



Superior Clamping and Gripping



Product Information

Anti-collision and overload protection sensor OPR

OPR

Anti-collision and overload protection sensor

Compliant. Highly responsive. Automatic reset.

OPR collision and overload sensor

Collision and overload protection with automatic reset for protecting robots and handling units against damage resulting from collisions or overload conditions.

Field of application

Standard solution for all robot applications whereby the robot, the tool or the workpiece are to be protected against greater damages in case of a collision.



Advantages – Your benefits

Automatic reset for faster production restart after a collision

Triggering force and torque can be adjusted via the operating pressure for optimal protection of your robots and components

Integrated monitoring for signal transmission in case of collision, whereby the robot can be stopped

ISO adapter plates as an option for easy assembly to most of robot types without any manufacturing costs/ work

On option also with integrated springs for optimal monitoring of the robot and the components at low process forces and for sensitive applications

Mechanical flexibility in the event of collisions permits a delay-free reaction to any collisions which occur and overload



Sizes
Quantity: 7



Triggering force F^d
440 .. 14000 N



Trigger moment M_x
6 .. 2000 Nm



Trigger moment M_y
6 .. 2000 Nm



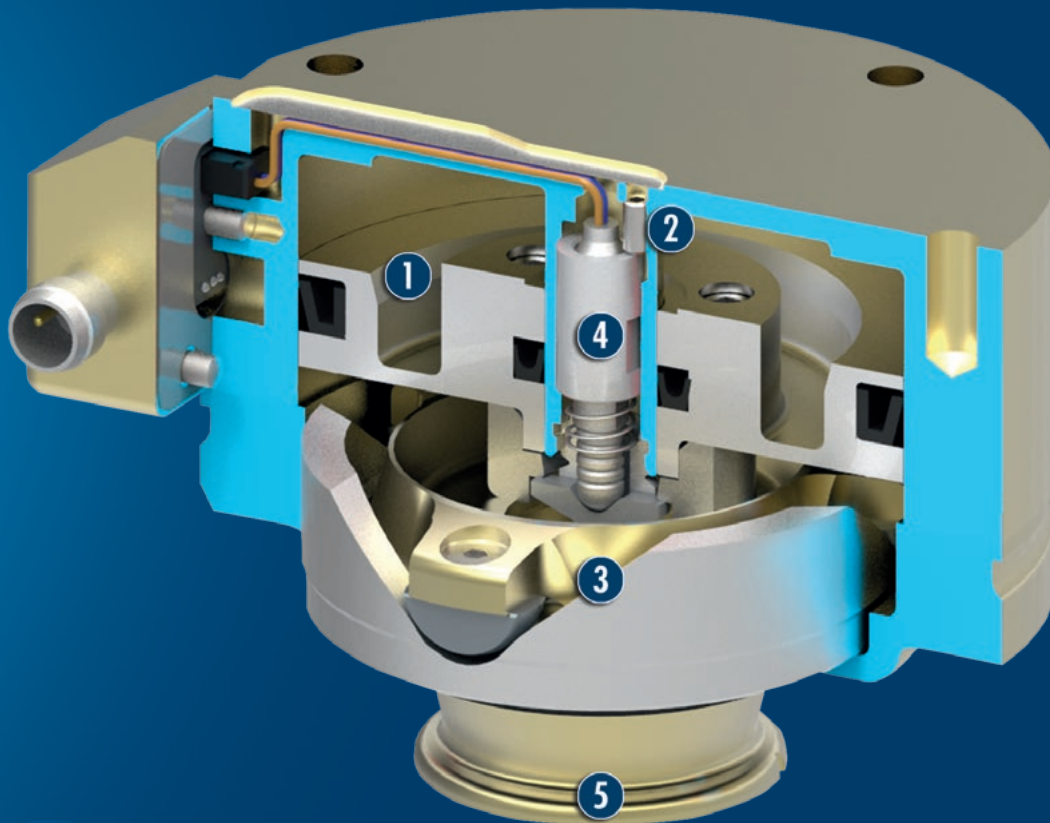
Trigger moment M_z
6.9 .. 1500 Nm

Functional description

In case of a collision, the tool plate deflects while simultaneously actuating the system's emergency stop mechanism.

The OPR automatically returns to zero position when the

gripper moves away from the collision object. Production can continue immediately as manual resetting is not necessary.



① **Pneumatic pistons**
for easy responsiveness by pressure

② **Adjustment screw**
for adjusting the switching point

③ **Bearing**
for absorption of high forces and moments

④ **Monitoring**
via mechanical switch

⑤ **Mounting flange**
deflects in the event of a collision

CAD data, operating manuals and other current product documents can be found online.

General notes about the series

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

Operating principle: Integrated cylinder pistons

Splash water protection: Optional

Scope of delivery: Angular plug with 5 m cable and open wire strand, operating and maintenance instructions, Manufacturer's Declaration

Warranty: 24 months

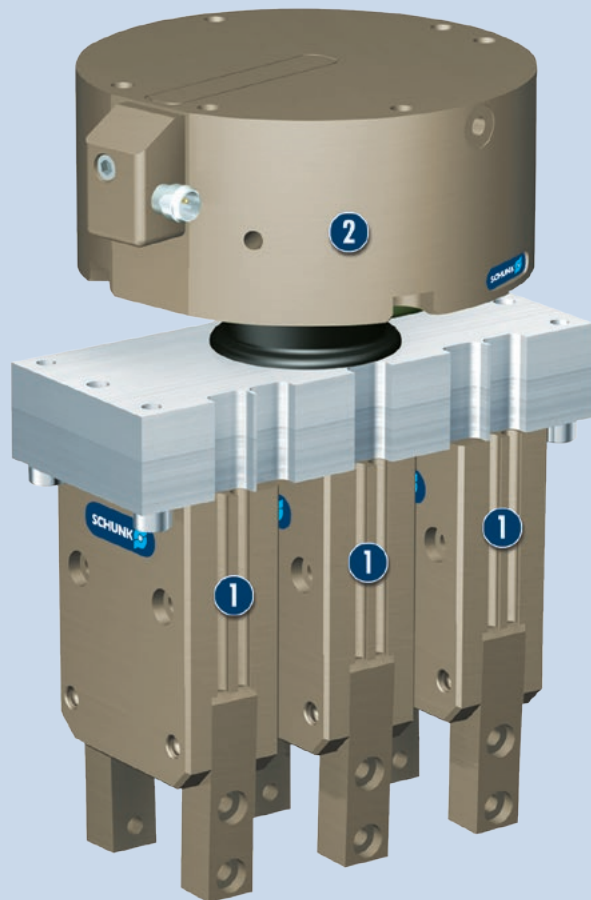
Harsh environmental conditions: Please note that the use under harsh environmental conditions (e.g. with coolant or cast and grinding dust) can considerably reduce the service life of the units and is not covered in the warrant. In many cases, however, we can find a solution. Please contact us for assistance.

Handling weight: is the weight of the total load attached to the flange. When designing, the permissible forces and moments have to be paid attention to. Please note that exceeding the recommended handling weight will shorten the lifespan.

Application example

Triple transfer unit for packaging with small boxboards

- ❶ SWG 2-finger angular gripper
- ❷ OPR collision sensor



SCHUNK offers more ...

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



Pallet change system



Quick-Change-System



Manual Gripper Change System



Rotary feed-through



Angular gripper



Centric gripper



Parallel gripper

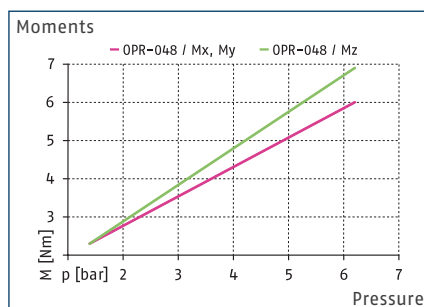
① Additional information regarding the products can be found on the following product pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

OPR 048

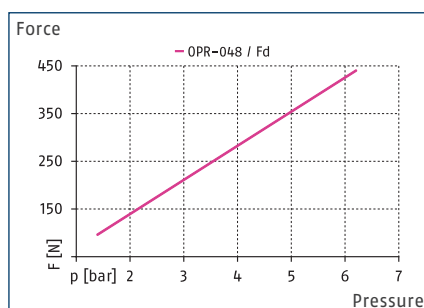
Anti-collision and overload protection sensor



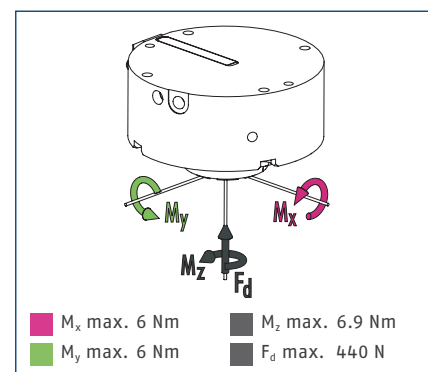
Triggering torque M_x , M_y , M_z



Triggering force F_d



Forces and moments



① The design of the collision sensors are defined through the occurring forces and moments of your application.

Technical data

Description		OPR-048-P00	OPR-048-P05	OPR-048-P10	OPR-048-P15
ID		0321341	0321342	0321343	0321344
Axial deflection	[mm]	5.1	5.1	5.1	5.1
Angular deflection	[°]	13	13	13	13
Deflection, rotatory	[°]	20	20	20	20
Min. triggering moment, angular M_x, M_y	[Nm]	2.3	2.7	3.2	3.6
Min. triggering torque, rotatory M_z	[Nm]	2.3	2.7	3.1	3.5
Spring triggering force	[N]		24	48	72
Release torque spring, angular	[Nm]		0.4	0.9	1.3
Rotatory spring displacement	[Nm]		0.4	0.8	1.2
Supply voltage	[V]	10/30	10/30	10/30	10/30
Repeat accuracy	[mm]	± 0.025	± 0.025	± 0.025	± 0.025
Response sensitivity	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Weight	[kg]	0.24	0.25	0.25	0.25
Min./max. ambient temperature	[°C]	5/60	5/60	5/60	5/60

- ① Robot-side connection
- ② Tool-side connection
- ②④ Bolt circle
- ②⑦ Through holes for screw connections
- ②⑨ Air connection P
- ③⑩ Cable connector in enclosed pack with 5 m connection cable
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

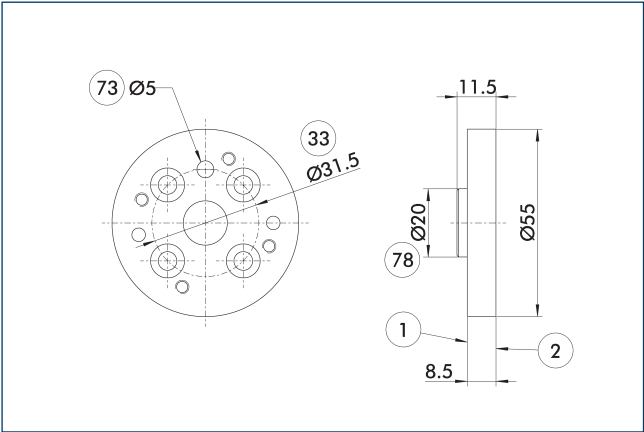
A graph showing the relationship between the angle in degrees (x-axis) and the moment M_x in Nm (y-axis). The x-axis ranges from 0 to 2.00 with major ticks every 0.25. The y-axis ranges from 0 to 8 with major ticks every 1. A dashed grid is present. A smooth, increasing curve is plotted, starting at (0, 0) and passing through approximately (0.5, 4.5), (1.0, 6.0), and (1.7, 6.8).

The chart shows the angular deflection of the OPR in the dependence of the moment $M_{x,y}$ with maximal permissible operating pressure.

OPR 048

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A31.5-R

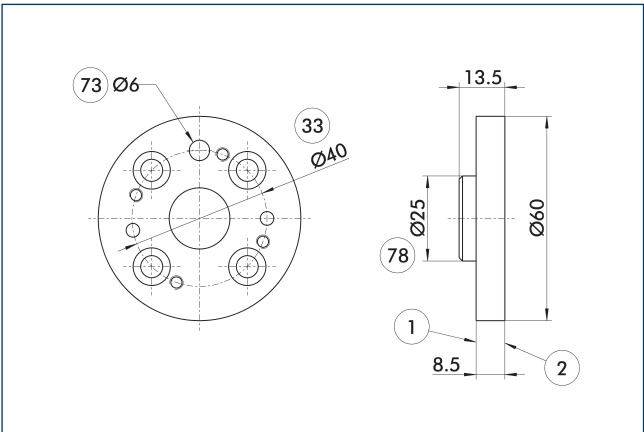


- ① Robot-side connection
- ② Tool-side connection
- ③③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-31.5-4-M5.

Description	ID	
Adapter plate		
A-OPR-048-ISO-A31-R	0321347	

Adapter plate ISO 9409-A40-R

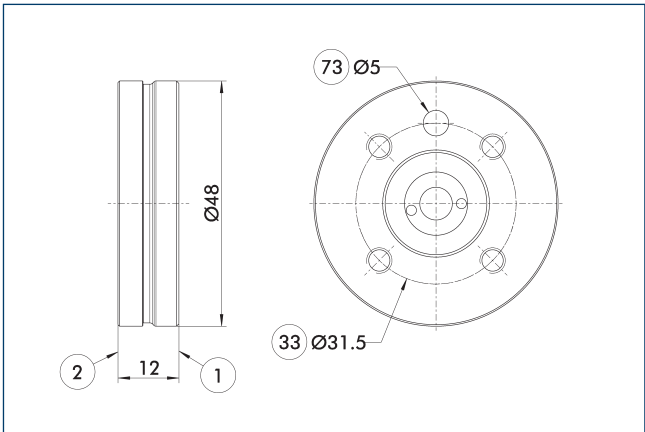


- ① Robot-side connection
- ② Tool-side connection
- ③③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate for direct attachment of the OPR to an ISO 9409-40-4-M6-compliant flange pattern.

