



## EAO Product Information

Series 70



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### Product Information

#### General notes

Series 70 offers users an all-bright momentary switch for use in membrane switching systems. Now for the first time the multi-6 LED permits exceedingly bright illumination of the complete touch surface in 4 colours in either a round or square configuration.

When employed together with the optionally available white caps the ON condition of these products is clearly visible even under conditions of high ambient lighting due to the change in colour from white to the corresponding LED colour.

Where more importance is attached to the brilliance than the wavelength (color) of the green light the yellow multi LED can be combined with the green cap to boost the light output of the naturally weaker green version. Switchless indicators, non-illuminated types as well as blank elements round of this assortment.

PCB layout and style are in keeping with the most popular switch elements employed in film-seal keypads. Merly the LED leads need to be supplemented in the existing layout. Due to the neat styling and sculptured surface of the caps all products can also be put to use as normal PCB switches having no film seal.

This permits huge savings in the cost of small quantities or pilot series and when keypad seal requirement are not critical. Customized and collated deliveries are possible on request for large-quantity orders.

#### Specimen order

##### Indicator :

- Illuminated pushbutton actuator, IP 40, frontring black, lens yellow 92-458-400

##### Essential accessories :

- Switching element illuminative 92-851.342
- Single-LED T1 Bi-Pin, yellow 10-2602.3174D
- Mounting flange 92-960.0

*We reserve the right to modify technical data  
All dimensions in mm*

## Illuminated pushbutton



- 1 Lens
- 2 Switching element

## Illumination element

The customer has to decide what series resistor shall be used to the LED



### Essential Accessories:

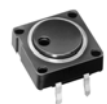
Lens page 9

	Operating voltage/-current	Illumination	Terminals	Typ-Nr.	Component layout	Technical drawing	Circuit drawing	
<b>Illumination element</b>	-	-	P	<b>92-800.042</b>	5	12	2	0.001
	12 VDC, 20 mA	Multi-Chip LED gelb	P	<b>70-810.4</b>	2	2	2	0.001
		Multi-Chip LED grün	P	<b>70-810.5</b>	2	2	1	0.001
		Multi-Chip LED orange	P	<b>70-810.3</b>	2	2	2	0.001
		Multi-Chip LED rot	P	<b>70-810.2</b>	2	2	2	0.001
	2.2 VDC, 20 mA	Single-Chip LED gelb	P	<b>70-820.4</b>	2	2	2	0.001
		Single-Chip LED grün	P	<b>70-820.5</b>	2	2	2	0.001
		Single-Chip LED orange	P	<b>70-820.3</b>	2	2	1	0.001
		Single-Chip LED rot	P	<b>70-820.2</b>	2	2	2	0.001

Terminals: P = PCB terminal

Component layout from page 13, Technical drawing from page 14, Circuit drawing from page 18

## Switching element non-illuminated



### Essential Accessories:

Spacing cap page 9

	Switching action	Contacts	Contact material	Terminals	Typ-Nr.	Component layout	Technical drawing	Circuit drawing	
<b>Switching element non-illuminated</b>	M	1 NO	Au	P	<b>70-201.0</b>	4	11	4	0.001
			Ag	P	<b>70-101.0</b>	3	10	5	0.001
	M	1 NO	Ag	P	<b>70-100.0</b>	3	9	5	0.001

Switching action: M = Momentary action

Contacts: NO = Normally open

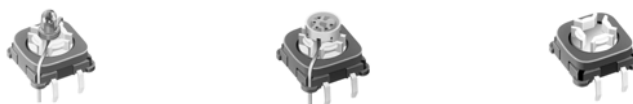
Contact material: Au = Gold, Ag = Silver

Terminals: P = PCB terminal

Component layout from page 13, Technical drawing from page 14, Circuit drawing from page 18

