OPERATING MANUAL

840 Series
Strain Gage Pressure Transmitters

Intrinsically safe and explosion proof pressure transmitters with integrated amplifier for use in hazardous environments

II 1G
ATEX 100a

FM Approvals

P/N 974123
07/05 Rev. C
ECO # 30337

Dynisco

Table of Contents

1. GENERAL

1.1 IMPORTANT INFORMATION

This manual applies to the 840 series 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 its entirety. 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 the product malfunctions, in sptie of having followed the operating instructions, please contact the **DYNISCO** customer service department (see the back of the manual for contact information).

1.2 COPYRIGHT

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:

O M Operating manual
f.s. Of full scale
PT Pressure transmitter

1.5 CORRECT USE

The 840 series of pressure transmitters is specially designed for measuring pressure in explosive atmospheres (safety class, EEx ia IIC T4, Ta=-20°C to +80°C) as part of a larger overall system. It contains an integrated signal amplifier. The 840 series of pressure transmitters can be used in media temperatures up to 85°C. If the pressure transmitter is used in other applications, the safety and accident prevention regulations specific to that application must be followed.

When using the PT as a safety component in accordance with the EC Machine Directive, Annex IIc, the equipment manufacturer must take any necessary precautions to ensure that malfunctions of the PTcannot cause damage or injury.

The 840 series of pressure transmitters are also designed for explosion proof areas approved by factory mutual for Class I, Division 1, Groups A, B, C & D. Explosion proof models are also approved for intrinsic safety by factory mutual for Class I, Division 1, Groups A, B, C, & D.

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.

When planning machinery and using the PT, follow the safety and accident prevention regulations that apply to your application, e.g.:

- EN 60204, Electrical equipment in machines.
- EN 292, Machine safety, general design guidelines.
- DIN 57 100 Part 410, Protection against electric shock.
- EN 50 014:1997, General Requirements
- EN 50 020:1994, Intrinsically safe apparatus
- EN50284:1999, Special requirements fro Group II Category 1G

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!

Ambient temperature for the electronics housing **max. +80°C** (safety class T4 max.).

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 only with an intrinsically safe, EMC compliant power supply with the following specifications when employing the pressure 4-20mA output:

Supply voltage max.	40 V DC
Current output max.	100 mA
Inductivity max.	0
Capacity max.	0.017 µF

FM Approvals For PT's that are explosion proof Class I, Division 1, Groups A, B, C & D, the power supply rating is 16-40 Vdc.

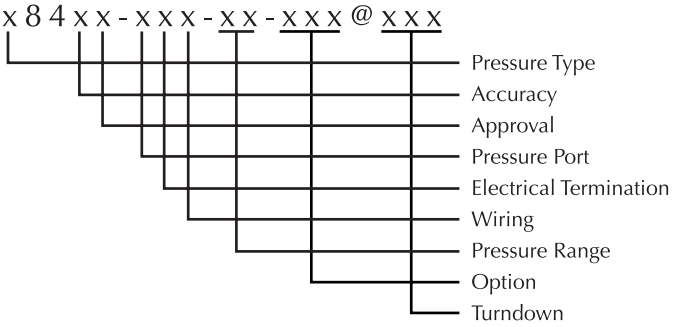
Do not lay connecting cables in the direct vicinity of cables carrying higher voltage or used to switch inductive or capacitive loads.

3. Technical Data

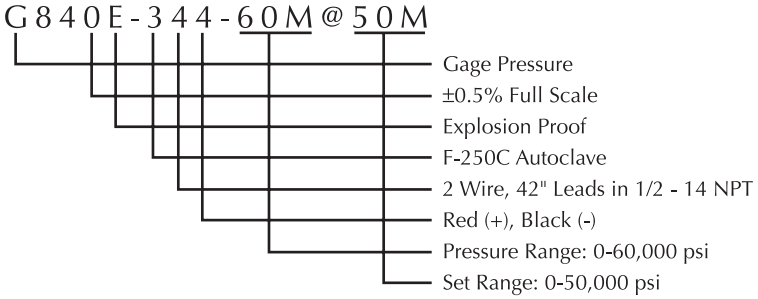
3.1 Ordering guides

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

3.1.1 Ordering guide for x84xx



3.2 Ordering Example



3.3 Safety related specifications

ATEX certificate	No.: SIRA 03ATEX2422
EX-Safety class	EEx ia IIC T4 (Ta = -20°C to +80°C)
FM approvals	Class I, Division 1 Groups A, B, C & D

Certified maximum values for EEx ia IIC T4

Associated electrical equipment must satisfy the following conditions:

Supply voltage max.	40 V DC
Current output max.	100 mA
Inductivity max.	0
Capacity max.	0.017 µF

3.4 Performance characteristics

x84xx - xxx - xx - xxx@xxx

3.4.1 Accuracy

(Linearity, hysterisis and repeatability)

3.4.1A X840

±0.50% of full scale

3.4.1B X841

±0.25% of full scale

3.4.1C X842

±0.15% of full scale

3.4.2 RESOLUTION

Infinite

3.4.3 REPEATABILITY

±0.10% of full scale

3.5 PRESSURE SIDE CONNECTION

The pressure port thread of the standard 840 Series (Code 0 in the model number) is internal 1/8 - 27 NPT fabricated from high strength stainless steel.

