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**CONTROL  
TECHNIQUES**



# DIGITAX HD

MINIMUM SIZE, MAXIMUM PERFORMANCE  
SERVO DRIVES

**DRIVE OBSESSED**

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# SERVO SOLUTIONS FOR CONTINUOUS & PULSE DUTY APPLICATIONS

Receive the ultimate in performance and flexibility for machinery manufacturers with a broad range of servo drives and motors.



## Digitax HD

Bring superior performance to high dynamic, pulse duty applications, where high peak torque is essential for fast acceleration with the Digitax HD range.

### Digitax HD

0.25 kW - 7.5 kW  
(0.6 hp - 9.8 hp)  
200 V | 400 V

### Unidrive M700

0.75 kW - 2.8 MW  
(1 hp - 4,200 hp)  
200 V | 400 V | 575 V | 690 V

## Unidrive M700

Providing optimum performance and an extensive power range - M700 is the ideal option for continuous duty applications that need precise continuous torque delivery.

300% Overload

200% Overload

## Unimotor

Unimotor is a comprehensive family of high-performance AC brushless servo motors. With a wide torque and speed range and a broad selection of feedback options, Unimotor offers the perfect match for Digitax HD and Unidrive M700 to meet any application requirement.



Pulse Duty Servo Range - Unimotor HD  
(Optimised with the Control Techniques pulse duty drive)

# MINIMUM SIZE SERVO SOLUTIONS

1.5 A – 16 A with 48 A peak

200 V | 400 V

## Downsize cost and upsize floor space

With a tiny footprint but exceptional power density, Digitax HD is one of the smallest servo drives on the market today. Build the most compact cabinets possible.

## The market's narrowest servo drive

- Digitax HD is just 40mm (1.6 in) wide
- 25 drives, up to 16A per drive, can fit in just 1 meter (40 in) of cabinet space

Actual size



Just 40 mm (1.6 in)



40mm (1.6 in)

Typical competitors



Install a Digitax HD in a 200 mm deep cabinet

## Drive dimensions

| Frame size | Dimensions H x W x D mm (in)        | Weight kg (lb) | Nominal current @ 400V | Peak current @ 400V |
|------------|-------------------------------------|----------------|------------------------|---------------------|
| 1          | 233 x 40 x 174 (9.17 x 1.57 x 6.85) | 0.75 (1.65)    | 4.2 A                  | 12.6 A              |
| 2          | 278 x 40 x 174 (11.0 x 1.57 x 6.85) | 1.3 (3.0)      | 10.5 A                 | 31.5 A              |
| 3          | 328 x 40 x 174 (12.9 x 1.57 x 6.85) | 1.5 (3.3)      | 12.9 A                 | 48 A                |

# ULTRAFLOW™ THERMAL MANAGEMENT

# KEEP CABINET

# SIZES COMPACT

## Heat management

Create shorter cabinets by directly stacking rows of drives. Control Techniques' unique Ultraflow™ technology expels heat directly outside the cabinet through the rear of the drive\* and stops heat building up in the cabinet.

## No Contamination

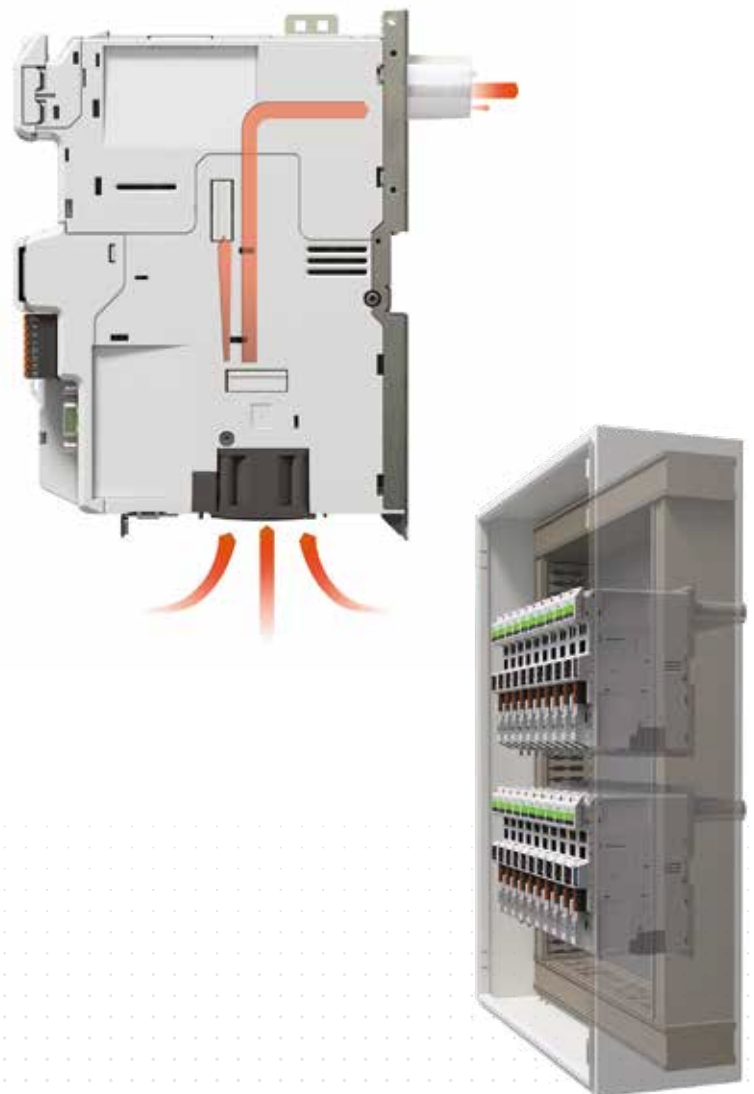
Ultraflow™'s guided internal airflow prevents ingress on drive circuits and, combined with conformal coating, minimises contamination risk.

## Smart fan control

An intelligently controlled fan means fans last longer and create less acoustic noise while contributing to the maximum thermal cooling by Ultraflow™.

## Easy installation

Ultraflow™ requires only a 32 mm (1.25 in) hole in the cabinet meaning rapid, trouble-free installation\*\*



Ultraflow™ is a registered Trademark of Control Techniques

\* Drive heat dissipation can also be achieved via vents on top of the drive, as standard.

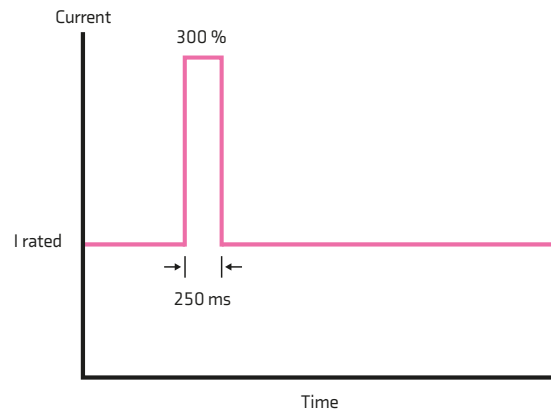
\*\* Frames 2 and 3 require 2 x 32mm (1.5 in) holes

# MAXIMUM PERFORMANCE SERVO SOLUTIONS

## Boost throughput with maximum control

**Get the best throughput and production quality in your machines by using Digitax HD, the perfect drive for high-dynamic applications.**

- 300% peak current performance
- Optimised control loops for high dynamic performance
  - i. 62.5  $\mu$ s current loop
  - ii. 250  $\mu$ s position and speed loop
- Unique 'dead beat' current controller for maximum bandwidth
- Up to 16 kHz switching frequency (default ratings specified at 8 kHz)
- Advanced bi-quad filters for suppression of mechanical resonances

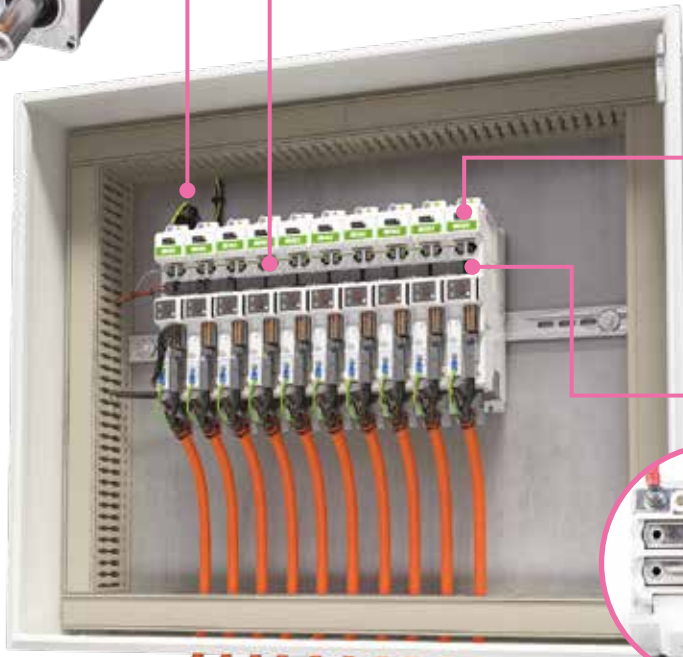


## Improving accuracy through precision encoder feedback

**The flexible speed and position feedback interface supports a wide range of feedback technologies, from robust resolvers to high resolution encoders:**

- Up to three onboard encoder channels simultaneously e.g. 1 feedback encoder, 1 reference encoder and 1 simulated output
- Quadrature, AB Servo, SinCos (including absolute), SSI, BiSS, EnDat 2.1/2.2, Hiperface and resolvers
- Simulated encoder output can provide position reference for cams, digital lock and electronic gearbox
- Up to 25 bit encoder resolution on Unimotor HD
- Feedback accuracy as low as  $\pm 20$  arcsec on Unimotor HD

# FROM STANDALONE...

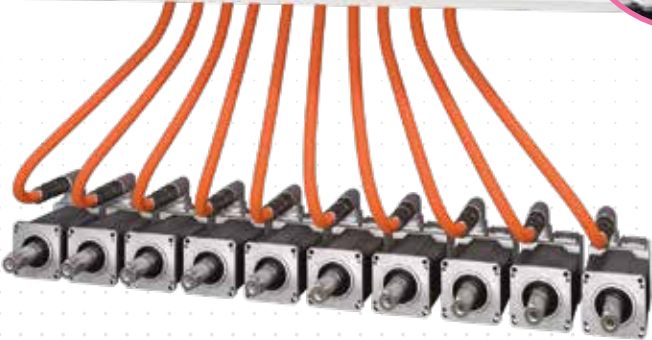


Single AC Input

Communication links

Common DC bus and earth

24 Vdc links



# ...TO A MODULAR COMMON DC BUS SYSTEM

# THE NEW PARADIGM OF SYSTEM DESIGN

# INTEGRATED

# SAFETY

**Modern industrial processes face a three-fold challenge: the constant demand for increased machine throughput, matched by a parallel need to reduce complexity and points of failure, all the while ensuring the health and safety of human operators and allowing them interaction with the running process.**

Modernising system design, replacing traditional electro-mechanical safety components with the capabilities of the latest generation of variable speed drives, is the new standard across industries to increase efficiency and availability.

Digitax HD offers integrated dual Safe Torque Off (STO) inputs, certified to SIL3 / PLe, providing an elegant and more reliable solution over traditional motor contactors.





## Enhanced, decentralised motion safety with the MiS250

The MiS250 safety option for Digitax HD extends the built-in STO with the ability to safely monitor and/or restrict the scope of motion. The use of drive-based safe motion provides faster reaction times while also reducing the demand upon - and therefore the cost of - the central safety PLC.

Wiring complexity is dramatically reduced, as the MiS250 can use the same encoder feedback already connected to the drive. Taking advantage of the Safe EnDat protocol, the MiS250 achieves up to SIL3 / PLe with a single encoder.

The MiS250 has been designed to meet the following standards:

- IEC 61508 SIL3
- IEC 62061
- ISO 13849-1 PLe
- IEC 61800-5-2
- European Machinery Directive 2006/42/EC

MiS250 adds the following motion safety functions to Digitax HD:

- Safe Stop 1 (SS1)
- Safe Stop 2 (SS2)
- Safely Limited Speed (SLS)
- Safe Operating Stop (SOS)
- Safe Direction (SDI)
- Safe Speed Monitor (SSM)
- Safe Emergency Stop (SES)
- Safely Limited Position (SLP)
- Safely Limited Acceleration (SLA)
- Safe Brake Control (SBC)
- Two Hand Control

Additionally, these motion safety functions can be controlled over the following safe networks:

- Safety over Ethernet with CIP Safety
- Fail Safe over EtherCAT, FSoE



# MINIMUM EFFORT RAPID INSTALLATION

Our innovative design means you only increase drive size when option modules are used. That means you can save oodles of space in the overall configuration.

The multi-axis paralleling kit includes busbars for quick connection of DC bus and earth link, as well as Quick Links to distribute 24 Vdc supply across drives:

- Reduces installation time and cost
- Improves energy efficiency and footprint



The LED display ensures access to drive diagnostics even in the absence of network connectivity.

Includes 2 rotary switches for hardware setting of the node address for faster commissioning of the motion network.

The motor power connector is in the same position for all frame sizes, making cable routing easier and tidier.

- Easy access pluggable connectors

AC input

DC bus cover

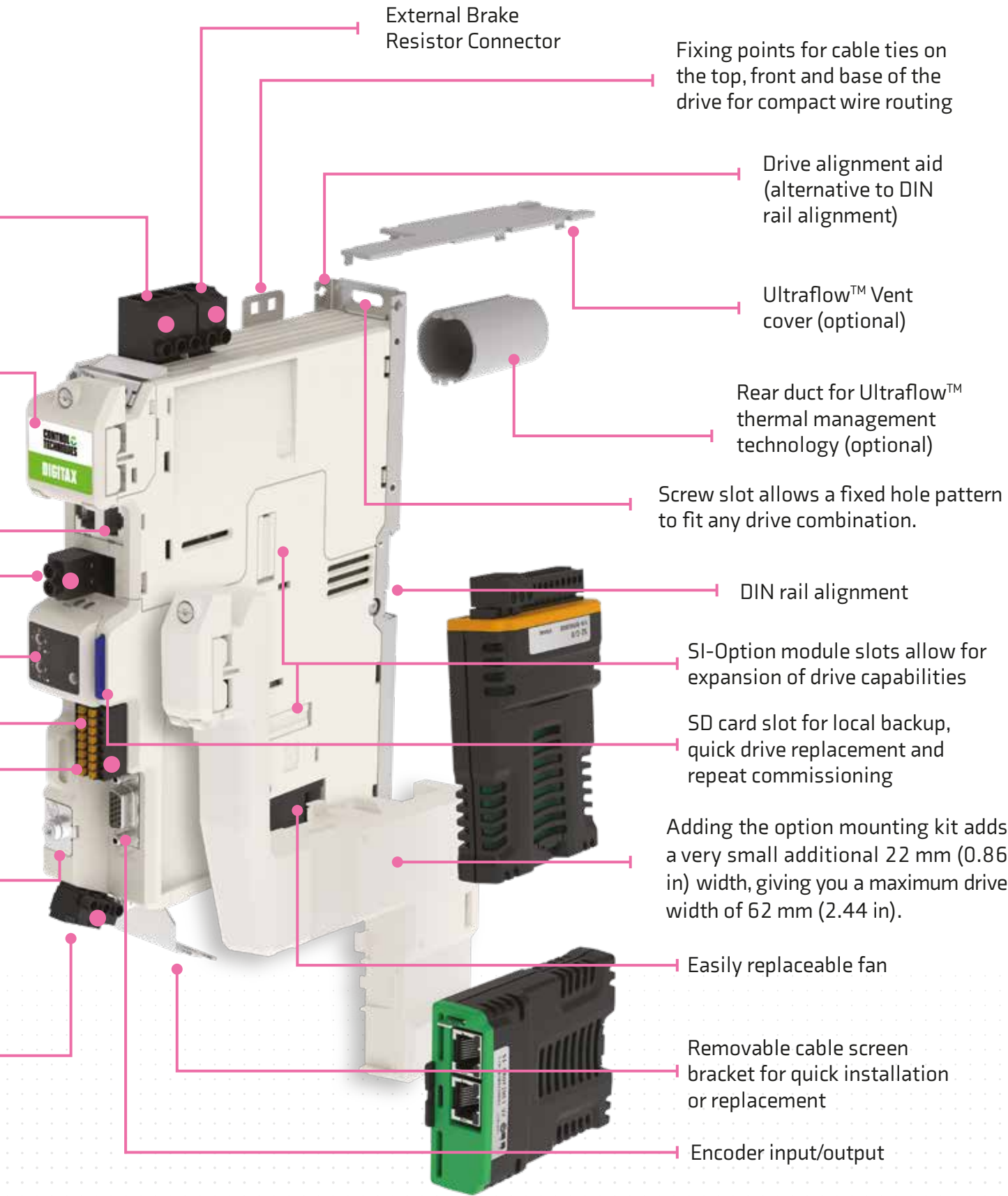
Communication ports

24 Vdc Input

I/O

Dual Safe Torque Off (STO)

Motor earth



External Brake Resistor Connector

Fixing points for cable ties on the top, front and base of the drive for compact wire routing

Drive alignment aid (alternative to DIN rail alignment)

Ultraflow™ Vent cover (optional)

Rear duct for Ultraflow™ thermal management technology (optional)

Screw slot allows a fixed hole pattern to fit any drive combination.

DIN rail alignment

SI-Option module slots allow for expansion of drive capabilities

SD card slot for local backup, quick drive replacement and repeat commissioning

Adding the option mounting kit adds a very small additional 22 mm (0.86 in) width, giving you a maximum drive width of 62 mm (2.44 in).

Easily replaceable fan

Removable cable screen bracket for quick installation or replacement

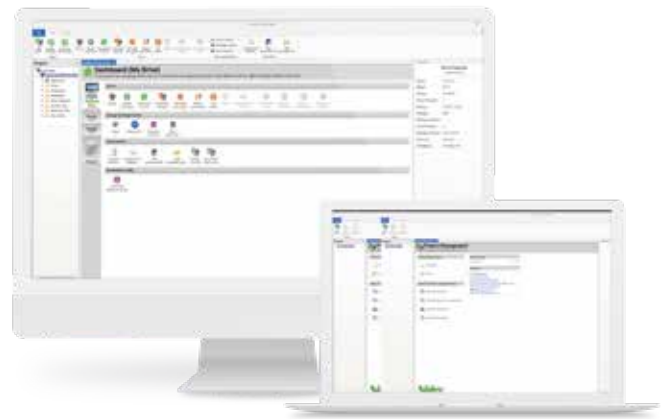
Encoder input/output

# RAPID COMMISSIONING

## Connect

The Connect PC tool is for rapid commissioning, plus optimising and monitoring drive/system performance:

- Task-based drive operations are simplified with intuitive graphical tools in a familiar Windows environment
- CTScope – a realtime software oscilloscope – facilitates tuning and monitoring
- Dynamic logic diagrams and searchable parameter listings
- Tool is scalable, through optional add-ins, to match application requirements
- Multiple communications channels for a more complete overview of the system
- Drive discovery gives the ability to find drives on a network automatically without the user having to specify their addresses
- Offline configuration



## SD card

Standard SD cards can be used for quick and easy parameter and program storage.

## Remote mountable keypad\*

Flexible mounting on the outside of a panel, for quick changes to drive parameters or reading diagnostics.



## Plug-and-play motor connection

Automatic electronic motor nameplate identification for fast setup

\*requires KI-Compact 485 adaptor to connect keypad to Drive



### Drive set-up

Quickly find everything you need for quick and easy installation of your drives.

Visit: [www.drive-setup.com](http://www.drive-setup.com)



### Diagnostic Tool

Quickly solve any error codes that the drive may show. You can download our Diagnostics Tool app at:

[controltechniques.com/mobile-applications](http://controltechniques.com/mobile-applications)



\*For Microsoft users, please note that this mobile app operates with Windows 10 only.

# APPLICATION FLEXIBILITY

# THE RIGHT VARIANT GUARANTEED



## M750 ETHERNET

The multi-protocol drive that does it all



## M753 ETHERCAT

For high-performance centralised motion control architecture



## M754 MCI

Servo drive and controller in one



## M751 BASE

Configuration flexibility with option modules



# M750 ETHERNET

Multi-protocol network drive for centralised and decentralised motion applications

## Digitax M750 Ethernet

- Onboard multi-protocol Ethernet, supporting Real Time Motion over Ethernet (RTMoE), EtherNet/IP, Modbus TCP/IP and PROFINET RT
- Onboard advanced motion controller for 1.5 axis motion control
- Ethernet webpages hosted onboard the M750 Ethernet drive
- Reduced downtime with machine safety
  - i. Integrated dual Safe Torque Off (STO)
  - ii. Meets SIL3 and PLe
  - iii. Safe motion and CIP Safety with MiS250 option (see p.9)

## Advanced Motion Controller onboard

Advanced 1.5 axes motion controller, key features include:

- 250  $\mu$ s cycle time
- Interpolated cam
- Motion profile generator
- Homing functions
- Electronic gearbox
- High speed position freeze

## RTMoE

Digitax HD's standard Ethernet supports RTMoE (Real-Time Motion over Ethernet) which provides synchronised communication between drives using the Precision Time Protocol as defined by IEEE1588 V2:

- Distributed clocks are used to automatically synchronise the position, speed and current loops across all drives
- High speed network synchronisation with less than 1  $\mu$ s jitter (typically <200 ns) and 250  $\mu$ s cycle time for synchronous cyclic data



EtherNet/IP

PROFINET

Modbus TCP/IP

RTMoE

I4.0 READY

SIL3

TÜVRheinland® Precisely Right.

PLe








# MULTI-PROTOCOL

## A single drive that does it all

Control Techniques' philosophy has always been to support innovators, regardless of which communications protocol they may use. It's for them that we've developed the most flexible servo drive platform on the market.

Having multiple protocols supported by one drive means that different systems can share one design, reducing engineering effort and complexity, and helping to rationalise inventory of parts and spares.

But we didn't stop there. Today Digitax drives offer EtherNet/IP, Modbus TCP/IP, RTMoE and PROFINET RT as standard, on a single drive platform, simultaneously.

|  |   |   |   |
|--|---|---|---|
| <br>RTMoE | <br>250 $\mu$ s drive-to-drive synchronous data transfer | <br>TCP/IP | <br>Maximum of up to 10 concurrent connections |
| EtherNet/IP  | <br>Support for RPI as low as 2 ms                       |            | <br>Support for 1 ms cyclic link cycle times   |

## PLC Controlled Motion

PLC Controlled Motion facilitates the integration of Control Techniques drives into major PLC architectures, simplifying the process to the point where our drives can be swapped into an application in a matter of hours.

A single installation will load all the function blocks and documentation required, as well as example projects to get the application up and running as quickly as possible. With the guided setup sequence provided inside the Connect software tool, users are taken through the setup process step-by-step, resulting in a ready-to-use configuration that can be loaded straight into the drive.

Utilising the high-performance Advanced Motion Controller inside Digitax HD once again yields significant performance benefits, and gives the possibility to create complex motion completely decoupled from the performance and computational power of the external PLC.



### Frequency Control

Allows frequency control of an open-loop axis.



### RPM Control

Allows speed control of a closed-loop (including sensorless) axis.



### Speed Control

Allows speed control of an axis, with dynamic control over motion parameters. With dedicated jogging reference.



### Position Control

Single motion or up to 10 index moves can be defined and executed.

Multiple homing modes.



### Electronic Gearbox Control

Electronic gearbox scaled motion

Master reference switchable at the PLC at run-time.

Multiple homing modes.

