SECTION 08 34 00

CUSTOM SINGLE PANEL HYDRAULIC DOORS

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\*\* NOTE TO SPECIFIER \*\* PowerLift Doors; hydraulic doors.
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This section is based on the products of PowerLift Doors, which is located at:305 4th St., Suite BBrookings, SD 57006Toll Free Tel: 844-275-9351Email: [request info (info@powerliftdoors.com)](https://arcat.com/rfi?action=email&company=PowerLift%252BDoors&message=RE%253A%2520Spec%2520Question%2520(08340pwl)%253A%2520&coid=49211&spec=08340pwl&rep=&fax=)
Web: <http://www.powerliftdoors.com>
 [ [Click Here](https://arcat.com/company/powerlift-doors-49211) ] for additional information.
Since 1992, PowerLift has exemplified quality, reliability, and service in the development of hydraulic door systems to suit any application. Every door is custom built, delivered and installed by factory trained, certified PowerLift professionals.
PowerLift has a sterling reputation through unwavering commitment to innovation, quality, and customer service. Established in 1992, the PowerLift design became the gold standard in aviation, agriculture, commercial and architectural doors. Rapid expansion led to construction of a much larger shop. PowerLift door inquiries began coming in from all over North America.
Realizing that it is impossible for one manufacturing facility to offer local installation, service, and support across a continent we entered a new expansion phase. We found other steel fabricators who share our customer centered quality and service ideals. Instead of a single production point, PowerLift now has over 40 manufacturing and service centers across North America.
Our single source accountability business model means every PowerLift location offers professional design, sales, manufacturing, delivery, installation, and support.
Please see our Locations page for a location near you. Look over our project pictures for details on PowerLift projects in many applications.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Custom designed single-panel hydraulic doors.
		2. Accessories and Controls.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 05 50 00 - Metal Fabrications. Door opening jamb and head members.
		2. Section 06 10 00 - Rough Carpentry. Door opening jamb and head members.
		3. Section 07 20 00 - Thermal Protection.
		4. Section - . Access doors.
		5. Section 08 70 00 - Hardware.
		6. Section 09 70 00 - Wall Finishes.
		7. Section 09 91 23 - Interior Painting. Field painting.
		8. Division 16 - Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, installation of control station and wiring, and connection to alarm system.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM International (ASTM):
			1. ASTM A36 - Standard Specification for Carbon Structural Steel.
			2. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
		2. American Society of Civil Engineers (ASCE):
			1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
		3. American Welding Society (AWS).
		4. Hydraulics Institute (HI).
		5. International Building Code (IBC).
		6. National Electric Code (NEC),
		7. National Fire Protection Association (NFPA).
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data:
			1. Manufacturer's data sheets on each product to be used.
			2. Preparation instructions and recommendations.
			3. Storage and handling requirements and recommendations.
			4. Typical installation methods.
		3. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
		4. Delegated-Design: For systems indicated by a Registered Professional Engineer, Certified and Licensed in the state or municipality the project is located.
			1. Details of fabrication of components.
			2. Signed and sealed design calculations for systems indicated used to determine load carrying capacities.
			3. Analysis Data: Signed and sealed.
			4. Sizing Methods and Calculations: Signed and sealed.
	2. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years' documented experience.
		2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
		3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
	3. DELEGATED DESIGN
		1. Engage a qualified professional engineer, as defined in Section 01 40 00 - Quality Requirements.
			1. Must be licensed in State or Municipality the project is located.
			2. Comply with performance requirements and design criteria.
	4. DELIVERY, STORAGE, AND HANDLING
		1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
		2. Protect from damage due to weather, excessive temperature, and construction operations.
	5. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	6. WARRANTY
		1. Manufacturer's standard limited warranty including seven (7) year warranty on materials and workmanship of the door structure and three (3) year warranty on electrical and hydraulic components.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: PowerLift Doors, which is located at:305 4th St., Suite BBrookings, SD 57006Toll Free Tel: 844-275-9351Email: [request info (info@powerliftdoors.com)](https://arcat.com/rfi?action=email&company=PowerLift%252BDoors&message=RE%253A%2520Spec%2520Question%2520(08340pwl)%253A%2520&coid=49211&spec=08340pwl&rep=&fax=);Web: <http://www.powerliftdoors.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
	1. PERFORMANCE AND DESIGN REQUIREMENTS

\*\* NOTE TO SPECIFIER \*\* Wind load and Dead load are dependent upon location-specific geographic features, design wind speeds, risk category, and cladding and insulation weights.

