

1 Injection Molding Machine Type KM 2000/33000 MX
including additional, special items and services

Hydraulic-mechanical 2-platen clamping system
with 4 pressure pads and 4 locking devices
on moving platen.

PV-closed loop control for the injection unit

MC6 control based on industrial PC
with real-time Ethernet technology.

Plasticising unit(s)

1 Thermoplast - Standard	
Plasticising size	33000
Plasticising arrangement	H
Screw diameter	175 mm
Nozzle radius	19.05 mm
Nozzle bore	12.7 mm

Additional / special items for base machine and injection unit 1: SP33000

Pos. No.	Number	Description
02.50	1	Wedge type anti-vibration pads (make Bilz)
02.5003	1	Shim plates, 1 set, for wedge type pads for machine levelling on uneven foundation
02.505	1	Horizontal stops for fixing the machine in longitudinal axis on the foundation, attached to the machine bed of the clamp unit
03.00	1	Oil drip tray beneath mold area between the machine bed support beams.
07.12	1	Electric screw motor: For independent plasticizing during mold opening and closing. For parallel plasticizing we recommend a shut-off nozzle. Note: Technical data not identical with the standard machine! (Instead of std. hydro-motor) (Not retrofittable) (Not possible with ZE 07.13, ZE 07.15, ZE 07.21 and ZE 07.22)
32.02	1	Cylindrical valve type shut-off nozzle HSVS, hydraulically operated, US design. Original machine equipment with hydraulic/electrical control. Nozzle tip with thread: Thread 1 3/4-8 THD, radius 3/4" orifice 1/2". (Delivery instead of ZE 32.00)
40.511	1	Pneumatic valve 1 on moving platen non-op side for blow function (1 off 5/2 directional valve with 1

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		<p>solenoid). Selectable control via stroke/time or time/time. Output air volume manually adjustable via 1 throttle valve. Connection via hose plug connector. (With ZE 40.511 fitted ZE 40.512 is not possible)</p>
45.65	1	<p>Mold fixing platens according to SPI (fixed and moving platens) up to KM 1600 MX: threads 1"-8 UNC-2B from KM 2000 MX: threads 1 1/4"-7 UNC-2B - Centering ring on fixed platen 5" (127 mm) - Cover on moving platen with central diameter 30 mm</p>
45.721	1	<p>Mechanical robot interface according to EUROMAP 18 on fixed platen</p>
49.05	1	<p>Mechanical progressive drop-in bar</p>
50.30	1	<p>Hydraulically actuated ejector plate including tapped holes and clearance holes in the moving platen for the ejector bolts (pattern according to SPI) up to KM 1600 MX: threads 1"-8 UNC-2B from KM 2000 MX: threads 1 1/4"-7 UNC-2B (Not retrofittable)</p>
Addition to Pos. No. 50.30	1	<p>Special ejector plate with extra tapped holes in the ejector and the MMP: - Additional tapped holes in ejector platen: 8x 1 1/4"-7 UNC-2B - Additional clearance holes in the moving platen: 8x D=57mm [2.24"]</p> <p>at position: ($\pm 2/\pm 8$), ($\pm 8/\pm 2$) [inch] ($\pm 50.8/\pm 203.2$), ($\pm 203.2/\pm 50.8$) [mm]</p>
54.35	1	<p>Hydr. operated safety gate on operator's side</p>
63.65	1	<p>Internal oil filtration in the bypass of the cooling pump. Filter change only when machine is switched off.</p>

Pos. No.	Number	Description
64.50	1	Level sensor for oil drip tray monitoring
65.01	1	Increased oil cooler for water intake temperature of max. 36 °C with a min. delta-P = 2.0 bar between water inlet and outlet
65.15	1	NPT- connections for machine cooling water
65.551	1	Pressure gauge with hydraulic selector switch on operator side, for service purposes, displaying alternatively: <ul style="list-style-type: none"> - system pressure (pump pressure) - injection pressure / holding pressure - hydro motor pressure
71.01	1	Injection/compression sequence: Coining stroke and speed adjustable via VDU Function: <ul style="list-style-type: none"> - mold closing up to an adjustable compression stroke position max. 21 mm: <ul style="list-style-type: none"> KM 850 MX to KM 1000 MX max. 26 mm: <ul style="list-style-type: none"> KM 1150 MX to KM 1600 MX max. 36 mm: <ul style="list-style-type: none"> KM 2000 MX to KM 2300 MX max. 41 mm: <ul style="list-style-type: none"> KM 2700 MX to KM 3200 MX max. 51 mm: KM 4000 MX - injection - closing/compression stroke - holding pressure
72.31	1	Hydr. core pull system 1-fold on moving platen (BWAP), non-op side. Speed and pressure adjustable via VDU. Socket pinout acc. to KM standard (up to core 2 acc. to EUROMAP 13 (HAN 16 A)). 4/3 directional valve with 2 solenoids and blocked center position, fitting sizes (internal thread): <ul style="list-style-type: none"> 1/2 inch from KM 850 to KM 1150 3/4 inch from KM 1300 to KM 4000 For prop. valve control (pressure and speed) for hydr. core pulls, separate for moving platen (BWAP) and fixed platen (FWAP) ZE 72.56 is required. (Only possible in connection with

