

# MILACRON THE eQ-SERIES

# HIGH PRECISION ELECTRIC INJECTION MOULDING

#### INGENUITY, DEDICATION AND EXPERIENCE

eQ-SERIES gives you the flexibility to handle more applications. eQ-SERIES's movements are entirely controlled by servo drives. This not only results in maximized acceleration, but it ensures ultimate accuracy and exceptional reliability across all processes as well as highly precise motion, position and pressure control.

### RELIABILITY AND REPEATABILITY FOR HIGH PRECISION ELECTRIC INJECTION MOULDING

- 😂 Large Tie Bar spacing and highly sensitive mould safety
- 😂 Moving platen on L M guideway
- Simplfied programming of freely configurable cores
- Solution Very low maintenance costs proven design and product optimisation results in maximum machine uptime, fewer components and less wear



# **SERVO TECHNOLOGY MAKES THE DIFFERENCE**

The latest generation servo drives are designed for handling fast acceleration and short time peak current. The feeding of energy back to the power supply optimizes energy consumption.

## **CYCLE TIME SAVINGS**

Optimize your cycle time using simple pre-injection function. Typical cycle reduction of 0.3 – 0.7 seconds.



## **UNMATCHED REPRODUCIBILITY**



Fast and Smooth Mould movements

# **THE eQ-SERIES**

#### **IMPROVED CLAMP DESIGN**



## PROVIDING THE HIGHEST PERFORMANCE, PRECISION AND FLEXIBILITY.



#### **STRONG & STABLE INJECTION UNIT**

# THE eQ-SERIES

The industry standard setting technology found in the eQ-SERIES all-electric injection moulding machine is a direct result of years of dedication and experience.

eQ-SERIES is the next generation of injection moulding machine, with higher precision and reliable moulding capabilities than ever before. Engineered for greater rigidity, eQ-SERIES's proven performance makes it the perfect solution for cleanrooms and other moulding environments that demand precise process control, high speed injection, and consistent repeatability.

## **Injection Unit Specifications**

IU	120	300	450	630	970	1540	2290	3470
eQ-SERIES 110								
eQ-SERIES 150								
eQ-SERIES 180								
eQ-SERIES 230								
eQ-SERIES 280								
eQ-SERIES 350								
eQ-SERIES 450								

## **Clamp Specifications**

MODEL	TONNAGE	PLATEN SIZE (H X V)	TIE BAR SPACING (H X V)	MAX DAYLIGHT	MIN/MAX MOULD THICKNESS
	tons	mm	mm	mm	mm
eQ-SERIES 110	110	690 x 645	480 x 435	900	150 / 520
eQ-SERIES 150	150	780 x 740	550 x 510	1060	200 / 600
eQ-SERIES 180	180	810 x 770	575 x 525	1100	200 / 600
eQ-SERIES 230	230	920 x 820	660 x 560	1260	200 / 710
eQ-SERIES 280	280	990 x 940	710 x 660	1400	250 / 750
eQ-SERIES 350	350	1120 x 1035	810 x 725	1520	300 / 800
eQ-SERIES 450	450	1245 x 1200	875 x 830	1670	350 / 820

### **APPLICATIONS**

• CAPS & CLOSURES • PACKAGING • MEDICAL • AUTOMOTIVE



## **CLAMPING UNIT**

The all new clamp system on the eQ-series has been mounted on the LM guideways which provide precise movement with no frictional losses. The clamp system has higher mold weight carrying capacity, enhanced parallelism and squareness.



- Clamp designed for uniform force distribution minimising platen deflection and reducing mould flash tendency
- Automatic Die Height adjustment for accurate tonnage setting
- Standard Core software provides flexibility to customer in configuring special sequences; Various options of portable hydraulic power units available.
- Water systems available to increase cooling efficiency and higher productivity
- Mould Guard & Eject Guard reduces risk of damaging delicate and expensive moulds. Tonnage drop feature helps reduce cycle time by releasing tonnage parallel to cooling.
- Anti-fretting Mould clamping design\*  $\bigcirc$
- Improved toggle clamp for increasing productivity with reduced vibrations\*



Smooth & Fast movement of Clamp

Better performance than conventional Electric Injection Moulding machines.



## **INJECTION UNIT**

#### C High performance injection motors

• Servo motors / drives optimised to deliver optimum performance with power.

• Reduced melt stress (70%)

#### 😂 High performance injection unit

- Fast & accurate injection pressure control with 500 sampling every second
- Selectable dynamics of Injection supports special applications & improves component life
- Hydraulic sled unit\* for higher nozzle contact force requirement in packaging application
- 25% Increased Injection Speed with reduced pressure possible

#### C Pre-Injection

eQ-SERIES's Pre-Injection feature enables the start of injection based on partial tonnage (selectable) built up.

- Enhanced mould venting is controlled by injection timing and also available based on pressure or clamp tonnage feedback
- Instant cycle time reduction by overlapping of injection and tonnage build and/or clamp force decompression during cooling stage











### **FLEXIBLE MACHINE**

# **PROTECT YOUR VALUABLE MOULDS**

The Mould is one of the most critical parts of the injection molding process. The all new eQ-SERIES machines take care of your mold with Mould Safety as a standard feature. It's a closed loop control process which senses the presence of left over article from the last process cycle or any foreign article in between the core & the cavity. It's a continuous monitoring system. The control records & analyses the data after every process cycle.