Options available include the following:

Code in Model No.	Description
0	1/8 - 27 NPTF, internal
1	1/4 - 18 NPT, internal
2	7/16 - 20 UNF, internal, O-ring, per MS33649-4
3	High Pressure, internal fitting per autoclave F-250-C
4	1/4 - 18 NPT, external
5	1/2 - 14 NPT, external
6	7/16 - 20 UNF, external, per MS33656-4
7	R 1/4 - metric, external
8	3/4 - 16 UNF, external, flush diaphragm**
9	Special (consult factory)
A	1/2 - 14 BSP, external
B	7/16 - 14 NPSM, external
C	Autoclave F-562-C
D	1” BSP, internal
G	Autoclave F-375C

** Each flush diaphragm transducer or transmitter is shipped with a DYNASEAL, Dynisco P/N 633014, for the pressure port seal. Recommended torque, for an adequate seal, is 100 in-lbs. Care should be exercised with the low pressure ranges. The flush diaphragm can be inadvertently overloaded with thumb pressure, which can be the equivalent of several hundred psi.

3.6 ELECTRICAL TERMINATION

The electrical terminations of the standard 840 series (Code 4 in the Model Number) is 2 wire, 4”

long leads and a 1/2 - 14 NPT conduit fitting fabricated from high strength stainless steel.

Options available include the following:

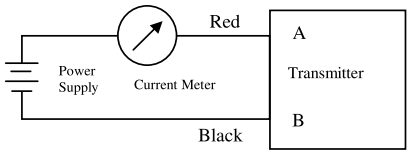
Code in Model No.	Description
0	PT02A-10-6P
1	PT02H-10-6P, hermetically sealed
2	PT1H-10-6P, hermetically sealed
3	4' six conductor wire, 1/2 - 14 conduit fitting
4	42" two conductor wire with ground, 1/2 - 14 conduit fitting
5	30' two conductor wire with ground, 1/2 - 14 conduit fitting
9	Special (consult factory)

3.7 WIRING

The wiring of the standard 840 series (Code 4 in the Model Number) is 2 wire red and black. Options available include the following:

Code in Model No.	Description
0	Connector (see above)
1	DHF/DV (BLH) wiring
2	Six conductor wiring
3	Six conductor DHF/DV (BLH) wiring
4	2 wire red and black
5	2 wire A and B
6	2 wire white and black
9	Special (consult factory)

Fig. 3-1 Power Supply Requirement and Typical Wiring Diagram

TRANSDUCER MODEL	OUTPUT	POWER SUPPLY	WIRING DIAGRAM
840 841 842	4 - 20 mA	Single 12 - 36 Vdc	

3.8 PRESSURE RANGES

Model number	Permitted pressure range in PSI
x84xx-xxx-2.5C	0-250
x84xx-xxx-5C	0-500
x84xx-xxx-1M	0-750
x84xx-xxx-1.5M	0-1,000
x84xx-xxx-2.5M	0-1,500
x84xx-xxx-3M	0-3,000
x84xx-xxx-5M	0-5,000
x84xx-xxx-7.5M	0-7,500
x84xx-xxx-10M	0-10,000
x84xx-xxx-15M	0-15,000
x84xx-xxx-20M	0-20,000
x84xx-xxx-30M	0-30,000
x84xx-xxx-35M	0-35,000
x84xx-xxx-40M	0-40,000
x84xx-xxx-50M	0-50,000
x84xx-xxx-60M	0-60,000

3.8.1 MAX. OVERLOAD (WITHOUT INFLUENCING OPERATING DATA)

x84xx	250-30,000 psi: 1.5x rated pressure 35,000-60,000 psi: 1.2x rated pressure

3.8.2 BURST PRESSURE

250 psi:	10x rated pressure
500-3,000 psi:	5x rated pressure
5,000-10,000 psi:	3x rated pressure
15,000-30,000 psi:	2.5x rated pressure
35,000-60,000 psi:	1.5x rated pressure

3.8.3 NATURAL FREQUENCY

50 Hz [-3db]

3.9 ELECTRICAL DATA

Configuration	4-arm Wheatstone bridge strain gauge with int. amplifier
Output signal	2-wire 4 - 20 mA
Supply voltage	16-40 VDC for EEx ia IIC T4 and FM approved explosion proof models

Maximum loop impedance	1200 ohms with 36 VDC 600 ohms with 24 VDC 0 ohms with 12 VDC
Power consumption	≤20 mA
Zero balance	±2% FSO
Zero adjustment	±5% FSO

3.10 TEMPERATURE INFLUENCE

Electronics housing

Max. housing temperatures

Safety class T4	-20°C to +80°C
Compenstated temperature range	-18°C to +66°C
Operating temperature range	-29°C to +85°C

Zero shift due to temperature change on electronics housing

x840x	±0.018% full scale/°C typical (±0.036% f.s./°C maximum)
x841x	±0.009% full scale/°C
x842x	±0.006% full scale/°C

3.11 EMC REQUIREMENTS

Conforming to CE in accordance with EMC directive.

