



SINAMICS S200

Servo drive system

Performance-optimized and easy to use for standard servo applications

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Ordering number structure

SINAMICS S200 Servo Drive System

The new servo drive system for standard servo market



SINAMICS S200 converter

S200 / S200 Basic
Pulse train / PROFINET
Power range: 1/3 AC 200V...240V: 0.1 – 1kW;
3AC 380...480V*: 0.2 - 7kW

SIMOTICS S-1FL2 motor

Low / Medium / High inertia
Absolute encoder single turn 17 / 21-bit single turn and multi
turn 21 + 12-bit
IP 54/ IP65

MOTION-CONNECT 350 / 380

Standard / Flexible bending cable
Up to 30m length
Dual cable(SH20/30/40) / 2 cables(SH48/52) / 3 cables(SH45/65/90)
Drive end direction / Non drive end direction

**Not available for S200 Basic*

Startdrive



Webserver



DriveSim
Basic



SINAMICS S200 System, Positioning within SINAMICS “Discontinuous Motion” Portfolio



Basic Servo Drive System SINAMICS V90

Single axis AC/AC servo drive system with basic functionality and performance

- PTI or PN
- 1FL6 motors
- MC 300 cables

Standard Servo Drive System SINAMICS S200

Single axis AC/AC servo drive system with high dynamic and highest compactness

- S200 / S200 Basic with PTI or PN
- 1FL2 motors
- MC 350 / 380 cables

Midrange Servo Drive System SINAMICS S210

Single axis AC/AC servo drive system with highest dynamic

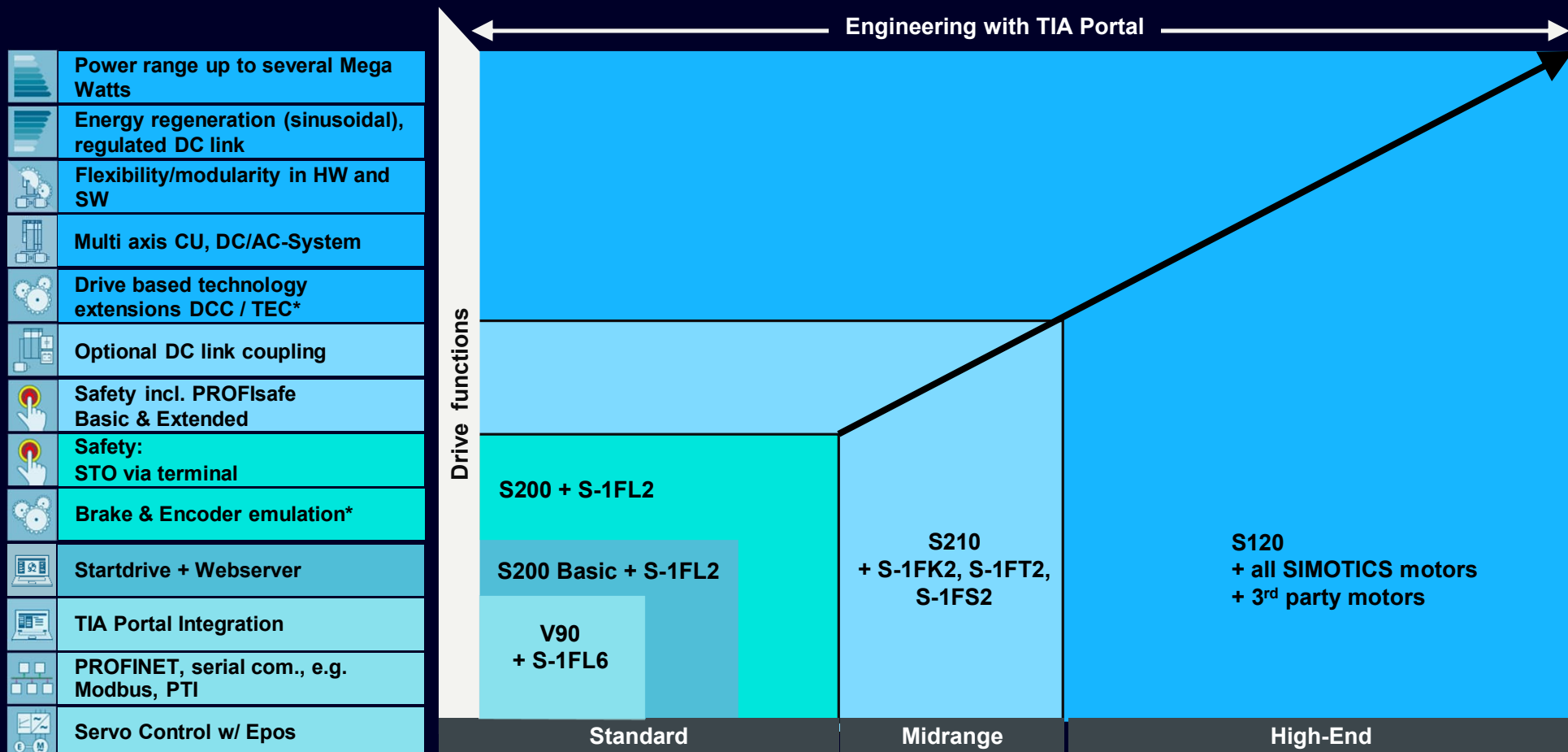
- 1FK2, 1FT2, 1FS2 motors
- OCC – One cable connection
- Perfect match with SIMATIC controllers