# MAXIMUM MOULD AND EJECTOR PROTECTION

eQ-SERIES Mould and Ejector Protection provides the best mould protection on the market.

#### **RELIABLE PROTECTION AT NO COST TO SPEED**

This kind of high-speed responsiveness is provided by its electric drives and superior motion control technology. Clamp tolerances are also programmable across the entire mould movement.

### YOUR BENEFITS WITH EQ-SERIES MOULD AND EJECTOR PROTECTION:

- · Protects your mould from damage
- Minimal repair costs
- Reduces costly downtime
- Very easy set-up just turn on and set sensitivity level







### LOW ENERGY CONSUMPTION

Milacron's superior servo technology and intelligent energy recovery system reduces eQ-SERIES's energy consumption by 50-70% compared to hydraulic machines. eQ-SERIES's regenerative power recovery system stores energy during motor braking and makes it available for other motions.

#### **POWER CONSUMPTION BREAKTHROUGHS**

Power consumption of each function is recorded. The excess energy fed back from the motors is also monitored. The insulated heater bands prevent loss of energy in form of heat.





# SMALLER FOOTPRINT. INTEGRATED POWERPACK\*

The eQ-SERIES comes equipped with a powerpack inside the base of the machine. This reduces the overall footprint of the machine and the need to invest in an additional external powerpack.

#### **Benefits**

- Space Saving
- Pre-configured / Integrated with machine capability
- Leakfree / Low noise design

#### **O** Application

- Core pull
- High ejector force
- High nozzle contact force



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## **VERSATILE MACHINERY FOR ALL APPLICATIONS**

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With models capable of exerting clamping forces from 110 to 450 tons, eQ-SERIES is ideally suited to a diverse range of straightforward as well as sophisticated injection moulding tasks. Offering huge versatility, eQ-SERIES's unique strength is the freedom it provides you to produce almost anything using just one machine – whether that be delicate items such as thick wall camera lenses, micro medical or thin wall packaging products, that require high levels of dynamic force to produce. Thanks to its high level of specification, even standard eQ-SERIES machines can be used to produce specialised items.



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# AUTOMOTIVE INDUSTRY

With a host of functions designed specifically to resolve the issues – such as gas venting or variations in plasticising time and volume – that can impact the production of automotive parts eQ-SERIES is ideally suited the large-scale manufacture of automotive parts. eQ-SERIES will continue producing flawless parts over the long term, delivering excellent cycle times and requiring minimum maintenance. Repeatability is also in a class of its own, with the machine delivering exactly the same quality after multiple cycles as it did on the first shot. What is more, because production runs in the automotive industry change frequently, eQ-SERIES comes with the widest range of available screw sizes, providing you with the power to adapt and enjoy outstanding versatility from a single machine.





#### **Ultimate flexibility**

The eQ-SERIES allows moulders the maximum amount of application flexibility with its increased daylight option and easily interchangeable barrels and screws. The eQ-SERIES also provides exetional repeatability when moving moulds from machine to machine even when changing models or tonnages.

#### Capability to integrate additional axes

By using servo motors and drives, the eQ-SERIES can fully integrate multiple additional axes all through one control. The eQ-SERIES has the capability to easily integrate and maintain precise control and movement repeatability.

eQ-SERIES can be fully integrated with other axes (like cores, both hydraulic and electric) allowing all functions to be operated from the one machine.

#### Optimal networking using Euromap 77 & M-Powered

M-Powered integrates all Injection Moulding Machines from Milacron to a single platform for performance management.

Euromap 77 are quality information management systems for globalised and larger scale of moulding plants.

- Central production monitoring
- Process data capture & extraction
- Machine status visualisation
- Customised reports

control.







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# MEDICAL INDUSTRY

Quality, reliability and repeatability are critical to the production of medical products. eQ-SERIES has a highly sensitive pre-injection process to resolve any issue related to processing of medical grade plastics.

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#### Integrated hot runner control

This allows the machine operator to control the processing parameters from the machine control thereby providing ease of operation.

#### **Historical traceability**

Given the nature of medical products, acquiring and processing data is critical. To make this easy eQ-SERIES is available with smart features – such as M-Powered & Euromap 77 OPC designed to capture and store data on a central server and provide complete part traceability.

#### **Enhanced processing information**

Just what you need for setting up, validation and ongoing monitoring.

- Reference data curve storage
- Quality control outputs
- Multiple curve display
- Optional multiple cavity pressure interface with external signal transfer
- Process data download during operation to External USB device / Network location.
- Available 0-10Vdc for multiple parameters
- Custom Signal capability to interface with automation

#### **Dimensional Accuracy**

The product output from the eQ-SERIES is always consistent in terms of weight and dimensions, two things that matter the most in the medical industry.

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# PACKAGING

eQ-SERIES offers solutions for maximum productivity in the packaging market. Whether it's sparkling clear, durable, or thin-walled parts, the eQ-SERIES can deliver rapid and precise injection and mould movements. The standard pre-injection function allows for faster injection times without vent burning and decompression of clamp force while in the cooling phase. Demanding process capabilities include in-mould-labeling, servo unscrewing for caps or multi-component technology. With the high acceleration injection, instantaneous transition and the high response servo-motor control, eQ-SERIES maintains superior shot weight control.



