

Selection chart

Motor base speed (rpm)	Motor max. speed (rpm)	Motor power (W)	Motor rated torque (N·m)	Motor peak torque (N·m)	Motor frame size (mm)	Rotor inertia (kg·cm²)	MS1 motor model ^[1]	SV680 drive model	SV680 rated current (A)	SV680 peak current (A)	SV680 size	Drive weight GINT/PINT (kg)	Motor weight (kg)
For 1/3PH 220V Servo Drive													
3000	7000	50	0.16	0.56	40×40	0.018	MS1H1-05B30CB-A6/S63*R-INT	SV680*S1R6I/S*INT	1.6	5.8	A	0.96/1.11	0.26
3000	7000	100	0.32	1.12	40×40	0.0316	MS1H1-10B30CB-A6/S63*R-INT	SV680*S1R6I/S*INT	1.6	5.8	A	0.96/1.11	0.35
3000	7000	200	0.64	2.24	60×60	0.094	MS1H1-20B30CB-A6/S63*R-INT	SV680*S1R6I/S*INT	1.6	5.8	A	0.96/1.11	0.80
3000	7000	400	1.27	4.45	60×60	0.145	MS1H1-40B30CB-A6/S63*R-INT	SV680*S2R8I/S*INT	2.8	10.1	A	0.96/1.11	1.11
3000	7000	550	1.75	6.13	80×80	0.55	MS1H1-55B30CB-A6/S63*R-INT ^[2]	SV680*S5R5I/S*INT	5.5	16.9	C	1.30/1.45	1.88
3000	7000	750	2.39	8.37	80×80	0.68	MS1H1-75B30CB-A6/S63*R-INT	SV680*S5R5I/S*INT	5.5	16.9	C	1.30/1.45	2.22
3000	7000	1000	3.18	11.13	80×80	0.82	MS1H1-10C30CB-A6/S63*R-INT	SV680*S7R6I/S*INT	7.6	23.0	C	1.30/1.45	2.61
3000	6000	1000	3.18	9.54	100×100	1.78	MS1H2-10C30CB-A6/S63*R-INT	SV680*S7R6I/S*INT	7.6	23.0	C	1.30/1.45	3.85
3000	6000	1500	4.90	14.70	100×100	2.35	MS1H2-15C30CB-A6/S63*R-INT	SV680*S012I/S*INT	12.0	32.0	D	1.80/1.95	4.65
1500	4500	850	5.39	13.50	130×130	13.56	MS1H3-85B15CB-A6/S63*R-INT	SV680*S7R6I/S*INT	7.6	23.0	C	1.30/1.45	5.80
1500	4500	1300	8.34	20.85	130×130	19.25	MS1H3-13C15CB-A6/S63*R-INT	SV680*S012I/S*INT	12.0	32.0	D	1.80/1.95	7.10
3000	7000	50	0.16	0.56	40×40	0.038	MS1H4-05B30CB-A6/S63*R-INT	SV680*S1R6I/S*INT	1.6	5.8	A	0.96/1.11	0.24
3000	7000	100	0.32	1.12	40×40	0.072	MS1H4-10B30CB-A6/S63*R-INT	SV680*S1R6I/S*INT	1.6	5.8	A	0.96/1.11	0.32
3000	7000	200	0.64	2.24	60×60	0.22	MS1H4-20B30CB-A6/S63*R-INT	SV680*S1R6I/S*INT	1.6	5.8	A	0.96/1.11	0.78
3000	7000	400	1.27	4.45	60×60	0.43	MS1H4-40B30CB-A6/S63*R-INT	SV680*S2R8I/S*INT	2.8	10.1	A	0.96/1.11	1.11
3000	7000	550	1.75	6.13	80×80	1.12	MS1H4-55B30CB-A6/S63*R-INT ^[2]	SV680*S5R5I/S*INT	5.5	16.9	C	1.30/1.45	1.85
3000	7000	750	2.39	8.37	80×80	1.46	MS1H4-75B30CB-A6/S63*R-INT	SV680*S5R5I/S*INT	5.5	16.9	C	1.30/1.45	2.18
3000	7000	1000	3.18	11.13	80×80	1.87	MS1H4-10C30CB-A6/S63*R-INT	SV680*S7R6I/S*INT	7.6	23.0	C	1.30/1.45	2.55
For 3PH 220V Servo Drive													
3000	6000	2000	6.36	19.10	100×100	2.92	MS1H2-20C30CB-A6/S63*R-INT	SV680*S018I/S*INT	18.0	45.0	E	3.60/3.75	5.50