* + 1. The Custom hydraulic door design is to comply with relevant IBC, NEC, and NFPA standards and relevant local codes governed by authorities having jurisdiction at the Project location. Where standards and local codes differ, the stricter is to apply.
		2. Typical Hydraulic Door Reaction Design Parameters:
			1. Wind Load:
				1. Wind Speed: Equal to \_\_\_\_ mph (\_\_\_\_kph).
				2. Wind Exposure: B.
				3. Wind Exposure: C.
				4. Wind Exposure: D.
				5. Risk Category: I.
				6. Risk Category: II.
				7. Risk Category: III.
				8. Risk Category: IV.
			2. Door Final Clear Opening Size: \_\_\_ ft (\_\_\_ mm) wide by \_\_\_ ft (\_\_\_ mm) tall.
			3. Door Manufacturer to provide specific door reaction design parameters including all anticipated cladding and insulation upon award of contract.
	1. HYDRAULIC DOORS
		1. Basis of Design: PowerLift Hydraulic Door as designed and furnished by a licensed PowerLift manufacturing location.
			1. Construction of Panel and Frame Sections:
				1. Framing:

Structural Steel Tubing: ASTM A500 minimum.

Structural Steel Flats, Bars, and Angles: ASTM A36 minimum.

Hinge Pins: ASTM 1144 Stress Proof or AISI 4140 Heat Treated.

* + - * 1. Frames: Structural steel tubing and other structural steel shapes.

Design to same loading requirements for live, dead and wind loads as the surrounding construction.

Maximum Spacing:

Between Vertical Members: 96 inches (2438 mm).

Between Horizontal Members: 48 inches (1219 mm).

* + - * 1. Panel Frame: Factory-welded at all joints and connections, with smooth welds minimum 1/4 inch (6 mm) thick.
				2. Frame and Panel System: Swinging door leaf panel mounted to manufactured door frame.

Door Leaf Panel: Not to be mounted directly to building header.

* + - * 1. Cane Bolts: On larger width doors, cane bolts may be added to inside of bottom door truss near door center adding strength at the door truss location.

If Severe or Abnormal Weather is Anticipated: Cane bolts are to engage by lowering bolt into a hole in the floor slab. This will aid in preventing building or door damage.

Normal Weather Conditions: Cane bolt may be left in the raised disengaged position.

Never operate door when cane bolts are in the lower engaged position.

* + - 1. Hinges: Silent, greaseless, efficient, with zero maintenance.
				1. Permanent Bronze Bushings: Teflon impregnated providing a greaseless solution to hinge lubrication.
				2. Hinge Pin: Yield Strength: 100,000 psi (689475.7 kPa).
			2. Factory-Supplied Upper Weather Stripping: Shipped with frame and door panel for field-install.
			3. Factory-Supplied Lower Weather Stripping: Installed on door panel before installation.
			4. Hydraulic Doors: Operated by hydraulic cylinders mechanically fastened to swinging door leaf and manufacturer's door frame.
			5. Two Hydraulic Cylinders: open and close hydraulic door. Designed to carry required loads during operation, open position, and closed position.
				1. Internal Stops: Installed to prevent over-extension of cylinders, restricting system from opening or closing beyond its limits.
				2. Equipped with restrictors to control oil flow on the down cycle.
			6. System to Lock Closed: Hydraulic cylinders to provide a minimum of 1,000 lbf (4.45 kN) of total closing force.
			7. Electric over hydraulic locks on cylinder ports:
				1. Standard for all SuperMax doors; optional for all other sizes.
				2. Normally closed hydraulic valve opens when power unit momentary switch is pressed, closes when momentary switch is released.

\*\* NOTE TO SPECIFIER \*\* Hydraulic doors will be powered by one or more of the following options. While these are the most common operating systems for a PowerLift door there may be special circumstances that require a different operating system. Please contact your PowerLift installer if you have additional questions regarding your operating system.

* + - 1. Hydraulic Power Unit:

\*\* NOTE TO SPECIFIER \*\* Delete power options not required.

* + - * 1. Power: 1 HP.

110 VAC Single-Phase: Requires 20 Amp breaker.

Momentary Toggle Style Switch:

Push in desired direction according to labels; raise or lower.