## Heavy-duty injection units for faster cycle times

The production of components for the packaging industry often demand machines that are capable to achieve cycle times less than 5 sec. to produce closures and food containers. eQ-SERIES has a proven injection unit to achieve this.

#### Increase the quality of your optical parts

For packaging parts, control of the mould temperature is critical for surface quality. Integrating this functionality into the control saves time and helps prevent errors.

Consistent moulding is enabled by the clamp and ejector compression function.

#### Screw variation and flexibility

Milacron offers a variety of different screw and barrel materials specifically designed to fit your application.

#### Wide Tie Bar Spacing

The eQ-SERIES is able to accommodate wider moulds for various packaging applications. This is due to the industry's best Tie-Bar spacing provided on the clamp. The clamp also has higher mould weight carrying capacity than the older generation machines.



## **STANDARD FEATURES**

CLAMP	
5 Operator adjustable closing & opening speeds	٠
Tonnage Display on screen	٠
All parameters set in Physical / Absolute values	٠
Mould safety speed and force adjustable	٠
Position based accel/decel	٠
Clamp position read out	٠
Open Loop Auto die height adjust (toggle)	٠
Moving Platen on Linear Guides and Grease Free Tie Bars	٠
Clamp try again	٠
Clamp Force Decompression during Cooling	٠
Grease Collection Tray below Toggle Area and Moving Platen	٠
Euromap Mould Mounting Holes pattern	•
Euromap 18 Robot mounting on Stationary Platen	٠
Extended Daylight	0
Extra Shoe for Stack Mould on LM guide	0
T-Slot Platen	0
T-Slot with tapped Holes	0
JIS Mould Mounting	0
JIS ejector	0
Quick change ejector coupling (Centre Ejector)	0
Pneumatic Jam Bar	0
Robot Mounting as per SPI	0
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#### EXTRUDER

EATRODER	
Digital set extruder speed (RPM)	٠
Digital read out actual RPM	•
Closed Loop speed (RPM) control	•
5 Extruder RPM steps - refilling cycle	•
Closed Loop Back Pressure control	•
5 Back pressure steps	•

#### EJECTOR

Ejector position read out	•
Closed Loop Speed control	٠
Intermediate retract setpoint	٠
Adjustable forward/retract speed	٠
2 Forward speeds (Separate speeds for 2nd pulse & 3-9 pulses i.e. 2 more speeds)	•
2 Retract speeds	•
9 Ejector pulses	٠
Parellel Ejection (Eject on Fly)	•
Ejector Stay Forward with Gate Open via Ejector Motor with Brake	•
Eject Retract verification by Limit Switch	•
SPI Knock out Bar for Multipoint Ejection	٠
Center Ejector Rod With Side Ejector Pins (4 +1) upto 450T	•
Hydraulic Ejector for High Ejector Force	0

INJECTION	
Closed Loop Velocity	
20 Configurable velocity steps (10 - Fill & 10- Pack/Hold)	
Closed Loop Pressure control	•
10 - Fill pressure steps	
10 Configurable packing/hold pressure steps	•
Transfer Ti = Time; Po = Position; Pr. = Pressure	
Delayed start of plasticizing function	•
Thermocouple breakage monitoring	•
All parameters set in Physical / Absolute values	•
Injection Position readout	
Injection pressure on screen by Loadcell	٠
Cold Start Protection	•
Injection decompression before/after/both	•
Insulated Ceramic Heaters for energy saving	•
Injection on Linear Guides for fast speed and smooth movement	•
Nitrided GPPS Screw, Barrel and Nonreturn valve	•
Electric Injection unit Movement and Nozzle Holding Force	•
Sliding Hopper with magnet	•
Pneumatic Shut Off Nozzle	0
Wear Resistant (Bi-Metalic) Barrel	0
Wear Resistant Feedscrew	0
Special TSV	0
High Temperature Heaters	0
Extended nozzle tip & Heaters	0
High Speed Injection	0
Longer Holding Time	0
Electric Nozzle Contact Force	0

TIMERS	
Overall cycle timer	٠
Injection delay timer	•
Injection timer	٠
Injection pack/hold	٠
Cool timer	٠
Extruder delay timer	٠
Extruder Overrun timer	٠
Sled retract delay timer	٠
Sprue break with timer	•
Clamp open dwell timer	٠
Ejector forward & retract delay timer	٠
Decompression Before & After Delay Timer	•
Timer precision - 0.01 Sec	٠
Weekday Timer	٠

TEMPERATURE CONTROL	
PID control nozzle	•
PID control all barrel zones	•
High/ low temperature alarms	٠
Feed Throat Temperature Control	•
Auto Heat Start Programme	٠
Heater Failure Detection & Monitoring on screen	•

