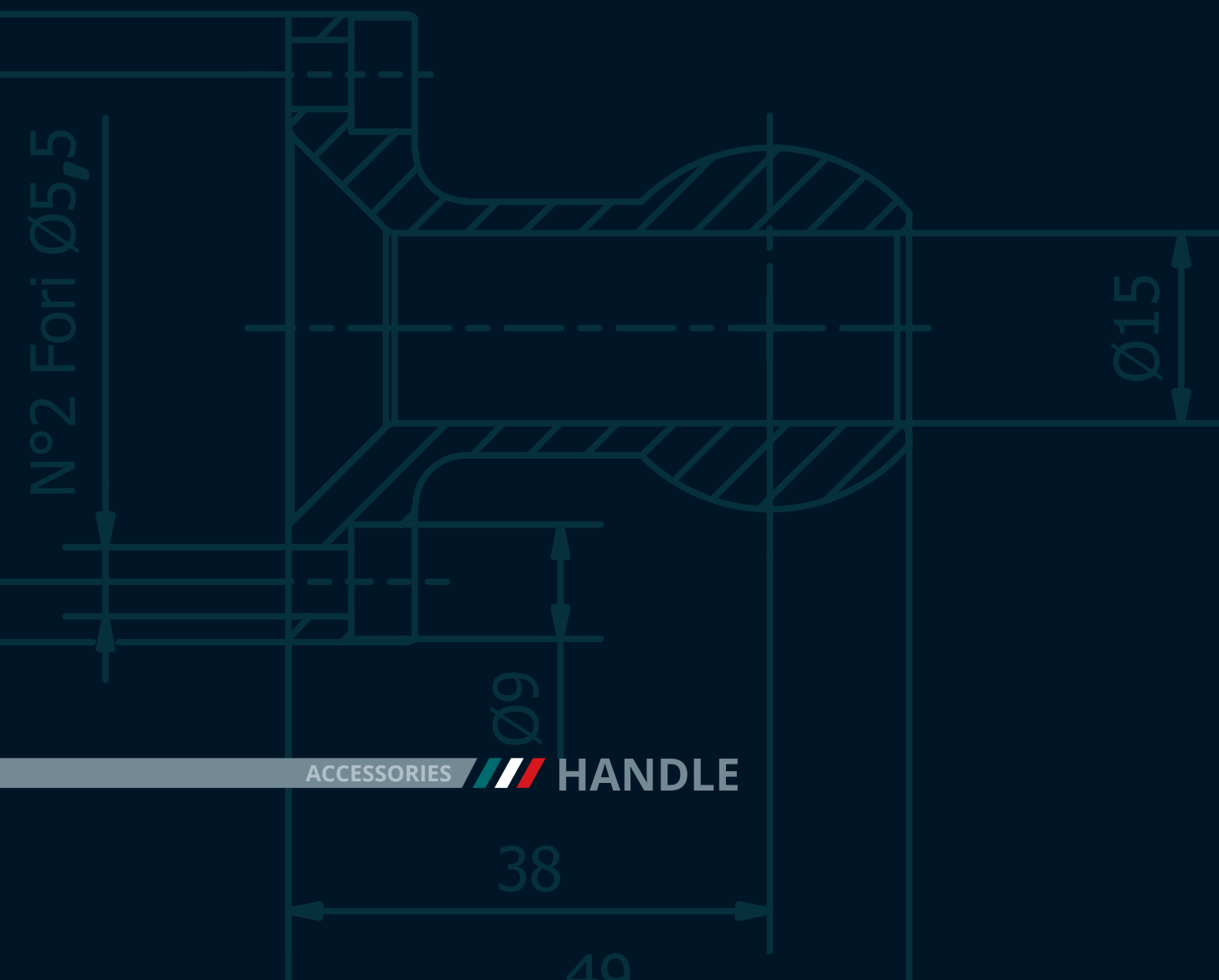


**TSA** **TECNOLOGIE  
SPECIALI  
APPLICATE**





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# TSA

## SPECIAL APPLIED TECHNOLOGIES

**TSA** founded in 1984, for over 30 years has been designing, manufacturing and distributing pneumatic motors, articulated arms for torque reaction, assembling systems and special equipment.