High-End Servo Drive System SINAMICS S120

Modular DC/AC multi axis system with highest performance, flexibility and most advanced drive based technology

- Seamless functionality from 1kW to 5.7 MW

The scalable SINAMICS Drives Portfolio for “Discontinuous Motion”



*DCC = Drive Control Chart; TEC = SINAMICS Technology; Brake = integrated holding brake control relay; Encoder emulation = PTO

Differentiation of S200, S210 and S120 System Portfolio overview

	SINAMICS S200 System ≤ 7kW	SINAMICS S210 System ≤ 7kW	SINAMICS S120 System ≤ 3.040 kW
 Dynamic	High (current controller 125 µs for PN version; PN IRT 250 µs)	Very high (current controller 62,5 µs; PN IRT 250 µs)	Very high (current controller 62,5 µs; PN IRT 250µs)
 Motion	Drive/Controller based (EPos & SIMATIC Technology Objects)	Drive/Controller based (EPos & SIMATIC Technology Objects)	Drive/Controller Based (EPos, DCC & SIMATIC Technology Objects)
 DC link	No	Energy between axes (400V device DC link coupling up to 6 axes)	Also recovery possible (Depends on BLM / ALM / SLM)
 Ease to use	Easy (One button tuning, electronic type plate)	Very Easy (One button tuning, electronic type plate, Plug and play, OCC)	More complex (Drive can be adjusted to exact required machine complexity)
 Safety	Only via Terminals (only STO, SS1-t*)	Also via PROFIsafe (Basic, Extended, advanced)	Also via PROFIsafe (Basic, Extended, Advanced)
 System	Closed System S-1FL2 motor combination	Closed System S-1FK2, S-1FT2, S-1FS2 motor combination	Open System (all different motors, infeed systems, encoders... possible)
 Price	\$	\$\$	\$\$\$

**in preparation*

Servo drive system for standard applications SINAMICS S200

Optimized-performance for standard solutions of motion applications.



Performance optimized

FAST. Current controller cycle 125us

Speed up communication with **PN IRT**

PRECISE. High resolution of **21-bit** encoder. **8kHz** PWM frequency with optimized speed ripple

DURABLE. **350%** overload capacity.

IP65 protection motors with metal connection solution

3C2 coated circuit board



Easy to use

Easy handling: **Compact** design. Integrated brake resistance and holding brake control

Easy Selection via TST, SPC, SINAMICS Selector App.

Easy engineering via **Webserver** and **Startdrive**, one button tuning

Easy implementation: global standards and certification of CE, **UL**, UKCA, KC, EAC, RCM, **SEMI47**



Fit for future

Flexibility: Optimized product line S200, S200 Basic, PN/PTI, low/medium/high inertia motor, standard and drag chain cable, scalable system together SIMATIC controllers

Digitalization: Machine simulation with **DriveSim Basic**

Safety& Security. Safety Integrated functions **STO**, **SS1-t***, **SIL3/PLe/Cat.4**.

