# Order Confirmation

KraussMaffei
Pioneering Plastics

**1 Injection Molding Machine Type KM 2000/33000 MX**
including additionals, 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 |

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

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

| Pos. No. | Number | Description |
|---|---|---|
| | | solenoid). Selectable control<br>via stroke/time or time/time.<br>Output air volume manually adjustable<br>via 1 throttle valve.<br>Connection via hose plug connector.<br>(With ZE 40.511 fitted ZE 40.512 is<br>not possible) |
| 40.752 | 1 | Maintenance unit for the treatment of<br>oil free compressed air, consisting of:<br>- shut-off valve (manual) with pressure<br>relief<br>- pressure adjustment valve (manual)<br>incl. pressure gauge and air filter<br>- pressure switch for electric<br>monitoring<br>-shut-off valve (electric) with<br>pressure relief<br>(Prerequisite for ZE 40.5xx, ZE 40.70,<br>ZE 40.71, ZE 40.71xx, ZE 40.77,<br>ZE 42.4x, ZE 49.05 and ZE 72.4xx) |
| 45.65 | 1 | Mold fixing platens according to SPI<br>(fixed and moving platens)<br>up to KM 1600 MX:<br>threads 1"-8 UNC-2B<br>from KM 2000 MX:<br>threads 1 1/4"-7 UNC-2B<br>- Centering ring on fixed platen 5"<br>(127 mm)<br>- Cover on moving platen with central<br>diameter 30 mm |
| Addition to<br>Pos. No.<br>45.65 | 1 | Locating ring on Stationary Plate to be<br>6" = 152.4 mm |
| 45.721 | 1 | Mechanical robot interface<br>according to EUROMAP 18<br>on fixed platen |
| 49.05 | 1 | Mechanical progressive drop-in bar |
| 50.30 | 1 | Hydraulically actuated ejector plate<br>including tapped holes and clearance<br>holes in the moving platen for the<br>ejector bolts (pattern according to SPI)<br>up to KM 1600 MX:<br>threads 1"-8 UNC-2B<br>from KM 2000 MX:<br>threads 1 1/4"-7 UNC-2B<br>(Not retrofittable) |
| Addition to | 1 | Special ejector plate with extra tapped |

| Pos. No. | Number | Description |
|---|---|---|
| Pos. No.<br>50.30 | | holes in the ejector and the MMP:<br>- Additional tapped holes in ejector platen: 8x 1 1/4"-7 UNC-2B<br>- Additional clearance holes in the moving platen: 8x D=57mm [2.24"]<br><br>at position:<br>(±2/±8), (±8/±2) [inch]<br><br>(±50.8/±203.2), (±203.2/±50.8) [mm] |
| 54.35 | 1 | Hydr. operated safety gate on operator's side |
| 63.65 | 1 | Internal oil filtration in the bypass of the cooling pump. Filter change only when machine is switched off. |
| 64.50 | 1 | Level sensor for oil drip tray monitoring |
| 65.01 | 1 | Increased oil cooler<br>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:<br>- system pressure (pump pressure)<br>- injection pressure / holding pressure<br>- hydro motor pressure |
| 71.01 | 1 | Injection/compression sequence:<br>Coining stroke and speed adjustable via VDU<br>Function:<br>- mold closing up to an adjustable compression stroke position<br>max. 21 mm:<br>KM 850 MX to KM 1000 MX<br>max. 26 mm:<br>KM 1150 MX to KM 1600 MX<br>max. 36 mm:<br>KM 2000 MX to KM 2300 MX<br>max. 41 mm:<br>KM 2700 MX to KM 3200 MX<br>max. 51 mm: KM 4000 MX<br>- injection<br>- closing/compression stroke<br>- holding pressure |

| Pos. No. | Number | Description |
|---|---|---|
| 72.31 | 1 | Hydr. core pull system 1-fold<br>on moving platen (BWAP), non-op side.<br>Speed and pressure adjustable via VDU.<br>Socket pinout acc. to KM standard<br>(up to core 2 acc. to EUROMAP 13<br>(HAN 16 A)).<br>4/3 directional valve with 2 solenoids<br>and blocked center position,<br>fitting sizes (internal thread):<br>1/2 inch from KM 850 to KM 1150<br>3/4 inch from KM 1300 to KM 4000<br>For prop. valve control (pressure and<br>speed) for hydr. core pulls, separate<br>for moving platen (BWAP) and fixed<br>platen (FWAP) ZE 72.56 is required.<br>(Only possible in connection with<br>ZE 72.55 or ZE 72.56) |
| 72.36 | 1 | Hydr. core pull system 1-fold on<br>fixed platen (FWAP), non-op side.<br>Speed and pressure adjustable via VDU.<br>Socket pinout acc. to KM standard<br>(up to core 2 acc. to EUROMAP 13<br>(HAN 16 A)).<br>4/3 directional valve with 2 solenoids<br>and blocked center position,<br>fitting sizes (internal thread):<br>1/2 inch from KM 850 to KM 1150<br>3/4 inch from KM 1300 to KM 4000<br>For prop. valve control (pressure and<br>speed) for hydr. core pulls, separate<br>for moving platen (BWAP) and fixed<br>platen (FWAP) ZE 72.56 is required.<br>(Only possible in connection with<br>ZE 72.55 or ZE 72.56) |
| 72.55 | 1 | Hydraulic ejector and hydraulic cores<br>on moving platen as well as hydraulic<br>cores on fixed platen are supplied in<br>parallel by one common pump during<br>opening and closing movement of the<br>clamp unit.<br>Core pulls and ejectors can be set into<br>a defined operation state sequentially<br>by pressure and quantity call. |
| 72.61 | 1 | Pressure maintaining function for<br>hydr. core circuits via the hydr.<br>system during opening and closing<br>movements of the mold.<br>Important: if pressure maintaining<br>function is required during plasticizing |

