CABLES AND EXTENSION CABLES TO CONNECT FAGOR ENCODERS TO CONTROLLERS

FAGOR encoder products should be connected to subsequent electronics using the recommended cables shown below. FAGOR shall not be held responsible for any problems caused by using other cables.

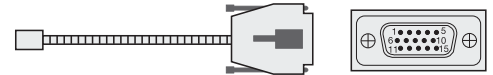Fagor Automation also provides other cables and extension cables for connecting encoders to electronic equipment. Contact the FAGOR center nearest you for other possibilities.

All cables are available with or without protective armour. Armour is provided as standard. To order cables without protective armour add an "N" to the order code.

Important: Vacant pins or wires must not be used

CABLES FOR DIRECT CONNECTION OF FAGOR INCREMENTAL ENCODERS TO FAGOR SYSTEMS

EC...P-D cable Cable for direct connection with FAGOR controllers
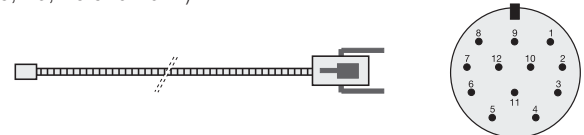1, 3, 4, 6, 8, 9, 10 and 12 meters long

PIN	1	2	3	4	5	6	9	11	15	Chassis
SIGNAL	A	/A	B	/B	I_0	/I_0	+5V	0V	Ground	Ground
COLOR	Green	Yellow	Blue	Red	Grey	Pink	Brown	White	Shield	Shield

Extension cables for connecting FAGOR incremental linear encoders to FAGOR controllers

Cable lengths over 12 meters require the use of extension cables; in those cases, an **EC-...A-C1** cable (FAGOR recommends a length between 1 and 3 m) must be combined with the **XC-C2-...D** extension cable (available in 5, 10, 15, 20 and 25 m).
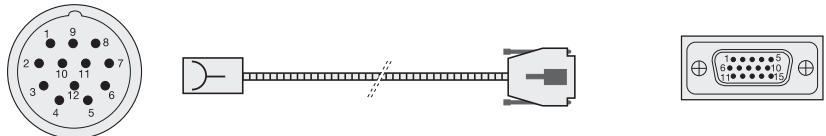
EC...A...C1 cable Cable to be used in combination with extension cables
Available in 1 and 3 meters
(Contact FAGOR for other lengths)

PIN	5	6	8	1	3	4	7	10	11	12	2	Chassis
SIGNAL	A	/A	B	/B	I_0	/I_0	/Alarm	0V	0V sensor	+5V	+5V sensor	Ground
COLOR	Green	Yellow	Blue	Red	Grey	Pink	Purple	White		Brown		Shield

XC...C2...D extension cable

Available in 5, 10, 15, 20 and 25 meters

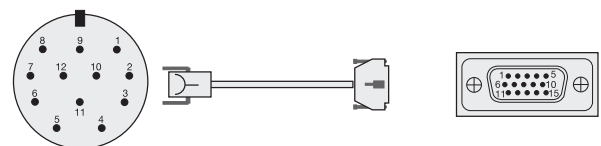| EXTENSION CABLE XC – C2 -...- D (4x2x0.14 + 4x0.5); Φ = 8 mm^2											
12-pin CIRCULAR female connector						**SUB D 15 HD male connector**					
PIN)—	5	6	8	1	3	4	7	12	2	10	11	Housing
PIN —▪	1	2	3	4	5	6	7	9	9	11	11	Housing
SIGNAL	A	/A	B	/B	I_0	/I_0	Alarm	5V	+5V sensor	0V	0V sensor	Ground
COLOR	Brown	Green	Grey	Pink	Red	Black	Purple	Brown/Green	Blue	White/Green	White	Shield

Extension cables for connecting FAGOR incremental angular encoders to FAGOR controllers

Cable lengths over 12 meters require the use of extension cables; in those cases, an **EC-...A-C5** cable (FAGOR recommends a length between 1 and 3 m) must be combined with the **XC-C4-...D** extension cable (available in 5, 10, 15, 20 and 25 m).

