

Motion Control



# FAGOR's Intelligent Servo Drive System CMC / MMC Series

## Positioning drive + PLC

Systems and motion control for industrial automation. Applicable to a great variety of market segments such as handling, packaging, special machinery, graphic arts, paper industry, woodworking industry, food, textile industry, glass, marble, automotive, machinery for plastics, rubber etc.

## Compact System (CMC)

The intelligent FAGOR positioning drive can govern a motor autonomously. Without the need for additional modules, with fewer cables, without an external auxiliary power supply and it may be connected directly to mains. Its parameters are the same as those of the FAGOR compact drive and it runs just like it. There are compact drives for brushless AC servomotors (synchronous) and for induction motors (asynchronous) connected to the same power supply.

### Compact servo drive / Positioning drive



MODEL	CMC				
	1.08	1.15	1.25	2.35	2.50
I nominal (Amp.)	4	7.5	12.5	17.5	25
I peak/0.5 sec.- (Amp)	8	15	25	35	50
Mains supply	3x400 VAC - 10% up to 460 VAC + 10%, 50/60 Hz.				
Internal Ballast resistor (Ohms)	75	75	-	-	-
Power (W) Ballast	150	150	-	-	-
Velocity feedback	Encoder				
Communication	RS-232 C / RS-422 / RS-485				
Supply for control circuits	2x400 VAC-15% up to 460 VAC+10%, 50/60 Hz.				
Service voltage (output)	24 Vdc (5%), 100 mA				
Protections	Overvoltage, overcurrent, overspeed, etc.				
PLC Module	Standard (24 VDC)				
Interface	Analogue or digital (SERCOS, CANopen or MOD BUS)				

## Modular System (MMC)

The intelligent FAGOR positioning drive system lets you control several drive modules for Brushless AC servomotors (synchronous) and induction (asynchronous) motors connected to the same power supply.

### Power supplies



MODEL	PS-65A	PS-25B	XPS-25	XPS-65	RPS-75	RPS-45	RPS-20
Mains	Three-phase 400 VAC - 10% up to 460 VAC +10%. 50/60 Hz.						
Output voltage	565-650 VDC			600, 625 or 725 V DC			
Maximum output power (Kw.)	65 Kw (195 kw, 1 sec)	25 Kw (75 Kw, 1 sec)	25 Kw (55 Kw, 1 sec)	65 Kw (108 kw, 1 sec)			
Nominal output current (Amp.)	120 A (360 A, 1 sec)	45 A (135 A, 1 sec)	45 A (135 A, 1 sec)	120 A (120 A, 1 sec)	120 A (156 A, 1 S6)	72 A (95 A, 1 S6)	32 A (41,6 A, S6)
Supply for control circuit	24 VDC (21-28 VDC)			Three-phase 50/60 Hz mains voltage range between 400 V AC - 10% and 460 V AC + 10%			
Power supply	Supplies 24 VDC (8 Amps) to the drives						
Internal crowbar resistance (Ballast)	9 / 600 w	16,5 / 500 w	18 / 520 w	9 / 1800 w			
Energy regeneration			20 Kw	54 Kw	20 Kw	45 Kw	75 Kw
Protections	Overvoltage, overcurrent, overspeed, etc.						

### Modular Servo Drive / Positioning drives

MODEL	MMC 1.08	MMC 1.15	MMC 1.25	MMC 1.35	MMC 2.50	MMC 2.75	MMC 3.100	MMC 3.150	MMC 3.200
nom. Amp.	4	7.5	12.5	17.5	25	37.5	50	75	100
I peak (0.5 sec) Amp.	8	15	25	35	50	75	100	150	200
Power voltage input	456-800 VDC								
Supply for control circuits	24 VDC (21-28 VDC)								
Velocity feedback	Resolver or encoder								
Feedback type	PWM, AC sinewave								
Communication	RS-232 C / RS-422 / RS-485								
Interface	Analogue or digital (SERCOS, CANopen or MOD BUS)								
Status display	7 segment display								
PLC Module	Standard ( 24 VDC )								
Protections	Overvoltage, overcurrent, overspeed, etc.								

## FAGOR Synchronous Brushless AC Motors FKM series

Among its many advantages, the following deserve a special mention:

- Easy mounting, with the possibility of rear mounting and a swivel connector that make it easy to adapt to any type of machine.

- Considerably smaller size for the same torque range.