Pos. No.	Number	Description
		ZE 72.55 or ZE 72.56)
72.36	1	<p>Hydr. core pull system 1-fold on fixed platen (FWAP), non-op side. Speed and pressure adjustable via VDU. Socket pinout acc. to KM standard (up to core 2 acc. to EUROMAP 13 (HAN 16 A)).</p> <p>4/3 directional valve with 2 solenoids and blocked center position, fitting sizes (internal thread):</p> <p>1/2 inch from KM 850 to KM 1150</p> <p>3/4 inch from KM 1300 to KM 4000</p> <p>For prop. valve control (pressure and speed) for hydr. core pulls, separate for moving platen (BWAP) and fixed platen (FWAP) ZE 72.56 is required. (Only possible in connection with ZE 72.55 or ZE 72.56)</p>
72.55	1	<p>Hydraulic ejector and hydraulic cores on moving platen as well as hydraulic cores on fixed platen are supplied in parallel by one common pump during opening and closing movement of the clamp unit.</p> <p>Core pulls and ejectors can be set into a defined operation state sequentially by pressure and quantity call.</p>
72.61	1	<p>Pressure maintaining function for hydr. core circuits via the hydr. system during opening and closing movements of the mold.</p> <p>Important: if pressure maintaining function is required during plasticizing (hydr. or electric screw drive) ZE 72.60 is required.</p>
89.07	1	Cold slug ejection
89.2001	1	Cooling fan for control cabinet
89.238	1	<p>Grid type of the power supply: TN-C or TN-C-S or TN-S system (3 ph grids with separate neutral or neutral together with ground)</p> <p>(Not possible in connection with ZE 89.2381)</p>
89.2471	1	<p>Nominal Input Voltage 460 V / 60 Hz without neutral.</p> <p>Suitable for nominal voltage 480 V</p>

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		(acc. to ANSI C84.1-2006) For mold hotrunner heaters with 220 V / 230 V a separate transformer or an additional supply is required.
89.260	1	Separate connection for heaters and power circuit (6-pole main switch)
89.5310	1	1 additional temperature zone for nozzle heater 110 V, incl. transformer (Only possible with ZE 89.247x) (Not possible in connection with ZE 89.299)
89.5902	1	Signal interface for handling unit acc. to EUROMAP 67 incl. reject signal and power socket 32 A (type Harting HAN 6 HSB or compatible connector). For movements of the handling unit during mold opening ZE 89.5915 is additionally required. (Not possible in connection with ZE 89.5901 or LR integration) (Prerequisite for IR series)
89.6702	1	Data logging (logbook) for continuous recording and retrospective display (max. 20,000 events) of: - changes of machine parameters - Alarm messages / acknowledgements - On/off of the machine control incl. date, time and current cycle as well as recording of the password (standard) resp. chip card (prerequisite ZE 89.6712) Analysis of the entries via export function on USB flash drive.
89.6781	1	Stabilized power supply unit (24 V) for machine control incl. buffering module. Holding time approx. 20 ms.
89.70	1	Start-up circuit: switch over from start-up to production values for plasticizing stroke, injection pressure, holding pressure, back pressure, heating time, etc. depending on cycles.
89.751	1	Quality monitoring package: Process monitoring (actual cycle values

