

VM R 40 – 270 t | CM 40 t | VM 60 – 200 t



Flexible, automated production with ultimate precision
Technology working for you.

Battenfeld
world of innovation

Special features and benefits of the VM R series 40 – 270 t



The rotary table machine series with clamping force sizes from 40 to 270 t (VM 40/.. R752 – VM 270/.. R1755), equipped with the high-performance **UNILOG B6[®]** control system and rotary tables ranging from 752 mm to 1,755 mm in diameter, represents a new benchmark in flexible parts production. It offers first-class precision and quality assurance and can be extended with automation concepts and a wide range of options. The rotary table machine is ideally suited for handling complex requirement profiles, special functions and processes, and for processing special materials as well.

Convertible injection units for horizontal and vertical configuration

Injection units with a uniform 22 : 1 L/D ratio, up to 3,000 bar injection pressure and increased injection and plasticizing performance offer additional scope for the production of injection-molded parts. With the help of an optional conversion package, existing injection units can be converted into horizontal as well as vertical units, thus offering even more flexibility. The version with a servo-electric injection unit is also available as an option.





Light curtain

Safety of the parts insertion and removal area is ensured by means of light curtains as standard. This gives the machine operator optimal access for parts removal and also ideal conditions for further automation concepts.

Media distributor

The supply of media to the molds in 2-station rotary table machines (oscillating operation) is handled by an easily accessible, robust media distributor offering a high degree of flexibility in the number of cooling and tempering circuits, hydraulic circuits for core pulls, the pneumatic system, mold heating and additional electrical signals. Rotary manifolds distributing various media and electrical signals are available for 3- and 4-station rotary table machines (rotary operation).



Servo-electric rotary plate

The drive of the rotary plate can be equipped with a speed-controlled servo motor as an option, which enables extremely fast and precise rotary motion.

Energy-saving hydraulic system

The machine's flexible drive concept, based on two electrically adjustable pumps for flow speed and hydraulic pressure control allows short machine cycle times and parallel movements of ejector and core pulls as part of the standard equipment package. The energy-saving ServoPower drive is available as an option.



Clamping system

Three symmetrically arranged clamping cylinders ensure fast, evenly distributed clamping force build-up as well as a compact design (low working height). As required, the hydraulic ejector can be repositioned for 2-, 3- and 4-station operation, and extended by the installation of additional ejector units. The clamping system allows free access to the mold from both the front and the side. This is ideal to facilitate automation of insertion and parts removal processes.

Special features of the CM series 40 t



Injection units

Servo valve controlled, vertical injection units from the TM and HM series to process TPE and various conventional thermoplastic resins.

Machine concept

Compact design with small footprint for space saving production.

Light curtain

The insertion and removal areas are secured by light barriers as standard. This provides optimal access for manual parts removal and further automation concepts.

Clamping unit

Vertical clamping unit in C frame design with 2 symmetrical clamping cylinders. Maximum mold space with optimal accessibility.

Ergonomic workstation

Reduced working height of just 1,000 mm for ergonomic working conditions in semi-automatic operation.

Special features of the VM series 60 – 200 t

Convertible injection units that can be mounted either horizontally or vertically

Innovative injection units with a universal 22 : 1 L/D ratio, up to 3,000 bar injection pressure and increased injection and plasticizing performance offer added scope for manufacturing injection molded parts. With the help of an optional conversion package, the existing injection unit can be mounted either horizontally or vertically, which means a further step-up in flexibility.

Light barrier

The insertion and removal areas are secured by light barriers as standard. This provides optimal access for manual parts removal and further automation concepts.

Clamping system

4 symmetrically arranged clamping cylinders ensure fast, even clamping force build-up with simultaneous short design. A low working height with optimal access to the central ejector provides ergonomic working conditions in semiautomatic operation.

Energy-efficient hydraulic systems with DFEE axial piston pumps

The flexible drive concept, based on an electrically adjustable delivery pump for load-sensing regulation of delivery and hydraulic pressure, allows short machine cycle times.



