Battenfeld

Wittmann

EcoPower 55 – 300 t

All-electric, fast and precise

world of innovation

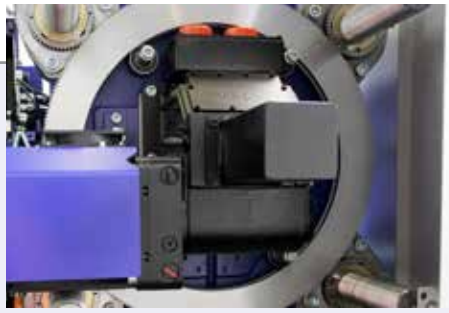
DYNAMIC – PRECISE – HIGHLY EFFICIENT
Optimal sustainability and performance

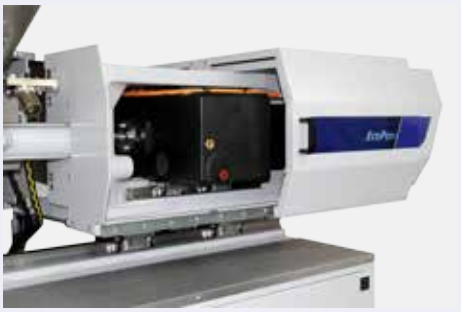
The advantages

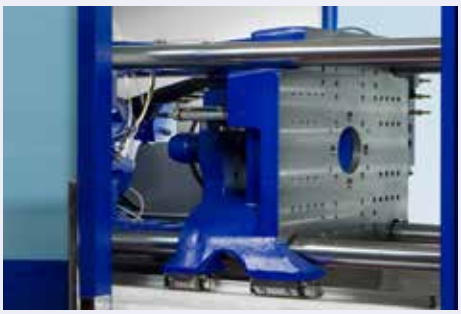
» Dynamic toggle clamping unit with sensitive mold protection
» High-precision injection units with extreme shot-by-shot accuracy
» Fast, precise and efficient thanks to servo drive axes with parallel operation
» Additional energy bonus through patented KERS energy recovery system
» User-friendly through new UNILOG B8 control system with integrated assistance systems
» "plug & produce" extension into a full-fledged production cell possible with WITTMANN peripheral units and the WITTMANN 4.0 integration package
» Optimal price/performance ratio

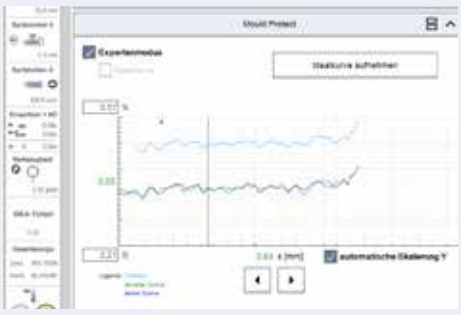
The machines series

EcoPower standard: 7 clamping force sizes from 55 to 300 t
EcoPower Medical: for clean room applications – from 55 to 300 t
EcoPower COMBIMOULD: for multi-component injection molding – from 55 to 300 t









EcoPower

The system-highlights

» **Direct servo drives for main movements**
The *EcoPower* machines come with highly dynamic servo motors to drive the main movements (closing/opening, plasticizing, injection). The mold height adjustment device in the clamping unit is also driven by a servo-electric motor. The ancillary strokes (ejector, nozzle stroke/contact pressure, core pulls) are driven by an integrated servo-hydraulic aggregate powered by a servo-electric motor. Direct servo-mechanic drives are available as an option.

» **High-performance injection unit**
The *EcoPower* injection units are equipped with a twin drive system for the injection and dosing functions. A torsion-resistant, one-piece cast iron frame with linear guides and a central ball screw drive provides the basis for highly dynamic, precise movements.

» **Fast toggle clamping system**
The *EcoPower* clamping unit is a 3-platen/4-tie-bar system with a 5-point toggle lever, driven directly by a servo motor via a rack-and-pinion drive. The moving platen of the machine travels on linear guides and rotating roller bearings without coming into contact with the tie-bars. Injection can already start during clamping force build-up.

» **KERS – energy recovery is standard**
The KERS kinetic energy recovery system, patented for injection molding machines, converts the kinetic energy released by braking processes into electrical energy. The resulting current is used within the machine, e. g. for barrel heating. With KERS, the energy consumption can be cut further by up to 5 %.

» **Mould Protect – fast-response mold protection**
The minimal rolling friction of the moving platen guide system combined with measurement of force changes inside the toggle lever drive offers optimal conditions for highly sensitive, self learning, fast-response mold protection.

CLAMPING UNIT
Servo-electric speed and dynamism

» **Ample space for complex molds**
- Generously dimensioned mold platens and a clean toggle lever clamping system offer the optimal environment for all molds including all media connections.
- The ejector area and the environment of the platens offer easy access for machine setup and adjustment work.

» **Sensitive and precise**
In the *EcoPower* clamping system, the tie-bars are exclusively used for force transmission between the outer platens. The moving platen travels virtually free of friction across the linear bearings without coming into contact with the tie-bars.

» **Servo-electric dynamism**
- The moving platen is moved quickly and with high precision by a self-locking 5-point toggle lever.
- The toggle lever is driven by a highly dynamic servo motor via a rack-and-pinion drive system.
- The synchronized mold height adjustment via 4 bronze bar nuts and a sun gear system is driven by a servo motor.

» **Servo-hydraulic ancillary strokes**
To drive the ancillary strokes (ejector, nozzle strokes and core pulls), a hydraulic aggregate powered by a servo-electric motor is mounted on the inside of the machine frame. Being specially designed for high efficiency, it requires no cooling water connection. Maintenance-friendly access is from the rear, behind the clamping unit. Servo-mechanical drives for the ancillary strokes are available as options.

INJECTION UNIT
Precision from beginning to end

» **Everything to ensure series consistency**
- All screws > 25 mm come with a 22:1 L/D ratio.
- All injection units offer a wide injection pressure range.
- Plasticizing parallel to clamping unit movements and start of the injection process during clamping force build-up are possible as standard.
- *EcoPower* injection units with a higher injection performance can be supplied as an option.
- Moment-free nozzle contact thanks to axial configuration of traveling cylinders
- Plasticizing units can be mounted to different injection aggregates with identical screw diameters
- In combination with WITTMANN BATTENFELD HiQ software packages sensitive adjustment facilities are available in the form of (optional) software modules to compensate environmental factors such as temperature and moisture, regrind or masterbatch content.

» **Optimal operational excellence**
- The complete range of all-electric injection units is designed for quick barrel exchange from above.
- Easy access for changeover work thanks to compact design and sliding guard

Anti-wear options
In addition to the premium-quality standard equipment, an extensive range of options is available to provide extra anti-wear and/or anti-corrosion protection. Predefined option packages and a selection matrix facilitate the selection of the right plasticizing unit.

DRIVE TECHNOLOGY
Energy efficiency with servo motors

Fast-responding, precise, cost-efficient
The use of servo-electric drive technology for all main movements affecting the cycle offers a large number of advantages compared to conventional hydraulic injection molding machines:

» Energy efficiency through direct drive without energy conversion into hydro energy
» Energy efficiency through the servo drives' high efficiency rates
» Digital control for maximum repeatability
» Use of recovered braking energy via KERS system for powering of heater bands and bridging of short power failures
» Cycle flexibility thanks to possibilities with parallel movements
» Low sound emission (< 65 dBA)

The combination of servo motors and drive units (rack-and-pinion drive for the toggle lever and spindle drive for the injection stroke) can be supplied at different performance levels for different speeds.

Basically, the *EcoPower* drive concept offers the advantage of modularity for demand-oriented adjustment of drive performance to the intended use in each case.