EC...A...C5 cable Cable to be used in combination with extension cables
Available in 1 and 3 meters
(Contact FAGOR for other lengths)

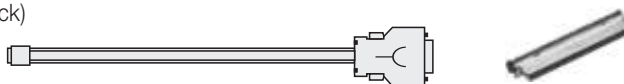| PIN	5	6	8	1	3	4	7	10	11	2	12	Chassis
SIGNAL	A	/A	B	/B	I_0	/I_0	/Alarm	0V	0V sensor	+5V sensor	+5V	Ground
COLOR	Green	Yellow	Blue	Red	Grey	Pink	Purple	White			Brown	Shield

XC...C4...D extension cable Available in 5, 10, 15, 20 and 25 meters

EXTENSION CABLE XC – C4 -...- D (4x2x0.14 + 4x0.5); Φ = 8 mm^2											
CONNEI 12 female connector						**SUB D 15 HD male connector**					
PIN)—	5	6	8	1	3	4	7	12	2	10	11	Housing
PIN —▪	1	2	3	4	5	6	7	9	9	11	11	Housing
SIGNAL	A	/A	B	/B	I_0	/I_0	Alarm	5V	+5V sensor	0V	0V sensor	Ground
COLOR	Brown	Green	Grey	Pink	Red	Black	Purple	Brown/Green	Blue	White/Green	White	Shield

CABLES FOR CONNECTING FAGOR INCREMENTAL ENCODERS TO OTHER CONTROLLERS

Besides being able to connect to FAGOR controllers, FAGOR incremental encoders may also be connected to most popular controllers on the market; here is a list of specific cables and extension cables for that type of connection.

EC...C...FN1 cable For direct connection to FANUC controllers (second feedback)
Available in 1, 3, 6, 9 and 12 meters

HONDA/HIROSE female connector												
PIN	1	2	3	4	5	6	9	12	14	18	20	16	Housing
SIGNAL	A	/A	B	/B	I_0	$/I_0$	+5V	0V	0V sensor	+5V	+5V sensor	Internal shield	Internal shield
COLOR	Green	Yellow	Blue	Red	Grey	Pink	Brown	White				Internal shield	External shield

EC...AS...H cable For direct connection to SIEMENS, HEIDENHAIN, SELCA and other controllers.
Available in 1, 3, 6, 9 and 12 meters

SUB D 15 female connector											
PIN	1	9	2	11	3	4	6	7	10	12	Housing
SIGNAL	+5V	+5V sensor	0V	0V sensor	A	/A	B	/B	I_0	$/I_0$	Ground
COLOR	Brown	Purple	White	Black	Green	Yellow	Blue	Red	Grey	Pink	Shield

EC...AS...O cable Without a connector at one end; for other applications
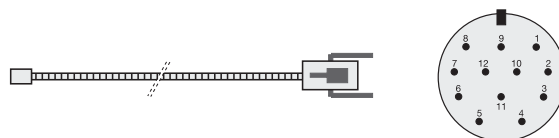1, 3, 6, 9, 12, 15 and 20 meters long

5x2x0.14 cable with sensor; $\Phi = 6$ mm^2										
SIGNAL	+5V	+5V sensor	0V	0V sensor	A	/A	B	/B	I_0	$/I_0$	Ground
COLOR	Brown	Purple	White	Black	Green	Yellow	Blue	Red	Grey	Pink	Shield

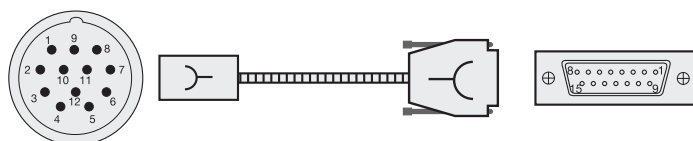### Extension cables for connecting FAGOR incremental encoders to other controllers

Cable lengths over 12 meters require the use of extension cables; in those cases, an **EC-...A-C1** cable (FAGOR recommends a length between 1 and 3 m) must be combined with the **XC-C2-...H** extension cable (available in 5, 10, 15, 20 and 25 m).

EC...A...C1 cable Cable to be used in combination with extension cables
Available in 1 and 3 meters
(Contact FAGOR for other lengths)

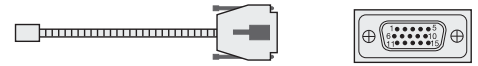| **PIN**	5	6	8	1	3	4	7	10	11	12	2	Chassis
SIGNAL	A	/A	B	/B	I_0	$/I_0$	/Alarm	0V	0V sensor	+5V	+5V sensor	Ground
COLOR	Green	Yellow	Blue	Red	Grey	Pink	Purple	White		Brown		Shield

XC...C2...H extension cable For direct connection to SIEMENS, HEIDENHAIN and other controllers.
Available in 5, 10, 15, 20 and 25 meters

