



ELECTRONIC CONTROL SYSTEM

ARC 300



 **walvoil**
HYDRAULIC CONTROL SYSTEMS

Additional information

This catalogue shows the product in the most standard configurations.
Please contact Sales Dpt. for more detailed information or special request.

WARNING!

All specifications of this catalogue refer to the standard product at this date.
Walvoil, oriented to a continuous improvement, reserves the right to discontinue, modify or revise the specifications, without notice.

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This edition supercedes all prior documents.

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Working principle

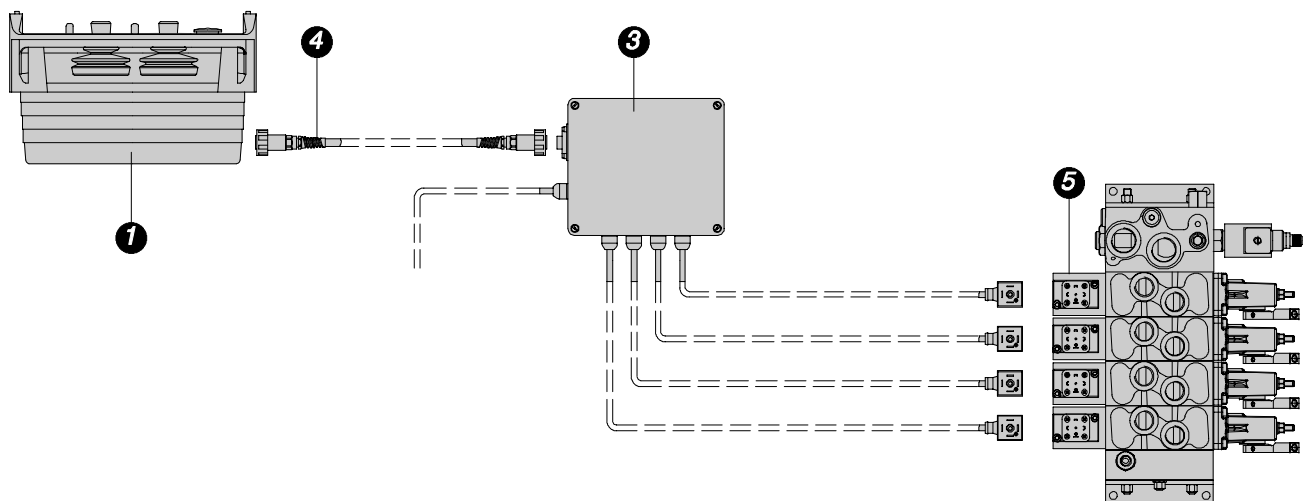
ARC300 remote control is an open loop electronic system consisting of joysticks (individual or assembled on console), a thin multi-core signal transmitting cable and an analog control unit containing the electronic cards.

These cards clean, amplify and convert output currents of the joysticks (proportional to the lever deflection angle) that, in turn, is feed to the proportional solenoids placed on the controlled valve.

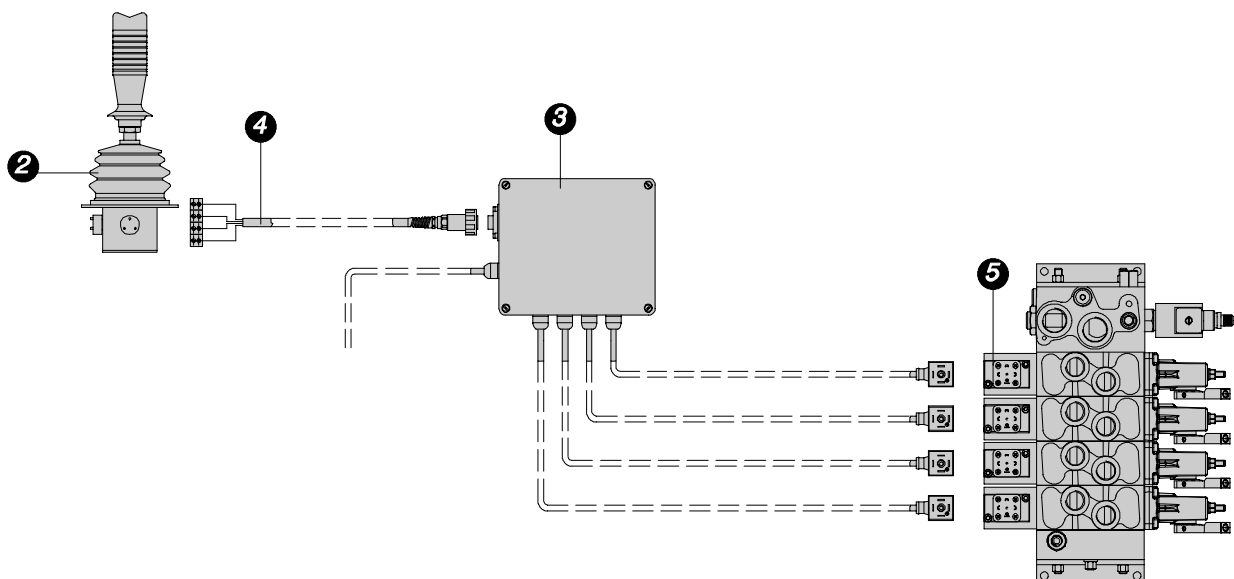
On cards, a sensor controls and stabilizes the current to the solenoids, keeping it constant, even under temperature variations (i.e. resistance variations) and/or supply voltage variations.

ARC300 is an "open system", so it can be used to drive ON/OFF functions and other auxiliary functions on the machine (engine start/stop, horn, etc...), by integrating electric components (relays, etc...) in the UGA control unit and the respective switches in the operational unit.

Control with console



Control with joystick



1) Console UPA

The UPA is the portable console unit for the ARC300 system.

Because its low weight and ergonomic shape it is ideal for applications where, for safety or visibility reasons, the operator needs to control the machine at a convenient distance.

In spite of the small dimensions, it can hold up to 6 single axis joysticks, emergency push-button, selectors, LEDs, microswitches and push-buttons for complete control of all the machine functions.

With the wide range of accessories and joysticks available, many combinations and configurations can be built up.

2) Joysticks series MAXI

These joysticks are larger in size than type mounted on console, and are suitable for using inside the cabs of mobile machines, on the seat arms rests or on fixed dashboards.

3) Analog control unit UGA

The UGA unit is the heart of the system.

It controls all proportional, ON/OFF and auxiliary functions of the machine.

The UGA control unit is placed close to the directional control valve to receive the weak signals coming from the joysticks.

It amplifies, cleans and transforms them to current that is supplied to the electrohydraulic modules.

Each proportional functions is easily adjustable using the potentiometer trimmers conveniently located under the box cover.

The UGA is a modular system prearranged to hold analog proportional and ON/OFF cards.

4) Signal transmitting cables

They connect the control unit with the electric joysticks.

As the ARC300 system has been developed for portable units as well as for fixed installations, the signal transmitting cables must be strong, light and flexible.

5) Directional control valve

With proportional and ON/OFF electrohydraulic control.

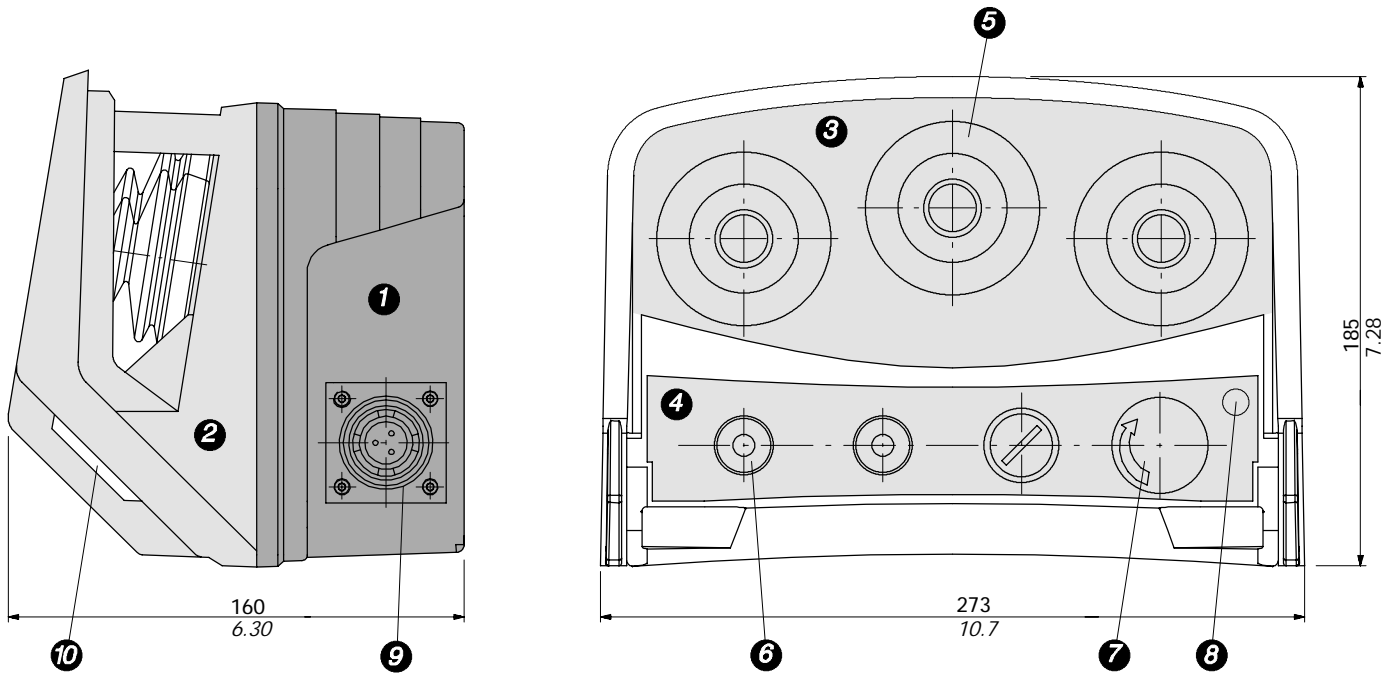
Features

- It hold single and double axis joysticks, emergency push-button (always present), selectors, LEDs, microswitches and push-buttons for control of all machine functions.
- The structure is made of injection molded glass filled polypropylene wich give it excellent characteristics against enviroments as well as strenght and light weight.
- It always includes SAJ card, for joystick supply.
- Optional black shoulder-strap.

Working conditions

Weather protection	<i>with connector assembled</i>	IP54	
Ambient temperature range		from -30° to 50°C	
Weight	<i>with emergency push-button, connector and n.4 MEN11 joysticks</i>	1,4 Kg	<i>3.1 lb</i>

NOTE - *For different conditions please contact Sales Dept.*



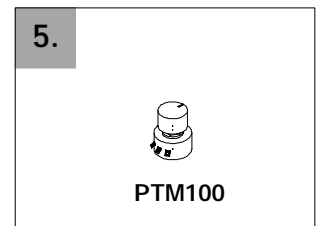
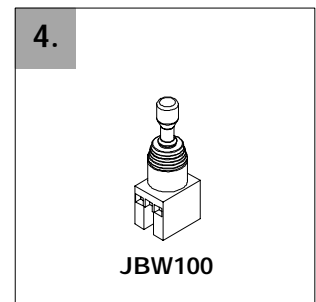
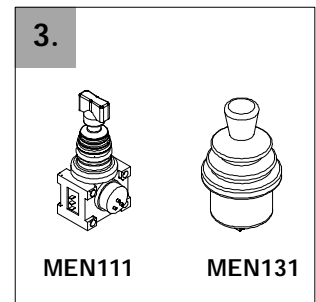
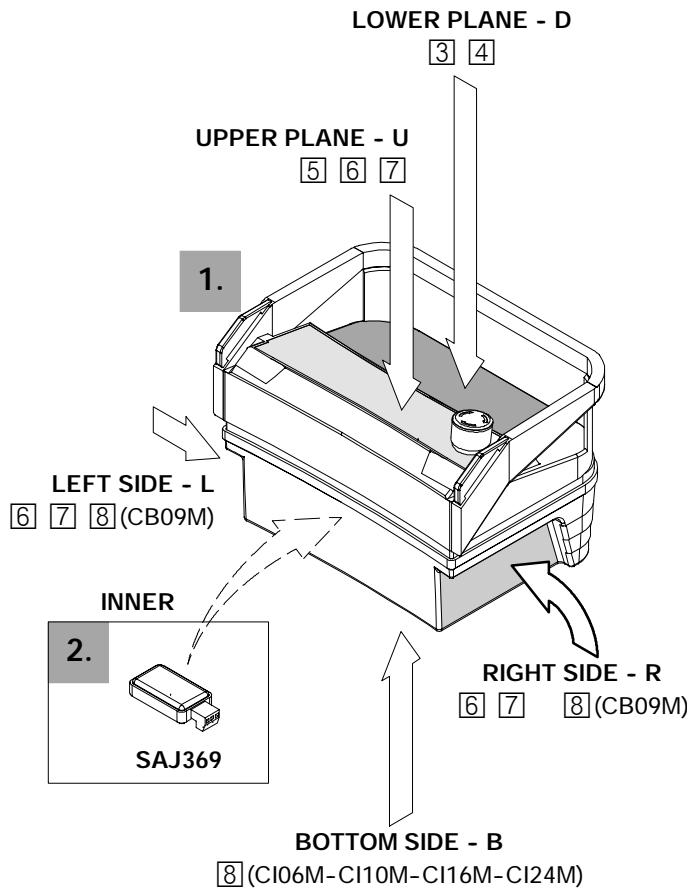
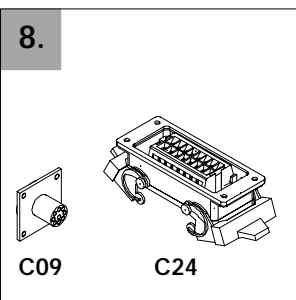
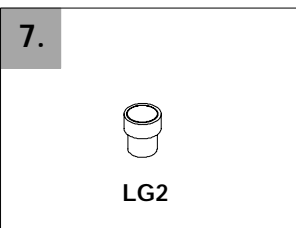
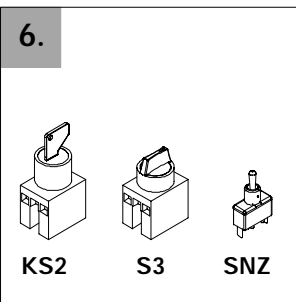
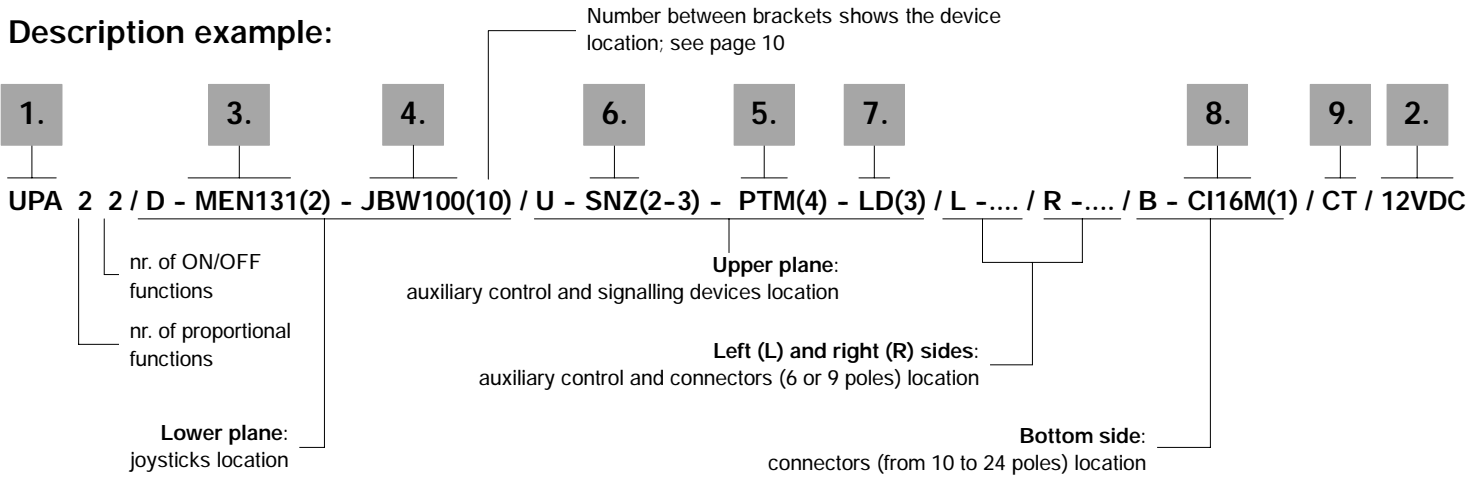
Callout

- 1) Base
- 2) Cover
- 3) Cover area for joystick location
- 4) Cover area for auxiliary control location
- 5) Joystick
- 6) Auxiliary control (ex.switch)
- 7) Emergency push-button (always present)
- 8) LED for supply on (always present)
- 9) Connector for UGA control unit connection
- 10) Slot for shoulder-strap

Ordering codes

Following description shows the sequence for console assembling.
 Joysticks, auxiliary controls and connectors location follow the instructions on the next pages.

Description example:



1. Base box

TYPE	CODE	DESCRIPTION
UPA00	VBOX700001	Base box without holes, with emergency push-button and red LED

2. Supply card *page 13*

TYPE	CODE	DESCRIPTION
SAJ309P	VSCH300001	Electronic card for 12 VDC supply
SAJ369	VSCH300002	Electronic card for 24 VDC supply

3. Proportional joysticks *page 14*

TYPE	CODE	DESCRIPTION
MEN111	VJOY100001	Ergonomic knob, single axis with centre microswitch
MEN112	VJOY100002	Ergonomic knob, single axis with 2 centre microswitches
MEN113	VJOY100003	Ergonomic knob, single axis with centre and 2 directional microswitches
MEN131	VJOY100006	Tapered knob, single axis with 1 centre microswitch
MEN231	VJOY100005	Tapered knob, double axis with centre microswitch

4. ON/OFF joysticks *page 19*

TYPE	CODE	DESCRIPTION
JBW100	VJOY300001	Cylindrical knob, single axis with spring return in neutral position
JBW101	VJOY300002	Cylindrical knob, single axis with detent in the 3 position
JBW200	VJOY300003	Cylindrical knob, double axis with spring return in neutral position

5. Aux. proportional control *page 18*

TYPE	CODE	DESCRIPTION
PTM100	VPOT100001	Unidirectional rotating potentiometer

6. Auxiliary ON/OFF controls *page 20*

TYPE	CODE	DESCRIPTION
SNZ	VINT100001	ON/OFF lever switch with detent
SNX	VINT100002	(ON)/OFF lever switch with spring return
SNT	VINT100003	ON/OFF/ON lever switch with detent
SNY	VINT100004	(ON)/OFF/(ON) lever switch with spring return
KS2	VSEL100001	2 positions key selector with detent
KS3	VSEL100002	3 positions key selector with detent
S2D	VSEL200001	2 positions selector with detent
S2T	VSEL200002	2 positions selector with spring return
S3D	VSEL200003	3 positions selector with detent
S3T	VSEL200004	3 positions selector with spring return
PNR	VPUL100001	(ON)/OFF red push-button with spring return
PNV	VPUL100002	(ON)/OFF green push-button with spring return

7. Signalling devices *page 21*

TYPE	CODE	DESCRIPTION
LDR	VLED100001	Red LED
LDV	VLED100004	Green LED
LDG	VLED100007	Yellow LED
LG2	VLED100002	Red signal lamp 12 VDC
LG4	VLED100003	Red signal lamp 24 VDC

8. Connectors *page 22*



TYPE	CODE	DESCRIPTION
CI06M	VCON130004	6 poles male connector
CB09M	VCON130005	9 poles male connector
CI10M	VCON130001	10 poles male connector
CI16M	VCON130002	16 poles male connector
CI24M	VCON130003	24 poles male connector

9. Accessories

TYPE	CODE	DESCRIPTION
CT	WW00650	Shoulder-strap

Devices location

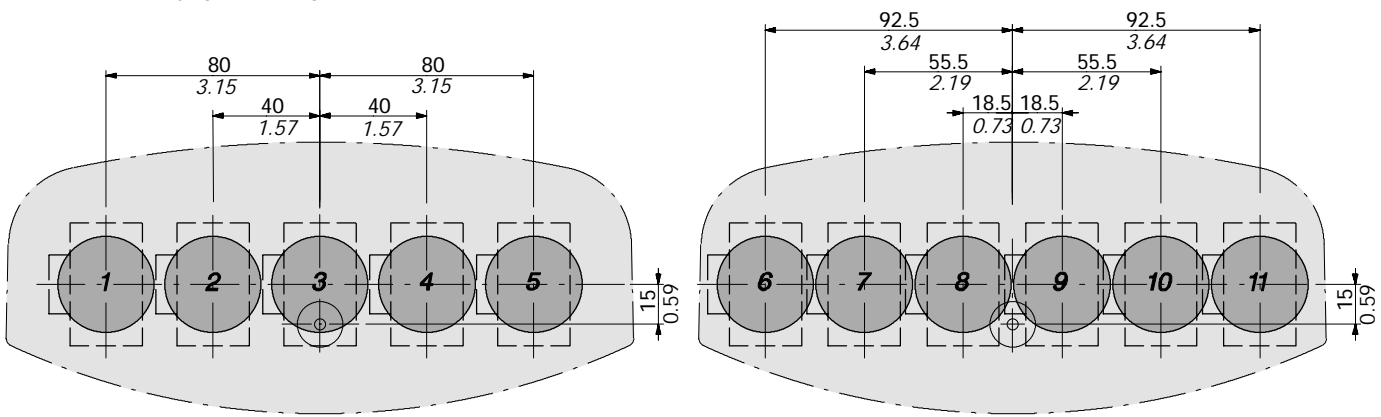
Here below are visualized the different positions where, joysticks, aux. components, connectors, etc., can be mounted. Each position has a number which must be indicated in the description, in order to obtain a correct configuration of the UPA.

