

The equipment features are valid for the following machines:

Tie-barless machines:

ES 80 / 75 HL (VICTORY)
 ES 200 / 75 HL (VICTORY)
 ES 330 / 75 HL (VICTORY)

STANDARD EQUIPMENT

- 3 Speeds for opening and closing
- Set-up
- Hydraulic ejector with shaking
- Electric and hydraulic closing safety with monitoring
- Hydraulic mould safety with monitoring
- Proportional valve on the clamping unit

Hydraulics

- Energy-saving electrically controlled variable displacement pump hydraulic system
- Hydraulic circuit with oil preheating, temperature control, oil level monitoring
- Pump station with locking mechanism and monitoring
- Return filtration

SPECIAL EQUIPMENT

- Mechanical closing safety
- Safety gate widened
- Safety gate above open
- Automatic safety gate
- Core-pull equipment single and multiple, hydraulic or pneumatic
- Solenoid air valves, function freely programmable
- Platen ejector
- Mould mounting crane
- Unscrewing device
- Preparation for mould shut-off nozzle
- Delivery chute alternatively with selection
- Ejection monitoring via light beam guard
- Failure test balance
- Enlarged mould fixing platens (B platens)
- Mould height increase *
- Delivery chute width increased with C plates *
- Clean room equipment *

Hydraulics

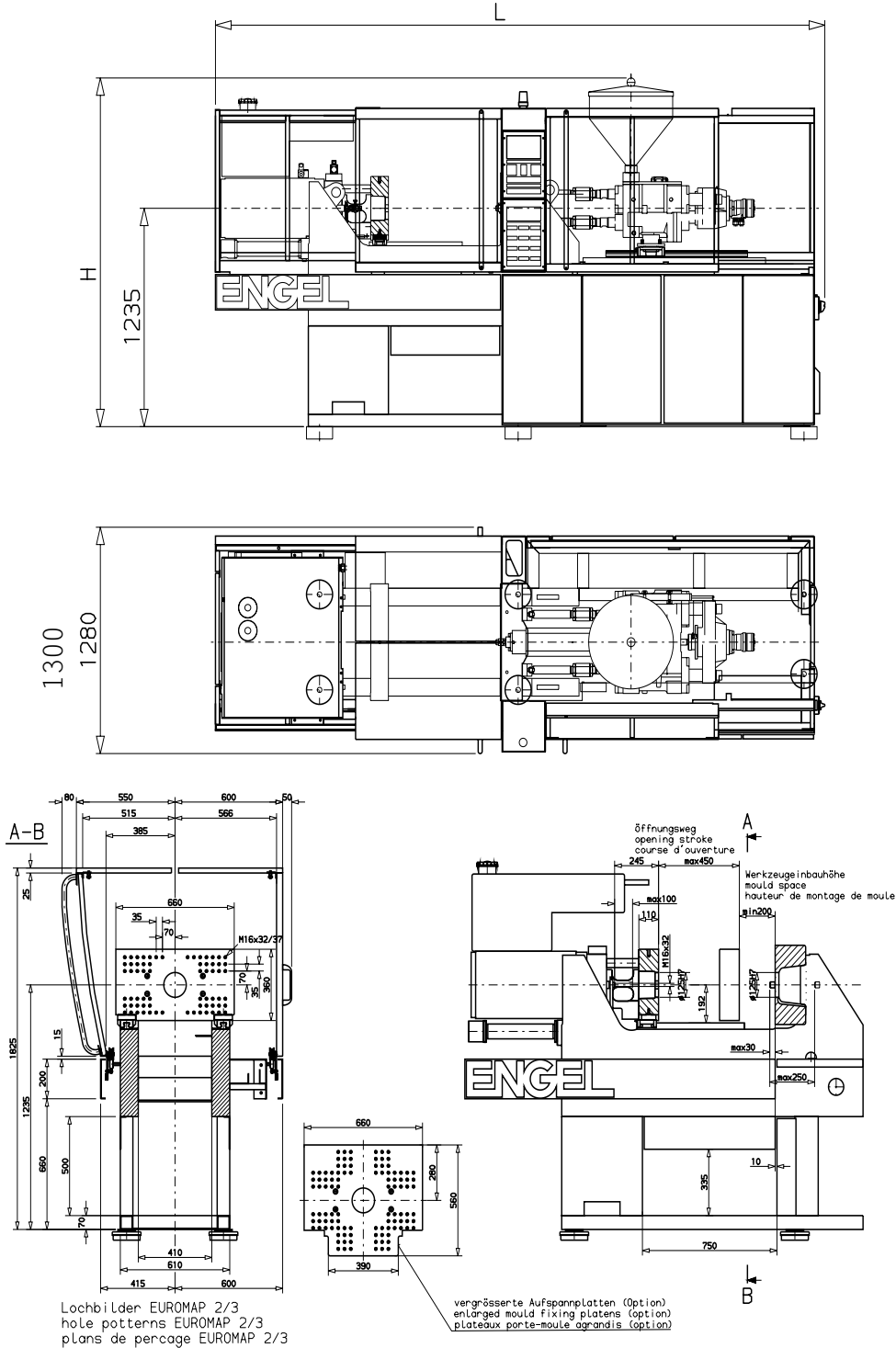
- Parallel movement for ejector, core-pull and unit *
- Accu plant *
- Increased drive power (N execution) *
- Increased cooling capacity
- Connections for external filter station