Full secure via **Next Generation UMAC**



Electronics



Battery



Packaging



Woodworking



Solar



Others

How to optimize the performance of your product?

By the **optimized performance**, S200 is fast, precise, durable



- Current controller cycle **125us**
- Speed up communication to controllers with PN IRT

Fast

- High resolution of **21-bit** encoder
 - **8kHz** PWM frequency with optimized speed ripple

Precise

Durable

- **350%** overload capacity
- **IP65** protection motors with metal connection solution, protect against harsh environments
- **3C2** coated circuit board



Production efficiency

Cost effective

System reliability



How to speed up time to market? Easy to use through the whole customer journey.

1

Easy **selection** via TST(TIA Selection Tool), SPC(Siemens Product Configurator), SINAMICS Selector App



2

Easy **setup** thanks to compact design and integrated components

**Com
pact**

Drive size save up to 30%, closer side by side clearance 1mm for 200V, greatly save the installation space in cabinet

Motor length shorter up to 24%, easy for installation
Brake connection integrated with power cable for LI/MI

**Integr
ated**

Integrated holding brake control and integrated brake resistor, saving the efforts of selection and wiring.

Less

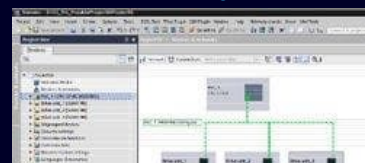


3

Easy **engineering** via Webserver and Startdrive, innovated guided quick setup is time saving by providing clear guide and concise instruction.

- Full integration in Startdrive
- **one button tuning** to optimize the system within seconds
- Motor electronic type plate to identify the motor type automatically
- Basic positioner (EPos) to save the resources of controller

SINAMICS Startdrive
TIA Portal V18 SP2



New guided quick setup

Webserver



No software needed

4

Easy **implementation** with Global standards and certifications: CE, UL, UKCA, KC, EAC, RCM, SEMI47.

5

Easy product **information acquisition** via QR code on the front of the product, all materials at your fingertips.



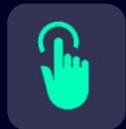
What is the future in your eyes?

Flexible, digital, safe and secure. Fit for your future from all aspects.



Fit for digitalization

on machine simulation with DriveSim Basic, reduce the risks and costs in the design and engineering phase, reflecting cost-effective and fast time to market as well.



Fit for your flexibility.

- **Scalable system** for motion control task together with SIMATIC controller and SINAMICS converter
- Optimized product line **S200, S200 Basic** with various communication type e.g. PROFINET RT/IRT, Pulse train, Analog, Modbus
- Flexible motor including **low / medium / high** moment of inertia and encoder options
- MOTION-CONNECT with **standard and flexible** cable solution up to 30m



Fit for your safety & security.

Always on the safe side with Safety Integrated functions STO, SS1-t*, SIL3/PLe/Cat.4.
New generation security concept, to secure the access with UMAC.

*SS1-t in preparation

System offering- S200 Servo Drive System

S200		S200 Basic(PN/PTI ¹⁾): 200V 0.1-1,0kW S200(PN/PTI ¹⁾): 200V 0.1-1,0kW; 400V 0.2~7.0kW																					
200V		FSA			FSB		FSC																
400V		FSA				FSB				FSC			FSA		FSB			FSC			FSD		
1FL2		SH20		SH30		SH40		SH48		SH52		SH45		SH65				SH90					
200V	LI ²⁾	0.05 ³⁾	0.1	0.2	0.4	0.75	1.0																
	MI			0.2	0.4	0.75	1.0																
400V	LI	0.05	0.1	0.2	0.4	0.75	1.0			1.5	2.0												
	MI			0.2	0.4	0.75	1.0	1.0	1.5														
	HI											0.4	0.75	0.75	1.0	1.5	1.75	2.0	2.5	3.5	5.0	7.0	
Encoder		Absolute encoder single turn 17-bit / 21-bit; Absolute encoder multi-turn 21 + 12-bit																					
Connection motor side (Power, Brake, Encoder)		hybrid connector 						metal angular connector 				metal angular connector 											
		Dual cable						2 cable solution				3 cable solution											

Remark:

1) PTI is in preparation 2) Motor inertia: LI/MI/HI → Low Inertia/Medium Inertia/High Inertia 3) Motor power rating, unit kW

