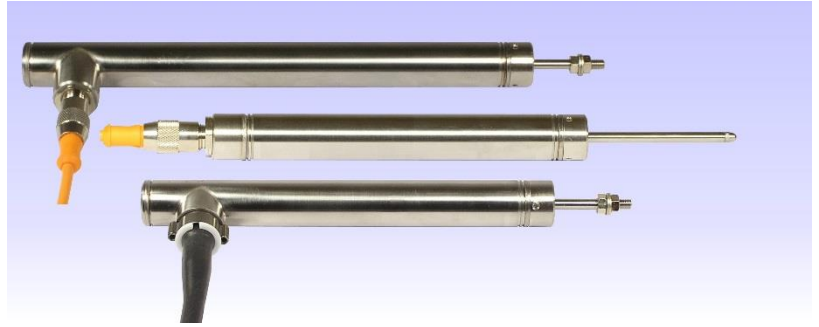


## DCWC Submersible LVDT Displacement Transducer 4-20mA

- High accuracy
- High cycle life
- Submersible
- Stainless steel
- Infinite resolution
- 4-20mA 2 wire interface



These transducers are for displacement / position measurement. They make an accurate position measurement of the movement of the armature (the sliding part) relative to the body of the displacement transducer.

This transducer uses the Linear Variable Differential Transformer (LVDT) principle which means that it is probably the most robust and reliable position sensor type available. The strength of the LVDT sensor's principle is that there is no electrical contact across the transducer position sensing element which for the user of the sensor means clean data, infinite resolution and a very long life.

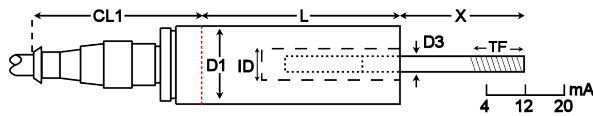
Our DC to DC LVDT transducer has all of the benefits of the LVDT sensor principle with the added convenience of built-in LVDT electronics enabling a dc supply and dc output. As an option we can offer a 4-20mA 2 wire connection to the transducer on some models.

Our submersible displacement transducers are designed to make measurements whilst submerged in suitable liquids. Fluids which are non-magnetic can be allowed to flood the armature tube without affecting the operation of the transducer.

This series of displacement transducer is available as either an unguided, captive or spring return version.

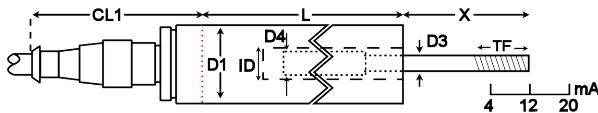
### Unguided version.

#### DCWC100 to DCWC400



CL1=62mm  
D1=20.6mm  $\pm 0.12$ mm  
D3=2.0mm  
ID=2.54mm  
TF=M3x0.5, 18mm  
X=Centre of range

#### DCWC500 to DCWC8000

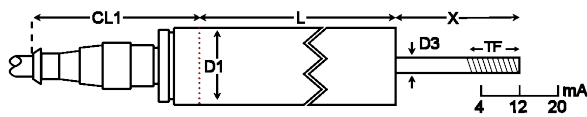


CL1=62mm  
D1=20.6mm  $\pm 0.12$ mm  
D3=4.75mm  
D4=5.97mm  
ID=6.80mm  
TF=M5x0.8, 15mm  
X=Centre of range

On our DCWC unguided LVDTs the armature assembly is a separate component, to make a measurement the user must guide the armature inside the body without touching the sides. Our DCWC unguided position measurement transducers are appropriate where external guidance is available and give truly non-contact operation