Automation modules

- High speed mould mounting device
- Mould change systems
- Robot systems: according to collective brochure (Please take the data of the robots from the robot data sheets)

* for VICTORY not available

SIZE DESIGNATION		ES ... / 75 HL (VICTORY)
Clamping force	kN	750
Opening stroke	mm	450
Mould height min.	mm	200
Platen distance max.	mm	650
Mould fixing platen size h x v	mm	660 x 360
Enlarged mould fixing platen h x v	mm	660 x 560
Delivery chute width	mm	410
Ejector stroke	mm	100
Ejector force	kN	40



s75

Possible combinations and dimensions of the standard machine

Machine designation	Dry operation / stroke (Euromap 6) [sec]	Weight [t]	L [mm]	H [mm]
ES 80 / 75 HL (VICTORY)	1,9 / 200	4,2	3810	2020
ES 200 / 75 HL (VICTORY)	1,9 / 200	4,6	3810	2020
ES 330 / 75 HL (VICTORY)	1,9 / 200	4,9	3810	2020

The equipment features are valid for the following machines:

Tie-barless machines:

ES 330 / 50 HL
 ES 330 / 60 HL
 ES 330 / 75 HL (VICTORY)
 ES 330 / 80 HL
 ES 330 / 90 HL
 ES 330 / 110 HL (VICTORY)
 ES 330 / 125 HL (VICTORY)
 ES 330 / 130 HL VICTORY
 ES 330 / 155 HL VICTORY

STANDARD EQUIPMENT

- 10--stage injection speed
- 10--stage holding pressure profile
- 5--stage screw speed
- 5--stage back pressure profile
- Display of the screw speed
- Injection time monitoring
- Automatic cushion monitoring
- Holding pressure switchover as a function of time, stroke, hydraulic pressure with switchover point display
- Increased injection pressure can be switched over
- Contact pressure relief
- Swivel-type injection unit
- Wear resistant bimetallic cylinder (for VICTORY optional)
- Manual high speed changeability of the material cylinder
- Ceramic heater bands
- Direct drive of the screw with hydraulic motor

Control system and electric system

- Microcomputer EC 100 closed loop controlled with integrated diskette drive
- TFT colour flat display incl. MICROGRAPH PLUS / MICROPLAST
- LCD flat display monochrome (for VICTORY)
- All functions on the injection unit closed loop controlled
- Patented linearization program
- Monitoring of process-critical functions with alarm message
- Graphic cycle time analysis with part-time monitoring
- Self-optimizing temperature control circuits
- Regulator and emergency service for temperature control circuits
- Automatic heating-up with start-up safety
- Automatic temperature reduction program
- Screen text in all languages (Latin characters)
- Malfunction message record
- QUICK SETUP with action display
- Graphic-supported set value setting
- Info package (help package, 2nd language, storage of data sets on CPU) (for VICTORY optional)
- Week switch clock for heating on/off motor off
- Access management system via password input
- Connection for PC keyboard and printer (V24)