SINAMICS S200

S200/ S200 Basic two drive versions to provide more suitable choice



	SINAMICS S200 A variety of functions for general application		SINAMICS S200 Basic Focus on entry level basic application
Line supply & power range	1/3AC 200V ~ 240V (-15%/+10%); 0.1~1.0kW 3AC 380V ~ 480V (-15% / +10%); 0.2~7.0kW		1/3AC 200V ~ 240V (-15%/+10%); 0.1~1.0kW
Safety	STO, SS1-t* via terminal (SIL 3 / PL e)	Upgr ade	n.a.
Brake resistor	Integrated brake resistor (>0.1kW)	USP	Integrated brake resistor (>0.4kW)
Control interface	PTI: 10 DI / 6 DO / 2 AI / 2AO PN: 4 DI (2 high speed) / 2 DO / PTO	Upgr ade	6 DI / 4 DO / PTI / PTO 4 DI (2 high speed) / 1 DO
	AC input detection (For power failure protection e.g. vertical axes)	New	n.a.
Holding brake control	Direct control of motor holding brake	USP	Ext' relay required for holding brake control

*SS1-t in preparation

SIMOTICS S-1FL2

Full upgrade motor for a stable and robust operation



Motor Features



- High dynamic through low inertia
- Compact design
- **Maximum speed up to 6,500rpm** for LI/MI motors
- Overload capacity: **up to 350%**
- Robust connection: **metal connector with IP65 protection**
- Rotatable connector (except SH20/30/40)

Motor Options



- Encoder types: absolute single turn 17bit, absolute single turn 21bit, absolute multi-turn 21bit (battery-less)
- Holding brake
- Plain shaft or shaft with key
- IP54, IP65 as option (SH20/30/40)
IP65 (SH48/52/45/65/90)

SINAMICS 1FL2 servo motor

With a range of 0.05kW - 7,0kW / 0,16 - 33.4Nm and shaft heights of SH 20 - 90

1/3AC 200V/3AC 400V 0.05kW to 1kW	3AC 400V 1.5kW to 2.0kW
Low inertia	

1/3AC 200V/3AC 400V 0.2kW to 1kW	3AC 400V 1.0kW to 1.5kW
Middle inertia	

3AC 380V~480V 0.4kW to 7kW
High inertia



SH 20

SH 30

SH 40

SH 52

SH 30

SH 40

SH48

SH 45

SH 65

SH 90

Mn(Nm)	0.16/0.32	0.64/1.27	2.40/3.20	4.6/6.6	0.64/1.27	2.40/3.20	3.0/4.6	2.40/3.20	3.58-9.60	11.9-33.4
Pn(kW)	0.05/0.10	0.2/0.4	0.75/1.0	1.5/2.0	0.2/0.4	0.75/1.0	1.0/1.5	0.4/0.75	0.75-2.0	2.5-7.0
Inertia without brake (kgcm2)	0.0166/0.0286	0.08/0.155	0.5/0.63	1.71/2.65	0.18/0.35	1.24/1.62	3.15/5.1	2.68/5.18	7.96-29.93	47.41-134.29
n _{rated} (rpm)	3000				3000			3000	2000	2000
n _{max} (rpm)	6500			6000	6500		6000	4000	3000	2100-3000
Encoder	ABS. 17bit or 21bit single-turn ABS.21bit single-turn+12bit multi-turn									

S200 Servo Drive System Vertical Approaches

Target verticals and applications

S200 system is focusing on the Verticals/Applications of...