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		and integrals) by setting of tolerances, actual value display and recording. Documentation printable.
89.76	1	Cycle time analysis: Display of the individual times and the total time of the last actual cycle and a selectable reference cycle. Graph display of the sequential and parallel times.
89.765	1	Cycle recording: Recording of actual process values for each cycle on an internal storage device. Export function to printer or data storage device in Excel compatible format.
89.7991	1	Interface for connection of a standard alphanumeric USB-keyboard for free text entry
89.80361	1	TFT color screen (19", pivot, glass surface) with touch screen functions for setting pages and machine operation. Additional functions like extended actual value column, free configurable graphic machine programming via process diagram with system control. Free choice of favorites and extended MC6 system control via intelligent machine operation keyboard. With resistive touch design (operation is possible wearing gloves). Improved contrast and less sensitive to scratches and chemicals. (Not possible in connection with ZE 89.8036x)
89.8039	1	Graph display of set and actual profiles for injection speed, injection pressure, holding pressure, back pressure and screw rpm.
89.807	1	Maintenance schedule: According to machine strain (working hours and cycle time) automatic calculation of maintenance intervals, signalled on VDU with alarm when due.
89.8191	1	Additional language German for VDU

Pos. No.	Number	Description
		and printer (selectable on screen)
89.829	1	<p>First language American</p> <ul style="list-style-type: none"> - VDU, printer American - operating manual American - machine plates American
89.9688	1	<p>WEB service box, hardware and software package for machine for customer's connection establishment via function key and automatic VPN routing as encrypted internet connection to the service hotline.</p> <p>The service box has an integrated firewall and TCP/IP interface.</p> <p>Note: The teleservice will be defined in a separate teleservice agreement.</p>
89.9693	1	<p>CIMI-Interface 1 for the monitoring of the injection process: Interface for the connection of an external computer system (e.g. KISTLER Dataflow), monitoring only of the injection process via selected process parameters.</p> <p>The external computer and software is not included in our scope of supply as well as the signals for mold cavity pressure, mold cavity wall temperature and melt temperature. These signals are optionally available against surcharge.</p> <p>(Not possible with ZE 89.523, ZE 89.524 and ZE 89.9694)</p>
96.401	1	<p>Machine painting, structural gloss paint</p> <ul style="list-style-type: none"> - machine 1 color RAL 9002 grey white - clamp bed RAL 7037 grey - cladding RAL 9002 grey white and KM blue - safety doors RAL 9002 grey white
97.040	1	<p>UVV for the USA: Safety standards acc to US regulations</p>

Pos. No.	Number	Description
		ANSI / SPI B151.1 resp. ANSI / SPI B151.29: Differing electrical safety regulations and country specific pressure accumulator acceptance test (Not possible together with ZE 97.00 or ZE 97.050)
100	1	Tie bar retraction system for tie bar on operator side, top. Drive cylinders of clamping unit with changed position (fixed on operator side bottom and non-op side top) The tie bar will be retracted in the direction of the injection unit. The tie bar is not completely pulled. The distance between tie bar and MP is max Mold height plus 200 mm. Restriction of tie bar retraction speed to 30 mm/s (technical safety measure acc. to DIN EN ISO 11161:2010). Restricted usability of the mechanical robot interface according to EUROMAP 18 (ZE45.721 und ZE45.7212).
101	1	BluePower - Servo pump drive Servo motor pump drive system for outstanding energy efficient operation of the machine, including a separate oil filter and oil cooling circuit integrated in the machine bed. Note: Technical data not identical with the standard machine!
102	1	Min. mould height and max. daylight reduced by 200 mm: - Min. mould height 600 mm.(Standard: 800mm) - Max. mould height 1700 mm.(Standard) - Opening stroke 2800 mm. (Standard) - Max. daylight 3400 mm. (Standard: 3600mm) Max. mould weight on the MP are to be reduced!
103	1	Additional main disconnect switch: disconnect pump motor with lock out capability, heats and control stay on.
104	1	Operation without safety step (delivery

