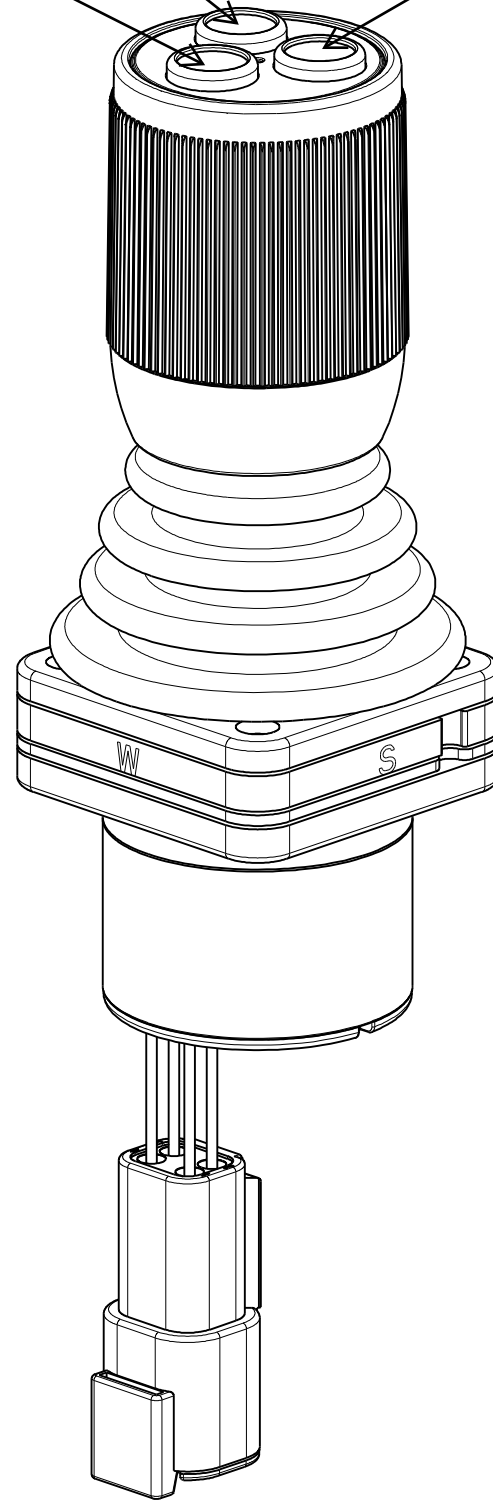


Push Button 1
Symbol: P008

Push Button 2
Symbol: P008

Push Button 3
Symbol: P008



Makersan Order No : MO395_V0014
Makersan Confid ID : MO 395 - H20 - S11 - A - 0 - 3 - A3
Part Name : Mini Joystick
Customer : EHR ELEKTRONİK
Project : -
Hardware : H20 - S11 - S:8-32V ; O: CANopen
Node ID : A - 10(0Ah)
Axis of Actuation : 0 - 2 Axis Full
Electrical Connection : 3 - Deutsch DTM04-4P
Grip : A3 - 388 Grip with 3 Buttons
Special Requirements :
Please refer to MO395-H2X datasheet for other information.

- Olası bir yay kırılmasında, joystick kalan yaylar ile kesinlikle kullanılmamalıdır.
In case of a spring break, joystick must not be used with remaining springs.
- Şok ve darbeye maruz kalan veya yere düşen joystick hurdaya ayrılmalıdır, kullanılmamalıdır.
Joystick must be separated to scrap if it has been exposed to any shock, impact or free fall.
- Joystick Base ve Grip'e ait datasheet'deki güvenlik talimatlarına uyulmalıdır.
Safety instruction in the Joystick Base and Grip datasheet shall be respected.
- Joystick Base ve Grip'e ait datasheet'deki hata modları, araç üreticisi tarafından dikkate alınmalıdır.
Failure modes in the Joystick Base and Grip datasheet should be taken into account by the vehicle manufacturer.
- Joystick Base and Grip'e ait kullanım kılavuzundaki uyarı işaretlerine uyulmalıdır.
The warning indications in the Joystick Base and Grip user manual shall be respected.

