







ROOF MOUNTED MATERIALS WINCH-HOIST

PROBEL

SAFETY SYSTEMS ENGINEERED FOR LIFE

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DESCRIPTION

The Pro-Bel Roof Mounted Materials Winch-Hoist is available as an all galvanized steel or all 6061-T6 aluminum arm that is secured to a permanently roofed-in steel base. The winch-hoist is typically reclined for storage; it is also demountable as a single unit (with extra dolly wheels) for relocation or storage. The winch-hoist however requires two men to dismantle the arm and concrete pavers will need to be provided to protect the roof surface when moving the arm.

Available in manual or a variety of motorized electric or gasoline powered models, the winch-hoist is equipped with a 360 degree rotating head, galvanized or stainless steel hoisting cable, shell block hook, dolly wheels, and other apparatus. Winch hoist is capable of sustaining without failure at least 3 times the maximum working load applied or transmittal to the components i.e. a 3 to 1 stability factor.

USE

Manual Hoist Operation: Fulton Mosinee K1051 hoist is suitable for maximum 88'-0" (26.8 m) building height and provides up to 2500 lbs (1134 kg) lifting capacity.

My-te Electric Motor Operation (Drum Type Hoist): My-te 100A or AC36 Model hoists are ideal for building heights up to 150'-0" (45.75 m) and lifting capacities up to 3000 lbs (1361 kg). Note: These models can be used intermittently over 150'-0" to 300'-0" (45.75 m to 91.5 m) for up to 500 lbs (227 kg) lifting capacity providing a duty cycle of 25% - 15 minutes/hour when operating at full load is not exceeded due to possibility of motor overheating.

Also, Pro-Bel offer an I-Beam Electric Winch-Hoist for long-lift applications where a chain hoist will not reach, or for outrigger beam or monorail applications, or in-plant operations where the load is being supported by the hoist hanging from an I-beam.

My-te Air-Powered Operation (Drum Type Hoist): These gasoline or diesel engine powered pneumatic hoists are recommended where electric power is unavailable or undesirable. See electric motor operation above for height and weight limits.



A section of a window cleaning platform is being lifted from a 40th floor roof storage area using a motor operated, demountable Pro-Bel winch-hoist. It is then swung across a promenade surface (inset photo) and then through a 10'-0" (3 m) diameter hole in a roof overhang for assembly on a lower roof. Enron Building 2, Houston Texas.

Skyman Electric Motor Operation (Trac-tion Type Hoist): Skyman Models H400E, SM500E and Octo 1760E hoists are heavy duty hoists that provide 882 lbs (400 kg), 1102 lbs (500 kg) and 1760 lbs (797 kg) lifting capacity respectively and are ideal for building heights up to 300'-0" (91.5 m). For building heights over 300'-0" certain restrictions will apply. Contact Pro-Bel for details. Also Pro-Bel offers an I-Beam Electric Winch-Hoist for long-lift applications where a chain hoist will not reach, or for outrigger beam and monorail applications, or in-plant operations where the load is being supported by the hoist hanging from an I-Beam.

Skyman Air-Powered Operation (Traction Type Hoist): These H400, SM500 and Octo 1760 gasoline or diesel powered pneumatic hoists are recommended where electric power is unavailable or undesirable. See electric motor operation above for height and weight limits.

Custom Designs: Pro-Bel can custom design winch-hoists to special requirements.

Suggested Uses: For the lifting of:

- Mechanical or electrical equipment e.g. motors, A/C units, and similar retrofit items.
- Re-roofing or other retrofit building materials.
- Telecommunications equipment.
- Window cleaning equipment.
- See both My-te and Skyman Electric Motor Operation above for additional uses.

TECHNICAL DATA

My-Te Electric Motor Operation (Drum Type Hoist)

Safety Factor: Hoist design is capable of sustaining without failure at least 3 times the maximum working load applied or transmitted to the components i.e. a 3 to 1 stability factor.

Power: 115V AC, draws 19 amps at full load, operates from readily available grounded outlet. No special wiring required.

Operating Controls: 24V AV pendant control with Up/Down "Hold To Run" push button operation. Operator never handles dangerous current. Long pendant lengths available.

