

# FAGOR AUTOMATION

Ordering Handbook

# CNC 8060/70 LASER

Ref.1704

Original instructions



FAGOR AUTOMATION

## DENOMINATIONS

## CNC 8060 LASER

C60 - 10K - L - B1S - .4 - 111 - - -

CNC	
Central Unit in Operator Panel	C60
Monitor Type	
10" LCD + Keyboard	10K
Type of function	
Laser	L
Processor	
Basic processor	B1
Interface	
Sercos - CAN I/O	S
Axes	From 3 to 6
Max. interpolated axes	4
Spindles	1
Magazines	1
Channels	1

01 Internal code

Advanced software

- Standard software
- AV Advanced software

Software options (1)

- B C axis
- g High speed machining (HSSA I)
- H Tandem axes
- N Synchronism
- r Third Party CANopen
- Z PWM Control
- e Tool radius compensation
- Profile editor
- I RTCP

## CNC 8070 LASER

- - L - S - - - - - - - -

CNC	
Central Unit in Operator Panel	C70
Central Unit for Cabinet	U70
Monitor type if C70	
10" LCD + Keyboard	10K
15" LCD	15
15" LCD Touch Screen	15T
Central Unit type if U70	
Modular	M
Type of function	
Laser	L
Processor	
Basic Processor	B
High level Processor	P
Compact Flash	
4 GB	4
8 GB	8
32 GB	32
Interface	
Sercos-CAN I/O	S
Windows	
XP	-
W7	7
W7 Multitouch	7A
Axes	From 3 to 28
Spindles	From 1 to 6
Magazines	From 1 to 4
Channels	From 1 to 4

MDU Dual-use products (2)

05 Internal code

Advanced software

- Standard software
- AV Advanced software

Software options (1)

- A Up to 4 interpolated axes
- B Tool Radius Compensation
- C High speed machining (HSSA II)
- E Profile Editor
- H C axis
- I Tandem axes
- J Synchronism
- K Tangential control
- M RTCP
- R Open system
- r Third Party CANopen
- V Volumetric com. (FVC) up to 10 m3
- W Volumetric com. (FVC) more than 10 m3
- Z PWM Control

(1) Depends on the type of function

(2) Products manufactured by FAGOR AUTOMATION since April 1st 2014 will include "-MDU" in their identification if they are included on the list of dual-use products according to regulation UE 428/2009 and require an export license depending on destination.

## 8070 CNC LASER

## CENTRAL UNIT



(a)

Code	Model	Description	
83701025	8070-L-ICU-RS	Integrate Central Unit for Laser	(a)
83701035	8070-L-MCU-RS	Modular Central Unit for Laser	(b)

## Central Unit components



(b)

Code	Model	Description	
83700065	SER-CAN-8I-8IO-A	Sercos-Can module	(1)
83700200	MP-BASIC-4	Basic Processor	(2)
83700201	MP-PLUS-4	High level Processor	
83701061	CF-DMA-4GB	4 GB Compact Flash for Basic Processor	(2)
83701059	CF-DMA-8GB	8 GB Compact Flash for Basic Processor	
83701062	CF-DMA-32GB	32 GB Compact Flash for Basic Processor	
83701090	CF-DMA-B7-4GB	4 GB Win7 Compact Flash for Basic Processor	
83701091	CF-DMA-B7-8GB	8 GB Win7 Compact Flash for Basic Processor	
83701092	CF-DMA-B7-32GB	32 GB Win7 Compact Flash for Basic Processor	
83701064	CF-DMA-P-4GB	4 GB Compact Flash for High level Processor	
83701066	CF-DMA-P-8GB	8 GB Compact Flash for High level Processor	
83701065	CF-DMA-P-32GB	32 GB Compact Flash for High level Processor	
83701081	CF-DMA-P7-8GB	8 GB Win 7 Compact Flash for High level Processor	
83701080	CF-DMA-P7-32GB	32 GB Win 7 Compact Flash for High level Processor	

(1) Required always

(2) Choose one of them

## MONITOR &amp; OPERATOR PANEL

## 10.4" LCD and Operator Panel



Code	Model	Description
83600004	MONITOR-LCD-10K-001	10" LCD Monitor + Keyboard

## 15" LCD, Keyboard and Operator Panel

## Monitor (choose one of them)

Code	Model	Description	
83700053	MONITOR-LCD-15	15" LCD monitor	(1)
83700054	MONITOR-LCD-15-TOUCH	15" LCD Touch Screen monitor	

