GUDAO TECH
Contactless proportional control

Joystick | Spring-Return Type (ZFW Series) | Product and Assembly Drawings

GUDAO TECH | Caterpillar Mount / Universal Mount (Danfoss Mount) | 4 drawing sheets + specifications + wiring and contacts

Caterpillar Mount (GD-ZFW-CT)

P1	Installation Drawing GD-ZFW-CT-01	Side view and mounting interface; flange top view; panel cutout reference (diameter 70 mm + 4 holes diameter 7.2 mm on 63 x 63 mm centres)
P2	Assembly Drawing GD-ZFW-CT-02	Isometric rendering, component callouts and BOM (6 items)

Universal Mount (Danfoss Mount) (GD-ZFW-DF)

P3	Installation Drawing GD-ZFW-DF-01	Side view, flange top view and panel reference: diameter 70 mm clearance hole and four corner slots; four radial slots
P4	Assembly Drawing GD-ZFW-DF-02	Isometric rendering, component callouts and BOM (6 items)

Mounting Variants

Mounting flange	Caterpillar: 80 x 80 mm square, R8 mm corners, thickness 13 mm; 4 holes diameter 7.0 mm on 63 x 63 mm centres
	Universal (Danfoss): 90 x 90 mm rounded square, R6 mm, thickness 10 mm, overall height including boss 26 mm; 4 radial slots, width 7 mm x overall length 16 mm
Panel cutout	Diameter 70 mm central clearance hole for both versions; confirm panel hole sizes, positions and fasteners for the actual installation

Mounting dimensions checked against the 3D model; panel cutout dimensions are references only and tolerances follow approved drawings.
Images rendered directly from the 3D model.
CAT (Caterpillar) and Danfoss are trademarks of their respective owners and are used only to describe mounting compatibility. GUDAO is not affiliated with them.

For selection reference only. Confirm product specifications, configurations and supply requirements with us; mutually approved technical documents or contractual terms shall prevail.

Hall-Effect Spring-Return Proportional Joystick

For manual proportional control on off-highway vehicles and construction equipment. Compact mounting, contactless sensing and automatic return to centre suit continuous adjustment and spring-return applications. Potential applications include loaders, excavators, cranes, aerial platforms, construction vehicles and harvesters; suitability is subject to validation on the machine.

Features and Benefits

Contactless Hall sensing

No potentiometer contact wear, giving long sensing life and low maintenance.

Automatic return to centre

Returns to centre on release for spring-return proportional control. Return to centre does not replace the machine safety-stop function.

Proportional control, compact mounting

Caterpillar Mount and Universal Mount (Danfoss Mount) interfaces for easy replacement; fit depends on the actual mounting dimensions.

Configurable per project

Grip, switches, signal output (voltage / PWM / CAN) and harness configurable per project.

Performance Specifications

Item	Value	Note
Sensing technology	High-performance Hall sensor; contactless position sensing	—
Return mechanism	Automatic return to centre on release	Spring-return version
Operating angle	Single axis: ±18°; maximum diagonal tilt: 25°	—
Breakout force	5–10 N (customisable, adjustable)	Per order configuration
End-of-travel force	16–22 N (customisable, adjustable)	Per order configuration
Mechanical life	At least 3 million cycles	—
Operating temperature	−30～+80 ℃	—
Storage temperature	−40～+80 ℃	—
Protection rating	IP65 – IP68 (by configuration)	Minimum IP65
Protection above flange	IP65	Standard
Higher protection ratings	IP67 / IP68 (customised on request)	Configuration agreed by both parties
Product weight	Less than 450 g	Varies slightly with grip and harness
Electrical output / wiring	Voltage / PWM / CAN bus output	Three configuration options; see wiring page
Grip / switch options	Grips with or without switches; auxiliary switch outputs	Optional per project

Contactless Position Sensing

A high-performance Hall sensor detects lever position and provides proportional X- and Y-axis signals. Voltage, PWM and CAN bus are alternative configurations, not simultaneous outputs. Signal range, neutral value, direction, PWM settings and CAN protocol must be confirmed for the ordered configuration.

