

MOUNTING INSTRUCTIONS
AND OPERATING MANUAL

KIT-UR-G



REVISIONS

DATE	REVISION	MAIN CHANGES
2017/10/17	Edition A	First release
2017/11/23	Edition B	Replaced jaws' screws (old VITE-016, new VITE-031)
2018/02/12	Edition C	Inserted additional cable for direct connection of the gripper to robot wrist removing the capbox unit. Revision of capbox circuit.
2018/02/17	Edition D	Gimatic logo rotated by 180°, minor review of the cover to allow unique installation of the capbox (repeatability of mass distribution) and new simplified fixation of capbox cover.
2018/03/26	Edition E	Replacement of the fixing plate with double plate for a simpler assembly
2018/07/23	Edition F	Replacement of 8 pin male straight with angular connector. Revision of capbox circuit.
2018/10/26	Edition G	Dedicated URCap release.

DOCUMENT LAYOUT

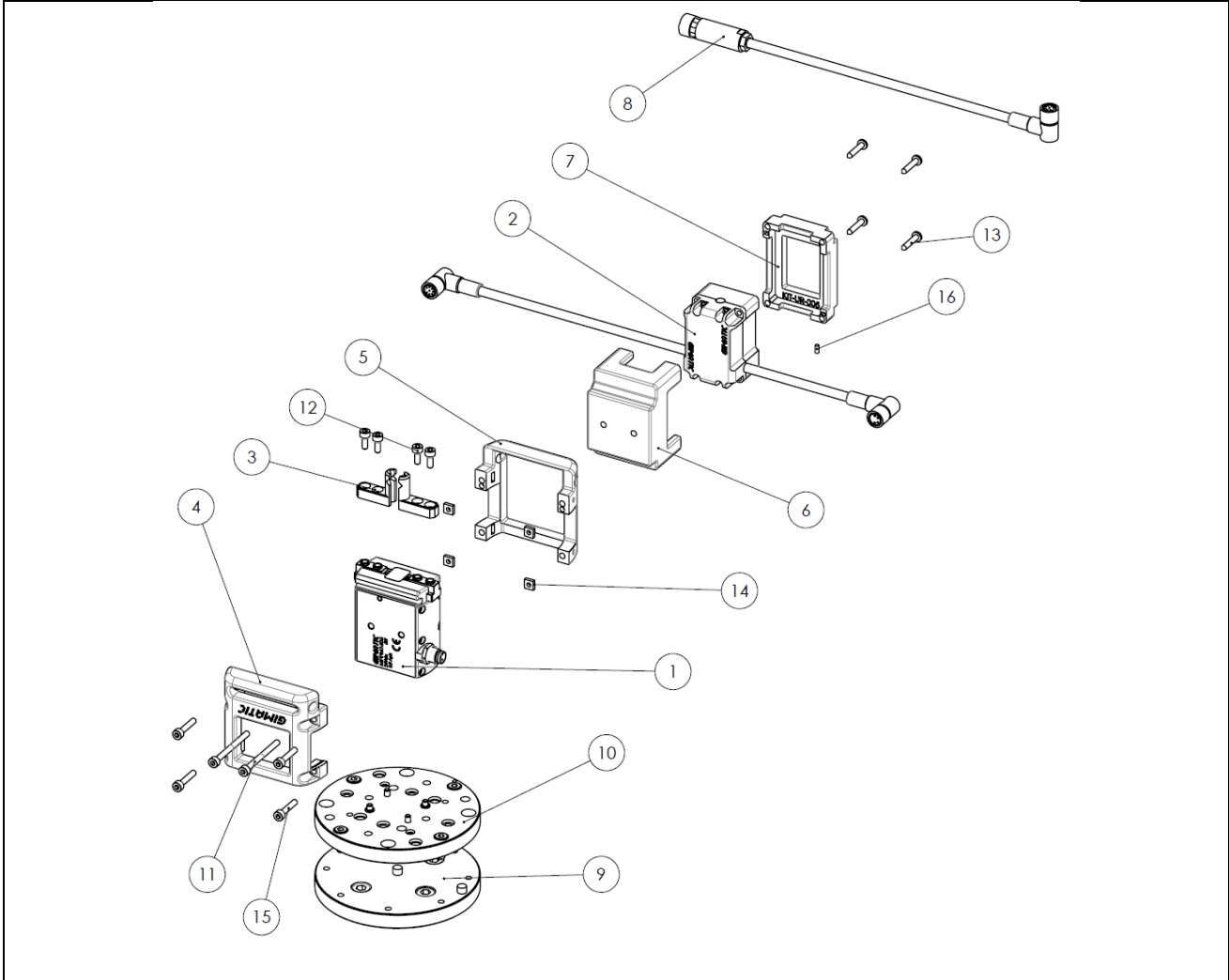
- Description
- Exploded view drawing of the final assembly
- Itemized list of assembly's components
- Gripper's main data
- Capacitor Box
- Electrical connections to robot wrist
- Assembly procedure
- Software: URCap
- Gripping force
- Electrical connections of the gripper
- Cautions
- CE marking reference
- Overall dimensions

- Dimensional drawings

DESCRIPTION

The KIT-UR-G is a plug & play gripping solution for UR3/UR5/UR10/UR16e collaborative robots by Universal Robot. This kit can be used in combination with any collaborative robot that provides a limited power supply capability at the wrist.

