

## ENCODER CABLE LENGTH

Based on the power supply, electronic interface and output frequency maximum cable length are as below tables:

<b>Incremental encoders</b>			
Power supply (Vdc)	Electronic interface	Frequency (kHz)	Max cable length (m)
5V	Line driver RS422	50	300
5V	Line driver RS422	100	200
5/28V - 8/24V	Line driver	50	80
5/28V - 8/24V	Line driver	100	40
5/28V - 8/24V	Push-pull	50	60
5/28V - 8/24V	Push-pull	100	30

*System setup: ambient temperature (20°C), load current 20 mA , Eltra AWG24 shielded cable.*

<b>Absolute encoders</b>			
Power supply (Vdc)	Electronic interface	Frequency (kHz)	Max cable length (m)
8/28V	Push pull Parallel	25	100
5V - 8/28V	SSI	100	300
5V - 8/28V	SSI	200	200
5V - 8/28V	SSI	400	50
5V - 8/28V	SSI	1000	10
12/28V	Analogue (current)	-	200

Depending on the application, maximum cable length might be shorter, particular eg: where a high level of electrical noise is present. Please carefully select the power supply core diameter. Its size should be big enough that encoder voltage is inside working parameters as specified within the product datasheet.

Use always shielded cables, for further details or informations please directly contact our offices.

### NPN / NPN open collector (TTL compatible) / push-pull

Function	5 wires	J connector 7 pins	M connector 7 pins	H connector 12 pins	V connector 9 pins	M12 connector 5 pins
+V DC	red	6	F	12	5	2
0 V	black	1	A	10	9	4
Signal A	green	3	C	5	1	3
Signal B	yellow	5	E	8	2	1
Signal Z	blue	4	D	3	3	5
⊕	shield	7	G	9	4	/

### Line driver (without Z)

Function	8 wires	J connector 7 pins	M connector 7 pins	H connector 12 pins	V connector 9 pins	M12 connector 8 pins
+V DC	red	4	D	12	5	7
0 V	black	6	F	10	9	1
Signal A	green	1	A	5	1	6
Signal B	yellow	2	B	8	2	4
Signal A -	brown	3	C	6	6	5
Signal B -	orange	5	E	1	7	3
⊕	shield	7	G	9	4	/

### Line driver (with Z)

Function	8 wires	J connector 10 pins	M connector 10 pins	H connector 12 pins	V connector 9 pins	M12 connector 8 pins	MA connector 19 pins
+V DC	red	4	D	12	5	7	A
+V DC	red	5	E	12	5	7	A
0 V	black	6	F	10	9	1	C
Signal A	green	1	A	5	1	6	M
Signal B	yellow	2	B	8	2	4	P
Signal Z	blue	3	C	3	3	2	R
Signal A -	brown	7	G	6	6	5	N
Signal B -	orange	8	H	1	7	3	B
Signal Z -	white	9	I	4	6	8	L
⊕	shield	10	J	9	4	/	D

Line driver (with Hall phases)		
Function	14 wires	MA connector 19 pins
+V DC	red	A
0 V	black	C
signal A	green	M
signal B	yellow	P
signal Z	blue	R
signal A -	brown	N
signal B -	orange	B
signal Z -	white	L
signal U	gray	H
signal V	purple	G
signal W	gray-pink	F
signal U -	red-blue	K
signal V -	white-green	V
signal W -	brown-green	U
⊕	shield	D

Connectors	
Connector type	Ref. code
J 7 pins cable mount straight plug (female)	PLS-20-7 (PLT® Apex)
J 10 pins cable mount straight plug (female)	SCC8A18-10S (Sam Woo Electronics)
M 7 pins cable mount straight plug (female)	MS3106-18S-1 (Amphenol®)
M 10 pins cable mount straight plug (female)	MS3106-18-1 (Amphenol®)
H 12 pins cable mount straight plug (female)	-
V 9 pins	D-Subminiature DE-9
M 12 5 pins	-
M 12 8 pins	-
MA 19 pins cable mount straight plug (female)	MS3116-14-19S (Amphenol®)

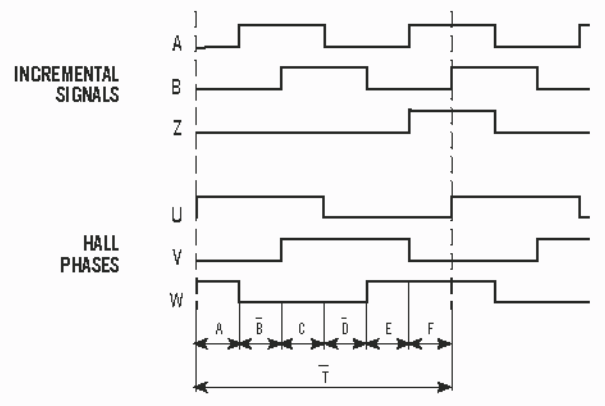
### Proper installation of cables

- Make sure cable shield is connected to the ground and avoid connecting it to the power ground (0 V).
- Keep the encoder cable (signal cable) sufficiently far from power lines.
- Choose the cable according to installation requirements.
- Lay the cable avoiding spirals.