> **Note:** Operating force depends on the measuring point and lever length and can be adjusted or customised. For customised IP67 / IP68, immersion depth, duration and installation conditions are agreed by both parties. The pneumatic-return version has different dimensions; its documents are available separately. No safety-function or certification claim is made.

For selection reference only. Confirm product specifications, configurations and supply requirements with us; mutually approved technical documents or contractual terms shall prevail.

GUDAO TECH

Contactless proportional control

Electrical Interface and Wiring

X / Y outputs | Voltage, PWM or CAN bus configuration

Power Supply

Item	Description
Sensor circuit supply	DC 4.5–5.5 V; typical 5 V (voltage / PWM version)
Complete product input	For direct 12 V / 24 V vehicle supply, or for the CAN bus version, the supply range is confirmed per order configuration.

> Do not connect 5 V versions directly to a 12 V / 24 V vehicle supply. Supply and signal ground must be common with the controller. Specify reverse-polarity or overvoltage protection when ordering if required.

Four-Wire Colour Assignment

Colour	Voltage / PWM version	Colour	CAN bus version
Red	Supply positive V+	Red	Supply positive V+
Black	Supply negative GND (signal reference)	Black	Supply negative GND
Blue	X-axis output (analogue / PWM)	Yellow	CAN_H (CAN high)
Green	Y-axis output (analogue / PWM)	Green	CAN_L (CAN low)

Voltage / PWM colours are the GUDAO standard; CAN bus colours follow the common SAE J1939 convention (CAN_H yellow, CAN_L green). Bus termination (120 Ω) depends on the system. Verify against the actual harness before first power-up.

Three Output Configurations

Voltage output

Separate X- and Y-axis analogue voltage outputs. Output range (e.g. 0.5–4.5 V), neutral voltage and polarity per order configuration.

PWM output

Separate X- and Y-axis PWM outputs. Confirm frequency, duty-cycle range, neutral duty cycle, signal levels and pull-up requirements for the configuration.

CAN bus output

X- and Y-axis position data over CAN bus. Baud rate, protocol (e.g. J1939 / CANopen), node address and harness definition per order configuration.

Voltage / PWM version: the four wires carry supply and the X and Y signals. CAN bus version: the four wires carry supply, CAN_H and CAN_L; switch states can be sent in CAN messages. Independent grip-switch outputs on the voltage / PWM version require additional wires.