Description	ID	
Adapter plate		
A-OPR-048-ISO-A40-R	0321348	

Adapter plate ISO-9409-A31.5-T

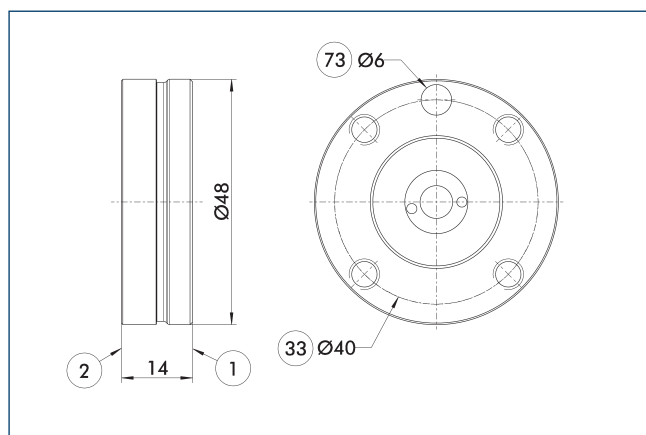


- ① Robot-side connection
- ② Tool-side connection
- ③③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-048-ISO-A31-T	0321356	

Adapter plate ISO 9409-A40-T

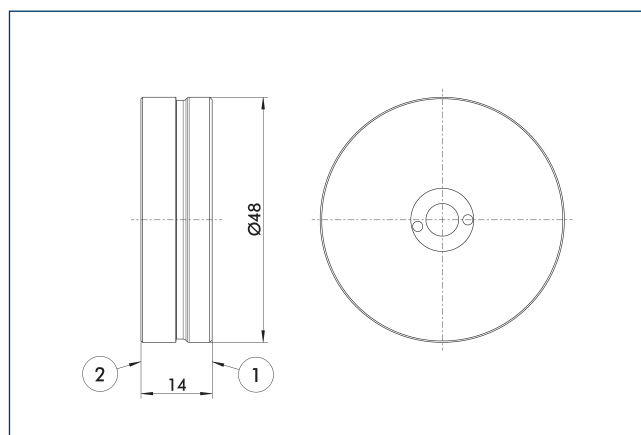


- ① Robot-side connection
- ② Tool-side connection
- ③③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-048-ISO-A40-T	0321357	

Adapter plate BLANK-T

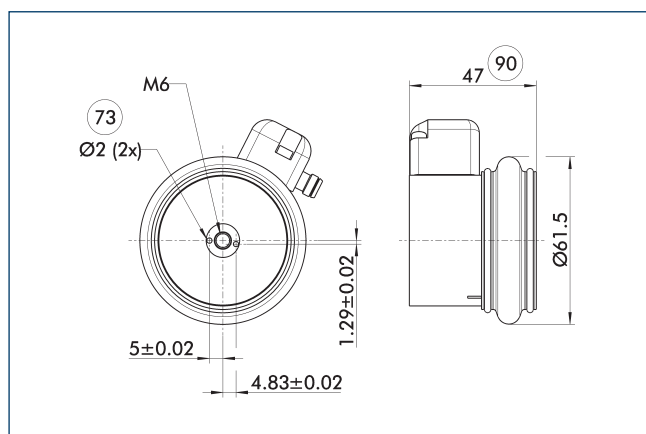


- ① Robot-side connection
- ② Tool-side connection

Unfinished tool-side adapter to be machined by the customer.

Description	ID	
Tool side		
A-OPR-048-BLANK-T	0321355	

Protection cover OPR-048



- ⑦③ Fit for centering pins
- ⑨⑩ Total height with adapter plate with flange pattern according to ISO 9409-A31.5/A40 and without flange pattern

The protection boot protects the OPR against coolants for use up to IP 65.

Description	ID	Protection class IP
Protection cover		
OPR-048 Flexboot	0321351	65

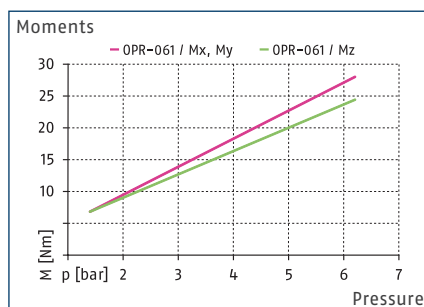
- ① Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 061

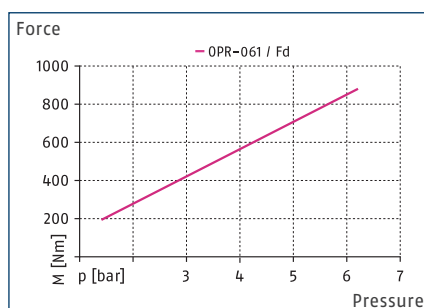
Anti-collision and overload protection sensor



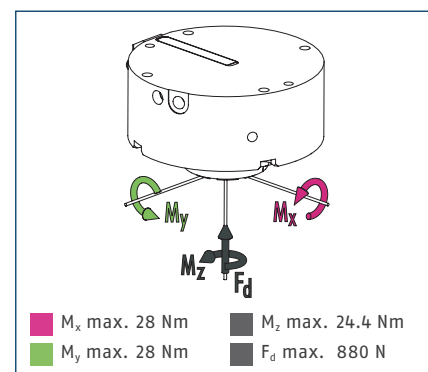
Triggering torque M_x , M_y , M_z



Triggering force F_d



Forces and moments

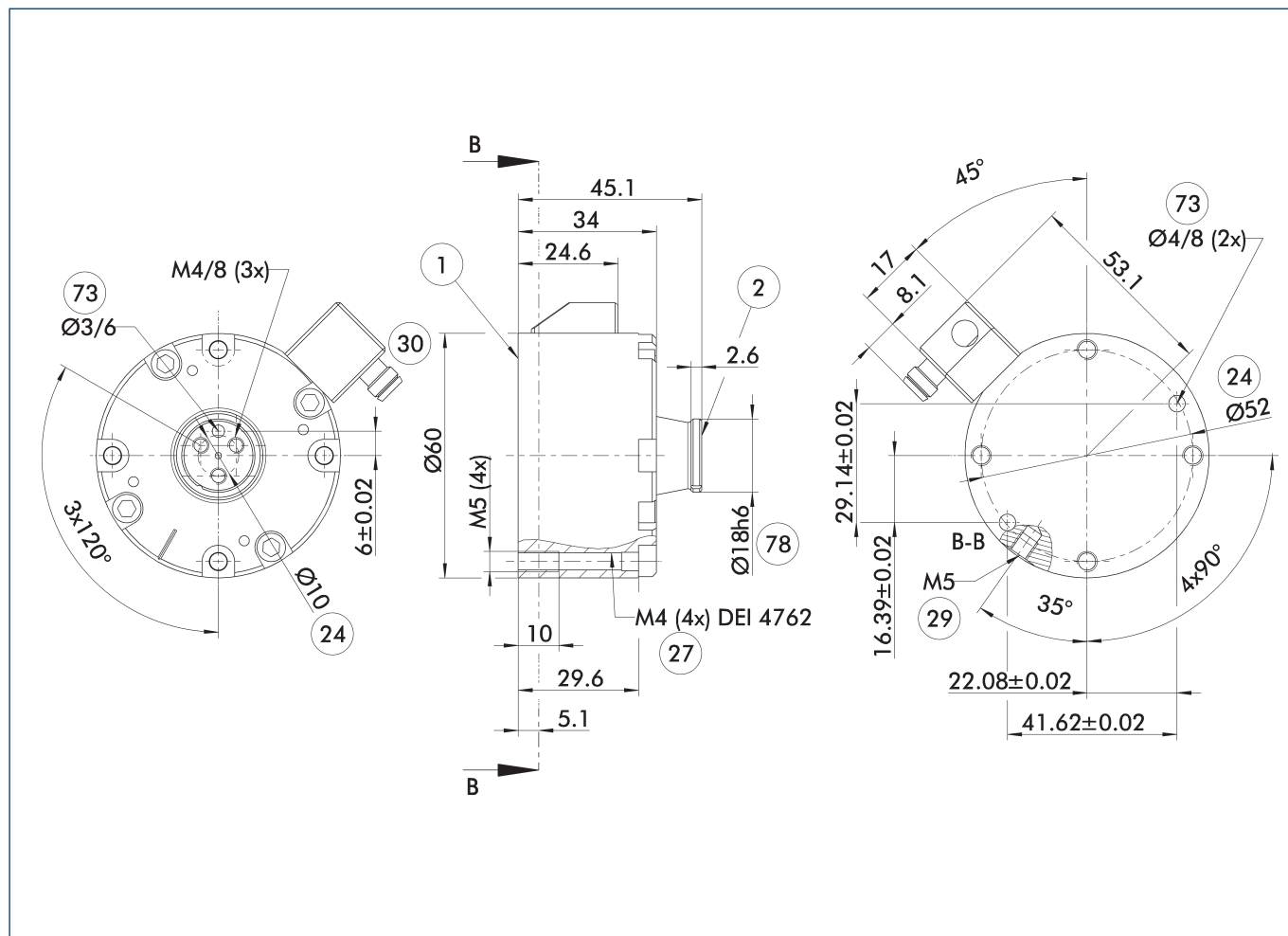


① The design of the collision sensors are defined through the occurring forces and moments of your application.

Technical data

Description		OPR-061-P00	OPR-061-P05	OPR-061-P10	OPR-061-P15
ID		0321361	0321362	0321363	0321364
Axial deflection	[mm]	5.6	5.6	5.6	5.6
Angular deflection	[°]	11	11	11	11
Deflection, rotatory	[°]	20	20	20	20
Min. triggering moment, angular M_x, M_y	[Nm]	6.8	8.6	10.3	12.1
Min. triggering torque, rotatory M_z	[Nm]	6.8	8.5	10.1	11.8
Spring triggering force	[N]		48	96	144
Release torque spring, angular	[Nm]		1.8	3.5	5.3
Rotatory spring displacement	[Nm]		1.7	3.3	5
Supply voltage	[V]	10/30	10/30	10/30	10/30
Repeat accuracy	[mm]	± 0.025	± 0.025	± 0.025	± 0.025
Response sensitivity	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Weight	[kg]	0.32	0.33	0.33	0.33
Min./max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Options and their characteristics					
Splash-proof version		OPR-061-P00-S	OPR-061-P05-S	OPR-061-P10-S	OPR-061-P15-S
ID		0321365	0321366	0321367	0321368
Protection class IP		65	65	65	65

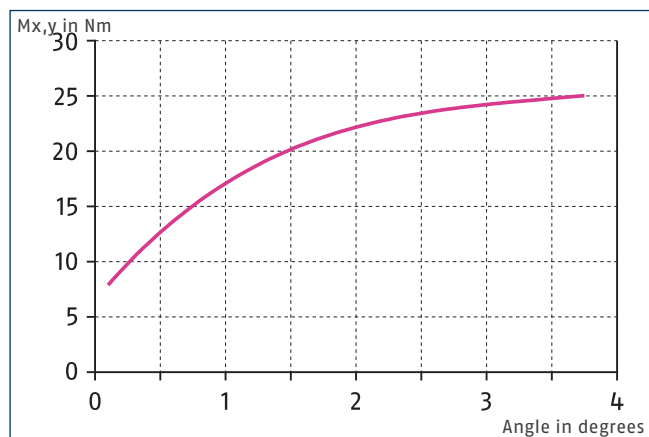
Main view



The main view shows the unit in its basic version.

- | | |
|---------------------------------------|---|
| ① Robot-side connection | ②⑨ Air connection P |
| ② Tool-side connection | ③⑩ Cable connector in enclosed pack with 5 m connection cable |
| ④ Bolt circle | ⑦③ Fit for centering pins |
| ⑦ Through holes for screw connections | ⑦⑧ Fit for centering |

Moment loading

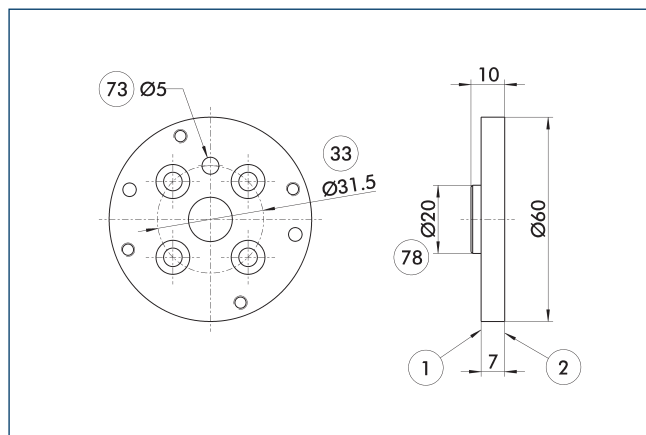


The chart shows the angular deflection of the OPR in the dependence of the moment $M_{x,y}$ with maximal permissible operating pressure.

OPR 061

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A31.5-R

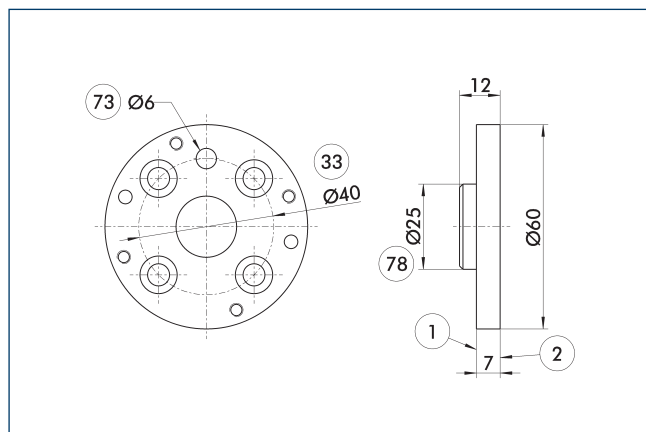


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-31.5-4-M5.

