

Bimetal thermometer

Process version per EN 13190

Model TG54

WIKA data sheet TM 54.02



for further approvals
see page 11

Applications

- General process instrumentation in the chemical and petrochemical industries, oil and gas industries, power generation and water/wastewater industries
- Temperature measurement in harsh and aggressive environments
- Suitable for applications with high vibrations

Special features

- Nominal sizes 63, 80, 100, 160 mm
- Robust, hermetically sealed case
- External reset for reference temperature adjustment
- Dished dial (anti-parallax) for ease of reading
- Adjustable stem and dial version enables optimal process connection



Fig. left: Back mount (axial)

Fig. right: Back mount, adjustable stem and dial

Description

The model TG54 bimetal thermometer has been developed and is manufactured in accordance with the EN 13190 standard. The thermometer meets the high requirements of the process industries.

Especially in the chemical and petrochemical, oil and gas, power engineering and shipbuilding industries, the temperature measuring instrument manufactured from stainless steel is used successfully. The robust, hermetically sealed case with IP65 ingress protection enables use with harsh external conditions and high vibration.

With a count of four different nominal sizes, an optimal matching to the available space and mounting conditions is possible.

At an easily accessible point on the back of the case, the zero point can be easily corrected.

The model TG54 satisfies the high requirements for resistance against aggressive media. As an option, the case, the stem and the process connection can be made from 316L.

Specifications

Bimetal thermometer, model TG54			
Measuring element	Bimetal coil		
Nominal size in mm	<ul style="list-style-type: none"> ■ 63 ■ 80 ■ 100 ■ 160 		
Connection location	<ul style="list-style-type: none"> ■ Back mount (axial) ■ Lower mount (radial) ■ Back mount, adjustable stem and dial 		
Unit (scale range)	<ul style="list-style-type: none"> ■ °C ■ °F Option: <ul style="list-style-type: none"> ■ °C/°F (dual scale) ■ °F/°C (dual scale) 		
Process connection	<ul style="list-style-type: none"> ■ Plain, without thread ■ G ½ B ■ ½ NPT ■ G ½ B female ■ ½ NPT female ■ M20 x 1.5 ■ M24 x 1.5 female others on request 		
Accuracy class	Class 1 per EN 13190		
Working range			
Continuous load (1 year)	Measuring range (EN 13190)		
Short time (max. 24 h)	Scale range (EN 13190)		
Stem diameter	<ul style="list-style-type: none"> ■ 6 mm ■ 8 mm 		
Insertion length L ₁	63 ... 1,000 mm Minimum/maximum length is dependent on the measuring range and diameter (see tables from page 5 and 6)		
Window	Instrument glass Option: <ul style="list-style-type: none"> ■ Laminated safety glass ■ Polycarbonate (shatterproof) 		
Damping	Without Option: With silicone oil case filling, up to max. 250 °C (at the probe)		
Versions (option)	<ul style="list-style-type: none"> ■ Oil and grease free version ■ Silicon oil free version 		
Materials			
Case, ring	Stainless steel 304 (option: stainless steel 316L)		
Stem, process connection (wetted)	Stainless steel 304 (option: stainless steel 316L)		
Elbow behind the case	Stainless steel 304 (option: stainless steel 316L), only with lower mount		
Dial	Aluminium, white, black lettering		
Pointer	Aluminium, black, adjustable pointer		
Ingress protection IEC/EN 60529	IP65 Option: <ul style="list-style-type: none"> ■ IP66 ■ IP67 ■ IP68 (continuous immersion up to 5 m) 		
Permissible ambient temperature at case	unfilled	filled	Option
Instrument glass	-40 ... +100 °C ¹⁾	-40 ... +70 °C	-50 ... +70 °C
Laminated and polycarbonate window	-40 ... +70 °C ¹⁾	-40 ... +70 °C	-50 ... +70 °C
Permissible operating pressure at the stem	max. 25 bar, static		

1) For ambient temperatures < 0 °C the measuring system and the window may fog up and possibly ice over.