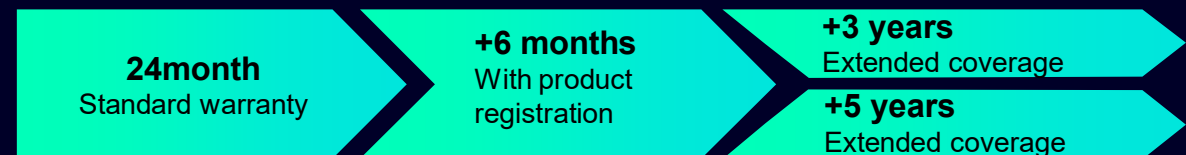
	 Battery	 Electronics	 Packaging	 Wood machine	 Solar	 Others
Focus	Battery cell production: electrode production and cell assembly - Coating machine - Stacking machine - Slitting machine - Calendaring machine	Final assembly test and packaging - Sorting machine - Inspection machine - Gluing machine	- Form, filling and sealing - Pouch making machinery - Blister machine - Labeling machine	- Edge bending - Panel saws - Machining centers	From wafer production to cell to module assembly	
Highlight	- High dynamic - Compact design - PTO: feedback position to other system - Dynamic frame pack - Multi certification	- Compact design - High dynamic - TIA portal and one button tuning	- High speed measuring thanks to the fast DI - Absolute encoder - Compact design	- Compact design - Easy commissioning, TIA solution - Multi certification	- Easy commissioning, TIA solution - Performance optimized	

Warranty – With Service Protect you will receive a product exchange or repair in a service case within the contract period.

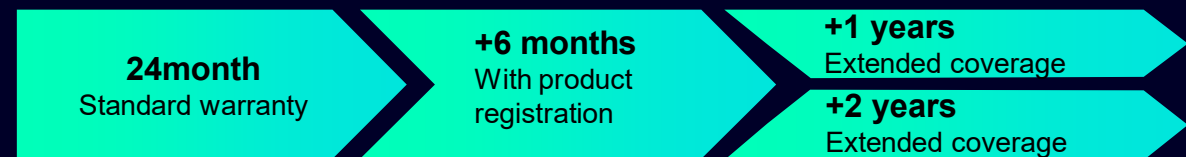
Customer benefits

- ✓ **Safeguard your investment** for an extended period
- ✓ **Ongoing support** by Siemens service experts throughout the **entire product lifecycle**
- ✓ **Opportunity** to cover the drive for **up to 7 years + ½** and the motor for up to **4 years + ½**

S200 converter:



1FL2 motor:



MC 350/380 cable:



Register your drive and receives an initial 6 month free of charge (FOC) extended coverage via <https://myregistration.siemens.com/>

Access it directly on the Industry Online Support platform under 'mySupport' <https://siemens.com/supportrequest/>