Machine safety

- European C standard EN201/1997

SPECIAL EQUIPMENT

- Increased torque of the screw
- Thermoset equipment
- Elastomer equipment
- PVC equipment
- GASMELT equipment
- Multi-component and multi-colour equipment *
- POWERMELT heavy duty screws
- Extremely wear resistant and corrosion resistant plasticizing units
- Needle shut-off nozzle spring actuated
- Pneumatic shut-off nozzle
- Insulating mats for heater bands
- Servo valve closed loop control for injection speed, holding pressure and back pressure
- Holding pressure switchover as a function of mould cavity pressure with charge amplifier

Control system and electric system

- Microcomputer CC 100 closed loop controlled incl. MICROGRAPH PLUS and QDP / CPC*
- TFT colour flat display (for VICTORY)
- MICROGRAPH / MICROPLAST (for VICTORY)
- MICROFLOW
- MICROTEMP
- Quality documentation package QDP incl. process data monitoring CPC (standard at CC100)
- Quality data statistics QDS
- Absolute value input
- Program cycle sequence freely programmable in 36 program steps
- AUTOPROTECT, self-learning precision mould protection
- Energy measurement + analysis
- Week switch clock for peripheral equipment and motor ON/OFF
- Network interface for central computer / teleservice
- Interface for handling system (Euromap 12)
- Interface (EUROMAP 17) for temperature control units, hot runner controller and conveying unit
- ENGEL Monitoring System (EMS)
- Injection-compression
- Printer, PC input keyboard
- Access authorization system with magnetic card
- Program package Expert Control
- Program automatic cylinder cleaning
- Manual control device for machine functions
- Start-up circuit with automatic switchover from start-up to production parameters
- Control circuits for mould heating
- additional electric connections (2-pole / 3-phase), switchable alternatively
- Interface for conveyor-belt
- Acoustic warning signal

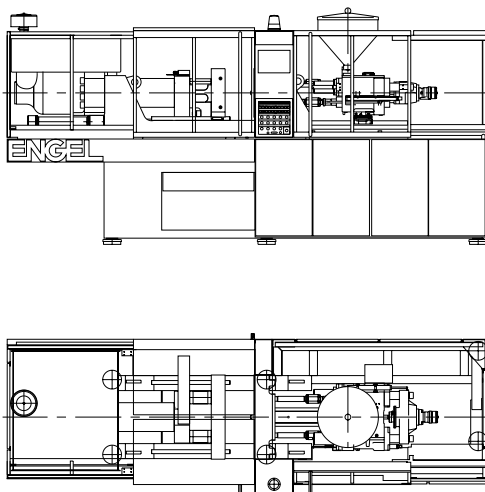
Automation modules

- Automatic feed units

* for VICTORY not available

INTERNATIONAL SIZE DESIGNATION ¹		330/...					
		Standard			N execution		
Screw diameter	mm	30	35	40	30	35	40
Plasticizing stroke	mm		160			160	
Max. stroke volume	cm ³	113	154	201	113	154	201
Screw speed	min ⁻¹	400	400	320	440	440	350
Screw length	L/D	23,6	20	17,5	23,6	20	17,5
Plasticizing capacity	g/sec	14	21	25	15,4	23,	27,3
Screw length barrier	L/D	23,6	20	-	23,6	20	-
Plasticizing capacity barrier screw	g/sec	21	26	-	23	28,6	-
Injection rate	cm ³ /sec	80/111	109/152	143/198	111	152	198
Injection rate injection pressure increased	cm ³ /sec	59/83	80/112	105/146	83	112	146
Spec. injection pressure	bar	2180	1600	1230	2180	1600	1230
Spec. injection pressure increased	bar	2400	2180	1670	2400	2180	1670
Nozzle stroke	mm		250			250	
Nozzle contact force	kN		47			47	
Heating capacity	kW		9,2			9,2	
Number of the heating zones incl. nozzle			4			4	
Pump drive power	kW		15/22			18,5/22	
Hopper contents	l		52			52	

