
Autotech Controls

RD180 Remote Display

Instruction & Operation Manual

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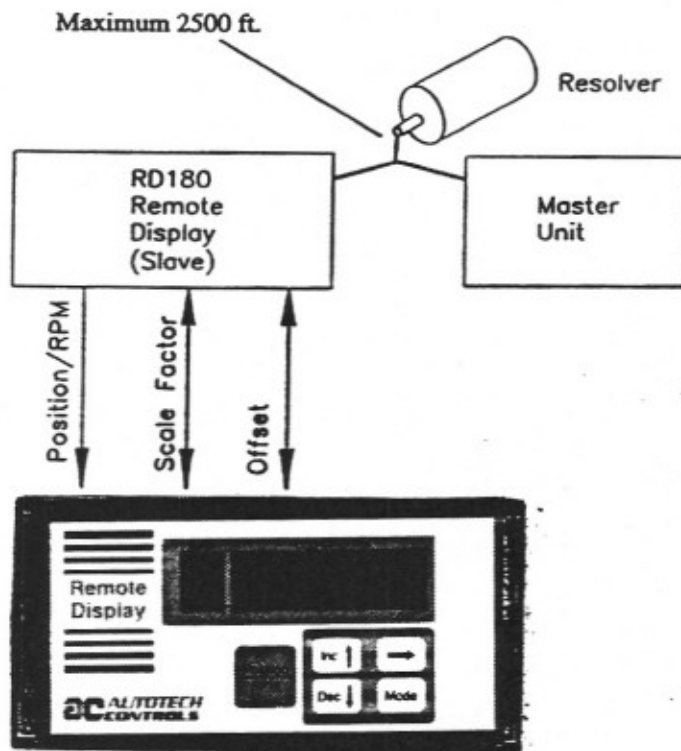
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RD180 Remote Display

Instruction Manual

The RD180 Remote Display is a slave unit to any Autotech device utilizing a single turn resolver. It provides position and RPM information on the front panel of the display.

As shown in the diagram below, the resolver inputs of the RD180 are parallel to the master unit. The resolver cable may not be more than 2500 feet in length. The Master and Remote Units are programmed to have identical Scale Factor and Offset values.



The zero offset entered from the front panel keypad is continuously added to the resolver's digital value. The offsetted digital data is scaled, converted to the digital format as selected from the keypad and displayed on the front panel of the unit.

Programmable Full Scale Offset for Easy Setup

The resolver can be mounted on the machine without any concern for mechanically aligning the resolver zero to the

machine zero. Once resolver is coupled to the machine shaft, the only thing you have to do is to bring the machine to a known position, say home position, and set an offset number from the front panel keypad until the display reads zero position. This is especially useful during initial start up in that it reduces the set up time. The offset can also be used to compensate for any machine wear. Offset is programmable between 0 and Scale Factor.

It is important to note that the *Scale Factor* must be identical to the master unit's scale factor for which the display is being used.

Programmable Resolution: 19-999 counts per turn

The scale factor can be programmed from the front panel and can be any number between 19 and 999 resulting in resolution of 20 to 1000 counts per turn. This feature allows you to scale the position to desired engineering units (inches, mm etc) if required.

Self Diagnostics

The RD180 Remote Display is provided with an internal self check circuit that continuously monitors the 120 VAC input power, resolver cable and if the microprocessor is not in reset. In case a fault occurs in any one of the above critical functions, the unit goes into fault mode and displays "Cable" on the display.

Highly Noise Immune Circuitry

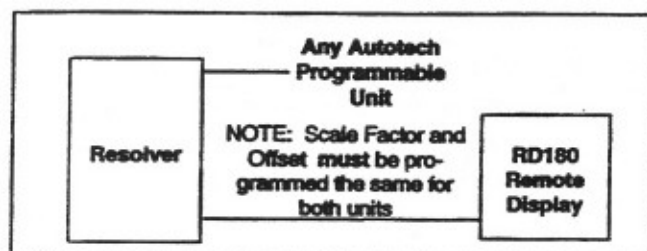
Ratiometric tracking converter technique employed for resolver to digital decoding provides the best protection against electrical noise generated by power line transients and varying ground potentials. This decoding method is inherently immune to temperature changes and line frequency variations. The optical isolation adds an additional layer of protection against electrical noise and enhances the environmental integrity of the system.

