

Model 15T Thru-Bore Encoder Model 15H Hollow Bore Encoder

**BRITISH
ENCODER
PRODUCTS COMPANY**



Ø38.1 mm

Features

- Very High Performance Economical Encoder
- Low Profile 25.4 mm Height and 38 mm Diameter
- Thru-Bore sizes up to 10 mm
- Simple, Innovative Flex Mounting System (Global Mounting Standards)
- Up To 12 Pole Commutation Optional (for brushless motor control)

The Model 15T or 15H offer a high performance feedback solution in a low profile package. Unlike modular or kit encoders, the Model 15 utilizes an integral bearing set, and an innovative flexible mounting system which is much more tolerant to axial misalignment or radial shaft run-out. The slotted flex mounts provide 20 or 30 degrees of rotational adjustment for commutation or index pulse timing. Installation is quick and easy! For brushless servo motor applications, three 120° electrical phase tracks can provide up to 12 pole commutation feedback. The optional 100° C temperature options allow servo motors to operate at higher power outputs and duty cycles. The Model 15 provides stable and reliable operation and is an excellent replacement for other manufacturer's modular encoders where a high performance solution is desired.

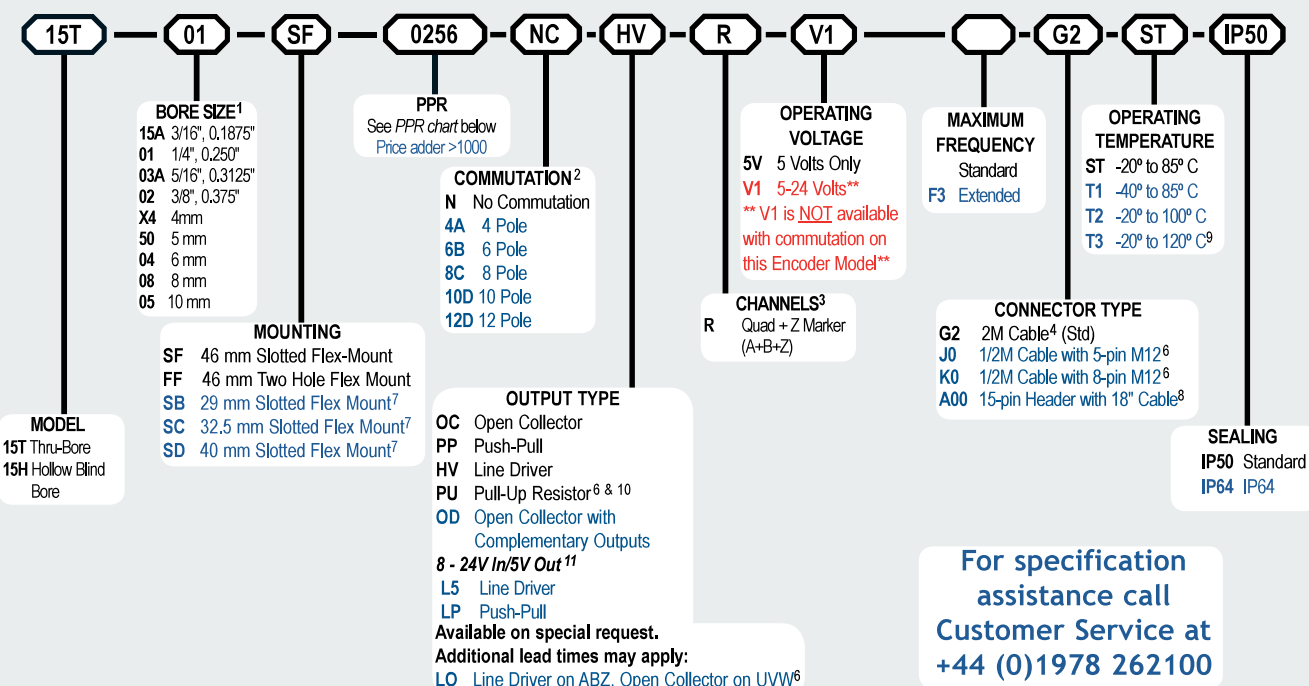
Common Applications

Servo Motor Control, Robotics, Speciality Assembly Machines, Digital Plotters, High Power Motors

Model 15T/H Ordering Guide

Blue type indicates price adder options. Not all configuration combinations may be available.

Contact Customer Service for details.