Servo-hydraulic drive for ancillary strokes
» Integrated in the machine frame without additional space requirements
» Drive unit for hydraulic core pulls
» Energy-efficient, maintenance-free nozzle contact with high pressure
» No cooling required for standard applications

INSIDER CONCEPT
"ex works" production cell

The insider concept is an ex-works solution to transform an *EcoPower* injection molding machine into a fully fledged production cell. In its basic version, the equipment cell integrates a parts handling system, a conveyor belt for parts transport and a protective housing firmly connected with the machine. Additional equipment modules for further processing, quality documentation and packaging are available as options. For the design and configuration of such higher automation levels, WITTMANN BATTENFELD places the combined expert knowledge of the entire group at its customers' disposal.

The advantages of insider automation

» **Material flow systematization**
thanks to a uniform logistics interface for finished parts transfer at the end of the clamping unit, a prerequisite for positioning of several machines in rows

» **Reduction of production space**
by up to 50 % compared to conventional automation solutions

» **Minimization of robot cycle times**
through shorter travel paths and immediate parts depositing on conveyor belt

» **Easy access in spite of integration**
to the mold and the robot thanks to mobility of the conveyor belt integrated in the protective housing

» **Cost benefits,**
since safety features for all danger areas are already in place and certified ex works.

» **CE mark included**
for every machine with an insider solution. No more costs for individual approval.

CE certified by type examination CE

UNILOG B8
Complex matters simplified

The new UNILOG B8 machine control system is the WITTMANN BATTENFELD solution to facilitate the operation of complex processes for human operators. For this purpose, the integrated industrial PC has been equipped with an enlarged intuitive touch screen operator terminal. The visualization screen is the interface to the new Windows® 10 IoT operating system, which offers extensive process control functions. Next to the pivotable monitor screen, a connected panel/handset is mounted on the machine's central console.

UNILOG B8
Highlights

» **Operating logic**
with a high degree of self-explanation, similar to modern communication devices

» **2 major operating principles**
- Operating/movement functions via tactile keys
- Process functions on touch screen (access via RFID, key card or key ring)

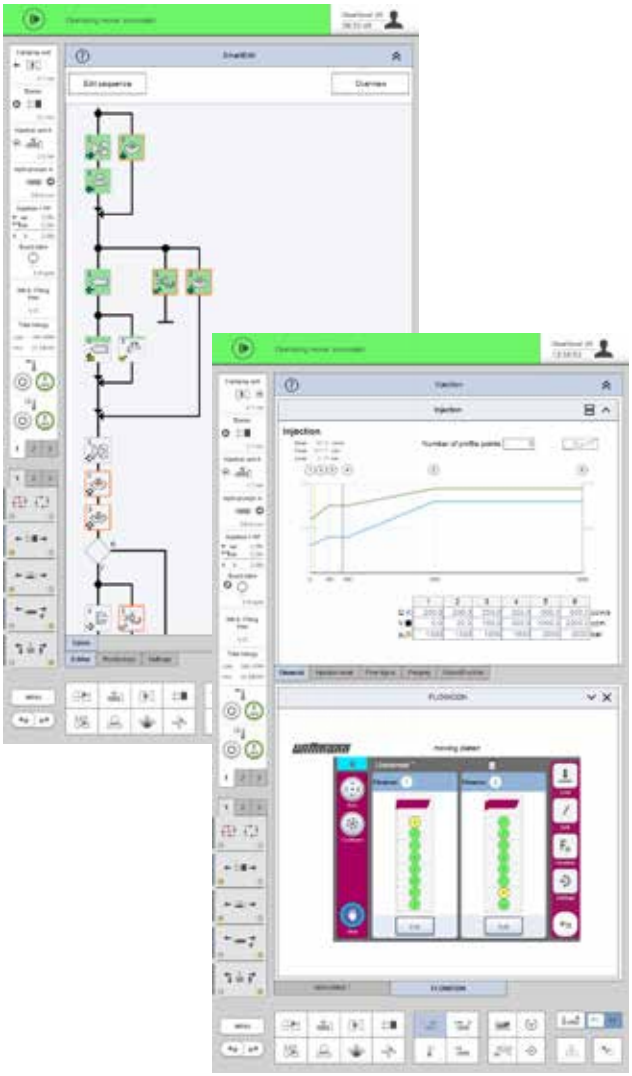
» **Process visualization**
via 21.5" touch screen display (full HD), pivoting laterally

» **New screen functions**
- Uniform layout for all WITTMANN appliances
- Recognition of gestures (wiping and zooming by finger movements)
- Container function – split screen for sub-functions and programs

» **Status visualization**
uniform signaling system across the entire WITTMANN group
- Headline on the screen with colored status bars and pop-up menus
- *ambiLED*-display on machine

» **Operator assistance**
- *QuickSetup*: process parameter setting assistant using an integrated material database and a simple query system to retrieve molded part data with machine settings pre-selection
- Extensive help library integrated

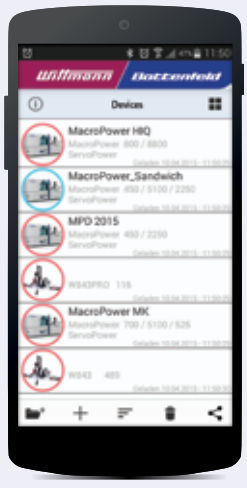
The process in constant view



» ***SmartEdit***
SmartEdit is a visual, icon-based cycle sequence programming facility, which enables direct addition of special functions (core pulls, air valves, etc.) based on a standard process via touch operation on the control system's monitor. In this way, a total user-defined sequence can be compiled from a sequence menu. This machine cycle, visualized either horizontally or vertically, can be adjusted simply and flexibly to the process requirements by finger touch with "drag & drop" movements.

The advantages
- Icon visualization ensures clarity.
- Clear events sequence through node diagram
- Alterations without consequences through "dry test runs"
- Theoretical process sequence can be quickly implemented in practice.
- Automatic calculation of the automation sequence based on the actual set-up data set without machine movements

» ***SmartScreen***
- Partitioning of screen displays to visualize and operate two different functions simultaneously (e.g. machines and peripherals)
- Uniform design of the screen pages within the WITTMANN group
- Max. 3 containers can be addressed simultaneously for the *SmartScreen* function.
- Adjustments of set values can be effected directly in the set value profile.



Remote communication

» ***QuickLook***
Production status check via smartphone – simple and comfortable:
- Production data and statuses of all essential appliances in a production cell
- Complete overview of the most important production parameters
- Access to production data, error signals and user-defined data
- Facilities for grouping of appliances and sorting according to status available

» **Global online service network**
- Web-Service 24/7: direct Internet connection to WITTMANN BATTENFELD service
- Web-Training: efficient staff training by means of the virtual training center

WITTMANN 4.0
Communication in and with production cells

With its internal communication standard WITTMANN 4.0, the WITTMANN group offers a uniform data transfer platform between injection molding machines and peripheral equipment from WITTMANN. For an appliance exchange, the correct operating software is loaded automatically via an update function according to the "plug & produce" principle.