Contact Us

GUDAO TECH | GOODAO

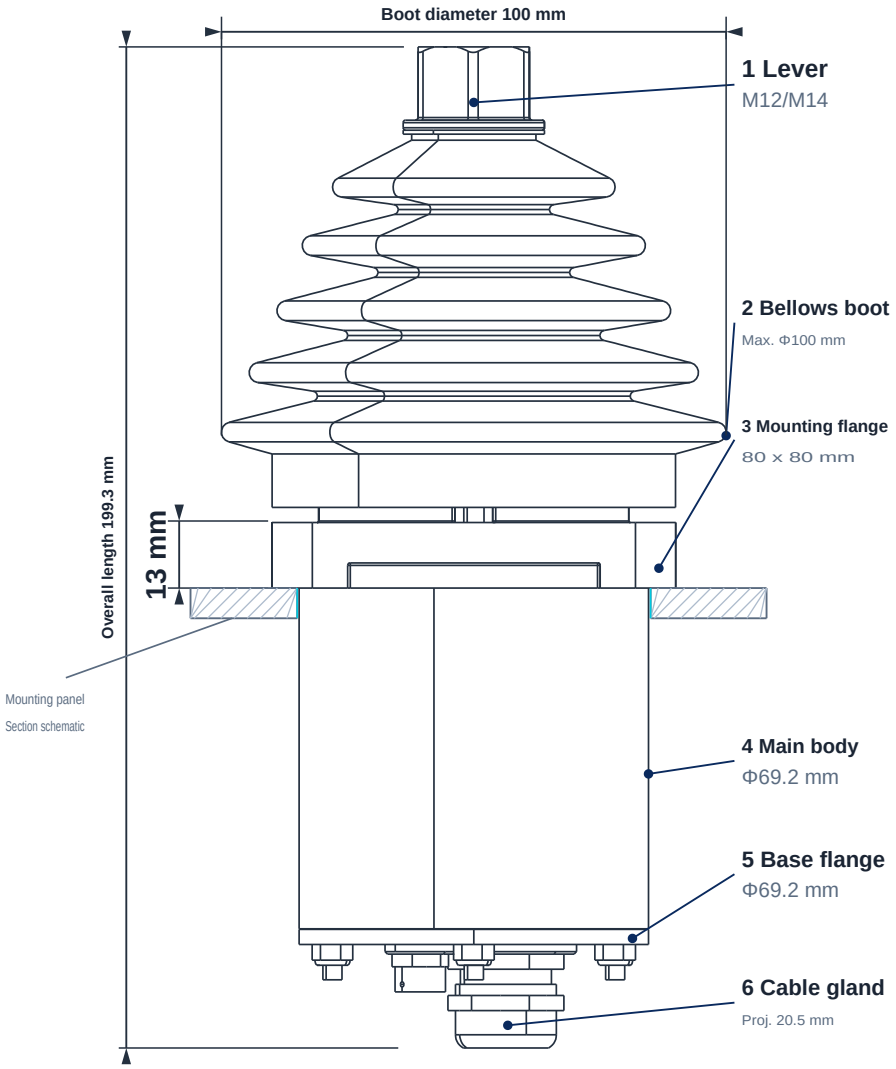
Phone / WeChat: +86 139 8004 0082
Email: 13980040082@139.com
Address: No. 24, Section 1, South 1st Ring Road, Wuhou District, Chengdu, Sichuan, China (Attn: Han Jiahua)
Website: www.gudao-tech.com

Please mention "joystick" when adding us on WeChat so we can identify your enquiry.

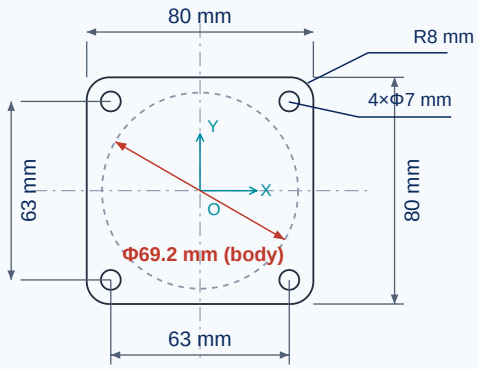
For selection reference only. Confirm product specifications, configurations and supply requirements with us; mutually approved technical documents or contractual terms shall prevail.

Joystick | Installation Drawing (Caterpillar Mount)

GUDAO ZFW Series (spring-return) | Panel mounting | Caterpillar Mount



Flange Top View: Dimensions and Hole Positions (mm)

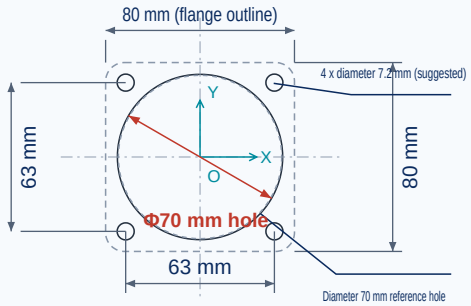


Hole centres: (+/-31.5, +/-31.5); O = flange centre

Flange thickness 13 mm; height including boss 23 mm

Dashed circle = body projection, not a flange hole

Panel Cutout Reference / Location Dimensions (mm)