• - Standard Feature O - Optional Feature

# **STANDARD FEATURES**

CONTROL & SOFTWARE	
15.6" FHD Multi-Touch Capacitive Display (MOSAIC G3 Control)	٠
20 function keys with LEDs (arranged around the Touch Screen)	•
Actual Injection Speed & Pressure Graph Display	•
30 Parameter monitoring for last 3000 cycles	•
500 Mould data storage	•
High / Low Limit Display for Each Adjustable Parameter	•
I/O diagnosis - Analog & Digital	•
Manual in PDF format for help	•
Overview Menu for Easy access of all axis parameters	•
Choice of Multiple Languages	•
Unit Selection (Metric or English)	•
Data Protection with four level of access	•
Graphical Representation of last 48 Hours Production	•
Daily Production Data of last 1 Year	•
Graphical Representation of Cycle Analysis	•
Energy Consumption analysis for each axis (Energy display in kWH for every cycle on MMI)	•
Automatic Reporting of Process Data, Alarms, Change log (USB or Network location)	•
Change Log Menu:logs last 3000 Set Points Changes with Time/Date & User	•
3000 Alarms History with Date & Time Log	•
Process Mode:Functions with its Co-functions on a Single Key Press	•
Note Pad	•
Freely Programmable Smart Outputs & Inputs (total 3 inputs and outputs)	•
Freely Configurable Cores, Ejector & Air	•
4 User Configurable actual parameters for ease of monitoring for operators	•
Soft Keys for selection of Cores, Air & Mold Gates to operate in Set/Manual Mode	•
Favorite Page - Select 4 frequently used pages & operate from single page	•
Graphical adjustment of Clamp & Extruder Speeds & Pressure	•
Graphical display of Actual Zone Temperature of last 30 mins.	•
Detailed Cause & Remedy of Alarm helps easy understanding and resolution of error	•
Filtering of Alarm - Helps in quick analysis of specific alarm	
Filtering & sort of Changelog - Helps in quick review / analysis of parameter changes	•
Configurable FlyOut area for viewing frequently used Monitoring Pages	٠
No Page more than two clicks away	•
Auto shut down	•
Visual & Audible Alarm	•
Set point and actual values shown as absolute values	•
Plausibility check on values entered	•
Data saving in USB-Mould Data, Change log, Trend Data, Log book, Alarm History, Screen Shot	•
Shift wise Production Counter	
Servo Motor / Drive diagnostic screen	
Semi Auto Purge	٠
Cold slug removal by extruder/ Injection	•
Intrusion Moulding	•
Insert Moulding	•
Freely Programmable Core pull Sequence	•
Sprue break with Limit Switch	•
2 free editing cores are controlled by the robot / Std EM 67	•
Pre-Injection (Injection along with Clamp force build up)	•
Parallel operation for mould movement, ejector and plasticizing	•

CONTROL & SOFTWARE	
Mould Guard	٠
Ejector Guard	•
Injection Acceleration Control Auto Modes	•
Automatic log off	•
Shift based Production Counter	•
Logbook Reading of Controller on screen	٠
Robot Interface (SPI & Euromap -12 & -67)	0
Eject Retract verification by Limit Switch	0
Good / Defective Part Signal	0
Gas Assist injection Interface	0

ELECTRICS	
Electrics - 400V, 50Hz, 3-Phase	٠
Servo Motor & Regenerative Drive for Clamp, Ejector, Injection and Extruder	•
Semi Auto Push Button	•
Hour Meter on electrical panel	•
Power on Push button present on control cabinet left door to reset control supply after machine power supply failure or clearance of fault in voltage monitor relay.	•
UV/OV monitoring Relay-Voltage monitor relay	•
Surge suppressor device	٠
Electrical unscrewing	0
Extra Power Supply	0
Neutral Free Electric Panel	0
Air Conditioning for Electrical Panel	0

HYDRAULIC, AIR & WATER	
Hydraulic Core	0
Hydraulic MGO	0
Pneumatic MGO	0
Hydraulic Unscrewing	0
Air Ejection	0
Manual Air eject (Up to 8 stage)	0
Water Manifold 4/5/7 Stack	0
Water Battery 4/5/7 Stack	0
Water saver valve for mould/pulse cooling	0

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• - Standard Feature O - Optional Feature

\* Features not available on all models.

# THE eQ-SERIES

### Injection Unit 120, 300, 450 TECHNICAL SPECIFICATIONS

105 (4 x)