3000	6000	2500	7.96	23.90	100×100	3.49	MS1H2-25C30CB-A6/S63*R-INT	SV680*S022I/S*INT	22.0	55.0	E	3.60/3.75	6.30
3000	6000	3000	9.80	29.40	130×130	6.40	MS1H2-30C30CB-A6/S63*R-INT	SV680*S022I/S*INT	22.0	55.0	E	3.60/3.75	10.00
3000	6000	4000	12.60	31.50	130×130	9.00	MS1H2-40C30CB-A6/S63*R-INT	SV680*S027I/S*INT	27.0	67.5	E	3.60/3.75	13.20
3000	6000	5000	15.80	39.50	130×130	11.60	MS1H2-50C30CB-A6/S63*R-INT	SV680*S027I/S*INT	27.0	67.5	E	3.60/3.75	16.35
1500	4500	1800	11.50	28.75	130×130	24.90	MS1H3-18C15CB-A6/S63*R-INT	SV680*S018I/S*INT	18.0	45.0	E	3.60/3.75	8.50
1500	4500	2900	18.60	46.50	180×180	44.70	MS1H3-29C15CB-A6/S63*R-INT	SV680*S022I/S*INT	22.0	55.0	E	3.60/3.75	13.80
1500	4500	4400	28.40	71.10	180×180	64.90	MS1H3-44C15CB-A6/S63*R-INT	SV680*S027I/S*INT	27.0	67.5	E	3.60/3.75	17.40
For 3PH 400V Servo Drive													
3000	6000	1000	3.18	9.54	100×100	1.78	MS1H2-10C30CD-A6/S63*R-INT	SV680*T3R5I/S*INT	3.5	11.0	C	1.30/1.45	3.85
3000	6000	1500	4.90	14.70	100×100	2.35	MS1H2-15C30CD-A6/S63*R-INT	SV680*T5R4I/S*INT	5.4	14.0	C	1.30/1.45	4.65
3000	6000	2000	6.36	19.10	100×100	2.92	MS1H2-20C30CD-A6/S63*R-INT	SV680*T8R4I/S*INT	8.4	20.0	D	1.80/1.95	5.50
3000	6000	2500	7.96	23.90	100×100	3.49	MS1H2-25C30CD-A6/S63*R-INT	SV680*T012I/S*INT	12.0	30.0	D	1.80/1.95	6.30
3000	6000	3000	9.80	29.40	130×130	6.40	MS1H2-30C30CD-A6/S63*R-INT	SV680*T012I/S*INT	12.0	30.0	D	1.80/1.95	10.00
3000	6000	4000	12.60	31.50	130×130	9.00	MS1H2-40C30CD-A6/S63*R-INT	SV680*T017I/S*INT	17.0	42.5	E	3.60/3.75	13.20
3000	6000	5000	15.80	47.40	130×130	11.60	MS1H2-50C30CD-A6/S63*R-INT	SV680*T021I/S*INT	21.0	52.5	E	3.60/3.75	16.35
1500	4500	850	5.39	13.50	130×130	13.56	MS1H3-85B15CD-A6/S63*R-INT	SV680*T3R5I/S*INT	3.5	11.0	C	1.30/1.45	5.80
1500	4500	1300	8.34	20.85	130×130	19.25	MS1H3-13C15CD-A6/S63*R-INT	SV680*T5R4I/S*INT	5.4	14.0	C	1.30/1.45	7.10
1500	4500	1800	11.50	28.75	130×130	24.90	MS1H3-18C15CD-A6/S63*R-INT	SV680*T8R4I/S*INT	8.4	20.0	D	1.80/1.95	8.50
1500	4500	2900	18.60	46.50	180×180	44.70	MS1H3-29C15CD-A6/S63*R-INT	SV680*T012I/S*INT	12.0	30.0	D	1.80/1.95	13.80
1500	4500	4400	28.40	71.10	180×180	64.90	MS1H3-44C15CD-A6/S63*R-INT	SV680*T017I/S*INT	17.0	42.5	E	3.60/3.75	17.40
1500	4500	5500	35.00	87.60	180×180	86.90	MS1H3-55C15CD-A6/S63*R-INT	SV680*T021I/S*INT	21.0	52.5	E	3.60/3.75	21.70
1500	4500	7500	48.00	119.00	180×180	127.50	MS1H3-75C15CD-A6/S63*R-INT	SV680*T026I/S*INT	26.0	65.0	E	3.60/3.75	29.00

