

FAGOR

101/101S/102/102S CNCs

The Solution to the Automation and Control Systems of 1 and 2 Axes



- DNC Communication, via RS-232 C:
 - Upload/download of Programs, Machine parameters, etc.
 - Monitoring of Coordinates, Arithmetic Parameters and Inputs/Outputs.
 - Keyboard simulation.
 - Execution of commands.
- Trapezoidal and sinusoidal acceleration/deceleration ramps.
- Optional External Feedrate Override Switch with connections for JOG keys.
- Operating Modes: Automatic, Single block, Editor, Teach-In, JOG, Play-Back, Special and Peripherals.
- Programming by manufacturing lots (length, number of parts).
- Linear and circular interpolation (102/102S models).
- Rigid tapping.
- Closed loop control for servo systems or control of standard AC motors via logic signals for contactors.
- Leadscrew backlash compensation.
- Synchronized axes G33.
- 18 inputs and 24 outputs to be configured according to the application.
- RS-485 to communicate with a PLC 64 or with an 8025 CNC via FAGOR Local Area Network (LAN).
- Feedback correction Factor.



FAGOR 101/101S/102/102S CNCs

**Adaptable to numerous applications,
thanks to its 120 machine parameters**

The versatility and great managing capability of these CNC, make them the ideal element for applications such as:

- Cyclic sheetmetal and cardboard feeders
- Transfer machines, grinders.
- Forming machines.
- Sheetmetal, tubing and profile cutters.
- Punch presses and shears.
- Indexers.
- Saws, polystyrene cutters.
- Portal type handlers.
- Label printing machines, etc.
- Textile machinery.
- Packaging machines.
- Thermal molding machines.
- Wood, marble, glass, etc. working machines.

When installed with the servo systems offered by FAGOR they become the perfect match for any special machine requiring rapid and precise positioning while offering undeniable advantages:

- Simple operation.
- Simple installation.
- Excellent quality/price/feature ratio.
- High reliability and environmental protection.

General characteristics

The FAGOR 101/101S/102/102S CNCs gather in a single product, which can be integrated inside the electrical cabinet of the machine, the most powerful and simple operative characteristics of a CNC of 1 or 2 axes:

- Maximum feedback counting frequency: 200 KHz.
- Preset and count: Up to ± 99999.99 mm. ($\pm 84546.60''$).
- Feedback Resolution: from 0.0001 mm. up to 0.255 mm.
- Linear or rotary axes (Rollover, HIRTH).
- Analog outputs: 2 (101/101S), 3 (102/102S).
- Feedback alarms.
- Programmable Feedrate: Up to 650 m./min. (25590 inches/min.).
- Leadscrew backlash compensation: Up to 0.255 mm. (0.01 inch.).
- Error codes.

- ISO language programming (also parametric).
- 100 arithmetic parameters for mathematic and conditional operations.
- Continuous/non-continuous axis control possibility.
- A.C. Supply voltage: 100/120/220/240 VAC.
- A.C. Supply frequency: 50/60 Hz.
- Rechargeable battery.
- Approximate consumption: 50 VA.
- Operating temperature: 5°C... 45°C (40°F...110°F).
- Storage temperature: -25°C... + 70°C (-12°F... 158°F).
- Relative humidity: 20... 80% (45°F 110°F... 80%; 40°C 110°F... 95%).
- Weight: 5 Kg.

Options

JOG 100



External Feedrate Override Switch that offers:

- 3 positions for Electronic Handwheel: 1, 10 and 100.
 - 4 positions for incremental JOG: 1, 10, 100 and 1000.
 - 9 positions for Feedrate Override: 0%, 12%, 25%, 50%, 75%, 100%, 125%, 150%, 200%.
- It also has connections for push-buttons from the operator panel:
- JOG (X+, X-, Y+, Y-).
 - Spindle (M3, M4, M5).
 - CNC/Panel (Manual) selector switch.

DNC 100



The DNC 100 is a software package that allows CNC <-> PC communications via RS-232 C.

