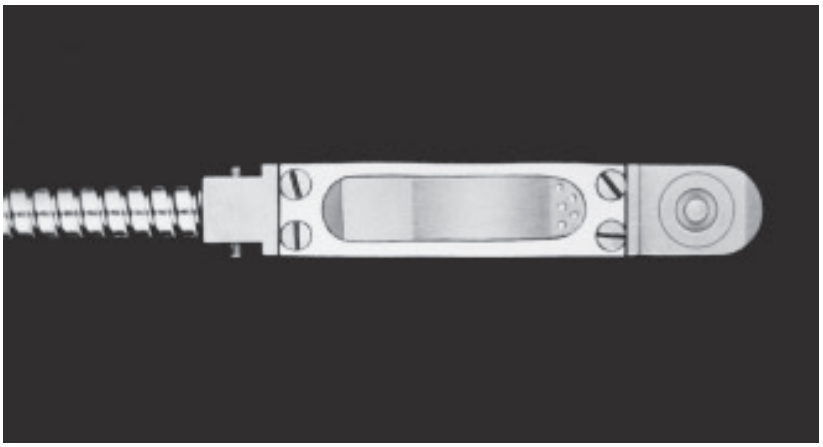
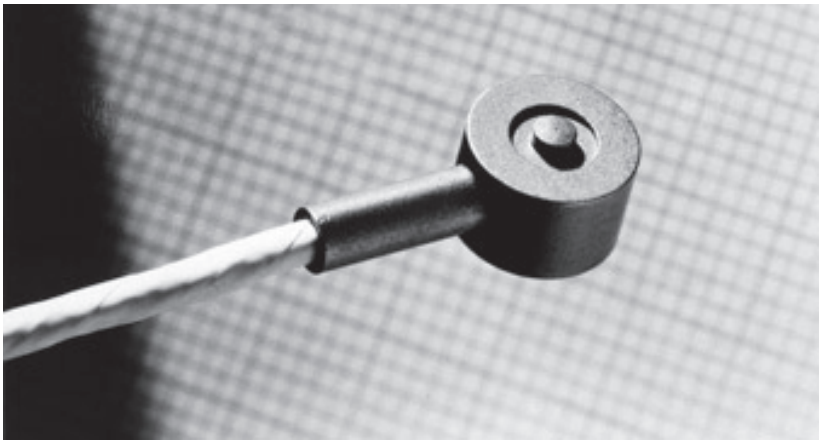
Dynisco
Instruments

INSTRUCTIONS FOR CAVITY PRESSURE TRANSDUCERS





The following models are covered in this manual:

FT444DH

FT446H

FT446HM

FT445H

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1. Introduction

The FT444DH, FT446H, FT446HM and FT445H force transducers are designed to sense mold cavity pressure. Mounted behind an ejector pin, they sense the force exerted on the ejector pin by the molten polymer. This force is converted into an electrical signal which is then fed back into a control/signal conditioning circuit. The 450° F temperature rating enables these transducers to be used in high temperature molds.

2. Transducer Selection

To read in direct engineering pressure units, the force on the transducer must be divided by the area of the pin. Proper transducer range may be calculated by multiplying the area of the pin face by the cavity pressure. If exact cavity pressure is not known, nozzle pressure or ten times (10x) the hydraulic pressure may be used for approximation.

EXAMPLE:

Pin diameter (D) = 1/8″ π = 3.14
π = 3.14
Max cavity pressure (P) = 20,000 psi
Force = area X pressure = $\frac{\pi D^2 \times P}{4} = \frac{3.14 (.125)^2}{4} \times 20{,}000 = 245$ lbs.

For this example a 250 lb. transducer would be used.

When selecting proper range, conservatism should be practiced. Had the force equaled 300 lbs., a 550 lb. unit would be required.

Assuming a typical maximum cavity pressure of 20,000 psi, the following table may be used for transducer selection:

