1410 Series

FEATURES

> Oil-less
> Low power consumption
> Low sound level
> Long lifetime
> Compact design
> Lightweight

TYPICAL APPLICATIONS

> Medical devices
> Gas detection
> Analysis
> Battery operated systems

BASE MODEL

1410 LC
1410 DC
1410 BLDC

Diaphragm
Diaphragm Pump 1410V DC

### Flow
- 4.2 l/min
- Final Vacuum 75%

### PNEUMATIC DATA
- Description: 1410V/2.2/E/DC
- Part number:
  - 12 V: 14100300
  - 24 V: 14100301
- Max. flow: 4.2 l/min
- Max. intermittent vacuum: 75%
- Max. continuous vacuum: 75%
- Max. restart vacuum: 50%

### ELECTRICAL DATA
- Motor type: DC brush
- Nominal speed: 3000 rpm
- Nominal voltage: 12/24 V DC
- Max. power consumption: 4.4 W
- Motor insulation class: A
- Protection class: IP20

### GENERAL DATA
- Ambient temperature: 15 to 40 ºC
- Media temperature: 15 to 40 ºC
- Weight: 190 g
- Port direction: D

### WETTED PARTS
- Pump head: PA
- Diaphragm: EPDM
- Valves: EPDM

### OPTIONS
- PPS
- FKM

### FLOW CURVES

---

### 1410...
Stock programme

Model key:

- Eccentric
- Endurance
- Motor type

- Vacuum
- Diaphragm, Valves

---

<table>
<thead>
<tr>
<th>Power [W]</th>
<th>Flow [l/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

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Vacuum rel. [%]

---

Dimensions in mm [inch]
Diaphragm Pump 1410D DC

**Flow**  4.3 l/min
**Final Pressure**  1.0 bar

### PNEUMATIC DATA

<table>
<thead>
<tr>
<th>Description</th>
<th>1410D/2.2/E/DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part number</td>
<td>12 V 14100302, 24 V 14100303</td>
</tr>
<tr>
<td>Max. flow</td>
<td>4.3 l/min</td>
</tr>
<tr>
<td>Max. intermittent pressure</td>
<td>1.0 bar</td>
</tr>
<tr>
<td>Max. continuous pressure</td>
<td>1.0 bar</td>
</tr>
<tr>
<td>Max. restart pressure</td>
<td>0.5 bar</td>
</tr>
</tbody>
</table>

### ELECTRICAL DATA

- **Motor type**: DC brush
- **Nominal speed**: 3000 rpm
- **Nominal voltage**: 12/24 V DC
- **Max. power consumption**: 4.0 W
- **Motor insulation class**: A
- **Protection class**: IP20

### GENERAL DATA

- **Ambient temperature**: 15 to 40 °C
- **Media temperature**: 15 to 40 °C
- **Weight**: 190 g
- **Port direction**: D

### WETTED PARTS

- **Pump head**: PA
- **Diaphragm**: EPDM
- **Valves**: EPDM

### OPTIONS

- **PPS**
- **FKM**

### FLOW CURVES

![Flow Curve Graph]

**Model key:**

- Eccentric: 1410
- Motor type: D / 2.2 / E / DC
- Pressure: 1410...
- Diaphragm, Valves
Diaphragm Pump 1410VD DC

**Flow** 3.2 l/min
**Final Pressure** 1.9 bar
**Final Vacuum** 73%

---

### PNEUMATIC DATA

- **Description**: 1410VD/1.5/E/DC
- **Part number**: 14100304
- **Max. flow**: 3.2 l/min
- **Max. intermittent pressure**: 1.9 bar
- **Max. continuous pressure**: 0.7 bar
- **Max. restart pressure**: 0.5 bar
- **Max. intermittent vacuum**: 73%
- **Max. continuous vacuum**: 73%
- **Max. restart vacuum**: 50%

