TABLE OF CONTENTS

TABLE OF CONTENTS................................................................................................................................................ 2

PRESENTATION................................................................................................................................................ 3

AMG GRIPPERS FOR ROBOTS .................................................................................................................................... 4

PREPARATION OF THE PARTS ................................................................................................................................... 5

PREPARING A MAIN BOOM ...................................................................................................................................... 6

PREPARING A SECONDARY BOOM ........................................................................................................................... 10

ASSEMBLY OF A GRIPPER ....................................................................................................................................... 13

ATTACHING THE SECONDARY BOOM ......................................................................................................................... 14

USING THE BALL JOINT HOLDER .............................................................................................................................. 17

USING THE ANGLED WEDGES ................................................................................................................................. 21

USING THE PNEUMATIC BRACKET .......................................................................................................................... 23

USING THE INTERFACE ............................................................................................................................................ 24

PNEUMATIC CABLING OF A GRIPPER ..................................................................................................................... 25
PRESENTATION
The A.M.G. gripper is a modular manipulation device composed of standard components assembled together by tightening screws.

Our robot grippers consist of a central profile in aluminium, generally called the main boom, to which other profiles, called antennae or secondary boom, are fixed.

Along the secondary boom, various support structures are used to hold the suction cups.

This manual is designed to allow you to build or repair your own grippers by yourself without any difficulty or damage.

Presented in the form of information sheets, they contain all the preparation and assembly instructions you will need.
PREPARATION OF THE PARTS
I / Preparation of a main boom compatible with a G1 type interface

- Check that the profile has the needed length

- Insert the template GPB 01 0G1 in one of the grooves until it is stopped up against the profile

- Block the template in position by turning the handle

- Drill a hole Ø 5
- Slide the positioning insert ref. BAP 01 0G1 into the groove and bolt it down in position using two grub screws Hc M5 x 12 and a split pin diameter 5 x 40.

II / Preparation of a main boom compatible with a G2 type interface

The process is identical to the first one.

Only the drilling template is different: use template P/N GPB 01 0G2.
I / Preparation of a main boom compatible with a G3 type interface

- Check that the profile has the needed length
- Insert the template GPB 01 0G1 in one of the grooves until it is stopped up against the profile
- Block the template in position by turning the handle
- Drill a hole ø 5
- Slide the positioning insert ref. BAP 01 0G3 into the groove and bolt it down in position using two screws Hc M5 x 10 and a split pin diameter 5 x 30.
PREPARING A SECONDARY BOOM

SECONDARY BOOM 30 X 30 mm OR 40 X40 mm WITH BRACKETS SERIES 50

Principle

The brackets series 50 allow fixing a secondary boom on a main boom of 50 x 50 mm (PRS 11 501 and PRS 11 502) or of diameter 75 mm (PRS 11 075).

In order to choose the dimension of the secondary boom, you can follow the following principle:

- Profile 30 x 30 (PRS 11 301) for length up to 400 or 500 mm
- Profile 30 x 30 (PRS 11 302) for length between 400/500 mm and 800 mm
- Profile 40 x 40 (PRS 11 401 or PRS 11 402) for length more than 800 mm.

Preparation of the profile

- Check that the profile has the needed length
- Insert the drilling template GPA 01 610 in one of the 8 mm grooves until it is stopped up against the front surface of the section
- Block the template in position by turning the handle
- Drill a hole ø 6.1
Assembly

- Slide the T-plate PLA 311M6 of the bracket with notches in the groove of the profile

- Link the two brackets together using a screw CHc M6 x 55. This must pass through the hole diameter 6.1 mm of the secondary boom.

Note: the tightening torque for each screw is 15 N.m
**Principle**

The brackets series 40 allow fixing a secondary boom on a main boom of 40 x 40 mm (PRS 11 401 and PRS 11 402).

**Preparation and assembly of the section**

Identical to series 50.
ASSEMBLY OF A GRIPPER
ATTACHING THE SECONDARY BOOM

ON A MAIN BOOM 50 X 50 mm OR DIAMETER 75 mm

Principle

The secondary boom Series 50 are the only ones which can be used on a main boom of 50 x 50 mm or diameter 75 mm.

Once placed along the main boom, the secondary boom can be tilted from the horizontal axis according to predefined angles.

Maintaining the secondary boom at the desired inclination is achieved by a system using a notching technique. This system has been patented by A.M.G.

Assembly

- Place the secondary boom at the end of the main boom then slide it along while introducing the two T-plates PLA 41 1M6 in the 8 mm groove of the profile (1)

- When the secondary boom is in the desired position, tighten the two clamping screws (2). The required tightening torque for each screw is 15 N.m.

Caution: If the gripper has several secondary booms, first attach those closest to the starting point (on the same side as the positioning insert).

Slide the 2 T-plates PLA 41 1M6 into the groove of the main boom

Tighten the 2 clamping screws
ATTACHING THE SECONDARY BOOM

Adjusting the inclination

It is possible to tilt the secondary boom from the horizontal axis according to pre-defined angles: 7°, 14°, 21° and 28° (3). To do this, simply loosen the blocker, tilt the secondary boom at the desired notch and retighten the locking screw.

Two additional inclinations (34° and 40°) are possible. For this, place the clamping screw in position 2 and the blocker in one of the two lower grooves (4).

The tightening torque for each screw is 15 N.m.
ATTACHING THE SECONDARY BOOM

ON BOOM 40 X 40 mm OR 30 X 30 mm

**Principle**

Secondary boom Series 40 are the only ones which can be used on a main boom 40 x 40 mm.

