High-speed series TM Xpress 160 – 450 t

Your fast track to business success
Technology working for you.
Special attributes of the TM Xpress series 160 – 450 t

The TM Xpress series – your fast track to business success

The HYBRID variant of the powerful high-speed model with clamping forces ranging from 160 to 450 t. Compact power packages of the TM series from WITTMANN BATTENFELD in the high-speed versions. The new, innovative TM Xpress series stands for excellent injection performance and accuracy.

The user-friendly UNILOG B6P control system offers a wide range of functions, providing support in process monitoring and documentation.

Combine speed with cost-efficiency. Let the TM Xpress fascinate you.

Clamping system

A rigid machine frame combined with reinforced bearing bolts and low-maintenance toggle jacks stands for high-precision, low-maintenance requirements and a long service life. The differential switching system of the clamping cylinder allows high opening and closing speeds and minimal dry cycle times.

Linear guides

Since the moving platen is supported by high-precision linear guides, no additional adjustment for complex molds is required. Lubrication has been reduced to a minimum. As they have no guiding functions, the hard-chrome-plated tie bars are free of lubricant residues.
**Injection unit**

The various barrels and screws come with a uniform L/D ratio of 22 : 1 or 26 : 1. The injection unit is mounted on linear guides. A separate service stroke function is available for insertion and removal of barrels and screws.

**Utility connections**

The machine concept provides sufficient space for utility connections at the rear. Cooling water and air supply pipes and cables for electrical signals can be connected to the moving platen according to customers' wishes.

**Metering motor – servo-electric**

A drive motor placed in the longitudinal axis of the machine takes care of the screw drive. Combined with a barrier compounding screw, this drive operates with high energy efficiency and ensures optimal homogeneity in the material being processed.

**Hydraulic accumulator**

Hydraulic accumulators to handle the machine's high injection performance are mounted at the rear. Thanks to their short distance to the injection cylinders, a high reaction speed with minimal pressure loss is achieved.
Clamping unit and injection unit TM Xpress 160 t – 450 t

Clamping unit

Outstanding features of the TM Xpress

- Short footprint.
- Extremely rigid, sturdy clamping plates and machine frame.
- Precise platen parallelism across the entire stroke.
- Low-maintenance linear guides to support the moving platen.
- Self-locking 5-point toggle system.
- Reinforced toggle bearings with low-maintenance toggle sleeves.
- Adhesive central oil lubrication of toggle system.
- High opening and closing speeds thanks to differential gears.
- Short dry cycle times.
- Flexible parts removal in three directions.
- High repeatability of all parameter settings.
- Sensitive mold safety device.
- Mold protection thanks to precise platen parallelism, minimal platen deflection and linear guides.
- Low-maintenance and service-friendly design of all machine parts.

Injection unit

A concept to improve parts quality

- Optimal homogeneity thanks to a uniform screw L/D ratio of 22 : 1 or 26 : 1 in combination with barrier compounding screws for processing HDPE, PP and PS.
- Min. 2,000 bar injection pressure for all screw diameters.
- High injection rate combined with acceleration rates of 10,000 mm/sec².
- Precise axial movements of the injection unit thanks to linear guides.
- Torque-free parallel nozzle contact due to positioning of traveling cylinders opposite each other.
**Ultimate precision and repeatability**
- Compact design with integrated hydraulic block and easy access to all components.
- Maximum repeatability thanks to servo-valve control.

**High-performance plasticizing systems**
- High plasticizing performance with barrier screw.
- Melting performance and homogeneity optimized by additional compounding section.
- Long service life thanks to optimal choice of materials.

**Servo motor for metering**
- The screw drive is powered by a servo motor positioned in the longitudinal axis of the machine.
- With circumferential speeds reaching more than 1 m/s, an extremely high plasticizing performance with simultaneous low energy consumption is achieved.
- Extremely short cycle times are possible thanks to parallel plasticizing function.

**High-performance hydraulic system**

**Extra high injection speeds**
- The injection units are equipped with hydraulic accumulators to reach the high injection speeds and acceleration rates required for thin-walled parts.
- Pressure loss is minimized thanks to the short distance between the hydraulic accumulators and the hydraulic block.
- The fast-reacting servo valves installed on the integrated hydraulic block ensure excellent precision and repeatability.

**Parallel operation**
- Loading of the accumulators via a separate loading pump with a reinforced drive.
- Separate operation of the clamping unit with a hydraulic pump of its own, independent of the accumulators.
- Capacity for parallel operation of all functions (opening, closing, ejection, core pulls, plasticizing) is available in this series as standard.
UNILOG B6° is the name of the new control system generation that is setting benchmarks in user-friendliness, speed and precision. It is used across the entire product portfolio. A powerful system concept optimally geared to the requirements of hydraulics/sensor technology ensures fast, accurate movements along all axes of the machine. Precise analysis of all important process parameters provides the user with the control required for demanding applications.

