

 **Quantum**

**Hot Chamber
Die Casting Machine**

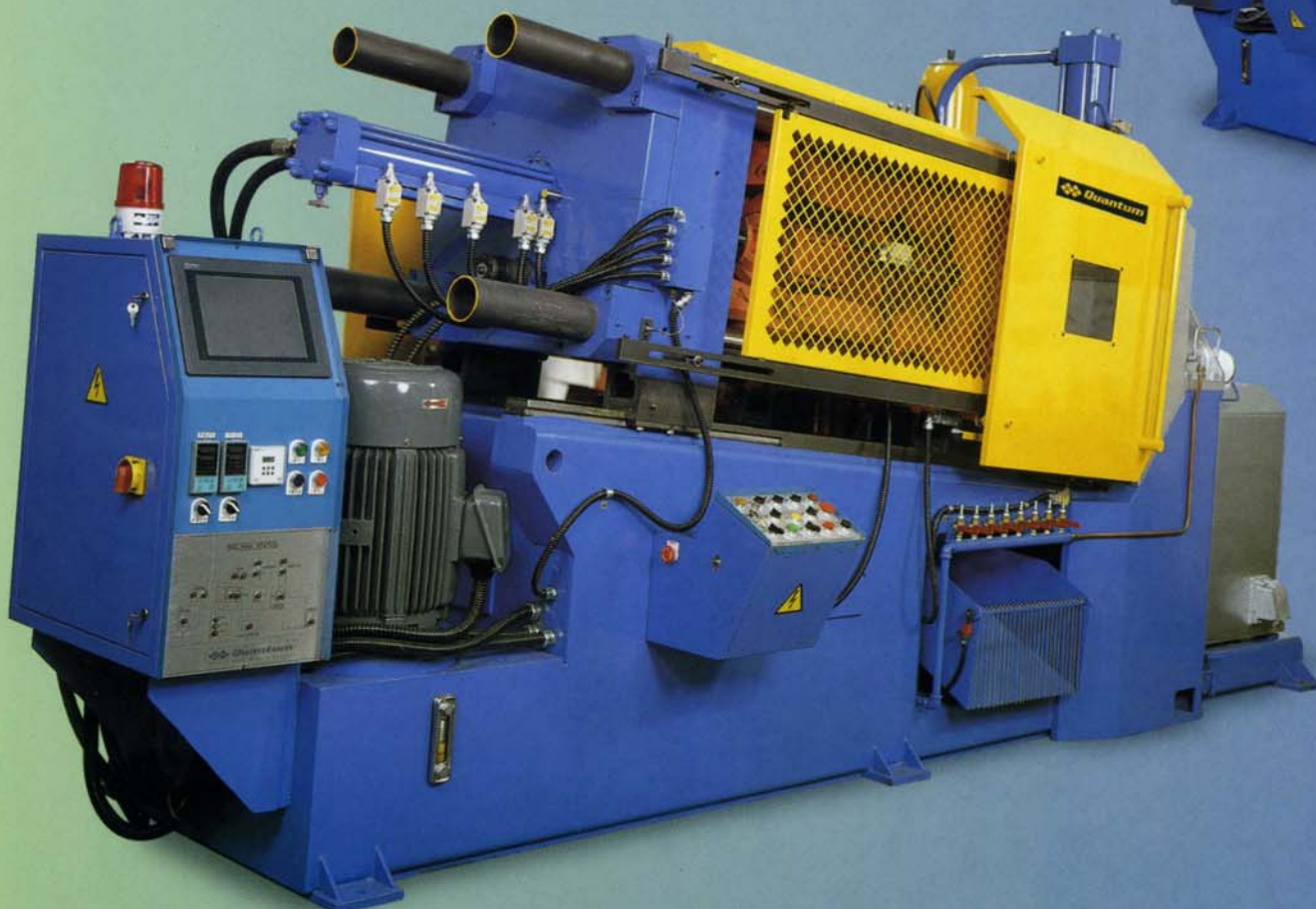


Four Corner
Lock-up System

QUANTUM Hot Chamber Die Casting Machines

Designed for high-speed, precision die casting, this innovative design offers you several cost-effective advantages over larger conventional hot chamber die casting machines.

- ◆ More Consistent Quality Parts
- ◆ Lower Die Costs
- ◆ Quicker Die Changeover
- ◆ Reduced Re-melt Parts Ratio
- ◆ Greater Energy Efficiency
- ◆ Lower Capital Investment



High Performance Shot System

The shot end of this machine features a rugged water-cooled A-frame assembly, containing the vertical shot cylinder, plunger, gooseneck and nozzle, together with a melting/holding furnace. The goosenecks feature cast-in stainless steel pipes, which allow for constant bore shape and diameter, smooth surface, and controlled bends which achieve excellent flow efficiency. The A-frame is equipped with travel cylinders to break the nozzle from the die. The nozzle is also available in a gas-fired or electrically heated version. Both options are available with a temperature controller.

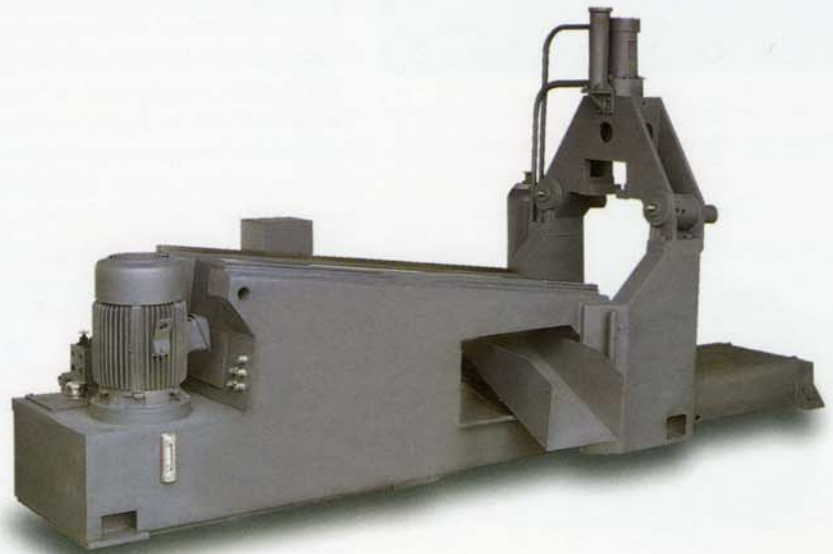
The machine is designed for fully automated operation. Therefore, the standard shot control system is designed to provide maximum plunger velocity for high-speed injection. An optional two-speed control system is also available. In the two-speed system, slow shot is controlled by a digital timer. When shot is initiated, the plunger moves at a preset slow speed. When the timer reaches the set point, the plunger accelerates to preset fast shot. Plunger velocity is controlled by hard stop setting in the pilot-operated hydraulic check valves. In turn, these P.O.C. valves control the orifice openings of the "low speed" and "fast speed" hydraulic flow control valves.





Strong, Solid Machine Base Structure

The nozzle alignment and lapping with dies are very important. To achieve correct alignment between locating hole of fixed platen and nozzle, a strong, precision made machine base is necessary to support the platen and A-frame. The QUANTUM machine base, features a uniquely designed, all-welded steel frame. After fabrication the frame is then machined, in one piece, on a five-axis CNC machine center. This results in extremely precise tolerances so no shims are necessary and die setup becomes as simple as putting the locating ring of die in the locating hole of fixed platen. There is no need for nozzle realignment and relapping. In addition, due to correct nozzle alignment and lapping you avoid flash from the mold seat and undue wear or damage.

