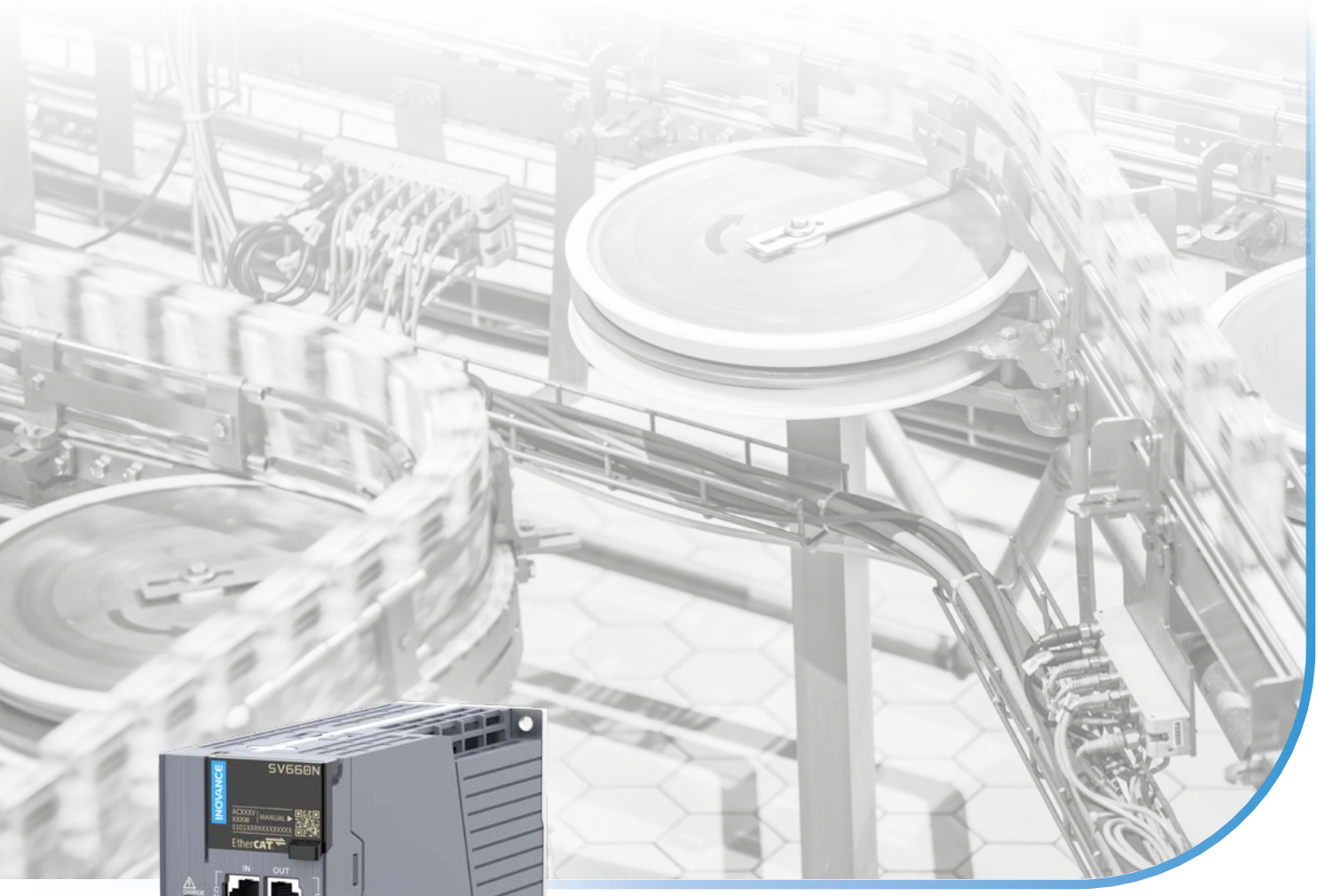
INOVANCE

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

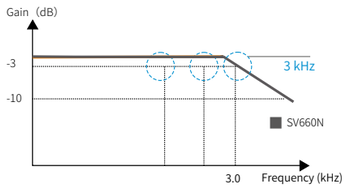
The SV660N

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 µs
Speed loop cycle time	62.5 µs
Position loop cycle time	62.5 µs