EXTENSION CABLE XC – C2 -...- H (4x2x0.14 + 4x0.5) $\Phi = 8$ mm^2											
12-pin CIRCULAR female connector						**SUB D 15 HD male connector**					
PIN	5	6	8	1	3	4	12	2	10	11	Housing
PIN	3	4	6	7	10	12	1	9	2	11	Housing
SIGNAL	A	/A	B	/B	I_0	$/I_0$	+5V	+5V sensor	0V	0V sensor	Ground
COLOR	Brown	Green	Grey	Pink	Red	Black	Brown/Green	Blue	White/Green	White	Shield

CABLES FOR DIRECT CONNECTION OF FAGOR ABSOLUTE LINEAR ENCODERS TO FAGOR CONTROLLERS

EC...B...D cable For direct connection with FAGOR controllers
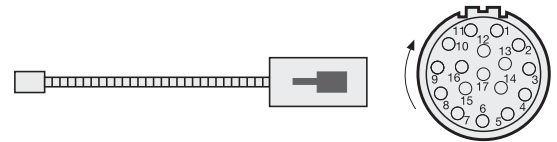Available in 1, 3, 6 and 9 meters

SUB D 15 HD connector														
PIN ▬	1	2	3	4	5	6	7	8	9	10	11	12	15	14
SIGNAL	A	/A	B	/B	DATA	/DATA	CLOCK	/CLOCK	+5V	+5V sensor	0V	0V sensor	Internal shield	External shield
COLOR	Green	Yellow	Blue	Red	Grey	Pink	Black	Purple	Brown	Light green	White	Orange	Internal shield	Shield

Extension cables for connecting FAGOR absolute linear encoders to FAGOR controllers

Cable lengths over 9 meters require the use of extension cables; in those cases, an **EC-...B - C9** cable (FAGOR recommends a length between 1 and 3 m) must be combined with the XC-C8-...F - D extension cable (available in 5, 10, 15, 20 and 25 m).

If with the available lengths of the **XC-C8-...F-D** extension cable (up to 25 meters) it is not possible to reach the desired total length, one must use the sum of the **EC...B...C9** cable + the necessary intermediate extension cables **XC-C8-...F-C9** + a final extension cable **XC-C8-...F-D** until the required length is reached.

EC...B...C9 cable Cable to be used in combination with extension cables
Available in 1 and 3 meters
(Contact FAGOR for other lengths)

Circular 17 male connector														
PIN ▬	7	1	10	4	15	16	12	13	14	17	8	9	11	Housing
SIGNAL	+5V	+5V sensor	0V	0V sensor	A	/A	B	/B	DATA	/DATA	CLOCK	/CLOCK	Ground	Ground
COLOR	Brown	Light green	White	Orange	Green	Yellow	Blue	Red	Grey	Pink	Black	Purple	Internal shield	Internal shield

XC...C8...F- D extension cable

Available in 5, 10, 15, 20 and 25 meters

EXTENSION CABLE XC – C8 -...F- D ((4x0,14)+2x4x0.14+4x0.5); with double shield Φ = 10 mm²													
Circular 17 female connector						SUB D 15 HD male connector							
PIN ⊃─	15	16	12	13	14	17	8	9	7	1	10	4	11	Housing
PIN ▬	1	2	3	4	5	6	7	8	9	10	11	12	15	Housing
SIGNAL	A	/A	B	/B	DATA	/DATA	CLOCK	/CLOCK	+5V	+5V sensor	0V	0V sensor	Ground	Ground
COLOR	Green-Black	Yellow-Black	Blue-Black	Red-Black	Grey	Pink	Purple	Yellow	Brown-Green	Blue	White-Green	White	Internal shield	Shield

XC...C8...F- C9 extension cable Intermediate extension cable
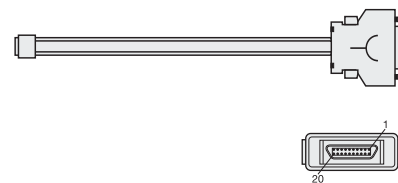Available in 5, 10, 15, 20 and 25 meters

EXTENSION CABLE XC – C8 -...F- C9 ((4x0,14)+2x4x0,14+4x0,5 mm²); Φ = 10 mm²													
17-pin Circular female connector						17-pin Circular male connector							
PIN ⊃─	15	16	12	13	14	17	8	9	7	1	10	4	11	Housing
PIN ▬	15	16	12	13	14	17	8	9	7	1	10	4	11	Housing
COLOR	Green-Black	Yellow-Black	Blue-Black	Red-Black	Grey	Pink	Purple	Yellow	Brown-Green	Blue	White-Green	White	Internal shield	External shield

