Advance automation

Digital Servo Metal Ladling Systems

Your "Window to the World"® of Die Casting Automation and Consumable Products

Introduction

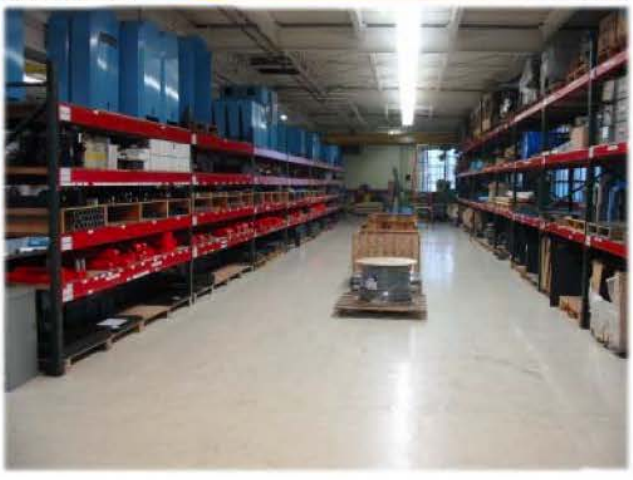
Welcome to Advance's World of Ladler Automation

Advance is your "Window to the World®" for digital automatic metal ladlers which are renowned worldwide for their ruggedness and reliability. Our ladlers have been proven to require less than $300 per year in maintenance costs.

In-House Manufacturing Capability

Advance automation products are made in-house at our Benton Harbor, MI, facility. By taking charge of every step of the manufacturing process, we can assure process consistency.

Process consistency is the first step in achieving total quality. A reliable, consistent process begins with reliable equipment. Parts are made by skilled craftsmen on state-of-the-art CNC machines.

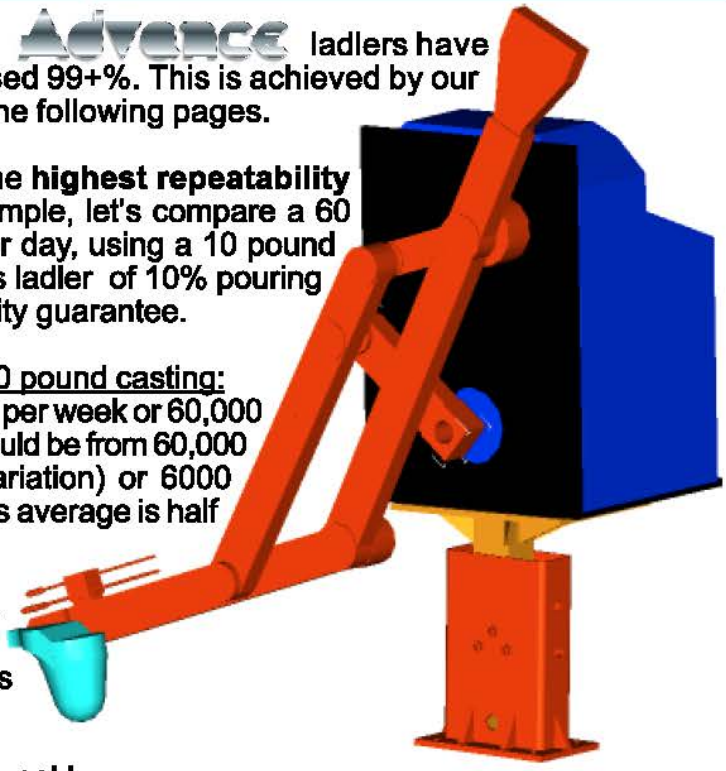


Engineering is another critical part in the manufacturing process. Advance engineers design equipment with the latest 3-D solid modeling computer systems and can provide you with a detailed drawing showing how a specific product would work with your die casting machine.

Advance ladlers - proudly **MADE IN AMERICA** by experienced craftsmen - are known for their durability, reliability, accuracy, ease of operation and low maintenance costs. This means a consistent, quality part at a world competitive price.

Let's Discuss How Shot Size Repeatability Saves You $MONEY$.

Independent customer testing has found that Advance ladlers have a repeatable accuracy higher than our advertised 99+%. This is achieved by our superior manufacturing process described in the following pages.



Advance designs its ladlers for the **highest repeatability** which means lower cost of operation. For example, let's compare a 60 second cycle operation for 5 days, 20 hours per day, using a 10 pound nominal pour. Now let's compare a competitor's ladler of 10% pouring repeatability against ADVANCE's 1% repeatability guarantee.

Competitor's ladler 10% repeatability for a 10 pound casting:
60 second shot X 20 hours X 5 days = 6000 shots per week or 60,000 pounds of aluminum. The shot weight variation would be from 60,000 pounds to 66,000 pounds (10 % maximum variation) or 6000 pounds too much. Let's say, however, the excess average is half of that or 3000 pounds of aluminum per week.

Now, compare to Advance 's **1%** repeatability:
The average shot weight variance is 300 pounds per week.

The metal saving difference is **2700 pounds per week!**

At 50 weeks per year, that's equal to **135,000 pounds** of metal you've purchased, inventoried, and melted unnecessarily! **And these figures are only for a 10 pound casting!**

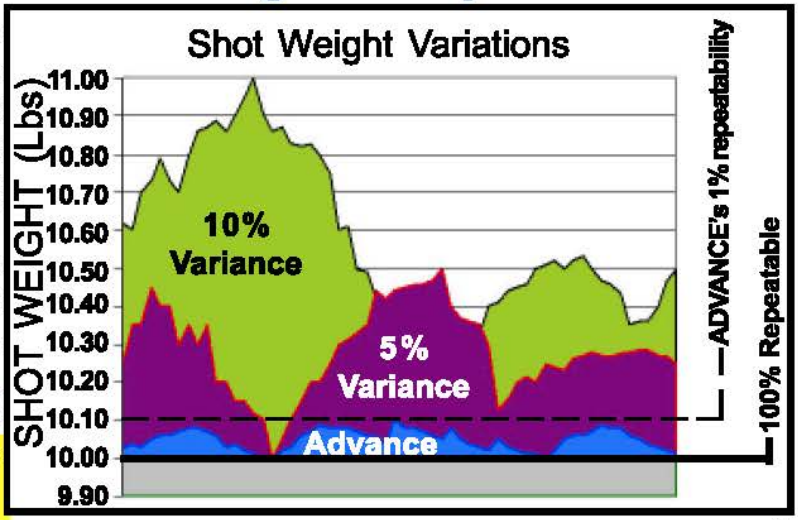
What is this costing your company!?!