-  Hatched line = overall dimensions under mounting plane
-  Continuous line = overall dimensions over mounting plane

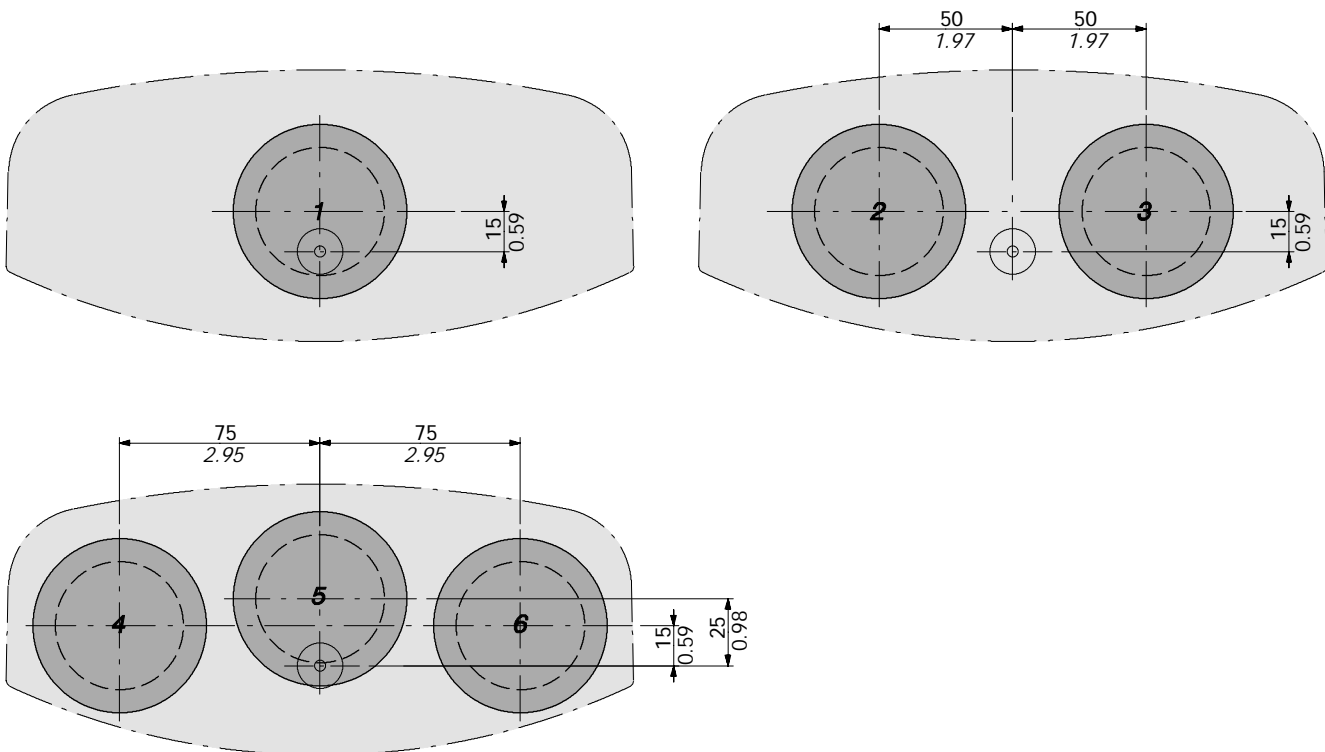
Joysticks location on lower plane D

Many arrangements are possible with several joysticks, but the positions must not be overlapped. Dimensions are referred to console central stud. For other arrangements or positioning please contact Sales Dept.

Proportional joysticks type MEN111-112-113

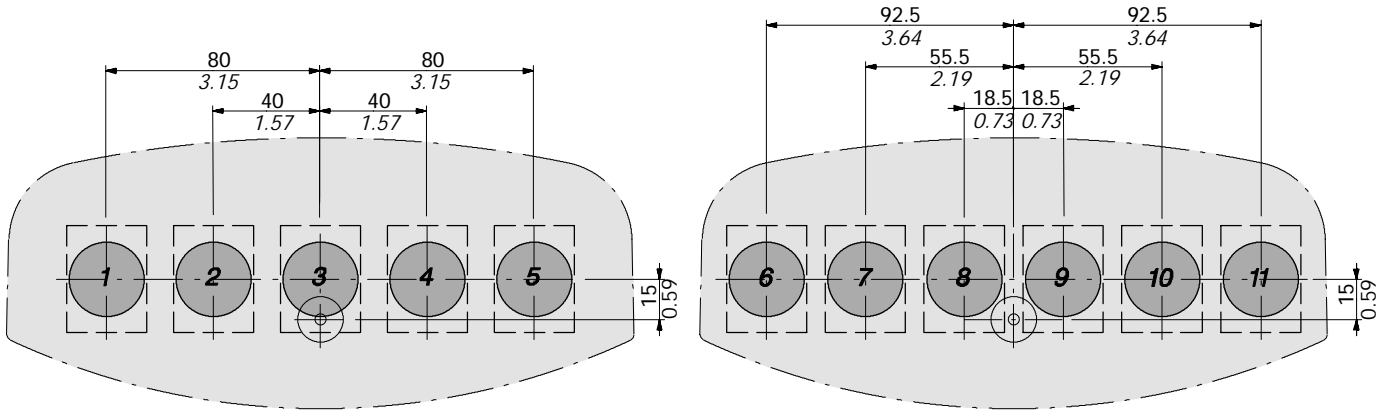


Proportional joysticks type MEN131-231



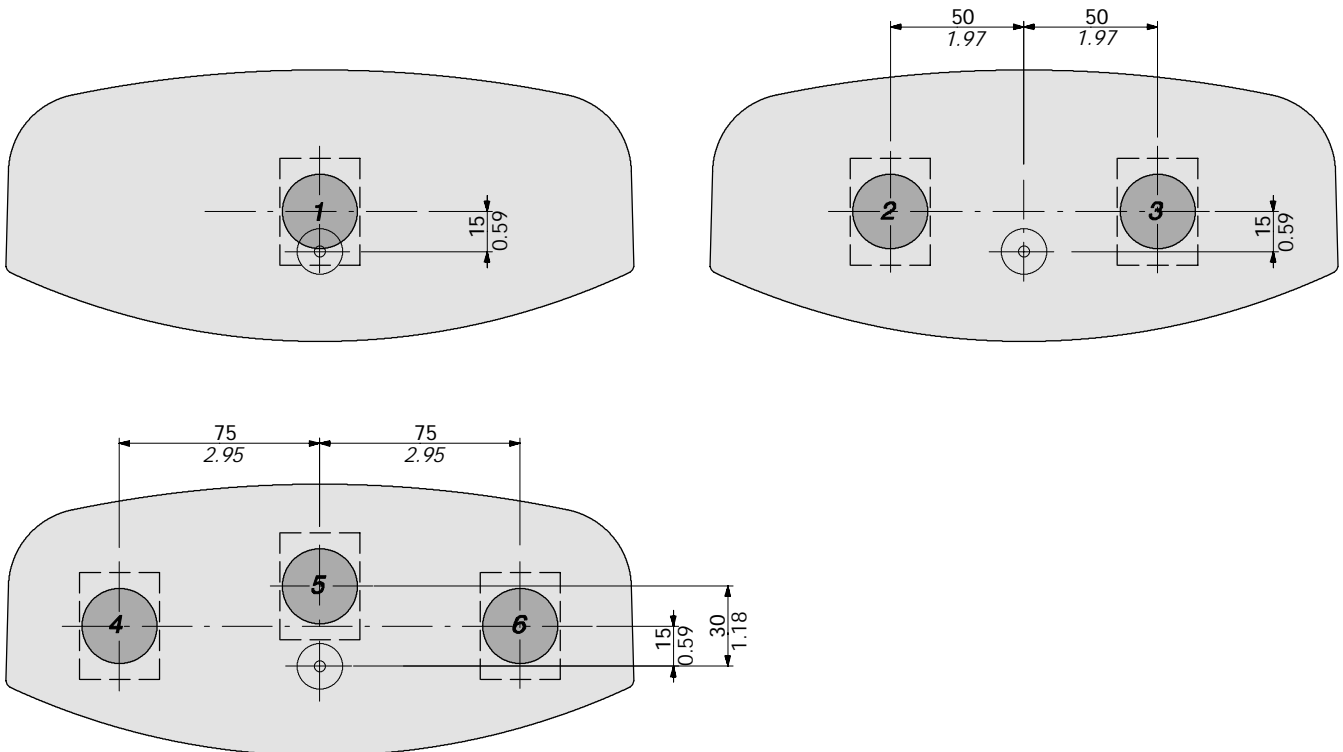
Joysticks location on lower plane D

ON/OFF joysticks type JBW100-101



ON/OFF joystick type JBW200

Even if they have the same dimensions of JBW100-101, we can't consider the same positioning, because they are double axis and they need more space.

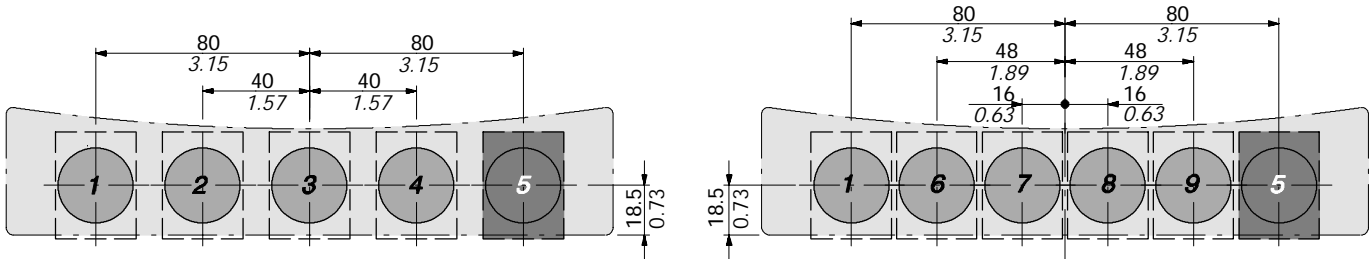


Devices location

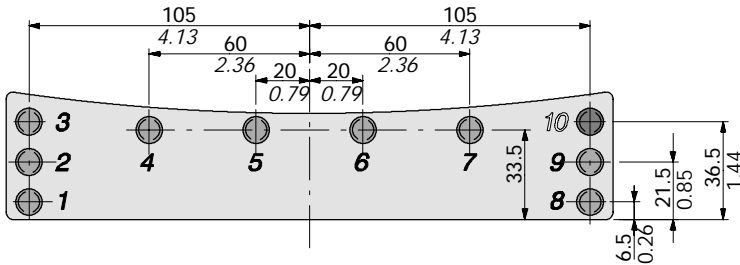
Auxiliary controls location

Upper plane U

Lever switches, selectors, push-buttons, potentiometer and signalling devices

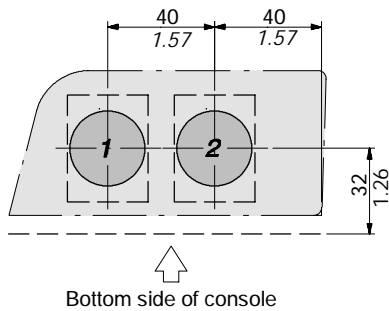


LEDs



It's possible to mount up to 6 auxiliary controls and up to 10 LEDs.
Control position nr. 5 and LED position nr. 10 are always used for emergency push-button and gen. LED.

On left side L and right side R



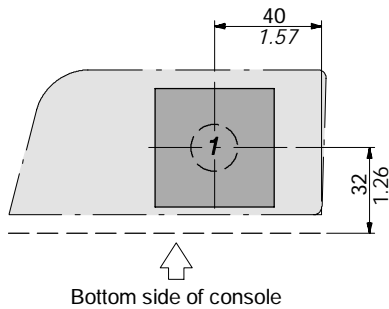
2 positions are available as standard; for different positions contact Sales Dept.

Connectors location

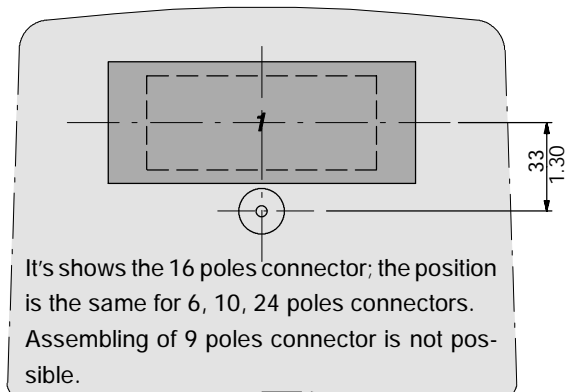
Connectors can be placed on left, right and bottom side.

On left side L and right side R

Only 9 poles connector are available for mounting on these sides.



On bottom side B



It's shows the 16 poles connector; the position is the same for 6, 10, 24 poles connectors.
Assembling of 9 poles connector is not possible.

Joysticks supply card SAJ369 - SAJ369P

Features

In order to operate correctly, joysticks of the type ARC300 need to be supplied by an electronic card (SAJ369) which provides a constant and stabilized voltage, so that their output signal is compatible with SAS cards. As this signal is of 6V + 3V, even if there is a short circuit, either with zero (0V) or with supply (12VDC or 24VDC), the SAS cards will receive a signal which is not included in the operating range; in this way undesirable operations are not possible.

ARC300 system has been designed to have only one SAJ369 card, regardless the number of joysticks. It can be placed near the joysticks or inside the portable unit according to the system configuration.

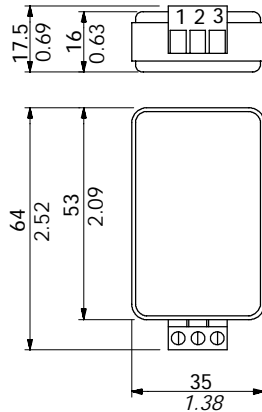
- It is feed by the supply voltage.
- It is protected against supply reverse voltage.
- Provides a constant and stabilized 9VDC voltage, independent from the supply voltage variations.

Working conditions

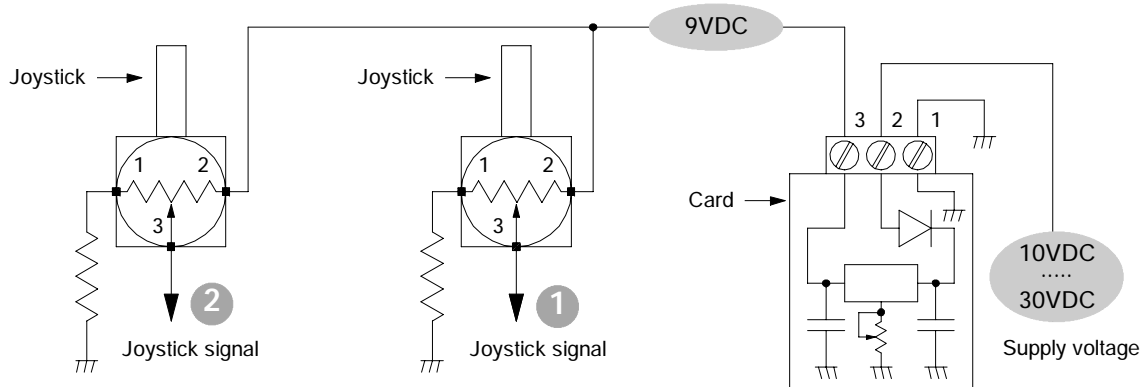
Nominal voltage 12VDC
 supply voltage : from 10 VDC to 15 VDC
 Nominal voltage 24VDC
 supply voltage : from 21 VDC to 30 VDC

Output voltage : 9 VDC
 Power rating : 72 mW
 Ambient temperature range : from -20°C to 70°C
 Weight : 0.1 Kg - 0.22 lb

Dimensional data



Wiring example



Proportional controls

Mini series single axis joysticks MEN111 - MEN112* - MEN113*

They are single axis proportional joysticks with small overall dimensions particularly suitable for integration into console (UPA). Low operation efforts, the possibility to incorporate one or two microswitches and ergonomic knob, make these joysticks the right devices to operate cranes, concrete booms, etc.

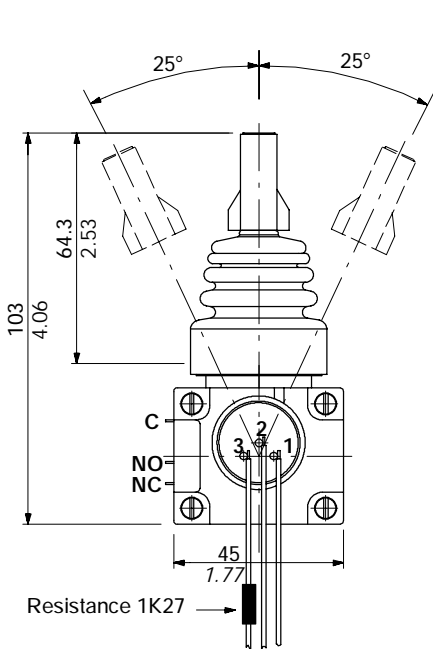
- Single axis proportional joysticks with rotating potentiometer.
- Ergonomic knob.
- Glass filled Nylon moulded enclosure.
- Single axis bi-directional movement with spring return to neutral position.
- Possibility to incorporate up to three microswitches providing an ON/OFF signal as soon as the joystick is activated.

Working conditions

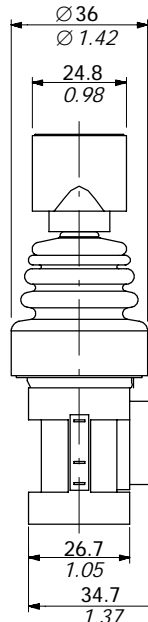
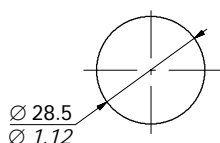
Supply voltage : from 5 VDC to 15 VDC
 Output signal (Vout/Vin%) : from 40% to 89%
 Centre signal (Vout/Vin%) : 66%
 Potentiometer resistance : 2.5 Kohm
 Power rating (at 20°C) : 2 W
 Resolution : infinite
 Full stroke deflection angle : ± 25°

Max. current (on microswitches) . . . : 1.5 A
 Nr. of proportional functions : 1
 Mechanical life : ≥ 2.8x10⁶ cycles
 Weather protection
 (above fixing panel) : IP65
 Ambient temperature range : from -20°C to 70°C

Dimensional data



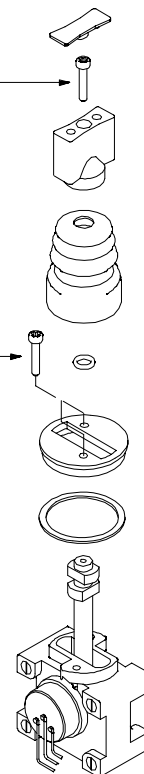
Drilling template



Nr.3 wires
 section. 0.35 mm² - 5.4x10⁻⁴ in²
 length 400 mm - 15.7 in

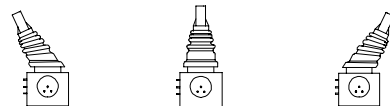
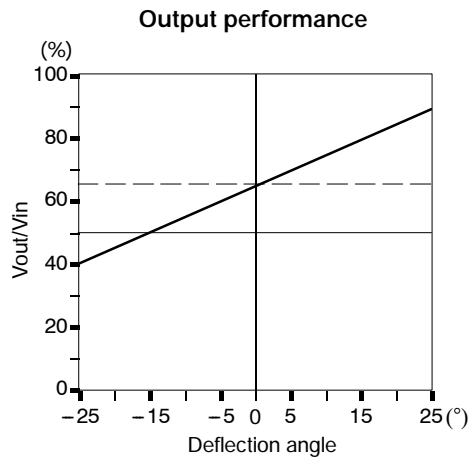
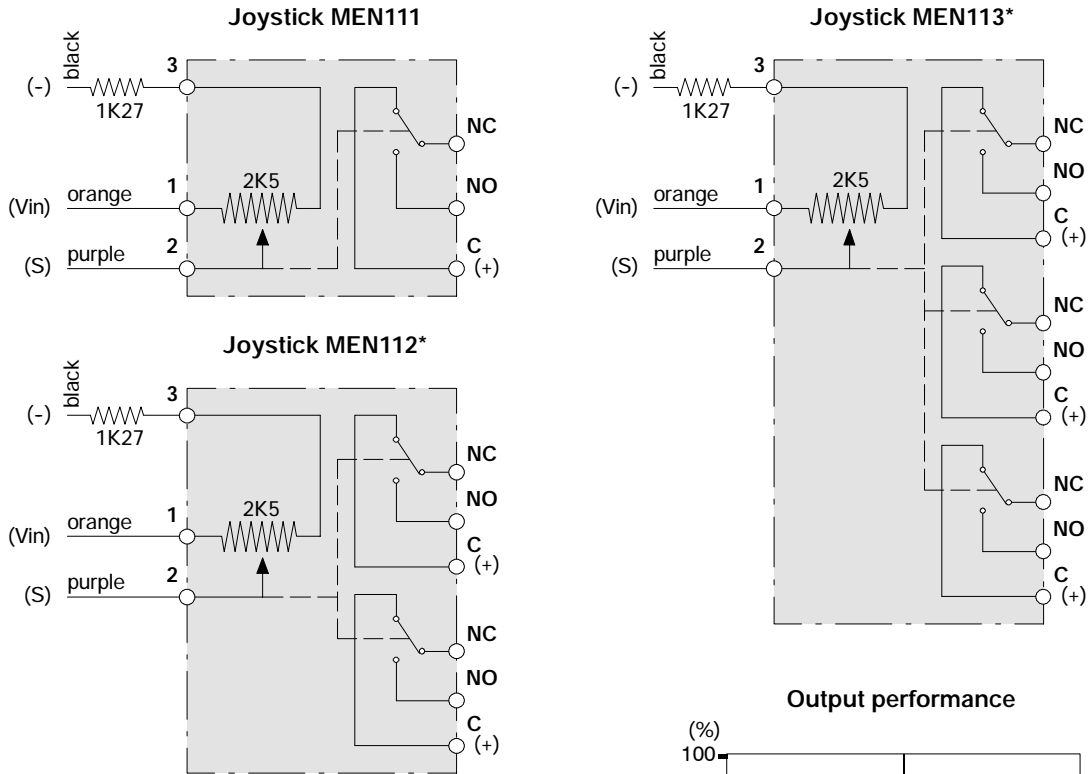
Assembling sequence

Nr.3 thread-forming
 self-tapping screws
 ISO 7051-ST2.9x1.6-C-H



Mini series single axis joysticks MEN111 - MEN112* - MEN113*

Electric circuit



NOTE (*) - Special configuration not available as standard

Description

	MEN 1	1	2	
Nr. of proportional functions	1	1	1	With 1 centre microswitch
		2	2	With 2 directional microswitches *
Ergonomic knob	1	3	3	With 1 centre microswitch and 2 directional microswitches *

Proportional controls

Mini series single and double axis joysticks MEN131 - MEN231

They are single and double axis proportional joysticks with small overall dimensions particularly suitable for integration into console (UPA).

