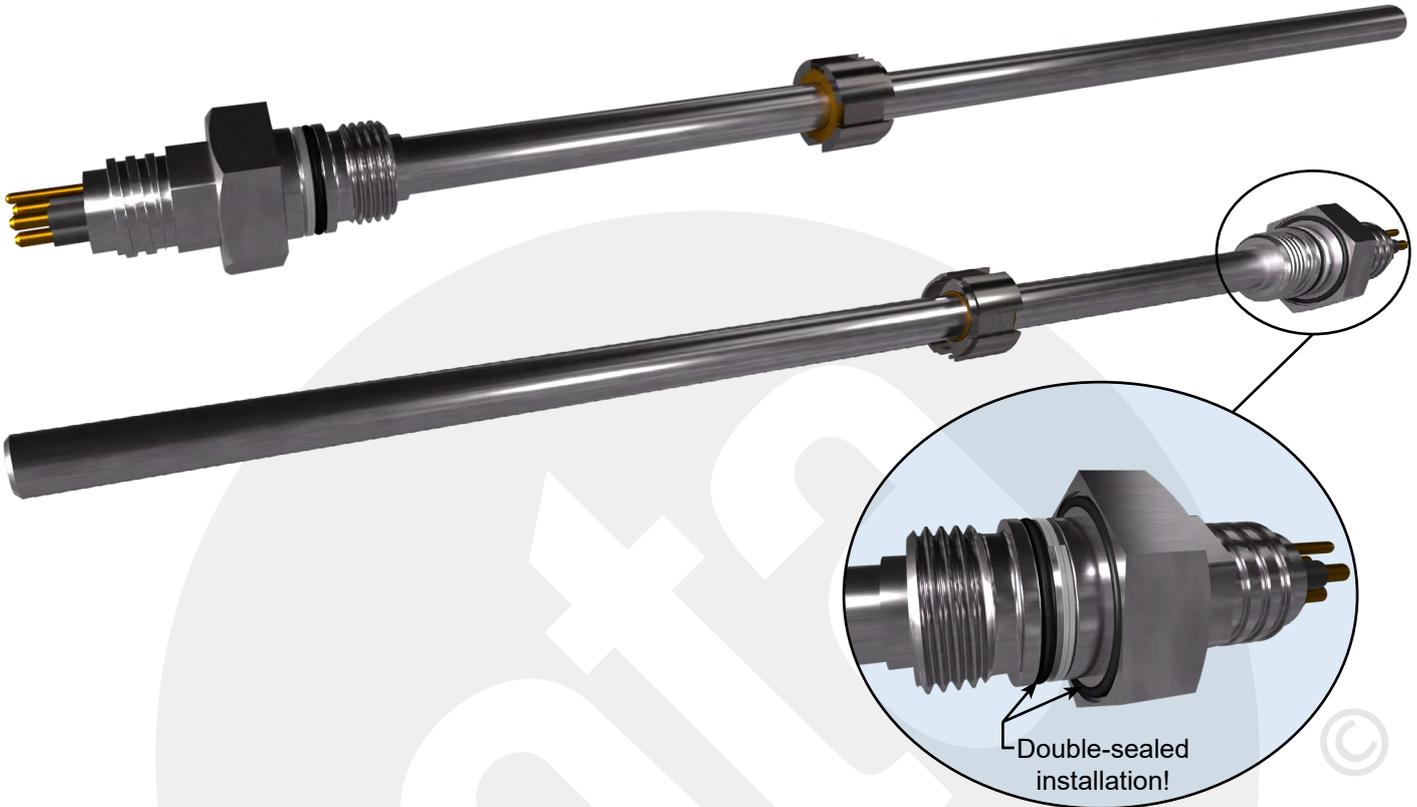




LJW SERIES LINEAR TRANSDUCER DATA SHEET

LJW Transducer for Subsea Applications



BENEFITS

- Extensive subsea track record
- Double-sealed sensor mounting
- No external signal conditioning
- Excellent shock and vibration resistance
- Compact and robust construction
- Solid-state, zero wear
- High-pressure float options available for ballast tank level monitoring

PERFORMANCE

- Absolute signal output
 - 0.05 mm resolution CANbus outputs
 - Up to 20 metre stroke
 - -40 to +105°C operating temperature*
- *Temperature rating is subject to subsea connector rating

ENCLOSURE

- 316L stainless steel, pressure tested
 - Ø12 mm, Ø16 mm, and Ø19 mm tube options
 - 500 bar / 5000 metre depth working pressure rating as standard, with 720 bar / 7200 metre depth working pressure LFW options*
- *Pressure/depth ratings are subject to subsea connector rating

OUTPUTS

- Analogue Voltage/Current/PWM options
- CANbus SAE J1939, CANopen and ISOBUS
- CANbus with Temperature indication option
- SSI (Asynchronous Mode) option

TERMINATION

- Compatible with most underwater connectors - over 70 types of connector used!
- Penetrator options available



RELIABLE OPERATION TOUGH APPLICATION



OVERVIEW OF ROTA LIMITED'S SUBSEA TRANSDUCER RANGE

Rota Limited (formerly known as Rota Engineering Limited) is based in Manchester, UK and was established in 1964. Our first subsea Linear Transducer was designed and manufactured in 1993.

SUBSEA LINEAR SENSORS

Principal applications include; ROV compensators/bladders, ROV controls/tooling, trenching, pipe laying, piling & grouting templates. Other applications include equipment used in conjunction with ROVs; pipe/cable lay including angle or tension measurement. Equipment designed for erection/construction of sub-sea bases for wind turbines or offshore installations and subsea templates for oil & gas production equipment. Also ballast tanks, fluid volume measurement and marine handling such as brakes/locks of anchor chains for floating/semi-submersible rigs & FPSOs. They are also used in high-pressure applications including valves/actuators for non-permanent installations.

QUALITY

Designing and building Transducers and Connectors for use in explosive atmospheres requires an obsession with quality. Rota's quality systems were originally approved to British Standard 5750 back in 1986 and are now assessed by BSI to ISO 9001:2015. The QA system is also audited by BSI and CSA for EX certified Transducers and Connectors.

