Dynisco

From lab to production,
providing a window into the process

PT303 Strain Gage Pressure Transmitter

Explosion proof pressure transmitter with integrated amplifier for use in hazardous environmeents

Operating Manual

P/N: 974124 | Rev: 1217 | ECO: 27882
www.dynisco.com

Table of Contents

1. General

1.1 Important information

This manual applies to the PT303 only. It must be kept near the equipment in a readily and immediately accessible location at all times.

The content of this manual must be read, understood and followed in all points by all relevant people. This applies in particular to the notes on safety. Following the safety instructions will help to prevent accidents, defects and malfunctions.

DYNISCO will not be held liable for any injury, loss or damage resulting from failure to follow the instructions in this manual.
If malfunctions occur in spite of having followed the operating instructions, please contact the **DYNISCO** customer service department (see chapter 8, Maintenance).

This applies in particular during the warranty period.

1.2 Copyright

Copyright law requires that this manual be used for inhouse purposes only.

All reproduction, even partially and for in-house purposes, requires the approval of **DYNISCO.** This manual may not be forwarded to third parties.

1.3 Explanation of icons

The manual uses icons to indicate information pertaining to safety:

ATTENTION Risk of destruction or damage to equipment, machines or installations

General danger to life or limb

Specific danger to life or limb

You MUST do this

The safety instructions are provided again in the individual chapters of the manual.

1.4 Abbreviations

The following abbreviations are used:

OM	Operating manual
PT	pressure transmitter
f.s.	of full scale

1.5 Correct use

The PT303 is designed for measuring pressure in explosive atmospheres (Class I, Division 1, Groups A, B, C & D) as part of a larger overall system. It contains an integrated signal amplifier. The PT303 pressure transmitter can be used in media temperatures up to 170°F. If the pressure transmitter is used in other applications, the safety and accident prevention regulations specific to that application must be followed.

1.6 User's obligations

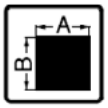
The operator or owner of the larger overall system, e.g. a machine, is responsible for following the safety and accident prevention regulations that apply to the specific application.

2. Notes on safety

The operator or owner of the larger overall system is responsible for following the safety and accident prevention regulations that apply to the specific application.

Mounting and electrical connection of the PT must be done by specialists with EMC training, following all applicable regulations, and in **pressureless, voltage-free** condition with the **machine switched off. The machine must be secured against being switched back on!** Ambient temperature for the electronics housing **max. +170°F.**
Higher temperatures can result in damage and malfunction. Do not install the pressure transmitter in places where this temperature is exceeded.

Explosion hazard!
Deviation of the supply voltage from the value given in the technical specifications, or false polarity, can damage the pressure transmitter and cause malfunctions that can pose a risk of explosion. Operate with a power supply with the following specifications when employing the pressure 0 - 5 Vdcoutput:
Do not lay connecting cables in the direct vicinity of cables carrying higher voltage or used to switch inductive or capacitive loads.

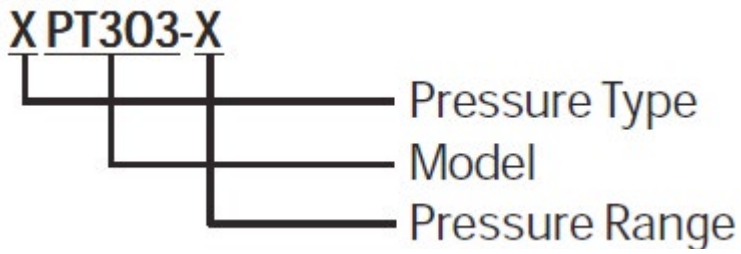


3. Technical Data

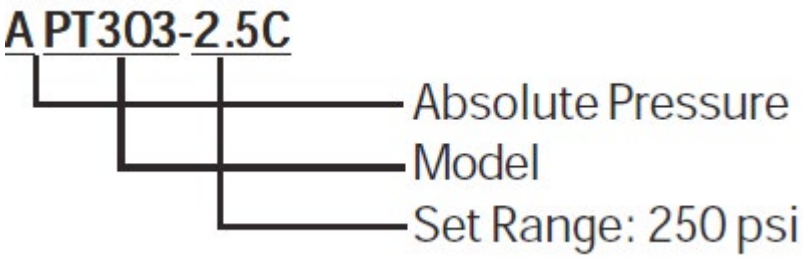
3.1 Ordering guide

The exact meanings of the letter/digit combinations are given in the corresponding sections of chapter 3.