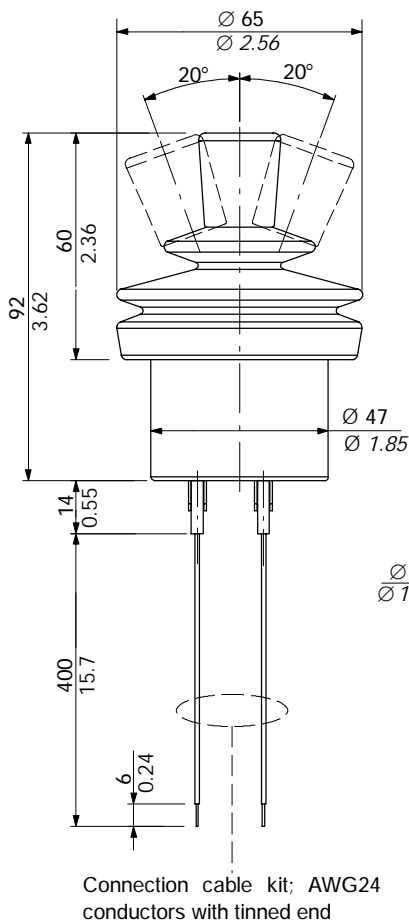
- Single or double axis proportional joystick.
- Tapered knob.
- Glass filled Nylon moulded enclosure.
- Movement with spring return in neutral position.
- With 1 microswitch in central position.
- It is complete with cable kit for all functions connection.

Working condition

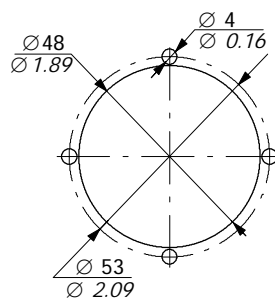
Supply voltage : from 5 VDC to 15 VDC
 Output signal (Vout/Vin%) : from 33% to 100%
 Centre signal : 66%
 Resistance : 5 Kohm
 Power rating (at 40°C) : 0,2 W
 Resolution : infinite
 Max. current
 (on directional microswitch) : 3 A at 30VDC

Nr. of proportional functions : up to 2
 Full stroke deflection angle : ± 20°
 Mechanical life : ≥ 2,8x10⁶ cycles
 Weather protection
 (above fixing panel) : IP65
 Ambient temperature range : from -20°C to 70°C

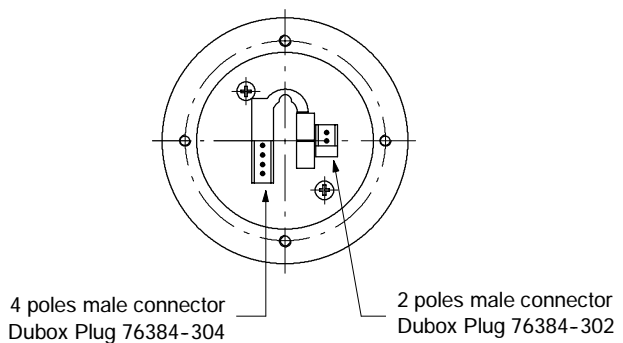
Dimensional data



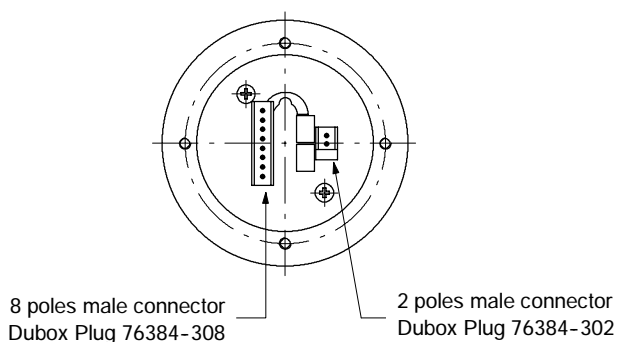
Drilling template



Single axis joystick bottom view
 (cable less: for cable kit see next page)

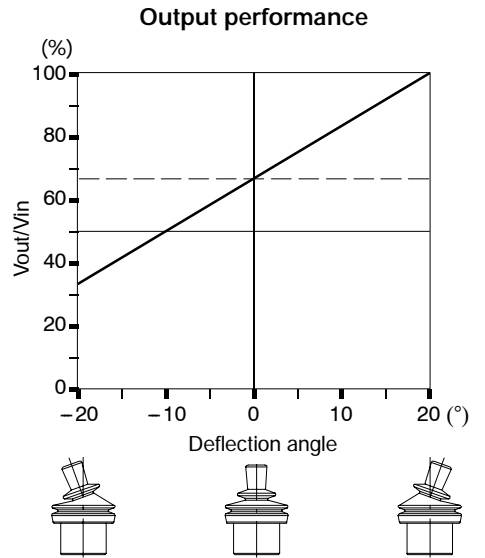
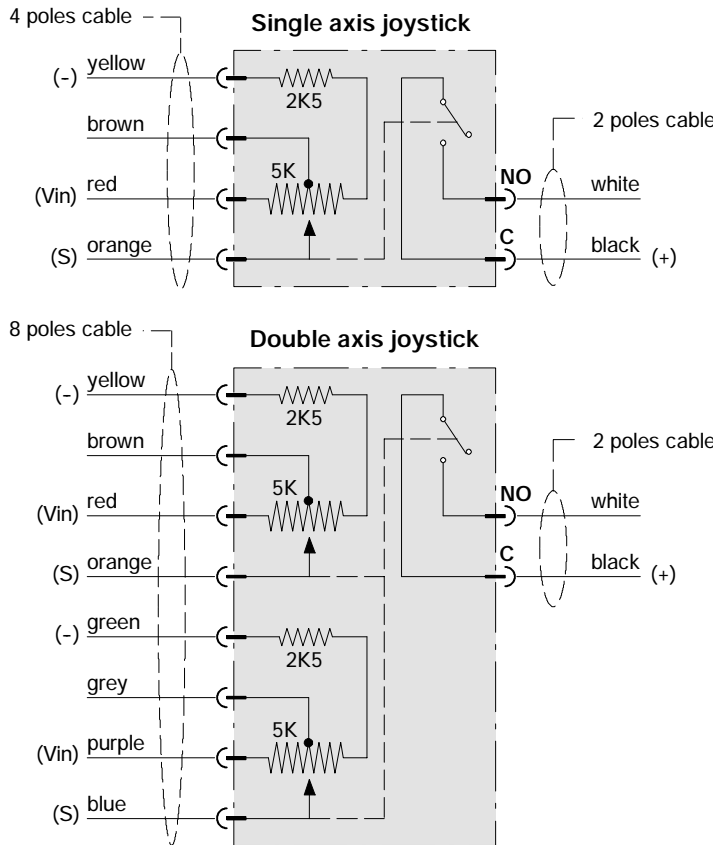


Double axis joystick bottom view
 (cable less: for cable kit see next page)



Mini series single and double axis joysticks MEN131 - MEN231

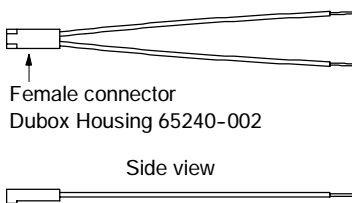
Electric circuit



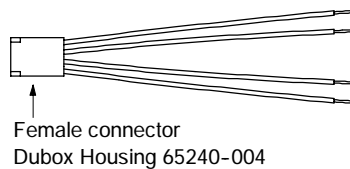
Cables

Connecting cables are supplied with the joystick, but they are also available as spare parts: they consist of a female connector and AWG24 wires with tin-plate terminals.

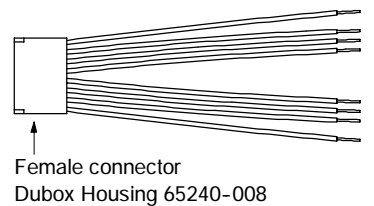
2 poles cable: code **W0450001**



4 poles cable: code **W0450002**



8 poles cable: code **W0450004**



Description

MEN **2** **3** **1**

Nr. of proportional functions (up to 2) ... **1** **1** ... With 1 central microswitch

..... **2**

Tapered knob **3**

Single and double axis joysticks JBW100-101-200

They are single and double axis ON/OFF joysticks with small overall dimensions suitable for integration into console (UPA).

- Thermoplastic body with high mechanical strenght.
- With temporarily positions or detent.
- Cable tightening with binding-screw (cross head).

Working conditions

Nominal current : 10A/24VAC
2.5A/24VDC

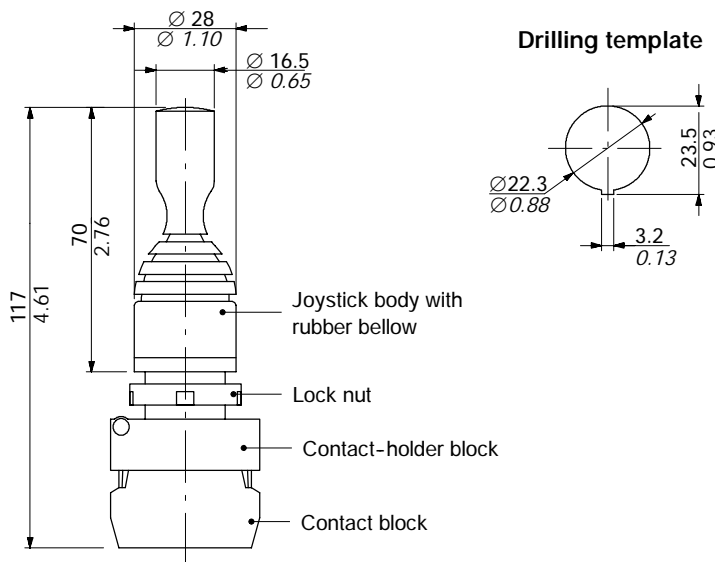
Conductor size : min 22 AWG
max 12 AWG

Electrical life : $\geq 10^6$ cycles / 24VDC

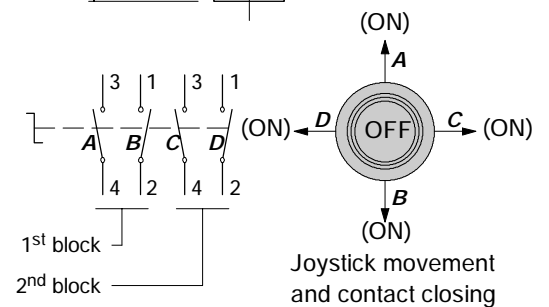
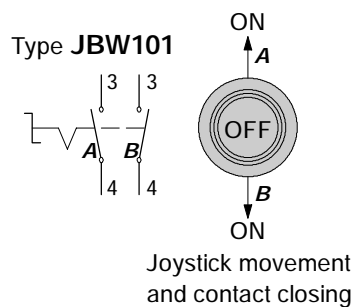
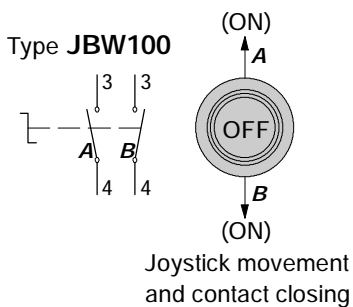
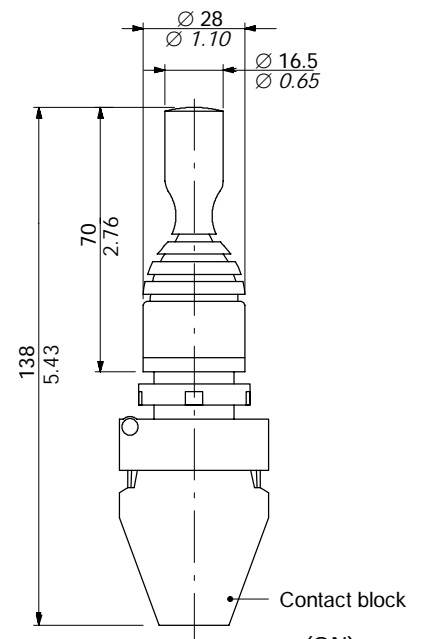
Ambient temperature range : from -25°C to 70°C

Mechanical life : $\geq 0.5 \times 10^6$ cycles

Single axis dimensional data JBW100-101



Double axis dimensional data JBW200



Description

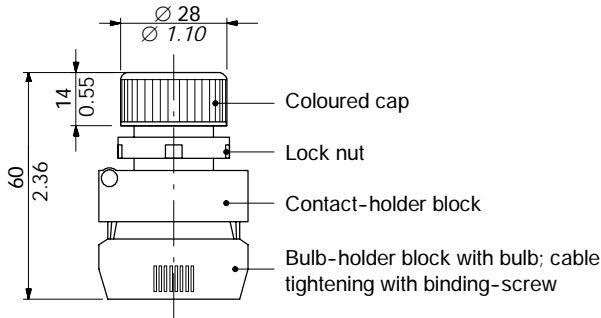
JBW 1 0 0

Single axis 1 0 Temporarily positions
Double axis 2 1 Positions with detent

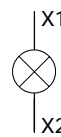
Signal lamps

Working conditions

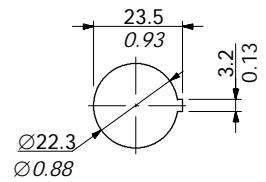
Max. electric load : 250V - 2W
 Bulb type : BA9S
 Cap colour : red (differen colours on request)
 Ambient temperature range : from -20°C to 70°C



Scheme



Drilling template



Description

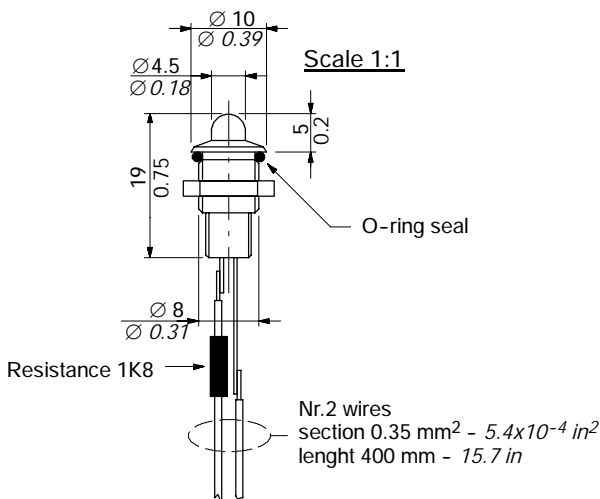
LG R 2

Red cap **R 2** 12VDC supply
 **4** 24VDC supply

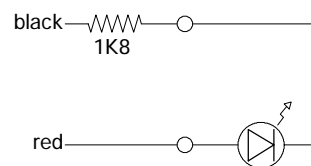
LEDs

Working conditions

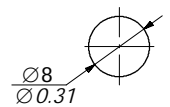
Colour : red green yellow
 Nominal current I_F : 30 mA 25 mA 50 mA
 Candle-power (at 20 mA) : 600 mcd 60 mcd 400 mcd
 View angle : 60°
 Ambient temperature range : from -55°C to 100°C



Electric circuit



Drilling template



Description

LD R

R Red
D Green
G Yellow

Connectors

The choice of the right connector (male) for the console is related to the number of poles needed to control all the functions (proportional and ON/OFF) of the system.

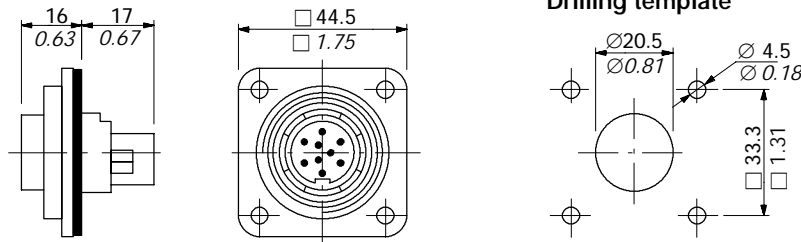
The overall number of poles is obtained adding to the 3 basic poles (+, -, emergency push-button), the number showed in the chart below.

LEDs and lamps don't need any additional pole.

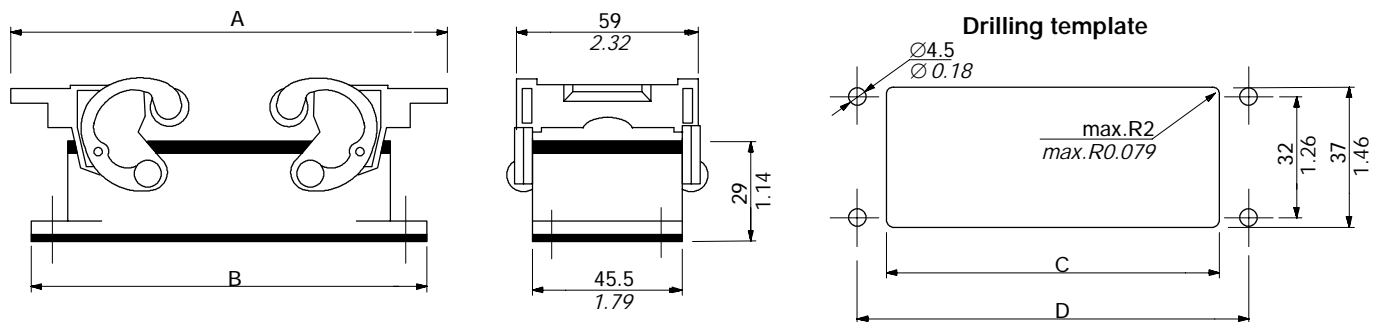
Proportional joysticks		ON/OFF joysticks		Potentiometer		Lever switches		Selectors and push-buttons	
Type	poles	Type	poles	Type	poles	Type	poles	Type	poles
MEN111	1 - (2)	JBW100	2	PTM100	1	SNZ	1	KS2	0
MEN112	1 - (3)	JBW101	2			SNX	1	KS3	1
MEN113	1 - (4)	JBW200	4			SNT	2	S2D	1
MEN131	1 - (2)					SNY	2	S2T	1
MEN231	2 - (3)							S3D	2
								S3T	2
								PTR-PTV	1

NOTA - The number in brackets is the number of poles to be considered when the directional switch is used.

Male 9 poles Buccaneer connector



Male 6-10-16-24 poles connector



Connector type	Dimension A (mm - in)	Dimension B (mm - in)	Dimension C (mm - in)	Dimension D (mm - in)
6 poles CI06M	76 - 2.99	82.5 - 3.25	54 - 2.13	70 - 2.76
10 poles CI10M	135 - 5.31	95.5 - 3.76	67 - 2.64	83 - 3.27
16 poles CI16M	153 - 6.02	115.5 - 4.55	88 - 3.46	103.5 - 4.07
24 poles CI24M	179.5 - 7.07	142.5 - 5.61	104 - 4.09	130 - 5.12

Single and double axis joystick ME

They consist of a glass filled nylon moulded enclosure where the potentiometer and cam microswitches are mounted.

The lever, protected with a rubber bellow, is pivoted on a robust steel plate on which special grooves are machined.

When being used in a X or Y axis and a diagonal axis movement is required to operate two functions simultaneously, by slightly increasing the effort the operator can "feel" when is leaving the main axis and moving in a diagonal axis.

Many knobs of different shapes and dimensions are available.

They can be customized by incorporating either ON/OFF functions activated by push type or rocker type microswitches.

The number and type of the functions are determined by the different kind of bodies, while the movements depends on the kind of actuation (see page 26).