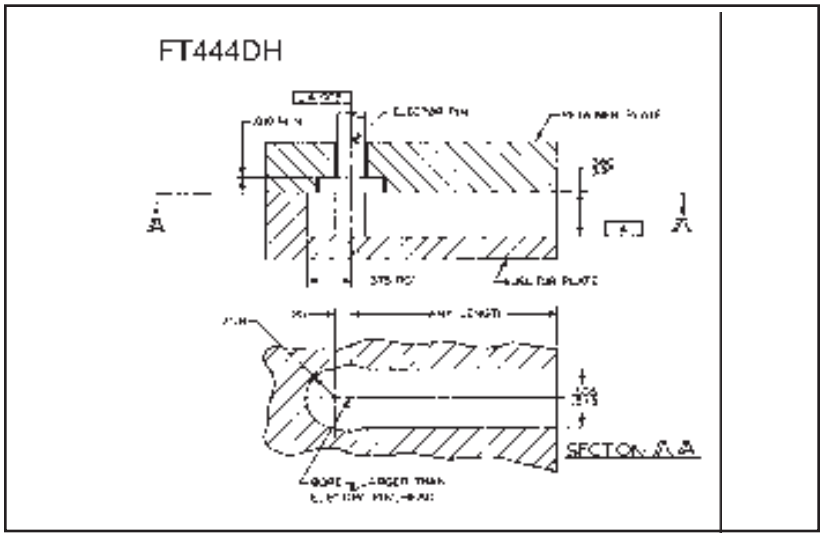
TABLE I

RANGE		PIN DIAMETER	
50 lbs	(23 Kg)	3/64 - 1/16 in.	(1.5 mm)
100 lbs.	(45 Kg)	1/16 - 3/32 in.	(2 mm)
250 lbs.	(113 Kg)	3/32 - 1/8 in.	(2.5 - 3 mm)
550 lbs.	(250 Kg)	1/8 - 3/16 in.	(3.5 - 4 mm)
1000 lbs.	(450 Kg)	3/16 - 1/4 in.	(5 -6 mm)
2200 lbs.	(1000 Kg)	1/4 - 7/16 in.	(8 - 10 mm)

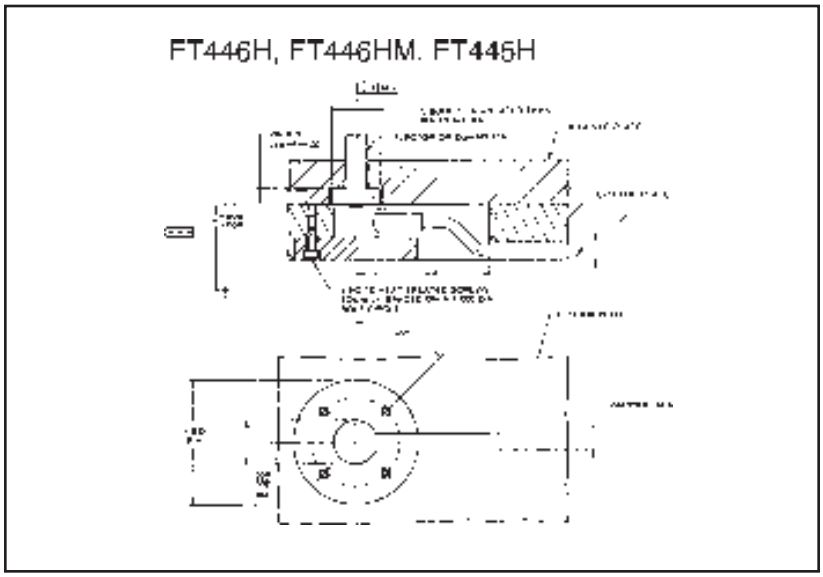
3. INSTALLATION

The sensor is installed behind an ejector pin. Recommended installation drawings are below.

Several parameters affect the selection of the sensing ejector pin. In all cases, the best location is behind an active ejector pin. In this way, if any material is forced into the clearances around the pin, it will be ejected during the normal cycle. The optimum location will vary depending on the response time of the hydraulic system and the exact part configuration. It is advisable to put more than one slot in a mold when possible to determine the dynamic characteristics of the press, mold and material.