CONNECTION WITH FANUC

EC...PA...FN cable For direct connection to FANUC absolute controllers (second feedback)
Available in 1, 3, 6 and 9 meters

HONDA/HIROSE type female connector									
PIN	9	18-20	12	14	1	2	5	6	16
SIGNAL	+5V	+5V sensor	0V	0V sensor	DATA	/DATA	REQUEST	/REQUEST	Ground
COLOR	Brown	Grey	White	Pink	Green	Yellow	Blue	Red	

Cables with extension cables for connecting with FANUC

Cable lengths over 9 meters require the use of extension cables; in those cases,
an **EC-...B - C9** cable (FAGOR recommends a length between 1 and 3 m) must be combined
with the **XC-C8- ..FN** extension cable (available in 5, 10, 15, 20 and 25 m).
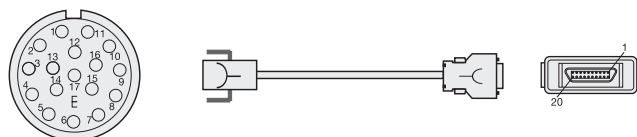
If with the available lengths of the **XC-C8-...FN** extension cable (up to 25 meters) it is not
possible to reach the desired total length, one must use the sum of the **EC...B...C9** cable +
the necessary intermediate extension cables **XC-C8-...F-C9** + a final extension cable
XC-C8-...FN until the required length is reached.

EC...B...C9 cable Cable to be used in combination with extension cables.
Available in 1 and 3 meters (contact FAGOR for other lengths))

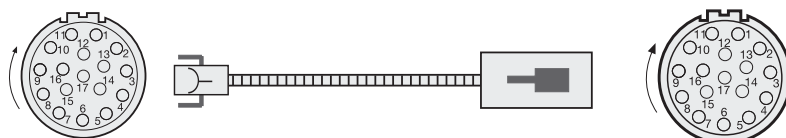| Circular 17 male connector									
PIN	7	1	10	4	14	17	8	9	11	Housing
SIGNAL	+5V	+5V sensor	0V	0V sensor	DATA	/DATA	REQUEST	/REQUEST	Ground	Ground
COLOR	Brown	Light green	White	Orange	Grey	Pink	Black	Purple	Internal shield	Internal shield

XC...C8...FN extension cable For direct connection to FANUC controllers.
Available in 5, 10, 15, 20 and 25 meters

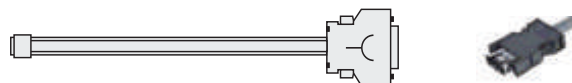| ((4x0.09) + 4x0.09 + 4x0.14) cable with double shield								
Circular 17 female connector						20-pin HONDA/HIROSE rectangular female connector		
PIN	1	4	7	8	9	10	14	17	Housing
PIN	18-20	14	9	5	6	12	1	2	16
SIGNAL	+5V sensor	0V sensor	+5V	REQUEST	/REQUEST	0V	DATA	/DATA	Shield
COLOR	Blue	White	Brown-Green	Purple	Yellow	White-Green	Grey	Pink	Black wire

XC...C8...F- C9 extension cable

Intermediate extension cable
Available in 5, 10, 15, 20 and 25 meters

EXTENSION CABLE XC – C8 -...F- C9 (4x2x0,14mm² +4x0,5 mm² +4x0.14mm²)													
17-pin Circular female connector						17-pin Circular male connector							
PIN	15	16	12	13	14	17	8	9	7	1	10	4	11	Housing
PIN	15	16	12	13	14	17	8	9	7	1	10	4	11	Housing
COLOR	Green-Black	Yellow-Black	Blue-Black	Red-Black	Grey	Pink	Purple	Yellow	Brown-Green	Blue	White-Green	White	Internal shield	External shield

■ **CONNECTION WITH MITSUBISHI CNC**

EC...AM...MB Cable For direct connection to MITSUBISHI absolute controllers (Half Duplex applications). Available in 1, 3, 6 and 9 meters.
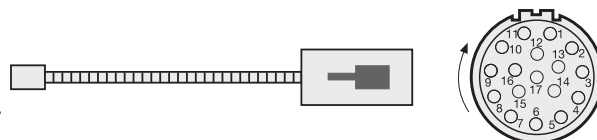
10-pin MOLEX/3M type female connector							
PIN ─C	1	2	7	8	3	4	Housing
SIGNAL	+5V	0V	DATA	/DATA	REQUEST	/REQUEST	Ground
COLOR	Brown	White	Green	Yellow	Grey	Purple	Shield