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REVIZYON REVISION	TARİH DATE	20-Jan-26 08:00:00 AM	KONTROL CHECKED BY	Levent ERKOCAK	ACIKLAMA DESCRIPTION			
Belirtilmeyen toleranslar / Unspecified tolerances according to TS 1980-1 (DIN ISO 2768-1)			v		MALZEME/MATERIAL		YUZEY/AREA_mm2 -	AGIRLIK/MASS_kg -
CİZEN DRAWN BY	U.DEMİR	TARİH/DATE	11/11/20		YUZEY İŞLEM/FINISH		ISIL İŞLEM/HEAT TREATMENT	
OLÇEK/SCALE 1,000	A3			PARÇA ADI /PART NAME		 MAKERSAN www.makersan.com		
PARÇA /PART NO MO395_HXX_X_X_XX				Mini Joystick				



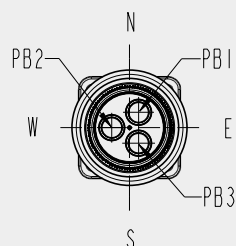
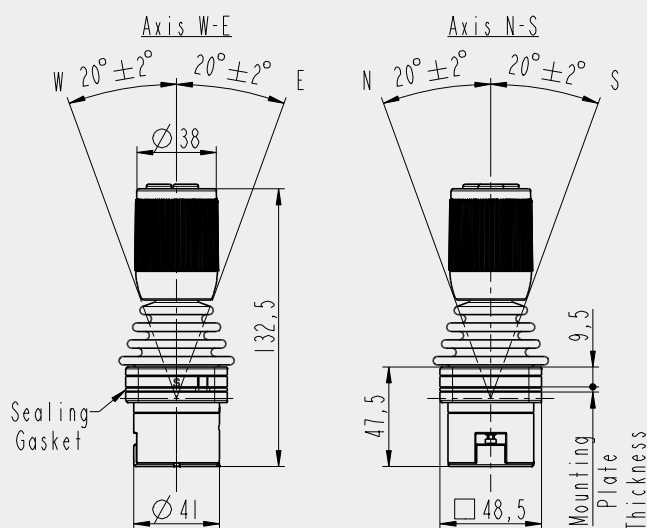
Product Characteristics

Technology	Contactless Hall Measuring Principle (Redundant - for safety double sensor output per axis)
Lifetime at Full Stroke	Up to 2 axis base, up to 1 axis grip, up to 3 buttons Up to 5 million cycles for no detent, up to 2 million cycles for Z axis and up to 500k for Z axis with detent Up to 2 million cycles for the grip buttons
Lever Operating Angle	$\pm 20^\circ$
Lever	Self Centering
Axis of Actuation	2 Axis Full, 2 Axis Plus, Single Axis WE, Single Axis SN
Grip	Z Axis: $\pm 45^\circ$ working angle Detent: $\pm 20^\circ$ working angle with 3 detent positions
Operating Temperature	$-40^\circ \dots +85^\circ$
Protection	IP65 from surface of mounting till top

Electrical Data

Supply Voltage	8-32V DC
Supply Current	50mA typ. @12V supply
CAN	ISO 11898, CAN specification 2.0A - 2.0B
Protocol	SAE J1939 or CANopen
Baud Rate	250 kbit/s (default)
Termination Resistor	External
Programmable Parameters	Node ID, baud rate and others
Overvoltage Protection	Up to 36V
Reverse Battery Protection	Provided
Button Characteristics	Up to 3 mechanical switches (1mA min. - 20mA max.) Up to 1 Hall effect low side switch (10mA max.)