One die caster has stated that *"a biscuit 1" longer than needed (on a 2 1/2" diameter sleeve) costs about $50,000 a year (per machine) in remelt costs".* You can't afford not to have the most accurate ladler in the industry!

How Does ADVANCE Achieve 99+% Pouring Accuracy in Its Ladlers?

The 99+% is achieved because the ladle cup "spill off angle" is controlled by the servo motor and servo drive. One revolution of the ladle cup is divided into almost 2 million parts (1,966,000 to be exact). What this means is that the cup "spill off angle" can be controlled to 2 millionth of its rotation and it's this repeatability of the "spill off angle" that achieves the ladlers' shot size repeatability.

Unlike other ladles, the Advance **ladler achieves the same repeatability regardless of metal level draw down.**



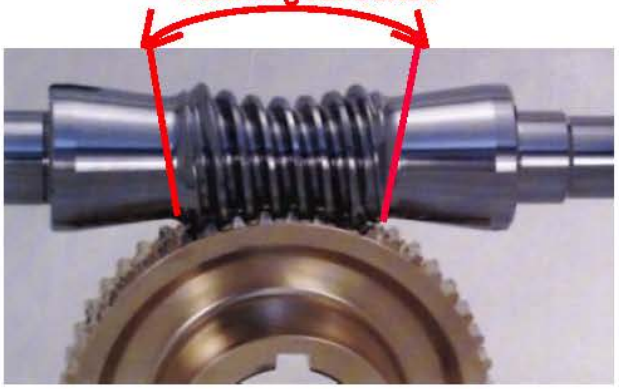
Advance's Design Capabilities Gives You Quality, Low Replacement Costs & Higher Up-Time

The average cost that companies spend with Advance per year on ladlers after the warranty period is under $300 per year. Why is this so?

Well, Advance designs its products starting with 3-D solid modeling software. The design criteria set by our president is to "design the product so it never breaks down"! That's a tough goal, but the minimal amount of money that companies spend with us on replacement parts proves the ladlers are very well designed.

An example of this quality is Advance 's **Direct-Drive System**

Provides 9 times the tooth contact of normal gear boxes



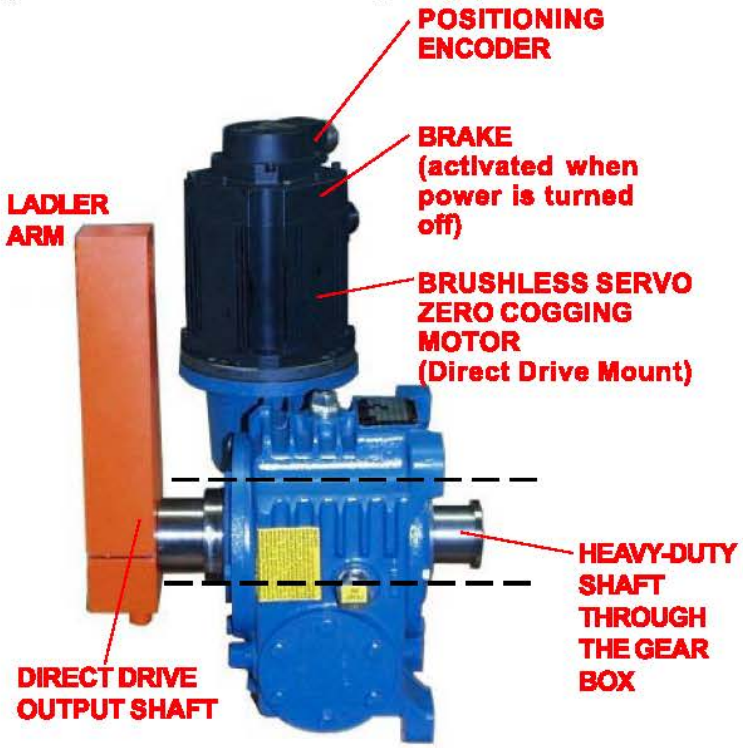
The gear box in Advance ladlers is either a ground helical gear set or a Cone Drive double-enveloping gear set where the worm is manufactured in an hour-glass configuration and wraps around the worm wheel. Either provides low backlash and extremely long-life.
The brushless servo motors are directly coupled to the gearset reducing service drive train problems and improving mechanical response to the servo motors.

The output shaft of the ladler linkage arms is a large, one-piece shaft, which goes completely through the gear box. The positioning encoder, motor and gearbox are giving direct drive without use of pulleys, belts or cams.

Heavy-Duty Arm Support

On SL-2000 and larger models (more than 50 pounds of metal) the entire arm assembly is supported by a large housing with double opposed Timken tapered roller bearings.

This housing assembly supports the total weight of the arm so there is no load applied to the gear box assembly, allowing very smooth arm travel without torque interruptions. Without the weight of the arm being supported by the gearbox, the gear box works for many years of service.