| Pos. No. | Number | Description |
|---|---|---|
| | | (hydr. or electric screw drive)<br>ZE 72.60 is required. |
| 89.07 | 1 | Cold slug ejection |
| 89.2001 | 1 | Cooling fan for control cabinet |
| 89.238 | 1 | Grid type of the power supply:<br>TN-C or TN-C-S or TN-S system<br>(3 ph grids with separate neutral or neutral together with ground)<br>(Not possible in connection with ZE 89.2381) |
| 89.2471 | 1 | Nominal Input Voltage 460 V / 60 Hz without neutral.<br>Suitable for nominal voltage 480 V (acc. to ANSI C84.1-2006)<br><br>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<br>(Only possible with ZE 89.247x)<br>(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).<br>For movements of the handling unit during mold opening ZE 89.5915 is additionally required.<br>(Not possible in connection with ZE 89.5901 or LR integration)<br>(Prerequisite for IR series) |
| 89.5924 | 1 | Electric interface according to EUROMAP 73 incl. signals for locking, locking monitoring and request for unlocking for external safety fence on non-op side of machine.<br>This interface allows the take over of the machine's safety gate functions (according to EN201, Typ III) by the external safety fence. The machine |

| Pos. No. | Number | Description |
|---|---|---|
| | | safety gate can be permanently mechanically secured when open. Reconstitution of complete functions of the machine safety gate according to regulations when interface is not used is incumbent upon the operator. |
| 89.6702 | 1 | Data logging (logbook) for continuous recording and retrospective display (max. 20,000 events) of:<br>- changes of machine parameters<br>- Alarm messages / acknowledgements<br>- On/off of the machine control incl. date, time and current cycle as well asrecording of the password (standard) resp. chip card (prerequisite ZE 89.6712)<br>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:<br>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:<br>Process monitoring (actual cycle values and integrals) by setting of tolerances, actual value display and recording.<br>Documentation printable. |
| 89.76 | 1 | Cycle time analysis:<br>Display of the individual times and the total time of the last actual cyle and a selectable reference cycle. Graph display of the sequential and parallel times. |
| 89.765 | 1 | Cycle recording:<br>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 |

| Pos. No. | Number | Description |
|---|---|---|
| | | alphanumeric USB-keyboard for<br>free text entry |
| 89.80361 | 1 | TFT color screen<br>(19", pivot, glass surface)<br>with touch screen functions for setting<br>pages and machine operation.<br>Additional functions like extended<br>actual value column, free configurable<br>graphic machine programming via process<br>diagram with system control.<br>Free choice of favorites and extended<br>MC6 system control via intelligent<br>machine operation keyboard.<br>With resistive touch design<br>(operation is possible wearing gloves).<br>Improved contrast and less sensitive to<br>scratches and chemicals.<br>(Not possible in connection with<br>ZE 89.8036x) |
| 89.8039 | 1 | Graph display of set and actual profiles<br>for injection speed, injection pressure,<br>holding pressure, back pressure and<br>screw rpm. |
| 89.807 | 1 | Maintenance schedule:<br>According to machine strain (working<br>hours and cycle time) automatic cal-<br>culation of maintenance intervals,<br>signalled on VDU with alarm when due. |
| 89.8191 | 1 | Additional language German for VDU<br>and printer (selectable on screen) |
| 89.829 | 1 | First language American<br>- VDU, printer<br>American<br>- operating manual<br>American<br>- machine plates<br>American |
| 89.9688 | 1 | WEB service box, hardware and software<br>package for machine for customer's<br>connection establishment via function<br>key and automatic VPN routing as<br>encrypted internet connection to the<br>service hotline.<br>The service box has an integrated<br>firewall and TCP/IP interface.<br><br>Note: |

