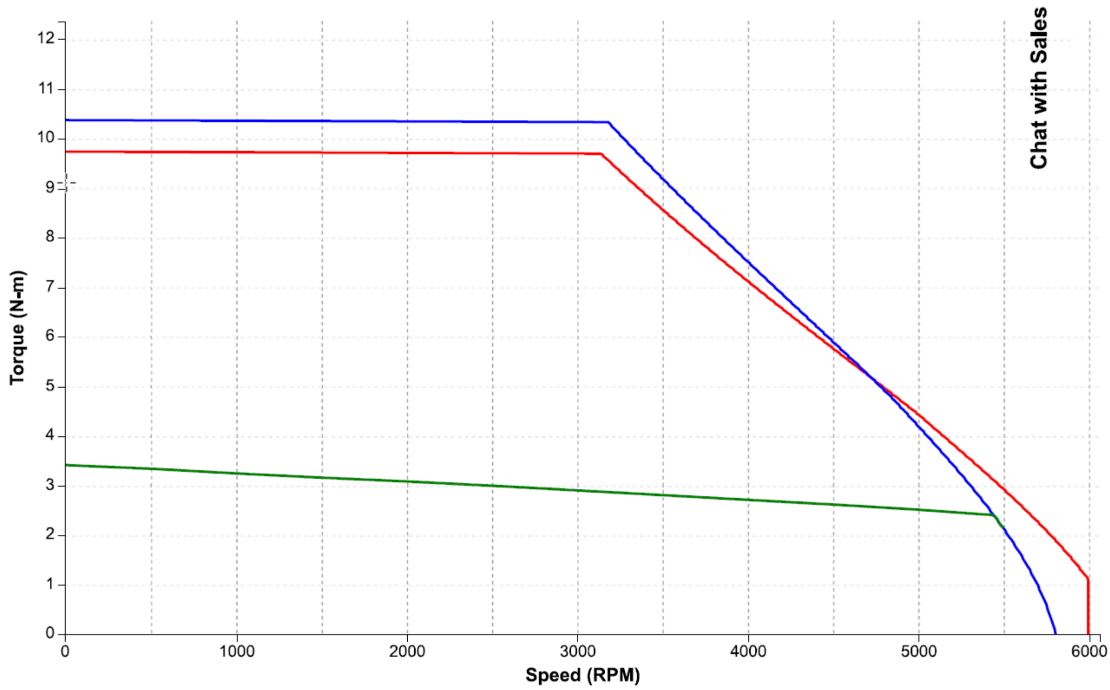
Drive Parameters

Peak Current: 11 Arms

Bus Voltage: 565 Vdc

9.19 IC830M42E with IC830DP00307 at 480 VAC

Figure 36: Speed-torque performance of an IC830M42E motor with an IC830DP00307 drive at 480 VAC



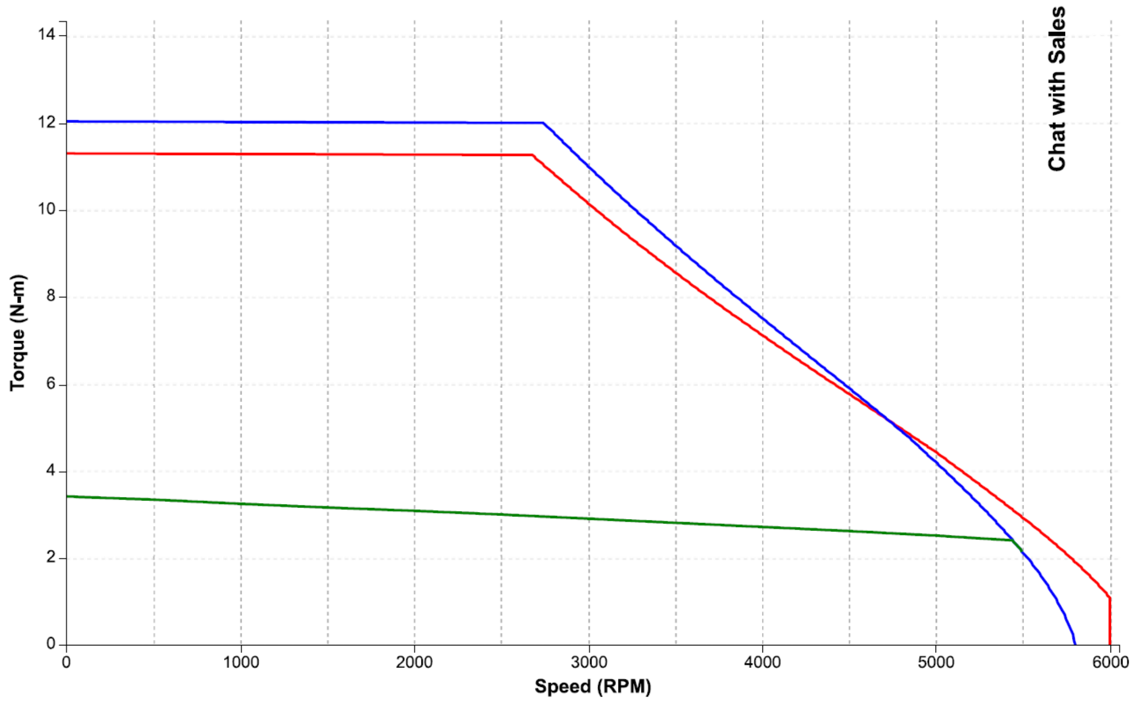
Drive Parameters

Peak Current: 9 Arms

Bus Voltage: 678 Vdc

9.20 IC830M42E with IC830DP00607 at 480 VAC

Figure 37: Speed-torque performance of an IC830M42E motor with an IC830DP00607 drive at 480 VAC



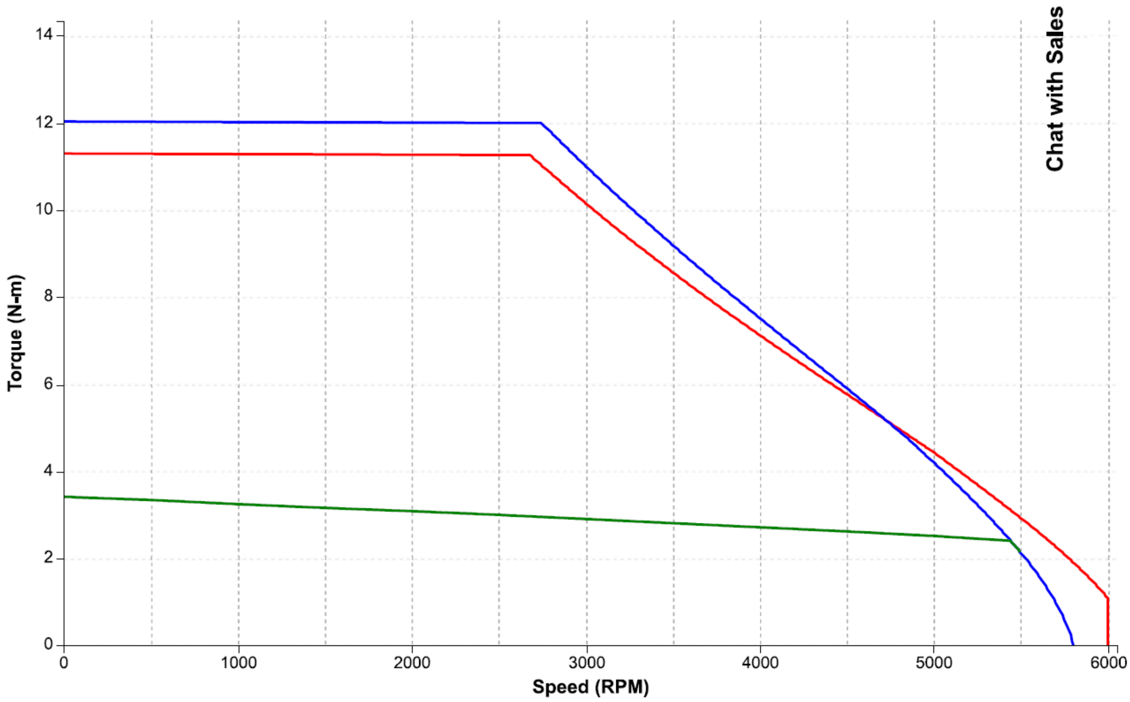
Drive Parameters

Peak Current: 11 Arms

Bus Voltage: 678 Vdc

9.21 IC830M42G with IC830DP00606 at 240 VAC

Figure 38: Speed-torque performance of an IC830M42G motor with an IC830DP00606 drive at 240 VAC



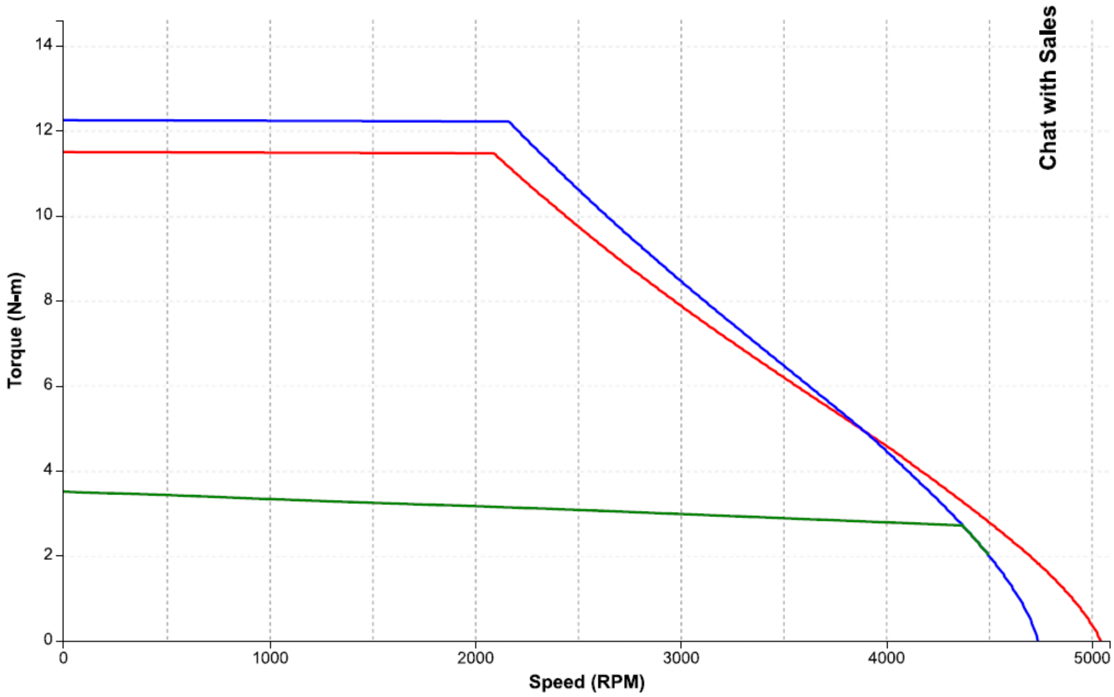
Drive Parameters

Peak Current: 18 Arms

Bus Voltage: 325 Vdc

9.22 IC830M42G with IC830DP01206 at 240 VAC

Figure 39: Speed-torque performance of an IC830M42G motor with an IC830DP01206 drive at 240 VAC



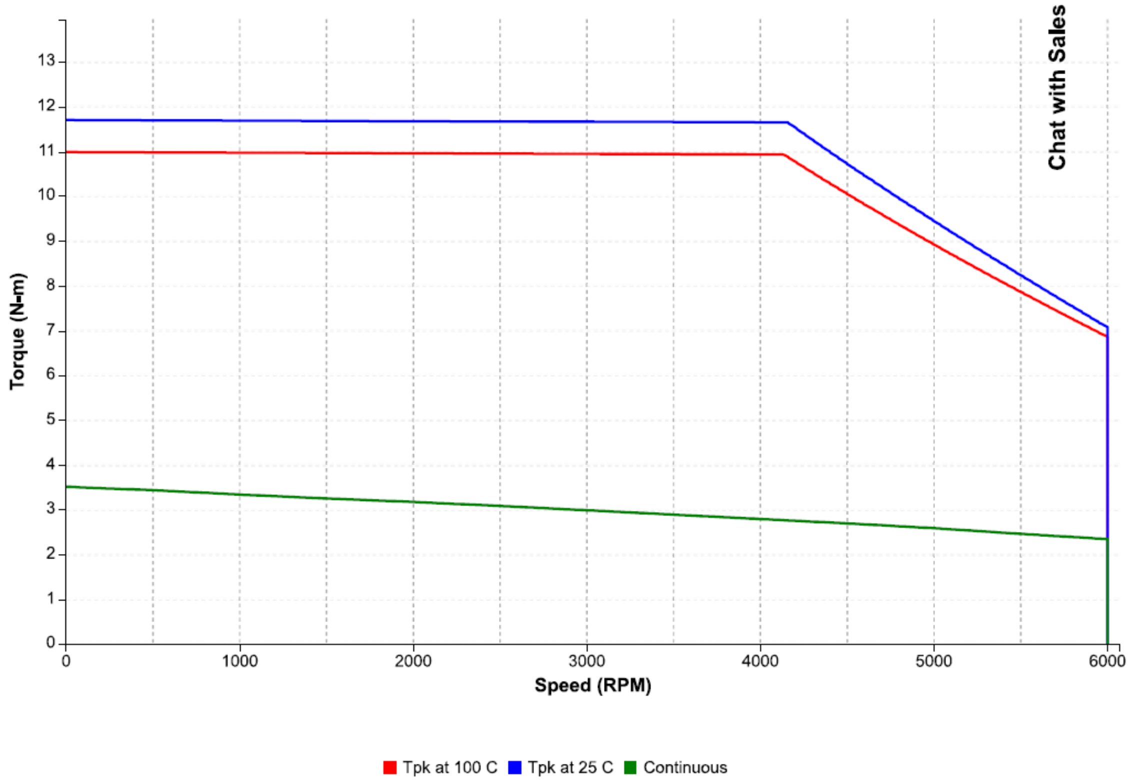
Drive Parameters

Peak Current: 19.2 Arms

Bus Voltage: 325 Vdc

9.23 IC830M42G with IC830DP00607 at 400 VAC

Figure 40: Speed-torque performance of an IC830M42G motor with an IC830DP00607 drive at 400 VAC



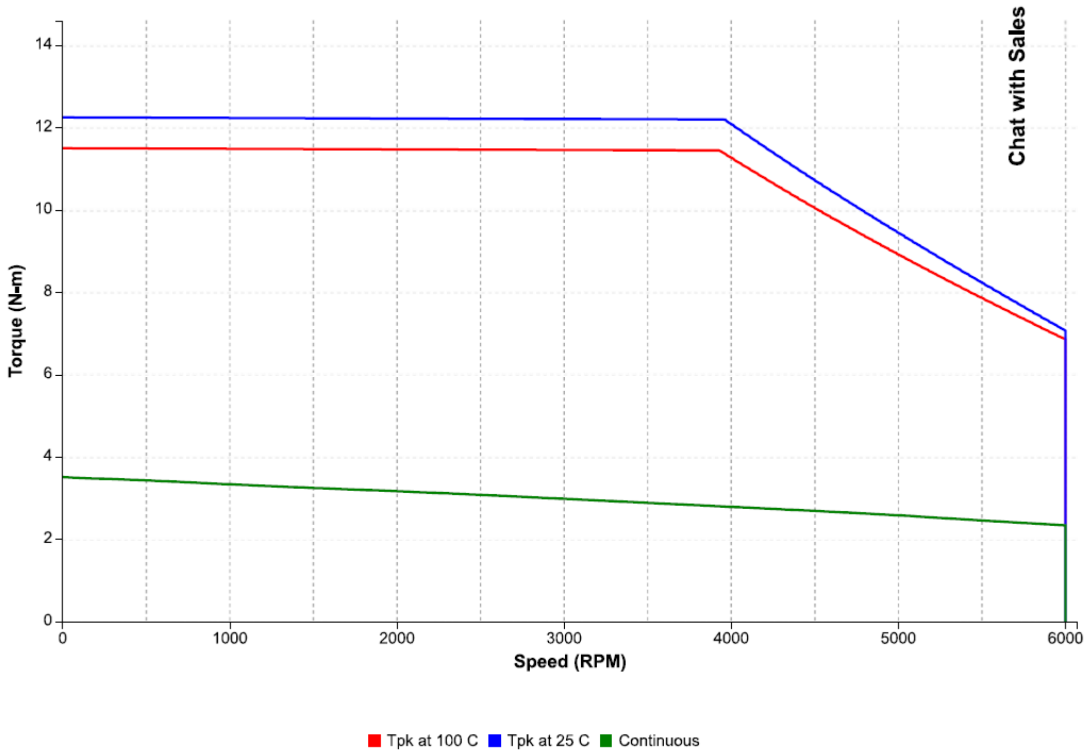
Drive Parameters

Peak Current: 18 Arms

Bus Voltage: 565 Vdc

9.24 IC830M42G with IC830DP01207 at 400 VAC

Figure 41: Speed-torque performance of an IC830M42G motor with an IC830DP01207 drive at 400 VAC



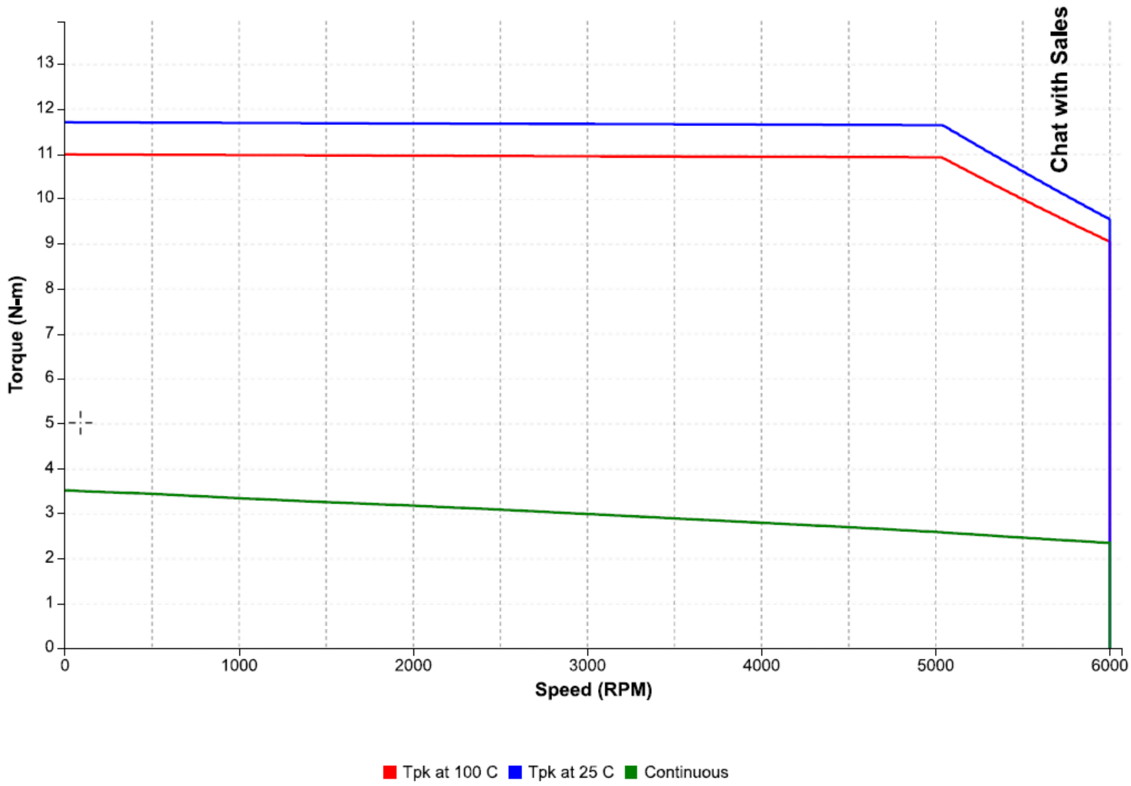
Drive Parameters

Peak Current: 19.2 Arms

Bus Voltage: 565 Vdc

9.25 IC830M42G with IC830DP00607 at 480 VAC

Figure 42: Speed-torque performance of an IC830M42G motor with an IC830DP00607 drive at 480 VAC



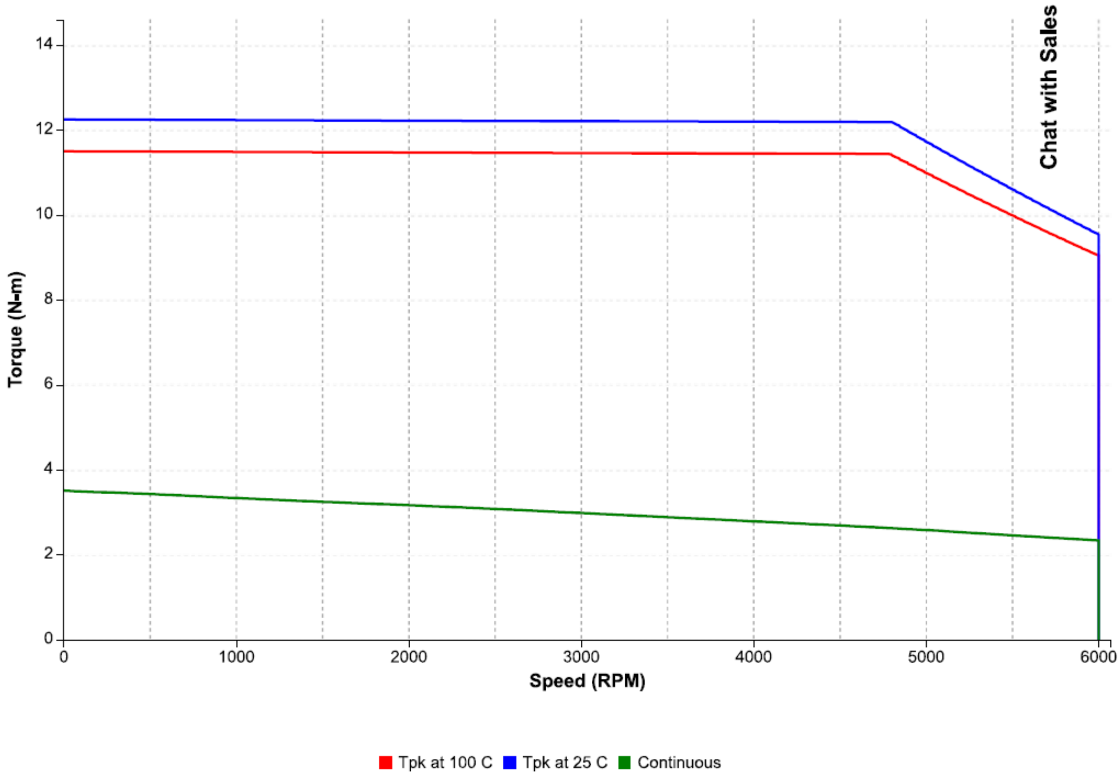
Drive Parameters

Peak Current: 18 Arms

Bus Voltage: 678 Vdc

9.26 IC830M42G with IC830DP01207 at 480 VAC

Figure 43: Speed-torque performance of an IC830M42G motor with an IC830DP01207 drive at 480 VAC