Connection of peripherals via WITTMANN 4.0

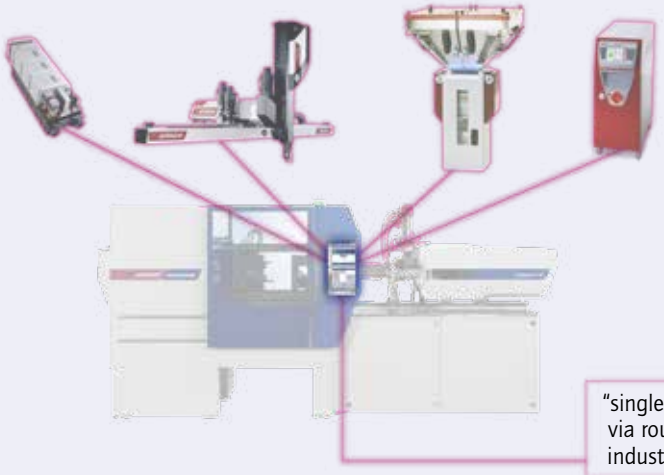
» **WITTMANN FLOWCON plus water flow regulator and GRAVIMAX blenders**
- Units directly addressed and controlled via the machine's control system
- Joint saving of data in the production cell, the machine and in the network via MES

» **WITTMANN robots with R9 control system**
- Operation of robots via the machine's monitor screen
- High-speed communication between machine and robot to synchronize movements
- Important machine movements can be set via the R9 robot control system

» **WITTMANN TEMPRO plus D temperature controllers**
- Setting and control of temperatures via the machine's control system possible
- All functions can be operated either on the unit or via the machine's control system

Production monitoring

» ***SmartMonitoring*: process data acquisition via *authentig***
For monitoring of machines or production cells or entire manufacturing areas, WITTMANN BATTENFELD uses the "authentig" MES system (Manufacturing Execution System). In combination with the "*SmartMonitoring*" module, the current status of an injection molding operation can be visualized also on any machine monitor screen B8 in real time.



WITTMANN 4.0 system
With WITTMANN 4.0, a machine and its robots and peripherals are transformed into a uniform technical organism, which communicates externally via a specific IP address. A single point entry increases the cyber security significantly.

OPTIONS
Modular and flexible

EcoPower
The option highlights

» **Performance increase for toggle lever and injection**
As an option, a "high-speed" version of the toggle lever drive is available, which significantly reduces the dry-cycle time. Doubling the injection rate is an option available on the injection side.

» **Faster ejection**
As an alternative to the standard servo-hydraulic drive for the ejector, a more powerful version with a servo-mechanical drive is available as an option.

» **Electrical nozzle movement**
Instead of the standard version of the nozzle system with hydraulic cylinders, the nozzle carriage equipped with a servo-electric drive can be supplied as an option.

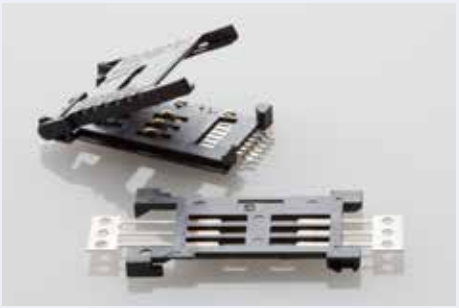
» **Fast media connections**
For the ergonomically positioned standard connection points for cooling water, air and core pull hydraulics, optional fast-coupling plates (individual plates or system plates) can be supplied, as well as electrical plug-in systems for the hot runner heating circuits, temperature and pressure sensors and coding signals.

» **WITTMANN peripherals**
The extensive range of WITTMANN peripheral units offers appropriate solutions for all secondary processes of injection molding, including parts handling, material feeding and drying, sprue recycling and mold cooling. Via the optional WITTMANN 4.0 integration package, all additional appliances can be integrated into the production cell according to the "plug & produce" principle.

APPLICATION TECHNOLOGY
Outstanding competence

Photo: Greiner Bio-One GmbH

» **Clean room injection molding**
Whenever medical or electronic components need to be manufactured in a particle-free environment, the *EcoPower* concept with its easy-to-clean mold space offers good basic conditions, which can be further optimized to meet more stringent requirements by adding optional equipment modules (such as water-cooled servo motors).



» **Technical precision injection molding**
The *EcoPower* ensures highest standards of precision and reproducibility, with free-of-play force transmission and servo-electric drives. Technical parts such as SIM card holders can be produced with high accuracy and at high speeds. Minimal cycle times and reliable production processes ensure profitability and top-quality products.

» **IML – In-mold labeling**
The fast running *EcoPower* or TMX machines in combination with the proven WITTMANN handling technology are the basic equipment for high-performance in-mold labeling production cells to make directly decorated containers.

» **COMBIMOULD**
Where two or more different plastic materials in different colors or with different attributes are to be combined into one part, the *EcoPower* machines can be fitted with additional injection units in V or L configuration.

» **LIM – liquid injection molding**
LIM designates the injection molding process to make elastic parts from 2-component LSR (liquid silicon rubber). For LSR product manufacturing, WITTMANN BATTENFELD uses proven modular machine and automation concepts with special plasticizing systems adapted to the viscosity of LSR.

» **PIM (CIM/MIM) – powder injection molding**
Powder injection molding (PIM) is a manufacturing process for series production of parts made of metallic or ceramic materials. PIM is the ideal process to produce large quantities of complex, functional components with a high material requirements profile.

» **Injection molding of high-precision components**
The high degree of precision in the movements of servo drives stands for an equally high level of precision and consistency of the injection parameters. This provides ideal conditions for processing engineering plastics into all kinds of high-precision components.

» **BFMOLD© – variothermic technology**
BFMOLD® ("ball filled mold") technology combined with specially adapted heating and cooling aggregates enables cyclical heating and cooling of cavity areas close to the contours. The effect of this process is the elimination of joint lines and sink marks as well as accurate forming of high-gloss surfaces.

COMBINATIONS OF CLAMPING UNITS/INJECTION UNITS						
Clamping unit	Injection unit					
t	70	130	350	750	1330	2100
55	•	•	•			
90		•	•			
110		•	•	•		
160			•	•		
180			•	•	•	
240				•	•	•
300				•	•	•

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

The maximum shotweights (g) are calculated by multiplying the theoretical shot volume (cm^3) by the above factor.

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

Dark grey boxes = thermosets

DATA *EcoPower* 55

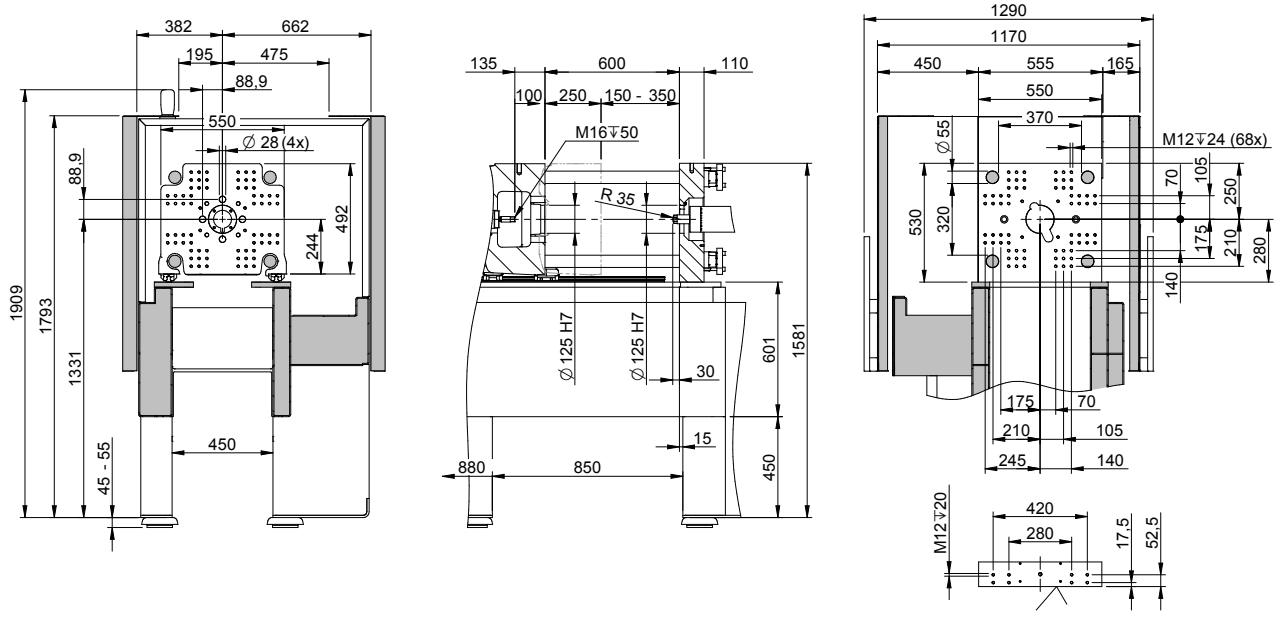
Clamping unit		***EcoPower* 55**
Clamping force/pressure	kN	550
Distance between tie bars	mm x mm	370 x 320
Mold height	mm	150 ... 350
Opening stroke	mm	250
Max. daylight	mm	600
Ejector stroke hydr./electr.	mm/mm	100/100
Ejector force	kN	25
Dry cycle time[1]	s – mm	1.3 – 224

