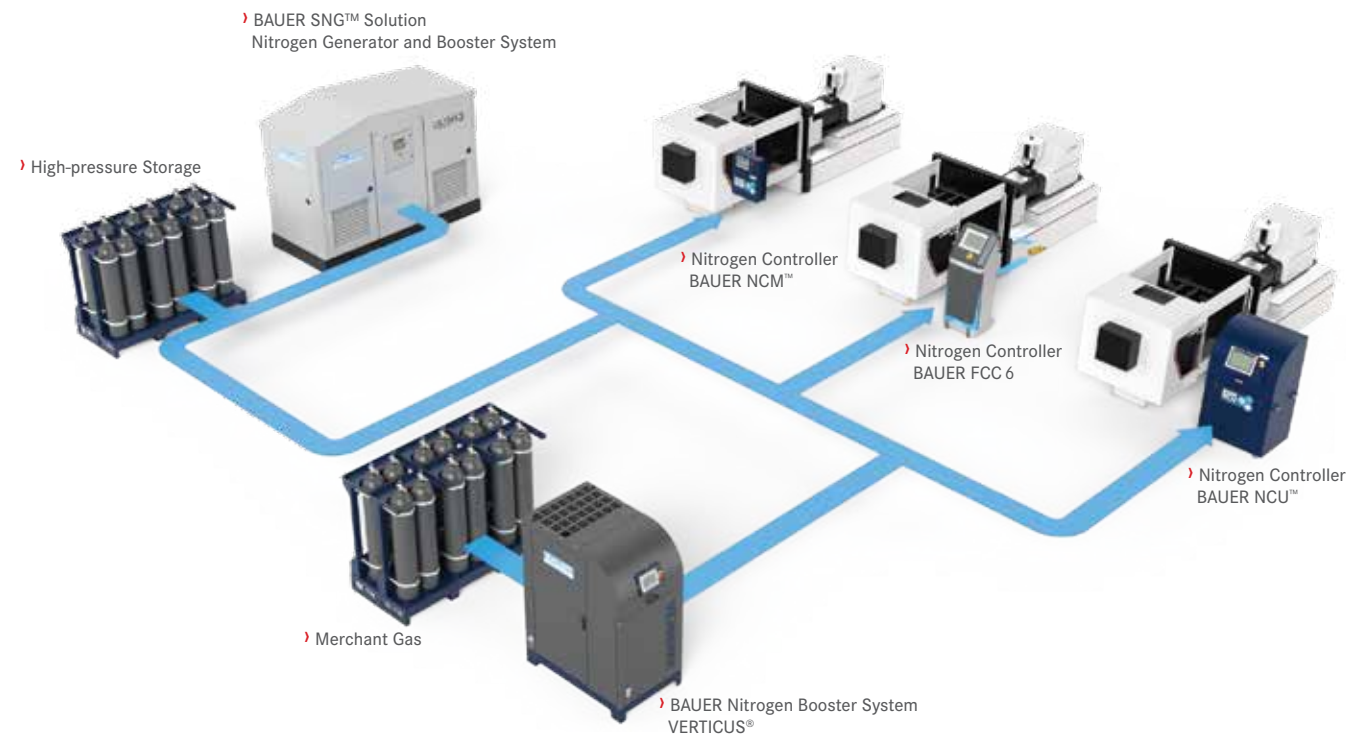


BAUER NITROGEN CONTROLLER SYSTEMS FOR GAS ASSIST INJECTION MOLDING



BAUER NITROGEN CONTROLLER SYSTEMS



GAS ASSIST PROCESS CONTROL



Injection molding is a study in precision, a symphony of numerous process parameters working simultaneously to create a single part. If even one of the process parameters is the slightest bit off, the part manufactured can be compromised. This is particularly true with gas-assist injection molding, where the timing of gas injection can make the difference between a quality part or scrap. Given the ever-rising costs of energy and raw materials, you need the assurance that your gas-assist controls can perform consistently and accurately, time and time again.

BAUER understands that reliability and optimal performance are extremely critical for these applications. That's why we've worked for many years to develop the very best gas-assist injection molding solutions in the world. Our control systems are engineered to provide the highest level of pressure control that is repeatable and reliable. When you need control of your gas assist process, BAUER Plastics Technology Group can assist with hands-on consultation and prototyping.

