The Avtron Model AV25 Encoder is a light mill duty speed and position transducer (also known as tachometer or rotary pulse generator). When coupled to a motor or machine, its output is directly proportional to shaft position (pulse count) or speed (pulse rate).

Mechanically the AV25 mounts using industry standard 2.650" square flanges, as well as servo mount 2.500" or 2.625" round flanges. The AV25 can also be mounted using an optional industry standard face mount bolt pattern.

The AV25 encoder offers 2Ø outputs (A,B) 90° apart for direction sensing. Optional complements (A,B) and marker pulse and complement (Z,Z) are available; see channel options.

**DRIVE INSTALLATION INSTRUCTIONS**

The AV25 may be driven via a contact/friction wheel provided the axial load is modest, less than 25% of the 100 lb maximum radial load. Excessive tension will shorten belt life. If a rubber slinger disc is used, position it on the tension to eliminate belt sag. Overhung loads should also be minimized.

Installations using timing belts/pulleys should have just enough belt to any axial thrust. Overhung loads should also be minimized. The encoder should not be subjected to any axial thrust. Overhung loads should also be minimized.

With a direct drive, use a flexible, insulated disc coupling and align the shafts as accurately as possible. The encoder should not be subjected to any axial thrust. Overhung loads should also be minimized.

**CAUTION**

Do not force or drive the coupling onto the shaft or damage to the bearings may result. The coupling should slide easily on the shaft. Remove nicks and burrs if necessary. Consider driving shaft endplay when positioning coupling.

