

# Model 744 Heavy Duty 444 Tacho Style



## Features

- Standard "444" Style, 115mm Diameter
- Up to 30,000 PPR
- Choice of Shaft Sizes
- IP64 Sealing Available

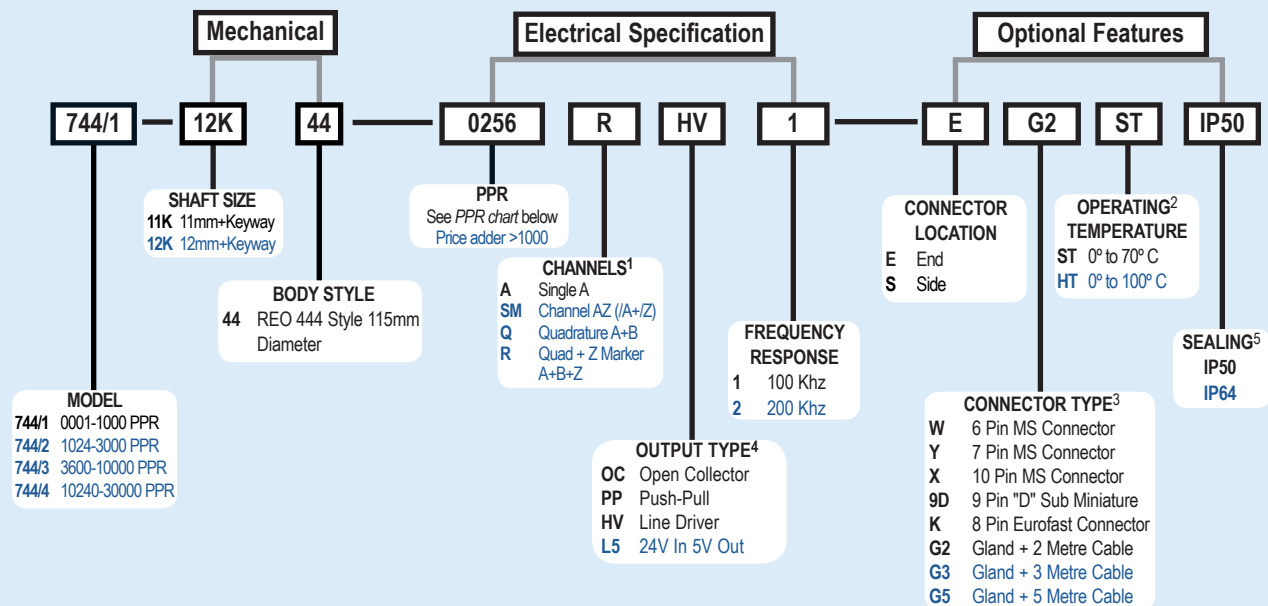
The 744 is designed to provide a digital encoder signal format to replace traditional Tacho style feedback devices. The heavy duty bearings and mechanical assembly make the 744 perfect for those applications requiring a rugged and dependable encoder.

## Common Applications

Motion Control Feedback, Conveyors, Elevator Controls, Machine Control, Food Processing, Process Control, Robotics, Material Handling, Textile machines

## Model 744 Ordering Guide

Blue type indicates price adder options. Not all configuration combinations may be available. Contact Customer Service for details.



### Model 744 PPR Options

|                     |                     |                     |                     |                     |                     |                     |                     |                     |
|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| 0001*               | 0002*               | 0004*               | 0005*               | 0006*               | 0007*               | 0008*               | 0010*               | 0011*               |
| 0012*               | 0014*               | 0020                | 0021*               | 0024*               | 0025*               | 0028*               | 0030*               | 0032*               |
| 0033*               | 0034*               | 0035*               | 0038*               | 0040*               | 0042*               | 0045*               | 0050*               | 0060                |
| 0064*               | 0100                | 0120                | 0125                | 0128*               | 0144*               | 0150*               | 0160*               | 0192*               |
| 0200                | 0240*               | 0250                | 0254*               | 0256*               | 0300                | 0333*               | 0360                | 0400                |
| 0500                | 0512                | 0600                | 0625*               | 0635                | 0665*               | 0720                | 0768*               | 0800                |
| 0889                | 0900*               | 1000                | 1024                | 1200                | 1201 <sup>a</sup>   | 1203 <sup>a</sup>   | 1204 <sup>a</sup>   | 1250 <sup>a</sup>   |
| 1270 <sup>a</sup>   | 1440                | 1500                | 1800                | 2000                | 2048                | 2400 <sup>a</sup>   | 2500                | 2540 <sup>a</sup>   |
| 2880 <sup>a</sup>   | 3000 <sup>a</sup>   | 3600 <sup>a</sup>   | 4000 <sup>a</sup>   | 4096 <sup>a</sup>   | 5000 <sup>a</sup>   | 6000 <sup>a</sup>   | 7200 <sup>a</sup>   | 7500 <sup>a</sup>   |
| 9000 <sup>a</sup>   | 10,000 <sup>a</sup> | 10,240 <sup>a</sup> | 12,000 <sup>a</sup> | 12,500 <sup>a</sup> | 14,400 <sup>a</sup> | 15,000 <sup>a</sup> | 18,000 <sup>a</sup> | 20,000 <sup>a</sup> |
| 20,480 <sup>a</sup> | 25,000 <sup>a</sup> | 30,000 <sup>a</sup> |                     |                     |                     |                     |                     |                     |