Rota's environmental management system has achieved ISO 14001:2015 certification.

SUBSEA SENSOR RANGE

LJW	Welded 316 stainless steel subsea transducer rated to 5000m water depth
LFW	Welded 316 stainless steel subsea transducer rated to 7200m water depth
LNW	Normal-duty 316 stainless steel independently pin-mounted transducer rated to 3000m water depth
LUW	Ultra-heavy-duty 316 stainless steel independently pin-mounted transducer rated to 3000m water depth*
RTW	Radial transducer with low resolution 90° position monitoring
RJW	Radial transducer with high resolution 270° position monitoring
ROW	Rotary transducer with high resolution 360° position monitoring

PERMANENT SUBSEA SENSORS

Principal applications include; HIPPS (High Integrity Pressure Protection System), SSIVs (Subsea Shutdown Valves), check valves, pigging valves.

Normally used on safety-critical systems subsea, including optional testing to API 17f / ISO 13628-6.

LWJ	Welded 316 stainless steel subsea transducer rated to 3000m water depth*
RWJ	Radial transducer with up to 90° Position Monitoring rated to 3000m water depth*

*Redundant (two-output) version available. Please contact Rota for more information.

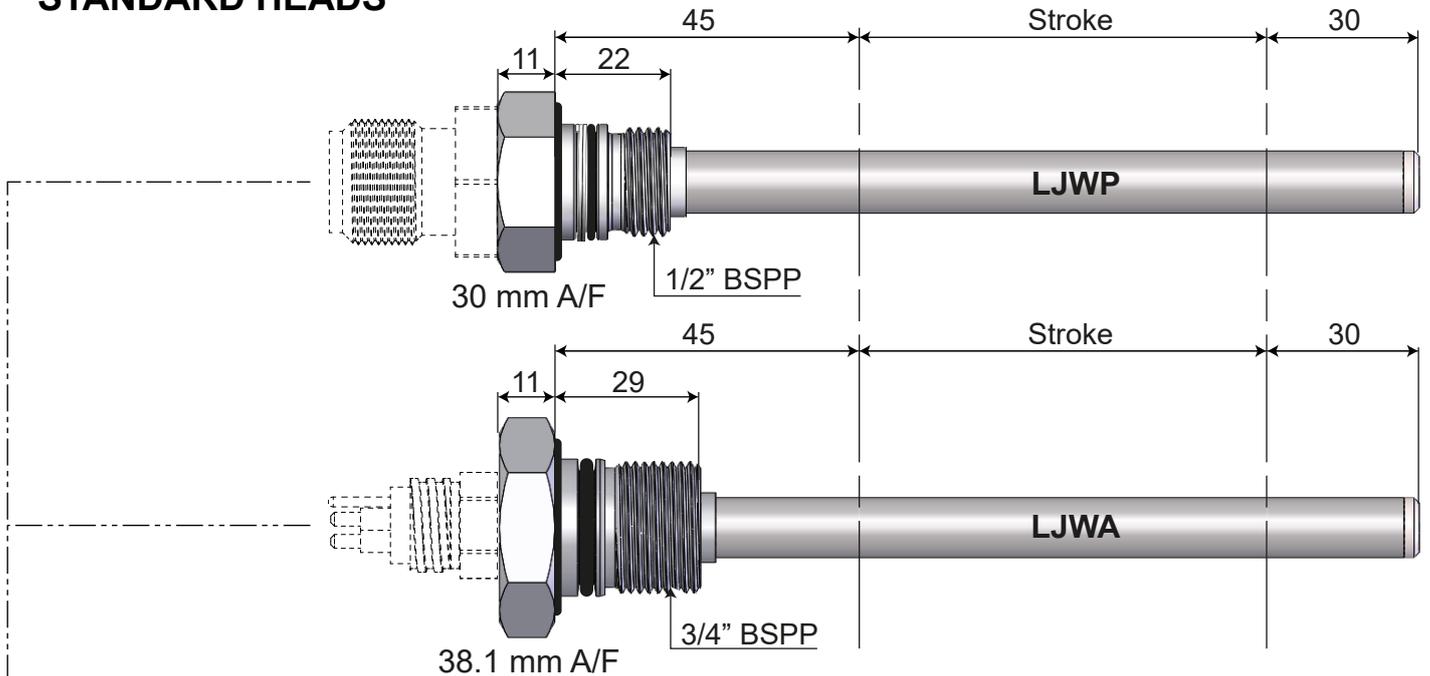


RELIABLE OPERATION TOUGH APPLICATION



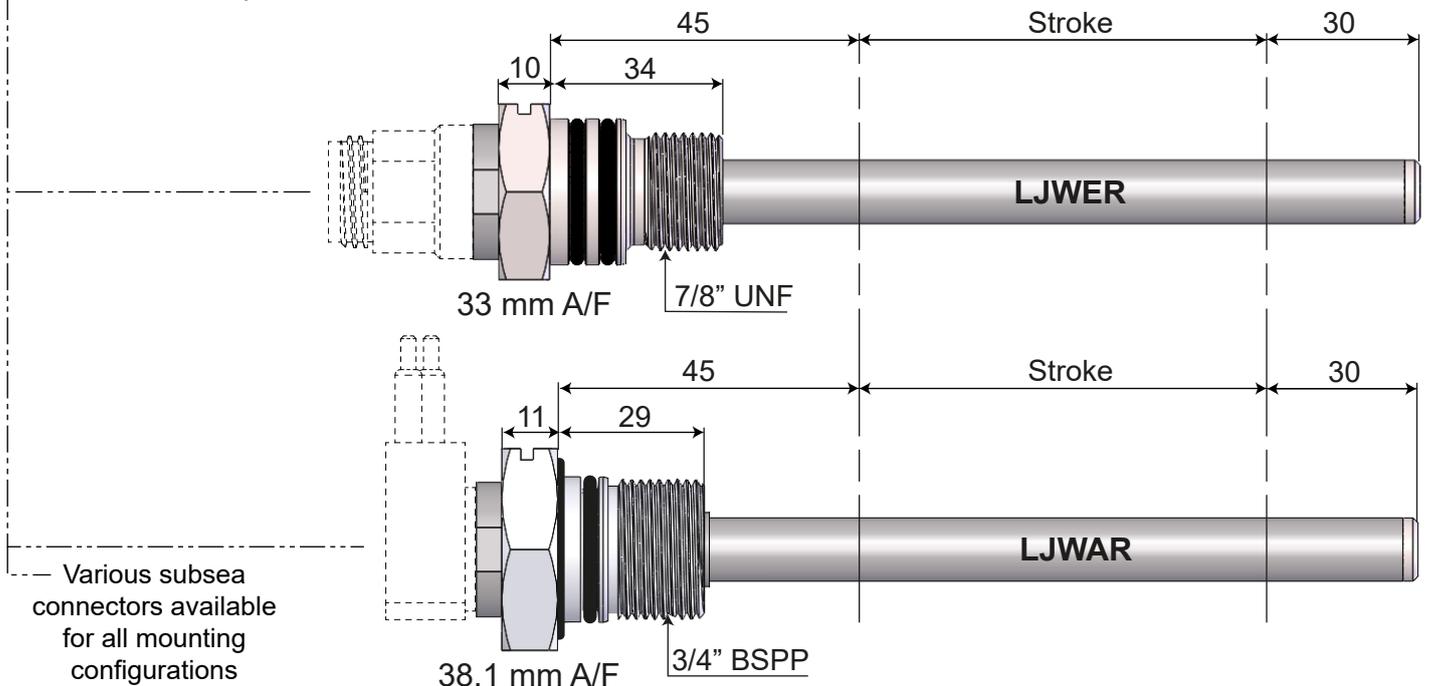
LJW TRANSDUCER MOUNTING CONFIGURATIONS

STANDARD HEADS