Note: [1]: MS1 A6 motor for SV680-XXXXX-I model (standard type); MS1 S6 motor for SV680-XXXXX-S model (functional safety type).
[2]: Brake option not available.

MS1 H1- 75B 30C B - A6 3 1 R - * - INT

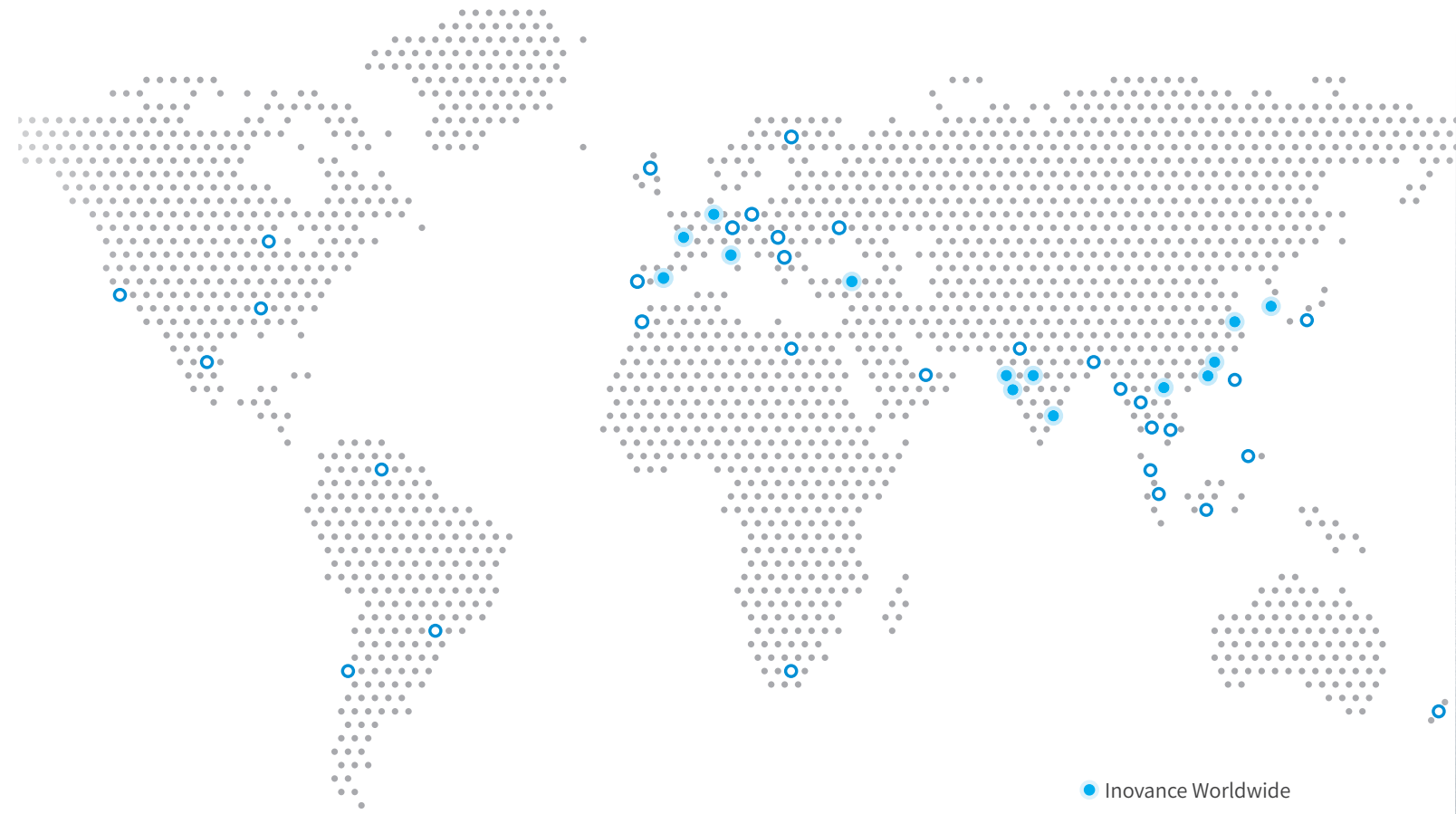
① MS1 series servo motor	④ Rated speed (rpm) Comprised of a letter and two digits B: x 10 C: x 100 Example: 30C: 3000 rpm	⑦ Shaft connection mode 3: Solid and keyed, with threaded hole in the shaft center
② Inertia and capacity type H1: Low inertia, small capacity H2: Low inertia, medium capacity H3: Medium inertia, medium capacity H4: Medium inertia, small capacity	⑤ Voltage class B: 200V D: 400V	⑧ Brake or oil seal ^[1] 0: Without oil seal or brake 1: With oil seal, without brake 2: Without oil seal, with brake 4: With oil seal and brake
③ Rated power (W) Comprised of a letter and two digits B: x 10 C: x 100 Example: 75B: 750 W	⑥ Encoder type Comprised of a letter and a digit A6: 26-bit multi-turn absolute encoder S6: 26-bit multi-turn absolute encoder of functional safety A3: 23-bit multi-turn absolute encoder V6: 26-bit multi-turn absolute battery-less encoder V3: 23-bit multi-turn absolute battery-less encoder	⑨ Sub-series No. R: R-series
		⑩ Customization information -: Standard type -S: Flying leads type -**: Other customized types
		⑪ Model type INT: International Version