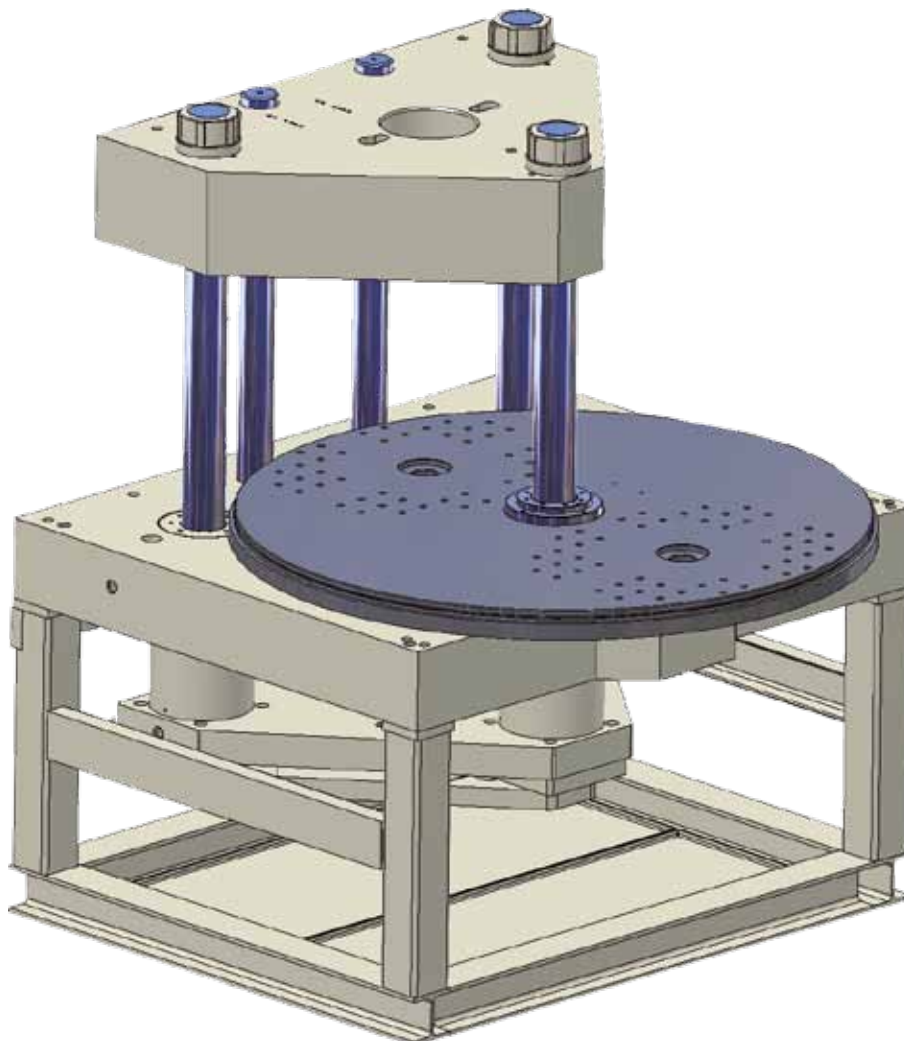
Clamping unit VM R 40 – 270 t

Special advantages of the VM R

- Symmetrical 3-point force transmission with below positioned clamping cylinders ensure optimal force distribution in the mold.
- Exact platen parallelism across the entire stroke.
- Fully hydraulic clamping concept.
- High opening and closing speeds thanks to differential control system and interconnection of both pumps.
- Short dry cycle times.
- High repeatability of all parameters.
- Ergonomic working height for the operator.
- Easy access to mold space and nozzle.
- Sensitive mold safety system.
- Extensive choice of rotary table diameters.
- Robust anti-friction surfaces below the rotary table.
- Fully controlled rotary table drive with precise positioning.
- Flexible configuration of rotary table stations.
- Low-maintenance and service-friendly design of all components.

