



LP SERIES | MODEL LP35

LOW PROFILE EXPLOSION-PROOF / FLAMEPROOF ENCODER

Introduction

For the absolute version Serial Synchronous Interface SSI output provides effective synchronisation in a closed-loop control system. A clock pulse train from a controller is used to shift out sensor data: one bit of position data is transmitted to the controller per clock pulse received by the sensor. Incremental versions provide two channels in quadrature with complements and an index. Resolutions up to 10,000 cpt are available.



Features

- Designed for use in Class I, Div.1 & Zone 1 hazardous areas
- Low profile package saves space
- Excellent resistance to shock and vibration
- 30mm standard through shaft, PEEK reduction hub available
- High protection level of IP66
- High performance in temperatures from -40°C to +100°C
- Resolutions up to 10,000 PPR, incremental or 16 BITS absolute
- Terminal box with Conduit Termination
- Encapsulated electronics
- TTL and HTL electronics
- Reinforced electrical output available on some incremental and absolute models
 - Wiring fault tolerant with terminal box connection
 - Long cable drive capability



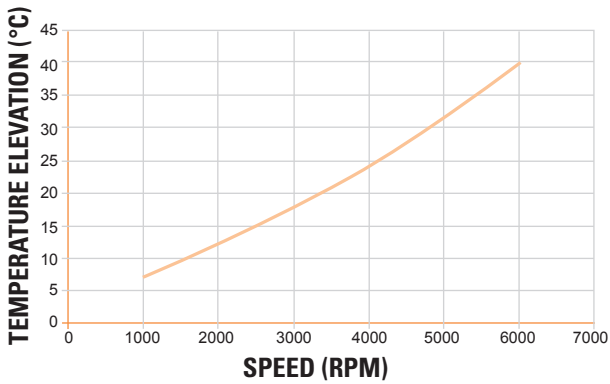
SPECIFICATIONS

Mechanical

Housing Size	124 mm x 156 mm x 52 mm (see dimensional drawings for other configurations)
Shaft Size	Hollow Shaft: Ø 1/2" to Ø 1" blind or through Solid Shaft: Ø12 mm x 20 mm with keyway, Ø 3/8 " x .78" with flat Hollow Shaft w/ Integrated Coupling: 14mm, 20mm, 1/2", 3/4"
Permissible Shaft Loads	Axial: 40 N [9 lbs] Radial: 80 N [18 lbs]
Shaft Runout	Hollow Shaft: 0.1 mm [0.004"] TIR Solid Shaft: 0.02 mm [0.001"] TIR Hollow Shaft w/ Integrated Coupling: N/A
Static/ Dynamic Torque	30 / 300 mN.m [4.2/ 42 oz-in] @ 25°C
Bearings	6807 - Sealed, deep groove ball bearing
Material	Cover: Hard anodized aluminum Body: Hard anodized aluminum Shaft: AISI 303 stainless steel
Bearing Life L_{10h} (Theoretical Mechanical Lifetime)	> 18.10 ⁹ turns / 100000 hours
Continuous Max. Speed^(A)	6000 RPM, (Reference Chart 1. Speed vs Temperature)
Shaft Moment of Inertia	< 130 000 g.mm ² [18.4 x 10 ⁻³ oz-in-sec ²]
Weight (aprox.)	1.6 kg [56.5 oz]

Chart 1. Speed vs Temperature

(Temperature on this chart to be added to ambient temperature. Do not exceed maximum temperature on datasheet.)



Electrical

	Absolute	Incremental
Output Format	SSI compatible (RS422)	Two channels in quadrature + index and complements
Resolution	Up to 16 BITS	Up to 10,000 CPT
Encoder Accuracy	±0.1°	
Supply Voltage Vcl	5-30 Vdc	
Supply Current (No Loads)	75mA Typ	
Current Per Channel Pair	40mA max	
Voltage / Output	28/SI: SSI RS485 w/o parity 28/SR: SSI RS485 reinforced w/o parity	28/V: Line driver 5-30 V In/Out; PushPull 28/5: Line driver with 5 V (TTL) regulated output 28/VR: Push Pull 11-30V reinforced
Short Circuit Proof	28/SI: Yes (except to V+) 28/SR: Yes	28/V: Yes 28/5: Yes (except to Vcl) 28/VR: Yes
Reverse Polarity Tolerant	Yes	
Wiring Fault Tolerant & Overvoltage Prot.	28/SI: No 28/SR: Yes	28/V: No 28/5: No 28/VR: Yes Up to 60Vdc
Frequency Response	Up to 1MHz (28/V and 28/5) Up to 300kHz (28/VR)	
Output Terminations	Enclosed terminal block, with three conduit fitting options: M16, 1/2" NPT, 3/4" NPT	
EMC	EN 61000-6-2 : 2005, see user manual for details EN 61000-6-4 : 2017 + A1 : 2011, see user manual for details	
Isolation	1000V	