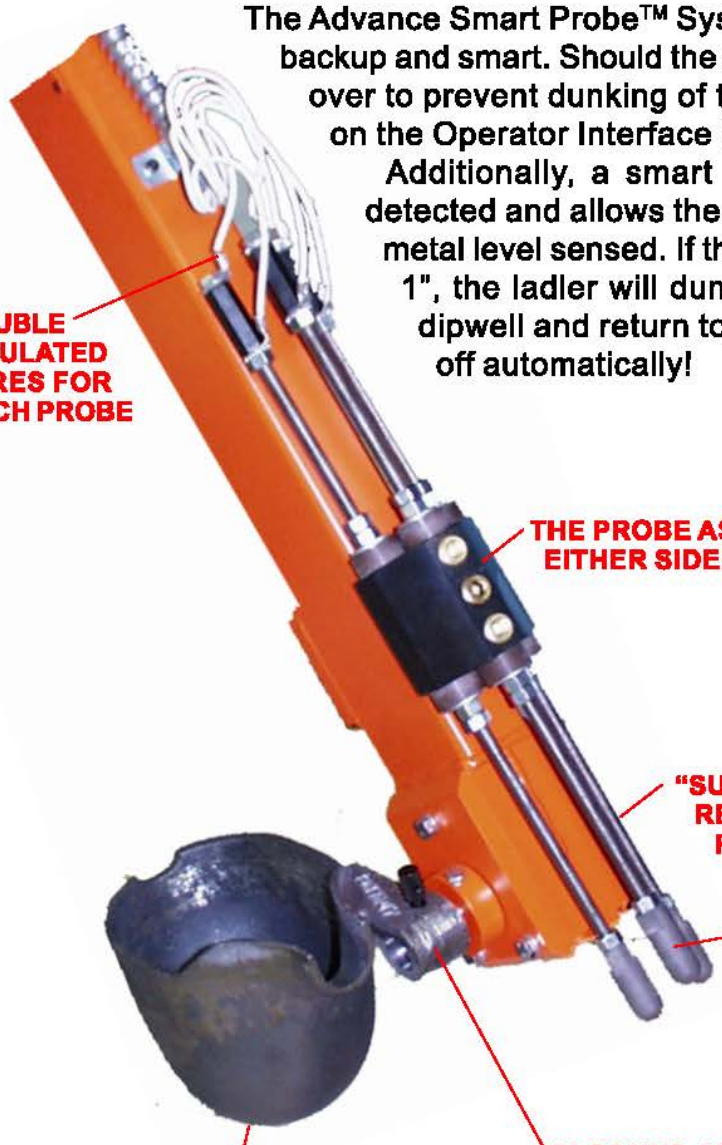


"NO DUNKING" Smart Probe™ System

Advance has developed proprietary circuitry which prevents dunking. The smart probe remembers the furnace metal position from its last pour pickup. A back-up probe is activated if the primary probe fails. If both probes fail, the ladler is programmed to go no more than 1" lower than the previous metal pickup point. If it doesn't sense the metal, it goes to its home position and turns itself off. The ladler doesn't dunk, even if all the probe wires are broken.

The Advance Smart Probe™ System consists of three probes - standard, backup and smart. Should the standard probe fail, a backup probe takes over to prevent dunking of the arm into metal. Warning Lights flash on the Operator Interface Station signaling a probe failure.

Additionally, a smart probe remembers the last metal level detected and allows the probes to advance only 1" below the last metal level sensed. If the smart probe doesn't sense metal within 1", the ladler will dump all the metal in the cup back into the dipwell and return to the Home position before shutting itself off automatically!



DOUBLE INSULATED WIRES FOR EACH PROBE

THE PROBE ASSEMBLY CAN BE MOUNTED ON EITHER SIDE OF THE ARM.

"SUPER" HIGH TEMPERATURE BEARINGS REQUIRE NO LUBRICATION OR GRAPHITE POWDER.

PROBE TIPS ARE EASILY REPLACEABLE AND TREATED WITH ADVANCE'S EXCLUSIVE "ADWEAR" TREATMENT WHICH RESISTS ALUMINUM FOR MONTHS AND SOMETIMES YEARS. THE PROBES DO NOT REQUIRE A COATING.

50 POUND AND LARGER LADLER SIZES USE INTERCHANGEABLE LADLE CUP ADAPTERS

ADVANCE LADLERS ARE DESIGNED TO USE ADVANCE QUICK-CHANGE LADLE CUPS

Ladler Features

Electronic Platform, Construction and Features

Advance uses standard Mitsubishi components. The human-machine interface, amplifier, and motor are all standard "off the shelf" Mitsubishi components. No special proprietary electronics with Advance. Mitsubishi is #1 worldwide in servo system reliability and Advance is proud to partner with them.

Computer Front End

The Advance Servo Ladler operator station uses an easy-to-read color 5.75" LCD.

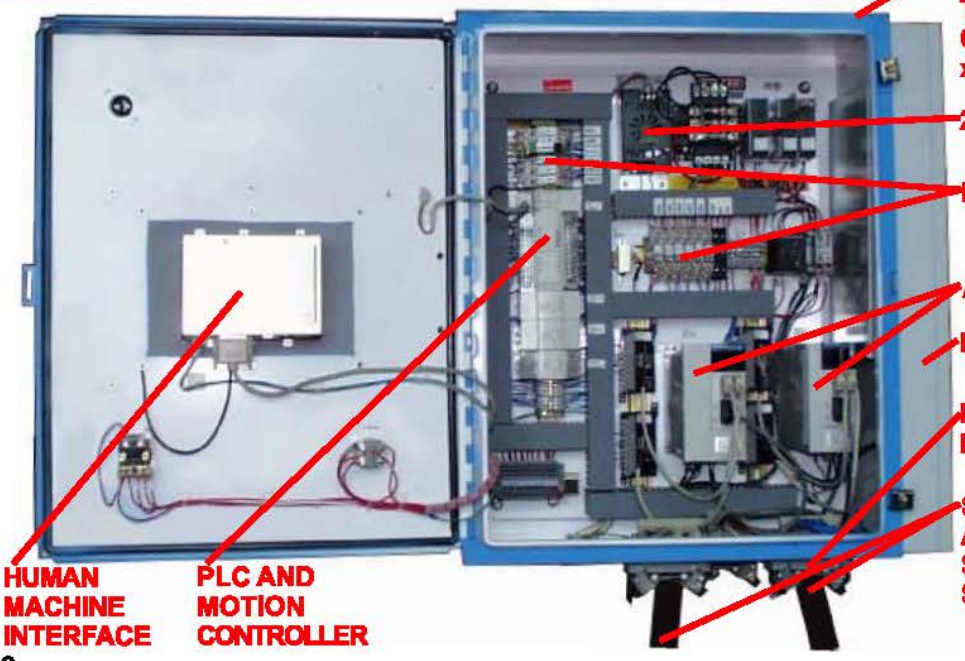
Each program is easy to set up and is menu prompted so even operators with little or no previous programming experience can program the ladle. The unit stores up to 500 parts programs in NV RAM.

Operator Interface Station

The Operator Interface Station allows the operator to monitor the status of the ladler, the metal level in the furnace, and, also, control all basic ladler functions. Warning lights signal probe failures, low metal levels, and aborted cycles. Indicators signal the mechanism position and ladle cup status. The Operator Interface Station size is: 9"H x 13"W x 4.38"D.

Controls can be set to Manual or Auto by turning a selector switch. A selector switch increases or decreases the shot size.