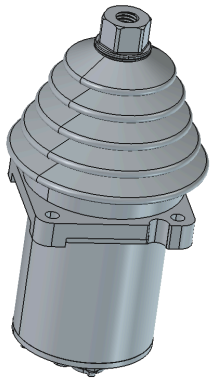


Four centres: (+/-31.5, +/-31.5); spacing 63 x 63 mm

Central hole concentric with flange origin O

Diameter 7.2 mm clearance holes suggested; confirm fasteners

Dashed 80 x 80 mm outline = flange, not panel perimeter



Isometric reference: rendered from the 3D model

Mounting Interface

Mounting flange	80 x 80 mm; R8 mm; thickness 13 mm
Mounting holes / slots	4 x diameter 7 mm; centres 63 x 63 mm
Body / clearance hole	Diameter 69.2 mm / 70 mm (hole suggested)
Location datum	O: flange and body axis centre
Panel outline	Length, width and thickness set by installation design
Cable gland	At body base; axially directed, off-centre

Dimension Notes

X/Y are local flange-plane axes, not machine axes.

Geometry checked against the 3D model; panel holes are references.

Coordinates and spacing shown; panel outline not assumed.

Tolerances, fasteners and clearances follow approved drawings.

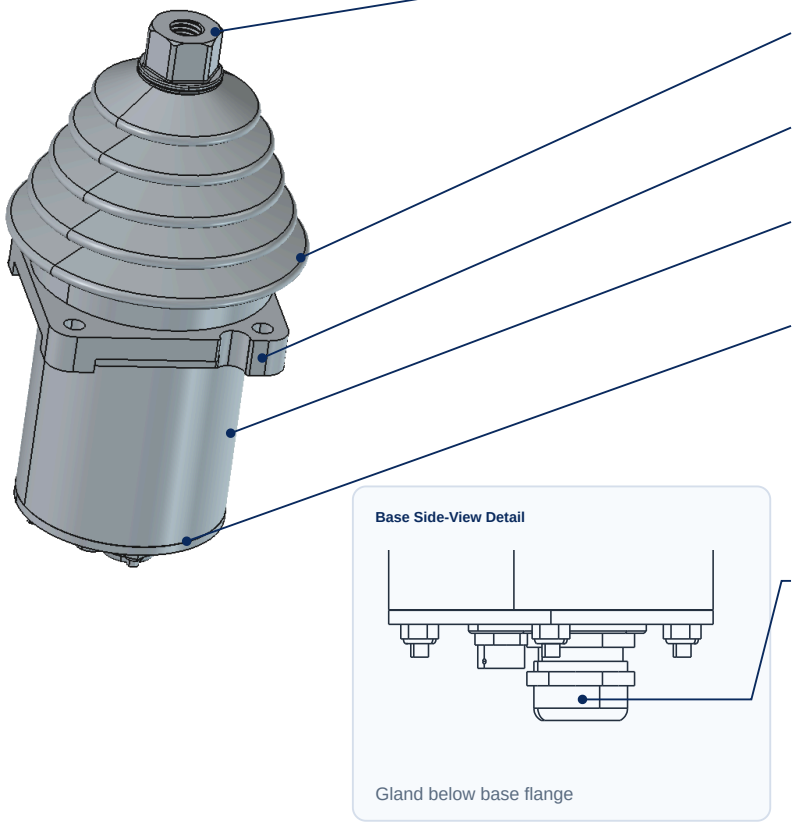
Installation Steps

1. Reference panel cutout: diameter 70 mm + 4 holes diameter 7.2 mm on 63 x 63 mm centres.
2. Insert body through diameter 70 mm hole until flange seats on top of panel.
3. Fit M6 screws from above (recommended); tighten evenly at four corners.
4. Route and connect cable through diameter 70 mm hole; check boot clearance.

For selection reference only. Confirm product specifications, configurations and supply requirements with us; mutually approved technical documents or contractual terms shall prevail.

