



Hand in hand for tomorrow



Product data sheet

Anti-collision and overload protection sensor OPR

OPR

Anti-collision and overload protection sensor

Compliant. Highly responsive. Automatic reset.

Collision and overload sensor OPR

for control of robots and handling units in the event of a collision 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 without delay in case of collisions so that the robot can be stopped immediately

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 maintaining the position in the event of pressure loss

Mechanical flexibility in the event of collisions for compensation of the robot's reaction pathway in the event of a collision or 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

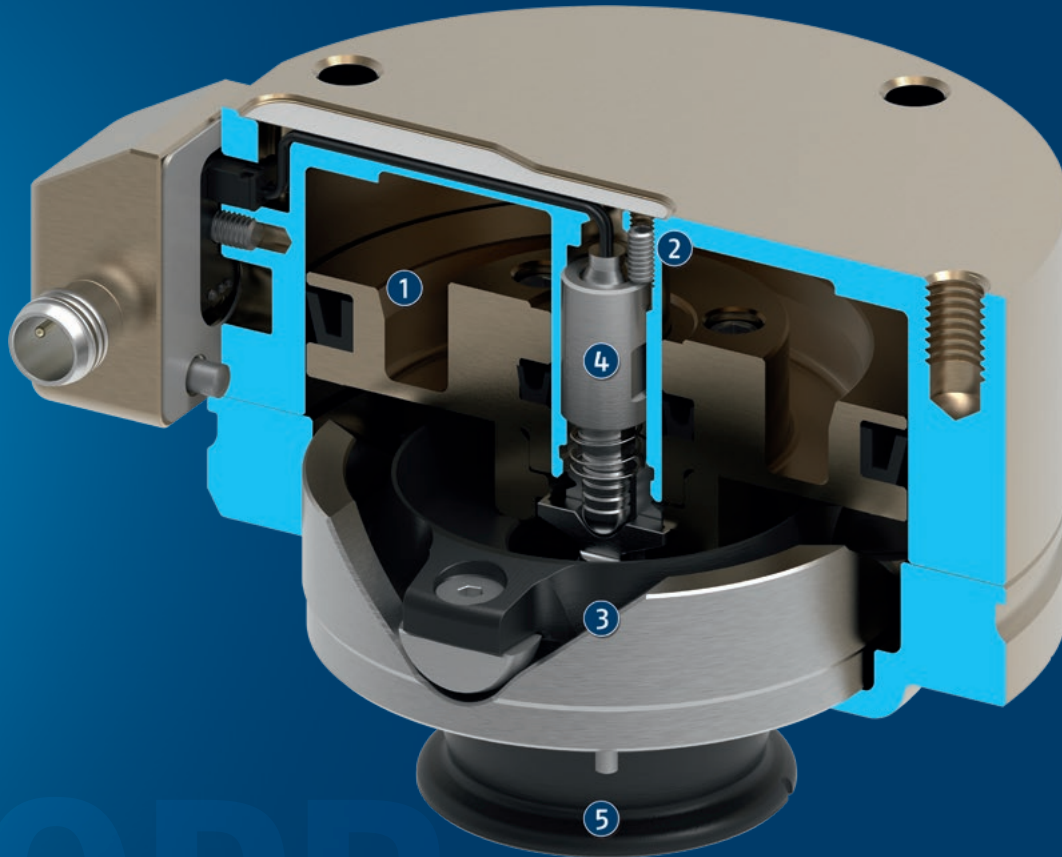


Trigger moment M_z
6.9 .. 1500 Nm

Functional description

In case of a collision, the mounting flange will be deflected. This simultaneously actuates a sensor whose signal triggers 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

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

Scope of delivery: Collision and overload sensor in the ordered variant, elements for electrical connection and safety information. Product-specific instructions can be downloaded at schunk.com/downloads-manuals.

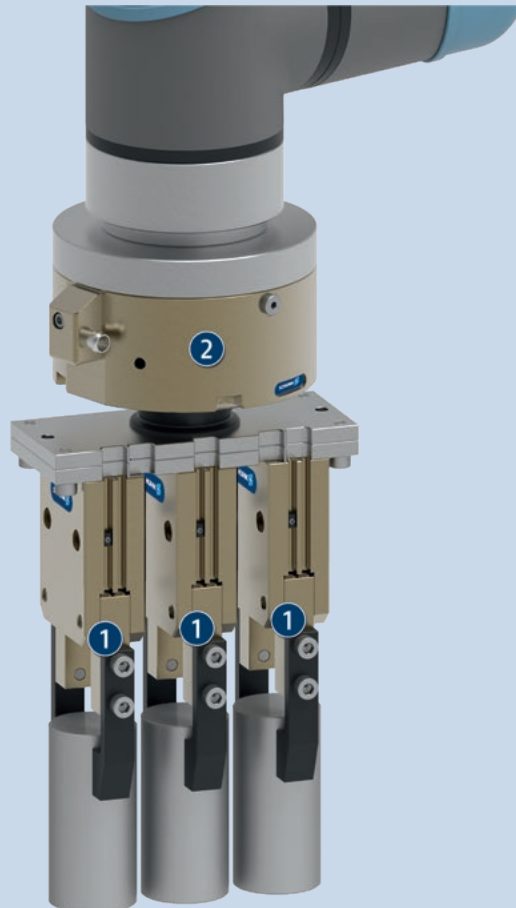
Warranty: 24 months

Harsh environmental conditions: Please note that use under harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service life of the units, and we will not take over any warranty. However, in many cases we can find a solution. Please contact us for assistance.

Application example

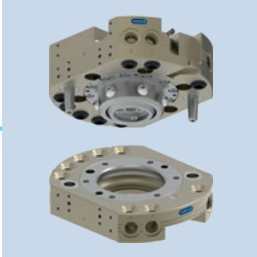
Triple transfer unit for packaging with small boxboards

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

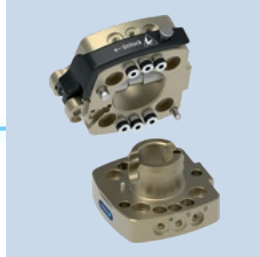


SCHUNK offers more ...

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



Tool changer



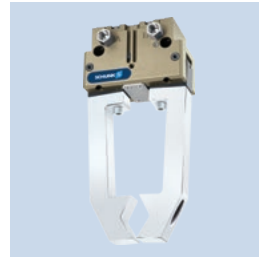
Manual change system



Rotary feed-through



Universal gripper



Angular gripper



Universal gripper

① For more information on these products can be found on the following product pages or at [schunk.com](https://www.schunk.com).

Options and special information

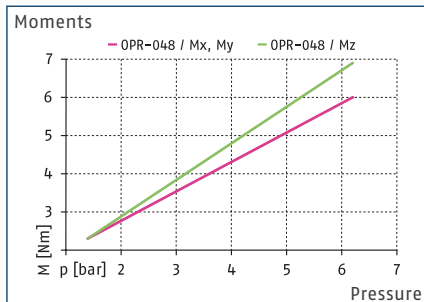
Food-grade lubrication: The product contains food-compliant lubricants as standard. The requirements of EN 1672-2:2020 are not fully met. The relevant NSF certificates are available at <https://info.nsf.org/USDA/Listings.asp> using the lubricant information in the operating manual.

OPR 048

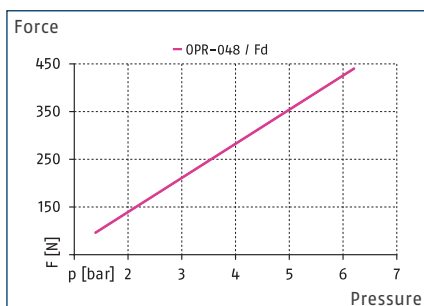
Anti-collision and overload protection sensor



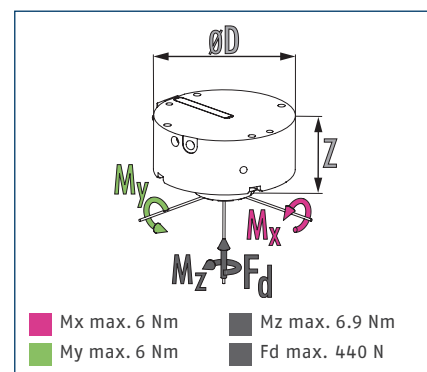
Trigger moment M_x , M_y , M_z



Triggering force F_d



Dimensions and maximum loads



① The design of a collision sensor is defined by the occurring forces and moments in 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 Mx, My	[Nm]	2.3	2.7	3.2	3.6
Min. triggering torque, rotatory Mz	[Nm]	2.3	2.7	3.1	3.5
Spring triggering force	[N]		24	48	72
Spring release torque, angular	[Nm]		0.4	0.9	1.3
Spring release torque, rotatory	[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
Responsiveness	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./nom./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
Dimensions Ø D x Z	[mm]	48 x 39	48 x 39	48 x 39	48 x 39

Technical drawing of a 3000 series hydraulic pump assembly, showing front, side, and detail views with dimensions and callouts.

Front View (Left):

- Callout 73: $\text{Ø}2/2.8$ (2x)
- Callout 30: M6x1/9.5
- Dimensions: 6.04 ± 0.02 , 3.54 ± 0.02 , 3.54 ± 0.02 , 7.87 ± 0.02

Side View (Middle):

- Callout 1: Main body
- Callout 2: Flange
- Callout 30: M5 (4x)
- Callout 78: $\text{Ø}14h6$
- Callout 27: M4 (4x) DEI 10642
- Dimensions: 39, 31.8, 25.9, 3.3, 10, 26.7, 5.1, $\text{Ø}48$
- Section line A-A

Detail View (Right):

- Callout 73: $\text{Ø}4/8$ (2x)
- Callout 24: $\text{Ø}40$
- Callout 29: M5
- Callout 78: M8
- Dimensions: 10 ± 0.02 , 47.6, 23.9, 8.1, $4 \times 90^\circ$, 57° , 18.79 ± 0.02 , 6.84 ± 0.02 , 17.32 ± 0.02 , 20°
- Section line A-A

- 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

The graph shows the relationship between the angle in degrees (x-axis) and the moment $M_{x,y}$ 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, magenta curve starts at approximately (0.1, 2.5) and increases monotonically, reaching about 6.8 Nm at 1.7 degrees.

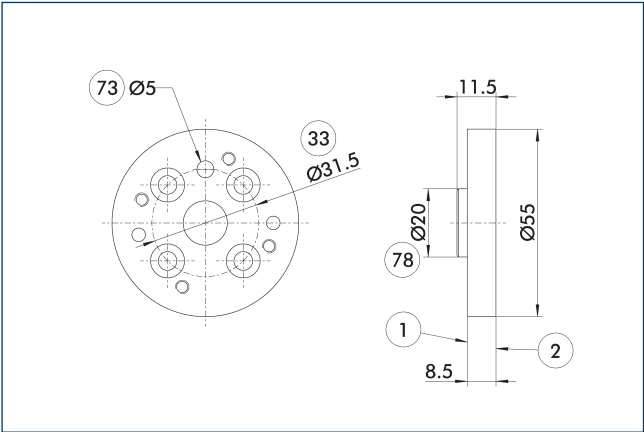
Angle in degrees	$M_{x,y}$ in Nm
0.1	2.5
0.25	3.3
0.50	4.7
0.75	5.7
1.00	6.1
1.25	6.4
1.50	6.6
1.70	6.8

The diagram shows the angular deflection of the OPR according to the moment $M_{x, MV}$ with maximum permissible operating pressure.