Injection unit		**70**			**130**					**350**			
Screw diameter	mm	14	18	22	14	18	22	25	30	25	30	35	40
Screw stroke	mm	90			90	110	110	125	125	175			
Screw L/D ratio		20			20	20	20	22	22	22			
Theoretical shot volume	cm^3	13.9	22.9	34.2	13.9	28	41.8	61.4	88.4	85.9	124	168	220
Specific injection pressure	bar	3000	3000	2046	3000	3000	2864	2218	1540	3000	2835	2083	1595
Max. screw speed	min^{-1}	600			500	500	500	400	400	350			
Max. plasticizing rate (PS)[2]	g/s	2	6	8.6	1.7	5	7.2	10.5	15.4	9.3	13.5	21	33.5
Max. screw torque	Nm	65	150	150	65	150	150	250	250	340	500	500	500
Nozzle stroke/contact force	mm/kN	250/40			250/40					250/40			
Injection rate into air	cm^3/s	61.6	102	152	30.8	50.9	76	98.2	141	98.2	141	192	251
Injection rate into air increased (option)	cm^3/s					102	152	196	283				
Barrel heating power	kW	2.9	5.5	6.3	2.9	5.5	6.3	9	10.4	9	10.4	10.4	12.9
Number heating zones		4			4					4			
Energy efficiency class[3]		6+			6+	6+	6+	5+	7+	5+	6+	8+	9+

Drive				
Electrical power supply without/with Europackage	kVA	11/40	11/40	22/51
Emission sound pressure level[4]	dB(A)	63	63	63

Weights, dimensions				
Net weight	kg	3200	3200	3400
Length x width x height[5]	m	3.8 x 1.4 x 2	3.9 x 1.4 x 2	4.2 x 1.4 x 2
Max. mold weight[6]	kg	600		
Min. mold dimension	mm x mm	246 x 196		

1) theoretical according to EUROMAP 6 2) according to WITTMANN BATTENFELD norm
3) calculated according to EUROMAP 60.1 (Cycle I) 4) according to ÖNORM EN 201:2010 annex K
5) Length with medium screw diameter in rearmost operating position 6) max. 2/3 on clamping platen



DATA *EcoPower* 90

Clamping unit		***EcoPower* 90**
Clamping force/pressure	kN	900
Distance between tie bars	mm x mm	470 x 420
Mold height	mm	200 ... 450
Opening stroke	mm	380
Max. daylight	mm	830
Ejector stroke hydr./electr.	mm/mm	140/125
Ejector force	kN	25
Dry cycle time[1]	s – mm	1.5 – 294

Injection unit		**130**					**350**			
Screw diameter	mm	14	18	22	25	30	25	30	35	40
Screw stroke	mm	90	110	110	125	125	175			
Screw L/D ratio		20	20	20	22	22	22			
Theoretical shot volume	cm^3	13.9	28	41.8	61.4	88.4	85.9	124	168	220
Specific injection pressure	bar	3000	3000	2864	2218	1540	3000	2835	2083	1595
Max. screw speed	min^{-1}	500	500	500	400	400	350			
Max. plasticizing rate (PS)[2]	g/s	1.7	5	7.2	10.5	15.4	9.3	13.5	21	33.5
Max. screw torque	Nm	65	150	150	250	250	340	500	500	500
Nozzle stroke/contact force	mm/kN	250/40					250/40			
Injection rate into air	cm^3/s	30.8	50.9	76	98.2	141	98.2	141	192	251
Injection rate into air increased (option)	cm^3/s		102	152	196	283	196	283	385	503
Barrel heating power	kW	2.9	5.5	6.3	9	10.4	9	10.4		12.9
Number heating zones		4					4			
Energy efficiency class[3]		3+	4+	4+	4+	6+	3+	5+	7+	8+

Drive			
Electrical power supply without/with Europackage	kVA	17/46	28/58
Emission sound pressure level[4]	dB(A)	63	63

Weights, dimensions			
Net weight	kg	4600	4800
Length x width x height[5]	m	4.2 x 1.5 x 2.1	4.5 x 1.5 x 2.1
Max. mold weight[6]	kg	1000	
Min. mold dimension	mm x mm	296 x 246	

1) theoretical according to EUROMAP 6 2) according to WITTMANN BATTENFELD norm
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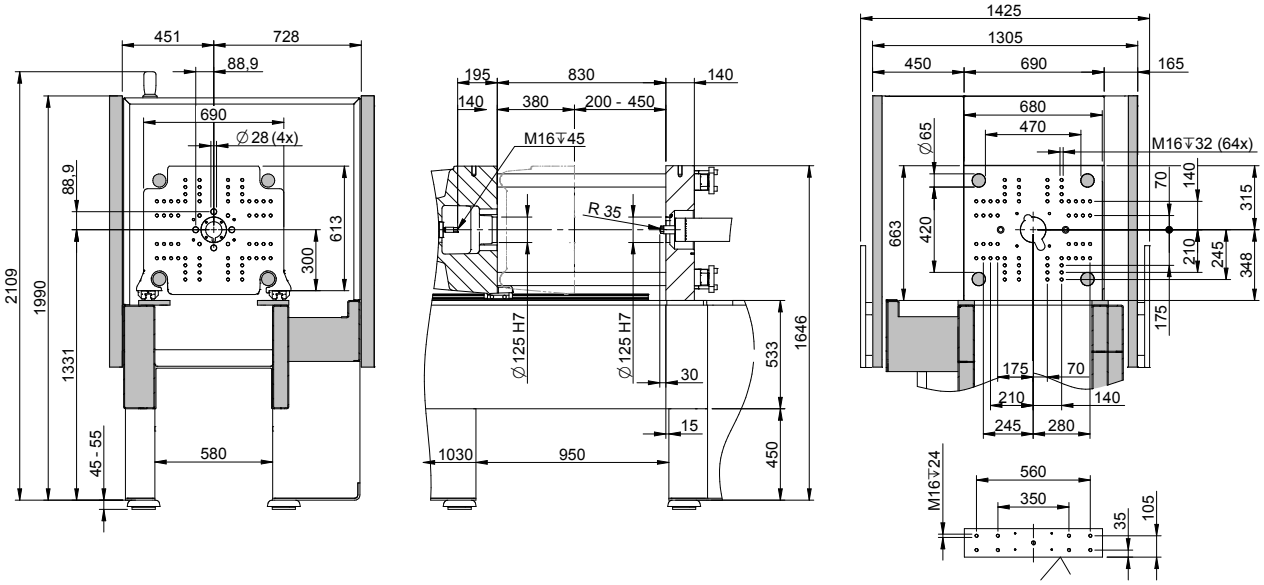
5) Length with medium screw diameter in rearmost operating position 6) max. 2/3 on clamping platen



