



Built on the same rugged design as the incremental model, the HS35 Absolute Encoder is available with various output options including Gray Code and Natural Binary. Designed with a cast aluminum housing, a sealed connector and shaft seals, it carries an IP65 environmental rating. With the optional insulating inserts, it can be mounted on smaller diameter shafts. It is designed for either a through shaft mounting or blind shaft mounting with a closed cover to maintain its environmental rating.

The HS35 Absolute Encoder is available with the following certification:

EN 55011 and EN 61000-6-2

Electrical Specifications

Options: Parallel: NB or GC 12-14 Bits (see Table 1)
 Serial (S3): 12-16 Bits (see Table 3)
 Analog: (A1-A5) 12-16 Bits (see Table 2)

Counts Per Shaft Turn: 4096–65536 depending on options
Count Transition Accuracy: $\pm 1/2$ bit maximum (Consult factory over 13 Bits)
Supply Voltage: 5–28 VDC ; 13-28 VDC for Analog
Current Requirements: 120 mA typical
Output Formats: **Parallel:** Gray Code, Natural Binary, Serial and Analog
Voltage/Output: (see note 2)
 28V/V: Line Driver, 5–28 VDC in, $V_{out} = V_{in}$
 28V/5: Line Driver, 5–28 VDC in, $V_{out} = 5$ VDC
 28V/OC: Open Collector, 5–28 VDC in, OC_{out}
 SSI: 5–28 VDC in/ $5V_{out}$ (consult factory for more information)
 Analog: A1-A5

Protection Level: Reverse, overvoltage and output short circuit protection
Frequency Response: 500kHz or 6000 RPM (Parallel)

Output Termination Pinouts: see tables
 For S3 options, reference Spec Addendum 02087-005
 For A1-A5 options, reference Spec Addendum 02088-002

Mechanical & Environmental Specs

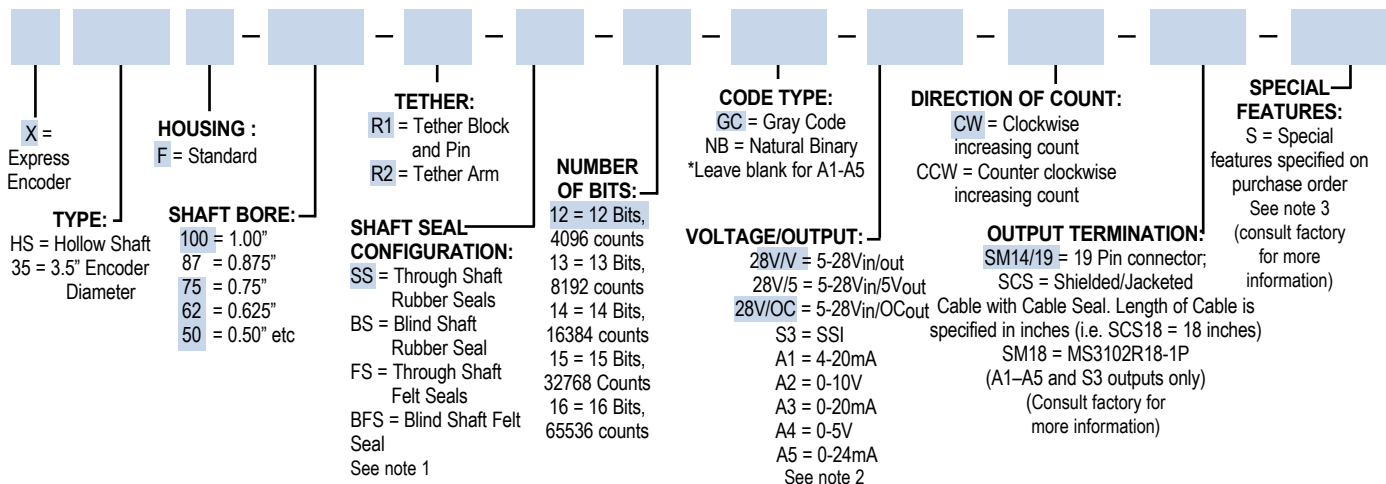
Shaft Bore: many diameters from .375 to 1.000 inch are available, including metric. (Consult factory for details)
Allowable Misalignment: 0.005" T.I.R. on mating shaft 0.75" from shaft end
Bore Runout: 0.001 T.I.R. maximum
Starting Torque at 25°C: Through shaft version (SS) = 7 in-oz (max);
 Blind shaft version (BS) = 4 in-oz max
Bearings: 52100 SAE High carbon steel
Shaft Material: 416 Stainless Steel
Bearing Housing: Die cast aluminum with protective finish
Cover: Die cast aluminum with protective finish
Bearing Life: 7.5×10^9 revs (50,000 hours @ 2500 RPM)
Maximum RPM: 6,000 mechanical (see frequency response, above)
Moment of Inertia: 0.019 oz-in-sec²
Weight: 18oz typical
Temperature: Operating, 0° to 70°C; Extended temperature ratings are available in the following ranges: -40 to 70°C, -40 to 85°C. Extended temperature ranges can affect other performance factors.