OPR 048

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A31.5-R

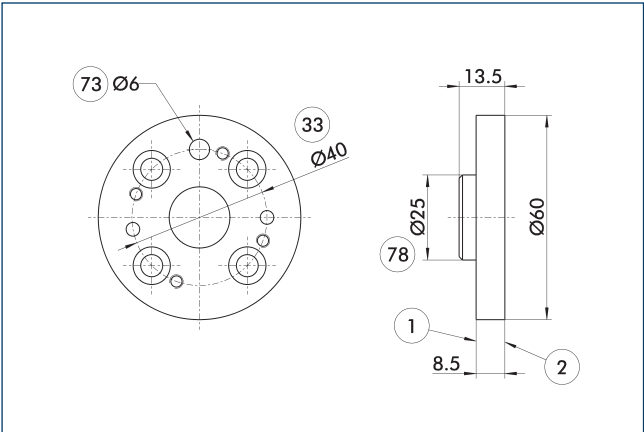


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-048-ISO-A31-R	0321347	

Adapter plate ISO 9409-A40-R

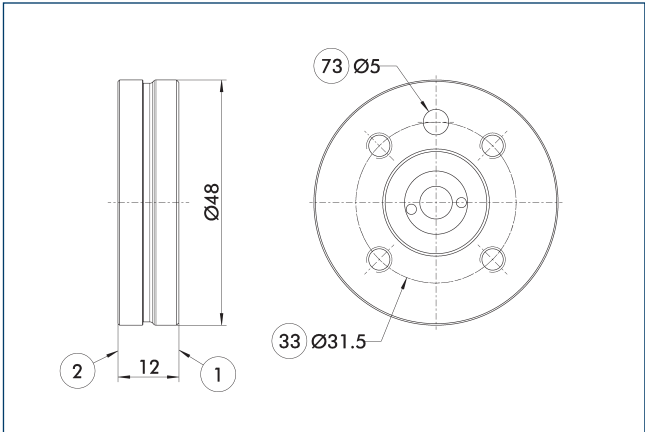


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-048-ISO-A40-R	0321348	

Adapter plate ISO-9409-A31.5-T

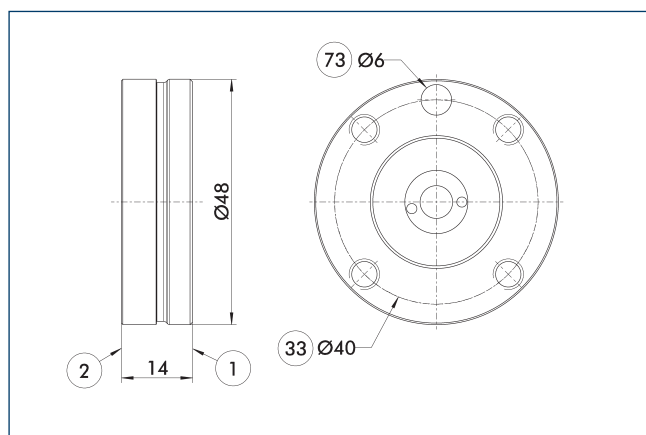


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins

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

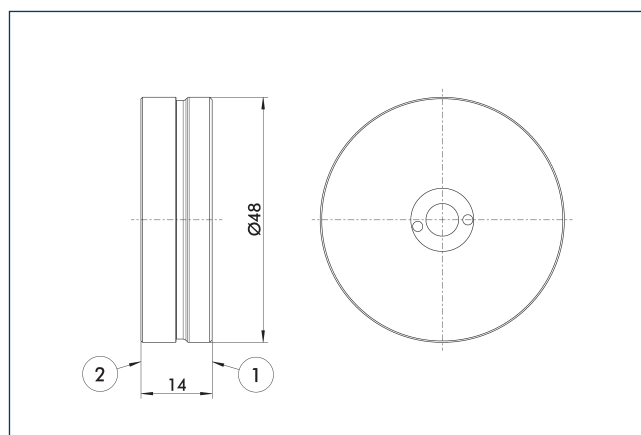


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦ Fit for centering pins

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

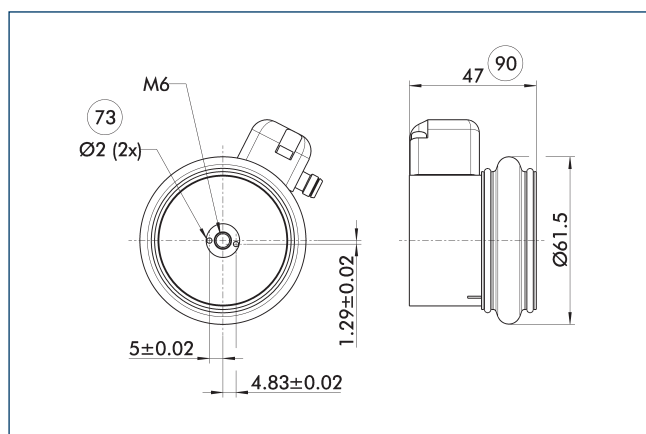


- ① Robot-side connection
- ② Tool-side connection

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

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

Protection cover OPR-048



- ⑦ Fit for centering pins
- ⑨ 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	IP protection class
Protection cover		
OPR-048 Flexboot	0321351	65

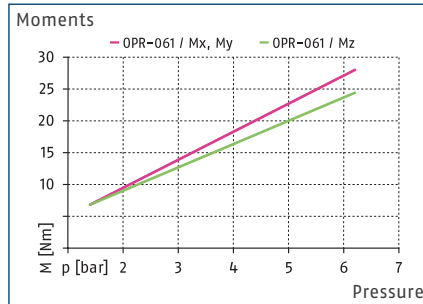
- ① Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 061

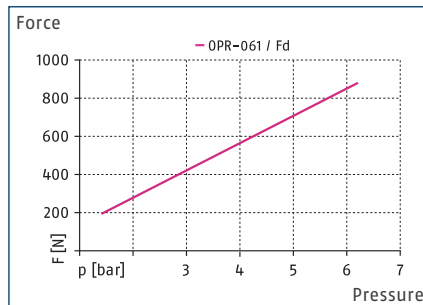
Anti-collision and overload protection sensor



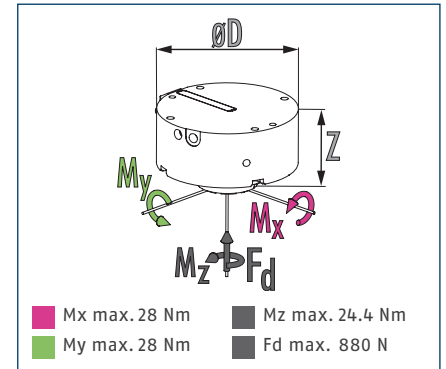
Trigger moment M_x , M_y , M_z



Triggering force F_d



Dimensions and maximum loads

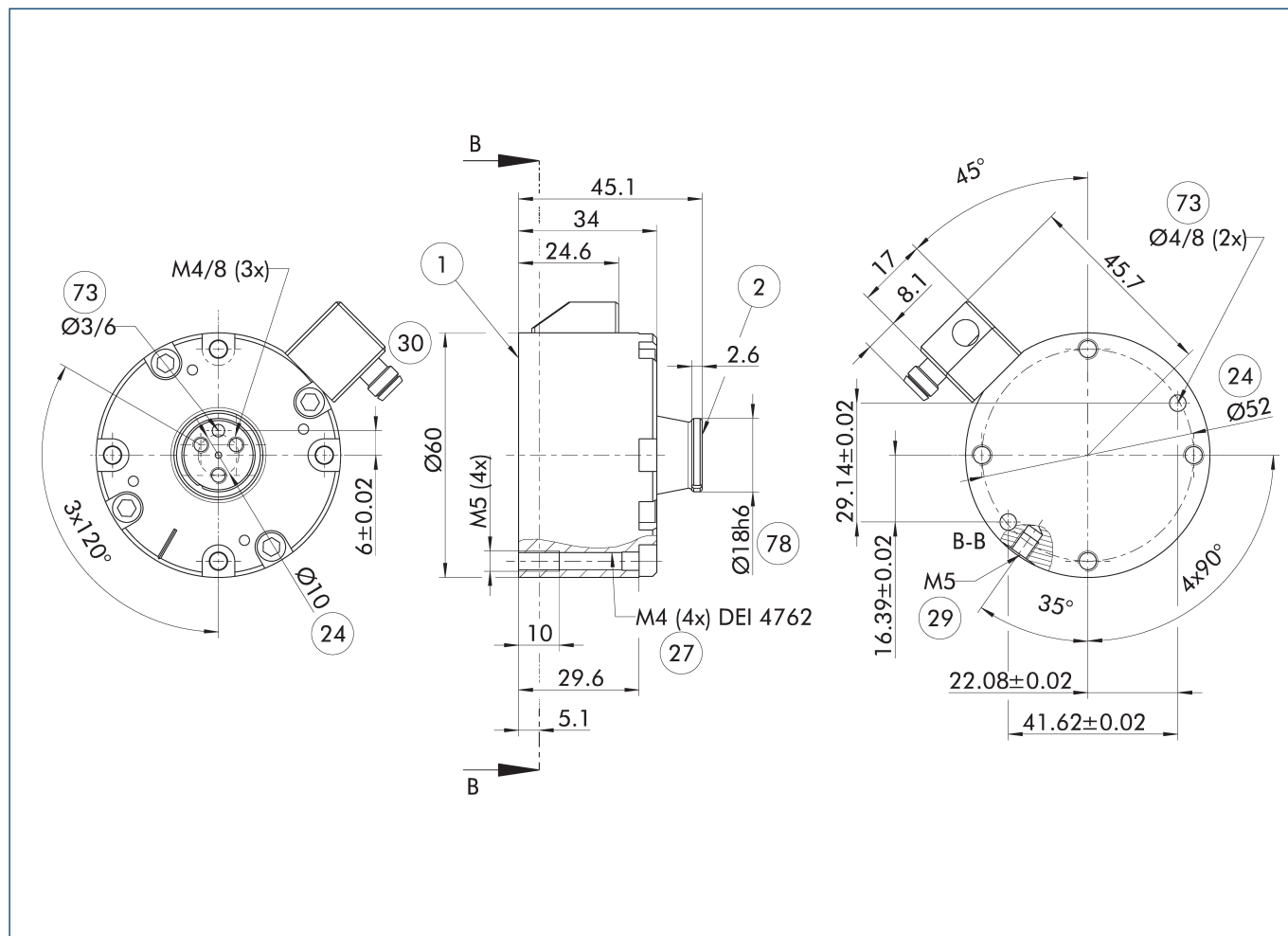


① The design of a collision sensor is defined by the occurring forces and moments in your application.

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 Mx, My	[Nm]	6.8	8.6	10.3	12.1
Min. triggering torque, rotatory Mz	[Nm]	6.8	8.5	10.1	11.8
Spring triggering force	[N]		48	96	144
Spring release torque, angular	[Nm]		1.8	3.5	5.3
Spring release torque, rotatory	[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
Responsiveness	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./nom./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
Dimensions Ø D x Z	[mm]	60 x 45.1	60 x 45.1	60 x 45.1	60 x 45.1

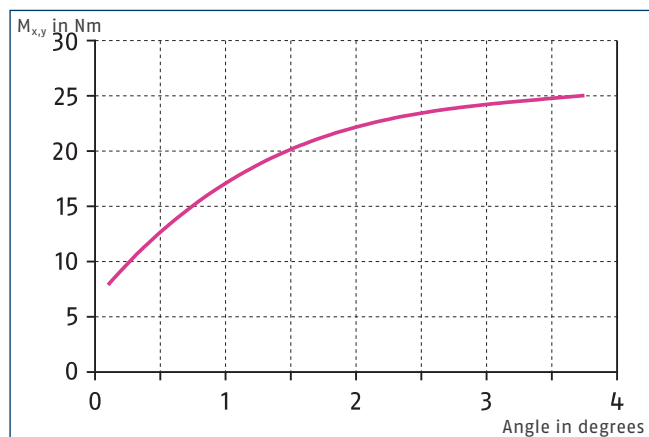
Main view



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

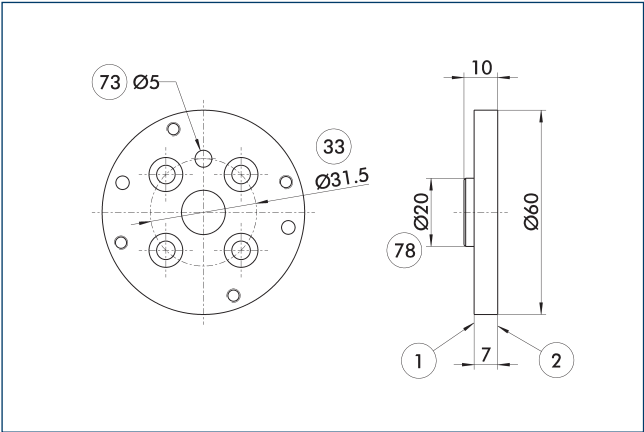


The diagram shows the angular deflection of the OPR according to the moment $M_{x,y}$ with maximum permissible operating pressure.

