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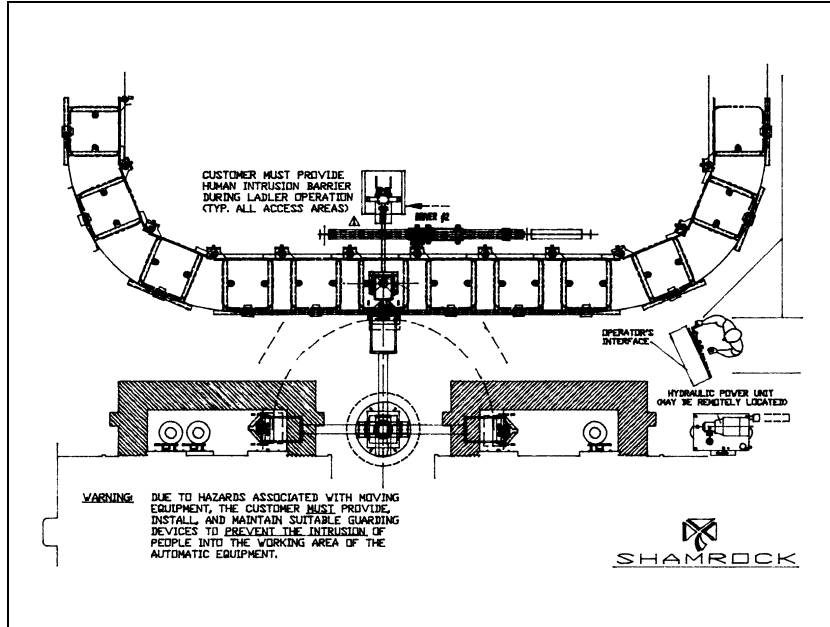
MODEL FJ ROBOTIC POURING DEVICE



Spec # XSFSS-250-190-00-00-68-FJ

The Model FJ is a three-axis robotic device designed to pour up to 250 pounds of aluminum along a fixed radius of up to 120 inches. The radius is manually adjustable providing ± 6 inches of movement of the ladle. All actuating devices are located at the back of the arm behind protective heat shielding. All bearings on the ladle end are heat treated, nitrided, H-13 tool steel. Ideally suited for evaporative foam and permanent mold applications the system can memorize thousands of pouring profiles for individual molds. This eliminates many of the variables associated with the pouring process. You can be assured that the selected mold will be poured the same today as it was a year ago. Shamrock also produces a wide variety of custom pour trough manipulators for incorporation with the pouring system used in evaporative foam applications. Please refer to the Robotic Control section for details of the electrical controls used on the unit.

TYPICAL LAYOUT FOR MODEL FJ ROBOTIC POURING DEVICE AND SPEC SHEET



Maximum Pour Weight: 250 pounds @ 120 inches (Arm Length)

Power Required: 440/220 volts
20/40 amps
8800 KVA

External Heater: 120 volts
10 amps

Controls: PLC Type: ControlLogix
Enclosure Size: 48"H x 36"W x 10"D
HMI Type: PanelView 1000
Metal Sensing: Probes

Hydraulics: Pressure: 1000
GPM: 15
Cooling: Water

AXIS	MAX. MOVEMENT	POSITION CONTROL	SPEED CONTROL	OPTIONS
ROTATION	270°	servo ± .1°	Programmable 60°/sec. max.	310° max. available
REACH	Fixed			
HEIGHT	± 20°	servo ± .02°	Programmable 20°/sec. max.	
TILT	75°	servo ± .02	Programmable 90°/sec. max.	

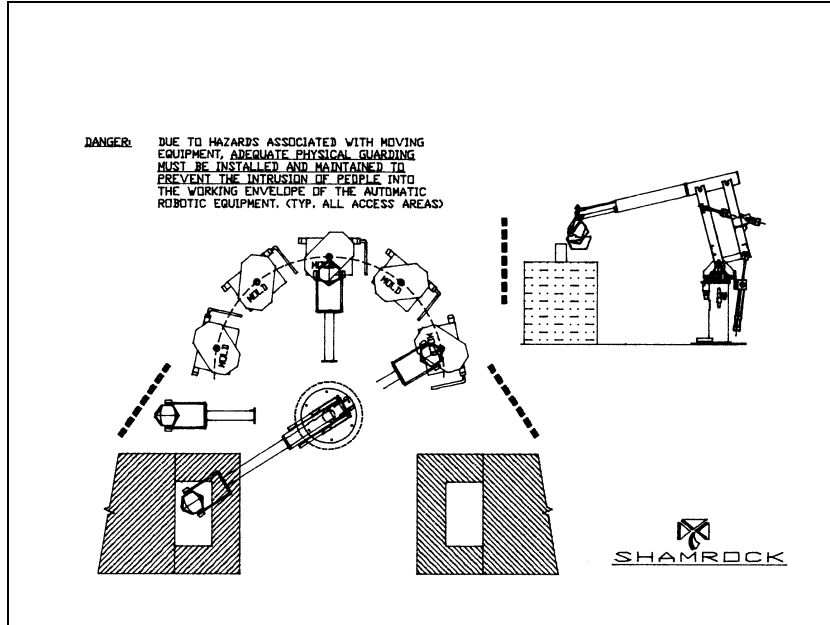
MODEL EFJ ROBOTIC POURING DEVICE



Spec # XSSSS-180-270-00-60-68-EF

The Model EFJ is a four-axis robotic device designed to pour up to 250 pounds of aluminum along a variable radius of 60 to 120 inches. All actuating devices are located at the back of the arm. All bearings on the ladle end are heat treated, nitrided, H-13 tool steel. Ideally suited for green sand, permanent mold, and other casting processes, the system can memorize thousands of pouring profiles for individual molds. This eliminates many of the variables associated with the pouring process. You can be assured that the selected mold will be poured the same today as it was a year ago. Providing the highest flexibility for layout, the Model EFJ is used in multiple furnace, multiple pour position applications. It is also capable of pouring multiple positions from a single fill at the furnace. Please refer to the Robotic Control section for details of the electrical controls used on the unit.

TYPICAL LAYOUT FOR MODEL EFJ ROBOTIC POURING DEVICE AND SPEC SHEET



Maximum Pour Weight: 250 pounds @ 120 inches (Arm Length)

Power Required: 440/220 volts
20/40 amps
8800 KVA

External Heater: 120 volts
10 amps

Controls: PLC Type: ControlLogix
Enclosure Size: 48"H x 36"W x 10"D
HMI Type: PanelView 1000
Metal Sensing: Probes

Hydraulics: Pressure: 1000
GPM: 15
Cooling: Water

AXIS	MAX. MOVEMENT	POSITION CONTROL	SPEED CONTROL	OPTIONS
ROTATION	270°	servo ± .1°	Programmable 60°/sec. max.	310° max. available
REACH	60"	servo ± .05"	Programmable 30°/sec. max.	
HEIGHT	± 20°	servo ± .02°	Programmable 20°/sec. max.	
TILT	75°	servo ± .02	Programmable 90°/sec. max.	

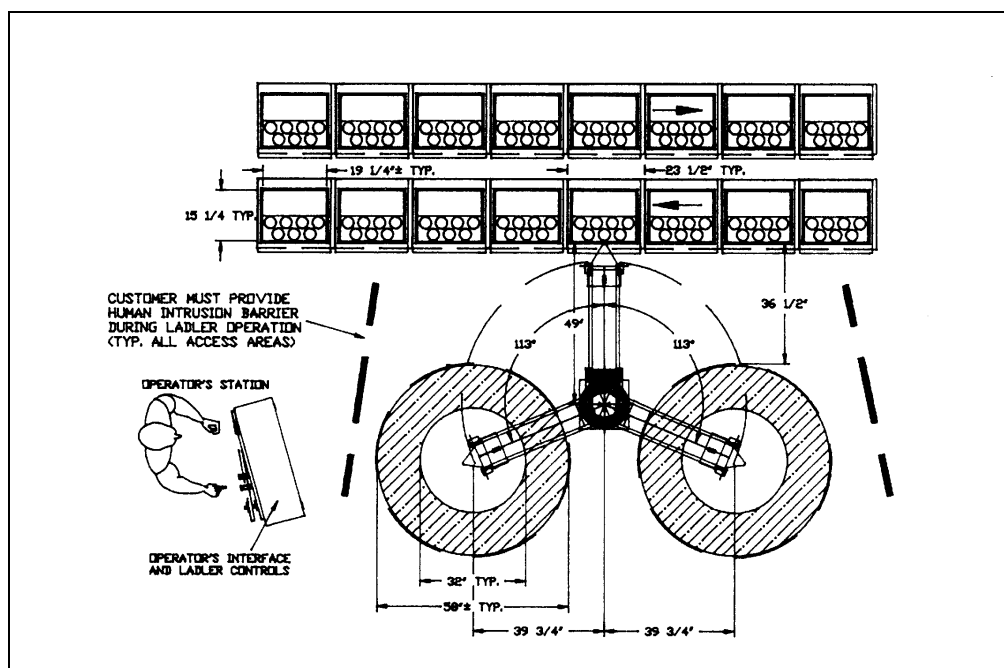
MODEL SD-3SA ROBOTIC POURING DEVICE



Spec # XSFSS-40-230-00-00-48-TF

The Model SD-3SA is a three-axis robotic pouring device designed to pour up to 150 pounds of aluminum anywhere along a fixed radius of up to 36 inches. The radius is manually adjustable providing ± 6 inches of movement of the ladle. All actuating devices are located at the back of the arm behind protective heat shielding. All bearings on the ladle end are heat treated, nitrided, H-13 tool steel. This unit is ideally suited for green sand and permanent mold applications on which the furnaces and pour positions lie along a fixed radius. Please refer to the Robotic Control section for details of the electrical controls used on the unit.

TYPICAL LAYOUT FOR MODEL SD-3SA ROBOTIC POURING DEVICE AND SPEC SHEET



Maximum Pour Weight: 150 pounds @ 36 inches (Arm Length)

Power Required: 440/220 volts

External Heater: 120 volts
5 amps

Controls: PLC Type: ControllLogix
Enclosure Size: 48"H x 36"W x 10"D
HMI Type: PanelView 1000
Metal Sensing: Probes

Hydraulics: Pressure: 1000
GPM: 3.25
Cooling: Water

AXIS	MAX. MOVEMENT	POSITION CONTROL	SPEED CONTROL	OPTIONS
ROTATION	270°	servo ± .1°	Programmable 60°/sec. max.	310° max. available
REACH	Fixed			
HEIGHT	± 20°	servo ± .02°	Programmable 20°/sec. max.	
TILT	75°	servo ± .02	Programmable 90°/sec. max.	