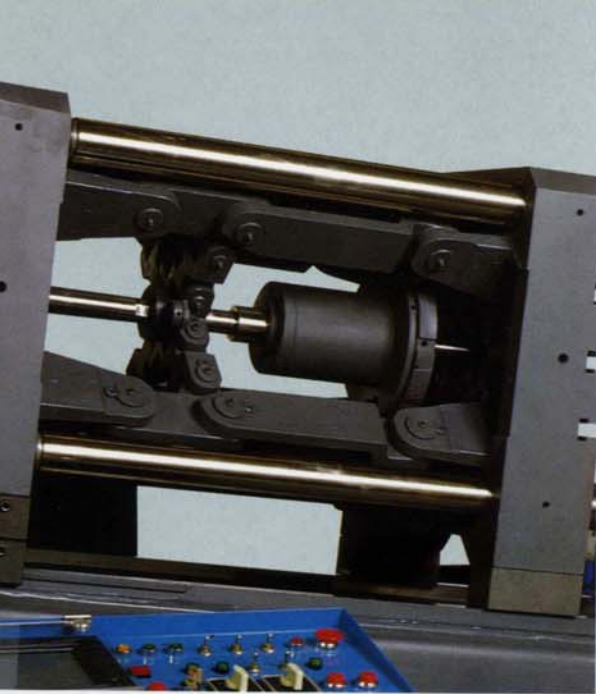


Also included with all machines are specially designed leveling mounts. These mounts make machine leveling very easy and eliminate the usual machine installation costs. They also prevent unnecessary machine vibration, which, in the long run, reduces maintenance.

The piston type fluid accumulator and other manifold-mounted hydraulic components are compactly arranged in a close-coupled assembly to minimize hydraulic piping and maximize operational response. Shorter hydraulic flow paths result in higher shot velocities at minimum pressure drop with low impact due to the reduction in "fluid hammer" effect. This also allows greater die surface area loading with minimum flashing.

The free standing melting/holding furnace features a special large capacity "anti-zinc corrosion alloyed stainless steel pot" for economic operation and long life. This rugged furnace features all-welded steel plate construction. The furnace is well insulated for low thermal conductivity, high temperature stability and superior resistance to thermal shock.





Precision Clamping System

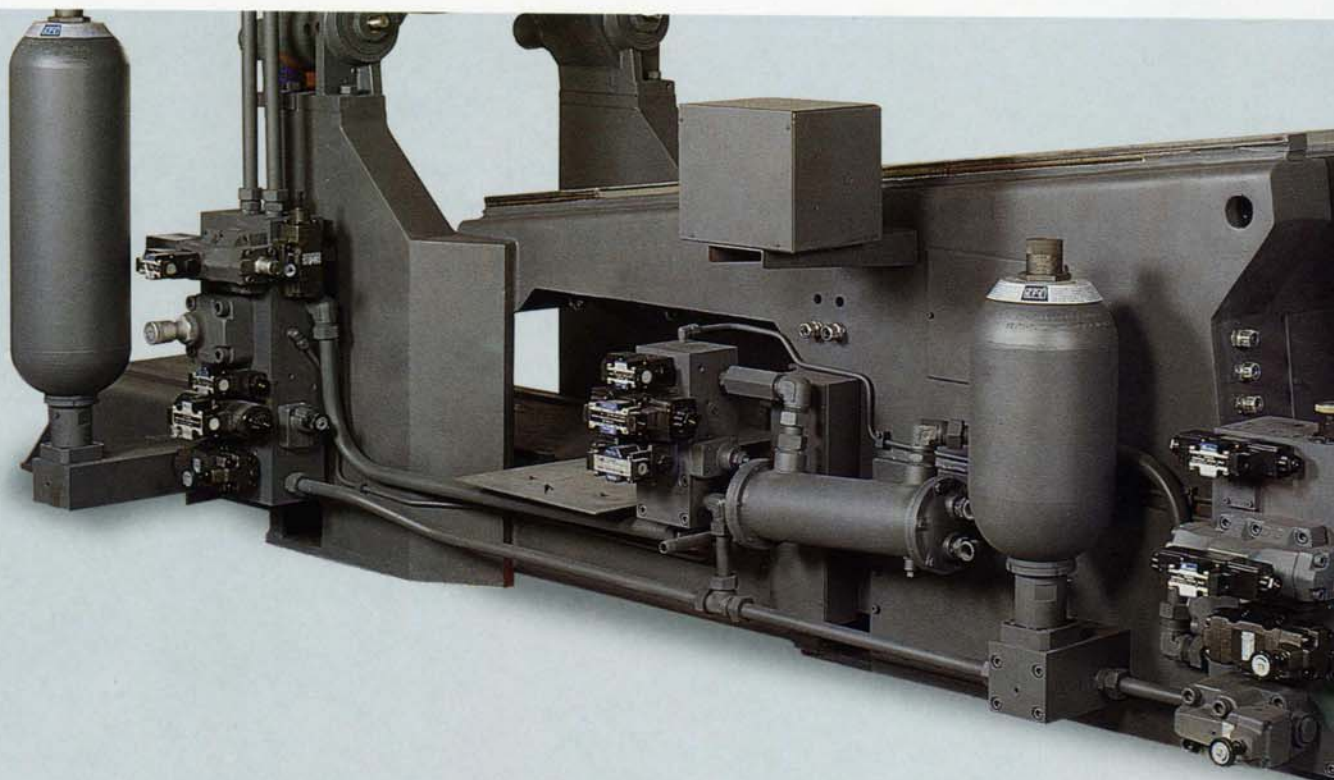
The advanced design of the QUANTUM four corner lock-up closing system offers several extraordinary features that contribute not only to the quality and consistency of castings, but also to protecting the machine itself from undue wear and damage. The design puts support where it is needed, behind the die, and it also contributes to ease of maintenance. This four-corner design minimizes platen deflection around the die, compared to other toggle systems. All toggle castings are machined on special CNC machines so that toggle parts are interchangeable and there is no need for shims or selection to achieve uniform toggle stack length. Short, large diameter toggle pins are used to prevent pin breakage and minimize bushing pressure. All movement of the traveling plates is supported by hardened steel ways. A crosshead guide with a large bearing area assures straight toggle travel and positive lock-up.

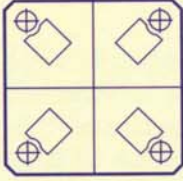
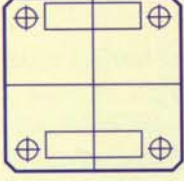
All machines have a motorized die height adjustment mechanism to allow for precise adjustment of various die thicknesses. The ejection systems can be either center hydraulic ejection or hydraulic bumper plate ejection. The hydraulic bumper plate provides a large area for "knockout" rods and can accommodate many different size of dies.



The QUANTUM corner lock-up system, with the unique ability to adjust each corner of the machine individually, provides the accurate repeatable lock-up that is required to produce consistent, high quality castings. The QUANTUM four corner toggle design puts support directly behind the die, thus preventing warpage of the plates or a "warp-around" effect of plate to die. In addition, the closing system utilizes an economical regenerative hydraulic power system, which requires less motor horsepower and therefore is less expensive to operate.

