

MAXIMATOR®

HIGH PRESSURE
TECHNOLOGY
HYDRAULICS
PNEUMATICS
TESTING
EQUIPMENT



MAXIMATOR GmbH

GasAssistedMoulding (GID)
WaterAssistedMoulding (WID)

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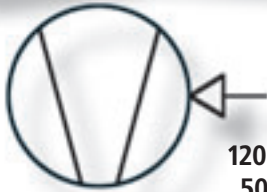
Technics for Market Leader **MAXIMATOR**[®]

Products and services



Consultancy

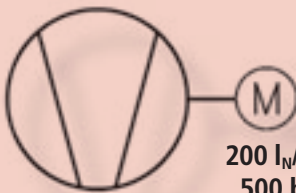
- Mould design
- Patents
- Process design



120 l_N/min
500 bar

N₂ Compressor, pneumatic drive

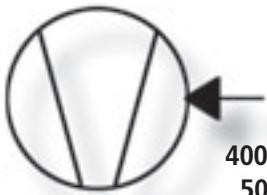
- free of oil and grease
- proprietary manufacturing



200 l_N/min
500 bar

N₂ Compressor, electric drive

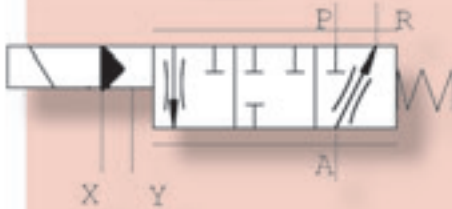
- free of oil and grease
- high performance
- low energy



400 l_N/min
500 bar

N₂ Compressor, hydraulic drive

- free of oil and grease



N₂ Control

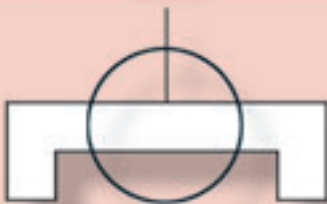
- high reproducibility – stainless steel
- fast response time
- suitable for water-assisted systems (WID)
- metallic sealing



H₂O
Injektion

WID - Water Assisted Molding

- Volume-flow and pressure-control
- Compact design for 2 cavities
- Tik-WIT qualified with integrated injector control and blow out function



N₂ Injector

- self-cleaning function
- fast replacement with open mould



Field service

- swift logistic
- maintenance contracts
- skilled personnel



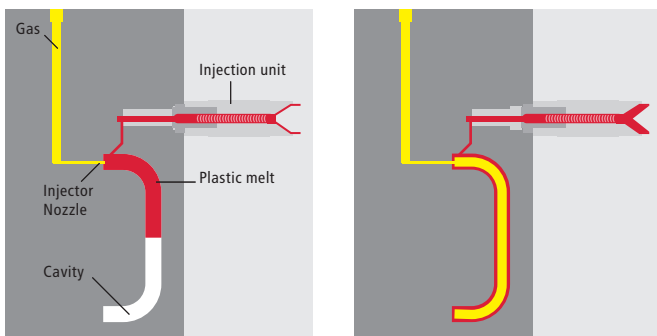
Gas-assisted Systems

This special technology is applied in plastics injection moulding and provides the following advantages:

- Reduction of cycle times
- Prevention of sunk spots
- Reduction of locking forces
- Low-warp mouldings
- Simplified mould design
- Reduction of ridge formation
- Material savings

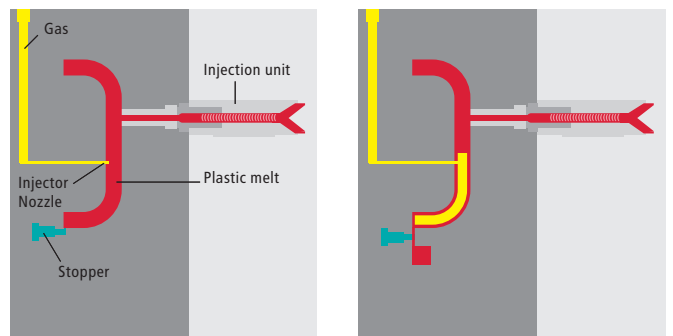


Short shot gas assisted moulding



A predefined short shot of plastic melt is injected into the mould. During or right after this injection gas is injected, causing the material to inflate and fill the mold cavity. The gas can be injected by injector nozzels placed directly in the mould or runner or through the sprue of the injection unit

Full shot or spillover gas assisted moulding



Plastic melt is injected and the cavity is filled volumetric. After applying a short period of packing pressure, the stopper opens the spillover cavity and allows the gas to core out the melt.

