



## I/A Series Electronic Differential Pressure Transmitter Model IDP10

### Features Include

- ◆ **Accuracy :  $\pm 20\%$  of Span**
- ◆ **Span limits: 0.5 in H<sub>2</sub>O to 3000psi**
- ◆ **Simple, elegant sensor packaging uses very few parts to achieve exceptionally high reliability**
- ◆ **Aluminum housing has durable, corrosion resistant epoxy finish; 316 s/s housing also available; both meet NEMA® 4X and IEC IP66**
- ◆ **316 s/s process covers are standard.**
- ◆ **Choice of highly corrosion-resistant Cobalt-Nickel-Chromium (Co-Ni-Cr) or Industry-Standard 316L s/s offered for sensor wetted parts material. Other materials also available.**
- ◆ **Liquid Crystal Display (LCD) digital indicator with on-board pushbuttons provides the ability to rerange to new calibrated ranges, without the need to apply calibration pressure.**
- ◆ **Standard 2-year warranty; 5-year optional**

The **Foxboro I/A Series** Pressure Transmitters are a complete family of pressure transmitters. These 4 to 20 mA analog output transmitters use the -A electronics module. It is the most cost effective analog output transmitter available providing full configuration capability. The **IDP10** Differential Pressure transmitter has five d/p range sensors to cover measurement spans from 0.5 in H<sub>2</sub>O to 3000 psi. The high turndown capability of the transmitter means that nearly all d/p applications can be satisfied with only these five

ranges, greatly simplifying your spare transmitter and spare parts requirements.

A two-line digital indicator, is provided as standard with this transmitter. The indicator displays the measurement with a choice of units. Two on-board pushbuttons allow zero and span adjustments, as well as local configuration, without the need for a Hand-Held Terminal or PC-Based configurator.

The IDP series has a standard 2 year warranty or an optional 5 year warranty is available.



**Foxboro Instruments-**  
**A legacy of accuracy and reliability**



## Condensed Specifications

### FUNCTIONAL SPECIFICATIONS

#### Span Limits for IDP10 d/p Cell Transmitters

Code	kPa	psi	mbar	mmHg	mmH <sub>2</sub> O	inH <sub>2</sub> O
A (a)	0.12 and 7.5	0.018 and 1.1	1.2 and 75	0.93 and 56	12 and 750	0.5 and 30
B	0.87 and 50	0.125 and 7.2	8.7 and 500	6.5 and 375	87 and 5000	3.5 and 200
C	7 and 210	1 and 30	70 and 2100	50 and 1500	700 and 21 000	28 and 840
Code	MPa	psi	bar or kg/cm <sup>2</sup>	mHg	mH <sub>2</sub> O	ftH <sub>2</sub> O
D	0.07 and 2.1	10 and 300	0.7 and 21	0.5 and 15	7 and 210	23 and 690
E (b)	0.7 and 21(b)	100 and 3000 (b)	7 and 210 (b)	5 and 150 (b)	70 and 2100 (b)	230 and 6900 (b)

(a) Span Limit Code "A" not available when pressure seals are selected.

(b) When certain options are specified, the upper span and range limits are reduced as shown in the "Options Impact" table below.

#### Range Limits for IDP10 d/p Cell Transmitters (a)

Code	kPa	psi	mbar	mmHg	mmH <sub>2</sub> O	inH <sub>2</sub> O
A (b)	-7.5 and +7.5	-1.1 and +1.1	-75 and +75	-56 and +56	-750 and +750	-30 and +30
B	-50 and +50	-7.2 and +7.2	-500 and +500	-375 and +375	-5000 and +5000	-200 and +200
C	-210 and +210	-30 and +30	-2100 and +2100	-150 and +150	-21 000 and +21 000	-840 and +840
Code	MPa	psi	bar or kg/cm <sup>2</sup>	mHg	mH <sub>2</sub> O	ftH <sub>2</sub> O
D	-0.21 and +2.1	-30 and +300	-2.1 and +21	-1.5 and +15	-21 and +210	-69 and +690
E (c)	-0.21 and 21 (c)	-30 and +3000 (c)	-2.1 and +210 (c)	-1.5 and +150 (c)	-21 and +2100 (c)	-69 and +6900 (c)

(a) Positive values indicate HI side of sensor at the high pressure, and negative values indicate LO side of sensor at the high pressure.

