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Description:

Straight handles with multifunctional option series IC can be supplied as individual units or mounted on our electrical or hydraulic joysticks, and on control levers of our main directional control valves. They represent a good alternative to the multifunctional ergonomic grip for those applications where compact dimensions at lower cost are required, without sacrificing versatility and reliability.

IC handles are available in 2 basic configurations:

• **Single switch IC1**, with momentary on-off function or with 3 momentary position rocker switch. Both functions have a heavy duty micro-switch rated 16 A at 250 VAC. Push button and rocker are on the top side of the handle and are protected with a water and oil proof rubber cap.

• **Multi function push-button IC2**, with momentary or latched push-button switches or 2 and 3 position rocker switches, rated 5 A at 28 VDC and IP64 protection degree or IP68 on request.

All push-buttons have a plastic cap actuator available on a choice of 9 colours. Optional silicon protection caps are available and can be used to cover the actuator buttons when used in very dusty environments. Other options as push-buttons with signalling led or 4 way push-buttons are available.

Handle body is made with oil-proof black thermoplastic material and UV resistant.

Use of high quality electrical components, in compliance with European directive 2002/95/CE, ensures the maximum reliability and long life also for the heaviest working conditions.

A wide range of additional options, including mounting levers and fittings, rubber boots, customized wirings and connectors, can cover the most demanding applications of different market sectors like agricultural machines, industrial automation, electrical, hydraulic and pneumatics tools, building tools, earth moving machines, gardening machines, traffic signal and many others.

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:

Handle:

- Shell material: Techno-polymer PA6+30%FV
- UV resistance: Good
- Mineral oil resistance: Good
- Protection degree: IP54
- Ambient temperature range: from -20° to + 60°C
- Adapter material: Zinc plated steel or brass

Micro-switches for handle series IC1:

- Maximum current: 10 A inductive, 16 A resistive
- Maximum input voltage: 250 VAC
- Electrical life: 100,000 cycles at maximum load.
- Mechanical life: 1,000,000 cycles
- Protection degree: IP54
- Ambient temperature range: from -55° to + 85°C
- Total operating stroke: 2,4 mm max.
- Operating force: 3,00 N max.
- Release force: 0,75 N min.
- Terminal materials: Cadmium silver alloy
- Body material: Thermoplastic polymer
- Approvals: CE, CSA, UL,VDE

Micro-switches for handle series IC2:

- Maximum current: 5 A resistive, 3 A inductive
- Input voltage range: from 5 to 28 VDC
- Electrical life: from 25,000 cycles at max. current to 1,000,000 cycles at 1A resistive
- Mechanical life: 1,000,000 cycles
- Protection degree: IP64 standard (IP68 on request)
- Ambient temperature range: from -55° to + 85°C
- Total operating stroke: 2 mm max.
- Operating force: 7,5±0,2 N
- Terminal materials: Gold plated silver alloy

Terminals:

- Terminal material: Tinned copper strands
- External insulation material: Silicon or PVC
- Wire sleeve material: Black polyester fibre
- Wire section: 0,50 mm²
- Rope making wires: Class 6 VDE 0295
- Approvals: UL - CSA - HAR
- Standard length: 500 mm (other length on request)
Overall dimensions:

IC1 handle series without adapter and pushbutton
STRAIGHT HANDLE IC1

Pushbutton and wiring configuration:

<table>
<thead>
<tr>
<th>Handle</th>
<th>A</th>
<th>With one N.O. switch</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without switch</td>
<td></td>
<td></td>
<td>Electric diagram B</td>
</tr>
</tbody>
</table>

Electric diagram B
STRAIGHT HANDLE IC1

Pushbutton and wiring configuration:

C: With one N.O. switch and safety device

D: With 3 position rocker "mom-off-mom"

C configuration has a safety device to prevent the accidental operation of the pushbutton.

Electric diagram C

Electric diagram D
STRAIGHT HANDLE IC2

Colour selection of standard pushbuttons:

| Colour | | Colour | | Colour | | Colour |
|--------|--------|--------|--------|--------|--------|
| Orange | O      | Yellow | Y      | Red    | R      |
| White  | W      | Grey   | H      | Green  | G      |
| Blue   | B      | Black  | N      | Violet | V      |

Push-buttons and wiring configuration for IC2 cap:

Standard momentary N.O. push-buttons

- Standard red raised push-button AR (if flush BR)
- Red raised push-button AR With protection cap type ARS

With 1 push-button in pos.1 | With 2 push-buttons in pos.2-3 | Without push-buttons

Electric diagram A | Electric diagram B
Cap push-button and wiring configuration:

On-off push-buttons with signalling led, available latching or momentary can be mounted on the upper cap with the colour range below

- Green momentary push-button with led: GL
- Yellow momentary push-button with led: YL
- Red momentary push-button with led: RL
- Blue latching push-button with led: BIL
- Red latching push-button with led: RIL
- Green latching push-button with led: GIL