Electromagnetic Interference	DIN EN 550223 1995
Immunity	DIN EN 61000-4-2 1995
Radiated, Radio Freq, etc.	DIN EN 61000-4-3 1995 +A1:1998+A2:2000
Pulse Magnetic Field	DIN EN 61000-4-9 1993 + A1:2001
Surge Immunity	DIN EN 61000-4-5 1995 + A1:2000
Conducted Disturbences	DIN EN 61000-4-6 1996 + A1:2000
Power Frequency Magnetic Field	DIN EN 61000-4-8 1993 + A1:2001

3.12 MATERIALS

Diaphragm	15-5PH Mat. No. 1.4545
Wetted Materials	17-4PH Mat. No. 517400

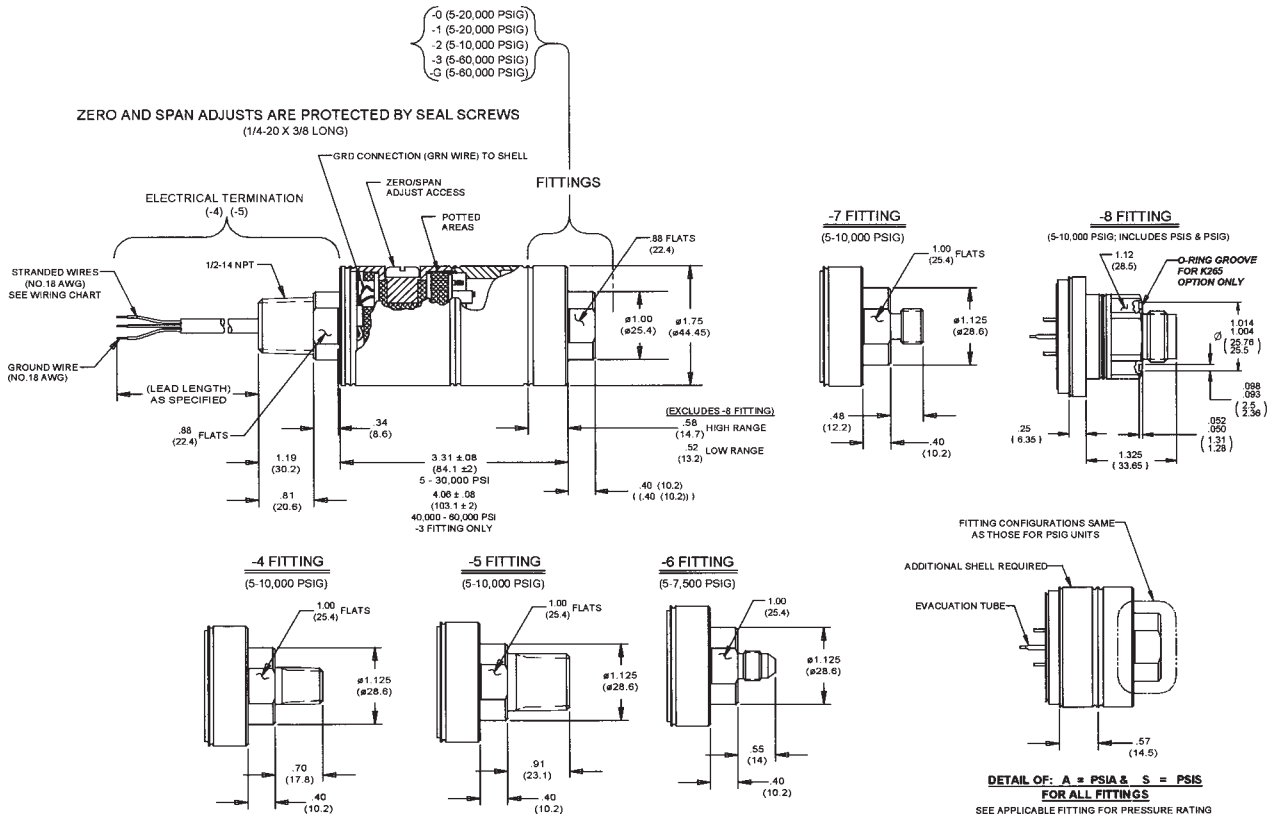
3.13 Environmental protection to IEC 529

PT housing with conduit	1P66 nema 4x
PT02A-10-6P	1P55 nema 4x (Using Dyinsco P/N 711600)
PT02H-10-6P	1P66 nema 4x (Using Dyinsco P/N 711610)
PT1H-10-6P	1P66 nema 4x (Using Dyinsco P/N 711610)

3.14 Weight

~17 oz.