Winch-Hoist: My-te Model as selected Single Line Lift with: worm gear reduction for positive load holding (drum cannot slip or backdrive the gear box, even under

loss of power); machine cut gears for high strength, long life, low risk of failure; oil filled gear box for extended gear life; dynamic braking for instant stopping; 1.4 HP motor (no-load speed); 15 ft (4.5 m) power cord; low voltage 10 ft (3 m) long weatherproof pendant control; welded frames (high strength, ductility); high capacity cable drum; cable tensioner bar helps prevent cable damage and cable wrapped on drum when winch is not in use; frictionless bearings; and full power reversible motor, operating at 18,000 RPM (no load), 11,500 (loaded).

Factory-Installed Electric Options:
- 230 Volt
- Alternate Drums
- Limit Switch
- Clutch
- Variable Speed
- High Speed Gears
- Hand Crank

My-te Air-Powered Operation (Drum Type Hoist)

Technical data regarding mechanics is similar to electric operation except pneumatic operation. Contact Pro-Bel for complete data.

Skyman Electric Motor Operation (Traction Type Hoist)

Power: 220V/60Hz 3-Phase, draws 5 amps at full load, operates from readily available grounded outlet. No special wiring required.

Operating Controls: Hand operated lever; automatically re-sets to off position when released. Pendant control available.

Winch-Hoist: H400E, modular construction; self-reeving; thermal overload protection; fail safe primary brake; low current draw (1.8 or 3.6 amps at full load); control options (pendant and central control); low rope wear factor; independent secondary overspeed brake; controlled speed emergency descent; complies with all current safety standards.

SM500 features are the same as H400E except an additional overspeed centrifugal brake is incorporated onto the gearbox inputshaft. Complies with all current safety standards and is approved to UL 1323.

Skyman Air-Powered Operation (Traction Type Hoist): Technical data regarding mechanics is similar to electric operation except pneumatic operation. Ambient temperature range of use is from - 4 degrees F to +149 degrees F (-20 degrees C to 65 degrees C). Contact Pro-Bel for complete data.

LIMITATIONS

Pro-Bel Winch-Hoists are designed for material handling usage only, and not for hoisting personnel at any time.

Note: My-te drum type winch hoist are suitable for heavy lifting of short duration only due to duty cycle contraints. See Section Data on page WH-4.

FEATURES

All corrosion resistant materials; winch-hoist components are hot dip galvanized steel, aluminum and stainless steel. Note: My-te motors are lacquer sprayed only.

Standards conformance; all winch-hoists comply with OSHA and ASME/ANSI safety requirements and various material standards. See Selection Data chart (footnote) at top of page WH-4 for limitation.

Easily dismantled; winch-hoist arm is quickly taken down and equipped with a transport dolly for moving the assembly as a single unit for storage or relocation.

Safe assembly; winch-hoist arms are designed to ensure safe assembly. Pivoting, locking design facilitates insertion or removal of the arm inboard of the building face.

Engineer certified; Pro-Bel winch-hoist performance is based on data derived from independent testing and/or engineering calculations as per OSHA requirements and are rated at minimum 1,000 lb (4.5 kN) vertical service load.

Weatherproof motor components; My-te drum type hoist motor is open fan cooled unit however neoprene gasketing is used between control box enclosure and cover and electrical component mounting panel. Rubber boot is used on manual reset circuit breaker which extends through mounting panel, and 100% silicone caulk/ adhesive is applied to electrical component mounting hardware.

Skyman traction type hoist is completely sealed against weather.

Compatible with roofing; an important consideration in the design of Pro-Bel winch-hoists is the need to maintain the long term watertight integrity of the building. Bases are designed to satisfy virtually any roof condition.

Sole responsibility; Pro-Bel provides complete winch-hoist systems from design to the supply and installation of same, including annual inspection.

Specific liability insurance; all Pro-Bel winch-hoist installations automatically carry $5,000,000.00 or greater product liability insurance coverage.



Winch-hoist shown in partially inclined position (typically raised using manual hand crank).

