AE 100 M/S Universal

PROGRAMMER INSTRUCTION ABSOLUTE-ENCODER

Please keep for further use !

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Printing

This manual was edited using text formatting software on a DOS personal computer. The text was printed in *Arial*.

Fonts

Italics and **bold** type are used for the title of a document or to emphasize text passages.

Passages written in `Courier` show text which is visible on the display as well as software menu selections.

"< >" refers to keys on your computer keyboard (e.g. <RETURN>).

Note

Text following the "NOTE" symbol describes important features of the respective product.

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Revision History

Note:
The cover of this document shows the current revision status and the corresponding date. Since each individual page has its own revision status and date in the footer, there may be different revision statuses within the document.

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Revision	Date

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1 Setting up the Universal Absolute-Encoder

The number of steps/revolution, the range of revolutions, the transducer code and the options (bus, latch and parity) are set according to order specification upon delivery; thus, only the direction of rotation and, after the adjustment, the preset lock have to be set.

Configuration

a) Output plug

b) Decimal switch for 1st to 7th decade

c) Hexadecimal program switch 'P'

d) Preset button

1.1 Inputs

a) Bus input for switching off open collector output drivers.

b) Latch input for freezing transducer data.

c) Preset input for electrical preset adjustments.

d) Two-way input for switching the counting direction.

e) Input for inverting the analogue signal.
If this input is higher than or equal to 8 V, then the sign of the analogue signal will invert.

1.2 Outputs

a) Positional data with sign and parity.

b) Up/down output to give a readout of the current counting direction.
Low = increasing
High = decreasing

c) Strobe output; square wave signal 3 kHz.
The data outputs change when the strobe output is high.

d) Output for analogue voltage – 10 V to + 10 V:
The output voltage is 0 V at position 0 and increases linearly to – 10 V when the position moves to the final analogue quantity.
If the transducer (position) is negative, then the output is also negative.

e) Output for analogue current:
The output current is 0 mA or 4 mA at position 0 and increases linearly to – 20 mA when the position moves to the final analogue quantity. Terminal resistance to mass must be less than 500 Ohms.

Note:

The lowest order data output can be programmed to switch back and forth from high to low four times after switching on or after a preset adjustment (see chapter 2.1, 5th decade).

1.3 Programming switch 'P'

P = 0: programming of transducers (code), parity, bus input and latch input.

P = 1: programming of resolution from 1 to 2000, 4096 or 8192 steps/revolution

P = 2: programming of range of revolutions (not applicable to single-turn)

P = 3: readout of the number of data channels required

P = 4: transducer (operation) with preset adjustment – increasing when turning clockwise

P = 5: transducer (operation) with locked preset adjustment – increasing when turning clockwise

P = 6: transducer (operation) with preset adjustment – decreasing when turning clockwise

P = 7: transducer (operation) with locked preset adjustment – decreasing when turning clockwise

P = 8: displacement of spare outputs, sign, parity, up/down and strobe

P = 9: programming of resolution to 4 decimal places (not applicable to single-turn)

P = A: programming the positive sign span

P = B: programming the final quantity for analogue output (option)

Note:

Locking the preset adjustment prevents accidental presetting!

If there is no connection between programming pin and supply voltage, then it is only possible to operate by means of transducer.

2 Operation

2.1 Programming transducer code, parity, bus input and latch input

Set programming switch 'P' to '0'. The existing program then appears at the data outputs of the 1st to 5th decade. The decimal switches of the 1st to 5th decade must be set according to the following table:

1st decade:
0 – BCD-code
1 – Excess-3-code
2 – Binary code
3 – Gray code
4 – Gray code

2nd decade:
0 – even parity
1 – odd parity

3rd decade:
0 – open collector outputs are switched off when the bus input is at high = higher than or equal to 8 Volts.

1 – open collector outputs are switched off when the bus input is at low = lower than or equal to 0 Volts or free.

2 – open collector outputs are never switched off (NO BUS FUNCTION!!)