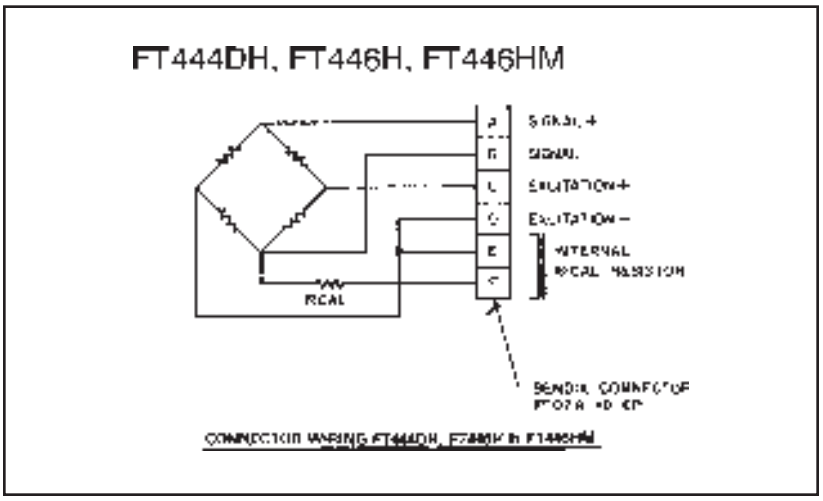
FT44DH Installation Drawing



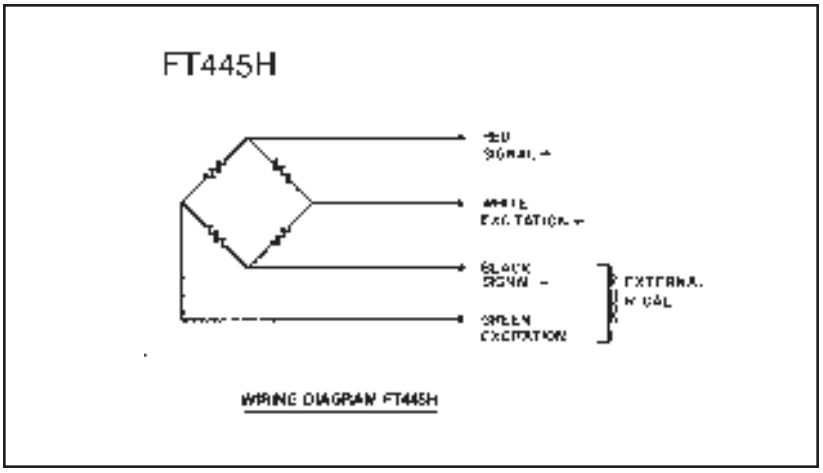
FT44GH, FT446HM, FT445H Installation Drawing

4. Electrical Connections

Electrically, these transducers are 350 ohm active arm strain gage devices. As such, they require a highly regulated power supply of between 6 and 10 VDC. Their output is typically amplified and fed into a controller and display.



Connector Wiring FT444DH, FT446H, FT446HM



Wiring Diagram FT445H

5. CALIBRATION

All FT444DH, FT446H, FT446HM and FT445H transducers are provided with an internal 80% calibration resister. After nulling the zero, shorting terminals E and F provides a simulated output equivalent to 80% of full scale +/- 1%. These transducers are also standardized for 40% external calibration. For 40% calibration, a 110,000 ohm +/- 1% resistor should be connected between pins B and E.

The FT445H transducer may be calibrated using external shunt resistance across the excitation - and signal - leads. The exact load simulated with a 110,000 ohm +/- 1% resistor is noted on the transducers' data sheet. Alternately, a known multi-volt source or dead weight calibration may be used. When calculating the specific calibration point in engineering pressure units, the load simulated is divided by the pin area to obtain the proper calibration point.

EXAMPLE:

Transducer = FT444DH - 2.5C
Calibration Point = 40% (110,000 ohm)
Pin diameter = 1/8″ = .125
Load simulated = full scale load X calibration point = 250 X 40% = 100 lbs.
Pressure simulated = $\frac{\text{load simulation (lbs.)}}{\text{pin area (in2)}} = \frac{100}{0.01227} = 8150$

The controller should now be adjusted to read 8150 psi when the 110,000 ohm resistor is shunted across pins E and F. Table 2 lists pin areas for various standard pins.

TABLE 2

English Pin Size (in.)	Pin Area (in^2)	Metric Pin Size (mm)	Pin Area (cm^2)
3/64	0.00173	1.5	0.01767
1/16	0.00307	2	0.03142
3/32	0.00690	2.5	0.04909
1/8	0.01227	3	0.07069
3/16	0.02761	3.5	0.09621
1/4	0.04909	4	0.1257
5/16	0.07670	5	0.1963
3/8	0.1104	6	0.2827
7/16	0.1503	8	0.5027
1/2	0.1963	10	0.7854
		12	1.1310
		13	1.3173
		14	1.5394

6. Warranty and Service

This equipment is sold subject to the mutual agreement that it is free from defects of material and construction. Our liability in connection with it shall be limited to the replacement or repair, without charge at our factory, of any material or construction defect that becomes apparent within two years from the date that the products are shipped. We are not liable for damages of any kind arising from the installation or use of our products or both.

Damaged transducers should be returned to:

DYNISCO INSTRUMENTS

38 Forge Parkway

Franklin, MA 02038

Attn: Repair Dept. RA #_____

Please call for a Return Authorization Number before returning product to Dynisco.

Questions concerning warranty, repair cost, and delivery should be directed to the Dynisco Repair Department, telephone number 508-541-9400 or E-mail: repair@dynisco.com

For technical assistance, call:

800-221-2201

DYNISCO INSTRUMENTS

38 Forge Parkway

Franklin, MA 02038

Tel.: 508-541-9400

Fax: 508-541-9436

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