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## Description:

Knobs range type "IP1" includes different shapes as conical and spherical, with threaded or press-fit assembly and are available with or without electric pushbutton. In the standard configuration, the pushbutton is two positions and N.O. on-off circuit.

They can be supplied loosen or assembled on levers of different lengths, with standard or customized wiring, with connectors on specific request.



The "IP1" knob body is made of black thermoplastic material with good resistance to solvents, oils, greases and other chemical agents. It can be used at low or high ambient temperatures and it's UV resistant.



On request, knobs are available in 5 colour options: light blue, red, white, yellow, orange.

Some versions without pushbutton are available with magnifying lens for functional symbols or ideograms.



Knobs with electric components are assembled with dust-proof pushbuttons with 5 A resistive (3 A inductive) maximum current, maximum voltage 28 VDC, 2 or 4 pins and protection degree IP64 (IP68 on request). Pushbuttons serviceable plastic cap actuator available in 9 different colours and flush or raised shape.



Optional transparent silicon caps are available for very dusty environments.



All items are in compliance with European Directive 2002/95/CE



The data and the technical features in this catalogue are not binding. The manufacturer reserves the right to carry out modifications, by its unquestionable judgement and without prior notice, in order to improve its products. The manufacturer is not responsible for damage to people or properties caused by an improper use of the product.

## Technical features:

### Shells:

Material:	Polyamide Techno polymer (PA)
UV resistance:	Good
Mineral oil resistance:	Good
Ambient temperature range:	from -30 to +85°C

### Levers:

Material:	Steel
Protecting treatment:	Galvanizing

### Pushbuttons:

Maximum current:	5 A resistive, 3 A inductive
Supply voltage:	from 5 to 28 VDC
Electrical life:	from 25.000 cycles for 5A @ 28 VDC up to 1.000.000 cycles for 1A
Mechanical life:	1.000.000 cycles
Protection degree:	IP64 standard (IP68 on request)
Ambient temperature range:	from -55 to +85°C
Operating force:	7,5±0,2 N
Total stroke:	2 mm max.


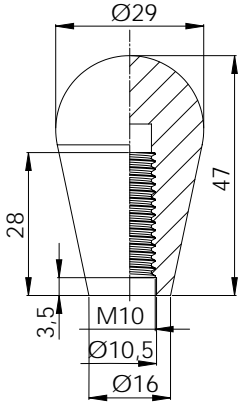

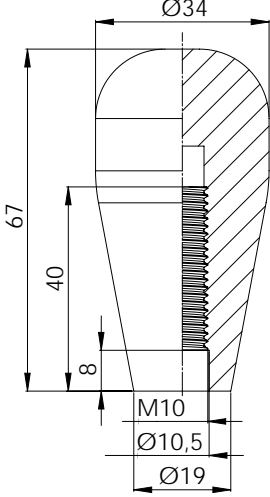
### Terminals:

Terminal material:	Tinned copper strands
External insulation material:	Black PVC
Wire sleeve material:	Black polyester fibre
Wire section:	0,50 mm <sup>2</sup>
Rope making wires:	Class 6 VDE 0295
Approvals:	UL - CSA - HAR
Standard length:	500 mm (other length on request)

## Range and overall dimensions of the configurations without pushbutton


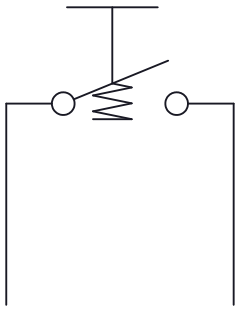

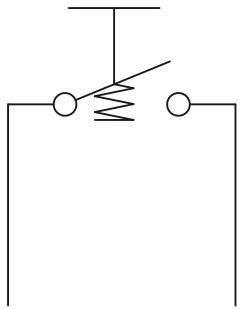

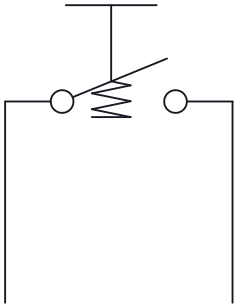
		<p>Standard Spherical knob D50 <b>AS</b></p>
		<p>Spherical knob D47 with stem <b>BS</b></p>
		<p>Conical knob D34x54,5 <b>CS</b></p>

