

# Bourdon tube pressure gauge with switch contacts

## Stainless steel case, NS 40 [1 1/2"], 50 [2"] and 63 [2 1/2"]

### Models PGS21.040, PGS21.050 and PGS21.063

WIKA data sheet PV 21.02



for further approvals,  
see page 7

## switchGAUGE

### Applications

- Display and monitoring of vessel pressure and for alerting the loss of contents from the vessel
- General industrial applications
- Machine building and general plant construction

### Special features

- High switching reliability and long service life
- Switch contacts fixed to customer requirements
- Increased ingress protection, IP65
- Scale ranges from 0 ... 2.5 to 0 ... 400 bar  
[0 ... 60 to 0 ... 6,000 psi]



Bourdon tube pressure gauge model PGS21

## Description

The model PGS21 switchGAUGE is a combination of a Bourdon tube pressure gauge and a pressure switch. It offers the usual analogue display, which can be read on-site irrespective of the power supply, and in addition the possibility to switch a potential-free electrical signal.

One or two switch points are factory-set to customer requirements, fixed between 10 and 90 % of the scale range, and indicated on the dial by red mark pointers. Depending on the pointer position, the circuit will be opened or closed. Thus the switchGAUGE can be used actively for process monitoring, for example to monitor the level of a gas cylinder or a hydraulic circuit.

The switchGAUGE is available in scale ranges from 0 ... 2.5 to 0 ... 400 bar [0 ... 60 bis 0 ... 6,000 psi] with an accuracy class of 2.5 and a 1 m round cable for the electrical connection. There are further versions available, e.g. with higher accuracy class, a different cable length or with plug connection. Thus, the instrument can be adapted to customer-specific requirements for each application.

The instrument has been designed in accordance with EN 837-1 and fulfils all the requirements within it. Furthermore it features increased ingress protection of IP65 and can therefore be offered with optional liquid filling to increase its vibration resistance.

## Specifications

Basic information	
<b>Standard</b>	
Bourdon tube pressure gauges	EN 837-1
Pressure gauges with electrical limit contact devices	DIN 16085
→ For information on the "Selection, installation, handling and operation of pressure gauges", see Technical information IN 00.05.	
<b>Nominal size (NS)</b>	<ul style="list-style-type: none"><li>■ Ø 40 mm [1 ½"]</li><li>■ Ø 50 mm [2"]</li><li>■ Ø 63 mm [2 ½"]</li></ul>
<b>Window</b>	Polycarbonate (PC)
<b>Case</b>	
Design	Safety level "S1" per EN 837-1: With blow-out device
Material	Stainless steel 1.4301 (304)
<b>Movement</b>	Copper alloy

Measuring element	
<b>Type of measuring element</b>	Bourdon tube, C-type or helical type
<b>Materials (wetted)</b>	Copper alloy
<b>Leak tightness</b>	Helium tested, leakage rate: $< 5 \cdot 10^{-5}$ mbar l/s

Accuracy specifications	
<b>Accuracy class</b>	<ul style="list-style-type: none"><li>■ 2.5</li><li>■ 1.6</li></ul>
<b>Temperature error</b>	On deviation from the reference conditions at the measuring system: $\leq \pm 0.4 \%$ /10 K of respective full scale value
<b>Reference conditions</b>	
Ambient temperature	+20 °C

## Scale ranges

bar	
0 ... 2.5	0 ... 60
0 ... 4	0 ... 100
0 ... 6	0 ... 160
0 ... 10	0 ... 250
0 ... 16	0 ... 315
0 ... 25	0 ... 400
0 ... 40	

psi	
0 ... 60	0 ... 1,000
0 ... 100	0 ... 1,500
0 ... 160	0 ... 2,000
0 ... 200	0 ... 3,000
0 ... 300	0 ... 4,000
0 ... 400	0 ... 5,000
0 ... 600	0 ... 6,000
0 ... 800	

kPa	
0 ... 250	0 ... 4,000
0 ... 400	0 ... 6,000
0 ... 600	0 ... 10,000
0 ... 1,000	0 ... 16,000
0 ... 1,600	0 ... 25,000
0 ... 2,500	0 ... 40,000

kg/cm <sup>2</sup>	
0 ... 2.5	0 ... 40
0 ... 4	0 ... 60
0 ... 6	0 ... 100
0 ... 10	0 ... 160
0 ... 16	0 ... 250
0 ... 25	0 ... 400

