Honeywell

Model FP2000

Configurable Pressure Transducer

DESCRIPTION

The FP2000 series is a configurable differential pressure transducer which allows the customer to select the configuration which best fits the needs of the application. Choose from multiple accuracies, outputs, pressure ports, electrical terminations, and pressure ranges.

The FP2000 is available with gage, absolute, barometric, or vacuum reference and, best of all, they delivery in two weeks or less.

Approved Approved

FEATURES

- mV/V, 0 Vdc to 5 Vdc, 0 Vdc to 10 Vdc, 4 mA to 20 mA
- Gage, absolute, barometric, vacuum
- Differential (wet/wet, wet/dry)
- Intrinsically safe option[5]
- CE available[6]

FP2000 pressure sensors are custom built from stocked components, and most are shipped in 10 business days or less. Please see http://measurementsensors.honeywell.com for updated listings

Model FP2000

PERFORMANCE SPECIFICATIONS

Characteristic	Measure
Accuracy [1]	See accuracy table
Output (selectable)	mV/V (see accuracy table), 0 Vdc to 5 Vdc, 0 Vdc to 10 Vdc, or 4 mA to 20 mA (two wire)
Resolution	Infinite

ENVIRONMENTAL SPECIFICATIONS

Characteristic	Measure
Temperature, operating	-40 °C to 116 °C [-40 °F to 240 °F]
Temperature, compensated	4 °C to 60 °C [40 °F to 140 °F] [2]
Temperature, error band [2]	
0.10 % accuracy	±0.5 % full scale
0.25 % accuracy	±1.0 % full scale

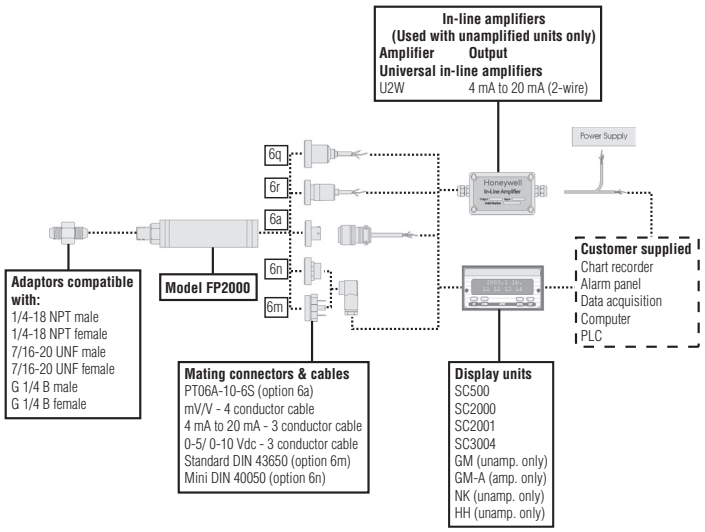
ELECTRICAL SPECIFICATIONS

Characteristic	Measure
Excitation (calibration)	
Amplified	
(4 mA to 20 mA; 0 Vdc to 5 Vdc)	9 Vdc to 28 Vdc
Amplified	
(0 Vdc to 10 Vdc)	15 Vdc to 28 Vdc
Unamplified (mV/V)	10 Vdc

MECHANICAL SPECIFICATIONS

Characteristic	Measure
Media 3	Gas, liquid
Overload - safe	
positive (+) direction	4X full scale or 3000 psi, whichever is less
negative (-) direction	4X full scale or 250 psi, whichever is less
Overload - burst	
positive (+) direction	3000 psi
negative (-) direction	500 psi
Pressure port	200 % over capacity
Wetted parts material	Ha C276 & 316L stainless steel