3.1.1 Ordering guide for pt303



3.2 Example for Ordering



3.3 Safety Related Specifications

FM approvals	Class I, Division 1 Groups A, B, C & D

3.4 Performance Characteristics

PT303-X

3.4.1 Accuracy

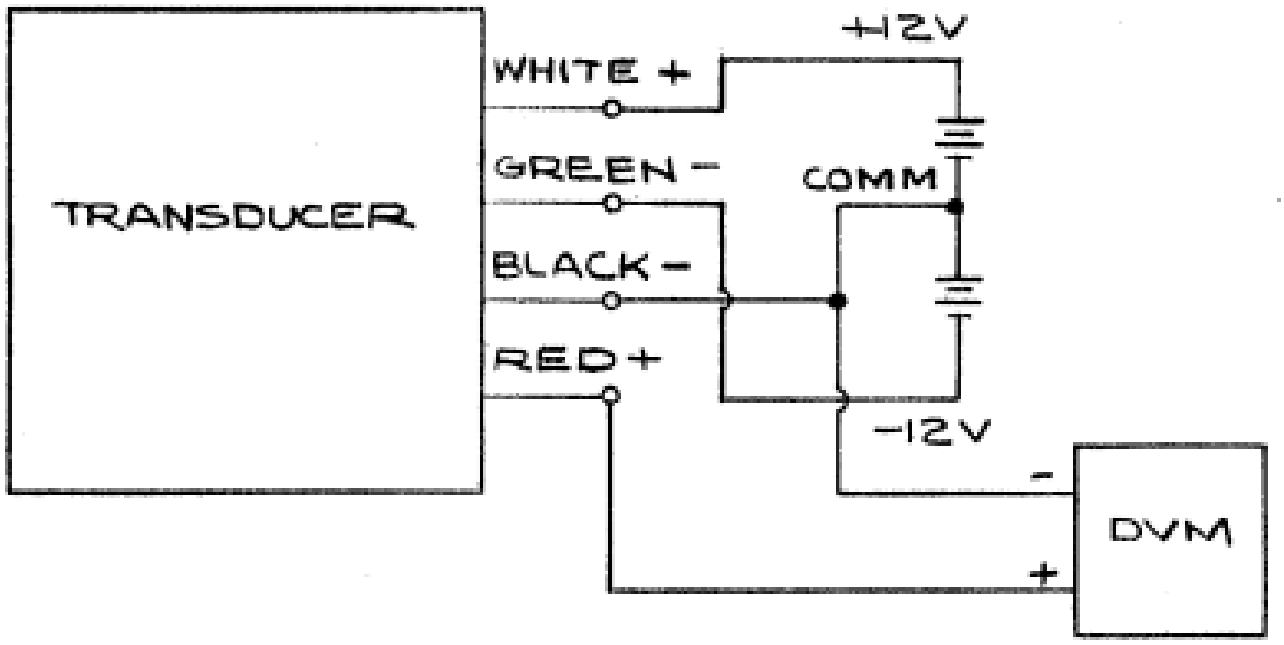
±0.25% of full scale (Including Linearity, hysterisis and repeatability)

3.5 Wiring/Electrical Termination

The electrical termination of the PT303 is 72” of four conductor sheilded cable, #22 AWG conductors, with 1/2-14 NPT conduit fitting.

