



Digitax ST

Servo drives range that is intelligent, compact and dynamic

1.1 A - 8 A
200 V | 400 V



CONTROL TECHNIQUES™

Nidec
All for dreams

Servo drives: Digitax ST - pulse duty

Digitax ST

From 1.1 A to 8 A

Digitax ST is a dedicated servo drive optimized for pulse duty. The drive is designed to meet the demands of modern manufacturers for smaller, more flexible and higher performing machinery.

Benefits:

Maximize throughput with superior motor control

- High bandwidth motor control algorithm for servo motors
- Optimum performance for high-dynamic applications with 300 % overload
- Supports a wide range of feedback technologies from robust resolvers to high resolution encoders
 - Up to two encoder channels simultaneously e.g. 1 feedback encoder and 1 simulated output
 - Quadrature, SinCos, SSI, EnDat, Hiperface
 - Robust resolvers (SM resolver module required)
 - Simulated encoder output can provide position reference for CAMs, digital lock and electronic gearbox applications

Reduce cabinet size with compact drive design

- Digitax ST is compact and can be flush mounted which at high current ratings can save up to 50% of cabinet space compared to competitor products
- Onboard features such as Safe Torque Off reduce the need for external components

Flexible machine design with option modules

Digitax ST drives can be tailored for a variety of applications. Two option slots allow increasing capabilities.

- Communication options: to support Ethernet or popular fieldbuses such as Ethernet/IP, PROFIBUS-DP and CANopen
- Feedback options: to support resolvers, or to increase the number of encoder inputs/outputs
- Input and output options: for additional on-board digital, analog or high-speed I/O
- Application modules: second processor for specific applications such as register control

(see page 11 for a full list of available option modules)

Reduce development time

- Three motion programming options:
 - CTSofT index motion
 - SyPTPro
 - PowerTools Pro
- Fieldbus option modules are independently certified for conformity with open standards
- 2D and 3D CAD files to make it easier and quicker to design the drive into your machine

Quicker installation

- The top or bottom of the drive can be located onto a DIN rail
- Features grounding brackets and cable management support for easy mounting
- Pluggable control terminals enable looms to be easily prepared

Reduce commissioning time

- Digitax ST can be quickly configured using the removable keypad, Smartcard or supplied commissioning software
- Autotune gets the best performance by measuring machine dynamics and automatically optimizing control loop gains
- CTSofTscope – a realtime software oscilloscope – is supplied for tuning and monitoring
- Motor data can be retrieved automatically from the electronic nameplate on the digital encoder





Digitax ST is available in five variants:

Digitax ST Base - Centralized, coordinated motion

Designed for integration with centralized motion controllers and can connect with either digital or analog technology.

Digitax ST Indexer - Easy to use, point-to-point positioning

Has the same high performance features as the Base model, but additionally offers easy to use point-to-point positioning functionality.

Digitax ST EZ Motion - Easy programming of high performance, synchronized motion applications

Features an easy-to-use programming environment and high performance, offering a solution for many common positioning and synchronized motion applications.

Digitax ST Plus - Flexibility for the most demanding applications

Offers all of the features available on the Indexer drive together with more advanced motion functionality including cam profiling and synchronized motion.

Digitax ST EtherCAT - Built in EtherCAT for integration with industrial EtherCAT networks

Has the same high performance features as the Base model, but makes them easily accessible over any industrial EtherCAT network.

Drive features	EtherCAT	Plus	EZ Motion	Indexer	Base
Two option module slots	✓	✓	✓	✓	✓
Digital and analog I/O	✓	✓	✓	✓	✓
Smartcard	✓	✓	✓	✓	✓
High speed freeze input	✓	✓	✓	✓	✓
Safe Torque Off	✓	✓	✓	✓	✓
DC bus paralleling	✓	✓	✓	✓	✓
CTSoft and CTScope commissioning software	✓	✓		✓	✓
Removable keypad (optional)	✓	✓	✓	✓	✓
RS485 PC programming port	✓	✓	✓	✓	✓
Intellectual property protection		✓		✓	
CTSoft programming		✓		✓	
Program multi-tasking		✓	✓		
PowerTools Pro programming			✓		
SyPT Pro programming with PLCopen		✓			
Drive-to-drive networking		✓			