Compare the QUANTUM die casting machine with any other machine and you will find that the construction, design, operational efficiency, the "teamwork" of the four corner lock-up closing system along with the proven and reliable shot system will convince you that QUANTUM is the finest value on the market today.



| | | |
|-------------------------------|---|--|
| Machine Features | QUANTUM Four Toggle Corner Loaded  | Other Machine Two Toggle Horizontal or Vertical  |
| Die Supported Area | Large Supported Area | Limited Supported Area |
| Locking Toggle Type | Four corner lock-up toggle system. Locking load is displaced over large area. Allows for large ejection patterns. | Two horizontal or vertical toggle. Locking load poorly distributed over platens. Platens tend to wrap around dies. Allow large ejection patterns. |
| Component Replacement | Toggle components machined on special CNC system assures complete interchangeability. Linkage can be disassembled without pulling tie bars. | Shim or parts selection required to match toggle stackup lengths. Tie bars must be pulled to disassemble linkage. |
| Component Life | Large diameter short toggle pins assure long life and rarely break. | Long toggle pins are susceptible to bending and breakage. |
| Toggle Lubrication | Special embedded solid lubricants have excellent self-lubricating features and remarkable wear resistance in any severe condition and under high load. Grease once a month, no environmental pollution. | Requires delivery of a constant metered flow of lubricating oil to all moving parts to reduce operational friction and wear, but causes environmental pollution. |
| Four Corner Adjustment | Possible and simple. | Possible but difficult. |
| Locking Comparison | Balanced loads - minimizes platen deflection around the die area. Unbalanced loads - tie bar is able to compensate and balance the loads simply. | Unbalanced loads - tie bar unable to compensate. |

Quiet And Efficient Hydraulic System

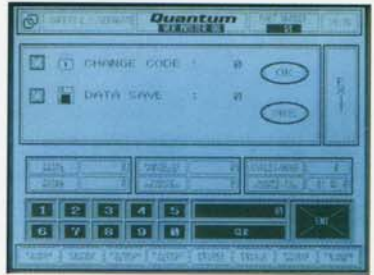
Each QUANTUM machine features an unusually quiet, no leak hydraulic system. The main idea behind the design of the hydraulic system was to make it quick and convenient to service. High quality components along with a leading technological design offer excellent stability and high speed response. The hydraulic layout is ideally arranged for easy maintenance using one manifold for the injection unit, one manifold for the locking unit and one manifold for the ejector and core pull unit. This keeps pipe work to a minimum and improves efficiency and response time. All hydraulic pipes are constructed from a specially made high pressure, anti vibration, no crack steel.

Features:

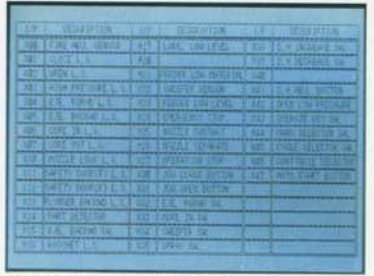
- ◆ Quiet, high pressure pump.
- ◆ Accumulators for high speed and efficiency.
- ◆ Hydraulic circuit for unloading of pressure.
- ◆ Independent manifolds for injection, locking and ejector/core pull.
- ◆ Special high pressure, no crack piping with smooth orifice opening to reduce friction. Increases response efficiency and reduces energy consumption.
- ◆ "Bite" type, high pressure fittings to eliminate oil leakage.
- ◆ Special anti-wear, anti-leak oil seals to assure stable and high pressure injection.

Advanced - Yet Simple Control System

The control system for a die casting machine should be simple and practical in design instead of being a complex series of operational procedures. QUANTUM hot chamber machines feature the Digital™ Pro-Face GP touch screen, operator interface combined with a MITSUBISHI™ FX-2n programmable controller. The simple, yet powerful graphical interface is easy enough to be used by just about anyone and reduces the "learning curve" associated with new equipment.



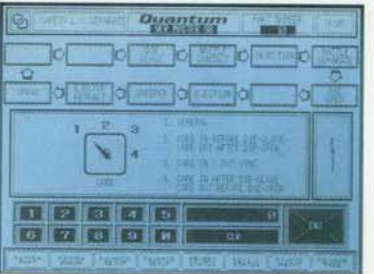
SYSTEM MAINTENANCE SCREEN



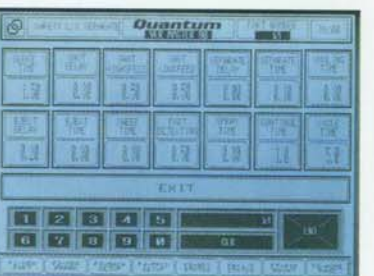
I/O STATUS SCREEN



PRODUCTION SETUP SCREEN



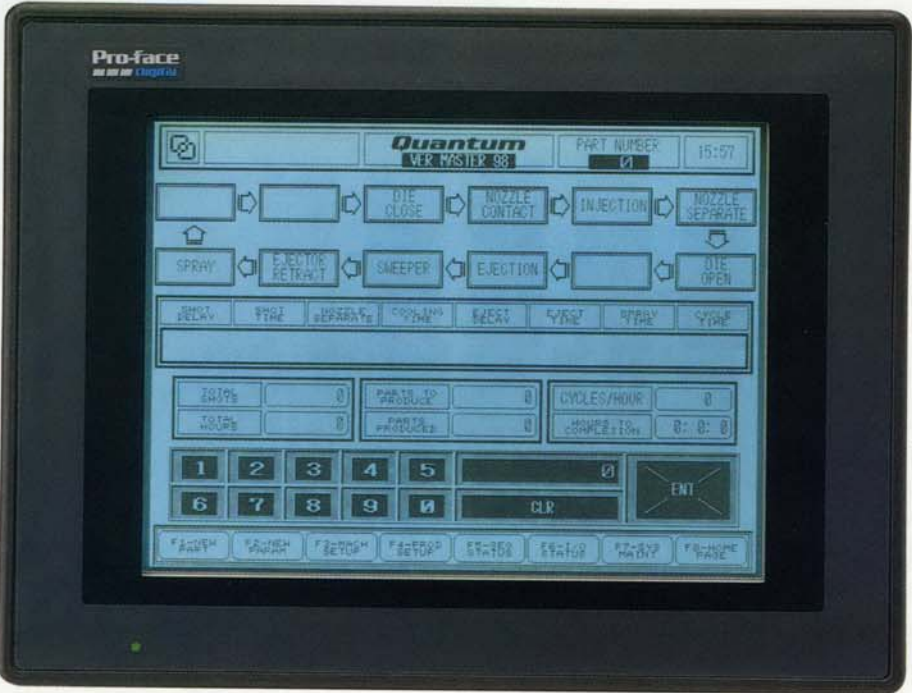
SEQUENCE SELECT SCREEN



NEW PARAMETER SCREEN



MACHINE SETUP SCREEN



MAIN OPERATOR SCREEN



- ◆ Directly run management program control.
- ◆ Features drawings along with digits, characters and on screen buttons and gauges.
- ◆ Big, clear LED touch panel.
- ◆ Each screen is dynamic and reflects what is occurring on the machine at that moment.
- ◆ Automatic self-diagnosis screen can assist in adjustment and repair of machine.
- ◆ Screen displays include numeric keyboard, machine status, part counter, die number, and clock.
- ◆ Screen also automatically displays illustrated cycle sequence, parts produced, hours to completion, etc.
- ◆ System can store 24 die casting parameters in memory.
- ◆ RS 232 interface card can be connected to a personal computer.
- ◆ System has been specially designed for quick learning and easy operation.