## Keyboard (choose one of them)

Code	Model	Description	
83760020	HORIZONTAL KEYB	Horizontal Qwerty keyboard	(2)
83760021	HORIZONTAL KEYB+MOUSE	Horizontal Qwerty keyboard with mouse	
83760022	VERTICAL KEYB	Vertical alphanumeric keyboard	(3)
83760023	VERTICAL KEYB+MOUSE	Vertical alphanumeric keyboard with mouse	

## Operator Panel (choose one of them)

Code	Model	Description	
83760024	OP PANEL	JOG Panel	(4)
83760025	OP PANEL+SPDL RATE	JOG Panel with Spindle override	



(1)



(2)



(4)



(1)

(3)



(4)

## 8060 CNC LASER

### CENTRAL UNIT



#### 8060 CNC with 10.4" LCD and Operator Panel

Code	Model	Description
83600021	8060-L-ICU	Integrate Central Unit for Laser

#### Central Unit components

Code	Model	Description
83600031	MP-601	MP-601 Microprocessor
83600050	8060-SERCOS-2	Sercos module

### MONITOR & OPERATOR PANEL



#### 10.4" LCD and Operator Panel

Code	Model	Description
83600004	MONITOR-LCD-10K-001	10" LCD Monitor + Keyboard

## SOFTWARE OPTIONS

			8060 L			8070 L		
MONITOR			10K			10K / 15 / 15T		
PROCESSOR			MP-601			MP-Basic MP-Plus		
COMPACT FLASH (GB)			(-)			4, 8, 32		
AXES			3 .. 6			3 .. 31		
INTERPOLATED AXES			4			3 .. 31		
SPINDLES			1			1 .. 6		
MAGAZINES			1			1 .. 4		
CHANNELS			1			1 .. 4		
MAX. AXES + SPINDLES			7			32		
SOFT ADDIT AXES			83600076		( )	83740030		( )
SOFT ADDIT SPINDLES					(-)	83740031		( )
SOFT ADDIT TOOL MAGAZ					(-)	83740032		( )
SOFT ADDIT CHANNELS					(-)	83740033		( )
SOFT 4 AXES INTERPOLATION LIMIT					(-)	83740008	A	( )
SOFT TOOL RADIUS COMP			83740011	b	( )	83740011	B	( )
SOFT EDIT/SIMUL					(A)			(A)
SOFT PROFILE EDITOR			83740018	e	( )	83740018	E	( )
SOFT DIGITAL SERCOS					(A)			(A)
SOFT PROBE					(A) (1)			(A) (1)
SOFT C AXIS			83600080	B	( )	83740010	H	( )
SOFT HSSA II MACHINING SYSTEM					(-)	83740013	C	( )
SOFT 60 HSSA I MACHINING SYSTEM			83600101	g	( )			(-)
SOFT TANDEM AXES			83600094	H	( )	83740034	I	( )
SOFT SYNCHRONISM			83600092	N	( )	83740035	J	( )
SOFT TANGENTIAL CONTROL					(-)	83740012	K	( )
SOFT RTCP			83600086	I	( )	83740009	M	( )
SOFT OPEN SYSTEM					(-)	83740043	R	( )
SOFT THIRD PARTY CANOPEN			83740065	r	( )	83740065	r	( )
SOFT FVC UP TO 10 m3					(-)	843740078	V	( ) (2)
SOFT FVC MORE 10 m3					(-)	843740079	W	( ) (2)
SOFT GAP CONTROL					(A)			(A)
SOFT PWM CONTROL			83600099	Z	( )	843740062	Z	( )

(A)	Standard feature, always active
( )	Optional Feature
(-)	Not available

(1) Only functions G100 to G104 included, probing canned cycles excluded.

(2) MP-PLUS processor required.

## SOFTWARE DESCRIPTIONS

### Compact Flash (GB) (8070 CNC only)

It may be of 4GB, 8GB or 32 GB. It must be present in all the configurations. By default, the option with the least capacity is always offered, the 4GB compact by default.

### SOFT 4 AXES INTERPOLATION LIMIT (8070 CNC only)

It limits the number of axes that may be interpolated at the same time. When having this software option, they can interpolate a maximum of 4 axes at the same time.