- Windows operating system
- 15” TFT color screen with unlimited touch screen functionality for operation and display.
- 2 rows of soft keys to select machine functions.
- Freely configurable status bar for all machine operating functions.
- Access authorization via password system and USB flash drive, complete events protocol, quality table, online support system, envelope curves monitoring, cycle time analysis, alarm message via E-mail and other functions.
- Manual operating panel with 48 membrane keys to operate the machine’s axes and optional equipment and 10 membrane keys with luminous rings are available for the basic machine functions (drive, operation modes, heaters). Space for 7 additional optional mechanical switches/keys.
- The complete machine documentation including all operation manuals, spare parts drawings and parts lists can also be retrieved. In addition, users can integrate their own PDF files and make them available to machine operators.
- USB interfaces are available on the operating unit to connect peripheral equipment such as a printer, keyboard or USB flash drive, or they may be used as an access control system in combination with the integrated password system. Two Ethernet interfaces are installed in the control cabinet at the rear.
- Optional: HiQ package with SPC chart, trend diagram and further recording possibilities.
Control elements

Mold safety

The dual mold safety provides optimized protection due to free adjustable mold safety force. Additionally, the mold safety force and speed is monitored by an envelope curve.

An innovative algorithm enables easy usability with just one parameter. The start-up tolerance can be set up bigger for a certain number of start-up cycles.

Quality monitoring

With up to four (HiQ package up to 16) envelope curves, the monitoring parameters are optimally adapted to the individual process.

An ideal curve serves as monitoring reference within the tolerance margin. Whenever the tolerance margin is exceeded, an alarm is triggered and the faulty part automatically sorted out.

Every parameter can be visualized via the quality table and evaluated by means of an SPC chart.

Cycle time analysis

The purpose of cycle time analysis is to record and optimize all movements. It is a fast and simple method of defining the optimal cycle.

The ideal cycle is stored as part of the mold data set and can be retrieved for the next production run of the mold. This enables quick recognition and correction of any process deviations.

Injection

The combination of tabular input with graphic display facilitates setting of the machine. The number of profile points is set simply by checking boxes.

A status bar on the right side of the screen gives a quick overview of the current machine status. The data is entered in physical units; alternatively, settings can be made graphically.
Integration and communication

Robot control

WITTMANN meets the plastics industry’s demand for 24/7 availability with a global network of experts.

With the help of the web service center, experienced service engineers establish a direct link to the customer’s injection molding machine via the Internet.

In this way, actual service tasks on the machines are performed quickly and flexibly, which ensures optimal productivity and conservation of value.

Robot control

WITTMANN robots are operated simply and flexibly via the machine’s monitor screen, no switch-over is necessary between machine and robot control.

The total overview is given on one screen. The control system of the robot itself is still placed directly on the robot.

Communication takes place via a CAN bus system, the EUROMAP interface remains free.

Webcam

A webcam is integrated in the injection molding machine to visualize production monitoring. This makes it possible to display areas on the B6" control system that are normally not open to view, such as robot-assisted part deposition or the mold area.

The integrated webcam is used in particular also for Web-Service 24/7. Intelligible pictures of the problem situation on site can be transmitted to our global support center to enable effective analysis.

Webcam

Process data acquisition via K4

We offer BATTENFELD K4, a process data acquisition software that provides access to a central database. Centralized data administration runs on a server and is also directly integrated in the UNILOG B6". Thus the plant’s entire machinery can be monitored and all machine data accessed via every machine control system.

K4 is an innovative MES (Manufacturing Execution System) and provides a unique scope of functions. It not only offers machine parameter settings and quality assurance, but also maintenance records, preliminary and final costing, order-related staff work time logging and hall layout, as well as innumerable evaluation options including open item management, everything covered by and available from a single system.

Process data acquisition via K4

Web-Service 24/7

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Web-Service 24/7
The fast TM Xpress for cost-efficient applications

The high-speed TM Xpress series from WITTMANN BATTENFELD provides the ideal basis for a great number of applications. Whether it be thin-walled packaging parts (such as yoghurt cups, trays or IML-decorated cups), disposable medical products (syringe barrels, pistons, etc.) or high-precision industrial components, in cooperation with our team of specialists, we will work out the optimal equipment package for every application. We put a special focus on targeted project management to ensure maximum performance for every production line.