| Type     | Range         | Linearity error (% F.S.)   | L     | X (nom) | Total weight | Armature weight | Inward over-travel |
|----------|---------------|----------------------------|-------|---------|--------------|-----------------|--------------------|
| DCWC100  | $\pm 2.5$ mm  | $\pm 0.5/\pm 0.25$         | 68mm  | 33mm    | 125g         | 1.4g            | 9.6mm              |
| DCWC200  | $\pm 5$ mm    | $\pm 0.5/\pm 0.25$         | 68mm  | 33mm    | 125g         | 1.8g            | 7.1mm              |
| DCWC300  | $\pm 7.5$ mm  | $\pm 0.5/\pm 0.25$         | 68mm  | 33mm    | 125g         | 1.8g            | 4.6mm              |
| DCWC400  | $\pm 10$ mm   | $\pm 0.5/\pm 0.25$         | 68mm  | 33mm    | 125g         | 1.9g            | 2.1mm              |
| DCWC500  | $\pm 12.5$ mm | $\pm 0.5/\pm 0.25/\pm 0.1$ | 203mm | 38mm    | 243g         | 19g             | 10mm               |
| DCWC1000 | $\pm 25$ mm   | $\pm 0.5/\pm 0.25/\pm 0.1$ | 231mm | 63mm    | 300g         | 26g             | 23mm               |
| DCWC2000 | $\pm 50$ mm   | $\pm 0.5/\pm 0.25/\pm 0.1$ | 354mm | 76mm    | 399g         | 40g             | 10mm               |
| DCWC3000 | $\pm 75$ mm   | $\pm 0.5/\pm 0.25/\pm 0.1$ | 470mm | 114mm   | 527g         | 57g             | 23mm               |
| DCWC4000 | $\pm 100$ mm  | $\pm 0.5/\pm 0.25/\pm 0.1$ | 503mm | 127mm   | 655g         | 71g             | 10mm               |
| DCWC6000 | $\pm 150$ mm  | $\pm 0.5/\pm 0.25$         | 707mm | 178mm   | 882g         | 104g            | 10mm               |
| DCWC8000 | $\pm 200$ mm  | $\pm 0.5/\pm 0.25$         | 909mm | 254mm   | 1.3kg        | 142g            | 36mm               |

## Captive guided version.



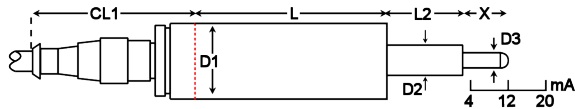
CL1=62mm  
D1=20.6mm  $\pm 0.12$ mm  
D3=4.75mm  
TF=M5x0.8, 15mm  
X=Centre of range

Our DCWC captive guided displacement transducer has bearings to guide the armature inside the measurement sensor. Our DCWC captive LVDTs are for position measurement applications where guidance may be poor and end bearings may be required.

| Type       | Range         | Linearity error (% F.S.)   | L      | X (nom) | Total weight | Inward over-travel | Outward over-travel |
|------------|---------------|----------------------------|--------|---------|--------------|--------------------|---------------------|
| DCWC500B   | $\pm 12.5$ mm | $\pm 0.5/\pm 0.25/\pm 0.1$ | 203mm  | 38mm    | 370g         | 10mm               | 28mm                |
| DCWC1000B  | $\pm 25$ mm   | $\pm 0.5/\pm 0.25/\pm 0.1$ | 231mm  | 63mm    | 428g         | 17mm               | 25mm                |
| DCWC2000B  | $\pm 50$ mm   | $\pm 0.5/\pm 0.25/\pm 0.1$ | 354mm  | 76mm    | 541g         | 10mm               | 28mm                |
| DCWC3000B  | $\pm 75$ mm   | $\pm 0.5/\pm 0.25/\pm 0.1$ | 470mm  | 114mm   | 655g         | 23mm               | 28mm                |
| DCWC4000B  | $\pm 100$ mm  | $\pm 0.5/\pm 0.25/\pm 0.1$ | 503mm  | 127mm   | 797g         | 10mm               | 28mm                |
| DCWC6000B  | $\pm 150$ mm  | $\pm 0.5/\pm 0.25$         | 707mm  | 178mm   | 1.1kg        | 10mm               | 35mm                |
| DCWC8000B  | $\pm 200$ mm  | $\pm 0.5/\pm 0.25$         | 909mm  | 254mm   | 1.5kg        | 36mm               | 41mm                |
| DCWC10000B | $\pm 250$ mm  | $\pm 0.5/\pm 0.25$         | 1094mm | 305mm   | 1.7kg        | 36mm               | 47mm                |
| DCWC15000B | $\pm 380$ mm  | $\pm 0.5$                  | 1493mm | 406mm   | 2.2kg        | 10mm               | 28mm                |
| DCWC18500B | $\pm 470$ mm  | $\pm 0.5$                  | 1766mm | 508mm   | 2.6kg        | 23mm               | 35mm                |