Pos. No.	Number	Description
		without the safety step):
		Installation of confirmation system acc to ANSI standards. Confirmation button 1 in clamp area Confirmation button 2 under MC6.
105	1	<p>Special Mould cooling:</p> <p>Main connection point (1x IN, 1x OUT) with 4" near fixed platen NOS. Hoses/ Pipes: Supply MP/NOS: 4x 2 inch (2 circuits) Supply MP/OS: 4x 2 inch (2 circuits) Supply FP/NOS: 2x 2 inch (1 circuits) Supply FP/OS: 2x 2inch (1 circuits)</p> <p>Moving plate/ NOS water connection ever circuit with 2 inlets and 2 outlets 1 1/2" Moving plate/ OS water connection ever circuit with 2 inlets and 2 outlets 1 1/2" Fixed plate/ NOS water connection ever circuit with 2 inlets and 2 outlets 1 1/2" Fixed plate/ OS water connection ever circuit with 2 inlets and 2 outlets 1 1/2"</p> <p>All connection in each circuit (inlet and outlet) with manual ball-type stop valves and towards mold with 1 1/2" NPT male thread Air line connection with ball valves for blow out of water lines.</p> <p>For water temperatures 85°C max.</p> <p>Max. flow rate is 136 l/min (1 1/2 inch piping) assumed the velocity of flow is 2 m/s Max. flow rate is 243 l/min (2 inch piping) assumed the velocity of flow is 2 m/s</p> <p>The customer gets the Water cooling-drawings for confirmation.</p>
106	1	Cutout for conveyor belt in the short end of the machine guarding.

Pos. No.	Number	Description
		<p>Conveyor belt inside the oil drip tray of the clamp unit. Distance between conveyor belt and lower edge of the oil drip tray to be min. 50mm.</p> <p>Conveyor belt must be additionally increased between the machine bed and the guarding due to the cutout of the cross beam. The cutout in the guarding is designed to create a free area in the machine bed of min. 1400mm x 500mm (h x v).</p> <p>Details see ADOCS (without machine pads)</p> <p>The step on safety grids are removable and a double acknowledge system for operation without safety grid is required (see subitem)</p> <p>Removable safety panels at the cutout of the guarding shall be provided.</p> <p>Attention! Safety panels must be adapted by the customer to the applicable rules and must be remounted.</p>
107	1	<p>ZE 42.25</p> <p>Electric connection for eject control by balance or photo cell (Harting plug)</p> <p>Mounted on the left small side control cabinet</p>
-108	1	<p>Eject control by 3 parallel infra-red photo cells.</p> <p>On screen selectable which photo cells to be used</p>

Additional / special items for plasticising unit 1: SP33000

Pos. No.	Number	Description
21.80	1	<p>Electronic coding of the plasticizer. For automatic identification of the technical data and of the max operating parameters: screw diameter, temperature, inj.-pressure, screw rpm, plasticizing torque.</p>

General Technical Information:

Except when confirmed otherwise, the following supply requirements and environmental conditions do apply to KM molding machines and KM robots. For any variances special equipment must be agreed on.

Documentations

- 1 set of the short version of the instruction manual in a binder
- 1 USB with the full version of the instruction manual and the complete technical documentation (spare parts – packaging lists, drawings, etc.,)

The short version contains all information which is needed for commissioning and which is stipulated. Detailed information for operation of the machine is only included on the USB.

Machine specific documentation/software: (<http://www.kraussmaffei.com/documentation>)

Key: PFMD0.

Electric

Nominal Input Voltage (V)	460 Volt
Frequency (Hz)	60 Hz
Phases	3
Neutral	N
Socket type	A & B - UL 498/NEMA 5-15 R, 110V /15A, CSA C22.2 Nr.:42

Pneumatics

Pneumatic cascades, core pulls, blow and movement valves have at a max. pressure of 7 bar a flow of about 900l/min.

In case safety guards are omitted the machine or facility may only be operated after it has been determined that the machine or facility complies with the local regulations.
The operator is responsible for the correct set-up of the safety guards.

KM Molding Machine:

Cooling water supply for cooling system

Unless stated differently in the quotation, the oil coolers for the injection molding machine are laid out for cooling water supply at the inlet of max. 31°C and pressure at the connection point of 4-6 bar.

For the functional testing of machines and devices with hydraulic drive systems in the factory, hydraulic oil type Shell Tellus S3 M46 will be used in-house at KraussMaffei.

The hydraulic oil is not included in the scope of supply.

Hydraulic accumulators are supplied with a pressureless nitrogen bubble due to hazardous materials regulations.

For operating fluid specifications, please refer to the respective operating instructions.

Environmental conditions for hydraulic molding machines

min. / max. temperature +5°C to +40°C

min. / max. humidity 0% to 80% r.F.

max. absolute humidity 23,5 g/kg (in dry)

Environmental conditions for electric molding machines:

min. / max. temperature +15°C to +40°C

min. / max. humidity 0% to 80% r.F.

max. absolute humidity 23,5 g/kg (in dry)