Automation Equipment



Automatic Ingot Feeder (optional)

This optional device is simple to use and saves a lot of time and labor. Just put the ingots on the hooks. Once this is done, the feeder works in automatic mode. This innovative design offers you the following advantages:

- ◆ Consistent molten alloy temperature - makes operation predictable.
- ◆ Consistent molten alloy level - improves the casting quality.
- ◆ Ingot auto preheat - reduces energy usage.
- ◆ Greater purity of molten alloy - increases plunger/ring and gooseneck life.
- ◆ Reduces the need of additional labor and personnel.

Reciprocating Sprayer (optional)

This optional, well constructed vertical sprayer features a multi-spray manifold. Horizontal and vertical lead screw positioning make for easy setup and change over. Control is through the main touch screen interface for easy operation. The sprayer has its own separate pressure spray tank.



Separator Conveyor (optional)

This optional, heavy-duty steel belt, air cooling conveyor takes away the tedious job of sorting sprues/runners and parts. Utilizing in-die degating, it automatically separates the sprue/runner from the part and ejects them both at different levels. Control is through the main touch screen interface for easy operation.

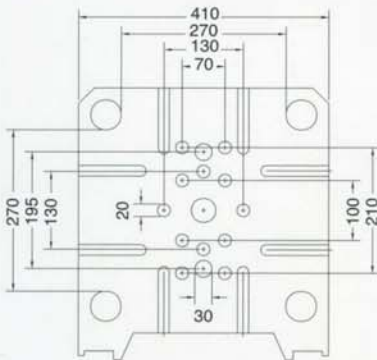
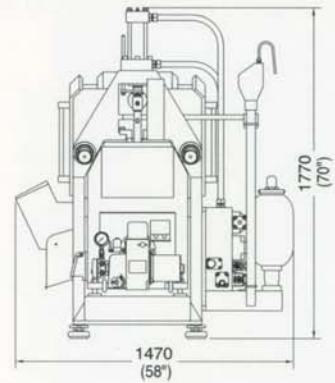
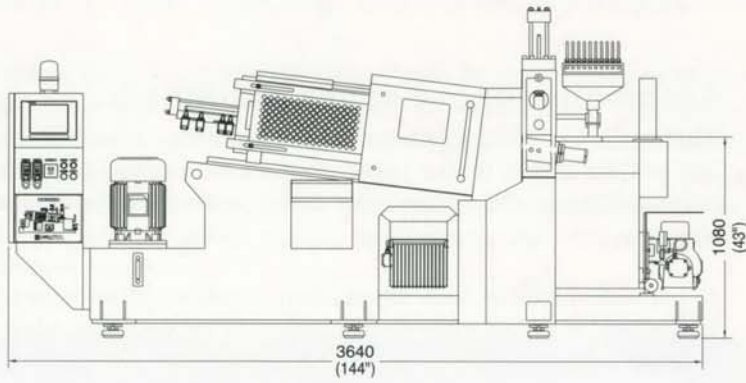
Regular Conveyor (optional)

Same as above but does not perform separation process.

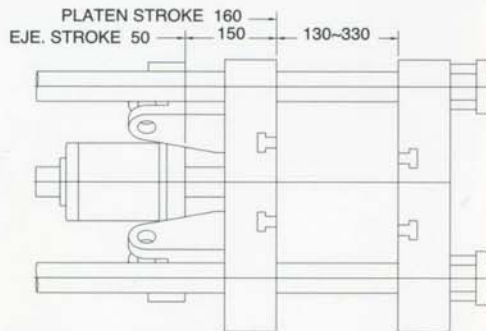


QDC-25/10Z

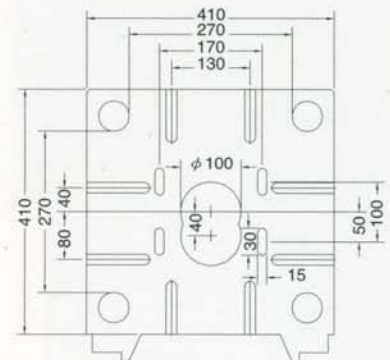
MACHINE EXTERNAL DIMENSIONS



MOVING PLATEN



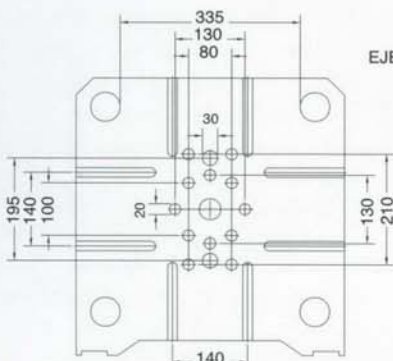
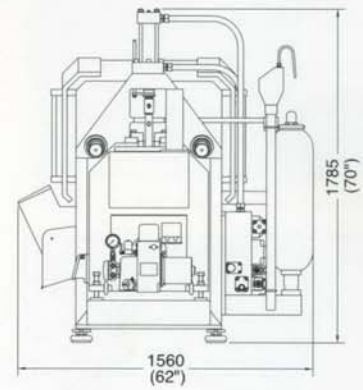
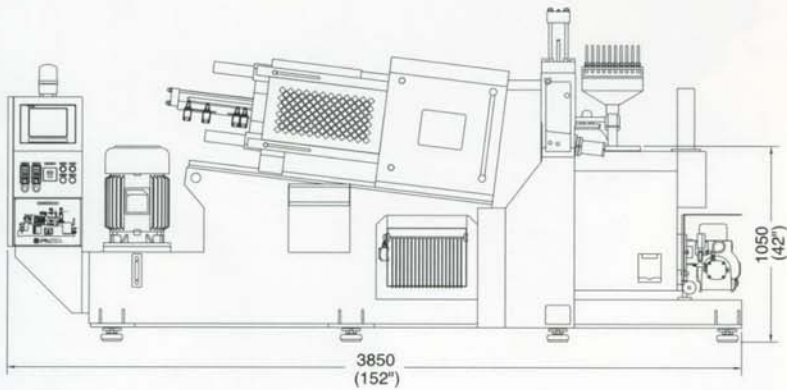
DIE MOUNTING PLATEN