ROTATING HEADS

Heads with a swivel nut, to allow connectors to be fitted in the preferred orientation



Various subsea connectors available for all mounting configurations

NB 3/4" BSPP is the only mounting option for Ø16 mm and Ø19 mm tube options

Subject to reasonable modifications due to technical advances



RELIABLE OPERATION TOUGH APPLICATION



INTERNAL MAGNET OPTIONS

12 mm TUBE DIAMETER SENSORS

Internal magnets must be housed in magnetic material - for housing in non-magnetic material please contact Rota. For machining details please see page 7.

MAXIMUM ELECTRONIC SPEED:

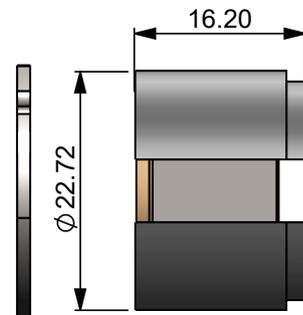
Output	Magnet	M, FV	JW, FW, QW ***
Analogue **		2.5 m/s	8 m/s
J1939		2 m/s	8 m/s
CANopen		1.75 m/s	7 m/s

Electronics speed only, mechanical constraints may exist. For longer transducers, particularly when used with certain types of hydraulic oil or in sub-zero temperatures this velocity must be significantly reduced.
 **3-wire outputs only, 2-wire output is slower, please contact Rota.
 ***For higher speeds please contact Rota.

CIRCLIP DESIGN

'M' Magnet (Rota P/N LJ 1234)

- <±0.5 mm Non-linearity
- 0.05 mm Resolution: - CANbus/SSI any length
- 0.1 mm Resolution: - Analogue ≤2 m stroke
- 0.2 mm Resolution: - Analogue >2 m stroke

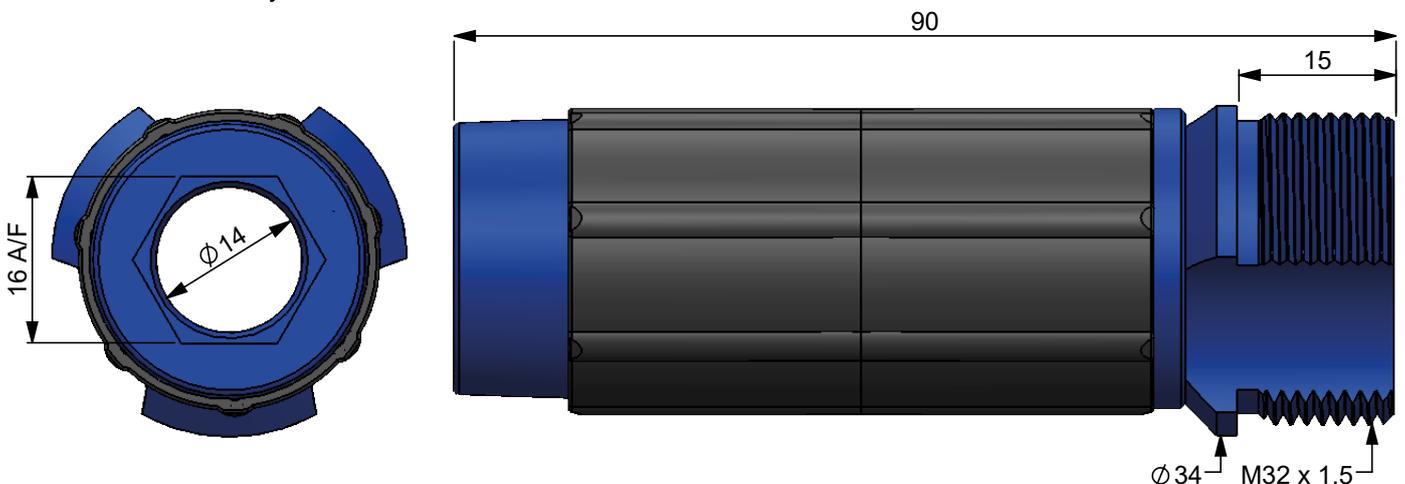


THREAD-MOUNTED DESIGN

'JW' Magnet (Rota P/N LV 6311)

