



EPVJ SERIES ELECTRICAL REMOTE CONTROL

TECHNICAL CATALOGUE



ELECTRICAL ON-OFF JOYSTICK

The HANSA TMP EPVJ series joystick provides a remote electrical "ON-OFF" signal to control solenoid operated devices.

EPVJ has been developed as compact, lightweight and with the maximum number of possible switches to be controlled by one hand in order to replace multi-switch panels on mobile machinery.

In addition, Mini-EPVJ version is available to fit smaller space for armrest and console mounting, preserving strong mechanical structure and high reliability.

APPLICATIONS

Typical applications include agricultural tractors, mobile grass cutters, fruit picking machines, viticulture machines, material handling machines, road maintenance machines and marine applications

EPVJ SERIES - MODEL CODING

HANSA TMP reserves the right to update the information and data contained in this catalogue at any time without notice

BENEFITS

- Compact and lightweight
- Intuitive identification of basic service functions
- Multifunction ergonomic handle, controlled with one hand
- Easy and fast control of the solenoid operated devices
- Reliable for heavy duty applications
- Wide range of multifunctional ergonomic handles
- · Cable and wired connectors as customer specifications

TECHNICAL FEATURES

- Dual axis function
- Up to 2 additional contacts on opposite movements
- 16 Amps micro-switches for EPVJ version
- 5 Amps rated outputs for Mini EPVJ version

 	\bigcirc	\sim	Х			
				Handle Coo	le *	
				* Define	d by I	HANSA TMP (only for MFE, MFE2 and EXM)
				— Handle Typ	e **	
				w	=	Without Handle
				S	=	Straight Series
				Е	=	MFE Multifunction Ergonomic
				EX	=	Multifunction EXM Handle
				м	=	MFE2 Handle
				** See	Handl	les Catalogue
				Joint Type		
				S	=	Standard
				С	=	Cross (combined movements inhibited)
				Switch Opt	ions *	***
				41	=	Dual Axis, 4 micro-switches
				51	=	Dual Axis, 5 micro-switches
				52	=	Dual Axis, 5 micro-switches
				53	=	Dual Axis, 5 micro-switches
				54	=	Dual Axis, 5 micro-switches
				61	=	Dual Axis, 6 micro-switches
				62	=	Dual Axis, 6 micro-switches
				*** See	Page	2
				Models		
				EPVJ	=	Electrical Pilot Valve Joystick
				MINI EPVJ	=	Mini Electrical Pilot Valve Joystick

Example: ELECTRICAL PILOT VALVE JOYSTICK, DUAL AXIS 4 MICRO-SWITCHES, STANDARD JOINT, MFE HANDLE N. 12493: EPVJ-41-S-E-12493



ELECTRICAL CIRCUIT DIAGRAM

The circuit diagrams below show general examples of the possible combination of buttons. Please contact HANSA TMP for more information. The electrical circuit diagrams shown correspond to the joysticks on page 3 and 4.

Circuit Example - EPVJ Version







NOTES

- 1. Different cable lenghts can be supplied to customer
- 2. Other joystick variants are available. For details please contact HANSA TMP
- 3. Connectors can be fitted to customer requirements.
- 4. Single axis version available on request.

SWITCH POSITION OPTIONS



ELECTRICAL REMOTE CONTROLS EPVJ Series - EPVJ TECHNICAL DATA



EPVJ





EPVJ INSTALLATION DRAWING



EPVJ FOOTPRINT



ELECTRONIC REMOTE CONTROLS EPVJ Series - MINI EPVJ TECHNICAL DATA



MINI EPVJ





MINI EPVJ INSTALLATION DRAWING



MINI EPVJ FOOTPRINT







MDC SERIES

MULTIFUNCTION DIGITAL CONTROL JOYSTICK

TECHNICAL CATALOGUE



MDC PILOT CONTROL

The MDC Joystick combines the extensive HANSA TMP experience in Hydraulics and the latest technologies based on SMD Hall effect sensors and microcontroller's architecture.

The product has a new design meant to provide a comfortable and fine control of mobile and industrial applications. It's a single lever with single / dual axis control, supported by an extensive range of handle options.

