

DR738



Direct replacement encoder for 444 Tach Style encoders



The **DR738** 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 DR738 perfect for those applications requiring a rugged and dependable encoder. Typically replaces encoders from Hubner, Baumer, Tekel, etc.

COMMON APPLICATIONS

Motion Control Feedback, Conveyers, Elevator Controls, Machine Control, Food Processing, Process Control, Robotics, Material Handling, Textile Machines

Features:

- Standard REO 444 Style, 115 mm diameter flange
- Up to 30,000 CPR
- Two standard shaft sizes
- IP64 sealing available
- Extended life disk technology

MODEL DR738 ORDERING GUIDE

Blue type indicates price adder options.

DR738	N	51	S	1000	R	HV	1	Y	2	E	X	N	CE
Model DR738 444 Tach	Housing Style N Standard Housing	Operating Temperature S 0° to 70° C H 0° to 100° C ¹	Cycles Per Revolution 1-30,000 See CPR Options for available resolutions. Price adder for CPR >1270 1271-3000 3001-5000 5001-6000 6001-10,000 10,001-18,000 18,001-24,000 24,001-30,000	Output Type 5 - 28V In/Out ³ OC Open Collector PU Pull-Up Resistor PP Push-Pull HV Line Driver ⁴ 8 - 28V In/5V Out ^{5,6} H5 Line Driver ⁴ P5 Push-Pull	Mounting Y 444 Tach	Seal 2 IP64	Connector Location S Side E End	Mating Connector N No Y Yes 6-pin MS Style 7-pin MS Style 10-pin MS Style 9-pin D-sub	Maximum Frequency 1 Standard 100 kHz 2 200 kHz - \$19 5 250 kHz, >3000 CPR 3 500 kHz, >6000 CPR ⁷ 4 1 MHz, >10,000 CPR ⁷	Connector Type⁸ W 6-pin MS Style Y 7-pin MS Style X 10-pin MS Style 9D 9-pin D-subminiature J 5-pin M12 (12 mm) K 8-pin M12 (12 mm) G Gland, 24" Cable ⁹	Certification N None CE CE marked ¹⁰		

Number of Channels²

A Channel A
Channel A Leads B
Q Quadrature A & B
R Quadrature A & B with Index
Channel B Leads A
K Reverse Quadrature A & B
D Reverse Quadrature A & B with Index

MODEL DR738 CPR

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*	0200	0240*	0250	0254*	0256*	0300	0333*	0360	0400
0500	0512	0600	0625*	0635	0665*	0720	0768*	0800	0889	0900*
1000	1024	1200	1201**	1203**	1204**	1250*	1270*	1440	1500	1800
2000	2048	2400a	2500	2540*	2880*	3000*	3600*	4000*	4096*	5000*
6000*	7200*	7500*	9000*	10,000*	10,240*	12,000*	12,500*	14,400*	15,000*	18,000*
20,000*	20,480*	25,000*	30,000*							

* Contact Customer Service for High Temperature Option.
^a High Temperature Option (H) limited to 85° C maximum for these CPR options.

- NOTES:
- 1 0° to 85° C for certain resolutions, see CPR Options.
 - 2 Contact Customer Service for index gating options.
 - 3 24 VDC max for high temperature option.
 - 4 Line Driver not available with 5-pin M12 or 6-pin MS connector. Available with 7-pin MS connector only without Index Z.
 - 5 Standard temperature, 60 to 3000 CPR only.
 - 6 H5 and P5 outputs not available with CE option, or any End Mount MS Connector.
 - 7 Standard cable lengths only. For details, please refer to Technical Bulletin TB-116: Noise and Signal Distortion Considerations at encoder.com.
 - 8 For Mating Connectors, Cables, and Cordsets see Accessories at encoder.com.
 - 9 For Non-Standard Cable Lengths add a forward slash (/) plus cable length expressed in feet. Example: SG/6 = 6 feet of cable.
 - 10 Please refer to Technical Bulletin TB-100: When to Choose the CE Mark at encoder.com.

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MODEL DR738 SPECIFICATIONS

Electrical

Input Voltage	4.75 to 28 VDC for temperatures up to 70° C 4.75 to 24 VDC for temperatures between 70° C to 100° 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 – 100 mA max per channel Pull-Up- 100 mA max per channel Push-Pull – 20 mA max per channel Line Driver – 20 mA max per channel (Meets RS 422 at 5 VDC supply)
Index	Occurs once per revolution. The index for units >3000 CPR is 90° gated to Outputs A and B. See Waveform Diagrams below.
Max Frequency	Up to 1 MHz
Noise Immunity	Tested to BS EN61000-4-2; IEC801-3; BS EN61000-4-4; DDENV 50141; DDENV 50204; BS EN55022 (with European compliance option); BS EN61000-6-2; BS EN50081-2
Symmetry	1 to 6000 CPR: 180° (±18°) electrical at 100 kHz output 6001 to 20,480 CPR: 180° (±36°) electrical
Quad Phasing	1 to 6000 CPR: 90° (±22.5°) electrical at 100 kHz output 6001 to 20,480 CPR: 90° (±36°) electrical
Min Edge Sep.	1 to 6000 CPR: 67.5° electrical at 100 kHz output 6001 to 20,480 CPR: 54° electrical >20,480 CPR: 50° electrical
Rise Time	Less than 1 microsecond
Accuracy	Instrument and Quadrature Error: For 200 to 1999 CPR, 0.017° mechanical (1.0 arc minutes) from one cycle to any other cycle. For 2000 to 3000 CPR, 0.01° mechanical (0.6 arc minutes) from one cycle to any other cycle. Interpolation error (units > 3000 CPR only) within 0.005° mechanical. (Total Optical Encoder Error = Instrument + Quadrature + Interpolation)