Speed loop response graph



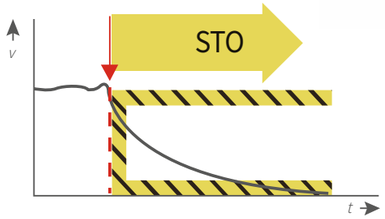
High speed EtherCAT communications – 125 µs
The SV660N series uses a high performance processor for high speed communications, achieving a cycle time of 125 µs for all EtherCAT operating modes.

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 ± 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.

[*1] STO is supplied in the standard FS version. A non-STO version is also available.

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.

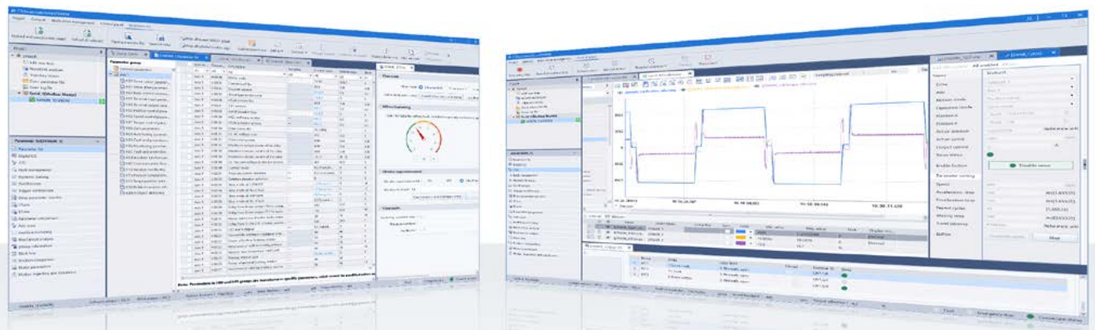
Reduced panel size
SV660N offers a compact footprint and increased power density, with an average 30% smaller footprint than the previous generation.

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.

New iFA Drive PC commissioning software with advanced graphical interface
- Specialist skills not needed for commissioning
- Software included free of charge
- Allows to connect locally (through RS232 or EtherCAT ports) or remotely (using EoE)
- Optional communication cable (S6-L-T00-3.0) required when connecting locally through RS232 port



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The information contained in
the brochure is for guidance only.

