

038 Series OPTICAL TRACKBALLS

IP68 Sealing

USB, PS/2 and Quadrature Outputs

- Solid State Optical Navigation Technology
- Totally Waterproof (IP68)
- ESD Protected (Impenetrable Barrier)
- Adjustable Friction Control
- Fixed and Removable Ball Versions
- Self-draining/back flushing Models
- OEM Custom Resolutions
- Decontamination Friendly



• SPECIFICATIONS

Mechanical

Weight	120 grams
Ball	Epoxy Resin, 38.10 mm
Tracking Force	5 grams Nominal Continuous Free Running 20 grams Nominal Continuous Friction / Scraper Ring 5 - 200 grams Nominal Continuous Variable Friction Ring/Removable Ball
Ball Load	>300N Maximum downward pressure (30 Kg) for 2 mins.
Ball Rotation	Continuous and reversible any direction
Resolvable Ball Speed	14.4 Inches/sec.
Housing Material	Polycarbonate (Lexan®LS2 lens grade)
Transducer	Optical Navigation Technology (solid state sensing)
Mounting Position	All angles (Dependant on top plate arrangement)

Electrical

Standard Output Connector	JST style, 2mm Pitch, PH series 10 way right-angled header
Mating Connector	JST style, 10 way CR, KR or KRD type connector JST part no: PHR 10
Resolution (Quadrature)	314 / 157 pulses per ball revolution, switchable (custom resolutions available)
Resolution (Protocol mode)	1256 pulses per ball revolution (custom resolutions available)
External Switch Inputs	3 switches Left, Middle, and Right. Connection through JST, 2 mm pitch, 4-way right-angled header. Mating part no: PHR 4
Supply Voltage	3.6V to 5.5V
Supply Current	110mA typical 150mA maximum

Environmental

Operating Temperature	0°C to +55°C *
Storage Temperature	-25°C to + 85°C *
ESD	>15kV air discharge and 8 kV contact fully protected
Impact	10 Joules
Lifetime	> 1 million ball revolutions
Sealing Capabilities	Ip68

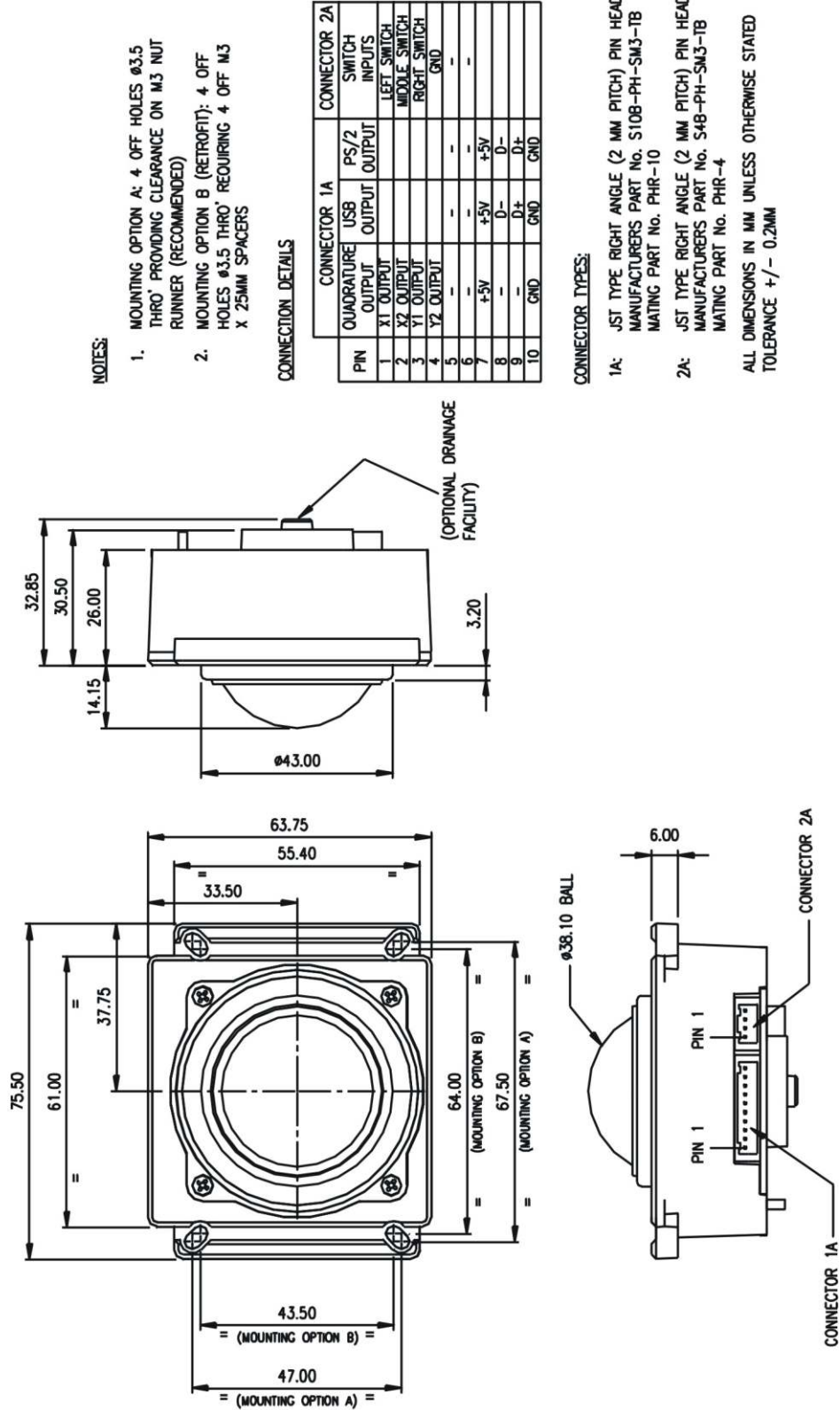
* Rating of most sensitive components.

