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## Brakes with Internal Encoders

**Stearns can supply encoders internally mounted inside new SAB brake enclosures as well as machine brake housings for fixed or shaft mount encoders.**

### Internal Encoders:

Interest in internal mounted encoders started with hazardous brake motors. Hazardous location brake flame path requirements do not allow a shaft to pass through the housing. The motor company could use an encoder, or a brake, on the non-drive end – but not both. The hazardous rated in-line encoder is an expensive alternative.

While industrial motors do not have the same restrictions, an internal encoder offers the same benefits. Stearns can mount an encoder inside the brake enclosure for either an industrial or hazardous duty brake.

- The encoder is in an enclosed environment.  
The encoder is out of the weather which is especially important in vertical mounting.  
The encoder is protected from accidental contact.
- The overall length of the encoder & brake package is reduced.
- Shaft mount encoders are lighter than larger rigidly mounted encoders reducing the load on the shaft. Less shafting length minimizes potential for shaft run-out problems affecting the encoder.
- Remove the brake housing without disturbing the encoder mount.  
The brake coil can be checked or replaced without unbolting and removing the encoder.
- Shaft mount encoders are rapidly fitted.  
The motor shaft design integrates encoder placement.



Picture one:  
An encoder is rigidly mounted to the brake housing.  
To inspect the brake, the encoder must be unbolted and removed.  
The through shaft is a potential leak path.

Fixed register mount continues as an available encoder option.



Picture two:  
An encoder is mounted on a stepped shaft extension inside the brake enclosure. The encoder is tethered to the brake support plate.

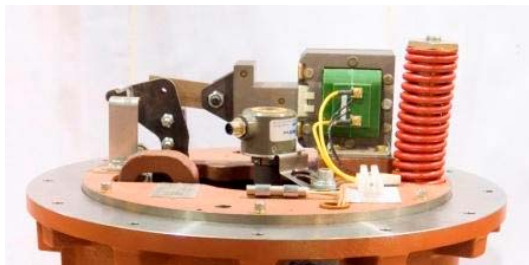
## Internal Mounting:

**Hazardous brake** hubs are machined for hub mounting. The encoder fits onto the hub shaft locating at the shoulder provided. The catalog dimensioned hazardous brake shaft length does not change and flame-path tolerances are not affected. Shaft concentricity and run-out continue to be important.



Picture three:  
A division one hazardous 1-082-300 hub machined for encoder mounting.

**Standard industrial brakes** with internal encoders do require a non-standard shaft length and are generally provided as a brake-motor-encoder package through the motor manufacturer. A stepped shaft is required and the necessary dimensions are detailed on drawings available from Stearns. A standard hub is used.



Picture four:  
In an industrial brake, the encoder locates at the shoulder of a stepped shaft.

## Encoders Offered:

Internal encoders are offered in the 1-087, 1081, 1082 & 1086 series of brakes. The HS 20 is the largest encoder size offered as a standard option, with a 2 inch outside diameter mounted on a 5/8 inch diameter turned shaft in the 10-440 lbft brakes. The 1-086 series will accept larger encoders although the standard encoder choices have a minimal lead-time requirement. The encoder brake brochure posted at [www.stearns.rexnord.com](http://www.stearns.rexnord.com) details the brand and model choices. A cable is provided with an M12, 8 pin connector. The encoders are optical, 1024 bit, the shielded cable exits the brake separately from the coil lead-wires and any options such as space heaters. Coils are wired through a fixed voltage and frequency power supply.



Picture five: The encoder cable is routed separately from the coil & heater.

## Engineered Solutions:

As with any Stearns brake modification, after a review of the standard offerings, Stearns design engineers will work with you to evaluate other specifications presented by your customers.



Picture six:  
An engineered mounting of a HS25 2.5" dia. Encoder, switch and right angle connector inside a 1-087-000 brake.



Picture seven:  
A 1-086-600 brake with a HS35M is mounted and packaged for shipping.

Finally, Stearns continues to offer both the external fixed and shaft mount options that are already familiar to you. The internal encoder expands your system design capability.

Your suggestions and comments are encouraged, your own stories and experiences most welcome.

**Stearns®: Reliable brakes through design, manufacture and support.**