3.15 Dimensions


-0 (5-20,000 PSIG)
-1 (5-20,000 PSIG)
-2 (5-10,000 PSIG)
-3 (5-60,000 PSIG)
-C (5-60,000 PSIG)
ZERO AND SPAN ADJUSTS ARE PROTECTED BY SEAL SCREWS
(1/4-20 X 3/8 LONG)
GRD CONNECTION (GRN WIRE) TO SHELL
ELECTRICAL TERMINATION
(-4) (-5)
ZERO/SPAN ADJUST ACCESS
FITTINGS
POTTED AREAS
.88 FLATS (22.4)
STRANDED WIRES (NO.18 AWG) SEE WIRING CHART
1/2-14 NPT
ø1.00 (ø25.4)
ø1.75 (ø44.45)
GROUND WIRE (NO.18 AWG)
(LEAD LENGTH) AS SPECIFIED
(EXCLUDES -8 FITTING)
.58 (14.7) HIGH RANGE
.52 (13.2) LOW RANGE
.88 (22.4) FLATS
.34 (8.6)
1.19 (30.2)
.81 (20.6)
3.31 ±.08 (84.1 ±2) 5 - 30,000 PSI
4.06 ±.08 (103.1 ±2) 40,000 - 60,000 PSI -3 FITTING ONLY
.40 (10.2) ((.40 (10.2)))
-7 FITTING
(5-10,000 PSIG)
1.00 (25.4) FLATS
ø1.125 (ø28.6)
.48 (12.2)
.40 (10.2)
-8 FITTING
(5-10,000 PSIG; INCLUDES PSIS & PSIG)
1.12 (28.5)
O-RING GROOVE FOR K265 OPTION ONLY
1.014 1.004 (25.76 25.5)
.098 .093 (2.5 2.36)
.25 (6.35)
.052 .050 (1.31 1.28)
1.325 (33.65)
-4 FITTING
(5-10,000 PSIG)
1.00 (25.4) FLATS
ø1.125 (ø28.6)
.70 (17.8)
.40 (10.2)
-5 FITTING
(5-10,000 PSIG)
1.00 (25.4) FLATS
ø1.125 (ø28.6)
.91 (23.1)
.40 (10.2)
-6 FITTING
(5-7,500 PSIG)
1.00 (25.4)
ø1.125 (ø28.6)
.55 (14)
.40 (10.2)
FITTING CONFIGURATIONS SAME AS THOSE FOR PSIG UNITS
ADDITIONAL SHELL REQUIRED
EVACUATION TUBE
.57 (14.5)
DETAIL OF: A = PSIA & S = PSIS FOR ALL FITTINGS
SEE APPLICABLE FITTING FOR PRESSURE RATING

