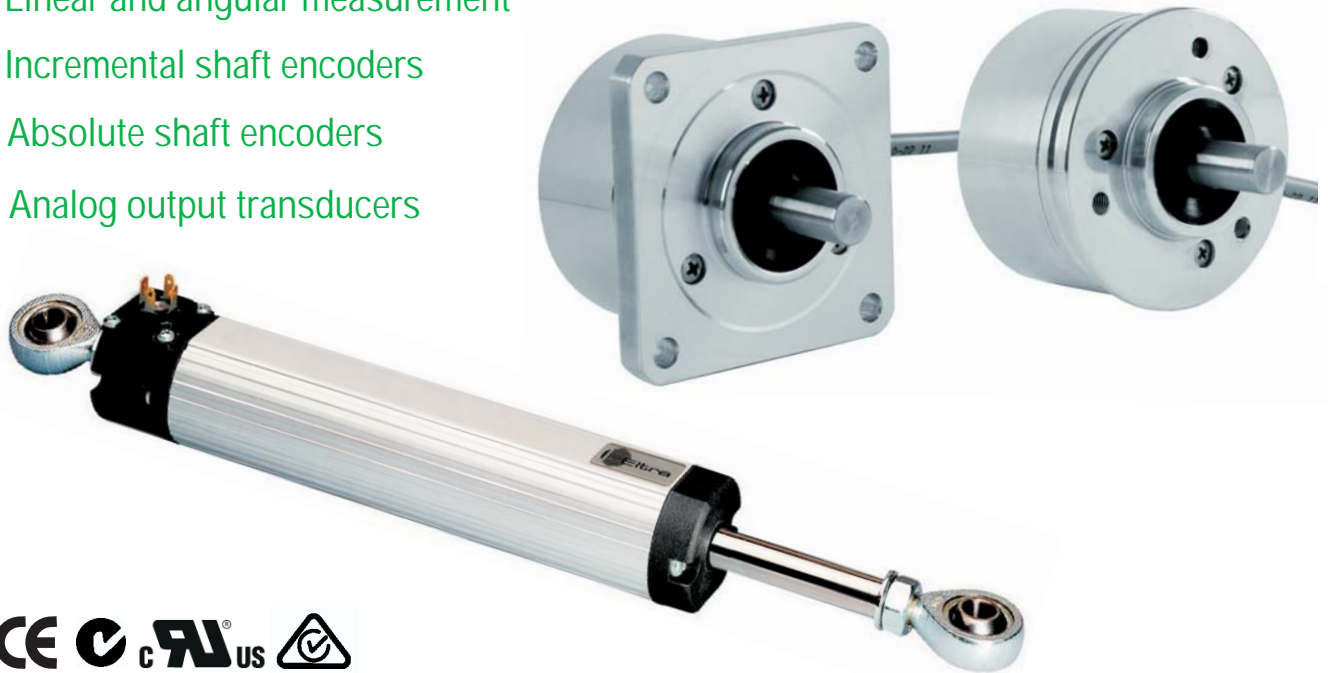


Linear and angular measurement

Incremental shaft encoders

Absolute shaft encoders

Analog output transducers



## ELTRA

ELTRA is based in Northern Italy and has manufactured shaft encoders since 1985. Their encoders are used worldwide by machine manufacturers. Automated Motion Systems has been the Australian agent for ELTRA since 1988.

### Incremental encoders

Optical incremental encoders consist of a transparent disk fixed to a shaft and marked with a defined number of radial sectors. A set of LEDs are positioned to pass light through the disk to phototransistors on the other side, thereby detecting interruptions of the light beam. Electronic amplifiers provide pulse outputs as the shaft is rotated. The number of pulses per revolution is constant for a particular encoder model. By counting the pulses the relative shaft position can be determined and by measuring the frequency of the pulses the speed of rotation can be calculated. All Eltra incremental encoders have two output channels 'A' and 'B' with the 'A' channel leading by 90 degrees when the shaft is rotated in the clockwise direction, enabling the user to also determine the direction of rotation as well as speed and position.

