

*The high
performance machine*



Demag Plastics Group

System Large



System – The advantages in perspective

- **Versatile:**
Bespoke-tailored solutions for large mouldings; flexibly adaptable to new moulds, materials and complex applications; a choice of screw geometries are available for processing different plastics
- **Precise:**
Low-wear when working with heavy, large moulds; fast, precise opening movements coupled with quiet running, optimum platen parallelism; non-contact ultrasonic sensors for all movement axes
- **Modular:**
Open architecture expandable as required; machine with numerous cost-effective extension packages, custom-configurable for all requirements; Demag's modular system readily permits retrofitting and upgrading
- **Economical:**
Up to 15 % power savings due to mechanical locking technology; low energy and cooling water consumption; low first cost due to custom configuration capability
- **Safe:**
Active mould protection with envelope-type monitoring up to 800 tonnes (basic configuration); positive locking of System clamping unit with up to 10 % reserve over nominal clamping force; computer-optimised lubrication
- **Ergonomical:**
Unified, freely programmable operator interface for all machines; assists user from setting up to monitoring of process sequences; straightforward operation with process control, optimisation and data acquisition

“Small things can make the big difference, but sometimes it takes big things to get big results.”

Rolf Zimmermann, Head of Sales, Demag Plastics Group



„Made by Demag“ – Competence and production centre in Schwaig

With a view to providing users of System machines with prompt and optimal support, our facility in Schwaig, Bavaria, specialises in the development, design and production of medium-size and large injection moulding machines. Up to 1,000 machines and production cells with clamping forces up to 30,000 kN are shipped every year from the plant. An experienced workforce some 800 strong are engaged here in building what is best in German injection moulding expertise, to the benefit of users across the world – for top quality moulded parts.

System – High performance for standard and precision parts

- Designed for sophisticated high performance work
- Expandable for complete cell production
- Energy-saving drive through variable pump system
- Modular options for injection unit, pump rating, screw, and metering drive
- Heavy-duty, compact machine construction
- High precision through toggle clamping unit

System – Precision with production-proven toggle system

- Fast and precise opening movement in conjunction with smooth running of the machine
- Positive locking without the need for additional energy
- High locking reserves (10 % above nominal clamping force)
- Optimum platen parallelism through long tie-bar guidance and support of platen at platen/mould centre of gravity
- Short locking times and high breakaway forces through optimised kinematics
- High machine productivity through computer-optimised lubricating intervals
- Active mould protection and envelope-curve monitoring
- Non-contacting ultrasonic sensors for all movement axes



System – Competence for great solutions

It is true for large moulded parts, too, that good part quality is no longer sufficient today to stay competitive in what are increasingly “borderless” markets. What is called for today is solutions that permit easy and flexible adaptation to address new challenges and meet the requirements of new tools, new materials and ever more complex applications.

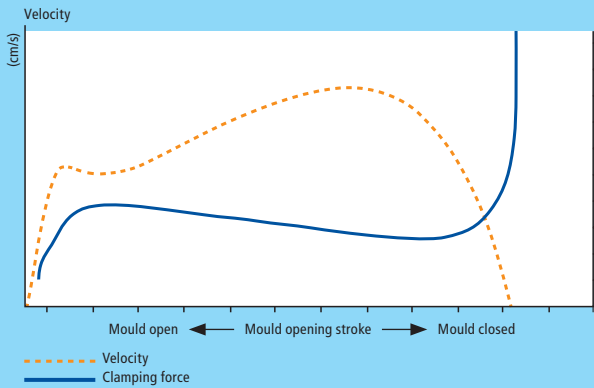
It is for such requirements that Demag’s large System series from 5,000 to 20,000 kN is a perfect match: with powerful features for high-precision and low-wear operation using heavy and big moulds. With modular options for injection unit, screw, pump rating and metering drive. And with competitively priced expansion packages, for instance, for special injection moulding processes.

The basis for this enormous versatility in use is a heavy-duty, intelligent machine design that makes process control and monitoring and mould handling easier and safer. And the basis is, above all, the powerful Demag clamping unit featuring the five-point double toggle whose kinematics provide fast movements and extremely sensitive end approach.

