

Endura Series

Injection Moulding Machines



...THE WELL-PROVEN MOLDING SOLUTION

Endura Series :

Clamping force: 600 to 6500 kN

The diversified range of plastic injection molding machines from Electronica Plastic Machines' portfolio covers a variety of applications and fulfills the international quality standards.

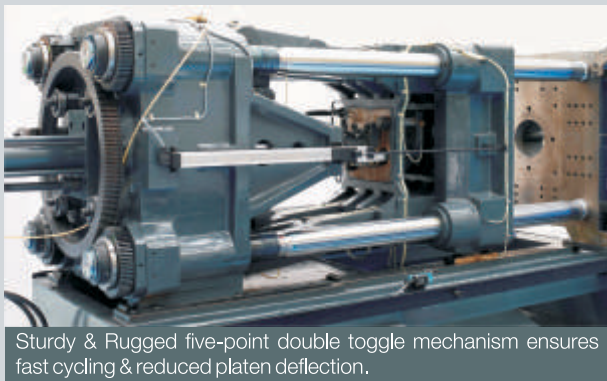
With clamping forces from 600 to 6500 kN and shot capacities from 64 gms to 3505 gms; backed up by our nationwide efficient sales and service network, we provide a competitive edge for our customers.

The Electronica "Endura" Series Plastic Injection Molding Machine is characterized by the robust machine design with high quality components, providing the highest performance, versatility, durability, consistency and productivity.

STANDARD FEATURES & OPTIONS

CLAMP

- ▶ Sturdy and optimized five-point double toggle system, known for its quick mold open and close movements along with its good mold safety characteristics is one of the most preferred clamping mechanisms in the world.



- ▶ Moving platen supported on machine base with adjustable sliding shoes.



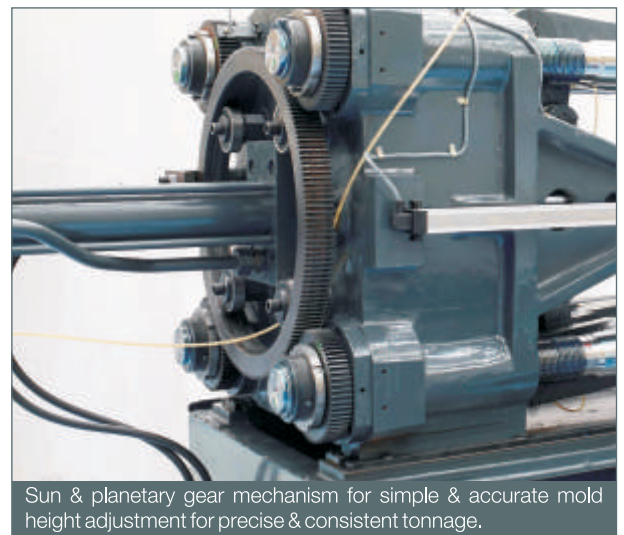
- ▶ Wear resistant stainless steel supporting tracks for moving platen.
- ▶ Sturdy and optimized platen design.
- ▶ Hard chrome plated, high tensile steel tie bars.
- ▶ Stress-relieved sturdy machine base frame.
- ▶ Closing and opening speeds, pressures and positions independently settable. Each programmable in 05 stages.
- ▶ Linear position transducer for accurate clamp position control.

- ▶ Mold opening and ejector forward with safety gate open / closed position.
- ▶ Auto-lubrication with grease, based on number of clamp cycles.
- ▶ Self-lubricating bushes for toggle mechanism.
- ▶ Foolproof and fast responding hydraulic and electrical interlocks for safety doors / gates.



Graphite impregnated bushes providing self lubrication, increased toggle mechanism life & clean molding operation.