EXPLODED VIEW DRAWING OF THE FINAL ASSEMBLY



ITEMIZED LIST OF ASSEMBLY'S COMPONENTS

Position	Description	Q.ty	Code	Edition
1	Electric gripper (NPN, peak output)	1	MPPM1606NP	A
2	Capacitor Box (4 pins)	1	CAPBOX1625-04	B
3	Gripper's jaws	2	KIT-UR-001	A
4	Frontal cover of the gripper	1	KIT-UR-002	B
5	Posterior cover of the gripper	1	KIT-UR-003	B
6	Posterior cover of the capbox	1	KIT-UR-004	C
7	Frontal cover of the capbox	1	KIT-UR-005	B
8	Cable 200 mm 8 pin - 4pin	1	KIT-UR-011	A
9	Fixing kit electric gripper for UR robot (robot side)	1	MFI-A374-B	B
10	Fixing kit electric gripper for UR robot (gripper side)	1	MFI-A374-A	A
11	Hex socket head cap screws M3x35 DIN 912	2	VITE-101	-
12	Hex socket head cap screws M3x8 DIN 912	4	VITE-031	-
13	Self tapping screw 2.9X16 DIN 7981 C INOX A2	4	VITE-393	-
14	Square nut M3 DIN 562 ZB	6	VITE-484	-

15	Hex socket head cap screws M3x16 DIN 912	4	VITE-050	-
16	Dowel pin 2x5.1 DIN 5402	1	SPINA-104	-

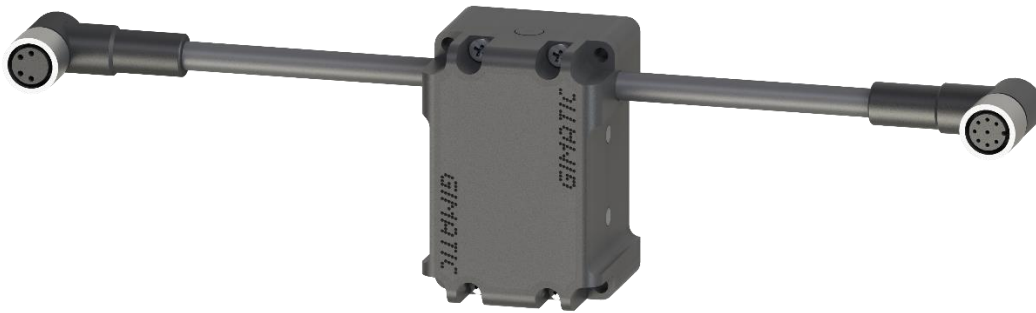
GRIPPER'S MAIN DATA



	MPPM1606NP
Total gripping force	67 [N]
Stroke	2x3 [mm] (±0.2 [mm])
Maximum frequency (at an ambient temperature of 30 [°C])	1 [Hz]
Jaw closing time	0.08 [s]
Gripper working time	0.21 [s]
Maximum duty cycle (at an ambient temperature of 30 [°C])	43%
Power supply	24 [Vdc] ±10%
Peak current	0.9 [A]
Nominal current	0.3 [A]
Electrical connections	M8 4 poles
Open/closed input signal	NPN open collector
Operating temperature	5÷60 [°C]
Environmental degree	IP54
Mass	145 [g]

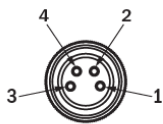
CAPACITOR BOX

The Capacitor Box circuit has an input side and an output side. The input side allows for connection of power supply, command signal and auxiliary I/O by a M8-8pin female connector. Default configuration is with both input and output command signals in NPN version.

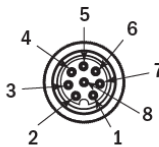


CAPBOX1625-04	
Body material	Polycarbonate, glass fiber reinforced
Overall dimensions	42 x 48.5 x 28 [mm]
Mass	70 [g]
Allowed temperature range	60 [°C]
Electrical connections	Input: M8 - 8 poles female Output: M8 - 4 poles female
Environmental degree	IP66
Power supply	24 [Vdc] ±10% 0.5 [A]rms
Input command signal (default configuration)	NPN command type
Output command signal (default configuration)	NPN command type

The user can customize configuration by simply switching internal selectors (please refer to the following pictures and connections schema).