Environmental

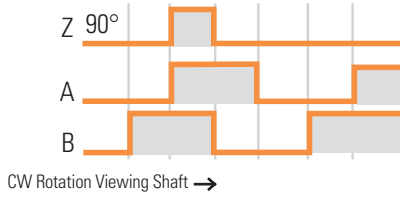
Protection Class (sealing)	IP65	
Temperature Range	Operating	-40°C to +85°C
	Storage	-40°C to +100°C
Mechanical Resistance	Shock	(EN60068-2-27): ≤ 3000m.s-2 (during 5 ms, half sine)
	Vibration	(EN60068-2-6): ≤ 200m.s-2 (55 ... 2 000 Hz)
Humidity	98% RH without condensation	

OUTPUT WAVEFORMS

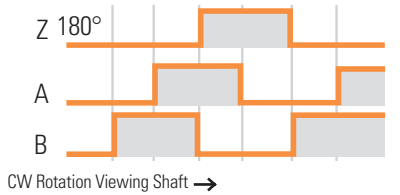
Waveform AA/ BB/ 00/ Channel B before A Clockwise (US convention is A leads B CCW)

Incremental Waveform

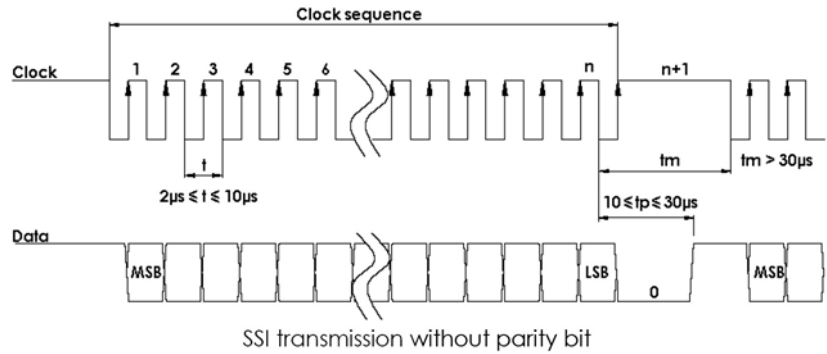
INDEX GATED WITH A & B HIGH (CODE Q28)



INDEX GATED WITH B LOW (CODE Q29)



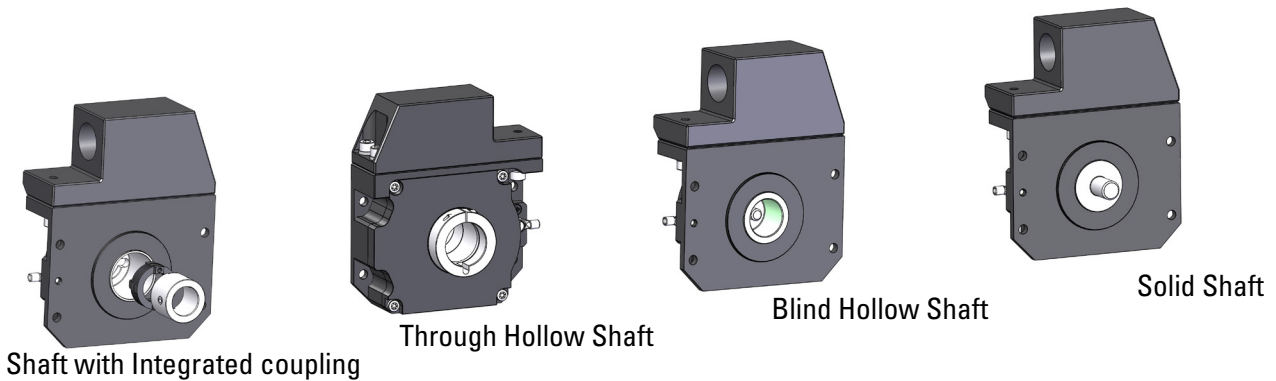
Absolute SSI Waveform



DIMENSIONS ^(A)

