Superior Clamping and Gripping

SCHUNK®

Product Information

Angular parallel gripper GAP 20

Flexible. Productive. Slim.
Angular parallel gripper GAP

2-finger angular parallel gripper with gripper finger actuation of up to 90° per jaw

Field of application

Gripping and moving small to medium workpieces in low contamination environments

Advantages – Your benefits

Positively driven angle and parallel stroke in one functional unit

Absolutely clamping in parallel stroke for highest positioning accuracy

Stable kinematics for high power transmission and synchronized gripping

High gripping force in parallel stroke

Opening angle of jaws up to 180° for maximum flexibility in applications

Integration of a gripping force maintenance is optional for firm grip even in the event of power failure

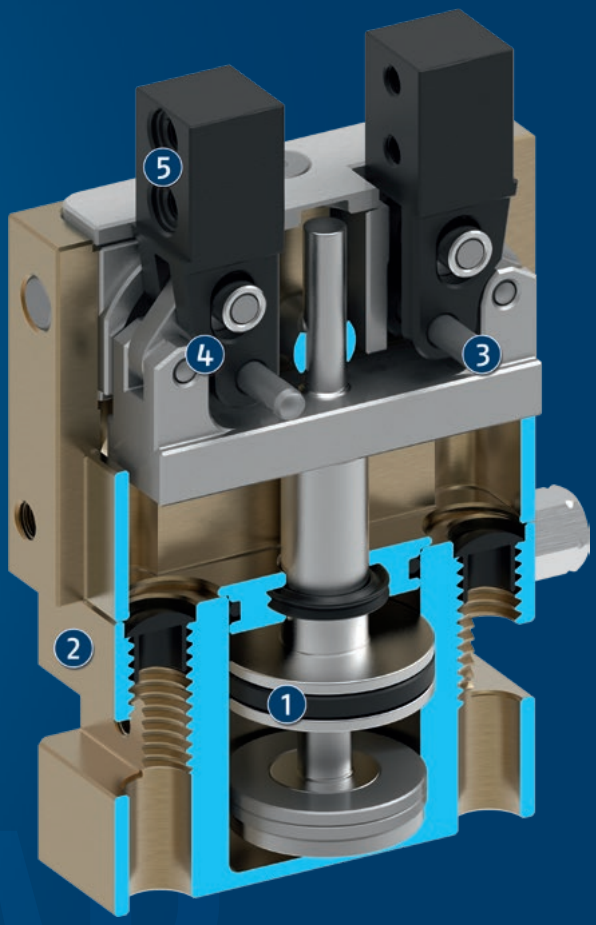
End-position monitoring with optional standardized monitoring sets

Standardized mounting bores for numerous combinations with other components from the modular system

Sizes	Weight	Gripping force	Stroke per jaw	Workpiece weight
Quantity: 3	0.3 .. 1.33 kg	92 .. 430 N	1 .. 2 mm	0.46 .. 1.25 kg

Functional description

The piston is moved up or down with compressed air. The base jaws are first put into a rotating and then into a parallel movement via the toggle-lever kinematics.



① **Drive**
double-acting piston drive system

② **Housing**
is weight-optimized due to the use of high-strength aluminum alloy

③ **Base jaw seated**
for rotary movement over hardened cylindrical pivot pins

④ **Kinematics**
Positively driven toggle-joint kinematics for rotating and parallel movement

⑤ **Base Jaws**
for the connection of workpiece-specific gripper fingers

General notes about the series

Operating principle: Positively driven toggle-joint kinematics

Housing material: Aluminum alloy, anodized

Base jaw material: Steel

Actuation: pneumatic, with filtered compressed air as per ISO 8573-1:2010 [7:4:4].

