

# Innovative into the Future – BOY-Injectioneering



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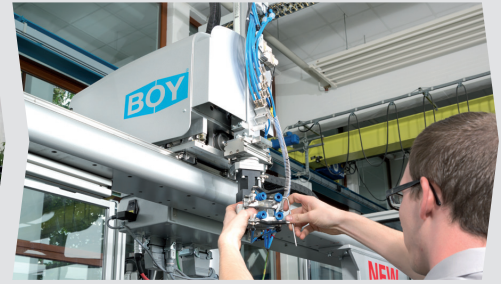
Injection molding machine BOY 60 E



Most efficient technology with servo-motor pump drive



Production cell with CE-compliant safety housing



Simplest possibilities to integrate a four-axis industrial robot

- **Servo-motor pump drive**
- Four-tie bar, cantilevered **two-platen clamping system**
- Generous tie bar and platen distances
- Most exact positioning of the moving platen via proportional valve and servo drive technology
- Easily accessible ejector at the rear of the moving platen
- Lateral swivel-out injection unit
- Robust machine frame with integrated oil tank
- Optimum L/D ratio of the screw
- Optional with SP 56, SP 69 or SP 82 injection unit
- Different injection units for thermoplastic, thermoset, LSR, and elastomer processing
- **Compact design** with little floor space needed
- Optional with energy-efficient and high wear-resistant **EconPlast** unit

With its appealing design, the BOY 60 E is an optical highlight. But it is more than just optics which convinces the experts, namely its technical and operational values and its orientation towards cost-saving. Which is no surprise, for all the experience and innovative ideas BOY gained from decades of machine manufacturing went into the development of the BOY 60 E.

The result is a **servo hydraulic** injection molding machine which is characterized by precision, performance, and compact design, simultaneously meeting the highest technical demands. The BOY 60 E fulfills highest technical requirements. The servo-motor pump drive for example ensures a very effective mode of operation which is smooth and energysaving at the same time.

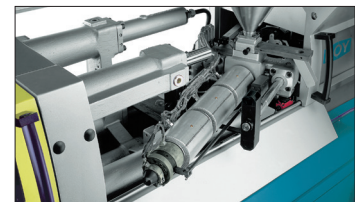
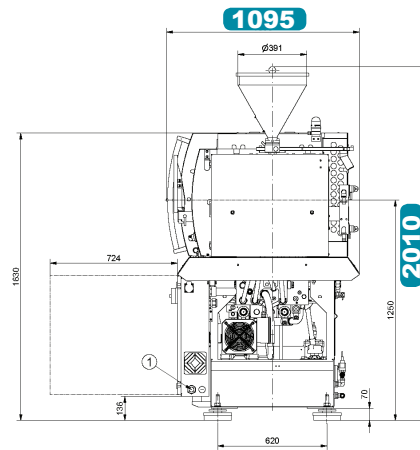
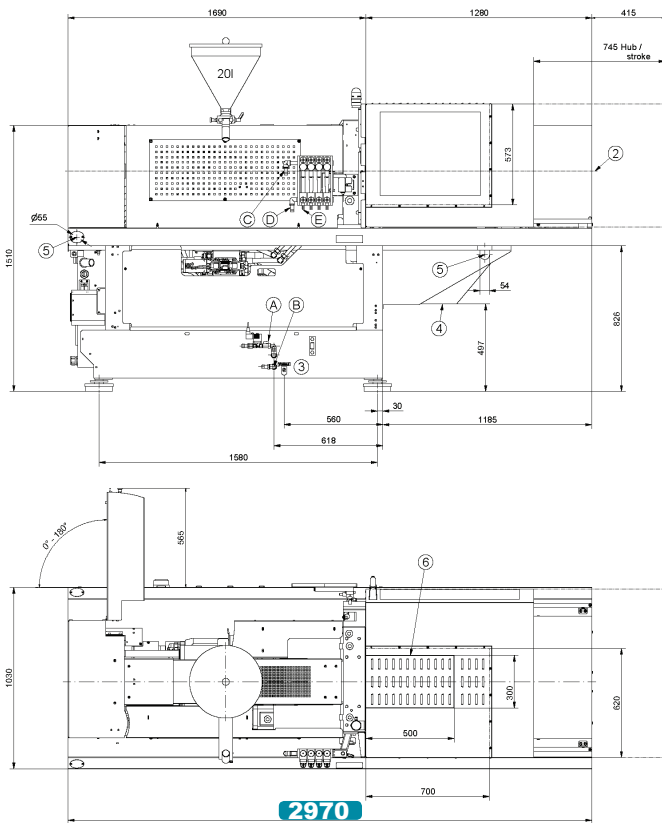
The patented pressure intensifier with integrated valve function reduces energy consumption to a minimum and guarantees secure clamping during the injection and cooling phases, without the need for a pressure sustaining pump. The extremely **compact design** of the BOY 60 E significantly reduces the required floor space, compared to customary machines with a three-platen concept. Due to the cantilevered clamping unit, no additional space is needed for conveying systems or storage containers. Equipment for process automation or special assemblies for clean room applications, for example, can be mounted atop the BOY 60 E in a space-saving manner.