Its technical design office is in charge of studying all of the required characteristics to guarantee maximum reliability and high productivity, according to modern ergonomic principles. Product quality and safety are now a consolidated standard for TSA.

Just-in-time deliveries, a wide, flexible range of products, including diversified motors and arms, an efficient spare parts warehouse and effective before- and after sales: these are the services offered by TSA to its customers. Thanks to its constant commitment and to the professionalism of its technicians,

**TSA** has gained the trust of major companies on the market. Its aim is to meet customer requirements in all respects: QUALITY, PERFORMANCE AND COST EFFECTIVENESS.

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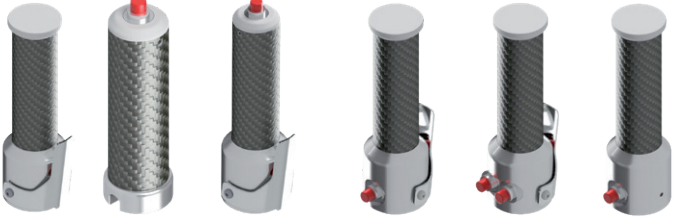
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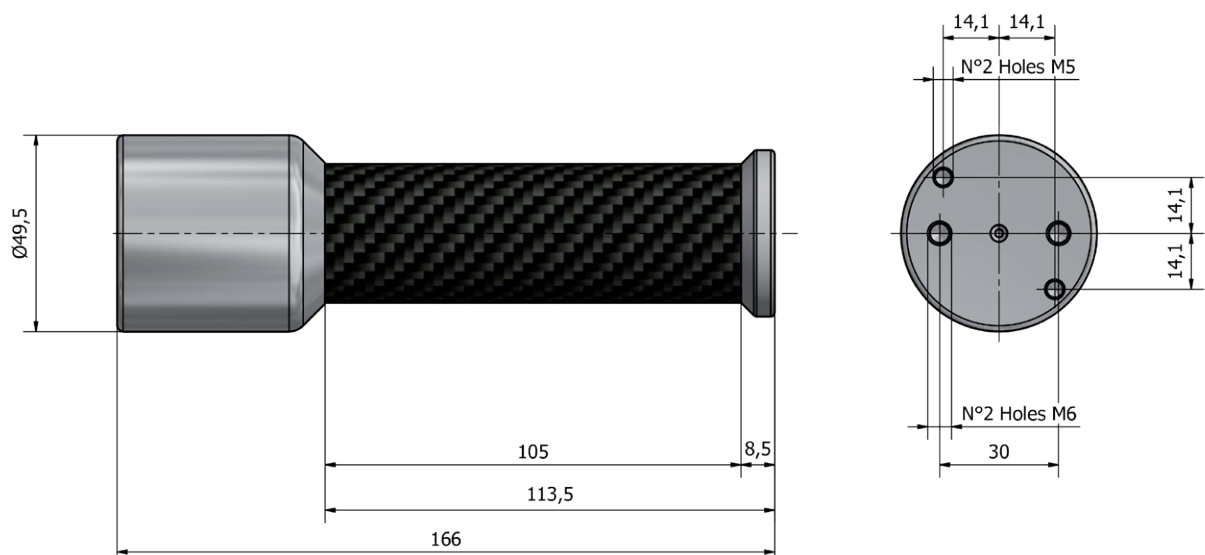
## HANDLE

The Handle differ in terms of the position of the buttons and the relevant function. Operating logics:

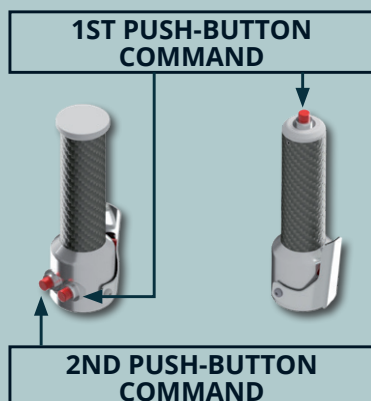
- Neutral
- Single signal pneumatic
- Double signal pneumatic
- Single signal electric
- Double signal electric
- Triple signal electric

HDD0000000	HDP-----	HDE-----
		

MODELS	DESCRIPTION	POWER	CONNECTION
<b>HDD0000000</b>	Neutral handle	-	-
<b>HDP-----</b>	Pneumatic handle	Pneumatic	Tube Ø4x2.5 length 3M
<b>HDE-----</b>	Electric handle	Electrical	4 Pin