Bimetal thermometer, model TG54

Temperature limits for storage and transport

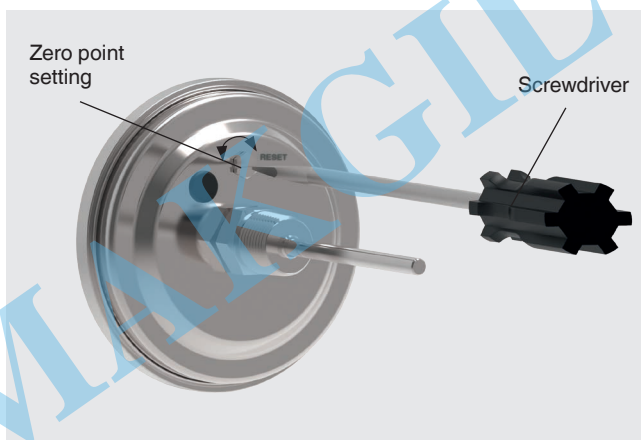
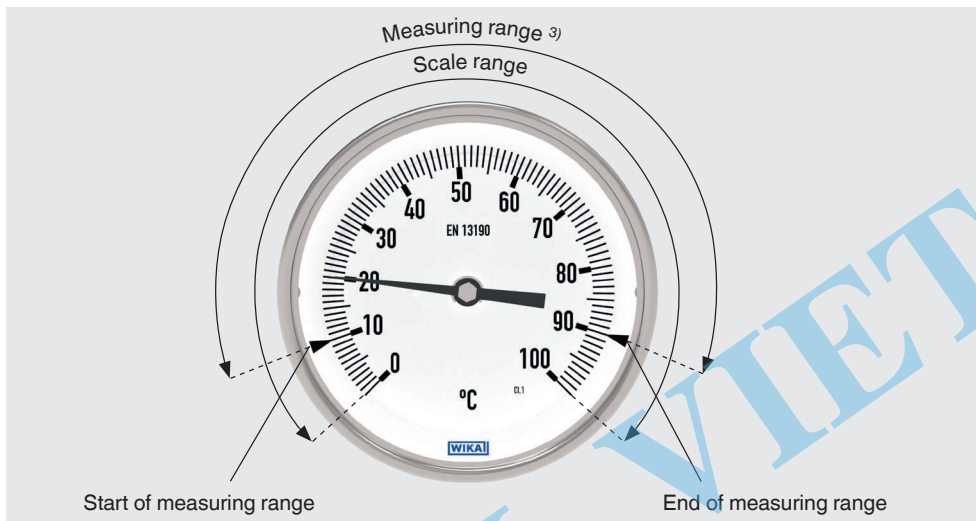
Without liquid damping	-50 ... +70 °C
With liquid damping	-40 ... +70 °C

Overtemperature stability ²⁾

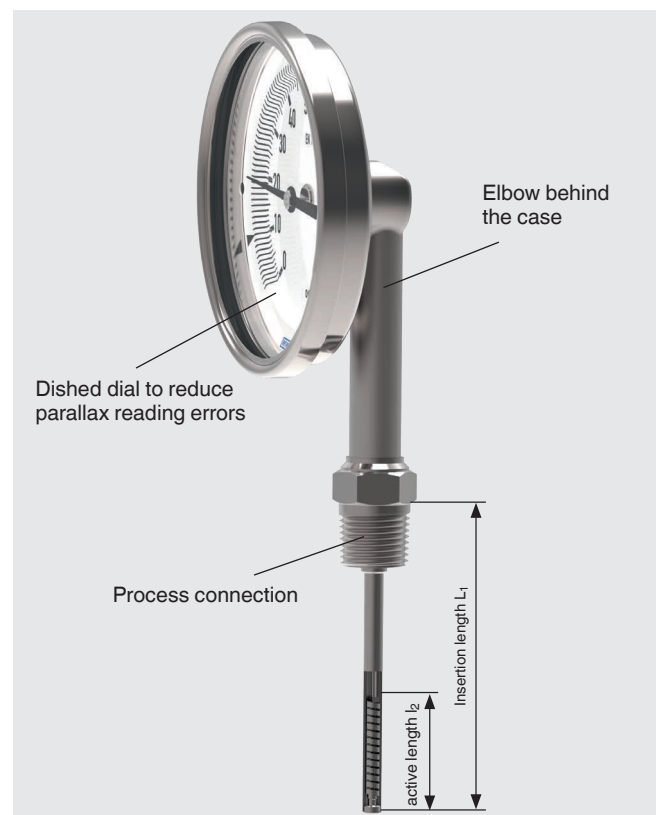
Scale range -70 ... +120 °C	100 % overload safety of scale range
Scale range 120 ... 280 °C	50 % overload safety of scale range
Scale range 280 ... 400 °C	max. 430 °C of scale range
Scale range 400 ... 600 °C	max. full scale value

2) Overtemperature stability only in non-Ex area

Detailed views



3) Only within the measuring range will the printed accuracy class (class 1 or 2) be guaranteed.