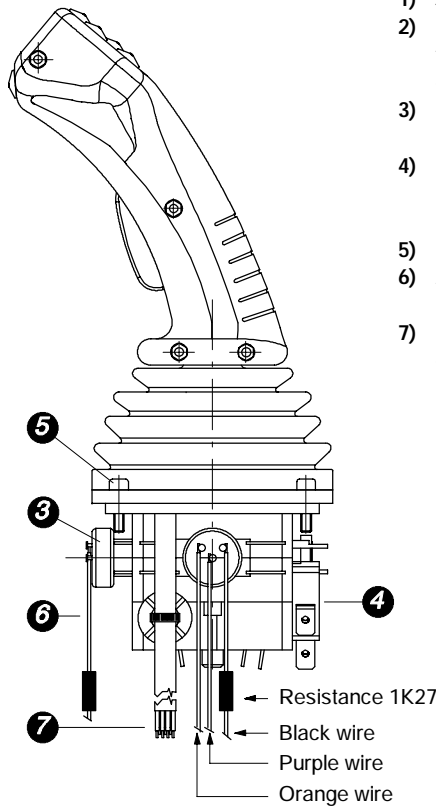
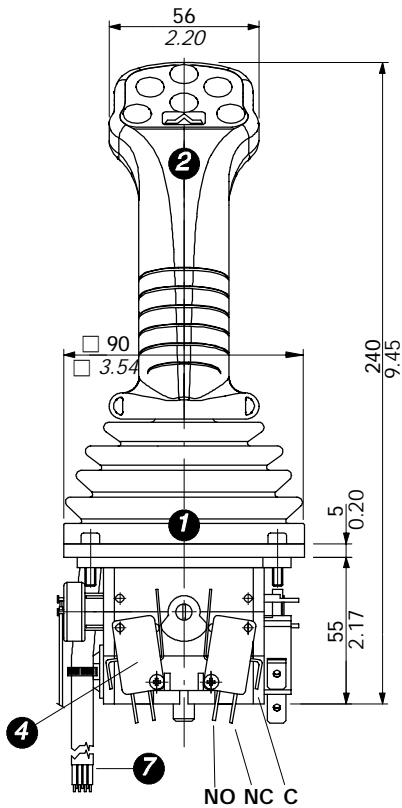
Working conditions

Supply voltage (Vin) : from 5 to 15 VDC
 Output signal (Vout/Vin%) : from 40% to 89%
 Centre signal (Vout/Vin%) : 66%
 Total resistance : 2,5 Kohm
 Power rating (at 20°C) : 2 W
 Max. current on directional
 microswitches : 5 A at 250 VDC

Full stroke deflection angle $\pm 25^\circ$
 Mechanical life : $\geq 2,8 \times 10^6$ cicli
 Weather protection
 (above fixing panel) : IP65
 Ambient temperature range : from -40°C to 75°C

Dimensional data

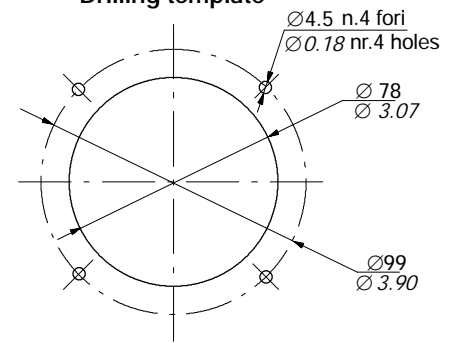
The picture below shows a typical configuration with H series handle, for different configurations see next pages.



Callout

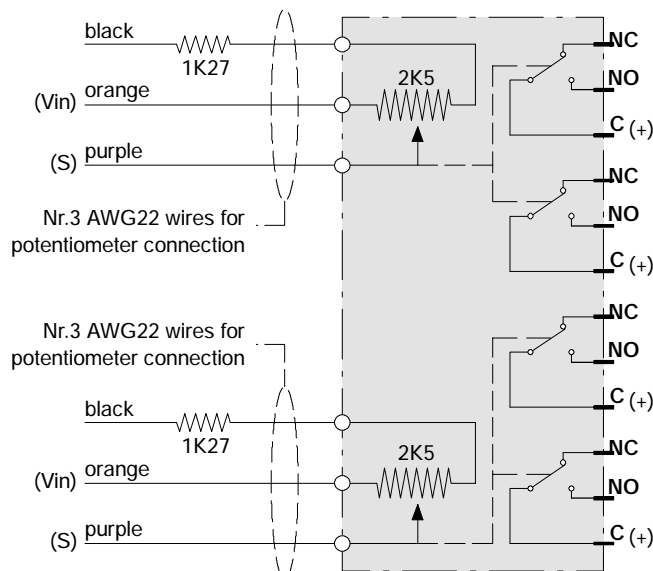
- 1) Joystick body
- 2) Knob with microswitches (it's show Series 40 type; for information and features see specific documentation)
- 3) Potentiometer: nr.1 for single axis, nr.2 for double axis
- 4) Directional microswitches (nr.2 for single axis, nr.4 for double axis) with 6.3x0.8 mm - 0.25x0.031 in Faston pin
- 5) M4 fixing screw (nr.4)
- 6) AWG22 wires L = 400 mm - 15.7 in , for potentiometer connection
- 7) Knob cable (for information see specific documentation)

Drilling template



Electric circuit

Joystick example with double axis and 4 microswitches



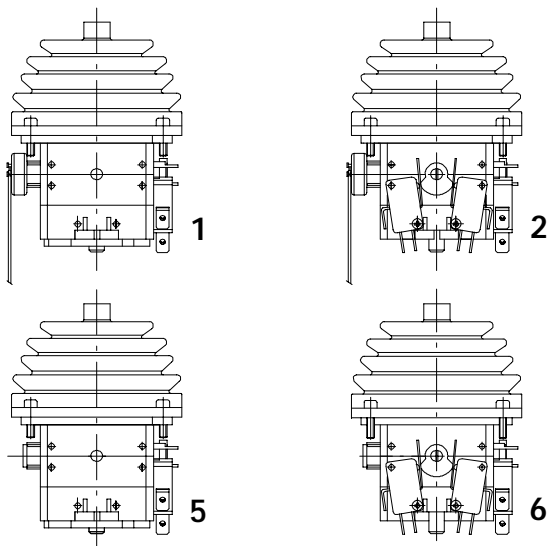
Ordering codes

Description example:



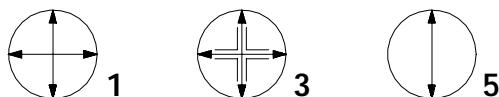
1. Function

TYPE	DESCRIPTION
1	Single axis, 1 proportional function
2	Double axis, 2 proportional functions
5	Single axis, 1 ON/OFF function
6	Double axis, 2 ON/OFF functions



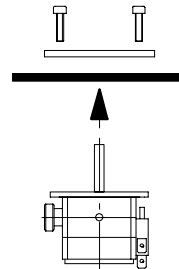
2. Actuation

TYPE	DESCRIPTION
1	Along all diagonal
3	Guided axis *
5	Single axis



3. Mounting

TYPE	DESCRIPTION
1	Bottom mounting (see page 25 for drilling template)



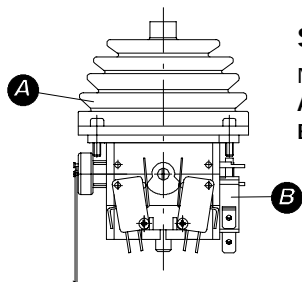
5. Complete body kit

Here below are listed the part number available; for different configuration contact Sales Dept.

TYPE	CODE	DESCRIPTION
ME151	VJOY150001	Single axis, 1 proportional function + 2 ON/OFF functions and bottom mounting
ME211	WW00205	Double axis, 2 proportional functions, actuation along all diagonal and bottom mounting
ME631	WW00544	Double axis, 2 ON/OFF functions, guided axis action and bottom mounting
ME611	WW00314	Double axis, 2 ON/OFF functions, actuation along all diagonal and bottom mounting

Spare parts

N.	CODE	DESCRIPTION
A	W1090001	Rubber bellow
B	WW00620	Honeywell directional microswitches



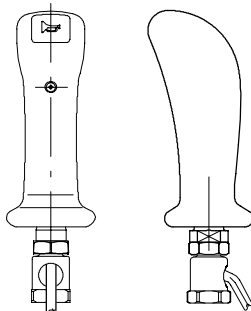
4. Available handles

Series 10, V, H handles assembled on a ME type joystick are available.
For any further information, please contact Sales Dept. or ask the related catalogue DHR001E.



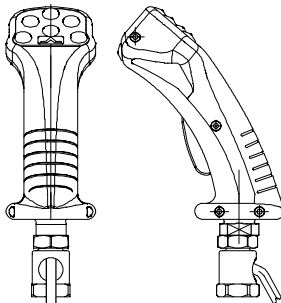
Series 10

TYPE	DESCRIPTION
WB	Without switches
XB	With upper spring return push-button
ZB	With upper detent push-button
YB	With 3 positions spring return rocker switch
KB	With upper protected spring return push-button
TB	With 3 positions detent rocker switch



Series V

TYPE	DESCRIPTION
V	Without switches or fitted with upper push-button or upper or front rocker switch.
VM	Fitted up to 4 (nr.1 upper, nr.3 front) push-buttons, 100/200mA type
VT	Fitted up to 4 (nr.1 upper, nr.3 front) push-buttons, 5A type
<u>EXAMPLE OF COMPLETE DESCRIPTION</u>	
V05B-045 = with front 3 positions spring return rocker switch, mounting joint and 450mm / 17.7 in length cable.	
VT11B-1R1045-2R2045 = with nr.1 front and nr.1 upper 5A red push-buttons, mounting joint and 450mm / 17.7 in length cable.	



Series H

TYPE	DESCRIPTION
H	Fitted up to 8 microswitch push-button, with rocker switch and "dead man" switch
HM	Fitted up to 4 push-buttons (100/200mA types), with "dead man" and ON/OFF switches
HT	Fitted up to 4 push-buttons (5A types), with rocker switch, "dead man" and ON/OFF switches
HZ	With potentiometer, fitted up to 2 microswitch push-button, "dead man" and ON/OFF switches
<u>EXAMPLE OF COMPLETE DESCRIPTION</u>	
HA06B-0RD035-1RD035-2RD035-3RD035-4RD035-5RD035-6RD035 = with nr.6 microswitch red push-buttons on plate, mounting joint and "dead man" switch.	
HTPB03B-PN035-1N035-4N035-5N035 = with nr.3 5A black push-buttons on plate, mounting joint and ON/OFF switch.	

Features

The UGA unit is the heart of the system.

It controls all proportional, ON/OFF and auxiliary functions of the machine.

The UGA control unit is placed close to the directional control valve to receive the weak signals coming from the joysticks.

It amplifies, cleans and transforms them to current that is supplied to the electrohydraulic modules.

Each proportional functions is easily adjustable using the potentiometer trimmers conveniently located under the box cover.

The UGA unit is available in 12VDC or 24VDC versions.

It can control up to 8 proportional and ON/OFF cards in a very small package size.

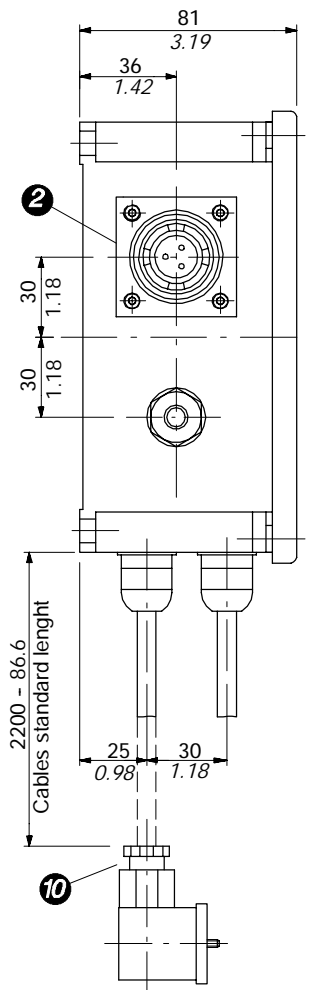
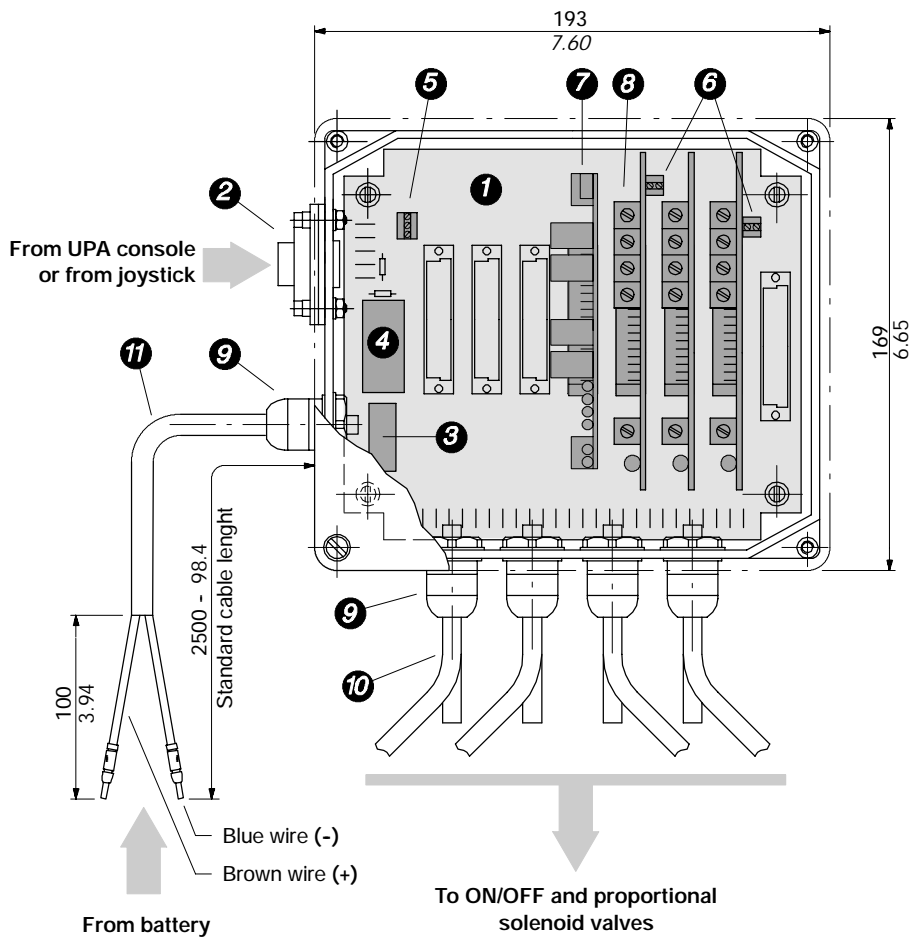
The cards can easily be replaced or adjusted in the field without changing electrical connections.

- It's supplied complete with fuse and emergency relay.
- Connection with portable unit or with separate joysticks is by a connector.
- Connection with solenoid pressure reducing valves is either by means of a suitable cable with connector or, if cables are more of 10, by means of a "connector kit" which can be disconnected from the box is required.

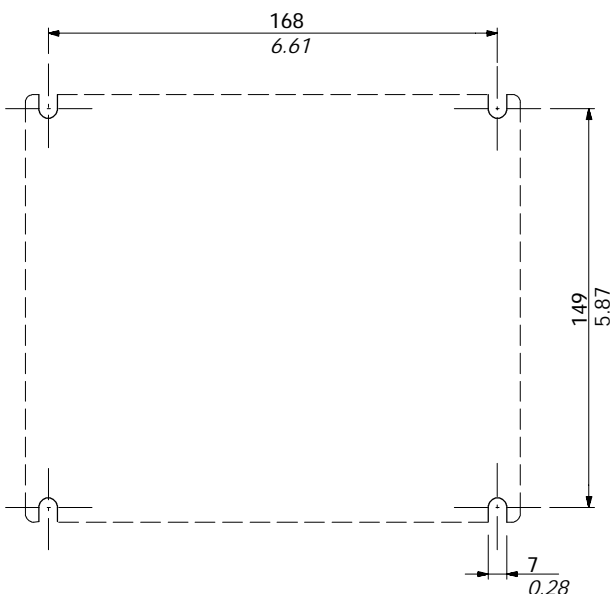
Working conditions

Supply voltage	<i>12 VDC nominal voltage</i>	from 11 VDC to 15 VDC	
	<i>24 VDC nominal voltage</i>	from 21 VDC to 30 VDC	
Permissive voltage variation	<i>12 VDC nominal voltage</i>	10%	
	<i>24 VDC nominal voltage</i>	10%	
Minimum drawn current (with 1 proportional card)	<i>12 VDC nominal voltage</i>	80 mA	
	<i>24 VDC nominal voltage</i>	50 mA	
Weather protection (CEI EN 60529)		IP55	
Ambient temperature range		from -20° to 70°C	
Weight	<i>Without cards</i>	0.9 Kg	1.98 lb

NOTE - For different conditions please contact Sales Dept.



Drillinf template

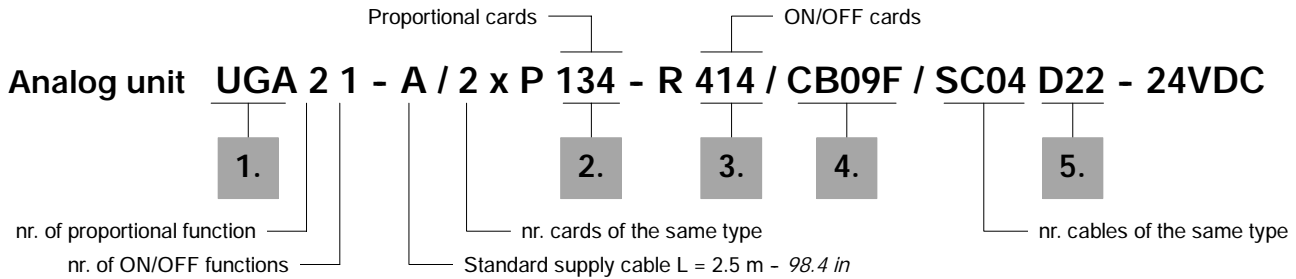


Callout

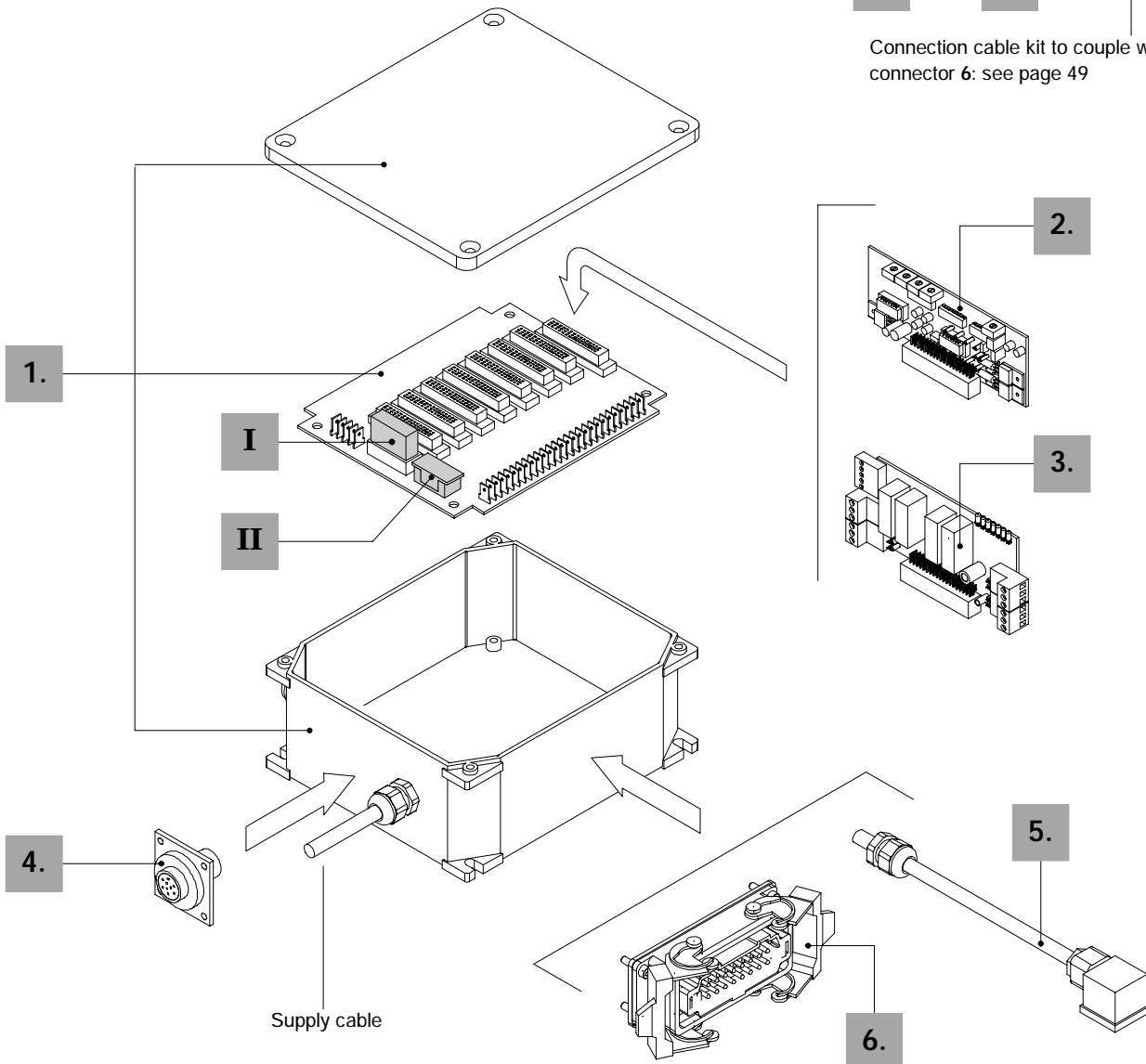
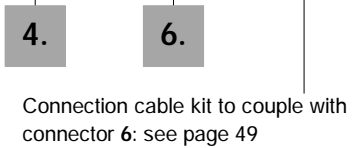
- 1) Main cards
- 2) 9 poles connector for Upa console and joysticks connection
- 3) Protective fuse
- 4) Emergency relay
- 5) Binding-screw block for SAS card signal
- 6) Binding-screw block for Fast/Slow function
- 7) ON/OFF card
- 8) Proportional card
- 9) PG9 core hitch.
- 10) Cable for solenoid valves connection, fit with connector
- 11) 2x1.5 mm² - 0.079x0.059 in² supply cable, with pin

Ordering codes

Description example:



UGA 3 3 / 3 x P 134 - 3 x R 414 / CI16F / CI16M / KC15 - 24VDC



1. Base box

TYPE	CODE	DESCRIPTION
UGA02	VBOX600001	Box with main card for 12VDC supply
UGA04	VBOX600002	Box with main card for 24VDC supply

2. Proportional cards *page 32*

TYPE	CODE	DESCRIPTION
<u>For control with joystick</u>		
SAS102	VSCH100001	12VDC card
SAS104	VSCH100002	24VDC card
SAS112	VSCH100005	12VDC card with ramp setting
SAS114	VSCH100006	24VDC card with ramp setting
SAS122	VSCH100009	12VDC card with Fast/Slow function
SAS124	VSCH100010	24VDC card with Fast/Slow function
SAS132	VSCH100013	12VDC card with Fast/Slow function and ramp setting
SAS134	VSCH100014	24VDC card with Fast/Slow function and ramp setting
<u>For control with potentiometer</u>		
SAS202	VSCH100003	12VDC card
SAS204	VSCH100004	24VDC card
SAS212	VSCH100007	12VDC card with ramp setting
SAS214	VSCH100008	24VDC card with ramp setting
SAS222	VSCH100011	12VDC card with Fast/Slow function
SAS224	VSCH100012	24VDC card with Fast/Slow function
SAS232	VSCH100015	12VDC card with Fast/Slow function and ramp setting
SAS234	VSCH100016	24VDC card with Fast/Slow function and ramp setting

3. ON/OFF cards *page 45*

TYPE	CODE	DESCRIPTION
REC012	VSCH200001	Without relay, for 12VDC direct connection
REC014	VSCH200002	Without relay, for 24VDC direct connection
REC212	VSCH200003	With 2 relays, 12VDC
REC214	VSCH200004	With 2 relays, 24VDC
REC412	VSCH200005	With 4 relays, 12VDC
REC414	VSCH200006	With 4 relays, 24VDC

4. Multipoles female connector *page 48*

It connects the analog unit to console

TYPE	CODE	DESCRIPTION
CI06F	VCON110001	6 poles
CB09F	VCON110002	9 poles
CI10F	VCON110003	10 poles
CI16F	VCON110004	16 poles
CI24F	VCON110005	24 poles

5. Cable kit with connector *page 48*

TYPE	CODE	DESCRIPTION
B22	VCAV100001	2P+T DIN43650/A connector with cable L = 2.2 m - 86.6 in
D22	VCAV100002	3P+T DIN43650/A connector with cable L = 2.2 m - 86.6 in
S16	VCAV100003	2P+T DIN43650/B connector with cable L = 1.6 m - 63 in
S22	VCAV100004	2P+T DIN43650/B connector with cable L = 2.2 m - 86.6 in
T22	VCAV100005	AMP "JPT" connector with cable L = 2.2 m - 86.6 in
O22	VCAV100006	Cable L = 2.2 m connector less

6. Multipoles male connector *page 49*

Cables for solenoids connection can be substitute by a multipoles connector.