- For approx. ≥60 mm I/D magnet cavity
- Ideal for long stroke and high speed applications
- 0.2 mm (CANbus/SSI) or various Analogue resolutions dependent on stroke length
- <±2.0 mm Non-linearity

Patents
 CNZL201580063891.8
 EP 3198231
 KR10-1960719
 JP 6713457
 US 10,222,238



Subject to reasonable modifications due to technical advances



RELIABLE OPERATION TOUGH APPLICATION

Rota Limited, Manchester UK

www.rota-ltd.com
 LJWDS V1.04.01



INTERNAL MAGNET OPTIONS 16 mm & 19 mm TUBE DIAMETER SENSORS

16 mm TUBE DIAMETER SENSORS

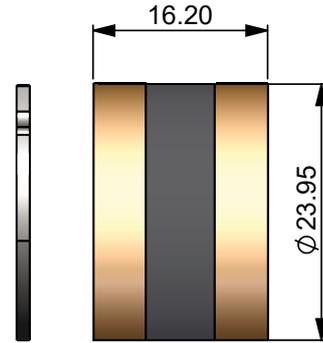
'FV' Magnet (Rota P/N LJ 8456)

Circlip Design

<±1.0 mm Non-linearity

0.2 mm Resolution: - CANbus/SSI any length

0.3 mm Resolution: - Analogue any length



'FW' Magnet (Rota P/N LJ 7991)

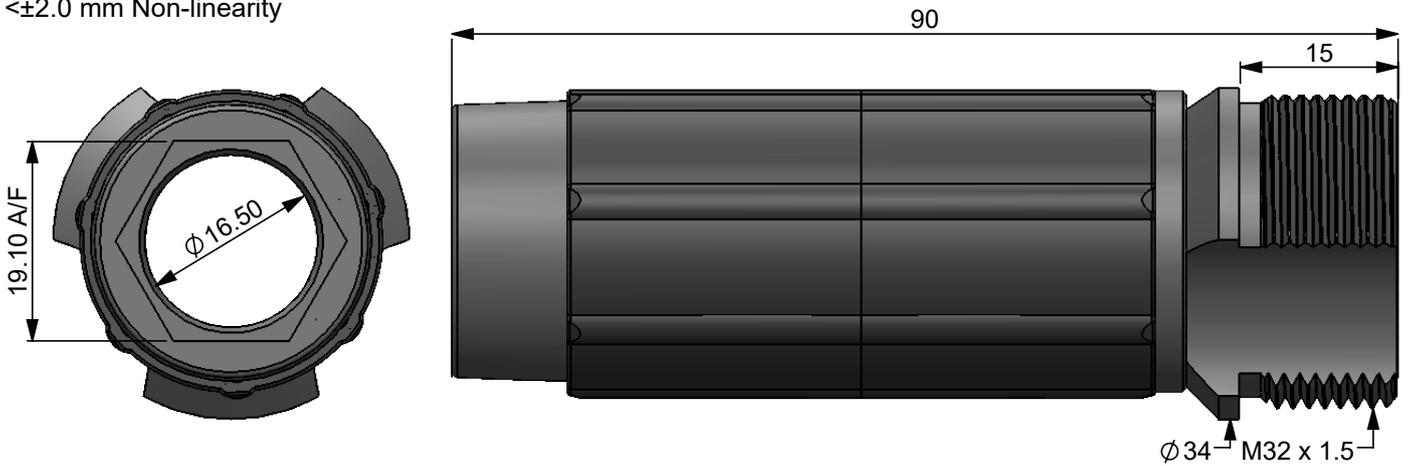
Thread-Mounted Design

For approx. ≥60 mm I/D magnet cavity

Ideal for long stroke and high speed applications

0.2 mm (CANbus/SSI) or various Analogue resolutions dependent on stroke length

<±2.0 mm Non-linearity



19 mm TUBE DIAMETER SENSORS

'QW' Magnet (Rota P/N LJ 7992)

