

Compliant. Highly responsive. Automatic reset. OPR Collision and Overload Protection Sensor

To assist in preventing damage to robots and tooling in the event of a collision or overload situation.

Field of Application

The ideal solution for all robot applications whereby the robot, the tool or the workpiece need to be protected from serious damage in the event of a collision.



Advantages – Your benefit

Automatic reset for faster production restart after a collision

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

Integrated monitoring for signal transmission in case of collision. The robot will stop immediately in the event of a collision.

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

One option includes integrated springs for optimal monitoring of the robot and the components at low process forces and for sensitive applications

Mechanical flexibility on collisions allows an immediate reaction to any collision or overload.



Sizes
Quantity: 7



Triggering force F_d
440 .. 14000 N



Triggering moment M_x
6 .. 2000 Nm



Triggering moment M_y
6 .. 2000 Nm

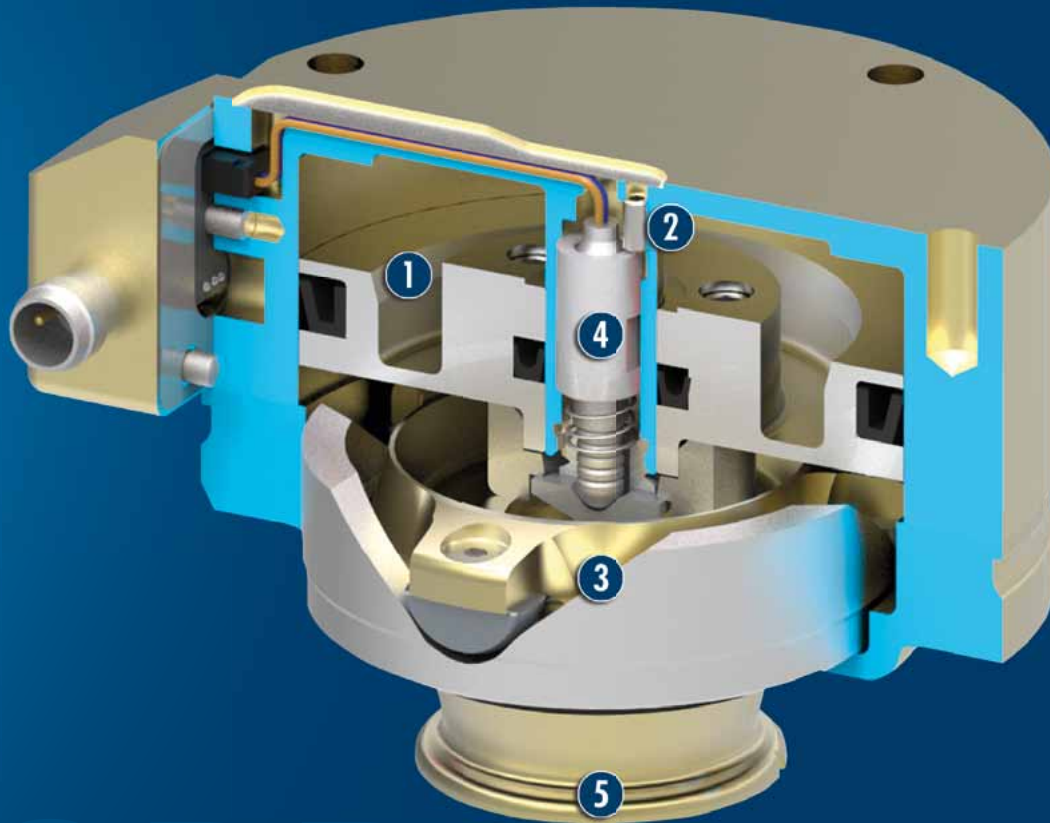


Triggering moment M_z
6.9 .. 1500 Nm

Functional Description

In the event 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**
pneumatic for ease of setting sensitivity

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

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

④ **Monitoring**
via mechanical switch

⑤ **Tool plate**
Deflects in the event of a collision

CAD data, operating manuals and other current product documents are available at www.schunk.com

General Notes to the Series

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Operating principle: Integrated cylinder pistons

Splash 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 (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Triple transfer unit for packaging with small boxboards

- 1 SWG 2-Finger Angular Gripper
- 2 OPR Collision Sensor



SCHUNK offers more ...

