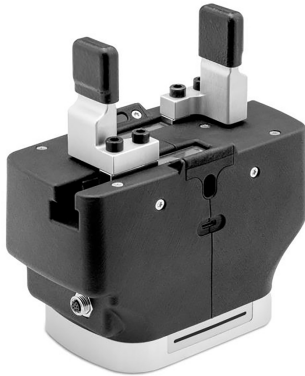


# SMART PARALLEL GRIPPER FOR COLLABORATIVE ROBOTS

## SERIES CSPT

Size 20



- Precise force and position control
- Measurement of the workpiece size
- Gestures recognition
- Workpiece presence detection
- Anti-slip grip function
- Compliant with ISO TS15066

The collaborative gripper Series CSPT, equipped with integrated valves and sensors, performs smart functions such as force and position monitoring.

It collects and transmits data in real-time, improving process control. It ensures high operational quality, reduces cycle times, and increases production efficiency.

### General Data

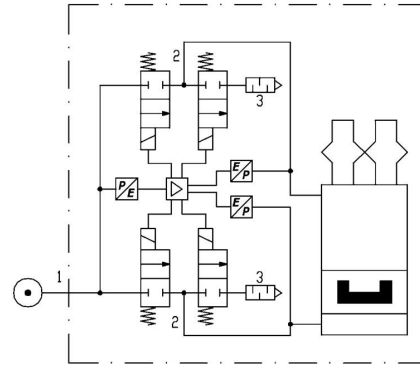
Type of construction	Self-centering collaborative gripper with T-guide
Operation	Double acting
Size	20 mm
Air connections	Tube Ø4 mm
Operating temperature	5°C + 50°C
Storage temperature	-10°C + 60°C
Repeatability	0.05 mm (with part clamped)
Medium	Filtered air in class [7:4:4] according to ISO 8573-1. In case lubricated air is used, we recommend ISOVG32 oil and to never interrupt lubrication.
Protection class	IP40
Compatibility	ROHS and REACH Directives
Certifications	ISO 12100, ISO 10218, ISO TS15066, ISO 4414, IEC 61000-6-2, IEC 61000-6-4
Operating pressure	2 + 10 bar
Voltage	24V
Max current	0.25A
Closing force per jaw at 0 mm (6bar)	150N
Opening force per jaw at 0 mm (6bar)	150N
Closing / Opening time	<1,2S
Stroke per gripper jaw [mm]	40 mm
Weight	1.6 kg

### Coding example

CSPT	-	20	-	80	-	1
CSPT	SERIES					
20	SIZE 20					
80	STROKE 80					
1	ELECTRIC INTERFACE RS 485 modbus					

## Pneumatic circuit diagram

The pneumatic circuit of the CSPT gripper integrates proportional valves and pressure sensors, enabling independent control of the opening and closing chambers. The system allows for pressure, force, or position control—also in combination within the same work cycle. An integrated encoder adjusts the stroke, optimizing opening and closing times. Open-loop force control and intermediate positioning are achieved by pressure balancing, ensuring high precision and operational flexibility.



## Notes on Functioning

Thanks to the integration of proportional valves, it is possible to adjust the desired pressure in both chambers and achieve the required force based on the application.

Additionally, with the integration of an encoder, it is possible to control the position of the jaws, optimizing opening and closing times by limiting the gripper's stroke.

Depending on the application, it is possible to choose whether to control the gripper by adjusting the pressure, force, or position.

Different controls can be combined within a single working cycle of the gripper.

For instance, controlling the pressure during closing and then the position during opening.

## Pressure Control

Inside the gripper, there are three pressure sensors.

The first monitors the supply pressure, while the other two monitor the pressure in the opening and closing chambers, respectively.

Thanks to these sensors and the integration of proportional valves, proportional pressure control can be performed independently in both chambers.

The force exerted by the gripper, which depends on the pressure, is represented in the graph.

Using the tables in the next chapter, it is possible to determine the resulting force for a given pressure and a given distance of the piece to be handled.