- ▶ Low pressure mold safety, settable.
- ▶ Position based ramping for accurate position change-over and precise speed and pressure control.
- ▶ Sensitive mold protection with clamp stroke dependent change over, with time monitoring and "try again" circuit.
- ▶ Automatic, motorized mold height adjustment through sun and planetary gear mechanism ensures that there is no backlash during operation and provides for uniform transmission of forces to all the four tie bars during operation.
- ▶ Automatic mold height adjustment sensed through proximity switch.



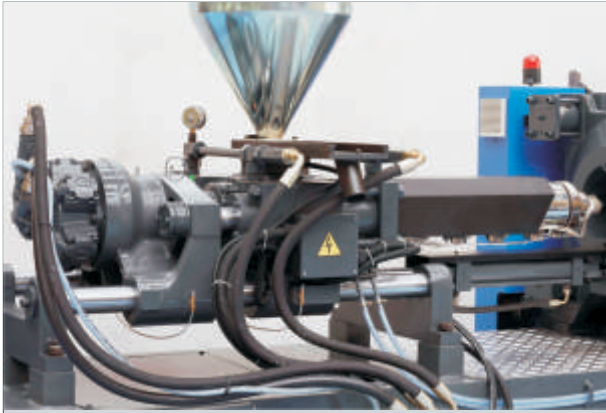
EJECTOR

- ▶ Central hydraulic ejector with multiple stroke feature. Speed, pressure and position independently settable in both directions.
- ▶ Ejector forward speed and pressure programmable in two stages.
- ▶ Linear transducer for accurate ejector position control.
- ▶ Multi point ejector plate.
- ▶ Provided with multiple ejector rods.

- ▶ Pulsating ejector strokes up to 99 pulses.
- ▶ Intermediate ejector retract set point.
- ▶ Ejector hold / stay forward function.

INJECTION

- ▶ Strong & balanced twin cylinder injection unit distributes the load / pressure equally along the screw centerline.



Twin cylinder injection unit.

- ▶ Wide choice of injection units with A / B / C versions of screw / barrel combinations.
- ▶ Fitted with nitrided screw and nitrided barrel, non-return valve and barrel closure assembly with open nozzle suitable for various thermoplastics.
- ▶ Injection speed and pressure profile programmable in 06, position dependent stages.
- ▶ Follow-up / hold-on pressure profile programmable in 05, time dependent stages.
- ▶ Screw speed control profile programmable in 05, position dependent stages.
- ▶ High torque, low speed direct hydraulic screw drive.
- ▶ Digital read out of actual screw RPM in the controller.
- ▶ Split nozzle as standard scope of supply.
- ▶ Nozzle contact force setting through control panel.
- ▶ Delay feature for commencement of plasticizing to aid processing of engineering plastics.
- ▶ Screw rotation interlock till barrel reaches the set temperatures.
- ▶ Proven screw geometry for optimum plasticizing capacities with excellent melt homogeneity.



Proven screw geometry & quality for long lasting & consistent performance.

- ▶ Back pressure adjustment through controller with profile programmable in position dependent stages.
- ▶ Monitoring of melt cushion during the follow-up / hold-on pressure phase.
- ▶ Switch over from fill to pack based on position or time.
- ▶ Hydraulic screw retraction after follow-up / hold-on pressure phase and / or after plasticizing process, programmable, dependent on position or time, to prevent melt drooling.
- ▶ Linear position transducer for accurate injection position control.
- ▶ Injection unit forward speed and pressure programmable in two stages for enhancing mold / sprue bush life.
- ▶ Delay feature for commencement of nozzle retraction.
- ▶ Cold slug removal & flow (intrusion) molding.
- ▶ Sprue break with timer.
- ▶ Auto-purge facility.
- ▶ Aluminum chequered plate below purge area.
- ▶ Material hopper with easy sliding arrangement.