## ORDER CODE



### LEVER CONTROL

- 0 - None
- 1 - Pneumatic
- 2 - Single contact
- 4 - Double contact
- 5 - Withholding contact



### 1ST PUSH-BUTTON CONTROL

- 0 - None
- 1 - Pneumatic
- 2 - Single contact
- 4 - Double contact
- 5 - Withholding contact

**HD X X X X X X XX**

### SUPPLY

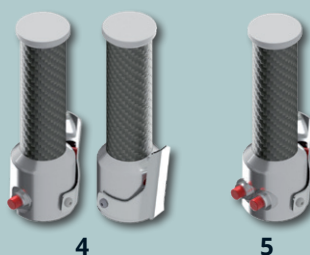
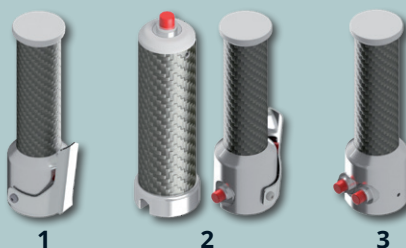
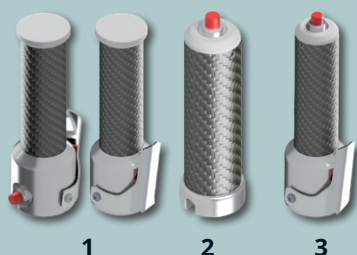
- D - Neutral
- P - Pneumatic
- E - Electric

### SIGNALS QUANTITY

- 1 - Single lever signal
- 2 - Single push-button signal
- 3 - Dual 2-button signal
- 4 - Double lever signal + button
- 5 - Triple signal \*

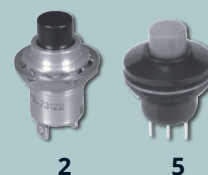
### COMMAND POSITION

- 0 - Neutral
- 1 - Side
- 2 - Superior
- 3 - Both (side + top)



### 2ND PUSH-BUTTON CONTROL

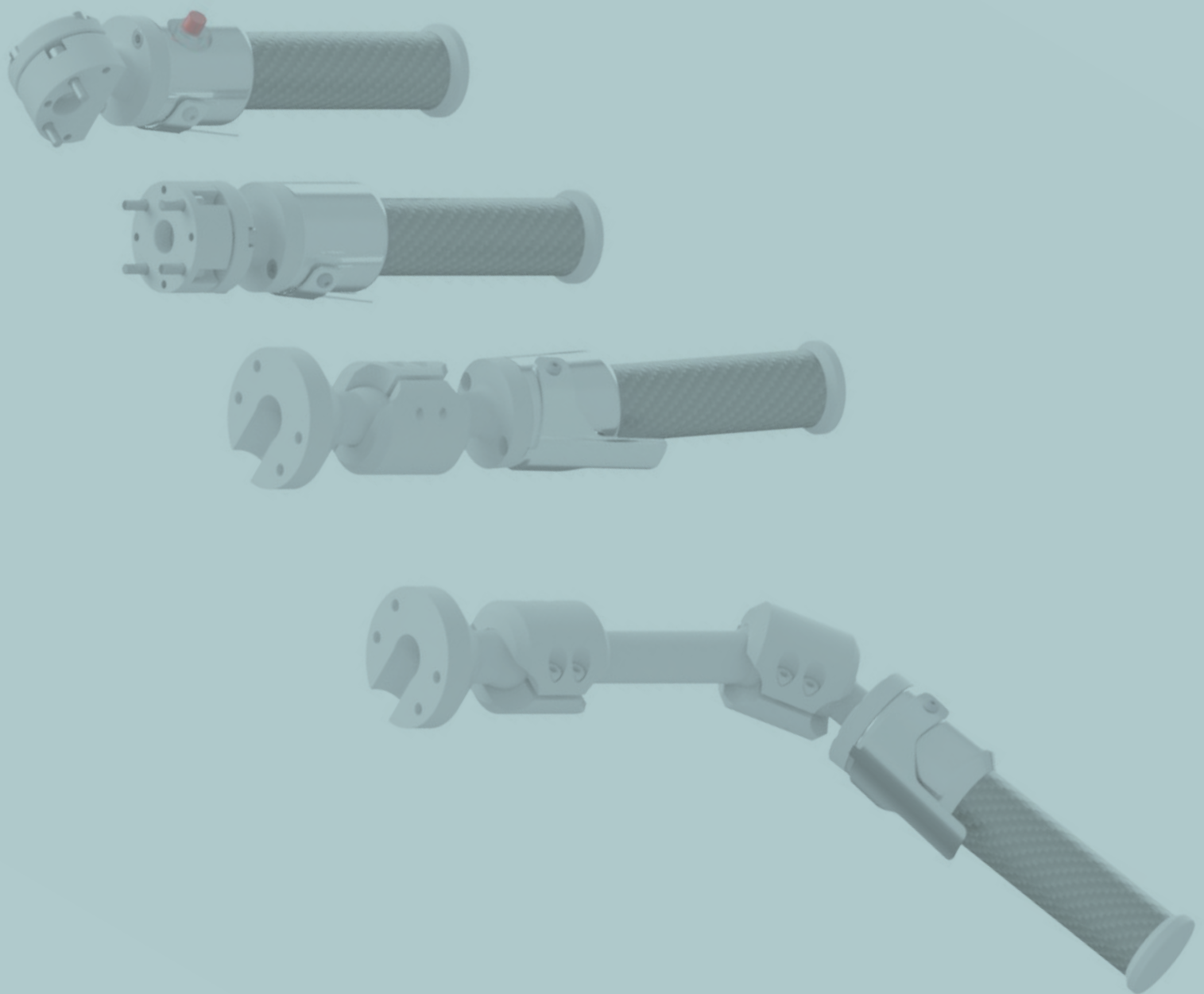
- 0 - None
  - 2 - Single contact
  - 5 - Withholding contact
- Not available for the pneumatic version