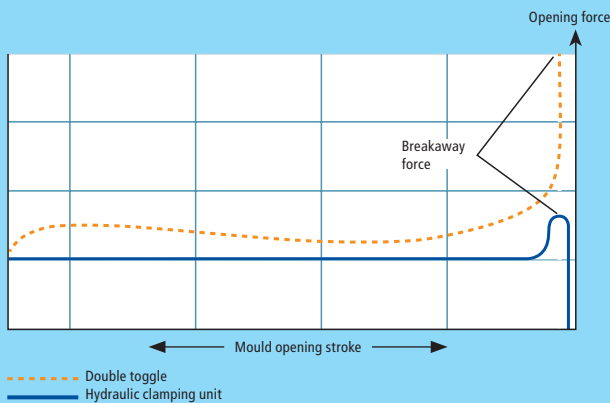


HIGH PRECISION

The force and velocity profile of the 5-point double toggle



The kinematics of the toggle provide smooth starting movements, fast travel speeds, and sensitive closing.



Compared to a hydraulic clamp, the 5-point double toggle provides substantially higher opening forces.

Power for high breakaway force and short locking cycles:

The special toggle kinematics with computer-optimised decelerating and accelerating profiles provide fast, responsive movements and sensitive slow-down during mould protection for minimum mould wear



Short-length injection unit (shown here: 11,500)

System – The power of the toggle

Power, speed, accuracy, heavy duty construction – these key features make the large System an ideal machine for the injection moulding of large parts that are required to meet high standards of precision.

The System clamping unit with the short-length 5-point double-toggle provides fast, powerful movements and very sensitive slow-down during mould protection. Low-stress, uniform power transmission even where moulds are eccentrically placed is provided by the design of the moving platen with the links connected at the extreme outside and forces applied at an optimum angle. Two added advantages over full hydraulic machines: With 10% locking force reserve above the nominal clamping force, the 5-point double toggle ensures positive locking of the mould.

In addition, the mechanical locking system provides some 15% saving in energy.

The Demag building block range of injection units provides excellent plasticising results and operating convenience: There is a choice of three injection units for each clamping unit, each with three screw cylinders made of wear-resistant bimetal alloy, as well as special screw geometries to process various types of plastic. And there is the quick-connect coupling which enables plasticising units to be exchanged in a minimum of time.

Optimum platen parallelism
due to extended guidance on tie-
bars and platen supported at platen/
mould centre of gravity

Automatic tie-bar retraction
(optional)
for quick installation of bulky moulds
reduces set-up time from 1 to 2 hours
to under 60 seconds

Core pullers and ejectors
can be freely programmed for complex
mould and secondary movements

High stiffness of the platens,
and the moving platen being supported
on the machine bed reduce mould wear

The stiff machine bed
provides a high degree of stability

Horizontally enlarged platens
for sophisticated mould details
(e.g. cores or slides)