C Ø27 THRU, (4) HOLES IN MOVING PLATEN, K/O BAR M16 THRU (4) HOLES





†IU 120 / 300 / 450

	UNIT	120				300		450		
	METRIC	Α'	A	В	A'	Α	В	A'	В	C
INJECTION UNIT SPECIFICATIONS				1	1					
INJECTION CAPACITY MAX. (GPPS)	gms	29	56	81	108	146	191	165	215	272
THEORETICAL DISPLACEMENT	cc	31	59	85	113	154	201	173	226	286
INJECTION PRESSURE MAX.	bar	2444	2016	1400	2510	1958	1499	2443	1984	1568
INJECTION RATE (STD) *	cc/sec	52	98	142	141	193	251	168	220	278
INJECTION SPEED (STD)	mm/sec	200	200	200	200	200	200	175	175	175
INJECTION RATE (HIGH) *	cc/sec	90	172	248	247	337	440	336	439	556
INJECTION SPEED (HIGH)	mm/sec	350	350	350	350	350	350	350	350	350
INJECTION SCREW STROKE	mm	120	120	120	160	160	160	180	180	180
SCREW DIAMETER	mm	18	25	30	30	35	40	35	40	45
SCREW L/D RATIO		20	20	20	26.6	22.9	20	25.7	22.2	20
SCREW SPEED	rpm	400	400	400	400	400	400	400	400	400
SCREW TORQUE	NM	175	175	175	350	350	350	550	550	550
PLASTICISING RATE (GP SCREW) *	gm/sec	3	8	12	13	17	24	18	25	34
PLASTICISING RATE (BARRIER SCREW) *	gm/sec	-	-	-	-	24	32	24	33	44
NOZZLE HOLDING FORCE	kN		25		25			25		
NO. OF THERMOCOUPLES (BAR- REL&NOZZLE)			3+1		4+1			4+1		
TOTAL HEAT CAPACITY	KW	4.6	6.7	7.9	9.2			11.3		
CLAMP UNIT SPECIFICATIONS										
CLAMP FORCE	Ton		110			110			110	
CLAMP STROKE	mm		380		380			380		
MAXIMUM DAYIGHT	mm		900		900			900		
MINIMUM MOULD HEIGHT	mm		150		150			150		
MAXIMUM MOULD HEIGHT	mm		520		520			520		
PLATEN SIZE (H X V)	mm		690 X 645		690 X 645			690 X 645		
TIE BAR SPACING	mm		480 X 435		480 X 435			480 X 435		
TIE BAR DIAMETER	mm		75		75			75		
EJECTOR STROKE	mm		140		140				140	
EJECTOR FORCE	Ton		3.2		3.2				3.2	
MOULD WEIGHT CAPACITY (STAT. / MOVING)	kg		1540 (770 / 770)	)	1540 (770 / 770)				1540 (770 / 770)	
GENERAL	GENERAL									
TOTAL CONNECTED LOAD	kW	11 12 13			15				18	
WATER REQUIREMENT (INLET TEMP. 29°C)	lpm	30			30			30		
MACHINE DIMENSION (L X W X H)	m		4.9 x 1.6 x 2.3		5.4 x 1.6 x 2.3			5.7 x 1.6 x 2.3		
MACHINE WEIGHT	kg		5500			5700		6200		

\* WITH OPEN NOZZLE

All machine dimensions and specifications are subject to change. Values are for reference only. These values are for standard machine power.

### THE eQ-SERIES TONNAGE: 150

### Injection Unit 300, 450, 630 TECHNICAL SPECIFICATIONS

105





<sup>†</sup>IU 300 / 450 / 630

	UNIT	300				450		630		
	METRIC	A'	Α	В	A'	A	В	A'	В	C
INJECTION UNIT SPECIFICATIONS	1	<u>.</u>			1	1	1	1	1	<u>.</u>
INJECTION CAPACITY MAX. (GPPS)	gms	108	146	191	165	215	272	239	303	374
THEORETICAL DISPLACEMENT	CC	113	154	201	173	226	286	251	318	393
INJECTION PRESSURE MAX.	bar	2510	1958	1499	2443	1984	1568	2492	1969	1595
INJECTION RATE (STD) *	cc/sec	141	193	251	168	220	278	220	278	344
INJECTION SPEED (STD)	mm/sec	200	200	200	175	175	175	175	175	175
INJECTION RATE (HIGH) *	cc/sec	247	337	440	336	439	556	415	525	648
INJECTION SPEED (HIGH)	mm/sec	350	350	350	350	350	350	330	330	330
INJECTION SCREW STROKE	mm	160	160	160	180	180	180	200	200	200
SCREW DIAMETER	mm	30	35	40	35	40	45	40	45	50
SCREW L/D RATIO		26.6	22.9	20	25.7	22.2	20	25	22.2	20
SCREW SPEED	rpm	400	400	400	400	400	400	400	400	400
SCREW TORQUE	NM	350	350	350	550	550	550	700	700	700
PLASTICISING RATE (GP SCREW) *	gm/sec	13	17	24	18	25	34	25	34	45
PLASTICISING RATE (BARRIER SCREW) *	gm/sec	-	24	32	24	33	44	32	49	67
NOZZLE HOLDING FORCE	kN		25		25			25		
NO. OF THERMOCOUPLES (BARREL&NOZ- ZLE)		4+1			4+1			4+1		
TOTAL HEAT CAPACITY	KW		9.2		11.3			15.7		
CLAMP UNIT SPECIFICATIONS										
CLAMP FORCE	Ton		150		150				150	
CLAMP STROKE	mm		460		460				460	
MAXIMUM DAYIGHT	mm		1060			1060		1060		
MINIMUM MOULD HEIGHT	mm		200		200			200		
MAXIMUM MOULD HEIGHT	mm		600		600			600		
PLATEN SIZE (H X V)	mm		780 X 740		780 X 740			780 X 740		
TIE BAR SPACING	mm		550 X 510		550 X 510			550 X 510		
TIE BAR DIAMETER	mm		85		85			85		
EJECTOR STROKE	mm		160		160				160	
EJECTOR FORCE	Ton		4		4				4	
MOULD WEIGHT CAPACITY (STAT. / MOVING)	kg	2300 (1100 / 1200)			2300 (1100 / 1200)			2300 (1100 / 1200)		
GENERAL										
TOTAL CONNECTED LOAD	kW	15			18				25	
WATER REQUIREMENT (INLET TEMP. 29°C)	lpm		30		30			30		
MACHINE DIMENSION (L X W X H)	m		5.6 x 1.6 x 2.4			5.9 x 1.6 x 2.4			6.2 x 1.6 x 2.4	
MACHINE WEIGHT	kg		7000			7500		7800		

\* WITH OPEN NOZZLE

All machine dimensions and specifications are subject to change. Values are for reference only. These values are for standard machine power.

