Applied Motion Products

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Product Datasheet
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ST10-Si-NE

DC Advanced Microstep Drive w/ Si Programming & Encoder Input

Product Features

- *Programmable microstepping drive with advanced current control*
- *100 lines of icon-based program capability*
- *Si Programmer™ is heralded for its programming ease*
- *Animation mode displays operation in real time, great for debugging*
- *Wide current range 0.1 to 10.0 A/phase (peak of sine) with idle current reduction*
- *Advanced anti-resonance algorithm*
- *Torque ripple smoothing*
- *Microstepping and Microstep Emulation*
- *8 digital inputs, 4 digital outputs, optically isolated*
- *Encoder feedback connector for Stall Prevention & Stall Detection*
- *RS-232 cable and mating connectors included*

Description

The ST10-Si-NE stepper drive is a DC-powered microstepping drive for controlling two-phase, bipolar step motors. It offers advanced current control and a sophisticated 3rd generation anti-resonance algorithm that electronically dampens motor and system resonances to improve motor smoothness and usable torque over a wide speed range. The drive also employs electronic torque ripple smoothing and microstep emulation to greatly reduce motor noise and vibration. The drive must be powered from 24-80 VDC and can output up to 10.0 A/phase (peak-of-sine) to the step motor. Over-voltage, over-temperature and over-current protection features prevent damage while running in adverse conditions. The drive is complemented by a specifically matched set of NEMA 23 and NEMA 34 frame stepper motors (see Related and Recommended products below).

The ST10-Si-NE can operate in all of the same control modes as the Q models, plus it has the ability to run a stand-alone Si program stored in non-volatile memory. Si programs are created using the _Si Programmer™_ software, which provides unparalleled simplicity in indexer-drive programming via Applied Motion's unique and powerful icon-based programming environment. Preconfigured motor setup files included with _Si Programmer™_ make it easy to set up the drive for optimum results.

For connecting to external devices such as control signals, incremental encoders, limit switches, proximity or photoelectric sensors, PLC I/O, lamps, and other devices, the drive comes with 8 digital inputs and 4 digital outputs. Adjustable digital filters are present on the digital inputs for enhanced reliability in noisy environments. _Note: 2 single-ended analog inputs, which can be wired together as 1 differential analog input, are also available, but not in Si program mode_.

The drive comes with an RS-232 port for configuration and programming.

The ST10-Si-NE comes with an encoder feedback connector for applications that demand a higher level of position control than ordinary open-loop step motor systems can provide. Use our double-shaft step motors with incremental encoders and activate either Stall Detection or Stall Prevention in the drive. Stall Detection notifies the system as soon as the required torque is too great for the motor, which results in a loss of synchronization between the rotor and stator, also known as stalling. Stall Prevention automatically adjusts motor speed to maintain synchronization of the rotor to the stator under all conditions. This unique feature allows step motors to operate in a much broader range of applications than previously possible, such as torque-control. The Stall Prevention feature also performs static position maintenance, which maintains the position of the motor shaft when at rest. Additionally, the inclusion of the optional encoder allows the motor to be precisely homed to the index (marker) pulse.

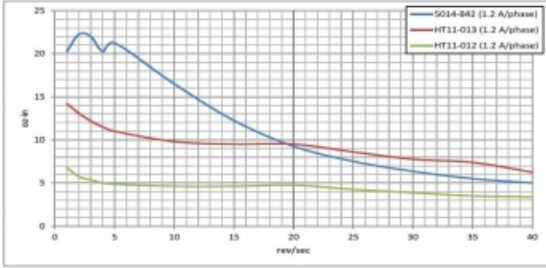All ST drives are CE approved and RoHS compliant.

Specifications

Model Number:	ST10-Si-NE
Part Number:	5000-141
Supply Voltage:	24-80 VDC
Supply Voltage Type:	DC
Control Modes:	Si Programming
Output Current:	0.1-10.0 A/phase
Communication Ports:	RS-232
Encoder Feedback:	Yes
Step Resolution:	Microstepping Microstep Emulation
Idle Current Reduction:	0-90%
Setup Method:	Software setup
Digital Inputs:	8
Digital Outputs:	4
Dimensions:	5.0 x 3.0 x 1.75 inches
Weight:	10.4 oz
Operating Temperature Range:	0-70 °C
Ambient Temperature Range:	0-55 °C
Ambient Humidity:	90% max, non-condensing
Status LEDs:	1 red, 1 green
Circuit Protection:	Short circuit Over-voltage Under-voltage Over-temp

