



Superior Clamping and Gripping



Product Information

Universal rotary unit PR

Loadable. Flexible. Robust.

PR universal rotary unit

Servo-electric rotary unit with angle of rotation $> 360^\circ$, precision gear and integrated electronics

Field of application

Versatile, ultra-flexible rotary unit in clean and slightly contaminated environments as a component of positioning systems or as an axis module of lightweight arms used in fields of industry or service robotics

Advantages – Your benefits

Brushless DC servomotor for flexible use by controlled position, velocity, and torque

High torque, velocity, and precision for fast acceleration and short cycle times at a high precision

Fully integrated control and power electronics for creating a decentralized control system

Versatile actuation options for simple integration into existing control concepts via PROFIBUS-DP, or CAN

Standard connecting elements and integrated control concept for extensive combination possibilities with other mechatronic modules



Sizes
Quantity: 3



Weight
1.7 .. 5.6 kg



Torque
3.6 .. 88 Nm



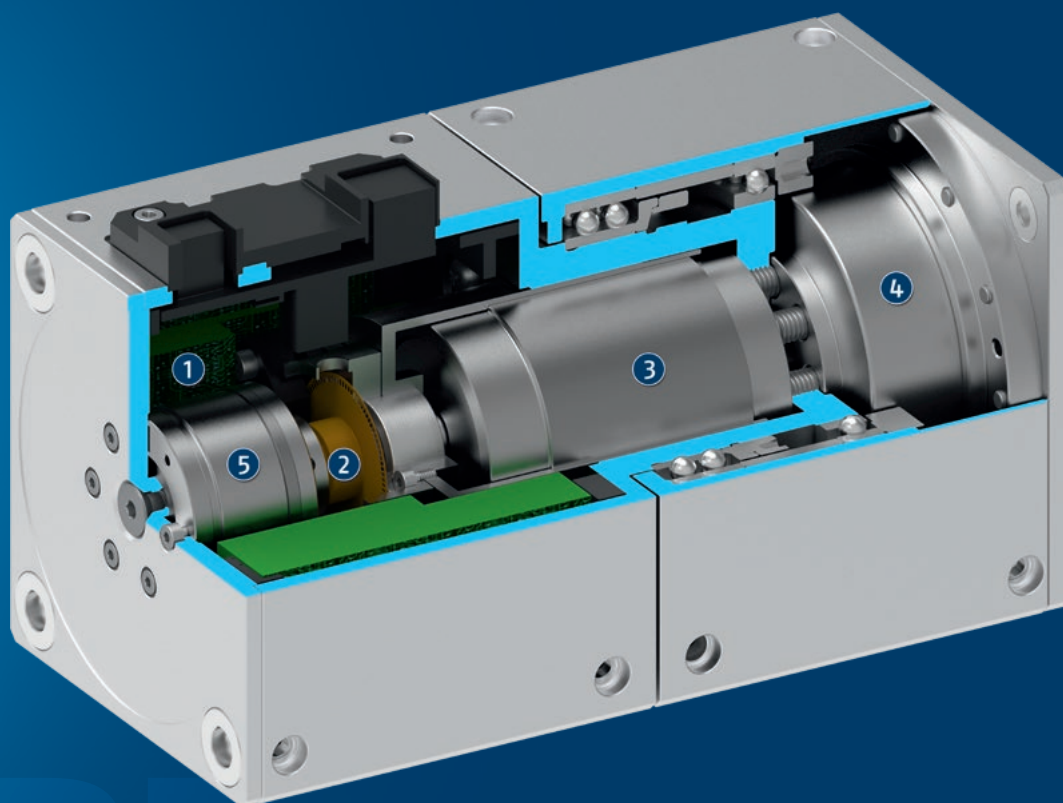
Repeat accuracy
0.03 .. 0.08°



Angle of rotation
 $> 360^\circ$

Functional description

The rotary unit has a Harmonic Drive® precision gear, which is directly driven by a brushless DC-servo drive.



① **Control electronics**
integrated control and power electronics

② **Encoder**
for position evaluation

③ **Brushless DC servomotor**
Brushless DC servomotor for maximum torques

④ **Harmonic Drive® gears**
for different gear ratios and high rigidity

⑤ **Brake**
for maintaining position on shutdown and power failure

General notes about the series

Housing material: Aluminum alloy, coated

Actuation: Servo-electric, via brushless servomotor and incremental encoder for position and speed control

Operating principle: Harmonic drive® gear driven directly via brushless DC servomotor

Scope of delivery: DVD with SCHUNK software and commissioning assistant, includes assembly and operating manual, declaration of incorporation, functional module for control via Siemens S7.

Warranty: 24 months

Service life characteristics: on request

Swiveling times: are purely the times of the module to rotate from rest position to rest position. Relay switching times or PLC reaction times are not included in the above times and must be taken into consideration when determining cycle times. Load-dependent rest periods may have to be included in the cycle time.

Repeat accuracy: Is defined as the spread of the target position after 100 consecutive positioning cycles.

Nominal currents: can be permanently actuated. With regard to all the currents which are ranging above the nominal current up to the maximum current, the notes of the individual product documentation has to be respected.

Electrical brake: The installed, electric holding brake serves to fix and hold the position in case of power failure up to the rated torque. It cannot cover any complete safety functions.

Peak torque: The peak torques serve as short-term drive reserves when accelerating and delaying.

Application example

Double rotary gripping module for loading and unloading different sensitive components

- ❶ Servo-electric 2-finger parallel gripper PG
- ❷ PR servo-electric rotary module



SCHUNK offers more ...

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



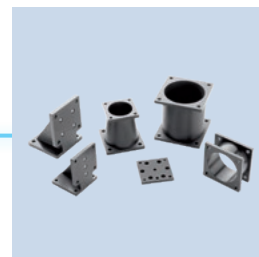
Connection cap DMI



Power- / and data cable



Linear module



Connecting elements PAM



Rotary Unit electric PDU



PW electrical rotary pan-tilt actuator



PEH servo-electric 2-finger parallel gripper

① For more information on these products can be found on the following product pages or at schunk.com.

Options and special information

Integrated electronics: The electrical control of the PR is carried out by the fully integrated control and power electronics. Hence, the module does not require any additional external control units.

Easy integration: There is a varied range of interfaces available, such as PROFIBUS DP or CAN as types of communication. This enables the assembly of industrial bus networks and ensures simple integration into existing control concepts.

Technological functions: Pseudo absolute encoder function, freely programmable sequences, and directly controllable via digital I/O or fieldbus interface using the SCHUNK Motion Protocol (SMP)

Monitoring functions: I²t monitoring, current monitoring, power failure detection, contouring error monitoring, software end position monitoring, position monitoring

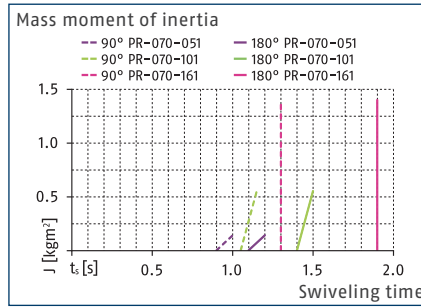
IP protection class: The indicated protection class can only be achieved in conjunction with a connection cap DMI.