# M753 ETHERCAT

For high-performance centralised motion control applications

## Digitax M753 EtherCAT

- Digitax M753 features an integrated 2-port EtherCAT switch for easy integration in centralised motion control applications
- EoE (Ethernet over EtherCAT) support allows PC tool connection for commissioning and monitoring over the EtherCAT network
- The station alias can be dynamically assigned by the EtherCAT master, or hardwired with the two rotary switches built into the display
- An optional RS485 adaptor is available, providing a back-up PC tool connection in case of network failure

## High performance with flexibility

Operate with any automation product via EtherCAT

- Operate with motion controllers, motion PLCs and Industrial PCs via built-in EtherCAT
- Dual 100Mbps EtherCAT interfaces for use with in-line topologies
- Non-cyclic data communication using the CANopen over EtherCAT (CoE) mailbox

Flexibility for all applications achieved through full access to drive functions

- CANopen over EtherCAT (CoE) with CiA-402 profile including:
  - Cyclic synchronous position mode
  - Cyclic synchronous velocity mode
  - Cyclic synchronous torque mode
  - Homing mode
  - Interpolated position mode
  - Velocity mode
  - SDO access to all profile objects and drive parameters



## Improved productivity with machine safety

The built-in dual Safe Torque Off is certified to SIL3 / PL<sub>e</sub>.

With the MiS250 option(\*), the integrated safety can be extended to include

- Safe Motion
  - i. Safe Stop 1 (SS1)
  - ii. Safe Stop 2 (SS2)
  - iii. Safely Limited Speed (SLS)
  - iv. Safe Operating Stop (SOS)
  - v. Safe Direction (SDI)
  - vi. Safe Speed Monitor (SSM)
  - vii. Safe Emergency Stop (SES)
  - viii. Safely Limited Position (SLP)
  - ix. Safely Limited Acceleration (SLA)
  - x. Safe Brake Control (SBC)
  - xi. Two Hand Control
- Fail Safe over EtherCAT
  - xii. Up to 32 booleans and 4 integers communication interface
  - xiii. Safe speed and position transfer to safety controller

(\* refer to page 9

## Rapid and flexible commissioning

- Ethernet over EtherCAT (EoE) for PC tool communication
- File over EtherCAT (FoE) for drive parameter transfer
- Rotary dials can be used for local setting of the station alias

# MACHINE CONTROLLERS

# M754 MCI

Servo drive and controller in one

## Digitax M754 MCI

A powerful MCI second processor onboard the Digitax M754 servo drive brings a whole host of machine design opportunities.

The onboard MCI processor executes comprehensive programs that can control multiple drives and motors simultaneously across real-time networks

Onboard Ethernet using RTMoE (Real Time Motion over Ethernet) provides synchronization and communication between drives using the Precision Time Protocol (PTP) as defined by IEEE1588 V2

Simple integration with external components such as Remote I/O, HMIs and PLCs can be achieved with Modbus TCP/IP on the integrated 2-port standard Ethernet switch.

- Two Ethernet ports with an internal switch
- Support for standard Ethernet protocols
- RTMoE for synchronised cyclic data at 250  $\mu$ s
- Modbus TCP/IP master



# MACHINE CONTROL STUDIO

## Fast Programming and Commissioning

The Machine Control Studio programming environment provides a flexible and intuitive environment for programming automation and motion control features.

### The software provides programming for:

- Onboard PLC
- Integrated MCI on M754
- MCI200 or MCI210 integrated machine control modules
- Ethernet network data configurations

### Productivity features also supported:

- Intuitive IntelliSense functionality helps to write consistent and robust programs speeding up software development
- Programmers have access to a vibrant Open-source community for function blocks
- Machine Control Studio also supports customers' own function block libraries

## Familiar automation programming languages

The programming environment is fully IEC 61131-3 compliant and therefore familiar, fast and easy to use for control engineers around the world. The following IEC 61131-3 programming languages are supported:

- Structured Text (ST)
- Function Block Diagram (FBD)
- Structured Function Chart (SFC)
- Ladder Diagram (LD)
- Instruction List (IL)
- Continuous Function Chart (CFC)



| Feature                     | Digitax HD onboard PLC                   | MCI Option Module /M754   |
|-----------------------------|--|---|
| Breakpoints                 | -  | Yes   |
| Source code upload/download | -  | Yes   |
| Online change               | -  | Yes   |
| Trigonometric functions     | -  | Yes   |
| 64 bit data types           | -  | Yes   |
| Real-time task(s)           | Yes (min 4ms)                            | Yes (min 250 µs)  |
| Customisable drive menu     | Yes                                      | Yes   |
| Variable tracing            | -  | Yes   |
| Tasks available             | 1 x Freewheeling task,<br>1 x Clock task | 1 x Freewheeling task,<br>1 x Position task,<br>1 x Initial task,<br>4 x Clock tasks,<br>1 x Error task,<br>4 x Event tasks |
| Centralised controller      | -  | Yes   |
| Decentralised controller    | Yes                                      | Yes   |

# M751 BASE

Base drive for configuration flexibility

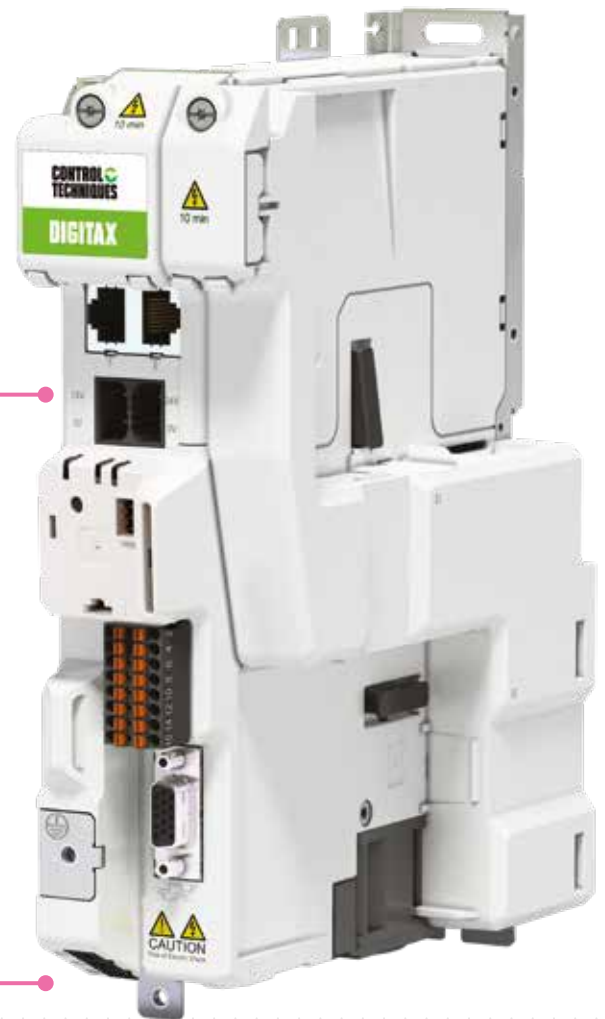
## Digitax M751 flexibility

- Two option slots for functionality extension and customisation
- Built-in Modbus RTU over RS485 communications
- Onboard Advanced Motion Controller for 1.5 axis motion control
- Analog and pulse/direction control for centralised motion
- Improved productivity with machine safety
  - i. Integrated dual Safe Torque Off
  - ii. Meets SIL3 and PLe

## Advanced Motion Controller onboard





Advanced 1.5 axes motion controller, key features include:

- 250  $\mu$ s cycle time
- Motion profile generator
- Electronic gearbox
- Interpolated cam
- Homing functions
- High speed position freeze



# OPTION MODULE FLEXIBILITY

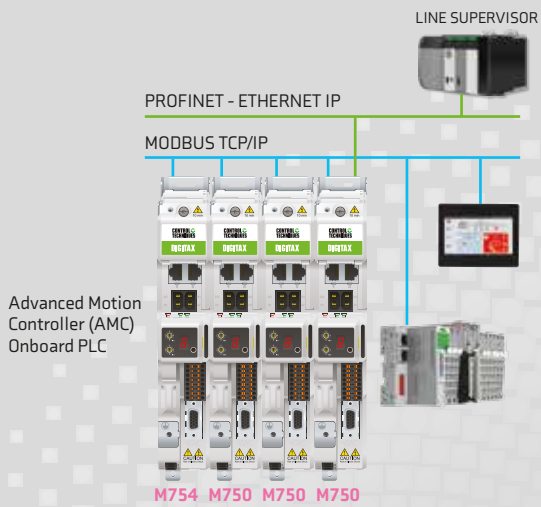
Digitax HD supports a range of communications, I/O, feedback and machine control option modules.

| Option module   | Description  |
|---|--|
| <b>Feedback</b>   |  |
| <b>SI-Universal Encoder</b>  | Encoder input and output interface supporting Quadrature, SinCos, EnDat and SSI encoders.  |
| <b>SI-Encoder</b>           | Quadrature encoder input interface module.   |
| <b>I/O</b>  |  |
| <b>SI-I/O</b>              | Extended I/O interface module to increase the number of analog and digital I/O points on the drive.<br><br>Programmable I/O functions for:<br>4 x DI/DI,<br>3 x AI / DI, 1 x AO / DI, 2 x Relays |
| <b>Communications</b>   |  |
| <b>SI-EtherCAT</b>         | <b>SI-CANopen</b>   |
| <b>SI-PROFINET</b>         | <b>SI-PROFIBUS</b>    |
| <b>SI-Ethernet*</b>        | <b>SI-POWERLINK</b>   |
| <b>SI-DeviceNet</b>        | <b>SI-INTERBUS</b>    |

| Option module  | Description  |
|--|--|
| <b>Second processor for Logic and Motion</b>   |  |
| <b>MCi200</b>             | Advanced machine control using industry standard IEC61131-3 programming languages                                  |
| <b>MCi210</b>            | Extended advanced machine control using industry standard IEC61131-3 programming languages and integrated Ethernet |
| <b>SI-Apps Compact</b>  | Compatible module allows legacy SyPTPro application programs to be re-compiled for Digitax HD                      |
| <b>PTi210</b>           | PTi210 Simple, fast and effective motion control solutions using intuitive PowerTools Studio Software              |
| <b>Safety</b>  |  |
| <b>MiS250</b>           | Integrated safe motion up to SIL3 / PLe. Support for CIP Safety and Safety over EtherCAT (FSoE)                    |

# SCALABLE MOTION CO

## Small machine



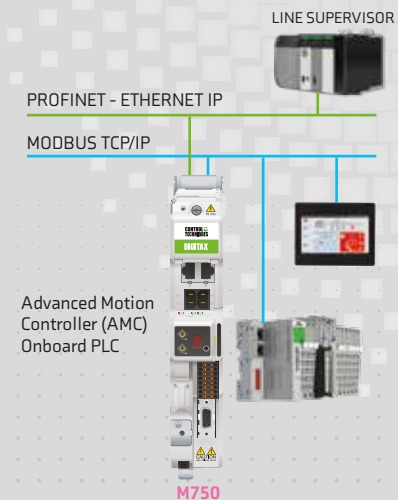
High-end controller  
11-50 axes

Mid-range controller  
5-10 axes

Full machine controller  
1-4 axes

Simple on-board logic  
1.5 axis

## Single-Axis machine / Machine module



M754

|                            | AMC<br>Built-in Advanced<br>Motion Controller | M754 with built-in M754<br>M754 with built-in M754 |
|----------------------------|---|--|
| Speed control              | ✓   | ✓  |
| Positioning                | ✓   | ✓  |
| Gearing                    | ✓   | ✓  |
| Simple cam profiles        | ✓   | ✓  |
| Advanced cam profiles      | ✓   | ✓  |
| High-speed position freeze | ✓   | ✓  |
| Digital cam switch         |   | ✓  |
| Interpolated Motion        |   | ✓  |
|                            | Drive based                                   |  |



# UNIMOTOR HD

# HIGH DYNAMIC

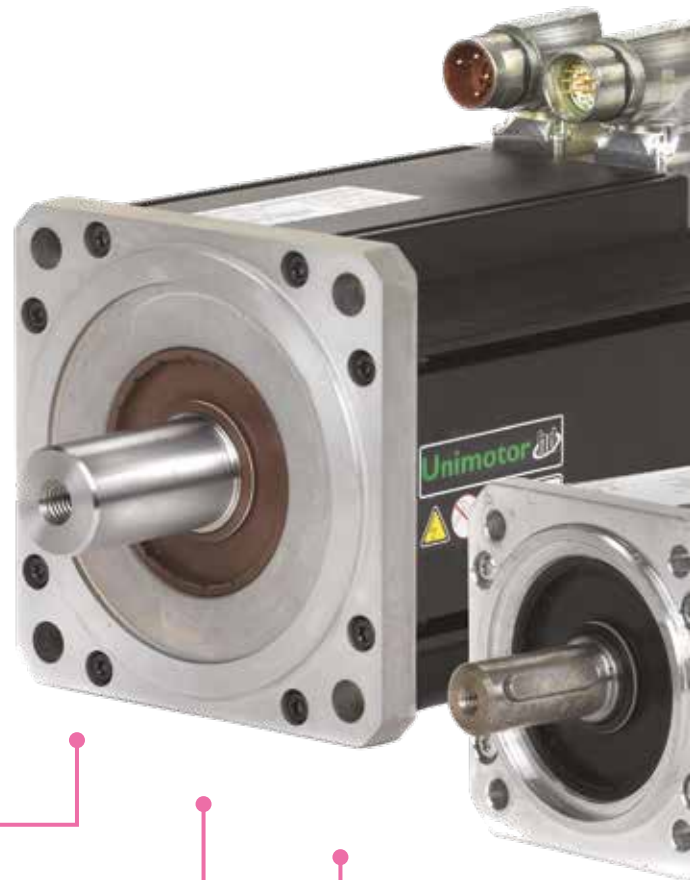
# SERVO MOTOR

For pulse duty applications

Unimotor HD is a high dynamic brushless AC servo motor range designed for use in pulse duty applications where rapid acceleration and deceleration is required.

## High torque to inertia ratio

Unimotor HD has a high power to weight ratio, meaning that it can be easily integrated into the smallest, most demanding applications such as industrial robotics, pick & place and packaging.



### Patented rotor technology

High torque to inertia ratio for high dynamic performance

### Compact but powerful

### Parking brake available



Supported by rigorous testing for performance and reliability

Windings to suit 400 V and 200 V

Rated speeds include 1,000 rpm – 6,000 rpm depending on motor size

IP65 conformance: sealed against water spray and dust when mounted and connected

Segmented stator design for high power density and compactness

0.7 Nm to 85.0 Nm (6.2 lb-in to 752 lb-in) and up to 300% overload

# ENERGY EFFICIENCY

## M75C Capacitor Module

Available in 200 V and 400 V variants, the M75C CapShare Capacitor Module is contained within a M75x Frame 1 chassis measuring 40mm width. M75C CapShare is designed for use in multi-axis applications to offer:

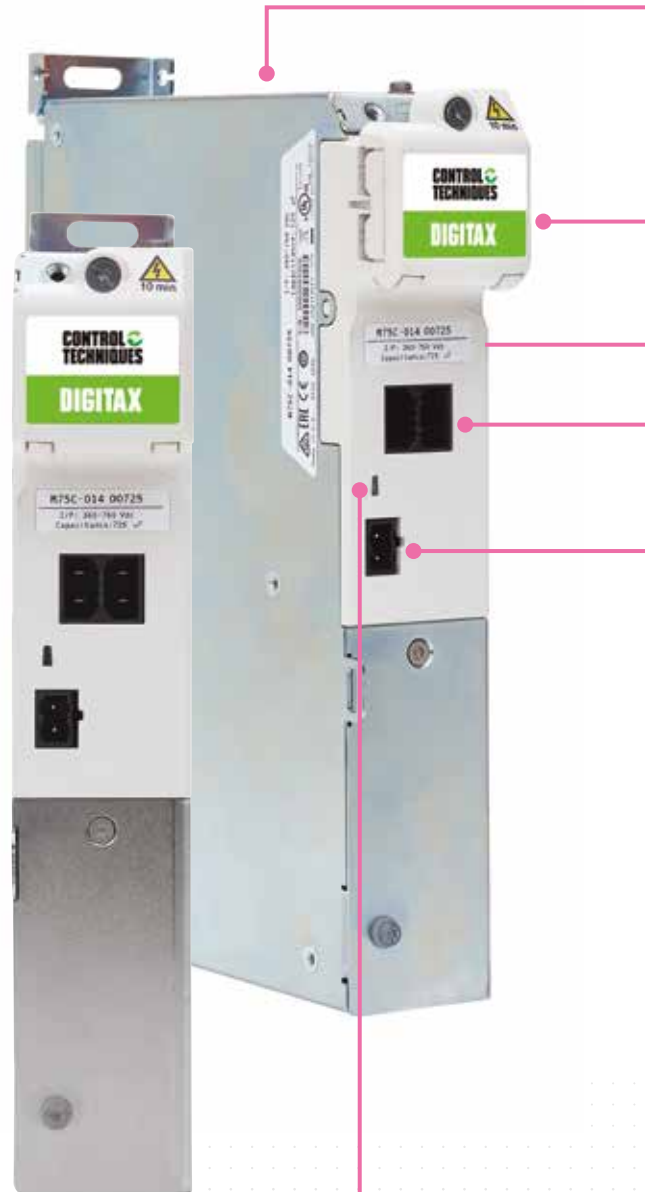
- Ways to cope with fluctuations in power supply by increasing the ability to ride through short cut outs in mains power
- Dynamic performance with quick-access energy storage for fast acceleration / deceleration
- Energy efficiency as more energy can be stored rather than being wasted as heat

Multiple M75C CapShare units can be paralleled in a scalable architecture, which is also quick and easy to install with DIN rail alignment, and easy DC bus paralleling.

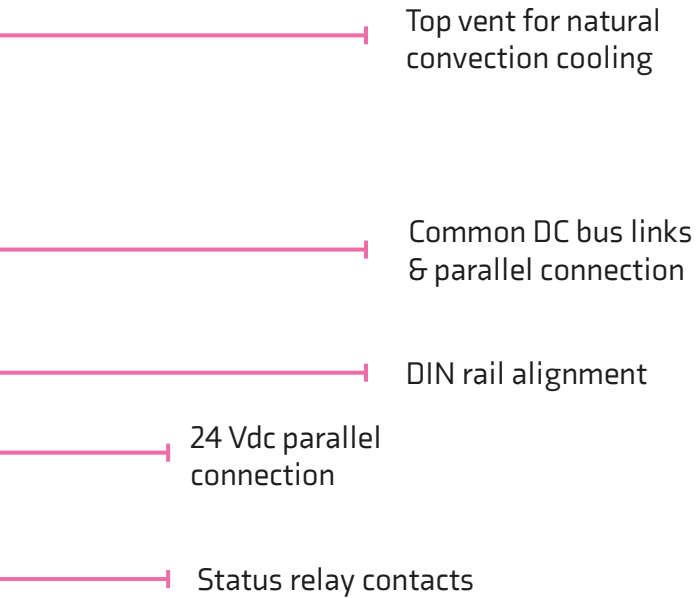
## M75C CapShare Capacitor Module

| Product code                               | M75C-01201740 | M75C-01400725 |
|--|---------------|---------------|
| Rated Voltage                              | 200 V         | 400 V         |
| Onboard capacitance                        | 1740 µF       | 725 µF        |
| DC supply                                  | 200-370 Vdc   | 360-760 Vdc   |
| External 24 Vdc supply for control         |               | Yes           |
| Internal Current Inrush limitation Circuit |               | Yes           |
| Status Relay (Potential Free Contacts)     |               | Yes           |
| Status Indication On Front Panel           |               | Single LED    |
| Thermal Protection                         |               | Yes           |

Easy connection to a drive or drive group can be achieved with the multiaxis kit (9500-1048) – no additional fusing required.



Status LED



### Common DC bus and Active Front End

Easy common DC bus connection enables braking energy to be recycled within the drive system, optimising energy usage.

Any Digitax HD drive can be used as an Active Front End (AFE) to create a regenerative AC drive system.

Active Front End also provides power factor control for power quality management, and greatly reduced unwanted power harmonics.