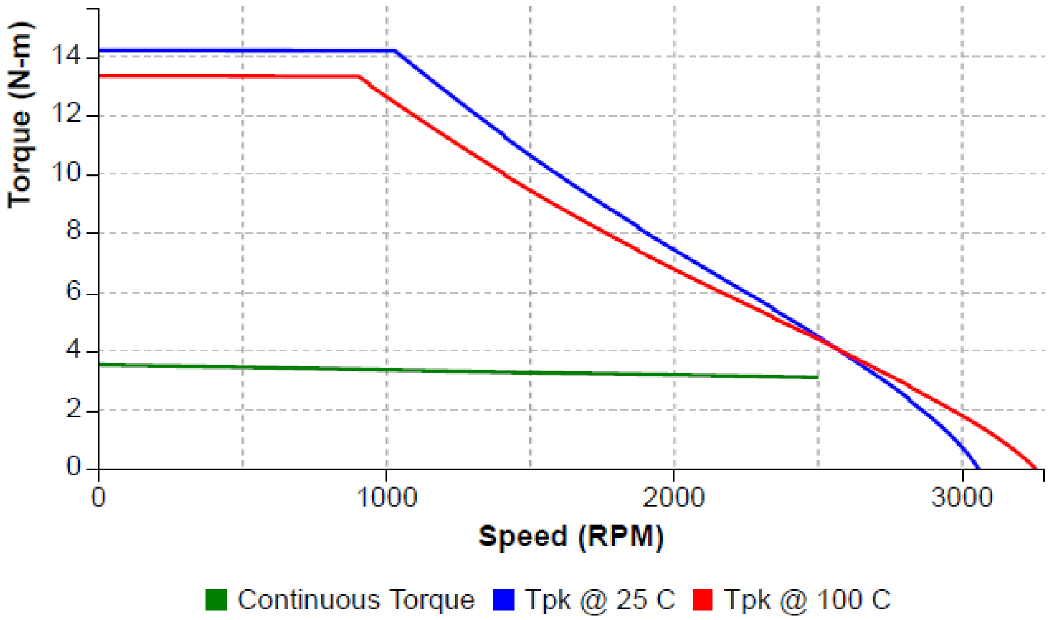
Drive Parameters

Peak Current: 19.2 Arms

Bus Voltage: 678 Vdc

9.27 IC830M42H with IC830DP00606 at 120 VAC

Figure 44: Speed-torque performance of an IC830M42H motor with an IC830DP00606 drive at 120 VAC



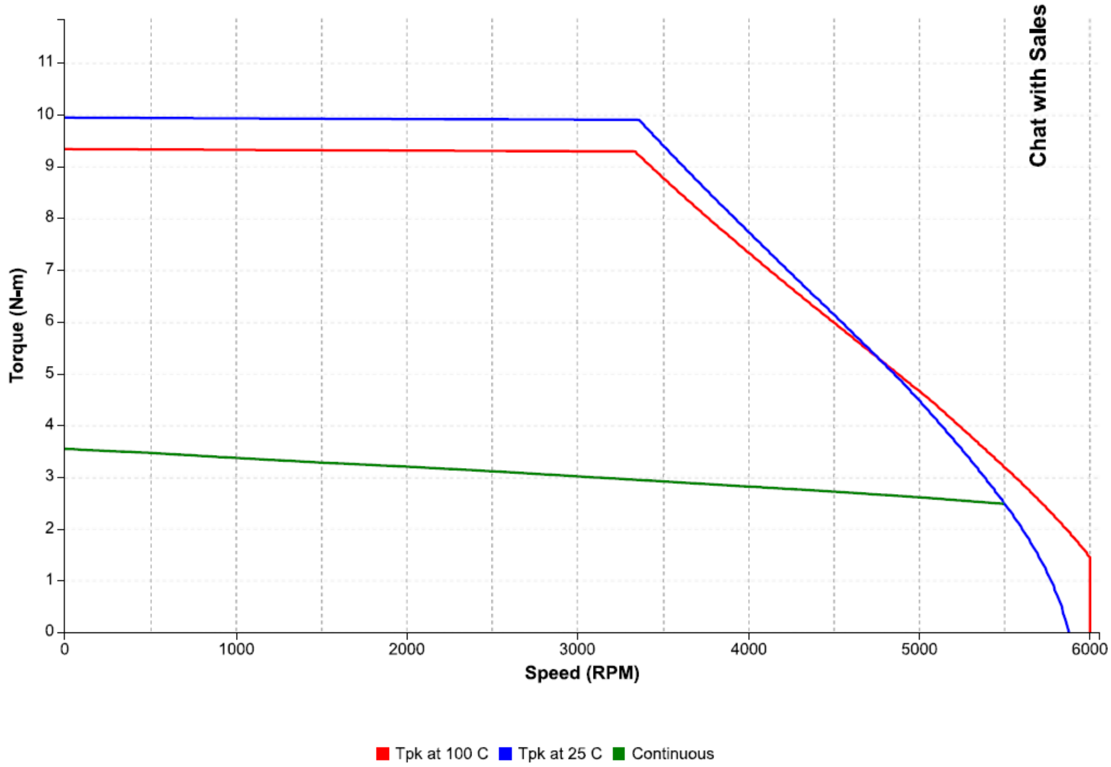
Drive Parameters

Peak Current: 30 Arms

Bus Voltage: 160 Vdc

9.28 IC830M42H with IC830DP00606 at 240 VAC

Figure 45: Speed-torque performance of an IC830M42H motor with an IC830DP00606 drive at 240 VAC



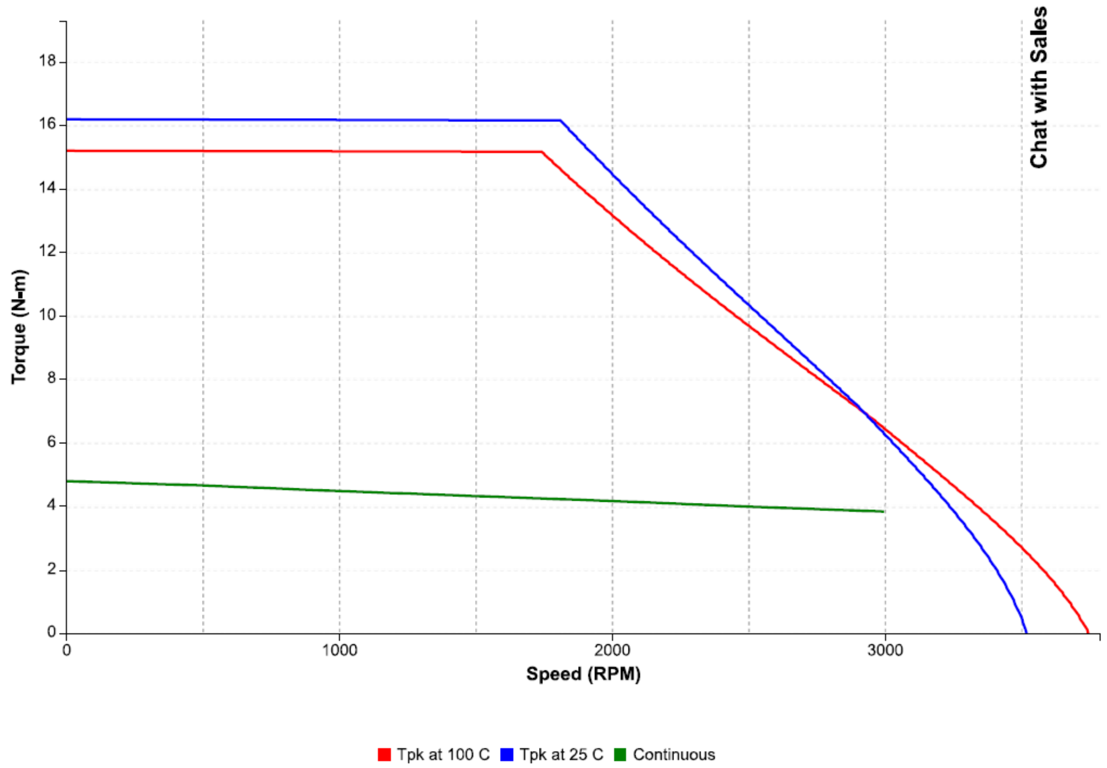
Drive Parameters

Peak Current: 18 Arms

Bus Voltage: 325 Vdc

9.29 IC830M43G with IC830DP00606 at 240 VAC

Figure 46: Speed-torque performance of an IC830M43G motor with an IC830DP00606 drive at 240 VAC



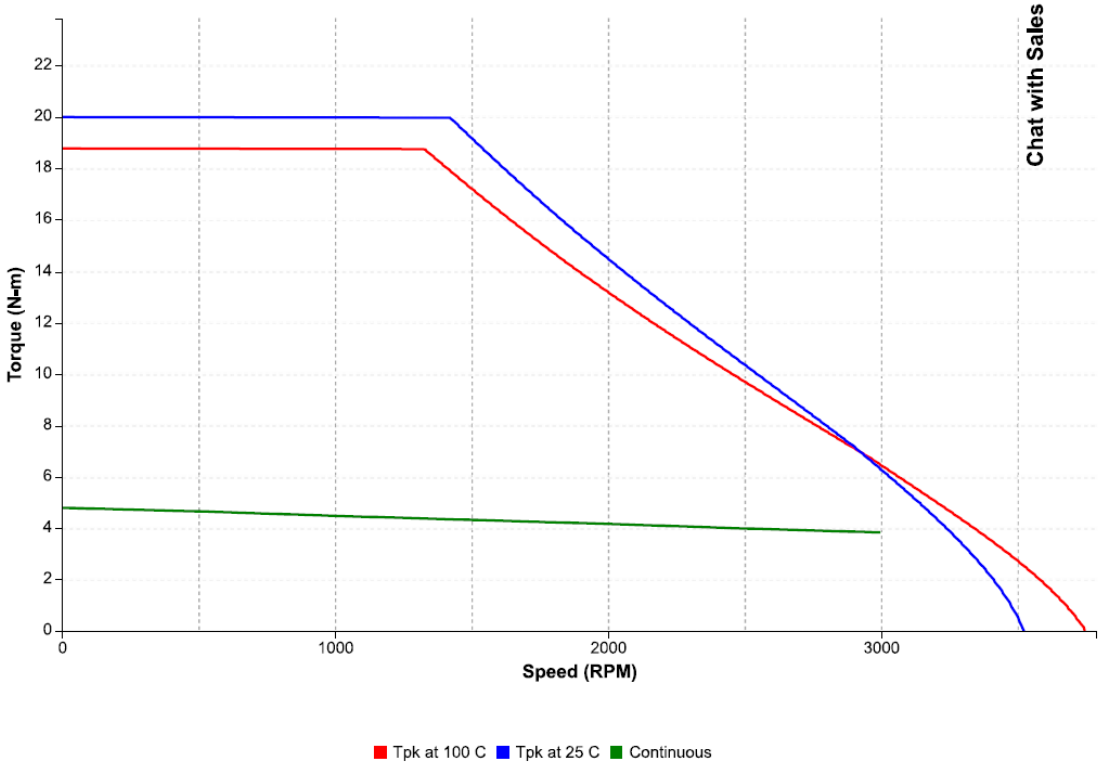
Drive Parameters

Peak Current: 18 Arms

Bus Voltage: 325 Vdc

9.30 IC830M43G with IC830DP01206 at 240 VAC

Figure 47: Speed-torque performance of an IC830M43G motor with an IC830DP01206 drive at 240 VAC



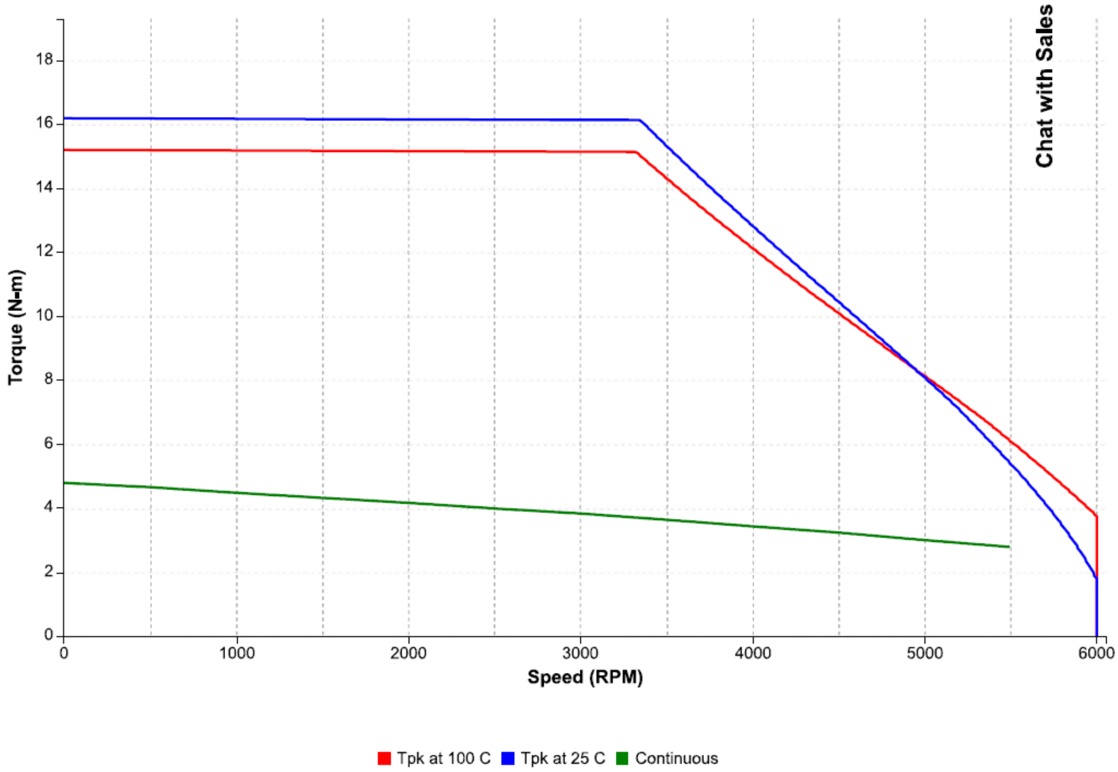
Drive Parameters

Peak Current: 18 Arms

Bus Voltage: 325 Vdc

9.31 IC830M43G with IC830DP00607 at 400 VAC

Figure 48: Speed-torque performance of an IC830M43G motor with an IC830DP00607 drive at 400 VAC



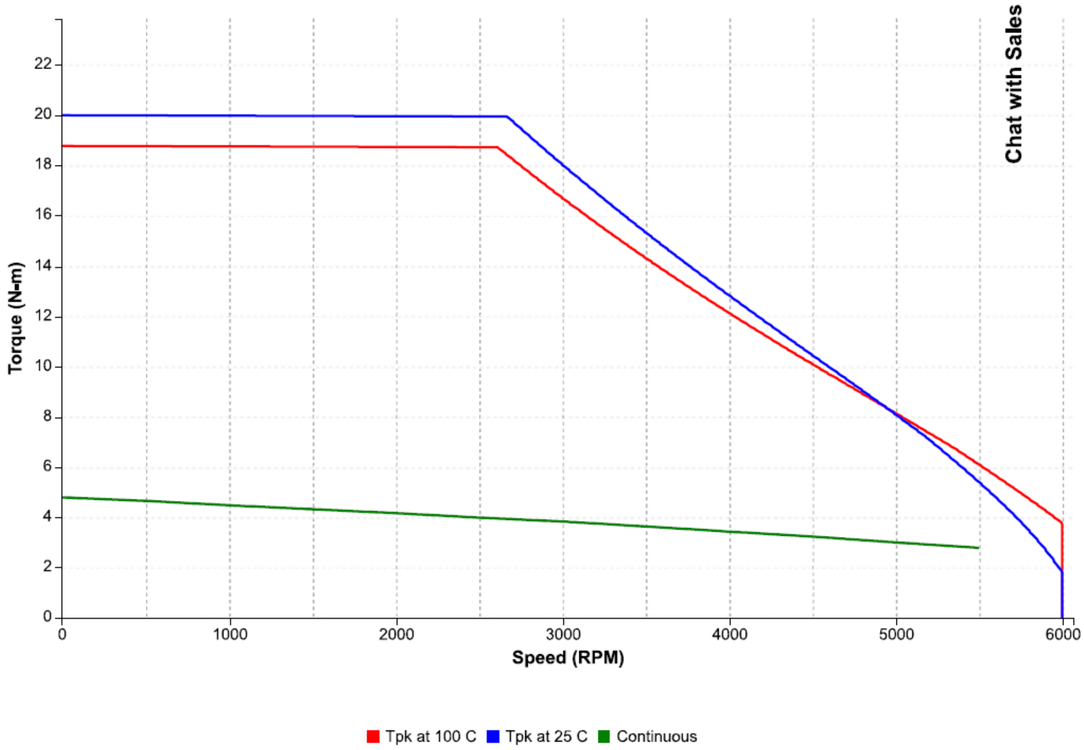
Drive Parameters

Peak Current: 18 Arms

Bus Voltage: 565 Vdc

9.32 IC830M43G with IC830DP01207 at 400VAC

Figure 49: Speed-torque performance of an IC830M43G motor with an IC830DP01207 drive at 400 VAC



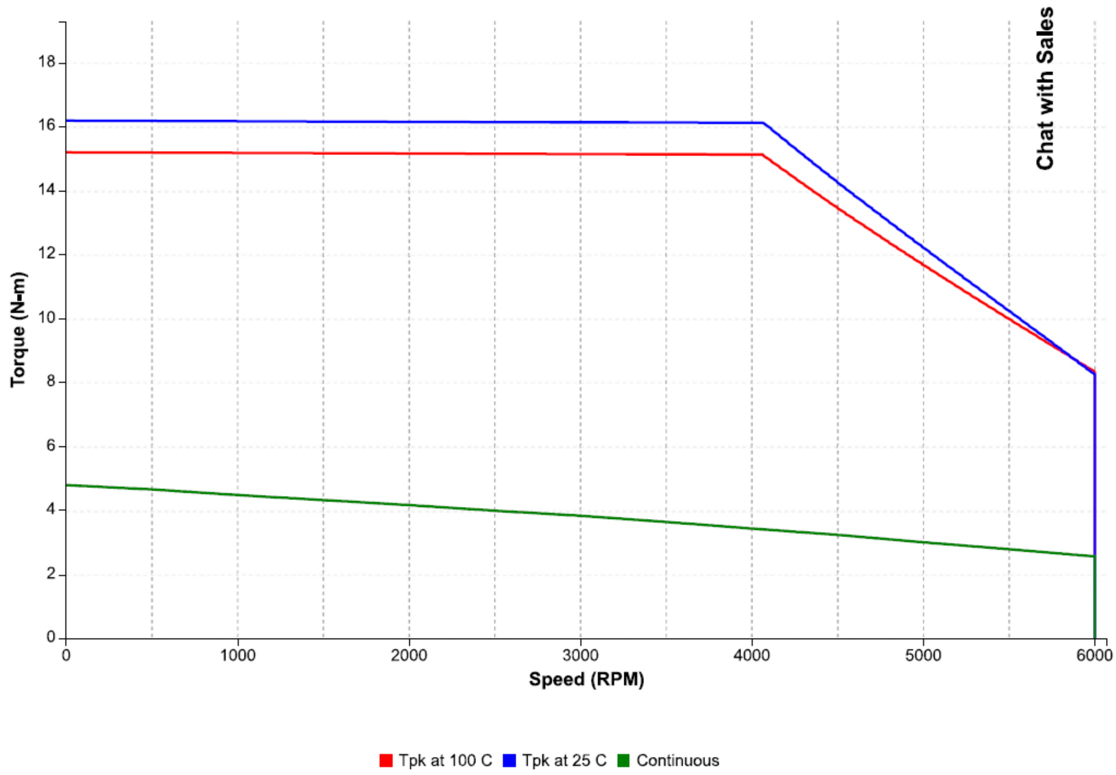
Drive Parameters

Peak Current: 24.3 Arms

Bus Voltage: 565 Vdc

9.33 IC830M43G with IC830DP00607 at 480VAC

Figure 50: Speed-torque performance of an IC830M43G motor with an IC830DP00607 drive at 480 VAC



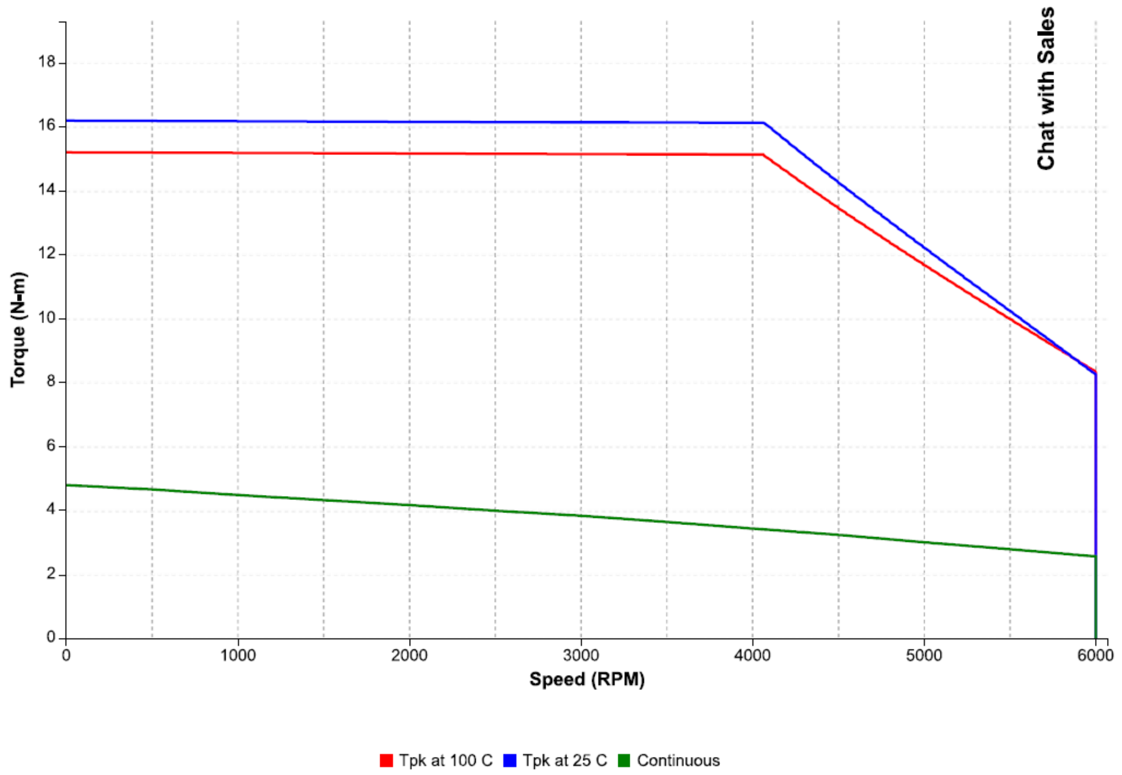
Drive Parameters

Peak Current: 18 Arms

Bus Voltage: 678 Vdc

9.34 IC830M43G with IC830DP00607 at 480VAC

Figure 51: Speed-torque performance of an IC830M43G motor with an IC830DP00607 drive at 480 VAC