The functions possible from the computer are:

- Upload/download of programs, parameters, tables, etc.
- Execution of commands.
- Monitoring of coordinates, inputs/outputs, Status, etc.
- Keyboard simulation.

Great application possibilities

INTERFACE	101	101S	102	102S
FEEDBACK INPUTS	1	2	2	2
ANALOG OUTPUTS	2	2	3	3
INPUTS/OUTPUTS	1804	1804	1804	1804
RS-232 C/RS-485		•	•	•

APPLICATION POSSIBILITIES	101	101S	102	102S
1 AXES	•	•		
1 AXES PLUS HANDWHEEL		•	•	•
2 AXES				•
1 AXES WITH DUAL FEEDBACK		•		
CONNECTION TO JOG 100		•		•
SPINDLE	•	•	•	•
DNC 100		•		•
CONNECTION TO PLC IN CNC 101S		•	•	•
CONTROL OF A.C. MOTORS	•		•	

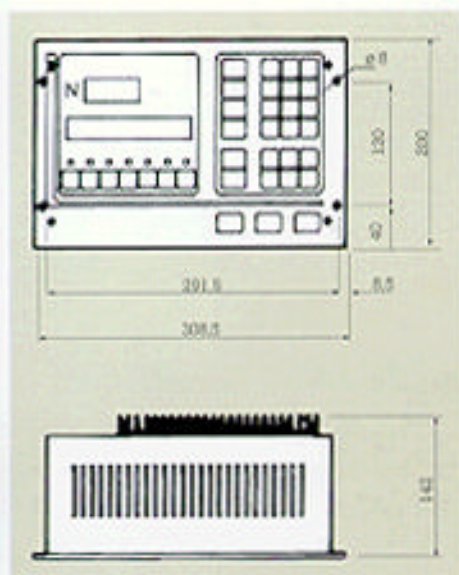


Arithmetic operations

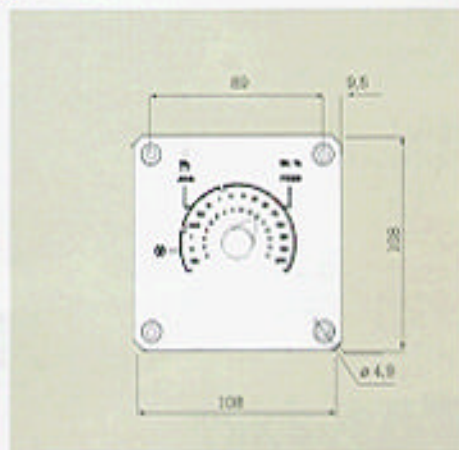
- F1 Addition.
- F2 Subtraction.
- F3 Multiplying.
- F4 Division.
- F5 Square root.
- F6 $\sqrt{A^2 + B^2}$
find hypotenuse.
- F7 Sine.
- F8 Cosine.
- F9 Tangent.
- F10 Arc Tangent.
- F11 Comparison (<, =, >).
- F12 Integer value.
- F13 Integer + 1.
- F14 Integer - 1.
- F15 Absolute Value.
- F16 Invert sign.

Dimensions (mm.)

101/101S/102/102S CNC



JOG 100



Programming

PROGRAMING	101	101S	102	102S
NUMBER OF BLOCKS	1000	900	900	900
FUNCTIONS PER BLOCK	1	1	1	1
FUNCTIONS ADMITTED IN THE BLOCK	X, M, G, N, F, S	X, M, G, N, F, S, R, K, T, E	X, Y, M, G, N, F, S, I, J, P, K, T, E	X, Y, M, G, N, F, S, I, J, P, K, T, E
CONDITIONAL BLOCKS	•	•	•	•
FIXED COUNTER	•	•	•	•
LOT PROGRAMING		•		•
ARITHMETIC PARAMETERS		100	100	100
ARITHMETIC OPERATIONS		•	•	•