Appendix- SINAMICS S200 & SIMOTICS 1FL2 & MC350/380

Technical comparison with V90 servo drive system

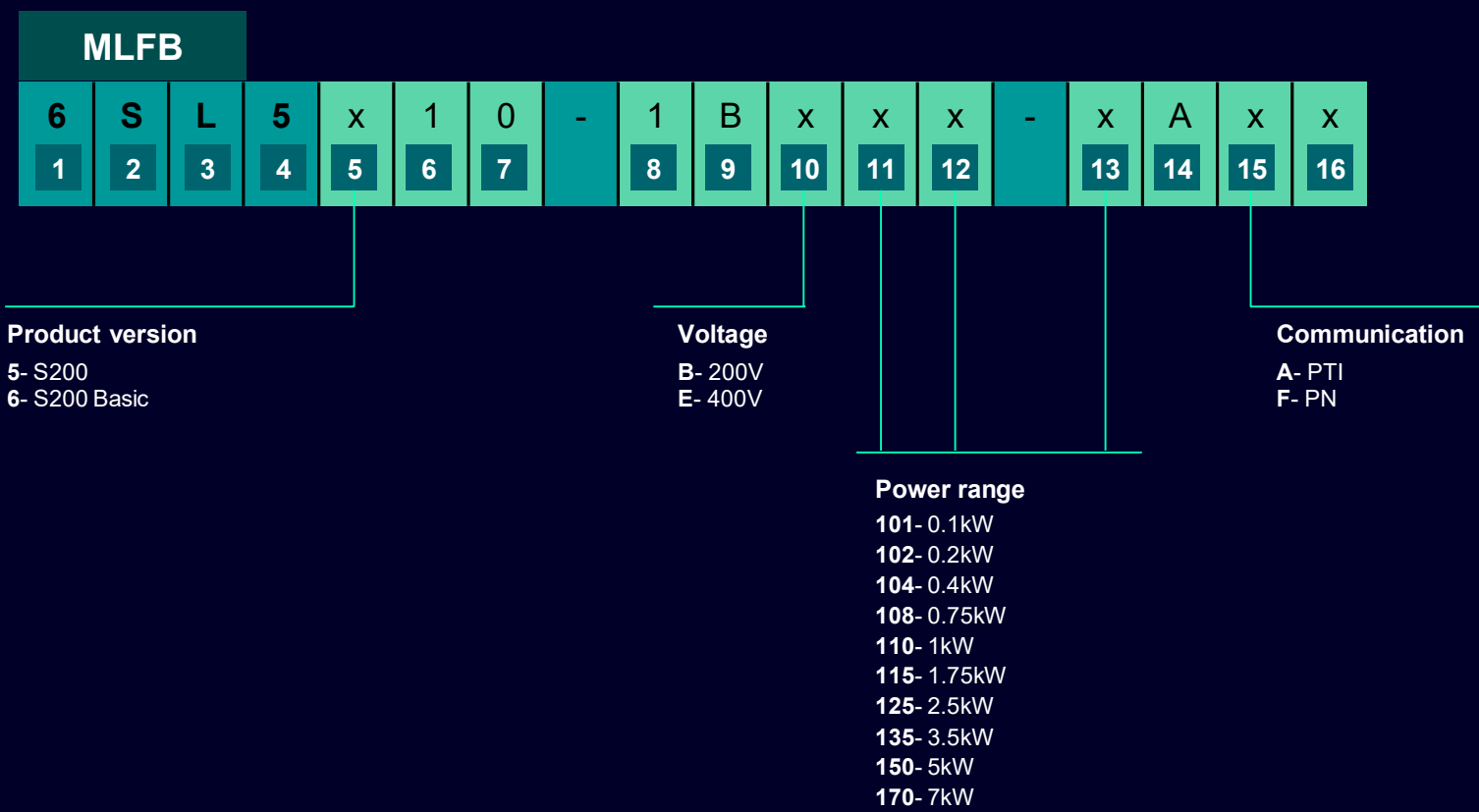
	S200 Basic PTI	S200 Basic PN	S200 PTI	S200 PN	V90 PTI	V90 PN
Line voltage & Power range	1/3 AC 200V...240V: 0.1~1.0kW	1/3 AC 200V...240V: 0.1~1.0kW	1/3 AC 200V...240V: 0.1~1.0kW 3AC 380...480V: 0.2~7.0kW	1/3AC 200V...240V: 0.1~1.0kW 3AC 380...480V: 0.2~7.0kW	1/3AC 200V...240V: 0.1-2kW 3AC 380...480V: 0.4-7kW	
Safety	No	No	STO, SS1-t via terminal, SIL3	STO, SS1-t via terminal, SIL3	STO, SIL2	
Holding brake control	No, external relay req'd	No, external relay req'd	Yes, integrated	Yes, integrated	Integrated for 400V version	
Integrated brake resistor	S200 Basic: Yes, > 0.4kW		Yes		Yes	
Control system	8kHz PWM frequency; Current controller cycle 62.5us (PTI) and 125us (PN)				4kHz PWM frequency	
Control mode	• Pulse train position control	• EPos, TO	• Pulse train position control • EPos(former: IPos), Speed, Torque, Control mode switch	EPos, TO	• Pulse train position control • IPos, Speed, Torque, Control mode switch	• EPos, TO
Control feature	• Motor E-Nameplate and auto identification; cogging torque compensation(internal); • One button tuning and real time auto tuning; • Travel to fixed stop, vertical axes, measuring probe				• One button tuning and real time auto tuning; • Travel to fixed stop	
Commissioning	Webserver	Webserver, Startdrive	Webserver	Webserver, Startdrive	V-assistant, HSP for PN version	
SD card	Standard SD card				Micro SD card for 200V, standard SD card for 400V	
Communication	• N.a.	• PN RT / IRT (250us)	• Modbus RTU	• PN RT / IRT (250us)	• Modbus RTU/USS	• PN RT/IRT(2ms)
Control interface	•PTI, PTO •6 DI, 4 DO	•4 DI (2 Fast DI), 1 DO	•PTI, PTO •10 DI (2 Fast DI), 6DO, 2AI, 2AO	•4 DI (2 Fast DI), 2 DO, PTO	• PTI, PTO • 10DI, 6DO, 2AI, 2AO	4DI, 2DO
Integrated brake resistor	S200 Basic: Yes, > 0.4kW	S200: Yes, > 0.2kW			• Yes, > 0.2kW	
Dimension and installation	• Drive: up to 30% smaller than predecessor V90 • Drive: Side by side > 1mm (200V) ; > 10mm (400V) • Motor: up to 24% smaller than 1FL6				• Drive: Side by side > 10mm	