All dimensions are in millimeters [inches]
All drawings: For dimensions A-E refer to Table 1

SHAFT OPTIONS



Shaft with integrated coupling

Through driving
sleeve configuration

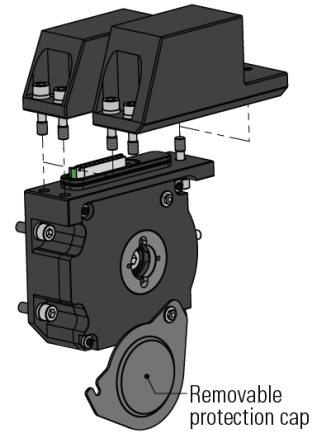
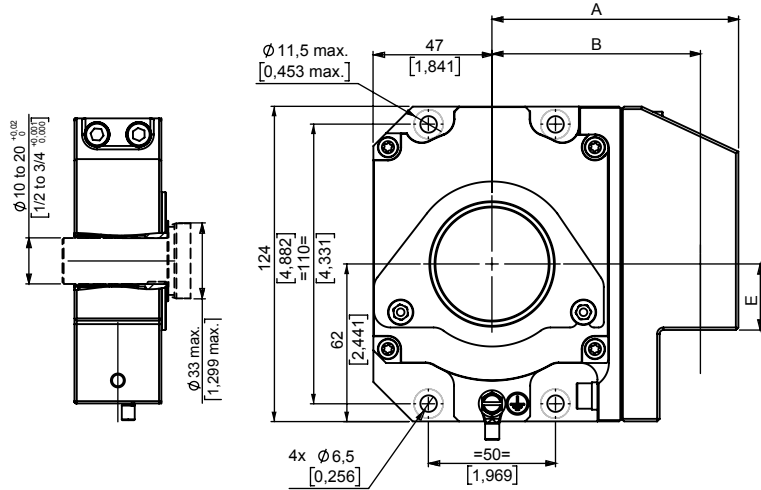
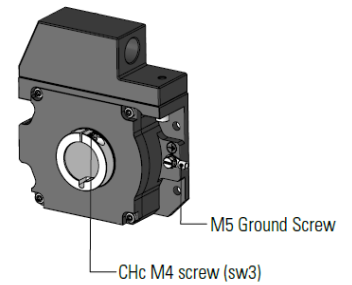
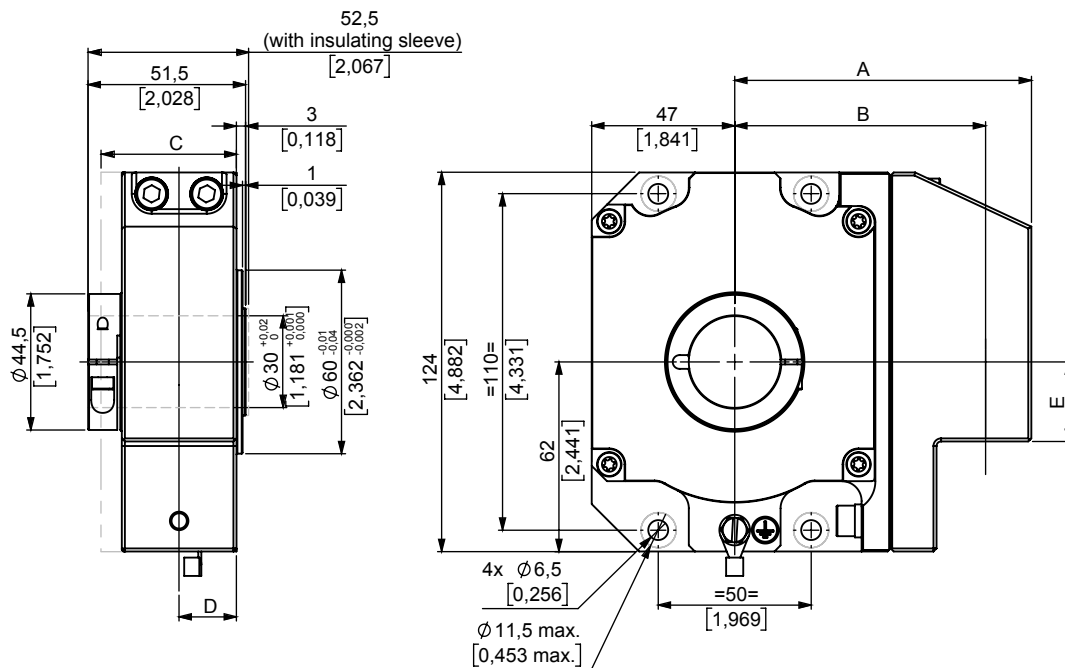