Switch requires constant pressure to operate.

When pressure on switch is released, pump operation stops causing door to stop and stay at door's present position.

* + - * 1. Power: 3 HP.

230 VAC Single-Phase: Requires 30 Amp breaker.

Momentary Toggle Style Switch:

Push in desired direction according to labels; raise or lower.

Switch requires constant pressure to operate.

When pressure on switch is released, pump operation stops causing door to stop and stay at door's present position.

* + - * 1. Power: 5 HP.

\*\* NOTE TO SPECIFIER \*\* Delete electric options not required.

230 VAC Single-Phase: Requires 40 Amp breaker.

230 VAC 3-Phase: Requires 40 Amp breaker.

460 VAC 3-Phase: Requires 20 Amp breaker.

Momentary Toggle Style Switch:

Push in desired direction according to labels; raise or lower.

Switch requires constant pressure to operate.

When pressure on switch is released, pump operation stops causing door to stop and stay at door's present position.

\*\* NOTE TO SPECIFIER \*\* For MAX/Max Plus PowerLift Doors. Delete options not required.

* + - * 1. Power: 10 HP.

\*\* NOTE TO SPECIFIER \*\* Delete electric options not required.

230 VAC Single-Phase: Requires 70 Amp breaker.

230 VAC 3-Phase: Requires a 70 Amp breaker.

460 VAC 3-Phase: Requires a 35 Amp breaker.

Double Push Button Controls:

Push button for desired direction according to labels; raise or lower.

Buttons require constant pressure to operate.

When pressure on button is released, pump operation stops causing door to stop and stay at door's present position.

\*\* NOTE TO SPECIFIER \*\* Only on SuperMax PowerLift Doors. Delete options not required.

* + - * 1. Power: 15 HP.

\*\* NOTE TO SPECIFIER \*\* Delete electric option not required.

230 VAC 3-Phase: Requires 110 Amp breaker.

460 VAC 3-Phase: Requires 50 Amp breaker.

Double Push Button Controls:

Push button for desired direction according to labels; raise or lower.

Buttons require constant pressure to operate.

When pressure on button is released, pump operation stops causing door to stop and stay at door's present position.

\*\* NOTE TO SPECIFIER \*\* Only on SuperMax PowerLift Doors. Delete options not required.

* + - * 1. Power: 20 HP.

\*\* NOTE TO SPECIFIER \*\* Delete electric option not required.

230 VAC 3-Phase: Requires 140 Amp breaker.

460 AC 3-Phase: Requires 70 Amp breaker.

Double Push Button Controls:

Push button for desired direction according to labels; raise or lower.

Buttons require constant pressure to operate.

When pressure on the button is released, pump operation stops causing door to stop and stay at door's present position.

* + - * 1. Electric motor and pump are combined into one self-contained unit located adjacent to the door.

Fastened to Framing: Four, 1/4 inch (6 mm) lags.

* + - * 1. The Owner is responsible for providing electrical power connections for the pump unit.
				2. Electrical power installation is to meet federal, state, and local codes.
				3. Pre-wired and factory tested. Final hook-up by others.
				4. Controls: Wired for constant-hold operation to raise or lower the door.

Controls Height: 72 inches (1829 mm) or higher from finished floor.

* + - * 1. Hydraulic Oil: ISO 32 or ISO 22.
			1. Alternative Hydraulics: Allow door operation when electrical pump has lost power.
				1. Two Male Pioneer Style Hydraulic Connections: Pump side, adjacent to pump.
				2. Hydraulic Oil in Pump Reservoir: Must be compatible with equipment to operate door.
				3. Parker Couplers: Allow hook up to hydraulics under pressure.
		1. Finishes:
			1. System Frames and Panels: Cleaned and painted with direct to metal paint, prepared for field finish.
			2. Exterior Field Finish: By others. Door Manufacturer is to approve finishing and application.
			3. Interior Field Finish: By others. Door Manufacturer is to approve finishing and application.

\*\* NOTE TO SPECIFIER \*\* The available accessories are optional. Delete options not required or delete the paragraph in its entirety.

* + 1. Available Accessories and Options:
			1. Walk-door framing.
			2. Window framing.
			3. Inside-facing bottom door truss.
			4. Secondary Bottom Door Seal: Foam core seal for climate-controlled facilities.
			5. Backup Operating System:
				1. Self-contained power unit mounted to a two wheeled cart.
				2. Requires 12 VDC deep cycle battery; group 27 recommended.
				3. Door Operation Pendant:

Push the desired button on pendant to raise and lower door.

