

**CONTROLTM
TECHNIQUES**

SERVO DRIVE SERIES

DIGITAX HD



**Minimum size,
maximum performance**

**0.7 Nm - 51 Nm
with 153 Nm peak**

**1.5 A - 16 A
with 48 A peak**

200 V | 400 V

0.25 kW - 7.5 kW

Nidec
All for dreams



All for dreams

#1 for advanced motor and drive technology

Nidec Corporation is a global manufacturer of electric motors and drives. Founded in 1973, Nidec has worldwide operations and a workforce of more than 110,000 who develop, manufacture and install motors, drives and control systems in industrial plants, automobiles, home appliances, office equipment and information technology.



110,000
EMPLOYEES
WORLDWIDE



\$11B
GROUP
TURNOVER



70+
COUNTRIES



230+
COMPANIES

CONTROLTM TECHNIQUES

DRIVE SPECIALISTS SINCE 1973

Industries which require the use of electric motors, and therefore drives, will form the backbone of the world's economy in the future. We will put great emphasis on research and development. As an R&D engineer myself, I know that it is technology which will ensure our businesses succeed.

Shigenobu Nagamori, Founder of Nidec



1,000+
OEM
CUSTOMERS



3M+
INSTALLED
DRIVES



1,000+
EMPLOYEES
WORLDWIDE



70
COUNTRIES



Global reach, local support

Highly experienced, locally based Application Engineers design and support drive technology to provide maximum value, wherever you are in the world.

Outstanding performance

The outstanding performance of our drives is the fruit of over 45 years of engineering experience in drive design.



Technology you can rely on

Robust design and the highest build quality ensure the enduring reliability of the millions of drives installed around the world.



Open design architecture

Based on open design architecture, our drives integrate with all primary communication protocols.



Embedded intelligence

Precision motor control is combined with the highest embedded intelligence, ensuring maximum productivity and efficiency of your machinery.

Servo solutions for continuous and pulse duty applications

Control Techniques' servo solutions provide ultimate performance and flexibility for machinery manufacturers: a range of fully integrated drives from 0.25 kW through to 2.8 MW, from open loop motor control through to maximum performance servo control. With integrated PLC technology, matched motors plus a wide range of options to extend functionality and real time communications, Unidrive M700 and Digitax HD offer extensive scalability in a comprehensive drive range.

Unidrive M700

Unidrive M700, with high performance and an extensive power range, is the ideal option for continuous duty applications, where precise, continuous torque delivery is required.

Digitax HD







The new Digitax HD range brings ultimate performance to high dynamic, pulse duty applications, where high peak torque is required for fast acceleration.

Unimotor

Unimotor is a comprehensive family of high performance AC brushless servo motors.

With a wide torque range, from 0.72 Nm up to 136 Nm, rated speeds from 1000 rpm to 6000 rpm, several inertia levels and a broad selection of feedback options, Unimotor offers the perfect fit for any application requirement.

Various mounting arrangements and a single cable option provide additional flexibility, while drive integration with electronic nameplate offers ultimate ease of use.

Drive Model			0.75 KW – 2.8 MW		0.25 KW – 7.5 KW
		Unidrive M700		Digitax HD	
Control Modes	Induction	<ul style="list-style-type: none"> • V/F • Open loop vector 	<ul style="list-style-type: none"> • RFC-A sensorless • RFC-A closed loop 	<ul style="list-style-type: none"> • V/F • Open loop vector 	<ul style="list-style-type: none"> • RFC-A sensorless • RFC-A closed loop
	Permanent Magnet Motors	<ul style="list-style-type: none"> • RFC-S sensorless 	<ul style="list-style-type: none"> • RFC-S closed loop 	<ul style="list-style-type: none"> • RFC-S sensorless 	<ul style="list-style-type: none"> • RFC-S closed loop
		2.2 A – 464 A 200% OVERLOAD		1.5 A – 16 A 300% OVERLOAD	
Motor Compatibility		 <p>Induction (Optimized with the Leroy-Somer IMfinity® range)</p>			
		 <p>Permanent Magnet (Optimized with the Leroy-Somer Dyneo® range)</p>			
		 <p>Continuous Duty Servo Range Unimotor FM (Optimized with the Control Techniques continuous duty drive)</p>		 <p>Pulse Duty Servo Range Unimotor HD (Optimized with the Control Techniques pulse duty drive)</p>	



Digitax HD

Digitax HD extends the Unidrive M range with maximum servo performance in a minimum size package. Optimized for high-dynamic applications, Digitax HD provides the flexibility of both standalone and modular configurations. The drive offers full servo control plus open loop permanent magnet motor and induction motor control across four functionality levels: EtherCAT, MCI machine control, Ethernet and the flexible Base drive.



Unimotor HD

Unimotor HD is Control Techniques' high dynamic brushless AC servo motor range. With high peak torque, low inertia and the most compact dimensions, Unimotor HD is optimized for applications requiring rapid acceleration and deceleration.



Actual size



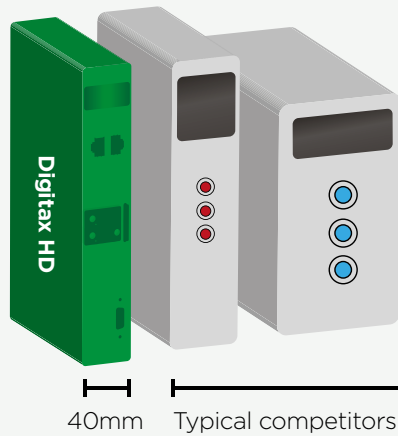
Minimum size servo solutions

Reduce cost and maximize floor space

Minimal footprint and exceptional power density make Digitax HD one of the **smallest servo drives** on the market today. This means that you can build the most compact cabinets possible.

The market's narrowest servo drive

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



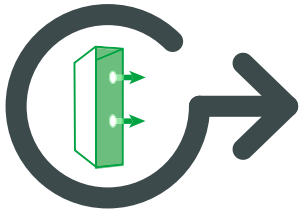
Just 40 mm

Drive dimensions at a glance

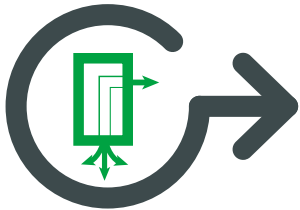
Dimensions	Frame 1	Frame 2	Frame 3
Width (mm)	40 mm	40 mm	40 mm
Depth (mm)	174 mm	174 mm	174 mm
Height (mm)	233 mm	278 mm	328 mm
Nominal current @ 400 V	4.2 A	10.5 A	16 A
Peak current @ 400 V	12.6 A	31.5 A	48 A



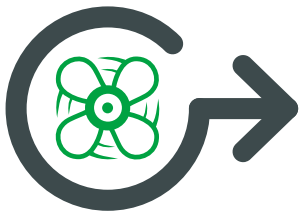
Reduce cabinet size with Ultraflow™ thermal management



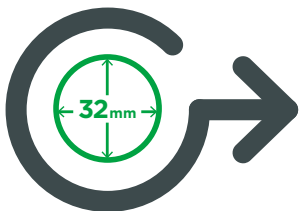
Reduce cabinet height by directly stacking rows of drives. Control Techniques' patented Ultraflow™ technology expels heat directly outside of the cabinet through the rear of the drive* and removes heat build-up in the cabinet.



Combined with conformal coating, Ultraflow™ minimizes contamination risk as a result of guided internal airflow, which prevents ingress on drive circuits.



An intelligently controlled fan minimizes acoustic noise and optimizes fan lifetime, while contributing to the maximum thermal cooling by Ultraflow™.



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

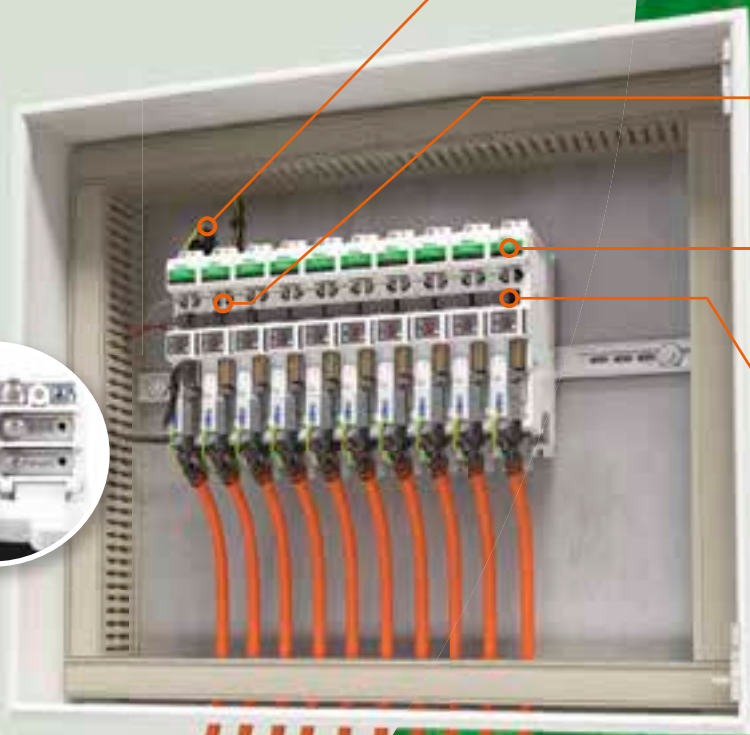


* Drive heat dissipation can also be achieved via vents on top of the drive, as standard.

** Frames 2 and 3 require 2 x 32mm holes

From
standalone...

...to a modular
common dc
bus system



SINGLE AC
INPUT

COMMUNICATION
LINKS

COMMON
DC BUS

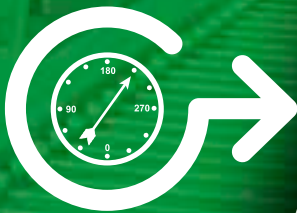
24V LINKS



PERFORMANCE



SPEED



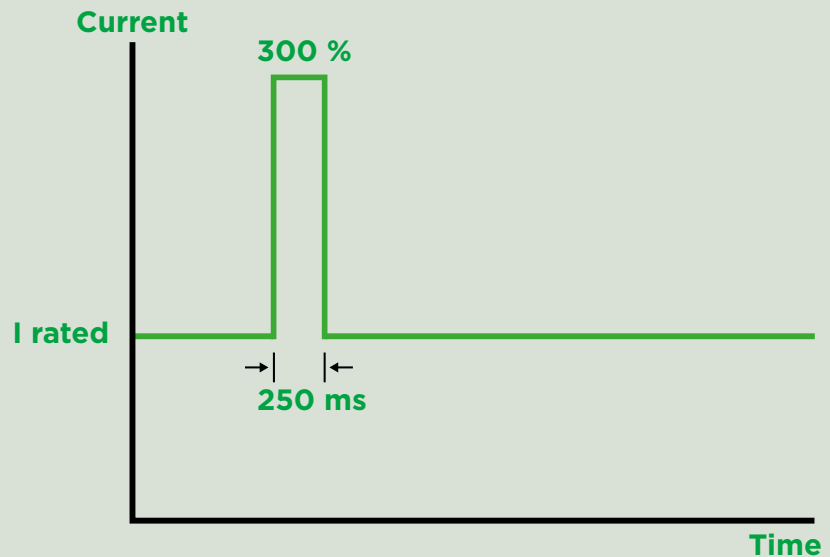
PRECISION

Maximum performance servo solutions

Boost throughput with maximum control

Optimized for high-dynamic applications and with high speed control loops, Digitax HD is one of the best performing servo drives on the market today. This means maximum throughput and product quality from your machines.