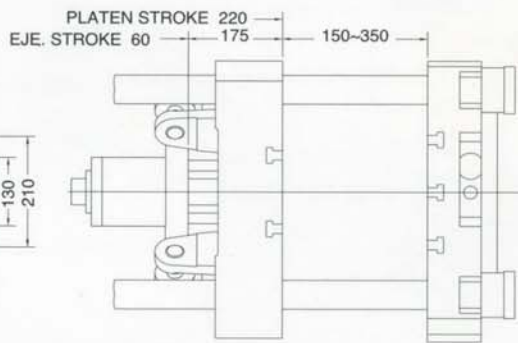
FRONT PLATEN

QDC-50/13Z

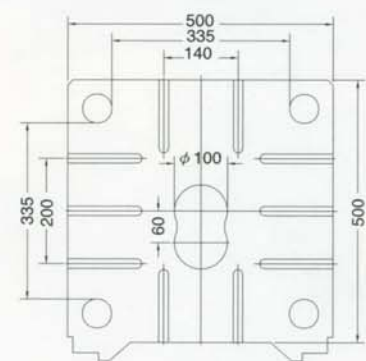
MACHINE EXTERNAL DIMENSIONS



MOVING PLATEN



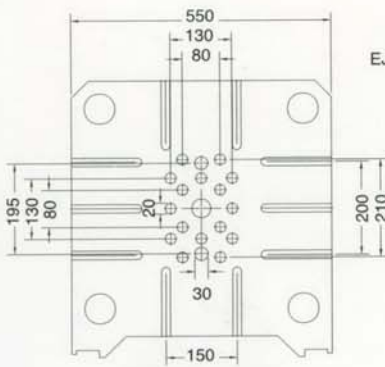
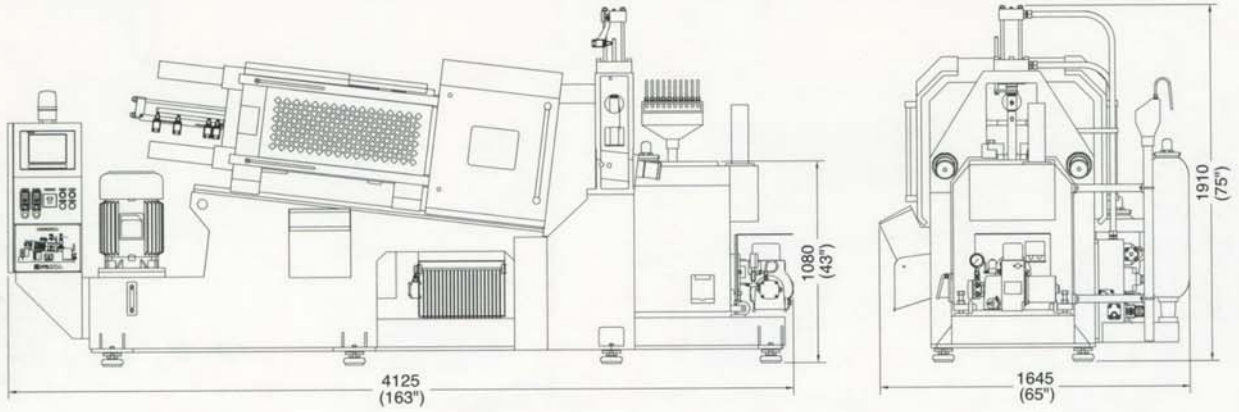
DIE MOUNTING PLATEN



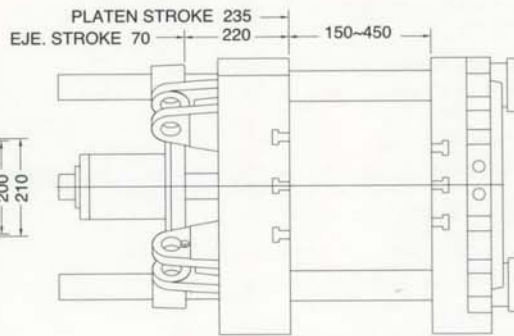
FRONT PLATEN

QDC-80/14Z

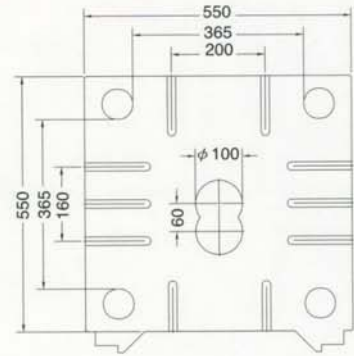
MACHINE EXTERNAL DIMENSIONS



MOVING PLATEN



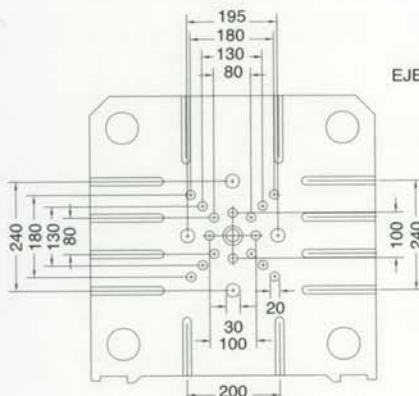
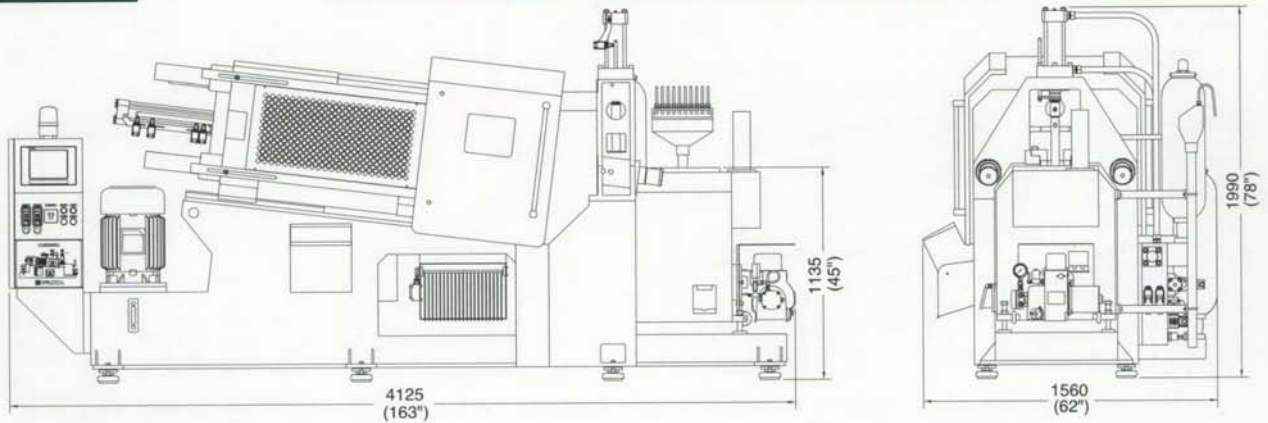
DIE MOUNTING PLATEN