Note: [1] H1 type motors with a 40mm flange size are not equipped with an oil seal.
[2] Battery-less encoder motors do not have 40mm frame-size options (with powers of 50W and 100W).



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SV680 Series Servo Drive

Precision with Safety & Flexible Functionality



Safety over EtherCAT
Safety function supported

EnDat 2.2 SSI / BiSS INTERFACE
Multi-encoder supported

Linear motor supported

3 YEARS WARRANTY
3 years global warranty

CANopen

EtherCAT

Modbus

UL LISTED

CE

UK CA

CCC

EAC

Hydraulic

RoHS



Scan for the manual of SV680-INT.

Power cables

Motor Model	Cable Name	Cable Model	Cable Length (m)
MS1H1/MS1H4 terminal type motor	Front outlet	Without brake	S6-L-M107-3.0(-T)-INT 3 S6-L-M107-5.0(-T)-INT 5 S6-L-M107-10.0(-T)-INT 10
		With brake	S6-L-B107-3.0(-T)-INT 3 S6-L-B107-5.0(-T)-INT 5 S6-L-B107-10.0(-T)-INT 10
		Without brake	S6-L-M108-3.0(-T)-INT 3 S6-L-M108-5.0(-T)-INT 5 S6-L-M108-10.0(-T)-INT 10
	Back outlet	Without brake	S6-L-B108-3.0(-T)-INT 3 S6-L-B108-5.0(-T)-INT 5 S6-L-B108-10.0(-T)-INT 10
		With brake	S6-L-B108-3.0(-T)-INT 3 S6-L-B108-5.0(-T)-INT 5 S6-L-B108-10.0(-T)-INT 10
		Without brake	S6-L-M111-3.0(-T)-INT 3 S6-L-M111-5.0(-T)-INT 5 S6-L-M111-10.0(-T)-INT 10
MS1H2 motors of 3 kW and below/MS1H3 motors of 1.8 kW and below	Without brake	S6-L-B111-3.0(-T)-INT 3 S6-L-B111-5.0(-T)-INT 5 S6-L-B111-10.0(-T)-INT 10	
	With brake	S6-L-B111-3.0(-T)-INT 3 S6-L-B111-5.0(-T)-INT 5 S6-L-B111-10.0(-T)-INT 10	