- Protection degree: IP 64 or IP 65 with a seal (IEC-34-5).

- Temperature sensor: Thermistor PTC KTY-84 in the stator winding.

- Electrical connection: Swivel connectors for power and signal feedback.

- Types of construction: IMB5-V1-V3 (as recommended by IEC-34-3-72).

- Balancing: Class N (meets DIN45665).

- Standard shaft: Cylindrical, keyless and without keyway.

- Optional shaft with key and keyway: half-key balancing.

Note: The brake configuration does not alter the dimensions.



FAGOR Brushless AC Motors - FKM series (400 V)

	Stall torque (Nm)	Peak torque (Nm)	Stall current					Inertia (Kg.cm <sup>2</sup> )	Weight (Kg.)
			3000 rpm.	4000 rpm.	4500 rpm.	5000 rpm.	6000 rpm.		
			I <sub>0</sub> (Amp.)						
FKM 21	1.7	7					2.8	1.6	4.2
FKM 22	3.2	13	2.4				4	2.9	5.3
FKM 42	6.3	25	4.6		6.9			8.5	7.8
FKM 44	11.6	47	8.2	10.7				16.7	11.7
FKM 62	8.9	35	7.1	9.3				16	11.9
FKM 64	16.5	66	12.11	16.2				29.5	17.1
FKM 66	23,5	94	16,4					43	22,3

## FAGOR Brushless AC Servomotors FXM series



- This series of synchronous permanent-magnet motors (SmCo) offers unmatched dynamic characteristics, sturdiness and great acceleration capability.

- Velocity feedback may be handled via encoder. It may also have a brake as an option.

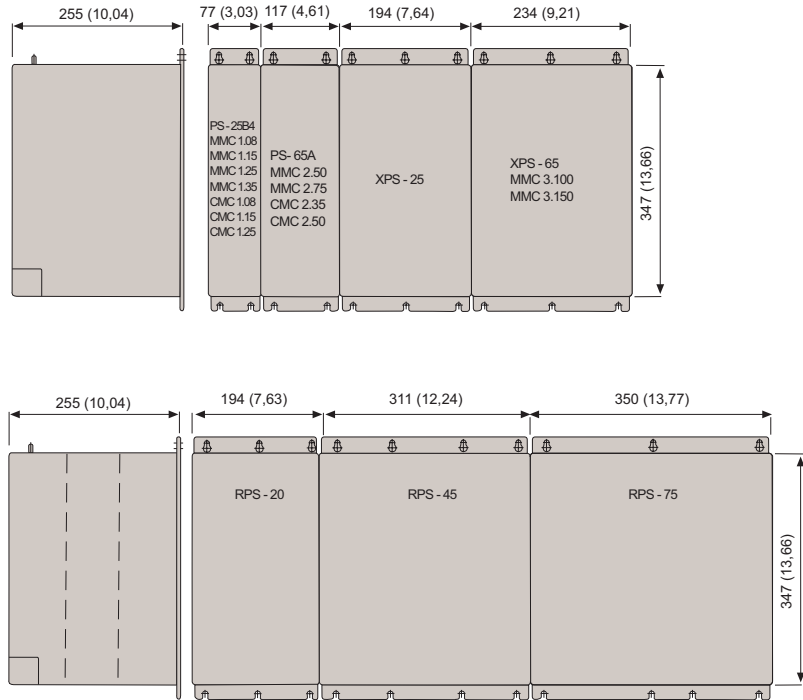
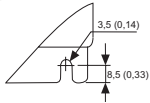
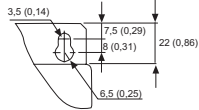
	Stall torque (Nm)	Peak torque (Nm)	Stall current				Inertia (Kg.cm <sup>2</sup> )	Weight (Kg.)
			1200 rpm.	2000 rpm.	3000 rpm.	4000 rpm.		
			I <sub>0</sub> (Amp.)					
FXM 11	1.2	6		0.45	0.67	0.9	1.2	3.3
FXM 12	2.3	11		0.86	1.29	1.72	1.9	4.3
FXM 13	3.3	16		1.23	1.85	2.5	2.6	6.4
FXM 14	4.1	20		1.55	2.3	2.1	3.3	7.6
FXM 31	2.6	13		0.97	1.45	1.92	3.5	5.5
FXM 32	5.1	25		1.89	2.8	3.8	6	7.5
FXM 33	7.3	36		2.7	4.1	5.5	8.5	9.6
FXM 34	9.3	46		3.4	5.1	6.9	11	11.5
FXM 53*	11.9	59	2.8	4.7	7.1	9.3	22	15.8 (20)
FXM 54*	14.8	74	3.5	5.9	8.7	11.8	29	17.8 (22)
FXM 55*	17.3	86	4.1	6.7	1.3	14.1	36	20 (24)
FXM 73*	20.8	104	4.9	8.2	12.3	16.5	61	29 (33)
FXM 74*	27.3	135	6.6	11.1	16.2	22.1	79	31.6 (36)
FXM 75*	33.6	165	8	13.3	19.9	26.6	97	36 (40)
FXM 76*	39.7	195	9.4	15.7	23.6	32.1	115	40 (44)
FXM 77*	45.6	225	11	17.8	29	36.6	133	43 (47)
FXM 78*	51.1	255	12.6	20.7	28.4	42.7	151	47 (51)

