

NOVA SWISS



**GAS INJECTION UNIT
565.0522**

Gas Injection Unit (GIU)

Gas Injection Unit is designed to supply an inert gas into an extrusion unit combined with a regulated and stabilized pressure level. With servo-controlled motor concept, the performance of pressure regulation will be secured through a state-of-the-art speed controlling of the pressure generator.

Herewith any problems related to the complex controlling valve-regulation are eliminated. Therefore, the process will be more stable and the result (imbedded gas quantities) are much better repeatable without periodic adjustment during operations.

ADVANTAGES AND IMPROVEMENTS

- High flow rate
- Low maintenance expenditures
- No daily adjustments needed
- Quick restart after standstill or break-down of the line
- Lower waste quantity of finished product while starting
- No consumption of expensive compressed air
- 100% stable oil pressure due to intelligent hydraulic management
- Lifetime lubricated gearbox
- Smooth and silent operating

The NOVA WERKE AG Gas Injection Unit with servo-controlled motor as compressor drive does not need compressed air like a pneumatic intensifier does. There is no need of, non-efficient energy carrier, compressed air.

The compressor assembly with servo motor is equipped with an external lubrication unit which makes possible to run the compressor at very low speed. Intelligent oil pressure lubrication management guarantees constant and stable oil pressure.

Please note that the Gas Injection Unit working with a diaphragm compressor shows no wear of sealing components. This will keep the gas volume free of residuals (abraded material and/or oil).

SCOPE OF THE DELIVERY OF THE GAS INJECTION UNIT

Gas Injection Unit, includes:

- MK-1000-V09-SD (555.0228-005) servo-controlled compressor
- Welded robust steel housing with stainless steel mimic front panel
- Pressure reducing valve 200 bar ... 10 bar
- Diaphragm compressor with 1/4" inlet/outlet HP-connections
- Servo drive system
- Digital monitoring of diaphragm rupture
- Lubrication unit with intelligent oil pressure management.

Instrumentation:

- Sensors
- Connectors
- Tubing
- Wiring

Control cabinet for GIU, includes:

- Servo-controller B&R ACOPOS P3
- Control system PLC (type B&R)
- Human machine interface (HMI) (OP touch screen, type B&R with ethernet, powerlink & CAN bus)
- Electrical power supply devices: CPU supply, I/O supply, extended voltage (200 – 480 V) and frequency 50 or 60 Hz range
- Speed monitored service interval
- Error log (audit trail)
- Plug & play connection to the main unit
- 4 levels SW user rights
- Prepared for remote access.

Inlet bottle connection kit, includes:

- Inlet low-pressure hose to connect N₂ or CO₂ bottle to GIU trolley.

High pressure outlet connection kit, includes:

- Outlet high pressure tube for N₂ or CO₂ to connect GIU trolley to extruder.

Standard colour of the unit envelope is light grey RAL 7035

APPLICATION

Gas Injection Unit, suitable for physical foaming of cable insulation or plastic moulded parts at max 700 bar nominal working pressure with N₂ or CO₂.

	N ₂	N ₂ / KHK CERTIFIED	CO ₂
INLET PRESSURE	20 to 200 bar		
OUTLET PRESSURE	up to 700 bar	up to 500 bar	up to 700 bar
PRESSURE CONTROL ACCURACY	relative max. +/- 1 bar (guaranteed +/- 2 bar)		relative max. +/- 2 bar (guaranteed +/- 6 bar)
PRESSURE SENSOR FLUCTUATION	absolute less +/- 0.5% FS (1'000 bar)	absolute less +/- 0.5% FS (500 bar)	absolute less +/- 0.5% FS (1'000 bar)
FLOW RANGE	6 – 500 NI/h at min. inlet pressure of 50 bar		
POWER SUPPLY	3 x 200 – 480 VAC; 50 – 60 Hz (kVA) – no neutral		
PRESSURE GENERATOR	Nova Swiss diaphragm compressor MK-1000-V09-SD		

ENVIRONMENT CONDITIONS PREREQUISITES

- Operating temperature: +10°C to +40°C
- Ambient temperature during operation as a prerequisite for the warranty
- Operating humidity: max. 80% relative humidity

QUALIFICATIONS AND CERTIFICATIONS

The GIU system is built in accordance with following directives;

- European Machinery Directive 2006/42/EG
- European Pressure Equipment Directive 2014/68/EU
- European Low Voltage Directive 2014/35/EU

TEST AND FACTORY ACCEPTANCE TEST

A factory acceptance test (FAT) will be executed prior the shipment at the premises of Nova Werke AG in Effretikon Switzerland. The customer should attend the FAT to confirm the function and quality prior the transportation. The FAT comprises a leakage test with nitrogen and a mechanical and electrical function test, after passing the FAT the GIU system will be ready for shipment. Nova Werke AG will not perform a test on the site of the customer.

DOCUMENTATION

The documentation includes: Comprehensive operating manual, Certificate of Conformity, and calibration certificates.

Operating manual and certificates in German or English: one (1) CD or memory stick with PDF-file of the documentation. HMI in English or German.

Documentation with any other language is subject to additional cost and will be quoted separately.

PACKING AND DIMENSIONS

Two wooden boxes (applicable for sea freight, data may vary depending on chosen options).

GIU Trolley: 127 × 74 × 131 cm
 – packed 140 × 89 × 155 cm (L × D × H)
 – weight gross/nett 360/260 kg

Control cabinet: 65 × 60 × 166 cm
 – packed 86 × 75 × 190 cm (L × D × H)
 – weight gross/nett 130/85 kg

OPTIONS

OPTIONS	FOR N ₂	FOR CO ₂
562.0369	Bottle connection for nitrogen: inlet low-pressure hose to connect N ₂ bottle to GIU trolley.	
562.0370		Bottle connection for carbon dioxide: inlet low-pressure hose to connect CO ₂ bottle to GIU trolley.
562.0371	High pressure outlet connection kit: one outlet high pressure tube for N ₂ and CO ₂ to connect GIU trolley to extruder.	
562.0366	Automatic bottle change-over option: valves, fitting, tubing, pressure transducers and necessary components to handle two bottles in the inlet of the gas avoiding production interruption. Max. 200 bar inlet pressure.	
562.0368	High precision pressure transducer: +/- 0.15% FS pressure transducer installed after the compressor.	
562.0374	Second high-pressure gas outlet: valves, fitting and tubing allowing to have a second outlet to feed a second extruder downstream.	
562.0375	Second high-pressure transducer at the outlet: necessary components and high-pressure transducer located at the outlet of the GIU trolley, allowing having precise pressure feedback.	
582.0026	Outlet flow meter up to 700 bar; flow 0–500 nlph N ₂ at 700 bar – tolerance +/- 1% FS – output signal 0–10VDC.	
562.0376	Gas accumulator kit: valves, fittings, tubing and other necessary documents to create additional volume in the high-pressure circuit and further reduce any remaining pulsation of the high-pressure line to the extruder.	
582.0027	Rapid N ₂ pressure release valve: valve, fittings and tubing necessary allowing rapidly to release the high-pressure circuit pressure.	
5.4770.004	Interface B&R powerlink »Profinet«: modification allows customer to access control cabinet and input parameters remotely.	
5.4770.005	Remote access to GIU system: necessary hardware and software, allowing access for diagnosis remotely. Customer must allow ethernet connection.	
5.4770.006	Portable HMI touch screen device: HMI touch screen, 20 m connecting cable.	