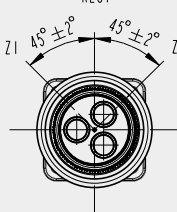
With 388 Grip



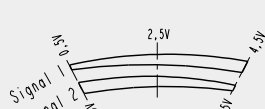
Working Angle for Z AXIS



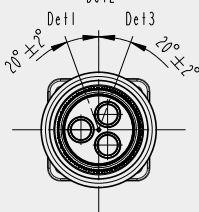
REST



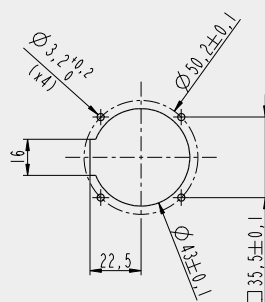
Working Angle for DETENT



1



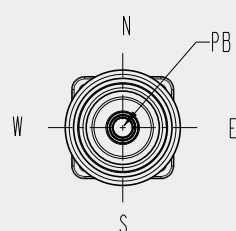
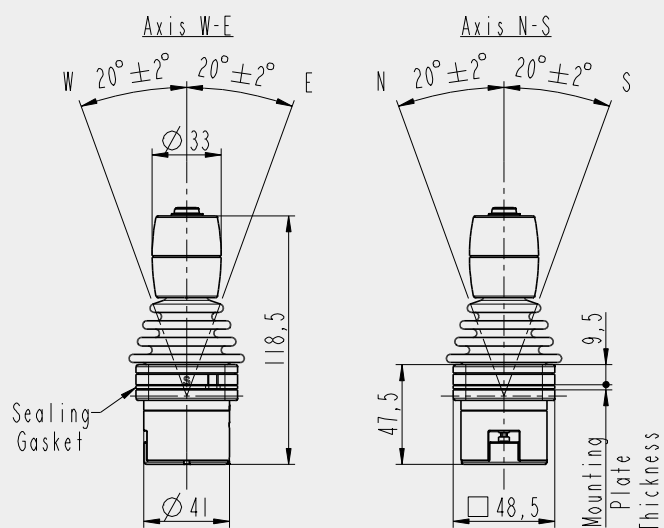
Recommended Cut-Out Dimensions for Customer



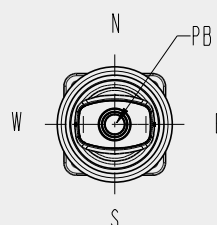
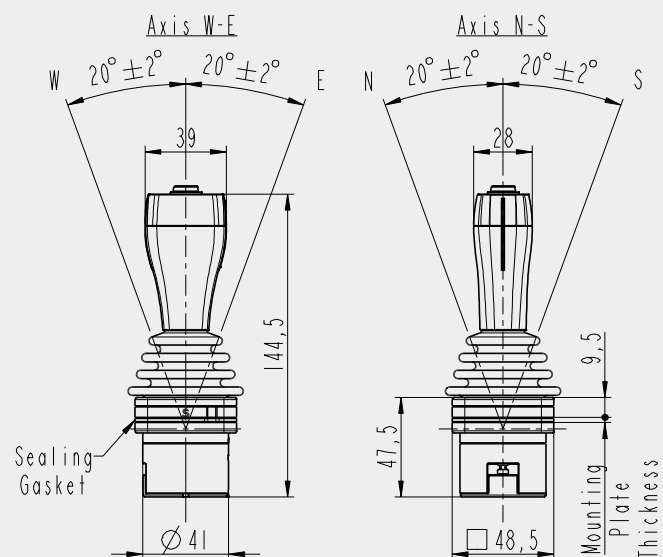
* Cut-Out dimensions is the same for all versions.

Unspecified tolerances according to TS 1980-1 (DIN ISO 2768-1)	-	v
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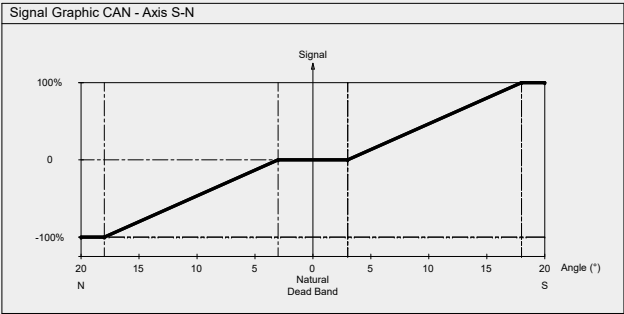
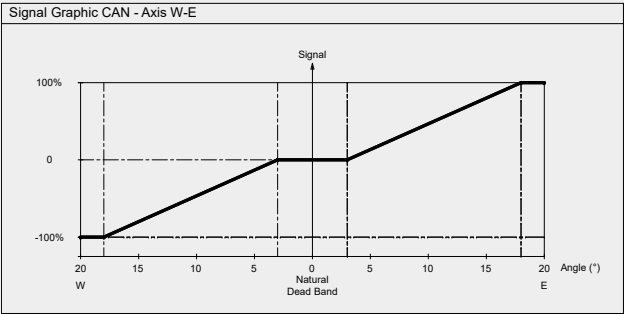
With 388B Grip