Warranty: 24 months

Scope of delivery: Centering sleeves, O-rings for direct connection, assembly instructions (operating manual with declaration of incorporation is available online)

Gripping force maintenance device: possible by using the version with mechanical gripping force maintenance or pressure maintenance valve SDV-P

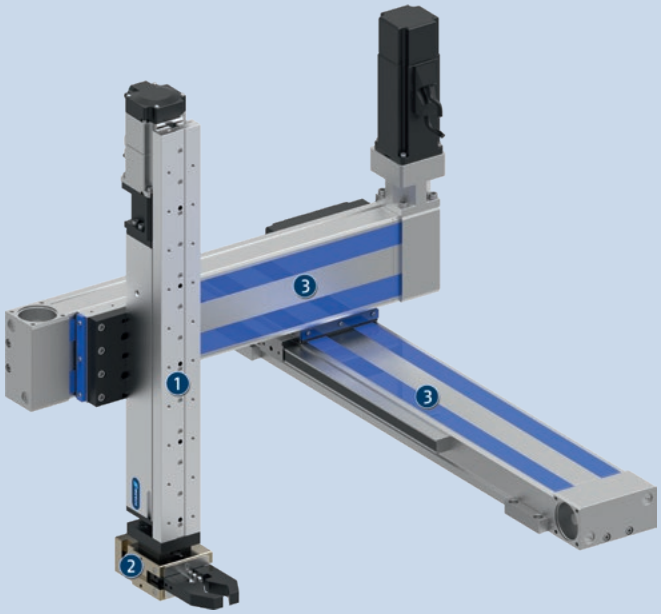
Gripping force: is the arithmetic sum of the individual force applied to each jaw at distance P (see illustration).

Finger length: is measured from the reference surface as the distance P in direction to the main axis.
The maximum permissible finger length applies until the nominal operating pressure is achieved. With higher pressures, the finger length must be reduced proportionally to the nominal operating pressure.

Repeat accuracy: is defined as a distribution of the end Position for 100 consecutive strokes.

Workpiece weight: is calculated for force-fit gripping with a coefficient of static friction of 0.1 and a safety factor of 2 against workpiece slippage at acceleration due to gravity g. For form-fit or capture gripping, there are significantly higher permissible workpiece weights.

Closing and opening times: are purely the times that the base jaws or fingers are in motion. Valve switching times, hose fill times, or PLC reaction times are not included, and are to be considered when cycle times are calculated.



Application example

Electric linear gantry to center or reposition small components.

1. Compact linear module ELS
2. 2-finger angular parallel gripper GAP
3. Flat linear module Delta with toothed-belt drive

SCHUNK offers more ...

The following components make the product even more productive – the suitable addition for the highest functionality, flexibility, reliability, and controlled production.

Miniature swivel unit

Linear module

Pick & Place Unit

Line gantry

Magnetic switches

Pressure maintenance valve

Pillar assembly system

ⓘ For more information on these products can be found on the following product pages or at schunk.com.

Options and special information

Gripping force maintenance version AS: The mechanical gripping force maintenance ensures that a minimum clamping force will be applied even in case of pressure drop. This acts as closing force in the AS version. Besides this, the gripping force maintenance can be used to increase gripping force or for single actuated gripping.
Shock absorber version: A shock absorber version is available for particularly damping-intensive movements. Please ask for details.
As standard, this module can be combined with numerous components from the modular system. We would be happy to assist you.

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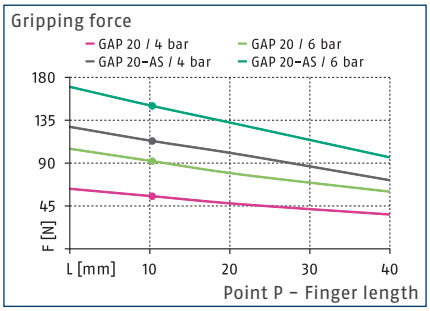
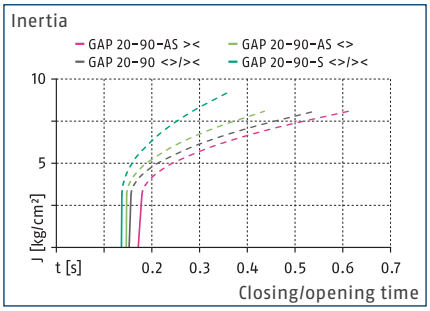
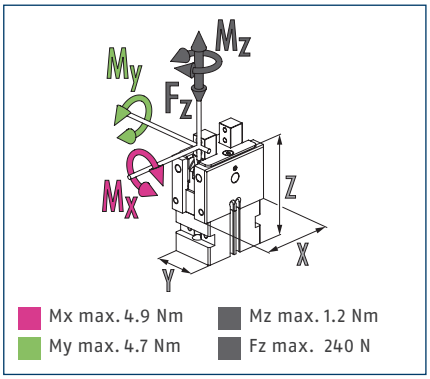
Gripping force O.D. gripping