## Switching element illuminative

The customer has to decide what series resistor shall be used to the LED



### Essential Accessories:

Lens page 9

	Switching action	Contacts	Operating voltage/-current	Illumination	Terminals	Typ-Nr.	Component layout	Technical drawing	Circuit drawing	
<b>Switching element illuminative</b>	M	1 NO	-	-	P	<b>92-851.342</b>	6	13	3	0.001
			12 VDC, 20 mA	Multi-Chip LED gelb	P	<b>70-210.4</b>	1	1	3	0.001
				Multi-Chip LED grün	P	<b>70-210.5</b>	1	1	3	0.001
				Multi-Chip LED orange	P	<b>70-210.3</b>	1	1	3	0.001
				Multi-Chip LED rot	P	<b>70-210.2</b>	1	1	3	0.001
				2.2 VDC, 20 mA	Single-Chip LED gelb	P	<b>70-220.4</b>	1	1	3
			Single-Chip LED grün		P	<b>70-220.5</b>	1	1	3	0.001
			Single-Chip LED orange		P	<b>70-220.3</b>	1	1	3	0.001
			Single-Chip LED rot		P	<b>70-220.2</b>	1	1	3	0.001

Switching action: M = Momentary action

Contacts: NO = Normally open

Terminals: P = PCB terminal

Component layout from page 13, Technical drawing from page 14, Circuit drawing from page 18

## Front

### Lens

Lens	Lens	□ 19.05 x 19.05 mm	□ 15.4 x 15.4 mm	□ 12.4 x 12.4 mm	∅ 15.4 mm	∅ 12.4 mm	Technical drawing	Ⓜ
		Typ-Nr.	Typ-Nr.	Typ-Nr.	Typ-Nr.	Typ-Nr.		
Plastic translucent	white	<b>70-920.9</b>	<b>70-921.9</b>		<b>70-911.9</b>		7	0.001
	blue		<b>70-921.6</b>				7	0.001
	green		<b>70-921.5</b>		<b>70-911.5</b>		7	0.001
	orange		<b>70-921.3</b>		<b>70-911.3</b>		7	0.001
	red		<b>70-921.2</b>		<b>70-911.2</b>		7	0.001
	yellow		<b>70-921.4</b>		<b>70-911.4</b>		7	0.001
	blue			<b>70-922.6</b>			8	0.001
	green			<b>70-922.5</b>		<b>70-912.5</b>	8	0.001
	orange			<b>70-922.3</b>		<b>70-912.3</b>	8	0.001
	red			<b>70-922.2</b>		<b>70-912.2</b>	8	0.001
	white			<b>70-922.9</b>		<b>70-912.9</b>	8	0.001
	yellow			<b>70-922.4</b>		<b>70-912.4</b>	8	0.001



Technical drawing from page 14

### Spacing cap

Spacing cap	Typ-Nr.	Technical drawing	Ⓜ
2 recesses for LED, H 22.5 mm	<b>70-912.0</b>	5	0.001
2 recesses for LED, H 9 mm	<b>70-910.0</b>	3	0.001
without recesses for LED, H 18.9 mm	<b>70-901.0</b>	6	0.001




Technical drawing from page 14



## Illumination

### Single-LED


The customer has to decide what series resistor shall be used to the LED

	Socket	Operating voltage/-current	Light colour	Typ-Nr.	
Single-LED	T1 Bi-Pin	2.2 VDC, 20 mA	green	<b>10-2602.3175D</b>	0.001
			orange	<b>10-2602.3173D</b>	0.001
			red	<b>10-2602.3172D</b>	0.001
			yellow	<b>10-2602.3174D</b>	0.001
		3.6 VDC, 20 mA	white	<b>10-2603.3179D</b>	0.001



### Multi-LED

The customer has to decide what series resistor shall be used to the LED

	Socket	Operating voltage/-current	Light colour	Typ-Nr.	
Multi-LED	T1 Bi-Pin	12 VDC, 40 mA	orange	<b>10-5609.3173D</b>	0.001
			red	<b>10-5609.3172D</b>	0.001
			yellow	<b>10-5609.3174D</b>	0.001
		6 VDC, 40 mA	orange	<b>10-5606.3243D</b>	0.001
			red	<b>10-5606.3242D</b>	0.001
			yellow	<b>10-5606.3244D</b>	0.001



## Switching element illuminated

### Switching system

Short-travel switching system with 2 independent contact points and tactile operation. Guarantees reliable switching even of very light loads.