PR 70

Universal rotary unit

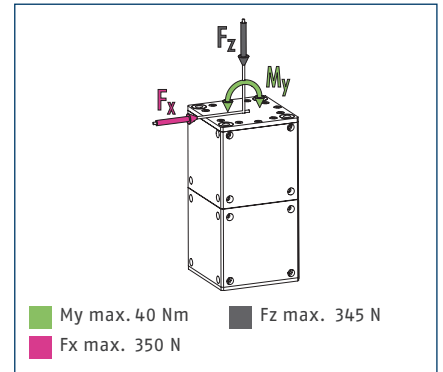


Swivel time diagram



① The diagram is only valid for applications with vertical swivel axes or horizontal swivel axes with even mass distribution and without the effects of gravity.

Max. loads



① Moments and forces may occur simultaneously.

Technical data

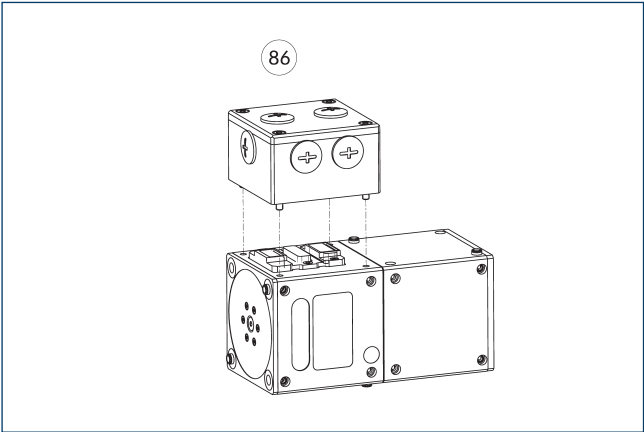
Description		PR 070-51-B	PR 070-101-B	PR 070-161-B
ID		0307304	0307302	0307300
Mechanical operating data				
Nominal torque	[Nm]	3.6	7.2	10
Max. torque	[Nm]	16	34.4	51.2
Max. RPM	[1/min]	78	40	25
Max. permissible mass moment of inertia	[kgm²]	0.14	0.55	1.4
Repeat accuracy	[°]	0.08	0.04	0.03
Transmission		51:1	101:1	161:1
General operating data				
Brake		yes	yes	yes
Weight	[kg]	1.7	1.7	1.7
Min./max. ambient temperature	[°C]	5/55	5/55	5/55
IP protection class		40	40	40
Electrical operating data				
Nominal voltage	[V]	24	24	24
Nominal current	[A]	4.4	4.4	4.4
Max. current	[A]	8	8	8
Integrated control electronics				
Power supply	[V]	24	24	24
Encoder system		Encoder (incremental)	Encoder (incremental)	Encoder (incremental)
Interface		PROFIBUS, CAN, 4/4 digital I/O, RS232	PROFIBUS, CAN, 4/4 digital I/O, RS232	PROFIBUS, CAN, 4/4 digital I/O, RS232

① The peak torques serve as short-term drive reserves when accelerating and delaying.

[illegible]

① Connection swivel unit	⑤① Electrical connection
② Attachment connection	⑦② Fit for centering sleeves
③④ On both connection faces	⑧① Depth of the centering sleeve hole in the counter part

Connection caps

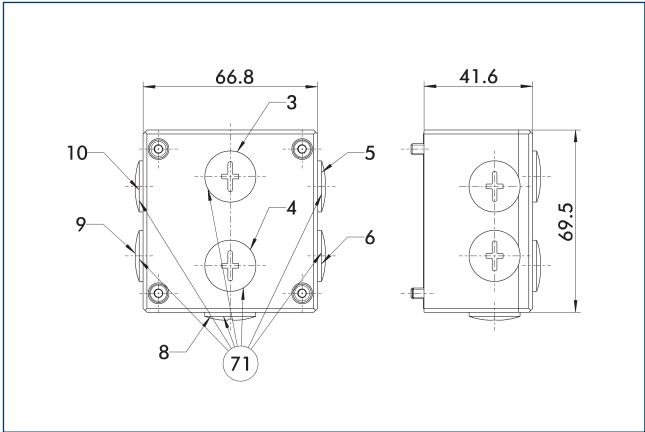


86 Connection cap DMI

The DMI connection cap is required to connect the modules to the voltage supply or higher-level control unit. The wire strands are connected via connection terminals. The DMI connection cap is optionally available with digital I/O (D), with either PROFIBUS (PB) or CAN (CN) interface.

Description	ID	
Connection cap		
DMI 070-V05-B	0307732	

Connection cap DMI

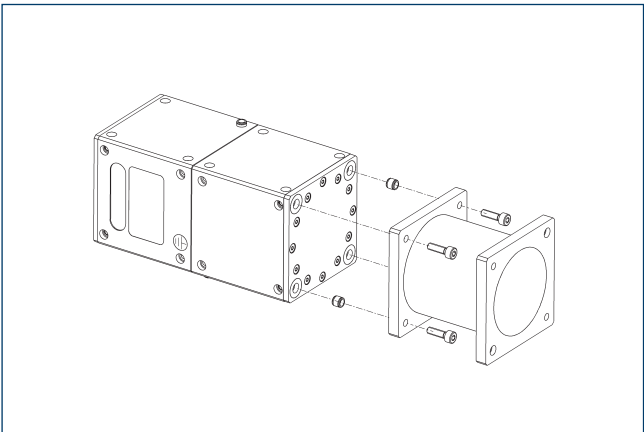


71 M16x1.5 for cable guide penetrating screw connection

The DMI's wire strands are connected via connection terminals. The DMI is prepared for PROFIBUS and CAN communication interfaces.

Description	ID	
Connection cap		
DMI 070-V05-B	0307732	

Connecting element – straight

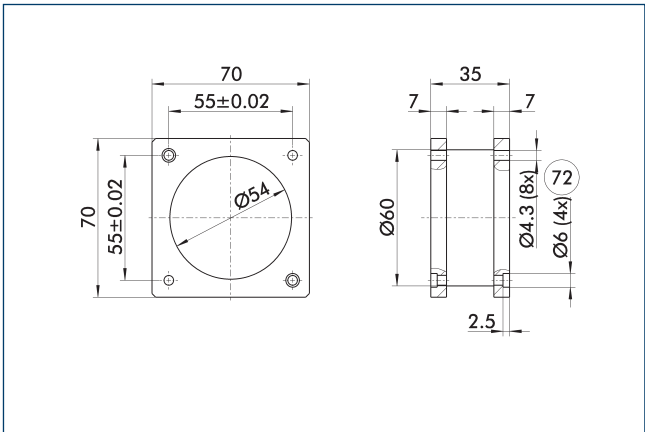


Straight standard element for connection of PowerCube modules with repeat accuracy

Description	ID	Dimensions
Connecting element		
PAM 100	0307800	70x70/35/70x70 mm
PAM 101	0307801	70x70/70/70x70 mm

① Application-specific sizes are available upon request. Please contact us for assistance.