Encoder cables

Motor Model	Cable Model	Cable Length (m)	
MS1H1/MS1H4 terminal-type motor	Front outlet	Single-turn absolute encoder	S6-L-P114-3.0(-T)-INT 3 S6-L-P114-5.0(-T)-INT 5 S6-L-P114-10.0(-T)-INT 10
		Multi-turn absolute encoder	S6-L-P124-3.0(-T)-INT 3 S6-L-P124-5.0(-T)-INT 5 S6-L-P124-10.0(-T)-INT 10
		Single-turn absolute encoder	S6-L-P115-3.0(-T)-INT 3 S6-L-P115-5.0(-T)-INT 5 S6-L-P115-10.0(-T)-INT 10
		Multi-turn absolute encoder	S6-L-P125-3.0(-T)-INT 3 S6-L-P125-5.0(-T)-INT 5 S6-L-P125-10.0(-T)-INT 10
		Single-turn absolute encoder	S6-L-P114-3.0(-T)-INT 3 S6-L-P114-5.0(-T)-INT 5 S6-L-P114-10.0(-T)-INT 10
	Rear outlet	Single-turn absolute encoder	S6-L-P114-3.0(-T)-INT 3 S6-L-P114-5.0(-T)-INT 5 S6-L-P114-10.0(-T)-INT 10
		Multi-turn absolute encoder	S6-L-P124-3.0(-T)-INT 3 S6-L-P124-5.0(-T)-INT 5 S6-L-P124-10.0(-T)-INT 10
		Single-turn absolute encoder	S6-L-P115-3.0(-T)-INT 3 S6-L-P115-5.0(-T)-INT 5 S6-L-P115-10.0(-T)-INT 10
		Multi-turn absolute encoder	S6

Product family overview

Encoder interfaces

- Inovance's latest 26 bit serial single/multi-turn absolute provides more than 67.1 million pulses within one mechanical turn. Multi-turn absolute information can be also saved at power down(when using optional backup battery), avoiding the need to perform machine homing at every power-up. The MS1 series of servo motors are available with both Inovance's 23 and 26 bit serial single/multi-turn absolute encoders.
- The SV680 servo drive as standard, supports Endat 2.2, BISS-C, SSI and ABZ incremental encoders fitted to customer's choice of servo motor.



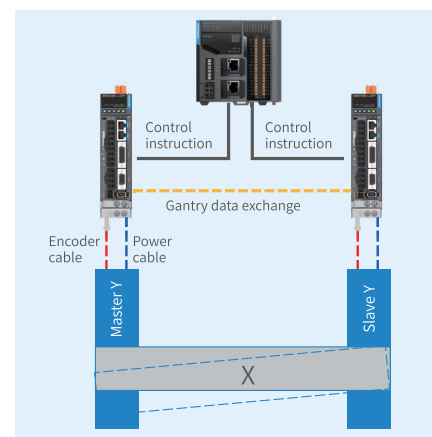
Linear and direct drive rotary motor control



- SV680-INT supports direct-drive motors (DDL&DDR) and is compatible with Inovance communication encoders, as well as various third-party encoders.
- For DDL&DDR motors, accuracy compensation function is available, which accurately compensates for direct-drive motor inherent errors, encoder errors, and motor wear errors caused by long-term operation.

