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Technical data

BASIC DATA

ERC 94/x-E (EH)

ERC 104/x-E (EH)

ERC 114/x-E (EH)

ERC 124/x-E

ERC 134/x-E

ERC 144/x-E

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ENGEL
roboTer

STANDARD EQUIPMENT

Mechanics:

- Compact low construction
- Y-tandem axis, standard for Vertical stroke
- Helical and permanently greased gear racks in the Z- and Y-axis
- Low-noise energy chains
- Torsion-stiff vertical stroke
- Mounting on the fixed mould fixing platen (with Z support at EH)
- Depositing of the parts alternatively on the front or rear side of the machine (Definition when ordering)
- 3 freely positionable servo axes
- Hardened, ground and low-maintenance precision guides
- Drive by means of highly dynamic, maintenance-free three-phase servomotors
- Swivelling module (C-Servo) 0-180°

Pneumatics:

- Air maintenance unit with shut-off valve
- Central valve ramp with direct CAN bus connection
- 2 switchable sucker / gripper circuits
- Per sucker/gripper circuit:
 - 1 Parts, 2 end positions and 1 vacuum monitoring
- 2 End position monitoring per pneumatic circuit
- Vacuum production via Venturi nozzle
- Connection of the gripping and suction elements via pneumatic quick-action couplings

Electric system:

- Control cabinet alternatively free-standing or integrated into the injection moulding machine
- Electric plug for takeover head (standard 25-pole D-Sub)
- 1 Conveyor-belt socket for stepping operation (depositing belt and rejects or control part belt) 3-phase, 6A
- Electric preparation for access door and external emergency stop
- digital in and outputs can be retrofitted individually
- Plug-in limit switches

CONTROL SYSTEMS

RC 100

- Standard control for a robot
- For integrated applications (CPU integrated in the control cabinet)
- Option for complex standalone applications
- Input medium: 3 1/2" diskette
- Flexible manual control device with LCD display
- Connection of different manual control devices possible (HBG2, HBG3)

MANUAL CONTROL DEVICES

HBG 2

- Standard manual control device for integrated execution
- Two-line display for the actual value and error display
- Emergency stop switch

Control system RC 100:

- Axis control with linear interpolation and rapid overgrinding in all axes
- 64 Bit RISC computer
- CAN bus for drive connections and in/output modules
- Parameter input via the control panel of the ENGEL machine control unit
- Common data protection of handling system, machine and mould parameters on one data carrier
- Screen texts possible in almost all national languages
- Plain language display of machine errors, waiting messages and plant status on the machine screen
- Actual value and error display in addition on the manual control device (HBG 2)
- Automatic referencing
- Automatic and teachable home run in the start position
- Structured, navigable handling system setup
- Status page for state visualization of the whole handling system, with diagnostics and test
- Central language and unit switchover (for integrated systems)
- Diversion of the print files into a file
- Continuation of the sequence in the automatic cycle after an interruption (repositioning)
- Takeover of the current handling system position into the program (Quickset)
- Approach of a set position in the manual mode (quick pos.)
- Cycle time saving by early start of the handling system at the take-off

Program package for standard applications:

- Free input of axis speeds, positions and times
- Take-off from moving and fixed mould half
- Vacuum circuits with underpressure monitoring
- Gripper circuits with monitoring of parts and end positions
- Pneumatic circuits with monitoring of end positions
- Variable ejector control via freely adjustable control times
- Rejects separation (good/bad - according to Euromap)

RC 511

- For Standalone applications
- Program volume like at RC 100
- Control system integrated into the HBG (manual control device)
- max. 2 CAN bus connections
- Control of a drive unit (6 axes)
- Input medium: Flash Card
- 1 Interface RS-422A
- Monochrome screen
- Connection for printer and external diskette drive

HBG 3

- Manual control device with monochrome screen for integrated as well as Standalone applications with RC100 control system
- Operation of the robot possible like on the machine terminal
- emergency stop

- Quality control
- Sprue separation
- Depositing in intermediate position for secondary finishing (imprinting, milling etc.)
- Stacking with intermediate layers
- Adjustable swivelling area in the vertical stroke Y (for swivelling axes and axes of rotation)
- Free input of the depositing screen in X-Y-Z with processing priorities
- Service interval display (kilometer counter)
- Program test with Step-by-Step

Teach-In program package:

- Free creation of max. 20 programs per sequence; can be used as sub-program or parallel program
- Page of variables and diagnostics with state control (ABC axes, suckers, grippers, etc.)
- Program sequence control
- Representation mode which can be switched over for Teach-In editor (individual/list representation)
- Relative and absolute moving instructions
- Free establishment of depositing screens (space optimization)
- Free inclusion of menu programs, such as: Take-off, rejects, quality control, depositing, etc.
- Free inclusion of in/outputs for special grippers or peripheral unit
- Plain language designations for all variables (markers, counters, etc.)
- Programmable home run from a critical area of the sequence in the start position (teachable home run)