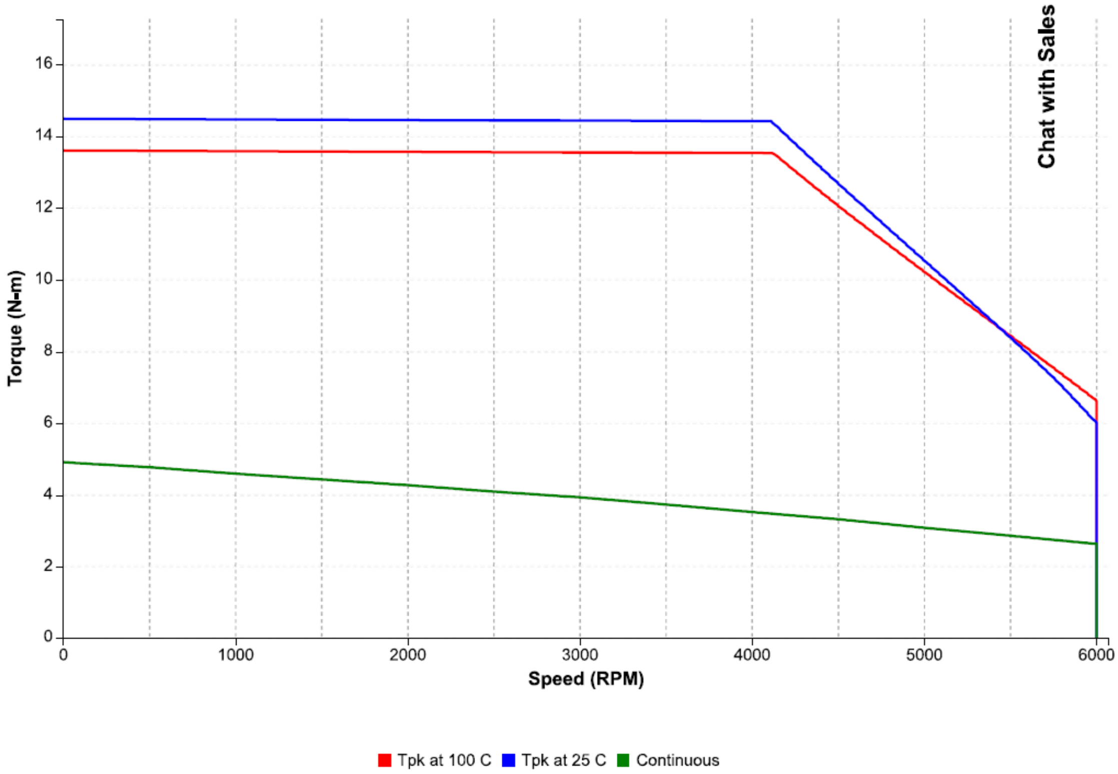
Drive Parameters

Peak Current: 18 Arms

Bus Voltage: 678 Vdc

9.35 IC830M43K with IC830DP01206 at 240 VAC

Figure 52: Speed-torque performance of an IC830M43K motor with an IC830DP01206 drive at 240 VAC



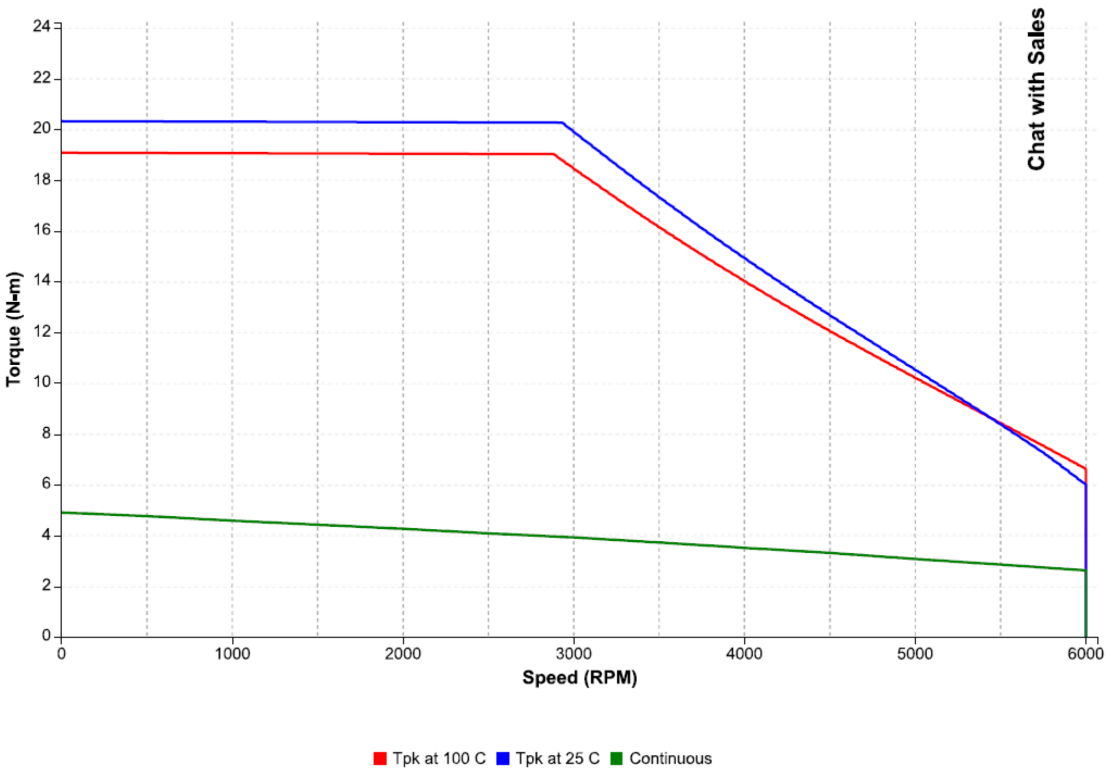
Drive Parameters

Peak Current: 30 Arms

Bus Voltage: 325 Vdc

9.36 IC830M43K with IC830DP02406 at 230VAC

Figure 53: Speed-torque performance of an IC830M43K motor with an IC830DP02406 drive at 240 VAC



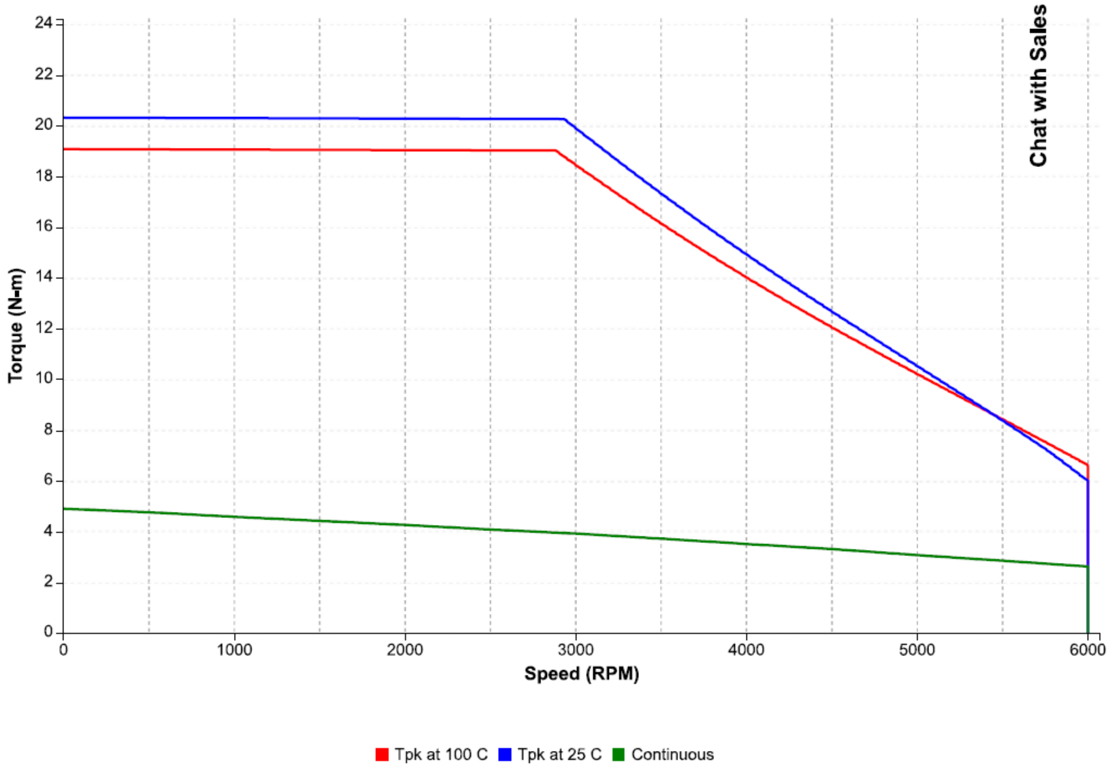
Drive Parameters

Peak Current: 47.9 Arms

Bus Voltage: 325 Vdc

9.37 IC830M62H with IC830DP00606 at 230VAC

Figure 54: Speed-torque performance of an IC830M62H motor with an IC830DP00606 drive at 240 VAC



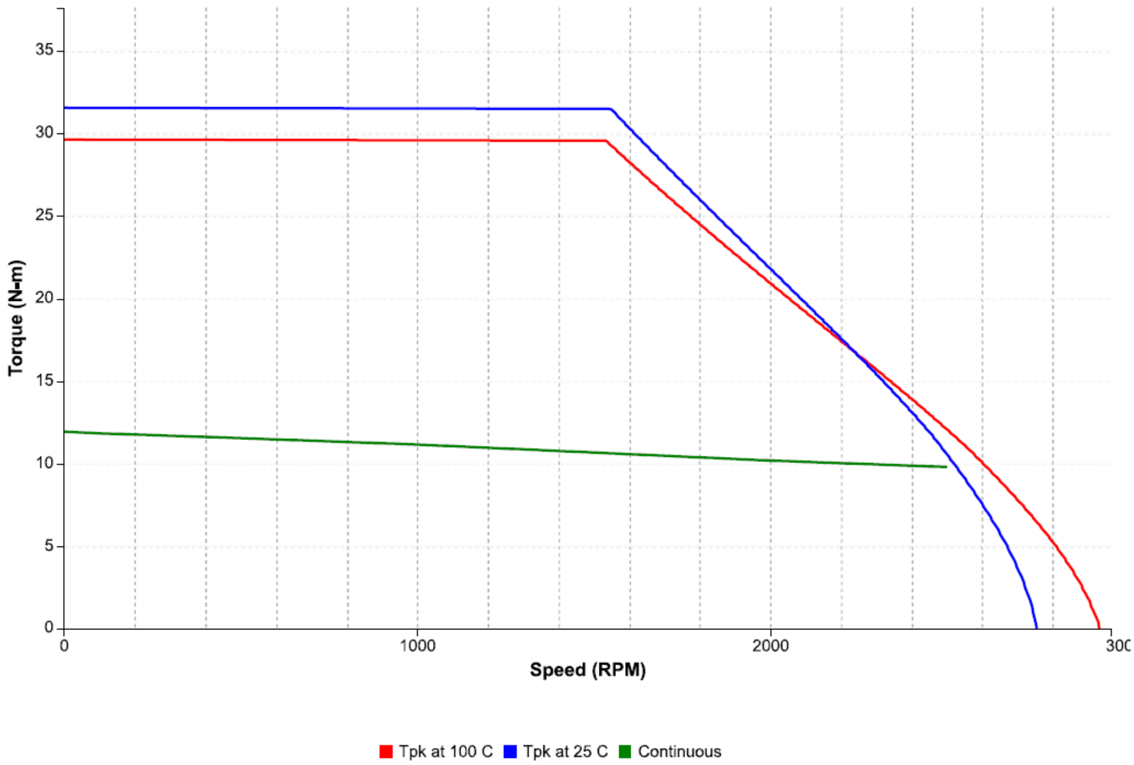
Drive Parameters

Peak Current: 16.2 Arms

Bus Voltage: 325 Vdc

9.38 IC830M62H with IC830DP00607 at 400 VAC

Figure 55: Speed-torque performance of an IC830M62H motor with an IC830DP00607 drive at 400 VAC



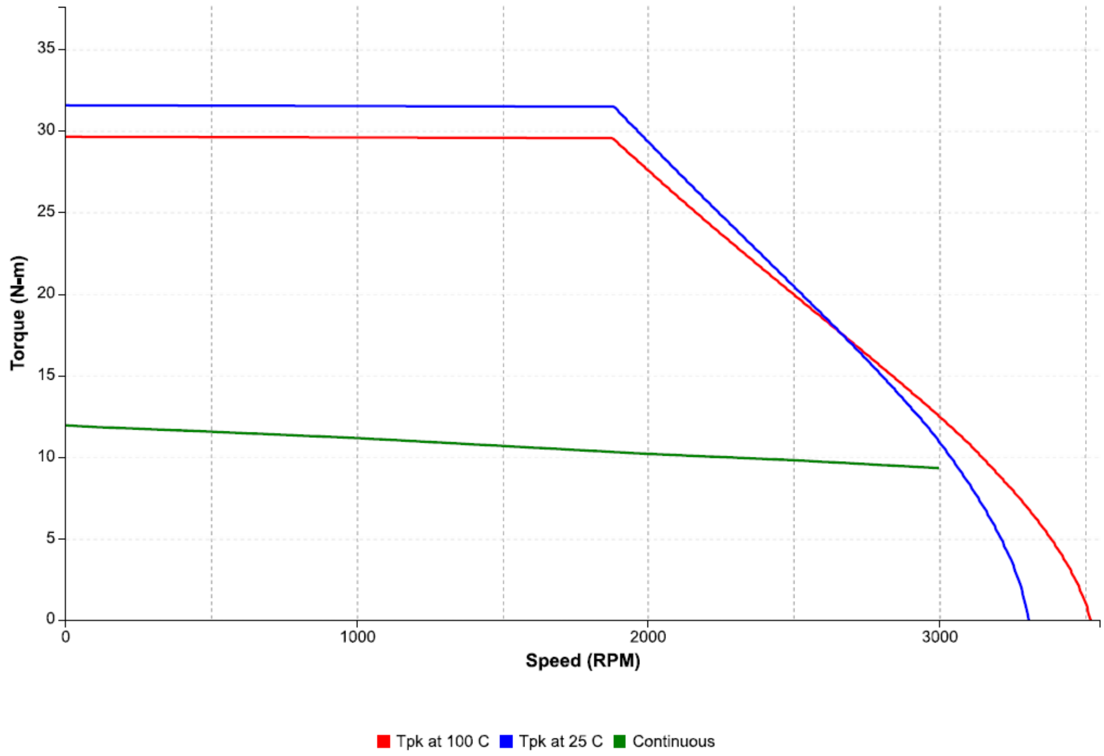
Drive Parameters

Peak Current: 16.2 Arms

Bus Voltage: 565 Vdc

9.39 IC830M62H with IC830DP00607 at 480 VAC

Figure 56: Speed-torque performance of an IC830M62H motor with an IC830DP00607 drive at 480 VAC



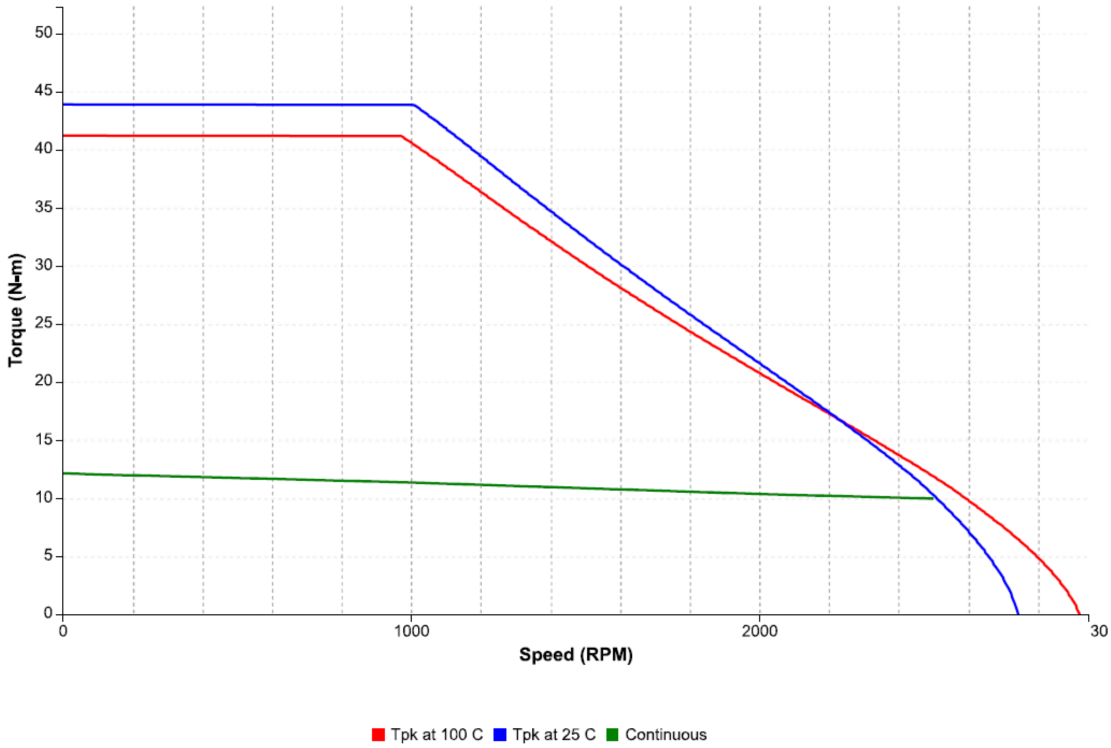
Drive Parameters

Peak Current: 16.2 Arms

Bus Voltage: 678 Vdc

9.40 IC830M62H with IC830DP02406 at 240 VAC

Figure 57: Speed-torque performance of an IC830M62H motor with an IC830DP02406 drive at 240 VAC



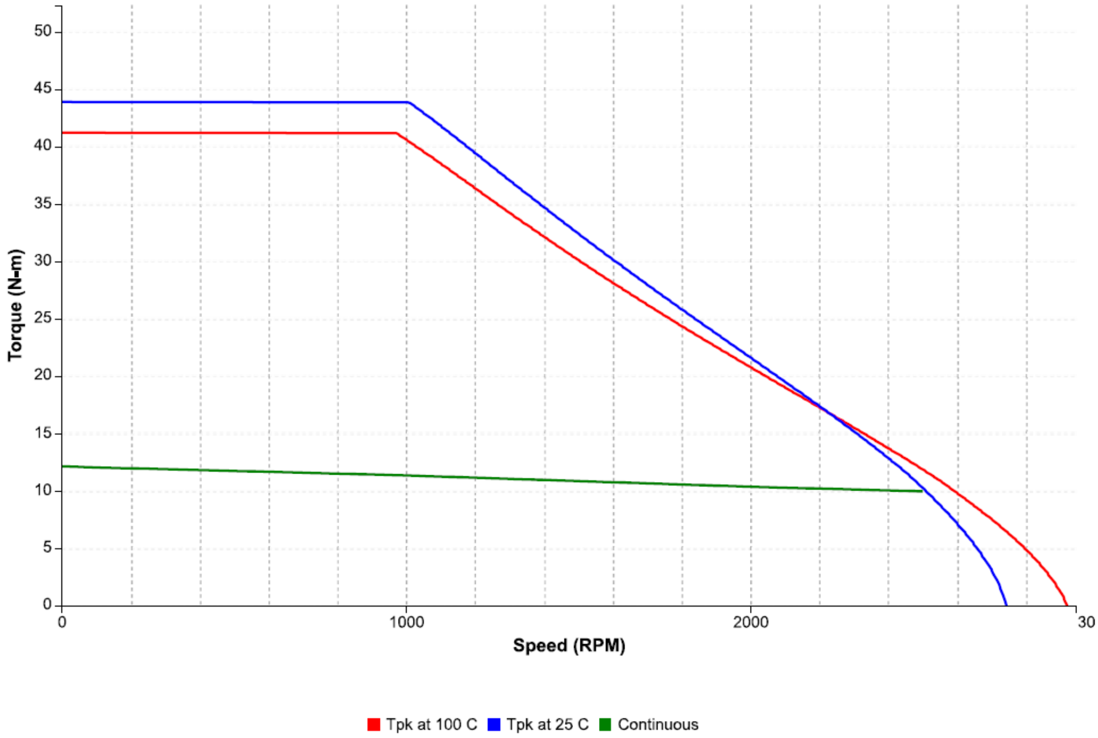
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 325 Vdc

9.41 IC830M62K with IC830DP02406 at 240 VAC

Figure 58: Speed-torque performance of an IC830M62K motor with an IC830DP02406 drive at 240 VAC



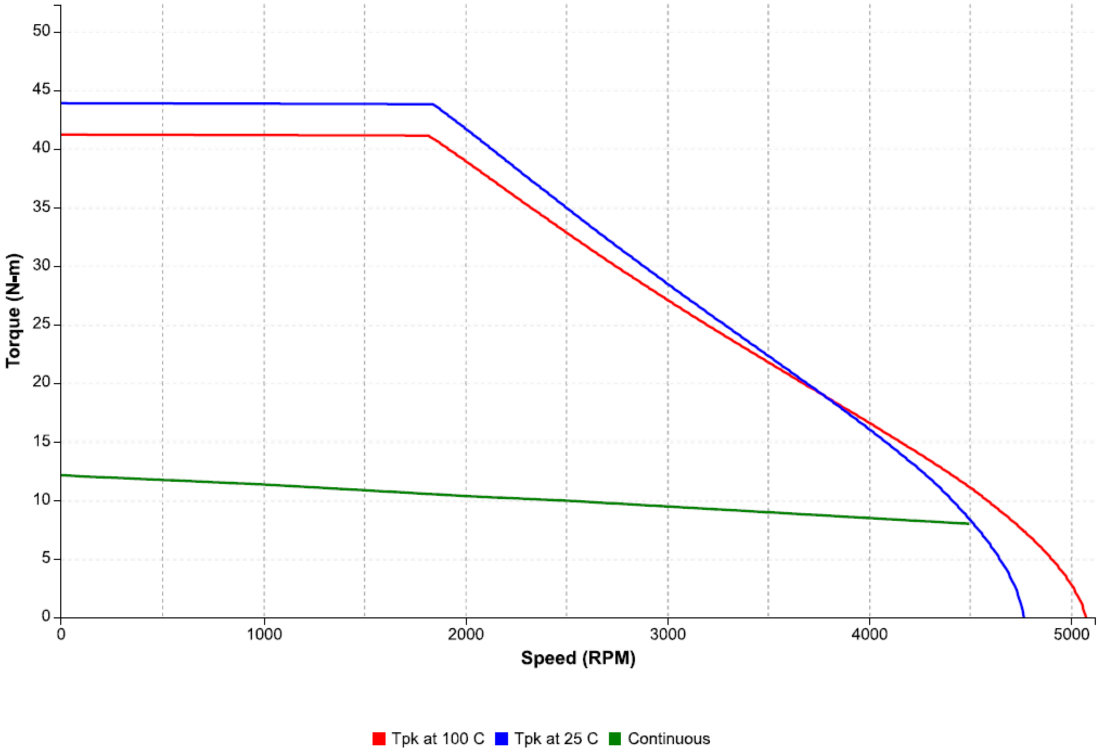
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 325 Vdc