Torque Curves

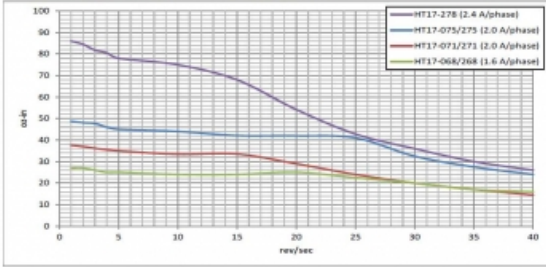### HT11-012, HT11-013, 5014-842
24 VDC power supply, 20000 steps/rev

Legend:
- 5014-842 (1.2 A/phase)
- HT11-013 (1.2 A/phase)
- HT11-012 (1.2 A/phase)

HT17
24 VDC power supply, 20000 steps/rev, all motors connected in parallel

Legend:
- HT17-278 (2.4 A/phase)
- HT17-075/275 (2.0 A/phase)
- HT17-071/271 (2.0 A/phase)
- HT17-068/268 (1.6 A/phase)

HT17
48 VDC power supply, 20000 steps/rev, all motors connected in parallel

Legend:
- HT17-278 (2.4 A/phase)
- HT17-075/275 (2.0 A/phase)
- HT17-071/271 (2.0 A/phase)
- HT17-068/268 (1.6 A/phase)

HT23
24 VDC power supply, 20000 steps/rev, all motors connected in parallel

Legend:
- HT23-603 (6.0 A/phase)
- HT23-401/601 (5.0 A/phase)
- HT23-398/598 (5.0 A/phase)
- HT23-394/594 (3.4 A/phase)

HT23
48 VDC power supply, 20000 steps/rev, all motors connected in parallel

Legend:
- HT23-603 (6.0 A/phase)
- HT23-401/601 (5.0 A/phase)
- HT23-398/598 (5.0 A/phase)
- HT23-394/594 (3.4 A/phase)

HT24
24 VDC power supply, 20000 steps/rev

Legend:
- HT24-108 (4.8 A/phase)
- HT24-105 (4.8 A/phase)
- HT24-100 (3.36 A/phase)

HT24
48 VDC power supply, 20000 steps/rev

Legend:
- HT24-108 (4.8 A/phase)
- HT24-105 (4.8 A/phase)
- HT24-100 (3.36 A/phase)
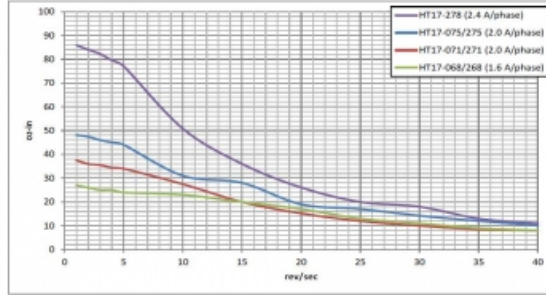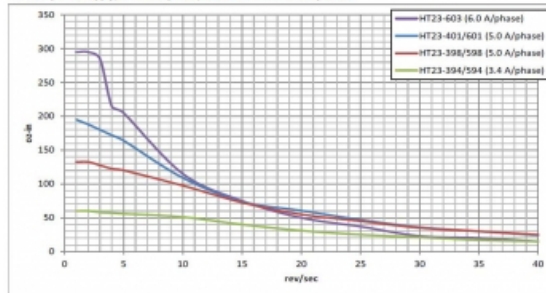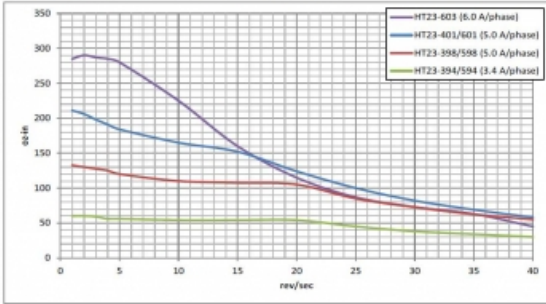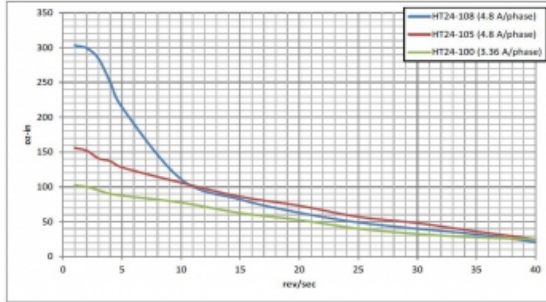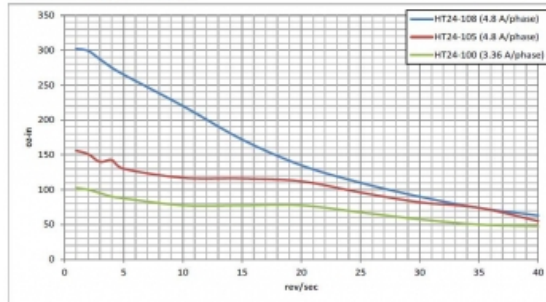
HT34-485/486/487 with ST10
24 VDC power supply, 20000 steps/rev, all motors connected in parallel

