AC Servo Systems

Drive features

- Power:
  - 1 phase 110VAC: 100W-2kW
  - 1 phase 220VAC: 100W-2kW
  - 3 phase 220VAC: 100W-15kW
  - 3 phase 460VAC: 400W-15kW
- Fully digital with up to 3.1 kHz bandwidth velocity loop response
- Easy setup and diagnostics with built-in keypad/display or the SureServo2 Pro PC-based software
- Field upgradeable firmware ensures the drive can always be upgraded to the latest operating system
- Communications include:
  - Serial Modbus (native/built-in)
  - Optional Modbus TCP card
  - Optional Ethernet/IP card (this card can use implicit and explicit messaging. SureServo2 Pro software can generate an EDS file to transfer custom data between PLC and drive)
- Command options include:
  - ± 10V torque or velocity command
  - Pulse train or master encoder position command (accepts line driver or open collector) with electronic gearing
  - Powerful built-in motion controller for position control using 99 preset positions (enter these during development, or send them through the communications options above during runtime)
  - Internal sequencing for position/speed commands, registration (capture/compare), electronic camming, homing (10 different options), Jumps, and arithmetic statements.
- The 3.1 kHz bandwidth allows for high-level automatic tuning. Several modes of tuning are available including Auto Tune that can estimate the load inertia and fine-tune the system when all the loads are attached.
- Optically isolated digital inputs (10) and outputs (6), analog outputs for monitor signals (2), and line driver output for encoder (with scalable resolution).
- Other Features:
  - Secondary/Auxiliary encoder feedback (for true closed loop control)
  - Registration ability
  - Analog positioning
  - Safe Torque Off (STO) included - so no need for large, bulky contactors to disconnect power from the drive in E-stop situations
  - Absolute Encoder operation (with optional encoder battery backup)
  - Electronic camming (you can define the cam with SureServo2 Pro software or you can import an Excel spreadsheet)
  - Advanced Scope feature that can monitor a variety of command and status signals, including output speed, torque, power, etc.

Motor features

- Low inertia models:
  - 100W, 200W, 400W, 750W, 1kW, 1.5 kW, and 2kW
  - Speeds up to 6,000 rpm
- Medium inertia models:
  - 1kW, 1.5 kW, 2kW, and 3kW
  - Speeds up to 3,000 rpm
- High inertia models:
  - 3kW, 4.5 kW, 5.5 kW, 7.5 kW, 11kW, and 15kW
  - Speeds up to 3,000 rpm
- Permanent magnet 3-phase synchronous motor
- Keyed drive shafts support clamp-on style couplings or key-style couplings
- Integrated encoder with 16,777,216 encoder pulses/revolution plus marker pulse (once per revolution)
- Optional 24 VDC spring-set holding brakes (xxxxB series motors)
- Standard hook-up cables for motor power, encoder, and brake (separate brake cable for brake motors 230V systems 5.5kW and larger or 460V systems 11kW and larger)
- Motor cables available in standard or flex-rated lengths of 3, 5, 10, and 20m
- Standard 50-pin DIN-rail mounted break-out kit for the drive's CN1 connector (with screw terminal connections), or 20-pin spring clamp terminal block (limited I/O) that mounts directly to the drive

SureServo2 tuning technology

The SureServo2 drive closes the loop on current, velocity, and position (depending on control mode selection). The 3.1 kHz bandwidth in the drive assures precise speed and current control and easy tuning. Proportional gain, integral gain and compensation, feed forward compensation, command low pass filter, and five (5) notch filters for resonance suppression are available. Auto Tuning has been greatly improved and can easily tune systems with as much as 60:1 inertia mismatch.

There is an inertia estimation function that analyzes the motor and load to measure how much inertia is coupled to the motor.

The drive has several tuning methods available:

- One Touch Auto Tuning–the drive tunes the motor without any motion (static motor/system analysis)
- Normal Auto Tuning–the drive tunes the load while an external controller or the drive's internal indexer provides point-to-point moves
- Assisted Tuning–3 modes where the drive tunes the motor while moving. The user can adjust responsiveness while the drive is analyzing the system
- Manual Tuning–20+ parameters are available to give power users the ultimate flexibility to tune their systems.

*Sure*Servo2 Built-in motion controller

While the SureServo2 drives can accept traditional commands from host controls, they can also provide their own internal motion control. For example, up to 99 index moves can be pre-defined and stored in the drive and then selected and executed using digital inputs (inputs as events or inputs used as a multiplexer) or communication (serial Modbus, Modbus TCP, or Ethernet/IP). The index profiles can also be changed while in-process with digital events or via comms. The internal motion can consist of incremental or absolute moves, and can be sequenced internally with delays in between the moves or moves can be linked together so they are processed one after the other.

Multi-axis systems can be controlled via digital inputs, or serial/Ethernet communication. The motion can be commanded from a powerful external controller that sends out high speed pulses to each drive, or the motion can be initiated by a low-level controller (the simplest CLICK PLC) since each drive has a powerful motion controller inside. Applications include press feeds, auger fillers, rotary tables, robots for pick and place, test or assembly operations, drilling, cutting, tapping, and similar applications using simple index moves for single or multi-axis motion.

*Sure*Servo2 Optional Holding Brake

Each SureServo2 motor rating can be ordered with an optional 24VDC spring-set holding brake that holds the motor in place when power is removed.

*Sure*Gear® Precision Gearboxes for Servo motors

Inertia balancing issue in your design?

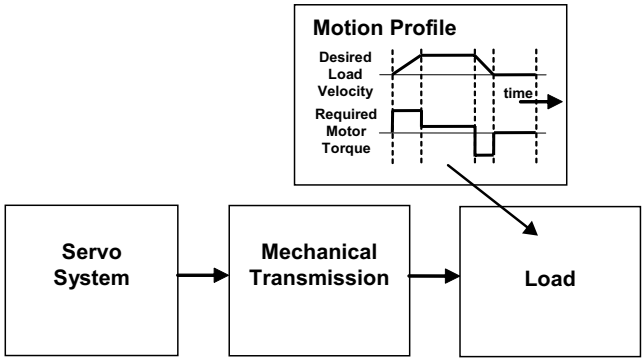
The SureGear PGA series easily mates to SureServo2 motors. Everything you need to mount your SureServo2 motor is included!

- Four gear ratios available (5, 10, 15, 25:1)
- Mounting hardware included for attaching to SureServo2 motors
- Industry-standard mounting dimensions
- Thread-in mounting style
- Best-in-class backlash (5 arc-min)
- 5-year warranty

How to select and apply *Sure*Servo2 systems

The primary purpose of the AC servo system is to precisely control the motion of the load. The most fundamental considerations in selecting the servo system are "reflected" load inertia, servo system maximum speed requirement, servo system continuous torque requirement, and servo system peak torque requirement. In a retrofit application, select the largest torque SureServo2 system that most closely matches these parameters for the system being replaced. In a new application, these parameters should be determined through calculation and/or measurement. SureServo2 Pro has the ability to measure the load (reflected) inertia and accurately measure the motor torque output.

AutomationDirect has teamed with Copperhill Technologies to provide free servo-sizing software. "VisualSizer-SureServo" software will assist in determining the correct motor and drive for your application by calculating the reflected load inertia and required speed and torque based on the load configuration. "VisualSizer-SureServo" software can be downloaded from www.automationdirect.com on the store page for your drive.



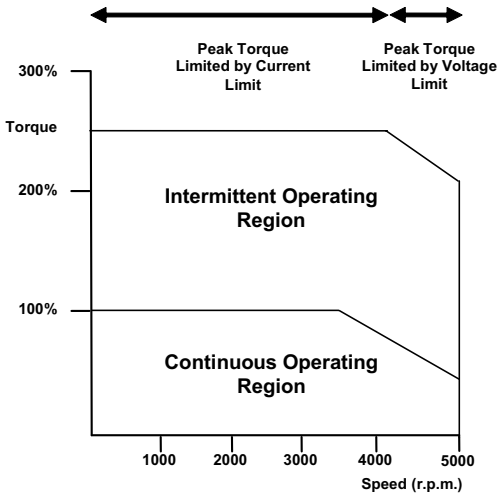
1. "Reflected" load inertia

The inertia of everything attached to the servo motor driveshaft needs to be considered and the total "reflected" inertia needs to be determined. This means that all elements of any mechanical transmission and load inertia need to be translated into an equivalent inertia as if attached directly to the motor driveshaft. The ratio of "reflected" load inertia to motor inertia needs to be carefully considered when selecting the servo system.

In general, applications that need high response or bandwidth will benefit from keeping the ratio of load inertia to motor inertia as low as possible and ideally under 10:1. Systems with ratios as high as 200:1 can be implemented, but corresponding lower bandwidth or responsiveness must be accepted. The servo response including the attached load inertia is determined by the servo tuning. SureServo2 systems may be tuned manually, fully Automatically, or via a hybrid mode where the software tunes the system with input for system responsiveness from the user.

2. Torque and speed

With knowledge of the motion profile and any mechanical transmission between the motor and load, calculations can be made to determine the required servo motor continuous torque, peak torque, and maximum motor speed. The required amount of continuous torque must fall inside the continuous operating region of the system torque-speed curve (you can check the continuous torque at the average speed of the motion profile). The required amount of peak torque must also fall within the servo system's intermittent operating region of the system torque-speed curve (you need to check this value at the required maximum speed or torque). If you have a SureServo2 system, these values are easily captured and recorded with the Scope feature built into SureServo2 Pro. If you are designing the system, use VisualSizer to define the system and calculate expected inertia and required power.