Digitax ST features

AC Input Power, 48 Vdc &
Dynamic Brake Terminals

Optional
Removable Keypad

Programming Port

Analog I/O

Digital I/O & 24Vdc

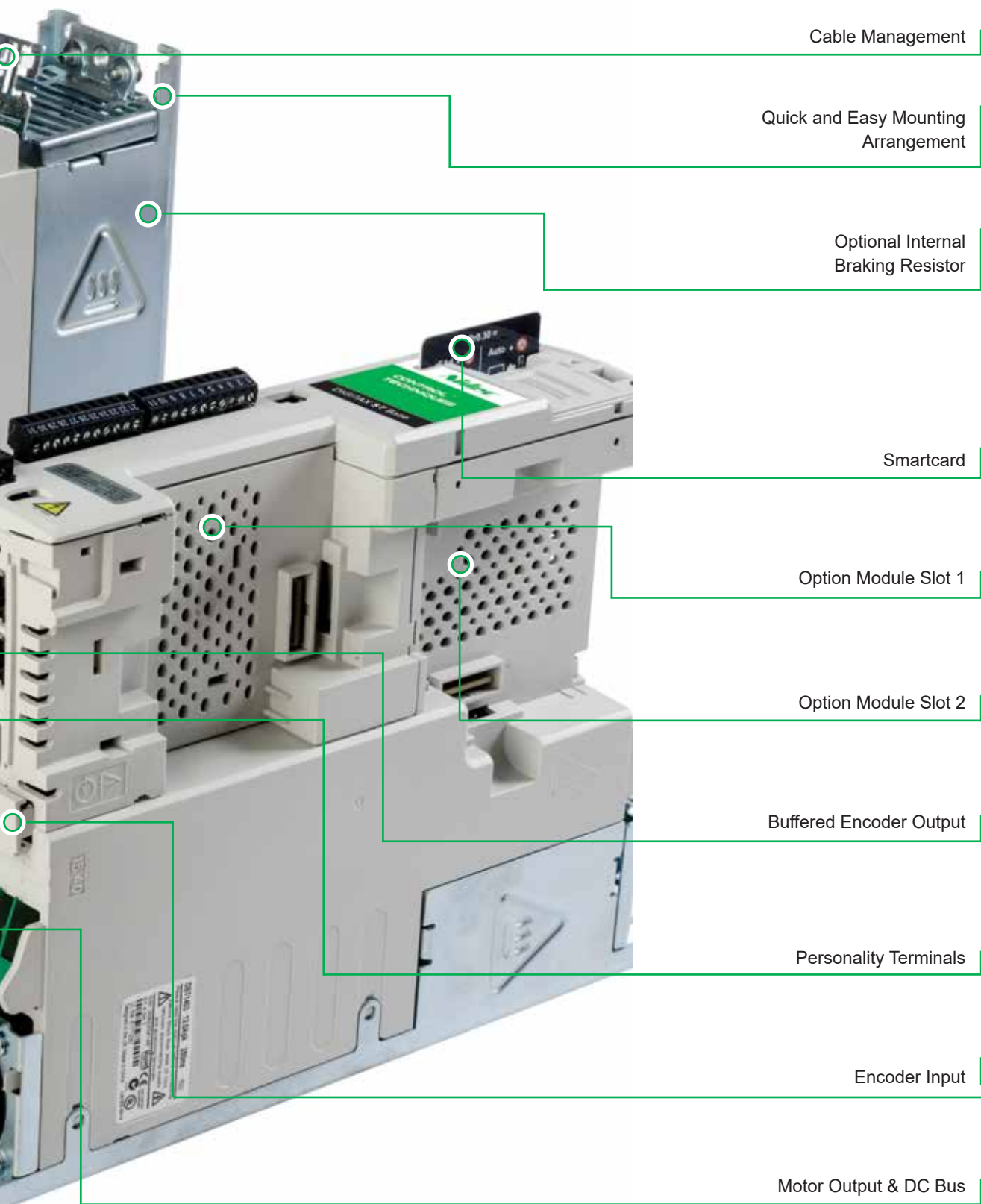
Safe Torque Off

Relay Output

Cable Management

Quick and easy mounting arrangement
with DIN rail clip





Cable Management

Quick and Easy Mounting Arrangement

Optional Internal Braking Resistor

Smartcard

Option Module Slot 1

Option Module Slot 2

Buffered Encoder Output

Personality Terminals

Encoder Input

Motor Output & DC Bus

Digitax ST Base



Centralized, coordinated motion

Digitax ST - Base is designed for integration with centralized motion controllers and can connect with either digital or analog technology. The drive offers optimized performance and is quick and simple to configure.