\* Only in the electric version  
Only in the side version

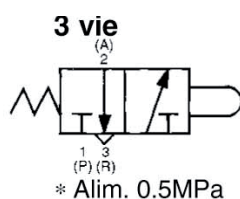
## HANDLE

### Features, dimensions and performance



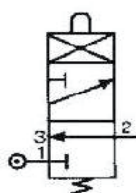
## FEATURES

Features pneumatic button side mounting



Valve type	Shutter
Number of routes	3
Total race	4.8 mm
Connections	lower
Fluid	Air
Working pressure	5 - 0.8MPa
Operating temperature	-5 ° - 60 ° C (without freezing)
Sec. equivalent (NI / min.)	1mm square
Lubrication	Not required
Reconciliation	With flexible connection
Weight	6g

Features of pneumatic button for top mounting



Working pressure	0.1 - 8 bar
Number of routes	3
Hole diameter	2
Flow at 6 bar	130 NI / min
Connections	lower
Fluid	Air
Implementation force	16 N
Circuit function	NC
Operating temperature	-5 ° + 50 ° C
Reconciliation	With flexible connection
Weight	27g



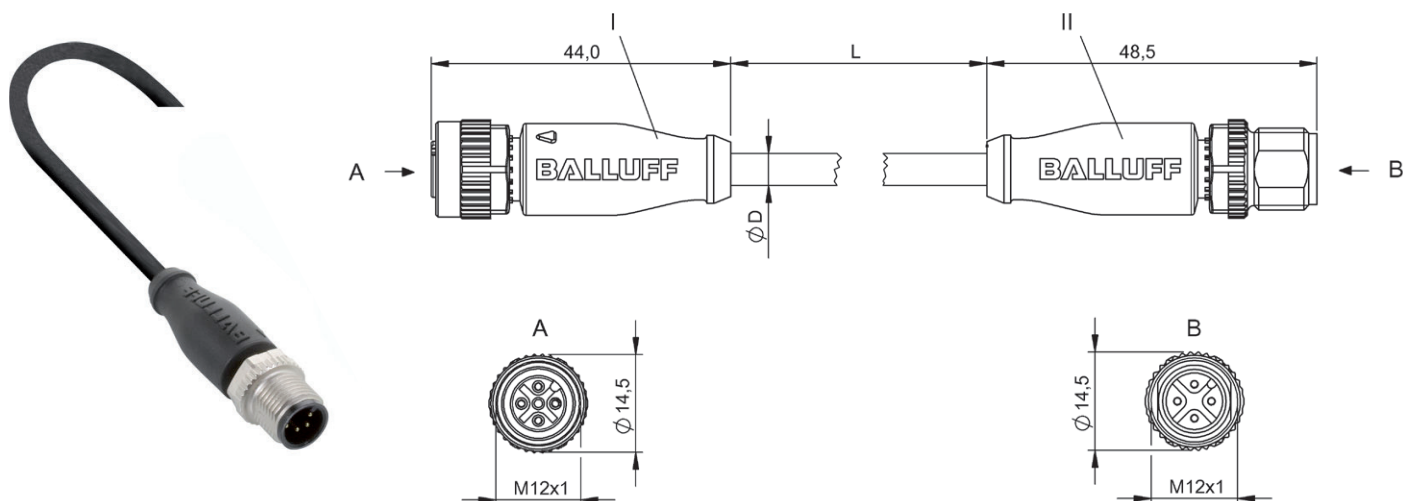


- Resistance Less than 25mΩ contact
- Positive tactile feedback
- RoHS & WEEE



- Resistance Less than 25mΩ contact
- Positive tactile feedback
- UL recognized
- RoHS & WEEE

## Features pneumatic button side mounting



### CHARACTERISTIC DATA

Number of conductors	4
Connector style (Head I)	Plug M12
Connector type (Head II)	Connector M12
System	molded/ molded
Special properties	Drag chain compatible
Power indicator	No / No
Function indicator (PIN 2)	No / No
Function indicator (PIN 4)	No / No
Cable jacket colour	black
Switching output	No
Switching function	Complementary (NO/NC)