### SOFT TOOL RADIUS COMP

Tool compensation allows programming the contour to be machined based on part dimensions and without taking into account the dimensions of the tool that will be used later on. This avoids having to calculate and define the tool path depending on the radius of the tool.

### SOFT EDIT/SIMUL (Standard on all models)

It allows editing, modifying and simulating a part-program.

### SOFT PROFILE EDITOR

It allows editing part profiles graphically and importing DXF files.

### SOFT DIGITAL SERCOS (Standard on all models)

Sercos drive system bus.

### SOFT PROBE

The CNC may have two probes; usually a tabletop probe to calibrate tools and a measuring probe to measure the part. It also offers functions G100 to G104 for programming probing moves; but the probing canned cycles are **not** included.

### SOFT C AXIS

It activates the kinematics for working with C axis and their associated machining cycles.

The 8070/60 CNC may be used with several C axis. The parameters of each spindle indicate whether it will work as a C axis or not and it won't be necessary to activate another axis in the machine parameters.

### SOFT HSSA MACHINING SYSTEM (HSSA I) (8060 CNC only)

### SOFT HSSA MACHINING SYSTEM (HSSA II) (8070 CNC only)

The acronym "HSSA" means High Speed Surface Accuracy. It is the new improved version of HSC (High Speed Cutting).

HSSA algorithm calculations make it possible to optimize high speed machining. This achieves higher cutting speeds, smoother contours, better surface finish and higher accuracy.

This system is now offered in two levels, according to the CNC models, providing a choice between the **HSSA I** system in the CNC 8060 and the **HSSA II** system in the CNC 8070, which has more resources for faster speed.

### SOFT TANDEM AXES

A tandem axis consists in two motors mechanically coupled (slaved) and making up a single transmission system (axis or spindle). This system is normally used to move the axes on large machines.

The CNC configuration contemplates both axes of the tandem. Only an axis is programmed (the master tandem). The other one (the slave tandem) cannot be programmed, but it is controlled by the CNC.

When activating this feature, it must be borne in mind that for each Tandem axis of the machine, another axis must be added to the whole configuration of the machine. For example, on a large 3-axis lathe (XZ and tailstock), if the tailstock is a Tandem axis, the final purchase order for the machine must indicate 4 axes.

### SOFT SYNCHRONISM

**LASER PATH COMPENSATION:** This is one of the typical functionalities on CO2 laser machines, used to keep the overall laser path constant to prevent variations in beam dispersion at the cutting point of the sheet. This feature is implemented using a special type of synchronization.

### SOFT TANGENTIAL CONTROL (8070 CNC only)

"Tangential Control" Keeps a rotary axis always in the same orientation with respect to the programmed path. The machining path is defined in the axes of the active plane and the CNC keeps the orientation of the rotary axis along the whole path.

### SOFT RTCP

The "DYNAMIC RTCP" option is a must for machining in RTCP (Rotating Tool Center Point) with 4, 5 or 6-axis interpolation.

## SOFTWARE DESCRIPTIONS

### SOFT OPEN SYSTEM (8070 CNC only)

The CNC is a closed system that offers all the features needed to machine parts. However, sometimes, specific customers use third-party applications for taking measurements, doing statistics or running other tasks besides machining a part.

This feature must be active when installing this type of applications, even if it is an Office file. Once the application has been installed, it is recommended to close the CNC back in order to prevent the operators from installing other kinds of applications that could slow the system down and affect the machining operations.

### SOFT THIRD PARTY CANOPEN

Enables the use of CANOpen non-Fagor modules.

### SOFT FVC UP TO 10 m3 (8070 CNC only)

### SOFT FVC MORE 10 m3 (8070 CNC only)

5-axis machines are usually used to make large parts. The accuracy of the parts is limited by the machine manufacturing tolerances and by the effect of temperature while machining.

In industries like aerospace, the machining demands render the classical compensation tools insufficient.

Volumetric compensation FVC comes in to complement the machine adjusting tools. By mapping the total work volume of the machine, the CNC knows the exact position of the tool at all times. After applying the necessary compensations, the resulting part has the desired accuracy and tolerance.

There are 2 choices depending on the size of the machine, up to 10 m3 and over 10 m3. This feature is only available on the 8070 CNC model.

This feature requires a MP-PLUS (High level Processor).

### SOFT GAP CONTROL (Standard on all models)

Functionality that makes it possible to maintain a set distance between the laser nozzle and the surface of the sheet (GAP).