9.42 IC830M62K with IC830DP02407 at 400 VAC

Figure 59: Speed-torque performance of an IC830M62K motor with an IC830DP02407 drive at 400 VAC



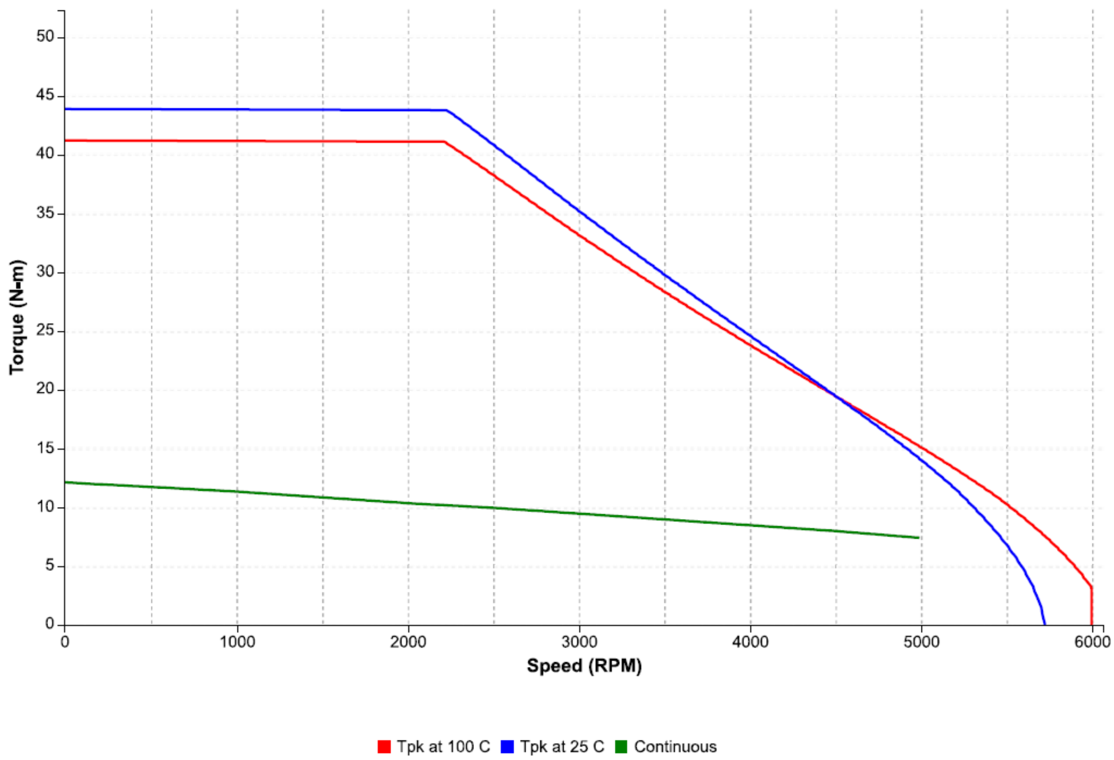
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 565 Vdc

9.43 IC830M62K with IC830DP02407 at 480 VAC

Figure 60: Speed-torque performance of an IC830M62K motor with an IC830DP02407 drive at 480 VAC



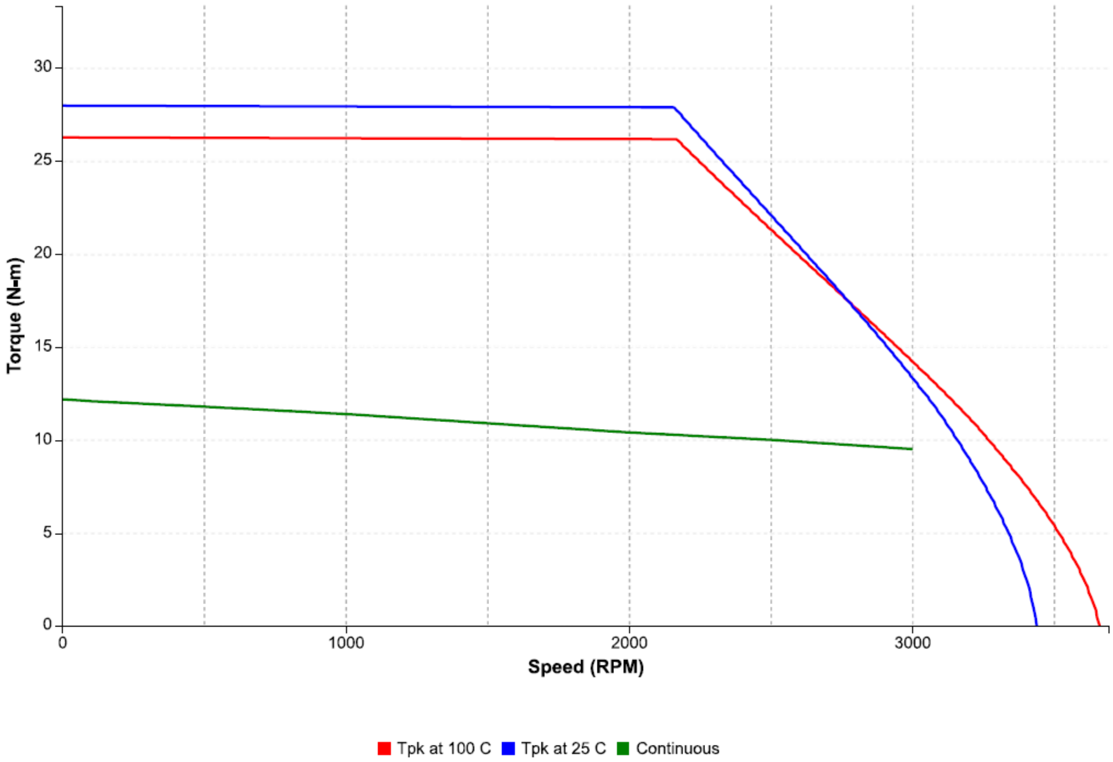
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 678 Vdc

9.44 IC830M62L with IC830DP02406 at 240 VAC

Figure 61: Speed-torque performance of an IC830M62L motor with an IC830DP02406 drive at 240 VAC



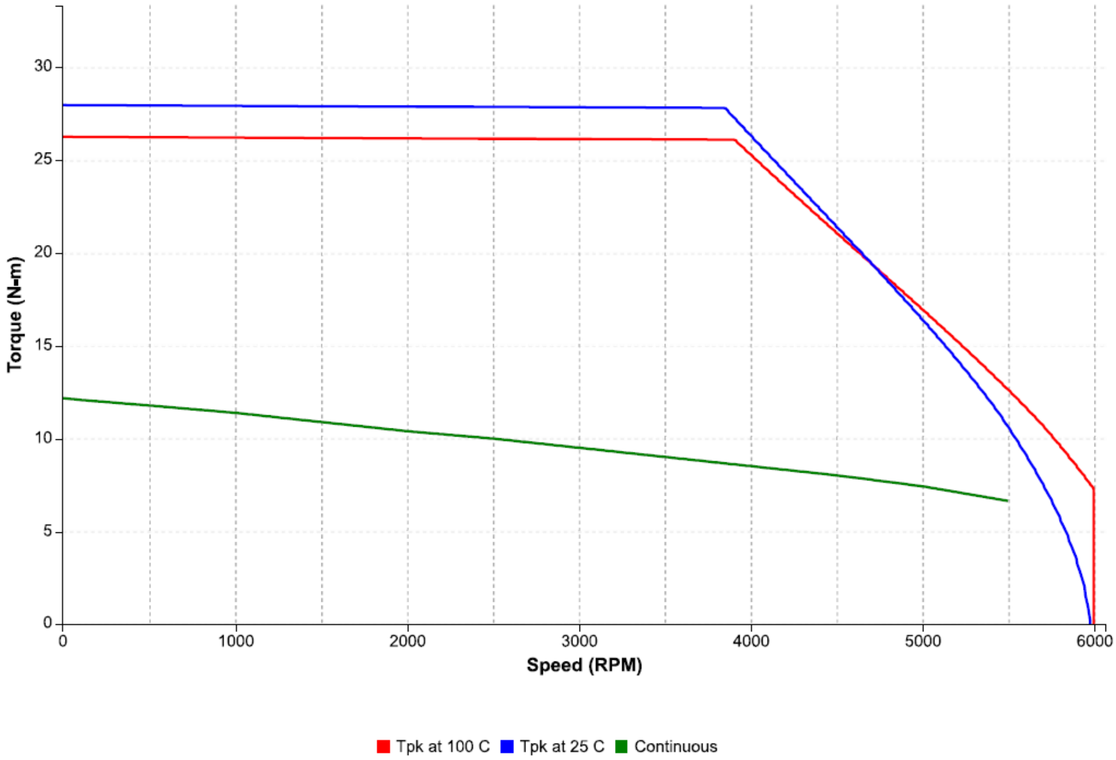
Drive Parameters

Peak Current: 30 Arms

Bus Voltage: 325 Vdc

9.45 IC830M62L with IC830DP02407 at 400 VAC

Figure 62: Speed-torque performance of an IC830M62L motor with an IC830DP02407 drive at 400 VAC



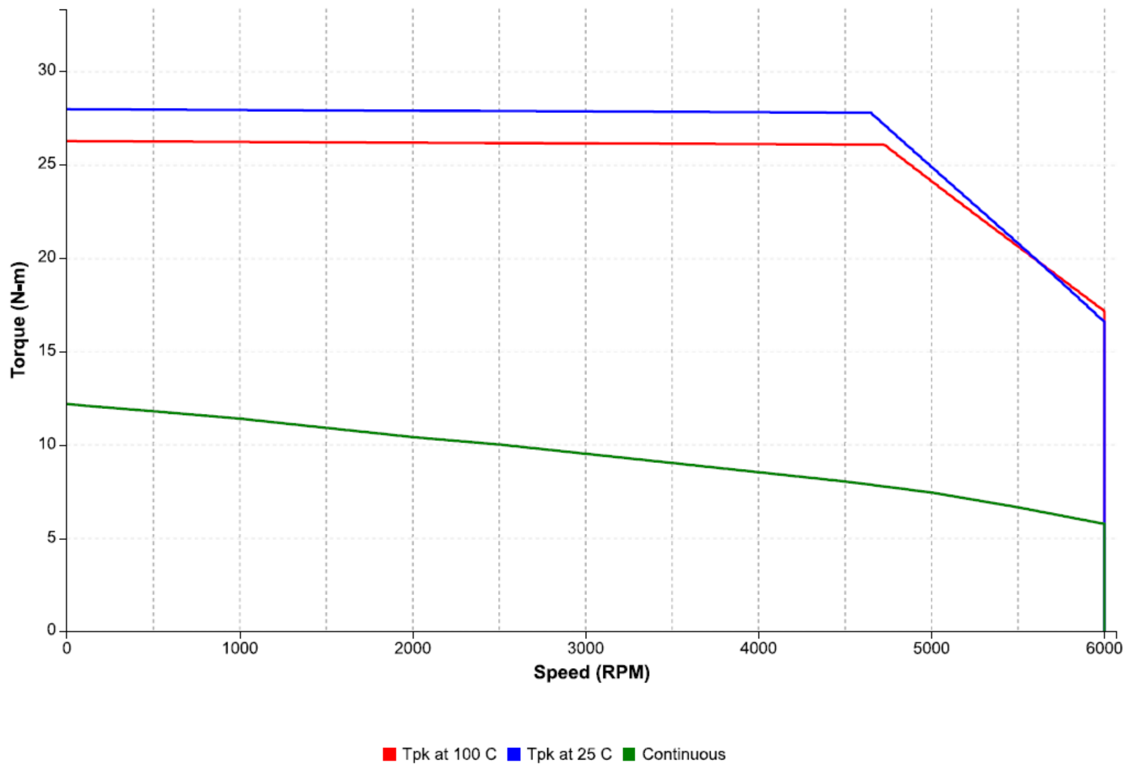
Drive Parameters

Peak Current: 30 Arms

Bus Voltage: 565 Vdc

9.46 IC830M62L with IC830DP01207 at 480 VAC

Figure 63: Speed-torque performance of an IC830M62L motor with an IC830DP01207 drive at 480 VAC



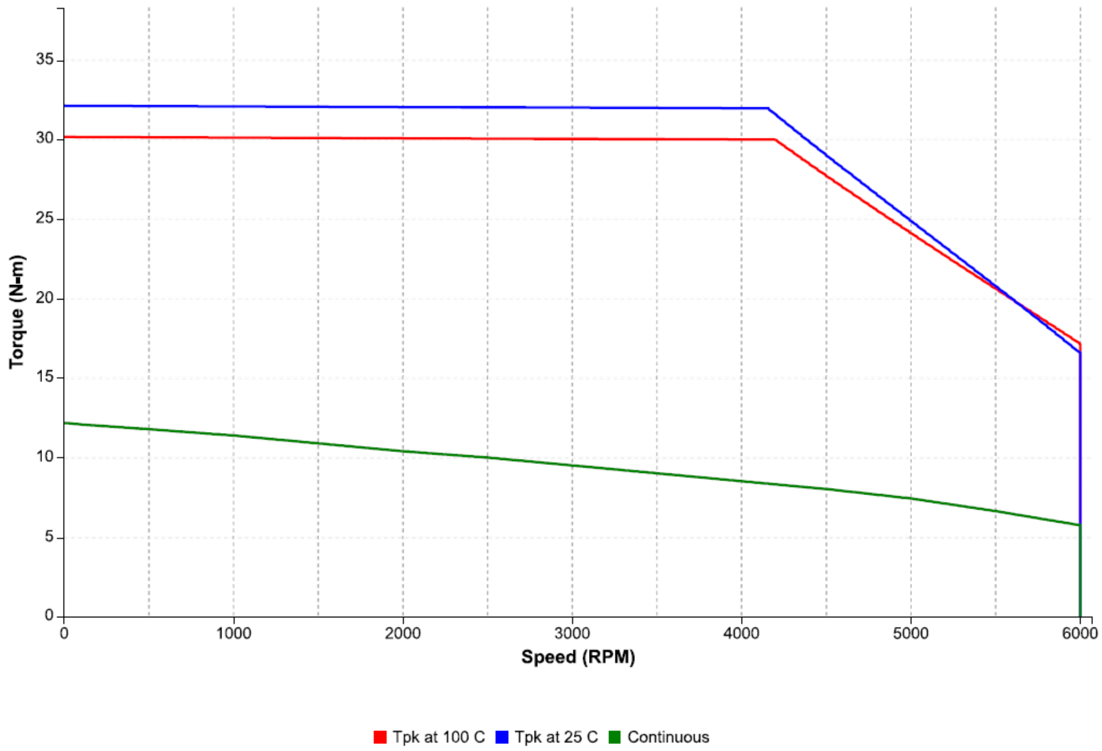
Drive Parameters

Peak Current: 30 Arms

Bus Voltage: 678 Vdc

9.47 IC830M62L with IC830DP02407 at 480 VAC

Figure 64: Speed-torque performance of an IC830M62L motor with an IC830DP02407 drive at 480 VAC



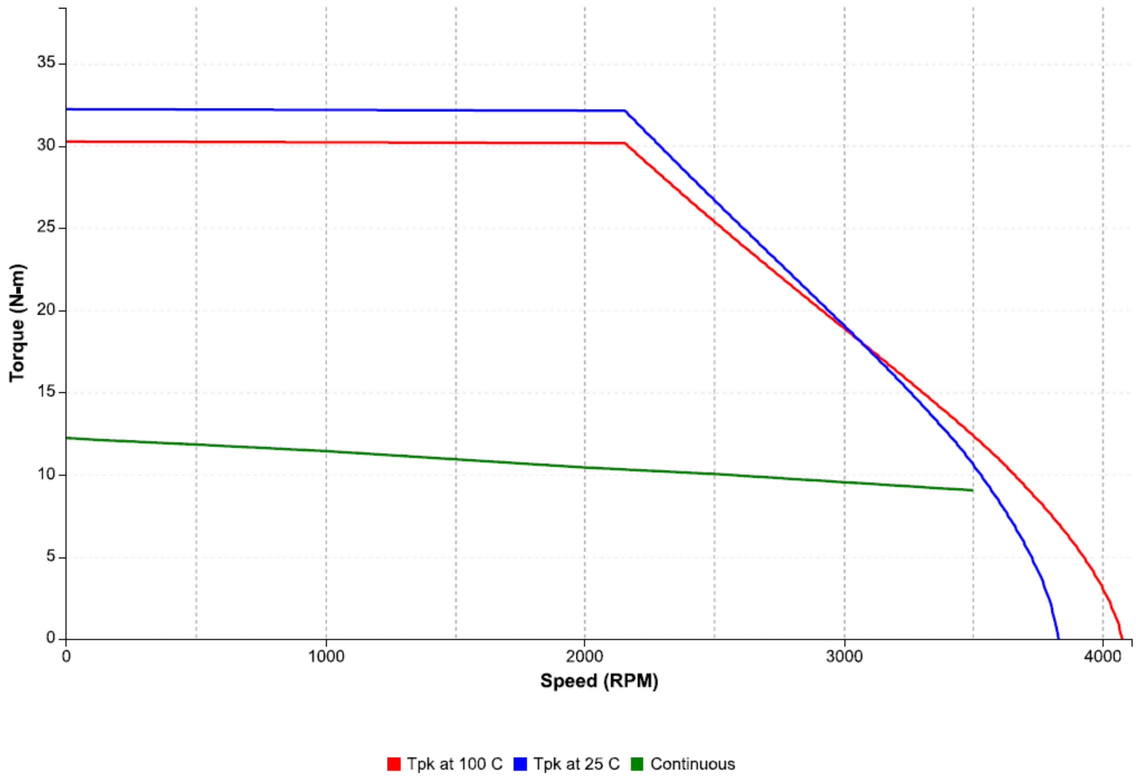
Drive Parameters

Peak Current: 36 Arms

Bus Voltage: 678 Vdc

9.48 IC830M62M with IC830DP02406 at 240 VAC

Figure 65: Speed-torque performance of an IC830M62M motor with an IC830DP02406 drive at 240 VAC



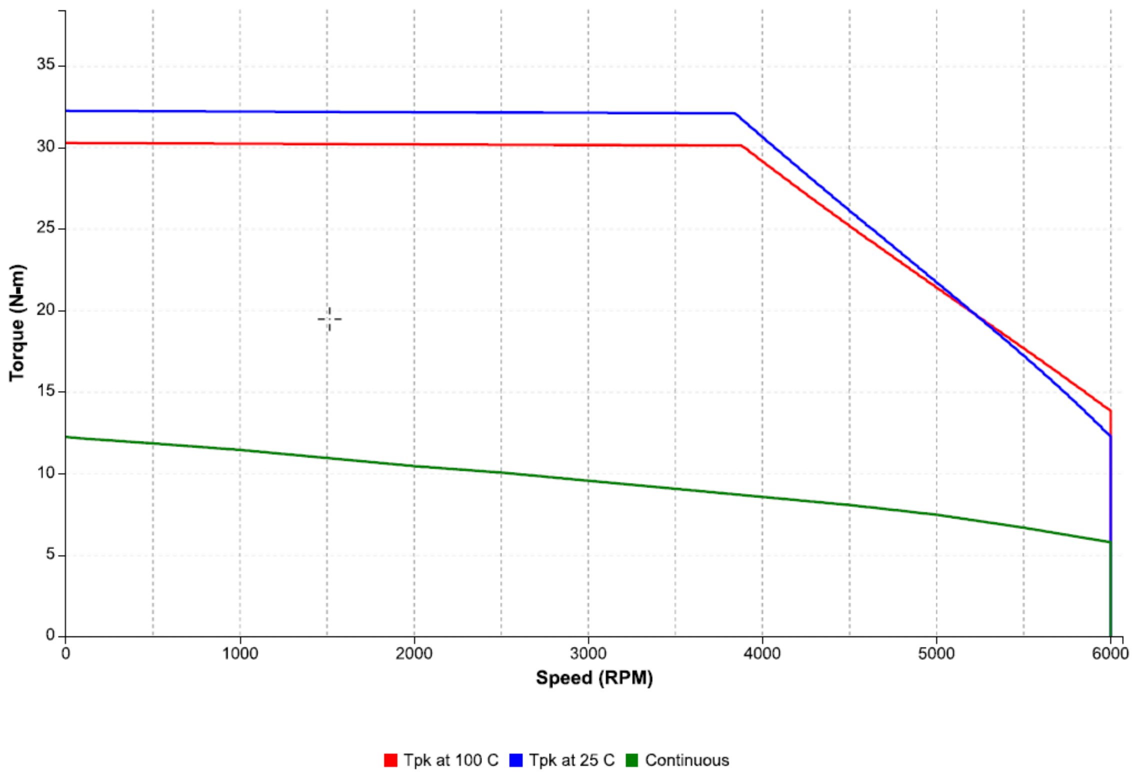
Drive Parameters

Peak Current: 40.3 Arms

Bus Voltage: 325 Vdc

9.49 IC830M62M with IC830DP02407 at 480 VAC

Figure 66: Speed-torque performance of an IC830M62M motor at 400 VAC with an IC830DP02407 drive at 480 VAC