Gantry synchronization

- Gantry synchronization is supported both by the pulse type and bus type drives. Rotary and linear motor gantry functions supported.
- The position error between two axes can be reduced to 1/5000 of a revolution for a travel distance of 1.2 m.
- Multiple gantry alignment modes are available, including: alignment after enabling the axis, by home, by torque or by digital input.



Extra functions

- Built-in brake output
- Control signals I/Os: 2x AI (16 bits and 12 bits), 1x AO, 5x DI, 2x DO (8x DI, 5x DO pulse model), PTC input (motor thermal protection).
- Process segment mode: a multi-function position mode integrated with homing, constant speed control, and positioning. SV680-INT support 16 process segment, process segments 1 to 15 are defined by users.
- Full closed loop with INOVANCE serial type (23 and 26 bits, single/multi-turn absolute), EnDat 2.2, BISS-C, SSI, and ABZ incremental encoders.
- SEMI F47-compliant, maintains operation without shutdown during voltage drop or instantaneous power failure.

3 years global warranty

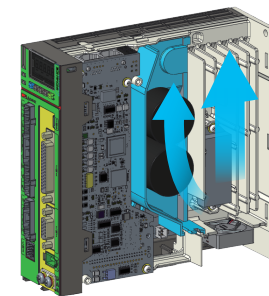
- All SV680-INT models come with a 3-years worldwide warranty.



SV680 "GINT" Version

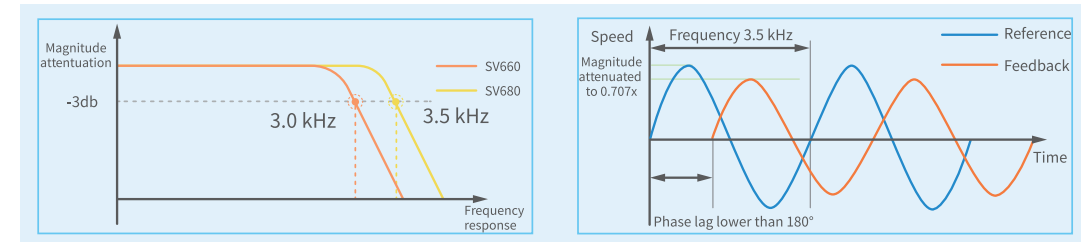
Designed for harsh environments

- Conformally coated PCBs are resistant to 3S2 and 3C3 environments (acc. to IEC 60721-3-3), providing further protection.
- Isolated cooling duct prevents dust contamination of internal electrical components.



Superior control with ultra fast current loop

- Superior current loop control algorithm to deliver smooth and accurate motion profile.
- A speed loop response bandwidth of 3.5 kHz* gives significantly improved performance compared to the previous generation of Inovance products.
- Current loop cycle 1.6 μs (625 kHz), speed loop cycle 62.5 μs (16 kHz), position loop cycle 62.5 μs (16 kHz).



*Please note: The statement refers to the highest frequency speed command change that the servo system can respond to.

Easy tuning with STune and ETune

- Plug & play system that recognizes INOVANCE motors by reading the motor data from the encoder memory.
- 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 rigidity level.
 - ETune automatically adjusts the optimal gain parameters of the servo drive to deliver the best performance.
- Notch and Biquad filters for mechanical resonance suppression.

Guided PC commissioning software

- All-new InoDriverShop commissioning software, lowers the threshold for servo usage. With guided instructions and graphical parameter configuration, servo parameter setup is easily completed.
- Software is included free of charge
- Connect to a PC using standard USB-C cable