Key benefits

- Enhance machine performance through easy integration with any motion controller
 - Integrated high resolution analog input and encoder output
 - Predefined digital I/O for controller connection
 - Integrated high speed freeze input
 - Digital servo networks (EtherCAT, SERCOS and CANopen) available via option module
- Tailor the drive to a variety of application requirements
 - On-board encoder input supports Incremental, SinCos, Hipurface, EnDAT and SSI encoders
 - Two option slots for functionality expansion via a full range of option modules
- Reduced downtime with machine safety
 - Integrated safe torque off



*Requires option module

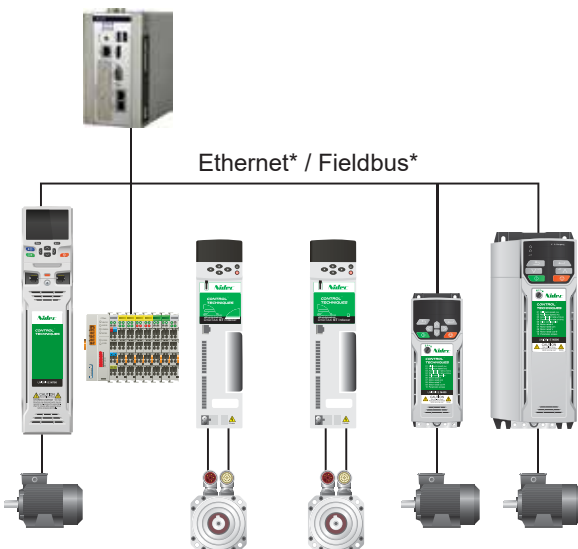
Easy to use, point-to-point positioning

Digitax ST - Indexer has the same high performance features as the Base model, but additionally offers easy to use point-to-point positioning functionality.

The drive can operate as a standalone controller or integrate with a wider automation system using fieldbus and I/O.

Key benefits

- Simplified motion programming
 - Configure positioning applications quickly and easily using powerful graphical software
 - Access advanced features such as drive-to-drive communications through positioning applications developed specifically for the Indexer
- Tailor the drive to a variety of application requirements using options
 - Integrate with wider automation systems with option modules for Ethernet and fieldbus connectivity
- Reduced downtime with machine safety
 - Integrated safe torque off



*Requires option module

Digitax ST Indexer



Digitax ST EZ Motion

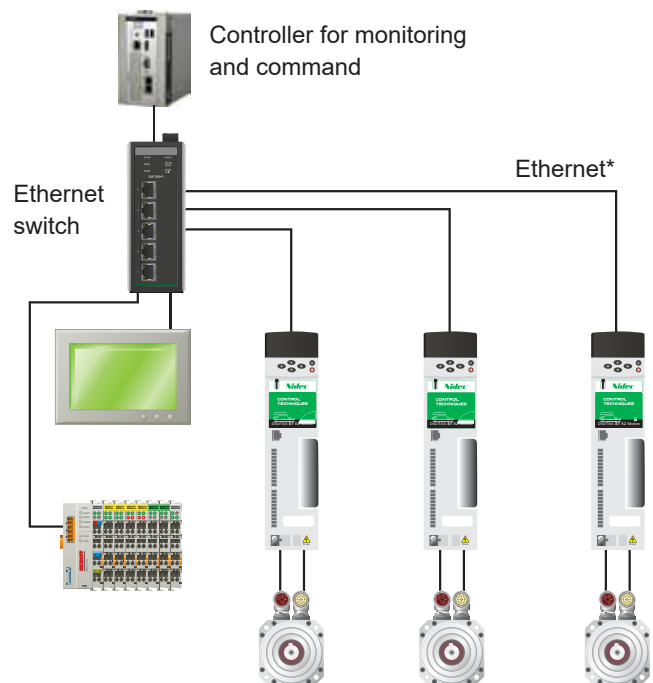


Easy programming of high performance, synchronized motion applications

Digitax ST - EZ Motion features an easy-to-use programming environment and high performance, offering a solution for many common positioning and synchronized motion applications.