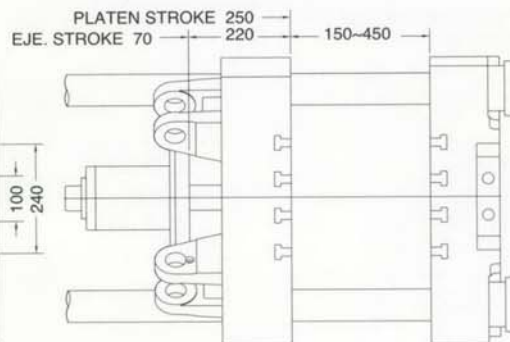
FRONT PLATEN

QDC-100/16Z

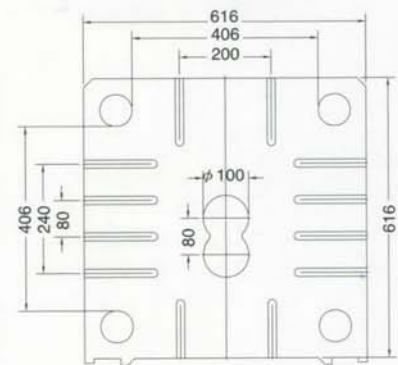
MACHINE EXTERNAL DIMENSIONS



MOVING PLATEN



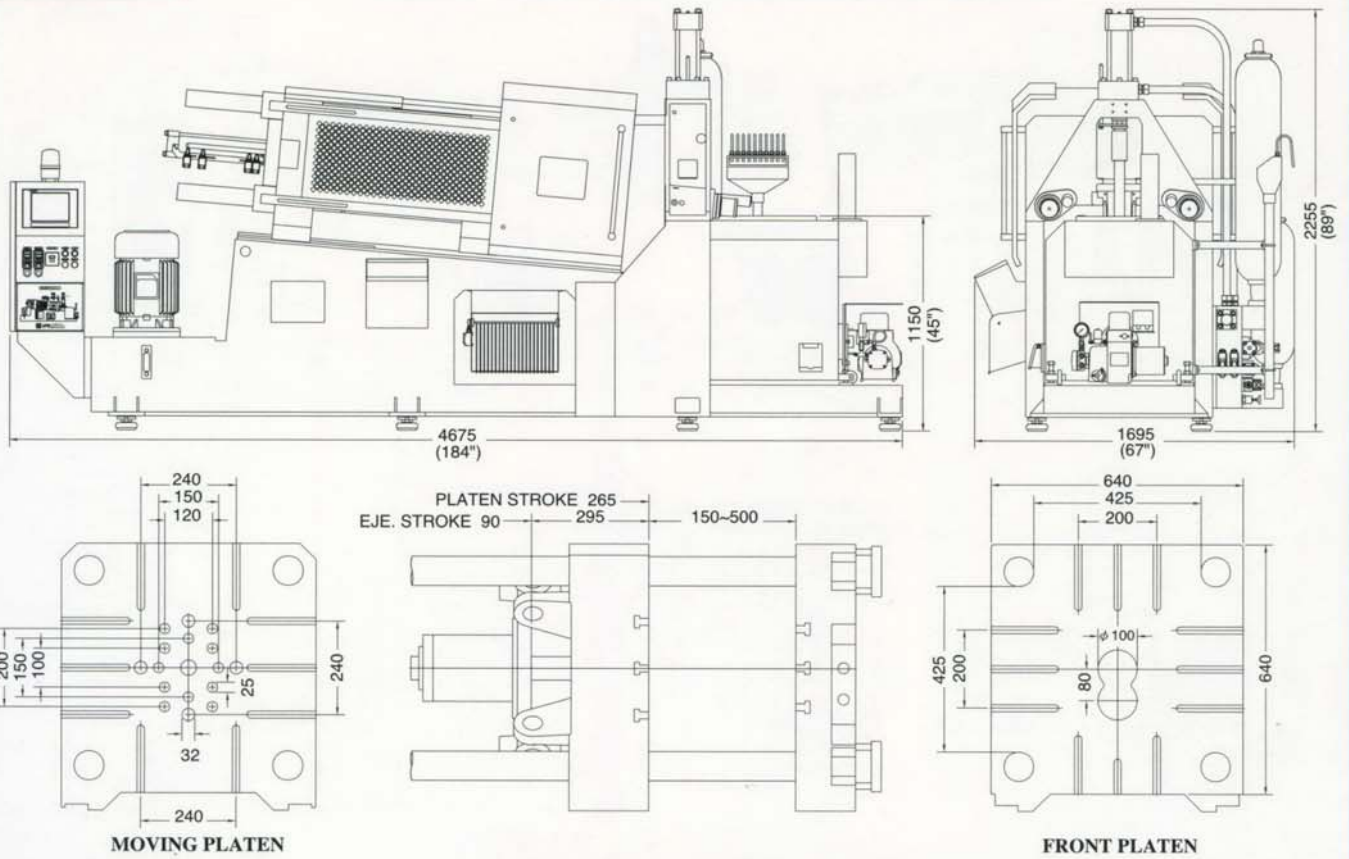
DIE MOUNTING PLATEN



FRONT PLATEN

QDC-125/17Z

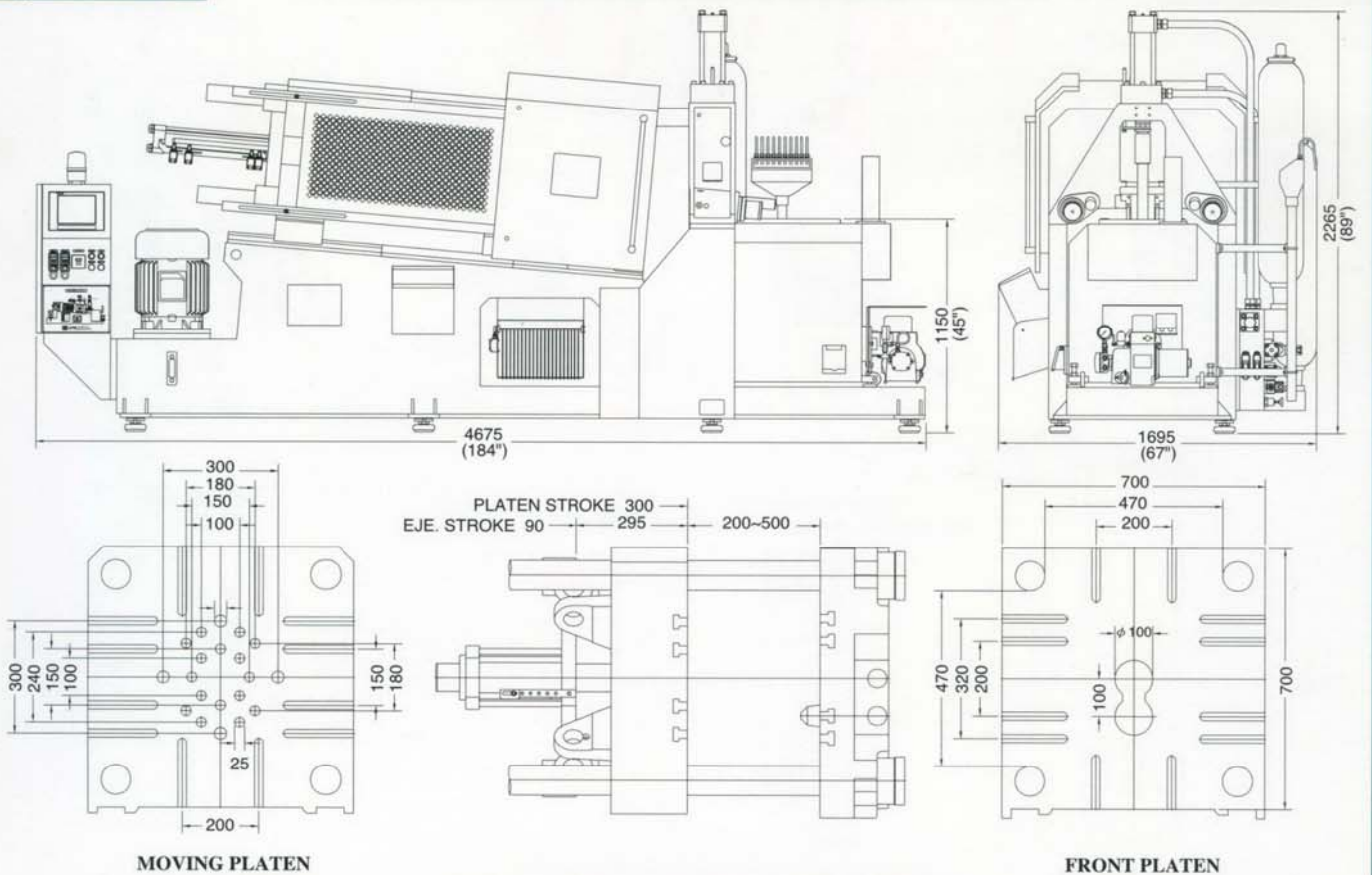
MACHINE EXTERNAL DIMENSIONS



DIE MOUNTING PLATEN

QDC-150/18Z

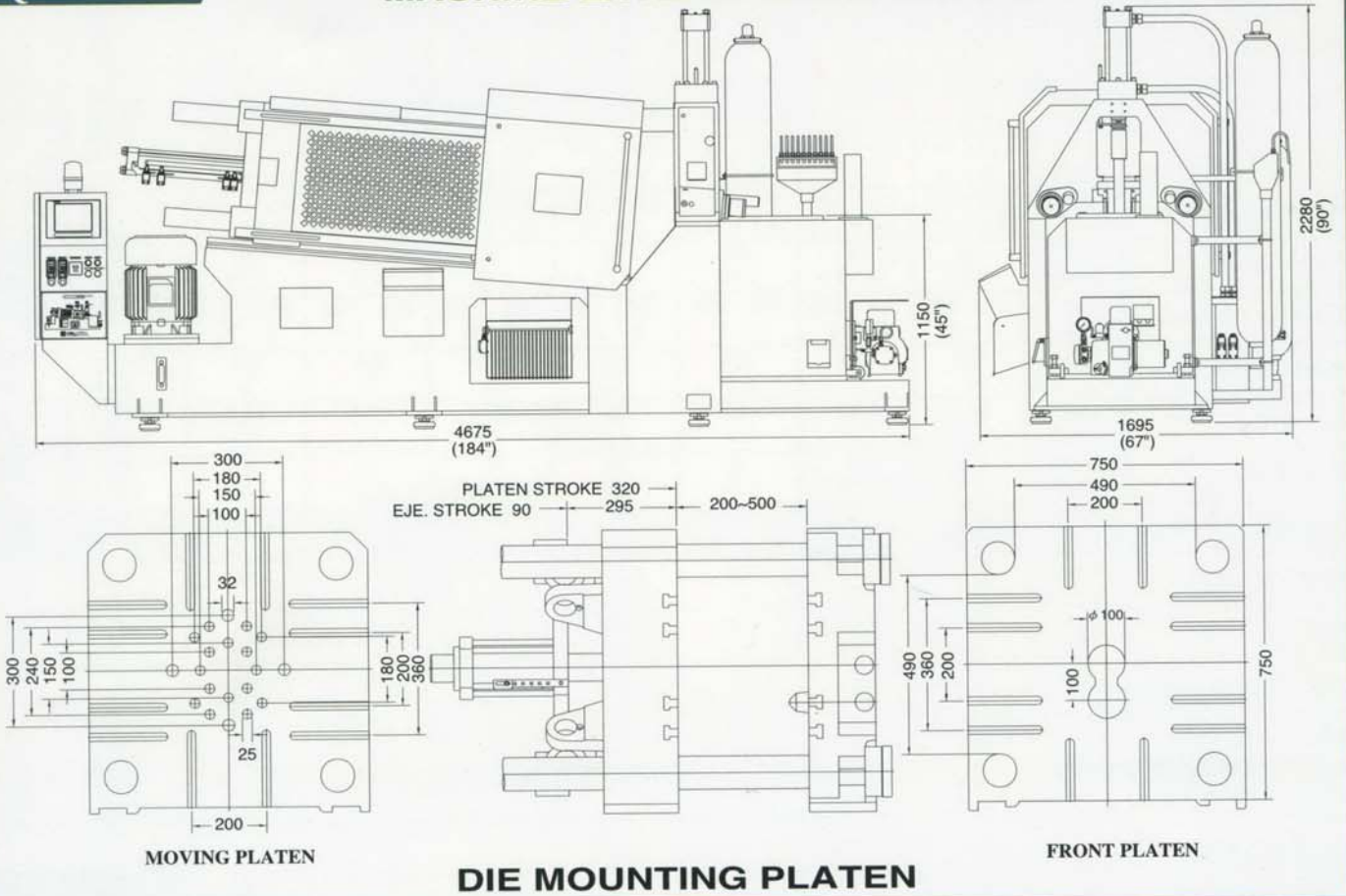
MACHINE EXTERNAL DIMENSIONS



DIE MOUNTING PLATEN

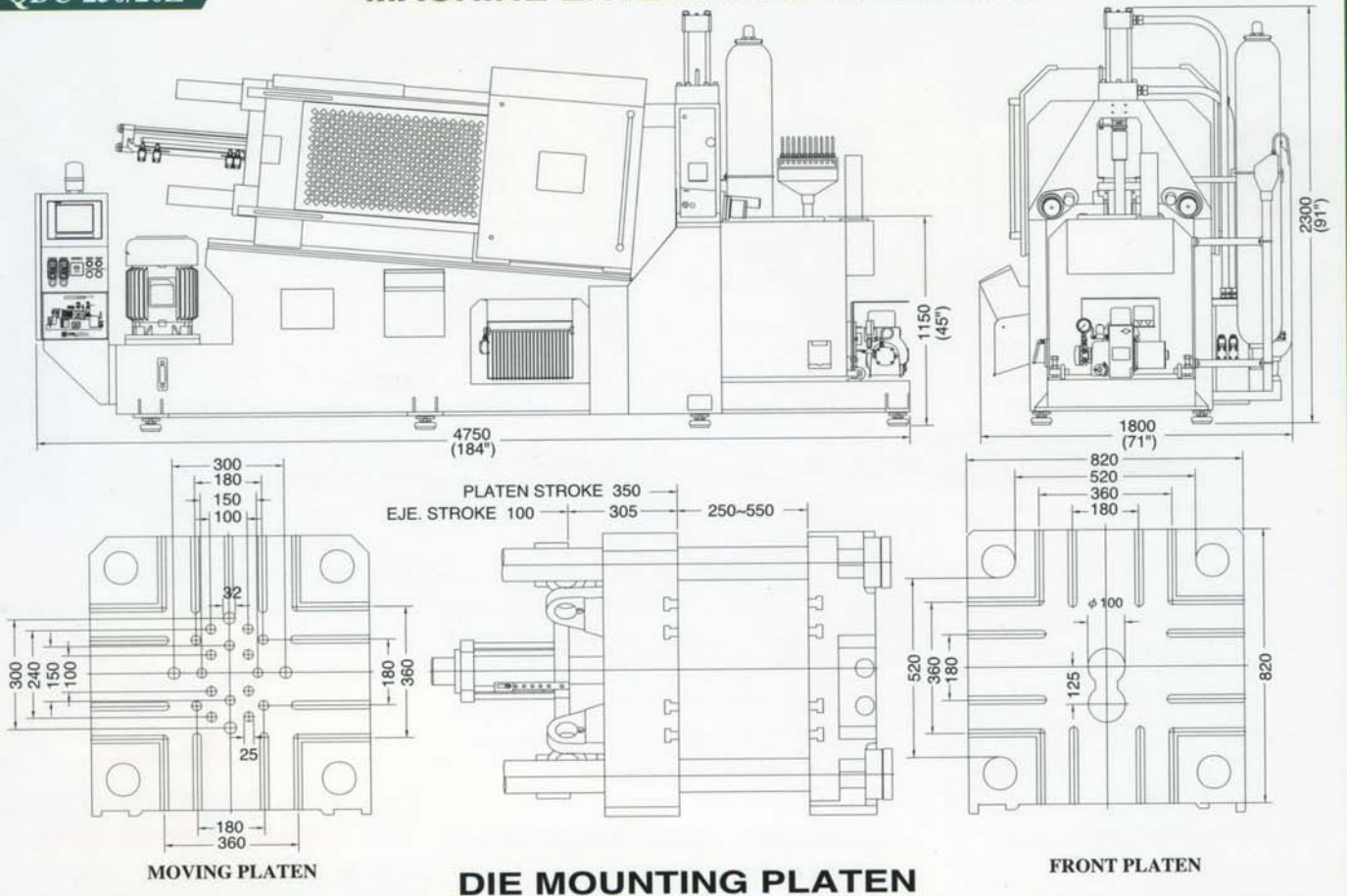
QDC-200/19Z

MACHINE EXTERNAL DIMENSIONS



QDC-250/20Z

MACHINE EXTERNAL DIMENSIONS



Technical Specifications

| LOCKING UNIT | | QDC-25/10Z | QDC-50/13Z | QDC-80/14Z | QDC-100/16Z | QDC-125/17Z | QDC-150/18Z | QDC-200/19Z | QDC-250/20Z | QDC-350/23Z |
|----------------------------------|-----------------------------|--------------------------|--------------------------|--------------------------|----------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Locking force | kN ton | 294 30 | 588 60 | 833 85 | 980 100 | 1274 130 | 1470 165 | 1862 190 | 2450 250 | 3724 350 |
| Closing stroke | mm inch | 160 6 | 220 8.7 | 235 9.25 | 250 10 | 265 10.5 | 300 12 | 310 12.25 | 330 13 | 400 15.75 |
| Platen size | mm inch | 410 x 410 16 x 16 | 500 x 500 20 x 20 | 550 x 550 22 x 22 | 616 x 616 24 x 24 | 640 x 640 25 x 25 | 700 x 700 27.5 x 27.5 | 750 x 750 29.5 x 29.5 | 820 x 820 32 x 32 | 930 x 930 36.5 x 36.5 |
| Space between tie bar | mm inch | 270 x 270 10.6 x 10.6 | 335 x 335 13.2 x 13.2 | 365 x 365 14.3 x 14.3 | 406 x 406 16 x 16 | 425 x 425 16.7 x 16.7 | 470 x 470 18.5 x 18.5 | 490 x 490 19.3 x 19.3 | 520 x 520 20.5 x 20.5 | 560 x 560 22.8 x 22.8 |
| Tie bar diameter | mm inch | 45 1.77 | 55 2.16 | 65 2.56 | 70 2.75 | 75 2.95 | 80 3.15 | 90 3.54 | 100 3.93 | 115 4.63 |
| Die height (min.-max.) | mm inch | 125 ~ 330 5 ~ 13 | 150 ~ 360 6 ~ 14 | 150 ~ 430 6 ~ 7 | 200 ~ 500 8 ~ 20 | 200 ~ 500 8 ~ 20 | 200 ~ 500 8 ~ 20 | 200 ~ 500 8 ~ 20 | 250 ~ 550 10 ~ 22 | 250 ~ 600 10 ~ 24 |