OPR 061

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A31.5-R

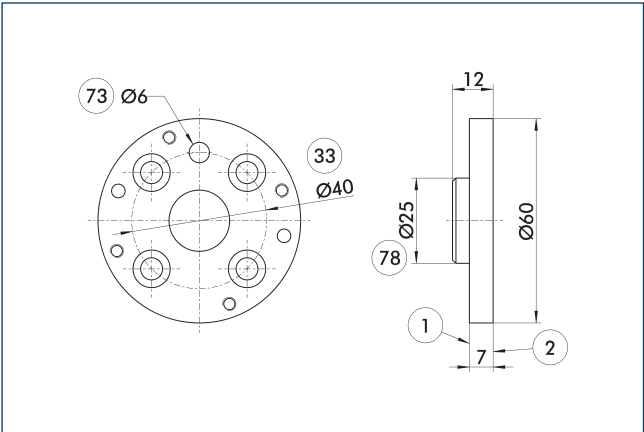


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-061-ISO-A31-R	0321369	

Adapter plate ISO 9409-A40-R

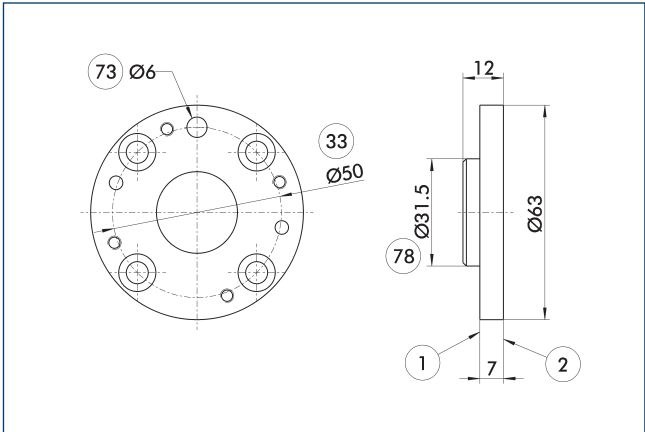


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-061-ISO-A40-R	0321370	

Adapter plate ISO 9409-A50-R

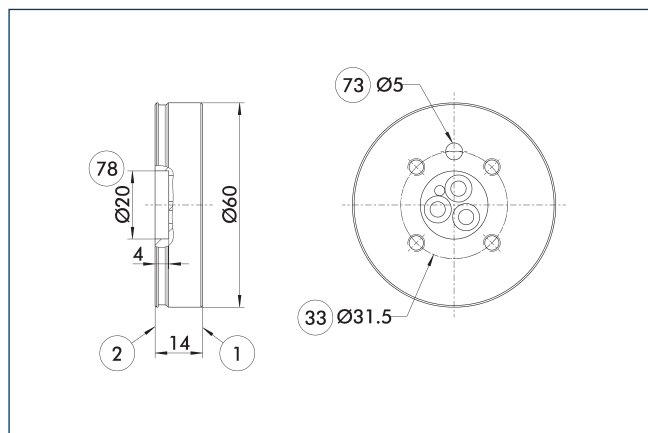


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-061-ISO-A50-R	0321371	

Adapter plate ISO-9409-A31.5-T

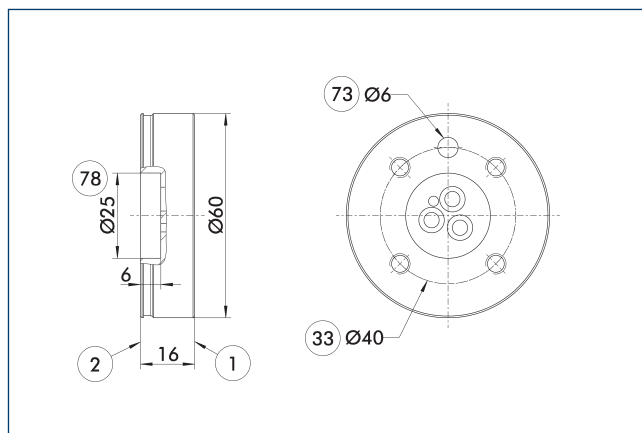


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

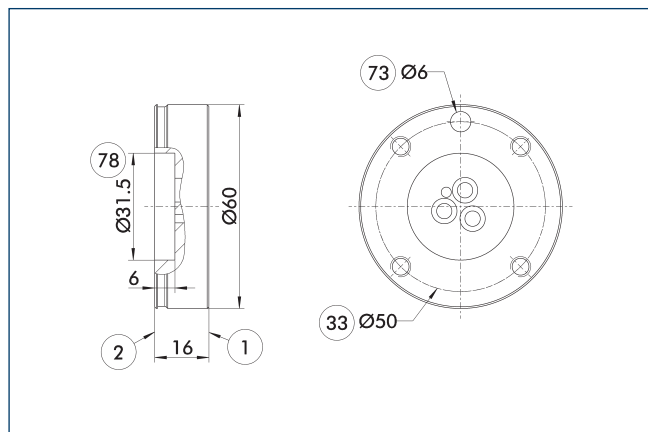


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

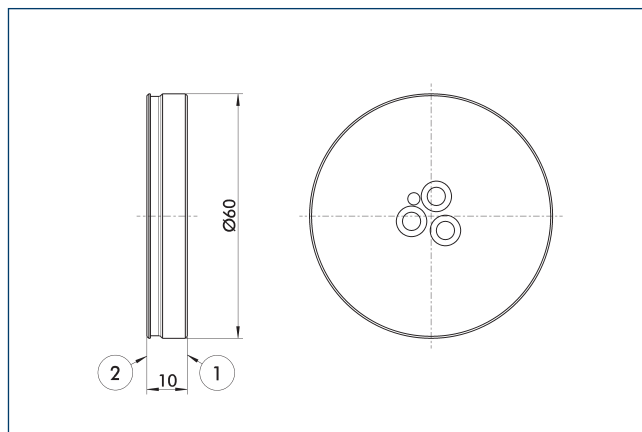


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

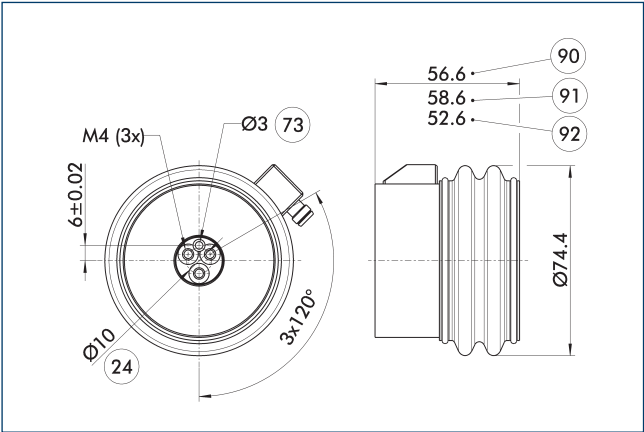
Unfinished tool-side adapter to be machined by the customer.

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	IP protection class
Protection cover		
OPR-061 Flexboot	0321376	65

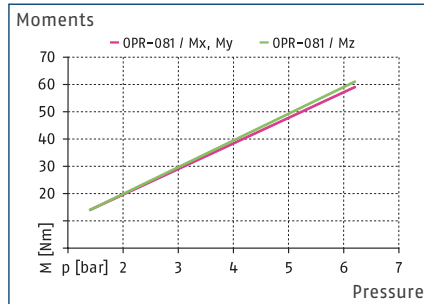
- ⓘ Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 081

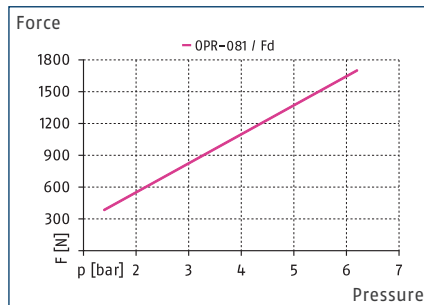
Anti-collision and overload protection sensor



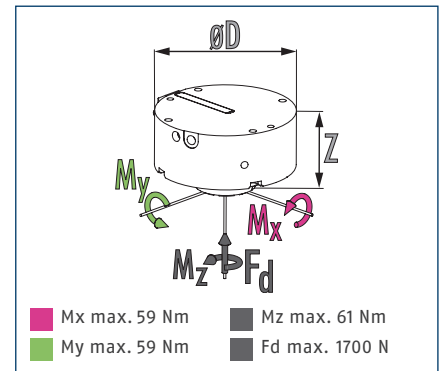
Trigger moment M_x , M_y , M_z



Triggering force F_d



Dimensions and maximum loads

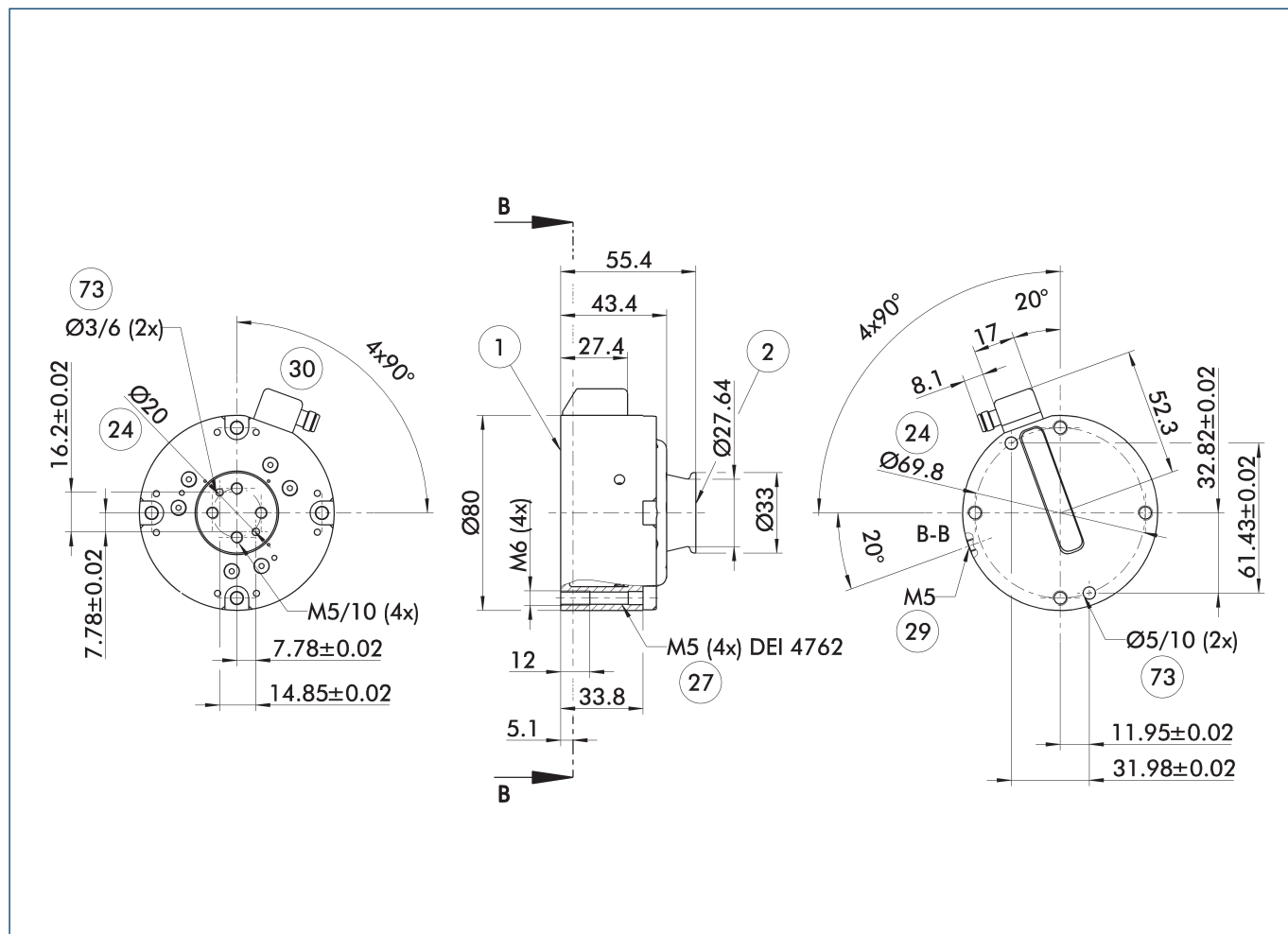


① The design of a collision sensor is defined by the occurring forces and moments in your application.

