Fisher™ 846 Current-to-Pressure Transducer

Contents

Figure 1. Fisher 846 Current-to-Pressure Transducer

X0234

Introduction

Scope of Manual

This instruction manual provides installation, operating, calibration, maintenance, and parts ordering information for Fisher 846 current-to-pressure transducers. Refer to separate manuals for instructions covering equipment used with the transducers.

Do not install, operate or maintain an 846 current-to-pressure transducer without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. **To avoid personal injury or property damage, it is important to carefully read, understand, and follow all of the contents of this manual, including all safety cautions and warnings.** If you have any questions about these instructions, contact your Emerson sales office before proceeding.

Description

The 846 current-to-pressure transducer, shown in figure 1, accepts an electrical input signal and produces a proportional pneumatic output. Typically, 4 to 20 mA is converted to 0.2 to 1.0 bar (3 to 15 psi). Models are available in direct or reverse action and field-selectable for full or split range inputs. Refer to the Calibration section for more information on input/output combinations.

The most common application of the transducer is to receive an electrical signal from a controller and produce a pneumatic output for operating a control valve actuator or positioner. The 846 may also be used to produce a signal for a pneumatic receiving instrument.

The 846 is an electronic I/P transducer. It has a single electronic circuit board, as shown in figure 2. The circuit contains a solid-state pressure sensor that monitors output pressure and is part of an electronic feedback network. The self-correcting ability provided by the sensor/circuit combination allows the transducer to produce a very stable and responsive output signal.

All active mechanical and electrical components of the 846 are incorporated into a single, field-replaceable module called the module final assembly, shown in figure 2. The module final assembly contains the electronic circuit board, pilot/actuator assembly, and booster stage. The module final assembly is easily removed by unscrewing the module cover. Its design minimizes parts and reduces the time required for repair and troubleshooting.

The terminal compartment and module compartment are separated by a sealed compartment wall. This multi-compartment housing also protects the electronics from contaminants and moisture in the supply air.

Specifications

⚠ WARNING

This product is intended for a specific range of pressures, temperatures, and other application specifications. Applying different pressure, temperature and other service conditions could result in a malfunction of the product, property damage or personal injury.

Specifications for the 846 transducer are listed in table 1.

Table 1. Specifications

Input Signal

Standard Performance:
4 to 20 mA DC, 4 to 12 mA DC, or 12 to 20 mA DC. Field adjustable split ranging.

Multirange Performance:
4 to 20 mA DC. Consult factory for split range input

Equivalent Circuit

See figure 3

Output Signal(1)

Standard Performance:
(Consult factory for split range output)
Direct Action (Minimum span of 6 psi)
Typical outputs: 0.2 to 1.0 bar (3 to 15 psi).
Rangeability between 0.1 and 1.2 bar (1 and 18 psi)
Reverse Action (Minimum span of 11 psi)
Typical outputs: 1.0 to 0.2 bar (15 to 3 psi)
Rangeability between 1.2 and 0.1 bar (18 and 1 psi)

Multirange Performance:
Direct Action (Minimum span of 6 psi)
Typical outputs: 0.2 to 1.9 bar (3 to 27 psi), 0.4 to 2 bar (6 to 30 psi), and 0.3 to 1.7 bar (5 to 25 psi)
Rangeability between 0.03 and 2.3 bar (0.5 and 33 psi)
Reverse Action (Minimum span of 11 psi)
Typical outputs: 1.9 to 0.2 bar (27 to 3 psi), 2 to 0.4 bar (30 to 6 psi), and 1.7 to 0.3 bar (25 to 5 psi)
Rangeability between 2.3 and 0.03 bar (33 and 0.5 psi)

Supply Pressure(2)

Standard Performance: 1.2 to 1.6 bar (18 to 24 psi)

Multirange Performance:
0.2 bar (3 psi)(3) greater than the maximum calibrated output pressure

Maximum: 2.4 bar (35 psi)

Supply Pressure Medium

Clean, dry air

Per ISA Standard 7.0.01
A maximum 40 micrometer particle size in the air system is acceptable. Further filtration down to 5 micrometer particle size is recommended. Lubricant content is not to exceed 1 ppm weight (w/w) or volume (v/v) basis. Condensation in the air supply should be minimized

Per ISO 8573-1
Maximum particle density size: Class 7
Oil content: Class 3
Pressure Dew Point: Class 3 or at least 10°C less than the lowest ambient temperature expected

Output Air Capacity(4)