### Active Front End Kits

| Voltage | Model (M75X-...) | Switching Frequency Filter Capacitors | Regenerative Choke | Switching Frequency Filter Choke |
|---------|------------------|---------------------------------------|--------------------|----------------------------------|
|         |                  | Product codes                         | Product codes      | Product codes                    |
| 200 V   | 2200090          | 1610-8104                             | 4401-0310          | 4401-1311                        |
|         | 2200120          | 1610-8104                             | 4401-0312          | 4401-1312                        |
|         | 3200160          | 1610-8104                             | 4401-0313          | 4401-1313                        |
| 400 V   | 2400080          | 1610-8104                             | 4401-0405          | 4401-0162                        |
|         | 2400105          | 1610-8104                             | 4401-0406          | 4401-0163                        |
|         | 3400135          | 1610-8104                             | 4401-0407          | 4401-0164                        |
|         | 3400160          | 1610-8104                             | 4401-0407          | 4401-0164                        |

# DIGITAX HD

# SPECIFICATION

| Servo Series Specification |   | M753 EtherCAT   | M751 Base | M750 Ethernet                            | M754-MCi |
|----------------------------|---|---|-----------|--|----------|
| Performance                | Update Rates  | Current Loop Update: 62 $\mu$ s   |           |  |          |
|                            |   | Speed Loop Update: 250 $\mu$ s  |           |  |          |
|                            |   | Position Loop Update: 250 $\mu$ s   |           |  |          |
|                            | Overload  | *Closed-loop Overload: Maximum closed loop peak current for 0.25 s (from cold: 300 % for 8 s or 200 % for 60 s)             |           |  |          |
|                            |   | *Open-loop Overload: Maximum open loop peak current for 8 s (from cold: 150 % for 100 s)                                    |           |  |          |
| Max Output Frequency       | 550 Hz (RFC-A and RFC-S) 599 Hz (Open Loop)                       |   |           |  |          |
| Switching Frequency        | Configurable range: 2, 3, 4, 6, 8, 12, 16 kHz                     |   |           |  |          |
|                            | Default: 8kHz   |   |           |  |          |
| Ultraflow™ Technology      | Adjustable Venting  | Top venting or rear venting (with optional kit)   |           |  |          |
|                            | Intelligent Fan Control   | Temperature controlled fan operation with user adjustable speed limit   |           |  |          |
|                            | Managed Internal Airflow  | Managed airflow for maximum ingress protection  |           |  |          |
| Onboard Intelligence       | Motion  | Advanced Motion Controller  |           | MCI                                      |          |
|                            |   | Parameterised motion  |           | Programmable motion                      |          |
|                            |   | 1.5 Axes  |           | Up to 5 Axes                             |          |
|                            | PLC   | Positioning digital lock control  |           | Positioning digital lock control camming |          |
|                            |   | Real-time tasks   |           |  |          |
| Control                    | Motor Control Modes   | Onboard PLC   |           |  |          |
|                            |   | Onboard Machine Controller  |           |  |          |
|                            | Control Modes   | IEC61131-3 programming (IL, LD, FBD, SFC, ST, CFC)  |           |  |          |
|                            |   | V/F, Open loop vector, RFC-A (Sensorless or with feedback 'Closed Loop'), RFC-S (Sensorless or with feedback 'Closed Loop') |           |  |          |
|                            |   | Position control, speed control, torque control   |           |  |          |
| Control Features           | Stationary autotune for permanent magnet motors                   |   |           |  |          |
|                            | Advanced bi-quad filters for suppression of mechanical resonances |   |           |  |          |

RFC-S: Rotor Flux Control for Synchronous (permanent magnet brushless) motors

RFC-A: Rotor Flux Control for Asynchronous (induction) motors

\* The stated percentages apply only to three phase continuous current

|                                   |                         | M753 EtherCAT   | M751 Base    | M750 Ethernet                           | M754-MCi               |
|-----------------------------------|-------------------------|---|--------------|---|------------------------|
| <b>Interface</b>                  | Onboard Communications  | 2-port EtherCAT switch  | 2-port RS485 | 2-port Ethernet switch                  | 2-port Ethernet switch |
|                                   | Fieldbus                | EtherCAT  | Modbus RTU   | Modbus TCP/IP, EtherNet/IP, PROFINET RT | Modbus TCP/IP          |
|                                   | Real Time Motion        | EtherCAT (CoE)  | None         | RTMoE                                   | RTMoE                  |
|                                   | Analog I/O              | 1 Analog Input $\pm 10V$ , 12 bits (11 bits + sign)                           |              |   |                        |
|                                   | Digital I/O             | 2 DI, 2 DO (100 mA), 1 motor brake output (1 A, max 1.3 A)                    |              |   |                        |
|                                   | Pulse Train Input       | Frequency/Direction 5 V differential, 500 kHz                                 |              |   |                        |
|                                   | Encoder Feedback        | 2 x Encoder input and 1 simulated encoder output                              |              |   |                        |
|                                   | Supported Encoders      | Resolver, Quadrature, AB Servo, SinCos, EnDat (2.1/2.2), SSI, BiSS, Hiperface |              |   |                        |
|                                   | Safety                  | 2 x Safe Torque Off (STO) via terminal, PLe, SIL3                             |              |   |                        |
| <b>Commissioning</b>              | Interface               | Ethernet over EtherCAT (EoE)  | RS485        | Ethernet                                | Ethernet               |
|                                   | Commissioning Tool      | Connect   |              |   |                        |
|                                   | Motion Programming Tool | Machine Control Studio  |              |   |                        |
| <b>General</b>                    | Mechanical Attributes   | Removable cable screen clamp  |              |   |                        |
|                                   |                         | User replaceable fan(s)   |              |   |                        |
|                                   |                         | Conformal coating   |              |   |                        |
|                                   | Backup                  | SD Card   |              |   |                        |
|                                   |                         | Electronic motor nameplate parameter storage (HIPERFACE, Endat 2.2, BiSS)     |              |   |                        |
|                                   | Braking                 | Braking resistor: external / drive mountable                                  |              |   |                        |
|                                   |                         | Braking chopper: integrated   |              |   |                        |
|                                   | Multi-axis              | Busbars for common DC bus and earthing  |              |   |                        |
| Quick Links for 24 V distribution |                         |   |              |   |                        |
| Display                           | Yes                     | Optional  | Yes          | Yes                                     |                        |

# ENVIRONMENT SAFETY AND ELECTRICAL CONFORMANCE

## Environment

- IP rating: M75x drives are rated to IP20 (dry, non-conductive contamination)
- UL open class
- Ambient temperature -20 °C (-4 °F) to 40 °C (104 °F) as standard. Up to 55 °C (131 °F) with derating
- Humidity 95 % maximum (non-condensing) at 40 °C (104 °F)
- 1,000 m to 3,000 m (3,300 ft to 9,900 ft) above sea level: de-rate the maximum output current from the specified figure by 1% per 100 m (330 ft) above 1,000 m (3,300 ft)
- Storage temperature -40 °C (-40 °F) to 70 °C (158 °F)
- Mechanical Shock Tested in accordance with IEC 60068-2-27
- Random Vibration: Tested in accordance with IEC 60068-2-64

## Safety

- Safe Torque Off independently assessed by TÜV to IEC 61800-5-2
- SIL 3 and EN ISO 13849-1 PLe
- UL 61800-5-1 (Electrical Safety)

## Electrical conformance

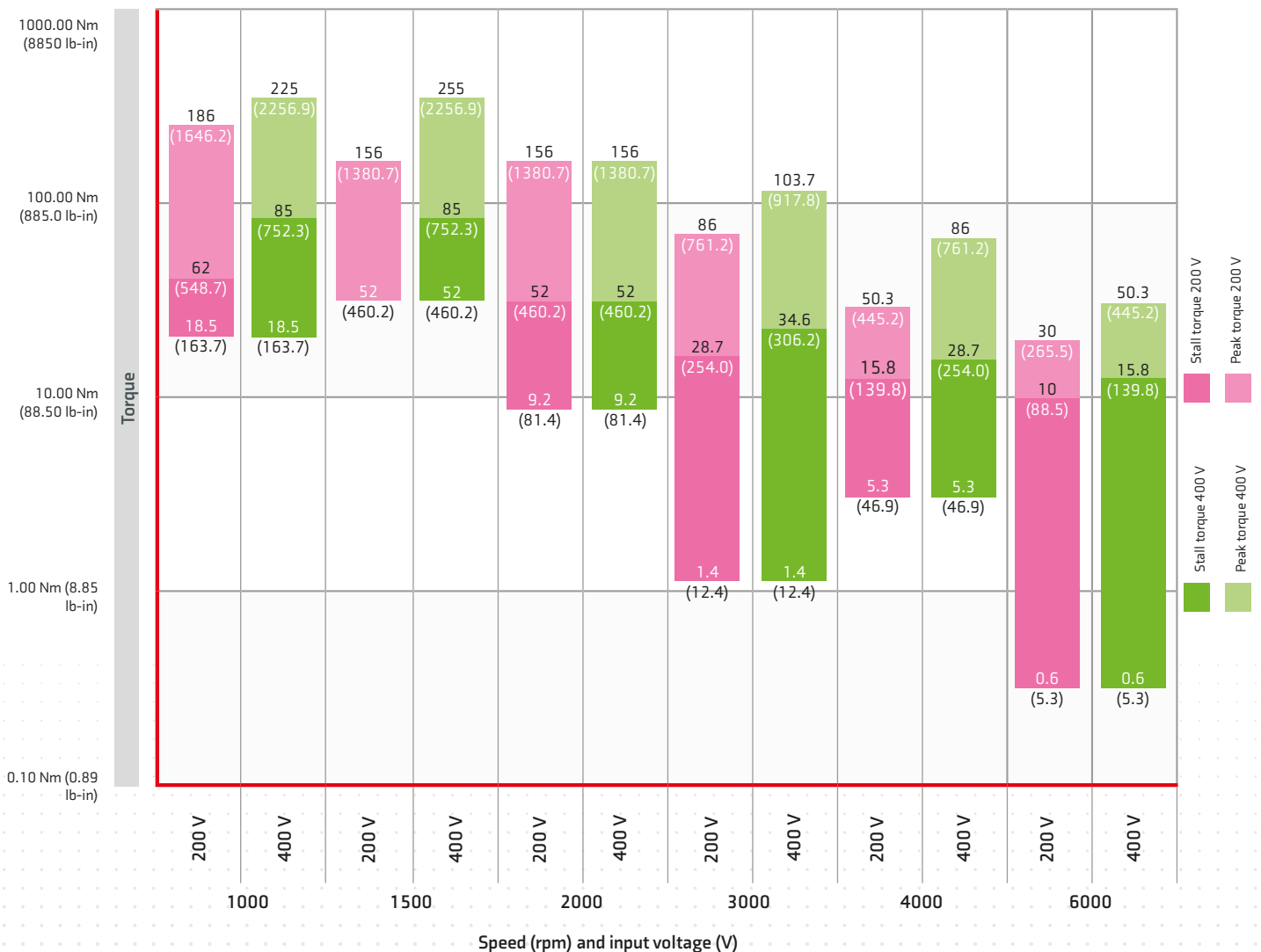
- Electromagnetic Immunity complies with EN 61800-3 and EN 61000-6-2
- With onboard EMC filters, complies with EN 61800-3 (2nd environment)
- EN 61000-6-3 and EN 61000-6-4 with optional EMC filter
- IEC 60146-1-1 supply conditions
- IEC 61800-5-1 (Electrical Safety)
- IEC 61131-2 I/O





# DIGITAX HD & UNIMOTOR HD MOTOR AND DRIVE COMBINATIONS

400 V range – 0.7 to 51 Nm (6.2 to 451 lb-in) with 300% peak stall torque  
 200 V range – 0.7 to 45 Nm (6.2 to 398 lb-in) with 300% peak stall torque



200 V Three Phase

For drive ratings, please see page 46 and motor ratings from page 50-61  
 \* Acceleration time to nominal speed is based on 1:1 motor to load inertia ratio

| Nominal speed 6000 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                              |                   |      |                        |
|--|---------------|--------------|--------------|---------|-------------|---------|-----------------------|---------------------------|-------------------------|------------------------------|-------------------|------|------------------------|
| Motor                                  | Drive         | Hybrid Cable | Stall Torque |         | Peak Torque |         | Inertia               |                           | Drive Cont. Current [A] | Drive Capacitance [ $\mu$ F] | Motor Cont. power |      | Time to 6000 rpm [ms]* |
|  |               |              | [Nm]         | [lb-in] | [Nm]        | [lb-in] | [kg-cm <sup>2</sup> ] | [lb-in-sec <sup>2</sup> ] |                         |                              | [kW]              | [hp] |                        |
| 060EDA60                               | M75x-01200022 | HYBAxAxxxx   | 0.6          | 5.3     | 2.2         | 19.5    | 0.18                  | 0.00016                   | 2.2                     | 580                          | 0.4               | 0.54 | 10.1                   |
| 060EDB60                               | M75x-01200040 | HYBAxAxxxx   | 1.3          | 11.5    | 4.5         | 39.8    | 0.33                  | 0.00029                   | 4                       | 580                          | 0.8               | 1.07 | 9.3                    |
| 060EDC60                               | M75x-01200040 | HYBAxAxxxx   | 1.9          | 16.8    | 6.7         | 59.3    | 0.48                  | 0.00042                   | 4                       | 580                          | 1.2               | 1.61 | 10.7                   |
| 067EDA60                               | M75x-01200040 | HYBAxAxxxx   | 1.4          | 12.4    | 4.3         | 38.1    | 0.30                  | 0.00027                   | 4                       | 580                          | 0.8               | 1.07 | 8.8                    |
| 067EDB60                               | M75x-01200065 | HYBAxAxxxx   | 2.5          | 22.1    | 7.5         | 66.4    | 0.53                  | 0.00047                   | 6.5                     | 580                          | 1.4               | 1.88 | 8.9                    |
| 067EDC60                               | M75x-01200040 | HYBAxAxxxx   | 3.6          | 31.9    | 10.9        | 96.5    | 0.75                  | 0.00066                   | 4                       | 580                          | 1.2               | 1.61 | 16.7                   |
| 067EDD60                               | M75x-02200120 | HYBAxAxxxx   | 4.6          | 40.7    | 14.3        | 126.6   | 0.94                  | 0.00083                   | 12                      | 1160                         | 2.5               | 3.35 | 8.3                    |
| 089EDA60                               | M75x-02200090 | HYBAxAxxxx   | 3.1          | 27.4    | 9.3         | 82.3    | 0.87                  | 0.00077                   | 9                       | 1160                         | 1.7               | 2.28 | 11.7                   |
| 089EDB60                               | M75x-02200120 | HYBAxAxxxx   | 5.3          | 46.9    | 16.0        | 141.6   | 1.61                  | 0.00142                   | 12                      | 1160                         | 2.4               | 3.22 | 12.6                   |
| 089EDC60                               | M75x-03200160 | HYBBxAxxxx   | 7.8          | 69.0    | 23.3        | 206.2   | 2.34                  | 0.00207                   | 16                      | 1880                         | 3.1               | 4.16 | 13                     |
| 115EDA60                               | M75x-02200120 | HYBAxAxxxx   | 5.7          | 50.4    | 17.1        | 151.3   | 2.40                  | 0.00212                   | 12                      | 1160                         | 2.3               | 3.08 | 17.8                   |
| 115EDB60                               | M75x-02200090 | HYBAxAxxxx   | 10.0         | 88.5    | 30.0        | 265.5   | 4.41                  | 0.00390                   | 9                       | 1160                         | 2.7               | 3.62 | 43.7                   |
| Nominal speed 4000 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                              |                   |      |                        |
| 089EDB40                               | M75x-02200090 | HYBAxAxxxx   | 5.3          | 46.9    | 16.0        | 141.6   | 1.61                  | 0.00142                   | 9                       | 1160                         | 1.9               | 2.55 | 8.4                    |
| 089EDC40                               | M75x-02200120 | HYBAxAxxxx   | 7.8          | 69.0    | 23.3        | 206.2   | 2.34                  | 0.00207                   | 12                      | 1160                         | 2.7               | 3.62 | 8.4                    |
| 115EDC40                               | M75x-03200160 | HYBBxAxxxx   | 14.3         | 126.6   | 42.9        | 379.7   | 6.39                  | 0.00566                   | 16                      | 1880                         | 3.6               | 4.83 | 15.9                   |
| 142EDB40                               | M75x-03200160 | HYBBxBxxxx   | 15.8         | 139.8   | 50.3        | 445.2   | 11.00                 | 0.00974                   | 16                      | 1880                         | 4.7               | 6.30 | 27.4                   |
| Nominal speed 3000 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                              |                   |      |                        |
| 067EDA30                               | M75x-01200022 | HYBAxAxxxx   | 1.4          | 12.4    | 4.3         | 38.1    | 0.30                  | 0.00027                   | 2.2                     | 580                          | 0.4               | 0.54 | 4.4                    |
| 067EDB30                               | M75x-01200040 | HYBAxAxxxx   | 2.5          | 22.1    | 7.5         | 66.4    | 0.53                  | 0.00047                   | 4                       | 580                          | 0.8               | 1.07 | 4.4                    |
| 067EDC30                               | M75x-01200040 | HYBAxAxxxx   | 3.6          | 31.9    | 10.9        | 96.5    | 0.75                  | 0.00066                   | 4                       | 580                          | 1.1               | 1.48 | 4.3                    |
| 067EDD30                               | M75x-01200065 | HYBAxAxxxx   | 4.6          | 40.7    | 14.3        | 126.6   | 0.94                  | 0.00083                   | 6.5                     | 580                          | 1.4               | 1.88 | 4.1                    |
| 089EDA30                               | M75x-01200040 | HYBAxAxxxx   | 3.1          | 27.4    | 9.3         | 82.3    | 0.87                  | 0.00077                   | 4                       | 580                          | 0.9               | 1.21 | 5.9                    |
| 089EDB30                               | M75x-01200065 | HYBAxAxxxx   | 5.3          | 46.9    | 16.0        | 141.6   | 1.61                  | 0.00142                   | 6.5                     | 580                          | 1.5               | 2.01 | 6.3                    |
| 089EDC30                               | M75x-02200090 | HYBAxAxxxx   | 7.8          | 69.0    | 23.3        | 206.2   | 2.34                  | 0.00207                   | 9                       | 1160                         | 2.1               | 2.82 | 6.3                    |
| 089EDD30                               | M75x-02200120 | HYBAxAxxxx   | 10.0         | 88.5    | 30.6        | 270.8   | 3.20                  | 0.00283                   | 12                      | 1160                         | 2.6               | 3.49 | 6.6                    |
| 115EDA30                               | M75x-01200065 | HYBAxAxxxx   | 5.7          | 50.4    | 17.1        | 151.3   | 2.40                  | 0.00212                   | 6.5                     | 580                          | 1.5               | 2.01 | 8.8                    |
| 115EDB30                               | M75x-02200120 | HYBAxAxxxx   | 10.0         | 88.5    | 30.0        | 265.5   | 4.41                  | 0.00390                   | 12                      | 1160                         | 2.4               | 3.22 | 9.2                    |
| 115EDC30                               | M75x-03200160 | HYBBxAxxxx   | 14.3         | 126.6   | 42.9        | 379.7   | 6.39                  | 0.00566                   | 16                      | 1880                         | 3.2               | 4.29 | 9.4                    |
| 142EDA30                               | M75x-02200120 | HYBAxAxxxx   | 9.2          | 81.4    | 27.6        | 244.3   | 5.60                  | 0.00496                   | 12                      | 1160                         | 2.3               | 3.08 | 12.8                   |
| 142EDB30                               | M75x-03200160 | HYBBxBxxxx   | 15.8         | 139.8   | 50.3        | 445.2   | 11.00                 | 0.00974                   | 16                      | 1880                         | 4                 | 5.36 | 15.5                   |
| 142EDC30                               | M75x-03200160 | HYBBxBxxxx   | 22.8         | 201.8   | 68.3        | 604.5   | 17.00                 | 0.01505                   | 16                      | 1880                         | 4.7               | 6.30 | 23.9                   |
| 142EDD30                               | M75x-02200120 | HYBAxBxxxx   | 28.7         | 254.0   | 86.0        | 761.2   | 22.10                 | 0.01956                   | 12                      | 1160                         | 3.5               | 4.69 | 41.5                   |
| 190EDA30                               | M75x-03200160 | HYBBxBxxxx   | 18.5         | 163.7   | 51.0        | 451.4   | 22.00                 | 0.01947                   | 16                      | 1880                         | 4.7               | 6.30 | 31                     |
| Nominal speed 2000 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                              |                   |      |                        |
| 115EDC20                               | M75x-02200120 | HYBAxAxxxx   | 14.3         | 126.6   | 42.9        | 379.7   | 6.39                  | 0.00566                   | 12                      | 1160                         | 2.4               | 3.22 | 6.2                    |
| 115EDD20                               | M75x-03200160 | HYBBxAxxxx   | 18.4         | 162.9   | 55.3        | 489.4   | 8.38                  | 0.00742                   | 16                      | 1880                         | 3.2               | 4.29 | 6.4                    |
| 142EDA20                               | M75x-01200065 | HYBAxAxxxx   | 9.2          | 81.4    | 27.6        | 244.3   | 5.60                  | 0.00496                   | 6.5                     | 580                          | 1.6               | 2.15 | 8.6                    |
| 142EDB20                               | M75x-02200120 | HYBAxAxxxx   | 15.8         | 139.8   | 50.3        | 445.2   | 11.00                 | 0.00974                   | 12                      | 1160                         | 2.9               | 3.89 | 9.2                    |
| 142EDC20                               | M75x-03200160 | HYBBxBxxxx   | 22.8         | 201.8   | 68.3        | 604.5   | 17.00                 | 0.01505                   | 16                      | 1880                         | 4.1               | 5.50 | 10.6                   |
| 190EDC20                               | M75x-03200160 | HYBBxBxxxx   | 49           | 433.7   | 156.0       | 1380.7  | 54.60                 | 0.04833                   | 16                      | 1880                         | 4.7               | 6.30 | 34.3                   |

| Nominal speed 1500 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                              |                   |      |                        |
|--|---------------|--------------|--------------|---------|-------------|---------|-----------------------|---------------------------|-------------------------|------------------------------|-------------------|------|------------------------|
| Motor                                  | Drive         | Hybrid Cable | Stall Torque |         | Peak Torque |         | Inertia               |                           | Drive Cont. Current [A] | Drive Capacitance [ $\mu$ F] | Motor Cont. power |      | Time to 1000 rpm [ms]* |
|  |               |              | [Nm]         | [lb-in] | [Nm]        | [lb-in] | [kg-cm <sup>2</sup> ] | [lb-in-sec <sup>2</sup> ] |                         |                              | [kW]              | [hp] |                        |
| 190EDC15                               | M75x-03200160 | HYBBxBxxxx   | 49           | 433.7   | 156.0       | 1380.7  | 54.60                 | 0.04833                   | 16                      | 1880                         | 4.7               | 6.30 | 19.2                   |
| Nominal speed 1000 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                              |                   |      |                        |
| 190EDA10                               | M75x-01200065 | HYBAxBxxxx   | 18.5         | 163.7   | 51.0        | 451.4   | 22.00                 | 0.01947                   | 6.5                     | 580                          | 1.8               | 2.41 | 9                      |
| 190EDC10                               | M75x-03200160 | HYBBxBxxxx   | 49           | 433.7   | 156.0       | 1380.7  | 54.60                 | 0.04833                   | 16                      | 1880                         | 4.7               | 6.30 | 8.5                    |
| 190EDD10                               | M75x-03200160 | HYBBxBxxxx   | 62.0         | 548.7   | 186.0       | 1646.2  | 70.90                 | 0.06275                   | 16                      | 1880                         | 4.7               | 6.30 | 11                     |