Scale and measuring ranges ¹⁾ (EN13190)

Scale graduation per WIKA standard

Scale range in °C	Measuring range ¹⁾ in °C	Scale spacing in °C	Standard
-70 ... +70	-50 ... +50	2	
-70 ... +30	-60 ... +20	1	●
-60 ... +50	-50 ... +40	1	
-50 ... +50	-40 ... +40	1	
-50 ... +100	-30 ... +80	2	
-50 ... +200	-20 ... +170	5	
-50 ... +300	0 ... 250	5	
-50 ... +400	0 ... 350	5	
-50 ... +500	0 ... 450	10	
-40 ... +40	-30 ... +30	1	●
-40 ... +60	-30 ... +50	1	●
-40 ... +80	-20 ... +60	2	
-40 ... +160	-20 ... +140	2	
-30 ... +30	-20 ... +20	1	●
-30 ... +50	-20 ... +40	1	●
-30 ... +70	-20 ... +60	1	●
-20 ... +40	-10 ... +30	1	●
-20 ... +60	-10 ... +50	1	
-20 ... +80	-10 ... +70	1	
-20 ... +100	0 ... 80	2	
-20 ... +120	0 ... 100	2	●
-20 ... +140	0 ... 120	2	
-10 ... +50	0 ... 40	1	
0 ... 60	10 ... 50	1	●
0 ... 80	10 ... 70	1	●
0 ... 100	10 ... 90	1	●
0 ... 120	10 ... 110	2	●
0 ... 160	20 ... 140	2	●
0 ... 200	20 ... 180	2	●
0 ... 250	30 ... 220	5	●
0 ... 300	30 ... 270	5	●
0 ... 400	50 ... 350	5	
0 ... 500	50 ... 450	5	
0 ... 600	100 ... 500	5	

Scale range in °F	Measuring range ¹⁾ in °F	Scale spacing in °F	Standard
-100 ... +150	-70 ... +120	5	●
-80 ... +120	-40 ... +100	2	
-80 ... +240	-50 ... +210	5	
-40 ... +120	-20 ... +100	2	
0 ... 140	20 ... 120	2	●
0 ... 200	20 ... 180	2	
0 ... 250	30 ... 220	5	●
30 ... 300	60 ... 270	2	●
30 ... 400	80 ... 350	5	
50 ... 400	100 ... 350	5	●
100 ... 800	200 ... 700	10	
150 ... 750	200 ... 700	5	●
200 ... 1,000	300 ... 900	10	

¹⁾ The measuring range is indicated on the dial by two triangular marks. Only within this range is the stated error limit valid per EN 13190.

