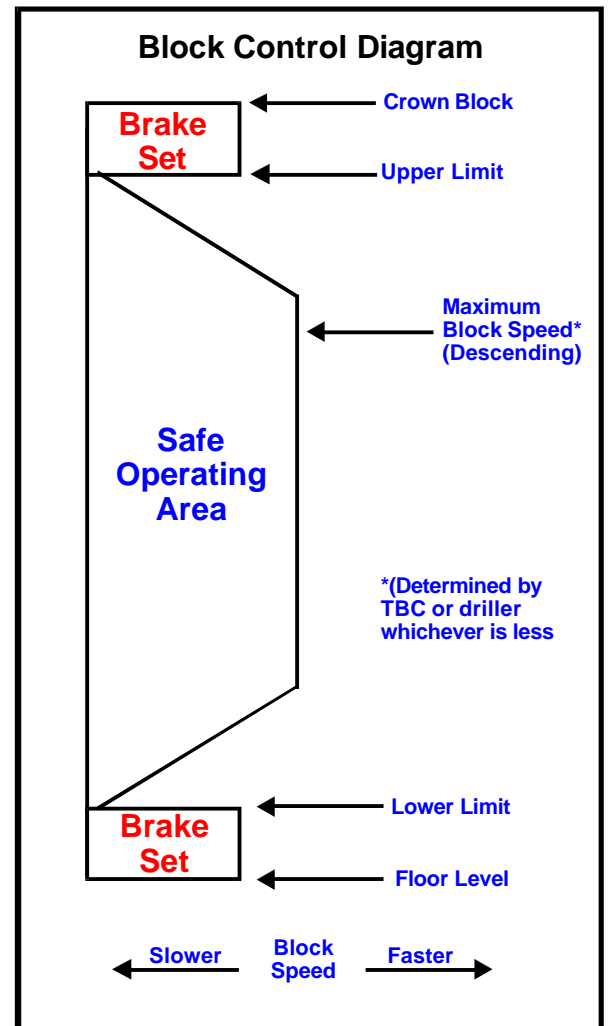


FEATURES:

- **Meets HSE And NPD Requirements**
- **Protects Crown And Floor**
- **Modular Construction**
Quick, simple, installation
- **Block Speed Control**
Keeps block velocity versus position within safe operating parameters
- **Auto-Driller Option**
- **Anti-Collision Option**
- **RS 232 Serial Interface Port**