## 400 V Three Phase

For drive ratings, please see page 45 and motor ratings from page 50 to 61.  
\* Acceleration time to nominal speed is based on 1:1 motor to load inertia ratio

| Nominal speed 6000 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                              |                   |      |                        |
|--|---------------|--------------|--------------|---------|-------------|---------|-----------------------|---------------------------|-------------------------|------------------------------|-------------------|------|------------------------|
| Motor                                  | Drive         | Hybrid Cable | Stall Torque |         | Peak Torque |         | Inertia               |                           | Drive Cont. Current [A] | Drive Capacitance [ $\mu$ F] | Motor Cont. power |      | Time to 6000 rpm [ms]* |
|  |               |              | [Nm]         | [lb-in] | [Nm]        | [lb-in] | [kg-cm <sup>2</sup> ] | [lb-in-sec <sup>2</sup> ] |                         |                              | [kW]              | [hp] |                        |
| 060UDA60                               | M75x-01400015 | HYBAxAxxxx   | 0.6          | 5.3     | 2.2         | 19.5    | 0.18                  | 0.00016                   | 1.5                     | 110                          | 0.4               | 0.54 | 10.1                   |
| 060UDB60                               | M75x-01400015 | HYBAxAxxxx   | 1.3          | 11.5    | 4.5         | 39.8    | 0.33                  | 0.00029                   | 1.5                     | 110                          | 0.8               | 1.07 | 11.5                   |
| 060UDC60                               | M75x-01400030 | HYBAxAxxxx   | 1.9          | 16.8    | 6.7         | 59.3    | 0.48                  | 0.00042                   | 3                       | 110                          | 1.2               | 1.61 | 9                      |
| 067UDA60                               | M75x-01400030 | HYBAxAxxxx   | 1.4          | 12.4    | 4.3         | 38.1    | 0.30                  | 0.00027                   | 3                       | 110                          | 0.8               | 1.07 | 8.8                    |
| 067UDB60                               | M75x-01400042 | HYBAxAxxxx   | 2.5          | 22.1    | 7.5         | 66.4    | 0.53                  | 0.00047                   | 4.2                     | 110                          | 1.4               | 1.88 | 8.9                    |
| 067UDC60                               | M75x-02400060 | HYBAxAxxxx   | 3.6          | 31.9    | 10.9        | 96.5    | 0.75                  | 0.00066                   | 6                       | 290                          | 1.9               | 2.55 | 8.7                    |
| 067UDD60                               | M75x-02400060 | HYBAxAxxxx   | 4.6          | 40.7    | 14.3        | 126.6   | 0.94                  | 0.00083                   | 6                       | 290                          | 2.5               | 3.35 | 8.3                    |
| 089UDA60                               | M75x-01400042 | HYBAxAxxxx   | 3.1          | 27.4    | 9.3         | 82.3    | 0.87                  | 0.00077                   | 4.2                     | 110                          | 1.7               | 2.28 | 11.7                   |
| 089UDB60                               | M75x-02400080 | HYBAxAxxxx   | 5.3          | 46.9    | 16.0        | 141.6   | 1.61                  | 0.00142                   | 8                       | 290                          | 2.4               | 3.22 | 12.6                   |
| 089UDC60                               | M75x-02400105 | HYBAxAxxxx   | 7.8          | 69.0    | 23.3        | 206.2   | 2.34                  | 0.00207                   | 10.5                    | 290                          | 3.1               | 4.16 | 12.6                   |
| 115UDA60                               | M75x-02400080 | HYBAxAxxxx   | 5.7          | 50.4    | 17.1        | 151.3   | 2.40                  | 0.00212                   | 8                       | 290                          | 2.3               | 3.08 | 17.7                   |
| 115UDB60                               | M75x-03400135 | HYBBxAxxxx   | 10.0         | 88.5    | 30.0        | 265.5   | 4.41                  | 0.00390                   | 13.5                    | 470                          | 3                 | 4.02 | 18.5                   |
| 142UDB60                               | M75x-03400160 | HYBBxBxxxx   | 15.8         | 139.8   | 50.3        | 445.2   | 11.00                 | 0.00974                   | 16                      | 470                          | 4.4               | 5.90 | 36                     |
| Nominal speed 4000 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                              |                   |      |                        |
| 089UDB40                               | M75x-02400060 | HYBAxAxxxx   | 5.3          | 46.9    | 16.0        | 141.6   | 1.61                  | 0.00142                   | 6                       | 290                          | 1.9               | 2.55 | 8.4                    |
| 089UDC40                               | M75x-02400080 | HYBAxAxxxx   | 7.8          | 69.0    | 23.3        | 206.2   | 2.34                  | 0.00207                   | 8                       | 290                          | 2.7               | 3.62 | 8.4                    |
| 115UDC40                               | M75x-03400135 | HYBBxAxxxx   | 14.3         | 126.6   | 55.3        | 489.4   | 6.39                  | 0.00566                   | 13.5                    | 470                          | 3.6               | 4.83 | 11                     |
| 142UDB40                               | M75x-03400135 | HYBBxAxxxx   | 15.8         | 139.8   | 50.3        | 445.2   | 11.00                 | 0.00974                   | 13.5                    | 470                          | 4.9               | 6.57 | 19                     |
| 142UDD40                               | M75x-03400160 | HYBBxBxxxx   | 28.7         | 254.0   | 86.0        | 761.2   | 22.10                 | 0.01956                   | 16                      | 470                          | 6.2               | 8.31 | 32.1                   |

| Nominal speed 3000 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                        |                   |       |                        |
|--|---------------|--------------|--------------|---------|-------------|---------|-----------------------|---------------------------|-------------------------|------------------------|-------------------|-------|------------------------|
| Motor                                  | Drive         | Hybrid Cable | Stall Torque |         | Peak Torque |         | Inertia               |                           | Drive Cont. Current [A] | Drive Capacitance [µF] | Motor Cont. power |       | Time to 3000 rpm [ms]* |
|  |               |              | [Nm]         | [lb-in] | [Nm]        | [lb-in] | [kg-cm <sup>2</sup> ] | [lb-in-sec <sup>2</sup> ] |                         |                        | [kW]              | [hp]  |                        |
| 067UDA30                               | M75x-01400030 | HYBAxAxxxx   | 1.4          | 12.4    | 4.3         | 38.1    | 0.30                  | 0.00027                   | 3                       | 110                    | 0.4               | 0.54  | 4.4                    |
| 067UDB30                               | M75x-01400015 | HYBAxAxxxx   | 2.5          | 22.1    | 7.5         | 66.4    | 0.53                  | 0.00047                   | 1.5                     | 110                    | 0.8               | 1.07  | 4.6                    |
| 067UDC30                               | M75x-01400030 | HYBAxAxxxx   | 3.6          | 31.9    | 10.9        | 96.5    | 0.75                  | 0.00066                   | 3                       | 110                    | 1.1               | 1.48  | 4.3                    |
| 067UDD30                               | M75x-01400030 | HYBAxAxxxx   | 4.6          | 40.7    | 14.3        | 126.6   | 0.94                  | 0.00083                   | 3                       | 110                    | 1.4               | 1.88  | 4.1                    |
| 089UDA30                               | M75x-01400030 | HYBAxAxxxx   | 3.1          | 27.4    | 9.3         | 82.3    | 0.87                  | 0.00077                   | 3                       | 110                    | 0.9               | 1.21  | 5.9                    |
| 089UDB30                               | M75x-01400042 | HYBAxAxxxx   | 5.3          | 46.9    | 16.0        | 141.6   | 1.61                  | 0.00142                   | 4.2                     | 110                    | 1.5               | 2.01  | 6.3                    |
| 089UDC30                               | M75x-02400060 | HYBAxAxxxx   | 7.8          | 69.0    | 23.3        | 206.2   | 2.34                  | 0.00207                   | 6                       | 290                    | 2.1               | 2.82  | 6.3                    |
| 089UDD30                               | M75x-02400080 | HYBAxAxxxx   | 10.0         | 88.5    | 30.6        | 270.8   | 3.20                  | 0.00283                   | 8                       | 290                    | 2.6               | 3.49  | 6.6                    |
| 115UDA30                               | M75x-01400042 | HYBAxAxxxx   | 5.7          | 50.4    | 17.1        | 151.3   | 2.40                  | 0.00212                   | 4.2                     | 110                    | 1.5               | 2.01  | 8.8                    |
| 115UDB30                               | M75x-02400080 | HYBAxAxxxx   | 10.0         | 88.5    | 30.0        | 265.5   | 4.41                  | 0.00390                   | 8                       | 290                    | 2.4               | 3.22  | 9.2                    |
| 115UDC30                               | M75x-02400105 | HYBAxAxxxx   | 14.3         | 126.6   | 42.9        | 379.7   | 6.39                  | 0.00566                   | 10.5                    | 290                    | 3.2               | 4.29  | 9.4                    |
| 115UDD30                               | M75x-03400135 | HYBBxAxxxx   | 18.4         | 162.9   | 55.3        | 489.4   | 8.38                  | 0.00742                   | 13.5                    | 470                    | 4.2               | 5.63  | 9.5                    |
| 142UDA30                               | M75x-02400060 | HYBAxAxxxx   | 9.2          | 81.4    | 27.6        | 244.3   | 5.60                  | 0.00496                   | 6                       | 290                    | 2.3               | 3.08  | 12.8                   |
| 142UDB30                               | M75x-02400105 | HYBAxAxxxx   | 15.8         | 139.8   | 50.3        | 445.2   | 11.00                 | 0.00974                   | 10.5                    | 290                    | 4                 | 5.36  | 13.7                   |
| 142UDC30                               | M75x-03400160 | HYBBxAxxxx   | 22.8         | 201.8   | 68.3        | 604.5   | 17.00                 | 0.01505                   | 16                      | 470                    | 5.3               | 7.11  | 15.7                   |
| 142UDD30                               | M75x-03400160 | HYBBxBxxxx   | 28.7         | 254.0   | 86.0        | 761.2   | 22.10                 | 0.01956                   | 16                      | 470                    | 6                 | 8.05  | 18.1                   |
| 142UDE30                               | M75x-03400160 | HYBBxBxxxx   | 34.6         | 306.2   | 103.7       | 917.8   | 27.20                 | 0.02407                   | 16                      | 470                    | 6.6               | 8.85  | 22.3                   |
| 190UDA30                               | M75x-03400135 | HYBBxBxxxx   | 18.5         | 163.7   | 51.0        | 451.4   | 22.00                 | 0.01947                   | 13.5                    | 470                    | 4.9               | 6.57  | 27.1                   |
| 190UDB30                               | M75x-03400160 | HYBBxBxxxx   | 32.7         | 289.4   | 95.0        | 840.8   | 38.30                 | 0.03390                   | 16                      | 470                    | 7.9               | 10.59 | 31.3                   |
| Nominal speed 2000 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                        |                   |       |                        |
| 115UDC20                               | M75x-02400060 | HYBAxAxxxx   | 14.3         | 126.6   | 42.9        | 379.7   | 6.39                  | 0.00566                   | 6                       | 290                    | 2.4               | 3.22  | 6.2                    |
| 115UDD20                               | M75x-02400080 | HYBAxAxxxx   | 18.4         | 162.9   | 55.3        | 489.4   | 8.38                  | 0.00742                   | 8                       | 290                    | 3.2               | 4.29  | 6.4                    |
| 142UDA20                               | M75x-01400042 | HYBAxAxxxx   | 9.2          | 81.4    | 27.6        | 244.3   | 5.60                  | 0.00496                   | 4.2                     | 110                    | 1.6               | 2.15  | 8.5                    |
| 142UDB20                               | M75x-02400080 | HYBAxAxxxx   | 15.8         | 139.8   | 50.3        | 445.2   | 11.00                 | 0.00974                   | 8                       | 290                    | 2.9               | 3.89  | 9.2                    |
| 142UDC20                               | M75x-02400105 | HYBAxAxxxx   | 22.8         | 201.8   | 68.3        | 604.5   | 17.00                 | 0.01505                   | 10.5                    | 290                    | 4.1               | 5.50  | 10.4                   |
| 190UDC20                               | M75x-03400160 | HYBBxBxxxx   | 49           | 433.7   | 156.0       | 1380.7  | 54.60                 | 0.04833                   | 16                      | 470                    | 8                 | 10.73 | 19.9                   |
| Nominal speed 1500 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                        |                   |       |                        |
| 190UDC15                               | M75x-03400160 | HYBBxBxxxx   | 52.0         | 460.2   | 156.0       | 1380.7  | 54.60                 | 0.04833                   | 16                      | 470                    | 7.3               | 9.79  | 11.2                   |
| 190UDF15                               | M75x-03400160 | HYBBxBxxxx   | 85.0         | 752.3   | 255.0       | 2256.9  | 103.50                | 0.09161                   | 16                      | 470                    | 8                 | 10.73 | 21.2                   |
| Nominal speed 1000 rpm - 300% overload |               |              |              |         |             |         |                       |                           |                         |                        |                   |       |                        |
| 190UDA10                               | M75x-01400042 | HYBAxBxxxx   | 18.5         | 163.7   | 51.0        | 451.4   | 22.00                 | 0.01947                   | 4.2                     | 110                    | 1.8               | 2.41  | 9                      |
| 190UDF10                               | M75x-03400160 | HYBBxBxxxx   | 85.0         | 752.3   | 255.0       | 2256.9  | 103.50                | 0.09161                   | 16                      | 470                    | 8                 | 10.73 | 9.4                    |

# MODULAR MULTI-AXIS CONFIGURATION

## Sizing the common DC bus

### Basic sizing of your system in 4 easy steps

- 1 Choose drive & motor combination based on speed and torque requirements [see pages 33 to 35](#)
- 2 Note nominal power & drive capacitance for each combination
- 3 Choose the drive to act as power supply for the drive group. Usually the largest drive
- 4 Check that:
  - sum of drive capacitance  $\leq$  maximum capacitance\*\*
  - sum of nominal power  $\leq$  maximum input power\*\*
 (Refer to tables opposite)

Digitax HD drives have a high capacity input power stage, allowing for a group of drives on a common DC bus to be powered by a single AC connection.

Alternatively, for larger configurations an external DC source can be used, such as a larger frame Unidrive M.

\* External AC Line Reactor required. Please refer to the Installation and Technical Guide.  
 \*\* If any of the values are exceeded, the system needs to be split in groups and the procedure repeated for each group.

|        |               | 200V                 |                           |                      |                      |
|--------|---------------|----------------------|---------------------------|----------------------|----------------------|
|        |               | Max Capacitance (µF) | Internal Capacitance (µF) | Max Input Power (kW) | Max Input Power (hp) |
| Size 1 | M75x-01200022 |                      |                           |                      |                      |
|        | M75x-01200040 | 5800                 | 580                       | 4 / 5.2*             | 5.4 / 7.0*           |
|        | M75x-01200065 |                      |                           |                      |                      |
| Size 2 | M75x-02200090 | 4640                 | 1160                      | 5.3 / 6.9*           | 7.1 / 9.3*           |
|        | M75x-02200012 |                      |                           |                      |                      |
| Size 3 | M75x-03200160 | 3760                 | 1880                      | 6.3 / 10*            | 8.5 / 13.4*          |

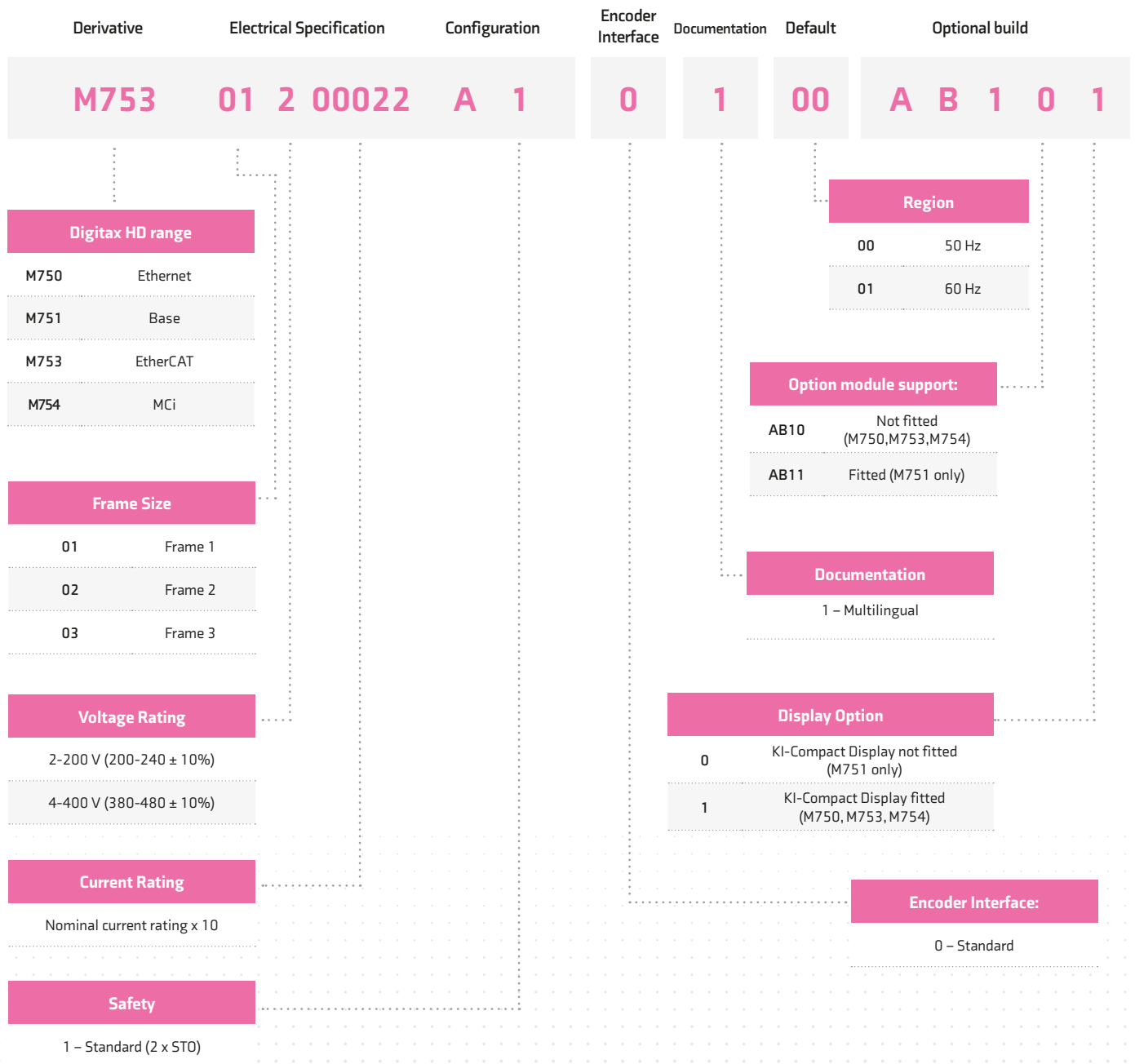
|        |               | 400V                 |                           |                      |                      |
|--------|---------------|----------------------|---------------------------|----------------------|----------------------|
|        |               | Max Capacitance (µF) | Internal Capacitance (µF) | Max Input Power (kW) | Max Input Power (hp) |
| Size 1 | M75x-01400015 |                      |                           |                      |                      |
|        | M75x-01400030 | 1900                 | 110                       | 6.5 / 8.5*           | 8.7 / 11.4*          |
|        | M75x-01400042 |                      |                           |                      |                      |
| Size 2 | M75x-02400060 |                      |                           |                      |                      |
|        | M75x-02400080 | 2030                 | 290                       | 8.7 / 11.4*          | 11.7 / 15.3*         |
|        | M75x-02400105 |                      |                           |                      |                      |
| Size 3 | M75x-03400135 | 2210                 | 470                       | 10 / 13*             | 13.4 / 17.4*         |
|        | M75x-03400160 |                      |                           |                      |                      |

**NOTE:** The number of drives that can be connected on a common DC bus group depends on the total installed capacitance, the power rating of the input stage and the power profile of each axis. There is also a limit of 10 drives for the 24 Vdc link.

**For optimised sizing please refer to the Installation and Technical Guide.**

# DIGITAX HD DRIVES

## PRODUCT CODE STRUCTURE



# UNIMOTOR HD MOTORS

## PRODUCT CODE STRUCTURE



<sup>1</sup> See "Recommended power connector size" in motor rating tables p. 50 onwards

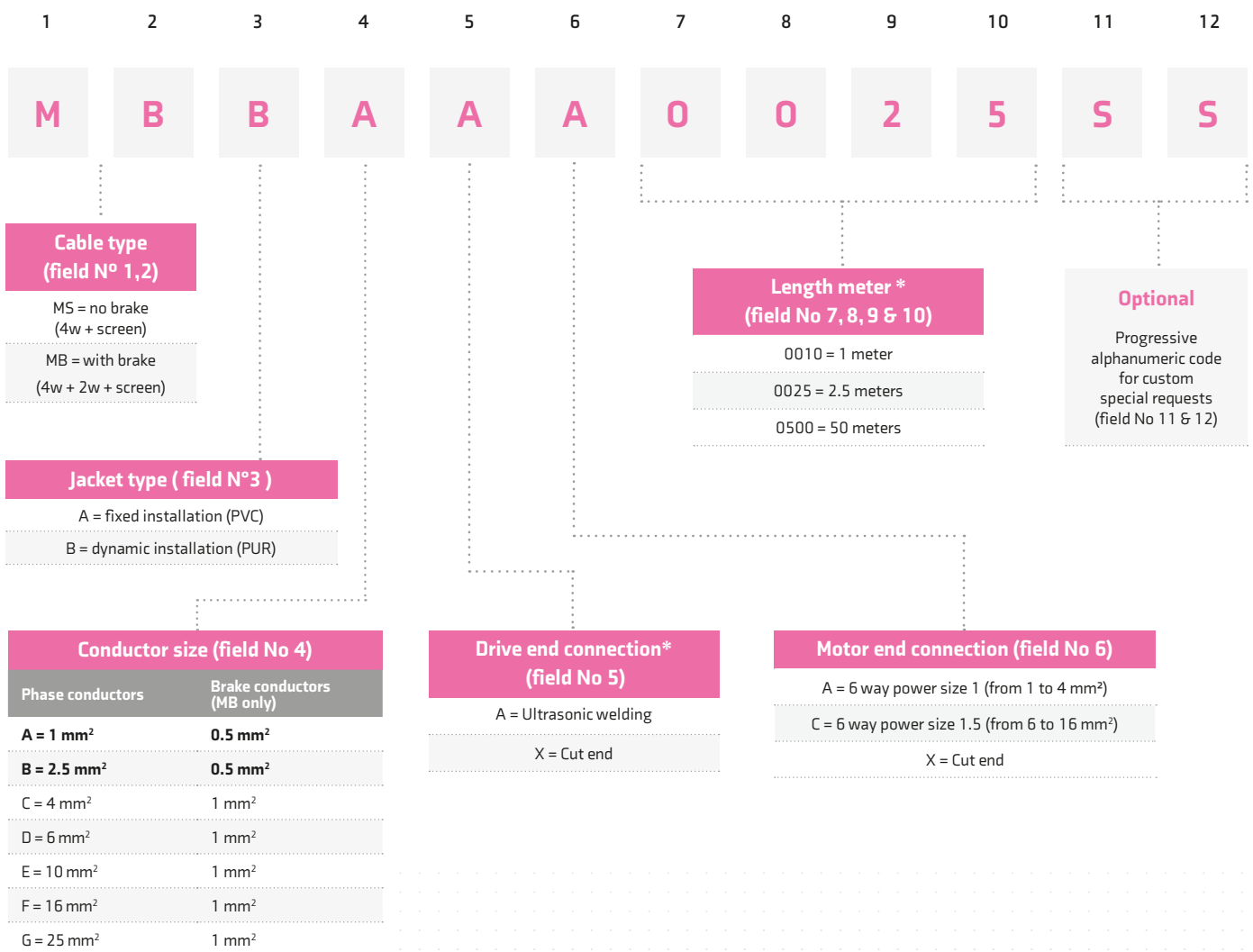
Additional feedback options available on request.

for Functional Safety up to SIL 3 please add -SRES at the end of the product code

# CABLES AND CONNECTIONS

# POWER CABLE

## PRODUCT CODE STRUCTURE

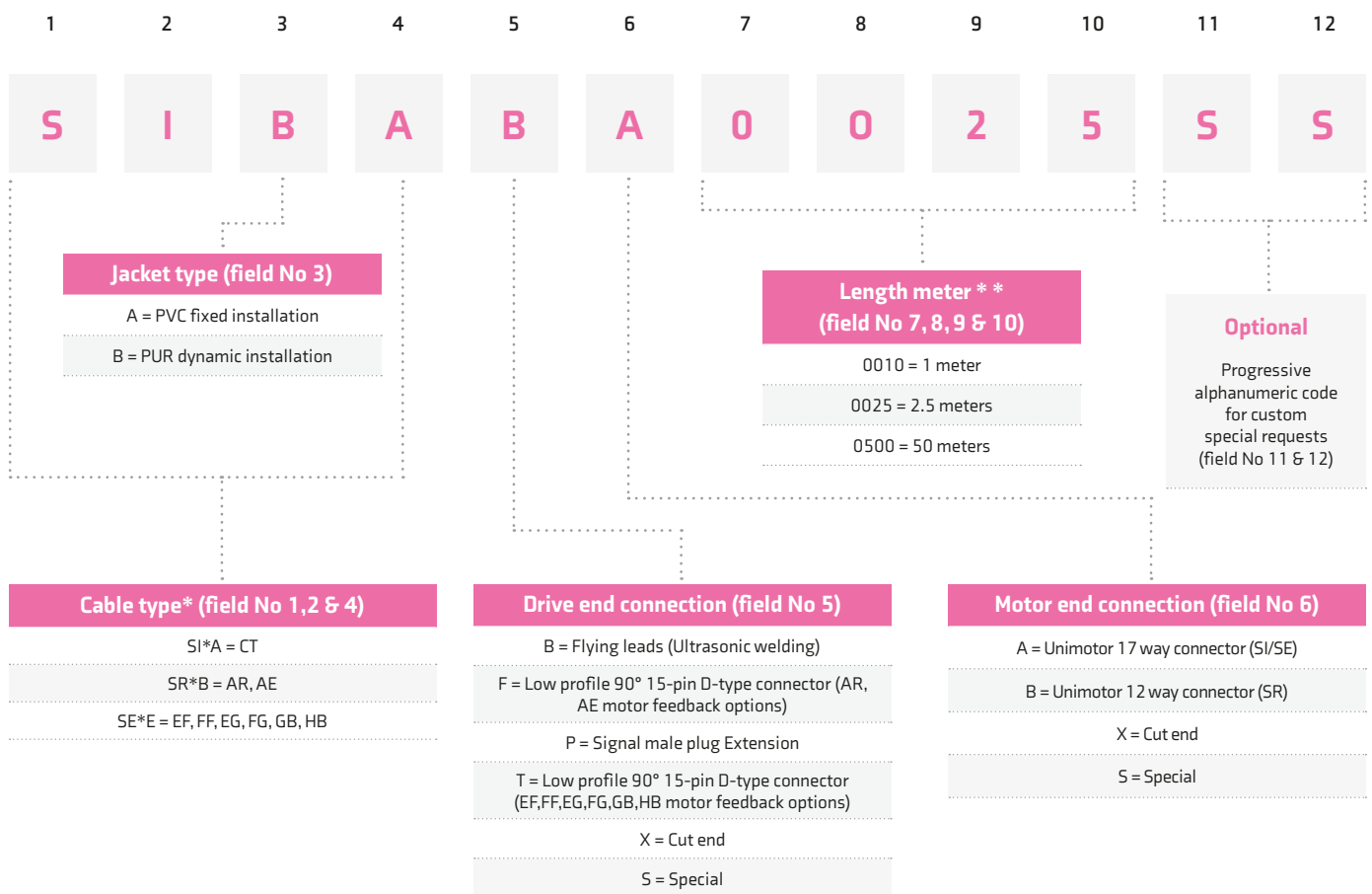


\* Cable length always rounded up to the next half meter; Eg. 2.1 will be changed to a 2.5 meter cable.  
Maximum cable length is 50m

# CABLES AND CONNECTIONS

# SIGNAL CABLE

## PRODUCT CODE STRUCTURE



\* Selected based on the "Feedback Device" field of the motor product code key, see page 38.

e.g. 067UDB300BACRA would require a SIBAF A0050 cable part number.

