

## 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

## 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


## EPVJ SERIES - MODEL CODING

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


## Switch Options ***

$41=$ 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
Handle


## 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



4 micro-switches




## EPVJ INSTALLATION DRAWING



## 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

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## 0-5 VERSION GENERAL TECHNICAL FEATURES

Voltage supply:
Output voltage range on X/Y Axis:
Tolerance on output signal:
Out of central position:
Mechanical life:
IP protection:
Operating temperature:


WIRING TABLE MDC 0-5V

| WIRE COLOR | FUNCTION |
| :--- | :--- |
| RED | $12 / 24$ VBatt |
| BLACK | Gnd |
| YELLOW | X Axis |
| GRAY | Y Axis |
| GREEN | Y Out of centre |
| ORANGE | X Out of centre |

## RATIOMETRIC VERSION TECHNICAL FEATURES

## Voltage supply: 9 V to 32 V

Output voltage range on X/Y Axis: $25 \%$ Vcc- $75 \%$ Vcc
Digital outputs:
Power digital outputs: 2 power digital outputs@5A
Mechanical life: $\quad>5$ million cycles
IP Protection:
IP65
$-40^{\circ} \div 85^{\circ} \mathrm{C}$


## WIRING TABLE MDC RATIOMETRIC

WIRE COLOR
RED
BLACK
YELLOW
GREEN
GREY
ORANGE
BLUE (1)
BLUE (2)
blUE (3)
BLUE (4)

FUNCTION
12 / 24 VBatt
Gnd
X Axis output signal
Power On-Off out of centre Y Axis Y Axis output signal
Power On-Off Out of centre X Axis ON-OFF Out of centre (South)
ON-OFF Out of centre (North)
ON-OFF Out of centre (West)
ON-OFF Out of centre ( East)

## WIRING TABLE MDC CANopen

## WIRE COLOR

RED
BLACK
BROWN
BLUE

FUNCTION
12 / 24 VBatt
Gnd
CAN_L
CAN_H

## Byte 4

Byte 5
Byte 6
Byte 7

| Bit $0:$ Axis 1+ | Bit $0:$ DIG_1 | Bit $0-3:$ |
| :--- | :--- | :--- |
| Bit $1:$ Axis 1- | Bit $1:$ DIG_2 | Firmware |
| Bit $2:$ Axis 2+ | Bit $2:$ DIG_3 | version |
| Bit $3:$ Axis 2- | Bit $3:$ DIG_4 | Zero |
| Bit $4: 0$ | Bit $4:$ DIG_5 |  |
| Bit $5: 0$ | Bit $5:$ DIG_6 | Bit $-7:$ |
| Bit $6: 0$ | Bit $6: 0$ | Counter |
| Bit $7: 0$ | Bit $7: 0$ | $0 \div 15$ |

## CANopen DICTIONARY

Communication Profile Area covers index form 1000 to 1FFF

| Index | Sub | Designation | Type | Default | Description |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1000 | 0 | Device type | U32, rwr | 0x00050191 | Profile 401; Inputs binary and analog |
| 1800 | 0 | Transmit PDO 1 | U8, rwr | $0 \times 05$ | Number of the entries Trans PDO 1 Binary inputs |
|  | 1 | COB ID PDO 1 | U32, rwr | $\begin{aligned} & \text { Ox180 + NODE } \\ & \text { ID } \\ & \hline \end{aligned}$ | - PDO is valid (bit 31=0) <br> - 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 ( 0 .. 65535 ms ) |
| 1 AOO | 0 | Mapping Trans PDO 1 | U8, rwr | $0 \times 01$ | Number of the application objects linked with the binary input PDO 1 |
|  | 1 | Index in the object directory | U32, rwr | 0x6400 0108 | Axis 1 |
|  | 2 | Index in the object directory | U32, rwr | 0x6400 0208 | Axis 2 |
|  | 3 | Index in the object directory | U32, rwr | 0x6400 0308 | Roller 1 |
|  | 4 | Index in the object directory | U32, rwr | 0x6400 0408 | Roller 2 |
|  | 5 | Index in the object directory | U32, rwr | 0x6000 0108 | 1 byte binary Axis out of center bits $1 . .8,8$ bits lenght |
|  | 6 | Index in the object directory | U32, rwr | 0x6000 0208 | 1 byte binary inputs bits $1 . .6,8$ bits lenght |
|  | 7 | Index in the object directory | U32, rwr | 0x6000 0308 | 1 byte binary errors bits 1..8, 8 bits lenght |
|  | 8 | Index in the object directory | U32, rwr | 0x6000 0408 | 1 byte binarystatus inputs bits $1 . .8$, 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


PWM VERSION TECHNICAL FEATURES

Voltage supply:
Outputs

Digital out of centre signals: Digital control:

Output currents:

Ramps:
Dither:
Programming software:

Mechanical life:
Ip Protection:
Operating temperature:

9 V to 32 V
4 PWM currents signals on each semi-axis with $100 \%$ duty cycle load
One for each semi-axis@500mA Closed-loop digital controlled outputs
$100 \div 2000 \mathrm{~mA} @ 12 \mathrm{~V}$;
$100 \div 1000 \mathrm{~mA} @ 24 \mathrm{~V}$
$0-2 \mathrm{sec}$
$100 \mathrm{~Hz}, 150 \mathrm{~Hz}, 200 \mathrm{~Hz}, 250 \mathrm{~Hz}$ MDC settings environment with PC USB Windows interface
>5 million cycles
IP65
$-40^{\circ} \mathrm{C} \div 85^{\circ} \mathrm{C}$

## WIRING TABLE MDC PWM

WIRE COLOR
RED
BLACK
WHITE
YELLOW
GREEN
GREY
ORANGE
BROWN
BLUE(1)
BLUE(2)
BLUE(3)
BLUE(4)

## FUNCTION

12 / 24 VBatt
Gnd
X Axis Outout signal (East)
Y Axis Output signal (South)
Y Axis Output signal (North)
X Axis Output signal (West)
X Axis Common GND (West-East)
Y Axis Common GND (Morth-South)
ON-OFF Out of centre (South)
ON-OFF Out of centre (North)
ON-OFF Out of centre (West)
ON-OFF Out of centre (East)


MDC INSTALLATION DRAWING


## 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


Home Page


PWM Version

## MDC DEVICE SETTINGS

## MDC Programming Kit

Code: G9634010393


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) |
| :---: | :---: | :---: | :---: |
|  |  |  |  |
| Transmit Data | TD | 2 | B |
| Receive Data | RD | 3 | A |
| Request To Send | RTS |  |  |
| Clear To Send | CTS |  |  |
| Signal Ground | SG | 5 | C |
| Data Set Ready Carrier Detect | $\begin{aligned} & \text { DSR } \\ & \text { CD } \end{aligned}$ |  |  |
| Data Terminal Ready | DTR |  |  |



## HANDLES

RANGE

## 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


## K- KNOB SERIES

| KB | $=$ Duroplast knob |
| ---: | :--- |
| KC | $=$ Technopolymer knob |
| KD | $=$ Duroplast knob with switch |
| KK | $=$ Duroplast knob with rubber cap |
| KP | $=$ Duroplast knob with switch |

## S- STRAIGHT SERIES

| SA | $=$ Handle without electric switch |
| ---: | :--- |
| SD | $=$ Handle with electric switch |
| SS | $=$Handles with electric switch to close <br> and safety button |
| SX | $=$ Handle with electric switch to close |
| SY | $=$Handle with electric switch dual <br> rocker type |
| SZ | $=$Handle with 2 or 3 positions latched <br> rocker |

KB - DUROPLAST KNOB


KC - TECHNOPOLYMER KNOB


KP - DUROPLAST SPHERICAL KNOB


KK - DUROPLAST KNOB WITH RUBBER CAP


KD - DUROPLAST KNOB WITH SWITCH


For installation dimensions see $K n o b K B$

KW - DUROPLAST KNOB WITH SWITCH


Protection: IP54
Rating current: 6A@250VAC
Mechanical life: 10 cycles

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
(

Insert ID letter for each button/switch chosen on the following list and in progressive sequence from 1 up to position 6.

X = No button switch $\mathrm{L}=$ Signaling led
$\mathbf{B}=$ Blue $\quad \mathbf{K}=$ Black (Only type C)
G = Green $\quad$ A $=$ Grey (Only type C)
$\mathbf{R}=$ Red $\quad \mathbf{V}=$ Purple (Only type C)
$\mathbf{Y}=$ Yellow $\quad \mathbf{O}=$ Orange (Only type C)
W = White (available only
for type C and E)

## Push Button/Switch Option See Page 5

A $=$ Plastic push button with microswitches
C $=$ Push button with micro-switches
E = Sealed push button with micro-switches

## Model

MFE $=$ Multifunction Ergonomic

A - PLASTIC PUSH BUTTON

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

IP40
5A@30VDC resistive load 30 VDC
$10^{4}$ cycles
$2 \times 10^{6}$ cycles


## C - ISOLATED PUSH BUTTON

Protection:
Rating currents:
Electrical life:
Mechanical life:

IP64
5A@28VDC resistive load
$25 \times 10^{3}$ cycles
$10^{6}$ 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
$2 \times 10^{6}$ cycles


T - SAFETY TRIGGER

## Protection:

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

IP40
5A@30VDC resistive load
30 VDC
$10^{4}$ cycles
$2 \times 10^{6}$ cycles


TCAP - CAPACITIVE SAFETY TRIGGER

## Protection:

Rating currents:
Input voltage range:
Electrical life:

IP65 / IP54 for redundant version 100 mA / up to 3 A for redundant version $10-30$ VDC $3 \times 10^{6}$ cycles


S - TYPE

Protection: IP68S

Rating currents: 16A@28VDC resistive load Mechanical life: $10^{5}$ cycles Electrical life: $\quad 25 \times 10^{3}$ cycles