TEMPERATURE CONTROL

- ▶ 4 / 5 self-optimizing temperature control zones / circuits for the barrel and nozzle flange heating system.
- ▶ Adjustable high / low tolerance band for monitoring with alarm for deviation from set point.
- ▶ Thermocouple break down alarm.
- ▶ Operating temperature range of up to 450°C.
- ▶ Ceramic barrel heating bands.
- ▶ Reduction in barrel temperature to a preset value during machine idle time.
- ▶ "PID" controlled barrel heater bands, with solid state relays and fast blowing semi conductor fuses for barrel heating system.
- ▶ Auto heat start-up and shut down.
- ▶ Feed throat temperature indication.

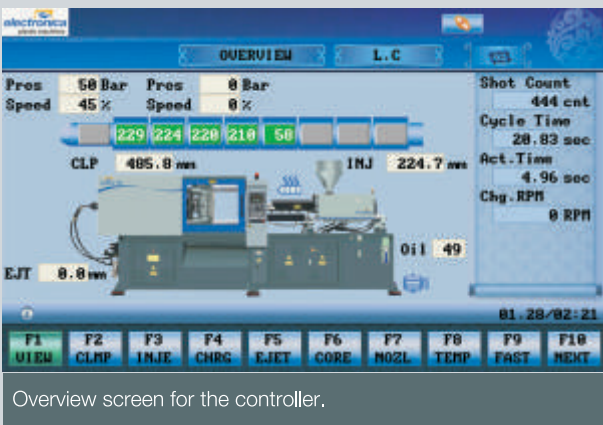
CONTROLS

- ▶ Intelligent operator-machine interface with large, 8.4" TFT, multi-color display with alpha numeric keyboard.
- ▶ Actual position measuring / indicating system for moving platen, screw travel and ejector.
- ▶ Continuous process control via monitoring of important process parameters with selectable tolerance band.
- ▶ Shot (molding) counter pre-selection with automatic switch off feature.
- ▶ Batch production counter with alarm indication.
- ▶ Fault diagnostics in the event of machine malfunction or operator error with plain text messages and recording of source of error.
- ▶ Data storage on removable USB drive.
- ▶ Individual keys for manual functions including process mode selection.
- ▶ Ergonomic layout.
- ▶ Separate single screen (page) for quick setting of all important process parameters.
- ▶ Internal storage of up to 200 sets of mold data.
- ▶ Injection speed settable in % and pressure settable in bar.



Advanced user friendly controller.

- ▶ 14 important parameters monitoring for last 500 cycles.
- ▶ Hourly production monitoring data.
- ▶ Core hold (energized) during injection stage to retain the core position.
- ▶ Filters for electrical noise suppression.
- ▶ Multi-level password for preventing tampering of parameters.
- ▶ Flash lamp and acoustic alarm.
- ▶ Function wise layout of pages (screens) and display of various process parameters in clear text.
- ▶ Regulated power supply 24VDC for controls and actuators.
- ▶ Digital setting of all times, setting range in 0.01 seconds.
- ▶ I / O diagnosis - analog & digital.



Overview screen for the controller.

- ▶ Main voltage 415V / 3 ph / 50 Hz. Control voltage 24 VDC / 220 V.
- ▶ MPCB for main electric motor protection (to protect against single phase, short circuit & overload).
- ▶ "On-delay" timer for the control circuit.

HYDRAULICS

- ▶ All hydraulic manifolds and valves mounted close to the actuators for faster response.
- ▶ Hydraulic valve on / off signal indication.
- ▶ Hydraulic oil tank with large and easy access for cleaning.
- ▶ Hydraulic oil low and high temperature monitoring with alarm and machine stopped in case of deviation.
- ▶ Hydraulic oil preheating circuit by kinetic energy (not by thermal heating).
- ▶ Large capacity heat exchanger for hydraulic oil cooling.
- ▶ Fast responding hydraulic door safety interlock.
- ▶ Core pulling control set for hydraulic cores independently programmable.
- ▶ Ergonomically designed, easy to access and easy to service hydraulic circuit layout.
- ▶ Hydraulic oil suction filter (strainer).
- ▶ Energy saving "pump switch off feature" in case of idle running.