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Examples of use GID / WID



Gas injection



Water injection



Gas injection



Gas injection



Gas injection

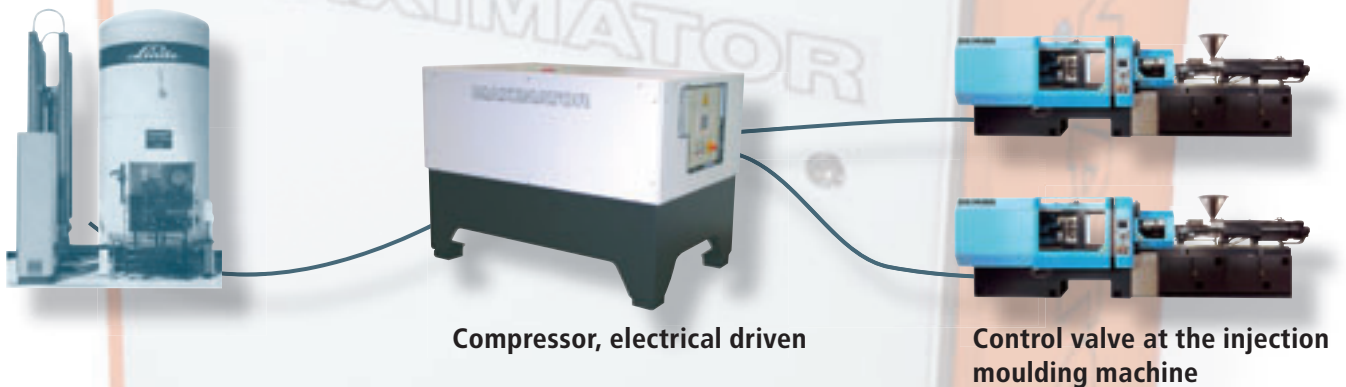
MAXIMATOR® Technics for Market Leader

Production program

Compressor station Type VP (cf. Page 7)



Compressor station Type VE (cf. Page 8)



Compressor station Type VH (cf. Page 9)



Compressor station Type VP/120/500/300

Compressor with continuous pressure generation

- cart-type
- full use of cylinder pressure
- oil- and grease-free compression
- without accessory electrical energy
- without cooling water

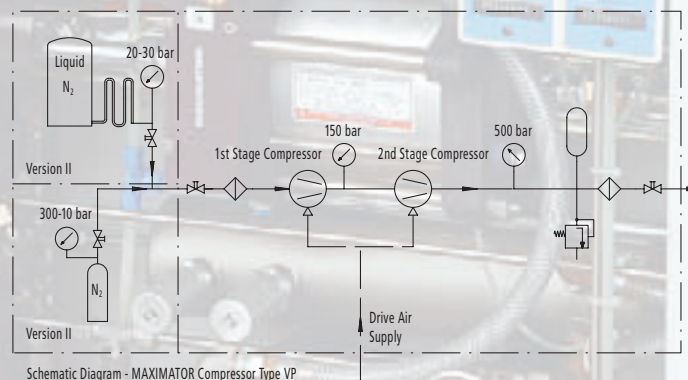
This mobile compressor station is a self-contained pneumatic driven gas compression unit in compact design.

The compressor continuously delivers N₂ into a storage tank and thus ensures that the pressure in this storage tank is always within the adjustable limiting values.

The required gas volume of the connected control modules is provided by the storage tank. The concept permits a considerable increase of the delivery output by means of 300 bar (200 bar) N₂ cylinders.



Compressor, pneumatic drive



Technical parameters

Operating pressure	20 – 500 bar, adjustable via pressure reducer
Compressor output at 18 bar admission pressure	120 I _N /min*
Compressor output at 300 bar admission pressure	400 I _N /min
N ₂ outlet	M16 x 1,5 (Ermeto 8S) 4 Nos.
N ₂ inlet	M16 x 1,5 (Ermeto 8S) 1 Nos.
N ₂ storage tank	5 l/ 550 bar
N ₂ admission pressure (from evaporator)	20 bar – 36 bar
N ₂ recuperation	M16 x 1,5 (Ermeto 8S) 4 Nos. (Optional)
N ₂ cylinder supply	300 – 10 bar
N ₂ cylinder connector 2 Nos.	W24, 32 x 1/14 (200 bar) / 300 bar
Pressurised air drive	5 – 11 bar/ IT 1/2" hose nozzle
Pressurised air consumption	1480 I _N /min – 1980 I _N /min
Dimensions (WxDxH)	(720/560/1230) mm
Casing	cart-type with guide rollers
Weight (incl. packaging)	211 kg (315 kg)