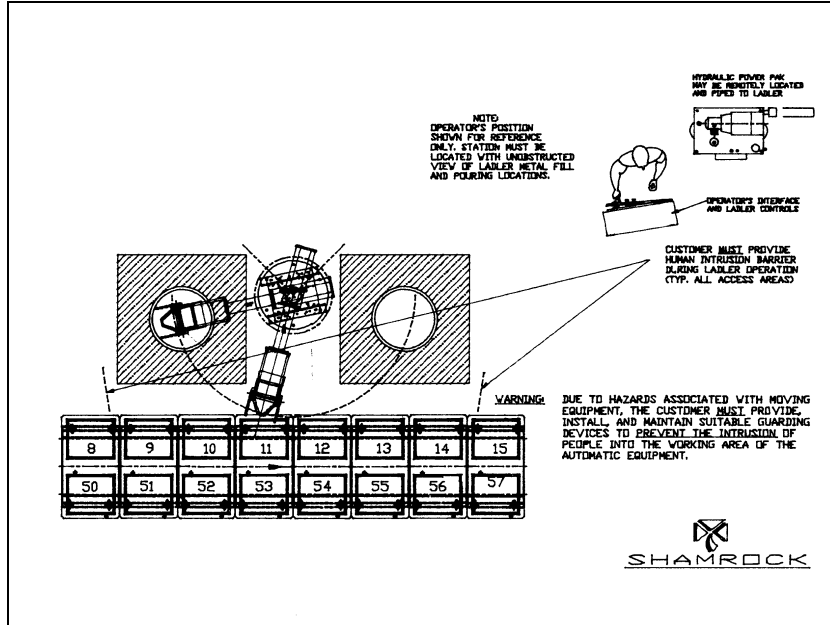
MODEL XDJ ROBOTIC POURING DEVICE



Spec # XSSSS-150-220-00-36-48-XD

The Model XDJ is a four-axis robotic pouring device capable of pouring up to 250 pounds of aluminum along a variable radius of up to 120 inches with 48 inches of variance. All actuating devices are located at the back of the arm. All bearings on the ladle end are heat treated, nitrided, H-13 tool steel. Ideally suited for green sand, permanent mold, and other casting processes, the system can memorize thousands of pouring profiles for individual molds. This eliminates many of the variables associated with the pouring process. Please refer to the Robotic Control section for details of the electrical controls used on the unit.

TYPICAL LAYOUT FOR MODEL XDJ ROBOTIC POURING DEVICE AND SPEC SHEET



Maximum Pour Weight: 250 pounds @ 120 inches (Arm Length)

Power Required: 440/220 volts
20/40 amps
8800 KVA

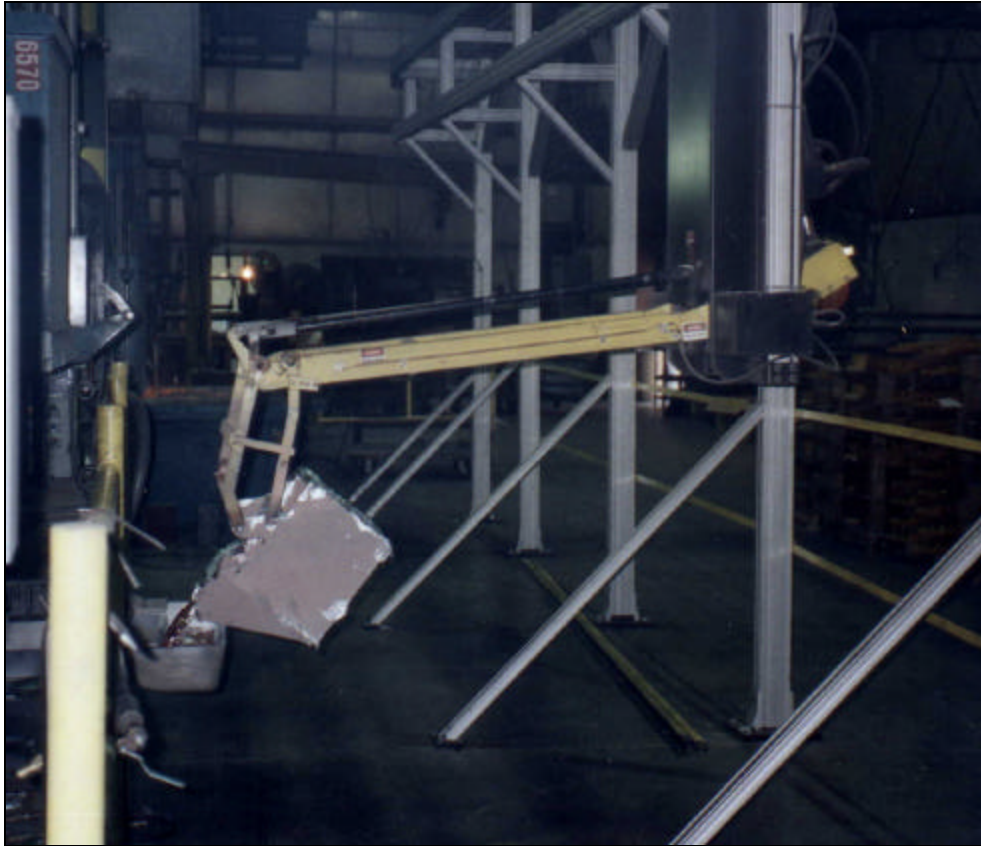
External Heater: 120 volts
10 amps

Controls: PLC Type: ControlLogix
Enclosure Size: 48"H x 36"W x 10"D
HMI Type: PanelView 1000
Metal Sensing: Probes

Hydraulics: Pressure: 1000
GPM: 15
Cooling: Water

AXIS	MAX. MOVEMENT	POSITION CONTROL	SPEED CONTROL	OPTIONS
ROTATION	270°	servo ± .1°	Programmable 60°/sec. max.	310° max. available
REACH	48"	servo ± .05"	Programmable 24"/sec. max.	
HEIGHT	± 20°	servo ± .02°	Programmable 20°/sec. max.	
TILT	75°	servo ± .02	Programmable 90°/sec. max.	

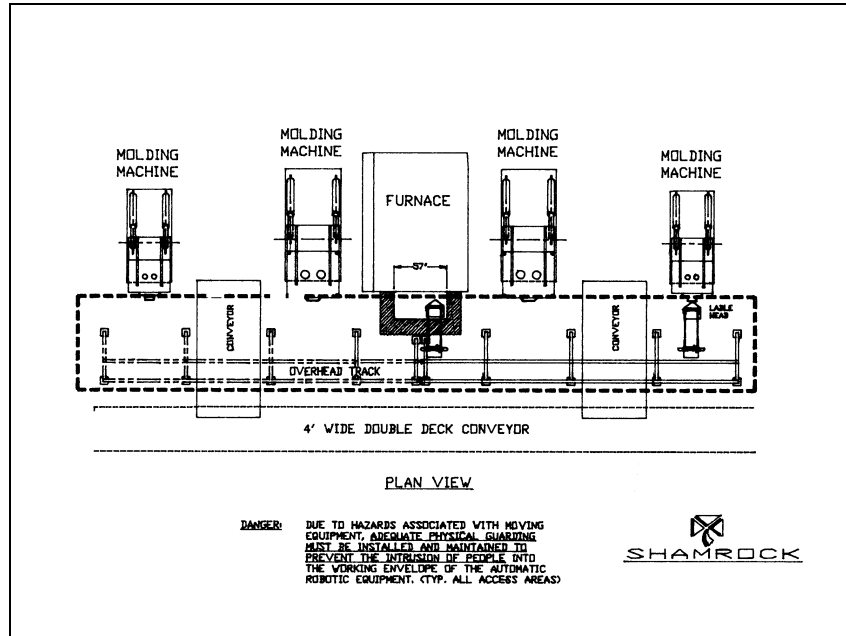
MODEL HYBS ROBOTIC POURING DEVICE



Spec # SXFSS-40-00-720-00-48-HB

The Model HYBS is a three-axis linear pouring device designed to pour up to 200 pounds of aluminum along a straight line up to 80 feet in length. The system is available in an electric powered version with load capacity of 40 pounds. The linear axis is supported by floor mounted columns spaced at up to 100 inch intervals. This allows parts conveyors, extractors or other peripheral devices to be located below the assembly. In addition to the standard three axis design, a rotational axis and or reach axis may also be added for further flexibility of layout. All actuators are located behind protective heat shielding. All bearings used on the ladle end are heat treated, nitrided, H-13 tool steel. Ideally suited for permanent mold applications, the linear design provides easier work flow into and out of the cell and minimizes floor space requirements. Please refer to the Robotic Control section for details of the electrical controls used on the unit.

TYPICAL LAYOUT FOR MODEL HYBS ROBOTIC POURING DEVICE AND SPEC SHEET



Maximum Pour Weight: 200 pounds @ 36 inches (Arm Length)

Power Required: 440/220 volts
20/40 amps
8800 KVA

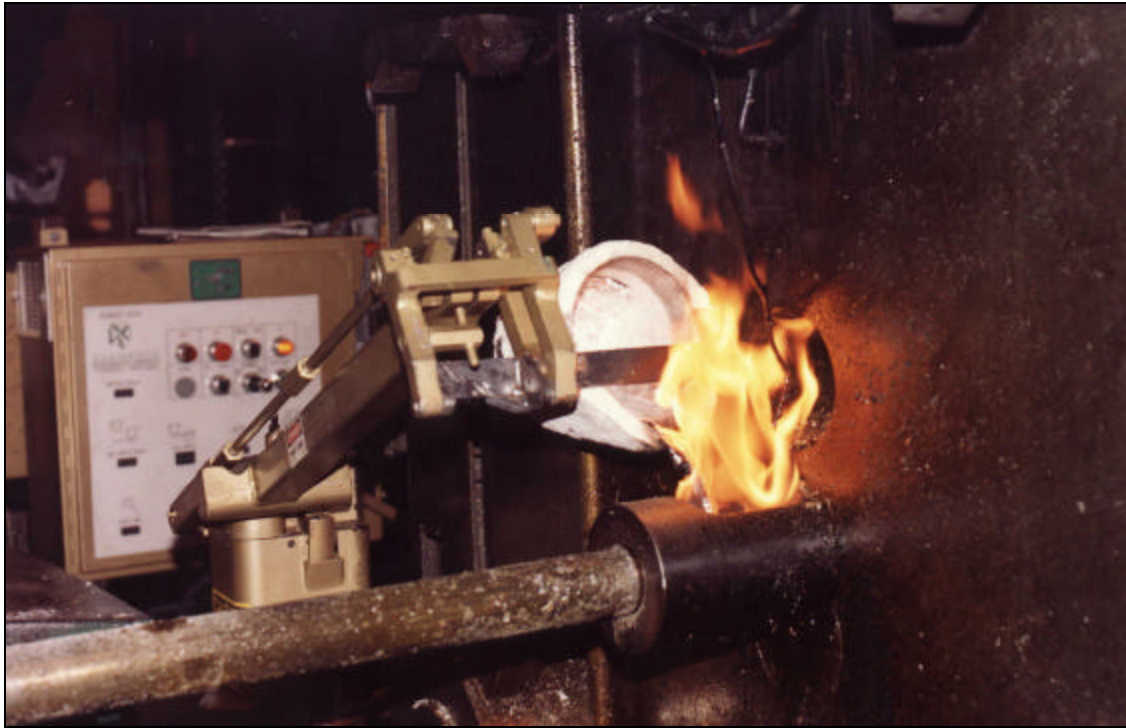
External Heater: 120 volts
10 amps

Controls: PLC Type: ControlLogix
Enclosure Size: 48"H x 36"W x 10"D
HMI Type: PanelView 1000
Metal Sensing: Probes

Hydraulics: Pressure: 1000
GPM: 15
Cooling: Water

AXIS	MAX. MOVEMENT	POSITION CONTROL	SPEED CONTROL	OPTIONS
ROTATION	270° optional	servo ± .1°	Programmable 60°/sec. max.	
LINEAR	80'	servo ± .01°	Programmable 72"/sec. max.	
REACH	fixed			servo reach available
HEIGHT	± 20°	servo ± .02°	Programmable 20°/sec. max.	
TILT	75°	servo ± .02	Programmable 90°/sec. max.	