Incremental encoders are used as feedback devices to determine position, speed, direction of rotation or acceleration.

### Absolute encoders

Absolute encoders have a more complex optical disc and multiple outputs. If the power is removed and reapplied, they will remember their current position. The cost is higher but it is sometimes necessary where movement in a machine may occur without power. Some of the ELTRA absolute encoders are also capable of measuring a multiple number of turns.

### Applications

Shaft encoders are used widely in industry where linear and angular displacement must be measured with high accuracy and reliability or where machine speed requires control. Typical applications include CNC machines, robotics, printing presses, plotters, weighing systems, cutting to length of cables or paper and digital position readouts. Many of the hollow shaft encoders are designed specially to fit on the rear of a DC or AC motor for speed and position feedback.

Outputs of encoders can be usually interfaced to most programmable logic controllers, frequency to current converters and microprocessor based digital displays. Several types of output signals are available to enable ease of interfacing to a wide range of devices.

### Analog output transducers

ELTRA also manufactures linear and rotary transducers with analog potentiometer, 0-5V, 0-10V or 4-20mA outputs. Analog models do not have the accuracy of digital outputs but have a signal that is easy to measure, check and interface to other instruments. The linear transducers are available with both magnetorestrictive (non contact) or potentiometric sensing. Displacements of upto 1500mm are available.
















### Special Encoders

ELTRA also manufactures encoders for special applications such as cable extension (upto 20 metres), rack and pinion encoders, encoders for large shaft diameters, CNC manual control encoders and hazardous area encoders.

For more information on encoders see [www.automotsys.com.au/encodersmc.html](http://www.automotsys.com.au/encodersmc.html).












# INCREMENTAL ENCODERS

Special options are available (eg. imperial shaft, special connectors). Check with office.  
 This brochure is a general guide only. Check full data sheet before deciding on model.  
 Continuous development may necessitate changes in models and specifications without notice.

	IMAGE	MODEL	MOUNTING OPTIONS	DIAMETER	PULSES /REV	SHAFT SIZES	MAXIMUM SEALING	FEATURES
FLANGE MOUNTING		EL30 ER30	E H	30mm	1 to 2500	4,6	IP54	small size potentiometer style mounting
		EH38	A B D	38mm	50 to 1024	6	IP54	small size
		EL40 ER40	A B C H I N X	42mm	1 to 14400	4,6,8	IP66	small size high resolution
		EL58 ER58	B C H T	58mm	1 to 24000	6,8,9,52 10,12	IP66	high mechanical loads
		EL63 ER63	A D E	63.5mm	1 to 24000	8, 9, 52 10	IP66	general purpose high mechanical loads high resolution
		EL63	A X D X	63.5mm	2 to 24000	9, 52 10	IP66	stainless steel for outdoor use high sealing
		EH90	A	90mm	40 to 2048	8, 9, 52 10, 11	IP66	high mechanical loads double electronics option centrifugal relay option
		EL90 ER90	A	90mm	2 to 10000	8, 9, 52 10, 11	IP54	high mechanical loads
		EH115	A R	115mm	40 to 2048	10, 11	IP54	high mechanical loads optional tachometer
		EL115 ER115	A	115mm	2 to 10000	10, 11	IP54	high mechanical loads optional tachometer
MAGNETIC		EMI22	A	22mm	2 to 2048	6,8 9,52,10	IP68	high sealing high speed high temperature
		EMI38	A	38mm	2 to 2048	6,8 9,52,10	IP64	high sealing high speed high temperature
		EMI55	A	55mm	2 to 2048	6,8 9,52,10	IP68	high sealing high speed high temperature
		EMI40	A	42mm	2 to 2048	4,6	IP66	for harsh applications compact size 100 C operating temperature
		EMI63	A D	63mm	2 to 2048	9, 52, 10	IP66	for harsh outdoor applications 100 C operating temperature