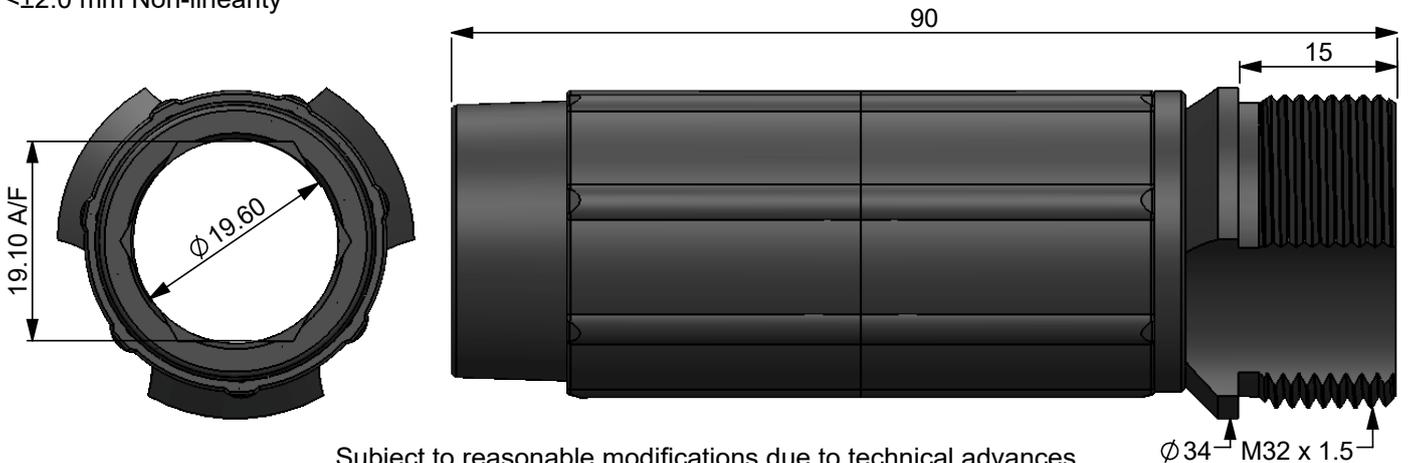
Thread-Mounted Design

For approx. ≥60 mm I/D magnet cavity

Ideal for long stroke and high speed applications

0.2 mm (CANbus/SSI) or various Analogue resolutions dependent on stroke length

<±2.0 mm Non-linearity



Subject to reasonable modifications due to technical advances

Patents
CNZL201580063891.8
EP 3198231
KR10-1960719
JP 6713457
US 10,222,238



RELIABLE OPERATION TOUGH APPLICATION

Rota Limited, Manchester UK

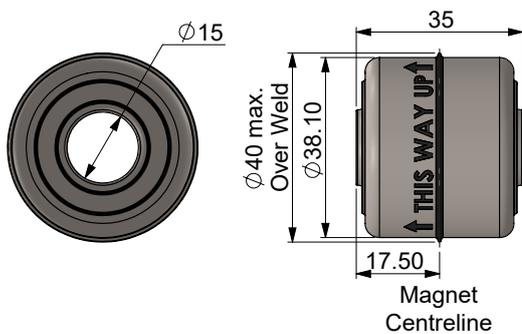
www.rota-ltd.com

LJWDS V1.05.01

Low-pressure stainless steel 316L float options.

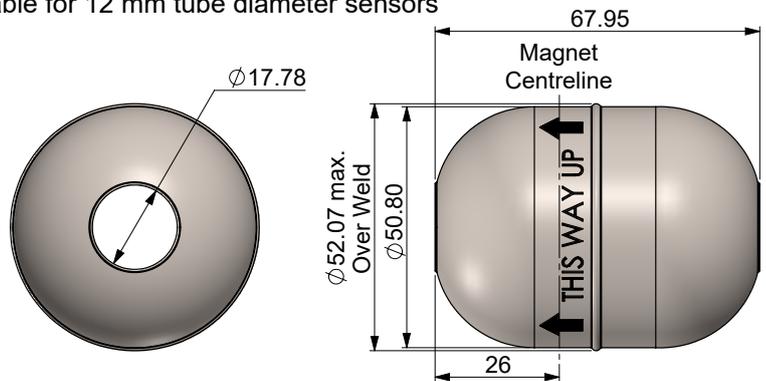
'D' Float (Rota P/N 254541)

13 bar max. operating pressure
0.3 mm Resolution
Suitable for 12 mm tube diameter sensors



'E' Float (Rota P/N 253871)

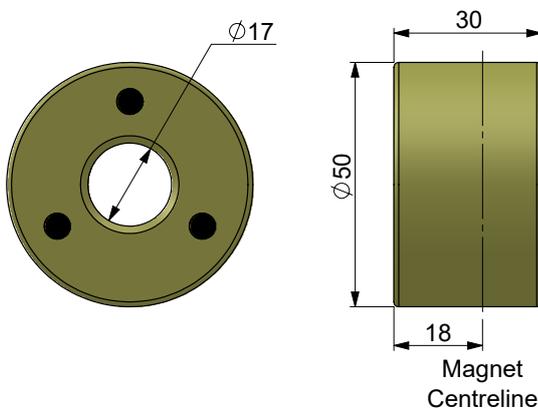
27 bar max. operating pressure
0.3 mm Resolution
Suitable for 12 mm tube diameter sensors



High-pressure foam float options with 620 bar max. operating pressure.
This material is resistant to sea water, water glycol, diesel, and hydraulic fluids.

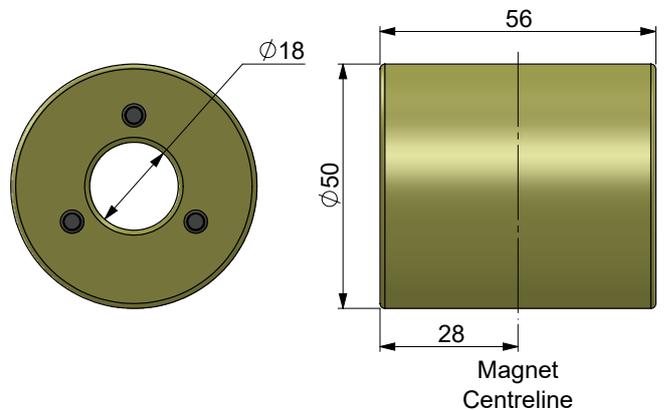
'HV' Float (Rota P/N LJ 8172)

0.5 mm Resolution
Suitable for 12 mm tube diameter sensors



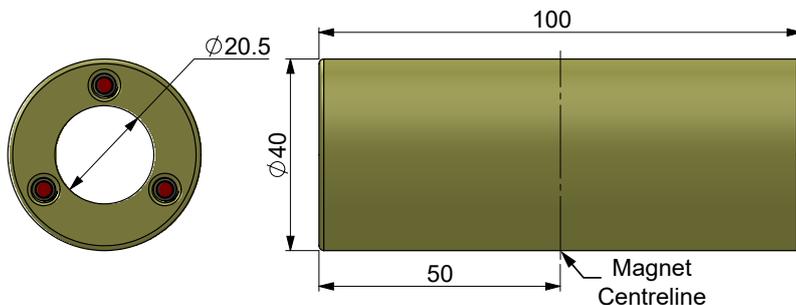
'HW' Float (Rota P/n LJ 3517)

0.3 mm Resolution
Suitable for 12 mm tube diameter sensors



'LW' Float (Rota P/N LJ 8204)

0.3 mm Resolution
Suitable for 12 or 16 mm tube diameter sensors



Notes for LJW Floats:

There must be no magnetic material within 15 mm of the top and bottom of the float assembly, or 35 mm from the centre.

Floats may perform differently in different fluids, dependent on viscosity, temperature, and operating speed.

Please contact Rota for more info.