GENERAL

- ▶ Ergonomically designed machine covers and doors for safety, with elegant aesthetics.
- ▶ One piece machine base (up to 320T).
- ▶ Flexible machine supports with anti vibration pads.
- ▶ Magnetic trap in feed hopper.
- ▶ Water battery with inlet and outlet temperature indicator.
- ▶ Set of electrical output - single phase (1 x 16A) and three phase (1 x 32A).

OPTIONAL FEATURES

- ▶ Additional core pulling control set for hydraulic cores, independently programmable for sequential or parallel operation.
- ▶ Air blast with pneumatic valve on moving platen.
- ▶ Air blast with pneumatic valve on fixed / stationary platen.
- ▶ Rotating core (hydraulic un-screwing) interface.
- ▶ Electrical un-screwing interface.
- ▶ Robotic arm interface. (Std. or Euromap - 12)
- ▶ Photo-sensor arrangement for molded part drop detection for single cavity.
- ▶ Interface for ejector retract (back) verification with limit switch.
- ▶ Interface for additional nozzle heater band (plug-in only).
- ▶ Injection pressure close-loop.
- ▶ Variable displacement pump.
- ▶ Special barrier screws for better melt homogenization and plasticizing.
- ▶ Wear resistant, bimetallic screw and barrel for processing abrasive / corrosive materials.
- ▶ Hydraulic motor for higher plasticizing speed.

- ▶ Insulated energy saving heater bands.
- ▶ Water battery with flow rate control and temperature indicator.

- ▶ In built, "Elektra Power Saver" (EPS) with thermal cut-off switch for electric motor protection.
- ▶ Accumulator for higher injection rates.

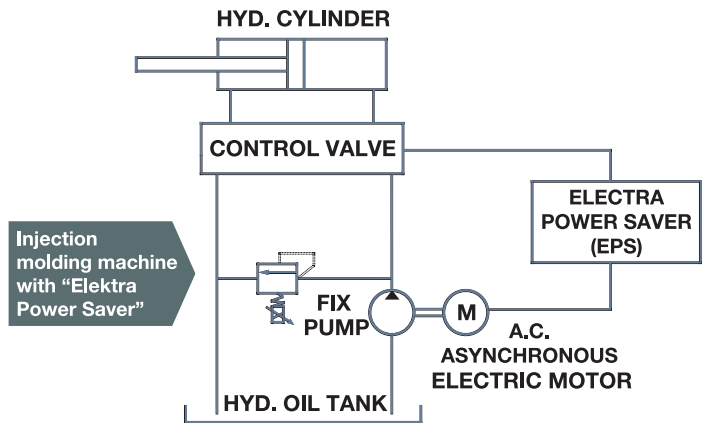
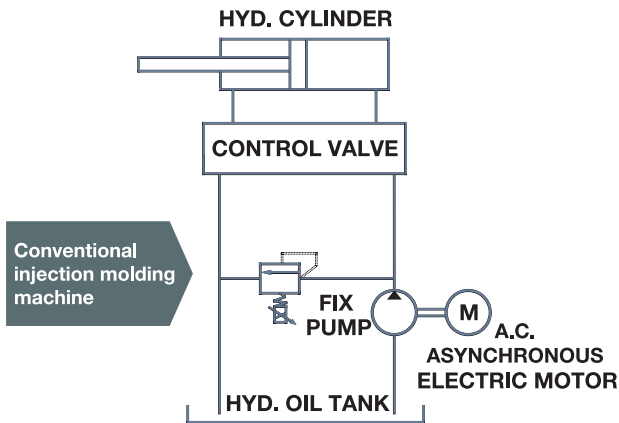
ELEKTRA POWER SAVER

The "Elektra Power Saver" (EPS) is a patented product of Electronica.