Application tip - coupling considerations

The SureServo2 motors have keyed shafts that can be used with keyed couplings or with clamp-on or compression style couplings. "Servo-grade" clamp-on or compression style couplings are usually the best choice when you consider the stiffness, torque rating, and inertia. Higher stiffness (lb-in/radian) is needed for better response but there is a trade-off between the stiffness and the added inertia of the coupling. Concerning the torque rating of the coupling, use a safety factor of 1.25 over the SureServo2 **peak** torque requirement of your application.

Available Couplings

Mechanical transmissions

Common mechanical transmissions include leadscrews, rack & pinion mechanisms, conveyors, gears, and timing belts. The use of leadscrew, rack & pinion, or conveyor are common ways to translate the rotary motion of the servo motor into linear motion of the load. The use of a speed reducer such as a gearbox or timing belt can be very beneficial as follows:

1. Reduction of reflected load inertia

As a general rule, it is beneficial to keep the reflected load inertia as low as possible while using the full range of servo speed. SureServo2 systems can go up to 6,000 rpm for the low inertia motors and up to 3,000 rpm for the medium inertia motors.

Example: A gearbox reduces the required torque by a factor of the gear ratio, and reduces the reflected load inertia by a factor of the gear ratio squared. A 10:1 gearbox reduces output speed to 1/10, increases output torque 10 times, and decreases reflected inertia to 1/100.

However, when investigating the effect of different speed reduction ratios DO NOT forget to include the added inertia of couplings, gearbox, or timing belt pulleys. These added inertias can be significant, and can negate any inertia reduction due to the speed reduction.

2. Low speed and high torque applications

If the application requires low speed and high torque then it is common to introduce a speed reducer so that the servo system can operate over more of the available speed range. This could also have the added benefit of reducing the servo motor torque requirement which could allow you to use a smaller and lower cost servo system. Additional benefits are also possible with reduction in reflected inertia, increased number of motor encoder counts at the load, and increased ability to reject load disturbances due to mechanical advantage of the speed reducer.

3. Space limitations and motor orientation

SureServo2 motors can be mounted in any orientation, but the shaft seal should not be immersed in oil (open-frame gearbox, etc.). Reducers can possibly allow the use of a smaller motor or allow the motor to be repositioned. For example, some reducers would allow for in-line, right angle, or parallel mounting of the motor.

For more information, refer to the website listed below.

Mechanical Transmission: Timing Belts and Pulleys
Precision Gearboxes

Ordering guide instructions

The following four pages are your ordering guide for SureServo2 systems. Each system has a torque-speed curve included for reference. This is the fundamental information that you need to select the servo motor and matching drive for your application.

Each system needs:

- Motor
- Drive
- Motor Power Cable
- Motor Encoder Cable
- I/O connections (either CN1 cable + RTB breakout board, or an LTB20 breakout board that mounts on the drive)
- For brakemotors 4.5 kW and below, the brake wiring is included in the power cable. For brakemotors 5.5 kw and above, a separate brake cable is required.

A wide variety of optional accessories are also available, such as Ethernet cards, RS485 splitters/terminators, toroids, etc.

You can also use the SureServo2 selector tool on the AutomationDirect.com website to help you configure your system.

AC Servo System Configuration

*Sure*Servo2 series drives and motors part numbering system

SV2 A - 2 04 0

Component Option
#: Drive
N: Motor without brake
B: Motor with brake

Rated Output Power

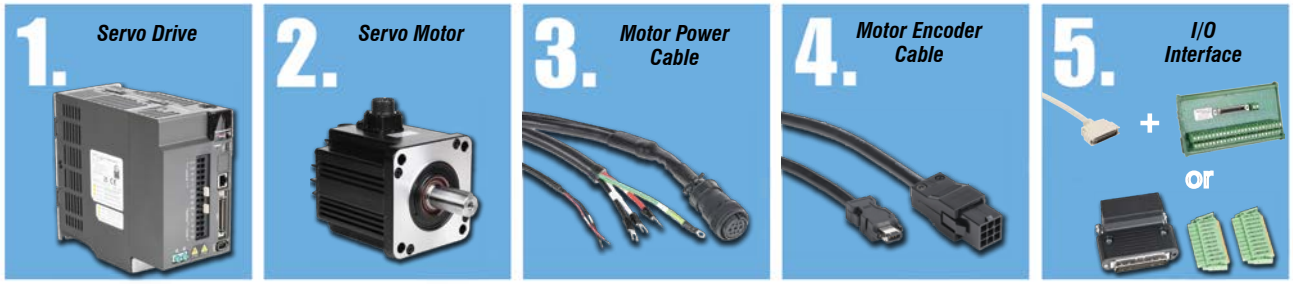
01: 100W	10: 1kW	45: 4.5 kW
02: 200W	15: 1.5 kW	55: 5.5 kW
04: 400W	20: 2kW	75: 7.5 kW
07: 750W	30: 3kW	B0: 11 kW
		F0: 15 kW

Nominal Input Voltage
2: 400W–2kW: 110/220 VAC 1-phase, 220VAC 3-phase
Over 2kW: 220VAC 3-phase
4: 460VAC 3-phase

Component Type
A: Drive
L: Low inertia motor
M: Medium inertia motor
H: High inertia motor

Series
SV2: SureServo2 AC servo

Here is what you will need to order a complete servo system:



NOTE: Unit can be programmed via keypad. Optional programming software (free download) and optional programming cable available.

NOTE: If you need a gear box for your configuration, you can do it easily online: http://www.sureservo.com/gearbox/selector

AC Servo System Configuration

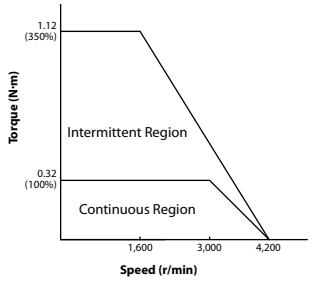
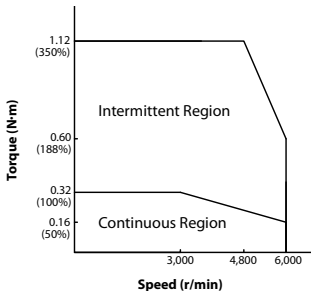
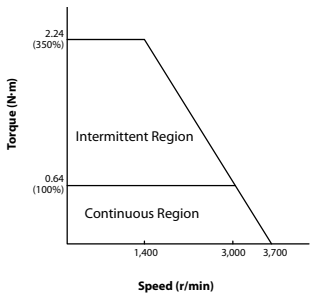
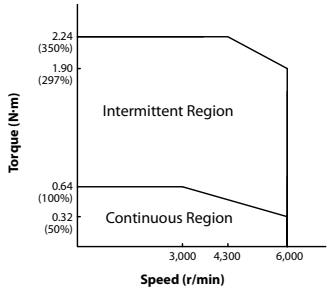
Torque to SureServo2 System Quick Reference

230V System Torque			
System Rated Torque (N·m)	***System Maximum Torque (N·m)***	***Suggested Servo Motor***	***Required Servo Drive***
0.32	1.12	SV2L-201N or SV2L-201B	SV2A-2040
0.64	2.24	SV2L-202N or SV2L-202B	SV2A-2040
1.27	3.96	SV2L-204N or SV2L-204B	SV2A-2040
2.39	7.86	SV2L-207N or SV2L-207B	SV2A-2075
3.18	8.12	SV2L-210N or SV2L-210B	SV2A-2150
4.77	14.32	SV2M-210N or SV2M-210B	SV2A-2150
7.16	14.88	SV2M-215N or SV2M-215B	SV2A-2150
9.55	24.54	SV2M-220N or SV2M-220B	SV2A-2200
17.55	48.29	SV2M-230N or SV2M-230B	SV2A-2300
28.65	71.62	SV2H-245N or SV2H-245B	SV2A-2550
35.01	87.53	SV2H-255N or SV2H-255B	SV2A-2550
47.74	119.36	SV2H-275N or SV2H-275B	SV2A-2750
70	175	SV2H-2B0N or SV2H-2B0B	SV2A-2F00
95.4	224.0	SV2H-2F0N or SV2H-2F0B	SV2A-2F00

460V System Torque			
System Rated Torque (N·m)	***System Maximum Torque (N·m)***	***Suggested Servo Motor***	***Required Servo Drive***
1.27	4.45	SV2L-404N or SV2L-404B	SV2A-4040
2.24	7.58	SV2L-407N or SV2L-407B	SV2A-4075
3.18	9.54	SV2L-410N or SV2L-410B	SV2A-4150
4.77	14.32	SV2M-410N or SV2M-410B	SV2A-4150
7.16	18.1	SV2L-415N or SV2L-415B	SV2A-4150
9.55	28.65	SV2L-420N or SV2L-420B	SV2A-4200
19.1	49.38	SV2H-430N or SV2H-430B	SV2A-4300
28.65	64.61	SV2H-445N or SV2H-445B	SV2A-4550
35.01	73.48	SV2H-455N or SV2H-455B	SV2A-4550
47.74	93.71	SV2H-475N or SV2H-475B	SV2A-4750
70	175	SV2H-4B0N or SV2H-4B0B	SV2A-4F00
95.4	224.0	SV2H-4F0N or SV2H-4F0B	SV2A-4F00

AC Servo System Configuration

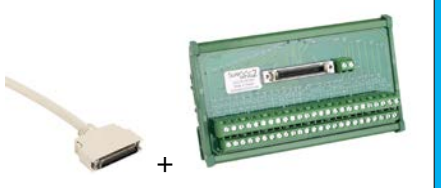
*Sure*Servo2 AC servo drive, motor, and cable combinations

	Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
100W Low Inertia System	120V		SV2L-201N	SV2A-2040	SV2C-PA18-xxNN	SV2C-E122-xxNN
					SV2C-PA18-xxFN	SV2C-E122-xxFN
			SV2L-201B		SV2C-PB18-xxNB	SV2C-E122-xxNN
					SV2C-PB18-xxFB	SV2C-E122-xxFN
	230V		SV2L-201N	SV2A-2040	SV2C-PA18-xxNN	SV2C-E122-xxNN
					SV2C-PA18-xxFN	SV2C-E122-xxFN
			SV2L-201B		SV2C-PB18-xxNB	SV2C-E122-xxNN
					SV2C-PB18-xxFB	SV2C-E122-xxFN
200W Low Inertia System	120V		SV2L-202N	SV2A-2040	SV2C-PA18-xxNN	SV2C-E122-xxNN
					SV2C-PA18-xxFN	SV2C-E122-xxFN
			SV2L-202B		SV2C-PB18-xxNB	SV2C-E122-xxNN
					SV2C-PB18-xxFB	SV2C-E122-xxFN
	230V		SV2L-202N	SV2A-2040	SV2C-PA18-xxNN	SV2C-E122-xxNN
					SV2C-PA18-xxFN	SV2C-E122-xxFN
			SV2L-202B		SV2C-PB18-xxNB	SV2C-E122-xxNN
					SV2C-PB18-xxFB	SV2C-E122-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50



OR

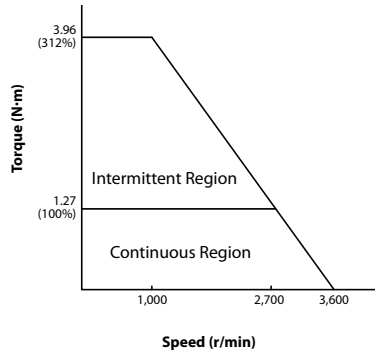
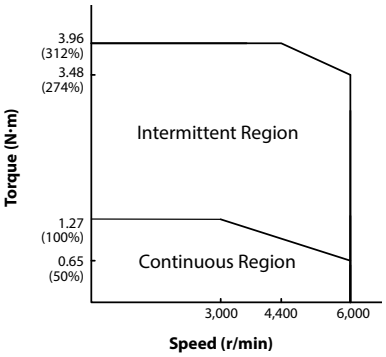
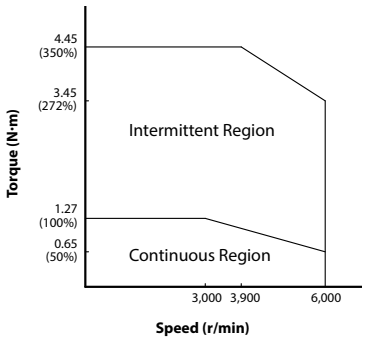
SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

400W Low Inertia System

Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
120V		SV2L-204N	SV2A-2040	SV2C-PA18-xxNN	SV2C-E122-xxNN
				SV2C-PA18-xxFN	SV2C-E122-xxFN
		SV2L-204B		SV2C-PB18-xxNB	SV2C-E122-xxNN
				SV2C-PB18-xxFB	SV2C-E122-xxFN
230V		SV2L-204N	SV2A-2040	SV2C-PA18-xxNN	SV2C-E122-xxNN
				SV2C-PA18-xxFN	SV2C-E122-xxFN
		SV2L-204B		SV2C-PB18-xxNB	SV2C-E122-xxNN
				SV2C-PB18-xxFB	SV2C-E122-xxFN
460V		SV2L-404N	SV2A-4040	SV2C-PA18-xxNN	SV2C-E122-xxNN
				SV2C-PA18-xxFN	SV2C-E122-xxFN
		SV2L-404B		SV2C-PB18-xxNB	SV2C-E122-xxNN
				SV2C-PB18-xxFB	SV2C-E122-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50

OR

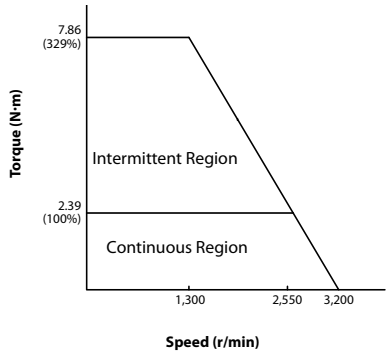
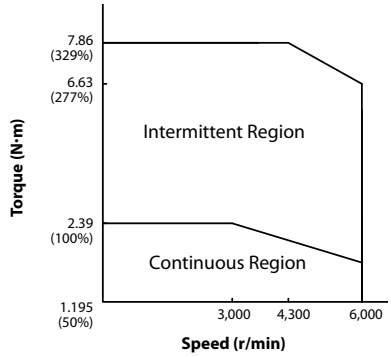
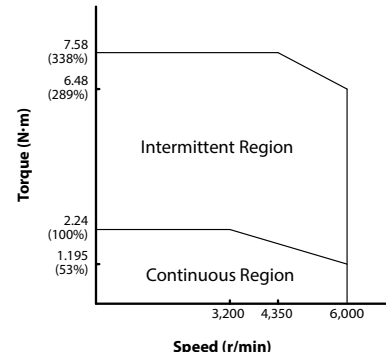
SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

750W Low Inertia System

Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
120V		SV2L-207N	SV2A-2075	SV2C-PA18-xxNN	SV2C-E122-xxNN
				SV2C-PA18-xxFN	SV2C-E122-xxFN
		SV2L-207B		SV2C-PB18-xxNB	SV2C-E122-xxNN
				SV2C-PB18-xxFB	SV2C-E122-xxFN
230V		SV2L-207N	SV2A-2075	SV2C-PA18-xxNN	SV2C-E122-xxNN
				SV2C-PA18-xxFN	SV2C-E122-xxFN
		SV2L-207B		SV2C-PB18-xxNB	SV2C-E122-xxNN
				SV2C-PB18-xxFB	SV2C-E122-xxFN
460V		SV2L-407N	SV2A-4075	SV2C-PA18-xxNN	SV2C-E122-xxNN
				SV2C-PA18-xxFN	SV2C-E122-xxFN
		SV2L-407B		SV2C-PB18-xxNB	SV2C-E122-xxNN
				SV2C-PB18-xxFB	SV2C-E122-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50

OR

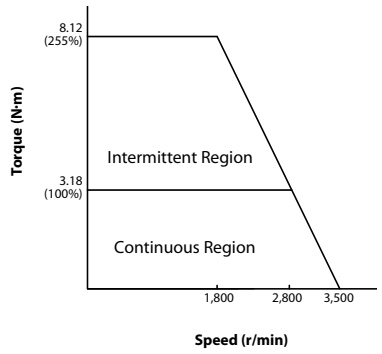
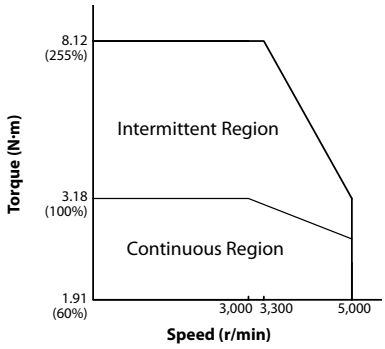
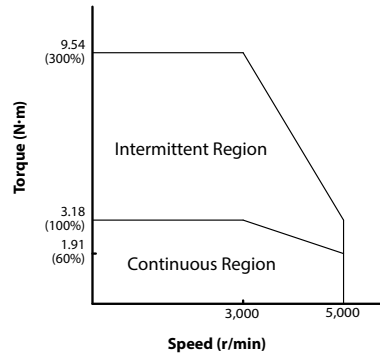
SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

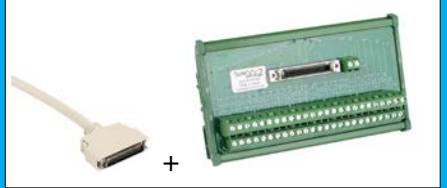
1.0 kW Low Inertia System

Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
120V		SV2L-210N	SV2A-2150	SV2C-PC16-xxNN	SV2C-E222-xxNN
				SV2C-PC16-xxFN	SV2C-E222-xxFN
		SV2L-210B		SV2C-PC16-xxNB	SV2C-E222-xxNN
				SV2C-PC16-xxFB	SV2C-E222-xxFN
230V		SV2L-210N	SV2A-2150	SV2C-PC16-xxNN	SV2C-E222-xxNN
				SV2C-PC16-xxFN	SV2C-E222-xxFN
		SV2L-210B		SV2C-PC16-xxNB	SV2C-E222-xxNN
				SV2C-PC16-xxFB	SV2C-E222-xxFN
460V		SV2L-410N	SV2A-4150	SV2C-PC16-xxNN	SV2C-E222-xxNN
				SV2C-PC16-xxFN	SV2C-E222-xxFN
		SV2L-410B		SV2C-PC16-xxNB	SV2C-E222-xxNN
				SV2C-PC16-xxFB	SV2C-E222-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50



OR

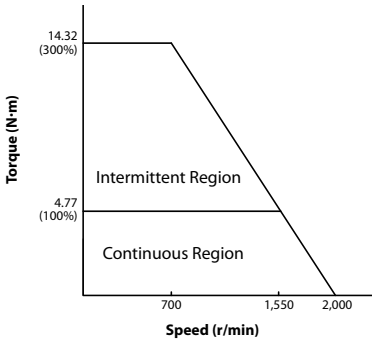
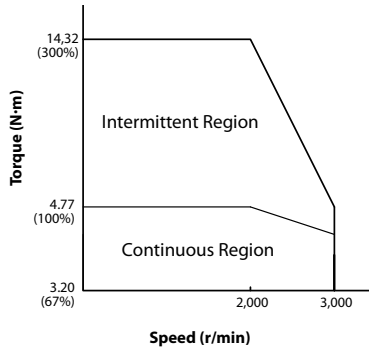
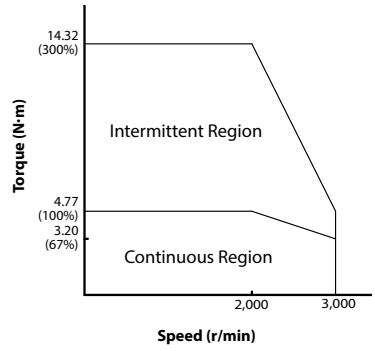
SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