Minimum insertion lengths in mm

Scale range in °C

Minimum insertion length in mm						
Scale range in °C	Connection location					
	Back mount		Lower mount		Adjustable stem and dial	
	Ø 6 mm	Ø 8 mm	Ø 6 mm	Ø 8 mm	Ø 6 mm	Ø 8 mm
-70 ... +70	80	63	80	80	80	80
-70 ... +30	90	80	100	90	100	90
-60 ... +50	90	80	100	90	100	90
-50 ... +50	90	80	90	80	90	80
-50 ... +100	80	63	90	80	90	80
-50 ... +200	80	80	90	80	90	80
-50 ... +300	125	125	125	125	125	125
-50 ... +400	125	125	125	125	125	125
-50 ... +500	125	125	125	125	125	125
-40 ... +40	100	90	125	100	125	100
-40 ... +60	90	80	90	80	90	80
-40 ... +80	90	80	90	80	90	80
-40 ... +160	80	63	80	63	80	63
-30 ... +30	125	100	125	125	125	125
-30 ... +50	90	80	100	90	100	90
-30 ... +70	90	80	100	90	100	90
-20 ... +40	125	90	125	100	125	100
-20 ... +60	90	80	100	90	100	90
-20 ... +80	80	80	90	80	90	80
-20 ... +100	80	63	80	80	80	80
-20 ... +120	80	63	80	80	80	80
-20 ... +140	80	63	80	80	80	80
-10 ... +50	125	90	125	100	125	100
0 ... 60	125	90	125	100	125	100
0 ... 80	90	80	100	90	100	90
0 ... 100	80	63	100	80	100	80
0 ... 120	80	63	80	80	80	80
0 ... 160	63	63	80	63	80	63
0 ... 200	63	63	63	63	63	63
0 ... 250	80	80	90	80	90	80
0 ... 300	125	125	125	125	125	125
0 ... 400	125	125	125	125	125	125
0 ... 500	125	125	125	125	125	125
0 ... 600	125	125	125	125	125	125

Notes:

- Optionally with 2nd scale °C/°F or °F/°C
- The minimum insertion lengths of 100 and 125 mm are valid for ≤ 15 pieces per order.
For larger lot sizes (> 15 pieces), as a variation to the standard minimum insertion lengths, other lengths can be requested.

Scale range in °F

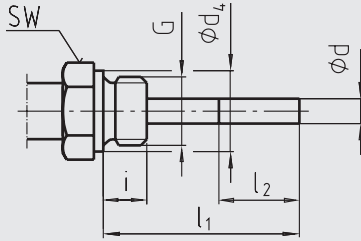
Minimum insertion length in mm						
Scale range in °F	Connection location					
	Back mount		Lower mount		Adjustable stem and dial	
	Ø 6 mm	Ø 8 mm	Ø 6 mm	Ø 8 mm	Ø 6 mm	Ø 8 mm
-100 ... +150	90	80	90	90	90	90
-80 ... +120	90	80	100	90	100	90
-80 ... +240	90	80	90	80	90	80
-40 ... +120	100	90	125	100	125	100
0 ... 140	90	80	100	90	100	90
0 ... 200	125	125	125	125	125	125
0 ... 250	80	63	80	80	80	80
30 ... 300	80	63	80	80	80	80
30 ... 400	63	63	63	63	63	63
50 ... 400	63	63	63	63	63	63
100 ... 800	125	125	125	125	125	125
150 ... 750	125	125	125	125	125	125
200 ... 1,000	125	125	125	125	125	125

Notes:

- Optionally with 2nd scale °C/°F or °F/°C
- The minimum insertion lengths of 100 and 125 mm are valid for ≤ 15 pieces per order.
For larger lot sizes (> 15 pieces), as a variation to the standard minimum insertion lengths, other lengths can be requested.

Connection designs

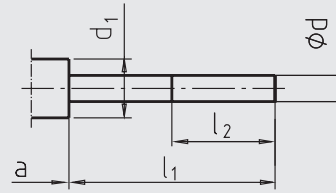
Standard design (male thread connection)



Standard insertion length $l_1 = 100, 160, 200, 250$ mm
 Recommendation: For applications with vibration on the process side

Nominal size	Process connection		Dimensions in mm		
NS	G	i	SW	d_4	$\varnothing d$
63, 80, 100, 160	G ½ B	14	27	26	6 or 8
	½ NPT	19	22	-	6 or 8

Design 1, plain stem (without thread)

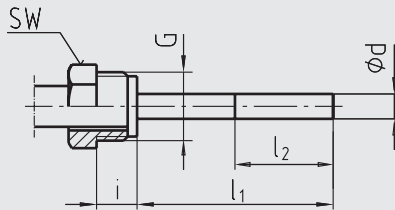


Standard insertion length $l_1 = 100, 140, 160, 200, 240, 290$ mm
 Basis for design 4, compression fitting

Nominal size	Dimensions in mm			
	d_1	$\varnothing d$	a for axial	a for adjustable stem and dial
63, 80, 100, 160	18	8	28	30

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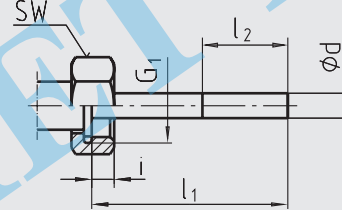
Design 2, male nut



Standard insertion length $l_1 = 140, 180, 230$ mm
 Non-sealed process connection, thus use with thermowell.

