
XP2F ELECTRONIC METERING PACKAGE

INTRODUCTION

This specification covers the design, manufacture, and testing of the XP2F Electronic Metering Package

PART 1 - GENERAL

1. Standard products - use the same manufacturer for multiple units of the same type.

PART 2 - PRODUCTS

2.01 XP2F ELECTRONIC METERING PACKAGE

A. FUNCTION

The XP2F Electronic Metering Package shall be capable of accurately metering and totalizing the flow through an automatic control valve manufactured by Cla-Val Co. The XP2F Package assimilates data from valve-mounted pressure transmitters and a valve-mounted position transmitter to meter the flow. Using a proprietary algorithm, the flow rate through the automatic control valve manufactured by Cla-Val Co shall be calculated and shown on a local display. The XP2F Package shall provide 4-20mA analog outputs giving the ability to retransmit the calculated flow, measured pressures, and measured position transmitter to a nearby PLC/SCADA system. The XP2F Package shall also have the ability to log all data to a local SD card which can be exported in CSV file format for analysis. The XP2F Package shall be retrofittable on existing automatic control valves manufactured by Cla-Val Co. The XP2F Electronic Metering Package shall offer the ability to meter flow on a full port, reduced port, globe, and angled control valves with either standard or anti-cavitation trim manufactured by Cla-Val Co. The XP2F Package shall additionally offer the ability to meter reverse flow on control valves manufactured by Cla-Val Co. The XP2F Package shall offer the ability to adjust the flow curve output by applying a single gain factor to the entire metered flow curve or the ability to adjust the gain factors in 5% of valve open increments for the entire metered flow curve.

B. COMPONENTS

The XP2F Electronic Metering Package shall use 4-20mA measurements from a Cla-Val Model X141-PT valve mounted inlet & outlet pressure transmitters and a Cla-Val Model X117H valve mounted position transmitter and, using the X35 Flow Module, calculate the flow.

2.02 X35 FLOW MODULE

A. FUNCTION

The Cla-Val Model X35 shall accept signals from the valve-mounted pressure transmitters and the position transmitter. The X35 shall use a proprietary algorithm program to calculate a flow measurement. The flow and transmitter measurements can be retransmitted via 4-20mA signals to PLC or SCADA systems. The X35 can also accept additional field instrumentation signals to retransmit via a 4-20mA signal. Real-time data can be logged to an onboard SD card.

B. MATERIALS

Material Specification for the X35 Flow Module are as follows:

Enclosure & Display:

5.19in (132mm) Diameter by 5.10in Deep (130mm)
IP-68 Water Resistant up to 6.6 ft (2m) for 1 Month

Power Requirements:

Voltage: 6-24 VDC Input Consumption (not including transmitters)

Display off: 2.2 watts

Display on: 3.3 watts

Reverse Polarity Protection

Inputs:

4x Analog Inputs Type: 4-20mA

Optionally Provides Loop Power

Outputs:

4x Analog Outputs Type: 4-20mA

Provides Loop Power

Data Storage:

32GB SD Card Periodic Logging of Real-Time Data CSV File Format

Temperature Range:

Operating Temperature: 14°F to 158°F (-10C to 70C)

Storage Temperature: -4°F to 176°F (-20C to 80C)

Mounting:

Available Mounted on Valve or Remote

2.02 X117H VALVE POSITION TRANSMITTER

A. FUNCTION

The Cla-Val Model X117H Valve Position Transmitter shall provide 4-20mA analog electrical indication of the position of automatic control valve manufactured by Cla-Val Co. The X117H Valve Position Transmitter shall additionally offer the ability to visually see the movement of the valve stem through a sight glass.

B. MATERIALS

Material Specification for the X117H Position Indicator is as follows:

Enclosure:

IP-68 Water Resistant up to 6.6 ft (2m) for 1 Month

Electrical Connection:

Cable Length: 6.6 Feet (2m)

Power Supply Voltage 15-30 VDC

Output Signal 4-20mA or 0-10 VDC (configurable)

Temperature Range:

Ambient Temperature: -13°F to 185°F (-25C to 85C)

Fluid Temperature: 32°F to 185°F (0C to 85C) Mounting:

Parameters:

Pressure Rating: 360 psi max

Accuracy: $\pm 100 \mu\text{m}$

Standard Materials

Site Tube: Pyrex Site Tube

Housing: 316 Stainless Steel

2.03 X141-PT VALVE PRESSURE TRANSMITTER ASSEMBLY

A. FUNCTION

The Cla-Val Model X141-PT Valve Pressure Transmitter Assembly shall consist of an X141-PT Pressure Transmitter, an X141 Pressure Gauge, and an Isolation Ball Valve. The X141-PT Transmitter shall provide 4-20mA analog electrical indication of the pressure of automatic control valve manufactured by Cla-Val Co. The Model X141-PT Valve Pressure Transmitter Assembly shall be installed on the Inlet & Outlet Ports of an automatic control valve manufactured by Cla-Val.

B. MATERIALS

Material Specification for the X141-PT Pressure Transmitter is as follows:

Enclosure:

IP-67

Process Connection:

1/4" NPT Male Threaded

Electrical Connection:

2 Wire 4-20mA Supply

Voltage 8-30 VDC

Cable Length: 33 Feet (10m)

Temperature Range:

Ambient Temperature: -40°F to 176°F (-40C to 80C)

Fluid Temperature: 32°F to 176°F (0C to 80C)

Parameters:

Pressure Ranges: 0-290 psi

Accuracy $\pm 0.5\%$ of Span (per IEC 61298-2)

Pressure Overload 2X Max Scale Standard Materials

Wetted Material:

316 Stainless Steel

Material Specification for the X141 Pressure Gauge are as follows:

Type:

Glycerin-filled

Dual scale (PSI/BAR)

Enclosure:

Stainless steel case (Waterproof, Shock resistant)

Bronze wetted parts.

Process Connection:

1/4" NPT Male Threaded

Temperature Range:

Ambient Temperature: -4°F to 140°F (-20C to 60C)

Fluid Temperature: 32°F to 140°F (0C to 60C)

MANUFACTURE

1. Each XP2F Electronic Metering Package shall be supplied and assembled by the control valve manufacturer.

I. PRODUCT DATA

1. XP2F Electronic Metering Package manufacturer's technical product data shall be provided.

The XP2F Electronic Metering Package manufacturer shall warrant the controller to be free of defects in material and workmanship for a period of one year from the date of shipment, provided the controller is installed and used in accordance with all applicable instructions.

The XP2F Electronic Metering Package shall be manufactured by Cla-Val Co., Newport Beach, CA 92659-0325.

END OF SECTION