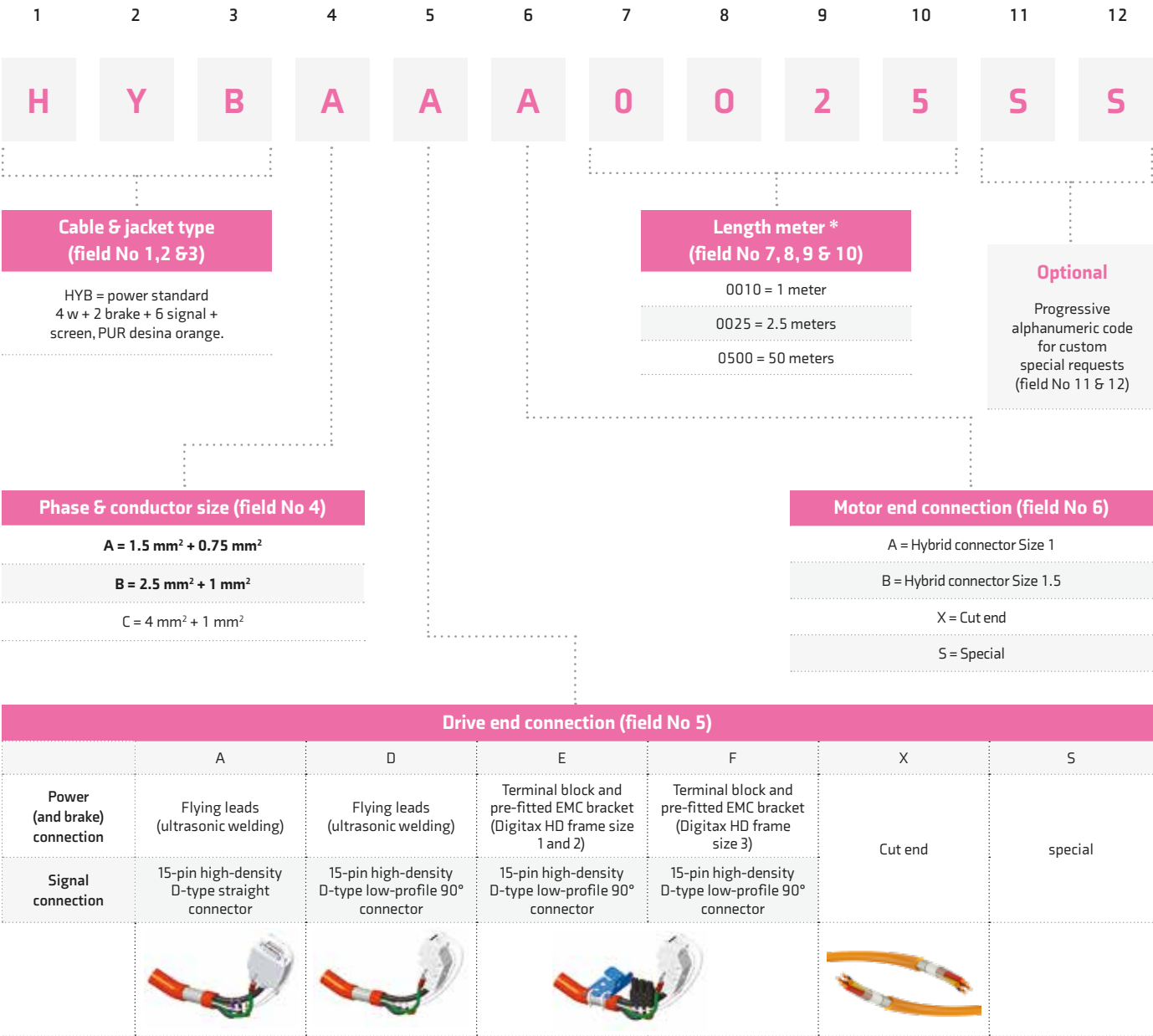
\*\* Cable length always rounded up to the next half meter; Eg. 2.1 will be changed to a 2.5 meter cable.

Maximum cable length is 50m.

# CABLES AND CONNECTIONS

# HYBRID CABLE

## PRODUCT CODE STRUCTURE

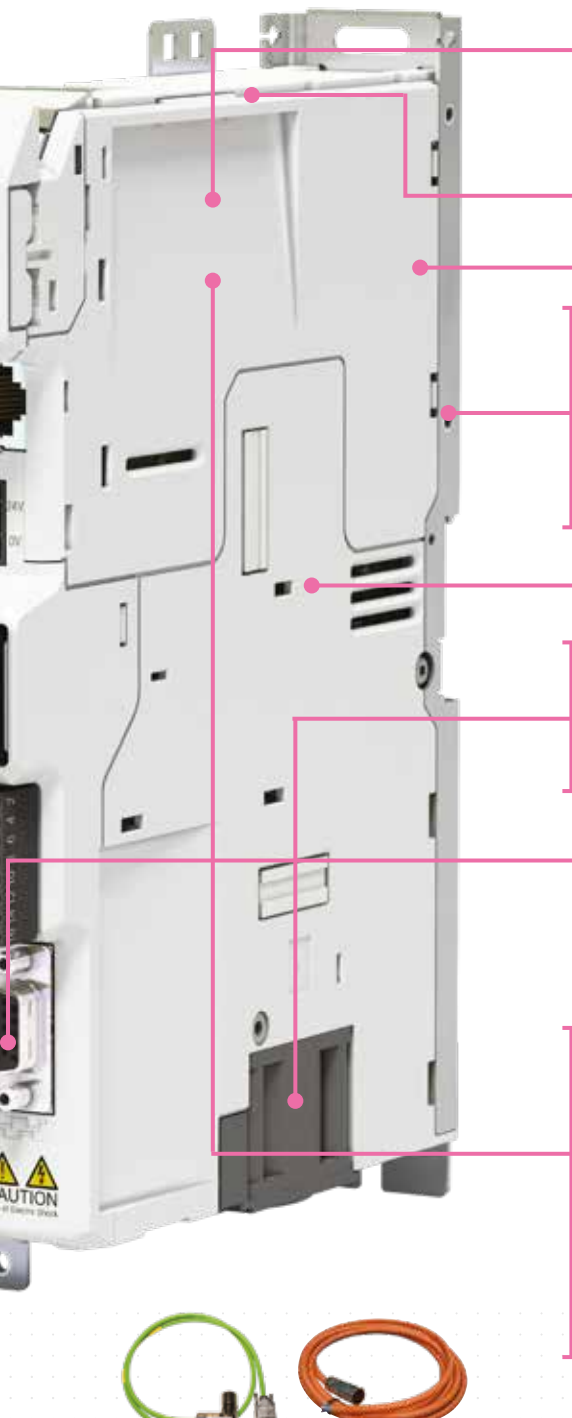


\* Cable length always rounded up to the next half meter; Eg. 2.1 will be changed to a 2.5 meter cable.  
Maximum cable length is 50m






# KITS AND ACCESSORIES ORDERING GUIDE

| Multi-axis Kit                 |   |   |
|--------------------------------|---|---|
| Product code                   | Accessory   | Description   |
| 9500-1047                      |    | Multi-axis Kit (standard – without SI-Option Mounting Kit fitted) |
| 9500-1048                      |   | Multi-axis Kit (with SI-Option Mounting Kit fitted)               |
| DC bus accessories             |   |   |
| 3470-0145                      |  | External Cable Grommet Kit up to 6mm <sup>2</sup>                 |
| 9500-1050                      |  | External DC Cable connection Kit up to 16mm <sup>2</sup>          |
| Communications and Diagnostics |   |   |
| 4500-0096                      |  | USB to EIA485 Communications Converter Cable                      |
| 82700000020300                 |  | KI-Compact 485 Adaptor  |
| 82700000020400                 |  | KI-Compact Display  |
| 82400000019600                 |  | Remote Keypad RTC   |






**General accessories**

| Product code   | Accessory   | Description                         |
|----------------|---|-------------------------------------|
| 4401-0236      |    | Input Line Choke                    |
| 3470-0158      |    | Frame 1 Rear Ultraflow™ Vent Kit    |
| 3470-0181      |    | Frame 2/3 Rear Ultraflow™ Vent Kit  |
| 3470-0185      |    | Retrofit Kit – Epsilon 202-206      |
| 3470-0184      |    | Retrofit Kit – Epsilon 209-216      |
| 3470-0182      |    | Retrofit Kit – Digitax ST/SP0       |
| 3470-0183      |    | Retrofit Kit – M'Ax                 |
| 9500-1055      |   | SI-Option Mounting Kit              |
| 9500-1053      |  | Fan Replacement Kit (frame 1 and 2) |
| 9500-1054      |  | Fan Replacement Kit (frame 3)       |
| 82700000020200 |  | Encoder breakout kit                |

**Drive – Mountable Brake Resistor**

|           |   |   |
|-----------|---|---|
| 9500-1049 |  | Compact Brake Resistor Kit – 50 W, 70 Ω |
|-----------|---|---|

**External Brake Resistor**

|           |  |   |
|-----------|--|---|
| 1220-2201 |  | External Brake Resistor – DBR 100 W, 20 Ω |
| 1220-2401 |  | External Brake Resistor – DBR 100 W, 40 Ω |
| 1220-2801 |  | External Brake Resistor – DBR 100 W, 80 Ω |

Drive and motor cables available  
Refer to pages 39 - 41

# KITS AND ACCESSORIES ORDERING GUIDE (CONTINUED)

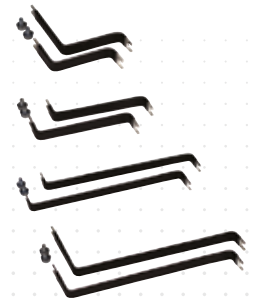
## EMC Filters

| Voltage | Model (M75X-...)           | Phases | Product code |
|---------|----------------------------|--------|--------------|
| 200 V   | 1200022                    | 1      |              |
|         | 1200040                    | 1      | 4200-3503    |
|         | 1200065                    | 1      |              |
|         | 2200090                    | 1      | 4200-5033    |
|         | 2200120                    | 1      |              |
|         | 3200160                    | 1      | 4200-6034    |
|         | 1200022                    | 3      | 4200-8744    |
|         | 1200040                    | 3      | 4200-6002    |
|         | 1200065                    | 3      | 4200-6001    |
|         | 2200090                    | 3      | 4200-5833    |
|         | 2200120                    | 3      | 4200-5833    |
|         | 3200160                    | 3      | 4200-5833    |
| 400 V   | 01400015 to 01400042       | 3      | 4200-8744    |
|         | 02400060 to 02400105       | 3      | 4200-1644    |
|         | 03400135 to 03400160       | 3      | 4200-5833    |
|         | * Multi-axis up to 46 A    |        | 4200-3233    |
|         | * Multi-axis up to 60.2 A  |        | 4200-5534    |
|         | * Multi-axis up to 82.2 A  |        | 4200-7534    |
|         | * Multi-axis up to 109.5 A |        | 4200-0035    |
















\* EMC filter ratings provided at maximum continuous current at 40 °C (104 °F). Please refer to the installation and Technical Guide.



| Description  | Product code |
|--|--------------|
| DC bus conn. kit - Unidrive M fr03 (panel mount)   | 3470-0146    |
| DC bus conn. kit - Unidrive M fr03 (through mount) | 3470-0147    |
| DC bus conn. kit - Unidrive M fr06 (panel mount)   | 3470-0148    |
| DC bus conn. kit - Unidrive M fr06 (through mount) | 3470-0149    |



## System Integration Option Modules

| Option          |   | Product code   | Option               |   | Product code   |
|-----------------|---|----------------|----------------------|---|----------------|
| MCI200          |    | 82400000017000 | SI-DeviceNet         |    | 82400000017700 |
| MCI210          |    | 82400000016700 | SI-POWERLINK         |    | 82400000021600 |
| SI-Apps Compact |    | 82400000020700 | SI-Universal Encoder |    | 82400000018300 |
| MiS250          |    | 82700000021500 | SI-Encoder           |    | 82400000018100 |
| SI-Ethernet     |   | 82400000017900 | SI-I/O               |   | 82400000017800 |
| SI-PROFINET RT  |  | 82500000018200 | SI-EtherCAT          |  | 82400000018000 |
| SI-PROFIBUS     |  | 82400000017500 | PTI210               |  | 82400000021400 |
| SI-CANopen      |  | 82400000017600 |                      |   |                |

## In the box for each Digitax HD M75x

| Description   | Product code   | M750 Ethernet | M751 Base | M753 EtherCAT | M754 MCI | M75C CapShare |
|---|----------------|---------------|-----------|---------------|----------|---------------|
| KI-Compact Display  | 82700000020400 | Yes           | No        | Yes           | Yes      | N/A           |
| SI-Option Mounting Kit  | 9500-1055      | No            | Yes       | No            | No       | N/A           |
| Removable cable screen bracket                                    | -              | Yes           | Yes       | Yes           | Yes      | N/A           |
| Brake Connector   | -              | Yes           | Yes       | Yes           | Yes      | N/A           |
| Power Input Connector   | -              | Yes           | Yes       | Yes           | Yes      | N/A           |
| 24 Vdc Supply Input Connector                                     | -              | Yes           | Yes       | Yes           | Yes      | Yes           |
| I/O Connector   | -              | Yes           | Yes       | Yes           | Yes      | N/A           |
| Motor Connector   | -              | Yes           | Yes       | Yes           | Yes      | N/A           |
| M4 x 8 Screws (Motor earth, Input earth and cable screen bracket) | -              | Yes           | Yes       | Yes           | Yes      | N/A           |

# DIGITAX HD

# RATING AND DIMENSIONS

## 200 V Single Phase

| Frame Size<br>W x D x H mm (in)    | Frame Size 01<br>40 x 174 x 233 (1.57 x 6.85 x 9.17) |          |          | Frame Size 02<br>40 x 174 x 278 (1.57 x 6.85 x 10.94) |          | Frame Size 03<br>40 x 174 x 328<br>(1.57 x 6.85 x 12.91) |          |
|------------------------------------|--|----------|----------|---|----------|--|----------|
| Line Supply                        | Single Phase AC 200 V...240 V (± 10%) @ 45...66 Hz   |          |          |   |          |  |          |
|                                    | M75X-...   | 01200022 | 01200040 | 01200065  | 02200090 | 02200120   | 03200160 |
| <b>Input</b>                       |  |          |          |   |          |  |          |
| Max Power (kW)                     |  | 1.2      |          |   | 2.6      |  | 3.8      |
| <b>Output Servo (RFC-5)</b>        |  |          |          |   |          |  |          |
| Rated Current (A)                  |  | 1.1      | 2.2      | 3.5   | 5.6      | 7.5  | 10.8     |
| Max Peak Current (A)               |  | 6.6      | 12       | 19.5  | 27       | 36   | 48       |
| <b>Output AC Induction (RFC-A)</b> |  |          |          |   |          |  |          |
| Max Continuous Current (A)         |  | 1.1      | 2.2      | 3.5   | 5.6      | 7.5  | 10.8     |
| Open Loop Peak Current (A)         |  | 3.3      | 6        | 9.8   | 13.5     | 18   | 24       |
| Closed Loop Peak Current (A)       |  | 6.6      | 12       | 19.5  | 27       | 36   | 48       |
| Motor Power at 230 V (kW)          |  | 0.18     | 0.37     | 0.75  | 1.1      | 1.5  | 2.2      |
| Motor Power at 230 V (hp)          |  | 0.25     | 0.5      | 1.0   | 1.5      | 2.0  | 3.0      |
| <b>Overload</b>                    |  |          |          |   |          |  |          |
| Closed-loop Overload               | Maximum closed loop peak current for 0.25 s          |          |          |   |          |  |          |
| Open-loop Overload                 | Maximum open loop peak current for 8 s               |          |          |   |          |  |          |

## 200 V Three Phase

| Frame Size<br>W x D x H mm (in)    | Frame Size 01<br>40 x 174 x 233 (1.57 x 6.85 x 9.17) |          |          | Frame Size 02<br>40 x 174 x 278 (1.57 x 6.85 x 10.94) |          |          | Frame Size 03<br>40 x 174 x 328 (1.57 x 6.85 x 12.91) |          |  |
|------------------------------------|--|----------|----------|---|----------|----------|---|----------|--|
| Line supply                        | Three Phase AC 200 V...240 V (± 10%) @ 45...66 Hz    |          |          |   |          |          |   |          |  |
|                                    | M75X-...   | 01200022 | 01200040 | 01200065  | 02200090 | 02200120 |   | 03200160 |  |
| <b>Input</b>                       |  |          |          |   |          |          |   |          |  |
| Max Power (kW)                     | 4 / 5.2*   |          |          | 5.3 / 6.9*  |          |          | 6.3/10*   |          |  |
| <b>Output Servo (RFC-S)</b>        |  |          |          |   |          |          |   |          |  |
| Rated Current (A)                  | 2.2  | 4        | 6.5      | 9   | 12       | 16       |   |          |  |
| Max Peak Current (A)               | 6.6  | 12       | 19.5     | 27  | 36       | 48       |   |          |  |
| <b>Output AC Induction (RFC-A)</b> |  |          |          |   |          |          |   |          |  |
| Max Continuous Current (A)         | 2.2  | 4        | 6.5      | 9   | 12       | 16       |   |          |  |
| Open Loop Peak Current (A)         | 3.3  | 6        | 9.8      | 13.5  | 18       | 24       |   |          |  |
| Closed Loop Peak Current (A)       | 6.6  | 12       | 19.5     | 27  | 36       | 48       |   |          |  |
| Motor Power at 230 V (kW)          | 0.37   | 0.75     | 1.1      | 2.2   | 2.2      | 4.0      |   |          |  |
| Motor Power at 230 V (hp)          | 0.5  | 1.0      | 1.5      | 2.0   | 3.0      | 5.0      |   |          |  |
| <b>Overload</b>                    |  |          |          |   |          |          |   |          |  |
| Closed-loop Overload               | 300 % for 0.25 s or 200 % for 4 s                    |          |          |   |          |          |   |          |  |
| Open-loop Overload                 | 150 % for 8 s  |          |          |   |          |          |   |          |  |

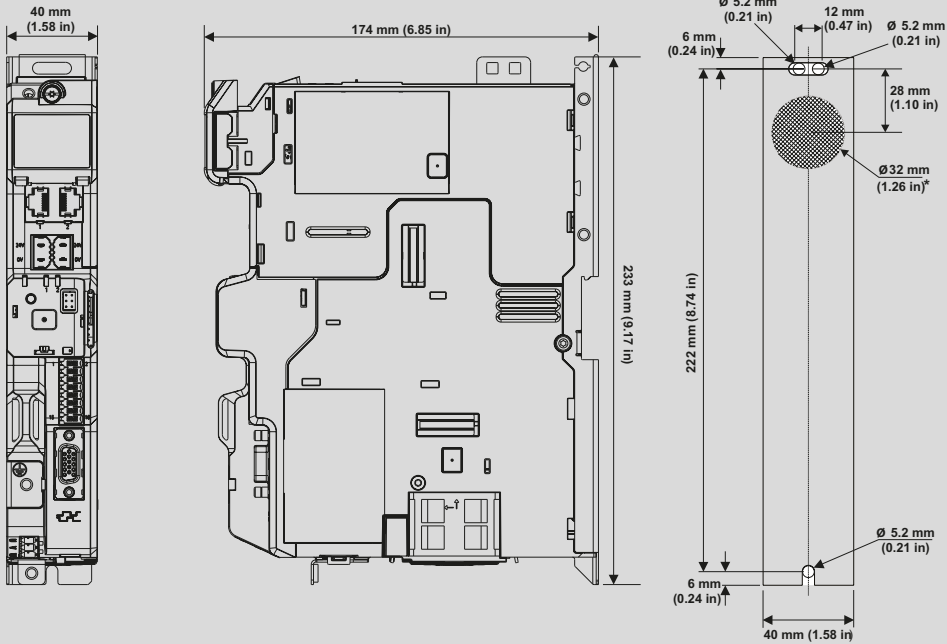
## 400 V Three Phase

| Frame Size<br>W x D x H mm (in)    | Frame Size 01<br>40 x 174 x 233 (1.57 x 6.85 x 9.17) |          |          | Frame Size 02<br>40 x 174 x 278 (1.57 x 6.85 x 10.94) |          |          | Frame Size 03<br>40 x 174 x 328 (1.57 x 6.85 x 12.91) |          |          |
|------------------------------------|--|----------|----------|---|----------|----------|---|----------|----------|
| Line supply                        | Three Phase AC 380 V...480 V (± 10%) @ 45...66 Hz    |          |          |   |          |          |   |          |          |
|                                    | M75X-...   | 01400015 | 01400030 | 01400042  | 02400060 | 02400080 | 02400105  | 03400135 | 03400160 |
| <b>Input</b>                       |  |          |          |   |          |          |   |          |          |
| Max Power (kW)                     | 6.5 / 8.5*   |          |          | 8.7 / 11.4*   |          |          | 10 / 13*  |          |          |
| <b>Output Servo (RFC-S)</b>        |  |          |          |   |          |          |   |          |          |
| Rated Current (A)                  | 1.5  | 3        | 4.2      | 6   | 8        | 10.5     | 13.5  | 16       |          |
| Max Peak Current (A)               | 4.5  | 9        | 12.6     | 18  | 24       | 31.5     | 40.5  | 48       |          |
| <b>Output AC Induction (RFC-A)</b> |  |          |          |   |          |          |   |          |          |
| Max Continuous Current (A)         | 1.5  | 3        | 4.2      | 6   | 8        | 10.5     | 13.5  | 16       |          |
| Open Loop Peak Current (A)         | 2.3  | 4.5      | 6.3      | 9   | 12       | 15.8     | 20.3  | 24       |          |
| Closed Loop Peak Current (A)       | 4.5  | 9        | 12.6     | 18  | 24       | 31.5     | 40.5  | 48       |          |
| Motor Power at 400 V (kW)          | 0.37   | 0.75     | 1.5      | 2.2   | 3.0      | 4.0      | 5.5   | 5.5      |          |
| Motor Power at 400 V (hp)          | 0.75   | 1.5      | 2.0      | 3.0   | 5.0      | 5.0      | 7.5   | 10.0     |          |
| <b>Overload</b>                    |  |          |          |   |          |          |   |          |          |
| Closed-loop Overload               | 300 % for 0.25 s or 200 % for 4 s                    |          |          |   |          |          |   |          |          |
| Open-loop Overload                 | 150 % for 8 s  |          |          |   |          |          |   |          |          |

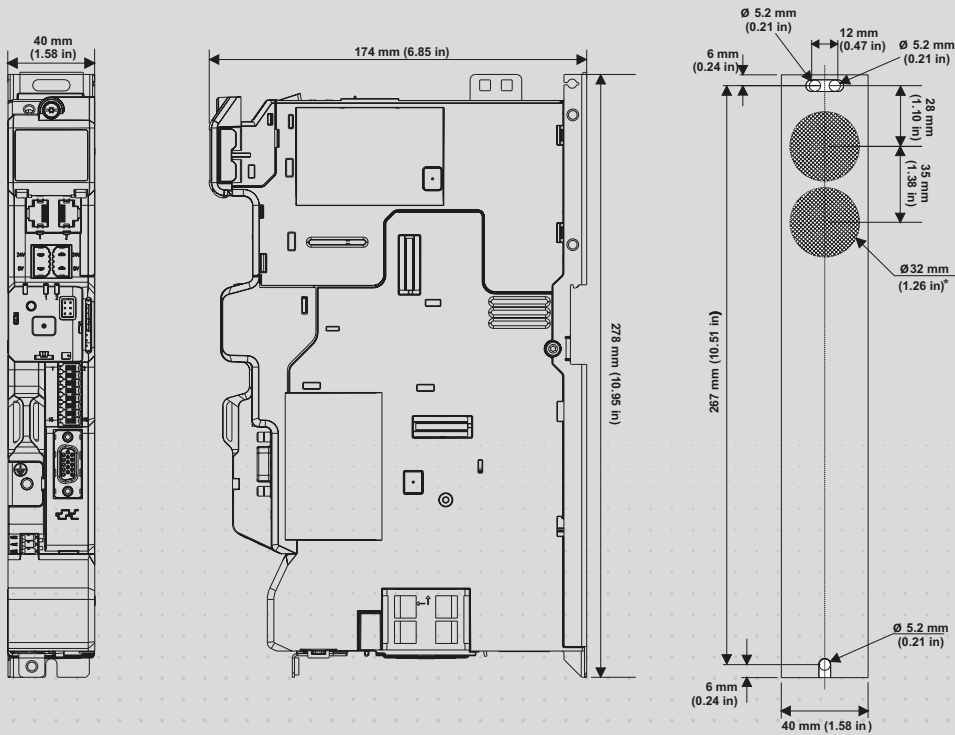
\* External AC line reactor required. Please refer to the installation and technical guide.