Key benefits

- Complex motion control made easy
 - Quick set-up and programming with unique PowerTools Pro software
 - Camming, positioning, electronic gearing, velocity and torque modes can be accomplished through simple drag-and-drop, fill-in-the-blank set-up
- Higher performance through advanced motion capabilities
 - Position capture and registration through six additional digital I/O points
 - Real-time programs with “basic-like” command structured text to program the machine sequencing
- Reduced downtime with machine safety
 - Integrated safe torque off



*Requires option module

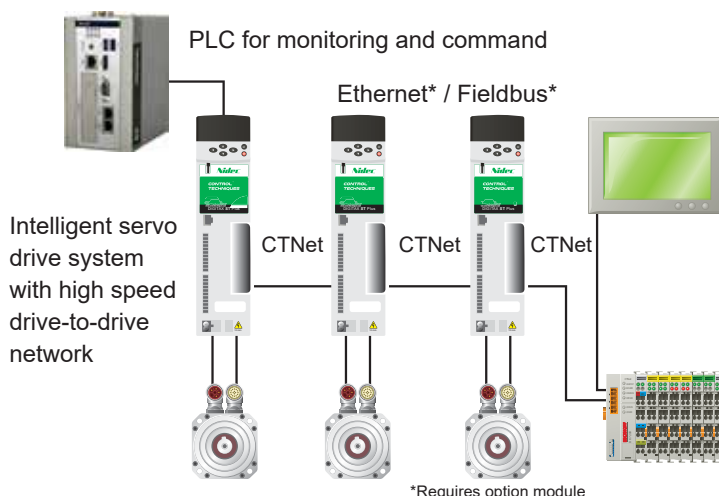
Flexibility for the most demanding applications

Digitax ST - Plus offers all of the features available on the Indexer drive together with more advanced motion functionality including cam profiling and synchronized motion. Onboard drive-to-drive networking links multiple axes and enables true distributed control.

Key benefits

- Superior performance and reduced cost, complexity and machine size
 - On-board motion controller means no need to buy or wire in a PLC
 - High speed, deterministic drive-to-drive communications
- Reduced development time
 - SyPTPro
 - Multi-tasking
 - PLCopen motion function blocks
- Protect intellectual property through protecting your source code
 - SYPT Pro programming software downloads only the compiled binary version of your software (not the source code) therefore preventing your customers and competitors accessing your work
- Full connectivity
 - Wide range of network communication options
 - Drive-to-drive network
- Reduced downtime with machine safety
 - Integrated safe torque off

Digitax ST Plus



Digitax ST EtherCAT

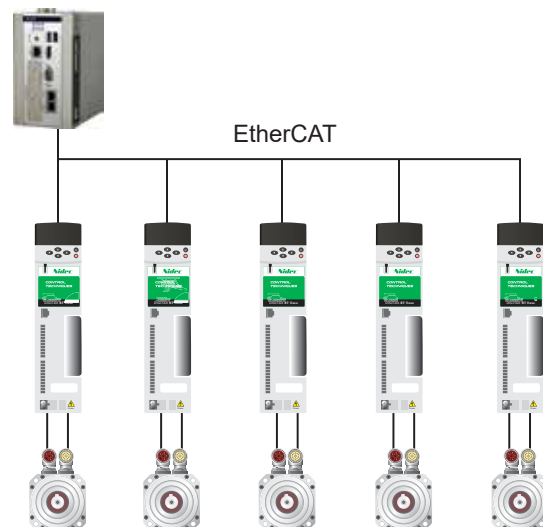


Built in EtherCAT for integration with industrial EtherCAT networks

Digitax ST - EtherCAT has the same high performance features as the Base model, but makes them easily accessible over any industrial EtherCAT network. The drive offers cyclic and non-cyclic communication with less than 1µs jitter on network synchronization, guaranteeing optimum performance for demanding, high-axis-count, motion applications.

Key benefits

- 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 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:
 - > DS-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 safe torque off