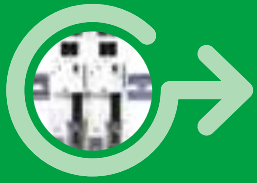
- 300% peak current performance
- Optimized control loops for high dynamic performance
 - 62.5 μ s current loop
 - 250 μ s position and speed loop
- Unique 'dead beat' current controller for maximum bandwidth
- Up to 16 kHz switching frequency (default ratings specified at 8 kHz)
- Notch filter for suppression of mechanical resonances



Improving accuracy through precision encoder feedback

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, SinCos (including absolute), SSI, BiSS, EnDat (up to 4 Mb with EnDat 2.2) and resolvers
- Simulated encoder output can provide position reference for CAMs, digital lock and electronic gearbox
- Up to 25 bit encoder resolution
- Feedback accuracy as low as $\pm 20''$



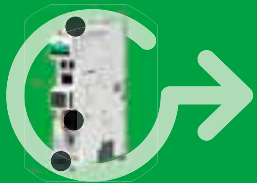
DIN rail alignment



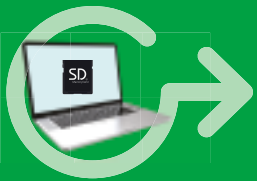
Remote mountable, plain text, multi-language LCD keypad



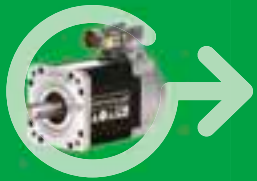
Single cable technology with electronic motor name plate for fast set up



Easy access pluggable connectors



Fast commissioning with PC tools or SD cards

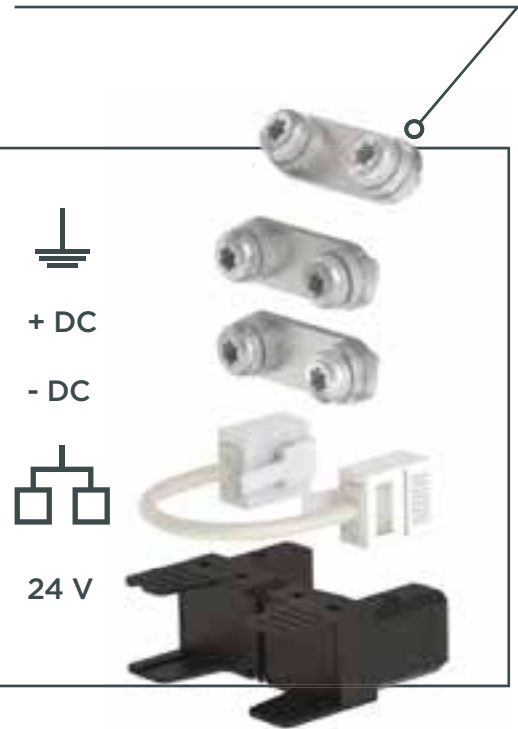


Unimotor's electronic nameplate provides support for parameter set-up between motor and drive

Rapid installation and commissioning

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

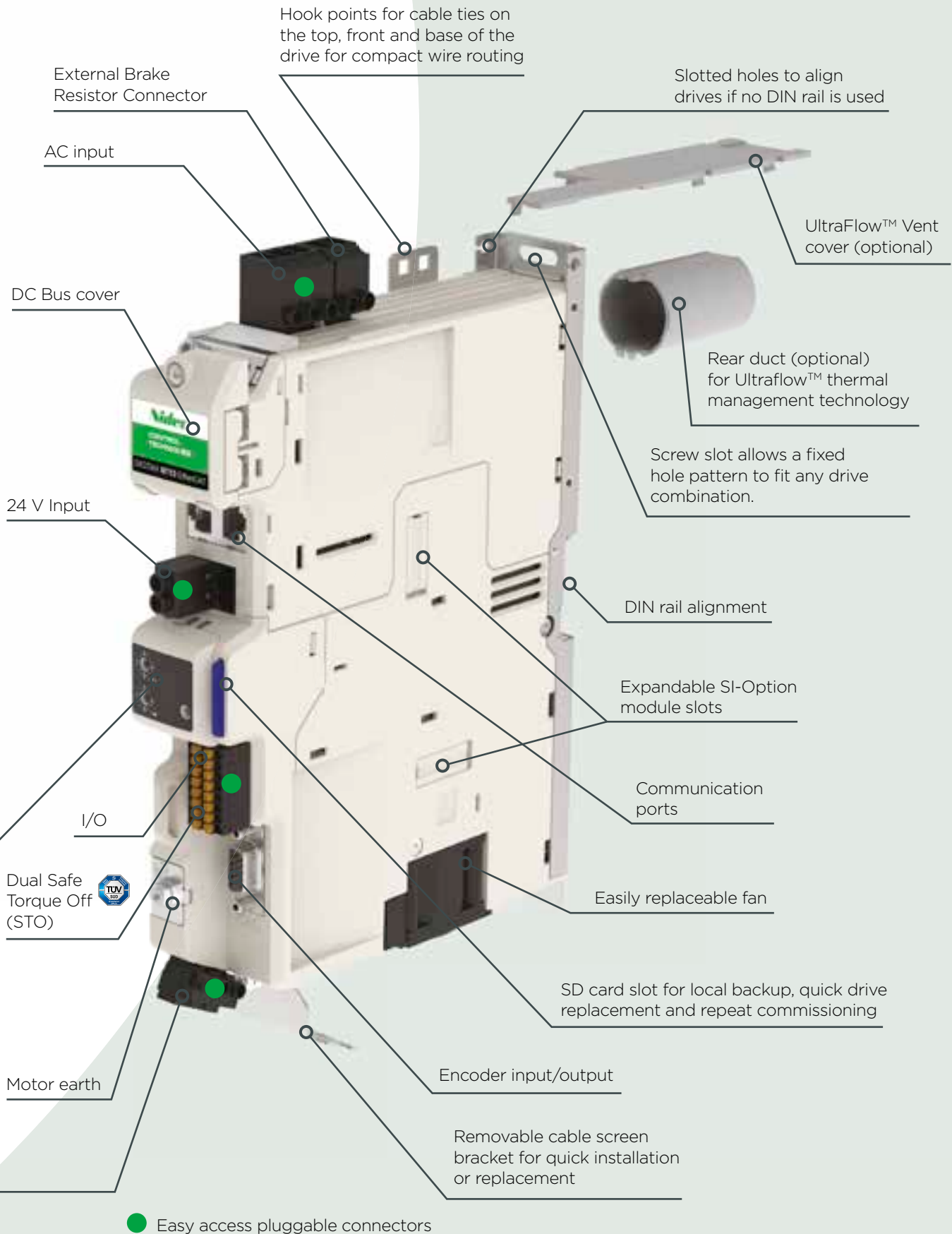
- Reduces installation time and cost
- Improves energy efficiency and footprint



The display (built-in on M753, optional on M751) 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 25 degree angle cutaway at the base of the drive ensures the same position for the motor power connector for all frame sizes, making cable routing easier and tidier.





Fast programming and commissioning

SOFTWARE

Programming Machine Control Studio

Machine Control Studio, built using an IEC61131-3 programming environment, provides a flexible and intuitive environment for programming automation and motion control features.

The software provides programming for:

- Onboard PLC
- Digitax M751 fitted with MCI200 or MCI210 integrated machine control modules
- Ethernet network data configurations



IEC 61131-3 motion and automation programming

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)

Also supported:

- Continuous Function Chart (CFC)
- 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

Features	Digitax HD onboard PLC	MCI Option Module
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)
Customizable drive menu	Yes	Yes
Variable tracing	-	Yes
Tasks available	1 x Freewheeling task, 1 x Clock task	1 x Freewheeling task, 1 x Position task, 1 x Initial task, 4 x Clock tasks, 1 x Error task, 4 x Event tasks
Centralized controller	-	Yes
Decentralized controller	Yes	Yes

Commissioning Connect

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

- Task-based drive operations are simplified with intuitive graphical tools in a familiar Windows environment
- Autotune ensures the best performance by measuring machine dynamics and automatically optimizing control loop gains
- CTScope – a realtime software oscilloscope – is supplied for tuning and monitoring
- Dynamic drive logic diagrams and enhanced searchable listings tool is scalable 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.



Drive Set-Up

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

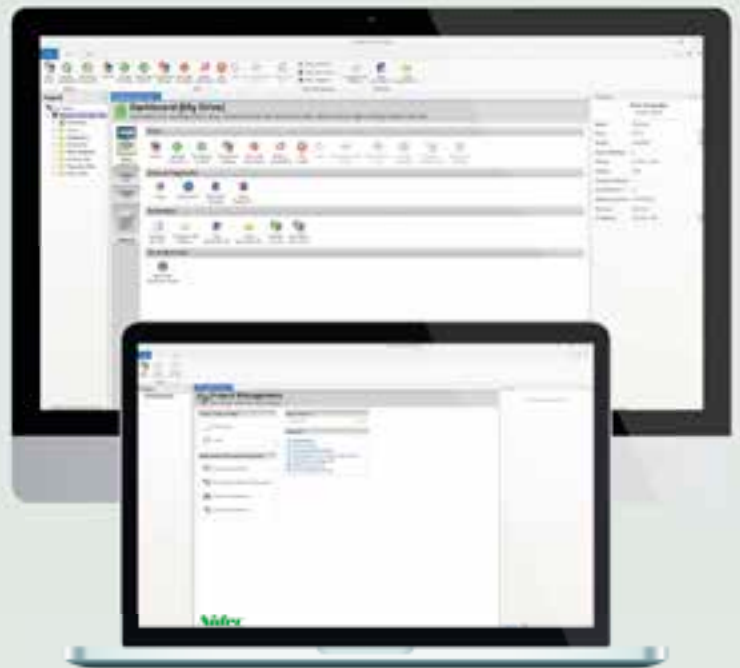
Visit: www.drive-setup.com



Diagnostics tool

Quickly solve any error codes that the drive may show.

You can download our **Diagnostics Tool** app at: www.controltechniques.com/mobile-applications



M751 Base

Base drive for configuration flexibility



Digitax M751 flexibility

Two option slots for functionality extension and customization – refer to page 29 for the comprehensive option module list

Built-in RS485 communications

Onboard Advanced Motion Controller for distributed 1.5 axis motion control

Analog and pulse/direction control for centralized motion

Reduced downtime with machine safety

- Integrated Dual Safe Torque Off
- Meets SIL3 (Safety Integrity Level 3) and PLe (Performance Level e)

Advanced Motion Controller onboard

Advanced 1.5 axes motion controller, key features include:

- Real-time tasks
- 250 μ s cycle time
- Motion profile generator
- Electronic gearbox
- Interpolated CAM
- Homing functions
- High speed position freeze

Can be configured using the Connect PC tool or the remote keypad

M751 + MCi210

Intelligent drive for decentralized motion applications

Digitax M751 plus MCi210 Machine Control

MCi210 Machine Control module for complete standalone capability, removing the need for an external controller

Provides a complete machine or sectional control solution

Faster throughput due to position loop @ 50 μ s and use of Real Time Motion over Ethernet

Synchronized peer-to-peer communication over Ethernet

Single drive with MCi210 can control multiple axes using RTMoE (see page 18)

Programmable with IEC61131 standard languages using Machine Control Studio

Reduced downtime with machine safety

- Integrated Dual Safe Torque Off
- Meets SIL3 (Safety Integrity Level 3) and PLe (Performance Level e)

MCi210 features

Two Ethernet ports with an internal switch

Support for standard Ethernet protocols, along with RTMoE for PTP (IEEE 1588) synchronization

Modbus TCP/IP master (up to 5 nodes)

Parallel interface with drive processor provides faster data exchange



M751 + SI-Ethernet

Network drive for centralized and decentralized motion applications



Digitax M751 plus SI-Ethernet

Support of real-time Ethernet (IEEE 1588 V2 Precision Time Protocol), HTTP, SMTP, EtherNet/IP and Modbus TCP/IP

Onboard advanced motion controller for distributed 1.5 axis motion control (see M751 Base, page 16, for more details)

Synchronized peer-to-peer communication over Ethernet

Reduced downtime with machine safety

- Integrated Dual Safe Torque Off
- Meets SIL3 (Safety Integrity Level 3) and PLe (Performance Level e)

Open, efficient, synchronized Ethernet

Maximize machine productivity through high performance deterministic Ethernet

Access future developments in IT-based industries where billions of nodes are installed, future proofing your investments

Ethernet web pages hosted on the SI-Ethernet option module

RTMoE

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

Distributed clocks are used to automatically synchronize the position, speed and current loops across all drives

1 ms cycle time for synchronous cyclic data

High speed network synchronization of less than 1 μ s jitter (typically <200 ns) and 1 ms cycle time for synchronous cyclic data



M753 EtherCAT

EtherCAT device for centralized motion control applications

Digitax M753 EtherCAT

Digitax M753 features an integrated 2-port EtherCAT switch for easy integration in centralized 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 in 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 CoE mailbox

Flexibility for all applications achieved through full access to drive functions

- CANopen over EtherCAT (CoE) including:
 - > CIA-402 profile
 - > Cyclic sync position mode
 - > Interpolated position mode
 - > Velocity mode
 - > Profile torque mode
 - > SDO access to all profile objects and drive parameters

Reduced downtime with machine safety

- Integrated Dual Safe Torque Off
- Meets SIL3 (Safety Integrity Level 3) and PLe (Performance Level e)



SIL3
Safety Integrity Level



Option module flexibility

Our innovative design means you only increase drive size when option modules are used, therefore **achieving significant space saving** in the overall configuration.



Adding the option mounting bracket **only adds an additional 22 mm width**, providing a highly competitive maximum drive width of 62 mm.

Option modules

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



Feedback

SI-Universal Encoder

Encoder input and output interface supporting Quadrature, SinCos, EnDat and SSI encoders.



SI-Encoder

Quadrature encoder input interface module.



I/O

SI-I/O

Extended I/O interface module to increase the number of I/O analog and digital points on a drive.



