Injecting

füller
GLASTECHNOLOGIE

Linear Injection Press

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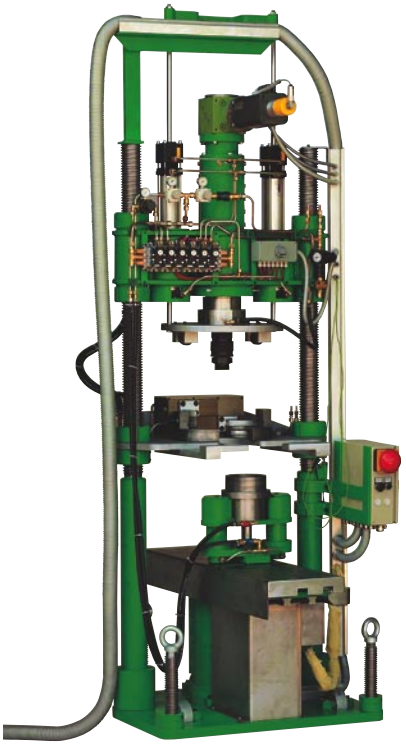
APPLICATION

The injection manufacturing mode is designed to produce (heavy) glass items with décor and items with a wide range of simple, complex and especially slender shapes.

GLASS ITEMS	candleholders, figurines, tampers, vases with a stem and base, chandelier parts
TYPES OF GLASS COMPOSITION	lead glass, soda-lime glass, recycling glass, borosilicate glass
DIMENSIONS OF GLASS ITEM	standard machine layout: - diameter: up to 200 mm - height: up to 300 mm XXL-version: - diameter: up to 300 mm - height: up to 400 mm
GLASS QUANTITY / WEIGHT OF GLASS ITEM	60 g (e.g. stems) up to 6,5 kg net weight of item (glass quantity up to 10 kg)
PRODUCTION RATE	up to 3 pieces/min. (depending on the mould layout; more than one item may be embedded into one mould, e.g. up to 200 chandelier parts may be manufactured in one nest)



MODE OF OPERATION

The telescope unit moves the injection reservoir into the feeding position, where it is supplied with a precisely defined quantity of glass by the feeder. After being filled, the press reservoir is precisely positioned beneath the mould table, so that the lower pressing unit may inject the glass from the reservoir into the mould. The mould is closed and clamped as soon as the press reservoir is moved to the press station and the injection process is started. The linear injection press is equipped with two servo-motor pressing units: the lower pressing unit for injecting and the upper servo-motor system which holds the mould, the mould lid, the plunger for vases or a nose piece for pressing a thorn (e.g. hole for candleholders). The motor-pressing system is equipped with a sensor which reduces the pressing pressure to a holding pressure as soon as the item is sufficiently pressed and the pneumatic after-pressing process is started, which compensates for shrinkage in the cooling glass item. The mould is opened as soon as the glass item is sufficiently cooled and is taken out by hand or fully automatically.

FEATURES

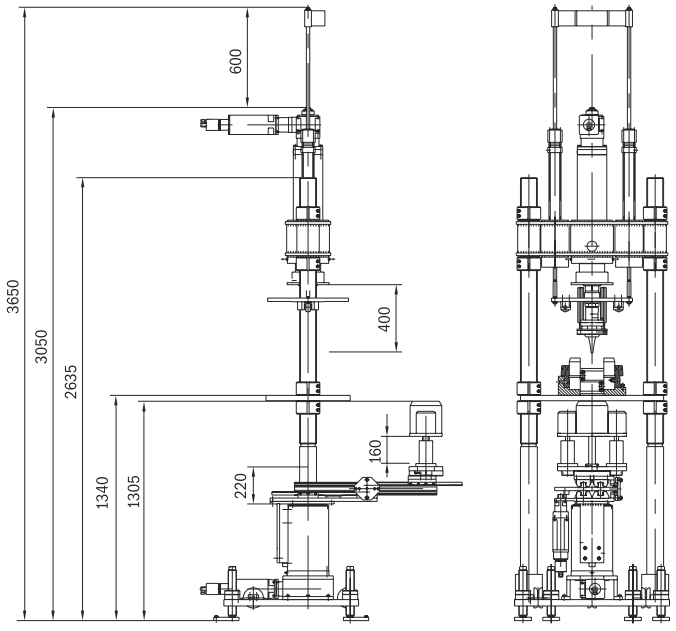
wide range of complex shapes	• because the injection system has been designed to meet the technical requirements of especially slender-shaped and heavy glass items
very high quality	• because the two servo-motor systems – vertical and horizontal movement of the press reservoir – allow a precise positioning of the press reservoir for feeding and for injection pressing • due to a electronically controlled servo-motor pressing unit which allows a precise pressing pressure adjustment and ensures an optimal pressing pressure (motor torque = pressing force)
very high quality of heavy items	• because a fully electronically controlled servo-motor system (providing for the vertical movement of the telescope unit) allows to lower the mould while being filled in order to keep a minimum distance between the orifice of the feeder and the base of the mould and guarantees a carefully tuned filling process • because the press reservoir may be equipped with a base lifting device in order to keep a minimum distance between the orifice of the feeder and the base of the mould
consistent quality (esp. surface quality)	• due to fully electronically controlled systems for plunger-cooling and ring-heating which provide optimal mould and plunger temperatures • due to a pneumatic after-pressing unit which compensates for flaws resulting from shrinkages and eliminates the risk of vacuum blisters
highly flexible production	• because up to three linear systems may be alternately (independently but synchronised with each other) fed by the feeder – thus meeting the capacity of the feeder, while tool costs (mould and plunger) are reduced to a minimum and an extremely flexible production is guaranteed • due to quick-change systems for the plunger and moulds reducing job-change times to a minimum • due to easy job-changes since the MMC-software provides an efficient product management tool which stores the adjustments of all production parameters under the specific name of the glass item and provides optimal production parameters for later resumption of production
easily adapted to any existing production surroundings	• because the telescope unit is compatible with different feeding systems: manual feeding, ball feeder and all feeder systems available
very high productivity	• because the servo-motor based telescope unit is freely programmed so that an optimum timing of the production cycle may be achieved, guaranteeing minimum time-loss between the take-out position and the new feeding cycle