# DIMENSIONS

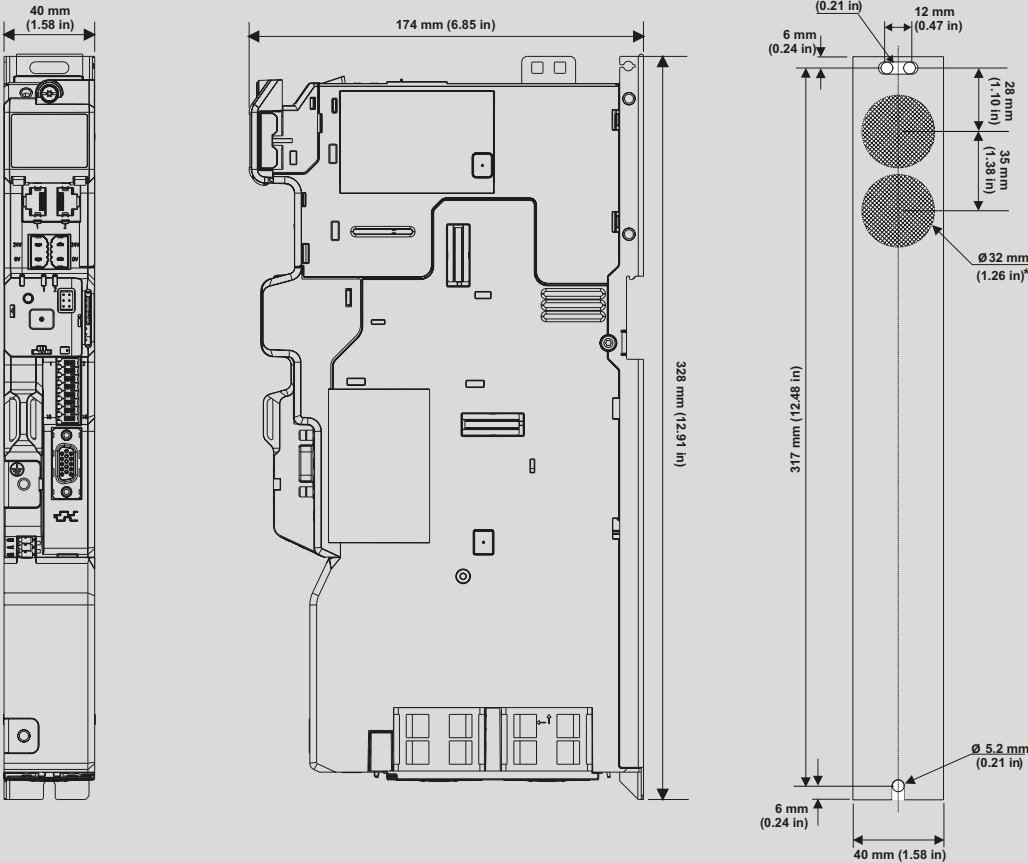
## Frame 1



## Frame 2



### Frame 3

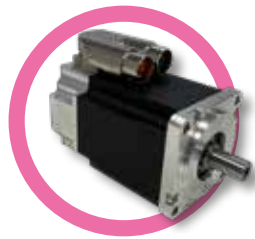


- Notes:**
- Additional space above and below the drive may be required for cable routing.
  - Option module frame adds 22mm width.
  - Alternative screw mounting options available. Please refer to the Installation Guide.

# UNIMOTOR HD

# RATINGS AND DIMENSIONS

## FRAME SIZE 060



| Motor frame size (mm)                  | 060ED                                  |      |      |
|--|--|------|------|
| Voltage (Vrms)                         | 200-240                                |      |      |
| Frame length                           | A                                      | B    | C    |
| Continuous stall torque (Nm)           | 0.64                                   | 1.28 | 1.92 |
| Peak torque (Nm)                       | 2.24                                   | 4.48 | 6.72 |
| Standard inertia (kg cm <sup>2</sup> ) | 0.18                                   | 0.33 | 0.48 |
| Standard motor weight (kg)             | 1.6                                    | 2.0  | 2.2  |
| Number of poles                        | 10                                     | 10   | 10   |
| Speed 6000 (rpm)                       | Kt (Nm/A) = 0.47<br>Ke (V/krpm) = 28.5 |      |      |
| Rated torque (Nm)                      | 0.64                                   | 1.28 | 1.92 |
| Stall current (A)                      | 1.36                                   | 2.72 | 4.09 |
| Rated power (kW)                       | 0.4                                    | 0.8  | 1.2  |
| R (ph-ph) (Ohms)                       | 5.15                                   | 1.90 | 1.15 |
| L (ph-ph) (mH)                         | 23.8                                   | 11.1 | 7.3  |
| Recommended power conn' size           | Y-TEC                                  |      |      |

| Motor frame size (mm)                  | 060UD                               |       |      |
|--|-------------------------------------|-------|------|
| Voltage (Vrms)                         | 380-480                             |       |      |
| Frame length                           | A                                   | B     | C    |
| Continuous stall torque (Nm)           | 0.64                                | 1.28  | 1.92 |
| Peak torque (Nm)                       | 2.24                                | 4.48  | 6.72 |
| Standard inertia (kg cm <sup>2</sup> ) | 0.18                                | 0.33  | 0.48 |
| Standard motor weight (kg)             | 1.6                                 | 2.0   | 2.2  |
| Number of poles                        | 10                                  | 10    | 10   |
| Speed 6000 (rpm)                       | Kt (Nm/A) = 0.8<br>Ke (V/krpm) = 49 |       |      |
| Rated torque (Nm)                      | 0.64                                | 1.28  | 1.92 |
| Stall current (A)                      | 0.8                                 | 1.6   | 2.4  |
| Rated power (kW)                       | 0.4                                 | 0.8   | 1.2  |
| R (ph-ph) (Ohms)                       | 24.00                               | 10.10 | 5.90 |
| L (ph-ph) (mH)                         | 91.5                                | 46.8  | 32.6 |
| Recommended power conn' size           | Y-TEC                               |       |      |

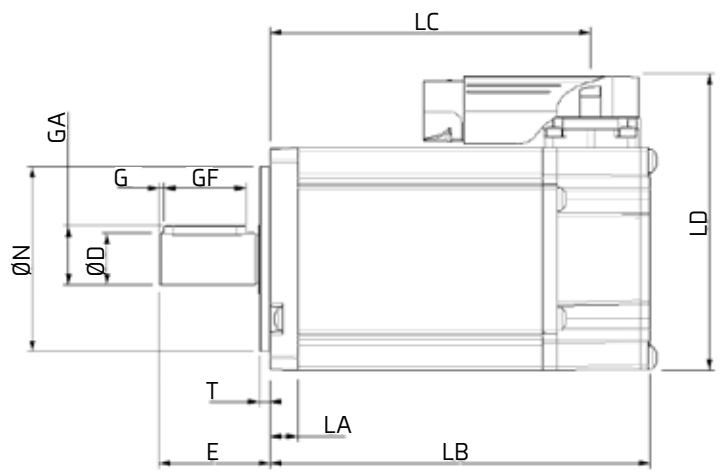
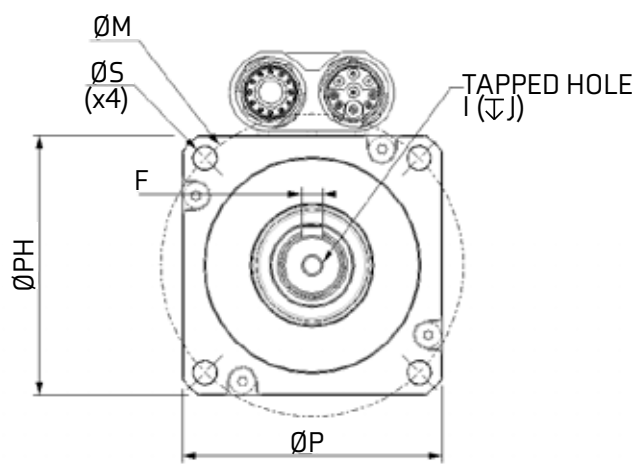
All data subject to +/-10% tolerance  
 Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12 kHz drive switching frequency  
 All other figures relate to a 20°C motor temperature.  
 Maximum intermittent winding temperature is 140°C

|      | Motor Dimension |               |            |            |                  |                 |                   |                |               |                      |                 |               |                |    |  |
|------|-----------------|---------------|------------|------------|------------------|-----------------|-------------------|----------------|---------------|----------------------|-----------------|---------------|----------------|----|--|
|      | Feedback CT     |               |            |            | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |    |  |
|      | Unbraked length | Braked length |            |            |                  |                 |                   |                |               |                      |                 |               |                |    |  |
|      | LB (± 0.9)      | LC (± 1.0)    | LC (± 1.0) | LC (± 1.0) | LA (± 0.5)       | T (± 0.1)       | N (j6)            | LD (± 0.3)     | P (± 0.3)     | S (H14)              | M (± 0.5)       | PH (± 0.5)    |                |    |  |
| 060A | 82.5            | 66.5          | 119.5      | 103.5      | 7.5              | 3               | 50                | 80             | 60            | 5.5                  | 70              | 60            | M5             | mm |  |
| 060B | 102.5           | 86.5          | 139.5      | 123.5      |                  |                 |                   |                |               |                      |                 |               |                |    |  |
| 060C | 122.5           | 106.5         | 159.5      | 143.5      |                  |                 |                   |                |               |                      |                 |               |                |    |  |

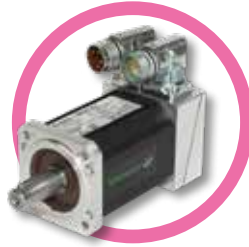


| Shaft Dimension |                |              |            |            |                  |           |                         |                   |    |
|-----------------|----------------|--------------|------------|------------|------------------|-----------|-------------------------|-------------------|----|
|                 | Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |    |
|                 | D(j6)          | E            | GA         | GF         | G                | F(h9)     | I                       | J(±1)             |    |
| 14.0 Std        | 14             | 30           | 16         | 22         | 1.5              | 5         | M5 x 0.8                | 10                | mm |

| Feedback EG, FG |                 |               |
|-----------------|-----------------|---------------|
|                 | Unbraked length | Braked length |
|                 | LB (± 0.9)      | LB (± 0.9)    |
| 060A            | 100             | 137           |
| 060B            | 120             | 157           |
| 060C            | 140             | 177           |

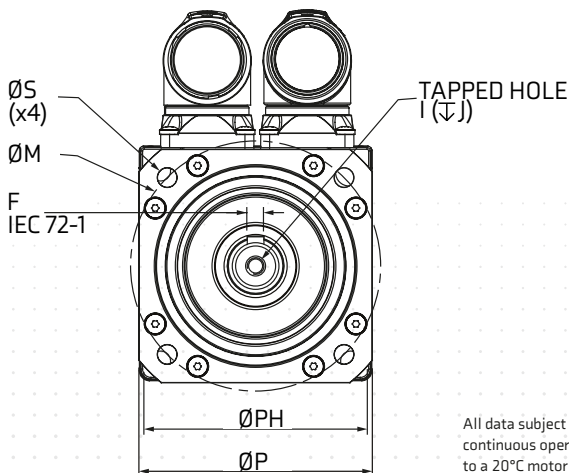


# FRAME SIZE 067

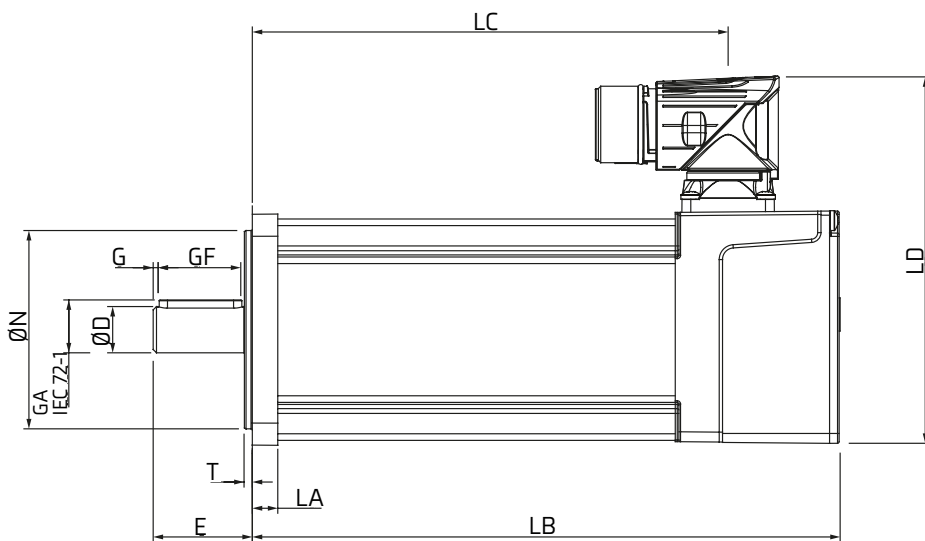


| Motor frame size (mm)                  |                                    | 067ED        |      |       |       |
|--|------------------------------------|--------------|------|-------|-------|
| Voltage (Vrms)                         |                                    | 200-240      |      |       |       |
| Frame length                           |                                    | A            | B    | C     | D     |
| Continuous stall torque (Nm)           |                                    | 1.44         | 2.55 | 3.70  | 4.72  |
| Peak torque (Nm)                       |                                    | 4.35         | 7.65 | 11.10 | 14.60 |
| Standard inertia (kg cm <sup>2</sup> ) |                                    | 0.30         | 0.53 | 0.75  | 0.94  |
| Winding thermal time constant (sec)    |                                    | 54           | 61   | 65    | 68    |
| Standard motor weight (kg)             |                                    | 1.96         | 2.56 | 3.16  | 3.80  |
| Number of poles                        |                                    | 10           | 10   | 10    | 10    |
| Speed<br>3000 (rpm)                    | $K_t$ (Nm/A) =<br>$K_e$ (V/krpm) = | 0.93<br>57   |      |       |       |
| Rated torque (Nm)                      |                                    | 1.40         | 2.45 | 3.50  | 4.60  |
| Stall current (A)                      |                                    | 1.55         | 2.74 | 3.98  | 5.08  |
| Rated power (kW)                       |                                    | 0.44         | 0.77 | 1.10  | 1.45  |
| R (ph-ph) (Ohms)                       |                                    | 15.16        | 5.85 | 3.33  | 2.32  |
| L (ph-ph) (mH)                         |                                    | 46.7         | 20.6 | 12.7  | 10.6  |
| Recommended power conn' size           |                                    | 1            | 1    | 1     | 1     |
| Speed<br>6000 (rpm)                    | $K_t$ (Nm/A) =<br>$K_e$ (V/krpm) = | 0.47<br>28.5 |      |       |       |
| Rated torque (Nm)                      |                                    | 1.3          | 2.2  | 3.1   | 4.0   |
| Stall current (A)                      |                                    | 3.06         | 5.43 | 7.87  | 10.04 |
| Rated power (kW)                       |                                    | 0.82         | 1.38 | 1.95  | 2.51  |
| R (ph-ph) (Ohms)                       |                                    | 3.79         | 1.46 | 0.76  | 0.54  |
| L (ph-ph) (mH)                         |                                    | 11.7         | 5.2  | 3.6   | 2.03  |
| Recommended power conn' size           |                                    | 1            | 1    | 1     | 1     |

| Motor frame size (mm)                  |                                    | 067UD     |       |       |       |
|--|------------------------------------|-----------|-------|-------|-------|
| Voltage (Vrms)                         |                                    | 380-480   |       |       |       |
| Frame length                           |                                    | A         | B     | C     | D     |
| Continuous stall torque (Nm)           |                                    | 1.44      | 2.55  | 3.70  | 4.72  |
| Peak torque (Nm)                       |                                    | 4.35      | 7.65  | 11.10 | 14.60 |
| Standard inertia (kg cm <sup>2</sup> ) |                                    | 0.30      | 0.53  | 0.75  | 0.94  |
| Winding thermal time constant (sec)    |                                    | 54        | 61    | 65    | 68    |
| Standard motor weight (kg)             |                                    | 1.96      | 2.56  | 3.16  | 3.80  |
| Number of poles                        |                                    | 10        | 10    | 10    | 10    |
| Speed<br>3000 (rpm)                    | $K_t$ (Nm/A) =<br>$K_e$ (V/krpm) = | 0.8<br>49 |       |       |       |
| Rated torque (Nm)                      |                                    | 1.40      | 2.45  | 3.50  | 4.60  |
| Stall current (A)                      |                                    | 1.80      | 1.59  | 2.31  | 2.95  |
| Rated power (kW)                       |                                    | 0.44      | 0.77  | 1.10  | 1.45  |
| R (ph-ph) (Ohms)                       |                                    | 11.69     | 18.55 | 10.70 | 6.42  |
| L (ph-ph) (mH)                         |                                    | 35.2      | 65.6  | 40.8  | 31.2  |
| Recommended power conn' size           |                                    | 1         | 1     | 1     | 1     |
| Speed<br>6000 (rpm)                    | $K_t$ (Nm/A) =<br>$K_e$ (V/krpm) = | 0.8<br>49 |       |       |       |
| Rated torque (Nm)                      |                                    | 1.3       | 2.2   | 3.1   | 4.0   |
| Stall current (A)                      |                                    | 1.80      | 3.19  | 4.63  | 5.90  |
| Rated power (kW)                       |                                    | 0.82      | 1.38  | 1.95  | 2.51  |
| R (ph-ph) (Ohms)                       |                                    | 11.69     | 4.64  | 2.73  | 1.60  |
| L (ph-ph) (mH)                         |                                    | 35.2      | 16.4  | 10.2  | 7.8   |
| Recommended power conn' size           |                                    | 1         | 1     | 1     | 1     |



All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature. Maximum intermittent winding temperature is 140°C



| Motor Dimension |                                 |               |            |            |                  |                 |                   |                |               |                      |                 |               |                |    |  |
|-----------------|---------------------------------|---------------|------------|------------|------------------|-----------------|-------------------|----------------|---------------|----------------------|-----------------|---------------|----------------|----|--|
|                 | Feedback AR, CR, EM, FM, EG, FG |               |            |            | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |    |  |
|                 | Unbraked length                 | Braked length |            |            |                  |                 |                   |                |               |                      |                 |               |                |    |  |
|                 | LB (± 0.9)                      | LC (± 1.0)    | LC (± 1.0) | LC (± 1.0) | LA (± 0.5)       | T (± 0.1)       | N (j6)            | LD (± 0.3)     | P (± 0.3)     | S (H14)              | M (± 0.5)       | PH (± 0.5)    |                |    |  |
| 067A            | 142.9                           | 109           | 177.9      | 144        | 7.7              | 2.5             | 60                | 111.5          | 70            | 5.8                  | 75              | 67            | M5             | mm |  |
| 067B            | 172.9                           | 139           | 207.9      | 174        |                  |                 |                   |                |               |                      |                 |               |                |    |  |
| 067C            | 202.9                           | 169           | 237.9      | 204        |                  |                 |                   |                |               |                      |                 |               |                |    |  |
| 067D            | 232.9                           | 199           | 267.9      | 234        |                  |                 |                   |                |               |                      |                 |               |                |    |  |

| Shaft Dimension |                |              |            |            |                  |           |                         |                   |
|-----------------|----------------|--------------|------------|------------|------------------|-----------|-------------------------|-------------------|
|                 | Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|                 | D(j6)          | E            | GA         | GF         | G                | F(h9)     | I                       | J(±1)             |
| 14.0 Std        | 14             | 30           | 16         | 25         | 1.5              | 5         | M5 x 0.8                | 13.5 mm           |

19mm shaft and 90mm flange options are available. Refer to factory for more information.