## Range and overall dimensions of the configurations without pushbutton

	
<p>Conical knob D29x47</p>	
<p><b>DS</b></p>	
	
<p>Conical knob D34x67</p>	
<p><b>ES</b></p>	


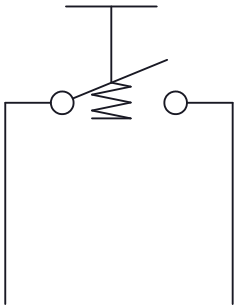

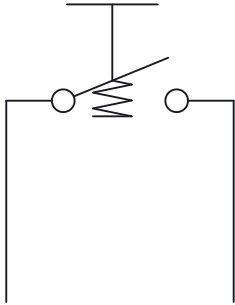
## Range and overall dimensions of the configurations with pushbutton

All the overall dimensions are the same of the knobs without pushbutton

	
<p>Standard Spherical knob D50 <b>AP</b></p>	
	
<p>Spherical knob D47 with stem <b>BP</b></p>	
	
<p>Conical knob D34x54,5 <b>CP</b></p>	

## Range and overall dimensions of the configurations with pushbutton

All the overall dimensions are the same of the knobs without pushbutton

	
<p>Conical knob D29x47</p>	
<p><b>DP</b></p>	
	
<p>Conical knob D34x67</p>	
<p><b>EP</b></p>	



## Pushbutton options:

Pushbuttons actuator caps are available in two shapes **A** (raised) and **B** (flush) with dimensions and colour options shown below

Raised Pushbutton <b>A</b>	Flush Pushbutton <b>B</b>

## Standard colour option for the actuator caps

Orange	<b>O</b>		Yellow	<b>Y</b>		Red	<b>R</b>	
White	<b>W</b>		Grey	<b>H</b>		Green	<b>G</b>	
Blue	<b>B</b>		Black	<b>N</b>		Violet	<b>V</b>	

The colour options shown above are valid for the standard momentary pushbuttons with on-off N.O. circuit, with raised (**A**) or flush (**B**) cap actuator without led

## Pushbutton option:

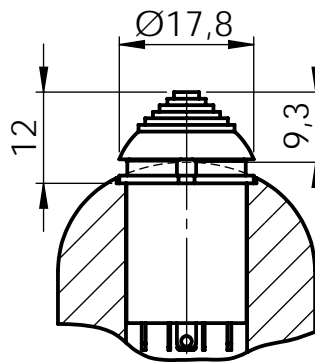
4-way on-o  
pushbutton

MJ4

## Technical features:

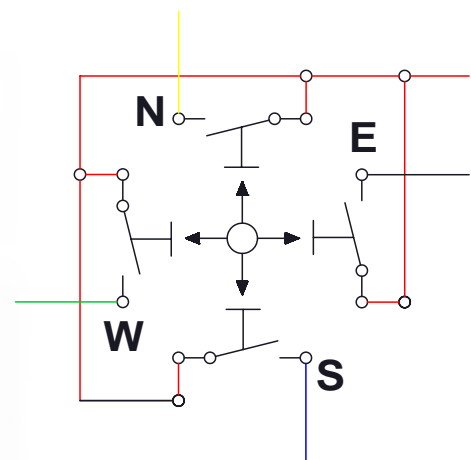
- |                          |                              |
|--------------------------|------------------------------|
| - Maximum current        | 1 A resistive, 2 A inductive |
| - Minimum current.       | 10 $\mu$ A @ 30 mV           |
| - Maximum supply voltage | 28 VDC                       |
| - Electrical life        | 100.000 cycles               |
| - Mechanical life        | 500.000 cycles               |
| - Protection degree:     | IP68                         |
| - Ambient temperature    | from - 55 to + 85°C          |
| - Operating angle        | 10° $\pm$ 0,5                |
| - Operating force        | 33 $\pm$ 1 N                 |

The 4-way pushbutton can be assembled only on knob type ES whose overall dimensions without pushbutton are shown at page 6 of this catalogue.