Color	Function
Red	Signal +
Black	Signal -
White	Excitation +
Green	Excitation -

Fig. 3-1 Typical Wiring Diagram



3.6 Pressure Ranges

(A) PT303-15	0-15
(A) PT303-30	0-30
(A) PT303-50	0-50
(A) PT303-75	0-75
(A) PT303-1C	0-100
(A) PT303-1.1C	0-110
(A) PT303-1.75C	0-175
(A) PT303-2C	0-200
(A) PT303-2.5C	0-250
(A) PT303-3C	0-300
(A) PT303-4C	0-400
(A) PT303-5C	0-500
(A) PT303-7.5C	0 - 750
(A) PT303-1M	0-1,000
(A) PT303-1.5M	0-1,500
(A) PT303-2M	0-2,000
(A) PT303-2.5M	0-2,500
(A) PT303-3M	0-3,000
(A) PT303-5M	0-5,000
(A) PT303-7.5M	0-7,500
(A) PT303-10M	0-10,000

3.6.1 Max Overload (Without influencing Operation Data)

PT303	2x rated pressure

3.6.2 Frequency Response

> 2000 Hz

3.7 Electrical Data

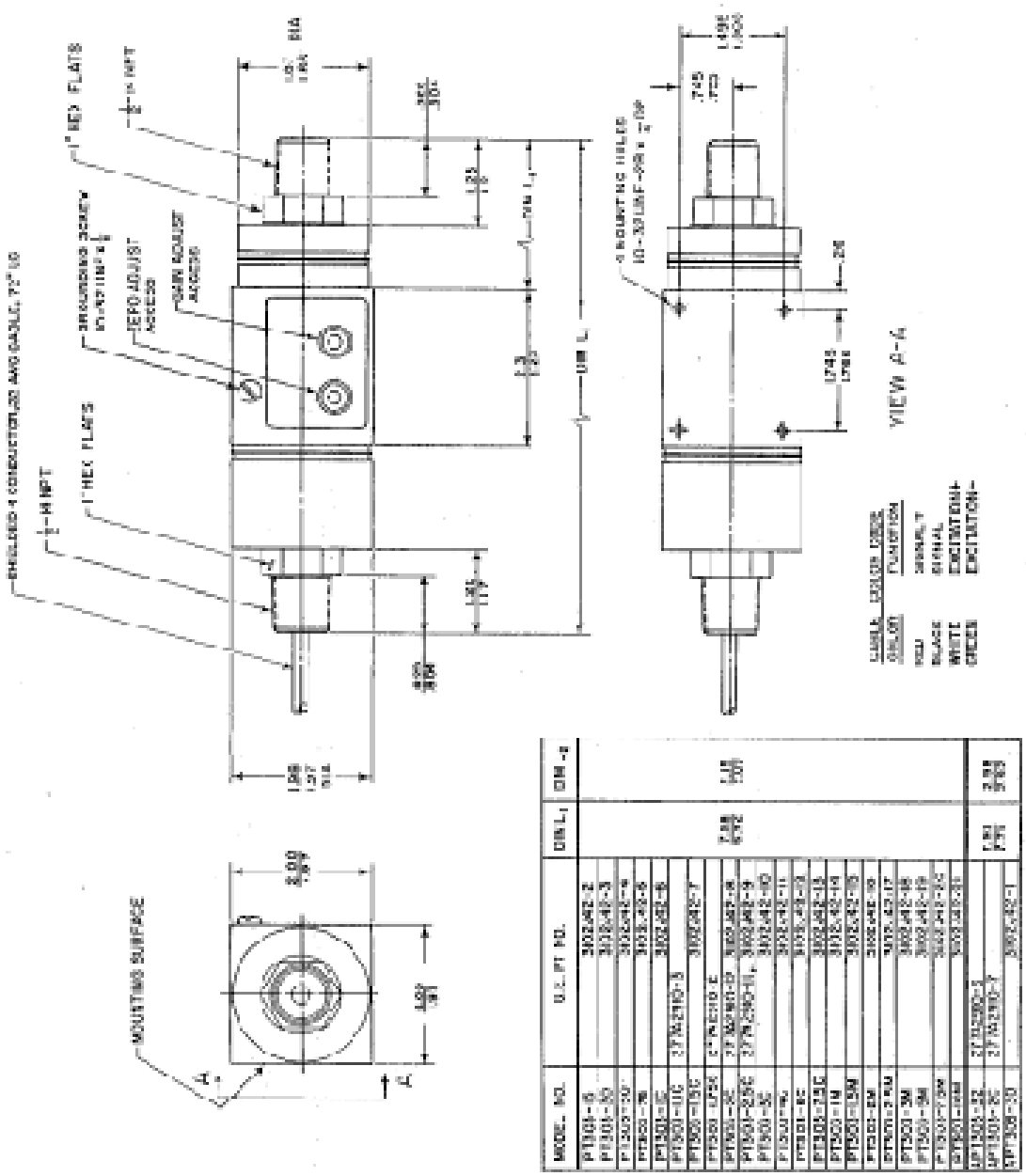
Configuration	4-arm Wheatstone bridge strain gauge with int. amplifier
Output signal	4-wire 0 -5 Vdc
Supply voltage	+/- 12 Vdc for FM approved explosion proof models