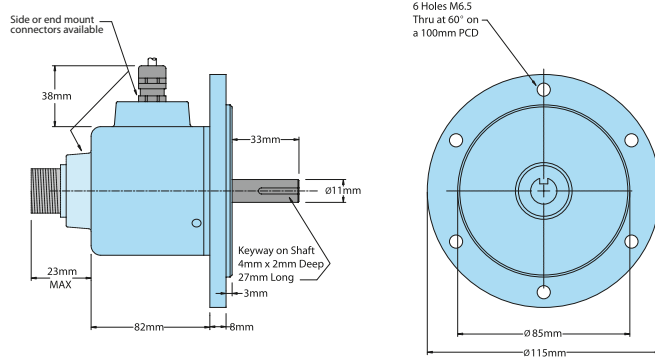
Mechanical

Max Shaft Speed	6000 RPM. Higher shaft speeds may be achievable, contact Customer Service.
Shaft Size	11 mm or 12 mm (both have keyways)
Shaft Material	303 stainless steel
Shaft Rotation	Bi-directional
Radial Shaft Load	27 lb max
Axial Shaft Load	27 lb max
Starting Torque	1.0 oz-in typical with IP64 seal
Moment of Inertia	5.2 x 10 ⁻⁴ oz-in-sec ²
Max Acceleration	1 x 10 ⁵ rad/sec ²
Electrical Conn.	6-, 7-, or 10-pin MS Style, 5- or 8-pin M12 (12 mm), 9-pin D-subminiature, or gland with 24 inches of cable (foil and braid shield, 24 AWG conductors)
Housing	Black non-corrosive finish
Bearings	Precision ABEC ball bearings
Mounting	444 Tach Style Flange
Weight	22 oz typical

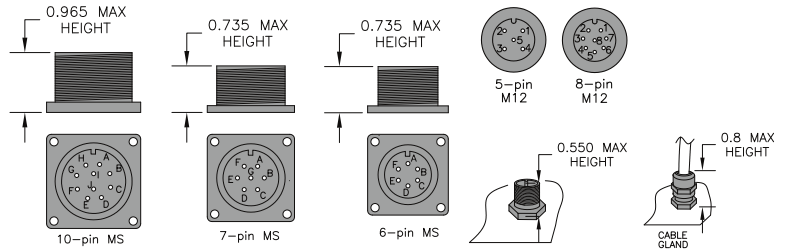
Environmental

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 CPR Options.)
Storage Temp	-25° to 85° C
Humidity	95% RH non-condensing
Vibration	10 g @ 58 to 500 Hz
Shock	50 g @ 11 p duration
Sealing	IP64

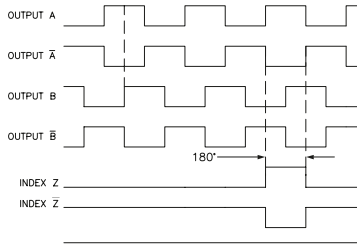
DR738 REO 444 Style 115 mm Diameter



CONNECTOR PIN-OUTS



DR738 Output Waveform



CLOCKWISE ROTATION AS VIEWED FROM THE MOUNTING FACE

NOTE: ALL DEGREE REFERENCES ARE ELECTRICAL DEGREES

DR738 Wiring Table

Function	Gland Cable Wire Color	5-pin M12 ²	8-pin M12 ²	10-pin MS	7-pin MS HV, H5	7-pin MS PU, PP OC, P5	6-pin MS PU, PP OC, P5	9-pin D-sub	10-pin Bayonet
Com	Black	3	7	F	F	F	A, F	9	F
+VDC	Red	1	2	D	D	D	B	1	D
A	White	4	1	A	A	A	D	2	A
A'	Brown	---	3	H	C	---	---	3	H
B	Blue	2	4	B	B	B	E	4	B
B'	Violet	---	5	I	E	---	---	5	J
Z	Orange	5	6	C	---	C	C	6	C
Z'	Yellow	---	8	J	---	---	---	7	K
Case	Green	---	---	G	G	G	---	8	G
Shield	Bare ¹	---	---	---	---	---	---	---	---

¹CE Option: Cable shield (bare wire) is connected to internal case

²CE Option: Read Technical Bulletin TB111