Hybrid technology

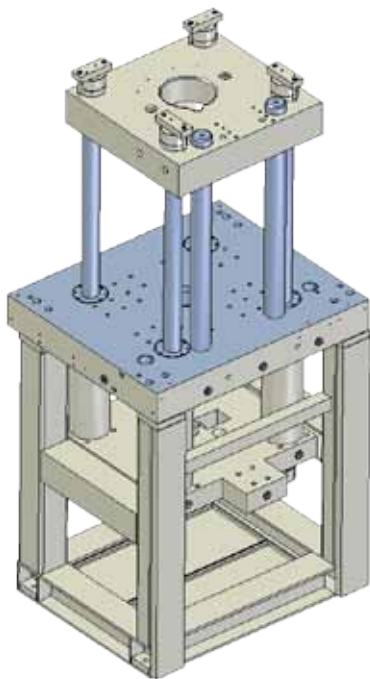
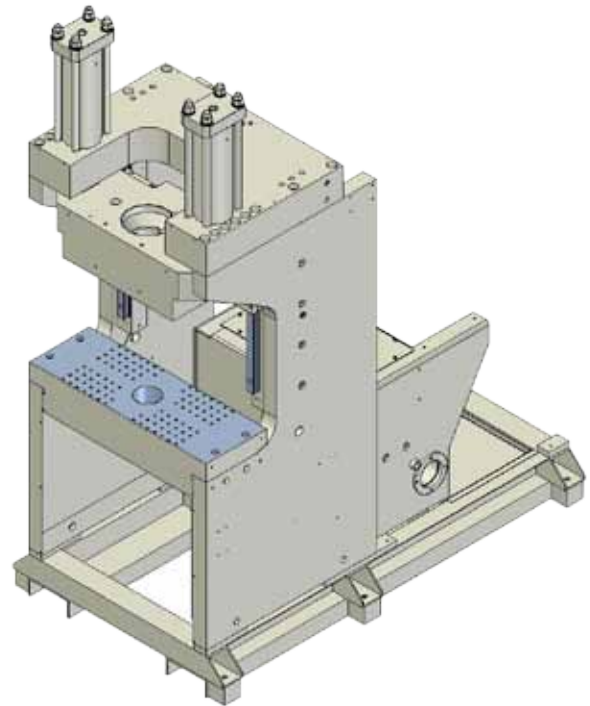
- With servoelectric rotary table and servoelectric ejector as an option.



Clamping unit CM 40 t, VM 60 – 200 t

Special advantages of the CM

- Vertical clamping unit without tie bars.
- Symmetrical 2-point force transmission by means of clamping cylinders mounted above.
- Precise platen parallelism across the entire stroke through support via linear guides.
- Fully hydraulic clamping system.
- High opening and closing speeds thanks to differential control system.
- Short dry cycle times.
- High repeatability of all parameters.
- Ergonomic working height for the operator.
- Easy access to the mold and to the nozzle.
- Sensitive mold safety system.



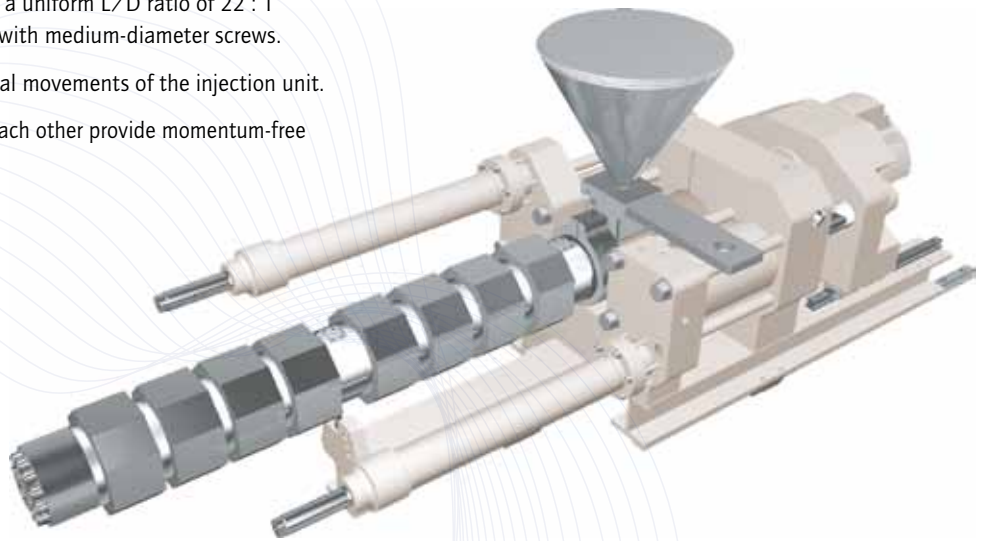
Special advantages of the VM

- Symmetrical 4-point force transmission by means of clamping cylinders mounted below to ensure optimal force distribution inside the mold.
- Precise platen parallelism across the entire stroke.
- Fully hydraulic clamping system.
- High opening and closing speeds thanks to differential control system.
- Short dry cycle times.
- High repeatability of all parameters.
- Ergonomic working height for the operator.
- Easy access to the mold and to the nozzle.
- Sensitive mold safety system.