### Further informations

- Custom cables, extensions and connectors are available on demand.
- Testing on 100% of the production.
- Anti-vibration wiring system.
- Contact us for further informations.

### Signal configuration



POLES	A/B/C/D/E/F	T
4	30° ±1,5°	180°
6	20° ±1,5°	120°
8	15° ±1,5°	90°

### Precautions against electrostatic discharges

Be sure the metallic case of the connector is connected to the ground through a ring fixed to the screw of the connector itself. (Fig. 1)

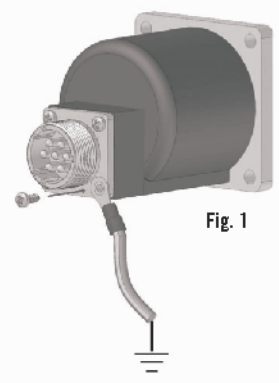


Fig. 1

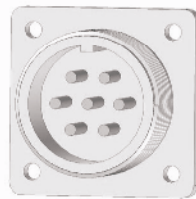
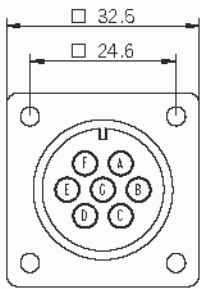
Connect the cable shield to the ground and to the connector case. (Fig. 2)



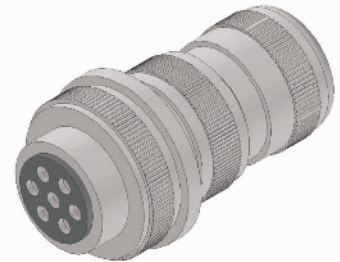
Fig. 2

## STANDARD CONNECTORS FOR ABSOLUTE ENCODERS

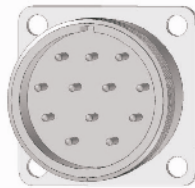
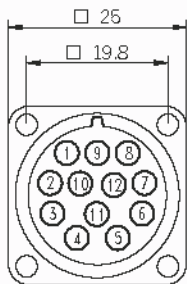
**M07MP**



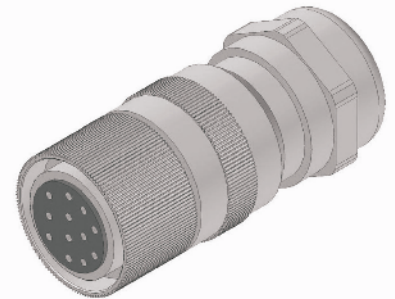
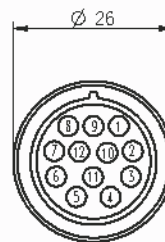
**M07FV**



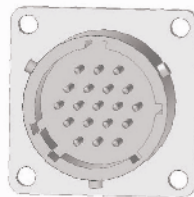
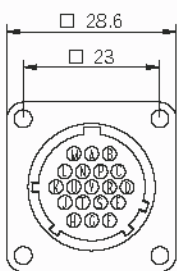
**H12MP**



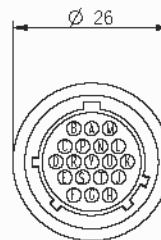
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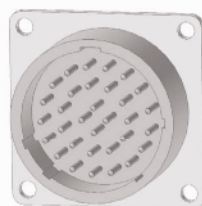
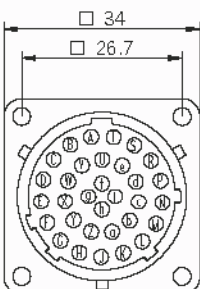
**M19MP**



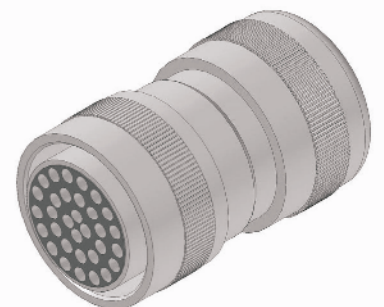
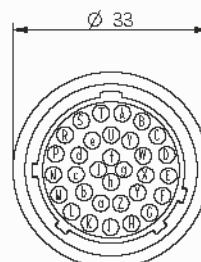
**M19FV**