* Following VDMA 4362 Tolerance ± 5 %

Compressor station Type VE/200/500/10

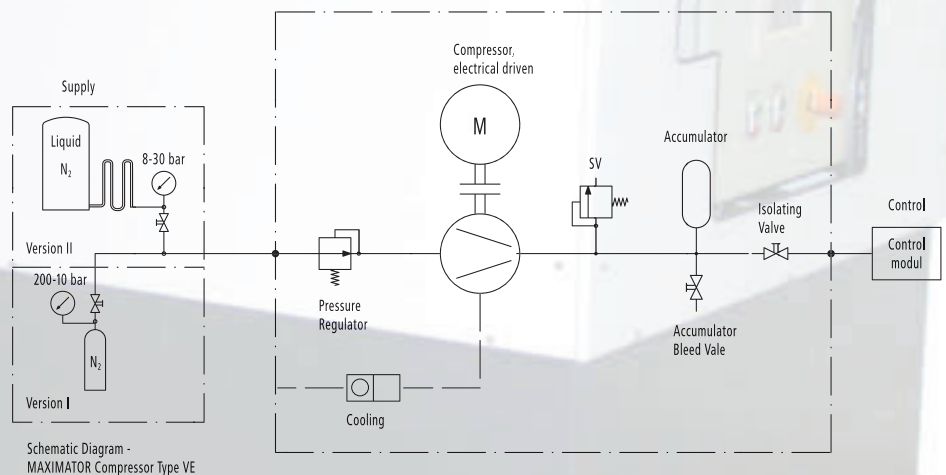
Compressor station with continuous pressure generation

- oil free
- dry run unit
- electric drive
- no external cooling water connection

This compressor station is a dry running, four-stage, electrically driven compressor. Compression is performed without any oil to prevent oil impurification. The compressor stages are harmonised which guarantees a high compressor output rate. Safe operations are ensured by employment of high-pressure stages that have proven for decades in our pneumatically driven compressors. Priorities of the design were easy maintenance and easy handling.



Compressor, electrical driven



Technical parameters

Operating pressure	500 bar
Compressor output	200 l _N /min
N ₂ outlet	M 16x1,5 (4 Nos.)
N ₂ inlet	M 22x1,5
N ₂ storage tank	5 l / 550 bar
N ₂ admission pressure	10 bar
Connected electrical load	400 VAC – 15kW
Casing	For forklift truck transport
Dimensions (WxDxH)	(1800/1230/965) mm
Weight	450 kg
Cooling (internal)	Water / air

Compressor station Type VH/400/500/R

Compressor with continuous pressure generation

- nitrogen pressure max. 500 bar
- compressor output 400 lN/min
- gas recovery
- low-noise

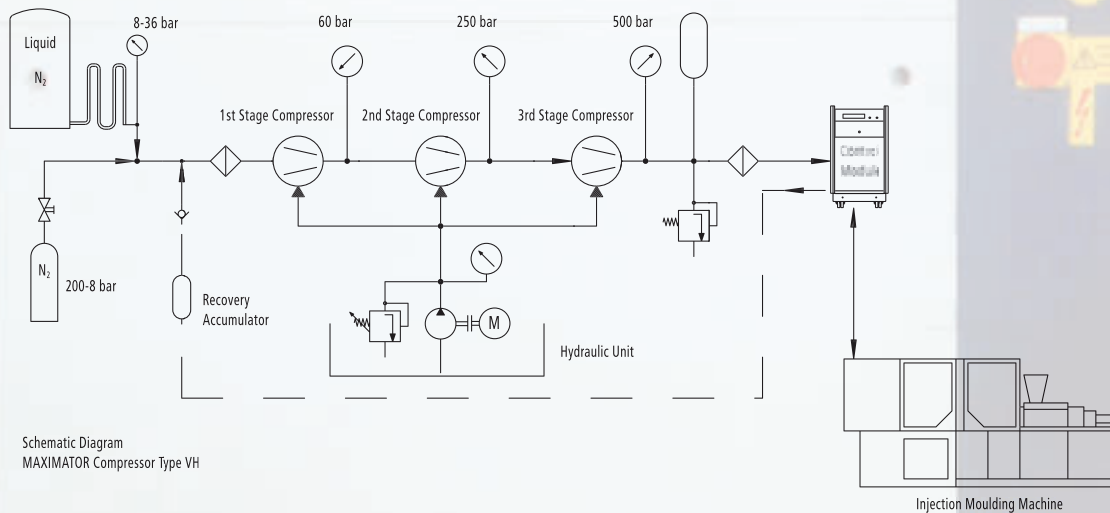
This central supply station is a self-contained hydraulic driven gas compression unit in compact design.