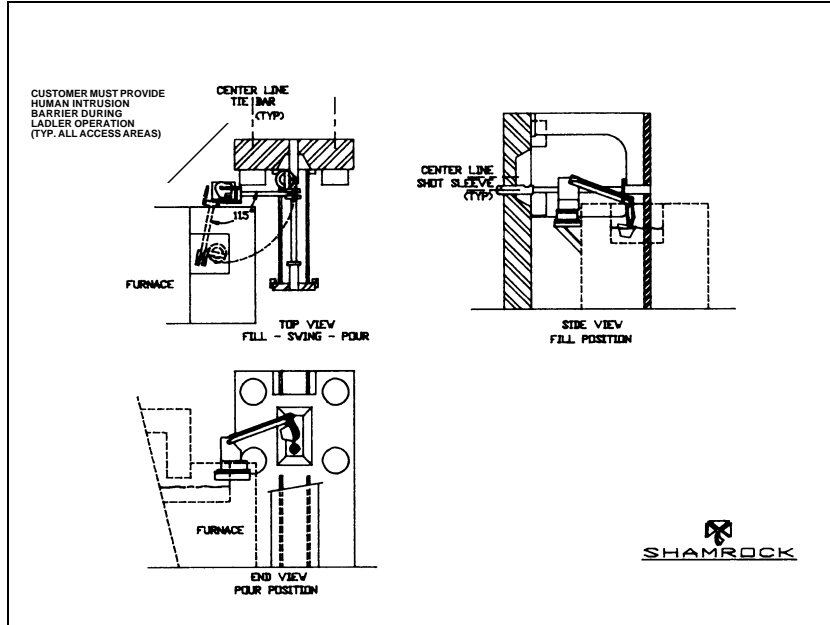
MODEL L AUTOMATIC LADLER



Spec # XFFFF-20-115-00-00-32-LD

The Model L Automatic Ladler is designed to pour up to 20 pounds of aluminum at a fixed radius of 36 inches. The unit uses a fixed mechanical rotation of up to 140 degrees designed to your exact application requirements. A manual reach adjustment allows ± 4 inches of ladle movement. Speeds are set by manually adjusted hydraulic flow controls. An optional Multi-speed function is available for both the height and tilt to allow software controlled speeds throughout the automatic cycle. All actuators are located behind protective heat shielding and all bearings used on the ladle end are heat treated, nitrided, H-13 tool steel. The unit uses Shamrock's exclusive "NO PROBES" feature to sense metal level in the furnace. This unit is ideally suited for permanent mold and high-pressure die casting applications with a single furnace and single pour location. Pour weight is extremely consistent and adjusted manually. An optional shuttle base is available for reaching recessed pour locations. Please refer to the Autoladle Control section for details of the electrical controls used on this unit.

TYPICAL LAYOUT FOR MODEL L AUTOMATIC LADLER AND SPEC SHEET



Maximum Pour Weight: 20 pounds @ 36 inches (Arm Length)

Power Required: 440/220 volts
5/10 amps
2200 KVA

External Heater: 120 volts
5 amps

Controls: PLC Type: SLC-500
Enclosure Size: 24"H x 24"W x 10"D
HMI Type: PanelView 300
Metal Sensing: Transducer

Hydraulics: Pressure: 600
GPM: 1.6
Cooling: Water

AXIS	MAX. MOVEMENT	POSITION CONTROL	SPEED CONTROL	OPTIONS
ROTATION	140°	Timer/Limit Switch	Manual Flow	
REACH	6"	Manual Adjust.	NONE	Shuttle Available
HEIGHT	+20° / -20°	Timer	Manual Flow	Multi-Speed
TILT	75°	Timer/Hard Stops	Manual Flow	Multi-Speed

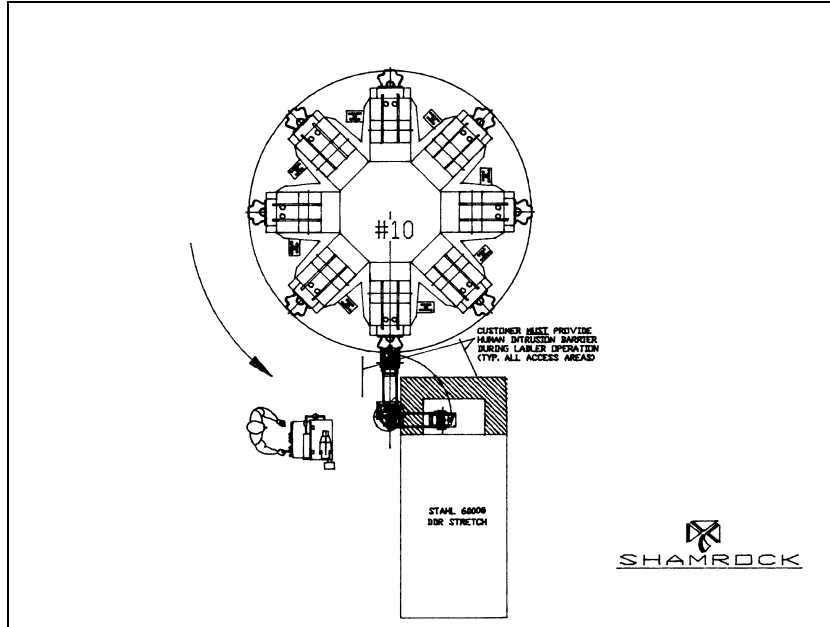
MODEL HD AUTOMATIC LADLER



Spec # XFFFF-40-90-00-00-38-HD

The Model HD Automatic Ladler is designed to pour up to 60 pounds of aluminum on a fixed radius of 36 inches. The unit uses a fixed mechanical rotation of up to 140 degrees designed to your exact application requirements. A manual reach adjustment allows ± 4 inches of ladle movement. Speeds are set by manually adjusted hydraulic flow controls. An optional Multi-speed function is available for both the height and tilt to allow software controlled speeds throughout the automatic cycle. All actuators are located behind protective heat shielding and all bearings used on the ladle end are heat treated, nitrided, H-13 tool steel. The unit uses Shamrock's exclusive "NO PROBES" feature to sense metal level in the furnace. This unit is ideally suited for permanent mold and high-pressure die casting applications with a single furnace and single pour location. Pour weight is extremely consistent and adjusted manually. An optional shuttle base is available for reaching recessed pour locations. Please refer to the Autoladle Control section for details of the electrical controls used on this unit.

TYPICAL LAYOUT FOR MODEL HD AUTOMATIC LADLER AND SPEC SHEET



Maximum Pour Weight: 60 pounds @ 36 inches (Arm Length)

Power Required: 440/220 volts
5/10 amps
2200 KVA

External Heater: 120 volts
5 amps

Controls: PLC Type: SLC-500
Enclosure Size: 24"H x 24"W x 10"D
HMI Type: PanelView 300
Metal Sensing: Transducer

Hydraulics: Pressure: 600
GPM: 1.6
Cooling: Water

AXIS	MAX. MOVEMENT	POSITION CONTROL	SPEED CONTROL	OPTIONS
ROTATION	140°	Timer/Limit Switch	Manual Flow Control	
REACH	Fixed	Manual Adjust.	NONE	Shuttle Available
HEIGHT	+20° / -20°	Timer	Manual Flow Control	Multi-Speed
TILT	75°	Timer/Hard Stop	Manual Flow Control	Multi-Speed

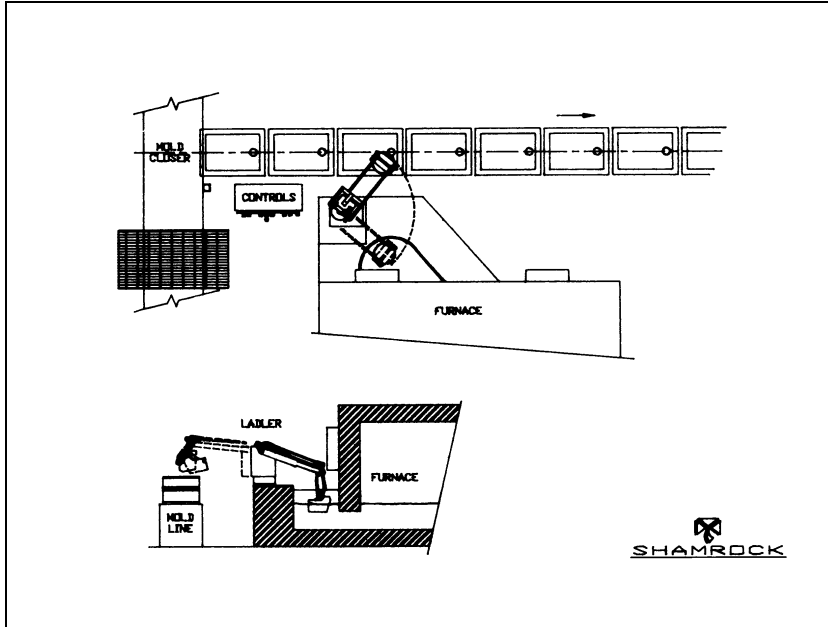
MODEL SD AUTOMATIC LADLER



Spec # XFFMM-100-90-00-00-36-SD

The Model SD Automatic Ladler is designed to pour up to 150 pounds of aluminum along a fixed radius of 36 inches. The unit uses a fixed mechanical rotation of up to 140 degrees designed to your exact application requirements. A manual reach adjustment allows ± 4 inches of ladle movement. Speeds are set by manually adjusted hydraulic flow controls. An optional Multi-speed function is available for both the height and tilt to allow software controlled speeds throughout the automatic cycle. All actuators are located behind protective heat shielding and all bearings used on the ladle end are heat treated, nitrided, H-13 tool steel. The unit uses Shamrocks exclusive "NO PROBES" feature to sense metal level in the furnace. This unit is ideally suited for permanent mold and high-pressure die casting applications with a single furnace and single pour location. Pour weight is extremely consistent and adjusted manually. An optional shuttle base is available for reaching recessed pour locations. Please refer to the Autoladle Control section for details of the electrical controls used on this unit.

TYPICAL LAYOUT FOR MODEL SD AUTOMATIC LADLER AND SPEC SHEET



Maximum Pour Weight: 150 pounds @ 36 inches (Arm Length)

Power Required: 440/220 volts
5/10 amps
2200 KVA

External Heater: 120 volts
5 amps

Controls: PLC Type: SLC-500
Enclosure Size: 24"H x 24"W x 10"D
HMI Type: PanelView 300
Metal Sensing: Transducer

Hydraulics: Pressure: 600
GPM: 3.25
Cooling: Water

AXIS	MAX. MOVEMENT	POSITION CONTROL	SPEED CONTROL	OPTIONS
ROTATION	140°	Timer/Limit Switch	Manual Flow Control	
REACH	Fixed	Manual Adjust.	NONE	Shuttle Available
HEIGHT	+20° / -20°	Timer	Manual Flow Control	Multi-Speed
TILT	75°	Timer/Hard Stop	Manual Flow Control	Multi-Speed

Shamrock Automation™ Autoladles & Robotic Pouring Systems

What is the difference?

With all of the various models of pouring systems, there are quite a few options available to suit different applications. This section describes the differences between the models and will assist in choosing the most efficient and cost effective equipment for the application.

