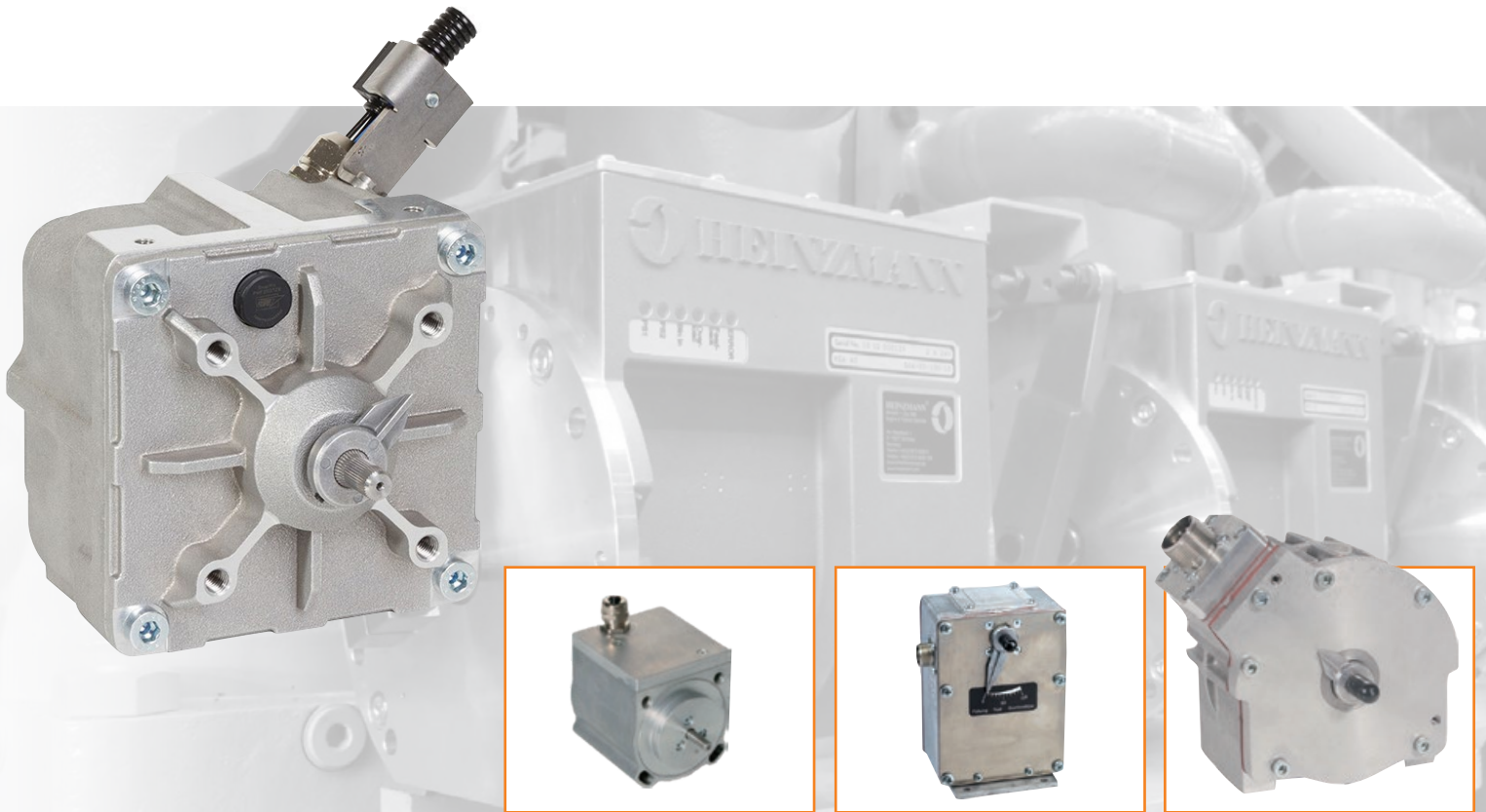


ACTUATORS



Conventional Fuel Injection Control Systems

- ▶ Easily fitted to any engine
- ▶ Proven reliability and long-life cycle
- ▶ Covering any field of application
- ▶ Actuators with gears
- ▶ Direct acting actuators with rotary or linear output
- ▶ Actuators with integrated positioning electronics

ACTUATORS

Based on HEINZMANN's more than 100 years' experience in developing and producing high-performance actuators, their proven reliability and long service life is well known in the market.

