

8007/8008 Series

Electro-pneumatic Transducers

Nozzle Design Reducing Effects of Vibration

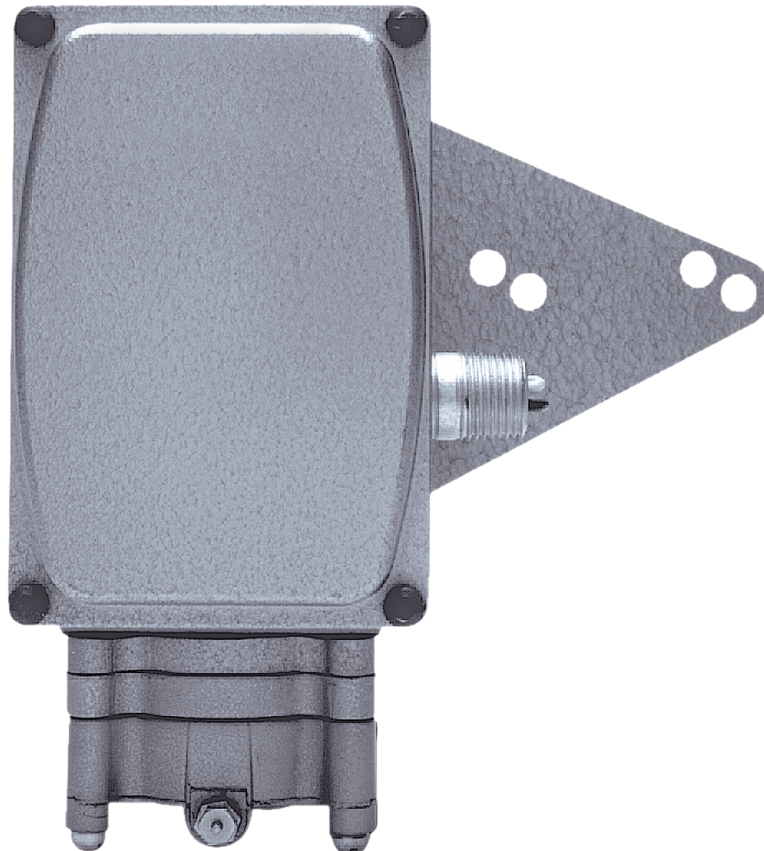
Overview

Model 8007 and 8008 electro-pneumatic transducers convert a low-power DC signal into a proportional pneumatic signal in the 207-to-1035 mbar (3-to-15 psi), or 414-to-2070 mbar (6-to-30psi) range, as appropriate. They are of the force balance type.

Generally speaking, a signal from the Model 8007 is used by a pneumatic positioner or a supply relay of the volume booster type.

Model 8008 is fitted with a relay, which allows the transducer output signal to directly control a valve pneumatic actuator.

These transducers are either direct or reverse action. Action direction can be changed very easily, reversing the connections of the signal leads on the terminal board. These transducers can be installed in several positions without affecting their operation, and they are not sensitive to radio waves.

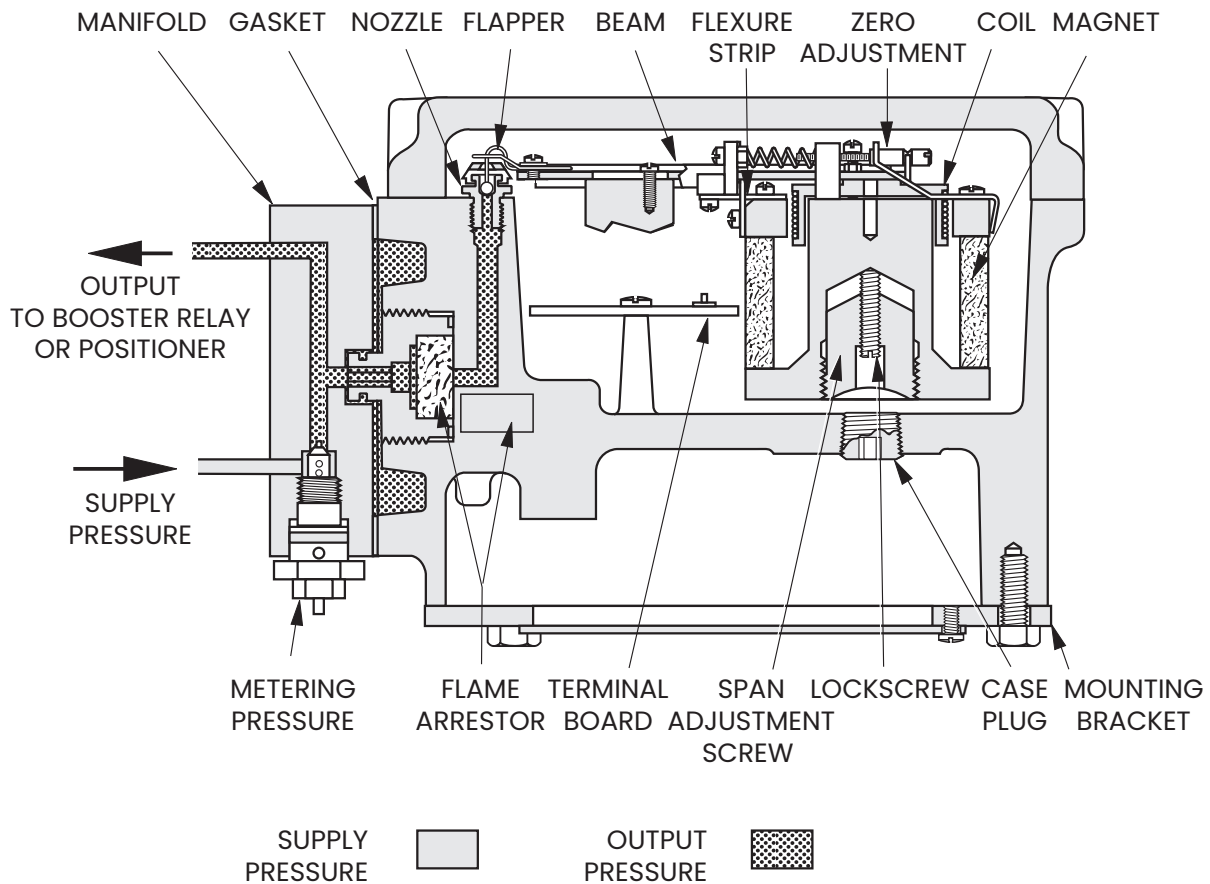


Operation

Any variation in the control input signal through the coil changes the gap between flapper and nozzle, causing a change in nozzle back pressure. This change in pressure counteracts beam movement until equilibrium is restored. Output pressure is the same as nozzle circuit pressure in Model 8007 transducers.

With direct action, any increase in the input signal brings about an increase in output air pressure. With reverse action, any increase in the input signal brings about a decrease in output air pressure.

Sectional View of Transducer (Model 8007 illustrated)



Model 8008, with relay:

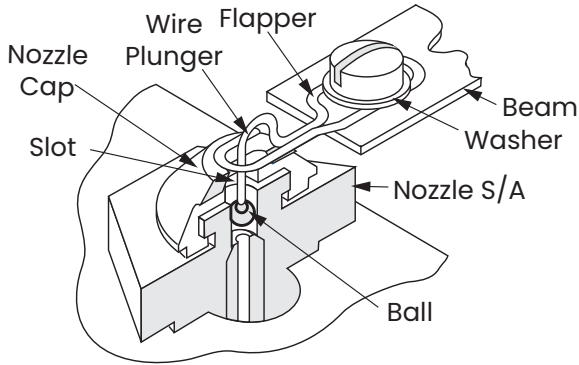
Supply air enters the circuit via a metering tube. When the flapper blocks off the nozzle, pressure in the nozzle circuit rises. The resulting force moves the diaphragm unit in the direction of the relay plug, and this movement blocks off the vent from the atmosphere and releases the supply orifice in the direction of the output. The action of the resulting increase in pressure is to move the diaphragm unit away from the relay plug.

When forces generated by the nozzle and output circuits balance each other, the relay plug no longer allows supply air into the output circuit. There is a provision made for a small bleed between supply and output, and this keeps the relay plug slightly clear of its seat in order to speed up transducer response.

Description

Beam Support: The beam is supported on a friction-free fulcrum provided by two beryllium copper flexure bearings.

Nozzle: This has been designed so that vibration will have little or no effect on transducer response.

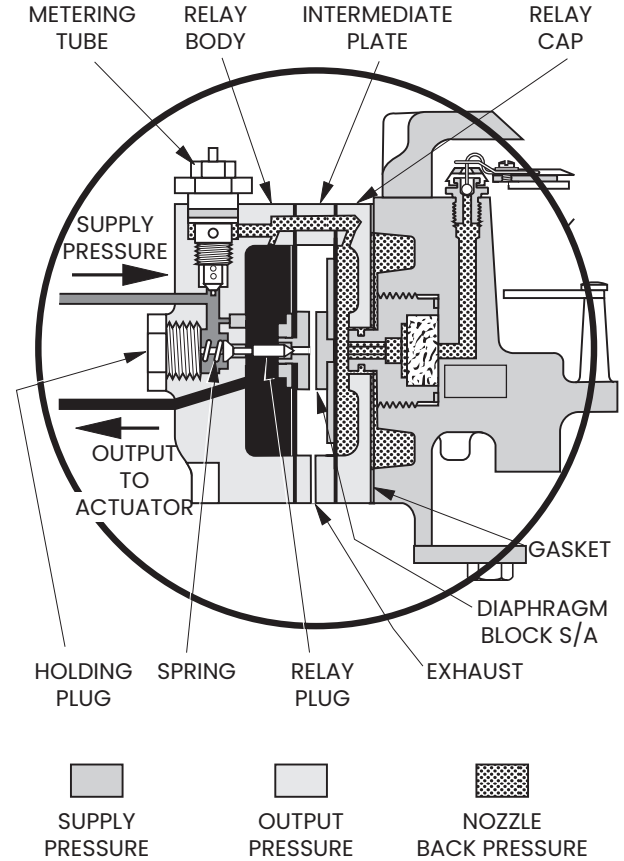


Nozzle Assembly

Electrical Circuit: The input circuit of Model 8007 and 8008 transducers can be adapted to suit DC current signals from most electrical controllers. Signal leads are taken into the casing through a 1/2-inch NPT- tapped hole. This connection will accept a cable gland complying with the relevant protection standard.

Coil: Windings are epoxy resin impregnated.

Relay (Model 8008 only): A diaphragm unit separates the output and nozzle circuits. A double-seated valve controls the flow of supply air to the output and from the output to the exhaust orifice. Supply air enters the nozzle circuit via a metering tube. If necessary, the orifice can be cleared by the manually operated plunger.



Pneumatic Circuit: The transducer supply and output connections are tapped 1/4-inch NPT. They are located on the manifold on Model 8007, and on the relay on Model 8008. To facilitate pneumatic circuit connection, the manifold and relay can be fitted to the transducer in any of four different positions.

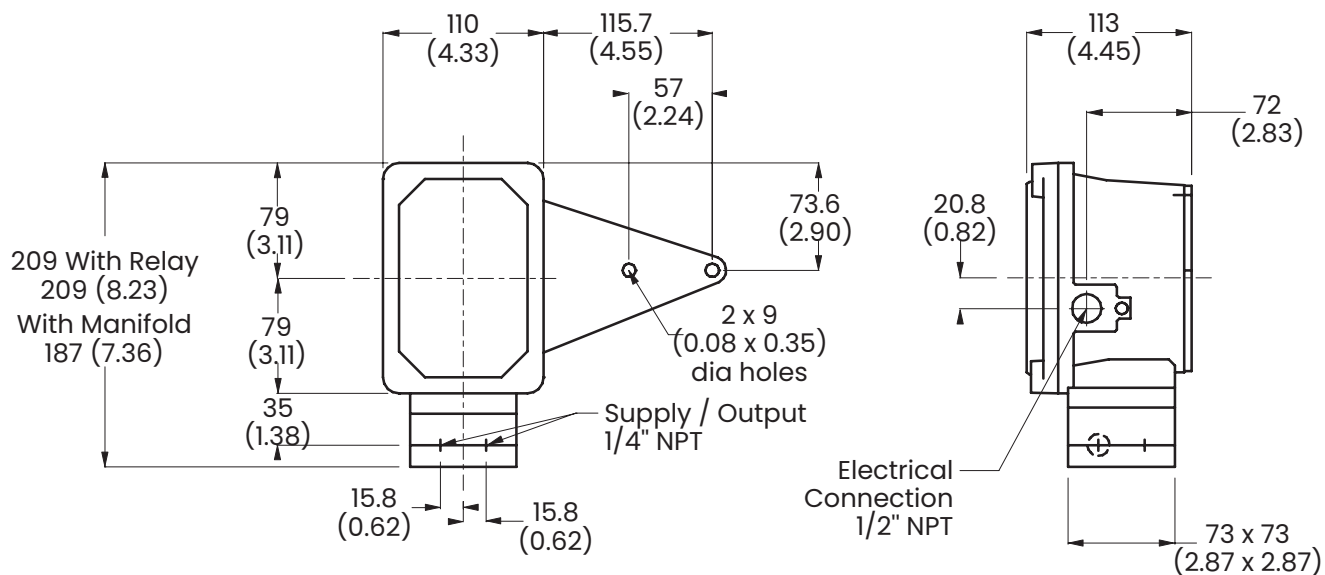
Hazardous Environment Approvals

ATEX Approvals (2014/34/EU Directive)

For all details dealing with Explosion-proof and Intrinsic safety, please refer to 8000 ATEX Manual (ref. 33467).

Description

Casing: Several mounting plates allow the transducers to be fitted to the yoke of all **Masoneilan™** actuators.



General Data

Electrical Circuit:

Resistance of the standard circuit is 216 ohms for a 4- to 20-mA signal (direct current). Some models can be adapted to suit most signals in present use. Apparatus is intrinsically safe only at 4-20 mA and 216 ohms. Please see table below.

Control input signal	Transducer input resistance
mA	ohms
1-5	2753
4-20	216
10-50	105
Other signals	On request

Note: For intrinsically safe, 4-20 mA and 216 ohms only.

Pressure Table:

Transducer Model	Supply pressure		Output signal pressure	
	mbar	psi	mbar	psi
8007	1586	23	207 to 1035	3 to 15
8008	1586	23	207 to 1035	3 to 15
	2413	35	414 to 2068	6 to 30

Air Consumption:

Transducer	Model 8007	Model 8008	
Output signal	207 to 1035 mbar (3 to 15 psi)	207 to 1035 mbar (3 to 15 psi)	414 to 2680 mbar (6 to 30 psi)
Max consumption (steady state)	0.30 std. m ³ /h n (0.18 scfm)	0.45 std. m ³ /h (0.26 scfm)	0.60 std. m ³ /h (0.35 scfm)
Max. Instantaneous Flow Rate	0.30 std. m ³ /h (0.18 scfm)	4.30 std. m ³ /h (2.53 scfm)	9.00 std. m ³ /h (5.30 scfm)

Air Connections: 1/4" NPT

Effect of Supply Pressure:

For a supply pressure of 1586 mbar (23 psi): 0.75 percent of output span for a supply pressure variation of 100 mbar (0.5 percent per psi).

Electromagnetic compatibility:

These devices fall under the scope of the Article 2.2.(d) of the EMC 2014/30/EU Directive. Consequently, this Directive does not apply.

Performance Data:

- Hysteresis: 0.8 percent of output span
- Sensitivity: 0.5 percent of input span
- Accuracy: ± 1 percent of full span

Performance of a system comprised of valve, packing, actuator, transducer, and fittings depends on the individual performance of each component.

Net Weight:

3.5 kg (7.7 lbs)

Working Temperature:

(Also refer to the marking of the device and ATEX Manual 33467)

Model 8007:

- down to -20°C (-4°F)
- down to -55°C (-67°F) - optional

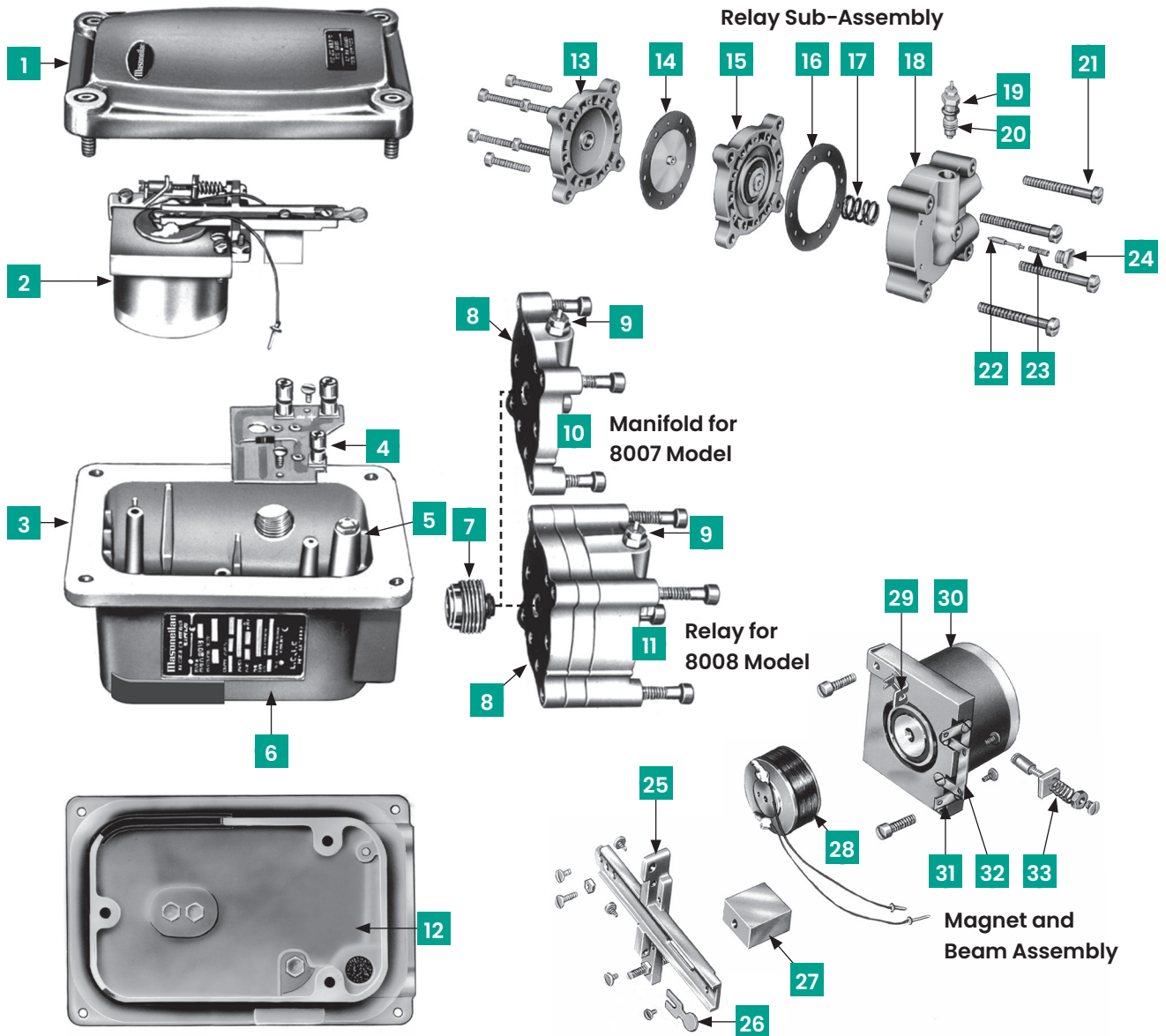
Model 8008, standard:

- Neoprene type polydiene cloth-reinforced membrane
- down to -20°C (-4°F)

Model 8008, low temperature instrument:

- Silicon cloth-reinforced membrane
- down to -55°C (-67°F)

Construction and Part Reference



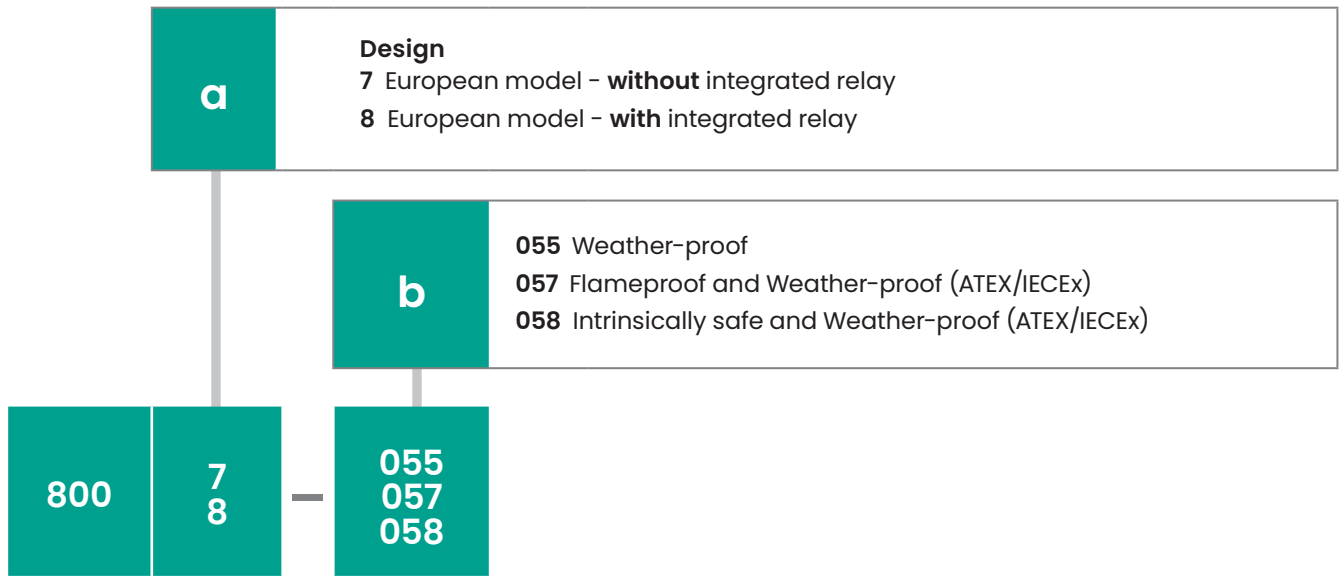
1	Cover
2	Magnet S/A
3	Case
4	Terminal board S/A
5	Nozzle
6	Serial plate
7	Adapter (flame arrester)
8	Gasket
9	Metering Tube S /A & O-Ring
10	Manifold (8007 model)
11	Relay (8008 model)

12	Flame arrester
13	Cap
14	Diaphragm S/A
15	Bellofram plate S/A
16	Gasket
17	Spring
18	Relay body
19	O-ring
20	Metering tube S/A
21	Mounting screw (relay)
22	Relay plug

23	Spring
24	Holding screw
25	Beam
26	Flapper
27	Weight
28	Coil S/A
29	Spring bracket
30	Magnet S/A
31	Flexure bearing
32	Flexure bearing
33	Biasing spring

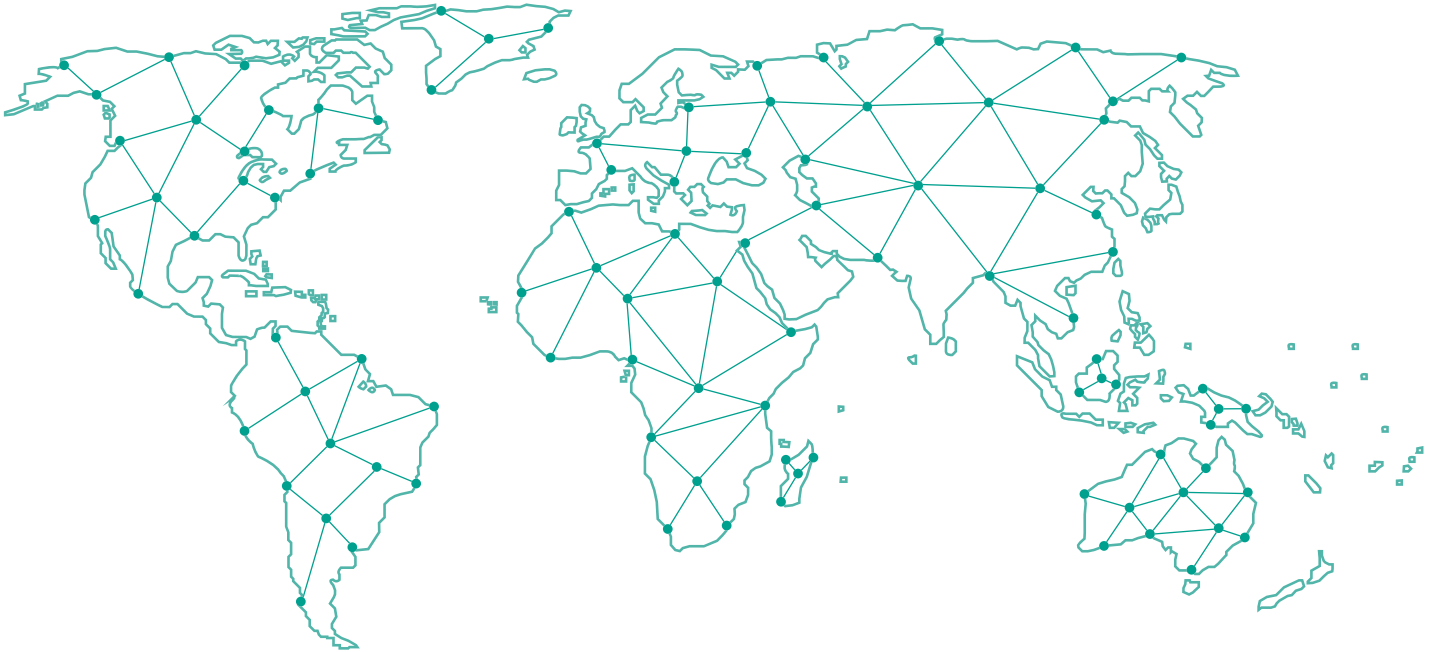
Numbering System

Series Identification 800a-b



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