

SV660N – Single-Axis EtherCAT Servo

High dynamic performance with a compact footprint:
the SV660N servo solution for industrial automation applications

- User friendly installation
- Easy set-up and tuning
- Ultra-fast 4.5 kHz current loop
- Safe Torque Off - SIL3

EtherCAT[®]



The SV660N

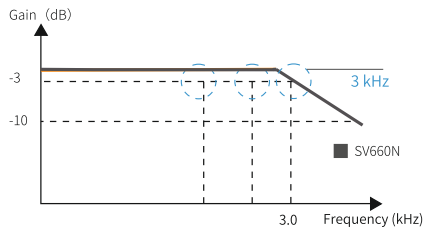
Product overview

Improved performance with ultra-fast current loop

SV660N's 4.5 kHz current loop bandwidth allows the motor to follow the motion profile with minimal error. The drive achieves a radically improved system performance with a shorter settling time and higher throughput. In case of mechanical resonance, high performance can be ensured through use of notch filters (up to four notch filters are available for simultaneous use if necessary).

	SV660N
Carrier frequency	12 kHz
Current loop cycle time	1.6 μ s
Speed loop cycle time	62.5 μ s
Position loop cycle time	62.5 μ s

Speed loop response graph



High speed EtherCAT communications – 125 μ s

The SV660N series uses a high performance processor for high speed communications, achieving a cycle time of 125 μ s for all EtherCAT operating modes.

Seven EtherCAT CiA402 profile (CoE) operation modes are available

- Profile Position Mode (PP)
- Profile Velocity Mode (PV)
- Profile Torque Mode (PT)
- Homing Mode (HM)
- Cyclic Synchronous Position Mode (CSP)
- Cyclic Synchronous Velocity Mode (CSV)
- Cyclic Synchronous Torque Mode (CST)

Accurate EtherCAT synchronization – 20 ns synchronization jitter

Through precise operation of the EtherCAT distributed clock, SV660N achieves a 15 ns synchronization error and $\pm$ 20 ns synchronization jitter for 300 nodes (with a maximum distance of 120 m). Position control loops are coordinated with the synchronization signal to further improve the accuracy of multi-axes control.

Functional safety – STO SIL3 EN/IEC 61800-5-2 compliant^{*1}

The STO function guarantees safe machine stop without using additional contactors.

High resolution feedback encoder

23 bit serial single/multi-turn absolute encoder provides 8,388,608 pulses within one mechanical turn. Multi-turn absolute information can be also saved at power down, avoiding the need to perform machine homing at every power-up.

Short output winding

Standard, built-in, *short output winding* ensures safe braking if the drive is unexpectedly disabled – even in the case of a failure in the motor holding brake.



Robust and reliable – designed for harsh environments

Isolated cooling channel prevents dust contamination of internal electrical components. Conformally coated PCBs are resistant to 3S2 and 3C2 environments (acc. to IEC 60721-3-3), providing further protection.

Comprehensive data storage in case of failure

Allows for thorough failure analysis.

Reduced panel size

SV660N offers a compact footprint and increased power density, with an average 30% smaller footprint than the previous generation.

Easy installation and fast commissioning

Pluggable connectors for both signal and power allows avoidance of wiring mistakes. Fine tuning is possible using the STune and ETune software functions, which are both designed for use in applications with small load inertia changes:

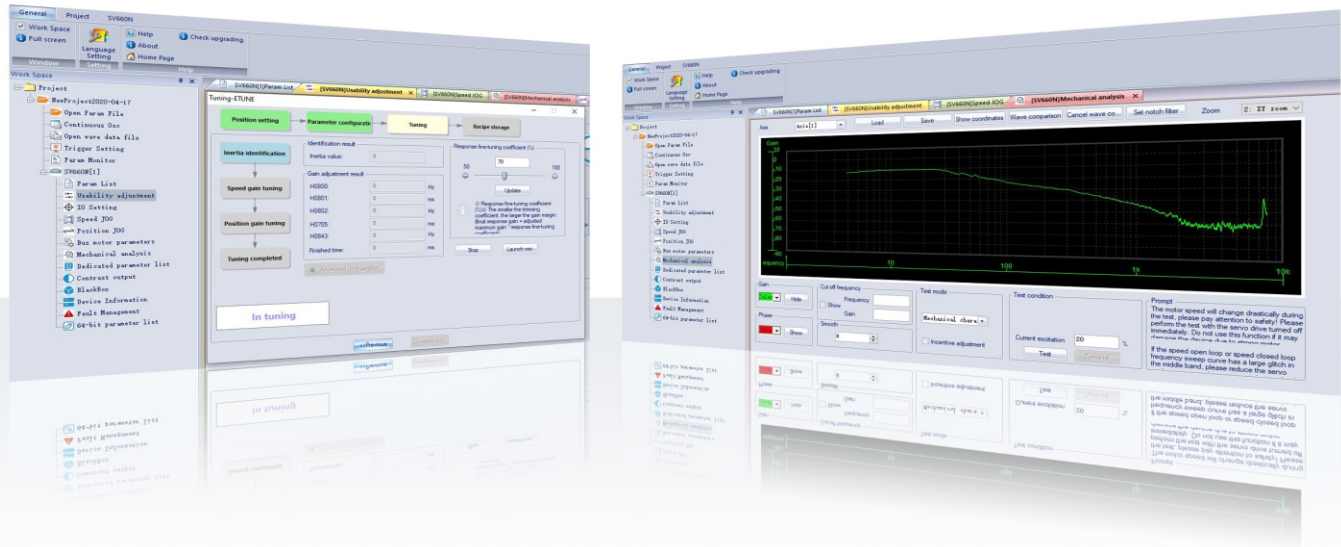
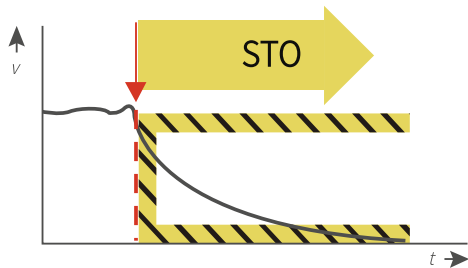
- STune obtains the gains using a calculation based on the set stiffness level
- ETune automatically adjusts the optimal gain parameters of the servo drive to deliver the best performance

Easy cloning of drive parameters

Parameters of all SV660N drives in a machine can be cloned in one go using the commissioning software and the EtherCAT network.

Guided PC commissioning with advanced software wizard

A graphical user interface means specialist technical skills are not required for drive commissioning, freeing up skilled engineering personnel for other tasks.



^{*1} STO is supplied in the standard FS version. A non-STO version is also available.