Legend:
- HT34-487 (10 A/phase)
- HT34-486 (9.7 A/phase)
- HT34-485 (10 A/phase)
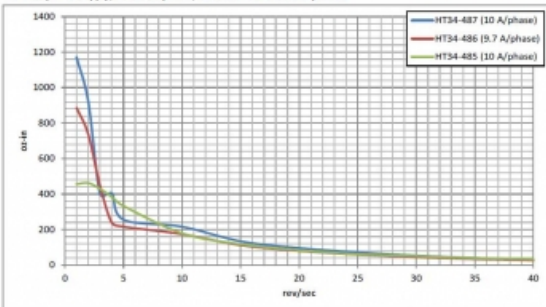
HT34-485/486/487 with ST10
48 VDC power supply, 20000 steps/rev, all motors connected in parallel

Legend:
- HT34-487 (10 A/phase)
- HT34-486 (9.7 A/phase)
- HT34-485 (10 A/phase)

HT34-485/486/487 with ST10
80 VDC power supply, 20000 steps/rev, all motors connected in parallel

Legend:
- HT34-487 (10 A/phase)
- HT34-486 (9.7 A/phase)
- HT34-485 (10 A/phase)

HT34-504/505/506 with ST10
24 VDC power supply, 20000 steps/rev, all motors connected in parallel

HT34-504/505/506 with ST10
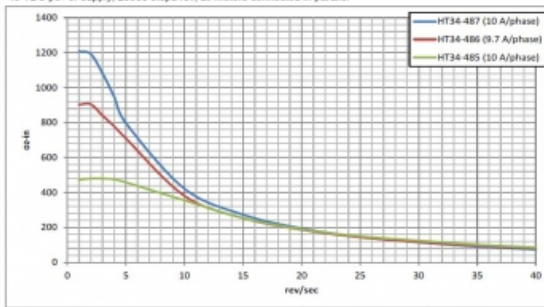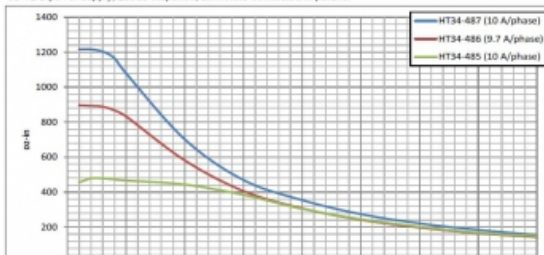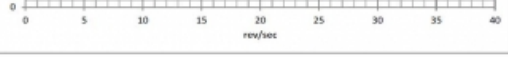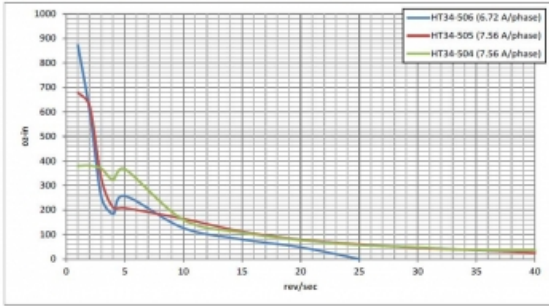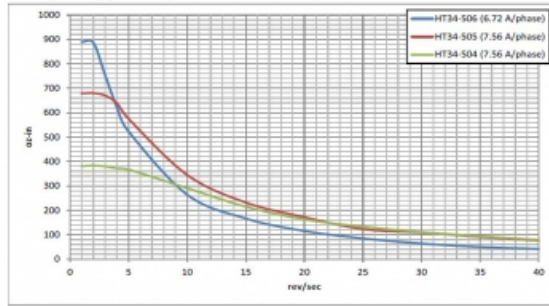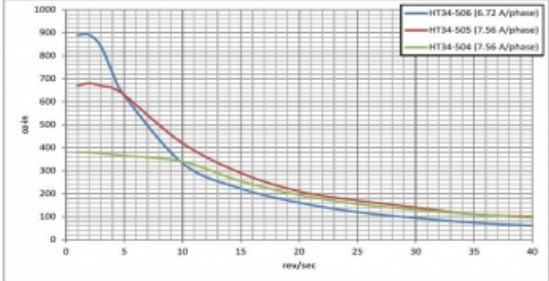48 VDC power supply, 20000 steps/rev, all motors connected in parallel