NOTES & TABLES: All notes and tables referred to in the text can be found on pages 2 & 3.

HS35 Absolute Encoder Ordering Options

FOR ASSISTANCE CALL 800-350-2727

Use this diagram, working from left to right to construct your model number (example: HS35F-100-R1-SS-12GC-28VV-CCW-SM14/19). All notes and tables referred to can be found on the back of this page.



EXPRESS ENCODERS: ITEMS HIGHLIGHTED WITH ARE STANDARD EXPRESS ENCODERS AND SHIP IN ONE TO THREE DAYS.

(consult factory for more information)

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Table 1: Parallel Output Code and Terminations

| PARALLEL Gray or Natural code | | | TERMINATION | |
|---|----------------|-------------|-------------|-------------|
| 14 BIT | 13 BIT | 12 BIT STD. | M14/19 CONN | CABLE COLOR |
| B13 (MSB) | B12 (MSB) | B11 (MSB) | A | W/BLK |
| B12 | B11 | B10 | B | W/BRN |
| B11 | B10 | B9 | C | W/RED |
| B10 | B9 | B8 | D | W/ORN |
| B9 | B8 | B7 | E | W/YEL |
| B8 | B7 | B6 | F | W/GRN |
| B7 | B6 | B5 | G | W/BLU |
| B6 | B5 | B4 | H | W/VIO |
| B5 | B4 | B3 | J | W/GRY |
| B4 | B3 | B2 | K | WHT |
| B3 | B2 | B1 | L | GRY/BLK |
| B2 | B1 | B0 (LSB) | M | GRY/BRN std |
| B1 | B0 (LSB) OR NC | | N | GRY/RED* |
| OV std. (BO_LSB 14 BIT or Enable, Dir C, latch) | | | P | GRY/ORN* |
| Dir Control std. (optional: latch or Enable) | | | R | ORN* |
| Case GND | | | S | GRN |
| OV RETURN | | | T | BLK |
| LATCH std. (optional: DC or Enable) | | | U | YEL* |
| +V SUPPLY | | | V | RED |
| SHIELD DRAIN | | | - | BARE |
| *Optional | | | | |

Table 2: Analog Termination and Options

| Analog | M18 | M14/19 | CABLE COLOR |
|---------------|-----|--------|-------------|
| A1,2,3,4 & A5 | M18 | M14/19 | CABLE COLOR |
| A+ OUT | A | A | YEL |
| A Return | H | B | W/YEL |
| Dir Control | C | U | ORN |
| Reset* | B | C | BLU |
| OV Return | F | T | BLK |
| +V Supply | D | V | RED |
| CASE GND | G | S | GRN |
| *Optional | | | |

Table 3: SSI Termination

| SSI | Termination | | |
|--------------|-------------|--------|-------|
| | M18 | M14/19 | CABLE |
| DATA+ | A | A | YEL |
| DATA- | H | B | W/YEL |
| CLK+ | B | C | BLU |
| CLK- | I | D | W/BLU |
| Dir Control | C | R | ORN |
| ENABLE* | J | P | W/ORN |
| OV RETURN | F | T | BLK |
| +V SUPPLY | D | V | RED |
| CASE GND | G | S | GRN |
| SHIELD DRAIN | - | - | BARE |
| *Optional | | | |

Ordering SSI : HOW TO SPECIFY SSI OUTPUT IN THE ENCODER MODEL NUMBER:
 Example: HS35-100-R2-SS-12-NB-S3-CW-SM18

Direction of Count: Standard is CW increasing when viewed from the shaft end. Pin R is normally HI (or N/C) and is pulled up internally to +V. To reverse the count direction, Pin R must be pulled LO (COMMON).

Latch control: Encoder outputs are active and provide continuous parallel position information when Pin U is HI (or N/C). Pin U is pulled up internally to +V. When Pin U is LO (COMMON) the encoder outputs are latched at the logic state that is present when the latch is applied and will stay latched until Pin U is no longer LO (COMMON).

M18 Connector is a MS3102R18-1P, 10-pin connector on the encoder body and mates to an MS3106F18-1S connector or can be used with a standard cable/connector assembly, BEI P/N 924-31186-18XX (Where XX = 10, 20 30 or 50 for a 10, 20, 30, or 50 foot length). This is the preferred connector for SSI output.

M14/19 Connector is a MS3112E14-19P, 19-pin connector on the encoder body and mates to an MS3116J14-19S or equivalent.

Figures

Figure 1
Gray Code

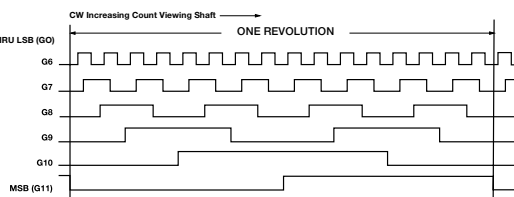


Figure 2
Natural Binary