The compressor continuously delivers N₂ into a storage tank and thus ensures that the pressure in this storage tank is always within the adjustable limiting values.

The recovered gas volume of the control modules is stored in a buffer tank, thus a large quantity of the gas is re-supplied to the compressor. The individual compressors are individually driven with proportional equipment which ensures their smooth running with low sound emission.



Compressor, hydraulic driven



Technical parameters

Operating pressure	200 – 500 bar, variable*
Compressor output	400 l _N /min**
HP storage tank	10 l / 550 bar
N ₂ admission pressure	8 – 36 bar
N ₂ inlet	M22x1,5 24° cone (Ermeto 15L)
N ₂ outlet	M20x1,5 24° cone (Ermeto 12S) 4 Nos.
Pressurised air inlet	T 1/2" (internal thread – IT)
Driving power	22 kW max.
Cooling water connection	Internal thread 3/4" / 0,8 m ³ / hr / T _{inlet} = 14° C
Dimensions (WxDxH)	(2180/1000/1900) mm
Weight	1600 kg

* Factory adjustment: ca. 480 – 430 bar, **Following VDMA 4362 Tolerance ± 5 % (at 14 bar admission pressure)

Control module with 2 and 4 valves Type RM/500/R2 and Type RM/500/R4

Pressure control by means of control module

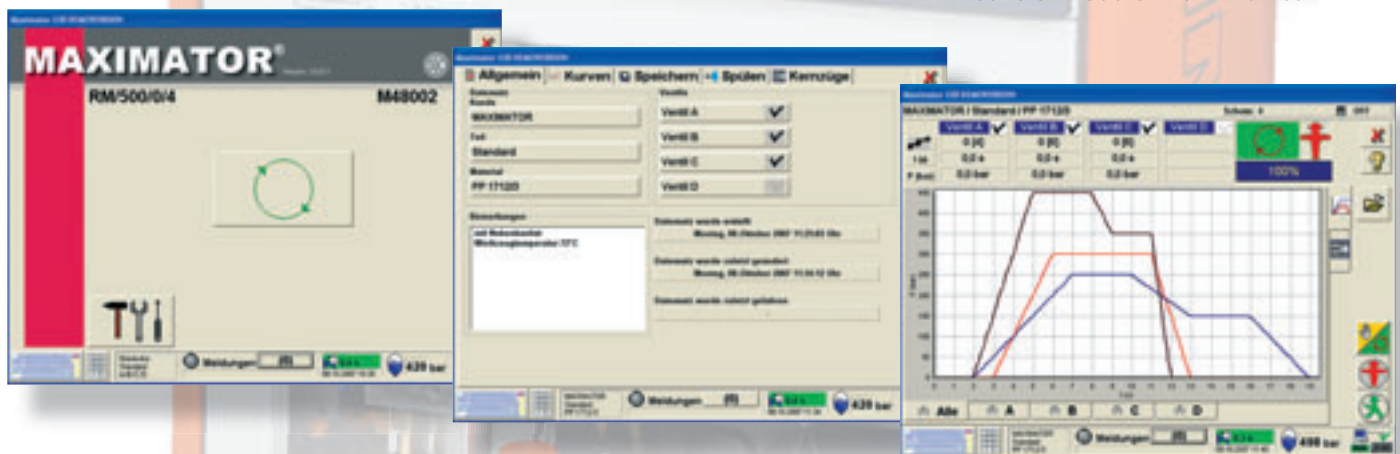
- high reproducibility
- pressure profile freely selectable
- defined interface to all injection moulding machines
- graphic representation of curve progressions
- optional with Gas Injection Control (GIC)

This control module is a self-contained functional unit that can be adapted to all injection moulding machines, irrespective of their type and make. Gas discharge begins after reception of the start signal.

Pressure control is carried out by means of high-dynamic 3/3-port directional proportional control valves in order to avoid change-over marks and melt stoppage.



Control module with 4 valves



Control module user interface

Rising and falling ramps can be freely adjusted. Thus, rough internal surfaces in the gas bubble are avoided. The control module is compact and operator-friendly.