They are driven electrically. Therefore, no mechanical drive is needed. This allows HEINZMANN actuators to be easily fitted to any engine. This is another reason why our units are also suitable for retrofit systems.

Our actuators feature high torque ratings packed into a lightweight, compact unit and have a high degree of protection.

HEINZMANN provides a wide range of actuators including direct working actuators, actuators with gears and actuators with integrated positioning electronics and brushless motors.

We have a large range of actuator models covering practically any application and sector. This means that customers can find a product tailored to their exact requirements.

Alongside the wide range of HEINZMANN control units we offer complete series of control systems covering a broad spectrum of applications. HEINZMANN systems provide complete solutions to match all customer needs.



ACTUATOR APPLICATIONS

- ✓ **Power generation**
- ✓ **Pump drives**
- ✓ **Locomotives**
- ✓ **Marine applications**
- ✓ **Mechanical drives**
- ✓ **Industrial applications**
- ✓ **All turbine applications**

DIRECT ACTING ACTUATORS WITH ROTARY OUTPUT

The actuators of this family are rotary and direct acting all electric actuators with 0.55 to 13 Nm output torque and 36°, 53° or 68° travel. Their main application is on industrial diesel, gas and dual-fuel engines from 100 to 1000 kW. These actuators provide a contactless position feedback. Their distinctive features are a compact design and a high-dynamic performance. They may be combined with various analogue or digital HEINZMANN control units.

StG 3 / StG 1.5

Small and medium-sized diesel and gas engines or turbines are the preferential application for these powerful types of actuators. The robust and enduring construction allows operation under roughest ambient conditions. The armature is optimised for lowest heat build-up and allows a wide working temperature range up to 150 °C and offers a very fast response time.

- ✓ 3 Nm / 1.5 Nm
- ✓ up to 72° rotation
- ✓ very precise analogue feedback
- ✓ IP6K9K
- ✓ 150 °C



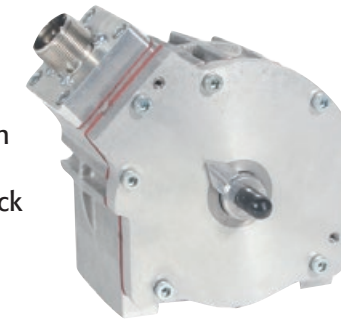
StG 3

StG 1.5

StG 2010 / StG 2040 / StG 2080

The most powerful versions of the 2000 series are installed in diesel and gas engines as well as in dual-fuel engines and can be driven by HEINZMANN analogue or digital control units and HEINZMANN positioner units. The integration with different throttle valve sizes for hot and cold gas engine applications is possible. Together with integrated driver electronics these actuator models turn into positioning units suitable for current/voltage and PWM input signals.

- ✓ 2, 7.4 and 11 Nm (at 36°)
- ✓ up to 68° rotation
- ✓ analogue feedback
- ✓ fast acting
- ✓ ATEX category 3
- ✓ CSA certified



StG 2010 / 2040 / 2080

StG 2120

The StG 2120 actuators are for dedicated turbine applications and meet specific environmental requirements on top of their compact design and high-dynamic performance. They work with HEINZMANN digital control units and HEINZMANN positioner units.

- ✓ 13 Nm
- ✓ 68° rotation
- ✓ analogue feedback
- ✓ meets specific environmental requirements
- ✓ ATEX category 2



StG 2120

StG 1 / StG 2

These actuators are utilised on industrially used diesel, gas and gasoline engines rated less than 180 kW. StG 1 and StG 2 actuators are driven by a dedicated analogue control unit.

- ✓ 0.9 Nm / 1.4 Nm
- ✓ 68° rotation



StG 1/2

StG 3005 / StG 3010

The cost-effective actuators StG 3005 and StG 3010 are designed for direct mounting on small diesel and gas engines. Identical in size but equipped with different magnetic material they are driven by dedicated analogue HEINZMANN control unit ORION AC 3 or digital control unit ORION DC 9.

- ✓ 0.3 Nm / 0.6 Nm
- ✓ 50° / 53° rotation
- ✓ digital feedback



StG 3005 / 3010

StG 2005 DP / StG 2040 DP

DP versions of the StG 2000 series are designed for direct mounting at diesel conventional block type fuel injection pumps and driven by digital control units. Main applications are industrial diesel engines from 100 to 1.000 kW. They combine a compact design and high-dynamic performance. Maximal fuel rack stroke is 24.5 mm. These actuators are mainly used to replace integrated mechanical governors on diesel and dual-fuel engines, thus enhancing the engines with the additional features of an electric governor.

- ✓ 0.8 / 5.6 Nm
- ✓ 32° / 36° rotation
- ✓ digital feedback
- ✓ directly mounted



StG 2005 DP / 2040 DP

ROTARY ACTUATORS WITH INTEGRATED POSITIONERS

This family of HEINZMANN actuators is based on similar standard versions, equipped with integrated positioning electronics. Output torque range is 4 up to 44 Nm at 68°, 75° or 90° rotary travel. Main applications are medium and large diesel, gas and dual-fuel engines. The actuators may be driven by any electronic speed control unit, supplying an analogue position demand signal or CAN. An analogue position feedback is available as a 4 - 20 mA or a 0 - 5 V signal. Versions with integrated control unit are available on request.

StG 3-PD

StG 3-PD is a very fast directly working brushless actuator with an integrated positioner. It powerfully works in both directions of rotation equally in 4Q operation. The armature is optimised for lowest heat build-up, additionally the design enhances heat dissipation. Optionally it is available with liquid cooling. Its robust construction makes it fit for mobile applications even.

- ✓ 3 Nm
- ✓ 72° rotation
- ✓ very short actuating times
- ✓ with integrated positioner
- ✓ 150 °C



StG 3-PD

StG 2040-PD / StG 2080-PD

This system consists of an actuator StG 2040 or StG 2080 combined internally with a digital electronic position control that is parameterised by a powerful software package. The compact design allows any mounting position and provides interchangeability with other proprietary units. Precise and fast positioning in both working directions and very low consumption make this system best for applications such as gas engines.

- ✓ 6.6 Nm / 7.8 Nm
- ✓ 68° rotation
- ✓ with integrated positioner
- ✓ CSA certified

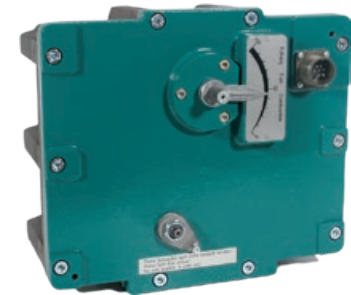


StG 2040-PD / 2080-PD

StG 30.90-PD / StG 40.90-PD

These two units are based on the HEINZMANN actuators StG 30 or StG 40 with gears. The integrated positioner is parameterised by a powerful software package. These actuators are driven by powerful DC disc motors. Output torque is multiplied by a twin-stage gear. Furthermore, these positioners are distinguished by fast response, high torque in either direction and moderate consumption.

- ✓ 28 Nm / 44 Nm
- ✓ 90° rotation
- ✓ with integrated positioner
- ✓ CSA certified



StG 30.90-PD / 40.90-PD

ACTUATORS WITH INTEGRATED GEARBOX AND POSITIONER

This type of actuators provides high performance combined with rapid response, irrespective of direction of rotation or shaft position. Functional ranges are provided for marine applications and industrial purposes. StG EC 40 and StG EC 250 come with a fully maintenance-free brushless disc motor which has a typical high torque multiplied by the use of a planetary gear. In case of power loss the self-locking gear is able to prevent undesired reactions of the linkage. Manual override is also possible. The electronics are fully EMC protected and all customer interfaces are totally galvanically insulated from each other and from ground. The high protection degree IP66 guarantees optimum resistance to adverse environments. They are used in marine applications, cooling water valves and industrial engine applications.

StG EC 250

This powerful actuator delivers a maximum torque of 250 Nm. It needs one power supply to drive the electronics and a second power supply with higher voltage to drive the motor.

- ✓ 250 Nm
- ✓ brushless
- ✓ 90° rotation
- ✓ analogue or PWM setpoint
- ✓ marine certified



StG EC 250

StG EC 40

The StG EC 40 is available with an optional return spring to ensure setting to zero position if power supply fails.

- ✓ 40 Nm
- ✓ brushless
- ✓ 90° rotation
- ✓ analogue or PWM setpoint
- ✓ marine certified



StG EC 40

ACTUATORS WITH GEARS

This series of gear-type all-electric actuators is based on a DC disc motor and gear transmission, with 4 up to 180 Nm output torque and 36° or 42° travel. Applications are medium-sized and large diesel and gas engines, as well as gas and steam turbines. The actuators can be combined with various analogue or digital HEINZMANN control units and provide a contactless position feedback.

StG 180

This powerful actuator is used on industrial diesel and gas engines and on turbines. The StG 180 actuator is driven by HEINZMANN digital controls.

- ✓ 180 Nm
- ✓ 42° rotation
- ✓ analogue feedback



StG 180

StG 64 / StG 90

These powerful actuators are proven on industrial diesel or gas engines, and on turbines, which require less than the undermentioned torque to move the fuel rack or fuel metering valves. They are for dedicated use with HEINZMANN digital controls.

- ✓ 64 Nm / 90 Nm
- ✓ 42° rotation
- ✓ analogue feedback



StG 64 / 90

StG 16 / StG 30 / StG 40

These actuators are utilised on industrial diesel and gas engines and on turbines, which require less than the undermentioned torque to move the fuel rack or fuel metering valves. Application examples are marine, locomotive and power generation. They work with HEINZMANN analogue and digital controls or HEINZMANN's JANUS positioners.

- 15 Nm / 31.5 Nm / 44 Nm
- 42° or 90° rotation
- analogue feedback



StG 16 / 30 / 40

StG 6 / StG 10

The main application of StG 6 and StG 10 actuators is on industrial diesel and gas engines, which require less than respectively 6 and 10 Nm torque to move the fuel rack or the fuel metering valves. They are driven by HEINZMANN analogue or digital controls or JANUS positioners.

- 6 Nm / 10 Nm
- 36° rotation
- analogue feedback



StG 6 / 10

DIRECT ACTING ACTUATORS WITH LINEAR OUTPUT

This group of all-electric direct acting actuators is designed for direct mounting at diesel inline injection pumps. The linear actuators are driven by HEINZMANN's ORION Control Units. The ORION family consists of either the dedicated analogue control unit AC 3 or a range of digital control units as DC 7, DC 9, DC 10 and DC 12. The LA actuators provide a special contactless position feedback.

LA Series

Application of these direct acting linear actuators is on small diesel engines for power generation. They are designed particularly for small diesel and gas engines. Three different sizes are available:

- LA 25 / 19.5 mm
- LA 30 / 15.5 mm
- LA 35 / 12.5 mm

- force up to 35 N
- up to 19.5 mm operating range
- digital feedback



LA 25 / 30 / 35

TECHNICAL INFORMATION

Actuator data											Applicable control units and direction of work											
	Actuator type	Max. rotation/ stroke	Max. torque/ force	Torque/force in steady state position	No load response time	Steady state current	Max. current	Ambient temperature °C	Degree of protection	Weight approx.												
											PRAMOS DC 1-03	PRAMOS DC 1-04	HELENOS DC 2	PANDAROS DC 6	ORION DC 7	DC 8	ORION DC 9	ORION DC 10	ORION DC 11	ORION DC 12	XIOS	Analogue
Rotary output	StG 3005	53°	0.30 Nm (spring)	0.18 Nm	70 ms	3 A	5 A	-40° ... 90°	IP65	0.8 kg				4Q	2Q		4Q	2Q		4Q		
	StG 3010	50°	0.60 Nm (spring)	0.36 Nm	70 ms	3 A	5 A	-40° ... 90°	IP65	0.8 kg				4Q	2Q		4Q	2Q		4Q		
	StG 1	68°	0.9 Nm	0.3 Nm	40 ms	1.7 A	5 A	-25° ... 90°	IP50	1.9 kg												4Q
	StG 2	68°	1.4 Nm	0.45 Nm	40 ms	1.7 A	5 A	-25° ... 90°	IP50	1.9 kg												4Q
	StG 1.5	72°	1.5 Nm	0.75 Nm	< 50 ms	3.5 A	6 A	-25° ... 105°	IP6K9K	3.8 kg												4Q
	StG 3	72°	3 Nm	1.5 Nm	< 50 ms	3.5 A	6 A	-40° ... 150°	IP6K9K	4.9 kg												4Q
	StG 2010	36°	2 Nm (spring)	1 Nm	45 ms	3 A	6 A	-25° ... 90°	IP65	2.2 kg			4Q	4Q		4Q	4Q					4Q
	StG 2010	68°	1.4 Nm (spring)	0.7 Nm	60 ms	3 A	6 A	-25° ... 90°	IP65	2.2 kg			4Q	4Q		4Q	4Q					4Q
	StG 2040	36°	7.4 Nm (spring)	3.7 Nm	50 ms	4 A	8 A	-25° ... 90° -40° ... 90°	IP65	6.5 kg			4Q	4Q		4Q	4Q		4Q		4Q	4Q
	StG 2040	68°	5.6 Nm	3.4 Nm	70 ms	4 A	8 A	-25° ... 90° -40° ... 90°	IP65	6.5 kg			4Q	4Q		4Q	4Q		4Q		4Q	4Q
	StG 2080	36°	11 Nm (spring)	5.5 Nm	60 ms	4 A	8 A	-25° ... 90° -40° ... 90°	IP65	8.6 kg			4Q	4Q		4Q	4Q		4Q		4Q	4Q
	StG 2080	68°	8.4 Nm (spring)	4.2 Nm	85 ms	4 A	8 A	-25° ... 90° -40° ... 90°	IP65	8.6 kg			4Q	4Q		4Q	4Q		4Q		4Q	4Q
	StG 2005 DP	32°	0.8 Nm	0.4 Nm	50 ms	3 A	6 A	-25° ... 90°	IP55	2.4 kg			4Q	4Q	2Q					4Q		
	StG 2040 DP	36°	5.6 Nm	2.8 Nm	50 ms	3 A	6 A	-25° ... 90° -40° ... 90°	IP55	4.2 kg			4Q	4Q	2Q					4Q		
	StG 2120	68°	13 Nm	4.3 Nm	<100 ms	2.3 A	7 A	-20° ... 60°	IP55	17,8 kg			4Q								4Q	4Q
	StG 6-01	36°	4 Nm	1.4 Nm	75 ms	1.7 A	5 A	-25° ... 90°	IP55	3.5 kg	4Q	4Q	4Q	4Q		4Q	4Q				4Q	4Q
	StG 6-02V	36°	6 Nm	2 Nm	50 ms	1.7 A	5 A	-25° ... 90°	IP55	3.5 kg	4Q	4Q	4Q	4Q		4Q	4Q				4Q	4Q
	StG 10	36°	10 Nm	3.3 Nm	60 ms	1.7 A	5 A	-25° ... 90° -40° ... 90°	IP55	4.3 kg	4Q	4Q	4Q	4Q		4Q	4Q				4Q	4Q
	StG 16	42°	15 Nm	5 Nm	120 ms	1.7 A	5 A	-25° ... 90°	IP55	12.3 kg	4Q	4Q	4Q	4Q		4Q	4Q				4Q	4Q
	StG 30	42°	31.5 Nm	10.7 Nm	190 ms	1.7 A	5 A	-25° ... 90°	IP55	12.3 kg	4Q	4Q	4Q	4Q							4Q	4Q
StG 30.90	90°	31.5 Nm	10.7 Nm	235 ms	1.7 A	5 A	-25° ... 90°	IP55	24.5 kg			4Q								4Q	4Q	
StG 40	42°	44 Nm	14.5 Nm	190 ms	2.3 A	7 A	-25° ... 90°	IP55	12.3 kg	4Q	4Q	4Q								4Q	4Q	
StG 40.90	90°	44 Nm	14.5 Nm	275 ms	2.3 A	7 A	-25° ... 90°	IP55	24.5 kg			4Q								4Q	4Q	
StG 64	42°	64 Nm	21 Nm	270 ms	2.3 A	7 A	-25° ... 90°	IP65	32 kg	4Q	4Q				4Q					4Q	4Q	
StG 90	42°	90 Nm	30 Nm	320 ms	2.3 A	7A	-25° ... 90°	IP65	32 kg	4Q	4Q				4Q					4Q	4Q	
StG 180	42°	180 Nm	60 Nm	320 ms	4.4 A	13 A	-25° ... 90° -40° ... 90°	IP 55	39 kg		4Q				4Q							
Positioners	StG 2040-PD	68°	6.6 Nm	3.3 Nm	< 150 ms	3.5 A	7 A	-25° ... 90°	IP65	6.5 kg	integrated position control											
	StG 2080-PD	68°	7.8 Nm	4.6 Nm	< 90 ms	3,5 A	7 A	-25° ... 90°	IP65	8.6 kg												
	StG 30.90-PD	90°	31.5 Nm	10.7 Nm	< 240 ms	1.7 A	5 A	-20° ... 60°	IP55	24.5 kg												
	StG 40.90-PD	90°	40 Nm	14.5 Nm	< 280 ms	2.3 A	6.3 A	-20° ... 60°	IP55	24.5 kg												
	StG 3-PD	72°	3 Nm	1.5 Nm	< 30 ms	3 A	6 A	-40° ... 105° -40° ... 150° cooled	IP6K9K	6.8 kg												
	StG EC 40	82°/ 90°	> 40 Nm	> 20 Nm	< 220 ms (40°) 355 ms (82°)	5 A		-40° ... 80°	IP66	19 kg												
	StG EC 250	82°/ 90°	> 250 Nm	> 125 Nm	< 250 ms (40°) 400 ms (82°)	external power supply		-40° ... 80°	IP66	37 kg												
Linear output	LA 25	19.5 mm	25 N	20 N	100 ms	2 A	2.8 A	-40° ... 90°	IP65	0.7 kg					2Q		2Q	2Q				
	LA 30	15.5 mm	30 N	24 N	100 ms	2 A	2.8 A	-40° ... 90°	IP65	0.7 kg					2Q		2Q	2Q				
	LA 35	12.5 mm	35 N	28 N	100 ms	2 A	2.8 A	-40° ... 90°	IP65	0.7 kg					2Q		2Q	2Q				

4Q = bidirectional; 2Q = unidirectional/spring return

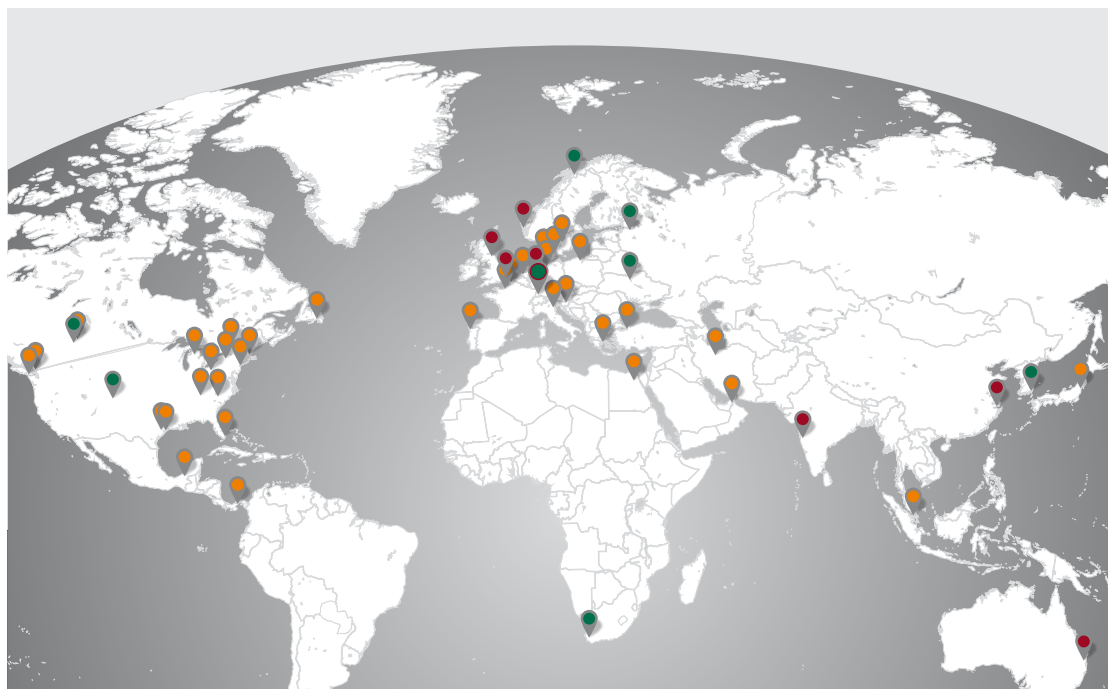
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