Option modules	Digitax ST - Base	Digitax ST Indexer	Digitax ST Plus	Digitax ST EZMotion	Digitax ST EtherCAT
SM-Applications	✓	✓	✓	✓	✓
SM-Applications Lite	✓		✓	✓	✓
SM-Applications Lite V2	✓		✓	✓	✓
SM-Applications Plus	✓	✓		✓	✓
SM-EZmotion	✓	✓	✓		✓
SM-Register	✓	✓	✓	✓	✓
SM-Safety	✓	✓	✓	✓	✓
SM-EtherCAT	✓	✓	✓	✓	
SM-LON	✓	✓	✓	✓	✓
SM-Profibus-DP-V1	✓	✓	✓	✓	✓
SM-Interbus	✓	✓	✓	✓	✓
SM-CAN	✓	✓	✓	✓	✓
SM-DeviceNet	✓	✓	✓	✓	✓
SM-EtherNet	✓	✓	✓	✓	✓
SM-CANopen	✓	✓	✓	✓	✓
SM-SERCOS	✓	✓	✓	✓	✓
SM-Resolver	✓	✓	✓	✓	✓
SM-Universal Encoder Plus	✓	✓	✓	✓	✓
SM-Encoder Plus	✓	✓	✓	✓	✓
SM-Encoder Output Plus	✓	✓	✓	✓	✓
SM-SLM	✓	✓	✓	✓	✓
SM-I/O 32	✓	✓	✓	✓	✓
SM I/O Plus	✓	✓	✓	✓	✓
SM I/O Lite	✓	✓	✓	✓	✓
SM-I/O Timer	✓	✓	✓	✓	✓
SM-I/O 120V	✓	✓	✓	✓	✓
SM-I/O PELV	✓	✓	✓	✓	✓
SM-I/O 24V Protected	✓	✓	✓	✓	✓

Control Techniques Software

Control Techniques makes it easier to access the drive's full feature set. Our software allows you to optimize the drive tuning, back-up the configuration, configure the on-board motion controller and design the drive-to-drive network data links. There are five main software packages:

- CTSOft - Drive configuration and index motion editor
- CTScope - Real-time software oscilloscope
- PowerTools Pro - Easy to use, all in one drive configuration software for Digitax ST - EZ Motion drives
- SyPT Pro - Drive automation and motion programming environment
- CTOPCServer - OPC compliant server for interfacing your own PC software with Control Techniques drives



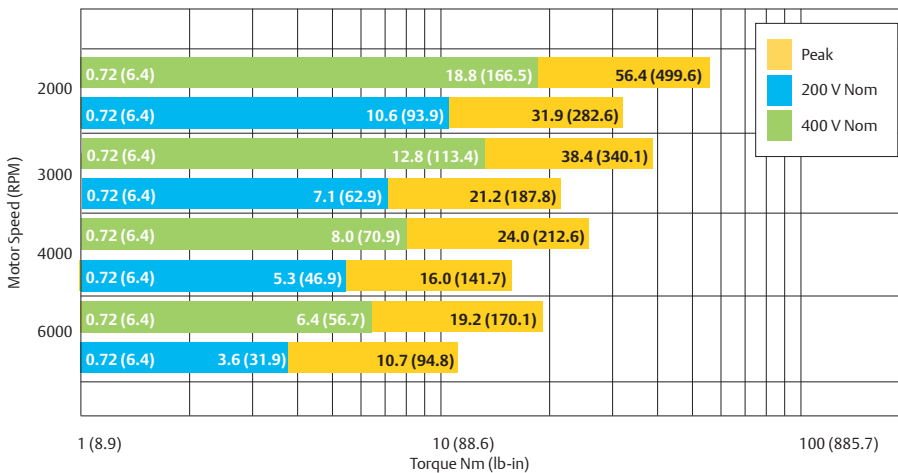
The software packages connect using Ethernet, CNet or RS232 protocols. Ethernet communications allow the drives to be accessed remotely, anywhere in the world.

	Ethernet	RS485	CNet	USB
CTSOft	✓	✓	✓	✓
CTScope	✓	✓	✓	✓
PowerTools Pro	✓	✓		✓
SyPTPro	✓	✓	✓	✓
CTOPCserver	✓	✓	✓	✓

	Base	Indexer	EZ Motion	Plus	EtherCAT
CTSOft	✓	✓		✓	✓
Index Motion Controller		✓			
CTScope	✓	✓		✓	✓
PowerTools Pro			✓		
SyPTPro				✓	
CTOPCserver	✓	✓	✓	✓	✓

Available motor and drive combinations

From 0.72 Nm (6.4 lb-in) to 18.8 Nm (166.5 lb-in)
56.4 Nm/ 499.6 lb-in peak



NB: The selection of Drive-Motor combinations should be based on Duty/Load Profiles of the application

Signal and power cables for static and dynamic applications are available



For more information about the full servo range, please refer to the Servo drives and motors overview brochure and the servo drives and motors technical data document