### THE eQ-SERIES TONNAGE: 180

### Injection Unit 450, 630, 970 TECHNICAL SPECIFICATIONS





UNIT METRIC A' A B A' Α В A' В C INJECTION UNIT SPECIFICATIONS INJECTION CAPACITY MAX. (GPPS) ams THEORETICAL DISPLACEMENT CC INJECTION PRESSURE MAX. bar INJECTION RATE (STD) \* cc/sec INJECTION SPEED (STD) mm/sec INJECTION RATE (HIGH) \* cc/sec INJECTION SPEED (HIGH) mm/sec INJECTION SCREW STROKE mm SCREW DIAMETER mm SCREW L/D RATIO 22.2 SCREW SPEED rpm SCREW TORQUE NM PLASTICISING RATE (GP SCREW) \* am/sec PLASTICISING RATE (BARRIER SCREW) \* gm/sec NOZZLE HOLDING FORCE kΝ NO. OF THERMOCOUPLES (BARREL&NOZ-4+1 4+1 4+1 ZLE) TOTAL HEAT CAPACITY 16.9 KW 11.3 15.7 **CLAMP UNIT SPECIFICATIONS CLAMP FORCE** Ton **CLAMP STROKE** mm MAXIMUM DAYIGHT mm MINIMUM MOULD HEIGHT mm MAXIMUM MOULD HEIGHT mm PLATEN SIZE (H X V) 810 x 770 810 x 770 810 x 770 mm **TIE BAR SPACING** 575 x 525 575 x 525 575 x 525 mm TIE BAR DIAMETER mm EJECTOR STROKE mm EJECTOR FORCE Ton MOULD WEIGHT CAPACITY 2500 (1200 / 1300) 2500 (1200 / 1300) 2500 (1200 / 1300) kg (STAT. / MOVING) GENERAL TOTAL CONNECTED LOAD kW WATER REQUIREMENT lpm (INLET TEMP. 29°C) MACHINE DIMENSION (L X W X H) m 6.0 x 1.7 x 2.5 6.3 x 1.7 x 2.5 6.3 x 1.7 x 2.5 MACHINE WEIGHT 

#### \* WITH OPEN N077LE

All machine dimensions and specifications are subject to change. Values are for reference only. These values are for standard machine power.

kg

†IU 450 / 630

THE eQ-SERIES TONNAGE: 230

### Injection Unit 450, 630, 970 TECHNICAL SPECIFICATIONS







†IU 450 / 630 / 970

	UNIT	450				630		970		
	METRIC	A'	A	В	Α'	A	В	A'	В	C
INJECTION UNIT SPECIFICATIONS										
INJECTION CAPACITY MAX. (GPPS)	gms	165	215	272	239	303	374	363	448	646
THEORETICAL DISPLACEMENT	CC	173	226	286	251	318	393	382	471	679
INJECTION PRESSURE MAX.	bar	2443	1984	1568	2492	1969	1595	2249	2057	1428
INJECTION RATE (STD) *	cc/sec	168	220	278	220	278	344	279	343	495
INJECTION SPEED (STD)	mm/sec	175	175	175	175	175	175	175	175	175
INJECTION RATE (HIGH) *	cc/sec	336	439	556	415	525	648	525	648	934
INJECTION SPEED (HIGH)	mm/sec	350	350	350	330	330	330	330	330	330
INJECTION SCREW STROKE	mm	180	180	180	200	200	200	240	240	240
SCREW DIAMETER	mm	35	40	45	40	45	50	45	50	60
SCREW L/D RATIO		25.7	22.2	20	25	22.2	20	26.7	24	20
SCREW SPEED	rpm	400	400	400	400	400	400	350	350	320
SCREW TORQUE	NM	550	550	550	700	700	700	1100	1100	1100
PLASTICISING RATE (GP SCREW) *	gm/sec	18	25	34	25	34	45	30	39	58
PLASTICISING RATE (BARRIER SCREW) *	gm/sec	24	33	44	32	49	67	39	53	74
NOZZLE HOLDING FORCE	kN		25		25			30		
NO. OF THERMOCOUPLES (BARREL&NOZ- ZLE)			4+1		4+1			4+1		
TOTAL HEAT CAPACITY	KW		11.3		15.7			16.9		
CLAMP UNIT SPECIFICATIONS										
CLAMP FORCE	Ton		230			230			230	
CLAMP STROKE	mm		550		550				550	
MAXIMUM DAYIGHT	mm		1260			1260			1260	
MINIMUM MOULD HEIGHT	mm		200		200				200	
MAXIMUM MOULD HEIGHT	mm		710			710		710		
PLATEN SIZE (H X V)	mm		920 x 820			920 x 820		920 x 820		
TIE BAR SPACING	mm		660 x 560		660 x 560			660 x 560		
TIE BAR DIAMETER	mm		105			105		105		
EJECTOR STROKE	mm		180			180			180	
EJECTOR FORCE	Ton		6.0		6.0				6.0	
MOULD WEIGHT CAPACITY (STAT. / MOVING)	kg	3200 (1500 / 1700)			3200 (1500 / 1700)			32	200 (1500 / 1700	)
GENERAL										
TOTAL CONNECTED LOAD	kW		18		25				32	
WATER REQUIREMENT (INLET TEMP. 29°C)	lpm		30		30			30		
MACHINE DIMENSION (L X W X H)	m		6.6 x 1.8 x 2.6		6.5 x 1.8 x 2.6			6.8 x 1.8 x 2.6		
MACHINE WEIGHT	kg		10500			10800		12000		