All specifications nominal at 20°C except where stated

O38 series OPTICAL TRACKBALLS

• DIMENSIONAL DRAWING

Dimensions for free running and fixed friction/scrapper devices



038 series OPTICAL TRACKBALLS

• DIMENSIONAL DRAWING

Dimensions for Variable Friction / Removable Ball device

NOTES:

1. MOUNTING OPTION A: 4 OFF HOLES $\phi 3.5$ THRO' PROVIDING CLEARANCE ON M3 NUT RUNNER (RECOMMENDED)
2. MOUNTING OPTION B (RETROFIT): 4 OFF HOLES $\phi 3.5$ THRO' REQUIRING 4 OFF M3 X 25MM SPACERS

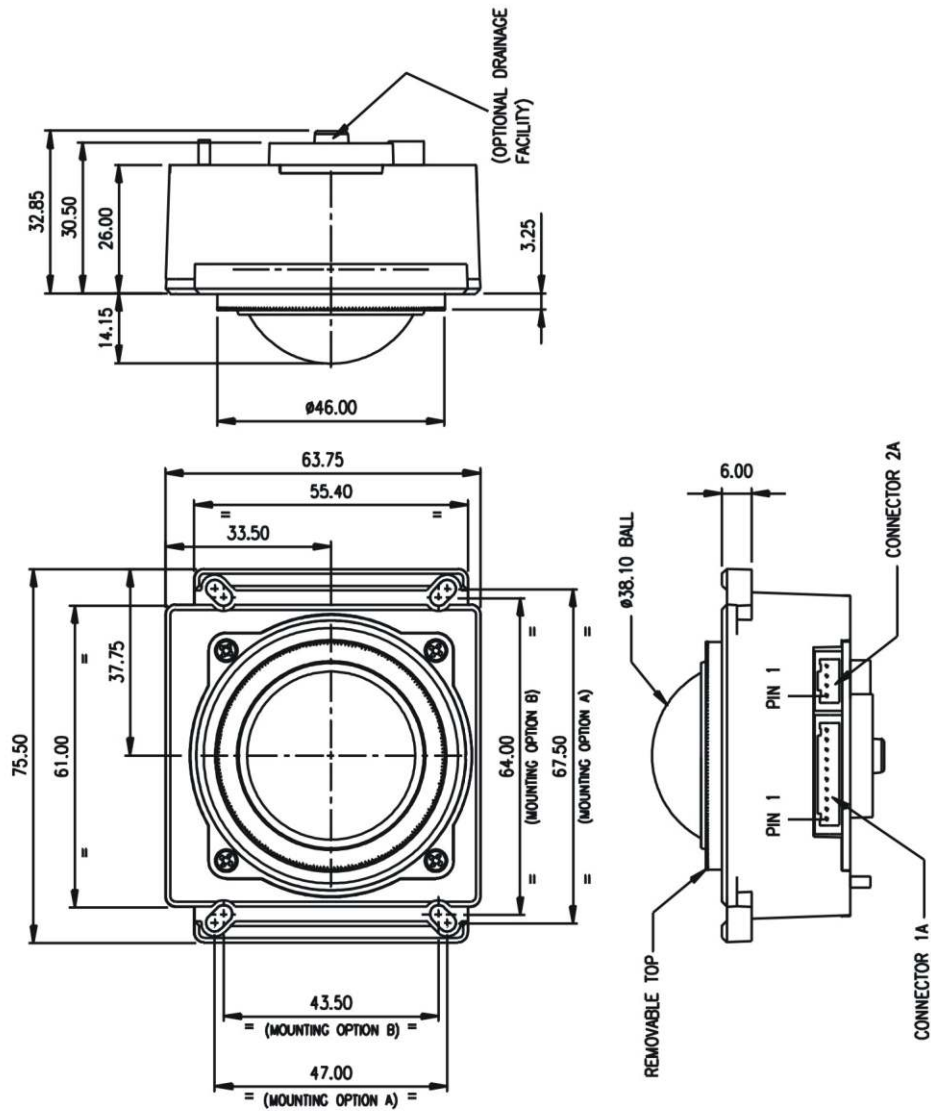
CONNECTION DETAILS

PIN	CONNECTOR 1A		CONNECTOR 2A	
	QUADRATURE OUTPUT	USB OUTPUT	PS/2 OUTPUT	SWITCH INPUTS
1	X1 OUTPUT			LEFT SWITCH
2	X2 OUTPUT			MIDDLE SWITCH
3	Y1 OUTPUT			RIGHT SWITCH
4	Y2 OUTPUT			GND
5	-	-	-	-
6	-	-	-	-
7	+5V	+5V	+5V	-
8	-	-	0-	-
9	-	-	0+	-
10	GND	GND	GND	GND

CONNECTOR TYPES:

- 1A: JST TYPE RIGHT ANGLE (2 MM PITCH) PIN HEADER
MANUFACTURERS PART No. S10B-PH-SM3-TB
MATING PART No. PHR-10
- 2A: JST TYPE RIGHT ANGLE (2 MM PITCH) PIN HEADER
MANUFACTURERS PART No. S4B-PH-SM3-TB
MATING PART No. PHR-4

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED
TOLERANCE +/- 0.2MM



O38 series OPTICAL TRACKBALLS

• DIMENSIONAL DRAWING

Connections are made to the O38 series unit by means of two latching JST (or equivalent) connectors.

Connector 1A: - Quadrature, USB and PS/2 protocols.

Connector 2A: - Switch Inputs.

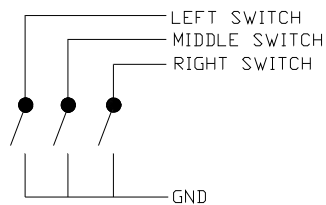
Output Connector 1A

Pin Number	Quadrature output	USB Output	PS/2 Output
1	X1 output	-	-
2	X2 output	-	-
3	Y1 output	-	-
4	Y2 output	-	-
5	-	-	-
6	-	-	-