- (1) Working capacity injection unit-clamping force in Mp
- (2) Values for polystyrene (MVR 200/5=10 cm³ /10 min according to ENGEL works standard ETR 10100)
- (3) Values for HDPE (MVR 190/2,16=5 cm³ /10 min)
- (4) Dependent on pump drive power



sp330

Possible combinations of the injection unit

Machine designation	Oil filling [l]	Pump capacity [kW]		Connected load / current [kW / A]	
		Standard	N execution	Standard	N execution
ES 330 / 50, 60 HL	140	15/18,5		25/45	28/51
ES 330 / 75 HL (VICTORY)	140	15/18,5		25/45	28/51
ES 330 / 80, 90 HL	260	15/18,5		25/45	28/51
ES 330 / 110 HL (VICTORY)	260	15/18,5		25/45	28/51
ES 330 / 125 HL (VICTORY)	460	22/22		33/58	33/58
ES 330 / 130, 155 VICTORY	450	22/22		33/58	33/58

Robots for Tiebarless & Rotary Machines

STANDARD FEATURES ER TLi 21-91, ERV 21-41

Mechanical

- Robot mounted on the vertical supports of the bridge on rotary table
- One freely positionable linear Z servo axis
- Absolute positioning – servo-driven Z axis
- Maintenance-free, 3-phase servo motor drives on Z axis
- Option of positioning inserts/parts to left or right side of rotary table
- Precision linear bearings on all linear axes
- Part insert/take-off is from the outward bound table positions for 2 and 3 position molding
- Insert/take-off axes (Y1/Y2) are manually adjustable according to nozzle height adjustment on rotary table
- Take-off device integrated completely into the IMM, i.e. moving IMM safety gate BRS in widened execution, IMM with safety gate above open, no additional base of handling system or conveyor-belt on the floor required on TLi
- Optimum operator accessibility to the IMM mould and handling system setting by manually displaceable conveyor-belt in IMM longitudinal direction on TLi
- Mounting of the take-off device on the fixed mould platen (STANDARD) and on the moving mould platen (OPTION) on TLi
- Depositing of the parts on a stepped conveyor belt on the operator rear side of the injection moulding machine on TLi
- All linear axes with hardened and ground linear guides

Z-axis

- freely positionable linear axis (with maintenance-free, digital rotary current servo drive and force transmission by means of toothed belt)

X-axis

- actuated pneumatic with cylinder
- adjustable manually within a certain area
- rear and front end position adjustable independently of each other on TLi

Y-axis

- actuated pneumatically with cylinder
- upper end position (take-off position in the IMM) for the take-off of parts adjustable manu-

- ally over and under nozzle middle
- lower end position is suitable for stacking parts on TLi

C-axis

- actuated pneumatically with cylinder - 2 positions 0°/90° on TLi

Pneumatics

- Air maintenance unit with hand slide valve
- Central valve ramp
- 1 Vacuum circuit (sucker function) changeable manually to 1 gripper circuit (STANDARD)
- Max. 3 vacuum circuits (sucker function) changeable manually to 3 gripper circuits (OPTION)
- Monitoring of the pneumatic circuits
- Vacuum production via Venturi nozzle
- Connection of the gripping or suction elements via pneumatic quick-action couplings

Electrical and Controls

- Monitoring of vacuum pressure
- High quality cables on all linear axes
- Robot status and error messages displayed
- 240 volt 3 phase supply
- Monitoring of end of arm tooling for no part
- All speeds, accelerations and timers operator adjustable
- Sequencing is user definable via simple text input line program
- Control system integrated into IMM (Engel machines only)
- Automatic storage of the settings with the machine data
- Operation via IMM operation terminal
- Error display and diagnostics via machine screen
- Sequence in menu technology programmed
- Positions and parameters adjustable via machine screen
- Vertical stacking of parts via key limit switch
- Depositing of parts in screen (X-axis 2 positions; Z-axis freely adjustable)
- Optimization of the take-off time by handling system early start