U. S. Patent Number 5,342,020

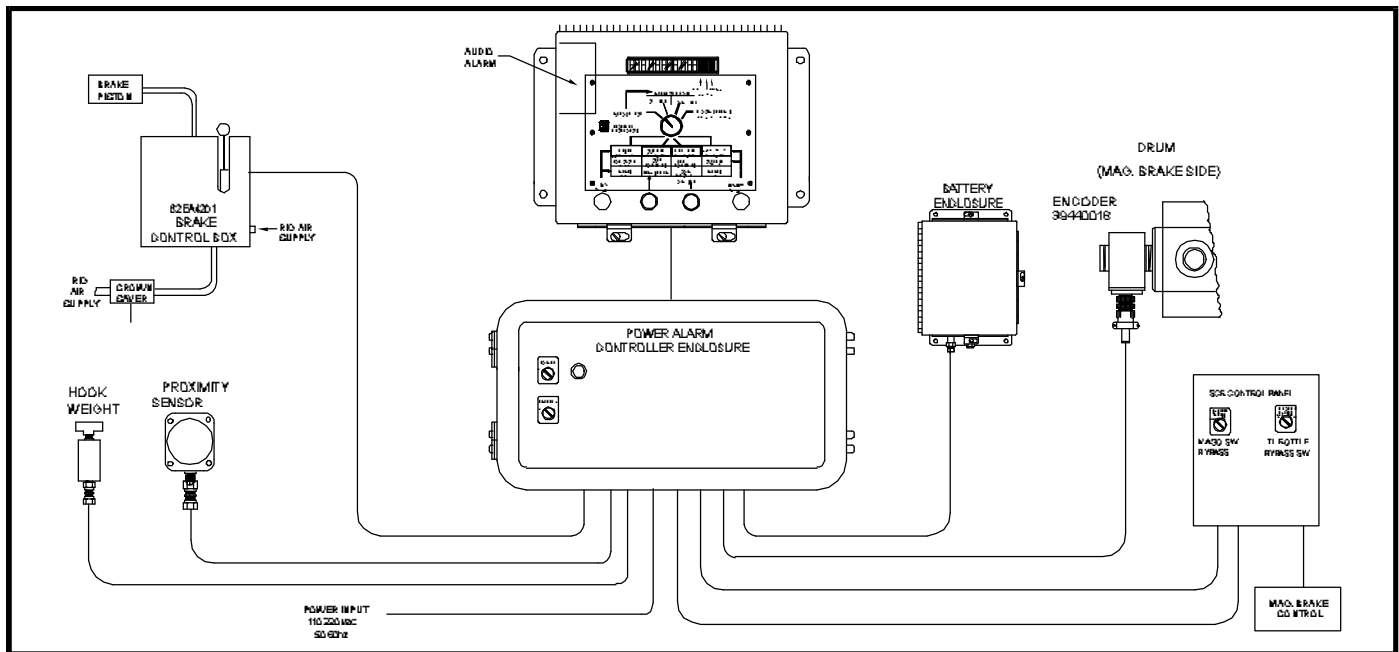
Crown Protection

Derrick designs generally incorporate extra space at the crown area to allow for safer operation of the traveling block in an area that is hard for the driller to see, and also to allow for potential traveling block overrun of the upper mechanical stop caused by high block ascending speeds near the crown. Fitting portable top-drives to rigs reduces this extra space in creating the possibility of the traveling block impacting the crown. By installing the TBC, safe and accurate operation of the Traveling Block is maintained to the maximum upper block travel limit. The TBC eliminates the problem of overrunning the top stop by monitoring and controlling the blocks ascending velocity when the traveling block is being operated near the crown. This allows the traveling block's upper travel limit to be safely moved closer to the crown, eliminating the necessity of adding extra derrick height.

Floor Protection

Protecting the floor has always been difficult because block speed must be continually monitored and controlled to prevent the drawworks brakes from being overrun. Because the Traveling Block Controller is an intelligent kinetic energy monitoring system (kems) with an added "Soft Stop" feature, it ensures that the safe and accurate operation of the traveling block is maintained all the way to lower block travel limit.

When the traveling block is descending, the TBC monitors the block's position and speed against the hook load, if the downward speed is greater than the preset drawworks brake capacity parameters, the magnetic brake is activated slowing the blocks descending velocity. When the traveling block reaches the absolute lower limit, the drawworks mechanical brake is set.



System Operation

The TBC continually monitors block position, velocity and hook weight. If the traveling block's UPWARD velocity versus distance from the upper limit is too high, the TBC reduces the block's speed by reducing the signal to the driller's foot throttle control. When the block has slowed to the desired speed, the signal to the foot throttle is returned.

If the traveling block's DOWNWARD speed versus position from the lower limit is too high, the TBC reduces the block's speed by energizing the magnetic brake. The TBC also calculates the stopped position of the block if the mechanical brake were to be set. If this stopped position reaches the low travel limit, the TBC sets the mechanical brake. If the traveling block reaches its upper or lower travel limit, the TBC sets the drawworks brake, stopping the traveling block.

By providing a controlled slowing, or "Soft Stop", of the traveling block as it approaches its upper or lower travel limit, the problem of over running the top or bottom stop is eliminated. Also eliminated are the potential

hazards normally associated with suddenly stopping a fast ascending, lightly loaded, traveling block.

Position Sensor

The relationship between the linear movement of the wire line and the angular position of the drawworks drum is predictable, repeatable and can be calculated using the diameter and the length of the drum and the size of the wire line. By adding the number of lines strung, the operating relationship between the angular position of the drawworks drum and the traveling block can be established.

The block position encoder sensor is directly driven by the main drive shaft of the drawworks drum. It provides, to the computer, a value that represents the angular position of the drawworks drum. A proximity switch mounted in the derrick and actuated by the passing traveling block checks the reliability and accuracy of the position sensor. Failure of the position sensor or the proximity switch activates the alarm horn and warning indicator.

Additional Information

The TBC system meets HSE, DNV & NPD safety and construction requirements for installation on land or offshore rigs. The TBC system does not require a purge system. The TBC can interface with the Innovative Electronics **FIRMS**® (Fully Integrated Rig Management System), the crown TV system, rig computer systems, logging computer systems, and can be programmed to provide anti-collision capability for the RBS, Automatic Pipe Racker, or Iron Roughneck. An auto-drilling option is also available. The TBC can be supplied in various configurations depending on requirements. Systems are available with or without cables and/or junction boxes, for permanent installation or for moving from site to site. These components can be combined with other Innovative Electronics packages for complete consoles containing both hydraulic and electronic gauges and instruments.

For Additional Information Contact:



P.O. Box 1367, Stafford, Texas 77497 U.S.A. • Phone: (281) 240-7355 • Fax: (281) 240-7356
www.innelect.com Email: sales@innelect.com Div. of Lucere, LLC TbcA4 Rev. 04/18/02