MDC versatility and flexibility of use satisfies the most demanding customer's requirements, offering a complete range of output versions: CANopen, 0-5 Volt, PWM, Ratiometric.

Our engineers can offer specialistic support to optimize the solution which suits each application.

FEATURES

- Compact, lightweight and robust PA66 body with glass fiber.
- Reliable embedded electronics and strong mechanical structure for long operating life.
- Suitable for armrest of console mounting.
- Wide range of electrical options in multifunctional ergonomic handles.
- Optional friction and detent functions available on single axis version.
- IP65 Protection
- Available for the different output versions of the joystick.
- PC Software environment to set CANopen and PWM joystick's parameters.
- MDC Joystick are compliant with the EMC Directive and the following regulations : UNI EN 13309:2010 / 14982:2009 CEI EN 61000-6-2:2006-10 / 61000-6-4:2007-11
 - 61000-6-4/A1:2013-06

MDC SERIES - MODEL CODING

HANSA TMP reserves the right to update the information and data contained in this catalogue at any time without notice

(MDC) X	xx)	x	XXX	XX		XXXXX			
							Handle Co	de *	
							* Defin	ed by	HANSA TMP (only for MFE, MFE2 and EXM)
					<u> </u>		Firmware \	Versio	n
							SXXXX	=	Firmware Code
							Return Spi	ring	
							FO	=	Standard: 1,2 to 2,5 daN
							F1	=	Medium : 1,7 to 3,2 daN
							Joystick V	ersion	
							A5V	=	0,5 - 4,5 V Output Voltage
							PWM	=	PWM Currents Output
							CAN	=	CANopen Output
							RTM	=	Ratiometric Output
							Handle Typ	pe **	
							w	=	Without handle
							S	=	Straight Series (Handle Catalogue)
							Е	=	MFE Handle
							EX	=	Multifunctional EXM Handle
							м	=	MFE2 Handle
							** See	e Hand	dle catalogue
							Basic Mod	el Typ	e
							C01	=	Double Axis return to spring
							S01	=	Single Axis return to spring
							S02	=	Single Axis lever detented in any position
							S03	=	Single Axis lever detented in any position with neutral sensor
							S04	=	Single Axis lever detented at both stroke ends
							S05	=	Single Axis lever detented in neutral position
							S06	=	Single Axis lever detented in neutral and frictioned in any position
							Model		
							MDC	=	Multifunction Digital Control



0-5 VERSION GENERAL TECHNICAL FEATURES

Voltage supply:	9
Output voltage range on X/Y Axis:	0
Tolerance on output signal:	<u>+</u>
Out of central position:	2
Mechanical life:	>
IP protection:	I
Operating temperature:	_

V to 32 V ,5 ÷ 4,5 V 0,03 V out 0-5 V @ 15mA 5 million cycles P 65 40°÷ 85° C



WIRING TABLE MDC 0-5V

WIRE COLOR
RED
BLACK
YELLOW
GRAY
GREEN
ORANGE

Voltage supply:

Mechanical life: Ip protection:

Digital input:

Proportional axis:

CANopen joystick bit rate:

Message frequency setting:

120 Ohm terminator setting:

FUNCTION 12 / 24 VBatt Gnd X Axis Y Axis Y Out of centre X Out of centre

IP65

RATIOMETRIC VERSION TECHNICAL FEATURES

9 V to 32 V
25%Vcc-75%Vcc
1 for each semi-axis@500mA
2 power digital outputs@5A
>5 million cycles
IP65
-40° ÷ 85° C



WIRING TABLE MDC RATIOMETRIC

WIRE COLOR	FUNCTION
RED	12 / 24 VBatt
BLACK	Gnd
YELLOW	X Axis output signal
GREEN	Power On-Off out of centre Y Axis
GREY	Y Axis output signal
ORANGE	Power On-Off Out of centre X Axis
BLUE (1)	ON-OFF Out of centre (South)
BLUE (2)	ON-OFF Out of centre (North)
BLUE (3)	ON-OFF Out of centre (West)
BLUE (4)	ON-OFF Out of centre (East)