FEATURES

large cost-savings	• because the décor pressing-moulds replace cost-intensive engraving, cutting and acid-polishing • because tool costs are significantly reduced since only one mould for each item is required • due to a mould-check system which eliminates the risk of damaging the pressing tools if moulds are not empty and reduces standstills for tool changes and maintenance to a minimum
optimal production conditions	• the relevant parameters may be altered while the machine is in operation and optimal results may thus be immediately achieved • the MMC-software facilitates noting, connecting and keeping record of all adjustments and events and helps to efficiently control and monitor the production process
extremely user-friendly	• due to the uncomplicated user menu of the MMC-software • due to the MMC-software's graphic programming tool which includes all movement cycles, the pressing process and the pressing sensor

TECHNICAL DETAILS

ELECTRICAL SUPPLY	3/N/PE AC 50/60 Hz 230/400 V 3 x 220 V optional
COMPRESSED AIR	0,5 – 0,6 MPa
DISTILLED COOLING WATER IN THE CIRCULATION	0,3 MPa
GAS	5 kPa
OXYGEN	0,5 Mpa



THE PACKAGE INCLUDES

BASIC EQUIPMENT

- base plate, 2 columns and a crossbeam
- telescope unit for linear horizontal movement
- servo-motor system for the vertical movement of the mould (reducing the distance between the mould and the orifice of the feeder to a minimum)
- mould plate (with quick change system)

INJECTION PRESSING EQUIPMENT

- lower pressing unit for injection pressing; fully electronically controlled servo-motor system which performs a double-function: lower pressing unit, injecting the glass from the press reservoir into the injection mould and performing the vertical movement of the press reservoir (reducing the distance between the mould and the orifice of the feeder to a minimum)
- pressing unit from top; fully electronically controlled servo-motor system [the top pressing unit is used to hold the injection mould or a plunger for producing injected vases]
- reinforced pneumatic press plate for the ring
- press reservoir
- holder for the plunger and ring
- quick-change system for the plunger and ring
- pneumatic after-pressing unit which compensates for flaws resulting from shrinkages and vacuum blisters

TEMPERATURE REGULATION

- thermocouples for measuring the temperature of the mould, plunger and ring
- cooling-system for the glass item (airmover)

ELECTRONIC CONTROL SYSTEM

- PC-based real time system with MMC-software and Windows 2000 operating system, incl. cooling system

OPTIONS

MACHINE LAYOUT

- standard (for standard mould sizes)
- XXL (for extremely large moulds)

PERFORMANCE OF PRESS UNITS

- force: 2,2 t to 4,5 t, 9 t
- speed: 100 mm/s to 600 mm/s

MOULD EQUIPMENT

- air-cooled mould plate/mould holder
- water-cooled mould plate/mould holder
- electrically isolated mould plate/mould holder
- quick change system for mould plate/mould holder
- pneumatic opening- and closing device for the mould
- fully electronically and position-controlled servo-motor system for opening and closing of mould
- pneumatic mould clamp
- pneumatic double-clamp system for the moulds
- fully electronically and position-controlled servo-motor system for clamping the mould
- mould holder for hinge mould
- mould holder for 2-parted mould
- mould holder for 3-parted mould
- mould holder for 4-parted mould

TEMPERATURE REGULATION FOR TOOLS

- thermocouples for measuring the temperature of the tools

cooling

- air-cooling/air manifold
- airmover based on injector principle
- airmover based on water/air-mixture
- water-cooling (closed circulation)

heating

- burner system
- electrical resistance heating

EXTENSIONS

- Four-in-One Combi-System (combination of injecting, pressing, spinning and/or casting manufacturing mode)

ELECTRONIC CONTROL

- external control panel, when there is insufficient space to install the control panel close to the press