TYPICAL SYSTEM DIAGRAM



PRESSURE RANGES AND RANGE CODES

	psi	Range code	torr	Range code	mBar	Range code	kPa	Range code	Bar	Range code	in Hg	Range code	mm Hg	Range code	in H_2O	Range code
Gage/ Absolute	0.5*	AN	15**	HA	35**	JA	2**	KA	0.035**	MA	1**	UB	15**	VA	5**	WB
	1*	AP	50**	HB	70**	JB	7**	KB	0.1**	MB	2**	UD	50**	VB	10**	WA
	2*	AR	135**	HC	175**	JC	15**	KC	0.2	MC	5	UF	135	VC	20**	WC
	2.5*	AS	250	HD	350	JD	35	KD	0.5	MD	10	UA	250	VD	30**	WE
	5	AT	750	HE	700	JE	70	KE	1	ME	15	UC	750	VE	50**	WG
	10	AV	1500	HF	750	JF	100	KF	2	MF	20	UE	1500	VF	100	WI
	15	BJ			1000	JG	200	KG	3.5	NA	30	UG			120	WK
	25	BL			3500	JH	300	KH	5	MG	50	UI			150	WM
	30	BM			7000	JI	700	KJ	7	NB	60	UK			200	WP
	50	BN			10000	JK	1000	KL	10	MH	80	UM			300	WR
	75	BP					1500	KM	20	MI	100	UP			500	WS
	100	BR					1700	KN	30	MJ	200	UH				
	150	CJ					2000	KP	35	NC	300	UJ				
	200	CL					3000	KQ	50	MK	500	UL				
	250	CN					5000	KR	70	ND	1000	UN				
	300	CP					7000	KS	100	ML	0-32	US				
	400	CQ					10000	KT	135	NE	16-32	UQ				
	500	CR					15000	KU	350	NG	26-32	UR				
	600	CS					20000	KV	500	MM						
	750	CT					35000	KW	700	NH						
	1000	CV					50000	KY								
	1500	DJ					70000	KZ								
	2000	DL														
	2500	DM														
	3000	DN														
	5000	DR														
	6000	DS														
	7500	DT														
	10000	DV														
Barometric (Order code FPB)											0-30	UG				
											16-32	UQ				
											26-32	UR				
Vacuum (Order code FPV)	1	AP	50	HB	35	JA	7	KB	0.035	MA	10	UA	15	VA	10	WA
	5	AT	135	HC	70	JB	15	KC	0.1	MB	20	UE	50	VB	20	WC
	10	AV	250	HD	175	JC	35	KD	0.2	MC	30	UG	135	VC	30	WE
	15	BJ	750	HE	350	JD	100	KF	0.5	MD			250	VD	50	WG
					700	JE			1	ME			750	VE	100	WI
					750	JF										
					1000	JG										
Differential (Order codes FDD, FDW)	0.5	AN	15	HA	35	JA	2	KA	0.035	MA	1	UB	15	VA	5	WB
	1	AP	50	HB	70	JB	7	KB	0.1	MB	2	UD	50	VB	10	WA
	2	AR	135	HC	175	JC	15	KC	0.2	MC	5	UF	135	VC	20	WC
	2.5	AS	250	HD	350	JD	35	KD	0.5	MD	10	UA	250	VD	30	WE
	5	AT	750	HE	700	JE	70	KE	1	ME	15	UC	750	VE	50	WG
	10	AV	1500	HF	750	JF	100	KF	2	MF	20	UE	1500	VF	100	WI
	15	BJ			1000	JG	200	KG	3.5	NA	30	UG			120	WK
	25	BL			3500	JH	300	KH	5	MG	50	UI			150	WM
	30	BM			7000	JI	700	KJ	7	NB	60	UK			200	WP
	50	BN			10000	JK	1000	KL	10	MH	80	UM			300	WR
	75	BP					1500	KM	20	MI	100	UP			500	WS
	100	BR					1700	KN	30	MJ	200	UH				
	150	CJ					2000	KP	35	NC	300	UJ				
	200	CL					3000	KQ	50	MK	500	UL				
	250	CN					5000	KR	70	ND	1000	UN				
	300	CP					7000	KS			0-32	US				
	400	CQ					10000	KT			16-32	UQ				
	500	CR					15000	KU			26-32	UR				
	600	CS					20000	KV								
	750	CT					35000	KW								
	1000	CV					50000	KY								