| Pos. No. | Number | Description |
|---|---|---|
| | | The teleservice will be defined in a separate teleservice agreement. |
| 89.9693 | 1 | CIMI-Interface 1 for the monitoring of the injection process:<br>Interface for the connection of an external computer system (e.g. KISTLER Dataflow), monitoring only of the injection process via selected process parameters.<br>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.<br>(Not possible with ZE 89.523, ZE 89.524 and ZE 89.9694) |
| 96.401 | 1 | Machine painting, structural gloss paint<br>- machine 1 color<br>RAL 9002 grey white<br>- clamp bed<br>RAL 7037 grey<br>- cladding<br>RAL 9002 grey white and<br>KM blue<br>- safety doors<br>RAL 9002 grey white |
| 97.040 | 1 | UVV for the USA:<br>Safety standards acc to US regulations ANSI / SPI B151.1 resp. ANSI / SPI B151.29:<br>Differing electrical safety regulations and country specific pressure accumulator acceptance test<br>(Not possible together with ZE 97.00 or ZE 97.050) |
| 100 | 1 | Tie bar retraction system for tie bar on operator side, top.<br>Drive cylinders of clamping unit with changed position (fixed on operator side bottom and non-op side top)<br>The tie bar will be retracted in the direction of the injection unit. The tie bar is not completely pulled.<br>The distance between tie bar and MP is max Mold hight plus 200 mm.<br>Restriction of tie bar retraction speed to 30 mm/s (technical safety measure |

| Pos. No. | Number | Description |
|---|---|---|
| | | acc. to DIN EN ISO 11161:2010).<br>Restricted usability of the mechanical robot interface according to EUROMAP 18 (ZE45.721 und ZE45.7212). |
| 101 | 1 | BluePower - Servo pump drive<br>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.<br>Note:<br>Technical data not identical with the standard machine! |
| 102 | 1 | Min. mould height and max. daylight reduced by 200 mm:<br>- Min. mould height 600 mm.(Standard: 800mm)<br>- Max. mould height 1700 mm.(Standard)<br>- Opening stroke 2800 mm. (Standard)<br>- Max. daylight 3400 mm. (Standard: 3600mm)<br><br>Max. mould weight on the MP are to be reduced! |
| 103 | 1 | Additional main disconnect switch:<br><br>disconnect pump motor with lock out capability, heats and control stay on. |
| 104 | 1 | ZE 42.25<br>Electric connection for eject control by balance or photo cell (Harting plug)<br><br>Mounted on the left small side control cabinet |
| -105 | 1 | Eject control by 3 parallel infra-red photo cells.<br><br>On screen selectable which photo cells to be used |
| 106 | 1 | Operation without safety step (delivery without the safety step):<br><br>Installation of confirmation system acc to ANSI standards.<br>Confirmation button 1 in clamp area<br>Confirmation button 2 under MC6. |

| Pos. No. | Number | Description |
|---|---|---|
| 107 | 1 | Special Mould cooling:<br><br>Main connection point (1x IN, 1x OUT) with 4" near fixed platen NOS.<br>Hoses/ Pipes:<br>Supply MP/NOS: 4x 2 inch (2 circuits)<br>Supply MP/OS: 4x 2 inch (2 circuits)<br>Supply FP/NOS: 2x 2 inch (1 circuits)<br>Supply FP/OS: 2x 2inch (1 circuits)<br><br>Moving plate/ NOS water connection ever circuit with 2 inlets and 2 outlets 1 ½"<br>Moving plate/ OS water connection ever circuit with 2 inlets and 2 outlets 1 ½"<br>Fixed plate/ NOS water connection ever circuit with 2 inletsand 2 outlets 1 ½"<br>Fixed plate/ OS water connection ever circuit with 2 inlets and 2 outlets 1 ½"<br><br>All connection in each circuit (inlet and outlet) with manual ball-type stop valves and<br>towards mold with 1 1/2" NPT male thread<br>Air line connection with ball valves for blow out of water lines.<br><br>For water temperatures 85°C max.<br><br>Max. flow rate is 136 l/min (1½ inch piping) assumed the velocity of flow is 2 m/s<br>Max. flow rate is 243 l/min (2 inch piping) assumed the velocity of flow is 2 m/s<br><br>The customer gets the Water cooling-drawings for confirmation. |
| 108 | 1 | Cutout for conveyor belt in the short end of the machine guarding.<br><br>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.<br>Conveyor belt must be additionally increased |

| Pos. No. | Number | Description |
|---|---|---|
| | | 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). |
| | | Details see ADOCS (without machine pads) |
| | | The step on safety grids are removable and a double acknowledge system for operation without safety grid is required (see subitem) |
| | | Removable safety panels at the cutout of the guarding shall be provided. |
| | | Attention! Safety panels must be adapted by the customer to the applicable rules and must be remounted. |

**Additionals / special items for plasticising unit 1: SP33000**

| Pos. No. | Number | Description |
|---|---|---|
| 21.80 | 1 | 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. |

## 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: HRLAN.

### 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)