

PRO. SIS. TEL.

Produzione sistemi telecomunicazioni

Antenna Rotator

User's manual



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Warning

This manual must be read carefully before proceeding to assembly.

Warranty

- 1) The rotator with the control box, hereinafter called "The Product", or "The Rotator", is warranted for 2 years from date of purchase, provided that it is supported by the document of sale issued by the manufacturer or authorized distributor.
- 2) The warranty includes free replacement or repair of any defective component.
- 3) This warranty does not cover misuse, negligence, accident, incorrect wiring, improper installation, use contrary to instructions furnished by us, damage to units which have been repaired or altered outside of our factory, or to injury or loss resulting from improper maintenance. The warranty escludes damage caused by transport and all causes no arising from defects in workmanship.
- 4) The warranty does not includes the cost of trasport or insurance for material returned to our workshops.
- 5) The manufactures is not responsible for personal injury, or property damage resulting from improper usage of the product.
- 6) All product is tested after assembly and is supplied without defect. We exclude the substitution or the prolongation of warranty for a possible damage.
- 7) After the 2 years warranty period, maintenance or repair will be subject to parts or labour charges.
- 8) No person is authorized to assume for us any liability in connection with the sale of our products.
- 9) This warranty excludes damage to people or property, arising from misure, improper or careless installation, or disregard of instructions furnished by us.
- 10) The right of recession must be exercised in according to the law.
- 11) Our products are subject to continuous improvement. We reserve the right to effect changes without notice.
- 12) The legal code applying in MONOPOLI, Italy, will apply, in cases of dispute.
- 13) Purchasers of product are deemed to accept paragraphs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13 as above.

Model: PST 641 - 2051

S/N:

Date of purchase:

Introduction

This manual contains instructions for installation, use and maintenance of the P.S.T. 641 - 2051 antenna rotators.

Table of contents

Section 1:	Description;
Section 2:	Installation and use;
Section 3:	Principle of operation ;
Section 4:	Technical specifications.
Section 5:	Special functions

Note:

Section 1

Description

1.1 General

This manual cover installation on a mounting plate inside a tower or a rotator cage with a thrust bearing.

The rotator consists of a rotator and a control box unit.

1.2 Unpacking and inspection

Be sure to check the rotator and control box after unpacking, especially if there is damage to the carton. If damage is evident, you are advised to contact the carrier without delay.

1.3 The control box

FRONT PANEL- The power switch, the direction rotation switch, and the display that shows the antenna position in degrees, are located on the front of panel.



REAR PANEL- The AC power supply socket, fuse holder, rotator control cable socket and DB 9 socket for remote control (i.e. computer interface or footswitch), are located on the rear panel.



Fig. 2

1.4 The rotator

The rotator has a unique design. The motor is located on the side of a wormgeared motor.

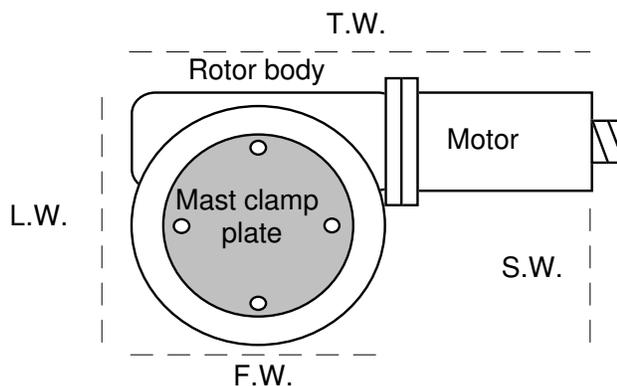
The motor output shaft terminates on a flange, where different kinds of mast clamp, available from us, may be fixed with bolts. Users may also supply their own clamp.

On the motor side is located a five-contact connector for motor power supply and potentiometer terminals.

The potentiometer, used as the antenna position reader, is located inside the foot plate, and driven by the transmission output shaft.

1.5 Accessories

The rotator is supplied with following accessories: AC power cable, plug for remote control cable, standard mast clamp, steel bolts, and user manual.



Dimensions:

Height H = cm - inch
 Wide F.W. = cm - inch
 Wide T.W. = cm - inch
 Wide L.W. = cm - inch

PST 641

15 - 6"
 14 - 5" 1/2
 24 - 9" 3/4
 as F.W.