Description	ID	
Adapter plate		
A-OPR-061-ISO-A31-R	0321369	

Adapter plate ISO 9409-A40-R

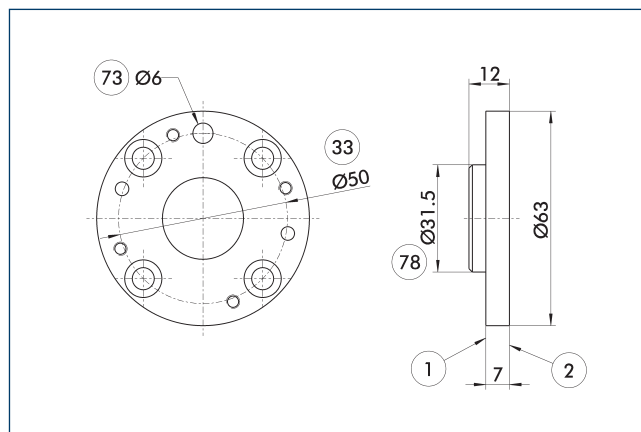


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate for direct attachment of the OPR to an ISO 9409-40-4-M6-compliant flange pattern.

Description	ID	
Adapter plate		
A-OPR-061-ISO-A40-R	0321370	

Adapter plate ISO 9409-A50-R

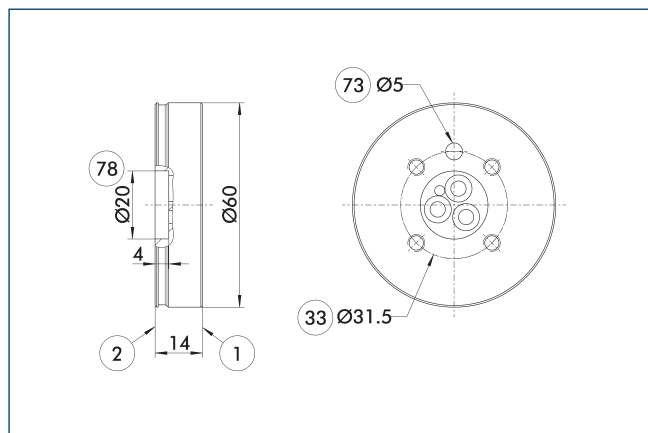


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-50-4-M6.

Description	ID	
Adapter plate		
A-OPR-061-ISO-A50-R	0321371	

Adapter plate ISO-9409-A31.5-T

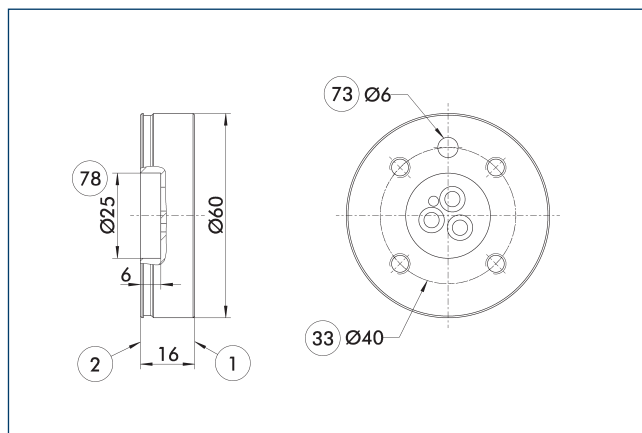


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-061-ISO-A31-T	0321372	

Adapter plate ISO 9409-A40-T

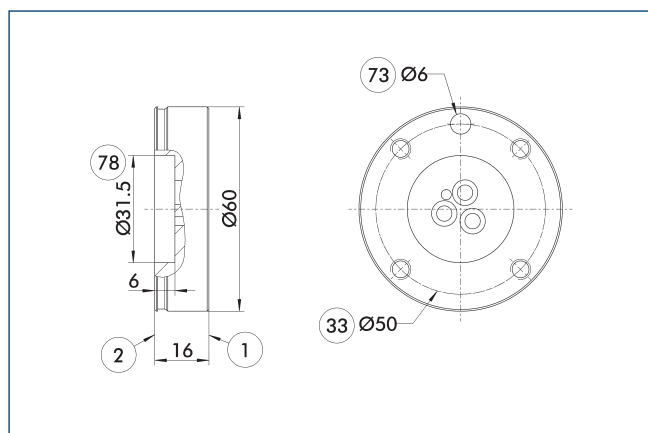


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-061-ISO-A40-T	0321373	

Adapter plate ISO 9409-A50-T

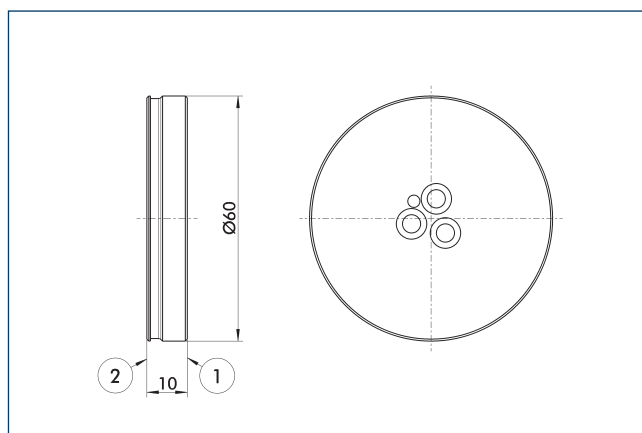


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-061-ISO-A50-T	0321374	

Adapter plate BLANK-T



- ① Robot-side connection
- ② Tool-side connection

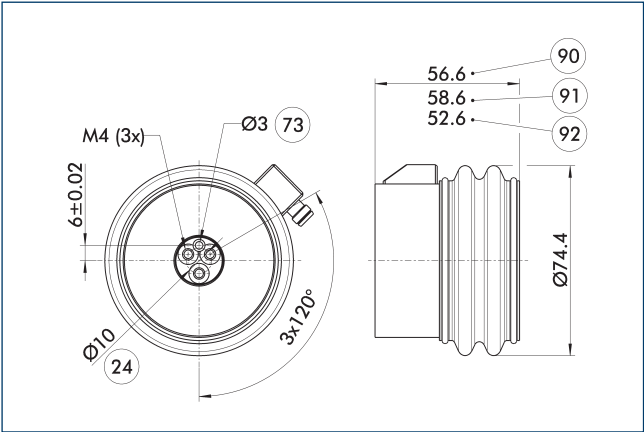
Unfinished tool-side adapter to be machined by the customer.

Description	ID	
Tool side		
A-OPR-061-BLANK-T	0321375	

OPR 061

Anti-collision and overload protection sensor

Protection cover OPR-061



- 24 Bolt circle

73 Fit for centering pins

90 Total height with adapter plate with flange pattern according to ISO 9409-A31.5
- 91 Total height with adapter plate with flange pattern according to ISO 9409-A40/A50

92 Total height with adapter plate without flange pattern

The protection boot protects the OPR against coolants for use up to IP 65.

Description	ID	Protection class IP
Protection cover		
OPR-061 Flexboot	0321376	65

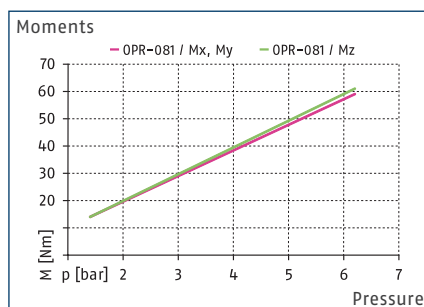
- ⓘ Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 081

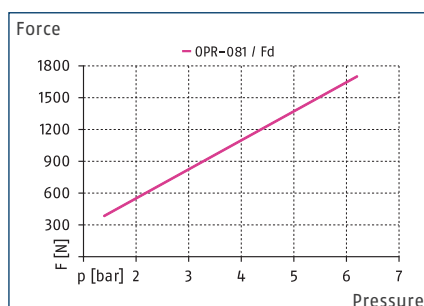
Anti-collision and overload protection sensor



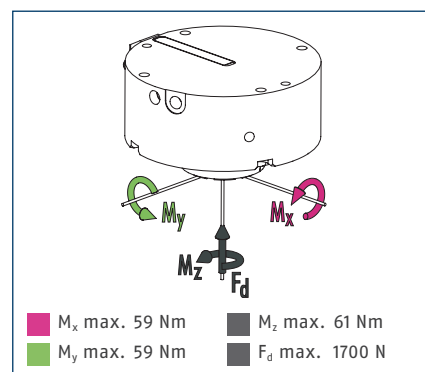
Triggering torque M_x , M_y , M_z



Triggering force F_d



Forces and moments

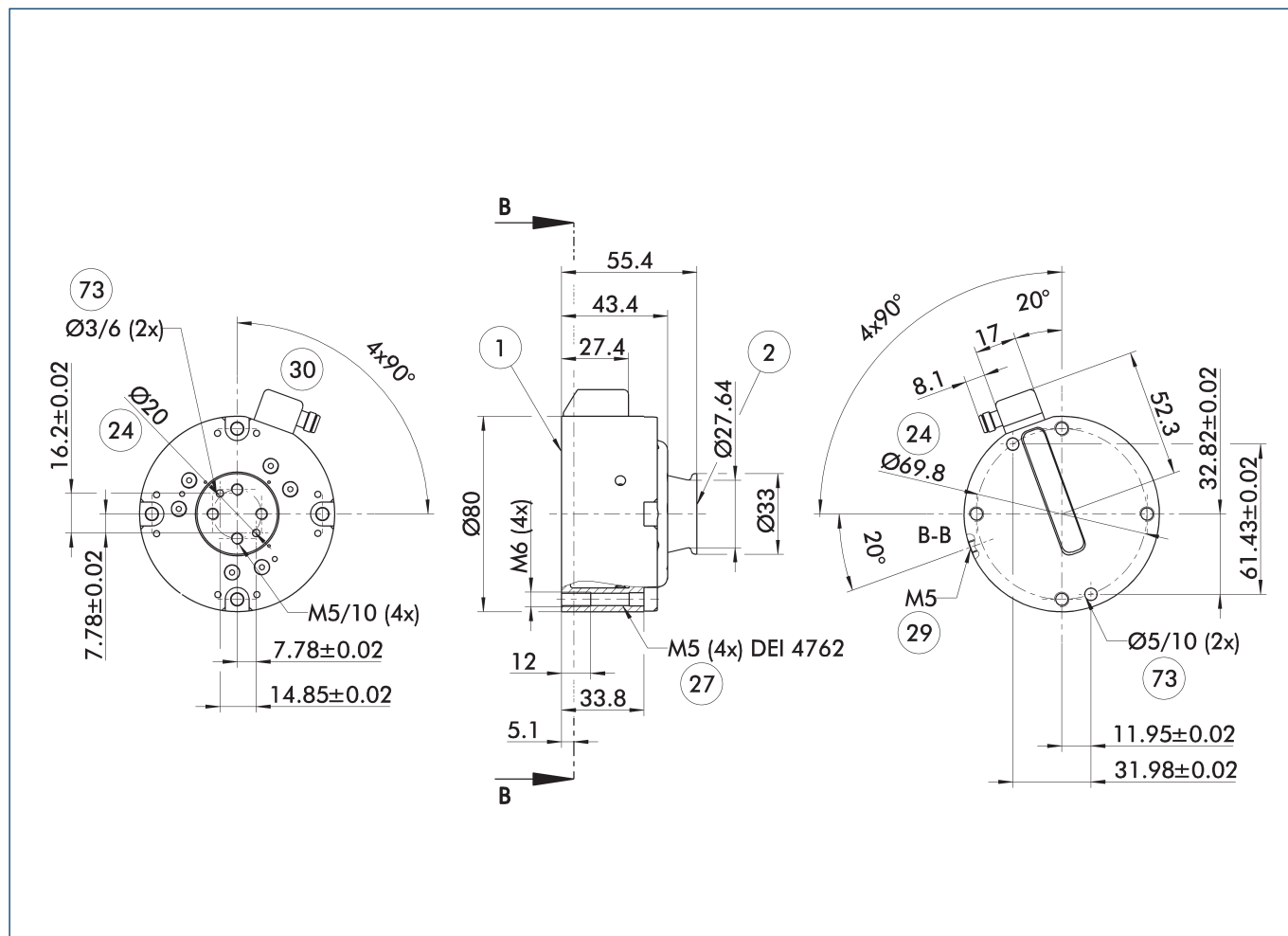


① The design of the collision sensors are defined through the occurring forces and moments of your application.

Technical data

Description		OPR-081-P00	OPR-081-P05	OPR-081-P10	OPR-081-P15
ID		0321381	0321382	0321383	0321384
Axial deflection	[mm]	8.6	8.6	8.6	8.6
Angular deflection	[°]	13	13	13	13
Deflection, rotatory	[°]	25	25	25	25
Min. triggering moment, angular M_x, M_y	[Nm]	14	17.3	20.6	24
Min. triggering torque, rotatory M_z	[Nm]	14	17.5	21	24.5
Spring triggering force	[N]		95	191	286
Release torque spring, angular	[Nm]		3.3	6.6	10
Rotatory spring displacement	[Nm]		3.5	7	10.5
Supply voltage	[V]	10/30	10/30	10/30	10/30
Repeat accuracy	[mm]	± 0.025	± 0.025	± 0.025	± 0.025
Response sensitivity	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Weight	[kg]	0.58	0.6	0.6	0.6
Min./max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Options and their characteristics					
Splash-proof version		OPR-081-P00-S	OPR-081-P05-S	OPR-081-P10-S	OPR-081-P15-S
ID		0321385	0321386	0321387	0321388
Protection class IP		65	65	65	65

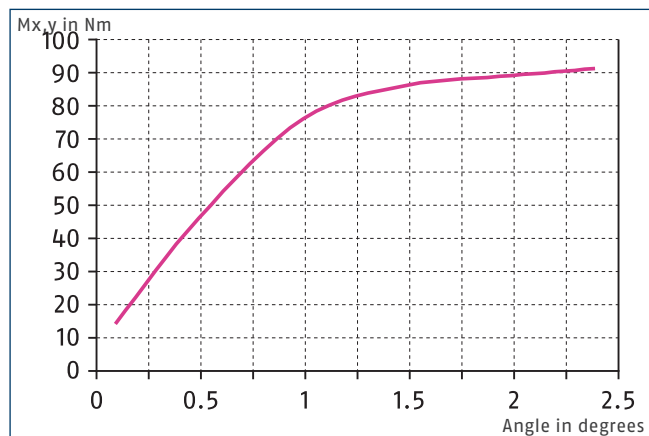
Main view



The main view shows the unit in its basic version.

