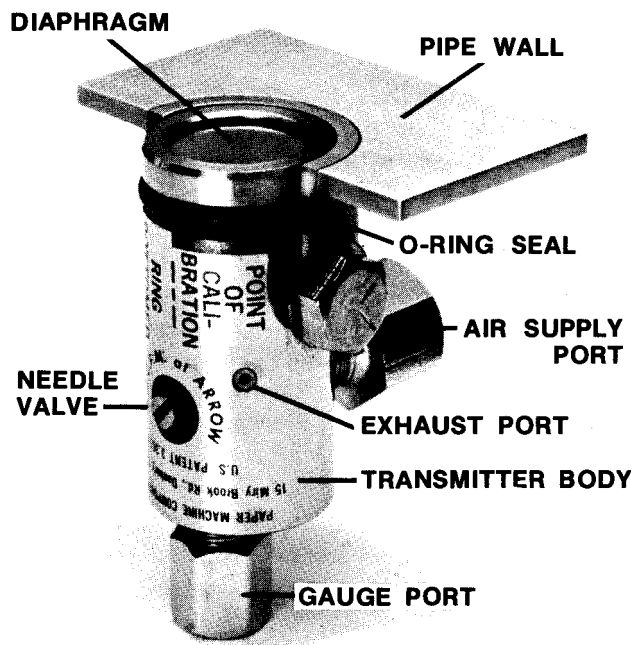




PAPER MACHINE COMPONENTS, INC. MINIATURE PRESSURE TRANSMITTER INSTALLATION & OPERATING DATA

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(1) CUT HOLE FOR NIPPLE

Drill or cut a hole slightly smaller than the nipple outside diameter (1.316"), in the top or side of the pipe where the transmitter is to be located. The hole should be close to a flange or opening so that the inside wall of the pipe can be cleaned up after the nipple is welded in place. File the hole so that the steel nipple fits tightly into the hole. The fit must be snug, otherwise the nipple will cock when it is welded in place. Some customers have made up a collapsing internal mandrel to insert into the nipple before the weld operation. This helps prevent distortion of the nipple.

NOTE: Marvel* or similar nipple hole saws (1.316")O.D. (33mm) may be used with a slow speed drill (150 RPM) to cut out the proper size hole. The saw teeth should be continuously cooled and lubricated while cutting the hole, with a water soluble cutting oil such as Rustlick WS-500. (*Armstrong-Blum Mfg. Company, 5700 W. Bloomingdale Ave., Chicago 39, Illinois, manufacture Marvel hole saws.)

PMC offers a Hole saw kit (PT - HSK) which includes a ground Marvel hole saw, mandrel, drill, guide dowel, SRC speed control, cutting oil concentrate, applicator and case. Needs ½" electric drill.....Kit cost:

(2) WELD NIPPLE IN PLACE

Position the nipple and transmitter with set screw installed into the hole, so that the diaphragm on the transmitter is flush with the inside wall of the pipe. Mark the nipple both inside and out. On small diameter pipes (4" or less) the nipple and transmitter will protrude into the pipe due to crown of the pipe. **(The Transmitter must be removed from the nipple before welding.)** Weld the nipple in place with either Heliarc (inert gas arc process) or with arc and stabilized 316 stainless steel rods. This will prevent carbide precipitation and subsequent corrosion at the weld.

(3) GRIND NIPPLE FLUSH

Finish grind the nipple flush with the inside of the pipe. Clean up the inside edge of the nipple at the pipe end with a fine half round file. Remove all burrs but do not make any ridges or grooves on the inside nipple wall, otherwise material inside the tank will leak past the O-ring seal.

(4) **INSTALL TRANSMITTER**

Capsules of Dow Silicone grease (Valve Seal) are furnished with each order. Apply a thin wipe to the O-ring, diaphragm ring, edge of the nipple, and the remainder to the inside wall of the nipple at the bottom end where it connects to the pipe wall. Silicone grease is stable from -40°F to 500° and does not readily dissolve. Install the transmitter and locate with set screw. The transmitter diaphragm will be flush with the inside wall of the pipe if the nipple was properly positioned before welding. NOTE: Avoid contact with the eyes when using silicone grease.