The CNC is in charge of compensating for the existing undulations on the surface of the sheet to ensure the optimal positioning of the laser nozzle at all times.

### SOFT PWM CONTROL

This feature is only available with Sercos drive system bus. Aimed mainly at Laser machines for cutting very thick sheet metal.

The CNC generates a series of PWM pulses to control the power of the Laser when drilling the starting point. This feature is a must for cutting very thick sheet metal and requires two quick outputs available at the module "SER-CAN-8I-8IO-A (83700065)" of the central unit of the CNC 8070.

With this new feature, the OEM does not need to install external devices and programming them, thus reducing the cost of the machine and installing time. The end user also benefits because the "Cutting with PWM" feature is much easier to use and program.

ACCESORIES

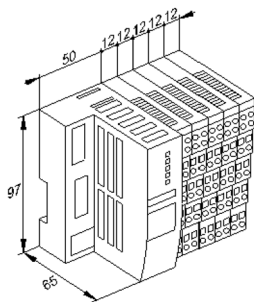
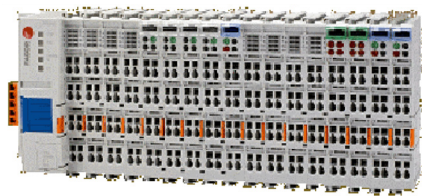
Code	Model	Description
83760005	CNC FPU	Fagor Power Unit
83700075	TRANSP-KEYS & EXTRACTOR	20 transparent key caps and an extractor tool
83700076	TRANSP-KEYS	20 transparent key caps
83700077	WHITE-KEYS	20 white key caps

REMOTE I/O MODULES

Are easy to install, they can be mounted at strategic points of the machine for having extra inputs and outputs distributed next to each device. They are distributed in groups and are connected to the central unit through the CAN bus.

REMOTE MODULES - RIOW serie

RIOW series. Remote modules with CANopen protocol



Header CANopen.....	RIOWCANOPENSTAND.....	03300010
Expansion module with 8 digital inputs.....	RIOW 801-51205053.....	03300008
Expansion module with 8 digital outputs.....	RIOW 800-51205043.....	03300007
Expansion module with 4 analog inputs.....	RIOW 4AI-51205050.....	03300006
Expansion module with 4 analog outputs (12 bits).....	RIOW 4AO-51205039.....	03300005
Expansion module with 2 PT100 inputs.....	RIOW 2AI PT100-51205048.....	03300004
24V0c 10A power supply for the modules.....	RIOW PS24-51205036.....	03300003
Line terminating module.....	RIOW END-51205037.....	03300000

REMOTE MODULES - RIOR serie

RIOR series. Remote modules with CANopen protocol



RIOR-48I32O.....	83720200
Module with 48 digital inputs and 32 digital outputs	
RIOR-4AI2AO.....	83720201
Module with 4 analog inputs and 2 analog outputs (16 bits)	

REMOTE MODULES - RCS-S

RCS-S series. Remote counter Station - Sercos protocol



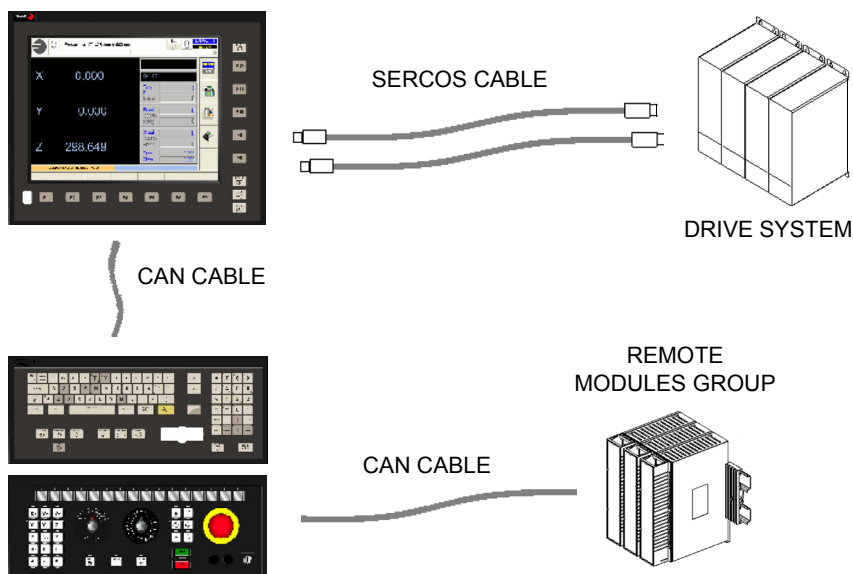
RCS-S-4F4AO.....	83720500
Module with 4 feedback inputs and 4 analog outputs	



## SELECT THE CABLES NECESSARY FOR EACH CONFIGURATION

### CENTRAL UNIT IN OPERATOR PANEL

Ready Made cables for CAN Bus (CAN CABLE) and Sercos ring (SFO & SFO-FLEX).