Customized wiring available on request
STRAIGHT HANDLE IC2

Cap push-button and wiring configuration:

4-way Mini-joystick “off-mom” MJ4

Technical features:
- Maximum current: 1 A resistive, 2 A inductive
- Minimum current: 10 µA @ 30 mV
- Maximum input 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° +/- 0.5
- Operating force: 330 N +/- 10

Electrical diagram:

Overall dimension MJ4:

For handle body overall dimension
See page 5
STRAIGHT HANDLE IC2

Cap pushbutton and wiring configuration:

Two or three position Rocker switch (available only on the upper cap)

- Two position latching rocker switch
- Two position momentary rocker switch
- Three position latching rocker switch
- Three position momentary rocker switch

Electrical diagram D1

Electrical diagram E1

Electrical diagram D2

Electrical diagram E2
STRAIGHT HANDLE IC2

Cap pushbutton and wiring configuration:

Rocker switch orientation, view from the top (omit the code if the cap has standard push-buttons)

- Aligned with push-buttons on the handle body
- Orthogonal to push-buttons on the handle body

2 position rocker switch “off-mom” type A

Handle IC2 with two latching position rocker switch on the cap and 2 momentary push-buttons with raise cap on the handle body in position G4 and R5 (rocker switch orientation type S)
STRAIGHT HANDLE IC2

Push-button configuration and electric diagram on the handle body:

Momentary N.O. push-buttons

IC2 body without push-buttons

IC2 body with one push-button in pos.4

Electric diagram 1
STRAIGHT HANDLE IC2

Pushbutton configuration and electric diagram on the handle body:

Momentary N.O. pushbuttons

<table>
<thead>
<tr>
<th>IC2 body with two pushbuttons in pos.4 and 5</th>
<th>Electric diagram 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC2 body with three pushbuttons in pos.4, 5 and 6</td>
<td>Electric diagram 3</td>
</tr>
</tbody>
</table>
Mounting adapters:

<table>
<thead>
<tr>
<th>Adapter Type</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>M8-F with collar and radial wire exit</td>
<td><img src="M8_F_collar_radial_exit.png" alt="Image" /></td>
</tr>
<tr>
<td>M10-F with collar and radial wire exit</td>
<td><img src="M10_F_collar_radial_exit.png" alt="Image" /></td>
</tr>
<tr>
<td>M8-F without collar and radial wire exit</td>
<td><img src="M8_F_no_collar_radial_exit.png" alt="Image" /></td>
</tr>
<tr>
<td>M10-F without collar and radial wire exit</td>
<td><img src="M10_F_no_collar_radial_exit.png" alt="Image" /></td>
</tr>
<tr>
<td>M10-F without collar and radial wire exit</td>
<td><img src="M10_F_no_collar_radial_exit.png" alt="Image" /></td>
</tr>
<tr>
<td>M12-F with and without collar and radial wire exit</td>
<td><img src="M12_F_collar_radial_exit.png" alt="Image" /></td>
</tr>
<tr>
<td>M10-F without collar swivelling radial wire exit</td>
<td><img src="M10_F_swivel_radial_exit.png" alt="Image" /></td>
</tr>
<tr>
<td>M14x1.5 F Without adapter</td>
<td><img src="M14x1.5_F.png" alt="Image" /></td>
</tr>
</tbody>
</table>
Mounting levers:

- **L1**
  - Straight lever
  - M10 M x L=150

- **L2**
  - Straight lever
  - M12 M x L=150

Special adapters and lever can be supplied on request
## Wire configuration

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Without wires</td>
<td>Z</td>
</tr>
<tr>
<td>Single high flexibility, section 0.50 mm$^2$</td>
<td>G</td>
</tr>
<tr>
<td>Multicore cable section 0.50 mm$^2$</td>
<td>S</td>
</tr>
<tr>
<td>Special wire on request (specify features)</td>
<td>SP</td>
</tr>
</tbody>
</table>

## Wire length

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Without wires</td>
<td>00</td>
</tr>
<tr>
<td>Standard length, from handle bottom (cm)</td>
<td>50</td>
</tr>
<tr>
<td>Length on request, from handle bottom (cm)</td>
<td>300</td>
</tr>
</tbody>
</table>

## Wire terminals

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Without wires</td>
<td>Z</td>
</tr>
<tr>
<td>Wire terminal with 5 mm strip, without tinplate</td>
<td>N</td>
</tr>
<tr>
<td>With faston (specify brand and type)</td>
<td>S</td>
</tr>
<tr>
<td>Connector (specify brand and type) with wired terminals</td>
<td>C</td>
</tr>
</tbody>
</table>
Protection boot:

- Without rubber boot: Z
  - Available with adapter type C8 (pag.15)

- With square rubber boot: Q
  - Available with adapter type C1 and C2 (pag.15)

- With round rubber boot: R
### Ordering key handle type IC1

<table>
<thead>
<tr>
<th>IC1</th>
<th>B</th>
<th>L1</th>
<th>S</th>
<th>50</th>
<th>N</th>
<th>Z</th>
</tr>
</thead>
</table>