WIRING TABLE MDC CANopen

9 V to 32 V	WIRE COLOR
Up to N.4	RED
6 ON-OFF (0-5V)	BLACK
125-250-500-1000 kBit/s	BROWN
20-60 ms	BLUE
ON/OFF	
>5 million cycles	

Operating temperature: $-40^{\circ}C \div 85^{\circ}C$

CANopen VERSION TECHNICAL FEATURES

CANopen MESSAGE CONTENT TX PDO

Byte O	Byte 1	Byte 2	Byte 3	
Position	Position	Position	Position	
Axis 1	Axis 2	Axis 3	Axis 4	
0 ÷ 250	0 ÷ 250	0 ÷ 250	0 ÷ 250	

ICTION
/ 24 VBatt
I_L
I_H

B	yte 4		Byt	e 5	E	Byte 6	Byte 7
t (: 1 : 2	D : Axis I : Axis 2 : Axis	1+ 1- 2+	Bit 0 : Bit 1 : Bit 2 :	DIG_1 DIG_2 DIG_3			Bit 0 - 3: Firmware version
: 3	3:Axis	2-	Bit 3 :	DIG_4		Zero	
Bi	it 4 : 0		Bit 4 :	DIG_5			Bit 4 - 7:
В	it 5 : 0		Bit 5 :	DIG_6			Counter
В	it 6 : 0		Bit 6	5:0			0 ÷ 15
Bi	it 7 : 0		Bit 7	7:0			



CANopen DICTIONARY

Communication Profile Area covers index form 1000 to 1FFF

Index	Sub	Designation	Туре	Default	Description
1000	0	Device type	U32, rwr	0x00050191	Profile 401; Inputs binary and analog
1800	0	Transmit PDO 1	U8, rwr	0x05	Number of the entries Trans PDO 1 Binary inputs
	1	COB ID PDO 1	U32, rwr	0x180 + NODE ID	PDO is valid (bit 31=0)CAN ID of the 1st Trans PDOs
	2	Trans type PDO 1	U8, rwr	OxFE	OxFE = asynch manuf. Specific event, inputs are transferred on event timer
	3	Inhibit timer	U16, rwr	0x64(100)	Min period time before 2 transmission (065535 ms)
1A00	0	Mapping Trans PDO 1	U8, rwr	0x01	Number of the application objects linked with the binary input PDO 1
	1	Index in the object directory	U32, rwr	0x6400 01 08	Axis 1
	2	Index in the object directory	U32, rwr	0x6400 02 08	Axis 2
	3	Index in the object directory	U32, rwr	0x6400 03 08	Roller 1
	4	Index in the object directory	U32, rwr	0x6400 04 08	Roller 2
	5	Index in the object directory	U32, rwr	0x6000 01 08	1 byte binary Axis out of center bits 18, 8 bits lenght
	6	Index in the object directory	U32, rwr	0x6000 02 08	1 byte binary inputs bits 16, 8 bits lenght
	7	Index in the object directory	U32, rwr	0x6000 03 08	1 byte binary errors bits 18, 8 bits lenght
	8	Index in the object directory	U32, rwr	0x6000 04 08	1 byte binarystatus inputs bits 18, 8 bits lenght

DEVICE SPECIFIC PROFILE AREA

Manufacturer Specific Profile Area covers index from 0x2000 to 0x5FFF. Device Specific Profile Area covers index from 0x6000 to 0x6FFF

6000	0	Read 8bit In	U8, rwr	0x02	Number of inputs 8 bit										
	1	AXIS OUT OF CENTRE	U8, rwr	0x00	Msb Roller 2 backward	Roller 2 forward	Roller 1 backward	Roller 1 forward	Axel2 left	Axel2 right	Axel1 backward	Lsb Axel1 forward			
	-		rwr	ene e	0	0	DI6	DI5	DI4	DI3	DI2	DI1			
	3	Errors	U8, rwr	0x00	Msb 00	0	0	0	0	0	0	Lsb O			
	4	Status	U8, rwr	0x00	Msb Firmware Revision						Tran Cour 015	Lsb smission nter			
6400	0	Write 8bit Out	U8, rwr	0x04	Number of Axis										
	1	Forward / Backward axis	U8, rwr	0x00	RangeMeans0124Backward125Center126_250Forward										
	2	Left / Right Axis	U8, rwr	0x00	Range 0124 125 26250	Range 0124 125 26.250					Means Left Center Right				
	3	Roller 1	U8, rwr	0x00	Range 0124 125 126250					Means Backward Center Forward					
	4	Roller 2	U8, rwr	0x00	Range 0124 125 126250				Mean Backy Cente Forwa	Means Backward Center Forward					