1.0 kW Medium Inertia System

Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
120V		SV2M-210N	SV2A-2150	SV2C-PC12-xxNN	SV2C-E222-xxNN
				SV2C-PC12-xxFN	SV2C-E222-xxFN
		SV2M-210B		SV2C-PC12-xxNB	SV2C-E222-xxNN
				SV2C-PC12-xxFB	SV2C-E222-xxFN
230V		SV2M-210N	SV2A-2150	SV2C-PC12-xxNN	SV2C-E222-xxNN
				SV2C-PC12-xxFN	SV2C-E222-xxFN
		SV2M-210B		SV2C-PC12-xxNB	SV2C-E222-xxNN
				SV2C-PC12-xxFB	SV2C-E222-xxFN
460V		SV2M-410N	SV2A-4150	SV2C-PC16-xxNN	SV2C-E222-xxNN
				SV2C-PC16-xxFN	SV2C-E222-xxFN
		SV2M-410B		SV2C-PC16-xxNB	SV2C-E222-xxNN
				SV2C-PC16-xxFB	SV2C-E222-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50

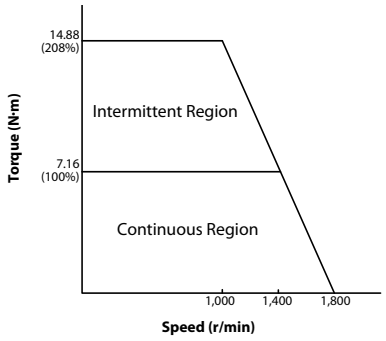
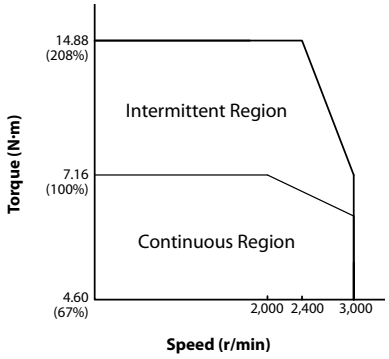
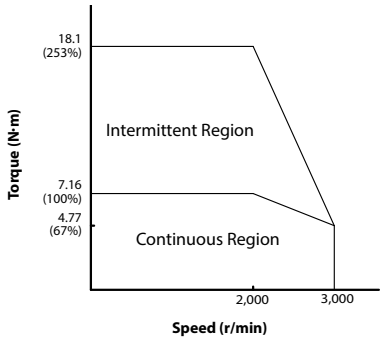
OR

SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

	Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
1.5 kW Medium Inertia System	120V		SV2M-215N	SV2A-2150	SV2C-PC12-xxNN	SV2C-E222-xxNN
					SV2C-PC12-xxFN	SV2C-E222-xxFN
			SV2M-215B		SV2C-PC12-xxNB	SV2C-E222-xxNN
					SV2C-PC12-xxFB	SV2C-E222-xxFN
	230V		SV2M-215N	SV2A-2150	SV2C-PC12-xxNN	SV2C-E222-xxNN
					SV2C-PC12-xxFN	SV2C-E222-xxFN
			SV2M-215B		SV2C-PC12-xxNB	SV2C-E222-xxNN
					SV2C-PC12-xxFB	SV2C-E222-xxFN
1.5 kW Low Inertia System	460V		SV2L-415N	SV2A-4150	SV2C-PC16-xxNN	SV2C-E222-xxNN
					SV2C-PC16-xxFN	SV2C-E222-xxFN
			SV2L-415B		SV2C-PC16-xxNB	SV2C-E222-xxNN
					SV2C-PC16-xxFB	SV2C-E222-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50

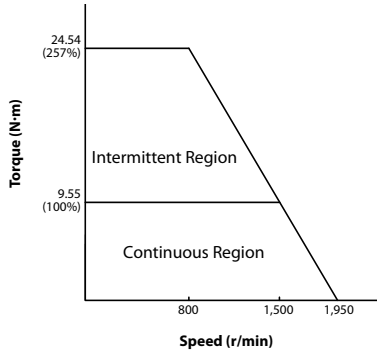
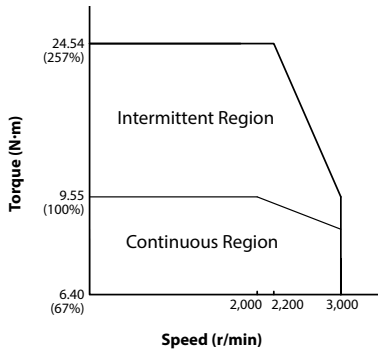
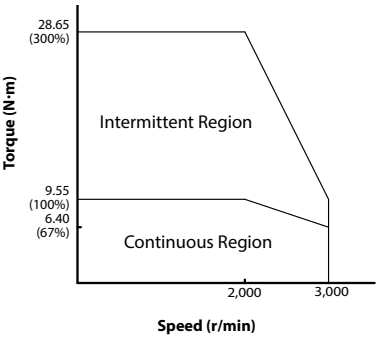
OR

SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

	Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
2.0 kW Medium Inertia System	120V		SV2M-220N	SV2A-2200	SV2C-PD12-xxNN	SV2C-E222-xxNN
					SV2C-PD12-xxFN	SV2C-E222-xxFN
			SV2M-220B		SV2C-PD12-xxNB	SV2C-E222-xxNN
					SV2C-PD12-xxFB	SV2C-E222-xxFN
	230V		SV2M-220N	SV2A-2200	SV2C-PD12-xxNN	SV2C-E222-xxNN
					SV2C-PD12-xxFN	SV2C-E222-xxFN
			SV2M-220B		SV2C-PD12-xxNB	SV2C-E222-xxNN
					SV2C-PD12-xxFB	SV2C-E222-xxFN
2.0 kW Low Inertia System	460V		SV2L-420N	SV2A-4200	SV2C-PC16-xxNN	SV2C-E222-xxNN
					SV2C-PC16-xxFN	SV2C-E222-xxFN
			SV2L-420B		SV2C-PC16-xxNB	SV2C-E222-xxNN
					SV2C-PC16-xxFB	SV2C-E222-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50

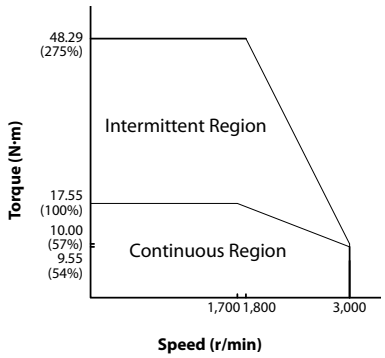
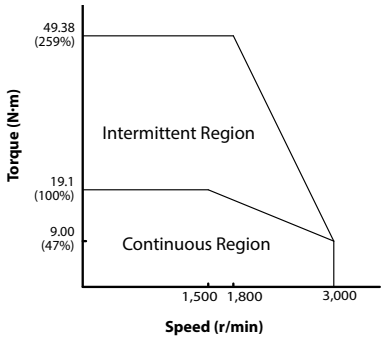
OR

SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

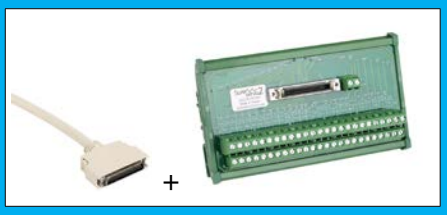
*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

	Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
3.0 kW Medium Inertia System	230V		SV2M-230N	SV2A-2300	SV2C-PD12-xxNN	SV2C-E222-xxNN
					SV2C-PD12-xxFN	SV2C-E222-xxFN
			SV2M-230B		SV2C-PD12-xxNB	SV2C-E222-xxNN
					SV2C-PD12-xxFB	SV2C-E222-xxFN
3.0 kW High Inertia System	460V		SV2H-430N	SV2A-4300	SV2C-PD12-xxNN	SV2C-E222-xxNN
					SV2C-PD12-xxFN	SV2C-E222-xxFN
			SV2H-430B		SV2C-PD12-xxNB	SV2C-E222-xxNN
					SV2C-PD12-xxFB	SV2C-E222-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50



OR

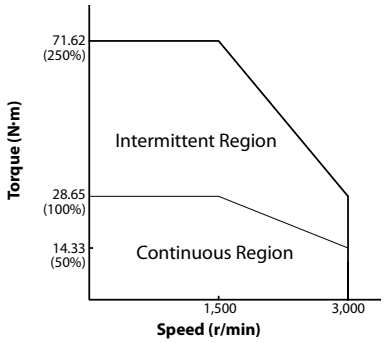
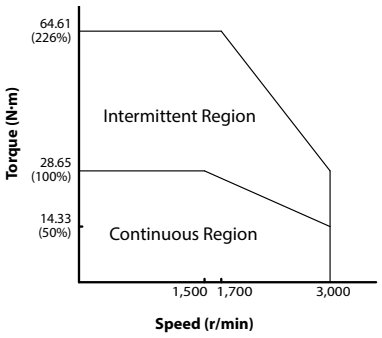
SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