Shamrock manufactures two basic varieties of pouring systems. For our purposes here we will refer to them as the autoladle type versus the robotic type. There are three models in the autoladle line of products. They are the L, HD, and XD series of ladlers. Four basic models comprise the robotic series. They are the FJ, EFJ, 3SA, and HYBS models. From a safety standpoint, both types may be considered as industrial robots and therefore must meet applicable OSHA, ANSI, and other standards for safeguarding personnel during operation

Autoladle Type:

The autoladles are designed primarily for high-production, infrequent change-over, dedicated workcells. They are limited to a single furnace location, and a single pouring location. These locations are determined during the engineering phase of a project and are fixed by mechanical linkage design. This rotation angle is limited to less than 140 degrees. In order to change the total rotation, the mechanical linkage must be replaced. The elevation and tilt functions of the autoladle are timer controlled, and all velocities are controlled by manually adjusted hydraulic flow controls. Because of this, these are typically used in applications in which metal entry into the mold is controlled by another process (i.e. tilt casting or high pressure die casting machines). Pour weight is determined by the location of a fill slot which is cut into the back of the ladle. The pour weight may be adjusted ($\pm 10\%$) by a manual mechanical linkage adjustment. For large pour weight variations the ladle must be replaced with one having a different fill slot location. This type of ladler is able to use Shamrocks exclusive "NO PROBES" technology to sense the elevation of the metal in the furnace. The autoladle may be mounted on a shuttle base to reach recessed or alternate pouring locations.



Robotic Type:

These pouring systems are designed for use in high flexibility, rapid changeover, multiple pour and/or furnace location applications. All motions have programmable position and speed parameters. The robotic type consists of linear and rotational models. The rotation type are limited to 310 degrees of rotation. Maximum velocities on the rotation axis may be up to 70 degrees/second. On the linear model, the HYBS, the linear axis may travel at speeds up to 72 inches/second. Keep in mind that



these are maximum speeds and do not include acceleration and deceleration which is determined by the amount of freeboard in the ladle. The linear model may be equipped with a rotation and/or reach axis to further enhance the flexibility of the system. The rotation for the HYBS may be up to 270 degrees. Pour weight is programmable and the pouring action is contoured to allow direct metal entry into the mold cavity of sand molds or gravity poured castings. These systems are able to memorize up to 2000 pouring patterns which insures that a given mold will be poured exactly the same today as it was two years ago. These devices may be programmed to pour multiple molds from a single trip to the furnace, which enhances cycle time. These systems may be utilized in virtually any application with the imagination as the only limiting factor.

Exceptions:

As with any firm differentiation between models, there are gray areas in which the two types overlap.

Exception #1 - The autoladle models may be equipped with a programmable rotation axis. This allows multiple pour positions or furnaces to be utilized in the layout. The limiting factor remains that each mold must have the same pour weight.

Exception #2 - The autoladle models may be equipped with a multispeed option on the height and/or tilt functions. This allows the software to control the speed of each movement throughout the cycle and also provides a profiled pouring action.

Shamrock Automation™ Autoladle Controls



The electrical controls used on the automatic ladlers consist of an Allen-Bradley SLC-500 PLC housed in a 24"W x 24"H x 10"D NEMA 12 enclosure. The operator interface is a 4" x 3" LCD display with keypad. All operating parameters are available through the interface without stopping the automatic operation of the ladler. Manual controls are also provided through the display. Pre-labeled terminals are included for users mold signals, guarding inputs, and remote emergency stop circuits.

Shamrock Automation™ Robotic Controls



The electrical controls used on the robotic pouring systems consist of an Allen-Bradley ControlLogix PLC housed in a 36"W x 48"H x 10"D NEMA 12 control cabinet. The operator interface is a 10" color graphic display, which provides access to all operating parameters and troubleshooting tools. Parameters such as fill angle and pouring speeds may be changed without interrupting the robot cycle. Positions may be taught using the manual functions available on the display. With the extensive memory, thousands of pouring profiles, sprue locations, and other variables may be committed to memory and recalled for later use. All system interface signals, such as “mold ready” and “pour complete” are displayed as LED’s for quick troubleshooting. Numeric readouts display current axis positions, commanded positions, or following error distances. Pre-labeled terminals are included for users mold signals, guarding inputs, and remote emergency stop circuits.

**BASIC ELECTRICAL INTERFACE
SHAMROCK LADLERS
ALL MODELS**

The following describes the interface signals exchanged between the ladler and the mold equipment. Additional signals and modifications are available by contacting Shamrock Automation, Inc.

All Interface signals are routed via dry contact relays located in the ladler control enclosure. Signals to the ladler are routed to relay coils (120V unless specified otherwise), signals from the ladler are routed to relay contacts. Please specify if more than one energy source will be used from the mold equipment.

Signals to the Ladler:

MOLD REQUEST: This signal indicates that the mold equipment will be ready for pouring within a short period of time. (i.e. <20 secs.) The signal initiates the drawing of metal from the bath or enters the machine into the pouring queue if more than one mold machine is being serviced. Signal should be maintained until receipt of a POUR COMPLETE signal from the ladler. One signal from each mold machine.

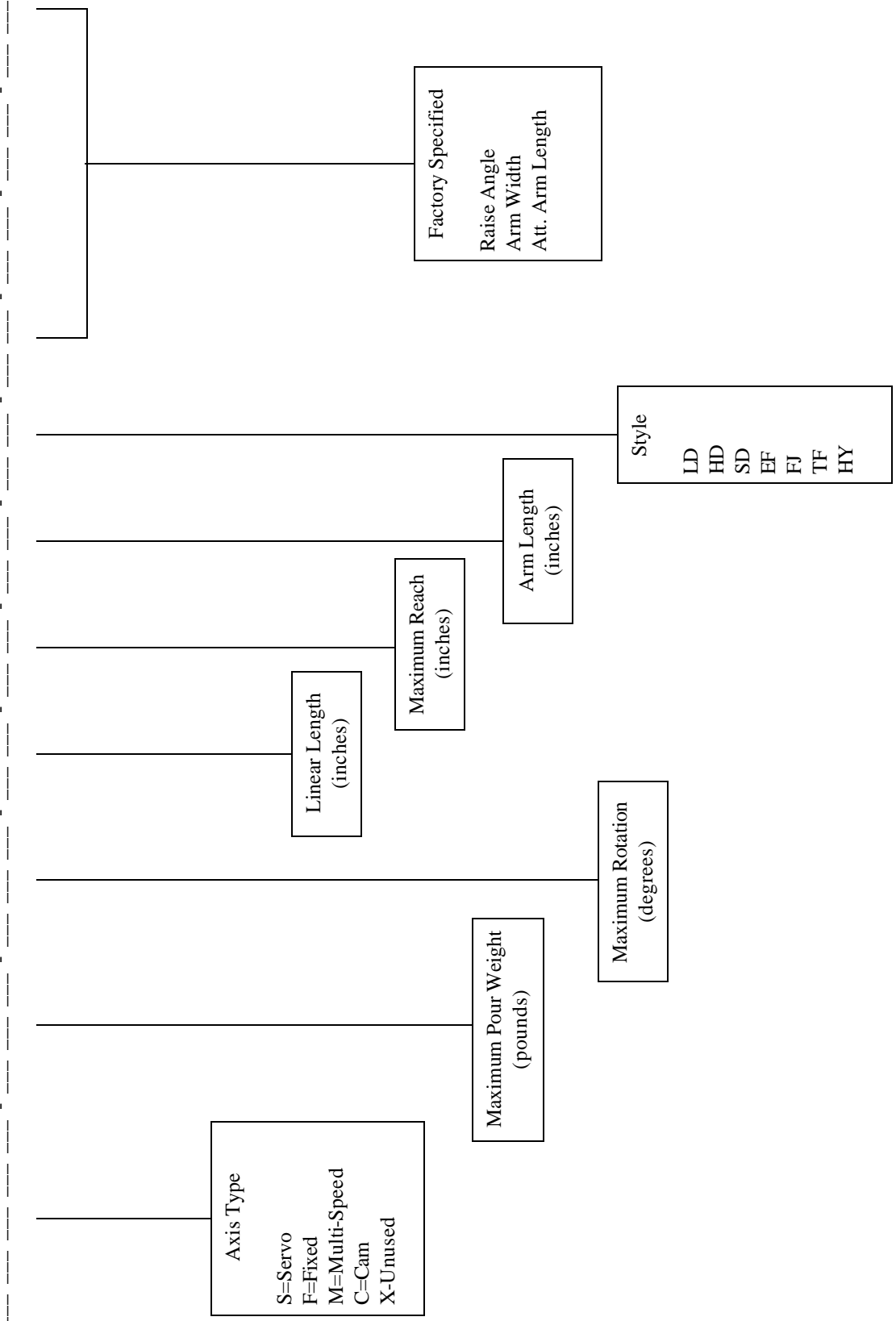
MOLD READY: This signal indicates that all conditions are correct for the pouring sequence to begin. This signal must be maintained until receipt of a POUR COMPLETE signal from the ladler. One signal from each mold machine.

Signals from the Ladler:

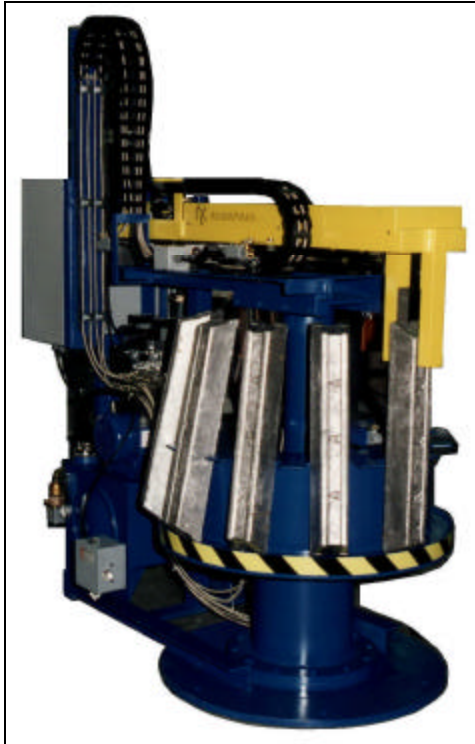
POUR COMPLETE: This signal indicates that the pouring sequence is complete. The signal may be programmed to energize at completion of pour, after raising from the pour position, or after returning to the furnace. One signal is provided for each mold machine. This signal will remain energized until the corresponding MOLD REQUEST and MOLD READY signals are de-energized.

Shamrock Lading System Descriptors

Linear
Rotation
Reach
Height
Tilt



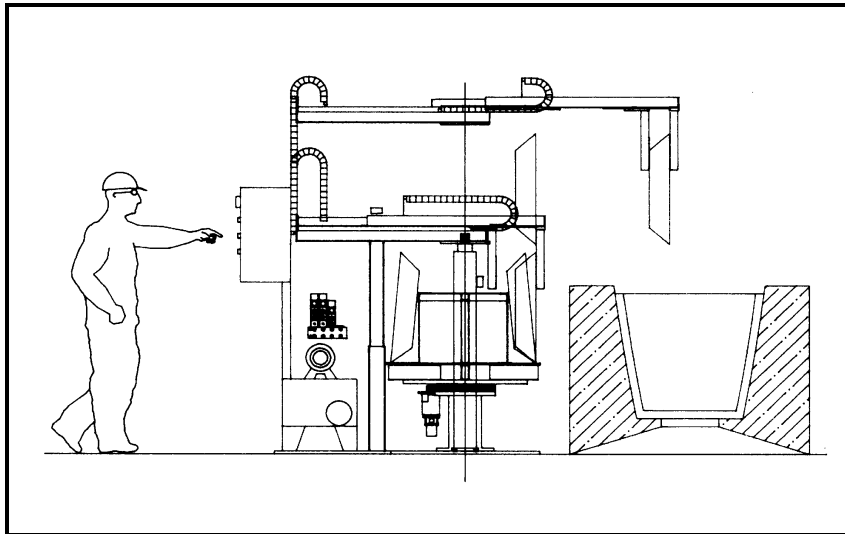
AUTOMATIC ALUMINUM FURNACE CHARGING SYSTEM



- VERSATILE**
- DEPENDABLE**
- HARD WORKING**
- EASY LOADING**
- SMOOTH OPERATION**
- FULLY HYDRAULIC**

- *VERSATILE-** The grippers will handle a wide variety of lengths and thickness with only a simple height adjustment.
- *DEPENDABLE-** All seals and control switches are located outside of the furnace heat area for longer life.
- *HARD WORKING-** Ingots are lifted with a hydraulic cylinder and a hydraulically powered pair of grippers to insure an absolute grip.
- *EASY LOADING-** The carousel indexes the empty slots to the loading station so that the operator does not have to walk around the machine.
- *SMOOTH OPERATING-** With all motion being hydraulic, there is no 'gear-box' or 'chain-and-sprocket' slipping and jerking to contend with.
- *FULLY HYDRAULIC-** Designed to be compatible with your die casting machine.