GAS INJECTION TECHNOLOGY

Gas injection technology (GIT) is a low-pressure process where a fluid, usually nitrogen gas, is used to create hollow sections in an injection molded part. The gas flows through the part's thicker sections or via a network of strategically located gas channels designed into the part and evacuates the molten resin from the channels. This evacuated resin is either used to fill the remainder of the cavity or expelled from the part into a spillover.

The pressurized gas is then used to pack out the part during cooling. The gas pressure, usually ranging from 500 psi to 3500 psi, is much lower than the internal cavity pressure that is required in conventional injection molding. This lower pressure is also distributed more equally throughout the part, thus reducing stress and warp. Higher quality parts and reduced scrap can be realized with GIT.

Another benefit of GIT is the reduction of the clamping force necessary from the injection molding machine. The added gas channels act as flow runners and lower pressure is needed to fill the cavity. Also, the pressure spike from fill to pack is greatly reduced because of the relatively low pressure of the gas. With GIT, parts can be molded in smaller tonnage molding machines greatly reducing manufacturing costs.

Tooling costs can also be reduced with GIT. The elimination of lifters and coring can simplify the mold design and lower maintenance costs.

BENEFITS OF GIT:

- › Reduction of part weight
- › Reduction of cycle time
- › Reduction of clamping force
- › Reduced tooling costs
- › Higher quality parts
- › Reduced manufacturing costs

BAUER OFFERS THE COMPLETE SOLUTION.

Bauer is available to assist through every step of the process. Our experienced staff of GIT experts will assist you with:

- › GIT tool design
- › Part evaluation
- › Process training and development
- › Equipment selection
- › Equipment installation and training
- › GIT mold trial service
- › Gas injectors and nozzles

BAUER EXCLUSIVE PROCESS CONTROL FEATURES



TRUE TRACK RAMPING®

BAUER's TRUE TRACK RAMPING® technology provides the ability to precisely control the gas injection profile. The processor can program set points to control the rate of gas pressure increase and decrease during each step of the gas injection cycle. With TRUE TRACK RAMPING®, you can prevent gas blow through and minimize gas permeation into the thin wall sections of the part.



OXYPURGE™

BAUER's OXYPURGE™ technology purges any oxygen from the mold cavity before resin is injected to prevent burning of the material.

BAUER NCM™

SINGLE CHANNEL NITROGEN CONTROL MODULE

An economical nitrogen control option for injection molding applications that only require a single channel configuration. The BAUER NCM™ offers a full functioning gas assist system in a compact and durable design allowing molders to maximize their production efficiency by implementing a gas assist solution that:

- › Reduces clamp tonnage
- › Reduces cycle time
- › Saves resin
- › Improves part quality



STANDARD FEATURES

- › Compact design
- › Easily interfaces with any injection molding machine
- › Single channel configuration
- › Precise pressure control with True Track Ramping™ and real time monitoring
- › Process parameter storage
- › Lowest maintenance cost in the industry
- › Mold purge control with OXPURGE™ Technology

SYSTEM FOOTPRINT

Wall or Machine Mounted

DIMENSIONS L x W x H inches (mm)

- › 20.75 x 7.5 x 28.5 (527 x 190 x 724)

WEIGHT pounds (kg)

- › 60 (27.2)

TECHNICAL DATA

Model	Inlet Pressure		Outlet Pressure		Power	
	PSIG	BAR	PSIG	BAR	HZ	V
BAUER NCM	6000	414	5000	345	60 or 50	110 or 220
BAUER NCM-LP	6000	414	1500	103	60 or 50	110 or 220

CONTROL SYSTEM

State-of-the-art control system with intuitive HMI interface allows for simple operation and realtime diagnostics.

- › 7" touch-screen color display
- › Precise electro-pneumatically controlled valves
- › Accurate control of pressure profiles

COST OF OWNERSHIP

Like all BAUER controllers, the system is designed for long periods between maintenance intervals and has a very low cost of ownership.

- › Lifetime BAUER support

BAUER NCU™

MULTI-CHANNEL NITROGEN CONTROL UNIT

As injection molding processes become more complex and multiple channel configurations are required, the BAUER NCU™ is ready for the challenge. Overcome the limitations of conventional injection molding and discover the economic savings of the gas assist process with the BAUER NCU™.