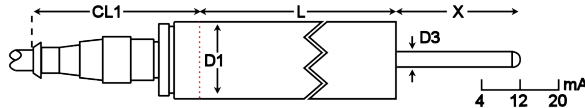
## Spring return version.

DCWC100A to DCWC400A



CL1=62mm  
D1=20.6mm  $\pm 0.12$ mm  
D2=8.0mm  
D3=4mm  
L2=36mm  
X=Centre of range

DCWC500A to DCWC3000A



CL1=62mm  
D1=20.6mm  $\pm 0.12$ mm  
D3=4.75mm  
X=Centre of range

Our DCWC spring displacement transducer has bearings to guide the armature inside the measurement sensor and a spring which pushes the armature to the fully out position. Our DCWC spring return LVDTs are appropriate where it is not possible to connect the transducer armature to the moving component being measured.

| Type      | Range         | Linearity error (% F.S.)   | L     | X (nom) | Total weight | Spring force at X | Spring rate | Inward over-travel | Outward over-travel |
|-----------|---------------|----------------------------|-------|---------|--------------|-------------------|-------------|--------------------|---------------------|
| DCWC100A  | $\pm 2.5$ mm  | $\pm 0.5/\pm 0.25$         | 68mm  | 11mm    | 135g         | 0.9N              | 0.9N/cm     | 2.3mm              | 1.4mm               |
| DCWC200A  | $\pm 5$ mm    | $\pm 0.5/\pm 0.25$         | 68mm  | 13mm    | 136g         | 0.9N              | 0.8N/cm     | 0.3mm              | 1.4mm               |
| DCWC300A  | $\pm 7.5$ mm  | $\pm 0.5/\pm 0.25$         | 68mm  | 18mm    | 137g         | 1.3N              | 0.6N/cm     | 1.5mm              | 1.4mm               |
| DCWC400A  | $\pm 10$ mm   | $\pm 0.5/\pm 0.25$         | 68mm  | 22mm    | 138g         | 1.7N              | 0.8N/cm     | 1.5mm              | 1.4mm               |
| DCWC500A  | $\pm 12.5$ mm | $\pm 0.5/\pm 0.25/\pm 0.1$ | 203mm | 38mm    | 257g         | 1.2N              | 0.2N/cm     | 6mm                | 28mm                |
| DCWC1000A | $\pm 25$ mm   | $\pm 0.5/\pm 0.25/\pm 0.1$ | 231mm | 63mm    | 314g         | 1.9N              | 0.3N/cm     | 4mm                | 25mm                |
| DCWC2000A | $\pm 50$ mm   | $\pm 0.5/\pm 0.25/\pm 0.1$ | 354mm | 76mm    | 428g         | 4.1N              | 0.4N/cm     | 6mm                | 28mm                |
| DCWC3000A | $\pm 75$ mm   | $\pm 0.5/\pm 0.25/\pm 0.1$ | 470mm | 114mm   | 541g         | 5.4N              | 0.4N/cm     | 15mm               | 28mm                |

## Options And Accessories

Rod-end bearings for captive-guided position transducers



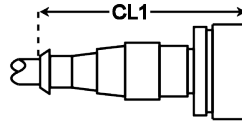
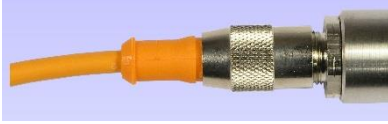
Mounting block