This operation is executed always when cables are more than 10.

TYPE	CODE	DESCRIPTION
CI10M	VCON130001	10 poles (substitute from 4 to 8 cables)
CI16M	VCON130002	16 poles (substitute from 9 to 12 cables)
CI24M	VCON130003	24 poles (substitute from 12 to 20 cables)

I Cards supply relay

CODE	DESCRIPTION
WW00213	Double poles 12VDC/5A
WW00279	Double poles 24VDC/5A

II Cards protection fuse

CODE	DESCRIPTION
WW00282	Fuse 1A 5x20
WW00302	Fuse 2A 5x20
WW00281	Fuse 3.15A 5x20
WW00058	Fuse 5A 5x20
WW00284	Fuse 6.3A 5x20
WW00283	Fuse 10A 5x20
WW00521	Fuse 16A 5x20

Proportional electronic cards

For joystick control

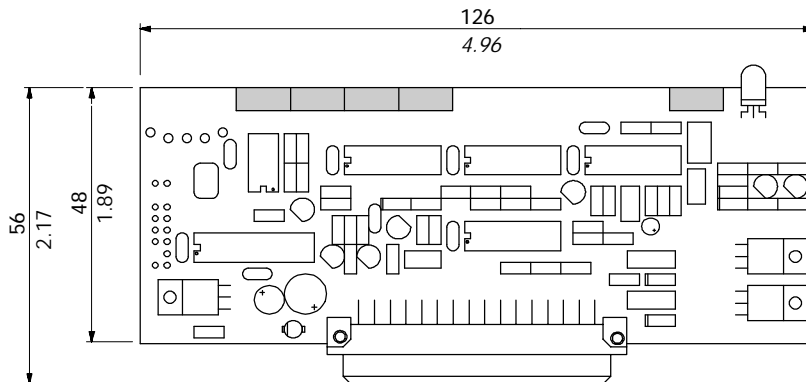
These SAS analog proportional cards convert the input signal (6V/3V for solenoid A and 6V/9V for solenoid B) provided by the electric joystick to a useable amplified output current.

They provide the proportional control of two solenoid operated pressure reducing valves.

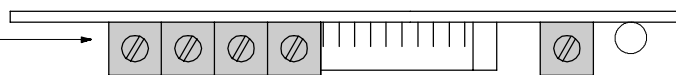
- The output current (solenoid pilot current) is a pulse width modulated current (PWM modulation). It involves a square wave with constant frequency (dither frequency), in which ON/OFF ratio varies according to the required current value on the proportional solenoid. By piloting with a PWM modulated current, friction effects on the valves spools are substantially reduced.
- The output current is kept constant even with variations in temperature and solenoid resistance.
- Imin setting determines the value of the current at the exit from the dead band of the joystick; this adjustment gives a slower or a faster response when the joystick is operated.
- Imax setting determines the maximum achievable current value i.e. the max stroke of the main spool. In the DPC proportional valve, it determines the maximum flow value (l/min) from A and B ports.
- Using the dither frequency setting, the card can be used in connection with valves having different characteristics.
- The card is protected against supply reverse voltage and overvoltage and against solenoid short-circuits and overvoltages.

WARNING Welding on the machine frame may permanently damage the electronic components.

- As the card is able to recognize short-circuits in the connection with the joystick-console, undesirable actuations of the valve, caused by damage or incorrect connection of the cable, are avoided.



Adjusting trimmer: number and function depending on card type



Common working conditions

Nominal voltage 12VDC

- supply voltage : from 11 VDC to 15 VDC
- max.output current : 1.2 A
- min.output current range : from 0 to 0.70 A

Nominal voltage 24VDC

- supply voltage : from 21 VDC to 30 VDC
- max.output current : 0.65 A
- min.output current range : from 0 to 0.35 A

For joystick control

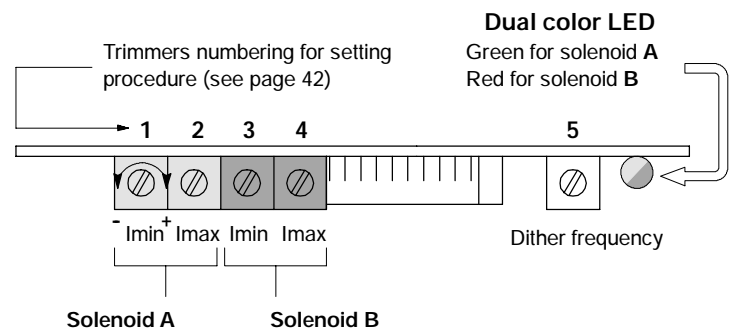
Standard type SAS102 - SAS104

Minimum currents (I_{min}) and maximum currents (I_{max}) can be set by means of potentiometer trimmers for solenoids A and B. The dither frequency potentiometer trimmer is the same for both solenoids.

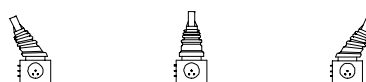
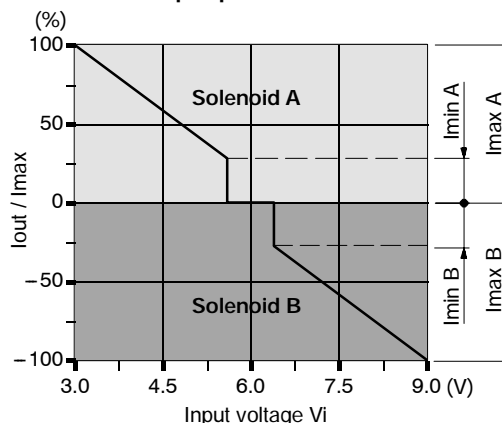
In order to simplify setting operations and to identify which trimmer to operate, there is a dual color LED, which can be green or red according to the operating direction of the joystick; for correct setting procedure see page 42.

Working conditions

- Maximum ripple : 10%
- Current drawn in neutral position . . : 20 mA
- Input signal voltage : from 3 V to 9 V
- Neutral voltage : 6 V
- Power rating : 15 W
- Dither frequency range (250Hz std) : from 80 Hz to 300 Hz
- Input impedance : 100 Kohm
- Dead band : $\pm 0,5$ V
- Joystick dead band : $\pm 5^\circ$
- Ambient temperature range : from -20°C to 70°C



Output performance



Proportional electronic cards

For Joystick control

With ramps type SAS112 - SAS114

It is possible to set two ramps for each solenoid, one positive (acceleration) and one negative (deceleration). For this reason they are recommended for those applications where start and stop have to follow predetermined settings.

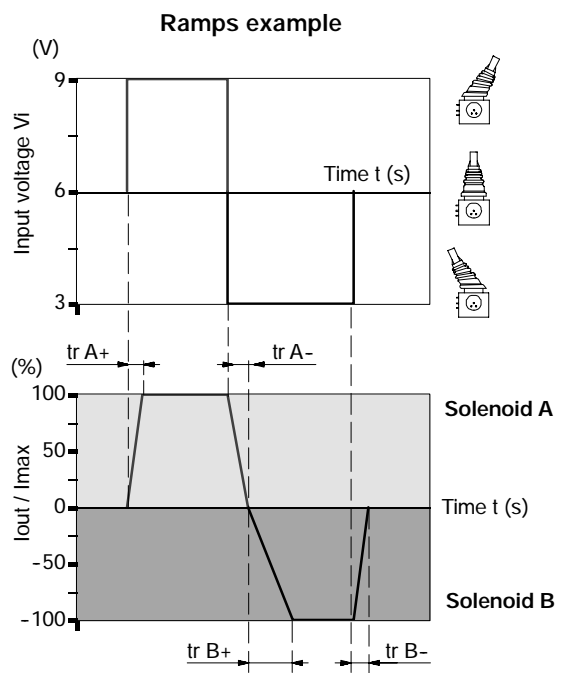
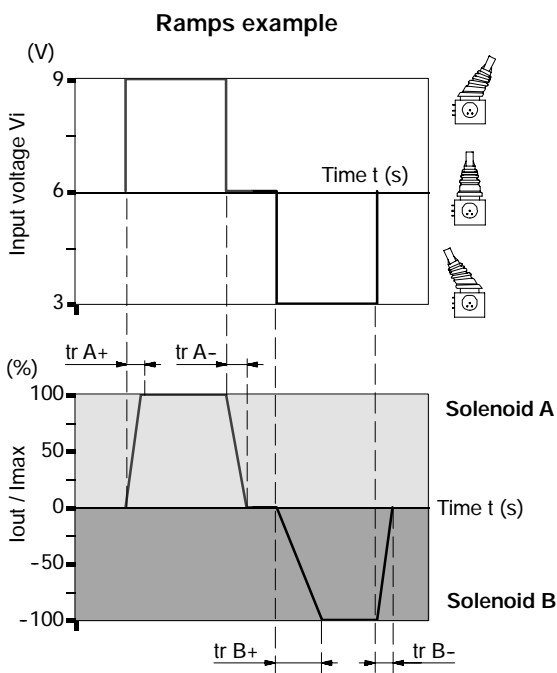
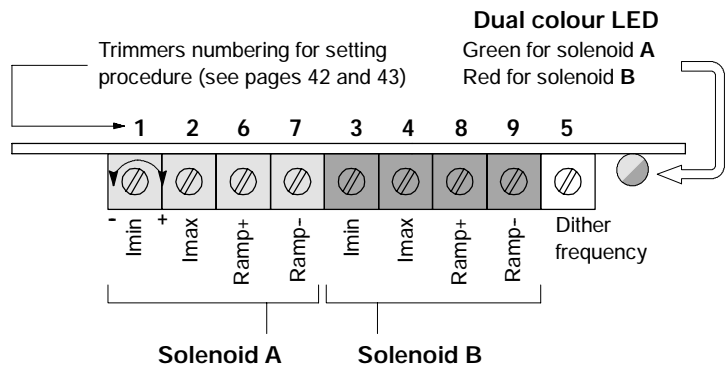
Minimum currents (I_{min}), maximum currents (I_{max}), negative and positive ramps can be set by means of potentiometer trimmers for solenoids A and B.

The dither frequency potentiometer trimmer is the same for both solenoids.

In order to simplify setting operations and to identify which trimmer to operate, there is a dual color LED, which can be green or red according to the operating direction of the joystick; for correct setting procedure see pages 42 and 43.

Working conditions

- Maximum ripple : 10%
- Current drawn in neutral position ... : 20 mA
- Input signal voltage : from 3 V to 9 V
- Neutral voltage : 6 V
- Power rating : 15 W
- Dither frequency range (250Hz std) : from 80 Hz to 300 Hz
- Input impedance : 100 Kohm
- Ramp time : from 0 to 2.5 s
- Dead band : $\pm 0,5$ V
- Ambient temperature range : from -20°C to 70°C



For joystick control

With Fast/Slow type SAS122 - SAS124

Using an external switch, the operator can choose two different machine speeds (Fast/Slow functions); for this reason they are recommended for those applications where, in addition to usual working requirements, special accuracy and sensitivity are mandatory. Minimum currents (I_{min}) and maximum currents (I_{max}), as well as Fast/Slow function can be set by means of potentiometer trimmers for solenoids A and B.

The dither frequency potentiometer trimmer is the same for both solenoids.

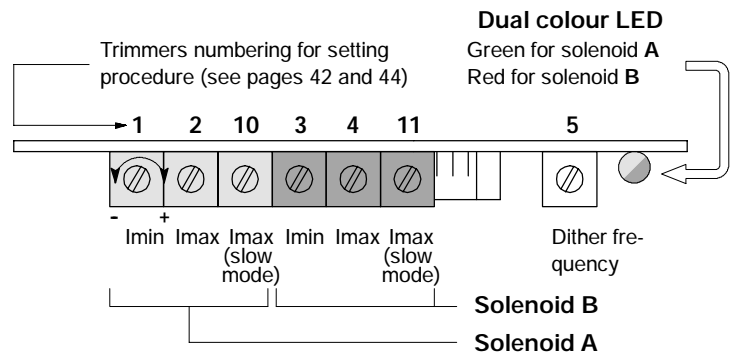
In order to simplify setting operations and to identify which trimmer to operate, there is a dual color LED; for correct setting procedure see pages 42 and 44.

Fast/Slow function is activated by an external switch.

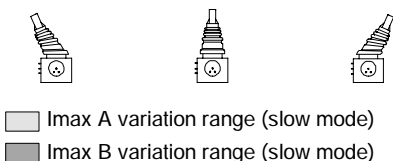
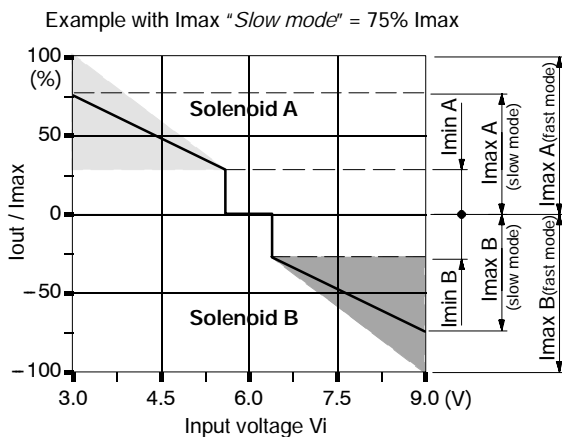
It can be operated either automatically or manually by the operator. This function reduces the maximum current (I_{max}) to a value preset on the relevant trimmer. As minimum current value (I_{min}) does not change, current variation range on the solenoid is reduced and as this sensed on the entire stroke of the joystick a higher sensitivity is obtained. The result is more precise control of the machine.

Working conditions

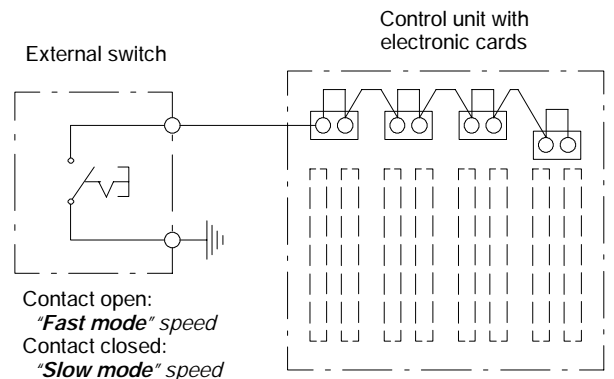
- Maximum ripple : 10%
- Current drawn in neutral position : 20 mA
- Input signal voltage : from 3 V to 9 V
- Neutral voltage : 6 V
- Power rating : 15 W
- Dither frequency range (250Hz std) : from 80 Hz to 300 Hz
- Input impedance : 100 Kohm
- "Slow mode" signal voltage : 0 V
- I_{max} (slow mode) variation range : I_{min} - I_{max}
- Dead band : ± 0.5 V
- Ambient temperature range : from -20°C to 70°C



Output performance



Wiring example



Proportional electronic cards

For joystick control

With ramp and Fast/Slow type SAS132 - SAS134

It is possible to set two ramps for each solenoid, one positive (acceleration) and one negative (deceleration) and choose two different machine speeds (Fast/Slow functions); for this reason they are recommended for those applications where, in addition to usual working requirements, special accuracy and sensitivity are mandatory

Minimum currents (I_{min}), maximum currents (I_{max}), negative and positive ramps can be set by means of potentiometer trimmers for solenoids A and B.

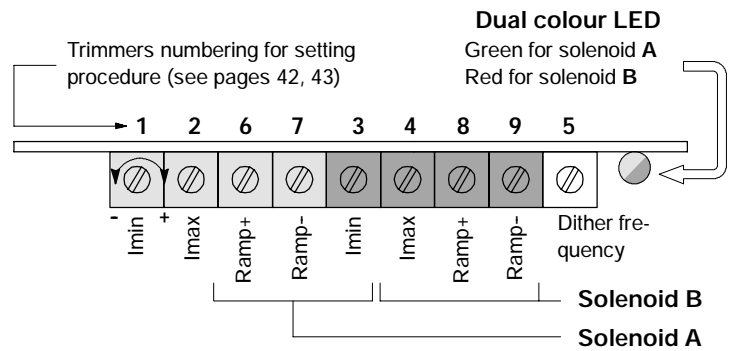
The dither frequency potentiometer trimmer is the same for both solenoids.

In order to simplify setting operations and to identify which trimmer to operate, there is a dual color LED, which can be green or red according to the operating direction of the joystick; for correct setting procedure see pages 42 and 43.

- **Fast/Slow function is activated by an external switch.** This function reduces the maximum current (I_{max}) to a 75% fixed value, not adjustable. As minimum current value (I_{min}) does not change, current variation range on the solenoid is reduced and as this sensed on the entire stroke of the joystick a higher sensitivity is obtained. The result is more precise control of the machine.

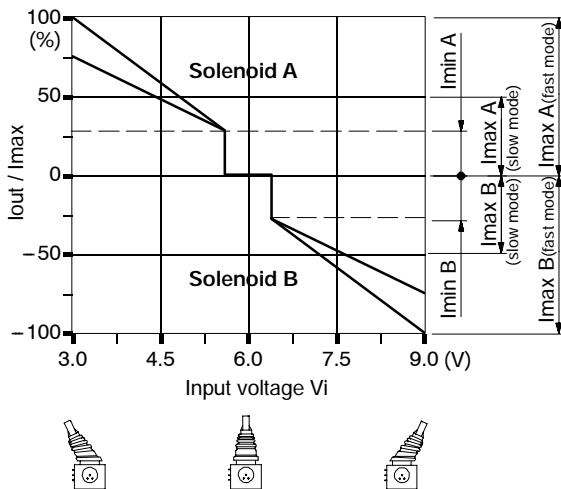
Working conditions

- Maximum ripple : 10%
- Current drawn in neutral position : 20 mA
- Input signal voltage : from 3 V to 9 V
- Neutral voltage : 6 V
- Power rating : 15 W
- Dither frequency range (250Hz std) : from 80 Hz to 300 Hz
- Input impedance : 100 Kohm
- Ramp time : from 0 to 2.5 s
- "Slow mode" signal control : 0 V
- Dead band : ± 0.5 V
- Ambient temperature range : from -20°C to 70°C



Output performance

I_{max} "Slow mode" = 75% I_{max}

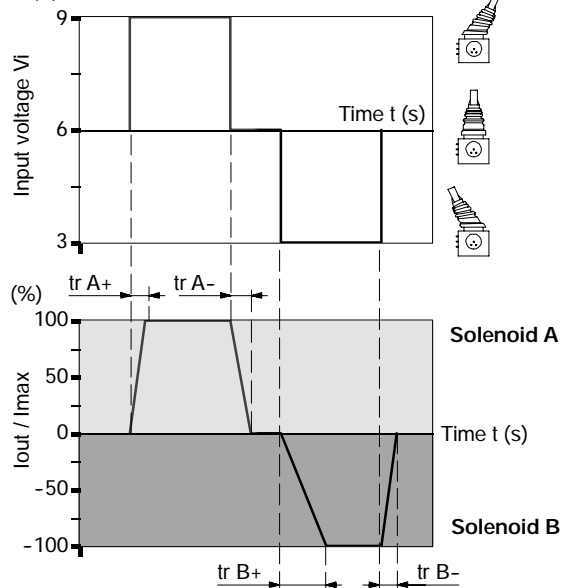


Wiring example

See SAS122 - SAS124 cards on page 35.