* 0.5 psi to 2.5 psi ranges are not available for absolute pressure

** Not available in absolute

Model FP2000

INTERNAL AMPLIFIERS

Amplifier specifications	Unamplified output: Option 2u	Voltage output: Option 2d	Voltage output: Option 2g	Current two-wire: Option 2p
Output signal	See accuracy table	0 Vdc to 5 Vdc	0 Vdc to 10 Vdc	4 mA to 20 mA
Input power (voltage)	10 Vdc	9 Vdc to 28 Vdc	15 Vdc to 28 Vdc	9 Vdc to 32 Vdc
Input power (current)	2 mA @ 10 Vdc	10 mA	15 mA	4 mA to 24 mA
Frequency response	Natural frequency	300 Hz	300 Hz	300 Hz
Power supply rejection	N/A	60 dB	60 dB	60 dB
Operating temperature	-40 °C to 116 °C [-40 °F to 240 °F]	-29 °C to 85 °C [-20 °F to 185 °F]	-29 °C to 85 °C [-20 °F to 185 °F]	-29 °C to 85 °C [-20 °F to 185 °F]
Reverse voltage protection	N/A	Yes	Yes	Yes
Short circuit protection	N/A	Momentary	Momentary	Yes

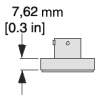
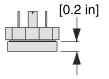
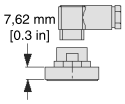
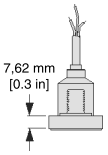
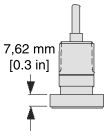
Amplifier specifications	Voltage output: Option 2e	Voltage output: Option 2f	Intrinsically safe amp: Option 2n (2N)***	Current two-wire: Option 2y
Output signal	0 Vdc to 5 Vdc	0 Vdc to 10 Vdc	4 mA to 20 mA	4 mA to 20 mA
Input power (voltage)	9 Vdc to 28 Vdc	15 Vdc to 28 Vdc	9 Vdc to 28 Vdc	9 Vdc to 32 Vdc
Input power (current)	10 mA	15 mA	4 mA to 24 mA	4 mA to 24 mA
Frequency response	2000 Hz	2000 Hz	2000 Hz	2000 Hz
Power supply rejection	60 dB	60 dB	60 dB	60 dB
Operating temperature	-29 °C to 85 °C [-20 °F to 185 °F]	-29 °C to 85 °C [-20 °F to 185 °F]`	-29 °C to 85 °C [-20 °F to 185 °F]	-29 °C to 85 °C [-20 °F to 185 °F]
Reverse voltage protection	Yes	Yes	Yes	Yes
Short circuit protection	Momentary	Momentary	Yes	Yes