- | | |
|--|---|
| ① Robot-side connection | ②⑨ Air connection P |
| ② Tool-side connection | ③⑩ Cable connector in enclosed pack with 5 m connection cable |
| ④⑪ Bolt circle | ⑦⑩ Fit for centering pins |
| ⑤⑪ Through holes for screw connections | |

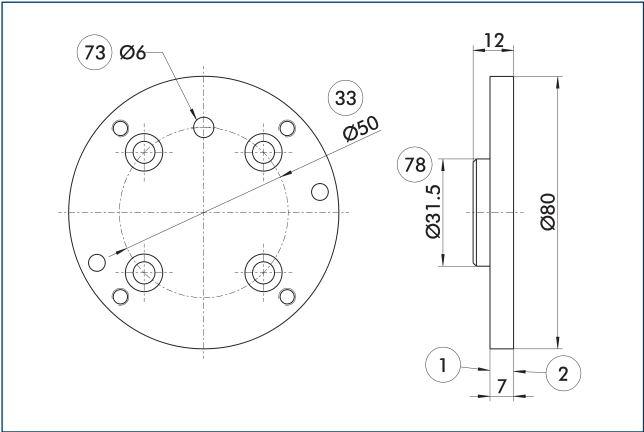
Moment loading



OPR 081

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A50-R

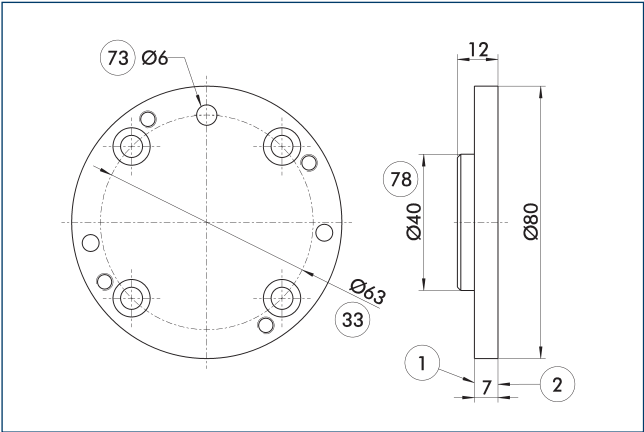


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-50-4-M6.

Description	ID	
Adapter plate		
A-OPR-081-ISO-A50-R	0321190	

Adapter plate ISO 9409-A63-R

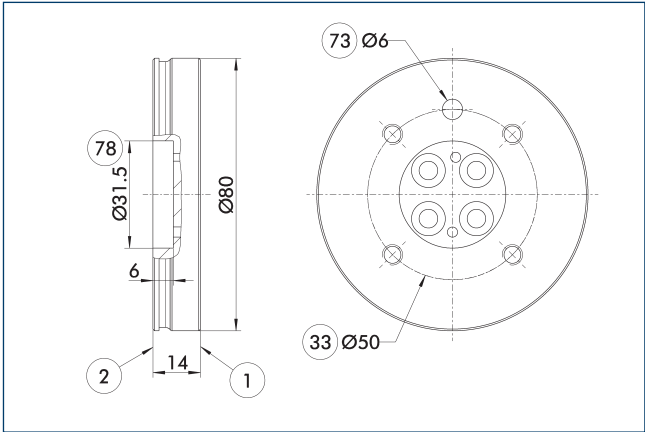


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-63-4-M6.

Description	ID	
Adapter plate		
A-OPR-081-ISO-A63-R	0321191	

Adapter plate ISO 9409-A50-T

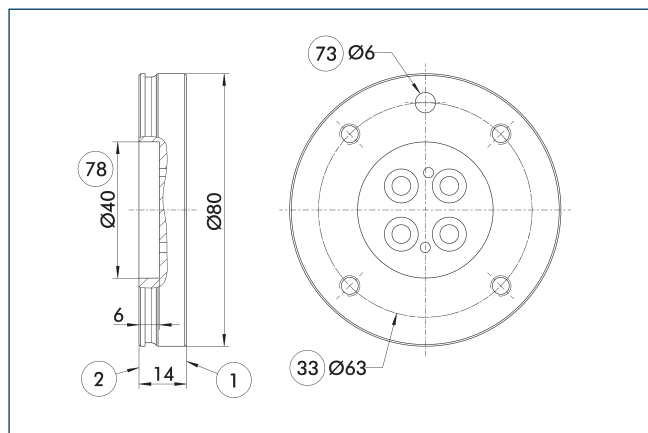


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-081-ISO-A50-T	0321192	

Adapter plate ISO 9409-A63-T

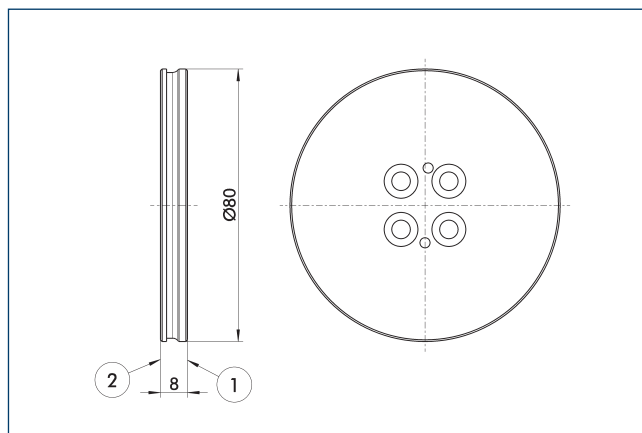


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦ Fit for centering pins
- ⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID
Tool side	
A-OPR-081-ISO-A63-T	0321193

Adapter plate BLANK-T

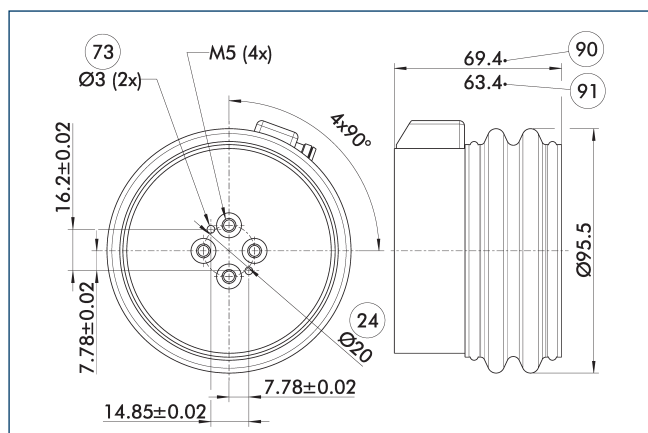


- ① Robot-side connection
- ② Tool-side connection

Unfinished tool-side adapter to be machined by the customer.

Description	ID
Tool side	
A-OPR-081-BLANK-T	0321194

Protection cover OPR-081



- ② Bolt circle
- ⑦ Fit for centering pins
- ⑨ Total height with adapter plate with flange pattern according to ISO 9409-A50/A63
- ⑩ Total height with adapter plate without flange pattern

The protection boot protects the OPR against coolants for use up to IP 65.

Description	ID	Protection class IP
Protection cover		
OPR-081 Flexboot	0321195	65

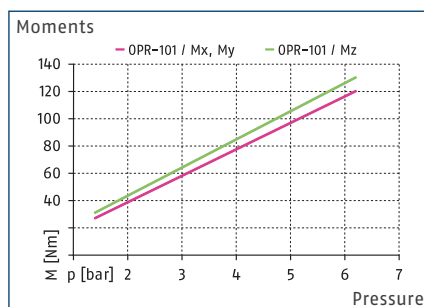
- ① Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 101

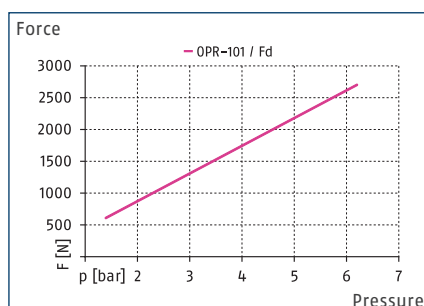
Anti-collision and overload protection sensor



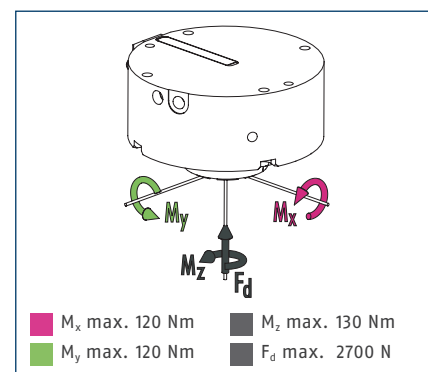
Triggering torque M_x , M_y , M_z



Triggering force F_d



Forces and moments

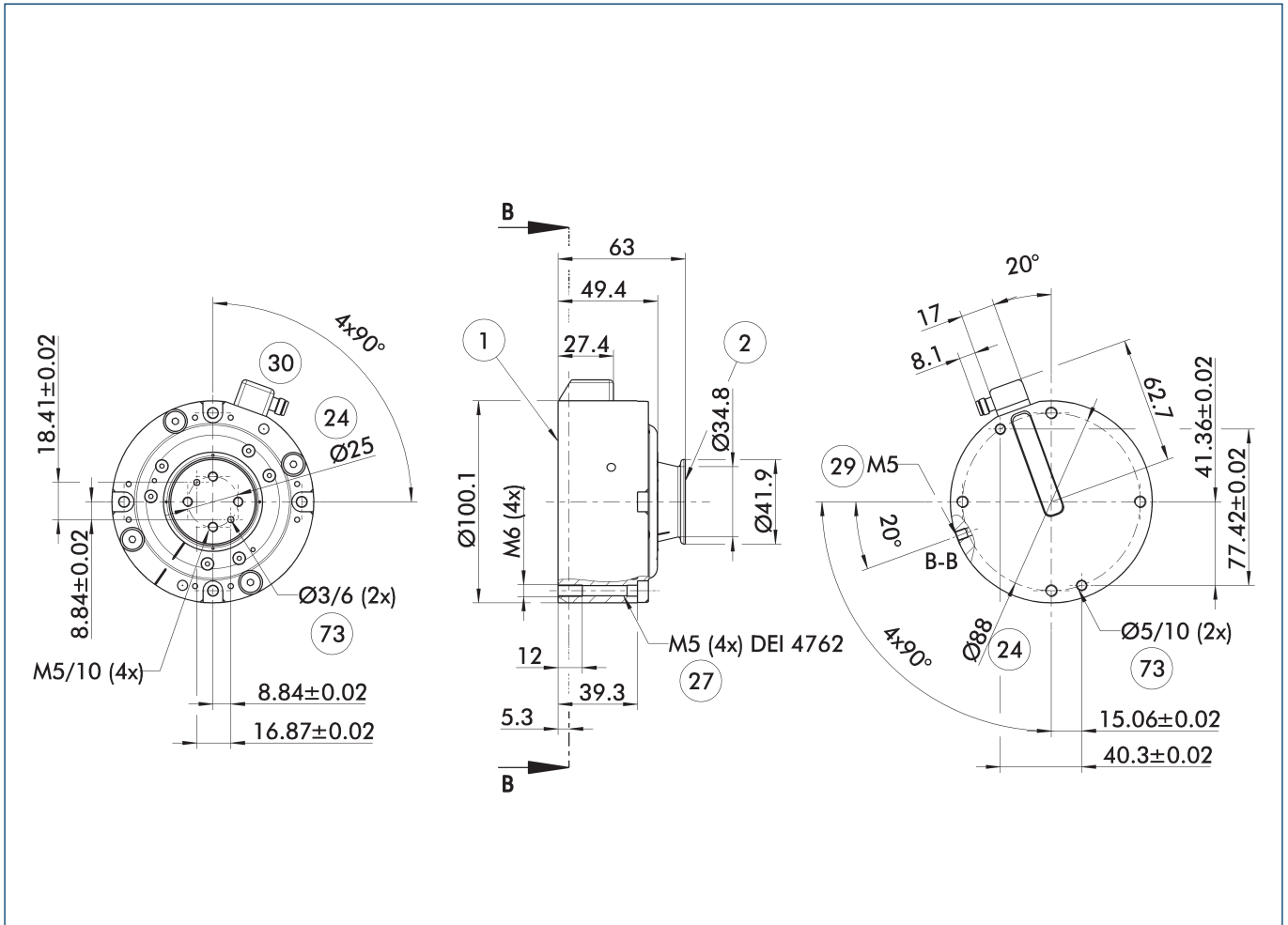


① The design of the collision sensors are defined through the occurring forces and moments of your application.

