#### TRIFORCE MODEL

**POLYSTYRENE INSULATED**

**GARAGE DOOR**

**Galvanized steel,** 26-gauge, door thickness 2" (50 mm)

**OVERHEAD RETRACTABLE DOORS**

**WITH METAL PANELS ON HINGES**

**PART 1: OVERVIEW**

**1.1 RELATED WORK**

*The author must give all the necessary references.*

**1.1.1** Electrical connections, water tightness of openings, and so on. Note that all electrical connections and installations must be done by a qualified electrician as recommended by the manufacturer of the electric garage door operators.

**1.2 MAINTENANCE RECORDS**

**1.2.1** Provide the necessary instructions to ensure proper operation and maintenance of all the hardware components for the doors as well as the electric garage door operators, included in the manual of the garage door and door operator.

**1.3 Qualifications**

**1.3.1** The installation of the mentioned products must be executed by a company with a minimum of 5 years of experience in the specified products.

* + 1. The installation must be executed by a company approved by the garage door manufacturer as an installer, using skilled installers experienced in this work.

**PART 2: GARAGE DOOR**

**2.1 CALCULATION CRITERIA**

* + 1. The doors and the hardware system must be designed to meet standard ANSI/DASMA 102 (American National Standard Specifications for Sectional Overhead-Type Doors; DASMA: Door & Access Systems Manufacturer Association).

*(Note: for doors wider than 18' (5.5 m), or high wind situations, consult our engineering department).*

* + 1. The doors must have a thermal resistance factor of RSI 2.8 (k = 0.357 W/m2K)
		2. The doors, the tracks, and the springs must be made to withstand at least 10,000 total operation cycles over their lifespan.

 **2.2 MATERIALS**

**2.2.1 Coating: enameled steel (26-gauge on both sides)**

26-gauge galvanized steel sheet, in accordance with ASTM A653 and ASTM A653M, has G60 coating, in manufacturer’s standard color. The galvanized steel sheet has a zinc coating with a minimum thickness of 0.04 lb./ft2 (180 g/m2). The polyester paint finish, 2 coats, conforms to standard ASTM A924 and ASTM A924M and has a thickness of 1.0 mil.

The surface of the exterior steel sheet is woodgrain in one of the following designs *(to select):*

🞎 Classic CC 🞎 Classic MIX 🞎 Classic XL

🞎 North Hatley SP 🞎 Shaker NH-LP 🞎 Flush

**2.2.2 Insulation**

A panel of CFC-free expanded polystyrene is bonded between the walls of the sections. It has a thermal resistance factor of RSI 0.9 per 1" (25 mm) of thickness and a total insulation factor R-10, RSI 1.8 (k = 0.556 W/m2K).

**2.2.3 Reinforcements**

 Steel reinforcement plates with a minimum thickness of 20-gauge (0.034 in or 0.85 mm) are inserted within the door sections to provide proper fastening for the hinges and plates.

**2.2.4 Section ends**

A block of grade 4 dry pine, guaranteed against cracking and rot, is inserted at both ends of each insulated garage door section for superior strength in the fastening of the lateral hinges. These wood end blocks ensure a thermal break with the door’s exterior.

**2.2.5 Assembly joints**

Galvanized steel sheets of each door section will be assembled with a mechanically-embedded weatherstripping, known as InterStop™, to prevent air infiltration.

**2.2.6 Regular windows *(if applicable)***

Windows have clear, double thermo panes with a total thickness of 5/8" (15.9 mm). The 1/8” (3 mm) panes are sealed in stainless steel extrusions using the InterceptTM system with 3/8" (9.5 mm) air space. The windows are inserted in an expanded PVC frame and factory installed by the manufacturer.

**2.3 DOORS**

**2.3.1** The garage doors shall be the model Triforce as made by Garaga Inc. The sections are shaped with 26-gauge steel, interior and exterior, on a roll forming machine, with an insulating panel of CFC-free expanded polystyrene bonded between the walls of the sections, for a total minimum thickness of 2" (50 mm).