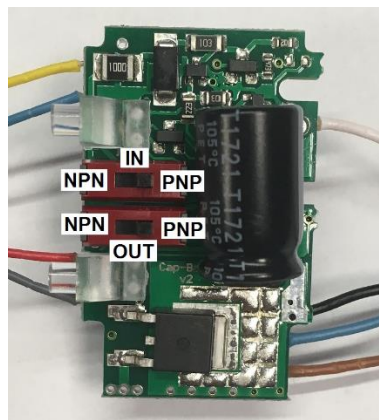


M8 4 pin femmina MS 4 pins female		
1	Marrone	Brown
2	Bianco	White
3	Blu	Blue
4	Nero	Black



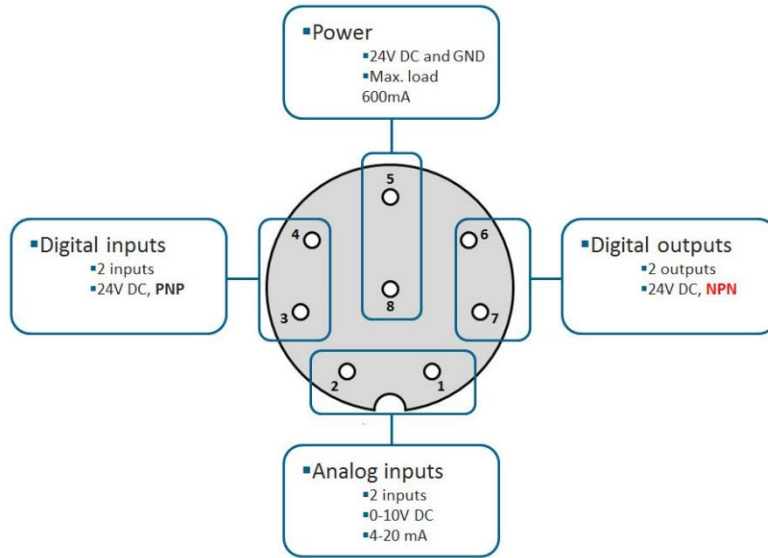
M8 8 pin femmina MS 8 pins female		
1	Bianco	White
2	Marrone	Brown
3	Verde	Green
4	Giallo	Yellow
5	Grigio	Grey
6	Rosa	Pink
7	Blu	Blue
8	Rosso	Red

Cavo d'ingresso standard Standard input cable		
I/1	+24Vcc	Grigio Grey
I/2	GND	Rosso Red
I/3	Ingresso digitale Digital input	Blu Blue
I/4	I/O ausiliari Auxiliary I/O	Giallo Yellow



Cavo d'uscita standard Standard output cable		
O/1	+24Vcc	Marrone Brown
O/2	GND	Blu Blue
O/3	Uscita digitale Digital output	Nero Black
O/4	I/O ausiliari Auxiliary I/O	Bianco White

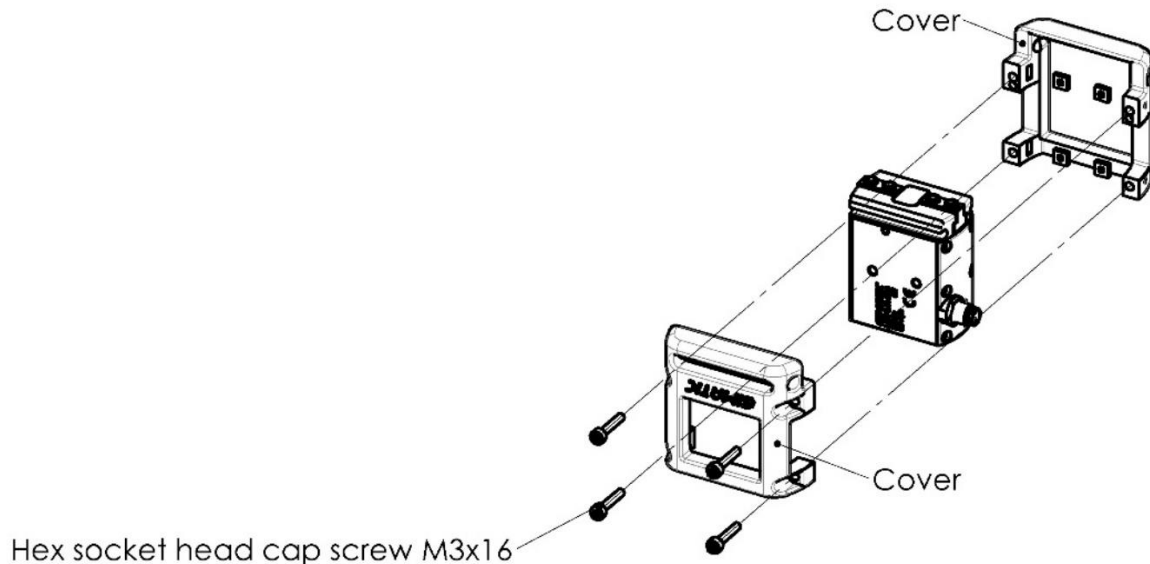
The following picture shows the electric connection schema of the connector located at the wrist of UR collaborative robots. The CAPBOX unit has been designed to be directly connected to the robot wrist.