Technical data

Description		OPR-101-P00	OPR-101-P05	OPR-101-P10	OPR-101-P15
ID		0321401	0321402	0321403	0321404
Axial deflection	[mm]	10	10	10	10
Angular deflection	[°]	12	12	12	12
Deflection, rotatory	[°]	25	25	25	25
Min. triggering moment, angular M_x, M_y	[Nm]	27	33.6	40.3	46.9
Min. triggering torque, rotatory M_z	[Nm]	31	39	46.9	54.9
Spring triggering force	[N]		151	303	454
Release torque spring, angular	[Nm]		6.6	13.3	19.9
Rotatory spring displacement	[Nm]		8	15.9	23.9
Supply voltage	[V]	10/30	10/30	10/30	10/30
Repeat accuracy	[mm]	± 0.025	± 0.025	± 0.025	± 0.025
Response sensitivity	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Weight	[kg]	1.2	1.3	1.3	1.3
Min./max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Options and their characteristics					
Splash-proof version		OPR-101-P00-S	OPR-101-P05-S	OPR-101-P10-S	OPR-101-P15-S
ID		0321405	0321406	0321407	0321408
Protection class IP		65	65	65	65

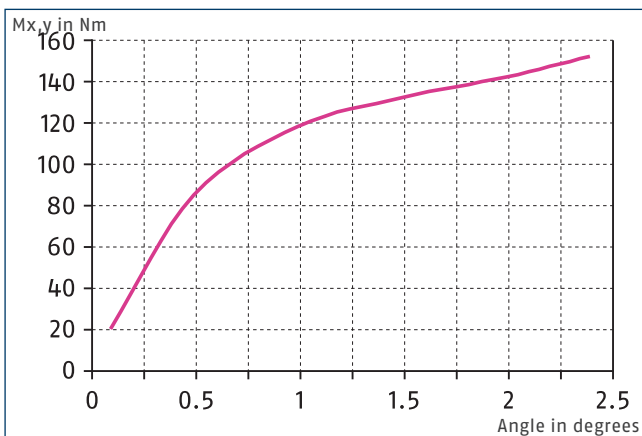
Main view



The main view shows the unit in its basic version.

- | | |
|---------------------------------------|---|
| ① Robot-side connection | ②⑨ Air connection P |
| ② Tool-side connection | ③⑩ Cable connector in enclosed pack with 5 m connection cable |
| ④ Bolt circle | ⑦⑩ Fit for centering pins |
| ⑤ Through holes for screw connections | |

Moment loading

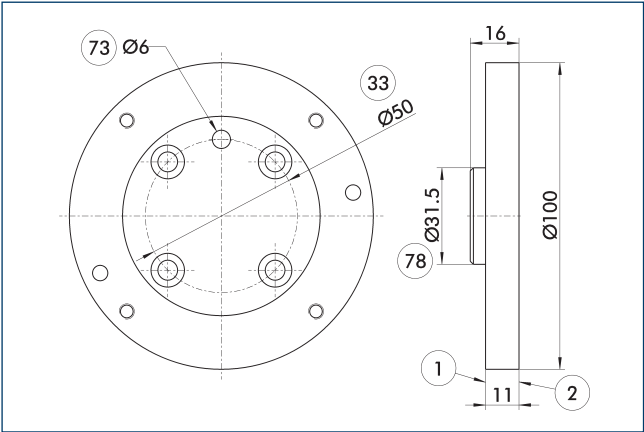


The chart shows the angular deflection of the OPR in the dependence of the moment $M_{x,y}$ with maximal permissible operating pressure.

OPR 101

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A50-R

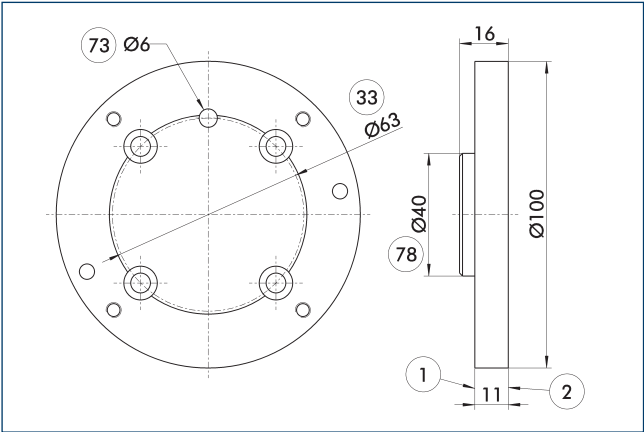


- ① Robot-side connection
- ② Tool-side connection
- ③③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-50-4-M6.

Description	ID	
Adapter plate		
A-OPR-101-ISO-A50-R	0321410	

Adapter plate ISO 9409-A63-R

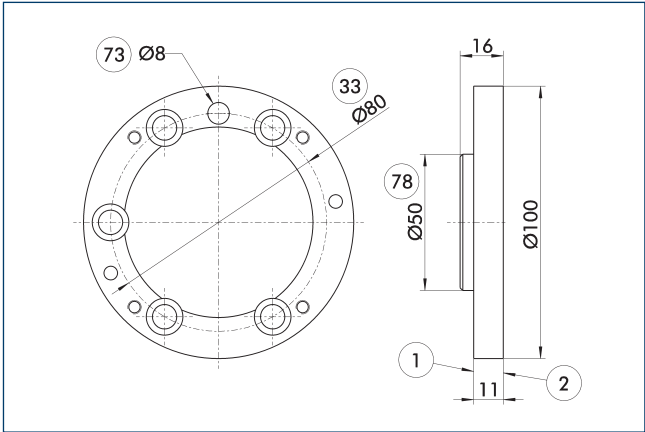


- ① Robot-side connection
- ② Tool-side connection
- ③③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-63-4-M6.

Description	ID	
Adapter plate		
A-OPR-101-ISO-A63-R	0321411	

Adapter plate ISO 9409-A80-R

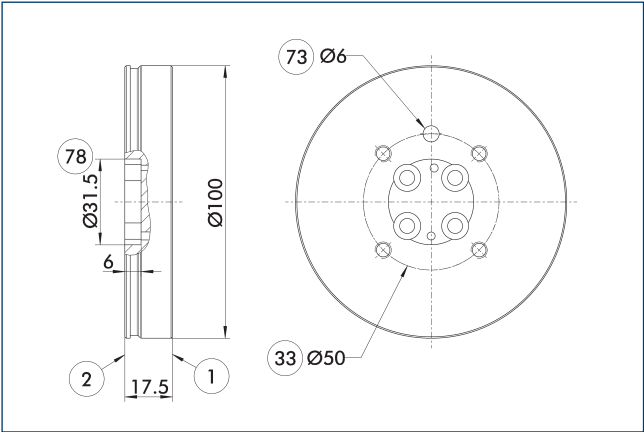


- ① Robot-side connection
- ② Tool-side connection
- ③③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-80-6-M8.

Description	ID	
Adapter plate		
A-OPR-101-ISO-A80-R	0321412	

Adapter plate ISO 9409-A50-T

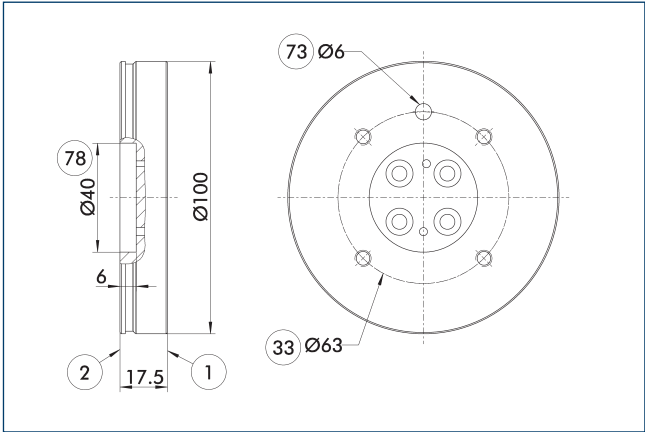


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-101-ISO-A50-T	0321413	

Adapter plate ISO 9409-A63-T

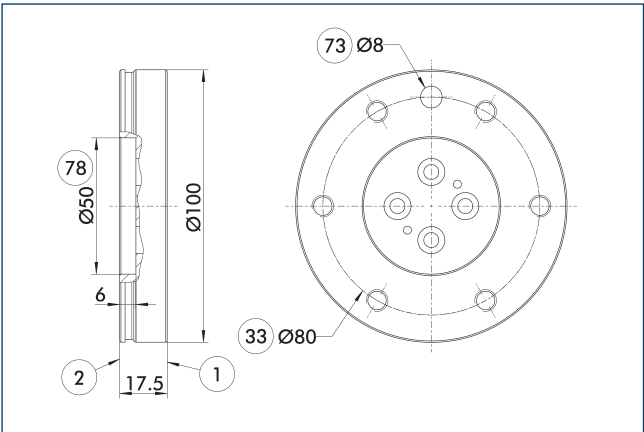


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-101-ISO-A63-T	0321414	

Adapter plate ISO 9409-A80-T

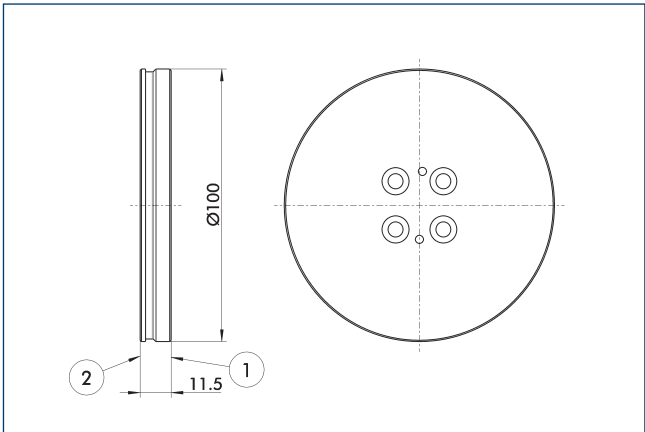


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-101-ISO-A80-T	0321415	

Adapter plate BLANK-T



- ① Robot-side connection
- ② Tool-side connection

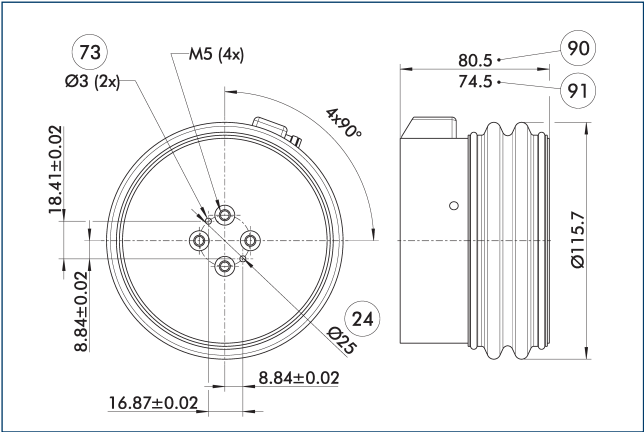
Unfinished tool-side adapter to be machined by the customer.

Description	ID	
Tool side		
A-OPR-101-BLANK-T	0321417	

OPR 101

Anti-collision and overload protection sensor

Protection cover OPR-101



- 24 Bolt circle
- 73 Fit for centering pins
- 90 Total height with adapter plate with flange pattern according to ISO 9409-A50/A63/A80
- 91 Total height with adapter plate without flange pattern

The protection boot protects the OPR against coolants for use up to IP 65.

Description	ID	Protection class IP
Protection cover		
OPR-101 Flexboot	0321416	65

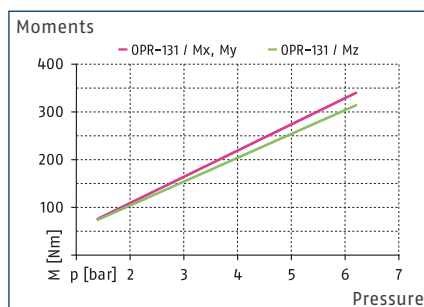
- 1 Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 131

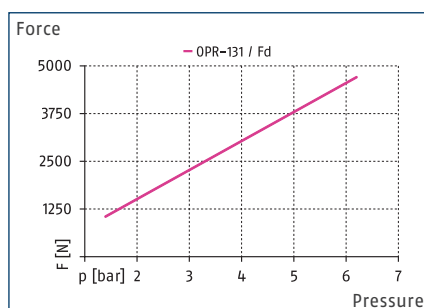
Anti-collision and overload protection sensor