PAM 100 – straight

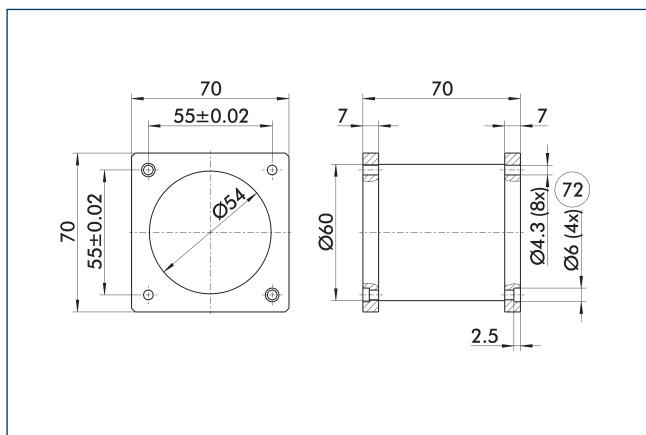


72 Fit for centering sleeves

Suitable for the mechatronic modules PG, PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the size 70

Description	ID	Dimensions
Connecting element		
PAM 100	0307800	70x70/35/70x70 mm

PAM 101 – straight

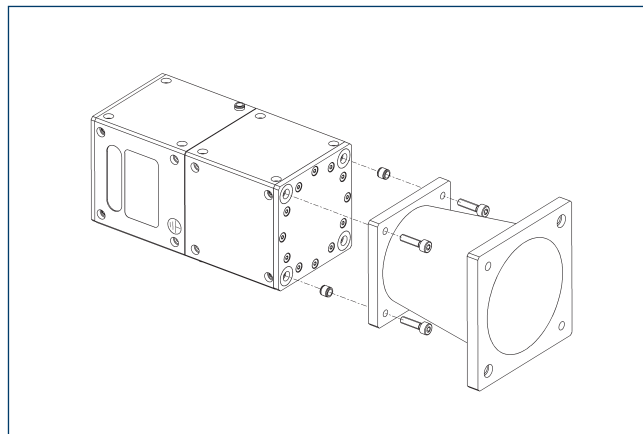


72 Fit for centering sleeves

Suitable for the mechatronic modules PG, PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the size 70

Description	ID	Dimensions
Connecting element		
PAM 101	0307801	70x70/70/70x70 mm

Connecting element – conical

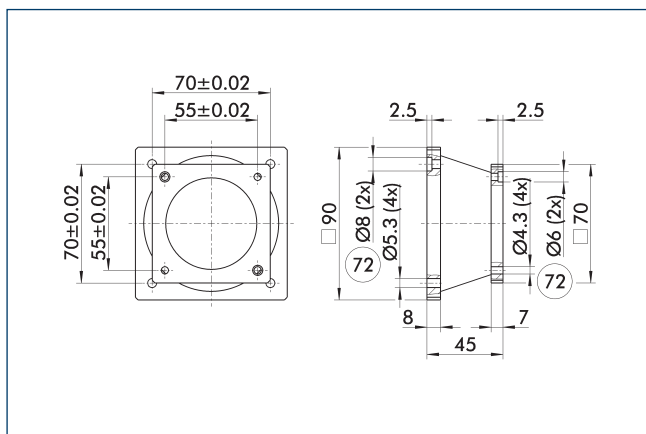


Conical standard element for connection of PowerCube modules with repeat accuracy

Description	ID	
Connecting element		
PAM 110	0307810	
PAM 111	0307811	

① Application-specific sizes are available upon request. Please contact us for assistance.

PAM 110 – conical

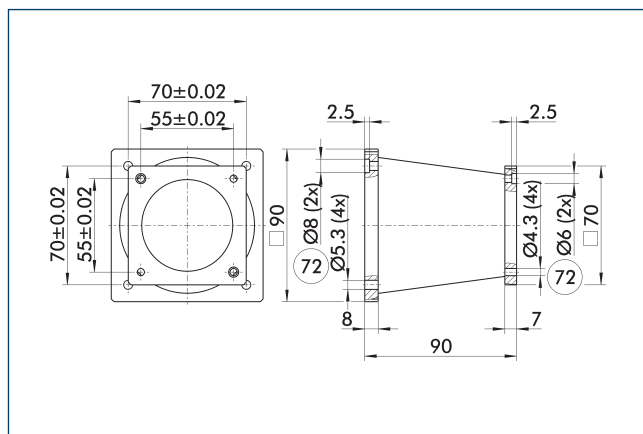


72 Fit for centering sleeves

Suitable for the mechatronic modules PG, PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the sizes 70/90.

Description	ID	
Connecting element		
PAM 110	0307810	

PAM 111 – conical



72 Fit for centering sleeves

Suitable for the mechatronic modules PG, PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the sizes 70/90.

Description	ID	
Connecting element		
PAM 111	0307811	

Universal rotary unit

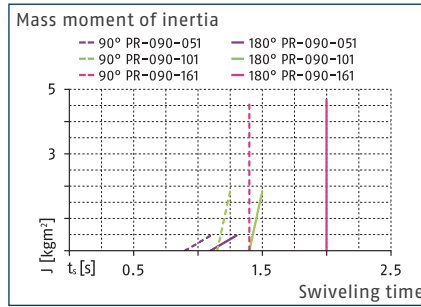
Description	ID	
Connecting element		
PAM 120	0307820	

-
- Technical drawing of a mechanical part, showing two views: a front view (left) and a side view (right).
- Front View (Left):**
- Overall width: 70
 - Central slot width: 40
 - Base thickness: 7.5
 - Top flange width: 55 ± 0.02
 - Top flange thickness: 6
 - Distance from top flange to base: 20.5
 - Distance from base to bottom flange: 70.5
 - Bottom flange width: 55 ± 0.02
 - Bottom flange thickness: 7.5
- Side View (Right):**
- Overall height: 98
 - Base thickness: 7.5
 - Central slot width: 40
 - Top flange width: 55 ± 0.02
 - Top flange thickness: 6
 - Distance from top flange to base: 20.5
 - Distance from base to bottom flange: 70.5
 - Bottom flange width: 55 ± 0.02
 - Bottom flange thickness: 7.5
- Material Specifications:**
- Top flange: 72
 - Base: 72
 - Central slot: Ø6 (2x)
 - Side flange: Ø4.3 (4x)
 - Bottom flange: Ø4.3 (4x)
 - Base: Ø6 (2x)

Description	ID	
Connecting element		
PAM 120	0307820	

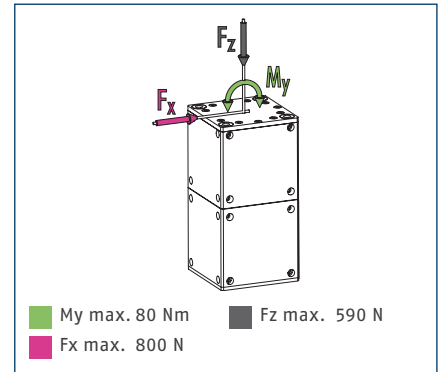


Swivel time diagram



- ① The diagram is only valid for applications with vertical swivel axes or horizontal swivel axes with even mass distribution and without the effects of gravity.