The major advantages of this product are as follows:

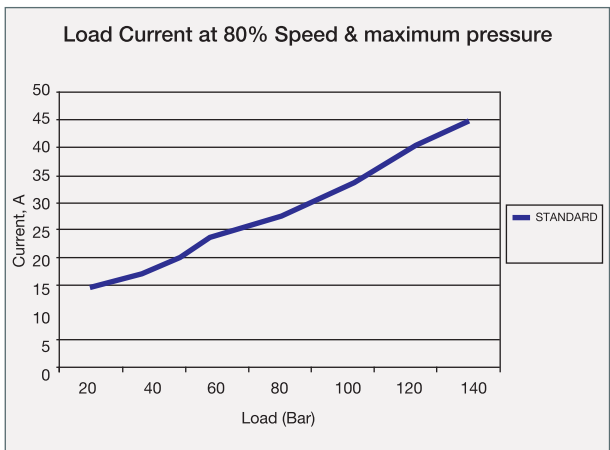
- ▶ It substantially saves the energy required by the electric motor to drive the fixed displacement hydraulic pump up to 20 to 50%.
- ▶ Flux vector control drive ensures the required torque characteristics even at lower motor rpm.
- ▶ It results in the enhanced life of hydraulic oil due to less frictional heat generation.

- ▶ It has a built-in function of electric motor soft start, resulting in lower start up currents.
- ▶ It improves the overall power factor.
- ▶ This results in better machine operational consistency and repeatability.
- ▶ This improves the overall operator's efficiency due to reduced dB levels of machine operating noise.
- ▶ It can be retrofitted on variety of other make of plastic injection molding machines also.

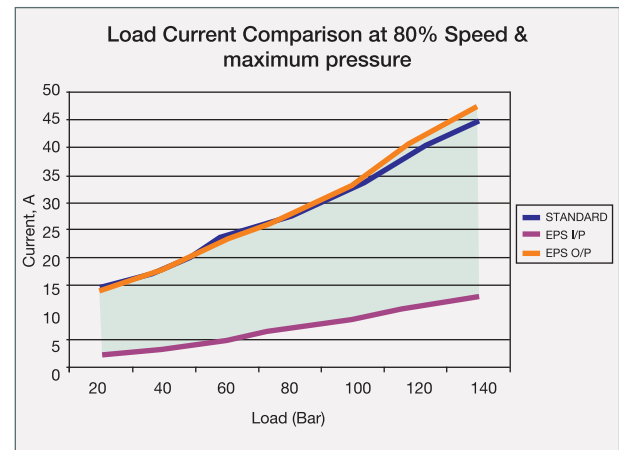


FIXED PUMP + A.C. ASYNCHRONOUS ELECTRIC MOTOR
Standard hydraulic machine with fixed displacement pump & proportional hydraulics.

FIXED PUMP + A.C. ASYNCHRONOUS ELECTRIC MOTOR + ELEKTRA POWER SAVER
Standard hydraulic machine with fixed pump, proportional hydraulics & Elektra Power Saver (EPS).



Standard hydraulic machine - current drawn by the electric motor at 80% speed & maximum pressure.



Standard hydraulic machine with Elektra Power Saver at 80% speed & maximum pressure. Difference between input & output current of the drive is the indication of the power saving.