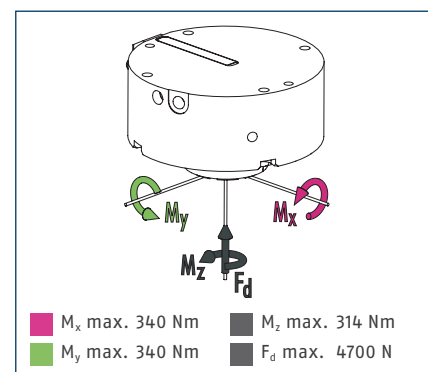
Triggering torque M_x , M_y , M_z



Triggering force F_d



Forces and moments

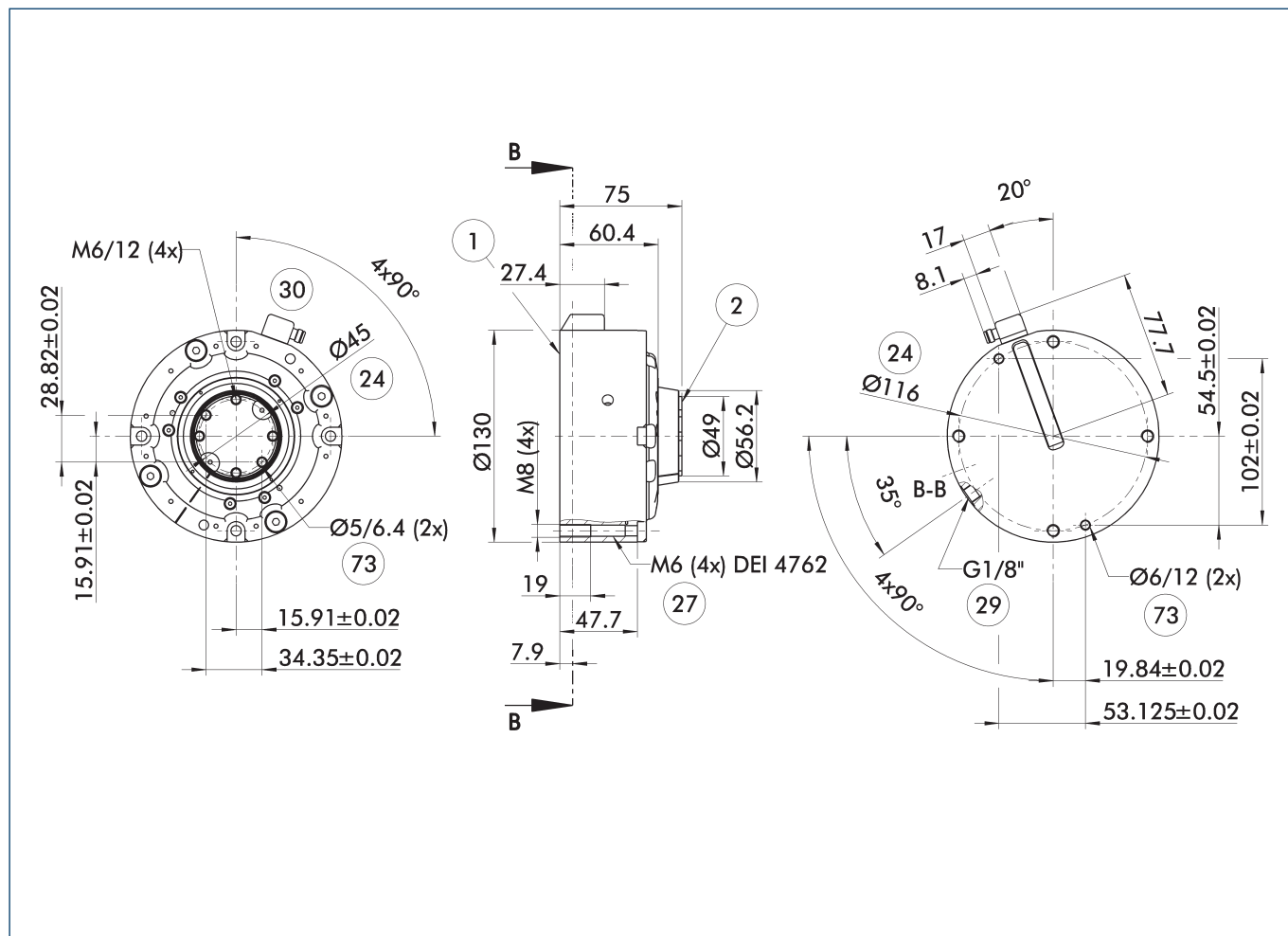


① The design of the collision sensors are defined through the occurring forces and moments of your application.

Technical data

Description		OPR-131-P00	OPR-131-P05	OPR-131-P10
ID		0321431	0321432	0321433
Axial deflection	[mm]	11.5	11.5	11.5
Angular deflection	[°]	10	10	10
Deflection, rotatory	[°]	20	20	20
Min. triggering moment, angular M_x, M_y	[Nm]	76	94.8	113.7
Min. triggering torque, rotatory M_z	[Nm]	74	92.6	111.1
Spring triggering force	[N]		262	523
Release torque spring, angular	[Nm]		18.8	37.7
Rotatory spring displacement	[Nm]		18.6	37.1
Supply voltage	[V]	10/30	10/30	10/30
Repeat accuracy	[mm]	± 0.025	± 0.025	± 0.025
Response sensitivity	[mm]	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5
Min./max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5
Weight	[kg]	2.3	2.4	2.4
Min./max. ambient temperature	[°C]	5/60	5/60	5/60
Options and their characteristics				
Splash-proof version		OPR-131-P00-S	OPR-131-P05-S	OPR-131-P10-S
ID		0321435	0321436	0321437
Protection class IP		65	65	65

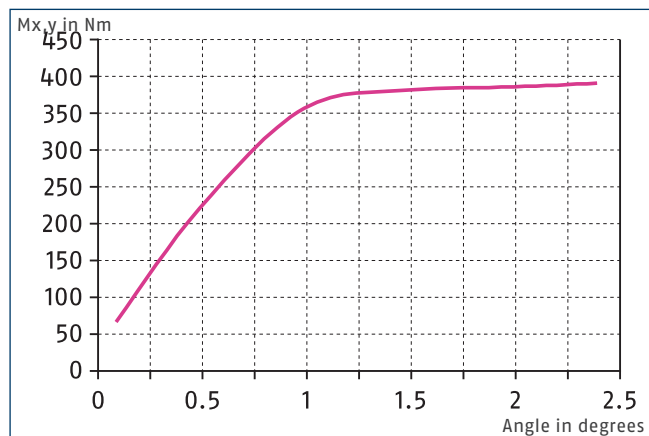
Main view



The main view shows the unit in its basic version.

- | | |
|---------------------------------------|---|
| ① Robot-side connection | ②⑨ Air connection P |
| ② Tool-side connection | ③⑩ Cable connector in enclosed pack with 5 m connection cable |
| ④ Bolt circle | ⑦⑩ Fit for centering pins |
| ⑤ Through holes for screw connections | |

Moment loading

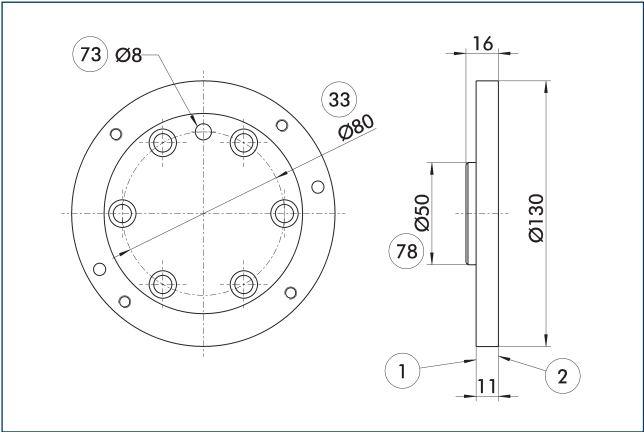


The chart shows the angular deflection of the OPR in the dependence of the moment $M_{x,y}$ with maximal permissible operating pressure.

OPR 131

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A80-R

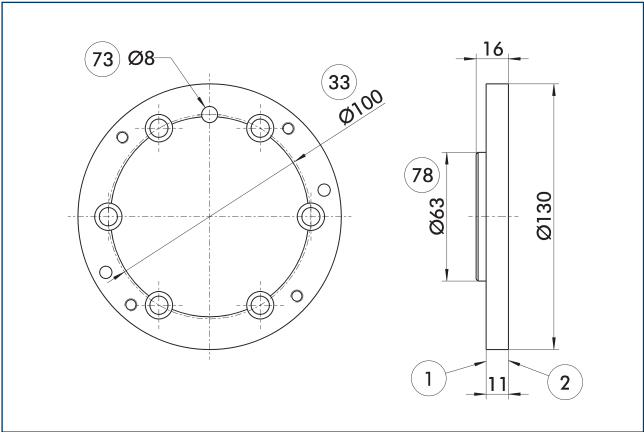


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-80-6-M8.

Description	ID	
Adapter plate		
A-OPR-131-ISO-A80-R	0321440	

Adapter plate ISO 9409-A100-R

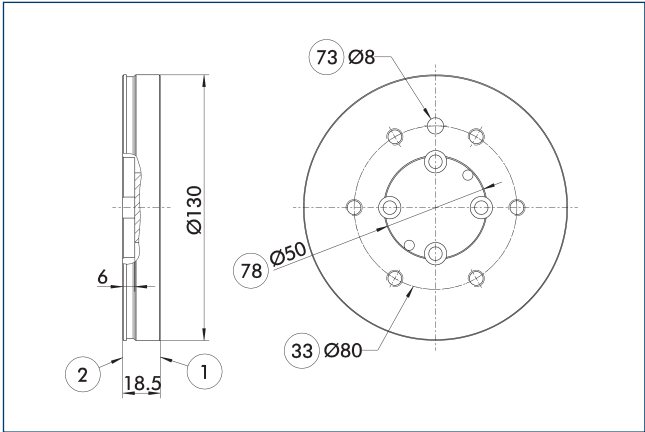


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-100-6-M8.

Description	ID	
Adapter plate		
A-OPR-131-ISO-A100-R	0321441	

Adapter plate ISO 9409-A80-T

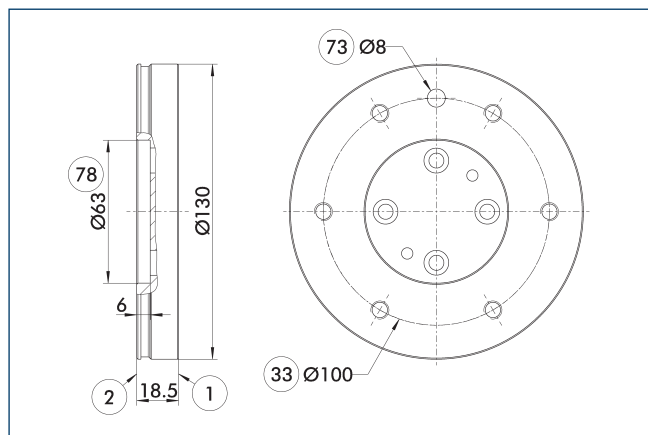


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-131-ISO-A80-T	0321444	

Adapter plate ISO 9409-A100-T

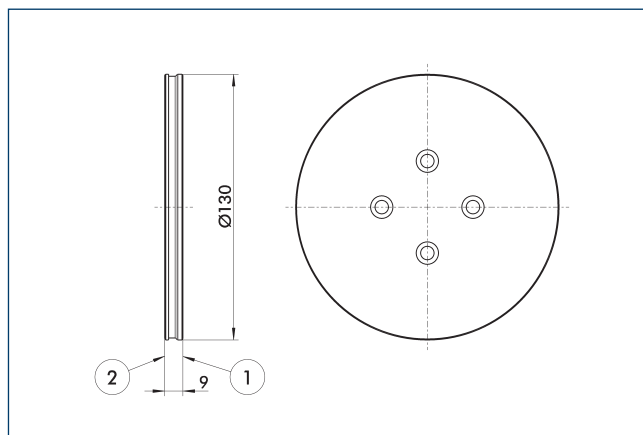


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-131-ISO-A100-T	0321445	

Adapter plate BLANK-T

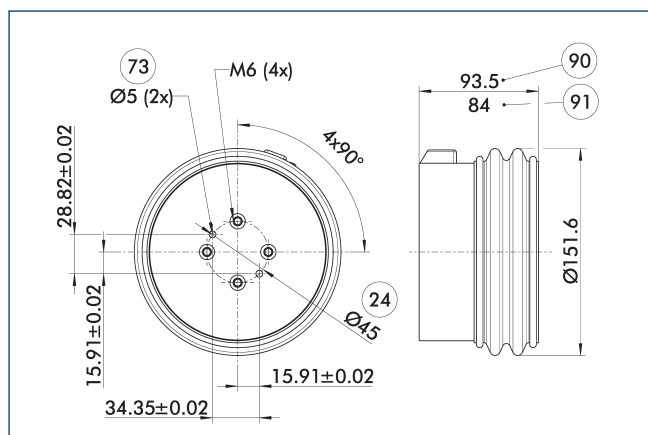


- ① Robot-side connection
- ② Tool-side connection

Unfinished tool-side adapter to be machined by the customer.

Description	ID	
Tool side		
A-OPR-131-BLANK-T	0321551	

Protection cover OPR-131



- ②④ Bolt circle
- ⑦③ Fit for centering pins
- ⑨① Total height with adapter plate with flange pattern ISO 9409
- ⑨② Total height with adapter plate without flange pattern

The protection boot protects the OPR against coolants for use up to IP 65.

Description	ID	Protection class IP
Protection cover		
OPR-131 Flexboot	0321447	65

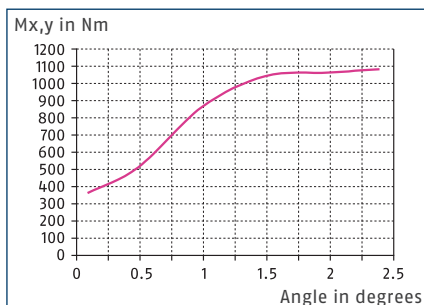
- ① Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 176

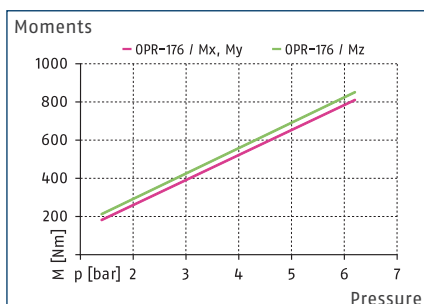
Anti-collision and overload protection sensor



