50 mm TRACKBALL Vandalproof & Waterproof

VANDALPROOF & WATERPROOF 50 mm TRACKBALLS

STAINLESS STEEL CARRIER & SWITCHES

• GENERAL DESCRIPTION

The **TSA50 series** are waterproof and vandalproof (over 20 Joules impacts) industrial trackball units, directly plug compatible to PS/2 or USB ports.

The IP68 waterproof level of the trackball module is inherent to the used Optical Navigation Technology with solid state sensing. The trackball is maintenance free as there are no moving parts except for the ball and it withstands impacts on the top of over 20 Joules.
The unit has an appealing and robust look, the carrier plate, cover ring and the three anti-vandal switches being all made of high grade stainless steel. A specially made panel sealring forms part of the supply.

Due to its outstanding sealing - and impact specification levels, its professional style and its industrial robustness, this trackball unit is the best suited pointing device for all harsh or hostile environments, indoor and outdoor. Fields of applications are therefore very wide : public access- and information kiosks, internet- and entertainment terminals, navigation controls, processing industries and many others.

TSA50F2 : WITH IP65 PUSHBUTTON SWITCHES
OPTION **:** The TSA50F2 can be supplied with a black coated stainless steel topplate. **TSA50F2-BT1**

TSA50F8 : COMPLETE WATERPROOF UNIT
All parts of this unit are waterproof to IP68 sealing grade; not just the trackball itself but also the three switches.

Dim : 100 x 116 x 40
Weight : 0,6 kg

TSA50F2

TSA50F8

• SPECIFICATIONS

Carrier plate : Brushed Stainless Steel (AISI 316)
Ball diameter : 50,8 mm.
Ball material : epoxy resin, mid-grey
Tracking force : nom. 50 grams
Lifetime > 2 million ball revolutions
Protection class : IP68 (trackball module)
Impact : up to 20 Joules
Mounting position : all angles
Supply voltage : 3,6V to 5,5V
Supply current : 150 mA max
Operating temperature range : 0°C to +55°C
Storage temperature range : -25°C to +80°C

PUSH BUTTON SWITCHES

	TSA50F2	**TSA50F8**
Sealing	IP65	IP68
Travel	1,3mm	0,5 mm
Operating force	4N typ	4N typ
Material	stainless steel	stainless steel
Contacts :	gold plated	st.st. dome on gold
Mechanical life	1 million cycles	3 million cycles

CE : compliant to EMC Directive 89/336/EEC for Electromagnetic Compatibility. Low Voltage Directive 73/23/EEC not applicable for our trackballs.

• CONNECTIVITY

The PS/2 and the USB versions are supplied with a 1,6m long, shielded straight cable ended with a PS/2 or USB type A plug. No device driver is supplied with the unit. Please use standard available drivers in your operating system.