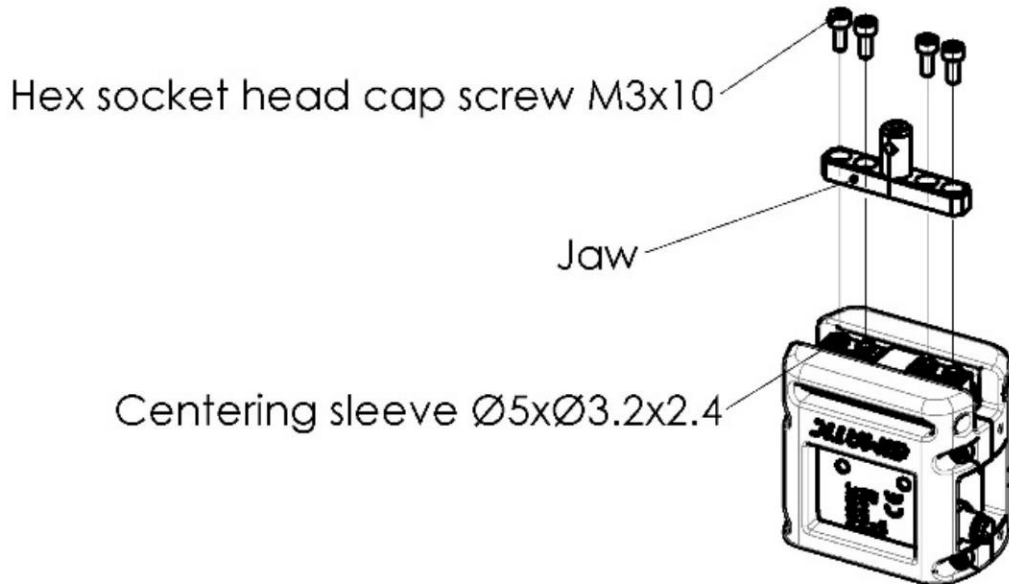
CAPBOX CONNECTION	UR CONNECTION
I/1 - +24Vcc - GREY	PIN 5 - +24Vcc
I/2 - GND - RED	PIN 8 - GND
I/3N - NPN digital input - BLUE	PIN 7 - Gripper command
I/4 - Gripper's peak output - YELLOW	PIN 4 - Peak input

ASSEMBLY PROCEDURE

Install the covers of the gripper KIT-UR-002 and KIT-UR-003 by using M3x16 hex socket head cap screws.

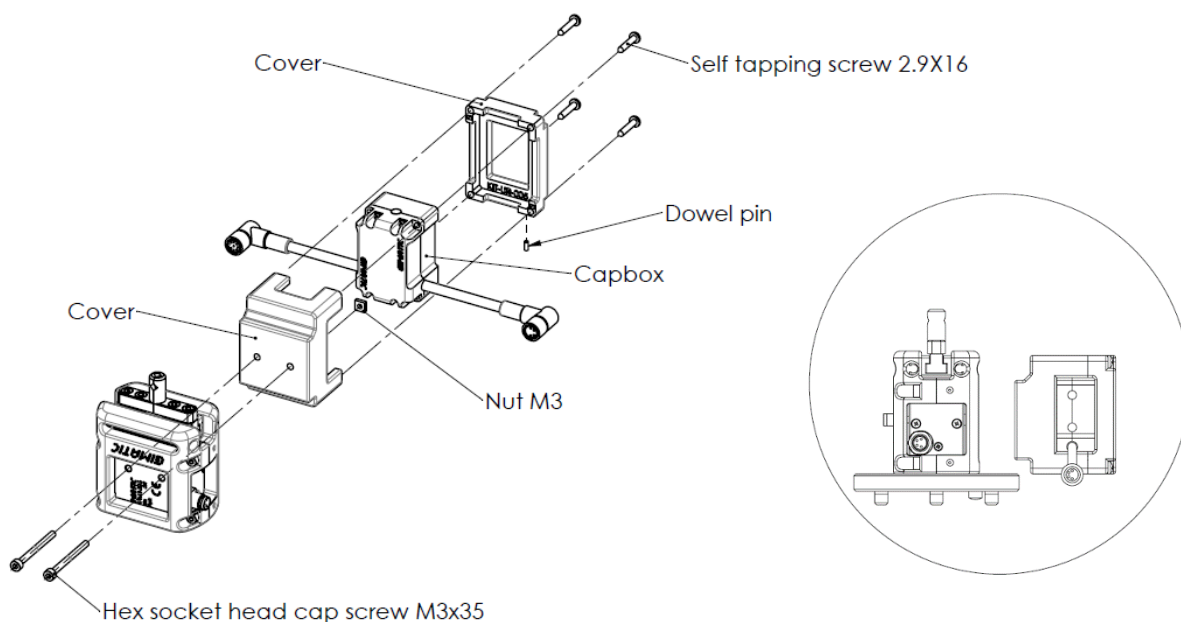


Fix the jaws KIT-UR-001 to the gripper by using centering sleeves and M3x10 hex socket head cap screws.