**Rubber boot (pag.18):**
- without rubber boot = Z
- with round rubber boot = R
- with square rubber boot = Q

**Wire terminals (pag.17):**
- 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 (pag.17):**
- without wires = 00
- standard length, from handle bottom (cm) = 50
- length on request, from handle bottom (cm) = XX

**Wire configuration (pag.17):**
- without wire = Z
- single high flexibility, section 0,50 mm² with PVC sleeve = G
- Multicore cable section 0,50 mm² (with silicon protection) = S
- Special wire on request (specify features) = SP

**Mounting adapters and levers (pag.15-16):**
- without wires, internal thread M14x1,5 = Z1
- with straight adapter, internal thread M8 with collar = C1
- with straight adapter, internal thread M10 with collar = C2
- with straight hexagonal adapter, internal thread M8 without collar = C3
- with straight hexagonal adapter, internal thread M10 without collar = C4
- with straight adapter, internal thread M10 without collar = C7
- with straight adapter, internal thread M10 with and without collar = C8
- with straight adapter, internal thread M10 swivelling, without collar = C9
- with straight lever, external thread M10, L=150 mm = L1
- with straight lever, external thread M12, L=150 mm = L2

**Configuration and wire diagram (pag.6 and 7):**
- handle without push-buttons = A
- with one N.O. momentary push-button = B
- with one N.O. momentary push-button with safety device = C
- with one N.O. momentary rocker switch = D

**Model:** = IC1
### Ordering key handle type IC2

<table>
<thead>
<tr>
<th>IC2</th>
<th>W</th>
<th>D</th>
<th>1AR4</th>
<th>C1</th>
<th>G</th>
<th>50</th>
<th>N</th>
<th>Z</th>
</tr>
</thead>
</table>

#### Rubber boot (pag.18):  
- without rubber boot = Z  
- with round rubber boot = R  
- with square rubber boot = Q

#### Wire terminals (pag.17):  
- 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 (pag.17):  
- without wires = 00  
- standard length, from handle bottom (cm) = 50  
- length on request, from handle bottom (cm) = XX

#### Wire configuration (pag.17):  
- without wire = Z  
- single high flexibility, section 0,50 mm² with PVC sleeve = G  
- Multicore cable section 0,50 mm² (with silicon protection) = S  
- Special wire on request (specify features) = SP

#### Mounting adapters and levers (pag.15-16):  
- without wires, internal thread M14x1.5 = Z1  
- with straight adapter, internal thread M8 with collar = C1  
- with straight adapter, internal thread M10 with collar = C2  
- with straight hexagonal adapter, internal thread M8 without collar = C3  
- with straight hexagonal adapter, internal thread M10 without collar = C4  
- with straight adapter, internal thread M10 without collar = C7  
- with straight adapter, internal thread M10 with and without collar = C8  
- with straight adapter, internal thread M10 swivelling, without collar = C9  
- with straight lever, external thread M10, L=150 mm = L1  
- with straight lever, external thread M12, L=150 mm = L2

#### Handle body configuration (pag.13-14):  
- without pushbutton = 0  
- with 1 N.O. pushbutton in pos.4 = 1  
  (followed by cap code, Raised (A)/Flush (B), colour and position ex. 1AR4)  
- with 2 N.O. pushbuttons in pos.4-5 = 2  
  (followed by cap code, Raised (A)/Flush (B), colour and position ex. 2AR4AB5)  
- with 3 N.O. pushbuttons in pos.4-5-6 = 2  
  (followed by cap code, Raised (A)/Flush (B), colour and position ex. 3AR4AB5AV6)

#### Cap configuration (pag.8-9-10 e 11):  
- with 1 N.O. pushbutton in pos.1 = A  
  (followed by cap code, Raised (A)/Flush (B), colour and position ex. AAY1)  
- with 2 N.O. pushbuttons in pos.2-3 = B  
  (followed by cap code, Raised (A)/Flush (B), colour and position ex. BAY2AG3)  
- with 1 latching N.O. 2-position rocker switch = D1  
- with 1 latching N.O. 3-position rocker switch = D2  
- with 1 momentary N.O. 2-position rocker switch = E1  
- with 1 momentary N.O. 3-position rocker switch = E2  
- without pushbuttons = Z

#### Pushbutton orientation (pag.12):  
- South orientation (standard) = blank  
- West orientation = W

**Model:** = IC2
Design and production of remote control components & systems

The comprehensive range includes the following manufactured and marketed equipment:

- Hydraulic pumps and motors
- Directional control valves
- Proportional pressure reducing valves
- Hydraulic, pneumatic and electric joysticks
- Radio controls and electronic controllers
- Control pads, dashboards and armrests
- Ergonomic, cylindrical and palm grips
- Electro-hydraulics pilot blocks
- Hydraulic filters
- Heat exchangers and cooling systems
- Fluid monitoring and diagnostic equipment
- Bell housings, driving flanges & elastic couplings