# FRAME SIZE 089

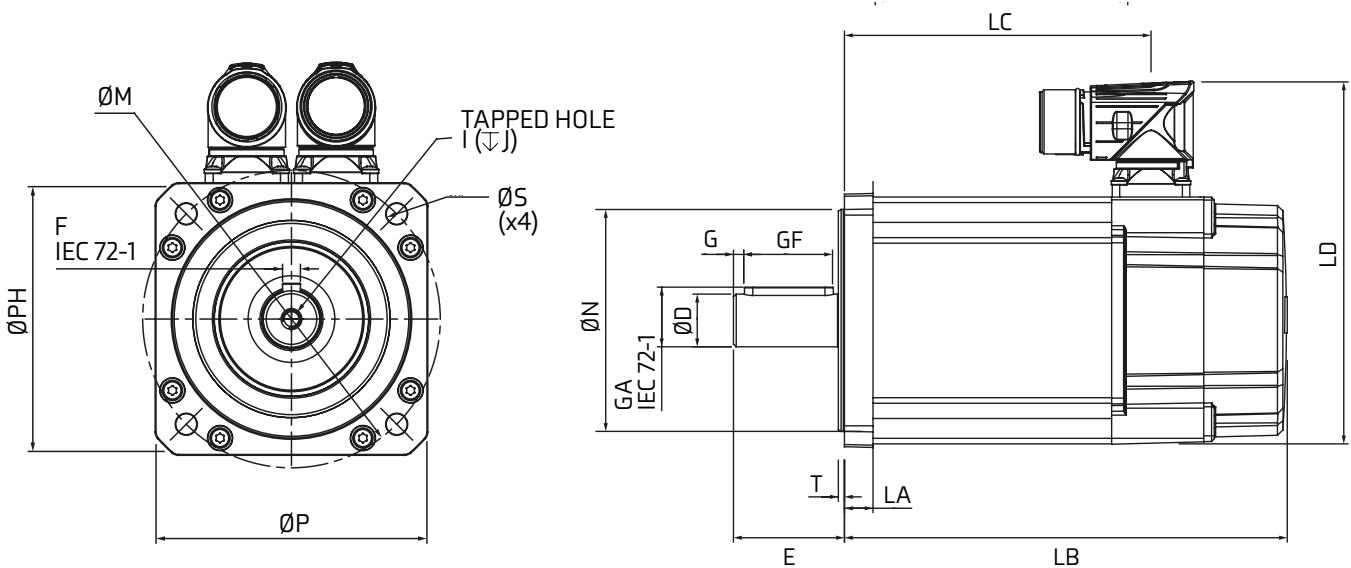


| Motor frame size (mm)                  |                              | 089ED         |       |       |       |
|--|------------------------------|---------------|-------|-------|-------|
| Voltage (Vrms)                         |                              | 200-240       |       |       |       |
| Frame length                           |                              | A             | B     | C     | D     |
| Continuous stall torque (Nm)           |                              | 3.2           | 5.5   | 8.0   | 10.3  |
| Peak torque (Nm)                       |                              | 9.6           | 16.5  | 24.0  | 30.9  |
| Standard inertia (kg cm <sup>2</sup> ) |                              | 0.87          | 1.61  | 2.34  | 3.20  |
| Winding thermal time constant (sec)    |                              | 85            | 93    | 98    | 103   |
| Standard motor weight (kg)             |                              | 3.18          | 4.28  | 5.38  | 6.48  |
| Number of poles                        |                              | 10            | 10    | 10    | 10    |
| Speed<br>3000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.93<br>57    |       |       |       |
| Rated torque (Nm)                      |                              | 3.00          | 4.85  | 6.90  | 8.50  |
| Stall current (A)                      |                              | 3.44          | 5.91  | 8.60  | 11.08 |
| Rated power (kW)                       |                              | 0.94          | 1.52  | 2.17  | 2.67  |
| R (ph-ph) (Ohms)                       |                              | 4.1           | 1.64  | 0.93  | 0.45  |
| L (ph-ph) (mH)                         |                              | 25.0          | 11.8  | 7.1   | 13.7  |
| Recommended power conn' size           |                              | 1             | 1     | 1     | 1     |
| Speed<br>4000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.47<br>42.75 |       |       |       |
| Rated torque (Nm)                      |                              | ◆             | 4.55  | 6.35  | ◆     |
| Stall current (A)                      |                              | ◆             | 7.86  | 11.43 | ◆     |
| Rated power (kW)                       |                              | ◆             | 1.91  | 2.66  | ◆     |
| R (ph-ph) (Ohms)                       |                              | ◆             | 0.82  | 0.56  | ◆     |
| L (ph-ph) (mH)                         |                              | ◆             | 6     | 4.3   | ◆     |
| Recommended power conn' size           |                              | ◆             | 1     | 1     | ◆     |
| Speed<br>6000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.47<br>28.5  |       |       |       |
| Rated torque (Nm)                      |                              | 2.65          | 3.80  | 5.00  | ◆     |
| Stall current (A)                      |                              | 6.93          | 11.70 | 17.02 | ◆     |
| Rated power (kW)                       |                              | 1.67          | 2.39  | 3.14  | ◆     |
| R (ph-ph) (Ohms)                       |                              | 1.03          | 0.41  | 0.24  | ◆     |
| L (ph-ph) (mH)                         |                              | 6.2           | 2.96  | 1.77  | ◆     |
| Recommended power conn' size           |                              | 1             | 1     | 1     | ◆     |

| Motor frame size (mm)                  |                              | 089UD       |      |       |      |
|--|------------------------------|-------------|------|-------|------|
| Voltage (Vrms)                         |                              | 380-480     |      |       |      |
| Frame length                           |                              | A           | B    | C     | D    |
| Continuous stall torque (Nm)           |                              | 3.2         | 5.5  | 8.0   | 10.3 |
| Peak torque (Nm)                       |                              | 9.6         | 16.5 | 24.0  | 31.5 |
| Standard inertia (kg cm <sup>2</sup> ) |                              | 0.87        | 1.61 | 2.34  | 3.20 |
| Winding thermal time constant (sec)    |                              | 85          | 93   | 98    | 103  |
| Standard motor weight (kg)             |                              | 3.18        | 4.28 | 5.38  | 6.48 |
| Number of poles                        |                              | 10          | 10   | 10    | 10   |
| Speed<br>3000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = | 1.6<br>98   |      |       |      |
| Rated torque (Nm)                      |                              | 3.00        | 4.85 | 6.90  | 8.50 |
| Stall current (A)                      |                              | 2.00        | 3.44 | 5.00  | 6.44 |
| Rated power (kW)                       |                              | 0.94        | 1.52 | 2.17  | 2.67 |
| R (ph-ph) (Ohms)                       |                              | 10.80       | 5.18 | 2.79  | 1.89 |
| L (ph-ph) (mH)                         |                              | 66.8        | 36.7 | 21.7  | 17.5 |
| Recommended power conn' size           |                              | 1           | 1    | 1     | 1    |
| Speed<br>4000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = | 1.2<br>73.5 |      |       |      |
| Rated torque (Nm)                      |                              | ◆           | 4.55 | 6.35  | ◆    |
| Stall current (A)                      |                              | ◆           | 4.58 | 6.67  | ◆    |
| Rated power (kW)                       |                              | ◆           | 1.91 | 2.66  | ◆    |
| R (ph-ph) (Ohms)                       |                              | ◆           | 2.60 | 1.80  | ◆    |
| L (ph-ph) (mH)                         |                              | ◆           | 18.8 | 13.4  | ◆    |
| Recommended power conn' size           |                              | ◆           | 1    | 1     | ◆    |
| Speed<br>6000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.8<br>49   |      |       |      |
| Rated torque (Nm)                      |                              | 2.65        | 3.80 | 5.00  | ◆    |
| Stall current (A)                      |                              | 4.00        | 6.88 | 10.00 | ◆    |
| Rated power (kW)                       |                              | 1.67        | 2.39 | 3.14  | ◆    |
| R (ph-ph) (Ohms)                       |                              | 2.70        | 1.30 | 0.67  | ◆    |
| L (ph-ph) (mH)                         |                              | 16.7        | 9.2  | 5.4   | ◆    |
| Recommended power conn' size           |                              | 1           | 1    | 1     | ◆    |

◆ Not available

All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature. Maximum intermittent winding temperature is 140°C



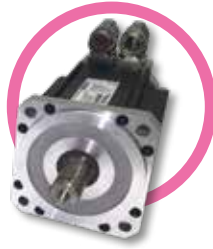
| Motor Dimension         |           |               |           |                  |                 |                   |                |               |                      |                 |               |                |       |
|-------------------------|-----------|---------------|-----------|------------------|-----------------|-------------------|----------------|---------------|----------------------|-----------------|---------------|----------------|-------|
| Feedback EC, FC, EF, FF |           |               |           | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCO | Motor housing | Mounting bolts |       |
| Unbraked length         |           | Braked length |           |                  |                 |                   |                |               |                      |                 |               |                |       |
|                         | LB (±0.9) | LC (±1.0)     | LC (±1.0) | LC (±1.0)        | LA (±0.5)       | T (±0.1)          | N (j6)         | LD (±0.3)     | P (±0.3)             | S (H14)         | M (±0.5)      | PH (±0.5)      |       |
| 089A                    | 147.8     | 110.5         | 187.9     | 150.6            | 10.3            | 2.2               | 80             | 130.5         | 91                   | 7               | 100           | 89             | M6 mm |
| 089B                    | 177.8     | 140.5         | 217.9     | 180.6            |                 |                   |                |               |                      |                 |               |                |       |
| 089C                    | 207.8     | 170.5         | 247.9     | 210.6            |                 |                   |                |               |                      |                 |               |                |       |
| 089D                    | 237.8     | 200.5         | 277.9     | 240.6            |                 |                   |                |               |                      |                 |               |                |       |

| Shaft Dimension |                |              |            |            |                  |           |                         |                   |
|-----------------|----------------|--------------|------------|------------|------------------|-----------|-------------------------|-------------------|
|                 | Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |
|                 | D(j6)          | E            | GA         | GF         | G                | F(h9)     | I                       | J(±1)             |
| 19.0 Std        | 19             | 40           | 21.5       | 32         | 3.7              | 6         | M6 x 1                  | 17 mm             |

24mm shaft and 115mm flange options are available. Refer to factory for more information.

|      | Feedback CA, GB, HB |               | Feedback AE     |               |    |
|------|---------------------|---------------|-----------------|---------------|----|
|      | Unbraked length     | Braked length | Unbraked length | Braked length |    |
|      | LB (±0.9)           | LB (±0.9)     | LB (±0.9)       | LB (±0.9)     |    |
| 089A | 160.8               | 200.9         | 137.8           | 177.9         | mm |
| 089B | 190.8               | 230.9         | 167.8           | 207.9         |    |
| 089C | 220.8               | 260.9         | 197.8           | 237.9         |    |
| 089D | 250.8               | 290.9         | 227.8           | 267.9         |    |

# FRAME SIZE 115

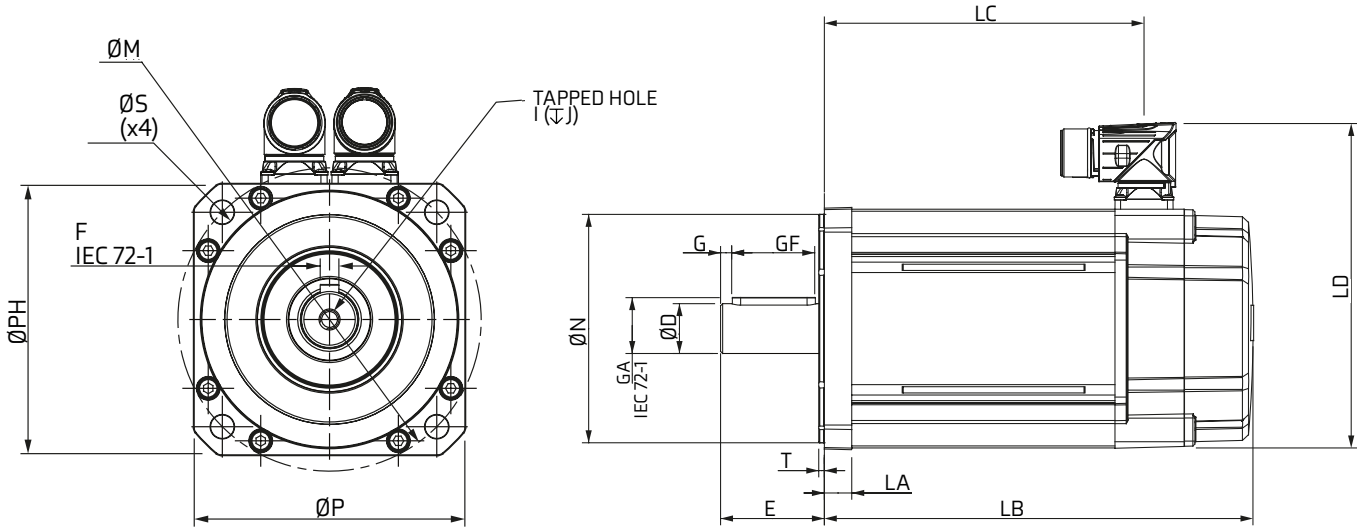


| Motor frame size (mm)                  |                              | 115ED        |       |       |       |
|--|------------------------------|--------------|-------|-------|-------|
| Voltage (Vrms)                         |                              | 200-240      |       |       |       |
| Frame length                           |                              | A            | B     | C     | D     |
| Continuous stall torque (Nm)           |                              | 5.8          | 10.2  | 14.6  | 18.8  |
| Peak torque (Nm)                       |                              | 17.4         | 30.6  | 43.8  | 56.4  |
| Standard inertia (kg cm <sup>2</sup> ) |                              | 2.40         | 4.41  | 6.39  | 8.38  |
| Winding thermal time constant (sec)    |                              | 161          | 164   | 168   | 175   |
| Standard motor weight (kg)             |                              | 5.20         | 6.95  | 8.72  | 10.49 |
| Number of poles                        |                              | 10           | 10    | 10    | 10    |
| Speed<br>2000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 1.4<br>85.5  |       |       |       |
| Rated torque (Nm)                      |                              | ◆            | ◆     | 11.9  | 15.6  |
| Stall current (A)                      |                              | ◆            | ◆     | 10.43 | 13.43 |
| Rated power (kW)                       |                              | ◆            | ◆     | 2.49  | 3.27  |
| R (ph-ph) (Ohms)                       |                              | ◆            | ◆     | 0.77  | 0.61  |
| L (ph-ph) (mH)                         |                              | ◆            | ◆     | 7.9   | 6.6   |
| Recommended power conn' size           |                              | ◆            | ◆     | 1     | 1     |
| Speed<br>3000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.93<br>57   |       |       |       |
| Rated torque (Nm)                      |                              | 4.8          | 7.7   | 10.5  | ◆     |
| Stall current (A)                      |                              | 6.24         | 10.97 | 15.70 | ◆     |
| Rated power (kW)                       |                              | 1.51         | 2.42  | 3.30  | ◆     |
| R (ph-ph) (Ohms)                       |                              | 1.59         | 0.58  | 0.39  | ◆     |
| L (ph-ph) (mH)                         |                              | 12.8         | 5.4   | 4.0   | ◆     |
| Recommended power conn' size           |                              | 1            | 1     | 1     | ◆     |
| Speed<br>4000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.7<br>42.75 |       |       |       |
| Rated torque (Nm)                      |                              | ◆            | ◆     | 8.7   | ◆     |
| Stall current (A)                      |                              | ◆            | ◆     | 20.86 | ◆     |
| Rated power (kW)                       |                              | ◆            | ◆     | 3.64  | ◆     |
| R (ph-ph) (Ohms)                       |                              | ◆            | ◆     | 0.12  | ◆     |
| L (ph-ph) (mH)                         |                              | ◆            | ◆     | 4     | ◆     |
| Recommended power conn' size           |                              | ◆            | ◆     | 1     | ◆     |
| Speed<br>6000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.47<br>28.5 |       |       |       |
| Rated torque (Nm)                      |                              | 3.6          | 4.8   | ◆     | ◆     |
| Stall current (A)                      |                              | 12.34        | 21.70 | ◆     | ◆     |
| Rated power (kW)                       |                              | 2.26         | 3.02  | ◆     | ◆     |
| R (ph-ph) (Ohms)                       |                              | 0.40         | 0.09  | ◆     | ◆     |
| L (ph-ph) (mH)                         |                              | 3.2          | 2.8   | ◆     | ◆     |
| Recommended power conn' size           |                              | 1            | 1     | ◆     | ◆     |

| Motor frame size (mm)                  |                              | 115UD       |       |      |       |
|--|------------------------------|-------------|-------|------|-------|
| Voltage (Vrms)                         |                              | 380-480     |       |      |       |
| Frame length                           |                              | A           | B     | C    | D     |
| Continuous stall torque (Nm)           |                              | 5.8         | 10.2  | 14.6 | 18.8  |
| Peak torque (Nm)                       |                              | 17.4        | 30.6  | 43.8 | 56.4  |
| Standard inertia (kg cm <sup>2</sup> ) |                              | 2.40        | 4.41  | 6.39 | 8.38  |
| Winding thermal time constant (sec)    |                              | 161         | 164   | 168  | 175   |
| Standard motor weight (kg)             |                              | 5.20        | 6.95  | 8.72 | 10.49 |
| Number of poles                        |                              | 10          | 10    | 10   | 10    |
| Speed<br>2000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 2.4<br>147  |       |      |       |
| Rated torque (Nm)                      |                              | ◆           | ◆     | 11.9 | 15.6  |
| Stall current (A)                      |                              | ◆           | ◆     | 6.08 | 7.83  |
| Rated power (kW)                       |                              | ◆           | ◆     | 2.49 | 3.27  |
| R (ph-ph) (Ohms)                       |                              | ◆           | ◆     | 2.41 | 1.80  |
| L (ph-ph) (mH)                         |                              | ◆           | ◆     | 24.7 | 19.5  |
| Recommended power conn' size           |                              | ◆           | ◆     | 1    | 1     |
| Speed<br>3000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 1.6<br>98   |       |      |       |
| Rated torque (Nm)                      |                              | 4.8         | 7.7   | 10.5 | 13.6  |
| Stall current (A)                      |                              | 3.03        | 6.38  | 9.13 | 11.75 |
| Rated power (kW)                       |                              | 1.51        | 2.42  | 3.30 | 4.27  |
| R (ph-ph) (Ohms)                       |                              | 5.00        | 1.90  | 1.21 | 0.78  |
| L (ph-ph) (mH)                         |                              | 40.3        | 18.0  | 12.7 | 8.7   |
| Recommended power conn' size           |                              | 1           | 1     | 1    | 1     |
| Speed<br>4000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 1.2<br>73.5 |       |      |       |
| Rated torque (Nm)                      |                              | ◆           | ◆     | 8.7  | ◆     |
| Stall current (A)                      |                              | ◆           | ◆     | 12.1 | ◆     |
| Rated power (kW)                       |                              | ◆           | ◆     | 3.64 | ◆     |
| R (ph-ph) (Ohms)                       |                              | ◆           | ◆     | 0.6  | ◆     |
| L (ph-ph) (mH)                         |                              | ◆           | ◆     | 6.6  | ◆     |
| Recommended power conn' size           |                              | ◆           | ◆     | 1    | ◆     |
| Speed<br>6000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.8<br>49   |       |      |       |
| Rated torque (Nm)                      |                              | 3.6         | 4.8   | ◆    | ◆     |
| Stall current (A)                      |                              | 7.25        | 12.75 | ◆    | ◆     |
| Rated power (kW)                       |                              | 2.26        | 3.02  | ◆    | ◆     |
| R (ph-ph) (Ohms)                       |                              | 1.25        | 0.47  | ◆    | ◆     |
| L (ph-ph) (mH)                         |                              | 10.1        | 4.5   | ◆    | ◆     |
| Recommended power conn' size           |                              | 1           | 1     | ◆    | ◆     |

◆ Not available

All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature. Maximum intermittent winding temperature is 140°C



| Motor Dimension         |           |               |           |           |                  |                 |                   |                |               |                      |                 |               |                |           |          |
|-------------------------|-----------|---------------|-----------|-----------|------------------|-----------------|-------------------|----------------|---------------|----------------------|-----------------|---------------|----------------|-----------|----------|
| Feedback EC, FC, EF, FF |           |               |           |           | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |           |          |
| Unbraked length         |           | Braked length |           |           |                  |                 |                   |                |               |                      |                 |               |                | LA (±0.5) | T (±0.1) |
|                         | LB (±0.9) | LC (±1.0)     | LC (±1.0) | LC (±1.0) |                  |                 |                   |                |               |                      |                 |               |                |           |          |
| 115A                    | 163.8     | 124           | 200.9     | 161.1     | 13.2             | 2.7             | 110               | 156.5          | 116           | 10                   | 130             | 115           | M8             | mm        |          |
| 115B                    | 193.8     | 154           | 230.9     | 191.1     |                  |                 |                   |                |               |                      |                 |               |                |           |          |
| 115C                    | 223.8     | 184           | 260.9     | 221.1     |                  |                 |                   |                |               |                      |                 |               |                |           |          |
| 115D                    | 253.8     | 214           | 290.9     | 251.1     |                  |                 |                   |                |               |                      |                 |               |                |           |          |

| Shaft Dimension |                |              |            |            |                  |           |                         |                   |    |
|-----------------|----------------|--------------|------------|------------|------------------|-----------|-------------------------|-------------------|----|
|                 | Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |    |
|                 | D (j6)         | E            | GA         | GF         | G                | F (h9)    | I                       | J (±1)            |    |
| 24.0 Std        | 24             | 50           | 27         | 40         | 5.3              | 8         | M8 x 1.25               | 20                | mm |

28mm shaft and 145mm flange options are available. Refer to factory for more information.

|      | Feedback CA, GB, HB |               | Feedback AE     |               | mm |
|------|---------------------|---------------|-----------------|---------------|----|
|      | Unbraked length     | Braked length | Unbraked length | Braked length |    |
|      | LB (±0.9)           | LB (±0.9)     | LB (±0.9)       | LB (±0.9)     |    |
| 115A | 176.8               | 213.9         | 153.8           | 190.9         | mm |
| 115B | 206.8               | 243.9         | 183.8           | 220.9         |    |
| 115C | 236.8               | 273.9         | 213.8           | 250.9         |    |
| 115D | 266.8               | 303.9         | 243.8           | 280.9         |    |