MPa	
0 ... 0.25	0 ... 4
0 ... 0.4	0 ... 6
0 ... 0.6	0 ... 10
0 ... 1	0 ... 16
0 ... 1.6	0 ... 25
0 ... 2.5	0 ... 40

## Vacuum and +/- scale ranges

bar	
-0.6 ... 0	-1 ... +5
-1 ... 0	-1 ... +9
-1 ... +0.6	-1 ... +15
-1 ... +1.5	-1 ... +24
-1 ... +3	

psi	
-30 inHg ... 0	-30 inHg ... +100
-30 inHg ... +15	-30 inHg ... +160
-30 inHg ... +30	-30 inHg ... +200
-30 inHg ... +60	-30 inHg ... +300

kPa	
-60 ... 0	-100 ... +500
-100 ... 0	-100 ... +900
-100 ... +60	-100 ... +1,500
-100 ... +150	-100 ... +2,400
-100 ... +300	

MPa	
-0.06 ... 0	-0.1 ... +0.5
-0.1 ... 0	-0.1 ... +0.9
-0.1 ... +0.06	-0.1 ... +1.5
-0.1 ... +0.15	-0.1 ... +2.4
-0.1 ... +0.3	






Other scale ranges on request

Further details on: Scale ranges		
<b>Unit</b>	<ul style="list-style-type: none"> <li>■ bar</li> <li>■ psi</li> <li>■ kg/cm<sup>2</sup></li> <li>■ MPa</li> <li>■ kPa</li> </ul>	
	Other units on request	
<b>Dial</b>		
Scale layout	<ul style="list-style-type: none"> <li>■ Single scale</li> <li>■ Dual scale</li> </ul>	
Scale colour	Single scale	Black
	Dual scale	Black/red
Material	Aluminium	
Customer-specific version	Other scales, e.g. with red mark, circular arcs or circular sectors, on request	
<b>Instrument pointer</b>	Plastic, black	
<b>Set pointer</b>	Plastic, red	

Process connection	
<b>Standard</b>	<ul style="list-style-type: none"> <li>■ EN 837</li> <li>■ ANSI/B1.20.1</li> <li>■ ISO 7</li> </ul>
<b>Size</b>	
EN 837-1	<ul style="list-style-type: none"> <li>■ G 1/8 B, male thread</li> <li>■ G 1/4 B, male thread</li> <li>■ M10 x 1, male thread</li> </ul>
ANSI/B1.20.1	<ul style="list-style-type: none"> <li>■ 1/8 NPT, male thread</li> <li>■ 1/4 NPT, male thread</li> </ul>
ISO 7	<ul style="list-style-type: none"> <li>■ R 1/8, male thread</li> <li>■ R 1/4, male thread</li> </ul>
<b>Materials (wetted)</b>	
Measuring element	Copper alloy
Process connection with lower measuring flange	Copper alloy

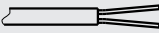
Other process connections on request


Output signal: Magnetic snap-action contact	
<b>Type of contact</b>	Magnetic snap-action contact
<b>Number of switch contacts</b>	
NS 40 [1 ½"], NS 63 [2 ½"]	1 contact
NS 50 [2"]	<ul style="list-style-type: none"> <li>■ 1 contact</li> <li>■ 2 contacts</li> </ul>
<b>Switching function</b>	→ See table "Switching function"
<b>Switch point setting</b>	Set pointer factory-set, fixed within scale range
<b>Setting range (recommended)</b>	10 ... 90 % of span (0 ... 100 % on request)
<b>Distance between switch points</b>	With a version with 2 contacts, these must not be set to the same point. The required offset is approx. 15 % of the span.
<b>Switching current</b>	5 ... 100 mA
<b>Switching voltage</b>	DC / AC 4.5 ... 24 V
<b>Switching power</b>	≤ 2.4 W