(b) Span Limit Code "A" not available when pressure seals are selected.

(c) When certain options are specified, the upper span and range limits are reduced as shown in the "Options Impact" table below.

#### Impact of Certain Options on Span and Range Limits (a)

Option	Description (Also see Model Code)	Span and Range Limits Derated to:
-B3	B7M Bolts and Nuts (NACE)	20 MPa (2900 psi, 200 bar, or kg/cm <sup>2</sup> )
-D1	DIN Construction	16 MPa (2320 psi, 160 bar or kg/cm <sup>2</sup> )
-D5 or -B1	DIN Construction or 316 ss Bolting	15 MPa (2175 psi, 150 bar or kg/cm <sup>2</sup> )
-D2, -D4, -D6, or -D8 (a)	DIN Construction (a)	10 MPa (1500 psi, 100 bar or kg/cm <sup>2</sup> ) (a)

(a) Refer to Model Code section for application and restrictions related to the items listed in the table.

#### Maximum Static and Proof Pressure Ratings for IDP10 d/p Cell Transmitters (a)

Transmitter Configuration (See Model Code for Description of Options)	Static Pressure Rating			Proof Pressure Rating (b)		
	MPa	psi	bar or kg/cm <sup>2</sup>	MPa	psi	bar or kg/cm <sup>2</sup>
With Option -D9 or -Y	40	5800	400	100	14500	1000
Standard or with Option -B2, -D3, or -D7	25	3625	250	100	14500	1000
With Option -B3	20	2900	200	70	11150	700
With Option -D1	16	2320	160	64	9280	640
With Option -B1 or -D5	15	2175	150	60	8700	600
With Option -D2, -D4, -D6, or -D8	10	1500	100	40	6000	400
With Structure Codes 78 and 79 (pdf insert)	2.1	300	21	8.4	1200	84

(a) Refer to Model Code section for application and restrictions related to the items listed in the table.

(b) Proof pressure ratings meet ANSI/ISA® Standard S82.03-1988. Unit may become nonfunctional after application of proof pressure.

### Output Signal

4 to 20 mA, Linear or square root (configurable)

### Field Wiring Reversal

No transmitter damage

### Supply Voltage Requirements and External Loop Load Limitations

Minimum supply voltage is 11.5 V dc. This can be reduced to 11 V dc using a plug-in jumper in the field wiring compartment terminal block.

### Suppressed Zero and Elevated Zero

Suppressed or elevated zero ranges are acceptable as long as the Span and Range Limits are not exceeded.

### Square Root Low Flow Cutoff

User configurable to provide:

- Cutoff to zero at flows <10% of maximum flow (1% of maximum differential pressure).
- Or active point-to-point line between zero and 20% of maximum flow (4% of maximum differential pressure).

### Zero and Span Adjustments (See Figure 8)

Zero and span adjustments can be accomplished using the pushbuttons on the LCD indicator.

### Optional External Zero Adjustment (See Figure 8)

An external zero pushbutton mechanism is isolated from the electronics compartment and magnetically activates an internal reed switch through the housing. This eliminates a potential leak path for moisture or contaminants to get into the electronics compartment. The external zero adjustment can be disabled by a configuration selection.

### Write Protect Jumper

Can be positioned to lock out all configurators from making database changes. This makes transmitter suitable for Safety Shutdown System Applications.

### Adjustable Damping

Transmitter response time is normally 0.75 s, or the electronically adjustable setting of 0 (none), 2, 4, or 8 seconds, whichever is greater, for a 90% recovery from an 80% input step per ANSI/ISA S51.1. (For 63.2% recovery, 0.5 s with sensors B to E, and 0.6 s with sensor A.)

### Standard LCD Indicator with On-Board Pushbuttons (Figure 8) Provides:

- Two lines; four numeric characters on top line, and seven alphanumeric characters on bottom line.
- Measurement Readout; value on top line and units label on bottom line.
- Configuration and Calibration Prompts.