Technical parameters	RM/500/2	RM/500/4
Valves	2 Nos. stainless steel	4 Nos. stainless steel
Control tolerance	± 500 mbar	± 500 mbar
Range of control	5 – 500 bar	5 – 500 bar
Response period	28 msec	28 msec
Pressure stages	10	10
Data storage	20 pressure profiles	20 pressure profiles
HP filters	3 Nos., 60 µm	6 Nos., 60 µm
Curve representation	2 curves	4 curves
Dimensions (WxDxH)	(720/560/1230) mm	(720/560/1230) mm
N ₂ inlet	M16 x 1,5 (Ermeto 85) 1 Nos.	M16 x 1,5 (Ermeto 85) 1 Nos.
N ₂ outlet	M16 x 1,5 (Ermeto 85) 2 Nos.	M16 x 1,5 (Ermeto 85) 4 Nos.
Voltage supply	220V / 50Hz (110 V / 60Hz) / 2A	220V / 50Hz (110 V / 60Hz) / 2A
Weight (incl. packaging)	226 kg (316 kg)	374 kg (464 kg)

Compressor control module Type RM/500/2/VP/80/500

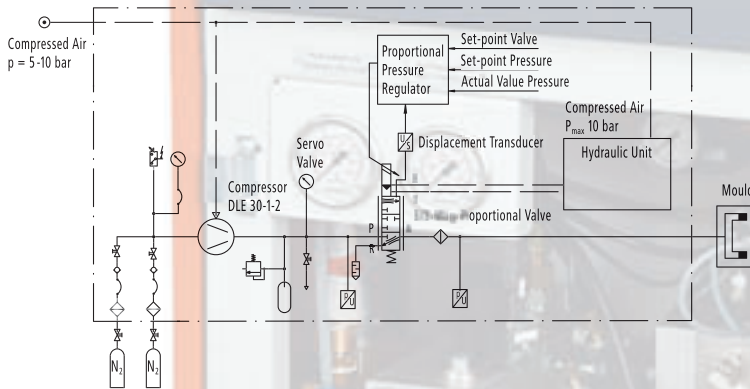
Control module with continuous pressure generation

- gas pressure up to 500 bar
- output volume 80 lN/min*
- pressure profiles freely selectable
- defined interface to all injection moulding machines

This control module is a self-contained functional unit that can be adapted to all injection moulding machines, irrespective of their type and make. Pressure is generated by means of a pneumatic driven piston compressor. The compressor continuously delivers into a storage tank and thus ensures that the pressure in this storage tank is always within the adjustable limiting values.



Compressor control module with 2 valves



Gas discharge begins after reception of the start signal. Pressure control is effected by means of high-dynamic 3/3-port directional proportional control valves in order to avoid change-over marks and melt stoppage. The curve progression can be freely adjusted as a ramp function and serves targeted gas filling and adjusted unloading of mouldings.

Technical parameters

Valves	2 Nos. stainless steel
Control tolerance	± 500 mbar
Range of control	5 – 500 bar
Response period	28 msec
Pressure stages	10
Data storage	20 pressure profiles
HP filters	3 Nos., 60 µm
Curve representation	2 curves
Dimensions (WxDxH)	(720/560/1230) mm
N ₂ outlet	M16 x 1,5 (Ermeto 8S) 2 Nos.
N ₂ storage tank	2,5 l / 550 bar
N ₂ cylinder-based supply	300 – 10 bar
N ₂ cylinder connection	W24 x 1/14 (300 bar and 200 bar cylinders)
Compressor DLE30-1-2	80 l _N /min, 500 bar
Compressed-air drive	min. 8 bar, 1/2" hose nozzle
Compressed-air consumption	400 – 1480 l _N /min.
Weight (incl. packaging)	275 kg (328 kg)
Voltage supply	220V / 50Hz (110 V / 60Hz) / 2A

* Following VDMA 4362 Tolerance ± 5 %

Nitrogen flushing module Type SM/500/1-4

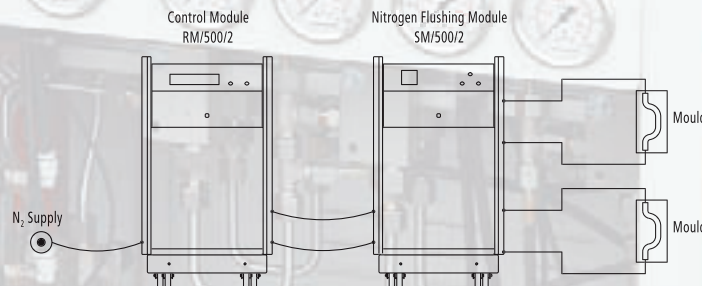
Advantages:

- cost savings due to reduction of cycle time
- simple user interface
- defined interface to all injection moulding machines
- 1, 2 or 4 cavity design available

The MAXIMATOR flushing module is used for pressurised flushing of GID Products with nitrogen. Cycle times can be reduced due to the cooling effect of the flushing process. The flushing velocity is adjustable by means of a throttle. An extra flushing connection and an external valve for fast pressure bleeding are available as an option.