Pendant buttons require constant pressure to operate.

When the pressure button is released, the pump stops causing the door to stop moving and stay at its present position.

* + - 1. Radio Remote Control System:
				1. Remote operates a power unit motor by energizing internally wired relays.
				2. Two wireless transmitters standard.

Additional transmitters available.

* + - * 1. Shared power between power unit and remote system.
				2. Push the desired button to raise and lower door.
				3. Operation of remote transmitter requires constant button pressure to operate.
				4. Small lights on the remote will flash when sending a signal to receiver.
				5. When button pressure is released the pump operation stops causing the door to stop moving and stay at the door's present position.
				6. Remote control requires batteries.

Change out batteries and inspect remote yearly to prevent damage to remote.

* + - * 1. Should the remote not energize the motor verify that the motor has electrical power or replace the remote control batteries.
				2. If the batteries show signs of corrosion, change them out immediately to prevent damage to the transmitter.
			1. Cellular Phone Remote Control System:
				1. System functions on standalone Wi-Fi network isolated from Internet using a cellular phone app:

Plastic electrical enclosure mounted adjacent to pump:

Dimensions: 14 inches (356 mm) tall by 11 inches (279 mm) wide by 8 inches (203 mm) deep.

Electrical connections to power unit routed through flexible liquid tight conduit.

Shared power between power unit and remote system

Wi-Fi access point mounted to exterior of building adjacent to door on power unit side minimum 10 feet (3.048 m) above finished floor.

Ethernet cable routed from electrical enclosure to Wi-Fi access point.

* + - * 1. Wi-Fi signal operates power unit motor by energizing internally wired relays.
				2. Push desired button on cellular phone application to raise and lower door.
				3. Operation requires constant button pressure to operate.
				4. When button pressure is released pump operation stops causing door to stop moving and stay at door's present position.
			1. Electric over hydraulic locks on cylinder ports:
				1. Normally closed hydraulic valve opens when power unit momentary toggle switch is pressed, closes when momentary toggle switch is released.
			2. Powder Coat Paint Finish: Frame and door leaf panel.
			3. Battery Back-Up System: 24 VDC.
				1. Integrated with power units 10 horsepower and up.
			4. Warning horn with strobe light assembly.
			5. Key Operation Switch:
				1. A key is required to open and close the door.
		1. Operation: Constant-contact momentary toggle switch or key switch operates hydraulic cylinders mounted to door. Hydraulic system extends and retracts hydraulic cylinders to open and close door.

\*\* NOTE TO SPECIFIER \*\* Sensors mount to the top corner or corners of the moving door leaf. Sensors move with the door and detect obstructions across entire door path. Doors wider than 80 feet, may require 2 sensors on each side of the moving door leaf to cover entire area. The sensors do not interfere with each other. They use Laser Time-of-Flight technology and are rated for outdoor use.

* + 1. Sensors stop the door from continuing in the direction of a detected obstruction, but allows door travel in the reverse direction of the obstruction. Sensors interrupt current to the solenoid coils that shift the hydraulic directional control valve to raise or lower the door in order to stop the door. They do not stop the motor on the power unit, they stop oil flow to the cylinders in the direction of travel of the obstruction.
		2. Delete paragraph if not required or delete sensors not required.
		3. Collision Laser Sensors and Scanners:
			1. Basis of Design: LZR-Flatscan S as manufactured by BEA. A compact, single-curtain, laser-based sensor designed for use on automatic industrial doors, gates, and barriers. Ensures accurate object detection across 18 x 18 ft (5.5 x 5.5 m) field. Capable of sensing people and vehicles, in indoor and outdoor environments.
				1. High resolution coverage with 400 spots and configurable object size detection according to the given application.
				2. Laser Sensor: CLASS 1 certified device according to IEC 60825-1.

Visible Laser Beams: CLASS 2, and automatically time out during normal operation.

* + - * 1. Compliance: IEC 60825-1, IEC 60950-1, IEC 61000-6-2, IEC 61000-6-3, and IEC 60529.
				2. Technology / Performance:

Technology: Laser sensor, time-of-flight measurement.