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	IMAGE	MODEL	MOUNTING OPTIONS	DIAMETER	PULSES /REV	SHAFT SIZES	MAXIMUM SEALING	FEATURES
<b>HOLLOW SHAFT</b>		EH17 EH30	M	30mm	40 to 1024	4, 6, 6.35	IP54	low cost OEM rear motor mounting
		EF36	K	36mm	500 to 1024	8, 9.52, 10	IP40	small size with commutation
		EL38 ER38	F G	39.5mm 46mm	2 to 14400	6, 8, 9.52, 10	IP65	small size general purpose
		EL48	C P	48.5mm	1 to 2048	6, 8	IP40	rear motor mounting with commutation
		EL49	C P	49mm	100 to 2048	6, 8, 9.52, 10, 12, 12.7	IP40	rear motor mounting with commutation
		EF49	C P	49mm	1 to 2048	6, 8, 9.52, 10, 12, 12.7	IP40	rear motor mounting with commutation
		EH50	FA FP	50, 60mm	100 to 1024	6, 8, 9.52, 10	IP55	easy mechanical mounting
		EH53	A B	53.5mm	40 to 1024	6, 8, 10	IP54	with internal flexible coupling
		EL53 ER53	A B	53.5mm 58mm	2 to 10000	6, 8, 10	IP64	with internal flexible coupling
		EL58 ER58	F G	58mm	1 to 24000	8, 9.52, 10, 12, 14, 15	IP66	high sealing high mechanical loads high resolution
		EL63 ER63	F G	63.5mm	1 to 24000	8, 9.52, 10, 12, 14, 15	IP66	high mechanical loads high resolution

# INCREMENTAL ENCODERS

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	IMAGE	MODEL	MOUNTING OPTIONS	DIAMETER	PULSES /REV	SHAFT SIZES	MAXIMUM SEALING	FEATURES
<b>HOLLOW SHAFT MOUNTING</b>		EL63	FB GB	63.5mm	1 to 2500	8,9.52, 10,12, 14,15	IP54	high mechanical loads
		EL63	PB PC PBF PCF	63.5mm	1 to 2500	8,9.52, 10,12, 14,15	IP54	through hole
		EL72 ER72	A B	63.5, 65, 57,60mm	1 to 24000	6,8,10	IP66	with internal flexible coupling
		EH80	C P K	80mm	200 to 2048	8, 9.52 10	IP54	rear motor mounting incremental output
		EF80	C P K	80mm	200 to 2048	8, 9.52 10	IP54	rear motor mounting incremental output with commutation
		EH80	PU	80mm	720 to 1440	14, 15	IP64	rear motor mounting incremental output
		EH88	PE PET	88mm	250 to 2500	25,30,	IP54	for large shafts
		EL88	P	88mm	2 to 2048	25,30,	IP54	for large shafts
		EH99	P	99mm	1000 to 2048	12,16, 17	IP67	for large shafts rugged high sealing
		EL120	P	120mm	250 to 2048	40, 50,60	IP54	for very large shafts
<b>WHEEL ENCODERS</b>		RH200	A B C	n/a	50 to 1024	n/a	IP54	200mm metric wheel (63.66mm dia)
		RM500 RL500	A B C	n/a	1 to 10000	n/a	IP66	rugged construction 500mm metric wheel (159.15mm dia)
<b>MAGNETIC STRIP</b>		ETM	A	n/a	0.1mm 0.04mm	n/a	IP67	good sealing, non contact upto 20 meters measurement upto 0.01mm resolution
		ETM	R	n/a	64 to 4096	9.52 to 28mm	IP67	high speed, non contact good sealing for large shafts