7	Vcc Supply	Vcc Supply	Vcc Supply
8	-	D-	PS/2 Data
9	-	D+	PS/2 Clock
10	GND	GND	GND

External Switch Input Connector 2A

Pin number	Function
1	Left Switch
2	Middle Switch
3	Right Switch
4	GND

Switch Schematic



• OPTIONAL LEAD ASSEMBLIES

Standard Lead assemblies for connection to the O38 unit are available (See table 1). Other lead assemblies can also be supplied to customer specifications.

PS/2, USB		
Cursor Controls Part Number	Leads / Adapters	Description
T9902128	Output cable USB	10 way JST - USB type A, 2.2 meters long
T9902147	Output cable PS/2	10 way JST style - PS/2, 2.2 meters long
T9902125	Switch Input	4 way JST style - bare wires, 35 cm long
A3900126	Interconnection	Interconnection cable, 35 cm long

Table1. Lead assemblies and adapters for connection to device

O38 series OPTICAL TRACKBALLS

• 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	Feature Enabled	Feature Disabled
4	function	Feature Enabled	Feature Disabled
5	Ballistic Mode	Feature Disabled	Feature Enabled
6, 7, 8	Inverted Y	Default	Default

Factory default setting: Switches 1,2, and 3 ON

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	Default
4	Resolution	314 pulses per revolution	157 pulses per revolution
5	Inverted Y	Feature Disabled	Feature Enabled
6, 7, 8	N/A	Default	Feature Enabled

Factory default setting: Switches 1 and 2 ON

Switches 1 and 2: Orientation settings

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

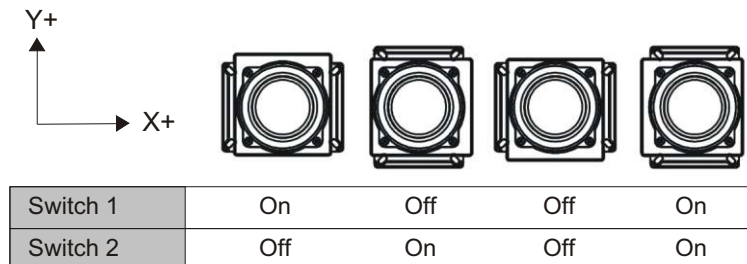


Figure.1 Mounting Orientations

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.