Max. permissible inertia J*



Dimensions and maximum loads



Mx max. 4.9 Nm
Mz max. 1.2 Nm
My max. 4.7 Nm
Fz max. 240 N

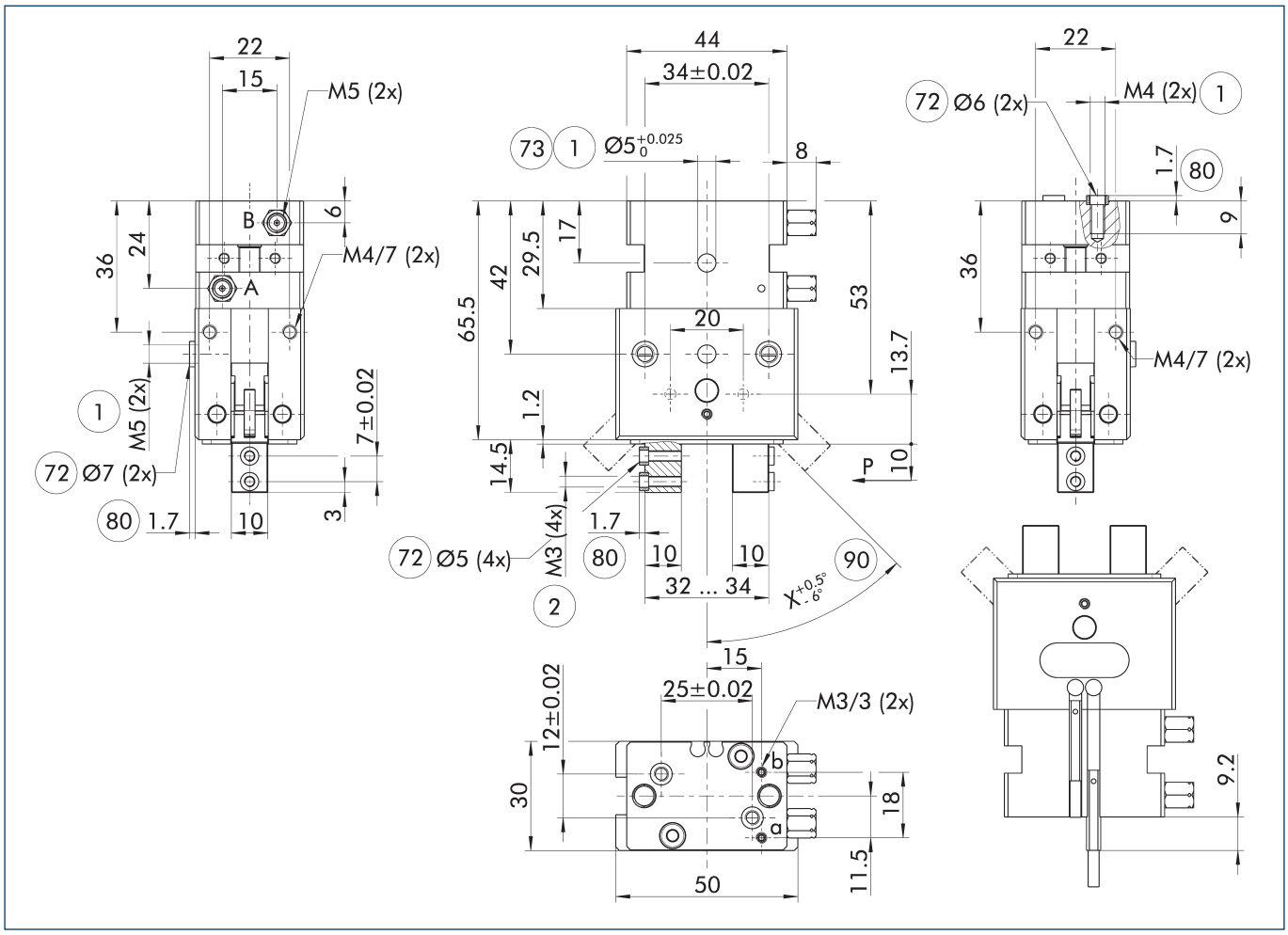
ⓘ The indicated moments and forces are statical values, apply for each base jaw and may appear simultaneously. Loads may additionally occur to the moment produced by the gripping force itself.