Nitrogen flushing module
Type SM/500



Technical parameters

Cavities	2 or 4
Operating pressure	500 bar
Nitrogen connections	
N ₂ inlet	Ermeto 8S
N ₂ outlet	Ermeto 8S
Release	Ermeto 8S
Compressed air	G 1/2"
Electric connections	
Voltage supply	230(110) V / 50(60) Hz
Electrical load	0,3 kW
PLC control	
Operation terminal	Siemens OP 7
Depth	500 mm
Wide	720 mm
Hight	1270 mm
Weight	approx. 155 kg

GAS INJECTION CONTROL

Process monitoring

Type GIC/500/2

Advantages

- Process monitoring in conformity with DIN ISO 9000
- Monitoring of gas consumption
- Detection of mould leakages
- Cost reduction
- GOOD/BAD criteria via Interfaces
- also conditionable for multicavities

Description

The process monitoring module is positioned between control module and mould. The introduced N₂ volume and the recirculated N₂ volume are exactly measured. Thus, the system is capable of detecting gas outbursts, injector impurities and mould leakages.

This is the first device for operators to **determine and monitor their gas consumptions**.

Technical parameters	GIC/500/1
Mass sensors	1 No. stainless steel
Measuring range	0 – 500 bar
Response period	150 msec
Dimensions (WxDxH)	(578/216/300) mm
N ₂ inlet/outlet	M16 x 1,5 (Ermeto 8S) 2 Nos.
Control unit	S 7
Voltage supply	220 V / 50 Hz
Accuracy	± 1 % of measured value
Temperature	Room temperature (RT)
Flow rate	min. 0,05 l _N /sec max. 15 l _N /sec (65 kg/h)
Weight	16 kg
I _N conversion (N ₂)	1 g = 0,85 l _N / 1 l _N = 1,17 g



Cavity measuring kit Type GIC/500/1



GIC/500 for multiple cavities



Compressor, pneumatically driven

Control module



injection moulding machine

Cavity measuring kit



Gas injector / injector service kit

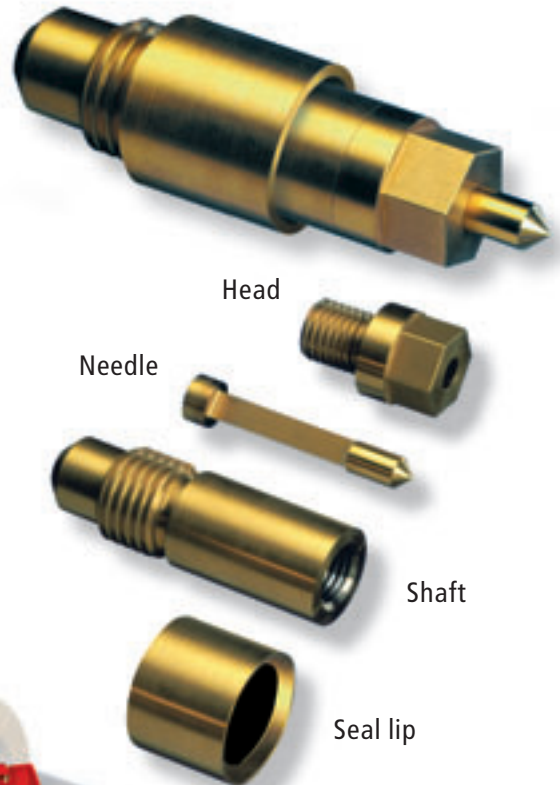
Advantages

- self-cleaning function
- fast replacement with open mould
- high reproducibility
- made in Germany

Mode of functioning

Nitrogen is charged – controlled by the control module – through the mould lines into the injector. The velocity of flow makes the needle move forward.

The freely movable needle extends the moulding time and the cleaning cycle. Additional gas channels prevent the melt from forming a skin around the injector. Upon pressure relief the needle moves backwards and wipes off impurities.