Function description

X, Y	• COORDINATES
M	• SPECIAL FUNCTIONS (DRUM, MMS), • BCD OR DECODED FUNCTIONS • THE DECODED M FUNCTIONS MAY BE MAINTAINED OR NOT
N	• JUMPS (TO A BLOCK NUMBER) • REPEITION OF PROGRAM SECTIONS
F	• FEEDRATE
S	• SPINDLE SPEED (ANALOG OUTPUT OR BCD)
I, J	• ARC CENTER ON CIRCULAR INTERPOLATION
P	• PARAMETRIC FUNCTIONS (UP TO 100 PARAMETERS)
K	• CONSTANT
E	• PROGRAMMABLE INPUT READING
T	• ZERO OFFSET/TOOL COMPENSATION
O	• PREPARATORY FUNCTIONS

Preparatory functions

FUNCTION	DESCRIPTION	101	101S	102	102S
O00	STOP MODE		•	•	•
O01	LINEAR INTERPOLATION		•	•	•
O02	CLOCKWISE CIRCULAR INTERPOLATION			•	•
O03	COUNTER-CLOCKWISE CIRCULAR INTERPOLATION			•	•
O04	DRILL	•	•	•	•
O05	ROUND CORNER	•	•	•	•
O07	SQUARE CORNER	•	•	•	•
O08	UNCONDITIONAL END	•	•	•	•
O09	ENDS IF = 0	•	•	•	•
O10	ENDS IF NOT = 0	•	•	•	•
O11	ENDS IF < 0	•	•	•	•
O12	ENDS IF > OR = 0	•	•	•	•
O13	SYNCHRONISM	•			
O16	INCREMENTAL PARTS COUNTER	•	•	•	•
O47	FEEDBACK INHIBIT	•	•	•	•
O50 / O50	OFFSET LOADING		•	•	•
O60 / O60	FEEDRATE OVERRIDE	•	•	•	•
O70 / O71	NOVMM CONVERSION	•	•	•	•
O74	HOME SEARCH	•	•	•	•
O75	PROBING	•	•	•	•
O81	LOT PROGRAMING		•		
O84	END TRAPING		•		
O90 / O91	ABSOLUTE INCREMENTAL COUNTING	•	•	•	•
O96	PROSET	•	•	•	•
O99	ACCELERATION/DECELERATION RAMP	•	•	•	•

General Characteristics

CHARACTERISTICS	101	101S	102	102S
AXIS POSITIONING	1	1	2	2
000 POSITIONING		•	•	•
LINEAR INTERPOLATION (LI)		•	•	•
CIRCULAR INTERPOLATION (CIR)			•	•
OPERATION IN OPEN VELOCITY LOOP	•		•	
OPERATION IN CLOSED LOOP	•	•	•	•
A.C. MOTORS			•	•
X-MULTIPLYING CIRCUIT (WITH SINEWAVE SIGNAL)		•	•	•
PARAMETRIC PROGRAMING		•	•	•
FEEDBACK CORRECTION FACTOR	•	•	•	•
ELECTRONIC HANDWHEEL		•	•	•
PROBING		•	•	•
ZERO OFFSET/TOOL COMPENSATION		•	•	•
OVERTEMPERATURE ALARM		•	•	•
NUMBER OF ANALOG OUTPUTS	2	2	3	3
CONDITIONAL JUMPS		•	•	•
RS-232 INTERFACE		•	•	•
RS-485 FOR EACH LOCAL AREA NETWORK (CAN, COMMUNICATION WITH CNC, ETC)			•	•
END TRAPING			•	•
ACCELERATION/DECELERATION RAMP	•	•	•	•
MAXIMUM VELOCITY		•	•	•
CNC		•	•	•
100/100		•	•	•