SELECTION DATA (Manually Operated Winch-Hoists)*

Lifting Capacity		Rated Wire Rope Diameter	Drum Diameter	Drum Capacity	Gear Ratio
First Layer	Full Drum				
1000 lbs (454 kg)	600 lbs (272 kg)	7/32" (5.6 mm)	2-1/4" (57 mm)	60'-0" (18.3 m)	4.1:1
1500 lbs (680 kg)	700 lbs (308 kg)	1/4" (6.4 mm)	2-1/2" (64 mm)	88'-0" (26.8 m)	5.1:1
2500 lbs (1134 kg)	1500 lbs (680 kg)	5/16" (7.9 mm)	3-1/8" (79.4 mm)	75'-0" (22.9 m)	15.8:1

*All of these units feature one-speed spur-gear hand winches with automatic brake. An automatic brake permits use in incline pulling and vertical lifting applications. Winches also have one-way ratchet operation and heat-treated stamped and riveted gears. Cable can be fed off drum by cranking after load is lowered. Winches are for use with wire rope (included) and include hardware for attaching rope to drum. Made of zinc-plated steel. Mounting allows line releasing off the drum to the right. Winches with gear cover protect gears and help prevent injury.

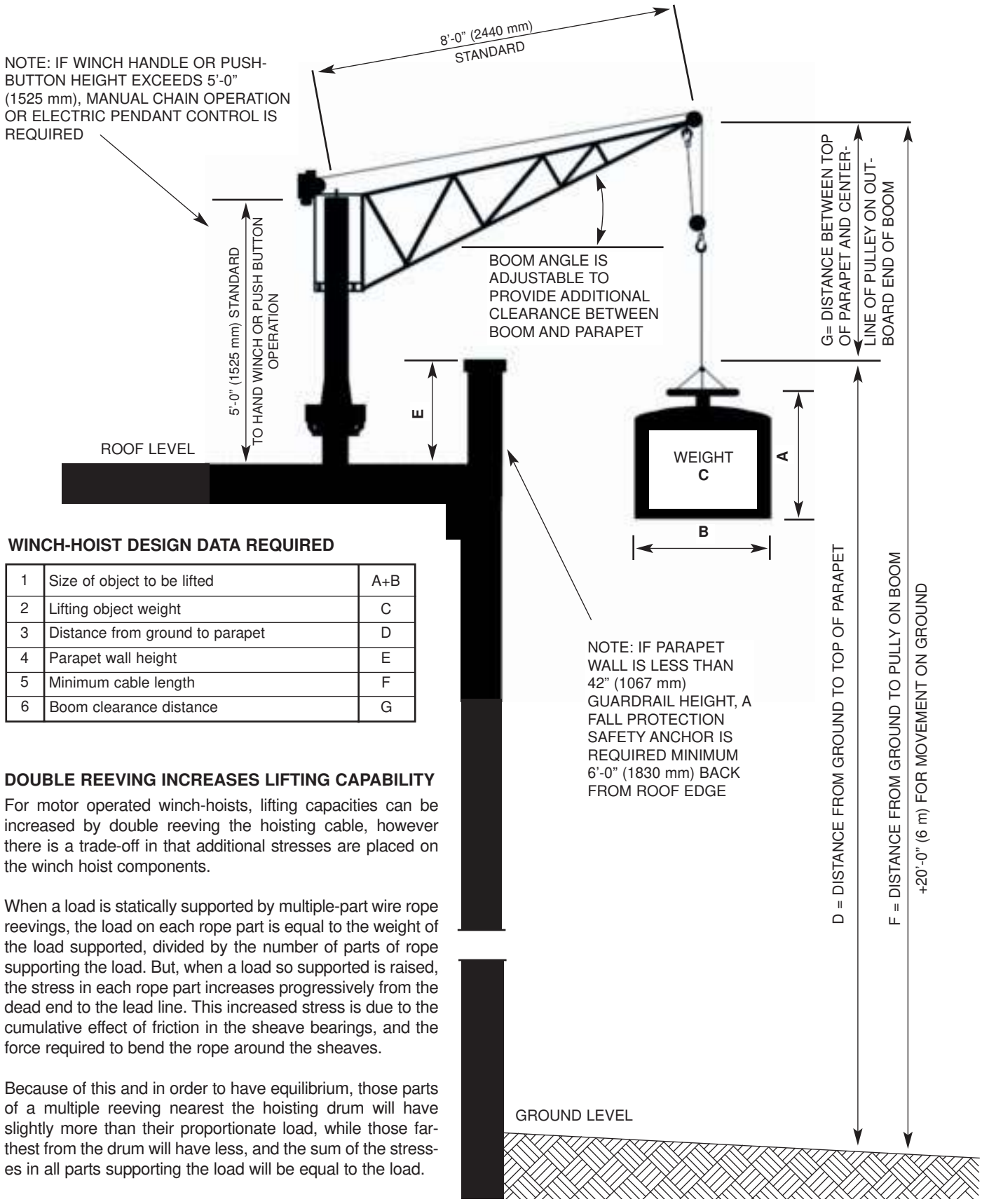
SELECTION DATA (My-te Motor Operated Drum Type Winch-Hoists)*