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 Mx, My	[Nm]	14	17.3	20.6	24
Min. triggering torque, rotatory Mz	[Nm]	14	17.5	21	24.5
Spring triggering force	[N]		95	191	286
Spring release torque, angular	[Nm]		3.3	6.6	10
Spring release torque, rotatory	[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
Responsiveness	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./nom./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
Dimensions Ø D x Z	[mm]	80 x 55.4	80 x 55.4	80 x 55.4	80 x 55.4

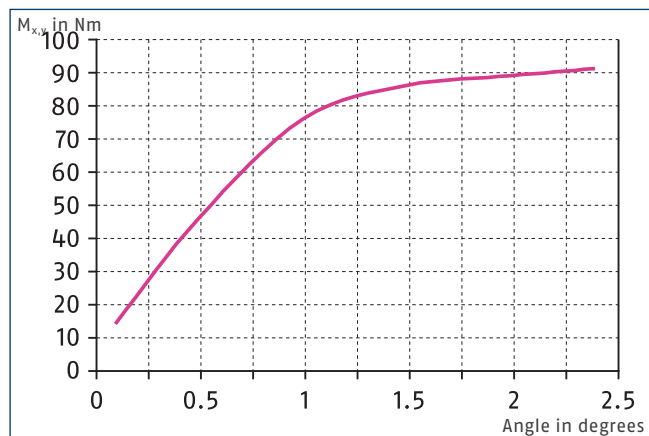
Main view



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 |
| ⑦ Through holes for screw connections | |

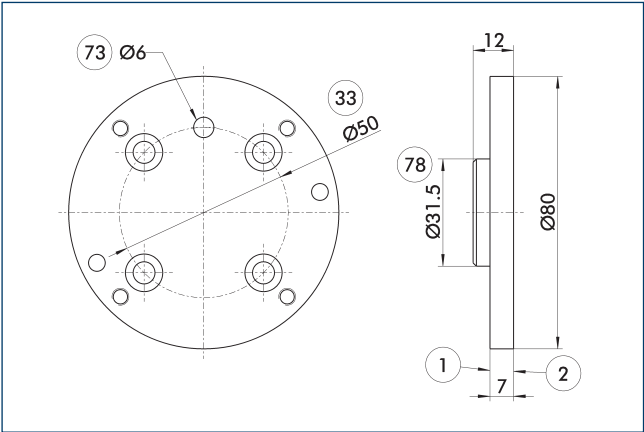
Moment loading



OPR 081

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A50-R

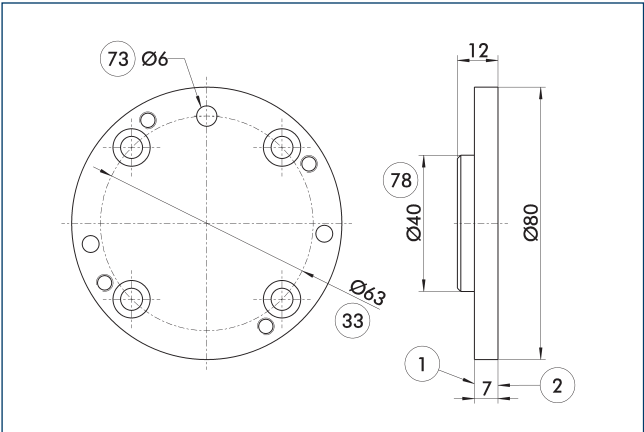


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-081-ISO-A50-R	0321190	

Adapter plate ISO 9409-A63-R

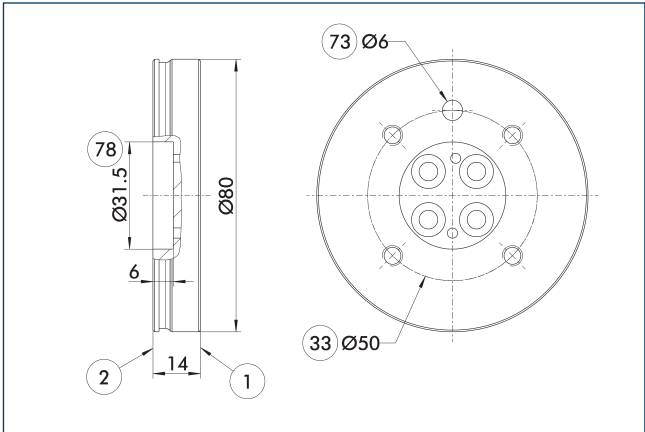


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-081-ISO-A63-R	0321191	

Adapter plate ISO 9409-A50-T

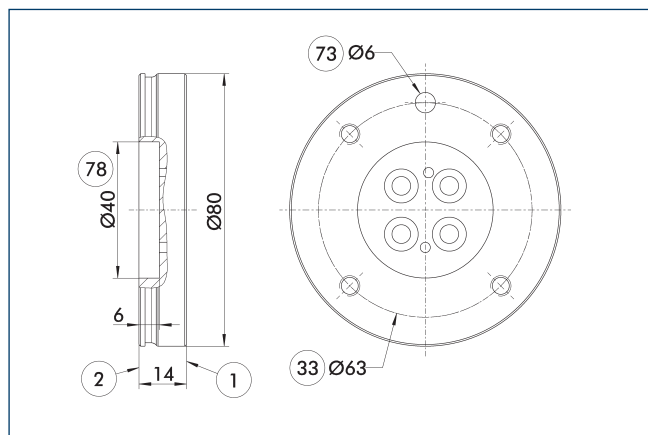


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

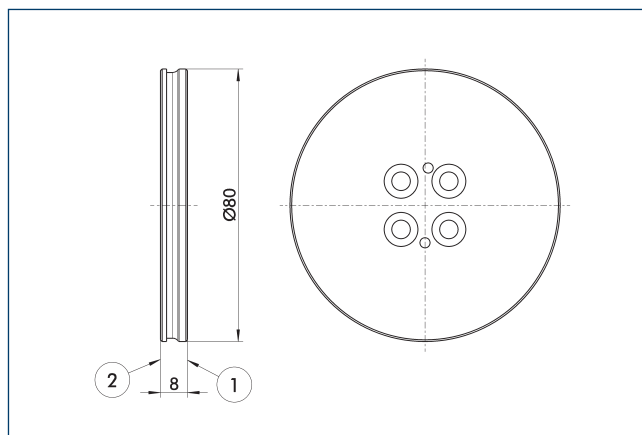


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

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

Adapter plate BLANK-T

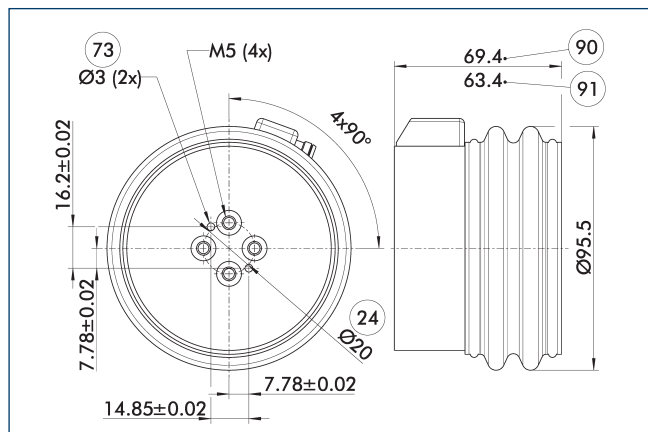


- ① Robot-side connection
- ② Tool-side connection

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

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

Protection cover OPR-081



- ②④ Bolt circle
- ⑦③ Fit for centering pins
- ⑨① Total height with adapter plate without flange pattern
- ⑨② Total height with adapter plate with flange pattern according to ISO 9409-A50/A63

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

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

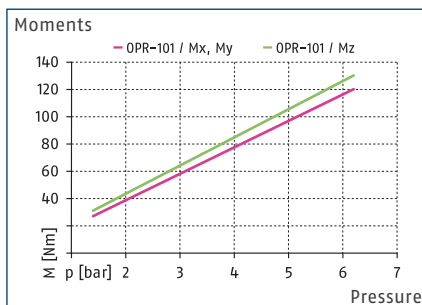
- ① Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 101

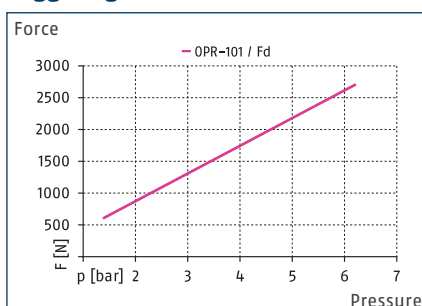
Anti-collision and overload protection sensor



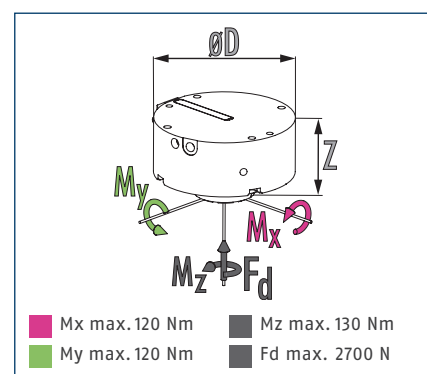
Trigger moment M_x , M_y , M_z



Triggering force F_d



Dimensions and maximum loads

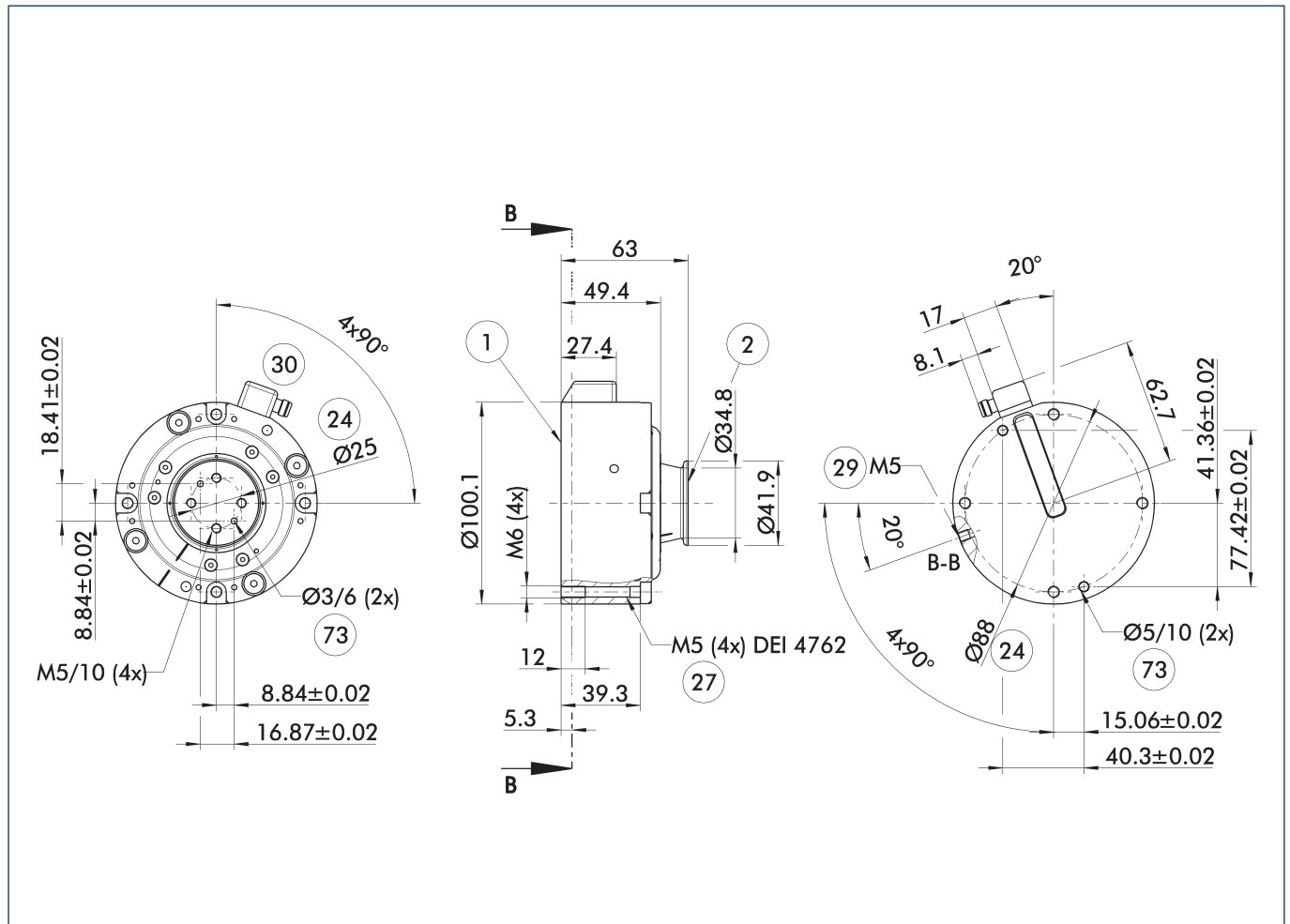


① The design of a collision sensor is defined by the occurring forces and moments in your application.