Cables with extension cables for connecting with MITSUBISHI CNC

Cable lengths over 9 meters require the use of extension cables; in those cases, an EC-...B - C9 cable (FAGOR recommends a length between 1 and 3 m) must be combined with the XC-C8- ..F-MB extension cable (available in 5, 10, 15, 20 and 25 m).
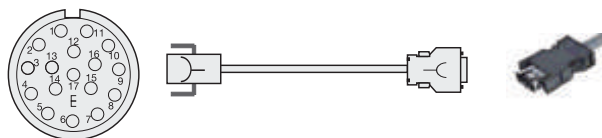
If with the available lengths of the XC-C8-...FN extension cable (up to 25 meters) it is not possible to reach the desired total length, one must use the sum of the EC...B...C9 cable + the necessary intermediate extension cables XC-C8-...F-C9 + a final extension cable XC-C8-...F-MB until the required length is reached.

EC...B...C9 Cable Cable to be used in combination with extension cables. Available in 1 and 3 meters. (contact FAGOR for other lengths).
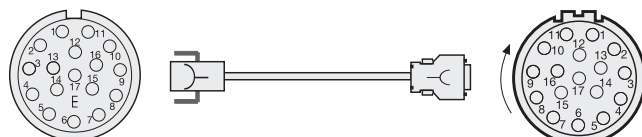
Circular 17 male connector									
PIN ─■	7	1	10	4	14	17	8	9	11	Housing
SIGNAL	+5V	+5V sensor	0V	0V sensor	DATA	/DATA	REQUEST	/REQUEST	Ground	Ground
COLOR	Brown	Light green	White	Orange	Grey	Pink	Black	Purple	Shield	Shield

XC...C8...F-MB extension cable For direct connection to MITSUBISHI CNC. Available in 5, 10, 15, 20 and 25 meters.

XC – C8 -...F-MB (4x2x0,14+4x0,5) Extension cable with double shield								
Circular 17 female connector					10-pin MOLEX/3M rectangular female connector			
PIN)─	7	1	10	4	14	17	8	9	Housing
PIN ─C	1	-	2	-	7	8	3	4	Housing
SIGNAL	+5V	+5V sensor	0V	0V sensor	DATA	/DATA	REQUEST	/REQUEST	Ground
COLOR	Brown-Green	Blue	White-Green	White	Grey	Pink	Purple	Yellow	Shield

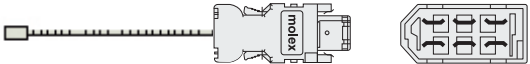**XC...C8...F- C9 extension cable** Intermediate extension cable. Available in 5, 10, 15, 20 and 25 meters.

XC – C8 -...F- C9 (4x2x0,14mm2+4x0,5 mm2+4x0.14mm2) EXTENSION CABLE									
Circular 17 female connector					17-pin Circular male connector				
PIN)─	14	17	8	9	7	1	10	4	11	Housing
PIN ─■	14	17	8	9	7	1	10	4	11	Housing
COLOR	Grey	Pink	Purple	Yellow	Brown-Green	Blue	White-Green	White	Shield	Shield

■ CONNECTION WITH PANASONIC (Matsushita)

EC...PA...PN cable For direct connection to PANASONIC (Matsushita) absolute controllers
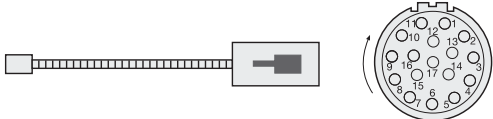Available in 1, 3, 6 and 9 meters

MOLEX type connector					
PIN ─⊂	1	2	5	6	Housing
SIGNAL	+5V	0V	DATA	/DATA	Shield
COLOR	Brown-Grey	White-Pink	Green	Yellow	Shield

■ CONNECTION WITH SIEMENS, SELCA and others (see references)

The **EC-...B...C9** cable is supplied for connecting to SIEMENS, SELCA and other controllers;
this cable ends on a 17-pin circular male connector with outside threading.
For greater lengths, extension cables supplied by the manufacturers of these controllers must
be used.

EC...B...C9 cable For direct connection to SIEMENS, SELCA and other absolute controllers.
Available in 1, 3, 6 and 9 meters

Circular 17 male connector							
PIN ─■	7	1	10	4	14	17	11	Housing
SIGNAL	+5V	+5V sensor	0V	0V sensor	DATA	/DATA	Ground	Ground
COLOR	Brown	Light green	White	Orange	Grey	Pink	Internal shield	Internal shield