Communications

SI-EtherCAT



SI-PROFINET



SI-Ethernet*



SI-DeviceNet



SI-CANopen



SI-PROFIBUS



Applications with PLC or Motion Functionality

MCI200

Advanced machine control using industry standard IEC61131-3 programming languages



MCI210

Extended advanced machine control using industry standard IEC61131-3 programming languages and integrated Ethernet connectivity



SI-Apps Compact

Compatible module allows SyPTPro application programs to be re-compiled for HD



* Support of real-time Ethernet (IEEE 1588 V2 Precision Time Protocol), HTTP, SMTP, EtherNet/IP and Modbus TCP/IP

Unimotor HD

High dynamic servo motor for pulse duty applications

Unimotor HD – high dynamic servo motor for pulse duty applications

0.7 Nm to 85.0 Nm (255.0 Nm peak)

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**
- IP65 conformance: sealed against water spray and dust when mounted and connected
- **Segmented stator design for high power density and compactness**
- 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
- **Customized motor build available**





DATA

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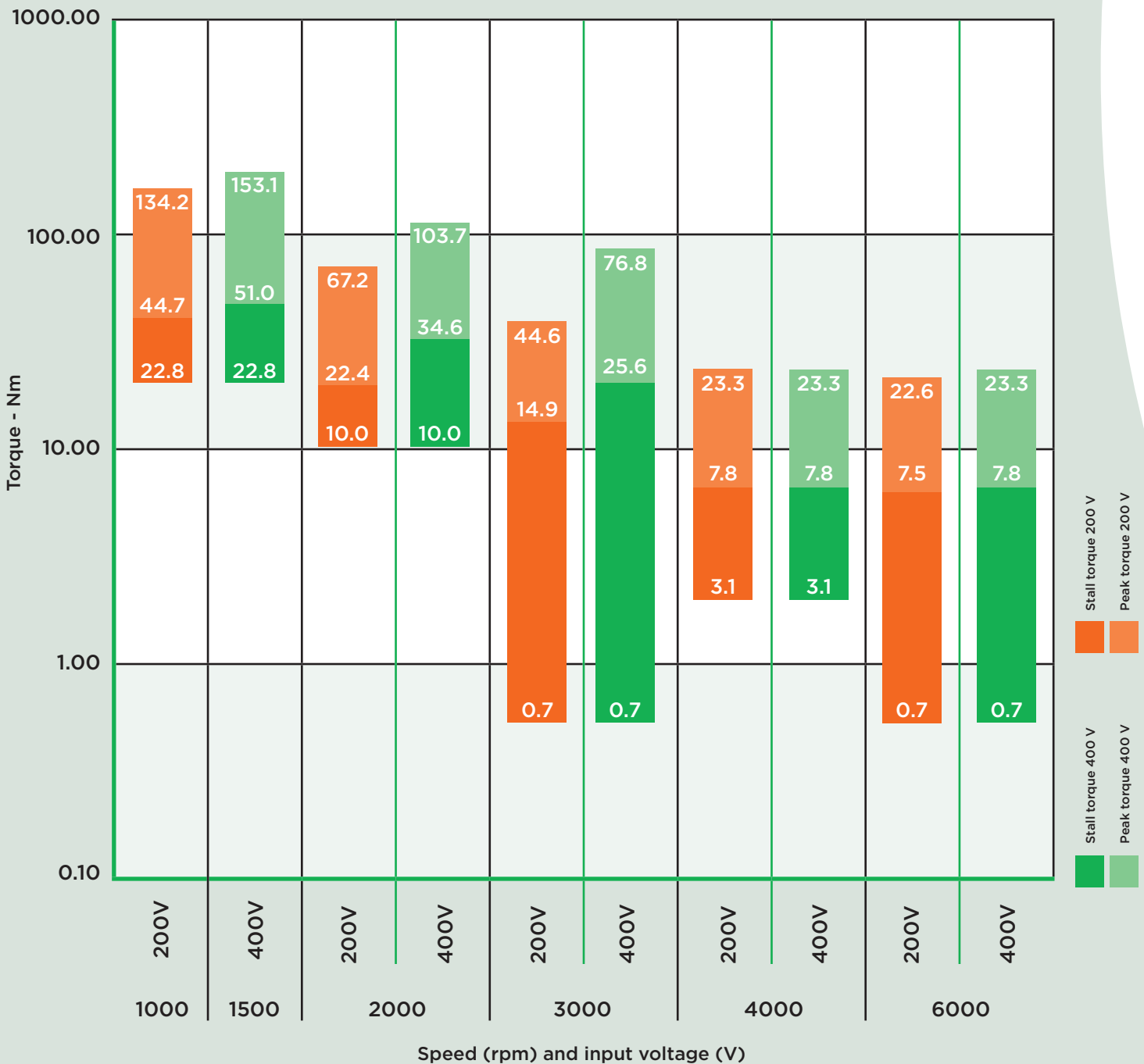
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Digitax HD & Unimotor HD motor and drive combinations

400 V range - 0.7 Nm to 51 Nm stall (153 Nm peak)
 200 V range - 0.7 Nm to 45 Nm stall (134 Nm peak)



Nominal speed 6000 rpm - 300% overload								
Motor	Drive	Hybrid Cable	Stall Torque [Nm]	Peak Torque [Nm]	Inertia [kg-cm ²]	Drive Capacitance [µF]	Cont. Power [kW]	Time to 6000 rpm [ms]*
HD055EDA60	M75x-01200022	HYBAxAxxx	0.69	2.1	0.14	580	0.05	8.5
HD055EDB60	M75x-01200040	HYBAxAxxx	1.1	3.4	0.25	580	0.09	9.2
HD055EDC60	M75x-01200040	HYBAxAxxx	1.6	4.8	0.36	580	0.12	9.5
HD067EDA60	M75x-01200040	HYBAxAxxx	1.4	4.3	0.30	580	0.10	8.8
HD067EDB60	M75x-01200065	HYBAxAxxx	2.5	7.5	0.53	580	1.4	8.9
HD089EDA60	M75x-02200090	HYBAxAxxx	3.1	9.3	0.87	1160	1.7	11.7
HD089EDB60	M75x-02200120	HYBAxAxxx	5.3	16.0	1.6	1160	2.4	12.6
HD089EDC60	M75x-03200160	HYBBxAxxx	7.5	22.6	2.3	1880	3.1	13.0

Nominal speed 4000 rpm - 300% overload								
Motor	Drive	Hybrid Cable	Stall Torque [Nm]	Peak Torque [Nm]	Inertia [kg-cm ²]	Drive Capacitance [µF]	Cont. Power [kW]	Time to 4000 rpm [ms]*
HD089EDA40	M75x-01200065	HYBAxAxxx	3.1	9.3	0.87	580	1.2	7.8
HD089EDB40	M75x-02200090	HYBAxAxxx	5.3	16.0	1.6	1160	1.9	8.4
HD089EDC40	M75x-02200120	HYBAxAxxx	7.8	23.3	2.3	1160	2.7	8.4

Nominal speed 3000 rpm - 300% overload								
Motor	Drive	Hybrid Cable	Stall Torque [Nm]	Peak Torque [Nm]	Inertia [kg-cm ²]	Drive Capacitance [µF]	Cont. Power [kW]	Time to 3000 rpm [ms]*
HD055EDA30	M75x-01200022	HYBAxAxxx	0.69	2.1	0.14	580	0.05	4.2
HD055EDB30	M75x-01200022	HYBAxAxxx	1.1	3.4	0.25	580	0.09	4.6
HD067EDA30	M75x-01200022	HYBAxAxxx	1.4	4.3	0.30	580	0.10	4.4
HD055EDC30	M75x-01200022	HYBAxAxxx	1.6	4.8	0.36	580	0.12	4.8
HD067EDB30	M75x-01200040	HYBAxAxxx	2.5	7.5	0.53	580	0.18	4.4
HD089EDA30	M75x-01200065	HYBAxAxxx	3.1	9.3	0.87	580	0.30	5.9
HD067EDC30	M75x-01200040	HYBAxAxxx	3.6	10.9	0.75	580	1.1	4.3
HD089EDB30	M75x-01200065	HYBAxAxxx	5.3	16.0	1.6	580	1.5	6.3
HD089EDC30	M75x-02200090	HYBAxAxxx	7.8	23.3	2.3	1160	2.1	6.3
HD115EDB30	M75x-02200120	HYBAxAxxx	10.0	30.0	4.4	1160	2.4	9.2
HD115EDC30	M75x-03200160	HYBBxAxxx	14.3	42.9	6.4	1880	3.2	9.4
HD142EDC30	M75x-03200160	HYBBxAxxx	14.9	44.6	17.0	1880	4.7	23.9

Nominal speed 2000 rpm - 300% overload								
Motor	Drive	Hybrid Cable	Stall Torque [Nm]	Peak Torque [Nm]	Inertia [kg-cm ²]	Drive Capacitance [µF]	Cont. Power [kW]	Time to 2000 rpm [ms]*
HD115EDB20	M75x-02200090	HYBAxAxxx	10.0	30.0	4.4	1160	1.8	6.2
HD115EDC20	M75x-02200120	HYBAxAxxx	14.3	42.9	6.4	1160	2.4	6.2
HD115EDD20	M75x-03200160	HYBBxAxxx	18.4	55.3	8.4	1880	3.2	6.4
HD142EDC20	M75x-03200160	HYBBxAxxx	22.4	67.2	17.0	1880	4.1	10.6

Nominal speed 1000 rpm - 300% overload								
Motor	Drive	Hybrid Cable	Stall Torque [Nm]	Peak Torque [Nm]	Inertia [kg-cm ²]	Drive Capacitance [µF]	Cont. Power [kW]	Time to 1000 rpm [ms]*
HD142EDC10	M75x-02200090	HYBAxAxxx	22.8	68.3	17.0	1160	2.2	5.2
HD142EDD10	M75x-02200120	HYBAxAxxx	28.7	86.0	22.1	1160	2.8	5.4
HD142EDE10	M75x-03200160	HYBBxAxxx	34.6	103.7	27.2	1880	3.3	5.5
HD190EDC10	M75x-03200160	HYBBxAxxx	44.7	134.2	54.6	1880	4.7	8.5

For drive ratings, please see page 34 and motor ratings from page 38 to 43

* 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 [Nm]	Peak Torque [Nm]	Inertia [kg-cm ²]	Drive Capacitance [µF]	Cont. Power [kW]	Time to 6000 rpm [ms]*
HD055UDA60	M75x-01400015	HYBAxAxxx	0.69	2.1	0.14	110	0.05	8.5
HD055UDB60	M75x-01400015	HYBAxAxxx	1.1	3.4	0.25	110	0.09	9.2
HD055UDC60	M75x-01400030	HYBAxAxxx	1.6	4.8	0.36	110	0.12	9.5
HD067UDA60	M75x-01400030	HYBAxAxxx	1.4	4.3	0.30	110	0.10	8.8
HD067UDB60	M75x-01400042	HYBAxAxxx	2.5	7.5	0.53	110	1.4	8.9
HD067UDC60	M75x-02400060	HYBAxAxxx	3.6	10.9	0.75	290	1.9	8.7
HD089UDA60	M75x-01400042	HYBAxAxxx	3.1	9.3	0.87	110	1.7	11.7
HD089UDB60	M75x-02400080	HYBAxAxxx	5.3	16.0	1.6	290	2.4	12.6
HD089UDC60	M75x-02400105	HYBBxAxxx	7.8	23.3	2.3	290	3.1	12.6

Nominal speed 4000 rpm – 300% overload								
Motor	Drive	Hybrid Cable	Stall Torque [Nm]	Peak Torque [Nm]	Inertia [kg-cm ²]	Drive Capacitance [µF]	Cont. Power [kW]	Time to 4000 rpm [ms]*
HD089UDA40	M75x-01400030	HYBAxAxxx	3.1	9.3	0.87	110	1.2	7.8
HD089UDB40	M75x-02400060	HYBAxAxxx	5.3	16.0	1.6	290	1.9	8.4
HD089UDC40	M75x-02400080	HYBAxAxxx	7.8	23.3	2.3	290	2.7	8.4

Nominal speed 3000 rpm – 300% overload								
Motor	Drive	Hybrid Cable	Stall Torque [Nm]	Peak Torque [Nm]	Inertia [kg-cm ²]	Drive Capacitance [µF]	Cont. Power [kW]	Time to 3000 rpm [ms]*
HD055UDA30	M75x-01400015	HYBAxAxxx	0.69	2.1	0.14	110	0.05	4.2
HD055UDB30	M75x-01400015	HYBAxAxxx	1.1	3.4	0.25	110	0.09	4.6
HD055UDC30	M75x-01400015	HYBAxAxxx	1.6	4.8	0.36	110	0.12	4.8
HD067UDA30	M75x-01400030	HYBAxAxxx	1.4	4.3	0.30	110	0.10	4.4
HD067UDB30	M75x-01400015	HYBAxAxxx	2.4	7.2	0.53	110	0.18	4.6
HD067UDC30	M75x-01400030	HYBAxAxxx	3.6	10.9	0.75	110	1.1	4.3
HD089UDA30	M75x-01400030	HYBAxAxxx	3.1	9.3	0.87	110	0.30	5.9
HD089UDB30	M75x-01400042	HYBAxAxxx	5.3	16.0	1.6	110	1.5	6.3
HD089UDC30	M75x-02400060	HYBAxAxxx	7.8	23.3	2.3	290	2.1	6.3
HD115UDB30	M75x-02400080	HYBAxAxxx	10.0	30.0	4.4	290	2.4	9.2
HD115UDC30	M75x-02400105	HYBBxAxxx	14.3	42.9	6.4	290	3.2	9.4
HD115UDD30	M75x-03400135	HYBBxAxxx	18.4	55.3	8.4	470	4.2	9.5
HD142UDC30	M75x-03400160	HYBBxAxxx	22.8	68.3	17.0	470	5.3	15.7
HD142UDD30	M75x-03400160	HYBBxAxxx	25.6	76.8	22.1	470	6.0	18.1