Turnkey in-mold labeling systems

In-mold labeling (IML) is a modern technology to produce plastics packaging. In this process, thermoplastic film is inserted directly into the mold prior to injection and then amalgamated with the molded part. With this technology, such products can be individually fitted with multi-colored inscriptions and decorations at low cost.
Packaging produced in an IML process offers highest quality standards, since the label is firmly bonded to the package. The drawbacks of conventional adhesive labels are absent. Moreover, the finished package can be manufactured in a single production step.

For IML production, the WITTMANN group offers turnkey solutions from a single source

- Injection molding machines from WITTMANN BATTENFELD.
- IML molds from the WITTMANN group’s French subsidiary, which is an IML specialist. This company supplies high-performance molds in excellent quality, capable of extremely short cycle times, as well as development and design services for both molded parts and labels.
- Peripheral equipment from WITTMANN.

As a customer of the WITTMANN group, you will get a 100% tried-and-tested, optimized package deal – with a considerable reduction in start-up time and consequently in total investment costs.
Closing systems

The TM Xpress series is ideally suited for manufacturing screw caps and closing systems for pouring liquids out of bottles. Equipped with a servo-electric screw drive and a high-performance screw, the machines are able to manufacture the products with multi-cavity and stack molds in minimal cycle times (depending on the product). In manufacturing screw caps, the short cycle time requires demolding of the parts in a soft, elastic state. Downstream cooling aggregates are used to prevent deformation.

IML decoration

In the area of food packaging, printed labels are used today as eye-catchers, which are inserted into the open mold and then insert-molded in fully automatic production cells. Optimized line concepts allow the production of various packaging products (cups, trays, lids) within extremely short cycle times. Feeding, sorting and positioning of the labels as well as removal and stacking of the finished parts are taken care of by automation solutions from WITTMANN.

Medical technology

Disposable medical products such as syringe barrels, syringe pistons, closing caps, etc. are produced in molds with high numbers of cavities and under ever-increasing competitive pressure.

Here, high-performance machinery and molds are the factors to ensure optimized, minimal cycle times. We cooperate closely with leading clean room equipment specialists to provide a clean room environment for our production cells.
**High-precision parts, long flow paths**

In the area of industrial parts, wall thicknesses are continually minimized and optimized. Wall thicknesses of only a few tenths of a millimeter and long flow paths (for example in producing cable straps) demand a high injection performance as well as parallel movements of the machine to ensure low-cost manufacturing of such parts. The optimal machine configuration for every application can be selected from the extensive range of options available for the TM Xpress series.

**Buckets**

The main factors influencing the cycle time in bucket production are wall thickness and cooling. To optimize cycle times for these products, the machine must be equipped for high injection performance and parallel movements. A major concern is also the removal of such bulky parts. Here, the specialists of the WITTMANN group will be glad to help you.

**Drinking cups**

Manufacturing mass products such as drinking cups requires extremely short cycle times and optimized production equipment, including automation. Highly dynamic parts removal systems ensure economical production of these parts.
### Hydraulic
- Hydraulic unit with variable pressure and speed axial piston pump
- Hydraulic accumulator for fast injection incl. loading pump and parallel ejector movement and core pull movement via double pump
- Reinforced drive motor
- Extra large oil cooler
- Injection parallel to clamp force build-up
- Oil filtration by fine flow filter with electrical clogging indicator
- Oil level indicator with alarm
- Closed-loop oil temperature control with oil pre-heating
- Oil temperature monitoring
- Oil tank with connections for external oil filtration
- Separate hand keys for core pulls
- Hydraulic pressure displayed

### Clamping unit
- Clamping force adjustable via touch-screen incl. clamping force control
- Closing and opening speed adjustable
- Closing and opening force adjustable
- Mold safety program via envelope curves monitoring
- Moving platen supported by positioned linear guides
- Platen drillings and register rings according to EUROMAP
- Fixing holes for robot on top of the fixed platen according to EUROMAP/VDMA
- Hydraulic mold close inhibit, electrically monitored on operator side
- Central hydraulic multi-stroke ejector, adjustable
- Flexible parts removal from 3 directions

### Injection unit
- Servo closed loop control
- Barrier mixing screw, screw L/D = 22 with check valve, wear resistant screw and barrel AK+
- Screw drive by a. c. servo motor
- Thermocouple failure monitor
- Maximum temperature supervision
- Plug-in ceramic heater bands
- Temperature control of feed throat integrated
- Open nozzle
- Relief valve for nozzle pressure control
- Purge guard electrically monitored
- Selectable barrel stand-by temperature
- Physical units – bar, ccm, mm/s etc.
- Screw protection
- Material shut off mechanism
- Linear bearings for the injection unit
- Hopper MH 206 WITTMANN