The following components make the OPR even more productive – the perfect complement for highest functionality, flexibility, and process reliability.



Adapter Plates



Fittings



Sensor Cables



SWS Quick-change System



NSR-A Pallet Change System



PZN-plus Centric Gripper



HWS Manual Gripper Change System



PGN-plus Universal Gripper System



PWG-plus Angular Gripper



DDF 2 Rotary Feed-through

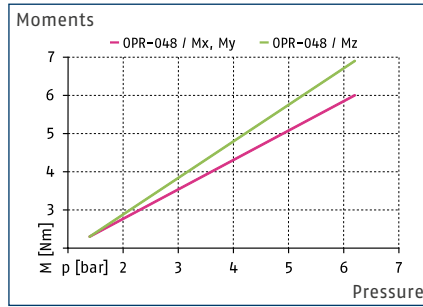
① Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

OPR 048

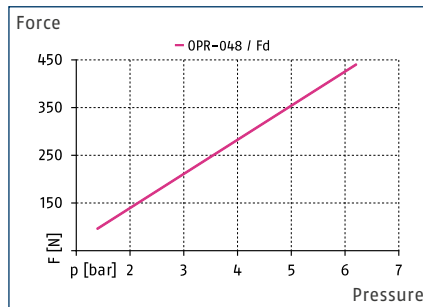
Robot Accessories | Protecting | Collision and Overload Protection