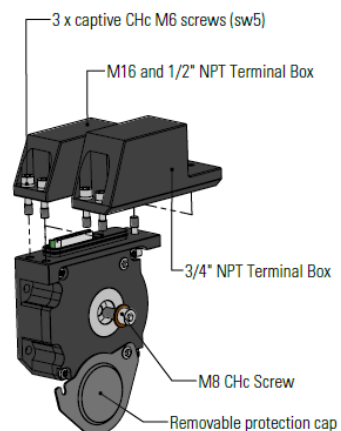
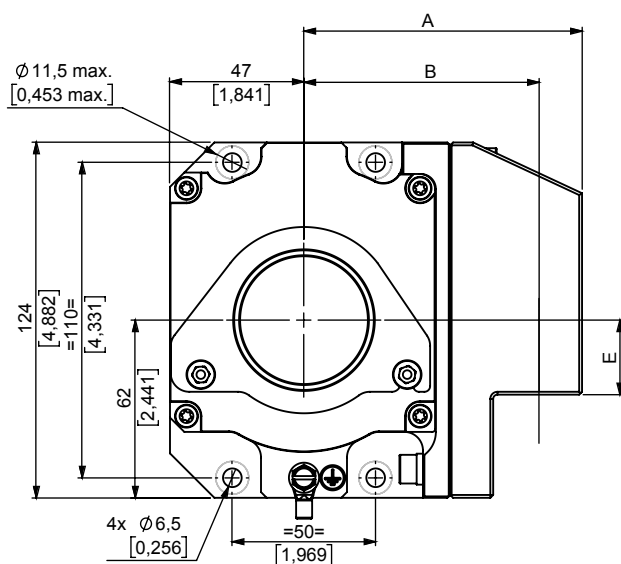
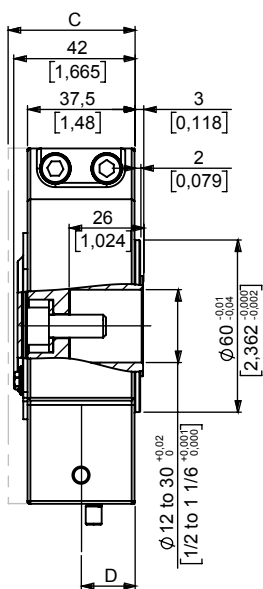
Table 1

	M16 and 1/2" NPT Terminal Box		3/4" NPT Terminal Box	
	mm	in	mm	in
A	97	3.819	109	4.291
B	82	3.228	88.5	3.484
C	37.50	1.437	44	1.732
D	18.25	0.719	22.25	0.876
E	27	0.945	24	0.945