Ramp example

(for other examples see page 34)

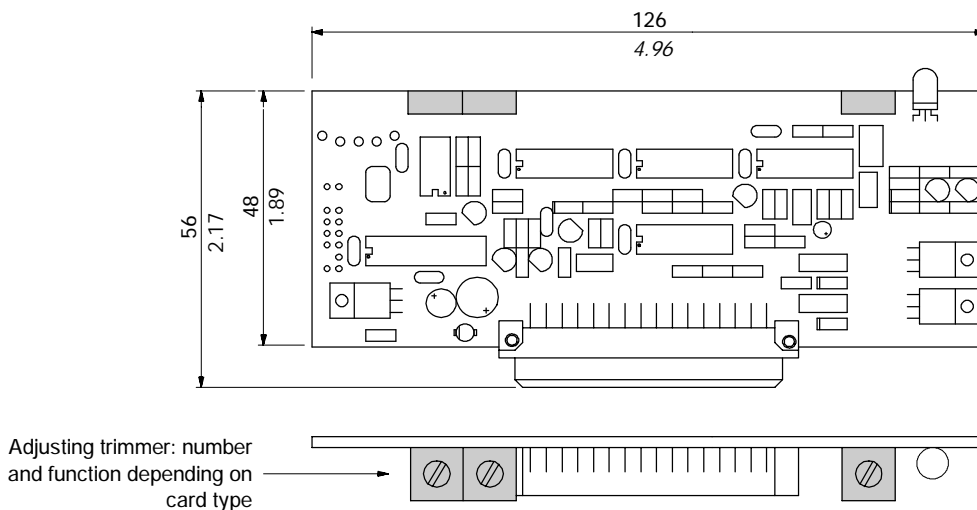


For potentiometer control

These SAS analog proportional cards convert the input signal (3V/9V) provided by the electric potentiometer to a useable amplified output current.

Using a potentiometer, they can drive a proportional solenoid of an hydraulic valve (pressure reducing valve, max. relief valve), flow regulator, etc.).

- The output current (solenoid pilot current) is a pulse width modulated current (PWM modulation). It involves a square wave with constant frequency (dither frequency), in which ON/OFF ratio varies according to the required current value on the proportional solenoid. By piloting with a PWM modulated current, friction effects on the valves spools are substantially reduced.
 - The output current is kept constant even with variations in temperature and solenoid resistance.
 - Imin setting determines the value of the current at the exit from the dead band; this adjustment gives a slower or a faster response when the potentiometer is operated.
 - Imax setting determines the maximum achievable current value i.e. the max stroke of the main spool. In the DPC proportional valve, it determines the maximum flow value (l/min) from A and B ports.
 - Using the dither frequency setting, the card can be used in connection with valves having different characteristics.
 - The card is protected against supply reverse voltage and overvoltage and against solenoid short-circuits and overvoltages.
- WARNING** Welding on the machine frame may permanently damage the electronic components.
- As the card is able to recognize short-circuits in the connection with the joystick-console, undesirable actuations of the valve, caused by damage or incorrect connection of the cable, are avoided.



Common working conditions

Nominal voltage 12VDC

supply voltage : from 11 VDC to 15 VDC
 max.output current : 1.2 A
 min.output current range : from 0 to 0.70 A

Nominal voltage 24VDC

supply voltage : from 21 VDC to 30 VDC
 max.output current : 0.65 A
 min.output current range : from 0 to 0.35 A

Proportional electronic cards

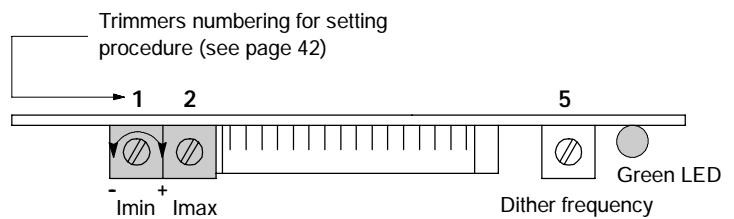
For potentiometer control

Standard type SAS202 - SAS204

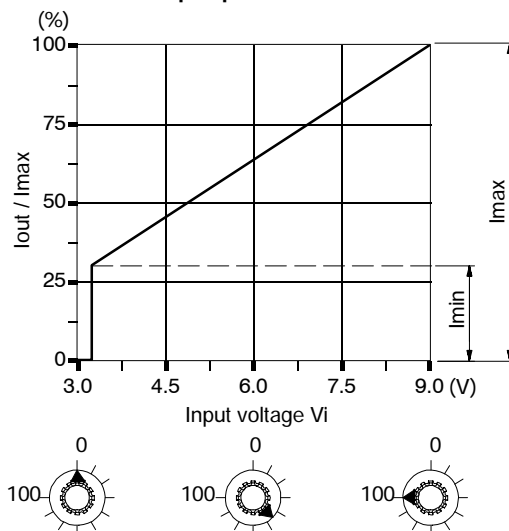
Minimum currents (I_{min}) and maximum currents (I_{max}) and dither frequency can be set by means of potentiometer trimmers. For correct setting procedure see page 42.

Working conditions

- Maximum ripple: 10%
- Current drawn in neutral position . . : 20 mA
- Input signal voltage: from 3 V to 9 V
- Neutral voltage: 3 V
- Power rating: 15 W
- Dither frequency range (250Hz std) : from 80 Hz to 300 Hz
- Input impedance: 100 Kohm
- Dead band: $\pm 0,5$ V
- Ambient temperature range: from -20°C to 70°C



Output performance



For potentiometer control

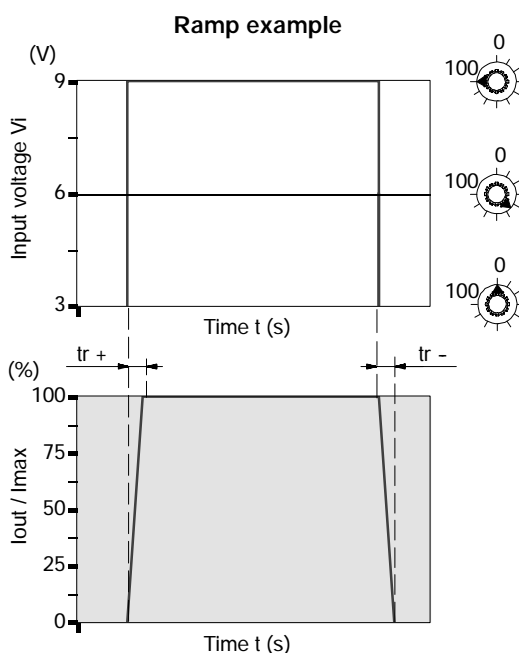
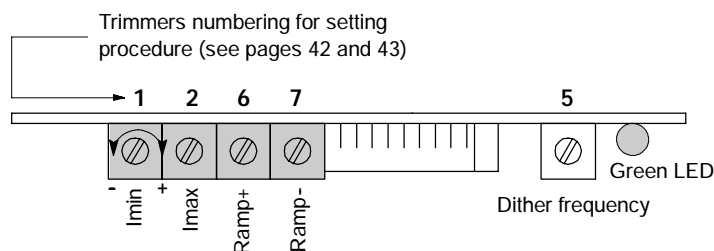
With ramps type SAS212 - SAS214

It is possible to set two ramps, one positive (acceleration) and one negative (deceleration). For this reason they are recommended for those applications where start and stop have to follow predetermined settings.

Minimum currents (I_{min}), maximum currents (I_{max}), positive and negative ramp and dither frequency, can be set by means of potentiometer trimmers: for correct setting procedure see pages 42 and 43.

Working conditions

- Maximum ripple : 10%
- Current drawn in neutral position . . : 20 mA
- Input signal voltage : from 3 V to 9 V
- Neutral voltage : 3 V
- Power rating : 15 W
- Dither frequency range (250Hz std) : from 80 Hz to 300 Hz
- Input impedance : 100 Kohm
- Ramp time : from 0 to 2.5 s
- Dead band : $\pm 0,5$ V
- Ambient temperature range : from -20°C to 70°C



Proportional electronic cards

For potentiometer control

With Fast/Slow type SAS222 - SAS224

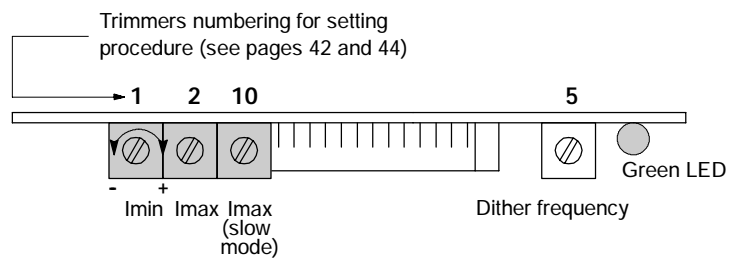
Using an external switch, the operator can choose two different machine speeds (Fast/Slow functions); for this reason they are recommended for those applications where, in addition to usual working requirements, special accuracy and sensitivity are mandatory. Minimum currents (I_{min}), maximum currents (I_{max}), Fast/Slow function and dither frequency can be set by means of potentiometer trimmers; for correct setting procedure see pages 42 and 44.

■ Fast/Slow function is activated by an external switch.

It can be operated either automatically or manually by the operator. This function reduces the maximum current (I_{max}) to a value preset on the relevant trimmer. As minimum current value (I_{min}) does not change, current variation range on the solenoid is reduced and as this sensed on the entire stroke of the joystick a higher sensitivity is obtained. The result is more precise control of the machine.

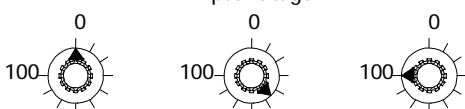
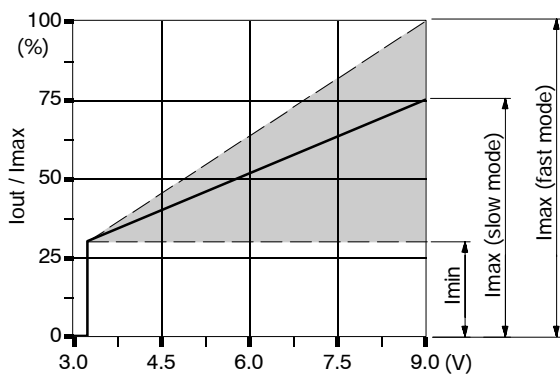
Working conditions

- Maximum ripple : 10%
- Current drawn in neutral position : 20 mA
- Input signal voltage : from 3 V to 9 V
- Neutral voltage : 6 V
- Power rating : 15 W
- Dither frequency range (250Hz std) : from 80 Hz to 300 Hz
- Input impedance : 100 Kohm
- "Slow mode" signal voltage : 0 V
- I_{max} (slow mode) variation range : I_{min} - I_{max}
- Dead band : $\pm 0,5$ V
- Ambient temperature range : from -20°C to 70°C



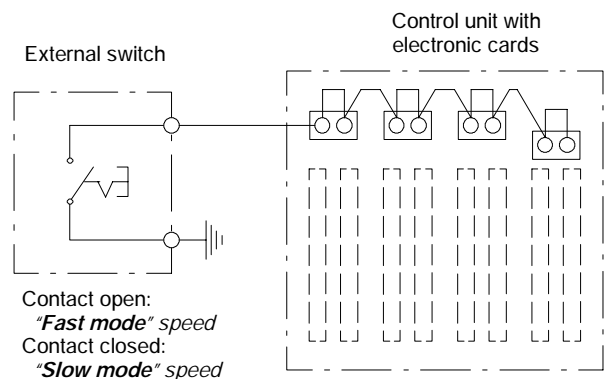
Output performance

Example with I_{max} "Slow mode" = 75% I_{max}



Imax variation range (slow mode)

Wiring example



For potentiometer control

With ramp and Fast/Slow type SAS232 - SAS234

It is possible to set two ramps, one positive (acceleration) and one negative (deceleration) and choose two different machine speeds (Fast/Slow functions); for this reason they are recommended for those applications where, in addition to usual working requirements, special accuracy and sensitivity are mandatory

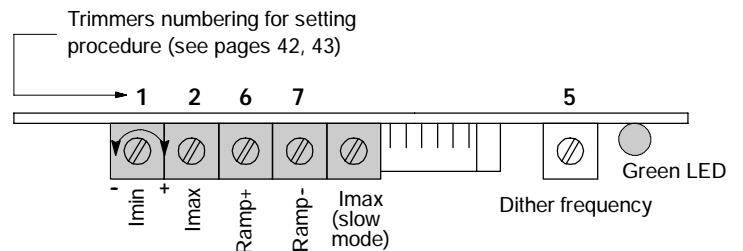
Minimum currents (I_{min}), maximum currents (I_{max}), negative and positive ramps, Fast/Slow function and the dither frequency can be set by potentiometer trimmers; for correct setting procedure see pages 42, 43 and 44.

■ **Fast/Slow function is activated by an external switch.**

It can be operated either automatically or manually by the operator. This function reduces the maximum current (I_{max}) to a value preset on the relevant trimmer. As minimum current value (I_{min}) does not change, current variation range on the solenoid is reduced and as this sensed on the entire stroke of the joystick a higher sensitivity is obtained. The result is more precise control of the machine.

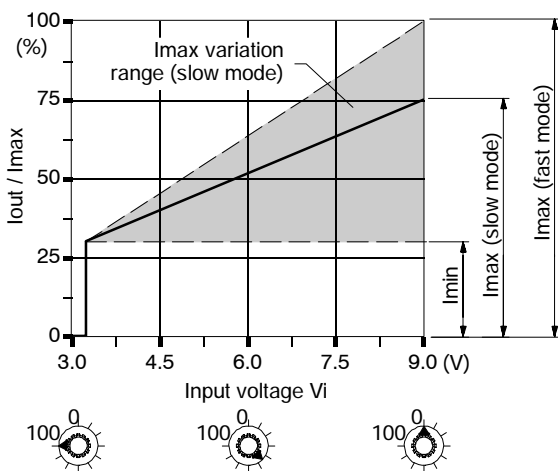
Working conditions

- Maximum ripple : 10%
- Current drawn in neutral position .. : 20 mA
- Input signal voltage : from 3 V to 9 V
- Neutral voltage : 3 V
- Power rating : 15 W
- Dither frequency range (250Hz std) : from 80 Hz to 300 Hz
- Input impedance : 100 Kohm
- Ramp time : from 0 to 2.5 s
- "Slow mode" signal control : 0 V
- Dead band : ± 0.5 V
- Ambient temperature range : from -20°C to 70°C



Output performance

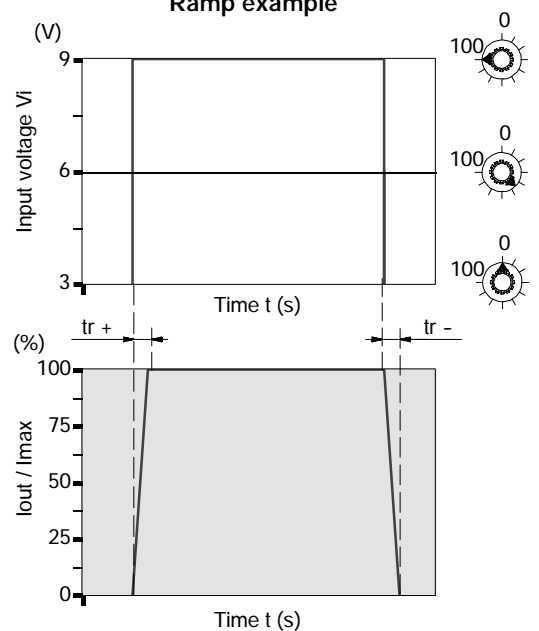
I_{max} "Slow mode" = 75% I_{max}



Wiring example

See SAS122 - SAS124 cards on page 40.

Ramp example

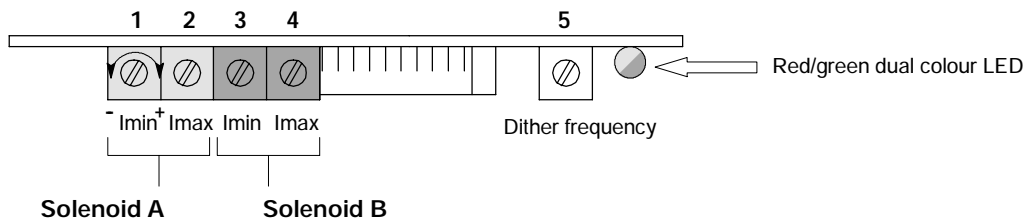


Proportional electronic card

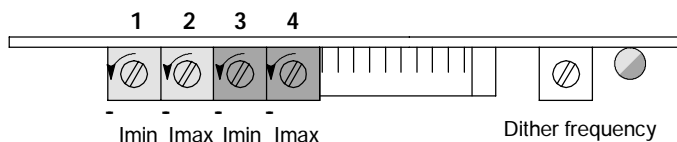
Minimum and maximum currents setting procedure

This procedure must be considered as standard for all SAS proportional cards

Preamble: take note, moving the joystick towards one side, the LED on card turns green, moving it to the other side the LED turns red.



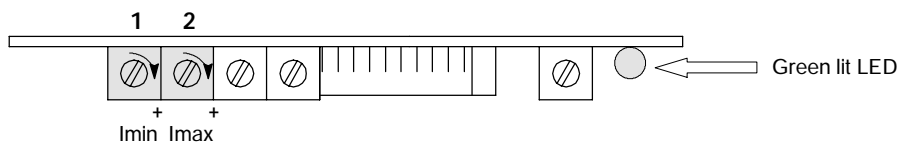
- Turn trimmers 1, 2, 3, and 4 towards "-" (anticlockwise), until end of screw.



Set solenoid A speed (green LED)

Operate on trimmers nr.1 and nr.2.

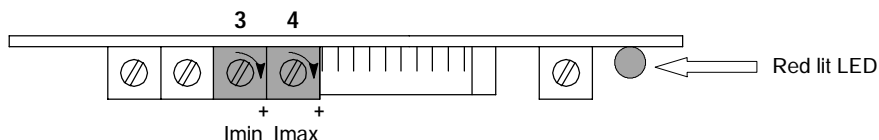
- Set minimum speed (Imin):** move the joystick lever to the end of the stroke; start turning trimmer nr.1 towards "+" (clockwise), until you see the first cylinder movement.
- Set maximum speed (Imax):** keep the joystick lever to the end of the stroke; start turning the trimmer nr.2 towards "+" (clockwise), until you see the cylinder gets requested speed.



Set solenoid B speed (red LED)

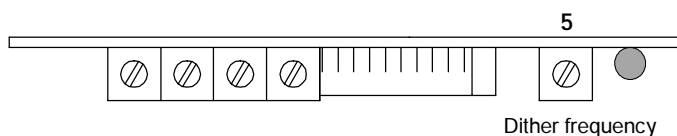
Operate on trimmers nr.3 and nr.4.

- Set minimum speed (Imin):** move the joystick lever to the end of the stroke; start turning trimmer nr.3 towards "+" (clockwise), until you see the first cylinder movement.
- Set maximum speed (Imax):** keep the joystick lever to the end of the stroke; start turning the trimmer nr.4 towards "+" (clockwise), until you see the cylinder gets requested speed.



Set dither frequency

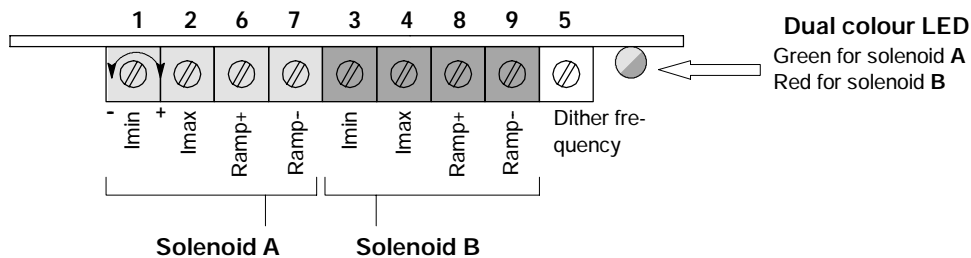
- The trimmer nr.5 set the dither frequency; it's already set at the factory (220 - 260 Hz).



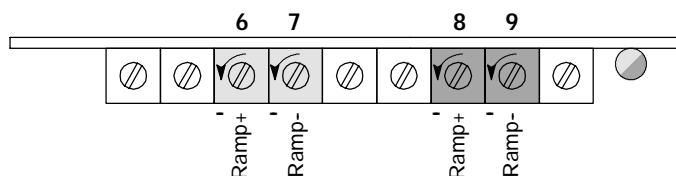
Ramp setting procedure

This procedure must be used for SAS112-114-212-214-132-134-232-234 cards.

Preamble: take note, moving the joystick towards one side, the LED on card turns green, moving it to the other side the LED turns red.



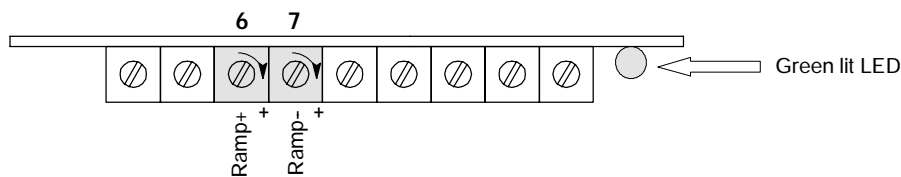
- Turn trimmers 6, 7, 8, and 9 towards "-" (anticlockwise), until end of screw.



Set solenoid A ramps (green LED)

Operate on trimmers nr.6 and nr.7.

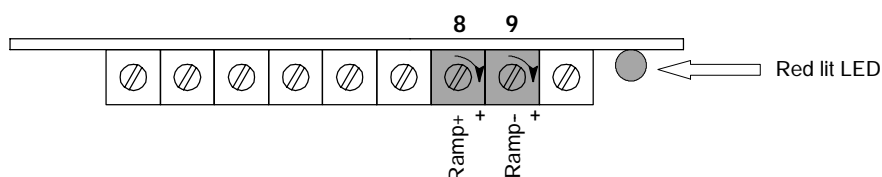
- Set positive ramp (ramp+):** start lightly turning trimmer nr.6 towards "+" (clockwise); move the joystick lever towards green LED direction to estimate the delay.
Repeat previous operations until you see the desired delay.
- Set negative ramp (ramp-):** start lightly turning trimmer nr.7 towards "+" (clockwise); release the joystick lever from green side position towards central position to estimate the delay.
Repeat previous operations until you see the desired delay.



Set solenoid B ramps (red LED)

Operate on trimmers nr.8 and nr.9.

- Set positive ramp (ramp+):** start lightly turning trimmer nr.8 towards "+" (clockwise); move the joystick lever towards red LED direction to estimate the delay.
Repeat previous operations until you see the desired delay.
- Set negative ramp (ramp-):** start lightly turning trimmer nr.9 towards "+" (clockwise); release the joystick lever from red side position towards central position to estimate the delay.
Repeat previous operations until you see the desired delay.