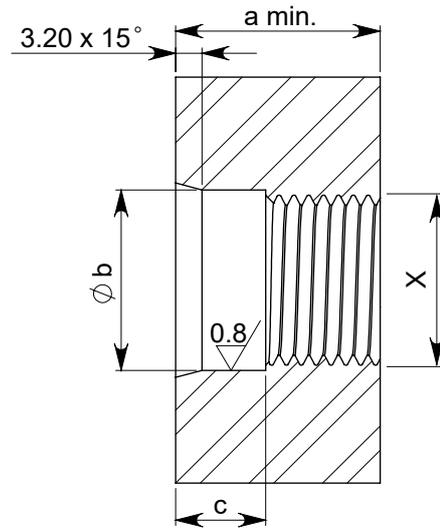
Subject to reasonable modifications due to technical advances



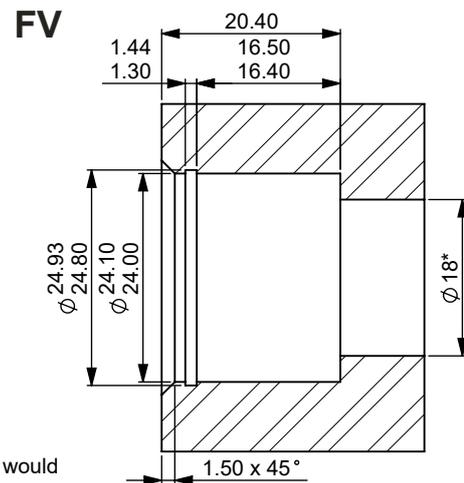
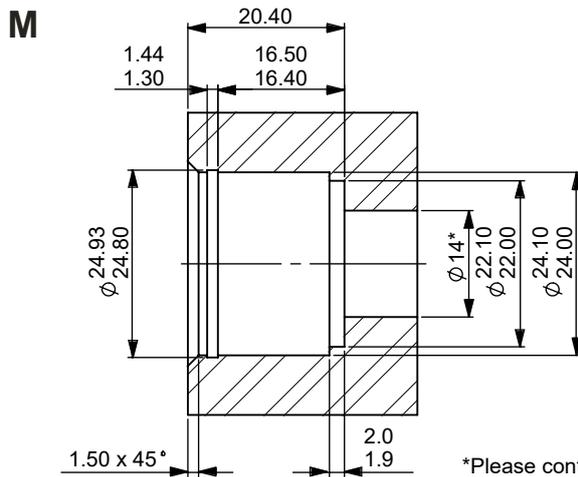
END CAP MACHINING AND MAGNET MACHINING DETAILS

END CAP MACHINING

Mounting Code	X	a	b	c
LJWP	1/2" BSPP	25	22.225/22.258	11
LJWA / LJWAR	3/4" BSPP	30	27.500/27.521	
LJWER	7/8" - 14 UNF (SAE #10)	35		16

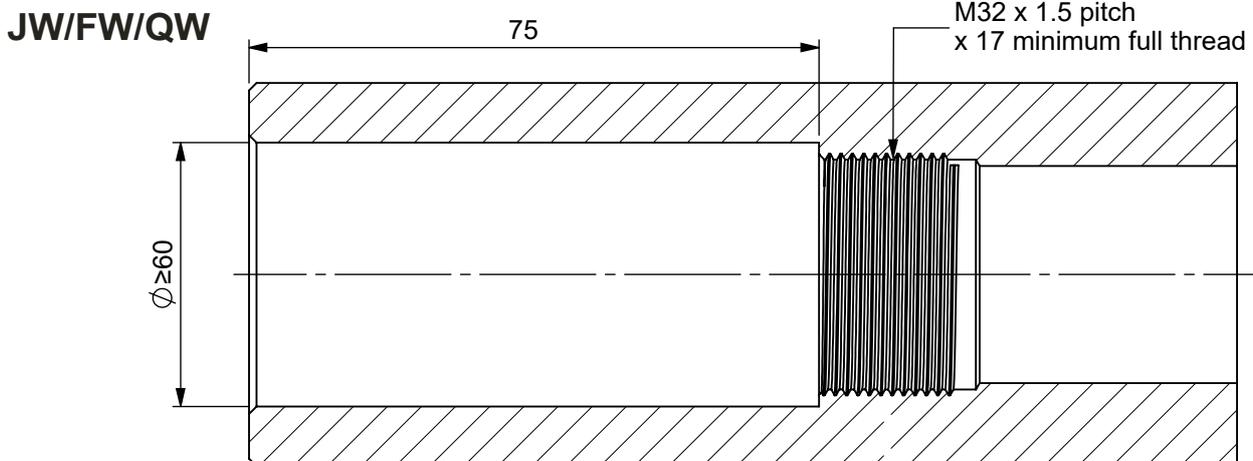


CIRCLIP-MOUNTED MAGNET MACHINING



*Please contact Rota if you would like to change the hole dimension.

THREAD-MOUNTED MAGNET MACHINING



Subject to reasonable modifications due to technical advances



RELIABLE OPERATION TOUGH APPLICATION



HOW TO ORDER

LJW E 0200 M 0.1 T R 2 1234

LJW Series

Linear Transducer

Mounting Configuration

A = 3/4" BSPP

E = 7/8" - 14 UNF (SAE #10)

P = 1/2" BSPP [not available as rotating]

Optional

R = Rotating head

Optional

S = Special metalwork

Stroke (mm)

Magnet*

FV = from 0.2 mm res - for 16 mm O/D tube sensors

FW = from 0.2 mm res - for 16 mm O/D tube sensors

JW = from 0.2 mm res - for 12 mm O/D tube sensors

M = from 0.05 mm res - for 12 mm O/D tube sensors

R = See LJ Cat page 16 for details

QW = from 0.2 mm res - for 19 mm O/D tube sensors

*For non-magnetic housing please contact Rota

Float

D = 0.3 mm res - for 12 mm O/D tube sensors

E = 0.3 mm res - for 12 mm O/D tube sensors

HV = 0.5 mm res - for 12 mm O/D tube sensors

HW = 0.3 mm res - for 12 mm O/D tube sensors

LW = 0.3 mm res - for 12 or 16 mm O/D tube sensors

Signal Resolution (mm)