Standard: 6.4 m^3/hr (240 scfh) at 1.4 bar (20 psi) supply pressure

Multirange: 9.7 m^3/hr (360 scfh) at 2.5 bar (35 psig) supply pressure

Maximum Steady-State Air Consumption(4)

0.3 m^3/hr (12 scfh) at 1.4 bar (20 psi) supply pressure

Temperature Limits(2)

Operating: -40 to 85°C (-40 to 185°F)

Storage :-40 to 93°C (-40 to 200°F)

Humidity Limits

0 to 100% condensing relative humidity

Performance(5)

Note: The performance of all 846 I/Ps is verified using computer automated manufacturing systems to ensure that every unit shipped meets its performance specifications

Accuracy: ± 0.30% of output span

Linearity, Hysteresis, and Repeatability: ± 0.3% of span.

Temperature Effect (total effect including zero and span): ± 0.07%/°C (0.045%/°F) of span

Vibration Effect: ± 0.3% of span per g during the following conditions:
5 to 15 Hz at 4 mm constant displacement
15 to 150 Hz at 2 g. 150 to 2000 Hz at 1 g.
per SAMA Standard PMC 31.1, Sec. 5.3, Condition 3, Steady State

Shock Effect: ± 0.5% of span, when tested per SAMA Standard PMC 31.1, Sec. 5.4.

Supply Pressure Effect: Negligible

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Table 1. Specifications (continued)

Performance (continued)[5]

Electromagnetic Interference (EMI): Tested per IEC 61326-1:2013. Meets emission levels for Class A equipment (industrial locations) and Class B equipment (domestic locations). Meets immunity requirements for industrial locations (Table A.1 in the IEC specification document). Immunity performance is shown in table 2.

Leak Sensitivity[4]: Less than 1.0% of span for up to 4.8 m^3/hr (180 scfh) downstream leakage.

Overpressure Effect: Less than 0.25% of span for misapplication of up to 7.0 bar (100 psi) supply pressure for less than 5 minutes to the input port.

Reverse Polarity Protection:

No damage occurs from reversal of normal supply current (4 to 20 mA) or from misapplication of up to 100 mA.

Connections

Supply Air, Output Signal, and Output Gauge: 1/4-18 NPT internal connection
Electrical: 1/2-14 NPT internal conduit connection

Adjustments

Zero and Span: screwdriver adjustments located in terminal compartment.

Remote Pressure Reading (RPR) Jumper selectable, ON or OFF, if unit includes option

Frequency Range: 0 to 10,000 Hz
Amplitude: 0.4 to 1.0 V_{p-p}

Required Operating Voltage with Remote pressure Reading Off

Min. 6.0 V (at 4 mA)
Max. 7.2 V (at 20 mA)

Required Operating Voltage with Remote Pressure Reading On

Min 6.4 V (at 4 mA)
Max. 8.2 V (at 20 mA)

Electrical Classification

Hazardous area:

CSA C/US—Intrinsically Safe, Explosion-proof, Non-Incendive

FM—Intrinsically Safe, Explosion-proof, Non-Incendive

ATEX—Intrinsically Safe, Flameproof, Type n

IECEx—Intrinsically Safe, Flameproof

Electrical Housing:

Tropicalization (Fungus test per MIL-STD-810)

CSA C/US—Type 4X

FM—Type 4X

ATEX—IP66[6]

IECEx—IP66[6]

Other Classifications/Certifications

CUTR— Customs Union Technical Regulations (Russian, Kazakhstan, Belarus, and Armenia)

ESMA— Emirates Authority for Standardization and Metrology - ECAS-Ex (UAE)

INMETRO—National Institute of Metrology, Quality, and Technology (Brazil)

KGS—Korea Gas Safety Corporation (South Korea)

NEPSI— National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation (China)

PESO CCOE— Petroleum and Explosives Safety Organization - Chief Controller of Explosives (India)

Contact your Emerson sales office for classification/certification specific information

Construction Materials

Housing: Low-copper aluminum with polyurethane paint, or 316 stainless steel
O-Rings: Nitrile, except silicone for sensor O-rings.

Options

Fisher 67CFR filter regulator, supply and output gauges or tire valve remote pressure reading, module cover with multiple stroke ports, stainless steel housing, or stainless steel mounting bracket.

Weight

Aluminum: 2.9 kg (6.5 lb) excluding options
Stainless Steel: 6.7 kg (14.8 lb) excluding options

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