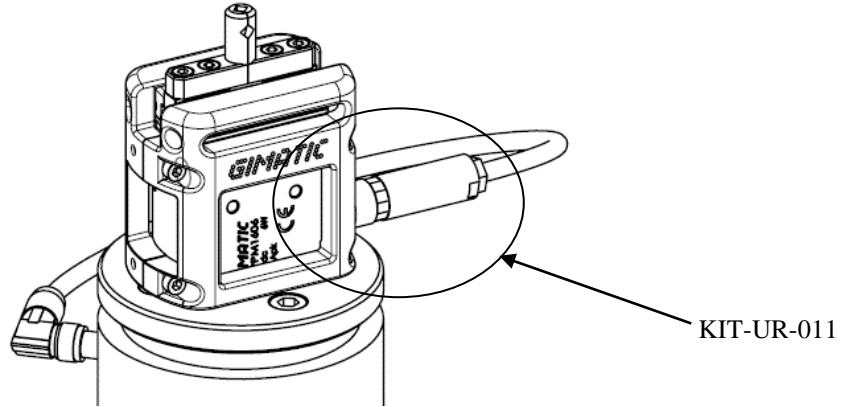
A) In case of use of the CAPBOX1625-04

Identify the correct orientation of the cover KIT-UR-004 (the chamfer must be in front of the gripper's sensors grooves). Install the cover KIT-UR-004 to the gripper assembly by using M3x35 hex socket head cap screws and complete the assembly by installing the CAPBOX1625-04 unit and KIT-UR-005 by using the self tapping screws. At last insert the dowel pin into the KIT-UR-004 cover.

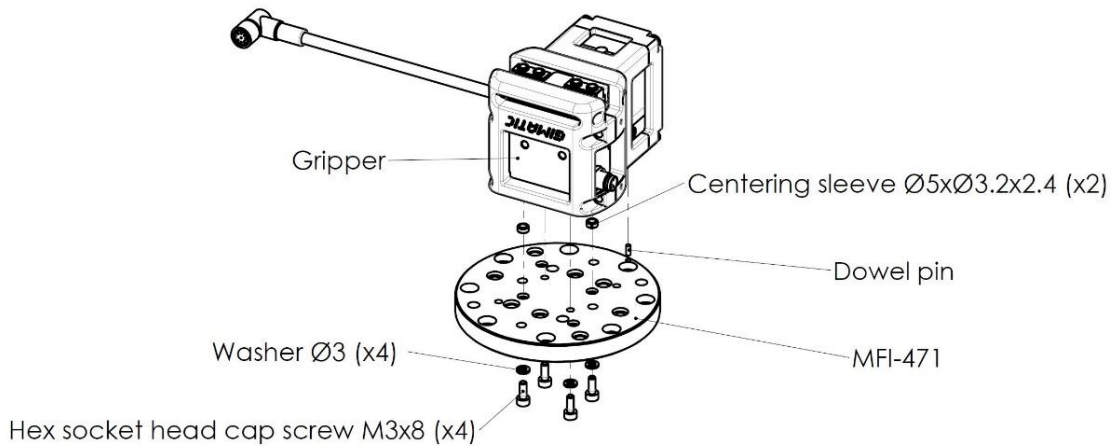


B) In case of a direct connection of the gripper to the robot wrist

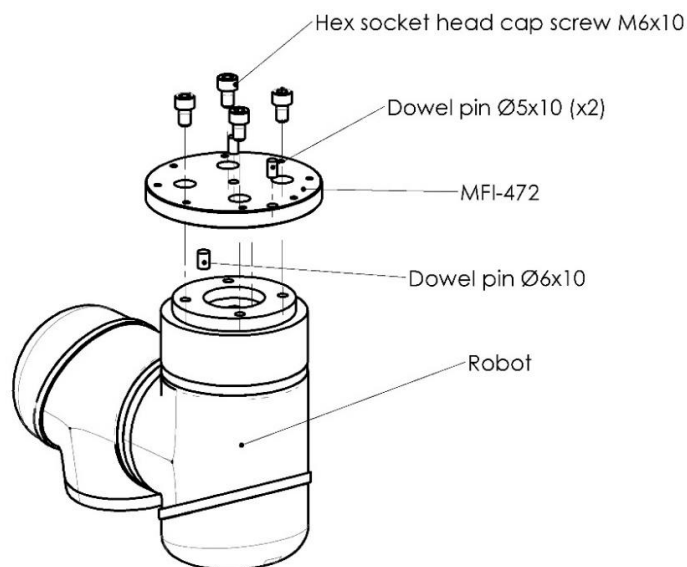
Use the dedicated KIT-UR-011 cable for a direct connection of the gripper to the robot wrist. Please be aware that gripper performances may be reduced according to robot's power supply limitations at the wrist.