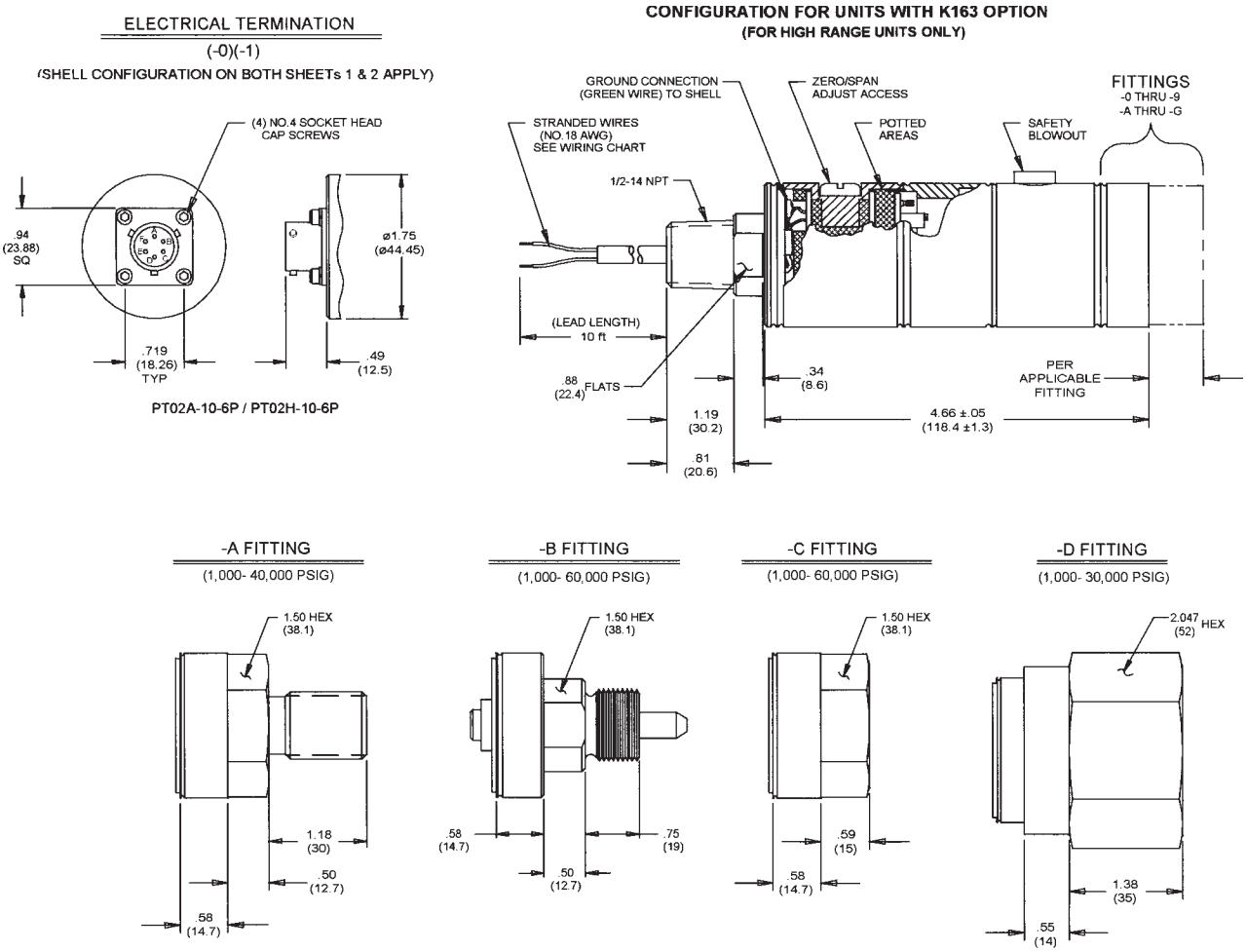


Fig. 3-3 x84xx Models, Part 2

4. FUNCTION

4.1 CONSTRUCTION

The PTs of series 840's are industry standard.

The main advantages are:
- Intrinsically safe EEx ia IIC T4
- thermal stability
- resistance to aggressive media
- insensitivity to electromagnetic radiation (EMC)

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 (mA) 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
- Calibration sheet
- Operating manual with declaration of conformity

6. ASSEMBLY

Ambient temperature for the electronics housing max. +80°C (safety class T4 max.).

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.

ATTENTION 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, intrinsically safe** condition with the **machine switched off**.

The machine must be secured against being switched back on!

Do not lay connecting cables in the direct vicinity of cables carrying higher voltage or used to switch inductive or capacitive loads.

Operate only with an intrinsically safe, EMC compliant power supply with the following specifications when employing the pressure 4-20 mA output:

Supply voltage max.	40 V DC
Current output max.	100 mA
Inductivity max.	0
Capacity max.	0.017 µF

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

ATTENTION The electrical connection must comply with EMC requirements.

ATTENTION If the electrical connection is not made as described in section 6.3, or if cables / cable connectors / cable glands other than those stipulated by **DYNISCO** are used, **DYNISCO** cannot guarantee that EMC requirements will be satisfied.

6.2.1 EMC / CE Compliant Connection

- Earth the machine section with the screw-in trunnion / process connection for the PT in accordance with regulations. The PT must be connected to earth via the screw-in trunnion / process connection.
- Connect the shield of the connecting cable on both sides, making sure it conducts with full and continuous contact.
- When introducing the connecting cable into an EMC compliant switch cabinet, for example, connect the shield correctely (cable gland, conducting, full contact, continuous) to the conductive housing or route it via built-in cable connector that is also connected to the conductive housing.
- Connect unused cable cores or free cable ends correctely to the cable shield on both sides.

6.3 Connection Assignments

Conduit / Leads

Red	+	Signal/Power
Black	-	Signal/Power
Green		Ground

Connector

A	+	Signal/Power
B	-	Signal/Power

Transmitter incorporates over-voltage protection and reverse polarity protection and will not operate if inputs are reversed.

7. COMMISSIONING

7.1 SUPPLY VOLTAGE

Please read the entire manual prior to installation and use.

EX

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.

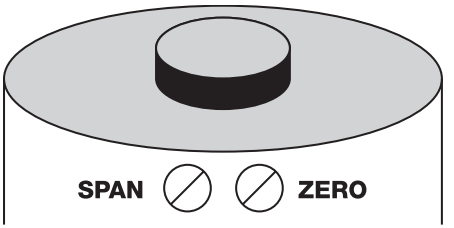
7.2 CALIBRATION

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 Electronics Housing Cover



- 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 PTs of series x84x, 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 Before starting the machine, wait until the medium at the diaphragm of the PT has reached its operating/processing temperature. If the machine is started before the medium reaches its operating temperature, the PT may be damaged.