Detection Mode: Presence

Detection Range: 18 x 18 ft (5.5 x 5.5 m); 13-1/8 ft (4 m) at 5 percent reflectivity

Opening Angle: 90 degrees.

Tilt Angles: &#177;3 degrees with accessory mounting bracket.

Emission Characteristics:

Output Pulse Power 25 W, Class 1: 905 nm wavelength.

Output CW power 0.95 mW, Cless 2 visible spot: 635 nm wavelength.

Angular Resolution: 0.23 degrees. 400 spots within 90 degrees.

LEDs: One Tri-Colored LED. Detection and output status.

Universal remote for controlling the sensor.

* + - * 1. Electrical:

Supply Voltage: 12 to 24 VDC. &#177;15 percent.

If only VAC power is available:

A 12 V transformer paired with a rectifier must be used.

01cvvnDo not use a 24V transformer and rectifier.

Power Consumption: 2.3 W or less. Peak Current: 1 A.

Response Time: 50 ms or less, plus output activation delay.

Output:

One opto (galvanic isolation - polarity free).

Switching Voltage: 42 VAC/VDC maximum.

Switching Current: 100 mA maximum.

One relay (free of potential contact).

Contact Voltage: 42 VAC/VDC maximum.

Contact Current: 1 A (resistive) maximum.

Switching Power: 30 W DC / 60 VAC maximum.

* + - * 1. Physical:

Housing: Metal enclosure.

Dimensions (LxHxD) 5 x 3-1/2 x 2 inches (127 x 89 x 51 mm); without bracket.

Color: Black

Protection per IEC 60529: IP66.

Temperature Range When Powered: -22 to 140 degrees F (-30 to 60 degrees C)

Humidity: 0 to 95 percent non-condensing

Vibrations: Less than 2 G

* + - * 1. Required for installation.

Mounting bracket.

Universal remote control.

\*\* NOTE TO SPECIFIER \*\* BEA's LZR-s600 represents the largest detection field offered in our laser time-of-flight product portfolio. This sensor is ideal for perimeter security protection, industrial automation and large industrial door/gate applications that require a wide field of detection.

The LZR-s600 is housed in a NEMA 4 rated enclosure and can be installed in outdoor, industrial, and other harsh environments. Three visible LED spots provide accurate reference points when adjusting the tilt angle. Parameter adjustments can be made with a BEA remote control. Delete if not required.

* + 1. Basis of Design: LZR-S600 as manufactured by BEA. A laser-based time-of-flight sensor. Provides four laser-based curtains offering a three dimensional presence detection zone.
			1. Reference Standards Compliance:
				1. RoHS: 2006 / 95 / EC: LVD; 2002 / 95 / EC.
				2. EM: 2004 / 108 / EC.
				3. EN 60529:2001; IEC 60825-1:2007 Laser Class 1 and 3R.
				4. EN 60950-1:2005.
				5. EN 61000-6-2:2005 EMC - Industrial level.
				6. EN 61000-6-3:2006 EMC - Commercial level.
			2. Technology: Laser sensor, time-of-flight measurement.
			3. Detection Mode: Motion / Presence (EN 12453 Typ. E)
			4. Detection Range: 82 x 82 ft (25 x 25 m) maximum.
			5. Detection Plane: 4 curtains per sensor, curtain spread dependent on mounting height.
			6. Angular Resolution: 0.3516 degrees.
			7. Emission Characteristics:
				1. IR Laser:

Wavelength 905 nm; maximum output pulse power 75 W.

* + - * 1. Red Visible Laser:

Wavelength 650 nm; maximum output CW power 3 mW.

* + - 1. Supply Voltage: 10 to .35 VDC at sensor terminal.
			2. Peak Current at Power-On: 1.8 A; Max. 80 ms at 35 V.
			3. Power Consumption: 5 W or less.
			4. Response Time: Typical is 20 ms; maximum is 80 ms, plus output activation delay.
			5. Output: 2 electronic relays; galvanic isolated and polarity free.
				1. Max. Switching Voltage: 35 VDC / 24 VAC.
				2. Max. Switching Current: 80 mA, resistive.
			6. LED-Signal:
				1. One Blue LED: Status; Power-On.
				2. One Orange LED: Status; Error.
				3. Two Bi-colored LEDs: Detection/Output Status

Green: No detection. Red: Detection.