SHAMROCK AUTOMATIC ALUMINUM FURNACE CHARGING SYSTEM



OPERATIONAL FUNCTION:

Ingots are loaded at the LOADING STATION as the CAROUSEL indexes empty slots to the station by use of the handy 'INDEXING' BUTTON, located within easy reach of the operator. The LOADING ARM lowers to the pick-up height and the GRIPPERS grasp the ingot. The LOADING ARM raises to the transfer height and the GRIPPERS extend to the furnace opening. The LOADING ARM lowers at the preset rate, taking up to three minutes, based on machine cycle time. The GRIPPERS release the remainder of the ingot and returns to the CAROUSEL for the next ingot.

FURNACE TEMPERATURE STABILITY:

Temperature shock is eliminated by loading one ingot at a time at a single rate, rather than dropping in several at a time which would cause the temperature to plunge far below the operating range. Temperature is barely effected with the slow lowering of the ingot into the metal bath.

PREHEATING CHIMNEY EFFECT:

A properly sized opening in the furnace lid creates a chimney that forces heat to surround the ingot as it is lowered into the furnace. This exposure raises the temperature of the ingot prior to entry into the metal bath and increases the efficiency of the furnace.

INCREASE OF FURNACE EFFICIENCY:

With the removal of temperature shock and the chimney preheating of the ingot, the furnace energy is concentrated on holding the desired temperature of the metal bath.

INCREASE OF CRUCIBLE AND LINING LIFE:

By loading ingots automatically, the chances of accidentally damaging a crucible or refractory lining are greatly reduced. Keeping the furnace full during operation reduces the oxidation at the top of the crucible which greatly extends crucible life.

IMPROVES METAL QUALITY:

By reducing the disturbance of the metal bath, oxidation, hard spots, and porosity are reduced.

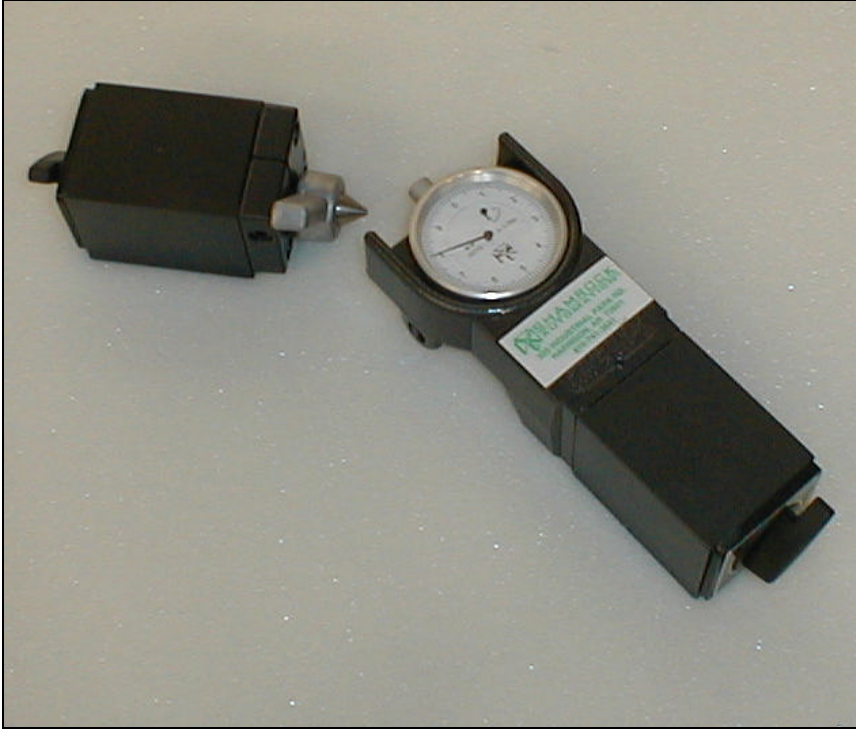
REDUCES OPERATOR FATIGUE:

Loading of the charging system can be done at set intervals by a forklift operator, allowing the machine operator to concentrate on casting duties.

CAPABILITY:

The charging system will hold from twelve up to twenty-eight ingots depending on user requirements. Ingots up to forty-two inches long with a weight of up to sixty pounds per ingot can be accommodated. The delivery rate is programmable by user.

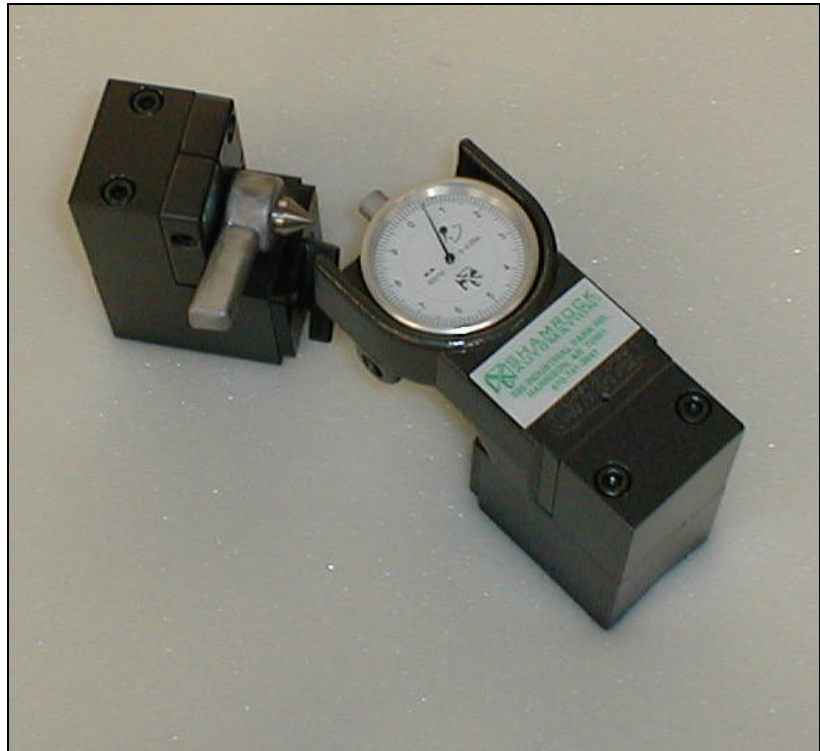
TIE BAR STRAIN GAGE



MODEL DA (2-PIECE) WITH DIAL INDICATOR

The unique Shamrock Tie Bar Strain Gage helps eliminate tie bar breakage, die spitting, and toggle pin wear by enabling you to adjust your machine for maximum locking tonnage. It also allows setting tie bar tension for equal lockup at reduced tonnage for small dies mounted in large die casting machines or for unequal lockup for dies mounted off-center. Simple to operate, the Tie Bar Strain Gage is attached with lever-engaged magnetic clamps and provides a direct read-out of relative tension in each tie bar. The Tie Bar Strain Gage can also be used to adjust two- and four-post trim press locking tonnage.

The gages are available in a variety of configurations. The standard Model DA is a two-piece system which makes alignment problems a thing of the past. It is used on large cold chamber die casting machines where there is a tie-bar of 2" or greater and 14" of clear space for taking readings. The Model DSA is a shorter version of the Model DA. Measuring just 8" in length (versus 12" for the Model DA) is suitable for use on smaller hot-chamber machines as well as plastic injection molding machines and other presses with less than 100 tons locking pressure or small diameter tie-bars. The original D and DS gages are one-piece systems and are available in limited quantities. All models are available with optional digital gage readouts which can provide remote access to the readings.



MODEL DSA (2-PIECE) WITH DIAL INDICATOR

SHAMROCK TIE BAR STRAIN GAGE

UNIQUE DESIGN FEATURES:

The dial indicator and NEW! electronic digital indicator accurately reads stress on tie bars so they can be adjusted for equal stress and maximum safe locking tonnage. The magnetic bases attach firmly to the tie bar when aligned with the tie bar axis. A simple on/off lever on each magnetic base controls the attachment force between the base and the tie bar being tested. A convenient zeroing lever on the dial gage (zeroing button on the electronic gage) sets the indicators to “0” prior to usage and between tests.

SIMPLE OPERATION:

- Place the gage on the tie bar and flip the magnet control levers to engage the magnetic clamps for a firm attachment.
- (Model D) Release the actuator lock knob.
(Model DA) Push the two halves firmly together.
- Set the dial or digital indicator using the zeroing lever.
- Clamp the dies in the closed and locked position.
- Read the indicated strain measurement on the dial or digital indicator.
- (Dial) Zero the gage with the zeroing lever between cycles.
(Digital) Depress the zero button on the indicator between cycles.
- Note: For most applications, the dial indicator will provide a direct reading of stress in thousands of pounds per square inch. The operating manual contains detailed instructions for interpreting the dial readings in unusual situations.
- Repeat the operational steps above for each of the tie bars, making adjustments until the tie bar strain gage indicates uniform stress on all of the tie bars.
- (Digital) Optional remote readouts are available in either 110VAC version or battery powered.

CONVENIENT:

The Shamrock Tie Bar Strain Gage is so simple to use that even inexperienced operators can obtain accurate readings quickly. For even quicker set-ups multiple gages may be used, with one mounted on each tie bar. Having a strain gage mounted on each tie bar drastically reduces set-up time by providing simultaneous stress readings. A hand-crafted oak carrying case is included to provide protection for the Tie Bar Strain Gage when not in use. Double boxes are available for multiple gage storage.

Two-Piece Tie Bar Strain Gage



Shamrock Automation™ now offers the Model DA and DSA Tie Bar Strain Gages. These models have a two-piece actuator rod, while the Model D and DS Strain Gages are equipped with the single piece actuator rod. This will eliminate the requirement of having to tap the magnet in order to get the rod centered. With the zeroing lever in the 10 o'clock position, simply attach the magnets to the tie bar and push the two-piece actuator rod together. The Strain Gage is ready to go.

PROCEDURE FOR ATTACHING TWO-PIECE STRAIN GAGE ON BAR

- A. Place the magnet base containing the indicator on the bar with the indicator toward the left side, turn the magnet handle on and insure the base is seated on to the tie bar and locked down by trying to move it.
- B. Place the magnet base with the zeroing lever in the 10 o'clock position up against the actuator rod of the first magnet. Push toward indicator until indicator long hand reads between 7 & 9, short hand on 0. Turn the magnet handle on and insure the base is seated on the tie bar and locked down by trying to move it.
- C. Move the zeroing lever away from you. It should start to move by the time you reach the far corner of the magnet.
- D. Place the long hand on "0". Gently try to move each magnet. You should not get a movement of the indicator.
- E. You are ready to go!