PWM VERSION TECHNICAL FEATURES

Output currents

20°

-20°

2000mA @12V 1000mA @24V

-20°

Voltage supply: Outputs	9 V to 32 V 4 PWM currents signals on each semi-axis with 100 % duty cycle load
Digital out of centre signals:	One for each semi-axis@500mA
Digital control:	Closed-loop digital controlled outputs
Output currents:	100÷2000mA@12V;
	100÷1000mA@24V
Ramps:	0-2sec
Dither:	100Hz,150Hz,200Hz,250Hz
Programming software:	MDC settings environment with
	PC USB Windows interface
Mechanical life:	>5 million cycles
Ip Protection:	IP65
Operating temperature:	-40°C ÷ 85° C

Voltage Supply = 12/24V Out of Centre X/Y

ov

20°

-2° 0° 2°

WIRING TABLE MDC PWM

WIRE COLOR	FUNCTION
RED	12 / 24 VBatt
BLACK	Gnd
WHITE	X Axis Outout signal (East)
YELLOW	Y Axis Output signal (South)
GREEN	Y Axis Output signal (North)
GREY	X Axis Output signal (West)
ORANGE	X Axis Common GND (West-East)
BROWN	Y Axis Common GND (Morth-South)
BLUE(1)	ON-OFF Out of centre (South)
BLUE(2)	ON-OFF Out of centre (North)
BLUE(3)	ON-OFF Out of centre (West)
BLUE(4)	ON-OFF Out of centre (East)

MDC INSTALLATION DRAWING

-2° 0° 2°







MDC SOFTWARE ENVIRONMENT

MDC CUSTOMER SUITE allows parameters setting for PWM and CANopen MDC Joystick. The parameters that can be set and adjusted during setting process or test on field are:

PWM version: Start current[mA], Mid Current[mA], Max current[mA], Dither[Hz], Ramps[ms]. CANopen version: ID, Bit rate[Kbps], ON-OFF termination resistor, TPDO Message timing[mS].

Contact Hydreco for more informations.



CANopen Version

CAR configuration used as have CAR configuration used as have MOC CUSTOMER SUITE PVM & CANBUS UNIT STEP VURSION 0.27

Home Page



PWM Version

MDC DEVICE SETTINGS

MDC Programming Kit Code: G9634010393



USB RS232 CONVERTER Part Number: C9634210413



CABLE KIT RS232 FEMALE DEUTSCH DT06-3S-CE06 Part Number: C9534010383



USB KEY MDC HYDRECO CUSTOMER SUITE Part Number: G9634010703

NOTE ABOUT PIN MAP CABLE KIT RS232 FEMALE DEUTSCH DT 06 -3S-CE06



DEUTSCH DT06-3S-CE06

When viewed from the front of the connector. ie. not the pins solder side.

The pin numbering layout used can be see in the table below.

Signal		Pin(s)	Pin(s)
	5 1 00000 9 6	A B	
Transmit Data	TD	2	В
Receive Data	RD	3	Α
Request To Send	RTS		
Clear To Send	CTS		
Signal Ground	SG	5	С
Data Set Ready	DSR		
Carrier Detect	CD		
Data Terminal Ready	DTR		







TECHNICAL CATALOGUE

ELECTRIC REMOTE CONTROLS Handles - INTRODUCTION

HANDLES

The HANSA TMP handles are available for fitting either to HANSA TMP pilot valves or other types of devices. The handles can also be used as stand alone device in many applications.

The selected materials suit both indoor or outdoor environments and are reliable, strong and suitable for heavy duty applications.