### DRIVE System

Each drive module having the Sercos interface option offers a small cable for connecting it to the adjacent module. Only the lines going to the CNC (Back and forth) or the ones joining the far between modules.

### SERCOS cables

#### Sercos optic fiber

1m	<b>SFO-1</b> .....	03900001
2m	<b>SFO-2</b> .....	03900002
3m	<b>SFO-3</b> .....	03900003
5m	<b>SFO-5</b> .....	03900005
7m	<b>SFO-7</b> .....	03900007
10m	<b>SFO-10</b> .....	03900010
12m	<b>SFO-12</b> .....	03900012

#### Flexible Sercos optic fiber

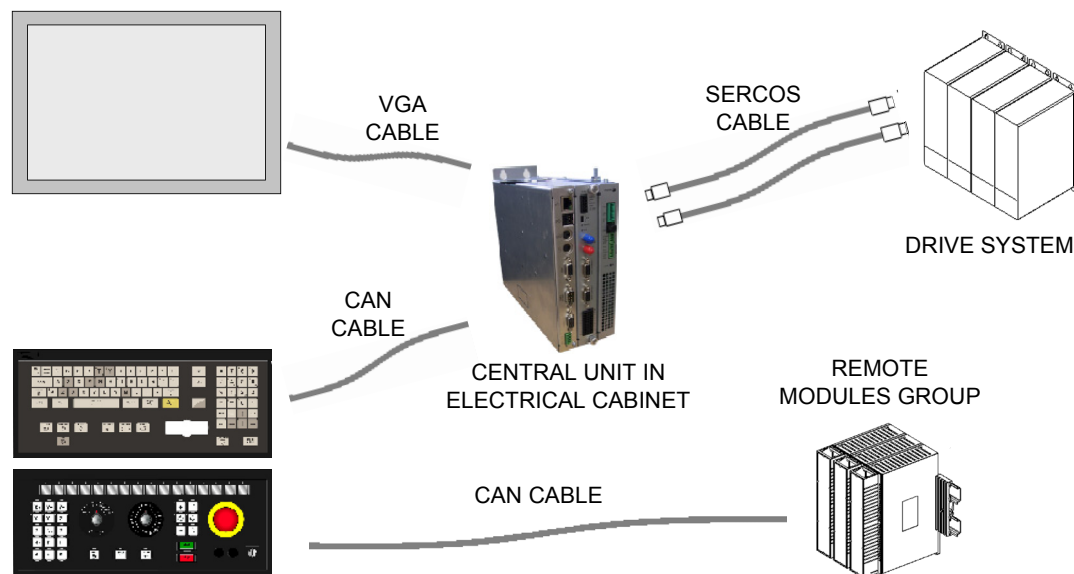
10m	<b>SFO-FLEX-10</b> .....	03910010
15m	<b>SFO-FLEX-15</b> .....	03910015
20m	<b>SFO-FLEX-20</b> .....	03910020
25m	<b>SFO-FLEX-25</b> .....	03910025
30m	<b>SFO-FLEX-30</b> .....	03910030
35m	<b>SFO-FLEX-35</b> .....	03910035
40m	<b>SFO-FLEX-40</b> .....	03910040
40m	<b>SFO-V-FLEX-40</b> .....	03920040
50m	<b>SFO-V-FLEX-50</b> .....	03920050
60m	<b>SFO-V-FLEX-50</b> .....	03920060
75m	<b>SFO-V-FLEX-75</b> .....	03920075
100m	<b>SFO-V-FLEX-100</b> .....	03920100