CALIBRATION OF THE TIE BAR STRAIN GAGE

When a Tie Bar Strain Gage is received for calibration, the gage is attached to the specially designed test stand and checked for accuracy and magnetic attraction. The gage is then disassembled, cleaned, and all components inspected. Any worn or damaged parts are replaced. The gage is lubricated, assembled, and then attached to the test stand for calibration.

The specially designed test stand consists of the minimum size tie bar (1 $\frac{3}{4}$ Ø) because this is the weakest part of the magnetic field created by these units. The bar is then put under a compression load of 10,000 PSI which is the maximum stress on each tie bar at full locking tonnage for most applications. The actual stretch of the tie bar is measured with two isolated and redundant NIST certified indicators. The test indicators are serial numbered and re-certified annually.

The Tie Bar Strain Gage being tested is then adjusted until this level of stress (10,000 PSI) on the tie bar results in a reading of one revolution on the gage + - .0003 upon lockup and release of the stress. The units are then tested through multiple set-ups to insure repeated accuracy.

A calibration form is completed, listing all parts replaced and listing the serial numbers of the NIST certified indicators used in the test procedure.

Sample of Short Form Calibration Report

TIE BAR STRAIN GAGE MAINTENANCE & CALIBRATION REPORT

CONTROL NUMBER (IF APPLICABLE) ____

GAGE TYPE: ____ "D" (30210000) ____ "DS" (30210016) ____ "DA" (30210001) ____ "DSA" (30210015)

MODIFICATION FROM "D" TO "DA" ____ MODIFICATION FROM "DS" TO "DSA" ____

UNIT DISASSEMBLED, CLEANED, INSPECTED, MODIFIED TO CURRENT PRODUCTION SPECIFICATIONS, REASSEMBLED, AND CALIBRATED USING TWO ISOLATED AND REDUNDANT GAGES ON TEST STAND.

GAGE #000267705 & 000267706 CERTIFIED TO NIST STANDARDS 02-16-00.

UNIT CALIBRATED TO WITHIN .0005 OF "0" ON CLOSING CYCLE.
 UNIT CALIBRATED TO WITHIN .0005 OF "0" ON OPENING CYCLE.

- | | |
|--|---|
| <p>____ 30210034 Magnetic Base (D, DA)</p> <p>____ 30210040 Magnetic Base (DS, DSA)</p> <p>____ 30210090 Actuator Rod Bracket</p> <p>____ 30210100 Actuator Rod</p> <p>____ 30210101 2 pc Actuator Rod</p> <p>____ 30210110 Actuator Rod Extension</p> <p>____ 30210180 Dial Indicator</p> <p>____ 30210185 Digital Indicator</p> <p>____ 30210210 Clamp Knob</p> <p>____ 30210050 Strain Gage Housing</p> <p>____ 30210060 Housing Cover (D, DA)</p> <p>____ 30210070 Housing Cover (DS, DSA)</p> <p>____ 30210120 Calibration Handle</p> <p>____ 30210130 Return Spring</p> <p>____ 30210140 Amplifier Arm (Long)</p> <p>____ 30210150 Amplifier Arm (Short)</p> | <p>____ 30210160 Intermediate Rod - Long (D, DA)</p> <p>____ 30210170 Intermediate Rod - Short (DS, DSA)</p> <p>____ 30210028 Single Long Box</p> <p>____ 30210026 Single Short Box</p> <p>____ 30210027 Double Long Box</p> <p>____ 30210025 Double Short Box</p> <p>____ 30210184 Digital Indicator Battery</p> <p>____ 30210190 Indicator Lens (old style)</p> <p>____ 30210200 Indicator Bezel (old style)</p> <p>____ 30210208 Bezel & Lens Kit (new style)</p> <p>____ 30210220 Handle & Retaining Ring</p> <p>____ 30210222 Retaining Ring</p> <p>____ 90000088 SGA Service</p> <p>____ 90000089 SGA Service - Long Form</p> <p>____ 30210005 Modification & Service</p> <p>____ 30210006 Modification & Service - Long Form</p> |
|--|---|

Shamrock recommends that the gage be recalibrated annually or sooner if any abnormalities have been noted, at the discretion of the operator/owner.

Sample of Long Form Calibration Report

CERTIFICATE OF CALIBRATION

Shamrock Automation, Inc.
 320 Industrial Park Road
 Harrison AR 72601

Job #: _____
 Report #: 990414-1
 Page: 2 of 2

Gage #: D__ DA__ DS__ DSA__
 Gage Desc.: 0-100T__ 100T-3000T__
 Tie Bar Strain Gage
 Manufacturer: Shamrock Automation, Inc.
 Model #: 30210000__ 30210001__ 30210016__ 30210015__
 Serial#: _____

Customer #: _____
 Last Calibration: _____
 Calibration Date: _____
 Next Calibration: _____

Received Condition: In Tolerance _____
 Out of Tolerance _____

Returned Condition: Not Repaired _____
 In Tolerance _____

This certifies the above Tie Bar Strain Gage was manufactured with an indicator complying with ANSI Standard B89.1.10M-1987, and that calibration was performed with indicators whose accuracies are traceable to NIST Standards. Results shall not be reproduced except in full.

<u>Test Indicator</u>	<u>Cal.Date</u>	<u>Due Date</u>	<u>Measurement Uncertainty</u>
Ser #: 000267705	02-16-00	02-16-01	+/- .0001 of indicator reading
Ser #: 000267706	02-16-00	02-16-01	

Results:

BEFORE

Stressed				Relaxed			
<u>Units</u>	<u>Standard</u>	<u>Actual</u>	<u>Error %</u>	<u>Standard</u>	<u>Actual</u>	<u>Error %</u>	
.0001	.0020	_____	_____	0	_____	_____	
	.0040	_____	_____	0	_____	_____	
	.0060	_____	_____	0	_____	_____	
	.0080	_____	_____	0	_____	_____	
	.0100	_____	_____	0	_____	_____	

Tolerance
 +/- .0005 stressed
 +/- .0005 relaxed

AFTER

Stressed				Relaxed			
<u>Standard</u>	<u>Actual</u>	<u>Error %</u>	<u>Standard</u>	<u>Actual</u>	<u>Error%</u>		
.0020	_____	_____	0	_____	_____		
.0040	_____	_____	0	_____	_____		
.0060	_____	_____	0	_____	_____		
.0080	_____	_____	0	_____	_____		
.0100	_____	_____	0	_____	_____		

Comments: Environmental Conditions during Calibration: ____ F., ____ % RH,
 Test Equipment is temperature compensated at time of Calibration.

 Calibration Technician

PRODUCT DATA SHEET



AUTOMATIC GREASE DISPENSER

Shamrock Automatic Grease Dispenser can make manual lubrication a thing of the past by putting the right amount of grease where you want it when you want it - automatically. This dispenser features an adjustable flow rate for perfectly lubed shots every time, from 1 drop to over 1.5 ounces per cycle. The included solenoid air valve and regulator provide full control of the dispenser when actuated by your die cast machine controller. The grease reservoir mounts compactly to the die cast machine platen. Reservoirs are available in one-gallon capacity (PN 30140000) and two-gallon capacity (PN 30140010). Please consult factory if an alternative reservoir capacity is needed.

SHAMROCK AUTOMATIC GREASE DISPENSER

UNIQUE DESIGN FEATURES:

The Shamrock Automatic Grease Dispenser was designed specifically to apply lubricant directly to the exposed end of a die casting machine plunger tip in the fully retracted position. Automatic application of the same precise amount of lube before every shot results in reduced cycle time, reduced lube usage, and extended plunger tip life when compared to intermittent manual lube application. The adjustable piston stroke permits exact metering of from one drop to over 1.5 ounces per cycle. Adjustable flow rate produces more even lube distribution and controls dripping from the bottom of the plunger tip.

The wide, flip-up lid on top of the lube reservoir allows easy refilling. To provide extra protection against contamination, the lid is designed to fall shut and not remain in the open position. A coarse wire screen in the filling area keeps flash and other contaminants out of the system for added reliability. The screen is easily removed for cleaning. There is also a sediment trap at the bottom of the reservoir.

The rugged steel design tolerates rough service. The actuating pump assembly is mounted under the reservoir for added protection. The entire unit projects only 4 inches from the mounting surface, which is less than most containers used for manual lubrication. The integral hanger-type mounting permits quick removal should servicing or relocation be required. The reservoir is designed to mount against the platen of the die casting machine. Heat conduction through the back wall of the reservoir will maintain the lubricant above room temperature for better flow and penetration of the clearances between the plunger tip and shot sleeve.

RELIABLE OPERATION:

The air-operated piston assembly is powerful enough to handle even the heaviest grease. An override button on the pilot valve permits manual cycling for air purging and system test. The lube is delivered through a 5/16" metal tube. The far end of the tube is normally positioned on top of the exposed plunger tip for drip application. The provision of a 1/32" deep by 1/4" wide groove around the plunger tip under the tube outlet will allow the lube to be carried forward through the entire length of the shot sleeve for maximum lubrication. The Shamrock Automatic Grease Dispenser may also be connected to a fitting on a shot sleeve with an internal distribution groove. Lubricant discharge pressure of 25 psi is sufficient to provide complete encirclement of the plunger tip in this type of installation.

For thick lubes, the flow can be triggered when the dies start to close, allowing the plunger tip to be completely encircled with lube by the time the shot is initiated. A time delay control may be used to start the lube flow later for thinner lubes.



SHAMROCK SHURSHOOTER™ – POWDERED LUBRICANT APPLICATOR



The Shamrock ShurShooter™ Dry Lubricant Applicator is designed for use with most dry or powdered plunger tip lubricants. It works efficiently and effectively with virtually any size of particle up to .130" diameter. The lubricant is placed into the large reservoir and upon initiation from the die casting machine, the ShurShooter™ dispenses a precise amount of lubricant into the delivery tube. A low pressure air stream then delivers the lubricant to the shot well. When the initiation signal is removed from the dispenser, the metering valve returns to its initial position and receives the next dose of lubricant. Positive air pressure is maintained on the delivery tube to keep smoke and other contaminants from entering the tube. The dispensed volume is dependent upon the size of the metering valve piston orifice. This opening is varied by loosening the locking wing nut, turning the piston clockwise to reduce, or counter-clockwise to increase the volume, then tightening the wing nut. The metering valve is constructed of non-stick materials which prevent build-up and subsequent clogging of the valve. An integrated cold plate cools the reservoir and allows material to flow regardless of ambient temperature. A manual shut-off valve allows removal of the metering valve without emptying the reservoir.

SHAMROCK SHURSHOOTER™ – POWDERED LUBRICANT APPLICATOR

UNIQUE DESIGN FEATURES:

- * Easily adjustable lube amount – Adjust between 0.358 Cu In (5.867 cc) and 0.00 Cu In (0.0 cc) with simple screw adjustment. (Minimum setting dependent upon particle size)
- * Integral Reservoir Cooling – Keeps product flowing on the hottest days.
- * Non-Stick metering valve eliminates “lock-ups”.
- * Manual shut-off valve prevents leakage during maintenance.
- * Sight glass quickly indicates level in reservoir.
- * Large capacity reservoir – Holds two gallons.
- * Adjustable air purge – Keeps delivery tube clean and cool.
- * Smart design – Requires only one signal from the die cast machine to energize a single solenoid valve.
- * Auto-Close reservoir – Keeps lid closed to prevent contamination.
- * Separate pressure regulators for main, delivery, and purge air pressures.
- * Push-Lock air hoses ease maintenance.
- * No seals to replace in the metering valve.
- * Compact and lightweight.
- * Made in the U.S.A.