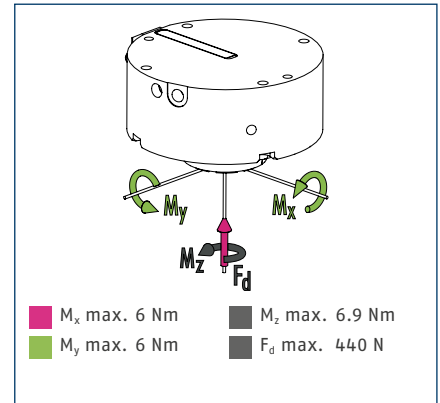
Triggering moment M_x , M_y , M_z



Triggering force F_d



Forces and moments

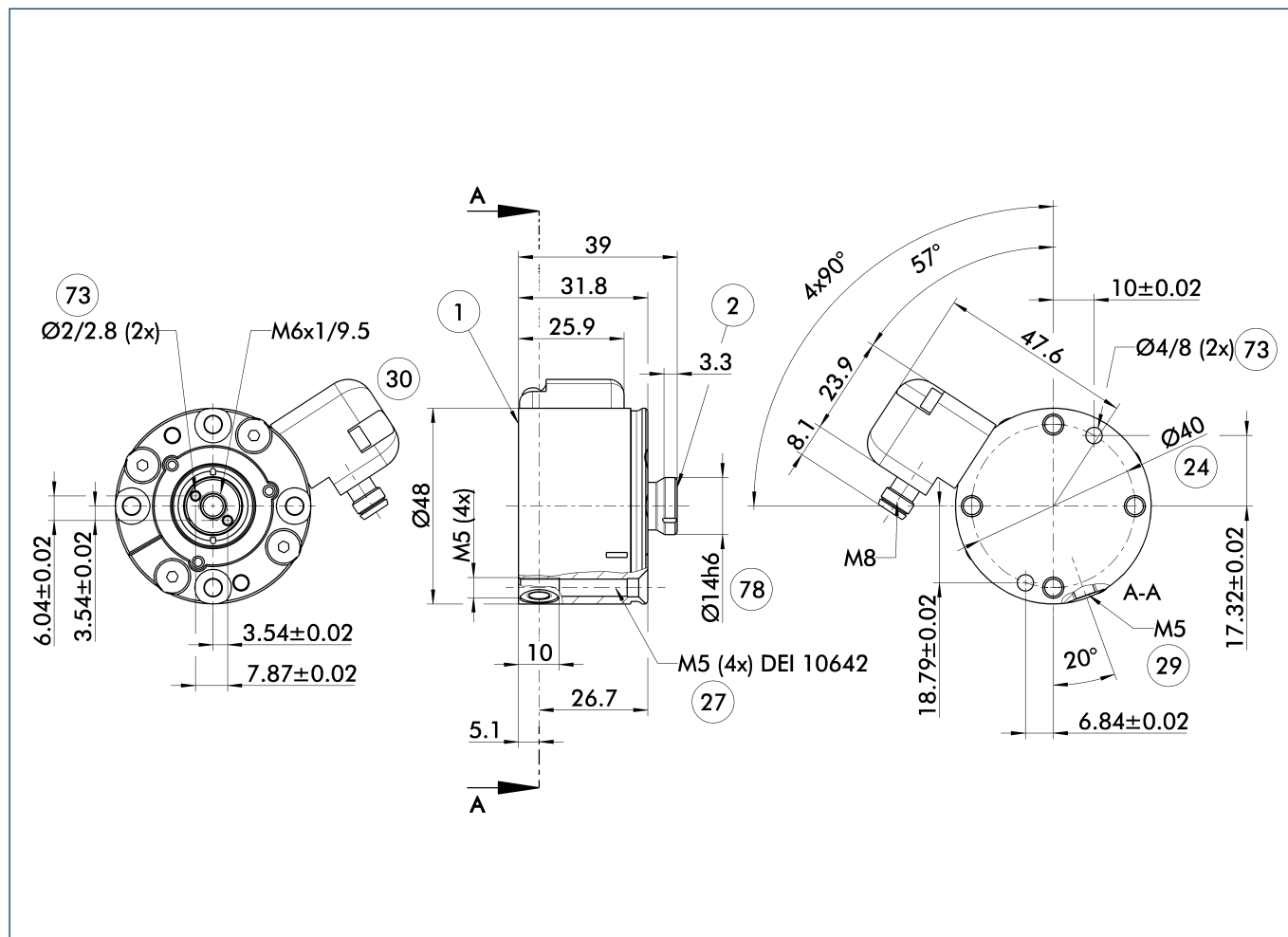


① The type of the collision sensors for the respective application are defined through the occurring forces and moments.

Technical data

Description		OPR-048-P00	OPR-048-P05	OPR-048-P10	OPR-048-P15
ID		0321341	0321342	0321343	0321344
Axial displacement	[mm]	5.1	5.1	5.1	5.1
Angular displacement	[°]	13	13	13	13
Rotatory displacement	[°]	20	20	20	20
min. angular triggering moment M_x, M_y	[Nm]	2.3	2.7	3.2	3.6
min. triggering moment rotary M_z	[Nm]	2.3	2.7	3.1	3.5
Spring triggering force	[N]		24	48	72
Angular spring displacement	[Nm]		0.4	0.9	1.3
Rotatory spring displacement	[Nm]		0.4	0.8	1.2
Repeat accuracy	[mm]	±0.025	±0.025	±0.025	±0.025
Sensitivity	[mm]	0.5	0.5	0.5	0.5
Rotation repeat accuracy	[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
Mass	[kg]	0.24	0.25	0.25	0.25
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Supply voltage	[V]	10 – 30	10 – 30	10 – 30	10 – 30

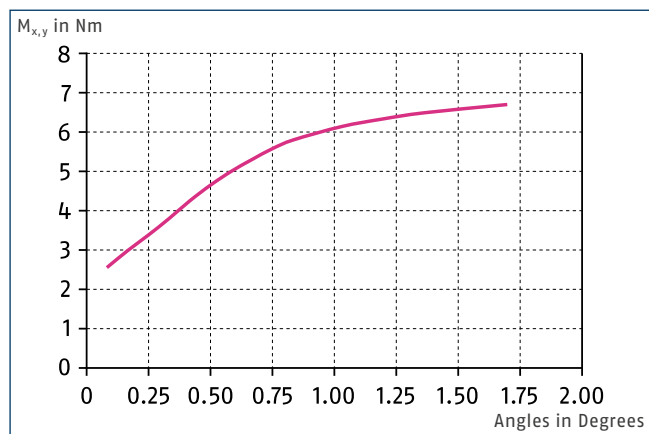
Main view



The main view shows the unit in its basic version.