3.8 Weight

-3.5 pounds

3.9 Dimensions

Fig. 3-2 PT303 Mechanical Drawing



4. Function

4.1 Construction

The PT303 are General Electric standards.
The main advantages are:
• thermal stability
• resistance to aggressive media

4.2 Description of Functions

Through a closed, direct contact measurement system, the PT furnishes an electrical signal that is proportional to the pressure of the media. The pressure is applied by the medium on the measuring diaphragm. The deflection of the measuring diaphragm changes the resistance of the strain gauge bonded to the measuring diaphragm. The strain gauge is a Wheatstone bridge. Depending on the model, the integrated amplifier generates an electrical signal (Vdc) proportional to the pressure.

5. Transport / delivery

ATTENTION ESD sensitive component. Electrostatic discharge may damage the PT. Take ESD precautions.

5.1 Transport/packing/transport damage

- Do not let the PT be damaged by other items during transit.
- Use only the original packaging.
- Report transport damage to **DYNISCO** immediately in writing.

5.2 Storage

- Store the PT in original packaging only.
- Protect against dust and moisture.

5.3 Scope of delivery

- Pressure Transmitter
- Calibratoin Sheet
- Operating manual with declaration of conformity

6. Assembly

Ambient temperature for the electronics housing max. +170°F.

Higher temperatures can result in damage and malfunction.

Do not install the pressure transmitter in places where this temperature is exceeded.

6.1 Mounting the Pressure Transmitter

Mounting and electrical connection of the PT must be done by specialists with EMC training, following all applicable regulations, and in **pressureless, voltage-free, intrinsically safe** condition with the **machine switched off.**

The machine must be secured against being switched back on!

ATTENTION ESD sensitive component. Electrostatic discharge may damage the PT. Take ESD precautions.

ATTENTION Before mounting the PT, check the process connection carefully. Before mounting the PT, ensure that the process connection is free from media.

ATTENTION To prevent the PT from sticking permanently in the process connection, coat the thread section of the transmitter with high temperature resistant grease or a suitable parting agent.

ATTENTION Always use a torque wrench when screwing the PT in and out. Do not apply the tool to the housing or housing / electrical connection!

• Screw the PT into the process connection and tighten.

6.2 Electrical Connection

Mounting and electrical connection of the PT must be done by specialists with EMC training, following all applicable regulations, and in **pressureless, voltage-free,** condition with the **machine switched off.**

The machine must be secured against being switched back on!

ATTENTION

Do not lay connecting cables in the direct vicinity of cables carrying higher voltage or used to switch inductive or capacitive loads.
ESD sensitive component. Electrostatic discharge may damage the PT. Take ESD precautions.