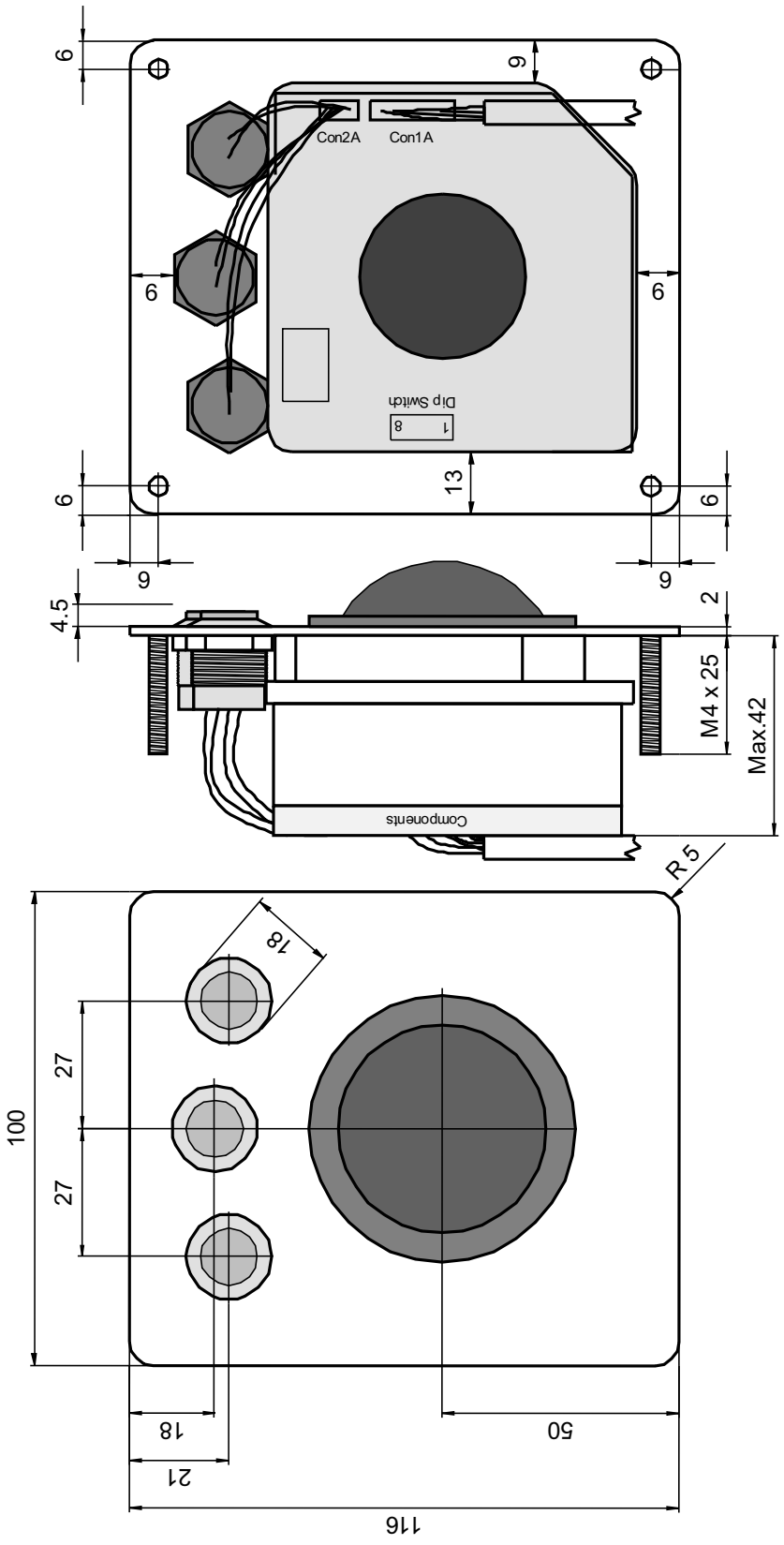
** Due to the increasing differences of the PS/2 mouse port specifications of the various PC manufacturers, we do recommend that this unit should be tested on the final PC configuration and operating system prior to installing it in series.*

• ORDERING INFO

Trackball with IP65 push button switches Optional black topplate	**TSA50 F2 yyy** **TSA50 F2 yyy-BT1**
Trackball with IP68 short travel switches	**TSA50 F8 yyy**