<table>
<thead>
<tr>
<th>Mount</th>
<th>PPR*</th>
<th>Line Driver</th>
<th>Shaft Size</th>
<th>Connector Options</th>
<th>Wiring</th>
<th>Mounting Style</th>
<th>Face/Bolt Pattern</th>
<th>Seals</th>
<th>Channels</th>
<th>Special Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV25</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>A-1</td>
<td>U-720</td>
<td>5-26V (272)</td>
<td>0-Non-std. With Flat</td>
<td>A-0.25 B-0.375 C-10mm</td>
<td>W-18&quot; cable (pigtail)</td>
<td>A-End</td>
<td>X-None</td>
<td>A- Shaft Sealed ** B- Bearing Sealed X-None**</td>
<td>With Comp. A- A,A,B,B B- A,B A- A,B Z- *** Without Comp. E- A, B, Z F- A, B</td>
<td></td>
</tr>
<tr>
<td>F-60</td>
<td>W-1000</td>
<td>5-15V (469)</td>
<td>0-Non-std. With Flat</td>
<td>A-0.25 B-0.375 C-10mm</td>
<td>W-18&quot; cable (pigtail)</td>
<td>A-End</td>
<td>X-None</td>
<td>A- Shaft Sealed ** B- Bearing Sealed X-None**</td>
<td>With Comp. A- A,A,B,B B- A,B A- A,B Z- *** Without Comp. E- A, B, Z F- A, B</td>
<td></td>
</tr>
<tr>
<td>G-100</td>
<td>Y-1024</td>
<td>4-26V in, 5V out (272)</td>
<td>A-25 B-0.375 C-10mm</td>
<td>W-18&quot; cable (pigtail)</td>
<td>A-End</td>
<td>X-None</td>
<td>A- Shaft Sealed ** B- Bearing Sealed X-None**</td>
<td>With Comp. A- A,A,B,B B- A,B A- A,B Z- *** Without Comp. E- A, B, Z F- A, B</td>
<td></td>
<td></td>
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<tr>
<td>K-200</td>
<td>1-1250</td>
<td>1-2400</td>
<td>0-Non-std. With Flat</td>
<td>A-0.25 B-0.375 C-10mm</td>
<td>W-18&quot; cable (pigtail)</td>
<td>A-End</td>
<td>X-None</td>
<td>A- Shaft Sealed ** B- Bearing Sealed X-None**</td>
<td>With Comp. A- A,A,B,B B- A,B A- A,B Z- *** Without Comp. E- A, B, Z F- A, B</td>
<td></td>
</tr>
<tr>
<td>L-240</td>
<td>2-1440</td>
<td>5-26V in, 5V out (272)</td>
<td>A-25 B-0.375 C-10mm</td>
<td>W-18&quot; cable (pigtail)</td>
<td>A-End</td>
<td>X-None</td>
<td>A- Shaft Sealed ** B- Bearing Sealed X-None**</td>
<td>With Comp. A- A,A,B,B B- A,B A- A,B Z- *** Without Comp. E- A, B, Z F- A, B</td>
<td></td>
<td></td>
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<tr>
<td>N-256</td>
<td>4-2048</td>
<td>4-26V in, 5V out (272)</td>
<td>A-25 B-0.375 C-10mm</td>
<td>W-18&quot; cable (pigtail)</td>
<td>A-End</td>
<td>X-None</td>
<td>A- Shaft Sealed ** B- Bearing Sealed X-None**</td>
<td>With Comp. A- A,A,B,B B- A,B A- A,B Z- *** Without Comp. E- A, B, Z F- A, B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-300</td>
<td>5-2500</td>
<td>3-2000</td>
<td>0-Non-std. With Flat</td>
<td>A-0.25 B-0.375 C-10mm</td>
<td>W-18&quot; cable (pigtail)</td>
<td>A-End</td>
<td>X-None</td>
<td>A- Shaft Sealed ** B- Bearing Sealed X-None**</td>
<td>With Comp. A- A,A,B,B B- A,B A- A,B Z- *** Without Comp. E- A, B, Z F- A, B</td>
<td></td>
</tr>
<tr>
<td>E-360</td>
<td>6-2540</td>
<td>1-2400</td>
<td>0-Non-std. With Flat</td>
<td>A-0.25 B-0.375 C-10mm</td>
<td>W-18&quot; cable (pigtail)</td>
<td>A-End</td>
<td>X-None</td>
<td>A- Shaft Sealed ** B- Bearing Sealed X-None**</td>
<td>With Comp. A- A,A,B,B B- A,B A- A,B Z- *** Without Comp. E- A, B, Z F- A, B</td>
<td></td>
</tr>
<tr>
<td>R-512</td>
<td>8-4096</td>
<td>4-26V in, 5V out (272)</td>
<td>A-25 B-0.375 C-10mm</td>
<td>W-18&quot; cable (pigtail)</td>
<td>A-End</td>
<td>X-None</td>
<td>A- Shaft Sealed ** B- Bearing Sealed X-None**</td>
<td>With Comp. A- A,A,B,B B- A,B A- A,B Z- *** Without Comp. E- A, B, Z F- A, B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-625</td>
<td>10-6000</td>
<td>1-2400</td>
<td>0-Non-std. With Flat</td>
<td>A-0.25 B-0.375 C-10mm</td>
<td>W-18&quot; cable (pigtail)</td>
<td>A-End</td>
<td>X-None</td>
<td>A- Shaft Sealed ** B- Bearing Sealed X-None**</td>
<td>With Comp. A- A,A,B,B B- A,B A- A,B Z- *** Without Comp. E- A, B, Z F- A, B</td>
<td></td>
</tr>
</tbody>
</table>

* up to 16,384 PPR available
** recommended, N/A with Mounting Styles "3".
*** N/A with MS 6 or 7 Pin Connector.
^ Only available with Mounting Style "3".
^^ not recommended for industrial applications

For more details on alignment specifications, measurement techniques, and special considerations in specifying and installing drive components, refer to separate installation instructions in the Avtron Encoder Handbook.

**AV25 PART NUMBERS AND AVAILABLE OPTIONS**

- w/o plug (std. phasing)
- w/ plug (reverse phasing)
- Specify cable length (use w/ Option "W")
- Connnector on 18" cable: Use w/ Option "T"-"U"
- w/o plug (Turck Pinout)
- w/ plug (US Pinout)

- Specified cable length (meters)
**WIRING INSTRUCTIONS**

**CAUTION**
Be sure to remove power before wiring the AV25 Encoder.
Be sure to ground the cable shield: It can be connected to
case ground at the encoder, or grounded at the receiving
device, but should not be grounded on both ends.

If necessary, case ground can also be provided through a separate
Be certain not to ground the case ground wire if the encoder is already
grounded by mechanical mounting or coupling.