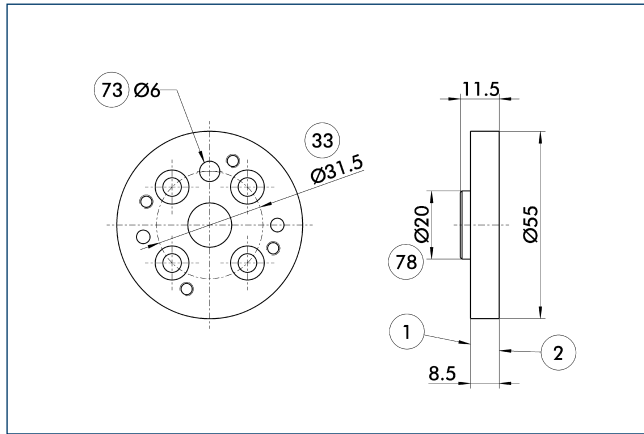
- ① Robot side connection
- ② Tool side connection
- ④ Bolt circle
- ⑦ Through-holes for screw connections
- ⑨ P air connection
- ⑩ Cable connector in the accessory pack with 5 m connection cable
- ⑬ Fit for a centering pin
- ⑭ Fitting for centering

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.

Adapter plate ISO 9409-A31.5-R

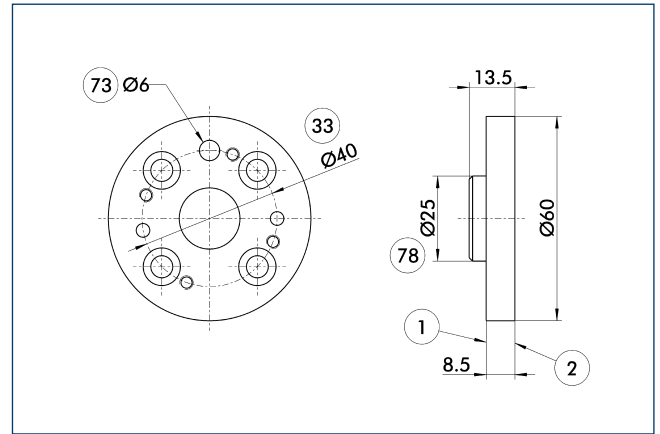


- ① Robot side connection
- ② Tool side connection
- ③③ DIN ISO-9409 bolt-hole circle diameter
- ⑦③ Fit for a centering pin
- ⑦⑧ Fitting for centering

Robot-side adapter plate with ISO 9409-31.5-4-M5 screw connection diagram.

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

Adapter plate ISO 9409-A40-R

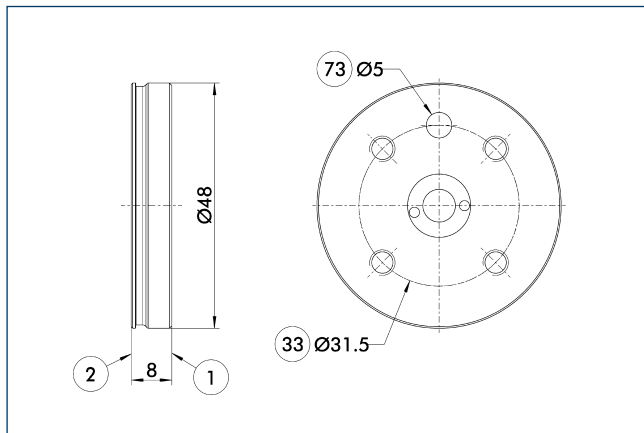


- ① Robot side connection
- ② Tool side connection
- ③③ DIN ISO-9409 bolt-hole circle diameter
- ⑦③ Fit for a centering pin
- ⑦⑧ Fitting for centering

Robot-side adapter plate with ISO 9409-40-4-M6 screw connection diagram.