Joystick | Assembly Drawing (Caterpillar Mount)

GUDAO ZFW Series (spring-return) | Component List and Assembly Drawing



Bill of Materials (BOM)

No.	Component	Specification	Qty
1	Lever	M12/M14; grip cap diameter 29.8 mm	1
2	Bellows boot	Max. OD 100 mm (tapered; narrow top, wide base)	1
3	Mounting flange (square)	80 x 80 mm; thickness 13 mm; R8 mm; 4 holes diameter 7.0 mm on 63 x 63 mm centres	1
4	Main body	OD 69.2 mm	1
5	Base flange and fasteners	Diameter 69.2 mm x 3 mm; 4 holes diameter 4.0 mm + M4 (internal tie rods)	1
6	Cable gland	Axial, off-centre outlet; projection 20.5 mm	1

Assembly and Installation Notes

Item 3: 80 x 80 mm square flange (R8 mm, diagonal approx. 106.5 mm); four diameter 7.0 mm holes at corners, 63 x 63 mm centres; underside seats on panel for mounting the assembly.

Item 2: tapered boot (max. diameter 100 mm) protects the movement of item 1, the lever.

Item 5: internal tie-rod flange (4 holes diameter 4.0 mm + M4 nuts), not for panel mounting.

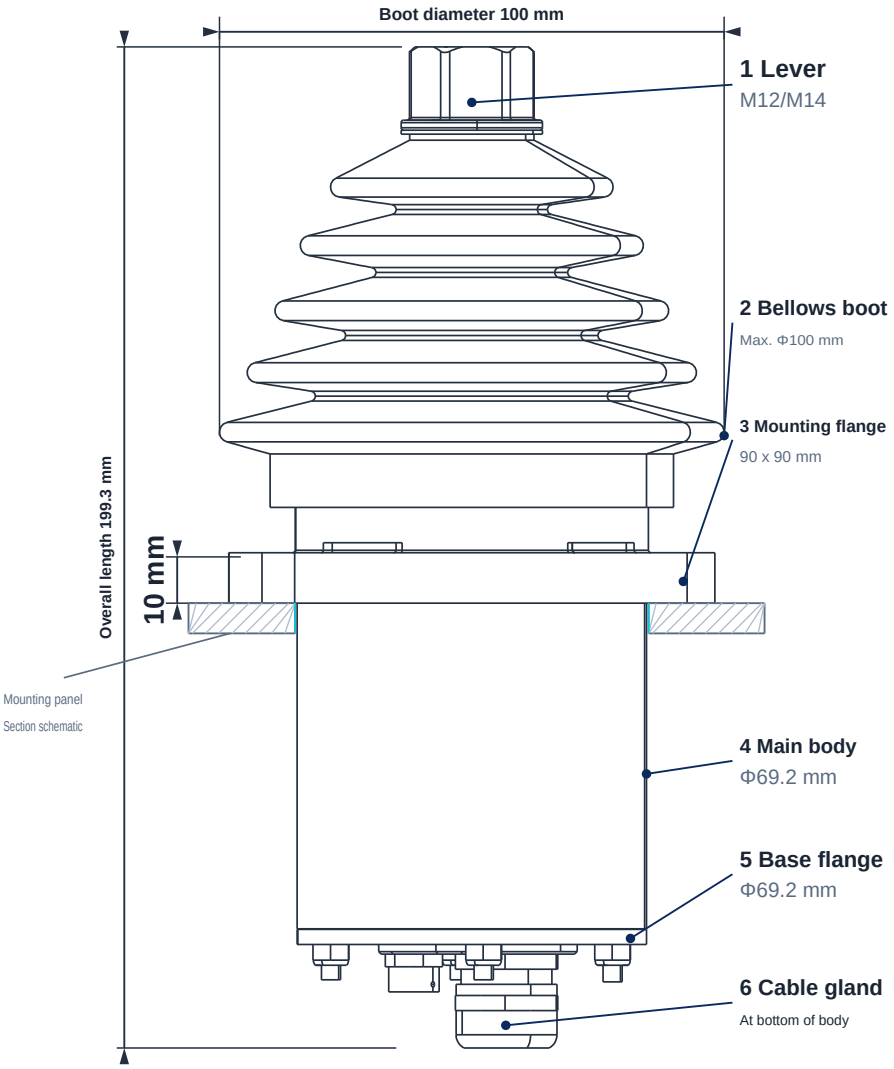
Item 6: axial off-centre cable outlet; route through diameter 70 mm hole; allow at least 91 mm below panel.