(\* Motor sizes 5 and 7 can provide about 50% higher torque with their optional electro-ventilation.

Note: See manual to select the peak torque in combination with the drive.

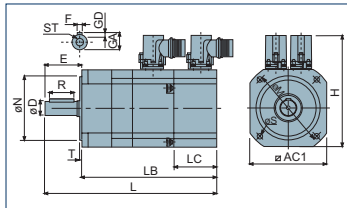
## Compact System (CMC) and Modular System (MMC)

Dimensions in mm



## FAGOR Synchronous Brushless AC Motors. FKM series

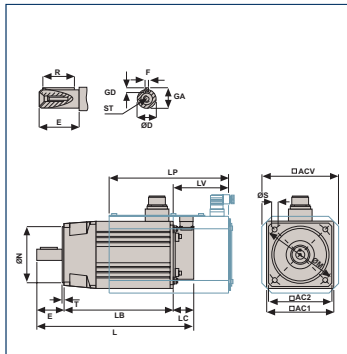
Dimensions in mm



TYPE	L	E	LB	LC	T	AC1	M	N	H	S	D	GA	GD	F	R	ST
FKM 21	208	40	168		3	97	100	80 j6	139.5	7	19 j6	21.5	6	6	30	M6x16
FKM 22	232		192													
FKM 42	247	50	197	54	3.5	126	130	110 j6	168.5	9	24 j6	27	7	8	40	M8x19
FKM 44	289		239													
FKM 62	260		202		158	165	130 j6	200.5	12	32 k6	35	8	10	50	M10x22	
FKM 64	296	58	238													
FKM 66	332		274													