DATA *EcoPower* 110

Clamping unit		***EcoPower* 110**
Clamping force/pressure	kN	1100
Distance between tie bars	mm x mm	470 x 420
Mold height	mm	200 ... 450
Opening stroke	mm	380
Max. daylight	mm	830
Ejector stroke hydr./electr.	mm/mm	140/125
Ejector force	kN	25
Dry cycle time[1]	s – mm	1.5 – 294

Injection unit		**130**					**350**				**750**			
Screw diameter	mm	14	18	22	25	30	25	30	35	40	35	40	45	50
Screw stroke	mm	90	110	110	125	125	175				200	225	225	225
Screw L/D ratio		20	20	20	22	22	22				22			
Theoretical shot volume	cm^3	13.9	28	41.8	61.4	88.4	85.9	124	168	220	193	283	358	442
Specific injection pressure	bar	3000	3000	2864	2218	1540	3000	2835	2083	1595	3000	2678	2116	1714
Max. screw speed	min^{-1}	500	500	500	400	400	350				325			
Max. plasticizing rate (PS)[2]	g/s	1.7	5	7.2	10.5	15.4	9.3	13.5	21	33.5	19.5	31.1	40.5	49
Max. screw torque	Nm	65	150	150	250	250	340	500	500	500	900			
Nozzle stroke/contact force	mm/kN	250/40					250/40				350/40			
Injection rate into air	cm^3/s	30.8	50.9	76	98.2	141	98.2	141	192	251	192	251	318	393
Injection rate into air increased (option)	cm^3/s		102	152	196	283	196	283	385	503	337	440	557	687
Barrel heating power	kW	2.9	5.5	6.3	9	10.4	9	10.4	10.4	12.9	11.5	14	17.3	21.9
Number heating zones		4					4				4	4	4	5
Energy efficiency class[3]		3+	4+	4+	4+	6+	3+	5+	7+	8+	6+	7+	8+	9+

Drive				
Electrical power supply without/with Europackage	kVA	17/46	28/58	34/64
Emission sound pressure level[4]	dB(A)	63	63	63

Weights, dimensions				
Net weight	kg	4600	4800	5200
Length x width x height[5]	m	4.2 x 1.5 x 2.1	4.5 x 1.5 x 2.1	5.2 x 1.5 x 2.1
Max. mold weight[6]	kg	1000		
Min. mold dimension	mm x mm	296 x 296		

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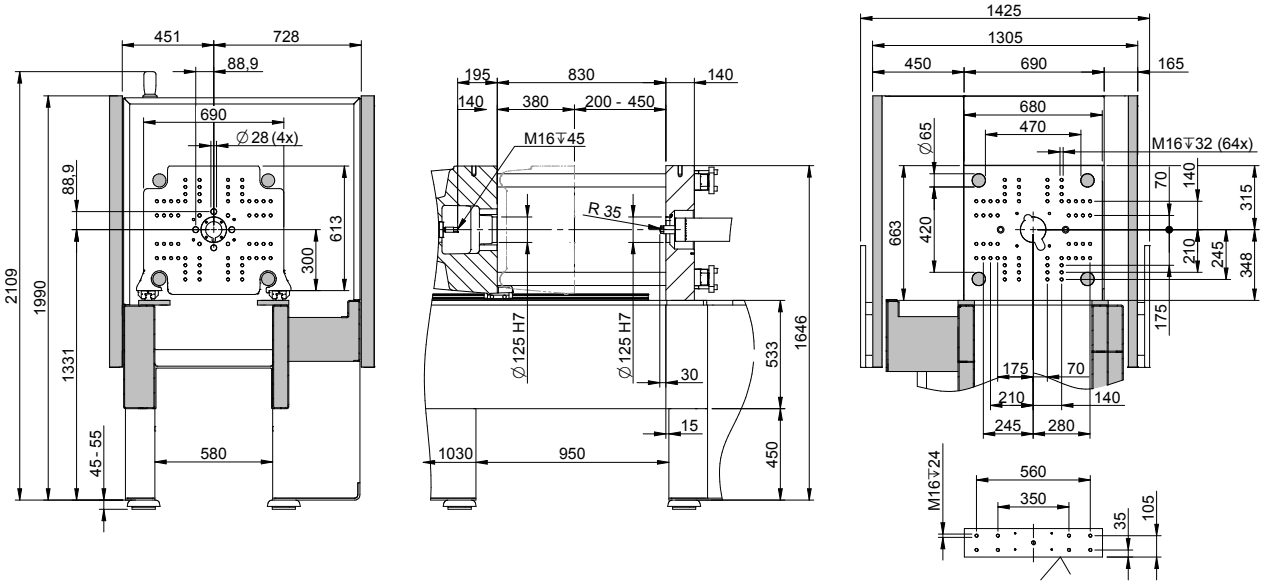
5) Length with medium screw diameter in rearmost operating position 6) max. 2/3 on clamping platen



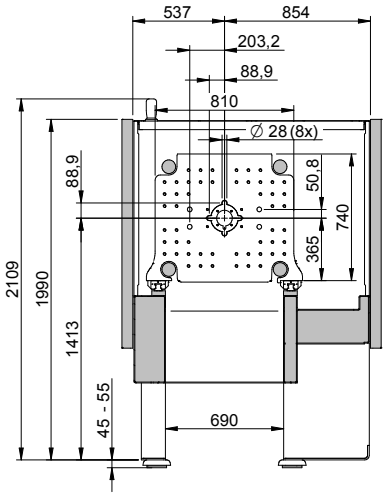
Clamping unit		***EcoPower* 160**
Clamping force/pressure	kN	1600
Distance between tie bars	mm x mm	570 x 520
Mold height	mm	225 ... 550
Opening stroke	mm	480
Max. daylight	mm	1030
Ejector stroke hydr./electr.	mm/mm	180/160
Ejector force	kN	40
Dry cycle time[1]	s – mm	1.7 – 364

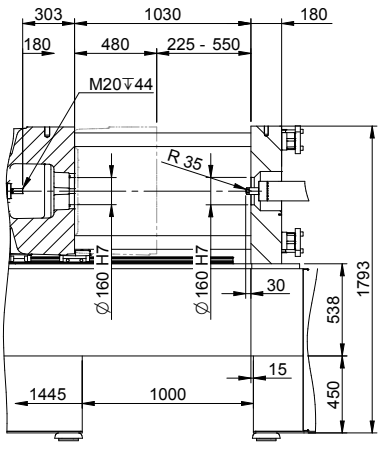
Injection unit		**350**				**750**			
Screw diameter	mm	25	30	35	40	35	40	45	50
Screw stroke	mm	175				200	225	225	225
Screw L/D ratio		22				22			
Theoretical shot volume	cm^3	85.9	124	168	220	193	283	358	442
Specific injection pressure	bar	3000	2835	2083	1595	3000	2678	2116	1714
Max. screw speed	min^{-1}	350				325			
Max. plasticizing rate (PS)[2]	g/s	9.3	13.5	21	33.5	19.5	31.1	40.5	49
Max. screw torque	Nm	340	500	500	500	900			
Nozzle stroke/contact force	mm/kN	250/40				350/40			
Injection rate into air	cm^3/s	98.2	141	192	251	192	251	318	393
Injection rate into air increased (option)	cm^3/s	196	283	385	503	337	440	557	687
Barrel heating power	kW	9	10.4	10.4	12.9	11.5	14	17.3	21.9
Number heating zones		4				4	4	4	5
Energy efficiency class[3]		2+	4+	6+	7+	5+	7+	8+	9+