Wide range of knobs and straight lever are available with different options, integrating switches and push buttons. Ergonomical MFE, EXM, and MFE2 handles offer multifunction and bespoke solutions for the most demanding applications; they can be equipped with a wide range of controls: rocker switch, proportional roller, minijoystick, latched or momentary push buttons, toggle switch, four way switch etc.

The ergonomic handles are available for both left and right operation selecting the proper tilting option.

MFE2 Handle is ready for standalone applications, integrating a specific electronic board.

Different circuit arrangements can be accomodated within the handle and the wiring can be designed as per customer's speciications.

Our engineers can offer special support to meet customer's requirements.

BENEFITS

- Many configurations available for knobs and straight handles suitable for both single and dual axis control
- Extensive range of electrical switch and button options
- All handles suitable to both HANSA TMP and other manufacturers equipments
- · Spare parts available for maintenance
- Configurable for right and left hand operation
- · Suitable to many environmental conditions
- High durability, low maintenance
- Standard safety switch or capacitive safety function available also to match redundancy requirements and different output currents ratings

KNOB AND STRAIGHT - MODEL CODING

HANSA TMP reserves the right to update the information and data contained in this catalogue at any time without notice

K- KNOB SERIES

S- STRAIGHT SERIES

КВ	= Duroplast knob	SA	= Handle without electric switch
КС	= Technopolymer knob	SD	= Handle with electric switch
KD	 Duroplast knob with switch 	SS	 Handles with electric switch to close and safety button
КК	= Duroplast knob with rubber cap	SX	 Handle with electric switch to close
КР	 Duroplast spherical knob 	SY	 Handle with electric switch dual rocker type
KW	 Duroplast knob with switch 	SZ	 Handle with 2 or 3 positions latched rocker

ELECTRIC REMOTE CONTROLS Handles - KNOB SERIES

KB - DUROPLAST KNOB





KC - TECHNOPOLYMER KNOB





KP - DUROPLAST SPHERICAL KNOB

KD - DUROPLAST KNOB WITH SWITCH





Protection: IP64 Rating current: 5A@28VDC resistive load Electrical life: 25,000 cycles Mechanical life: 10⁶ cycles

Wiring Diagram

For installation dimensions see Knob KB

KW - DUROPLAST KNOB WITH SWITCH





KK - DUROPLAST KNOB WITH RUBBER CAP





Protection: Rating current: 6A@250VAC Mechanical life: 10^7 cycles

IP54



Wiring Diagram

For installation dimensions see Knob KK

ELECTRIC REMOTE CONTROLS Handles - STRAIGHT SERIES

SA - WITHOUT SWITCH





SX - WITH ONE SWITCH ON THE TOP



SS - WITH ONE SWITCH ON THE TOP WITH SAFETY CAGE



SY - WITH ONE MOMENTARY 3 POSITION ROCKER



SZ3 - WITH 3 LATCHED Pos. | SZ2 - WITH 2 LATCHED Pos.



SD - WITH ONE SWITCH ON THE TOP AND ONE ON THE SIDE



MFE - MODEL CODING



Example: MULTIFUNCTION ERGONOMIC HANDLE, PUSH BUTTON C, POS.1 BLUE BUTTON, POS.4 RED BUTTON, WITHOUT SAFETY TRIGGER, STANDARD TERMINALS, SQUARE BOOT, TILTED 15° FORWARD: **MFE-C-1BXXRXX-X0S1**

ELECTRIC REMOTE CONTROLS Handles - MFE BUTTONS

A - PLASTIC PUSH BUTTON

Protection: Rating currents: Input voltage range: Electrical life: Mechanical life: IP40 5A@30VDC resistive load 30 VDC 10⁴ cycles 2x10⁶ cycles





C - ISOLATED PUSH BUTTON

Protection: Rating currents: Electrical life: Mechanical life: IP64 5A@28VDC resistive load 25x10³ cycles 10⁶ cycles





E - SEALED SEARVICEABLE PUSH BUTTON

Protection: Rating currents: Input voltage range: Electrical life: Mechanical life: IP40 5A@30VDC resistive load 30 VDC 10^4 cycles $2x10^6$ cycles