EAgent4



## INCREMENTAL ENCODERS

Special options are available (eg. imperial shaft, special connectors). Check with office.  
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	IMAGE	MODEL	MOUNTING OPTIONS	DIAMETER	PULSES /REV	SHAFT SIZES	MAXIMUM SEALING	FEATURES
<b>SPECIAL ENCODERS</b>		EX80	A D	80mm	100 to 10000	10	IP65	explosion proof rated for hazardous environments.
		EC34	A	n/a	1 to 2000	n/a	IP64	rack & pinion. preloaded pinion for low backlash
		ER	A B C	n/a	0.2mm 0.1mm 0.04mm	n/a	IP64	high accuracy linear measurement 100 to 500mm stroke lengths upto 0.01mm resolution.
		EV	A B C	80mm	100 to 2500	n/a	IP64	for manual control of CNC machines with handwheel and 0-100 dial spring loaded ball lock
		FE	C P		1.5m 4m	n/a	IP54	cable extension mechanism also available with absolute encoders upto 4000mm measurement
		FES	C P		3m, 6m, 15m	n/a	IP54	cable extension mechanism also available with absolute encoders upto 13500mm measurement







## ABSOLUTE ENCODERS

Special options are available (eg. imperial shaft, special connectors). Check with office.  
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	IMAGE	MODEL	MOUNTING OPTIONS	DIAMETER	MAX RES'N	SHAFT SIZES	MAXIMUM SEALING	FEATURES
<b>SINGLE TURN - ABSOLUTE</b>		EA36	A	36mm	4096	6	IP65	small size, SSI output general purpose Gray code output
		EA58	A B C D E	58mm	8192	6	IP66	general purpose Gray code output
		EA63	A B C D E	63mm	8192	6	IP66	general purpose Gray code output
		EA58	F G	58mm	8192	6,8	IP66	general purpose high resolution parallel, ICO & SSI outputs
		EA63	F G	63mm	8192	6,8	IP66	general purpose high resolution parallel, ICO & SSI outputs
		EA90	A B C D E	90mm	8192	6,8,9,52 10,12 14,15	IP66	general purpose, rugged construction metal housing parallel & SSI outputs
		EA115	A B C D E	115mm	8192	6,8,9,52 10,12 14,15	IP66	general purpose, rugged construction metal housing parallel & SSI outputs
		EAX80	C P	80mm	8192	10	IP65	explosion proof rated for hazardous environments.
		EA63	A X D X	63mm	8192	6, 8	IP66	SSI output stainless steel enclosure

# ABSOLUTE ENCODERS














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	IMAGE	MODEL	MOUNTING OPTIONS	DIAMETER	MAX RES'N	SHAFT SIZES	MAXIMUM SEALING	FEATURES
<b>SINGLE TURN MAGNETIC</b>		EMA22	A	22mm	8192	6,8 9.52,10	IP68	high speed high sealing no physical contact
		EA36	A	36mm	4096	6	IP67	high speed high sealing
		EMA55	A AY	55mm	8192	6, 8, 9.52, 10	IP68	high speed high sealing no physical contact
		EMA50	A AY B BY	50mm	8192	6,8, 9.52 10	IP67	magnetic encoder high sealing parallel output
		EMA50	F FY G GY	50mm	8192	6,8, 9.52 10	IP67	magnetic encoder high sealing parallel output
<b>MULTITURN</b>		EAM36	A	36mm	12 bit res 39 bit rev	6	IP65	metal housing SSI output compact size
		EAM36	F G	36mm	12 bit res 39 bit rev	6	IP65	metal housing SSI output compact size
		EAMW 58	B C	58mm	12 bit res 12 bit rev	6,9.52, 10	IP65	SSI output energy harvesting technology parallel & SSI outputs
		EAMW 63	A D E	63mm	12 bit res 12 bit rev	6,9.52, 10	IP65	SSI output energy harvesting technology parallel & SSI outputs
		EAM58	F	58mm	13 bit res 13 bit rev	8, 9.52, 10, 12 14, 15	IP66	metal housing parallel & SSI outputs
		EAM63	F G	63mm	13 bit res 14 bit rev	8, 9.52, 10, 12 14, 15	IP66	high mechanical loads metal housing parallel & SSI outputs
		EAM58	B C	58mm	13 bit res 14 bit rev	6, 9.52 10	IP66	high mechanical loads metal housing parallel & SSI outputs
		EAM63	A D C D E	63mm	13 bit res 14 bit rev	6, 9.52, 10	IP66	high mechanical loads metal housing parallel & SSI outputs
		EAM90	A	90mm	13 bit res 14 bit rev	9.52, 10, 11	IP66	high mechanical loads metal housing parallel & SSI outputs
		EAM115	A	115mm	13 bit res 14 bit rev	9.52, 10, 11	IP54	high mechanical loads metal housing parallel & SSI outputs
		EAM63	AX DX	63mm	13 bit res 14 bit rev	9.52, 10	IP66	high mechanical loads stainless steel housing parallel & SSI outputs
		EAMX80	A D AX DX	80mm	13 bit res 14 bit rev	10	IP65	explosion proof metal housing SSI output