SPECIFICATIONS:

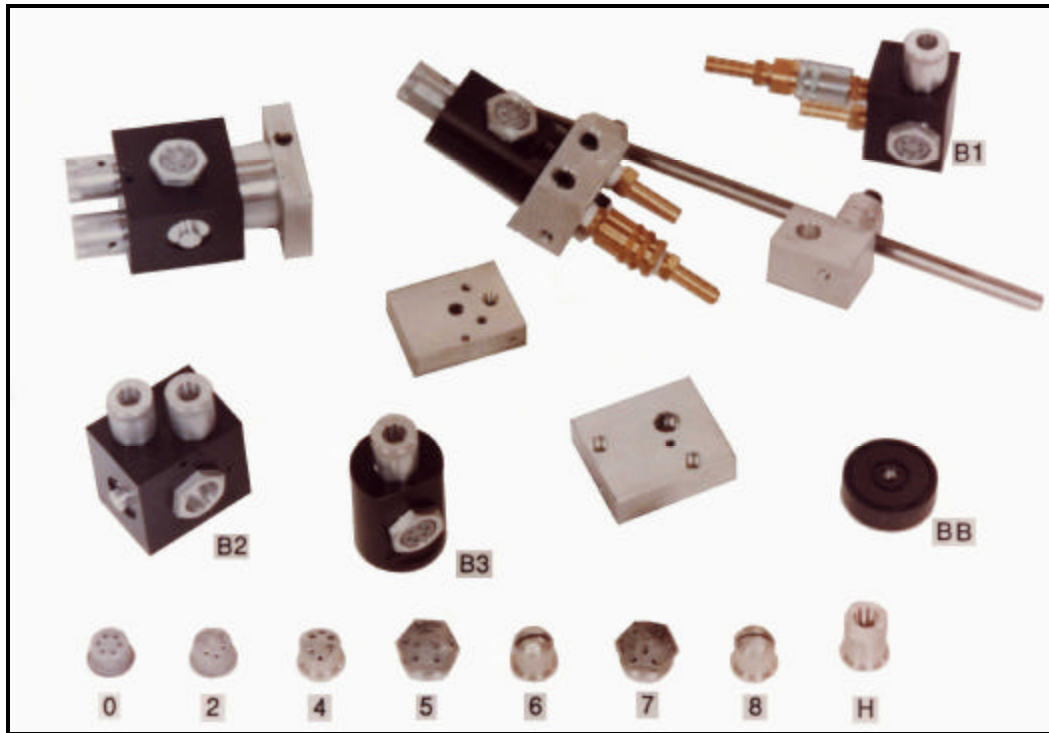
DIMENSIONS: 26" x 14" x 8"

WEIGHT: 15 Pounds – (6.8Kg)

POWER: 120 VAC 60Hz, 100mA activation signal (other voltages available upon request)

AIR: Dry, Filtered, Oil-Free, 30 PSI Minimum, 120 PSI Maximum, 2 CFM

PRODUCT DATA SHEET



AUTOMATIC SPRAY HEADS

Shamrock Automatic Spray Heads feature a unique drip-proof design. Available in rigid or swivel mounting, all of the housings are hard-coated and teflon impregnated for increased service life. Large, easy to grip volume adjustment knobs and interchangeable nozzles for different spray patterns are standard on all Shamrock Automatic Spray Heads. The patented atomizing system produces a fine mist with uniform spray coverage regardless of variations in air line pressure. Adapters are available to mount Shamrock Automatic Spray Heads on all major brands of automatic lube sprayers.

SHAMROCK AUTOMATIC SPRAY HEADS

UNIQUE DESIGN FEATURES:

All Shamrock Automatic Spray Heads are based on our unique atomizing system (U.S. Patent No. 3,907,207) which directs pressurized lube radially from the center of the nozzle mixing chamber into a thin curtain of high velocity air. This system produces a fine mist even at high fluid flow rates with a minimum air requirement. The fluid shut-off poppet is pilot controlled at the nozzle and opens fully every cycle. A separate metering valve adjusts the fluid flow. Pilot operation at the nozzle eliminates dripping associated with remote shut-off valves.

Since the design of the various spray heads allows a full range of articulation, the individual nozzles are mounted in a fixed position on each spray head. This simplifies initial set-up and minimizes subsequent tampering.

MODEL B-1:

The Model B-1 Automatic Spray Head is a special compact unit designed for fixed spray systems. On the Model B-1 Spray Head the air and fluid connections are made directly with pipe thread hose fittings. The Model B-1 mounts on an adapter similar to the swivel mounting adapter of the Model B-3.

MODEL B-2:

The Model B-2 is a dual nozzle Automatic Spray Head (spraying 180° apart) with individual fluid flow rate adjustments for each nozzle. The B-2 head can be rotated 360 degrees but is normally aimed to spray perpendicular to both die faces.

MODEL B-3:

The Model B-3 is a single nozzle automatic spray head. It can be rotated 360 degrees for aiming at a specific area on either die face. It can be used effectively in fixed spray systems, using a swivel mount adapter. When used in a fixed spray application, a quick disconnect fitting with built-in check valve is installed in the lube supply line. This allows the spray head to be rapidly changed without turning off the lube supply at a remote location.

MOUNTING DETAILS:

The Model B-2 and B-3 Automatic Spray Heads are attached to a manifold block by a single 3 inch socket head cap screw. Two concentric seals (standard O-rings) are recessed in the mounting face of the spray heads. Special manifolds and multiple spray head adapters can be provided on request.

STANDARD NOZZLE SPRAY PATTERNS: (Measured at 10 inches from the nozzle)

No. 0.....	1" diameter	No. 6.....	12" x 2" fan
No. 2.....	4" x 2" fan	No. 7.....	12" diameter
No. 4.....	8" x 2" fan	No. 8.....	18" x 2" fan
No. 5.....	6" diameter	No. H.....	Flared tubing adapter

PRODUCT DATA SHEET



HAND SPRAY GUN

This unique hand spray blow-off gun features an adjustable spray pattern and a calibrated lube flow adjustment knob. The patented atomizing system reduces air consumption and produces non-turbulent spray patterns extending up to 6 feet from the nozzles. A separate air-blast nozzle is used for maximum blow-off force. A wide variety of interchangeable nozzles are available. All nozzle components also interchange on Shamrock's Automatic Spray Heads used on reciprocating or stationary spray systems. All seals are standard O-rings. The extra-long operating lever reduces fatigue and increases control of the spray action.

SHAMROCK HAND SPRAY GUN

UNIQUE DESIGN FEATURES:

The Shamrock Hand Spray / Blow-off Gun uses innovative design and construction to overcome the most frequent complaints regarding other brands. Shamrock's unique atomizing system (U.S. Patent No. 3,907,207) directs pressurized lube radially from the center of the nozzle mixing chamber into a thin curtain of high-velocity air. This system produces a fine mist, even at high fluid flow rates, with a minimum compressed air requirement.

Interchangeable nozzles permit matching the spray pattern to the job. The No. 2 nozzle, producing a small fan spray pattern, is used on most dies. The No. 0 nozzle produces a narrow cone spray pattern and is used on dies having deep ribs and cores. The No. 4 nozzle which produces a medium fan spray pattern, is used on shallow contoured dies to minimize the spray cycle time. All nozzles are fully interchangeable between the Hand Spray Gun and Shamrock's Automatic Spray Heads.

A separate, vented air blast nozzle is used to provide maximum blow-off force with minimum air usage. Maximum operating noise level is within OSHA limits with an inlet air pressure of 90 psi.

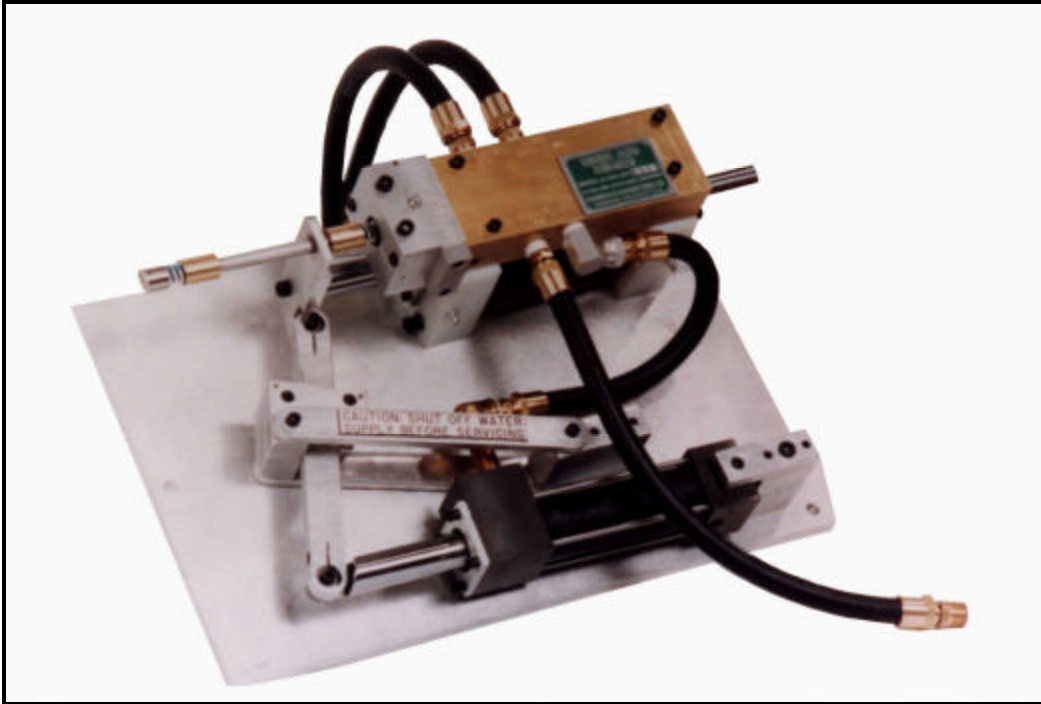
RELIABLE OPERATION:

The extra long control lever minimizes actuation effort and reduces operator fatigue. Pressing the control lever down slightly produces a strong air blast from the blow-off nozzle. Depressing the control lever farther stops the air blast and starts the atomized lube spray. The unique, non-turbulent spray pattern extends from 3 to 6 feet from the gun tip (depending on nozzle style) providing controlled lube coverage in deep cavities and on remote areas of large dies. The patented Shamrock atomizing system is much more efficient than other brands, requiring up to **60% less** compressed air volume for the same amount of effective lube transfer.

The large calibrated lube flow adjustment knob is easily gripped even while wearing gloves. Less than one full turn is required from minimum to full on, allowing lube flow to be increased quickly during the spray cycle to cool hot spots and then reduced to spray the rest of the die surface. This can reduce total spraying time and lube usage while improving casting quality. A positive mechanical stop prevents the knob from being removed accidentally.

The actuating valves are located under the control lever for added protection. The hand grip position adjusts easily to fit any hand size. No special seals are required as standard O-rings are used throughout. The adjustable hanger and integral brass flash scraper are convenient finishing touches.