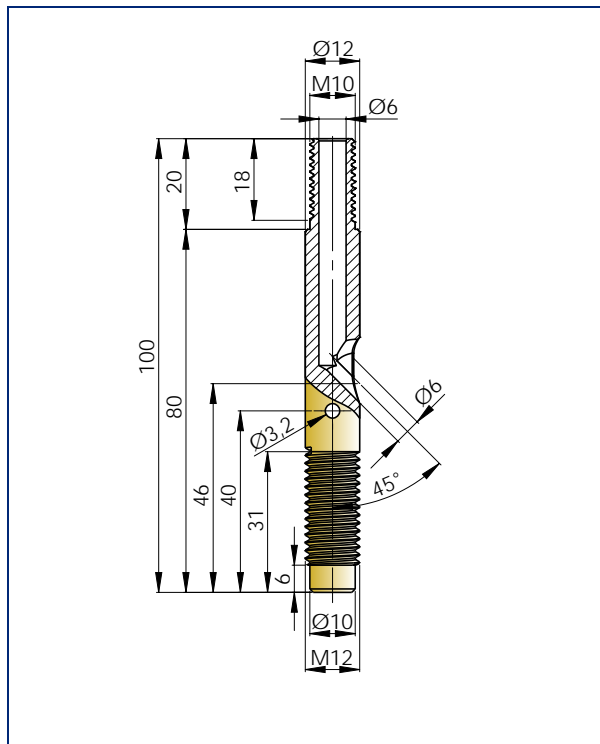


*Knob with pushbutton MJ4 fitted on lever type 1*

## Electric diagram:

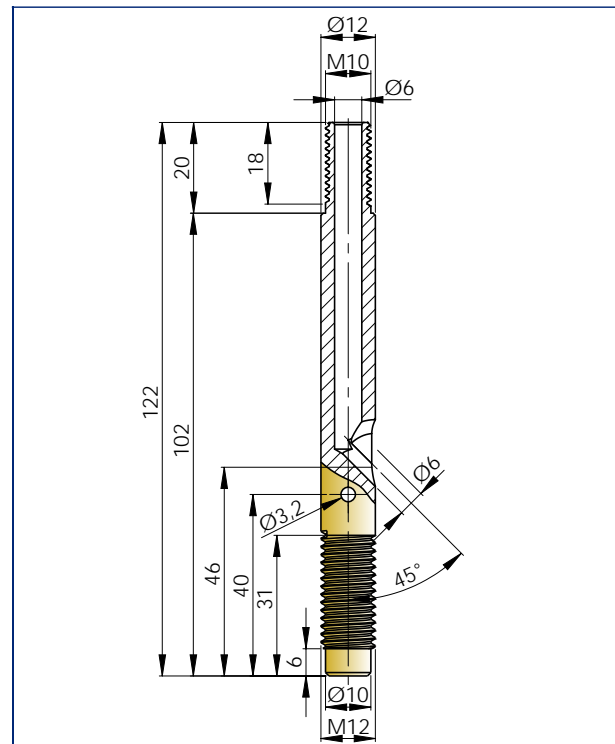


## Mounting Levers:



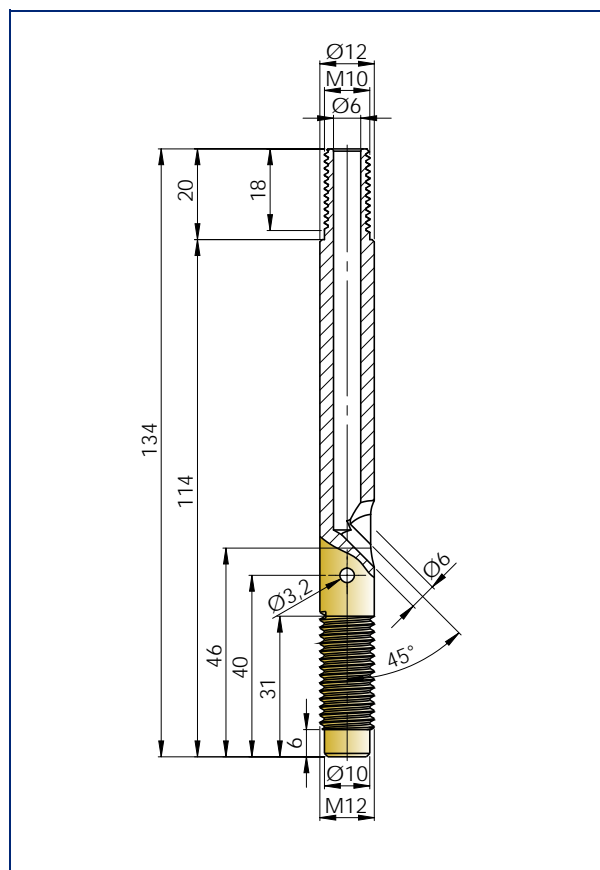
Straight lever M12 M x 80

**1**



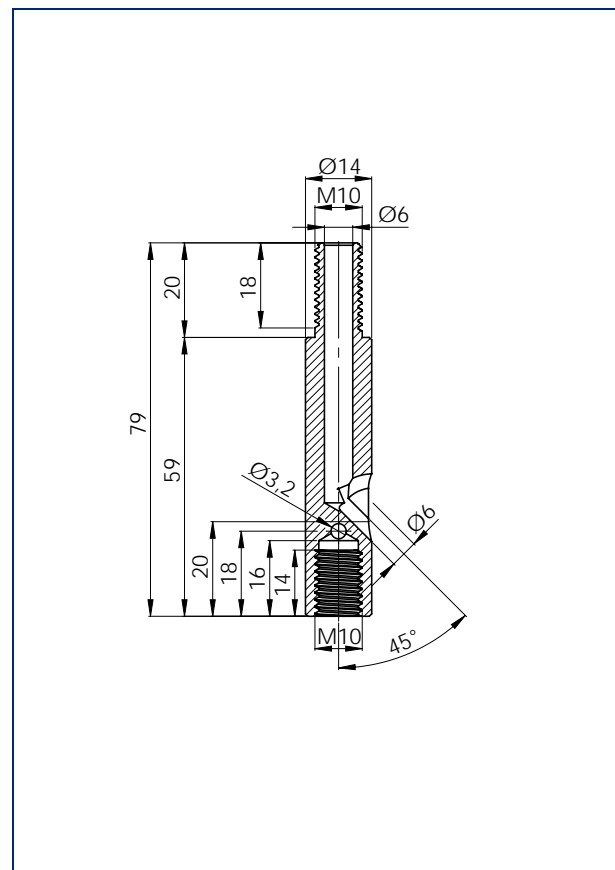
Straight lever M12 M x 102

**2**



Straight lever M12 M x 114

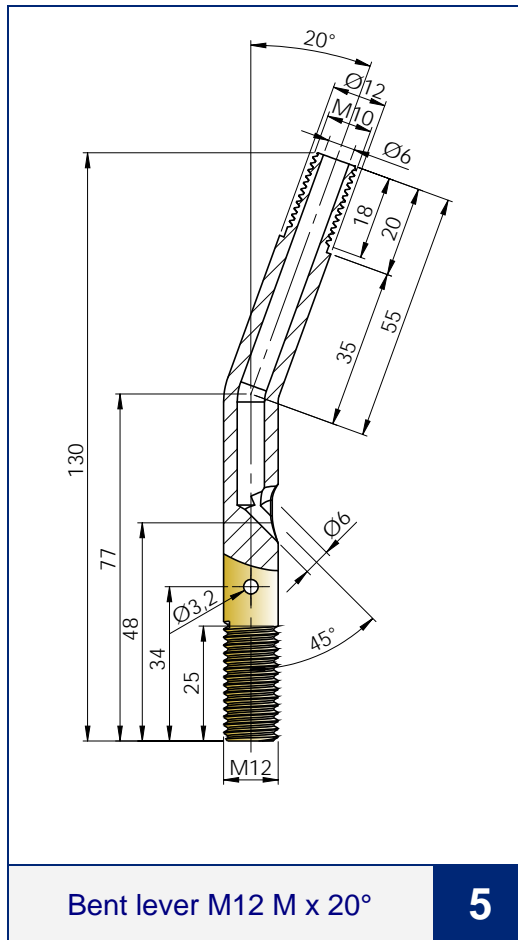
**3**



Straight lever M10 F x 59

**4**

## Mounting Levers:



*Knob samples fitted on threaded levers with pushbuttons*

## Wire configuration

Without wires	Z
Single high flexibility, section 0,50 mm <sup>2</sup>	G
Multicore cable, 2 or 3 wires, section 0,50 mm <sup>2</sup>	M
Special wire on request (specify features)	S

## Wire length

Without wires	00
Standard length, from handle bottom (cm)	50
Length on request, from handle bottom (cm)	300

## Wire terminals

Without wires	Z
Wire terminal with 5 mm strip, without tinplate	N
With faston (specify brand and type)	S
Connector (specify brand and type) with wired terminals	C



*Wide range of connectors are used for customized wirings*