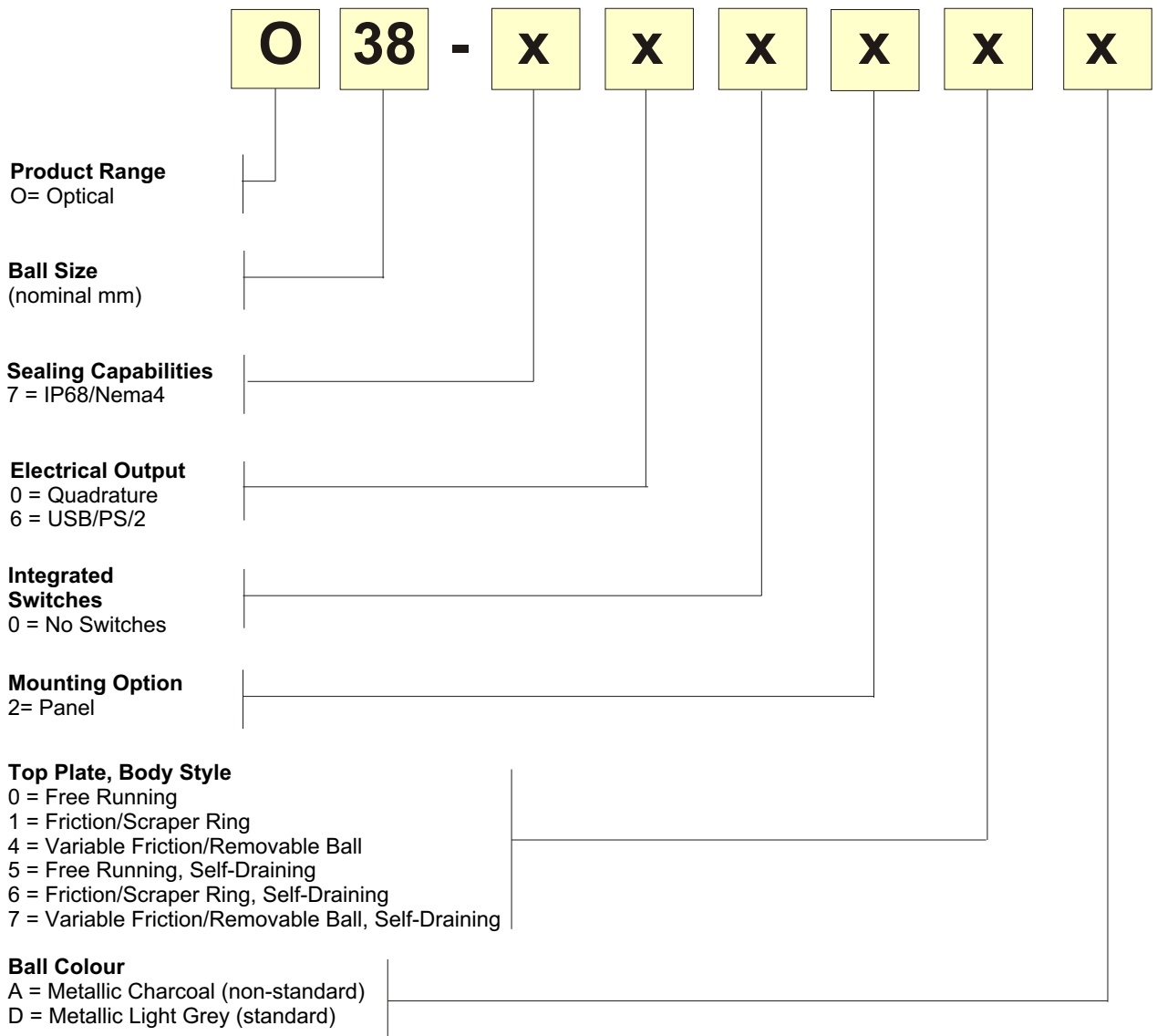
Switch 6, 7 & 8

Switch functions not used.

O38 series OPTICAL TRACKBALLS

• STANDARD PRODUCT OPTIONS

Product Ordering Code **O38 XXXXXX**. Please construct your standard product ordering code by selecting the numbers and letters to suit your specification.



Ordering Example **O38-70020D** :

Optical 38mm, IP68, phase quadrature only, no switches, panel mounted, free running, metallic light grey ball.

• OPTIONAL EXTRAS

- Anti-Vandal Option.
- Self-Draining Facility
- Optional Ball Colours (MOQ applies)
- Customer Specific Colour Matching (MOQ applies)
- Lead Assemblies

Contact your local distributor for further details on product variants and custom specifications.



MANUFACTURER
Cursor Controls Ltd, Brunel Drive,
Newark, U.K
Tel: ++44 (0) 1636 615600
Fax: ++44 (0) 1636 615601
Website : www.cursorcontrols.com
E-mail: sales@cursorcontrols.com