1 normally open contact

### Material

#### Material of contact

Gold (Au)

#### Switching element

Thermoplastic Polyester (PET, PBT) and Polyacetale (POM)

### Mechanical characteristics

#### Actuating force

with overlay foil 4 N  $\pm$ 1,5 N

Max. actuating force >50 N, as per DIN 42115

#### Actuating travel

0.4 mm

#### Rebound time

$\leq$ 1 ms

#### Resistance to heat of soldering

260 °C, 5 s, as per IEC 60068-2-20

#### Mechanical lifetime

>5 million operations

### Electrical characteristics

#### Contact resistance

Starting value (initial)  $\leq$ 100 m $\Omega$ , as per IEC 60512-2-2b

#### Isolation resistance

$\geq$ 1000 M $\Omega$

#### Contact resistance

$\leq$ 100 m $\Omega$

as per 500 000 cycles of operation at 12 VDC, 5 mA resistive load  $\leq$ 200 m $\Omega$

#### Electrical life

$\geq$ 500 000 operations at 42 VDC, 50 mA, as per IEC 60512-5-9c

When attention is paid to the direction of current flow from terminal  $\frac{3}{4}$  to  $\frac{1}{2}$  the electrical life can be prolonged.

#### Switch rating

max. 2 VA (resistive load)

#### Switch rating

Switching voltage VDC/VAC	min. 50 mV, max. 42 V
Switching current VDC/VAC	min. 10 $\mu$ A, max. 100 mA
Power rating	max. 2 W

#### Electric strength

500 VAC, 50 Hz, 1 min, as per IEC 60512-2-4a

### Electrical characteristics LED

#### Constant current

15 ... 20 mA

#### Pre-voltage

Multi-LED typ. 12.5 V

Single-LED typ. 2.2 V

### Environmental conditions

#### Storage temperature

-40 °C ... +85 °C

#### Operating temperature

-25 °C ... +70 °C

#### Front protection

front with overlay foil IP 65

### Approvals

RoHS compliant

## Switching element non-illuminated Typ-Nr. 70-100.0 and 70-101.0

### Switching system

Short-travel switching system with 2 independent contact points and tactile operation. Guarantees reliable switching even of very light loads.

1 normally open contact

### Material

#### Material of contact

Silver (Ag)

### Mechanical characteristics

#### Actuating force

with overlay foil 5 N  $\pm$ 2 N

Max. actuating force >50 N, as per DIN 42115

#### Actuating travel

0.3 mm

#### Rebound time

$\leq$ 5ms

#### Mechanical lifetime

>1 million operations

### Electrical characteristics

#### Isolation resistance

$\geq$ 50 M $\Omega$

#### Contact resistance

$\leq$ 100 m $\Omega$

as per 500 000 cycles of operation at 12 VDC, 5 mA resistive load  $\leq$ 200 m $\Omega$

#### Electrical life

at 5 VDC, 1 mA >1 million operations

at 24 VDC, 1 mA >100 000 operations

#### Switch rating

$\leq$ 1 VA (resistive load)

#### Switch rating

$\leq$ 24 VDC,  $\leq$ 50 mA

## Electric strength

250 VAC for 1min.

## Environmental conditions

### Storage temperature

-30 °C ... +85 °C

### Operating temperature

-20 °C ... +70 °C

### Front protection

front with overlay foil IP 65

## Approvals

RoHS compliant

## Switching element non-illuminated Typ-Nr. 70-201.0

## Switching system

Short-travel switching system with 2 independent contact points and tactile operation. Guarantees reliable switching even of very light loads.

1 normally open contact

## Material

### Material of contact

Gold (Au)

### Switching element

Thermoplastic Polyester (PET, PBT) and Polyacetale (POM)