Max. loads



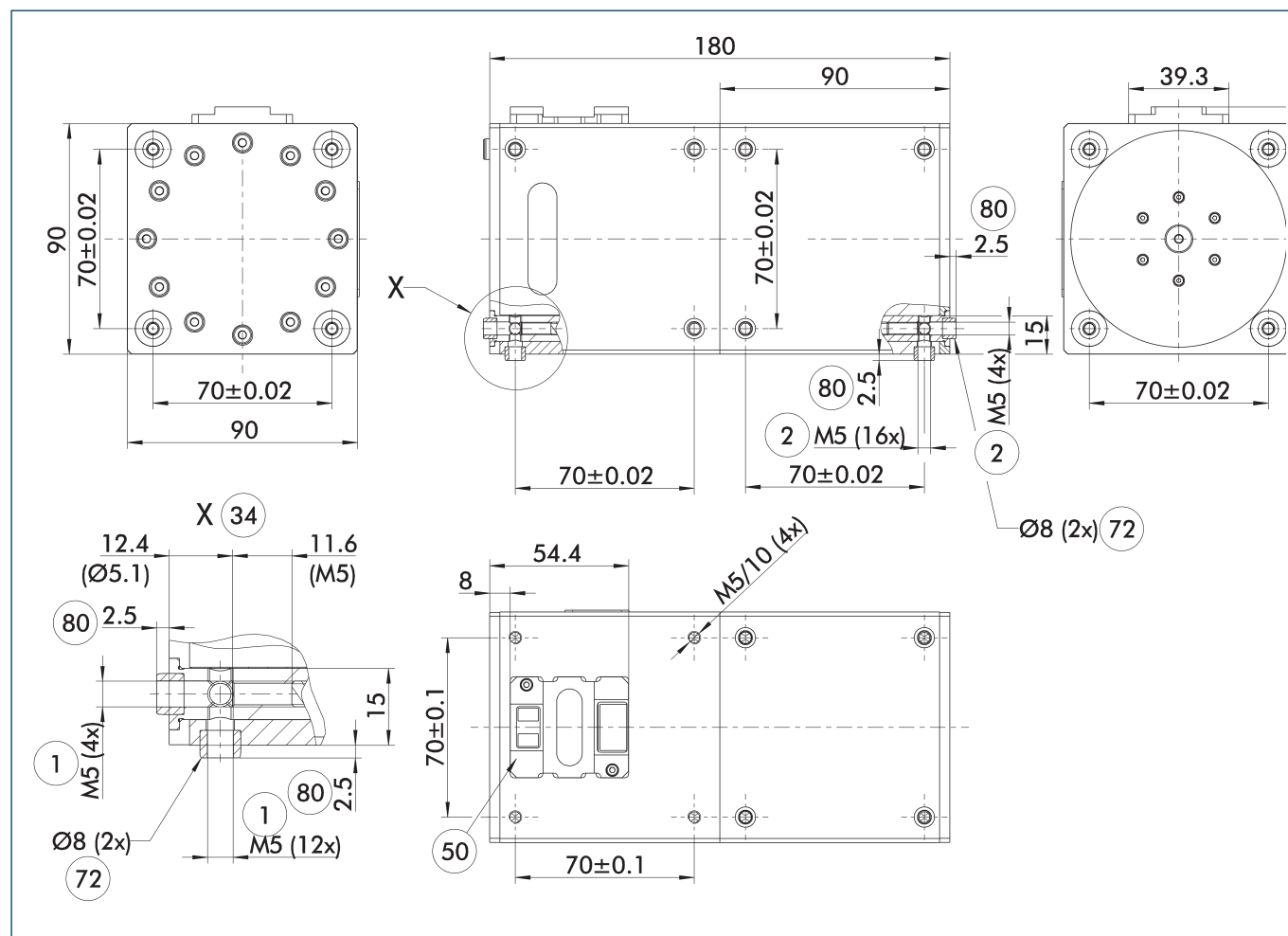
- ① Moments and forces may occur simultaneously.

Technical data

Description		PR 090-51-B	PR 090-101-B	PR 090-161-B
ID		0307314	0307312	0307310
Mechanical operating data				
Nominal torque	[Nm]	12.8	28.8	44.8
Max. torque	[Nm]	20.8	43.2	58.4
Max. RPM	[1/min]	78	40	25
Max. permissible mass moment of inertia	[kgm²]	0.47	1.84	4.67
Repeat accuracy	[°]	0.08	0.04	0.03
Transmission		51:1	101:1	161:1
General operating data				
Brake		yes	yes	yes
Weight	[kg]	3.4	3.4	3.4
Min./max. ambient temperature	[°C]	5/55	5/55	5/55
IP protection class		40	40	40
Electrical operating data				
Nominal voltage	[V]	24	24	24
Nominal current	[A]	10	10	10
Max. current	[A]	20	20	20
Integrated control electronics				
Power supply	[V]	24	24	24
Encoder system		Encoder (incremental)	Encoder (incremental)	Encoder (incremental)
Interface		PROFIBUS, CAN, 4/4 digital I/O, RS232	PROFIBUS, CAN, 4/4 digital I/O, RS232	PROFIBUS, CAN, 4/4 digital I/O, RS232

- ① The peak torques serve as short-term drive reserves when accelerating and delaying.

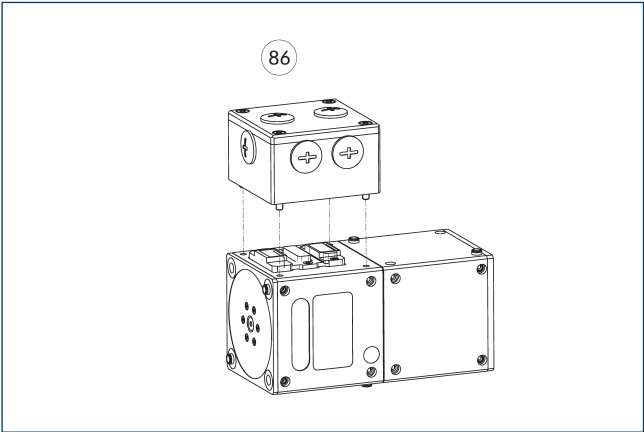
Main view



The drawing shows the basic design of the module without the connection cap without dimensional consideration of the options described below.

- | | |
|-----------------------------|---|
| ① Connection swivel unit | ⑤① Electrical connection |
| ② Attachment connection | ⑦② Fit for centering sleeves |
| ③④ On both connection faces | ⑧① Depth of the centering sleeve hole in the counter part |

Connection caps

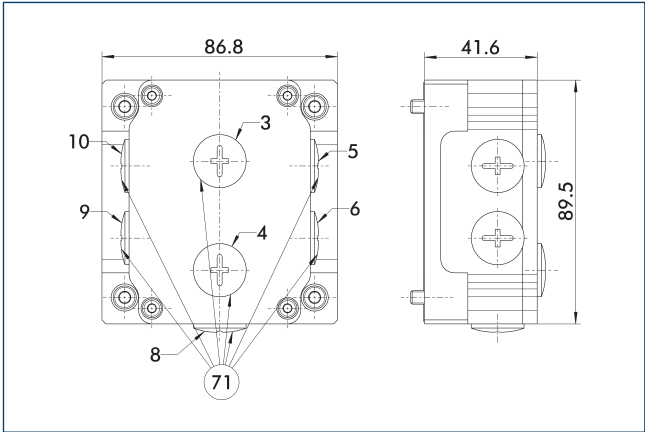


86 Connection cap DMI

The DMI connection cap is required to connect the modules to the voltage supply or higher-level control unit. The wire strands are connected via connection terminals. The DMI connection cap is optionally available with digital I/O (D), with either PROFIBUS (PB) or CAN (CN) interface.