4th decade:
0 – output data is frozen if the latch input is at high = higher than or equal to 8 Volts.

1 – output data is frozen if the latch unput is at low = 0 Volts, or is free.

2 – output data is never frozen (NO LATCH FUNCTION!!).

5th decade:
0 – analogue signal 0 V to 10 V; 2 to the power of 0 bit; does not switch after the appliance is turned on or preset.

1 – analogue signal 4 mA to 20 mA, 2 to the power of 0 bit; does not switch after the appliance is turned on or preset.

2 – analogue signal 0 V to 10 V; 2 to the power of 0 bit; switches 4 times after the appliance is turned on or preset.

3 – analogue signal 4 mA to 20 mA; 2 to the power of 0 bit; switches 4 times after the appliance is turned on or preset.

Note:

If the output signal is programmed at 4 mA to 20 mA, the sign must be negative (i.e. the positive sign span must be as big as the transducer capacity).

After the decimal switch is set, the preset button must be pressed until the new program appears at the data outputs (approximately 1 second).

2.2 Programming the resolution

Set programming switch 'P' to '1'. The programmed number of steps per revolution then appears at the data outputs in BCD-code.

Set the desired resolution from 1 to 2000, 4096 or 8192 steps per revolution on the decimal switches of the 1st to 4th decade.

The 5th, 6th and 7th decade must be set to '0'. Then the preset button is pressed until the new resolution appears at the transducer outputs (approximately 1 second).

2.3 Programming the range of revolutions

(not applicable to single-turn)

Set programming switch to '2'. The programmed range of revolutions from 1 to 4096 revolutions then appears at the data outputs in BCD-code.

Set the range of revolutions on the decimal switches of the 1st to 4th decade. All square numbers from 1 to 4096 are allowed; other inputs must be rounded off to the next square number.

All other decades must be set to '0'. Then the preset button is pressed until the new range of revolutions appears at the data outputs (approximately 1 second).

2.4 Number of required data channels

After programming the transducer code, resolution and span of revolutions check that the number of data channels available is sufficient to deal with the data.

When programming switch 'P' is set to 3, the number of data channels required appears at the outputs in BCD-code. If the number of channels required exceeds the number available, then either the resolution or the range of revolutions must be reduced.

2.5 Transducer operation with preset adjustment

The transducer can be adjusted after resolution and span of revolutions are programmed. Set programming switch to '4' if the transducer is to increase when turning clockwise. If it is to count backwards when turning clockwise, 'P' must be set to '6'. The current transducer position appears at the data outputs as transducer code. The desired transducer value then is set on the decimal switches of the 1st to 7th decade.

This value must be less than the transducer capacity or the preset adjustment will be blocked. The transducer capacity is the product of the range of revolutions multiplied by the number of steps per revolution. Then the preset button must be pressed until the desired value appears at the data outputs, changed into output code (approximately 1 second).

Please note:

If the plug arrangement calls for external presetting, then the appliance can also be set electrically by switching the preset input to "high is greater than or equal to 8 V". If the counting direction, the resolution or the range of revolutions is changed, all settings must be adjusted anew.

2.6 Transducer operation with locked preset adjustment

If the transducer only needs to be set once, then later accidental presetting can be blocked by turning the programming switch from '4' to '5' or from '6' to '7' after the transducer is set.

2.7 P = 8: Displacement of spare outputs, sign, parity, up/down and strobe

Set programming switch 'P' to '8'. The programmed number of bits for positional readout (for transducer operation) then appears in decimal at the data outputs. This number is also the number of the output with the highest order bit. The next highest bit is the sign. Parity, up/down and strobe follow.

The number of bits for positional readout can be changed around between 16 and 24, with a corresponding displacing effect on the spare outputs. If 24 positional bits are chosen, no spare outputs are left because only 24 outputs are available.

2.8 P = 9: Programming the decimal places after the number of steps/rev.

(not applicable to single-turn)

Set programming switch to '9'. The 4 decimal points relevant to the number of steps per revolution, from the tenth to the thousandth, then appear at the data outputs.