Program Security

A Program Enable input is needed to make any changes to the program to protect against unauthorized tampering.

Installation and Operation

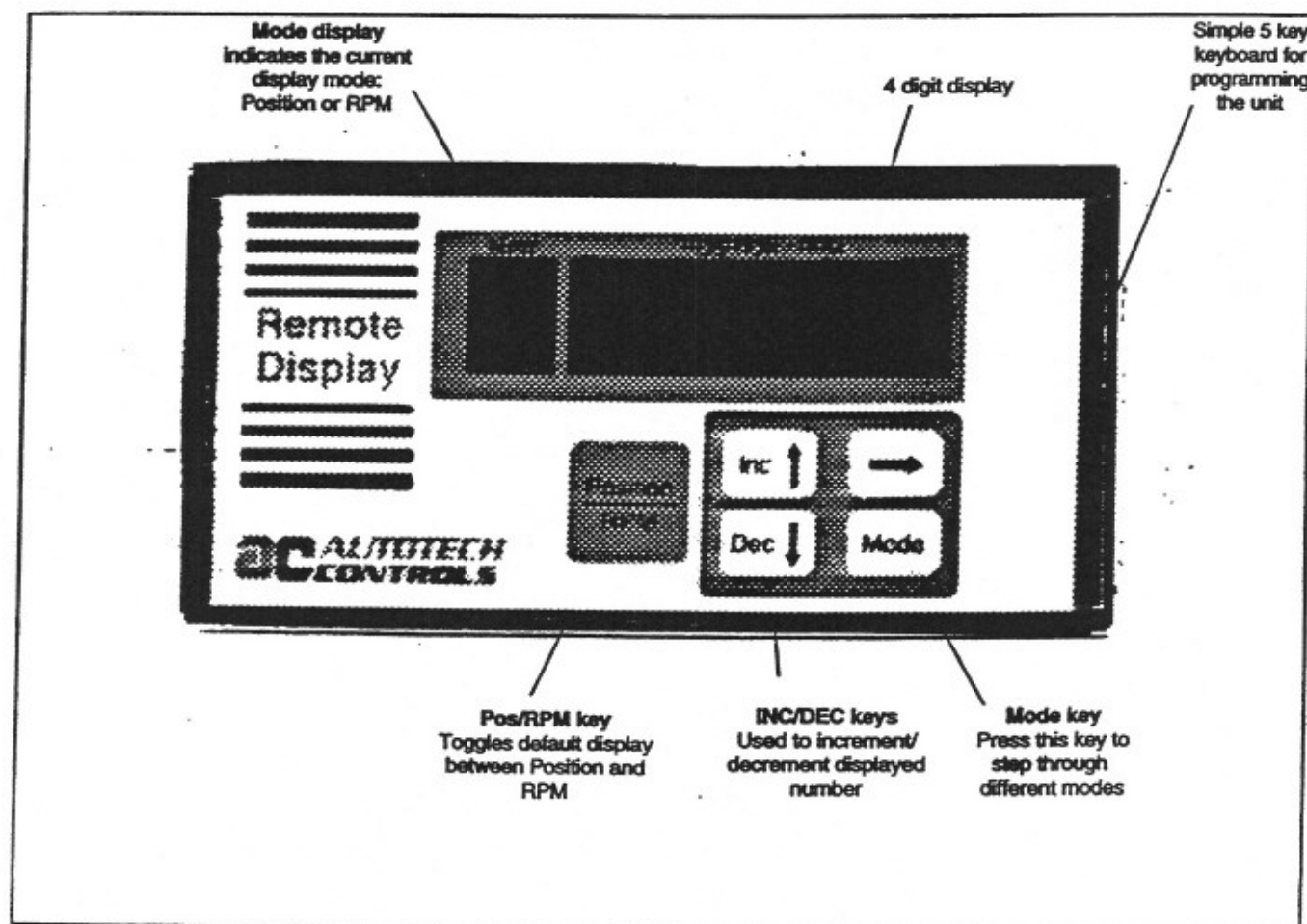
A functional block diagram of Autotech's Programmable resolver decoder model RD180 Remote Display is shown below:



RD180 Remote Display
Functional Diagram

As shown, the RD180 Remote Display accepts an input from a single turn resolver (such as Autotech's RL100, E6R, E7R & E8R series of resolvers, etc.) and decodes it to give a scaled digital position signal, giving a resolution of 1000 counts per turn. The decoded resolver position information is displayed on the front panel of the unit.

