



VANDALPROOF & WATERPROOF 50 mm TRACKBALLS

ALL STAINLESS STEEL: CARRIER PLATE, SWITCHES, HOUSING

The K-TSA50 series are waterproof and vandalproof (over 20 Joules impacts) industrial trackball units. 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, the three anti-vandal switches and the housing all made of high grade stainless steel. The unit has combo PS/2 & USB output with auto-recognition.

The use of stainless steel for the various parts ensures the best resistance in salty or greasy environments. 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 very wide : public access- and information kiosks, internet- and entertainment terminals, navigation controls, food industry, processing industries and many others.

WITH IP65 PUSHBUTTON SWITCHES

K-TSA50F2

Option : The K-TSA50F2 can be supplied with a black coated stainless steel topplate. K-TSA50F2-BT1

WITH IP68 SHORT TRAVEL SWITCHES

K-TSA50F8 (panelmount) & K-TSA50S8 (desktop)

Complete waterproof : all parts of this unit are waterproof to IP68 sealing grade; not just the trackball itself but also the three switches and the complete housing.



Panel mount versions :

A specially made panel seal ring forms part of the supply.

dim : 100 x 116 x 40 mm

weight : 0,6 kg

Enclosed version:

Stainless steel enclosure. Silicon sponge seals and sealed buttons warrant for an IP68 waterproof sealing grade for the complete desktop unit.

dim: 200 x 120 x 63 mm

weight: 1,3 kg

• CONNECTIVITY

These combo PS/2 & USB trackball units have a 1,6 meter long shielded straight cable ended by a PS/2 plug. An adaptor to USB type A is added. No special device driver is needed, use standard available drivers of 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

Vandalproof trackball	Panel mount version	Enclosed version
with IP65 push button switches Black topplate	K-TSA50F2 K-TSA50F2-BT1	
with IP68 short travel switches	K-TSA50F8	K-TSA50S8

Output : PS/2 & USB Combo

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• SPECIFICATIONS

Carrier plate : brushed stainless steel
 Ball diameter : 50,8 mm.
 Ball material : epoxy resin, mid-grey
 Tracking force : nom. 50 grams
 Lifetime : > 2 million ball revolutions
 Protection class : IP68
 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 +60°C
 Storage temperature range : -25°C to +80°C