T - SAFETY TRIGGER

Protection: Rating currents: Input voltage range: Electrical life: Mechanical life: IP40 5A@30VDC resistive load 30 VDC 10⁴ cycles 2x10⁶ cycles





TCAP - CAPACITIVE SAFETY TRIGGER

Protection: Rating currents: Input voltage range: Electrical life: IP65 / IP54 for redundant version 100mA/ up to 3A for redundant version 10-30 VDC 3x10⁶ cycles



ELECTRIC REMOTE CONTROLS Handles - MFE SWITCHES

S - TYPE

Protection:IP68SRating currents:16A@28VDC
resistive loadMechanical life: 10^5 cyclesElectrical life: $25x10^3$ cycles



VERTICAL MOUNTED



S1B: IP68S 3 positions momentary rocker switch **S2B**: IP68S 3 positions latched rocker switch

S5B: IP68S 2 positions latched rocker switches **S3B**: IP68S 3 positions latched and momentary rockers

HORIZONTAL MOUNTED



S1A: IP68S 3 position momentary rocker switch **S2A**: IP68S 3 position latched rocker switch

S5A: IP68S 2 positions latched rocker switches **S3A**: IP68S 3 positions latched and momentary rockers



TWO VERTICAL MOUNTED

S4A: IP68S 3 position momentary rocker switch **S4B**: IP68S 3 position latched rocker switch

S5E: IP68S 2 positions latched rocker switches **S3E**: IP68S 3 positions latched and momentary rockers

VERTICAL MOUNTED LEFT OFFSET



S1C: IP68S 3 position momentary rocker switch **S2C**: IP68S 3 position latched rocker switch

S5C: IP68S 2 positions latched rocker switches **S3C**: IP68S 3 positions latched and momentary rockers

VERTICAL MOUNTED RIGHT OFFSET



S1D: IP68S 3 position momentary rocker switch **S2D**: IP68S 3 position latched rocker switch

S5D: IP68S 2 positions latched rocker switches **S3D**: IP68S 3 positions latched and momentary rocker

ELECTRIC REMOTE CONTROLS Handles - TECHNICAL DATA

D - 4 WAY ON-OFF SWITCH

IP68S Protection: Rating current: 1A@28VDC inductive Electrical life: 10^⁵ Cycles

DLDRDB - 3 SWITCHES



DL - 1 SWITCH LEFT



RP - PROPORTIONAL ROLLER

Supply voltage: 5 VDC IP68S Sealing: Output signal: 0,5-4,5 VDC with 2,5V in neutral position Mechanical life: 3x10⁶ Cycles





DRDB - 2 SWITCHES RIGHT



DB - 1 SWITCH CENTER





DLDR - 2 SWITCHES TOP

DR - 1 SWITCH RIGHT







2RP - TWO CENTERED







RPD - ONE RIGHT OFFSET



ELECTRIC REMOTE CONTROLS Handles - TECHNICAL DATA

MFE



R - ROUND PROTECTION BOOT



S - SQUARE PROTECTION BOOT







ELECTRIC REMOTE CONTROLS Handles - TECHNICAL DATA

0 - STANDARD STRAIGHT



1 - TILTED 15° FORWARD



4 - COMBINED TILTED FRW & RIGHT

LH Handle



Ø 16

3 - TILTED 15° LEFT





5 - COMBINED TILTED FRW & LEFT

6 - WITH SPHERICAL JOINT

M 10



7 - TILTED 15° BACKWARD



2 - TILTED 15° RIGHT

LH Handle



MFE2 - MODEL CODING



MFE2 =

Multifunction Ergonomic Handle 2

= Assigned color

Example: MULTIFUNCTION ERGONOMIC HANDLE 2, POS 1 BLUE BUTTON, POS 4 GREEN LATCHED BUTTON WITH LED, POS 5 RED PUSH BUTTON, POS 8 FOUR WAY SWITCH, POS E PROPORTIONAL ROLLER WITHOUT LEVER, STANDARD SAFETY TRIGGER, FLYING LEADS: MFE2-1B4G5R8D-ERP-T-0