(5) **CONNECT SUPPLY AIR**

Connect dry filtered air to the **SUPPLY** port. The standard transmitter has been calibrated with 100 PSIG supply air and consumes approximately 3 standard cubic feet of air per hour. It will also operate at any specified range providing supply air 5 PSIG greater than the maximum reading desired is available. The air must be clean and dry otherwise the flow control needle will become plugged and fail to operate. **A 2" supply pressure gauge should be connected to the supply line to ensure that the flow control valve and transmitter are being supplied with adequate air pressure.**

(6) **MAKE GAUGE CONNECTION**

Connect a pressure gauge, manometer, or recorder to the **GAUGE** port. If remote operation is desired, readings up to 100 ft. away may be obtained if continuous 50 ft. lengths of $\frac{1}{4}$ " O.D. copper tubing are used. (We say continuous because this avoids connections which invariably are not tightened and therefore leak, and the transmitter does not yield proper readings.) **Special care must be taken to tighten all connectors and use thread seal on all pipe connections between transmitter and remote indicator or recorder, in order to avoid air leaks.** Leaks can be detected with children's soap bubble solution.

(7) **TURN ON SUPPLY AIR**

Turn on the air supply. Air should escape at a slight rate from the exhaust port.

(8) **ADJUSTMENTS TO FLOW CONTROL VALVE**

Normally there is no need to make any adjustment. The flow control valve has been set approximately $\frac{1}{2}$ turn open to deliver 3 SCFH (standard cubic per hour). A rota-meter-taper flowmeter, part PT-FM @ may be used for checking proper flow rate. If better response is required, be sure to check for air leaks in the connecting tubing with a soap bubble solution before making any adjustments to the needle valve. **Excess use of air and unsatisfactory operation will occur if the needle valve is opened beyond ONE FULL TURN.** The factory setting is marked in line with the needle valve slot.

(9) **LOW READINGS**

If gauge readings appear low, close the needle valve then reopen approximately $\frac{1}{2}$ turn to point where the slot lines up with the calibration vee mark. This action clears residual carbon and oil gum and restores proper air flow through the transmitter.

ADDITIONAL INFORMATION

- Do not use a pipe wrench on the body of the transmitter during installation. The fit between nipple and transmitter should be free enough to permit installation and removal by hand. Avoid excess clearance.
- Avoid excess use of thread seal, otherwise the gauge connection and supply connection filter discs may become plugged and prevent the transmitter from operating properly.
- **DUMMY TRANSMITTERS:** Are available in 303 stainless steel @ \$11.50 each. Order code PT-11-S/S. Also available in PVC with stainless steel insert @ \$8.65 each. Order code PT-11-PVCI. The plastic PVC dummy has a service temperature limit of 120°F (50°C).
- The transmitter body O-ring may be removed with a scribe or a small screw driver.

TROUBLE SHOOTING & CALIBRATION INSTRUCTIONS

FOR MINIATURE PRESSURE TRANSMITTERS

FIELD FUNCTION TESTS: The purpose of these tests is to determine whether installed and operating transmitters are yielding correct pressure readings.

(1) CHECK FOR CORRECT SUPPLY PRESSURE TO THE TRANSMITTER

The operating range of the transmitter is code marked above the serial number on the exposed end of the transmitter body. Domestic transmitters are marked PMC-PT-100-N-HA-S. The 100 signifies 0-100 psi and other ranges are marked 0-60, 0-30, 0-20, 0-15 and 0-10. Foreign transmitters are marked in bars, thus 7,6,5,4,3,2,1. The word STD signifies standard and is often used in place of PMC-PT-100# (7 bars)-N-HA-S.

The standard range transmitter works quite well with clean mill air supply pressure ranging from 65 psi to 105 psi or 4 to 7 bars.

If ranges other than STD/standard are installed then transmitters should be supplied with regulated supply 5 psi (0.3 bars) greater than the code marked range.

False readings result from incorrect supply pressure.

Ranges other than STD/standard are furnished to customers who wish to limit the maximum transmitter output pressure in order to prevent over ranging quality pressure gauges (such as installed on pulp cleaner systems) and receiver elements mounted in expensive recorders and controllers.

(2) CHECK FOR CORRECT FLOW OF AIR THROUGH TRANSMITTER

A PMC exhaust Flowmeter (PT-FM @ \$8.00) may be used to check for correct flow. At low process pressure 0-15 psi (0-1 bar) the flowmeter ball should indicate 3 SCFH. At higher pressure 40-60 psi (3-4 bars) the ball will drop to 2.5 SCFH reading. If the flow is low, adjust the needle valve to achieve correct flow.