HT34-504/505/506 with ST10
60 VDC power supply, 20000 steps/rev, all motors connected in parallel

Software

Software:	DSP Firmware Downloader Si Firmware Downloader Si Programmer™

Downloads

Manuals:	☑ ST5-10-QSi_Hardware Manual_920-0004F-opt-.pdf ☑ ST5_10_Si_QuickSetupGuide_920-0008D.pdf
Product PDF - S3 Link:	http://s3.amazonaws.com/applied-motion-pdf/ST10-Si-NE.pdf
Datasheet:	☑ ST-Datasheet_925-0007.pdf
2D Drawing:	☑ ST5_10 Dimensions.pdf ☑ ST_T_simple_3D.pdf
3D Drawing:	☐ ST5_10-Q_Si_C_SIMPLE.igs
Speed-Torque Curves:	☑ ST_Speed_Torque_revF.pdf
Agency Approvals:	☑ ST-Q-Si-C-IP_CE_DOC.pdf
Application Notes:	☑ APPN0016_Simple-25-pin-mating-connections.pdf ☑ APPN0015_Make-a-serial-programming-cable.pdf

2D Drawings

Mechanical Outline
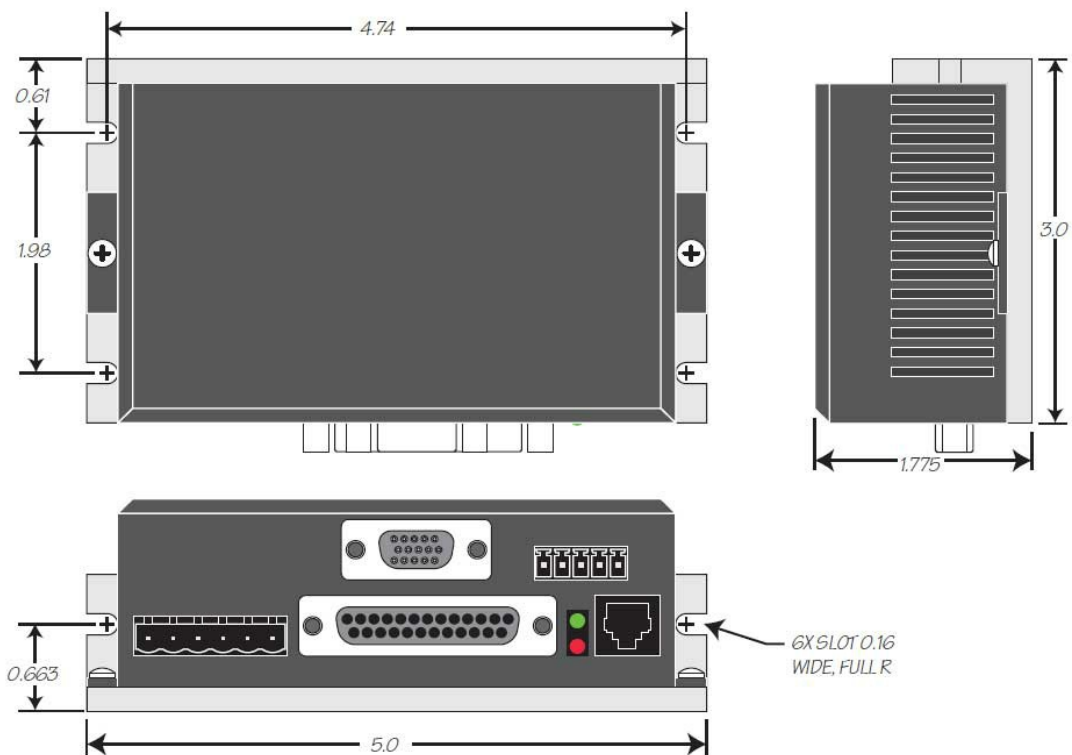
Products in the Series *ST Stepper Drives*