Inputs /Outputs

INPUTS/OUTPUTS	101	101S	102	102S
IN OUTPUTS				
IN BCD OR DECODED	•	•	•	•
100	•	•	•	•
X SOFTSWAKE ENABLE	•	•	•	•
Y SOFTSWAKE ENABLE			•	•
X AXIS IN POSITION	•	•	•	•
Y AXIS IN POSITION			•	•
M STOP	•	•	•	•
S STOP	•	•	•	•
T STOP	•	•	•	•
EMERGENCY	•	•	•	•
X AXIS FAST FEED IN AC	•	100 IN	•	100 IN
X AXIS SLOW FEED IN AC	•	100 IN	•	100 IN
X AXIS DIRECTION IN AC	•	100 IN	•	100 IN
Y AXIS FAST FEED IN AC		100 IN	•	100 IN
Y AXIS SLOW FEED IN AC			•	
Y AXIS DIRECTION IN AC				
ATOMATIC		•	•	•
IN INPUTS				
X AXIS HOME SWITCH	•	•	•	•
Y AXIS HOME SWITCH		•	•	•
EMERGENCY	•	•	•	•
FEED HOLD	•	•	•	•
CYCLE START	•	•	•	•
CYCLE STOP	•	•	•	•
BLOCK INP	•	•	•	•
DRO MODE	•	•	•	•
EXTERNAL RESET	•	•	•	•
2 INPUTS FOR ELECTRONIC HANDWHEEL		100 IN	•	100 IN
3 INPUTS PROGRAMMABLE BY PARAMETERS (I1, I2, I3)			•	•
2 INTERRUPT INPUTS		100 IN	•	100 IN
FEEDBACK COMPENSATION (I4)		•		
HOME SEARCHES		•	•	•

Completing the FAGOR Integral Solutions for applications on machines of up to 6 axes with General Purpose CNCs

The compact unit: Up to four axes FAGOR 8025 GP CNC

Adaptable and flexible in multi-axis applications, it offers parametric programming and the linear & circular interpolations of a full CNC. Its number of axes, four, can be expanded through the LOCAL AREA NETWORK (LAN), RS-485. It allows programming user defined canned cycles.



With modular structure: Up to six axes FAGOR 8050 GP CNC

This new CNC offers all the power of a full-fledged CNC:

- 32-bit microprocessor technology.
- Open architecture.
- Integrated PLC.
- Up to 232 inputs and 120 outputs.
- PLC programming and monitoring from the CNC.
- Logic analyzer for the PLC.
- Standard, parametric and modal subroutines.
- Manufacturer or End-user defined cycles.
- Great customizing capability.



With optional FAGOR PLC FAGOR 64 PLC

The FAGOR 64 PLC has a powerful software capable of performing logic and arithmetic operations, great number of marks, timers and counters, plus comparisons, jumps, etc. Among its characteristics the following should be pointed out:

- Programming modules.
- Programming at the CNC or at a PC via the applications software FAGOR PLC.
- Program capacity of 2000 instructions.
- 64 physical inputs and 32 physical outputs, expandable via FAGOR LAN.
- 2047 marks (internal relays) and 256 16-bit registers.



- 255 Timers and 255 Counters.
- Timing units: 0.01 sec.
- Cycle time: 10 ms/1000 instructions.

With a complete range of FAGOR Motors and Servo Drives

• Brushless servomotors

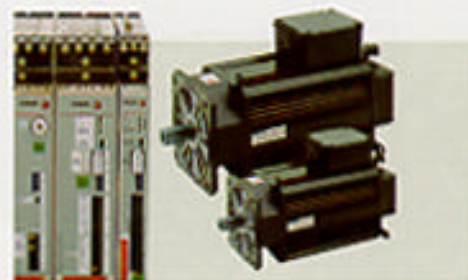
With high magnetic energy "rare earth" magnets:

- From 0.85 to 100 Nm.
- Up to 6000 rpm.
- Maintenance free.
- Great acceleration capability.
- Small size and inertia.
- Complying with IP 65 standard.

• Axes servo drives

With external current limit adjustment, a set-up module and a number of analog outputs. Two types:

- The BUG-BUS assembly, modular,



with a power module BUG and up to 6 BUS axes modules.

- The compact single axis unit BUM 25.

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Fagor Automation holds the ISO 9001 Quality System Certificate and by the CE certificate for all its products