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 Mx, My	[Nm]	27	33.6	40.3	46.9
Min. triggering torque, rotatory Mz	[Nm]	31	39	46.9	54.9
Spring triggering force	[N]		151	303	454
Spring release torque, angular	[Nm]		6.6	13.3	19.9
Spring release torque, rotatory	[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
Responsiveness	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./nom./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
Dimensions Ø D x Z	[mm]	100.1 x 63	100.1 x 63	100.1 x 63	100.1 x 63

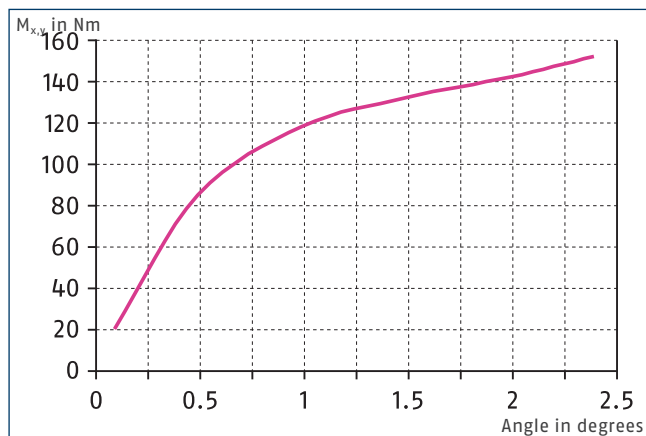
Main view



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 |
| ⑦ Through holes for screw connections | |

Moment loading

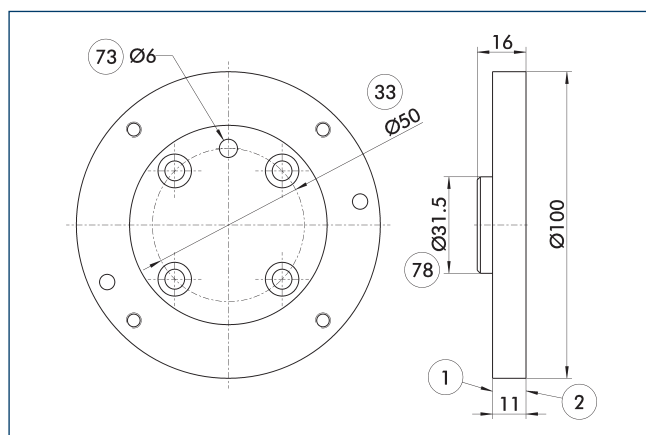


The diagram shows the angular deflection of the OPR according to the moment $M_{x, y}$ with maximum permissible operating pressure.

OPR 101

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A50-R

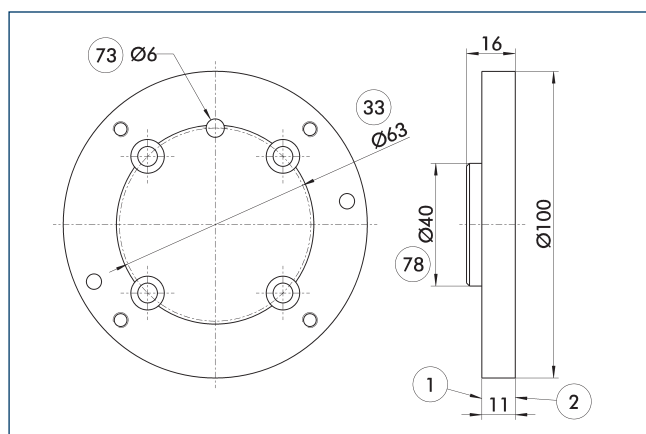


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-101-ISO-A50-R	0321410	

Adapter plate ISO 9409-A63-R

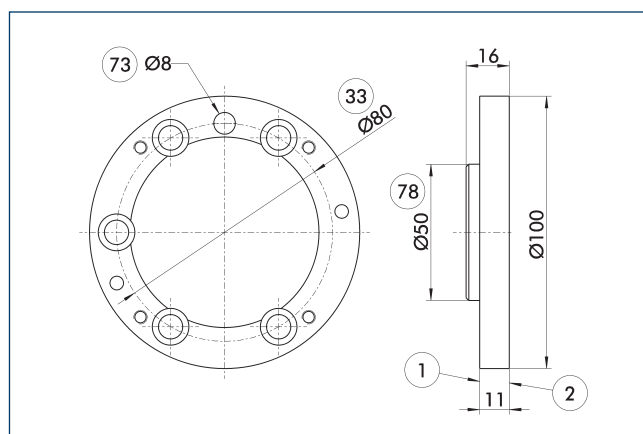


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-101-ISO-A63-R	0321411	

Adapter plate ISO 9409-A80-R

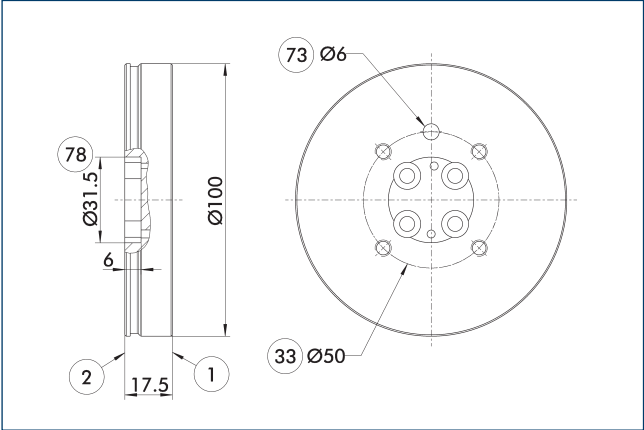


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-101-ISO-A80-R	0321412	

Adapter plate ISO 9409-A50-T

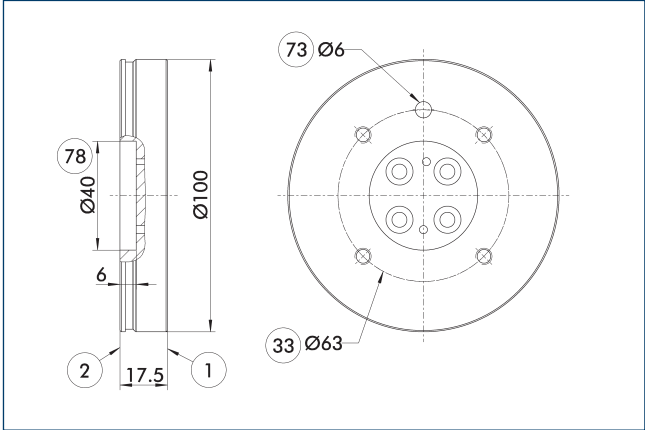


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- 73 Fit for centering pins
- 78 Fit for centering

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

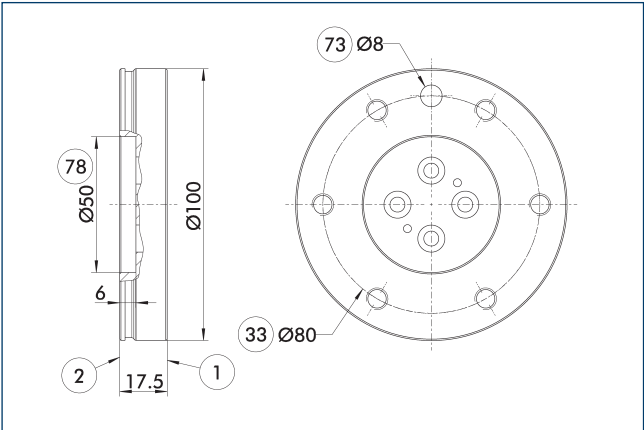


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- 73 Fit for centering pins
- 78 Fit for centering

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

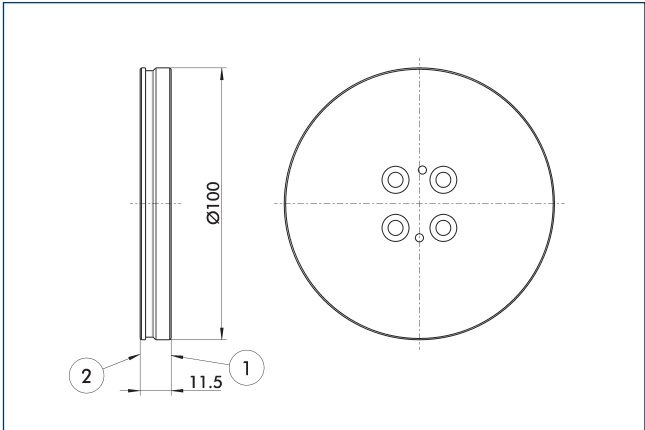


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- 73 Fit for centering pins
- 78 Fit for centering

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

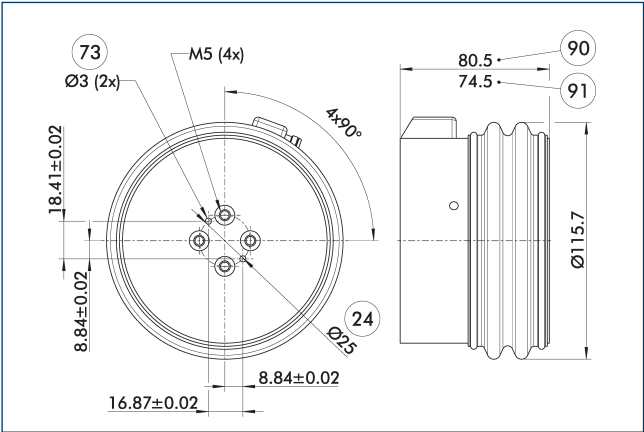
Unfinished tool-side adapter to be machined by the customer.

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	IP protection class
Protection cover		
OPR-101 Flexboot	0321416	65

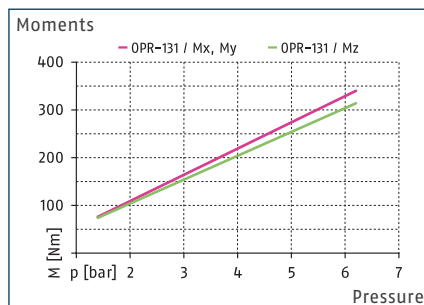
ⓘ Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 131

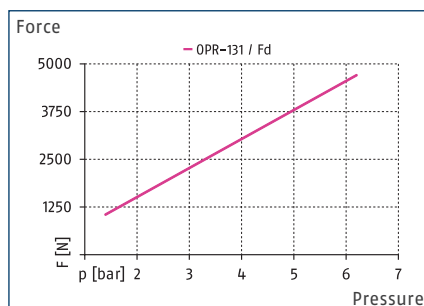
Anti-collision and overload protection sensor