\* WITH OPEN NOZZLE

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THE eQ-SERIES

### Injection Unit 630, 970, 1540

### **TECHNICAL SPECIFICATIONS**





1811.5/1811.5<sup>t</sup>

<sup>†</sup>IU 970 / 1540

	UNIT	630				970		1540		
	METRIC	Α'	A	В	A'	Α	В	A'	A	В
INJECTION UNIT SPECIFICATIONS										
INJECTION CAPACITY MAX. (GPPS)	gms	239	303	374	363	448	646	523	753	1025
THEORETICAL DISPLACEMENT	CC	251	318	393	382	471	679	550	792	1078
INJECTION PRESSURE MAX.	bar	2492	1969	1595	2249	2057	1428	2236	1941	1426
INJECTION RATE (STD) *	cc/sec	220	278	344	279	343	495	314	453	616
INJECTION SPEED (STD)	mm/sec	175	175	175	175	175	175	160	160	160
INJECTION RATE (HIGH) *	cc/sec	415	525	648	525	648	934	589	849	1155
INJECTION SPEED (HIGH)	mm/sec	330	330	330	330	330	330	300	300	300
INJECTION SCREW STROKE	mm	200	200	200	240	240	240	280	280	280
SCREW DIAMETER	mm	40	45	50	45	50	60	50	60	70
SCREW L/D RATIO		25	22.2	20	26.7	24	20	28	23.3	20
SCREW SPEED	rpm	400	400	400	350	350	320	350	320	275
SCREW TORQUE	NM	700	700	700	1100	1100	1100	1600	1600	1600
PLASTICISING RATE (GP SCREW) *	gm/sec	25	34	45	30	39	58	40	58	77
PLASTICISING RATE (BARRIER SCREW) *	gm/sec	32	49	67	39	53	74	52	74	101
NOZZLE HOLDING FORCE	kN		25		30			30		
NO. OF THERMOCOUPLES (BAR- REL&NOZZLE)			4+1		4+1			5+1		
TOTAL HEAT CAPACITY	KW		15.7		16.9			24.9		
CLAMP UNIT SPECIFICATIONS										
CLAMP FORCE	Ton		280			280			280	
CLAMP STROKE	mm		650		650				650	
MAXIMUM DAYIGHT	mm		1400		1400				1400	
MINIMUM MOULD HEIGHT	mm		250		250			250		
MAXIMUM MOULD HEIGHT	mm		750		750			750		
PLATEN SIZE (H X V)	mm		990 x 940			990 x 940		990 x 940		
TIE BAR SPACING	mm		710 x 660		710 x 660			710 x 660		
TIE BAR DIAMETER	mm		115		115				115	
EJECTOR STROKE	mm		180		180				180	
EJECTOR FORCE	Ton		6.0		6.0				6.0	
MOULD WEIGHT CAPACITY (STAT. / MOVING)	kg	4400 (1900 / 2500)			4400 (1900 / 2500)			44	400 (1900 / 2500	)
GENERAL						·				
TOTAL CONNECTED LOAD	kW		25		33				43	
WATER REQUIREMENT (INLET TEMP. 29°C)	lpm		30		30			30		
MACHINE DIMENSION (L X W X H)	m		7.0 x 1.9 x 2.8			7.1 x 1.9 x 2.8			7.5 x 1.9 x 2.8	
MACHINE WEIGHT	kg		12300			14200		14700		

\* WITH OPEN NOZZLE

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### THE eQ-SERIES TONNAGE: 350

### Injection Unit 970, 1540, 2290

### **TECHNICAL SPECIFICATIONS**



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UNIT 2290 970 1540 METRIC A' A В A' В A' В A A INJECTION UNIT SPECIFICATIONS INJECTION CAPACITY MAX. (GPPS) 363 448 646 523 753 1025 861 1172 1530 ams THEORETICAL DISPLACEMENT СС 382 471 679 550 792 1078 905 1232 1608 INJECTION PRESSURE MAX. 1941 bar 2249 2057 1428 2236 1426 2238 1856 1421 INJECTION RATE (STD) \* cc/sec 279 343 495 314 453 616 424 578 754 INJECTION SPEED (STD) mm/sec 175 175 175 160 160 160 150 150 150 INJECTION RATE (HIGH) \* 525 648 934 589 849 1155 792 1078 1407 cc/sec INJECTION SPEED (HIGH) 330 330 330 300 300 300 280 280 280 mm/sec INJECTION SCREW STROKE 240 240 240 280 280 280 320 320 320 mm SCREW DIAMETER mm 45 50 60 50 60 70 60 70 80 SCREW L/D RATIO 26.7 24 20 28 23.3 20 267 22.9 20 SCREW SPEED rpm 350 350 320 350 320 275 300 275 240 SCREW TORQUE NM 1100 1100 1100 1600 1600 1600 2600 2600 2600 PLASTICISING RATE (GP SCREW) \* 30 77 39 58 40 58 54 77 93 am/sec PLASTICISING RATE (BARRIER SCREW) \* gm/sec 39 53 74 52 101 69 101 118 74 NOZZLE HOLDING FORCE kΝ 30 30 40 NO. OF THERMOCOUPLES (BAR-4+1 5+1 5+1 REL&NOZZLE) TOTAL HEAT CAPACITY KW 16.9 39.6 24.9 **CLAMP UNIT SPECIFICATIONS CLAMP FORCE** Ton 350 350 350 **CLAMP STROKE** mm 720 720 720 MAXIMUM DAYIGHT 1520 1520 1520 mm MINIMUM MOULD HEIGHT mm 300 300 300 MAXIMUM MOULD HEIGHT 800 800 800 mm PLATEN SIZE (H X V) 1120 x 1035 1120 x 1035 1120 x 1035 mm TIE BAR SPACING 810 x 725 810 x 725 810 x 725 mm TIE BAR DIAMETER mm 125 125 125 EJECTOR STROKE mm 200 200 200 EJECTOR FORCE Ton 7.5 7.5 7.5 MOULD WEIGHT CAPACITY 6000 (2700 / 3300) 6000 (2700 / 3300) 6000 (2700 / 3300) kg (STAT. / MOVING) GENERAL TOTAL CONNECTED LOAD kW 35 45 58 WATER REQUIREMENT 30 30 30 lpm (INLET TEMP. 29°C) MACHINE DIMENSION (L X W X H) m 7.3 x 2.0 x 2.9 7.8 x 2.0 x 2.9 8.6 x 2.0 x 2.9 MACHINE WEIGHT kg 17500 18000 18250