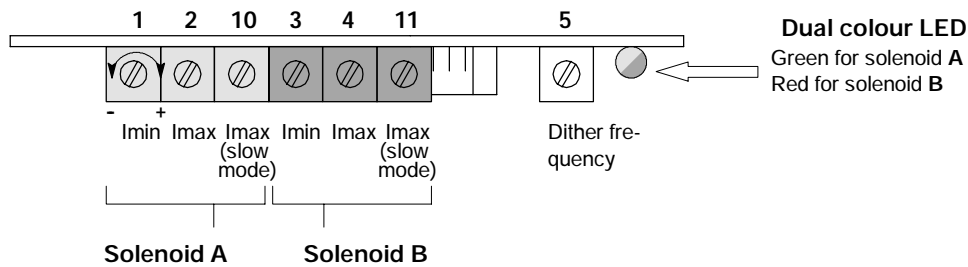


Proportional electronic card

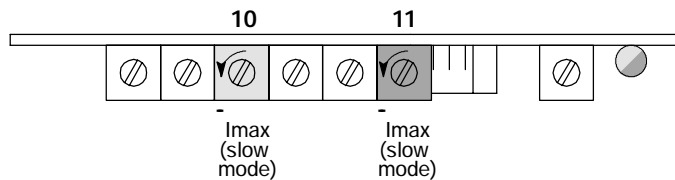
“Slow Mode” function setting procedure

This procedure must be used for SAS122-124-222-224-232-234 cards; in SAS132-134 cards, “Slow Mode” speed is set to 75%.

Preamble: take note, moving the joystick towards one side, the LED on card turns green, moving it to the other side the LED turns red.



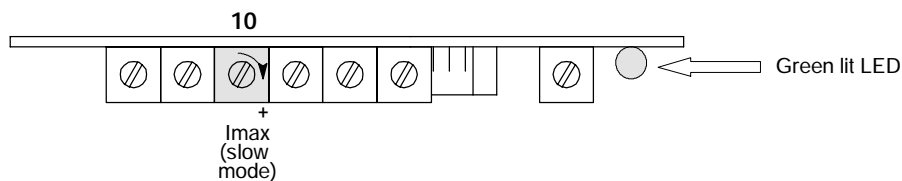
- Turn trimmers 10 and 11 towards “-” (anticlockwise), until end of screw.



Set solenoid A “Slow Mode” speed (green LED)

Operate on trimmer nr.10.

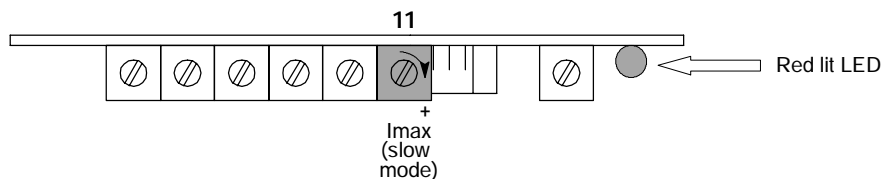
- Start lightly turning trimmer nr.10 towards “+” (clockwise).
- Move the joystick lever to the end of the stroke towards green LED direction, enable “Slow Mode” function (ex. operate the switch of relative control), and estimate the desired speed.
- Repeat previous operations until you see the desired relay.



Set solenoid B “Slow Mode” speed (red LED)

Operate on trimmer nr.11.

- Start lightly turning trimmer nr.11 towards “+” (clockwise).
- Move the joystick lever to the end of the stroke towards red LED direction, enable “Slow Mode” function (ex. operate the switch of relative control), and estimate the desired speed.
- Repeat previous operations until you see the desired relay.



ON/OFF electronic cards

They can control up to 5 direct operations or 2 or 4 relay piloted operations.

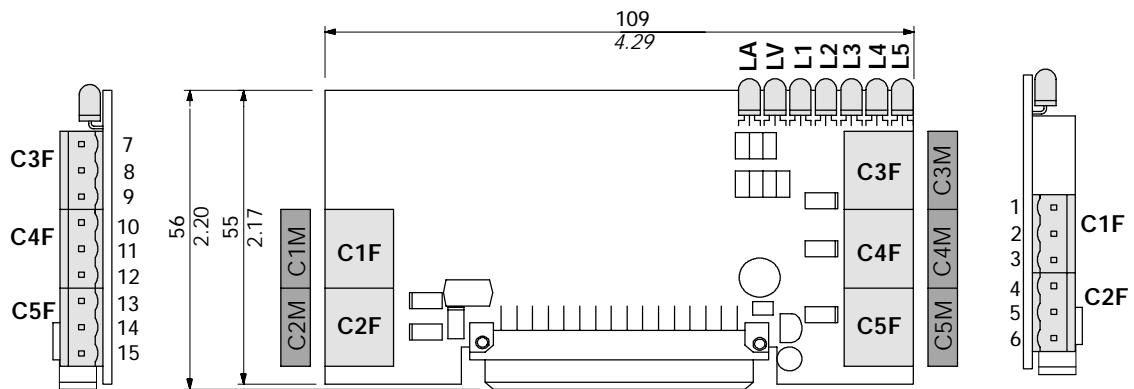
Working conditions

12VDC nominal voltage
 supply voltage : from 10 VDC to 15 VDC
 24VDC nominal voltage
 supply voltage : from 21 VDC to 30 VDC

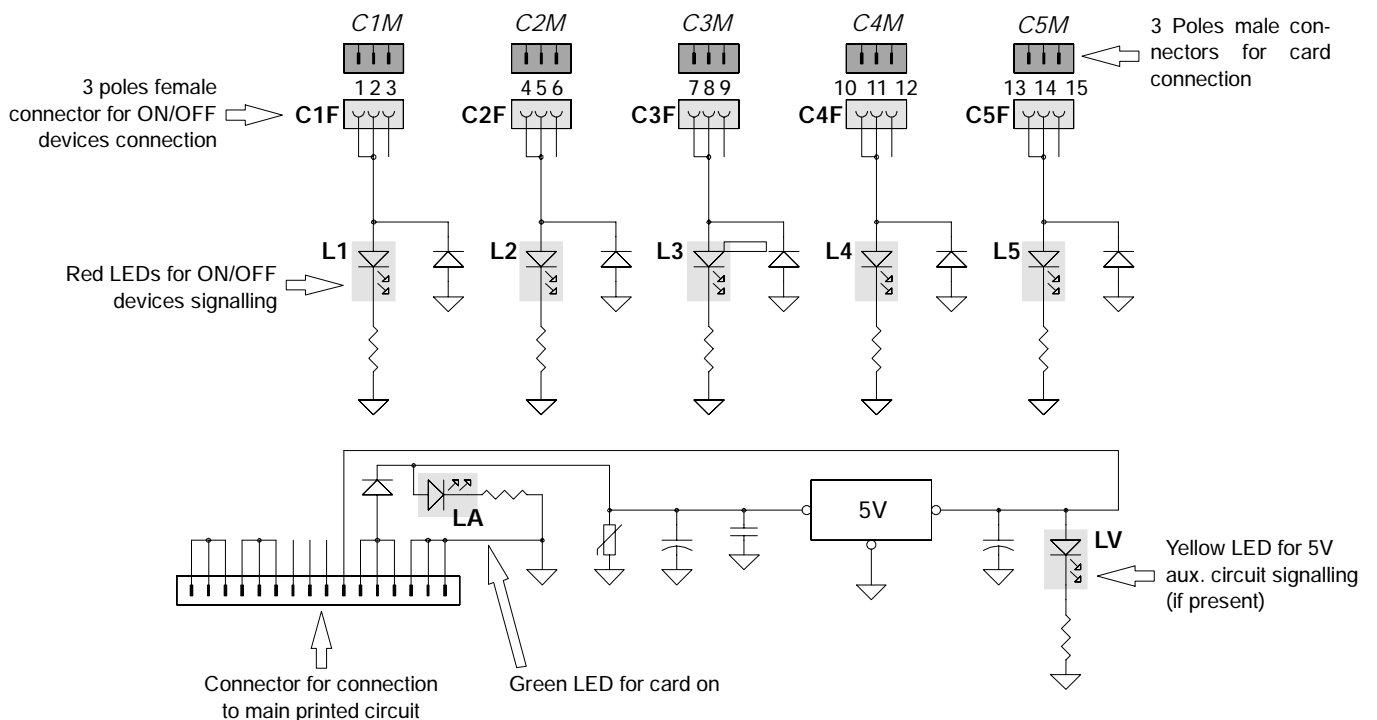
Max.current (for each relay) : 8 A
 Ambient temperature range : from -20°C to 70°C

Type REC012 - REC014

For 5 direct operations, without relays.



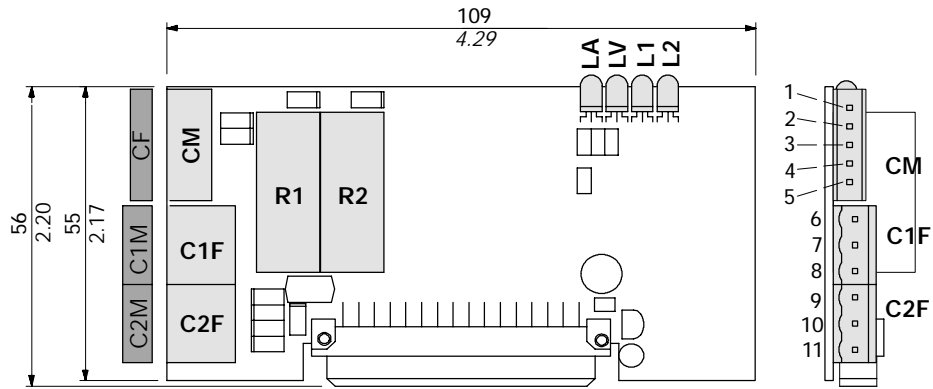
Electric circuit



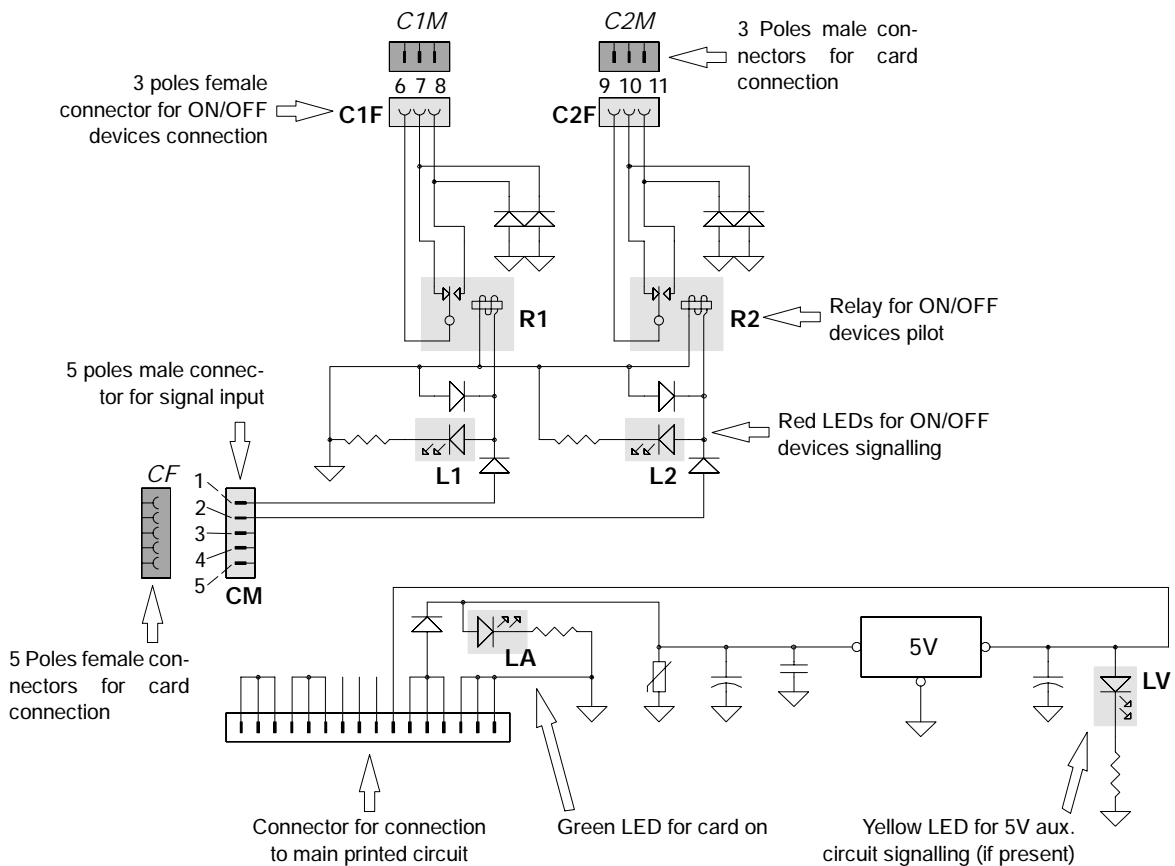
ON/OFF electronic cards

Type REC212 - REC214

With 2 relays for 2 piloted operations



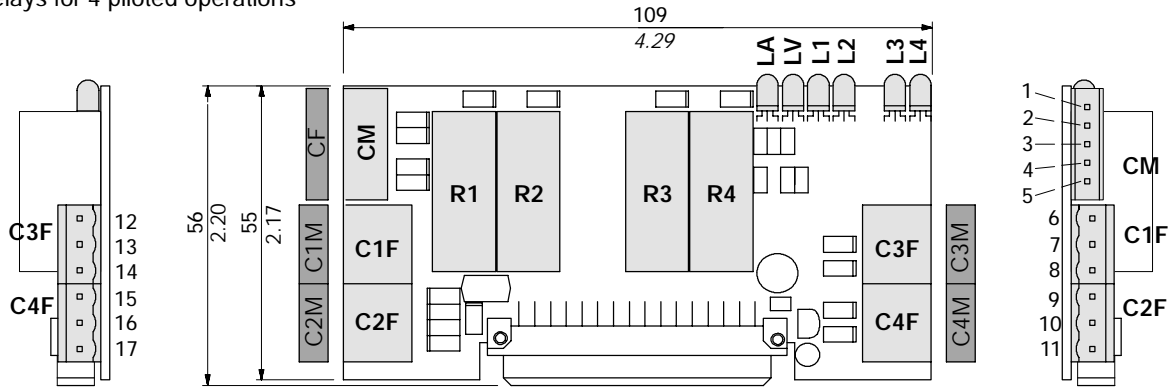
Electric circuit



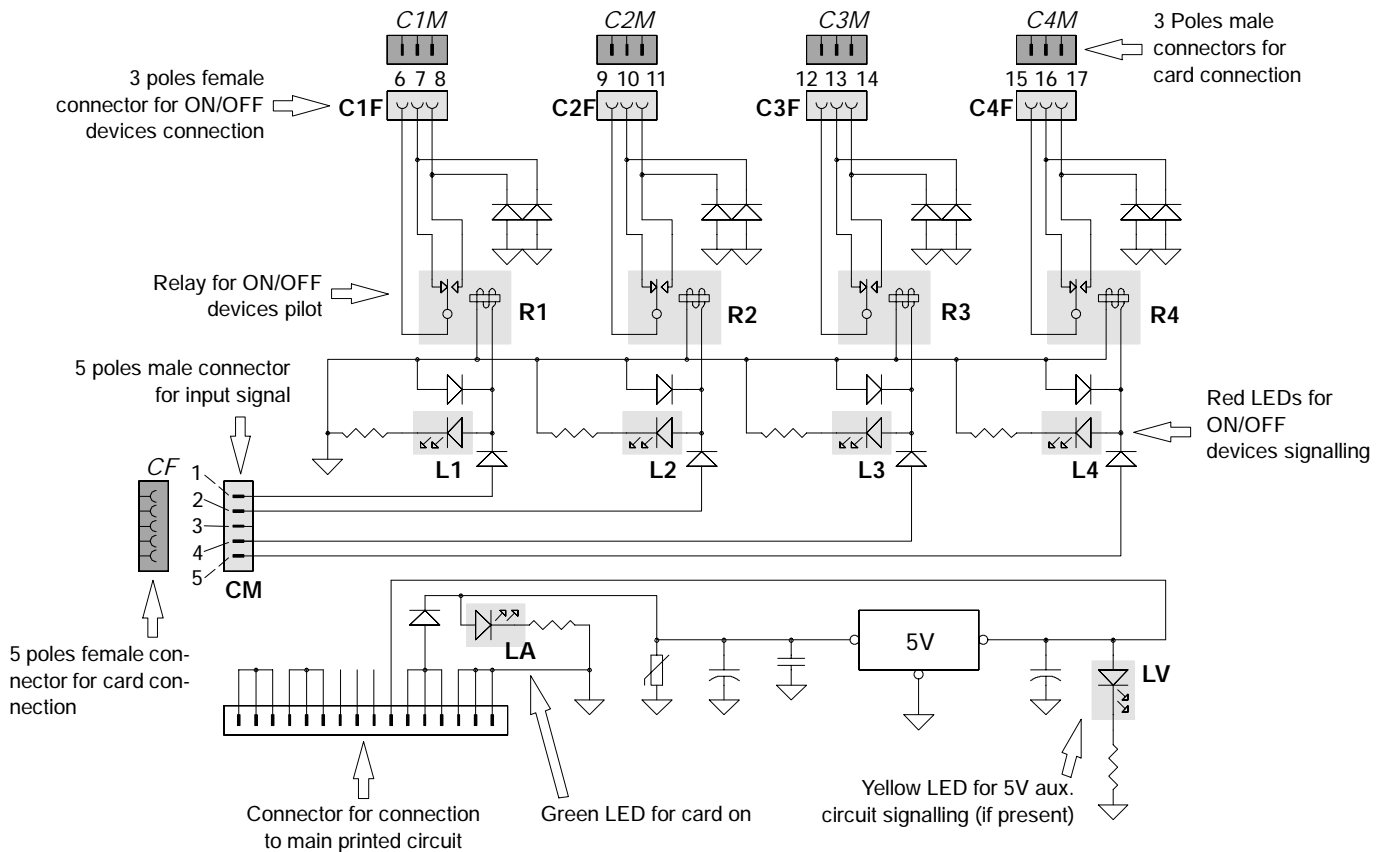
ON/OFF electronic cards

Type REC412 - REC414

With 4 relays for 4 piloted operations



Electric circuit



Description

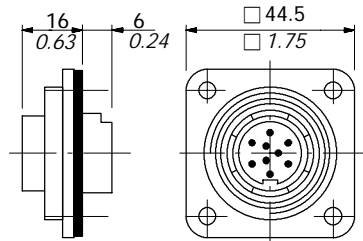
	REC	2	1	4	
Relay less		0			
With nr.2 relays		2	2		12 VDC supply
With nr.4 relays		4	4		24 VDC supply

Cables and connectors

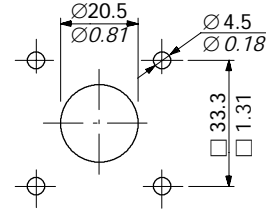
Connectors for UPA console connection

The female connector on the cable is determined by the male used on the console.

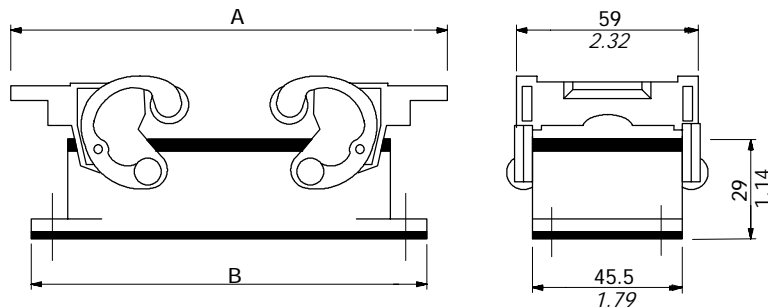
Female 9 poles Buccaneer connector



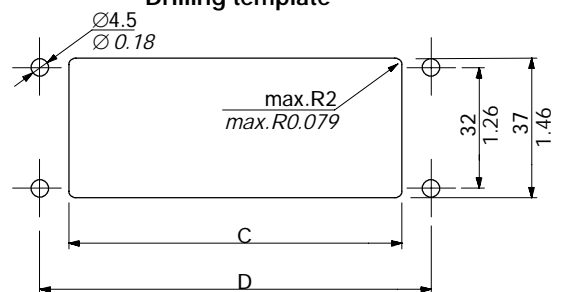
Drilling template



Female 6-10-16-24 poles connector



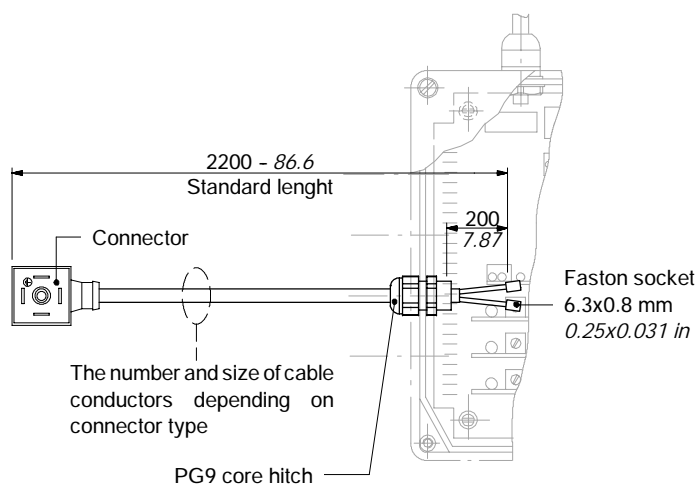
Drilling template



Connector type	Dimension A (mm - in)	Dimension B (mm - in)	Dimension C (mm - in)	Dimension D (mm - in)
6 poles CI06F	76 - 2.99	82.5 - 3.25	54 - 2.13	70 - 2.76
10 poles CI10F	135 - 5.31	95.5 - 3.76	67 - 2.64	83 - 3.27
16 poles CI16F	153 - 6.02	115.5 - 4.55	88 - 3.46	103.5 - 4.07
24 poles CI24F	179.5 - 7.07	142.5 - 5.61	104 - 4.04	130 - 5.12

Cable kit with connector

It's used for direct connection between UGA unit and directional valve and composed of connector, cable and core hitch for mounting on unit.