ATTENTION Operating temperature at the PT diaphragm **max. 85°C (185°F)**. Higher temperatures will damage the PT.

Ambient temperature for the electronics housing **max. +80°C** (safety class T4 max.). Higher temperatures can result in damage and malfunction.

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

7.5 Hazardous Area Electrical Configuration

Fig. 7-2 Electrical Configuration for Intrinsically Safe Hazardous Areas

TABLE 1, GROUP IIA				
BARRIER	CERTIFICATE N°	C (nF)	L (mH)	L/R
MTL 2441B	BAS N° Ex 92C2462	904	33.6	440
P+F ZG30/Ex	BAS N° Ex 84B2198	904	28	368
P+F ZG31/Ex	BAS N° Ex 84B2313	904	33.6	440
P+F KHD3-ICR/Ex 130	BAS N° Ex 89C2003	904	33.6	440
P+F KHD2-STC3-Ex 1.P	BAS N° Ex 89C2093	904	33.6	440
P+F KHD2-STC-Ex1	BAS N° Ex 89C2093	904	33.6	440

TABLE 2, GROUP IIB				
BARRIER	CERTIFICATE N°	C (nF)	L (mH)	L/R
MTL 2441B	BAS N° Ex 92C2462	339	12.6	165
P+F ZG30/Ex	BAS N° Ex 84B2198	339	10.5	138
P+F ZG31/Ex	BAS N° Ex 84B2313	339	12.6	165
P+F KHD3-ICR/Ex 130	BAS N° Ex 89C2003	339	12.6	165
P+F KHD2-STC3-Ex 1.P	BAS N° Ex 89C2093	339	12.6	165
P+F KHD2-STC-Ex1	BAS N° Ex 89C2093	339	12.6	165

TABLE 3, GROUP IIC				
BARRIER	CERTIFICATE N°	C (nF)	L (mH)	L/R
MTL 2441B	BAS N° Ex 92C2462	113	4.2	55
P+F ZG30/Ex	BAS N° Ex 84B2198	113	3.5	46
P+F ZG31/Ex	BAS N° Ex 84B2313	113	4.2	55
P+F KHD3-ICR/Ex 130	BAS N° Ex 89C2003	113	4.2	55
P+F KHD2-STC3-Ex 1.P	BAS N° Ex 89C2093	113	4.2	55
P+F KHD2-STC-Ex1	BAS N° Ex 89C2093	113	4.2	55

NOTES:

1. THE ELECTRICAL CIRCUIT IN THE HAZARDOUS AREA MUST BE CAPABLE OF WITHSTANDING AN AC TEST VOLTAGE OF 500 VOLTS R.M.S. TO EARTH OR FRAME OF THE APPARATUS FOR ONE MINUTE.

2. THE CAPACITANCE AND INDUCTANCE OR INDUCTANCE / RESISTANCE (L/R) RATIO OF THE HAZARDOUS AREA CABLES MUST NOT EXCEED THE VALUES SHOWN ON TABLES 1,2 & 3.

3. NON-HAZARDOUS AREA EQUIPMENT SHALL COMPRISE ONE OF THE FOLLOWING DUAL CHANNEL BARRIERS:
   A) PEPPER & FUCHS ZG30/Ex
   B) MTL 2441B
   OR
   TWO OF THE FOLLOWING SINGLE CHANNEL BARRIERS:
   PEPPERL/FUCHS ZG31Ex OR
   PEPPERL/FUCHS KHD3-ICR/Ex130 200 Y71688 OR
   PEPPERL/FUCHS KHD2-STC3-Ex 1.P OR
   PEPPERL/FUCHS KHD2-STC3-Ex 1.

4. THE INSTALLATION MUST COMPLY WITH THE NATIONAL INSTALLATION REQUIREMENTS (E.G. IN THE UK, BS EN 60079-14:1997).

5. IF TWO OR MORE SEPARATE 'IS' CIRCUITS ARE TO BE KEPT SEPARATE WITHIN A MULTICORE ,THEN TYPE A OR B CABLES MUST BE USED, OR SEPARATE CABLES TO BE USED.

6. CABLE SCREENS ARE TO BE EARTHED AT ONE END ONLY.

7. SYSTEM LABEL TO BE AFFIXED AT THE INTERFACE OF 'IS' OR 'NON-IS' CIRCUITS OR ADJACENT TOTHE PRINCIPAL APPARATUS.
   SIRA SYST. Ex 98E2139.