**M32MP**



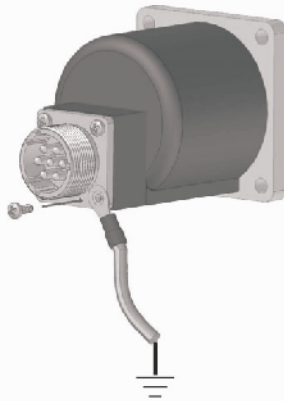
**M32FV**



## PRECAUTIONS AGAINST ELECTROSTATIC DICHARGES

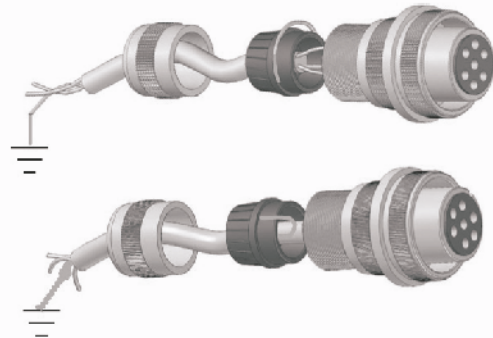
Be sure the metallic connector is connected to the ground through a ring fixed to the screw of the connector itself. (Fig. 1)

Fig. 1



Ground connect to the shield and the connector case. (Fig. 2)

Fig. 2



For a better protection of the electronics against electrostatic discharges connect the metallic connector case to ground.

## CABLE PROPER USE

Ensure a ground connection to the cable shield avoiding to connect it to the power ground.

Keep the encoder cable (signal cable) to a proper distance from the power ones.

Choose the cable's length according to installation requirements.

Spread the cable avoiding spirals.

## NEWS

Cable extensions and connectors could be designed on demand.

Testing on 100% of the production.

Antivibration wiring system.

Contact us for further information.

## Cables availability

POLES N°	CEI MARK	IEC MARK	UL MARK	SHIELD	TYPE
5	CEI 20-22 II			FOIL	SEMIRIGID
		IEC 60332-1	UL-CSA	BRAID	FLEXABLE
		IEC 60332-1	UL-CSA	FOIL	SEMIRIGID
8	CEI 20-22 II	IEC 60332.3		BRAID	SEMIRIGID
	CEI 20-22 II			FOIL	SEMIRIGID
	CEI 20-22 II	IEC 60332-1	UL-CSA	BRAID	FLEXABLE
	CEI 20-22 II	IEC 60332-1		FOIL	SEMIRIGID
	CEI 20-22 II	IEC 60332.3		BRAID	SEMIRIGID
	CEI 20-22 II			BRAID	SEMIRIGID
10	CEI 20-22 II			BRAID	SEMIRIGID
12	CEI 20-22 II			FOIL	SEMIRIGID
16	CEI 20-22 II			FOIL	SEMIRIGID
32	CEI 20-22 II			FOIL	SEMIRIGID

NOTE: please, directly contact our offices for non-standard cables availability.

## INSTALLATION AND OPERATION PRECAUTIONS



The encoder must be used with respect to its specifications. Encoder is a pulse generator and not a safety device.



Assembling and installing personnel must be qualified and carefully follow instructions of technical manual.



Don't expose the device to stress or impacts in order to ensure the correct working otherwise the warranty expires.



Make sure that the mechanical coupling of the encoder shaft is designed with the appropriate elastic couplings, especially in the case of accentuated axial or radial movements.



Make sure that the environment of use is free of corrosive agents (acids, etc.) or substances that are not compatible with the device.



Check the ground connection of the device if it is not possible to provide additional external connection.



Before putting it in operation, verify the voltage range applicable to the device and protect it from exceeding the stated technical specifications.



Connect power supply and signals cables in order to avoid capacitive or inductive interferences that may cause malfunction of the device.



Cable wiring must be carried out in a **POWER-OFF** condition.



For safety reason, we strongly recommend to avoid any mechanical or electrical modification. In that case, they will void the warranty.

## MAIN PRODUCT WARRANTY TERMS

Replacements or repairs whether under the warranty or at the customer's expense must be performed in the service department of Eltra Srl or by explicitly authorized personnel. Before sending material for repairing, you must obtain an RMA number from our sales office. During the repair process in our service department, Eltra srl will be authorized to remove all parts that the customer added to the product. Any malfunction due to a failure to observe these usage and installation precautions will lead to the warranty voiding. Repairs will not extend the product warranty. We also exclude compensation for any type of damage or injury due to the use, or suspension of use, of the transducer. Note: for additional information, refer to the sale terms on our website, [www.eltra.it](http://www.eltra.it), or call our office.