Off Limit program package:

- Workroom monitoring as collision protection for: Injection moulding machine, robot, takeover head, mould, safety gate, in the depositing area for peripheral unit, conveyor-belt, balance, etc.
- Machine- and mould-specific workrooms

Mounting on foreign machine (Standalone):

- Manual control device with VGA display and touch-sensitive keyboard (HBG 3)
- Flash card as input medium
- Interface according to Euromap 12
- Control cabinet free-standing

SPECIAL EQUIPMENT

Mechanics:

- Protection fence according to EN 294
- Extension of the Z-axis: in stages of 840 mm each
- Y-tandem stroke with 1800, 2200, 2600, 3000, 3600 mm
- Increased drive power for Y-axis
- Frame support with increased Drive power
- Z support incl. machine support pad
- Depositing on machine longitudinal side
- GRIP TOOLS: Modular system for takeover heads
- Fast change system for takeover head: manual / semiautomatic / fully automatic
- Sprue nippers (pneum.) on the cross-girder
- automatic central lubrication

Axes of rotation:

- C-TURNING, Servo, (0-180°)
- C-TURNING, servo - reinforced (0-180°)
- B-TURNING, Servo, (0-270°)
- A-TURNING, servo (0-270°)

Pneumatics:

- max. 8 additional sucker/gripper circuits (can be switched over)
- Additional compressed air circuits
- Vacuum pump instead of Venturi nozzle

Peripheral unit:

- Peripheral units with full integration in the menu program and free inclusion in Teach-In sequences
- Secondary finishing equipment fully integrated
- Balance for online weight examination and protection of the quality data

Electric system:

- Safety packages for safety guarding which can be entered from behind (alternatively with/without)
- Safety package 3 for the production with open rear safety gate (only at integrated version)
- Special voltage
- Interface peripheral unit for 3 zero-potential signals (with emergency stop and protection doors open)
- Electric connection 2-pole, 10A
- Electric connection 3-pole, 16A
- Interface on the Z carrier in plug-in execution

Special programs control:

- Clearing switch for the depositing conveyor-belt
- Take-off stroke correction: Correction of the take-off position by the mold actual position (only for integrated version)
- Release for mould or hall crane
- Take-off at mould intermediate stop (only at IMM support)
- Cylinder for space optimization
- Moving area limitation: electric safeguarding of the moving area within the IMM (X-Z safeguarding)
- Program for the communication with a balance
- Program for sprue gripper
- Horizontal/vertical take-off can be switched over
- Torque monitoring
- Synchronous process with mould or ejector
- Softservo (Take-off and/or insert-placing with plasticized force)
- Separate control of the core-pulls
- Interface for central computer (version ENGEL)
- Program test without IMM function (dry operation)

Technical data	TYPE		94	104	114	124	134	144
manipulable mass max.	E	kg	60 ^a / 80 ^b	60 ^a / 80 ^b	60 ^a / 80 ^b	80 ^a / 100 ^b	80 ^a / 100 ^b	80 ^a / 100 ^b
manipulable mass max.	EH	kg	40 ^a / 60 ^b	40 ^a / 60 ^b	40 ^a / 60 ^b	-	-	-
Repeatability		mm	± 0,2	± 0,2	± 0,2	± 0,2	± 0,2	± 0,2
X-AXIS (demoulding stroke)	STANDARD	mm	1300	1700	2100	2100	2500	3000
X-AXIS (demoulding stroke)	OPTION	mm	1700/2100	2100	-	2500/3000	3000	-
X speed max.		m/s	2	2	2	1,5	1,5	1,5
Y-AXIS TANDEM (Vertical stroke)	STANDARD	mm	1800	2200	2600	3000	3000	3000
Y-AXIS TANDEM (Vertical stroke)	OPTION		2200/2600/ 3000 ^c	2600/3000 ^c	3000 ^c	2200/2600/ 3000 ^c	2600/3000/ 3600 ^c	3000/ 3600 ^c
Y speed max.		m/s	3	3	3	2,5	2,5	2,5
Z-AXIS (cross transport)	STANDARD	mm	3200	3200	4040	4040	4040	4040
Z-AXIS (extension)	OPTION		1x840 - max.8x840	nx840 - max.8x840	nx840 - max.7x840	nx840 - max.7x840	nx840 - max.7x840	nx840 - max.7x840
Weight per 840mm Z stroke extension		kg	240	240	240	240	240	240
Z speed max.		m/s	2,5	2,5	2,5	2	2	2
C-AXIS (0-180°) Servo	STANDARD	Nm	340	340	340	340	340	340
C-AXIS (0-180°) Servo	OPTION	Nm	550	550	550	550	550	550
A-AXIS (0-270°) Servo	OPTION	Nm	250	250	250	250	250	250
B-AXIS (0-270°) Servo	OPTION	Nm	160	160	160	160	160	160
AIR CONSUMPTION ^d		Liters/min	15 / 68	15 / 68	15 / 68	15 / 68	15 / 68	15 / 68
Connected load		kVA	10	10	10	10	10	10
Transport weight robot		kg	3000	3000	3000	4000	4000	4000
Transport weight control cabinet		kg	220	220	220	220	220	220