### Electrical components
- Operating voltage 230/400 V-3PH, 50 Hz
- Control cabinet cooler
- Software for operating hours counter/shot counter
- Closing/opening – 5 profile steps
- Ejection forward/back – 3 profile steps
- Nozzle forward/back – 3 profile steps
- Injection/holding pressure – 10 profile steps
- Screw speed/back pressure – 6 profile steps
- Parts counter with good/bad part evaluation
- Purging program
- Stroke zero offset settings
- Start-up program
- Adjustable injection pressure limitation
- Switchover to holding pressure MASTER/SLAVE by injection time, screw stroke/injection volume and injection pressure
- Self-teaching temperature controller
- Display of temperature inside electrical cabinet
- Seven-day timer
- Access authorization via USB interface
- Access protection via password system
- Freely configurable status bar
- Physical, process-related units
- 15” TFT color screen – touchscreen
- Manual board with foil buttons
- Automatic dimming
- Logbook with filter function
- User programming system “APS”
- Cycle time analysis
- 1 freely configurable network connection
- Freely configurable screen pages “user page”
- Notepad function
- Hardcopy function
- Internal data storage via USB connection or network
- Online language selection
- Online selection of imperial or metric units
- Operator manual incl. hyd., mech. and el. schedules online
- Time monitoring
- Quality table, 1,000 storage depth
- Events protocol (logbook) for 1,000 events
- 1 envelope curve monitorings
- Injection Integral supervision
- Metering Integral supervision
- Alarm message via email
- USB – 2 x operating unit
- 2 Ethernet interfaces
- Printer via USB connection or network
- Fuse protection for sockets
- Purging program through the open mold

### Safety gate
- Monitored safety gate, CE-confirmed
- Maintenance-free safety gate locked by electromagnet
- Safety gate free for mold change and handling by robot
- Operating safety gate at the rear side

### Accessories
- Levelling pads
- Paint RAL 7047 telegrey 4/RAL 5002 ultramarine blue
**Optional Features TM Xpress UNILOG B6°**

### Hydraulic
- Hydraulic core pulls – limit switch function according to EUROMAP 13 – pressure and speeds adjustable
- Pneumatic core pull
- Pneumatic manifold for moldmaster nozzle (controlled 1 nozzle or more parallel in the mold)
- Hydraulic manifold for moldmaster nozzle (controlling 1 nozzle or more parallel in the mold)
- Filter in water inlet of oil cooler
- Adapter with ball valve on the oil tank for oil maintenance
- Separate bypass filtration unit

### Clamping unit
- Increased stationary platen thickness
- Non-standard mold hight after customers request
- SPI bolt pattern
- Ejector cross in clamping platen as per EUROMAP/SPI
- Maximum ejector force increased
- Mechanical ejector couple
- Ejector platen safety device
- Mechanical mold safety mechanism
- Air valve, action initiated and timer

### Injection unit
- Needle type shut-off nozzle, pneumatic operated
- Screw and barrel L/D = 26
- Barrel insulation

### Safety gate
- Safety gate clearance operator side/rear side extended
- Safety gate rear side lowered at the top of the upper tie bar

### Electrical components
- Additional flow controller with temperature gauges
- Shut-off valve for cooling water battery
- Blow out valve for cooling water battery
- Hosting of cooling circuits on the fixed platen of the moving platen

### Cooling and conditioning
- Temperature control zone for hot runner
- Non-contact stroke transducers (standard from 350 t)
- Special voltage
- Additional socket
- Interface for handling equipment
- Energy consumption analysis
- Switch over to holding pressure by cavity or melt pressure
- Switch over to holding pressure by external signal
- Melt cushion control
- Audible alarm
- Analog temperature control interface
- Temperature control interface digital, serial 20mA TTY protocol
- CAN-Bus interface for mold conditioner as per EUROMAP 66-2
- Interface for robots as per EUROMAP 67
- Adaptor from EUROMAP 67 to EUROMAP 12
- Interface for conveyor belt
- Host computer interface/PDA (EUROMAP 63)
- Relays contact parallel to plasticizing
- Machine fault (potential-free contact)
- BNC connectors for injection process analysis
- Interface for common data storage with robot
- Second injection data setting for automatic start-up
- Web- and remote service
- Control button BATTENFELD K4 incl. interface EUROMAP 63 – K4

### Accessoires
- Special paint and/or touch-up paint
- Tool kit
- USB flash drive for data storage
- Webcam

### Possible combinations of clamping units/injection units

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- denotes availability

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19