### CAN cable for Remote I/Os

5m	<b>CAN CABLE 5M</b> .....	03780100
10m	<b>CAN CABLE 10M</b> .....	03780101
15m	<b>CAN CABLE 15M</b> .....	03780102
20m	<b>CAN CABLE 20M</b> .....	03780103
25m	<b>CAN CABLE 25M</b> .....	03780104
30m	<b>CAN CABLE 30M</b> .....	03780106
35m	<b>CAN CABLE 35M</b> .....	03780107
40m	<b>CAN CABLE 40M</b> .....	03780108
45m	<b>CAN CABLE 45M</b> .....	03780109
50m	<b>CAN CABLE 50M</b> .....	03780110
75m	<b>CAN CABLE 75M</b> .....	03780111
100m	<b>CAN CABLE 100M</b> .....	03780112
150m	<b>CAN CABLE 150M</b> .....	03780113

## CENTRAL UNIT IN ELECTRICAL CABINET

Ready Made cables for passive monitor, CAN Bus (CAN CABLE) and Sercos ring (SFO & SFO-FLEX).



### DRIVE System

Each drive module having the Sercos interface option offers a small cable for connecting it to the adjacent module. Only the lines going to the CNC (Back and forth) or the ones joining the far between modules.

### SERCOS cables

#### Sercos optic fiber

1m	<b>SFO-1</b> .....	03900001
2m	<b>SFO-2</b> .....	03900002
3m	<b>SFO-3</b> .....	03900003
5m	<b>SFO-5</b> .....	03900005
7m	<b>SFO-7</b> .....	03900007
10m	<b>SFO-10</b> .....	03900010
12m	<b>SFO-12</b> .....	03900012

#### Flexible Sercos optic fiber

10m	<b>SFO-FLEX-10</b> .....	03910010
15m	<b>SFO-FLEX-15</b> .....	03910015
20m	<b>SFO-FLEX-20</b> .....	03910020
25m	<b>SFO-FLEX-25</b> .....	03910025
30m	<b>SFO-FLEX-30</b> .....	03910030
35m	<b>SFO-FLEX-35</b> .....	03910035
40m	<b>SFO-FLEX-40</b> .....	03910040
40m	<b>SFO-V-FLEX-40</b> .....	03920040
50m	<b>SFO-V-FLEX-50</b> .....	03920050
60m	<b>SFO-V-FLEX-50</b> .....	03920060
75m	<b>SFO-V-FLEX-75</b> .....	03920075
100m	<b>SFO-V-FLEX-100</b> .....	03920100

### CAN cable for Remote I/Os

5m	<b>CAN CABLE 5M</b> .....	03780100
10m	<b>CAN CABLE 10M</b> .....	03780101
15m	<b>CAN CABLE 15M</b> .....	03780102
20m	<b>CAN CABLE 20M</b> .....	03780103
25m	<b>CAN CABLE 25M</b> .....	03780104
30m	<b>CAN CABLE 30M</b> .....	03780106
35m	<b>CAN CABLE 35M</b> .....	03780107
40m	<b>CAN CABLE 40M</b> .....	03780108
45m	<b>CAN CABLE 45M</b> .....	03780109
50m	<b>CAN CABLE 50M</b> .....	03780110
75m	<b>CAN CABLE 75M</b> .....	03780111
100m	<b>CAN CABLE 100M</b> .....	03780112
150m	<b>CAN CABLE 150M</b> .....	03780113

### VGA cable for passive Monitor

15m	<b>CABLE VGA 15M</b> .....	03780215
20m	<b>CABLE VGA 20M</b> .....	03780220
30m	<b>CABLE VGA 30M</b> .....	03780230

## UPGRADES

Code	Model	Description
83701100	CF-DMA-B7- 4GB UPG (RF)	4GB Win 7 Compact Flash for Basic Processor
83701101	CF-DMA-B7- 8GB UPG (RF)	8GB Win 7 Compact Flash for Basic Processor
83701102	CF-DMA-B7- 32GB UPG (RF)	32GB Win 7 Compact Flash for Basic Processor
83701103	CF-DMA-P7- 8GB UPG (RF)	8GB Win 7 Compact Flash for High level Processor
83701104	CF-DMA-P7- 32GB UPG (RF)	32GB Win 7 Compact Flash for High level Processor

## MANUALS

The manuals of the CNC may be downloaded from our FAGOR corporate website.  
<http://www.fagorautomation.com>

Fagor Automation shall not be held responsible for any printing or transcribing errors in the Ordering Handbook and reserves the right to make any changes to the characteristics of its products without prior notice. You must always compare the data with that appearing in the manual.

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