Nominal speed 2000 rpm – 300% overload								
Motor	Drive	Hybrid Cable	Stall Torque [Nm]	Peak Torque [Nm]	Inertia [kg-cm ²]	Drive Capacitance [µF]	Cont. Power [kW]	Time to 2000 rpm [ms]*
HD115UDB20	M75x-01400042	HYBAxAxxx	10.0	30.0	4.4	110	1.8	6.2
HD115UDC20	M75x-02400060	HYBAxAxxx	14.3	42.9	6.4	290	2.4	6.2
HD115UDD20	M75x-02400080	HYBAxAxxx	18.4	55.3	8.4	290	3.2	6.4
HD142UDC20	M75x-02400105	HYBBxAxxx	22.8	68.3	17.0	290	4.1	10.4
HD142UDD20	M75x-03400135	HYBBxAxxx	28.7	86.0	22.1	470	4.9	10.8
HD142UDE20	M75x-03400160	HYBBxAxxx	34.6	103.7	27.2	470	5.6	11.0

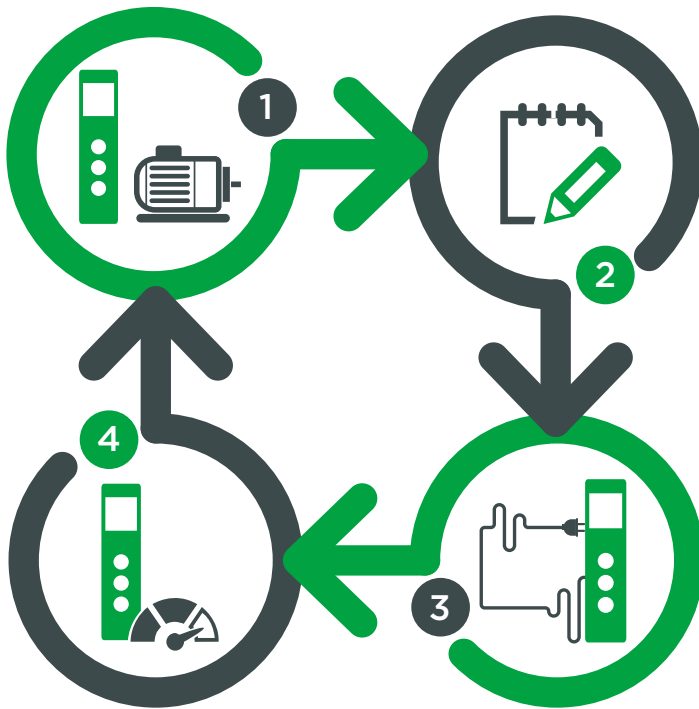
Nominal speed 1500 rpm – 300% overload								
Motor	Drive	Hybrid Cable	Stall Torque [Nm]	Peak Torque [Nm]	Inertia [kg-cm ²]	Drive Capacitance [µF]	Cont. Power [kW]	Time to 1500 rpm [ms]*
HD142UDC15	M75x-02400080	HYBAxAxxx	22.8	68.3	17.0	290	3.2	7.8
HD142UDD15	M75x-02400105	HYBBxAxxx	28.7	86.0	22.1	290	3.9	8.1
HD142UDE15	M75x-03400135	HYBBxAxxx	34.6	103.7	27.2	470	4.5	8.2
HD190UDC15	M75x-03400160	HYBBxAxxx	51.0	153.1	54.6	470	7.3	11.2

For drive ratings, please see page 34 and motor ratings from page 38 to 43.

* Acceleration time to nominal speed is based on 1:1 motor to load inertia ratio

Modular multi-axis configuration

Dimensioning the common DC bus



4 easy steps to accurately dimension your system

- 1 Choose drive & motor combination
Based on speed and torque requirements see pages 25 or 26
- 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:
 1. sum of drive capacitance \leq maximum capacitance**
 2. sum of nominal power \leq maximum input power**

(Refer to tables below)

Digitax HD drives have a higher 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 Digitax HD.

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 V link.

ADDITIONAL INFORMATION:

For optimized dimensioning please refer to the Installation and Technical Guide.



200V

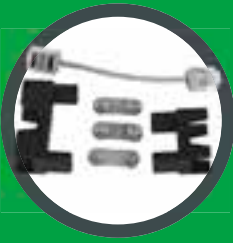
		Max Capacitance (μF)	Internal Capacitance (μF)	Max Input Power (kW)
Size 1	M75x-01200022	5800	580	4 / 5.2*
	M75x-01200040			
	M75x-01200065			
Size 2	M75x-02200090	4640	1160	5.3 / 6.9*
	M75x-02200012			
Size 3	M75x-03200160	3760	1880	6.3 / 10*

400V

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

* 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.



Digitax HD kits and accessories

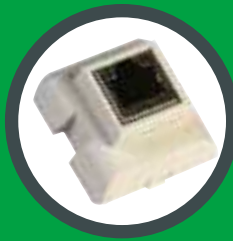
Multi-axis Kit	
Description	Order code
Multi-axis Kit (standard - without SI-Option Mounting Kit fitted)	9500-1047
Multi-axis Kit (with SI-Option Mounting Kit fitted)	9500-1048



Description	Order code
External Cable Grommet Kit up to 6mm ²	3470-0145
External DC Cable Connection Kit up to 16mm ²	9500-1050



Description	Order code
USB / EIA485 Communications Converter Cable	4500-0096



Description	Order code
KI-Compact 485 Adaptor	82700000020300



Description	Order code
KI-Compact Display	82700000020400



Standard cables available	
Description	Order code
Refer to pages 31 and 32	



Description	Order code
Remote Keypad RTC	8240000019600



Description	Order code
Input Line Choke	4401-0236



Description	Order code
Retrofit Kit - Epsilon 202-206	3470-0185
Retrofit Kit - Epsilon 209-216	3470-0184
Retrofit Kit - Digitax ST/SPO	3470-0182
Retrofit Kit - M'Ax	3470-0183



Description	Order code
Frame 1 Rear Ultraflow™ Vent Kit	3470-0158
Frame 2/3 Rear Ultraflow™ Vent Kit	3470-0181



Description	Order code
SI-Option Mounting Kit	9500-1055



Drive - Mountable Brake Resistor	
Description	Order code
Compact Brake Resistor Kit - 50 W, 70 Ω	9500-1049

External Brake Resistor	
Description	Order code
External Brake Resistor - DBR 100 W, 20 Ω	1220-2201
External Brake Resistor - DBR 100 W, 40 Ω	1220-2401
External Brake Resistor - DBR 100 W, 80 Ω	1220-2801



Description	Order code
Fan Replacement Kit (frame 1 and 2)	9500-1053
Fan Replacement Kit (frame 3)	9500-1054



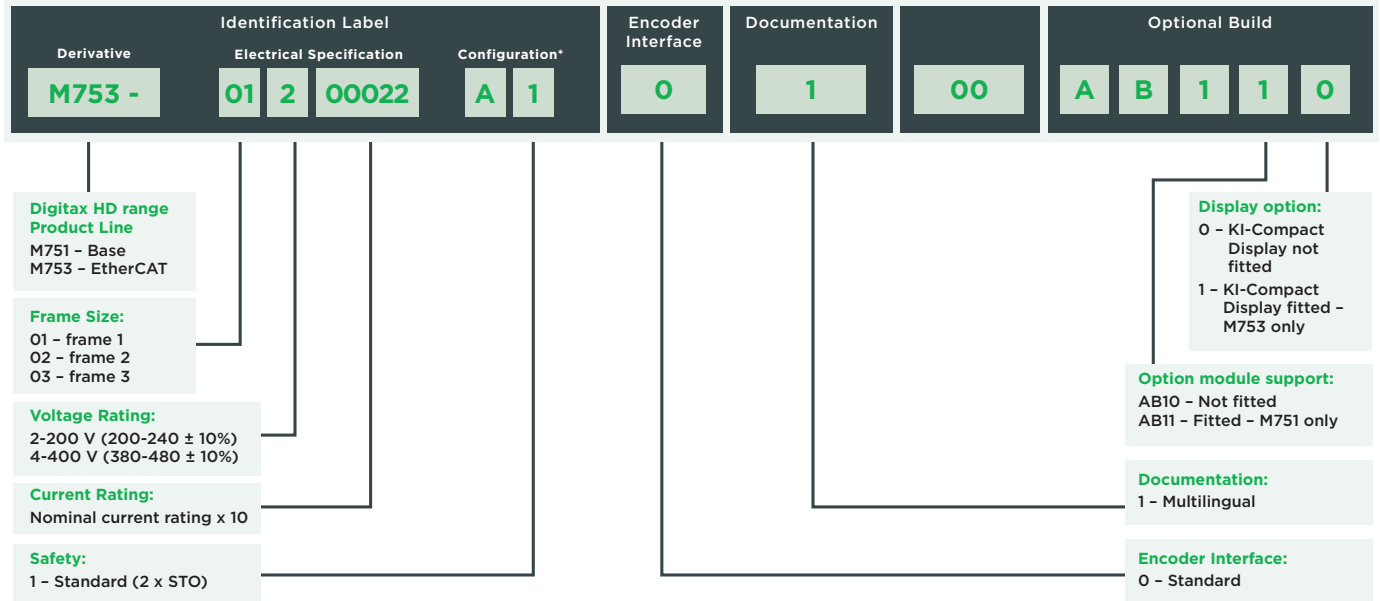
Description	Order code
Encoder breakout kit	82700000020200

EMC Filters			
Voltage	Model (M75X-...)	Phases	Order code
200 V	1200022	1	4200-3503
	1200040	1	
	1200065	1	4200-5033
	2200090	1	
	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	
400 V	01400015 to 01400042	3	4200-8744
	02400060 to 02400105	3	4200-1644
	03400135 to 03400160	3	4200-5833

System Integration Option Modules		
Option	Order code	
MCI200	82400000017000	
MCI210	82400000016700	
SI-Apps Compact	82400000020700	
SI-Ethernet	82400000017900	
SI-PROFINET RT	82500000018200	
SI-PROFIBUS	82400000017500	
SI-CANopen	82400000017600	
SI-DeviceNet	82400000017700	
SI-Universal Encoder	82400000018300	
SI-Encoder	82400000018100	
SI-I/O	82400000017800	

Digitax HD ordering information

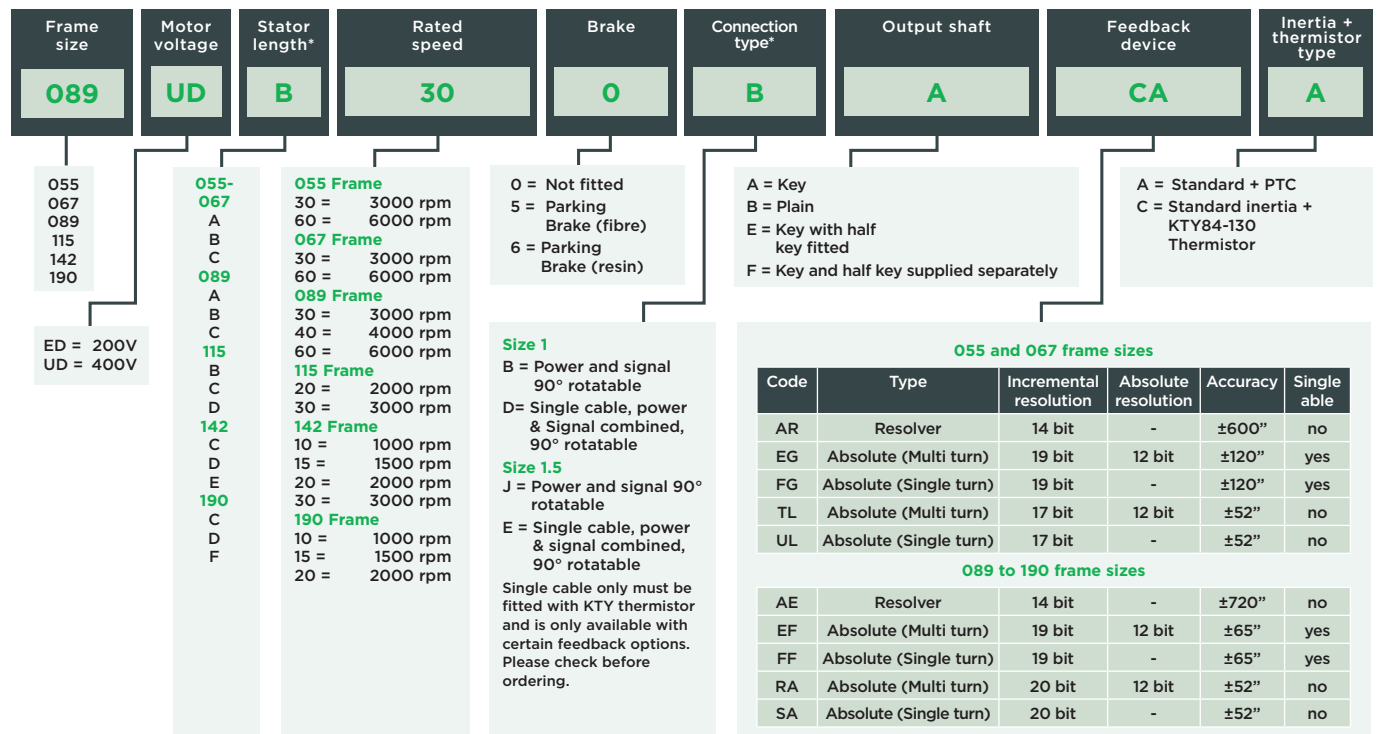
Drive part number key:



*For Ethernet and MCI versions, Option Modules are required separately. See page 29 for order codes.