The BAUER NCU™ will interface with any injection molding machine, regardless of make or model. The operator interface allows real-time access to all programmable functions including: time, pressure, ramp & start delay, real-time process pressure curves, process pressure gauges, inlet pressure meter and safety interlock confirmation.



STANDARD FEATURES

- › Portable compact design
- › Easily interfaces with any injection molding machine
- › 2, 4, 6 or 8 channels configuration available
- › Precise pressure control with True Track Ramping™ and real time monitoring
- › Process parameter storage
- › Can control separate processes on two (2) injection molding machines at the same time
- › Lowest maintenance cost in the industry
- › Mold purge control with OXPURGE™ Technology

SYSTEM FOOTPRINT

DIMENSIONS L x W x H inches (mm)

- › 57 x 24 x 36.375 (1448 x 610 x 924)

WEIGHT pounds (kg)

- › 300 (136)

TECHNICAL DATA

Model	Inlet Pressure		Outlet Pressure		Power	
	PSIG	BAR	PSIG	BAR	HZ	V
BAUER NCU	6000	414	5000	345	60 or 50	110 or 220
BAUER NCU-LP	6000	414	1500	103	60 or 50	110 or 220

CONTROL SYSTEM

State-of-the-art control system with intuitive HMI interface allows for simple operation and realtime diagnostics.

- › 10.5" touch-screen color display
- › Precise electro-pneumatically controlled valves
- › Accurate control of pressure profiles

COST OF OWNERSHIP

Like all BAUER controllers, the system is designed for long periods between maintenance intervals and has a very low cost of ownership.

- › Lifetime BAUER support

BAUER FCC 6

PREMIUM MULTI-CHANNEL NITROGEN CONTROL SYSTEM

The BAUER FCC 6 is the most advanced GIT process control system available within the industry. The FCC 6 offers GIT molders the highest level of process control.

Loaded with standard features including: historical data collection, remote support & diagnosis via Internet connection, OXYPURGE™, and programmable alarms for notification of out of control process conditions. As an option, pressure valves can also be relocated near the mold to reduce gas usage.



STANDARD FEATURES

- › 10.4" Touchscreen interface
- › Precise pressure regulation
- › Programs and quality data collected on internal memory, USB stick or through Ethernet on laptop
- › A powerful PLC able to manage numerical closed loop regulation
- › Password protected (3 user levels)
- › 7 pressure & time steps with TRUE TRACK RAMPING® set up on time to reach the following step
- › Available with up to 8 valves
- › Automatic cleaning cycle and clogged injector detection
- › Leakage detection
- › OXYPURGE™ to prevent part burning
- › Self-calibration of pressure valves reactivity
- › Graphic screens with set point and current value. Zoom & cursors to analyze
- › Quality screen with process values and graphic history
- › Alarms (message, lights, sound & stop cycle) with history
- › Service screen with maintenance history and diagnosis screen for technician
- › All data can be exported by Ethernet

SYSTEM FOOTPRINT

DIMENSIONS L x W x H inches (mm)

- › 24.5 x 24 x 55 (52 x 60 x 140)

WEIGHT pounds (kg)

- › 176.37 (80)



OPTIONS

Sequential piloting: 4 outputs in 24V DC to control the distributors on hydraulic pump. (to move tool actuators in sequence regarding cycle steps)

Integrated Volume: Nitrogen consumption monitoring for each valve with graphic & data display

- › To know the gas consumption & cost
- › To estimate needs of compressor flow
- › To detect leaks and to save Nitrogen
- › To calculate & survey gas pins flow
- › To monitor the process repeatability with alarms on 4 valves

2 IMM: The FCC can communicate with two Injection Moulding Machines simultaneously. The valves can be assigned to IMM1 or IMM2.

REGULATION VALVE

The reliability of this high precision proportional valve has been improved constantly for more than 20 years.