* + - 1. Housing Dimensions (WxHxD): 5 x 2-3/4 x 3.66 inches (127 x 70 x 93 mm).
				1. Mounting Bracket adds 0.55 inches (14 mm) to width.
			2. Material: PC / ASA. Color: Black
			3. Mounting Bracket:
				1. Rotation Angle: +/- 5 degrees; lockable.
				2. Tilt Angle: +/- 3 degrees.
			4. Protection per IEC 60529: IP65. NEMA 4.
			5. Temperature Range:
				1. When Powered: -22 to 140 degrees F (-30 to 60 degrees C).
				2. When Unpowered: 14 to 140 degrees F (-10 to 60 degrees C).
			6. Humidity: 0 to 95 percent non-condensing
			7. Vibrations: Less than 2 G
			8. Pollution of Front Screens: Maximum of 30 percent homogeneous.
			9. Required for installation.
				1. Mounting bracket.
				2. Universal remote control.

\*\* NOTE TO SPECIFIER \*\* The sensor is designed for the detection of people and vehicles, in both indoor and outdoor environments. Its detection accuracy makes this sensor ideal for high performance industrial doors, vehicle flow safety, perimeter protection and variety of applications. The LZR-I30 is housed in an NEMA 4 rated enclosure and can be installed in outdoor, industrial, and other harsh environments. Three visible LED spots provide accurate reference points when adjusting the tilt angle. Parameter adjustments can be made with a BEA universal remote control.

* + 1. Basis of Design: LZR-I30 as manufactured by BEA. A laser-based time-of-flight sensor. Provides four laser-based curtains offering a three dimensional presence detection zone.
			1. Reference Standards Compliance:
				1. LVD: 2006 / 95 / EC.
				2. EMC: 2002 / 95 / EC: RoHS; 2004 / 108 / EC.
				3. MD: 2006 / 42 / EC.
				4. EN 12453:2000 chapter 5.1.1.6, chapter 5.5.1 Safety device E.
				5. EN 12978:2009.
				6. EN ISO 13849-1:2008 CAT2, Pl "d"; EN 60529:2001.
				7. IEC 60825-1:2007.
				8. EN 60950-1:2005.
				9. EN 61000-6-2:2005.
				10. EN 61000-6-3:2006.
				11. IEC 61496-1:2009.
				12. EN61496-3: 2008 ESPE Type 2.
				13. EN 62061:2005 SIL 2.
			2. Technology: Laser sensor, time-of-flight measurement.
			3. Detection Mode: Motion / Presence (EN 12453 Typ. E).
			4. Detection Range: 30 x 30 ft (9.14 x 9.14 m) maximum.
			5. Remission Factor: Greater than 2 percent.
			6. Emission Characteristics:
				1. IR Laser:

Wavelength 905 nm; output power 0.10mW, Class 1.

* + - * 1. Red Visible Laser:

Wavelength 635 nm; output power 0.95 mW, Class 2.

* + - 1. Supply Voltage: 10 to 35 VDC at sensor terminal; to be operated from SELV compatible power supplies only.
			2. Peak Current at Power-On: 1.8 A; Max. 80 ms at 35 V.
			3. Power Consumption: 5 W or less.
			4. Response Time: Typical is 20 ms; maximum is 80 ms, plus output activation delay.
			5. Output: 2 electronic relays; galvanic isolated and polarity free.
				1. Max. Switching Voltage: 35 VDC / 24 VAC.
				2. Max. Switching Current: 80 mA, resistive.
			6. LED-Signal:
				1. One Blue LED: Status; Power-On.
				2. One Orange LED: Status; Error.
				3. Two Bi-colored LEDs: Detection/Output Status.

Green: No detection. Red: Detection.

* + - 1. Housing Dimensions (WxHxD): 5 x 2-3/4 x 3.66 inches (127 x 70 x 93 mm).
				1. Mounting Bracket adds 11/20 inches to width.
			2. Cable Length: 30 ft (9.14 m).
			3. Material: PC / ASA. Color: Black.
			4. Mounting Bracket:
				1. Rotation Angle: +/- 5 degrees; lockable.
				2. Tilt Angle: +/- 3 degrees.
			5. Protection: NEMA 4.
			6. Temperature Range:
				1. When Powered: -22 to 140 degrees F (-30 to 60 degrees C).
				2. When Unpowered: 14 to 140 degrees F ( degrees C).
			7. Humidity: 0 to 95 percent non-condensing.
			8. Vibrations: Less than 2 G.
			9. Pollution of Front Screens: Maximum of 30 percent homogeneous.
			10. Required for installation.
				1. Mounting bracket.
				2. Universal remote control.
			11. Accessories:
				1. Mounting Bracket Extension: 6 to 12 inches (152 x 305 mm).
				2. Mounting Bracket Extension: 20 to 26 inches (508 x 660 mm).
				3. Power Supply: UL/ULC Listed, 12 to 24 Vdc
				4. Power Supply: 100 to 240 Vac, 24 Vdc power supply.
				5. Power Supply: Plug-In, 242 Vdc 2A
				6. Harness: 30 ft (9.14 m), 8 conductor.