PST 2051

17 - 6" 3/4
 16 - 6" 1/4
 28 - 11"
 as F.W.

Note 1: Dimensions may change without notice.

Section 2

Installation and wiring

2.1 Control cable preparation & connection

Before installing the rotator inside a tower, you need to prepare remote control cable, make all connections and test rotator operation thoroughly on the ground, as described below.

Connect the rotator and control box with a 5-core control cable. Two cores are used for the motor DC power supply, and three for the position reading potentiometer. If the diameter of the control cable is too thin, it will limit the voltage and reduce the torque. Do not use cable with less than .5 mm² of section area.

Solder must be used to connect the individual cores to the 5 pin connector.

Cable plug		Motor terminals board
Wire no. 1	must be connected to	1 (VDC motor power)
Wire no. 2	must be connected to	2 (VDC motor power)
Wire no. 3	must be connected to	3 (P to pot central lead)
Wire no. 4	must be connected to	4 (- 12 Vdc pot lead)
Wire no. 5	must be connected to	5 (+ 12 Vdc pot lead)

Warning: Improper wiring can result in damage to the rotator circuitry when the power is switched on.

THIS IS NOT COVERED BY THE WARRANTY.

2.2 Inspection

Carefully check that the rotator and control box cable connections are as they should be before turning on the power for the first time.

2.4 Pre-installation check (regural A box only)

The control box is supplied for 117 VAC (USA) or 220 VAC (EU) power supply. Without the rotator control cable being connected, connect the power cable to the mains supply, and switch power on. Display will show 000°. Switch power off and insert the control cable plug into the socket on control box rear.

Switch power on and if all connections are correct, display will show about 000°. If a significantly different value appears, switch the power off and check the control cable connections.

Push the direction lever in CW (clockwise) direction and the rotator will turn in the right or clockwise direction. The display value will follow the rotator rotation. Continue until the CW electronic turn limit stop the motor rotation and display shows about 400°. Push the direction lever in the CCW direction, and the rotator will turn left or counterclockwise. Continue until the CCW electronic turn limit stop the motor rotation and display shows about -040°. Move the rotator back to 000° by pushing the direction lever in the CW direction, and switch power off.

2.5 Troubleshooting

A) Power

- 1) Check that the mains cable plugs are correctly connected.
- 2) Check the fuse. If it is blown, replace it with one of the correct value, and switch power on. If it blows again, the user contacts the local service agent.

B) Motor turns in the wrong direction

- 1) Check the connections on motor terminals board.
- 2) Check the wiring of the control cable at both ends.

C) Motor turns correctly but display indicates the opposite

- 1) Wires no. 4/4 (-12 Vdc) and no. 5/5(+12 Vdc) are reversed.

D) When the rotator turned in the opposite direction, the turn limitation point is exceeded

- 1) Switch off at the control box. Disconnect the wire connected to P (pins 3-3) and connect a

voltmeter on 2 Vdc scale, between 3-3 pin (P) and ground. Switch on the control box and rotate the rotator until the voltage on the voltmeter is about 0.1 volt, and reconnect wire to P.

E) Rotator turns but display show 000° : (regular A box only)

- 1) Check connection between pin-wire no.3 in control cable and 3 on motor terminal board.
- 2) Check connection between pins no. 4-4 and between pins no. 5-5.
- 3) Check -12 Vdc and +12 Vdc on pins 4-4 and 5-5
- 4) Check -12Vdc is on pin no. 4 and +12Vdc on pin no. 5 on control box socket.
- 5) Check the rotator potentiometer circuit. Disconnect the control cable plug from the socket and check the resistance between pin no. 4 and pin no. 5. It should be 10 Kohm. Check the resistance between pins no.3 and 4 and between pins no. 3 and 5, the values should be between 4 and 6 Kohm. Their sum must be 10 Kohm.

2.6 Control box adjustment (regular A box only)

All trimmers are set at the factory. To avoid problems, any adjustments should be made by expert personnel and only if they are necessary. If this occurs in the warranty period this work must be authorized in advance.

If the resistance of the control cable conductors is too high, the bearing value displayed may be some degrees below the real antenna direction.

The bearing shown on control box indicator may be adjusted with trimmer no.1.