Nominal size	Process connection		Dimensions in mm	
NS	G	i	SW	$\varnothing d$
63, 80, 100, 160	G ½ B	20	27	6 or 8
	M18 x 1.5	17	22	6 or 8

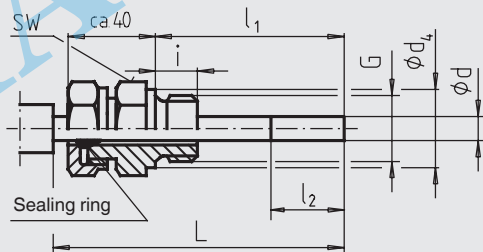
Design 3, union nut



Standard insertion length $l_1 = 126, 186, 226, 276$ mm

Nominal size	Process connection		Dimensions in mm	
NS	G	i	SW	$\varnothing d$
63, 80, 100, 160	G ½ B	8.5	27	6 or 8
	M24 x 1.5	13.5	32	6 or 8

Design 4, compression fitting (sliding on stem)



Insertion length $l_1 =$ variable
 Length $L = l_1 + 40$ mm

Nominal size	Process connection		Dimensions in mm		
NS	G	i	SW	d_4	$\varnothing d$
63, 80, 100, 160	G ½ B	14	27	26	6 or 8
	½ NPT	19	22	-	6 or 8

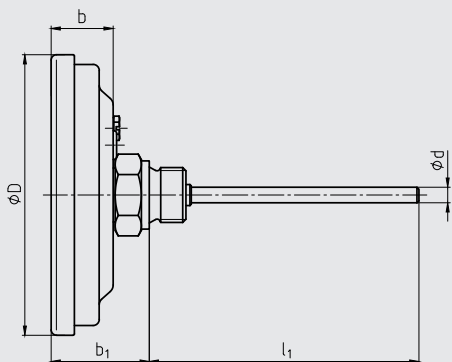
Legend:

- G Male thread
- G₁ Female thread
- i Thread length (incl. collar)
- a Distance to the case/articulated joint
- $\varnothing d_4$ Diameter of the sealing collar
- SW Spanner width
- $\varnothing d$ Stem diameter
- l_2 Active length

Dimensions in mm

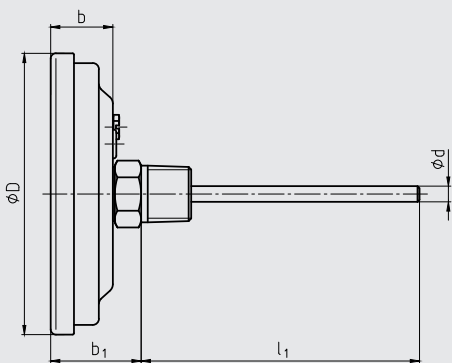
Back mount (axial)

G thread



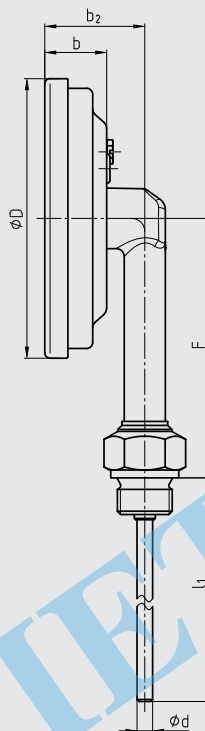
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NPT thread

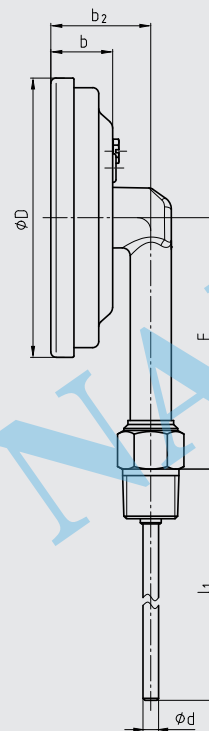


Lower mount (radial)