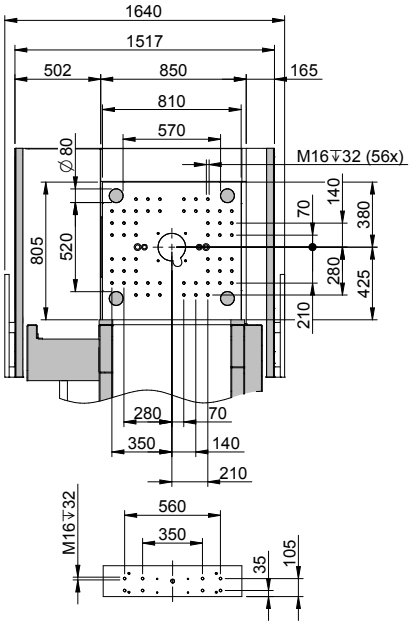
Drive			
Electrical power supply without/with Europackage	kVA	32/62	38/68
Emission sound pressure level[4]	dB(A)	64	64

Weights, dimensions			
Net weight	kg	6800	7200
Length x width x height[5]	m	5.2 x 1.6 x 2.1	5.7 x 1.6 x 2.1
Max. mold weight[6]	kg	1800	
Min. mold dimension	mm x mm	346 x 296	

1) theoretical according to EUROMAP 6 2) according to WITTMANN BATTENFELD norm
3) calculated according to EUROMAP 60.1 (Cycle I) 4) according to ÖNORM EN 201:2010 annex K
5) Length with medium screw diameter in rearmost operating position 6) max. 2/3 on clamping platen







DATA *EcoPower* 180

Clamping unit		*EcoPower* 180
Clamping force/pressure	kN	1800
Distance between tie bars	mm x mm	570 x 520
Mold height	mm	225 ... 550
Opening stroke	mm	480
Max. daylight	mm	1030
Ejector stroke hydr./electr.	mm/mm	180/160
Ejector force	kN	40
Dry cycle time[1]	s – mm	1.7 – 364

Injection unit		350				750				1330			
Screw diameter	mm	25	30	35	40	35	40	45	50	45	50	55	65
Screw stroke	mm	175				200	225	225	225	250	275	275	275
Screw L/D ratio		22				22				22			
Theoretical shot volume	cm^3	85.9	124	168	220	193	283	358	442	398	540	653	913
Specific injection pressure	bar	3000	2835	2083	1595	3000	2678	2116	1714	3000	2470	2041	1461
Max. screw speed	min^{-1}	350				325				300			
Max. plasticizing rate (PS)[2]	g/s	9.3	13.5	21	33.5	19.5	31.1	40.5	49	37.4	45.2	56	67
Max. screw torque	Nm	340	500	500	500	900				1500			
Nozzle stroke/contact force	mm/kN	250/40				350/40				400/80			
Injection rate into air	cm^3/s	98.2	141	192	251	192	251	318	393	254	314	380	531
Injection rate into air increased (option)	cm^3/s	196	283	385	503	337	440	557	687				
Barrel heating power	kW	9	10.4	10.4	12.9	11.5	14	17.3	21.9	17.3	21.9	24.2	27
Number heating zones		4				4	4	4	5	4	5	5	5
Energy efficiency class[3]		2+	4+	6+	7+	5+	7+	8+	9+	7+	8+	9+	10+

Drive				
Electrical power supply without/with Europackage	kVA	32/62	38/68	48/78
Emission sound pressure level[4]	dB(A)	64	64	64

Weights, dimensions				
Net weight	kg	6800	7200	8800
Length x width x height[5]	m	5.2 x 1.6 x 2.1	5.7 x 1.6 x 2.1	6.4 x 1.6 x 2.1
Max. mold weight[6]	kg	1800		
Min. mold dimension	mm x mm	346 x 346		

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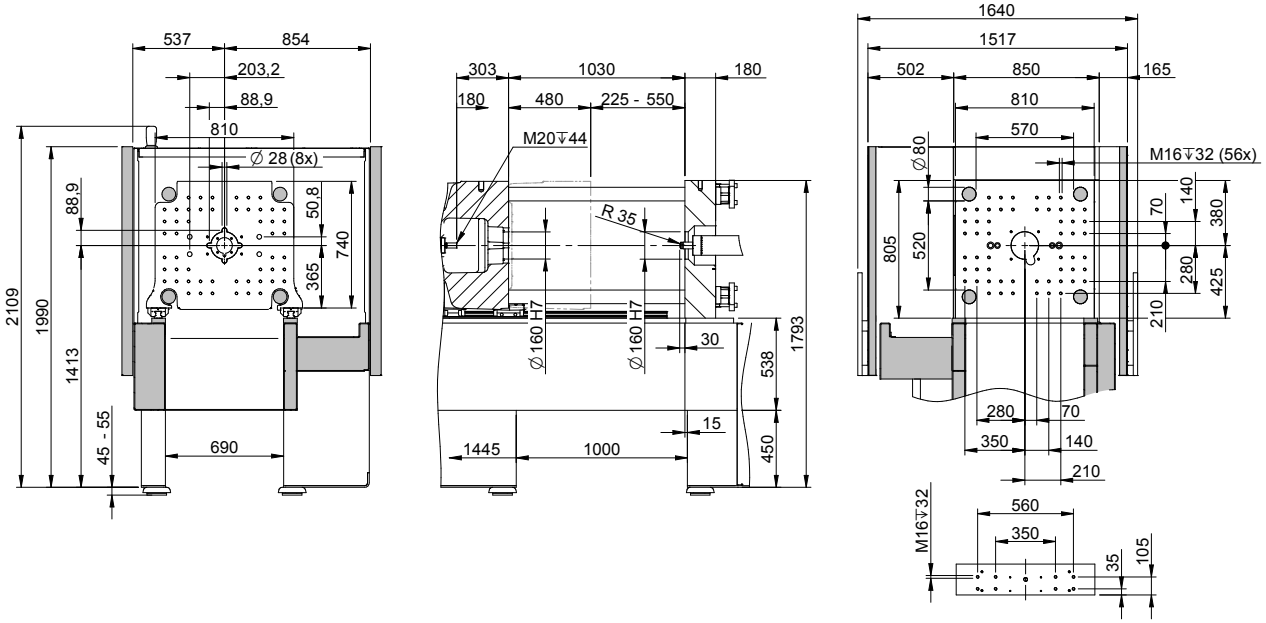
5) Length with medium screw diameter in rearmost operating position 6) max. 2/3 on clamping platen



DATA *EcoPower* 240

Clamping unit		***EcoPower* 240**
Clamping force/pressure	kN	2400
Distance between tie bars	mm x mm	670 x 620
Mold height	mm	250 ... 600
Opening stroke	mm	530
Max. daylight	mm	1130
Ejector stroke hydr./electr.	mm/mm	180/160
Ejector force	kN	40
Dry cycle time[1)]	s – mm	1.9 – 434

Injection unit		**750**				**1330**				**2100**		
Screw diameter	mm	35	40	45	50	45	50	55	65	55	65	75
Screw stroke	mm	200	225	225	225	250	275	275	275		320	
Screw L/D ratio			22				22				22	
Theoretical shot volume	cm^3	193	283	358	442	398	540	653	913	760	1062	1414
Specific injection pressure	bar	3000	2678	2116	1714	3000	2470	2041	1461	2500	1959	1471
Max. screw speed	min^{-1}		325				300				275	
Max. plasticizing rate (PS)[2)]	g/s	19.5	31.1	40.5	49	37.4	45.2	56	67	51	76	116
Max. screw torque	Nm		900				1500				2300	
Nozzle stroke/contact force	mm/kN		350/40				400/80				500/100	
Injection rate into air	cm^3/s	192	251	318	393	254	314	380	531	356	498	663
Injection rate into air increased (option)	cm^3/s	337	440	557	687							
Barrel heating power	kW	11.5	14	17.3	21.9	17.3	21.9	24.2	27	22.7	26.4	32.7
Number heating zones		4	4	4	5	4	5	5	5		5	
Energy efficiency class[3)]		5+	6+	7+	8+	7+	8+	8+	10+	8+	9+	10+