# FRAME SIZE 142

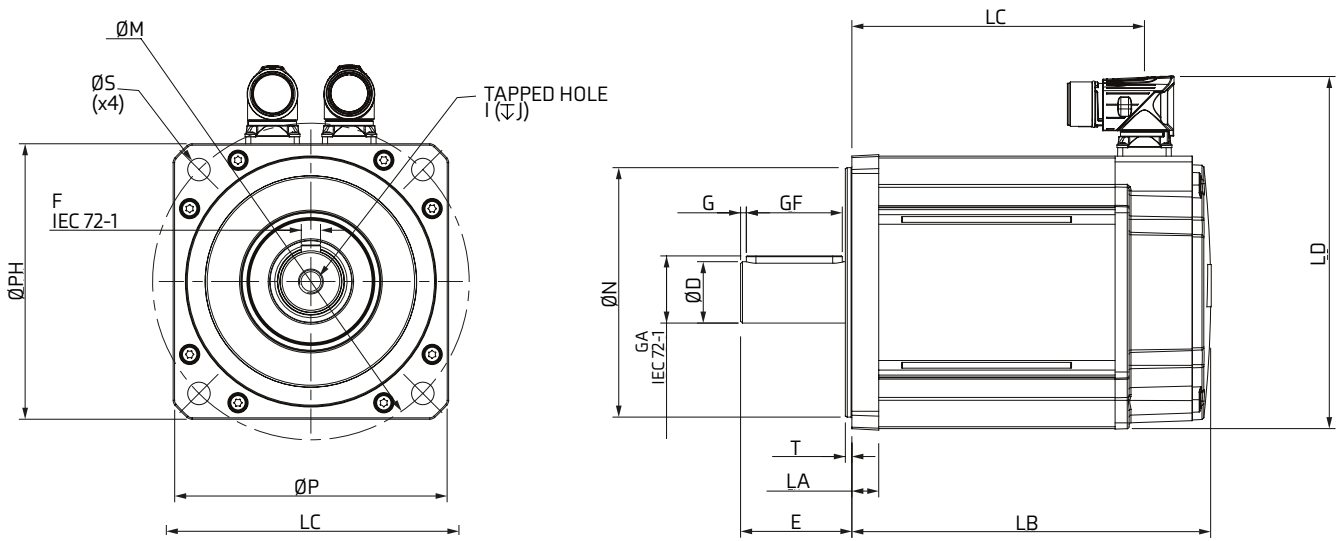


| Motor frame size (mm)                  |                              | 142ED        |       |       |       |       |
|--|------------------------------|--------------|-------|-------|-------|-------|
| Voltage (Vrms)                         |                              | 200-240      |       |       |       |       |
| Frame length                           |                              | A            | B     | C     | D     | E     |
| Continuous stall torque (Nm)           |                              | 10.1         | 17.4  | 25.0  | 31.5  | 38.0  |
| Peak torque (Nm)                       |                              | 30.3         | 52.2  | 75.0  | 94.5  | 114.0 |
| Standard inertia (kg cm <sup>2</sup> ) |                              | 5.6          | 11.0  | 17.0  | 22.1  | 27.2  |
| Winding thermal time constant (sec)    |                              | 235          | 240   | 245   | 251   | 256   |
| Standard motor weight (kg)             |                              | 7.40         | 10.10 | 12.74 | 15.39 | 18.04 |
| Number of poles                        |                              | 10           | 10    | 10    | 10    | 10    |
| Speed<br>2000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 1.4<br>85.5  |       |       |       |       |
| Rated torque (Nm)                      |                              | 8.6          | 15.3  | 21.4  | ◆     | ◆     |
| Stall current (A)                      |                              | 7.21         | 12.43 | 17.86 | ◆     | ◆     |
| Rated power (kW)                       |                              | 1.80         | 3.20  | 4.48  | ◆     | ◆     |
| R (ph-ph) (Ohms)                       |                              | 0.85         | 0.34  | 0.24  | ◆     | ◆     |
| L (ph-ph) (mH)                         |                              | 14.3         | 5.9   | 3.7   | ◆     | ◆     |
| Recommended power conn' size           |                              | 1            | 1     | 1.5   | ◆     | ◆     |
| Speed<br>3000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.93<br>57   |       |       |       |       |
| Rated torque (Nm)                      |                              | 8.2          | 14.0  | 18.4  | 20.9  | ◆     |
| Stall current (A)                      |                              | 10.86        | 18.71 | 26.88 | 33.87 | ◆     |
| Rated power (kW)                       |                              | 2.58         | 4.40  | 5.78  | 6.57  | ◆     |
| R (ph-ph) (Ohms)                       |                              | 0.38         | 0.22  | 0.12  | 0.09  | ◆     |
| L (ph-ph) (mH)                         |                              | 6.3          | 2.8   | 1.9   | 1.6   | ◆     |
| Recommended power conn' size           |                              | 1            | 1.5   | 1.5   | 1.5   | ◆     |
| Speed<br>4000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.7<br>42.75 |       |       |       |       |
| Rated torque (Nm)                      |                              | ◆            | 11.7  | ◆     | ◆     | ◆     |
| Stall current (A)                      |                              | ◆            | 24.86 | ◆     | ◆     | ◆     |
| Rated power (kW)                       |                              | ◆            | 4.90  | ◆     | ◆     | ◆     |
| R (ph-ph) (Ohms)                       |                              | ◆            | 0.08  | ◆     | ◆     | ◆     |
| L (ph-ph) (mH)                         |                              | ◆            | 4.5   | ◆     | ◆     | ◆     |
| Recommended power conn' size           |                              | ◆            | 1.5   | ◆     | ◆     | ◆     |
| Speed<br>6000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.47<br>28.5 |       |       |       |       |
| Rated torque (Nm)                      |                              | ◆            | ◆     | ◆     | ◆     | ◆     |
| Stall current (A)                      |                              | ◆            | ◆     | ◆     | ◆     | ◆     |
| Rated power (kW)                       |                              | ◆            | ◆     | ◆     | ◆     | ◆     |
| R (ph-ph) (Ohms)                       |                              | ◆            | ◆     | ◆     | ◆     | ◆     |
| L (ph-ph) (mH)                         |                              | ◆            | ◆     | ◆     | ◆     | ◆     |
| Recommended power conn' size           |                              | ◆            | ◆     | ◆     | ◆     | ◆     |

| Motor frame size (mm)                  |                              | 142UD      |       |       |       |       |
|--|------------------------------|------------|-------|-------|-------|-------|
| Voltage (Vrms)                         |                              | 380-480    |       |       |       |       |
| Frame length                           |                              | A          | B     | C     | D     | E     |
| Continuous stall torque (Nm)           |                              | 10.1       | 17.4  | 25.0  | 31.5  | 38.0  |
| Peak torque (Nm)                       |                              | 30.3       | 52.2  | 75.0  | 94.5  | 114.0 |
| Standard inertia (kg cm <sup>2</sup> ) |                              | 5.6        | 11.0  | 17.0  | 22.1  | 27.2  |
| Winding thermal time constant (sec)    |                              | 235        | 240   | 245   | 251   | 256   |
| Standard motor weight (kg)             |                              | 7.40       | 10.10 | 12.74 | 15.39 | 18.04 |
| Number of poles                        |                              | 10         | 10    | 10    | 10    | 10    |
| Speed<br>2000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 2.4<br>147 |       |       |       |       |
| Rated torque (Nm)                      |                              | 8.6        | 15.3  | 21.4  | ◆     | ◆     |
| Stall current (A)                      |                              | 4.21       | 7.25  | 10.42 | ◆     | ◆     |
| Rated power (kW)                       |                              | 1.80       | 3.20  | 4.48  | ◆     | ◆     |
| R (ph-ph) (Ohms)                       |                              | 3.90       | 1.53  | 0.79  | ◆     | ◆     |
| L (ph-ph) (mH)                         |                              | 46.28      | 20.97 | 12.15 | ◆     | ◆     |
| Recommended power conn' size           |                              | 1          | 1     | 1     | ◆     | ◆     |
| Speed<br>3000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 1.6<br>98  |       |       |       |       |
| Rated torque (Nm)                      |                              | 8.2        | 14.0  | 18.4  | 20.9  | 23.0  |
| Stall current (A)                      |                              | 6.31       | 10.88 | 15.63 | 19.69 | 23.75 |
| Rated power (kW)                       |                              | 2.58       | 4.40  | 5.78  | 6.57  | 7.23  |
| R (ph-ph) (Ohms)                       |                              | 1.50       | 0.63  | 0.34  | 0.24  | 0.18  |
| L (ph-ph) (mH)                         |                              | 18.1       | 8.6   | 5.3   | 3.8   | 2.9   |
| Recommended power conn' size           |                              | 1          | 1     | 1     | 1.5   | 1.5   |
| Speed<br>4000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 1.2<br>74  |       |       |       |       |
| Rated torque (Nm)                      |                              | ◆          | 11.7  | ◆     | 14.9  | ◆     |
| Stall current (A)                      |                              | ◆          | 14.50 | ◆     | 26.25 | ◆     |
| Rated power (kW)                       |                              | ◆          | 4.90  | ◆     | 6.24  | ◆     |
| R (ph-ph) (Ohms)                       |                              | ◆          | 0.36  | ◆     | 0.16  | ◆     |
| L (ph-ph) (mH)                         |                              | ◆          | 7.1   | ◆     | 2.4   | ◆     |
| Recommended power conn' size           |                              | ◆          | 1     | ◆     | 1.5   | ◆     |
| Speed<br>6000 (rpm)                    | Kt (Nm/A) =<br>Ke (V/krpm) = | 0.8<br>49  |       |       |       |       |
| Rated torque (Nm)                      |                              | ◆          | 7     | ◆     | ◆     | ◆     |
| Stall current (A)                      |                              | ◆          | 21.75 | ◆     | ◆     | ◆     |
| Rated power (kW)                       |                              | ◆          | 4.4   | ◆     | ◆     | ◆     |
| R (ph-ph) (Ohms)                       |                              | ◆          | 0.17  | ◆     | ◆     | ◆     |
| L (ph-ph) (mH)                         |                              | ◆          | 3.2   | ◆     | ◆     | ◆     |
| Recommended power conn' size           |                              | ◆          | 1.5   | ◆     | ◆     | ◆     |

◆ Not available

All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature. Maximum intermittent winding temperature is 140°C

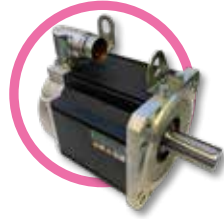


| Motor Dimension |                 |            |               |            |                  |                 |                   |                |               |                      |                 |               |                |
|-----------------|-----------------|------------|---------------|------------|------------------|-----------------|-------------------|----------------|---------------|----------------------|-----------------|---------------|----------------|
|                 | Unbraked length |            | Braked length |            | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |
|                 | LB (± 0.9)      | LC (± 1.0) | LC (± 1.0)    | LC (± 1.0) | LA (± 0.5)       | T (± 0.1)       | N (j6)            | LD (± 0.3)     | P (± 0.3)     | S (H14)              | M (± 0.5)       | PH (± 0.5)    |                |
| 142A            | 157             | 122.5      | 222.5         | 188        |                  |                 |                   | 183.5          |               |                      |                 |               |                |
| 142B            | 187             | 152.5      | 252.5         | 218        |                  |                 |                   | (Size 1)       |               |                      |                 |               |                |
| 142C            | 217             | 182.5      | 282.5         | 248        | 14               | 3.4             | 130               | 204.5          | 142           | 12                   | 165             | 142           | M10 mm         |
| 142D            | 247             | 212.5      | 312.5         | 278        |                  |                 |                   | (Size 1.5)     |               |                      |                 |               |                |
| 142E            | 277             | 242.5      | 342.5         | 308        |                  |                 |                   |                |               |                      |                 |               |                |

| Shaft Dimension |                |              |            |            |                  |           |                         |                   |    |
|-----------------|----------------|--------------|------------|------------|------------------|-----------|-------------------------|-------------------|----|
|                 | Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |    |
|                 | D(j6)          | E            | GA         | GF         | G                | F(h9)     | I                       | J(±1)             |    |
| 32.0 Std        | 32             | 58           | 35         | 50         | 3                | 10        | M12 x 1.75              | 29                | mm |

24mm shaft and 200mm flange options are available. Refer to factory for more information.

# FRAME SIZE 190

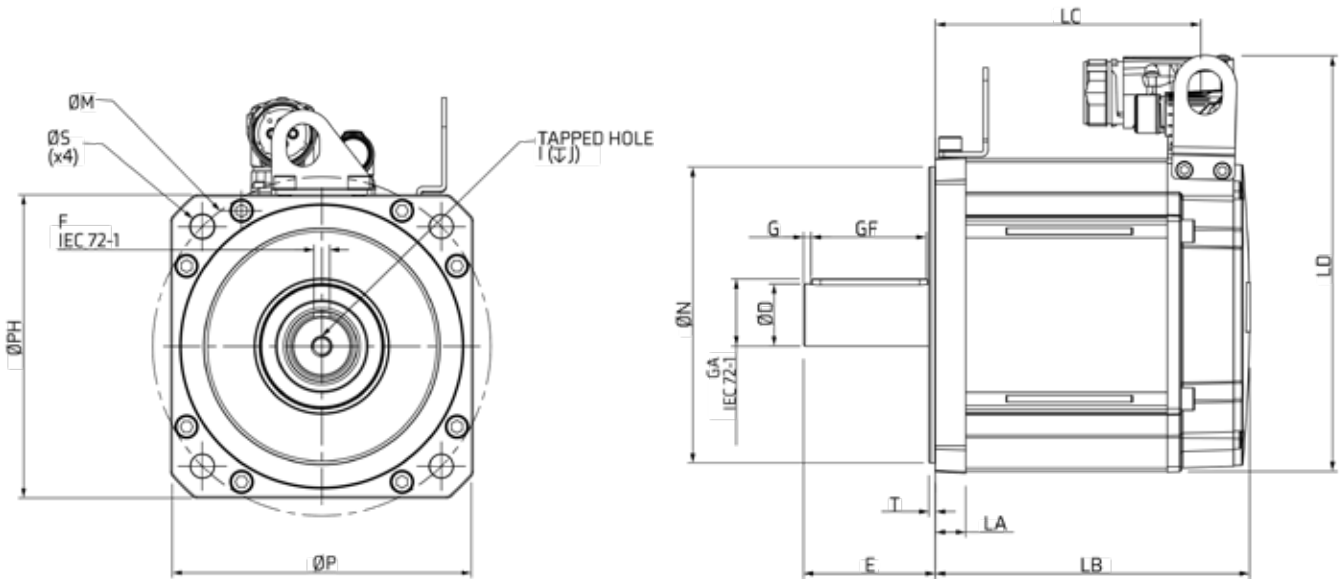


| Motor frame size (mm)                  |                              | 190ED   |       |             |       |       |       |
|--|------------------------------|---------|-------|-------------|-------|-------|-------|
| Voltage (Vrms)                         |                              | 200-240 |       |             |       |       |       |
| Frame length                           |                              | A       | B     | C           | D     | E     | F     |
| Continuous stall torque (Nm)           |                              | 18.5    | 32.7  | 52.0        | 62.0  | 73.5  | 85.0  |
| Peak torque (Nm)                       |                              | 55.5    | 98.10 | 156         | 186   | 220.5 | 255   |
| Standard inertia (kg cm <sup>2</sup> ) |                              | 22.0    | 38.3  | 54.6        | 70.9  | 87.2  | 103.5 |
| Winding thermal time constant (sec)    |                              | 286     | 292   | 300         | 308   | 316   | 324   |
| Standard motor weight (kg)             |                              | 14.60   | 21.20 | 27.74       | 34.30 | 40.90 | 47.42 |
| Number of poles                        |                              | 10      | 10    | 10          | 10    | 10    | 10    |
| Speed<br>1000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = |         |       | 2.8<br>171  |       |       |       |
| Rated torque (Nm)                      |                              | 17.6    | ◆     | 49.0        | 56.5  | ◆     | 77.5  |
| Stall current (A)                      |                              | 6.61    | ◆     | 18.57       | 22.14 | ◆     | 30.36 |
| Rated power (kW)                       |                              | 1.84    | ◆     | 5.13        | 5.92  | ◆     | 8.12  |
| R (ph-ph) (Ohms)                       |                              | 1.23    | ◆     | 0.30        | 0.27  | ◆     | 0.15  |
| L (ph-ph) (mH)                         |                              | 34.1    | ◆     | 10.0        | 7.1   | ◆     | 4.8   |
| Recommended power conn' size           |                              | 1.5     | ◆     | 1.5         | 1.5   | ◆     | 1.5   |
| Speed<br>1500<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = |         |       | 1.86<br>114 |       |       |       |
| Rated torque (Nm)                      |                              | ◆       | ◆     | 46.2        | ◆     | ◆     | ◆     |
| Stall current (A)                      |                              | ◆       | ◆     | 25.97       | ◆     | ◆     | ◆     |
| Rated power (kW)                       |                              | ◆       | ◆     | 7.26        | ◆     | ◆     | ◆     |
| R (ph-ph) (Ohms)                       |                              | ◆       | ◆     | 0.11        | ◆     | ◆     | ◆     |
| L (ph-ph) (mH)                         |                              | ◆       | ◆     | 3.5         | ◆     | ◆     | ◆     |
| Recommended power conn' size           |                              | ◆       | ◆     | 1.5         | ◆     | ◆     | ◆     |
| Speed<br>2000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = |         |       | 1.4<br>85.5 |       |       |       |
| Rated torque (Nm)                      |                              | ◆       | ◆     | 42.5        | ◆     | ◆     | ◆     |
| Stall current (A)                      |                              | ◆       | ◆     | 37.14       | ◆     | ◆     | ◆     |
| Rated power (kW)                       |                              | ◆       | ◆     | 8.9         | ◆     | ◆     | ◆     |
| R (ph-ph) (Ohms)                       |                              | ◆       | ◆     | 0.09        | ◆     | ◆     | ◆     |
| L (ph-ph) (mH)                         |                              | ◆       | ◆     | 2.5         | ◆     | ◆     | ◆     |
| Recommended power conn' size           |                              | ◆       | ◆     | 1.5         | ◆     | ◆     | ◆     |
| Speed<br>3000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = |         |       | 0.93<br>57  |       |       |       |
| Rated torque (Nm)                      |                              | 15.5    | 25.0  | 32.8        | ◆     | ◆     | ◆     |
| Stall current (A)                      |                              | 19.89   | 35.16 | 55.91       | ◆     | ◆     | ◆     |
| Rated power (kW)                       |                              | 4.87    | 7.85  | 10.30       | ◆     | ◆     | ◆     |
| R (ph-ph) (Ohms)                       |                              | 0.20    | 0.05  | 0.03        | ◆     | ◆     | ◆     |
| L (ph-ph) (mH)                         |                              | 3.1     | 1.6   | 1.2         | ◆     | ◆     | ◆     |
| Recommended power conn' size           |                              | 1.5     | 1.5   | 1.5         | ◆     | ◆     | ◆     |

| Motor frame size (mm)                  |                              | 190UD   |       |            |       |       |       |
|--|------------------------------|---------|-------|------------|-------|-------|-------|
| Voltage (Vrms)                         |                              | 380-480 |       |            |       |       |       |
| Frame length                           |                              | A       | B     | C          | D     | E     | F     |
| Continuous stall torque (Nm)           |                              | 18.5    | 32.7  | 52.0       | 62.0  | 73.5  | 85.0  |
| Peak torque (Nm)                       |                              | 55.5    | 98.10 | 156        | 186   | 220.5 | 255   |
| Standard inertia (kg cm <sup>2</sup> ) |                              | 22.0    | 38.3  | 54.6       | 70.9  | 87.2  | 103.5 |
| Winding thermal time constant (sec)    |                              | 286     | 292   | 300        | 308   | 316   | 324   |
| Standard motor weight (kg)             |                              | 14.60   | 21.20 | 27.74      | 34.30 | 40.90 | 47.42 |
| Number of poles                        |                              | 10      | 10    | 10         | 10    | 10    | 10    |
| Speed<br>1000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = |         |       | 4.8<br>296 |       |       |       |
| Rated torque (Nm)                      |                              | 17.6    | ◆     | ◆          | ◆     | ◆     | 78.3  |
| Stall current (A)                      |                              | 3.83    | ◆     | ◆          | ◆     | ◆     | 17.61 |
| Rated power (kW)                       |                              | 1.83    | ◆     | ◆          | ◆     | ◆     | 8.12  |
| R (ph-ph) (Ohms)                       |                              | 3.70    | ◆     | ◆          | ◆     | ◆     | 0.53  |
| L (ph-ph) (mH)                         |                              | 101.4   | ◆     | ◆          | ◆     | ◆     | 15.8  |
| Recommended power conn' size           |                              | 1.5     | ◆     | ◆          | ◆     | ◆     | 1.5   |
| Speed<br>1500<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = |         |       | 3.2<br>196 |       |       |       |
| Rated torque (Nm)                      |                              | ◆       | ◆     | 46.2       | ◆     | ◆     | 68.5  |
| Stall current (A)                      |                              | ◆       | ◆     | 16.25      | ◆     | ◆     | 26.56 |
| Rated power (kW)                       |                              | ◆       | ◆     | 7.26       | ◆     | ◆     | 10.76 |
| R (ph-ph) (Ohms)                       |                              | ◆       | ◆     | 0.55       | ◆     | ◆     | 0.23  |
| L (ph-ph) (mH)                         |                              | ◆       | ◆     | 14.2       | ◆     | ◆     | 6.8   |
| Recommended power conn' size           |                              | ◆       | ◆     | 1.5        | ◆     | ◆     | 1.5   |
| Speed<br>2000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = |         |       | 2.4<br>147 |       |       |       |
| Rated torque (Nm)                      |                              | ◆       | ◆     | 42.5       | 45.3  | 52.9  | 56    |
| Stall current (A)                      |                              | ◆       | ◆     | 21.67      | 25.83 | 30.63 | 35.42 |
| Rated power (kW)                       |                              | ◆       | ◆     | 8.90       | 9.49  | 11.08 | 11.73 |
| R (ph-ph) (Ohms)                       |                              | ◆       | ◆     | 0.32       | 0.17  | 0.16  | 0.14  |
| L (ph-ph) (mH)                         |                              | ◆       | ◆     | 8.2        | 5.1   | 4.6   | 4.3   |
| Recommended power conn' size           |                              | ◆       | ◆     | 1.5        | 1.5   | 1.5   | 1.5   |
| Speed<br>3000<br>(rpm)                 | Kt (Nm/A) =<br>Ke (V/krpm) = |         |       | 1.6<br>98  |       |       |       |
| Rated torque (Nm)                      |                              | 15.5    | 25.0  | 32.8       | 39.0  | ◆     | ◆     |
| Stall current (A)                      |                              | 11.56   | 20.44 | 32.50      | 38.75 | ◆     | ◆     |
| Rated power (kW)                       |                              | 4.87    | 7.85  | 10.30      | 12.25 | ◆     | ◆     |
| R (ph-ph) (Ohms)                       |                              | 0.57    | 0.23  | 0.11       | 0.11  | ◆     | ◆     |
| L (ph-ph) (mH)                         |                              | 11.6    | 5.7   | 3.1        | 2.7   | ◆     | ◆     |
| Recommended power conn' size           |                              | 1.5     | 1.5   | 1.5        | 1.5   | ◆     | ◆     |

◆ Not available

All data subject to +/-10% tolerance. Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency. All other figures relate to a 20°C motor temperature. Maximum intermittent winding temperature is 140°C



| Motor Dimension |                 |               |           |                  |                 |                   |                |               |                      |                 |               |                |        |
|-----------------|-----------------|---------------|-----------|------------------|-----------------|-------------------|----------------|---------------|----------------------|-----------------|---------------|----------------|--------|
|                 | Unbraked length | Braked length |           | Flange thickness | Register length | Register diameter | Overall height | Flange square | Fixing hole diameter | Fixing hole PCD | Motor housing | Mounting bolts |        |
|                 | LB (±0.9)       | LC (±1.0)     | LC (±1.0) | LC (±1.0)        | LA (±0.5)       | T (±0.1)          | N (j6)         | LD (±0.3)     | P (±0.3)             | S (H14)         | M (±0.5)      | PH (±0.5)      |        |
| 190A            | 160.6           | 131.1         | 259.1     | 229.6            |                 |                   |                |               |                      |                 |               |                |        |
| 190B            | 190.6           | 161.1         | 289.1     | 259.6            |                 |                   |                |               |                      |                 |               |                |        |
| 190C            | 220.6           | 191.1         | 319.1     | 289.6            |                 |                   |                |               |                      |                 |               |                |        |
| 190D            | 250.6           | 221.1         | 349.1     | 319.6            | 18.5            | 3.9               | 180            | 252.5         | 190.3                | 14.5            | 215           | 190            | M12 mm |
| 190E            | 280.6           | 251.1         | 379.1     | 349.6            |                 |                   |                |               |                      |                 |               |                |        |
| 190F            | 310.6           | 281.1         | 409.1     | 379.6            |                 |                   |                |               |                      |                 |               |                |        |

| Shaft Dimension |                |              |            |            |                  |           |                         |                   |    |
|-----------------|----------------|--------------|------------|------------|------------------|-----------|-------------------------|-------------------|----|
|                 | Shaft diameter | Shaft length | Key height | Key length | Key to shaft end | Key width | Tapped hole thread size | Tapped hole depth |    |
|                 | D(j6)          | E            | GA         | GF         | G                | F(h9)     | I                       | J(±1)             |    |
| 38.0 Std        | 38             | 80           | 41         | 70         | 4.6              | 10        | M12 x 1.75              | 29                | mm |

42mm shaft and 235mm flange options are available. Refer to factory for more information.

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