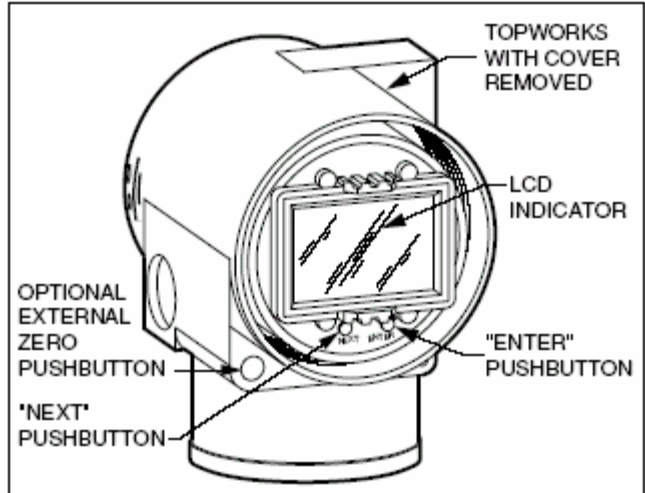


Figure 8. Standard LCD Indicator with Pushbuttons

### Accuracy (includes Linearity, Hysteresis, and Repeatability)

±0.20% of Span

### Small Span Accuracy for Spans <5% and <6.7% of URL

See Table 4 below.

Table 4. Accuracy with Small Spans

For Span Code	If Span is:	Then Small Span Accuracy in % of Span is:
B	<5% of URL	$\pm \left[ (0.10) + (0.005) \left( \frac{URL}{Span} \right) \right]$
A, C, D, E	<6.7% of URL	$\pm \left[ (0.10) + (0.0067) \left( \frac{URL}{Span} \right) \right]$

### Stability

Long term drift is less than ±0.05% of URL per year over a 5-year period.

## MODEL CODE

<b>Description</b>			<b>Model</b>
I/A Series, Electronic d/p Cell Transmitter for Differential Pressure Measurement			IDP10
<b>Electronics Versions and Output Signal</b>			
Analog; 4 to 20 mA dc (Version -A)			-A
<b>Structure Code</b>			
<b>Select if Transmitter Only (Pressure Seals are NOT Required)</b>			
<b>Hi-Side Cover</b>	<b>Sensor Material</b>	<b>Fill Fluid</b>	
Steel	Co-Ni-Cr	Silicone	10
Steel	Co-Ni-Cr	Fluorinert <sup>®</sup>	11
Steel	316L ss	Silicone	12
Steel	316L ss	Fluorinert	13
Steel	Hastelloy C <sup>®</sup>	Silicone	16
Steel	Hastelloy C	Fluorinert	17
316 ss	Co-Ni-Cr	Silicone	20
316 ss	Co-Ni-Cr	Fluorinert	21
316 ss	316L ss	Silicone	22
316 ss	316L ss	Fluorinert	23
316 ss	316L ss, Gold Plated	Silicone	2G
316 ss	Monel <sup>®</sup>	Silicone	24
316 ss	Monel	Fluorinert	25
316 ss	Hastelloy C	Silicone	26
316 ss	Hastelloy C	Fluorinert	27
Monel	Monel	Silicone	34
Monel	Monel	Fluorinert	35
Hastelloy C	Hastelloy C	Silicone	46
Hastelloy C	Hastelloy C	Fluorinert	47
Hastelloy C	Tantalum	Silicone	48
Hastelloy C	Tantalum	Fluorinert	49
pvdf Insert (Kynar <sup>®</sup> )	Tantalum	Silicone (Used w/Process Connector Type 7)	78 (a)
pvdf Insert (Kynar)	Tantalum	Fluorinert (Used w/Process Connector Type 7)	79 (a)
<b>Select only if Foxboro Installed Remote Mount Seal(s) IS/ARE Required (b)</b>			
<b>Seal Quantity and Orientation</b>		<b>Fill Fluid</b>	
Remote Seals on Both HI and LO Sides		Silicone	S1 (c)
Remote Seals on Both HI and LO Sides		Fluorinert	S2 (c)
Remote Seal HI Side, 1/2 NPT Connector LO Side		Silicone	S3 (c)
Remote Seal HI Side, 1/2 NPT Connector LO Side		Fluorinert	S4 (c)
Remote Seal LO Side, 1/2 NPT Connector HI Side		Silicone	S5 (c)
Remote Seal LO Side, 1/2 NPT Connector HI Side		Fluorinert	S6 (c)
<b>Select Only if Foxboro Installed Direct Connect Seal IS Required (b)</b>			
<b>Seal Quantity and Orientation, and Sensor Fill Fluid</b>			
Direct Connect Seal on HI Side; 1/2 NPT Process Connector LO Side; Silicone Fill			F1 (d)
Direct Connect Seal on HI Side; 1/2 NPT Process Connector LO Side; Fluorinert Fill			F2 (d)
Direct Connect Seal on HI Side; Remote Seal with Capillary LO Side; Silicone Fill			F3 (d)
Direct Connect Seal on HI Side; Remote Seal with Capillary LO Side; Fluorinert Fill			F4 (d)
<b>Select Only if Other Seals are used - Do not specify Foxboro Model Coded Seals</b>			
Remote Seal(s), HI, LO, or Both Sides, Silicone or Fluorinert Fill in Sensor			SA to SF
<b>Span Limits (Differential Pressure Units)</b>			
<b>kPa</b>	<b>inH<sub>2</sub>O</b>	<b>mbar</b>	
0.12 and 7.5	0.5 and 30	1.2 and 75	A (e)
0.87 and 50	3.5 and 200	8.7 and 500	B
7 and 210	28 and 840	70 and 2100	C
<b>MPa</b>	<b>psi</b>	<b>bar or kg/cm<sup>2</sup></b>	
0.07 and 2.1	10 and 300	0.7 and 21	D
0.7 and 21	100 and 3000	7 and 210	E (f)