The scale factor (desired counts per turn minus one) is programmable from 19 to 999 to match the display and position. A static offset value may be programmed in the unit to electronically align resolver zero with machine zero.

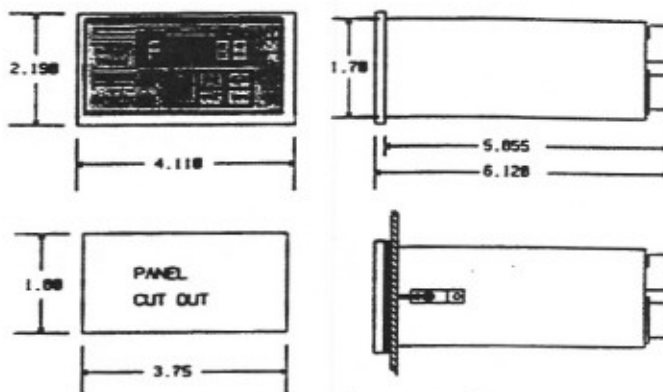


RD180 Remote Display

Mounting Dimensions

The figures to the right give mounting dimensions of the RD180 Remote Display. The unit is housed in an 1/8 DIN panel mount case, and requires a rectangular panel cutout only (no mounting screw holes are required). Slide the unit in through the panel opening with gasket, insert the two right-angle mounting brackets into the openings on either side of the RD180 Remote Display housing and slide brackets 1/4" towards the back of the unit to secure the brackets to the housing. Tighten the pair of screws on the right-angle brackets to hold the unit into the panel.

IMPORTANT NOTE: DO NOT OVER-TIGHTEN (80 inch-oz torque max)!



Note:
All dimensions are in inches

Rear View and Wiring Diagram

Notes on grounding and shielding:

Failure to observe any of these requirements may cause unpredictable operation and will void warranty.

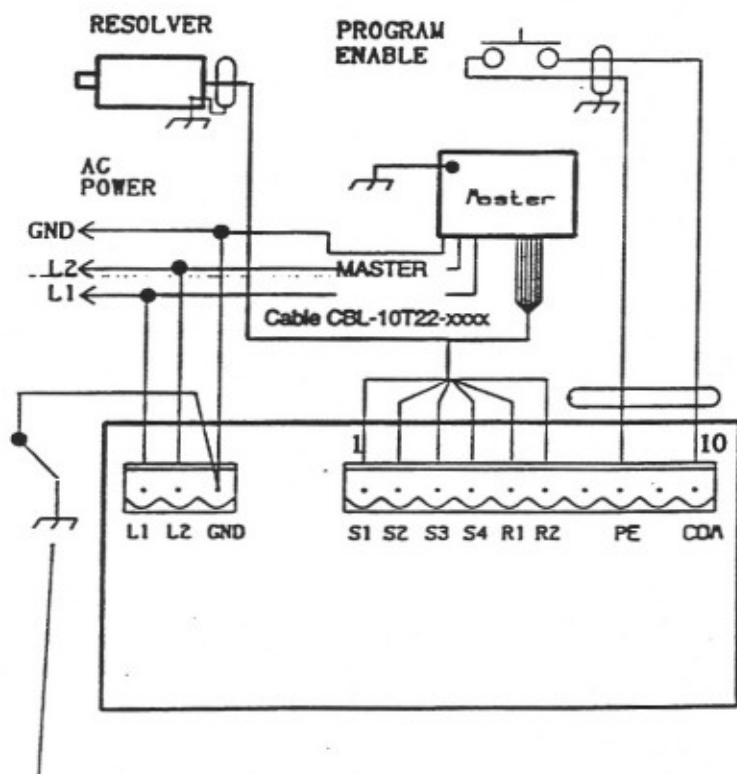
1. All logic level wiring (including resolver and external power supply) must be done using overall foil shielded cables, with shields and equipment grounded as per above drawing. See How to Order section for suitable cables offered by Autotech.
2. Resolver shielded cable must consist of twisted pairs, and the twisted pairs must be wired as per wiring instructions. See How to Order section for a suitable resolver cable offered by Autotech.