## Force Control

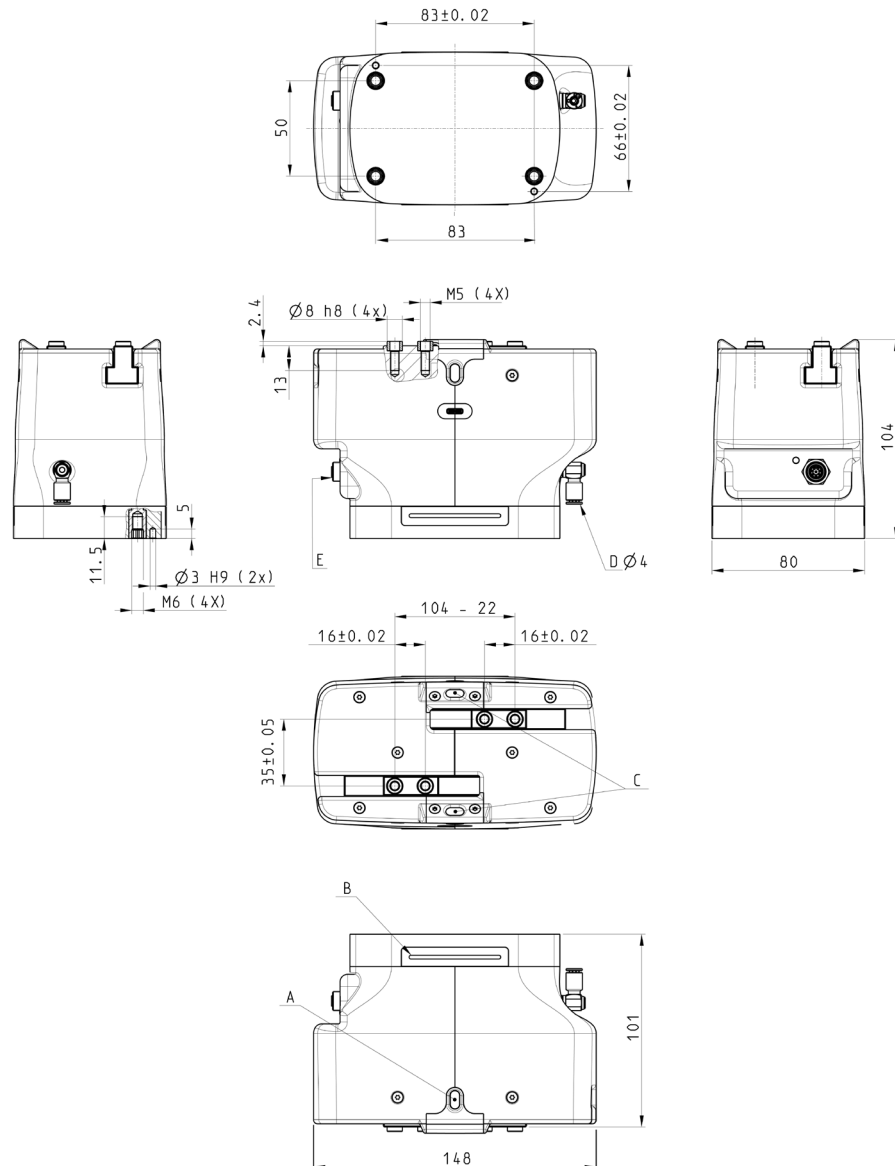
To simplify the installation and commissioning of the gripper, an open-loop force control has been developed, allowing the user to specify the target force to be reached at a given distance from the gripper body.

The system will adjust the pressures to achieve the chosen target force.

## Position Control

This control enables the gripper jaws to be positioned at an intermediate location.

The system adjusts the pressures to move the jaws, and once the target is reached, it creates a static condition with equal pressure in both chambers.

**CSPT gripper, size 20 mm**


**Legend:**  
**A = Top Sensor Facing Outward**  
**B = Status LED**  
**C = Top Sensor to detect the workpiece to be handled**  
**D = Pneumatic supply tube 4**  
**E = M8 electrical connector**

### Gripping force (F) per single jaw

The gripping force refers to a single jaw of the gripper. To calculate the total force developed by the gripper, you need to multiply the found value by 2:

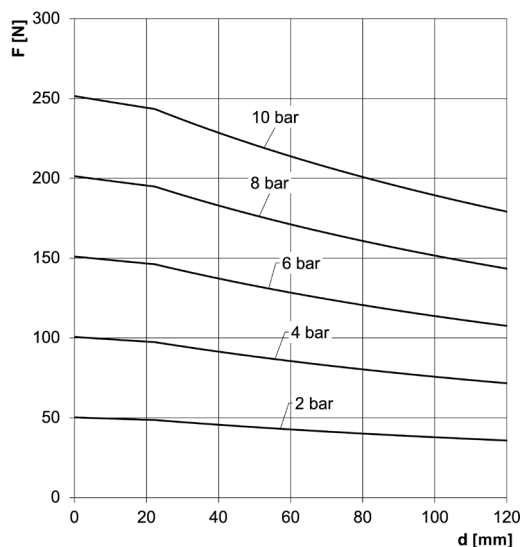
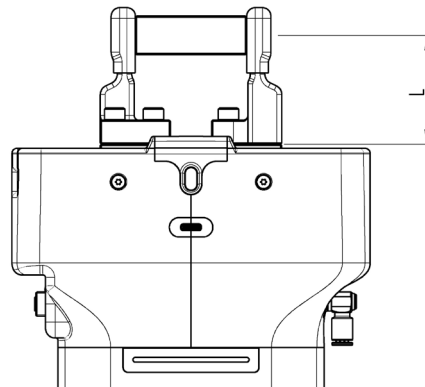
$$\text{Total } F = F \times 2$$

The graphs shown represent the trend of the supplied force  $F$ , per single jaw, according to distance  $L$ , where:

- $F$  is the force developed by the single jaw, both during opening and during closing;
- $L$  is the distance between the gripping point of the workpiece and the finger-jaw surface area (reference for the lever arm), expressed in mm.

Notes:

- The curves refer both to opening and closing force;
- Performance does not vary according to the stroke.



## Gripper's use area

The effective gripping force developed by the gripper is affected by the position of the gripping point, described by:

- $L$  is the distance between the gripping point of the workpiece and the finger-jaw surface area (reference for the lever arm), expressed in mm.
- $e$  is the eccentricity, i.e. the misalignment of the load with respect to the longitudinal axis of the gripper.

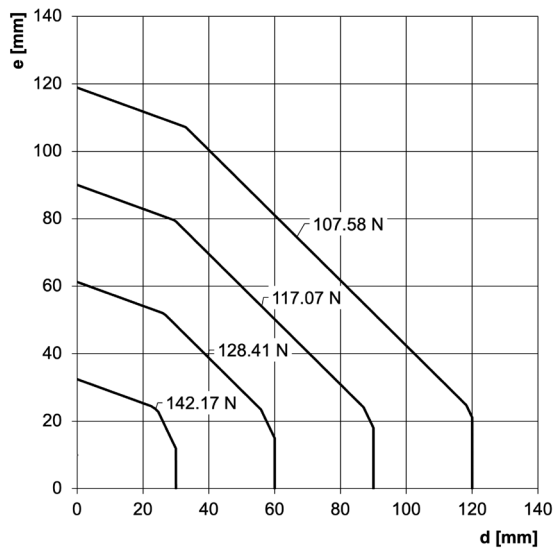
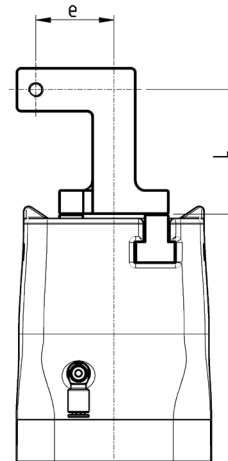
To calculate the total force developed by the gripper, you need to multiply the found value by 2:

$$\text{Total } F = F \times 2$$

The graphs shown represent the trend of the supplied force  $F$ , per single jaw, according to the distance between gripping point  $L$  and eccentricity  $e$ .

Note:

The force values indicated on the curves were obtained with 6bar.

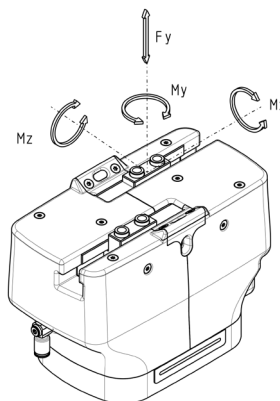


## Maximum permissible loads

The indicated force and moment values refer to a single jaw of the gripper and are calculated under static conditions, i.e. with the gripper and jaw in a stationary position.