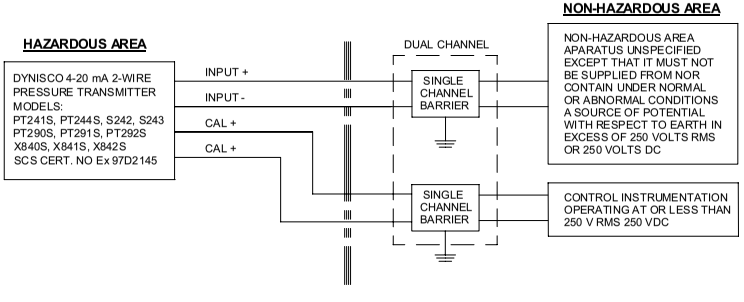
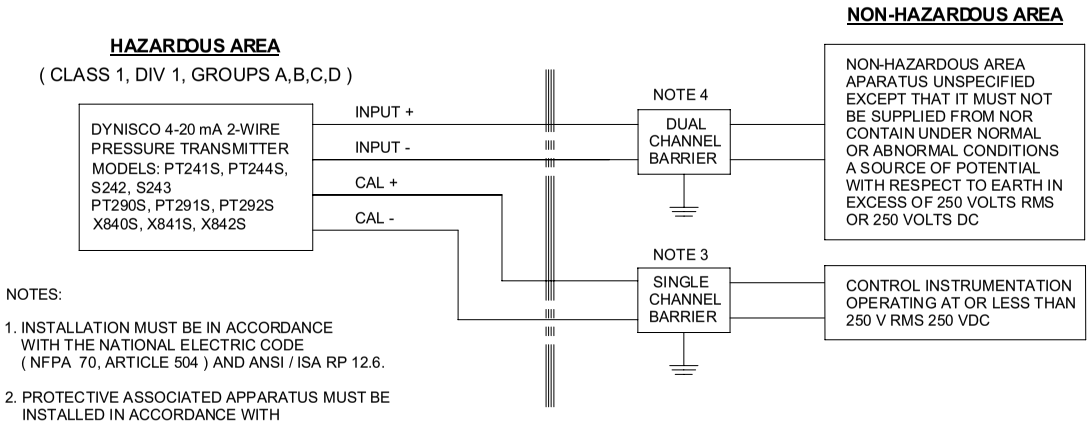


Fig. 7-3 Electrical Configuration for Explosion Proof Hazardous Areas



NOTES:

1. INSTALLATION MUST BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NFPA 70, ARTICLE 504) AND ANSI / ISA RP 12.6.

2. PROTECTIVE ASSOCIATED APPARATUS MUST BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTALLATION DRAWING.

3. ANY FMRC APPROVED SINGLE OR DUAL CHANNEL BARRIER WITH ENTITY PARAMETERS OF Voc OR Vt ≤ 25 V, Isc OR, It ≤ 100 mA, Ca > .017 uf, La > 0 mH OR PROTECTIVE BARRIER PEPPERL / FUCHS Z111/Ex.

4. ANY FMRC APPROVED SINGLE OR DUAL CHANNEL BARRIER WITH ENTITY PARAMETERS OF Voc OR Vt ≤ 40V, Isc OR It ≤ 100 mA, Ca > .017 uf, La > 0 mH OR ONE OF THE FOLLOWING PROTECTIVE BARRIERS: MTL 5042 OR PEPPERL / FUCHS KFD2-STC4-EX1.

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, intrinsically safe** 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!

ATTENTION 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

10. CE DECLARATION OF CONFORMITY

DECLARATION OF CONFORMITY

We Dynisco Instruments
38 Forge Parkway
Franklin Ma. 02038

Declare in our sole responsibility, that the following product(s):
S24X, PT24XS, PT29XS, X84XS (X indicating a variable number or letter)

To which this declaration relates is in conformity with the following standard(s): or other normative document(s):
EN 50081-2 "Electromagnetic Compatibility. Generic emission standard. Part2"
EN 50082-2 "Electromagnetic Compatibility. Generic immunity standard. Part2"
when the mating connector is a Bendix EMI Plug.

Following the provisions of the directive:
VDE 0839 Part 82-2/February 1996

Date: August 10,2000

Dynisco Instruments
Vice President of Operations

DOC 8-00

11. EX DECLARATION OF CONFORMITY

sira
Certification Service

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: Sira 03ATEX2422

4 Equipment: X24XX, X84XX, PT24XX and PT29XX Pressure Transducers

5 Applicant: Dynisco Instruments

6 Address: 38 Forge Parkway
Franklin
Massachusetts
USA

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number R52A10315A.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 (A1 and A2)
EN 50020:2002
EN 50284:1999

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

II 1 G
EEx ia IIC T4
T_{amb} = -20°C to +80°C

Project Number 52A10315
Date 19 September 2003
C. Index 13

M D Shearman
Certification Manager

Sira Certification Service
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Sira Certification Service is a service of Sira Test & Certification Ltd

ST&C(Chester) Form 9176 Issue 8

sira
Certification Service

SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE Sira 03ATEX2422

13 **DESCRIPTION OF EQUIPMENT**

Series X24XX, X84XX, PT24XX and PT29XX is a two-wire pressure transmitter designed to output a 4-20 mA signal corresponding to 0-100% of the full-scale pressure range. The circuit is designed to work with a supply voltage range of 16 to 40 V DC. Two additional terminals are provided to calibrate a specific measurement system. By shorting these two terminals, a fixed pre-set output signal at 80% full-scale is impressed on the output. The system is designed such that the calibration circuit is isolated from the amplifier circuit, so that only two barriers need be used when the customer chooses to use the calibration feature in a hazardous area.

