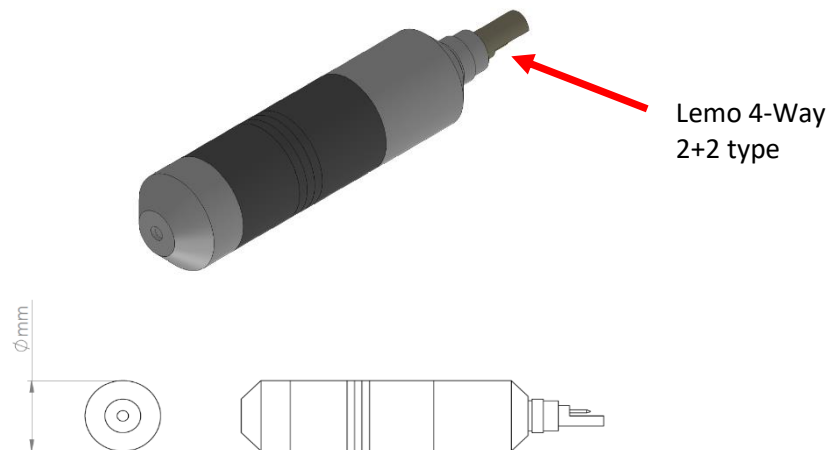


Internal Diameter (ID) Probes - Bridge



Application:

Differential ID probes - for internal diameter tube inspection, ideal for inspecting tubular heat exchangers.

Specification:

- Probe diameters from 7.5 to 150mm, available in 0.1mm steps
- Dis-connectable and integral probe cables
- Cable lengths from 3.0 to 30 metres
- Frequency range from 2.7 kHz to 1MHz, centre frequencies 2.7, 10, 24, 76, 190, 400kHz.

Notes:

When ordering ID probes allow 0.8 to 1.5mm less than the tube diameter, this should be good for typical tube condition and manufacturing tolerances. Where tolerances are poor allow for greater clearance, tape can be used were necessary to reduce probe 'wobble'.

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ID Probe Coding System

PID212L20R24k

PI	Probe Internal Diameter
D	Differential (Bridge)
091	Dia 9.1mm
212	Dia 21.2mm
D	Disconnectable (Standard - For probes diameters between 11.5mm and 55.0mm)
E	Disconnectable (For probes diameters above 55.0mm)
J	Jaeger 6-Way
L	Lemo 12-Way
M	Lemo 7-Way
N	Lemo 16-Way
Z	4-way Amphenol
03	3.0m Cable
05	5.0m Cable
10	10.0m Cable
20	20.0m Cable (Standard)
30	30.0m Cable
00	Disconnect
F	Flexible
R	Rigid Push/Pull (The minimum size of Rigid integral ID probes is 8.5mm; probes below this size require a flexible integral cable)
2.7k	2k7
10k	10kHz
24k	24kHz
190k	190kHz
400k	400kHz

Example Part Number: PID212L20R24k

Description: Probe, Internal Diameter, Differential, Dia 21.2mm, Lemo 12-Way, 20 metres, Rigid Push/Pull, 24kHz

Other options available on request.

ID Dis-connectable Cable Coding System

CIDL20R

CI Cable Internal Diameter

D Differential (Bridge)

J Jaeger 6-Way

L Lemo 12-Way

M Lemo 7-Way

Z 4-way Amphenol

03 3.0m Cable

05 5.0m Cable

10 10.0m Cable

20 20.0m Cable (Standard)

30 30.0m Cable

F Flexible

R Rigid Push/Pull

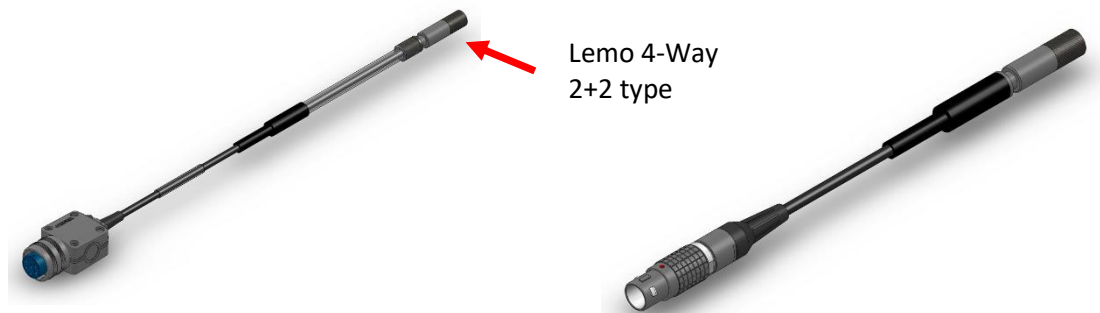
(Only For probes diameters above 55.0mm add a

E on the end)

Example Part Number: CIDL20R

Description: Cable, Internal Diameter, Differential, Lemo 12-Way, 20 meters, Rigid Push/Pull.