With seven different screw diameters and four different sized injection units, the BOY 60 E is a flexible to use **all-rounder** for various injection molding processes for example processing of **thermoplastics, elastomers, silicones** and **thermosets** as well as **metals** and **ceramics** (PIM-Technology).

Available options include controls for handling devices, picker as well as brush units, unscrewing devices, core pulls, and integrated hot runner controls.



- 1 The machine design features the best ergonomics and efficient operation.
- 2 The ejector chute, open on three sides, guarantees optimum removal of the molded parts.
- 3 Easy handling and flexibility with regard to additional equipment due to the cantilevered clamping system.
- 4 Optimum control technology with intuitive operation concept.
- 5 Robust machine design with integrated oil tank.



The swivel-out injection unit simplifies the retrofit procedure and maintenance.

## Technical Data – standard version<sup>1)</sup>

Injection unit for processing thermoplastics		SP 110 (speed injection)		SP 215 (Standard)			
Screw diameter	mm / in	28 / 1.1	32 / 1.26	28 / 1.1	32 / 1.26	38 / 1.5	42 / 1.65
Screw- L/D-ratio		22.7	20	22.7	20	16.7	15
Max. stroke volume (theoretical)	in <sup>3</sup>	4.7	6.13	4.7	6.13	8.65	10.57
Max. shot weight in PS (theoretical)	oz	2.47	3.23	2.47	3.23	4.55	5.56
Injection force	US Tons	9.9		19.3			
Injection volume flow	in <sup>3</sup> / sec	10.9	14.2	5.6	7.4	10.4	12.7
Max. spec. injection pressure	psi	20842	15954	40582	31067	22031	18043
Max. screw stroke	mm / in	125 / 4.92					
Nozzle force / contact pressure	US Tons	5.4					
Nozzle retraction stroke	mm / in	215 / 8.46					
Screw torque	ft / lbf	206.5 (9.9 in <sup>3</sup> / 1885 psi) / 258.1 (12.4 in <sup>3</sup> / 1885 psi)					
Screw speed (infinitely variable)	rpm	325 (12.4 in <sup>3</sup> ) / 410 (9.9 in <sup>3</sup> )					
Screw pulback force	US Tons	9.33					
Heating power (nozzle + cylinder)	W	7700					
Hopper capacity	Us gal.	5.28					
Injection speed	in / sec	11.42		150			

### Clamping unit

Clamping force	US Tons	67.44	
Distance between tie bars	in (h x v)	14.17 x 13.19	
Max. daylight between platen	mm / in	650 / 25.59	
Max. opening stroke (adjustable)	mm / in	400 / 15.75	
Min. mold height	mm / in	250 / 9.84	
Max. mold weight on moveable clamping side	lb (max)	881.85	
Mold opening force	US Tons	4.27	
Mold closing force	US Tons	2.74	
Ejector stroke (max.)	mm / in	80 / 3.15	(130 / 5.12) (150 / 5.91)
Ejector force pushing / pulling	US Tons	2.29 / 1.52	(2.29 / 1.52) (4.8 / 3.37)

### General

Installed driving power / total power	kW	11 / 18.7 (400 V)
Duration of the dry cycle (EUROMAP 6)	s (mm)	1.9 (252)
Hydraulic system pressure	psi	2828
Oil tank capacity	US gal.	52.83

### Dimensiones and weights

#### BOY 60 E

Dimensions (LxWxH) / Footprint	in / square in	119.41 x 43.11 x 79.13 / 5148
Total weight net (without oil)	lb	4960
Total weight gross (pallet & foil / wooden case)	lb	6900 / 7562
Transport dimensions / case (LxWxH) approx.	in	135 x 45.3 x 80.7 / 135.8 x 45.3 x 76.8

1) more injection units see Technical data and Equipment



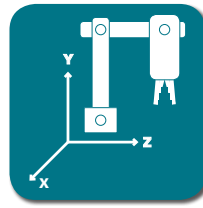
Servo-Drive



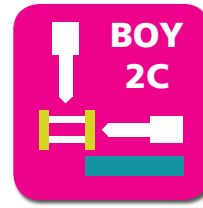
Control



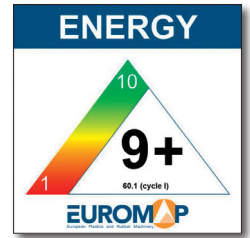
Injection Unit



Automation



Multi Component



The specified efficiency classification is achievable depending on the respective machine equipment.