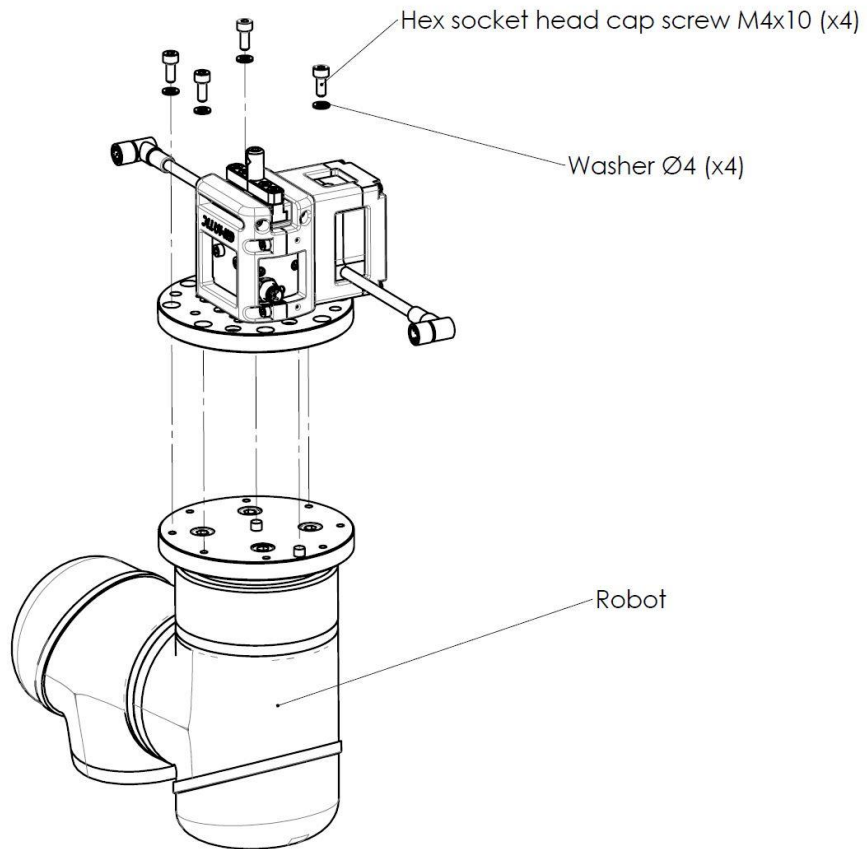
Fix the gripper to the mechanical interface MFI-471 by using centering sleeves, M3x8 hex socket head cap screws, Washers and a Dowel pin.



Insert M6x8 hex socket head cap screws and dowel pin into the mechanical flange MFI-472 and fix all to the robot flange.