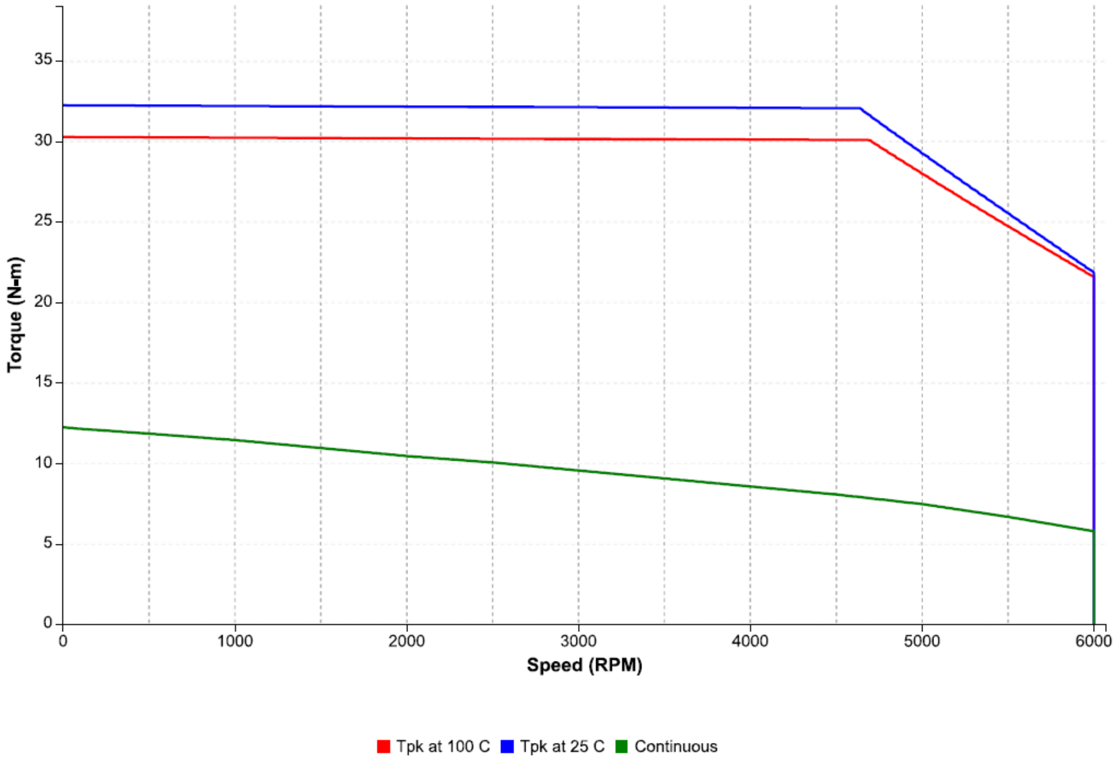
Drive Parameters

Peak Current: 40.3 Arms

Bus Voltage: 565 Vdc

9.50 IC830M62M with IC830DP02407 at 480 VAC

Figure 67: Speed-torque performance of an IC830M62M motor with an IC830DP02407 drive at 480 VAC



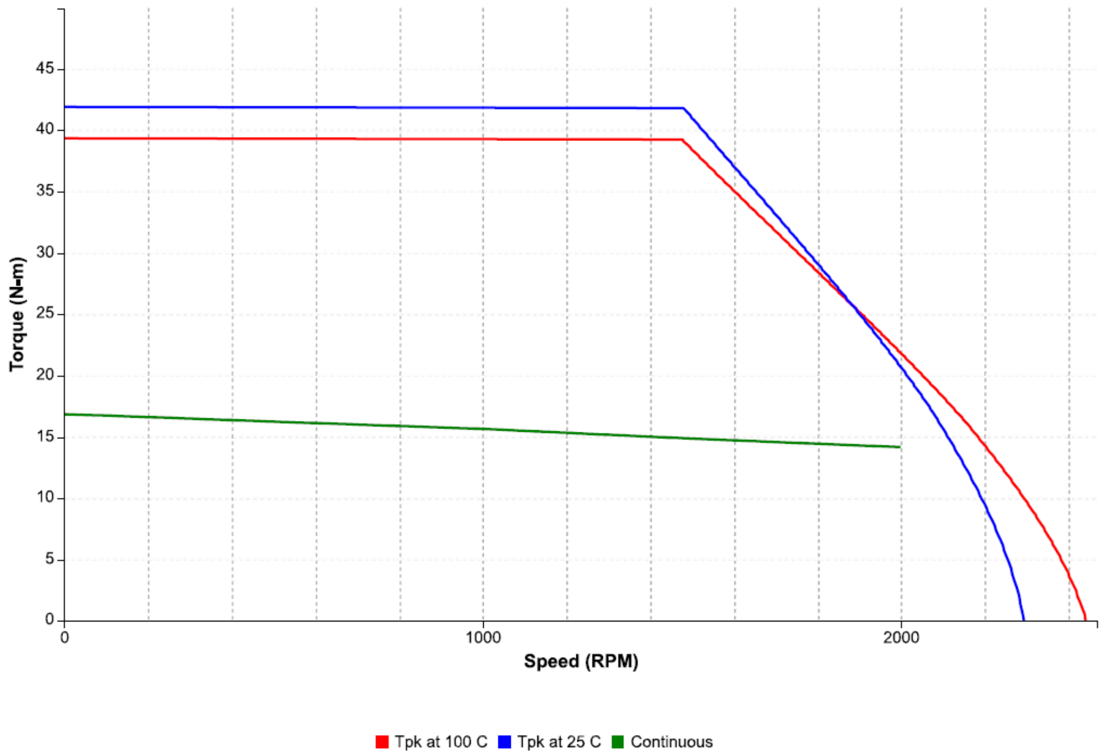
Drive Parameters

Peak Current: 40.3 Arms

Bus Voltage: 678 Vdc

9.51 IC830M63L with IC830DP01206 at 240 VAC

Figure 68: Speed-torque performance of an IC830M63L motor with an IC830DP01206 drive at 240 VAC



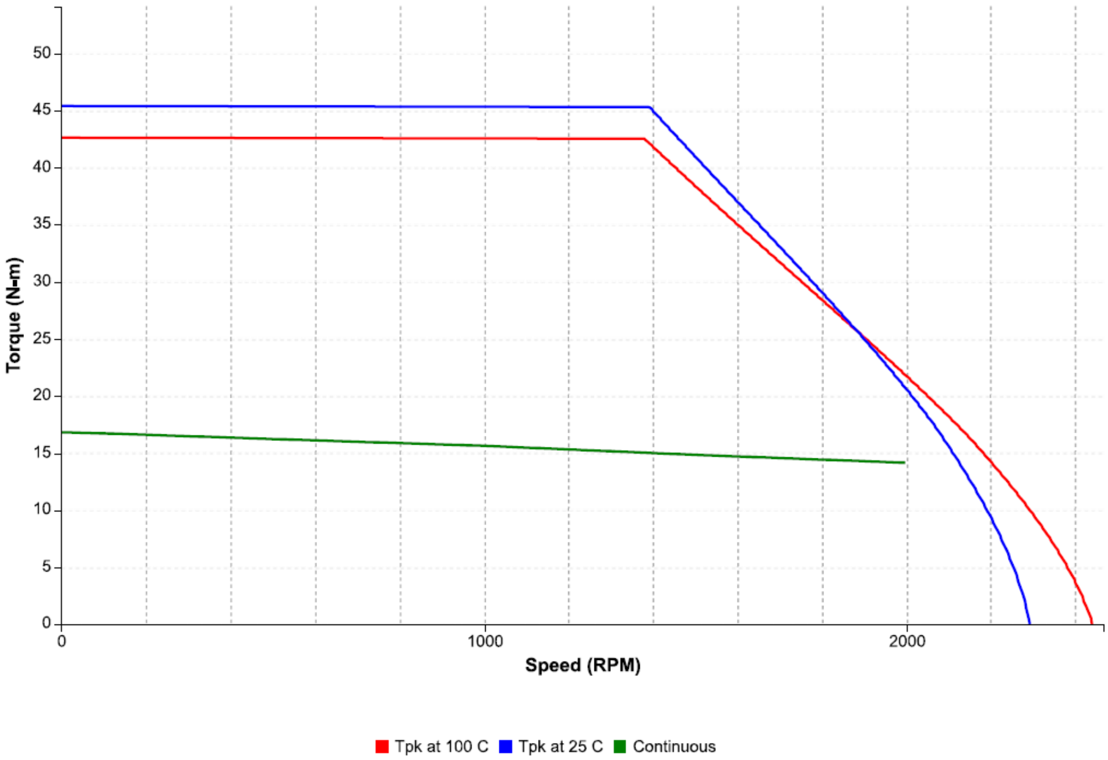
Drive Parameters

Peak Current: 30 Arms

Bus Voltage: 325 Vdc

9.52 IC830M63L with IC830DP02406 at 240 VAC

Figure 69: Speed-torque performance of an IC830M63L motor with an IC830DP02406 drive at 240 VAC



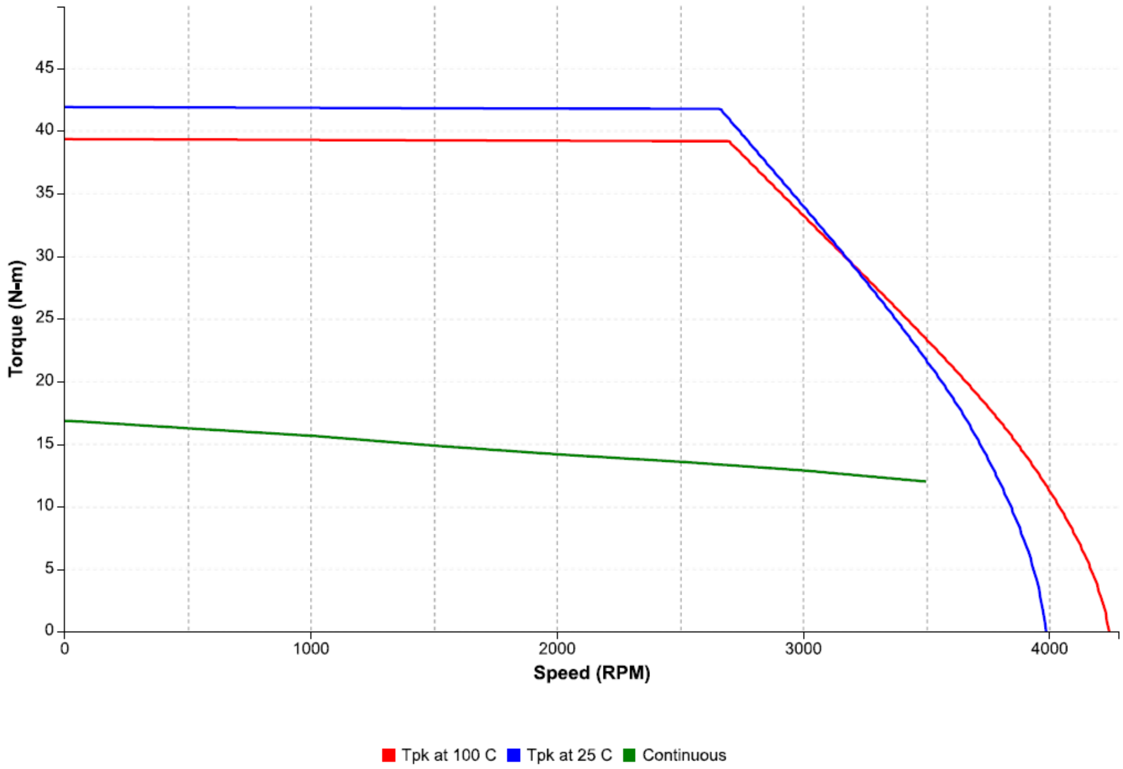
Drive Parameters

Peak Current: 33.3 Arms

Bus Voltage: 325 Vdc

9.53 IC830M63L with IC830DP01207 at 400 VAC

Figure 70: Speed-torque performance of an IC830M63L motor with an IC830DP01207 drive at 400 VAC



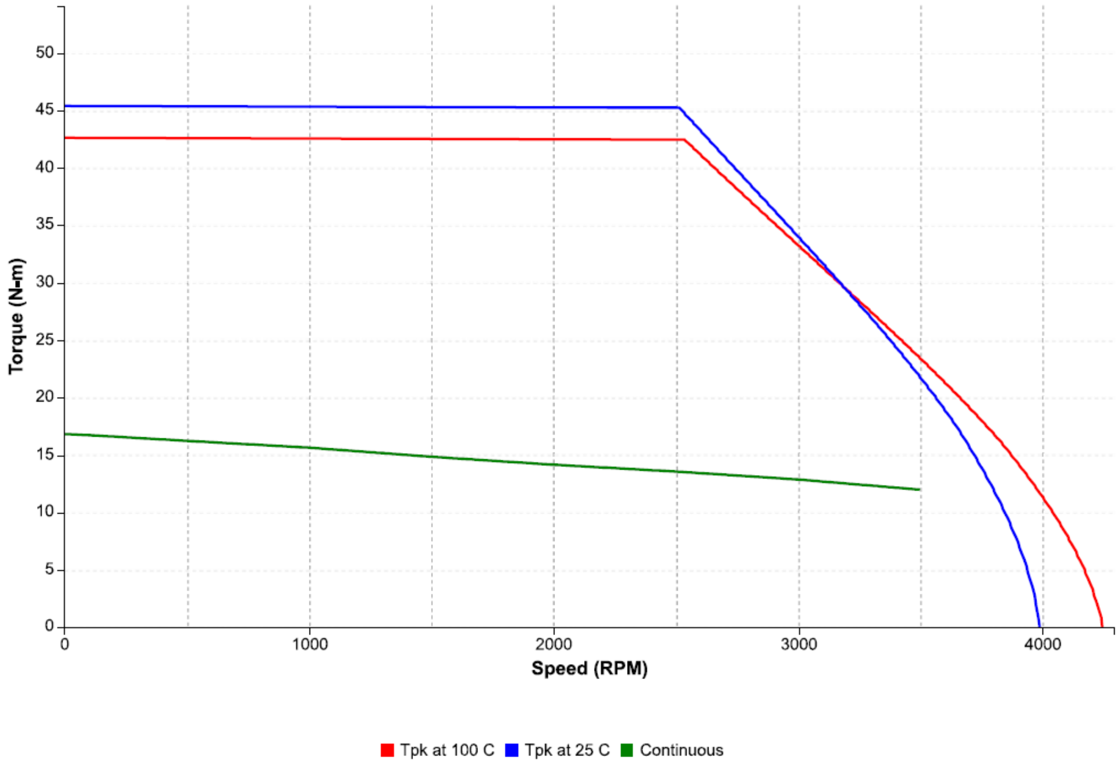
Drive Parameters

Peak Current: 30 Arms

Bus Voltage: 565 Vdc

9.54 IC830M63L with IC830DP02407 at 400 VAC

Figure 71: Speed-torque performance of an IC830M63L motor with an IC830DP02407 drive at 400 VAC



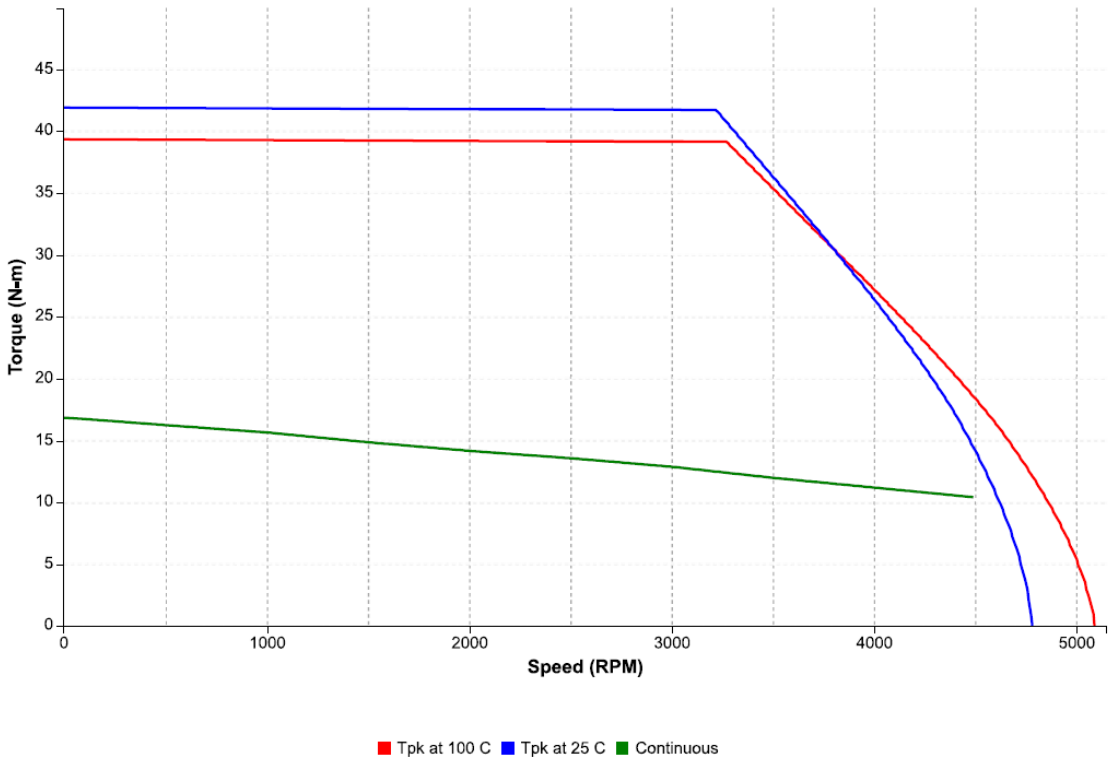
Drive Parameters

Peak Current: 30 Arms

Bus Voltage: 565 Vdc

9.55 IC830M63L with IC830DP01207 at 480 VAC

Figure 72: Speed-torque performance of an IC830M63L motor with an IC830DP01207 drive at 480 VAC



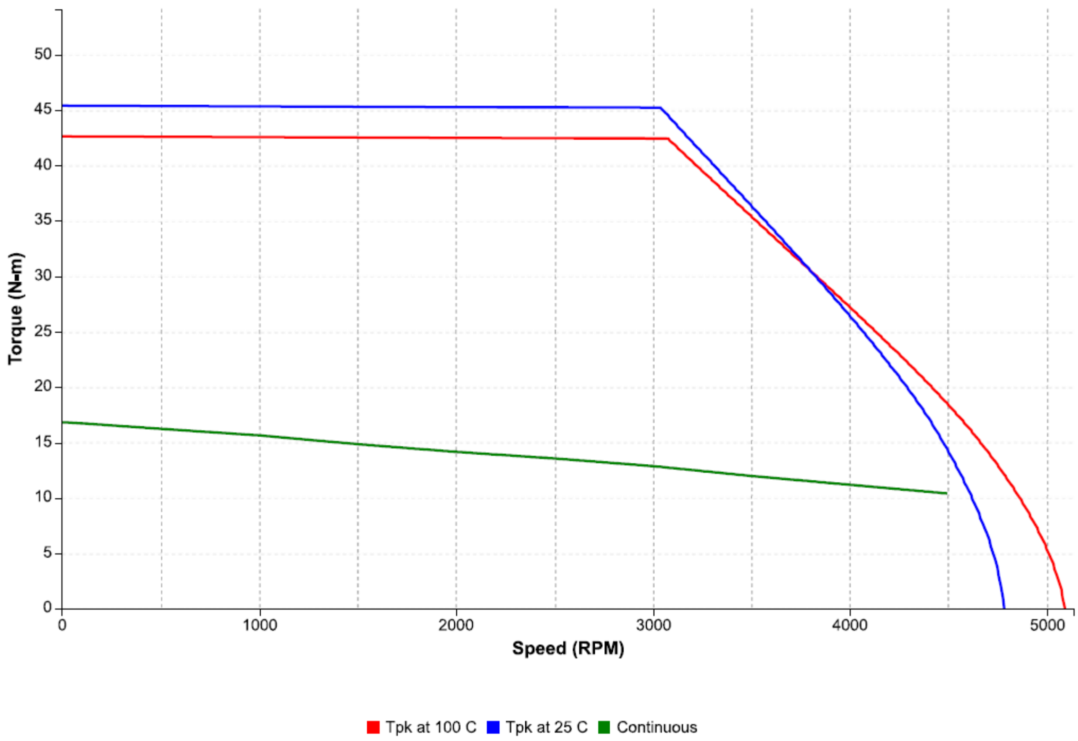
Drive Parameters

Peak Current: 30 Arms

Bus Voltage: 678 Vdc

9.56 IC830M63L with IC830DP02407 at 480 VAC

Figure 73: Speed-torque performance of an IC830M63L motor with an IC830DP02407 drive at 480 VAC



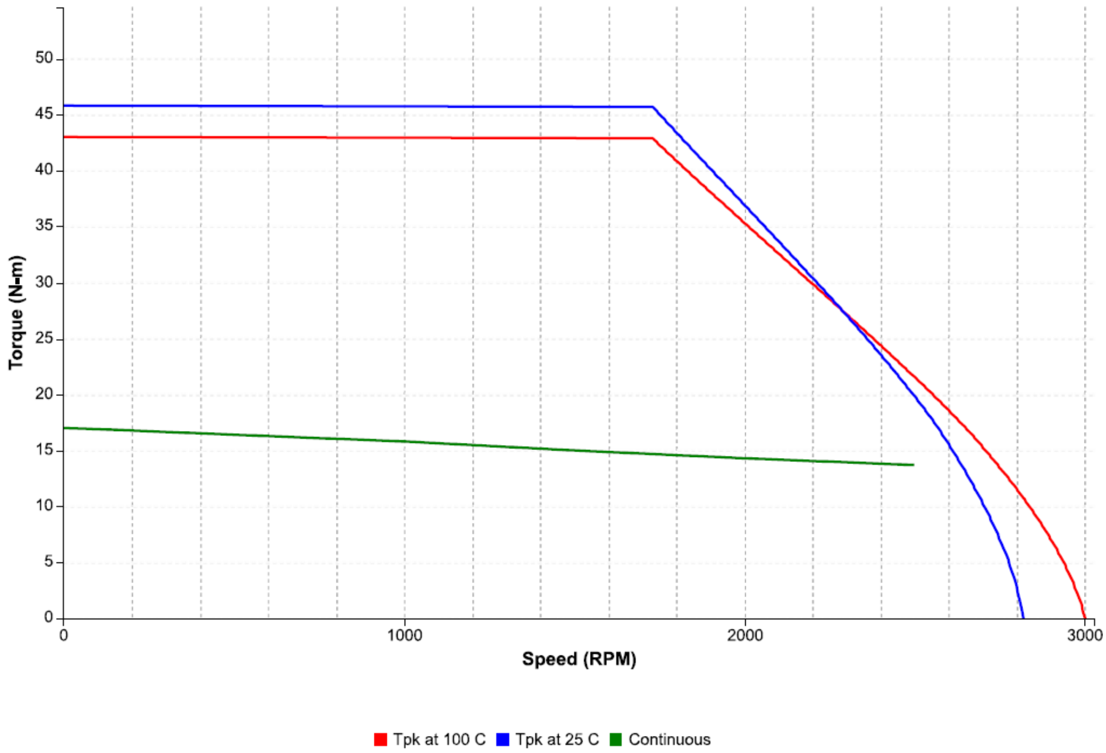
Drive Parameters

Peak Current: 33.3 Arms

Bus Voltage: 678 Vdc

9.57 IC830M63M with IC830DP02406 at 240 VAC

Figure 74: Speed-torque performance of an IC830M63M motor with an IC830DP02406 drive at 240 VAC