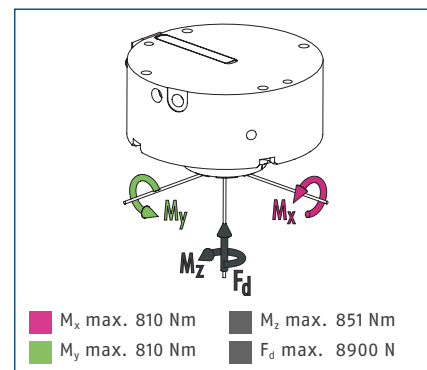
Moment loading



Triggering torque M_x , M_y , M_z



Forces and moments



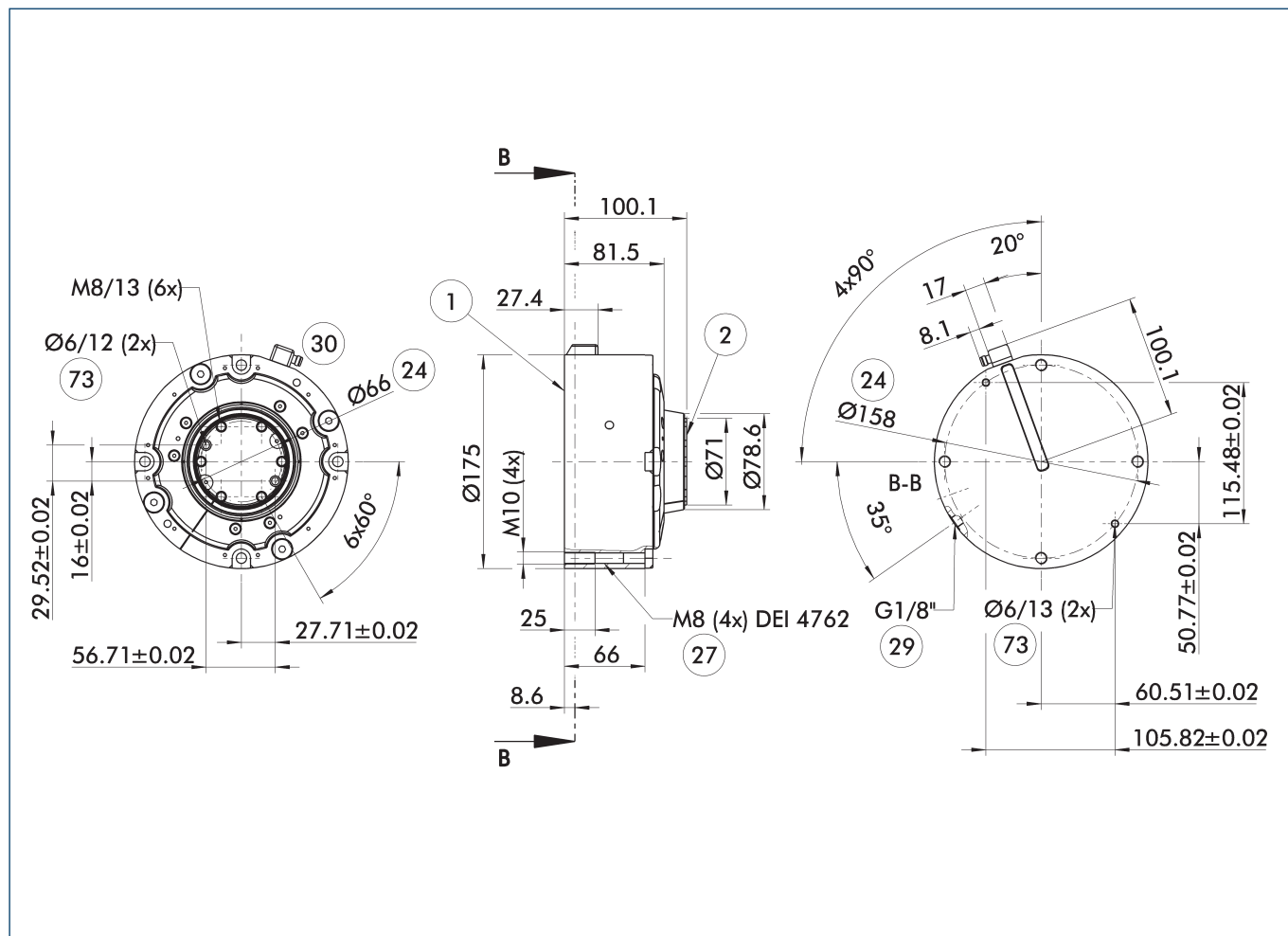
① The design of the collision sensors are defined through the occurring forces and moments of your application.

Technical data

Description		OPR-176-P00	OPR-176-P05	OPR-176-P10	OPR-176-P15
ID		0321476	0321477	0321478	0321479
Axial deflection	[mm]	16	16	16	16
Angular deflection	[°]	10	10	10	10
Deflection, rotatory	[°]	20	20	20	20
Min. triggering moment, angular M_x, M_y	[Nm]	180	223.5	266.9	310
Min. triggering torque, rotatory M_z	[Nm]	211	263.7	316	369
Spring triggering force	[N]		494	988	1483
Release torque spring, angular	[Nm]		43.5	86.9	130
Rotatory spring displacement	[Nm]		52.7	105	158
Supply voltage	[V]	10/30	10/30	10/30	10/30
Repeat accuracy	[mm]	± 0.025	± 0.025	± 0.025	± 0.025
Response sensitivity	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Weight	[kg]	5.4	5.5	5.5	5.5
Min./max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Options and their characteristics					
Splash-proof version		OPR-176-P00-S	OPR-176-P05-S	OPR-176-P10-S	OPR-176-P15-S
ID		0321480	0321481	0321482	0321483
Protection class IP		65	65	65	65

The chart shows the angular deflection of the OPR in the dependence of the moment $M_{x,y}$ with maximal permissible operating pressure.

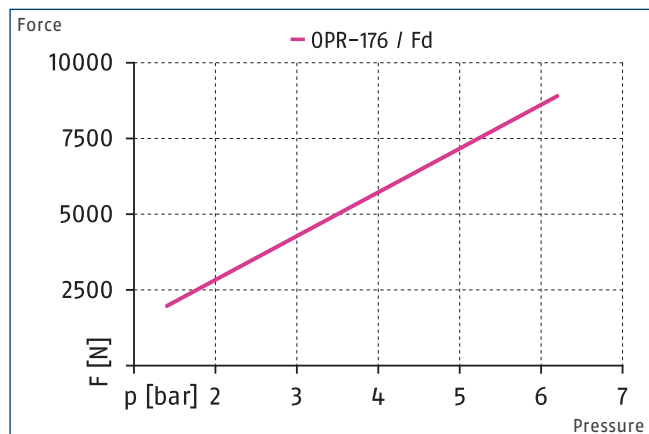
Main view



The main view shows the unit in its basic version.

- ① Robot-side connection
- ② Tool-side connection
- ②④ Bolt circle
- ②⑦ Through holes for screw connections
- ②⑨ Air connection P
- ③⑩ Cable connector in enclosed pack with 5 m connection cable
- ⑦③ Fit for centering pins

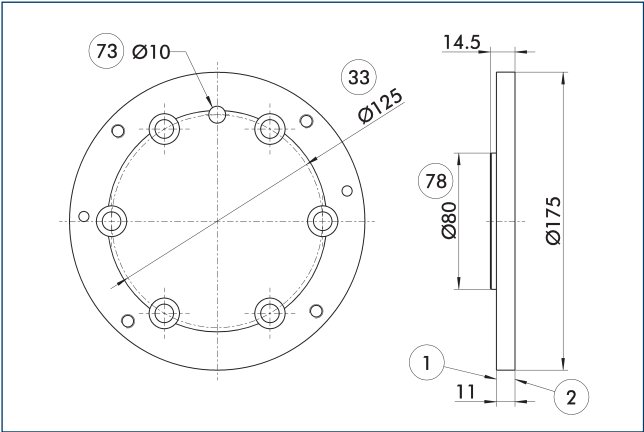
Triggering force F^d



OPR 176

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A125-R

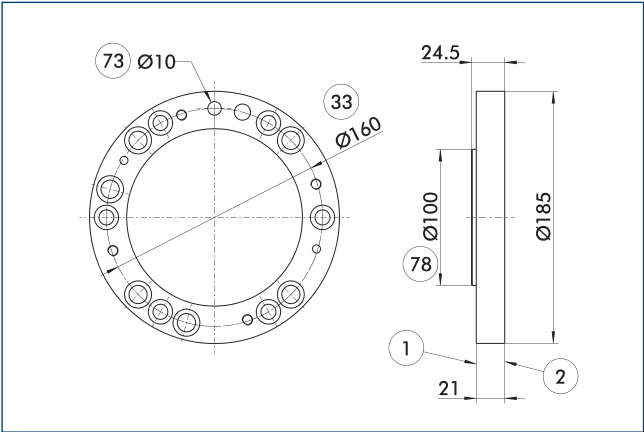


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-125-6-M10.

Description	ID	
Adapter plate		
A-OPR-176-ISO-A125-R	0321485	

Adapter plate ISO 9409-A160-R

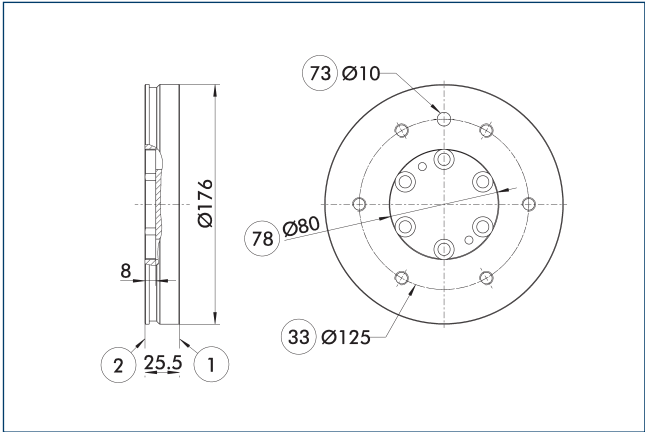


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-160-6-M10.

Description	ID	
Adapter plate		
A-OPR-176-ISO-A160-R	0321486	

Adapter plate ISO 9409-A125-T

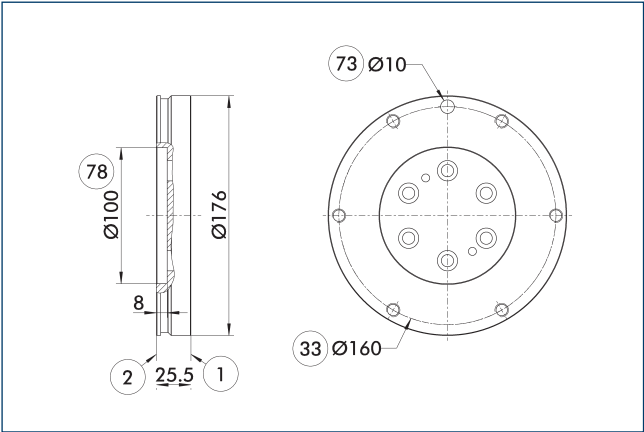


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-176-ISO-A125-T	0321552	

Adapter plate ISO 9409-A160-T

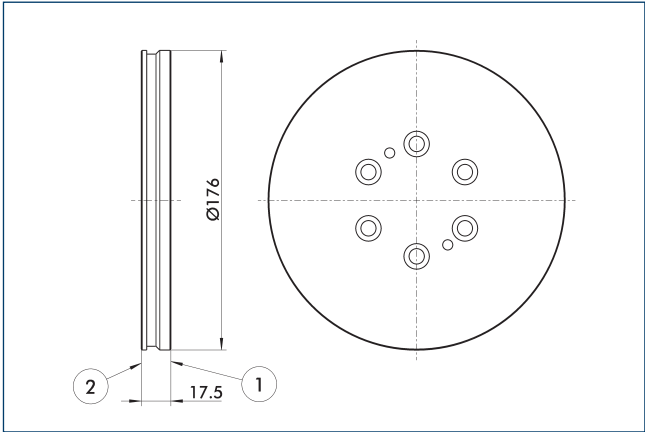


- 1 Robot-side connection
- 2 Tool-side connection
- 33 DIN ISO-9409 bolt circle
- 73 Fit for centering pins
- 78 Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-176-ISO-A160-T	0321553	

Adapter plate BLANK-T

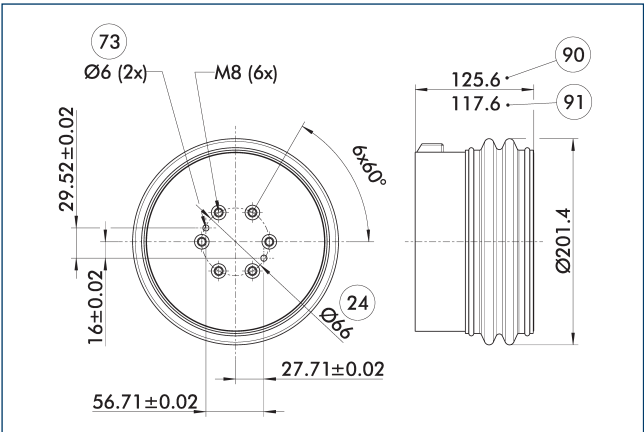


- 1 Robot-side connection
- 2 Tool-side connection

Unfinished tool-side adapter to be machined by the customer.

Description	ID	
Tool side		
A-OPR-176-BLANK-T	0321489	

Protection cover OPR-176



- 24 Bolt circle
- 73 Fit for centering pins
- 90 Total height with adapter plate with flange pattern according to ISO 9409-A125/A160
- 91 Total height with adapter plate without flange pattern

The protection boot protects the OPR against coolants for use up to IP 65.