Drive				
Electrical power supply without/with Europackage	kVA	50/80	60/90	90/120
Emission sound pressure level[4)]	dB(A)	64	64	64

Weights, dimensions				
Net weight	kg	9700	11300	13500
Length x width x height[5)]	m	6.2 x 1.8 x 2.4	6.9 x 1.8 x 2.4	7.5 x 1.8 x 2.4
Max. mold weight[6)]	kg	2400		
Min. mold dimension	mm x mm	396 x 396		

1) theoretical according to EUROMAP 6 2) according to WITTMANN BATTENFELD norm
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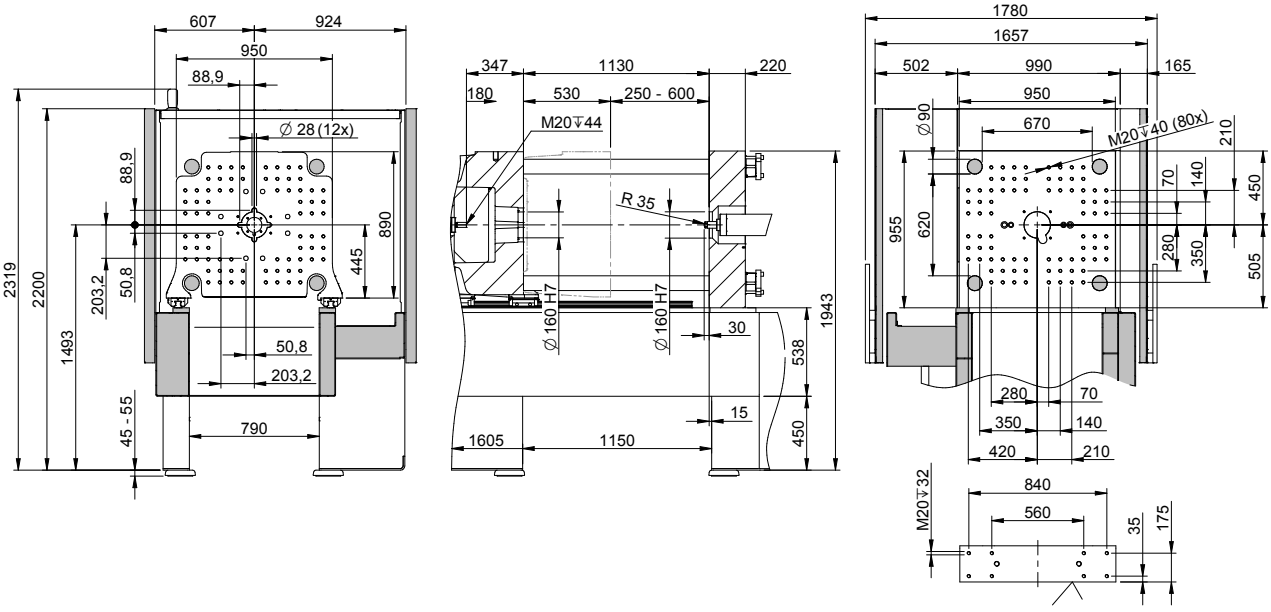
5) Length with medium screw diameter in rearmost operating position 6) max. 2/3 on clamping platen



DATA *EcoPower* 300

Clamping unit		*EcoPower* 300
Clamping force/pressure	kN	3000
Distance between tie bars	mm x mm	770 x 720
Mold height	mm	250 ... 650
Opening stroke	mm	600
Max. daylight	mm	1250
Ejector stroke hydr./electr.	mm/mm	200/180
Ejector force	kN	60
Dry cycle time[1]	s – mm	2.2 – 504

Injection unit		750				1330				2100		
Screw diameter	mm	35	40	45	50	45	50	55	65	55	65	75
Screw stroke	mm	200	225	225	225	250	275	275	275		320	
Screw L/D ratio			22				22				22	
Theoretical shot volume	cm^3	193	283	358	442	398	540	653	913	760	1062	1414
Specific injection pressure	bar	3000	2678	2116	1714	3000	2470	2041	1461	2500	1959	1471
Max. screw speed	min^{-1}		325				300				275	
Max. plasticizing rate (PS)[2]	g/s	19.5	31.1	40.5	49	37.4	45.2	56	67	51	76	116
Max. screw torque	Nm		900				1500				2300	
Nozzle stroke/contact force	mm/kN		350/40				400/80				500/100	
Injection rate into air	cm^3/s	192	251	318	393	254	314	380	531	356	498	663
Injection rate into air increased (option)	cm^3/s	337	440	557	687							
Barrel heating power	kW	11.5	14	17.3	21.9	17.3	21.9	24.2	27	22.7	26.4	32.7
Number heating zones		4	4	4	5	4	5	5	5		5	
Energy efficiency class[3]		4+	5+	7+	8+	6+	7+	8+	9+	8+	9+	10+

Drive				
Electrical power supply without/with Europackage	kVA	50/80	60/90	100/130
Emission sound pressure level[4]	dB(A)	64	64	64

Weights, dimensions				
Net weight	kg	12500	14100	16300
Length x width x height[5]	m	6.8 x 1.9 x 2.4	7.5 x 1.9 x 2.4	8.1 x 1.9 x 2.4
Max. mold weight[6]	kg	3000		
Min. mold dimension	mm x mm	446 x 396		

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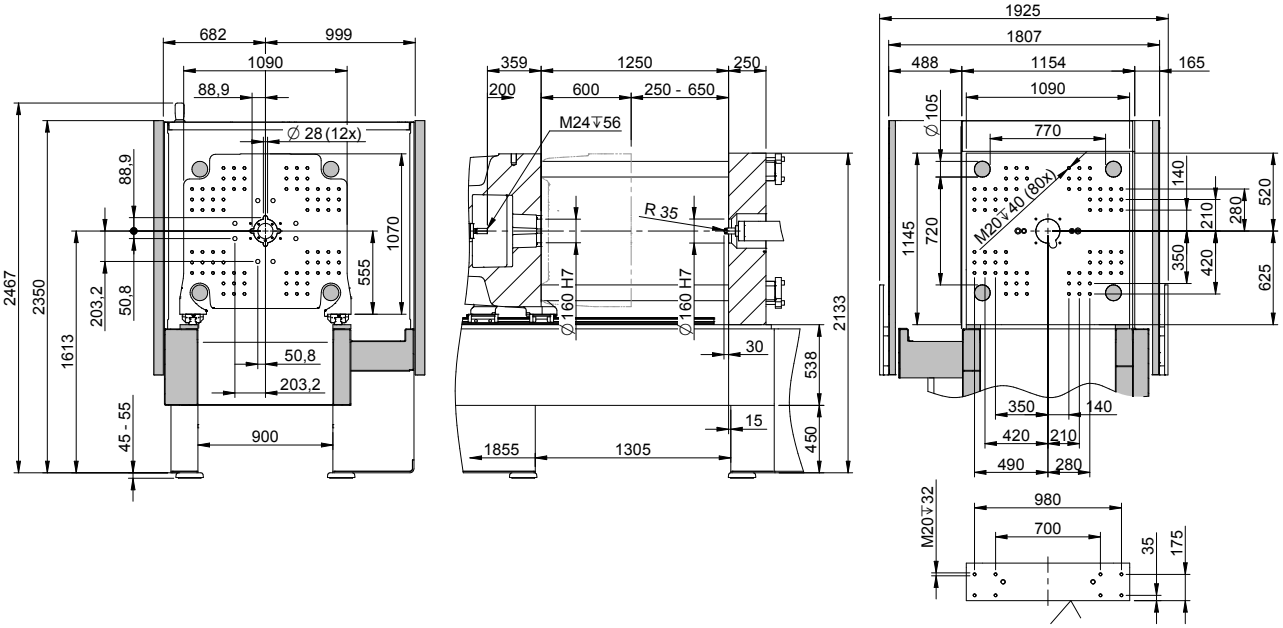
5) Length with medium screw diameter in rearmost operating position 6) max. 2/3 on clamping platen