NOTE: Low readings often result from partially plugged needle valves and are caused by dirty supply air. Needle valves since 1972 (Serial No. 14000) have been equipped with a groove to pass most of the supply air. This design change helped overcome the dirty air problem, however, all users should equip their service people with PMC exhaust flowmeters if only as field test aids.

(3) CHECK FOR AIR LINE LEAKS BETWEEN TRANSMITTER AND REMOTE GAUGE OR PANEL SYSTEM

If test (1) and (2) have been made and low readings are still suspected then all tubing connections between transmitter and remote gauge should be soap bubble tested for leaks. An alternate test is to mount a good gauge directly to the transmitter gauge port as an alternate to searching for and leak testing all fittings. Higher readings at the transmitter will confirm a fitting or line leak.

Comment: If test (1), (2) and (3) fail to give satisfactory readings the following steps can be taken:

(4) INSPECTION FOR DIAPHRAGM DAMAGE

Blown or ruptured diaphragms or foreign material trapped under the diaphragm may cause low readings. The suspected transmitter can be removed to inspect for diaphragm rupture or trapped particles during process shut-down.

P.M.C. offers a Field Extractor which permits transmitter inspection and exchange during operation at pressure of up to 100 psi (7 bars) Part No. (PT-FX @ \$250.00).

NOTE: Replacement diaphragms are now available only as BONDED ASSEMBLIES and consist of retainer rings, diaphragm bonded in place and inner o-ring. These assemblies provide long term dependable readings, eliminate the possibility of blow-out and errors due to accumulation between the diaphragm and lip of the retainer ring.

Bonded Assembly Installation:

Remove the outer o-ring. Unscrew the diaphragm retainer ring by hand or by fitting a hose clamp over the ring and loosen by hand or with pump pliers. Clean face and threads of body. Remove inner o-ring from new assembly and run ring up by hand until diaphragm contacts face, (avoid force). Mark ring opposite arrow on body with permanent marker. Remove ring, install inner o-ring, then thread assembly until ring mark lines up with existing calibration V or mark on body. Transmitter is ready for use. Use PMC field test panel for precise calibration.

(5) FIELD TEST

Transmitters that appear to yield low or false reading can be removed for field test during shut-down or extracted while under pressure and range tested. Part number for the Field Test Panel is (PT-FTP @ \$200.00). The test panel uses a 3-way air switch and single gauge to compare process pressure against transmitter output. This arrangement helps eliminate the normal error that exists between a pair of test gauges. (If customers elect to use a pair of test gauges or manometers a preliminary test should be made by connecting a common adjustable supply and a check made over the test range to determine variations between gauges. P.M.C. transmitters cannot be made to track test gauges with gross errors or leaking manometers. Be sure to check first before assuming P.M.C. transmitters are in error.)

(6) FACTORY REBUILDS

- All units no matter how old can be returned for rebuild, up-date and recalibration at approximately half the cost of a new unit and carry a new year guarantee.

(7) FACTORY CALIBRATION INFORMATION

All miniature pressure transmitters are factory calibrated, rechecked a week later and then code marked. There is no basic difference between a standard transmitter 100 psi(7 bars) range and one with a range of 0-15 psi(1 bar). During calibration the retainer ring and diaphragm are screwed down further, placing the diaphragm closer to the transmitter face for lower ranges. The needle valve is also opened to achieve correct flow (3 SCFH) for lower ranges. Supply pressure must be 5 psi(0.3 bar) greater than the range.

PT NIPPLE INSTALLATION INSTRUCTIONS AND WELDING MANDREL ASSEMBLY

PT-07 Nipple Installation Instructions

- Bore a 1- $\frac{5}{16}$ " ID hole in top or side of pipe.
- Mount MANDREL in NIPPLE, making sure that NIPPLE and MANDREL bottoms are flush.
- Expand MANDREL by tightening MANDREL NUT. Thread HANDLE onto exposed TAPER SCREW.
- Mount POSITIONING RING onto MANDREL and tighten SCREW.
- Adjust three LEG SCREWS to position nipple on pipe wall. On small diameter pipes the nipple protrudes into the flow line.
- Tack weld the nipple at three points then remove POSITIONING RING.
- Proceed to weld nipple at sides as noted then complete weld all around.
- Remove MANDREL by loosening MANDREL NUT and tapping TAPER SCREW free. Using a welding clamp, grip the outboard part MANDREL and work free.

CAUTION: Do not pull TAPER SCREW.