a. only with C-axis (other allowed axis combinations - see data sheet ABC-axes)

b. without C-axis

c. reduced dynamics and/or reduced manipulation mass

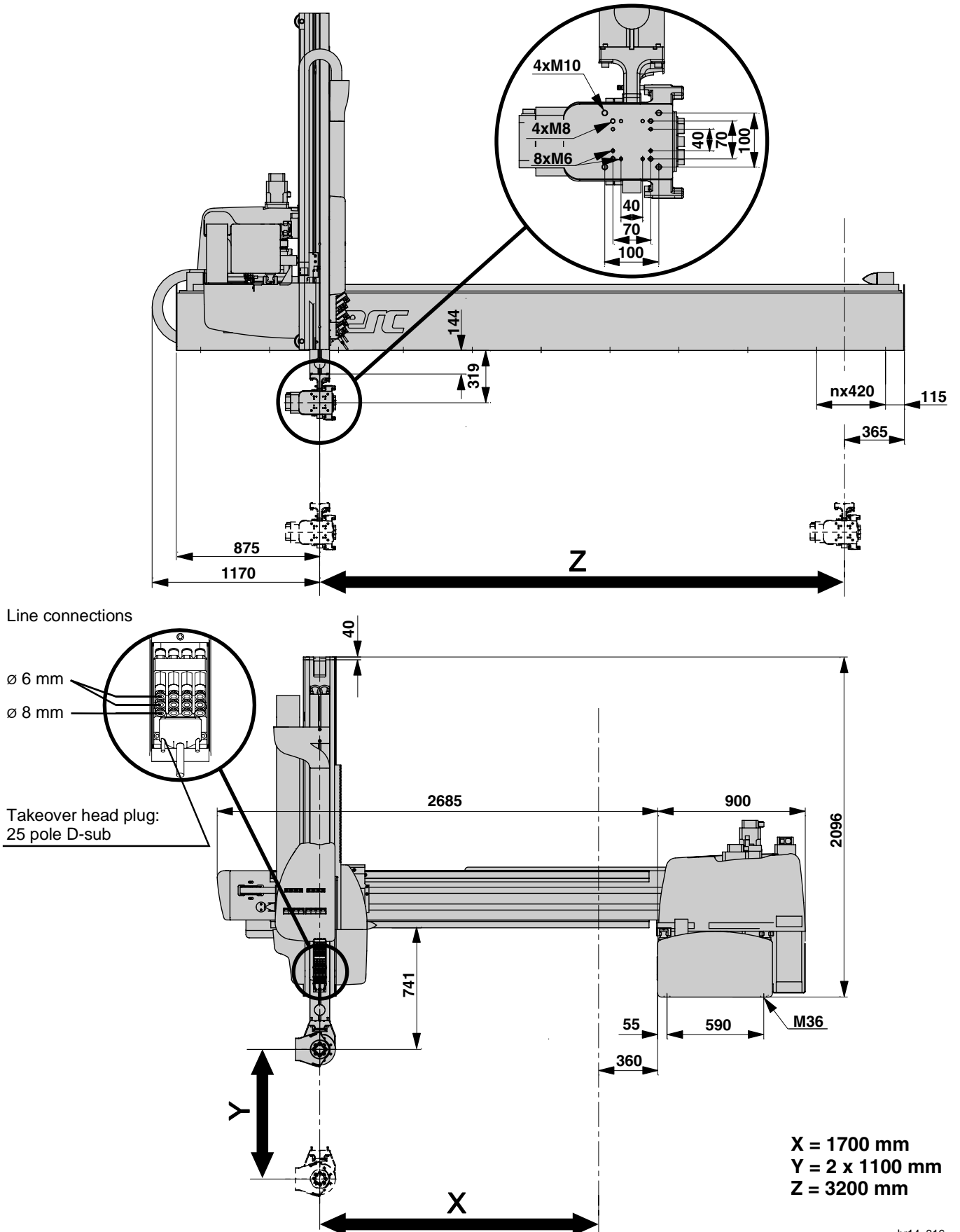
d. per cycle in litre / per suction nozzle in litre/min

94/114 E device = 30 sec cycle with 40% duty cycle with one suction circuit at 6 bar

94/114 E device = 20 sec cycle with 40% duty cycle with one suction circuit at 6 bar

124/144 E device = 40 sec cycle with 40% duty cycle with one suction circuit at 6 bar

DIMENSIONS



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