Turn the rotator till 000°, and with a pen make a mark between the rotator shaft and rotator body. Turn the rotator in CW direction until marks align. If the bearing indicator does not display 360°, using a small screwdriver slowly turn trimmer no. 1 until the indicator shows 360°.

The electronic turn limitation may be changed with trimmer no. 3 for CCW limit and trimmer no. 2 for CW limit. Due to component tolerance, the indicated voltages may be slightly different.

The rotation limits are set as follows:

trimmer 2/pin 3 i.c. 4558 = - 0.123 v on -040°
trimmer 3/pin 6 i.c. 4558 = + 1.219 v on + 400°

(use digital voltmeter on 2V dc scale)

The rotation limits may also be approximately set without a digital voltmeter.

Turn rotor on 000°. This is the start line. Turn rotator CCW and at the same time, with a small screwdriver, slowly turn trimmer 2 clockwise until the rotator stops. Adjust the trimmer in alternate directions until the motor stops at -040°, or where you want it to stop. This is the left turn limit.

The same procedure applies to the right turn limit with trimmer no.3 turned in the counterclockwise direction.

2.7 Installation

Before drilling holes in the mounting plate, place the rotator inside the tower and adjust its placement so that there will be no interference between rotator body and tower.

Put the antenna mast inside the mast clamp and lock centrally. The centre axis line must be within 0.5° of true.

With a pen, mark the position of the mounting holes on the mounting place, remove the rotator, and drill the holes .

Use the four bolts with washers and self-locking nuts to secure the rotator on the mounting plate.

Before tightening the bolts, insert the antenna mast in mast clamp, turn the rotator for 1 revolution and adjust its position until the central axis line is within 0.5° . Now tighten the bolts.

2.8 Antenna direction adjustment

Antenna rotator alignment is mechanical. After the antenna is installed on the mast, turn rotator to the desired direction, unlock the bolt on mast clamp, and with a magnetic compass turn the antenna mast until the antenna beam direction is as shown on the rotator control box. Lock the antenna mast with the mast clamp bolts. The antenna beam direction now is fixed. If you want to change it, you must rotate the antenna clamp on antenna mast. If some more corrections are required, you can do it with the trimmer TR7 within about 15 degrees for each side.

2.9 Rotator maintenance

The worm-gear motors are lubricated for life and no maintenance is required. If you live in an industrial zone or sea area, after a time you may have some corrosion to the outer casing. Rotators are coated with anticorrosive paint at the factory, and if repainting is necessary, use ordinary anticorrosive paint designed for ferrous metal.

2.10 Rotator control cable

As rotator control cable, you should use wires 1 and 2 having section no less than 1 mm², if

your rotator cable is too long and you have too motor volts attenuatin along the line, you can increase the motor voltage output. Remove the control box top cover, on the trasformer, there is a connector with: 0-12-15-18-24, move the wire lead to new wanted connection.

Section 3

Principles of operation

3.1 Rotator

The rotator is manufactured with a worm-wheel geared motor driven by a high torque 12Vdc motor. This method, normally used in heavy duty industrial and professional machinery, permits a very high reduction ratio, with high power torque with both low power motor drive and high brake torque, due the self-braking property of the worm-wheel geared motor.

3.2 Electrical configuration

3.2.1 Indicator circuit

Four digit, 7 segments led display are used for the direction indicator. This circuit is powered by a separate D.C. power supply, and the antenna direction is displayed in degrees.

3.2.2 Turn limitation circuit (North stop)

The turn limitation circuit is powered by +12 Vdc and -12 Vdc and includes the potentiometer located in the rotator base. Via terminal P, the antenna direction voltage is supplied to a double operational amplifier used as comparator for CW turn limit and CCW turn limit. Trimmers no. 2 and 3 allow turn limits to be set.

3.2.3 Motor power switch

The motor is powered through two 10 Amps long life relays.