Other options available on request.



Rigid Push/Pull

Flexible

Standard Heat Exchanger Tube Sizes:

Recommended ID probe diameters for different tube sizes:

These sizes are chosen to give a probe diameter between 0.8 and 1.5mm less than the tube internal diameter, more clearance being allowed for larger diameters. This should be acceptable for typical conditions of tube condition and manufacturing tolerances. If these are particularly poor then a greater clearance (ie. smaller probe size) should be chosen, with tape being used as necessary to reduce probe “wobble”. With tube in “as manufactured” condition larger probe size may be possible.

The table shows the calculated internal diameter of the tube, and the suggested probe size.

The following limitations apply:

- The minimum size for detachable ID probes is 11.5mm; probes below this require integral cables
- Detachable ID probe diameters over 55.0mm must be of the selections code type E
- The minimum size of Rigid integral ID probes is 8.5mm; probes below this size require a flexible integral cable

O/D	½"	5/8"	¾"	7/8"	1"	1 1/8"
T	12.7mm	15.88mm	19.05mm	22.23mm	25.4mm	28.58mm
12 BWG 2.77mm	7.16	10.34	13.51	16.69	19.86	23.04
13 BWG 2.41mm	7.88	11.06	14.13	17.41	20.58	23.76
14 BWG 2.11mm	8.48	11.65	14.83	18.01	21.18	24.36
15 BWG 1.83mm	9.04	12.22	15.39	18.57	21.74	24.92
16 BWG 1.65mm	9.4	12.58	15.75	18.93	22.1	25.28
17 BWG 1.47mm	9.76	12.94	16.11	19.29	22.46	25.64
18 BWG 1.24mm	10.22	13.40	16.57	19.75	22.92	26.1
19 BWG 1.07mm	10.56	13.74	16.91	20.09	23.26	26.44
20 BWG 0.89mm	10.92	14.1	17.27	20.45	23.62	26.8
21 BWG 0.81mm	11.09	14.26	17.43	20.61	23.78	26.96
22 BWG 0.71mm	11.28	14.46	17.63	20.81	22.98	27.16

ID Probe Frequency Table:

Quick estimation of test frequency in kHz for given tube material and wall thickness

BWG thou. Inch mm	24 022 0.56	22 028 0.71	20 035 0.89	-- 040 1.02	18 049 1.24	-- 060 1.24	16 065 1.65	-- 080 2.00	14 083 2.11	12 109 2.77	10 134 3.40
Titanium 6A1-4V 1.1% IACS	1500	930	592	470	305	208	170	117	105	61	41
Inconel 600 1.67% IACS	985	613	390	309	200	137	115	77	69	40	27
304 Stainless 2.5% IACS	660	410	260	206	134	92	76	52	46	27	18
Titanium 3.6% IACS	460	285	181	143	93	63	53	36	32	19	12
70/30 Copper Nickel 5.0% IACS	330	205	130	103	67	46	38	26	23	14	9
90/10 Copper Nickel 11.9% IACS	140	86	55	43	28	19	16	10.8	9.7	5.6	3.8
Aluminium Bronze 13% IACS	126	79	50	40	26	18	15	9.9	8.9	5.2	3.4
Admiralty Brass 25% IACS	66	41	26	21	13	9.2	7.6	5.2	4.6	2.7	1.8
Brass (70/30 Cu-Zn) 28% IACS	59	36	23	18	12	8.2	6.8	4.6	4.1	2.4	1.6
Brass (85/15) 37% IACS	44	28	17	14	9	6.2	5.1	3.5	3.1	1.8	1.2
Brass (95/5) 55% IACS	30	19	12	9.4	6.1	4.2	3.4	2.4	2.1	1.2	0.8
Copper 100% IACS	16	10	6.5	5.2	3.4	2.3	1.9	1.3	1.2	0.7	0.5

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