When calculating the acting loads, the following factors must be carefully considered:

- Additional loads caused by the weight of the workpiece and the fingers applied to the jaw;
- Gripping force generated during the gripping of the workpiece;
- The effect of the lever arm, i.e. the distance between the point of force application and the reference system indicated on the jaw;



### Permissible yield strength loads (low number of cycles)

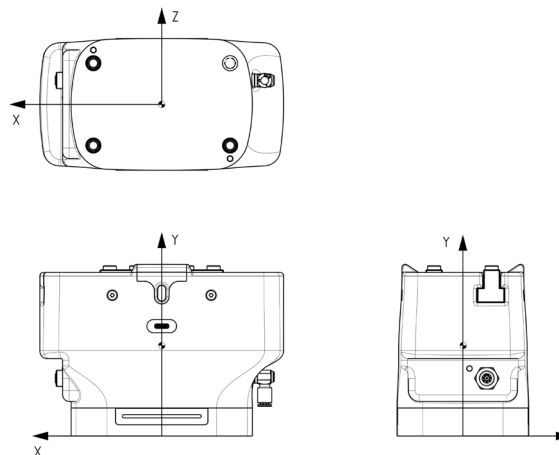
Mod.	Mx [Nm]	My [Nm]	Mz [Nm]	Fy [N]
CSPT-20-80	25	17	29	1950

### Permissible fatigue load limits (10,000,000 cycles)

Mod.	Mx [Nm]	My [Nm]	Mz [Nm]	Fy [N]
CSPT-20-80	21	14	24	1600

## Centre of gravity

The centre of gravity is calculated with the robot flange and standard fingers; the support surface between the robot interface flange and the robot wrist is used as a plane of the reference system.



Mod.	X [mm]	Y [mm]	Z [mm]
CSPT-20-80	0	55	0

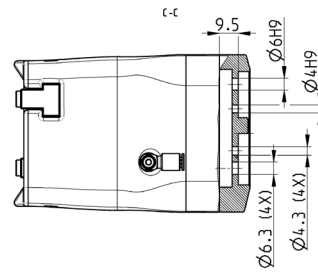
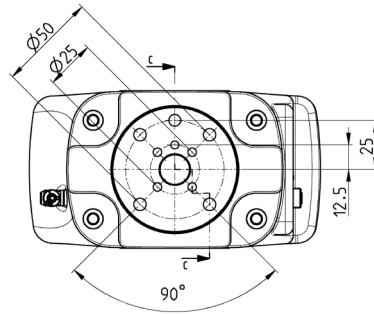
### Mechanical robot-gripper interface

News

In accordance with ISO 9409-1-50-4-M6.



Supplied with:  
 1x flange  
 3x pin  
 8x screws



Mod.	Robot Manufacturer	Robot	Weight (g)*
P-CSPT	UNIVERSAL ROBOT	UR3e   UR5e   UR10e   UR16e	200
	ABB	GoFa (CRB 15000)	200
	FANUC	CRX 5ia   CRX 10ia   CRX 10ia/L   CRX 20ia/L   CRX 25ia	200
	Doosan	M0609   M0617   M1013   M1509   H2017   H2515	200
	OMRON	TM5   TM5S   TM7S   TM12   TM12S   TM14   TM14S   TM16   TM20	200
	DOBOT	CR3 A, CR5 A, CR7 A, CR12 A, CR16 A	200

In the table you will find some compatible robots.  
 \* Refers to the weight of the accessory with screws.

GRIPPERS

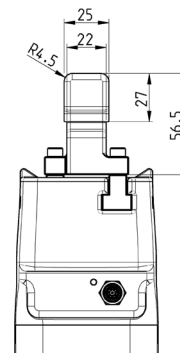
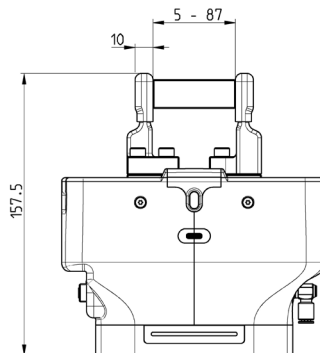
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### Gripper finger

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Supplied with:  
 2x screws  
 2x fingers

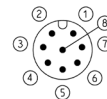
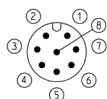
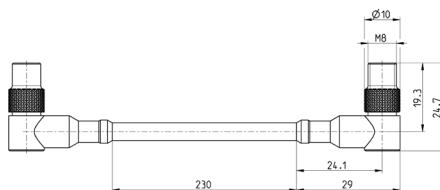


Mod.	Weight (g)*
F-CSPT	100

\* Refers to the weight of a single finger with relative fixing screw.