#### \* WITH OPEN NOZZLE

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<sup>†</sup>IU 970 / 1540

### THE eQ-SERIES TONNAGE: 450

### Injection Unit 1540, 2290, 3470 TECHNICAL SPECIFICATIONS



MOVING PLATEN

#### **ALL DIMENSIONS ARE IN MM**

- A M20X45 (164) PLACES ON BOTH PLATEN
- B MOVING PLATEN: Ø125(+0.04/-0.0) THRU BORE, K/0 BAR CENTRE HOLE M24X43 THRU STATIONARY PLATEN: Ø160(+0.040/-0.0) WITH LOCATING RING, Ø200(+0.046/-0.0) x 10(+0.15/-0.0) DEEP, WITHOUT LOCATING RING
- C Ø27 THRU, (12) HOLES IN MOVING PLATEN K/O BAR M16X40 THRU (20) HOLES









<sup>†</sup>IU 1540 / 2290 / 3470

	UNIT	1540				2290		3470			
	METRIC	Α'	Α	В	A'	Α	В	A'	Α	В	
INJECTION UNIT SPECIFICATIONS											
INJECTION CAPACITY MAX. (GPPS)	gms	523	753	1025	861	1172	1530	1318	1722	2179	
THEORETICAL DISPLACEMENT	сс	550	792	1078	905	1232	1608	1385	1810	2290	
INJECTION PRESSURE MAX.	bar	2236	1941	1426	2238	1856	1421	2289	1917	1515	
INJECTION RATE (STD) *	cc/sec	314	453	616	424	578	754	577	754	954	
INJECTION SPEED (STD)	mm/sec	160	160	160	150	150	150	150	150	150	
INJECTION RATE (HIGH) *	cc/sec	589	849	1155	792	1078	1407	962	1257	1590	
INJECTION SPEED (HIGH)	mm/sec	300	300	300	280	280	280	250	250	250	
INJECTION SCREW STROKE	mm	280	280	280	320	320	320	360	360	360	
SCREW DIAMETER	mm	50	60	70	60	70	80	70	80	90	
SCREW L/D RATIO		28	23.3	20	26.7	22.9	20	25.7	22.5	20	
SCREW SPEED	rpm	350	320	275	300	275	240	215	215	215	
SCREW TORQUE	NM	1600	1600	1600	2600	2600	2600	3000	3000	3000	
PLASTICISING RATE (GP SCREW) *	gm/sec	40	58	77	54	77	93	60	83	111	
PLASTICISING RATE (BARRIER SCREW) *	gm/sec	52	74	101	69	101	118	78	107	142	
NOZZLE HOLDING FORCE	kN		30		40			40			
NO. OF THERMOCOUPLES (BAR- REL&NOZZLE)			5+1		5+1			5+1			
TOTAL HEAT CAPACITY	KW		24.9		39.6			39.6			
CLAMP UNIT SPECIFICATIONS											
CLAMP FORCE	Ton		450			450			450		
CLAMP STROKE	mm		850		850				850		
MAXIMUM DAYIGHT	mm		1670		1670			1670			
MINIMUM MOULD HEIGHT	mm		350		350			350			
MAXIMUM MOULD HEIGHT	mm		820		820			820			
PLATEN SIZE (H X V)	mm		1245 x 1200		1245 x 1200			1245 x 1200			
TIE BAR SPACING	mm		875 x 830		875 x 830			875 x 830			
TIE BAR DIAMETER	mm		145		145			145			
EJECTOR STROKE	mm		230		230				230		
EJECTOR FORCE	Ton		10		10				10		
MOULD WEIGHT CAPACITY (STAT. / MOVING)	kg	8000 (4000 / 4000)			8000 (4000 / 4000)			8000 (4000 / 4000)			
GENERAL											
TOTAL CONNECTED LOAD	kW	52			63				91		
WATER REQUIREMENT (INLET TEMP. 29°C)	lpm	30			30			30			
MACHINE DIMENSION (L X W X H)	m		8.2 x 2.3 x 3.1			9.0 x 2.3 x 3.1			9.5 x 2.3 x 3.1		
MACHINE WEIGHT	kg		24500			26000		27600			

\* WITH OPEN NOZZLE

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FME0721