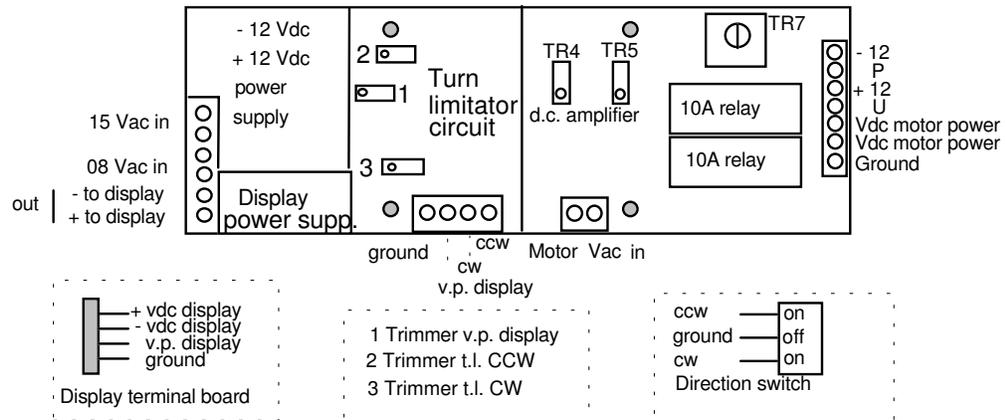


Fig. 3.2.4 Connections on printed circuit board.

Section 4

Specifications

4.1 Worm gear box

The worm gear box has a waterproof aluminium case conforms to the CEE 89/392/CEE standard.

4.2 Motor

12Vdc motor in steel waterproof case conforms to CE standards.

4.3 Anticorrosive treatment

The rotator is painted with high resistance paint.

4.4 Control box

Case in hot painted steel.

Display tolerance: 1° after 5 minutes

Dimensions: h = 13 cm, w = 20 cm, l = 21 cm

Weight: 3 kg

Power supply: 117/220 Vac 50 Hz 30 W

Conforms to applicable CE standards.

Specifications table

Mod.	PST 641	PST 2051
Wind load area (sq.ft)	16 or 1.2 m2	36 or 2.5 m2
Braking torque (in/lib)	4.840 or 5.500 kg/cm	10.800 or 12.500 kg/cm
Rotating torque (in/lbs)	528 or 600 kg/cm	1760 or 2000 kg/cm
Motor power Vdc	12	12
Rotation range	360° + and- 40° extra	360° + and - 40° extra
Rotation speed for 360°	+ - 60"	+ - 60"
Control cable cores	5	5
Weight (rotator unit) lbs	+ - 88 or 4 Kg	+ - 13 or 6 Kg
Control box power Vac	117-230	117-230

Note: Specifications may be changed without notice.

Section 5

Special functions

5.1 Remote control

The DB9 socket located on control box rear panel allows the remote control of the rotator via computer interface or foot-switch.

5.2 Computer compatible (A box only)

The rotator remote control had been tested and works well with the following computer interfaces: SARtek1 , ARS , Trak box.

The output voltage is available on pin no. 7 and may be set with trimmer TR5 from 2 to 10 DC volts and used to drive any computer interface.

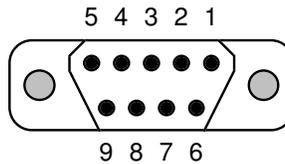
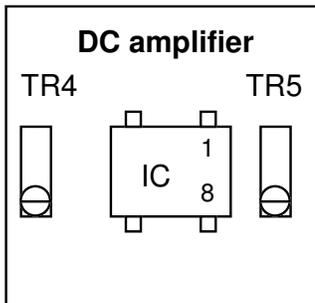
Check the voltage limits of the computer interface gate before connecting it to the remote control socket.

Output voltage is factory-set at 5 Vdc, to correspond to a 360° rotator position.

5.3 DC amplifier

A variable DC amplifier is used to increase the antenna direction voltage level.

This circuit is located on main printed circuit board close to the motor capacitor.



1- 5 = not used.

6 = ground

7 = antenna direction output voltage " P"

8 = CW

9 = CCW

To adjust, turn rotator to 000°, connect a digital voltmeter with 200 mV scale between pin 7 and ground. If you don't read 0V, using a small screwdriver, turn TR4 to read 0V. Turn rotator to 360°, switch voltmeter to 20 V scale and rotate TR5 until the voltage required by the computer interface is present.

To prevent damage to the computer interface, we suggest that the left rotator turn limit is set to 000°.

Dear customer, thank you for purchasing of the our rotators.

**If you are satisfied with it, tell to other people ,
if you are not satisfied with it, please talk to us!**

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