Switching function	Index	Symbol	Setting direction	Code
<b>1 normally open (NO)</b>	1		Contact makes with clockwise pointer motion	1
			Contact makes with anticlockwise pointer motion	5
<b>1 normally closed (NC)</b>	2		Contact breaks with clockwise pointer motion	2
			Contact breaks with anticlockwise pointer motion	4
<b>1 normally open + 1 normally closed</b>	12		For setting directions of the switching functions, see NO or NC	-
<b>2 normally open</b>	11		For setting directions of the switching functions, see NO or NC	-
<b>2 normally closed</b>	22		For setting directions of the switching functions, see NO or NC	-


Electrical connection				
Connection type	IP code <sup>1)</sup>	Wire cross-section	Cable diameter	Cable material
<b>Cable outlet</b>				
Unshielded	IP67	3 x 0.14 mm <sup>2</sup>	4 mm	PUR
<b>Angular connector DIN 175301-803 C</b>				
With mating connector	IP65	To max. 0.75 mm <sup>2</sup>	4.5 ... 6 mm	-
<b>Circular connector M12 x 1 (4-pin)</b>				
Without mating connector	IP67	-	-	-
<b>Circular connector M8 x 1 (3-pin)</b>				
Without mating connector	IP67	-	-	-


1) The stated IP codes only apply when plugged in using mating connectors that have the appropriate IP code.

Cable outlet, cable ends tin-coated for soldered joints per standard IPC-WHMA-A-620A			
		1 contact	2 contacts
	U <sub>B</sub>	Red	Red
	SP1	Black	Orange
	SP2	-	Black

Circular connector M12 x 1 (4-pin) <sup>1)</sup>			
		1 contact	2 contacts
	U <sub>B</sub>	1	1
	SP1	4	4
	SP2	-	2

1) Only available for NS 40 and 50

Angular connector DIN 175301-803 C <sup>1)</sup>			
		1 contact	2 contacts
	U <sub>B</sub>	1	1
	SP1	2	2
	SP2	-	3

Circular connector M8 x 1 (3-pin) <sup>1)</sup>			
		1 contact	2 contacts
	U <sub>B</sub>	1	1
	SP1	4	4
	SP2	-	3

#### Legend


- U<sub>B</sub> Positive power supply terminal
- SP1 Normally open/normally closed for switch contact 1
- SP2 Normally open/normally closed for switch contact 2

Operating conditions	
Medium temperature range	≤ +60 °C [+140 °F]
Ambient temperature range	-20 ... +60 °C [-4 ... +140 °F]
Storage temperature range	-40 ... +70 °C [-40 ... +158 °F]
Pressure limitation	
Steady	3/4 x full scale value
Fluctuating	2/3 x full scale value
Ingress protection per IEC/EN 60529	IP65






## Other versions

- Bourdon tube pressure gauge with electronic pressure switch; model PGS25; data sheet PV 21.04
- Bourdon tube pressure gauge with switch contact, with VdS approval; models PGS21.040 and PGS21.050; data sheet SP 21.03

## Approvals

Logo	Description	Region
	<b>EU declaration of conformity</b>	European Union
	RoHS directive	
-	<b>CRN</b> Safety (e.g. electr. safety, overpressure, ...)	Canada

### Optional approvals

Logo	Description	Region
	<b>EAC</b>	Eurasian Economic Community
	EMC directive	
	Low voltage directive	
	<b>PAC Russia</b> Metrology, measurement technology	Russia
	<b>PAC Kazakhstan</b> Metrology, measurement technology	Kazakhstan
-	<b>MChS</b> Permission for commissioning	Kazakhstan
	<b>PAC Belarus</b> Metrology, measurement technology	Belarus
-	<b>PAC Ukraine</b> Metrology, measurement technology	Ukraine
	<b>PAC Uzbekistan</b> Metrology, measurement technology	Uzbekistan

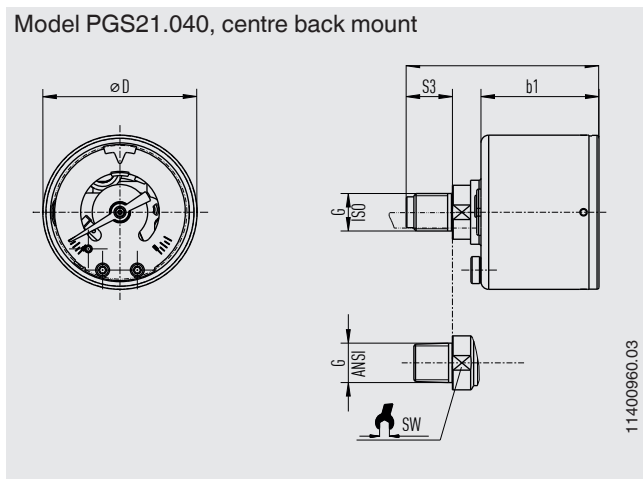
## Certificates (option)