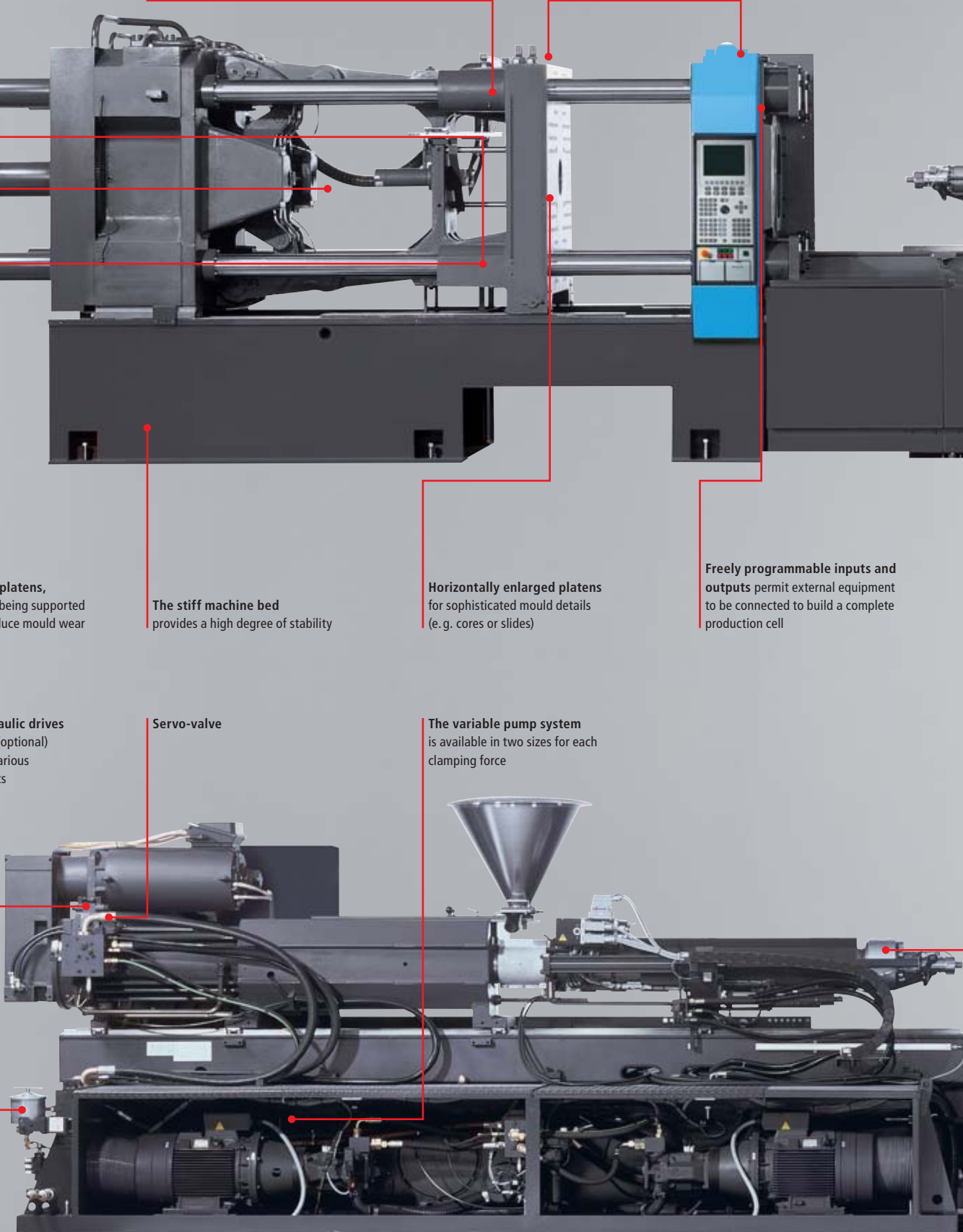
Freely programmable inputs and
outputs permit external equipment
to be connected to build a complete
production cell

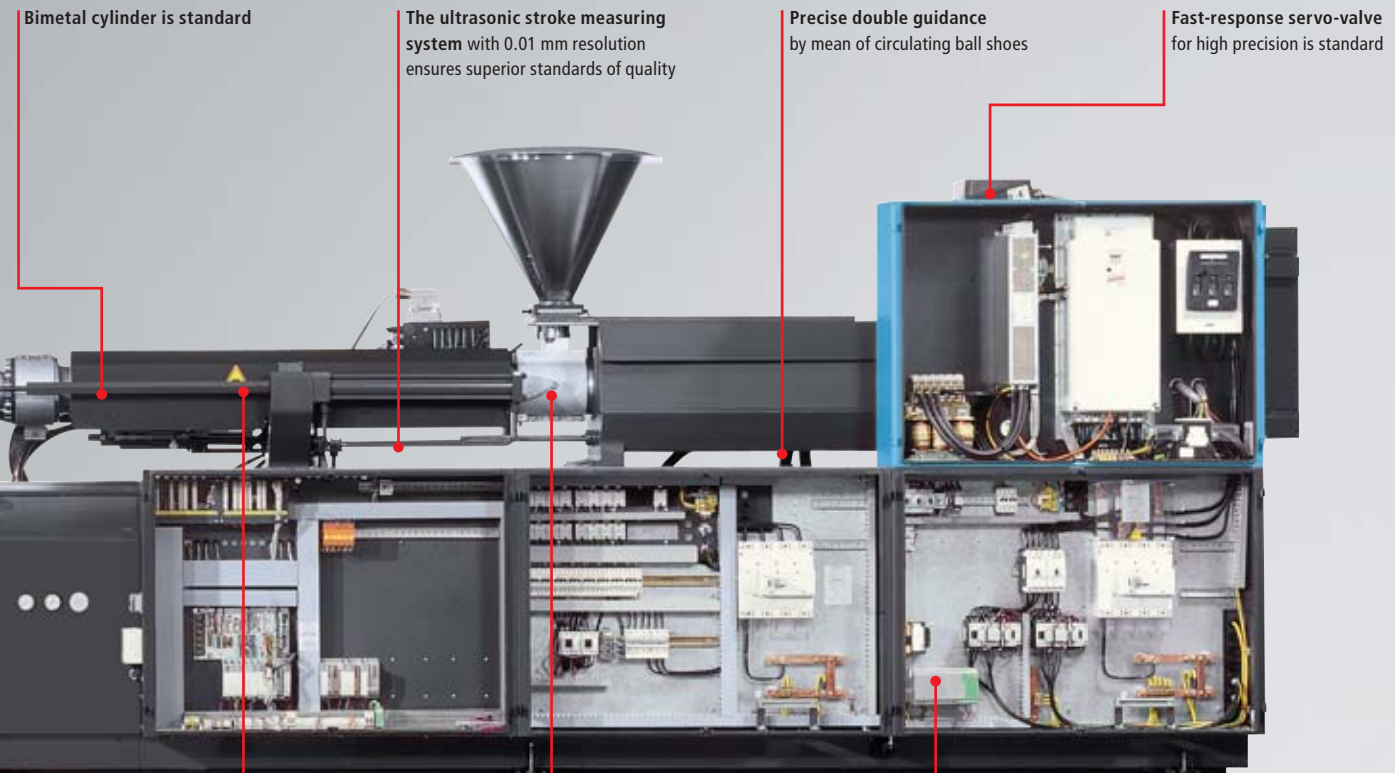
A choice of two hydraulic drives
and an electrical drive (optional)
are available to meet various
processing requirements