Main Control Box



SIMPLICITY IN CONTROL BOX DESIGN. HARD WIRED FOR EASY TROUBLESHOOTING. STANDARD CONTROL BOX SIZE IS: 30" H x 24"W x 15.37"D.

24 VOLT POWER SUPPLY

ISOLATION RELAYS

AMPLIFIERS

HEAT EXCHANGER IS STANDARD

DOUBLE CLAMPING PLUGS ON BOTH ENDS OF THE CABLES

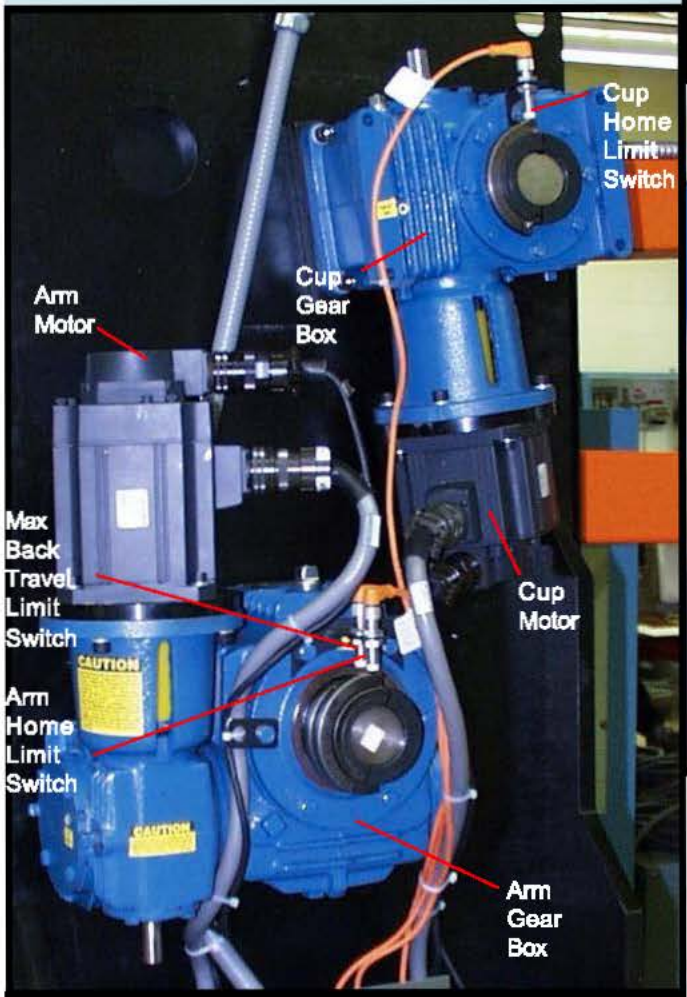
SEPARATE CABLES FOR POWER AND COMMUNICATION (30' CABLE SETS IN SEALTITE COME STANDARD WITH EACH LADLER)

HUMAN MACHINE INTERFACE

PLC AND MOTION CONTROLLER

Mechanical Photos

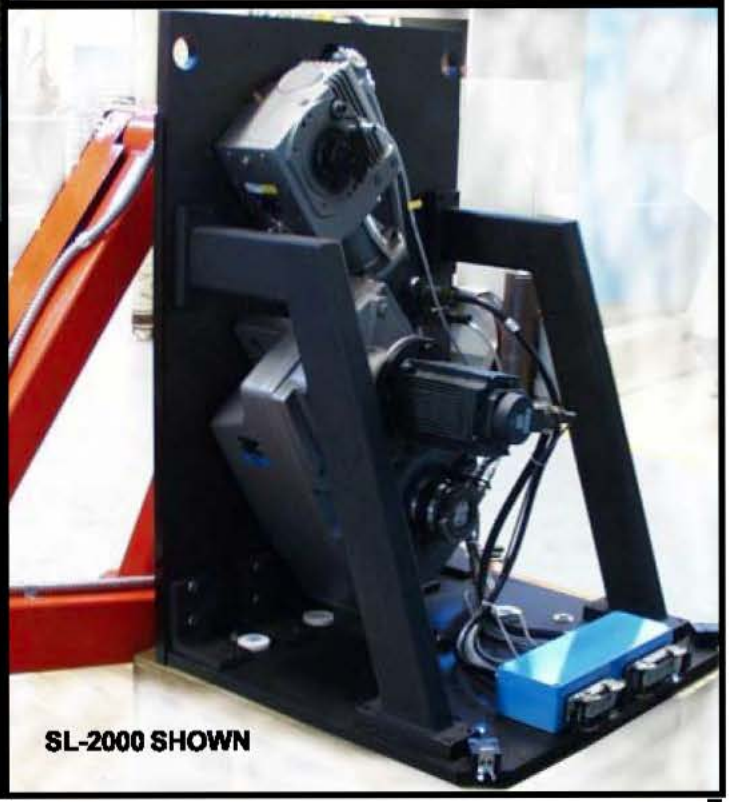
LADLER MAJOR PARTS
SL-650 / SL-1200 / SL-1500



Direct Drive Systems with Servo Motor and Encoder Mounted Directly to the Gear Box

Massive Arm Links with Timken Tapered Roller Bearings at Each Joint

SL-2000 SHOWN


SL-2000 SHOWN

Sizing Your Ladler Needs

QUICK REFERENCE LADLER SIZING MATRIX										
400T	800T	600T	1000T	1200T	1400T	1600T	2000T	2500T	3000T	3500T
SL-650										
	SL-1200									
	SL-1500									
				SL-2000						
						SL-3000				
										SL-4000

Advance makes an SL-1400 for 800-1400T DCM with launder systems.

How do I know what ladler size is the correct one for my application? The Quick Reference Ladler Sizing Matrix chart will get you to the general area.

Now determine what your maximum shot size is.

15#	_____
25#	_____
50#	_____
100#	_____
175#	_____

Advance ladlers come in several live metal capacities, so check the one that matches your requirements. Now, determine the stroke you need. The drawings on the next 2 pages give you the stroke. Here's where our planning sheet comes in handy. Just fill out a few dimensions, and we'll submit a 3-D drawing for your review.

Pouring height from the furnace makes a difference. ADVANCE has both standard (level pour) and low pour ladlers where the metal pour position is lower than the metal level. In extreme cases, for those customers who want to pour from a ladler system to larger size die casting machines, say 1200 ton, ADVANCE offers the SL-1400 ladler which has a metal height range of almost 5 feet!