Description	ID	
Connection cap		
DMI 090-V05-B	0307733	

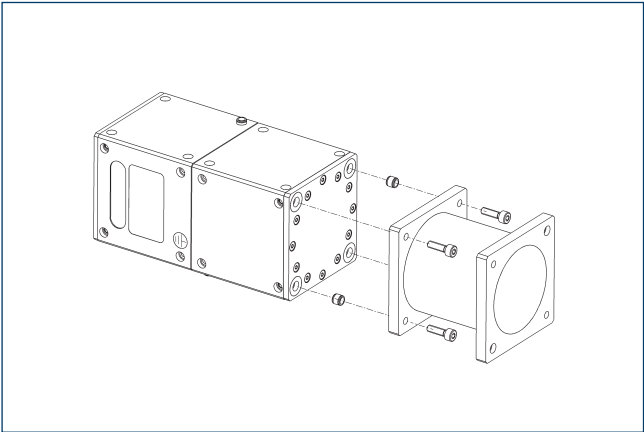
Connection cap DMI



71 M16x1.5 for cable guide penetrating screw connection

Description	ID	
Connection cap		
DMI 090-V05-B	0307733	

Connecting element – straight

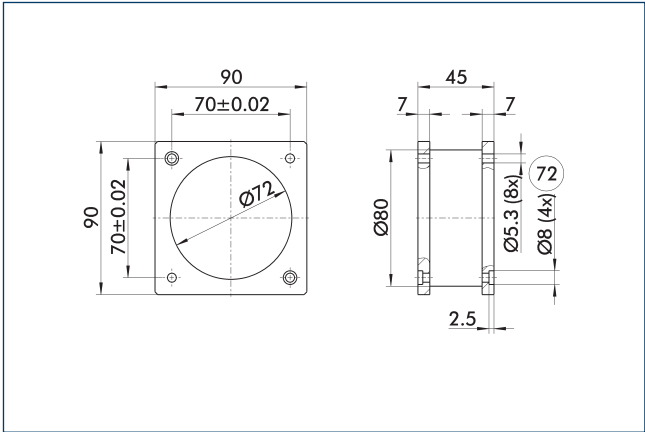


Straight standard element for connection of PowerCube modules with repeat accuracy

Description	ID	Dimensions
Connecting element		
PAM 102	0307802	90x90/45/90x90 mm
PAM 103	0307803	90x90/90/90x90 mm

① Application-specific sizes are available upon request. Please contact us for assistance.

PAM 102 – straight

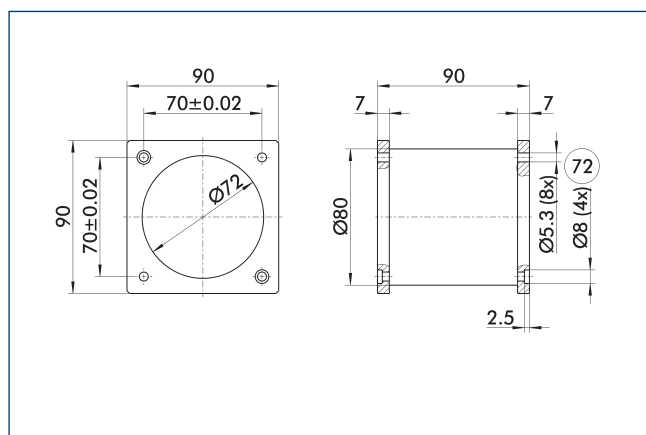


72 Fit for centering sleeves

Suitable for the mechatronic modules PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the size 90.

Description	ID	Dimensions
Connecting element		
PAM 102	0307802	90x90/45/90x90 mm

PAM 103 – straight

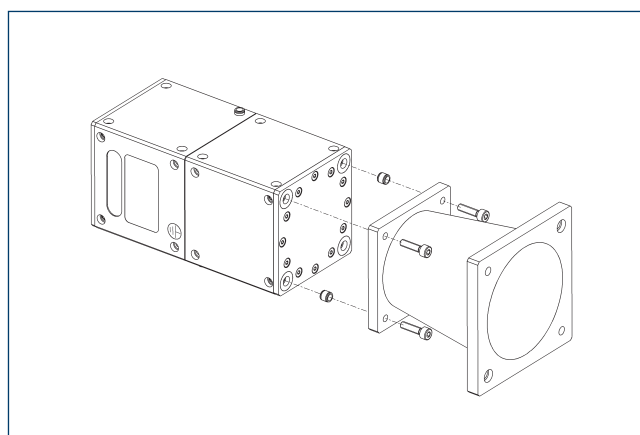


72 Fit for centering sleeves

Suitable for the mechatronic modules PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the size 90.

Description	ID	Dimensions
Connecting element		
PAM 103	0307803	90x90/90/90x90 mm

Connecting element – conical

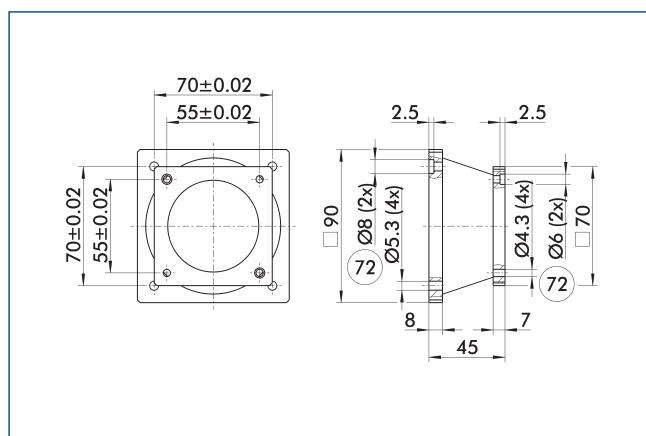


Conical standard element for connection of PowerCube modules with repeat accuracy

Description	ID	
Connecting element		
PAM 110	0307810	
PAM 111	0307811	
PAM 112	0307812	
PAM 113	0307813	

① Application-specific sizes are available upon request. Please contact us for assistance.

PAM 110 – conical

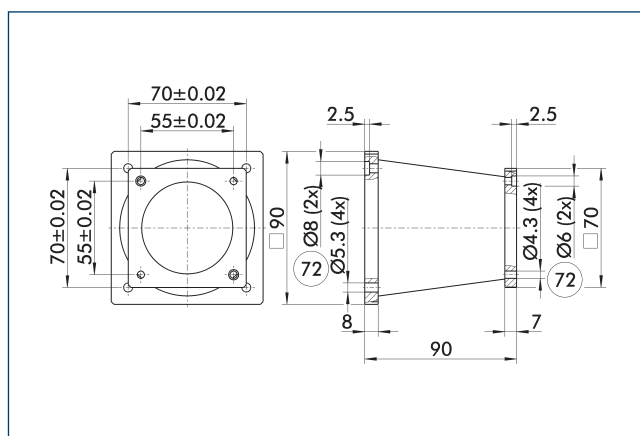


72 Fit for centering sleeves

Suitable for the mechatronic modules PG, PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the sizes 70/90.

Description	ID	
Connecting element		
PAM 110	0307810	

PAM 111 – conical

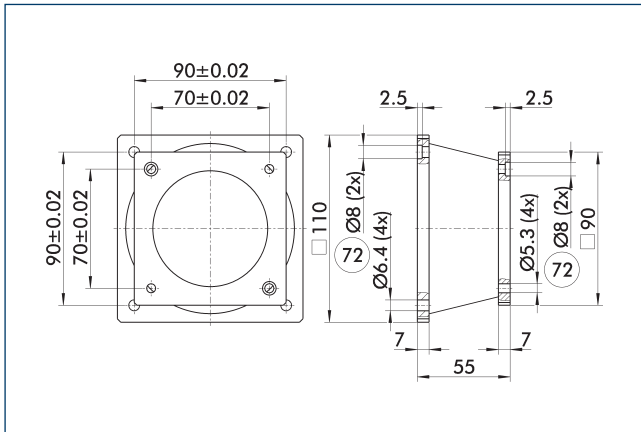


72 Fit for centering sleeves

Suitable for the mechatronic modules PG, PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the sizes 70/90.