### ELECTRICAL DATA

- **Motor type**: DC brush
- **Nominal speed**: 3000 rpm
- **Nominal voltage**: 12/24 V DC
- **Max. power consumption**: 4.3 W
- **Motor insulation class**: A
- **Protection class**: IP20

### GENERAL DATA

- **Ambient temperature**: 15 to 40 °C
- **Media temperature**: 15 to 40 °C
- **Weight**: 190 g
- **Port direction**: D

### WETTED PARTS

- **Pump head**: PA
- **Diaphragm**: EPDM
- **Valves**: EPDM

### OPTIONS

- **PPS**

---

### FLOW CURVES

<table>
<thead>
<tr>
<th>Flow [l/min]</th>
<th>Power [W]</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

---

**Model key:**

- **Type**: Vacuum, Pressure
- **Diaphragm, Valves, O-Ring**

**Eccentric**

- **Motor type**: DC

**1410... Stock programme**

**Stock programme**

- **Model key:**
  - 1410 VD / 2.2 / E / DC
  - **Type**: Vacuum, Pressure
  - **Diaphragm, Valves, O-Ring**
Diaphragm Pump 1410V LC

Flow 3.7 l/min
Final Vacuum 75 %

PNEUMATIC DATA

Description 1410V/2.2/E/LC
Part number 14100103
14100106
Max. flow 3.7 l/min
Max. intermittent vacuum 75 %
Max. continuous vacuum 75 %
Max. restart vacuum 75 %

ELECTRICAL DATA

Motor type DC brush
Nominal speed 3000 rpm
Nominal voltage 12/24 V DC
Max. power consumption 5.0 W
Motor insulation class F
Protection class IP00

* Suitable connector
Housing, receptacle, 1.5mm, pitch
Molex P/N: 87439-0200
2x Crimp receptacle, 1.5mm, pitch
Molex P/N: 87421-0000

GENERAL DATA

Ambient temperature 15 to 40 °C
Media temperature 15 to 40 °C
Weight 180 g
Port direction D

WETTED PARTS

Pump head PA
Diaphragm EPDM
Valves EPDM

OPTIONS

PPS

FLOW CURVES

Power [W] vs. Flow Rate [l/min] vs. Vacuumrel. [%]
Diaphragm Pump 1410D LC

Flow | 3.7 l/min
---|---
Final Pressure | 1.0 bar

PNEUMATIC DATA
Description | 1410D/2.2/E/LC
Part number | 14100104
| 14100107
Max. flow | 3.7 l/min
Max. intermittent pressure | 1.0 bar
Max. continuous pressure | 1.0 bar
Max. restart pressure | 1.0 bar

ELECTRICAL DATA
Motor type | DC brush
Nominal speed | 3000 rpm
Nominal voltage | 12/24 V DC
Max. power consumption | 4.8 W
Motor insulation class | F
Protection class | IP00
Suitable connector | Housing, receptacle, 1.5mm, pitch Molex P/N: 87439-0200
| 2x Crimp receptacle, 1.5mm, pitch Molex P/N: 87421-0000

GENERAL DATA
Ambient temperature | 15 to 40 °C
Media temperature | 15 to 40 °C
Weight | 180 g
Port direction | D

WETTED PARTS
Pump head | PA
Diaphragm | EPDM
Valves | EPDM

OPTIONS
PPS

FLOW CURVES

<table>
<thead>
<tr>
<th>Flow [l/min]</th>
<th>Power [W]</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>8.0</td>
</tr>
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<td>3.5</td>
<td>7.0</td>
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<td>3.0</td>
<td>6.0</td>
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<tr>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>0.0</td>
<td>0.0</td>
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</table>