\* Contact Customer Service for High Temperature Option.

<sup>a</sup> High Temperature Option (H) limited to 85° C maximum for these PPR options.

New PPR values are periodically added to those listed. Contact Customer Service to determine all currently available PPR values. Special disc resolutions are available upon request.

A one-time NRE fee may apply.

**For specification  
assistance call  
Customer Service at  
+44 (0)1978 262100**

### NOTES:

- 1 Contact Customer Service for additional index gating options.
- 2 24 Vcc max for high temperature option.
- 3 Contact Customer Service for non-standard cable lengths.
- 4 Marker (Index) not available with 6-Pin (HV-Q) or 7-Pin MS connector & HV Output.
- 5 Increased starting torque with IP64 option.

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## Model 744 Specifications

### Electrical

Input Voltage ..... 4.75 to 24 VCC max for temperatures up to 70° C  
 Input Current ..... 100 mA max with no output load  
 Input Ripple ..... 100 mV peak-to-peak at 0 to 100 kHz  
 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 *Waveform Diagrams* below.  
 Output Types ..... Open Collector- 50 mA max per channel  
 Push-Pull- 20 mA max per channel  
 Line Driver- 20 mA max per channel (Meets RS 422 at 5 VCC supply)  
 Index ..... Occurs once per revolution. The index for units >3000 PPR is 90° gated to Outputs A and B. See *Waveform Diagrams* below.  
 Freq Response ..... Up to 200 KHz  
 Noise Immunity ..... Tested to BS EN61000-4-2; IEC801-3; BS EN61000-4-4; DENV 50141; DENV 50204; BS EN55022 (with European compliance option); BS EN61000-6-2; BS EN50081-2  
 Symmetry ..... 1 to 6000 PPR: 180° (±18°) electrical at 100 kHz output  
 6001 to 20,480 PPR: 180° (±36°) electrical  
 Quad Phasing ..... 1 to 6000 PPR: 90° (±22.5°) electrical at 100 kHz output  
 6001 to 20,480 PPR: 90° (±36°) electrical  
 Min Edge Sep ..... 1 to 6000 PPR: 67.5° electrical at 100 kHz output  
 6001 to 20,480 PPR: 54° electrical  
 >20,480 PPR: 50° electrical  
 Rise Time ..... Less than 1 microsecond  
 Accuracy ..... Instrument and Quadrature Error: For 200 to 1999 PPR, 0.017° mechanical (1.0 arc minutes) from one cycle to any other cycle.  
 For 2000 to 3000 PPR, 0.01° mechanical (0.6 arc minutes) from one cycle to any other cycle. Interpolation error (units > 3000 PPR only) within 0.005° mechanical. (Total Optical Encoder Error = Instrument + Quadrature + Interpolation)