Appendix- SINAMICS S200 & SIMOTICS 1FL2 & MC350/380

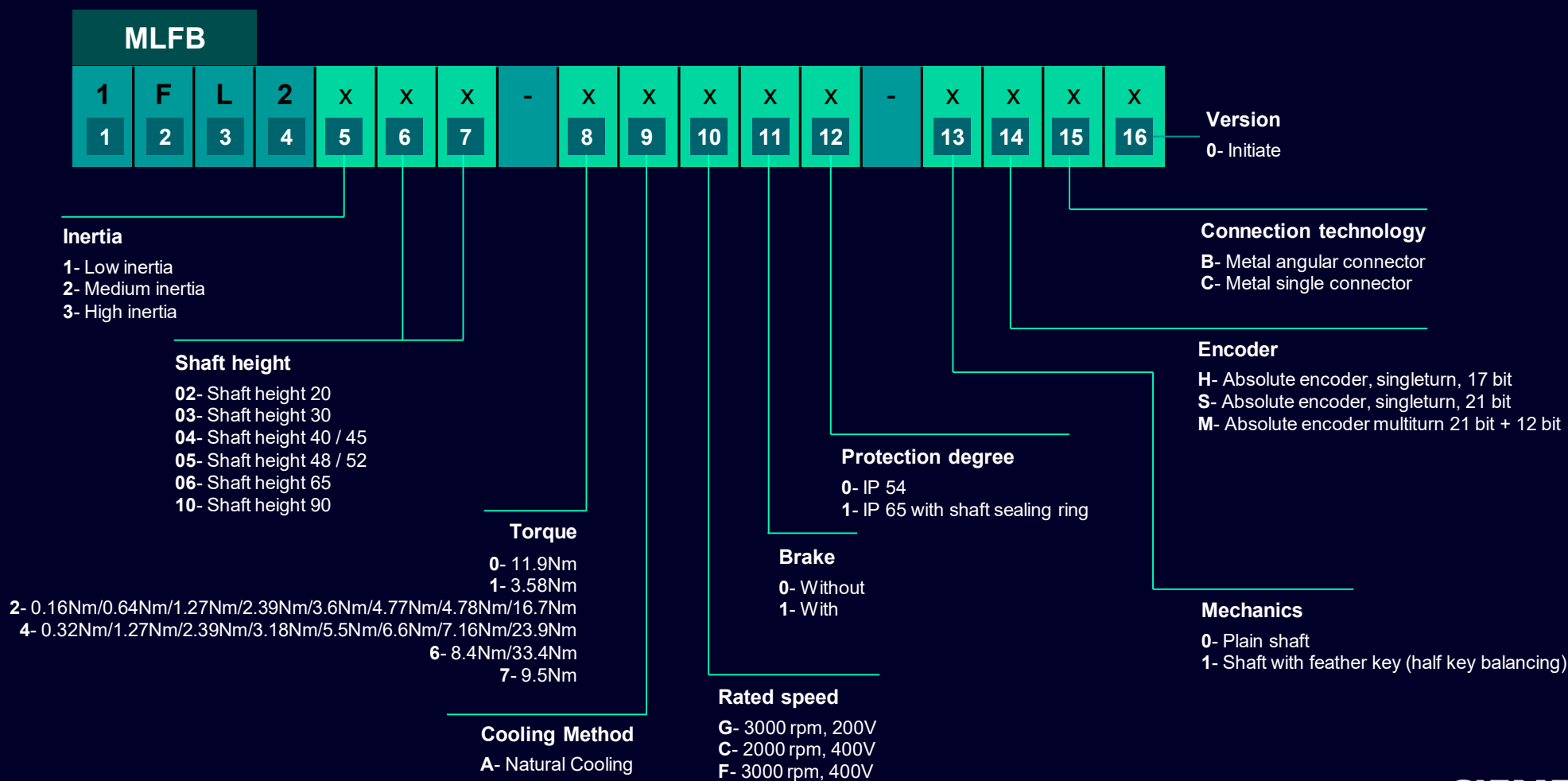
Technical comparison with V90 servo drive system