EAgent6

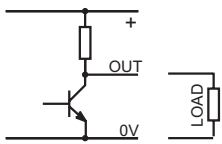
# ANALOG OUTPUT TRANSDUCERS

Special options are available (eg. imperial shaft, special connectors). Check with office.  
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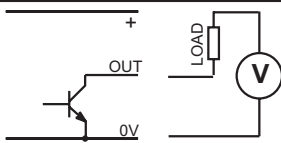
	IMAGE	MODEL	MOUNTING OPTIONS	SIZE	RANGE	NON LINEARITY	MAXIMUM SEALING	FEATURES
<b>ROTARY</b>		EP	A B	42mm	1 turn 3 turn 10 turn	0.2% to 3.0%	IP54	potentiometer output optional pinion
		EML50	A AY B BY	50mm	90°180° 270° 360°	12 bit	IP67	flange mounting magnetic encoder, 4-20mA, 0-10V absolute encoder with D/A converter
		EML50	F FY G GY	50mm	90°180° 270° 360°	12 bit	IP67	hollow shaft magnetic encoder, 4-20mA, 0-10V absolute encoder with D/A converter
<b>LINEAR (potentiometric)</b>		EPLA	SURFACE	34mm square	50mm to 900mm	0.05%	IP65	potentiometer output (3 wire) rod extension
		EPLB	BALL JOINTS	35mm dia	50mm to 750mm	0.05%	IP65	potentiometer output (3 wire) easy mounting by two bolts
		EPLC	SURFACE	40mm square	100mm to 1500mm	0.05% to 0.1%	IP40	potentiometer output (3 wire) easy mounting moving cursor long distance measurement
		EPLT	SURFACE	18mm square	10mm to 100mm	0.1% to 0.3%	IP40	potentiometer output (3 wire) easy mounting spring loaded plunger short distance measurement
<b>LINEAR (magnetostrictive)</b>		EMSPA	SURFACE	38mm square	50mm to 1500mm	0.04%	IP67	moving cursor 0-10V, 4-20mA analog output long life (no sliding contact)
		EMSPS	SURFACE	38mm square	50mm to 1500mm	0.04%	IP67	moving cursor SSI (Binary, Gray code) outputs long life (no sliding contact)
		EMSPP	SURFACE	38mm square	50mm to 1500mm	0.04%	IP67	moving cursor PROFIBUS output long life (no sliding contact)
		EMSSA	THREAD & NUT	46mm hex	100mm to 1500mm	0.03%	IP67	moving ring 0-10V, 4-20mA analog output long life (no sliding contact)
		EMSSS	THREAD & NUT	46mm hex	100mm to 1500mm	0.03%	IP67	moving ring SSI (Binary/Gray code) outputs long life (no sliding contact)
		EMSSP	THREAD & NUT	46mm dia	100mm to 1500mm	0.04%	IP67	moving ring PROFIBUS output long life (no sliding contact)