4.5 kW High Inertia System

Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
230V		SV2H-245N	SV2A-2550	SV2C-PD08-xxNN	SV2C-E222-xxNN
				SV2C-PD08-xxFN	SV2C-E222-xxFN
		SV2H-245B		SV2C-PD08-xxNB	SV2C-E222-xxNN
				SV2C-PD08-xxFB	SV2C-E222-xxFN
460V		SV2H-445N	SV2A-4550	SV2C-PD08-xxNN	SV2C-E222-xxNN
				SV2C-PD08-xxFN	SV2C-E222-xxFN
		SV2H-445B		SV2C-PD08-xxNB	SV2C-E222-xxNN
				SV2C-PD08-xxFB	SV2C-E222-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50

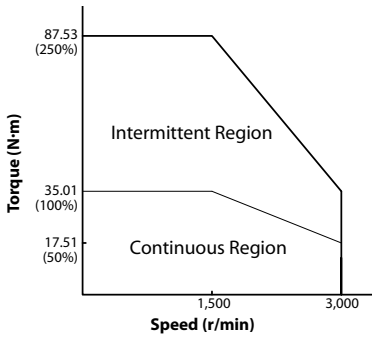
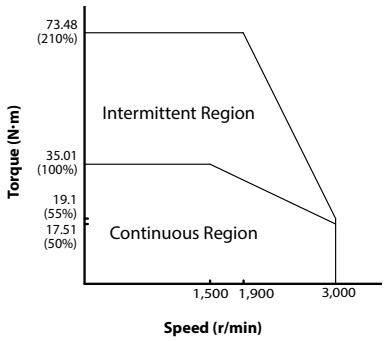
OR

SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

	Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
5.5 kW High Inertia System	230V		SV2H-255N	SV2A-2550	SV2C-PF06-xxNN	SV2C-E222-xxNN
					SV2C-PF06-xxFN	SV2C-E222-xxFN
			SV2H-255B		SV2C-PF06-xxNN and SV2C-B120-xxxx	SV2C-E222-xxNN
					SV2C-PF06-xxFN and SV2C-B120-xxxx	SV2C-E222-xxFN
	460V		SV2H-455N	SV2A-4550	SV2C-PD08-xxNN	SV2C-E222-xxNN
					SV2C-PD08-xxFN	SV2C-E222-xxFN
			SV2H-455B		SV2C-PD08-xxNN	SV2C-E222-xxNN
					SV2C-PD08-xxFN	SV2C-E222-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50

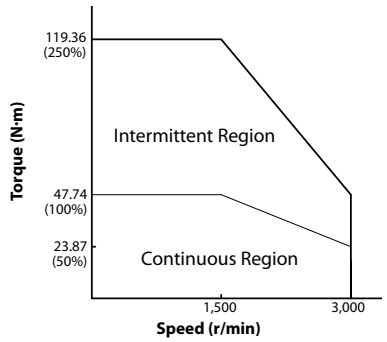
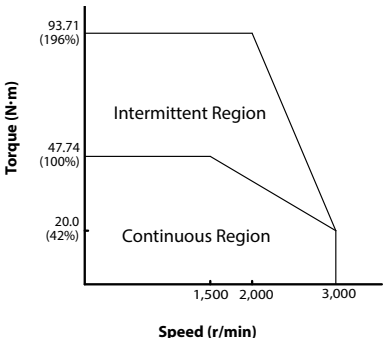
OR

SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

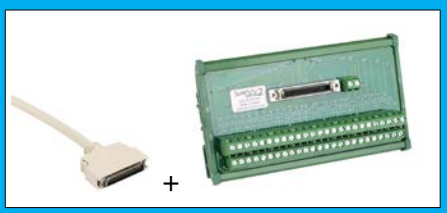
*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

	Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
7.5 kW High Inertia System	230V		SV2H-275N	SV2A-2750	SV2C-PF06-xxNN	SV2C-E222-xxNN
					SV2C-PF06-xxFN	SV2C-E222-xxFN
			SV2H-275B		SV2C-PF06-xxNN and SV2C-B120-xxxx	SV2C-E222-xxNN
					SV2C-PF06-xxFN and SV2C-B120-xxxx	SV2C-E222-xxFN
	460V		SV2H-475N	SV2A-4750	SV2C-PD08-xxNN	SV2C-E222-xxNN
					SV2C-PD08-xxFN	SV2C-E222-xxFN
			SV2H-475B		SV2C-PD08-xxNN	SV2C-E222-xxNN
					SV2C-PD08-xxFN	SV2C-E222-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable **SV2C-xxxx-xxFN is a flex-rated, non-brake cable**
SV2C-xxxx-xxNB is a non-flex, brake motor cable **SV2C-xxxx-xxFB is a flex-rated, brake motor cable**

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50



OR

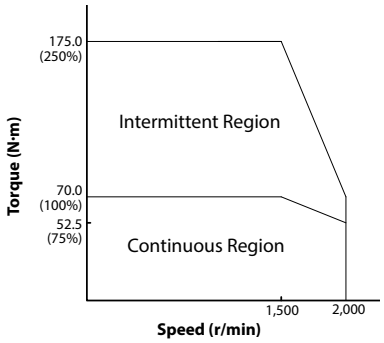
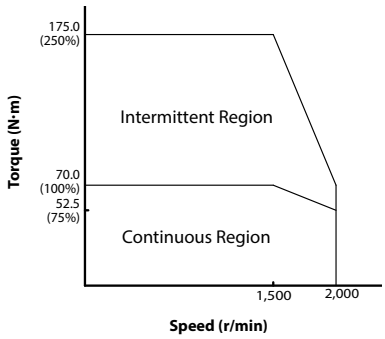
SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

11.0 kW High Inertia System

Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
230V		SV2H-2B0N	SV2A-2F00	SV2C-PF06-xxNN	SV2C-E222-xxNN
				SV2C-PF06-xxFN	SV2C-E222-xxFN
		SV2H-2B0B		SV2C-PF06-xxNN and SV2C-B120-xxNB	SV2C-E222-xxNN
				SV2C-PF06-xxFN and SV2C-B120-xxFB	SV2C-E222-xxFN
460V		SV2H-4B0N	SV2A-4F00	SV2C-PF08-xxNN	SV2C-E222-xxNN
				SV2C-PF08-xxFN	SV2C-E222-xxFN
		SV2H-4B0B		SV2C-PF08-xxNN and SV2C-B120-xxNB	SV2C-E222-xxNN
				SV2C-PF08-xxFN and SV2C-B120-xxFB	SV2C-E222-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50

OR

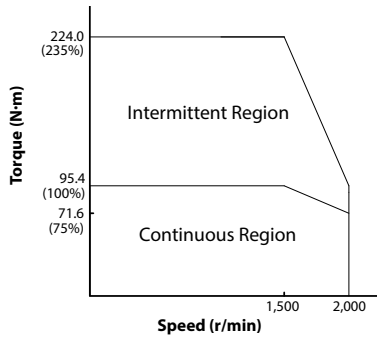
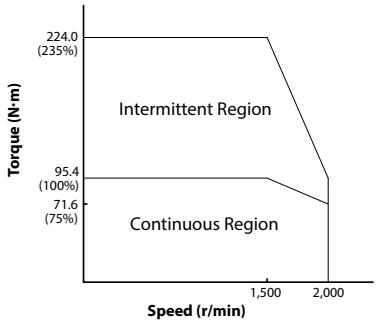
SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo System Configuration

*Sure*Servo2 AC servo drive, motor, and cable combinations, *continued*

15.0 kW High Inertia System

Input Voltage	Torque Chart	SureServo2 Motor	SureServo2 Drive	Power Cable*	Encoder Cable*
230V		SV2H-2F0N	SV2A-2F00	SV2C-PF04-xxNN	SV2C-E222-xxNN
				SV2C-PF04-xxFN	SV2C-E222-xxFN
		SV2H-2F0B		SV2C-PF04-xxNN and SV2C-B120-xxNB	SV2C-E222-xxNN
				SV2C-PF04-xxFB and SV2C-B120-xxFB	SV2C-E222-xxFN
460V		SV2H-4F0N	SV2A-4F00	SV2C-PF08-xxNN	SV2C-E222-xxNN
				SV2C-PF08-xxFN	SV2C-E222-xxFN
		SV2H-4F0B		SV2C-PF08-xxNN and SV2C-B120-xxNB	SV2C-E222-xxNN
				SV2C-PF08-xxFN and SV2C-B120-xxFB	SV2C-E222-xxFN

Note: "xx" in the cable part numbers represents cable length: SV2C-xxxx-10xx is a 10m cable.
The final two digits indicate flex rating and motor brake compatibility:
SV2C-xxxx-xxNN is a non-flex, non-brake motor cable
SV2C-xxxx-xxFN is a flex-rated, non-brake cable
SV2C-xxxx-xxNB is a non-flex, brake motor cable
SV2C-xxxx-xxFB is a flex-rated, brake motor cable

All Systems I/O

SV2-CN1-CBL50xxx + SV2-CN1-RTB50

OR

SV2-CN1-LTB20

SureServo2 System Selector Online

AC Servo Drive Specifications

Servo drive overview

Charge
LED is lit when DC bus is energized (may take several seconds for power to dissipate after incoming power is removed)

LED Display
The LED display has 5 full digits and is used to indicate servo status and alarms

Safe Torque Off (STO) Connector Port

Keypad
Five Function keys:
- MODE: Press to change mode
- SHIFT: Press to change parameter group or move cursor left
- UP: Press to increase values
- DOWN: Press to decrease values
- SET: Press to enter value

USB Connector
Used to connect a PC for configuration with SureServo2 Pro software

Control Power Terminal
220VAC drives: control power = 120 or 220 VAC single phase.