Hardware

- Servo drive with CAN bus actuation
- I/Os via CAN bus
- Push-buttons on machine control console

- 1 stepped conveyor-belt on TLi
- No separate HBG
- Electric connection to the machine RC100-compatible (ERC interface)

Pneumatics

- Common air manifold for all pneumatic functions
- Two vacuum circuits for suction function on ERV
- Two pressure circuits for part gripping on ERV
- Air preparation unit with manual shut-off valve
- Each pneumatic circuit monitored individually
- Vacuum generated by venturi nozzles

OPTIONS AVAILABLE

- Special programs via additional software
- Free programming of the sequences in connection with the core-pull control
- SPI interface

ENGEL

Engel Robotics & Automation
700 Woodlawn Road W.
Guelph, Ontario
N1K 1G4 Canada
(519) 836-0220
Fax (519) 821-3171

Engel Canada Inc.
545 Elmira Road
Guelph, Ontario
N1K 1G2 Canada
(519) 836-0220
Fax (519) 836-3714

Engel Machinery Inc.
3740 Board Rd., Rd. #5
York, Pennsylvania
17402 USA
(717) 764-6818
Fax (717) 764-0314

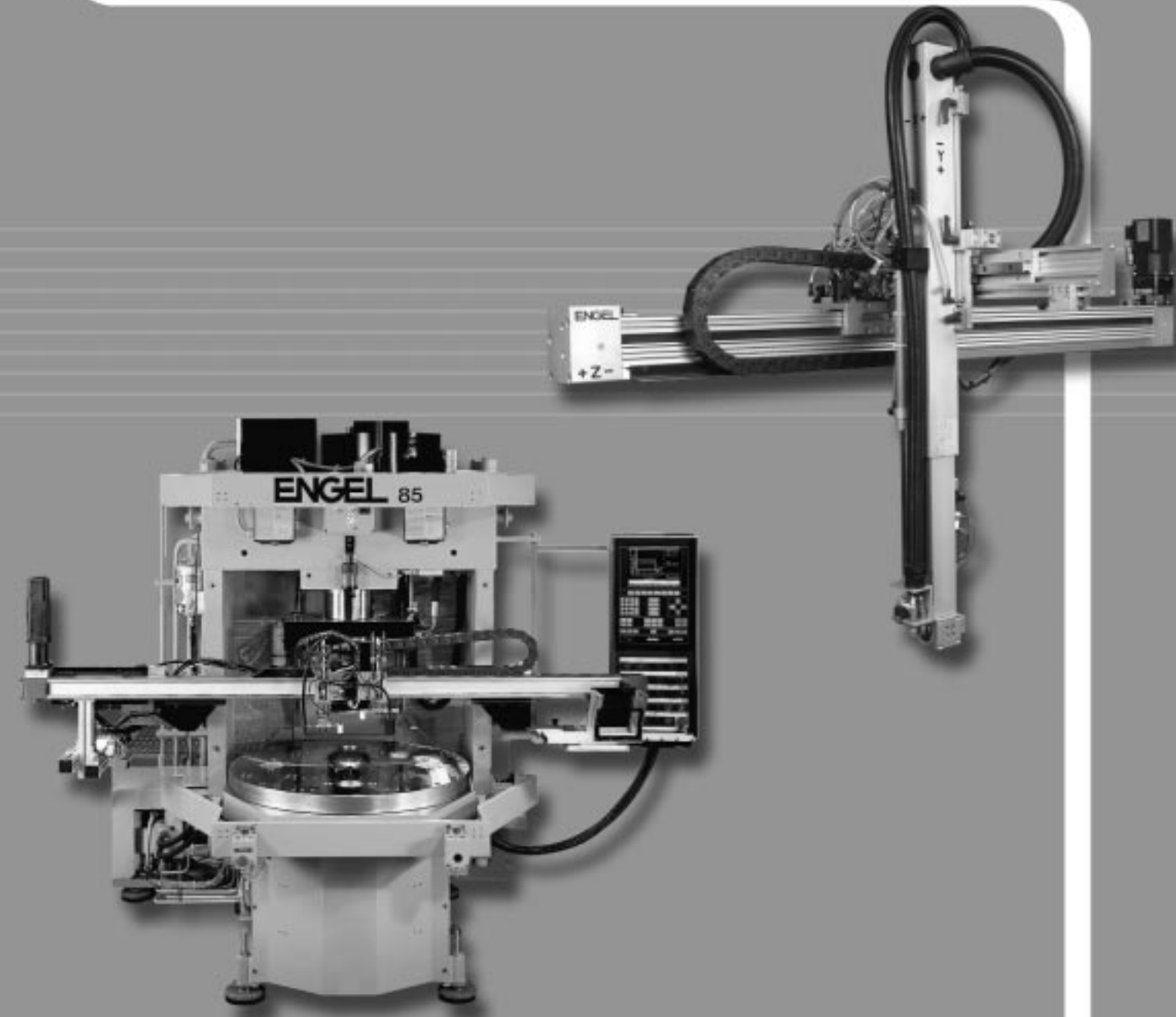
Engel de Mexico S.A. de C.V.
Gral Arista No. 54 Ofc. 105
Col. Argentina Poniente
11230 Mexico, D.F. Mexico
011 52 5 399-89-99
Fax 011-52 5 399-26-49