Advance offers several choices of tilting bases as part of the ADVANCE ladler system. The tilt bases allow for easy pouring position adjustment. See the section on pedestals and tilts for more information.

Advance

Advance Products Corporation - 2527 M-63 Benton Harbor, Michigan 49022
Phone (269) 849-1000 - Fax (269) 849-2200 - www.advanceproductscorp.com

LADLER - PLANT SURVEY

Return to Sales Department:
Date:_____

Company Name:_____

Contact Person:_____

Address:_____ City:_____

State/Zip:_____

Phone:_____ Fax:_____

E-mail Address:_____

DCM Manufacturer:_____

DCM Model:_____ DCM Tonnage:_____

Approx. max. shot size (weight):_____

Plant Voltage(circle one): 208 230 380 440 460 480 575 other:_____

DCM I/O signal voltage: 24vdc ☐ 120Vac ☐

Cable Length: (Power & Control) 30' Standard. Cable Length (Power & Control) Nonstandard length:_____ Note: (Additional cable length may incur extra charge.)
Remote Operator Cable Length is Standard at 30'. Consult sales department if you need a special cable length.

Which side of DCM is the dip well on: Operator ☐ Helper ☐

Are there any obstructions between the dip well and DCM?

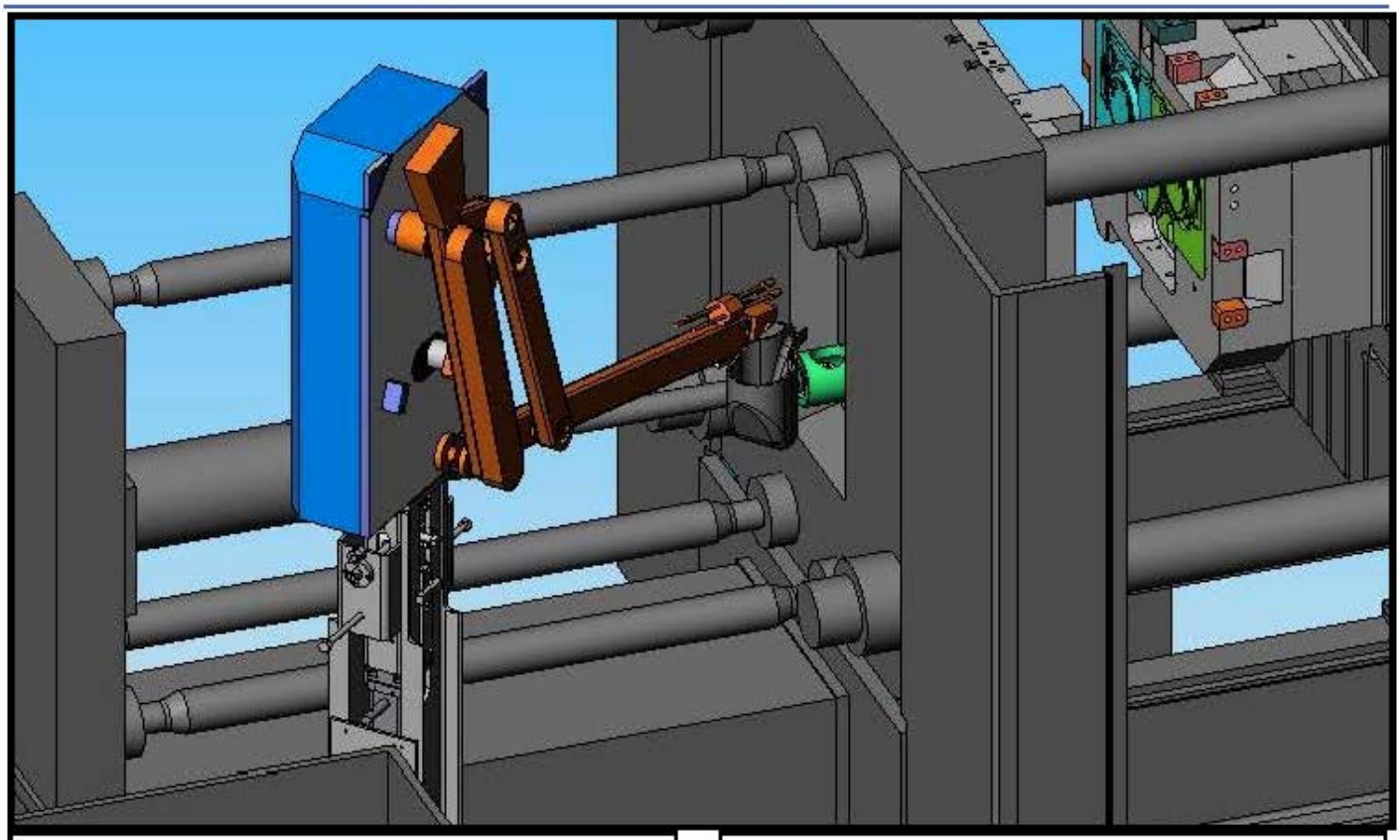
_____

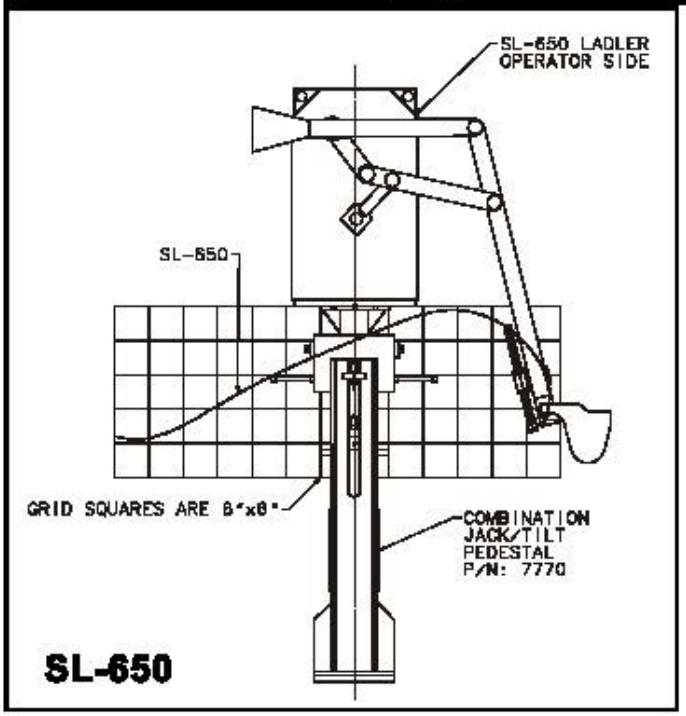
Please add additional pertinent information below and fill in the dimensions highlighted with red arrows on the back side of this form. Thanks!