460VAC drives: control power = 24VDC

Serial Communication Interface
RJ45 connectors for RS485 Modbus communication between drives and controllers. Modbus RTU/ ASCII protocol. Use our factory-made cables for easy connection to the PC or the host controller.

Main Power Terminal
- 1 phase 110VAC: 100W-2kW
- 1 phase 220VAC: 100W-2kW
- 3 phase 220VAC: 100W-15kW
- 3 phase 460VAC: 400W-15kW

I/O Interface
50-pin connector for interfacing the host controller and other types of I/O signals.
- CBL50 + RTB50 = Cable and remote DIN-rail mount module. All I/O pins available.
- LTB20 = Mounted and wired directly at CN1. Most commonly used pins available.
- Command inputs:
  Pulse and Direction
  Encoder Follower
  Analog Velocity/Torque
- (10) Digital Inputs
- (6) Digital Outputs
- (2) Analog Monitors
- Encoder Output (scalable)

A+, A-, B+, B-, Z+, Z-

Regenerative Resistor Terminal
1. When the internal regenerative resistor is used, the P3 and D terminal are connected together while the P3 and C connection is left open.
2. When an external regenerative resistor is used, it is connected across the P3 and C terminals while the P3 and D connection is left open. See the user manual for recommended resistance and power requirements for each system.

Motor Output Terminal
The servo motor power cable is connected to U, V and W. Use our factory made and tested cables available in 3, 5, 10, or 20 meter lengths for easy and trouble free connection.

Ground Terminals

High Density DB15 Connector
CN5: Auxiliary/Secondary Encoder input. Used for applications requiring Full Closed Loop, Linear Measurement, etc.

Encoder Interface
Connector for interfacing the servo motor encoder.
Use our factory-made and tested cables available in 3, 5, 10, or 20 meter lengths for easy and trouble free connection.

*Sure*Servo2 systems run "out-of-the-box"... but may be reconfigured for many applications!

The SureServo2 drives are fully digital and include over 400 programmable parameters. For convenience, the parameters are grouped into five categories:

1. Monitor parameters
2. Basic parameters
3. Extended parameters
4. Communication parameters
5. Diagnostic and analog parameters
6. Motion control parameters
7. PATH definition parameters

All parameters have commonly used default values which allow you to operate the SureServo2 system "out-of-the-box". However, the programmability and large variety of parameters make the SureServo2 systems suitable for a very broad range of applications, including almost all types of general purpose industrial machinery such as assembly, test, packaging, machine tool, and robotics.

The SureServo2 Pro configuration software has Parameter Wizards to quickly and easily guide you through the most common setup routines.

AC Servo Drive Specifications

230V Servo drive specifications

SureServo2 230V Drive Specifications									
	Model	**SV2A-2040**	**SV2A-2075**	**SV2A-2150**	**SV2A-2200**	**SV2A-2300**	**SV2A-2550**	**SV2A-2750**	**SV2A-2F00**
	Price	$047_6:	$047_7:	$047_8:	$047_9:	$047_a:	$;-04j!q:	$;;-004j!s:	$;;;-004j!t:
	Drawing	PDF	PDF	PDF	PDF	PDF	PDF	PDF	PDF
Power	**Power Rating**	400W	750W	1.5 kW	2kW	3kW	5.5 kW	7.5 kW	15kW
	Input Voltage	Single-phase 100–120 VAC, -15% to +10% Single-phase 200–230 VAC, -15% to +10% Three-phase 200–230 VAC, -15% to +10%				Three-phase 200–230 VAC, -15% to +10%			
	Input Current 200–230 VAC 3-phase [Amps] rms	2.76	5.09	8.09	11.36	14.52	27.06	37.33	69.95
	Input Current 100–120 VAC 1-phase [Amps] rms	3.98	7.73	12.56	18.03	–	–	–	–
	Input Current 200–230 VAC 1-phase [Amps] rms	4.69	8.71	14.82	20.83	–	–	–	–
	Continuous Output Current [Amps] rms	2.60	5.10	8.33	13.40	17.92	41.33	49.04	78
	Max. Instantaneous Output Current [Amps] rms	8.56	15.43	20.16	40.57	55.93	91.44	127.46	162.04
	Main Circuit Inrush Current [Amps]	1.44	1.40	1.44	4.64	4.42	9.55	28.68	32.0
	Control Circuit Inrush Current [Amps]	37.0	37.40	39.80	32.40	36.40	32.80	40.0	37.0
	Cooling Method	Air Conv. Cooling	Fan Cooling						
	Encoder Resolution	24-bit (16777216 p/rev)							
	Main Circuit Control	SVPWM control							
	Control Mode	Manual / Auto							
	Regenerative Resistor	Built-in (external options also available)					External (optional)		
Position Control Mode	**Pulse Type**	Pulse + Direction, CCW pulse + CW pulse, AB Quadrature							
	Max. Input Pulse Frequency	Pulse + Direction: 4 Mpps; CCW pulse + CW pulse: 4 Mpps; AB Quadrature: single-phase 4 Mpps; Open collector: 200 Kpps							
	Command Source	External pulse / Internal registers							
	Smoothing Method	Low-pass and P-curve filter							
	Torque Limit	Parameter settings							
	Feed Forward Compensation	Parameter settings							

AC Servo Drive Specifications

230V Servo drive specifications (continued)

SureServo2 230V Drive Specifications Continued									
		Model	SV2A-2040	SV2A-2075	SV2A-2150	SV2A-2200	SV2A-2300	SV2A-2550	SV2A-2750	SV2A-2F00
Speed Control Mode	Analog Command Input	Voltage Range	±10VDC							
		Resolution	15-bit							
		Input Impedance	1MΩ							
		Time Constant	25µs							
	Speed Control Range1		1 : 6000							
	Command Source		External analog command / Internal registers							
	Smoothing Method		Low-pass and S-curve filter							
	Torque Limit		Parameter settings / Analog input							
	Bandwidth		Maximum 3.1 kHz (closed-loop)							
	Speed Calibration Ratio2		±0.01% at 0% to 100% load fluctuation							
			±0.01% at ±10% power fluctuation							
			±0.01% at 0˚C to 50˚C ambient temperature fluctuation							
Torque Control Mode	Analog Command Input	Voltage Range	±10VDC							
		Input Impedance	1MΩ							
		Time Constant	25µs							
	Command Source		External analog command / Internal registers							
	Smoothing Method		Low-pass filter							
	Speed Limit		Parameter settings / Analog input							
Analog Monitor Output			Monitor signal can be set by parameters (voltage output range: ±8V); resolution:10-bit							
Digital Input/Output	Input		Servo on, Fault reset, Gain switch, Pulse clear, Zero speed clamping, Command input reverse control, Internal position command trigger, Torque limit, Speed limit, Internal position command selection, Motor stop, Speed command selection, Speed / position mode switching, Speed / torque mode switching, Torque / position mode switching, PT / PR command switching, motor override, Forward / reverse limit, Original point, Forward / reverse operation torque limit, Homing activated, E-Cam engage, Forward / reverse JOG input, Event trigger, E-Gear N selection, Pulse input prohibition							
	Output		A, B, Z line driver output							
			Servo ready, Servo on, Zero speed detection, Target speed reached, Target position reached, Torque limiting, Servo alarm, Magnetic brake control, Homing completed, Early warning for overload, Servo warning, Position command overflows, Software limit (reverse direction), Software limit (forward direction), Internal position command completed, Capture procedure completed, Servo procedure completed, Master position area of E-Cam.							

1 - Within the rated load, the speed ratio is: the minimum speed (smooth operation) / rated speed.
2 - Within the rated speed, the speed calibration ratio is: (rotational speed with no load - rotational speed with full load) / rated speed.

AC Servo Drive Specifications

230V Servo drive specifications (continued)

SureServo2 230V Drive Specifications Continued									
	Model	**SV2A-2040**	**SV2A-2075**	**SV2A-2150**	**SV2A-2200**	**SV2A-2300**	**SV2A-2550**	**SV2A-2750**	**SV2A-2F00**
	Protection Function	STO (Category 3 / SIL 2), Overcurrent, Overvoltage, Undervoltage, Overheat, Regeneration error, Overload, Excessive speed deviation, Excessive position deviation, Encoder error, Adjustment error, Emergency stop, Forward / reverse limit error, Excessive deviation of full-closed loop control, Serial communication error, RST leak phase, Serial communication timeout, Short-circuit protection for terminals U, V, W and CN1, CN2, CN3							
	Communication Interface	RS-485 / Modbus RTU / USB / Optional EtherNet/IP or Modbus TCP							
	Weight [kg (lb)]	0.92 (2.03)	1.3 (2.87)	1.3 (2.87)	2.7 (5.95)	2.7 (5.95)	4.9 (10.8)	7.2 (15.9)	13 (29)
Environment	**Installation Site**	Indoors (avoid direct sunlight), no corrosive vapor (avoid fumes, flammable gases, and dust)							
	Altitude	Altitude 1000m or lower above sea level							
	Atmospheric Pressure	86kPa - 106kPa							
	Operating Temperature	0˚C to 55˚C (If operating temperature is above 45˚C, forced cooling is required)							
	Storage Temperature	-20˚C to 65˚C							
	Humidity	Under 0 - 90% RH (non-condensing)							
	Vibration	9.80665 m/s2 (1 G) less than 20 Hz, 5.88 m/s2 (0.6 G) 20 to 50 Hz							
	IP Rating	IP20							
	Power System	TN system3,4							
	Approvals	IEC/EN 61800-5-1, UL 508C, TUV (for STO), CE							

3 - TN system: the neutral point of the power system connects directly to the ground. The exposed metal components connect to the ground through the protective ground conductor.
4 - Use a single-phase three-wire power system for the single-phase power model.