PAPER MACHINE COMPONENTS			
DANBURY, CONNECTICUT U.S.A.			
PART NAME PT-07 NIPPLE WELDING MANDREL ASSEMBLY			
MATERIAL	DATE	SCALE	
#303 STAINLESS STEEL	Jan. 21, 1993	FULL	
QUANTITY	DRAWN BY	ORIG. DWG.	ASSY. DWG.
	L.W.		
BREAK ALL SHARP EDGES AND CORNERS			DWG. NO.
FRACT. DIMS. +/- 1/64" . DECIMAL DIMS. +/- .005"			1925-A
ANGLES +/- 1/4" UNLESS OTHERWISE SPECIFIED			

ADDITIONAL INFORMATION (continued)

- **EXHAUST SILENCER:** A silicone sleeve has been pressed into the 1/8" exhaust port. The silencer is equipped with a .052"D hole to limit transmitter exhaust rate, thereby eliminating undesirable exhaust whistle.
- **SERIAL NUMBER:** Each transmitter is marked on the end opposite the diaphragm. Please refer to this number when ordering parts.
- **EXTREMELY IMPORTANT:** A white cap has been installed over the diaphragm to protect it during shipment and installation. **Keep this cap in place until the final tubing connections have been made.**
- **DIAPHRAGM REPLACEMENT:** *Replacement diaphragms are available only as BONDED ASSEMBLIES, and consist of retainer ring, diaphragm bonded in place, and inner O-ring. These assemblies provide long term dependable readings, eliminate the possibility of blow out and errors due to accumulation between the diaphragm and lip of the retainer ring.*
- **BONDED ASSEMBLY INSTALLATION:** Remove the outer O-ring. Unscrew the diaphragm retainer ring by hand or by fitting a hose clamp over the ring and loosen by hand or with pump pliers. Clean face and threads of body. Remove inner O-ring from new assembly and run ring up by hand until diaphragm contacts face (**avoid force**). Magic mark ring opposite arrow on body. Remove ring, install inner O-ring, then thread assembly until ring mark lines up with existing calibration V or dot mark on body. Transmitter is ready to use. Use PMC Field Test Panel for precise calibration.
- **FILTER DISC INFORMATION:** All transmitters are equipped with a filter adapter in the air supply port and gauge port. The air supply filter traps out final traces of dirt and oil that may clog the flow control needle valve. **This filter adapter is not intended as the main line instrument air filter.*** The gauge port filter traps out dirt and metal particles that may originate from the remote gauge connection. The filter discs are sintered from 316 stainless steel particles and have an average pore size of 20 microns (.001"). The standard adapter is chrome plated brass. Stainless adapters are available—see PT-10-SS & PT-12-SS on parts list page 4.
- **REPLACEMENT INFORMATION: Air Supply Port Filter**

In the unplugged state the filter disc will pass 30 x more air than is required to operate the transmitter. If it becomes necessary to open the needle valve beyond 1 turn, the filter disc should be replaced in the following manner:

 - (a) Shut off supply air and disconnect line at air supply port.
 - (b) Remove adapter fitting and push out plugged filter disc with a punch.
 - (c) Insert new disc and drive into place with a clean punch approximately 5/16"(8mm) in diameter.
 - (d) Re-assemble adapter fitting and air supply line. Avoid getting dirt in supply port.

NOTE: Transmitter can be worked on while under pressure without fear of damaging diaphragm.
- * **RECOMMENDED AIR FILTER:** Where clean instrument air is not available we recommend the following filter:
Adjustable Filter Regulator: (1) Norgren B11-221-M2E-W-5203-01 —our part LT-NMFR. This regulator handles four transmitters—two ranges 3-50 psi and 5-125 psi—*please specify range desired.*

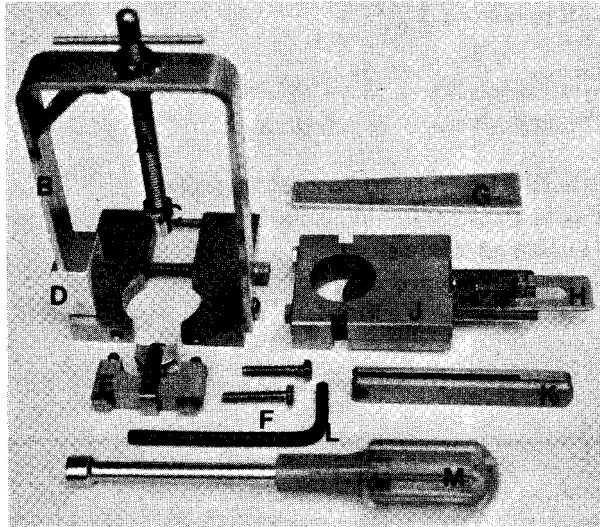


PAPER MACHINE COMPONENTS, INC.