## FAGOR Brushless AC Servomotors. FXM series

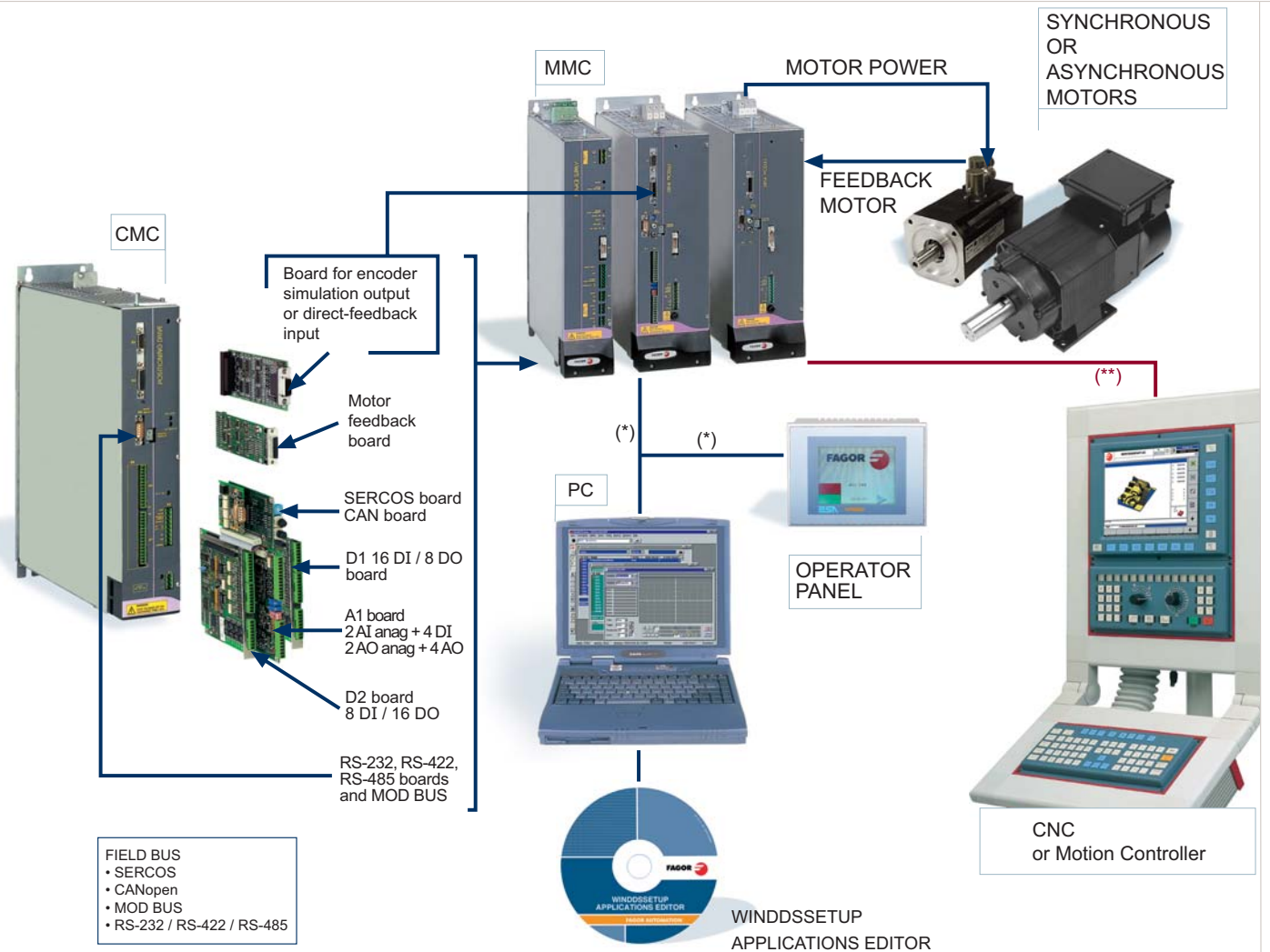
Dimensions in mm



TYPE	E	LB	BR (1)	T	AC1	AC2	M	N	S	D	GA	GD	F	R	ST	LP (2)	LV (2)	ACV (2)	LC (Encoder)			
FXM 11		136																				
FXM 12	30	171	25	3	86	80	100	80 J6	7	14 J6	16	5	6	20	M5 x 12.5							
FXM 13		206																				
FXM 14		241																				
FXM 31		152																				
FXM 32	40	187	23	3	114	105	115	95 J6	10	19 J6	21.5	6	6	30	M6 x 16							
FXM 33		222																				
FXM 34		257																				
FXM 53		237																				
FXM 54	50	272	28	3.5	145	130	165	130 J6	12	24 J6	27	7	8	40	M8 x 19	259	128	165	46			
FXM 55		307																				
FXM 73		256																				
FXM 74		291																				
FXM 75	58	321	41	4	185	180	215	180 J6	15	32 K6	35	8	10	50	M10 x 22	303	128	205				
FXM 76		361																				
FXM 77		396																				
FXM 78		431																				

(1) Add BR to the LB dimensions for motors with a brake.  
 (2) Only on electro-ventilated models.

## Configuration and electrical connection



(\*) Through RS-422, RS-232, RS-485 and MOD BUS

(\*\*) Analog interface or SERCOS

## Operator panel

The option for RS-232/422/485 and field bus communication, provide the best way for the panel to communicate with another one or with several servo drives offering numerous functions such as:

- PLC I/O control
- Modify variables and constants
- Show messages for alarm and dynamic display process, etc.

Types of Operator Panels available: Text, graphics/keyboard and graphics with a touch membrane. A programming KIT is available for customizing it.



## Other FAGOR products for motion control:

- 1 Multiaxis Motion Controller
- 2 Innova Intelligent Servo Drive System MCSi-MCPi Series Drives and FS Series Motors
- 3 FAGOR intelligent servo drive system, MCS-MCP-ACSD series
- 4 Asynchronous spindle motors: FM7
- 5 FAGOR feedback systems:
  - Absolute linear encoders
  - "Exposed" series linear encoders
  - High resolution rotary encoders



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