Model Code continued on next page

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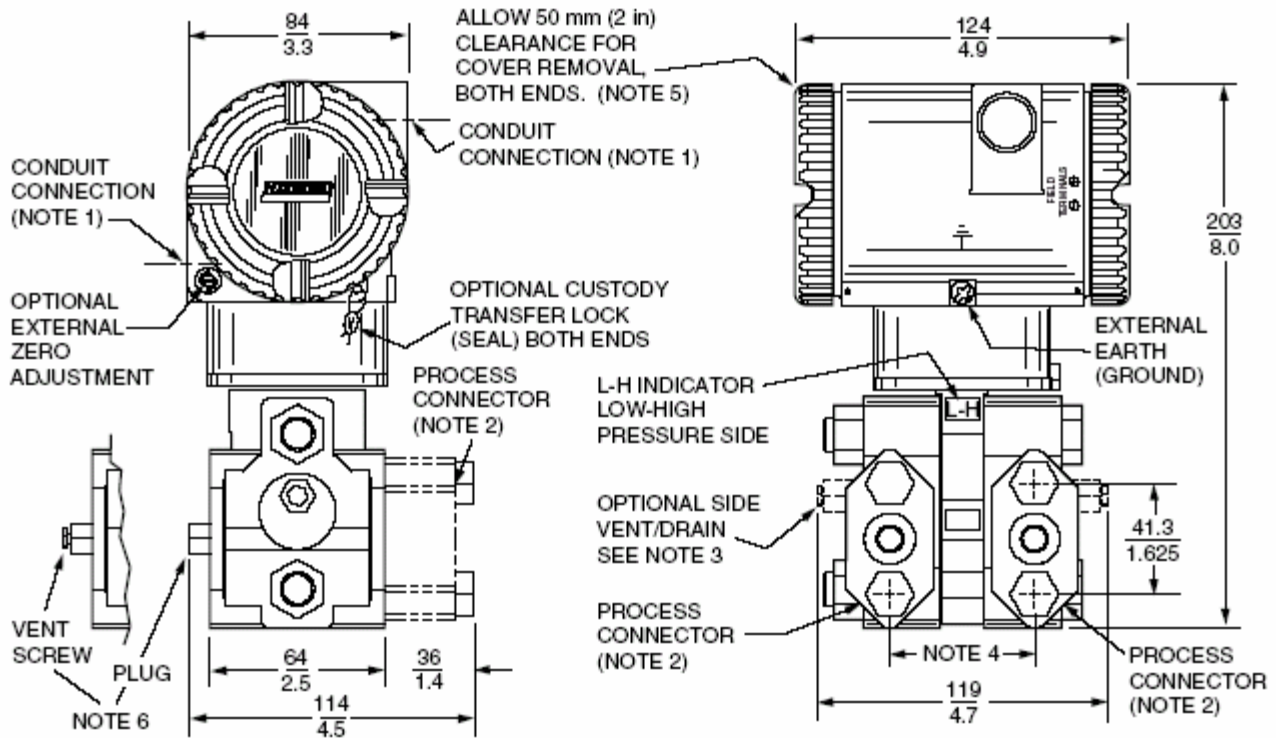
**MODEL CODE (Continued)**