Output Signal

A* = Current 4 to 20 mA (3 Wire) (13 - 32 V Input)

B = Current 4 to 20 mA (3 Wire) (10 - 18 V Input)

BU = Current 4 to 20 mA & Voltage 1.0 to 5.0 V (10 - 30 V Input)

C = Voltage 0.5 to 3.5 V (4 - 10 V Input)

F = Voltage 0.25 to 4.75 V (9 - 32 V Input)

G = Voltage 0.5 to 4.5 V (9 - 32 V Input)

H = Voltage 0.5 to 10.0 V (13 - 32 V Input)

J = CANbus SAE J1939 (9 - 32 V Input)

JT = CANbus SAE J1939 with temperature indicator (9 - 32 V Input)

L = Voltage 0.5 to 4.5 V (5 - 10 V Input)

O = CANopen (9 - 32 V Input)

OT = CANopen with temperature indicator (9 - 32 V Input)

Q = SSI Asynchronous (9 - 28 V Input)

R = Voltage 0.5 to 4.75 V (9 - 32 V Input)

T* = Current 4 to 20 mA (2 Wire) (11 - 28 V Input)

V = Voltage 0.5 to 5.0 V (9 - 32 V Input)

*Output signal type "A" designed for a 24V Input, 500ohm load and output

signal type "T" designed for a 12V Input, 250ohm load.

For other input voltages and load resistances please inform Rota.

Unique Transducer Calibration Number

Electrical Termination

Subconn

0 = BH6M Brass

1 = MCBH3M Brass

2 = MCBH3M SS

46 = LPBH3M Brass

Seacon

4 = 5507 1503

6 = BH4MPSS

27 = 5507 1504

28 = 5507 1508

Burton

5 = 5507 1503

7 = 5507 1508

Impulse

67 = MCBH3M SS

CRE

100 = CS MSSJ-3-BCR

Connectors from other manufacturers are available.

For a full comprehensive list of all connectors we are able to offer see LJW DS pgs 9&10.

Optional

R = Reversible Signal (analogue outputs only)

Subject to reasonable modifications due to technical advances



RELIABLE OPERATION TOUGH APPLICATION

Rota Limited, Manchester UK

www.rota-ltd.com

LJWDS V1.08.01



CONNECTOR OPTIONS BY ROTA PART NUMBER

Order Code	Description
0	Subconn BH6M Brass
1	Subconn MCBH3MP Brass* 3/4"
2	Subconn MCBH3MSS* 3/4"
3	Subconn BH3MP* 3/4"
4	Seacon 5507-1503
5	Burton 5507-1503 1/2"
6	Seacon Wet-Con BH4MPSS 3/4"
7	Burton 5507-1508 1/2"
9	Subconn LPBH4M Brass* 1"
9	Subconn LPBH4M Brass* 1/2 Lg. Thread
27	Seacon 5507-1504 1/2" LG
28	Seacon 5507-1508 (SS 8pin) 1/2"
29	Seacon MSXJJ-3-BCR
30	Seacon MSXJJ-5-BCR
31	Seacon MSXJJ-7-BCR
32	Seacon MCBH-3MSS* 1/2"
33	Seacon MCBH8MSS*
34	Seacon MING-3-BCR (with 2m tails, no encapsulant)
35	Seacon FAWL-3P-BC-RA* 1/2"
39	Seacon Wet-Con BH4MPSS inc DSLA-MR
40	Seacon CS-MSSJ-3-BCR
42	Subconn MCBH4M Brass* 3/4"
43	Subconn MCBH4MSS* 3/4"
44	Subconn MCBH6MSS* 3/4" LG
45	Subconn MCBH8FSS* 3/4" LG
46	Subconn LPBH3M Brass* 1"
47	Subconn LPBH4MSS*
48	Subconn LPBH5MSS* 1"
49	Subconn LPBH7MSS* (13mm)
50	Subconn BH4F* 3/4"
52	Subconn BH3M incl DLSA-M
53	Subconn BH6M incl DLSB-M
54	Subconn Micro MCBH3M Brass inc MCDLSM*
55	Subconn Micro MCBH3MSS inc MCDLSM*
56	Subconn MCBH-4-M Brass inc MCDLSM*
57	Subconn MCBH-4-MSS inc MCDLSM*
58	Subconn MCBH-6-MSS inc MCDLSM*
59	Subconn MCBH-8-FSS inc MCDLSF*
60	Subconn BH4F inc DLSA-F
61	Subconn MCBHRA4MSS
62	Subconn BH3MSS incl DLSA-M
63	Subconn MCBH2MSS incl MCDLSF 3/4" incl. snap ring
65	Impulse MSSJ-3-BCR
66	Impulse MSSJ-10-BCR
67	Impulse MCBH-3-MP-SS* 1/2"
68	Impulse MCBH-3-MPSS inc MCDLS-M*
69	Impulse MHDG-4-BCR
70	Impulse MHDG-9-BCR
71	Impulse LPBH-5MP-SS*
72	Impulse LPBH-5-MP* 1"
73	Impulse LPMBH-7-MP* 1/2"