"ENDURA" SERIES INJECTION MOLDING MACHINES - TECHNICAL SPECIFICATIONS

Machine Model		ENDURA 60			ENDURA 90			ENDURA 120			ENDURA 160			
International dimensions		600H-128			900H-200			1200H-430			1600H-526			
Injection unit number		128			200			430			526			
Injection unit		A	B	C	A	B	C	A	B	C	A	B	C	A
Screw diameter	mm	28	31	35	31	35	40	40	45	50	45	50	55	50
Screw L/D ratio	L/D	21	19	17	22	19	17	20	18	16	21	19	17	21
Stroke volume	cm ³	68	83	106	102	130	170	203	258	318	286	353	427	396
Injection weight max.*	g	64	79	100	97	123	161	193	245	302	272	336	406	377
Injection rate #	cm ³ /s	68	84	107	77	98	128	98	124	153	139	172	208	152
Plasticizing rate #	g/s	6.3	7.9	10.1	9.4	11.9	15.5	15.6	19.8	24.4	26.0	32.1	38.8	33.8
Injection pressure	bar	1897	1548	1214	1961	1539	1178	2112	1669	1352	1839	1490	1231	1971
Screw rpm	min-1	235			210			240			280			
Clamping unit														
Clamping force	kN	600			900			1200			1600			
Mold opening stroke	mm	300			320			400			450			
Dist. Bet. Tie bars, H X V	mm	320 X 320			360 X 360			410 X 410			470 X 470			
Mold thickness, min. - max.	mm	100-320			100-350			160-400			160-500			
Ejector stroke	mm	100			100			110			122			
Ejector force	kN	33			28			29			44			
Ejector number	pcs	5			5			5			5			
General data														
Pump drive	kW	9.30			11.00			15.00			18.50			
Installed heating capacity	kW	6.46			7.65			10.30			13.75			
Total connected power	kW	15.76			18.65			25.30			32.25			
Machine dimensions, LxWxH	m	3.7 X 1.5 X 1.7			3.8 X 1.6 X 1.8			4.3 X 1.7 X 2.0			4.8 X 1.8 X 2.0			
Oil tank capacity	l	140			190			250			300			
Net weight (without oil)	t	3.1			3.9			4.3			6.4			

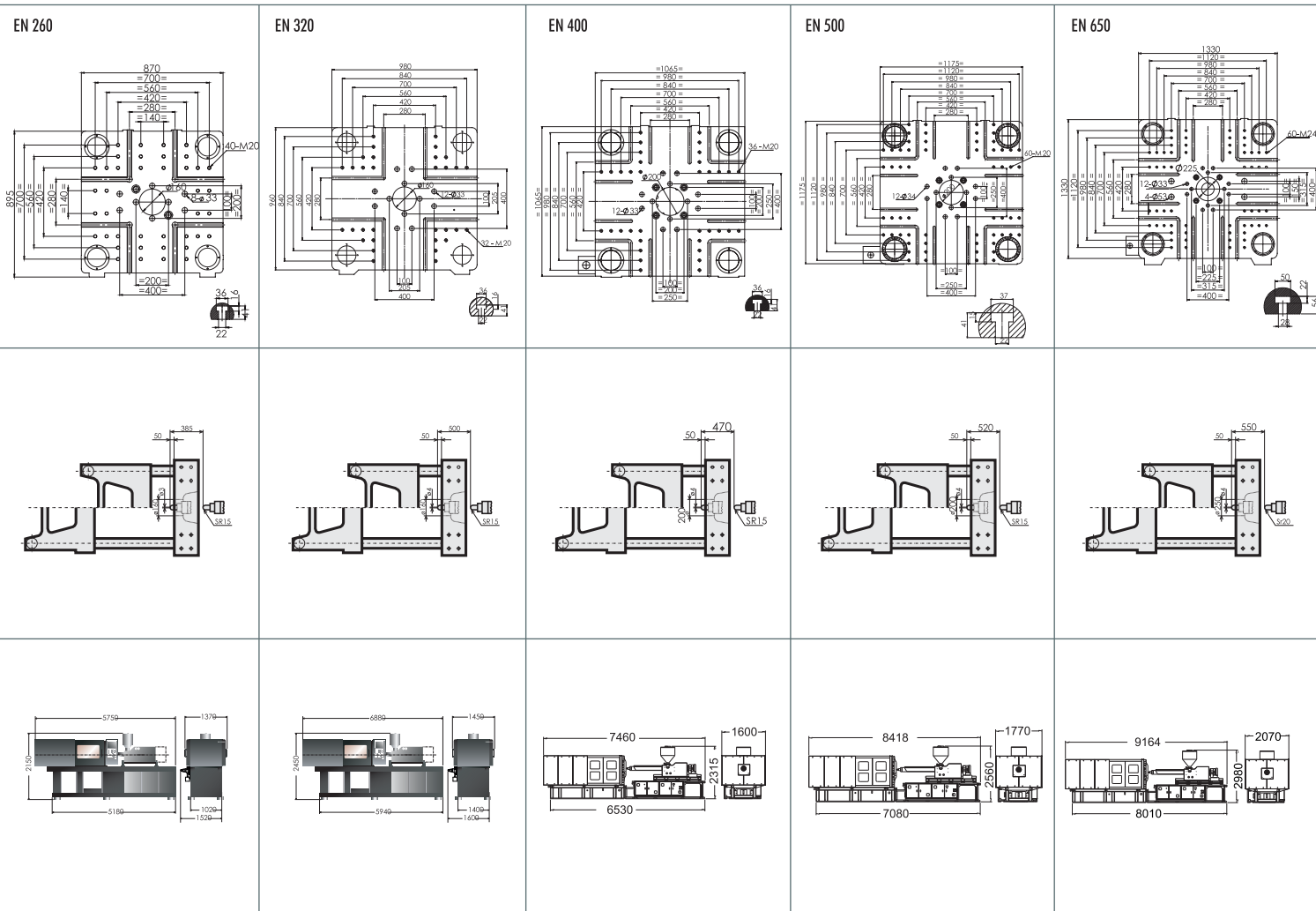
NOTE :