6.3 Connection Assignments

Conduit / Leads

Red	Signal +
Black	Signal -
White	Excitation +
Green	Excitation -

7. Commissioning

7.1 Supply Voltage

Please read the entire manual prior to installation and use. Maximum excitation is 28 Vdc. Rated excitation is +/- 12 Vdc. Recommended warmup is 15 minutes.

Explosion hazard!

Deviation of the supply voltage from the value given in the technical specifications, or false polarity, candamage the pressure transmitter and cause malfunctions that can pose a risk of explosion.

7.2 Calibration

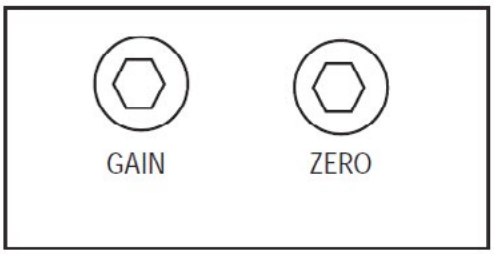
ATTENTION

Calibrate in pressureless state and at room temperature. Other ambient temperatures will corrupt the signal. Use an adjustment screwdriver!

The adjustment is made at two potentiometer screws in the cover section of the electronic housing.

- Remove the cap screws from the potentiometers.

Fig. 7-1 Gain and Zero Access on Electronics Housing



- Connect a meter or suitable instrument to the signal output to verify the settings.
- Adjust zero at potentiometer adjusting zero screw and verify on meter.

7.3 Zero Adjustment

For PT303, adjust zero at operating temperature!

- Wait until a steady operating temperature is reached at the pressure sensor.
- Adjust zero at potentiometer adjusting zero screw and verify on the meter.
- Replace the cover screws on the potentiometers.

7.4 Operation

ATTENTION

Operating temperature at the PT diaphragm max. 170°F.
Higher temperatures will damage the PT.
Ambient temperature for the electronics housing max. 170°F.
Higher temperatures can result in damage and malfunction.
Do not install the pressure transmitter in places where this temperature is exceeded.

8. Maintenance

8.1 Maintenance

Mounting and electrical connection of the PT must be done by specialists with EMC training, following all applicable regulations, and in **pressureless, voltage-free** condition with the **machine switched off.**

The machine must be secured against being switched back on!

Burn hazard!
The PT can be very hot when removed.

Wear protective gloves!

ESD sensitive component. Electrostatic discharge may damage the PT. Take ESD precautions.

ATTENTION

Always remove the PT before cleaning the machine with abrasives or steel wire brushes or suchlike.

ATTENTION

Removing the transmitter if the medium is in solidified condition can damage the diaphragm of the PT.

ATTENTION

Do not clean the screw-in section of the PT with hard objects. This will damage the PT!

ATTENTION

Always use a torque wrench applied to the designated hexagon collar when screwing the PT in and out. Do not apply the tool to the housing or housing/electrical connection!

• Remove the PT.
• Carefully clean the PT/process connection of the transmitter with a soft cloth, while the medium is still malleable.

8.2 Repair/Disposal

Please send defective PTs to your DYNISCO representative.
For addresses, see the back cover of the operating manual.

8.3 Warranty

This DYNISCO product is warranted under terms and conditions set forth in the DYNISCO web pages. Go to www.dynisco.com and click “warranty” at the bottom of any page for complete details.

9. Troubleshooting

Fault	Possible Cause	Resolution
No signal	Cable breakage or poor contact	Check cable and contact, or replace
	No supply voltage	Check supply voltage
Strong zero shift when screwing in	Process connection incorrectly produced (alignment error)	Check process connection with test bolt,rework if necessary
	Mounting torque too high	Adjust to recommended mounting torque
No signal change despite pressure rise	Plug forming in front of diaphragm	Check process connection
	Diaphragm damaged	Send pressure transmitter to **DYNISCO** for repair

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