\*\* NOTE TO SPECIFIER \*\* Door Pilot is an autonomous door control and actively-scanning collision avoidance system. It is a fail-safe system that automatically controls the movement of an overhead door while actively looking ahead of the movement for obstructions to stop the door if an obstruction is detected. The system operates through a single button press from the Door Pilot system or with the optional mobile phone application. This system can work with hydraulic and electrical motor-powered doors. Door Pilot has been in development and testing since 2021 and has been installed on numerous doors around the country in various environments.

* + 1. Basis of Design: Door Pilot as manufactured by Powerlift Hydraulic Doors.
			1. Door Sensors: Two sensors minimum per door.
				1. Door Widths up to 90 ft (27.432 m): One sensor on front and back side of the door.
				2. Door Widths Over 90 ft (27.432 m): Require two or more sensors per side.
				3. Sensor Attachment to Overhead Doors: With fasteners.
				4. Cable from Outside Mounted Sensor: Routes to the inside of door through a hole in door.
				5. Active, Sweeping Sensors: Utilizes eye safe Class 1M laser to detect objects.
				6. Cabled to Control Panel: For 24 VDC power and communications.
				7. Sensor Function:

With Sensor Mounted Near Top of the Door: Object detection covers 180 degrees or smaller; customizable in set up.

Stationary Object Detection: Objects larger than 12 x 12 x 12 inches (305 x 305 x 305 mm).

Door Opening:

An increasing safety-envelope; larger than actual door dimensions around the door, can be created through the sensor set up parameters providing an additional safety envelope.

Door Closing:

The sensor modifies its detection parameters to scan the pinch point on each side of the door between the door and the building.

The sensor tilts its scanning pattern along the bottom door to minimize encroachment on inside of building.

\*\* NOTE TO SPECIFIER \*\* Below is an advantage over "LiDAR Curtain" systems.

Door will close with objects as close as 12 inches (305 mm) from closed door.

Light to Moderate Precipitation: Sensors operate normally.

Heavy Precipitation: An override can open or close the door from the control panel.

* + - 1. Control Panels: One per door system.
				1. Dimensions (Width x Height x Depth): 12 x 16 x 7 inches (305 x 406 x 178 mm).
				2. Communicates with Door Sensors: To determine door position and object detection.

\*\* NOTE TO SPECIFIER \*\* The following paragraph is optional. Delete if not required.

* + - * 1. Mobile App Communication: Via the facilities 5GHz/2.4 GHz WiFi network.
				2. On/Off Button: Turns power on and off to the system.
				3. Reset Button: For soft reset.
				4. LCD Display: For system set up and system information.
				5. Toggle Switch: Manually opens and closes the overhead door.

To Open Door:

Momentarily toggle the switch up; single press and release.

Hold switch to open the door. Door will stop when switch is released.

To Close Door:

Momentarily toggle the switch down; single press and release.

Hold switch to close the door. Door will stop when switch is released.

* + - * 1. Manual Override Switch: Opens and closes door, if needed.
				2. Sealed conduit cable connected to pump.
				3. Power: Operates on 125/250 VAC.
				4. Shared Power with Pump: No additional outlets or circuits required.
				5. Circuit Breaker: Resettable One Amp.

\*\* NOTE TO SPECIFIER \*\* The following two paragraphs are optional connections that must be configured at time of order.

* + - * 1. Connects to PowerLift Radio Remote Control System via cable.
				2. Connects to wind pin safety system via cable.
				3. System Configuration: Through set up parameters to achieve "Soft Close Operation."
				4. System Stops Automatically. No user intervention required.

Full Open Door Angle: Set up parameter.

Full Open Door Angle: User defined preset.