Data code: L6210209 V0.6

SV660N Selection Chart

Drive power supply voltage	Motor base speed (rpm)	Motor maximum speed (rpm)	Motor rated power (W)	Motor rated torque (N·m)	Motor peak torque (N·m)	Motor frame size (mm)	Rotor inertia without brake (10^{-4} kg·m^2)	MS1 motor type (please refer to below notes)	SV660N-FS Type	Material code of SV660N	SV660 rated current (A)	SV660 peak current (A)	Drive size	Drive dimensions H x W x D (mm)	Connector kit
1 PH 220V	3000	7000	**50**	0.16	0.56	40X40	0.018	MS1H1-05B30CB-A33zR-INT	SV660NS1R6I-FS-INT	01052604	1.6	5.8	A	170X40X150	S6-C22
	3000	7000	**50**	0.16	0.56	40X40	0.038	MS1H4-05B30CB-A33zR-INT	SV660NS1R6I-FS-INT	01052604	1.6	5.8	A	170X40X150	S6-C22
	3000	7000	**100**	0.32	1.12	40X40	0.0316	MS1H1-10B30CB-A33zR-INT	SV660NS1R6I-FS-INT	01052604	1.6	5.8	A	170X40X150	S6-C22
	3000	7000	**100**	0.32	1.12	40X40	0.072	MS1H4-10B30CB-A33zR-INT	SV660NS1R6I-FS-INT	01052604	1.6	5.8	A	170X40X150	S6-C22
	3000	7000	**200**	0.64	2.24	60X60	0.094	MS1H1-20B30CB-yn3zR-INT	SV660NS1R6I-FS-INT	01052604	1.6	5.8	A	170X40X150	S6-C22
	3000	7000	**200**	0.64	2.24	60X60	0.22	MS1H4-20B30CB-yn3zR-INT	SV660NS1R6I-FS-INT	01052604	1.6	5.8	A	170X40X150	S6-C22
	3000	7000	**400**	1.27	4.45	60X60	0.145	MS1H1-40B30CB-yn3zR-INT	SV660NS2R8I-FS-INT	01052586	2.8	10.1	A	170X40X150	S6-C22
	3000	7000	**400**	1.27	4.45	60X60	0.43	MS1H4-40B30CB-yn3zR-INT	SV660NS2R8I-FS-INT	01052586	2.8	10.1	A	170X40X150	S6-C22
	3000	7000	**550**	1.75	6.13	80X80	0.55	MS1H1-55B30CB-yn31R-INT*	SV660NS5R5I-FS-INT	01052590	5.5	16.9	B	170X50X173	S6-C22
	3000	7000	**550**	1.75	6.13	80X80	1.12	MS1H4-55B30CB-yn31R-INT*	SV660NS5R5I-FS-INT	01052590	5.5	16.9	B	170X50X173	S6-C22
	3000	7000	**750**	2.39	8.36	80X80	0.68	MS1H1-75B30CB-yn3zR-INT	SV660NS5R5I-FS-INT	01052590	5.5	16.9	B	170X50X173	S6-C22
	3000	7000	**750**	2.39	8.37	80X80	1.46	MS1H4-75B30CB-yn3zR-INT	SV660NS5R5I-FS-INT	01052590	5.5	16.9	B	170X50X173	S6-C22
1/3 PH 220V	1500	4500	**850**	5.39	13.50	130X130	13.56	MS1H3-85B15CB-yn3zR-INT	SV660NS7R6I-FS-INT	01052598	7.6	23.0	C	170X55X173	S6-C29
	3000	7000	**1000**	3.18	10.67	80X80	0.82	MS1H1-10C30CB-yn3zR-INT	SV660NS7R6I-FS-INT	01052598	7.6	23.0	C	170X55X173	S6-C22
	3000	7000	**1000**	3.18	10.67	80X80	1.87	MS1H4-10C30CB-yn3zR-INT	SV660NS7R6I-FS-INT	01052598	7.6	23.0	C	170X55X173	S6-C22
	3000	7000	**1000**	3.18	11.13	80X80	0.82	MS1H1-10C30CB-yn3zR-INT	SV660NS012I-FS-INT	01052601	11.6	32.0	D	170X80X183	S6-C22
	3000	7000	**1000**	3.18	11.13	80X80	1.87	MS1H4-10C30CB-yn3zR-INT	SV660NS012I-FS-INT	01052601	11.6	32.0	D	170X80X183	S6-C22
	3000	6000	**1000**	3.18	9.54	100X100	1.78	MS1H2-10C30CB-yn3zR-INT	SV660NS7R6I-FS-INT	01052598	7.6	23.0	C	170X55X173	S6-C29