## Mechanical characteristics

### Actuating force

with overlay foil 2.1 N  $\pm$ 0.2 N

Max. actuating force >50 N, as per DIN 42115

### Actuating travel

max. 0.5 mm

### Rebound time

$\leq$ 1 ms

### Resistance to heat of soldering

260 °C, 5 s, as per IEC 60068-2-20

### Mechanical lifetime

>5 million operations

### Front protection

front with overlay foil IP 65

## Electrical characteristics

### Contact resistance

Starting value (initial)  $\leq$ 100 m $\Omega$ , as per IEC 60512-2-2b

### Isolation resistance

$\geq$ 1000 M $\Omega$

### Contact resistance

$\leq$ 100 m $\Omega$

as per 500 000 cycles of operation at 12 VDC, 5 mA resistive load

$\leq$ 200 m $\Omega$

## Electrical life

$\geq$ 500 000 operations at 42 VDC, 50 mA, as per IEC 60512-5-9c

When attention is paid to the direction of current flow from terminal  $\frac{3}{4}$  to  $\frac{1}{2}$  the electrical life can be prolonged.

## Switch rating

max. 42 V, 50 mA

min. 50 mV, 10  $\mu$

## Switch rating

Switching voltage VDC/VAC min. 50 mV, max. 42 V

Switching current VDC/VAC min.10 mA, max.100 mA

Switch rating max. 2 W

## Electric strength

500 VAC, 50 Hz, 1 min, as per IEC 60512-2-4a

## Environmental conditions

### Storage temperature

-40 °C ... +85 °C

### Operating temperature

-25 °C ... +70 °C

### Front protection

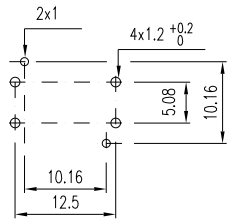
front with overlay foil IP 65

## Approvals

RoHS compliant

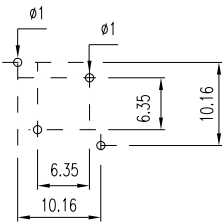
## Component layout

### 1 Switching element illuminative page 8



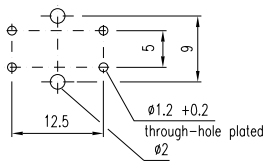
Libraries for the PCB layout-system p-cad 200X see : [www.pcad.com/en/library](http://www.pcad.com/en/library) Third-party Libraries

### 2 Illumination element page 7



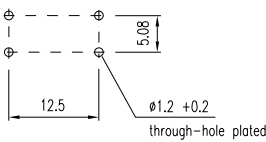
Libraries for the PCB layout-system p-cad 200X see : [www.pcad.com/en/library](http://www.pcad.com/en/library) Third-party Libraries

### 3 Switching element non-illuminated page 7



Libraries for the PCB layout-system p-cad 200X see : [www.pcad.com/en/library](http://www.pcad.com/en/library) Third-party Libraries

### 4 Switching element non-illuminated page 7



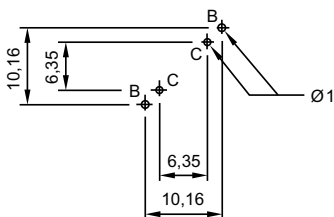
Libraries for the PCB layout-system p-cad 200X see : [www.pcad.com/en/library](http://www.pcad.com/en/library) Third-party Libraries

### 5 Illumination element page 7

Drilling plan (Elementside)

B Holes for LED

C Holes for centering pins

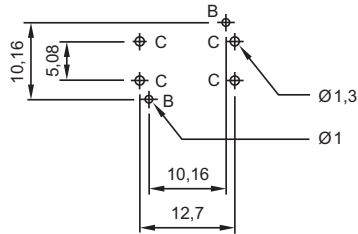


Libraries for the PCB layout-system p-cad 200X see : [www.pcad.com/en/library](http://www.pcad.com/en/library) Third-party Libraries

## 6 Switching element illuminative page 8

Drilling plan (Elementside)

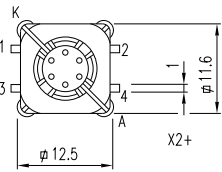
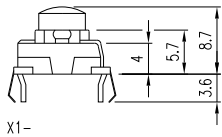
- B Fixing holes for LED
- C Holes for contact pins  
pad max. 2.5 mm dia.  
through-connection recommended



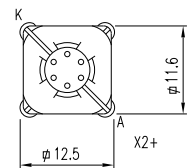
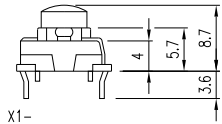
Libraries for the PCB layout-system p-cad 200X see : [www.pcad.com/en/library](http://www.pcad.com/en/library) Third-party Libraries