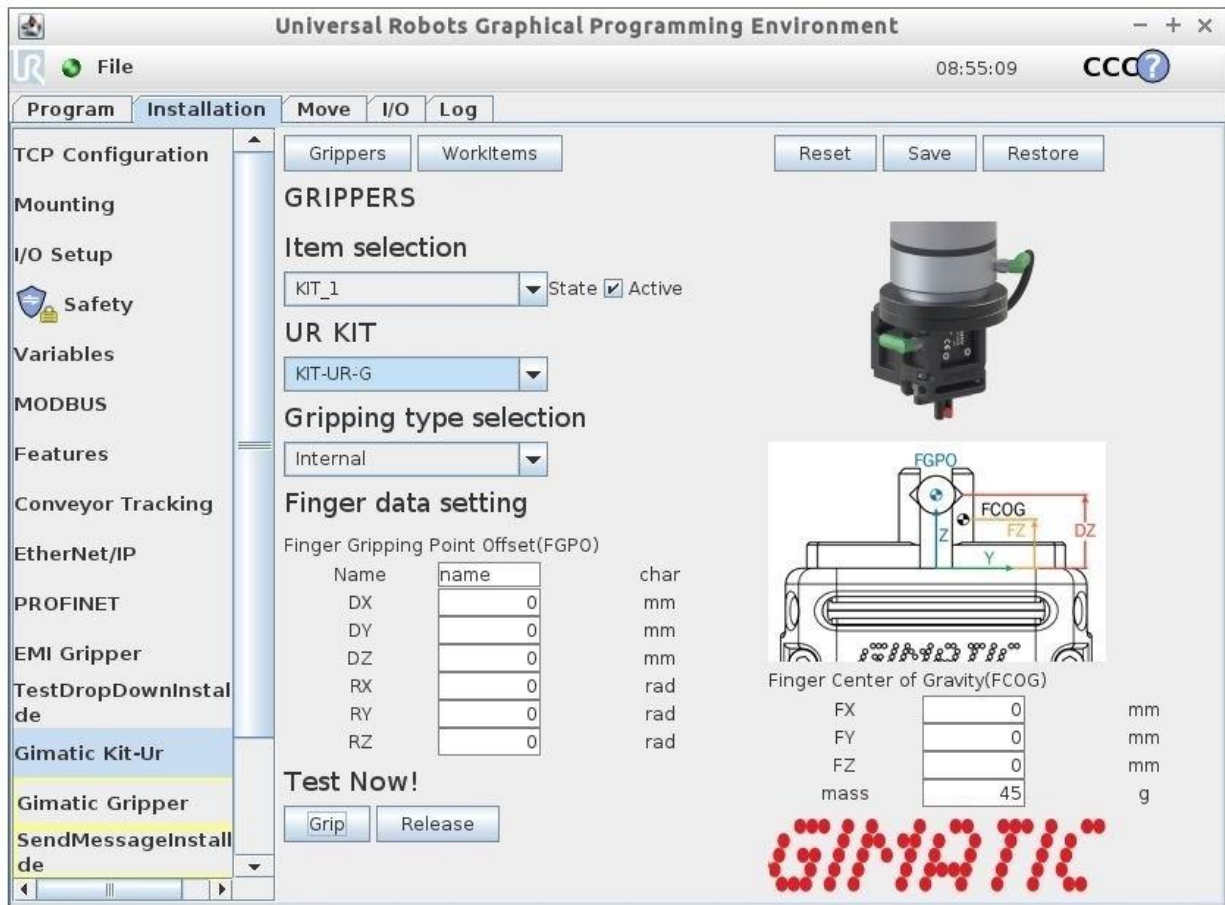


Fix the gripper subsystem to the robot wrist using hex socket head cap screws M4x10 and washer as shown.



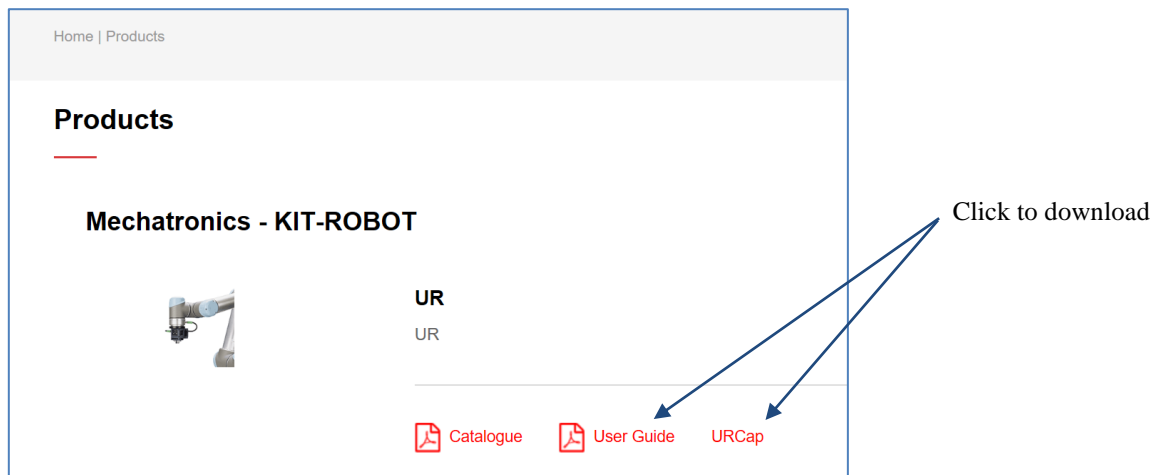
SOFTWARE: URCAP

URCap is a Polyscope PlugIn designed to control the KIT-URs as if they were parts of the UR robot: it allows an easy payload and Finger Gripping Point Offset (FGPO) assignment and automatic tool central point (TPC) update.



Download and Installation:

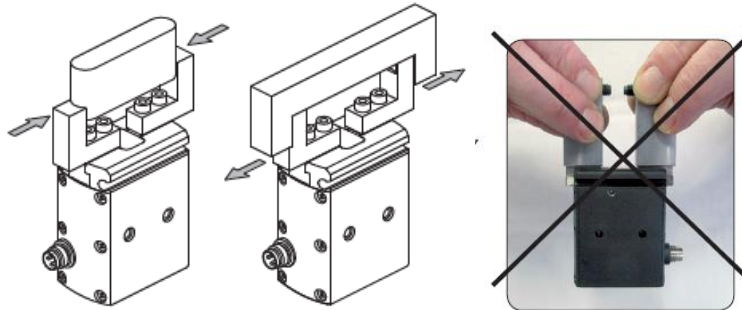
- 1) Download "URCap" and "User Guide" on Gimatic official website:
<http://www.gimatic.com/products/Details?language=en&catalogo=mechatronics¯ofamiglia=kit-robot&famiglia=ur>



- 2) Copy the "gimatic_gripper-1.0-SNAPSHOT.urcap" file on USB memory stick and plug it in the robot teach pedant.
- 3) Follow "IST-KIT-URCAP" instruction to install and configure the URCap.