<b>Process Connector Type (Material Same as Process Cover Material) (g)</b>	
See below:	0
<ul style="list-style-type: none"> <li>• For d/p: No connectors; both covers tapped for 1/4 NPT (316 ss only, no side vents)</li> <li>• Flange Mount Hi Side: 1/2 NPT, 316 ss Process Connector on Lo Side (F1 and F2 only)</li> <li>• Flange Mount Hi Side: No connectors; both sides prepared for seals (F3 and F4 only)</li> <li>• Two Remote Seals: No connectors; both covers tapped for capillary connection (S1 and S2 only)</li> <li>• One Remote Seal: 1/2 NPT, 316 ss Process Connector on Side Opposite Seal (S3 to S6 only)</li> </ul>	
1/4 NPT, Not with Hastelloy C Material, Structure Codes 78 or 79, or pressure seals	1
1/2 NPT, Not with Structure Codes 78 or 79, or pressure seals	2
Rc 1/4, Not with Hastelloy C Material, Structure Codes 78 or 79, or pressure seals	3
Rc 1/2, Not with Structure Codes 78 or 79, or pressure seals	4
1/2 Schedule 80 Welding Neck, Not with Hastelloy C Material, Structure Codes 78 or 79, or pressure seals	6
None; pvdf Insert tapped for 1/2 NPT/Process Inlet on Side of 316 ss Process Covers (only with 78/79 above)	7
<b>Conduit Connection and Housing Material</b>	
1/2 NPT, Aluminum Housing	1
PG 13.5, Aluminum Housing (Available with Electrical Safety Code D only)	2
1/2 NPT, 316 ss Housing	3
PG 13.5, 316 ss Housing (Available with Electrical Safety Code D only)	4
<b>Electrical Safety</b>	
ATEX II 2 G, EEx d IIC	D
CSA® Certified d and Division 2	C
FM Approved d and n	F
SAA Certified Ex, d, IIC, Zone 1	A
SAA Certified Ex n IIC, Zone 2	K
<b>Optional Selections</b>	
Refer to Optional Selections below.	
<b>Mounting Bracket Set</b>	
Painted Steel Bracket with Plated Steel Bolts	-M1 (h)
Stainless Steel Bracket with Stainless Steel Bolts	-M2 (h)
<b>Solid (Blind) Cover over Standard Indicator</b>	
Cover over Standard Indicator	-L2
<b>DIN 19213 Construction used with Process Connector Code "0" and 316 ss Covers Only (i)</b>	
Single Ended Process Cover with M10, B7 Steel Bolting	-D1 (j)
Double Ended Process Cover with M10, B7 Steel Bolting (Blind Kidney Flange on Back) (k)(l)	-D2 (j)
Single Ended Process Cover with 7/16 in, B7 Steel Bolting	-D3 (j)
Double Ended Process Cover with 7/16 in, B7 Steel Bolting (Blind Kidney Flange on Back) (k)(l)	-D4 (j)
Single Ended Process Cover with 7/16 in, 316 ss Bolting	-D5 (j)
Double Ended Process Cover with 7/16 in, 316 ss Bolting (Blind Kidney Flange on Back) (k)(l)	-D6 (j)
Single Ended Process Cover with 7/16 in, 17-4 ss Bolting	-D7 (j)
Double Ended Process Cover with 7/16 in, 17-4 ss Bolting (Blind Kidney Flange on Back) (k)(l)	-D8 (j)
Single Ended Process Cover with 7/16 in, 17-4 ss Bolting; Rated 400 bar, 5800 psi, 40 MPa (Not available with Span Codes A, D, or E; or Option Codes -B1, -B2, -B3, -V, or -Y)	-D9
<b>Cleaning and Preparation - Not Available with Gold-Plated Sensor, Structure 2G</b>	
Unit Degreased - for Silicone Filled Sensors Only (Not for Oxygen/Chlorine/Other Fluids that may react with Silicone)	-X1 (i)
Cleaned and Prepared for Oxygen Service - for Fluorinert Filled Sensors Only (Not Available with Carbon Steel Covers or with Silicone Filled Sensors)	-X2 (i)
Cleaned and Prepared for Chlorine Service - for Fluorinert Filled Sensors Only (m) (Not Available with Carbon Steel Covers or with Silicone Filled Sensors)	-X3 (i)
<b>Bolting for Process Covers/Connectors - Not with DIN 19213 Construction or Structure Codes 78 and 79</b>	
316 ss Bolts and Nuts (Pressure Derated; Not Available with -Y Option) (j)(n)	-B1
17-4 ss Bolts and Nuts (m)(n)	-B2
B7M Bolts and Nuts (NACE) (j)(n)	-B3
<b>Conduit Thread Adapters</b>	
Hawke-Type 1/2 NPT Cable Gland for use with Conduit Connection Codes "1" and "3" (o)	-A1
M20 Conduit Thread Adapter for use with Conduit Connection Codes "1" and "3" (o)	-A3