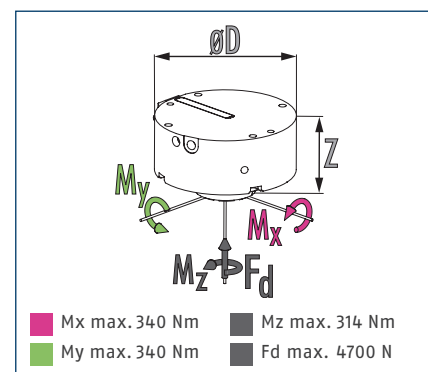
Trigger moment M_x , M_y , M_z



Triggering force F_d



Dimensions and maximum loads

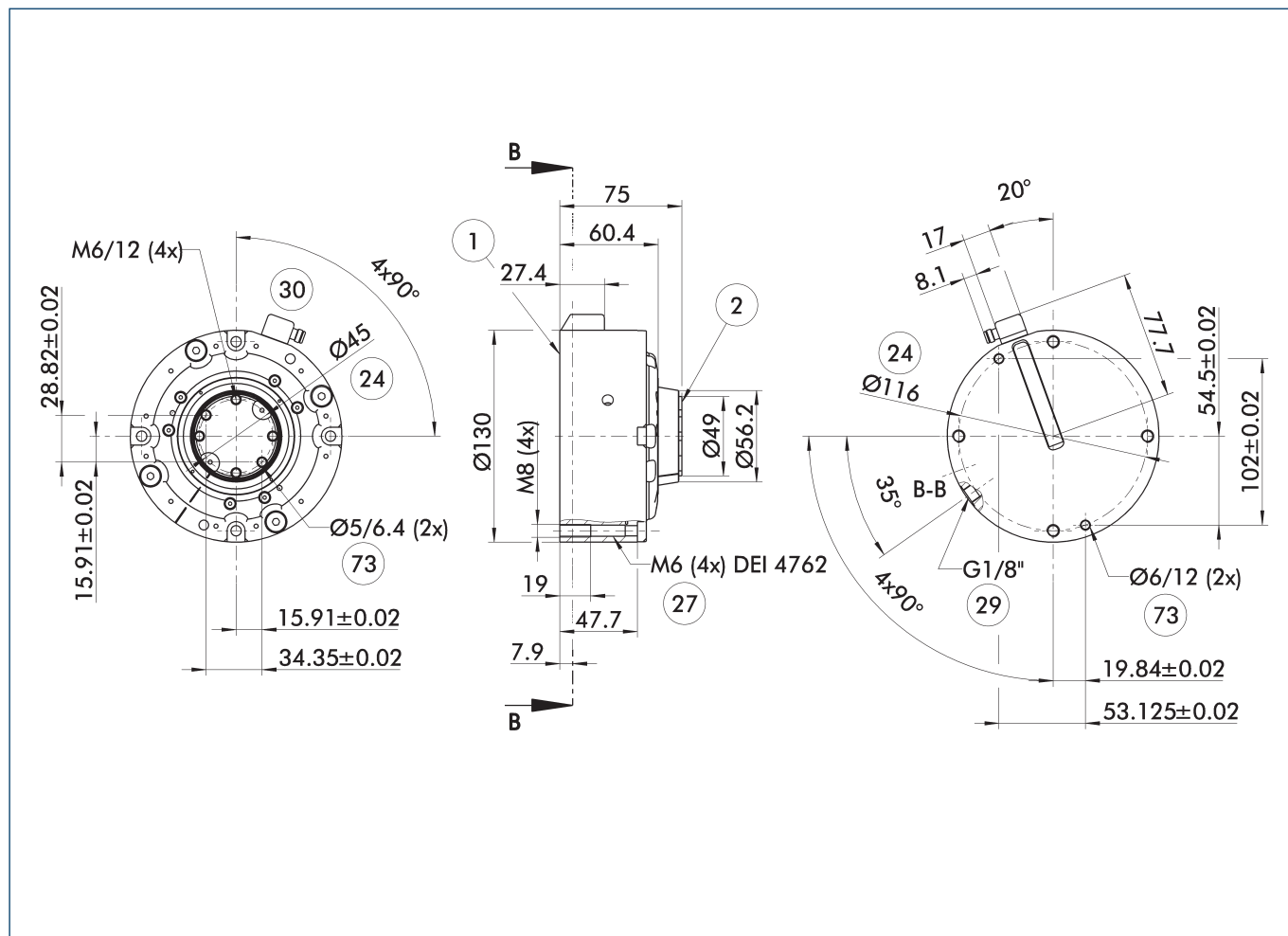


① The design of a collision sensor is defined by the occurring forces and moments in your application.

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
Spring release torque, angular	[Nm]		18.8	37.7
Spring release torque, rotatory	[Nm]		18.6	37.1
Supply voltage	[V]	10/30	10/30	10/30
Repeat accuracy	[mm]	±0.025	±0.025	±0.025
Responsiveness	[mm]	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5
Min./nom./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
Dimensions $\varnothing D \times Z$	[mm]	130 x 75	130 x 75	130 x 75

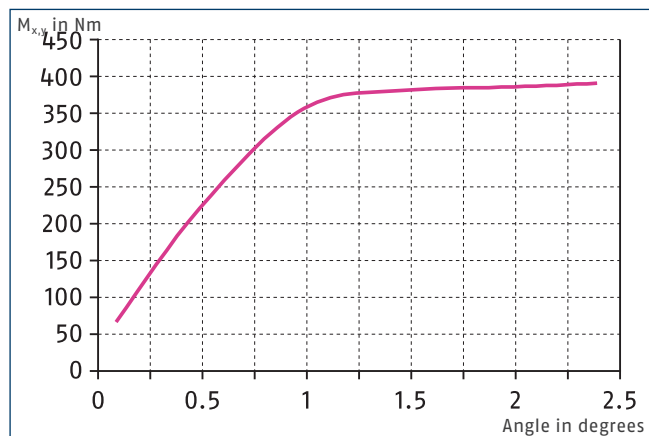
Main view



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 |
| ⑦ Through holes for screw connections | |

Moment loading

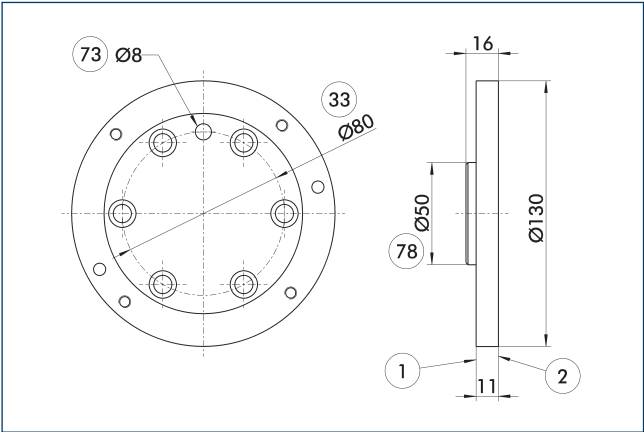


The diagram shows the angular deflection of the OPR according to the moment $M_{x, y}$ with maximum permissible operating pressure.

OPR 131

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A80-R

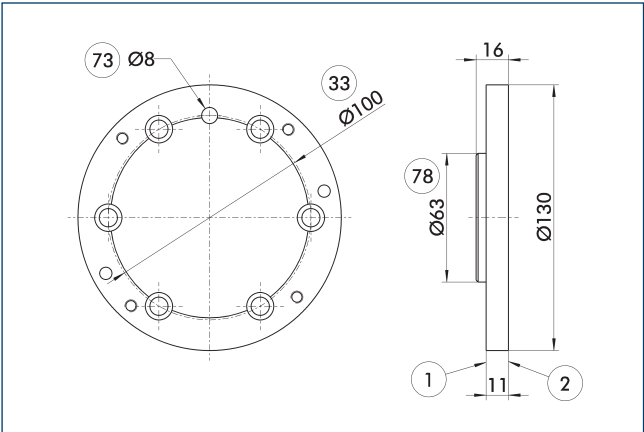


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-131-ISO-A80-R	0321440	

Adapter plate ISO 9409-A100-R

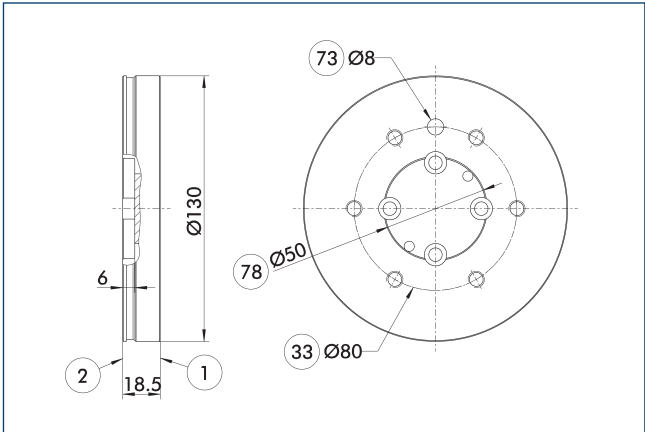


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-131-ISO-A100-R	0321441	

Adapter plate ISO 9409-A80-T

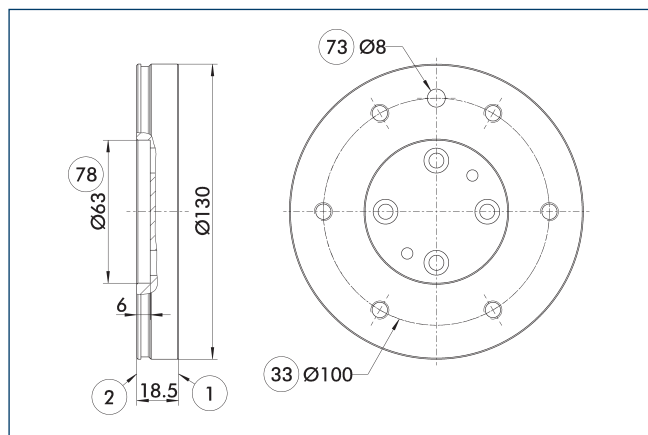


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

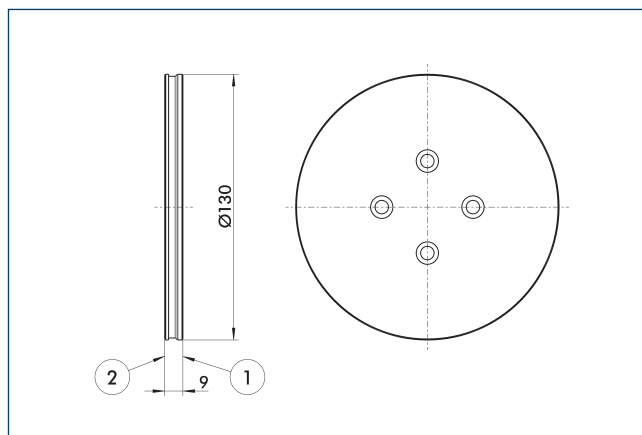


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Tool side		
A-OPR-131-ISO-A100-T	0321550	

Adapter plate BLANK-T

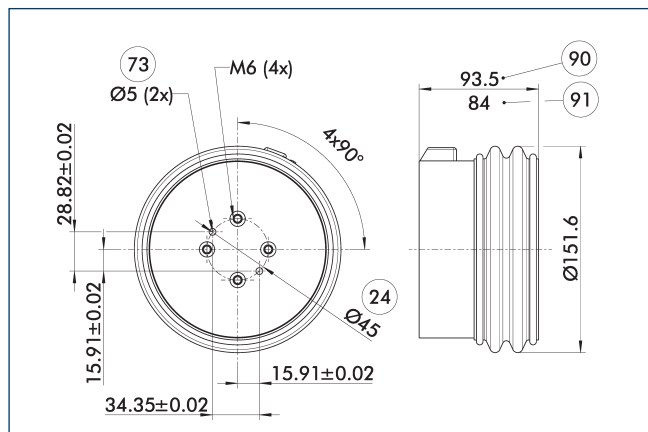


- ① Robot-side connection
- ② Tool-side connection

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	IP protection class
Protection cover		
OPR-131 Flexboot	0321447	65

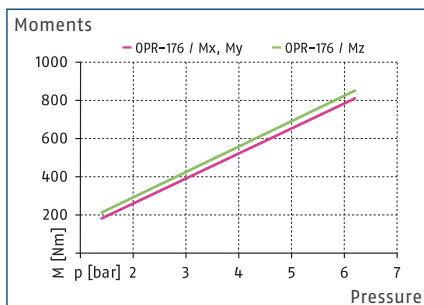
- ① Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 176

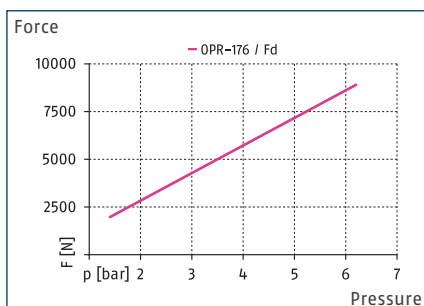
Anti-collision and overload protection sensor