Servo-valve

The variable pump system
is available in two sizes for each
clamping force

Bypass filter





Bimetal cylinder is standard

The ultrasonic stroke measuring system with 0.01 mm resolution ensures superior standards of quality

Precise double guidance by mean of circulating ball shoes

Fast-response servo-valve for high precision is standard

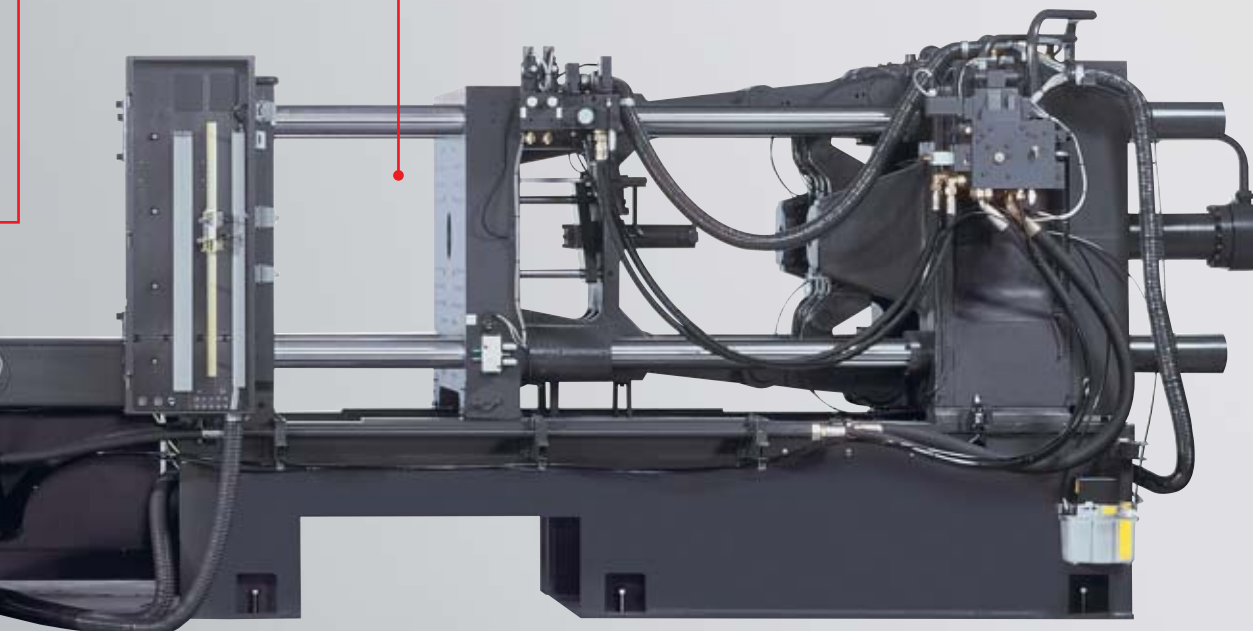
Fast cylinder change and automatic cylinder identification