Torque  
Position  
Pressure  
Load Cells  
Displacement  
Instrumentation

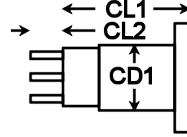
# Electrical termination options

Standard cable - End exit connector with cable fitted



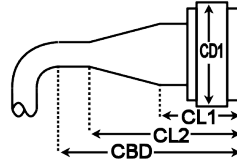
Cable length = 5m  
Operating temperature range\* = -25°C to 90°C  
Maximum static pressure\* = 1000kPa  
CL1 = 62mm

Cable Option 1 - End exit solder pins for customer to fit their own cable



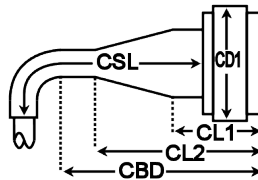
Operating temperature range\* = -40°C to 125°C  
CL1 = 21mm  
CL2 = 6.4mm  
CD1 = 12.7mm

Cable Option 2 - End exit fully sleeved integral cable



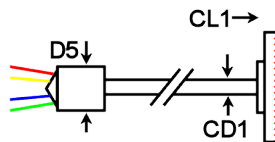
Cable length = 600mm to 7m  
Operating temperature range\* = -40°C to 100°C  
Maximum static pressure\* = 3.4MPa  
CL1 = 25mm  
CD1 = 25mm  
CL2 = 51mm  
CBD = 184mm

Cable Option 3 - End exit part-sleeved integral cable



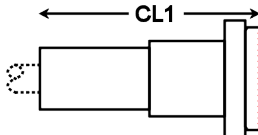
Cable length = 1m to 100m  
Cable sleeve length = 600mm  
Operating temperature range\* = -40°C to 90°C  
Maximum static pressure\* = 1.7MPa  
Cable sleeve length = 600mm  
CL1 = 25mm  
CL2 = 51mm  
CD1 = 25mm  
CBD = 184mm

Cable Option 5 - End exit integral MI (mineral insulated) stainless steel cable



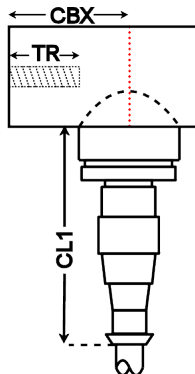
Cable length = 100mm to 70m  
Operating temperature range\* = -40°C to 200°C  
Maximum static pressure\* = 21MPa  
CL1 = 4mm  
CD1 = 4mm  
D5 = 11.7mm

Cable Option 6 - End exit connector with customer defined cable length fitted



Cable length = 0mm to 1000m  
Operating temperature range\* = -25°C to 125°C  
Maximum static pressure\* = 800kPa  
CL1 = 64mm

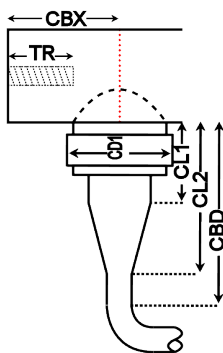
Cable Option 7 - Side exit connector with cable fitted



Cable length = 5m  
Operating temperature range\* = -25°C to 90°C  
Maximum static pressure\* = 1000kPa  
TR = M5x0.8, 11mm  
CL1 = 64mm  
CBX = 25mm

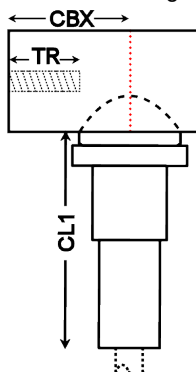
# Electrical termination options

Cable Option 8 - Side exit fully sleeved integral cable



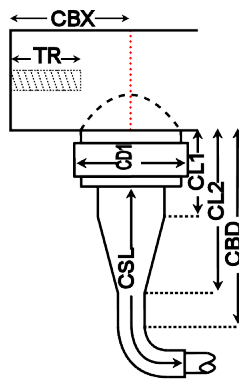
|                              |   |                |
|------------------------------|---|----------------|
| Cable length                 | = | 600mm to 7m    |
| Operating temperature range* | = | -40°C to 100°C |
| Maximum static pressure*     | = | 3.4MPa         |
| TR                           | = | M5x0.8, 11mm   |
| CBD                          | = | 184mm          |
| CBX                          | = | 25mm           |
| CD1                          | = | 25mm           |
| CL1                          | = | 30mm           |
| CL2                          | = | 55mm           |