AC Servo Drive Specifications

460V Servo drive specifications

SureServo2 460V Drive Specifications									
	Model	**SV2A-4040**	**SV2A-4075**	**SV2A-4150**	**SV2A-4200**	**SV2A-4300**	**SV2A-4550**	**SV2A-4750**	**SV2A-4F00**
	Price	$05zu#:	$;05zu!:	$05zu?:	$;05zu,:	$05zv0:	$;05zu]:	$;;005zu[:	$;005zu_:
	Drawing	PDF	PDF	PDF	PDF	PDF	PDF	PDF	PDF
Power	**Power Rating**	400W	750W	1.5 kW	2kW	3kW	5.5 kW	7.5 kW	15kW
	Input Voltage	Three-phase 380–480 VAC, ±10%							
	Input Current 380–480 VAC 3-phase [Amps] rms	1.49	2.31	4.98	6.29	9.92	16.83	23.06	36.65
	Continuous Output Current [Amps] rms	1.6	2.91	6.05	6.7	12.6	23.6	28.7	40.5
	Max. Instantaneous Output Current [Amps] rms	5.4	9.7	13.94	21.35	30.46	47.5	57.69	95.3
	Control Power Input Current	1.17	1.17	1.17	1.35	1.63	1.91	1.91	4.26
	Main Circuit Inrush Current [Amps]	5.6	5.6	5.6	12.5	12.5	12.5	12.5	12.5
	Control Circuit Inrush Current [Amps]	5	5	5	4.8	4.8	5.5	5.5	6
	Control Circuit Voltage	24VDC							
	Cooling Method	Fan cooling							
	Encoder Resolution	24-bit (16777216 p/rev)							
	Main Circuit Control	SVPWM control							
	Control Mode	Manual/Auto							
	Regenerative Resistor	Built-in (external options also available)			External (optional)				
Position Control Mode	**Pulse Type**	Pulse + Direction, CCW pulse + CW pulse, A phase + B phase							
	Max. Input Pulse Frequency	Pulse + Direction: 4 Mpps; CCW pulse + CW pulse: 4 Mpps; A phase + B phase: single-phase 4 Mpps; Open collector: 200 Kpps							
	Command Source	External pulse / Internal registers							
	Smoothing Method	Low-pass, moving-averaging, and S-curve filter							
	E-Gear Ratio	N/M times, limited to (1/4 < N/M < 262144) N: 1–536870911 / M: 1–2147483647							
	Torque Limit	Parameter settings							
	Feed Forward Compensation	Parameter settings							

AC Servo Drive Specifications

460V Servo drive specifications (continued)

SureServo2 460V Drive Specifications Continued									
		Model	SV2A-4040	SV2A-4075	SV2A-4150	SV2A-4200	SV2A-4300	SV2A-4550	SV2A-4750	SV2A-4F00
Speed Control Mode	Analog Command Input	Voltage Range	±10VDC							
		Resolution	12-bit							
		Input Impedance	1MΩ							
		Time Constant	25µs							
	Speed Control Range1		1 : 6000							
	Command Source		External analog command / Internal registers							
	Smoothing Method		Low-pass and S-curve filter							
	Torque Limit		Parameter settings / Analog input							
	Bandwidth		Maximum 3.1 kHz (closed-loop)							
	Speed Calibration Ratio2		±0.01% at 0% to 100% load fluctuation							
			±0.01% at ±10% power fluctuation							
			±0.01% at 0˚C to 50˚C ambient temperature fluctuation							
Torque Control Mode	Analog Command Input	Voltage Range	±10VDC							
		Input Impedance	1MΩ							
		Time Constant	25µs							
	Command Source		External analog command / Internal registers							
	Smoothing Method		Low-pass filter							
	Speed Limit		Parameter settings / Analog input							
Analog Monitor Output			Monitor signal can be set by parameters (voltage output range: ±8V); resolution:10-bit							
Digital Input/Output	Input		Servo on, Fault reset, Gain switch, Pulse clear, Zero speed clamping, Command input reverse control, Internal position command trigger, Torque limit, Speed limit, Internal position command selection, Motor stop, Speed command selection, Speed / position mode switching, Speed / torque mode switching, Torque / position mode switching, PT / PR command switching, Emergency Stop, Forward / reverse limit, Original point, Forward / reverse operation torque limit, Homing activated, E-Cam engage, Forward / reverse JOG input, Event trigger, E-Gear N selection, Pulse input prohibition							
	Output		A, B, Z line driver output							
			Servo ready, Servo on, Zero speed detection, Target speed reached, Target position reached, Torque limiting, Servo alarm, Magnetic brake control, Homing completed, Early warning for overload, Servo warning, Position command overflows, Software limit (reverse direction), Software limit (forward direction), Internal position command completed, Capture procedure completed, Servo procedure completed, Master position area of E-Cam.							

1 - Within the rated load, the speed ratio is: the minimum speed (smooth operation) / rated speed.
2 - Within the rated speed, the speed calibration ratio is: (rotational speed with no load - rotational speed with full load) / rated speed.

AC Servo Drive Specifications

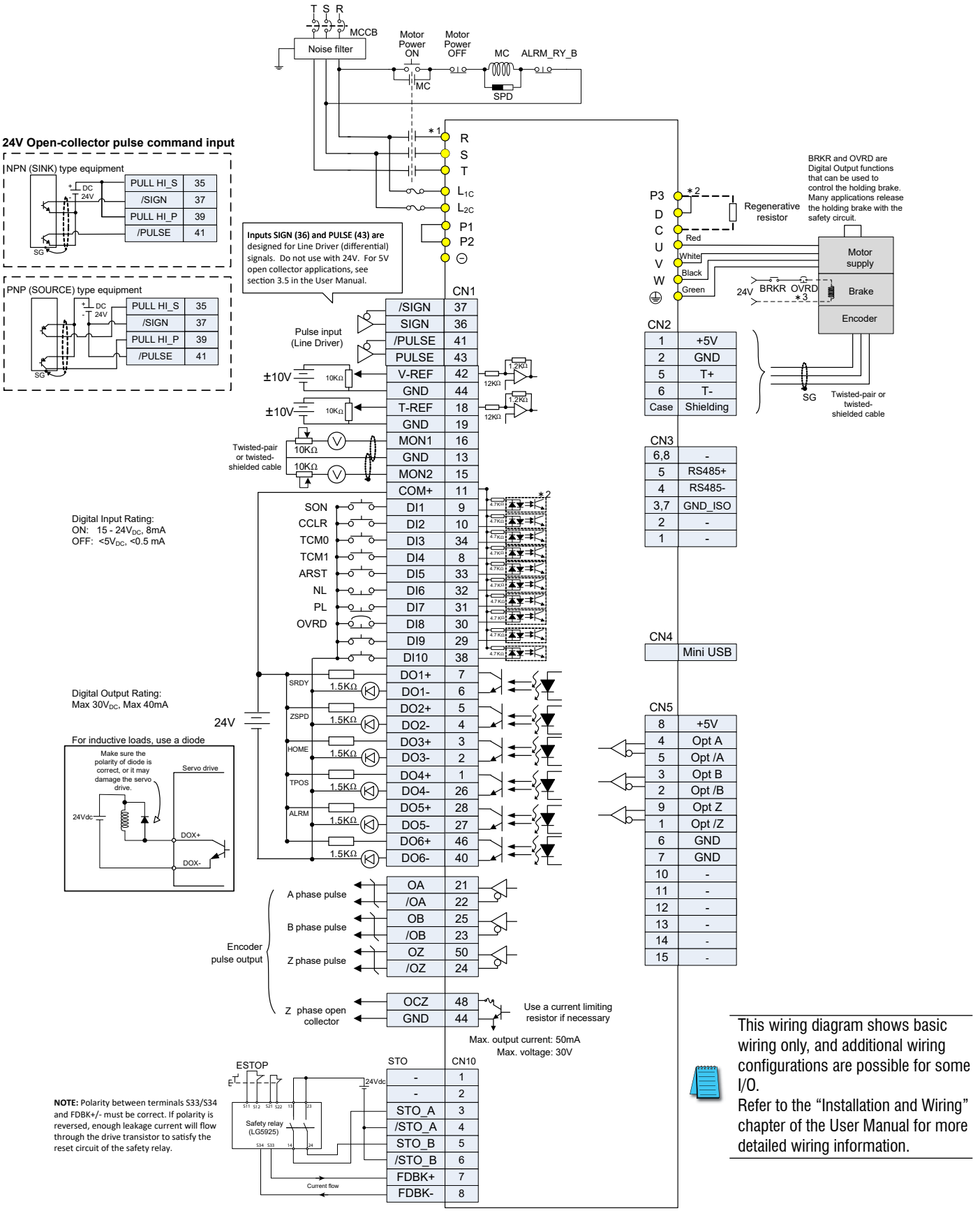
460V Servo drive specifications (continued)

SureServo2 460V Drive Specifications Continued									
	Model	***SV2A-4040***	***SV2A-4075***	***SV2A-4150***	***SV2A-4200***	***SV2A-4300***	***SV2A-4550***	***SV2A-4750***	***SV2A-4F00***
	Protection Function	Overcurrent, Overvoltage, Undervoltage, Overheat, Regeneration error, Overload, Excessive speed deviation, Excessive position deviation, Encoder error, Adjustment error, Emergency stop, Forward / reverse limit error, Excessive deviation of full-closed loop control, Serial communication error, RST leak phase, Serial communication timeout, Short-circuit protection for terminals U, V, W and CN1, CN2, CN3							
	Communication Interface	RS-485 / USB							
	Weight [kg (lb)]	5.96 [13.1]	5.96 [13.1]	5.96 [13.1]	9.71 [21.4]	9.71 [21.4]	12.14 [26.8]	12.14 [26.8]	15.01 [33.1]
Environment	***Installation Site***	Indoors (avoid direct sunlight), no corrosive vapor (avoid fumes, flammable gases, and dust)							
	Altitude	1000m or lower above sea level							
	Atmospheric Pressure	86kPa – 106kPa							
	Operating Temperature	0˚C to 55˚C [32˚F to 131˚F] (If operating temperature is above 45˚C, forced cooling is required)							
	Storage Temperature	-20˚C to 65˚C [-4˚F to 149˚F]							
	Humidity	Under 90% RH (non-condensing)							
	Vibration	9.80665 m/s2 (1 G) less than 20 Hz, 5.88 m/s2 (0.6 G) 20 to 50 Hz							
	IP Rating	IP20							
	Power System	TN system[3,4]							
	Approvals	IEC/EN 61800-5-1, UL 508C, TUV (for STO), CE							

3 - TN system: the neutral point of the power system connects directly to the ground. The exposed metal components connect to the ground through the protective ground conductor.
4 - Use a single-phase three-wire power system for the single-phase power model.