2.9 P = A: Programming the positive sign span

Set the programming switch to 'A'.
The positive sign span (sign bit = low) then appears at the data outputs. If the total number of steps (transducer capacity) is greater, the remainder are negative (sign bit = high).

Note:

After preset adjustments the sign is positive. If the negative sign is desired, the counting direction must be reprogrammed.

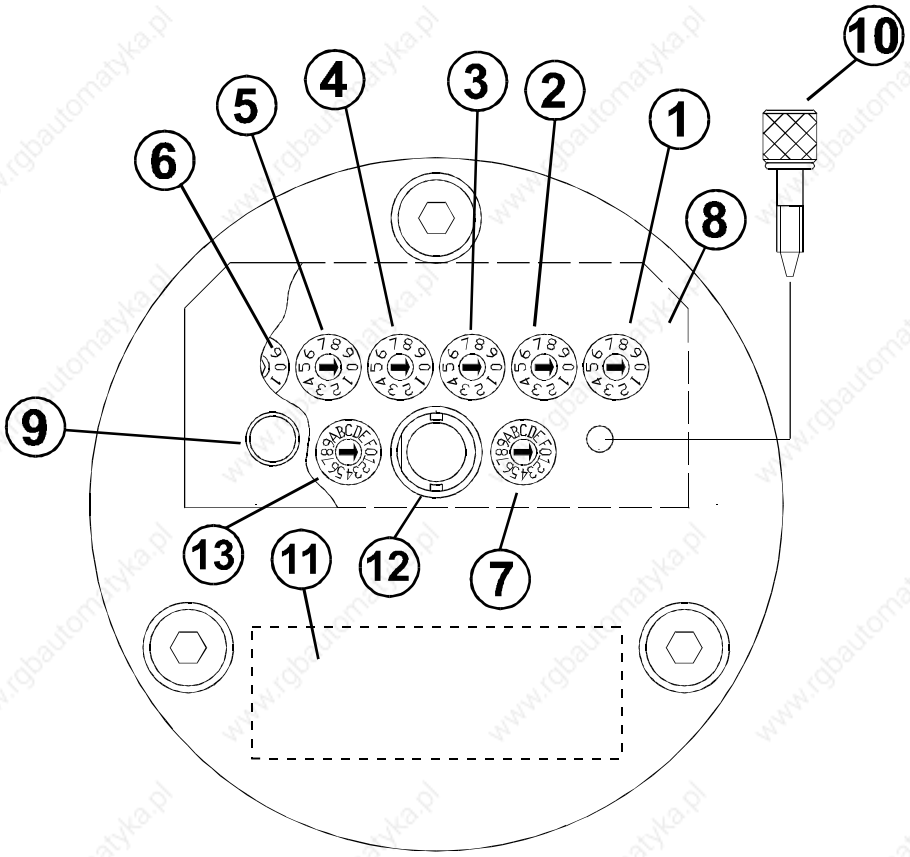
2.10 P = B: Programming the final quantity for analogue output (option)

Set the programming switch to 'B'. The programmed analogue final quantity, where the analogue signal is at its greatest, appears at the data outputs in binary (10 V or 20 mA). If the final quantity is exceeded, the analogue signal stays at maximum.

The desired final quantity is set in decimal and may exceed the transducer capacity. In that case the output signal can never reach the maximum – 10 V or 20 mA.

Then push preset button until the new final quantity appears at the outputs.

3 Drawing (Program-Switches)



1 Setting switch for 10^0 decade
2 Setting switch for 10^1 decade
3 Setting switch for10^2 decade
4 Setting switch for 10^3 decade
5 Setting switch for10^4 decade
6 Setting switch for 10^5 decade
7 Setting switch for 10^6 decade
8 Cover
9 Milled screw
10 Fixing screw
11 Attaching plug
12 Preset button = E-justage
13 Programming switch P