VERTICAL MOUNTED


## HORIZONTAL MOUNTED



## TWO VERTICAL MOUNTED



VERTICAL MOUNTED LEFT OFFSET


VERTICAL MOUNTED RIGHT OFFSET


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

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

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

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

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

D - 4 WAY ON-OFF SWITCH

## Protection: IP68S <br> Rating current: 1A@28VDC inductive <br> Electrical life: $\quad 10^{5}$ Cycles

## DLDRDB - 3 SWITCHES



DL-1 SWITCH LEFT


RP - PROPORTIONAL ROLLER

Supply voltage
Sealing:
Output signal:
5 VDC
IP68S
$0,5-4,5 \mathrm{VDC}$ with $2,5 \mathrm{~V}$ in neutral position
$3 \times 10^{6}$ Cycles

DLDR - 2 SWITCHES TOP


DR - 1 SWITCH RIGHT



## DRDB - 2 SWITCHES RIGHT



DB - 1 SWITCH CENTER



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 $15^{\circ}$ FORWARD


4 - COMBINED TILTED FRW \& RIGHT
LH Handle


2 - TILTED $15^{\circ}$ RIGHT
LH Handle




Push button / switch in position $\mathbf{1 \div 9}$ See Page 11
For eah control selected, insert position number and ID letter chosen on the following list. Note: \#= color code. Example: for a push button blue in position 2 and a minijoystick in position 5, type 2B 5J

| X | = | No button switch | Y | Yellow push button |
| :---: | :---: | :---: | :---: | :---: |
| B | = | Blue push button | A | Grey push button |
| K | = | Black push button | R | Red push button |
| G | = | Green push button | W | White push button |
| 0 | $=$ | Orange push button | L\# | Signalling led |
| \#L | $=$ | Latched button with led | \#M | Momentary button with led |
| D | = | Four ways switch | J | Four ways minijoystick |
| TS |  | Toggle Switch |  |  |

## Model

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

[^0]
## PUSH BUTTON TYPE C

| Protection: | IP64 |
| :--- | :--- |
| Rating currents: | 5A@28VDC resistive load |
| Electrical life: | 25,000 cycles |
| Mechanical life: | $10^{6}$ cycles |



## PROPORTIONAL ROLLER

| Supply voltage: | 5 VDC |
| :--- | :--- |
| Sealing: | IP68S |
| Output signal: | $0,5-4,5$ VDC with $2,5 \mathrm{~V}$ in neutral position |
| Mechanical life: | $3 \times 10^{6}$ cycles |

## ROCKER SWITCH

## Sealing:

Rating currents:
Mechanical life:
Electrical life:

IP68S
16A@28VDC resistive Ioad
$10^{5}$ cycles
$25 \times 10^{3}$ cycles

## FOUR WAYS SWITCH

| Protection: | IP68S |
| :--- | :--- |
| Rating currents: | 1 A@28VDC inductive |
| Electrical life: | $10^{5}$ cycles |



## SIGNALING LED

Color available:
Supply voltage:
Mounted:

White, Red, Yellow, Green, Blue
12 or 24 VDC
On panel with support

FOUR WAY PROPORTIONAL MINI-JOYSTICK

| Protection: | IP68S |
| :--- | :--- |
| Supply voltage: | 5 VDC |
| Output voltage: | $0.5-4.5 \mathrm{~V}$ with 2.5 V in neutral, for each axis |
| Mechanical life: | $10^{6}$ cycles |



[^1]

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


ELECTRIC REMOTE CONTROLS
Handles - MFE2 TILTED OPTIONS

0 - STANDARD STRAIGHT


S2 - TILTED $15^{\circ}$ RIGHT


S3-TILTED $15^{\circ}$ LEFT



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


Buttons Position

ELECTRIC REMOTE CONTROLS
Handles - EXM PUSH BUTTONS AND CONTROLS

## A - PLASTIC PUSH BUTTON

| Protection: | IP40 |
| :--- | :--- |
| Rating currents: | 5 A@30VDC resistive load |
| Input voltage range: | 30 VDC |
| Electrical life: | $10^{4}$ cycles |
| Mechanical life: | $2 \times 10^{6}$ cycles |



## C - ISOLATED PUSH BUTTON

Protection:
Rating currents:
Electrical life:
Mechanical life:

## P64

5A@28VDC resistive load 25,000 cycles
$10^{6}$ cycles


E - SEALED SERVICEABLE PUSH BUTTON

| Protection: | IP40 |
| :--- | :--- |
| Rating currents: | 5 A@30VDC resistive load |
| Input voltage range: | 30 VDC |
| Electrical life: | $10^{4}$ cycles |
| Mechanical life: | $2 \times 10^{6}$ cycles |

S TYPE - WATERPROOF ROCKER SWITCH
WATERPROOF ROCKER SWITCH


## 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


## VERTICAL MOUNTED



ELECTRIC REMOTE CONTROLS
Handles - EXM TILTED OPTIONS

0 - STANDARD STRAIGHT


2 - TILTED $15^{\circ}$ RIGHT


3 - TILTED $15^{\circ}$ LEFT


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Certified Company
ISO 9001:2015 - ISO 14001:2015


[^0]:    ** For special configuration, please contact HANSA TMP

[^1]:    Note: Other controls available on request.