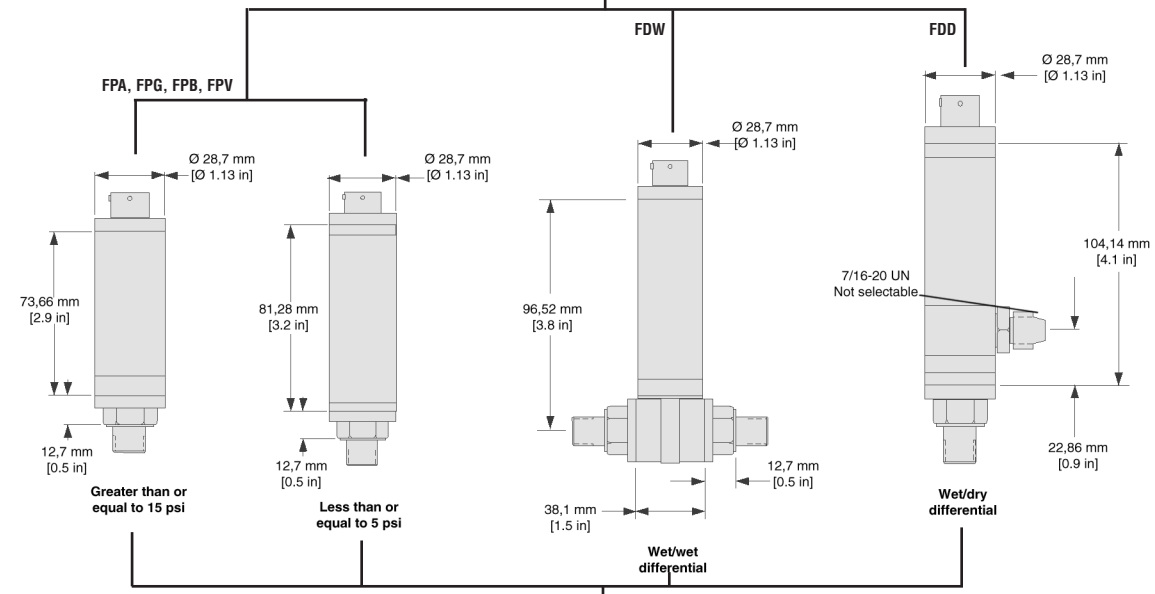
ACCURACY

Non-amplifed output @ 10 Vdc excitation	Gage and absolute	Vacuum	Barometric	Differential
0.10 % accuracy	50 mV[4]	25 mV	40 mV	50 mV[4]
0.25 % accuracy	100 mV	50 mV	80 mV	100 mV

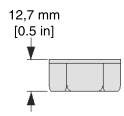
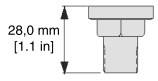
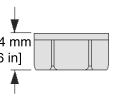
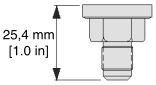
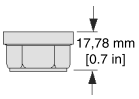
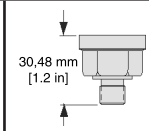
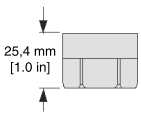
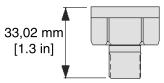
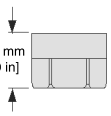
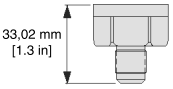
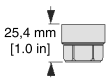
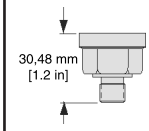
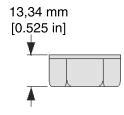
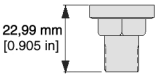
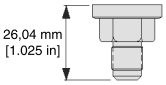
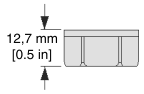
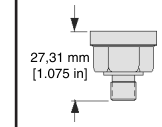
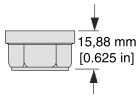
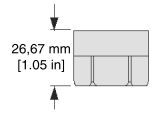
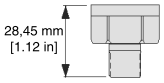
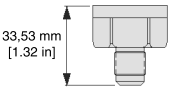
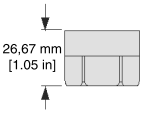
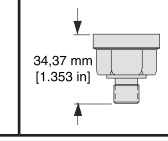
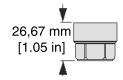
MOUNTING DIMENSIONS

Electrical termination

Code 6a: 6-pin, vented, Bendix style	Code 6m: 4-pin, vented, standard DIN (43650)	Code 6n: 4-pin, vented, mini DIN	Code 6q: 4-conductor, vented, integral cable, 1,52 m [5 ft]	Code 6r: 4-conductor, vented, integral cable, conduit fitting 1,52 m [5 ft]
				



Pressure ports

	Code 5a 1/4-18 NPT female	Code 5b 1/4-18 NPT male	Code 5c 7/16-20 UNF female	Code 5d 7/16-20 UNF male	Code 5f G 1/4 B female	Code 5g G 1/4 B male
Less than 1000 psi						
Greater than 1500 psi						
	Code 5h 1/8-27 NPT female	**Code 5i 1/8-27 NPT male**	**Code 5p M12-1.5 male**	**Code 5q M12-1.5 female**	**Code 5r 9/16-18 SAE male**	**Code 5s 9/16-18 SAE female**
Less than 1000 psi						
Greater than 1500 psi						