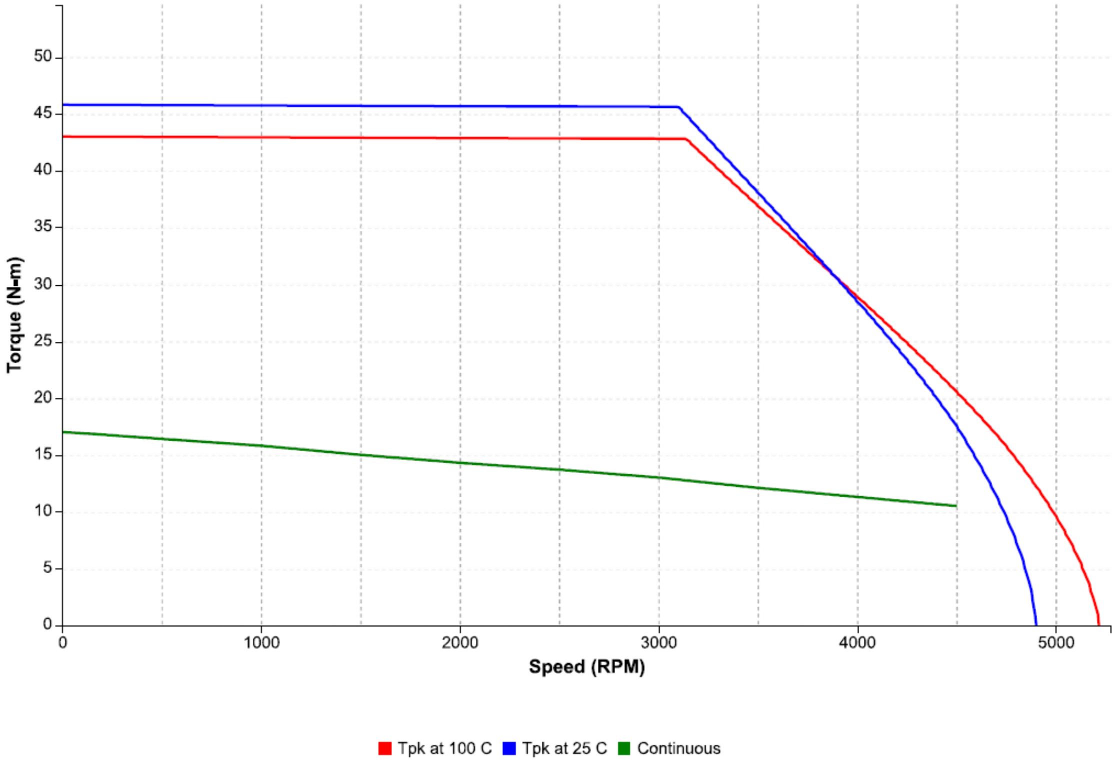
Drive Parameters

Peak Current: 41.4 Arms

Bus Voltage: 325 Vdc

9.58 IC830M63M with IC830DP02407 at 400 VAC

Figure 75: Speed-torque performance of an IC830M63M motor with an IC830DP02407 drive at 400 VAC



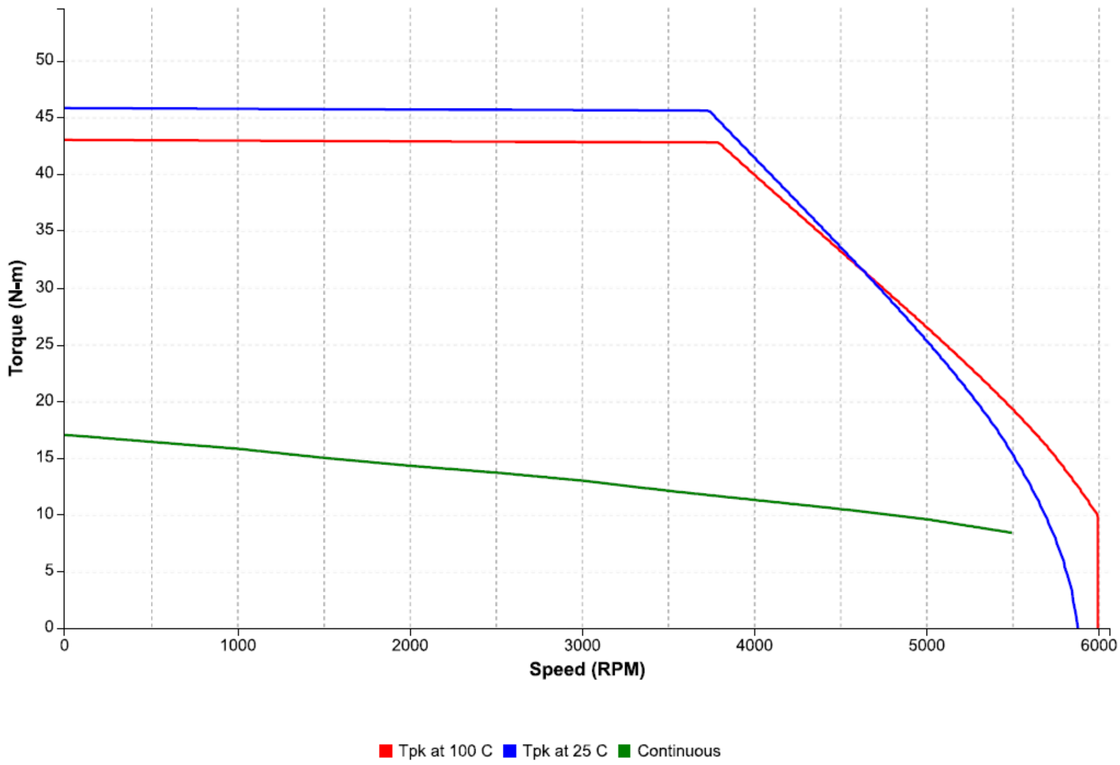
Drive Parameters

Peak Current: 41.4 Arms

Bus Voltage: 565 Vdc

9.59 IC830M63M with IC830DP02407 at 480 VAC

Figure 76: Speed-torque performance of an IC830M63M motor with an IC830DP02407 drive at 480 VAC



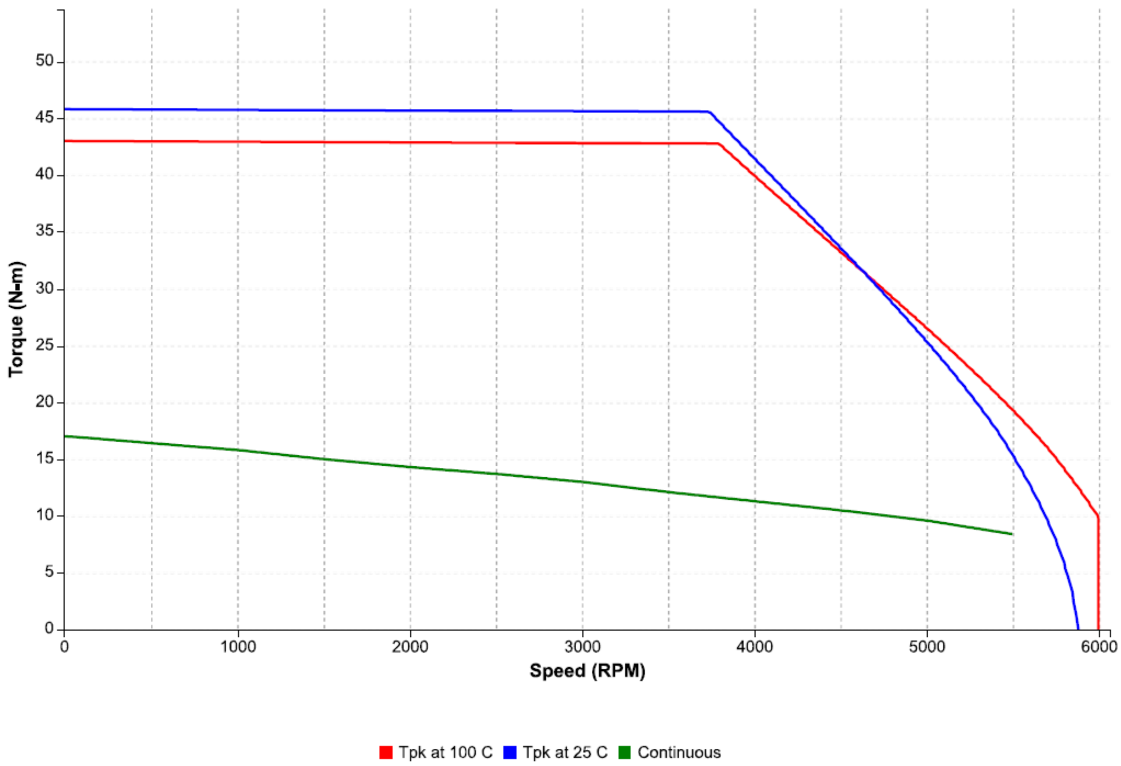
Drive Parameters

Peak Current: 41.4 Arms

Bus Voltage: 678 Vdc

9.60 IC830M72L with IC830DP01207 at 400 VAC

Figure 77: Speed-torque performance of an IC830M72L motor with an IC830DP01207 drive at 400 VAC



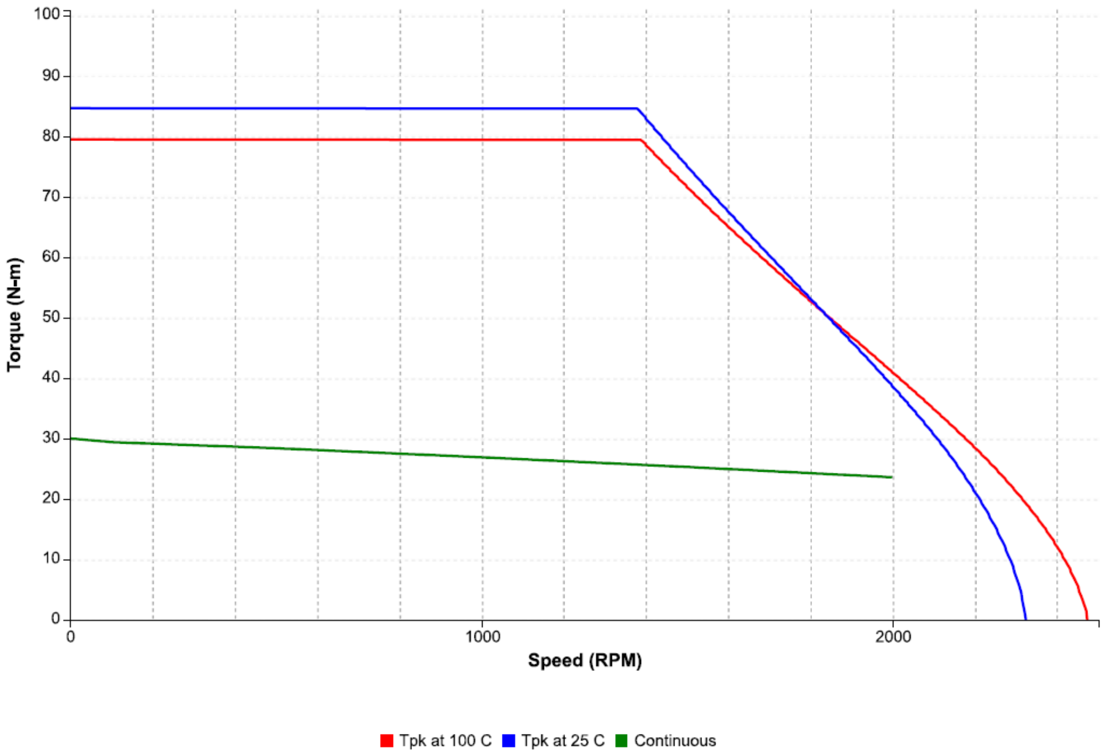
Drive Parameters

Peak Current: 30 Arms

Bus Voltage: 565 Vdc

9.61 IC830M72L with IC830DP02407 at 400 VAC

Figure 78: Speed-torque performance of an IC830M72L motor with an IC830DP02407 drive at 400 VAC



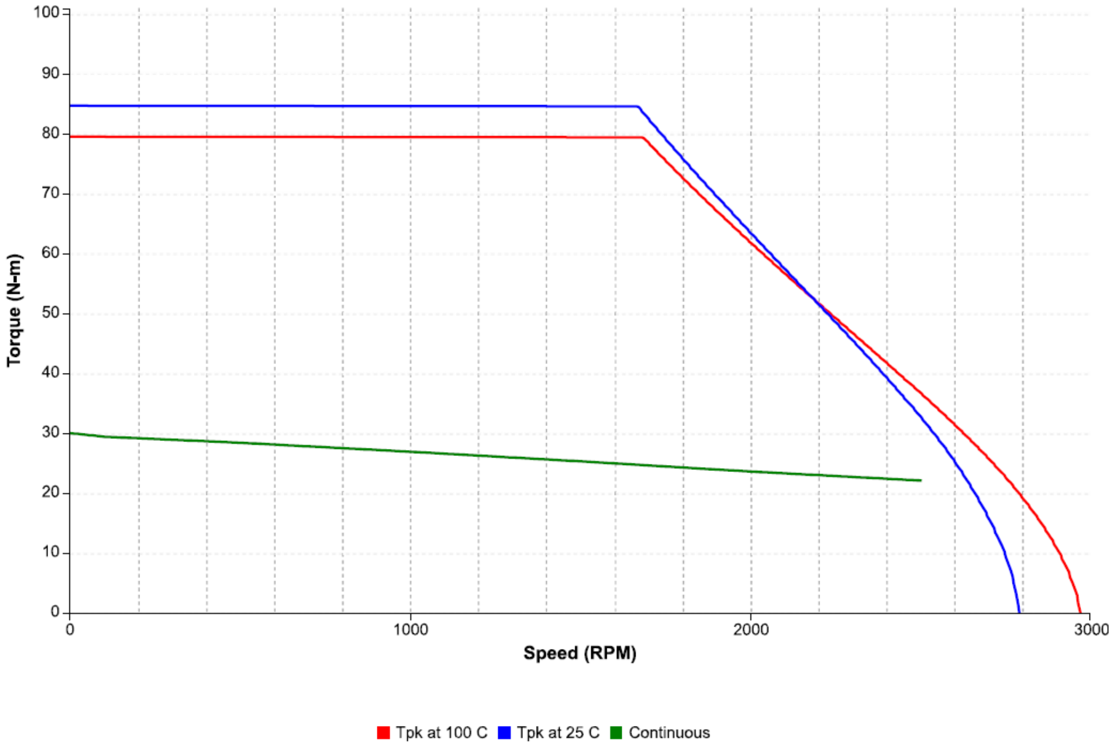
Drive Parameters

Peak Current: 34.5 Arms

Bus Voltage: 565 Vdc

9.62 IC830M72L with IC830DP02407 at 480 VAC

Figure 79: Speed-torque performance of an IC830M72L motor with an IC830DP02407 drive at 480 VAC



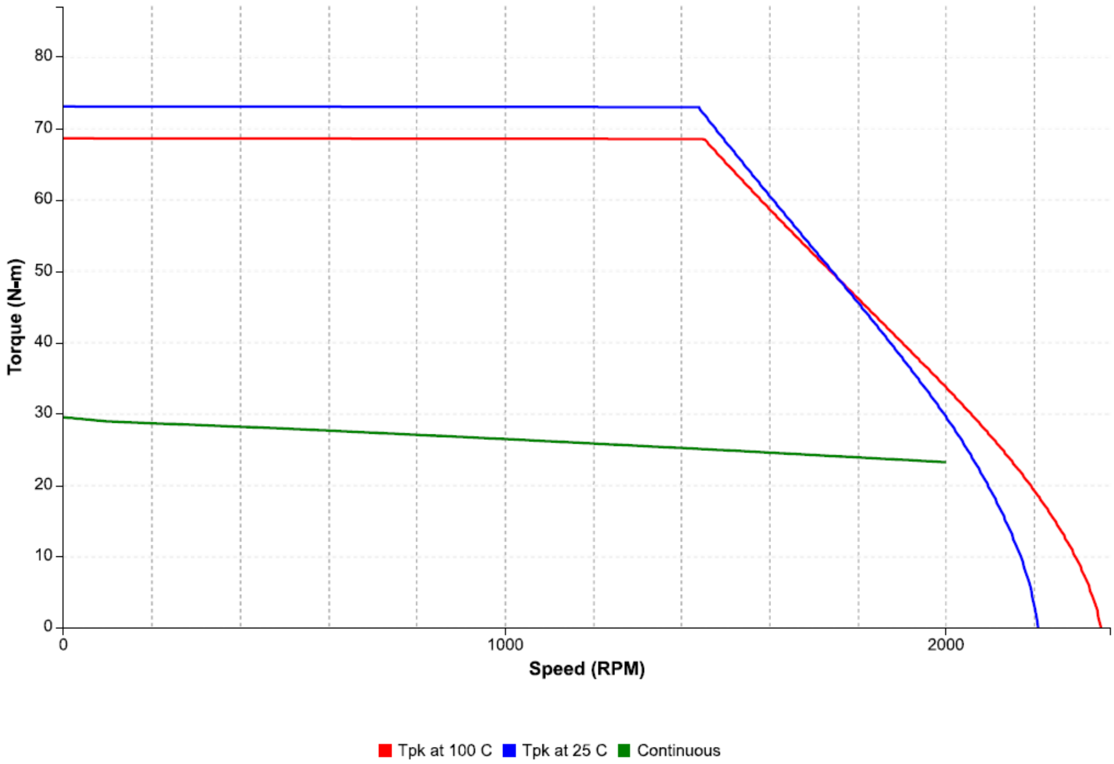
Drive Parameters

Peak Current: 34.5 Arms

Bus Voltage: 678 Vdc

9.63 IC830M72P with IC830DP02406 at 240 VAC

Figure 80: Speed-torque performance of an IC830M72P motor with an IC830DP02406 drive at 240 VAC



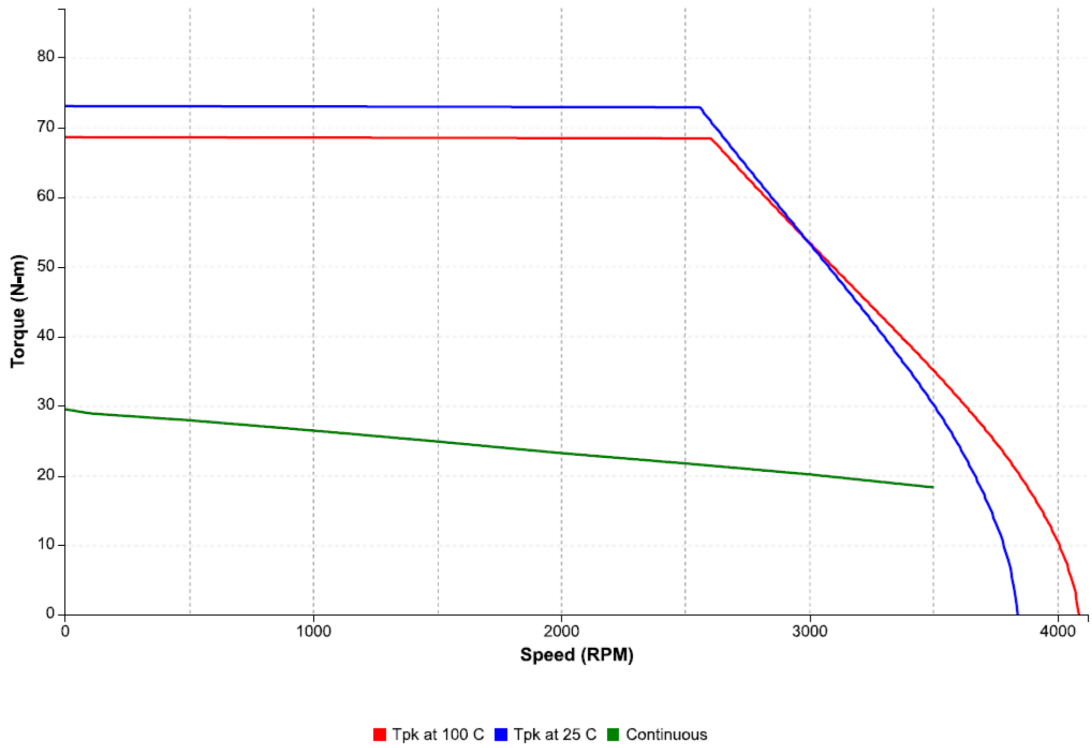
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 325 Vdc

9.64 IC830M72P with IC830DP02407 at 400 VAC

Figure 81: Speed-torque performance of an IC830M72P motor with an IC830DP02407 drive at 400 VAC



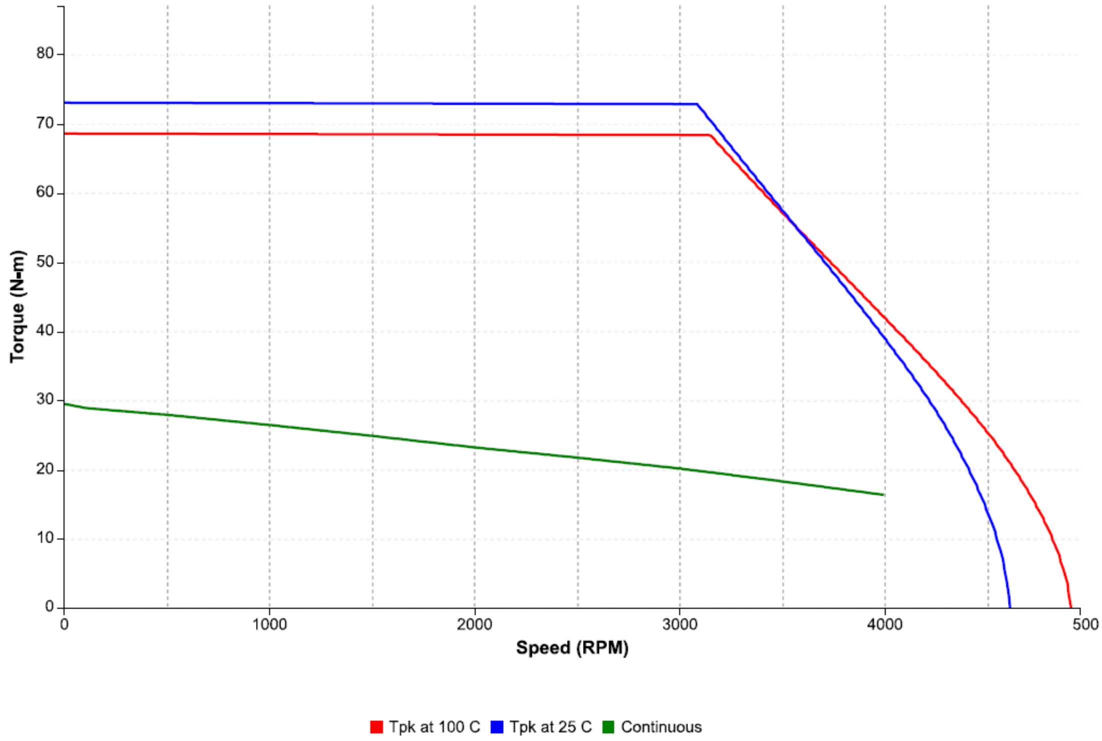
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 565 Vdc