Injection unit up to 1330

A concept for improved parts quality

- Optimized melt homogeneity thanks to a uniform L/D ratio of 22 : 1 and an injection pressure of 2,000 bar with medium-diameter screws.
- Linear guide systems ensure precise axial movements of the injection unit.
- Carriage cylinders positioned opposite each other provide momentum-free nozzle carriage.



Ultimate precision and repeatability

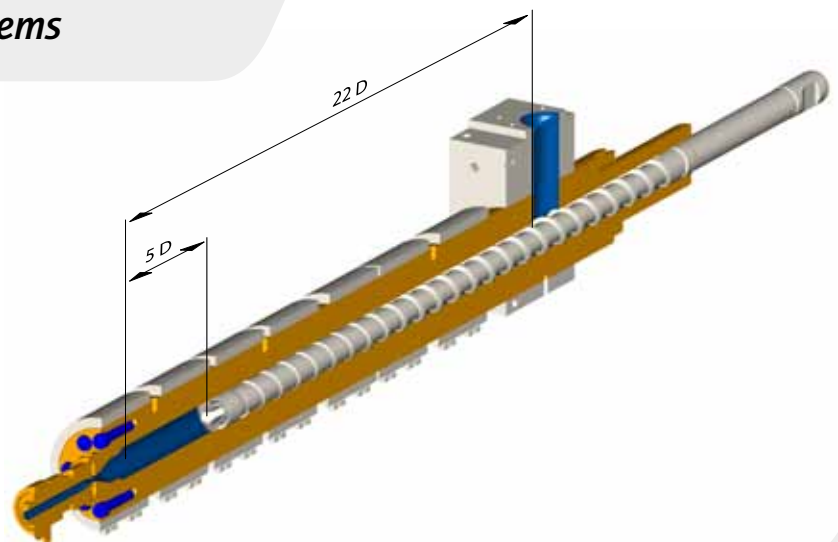
- Compact design with integrated hydraulic block and easy access to all components.
- Direct screw drive via low-speed hydraulic motor with optimal adaptation to individual plasticizing demands.
- Ultimate repeatability thanks to controlled servo-valve.

New injection units for more flexibility

- Short footprint with two pulling cylinders.
- High injection rates.
- Universal compatibility of barrels with different injection units.
- Injection unit also available in electric design.