Unimotor HD ordering information

Motor part number key:



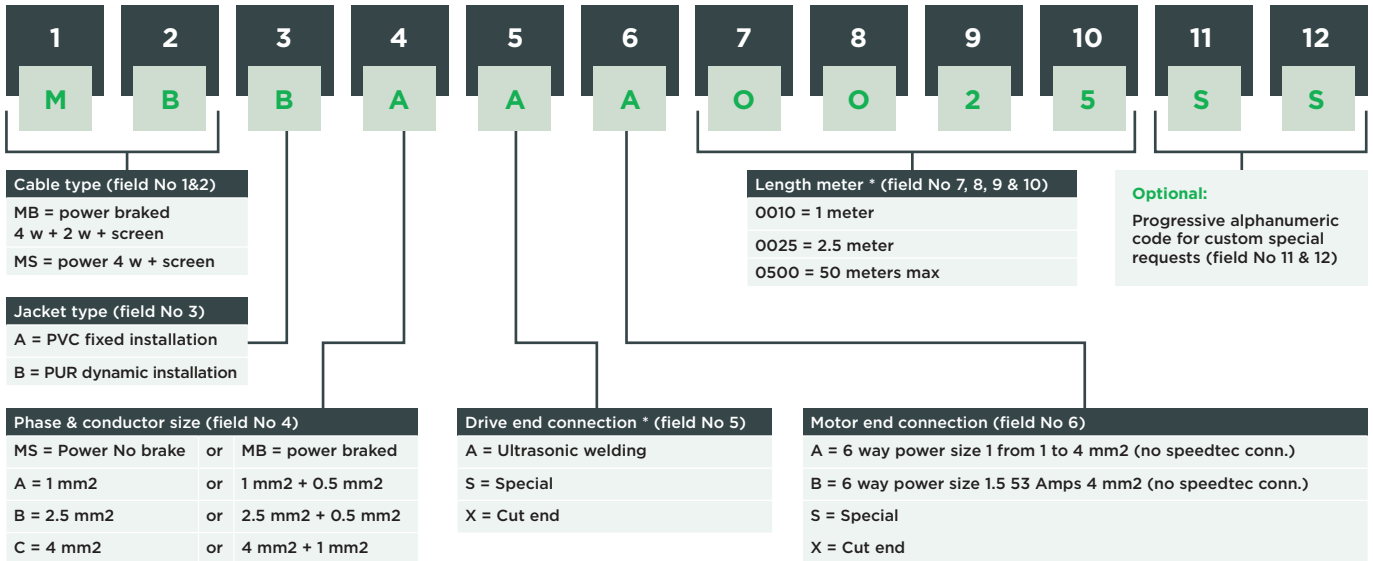
Additional feedback options available on request.

* For stator and connection length see page 38 - 43.

Cables and connections

Power cable codification

FIELD NUMBER

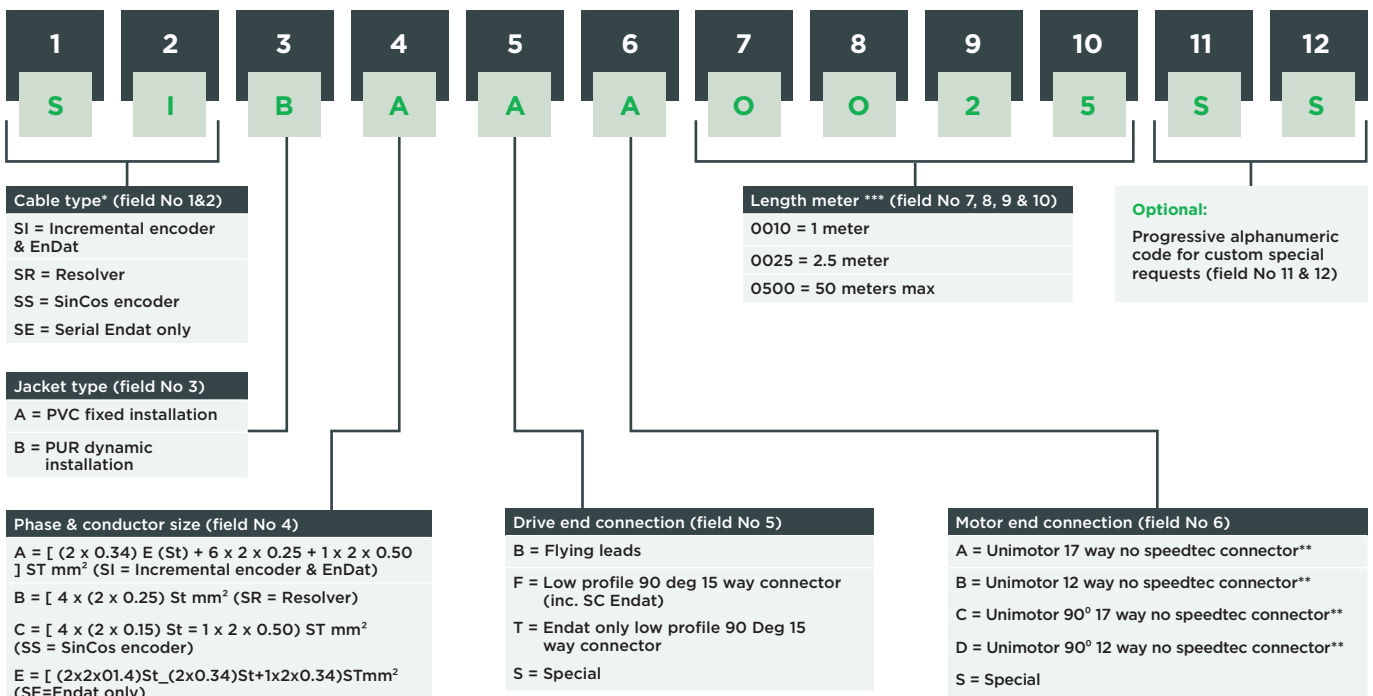


(*Length meter / cable requiring (cm) lengths will be rounded up to the next highest half meter; Eg. 2.1 will be changed to a 2.5 meter cable

Maximum cable assembly length 50 meters

Signal cable codification

FIELD NUMBER



* Based on feedback device (Unimotor HD order code): SR cable type for AE and AR feedback device, SE for EG and FG, SS for TL and UL, SI for EF and FF, and SS for RA and SA.

** Based on feedback device: 12 way for AE, AR, TL, UL; 17 way for EG, FG, EF, FF

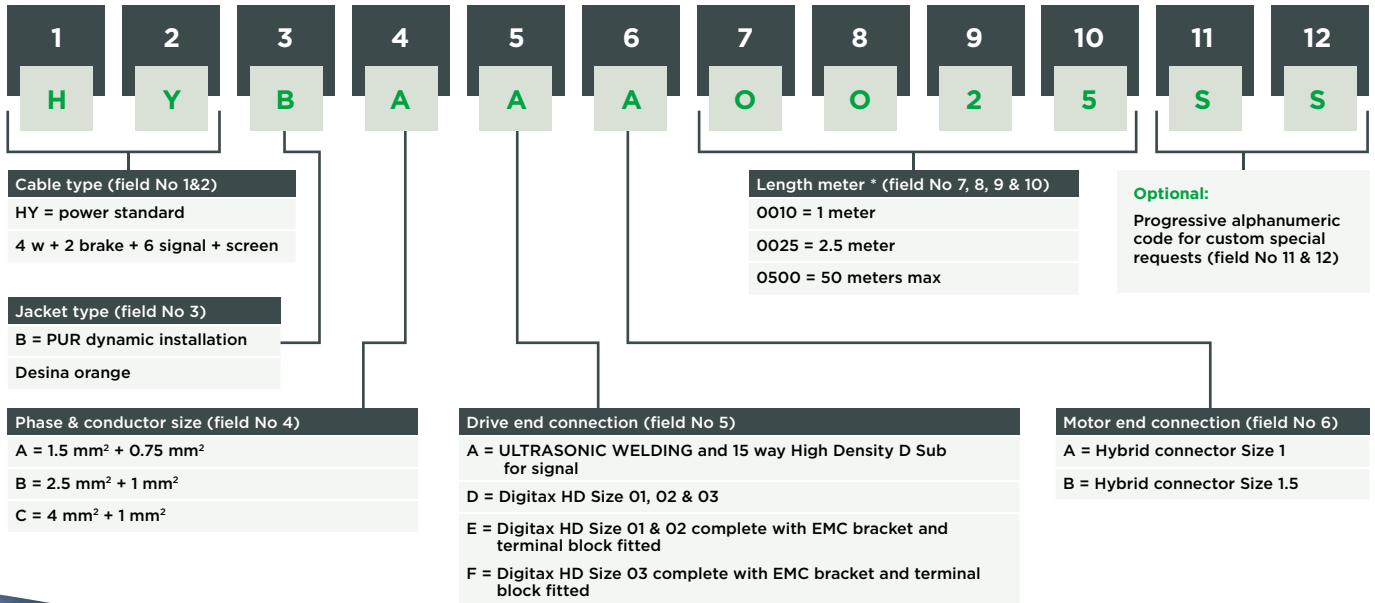
*** Length meter / cable requiring (cm) lengths will be rounded up to the next highest half meter; Eg. 2.1 will be changed to a 2.5 meter cable

Maximum cable assembly length 50 meters

Cables and connections

Hybrid cable codification

FIELD NUMBER



* Length meter / cable requiring (cm) lengths will be rounded up to the next highest half meter; Eg. 2.1 will be changed to a 2.5 meter cable
 Maximum cable assembly length 50 meters.



Digitax HD

Servo series specification

		M753 EtherCAT	M751 Base	M751 + SI-Ethernet	M751 + MCI210
Performance	Update Rates	Current Loop Update: 62 µs			
		Speed Loop Update: 250 µs			
		Position Loop Update: 250 µs			
	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	599 Hz				
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			MCI210
		Parameterised motion			Programmable motion
		1.5 Axes			Up to 5 Axes
		Positioning digital lock control			Positioning digital lock control camming
	Real-time tasks				
PLC	Onboard PLC			Onboard Machine Controller	
	IEC61131-3 programming (IL, LD, FBD, SFC)				
Control	Motor Control Modes	V/F, Open Loop Vector, RFC-A (Sensorless or Closed Loop), RFC-S (Sensorless Or Closed Loop)			
	Control Modes	Position control, speed control, torque control			
	Control Features	Stationary autotune for permanent magnet motors			
Notch filter for suppression of mechanical resonances					
Interface	Onboard Communications	2-port EtherCAT switch	2-port RS485	2-port RS 485 2-port Ethernet switch	2-port RS 485 2-port Ethernet switch
	Fieldbus	EtherCAT	Modbus RTU	Modbus RTU, Modbus TCP, Ethernet/IP	Modbus RTU, Modbus TCP, Ethernet/IP
	Real Time Motion	EtherCAT (CoE)	None	RTMoE	RTMoE
	Analog I/O	1 Analog Input ± 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 simulation encoder output			
	Supported Encoders	Resolver, Quadrature, AB Servo, SinCos, EnDat (2.2), SSI, BiSS, Hiperface			
	Safety	2 x Safe Torque Off (STO) via terminal, PLe, SIL3			
Commissioning	Interface	Ethernet over EtherCAT (EoE)	RS485	Ethernet	Ethernet
	Commissioning Tool	Connect			
	Motion Programming Tool	-	Machine Control Studio		
General	Mechanical Attributes	Removable cable screen			
		User replaceable fan(s)			
		Conformal coating			
	Backup	SD Card			
		Electronic motor nameplate parameter storage (HIPERFACE, Endat 2.2)			
	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	Optional	Optional	

* The stated percentages apply only to three phase continuous current

Drive ratings

200 V Single Phase	Frame Size W x D x H (mm)	Frame Size 01 40 x 174 x 233			Frame Size 02 40 x 174 x 278		Frame Size 03 40 x 174 x 328		
	Line Supply	Single Phase AC 200 V...240 V (± 10%) @ 45...66 Hz							
	M75X-...	01200022	01200040	01200065	02200090	02200120	03200160		
	Output Servo								
	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		
	Output AC Induction								
	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		
	Overload								
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 W x D x H (mm)	Frame Size 01 40 x 174 x 233			Frame Size 02 40 x 174 x 278		Frame Size 03 40 x 174 x 328		
	Line supply	Three Phase AC 200 V...240 V (± 10%) @ 45...66 Hz							
	M75X-...	01200022	01200040	01200065	02200090	02200120	03200160		
	Input								
	Max Power (kW)	4			5.3		10*		
	Output Servo								
	Rated Current (A)	2.2	4	6.5	9	12	16		
	Max Peak Current (A)	6.6	12	19.5	27	36	48		
	Output AC Induction								
	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			
Overload									
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 W x D x H (mm)	Frame Size 01 40 x 174 x 233			Frame Size 02 40 x 174 x 278		Frame Size 03 40 x 174 x 328		
	Line Supply	Three Phase AC 380 V...480 V (± 10%) @ 45...66 Hz							
	M75X-...	01400015	01400030	01400042	02400060	02400080	02400105	03400135	03400160
	Input								
	Max Power (kW)	6.5			8.7		10/13*		
	Output Servo								
	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
	Output AC Induction								
	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	
Overload									
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.