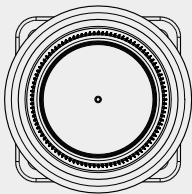
With 388C Grip



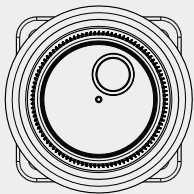
Signal Output Diagrams



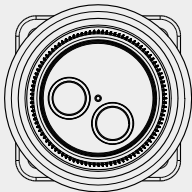
Grip Button Panel Variants



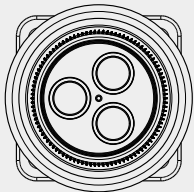
Z0 = No Button with Z Axis
Y0 = No Button with 3 Detent



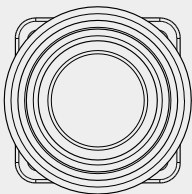
Z1 = 1 Button with Z Axis
Y1 = 1 Button with 3 Detent



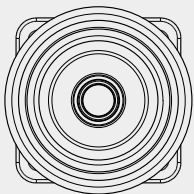
A2 = 2 Button
Z2 = 2 Button with Z Axis
Y2 = 2 Button with 3 Detent



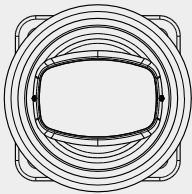
A3 = 3 Button
Z3 = 3 Button with Z Axis
Y3 = 3 Button with 3 Detent



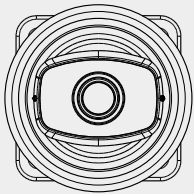
B0 = No Button



B1 = 1 Button



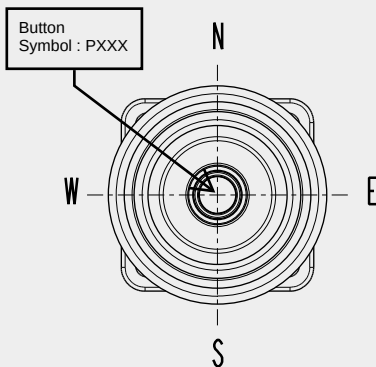
C0 = No Button



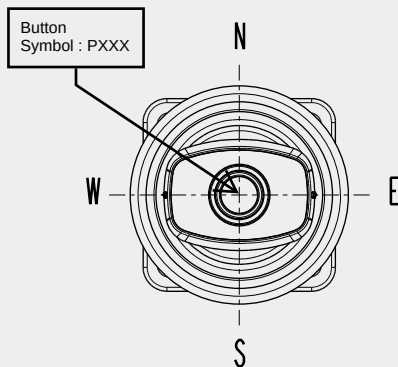
C1 = 1 Button

Button Symbol Options

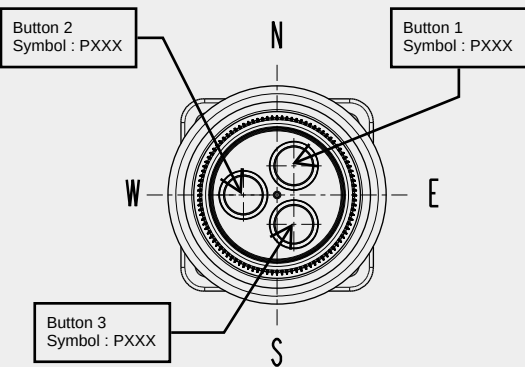
388B Grip



388C Grip



388 Grip



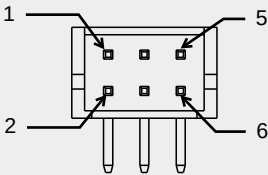
Code	Symbol	Description
P001		RAL 9003 Signal White
P002		RAL 3001 Signal Red
P003		RAL 5005 Signal Blue
P004		RAL 6010 Signal Green
P005		RAL 1023 Traffic Yellow
P006		RAL 2010 Signal Orange
P007		RAL 9005 Jet Black
P008		RAL 7043 Signal Gray B