Certificates	
<b>Certificates</b>	<ul style="list-style-type: none"> <li>■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, indication accuracy)</li> <li>■ 3.1 inspection certificate per EN 10204 (e.g. indication accuracy)</li> </ul>
<b>Recommended calibration interval</b>	1 year (dependent on conditions of use)

For approvals and certificates, see website

## Dimensions in mm [in]

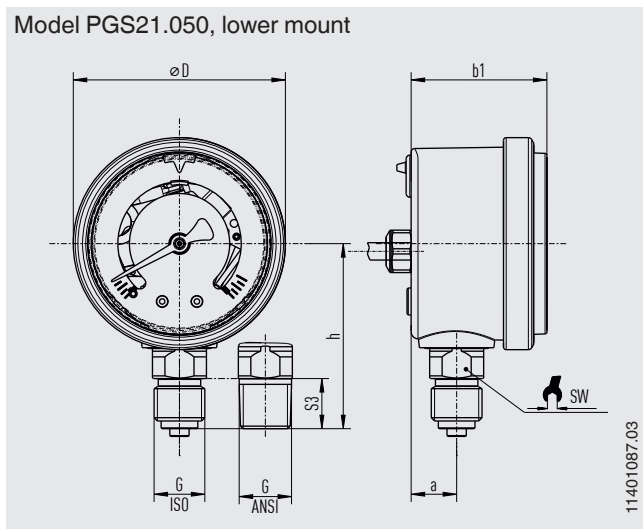
Model PGS21.040, centre back mount



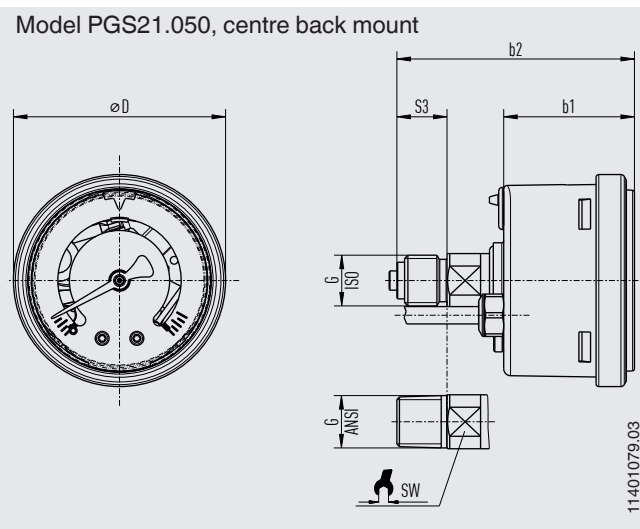
NS 40 [1 1/2"], 1 contact

G	Dimensions in mm [in]				
	D	b1 ±0.5 [±0.02]	b2 ±1 [±0.04]	S3	SW
G 1/8 B	40 [1.57]	30.5 [1.2]	53 [2.09]	12 [0.47]	14 [0.55]
G 1/4 B	40 [1.57]	30.5 [1.2]	54 [2.13]	13 [0.51]	14 [0.55]
M10 x 1	40 [1.57]	30.5 [1.2]	51.5 [2.03]	10.5 [0.41]	14 [0.55]
1/8 NPT	40 [1.57]	30.5 [1.2]	51 [2.01]	10 [0.39]	14 [0.55]
1/4 NPT	40 [1.57]	30.5 [1.2]	54 [2.13]	13 [0.51]	14 [0.55]
R 1/8	40 [1.57]	30.5 [1.2]	51 [2.01]	10 [0.39]	14 [0.55]
R 1/4	40 [1.57]	30.5 [1.2]	54 [2.13]	13 [0.51]	14 [0.55]