Technical data

Description		GAP 20-030	GAP 20-060	GAP 20-090
ID		0314600	0314601	0314602
Stroke per jaw	[mm]	1	1	1
Closing/opening force	[N]	92/-	92/-	92/-
Opening angle per jaw	[°]	30	60	90
Weight	[kg]	0.3	0.3	0.3
Recommended workpiece weight	[kg]	0.46	0.46	0.46
Fluid consumption double stroke	[cm³]	3	5	7
Min./nom./max. operating pressure	[bar]	3/6/7	3/6/7	3/6/7
Closing/opening time	[s]	0.09/0.09	0.12/0.12	0.15/0.15
Max. permissible finger length	[mm]	40	40	40
Max. permissible mass per finger	[kg]	0.1	0.1	0.1
Max. permissible mass moment of inertia per chuck jaw	[kgcm²]	3.12	3.12	3.12
IP protection class		40	40	40
Min./max. ambient temperature	[°C]	5/60	5/60	5/60
Repeat accuracy	[mm]	0.05	0.05	0.05
Dimensions X x Y x Z	[mm]	50 x 30 x 66.7	50 x 30 x 66.7	50 x 30 x 66.7
Options and their characteristics				
Gripping force maintenance version		GAP 20-030-AS	GAP 20-060-AS	GAP 20-090-AS
ID		0314603	0314604	0314605
Closing/opening force	[N]	150/-	150/-	150/-
Min. spring force	[N]	58	58	58
Weight	[kg]	0.39	0.39	0.39
Fluid consumption double stroke	[cm³]	4	7	10
Min./max. operating pressure	[bar]	4.5/6.5	4.5/6.5	4.5/6.5
Closing/opening time	[s]	0.12/0.08	0.15/0.11	0.17/0.14
Shock absorber version		GAP 20-030-S	GAP 20-060-S	GAP 20-090-S
ID		0314606	0314607	0314608
Weight	[kg]	0.33	0.33	0.33
Closing/opening time	[s]	0.07/0.07	0.1/0.1	0.13/0.13

* The unit can be actuated without an external customized throttling at the given value of max. mass moment of inertia per jaw. In case of higher mass moments of inertia, an additional throttling is possible.

Main view



The drawing shows the gripper in the basic version with closed jaws, without dimensional consideration of the options described below.

ⓘ The SDV-P pressure maintenance valve can also be used for I.D. or O.D. gripping alternatively or in addition to the spring-loaded, mechanical gripping force maintenance device (see catalog section on accessories).

A, a Main / direct connection, gripper opening

B, b Main / direct connection, gripper closing

(1) Gripper connection

(2) Finger connection

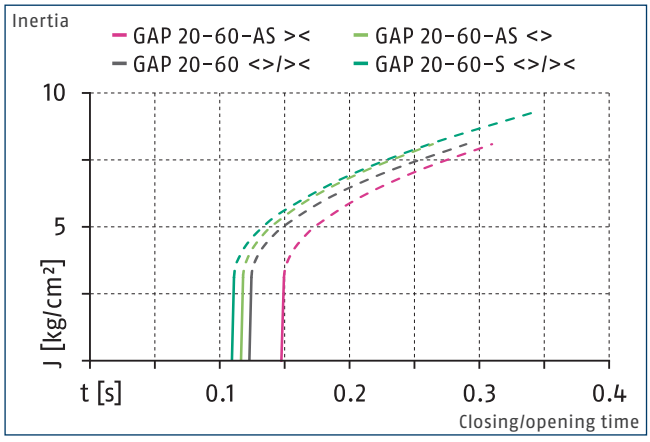
(72) Fit for centering sleeves

(73) Fit for centering pins

(80) Depth of the centering sleeve hole in the counter part

(90) See the technical data for "opening angle per jaw"