Full Close: Set up parameter.

* + - * 1. When Object is Detected: Door stops.

User is notified on the control panel screen.

\*\* NOTE TO SPECIFIER \*\* Delete paragraph below if not required.

User is notified on the mobile phone application.

* + - * 1. When Closing, if an object is detected greater than 2 seconds after door movement begins the Door will reverse (open) for 2 seconds.

\*\* NOTE TO SPECIFIER \*\* Delete mobile phone application if not required.

* + - 1. Mobile Phone Application: Door Pilot APP. Download on iPhone App Store or Google Play Store.
				1. Operate assigned doors from anywhere with WiFi or cellular data service.
				2. Control multiple doors at multiple locations via Smart Phone over Cellular Network or to specific doors through facility WiFi.
				3. Operation: One touch to open and close door.
				4. Monitor door status.
				5. Door Presets: Angle and clearance height.

Set specific angle and clearance height for door to open and close to.

* + - * 1. End User Administrator:

Assign control of doors to others.

Remove control of doors by others.

* + - * 1. Records door open/close cycles.

\*\* NOTE TO SPECIFIER \*\* Door Pilot Lite is a remote-control system for opening and closing hydraulic and electric motor powered overhead doors. The system operates with a mobile phone application and a hardware system connected to the hydraulic pump and the overhead door. Door Pilot Lite can operate on any size door. The Door Pilot Lite system works with Swing Open and Bi-Fold Doors. This Door Pilot Lite system does not provide any collision avoidance. Delete if not required.

* + 1. Door Pilot Lite (DPL):
			1. Door Angle Module:
				1. One Door Angle Module per door.
				2. Attached to overhead door with fasteners or double sided tape.
				3. Sensor used to determine position of door.
				4. Cabled to DPL control panel.
			2. DPL Control Panel:
				1. Communicates with Door Angle Module to determine door position.
				2. Mobile App Communication: Via standalone 2.4 GHz WiFi network.
				3. On/Off Button: Turns power on and off to the system.
				4. LCD Display: For system set up and system information.
				5. Toggle Switch: Manually opens and closes the overhead door.

To Open Door:

Momentarily toggle the switch up; single press and release.

Hold switch to open the door. Door will stop when switch is released.

To Close Door:

Momentarily toggle the switch down; single press and release.

Hold switch to close the door. Door will stop when switch is released.

* + - * 1. Plastic Enclosure (WxHxD): 9 x 7 x 4 inches (229 x 178 x 102 mm). Mounts to wall close to pump.
				2. Sealed conduit cable connected to pump.
				3. Power: Operates on 125/250 VAC.
				4. Shared Power with Pump: No additional outlets or circuits required.
				5. Circuit Breaker: Resettable One Amp.

\*\* NOTE TO SPECIFIER \*\* The following two paragraphs are optional connections that must be configured at time of order.

* + - * 1. Connects to PowerLift Radio Remote Control System via cable.
				2. Connects to wind pin safety system via cable.
				3. System Configuration: Through set up parameters to achieve "Soft Close Operation."
				4. Operate assigned doors from anywhere with WiFi or cellular data service.
				5. Control multiple doors at multiple locations via Smart Phone over Cellular Network or to specific doors through facility WiFi.
				6. Operation: One touch to open and close door.
				7. Monitor door status.
				8. Door Presets: Angle and clearance height.

Set specific angle and clearance height for door to open and close to.

* + - * 1. End User Administrator:

Assign control of doors to others.

Remove control of doors by others.

* + - * 1. Records door open/close cycles.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly constructed and prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
		3. Building rough opening jambs and header to be plumb and level within 1/4 inch (13 mm) from end to end.
		4. Foundation below door to be level and flat within 1/2 inch (13 mm) variation across door opening.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. No materials of any kind may protrude from building surface between manufacturer door frame and building structure (jambs, header).
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
			1. Installation of custom designed hydraulic door completed by licensed door manufacturer personnel only.
			2. Wood Rough Opening: Door frame attached to building using wood lag screws.
			3. Concrete Rough Opening: Door frame attached to building jamb and header using concrete wedge, screw, or epoxy anchors.
			4. Steel Rough Opening: Door frame stitch welded to building jamb and header.
	4. FIELD QUALITY CONTROL
		1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
	1. CLEANING AND PROTECTION
		1. Clean products in accordance with the manufacturer's recommendations.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION