

Masoneilan* 8007/8008 Series Electro-pneumatic Transducers

fact sheet

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. All that is needed to change the direction of operation is to reverse 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.



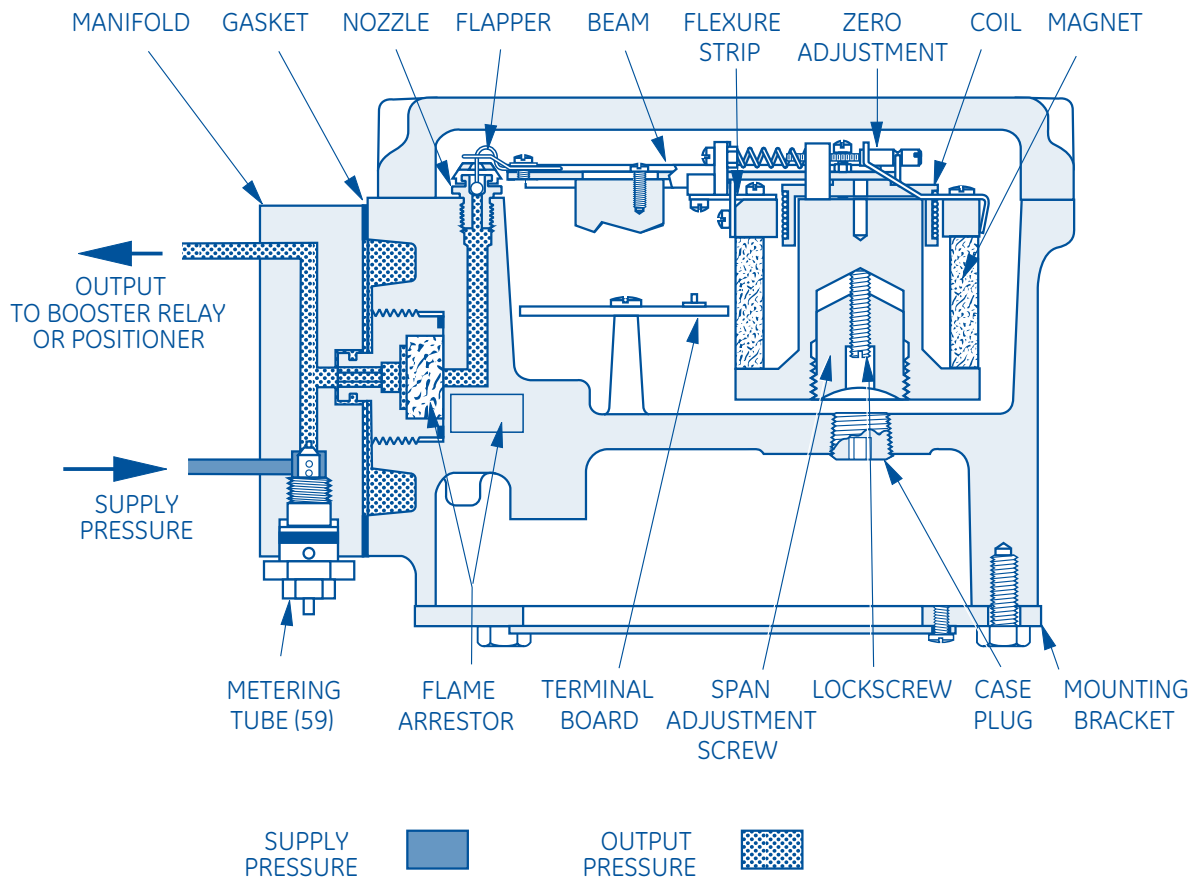
8007/8008 Series Electro-pneumatic Transducers

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.

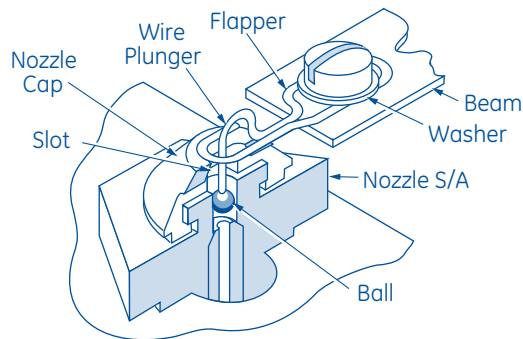
When forces generated by the nozzle and output circuits balance each other, the relay plug no longer allows supply air into the output circuit. There is a provision made for a small bleed between supply and output, and this keeps the relay plug slightly clear of its seat in order to speed up transducer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

Description

Tropicalization: This treatment helps to protect the transducer from the effects of dampness, i.e., fungus and micro-organisms.

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.

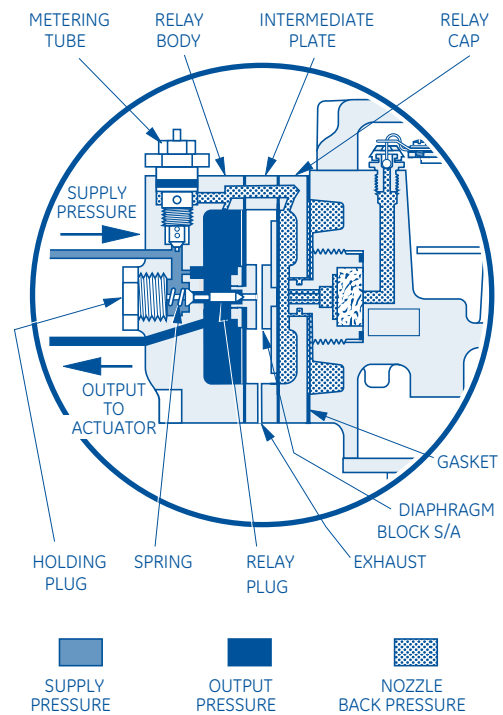


Nozzle Assembly

Electrical Circuit: The input circuit of Model 8007 and 8008 transducers can be adapted to suit DC signals from most electrical controllers. Signal leads are taken into the casing through a ½-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.



Relay

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.

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Hazardous Environment Approvals

ATEX Approvals

(94/9/EC Directive)

Explosion-proof:

- II 2 G/D EEx d IIB + H₂
- T6 (Tamb. = -20°C to +68°C)
- T5 (Tamb. = -20°C to +80°C)
- IP 6X T100 (Ta +80°C)

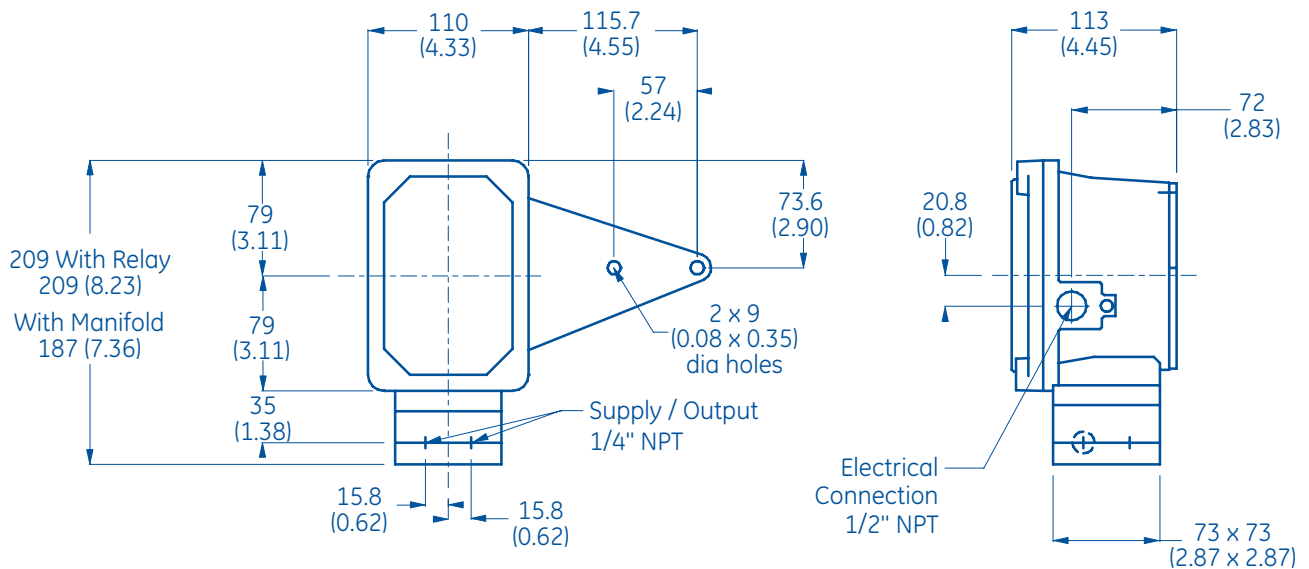
Intrinsic safety:

- II 1 G/D EEx ia IIC
- T6 (Tamb. = -55°C to +40°C)
- T4 (Tamb. = -55°C to +80°C)
- IP 6X T125 (Ta +80°C)

Description

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

Enclosure Rating for Non-Explosive Atmospheres: IP 65 according to EN 60529.



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

Pressure Table:

Transducer	Supply pressure		Output signal pressure	
	mbar	psi	mbar	psi
8007 model	1586	23	207 to 1035	3 to 15
8008 model	1586	23	207 to 1035	3 to 15
	2413	35	414 to 2070	6 to 30

Air Consumption:

Transducer	8007 model	8008 model	
Output signal	207 to 1035 mbar (3 to 15 psi)	207 to 1035 mbar (3 to 15 psi)	414 to 2070 mbar (6 to 30 psi)
Max consumption (steady state)	0.30 std. m ³ /h (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:

Compliance with 2004/108/EC Directive.

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.

Breakdown Voltage Test: 500 VAC (1 minute test)

Net Weight: 3.5 kg (7.7 lbs)

Working Temperature:

(Refer also to the marking of the apparatus)

Model 8007:

- 20°C to +80°C (-4°F to +176°F)
- 55°C to +80°C (-67°F to +176°F) (optional)

Model 8008, standard:

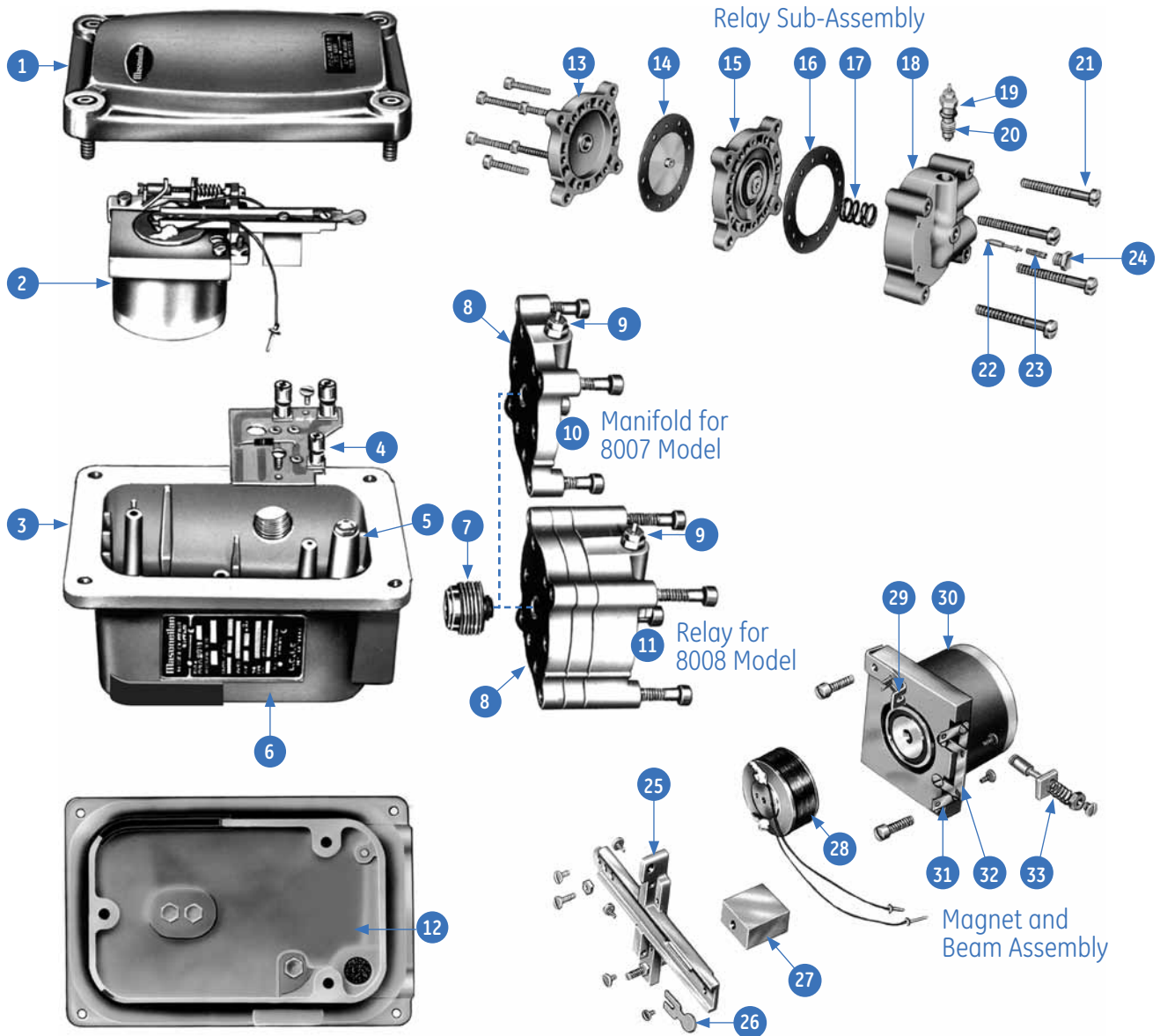
- Neoprene type polydiene cloth-reinforced membrane
- 20°C to +80°C (-4°F to +176°F)

Model 8008, low temperature instrument:

- Silicon cloth-reinforced membrane
- 55°C to +60°C (-67°F to +140°F)

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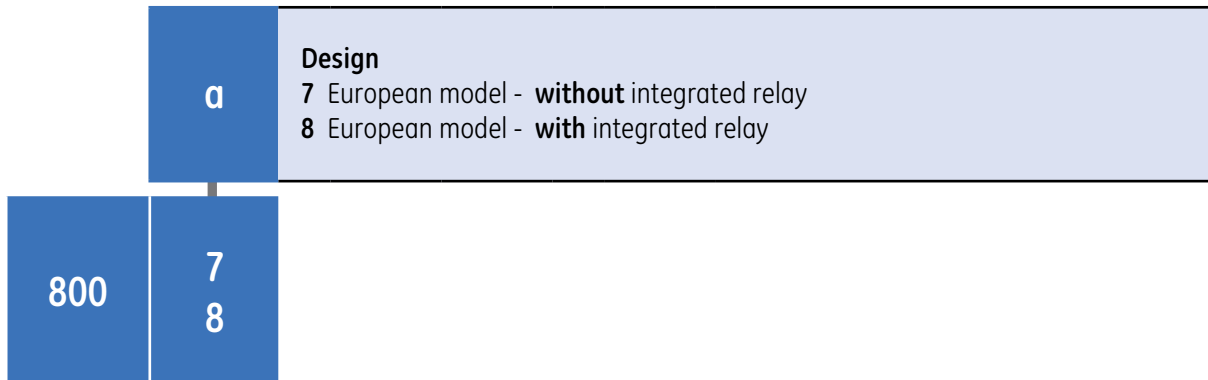
Construction and Part Reference



1	Cover	12	Flame arrester	23	Spring
2	Magnet S/A	13	Cap	24	Holding screw
3	Case	14	Diaphragm S/A	25	Beam
4	Terminal board S/A	15	Bellofram plate S/A	26	Flapper
5	Nozzle	16	Gasket	27	Weight
6	Serial plate	17	Spring	28	Coil S/A
7	Adapter (flame arrester)	18	Relay body	29	Spring bracket
8	Gasket	19	O-ring	30	Magnet S/A
9	Metering Tube S / A & O-Ring	20	Metering tube S/A	31	Flexure bearing
10	Manifold (8007 model)	21	Mounting screw (relay)	32	Flexure bearing
11	Relay (8008 model)	22	Relay plug	33	Biasing spring

Numbering System

Series Identification 800a



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