Achieved in air injection. * Theoretical value; actual value may vary depending on material, melt density & residence time • Figures in BOLD indicate standard scope of supply.

	EN 60	EN 90	EN 120	EN 160	EN 220
Platen Dimensions Moving platen					
Platen Dimensions Stationary Platen					
Machine dimensions					

ENDURA 220			ENDURA 260			ENDURA 320			ENDURA 400			ENDURA 500			ENDURA 650		
2200H-781			2600H-941			3200H-1440			4000H-2270			5000H-3080			6500H-4959		
781			941			1425			2270			3080			4959		
B	C		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
55	60		55	60	67	62	67	72	70	75	80	75	80	85	80	90	100
19	17		21	19	17	22.7	21	19.5	21.4	20	18.8	23.5	22	20.7	24.8	22	19.8
480	571		539	642	800	836	976	1127	1385	1590	1809	1762	2005	2263	2361	2988	3690
456	542		512	609	760	794	927	1071	1316	1510	1718	1674	1904	2150	2243	2839	3505
184	219		242	288	359	310	363	419	341	391	445	415	472	533	510	645	796
40.9	48.7		42.6	50.7	63.2	47.7	55.7	64.3	68	73	78	67	71	76	61	68	76
1629	1369		1745	1467	1176	1723	1476	1278	1639	1428	1255	1748	1536	1361	2100	1659	1344
255			273			170			177			158			147		
2200			2600			3200			4000			5000			6500		
480			550			640			700			770			900		
535 X 535			580 X 580			670 X 650			720 X 720			800 X 800			900 X 900		
200-550			200-600			250-660			220-730			250-800			320-900		
125			167			167			180			231			245		
44			66			68			118			142			170		
9			9			13			13			13			17		
22.00			30.00			37.00			37			45			30+37		
15.90			18.43			21.33			21			30			45		
37.90			48.43			58.33			58			75			112		
5.6 X 1.9 X 2.1			6.1 X 2.1 X 2.2			6.9 X 1.6 X 2.5			7.5 X 1.6 X 2.31			8.4 X 1.77 X 2.56			9.16 X 2.07 X 2.98		
400			490			600			720			900			1300		
7.8			9.3			11.5			16.5			20.3			32		

• Specifications are subject to change due to continuous improvements • To be used strictly under standard electrical supply conditions of 415V± 5% MAX., 50 Hz, 3 Phase + N.





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