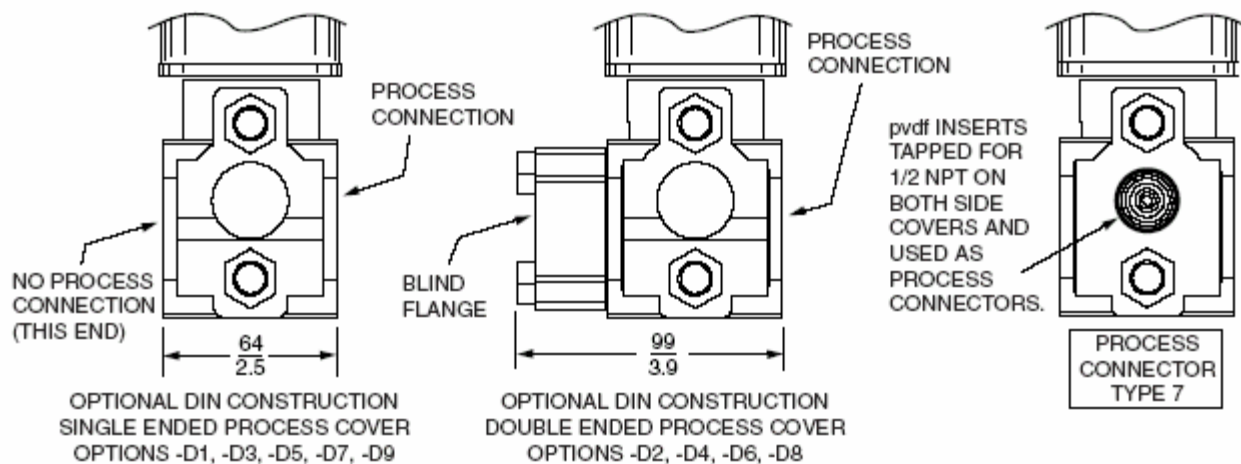
## DIMENSIONS-NOMINAL

**mm**  
**in**



**NOTES:**

1. CONDUIT CONNECTION 1/2 NPT OR PG 13.5, BOTH SIDES: PLUG UNUSED CONNECTION WITH METAL PLUG (SUPPLIED).
2. PROCESS CONNECTORS MAY BE REMOVED AND CONNECTIONS MADE DIRECTLY TO PROCESS COVER USING 1/4 NPT INTERNAL THREAD IN PROCESS COVER.
3. PROCESS COVER CAN BE INVERTED MAKING OPTIONAL SIDE VENTS OR SIDE DRAINS
4. PROCESS CONNECTORS CAN BE INVERTED TO GIVE EITHER 51, 54, OR 57 mm (2.0, 2.125, OR 2.25 in) CENTER-TO-CENTER DISTANCE BETWEEN HIGH AND LOW PRESSURE CONNECTIONS.
5. TOPWORKS CAN BE ROTATED TO ANY POSITION WITHIN ONE TURN COUNTERCLOCKWISE OF THE FULLY TIGHTENED POSITION.
6. PROCESS COVER END PLUGS ARE SUBSTITUTED FOR VENT SCREWS WHEN OPTIONAL SIDE VENTS (NOTE 3) ARE SPECIFIED.



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