Lifting Capacity	Range of Operation	Motor Model Number*	Line Speed (1st Layer)	Stainless Steel Cable Diameter	Drum Shaft Dimensions (Diameter x Length)
450 - 1000 lbs (204 - 454 kg)	1000 lbs @ 50'-0" (454 kg @ 15.2 m) TO 450 lbs @ 300'-0" (204 kg @ 91.4 m)	100A	20 fpm (0.102 m/sec)	3/16" (5 mm)	2" x 7.5" (51 mm x 191 mm)
2000 - 3000 lbs (907 - 1361 kg)	3000 lbs @ 50'-0" (1361 kg @ 15.2 m) TO 2150 lbs @ 110'-0" (975 kg @ 34 m)	AC36	8 fpm (0.041 m/sec)	3/8" (11 mm)	3.5" x 9.0" (90 mm x 229 mm)

*All of these units feature worm and worm gear drive trains with dynamic braking. They include motor controls, power cord and a two-button pendant. All models are available in 120V AC or 230V AC Single Phase, 50/60 Hz. Please add "/230V" to the model number to designate 230V AC motor. Some motors do not meet ASME/ANSI requirements for an 18.1 drum diameter to cable diameter ratio on some drum/cable combinations. Duty Cycle is 25% - 15 min/hr when operating at full load i.e. motor will overheat and stop after 15 minutes if hoist is operated continuously under full load (good for heavy lifts of short duration). Note: My-te Air-Powered Drum Type Winch-Hoists data is same as above except pneumatic operation (gasoline or diesel engine powered).

SELECTION DATA (Motor Operated Winch-Hoists)*

Lifting Capacity	Range of Operation	Motor Model Number*	Motor Options	Climbing Speed	Power Consumption	Galvanized Steel Cable Diameter
882 lbs (400 kg)	Up to 656'-0" (Up to 200 m)	H400E	220-240V/50Hz - 1 Phase	28 fpm (8.5 m/min)	3.6 A	5/16" (8.2 mm) 6 x 19 - IWRC
882 lbs (400 kg)	Up to 656'-0" (Up to 200 m)	H400E	380-440V/50Hz - 3 Phase	28 fpm (8.5 m/min)	1.8 A	5/16" (8.2 mm) 6 x 19 - IWRC
1100 lbs (499 kg)	Up to 656"-0" (Up to 200 m)	SM500E	220 Vac/60Hz - 1 Phase	35 fpm (10.7 m/min)	9.0 A	5/16" (8.2 mm) 6 x 17 Seale
1100 lbs (499 kg)	(Up to 656'-0") (Up to 200 m)	SM500E	220 Vac/60Hz - 3 Phase	35 fpm (10.7 m/min)	5.0 A	5/16" (8.2 mm) 6 x 17 Seale
1760 lbs (798 kg)	Up to 656'-0" (Up to 200 m)	Octo 1760E	220V/60Hz - 3 Phase	28 fpm (8.5 m/min)	6 A	3/8" (10 mm) 4 x 36 WS



WINCH-HOIST DESIGN DATA REQUIRED

1	Size of object to be lifted	A+B
2	Lifting object weight	C
3	Distance from ground to parapet	D
4	Parapet wall height	E
5	Minimum cable length	F
6	Boom clearance distance	G

DOUBLE REEVING INCREASES LIFTING CAPABILITY

For motor operated winch-hoists, lifting capacities can be increased by double reeving the hoisting cable, however there is a trade-off in that additional stresses are placed on the winch hoist components.

When a load is statically supported by multiple-part wire rope reevings, the load on each rope part is equal to the weight of the load supported, divided by the number of parts of rope supporting the load. But, when a load so supported is raised, the stress in each rope part increases progressively from the dead end to the lead line. This increased stress is due to the cumulative effect of friction in the sheave bearings, and the force required to bend the rope around the sheaves.