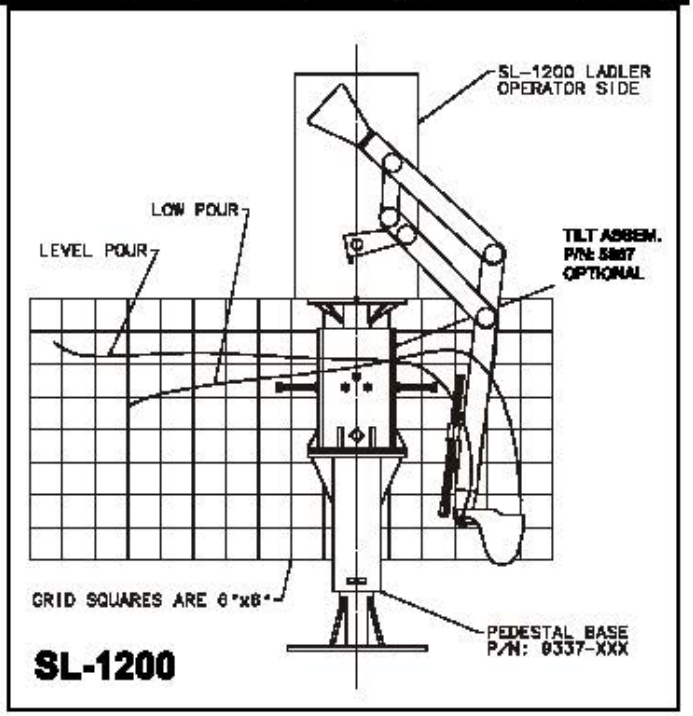
Your "Window to the World"® of Die Casting Automation and Consumable Products

6-11-04

3-D Views of Typical Ladler Layouts We Do For You!



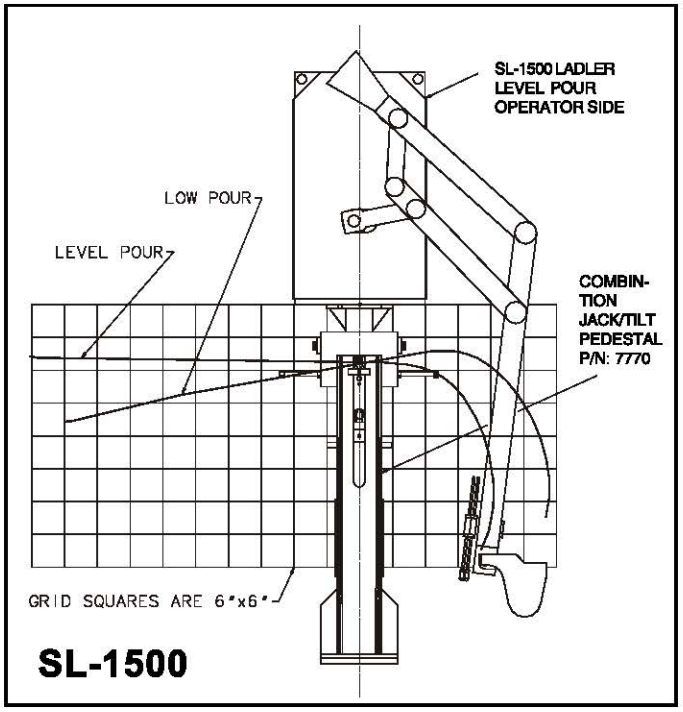




Total Stroke - Max.	69.2 In.(176 cm)
Forward Stroke - Max.	35.5 In. (90 cm)
Live Weight Metal	15 lb. (6.8 Kg)
Reach Back (Furnace)	33.7 In. (86 cm)

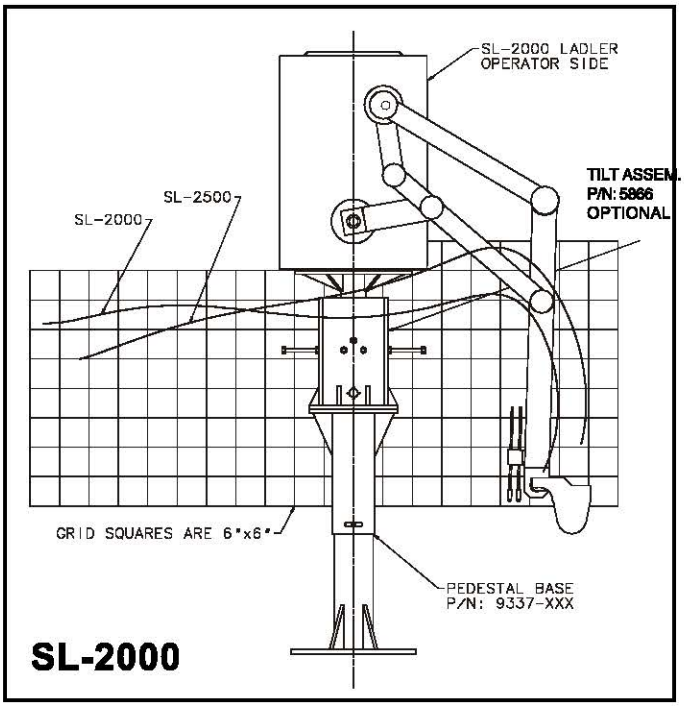
	LEVEL POUR	LOW POUR
Total Stroke - Max.	71 In.(180 cm)	72 In.(183 cm)
Forward Stroke - Max.	50 In. (127 cm)	42 In. (107 cm)
Live Weight Metal	25 lb. (10 Kg)	25 lb. (10 Kg)
Reach Back (Furnace)	21 In. (53 cm)	30 In. (76 cm)