Model 15T PPR Options

0001 thru 0189*	0198	0200	0250
0256	0300	0315	0360
0500	0512	0580	0600
0800	1000	1024	1200
1500	1800	2000	2048
2540	3000	3600	4000
5000	6000	7200	8192
			10,000

* Contact customer service for availability

New PPR values are periodically added to those listed. Contact Customer Service to determine all currently available values. Special disk resolutions are available upon request and may be subject to a one-time NRE fee.

NOTES:

- 1 Contact Customer Service for additional options not shown.
- 2 Not available in all configurations, and not available with V1 Input Voltage. Contact Customer Service for availability.
- 3 Contact Customer Service for non-standard marker gating or phase relationship options.
- 4 For non-standard cable lengths contact sales for availability and cost.
- 5 With Input Voltage above 16 Vcc, operating temperature is limited to 85° C. Not available with A00 15 Pin Header option.
- 6 Not available with commutation. 5-pin not available with Line Driver (HV, OD, LO) outputs. Additional cable lengths available. Please consult Customer Service.
- 7 This mount requires button head screws and a modified Hex wrench. Order appropriate Installation Kit listed under Specifications.
- 8 Pin Header available with 5 VDC Input Voltage, HV Line Driver and standard quadrature phasing only. Not available with CE Certification. IP50 sealing option only.
- 9 Only available with 5 Vcc Input Voltage.
- 10 Reverse Quadrature not available with PU output type.
- 11 Standard temperature only, Not available with commutation.

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Model 15T/H Specifications

Electrical

Input Voltage	5 Vcc $\pm 10\%$ Fixed Voltage for Commutation 4.75 to 24 Vcc max for temperatures up to 85° C 4.75 to 24 Vcc for temperatures between 85° to 100° C
Input Current	140 mA max (65 mA typical) with no output load
Output Format	Incremental- Two square waves in quadrature with channel A leading B for clockwise shaft rotation, as viewed from the encoder mounting face. See <i>Waveform Diagrams</i> .
Output Types	Open Collector- 20 mA max per channel Push-Pull- 20 mA max per channel Pull-Up- Open collector with 2.2K ohm Pull-Up 20 mA max per channel Line Driver- 20 mA max per channel (Meets RS 422 at 5 Vcc supply)
Marker/Index	Once per revolution, 401 to 10,000 PPR: Gated to output A 1 to 400 PPR: Ungated See <i>Waveform Diagrams</i> .
Max. Frequency	Standard Frequency Response is 200 kHz for PPR 1 to 2540 500 kHz for PPR 2541 to 5000 1 MHz for PPR 5001 to 10,000 Extended Frequency Response (optional) is 300 kHz for PPR 2000, 2048, 2500, and 2540
Noise Immunity	Tested to BS EN61000-6-2; BS EN50081-2; BS EN61000-4-2; BS EN61000-4-3; BS EN61000-4-6; BS EN500811
Symmetry	180° ($\pm 18^\circ$) electrical
Quad, Phasing	90° ($\pm 22.5^\circ$) electrical
Min. Edge Sep	67.5° electrical
Accuracy	Within 0.017° mechanical or 1 arc-minute from true position, (for PPR > 189)
Commutation	Up to 12 pole. Contact Customer Service for availability.
Comm. Accuracy	1° mechanical

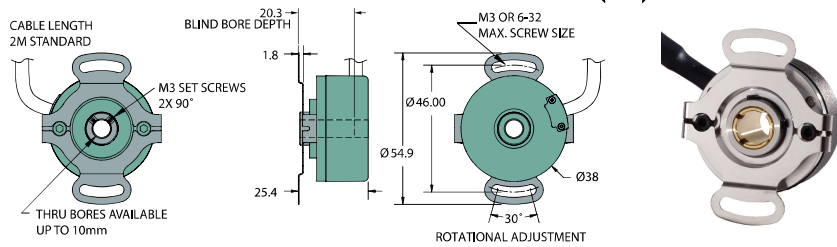
Mechanical

Max Shaft Speed	8000 RPM. Higher speeds may be achievable, contact Customer Service.
Bore Size	0.1875" through 0.375", 5 mm through 10 mm
Bore Tolerance	H7 (Sliding Fit for g6)
User Shaft Tolerances	
Radial Runout	0.20mm max
Axial Endplay	± 0.75 mm max
Starting Torque	IP50 Hollow Bore: 1.4123×10^{-3} Nm IP50 Thru-Bore: 2.1185×10^{-3} Nm IP64: 4.2370×10^{-3} Nm
Electrical Conn	2M cable (foil and braid shield, 24 AWG conductors non-commutated, 28 AWG commutated), 5- or 8-pin M12 (12 mm) in-line connector with 0.5M cable (braid shield), 15-pin Header with 18" cable
Mounting	46 mm Slotted Flex mount 46 mm Two Hole Flex Mount 29 mm Slotted Flex Mount 32.5 mm Slotted Flex Mount 40 mm Slotted Flex Mount 15-pin Single Row PCB Mount Connector (See mechanical drawings for dimensions)
Weight	100 grams typical