Pressure [mbar]
Diaphragm Pump **1410VD LC**

<table>
<thead>
<tr>
<th>Description</th>
<th>1410VD/1.5/E/LC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part number</td>
<td>14100105</td>
</tr>
<tr>
<td></td>
<td>14100108</td>
</tr>
<tr>
<td>Max. flow</td>
<td>2.6 l/min</td>
</tr>
<tr>
<td>Max. intermittent pressure</td>
<td>1.9 bar</td>
</tr>
<tr>
<td>Max. continuous pressure</td>
<td>0.7 bar</td>
</tr>
<tr>
<td>Max. restart pressure</td>
<td>1.9 bar</td>
</tr>
<tr>
<td>Max. intermittent vacuum</td>
<td>75 %</td>
</tr>
<tr>
<td>Max. continuous vacuum</td>
<td>75 %</td>
</tr>
<tr>
<td>Max. restart vacuum</td>
<td>75 %</td>
</tr>
</tbody>
</table>

**ELECTRICAL DATA**

- **Motor type**: DC brush
- **Nominal speed**: 3000 rpm
- **Nominal voltage**: 12/24 V DC
- **Max. power consumption**: 5.0 W
- **Motor insulation class**: F
- **Protection class**: IP00
- **Suitable connector**: Housing, receptacle, 1.5mm, pitch Molex P/N: 87439-0200
  - 2x Crimp receptacle, 1.5mm, pitch Molex P/N: 87421-0000

**GENERAL DATA**

- **Ambient temperature**: 15 to 40 °C
- **Media temperature**: 15 to 40 °C
- **Weight**: 180 g
- **Port direction**: D

**WETTED PARTS**

- **Pump head**: PA
- **Diaphragm**: EPDM
- **Valves**: EPDM

**OPTIONS**

- **PPS**

**FLOW CURVES**

<table>
<thead>
<tr>
<th>Flow [l/min]</th>
<th>Power [W]</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>9</td>
</tr>
<tr>
<td>2.5</td>
<td>8</td>
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<tr>
<td>2.0</td>
<td>7</td>
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<td>1.5</td>
<td>6</td>
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<td>1.0</td>
<td>5</td>
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<tr>
<td>0.5</td>
<td>4</td>
</tr>
<tr>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>0.5</td>
<td>2</td>
</tr>
<tr>
<td>1.0</td>
<td>1</td>
</tr>
<tr>
<td>1.5</td>
<td>0</td>
</tr>
</tbody>
</table>

Flow Rate

Diaphragm Pump 1410VD LC
Diaphragm Pump 1410V BLDC

**Flow**  5.5 l/min
**Final Vacuum**  75 %

---

### PNEUMATIC DATA

<table>
<thead>
<tr>
<th>Description</th>
<th>1410V/2.2/E/BLDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part number</td>
<td>12 V 14100210</td>
</tr>
<tr>
<td></td>
<td>24 V 14100211</td>
</tr>
<tr>
<td>Max. flow</td>
<td>5.5 l/min</td>
</tr>
<tr>
<td>Max. intermittent vacuum</td>
<td>75 %</td>
</tr>
<tr>
<td>Max. continuous vacuum</td>
<td>75 %</td>
</tr>
<tr>
<td>Max. restart vacuum</td>
<td>75 %</td>
</tr>
</tbody>
</table>

### ELECTRICAL DATA

- **Motor type**: Brushless DC
- **Nominal speed**: 0 - 4600 rpm
- **Nominal voltage**: 12/24 V DC
- **Drive electronics**: integrated with reverse supply voltage protection
- **Max. power consumption**: 6.3 W
- **Motor insulation class**: B
- **Protection class**: IP20
- **Connector Housing**: Molex KK 22-01-2045
- **Terminal Housing**: Molex KK 08-50-0031

### GENERAL DATA

- **Ambient temperature**: 15 to 40 °C
- **Media temperature**: 15 to 40 °C
- **Weight**: 170 g
- **Port direction**: D

### WETTED PARTS

<table>
<thead>
<tr>
<th>Part</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump head</td>
<td>PA</td>
</tr>
<tr>
<td>Diaphragm</td>
<td>EPDM</td>
</tr>
<tr>
<td>Valves</td>
<td>EPDM</td>
</tr>
</tbody>
</table>