	1FL2 & MC350/380	1FL6& MC300
Motor variants (inertia, line supply, power)	- LI (Ultra low inertia): 0.05 ~ 1.0kW (200V); 0.05 ~ 2.0kW (400V); MI (Low / Mid inertia): 0.2 ~ 1.0kW (200V); 0.2 ~ 1.5kW (400V); - HI (High inertia) : 0.4 ~ 7.0kW(400V)	LI: 0.05-2.0kW(200V) HI: 0.4-7.0kW(400V)
Motor encoder	17bit single turn , 21bit single turn, 21bit multiturn (battery-less)	Inc. TTL 2500 S/R, Abs. 21-bit single turn, Abs. 20-bit ST+ 12-bit multiturn(battery-less)
Motor speed	- LI/MI: 3,000rpm / up to 6,500 rpm - HI: same as 1FL6	- LI: 3000rpm/ up to 5000rpm - HI: 2000, 3000rpm/ up to 4000rpm
Cable	Length: 3/5/7/10/15/20/30m Standard & high dynamic for drag chain	Length: 3/5/10/20m(LI) 3/5/7/10/15/20m(HI)
Connector (motor side)	Robust metal connector@ motor side for SH20, 30, 40 Compact three-in-one connector Brake connection integrated with power cable (for the variants with holding brake) One-push-lock connector 	Connector: plastic for LI 
Degree of protection	IP54, IP65 as option (SH20/30/40); IP65 (SH48/52/45/65/90)	IP65(motor main body)
Certificate	CE, UL (for whole system) , UKCL, KC, EAC, RCM, SEMI47	- CE, KC, EAC, UL, RCM - CE, EAC for motor
Overload capacity	up to 350%	300%
System performance	• Dynamic performance and speed ripple: competitive in market, better than V90 system	

MLFB structure – S200 servo drive ordering data



MLFB structure – 1FL2 servomotor ordering data



MLFB structure – MOTION-CONNECT 350/380 ordering data

Hybrid connector cables: (suitable for SH20/30/40 1FL2 motor)

MLFB																	
6	F	X	3	x	0	2	-	7	x	x	0	1	-	1	x	x	0
1	2	3	4	5	6	7		8	9	10	11	12		13	14	15	16

Cable variant

- 5- MC 350 standard cable
- 8- MC 380 flexible cable

Cable type

- D- With brake
- C- Without brake

Outlet direction

- D- Drive end outlet
- N- Non-drive end outlet

Cable cross-section

- 01- 0.75mm²
- 02- 1.5mm²
- 12- 2.5mm²

Cable length

- AD- 3m
- AF- 5m
- AH- 7m
- BA- 10m
- BF- 15m
- CA- 20m
- DA- 30m

MLFB structure – MOTION-CONNECT 350/380 ordering data

M17 or M23 connector cables: (suitable for SH48/52/45/65/90 1FL2 motor)

MLFB																	
6	F	X	3	x	0	2	-	x	x	x	x	x	-	1	x	x	0
1	2	3	4	5	6	7		8	9	10	11	12		13	14	15	16

Cable variant

- 5- MC 350 standard cable
- 8- MC 380 flexible cable

Connector type

- 5- Power connector or brake connector
- 2- Encoder connector

Cable type

- D- With brake
- C- Without brake

Cable connector

- K- Power cable with M17 connector
- L- Power cable with M23 connector

Cable type

- BL- Brake cable
- XB- Encoder cable

Cable cross-section

- 01- Power cable with M23 connector (0.75mm²)
- 02- Power cable with M23 connector(1.5mm²)
- 12- Power cable with M23 connector(2.5mm²)
- 32- Power cable with M17 connector(0.75mm²)
- 03- Brake cable (0.75mm²)
- 11/12- Encoder cable (0.25 and 0.38mm²)

Cable length

- AD- 3m
- AF- 5m
- AH- 7m
- BA- 10m
- BF- 15m
- CA- 20m
- DA- 30m

Disclaimer

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