### ELECTRICAL DATA

Operating voltage UB max. AC	250 V
Operating voltage UB max. DC	250 V

### MECHANICAL DATA

Number of sockets or pins	5 / 4
Cable length	0.6 m
Conductor cross-section	0.34 mm <sup>2</sup>
Cable diameter D	4.3 +/- 0.10 mm
Drag chain compatible	
Acceleration max. (drag chain)	5 m/s <sup>2</sup>
Bending radius fixed cable	min. 5 x D

Bending radius repeated	min. 10 x D
Bending cycles (in million)	> 2 Mio.
Permiss. horizon. traverse dist.	at 5 m/sec <sup>2</sup> 5 m
Traverse speed max (drag chain)	at 5 m horiz. travel 200 m/min
Torsional stress of cable	±180° / m
Ambient temperature (fixed)	-40...80 °C
Ambient temperature (movable)	-25...80 °C
Ambient temperature (drag chain)	-25...60 °C
Grip material	PUR / PUR
Cover nut material	GD-Zn / GD-Zn
Cable jacket material	PUR weldingspark durable
Contact carrier material	PUR / PUR
Contact material	CuZn / CuZn
Tightening torque pigtail	0.6 Nm / 0.6 Nm

### BASIC DATA

Enclosure Type per IEC 60529	IP68 / IP68
Approvals	cULus LISTED

### REMARKS

Enclosure type accord. to IEC 60529, when threaded together with the appropriate counterpart.  
 Flame resistant per IEC 60332-1-2  
 Halogen-free per DIN VDE 0472 Part 815  
 Cable structure according to UL-AWM Style 20549

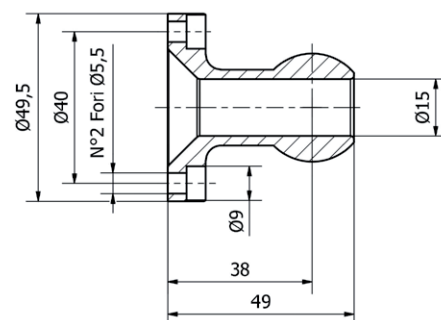
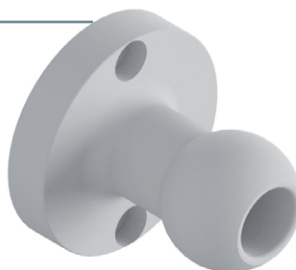
## ACCESSORI

The modular grip interface system allows for different combinations in various positions.