Constant L/D ratio of screw cylinder (20:1 and 25:1) provides uniform melt quality, good colour dispersion, and trouble-free change onto other Demag machines of the same clamping force

Control and power cabinet integrated in machine, reducing floor space required and facilitating commissioning

Ceramic heater bands are standard

Total opening stroke is available regardless of mould height



„High-performance“ package

- Injection via accumulator
- Electrical screw drive for metering in parallel
- Parallel movements
 - nozzle movement
 - ejector
 - cores
- Enhanced mould-closing action



Production cell incorporating System machines producing intake manifolds



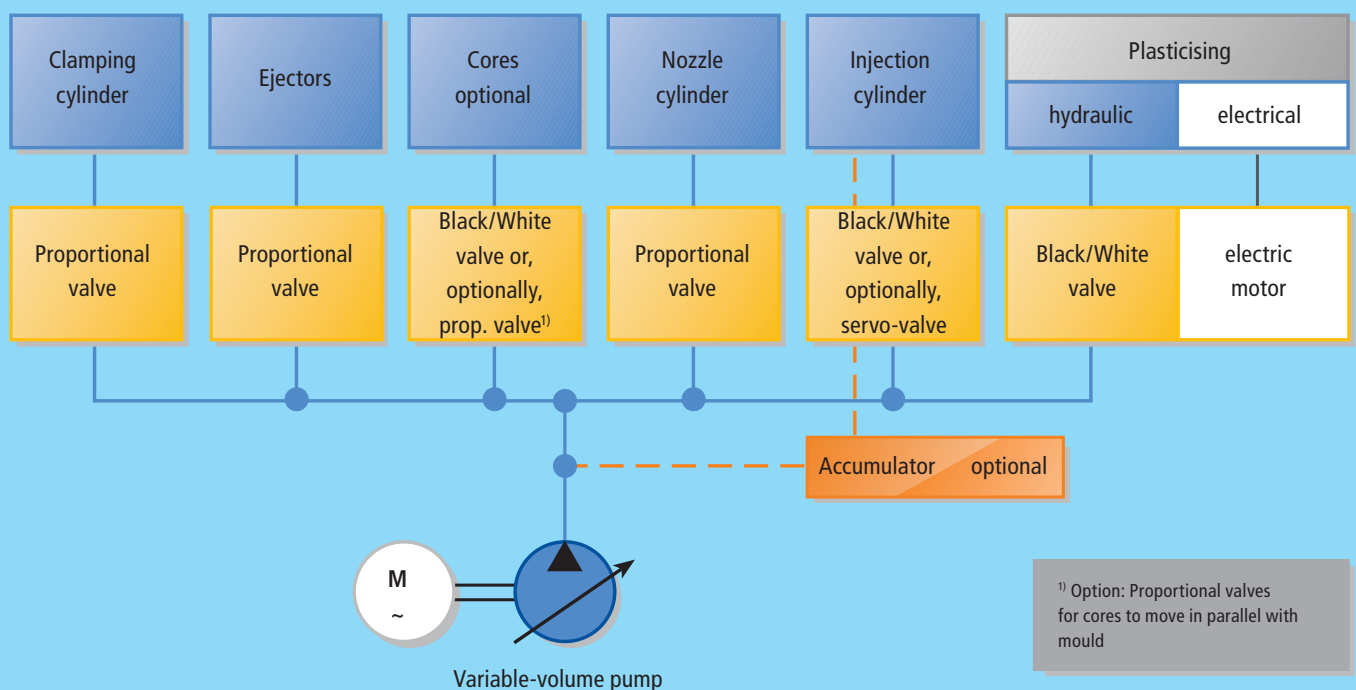
Production shop with System machines 5,000 kN for the production of automotive parts

Expertise in project engineering and automation

From machine options to complete production cells: Every System is open for a host of automation solutions to ensure optimum economy in the further processing of the moulded parts. Even with straightforward parts-handling equipment or CNC-handling equipment integrated in the control system, with quick-connect mould clamping systems, Ergorob sprue pickers, automatic ejector coupling, or segregation unit in the part-drop area discharge well, you are able to distinctly improve the efficiency of your System. And with peripheral components, such as synchronous belt conveyors, scales, cooling sections, finishing, stacking, labelling and packaging stations, we can upgrade your machine into a fully automatic production cell – precisely to your specifications and specific requirements.