Specifications



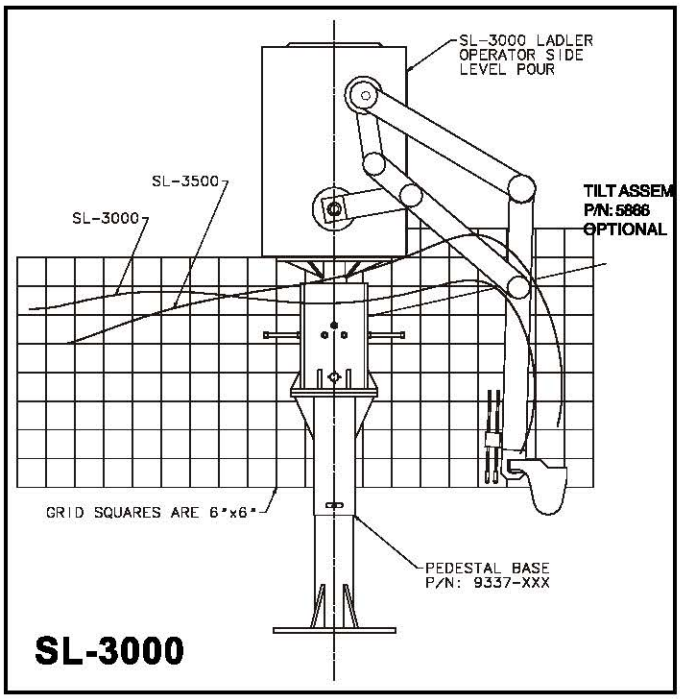
SL-1500

	LEVEL POUR	LOW POUR
Total Stroke - Max.	88.5 in.(225 cm)	92 in.(234 cm)
Forward Stroke - Max.	63 in. (160 cm)	56 in. (142 cm)
Live Weight Metal	25 lb. (10 Kg)	25 lb. (10 Kg)
Reach Back (Furnace)	25.5 in. (65 cm)	36 in. (91 cm)



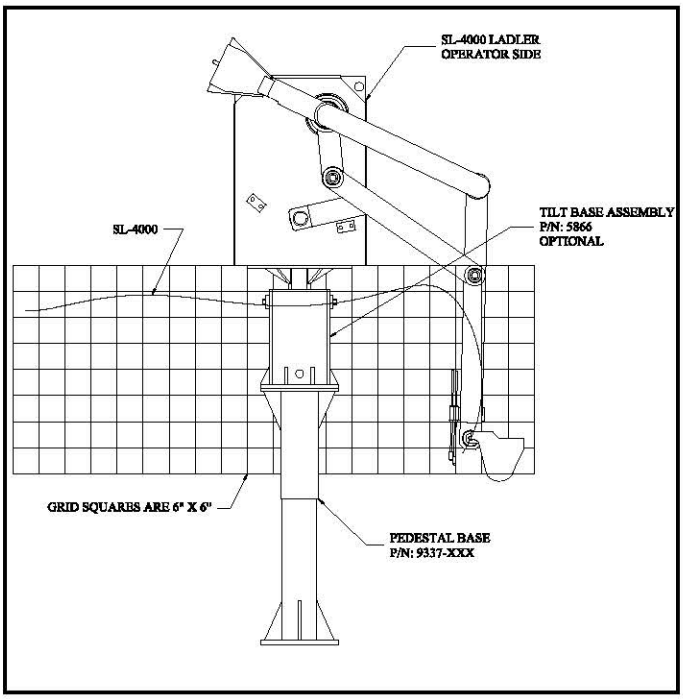
SL-2000

MODEL NUMBER	SL-2000 (Lev)
Total Stroke - Max.	104.8 in.(266 cm)
Forward Stroke - Max.	63 in. (160 cm)
Live Weight Metal	50 lbs. (23 Kg)
Reach Back (Furnace)	41.8 in. (106 cm)

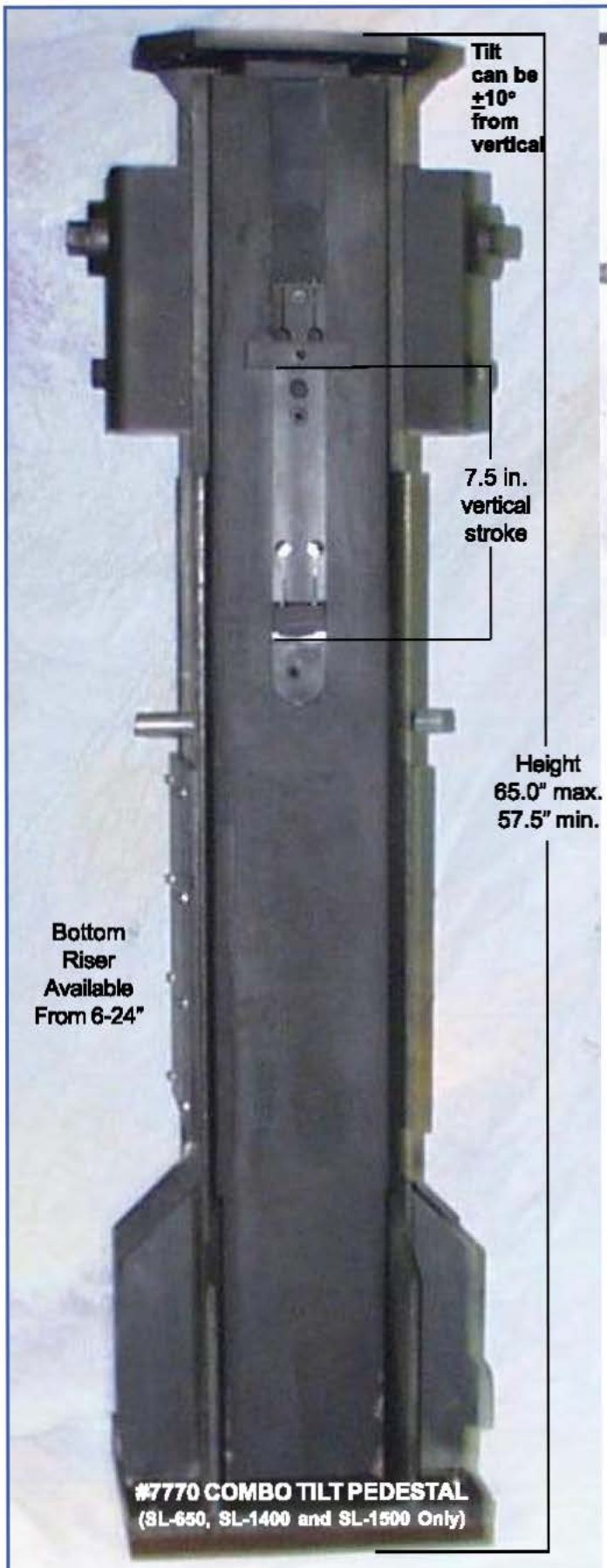


SL-3000

MODEL NUMBER	SL-3000 (Lev)	SL-3500 (Low)
Total Stroke - Max.	104.8 in. (266 cm)	102.5 in. (260 cm)
Forward Stroke - Max.	63 in. (160 cm)	55.5 in. (141 cm)
Live metal weight	100 lbs. (45 Kg)	100 lbs. (45 Kg)
Reach back into furnace	41.8 in. (106 cm)	47 in. (119 cm)



