HIGH-PRECISION ENCODERS

FORMOSA encoders are mainly classified into 3 types: optical, magnetic, and laser. Other types include miniature low-torque and high-resolution, high-precision encoders. We also manufacture manual-setting rotary encoders. No other manufacturer in Taiwan provides so many types as we do. These rotary encoders are used for office automation equipment, industrial equipment, and broadcast-ing/telecommunication equipment.

In computer World today, digital techniques in business have been greatly advanced. Among these, necessity for converting analog rotating value, shaft angle position etc to digital has been increased as measur-ement for physical value and automation for control systems are advanced.
Encoders, at present, have been widely used for factory automations, measurements, office automation devices, medical equipment, aviation and universal fields.

Various kinds of encoders (FORMOSA ENCODER) from small to high absolutional are available to meet all of the requirements. As a result of this, a maximum of resolution for encoder is one arc sec. High performance encoders supported by these high disk producing techniques are available.

■ **Shaft Rotary Type Encoder**

■ **Diversified potentiometers for varied applications**

■ **Noncontact potentiometers**

Please contact telst@ms67.hinet.net for more detailed technical spec. data/drawing

INCREMENTAL: SPECIFICATION LIST						
Applications		**For instrumentation**			**For Industrial**	**For milling**
Features		**Ultra small size**	**Small size and low cost**	**Wide range of resolution, a lot of options**		**Ultra rugged Model**
Series		**OIS28**	**OIS38**	**OIS66**	**OIS68**	**OIS128**
Model No.		**TS5150**	**TS5300**	**TS5100**	**TS5000**	**TS5080**
Resolution (Counts/Turn)		100 to 2,000C/T	100 to 2,500C/T	100 to 5,000C/T		25 to 5,000C/T
Output Phase		A, B Phase	A, B, Z Phase			A, B Phase
Max Response Frequency		80kHz	200kHz	125kHz		25kHz
Voltage Supply		DC + 5V	DC + 5V to DC + 12V	DC + 5V, DC+12V		DC + 24V
Consumption Current (NOTE1)		100mA Max		200mA Max		300mA Max
Output form		Open Collector	Open Collector Line Driver	Voltage, Open Collector, Line Driver		Voltage Complementary
Shaft Loading (NOTE2)	**Radial**	21.6N (2.2kgf)			98N (10kgf)	392N (40kgf)
	Axial	12.7N (1.3kgf)	10.8N (1.1kgf)	12.7N (1.3kgf)	49N (5kgf)	
Starting Torque		$2.9x10^{-3}$N·m (30gf·cm Max)	$4.4x10^{-3}$N·m (45gf·cm Max)	$2.9x10^{-3}$N·m (30gf·cm Max)	$9.8x10^{-2}$N·m (1kgf·cm Max)	$0.2x10^{-2}$N·m (2kgf·cm Max)
Protection		IP=50			IP=52	IP=57
Operating Temp, Range		0 to+60°C	-10 to +70°C	-10 to +70°C		0 to+50°C
Vibration (NOTE3)		$49m/s^2$ (5G)			$98m/s^2$ (10G)	
Shock (NOTE4)		$490m/s^2$ (50G)			$980m/s^2$ (100G)	
Mass		0.2kg Max	0.15kg Max	0.5kg Max	1kg Max	7kg Max

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INCREMENTAL: SPECIFICATION LIST							
Applications		**For ultra precision machine tools**		**For motor controls**			**Machine tools**
Features		**High resolution, high reliability and low cost**		**Hollow Shaft Small Size**	**Hollow Shaft Small Size**	**High speed responsi-bility and Big Size**	**Magnetic Encoder**
Series		**OIS85**	**OIS90**	**OIH35**	**OIH48**	**OIS80**	**MIB0.4**
Model No.		**TS5170**	**TS5410**	TS5200N300	TS5200N500	**TS5146**	**TS5270**
Resolution (Counts/Turn)		9,600 to 50,000C/T	90k to 480k C/T	500 to 3,000C/T	1,000 to 6,000C/T	5,000C/T	1024C/T (No. of teeth=256)
Output Phase		A, B, Z, U, V, W Phase	A, B, Z Phase	A, B, Z, U, V, W Phase			A, B, Z Phase
Max Response Frequency		1.5MHz	500kHz	200kHz		250kHz	200kHz
Voltage Supply		DC + 5V					
Consumption Current (NOTE1)		250mA Max	200mA Max			300mA Max	
Output form		Line Driver		Line Driver	Line Driver	Line Driver	
Shaft Loading (NOTE2)	**Radial**	19.6N (2kgf)	98N (10kgf)	Mounting tolerance Radial 0.05mm TIR Max Axial 0.2mm Max Shaft Runout 0.1° Max		19.6N (2kgf)	Air gap from Spur Wheel 0.15±0.01mm Allowable Tolerance Radial±0.3mm Axial ± 0.5mm
	Axial	9.8N (1kgf)	49N (5kgf)			9.8N (1kgf)	
Starting Torque		$2.0x10^{-2}$ N m (200gf cm Max)	$9.8x10^{-2}$ N m (1kgf cm Max)	$5.9x10^{-3}$ N m (60gf cm Max)	$9.8x10^{-3}$ N m (100gf cm Max)	$2.0x10^{-2}$ N m (200gf cm Max)	-
Protection		IP=52		IP=40 Electronic Circuits Disclosed	IP=40	IP=52	IP=50
Operating Temp, Range		-10 to +80°C	-10 to +75°C	-20 to +85°C	-20 to +85°C	-10 to +75°C	-10 to +80°C
Vibration (NOTE3)		$49m/s^2$ (5G)	$98m/s^2$ (10G)	$49m/s^2$ (5G)		$98m/s^2$ (10G)	Full Amplitude 1.5mm 0.5Hr (5 to 500Hz)
Shock (NOTE4)		$1,960 m/s^2$ (200G)	$980m/s^2$ (100G)	$490m/s^2$ (50G)	$980m/s^2$ (100G)		$294m/s^2$ (30G)
Mass		1kg Max	3kg Max	0.2kg	0.3kg	0.8kg Max	0.5kg Max