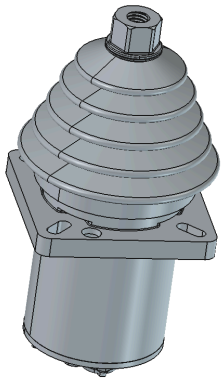
A separate side-view detail of the bottom cable gland is provided.

For selection reference only. Confirm product specifications, configurations and supply requirements with us; mutually approved technical documents or contractual terms shall prevail.

Joystick | Installation | Universal Mount (Danfoss Mount)

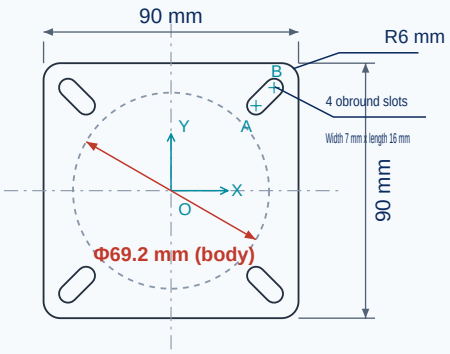
GUDAO ZFW Series (spring-return) | Panel mounting | Universal (Danfoss) Mount





Isometric reference: rendered from the 3D model

Flange Top View: Dimensions and Hole Positions (mm)



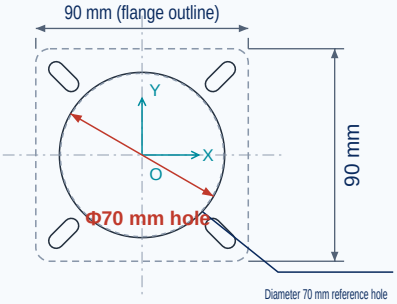
Top-right slot: A(30, 30) mm, B(36.364, 36.364) mm

Other slots mirrored about X/Y; slot axis at 45 degrees to X

A/B are end-arc centres; AB = 9 mm (see detail below)

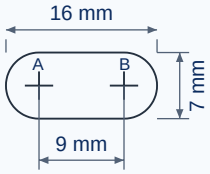
Flange thickness 10 mm; total height 26 mm; dashed circle = body

Panel Cutout Reference / Location Dimensions (mm)



Slots locate flange; confirm panel screw-hole sizes and positions

Single-Slot Detail (rotated view; dimensions unchanged)



Ends: R3.5 mm

A: X=30 mm, Y=30 mm

B: X=36.364 mm
Y=36.364 mm

Mirror other slots

Mounting Interface

Mounting flange	90 x 90 mm; R6 mm; thickness 10 mm
Mounting holes / slots	4 slots: width 7 mm, length 16 mm, end-centre spacing 9 mm
Body / clearance hole	Diameter 69.2 mm / 70 mm (hole suggested)
Location datum	O: flange and body axis centre
Panel outline	Length, width and thickness set by installation design
Cable gland	At body base; axially directed, off-centre

Dimension Notes

X/Y are local flange-plane axes, not machine axes.

Geometry checked against the 3D model; panel holes are references.

Length 16 mm includes end arcs; spacing 9 mm is not adjustment travel.

Tolerances, fasteners and clearances follow approved drawings.