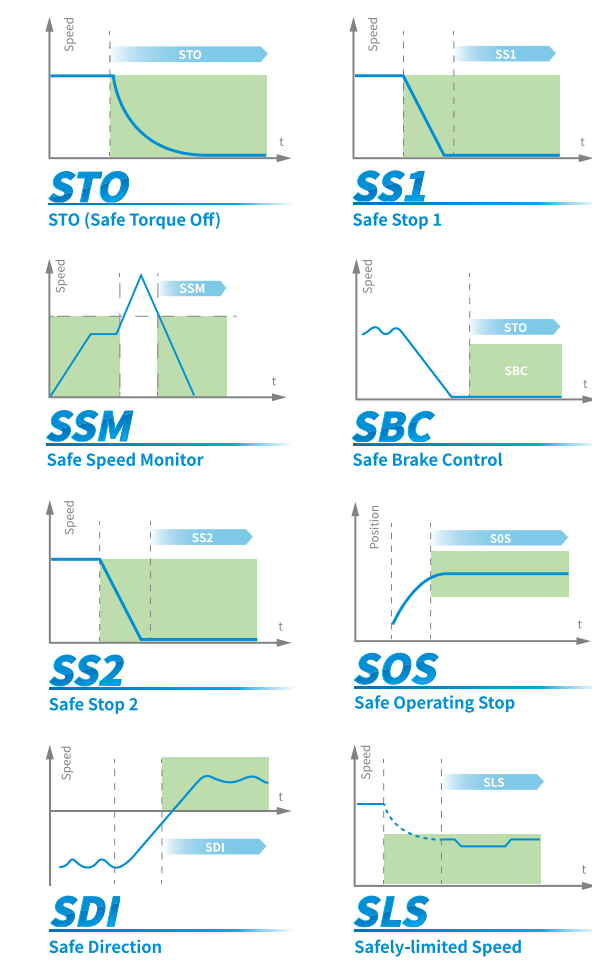
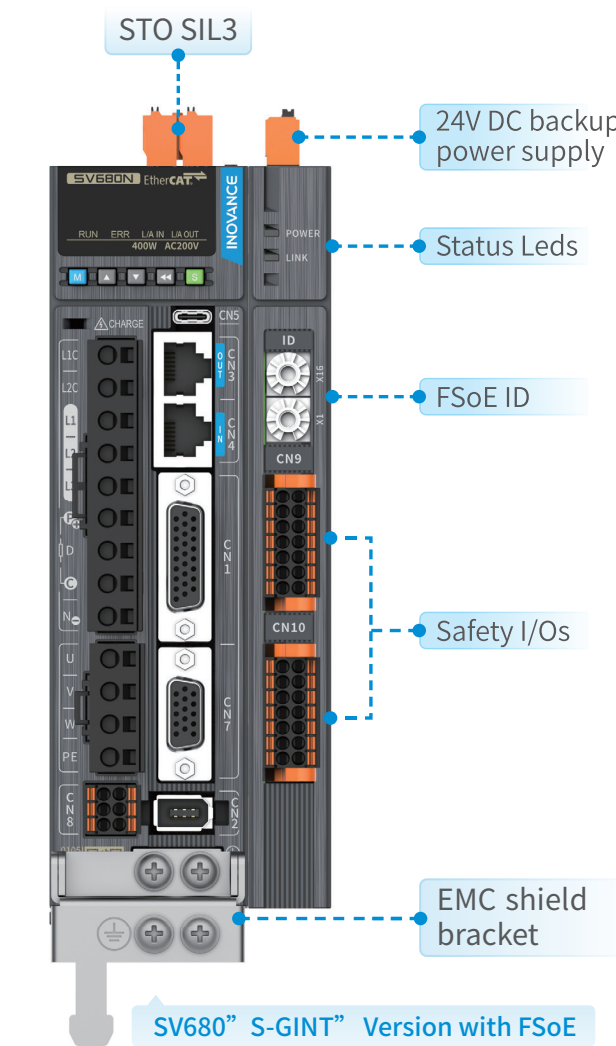
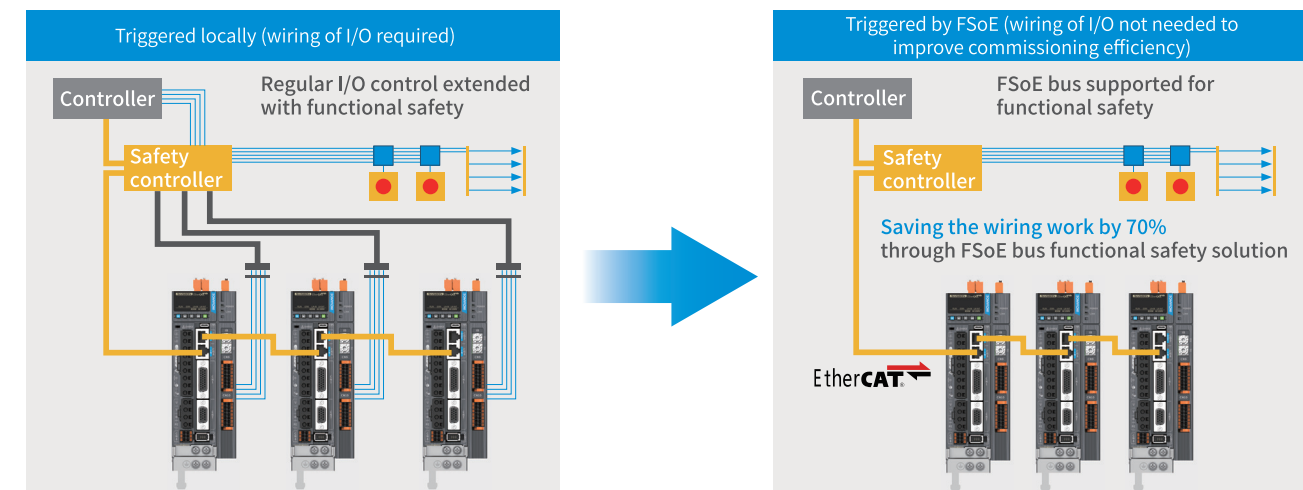
Advanced Functional Safety variant (FSoE)