Mould Injector Service Set

Service box for injector installation and cleaning

Service box including:

- Installation tool with torque and injector pin ejector device
- Cleaning tool
- Cleaning fleece



Please, make sure to use only our especially developed Service Set for installation and cleaning

Technical parameters

Type Standard design*	Immersion diameter	Immersion depth	Order ID
M4 x 0,5/4/5	4 mm	5 mm	3920.3814
M4 x 0,5/4/10	4 mm	10 mm	3920.3815
M6 x 1,0/4/5	4 mm	5 mm	3920.3816
M6 x 1,0/4/10	4 mm	10 mm	3920.3817
Type Special design	Immersion diameter	Immersion depth	Order ID
M6 x 1,0/6/5	6 mm	5 mm	3920.3818
M6 x 1,0/6/10	6 mm	10 mm	3920.3819
M4 x 0,5/3/5	3 mm	5 mm	3920.3820
M10 x 1,5/8/5	8 mm	5 mm	3920.3822
M10 x 1,5/8/10	8 mm	10 mm	3920.3823
Type Needle for injector			Order ID
1/100 1°	1,5 mm		3920.3945
3/100 1°	1,5 mm		3920.3946

* Standard: including needle with annular gap 1/100 1°

Proportioning Station Type DSD 500

Advantages

- exact flow-rate control
- easy operation
- automatic adjustment to extruder pressure reduces start-up process
- high degree of forming
- a high-dynamic control valve responds promptly to process changes

Process

Extrusion-foamed plastics open up new opportunities in all segments, e.g.:

- cable insulation
- sheets
- sealing profiles

The proportioning station doses N₂/CO₂ exactly into the extruder. The gas volume is measured at the pressure side. Volume control is insensitive to temperature and optimally adapts to pressure fluctuations with uniform quantity proportioning. The measured values are visualised.

Advantages of the process

- environmental compatibility, since no chemical propellants are used
- cost-effective
- chemically and physiologically inert
- temperature-independent

Impact on the process

The above-described advantages reduce production fluctuations under the same product, material and process conditions.

Technical parameters

Injection pressure	400 bar
Proportioning volume CO ₂	200 g/h to 40 kg/h
Medium	N ₂ / CO ₂
Weight	320 kg
Dimensions (WxDxH)	(610/720/1830) mm
Admission pressure	17 – 55 bar CO ₂ / N ₂ 200 bar
Connection	CO ₂ W 21,80 x 1 3/4"
Connection	N ₂ W 24 x 1 1/4"
Gas connection	M16 x 1,5 24°
Power supply	220 V / 50 Hz / 2A
Compressed air	1/2" hose nozzle min. 6 bar



Gas Proportioning Station



extrusion foamed plastic



stainless steel model

Water Assisted System WID/2/300/1,5

Main characteristic features:

- Volume-flow and pressure-controlled system
- Curve form freely programmable with ramp function
- Compact design for 2 cavities
- Emptying of components by blow-out
- Separate volume monitoring of each cavity also during pure pressure control
- TIK-WIT process selectable via touch panel

Application:

The MAXIMATOR Water-assisted System combines two equipment concepts in one system by providing both volume-flow and pressure control. This innovation remarkably extends the range of potential applications in the plastics industry.



Front view and operator panel

Technical parameters

Type	WID/2/300/1,5
Water outlet	2 x Ermeto 12 S
Operating pressure max.	approx. 300 bar
Inlet filter	20 µm
Pressure intensifiers	2 Nos. (each 1,5L/cavity)
Pressure accumulators	6 pcs. (each 3 x 5 L/cavity)
Operating medium	Cold water, in-house mains 2 - 4 bar
Injector control	oil- and grase free, 2 pcs. /cavity (8 pcs. overall)
Tempering	up to 50°C (optional)
Output capacity, max.	0-15 l/min, at 400 bar
Connected load	400 VAC – 15kW
Monitor	12" TFT SVGA
Compressed air supply	min. 7 bar
Weight	approx. 1,2 t
Dimensions (WxDxH)	(1550/1000/2100) mm

Water Assisted System WID/2/300/1,5

Function:

Pressure is generated by a three-piston pump driven by an electric motor. One pressure accumulator is provided for each cavity. Pressurised water controls the injector.

The pressure accumulator charges the tool either directly via a proportional valve or through a pressure piston. Following reception of the start signal, both volume flow and pressure can be controlled.

Additional volume metering is measuring the whole charged volume in both cases. Specified and generated values are graphically displayed on the touch panel. The touch panel is used for all necessary inputs and monitoring of process data.

The system is also equipped with a temperature and filling level monitoring function. Following depressurisation, components may be blown out with compressed air.

Design and installation are in particular focused on low maintenance demands, clear arrangement and easy handling of system components. This approach reflects the decade-long experience of MAXIMATOR in test stand and process plant engineering.



Front view with open door



External core puller control system Type HAG/160-210/(12; 8)

External core puller control with integrated hydraulics and storage programmable control (PLC)

- controls up to 6 double-acting cylinders or core pullers in the mould
- compatible with all injection moulding machines
- cart-type, for individual applications
- hydraulic pressure up to 210 bar
- 3 independent pressure circuits

The cart-type core puller control system is the ideal complement to all injection moulding machines which are not equipped with core puller control. Its features are easy installation and operation.