Digitax ST / Unimotor hd combinations

Table data based on 2000 rpm motors 3x stall torque

200 V						
Drive Part No.	Stall Nm / lb-in	Stall Amp	Peak Nm / lb-in	Peak Amp	Inertia kg/cm ² / lb-in ²	Motor Part No.
DST1204	10.20 / 90.3	7.29	30.60 / 271	21.86	4.41 / 1.51	115EDB200
DST1204	10.60 / 93.9	7.60	31.90 / 282.6	22.80	6.39 / 2.18	115EDC200

Table data based on 3000 rpm motors 3x stall torque

200 V						
Drive Part No.	Stall Nm / lb-in	Stall Amp	Peak Nm / lb-in	Peak Amp	Inertia kg/cm ² / lb-in ²	Motor Part No.
DST1201	0.72 / 6.4	0.97	2.88 / 25.5	3.89	0.14 / 0.05	055EDA300
DST1201	1.18 / 10.5	1.36	4.72 / 41.8	5.43	0.25 / 0.09	055EDB300
DST1201	1.45 / 12.8	1.56	4.35 / 38.5	4.68	0.30 / 0.1	067EDA300
DST1202	1.65 / 14.6	1.81	6.60 / 58.5	7.25	0.36 / 0.12	055EDC300
DST1202	2.55 / 22.6	2.74	7.65 / 67.8	8.23	0.53 / 0.18	067EDB300
DST1202	3.20 / 28.3	3.44	9.60 / 85	10.32	0.87 / 0.3	089EDA300
DST1203	3.70 / 32.8	3.98	11.10 / 98.3	11.94	0.75 / 0.26	067EDC300
DST1204	5.50 / 48.7	5.91	16.50 / 146.1	17.74	1.61 / 0.55	089EDB300
DST1204	7.10 / 62.9	7.60	21.20 / 187.8	22.80	2.34 / 0.8	089EDC300

Table data based on 4000 rpm motors 3x stall torque

200 V						
Drive Part No.	Stall Nm / lb-in	Stall Amp	Peak Nm / lb-in	Peak Amp	Inertia kg/cm ² / lb-in ²	Motor Part No.
DST1203	3.20 / 28.3	4.57	9.60 / 85	13.71	0.87 / 0.3	089EDA400
DST1204	5.30 / 46.9	7.60	16.00 / 141.7	22.80	1.61 / 0.55	089EDB400

Table data based on 6000 rpm motors 3x stall torque

200 V						
Drive Part No.	Stall Nm / lb-in	Stall Amp	Peak Nm / lb-in	Peak Amp	Inertia kg/cm ² / lb-in ²	Motor Part No.
DST1202	0.72 / 6.4	1.61	2.88 / 25.5	6.40	0.14 / 0.05	055EDA600
DST1202	1.18 / 10.5	2.74	4.72 / 41.8	10.98	0.25 / 0.09	055EDB600
DST1203	1.45 / 12.8	3.12	4.35 / 38.5	9.26	0.30 / 0.1	067EDA600
DST1202	1.65 / 14.6	3.44	6.60 / 58.5	13.75	0.36 / 0.12	055EDC600
DST1203	2.55 / 22.6	5.48	7.65 / 67.8	16.28	0.53 / 0.18	067EDB600
DST1204	3.20 / 28.3	6.88	9.60 / 85	20.43	0.87 / 0.3	089EDA600
DST1204	3.60 / 31.9	7.60	10.70 / 94.8	22.80	1.61 / 0.55	089EDB600

Table data based on 2000 rpm motors 3x stall torque

400 V						
Drive Part No.	Stall Nm / lb-in	Stall Amp	Peak Nm / lb-in	Peak Amp	Inertia kg/cm ² / lb-in ²	Motor Part No.
DST1404	10.20 / 90.3	4.25	30.60 / 271	12.75	4.41 / 1.51	115UDB200
DST1405	14.60 / 129.3	6.08	43.80 / 388	18.25	6.39 / 2.18	115UDC200
DST1405	18.80 / 166.5	7.83	56.40 / 499.6	23.50	8.38 / 2.86	115UDD200