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SIL3
Safety Integrity Level

SV660N Selection Chart

Power supply voltage	Motor base speed (RPM)	Motor maximum speed (RPM)	Motor power (W)	Motor rated torque (N·m)	Motor peak torque (N·m)	Motor frame size (mm)	Rotor inertia (0.0001x kg·m ²)	MS1 motor type	SV660N type	SV660N rated current (A)	SV660N peak current (A)	Size	Dimensions H x W x D (mm)	Connector kit
1PH 220 V	3000	6000	50	0.16	0.56	40X40	0.026	MS1H1-05B30CB-A330Z	SV660NS1R6I-FS-INT	1.6	5.80	A	170X40X150	S6-C22
	3000	6000	100	0.32	1.12	40X40	0.041	MS1H1-10B30CB-A330Z	SV660NS1R6I-FS-INT	1.6	5.80	A	170X40X150	S6-C22
	3000	6000	200	0.64	2.24	60X60	0.207	MS1H1-20B30CB-A331Z	SV660NS1R6I-FS-INT	1.6	5.80	A	170X40X150	S6-C22
	3000	6000	400	1.27	4.46	60X60	0.376	MS1H1-40B30CB-A331Z	SV660NS2R8I-FS-INT	2.8	10.10	A	170X40X150	S6-C22
	3000	6000	400	1.27	4.46	60X60	0.657	MS1H4-40B30CB-A331Z	SV660NS2R8I-FS-INT	2.8	10.10	A	170X40X150	S6-C22
	3000	6000	550	1.75	6.13	80X80	1.06	MS1H1-55B30CB-A331Z*	SV660NS5R5I-FS-INT	5.5	16.90	B	170X50X173	S6-C22
	3000	6000	750	2.39	8.36	80X80	1.38	MS1H1-75B30CB-A331Z	SV660NS5R5I-FS-INT	5.5	16.90	B	170X50X173	S6-C22
	3000	6000	750	2.39	8.36	80X80	2	MS1H4-75B30CB-A331Z	SV660NS5R5I-FS-INT	5.5	16.90	B	170X50X173	S6-C22
1/3 PH 220 V	1500	3000	850	5.39	13.50	130X130	13.3	MS1H3-85B15CB-A331Z	SV660NS7R6I-FS-INT	7.6	23.00	C	170X55X173	S6-C29
	3000	6000	1000	3.18	9.12	80X80	1.75	MS1H1-10C30CB-A331Z*	SV660NS7R6I-FS-INT	7.6	23.00	C	170X55X173	S6-C22
	3000	6000	1000	3.18	11.10	80X80	1.75	MS1H1-10C30CB-A331Z*	SV660NS012I-FS-INT	11.6	32.00	D	170X80X183	S6-C22
	3000	6000	1000	3.18	9.54	100X100	1.87	MS1H2-10C30CB-A331Z	SV660NS7R6I-FS-INT	7.6	23.00	C	170X55X173	S6-C29
	1500	3000	1300	8.34	20.85	130X130	17.8	MS1H3-13C15CB-A331Z	SV660NS012I-FS-INT	11.6	32.00	D	170X80X183	S6-C29
	3000	5000	1500	4.9	14.70	100X100	2.46	MS1H2-15C30CB-A331Z	SV660NS012I-FS-INT	11.6	32.00	D	170X80X183	S6-C29
3 PH 400 V	3000	6000	1000	3.18	9.54	100X100	1.87	MS1H2-10C30CD-A331Z	SV660NT5R4I-FS-INT	5.4	14.00	C	170X55X173	S6-C29
	3000	5000	1500	4.9	14.70	100X100	2.46	MS1H2-15C30CD-A331Z	SV660NT5R4I-FS-INT	5.4	14.00	C	170X55X173	S6-C29
	3000	5000	2000	6.36	19.10	100X100	3.06	MS1H2-20C30CD-A331Z	SV660NT8R4I-FS-INT	8.4	20.00	D	170X80X183	S6-C29
	3000	5000	2500	7.96	19.12	100X100	3.65	MS1H2-25C30CD-A331Z	SV660NT8R4I-FS-INT	8.4	20.00	D	170X80X183	S6-C29
	3000	5000	2500	7.96	23.90	100X100	3.65	MS1H2-25C30CD-A331Z	SV660NT012I-FS-INT	11.9	29.75	D	170X80X183	S6-C29
	3000	5000	3000	9.8	29.16	130X130	7.72	MS1H2-30C30CD-A331Z	SV660NT012I-FS-INT	11.9	29.75	D	170X80X183	S6-C29
	3000	5000	3000	9.8	29.40	130X130	7.72	MS1H2-30C30CD-A331Z	SV660NT017I-FS-INT	16.5	41.25	E	250X90X230	S6-C29
	3000	5000	4000	12.6	37.80	130X130	12.1	MS1H2-40C30CD-A331Z	SV660NT017I-FS-INT	16.5	41.25	E	250X90X230	S6-C29
	3000	5000	5000	15.8	40.91	130X130	15.4	MS1H2-50C30CD-A331Z	SV660NT017I-FS-INT	16.5	41.25	E	250X90X230	S6-C29
	3000	5000	5000	15.8	47.60	130X130	15.4	MS1H2-50C30CD-A331Z	SV660NT021I-FS-INT	20.8	52.12	E	250X90X230	S6-C29
	1500	3000	850	5.39	13.50	130X130	13.3	MS1H3-85B15CD-A331Z	SV660NT3R5I-FS-INT	3.5	11.00	C	170X55X173	S6-C29
	1500	3000	1300	8.34	20.85	130X130	17.8	MS1H3-13C15CD-A331Z	SV660NT5R4I-FS-INT	5.4	14.00	C	170X55X173	S6-C29
	1500	3000	1800	11.5	28.75	130X130	25	MS1H3-18C15CD-A331Z	SV660NT8R4I-FS-INT	8.4	20.00	D	170X80X183	S6-C29
	1500	3000	2900	18.6	37.20	180X180	55	MS1H3-29C15CD-A331Z	SV660NT012I-FS-INT	11.9	29.75	D	170X80X183	S6-C39
	1500	3000	4400	28.4	71.10	180X180	88.9	MS1H3-44C15CD-A331Z	SV660NT017I-FS-INT	16.5	41.25	E	250X90X230	S6-C39
	1500	3000	5500	35	87.60	180X180	107	MS1H3-55C15CD-A331Z	SV660NT021I-FS-INT	20.8	52.12	E	250X90X230	S6-C39
	1500	3000	7500	48	117.63	180X180	141	MS1H3-75C15CD-A331Z	SV660NT026I-FS-INT	25.7	64.25	E	250X90X230	S6-C39

*Brake option not available.
All MS1 motors are CE certified and UL listed.
For detailed motor dimension data please contact your local Invoiance representative or refer to the IS620 brochure.