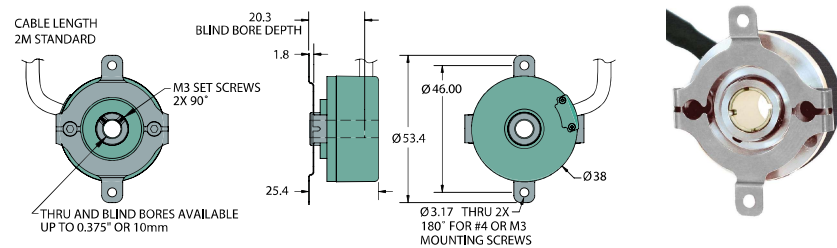
Environmental

Operating Temp	-20° to +85° C standard models -40° to +85° C for low temperature option -20° to +100° C for high temperature option -20° to +120° C for extreme temperature option
Storage Temp	-25° to +85° C
Humidity	98% RH non-condensing
Vibration	10 g @ 58 to 500 Hz
Shock	80 g @ 11 ms duration
Sealing	IP50 standard; IP64 available

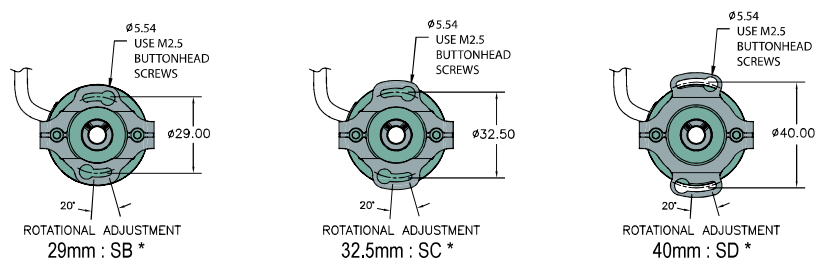
Model 15T/H 46mm Slotted Flex Mount (SF)



Model 15T/H 46mm Two Hole Flex Mount (FF)



Model 15T/H Small Diameter Slotted Flex Mounts

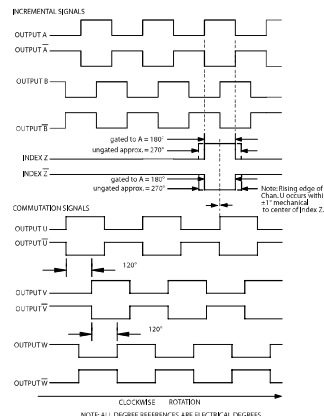


* Order Appropriate Mounting and Installation Kit for SB, SC, or SD Option	
176149-01	Installation Kit, M 2.5 Buttonhead Screws with 1.5 mm Shortened Hex Wrench
176150-01	Installation Kit, 4-40 Buttonhead Screws with 1.5 mm Shortened Hex Wrench

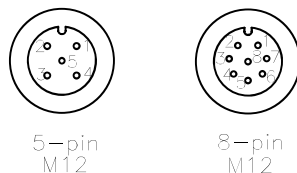
Each kit contains 10 screws for mounting 5 encoders

Encoder Length and Diameter are the same as SF and FF mounts detailed above. All dimensions are in mm with a tolerance of ± 0.254 unless otherwise specified.

Waveform Diagrams



In-Line Connector Pin-Outs



Wiring Table

Function	Gland Cable† Wire Color	5-pin M12* PP,OC,PU	8-pin M12* HV,OD	8-pin M12* OC,PP,PU	15 Pin Header HV,LS
0 Volts	Black	3	7	7	1
+VCC	White	1	2	2	2
A	Brown	4	1	1	4
A'	Yellow	—	3	—	3
B	Red	2	4	4	6
B'	Green	—	5	—	5
Z	Orange	5	6	6	7
Z'	Blue	—	8	—	8
U	Violet	—	—	—	10
U'	Gray	—	—	—	9
V	Pink	—	—	—	14
V'	Turquoise	—	—	—	13
W	Red/Green	—	—	—	12
W'	Red/Yellow	—	—	—	11
Shield	Bare†	Case	Case	8	—

*CE: Cable shield (bare wire) is connected to internal case.

†Standard cable is 24 AWG conductors with foil and braid shield.

**CE: Shield is connected to connector case unless otherwise specified.