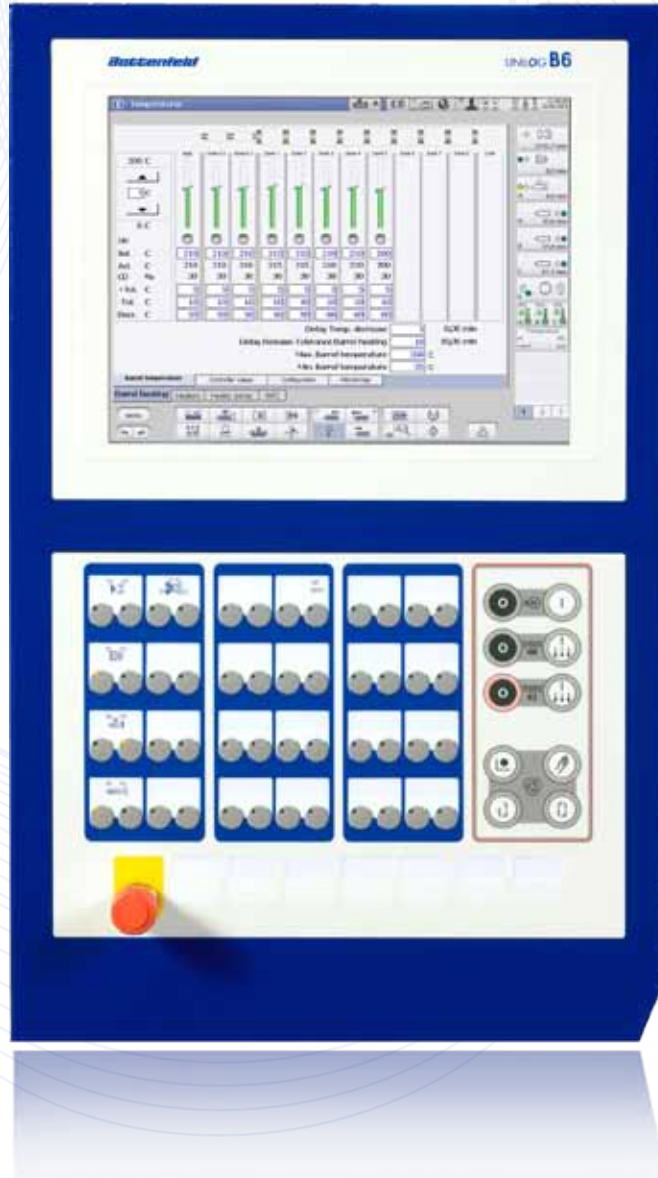
High-performance plasticizing systems

Plasticizing systems for injection molding machines must fulfill many different requirements. By applying a universal L/D ratio of 22 : 1 to the three screw sizes available for each injection unit, the processing window has been optimized to meet rising quality standards.

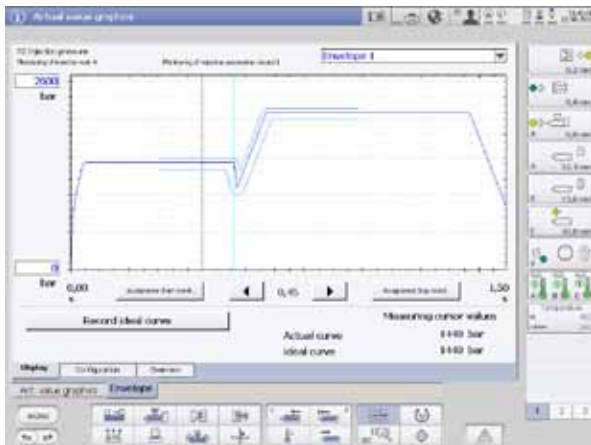


The UNILOG B6^P control system generation

UNILOG B6^P 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.



Quality monitoring

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

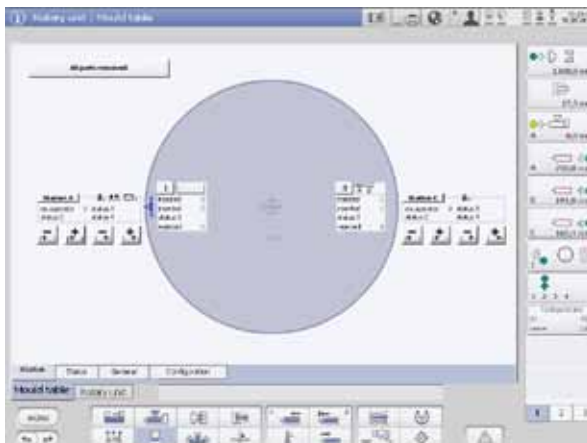
An ideal curve serves as monitoring reference within the tolerance margin. Whenever the tolerance margin is exceeded, an alarm is triggered and the faulty part automatically sorted out.

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.



Status display mold position

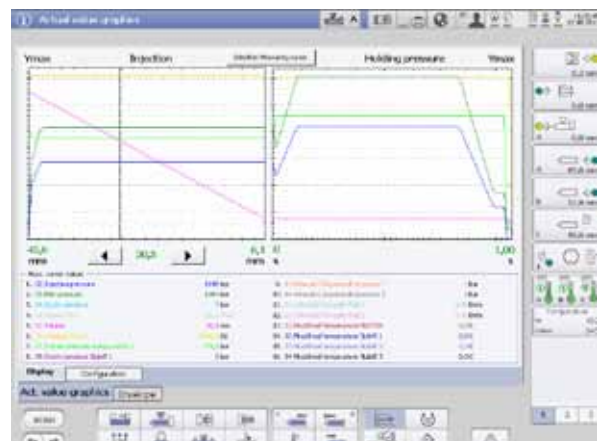
Up to four freely configurable items of status information per mold position/bottom part can be allocated in connection with a rotary unit. By means of an animated display, an overview of the current mold status of the individual mold bottom parts can be shown on this screen page, such as injection, insertion, removal or ejection status.

