

- 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

• DIMENSIONAL DRAWING

Dimensions for free running and fixed friction/scrapper devices

NOTES:

1. MOUNTING OPTION A: 4 OFF HOLES Ø3.5 THRO' PROVIDING CLEARANCE ON M3 NUT RUNNER (RECOMMENDED)
2. MOUNTING OPTION B (RETROFIT): 4 OFF HOLES Ø3.5 THRO' REQUIRING 4 OFF M3 X 25MM SPACERS

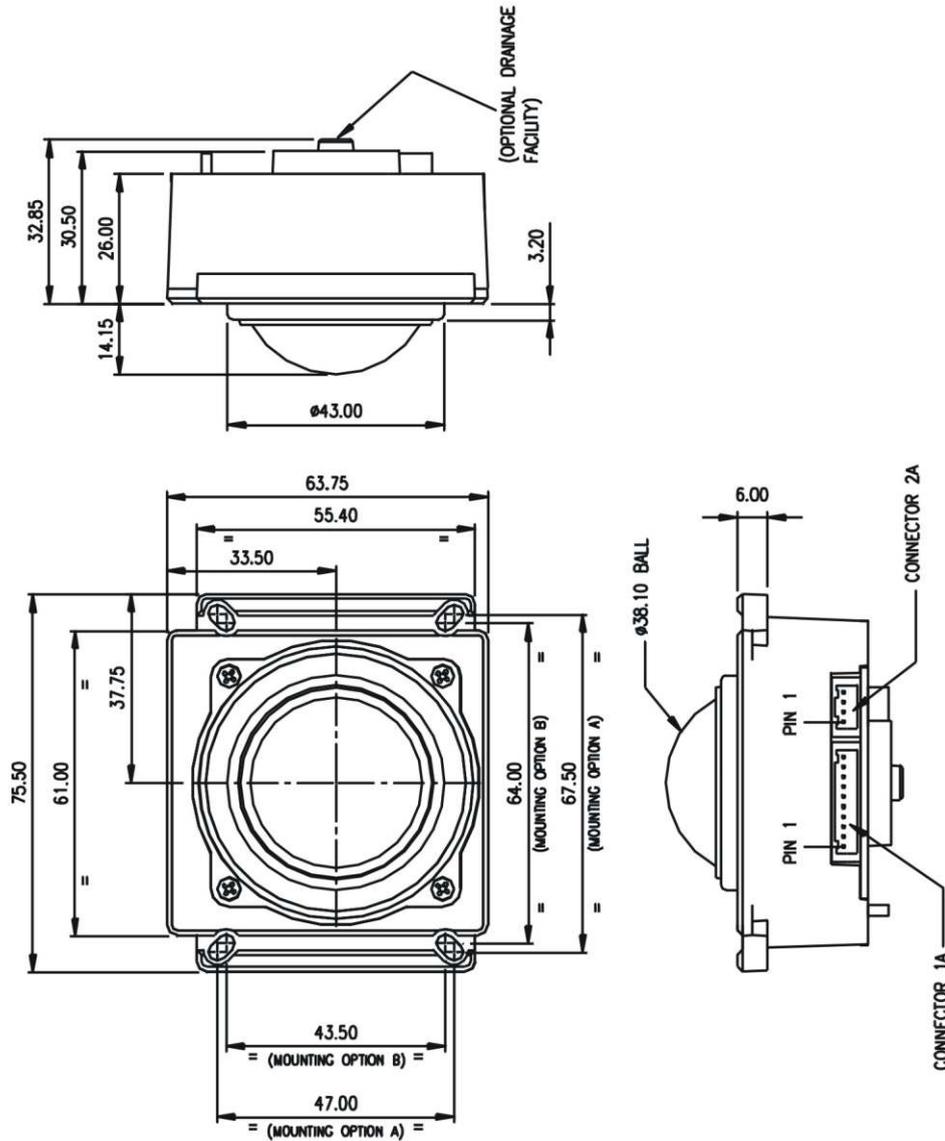
CONNECTION DETAILS

PIN	CONNECTOR 1A		CONNECTOR 2A	
	QUADRATURE OUTPUT	USB OUTPUT	PS/2 SWITCH INPUTS	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-	0-	
9	-	0+	0+	
10	GND	GND	GND	

CONNECTOR TYPES:

- 1A: JST TYPE RIGHT ANGLE (2 MM PITCH) PIN HEADER
MANUFACTURERS PART No. S108-PH-SM3-TB
MATING PART No. PHR-10
- 2A: JST TYPE RIGHT ANGLE (2 MM PITCH) PIN HEADER
MANUFACTURERS PART No. S48-PH-SM3-TB
MATING PART No. PHR-4

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



• DIMENSIONAL DRAWING

TW-38 series OPTICAL TRACKBALLS

Dimensions for Variable Friction / Removable Ball device

NOTES:

1. MOUNTING OPTION A: 4 OFF HOLES Ø3.5 THRO' PROVIDING CLEARANCE ON M3 NUT RUNNER (RECOMMENDED)
2. MOUNTING OPTION B (RETROFIT): 4 OFF HOLES Ø3.5 THRO' REQUIRING 4 OFF M3 X 25MM SPACERS

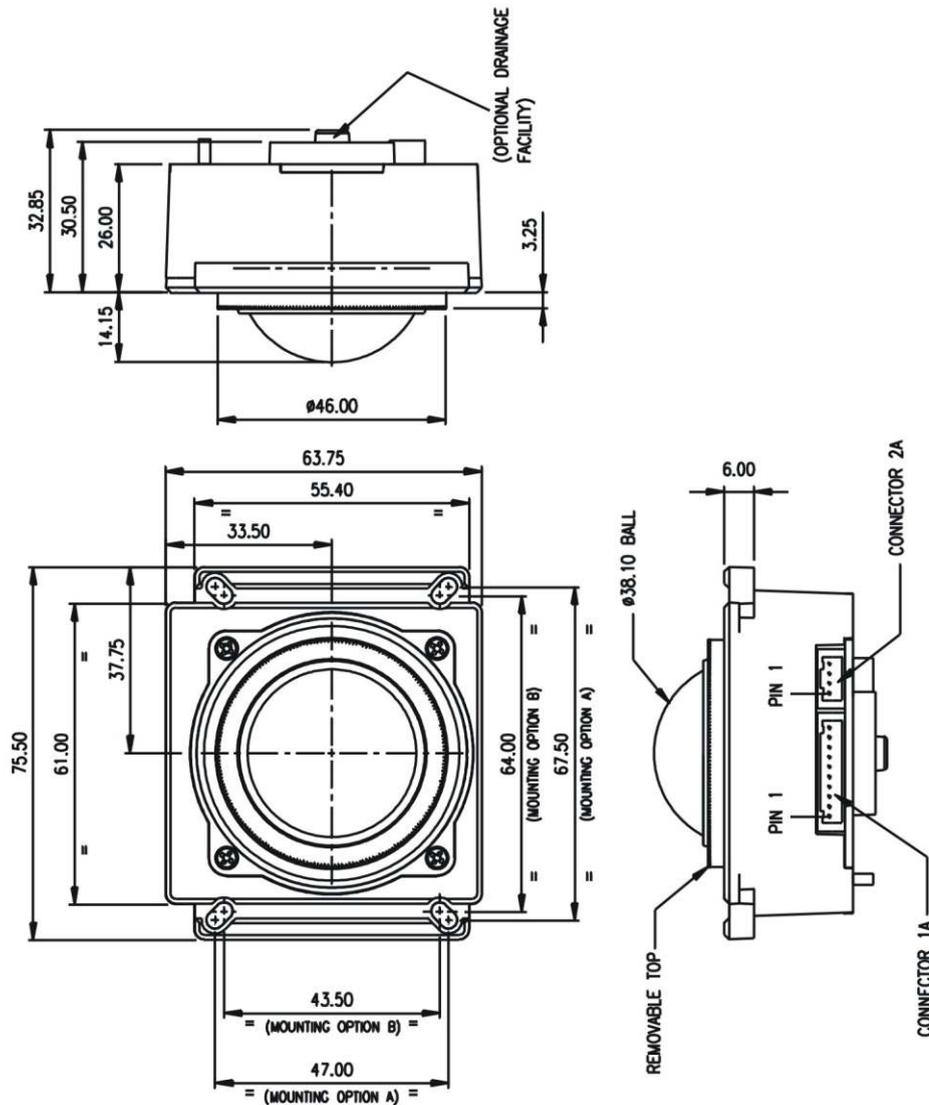
CONNECTION DETAILS

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



• 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