Environmental safety and electrical conformance

Safety Testing

UL open class

Ambient temperature -20 °C to 40 °C as standard. Up to 55 °C with derating

Humidity 95 % maximum (non-condensing) at 40 °C

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 to 70 °C

Mechanical Shock Tested in accordance with IEC 60068-2-27

Random Vibration: Tested in accordance with IEC 60068-2-64

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

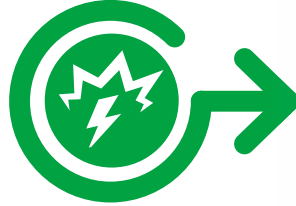
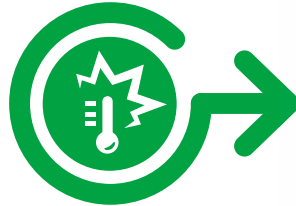
IEC 61800-5-1 (Electrical Safety)

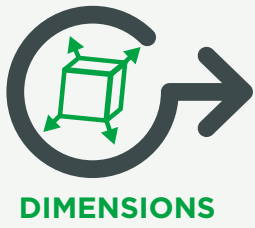
IEC 61131-2 I/O

Safe Torque Off independently assessed by TÜV to IEC 61800-5-2

SIL 3 and EN ISO 13849-1 PLe

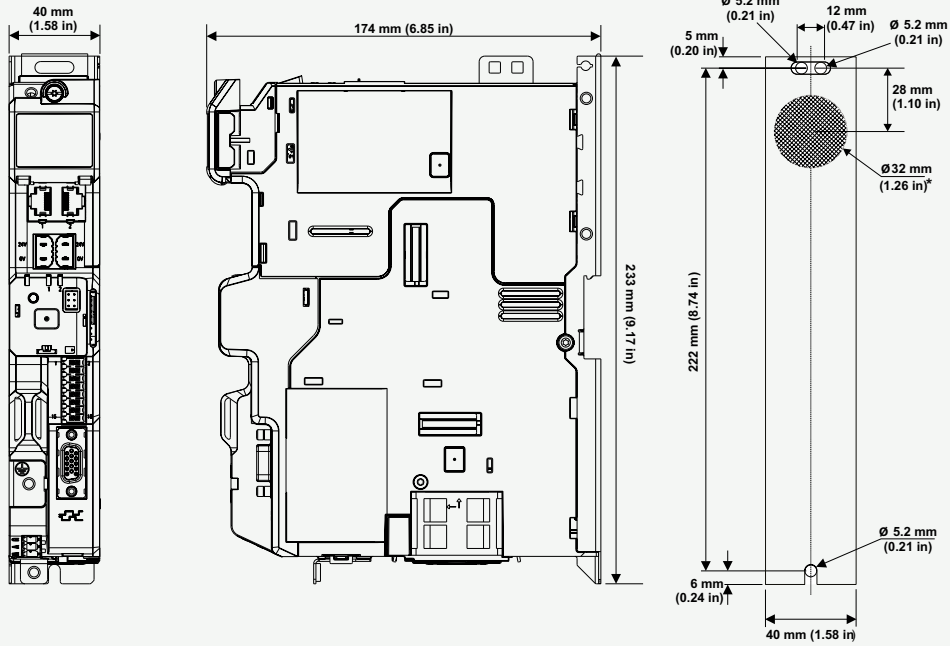
UL 61800-5-1 (Electrical Safety)



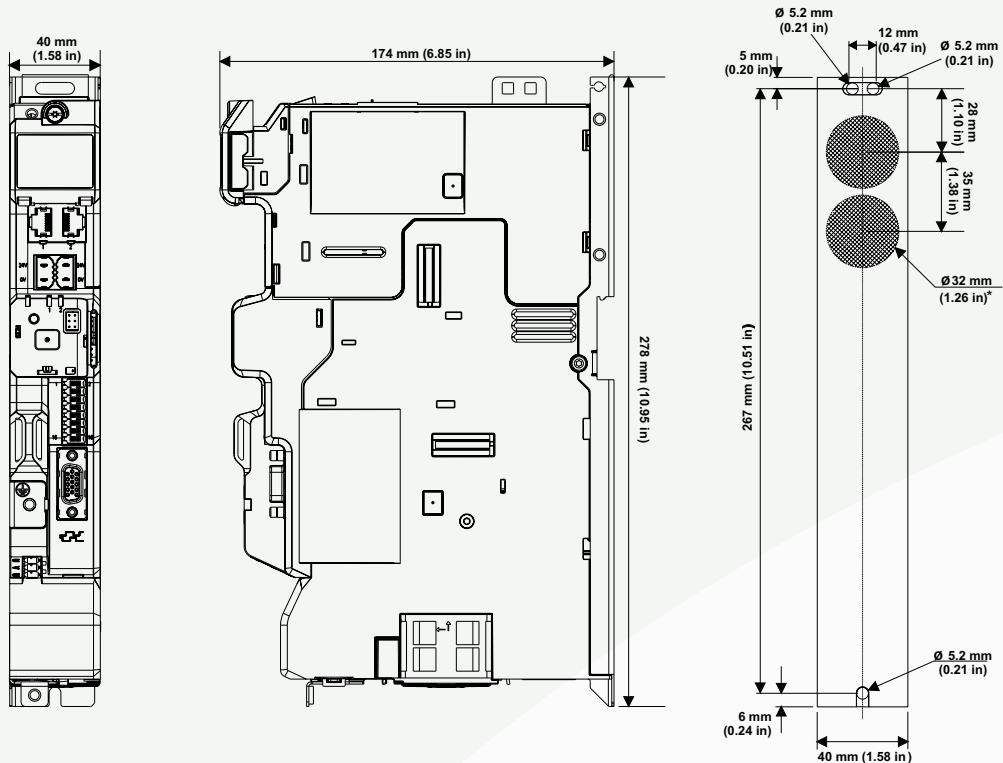


Digitax HD & Unimotor HD dimensions

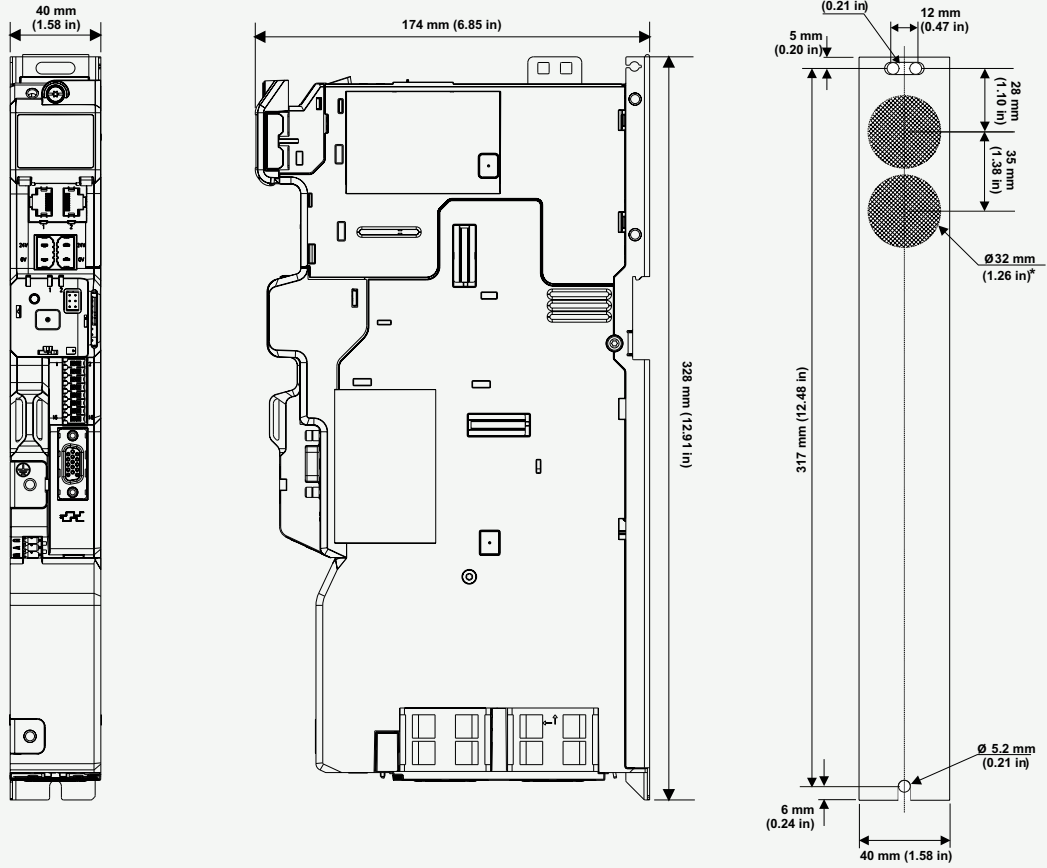
Frame 1



Frame 2



Frame 3



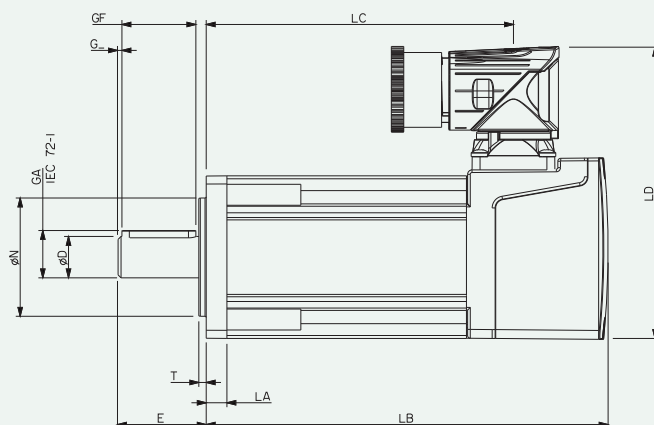
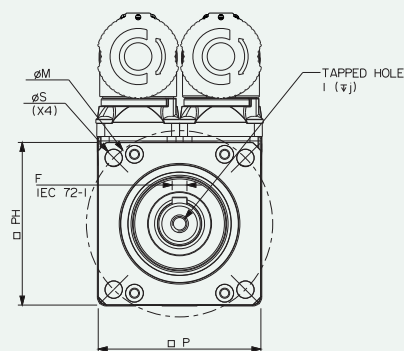
* Additional space above and below the drive may be required for cable routing.