9.65 IC830M72P with IC830DP02407 at 480 VAC

Figure 82: Speed-torque performance of an IC830M72P motor with an IC830DP02407 drive at 480 VAC



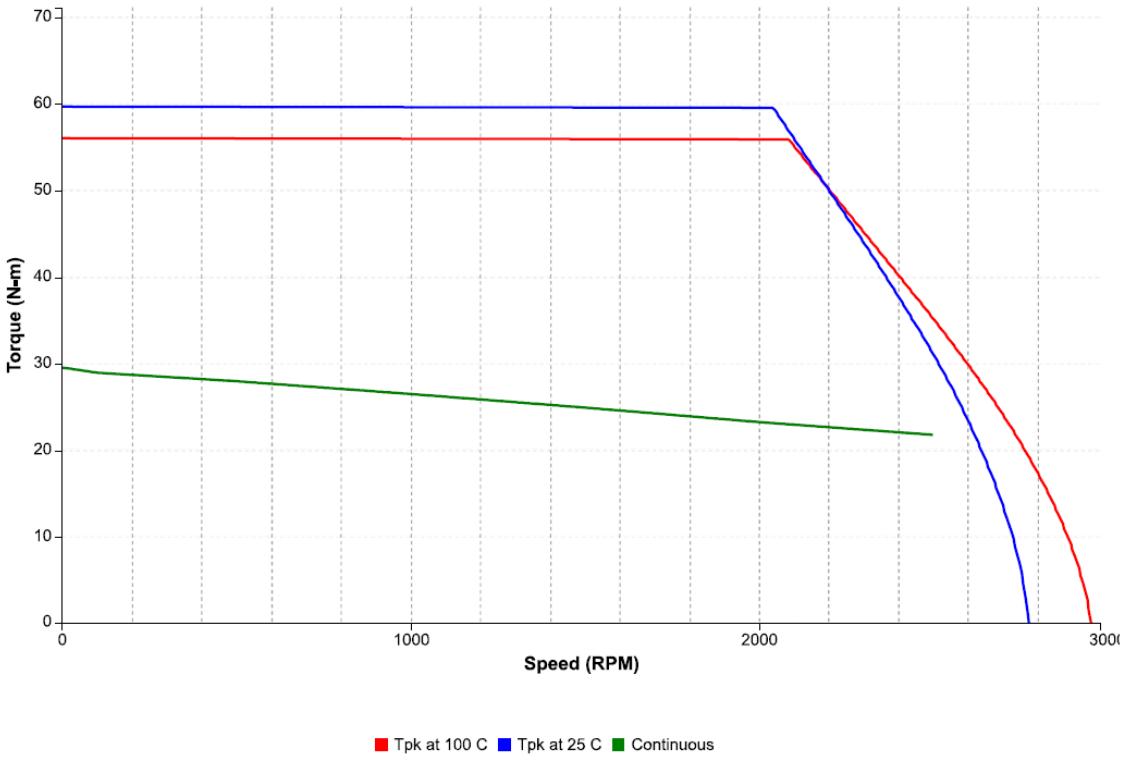
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 678 Vdc

9.66 IC830M72Q with IC830DP02406 at 240 VAC

Figure 83: Speed-torque performance of an IC830M72Q motor with an IC830DP02406 drive at 240 VAC



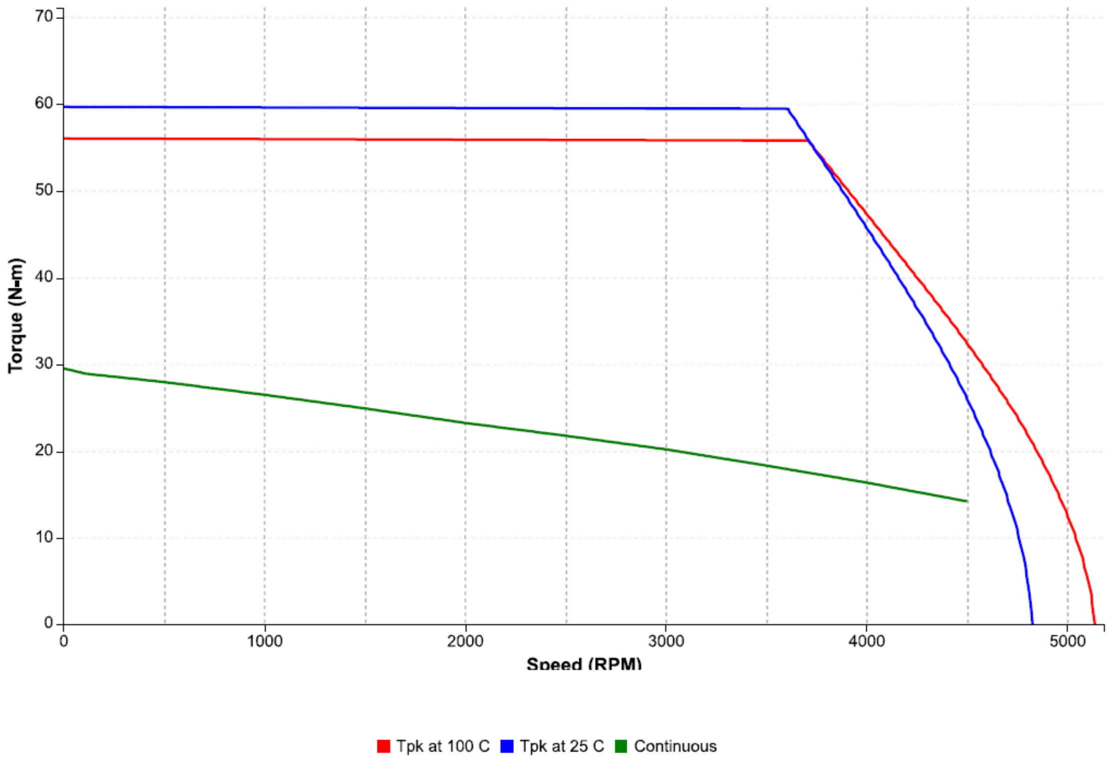
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 325 Vdc

9.67 IC830M72Q with IC830DP02407 at 400 VAC

Figure 84: Speed-torque performance of an IC830M72Q motor with an IC830DP02407 drive at 400 VAC



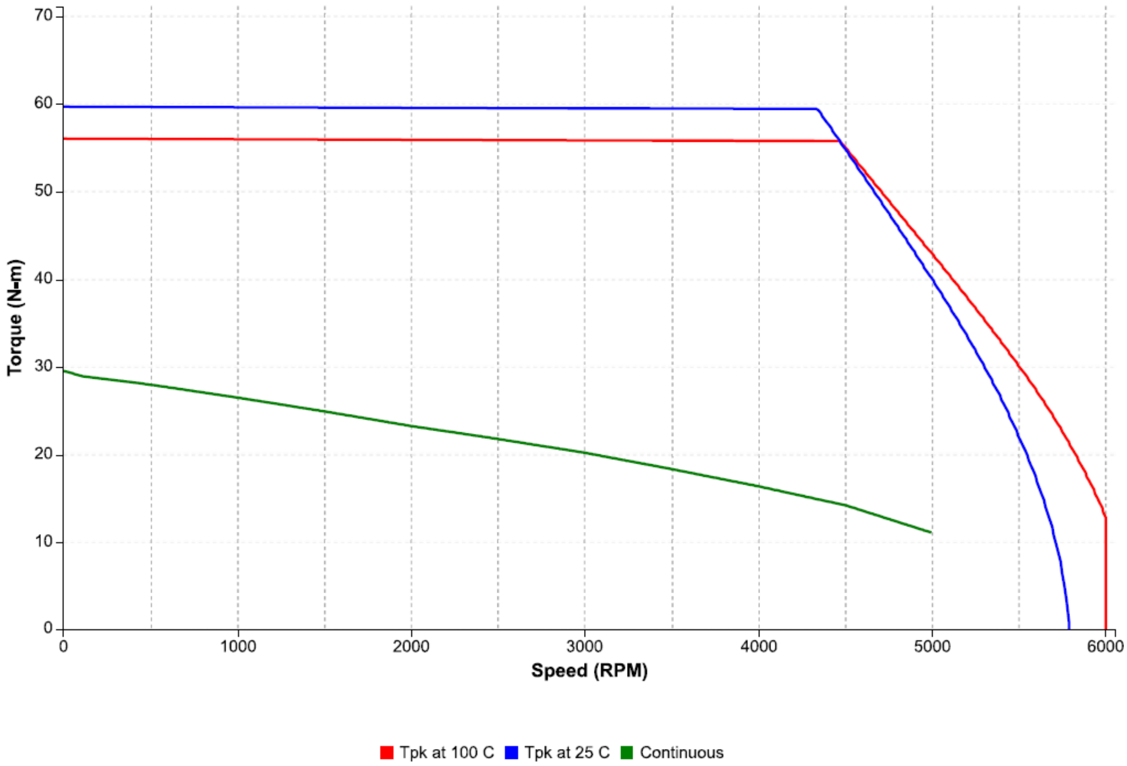
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 565 Vdc

9.68 IC830M72Q with IC830DP02407 at 480 VAC

Figure 85: Speed-torque performance of an IC830M72Q motor with an IC830DP02407 drive at 480 VAC



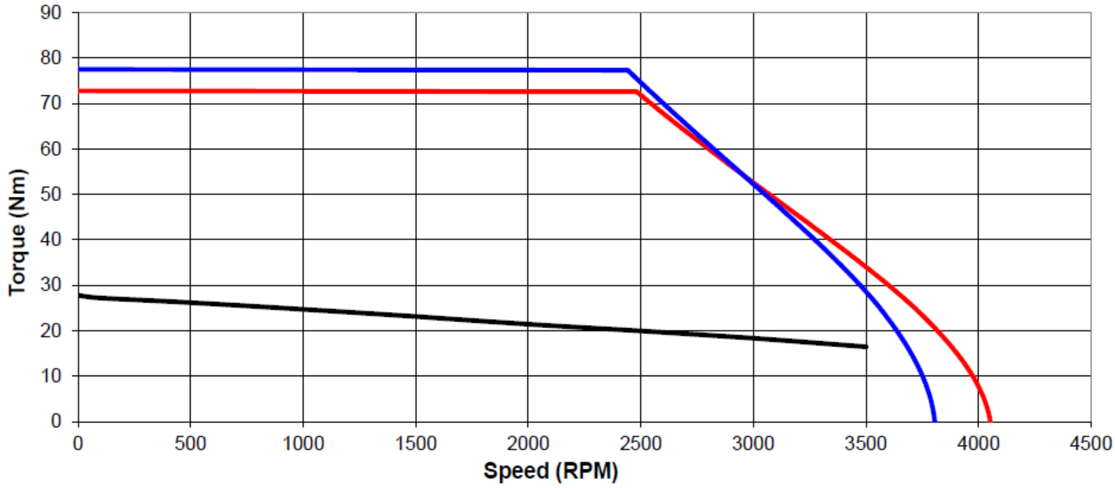
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 678 Vdc

9.69 IC830M72R with IC830DP02406 at 240 VAC

Figure 86: Speed-torque performance of an IC830M72R motor with an IC830DP02406 drive at 240 VAC



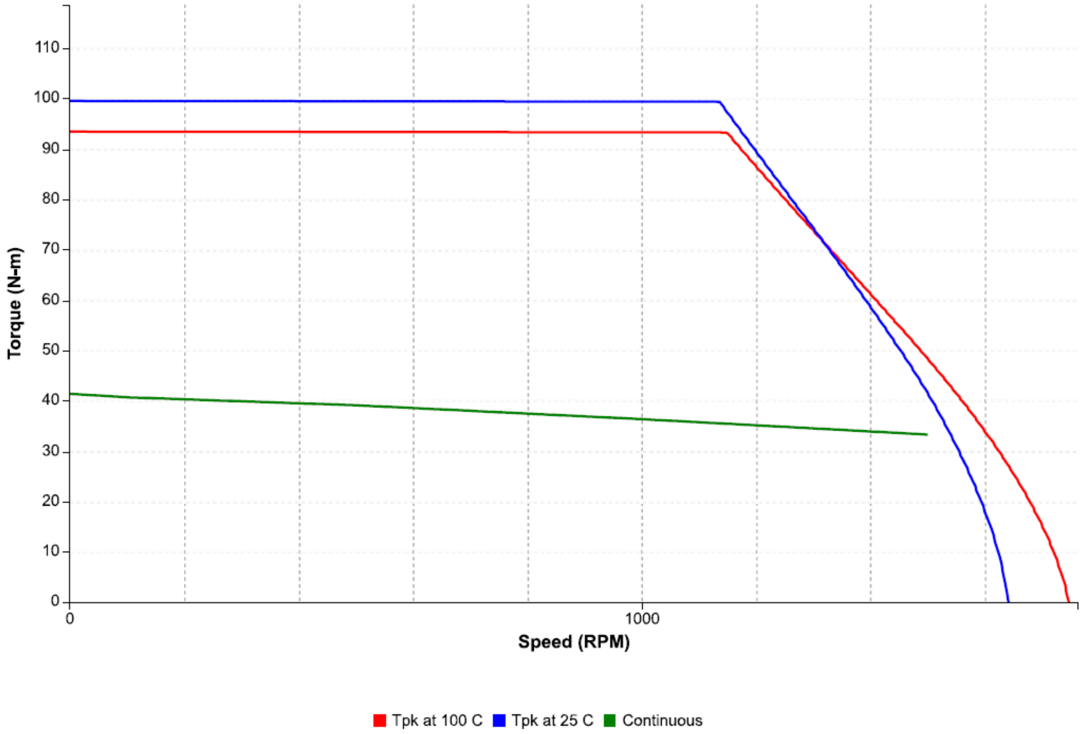
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 325 Vdc

9.70 IC830M73P with IC830DP02406 at 240 VAC

Figure 87: Speed-torque performance of an IC830M73P motor with an IC830DP02406 drive at 240 VAC



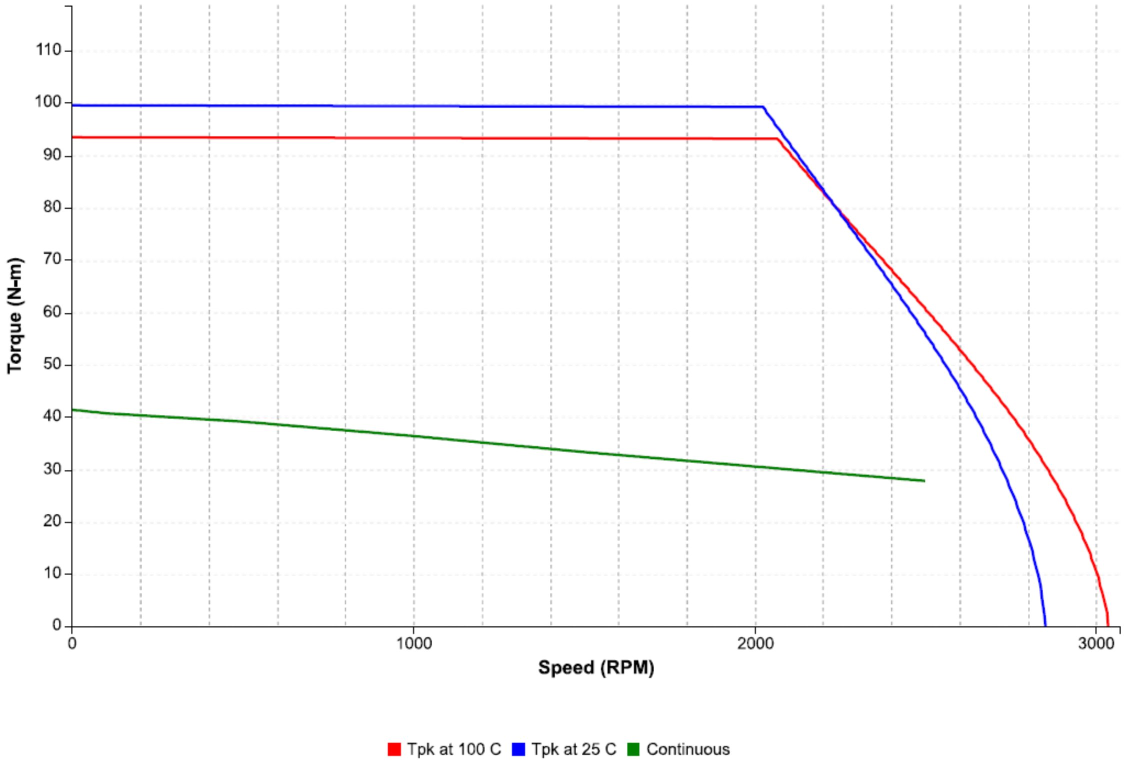
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 325 Vdc

9.71 IC830M73P with IC830DP02407 at 400 VAC

Figure 88: Speed-torque performance of an IC830M73P motor with an IC830DP02407 drive at 400 VAC



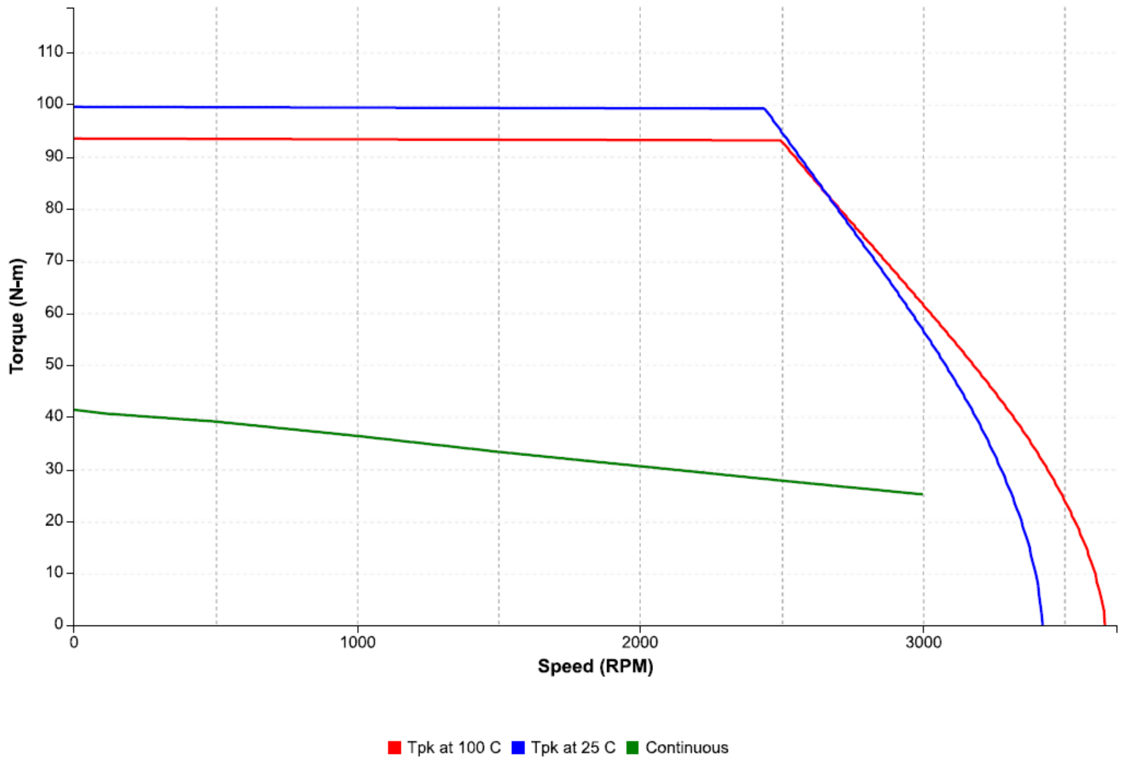
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 565 Vdc

9.72 IC830M73P with IC830DP02407 at 480 VAC

Figure 89: Speed-torque performance of an IC830M73P motor with an IC830DP02407 drive at 480 VAC



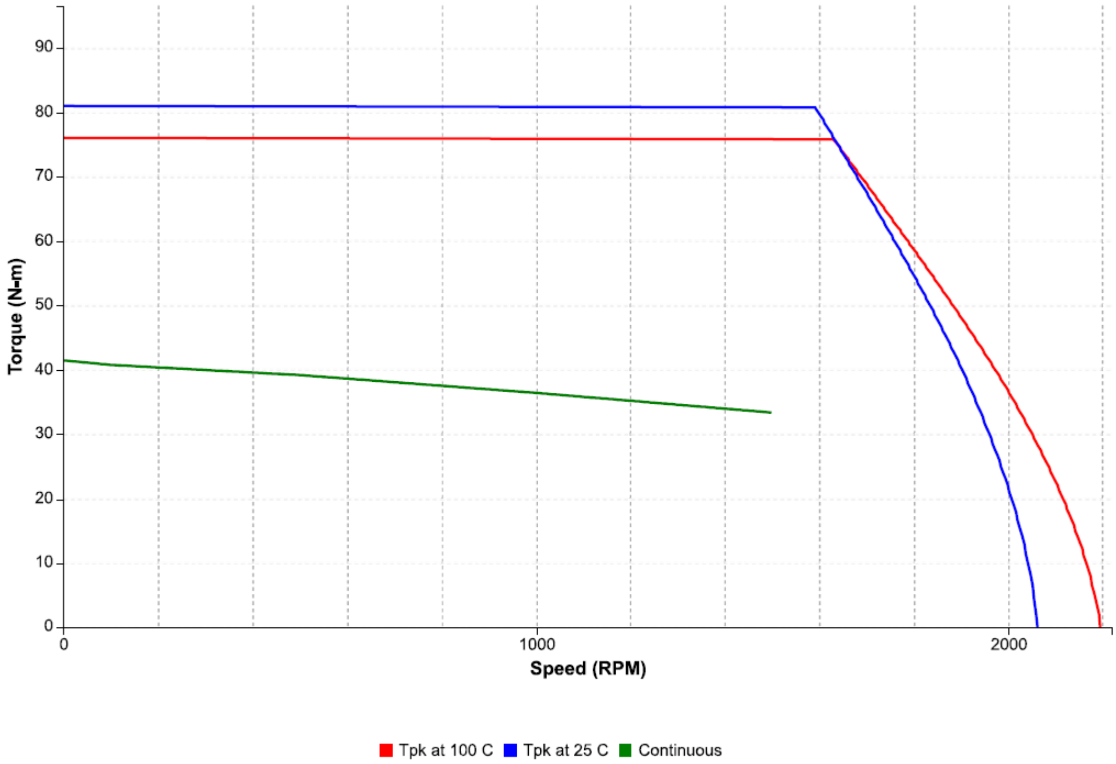
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 678 Vdc