Max. permissible inertia J*



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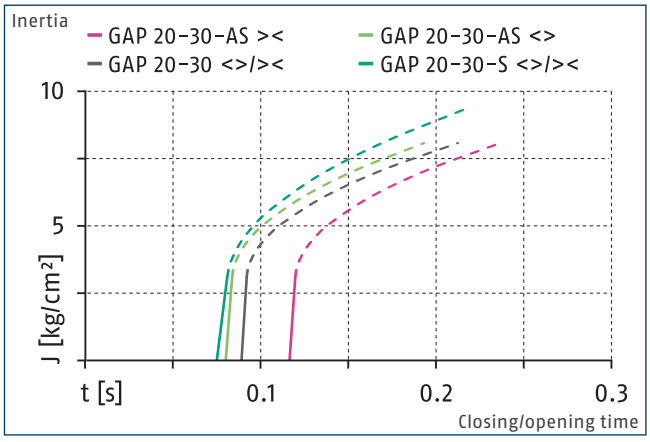
Max. permissible inertia J*



* The unit can be actuated without an external customized throttling at the given value of max. mass moment of inertia per jaw. In case of higher mass moments of inertia, an additional throttling is possible.

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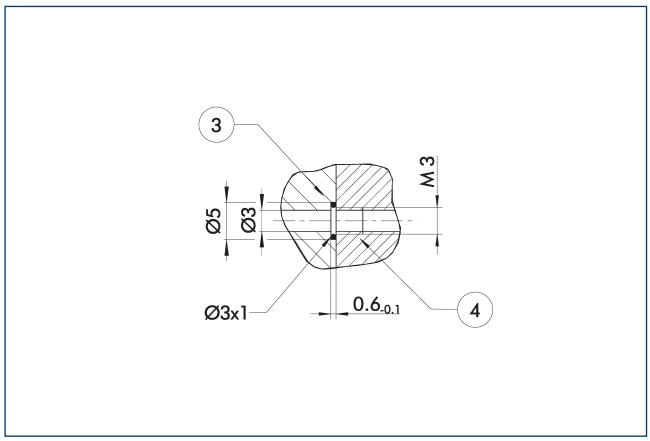
Angular parallel gripper