Because of this and in order to have equilibrium, those parts of a multiple reeving nearest the hoisting drum will have slightly more than their proportionate load, while those farthest from the drum will have less, and the sum of the stresses in all parts supporting the load will be equal to the load.

INSTALLATION
Due to liability issues, Pro-Bel winch-hoists are installed either under "Sole Responsibility Contracts" or furnish only with installation by others utilizing a strictly controlled sign-off and certification procedure.

INSPECTION & MAINTENANCE
Winch-hoists that are supplied and installed must be inspected annually as a minimum requirement. OSHA addresses the annual inspections through the enforcement of the General Industry and Duty clause, Section 5(a)(1) of the OSHA act.

OSHA Inspection Requirements
Winch-hoists shall be inspected and tested (as required) prior to initial use to determine that all safety and operating equipment is functioning as required. A similar inspection shall be made following any major alteration made to the existing installation.

All equipment and related components shall undergo periodic inspections by a competent person at intervals specified by the manufacturer/supplier, but not to exceed twelve (12) months, to determine that they are in safe operating condition. Parts subject to wear such as wire ropes, shall be inspected and/or tested to determine that they have not worn to such an extent as to affect the safe operation of the installation.

The building owner shall keep a certification record of each inspection and test required. The certification record shall include the date of the inspection, the signature of the person who performed the inspection, and the number, or other identifier, of the building support structure and equipment which was inspected. This certification record shall be kept readily available for review by the Assistant Secretary of Labor or the Assistant Secretary's representative and by the employer.

Pro-Bel Inspection Services
Pro-Bel offers owners/employers two inspection options. Inspections may be carried out using a Pro-Bel inspector or an independent engineer. Regardless of option selected, Pro-Bel must provide a 'Certification For Use' sign-off document at a minimal fee. Pro-Bel maintains up-to-date inspection records of all Pro-Bel winch-hoist installations. All inspection data is recorded in the building owner's/employer's Equipment Manual & Inspection Log Book. The Log Book, containing the necessary information to comply with all relevant State and Federal safety standards, will reduce both the design professional's and owner's legal exposure in the event of an accident.

Special Note: Pro-Bel customers automatically receive $5,000,000.00 or greater product liability insurance coverage providing the foregoing conditions are met.

Posting of Engineered Drawings
It is recommended that the building owner post a copy of the Pro-Bel engineer approved shop drawing showing equipment layout and details of the winch-hoist system. The drawing should be located adjacent to the roof entrance for ease of review by property management, maintenance personnel, inspection authorities, and Pro-Bel if necessary. A copy of this drawing must also be provided for the maintenance contractor/personnel prior to commencing work.

AVAILABILITY & COST
Available throughout North America and Internationally. Contact Pro-Bel for current pricing.

WARRANTY
Normal one year against faulty materials.

BASE OPTIONS
Pro-Bel roof mounted winch-hoists have been designed for all types of roof construction regardless of composition or complexity. An important consideration in the design of the permanently roofed-in steel bases is the need to maintain the long term watertight integrity of the building. Pro-Bel bases are designed to satisfy virtually any roof condition. Illustrated below are a variety of base options.


PRO-BEL 200 SERIES STEEL PIER BASE


PRO-BEL 200 SERIES METAL CLAD CONCRETE PIER BASE


PRO-BEL 500 SERIES CAST-IN-PLACE STEEL PIER BASE


PRO-BEL 400 SERIES RECESSED DECK-MOUNT BASE

OTHER PRO-BEL PRODUCTS

Pro-Bel also provides architects, roof designers and building owners with complete window cleaning/suspended maintenance equipment and fall protection systems from concept to manufacture, furnishing, installation, and inspection of the following:

Fall Arrest/Restraint Systems
- Safety & Tie-Back Anchors
- Horizontal Cable Lifeline Systems
- Horizontal Rail Lifeline Systems

Primary Suspension Supports
- Direct-to-Safety-Anchor Rigging Systems (see Pro-Bel Safety & Tie-back Anchors literature)
- Davit Systems
- Outrigger Beam Systems
- Monorail & Gantry Systems
- Rigging Sleeve Systems

Primary Suspension Equipment
- Permanent Powered Platforms, Single Work Cages, Motorized Bosun's Chairs, and Track Mounted Roof Car Systems

SPECIFICATION

Materials

SPEC NOTE: Delete items not required. Rooftop Materials Winch-Hoist: Pro-Bel [electric] [manual][air-powered] Roof Mounted Materials Winch-Hoist fabricated [all galvanized mild steel][all 6061-T6 aluminum] boom and mast arm, and galvanized steel base, with stainless steel retaining pins, rotating head and dolly wheels. Rated load to be as per model selected with hoist design capable of sustaining without failure at least 3 times the maximum working load applied or transmitted to the components i.e. a 3 to 1 stability factor.