Description	ID	Protection class IP
Protection cover		
OPR-176 Flexboot	0321492	65

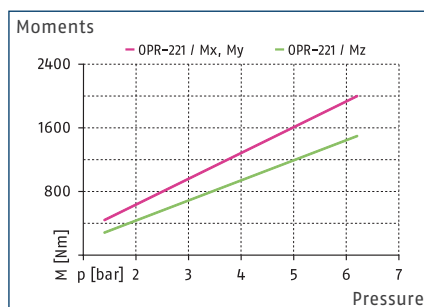
- 1 Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 221

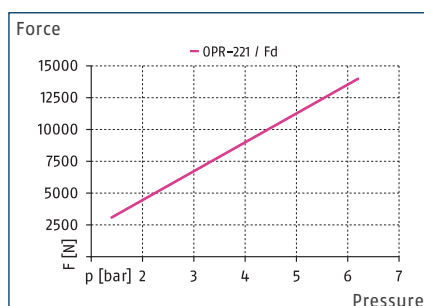
Anti-collision and overload protection sensor



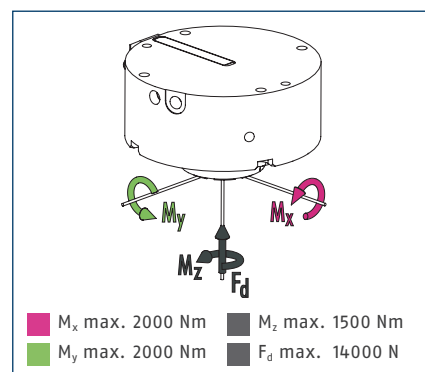
Triggering torque M_x , M_y , M_z



Triggering force F_d



Forces and moments

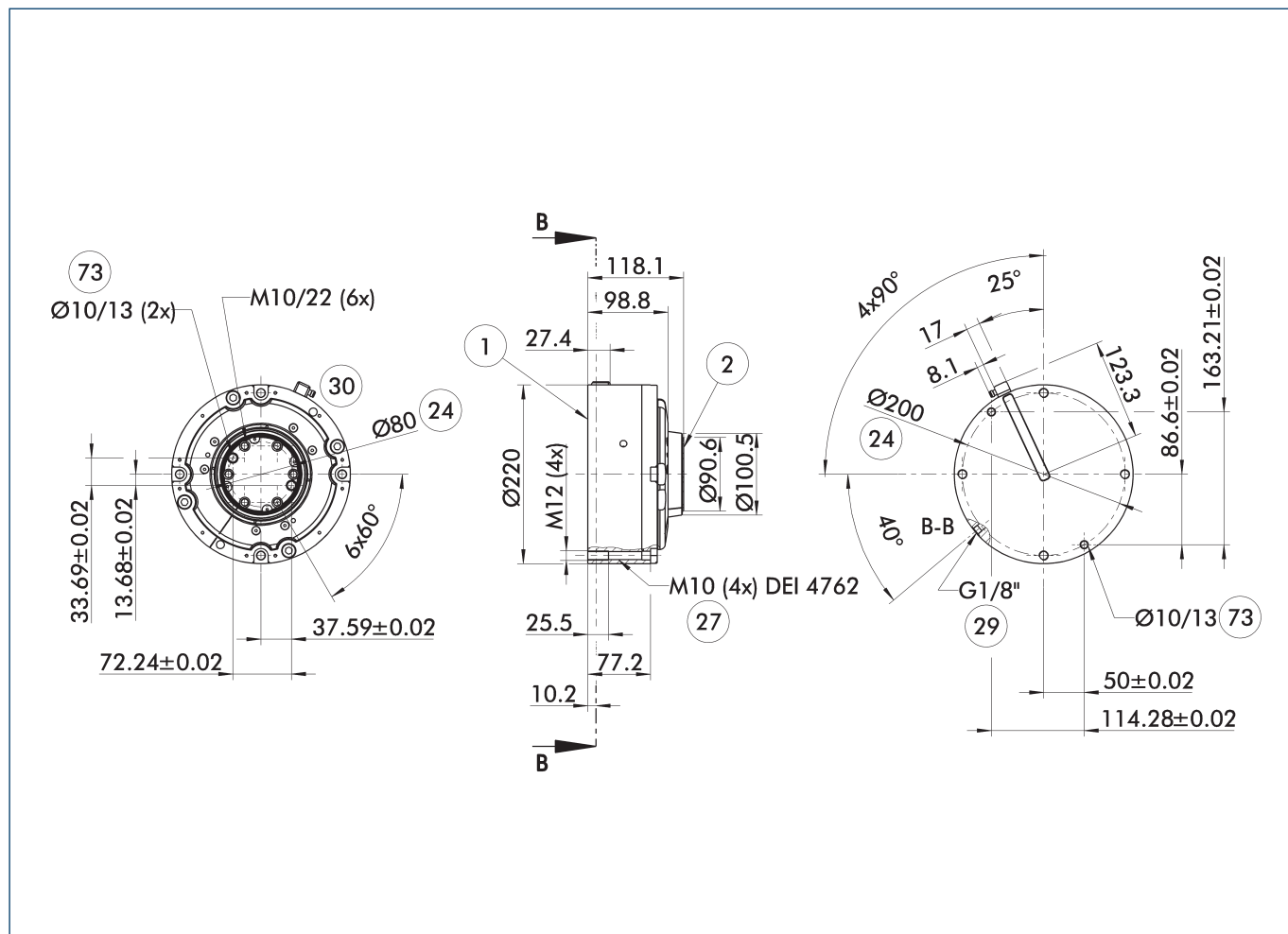


① The design of the collision sensors are defined through the occurring forces and moments of your application.

Technical data

Description		OPR-221-P00	OPR-221-P05	OPR-221-P10	OPR-221-P15
ID		0321521	0321522	0321523	0321524
Axial deflection	[mm]	16	16	16	16
Angular deflection	[°]	8	8	8	8
Deflection, rotatory	[°]	20	20	20	20
Min. triggering moment, angular M_x, M_y	[Nm]	440	549	722	766
Min. triggering torque, rotatory M_z	[Nm]	282	337.2	392	448
Spring triggering force	[N]		767	1534	2301
Release torque spring, angular	[Nm]		109	217	326
Rotatory spring displacement	[Nm]		55.2	110	166
Supply voltage	[V]	10/30	10/30	10/30	10/30
Repeat accuracy	[mm]	± 0.025	± 0.025	± 0.025	± 0.025
Response sensitivity	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Weight	[kg]	11.4	11.7	11.7	11.7
Min./max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Options and their characteristics					
Splash-proof version		OPR-221-P00-S	OPR-221-P05-S	OPR-221-P10-S	OPR-221-P15-S
ID		0321525	0321526	0321527	0321528
Protection class IP		65	65	65	65

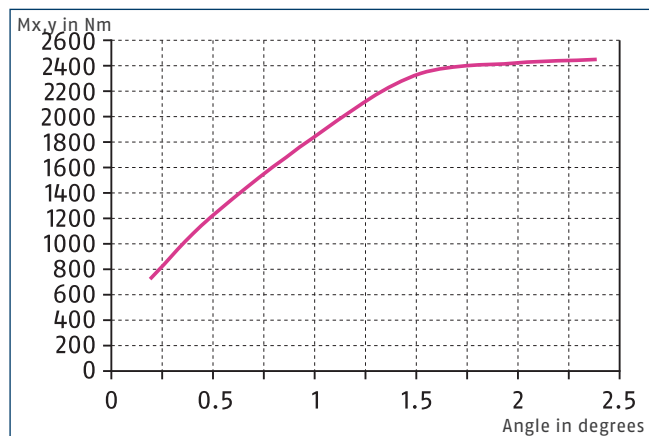
Main view



The main view shows the unit in its basic version.

- | | | |
|--------------------------|---------------------------------------|--|
| ① Robot-side connection | ② Tool-side connection | ③ Cable connector in enclosed pack with 5 m connection cable |
| ④ Bolt circle | ⑤ Through holes for screw connections | ⑥ Air connection P |
| ⑦ Fit for centering pins | | |

Moment loading

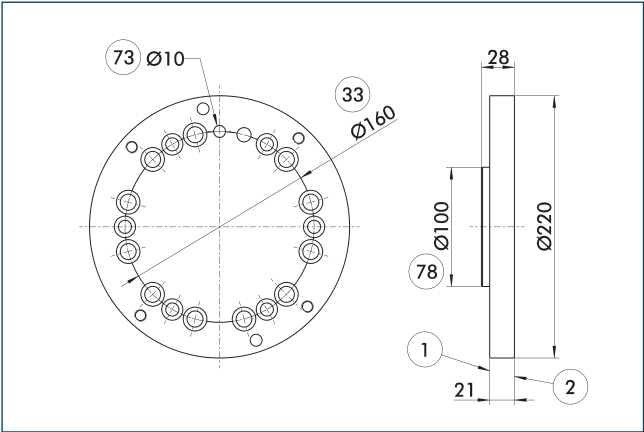


The chart shows the angular deflection of the OPR in the dependence of the moment $M_{x,y}$ with maximal permissible operating pressure.

OPR 221

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A160-R

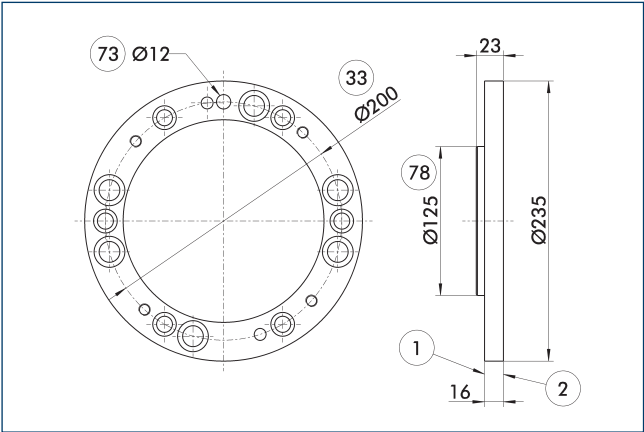


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-160-6-M10.

Description	ID	
Adapter plate		
A-OPR-221-ISO-A160-plus-IRB6600	0321530	

Adapter plate ISO 9409-A200-R

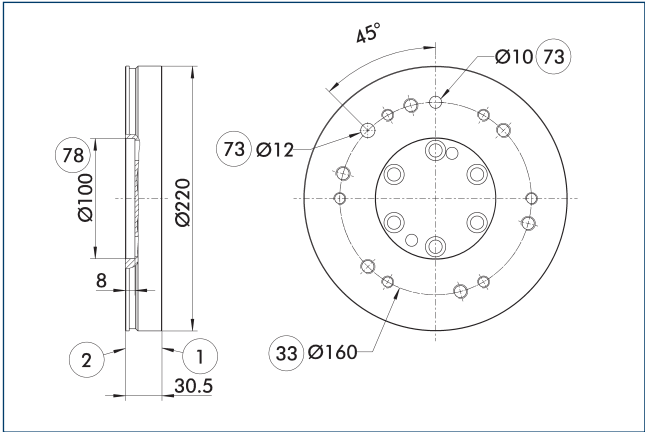


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Robot-side adapter plate to mount the OPR to a mounting pattern according to ISO 9409-200-6-M10.

Description	ID	
Adapter plate		
A-OPR-221-ISO-A200-plus-IRB7600	0321531	

Adapter plate ISO 9409-A160-T

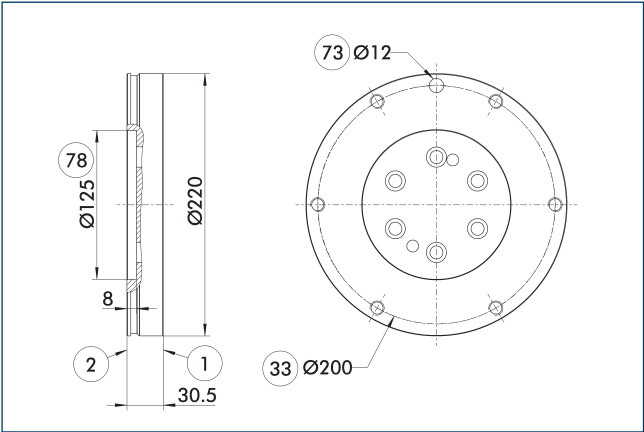


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-221-ISO-A160-T	0321532	

Adapter plate ISO 9409-A200-T

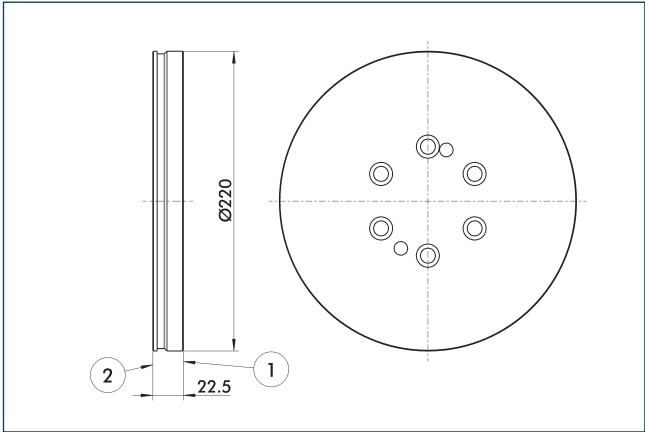


- 1 Robot-side connection
- 2 Tool-side connection
- 33 DIN ISO-9409 bolt circle
- 73 Fit for centering pins
- 78 Fit for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	
Tool side		
A-OPR-221-ISO-A200-T	0321533	

Adapter plate BLANK-T

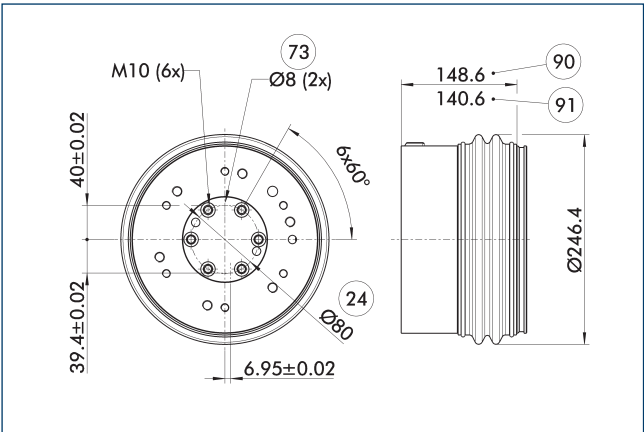


- 1 Robot-side connection
- 2 Tool-side connection

Unfinished tool-side adapter to be machined by the customer.

Description	ID	
Tool side		
A-OPR-221-BLANK-T	0321534	

Protection cover OPR-221



- 24 Bolt circle
- 73 Fit for centering pins
- 90 Total height with adapter plate with flange pattern according to ISO 9409-A160/A200
- 91 Total height with adapter plate without flange pattern

The protection boot protects the OPR against coolants for use up to IP 65.

Description	ID	Protection class IP
Protection cover		
OPR-221 Flexboot	0321535	65

- 1 Please note that when using the protection boot a tool side adapter plate is also needed.

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