The “High-performance” package for the System provides important features combining short cycles with extremely high capabilities for fast-cycling applications and thin-walled moulded parts with high shot weights. And we will assist you in every working step: From configuration through mould and machine tests to project management for complete plants, from the planning outline to the commissioning, and training of your operators. A great number of Demag centres for application engineering across the world are staffed and equipped to provide engineering and logistic support at any time.

Block diagram of System 5,000 to 20,000 kN

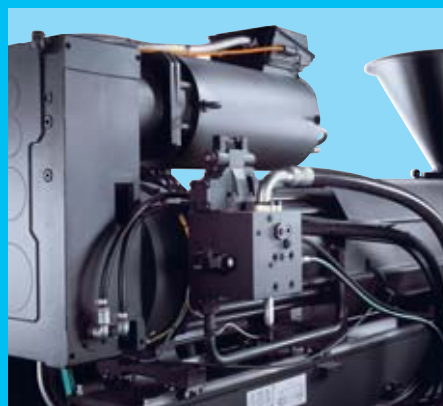


System – The way to pin-point solutions

Powerful drive

The powerful heart of the System machines from 5,000 to 20,000 kN clamping force is the variable pump system which – modular for each clamping force – is available in two rating levels for each size. High-precision pressure control, fast-response flow control, a high degree of reproducibility and harmonious movements characterise this drive design – any desired pressure/flow characteristic can be selected. Provision to move the ejector in parallel with the mould movement through the proportional valve is standard. And the electrical screw drive enables plasticising to take place simultaneously with mould movements. Two economic strong-points: Energy consumption and cooling water consumption are very low because pressure and flow rate are varied according to

demand; in addition, the choice of drive ratings reduces investment and operating costs.



Electrical screw drive (optional)

- Variable pump system for harmonious movements coupled with a high degree of reproducibility
- Low investment and operating costs through correct choice of drive rating
- Low energy and cooling water consumptions through pressure and flow control in accordance with demand
- Bypass filter for optimal oil conditioning reduces maintenance costs
- Electrical screw drive for simultaneous, energy-saving plasticising and injection (optional)
- Additional hydraulic accumulator for high-speed injection (optional)



Enhanced control consistency with the Ergocontrol operator interface

Ergocontrol makes control, operation and monitoring of every Demag machine simple and positive. Of uniform design for all machines, the control panel assists the operator from setting-up to continuous monitoring of the process sequences. All mould and secondary movements are freely programmable, the program for pneumatic valves is flexibly adjustable; matching up to peripherals – e.g. activation of pneumatic hot-runner shut-off nozzles – is possible without the need for an additional program. Extra features, such as automatic cylinder identification, are standard at no extra cost. In short: Ergocontrol is a performance package that ensures 100 % process control, complete data acquisition, and straightforward process optimisation – without any great amount of retraining.

Totally economical and modular:

The Demag building block range

The Demag building block system enables you to configure the machine that is best suited to your specific requirements, from screw and drive rating to software for special control tasks. This means you will be investing only in those components that you actually need now – and you are keeping open for future additions or conversions of the machine, for the integration of new peripherals, for new applications. With a view to being able to respond flexibly to every application, we manufacture all screws in house. Our strengths are in providing excellent melt quality and consistency – for every type of material.

Building block range System 5,000 to 20,000 kN

Clamping unit	5,000 kN	6,500 kN	8,000 kN	10,000 kN	13,000 kN	15,000 kN	20,000 kN
Injection unit/ Distance between tie-bars [mm]							
900 x 800	2300 60/70/80 3300 70/80/95 6400 80/95/110						
1000 x 900		3300 70/80/95 6400 80/95/110 9500 95/110/130					
1120 x 1000			6400 80/95/110 9500 95/110/130				
1400 x 1120				5200 80/95/110 8000 95/110/130 11500 110/120/130 16000 130/145			
1500 x 1250					8000 95/110/130 11500 110/120/130 16000 130/145	11500 110/120/130 16000 130/145	
1800 x 1500							11500 110/120/130 16000 130/145

Asia

Demag (Malaysia) Sdn Bhd
15-E, 5th Floor, Block 1
Worldwide Business Park
Jalan 13/50, Section 13
40000 Shah Alam
Selangor Darul Ehsan, Malaysia
Tel.: +60-3-55 12 97 40
Fax: +60-3-55 12 97 60
E-Mail: dpa@demag.com.my