SV680S-GINT variant supports advanced functional safety functions, with the following features:

- FSoE** (Fail Safe over EtherCAT) safe protocol based on EtherCAT fieldbus, compliant to SIL 3 PL e.
- 8 safety functions according to IEC 61800-5-2 SIL 3: STO, SS1, SS2, SOS, SSM, SBC, SDI, SLS.
- 5 digital safety inputs and 6 digital safety outputs.
- Two ways to activate advanced safety functions, through I/Os or through communications with **FSoE**.



Safety over EtherCAT



Ordering code

SV680 ① N ② S ③ 2R8 ④ I ⑤ -GINT ⑥

① Product series SV680: SV680 series servo drive	④ Rated output current S: 200 V ~ 240 V T: 380V ~ 480V	⑤ Model configuration I: Standard type S: Advanced functional safety type with 24V DC backup
② Product type N: EtherCAT communication P: Pulse + CANopen communication	1R6: 1.6 A 2R8: 2.8 A 5R5: 5.5 A 7R6: 7.6 A 012: 12.0 A 018: 18.0 A 022: 22.0 A 027: 27.0 A	⑥ Version GINT: General-purpose type PINT: 24V DC backup power supply type ^[1]
③ Voltage class S: 200 V ~ 240 V T: 380 V ~ 480 V	3R5: 3.5 A 5R4: 5.4 A 8R4: 8.4 A 012: 12.0 A 017: 17.0 A 021: 21.0 A 026: 26.0 A	

Note [1] If 24V DC backup function is required for the standard type, order the PINT variant.

Dimensions

Models without 24V DC backup		Frame size	W (mm)	H (mm)	D (mm)	Mass (kg)
SV680N****I-GINT	SV680P****I-GINT	SIZE A	45.5	170	150	0.96
		SIZE C	55±1	170	173±1	1.30
		SIZE D	80±1	170	183	1.80
		SIZE E	90	250	230	3.60

Models with 24V DC backup & FSoE		Frame size	W (mm)	H (mm)	D (mm)	Mass (kg)
SV680N****S-GINT & SV680N****PINT	SV680P****S-GINT & SV680P****PINT	SIZE A	64.5	170	150	1.11
		SIZE C	74±1	170	173±1	1.45
		SIZE D	99±1	170	183	1.95
		SIZE E	109	250	230	3.75

Note: Dimensions shown are for the drive module excluding the dimensions of the EMC shield brackets, terminals and DB connectors (refer to user guide).