Model FP2000

WIRING CODES

	Unamplified output: Option 2u	Voltage output: Option 2d/2e	Voltage output: Option 2g/2f	Current two-wire: Option 2p/2y	Intrinsically safe amp: Option 2n (2N)***
Bendix PTIH-10-6P (Option 6a)					
No shunt cal	A (+) Excitation B (+) Excitation C (-) Excitation D (-) Excitation E (-) Output F (+) Output	A (+) Supply B (-) Supply return C (-) Output 0 Vdc to 5 Vdc D (+) Output E No connection F No connection	A (+) Supply B (-) Supply return C (-) Output 0 Vdc to 10 Vdc D (+) Output Vdc E No connection F No connection	A (+) Supply B No connection C No connection D (+) Output 4 mA to 20 mA E No connection F No connection	A (+) Supply B No connection C No connection D (+) Output 4 mA to 20 mA E Case ground F No connection
With shunt cal (option 3d)	A (+) Excitation B (-) Excitation C (+) Output D (-) Output E No connection F Shunt Cal	A (+) Supply B (-) Supply return C (-) Output 0 Vdc to 5 Vdc D (+) Output E No connection F Shunt cal	A (+) Supply B (-) Supply return C (-) Output 0 Vdc to 10 Vdc D (+) Output E No connection F Shunt cal	A (+) Supply B No connection C No connection D (+) Output 4 mA to 20 mA E No connection F Shunt cal	A (+) Supply B No connection C No connection D (+) Output 4 mA to 20 mA E No connection F Shunt cal
Std. DIN 43650 (Option 6m)					
No shunt cal	1 (+) Excitation 2 (+) Output 3 (-) Output 4 (-) Excitation	1 (+) Supply 2 (+) Output 3 Supply/ output com. GND No connect. to case	1 (+) Supply 2 (+) Output 3 Supply/ output com. GND No connect. to case	1 (+) Supply 2 (+) Output 4 mA to 20 mA 3 No connection GND No connection	1 (+) Supply 2 (+) Output 3 Case ground GND No connection
With shunt cal (option 3d)	Not Applicable	1 (+) Supply 2 (+) Output 3 Supply/output com. GND Shunt cal	1 (+) Supply 2 (+) Output 3 Supply/output com. GND Shunt cal	1 (+) Supply 2 (+) Output 4 mA to 20 mA 3 No connection GND Shunt cal	1 (+) Supply 2 (+) Output 3 Case ground GND Shunt cal
Mini DIN 40050 (Option 6n)					
No shunt cal	1 (+) Excitation 2 (+) Output 3 (-) Output 4 (-) Excitation	1 (+) Supply 2 (+) Output 3 Supply/output com. GND No connect. to case	1 (+) Supply 2 (+) Output 3 Supply/output com. GND No connect. to case	1 (+) Supply 2 (+) Output 4 mA to 20 mA 3 No connection GND No connection to case	1 (+) Supply 2 (+) Output 3 Case ground GND No connection
With shunt cal (option 3d)	Not Applicable	1 (+) Supply 2 (+) Output 3 Supply/output com. GND Shunt cal	1 (+) Supply 2 (+) Output 3 Supply/output com. GND Shunt cal	1 (+) Supply 2 (+) Output 4 mA to 20 mA 3 No connection GND Shunt cal	1 (+) Supply 2 (+) Output 3 Case ground GND Shunt cal
1.83 m [5 ft] integral cable (Option 6q)					
No shunt cal	R (+) Excitation Bl (-) Excitation G (-) Output W (+) Output	R (+) Supply Bl (-) Supply return G (-) Output W (+) Output 0 Vdc to 5 Vdc	R (+) Supply Bl (-) Supply return G (-) Output W (+) Output 0 Vdc to 10 Vdc	R (+) Supply Bl (+) Output 4 mA to 20 mA	R (+) Supply Bl (+) Output 4 mA to 20 mA W Case ground
With shunt cal (option 3d)	Not Applicable	R (+) Supply Bl (-) Supply return G Shunt cal W (+) Output 0 Vdc to 5 Vdc	R (+) Supply Bl (-) Supply return G Shunt cal W (+) Output 0 Vdc to 10 Vdc	R (+) Supply Bl (+) Output 4 mA to 20 mA G Shunt cal	R (+) Supply Bl (+) Output 4 mA to 20 mA W Case ground G Shunt cal
Conduit fitting (Option 6r)					
No shunt cal	R (+) Excitation Bl (-) Excitation G (-) Output W (+) Output	R (+) Supply Bl (-) Supply return G (-) Output W (+) Output 0 Vdc to 5 Vdc	R (+) Supply Bl (-) Supply return G (-) Output W (+) Output 0 Vdc to 10 Vdc	R (+) Supply Bl (+) Output 4 mA to 20 mA	R (+) Supply Bl (+) Output 4 mA to 20 mA W Case ground
With shunt cal (option 3d)	Not Applicable	R (+) Supply Bl (-) Supply return G Shunt cal W (+) Output 0 Vdc to 5 Vdc	R (+) Supply Bl (-) Supply return G Shunt cal W (+) Output 0 Vdc to 10 Vdc	R (+) Supply Bl (+) Output 4 mA to 20 mA G Shunt cal	R (+) Supply Bl (+) Output 4 mA to 20 mA W Case ground G Shunt cal