**2.3.2** The doors must have the following sizes and specifications:

 **DOOR SIZES # OF SECTIONS # OF PANES**

**LOCATIONS (W. by H.) WITH PANES PER SECTION**

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**2.4 WEATHER TIGHTNESS**

**2.4.1** Provide and install continuous weatherstripping at the bottom of the lower section. The weatherstripping shall be made of a U-shaped black PVC extrusion as well as a semi-circular EPDM rubber tubing.

**2.4.2** The intersection of each section will have a mechanically-embedded weatherstripping, known as InterStop™, to prevent air infiltration.

**2.4.3** Provide and install, on the exterior side of the door jambs and lintel, weatherstripping made up of an aluminum extrusion as well as a double-edged strip of arctic vinyl.

**PART 3: RESIDENTIAL TYPE HARDWARE**

**3.1 PRODUCTS**

**3.1.1 Tracks**

The tracks are made of 14-gauge, 2” (50 mm) thick galvanized steel. The horizontal track is reinforced with a 2” x 2” (50 x 50 mm) steel angle for doors 12’4” (3.7 m) wide and over.

**3.1.2 Hardware**

The hinges are made of 14-gauge galvanized steel. The rollers are 2" (50 mm) residential-type steel with 10 ball bearings.

***Optional:*** white nylon rollers (10 ball bearings) or black nylon rollers.

The hardware includes an interior side lock as well.

**3.1.3 Struts for large doors *(if applicable)***

Doors measuring **12'4" (3759 mm)** and more in width will come with 22-gauge galvanized steel horizontal struts.

**3.1.4 Type of movement**

The movement of the hardware will allow for the most space possible available underneath the door when it is in the open position.

 **NUMBER OF TYPE OF AVAILABLE SPACE**

 **DOORS MOVEMENT (FLOOR / CEILING)**

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**3.1.5 Torsion-type springs**

The torsion spring lifting system will consist of all the parts and accessories needed for its installation.

**3.2 OPTION *(TO CHOOSE)***

**3.2.1 Double hinges**

Doors wider than 12’4" (3759 mm) must be provided with 14-gauge double hinges at each end.

**PART 4: RESIDENTIAL ELECTRIC OPERATOR**

**4.1 PRODUCTS**

**4.1.1** These are trolley-type electric operators that come equipped with a quick-release device which disconnects the door from the operator to enable manual operation in the event of a power failure. The one-piece T system consists of a carriage that slides between dual galvanized steel angle tracks.

 *Note: 2” (50 mm) of free space is required between the highest point of the door and the ceiling.*

 *Note: A residential Jackshaft-type operator is available for high-lift movement.*

**4.1.2** The electric motors, control mechanisms, relays, and electrical devices of the operator shall be approved according to CSA and UL standards.

**4.1.3** The electrical power supply is of 115 volts, ½ phase and 60 Hz.

 **LOCATION OF DOOR(S) \*TYPE OF OPERATION**

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\* *Standard lift or low headroom only.*

**4.1.4** The operators come equipped with a reversible motor, which has a built-in thermal protection mechanism. The electrical control circuit shall be of 24 volts.

**4.1.5** The control panel for the door operator must be of the push-button type and surface mounted on the inside wall, close to the door to the house.

**4.1.6** A safety mechanism with photocells will be included with each operator in order to stop and reverse the movement of the door in the event an object cuts off the light beam.

* + 1. The operator must be equipped with a remote control.
		2. A wireless keypad entry system must be installed outside the building *(optional).*

**PART 5: INSTALLATION**

**5.1** Before starting, make sure that the frames and the fixtures prepared by the general contractor are square.

 **5.2** Install the doors and the related hardware.

 **5.3** Apply some touch-up paint to areas where the finish might have been damaged during the mounting.

 **5.4** Install the electric motors, control devices, push-button control stations, relays, and other electrical equipment needed for operating the door.

 **5.5** All electrical connections must be done by a certified electrician.

**5.6** Adjust all movable parts and weatherstripping with the exterior jambs in order to get proper weather tightness for all conditions

 **5.7** Make sure all of the mechanisms that have been installed and work properly.

 **5.8** Clean doors as recommended by the manufacturer and get rid of all leftover materials and debris found near the openings and the hardware.