### OPTIONS

- **PPS**

### FLOW CURVES

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**WIRING DIAGRAM**

- **Pin 1 V Supply**: Red (max. voltage range: 10.18 V DC)
- **Pin 2 Ground**: Black (max. voltage range: 10.28 V DC)
- **Pin 3 Speed Control**: White analog: 0..5 V DC (max. 28V)
- **Pin 4 Tacho out**: Green
  - Pulse time "LOW": 195 µs
  - Output level "LOW": 0 / max. 0.5 V
  - Output level "HIGH": min. 4 V / max. 5 V

Optional: Adapter for 2-wire duty incl. potentiometer for speed adjustment

**Model key:**

- **Eccentric**
- **Motor type**: BLDC
- **Type**: Vacuum Diaphragm, Valves
Diaphragm Pump 1410D BLDC

Flow 5.5 l/min
Final Pressure 1.0 bar

**PNEUMATIC DATA**
- Description: 1410D/2.2/E/BLDC
- Part number: 14100212 (12 V), 14100215 (24 V)
- Max. flow: 5.5 l/min
- Max. intermittent pressure: 1.0 bar
- Max. continuous pressure: 1.0 bar
- Max. restart pressure: 1.0 bar

**ELECTRICAL DATA**
- Motor type: Brushless DC
- Nominal speed: 0 – 4600 rpm
- Nominal voltage: 12/24 V DC
- Drive electronics: integrated with reverse supply voltage protection
- Max. power consumption: 6.3 W
- Motor insulation class: B
- Protection class: IP20
- Connector Housing: Molex KK 22-01-2045
- Terminal: Molex KK 08-50-0031

**GENERAL DATA**
- Ambient temperature: 15 to 40 °C
- Media temperature: 15 to 40 °C
- Weight: 170 g
- Port direction: D

**WETTED PARTS**
- Pump head: PA
- Diaphragm: EPDM
- Valves: EPDM

**OPTIONS**
- PPS

**FLOW CURVES**

**WIRING DIAGRAM**
- Pin 1: V Supply Red 12 V DC (max. voltage range: 10..18 V DC)
- Pin 2: Ground Black
- Pin 3: Speed Control White analog: 0..5 V DC (max. 28V)
- PWM: 6..20kHz - 14..96%
- Speed voltage input threshold: 0.2 V
- Pin 4: Tacho out Green 18 pulses per revolution
- Pulse time “LOW”: 195 µs
- Output level “LOW”: 0 / max. 0.5 V
- Output level “HIGH”: min. 4 V / max. 5 V

Optional: Adapter for 2-wire duty
incl. potentiometer for speed adjustment

Model key:
1410 D / 2.2 / E / BLDC
- Type: Eccentric
- Pressure: Diaphragm, Valves
Diaphragm Pump 1410VD BLDC

**Flow** 4.3 l/min

**Final Pressure** 1.9 bar

**Final Vacuum** 73%

---

**PNEUMATIC DATA**

- **Description**: 1410VD/1.5/E/BLDC
- **Part number**: 12 V 14100216
  - 24 V 14100217
- **Max. flow**: 4.3 l/min
- **Max. intermittent pressure**: 1.9 bar
- **Max. continuous pressure**: 0.7 bar
- **Max. intermittent vacuum**: 1.9 bar
- **Max. continuous vacuum**: 0.73 %
- **Max. restart vacuum**: 73 %

**ELECTRICAL DATA**

- **Motor type**: Brushless DC
- **Nominal speed**: 0 – 4600 rpm
- **Nominal voltage**: 12/24 V DC
- **Drive electronics**: integrated with reverse supply voltage protection
- **Max. power consumption**: 7.0 W
- **Motor insulation class**: B
- **Protection class**: IP20
- **Connector Housing**: Molex KK 22-01-2045
- **Terminal**: Molex KK 08-50-0031

---

**GENERAL DATA**

- **Ambient temperature**: 15 to 40 °C
- **Media temperature**: 15 to 40 °C
- **Weight**: 170 g
- **Port direction**: D