G thread



NPT thread

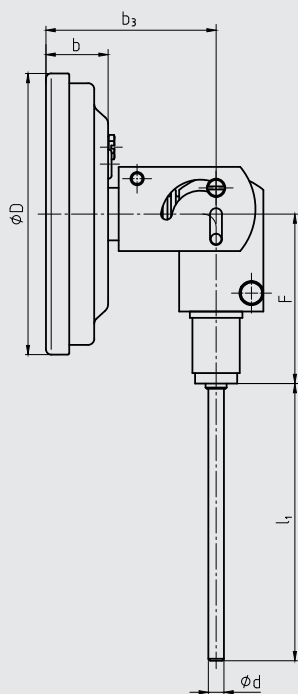


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Nominal size	Dimensions in mm								
	NS	Ø D	Ø d	b	b ₁ ¹⁾		b ₂	F	
					G thread	NPT thread		G thread	NPT thread
63	70	6 or 8	24	45	38	39	81	77	
80	83	6 or 8	23	44	37	38	88	84	
100	107	6 or 8	24	45	38	39	100	95	
160	167	6 or 8	24	45	38	39	130	125	

1) With scale ranges ≥ 0 ... 300 °C the dimensions increase by 40 mm

Back mount, adjustable stem and dial



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Nominal size	Dimensions in mm				
	Ø D	Ø d	b	b ₃	F
63	70	6 or 8	24	65	67
80	83	6 or 8	23	64	67
100	107	6 or 8	24	65	67
160	167	6 or 8	24	65	67

Thermowell

In principle, the operation of a mechanical thermometer is possible without a thermowell with low process-side loading (low pressure, low viscosity and low flow velocities).

However, in order to enable exchanging the thermometer during operation (e.g. instrument replacement or calibration) and to ensure a better protection of the measuring instrument and also the plant and the environment, it is advisable to use a thermowell from the extensive WIKA thermowell portfolio.

For further information on the wake frequency calculation, see Technical information IN 00.15.

Common thermowells for mechanical thermometers

Thermowell with flange (solid-machined), model TW10

Data sheets: TW 95.10, TW 95.11, TW 95.12



Threaded thermowell (solid-machined), model TW15

Data sheet: TW 95.15



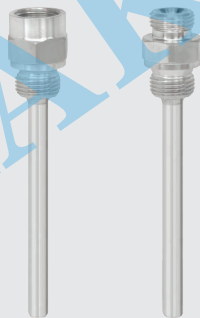
Weld-in thermowell (solid-machined), model TW25

Data sheet: TW 95.25



Threaded thermowell (fabricated), design per DIN 43772 form 5, 8, model TW45

Data sheet: TW 95.45



Threaded thermowell (solid-machined), design per DIN 43772 form 6, 7, 9, model TW50

Data sheet: TW 95.50









Thermowell, weld-in or with flange (solid-machined), design per DIN 43772 form 4, 4F, model TW55

Data sheet: TW 95.55



Special thermowells on request

Approvals

Logo	Description	Country
	EU declaration of conformity (option) ATEX directive Hazardous areas Ignition protection type "c" with instrument category 2G and 2D (marking, see instrument)	European Union
	GOST (option) Metrology, measurement technology	Russia
	KazInMetr (option) Metrology, measurement technology	Kazakhstan
-	MTSCHS (option) Permission for commissioning	Kazakhstan
	BelGIM (option) Metrology, measurement technology	Belarus
	Uzstandard (option) Metrology, measurement technology	Uzbekistan
-	CRN (option) Safety (e.g. electr. safety, overpressure, ...)	Canada
	DNV GL (option) Type approval for the shipbuilding industry - Nominal size: 63, 80, 100 mm - Damping: with liquid damping - Maximum insertion length: 500 mm Location classification: Humidity DNVGL-CG-0339, section 3, class B Salt mist DNVGL-CG-0339, section 3, class D Vibration DNVGL-CG-0339, section 3, class B Using a thermowell is absolutely necessary.	International

Certificates (option)

- 2.2 test report
- 3.1 inspection certificate with 3 test points (optionally with 5 test points)

Approvals and certificates, see website

Ordering information

Model / Nominal size / Connection location / Connection design / Unit / Scale range / Process connection / Stem diameter / Insertion length l_1 / Approvals / Certificates / Options

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