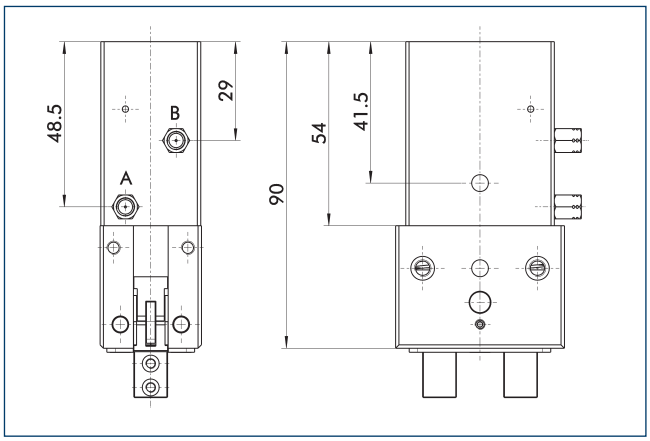
Hose-free direct connection M3



(3) Adapter (4) Grippers

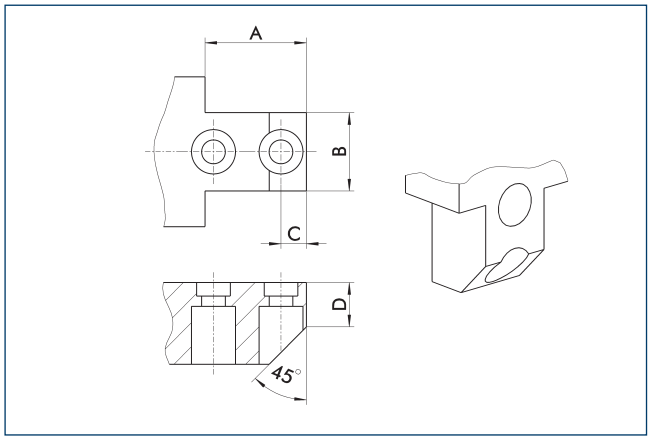
The direct connection is used for supplying compressed air without hoses. Instead, the pressure medium is fed through bore-holes in the mounting plate.

Gripping force maintenance AS



The mechanical gripping force maintenance ensures that a minimum gripping force will be applied even if there is a drop in pressure. This acts on the closing force. The gripping force maintenance can also be used to increase the gripping force or for one-way gripping.

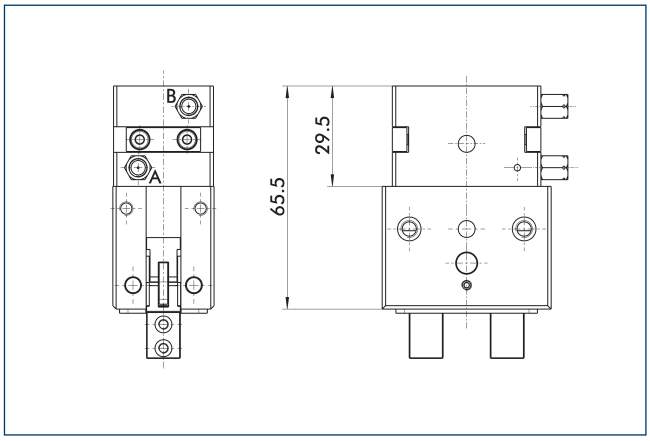
Finger design



The drawing shows a suggerstionof how to design the gripper fingers.

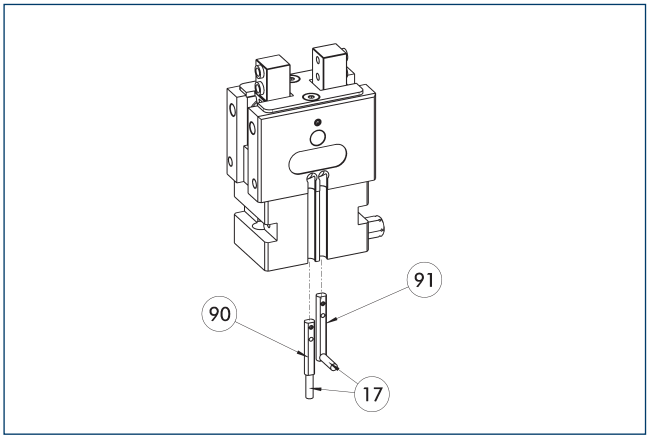
A (min.)	B (max.)	C (max.)	D
[mm]	[mm]	[mm]	[mm]
13.5	9.9	3.3	10

Version with shock absorbers



In the shock absorber variant, the opening movement of the fingers is braked via hydraulic shock absorbers. Therefore faster opening times are achieved.

Electronic magnetic switch MMS



(17) Cable outlet
(91) Sensor MMS 22...-SA
(90) Sensor MMS 22..

End position monitoring for mounting in the C-slot.

Description	ID	Often combined
Electronic magnetic switch		
MMS 22-S-M8-PNP	0301032	●
MMSK 22-S-PNP	0301034	
Electronic magnetic switches with lateral cable outlet		
MMS 22-S-M8-PNP-SA	0301042	●
MMSK 22-S-PNP-SA	0301044	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
clip for plug/socket		
CLI-M8	0301463	
Cable extension		
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
Sensor distributor		
V2-M8	0301775	●
V4-M8	0301746	
V8-M8	0301751	

ⓘ Two sensors are required per unit for monitoring two positions. On option, extension cables and sensor distributors are available. Additional product variants of the sensor, and further information and technical data can be found in the catalog chapter sensor system.

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