For bidirectional operation of the AV25 Encoder, proper phasing
of the two output channels is important. For models with A and B output
channels, Phase A channel leads Phase B channel for clockwise shaft
rotation as viewed from the rear of the encoder for the standard wiring
options. Follow instructions under corrective installation as needed to
reverse the direction of output or purchase AV25 with reverse phasing

**CORRECTIVE ACTION FOR PHASE REVERSAL**
1) Remove power.
2) Exchange wires on cable, either at encoder cable end, or at
speed controller end (but not both):
   a) Single Ended 2 Phase Wiring (see wiring diagram)
      Exchange A and B at the user end of the wires.
   b) Differential 2 Phase Wiring (see wiring diagram)
      Exchange either A with A in the phase A pair OR B with B
      in the phase B pair but NOT both.
3) Apply power.
4) Verify encoder feedback is correct, using hand rotation of shaft,
or jog mode of the speed controller.

**SPECIFICATIONS**

**ELECTRICAL**
A. Operating Power (Vin)
   1. Volts.........................See Line Driver Options
   2. Current.....................50mA, no load
B. Output Format................See Channel Options (A,A,B,B,2,3
   available)
C. Signal Type..................Incremental, Square Wave, 50% ±10%
D. Direction Sensing............Phasing with respect to rotation as
   viewed from the back of the encoder
   ØB for CW rotation (Std. phasing).
   CCW rotation (Reverse phasing).
E. Transition Separation........15% minimum
F. Frequency Range.............0 to 125kHz.
G. PPR..........................1 - 5000 standard (for other PPR needs
   up to 32,768 consult factory)
H. Output..........................See Line Driver Options

**MECHANICAL**
A. Acceleration..................6,000 RPM/Sec.
B. Speed..........................6,000 RPM max. (for higher RPM needs,
   Consult Factory).
C. Shaft Diameter..............0.25" to 0.394" [6.35mm to 10mm]
D. Shaft Loading................up to 100 lbs. [454 kg] axial or radial
E. Starting Torque @ 25C........2.5o-in [0.05n-m]
F. Weight.........................0.95 lbs. [431g]

**ENVIRONMENTAL**
A. Enclosure Rating...............NEMA 4, 13, IP65 (dust and water tight,
   not for immersion).

Interconnecting cables specified in the wire selection chart below are
based on typical applications. Refer to the system drawing for specific
cable requirements where applicable.

Physical properties of cable such as abrasion, temperature, tensile
strength, solvents, etc., are dictated by the specific application. General
electrical requirements are: stranded copper, 22 thru 16 gauge, each
wire pair individually shielded with braid or foil with drain wire, 0.05
uF maximum total mutual or direct capacitance, outer sheath insulator.

See Wire Selection Chart below for some suggested cables.

*Maximum cable length (and line driver selection) is limited by several
factors: line driver protection, maximum RPM, PPR, output voltage and
and cable capacitance. The open collector driver (option 2) is much more
heavily limited by output frequency on long cable runs, and is not
recommended for new applications. Line driver option 3 permits the
longest cable lengths but has the least built-in protection against short
circuits. Line driver options 1, 2 and 4 have the most protection against
external faults but have less line drive capacity. These factors may
dictate maximum potential cable length.

**LINE DRIVER OPTIONS**

<table>
<thead>
<tr>
<th>Output Options</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Type</td>
<td>Differential</td>
<td>Open Collector</td>
<td>High Current Differential Line Driver</td>
<td>Differential Line Driver, 5V fixed</td>
</tr>
<tr>
<td>Voltage Input (Vin)</td>
<td>5-28VDC</td>
<td>5-28VDC</td>
<td>5-15VDC</td>
<td>5-28VDC/5V Out</td>
</tr>
<tr>
<td>Protection</td>
<td>Reverse Voltage</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Transient</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Short Circuit</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Maximum Cable length*</td>
<td>5V 1000 ft [300m]</td>
<td>12V 500 ft [150m]</td>
<td>24V 200 ft [60m]</td>
<td>see note* 1000 ft [300m]</td>
</tr>
</tbody>
</table>

- B. Operating Temp.................~40° to +100°C
- C. Humidity......................98% Non-condensing
- D. Shock..........................50G, 11 ms Duration
- E. Vibration......................5-2000Hz @ 20G

*Maximum cable length (and line driver selection) is limited by several
factors: line driver protection, maximum RPM, PPR, output voltage and
cable capacitance. The open collector driver (option 2) is much more
heavily limited by output frequency on long cable runs, and is not
recommended for new applications. Line driver option 3 permits the
longest cable lengths but has the least built-in protection against short
circuits. Line driver options 1, 2 and 4 have the most protection against
external faults but have less line drive capacity. These factors may
dictate maximum potential cable length.
**WIRING DIAGRAMS**