## ENCODER OUTPUTS

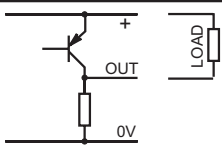
INCREMENTAL



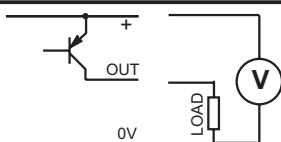
**STANDARD NPN**  
Voltage sourcing output  
Suits most devices



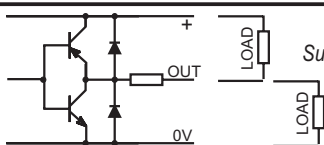
**OPEN COLLECTOR NPN**  
Current sink output  
Requires active source



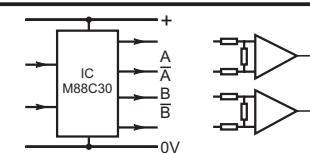
**STANDARD PNP**  
Only suits PNP devices



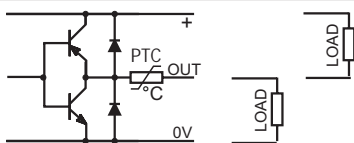
**OPEN COLLECTOR PNP**  
Current sink output



**PUSH - PULL**  
Suits both NPN and PNP devices  
Flexible output  
Switching to both + & - rails



**LINE DRIVER**  
Complimentary signals  
Good for noise immunity  
For long cables



**PROTECTION**  
PTC resistor  
Short circuit protection

Parallel output encoders have one output signal for each output. The type of signal can be one of the above. This is easy to interface to other equipment but it is a problem for large number of conductors. Other outputs include LATCH (maintain current output), RESET (set to zero position), STROBE and U/D (change direction of output reading).

**PARALLEL**  
Binary of Gray coded  
For single turn encoders

SSI output encoders transmit output position using a serial line communication synchronised by a clock. This greatly reduces the number of cables required when encoder resolution is high. The CLOCK and DATA signals are transmitted differentially (RS422) for interference immunity and longer transmission distances.

**SSI**  
Low number of conductors  
Long transmission distance

ICO encoders combine incremental and absolute outputs. They provide absolute output position within one revolution, using the same output signals of an incremental encoder. The main advantage is that the number of output conductors is reduced.

**ICO**  
Low number of conductors  
Easy interfacing to PLCs

PROFIBUS is a serial communications standard for devices connected to automation networks.

**PROFIBUS**

Please check individual specification sheets for more details.  
Specifications are subject to change without notice.

ABSOLUTE

## ACCESSORIES



FLEXIBLE  
SHAFT  
COUPLINGS



POTENTIOMETER &  
FREQUENCY/CURRENT  
CONVERTERS



POSITION, COUNTERS,  
TACHOMETERS &  
SPEED DISPLAYS

## SPECIALS

If a standard ELTRA encoder is not suitable for your application, the manufacturer may be able to supply non standard encoders. Typical non standard variants are as follows. Check office for details.

- special shaft length
- special shaft diameter (eg. imperial)
- flats on shaft
- non standard pin connections
- special connectors
- extra long cables
- adapter flanges

## EXPRESS

Encoders are used on a wide variety of automated machines. It is common for an encoder to be damaged or fail, shutting down the machine resulting in lost production. ELTRA offer an express service where they will manufacture an encoder in 48 hours (not including weekends or public holidays) and ship it by fast air freight. This results in a quicker return to production. Check office for details.

# AUTOMATED MOTION SYSTEMS PTY.LTD.

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W.A. 6947

PHONE: (08) 9309 1896

EMAIL: [sales@automotsys.com.au](mailto:sales@automotsys.com.au)

INTERNET: <http://www.automotsys.com.au>

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WANGARA, PERTH  
WESTERN AUSTRALIA