Cable Option 9 - Side exit connector with customer defined cable length fitted



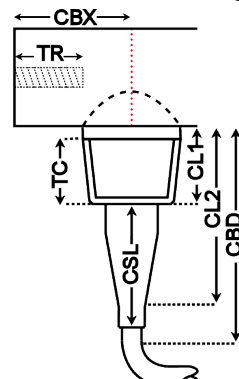
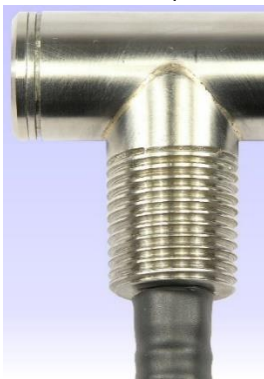
|                              |   |                |
|------------------------------|---|----------------|
| Cable length                 | = | 0mm to 1000m   |
| Operating temperature range* | = | -25°C to 125°C |
| Maximum static pressure*     | = | 800kPa         |
| TR                           | = | M5x0.8, 11mm   |
| CBX                          | = | 25mm           |
| CL1                          | = | 72mm           |

Cable Option 10 - Side exit part-sleeved integral cable



|                              |   |                |
|------------------------------|---|----------------|
| Cable length                 | = | 600mm to 1000m |
| Cable sleeve length          | = | 150mm          |
| Operating temperature range* | = | -40°C to 90°C  |
| Maximum static pressure*     | = | 1.7MPa         |
| TR                           | = | M5x0.8, 11mm   |
| CBD                          | = | 184mm          |
| CBX                          | = | 25mm           |
| CD1                          | = | 25mm           |
| CL1                          | = | 30mm           |
| CL2                          | = | 55mm           |

Cable Option 11 - Side exit part-sleeved integral cable and conduit fitting



|                              |   |                   |
|------------------------------|---|-------------------|
| Cable length                 | = | 1m to 1000m       |
| Cable sleeve length          | = | 150mm             |
| Operating temperature range* | = | -40°C to 90°C     |
| Maximum static pressure*     | = | 1.7MPa            |
| TR                           | = | M5x0.8, 11mm      |
| TC                           | = | 1/2"-14 NPT, 20mm |
| CBD                          | = | 184mm             |
| CBX                          | = | 25mm              |
| CL1                          | = | 25mm              |
| CL2                          | = | 50mm              |
| CSL                          | = | 150mm             |

| Specification *Transducer and cable option specifications should be compared and the worst figures used |                                  |
|---------------------------------------------------------------------------------------------------------|----------------------------------|
| Supply voltage (Vs)                                                                                     | 12V to 36V                       |
| Max loop resistance                                                                                     | (Supply voltage-11) x 50Ohms     |
| Output                                                                                                  | 4-20mA (4mA = inward full scale) |
| Output ripple                                                                                           | 50uA (peak-to-peak)              |
| Analogue output bandwidth                                                                               | 250Hz                            |
| Linearity error (Standard)                                                                              | ±0.5% F.S.                       |
| Linearity error (Optional on some models)                                                               | ±0.25% F.S.                      |
| Linearity error (Optional on some models)                                                               | ±0.1% F.S.                       |
| Temperature coefficient (span)                                                                          | ±0.03% F.S. /°C (typical)        |
| Operating temperature range                                                                             | -10°C to 70°C*                   |
| Maximum static pressure                                                                                 | 21MPa*                           |



Due to our policy of on-going development, DCWC specifications may change without notice. Any modification to our DCWC may affect some or all of the specifications for our equipment. All DCWC dimensions and specifications are nominal.

#### DCWC - WARNING - PERSONAL INJURY

Do not use our DCWC as safety, emergency stop or feedback devices in any application where the failure of this product could result in damage to equipment, personal injury or death.

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