Description	ID	
Connecting element		
PAM 111	0307811	

PAM 112 – conical

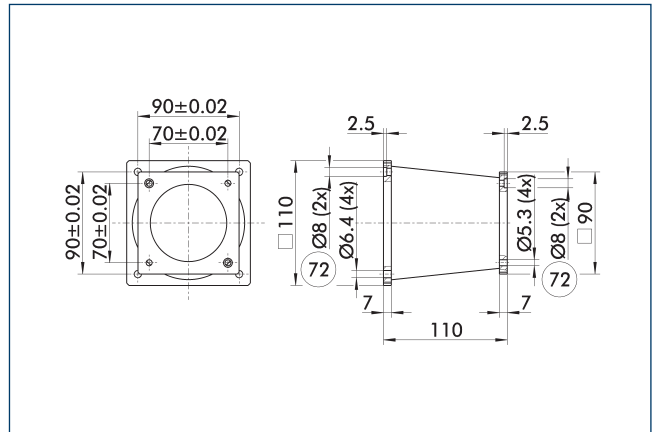


Fit for centering sleeves

Suitable for the mechatronic modules PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the sizes 90/110.

Description	ID	
Connecting element		
PAM 112	0307812	

PAM 113 – conical

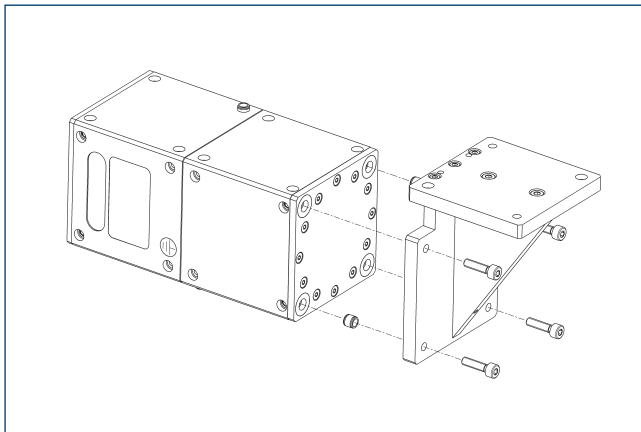


Fit for centering sleeves

Suitable for the mechatronic modules PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the sizes 90/110.

Description	ID	
Connecting element		
PAM 113	0307813	

Connecting element – angle

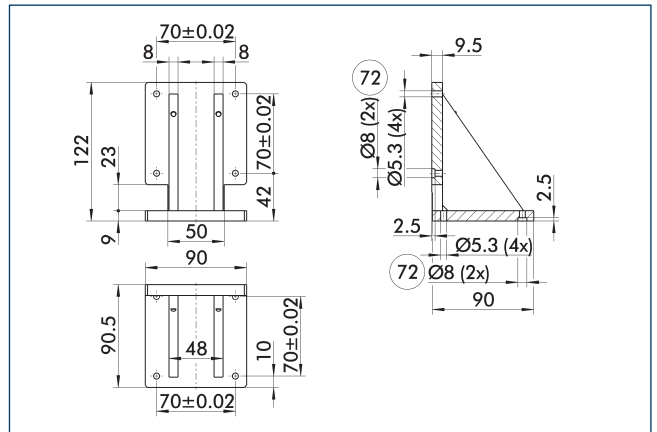


Angular standard element for connection of PowerCube modules with repeat accuracy

Description	ID	
Connecting element		
PAM 121	0307821	

Application-specific sizes are available upon request. Please contact us for assistance.

PAM 121 – angle



Fit for centering sleeves

Suitable for the mechatronic modules PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the size 90.

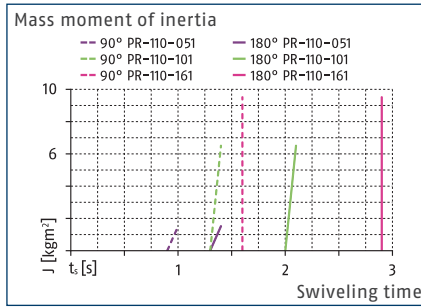
Description	ID	
Connecting element		
PAM 121	0307821	

PR 110

Universal rotary unit

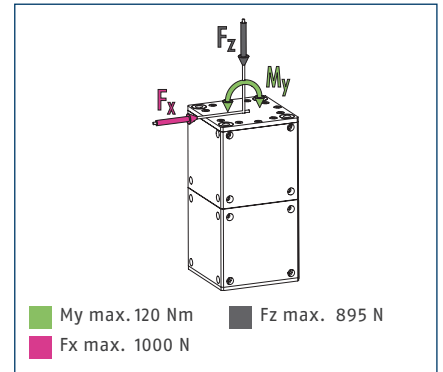


Swivel time diagram



- ① The diagram is only valid for applications with vertical swivel axes or horizontal swivel axes with even mass distribution and without the effects of gravity.

Max. loads



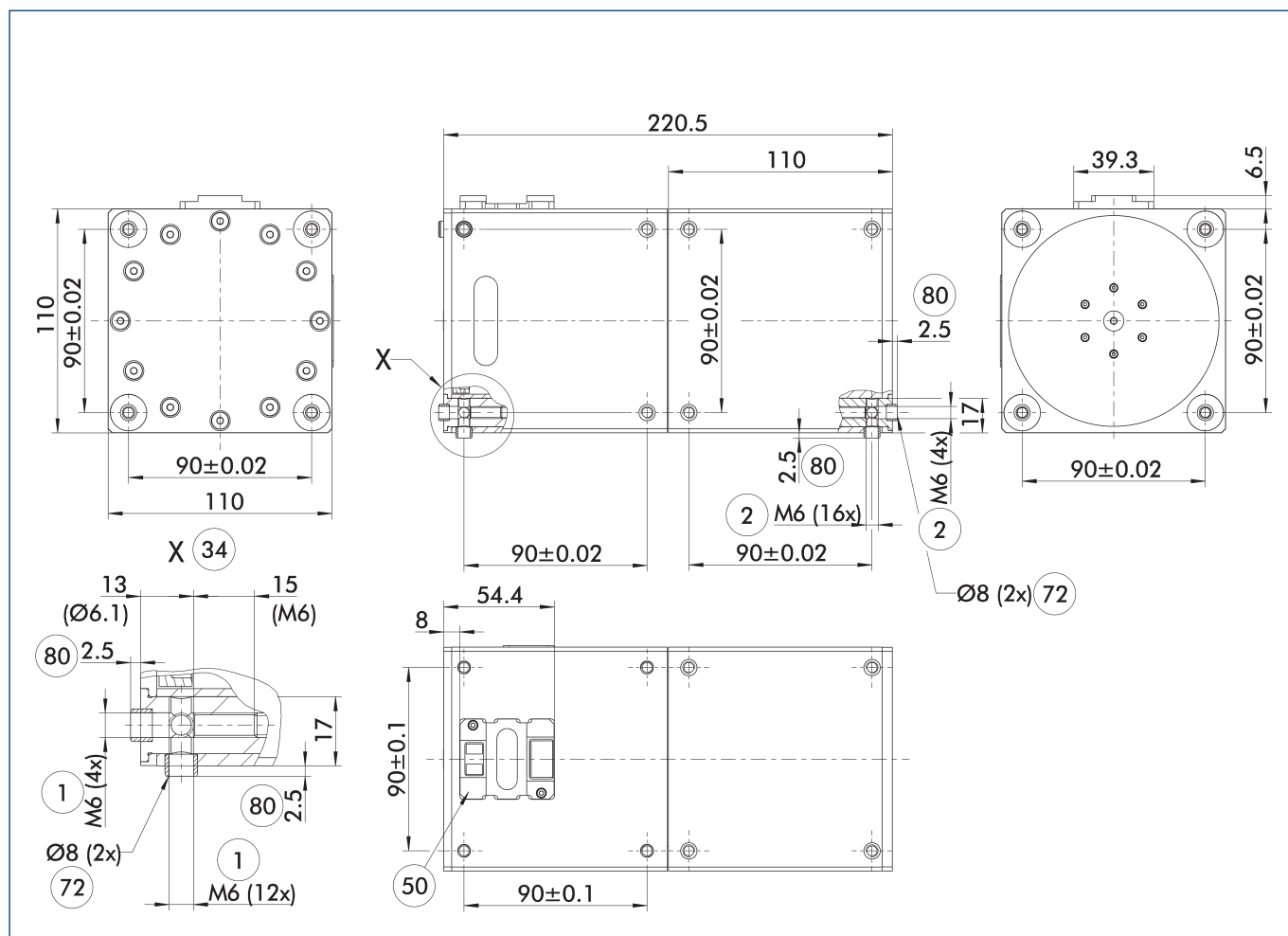
- ① Moments and forces may occur simultaneously.