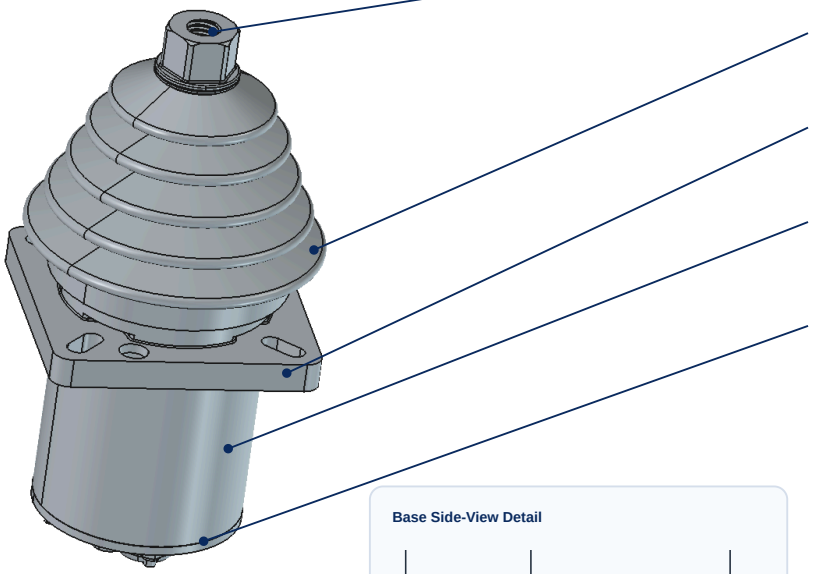
Installation Steps

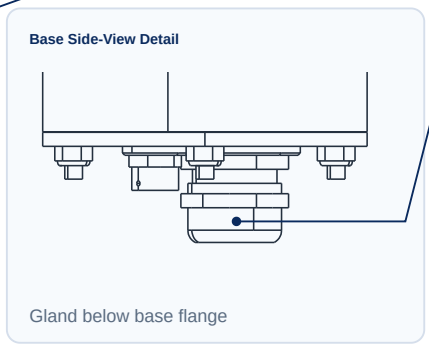
1. Check panel holes against flange slots; central diameter 70 mm is suggested.
2. Insert body through diameter 70 mm hole until flange seats on top of panel.
3. Fit suitable fasteners through slots; check seating and tighten evenly.
4. Route and connect cable through diameter 70 mm hole; check boot clearance.

For selection reference only. Confirm product specifications, configurations and supply requirements with us; mutually approved technical documents or contractual terms shall prevail.

Joystick | Assembly | Universal Mount (Danfoss Mount)

GUDAO ZFW Series (spring-return) | Component List and Assembly Drawing





Bill of Materials (BOM)

No.	Component	Specification	Qty
1	Lever	M12/M14; grip cap diameter 29.8 mm	1
2	Bellows boot	Max. OD 100 mm (tapered; narrow top, wide base)	1
3	Mounting flange (square)	90 x 90 mm; R6 mm; thickness 10 mm; height 26 mm; 4 slots 7 x 16 mm	1
4	Main body	OD 69.2 mm	1
5	Base flange and fasteners	Diameter 69.2 mm x 3 mm; 4 holes diameter 4.0 mm + M4 (internal tie rods)	1
6	Cable gland	Axial, off-centre outlet; projection 20.5 mm	1

Assembly and Installation Notes

Item 3: rounded-square flange, 90 x 90 mm, R6 mm, thickness 10 mm; underside seats on panel.

Four radial corner slots, width 7 mm, length 16 mm; confirm hole positions and fasteners.

Item 2: tapered boot (max. diameter 100 mm) protects the movement of item 1, the lever.

Item 5: internal tie-rod flange (4 holes diameter 4.0 mm + M4 nuts), not for panel mounting.

Item 6: axial off-centre cable outlet; route through diameter 70 mm hole; allow at least 91 mm below panel.

A separate side-view detail of the bottom cable gland is provided.

For selection reference only. Confirm product specifications, configurations and supply requirements with us; mutually approved technical documents or contractual terms shall prevail.