** Option module frame adds 22mm width.

*** Alternative screw mounting options available. Please refer to the Installation Guide.

Frame size 055

Motor frame size (mm)		055ED			055UD		
Voltage (Vrms)		200-240			380-480		
Frame length		A	B	C	A	B	C
Continuous stall torque (Nm)		0.69	1.13	1.58	0.69	1.13	1.58
Peak torque (Nm)		2.07	3.4	4.75	2.07	3.4	4.75
Standard inertia (kgcm ²)		0.14	0.25	0.36	0.14	0.25	0.36
Winding thermal time constant (sec)		34	38	42	34	38	42
Motor weight unbraked (kg)		2.0	2.6	3.2	1.96	2.56	3.16
Motor weight braked (kg)		2.6	3.2	3.8	2.56	3.16	3.76
Number of poles		8	8	8	8	8	8
Speed 3000 (rpm)	Kt (Nm/A) =	0.74	0.87	0.91	0.74	1.49	1.65
	Ke (V/krpm) =	45	52.5	55	45	90	100
Rated torque (Nm)		0.67	1.01	1.42	0.67	1.01	1.42
Stall current (A)		0.74	1.22	1.7	0.93	0.76	0.96
Rated power (kW)		0.21	0.32	0.45	0.21	0.32	0.45
R (ph-ph) (Ohms)		28	14.12	9.53	28	45	31
L (ph-ph) (mH)		50	32	23	50	100	75
Recommended power conn' size		1	1	1	1	1	1
Speed 6000 (rpm)	Kt (Nm/A) =	0.45	0.43	0.48	0.74	0.79	0.83
	Ke (V/krpm) =	27	26	29	45	47.50	50
Rated torque (Nm)		0.68	0.9	1.2	0.68	0.9	1.2
Stall current (A)		1.61	2.74	3.44	0.93	1.43	1.91
Rated power (kW)		0.43	0.57	0.75	0.43	0.57	0.75
R (ph-ph) (Ohms)		8.5	3.55	2.38	28	10.7	7.8
L (ph-ph) (mH)		16	8.2	6.3	50	25	20
Recommended power conn' size		1	1	1	1	1	1



- $\Delta t = 100^{\circ}\text{C}$ winding 40°C maximum ambient
All data subject to +/-10% tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 8 kHz drive switching frequency
- All other figures relate to a 20°C motor temperature.
- Maximum intermittent winding temperature is 140°C

Motor dimension (mm)

Drawing number: GM496400

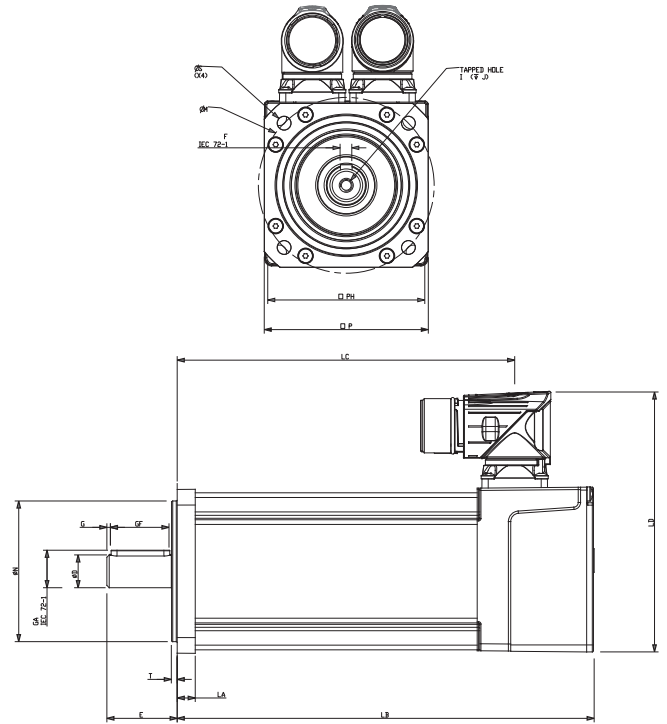
	Feedback AR, CR, EM/FM				Flange thickness	Register length	Register diameter	Overall height	Flange square	Fixing hole diameter	Fixing hole PCD	Motor housing	Mounting bolts
	Unbraked length		Braked length										
	A	B	A	B	K	L	M (j6)	N	P	R (H14)	S	T	
055A	118.0	90.0	158.0	130.0	7.0	2.5	40.0	99.0	55.0	5.8	63.0	55.0	M5
055B	142.0	114.0	182.0	154.0									
055C	166.0	138.0	206.0	178.0									

Shaft dimensions (mm)

	Shaft diameter	Shaft length	Key height	Key length	Key to shaft end	Key width	Tapped hole thread size	Tapped hole depth
	C (j6)	D	E	F	G	H (h9)	I	J
9.0 Opt	9	20	10.2	15	1	3.0	M4	10
11.0 Std	11	23	12.5	15	1.5	4.0	M4	10
14.0 Std	14	30.0	16.0	25.0	1.5	5.0	M5	12.5

Frame size 067

Motor frame size (mm)		067ED			067UD		
Voltage (Vrms)		200-240			380-480		
Frame length		A	B	C	A	B	C
Continuous stall torque (Nm)		1.42	2.5	3.63	1.42	2.5	3.63
Peak torque (Nm)		4.26	7.5	10.88	4.26	7.5	10.88
Standard inertia (kgcm ²)		0.3	0.53	0.75	0.3	0.53	0.75
Winding thermal time constant (sec)		54	61	65	54	61	65
Motor weight unbraked (kg)		2	2.6	3.2	1.96	2.56	3.16
Motor weight braked (kg)		2.6	3.2	3.8	2.56	3.16	3.76
Number of poles		10	10	10	10	10	10
Speed 3000 (rpm)	Kt (Nm/A) =	0.93			0.8	1.6	1.6
	Ke (V/krpm) =	57			49	98	98
Rated torque (Nm)		1.37	2.4	3.43	1.37	2.4	3.43
Stall current (A)		1.53	2.69	3.9	1.78	1.56	2.27
Rated power (kW)		0.43	0.75	1.08	0.43	0.75	1.08
R (ph-ph) (Ohms)		14.92	4.88	3.33	11.69	15.2	10.7
L (ph-ph) (mH)		45.43	17.40	12.7	35.18	54.2	40.8
Recommended power conn' size		1	1	1	1	1	1
Speed 6000 (rpm)	Kt (Nm/A) =	0.47			0.8		
	Ke (V/krpm) =	28.5			49		
Rated torque (Nm)		1.3	2.2		1.30	2.2	3.1
Stall current (A)		3.02	5.32		1.78	3.12	4.53
Rated power (kW)		0.82	1.38		0.82	1.38	1.95
R (ph-ph) (Ohms)		3.86	1.22		11.69	3.79	2.68
L (ph-ph) (mH)		11.06	4.35		35.18	13.6	10.2
Recommended power conn' size		1	1		1	1	1



- Δt= 100°C winding 40°C maximum ambient
All data subject to +/-10% tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 8 kHz drive switching frequency
- All other figures relate to a 20°C motor temperature.
- Maximum intermittent winding temperature is 140°C

Motor dimension (mm)

Drawing number: IM/0694/GA

	Feedback AR, CR, EM/FM, LM/NM				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)	LB (± 0.9)	LC (± 1.0)									
067A	142.9	109.0	177.9	144.0	7.7	2.5	60.0	111.5	70.0	5.8	75.0	67.00	M5
067B	172.9	139.0	207.9	174.0									
067C	202.9	169.0	237.9	204.0									

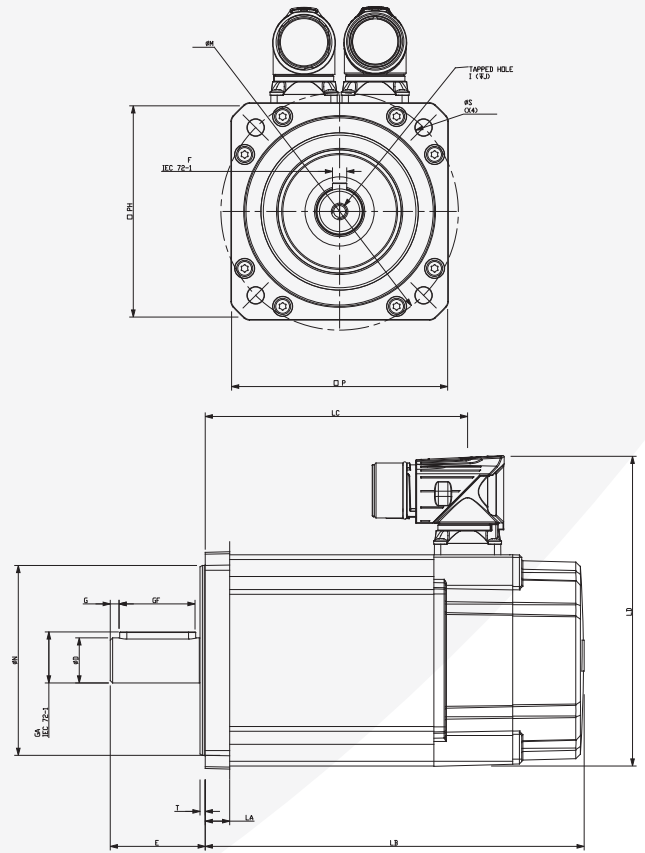
	Feedback TL/UL	
	Unbraked length	Braked length
	LB (± 0.9)	LB (± 0.9)
067A	157.4	123.5
067B	187.4	153.5
067C	217.4	183.5

Shaft dimensions (mm)

	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)	14.0	30.0	16.0	25.0	1.5	5.0	M5 x 0.8	13.5

Frame size 089

Motor frame size (mm)		089ED			089UD		
Voltage (Vrms)		200-240			380-480		
Frame length		A	B	C	A	B	C
Continuous stall torque (Nm)		3.1	5.34	7.76	3.1	5.34	7.76
Peak torque (Nm)		9.31	16.01	23.28	9.31	16.01	23.28
Standard inertia (kgcm ²)		0.87	1.61	2.34	0.87	1.61	2.34
Winding thermal time constant (sec)		85	93	98	85	93	98
Motor weight unbraked (kg)		3.18	4.28	5.38	3.18	4.28	5.38
Motor weight braked (kg)		4.28	5.38	6.48	4.28	5.38	6.48
Number of poles		10	10	10	10	10	10
Speed 3000 (rpm)	Kt (Nm/A) =	0.93			1.6		
	Ke (V/krpm) =	57			98		
Rated torque (Nm)		2.91	4.7	6.69	2.91	4.7	6.69
Stall current (A)		3.34	5.74	8.34	1.94	3.33	4.85
Rated power (kW)		0.91	1.48	2.1	0.91	1.48	2.1
R (ph-ph) (Ohms)		3.28	1.57	0.89	10.1	5.05	2.68
L (ph-ph) (mH)		21.55	11.84	7.09	65.17	38.36	21.72
Recommended power conn' size		1	1	1	1	1	1
Speed 4000 (rpm)	Kt (Nm/A) =	0.7			1.2		
	Ke (V/krpm) =	42.75			73.5		
Rated torque (Nm)		2.9	4.55	6.35	2.9	4.55	6.35
Stall current (A)		4.43	7.62	11.09	2.59	4.45	6.47
Rated power (kW)		1.21	1.91	2.66	1.21	1.91	2.66
R (ph-ph) (Ohms)		2.04	0.79	0.54	6.16	2.47	1.75
L (ph-ph) (mH)		13.2	5.97	4.38	39.78	18.8	14.03
Recommended power conn' size		1	1	1	1	1	1
Speed 6000 (rpm)	Kt (Nm/A) =	0.47			0.8		
	Ke (V/krpm) =	28.5			49		
Rated torque (Nm)		2.65	3.8	5	2.65	3.8	5
Stall current (A)		6.6	11.35	16.51	3.88	6.67	9.7
Rated power (kW)		1.67	2.39	3.14	1.67	2.39	3.14
R (ph-ph) (Ohms)		0.98	0.39	0.23	2.52	1.27	0.83
L (ph-ph) (mH)		6.24	2.96	1.89	16.29	9.59	6.66
Recommended power conn' size		1	1	1	1	1	1



- $\Delta t = 100^{\circ}\text{C}$ winding 40°C maximum ambient
- All data subject to +/-10% tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 8 kHz drive switching frequency
- All other figures relate to a 20°C motor temperature.
- Maximum intermittent winding temperature is 140°C

Motor dimension (mm)

Drawing number: IM/0688/GA

	Feedback EC/FC, LC/NC				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)	LB (± 0.9)	LC (± 1.0)									
089A	147.8	110.5	187.9	150.6	10.3	2.2	80.0	130.5	91.0	7.00	100.0	89.0	M6
089B	177.8	140.5	217.9	180.6									
089C	207.8	170.5	247.9	210.6									

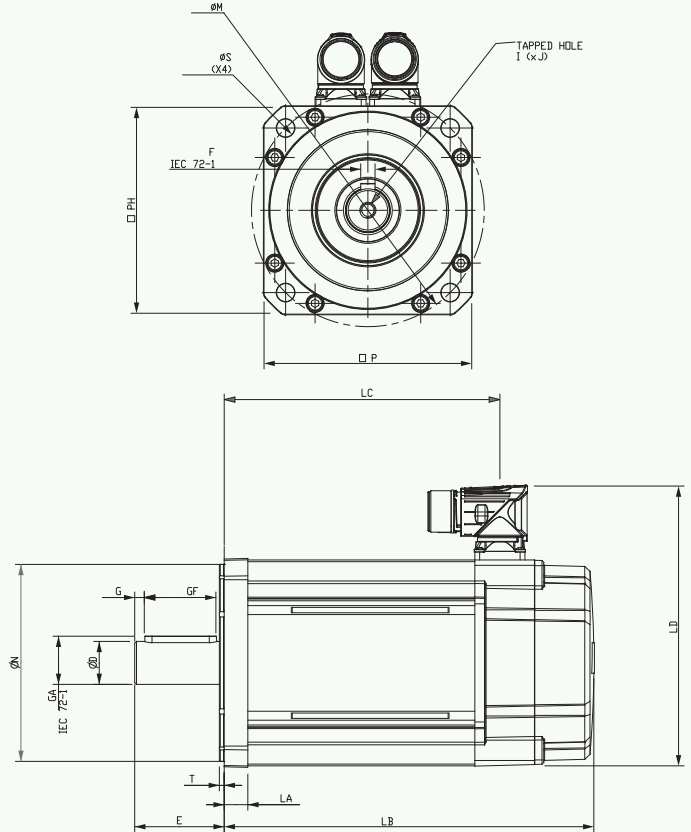
	Feedback FB, EB/CA/SA, RA		Feedback AE	
	Unbraked length	Braked length	Unbraked length	Braked length
	LB (± 0.9)	LB (± 0.9)	LB (± 0.9)	LB (± 0.9)
089A	160.8	200.9	137.8	177.9
089B	190.8	230.9	167.8	207.9
089C	220.8	260.9	197.8	237.9