PRODUCT DATA SHEET



VARIABLE-RATIO DIE LUBE MIXER

The Shamrock Model G Die Lube Mixer is designed to accurately and economically mix water-soluble die lubricants to the desired dilution. Shamrock's Variable-Ratio Die Lube Mixer is powered by inlet water pressure. The mix ratio is adjustable over a range from 16:1 up to 200:1 using a single allen wrench. Other units are available with 3:1 up to 30:1, and 8:1 up to 75:1. Upper and lower limits are approximate and can vary with viscosity, distance from concentrate, etc. Selecting a mixer with the desired operating range near the middle of the mixer's capability is recommended. The lube concentrate is automatically siphoned into the mixer as needed. The water pressure drop across the mixer controls the pumping rate. Using normal city water pressure with the minimum inlet pressure of 20 psi, the standard Model G Mixer will deliver over 100 gallons per hour of properly diluted die lubricant. With an inlet water pressure of 40 psi, the mixer will deliver up to 200 gallons of lube per hour.

SHAMROCK VARIABLE-RATIO DIE LUBE MIXER

UNIQUE DESIGN FEATURES:

The Shamrock Variable-Ratio Die Lube Mixer offers the ultimate in energy conservation..... NO ELECTRICAL OR COMPRESSED AIR CONNECTIONS ARE REQUIRED. Inlet water pressure, as low as 20 psi, provides all the energy required for mixing and pumping. The lube concentrate is automatically siphoned directly into the mixer as needed. An adjustable pivot point controls the mixture ratio. Simply loosen two screws, slide the pivot to the desired ratio (as indicated by marks on the rocker arm) and re-tighten the screws.

The pumping rate, in gallons per hour, is governed by the inlet water pressure. With the minimum inlet pressure of 20 psi, the standard Model G Mixer will deliver over 100 gallons per hour of properly diluted die lubricant. With an inlet water pressure of 40 psi, the Mixer will deliver up to 200 gallons of lube per hour. The standard Model G Mixer provides mixture ratios infinitely variable from a minimum of 16:1 to a maximum of 200:1. For lower numeric mixture ratios, the Model G-3 mixer provides ratios ranging from a low of 3:1 to a maximum of 30:1. The Model G-8 provides ratios ranging from 8:1 up to 75:1.

NOTE: The pumping rate for the Model G-3 is half that of the standard Model G.

SIMPLE OPERATION:

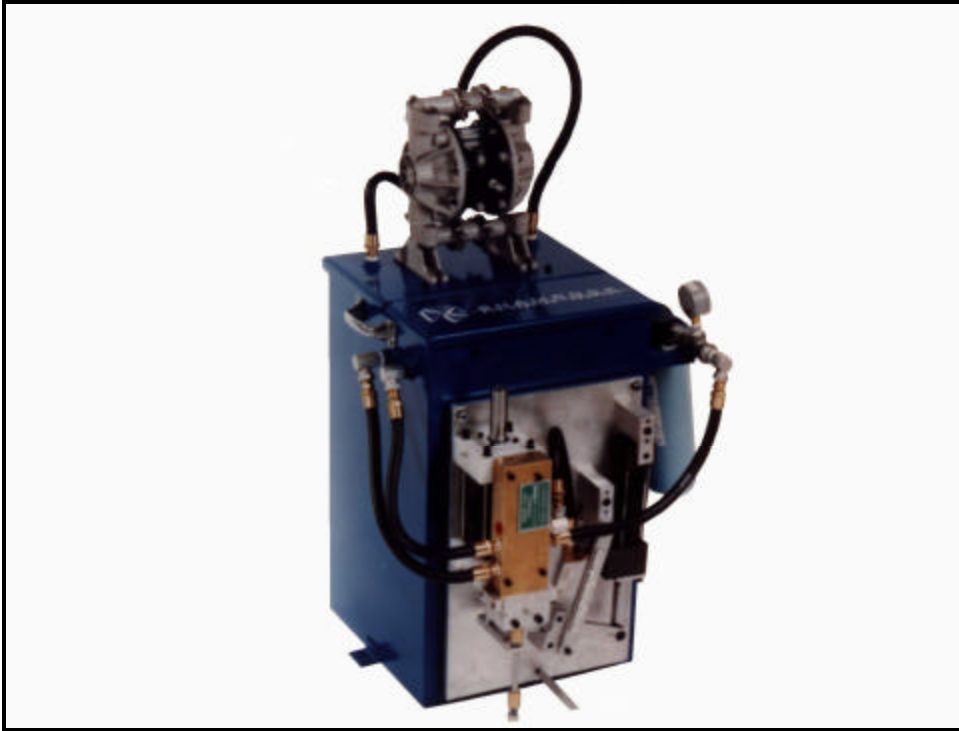
The use of large cylinders, ports, and valves assures a consistent mixture ratio over a wide range of pumping speeds. Even heavily pigmented lube may be successfully mixed since there are no check valves to stick or leak. A single manifold block mounted on the water cylinder minimizes mixer interconnect plumbing, with only one hose used between the manifold and the lube cylinder. The lube pumping circuit is designed to allow entrapped air to be purged automatically during normal operation.

The separate lube outlet port allows access for testing to verify proper output mixture ratios. During four operating cycles, the mixer will pump one gallon of water. For the standard Model G Mixer, simply compare the amount of lube discharged from the lube out port during four cycles to the one gallon of water to determine the actual mix ratio.

NOTE: For the Model G-3, multiply the measured flow by 5 before comparing to the one gallon of water discharged.

Four connections are required for operation. The inlet water supply hose and the lube concentrate siphon hose are connected directly to the valve manifold. The separate water out and lube out ports may be joined to a common outlet hose with "tee" fittings, or they may be run separately into a non-pressurized holding reservoir.

PRODUCT DATA SHEET



COMPACT LUBE SYSTEM

The Shamrock Compact Lube System, featuring a non-pressurized all stainless steel tank, is designed to mix, store, and pressurize water-soluble die lubricants in a single compact unit. Shamrock's Variable-Ratio Die Lube Mixer is powered by inlet water pressure. The mix ratio is adjustable over a range of 16:1 up to 200:1 using a single allen wrench. Other units are available with 3:1 up to 30:1, and 8:1 up to 75:1. Upper and lower limits are approximate and can vary with viscosity, distance from concentrate, etc. Exhaust from the air-powered pressurizing pump is used to agitate the lube mix, keeping solids in suspension. The standard 20 gallon non-pressurized reservoir will supply up to 200 gallons per hour of pressurized lube to manual or automatic spraying systems.

SHAMROCK COMPACT LUBE SYSTEM

UNIQUE DESIGN FEATURES:

The Shamrock Compact Lube System is a complete lube mixing and distribution center in miniature. The heart of the Compact Lube System is the Shamrock Variable Ratio Die Lube Mixer. Inlet water pressure (as low as 20 psi) provides the energy required to precisely dilute the water-soluble lube concentrate and pump the mixture into the non-pressurized holding reservoir. A float valve assembly stops the mixer when the reservoir is filled.

An air-powered double diaphragm pump, mounted to the lid of the holding reservoir, is used to pressurize and distribute the lubricant to spray guns or automatic sprayers. The standard 20 gallon unit will supply up to 200 gallons of pressurized lube per hour (with a maximum surge rate of 13 gallons per minute) to service the requirements of multiple die casting machines. The exhaust from the air-powered pump is routed to the bottom of the reservoir to agitate the contents and keep solids in suspension.

The entire Compact Lube System weighs only 125 pounds (dry). The unit measures 19" wide by 22" deep by 36" tall. Side mounted handles provide easy portability.

SIMPLE OPERATION:

The inlet water supply and lube concentrate siphon lines are connected directly to the Variable Ratio Die Lube Mixer. The discharge from the mixer is routed directly to the non-pressurized holding reservoir through factory installed plumbing. A supply of compressed air is connected to the top mounted pump and the output from the pump is plumbed directly into your distribution system.

The pressurizing pump only runs when lube is demanded from the system. When any spray gun or automatic sprayer begins spraying, the pressurizing pump starts running immediately to provide the required amount of pressurized lube. The flow rate will increase as more spray heads begin spraying to meet the required demand. As soon as the actual spraying stops, the pressurizing pump stops running. The entire operation is controlled by lube demand and no external controls are required.

The Variable Ratio Die Lube Mixer also operates on demand as the fluid level in the holding reservoir drops. Working independently from the pressurizing pump, the mixer also requires no external controls. The flow rate through the mixer is a function of the regulated inlet water pressure.

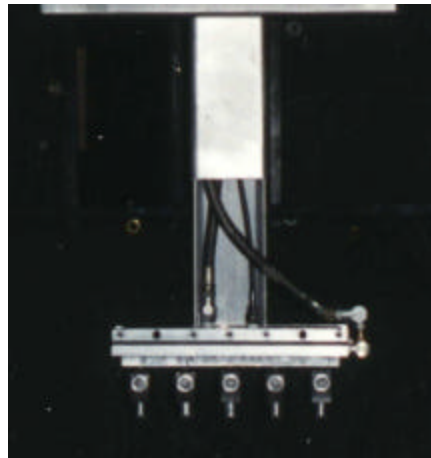


AUTOMATIC RECIPROCATING SWEEP SPRAYING SYSTEM MODEL LTS 24/72



FEATURES

- The only reciprocator on the market equipped with Shamrock's patented drip-proof Automatic Spray Heads.
- Separate Air-Amplifier, Blow-off Air Manifold, achieving 40% to 90% air savings, reducing noise level by 10 DBA or more while creating a curtain of air on your die.
- State-of-the-art compressed air rodless drive cylinder powering a maintenance free rail carriage assembly.



TECHNICAL DATA

- Power 120 VAC, 5 amp, 60 hz
- Vertical Stroke..... Various 24" to 72"
- Air requirements Minimum 80 psi
- Drive system Compressed air rodless cylinder powering a rail carriage assembly
- Spray capacity 1 liquid plus air
- Controls Allen-Bradley MicroLogix PLC
- Mounting system Top or side mounting is available

SHAMROCK LTS 24/72

The Shamrock LTS 24/72 Automatic Sweep Spraying System was designed for die cast applications where only a sweep spraying motion is required.

SIMPLICITY IN DESIGN AND FUNCTION:

The Shamrock LTS 24/72, with the exception of the hose carriage, has virtually only two moving parts: the rodless air cylinder and the rail carriage assembly. Motion is controlled using limit switches and an Allen-Bradley MicroLogix™ PLC.

EPA AND OSHA FRIENDLY:

The Shamrock LTS 24/72 is both EPA and OSHA friendly. The patented Shamrock Automatic Spray Heads, available in various spray patterns, feature a unique drip-proof design saving on die lube and disposal costs. The sprayer can be side mounted on your die cast machine, making the mounting of an exhaust hood more practical. The air-knife air curtain blow-off system will reduce noise level by 10 DBA or more while producing air savings from 40% to 90%.

LOW MAINTENANCE COST:

The simple design of the system lends itself to years of durable maintenance-free life. The system is designed to run around the clock with little or no maintenance. When maintenance is needed, the major components of the system can be replaced by your own maintenance personnel easily and efficiently, with as little down time as possible.

RETURN ON INVESTMENT:

Shamrock's Automatic Spray System can deliver the highest payback of just about any piece of equipment you can buy. By dispensing the exact amount of lube fully atomized to your die when needed, production increases up to 25% are common. With increased production comes lower scrap rates. These savings directly increase your bottom line.

AFFORDABILITY:

Because of the LTS 24/72's simplistic design and use of cost efficient components, the machine can be installed on your die casting machine for a fraction of the cost of more complex reciprocators.

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