The graphic display for each machine model is automatically adjusted.

Actual value graphics

Important process factors can be clearly and concisely visualized. All data processing and monitoring functions are covered by a single control system.

Open interfaces facilitate access, simplify operation and integration in customers' networks.





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^p 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 24/7 web service. Intelligible pictures of the problem situation on site can be transmitted to our global support center to enable effective analysis.



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^p. 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.

Web-Service 24/7

WITTMANN BATTENFELD 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.



Standard features VM R, CM, VM – UNILOG B6^P

• standard • optional – not available

Hydraulic	VM R	CM, VM
Hydraulic unit with 2 variable pressure and speed axial piston pumps	•	—
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	•	•
Display of actual pump system pressure via touchscreen	•	•

Clamping unit	VM R	CM, VM
Clamping force adjustable via touchscreen	•	•
Closing and opening speed adjustable	•	•
Closing and opening force adjustable	•	•
Mold safety program	•	•
Bolt pattern and mold centring via EUROMAP	•	•
Hydraulic mold close inhibit, electrically monitored	•	•
Mechanical mold safety mechanism for vertical clamp incl. electrical supervision	•	•
Hydr. ejector in operating position, several ejector programs, multiple strokes and parallel movements during machine cycle	•	—
Rotary table with 2 stations, oscillating 180°	•	—
Hardened rotary table gear ring	•	—
Mechanical indexation for final positioning of rotary table	•	—
Rotary table covered by stainless steel	•	—
Maintenance-poor slide plates below the rotary table	•	—
Central lubrication for rotary table: sliding plates and gear ring	•	—
Rotary table speed adjustable via touch screen	•	—
Rotary table position visualization via touch screen	•	—
Preselection of activ mold lower parts (1 or 2) for production process	•	—

Injection unit	VM R	CM, VM
Screw L/D = 22 with check valve, screw and barrel nitrated	•	•
Thermocouple failure monitor	•	•
Maximum temperature supervision	•	•
Plugable cylinder heater bands and thermocouple	•	•
Temperature control of feed throat, integrated	•	•
Open nozzle	•	•
Relief valve for nozzle pressure control	•	•
Injection unit mounted either in horizontal or vertical position (except CM)	•	•
Purge guard	•	•
Hopper MH 206 WITTMANN	•	•
Selectable barrel stand-by temperature	•	•
Physical units – bar, ccm, mm/s etc.	•	•
Screw protection	•	•
Linear bearings for the injection unit	•	•
Infinitely variable adjustable height of horizontal injection unit, including stroke measuring device	•	•

Safety gate	VM R	CM, VM
Safety gate left, right and behind clamp unit with electr. and hydr. monitoring, CE	•	•
Infra red light curtain in operating station	•	•

Cooling and conditioning	VM R	CM, VM
2 Cooling water circuits up to 120 °C on rotary table via medium distributor (oscil. operation)	•	—

Accessories	VM R	CM, VM
Paint RAL 7047 telegrey 4/RAL 5002 ultramarine blue	•	•

Electrical components	VM R	CM, VM
Operating voltage 230/400 V-3PH, 50 Hz	•	•
Software for operating hours 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	•	•
Manual purging program and material monitoring	•	•
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	•	•
Self-teaching temperature controller	•	•
Display of temperature inside electrical cabinet	•	•
Seven-day timer	•	•
Access authorization via USB interface	•	•
Access protection via password system	•	•
User programming system "APS"	•	•
Customized text system	•	•
1 freely configurable network connection	•	•
Freely configurable screen pages "User page"	•	•
Freely configurable status bar	•	•
Physical, process-related units	•	•
15" color-TFT-touchscreen	•	•
Manual board with foil buttons	•	•
Automatic dimming	•	•
Logbook with filter function	•	•
Hardcopy function	•	•
Swivel-mounted control panel in operation station	•	•
Notepad function	•	•
Internal data storage via USB connection or network	•	•
Online language selection	•	•
Online selection of imperial or metric units	•	•
Online operator manual	•	•
Time monitoring	•	•
Faster mold movements with both pump systems for choice	•	—
Quality table, storage capacity for 1,000 events	•	•
Events protocol (logbook) for 1,000 events	•	•
Cycle time analysis	•	•
Parts counter with good/bad part evaluation	•	•
Actual value graphics with 5 curves	•	•
Alarm message via email	•	•
USB – 2 x operating unit	•	•
2 Ethernet interfaces inside electrical cabinet	•	•
1 envelope curve	•	•
Injection integral supervision	•	•
Metering integral supervision	•	•
Time supervision for ejecting parts (min., max.)	•	•
Configurable manually or automatically stop of production	•	•
Dynamic visualization of rotary table movement	•	—
Mold status, injection status, insert and take out status and mold configuration	•	•
Supervision of safety strokes for ejector, clamping unit and injection unit	•	•
Preselection of several times operation concerning insert or take out procedures	•	•
Dry operation cycle and deactivateable machine movements	•	•
Printing via USB connection or network	•	•
Purging program through the open mold	•	•
RCD current protection for sockets	•	•