---

**FLOW CURVES**

**WETTED PARTS**

- **Pump head**: PA
- **Diaphragm**: EPDM
- **Valves**: EPDM

**OPTIONS**

- **PPS**

---

**WIRED DIAGRAM**

- **Pin 1 V Supply**: Red
  - **12 V DC**: (max. voltage range: 10..18 V DC)
  - **24 V DC**: (max. voltage range: 10..28 V DC)
- **Pin 2 Ground**: Black
- **Pin 3 Speed Control**: White
  - **Tacho out**: Green
  - **18 pulses per revolution**
  - **PWM**: 6..20kHz - 14..96%
  - **Speed voltage input threshold**: 0.2 V
- **Pin 4 Tacho out**: Green
  - **18 pulses per revolution**
  - **PWM**: 6..20kHz - 14..96%
  - **Speed voltage input threshold**: 0.2 V

Optional: Adapter for 2-wire duty incl. potentiometer for speed adjustment

**Model Key**

```
<table>
<thead>
<tr>
<th>Eccentric</th>
<th>Motor type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1410 VD / 2.2 / E / BLDC</td>
<td></td>
</tr>
</tbody>
</table>

Type               | Vacuum, Pressure | Diaphragm, Valves |
```

---

**DIAGRAM**

Dimensions in mm (inch)

---

**WETTING PARTS**

- **Pump head**: PA
- **Diaphragm**: EPDM
- **Valves**: EPDM

---

**OPTIONS**

- **PPS**
Wiring diagram (Brushless DC motor)

<table>
<thead>
<tr>
<th>Function</th>
<th>Colour</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 1 V Supply</td>
<td>Red</td>
<td>12 V DC (max. voltage range: 10..18 V DC)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 V DC (max. voltage range: 10..28 V DC)</td>
</tr>
<tr>
<td>Pin 2 Ground</td>
<td>Black</td>
<td>Ground for Vsupply (PIN 1) and Speed Control (PIN 3)</td>
</tr>
<tr>
<td>Pin 3 Speed Control</td>
<td>White</td>
<td>analog: 0.5 V DC (max. 28V)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PWM: 6..20kHz - 14..96%</td>
</tr>
<tr>
<td>Pin 4 Tacho out</td>
<td>Green</td>
<td>Speed voltage input threshold: 0.2 V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 pulses per revolution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pulse time „LOW“: 195 µs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Output level „LOW“: 0 / max. 0.5 V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Output level „HIGH“: min. 4 V / max. 5 V</td>
</tr>
</tbody>
</table>

**Speed Input**

```
+6V
10K
V_in
68K
```

**Speed Output**

```
FG
470p
```

Optional: Adapter for 2-wire duty incl. potentiometer for speed adjustment

**Options / Accessories**

- **P/N 29011932** Adapter for BLDC motor
  - 4-2 wire w/ manual speed control
  - 12 V DC “red”

- **P/N 29011933** Adapter for BLDC motor
  - 4-2 wire w/ manual speed control
  - 24 V DC “black”

- **P/N 29027486** Cable harness for LC motor version

```
<table>
<thead>
<tr>
<th>Housing, Receptacle, 15mm MTC</th>
<th>Housing, Receptacle, 15mm MTC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molex, Part-No. 87439-0200</td>
<td>Molex, Part-No. 87421-0000</td>
</tr>
<tr>
<td>(ODT: 29027485)</td>
<td></td>
</tr>
<tr>
<td>2xCom, Receptacle, 15mm MTC</td>
<td></td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>
```

300 mm
The information presented in this material is based on technical data and test results of nominal units. It is believed to be accurate and reliable and is offered as an aid to help in the selection of Thomas products. It is the responsibility of the user to determine the suitability of the product for the intended use and the user assumes all risk and liability in connection therewith. Thomas does not warrant, guarantee or assume any obligation or liability in connection with this information.

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