Shaft dimensions (mm)

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	19.0	40.0	21.5	32.0	3.7	M6 x 1.0	17.0

Frame size 115

Motor frame size (mm)		115ED			115UD		
Voltage (Vrms)		200-240			380-480		
Frame length		B	C	D	B	C	D
Continuous stall torque (Nm)		10	14.31	18.42	10	14.31	18.42
Peak torque (Nm)		29.99	42.92	55.27	29.99	42.92	55.27
Standard inertia (kgcm ²)		4.41	6.39	8.38	4.41	6.39	8.38
Winding thermal time constant (sec)		164	168	175	164	168	175
Motor weight unbraked (kg)		6.95	8.72	10.49	6.95	8.72	10.49
Motor weight braked (kg)		8.45	10.22	11.99	8.45	10.22	11.99
Number of poles		10	10	10	10	10	10
Speed 2000 (rpm)	Kt (Nm/A) =	1.4			2.4		
	Ke (V/krpm) =	85.5			147		
Rated torque (Nm)		8.43	11.66	15.29	8.43	11.66	15.29
Stall current (A)		7.14	10.22	13.16	4.17	5.96	7.68
Rated power (kW)		1.76	2.39	3.14	1.77	2.44	3.2
R (ph-ph) (Ohms)		1.4	0.77	0.61	4.41	2.41	1.8
L (ph-ph) (mH)		12.84	7.87	6.62	40.60	24.69	19.45
Recommended power conn' size		1	1	1	1	1	1
Speed 3000 (rpm)	Kt (Nm/A) =	0.93			1.6		
	Ke (V/krpm) =	57			98		
Rated torque (Nm)		7.55	10.29		7.55	10.29	13.33
Stall current (A)		10.75	15.38		6.25	8.94	11.52
Rated power (kW)		2.37	3.23		2.37	3.23	4.19
R (ph-ph) (Ohms)		0.58	0.39		1.83	1.21	0.78
L (ph-ph) (mH)		5.40	4.01		16.93	12.72	8.65
Recommended power conn' size		1	1		1	1	1



- Δt= 100°C winding 40°C maximum ambient
- All data subject to +/-10% tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 8 kHz drive switching frequency
- All other figures relate to a 20°C motor temperature.
- Maximum intermittent winding temperature is 140°C

Motor dimension (mm)

Drawing number: IM/0689/GA

	Feedback EC/FC, LC/NC				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)	LB (± 0.9)	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)	
115B	193.8	154.0	230.9	191.1	13.2	2.7	110.0	156.5	116.0	10.00	130.0	115.0	M8
115C	223.8	184.0	260.9	221.1									
115D	253.8	214.0	290.9	251.1									

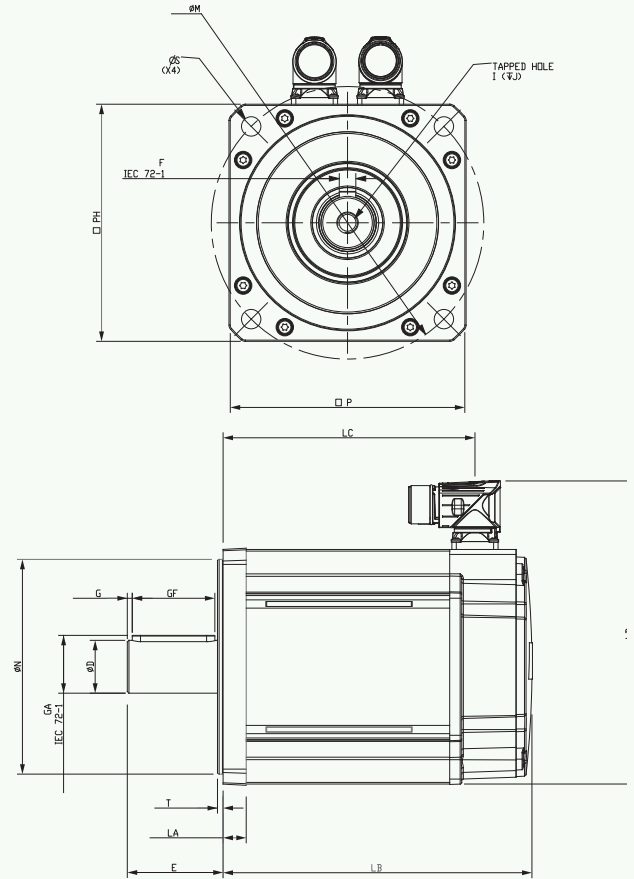
	Feedback FB, EB/CA/SA, RA		Feedback AE	
	Unbraked length	Braked length	Unbraked length	Braked length
	LB (± 0.9)	LB (± 0.9)	LB (± 0.9)	LB (± 0.9)
115B	206.8	243.9	183.8	220.9
115C	236.8	273.9	213.8	250.9
115D	266.8	303.9	243.8	280.9

Shaft dimensions (mm)

	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 (± 0.1)
24.0 Std	24.0	50.0	27.0	40.0	5.3	8.0	M8 x 1.25	20.0

Frame size 142

Motor frame size (mm)		142ED			142UD		
Voltage (Vrms)		200-240			380-480		
Frame length		C	D	E	C	D	E
Continuous stall torque (Nm)		22.75	28.67	34.58	22.75	28.67	34.58
Peak torque (Nm)		68.25	86	103.74	68.25	86	103.74
Standard inertia (kgcm ²)		17	22.1	27.2	17	22.1	27.2
Winding thermal time constant (sec)		245	251	256	245	251	256
Motor weight unbraked (kg)		12.74	15.39	18.04	12.74	15.39	18.04
Motor weight braked (kg)		14.82	17.47	20.12	14.82	17.44	20.12
Number of poles		10	10	10	10	10	10
Speed 1000 (rpm)	Kt (Nm/A) = Ke (V/krpm) =	2.8 171			3.2 196		
Rated torque (Nm)		21.2	26.39	31.4	20.29	24.57	28.85
Stall current (A)		8.1	10.19	12.38	7.1	8.92	10.83
Rated power(kW)		2.22	2.77	3.29	3.19	3.82	4.55
R (ph-ph) (Ohms)		1.36	0.94	0.72	1.36	0.94	0.72
L (ph-ph) (mH)		21.34	15.17	12.3	21.34	15.17	12.3
Recommended power conn' size		1	1	1	1	1	1
Speed 1500 (rpm)	Kt (Nm/A) = Ke (V/krpm) =	1.4 85.5			2.4 147		
Rated torque (Nm)		19.47	23.39	26.94	19.47	23.39	26.94
Stall current (A)		16.25	20.48	24.7	14.22	17.92	21.61
Rated power(kW)		4.08	4.9	5.64	5.27	5.97	6.58
R (ph-ph) (Ω)		0.34	0.24	0.18	0.34	0.24	0.18
L (ph-ph) (mH)		5.33	3.79	3.07	5.33	3.79	3.07
Recommended power conn' size		1.5	1.5	1.5	1	1	1
Speed 2000 (rpm)	Kt (Nm/A) = Ke (V/krpm) =	0.93 57			1.6 98		
Rated torque (Nm)		16.74	19.02		16.77	19.02	20.93
Stall current (A)		24.46	30.82		14.22	17.92	21.61
Rated power (kW)		5.26	5.97		5.27	5.97	6.58
R (ph-ph) (Ohms)		0.12	0.1		0.34	0.24	0.18
L (ph-ph) (mH)		1.9	1.57		5.33	3.79	3.07
Recommended power conn' size		1.5	1.5		1	1.5	1.5



- Δt= 100°C winding 40°C maximum ambient
- All data subject to +/-10% tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 8 kHz drive switching frequency
- All other figures relate to a 20°C motor temperature.
- Maximum intermittent winding temperature is 140°C

Motor dimension (mm)

Drawing number: IM/0709/GA

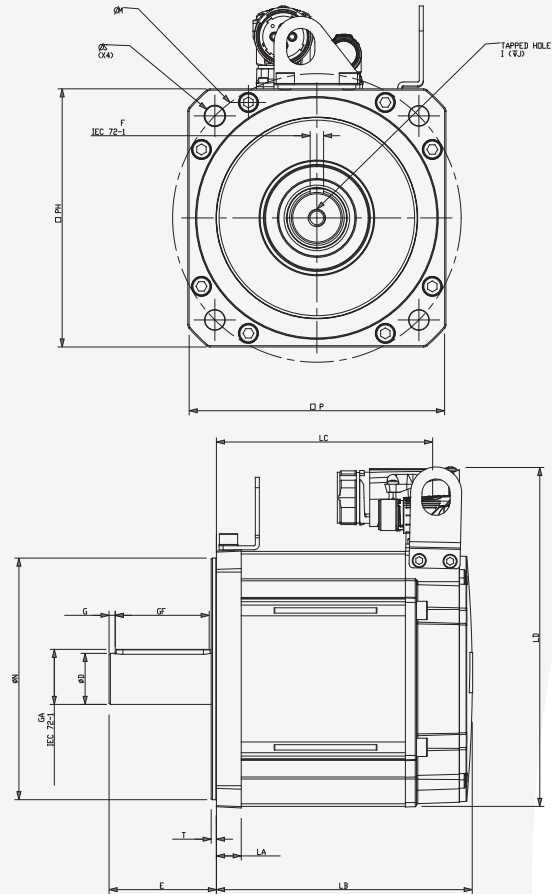
	Unbraked length		Braked length		Flange thickness	Register length	Register diameter	Overall height	Flange square	Fixing hole diameter	Fixing hole PCD	Motor housing	Mounting bolts
	LB (± 0.9)	LC (± 1.0)	LB (± 0.9)	LC (± 1.0)	LA (± 0.5)	T (± 0.1)	N (j6)	LD (± 0.3)	P (± 0.3)	S (H14)	M (± 0.5)	PH (± 0.5)	
142C	217.0	182.5	282.5	248.0	14.0	3.4	130.0	183.5	142.0	12.0	165.0	142.0	M10
142D	247.0	212.5	312.5	278.0				183.5-204.5					
142E	277.0	242.5	342.5	308.0									

Shaft dimensions (mm)

	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	32.0	58.0	35.0	50.0	3	10.0	M12 x 1.75	29.0

Frame size 190

Motor frame size (mm)		190ED			190UD		
Voltage (Vrms)		200-240			380-480		
Frame length		C	D	F	C	D	F
Continuous stall torque (Nm)		52	62	85	52	62	85
Peak torque (Nm)		156	186	255	156	186	255
Standard inertia (kgcm ²)		54.6	70.9	103.5	54.6	70.9	103.5
Winding thermal time constant (sec)		311	316	324	311.0	316	324
Motor weight unbraked (kg)		27.74	34.3	47.42	27.74	34.3	47.42
Motor weight braked (kg)		31.38	37.94	56.74	31.38	37.94	56.74
Number of poles		10	10	10	10	10	10
Speed 1000 (rpm)	Kt (Nm/A) =	2.8					
	Ke (V/krpm) =	171					
Rated torque (Nm)		49	56.5	77.5			
Stall current (A)		18.6	22.1	30.4			
Rated power (kW)		5.13	5.92	8.12			
R (ph-ph) (Ohms)		0.47	0.4	0.23			
L (ph-ph) (mH)		12.3	10.4	6.79			
Recommended power conn' size		1.5	1.5	1.5			
Speed 1500 (rpm)	Kt (Nm/A) =				3.2		
	Ke (V/krpm) =				196		
Rated torque (Nm)					46.2	52.2	68.5
Stall current (A)					16.3	19.4	26.6
Rated power (kW)					7.26	8.2	10.76
R (ph-ph) (Ohms)					0.57	0.4	0.23
L (ph-ph) (mH)					14.15	10.4	6.79
Recommended power conn' size					1.5	1.5	1.5
Speed 2000 (rpm)	Kt (Nm/A) =	1.4			2.4		
	Ke (V/krpm) =	85.5			147		
Rated torque (Nm)		42.5			42.5		
Stall current (A)		37.14			21.7		
Rated power (kW)		8.9			8.9		
R (ph-ph) (Ohms)		0.12			0.34		
L (ph-ph) (mH)		3.07			8.2		
Recommended power conn' size		1.5			1.5		



- Δt= 100°C winding 40°C maximum ambient
- All data subject to +/-10% tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 8 kHz drive switching frequency
- All other figures relate to a 20°C motor temperature.
- Maximum intermittent winding temperature is 140°C

Motor dimension (mm)

Drawing number: IM/00710/GA

	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)	LB (± 0.9)	LC (± 1.0)									
190C	220.6	191.1	319.1	289.6	18.5	3.9	180.0	252.5	190.3	14.5	215.0	190.0	M12
190D	250.6	221.1	349.1	319.6									
190F	310.6	281.1	409.1	379.6									

Shaft dimensions (mm)

	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	38.0	80.0	41.0	70.0	4.6	10.0	M12 x 1.75	29.0

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