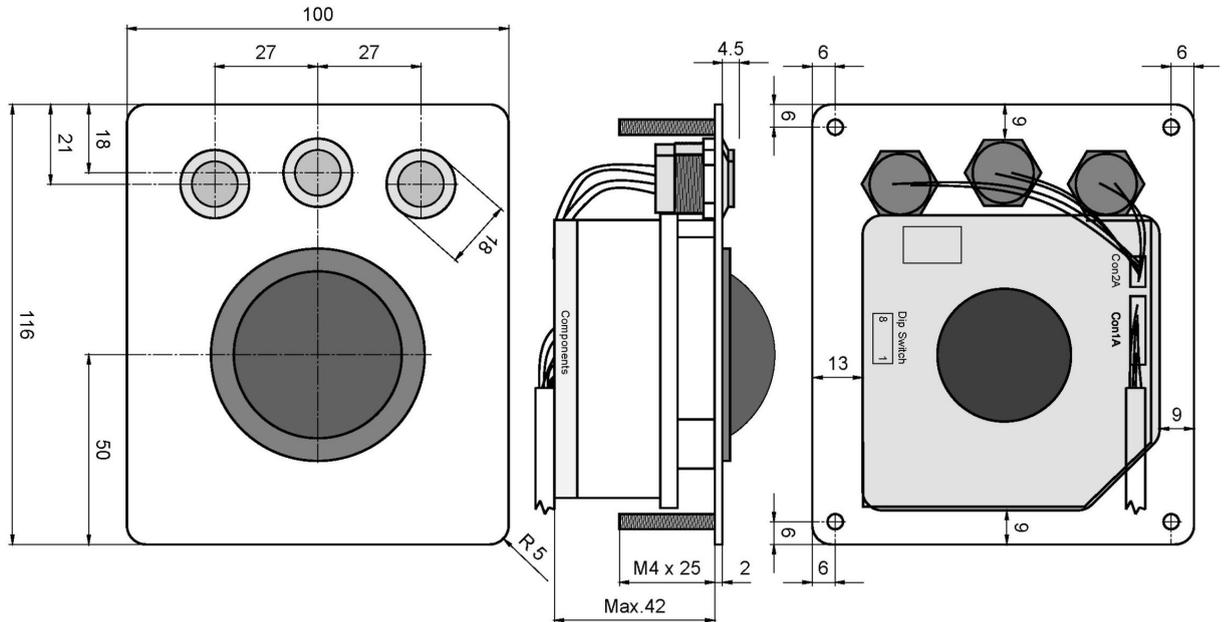
PUSH BUTTON SWITCHES

	K-TSA50F2	K-TSA50F8/S8
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

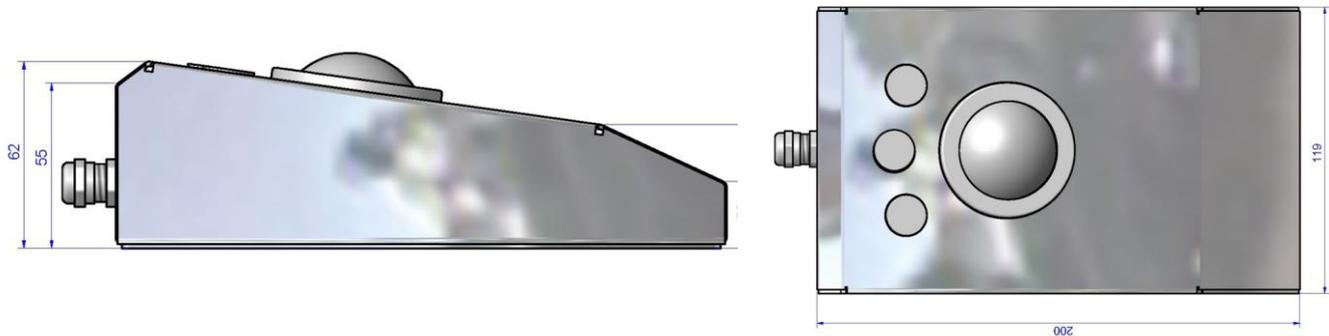
CE : compliant to EMC Directive 89/336/EEC for Electromagnetic Compatibility. Low Voltage Directive 73/23/EEC not applicable for our trackballs.