## Connection cable for DOOSAN

News



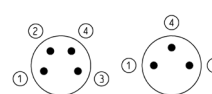
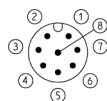
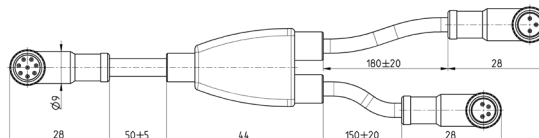
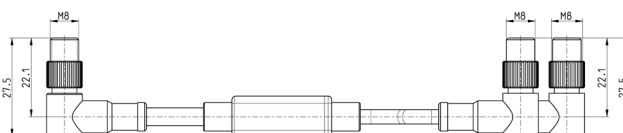
GRIPPERS

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Mod.	Robot Manufacturer	Robot
CS-DN08MC-E020D	DOOSAN	M0609   M0617   M1013   M1509   H2017   H2515

## Connection cable for ABB

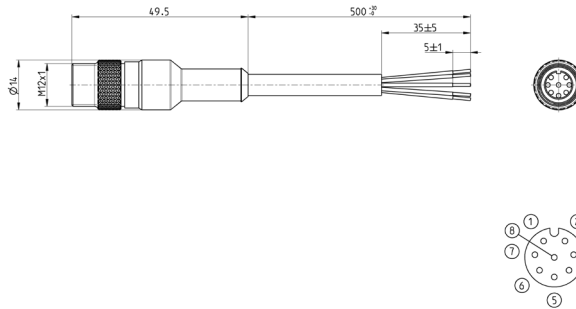
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Mod.	Robot Manufacturer	Robot
CS-DY08MC-E020A	ABB	GoFa

### Control Box Cable for ABB

News



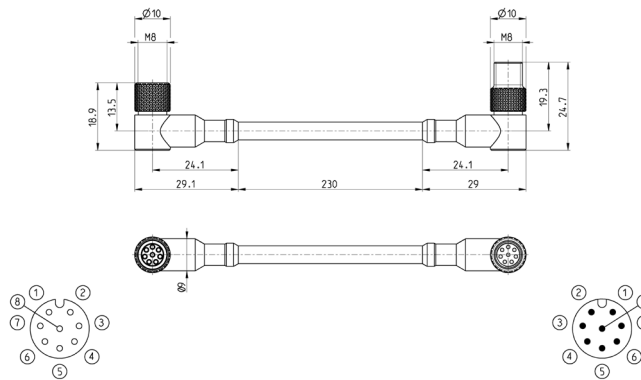
Mod.	Robot Manufacturer	Robot
CS-LM08HC-D050	ABB	GoFa

GRIPPERS

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### Connection cable for UR/FANUC

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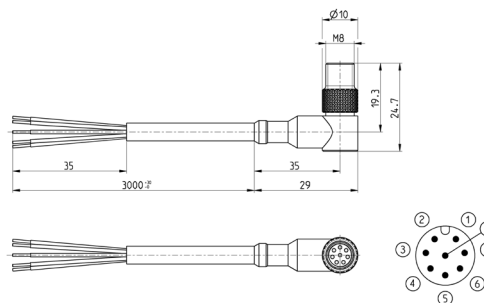


Mod.	Robot Manufacturer	Robot
CS-DL08MC-E020U	UNIVERSAL ROBOT	UR3e   UR5e   UR10e   UR16e
CS-DL08MC-E020U	FANUC	CRX 5ia   CRX 10ia   CRX 10ia/L   CRX 20ia/L   CRX 25ia

### Universal connection cable, 3 mt

News

Suitable for every robot.  
 See the [manual](#) for pinout and the correct wire connection.



Mod.
CS-DM08MC-E3000