Brazil

Demag Ergotech Brasil Ltda.
Av. Ceci, 608 – Galpao B11
Tamboré
06460-120 Barueri (SP)
Tel.: +55-11-41 95-41 12
Fax: +55-11-41 95-41 13
E-Mail: brasil@demag-ergotech.com.br

China

Demag Plastics Machinery (Ningbo) Co., Ltd.
No.669, Kunlunshan Road, Beilun District,
Ningbo, 315800, Zhejiang Province, P.R.China
Tel.: +86-5 74-86 18 15 00
Fax: +86-5 74-86 18 15 18
E-Mail: sales.cn@dpg.com

China

Demag Ergotech GmbH
Shanghai Rep. Office
6F, No. 1221, Hami Road,
Shanghai 200335, China
Tel.: +86-21-52 19 50 00
Fax: +86-21-52 19 62 50
E-Mail: shanghai@demag-ergotech.com.cn

CIS

Mannesmann Demag Plastservice
Prombaza OAO „Stroitransgaz“
d.Ascherino
Leninskiy raion
142717 Moscow region
Tel.: +74-95-9 37 97 64
Fax: +74-95-9 33 00 78
E-Mail: info.plastservice@dpg.com

France

Demag Ergotech France sas
Zac du Mandinet
9, rue des Campanules
77185 Lognes
Tel.: +33-1-60 33 20 10
Fax: +33-1-60 06 28 89
E-Mail: detf@dpg.com

Germany

Demag Ergotech GmbH
Werk Schwaig
Altdorfer Str. 15
90571 Schwaig
Tel.: +49-9 11-50 61-0
Fax: +49-9 11-50 61-2 65
E-Mail: info-dpde@dpg.com

Germany

Demag Ergotech GmbH
Werk Wiehe
Donndorfer Str. 3
06571 Wiehe
Tel.: +49-3 46 72-97-0
Fax: +49-3 46 72-97-333
E-Mail: info-dpde@dpg.com

India

L&T-Demag Plastics Machinery Limited
Mount-Poonamallee Road
Manapakkam/Chennai 600 089
Tel.: +91-44-22 49-04 32
Fax: +91-44-22 49-49 52
E-Mail: nss@ltdemag.com

Italy

Demag Plastics Group Italia s.r.l.
Via Bassano 3
03012 Anagni (FR)
Tel.: +39-07 75-77 20 04
Fax: +39-07 75-77 20 04
E-Mail: lido.ghirlandini@dpg.com

Poland

Demag Plastics Group Sp. z o.o.
ul. Jagiellońska 81-83
42-200 Częstochowa
Tel.: +48-34-3 70 95 40
Fax: +48-34-3 70 94 86
E-Mail: info@demag.pl

Spain

Demag Ergotech España, S.L.
Pol. Ind. Can Calderón
Avd. Riera de Fonollar
Esquina C/Murcia, nº37-A, Nave F
08830 – Sant Boi de Llobregat (Barcelona)
Tel.: +34-93-6 52 95 30
Fax: +34-93-6 54 78 10
E-Mail: angel.lozano@dpg.com

United Kingdom

Demag Hamilton Ltd.
Hamilton House, Broadfields
Bicester Road, Aylesbury
Bucks, HP19 8AY
Tel.: +44-12 96-31 82 00
Fax: +44-12 96-42 62 22
E-Mail: salesUK@dpg.com

USA

Demag Plastics Group Corp.
11792 Alameda Drive
Strongsville, Ohio 44149-3011
Tel.: +1-4 40-8 76-89 48
Fax: +1-4 40-8 76-64 39
E-Mail: info-dc@dpg.com

The responsibility to ensure that everything runs smoothly

Many moulders today operate three shifts, some on 365 days of the year – this calls for a maximum of availability of the machines, spare parts, and service support.

Backed by highly skilled service teams, advanced spare parts logistics, and multiple service levels to address a customer's specific needs, we provide total support world-wide: from straightforward inspections through comprehensive maintenance, and extended warranties for high capacity utilisation levels to emergency hotline support, and training of your personnel.

Full documentation and a digital catalogue ensure that spare parts are delivered to you in a minimum of time, usually within a few hours. Users of older machines can have them upgraded by our retrofit service at fair prices, for instance, by state-of-the-art control software or for specialised injection-moulding processes. In short, the Demag Service provides you with whatever support you need to complete your jobs efficiently and to schedule.

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