

INSTALLATION INSTRUCTIONS FOR SHAFTED STYLE ENCODERS.

Overview:

The mechanical workings of an encoder are straightforward. The rotor portion is coupled to a shaft, so that it will turn without slippage, and the encoder body is prevented from rotating so that it serves as a physical reference for the rotation of the rotor.

Within this framework, certain physical properties associated with mechanical coupling must be observed to ensure a long operating life. The mechanical structure of the encoder shaft, as well as the shaft that is being coupled to are both supported with some form of rotary bearing (typically ball or roller bearings). Mechanical processes are not perfect and no matter how smoothly a rotating shaft may appear to turn, it will wobble when rotated. This small amount of movement is referred to as runout and is usually a few thousandths of an inch (maximum) for most industrial installations. This same principle applies to the encoder shaft as well. And here lies the heart of the installation problem.

If you were to hard couple the encoder shaft to a motor shaft and also hard couple the encoder body to the motor casing, the runout of the motor shaft would fight against the smaller, more accurate encoder bearings. This is a perfect “bearing grinding” machine! The motor bearings will “win” in this contest and you will be replacing encoders on a regular basis.

The solution, of course, is to ensure that some part of the assembly is flexible to minimize the stress on the encoder bearings. In the case of a shafted encoder, there is typically a flexible coupling between the encoder shaft and the motor shaft. For hollow shaft encoders, a flexible tether is used between the encoder body and the motor casing. Armed with this knowledge, you are ready to install your encoder.



Step 1

Ensure that you have the correct hardware for your installation and that it all fits properly. Mating parts should line up, bolt thread pitches and lengths should be appropriate and all the tools should be the correct type and size and should be at hand. Have the manufacturer's installation instructions handy, since there may be some critical measurements or pieces of hardware required.



Step 2

Check that there are no burrs on the mating shaft and that the setscrews on the flexible coupling are backed off so they don't bind when slipped on the shaft. Slide the coupling onto the mating shaft. If the mating shaft has a flat or a key way, make sure that the setscrew is aligned to land on the flat part of the shaft.



Step 3

Mount the encoder to its bracket with screws for a square flange or face mount, servo clamps for a servo mount. Do not tighten them all the way. Position the encoder shaft with the mating shaft so that they are co-aligned with a gap of about 1/8 inch (see inset). Check the misalignment specifications for the coupling to ensure that it is not overstressed. Tighten the encoder mounting screws.



Step 4

Align the flat of the encoder shaft with the flat or keyway on the mating shaft. Center the coupling over the gap between the two shafts and tighten the setscrew on the mating shaft. Wiggle the encoder shaft back and forth slightly to ensure that the coupling is not binding and it is at its "free length". Now tighten the setscrew on the encoder shaft. Your installation is complete.