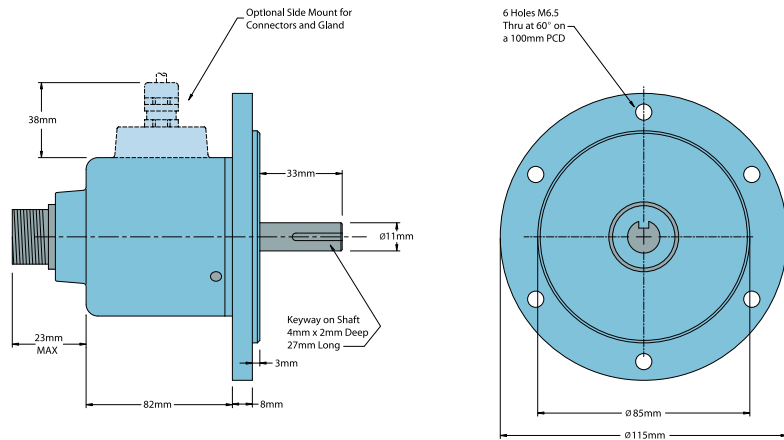
### Mechanical

Max Shaft Speed ..... 6000 RPM. Higher shaft speeds may be achievable, contact Customer Service.  
 Shaft Size ..... See order code  
 Shaft Material ..... 303 stainless steel  
 Shaft Rotation ..... Bi-directional  
 Radial Shaft Load ..... 120N Operating  
 Axial Shaft Load ..... 120N Operating  
 Starting Torque ..... 7.0615 x 10<sup>-3</sup> Nm typical with no seal  
 2.118 x 10<sup>-2</sup> Nm typical with IP64 shaft seal  
 Electrical Conn ..... 6-, 7-, or 10-pin MS Style, 8-pin M12 (12 mm), 9-pin D-subminiature, or gland with 2M of cable (foil and braid shield, 24 AWG conductors)  
 Housing ..... Black non-corrosive finish  
 Bearings ..... Precision ABEC ball bearings  
 Mounting ..... 115/85mm, 6 x M6 @ 100mm PCD  
 Weight ..... 600 grams typical

### Environmental

Operating Temp ..... 0° to 70° C for standard models  
 0° to 100° C for high temperature option (0° to 85° C for certain resolutions, see PPR Options.)  
 Storage Temp ..... -25° to +85° C  
 Humidity ..... 95% RH non-condensing  
 Vibration ..... 10 g @ 58 to 500 Hz  
 Shock ..... 50 g @ 11 ms duration  
 Sealing ..... IP50 standard, IP64 optional

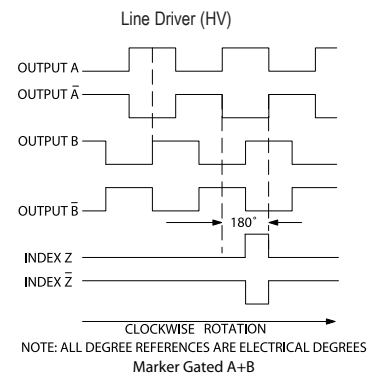
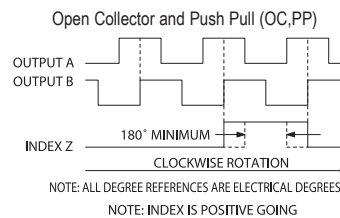
## Model 744 '444' Style 115mm Diameter



All dimensions are in mm with a tolerance of ±0.127mm or ±0.254 unless otherwise specified



### Waveform Diagrams



### Wiring Table

| Function | Gland Cable Wire Color | 5-pin M12 | 8-pin M12 | 10-pin MS | 7-pin MS L5 HV-Q | 7-pin MS PP OC, LP HV-R | 6-pin MS PP OC, LP HV-R | 6-pin MS L5 HV-Q | 9-pin D-sub |
|----------|------------------------|-----------|-----------|-----------|------------------|-------------------------|-------------------------|------------------|-------------|
| Com      | Black                  | 3         | 7         | F         | F                | F                       | F                       | F                | 9           |
| +Vcc     | White                  | 1         | 2         | D         | D                | D                       | D                       | D                | 1           |
| A        | Brown                  | 4         | 1         | A         | A                | A                       | A                       | A                | 2           |
| A'       | Yellow                 | —         | 3         | H         | C                | —                       | —                       | C                | 3           |
| B        | Red                    | 2         | 4         | B         | B                | B                       | B                       | B                | 4           |
| B'       | Green                  | —         | 5         | I         | E                | —                       | —                       | E                | 5           |
| Z        | Orange                 | 5         | 6         | C         | —                | C                       | C                       | —                | 6           |
| Z'       | Blue                   | —         | 8         | J         | —                | —                       | —                       | —                | 7           |
| Case     | —                      | —         | —         | G         | G                | G                       | —                       | —                | 8           |
| Shield   | Screen                 | —         | —         | —         | —                | —                       | —                       | —                | —           |

**CAUTION - Always check wiring colour code against Encoder Label due to changes in specification since September 2006**

Incremental Shaft Encoders