The principle is identical to the Series 50.

**Assembly**

Identical to the main boom 50 x 50.

**Adjustment of inclination**

It is possible to tilt the secondary boom from the horizontal axis according to pre-defined angles: 7° and 14° (3).

To do this, simply loosen the blocker, tilt the secondary boom at the desired notch and retighten the locking screw.

Two additional inclinations (20.5° and 26.5°) are possible. For this, place the clamping screw in position 2 and the blocker in one of the two lower grooves (4).

The tightening torque for each screw is 15 N.m.
There are three types of ball joint holders:

- Ball joint holders for tube
- Spring loaded ball joint holders
- Anti rotation spring loaded ball joint holders.

Assembly of a ball joint holder for tube

- Slide the split ball joint ROT 01 030 into the ball joint holder SPR 01 030 then turn through a quarter of a turn
- Place screw CHc M6 X 55 in its housing and tighten slightly in the plate PLA 41 1M6
- Insert the selected tube in the ball joint then tighten the screw to maintain in position.
Assembly of a spring loaded ball joint holder

- Slide the split ball joint ROT 01 030 into the ball joint holder SPR 01 030 then turn through a quarter of a turn

- Turn over the ball joint holder then insert the ring BAC 01 027 with ring BAG 01 001 in the ball joint. Maintain in position using a circlip external diameter 20

- Insert the spring along the tube and slide the whole in the ring BAC 01 27. Attach the tube by tightening the connector RAC 01 M15

- Place the screw CHc M6x55 in its hole and tighten in the T-plate PLA 41 1M6.
Assembly of an anti rotation spring ball joint holder

- Slide the split ball joint ROT 01 025 in the ball joint holder SPR 01 030 as indicated in view 3. Place the half moon DML 01017 inside the ball joint engaged in the split pin, then insert the pin with the spring by tightening the connector RAC 01M15 in the upper section.
ATTACHING THE BALL JOINT HOLDER TO A PROFILE

For all the types of ball joint holders, the method of attaching it on the profile is the same:

- Slightly loosen the T-plate PLA 41 1M6
- Slide the T-plate PLA 41M6 of the ball joint holder into one of the grooves in the profile then tighten in the desired position.

The recommended tightening torque is 15 N.m
There are two types of wedges:

- The horizontal angled wedge ref. PA CPH 01 020 allows increasing (or decreasing) by 20° the angular adjustment of a ball joint holder from the horizontal axis. (Picture 1)

- The vertical angled wedge ref. PA CPV 01 035 allows increasing (or decreasing) by 35° the angular adjustment of a ball joint holder from the vertical axis. (Picture 2)

**Use of the horizontal angled wedge**

*Note: this wedge can be used with any type of ball joint holder. Several assembly solutions are possible.*

- Insert the angled wedge between a ball joint holder and a T-plate PLA 41 1M6. Link the entire assembly using a screw CHC M6 X 65.

- Slide the assembly by inserting the T-plate PLA 41 1M6 in one of the grooves.

- Once the desired position has been achieved, tighten the screw taking care to ensure the split pins of the wedge are correctly positioned in the rear groove of the ball joint holder.

The recommended screw tightening torque is 15N.m.
**USING THE ANGLED WEDGES**

**Use of the vertical angled wedge**

*Note: this wedge can only be used with the ball joint holder for tube*

- Slide the wedge by inserting the T-plate PLA 41 1M6 in one of the grooves then tighten the screw

- Then screw the ball joint holder on the wedge ensuring the heel of the wedge is correctly positioned in the groove of the ball joint holder.

The recommended tightening torque for the screw is 15N.m.

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Example with PA CPV 01 035

Example with PA CPH 01 020
USING THE PNEUMATIC BRACKET

These brackets allow the quick pneumatic connection of a gripper.

Caution: the distance between the bracket and the end of the main boom depends on the type of the needed gripper (G1, G2 or G3).

Attaching the bracket PA ESR 01 216 on the main boom

- The bracket is equipped with one or two RFS 10006 connectors and the T-pale PLA 41 1M6
- Slide the bracket in the groove opposite to the one housing the positioning insert.
- Then tighten the screw
Caution: it is very important to ensure that the gripper is well positioned in the interface.

1. Put the gripper in the interface

2. Make sure that the pneumatic connection is done

3. Finally, activate manually the lever

Good pneumatic connection and clamping of the gripper
PNEUMATIC CABLING OF A GRIPPER

Pneumatic cabling of a gripper consists in linking the suction cups (attached at the extremities of the secondary boom) to the pneumatic connection bracket (attached at the extremity of the main boom).

Once equipped with the pneumatic equipment, the gripper can be inserted in the interface. The pneumatic connection between gripper and interface is made automatically, so it is possible to either suck or blow air.

Cabling is made using quick connectors. This allows the easy and rapid assembly of the gripper. Exceptionally and on request, cabling can be made using screw-equipped connectors.

Standard pneumatic cabling incorporates the following steps:

- Screwing of connectors on the tube at the ball joint holders (angled or straight connectors depending on the inclination and the connection with the hose)
- Linking of these connectors together using Y connectors and hoses of diameter 8mm. It is better to use the Y connectors but T or crossed connectors can also be used
- Linking the end of the hose to the pneumatic connection bracket at the extremity of the main boom.

A few recommendations

- Use only calibrated hoses
- Never bend a hose. The minimum curve radius must be 55 mm
- If a hose is marked by folding, replace it

Caution: Attaching the hoses to the connectors (independently of their type: straight, angled, ...) must be as follows: the end of the hose must be cut straight and cleanly.
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