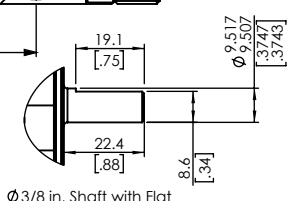
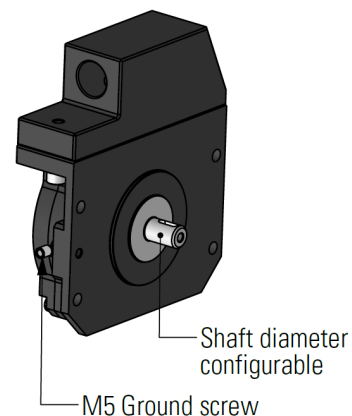
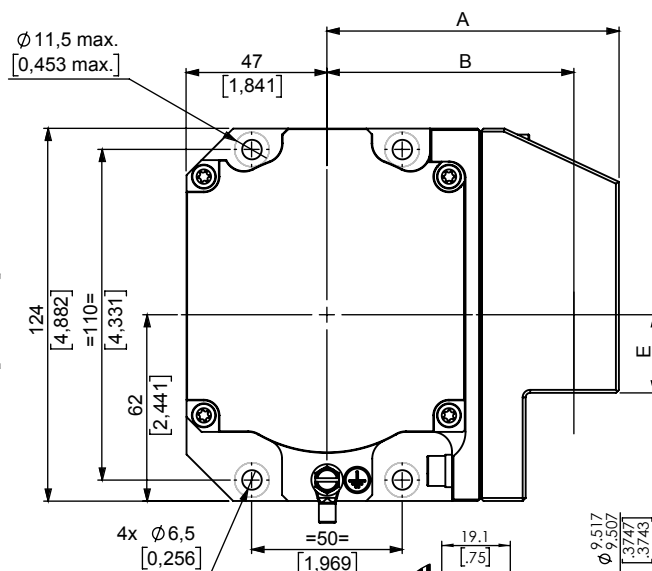
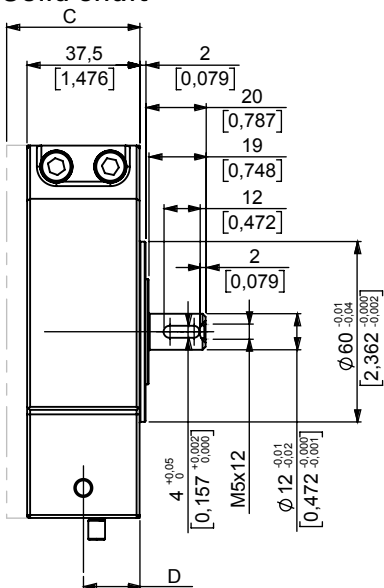
Through hollow shaft



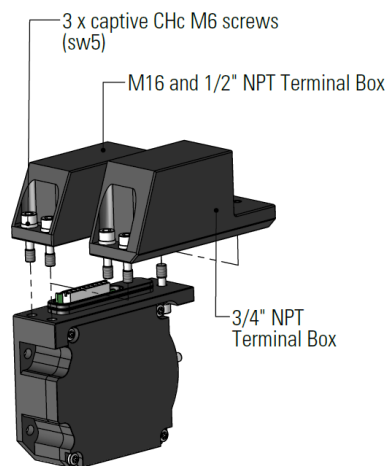
Blind hollow shaft



Solid shaft



Ø3/8 in. Shaft with Flat



TERMINATIONS

Absolute Terminal Box Connection

-	+	Clk+	Clk-	Data+	Data-	Reset	NC	Ground
1	2	3	4	5	6	7	8	9

Incremental Terminal Box Connection

-	+	A	B	Z	A/	B/	Z/	Ground
1	2	3	4	5	6	7	8	9



Incremental

32	64	100	128	250	256	360	500	512
600	720	1000	1024	1200	1250	1440	1500	2000
2048	2500	2880	3600	4096	5000	7200	8192	10000