Model PGS21.050, lower mount



Model PGS21.050, centre back mount

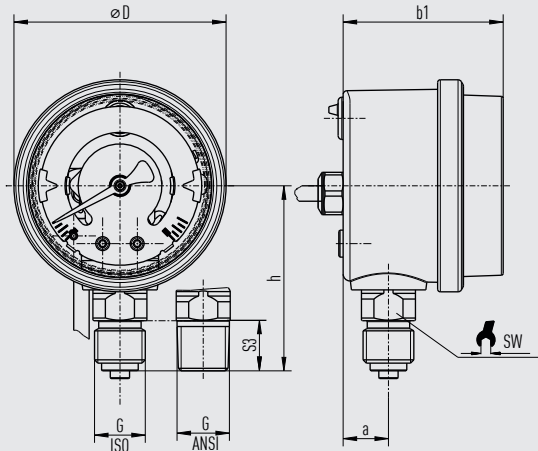


NS 50 [2"], 1 contact

G	Dimensions in mm [in]					
	D	h	b1 ±0.5 [±0.02]	b2 ±1 [±0.04]	S3	SW
G 1/8 B	55 [2.17]	49 [1.93]	35.5 [1.4]	62 [2.44]	12 [0.47]	14 [0.55]
G 1/4 B	55 [2.17]	50 [1.97]	35.5 [1.4]	63 [2.48]	13 [0.51]	14 [0.55]
M10 x 1	55 [2.17]	47.5 [1.87]	35.5 [1.4]	60.5 [2.38]	10.5 [0.41]	14 [0.55]
1/8 NPT	55 [2.17]	47 1.85	35.5 [1.4]	60 [2.36]	10 [0.39]	14 [0.55]
1/4 NPT	55 [2.17]	50 [1.97]	35.5 [1.4]	63 [2.48]	13 [0.51]	14 [0.55]
R 1/8	55 [2.17]	47 1.85	35.5 [1.4]	60 [2.36]	10 [0.39]	14 [0.55]
R 1/4	55 [2.17]	50 [1.97]	35.5 [1.4]	63 [2.48]	13 [0.51]	14 [0.55]

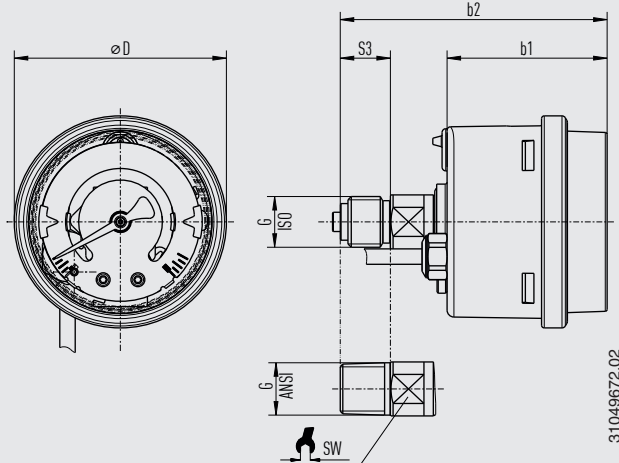


Model PGS21.050, lower mount



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Model PGS21.050, centre back mount