Optional features VM R, CM, VM – UNILOG B6^P

Hydraulic	VM R	CM, VM
Increased hydraulics for higher speeds	○	○
ServoPower – speed-controlled servo-motor for hydraulic pump	○	— ○
Hydraulic accumulator for fast injection incl. loading via main pump	○	○
Extra large oil cooler	○	○
Core pull movement and parallel ejection with double pump	●	○
Core pull movement and parallel ejection incl. fast injection with double pump	○	○
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 or in sequence in the mold)	○	○
Hydraulic manifold for Moldmaster nozzle (controlling 1 nozzle or more parallel or in sequence in the mold)	○	○
Core pull pressure release functions	○	○
Filter in water inlet of oil cooler	○	○
Adapter with ball valve on the oil tank for oil maintenance	○	○
Separate bypass filtration unit	○	○
Clamping unit	VM R	CM, VM
Non-standard mold height after customers request	○	○
Non-standard opening stroke after customers request	○	○
Non-standard layout of fastening bores in platens	○	○
T-slots in mold platens	—	○
Cooling of moving and fixed platens	○	○
SPI mold centring and bolt pattern	○	○
Ejector cross as per EUROMAP/SPI or special	○	○
Maximum ejector force increased	○	○
Ejector platen safety device	○	○
Hydraulic valve to hold ejector in limit position	○	○
Ejector location chooseable with 3 and 4 stationed machines	○	○
Mechanical ejector couple	○	○
Ejector back via 2-hand operation with activated safety device	○	○
Quick clamping systems, hydr. or mechanical	○	○
Rotary table with 3 stations 120 °	○	—
Rotary table with 4 stations 90 °	○	—
Servo-electrical rotary drive	○	—
Quick clamping systems, hydr. or mechanical	○	○
Injection unit	VM R	CM, VM
Additional injection unit (vertical/horizontal) plugable, for alternative use for VM and VM R	○	○
Preparation for mounting a second plugable injection unit, for alternative use	○	○
High revolution screw motor	○	○
Injection unit conversion kit from vertical to horizontal for VM and VM R	○	○
Stepless adjustable height of horizontal injection unit incl. stroke measuring device	●	○
Grooves in the feeding zone	○	○
High torque screw motor in lieu of standard	○	○
High temperature heaterbands (max. 450°C)	○	○
Screw drive by a.c. servo-motor	○	○
Ball type screw tip (from DM 30 mm)	○	○
Needle type shutoff nozzle with spring, pneumatic operated or hydraulic operated	○	○
Melt temperature or pressure sensor in cylinder head	○	○
Open AIRMOULD®-nozzle, pressure controlled	○	○
Barrel insulation	○	○
Pneumatic purging guard for horizontal injection unit for VM and VM R	○	○
Pneumatic purging tray for vertical injection unit	○	○
Wear resistant screw and barrel AK+	○	○
Screw with mixing section or barrier section	○	○
Application package processing thermosets	○	○
Application package processing liquid silicone rubber (LSR)	○	○
Application package processing PIM/MIM/CIM	○	○
2-component meter mix pump	○	○
Vacuum pump	○	○
Hopper loader UNIFEED A1 in lieu of material hopper	○	○