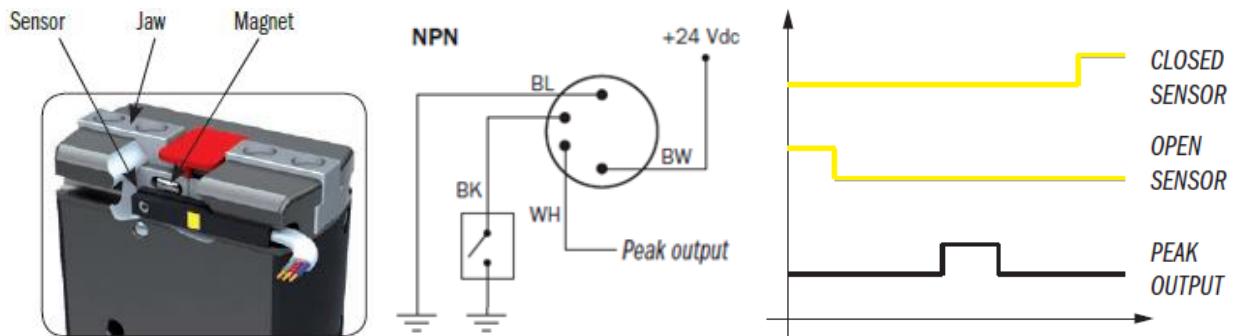
GRIPPING FORCE

Depending on the design of custom jaws, the electric gripper can be used for either external or internal gripping applications. The part will be gripped in any position within the jaw stroke. After the part is gripped, the spring force will hold the part (Motor OFF and ZERO consumption). Even in case of power black-out. Furthermore, the gripper mechanism is irreversible, even without power supply. Do not attempt to open or close the gripper manually.



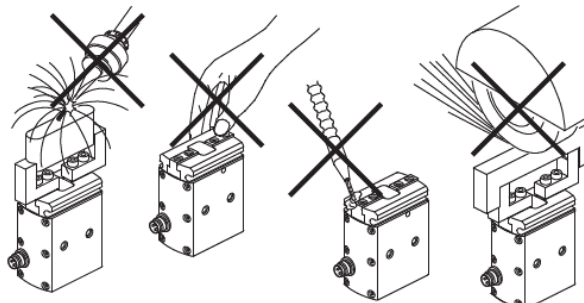
ELECTRICAL CONNECTIONS OF THE GRIPPER

The MPPM1606NP comes with a M8 4 poles connector. Beside the power supply and the input command signal pins, the last pin is associated to a digital output channel which is automatically enabled by the device when the jaws exert the gripping force. This will work like an integrated proximity sensor which can operate independently of the initial position of the jaws, and therefore with no adjustment.



CAUTIONS

Never let the gripper come into contact with corrosive substances, soldering splashes or abrasive powders as they may damage the gripper. Never let personnel or objects stand within the operating range of the gripper. Never operate the gripper if the machine on which it is fitted does not comply with safety laws and standards of your country.



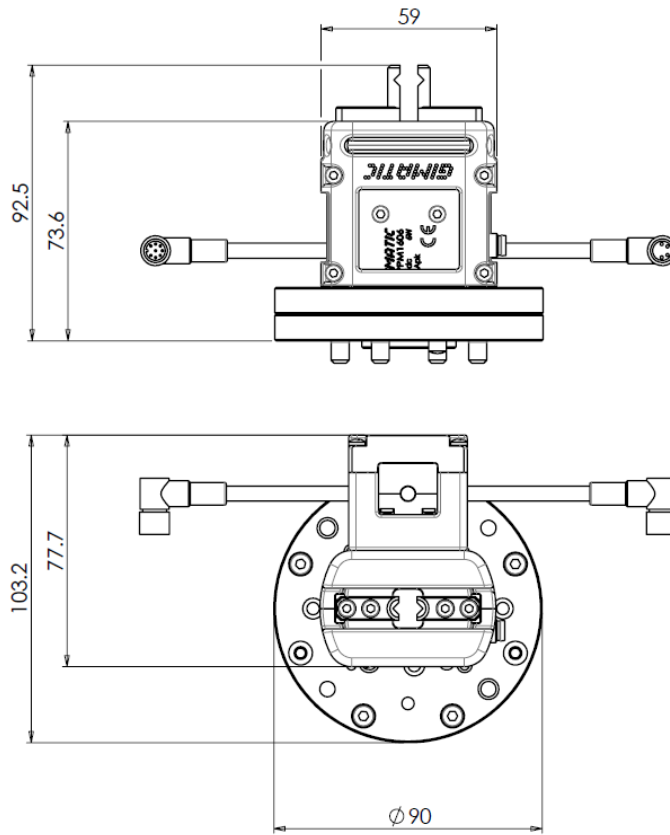
CE MARKING REFERENCE

The system is in conformance with:

Directive 2004/108/CE, EN 62233 (2008-04), EN 61000-6-2+EC+IS1 (2005-08;2005-09;2005-11), EN 61000-6-3+A1 (2007-01;2011-03), EN 61000-6-4 (2007-01), EN 55016-2-1+A1 (2004-10;2005-08), EN 55016-2-3 (2006-12), EN 61000-4-2 (2009-03), EN 61000-4-3+A1+IS1+A2 (2006-05;2008-02;2009-02;2010-07), EN 61000-4-4+A1 (2004-12;2010-03), EN 61000-4-5 (2006-11), EN 61000-4-6+A1+IS1 (1996-07;2001-12;2004-07), EN 61000-4-6 (2009-03), CEI EN 60529 (1997-06).

DIMENSIONAL DRAWINGS

OVERALL DIMENSIONS



GRIPPER'S JAWS (KIT-UR-001)