## Model coding:

<b>IP1</b>	<b>AP</b>	<b>BG</b>	<b>1</b>	<b>G</b>	<b>50</b>	<b>N</b>
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### Wire terminals (page 13):

- without wires = **Z**
- wire terminal with 5 mm strip, without tinplate = **N**
- with faston (specify brand and type) = **S**
- Connector (specify brand and type) with wired terminals = **C**

### Cable length, in cm (page 13):

- without wires = **00**
- standard length (cm) = **50**
- length on request (cm) = **XX**

### Wire configuration (page 13):

- without wire = **Z**
- single high flexibility, section 0,50 mm<sup>2</sup> with PVC sleeve = **G**
- Multicore cable section 0,50 mm<sup>2</sup> (with silicon protection) = **M**
- Special wire on request (specify features) = **S**

### Mounting levers (pages 11-12):

- without mounting lever **0**
- straight lever M12 M x 80 **1**
- straight lever M12 M x 102 **2**
- straight lever M12 M x 114 **3**
- straight lever M10 F x 59 **4**
- bent lever M12 M x 20° **5**

### Cap actuator and pushbutton configuration (page 9-10):

- without pushbutton **ZZ**
- with raised cap actuator **A**  
(followed by the code of colour option ex. **AR**)
- with flush cap **B**  
(followed by the code of colour option ex. **BG**)
- with 4-way on-off pushbutton **MJ4**

### Knob option (pages 5-6-7-8):

- Spherical standard knob =
  - Spherical knob with stem =
  - Conical knob D34 x 54,5 =
  - Conical knob D29 x 47 =
  - Conical knob D34 x 67 =
  - "Soft touch knob" D45 x 65 =
- For pushbutton option replace S digit with P

**Model = IP1**



## **THE COMPREHENSIVE RANGE OF MANUFACTURED AND MARKETED COMPONENTS INCLUDES:**

- Hydraulic gear and axial piston pumps & motors
- Directional control valves & selector valves
- Proportional EH pressure reducing valves & manifold blocks
- Hydraulic, pneumatic and electric on-off & proportional joysticks
- Control electronics
- Radio controls, push buttons stations, dashboards and armrests
- Multifunction ergonomic, cylindrical & palm grips
- Hydraulic filters & contamination control systems
- Heat exchangers and cooling systems
- Fluid monitoring & diagnostic instruments
- Bell housings, driving flanges & elastic couplings