SPEC NOTE: Specify paragraph 1 below for My-te electric operation.

1. Operation to be My-te electric motor drum type operation as per Model No. [100A][AC36], 115V AC with 10'-0" (3 m) long pendant control with up/down "Hold To Run" pushbuttons and stainless steel hoisting cable of length and diameter and drum size to suit application.

SPEC NOTE: Specify paragraph 2 below for Skyman electric operation.

2. Operation to be Skyman electric motor traction type operation as per [Model No. H400E, [220-240V/50 Hz - 1 phase][380-440V/50Hz-3 phase]] [Model No. SM500E [220 Vac/60Hz -1 phase][220 Vac/60 Hz - 3 phase]] [Model No. Octo 1760E, 220V/60Hz - 3 phase] with 10'-0" (3 m) long pendant control with up/down "Hold To Run" pushbuttons and galvanized steel hoisting cable of length and diameter and reeling drum to suit application.

SPEC NOTE: Specify paragraph 3 below for My-te manual operation.

3. Operation to be manual type hand winch operation with Fulton Mosinee K1051 hand winch designed for [1000 lbs (454 kg)][1500 lbs (680 kg)][2500 lbs (1134 kg) first layer lifting capacity with stainless steel hoisting cable of length and diameter and drum to suit application.

SPEC NOTE: Specify paragraph 4 below for My-te air powered drum hoist gasoline or diesel operation.

4. Operation to be My-te air powered drum type operation as per Model No. [100A][AC36] with up/down "Hold To Run" pushbuttons and stainless steel hoisting cable of length and diameter and drum size to suit application.

SPEC NOTE: Specify paragraph 5 below for Skyman air powered traction type gasoline or diesel operation.

5. Operation to be Skyman air powered traction type operation as per Model No. [H400A][SM500A][Octo 1760A] with up/down "Hold To Run" pushbuttons and galvanized steel hoisting cable of length and diameter and reeling drum to suit application.

Installation: Install winch-hoist in accordance with approved shop drawings and manufacturer's recommendations.

SPEC NOTE: In Roof Section [07500], specify winch-hoist base to be properly flashed in compatible with roofing. Specify aluminum flashing for BUR or modified bitumen roofs only (membrane above or below installation) sealed at the top with conformable mastic tape and heat-shrink rubber collar flashing. For single ply roofs, flashing to be in accordance with membrane manufacturer's instructions.



Winch-hoist shown in reclined position. Travis County Criminal Justice Center, Austin Texas.

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Winch-hoist being used to lift material onto roof. Travis County Criminal Justice Center, Austin Texas.

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www.pro-belgroup.com

Pro-Bel Group Ltd.
(Florida)
2501 NW 34th Place, Unit 23
Pompano Beach, FL 33069
954-457-5080 - local
866-377-6235 - toll free
954-457-9010 - fax
info@pro-belgroup.com

Pro-Bel Group Ltd.
(Chicago)
2850 West Fulton Street
Chicago, IL 60612
773-638-6714 - local
773-638-6715 - fax
info@pro-belgroup.com

Pro-Bel Group Ltd.
(Pennsylvania)
421 Guilford Avenue
PO BOX 556
Chambersburg, PA 17201
(717) 263-7400 - local
(717) 263-7414 - fax
info@pro-belgroup.com

Pro-Bel
(China)
36 Guangqumennei St.
Beijing, 100036, China
(+)86.10.6718 6272 - local
(+)86.10.6713 8186 - fax
(+)86.139 1146 0532 - cell
www.pro-bel.com.cn

Pro-Bel Enterprises Ltd.
(India)
#26, Chamundi Mansions
22nd Main, 2nd Phase
JP Nagar Bangalore
560078
(080) 2658-7856 - local

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