- › Highest level of pressure control
- › Inlet purge valve integrated
- › Precision ± 5 bar max
- › Range from 5 to 400 bar
- › Reactivity adjustment
- › Automatic calibration

CONNECTION

Communication device between PLC and IMM

- › EUROMAP 62 plug (32 pins)
- › Start signal: IMM Start injection dry contact

TECHNICAL DATA

Model	Inlet Pressure		Outlet Pressure		Power	
	PSIG	BAR	PSIG	BAR	HZ	V
BAUER FCC® 6	6000	414	5000	345	60 or 50	110 or 220

N2IT[®] XL

ALL-IN-ONE NITROGEN GENERATOR AND NITROGEN CONTROLLER SYSTEM



The N2IT[®] XL is a complete GIT Process control system. The system includes an integrated nitrogen generator, high pressure compressor, gas storage, and process control unit in a single mobile package. With only compressed air and electrical power required, N2IT[®] XL will control the gas assist process on any injection molding machine, eliminating the need for purchased nitrogen. N2IT[®] XL is loaded with user-friendly features and maintains accurate & repeatable processing with its precision pressure control system. Get N₂ gas assist with N2IT[®] XL today!

STANDARD FEATURES

State-of-the-art control system with True Track Ramping[®] and intuitive interface allows for simple operation.

The N2IT[®] XL includes EUROMAP 62 interface, and can easily be connected with any injection molding machine in your facility.

- › Real-time accurate diagnostics
- › Remote interface via smartphone option
- › On-screen manual and maintenance instructions
- › Three Stage, Air cooled, Reciprocating Compressor
- › Lubricated crankcase
- › 230v 60hz, Single phase (220v 50hz, 3 phase available)
- › High Durability membrane air separators
- › Electric motor (ODP) with belt drive
- › Pre membrane filters (particulate, moisture, and hydrocarbons)
- › On/Off switch
- › Automatic condensate collector with high condensate level switch
- › Compressor High temp switch
- › UL[®] labeled Control panel with PLC controller. Master central system includes interactive touchscreen interface for operation, maintenance, and trouble shooting
- › 7" Siemens touch screen (SD card upgradable)
- › Single point power supply connection
- › Nitrogen purity monitoring
- › Integrated storage vessel
- › Multiple pressure sensors including: Supply pressure, Compressor inlet pressure, and process pressure
- › Emergency stop push button
- › Light tower for alarm annunciation
- › 15' power cord
- › Ambient temperature range 40 °F to 113 °F

SYSTEM FOOTPRINT

DIMENSIONS L X W X H inches (mm)

- › 69.375" x 37" x 82" (1762.125mm x 939.8mm x 2082.8mm)

WEIGHT pounds (kg)

- › 1,700 lb. (771.107 kg)

COST OF OWNERSHIP

Like all BAUER compressors and controllers, the system is designed for long periods between maintenance intervals and has a very low cost of ownership.

- › Lifetime BAUER support

TECHNICAL DATA

Model	Nitrogen Flow at 98.0% Purity		Feed Air Required at: 101.5 PSIG (7 BAR)		Motor	
	SCFM	M ³ /HR	SCFM	M ³ /HR	HP	KW
5000 PSIG (4 14 BAR)						
N2IT XL	5	8.5	25	42.5	5	3.7

1) Capacity (FGD) is referenced to standard conditions. Tolerance +/- 5%. 2) Purity reflects content of O₂-free gas produced. Dimensions and weight are approximate. Volume flow rate is according to ISO 1217 with the following standard conditions: Inlet air pressure = sea level, 14.5 psia (1 bar a) Inlet air temperature = 68 °F (20 °C) Relative Water Vapor Pressure = 0 Contact BAUER for site conditions that are other than standard. Correction factors may apply that may derate performance.

G.I.T. ACCESSORIES

It's the little things that matter most with injection molding. Small components, such as slides or ejectors, play big roles in the molding process and are crucial to the finished product. The same principle applies to gas assist, where the little things such as injectors help to precisely target the injection point of nitrogen to deliver the very best results. Given the ever-increasing needs for efficiency and reliability, you need the assurance that the little things will work as consistently as the big things.

BAUER understands that reliability and optimal performance are critical for these applications. That's why we've worked for many years to develop the very best high pressure gas assist injection molding solutions in the world. Our accessories are application-tested and designed for simple installation and maintenance. We're so confident about our capabilities that we've even written a book on the process – feel free to contact us and take advantage of our industry-leading expertise!

VENT CONTROL VALVE

The compact, patented BAUER Vent Control Valve (VCV) has an overall length of only 4 1/2 inches and can be used with any gas assist control unit (standard with the BAUER NCU™). The VCV acts as a direct flow-through device giving the BAUER NCU™ full control of the profile during injection, but during the venting phase an internal check valve diverts volatiles and contaminants to atmosphere, reducing or eliminating the periodic cleaning and maintenance of the high pressure regulators.