MODEL NUMBER	SL-4000 (Lev)
Total Stroke - Max.	104.8 in.(266 cm)
Forward Stroke - Max.	63 in. (160 cm)
Live Weight Metal	175 lbs. (80 Kg)
Reach Back (Furnace)	41.8 in. (106 cm)

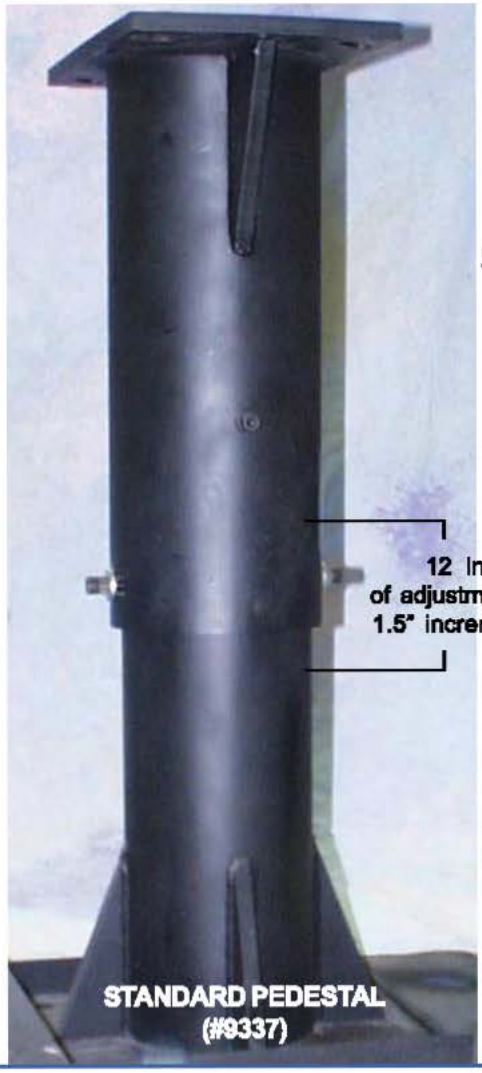


HEAVY-DUTY TILT ASSEMBLY
(#5867 SL-1200, #5866 SL2000/3000)

Tilts ±10° from vertical.

Usually mounted on a standard pedestal.

Also can be used with an Advance Rotary Base.



7 sizes

Collapsed Ht
36-1/2"
42-1/2"
48-1/2"
54-1/2"
60-1/2"
66-1/2"
72-1/2"

Ladle Cups

Advance Quick-Change Ladle Cups' pin-mount design means no tools are needed for changing cups.

Ladles are 1/4 to 5/16-inch thick, heat-treated cast iron for long life.

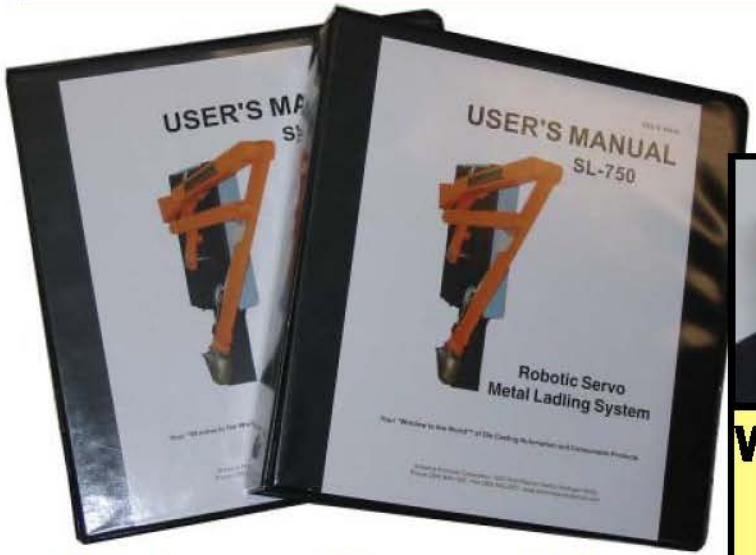
Made in the USA.

Sizes are available in both operator or helper side.

LADLE CUP # (Operator)	LADLE CUP # (Helper)	Rated Capacity In Kg	In Lbs.	Minimum Furnace Size (Round) 45° Angle of Entry	(Square) 45° Angle of Entry
0.5A	0.5B	0.5	1.1	17.25"	17.13 x 11.75
1.0A	1.0B	1.0	2.2	18.31"	18 x 12.13
1.5A	1.5B	1.5	3.3	18.75"	18.5 x 12.34
2.0A	2.0B	2.0	4.4	19.6"	19.25 x 13.25
2.5A	2.5B	2.5	5.5	19.75"	19.32 x 13.18
3.0A	3.0B	3.0	6.6	20"	19.69 x 14
3.5A	3.5B	3.5	7.7	20.45"	19.69 X 14.25
4.0A	4.0B	4.0	8.8	21.45"	20.84 x 16
6.0A	6.0B	6.0	13.2	22.5"	21.68 x 16.9
8.0A	8.0B	8.0	17.6	23.25"	22.28 x 18.13

Call us for additional information for new laminate ladle cups to 100# metal capacity. (New large cups are made with a steel fabric body that has a long life in molten aluminum. The cups have non-wetting surfaces that are resistant to thermal shock and breakage. The cups also insulate metal from heat loss during the delivery cycle for uniform product.)

Extensive Manuals



Technical Service Staff

Customer Support Team

It's free! - We don't charge for phone support. Call us!
1-269-849-1000

We would like to partner with you on your ladler needs!
Give us a call!
1-269-849-1000

Advance

Specifications are subject to change without notice.

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