EXTRACTOR INSTRUCTIONS FOR MINIATURE PRESSURE TRANSMITTERS

IMPORTANT

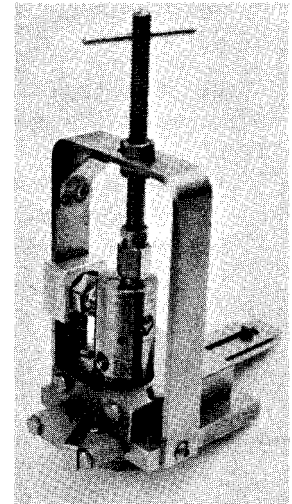
- Read instructions and study photographs before using extractor.
- Practice full extraction in shop with a spare transmitter before field use.



Unassembled Extractor Kit

PART NAME

- A. Extractor Screw
- B. Yoke Assembly
- C. 1/8" Male Connector
- D. Air Supply Port Clip
- E. Seal & Lock Assembly
- F. (2) 10-24x1" Gate Assembly Retainer Screws
- G. Aluminum Wedge
- H. Gate Tab
- I. Gate and Stop Pin
- J. Split Gate Assembly
- K. Gate Closing Fork
- L. Allen Wrench for Locking Yoke Assembly Screw
- M. Nut Driver for F.



Assembled Extractor. See Step 8

INSTRUCTIONS FOR EXTRACTION

1. Disconnect air supply and gauge port lines from transmitter filter adapters.
2. Loosen yoke set screw, then fit yoke and clamp assembly around transmitter and nipple. Nest air supply port with clip on yoke arm.
3. Center 5/16" screw in yoke opening and **lock** yoke to nipple by **tightening** yoke set screw.
4. Connect extractor screw to gauge port adapter, move transmitter down slightly by turning extractor screw. Remove 5/16" set screw from transmitter. (1/2" wrench not supplied)
5. Replace set screw with seal and lock assembly.
6. Extract transmitter until edge of the O-ring appears at the top edge of the nipple.
7. Start two 10-24 hex head screws on yoke base, swing air supply port to give clearance. Locate split gate assembly with gate tab above the long part of yoke base, (see photo) and **recessed edge** next to the nipple. Lock gate assembly together and tighten to base with moderate tension. Place clip over air supply port.
8. Extract transmitter through the gate body until O-ring appears at the top edge of the body of split gate assembly. Close gate, tap fully home with gate closing and opening fork.
9. Remove transmitter for service or exchange. Clear away pulp and any liquid from gate opening to prevent a **hydraulic lock** during re-installation.

CAUTIONARY MEASURES

- Pulp in the gate slot may tend to jam the transmitter during re-installation. If so, insert the aluminum wedge between yoke arms and transmitter body and rock body while it is being screwed in.
- Instructions 4 – 6 are **most** important.
- Never allow O-ring to appear too much in the opening of the nipple or the split gate assembly.
- Instruction 9. (**Avoid hydraulic lock**)

EXTRACTOR INSTRUCTIONS CONTINUED

RE-INSTALLATION OF TRANSMITTER

10. Mount extractor screw fitting to gauge port. Slip clip over air supply fitting. Move transmitter into split gate assembly slowly, until less than half of the O-ring is visible.
11. Open gate.
12. Move transmitter in until air supply fitting is almost touching the head of a 10-24 machine screw.
13. Remove split gate assembly, (reverse of item six) and move transmitter into nipple.
14. Remove seal and lock assembly and install 5/16" set screw and lock washer.
15. Disconnect extractor screw. Loosen yoke socket set screw and remove extractor.

PARTS PRICE LIST

B.	Yoke Assembly, complete	\$100.00
E.	Seal and Lock Assembly	15.00
F.	(2) 10-24X1" Gate Assembly Retainer Screws	2.00
G.	Aluminum Wedge	1.00
J.	Split Gate Assembly	100.00
K.	Gate Closing Fork	4.00
L.	Allen Wrench for locking Yoke Assembly Screw	1.50
M.	Nut Driver for F.	4.00

MINIMUM ORDER - \$10.00

MANUFACTURED AND SOLD BY



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