** For special configuration, please contact HANSA TMP

ELECTRIC REMOTE CONTROLS Handles - MFE2 CONTROLS

PUSH BUTTON TYPE C

Protection: Rating currents: Electrical life: Mechanical life: IP64 5A@28VDC resistive load 25,000 cycles 10° cycles

PROPORTIONAL ROLLER

Supply voltage: Sealing: Output signal: Mechanical life: 5 VDC IP68S 0,5-4,5 VDC with 2,5V in neutral position $3 \times 10^{\circ}$ cycles

ROCKER SWITCH

Sealing: Rating currents: Mechanical life: Electrical life: IP68S 16A@28VDC resistive load 10[°] cycles 25x10[°] cycles

FOUR WAYS SWITCH

Protection: Rating currents: Electrical life: IP68S 1A@28VDC inductive 10[°] cycles

SIGNALING LED

Color available:White, Red, Yellow, Green, BlueSupply voltage:12 or 24 VDCMounted:On panel with support

FOUR WAY PROPORTIONAL MINI-JOYSTICK

Protection: Supply voltage: Output voltage: Mechanical life: IP68S 5 VDC 0.5-4.5 V with 2.5 V in neutral, for each axis $10^{\circ}\mbox{ cycles}$













Note: Other controls available on request.

ELECTRIC REMOTE CONTROLS Handles - MFE2 CONFIGURATIONS



In case standard safety trigger is required, push buttons in position n.14, 15, 17, 18 cannot be added.

POSITIONS FOR CONTROLS

Standard positions for rocker and proportional roller, vertical mounted

Standard positions for rocker and proportional roller, horizontal mounted





0 - STANDARD STRAIGHT



S2 - TILTED 15° RIGHT







S3 - TILTED 15° LEFT

RH Handle



EXM - MODEL CODING



Example: EXCAVATOR MULTIFUNCTION HANDLE, PUSH BUTTON C, POS.1 BLUE BUTTON, POS.4 GREEN BUTTON, STRANDARD TERMI-NAL, SQUARE BOOT, STANDARD STRAIGHT: **EXM-C-BXXG-SO**



Buttons Position

ELECTRIC REMOTE CONTROLS Handles - EXM PUSH BUTTONS AND CONTROLS

A - PLASTIC PUSH BUTTON

Protection: Rating currents: Input voltage range: Electrical life: Mechanical life:

IP40 5A@30VDC resistive load 30 VDC 10^⁴ cycles 2x10⁶ cycles





C - ISOLATED PUSH BUTTON

Protection: Rating currents: Electrical life: Mechanical life:

IP64 5A@28VDC resistive load 25,000 cycles 10° cycles





E - SEALED SERVICEABLE PUSH BUTTON

Protection: Rating currents: Input voltage range: Electrical life: Mechanical life:

Sealing:

Mechanical life:

Electrical life:

IP40 5A@30VDC resistive load 30 VDC 10^⁴ cycles $2x10^{\circ}$ cycles

S TYPE - WATERPROOF ROCKER SWITCH

IP68S

resistive load

25x10³ cycles

10[°] cycles

Rating currents: 16A@28VDC



VERTICAL MOUNTED



S1B: IP68S 3 positions momentary rocker switch S2B: IP68S 3 positions latched rocker switch

S5B: IP68S 3 positions latched rocker switch

HORIZONTAL MOUNTED



S1A: IP68S 3 positions momentary rocker switch S2A: IP68S 3 positions latched rocker switch

S5A: IP68S 2 positions latched rocker switch S3B: IP68S 3 positions latched and momentary rocker S3A: IP68S 3 positions latched and momentary rocker

HORIZONTAL WITH TYPE C



PROPORTIONAL ROLLER

Supply voltage: 5VDC Sealing: Output signal:

IP68S 0,4-4,5 VDC with 2,5V in neutral position Mechanical life: 3x10⁶ cycles



VERTICAL MOUNTED



ELECTRIC REMOTE CONTROLS Handles - EXM TILTED OPTIONS

0 - STANDARD STRAIGHT



2 - TILTED 15° RIGHT



1 - TILTED 15° FORWARD

3 - TILTED 15° LEFT

180



15°



M 10

RH Handle



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