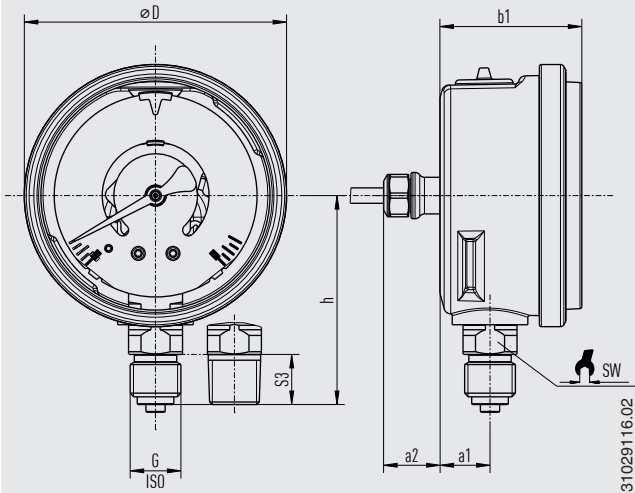


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NS 50 [2"], 2 contacts

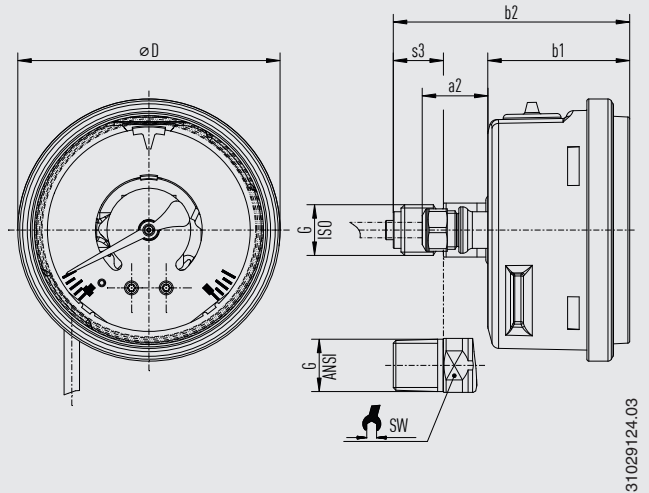
G	Dimensions in mm [in]					
	D	h	b1 ±0.5 [±0.02]	b2 ±1 [±0.04]	S3	SW
G ½ B	55 [2.17]	49 [1.93]	41.5 [1.63]	70.5 [2.76]	12 [0.47]	14 [0.55]
G ¼ B	55 [2.17]	50 [1.97]	41.5 [1.63]	71.5 [2.82]	13 [0.51]	14 [0.55]
M10 x 1	55 [2.17]	47.5 [1.87]	41.5 [1.63]	69 [2.72]	10.5 [0.41]	14 [0.55]
½ NPT	55 [2.17]	47 [1.85]	41.5 [1.63]	68.5 [2.7]	10 [0.39]	14 [0.55]
¼ NPT	55 [2.17]	50 [1.97]	41.5 [1.63]	71.5 [2.82]	13 [0.51]	14 [0.55]
R ½	55 [2.17]	47 [1.85]	41.5 [1.63]	68.5 [2.7]	10 [0.39]	14 [0.55]
R ¼	55 [2.17]	50 [1.97]	41.5 [1.63]	71.5 [2.82]	13 [0.51]	14 [0.55]

Model PGS21.063, lower mount



31029116.02

Model PGS21.063, centre back mount




31029124.03

NS 63 [2 ½"], 1 contact

G	Dimensions in mm [in]						
	D	h	b1 ±0.5 [±0.02]	b2 ±1 [±0.04]	S3	a2	SW
G ½ B	68 [2.68]	53.2 [2.09]	36.8 [1.45]	60.3 [2.37]	12 [0.47]	~ 17 [0.67]	14 [0.55]
G ¼ B	68 [2.68]	54.2 [2.13]	36.8 [1.45]	61.3 [2.41]	13 [0.51]	~ 17 [0.67]	14 [0.55]
M10 x 1	68 [2.68]	51.7 [2.03]	36.8 [1.45]	58.8 [2.15]	10.5 [0.41]	~ 17 [0.67]	14 [0.55]
½ NPT	68 [2.68]	51.2 [2.02]	36.8 [1.45]	58.3 [2.30]	10 [0.39]	~ 17 [0.67]	14 [0.55]
¼ NPT	68 [2.68]	54.2 [2.13]	36.8 [1.45]	61.3 [2.41]	13 [0.51]	~ 17 [0.67]	14 [0.55]
R ½	68 [2.68]	51.2 [2.02]	36.8 [1.45]	58.3 [2.30]	10 [0.39]	~ 17 [0.67]	14 [0.55]
R ¼	68 [2.68]	54.2 [2.13]	36.8 [1.45]	61.3 [2.41]	13 [0.51]	~ 17 [0.67]	14 [0.55]

## Accessories and spare parts

Model	Description
	<b>910.17</b> Sealings → See data sheet AC 09.08
	<b>910.15</b> Syphons → See data sheet AC 09.06
	<b>910.13</b> Overpressure protector → See data sheet AC 09.04
	<b>IV10, IV11</b> Needle valve and multiport valve → See data sheet AC 09.22
	<b>IV20, IV21</b> Block-and-bleed valve → See data sheet AC 09.19

### Ordering information

Model / Nominal size / Contact model / Contact version / Scale range / Connection location / Process connection / Options

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