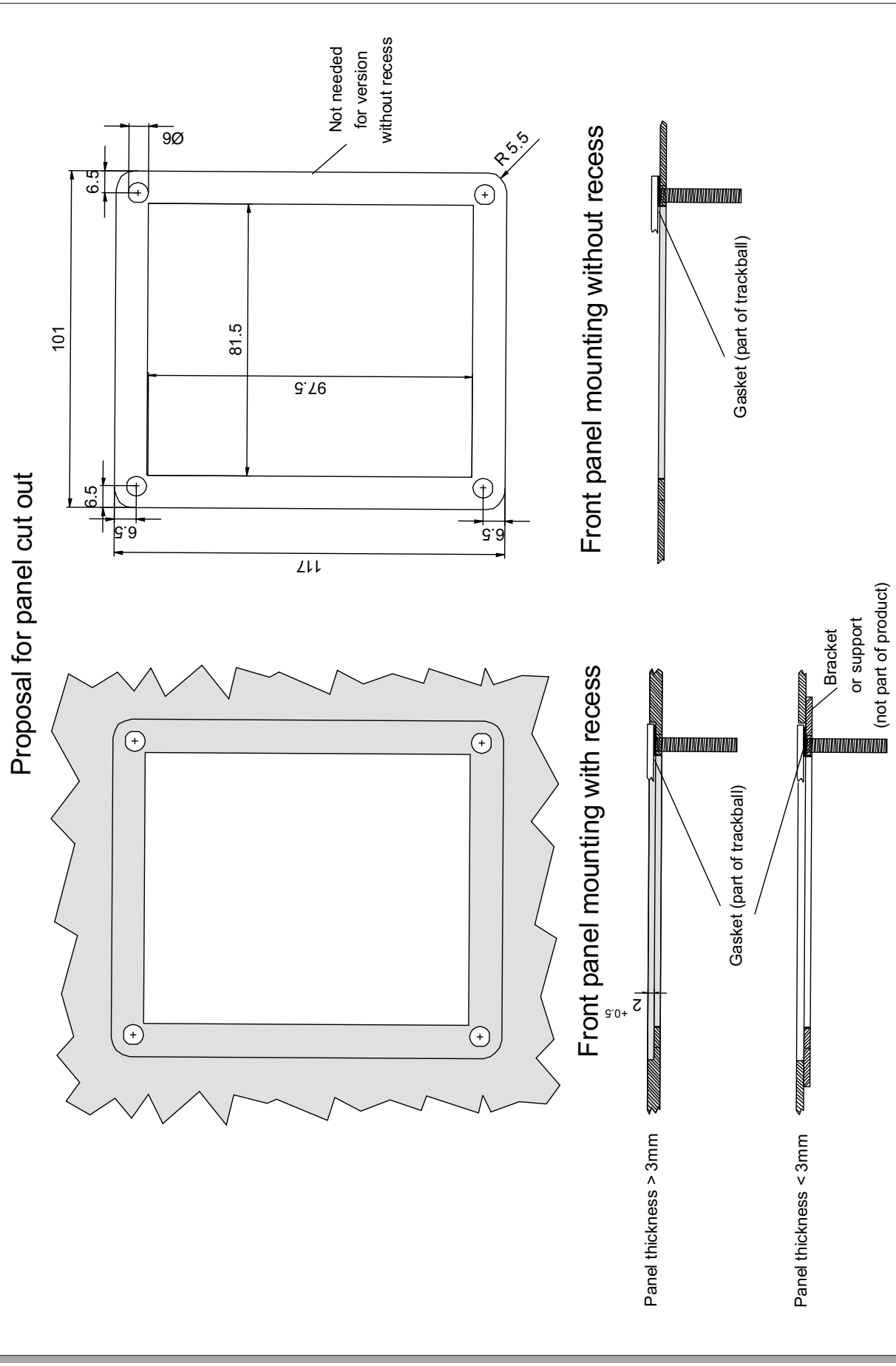
yyy = protocol output :
PS2 = PS/2 output
USB = USB output

• DIMENSIONAL DRAWING



TSA50Fxxxx

• PROPOSAL FOR PANEL CUT OUT



• INTERNAL / EXTERNAL CONNECTION DETAILS

Connections are made to the O50 series unit by means of two latching JST (or equivalent) connectors.