Technical data

Description		PR 110-51-B	PR 110-101-B	PR 110-161-B
ID		1356345	1356343	1356338
Mechanical operating data				
Nominal torque	[Nm]	22.4	40.8	88
Max. torque	[Nm]	61.6	120	184
Max. RPM	[1/min]	42	20	13
Max. permissible mass moment of inertia	[kgm²]	1.5	6.5	9.5
Repeat accuracy	[°]	0.08	0.04	0.03
Transmission		51:1	101:1	161:1
General operating data				
Brake		yes	yes	yes
Weight	[kg]	5.6	5.6	5.6
Min./max. ambient temperature	[°C]	5/55	5/55	5/55
IP protection class		40	40	40
Electrical operating data				
Nominal voltage	[V]	24	24	24
Nominal current	[A]	10	10	10
Max. current	[A]	20	20	20
Integrated control electronics				
Power supply	[V]	24	24	24
Encoder system		Encoder (incremental)	Encoder (incremental)	Encoder (incremental)
Interface		PROFIBUS, CAN, 4/4 digital I/O, RS232	PROFIBUS, CAN, 4/4 digital I/O, RS232	PROFIBUS, CAN, 4/4 digital I/O, RS232

- ① The peak torques serve as short-term drive reserves when accelerating and delaying.

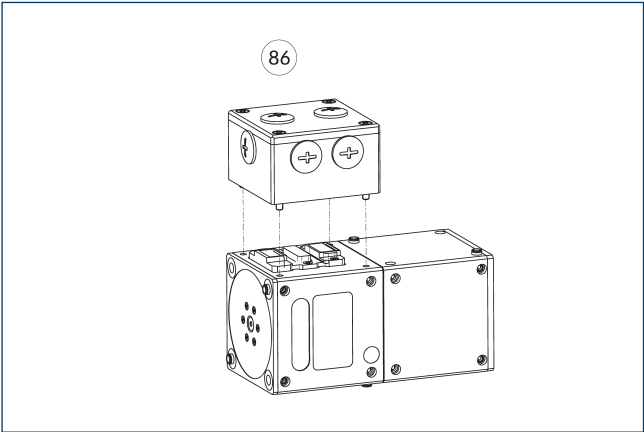
Main view



The drawing shows the basic design of the module without the connection cap without dimensional consideration of the options described below.

- ① Connection swivel unit
- ② Attachment connection
- ③④ On both connection faces
- ⑤⑥ Electrical connection
- ⑦⑧ Fit for centering sleeves
- ⑨⑩ Depth of the centering sleeve hole in the counter part

Connection caps

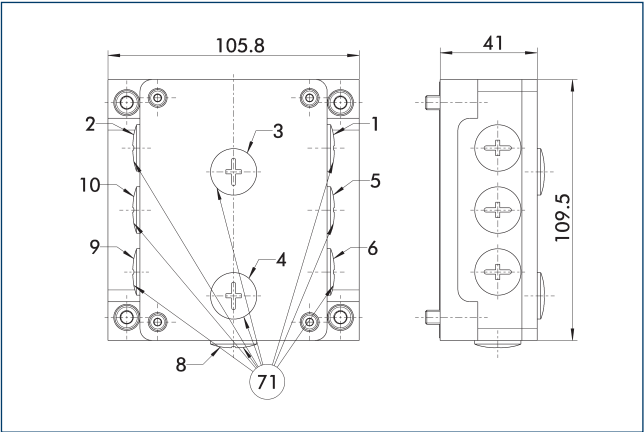


86 Connection cap DMI

The DMI connection cap is required to connect the modules to the voltage supply or higher-level control unit. The wire strands are connected via connection terminals. The DMI connection cap is optionally available with digital I/O (D), with either PROFIBUS (PB) or CAN (CN) interface.

Description	ID	
Connection cap		
DMI 110-V05-B	0307734	

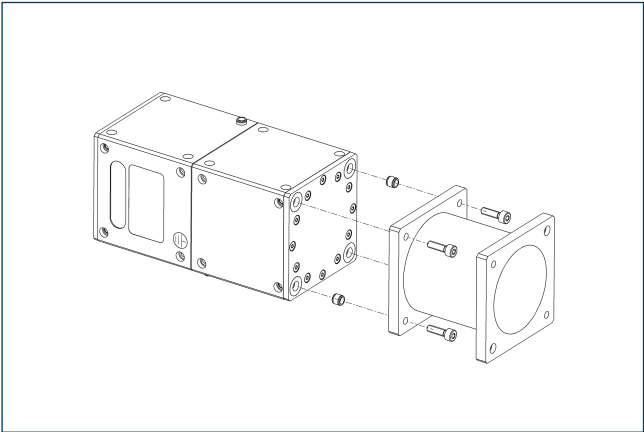
Connection cap DMI



71 M16x1.5 for cable guide penetrating screw connection

Description	ID	
Connection cap		
DMI 110-V05-B	0307734	

Connecting element – straight

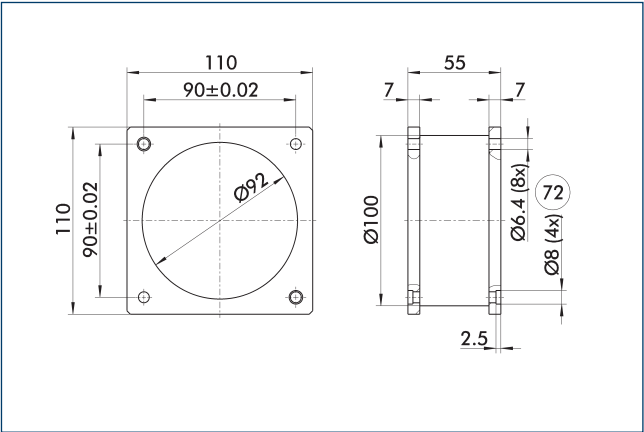


Straight standard element for connection of PowerCube modules with repeat accuracy

Description	ID	Dimensions
Connecting element		
PAM 104	0307804	110x110/55/110x110 mm
PAM 105	0307805	110x110/110/110x110 mm

① Application-specific sizes are available upon request. Please contact us for assistance.