GAS ASSIST INJECTION NOZZLE

The compact, patented Universal Self Actuating Nozzle (USN) has an overall length of only 5 1/2 inches and can be used on any molding machine 20 tons and larger. The USN (BAUER Model #ORF-0017) comes with a standard 1 3/4 - 8 thread size and can be used with any thermoplastic material. It requires no additional hydraulics or pneumatics and contains no seals to wear. The USN can be disassembled in minutes, allowing for quick and easy maintenance. Heater bands and check valves are available.

- › Custom gas injection nozzles available on request



GAS INJECTORS

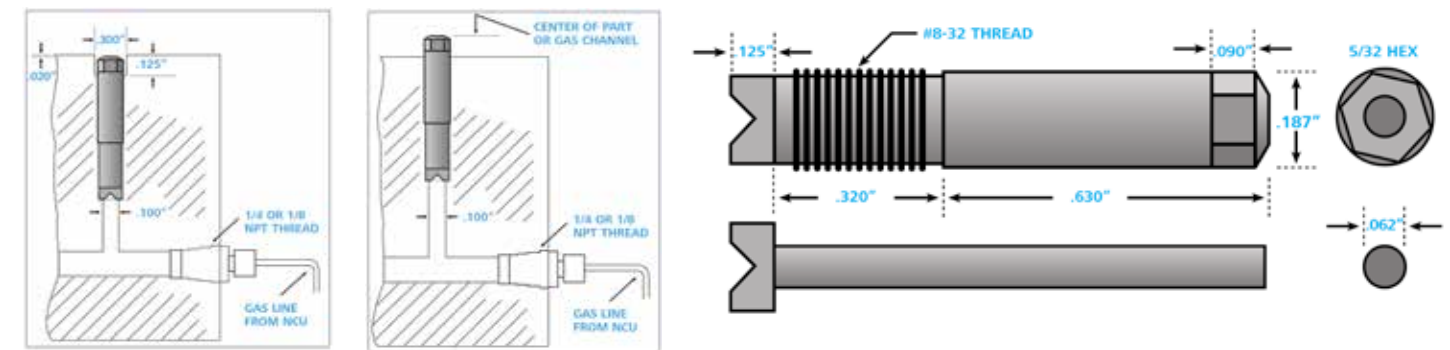
BAUER gas injectors are compact in size and easily installed in any injection mold. A definite advantage is the ease with which the injectors can be accessed for quick and easy cleaning.

- › Pin and sleeve design prevents plugging
- › Quick and easy-clean
- › Compact design
- › Custom gas injector pins available on request