Note: For wiring codes, R=red; Bl = black; W = white; G = green. Color specifies cable and letter or number specifies connection

*** See Honeywell's Web site (http://measurementsensors.honeywell.com) for most up-to-date information regarding Intrinsically Safe approvals ref. #008-0547-00.

How to order

Configurable Pressure Transducer

The FP2000 Order Code is an easy way for you to order exactly what you want the factory to build. Simply make one selection in each of the six required categories. Choose adders and accessories only if you require them. By visiting our Web site at **www.honeywell.com/sensing** you can view complete technical specifications for the FP2000, or click to our on-line shopping site and actually place your order.

Step 1

Transducer type

	Type Code
☐ Pressure - gage	FPG
☐ Pressure - absolute	FPA
☐ Differential - wet/wet	FDW
☐ Pressure - barometric	FPB
☐ Differential - wet/dry	FDD
☐ Pressure - vacuum	FPV

Unit type

☐ psi	☐ bar
☐ torr	☐ in Hg
☐ mBar	☐ mm Hg
☐ kPa	☐ in H_2O

Step 2

Pressure range

Gage, absolute, and differential

	Range code		Range code
☐ 0.5 psi	AN	☐ 250 psi	CN
☐ 1 psi	AP	☐ 300 psi	CP
☐ 2 psi	AR	☐ 400 psi	CQ
☐ 2.5 psi	AS	☐ 500 psi	CR
☐ 5 psi	AT	☐ 600 psi	CS
☐ 10 psi	AV	☐ 750 psi	CT
☐ 15 psi	BJ	☐ 1000 psi	CV
☐ 25 psi	BL	☐ 1500 psi	DJ
☐ 30 psi	BM	☐ 2000 psi	DL
☐ 50 psi	BN	☐ 2500 psi	DM
☐ 75 psi	BP	☐ 3000 psi	DN
☐ 100 psi	BR	☐ 5000 psi	DR
☐ 150 psi	CJ	☐ 6000 psi	DS
☐ 200 psi	CL	☐ 7500 psi	DT
		☐ 10000 psi	DV

Barometric		Vacuum	
☐ 16-32 in Hga	UQ	☐ 1 psi	AP
☐ 26-32 in Hga	UR	☐ 5 psi	AT
☐ 0-30 in Hga	UG	☐ 10 psi	AV
		☐ 15 psi	BJ

Accuracy

	Accuracy code
☐ 0.10 %	1
☐ 0.25 %	2

Step 3

Output

	Basic output code	If adding 9d or 9f (<5000 psi)	If adding 1y, 3d, 9e or 14c
☐ mV/V	2u	NA	2u
☐ 5 Vdc	2d	NA	2e
☐ 10 Vdc	2g	NA	2f
☐ 4 mA to 20 mA	2p	2n(2N)	2y

NOTE: If any ADDERS are required, the output code must be revised. See step 4.