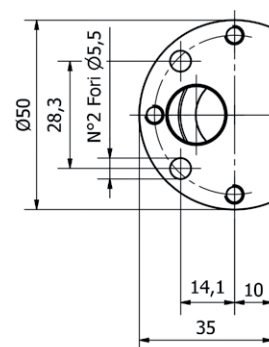
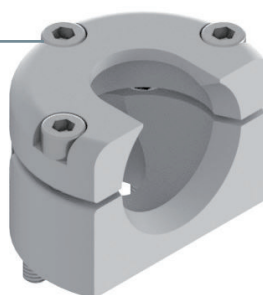
### HB-1 GRIP INTERFACE BASE

The interface base made of aluminium alloy serves to connect the grip to the modular system. The hole through the base of the sphere can be used for wires, cables or small flexible tubes.



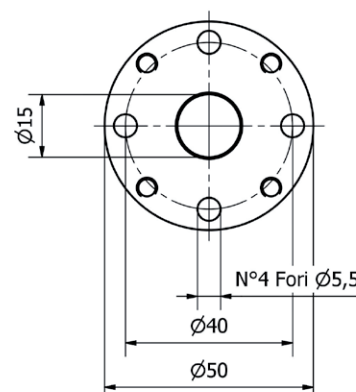
### HB-2 PARALLEL INTERFACE BASE

The plate interface base made of aluminium alloy is necessary to brace the grip parallel to the fixing surface. The hole through its base can be used for wires, cables or small flexible tubes.



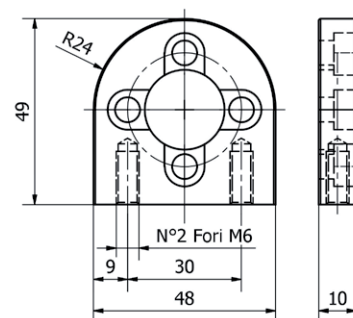
### HB-3 PERPENDICULAR INTERFACE BASE

The wall interface base made of aluminium alloy is necessary to brace the grip perpendicular to the fixing surface. The hole through its base can be used for wires, cables or small flexible tubes.



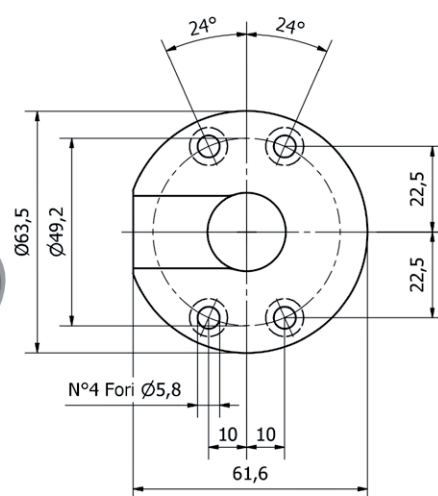
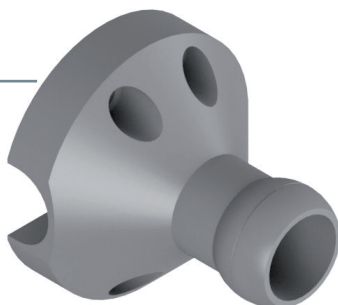
#### HB-4 PERPENDICULAR SUPPORT BRACKET

The use of the grip support bracket, made of aluminium alloy, is necessary when it is not possible to directly fix the grip using the available hole.



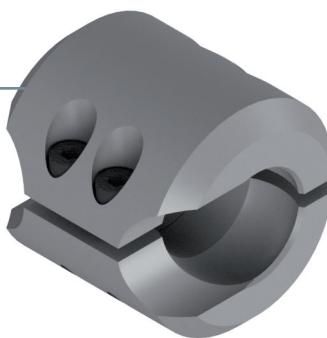
#### HBM-1 STANDARD SPHERICAL BASE

The spherical base made of aluminium alloy has a hole which makes it suitable for most aluminium profiles. The hole through the base of the sphere can be used for wires, cables or small flexible tubes. On the side of the base there is an output groove for cables, pipes and wires.