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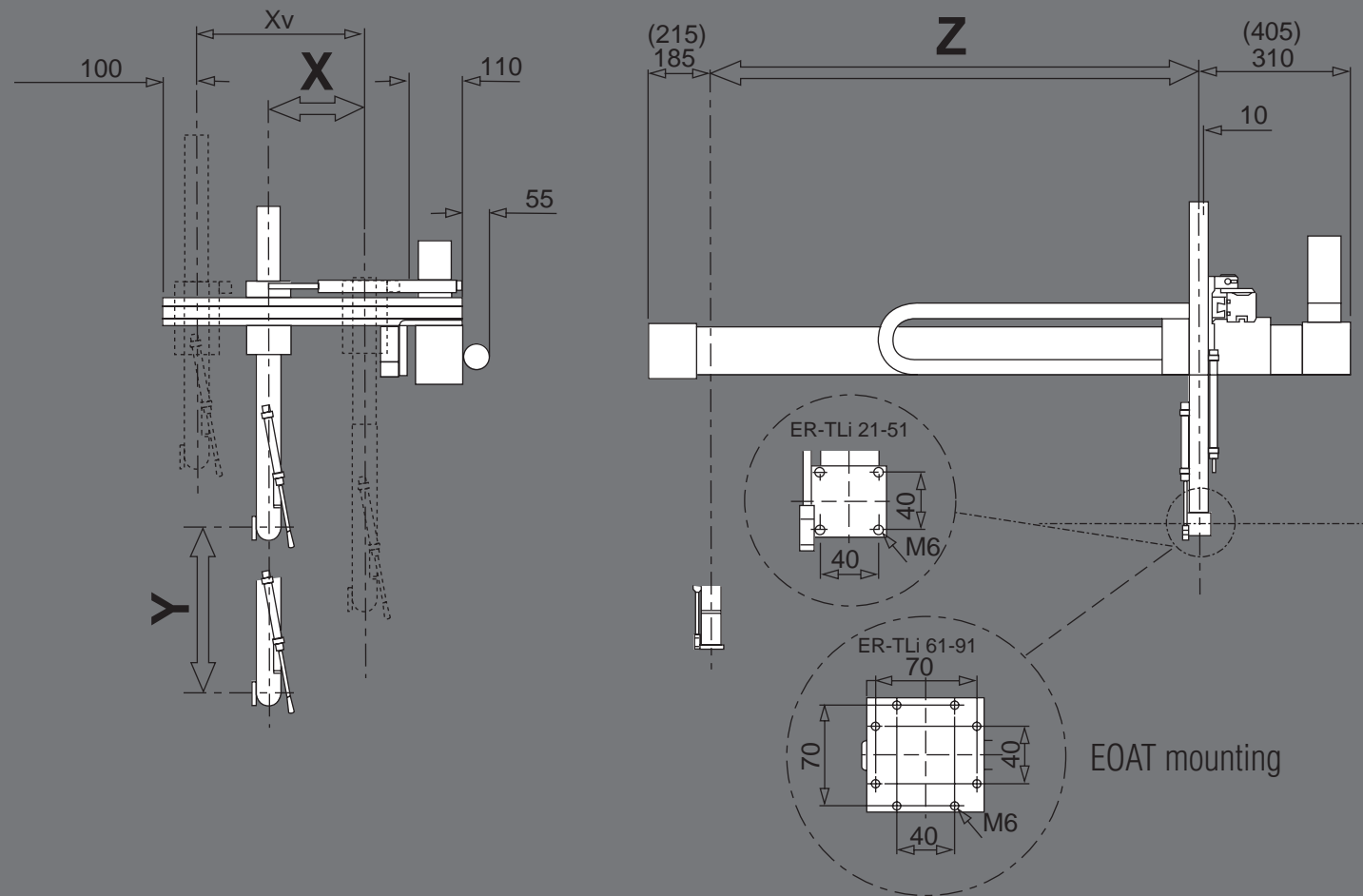
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Robots for Tiebarless & Rotary Machines