	1500	4500	**1300**	8.34	20.85	130X130	19.25	MS1H3-13C15CB-yn3zR-INT	SV660NS012I-FS-INT	01052601	11.6	32.0	D	170X80X183	S6-C29
	3000	6000	**1500**	4.9	14.70	100X100	2.35	MS1H2-15C30CB-yn3zR-INT	SV660NS012I-FS-INT	01052601	11.6	32.0	D	170X80X183	S6-C29
3 PH 400V	1500	4500	**850**	5.39	13.50	130X130	13.56	MS1H3-85B15CD-yn3zR-INT	SV660NT3R5I-FS-INT	01052602	3.5	11.0	C	170X55X173	S6-C29
	3000	6000	**1000**	3.18	9.54	100X100	1.78	MS1H2-10C30CD-yn3zR-INT	SV660NT3R5I-FS-INT	01052602	3.5	11.0	C	170X55X173	S6-C29
	1500	4500	**1300**	8.34	20.85	130X130	19.25	MS1H3-13C15CD-yn3zR-INT	SV660NT5R4I-FS-INT	01052603	5.4	14.0	C	170X55X173	S6-C29
	3000	6000	**1500**	4.9	14.70	100X100	2.35	MS1H2-15C30CD-yn3zRINT	SV660NT5R4I-FS-INT	01052603	5.4	14.0	C	170X55X173	S6-C29
	1500	4500	**1800**	11.5	28.75	130X130	24.9	MS1H3-18C15CD-yn3zR-INT	SV660NT8R4I-FS-INT	01052605	8.4	20.0	D	170X80X183	S6-C29
	3000	6000	**2000**	6.36	19.10	100X100	2.92	MS1H2-20C30CD-yn3zR-INT	SV660NT8R4I-FS-INT	01052605	8.4	20.0	D	170X80X183	S6-C29
	3000	6000	**2500**	7.96	18.38	100X100	3.49	MS1H2-25C30CD-yn3zR-INT	SV660NT8R4I-FS-INT	01052605	8.4	20.0	D	170X80X183	S6-C29
	3000	6000	**2500**	7.96	23.90	100X100	3.49	MS1H2-25C30CD-yn3zR-INT	SV660NT012I-FS-INT	01052588	11.9	29.7	D	170X80X183	S6-C29
	1500	4500	**2900**	18.6	46.42	180X180	44.7	MS1H3-29C15CD-yn3zR-INT	SV660NT012I-FS-INT	01052588	11.9	29.7	D	170X80X183	S6-C39
	3000	6000	**3000**	9.8	29.40	130X130	6.4	MS1H2-30C30CD-yn3zR-INT	SV660NT012I-FS-INT	01052588	11.9	29.7	D	170X80X183	S6-C29
	3000	6000	**4000**	12.6	36.64	130X130	9	MS1H2-40C30CD-yn3zR-INT	SV660NT017I-FS-INT	01052592	16.5	41.2	E	250x90x230	S6-C29
	1500	4500	**4400**	28.4	69.75	180X180	64.9	MS1H3-44C15CD-yn3zR-INT	SV660NT017I-FS-INT	01052592	16.5	41.2	E	250x90x230	S6-C39
	3000	6000	**5000**	15.8	47.04	130X130	11.6	MS1H2-50C30CD-yn3zR-INT	SV660NT021I-FS-INT	01052596	20.8	52.1	E	250x90x230	S6-C29
	1500	4500	**5500**	35	87.60	180X180	86.9	MS1H3-55C15CD-yn3zR-INT	SV660NT021I-FS-INT	01052596	20.8	52.1	E	250x90x230	S6-C39
	1500	4500	**7500**	48	117.54	180X180	127.5	MS1H3-75C15CD-yn3zR-INT	SV660NT026I-FS-INT	01052600	25.7	64.2	E	250x90x230	S6-C39

Notes:

"yn" can be:

A3: 23 bit absolute single/multi-turn encoder; V3: Batteryless 23 bit absolute single/multi-turn encoder

"z" can be (not in all models):

0: W/O oil seal, W/O brake; 1: With oil seal, W/O brake; 2: W/O oil seal, with brake; 4: With oil seal, with brake

***** Indicates that this model is not available with brake

For more detailed information about MS1 servomotors please refer to the corresponding brochure or the selection guide

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