STANDARD

Base machine
Regional packages, Europe
Drop – voltage 230/400V/3p+N-TN/TT, 50 Hz
Painting RAL 7047 tele grey 4/ RAL 5002 ultramarine blue
Cooling system machine – air cooling/water cooling
One-piece base frame with 3 disposal directions
Ejection area – coverage of ejection area according to EN201
Instruction manual and user manual in printed version and on USB flash drive
Operator manual incl. hydraulic, mech. and electr. schedules online

Clamping unit
Clamping force and closing and opening forces adjustable
Mold safety program
Moving platen supported by positioned linear guides
Mold platen according to EUROMAP 2
Fixing holes for robot on fixed platen as per EUROMAP 18
Hydraulic multi stroke ejector
Integrated servo hydraulic power unit containing speed controlled servo-motor and internal gear pump for ejector and nozzle movement including adjustable nozzle contact force
Servo electric ejector and injection unit movement (fully electric machine)
Clamping system with 5-point twin toggle, servo electric direct drive via rack-and-pinion drive
Servo electric mold height adjustment

Injection unit
Screw drive with servomotor for parallel metering, screw speed continuously adjustable via screen
Plasticizing unit L/D 22 (from ø 25 mm), with screw in nitrated steel quality and bimetallic barrel in AK+, incl. quick acting check valve
Thermocouple failure monitor
Maximum temperature supervision
Plug-in ceramic heater bands
Temperature control of feed throat integrated
Swivelling injection unit
Linear bearings for the injection unit
Selectable barrel stand-by temperature
Decompression before and/or after metering
Physical units – bar, ccm, mm/s etc.
Screw protection
Peripheral screw speed indication
Linear interpolation of holding pressure set values
Bar chart for barrel temperature with set value and actual value display
Selectable injection pressure limitation
Changeover from injection to holding pressure depending on stroke, time and pressure
Open nozzle R35
Barrel covering and splash guard according to EN201
Material hopper standard 6 litre, prepared for WITTMANN loader

Safety gate
Sliding protection on injection unit for easy maintenance
Safety gate clamping side front and back monitored according to CE standard
Safety gate clamping side free for easy mold change and handling by robot
Safety gate clamping side front and back with maintenance-free locking manually operated

Electrics
Control zone for nozzle heater band 230 V
*ambi*LED-status indicator
Fuse protection for sockets
Switch cabinet cooling – circulation fan for environment temperature to 30 °C
Emergency stop switch button
Printer socket
USB – 1 x operating unit
1 Ethernet interface (switch cabinet)
Printer via USB connection or network

Control system
Control system UNILOG B8 – 21,5" multi-touch screen (full HD)
Control panel with selectable haptic keys
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
Parts counter with good/bad part evaluation
Purging program through open mold
Stroke zero offset settings
Start-up program
Switch over 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, password system and RFID authorization system
Freely configurable status bar
Physical, process-related units
Automatic dimming
Logbook with filter function
User programming system (APS)
User page
Note pad function
Cycle time analysis
Hardcopy function
Internal data storage via USB connection or network
Online language selection
Online selection of imperial or metric units
Time monitoring
BASIC Quality Monitoring (1 freely configurable network connection, quality table with 1000 storage depth, events protocol (logbook) for 1000 events, actual value graphics with 5 curves, 1 envelope curves monitoring)
Injection integral supervision
Metering integral supervision
Alarm message via e-mail
SmartEdit – sequence editor
QuickSetup – assistance program for initial parameter setting

OPTIONS

Base machine
Regional packages, country-specific
Drop 1, special voltage, drop 2
Handling package with open machine safety gate on non operator side
Parts hopper
Parts chute for separation of good/bad parts or photoelectric ejection check

Hydraulics/Pneumatics
Raw filter in water inlet of cooling incl. adapter with ball valve for oil maintenance on oil tank
Hydraulic core pull for clamping plate, interface according to EUROMAP 13, incl. or without core pull pressure release
Pneum. core pull on clamping plate/nozzle plate, incl. pressure regulator
Hydraulic manifolds for one mold shut-off nozzle or more
Air valves on nozzle plate/clamping plate
Compressed air pressure maintenance unit incl. 1 or more way pressure regulation incl. directional exhaust valve with blocking function

Clamping unit
Mold platen according to SPI, JIS, T-slots
Mold platen incl. cooling channels
Mold platen chemically nickel-plated
Manuel tie-bar retract device
Hydraulic ejector in reinforced execution
Unscrewing device in lieu of ejector
Double check valve to keep ejector in end-position
Ejector cross according to EUROMAP/SPI
Mechanical or pneumatic ejector coupling
Ejector platen safety
Mechanical mold safety mechanism

Injection unit
Plasticizing unit AK+ in wear and corrosion resistant execution
Plasticizing unit AK++ in high wear and corrosion resistant execution
Plasticizing unit AKPA, high wear and corrosion resistant, for processing PA
Plasticizing unit AKCN in wear and corrosion resistant execution, for processing PMMA and ABS
Plasticizing unit AKTN in wear and corrosion resistant execution, for processing PC
Grooves in the feeding zone
Barrier section, screw with mixing section
Ball type screw tip
Melt pressure transducer, melt temperature sensor
Heater bands up to 450 °C
Plasticizing unit in special execution for LIM, MIM, CIM, PVC
Barrel insulation
Open nozzles in special execution
Needle type shut-off nozzle operated with spring, pneumatically or hydraulically
Barrel covering and splash guard in special execution
Vacuum package incl. vacuum pump
Material hopper in special execution
Hopper magnet

Safety gate
Safety gate clamping side, rear side and/or operator side elevated, lowered or extended
Insider package WITTMANN rear side incl. conveyor belt
Safety gate clamping side electrically operated
Front side gate safety system for manual part removal incl. clearance of ejector

Cooling and conditioning
Cooling water distributor with/without blow-off valve
Solenoid valve for cooling water distributor
Machine cooling by T-piece in inlet pipe
Filter back flushable/water pressure supervision in inlet pipe
Distributor block on nozzle plate/clamping plate

Electrics
Temperature control zones for hot runner
Acustic element integrated in signal lamp
Socket combination
Additional fan in electric switch cabinet for increased environment temperature
Cabinet air conditioner
Additional emergency stop switch button
Interface for robot, conveyor belt, TCU, dosing unit, AIRMOULD®, BFMOLD®, mold surveillance, production data logging system, RJG eDart, Priamus BlueLine, danger zone boundary, ejection in mold middle plate, brushing device, relay signals

Control system
Cavity pressure switch over
BNC sockets for injection process analysis
EXPERT Quality Monitoring (4 freely configurable network connections, quality table with 10000 storage depth, events protocol (logbook) for 10000 events, actual value graphic with 16 curves, 4 envelope curves monitoring, SPC charts, trend diagrams)
Mold identification
Special programs on customer request
HiQ-Cushion – melt cushion control
HiQ-Flow – injection integral control
HiQ-Melt – monitoring of material quality
Software Tandemmould, multiple data sets
Energy consumption analysis
Clamp force supervision
Injection compression and venting program
Initiate next cycle by closing safety gate
Special program ejector intermediate stop/ejection of cold slug
Additional output card/input card, freely programmable
Integration package WITTMANN 4.0

Additional equipment
Plinth for robot
Tool kit
Levelling pads
Lighting in mold space
Mold clamping systems in mechanical, electrical or hydraulic execution
Integration package (robot, feeder, dosing unit, TCU, mold integration)
Web-Service
Remote-Control package

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