Order Code	Description
79	Seacon Wet-Con BH6MPSS 3920-1-A 3/4"
80	Seacon BH6MP SS inc DSLB-M
81	Impulse IERD-2M-BC-3
82	Seacon MING-7 BCR
83	Burton 59F2M-3
84	Burton 59F2M-4
85	Seacon CS-MSAJ-3-BCR
86	Seacon GLOBG-7-BCR SS
87	Subconn MCBH4MSS G2
88	Seacon GLOBK-5-BCR SS
89	Burton 5507-1506
90	Subconn MCBHRA 3MSS
91	Impulse IESQ4M-BC
92	Impulse IERD 2M BC2
93	Seacon MCBH-4-MSS
94	Subconn FCR 1503M
95	Glenair SeaKing 700-007-G8PN
96	Seacon CS-MSSJ-5-BCR
97	Glenair G5507-1508-0004
98	CRE BRA04 BRA04 1808
99	CRE BRA04 1802
100	CRE CS MSSJ-3-BCR
101	Subconn MCLPBH3M
102	Subconn BH4M
103	Glenair SeaKing 700-007-G8-Z18N
104	Grove 2.15 MBORA-5
105	Burton MCBH3MSS
106	CRE CS-MSSJ-5-BCR
107	CRE BRB04M09001601
108	Grove 4.65 MBORA
109	Subconn MCBHRA3F
110	CRE BRA04MBA102508
111	Seacon MING-10-BCR
112	Glenair 700-207-E4-KPN
113	Scorpion 5507 - 1504
114	Scorpion 5507 1503
115	Subconn MCBHRA4M-G2
116	Souriau 8810-10H-1-04PA
117	CRE BRW03
118	Subconn MCBHRA6M-Brass
119	Subconn MCBH 8M SS
120	Subconn FCR 1502
121	Scorpion MCBH4F
122	Glenair 5507 - 1504
123	Burton 5507 - 1504
124	Glenair 5507 - 1503
125	Subconn MCBH5MSS
126	Subconn MCBH4F



RELIABLE OPERATION TOUGH APPLICATION



CONNECTOR OPTIONS BY MANUFACTURER

Order Code	Description
5	Burton 5507-1503 ½"
7	Burton 5507-1508 ½"
83	Burton 59F2M-3
84	Burton 59F2M-4
89	Burton 5507-1506
105	Burton MCBH3MSS
123	Burton 5507 - 1504
98	CRE BRA04 1808
99	CRE BRA04 1802
100	CRE CS MSSJ-3-BCR
106	CRE CS-MSSJ-5-BCR
107	CRE BRB04M09001601
110	CRE BRA04MBA102508
117	CRE BRW03
95	Glenair SeaKing 700-007-G8PN
97	Glenair G5507-1508-0004
103	Glenair SeaKing 700-007-G8-Z18N
112	Glenair 700-207-E4-KPN
122	Glenair 5507 - 1504
124	Glenair 5507 - 1503
104	Grove 2.15 MBORA-5
108	Grove 4.65 MBORA
65	Impulse MSSJ-3-BCR
66	Impulse MSSJ-10-BCR
67	Impulse MCBH-3-MP-SS* 1/2"
68	Impulse MCBH-3-MPSS inc MCDLS-M*
69	Impulse MHDG-4-BCR
70	Impulse MHDG-9-BCR
71	Impulse LPBH-5MP-SS*
72	Impulse LPBH-5-MP* 1"
73	Impulse LPMBH-7-MP* 1/2"
81	Impulse IERD-2M-BC-3
91	Impulse IESQ4M-BC
92	Impulse IERD 2M BC2
113	Scorpion 5507 - 1504
114	Scorpion 5507 1503
121	Scorpion MCBH4F
4	Seacon 5507-1503
6	Seacon Wet-Con BH4MPSS 3/4"
27	Seacon 5507-1504 1/2" LG
28	Seacon 5507-1508 (SS 8pin) 1/2"
29	Seacon MSXJJ-3-BCR
30	Seacon MSXJJ-5-BCR
31	Seacon MSXJJ-7-BCR
32	Seacon MCBH-3MSS* 1/2"
33	Seacon MCBH8MSS*
34	Seacon MING-3-BCR (with 2m tails, no encapsulant)
35	Seacon FAWL-3P-BC-RA* 1/2"
39	Seacon Wet-Con BH4MPSS inc DSLA-MR
40	Seacon CS-MSSJ-3-BCR

Order Code	Description
79	Seacon Wet-Con BH6MPSS 3920-1-A 3/4"
80	Seacon BH6MP SS inc DSLB-M
82	Seacon MING-7 BCR
85	Seacon CS-MSAJ-3-BCR
86	Seacon GLOBG-7-BCR SS
88	Seacon GLOBK-5-BCR SS
93	Seacon MCBH-4-MSS
96	Seacon CS-MSSJ-5-BCR
111	Seacon MING-10-BCR
116	Souriau 8810-10H-1-04PA
0	Subconn BH6M Brass
1	Subconn MCBH3MP Brass* ¾"
2	Subconn MCBH3MSS* ¾"
3	Subconn BH3MP* ¾"
9	Subconn LPBH4M Brass* ½ Lg. Thread
9	Subconn LPBH4M Brass* 1"
42	Subconn MCBH4M Brass* ¾"
43	Subconn MCBH4MSS* ¾"
44	Subconn MCBH6MSS* ¾" LG
45	Subconn MCBH8FSS* ¾" LG
46	Subconn LPBH3M Brass* 1"
47	Subconn LPBH4MSS*
48	Subconn LPBH5MSS* 1"
49	Subconn LPBH7MSS* (13mm)
50	Subconn BH4F* ¾"
52	Subconn BH3M incl DLSA-M
53	Subconn BH6M incl DL SB-M
54	Subconn Micro MCBH3M Brass inc MCDLSM*
55	Subconn Micro MCBH3MSS inc MCDLSM*
56	Subconn MCBH-4-M Brass inc MCDLSM*
57	Subconn MCBH-4-MSS inc MCDLSM*
58	Subconn MCBH-6-MSS inc MCDLSM*
59	Subconn MCBH-8-FSS inc MCDLSF*
60	Subconn BH4F inc DL SA-F
61	Subconn MCBHRA4MSS
62	Subconn BH3MSS incl DL SA-M
63	Subconn MCBH2MSS incl MCDLSF ¾" incl. snap ring
87	Subconn MCBH4MSS G2
90	Subconn MCBHRA 3MSS
94	Subconn FCR 1503M
101	Subconn MCLPBH3M
102	Subconn BH4M
109	Subconn MCBHRA3F
115	Subconn MCBHRA4M-G2
118	Subconn MCBHRA6M-Brass
119	Subconn MCBH 8M SS
120	Subconn FCR 1502
125	Subconn MCBH5MSS
126	Subconn MCBH4F



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