**DIFFERENTIAL TWO PHASE WIRING APPLICATIONS**

### PINOUT

<table>
<thead>
<tr>
<th>OPTION</th>
<th>MOUNTED ON ENCODER</th>
<th>MOUNTED ON 18&quot; CABLE (00W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;W&quot; (CABLE)</td>
<td>(10 PIN MS)</td>
<td>(6 PIN MS)</td>
</tr>
<tr>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>

**OPTION "A", "B", "C", "D"**

<table>
<thead>
<tr>
<th>OPTION</th>
<th>MOUNTED ON ENCODER</th>
<th>MOUNTED ON 18&quot; CABLE (00W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;J&quot;, &quot;K&quot;, &quot;M&quot;, &quot;N&quot;</td>
<td>(7 PIN MS)</td>
<td>(6 PIN MS)</td>
</tr>
<tr>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>D</td>
<td>D</td>
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</tbody>
</table>

**OPTION "E", "F", "G", "H"**

<table>
<thead>
<tr>
<th>OPTION</th>
<th>MOUNTED ON ENCODER</th>
<th>MOUNTED ON 18&quot; CABLE (00W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;T&quot;</td>
<td>(5 PIN MS)</td>
<td>(5 PIN MS)</td>
</tr>
<tr>
<td>A</td>
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<td>C</td>
<td>C</td>
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<tr>
<td>D</td>
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**OPTION "U"**

<table>
<thead>
<tr>
<th>OPTION</th>
<th>MOUNTED ON ENCODER</th>
<th>MOUNTED ON 18&quot; CABLE (00W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;T&quot;</td>
<td>(5 PIN MS)</td>
<td>(5 PIN MS)</td>
</tr>
<tr>
<td>A</td>
<td>A</td>
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<tr>
<td>B</td>
<td>B</td>
<td>B</td>
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<tr>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>D</td>
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<td>D</td>
</tr>
</tbody>
</table>

**TYPICAL WIRE SELECTION CHART**

for 18 AWG, multiple pair, individually shielded

<table>
<thead>
<tr>
<th>BELDEN</th>
<th>ALPHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 PAIR</td>
<td>9388</td>
</tr>
<tr>
<td>3 PAIR</td>
<td>9369</td>
</tr>
<tr>
<td>4 PAIR</td>
<td>9388</td>
</tr>
<tr>
<td>6 PAIR</td>
<td>9389</td>
</tr>
</tbody>
</table>

Open Collector Line Driver Output Option 2 requires pull up resistors from each active output to a +V reference.

For Connector Option "W", unused connections must be insulated to prevent accidental contact.

*NOTE:* Connecting Case Ground is optional, and is not recommended if the encoder is already grounded by mechanical means or coupling.
OUTLINE DRAWING

MOUNTING STYLE  OPTION 1
SQUARE FLANGE (MALE PILOT)

MOUNTING STYLE  OPTION 2
ROUND FLANGE (ø2.500 [63.50] SERVO MOUNT)

MOUNTING STYLE  OPTION 3
ROUND FLANGE (ø2.625 [66.68] SERVO MOUNT)

WIRING OPTIONS
CONNECTOR OPTION “W”
18” [457.2] CABLE (PIGTAIL)

CONNECTOR OPTIONS:
MS BOX CONNECTOR ONLY

CONNECTOR OPTIONS:
MS CONNECTOR WITH MATING PLUG

SHATFT OPTIONS
OPTIONS “A” “B” “C” WITH FLAT
(0.70 [17.8] LONG x 0.018 [0.46] DEEP)

OPTION “A” = SHAFT ø .2497/.2495 [6.342/6.337]
OPTION “C” = SHAFT ø 10mm [.3942/.3935]

OPTIONS “N” “P” “R” NO FLAT

OPTION “N” = SHAFT ø .2497/2495 [6.342/6.337]
OPTION “P” = SHAFT ø .3747/3745 [9.517/9.512]
OPTION “R” = SHAFT ø 10mm [.3942/.3935]

NOTES:
3. Dimensions are in inches [millimeters].
2. All dimensions are approximate.
1. Weight: 0.95 lbs [431 g]

Features and specifications subject to change without notice.
Avtron standard warranty applies. All dimensions are in inches [mm].