| Traverse stroke | mm inch | 150 6 | 150 6 | 165 6.5 | 180 7 | 200 8 | 200 8 | 200 8 | 230 9 | 250 10 |
| Ejector force | kN ton | 34.3 3.5 | 34.3 3.5 | 44.1 4.5 | 68.6 7.0 | 68.6 7.0 | 73.5 7.5 | 83.3 8.5 | 98.0 10.0 | 117.6 12.0 |
| Ejector stroke | mm inch | 50 2.0 | 60 2.36 | 70 2.75 | 70 2.75 | 90 3.54 | 90 3.54 | 90 3.54 | 100 4.0 | 100 4.0 |
| SHOT UNIT | | | | | | | | | | |
| Casting force (max.) | kN ton | 37.2 3.8 | 47.0 4.8 | 58.8 6.0 | 73.5 7.5 | 88.2 9.0 | 102 10.4 | 105.3 10.7 | 114.2 11.6 | 135.2 13.8 |
| Shot stroke | mm inch | 100 4.0 | 110 4.33 | 125 5.0 | 150 6.0 | 165 6.5 | 180 7.0 | 190 7.5 | 200 8.0 | 200 8.0 |
| Plunger diameter (std.) | mm inch | 46 1.75 | 50 2.0 | 55 2.25 | 60 2.5 | 65 2.5 | 70 2.75 | 70 2.75 | 75 3.0 | 80 3.15 |
| Casting area (max.) | cm ² sq / in | 128 19 | 246 38 | 337 56 | 377 65 | 481 70 | 611 95 | 701 108 | 954 152 | 1275 197 |
| Casting pressure (max.) | kg / cm ² psi | 239 3440 | 244 3587 | 252 3700 | 265 3890 | 271 3980 | 270 3969 | 278 4086 | 262 3851 | 274 4027 |
| Shot position (0=center) | mm inch | 0; -40 0; -1.5 | 0; -60 0; -2.3 | 0; -60 0; -2.3 | 0; -80 0; -3.1 | 0; -80 0; -3.1 | 0; -100 0; -1.5 | 0; -100 0; -3.9 | 0; -125 0; -4.9 | 0; -150 0; -5.9 |
| Max. shot weight (Zn) | kgs lbs | 0.76 1.68 | 1.00 2.3 | 1.40 3.14 | 2.00 4.5 | 2.63 5.8 | 2.87 6.32 | 3.50 7.76 | 4.24 9.35 | 4.97 10.96 |
| Dry cycle speed | per / min | 20 | 17 | 15 | 15 | 13 | 12 | 12 | 10 | 8 |
| Pot capacity (Zn) | kgs lbs | 200 440 | 250 550 | 350 770 | 350 770 | 500 1100 | 500 1100 | 500 1100 | 800 1760 | 800 1760 |
| GENERAL DATA | | | | | | | | | | |
| Hydraulic system pressure (max.) | kg / cm ² psi | 105 1500 | 105 1500 | 120 1750 | 110 1600 | 120 1750 | 110 1600 | 120 1750 | 110 1600 | 110 1600 |