## Equipment

### Injection unit

Pivoting injection unit	■
Preset screw speed values with ramping transition	■
Cold start protection	■
Number of set points of injection speed	9
Number of set points of injection pressure	9
Start of holding pressure dependent on hydraulic pressure. stroke and time	■
Start of holding pressure, cavity pressure-dependent	□
Number of set points of holding pressure	9
Production monitoring at start of holding pressure	■
Closed loop control for the complete injection profile and back pressure	■
Control for intrusion-injection (not for BOY 2C XS)	■
PID microprocessor-controlled heating zones for cylinder + nozzle set and temp. display	■
Hydraulically actuated needle shut-off nozzle (pneumatic for XS-LSR)	○
Slide-away for quick material change (25 + 35 + 60 VV / 35 HV / 2C M without hopper)	■
Automatic material loader / feeder	□
Adjustable nozzle force	■
Delayed nozzle retraction	■
Servo-electric screw drive (separate feed line required)	○
High wear-resistant plasticizing units	○
High wear-resistant EconPlast unit	○
Speed injection (not for BOY 2C XS)	-
Clamping force build-up can be activated parallel to injection	-
Electromechanical injection movement	-

### Clamping unit

Reduced mold height by 50 mm	□
Moving platen support to improve the precision when using large molds	□(■)
Number of set points of mold closing / opening speed	9
Number of reopening attempts after mold closing	■
Hydr. ejector with adjustable pressure, speed, position + no. of strokes, intermediate stop position	■
Hydraulic ejector with adjustable stroke 80 mm (for XS E = 50 mm)	■
Hydraulic ejector with adjustable stroke 130 mm	○
Hydraulic ejector with adjustable stroke 150 mm and 42.7 kN force	-
Electromechanical ejector 150 mm	○
Hydraulic unscrewing device, one or two directions of rotation with intermediate stop	□
Hydraulic unscrewing device, two directions, proportional valve and pulse generator	□
Core pull control with 4/3 way directional control valve and freely selectable operational programs	□
Injection compression (coining) and breathing with mold degassing control	□
Hydraulic guard safety device	■
Self adjusting mechanical drop bar safety system with electronic monitor	□
Safety gate for handling devices	■
Electronically operated safety gate	○
Selection flap	○
Air ejection	□
Mold lifting crane	□
Simultaneous ejector movement (with double pump/Electric)	□
Integrated sprue picker	□
Mold holder 75 x 75 mm	-

### Electronics

USB interface for access and data exchange	■
Interface kit: Serial/Temperature device, USB and Ethernet	□
OPC interface	□
4 freely programmable inputs/outputs	□
Piece counter	■
Preselect cycle counter with auto shut-off	■
Grounded socket outlet 230 V ~ / 10 A, (alternatively switched)	■(□)
CEE socket outlet 400 V ~ / 16 A (alternatively switched)	-(-)
Socket distributor 400 V ~ switched + 230 V ~ (Standard supply 32 A)	-
Socket distributor 400 V ~ / 230 V ~ switched (separate feed line required)	□
Energy distributor with four fixed connections, up to 5 x 400 V CEE + 3 x 230 V (sockets can be switched off optionally). Standard supply 125 A / 5 x 50 mm <sup>2</sup>	□
Switch cabinet ventilation	■
Standardized interface for handling units EUROMAP 67	□
Separate feeder (heating and motor current)	■
7-day timer	■
Additional temperature control	□
Brush control	□
Connector for safety switch to inhibit mold closing	□
Integrated hot runner control, 8/16-fold (separate feed line required)	□
Air conditioning unit for control cabinet	□
Alarm signal with sound	□

### Hydraulics

Electronically controlled variable pump	-
Servo-motor pump drive (Servo-drive)	■
Oil preheating circuit automatic	■
Oil temperatur gauge / Controlled oil cooling / Oil level indicator	■
Oil level and temperature monitoring	■
Proportional valve with stroke feedback and positioning action for clamp unit	■

### General

Cooling water distributor with electric shut-off valve for injection mold	○
Temperature control for feet throat	□
6- / 8-zone water distributor	○
Tool kit	□
Spare parts package	□
Oil filling	□
Anti-vibration mounts	■

■ standard    ○ alternatively    □ optional    - not available

You would like to learn more about this BOY injection molding machine?



Technical Data and Equipment (complete overview)



Competence brochure



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