Hopper magnet	○	○
Injection closed loop controlled via servo valve	○	○
Hopper of V2A stainless steel can be shut and emptied 29 liter	○	○
Safety gate	VM R	CM, VM
Additional operation station incl. infrared curtain and small manual desk (cycle start and emergency off)	○	—
Extended execution for manual part removal. Enable ejector and core pull movements with interrupted safety device incl. approval button and key switch preselection	○	○
Clamping unit protected by additional light curtain	○	—
Pneumatic safety gate at the operator side	○	○
Preparation for additional automation systems incl. safety related interfaces	○	○
Complete covering for horizontal injection unit	○	○
Cooling and conditioning	VM R	CM, VM
Cooling water battery with temperature gauges	○	○
Shut-off valve for cooling water battery	○	○
Venting valve for cooling water battery	○	○
Filter in water inlet of cooling circuit	○	○
Hosting of cooling circuits on the fixed and the moving nozzle platen	○	○
Rotary distributor for conditioning., hydr., pneum. and electr. circuits/signals (full turn of rotary table)	○	—
Rotary union for electrics, 8-pin	○	—
Electrical components	VM R	CM, VM
Clamp force display and supervision	○	○
Temperature control zone for hot runner	○	○
Non-contact stroke transducers	○	○
Special voltage	○	○
Control cabinet cooler	○	○
Closed loop temperature control of platen and mold	○	○
Additional socket	○	○
Interface for handling equipment	○	○
Energy consumption analysis	○	○
Interface for RJG-Insight System	○	○
Switch over to holding pressure by cavity or melt pressure	○	○
Switch over to holding pressure by external signal	○	○
Cavity pressure/cavity surface temperature display	○	○
Injection compression program/venting program	○	○
Melt cushion control	○	○
Audible alarm	○	○
Analog temperature control interface	○	○
Temperature control interface digital, serial 20 mA TTY protocol	○	○
CAN-Bus-interface for temperature controller as per EUROMAP 66.2	○	○
Interfaces for temperature supervision on upper mold or lower molds	○	○
Interfaces for extended mold supervision on upper mold or lower molds	○	○
Interface for AIRMOULD® mobile	○	○
Interface for robots as per EUROMAP 67	—	○
Interface for robots as per EUROMAP 67.1	○	—
Host computer interface/PDA (EUROMAP 63)	○	○
Potential free contact parallel to plasticizing	○	○
Machine fault (potential-free contact)	○	○
BNC connectors for injection process analysis	○	○
Interface for full integration of robot	○	○
Interface for brushing device	○	○
Interface for vacuum pump	○	○
Second injection parameter set for lower mold assignment or injection parameter switchover during starting phase	○	○
Web- and remote service	○	○
Control button BATTENFELD K4 incl. Interface EUROMAP 63 – K4	○	○
HiQ package	○	○
Accessories	VM R	CM, VM
Lighting in mold space	○	○
Special paint/touch-up kit	○	○
Tool kit	○	○
Levelling pads	○	○
USB flash drive for data storage	○	○
Webcam	○	○

Possible combinations of clamping units/injection units

Clamping units/injection units VM R

Clamping unit	Rotary table	Injection unit							
		60	130	210	350	525	750	1000	1330
to	mm								
40	752	•	•						
60	1040	•	•	•	•				
75	1040		•	•	•	•			
110	1280		•	•	•	•			
150	1280				•	•	•	•	
150	1520				•	•	•	•	
200	1520					•	•	•	
200	1755					•	•	•	
270	1755					•	•	•	•

Clamping units/injection units CM and VM

Clamping unit	Injection unit						
	60	130	210	350	525	750	1000
to							
CM 40	•	•	•	•			
VM 60	•	•	•	•			
VM 80		•	•	•	•		
VM 100		•	•	•	•		
VM 150				•	•	•	•
VM 200					•	•	•

Shot weight conversion table

Material	Factor
ABS	0.88
CA	1.02
CAB	0.97
PA	0.91
PC	0.97
PE	0.71
PMMA	0.94
POM	1.15
PP	0.73

Material	Factor
PP + 20% Talc	0.85
PP + 40% Talc	0.98
PP + 20% GF	0.85
PS	0.91
PVC-rigid	1.12
PVC-flexible	1.02
SAN	0.88
SB	0.88
PF	1.3
UP	1.6

The maximum shotweights (g) are calculated by multiplying the theoretical shot volume (cm³) by the above factor.

Dark grey boxes = thermosets



Technology working for you.

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