

General Specifications
Models 64-600, 64-1200, 64-2000, 64-2400

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
1. CertaStop failsafe Braking System
 2. Safety Device (redundant) (other)
- B. Related Sections:
1. Winch & hoist components (other than controls)

1.2 SYSTEM DESCRIPTION

- A. Redundant Brake Design Criteria:
1. The brake shall be installed as a secondary safety device.
 2. The brake shall operate autonomously without requiring input from an operator or electronic sensors.
 3. The brake shall arrest the load in the event of catastrophic failure of the gear motor, transmission, primary parking (electromagnetic motor) brake, chain coupler, keyway, driveshaft, or other systems which would decouple the load from the lifting mechanism.
 4. After engagement the brake shall hold the load static.
 5. The brake shall be affixed via keyway of sufficient size to the driveshaft.
 6. Brake capacity shall be sized such that Factors of Safety exceed generally recognized standards for Life Safety Critical applications.
 7. Braking force shall be adjustable in order to minimize dynamic shock loads throughout the system during engagement.
 8. Engagement speed of the brake shall be adjustable for a wide range of hoisting applications (and other uses).
 9. Minimum braking distance (post engagement): 2-6” for most applications. Note that longer stopping distances are often desirable.
 10. Maximum breaking distance (post engagement): 24-36” for heavy dead haul applications.
 11. Maximum brake disk rotation: 180* (greater disk slip may result in an inability to hold the load in lock-up)
 12. Taper-lock and similar fittings shall not be used to attach the brake or the drum to the driveshaft.
 13. Maximum driveshaft tolerance (cold rolled) shall not exceed 0.003” for most applications.
 14. The brake shall contain a plurality of engagement surfaces, with calculations to represent worst case scenario.
 15. Brake mounting shall be sufficient to absorb the dynamic braking load during engagement. Mounting shall be the responsibility of the customer unless otherwise requested.

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1.3 SUBMITTALS

A. Shop Drawings: brake shop drawings shall bear the stamp licensed mechanical engineer if requested. Include:

1. Structural engineering information: mounting location, loads imposed.
2. Documented letter of suitability.

B. Project Record Drawings:

1. Include reduced sets of shop drawings.
2. Electronic files of all as built drawings.

1.4 QUALITY ASSURANCE

A. All life safety rated brakes are manufactured in house at our facility in North Las Vegas, NV. All brakes are tested for engagement under both gradual (to simulate back winding) and rapid engagement (catastrophic failure). Each hub is then stamped with its engagement RPM and serialized. Both the hub/pawl assembly and pressure plates are individually inspected at several points throughout the manufacturing process and must be certified by signature of our QC officer before they leave our facility. Each order is shipped with a QC checklist including certified welding inspection, set screw torque, spring location, pre load torque, and other key aspects of the brake. Information on spring type/characteristics, engagement speed, and preload torque are stored in our records for each serial number should replacement of the unit or components ever become necessary. An Owner's Operation and Maintenance manual is provided.

B. The specification sets forth minimum safety standards, operational criteria, and minimum standards for quality of manufacturing and installation. It is the responsibility of the Contractor to furnish and install a safe, fully functional machine designed and engineered by the Manufacturer in compliance with applicable codes, standards, and Contract Documents.

C. Mechanical design and materials shall conform to the requirements of all applicable local codes and the National Electrical Code.

1.5 WARRANTY

A. Warrant the equipment in this section to be free of defects in materials and workmanship for a period of one year after acceptance of the completed installation by the Owner. Defective work shall be repaired and defective parts shall be replaced at no cost to the Owner. The warranty shall not cover the results of normal use, nor shall it cover damage due to the neglect or improper use of the equipment. Additional warranties may be available.



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- B. Provide all required maintenance or replacement within 30 days of notification by the Owner.

1.6 PROJECT CONDITIONS

- A. Area safety: When the brake installation commences, installer is responsible for maintaining the safety of the area and the safe operation of the brake.
 - 1. Provide temporary guardrails, barriers and warning signs as required.
 - 2. Shall inform the Architect and the General Contractor in writing of any unsafe conditions which are beyond the Contractors control, such as absence of guardrail protection and unauthorized or improper operation of the equipment.

1.7 MAINTENANCE

- A. Operation & Maintenance Manual; include:
 - 1. Operation safety instructions
 - 2. Installation instructions
 - 3. Maintenance instructions.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Design is based on system available from CertaStop, LLC a Division of Protech:
3431 N. Bruce Street
N. Las Vegas, Nevada 89030
Voice: (702) 639-0290 Fax: (702) 639-0294

2.2 CAPACITIES*

- A. Model 64-600: 3000 lb-in
- B. Model 64-1200: 8,700 lb-in
- C. Model 64-1600: 27,000 lb-in
- D. Model 64-2000: 50,000 lb-in
- E. Model 64-2400: 100,000 lb-in

*Torque calculations account for disk slip, load free fall in space, etc, and will be typically be significantly higher than static/lifting torque values.

2.2 CONSTRUCTION

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- A. The brake shall be constructed from ASTM A36 structural steel unless otherwise specified. Components may be manufactured by cnc flame torch, plasma, water jet, or laser depending on model and type. All hardware shall be a minimum of GR5. Components (excluding the brake disk) shall be powder coated in order to resist corrosion as standard equipment. Pins, springs, and other hardware shall be stainless steel. The brake and its component parts may be manufactured from other materials for marine or corrosive applications.
- B. A keyway of sufficient size shall be supplied with the brake.
- C. All dimensions shall be given in US imperial units unless otherwise specified.

2.3 OPERATION

- A. Normal operation.
 - 1. The brake pawl and hub assembly shall free wheel, creating no noise or friction under normal operation.
- B. Engagement
 - 2. Upon catastrophic failure of a critical drive component, the load will accelerate under the force of gravity. Centrifugal force generated during this event shall cause the brake pawls to engage the locking lugs machined into the brake disk.
 - 3. The brake disk shall rotate, being acted upon by the pawls and resisted by the friction material as a function of its coefficient of friction and the amount of pre-load torque on the brake pressure plates.
 - 4. The load will be arrested.
- C. Resetting the brake
 - 5. The brake shall automatically reset once the load has been removed.
 - 6. Torque the pressure plates back to factory specification.

END OF SECTION

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APPENDIX I: APPLICATION DATA

- 2.4 PERFORMANCE DATA (unstamped). Calculations show range of typical adjustment (90-180* disk rotation respectively). Field results may vary from calculated data due to a variety of factors.
- A. The customer supplied specifications along with some assumptions result in the following calculations
1. Free falling duration (assumed):
 2. Free falling angular velocity:
 3. Braking time:
 4. Angular deceleration rate:
 5. Realized braking torque:
 6. Total travel distance (inc. pre, during, post engagement):
 7. Total required preload torque:
 8. Total friction force on friction material:
 9. Required preload bolt torque:
- B. Provided for: EXAMPLE ONLY

The above information is provided as a courtesy to potential customers. These calculations are generated from a combination of customer specifications and necessary assumptions. These should not be considered “stamped calculations” and they have not been reviewed by a PE. These services are available for an extra fee. Customers are responsible for reviewing provided information and selecting a brake that is suitable for their application unless engineering services are purchased from and provided by CertaStop, LLC and/or its affiliates.