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

Adapter plate ISO 9409-A31.5-T

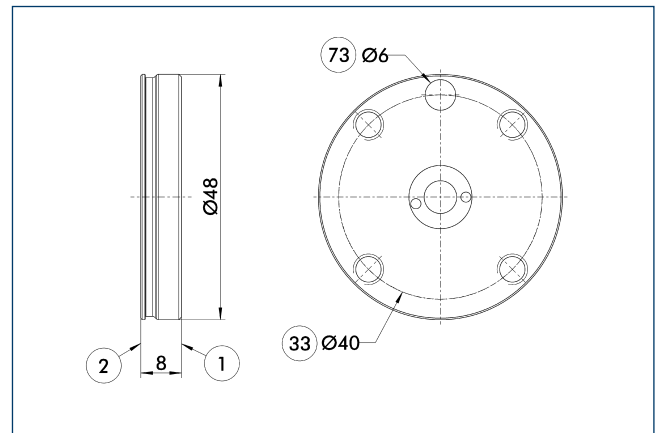


- ① Robot side connection
- ② Tool side connection
- ③③ DIN ISO-9409 bolt-hole circle diameter
- ⑦③ Fit for a centering pin

Tool-side adapter plate with ISO 9409-31.5-M5 screw connection diagram.

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

Adapter plate ISO 9409-A40-T

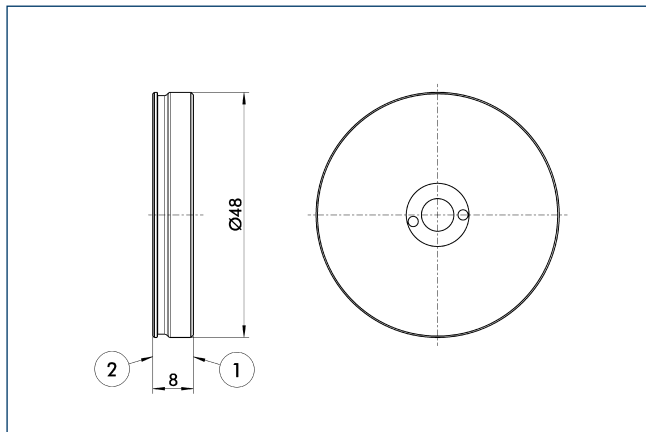


- ① Robot side connection
- ② Tool side connection
- ③③ DIN ISO-9409 bolt-hole circle diameter
- ⑦③ Fit for a centering pin

Tool-side adapter plate with ISO 9409-40-4-M6 screw connection diagram.

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

Adapter plate BLANK-T

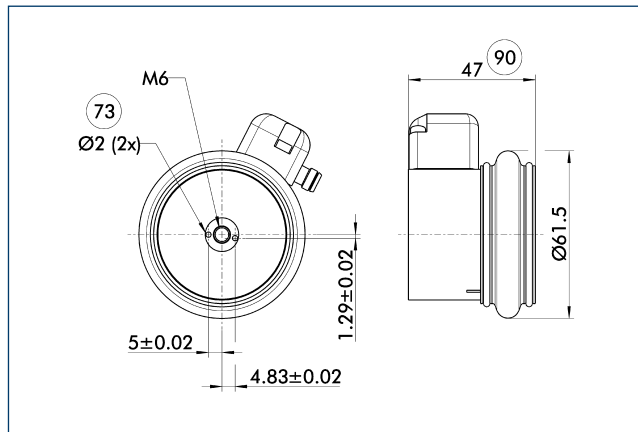


- ① Robot side connection
- ② Tool side connection

Tool-side adapter plate BLANK to be machined by the customer.

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

OPR-048 protection cover



- ⑦③ Fit for a centering pin
- ⑨① Total height with adapter plate with flange pattern according to ISO 9409-A31.5/A40 and also without flange pattern

The cover protects the OPR against coolant up to IP65.

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

Please note that a tool side adapter plate is required when using the protective cover.