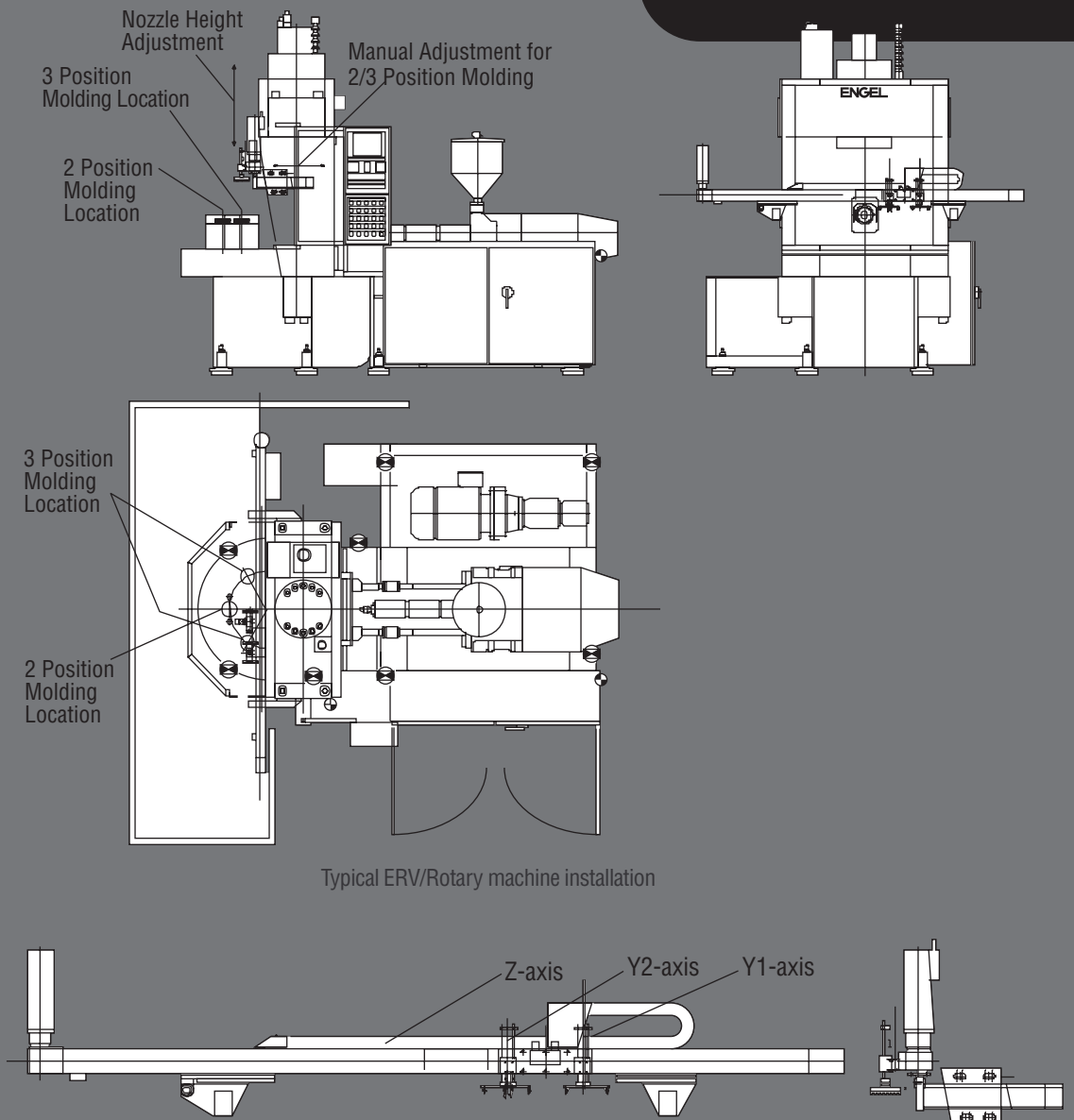


ENGEL Automation

ER TLI 21-91



ERV 21-41



MODEL	ER-TLI 21	ER-TLI 31	ER-TLI 41	ER-TLI 51	ER-TLI 61	ER-TLI 71	ER-TLI 81	ER-TLI 91
Demoulding Stroke (X-axis)								
Drive	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder
Transmission of Force								
Stroke (mm)	150	150	150	150	250	250	250	250
Vertical Stroke (Y-axis)								
Drive	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder
Transmission of Force								
Stroke (mm)	250	250	250	350	350	500	500	500
Swivelling Axis (C-axis)								
Drive	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder	Pneumatic Cylinder
Transmission of Force								
Swivelling Movement (Nm bar)	3.5/5	7/5	7/5	7/5	7/5	7/5	7/5	7/5
Cross Transport (Z-axis)								
Drive	Electric Servo Motor	Electric Servo Motor	Electric Servo Motor	Electric Servo Motor	Electric Servo Motor	Electric Servo Motor	Electric Servo Motor	Electric Servo Motor
Transmission of Force								