Cable kit description example:

CONNECTOR *

- Type C02, square 2P+T DIN43650/A B
- Type C03, square 3P+T DIN43650/A D
- (for valve DPC130)
- Type C01, rectangular 2P+T DIN43650/B S
- Type C08, 2 poles AMP "JPT" T
- Connector less O

Cable length in decimetres

NOTE (*) - For connectors features see page 50.

When the solenoid cables are more than 10, up to 20, it's necessary to put an additional connector on the UGA, in order to use a cable kit for solenoids connections.

Male connector (CI10M-CI16M-CI24M): dimensions are the same reported on previous page.

KCA cable kit spare parts

Connector kit on solenoids side

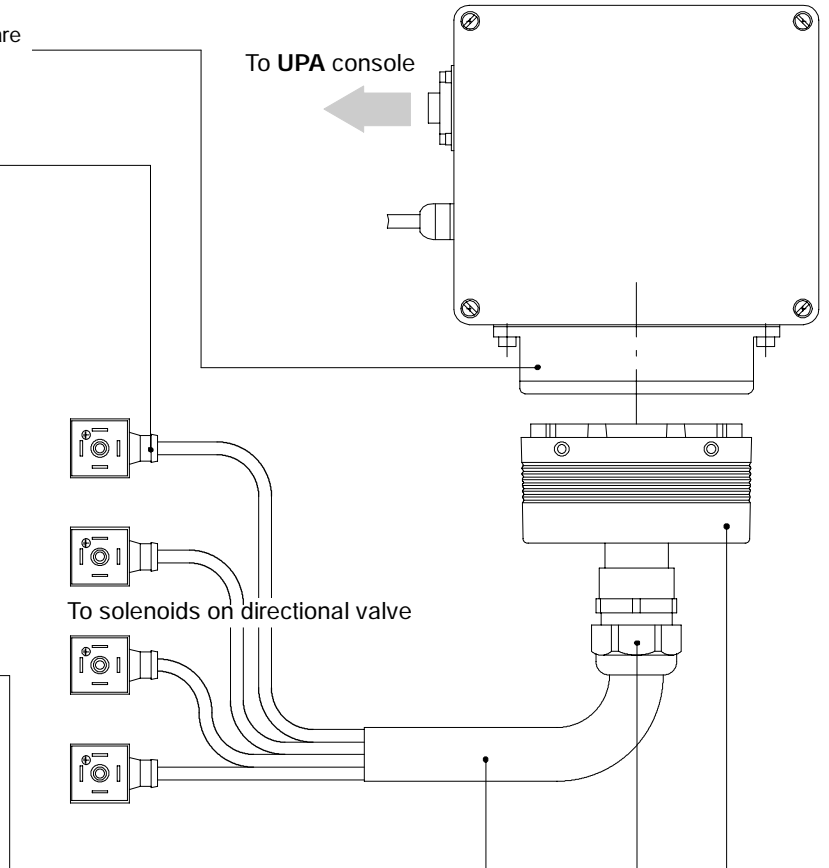
It's composed of connector and cable.
The number and size of cable conductors depending on connector type

TYPE	CODE	DESCRIPTION
B22	VCAV100007	Connector 2P+T DIN43650/A with cable L=2.2m - 86.6 in
D22	VCAV100008	Connector 3P+T DIN43650/A with cable L=2.2m - 86.6 in
S16	VCAV100009	Connector 2P+T DIN43650/B with cable L=1.6m - 63 in
S22	VCAV100010	Connector 2P+T DIN43650/B with cable L=2.2m - 86.6 in
T22	VCAV100011	Connector AMP tipo JPT with cable L=2.2m - 86.6 in
O22	VCAV100012	Cable L=2.2m - 86.6 in without connector

Connector kit on UGA side

It's composed of connector, core hitch and protective covering

TYPE	CODE	DESCRIPTION
C10	VCAV200001	10 poles
C16	VCAV200002	16 poles
C24	VCAV200003	24 poles



Cable kit description example:

1st group of cables 2nd group of cables

KCA 12 / CI16F / 07 S 16 - 03 B 22 -

Total numbers of cables Cable length in decimetres
CONNECTOR ON UGA SIDE CONNECTOR ON SOLENOIDS SIDE *	
Female 10 poles CI10F	B Type C02, square 2P+T DIN43650/A
(for cable from 4 to 8 conductors)	D Type C03, square 3P+T DIN43650/A
Female 16 poles CI16F	(for valve DPC130)
(for cable from 9 to 12 conductors)	S Type C01, rectangular 2P+T DIN43650/B
Female 24 poles CI24F	T Type C08, 2 poles AMP "JPT"
(for cable exceeding 12 conductors)	O Connector less
Nr. cables with connector of the specified type	

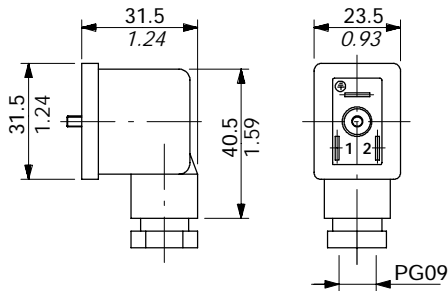
NOTE (*) - For connector features see page 50.

Cables and connectors

Connectors for valve connections

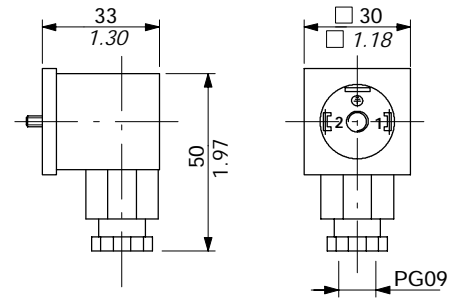
Type C01 (opt. S) code: 2X1001020

2P+T, according to DIN43650-B



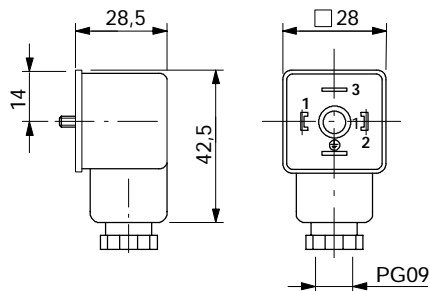
Type C02 (opt. B) code: 2X1001010

2P+T according to ISO4400 / DIN43650-A



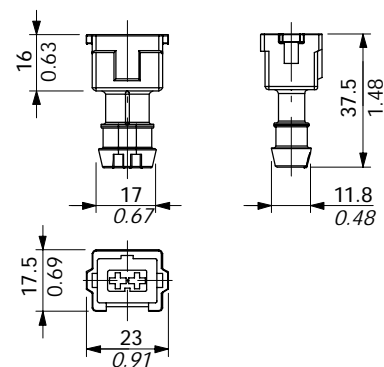
Type C03 (opt. D) code: 2X1001030

3P+T according to ISO4400 / DIN43650-A



Type C08 (opt. T) code: 5CON003

Female 2P AMP "Junior-Power-Timer"



Type	Poles	Nominal voltage	Nominal current	Conductors max. section	Weather protection
C01	2P + T	250 VAC / 300 VDC	10 A	1.5 mm ² - 0.0023 in ²	IP65
C02	2P + T	250 VAC / 300 VDC	10 A	1.5 mm ² - 0.0023 in ²	IP65
C03	3P + T	250 VAC / 300 VDC	10 A	1.5 mm ² - 0.0023 in ²	IP65
C08	2P	250 VAC	12 A	1.5 mm ² - 0.0023 in ²	IP65

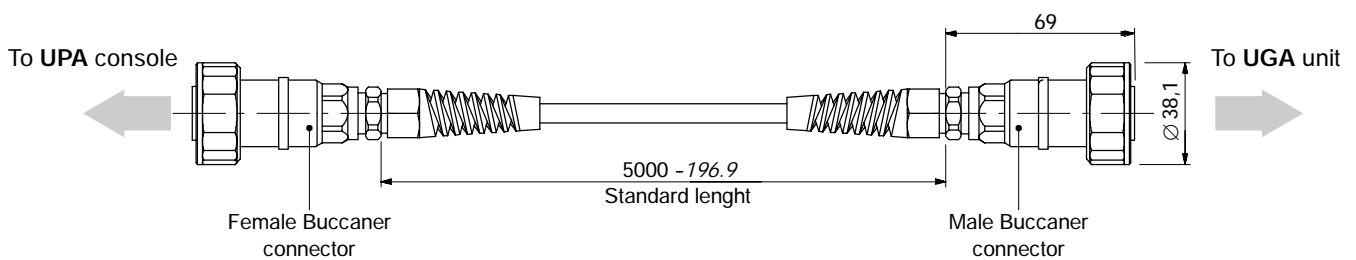
Features and choice principle

They are available in several configurations (nr. of poles and lenght) and two configurations, types **S** and **E**.
 Configuration **S**, with $0.25 \text{ mm}^2 - 3.9 \times 10^{-4} \text{ in}^2$ conductor section, is used where the currents between the console and the electronic unit are lower than 500 mA and when ON/OFF solenoids are energized by relays.
 Configuration **E**, with $0.8 \text{ mm}^2 - 1.2 \times 10^{-3} \text{ in}^2$ conductor section, is suggested when ON/OFF solenoids are directly energized without relays and when heavy duty cable is requested.

Connection between UPA console and UGA unit

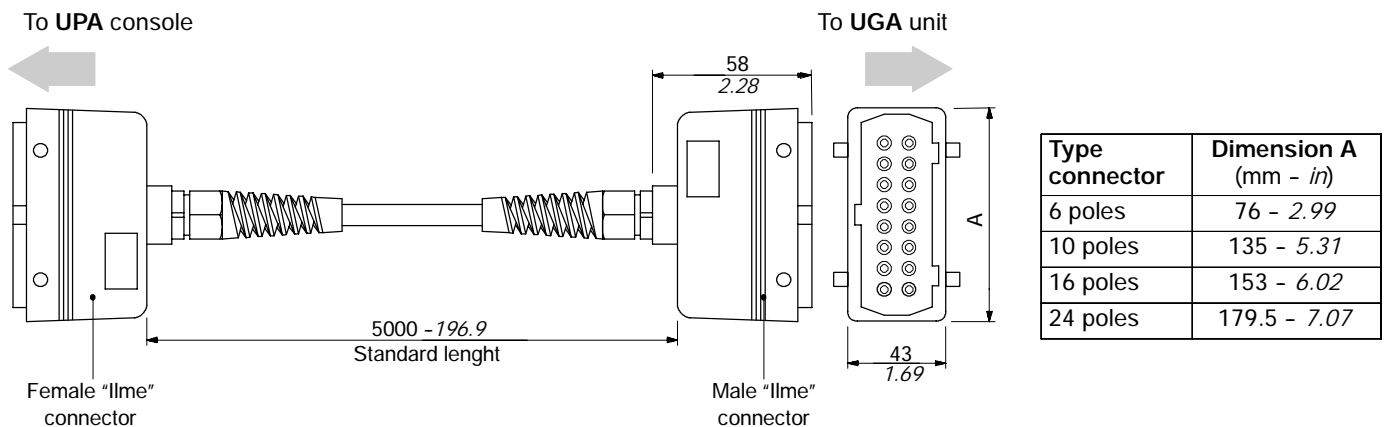
They are fitted with connectors on the both ends.

9 poles standard transmission cable



6-10-16-24 poles transmission cables

They are used when it's necessary to control more than 6 proportional function or more than 3 ON/OFF function.



Description and ordering codes					
<i>Configuration S (L = 5 m - 16.4 ft)</i>					
	6 poles	9 poles	10 poles	16 poles	24 poles
Description	CCS05C6	CCS05C9	CCS05C10	CCS05C16	CCS05C24
Code	182200001	182200002	182200003	182200004	182200005
<i>Configuration E (L = 5 m - 16.4 ft)</i>					
	6 poles	9 poles	10 poles	16 poles	24 poles
Description	CCE05C6	CCE05C9	CCE05C10	CCE05C16	CCE05C24
Code	182210001	182100002	182210003	182210004	182210005

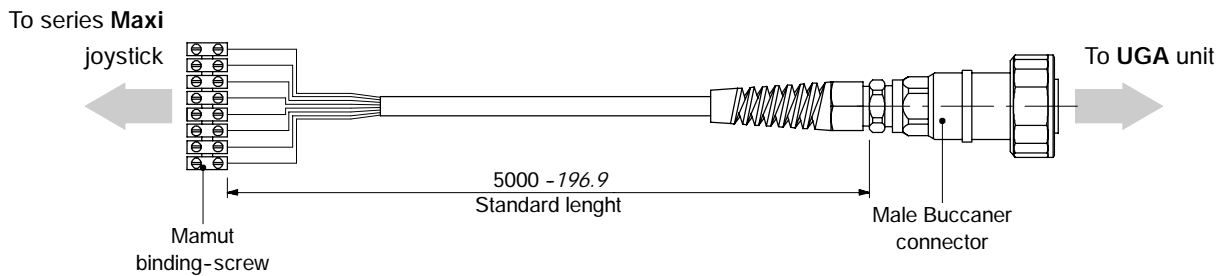
Features and choice principle

Connection between series MAXI joystick and UGA unit

They are composed of a connector on one side and a terminal strip on the other side.
For the wiring scheme please contact Sales Dept.

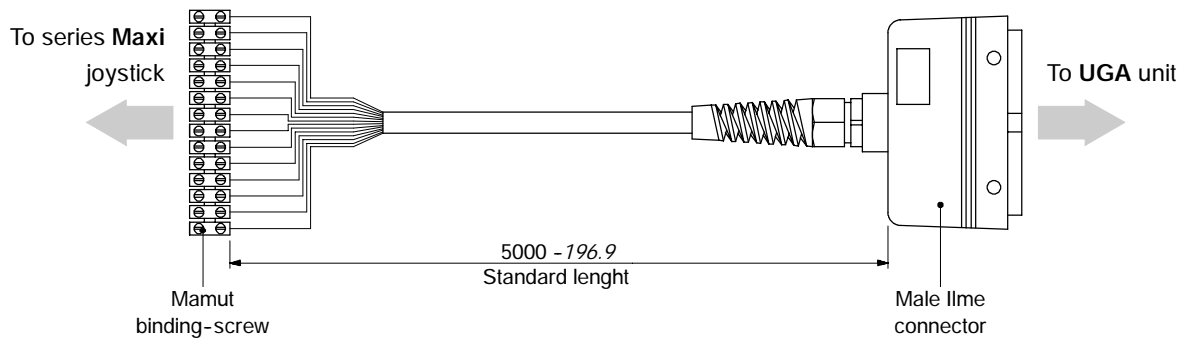
9 poles standard transmission cable

For dimensions see previous page.

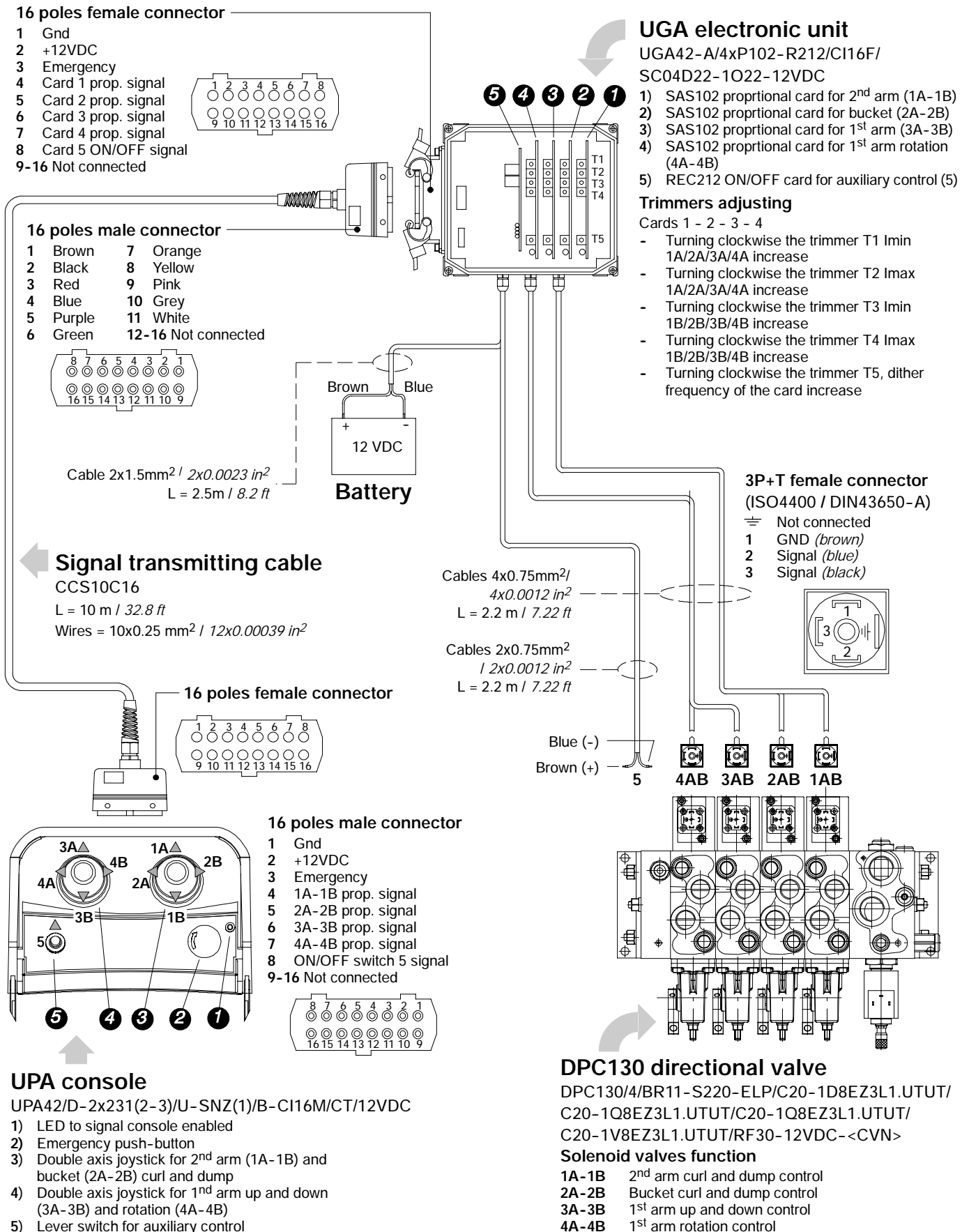


6-10-16-24 poles transmission cables

They are used when it's necessary to control more than 6 proportional function or more than 3 ON/OFF function.
For dimensions see previous page.



Description and ordering codes					
<i>Configuration S (L = 5 m - 16.4 ft)</i>					
	6 poles	9 poles	10 poles	16 poles	24 poles
Description	CMS05C6	CMS05C9	CMS05C10	CMS05C16	CMS05C24
Code	182220001	182220002	182220003	182220004	182220005
<i>Configuration E (L = 5 m - 16.4 ft)</i>					
	6 poles	9 poles	10 poles	16 poles	24 poles
Description	CME05C6	CME05C9	CME05C10	CME05C16	CME05C24
Code	182230001	182230002	182230003	182230004	182230005



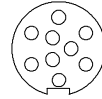
Boat rudder control

UGA electronic unit

UGA14-A/P104/CB09F/SC02B22-24VDC

9 poles female connector

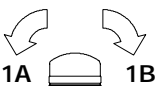
- 1 Gnd
- 2 +12VDC
- 3 Emergency
- 4 Joystick signal
- 5 Not connected
- 6 Not connected
- 7 Not connected
- 8 Not connected
- 9 Not connected



Trimmers adjusting

- Turning clockwise the trimmer T1, Imin 1A increase
- Turning clockwise the trimmer T2, Imax 1A increase
- Turning clockwise the trimmer T3, Imin 1B increase
- Turning clockwise the trimmer T4, Imax 1B increase
- Turning clockwise the trimmer T5, dither frequency of the card increase

Joystick
ME151LW



Signal transmitting cable

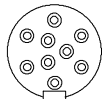
CMS10C9

L = 10 m / 32.8 ft

Wires = 10x0.25 mm² / 10x0.00039 in²

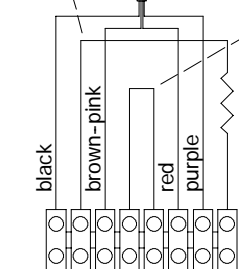
9 poles male connector

- 1 Black
- 2 Brown-pink
- 3 Red
- 4 Purple
- 5 Not connected
- 6 Not connected
- 7 Not connected
- 8 Not connected
- 9 Not connected



Cable 2x1.5mm²
/ 2x0.0023 in²
L = 2.5 m / 8.2 ft

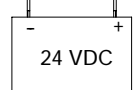
orange
purple
black
black 0.35 mm²
0.00054 in²



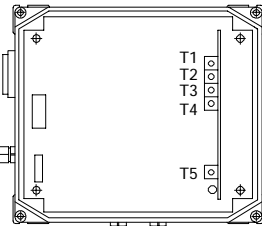
red 0.35 mm²
0.00054 in²

R 1K27

Brown Blue



Battery



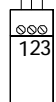
Cables 2x0.75mm²
/ 2x0.0012 in²
L = 2.2 m / 7.22 ft

3P+T female connector
(ISO4400 / DIN43650-A)

- ≡ Not connected
- 1 Signal (brown)
- 2 GND (blue)
- 3 Not connected



Emergency push-button prearrangement



Supply card
SAJ369-24VDC

SD25 directional valve
SD25/1/AC(XG-120)/18EZ3L.U3(G3-100)/RV-KE1R3-24VDC



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DEC002E