AC Servo System Wiring

Standard wiring example, 230V Systems

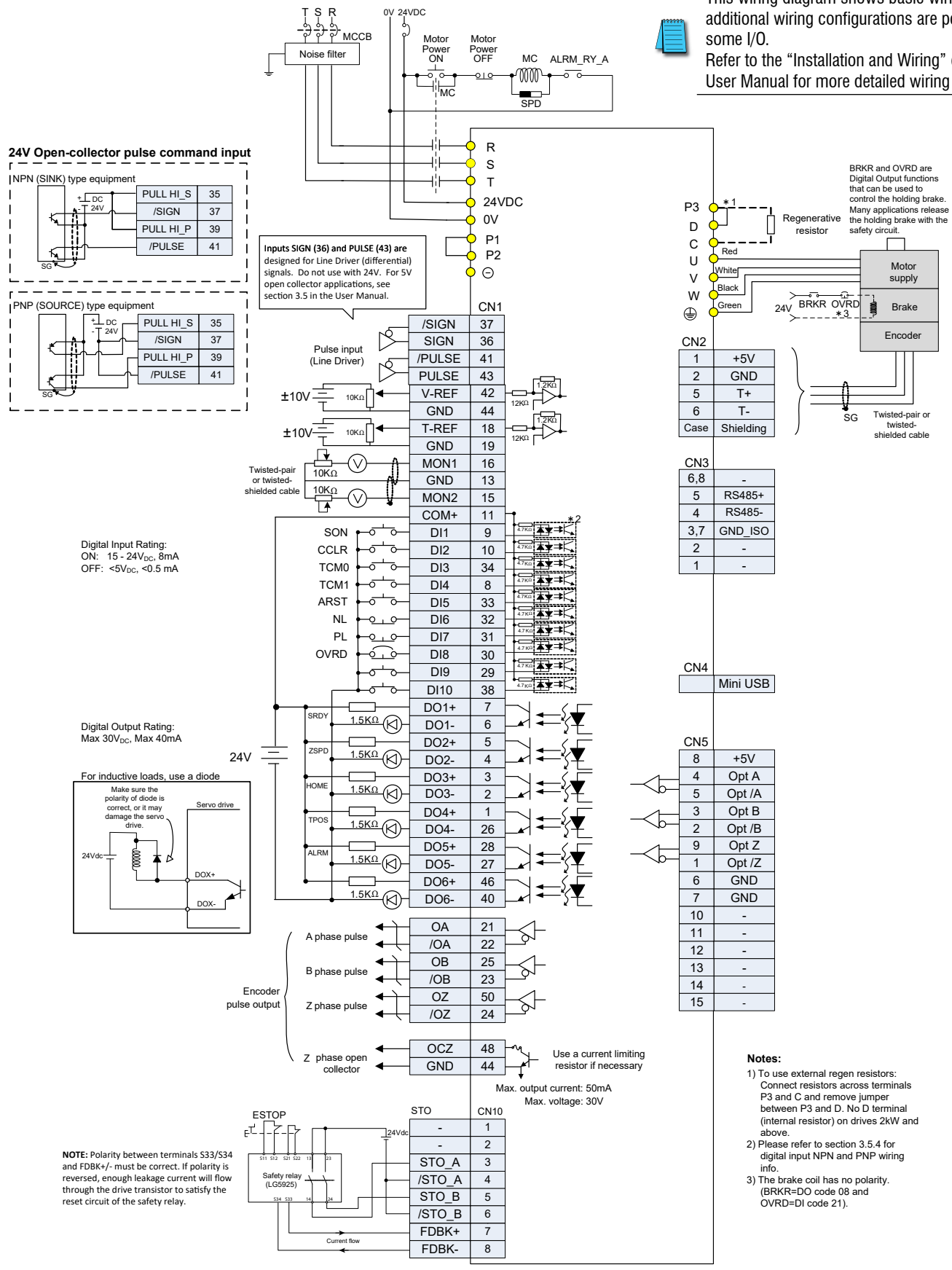


This wiring diagram shows basic wiring only, and additional wiring configurations are possible for some I/O.
Refer to the "Installation and Wiring" chapter of the User Manual for more detailed wiring information.

AC Servo System Wiring

Standard wiring example, 460V Systems

This wiring diagram shows basic wiring only, and additional wiring configurations are possible for some I/O.
Refer to the "Installation and Wiring" chapter of the User Manual for more detailed wiring information.

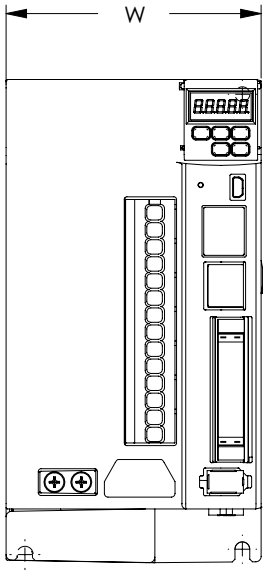


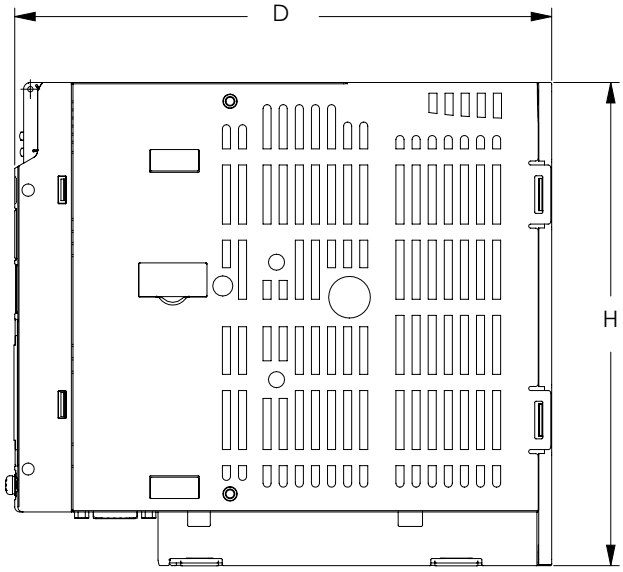
Notes:

1) To use external regen resistors: Connect resistors across terminals P3 and C and remove jumper between P3 and D. No D terminal (internal resistor) on drives 2kW and above.
2) Please refer to section 3.5.4 for digital input NPN and PNP wiring info.
3) The brake coil has no polarity. (BRKR=DO code 08 and OVRD=DI code 21).

AC Servo System Dimensions

Servo drive dimensions





SureServo2 Drive Dimensions				
Model	*Drawing Link*	*W mm [inches]*	*D mm [inches]*	*H mm [inches]*
SV2A-2040	PDF	35 [1.38]	170 [6.69]	170 [6.69]
SV2A-2075	PDF	50 [1.97]	180 [7.09]	180 [7.09]
SV2A-2150	PDF	50 [1.97]	180 [7.09]	180 [7.09]
SV2A-2200	PDF	95 [3.74]	200 [7.87]	180 [7.09]
SV2A-2300	PDF	95 [3.74]	200 [7.87]	180 [7.09]
SV2A-2550	PDF	120 [4.72]	206 [8.12]	273 [10.75]
SV2A-2750	PDF	141 [5.56]	226 [8.90]	312 [12.28]
SV2A-2F00	PDF	186 [7.32]	281 [11.08]	390 [15.35]
SV2A-4040	PDF	65 [2.55]	204 [8.03]	180 [7.09]
SV2A-4075	PDF	65 [2.55]	204 [8.03]	180 [7.09]
SV2A-4150	PDF	65 [2.55]	204 [8.03]	180 [7.09]
SV2A-4200	PDF	110 [4.33]	200.8 [7.9]	260 [10.24]
SV2A-4300	PDF	110 [4.33]	200.8 [7.9]	260 [10.24]
SV2A-4550	PDF	110 [4.33]	200.8 [7.9]	260 [10.24]
SV2A-4750	PDF	120 [4.72]	206.3 [8.12]	273 [10.75]
SV2A-4F00	PDF	141 [5.55]	225.5 [8.88]	312 [12.28]

For additional dimensions, see the AutomationDirect website or click on the drawing links.

Requires 2" above and below the drive for air flow. For proper air flow clearance, please see section 2.3.1 of the SureServo2 User Manual.

For cabinet depth, add approximately 100mm (4 inches) for CN1 (I/O) and CN2 (encoder) cable bend radius.