## Technical drawing

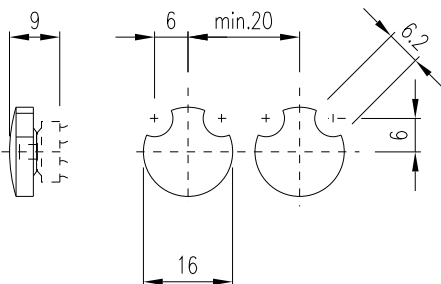
### 1 Switching element illuminative page 8



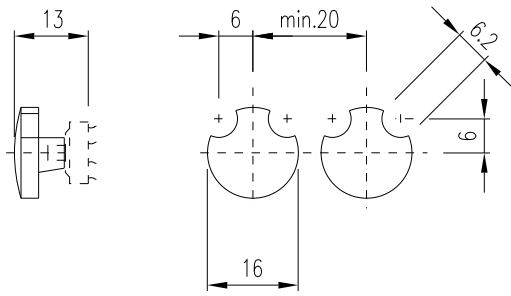
### 2 Illumination element page 7



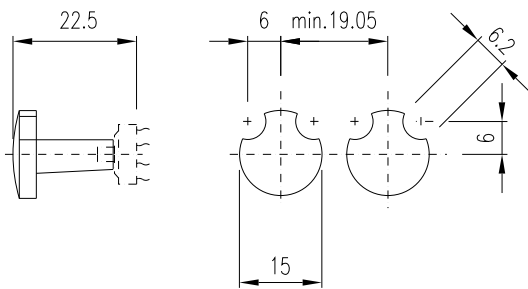
### 3 Spacing cap page 9



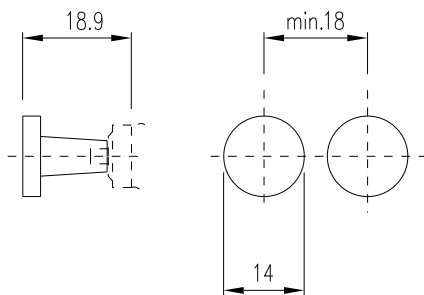
## 4 Spacing cap page 9



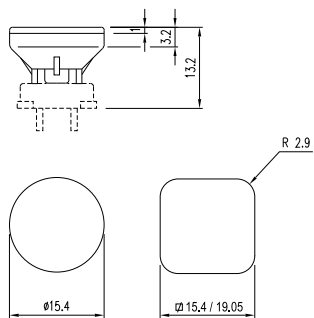
## 5 Spacing cap page 9



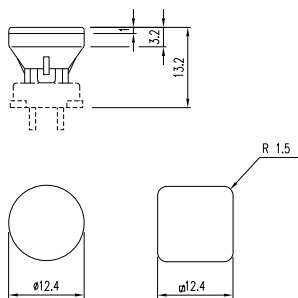
## 6 Spacing cap page 9



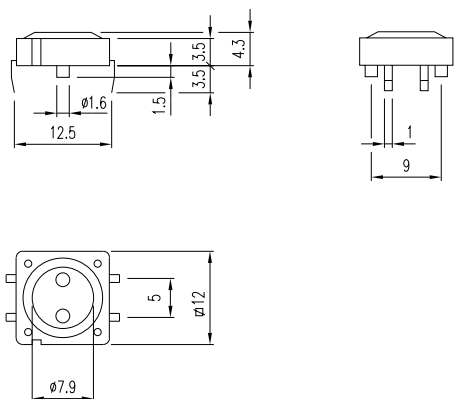
## 7 Lens page 9



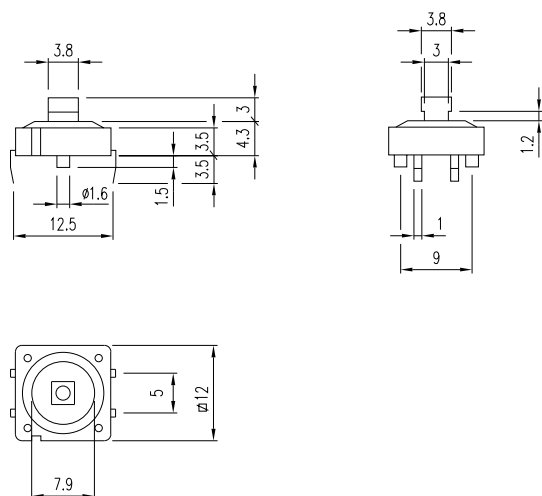
## 8 Lens page 9



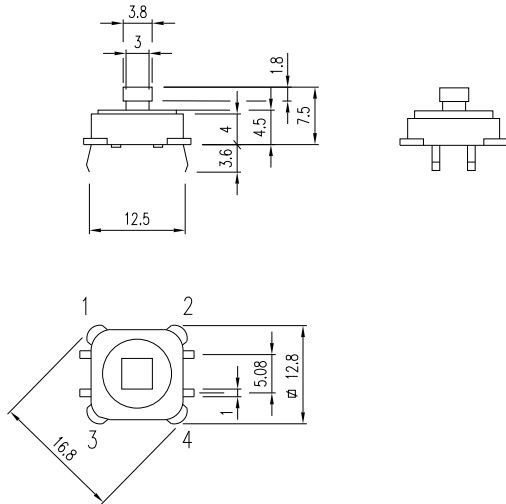
## 9 Switching element non-illuminated page 7



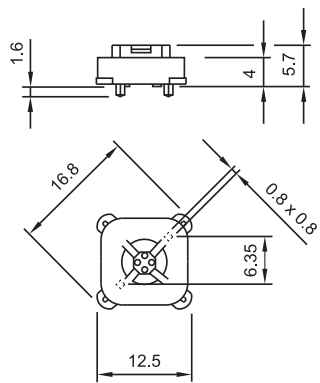
## 10 Switching element non-illuminated page 7



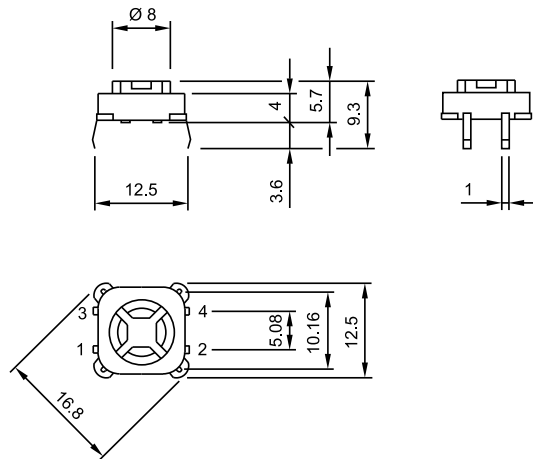
## 11 Switching element non-illuminated page 7



## 12 Illumination element page 7



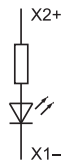
## 13 Switching element illuminative page 8





## Circuit drawing

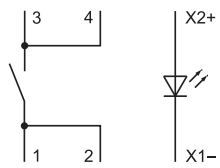
### 1 Illumination element page 7



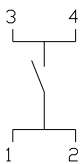
### 2 Illumination element page 7



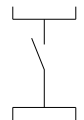
### 3 Switching element illuminative page 8



### 4 Switching element non-illuminated page 7



### 5 Switching element non-illuminated page 7



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10-2602.3174D	10				
10-2602.3175D	10				
10-2603.3179D	10				
10-5606.3242D	10				
10-5606.3243D	10				
10-5606.3244D	10				
10-5609.3172D	10				
10-5609.3173D	10				
10-5609.3174D	10				
70-100.0	7				
70-101.0	7				
70-201.0	7				
70-210.2	8				
70-210.3	8				
70-210.4	8				
70-210.5	8				
70-220.2	8				
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70-220.5	8				
70-810.2	7				
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70-810.5	7				
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70-901.0	9				
70-910.0	9				
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	<b>France</b>
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E-mail	sales.esa@eao.com
	<b>Germany</b>
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E-mail	sales.eit@eao.com
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	<b>USA</b>
Phone	+1/203 877 4577
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