Vmax. (m/s)	2	2	2	2	2	2	2	2
Stroke (mm)	950	950	1025	1200	1300	1430	1600	1750
Manipulable Mass Max. (lbs.)	4.4	4.4	4.4	4.4	11	11	11	11
Repeatability (mm)	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1	± 0.1
CFM Air Consumption (1/cycle)	.25	.25	.25	.25	.25	.25	.25	.25
Transport Weight Robot (lbs.)	155	155	155	155	420	420	420	420
Transport Weight Control Cabinet (lbs.)	145	145	145	145	145	145	145	145
Machine Size Range (U.S. Tons)	28-40	60	100	150	200	250-300	400	500-660

All dimensions in mm.

	ERV-21 (up to ES85 VHRB)	ERV-31 (up to ES200 VHRB)	ERV-41 (up to ES300 VHRB)
Maximum Payload (lbs.)	4.0	4.0	4.0
Power Supply – 240V (KVA)	2	2	2
Stroke Z-axis (mm)	2285	3175	3556
Stroke Y1 / Y2 axis (mm)	100	100	100
AXIS	Z	Y1	Y2
Designation	Transport stroke	Insert stroke	Take-off stroke
Drive	Servo Motor	Pneumatic	Pneumatic
Force transmitted by:	Belt	Cylinder	Cylinder
Maximum speed (m/sec)	3.0	—	—
Position Repeatability (mm)	±.1	—	—
Position Accuracy (mm)	±.1	—	—