9.73 IC830M73Q with IC830DP02406 at 240 VAC

Figure 90: Speed-torque performance of an IC830M73Q motor with an IC830DP02406 drive at 240 VAC



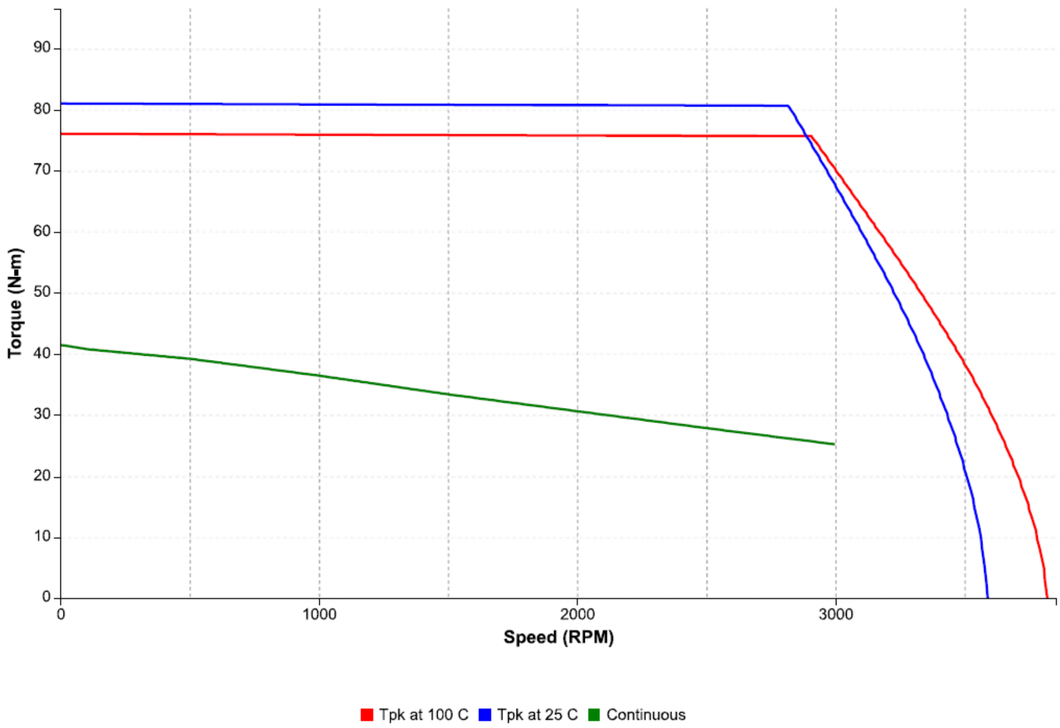
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 325 Vdc

9.74 IC830M73Q with IC830DP02407 at 400 VAC

Figure 91: Speed-torque performance of an IC830M73Q motor with an IC830DP02407 drive at 400 VAC



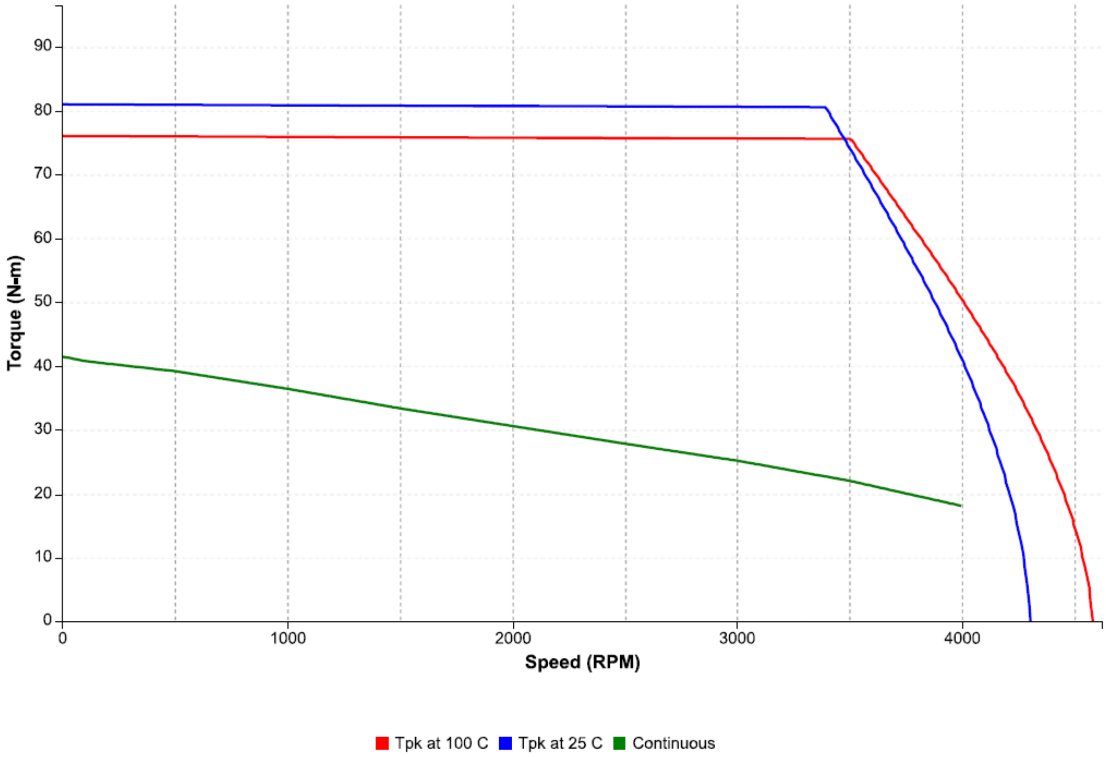
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 565 Vdc

9.75 IC830M73Q with IC830DP02407 at 480 VAC

Figure 92: Speed-torque performance of an IC830M73Q motor with an IC830DP02407 drive at 480 VAC



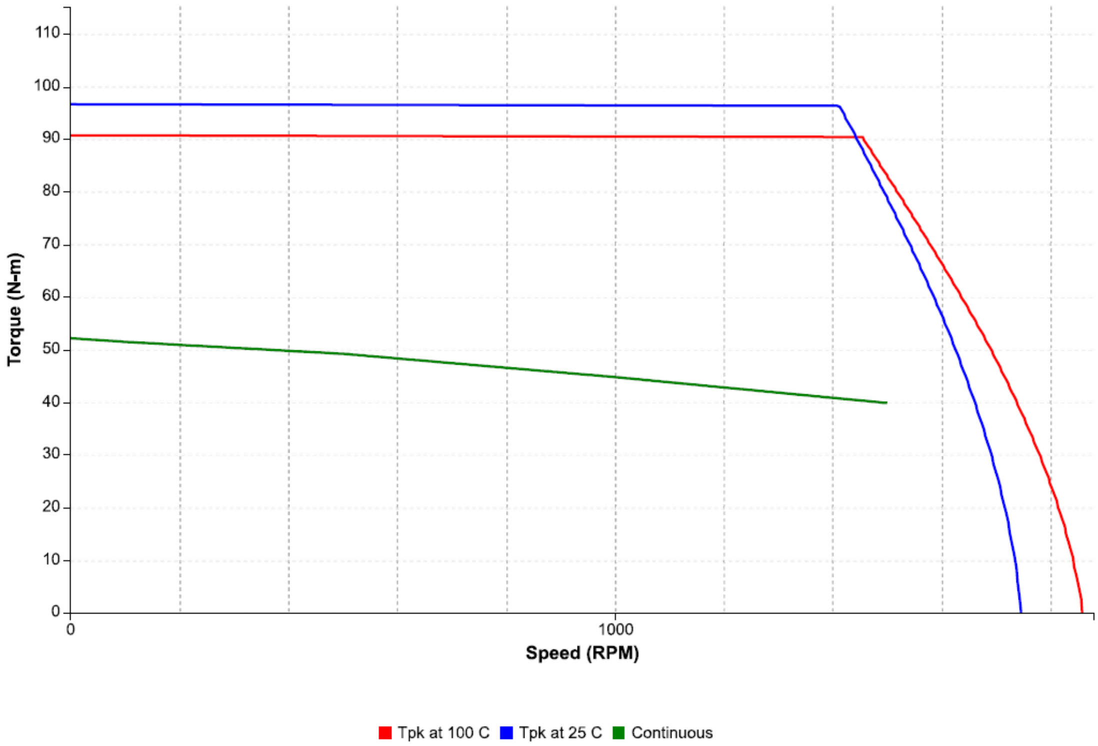
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 678 Vdc

9.76 IC830M74Q with IC830DP02406 at 240 VAC

Figure 93: Speed-torque performance of an IC830M74Q motor with an IC830DP02406 drive at 240 VAC



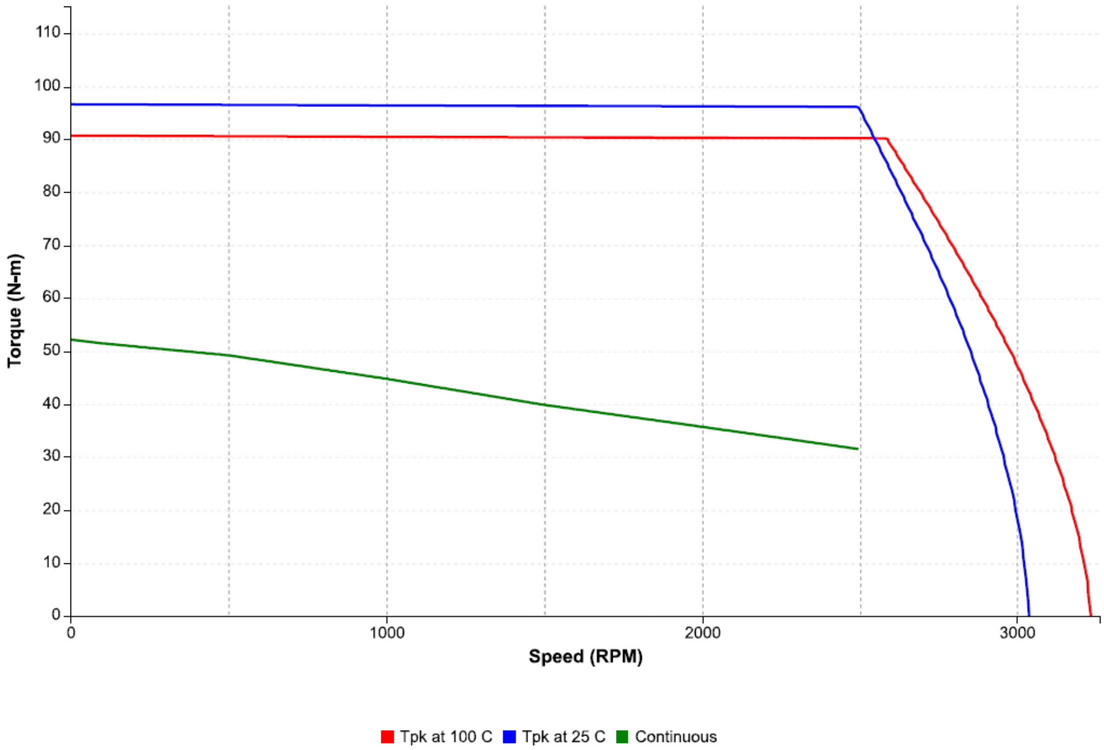
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 325 Vdc

9.77 IC830M74Q with IC830DP02407 at 400 VAC

Figure 94: Speed-torque performance of an IC830M74Q motor with an IC830DP02407 drive at 400 VAC



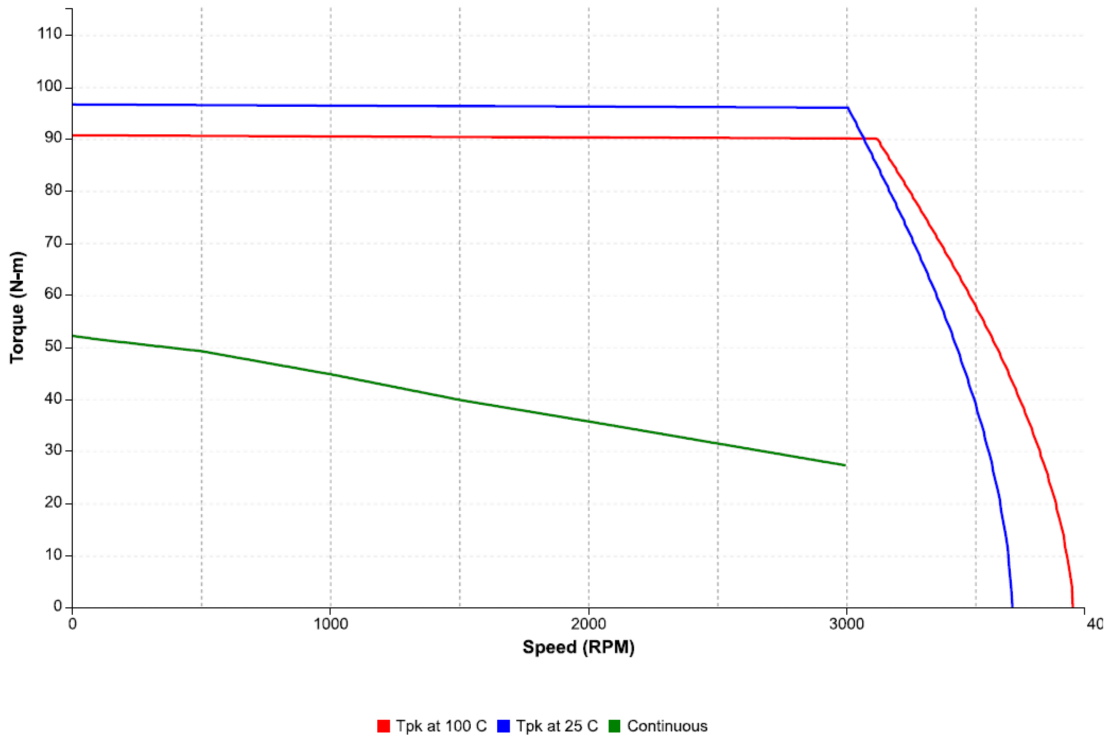
Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 565 Vdc

9.78 IC830M74Q with IC830DP02407 at 480 VAC

Figure 95: Speed-torque performance of an IC830M74Q motor with an IC830DP02407 drive at 480 VAC



Drive Parameters

Peak Current: 48 Arms

Bus Voltage: 678 Vdc

Section 10: Emerson Cable Guide

			"9" Connector CA or GF Feedback	"B" & "C" Connector, AB Feedback		
Motor	Drive		Hybrid Cable	Feedback	Power, No Brake	Power + Brake
120V to 240 V						
IC830M21C	IC830DP00306	3A, 6A	CCJ1A2-015-XXX-00	CF-SB7374N-XX-0	CP-507CCAN-XX-0	CP-507CDAN-XX-0
IC830M22E	IC830DP00306					
IC830M22E	IC830DP00606					
IC830M23E	IC830DP00306					
IC830M23E	IC830DP00606					
IC830M24F	IC830DP00606					
IC830M41E	IC830DP00306					
IC830M41E	IC830DP00606					
IC830M42E	IC830DP00306					
IC830M42E	IC830DP00606					
IC830M42G	IC830DP00606					
IC830M42H	IC830DP00606					
IC830M43G	IC830DP00606					
IC830M62H	IC830DP00606					

Motor	Drive		"9" Connector CA or GF Feedback Hybrid Cable	"B" & "C" Connector, AB Feedback Feedback	Power, No Brake	Power + Brake
240 V						
IC830M42G	IC830DP01206	12 A	CCJ2A2-025-XXX-00	CF-SB7374N-XX-0	CP-507CCAN-XX-0	CP-507CDAN-XX-0
IC830M42H	IC830DP01206					
IC830M43G	IC830DP01206					
IC830M43K	IC830DP01206					
IC830M62K	IC830DP01206					
IC830M62L	IC830DP01206					
IC830M63L	IC830DP01206					
IC830M43K	IC830DP02406	24 A	CCJ2A2-025-XXX-00	F1-12-FB4-A3-00-0XX000	P1-12-040-A5-00-0XX000	P2-12-040-A5-00-0XX000
IC830M62K	IC830DP02406					
IC830M62L	IC830DP02406					
IC830M62M	IC830DP02406					
IC830M63L	IC830DP02406					
IC830M63M	IC830DP02406					
IC830M72R	IC830DP02406		n/a			
IC830M72P	IC830DP02406					
IC830M72Q	IC830DP02406					
IC830M73P	IC830DP02406					
IC830M73Q	IC830DP02406					
IC830M74Q	IC830DP02406			CF-SB7374N-XX-0	CP-508EDBN-XX-0	CP-508EDBN-XX-0

			"9" Connector CA or GF Feedback	"B" & "C" Connector, AB Feedback		
Motor	**Drive**		**Hybrid Cable**	**Feedback**	**Power, No Brake**	**Power + Brake**
240V to 480V						
IC830M41E	IC830DP00307	3A, 6A	CCJ2A2-015-XXX-00	CF-SB7374N-XX-0	CP-507CCAN-XX-0	CP-507CDAN-XX-0
IC830M41E	IC830DP00607					
IC830M42E	IC830DP00307					
IC830M42E	IC830DP00607					
IC830M42G	IC830DP00607					
IC830M43G	IC830DP00607					
IC830M62H	IC830DP00607					
IC830M42G	IC830DP01207	12 A	CCJ2A2-025-XXX-00			
IC830M43G	IC830DP01207					
IC830M62K	IC830DP01207					
IC830M62L	IC830DP01207					
IC830M63L	IC830DP01207					
IC830M72L	IC830DP01207		n/a			
IC830M62K	IC830DP02407	24 A	CCJ2A2-025-XXX-00	F1-12-FB4-A3-00-0XX000	P1-12-040-A5-00-0XX000	P2-12-040-A5-00-0XX000
IC830M62L	IC830DP02407					
IC830M62M	IC830DP02407					
IC830M63L	IC830DP02407					
IC830M63M	IC830DP02407					
IC830M72L	IC830DP02407		n/a			
IC830M72P	IC830DP02407					
IC830M72Q	IC830DP02407					
IC830M73P	IC830DP02407					
IC830M73Q	IC830DP02407					
IC830M74Q	IC830DP02407			CF-SB7374N-XX-0	CP-508EDBN-XX-0	CP-508EDBN-XX-0

Section 11: Connector Codes

11.1 Connector Options (B)

11.1.1 Connector Description

Connector	Usage*	Contacts Power/Signal	max. Current [A] Power/Signal	max. Cross Section[mm²] Power/Signal	Protection Class
M40 (Size 1.5)	Power & Brake	4 / 2	75 / 30	16 / 4	IP65
M23 SpeedTec Ready (Size 1)	Power & Brake	4 / 4	30 / 10	4 / 1.5	IP65
	Feedback	- / 12	- / 10	- / 0.5	IP65
	Feedback	- / 17	- / 9	- / 0.5	IP65

* Hybrid means: Power and Feedback on the same connector and in one cable

11.1.2 Reference Connector-Motor

PTC*	Connection	Usable with	Position of connection
B	2 SpeedTec Ready connectors	IC830M2	Angular, rotatable, motor mounted
C	2 SpeedTec Ready connectors	IC830M3-IC830M7 (≤ 22A)	Angular, rotatable, motor mounted
9 PT1000	1 Hybrid connector SpeedTec Ready	IC830M2-IC830M6	Angular, rotatable, motor mounted

*Temperature sensor PTC

11.2 Feedback Options

The motor length depends on the built-in feedback device

11.2.1 Feedback Description

Code	Description	Type	Remarks	Lines per rev.	# of revs.
CA	SFD3	Size 10/15/21	Single turn, inductive, 2 lines	2 poles	1
AB	BiSS	AD34/AD58	Multi-turn, optical	2048	4096
GF	HIPERFACE DSL®	EKM36	Multi-turn, optical	18bit + 12bit	4096

* x/y data for IC830M2-4/IC830M5-8

11.2.2 Reference Feedback-Motor

Connector code (PTC)		B	C	9
Code	Feedback	Usable with IC830M...		
CA	SFD3	-	-	2-6 (PT1000)
AB	BiSS	2	3-7	-
GF	HIPERFACE DSL®	-	-	2-6 (PT1000)

Section 12: Connector Pinout

All connector views: facing front. Abbreviations used :

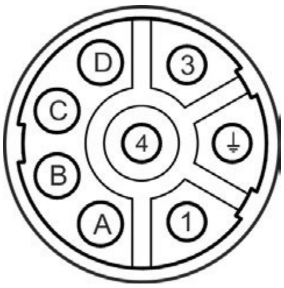
U	Motor phase U	BR	Motor holding brake	Up	Sensor Voltage supply
V	Motor phase V	TH	Thermal sensor	0V	Ground for Sensor Voltage supply
W	Motor phase W	Z	Zero pulse		
PE	Protection Earth	n.c.	not connected		

12.1 Connector codes B, C: IC830M2 - IC830M7

Model	Connector code (PTC)	Connector code PT1000
IC830M2	B	9
IC830M3 - IC830M7	C	9

12.1.1 Power

Connector codes B, C for IC830M2 - IC830M7

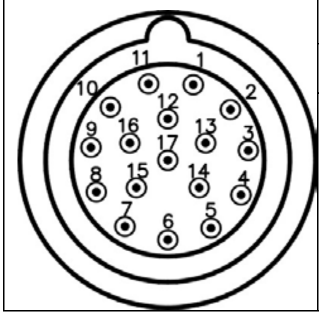


Pin	Function	Pin	Function
1	U	A	BR +
⏚	PE	B	BR -
3	W	C	n.c
4	V	D	n.c.

Encoder (Feedback codes AB)

Model	Feedback code
IC830M2 - IC830M7	AB

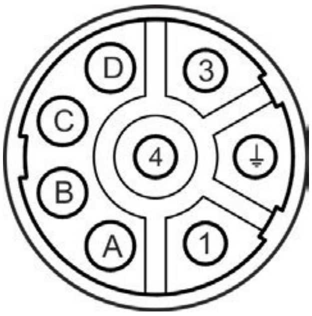
	Pin	Function	Pin	Function	Pin	Function
	1	B -	7	TH +	13	Data -
	2	0V	8	Clock +	14	TH -
	3	A -	9	B +	15	Clock -



4	Up	10	Sense -	16	n.c
5	Data +	11	A +	17	n.c.
6	n.c.	12	Sense +		

12.2 Connector code 9: IC830M2- IC830M6

12.2.1 Power & SFD3/DSL IC830M2 - IC830M6 (Feedback code CA, GF)



Pin	Function	Pin	Function
1	U	A	BR+
⏚	PE	B	BR-
3	W	C	Data -
4	V	D	Data +

General Contact Information

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Any escalation request should be sent to mas.sfdcescalation@emerson.com

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