Table data based on 3000 rpm motors 3x stall torque

400 V						
Drive Part No.	Stall Nm / lb-in	Stall Amp	Peak Nm / lb-in	Peak Amp	Inertia kg/cm ² / lb-in ²	Motor Part No.
DST1401	0.72 / 6.4	0.97	2.88 / 25.5	3.89	0.14 / 0.05	055UDA300
DST1401	1.18 / 10.5	0.79	4.72 / 41.8	3.17	0.25 / 0.09	055UDB300
DST1402	1.45 / 12.8	1.81	4.35 / 38.5	5.44	0.30 / 0.1	067UDA300
DST1401	1.65 / 14.6	1.00	6.60 / 58.5	4.00	0.36 / 0.12	055UDC300
DST1402	2.55 / 22.6	1.58	7.65 / 67.8	4.78	0.53 / 0.18	067UDB300
DST1402	3.20 / 28.3	2.00	9.60 / 85	6.00	0.87 / 0.3	089UDA300
DST1402	3.70 / 32.8	2.31	11.10 / 98.3	6.94	0.75 / 0.26	067UDC300
DST1403	5.50 / 48.7	3.44	16.50 / 146.1	10.31	1.61 / 0.55	089UDB300
DST1404	8.00 / 70.9	5.00	24.00 / 212.6	15.00	2.34 / 0.8	089UDC300
DST1405	10.20 / 90.3	6.38	30.60 / 271	19.13	4.41 / 1.51	115UDB300
DST1405	12.80 / 113.4	8.00	38.40 / 340.1	24.00	6.39 / 2.18	115UDC300

Table data based on 4000 rpm motors 3x stall torque

400 V						
Drive Part No.	Stall Nm / lb-in	Stall Amp	Peak Nm / lb-in	Peak Amp	Inertia kg/cm ² / lb-in ²	Motor Part No.
DST1402	3.20 / 28.3	2.67	9.60 / 85	8.00	0.87 / 0.3	089UDA400
DST1404	5.50 / 48.7	4.58	16.50 / 146.1	13.75	1.61 / 0.55	089UDB400
DST1405	8.00 / 70.9	6.67	24.00 / 212.6	20.00	2.34 / 0.8	089UDC400

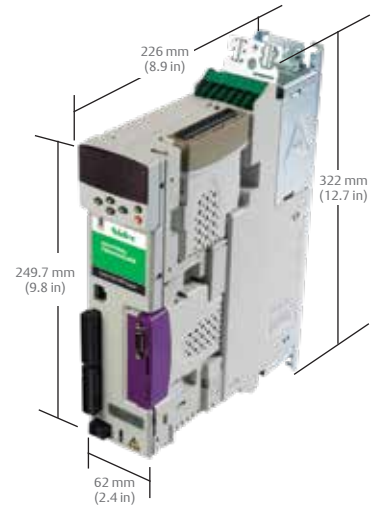
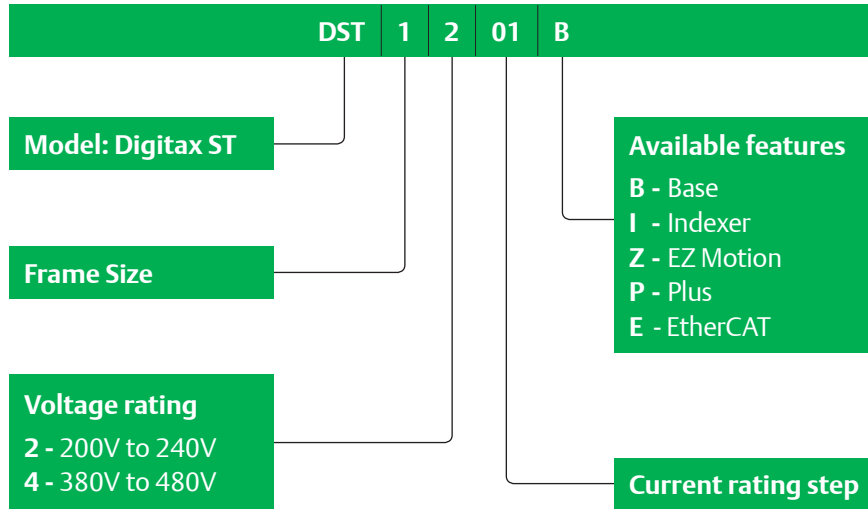
Table data based on 6000 rpm motors 3x stall torque