NOTE 1) Current consumption: This is a specification for no loading at output circuit.
NOTE 2) The specification for shaft allowable load shall be a mechanical value.
Actual specification allows us to recommend within 20 percents of the specification.
NOTE 3) Vibration: This is a value under the condition of meeting the total of 6 (six) hours consisting of 2 hours for each of X, Y and Z axis.
NOTE 4) Shock: This is a value under the condition of meeting the total of 18 (eighteen) times Consisting of 3 times for each of X, Y and Z axis.

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ABSOLUTE: SPECIFICATION LIST					
SPECIFICATION LIST		**Single-Turn Encoder**			
Applications		**For Machine tools**			**For Press machines**
Features		**Small & Rugged Model**	**Rugged Model**	**Rugged Model and Special divisions**	**Vitra rugged model with strobe signal**
Series		**OAS50**	**OAS68**	**OAS66**	**OAS66**
Model No.		**TS5610**	**TS5620**	**TS1857**	**TS5607**
Resolution		8 bit	10 to 13 bit 0 to 359C/T	8 to 90DIV.	0 to 359C/T
Output Phase		Gray	Pure Binary / Gray	Pure Binary	BCD
Max Response Frequency		10kHz		20kHz	2.5kHz
Voltage Supply		DC + 5V	DC + 5V DC + 12V	DC +24V	DC +12V
Supply Current (NOTE1)		120mA	250mA	150mA	300mA Max
Output form		Open Collector		Emitter follower	Open collector
Shaft Loading (NOTE2)	**Radial**	98N (10kgf)			
	Axial	49N (5kfg)			
Starting Torque		$9.8x10^{-3}$N·m (100gf·cm Max)	$9.8x10^{-2}$N·m (1kgf·cm Max)	$2.0x10^{-2}$N·m (200gf·cm Max)	$9.8x10^{-2}$N·m (1kgf·cm Max)
Protection		IP=50	IP=52	IP=53	IP=54
Operating Temp, Range		-10 to +70°C		-10 to +60°C	-10 to +70°C
Vibration (NOTE3)		$49m/s^2$ (5G)	$98m/s^2$ (10G)	$176m/s^2$ (18G)	continuous $98m/s^2$(10G)
Shock (NOTE4)		$490m/s^2$ (50G)	$980m/s^2$ (100G)		$490m/s^2$ (50G)
Mass		0.5kg Max	1.5kg Max	0.6kg Max	

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ABSOLUTE: SPECIFICATION LIST						
SPECIFICATION LIST		**Single-Turn & Multi-Turn Encoder**				
Applications		**For Motor control, For Robots**				
Features		For small wattage motor, Serial Data transfer		For Medium wattage Serial Data transfer		
Series		**SI35**	**SA35**	**SA48**	**SA56**	
Model No.		**TS5668N20**	**TS5667N120**	**TS5667N420**	**TS5645**	**TS5647 TS5648**
Resolution		17bit/turn	17 bit/turn and 16 bit/turn		11bit/turn and 13bit/turns	20bit/turn and 16bit turns
Output Phase		Pure Binary				
Max Response Frequency		Absolute Signal 13MHz			Absolute Signal 170kHz Incremental Signal 170kHz	52MHz (TS5648) 3.2MHz (TS5647)
Voltage Supply		DC + 5V				
Consumption Current (NOTE1)		110mA	150mA Max Battery operation 100uA Max			250mA Max Battery operation 50uA Max
Output form		Line Driver				
Shaft Loading (NOTE2)	**Radial**	–	0.05mm TIR Max 0.2mm Max			
	Axial	–	0.1°			
Starting Torque		–	5.9×10^{-3}N·m (60gf·cm Max)	9.8×10^{-3}N·m (100gf·cm Max)	5.9×10^{-3}N·m (60gf·cm Max)	4.9×10^{-3}N·m (50gf·cm Max)
Protection		Open				
Operating Temp, Range		-10 to +85°C				-10 to +70°C
Vibration (NOTE3)		$98m/s^2$ (10G)				$49m/s^2$ (5G)
Shock (NOTE4)		$1,960m/s^2$ (200G)				$960m/s^2$ (100G)
Mass		0.03kg (Without Cable)	0.06kg (Without Cable)	0.08kg (Without Cable)	0.5kg Max (Without Cable)	0.6kg Max

NOTE 1) Current consumption: This is a specification for no loading at output circuit.
NOTE 2) The specification for shaft allowable load shall be a mechanical value.
Actual specification allows us to recommend within 20 percents of the specification.
NOTE 3) Vibration: This is a value under the condition of meeting the total of 6 (six) hours consisting of 2 hours or each of X, Y and Z axis.
NOTE 4) Shock: This is a value under the condition of meeting the total of 18 (eighteen) times Consisting of 3 times for each of X, Y and Z axis.

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