Connector 1A: JST PH series 10 pin S10B-PH-SM3 - USB and PS/2 protocols.
Mating part : JST KR series 10KR-8M

Connector 2A: JST PH series 4 pin S4B-PH-SM3 **-** Switch inputs.
Mating part : JST KR series 4 pin 4KR-8M

Internal Protocol Connector 1A

Pin Number	USB Output	USB output Cable coding	PS/2 Output	PS/2 output cable coding
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	-
7	Vcc Supply	Red	Vcc Supply	Orange
8	D -	White	PS/2Data	Black
9	D+	Green	PS/2 Clock	Yellow
10	GND	Black	GND	Red

Internal Switch Connector 2A

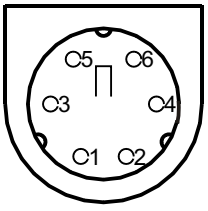
Pin Number	Universal interface
1	Left (Sw1)
2	Middle (Sw2)
3	Right (Sw3)
4	GND

Each switch has one common line to GND (ground)

PS/2 output cable :

6-Pin mini-DIN male connector

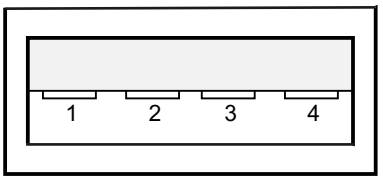
Pin number	Function	Color code cable
1	Data	Black
2	-	-
3	Ground	Red
4	+ 5 V	Orange
5	Clock	Yellow
6	-	-



View into connector

USB output cable :

Pin type “A” plug Pin number	Function	Color code cable
1	Vdd	Red
2	D-	White
3	D+	Green
4	Ground	Black



View into connector

• CONFIGURATION

The 8-way dipswitch, located on the underside of the unit, provides the user with optional configuration features. These are detailed in table 2.

Table 2: DIP Switch functionality (Universal Interface)

Universal Interface (PS/2 – USB)			
Switch	**Function**	**Off**	**On**
1	Orientation 1 setting	See diagram (fig 1)	See diagram (fig 1)
2	Orientation 2 setting	See diagram (fig 1)	See diagram (fig 1)
3	VX3 – Virtual 3 axis function	Feature Enabled	Feature Disabled
4	Ballistic Mode	Feature Enabled	Feature Disabled
5	Inverted Y	Feature Disabled	Feature Enabled
6, 7, 8	N/A	Default	

Factory default setting: Dipswitch 1 ON. All other switches OFF.

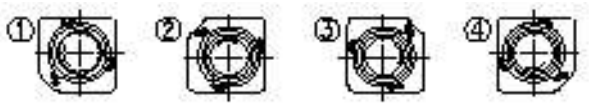
Table 3: DIP Switch functionality (Phase Quadrature)

Phase Quadrature			
Switch	Function	Off	On
1	Orientation 1 setting	See diagram (fig 1)	See diagram (fig 1)
2	Orientation 2 setting	See diagram (fig 1)	See diagram (fig 1)
3	N/A	Default	
4	Resolution	314 pulses per revolution	157 pulses per revolution
5	Inverted Y	Feature Disabled	Feature Enabled
6, 7, 8	N/A	Default	

Factory default setting: Dipswitch 1 and 2 ON. All other switches OFF.

Switches 1 and 2: Orientation settings

Switches 1 and 2 allow four possible mounting orientations for the Trackerball (See figure.1)



Orientation 1	On	Off	Off	On
Orientation 2	Off	On	Off	On

Switch 3

VX3: is a patent protected facility that provides the same 2 modes of function as a scroll wheel on a 3-axis mouse. This feature is disabled by default and must be enabled by setting dip switch 3 before use.

Operation:
Press middle button once to latch scroll mode one (e.g. dynamic pan feature);
Press middle button again to latch scroll mode two (e.g. 3rd axis zoom feature);
Further middle button presses toggles between scroll mode one and scroll mode two;
Press either left or right buttons to cancel feature and resume normal X-Y operation.

Switch 4

Ballistic Mode: Simulates cursor acceleration under fast ball movement. (Enabled by default)

Switch 5

Inverted Y: Y-axis is inverted for overhead operation.

Switch 6, 7 & 8

Switch functions not used.

• CUSTOM SPECIFIC POSSIBILITIES

- Self-Draining Facility
- Optional Ball Colours (MOQ applies)
- Customer Specific Colour Matching (MOQ applies)
- Special coloured panels
- Other Switch Types
- Other panel dimensions
- Other Output protocols

Contact Mulder-Hardenberg for further details on product variants and custom specifications.