400 V						
Drive Part No.	Stall Nm / lb-in	Stall Amp	Peak Nm / lb-in	Peak Amp	Inertia kg/cm ² / lb-in ²	Motor Part No.
DST1401	0.72 / 6.4	0.97	2.88 / 25.5	3.89	0.14 / 0.05	055UDA600
DST1402	1.18 / 10.5	1.49	4.72 / 41.8	5.97	0.25 / 0.09	055UDB600
DST1402	1.45 / 12.8	1.81	4.35 / 38.5	5.44	0.30 / 0.1	067UDA600
DST1402	1.65 / 14.6	1.99	6.60 / 58.5	7.95	0.36 / 0.12	055UDC600
DST1403	2.55 / 22.6	3.19	7.65 / 67.8	9.56	0.53 / 0.18	067UDB600
DST1403	3.20 / 28.3	4.00	9.60 / 85	12.00	0.87 / 0.3	089UDA600
DST1404	3.70 / 32.8	4.63	11.10 / 98.3	13.88	0.75 / 0.26	067UDC600
DST1405	5.50 / 48.7	6.88	16.50 / 146.1	20.63	1.61 / 0.55	089UDB600
DST1405	6.40 / 56.7	8.00	19.20 / 170.1	24.00	2.34 / 0.8	089UDC600

Technical data for Digitax ST

Model reference Drive dimensions

Model code explanation



Drive Model Ratings				
Model	Rated voltage (V)	No of input phases	Nominal current (Arms)	Peak current (Arms)
DST1201	230	1	1.1	2.2
DST1202	230	1	2.4	4.8
DST1203	230	1	2.9	5.8
DST1204	230	1	4.7	9.4
DST1201	230	3	1.7	5.1
DST1202	230	3	3.8	11.4
DST1203	230	3	5.4	16.2
DST1204	230	3	7.6	22.8
DST1401	400	3	1.5	4.5
DST1402	400	3	2.7	8.1
DST1403	400	3	4.0	12.0
DST1404	400	3	5.9	17.7
DST1405	400	3	8.0	24.0

NOTE: The drive selection should be based on the duty/load profile of the application.

Supply requirements		
Model	Supply voltage	Supply frequency range
DST120X	200V to 240V +/-10% single phase	48Hz to 65Hz
DST120X	200V to 240V +/-10% three phase	48Hz to 65Hz
DST140X	380V to 480V +/-10% three phase	48Hz to 65Hz

Internal braking resistor option

Part number	1299-0001
DC resistance at 25 °C	70R
Average power	50W
Peak instantaneous power over 1 ms at nominal resistance	2.2 kW/3 hp (230 V) 8.7 kW/11.7 hp (400 V)

Foot mounted EMC filters

Model	Voltage	Phases	Part number
DST120X	230	1	4200-6000
DST120X	230	3	4200-6001
DST140X	400	3	4200-6002

Other options

Description	Part number	Description	Part number
Keypad	Digitax ST Keypad	CT Comms Cable RS232	4500-0087
Additional Standard Smartcard	2214-4246	CT Comms Cable USB	4500-0096
High Capacity Smartcard	2214-1006		

General drive data

Type	Details		
IP rating	IP20 (UL Type 1 / NEMA 1)		
Weight (net)	2.1kg (4.6 lb) Excluding keypad and option modules		
Ambient operating temperature	0 °C to 50 °C (32 °F to 122 °F) Output current is derated at ambient temperatures >40 °C (104 °F)		
Operating humidity	Maximum relative humidity 95% non-condensing		
Altitude	0m to 3000m (9900ft). Derate the maximum output current for the specified figure by 1% per 100m (330 ft) above 1000m (3300 ft).		
Power cycles per hour	60 starts per hour equally spaced		
Digital and analog I/O	3 Dedicated inputs 1 High resolution analog input (16 bit + sign) 1 Standard analog input (10 bit + sign)	3 Bi-directional input/outputs	1 Relay output 2 Analog outputs 1 Freeze input (1µs)
Vibration	Tested in accordance to IEC60068-2-6/64		
Mechanical shock	Tested in accordance to IEC60068-2-29		
Electromagnetic immunity	Complies with EN61800-3 (2nd Environment)		
Electromagnetic emissions	Complies with EN61800-3 (2nd Environment) with onboard filter. EN61000-6-3 and EN61000-6-4 with optional footprint EMC filter		
Safe Torque Off	Approved by BGIA as meeting the requirements of the following standards for the prevention of unexpected starting of the drive: EN 61800-5-2:2007 SIL 3 EN ISO 13848-1:2006 PL e EN 954-1:1997 Category 3		

CONTROL TECHNIQUES™

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