| Pump output | ltr / min g.p.m. | 37 9.25 | 62 15.5 | 72 18 | 78 19.5 | 90 22.5 | 98 24.5 | 113 28.25 | 130 32.5 | 140 35 |
| Oil tank capacity | ltr gal | 250 62.5 | 300 75.0 | 350 87.5 | 350 87.5 | 450 112 | 450 112 | 450 112 | 500 125 | 500 125 |
| Pump motor | kw hp | 5.6 7.5 | 7.5 10 | 11 15 | 11 15 | 15 20 | 15 20 | 18.5 25 | 22 30 | 22 30 |
| Machine weight (approx) | kgs lbs | 3500 7700 | 4500 9900 | 5000 11000 | 5500 12100 | 6000 13200 | 6500 14300 | 7000 15400 | 8500 18700 | 11000 24200 |

Working specifications may vary depending on casting conditions and operating pressure. Specifications are subject to changed without notice due to an ongoing effort to improve quality.

Standard Features:

- Touch screen interface
- Hydraulic ejection with multi-stroke
- Die lube spray device with 4 heads
- Two stage injection control
- Auto die height fine adjustment
- Four toggle/linkage corner loaded system
- Sweeper with sensor
- Full safety guards and ratchet as per OSHA and CE standards
- Hydraulic core pull device
- Nozzle heater and temperature controller
- Auto drained accumulator
- Oiles bearing and slide block
- Mitsubishi™ FX2n PLC

- Low pressure die close protection
- Dual shot position
- Two separate accumulator for shot end and clamping
- Auto lube system with low level machine shut down
- Toggle/linkage pins and bushings designed for oil
- Gas melting furnace with special "anti-zinc corrosion" cast stainless steel melting pot
- Stainless steel water collector
- Hand spray gun
- Comprehensive operator, machine and parts manual with schematics

Optional Features:

- Automatic ingot feeder
- Reciprocating sprayer with pressure tank
- Canvas belt conveyor
- Regular steel belt conveyor
- Separator steel belt conveyor
- Pressure tank for release agent/material
- Fuel burner
- Electric melting furnace
- Custom color

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