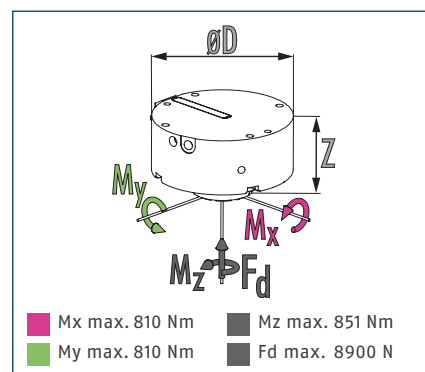
Trigger moment M_x , M_y , M_z



Triggering force F_d



Dimensions and maximum loads

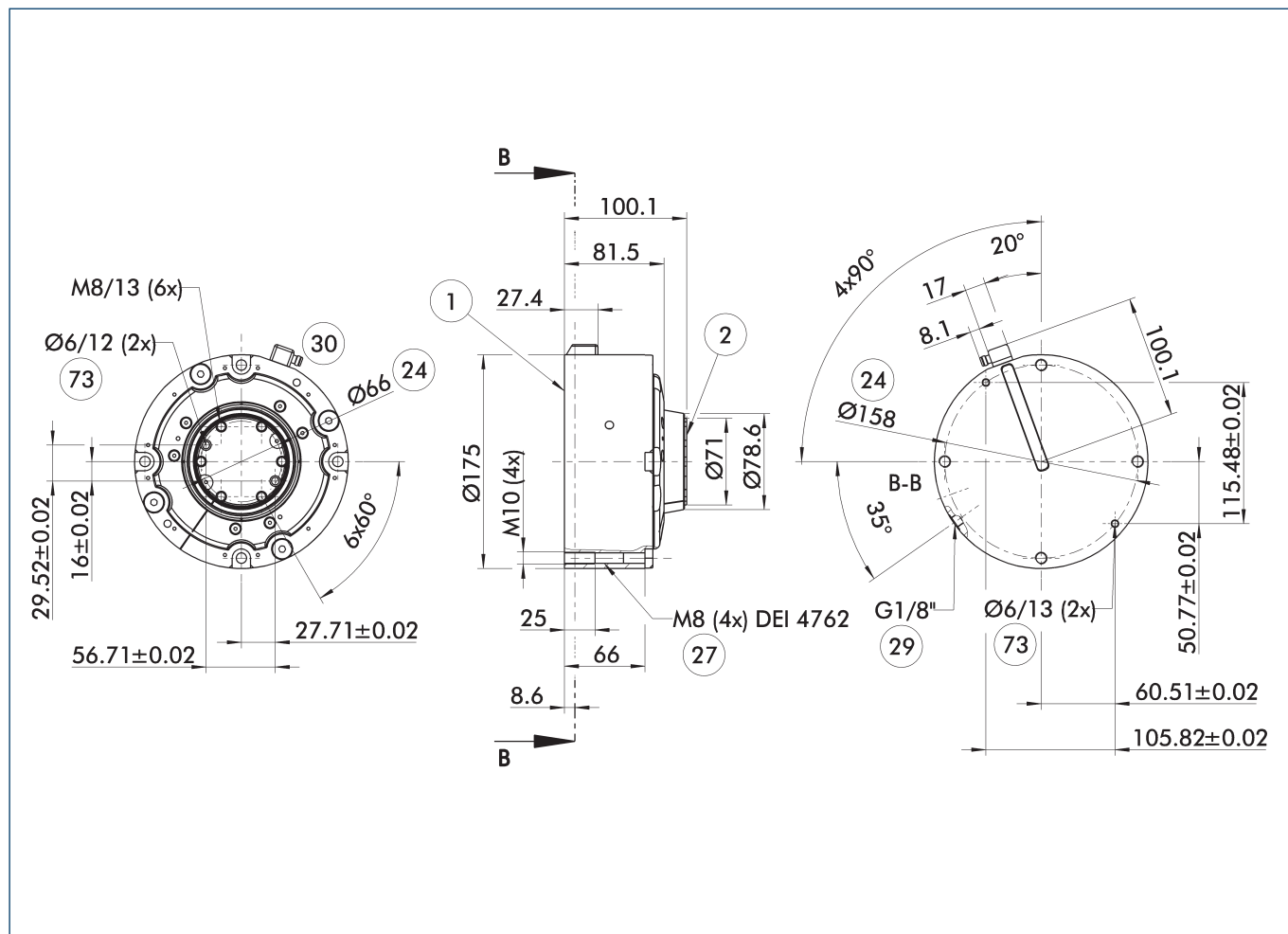


① The design of a collision sensor is defined by the occurring forces and moments in your application.

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
Spring release torque, angular	[Nm]		43.5	86.9	130
Spring release torque, rotatory	[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
Responsiveness	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./nom./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
Dimensions Ø D x Z	[mm]	175 x 100.1	175 x 100.1	175 x 100.1	175 x 100.1

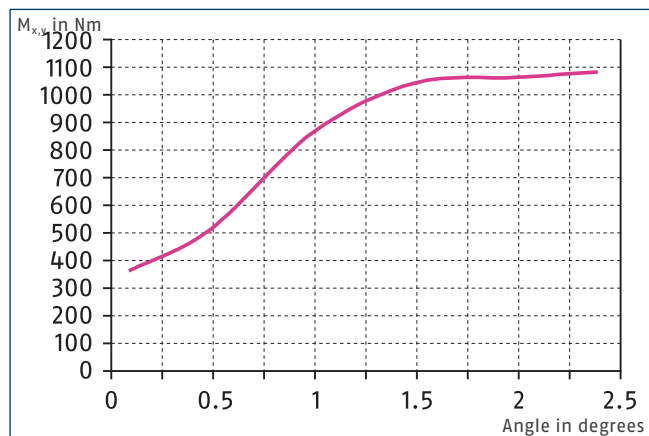
Main view



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 |
| ⑦ Through holes for screw connections | |

Moment loading

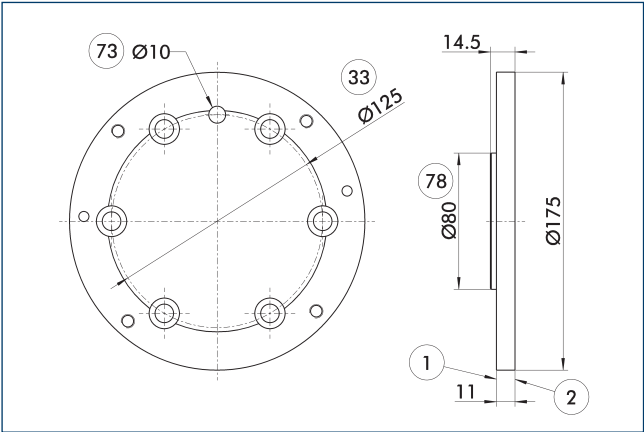


The diagram shows the angular deflection of the OPR according to the moment $M_{x, y}$ with maximum permissible operating pressure.

OPR 176

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A125-R

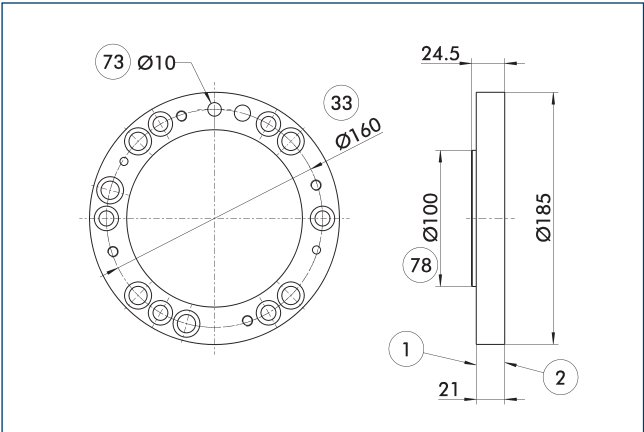


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-176-ISO-A125-R	0321485	

Adapter plate ISO 9409-A160-R

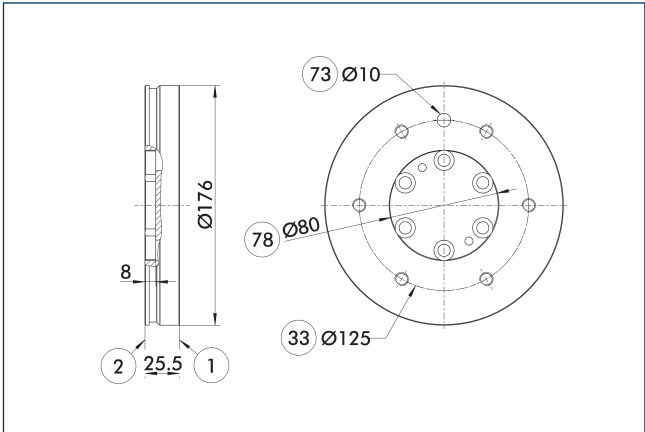


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-176-ISO-A160-R	0321486	

Adapter plate ISO 9409-A125-T

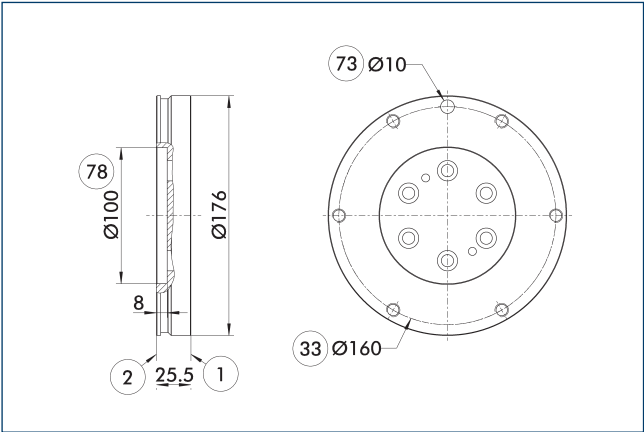


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

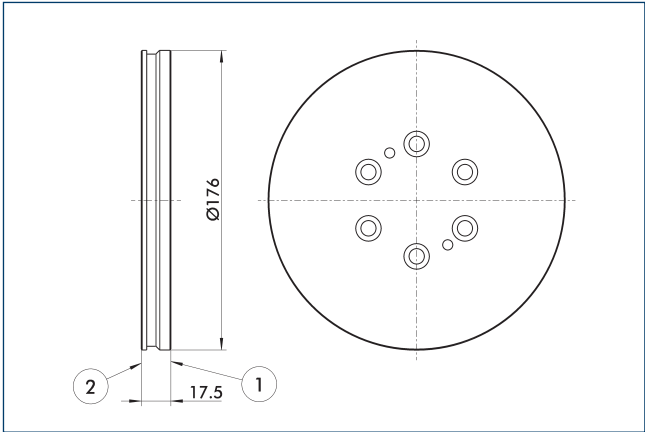


- 1 Robot-side connection
- 2 Tool-side connection
- 33 DIN ISO-9409 bolt circle
- 73 Fit for centering pins
- 78 Fit for centering

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

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

Adapter plate BLANK-T

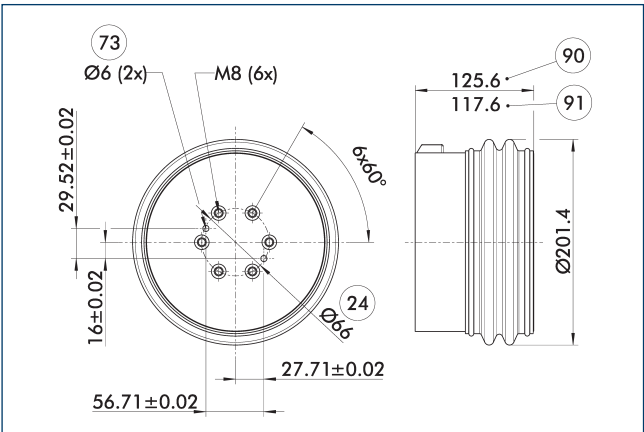


- 1 Robot-side connection
- 2 Tool-side connection

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	IP protection class
Protection cover		
OPR-176 Flexboot	0321492	65

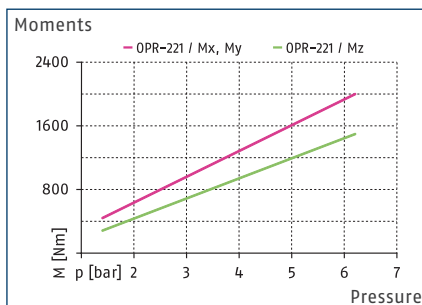
- 1 Please note that when using the protection boot a tool side adapter plate is also needed.