Pressure Port

	Port code
☐ 1/4-18 NPT female	5a
☐ 1/4-18 NPT male	5b
☐ 7/16-20 UNF female	5c
☐ 7/16-20 UNF male	5d
☐ G 1/4 B female	5f
☐ G 1/4 B male	5g
☐ 1/8-27 NPT female	5h
☐ 1/8-27 NPT male	5i
☐ M12 x 1.5 male	5p
☐ M12 x 1.5 female	5q
☐ 9/16-18 UNF SAE male	5r
☐ 9/16-18 UNF SAE female	5s

Electrical connector

	Connector code
☐ Bendix PTIH-10-6P	6a
☐ DIN 43650	6m
☐ Mini DIN (40050)	6n
☐ Integral polyurethane 5 ft cable	6q
☐ 1/2 x 14 NPT conduit 5 ft cable exit	6r

Step 4

Adders

	Adder code
☐ Enhanced thermals Gage: 0 °F to 180 °F Absolute: 0 °F to 180 °F Differential: 0 °F to 180 °F Barometric: 30 °F to 170 °F Vacuum: 10 °F to 170 °F	1y
☐ Shunt cal	3d
☐ IS rating	9d
☐ CE rating	9e
☐ IS and CE rating	9f
☐ Zero and span adjustments	14c
☐ mV/V	2u
☐ 5 Vdc	2e
☐ 10 Vdc	2f
☐ 4 mA to 20 mA (CE only)	2y
☐ 4 mA to 20 mA (IS only	2n (2N)
☐ 4 mA to 20 mA (IS and CE)	2n (2N)

NOTE: If you choose any adder output from step 4, you must revise your output code selection using this output code chart. IS outputs available only on ranges up to 5000 psi.

Accessories

Mating connectors only

	Acc. code
☐ Mini DIN	AA161
☐ Bendix	AA111

Mating conn. with 15 ft. cable for Bendix connector (6A)

	Without shunt	With shunt (3d)
☐ mV/V	AA113	AA513
☐ 4 mA to 20 mA	AA116	AA516
☐ 0 to 5/0 to 10 Vdc	AA117	AA517

Step 5

Example order code **FDW 1 CN 2y 5b 6a 1y AA116**

Selection	Description	Code
Transducer type	Differential wet/wet	FDW
Accuracy	0.10 %	1
Pressure range	250 psi	CN
Output	4 mA to 20 mA	2y
Pressure port	1/4-18 NPT male	5b
Electrical output connections	Bendix PTIH-10-6P	6a
Adders	Enhanced temperature range	1y
Accessories	Mating connector with cable	AA116

There must be a code in each of the six basic code boxes. If there are no adders or accessories chosen, leave the boxes blank.

Description	Basic code					Adder code (see step 4)				
	Type	Accuracy	Range	Output	Pressure	Elect. conn.	Extended	Shunt cal.	IS/CE rated	Pots
Order code										
Accessory code										

Zero and span adjustments are located on the side. See drawing for details. No zero and span adjustments are available on mV/V output option.

Model FP2000

Configurable Pressure Transducer

NOTES

1. Accuracies stated are expected for best-fit straight line for all errors, including linearity, hysteresis, and non-repeatability through zero.
2. For low pressure ranges, temperature effects may vary.
3. The wet/wet differential pressure transducer has two separate, welded Hastelloy diaphragms. In wet/dry unit, the wet port (high port) has all-welded stainless steel and Hastelloy construction. The dry port (low port) has no isolation diaphragm.
4. For low gage and differential pressure ranges at 0.10 % accuracy, non-amplified output @ 10 Vdc excitation = 100 mV.
5. Range up to and include 5000 psi.
6. Not available with 6m.

Warranty. Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

⚠ WARNING

PERSONAL INJURY

- DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

⚠ WARNING

MISUSE OF DOCUMENTATION

- The information presented in this datasheet is for reference only. DO NOT USE this document as product installation information.
- Complete installation, operation and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

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