PAM 104 – straight

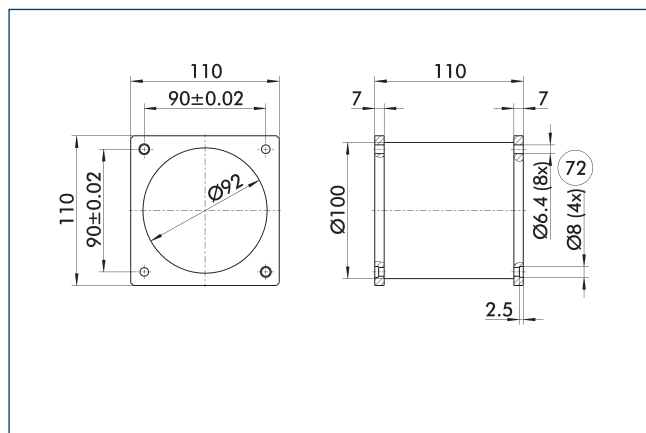


72 Fit for centering sleeves

Suitable for the mechatronic modules PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the sizes 110.

Description	ID	Dimensions
Connecting element		
PAM 104	0307804	110x110/55/110x110 mm

PAM 105 – straight

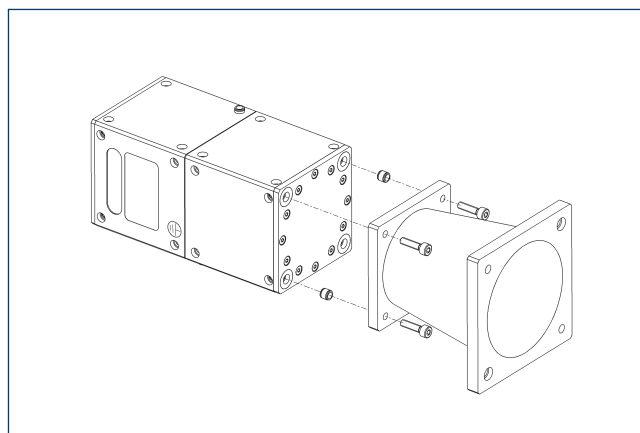


72 Fit for centering sleeves

Suitable for the mechatronic modules PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the sizes 110.

Description	ID	Dimensions
Connecting element		
PAM 105	0307805	110x110/110/110x110 mm

Connecting element – conical

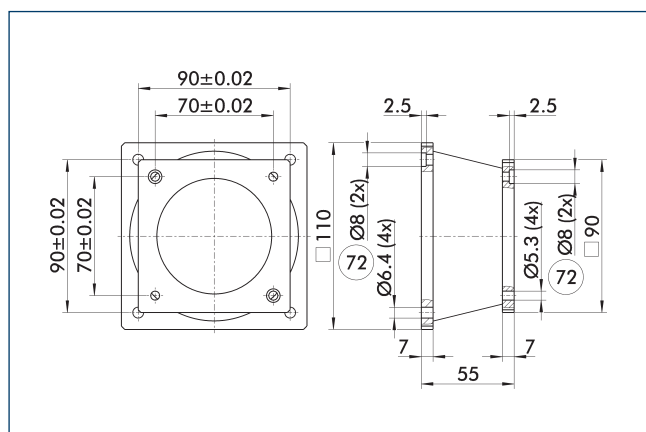


Conical standard element for connection of PowerCube modules with repeat accuracy

Description	ID	
Connecting element		
PAM 112	0307812	
PAM 113	0307813	

① Application-specific sizes are available upon request. Please contact us for assistance.

PAM 112 – conical

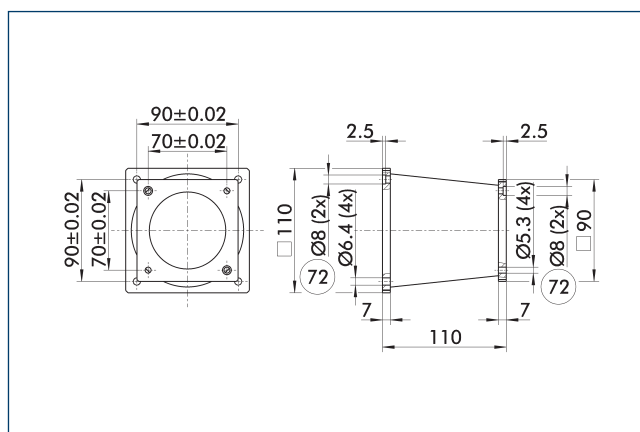


72 Fit for centering sleeves

Suitable for the mechatronic modules PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the sizes 90/110.

Description	ID	
Connecting element		
PAM 112	0307812	

PAM 113 – conical

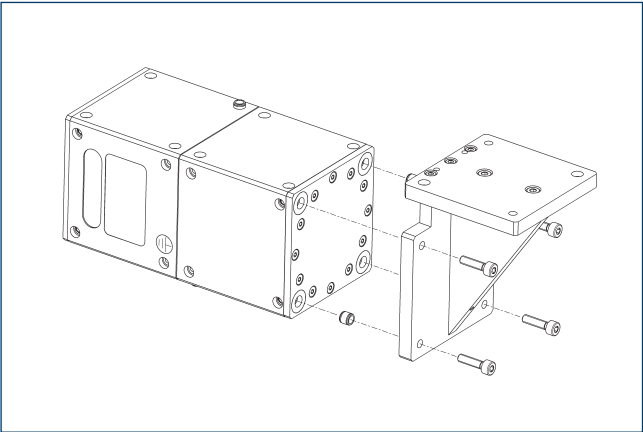


72 Fit for centering sleeves

Suitable for the mechatronic modules PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the sizes 90/110.

Description	ID	
Connecting element		
PAM 113	0307813	

Connectiing element - angle



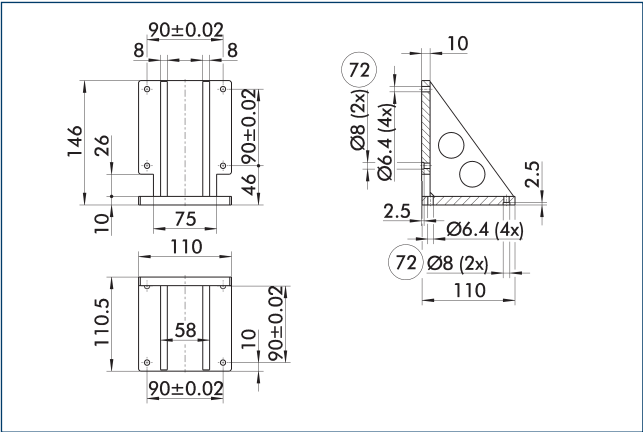
Angular standard element for connection of PowerCube modules with repeat accuracy

Description	ID	
Connecting element		
PAM 122	0307822	

- ❶

Application-specific sizes are available upon request. Please contact us for assistance.

PAM 122 - angle



- 72

Fit for centering sleeves
- Suitable for the mechatronic modules PW-V5, PW-V6, PR, PR2, PDU, PDU2, PSM and PSM2 of the sizes 110.

Description	ID	
Connecting element		
PAM 122	0307822	



SCHUNK GmbH & Co. KG
Spann- und Greiftechnik

Bahnhofstr. 106 - 134
D-74348 Lauffen/Neckar
Tel. +49-7133-103-0
Fax +49-7133-103-2399
info@de.schunk.com
schunk.com

Folgen Sie uns | *Follow us*