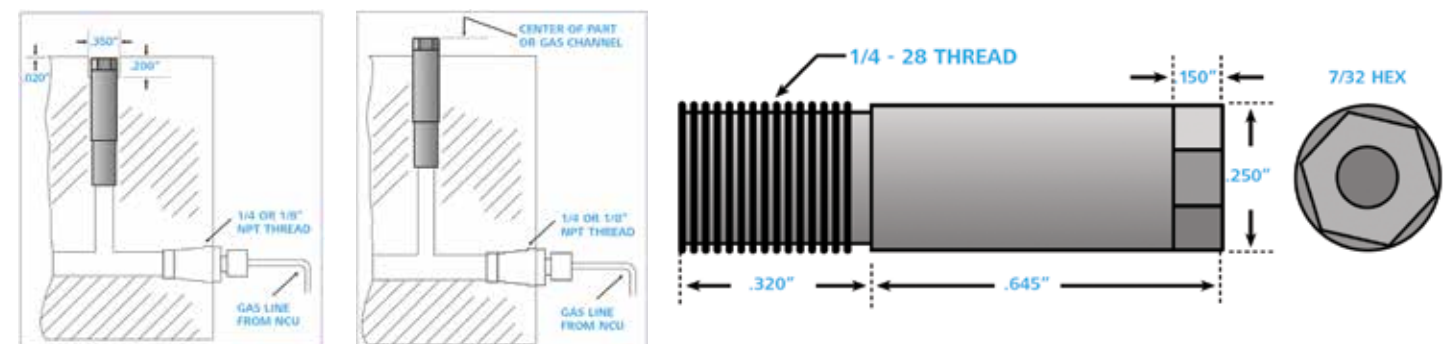
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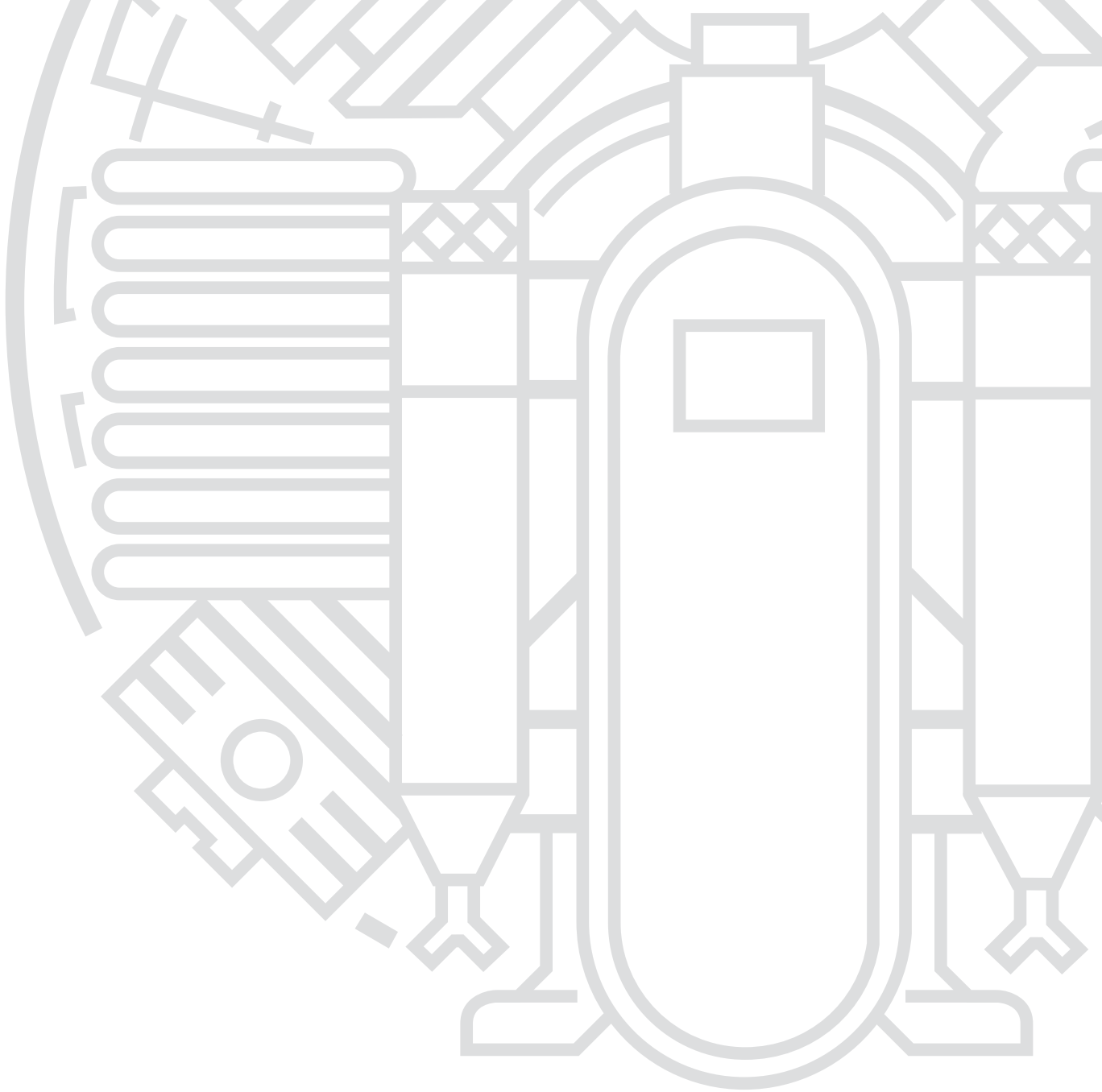
- › 3/16" Gas Injector Pin
- › Custom gas injector pins available on request.



INJ-0016

- › 1/4" Gas Injector Pin
- › Custom gas injector pins available on request





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