Model Number	Supply Voltage	Control Modes	Output Current	Communication Ports	Encoder Feedback	1pc.
ST10-C-CE	24-80 VDC	CANopen	0.1-10.0 A/Phase	RS-232, CANopen	Yes	$818.00
ST10-C-CN	24-80 VDC	CANopen	0.1-10.0 A/Phase	RS-232, CANopen	No	$757.00
ST10-IP-EE	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	0.1-10.0 A/Phase	Ethernet, EtherNet/IP	Yes	$852.00
ST10-IP-EN	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	0.1-10.0 A/Phase	Ethernet, EtherNet/IP	No	$791.00
ST10-Plus	24-80 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	0.1-10.0 A/Phase	RS-232	No	$322.00
ST10-Q-EE	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	0.1-10.0 A/Phase	Ethernet	Yes	$871.00
ST10-Q-EN	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	0.1-10.0 A/Phase	Ethernet	No	$792.00
ST10-Q-NE	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Velocity Control, Modbus RTU	0.1-10.0 A/Phase	RS-232	Yes	$696.00
ST10-Q-NF	24-80 VDC	Step & Direction, Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Velocity Control, Modbus RTU	0.1-10.0 A/Phase	RS-232	Yes	$668.00
ST10-Q-NN	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus RTU	0.1-10.0 A/Phase	RS-232	No	$618.00
ST10-Q-RE	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	0.1-10.0 A/Phase	RS-232, RS-485	Yes	$828.00
ST10-Q-RN	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	0.1-10.0 A/Phase	RS-232, RS-485	No	$756.00
ST10-S	24-80 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	0.1-10.0 A/Phase	RS-232	No	$274.00
ST10-Si-NE	24-80 VDC	Si Programming	0.1-10.0 A/Phase	RS-232	Yes	$756.00
ST10-Si-NF	24-80 VDC	Si Programming	0.1-10.0 A/Phase	RS-232	Yes	$763.00
ST10-Si-NN	24-80 VDC	Si Programming	0.1-10.0 A/Phase	RS-232	No	$696.00
ST5-C-CE	24-48 VDC	CANopen	0.1-5.0 A/Phase	RS-232, CANopen	Yes	$702.00
ST5-C-CN	24-48 VDC	CANopen	0.1-5.0 A/Phase	RS-232, CANopen	No	$649.00
ST5-IP-EE	24-48 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	0.1-5.0 A/Phase	Ethernet, EtherNet/IP	Yes	$786.00

ST5-IP-EN	24-48 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming, EtherNet/IP, Modbus TCP	0.1-5.0 A/Phase	Ethernet, EtherNet/IP	No	$728.00
ST5-Plus	24-48 VDC	Streaming Commands, Analog Positioning, Encoder Following, Q Programming	0.1-5.0 A/Phase	RS-232	No	$295.00
ST5-Q-EE	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	0.1-5.0 A/Phase	Ethernet	Yes	$737.00
ST5-Q-EN	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus TCP	0.1-5.0 A/Phase	Ethernet	No	$677.00
ST5-Q-NE	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus RTU	0.1-5.0 A/Phase	RS-232	Yes	$648.00
ST5-Q-NF	24-48 VDC	Step & Direction, Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Velocity Control, Modbus RTU	0.1-5.0 A/Phase	RS-232	Yes	$636.00
ST5-Q-NN	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, SiNet Hub Compatible, Modbus RTU	0.1-5.0 A/Phase	RS-232	No	$560.00
ST5-Q-RE	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	0.1-5.0 A/Phase	RS-232, RS-485	Yes	$750.00
ST5-Q-RN	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, Analog Positioning, Encoder Following, Q Programming, Modbus RTU	0.1-5.0 A/Phase	RS-232, RS-485	No	$684.00
ST5-S	24-48 VDC	Step & Direction, Velocity (Oscillator), Streaming Commands, SiNet Hub Compatible	0.1-5.0 A/Phase	RS-232	No	$247.00
ST5-Si-NE	24-48 VDC	Si Programming	0.1-5.0 A/Phase	RS-232	Yes	$695.00
ST5-Si-NF	24-48 VDC	Si Programming	0.1-5.0 A/Phase	RS-232	Yes	$727.00
ST5-Si-NN	24-48 VDC	Si Programming	0.1-5.0 A/Phase	RS-232	No	$588.00

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R88D1SN08HECT R88ACR1A003CFRA K6CMISZBI52 KLC35BE R88A-CA1A010B ST10-IP-EE ST10-Q-RN 103H7121-0410P
103H7123-0440P 103H7126-0740P 103H7126-5740P 103H7823-5740P SMCV6150 U-PKZ0(480V60HZ) ODE-3-120070-1F1A-01 ODE-
3-240041-3F4B ODE-3-120070-1F1B-01 132B0107 68581737 3AUA0000072069 3AUA0000089109 ODE-3-220105-1F4B
1SFA897103R7000 1SFA897102R7000 3AUA0000058190 68581974 68581796 MCD 201-007-T4-CV1 3AUA0000039627
3AXD50000031889 ATS22D17Q 3AXD50000716630 3AUA0000058169 ATV610U55N4 ATV310H075N4E