Absolute

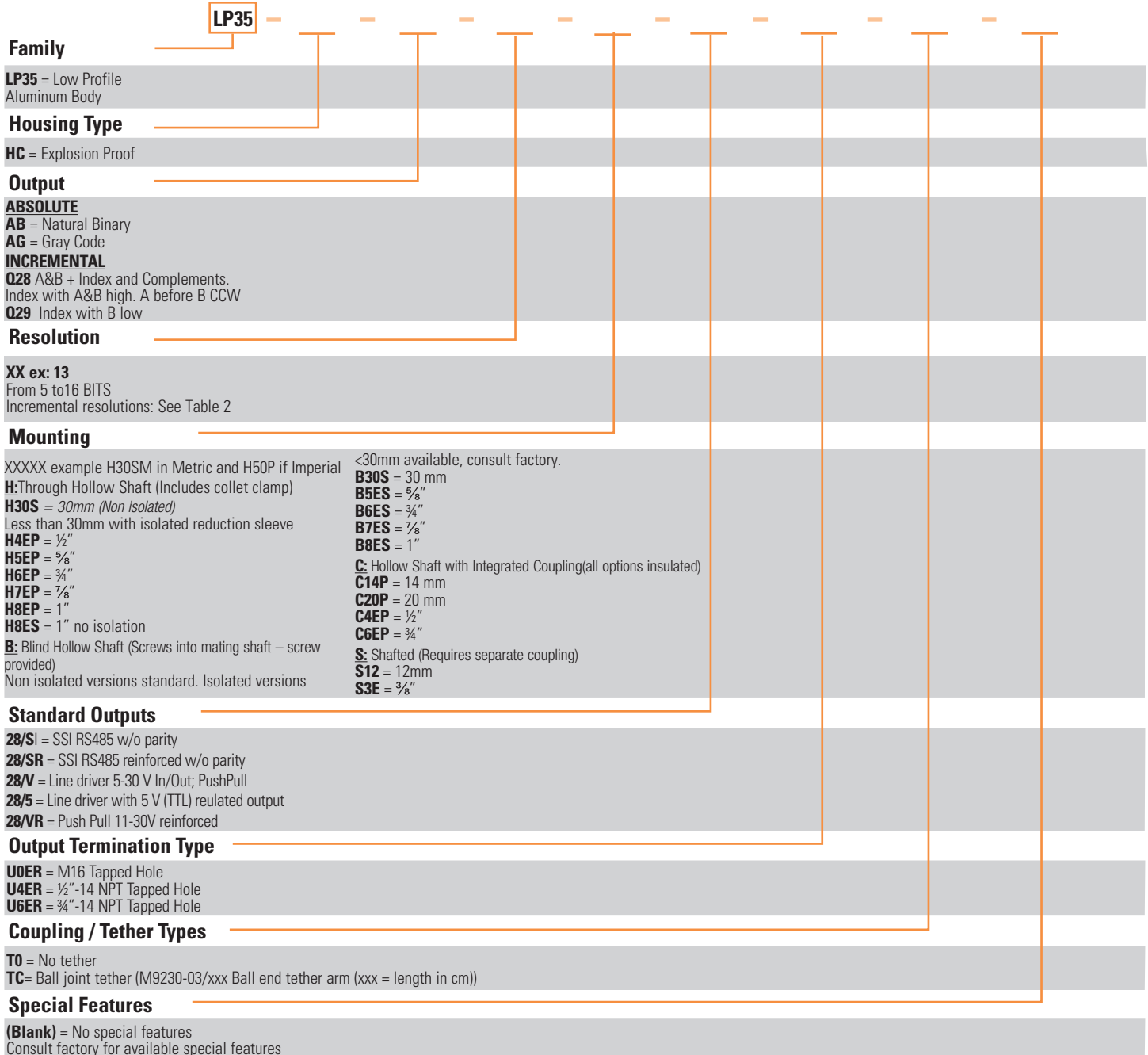
BITS	5	6	7	8	9	10	11	12	13	14	15	16
Counts	32	64	128	256	512	1024	2048	4096	8192	16384	32768	65536

For non-standard and resolutions above 10000 PPR, please contact factory



ORDERING OPTIONS - NORTH AMERICAN LP35 MODELS

Use this diagram, working from left to right to construct your model number (Example : LP35-HC-AB-13-H30S-28/SI-U0ER-T0)



AGENCY APPROVALS & CERTIFICATIONS



Class I, Group C & D



Ex db IIB T4 Gb



2017-031591-01



2004/108/CE



CENELEC
II 2 G Ex db IIB T4 Gb

DEMKO 16 ATEX 1691X
IECEX UL 16.0064X

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CONTROL DRAWINGS

Accompanying the spec is a control drawing. This is specific for the Explosion Proof products from the LP35 family and consist of Installation Requirements, Special Conditions of Operation and a Certificate of Conformity. In these documents, the LP series models are referred to as HH_X and AH_X. Despite the difference in nomenclature, these are the same product specified under the LP35 nomenclature. Both the LP35 and the HH_X or AH_X model numbers will appear on the label of the finished product.

GENERAL NOTES

^(A) For detailed installation instructions and recommend screw torques refer to the User's Manual

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