Code	Symbol	Description
P051		Background Color: RAL 7043 Legend Color: RAL 9003 "Arrow 1"
P501		Background Color: RAL 7043 Legend Color: RAL 9003 "Arrow 2"
P502		Background Color: RAL 9005 Legend Color: RAL 9003 "Differential Lock"
P503		Background Color: RAL 9005 Legend Color: RAL 9003 "HORN"
P504		Background Color: RAL 9005 Legend Color: RAL 9003 "TIP SHIFT"

* If unspecified; button symbol will be P008 (RAL 7043-Traffic Gray).

Electrical Connection

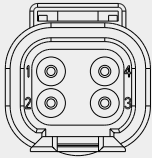
Hirose Conn Header 6 Pos



CONNECTOR PINS	
Pin No	Function
1	CAN L
2	CAN H
3	Vs
4	GND
5	-
6	-

Mating Connector:
DF11-6DS-2C(05)

Deutsch DTM04-4P



CONNECTOR PINS		
Pin No	Function	Color
1	Vs	Red
2	GND	Black
3	CAN H	Yellow
4	CAN L	Green

Mating Connector:
DTM06-4S

Ordering Code

MO 395 - H2X - S1X - X - X - X - XX

Hardware	Node ID	Axis of Actuation	Elec. Connection	Grip
395.H20.S10 - S:8-32V ; O: CANJ1939 395.H20.S11 - S:8-32V ; O: CANopen	J1939 CANopen A - 134(86h) 10(0Ah) B - 135(87h) 11(0Bh) C - 136(88h) 12(0Ch)	0 - 2 Axis Full 1 - 2 Axis Plus 2 - Single Axis WE 3 - Single Axis SN	0 - Hirose Conn 6 Pos 3 - Deutsch DTM04-4P *	B0 - 388B No Button B1 - 388B 1 Button C0 - 388C No Button C1 - 388C 1 Button A2 - 388 Grip with 2 Buttons A3 - 388 Grip with 3 Buttons Z0 - 388 Grip No Button with Z Axis Z1 - 388 Grip 1 Button with Z Axis Z2 - 388 Grip 2 Buttons with Z Axis Z3 - 388 Grip 3 Buttons with Z Axis Y0 - 388 Grip No Button with 3 Detent Y1 - 388 Grip 1 Button with 3 Detent Y2 - 388 Grip 2 Buttons with 3 Detent Y3 - 388 Grip 3 Buttons with 3 Detent

* Hirose connector is standard, other cable connections are available upon request with minimum order quantity.

Example : MO 395 - H20 - S10 - A - 0 - 0 - B0 is Mini Joystick CAN, CAN J1939 S:8-32V,
Node ID 134(86h), 2 Axis Full, with Hirose Connector, 388B Grip No Button

Safety Instructions

- *Do not use sensor in hazardous and explosive environment.
- *Keep the sensor away from magnets and radio equipment . Hall sensors are sensitive to external magnetic fields.
- *Do not place the sensor to the direct air flow of vehicles heating cooling air duct due to the high temperature stress.
- *Screen with the vehicle's ground the electric cables connected to sensor.Far away the sensor cable from power-conducting lines.
- *Provide a clean power supply to the sensor. Otherwise voltage transients may damage the sensor.
- *Do not direct the pressure washing jet to sensor.
- *Unplug connectors from the sensor during electrical welding operations.
- *Damages which result from improper use, all warranty and liability claims with respect to the manufacturer void.
- *To perform a risk analysis of the system is customer's responsibility at use in safety-related functions of the sensor.
- *These products are ESD (Electrostatic Discharge) sensitive devices. ESD may cause permanent damage. When handling these devices please observe standard ESD precautions.
- *Please refer to "User Manual" for other detail information.
- *Never use torn silicone rubber.

*Makersan Ltd. Co. reserves the right to make corrections, enhancements, improvements and other changes to its products at any time and without notice.