• DIMENSIONAL DRAWING

Panel mount version



Enclosed version



Kessler-Ellis Products

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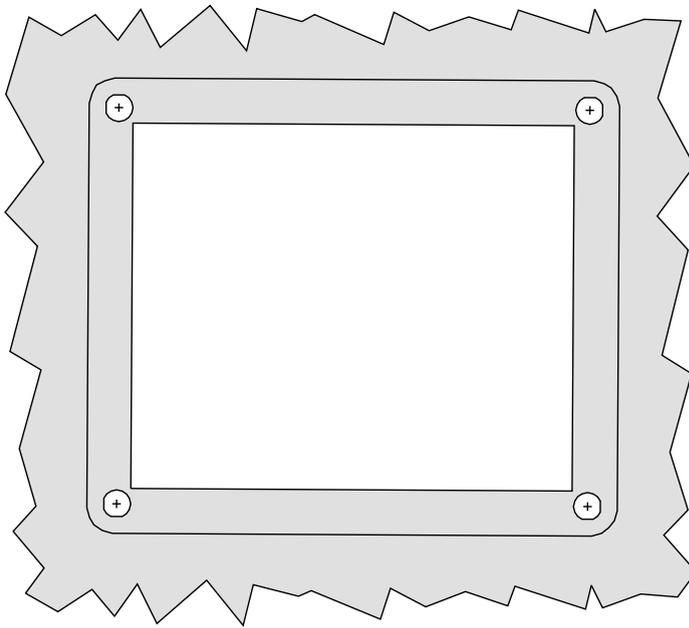
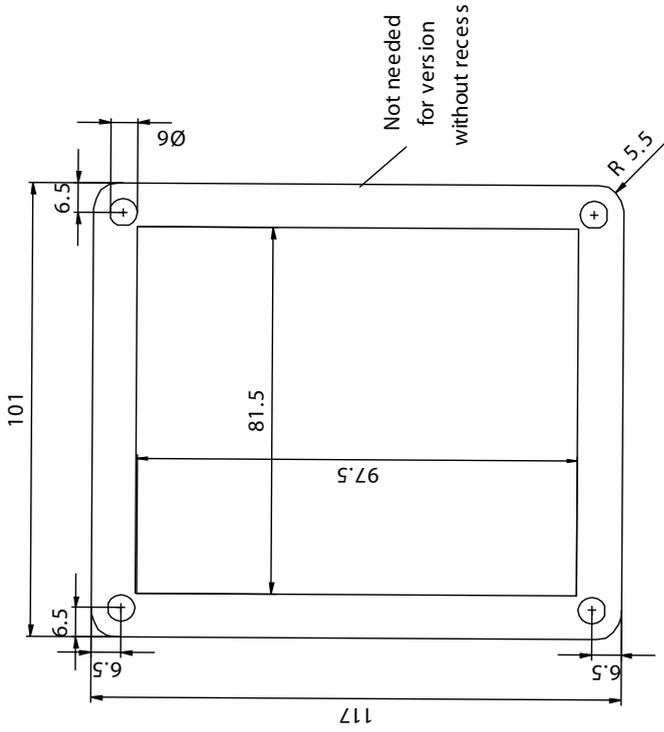
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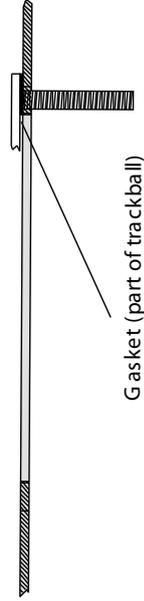
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• PROPOSAL FOR PANEL CUT OUT

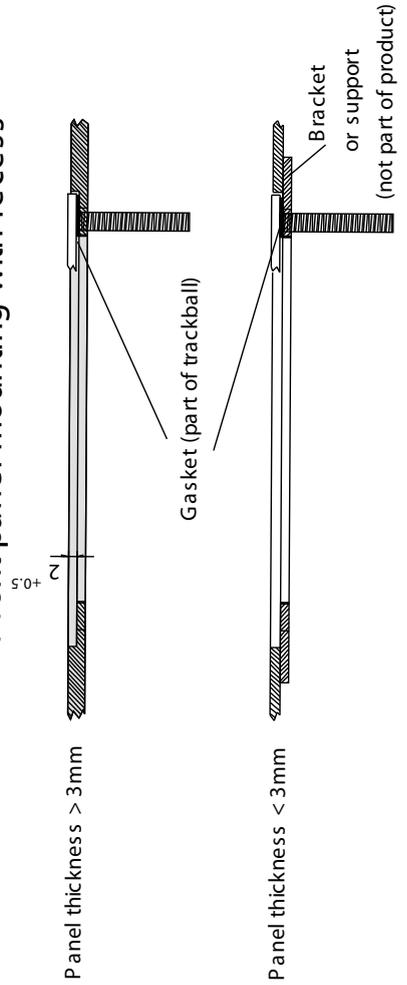
Proposal for panel cut out



Front panel mounting without recess



Front panel mounting with recess



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• 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

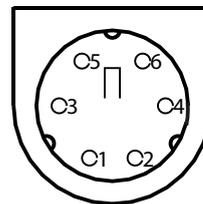
Pin Number	Universal interface
1	Left (Sw1)
2	Middle (Sw2)
3	Right (Sw3)
4	GND

Each switch has one common line to GND (ground)

PS/2 output cable :

6-Pin mini-DIN male connector

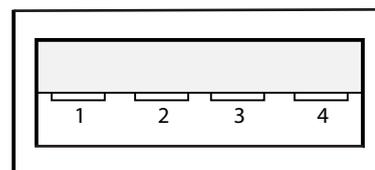
Pin number	Function	Color code cable
1	Data	Black
2	-	-
3	Ground	Red
4	+ 5 V	Orange
5	Clock	Yellow
6	-	-



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

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• 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.

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