#### HBM-2 JOINT

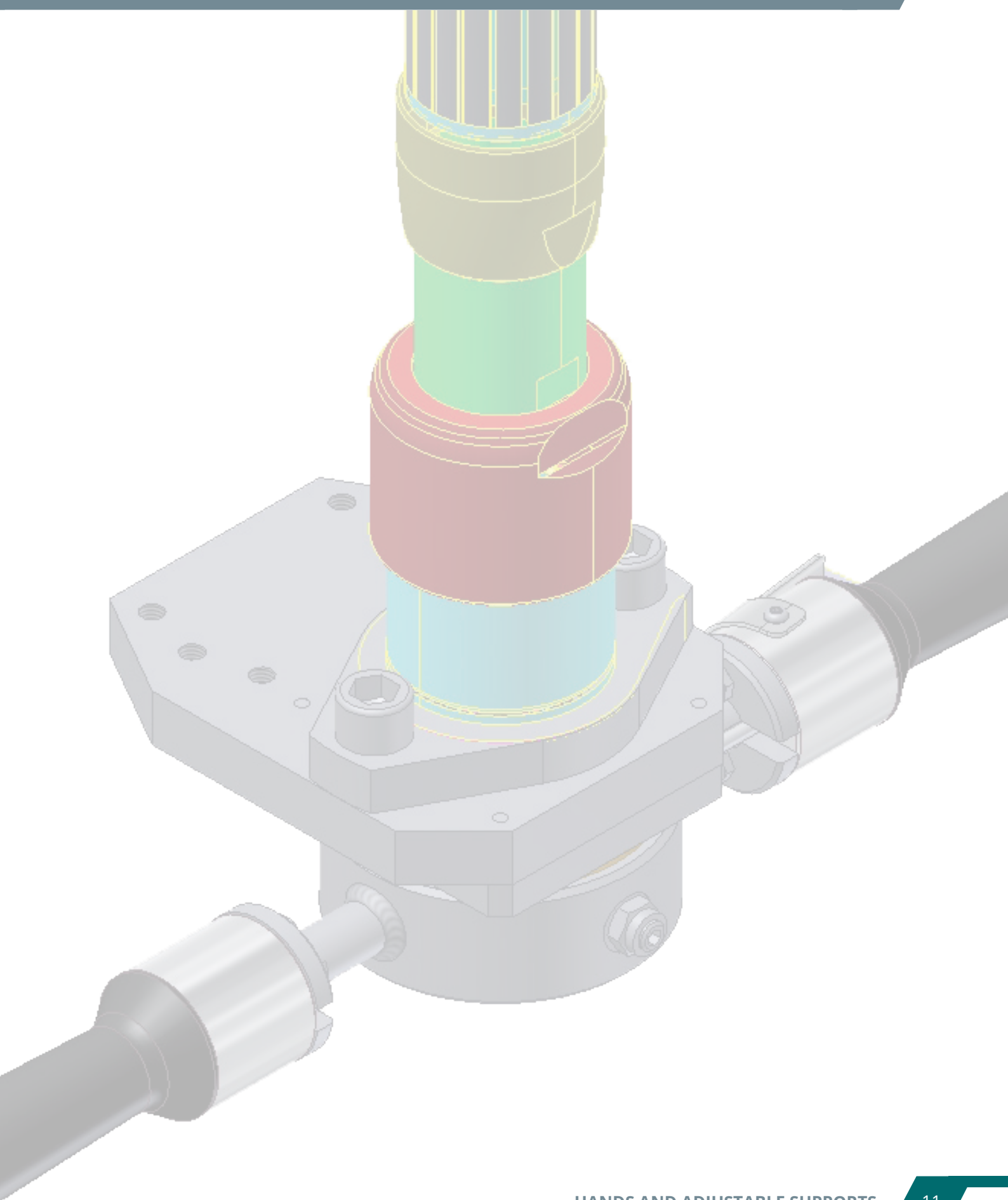
The joint made of aluminium alloy has a dual-grip configuration to block the sphere onto a base, connection or sensor support. Its design allows for a wide range of movements, keeping the inside hole and the rotation functionality of the cable unchanged.



#### HBM-3 L-50MM -100MM 150MM -200MM -300MM EXTENSIONS

Aluminium alloy extensions are used with joints to expand the range and increase flexibility. These extensions are available in five lengths: 50mm, 100mm, 150mm, 200mm and 300mm. The extensions are pierced in order to allow for inserting cables, pipes and wires.





## PNEUMATIC MOTORS



## GEAR-MOTORS



## TELESCOPIC ARMS



## ARTICULATED ARMS



## ACCESSORIES