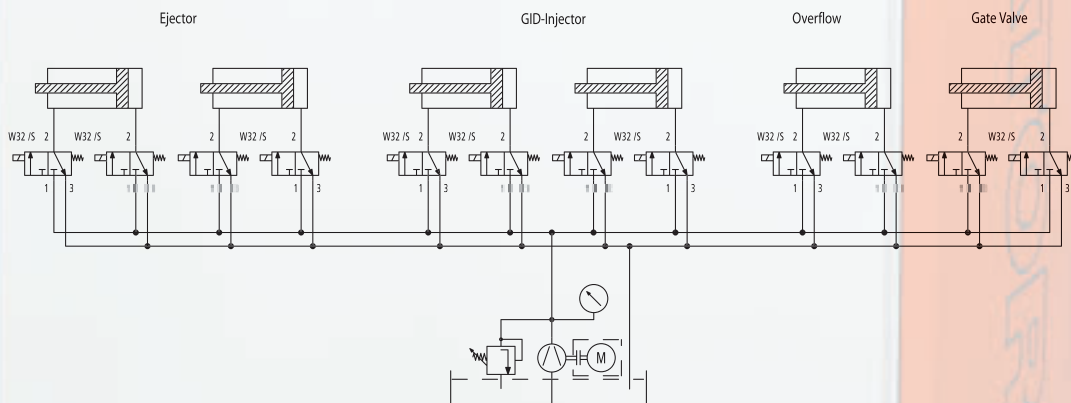
The system can be used to move movable devices at the mould, such as GID injectors or hydraulic gate valves.

The unit is equipped with all safety standards that are required in state-of-the-art injection moulding engineering.

The connection with the injection moulding machine is made via an interface. Limit switches in the mould are processed as signals in our PLC and thus ensure safe operation.



External core puller control



Technical parameters

Valves	12 Nos. seat valves
Hydraulic pressure	20 – 210 bar, adjustable
Control unit	Siemens PLC 7
Drive	6 bar pneumatic or 380V / 50Hz / 10A
Connections	M16x1,5 · 24° cone (Ermeto 8S) 12 Nos.
Compressed air connection	1/2"
Dimensions (WxDxH)	(720/560/1230) mm
Voltage supply	220V / 50Hz (110V / 60Hz) / 2A
Weight (incl. packaging)	190 kg, cart-type (280 kg)

Technics for Market Leader **MAXIMATOR**[®] *Service*

MAXIMATOR After-sales Service Testing at your site

The MAXIMATOR After-sales Service offers, inter alia, the following services:

- maintenance of compressors and control modules
- pressure generation with mobile units
- instrumentation testing of pressure gauging devices
- installation and laying of pipelines and closed circular pipelines

MAXIMATOR provides to you a particularly high-quality product. In addition, you will also benefit from our extraordinary after-sales service irrespective of the location of your site.

You can rely on outstanding technicians and fast-track spare part deliveries.

It goes without saying that MAXIMATOR provides comprehensive documentation of our systems and equipment. During servicing operations we provide to you substitute equipment in order to ensure your process safety.



MAXIMATOR®



High-pressure pumps for oil, water, emulsions

- Minimum maintenance, explosion-proof
- Low energy consumption
- Max. operating pressures 5500 bars



Compressed air amplifiers

- For increasing air pressure
- Specific air pressure amplification to suit your requirements
- Connection to electrical supply not necessary
- Max. operating pressures 40 bars



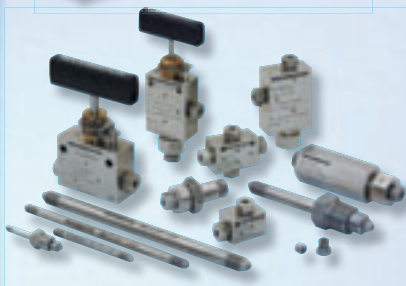
High Pressure Compressors

- For pressurizing gases (nitrogen, oxygen, inert gases)
- Simple handling
- Intrinsically safe and explosion proof i.e. not electromotive, but pneumatically powered
- Operating pressure max. 1,000 bar



Test rigs for pressure, bursting pressure and pulse tests

- Expansion hoses, tubing
- Valves, fittings, bolted unions
- Pressure gauges, pressure-operated switches
- Pressure transducers, vessels
- Special test rigs



Valves, tubing, accoutrements for high-pressure technology

- Stainless steel components in excellent workmanship
- Temperature range - 250 °C to + 650 °C
- Max. operating pressures 10,500 bars

Your Representative:



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