The enclosure material is stainless steel.

For the connection of associated apparatus the following entity parameters apply.

Input terminals

Ui = 40V
Ii = 100mA
Ci = 17nF
Li = 0

Calibration terminals

Ui = 25V
Ii = 100mA
Ci = 17nF
Li = 0

Note: Only linear supplies may be connected to the apparatus.

14 **DESCRIPTIVE DOCUMENTS**

14.1

Drawing No.	Sheet	Rev.	Date	Title
000052	1 of 1	B	06 Aug 97	Certification Dwg Electrical Connections (Connectors)
241099	1 to 2	B	06 Sept 02	Certification Dwg PT241, PT244 (E) (S)
242098	1 to 2	G	06 Sept 02	Certification Dwg S242 (Intrinsically Safe)
242110	1 of 1	E	09 Dec 99	Assembly X24X-XX-XX/XX Intrinsically Safe (S) Explosionproof (E)
242927	1 of 1	D	05 Sept 03	Engraving Drawing X24XX, PT24XX, PT29XX, X84XX
243098	1 to 2	D	06 Sept 02	Certification Dwg S243 (Intrinsically Safe)
290099	1 of 2	D	06 Sept 02	Certification Dwg PT29XX
290099	2 of 2	D	06 Sept 02	Certification Dwg PT29XX
856278	1 of 1	C	29 Aug 03	Label (Intrinsically Safe)
856280	1 of 1	E	05 Sept 03	CE Nameplate 24VDC input, 4-20mA output
870098	1 to 2	E	19 Dec 01	Certification Dwg X84XS (Intrinsically Safe)
952195B	1 of 1	A	15 Oct 96	Drill Drawing Amp Board
952195D	1 of 4	A	15 Oct 96	Layout Dwg Amp Board Layer 1

Date 19 September 2003

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Tel: +44 (0) 1244 670900 Fax: +44 (0) 1244 681330
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Certification Service

SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE Sira 03ATEX2422

Drawing No.	Sheet	Rev.	Date	Title
952195D	2 of 4	A	15 Oct 96	Layout Dwg Amp Board Layer 2
952195D	3 of 4	A	15 Oct 96	Layout Dwg Amp Board Layer 3
952195D	4 of 4	A	15 Oct 97	Layout Dwg Amp Board Layer 4
952196B	1 of 1	D	13 Feb 98	Drill Dwg Plug Board
952196D	1 of 2	D	13 Feb 98	Layout Dwg Plug Board Layer 1
952196D	2 of 2	D	13 Feb 98	Layout Dwg Plug Board Layer 2
952197B	1 of 1	C	13 Feb 98	Drill Dwg Comp Board
952197D	1 of 2	C	13 Feb 98	Layout Dwg Compo Board Layer 1
952197D	2 of 2	C	13 Feb 98	Layout Dwg Compo Board Layer 2
999500A	1 of 2	A	15 Oct 96	Assembly Dwg Amp Board (Top)
999500A	2 of 2	A	15 Oct 96	Assembly Dwg Amp Board (Bottom)
999501A	1 to 2	D	13 Feb 98	Assembly Dwg Plug Board
999502A	1 of 2	C	12 Nov 98	Assembly Dwg Compo Board (Top)
999502A	2 of 2	C	12 Nov 98	Assembly Dwg Compo Board (Bottom)
999500C	1 of 1	B	04 Nov 97	Schematic 4-20 mA Amplifier Board
999501C	1 of 1	C	17 Nov 97	Schematic Plug board 4-20 mA
999502C	1 of 1	A	15 Oct 96	Schematic Compo Board
BM999500	1 to 2	C	14 Oct 98	Amp Board PX24X/84X BM999500
BM999501	1 of 1	E	12 Nov 98	Plug Board X24X/84X BM999501
BM999502	1 of 1	B	13 Feb 98	Compo Board PX24X/84X BM999502

14.2 Report No. R52A10315A

15 **SPECIAL CONDITIONS FOR SAFE USE** (denoted by X after the certificate number)

None

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in Report No. R52A10315A.

17 **CONDITIONS OF CERTIFICATION**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

Date 19 September 2003

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