It is recommended that the resolver shielded cable be run in its own separate conduit.

3. All ground planes on which the RD180 Remote Display and all external equipment are mounted must be held to the same RF potential, by good metallic connections to building frames, conduit or wiring trays.

4. All shielded cable must be kept at a minimum distance of 2 inches from all high voltage or inductive wiring.

5. All shielded cable must be kept at a minimum distance of 12 inches from all motor wiring controlled by AC or DC drives.



Indicates good metallic connection to earth ground plane on which each unit is mounted with shortest possible wire length of 14 gauge or less

CBL-10T22-xxxx Cable

Wire Color	Resolver terminal	
Green-Black	R1	Twisted pair
Green	R2	
Yellow-Black	S1	Twisted pair
Yellow	S3	
Blue-Black	S2	Twisted pair
Blue	S4	

Note:
To change the resolver ascending count direction, reverse S1 and S3 connections.

Programming

Programming the RD180 Remote Display requires entering of following values/options for the unit:

- **Scale Factor:** desired counts per revolution minus one (Values between 19 and 999 are programmable)
- **Offset:** constant to be added to the true resolver position, used to align machine zero with resolver zero. (Values between 0 and scale factor are acceptable)

The five keys on the front panel are used in following manner:

Mode

Used to choose either Scale Factor (S) or Offset programming (F).

Inc ↑

The INC/DEC keys are used to increase/decrease numerical entries, such as scale factor offset, etc.

Dec ↓

Note:

The program enable input must be True to allow programming of the unit.

→

Not Used

Position
RPM

Used to toggle the default display between Position (P) and RPM (r) displays. Pressing this key any time returns display to Pos/RPM

Default Display:

The RD180 Remote Display normally displays the position (true resolver position + offset), or RPM of the resolver. The display may be toggled between these two by pressing Pos/RPM key. The Pos/RPM key may be pressed to bring up the default display any time.

The position display is as follows:

P 1234

The RPM display is as follows:

r 234

The INC, DEC keys are ignored in this mode

Scale Factor Programming:

Press

Mode

to display

S 999

Current scale factor is displayed

Use

Inc ↑

or

Dec ↓

to increase or decrease the displayed number until desired scale factor is displayed

Please note:

- Scale factor = desired counts per turn - 1
- Scale factor programming is inhibited when resolver is moving

Offset Programming:

Press

Mode

to display

F 123

Current offset is displayed

Use

Inc ↑

or

Dec ↓

to increase or decrease the displayed number until desired offset is displayed

Please note

- Default position display = true resolver position + offset

Thus offset may be used to electronically align resolver to machine zero. The offset should be less than the scale factor.

Specifications

Input Power:

AC: 105 to 135 VAC, 7 VA; Optional 220, 240 VAC

Operating Temperature

-10 °F to 130°F (-23°C to 55°C)

Position Transducer:

Autotech's series RL100, E6R, E7R, E8R or
RL101 resolvers

Display Signal Resolution:

20 to 1000 counts/turn

Programmable Scale Factor: 19 to 999

Display Update Rate: 200 ms

Programmable Offset: Full revolution (0 to scale factor)

Resolver Cable Length: 2500 Ft. (max) shielded

Resolver Cable: Autotech, CBL-10T22-xxx

Inputs :

Program Enable is tied to common

How to Order

Model RD180 Remote Display

SAC-RD180-010 RD180 Remote Display

WARRANTY

Autotech Corporation warrants its products to be free from defects in materials or workmanship for a period of one year from the date of shipment, provided the products have been installed and used under proper conditions. The defective products must be returned to the factory freight prepaid and must be accompanied by a Return Material Authorization (RMA) number. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

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