OPR 221

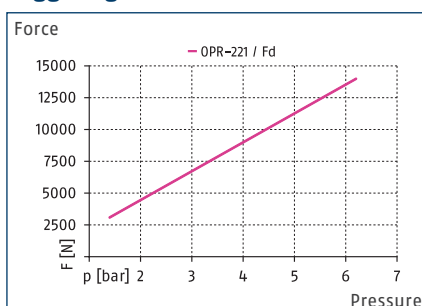
Anti-collision and overload protection sensor



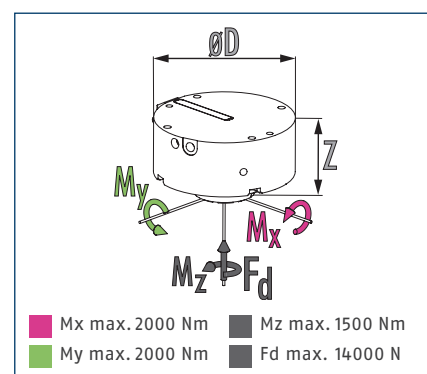
Trigger moment M_x , M_y , M_z



Triggering force F_d



Dimensions and maximum loads

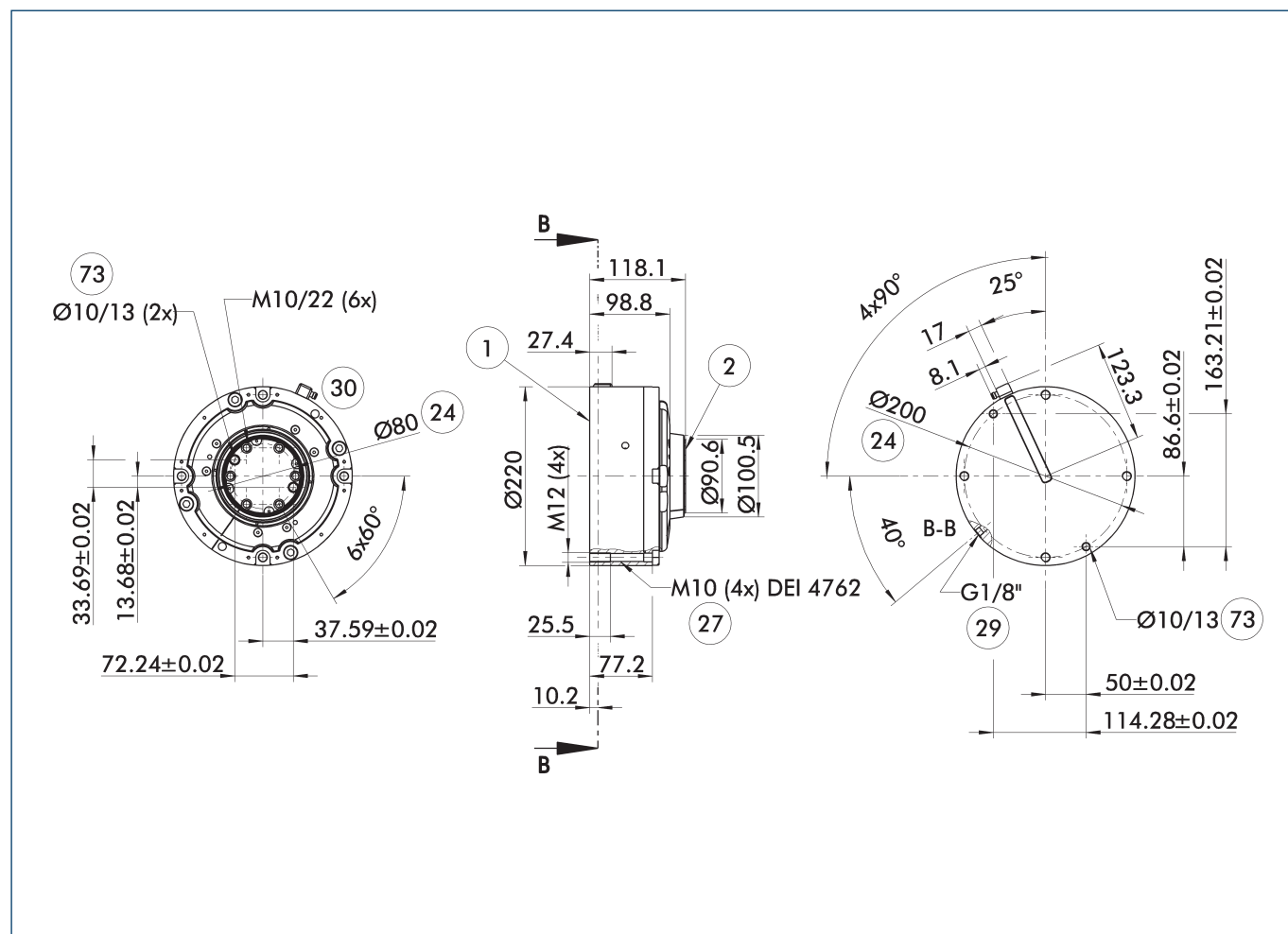


① The design of a collision sensor is defined by the occurring forces and moments in your application.

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
Spring release torque, angular	[Nm]		109	217	326
Spring release torque, rotatory	[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
Responsiveness	[mm]	0.5	0.5	0.5	0.5
Repeat accuracy, rotary	[min]	5	5	5	5
Min./nom./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
Dimensions Ø D x Z	[mm]	220 x 118.1	220 x 118.1	220 x 118.1	220 x 118.1

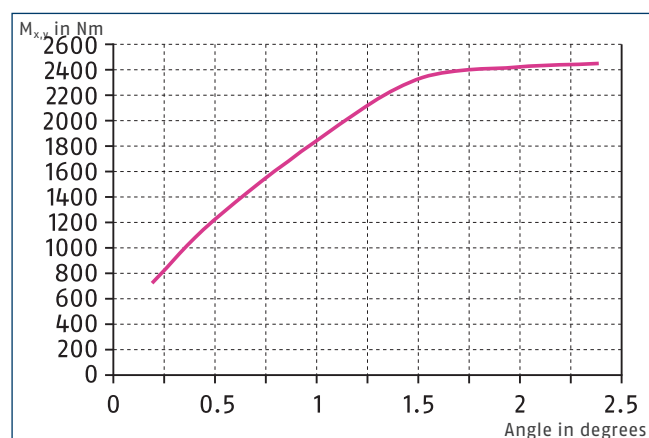
Main view



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

Moment loading

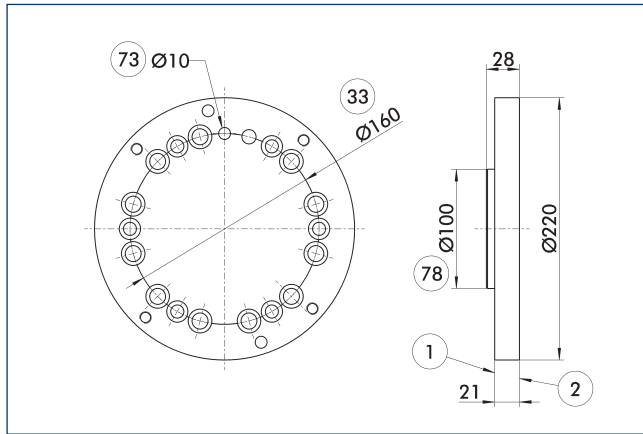


The diagram shows the angular deflection of the OPR according to the moment $M_{x, y}$ with maximum permissible operating pressure.

OPR 221

Anti-collision and overload protection sensor

Adapter plate ISO 9409-A160-R

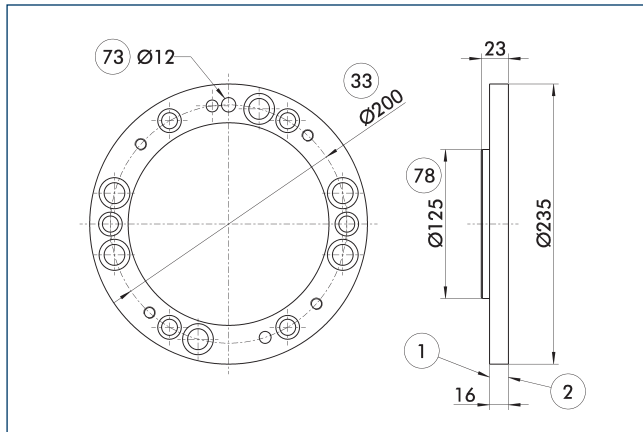


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-221-ISO-A160-plus-IRB6600	0321530	

Adapter plate ISO 9409-A200-R

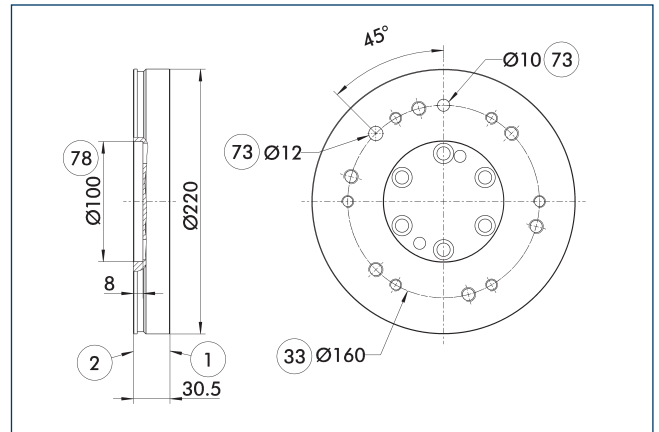


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

Description	ID	
Robot side		
A-OPR-221-ISO-A200-plus-IRB7600	0321531	

Adapter plate ISO 9409-A160-T

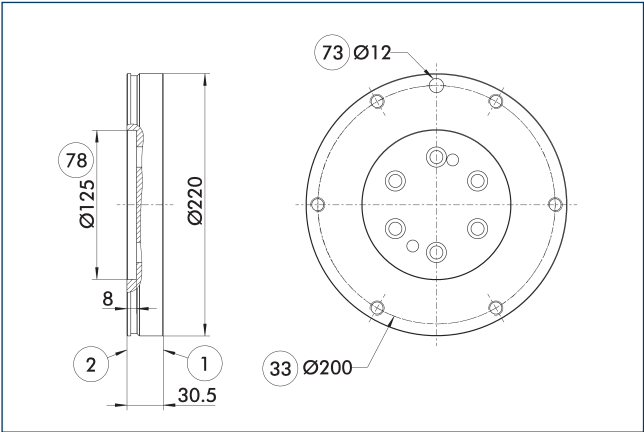


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦③ Fit for centering pins
- ⑦⑧ Fit for centering

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

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

Adapter plate ISO 9409-A200-T

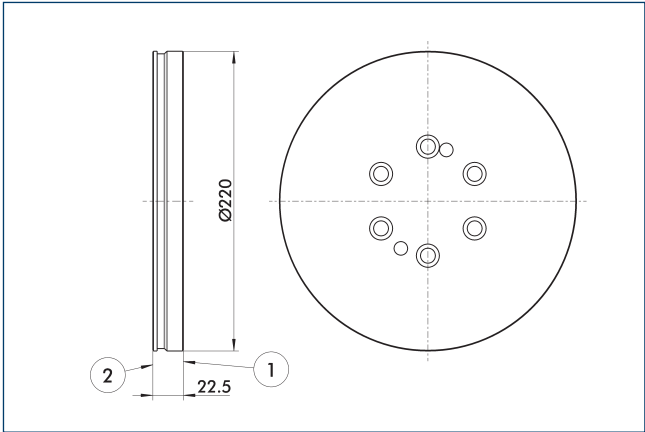


- ① Robot-side connection
- ② Tool-side connection
- ③ DIN ISO-9409 bolt circle
- ⑦ Fit for centering pins
- ⑧ Fit for centering

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

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

Adapter plate BLANK-T

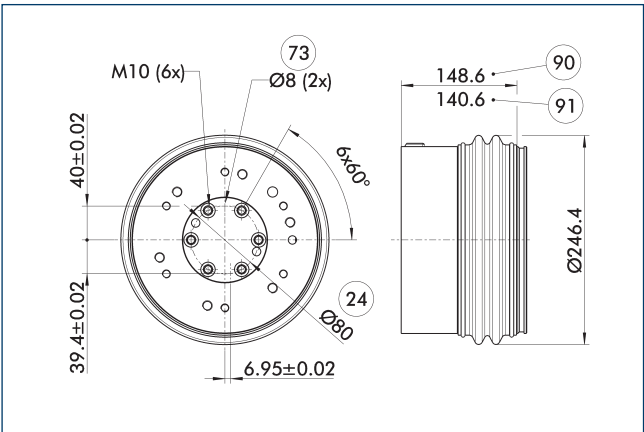


- ① Robot-side connection
- ② Tool-side connection

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

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

Protection cover OPR-221



- ② Bolt circle
- ⑦ Fit for centering pins
- ⑨ Total height with adapter plate with flange pattern according to ISO 9409-A160/A200
- 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	IP protection class
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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