MONO-AXIS PROGRAMMABLE POSITIONER
PRG 910A

MANUAL FOR USE AND PROGRAMMING

SOFTWARE TYPE 0101
HARDWARE TYPE A01
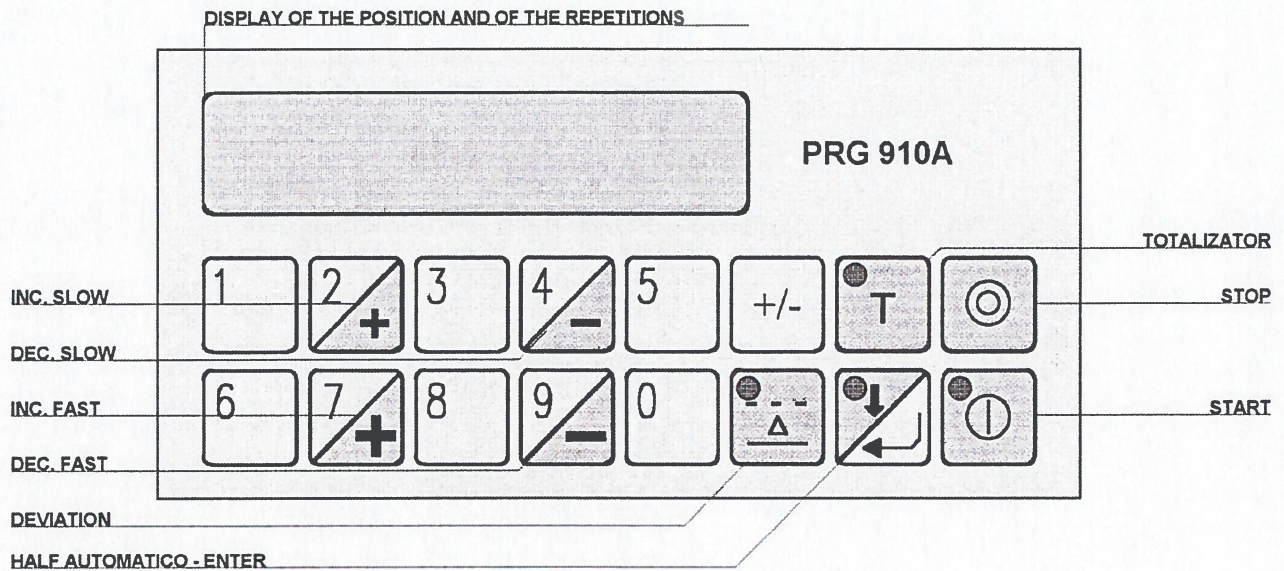
FRONTAL POSITIONER PRG 910A

DISPLAY OF THE POSITION AND OF THE REPETITIONS

INC. SLOW
DEC. SLOW
INC. FAST
DEC. FAST
DEVIATION
HALF AUTOMATICO - ENTER

PRG 910A

TOTALIZATOR
STOP
START

TECHNICAL FEATURES:

- Feeding 24 V c.a. + 20% - 10%
- Absorbed power : 8W.
- Exit stabilized encoder feeding or optical line : 12 V CC 100 mA
- Max. counting frequence 10 Khz. with mult. x 4
- Relay exits, axis control with interlock of contacts :   INCREASE/DECREASE , SLOW/FAST.
- Relay O.K. POSITION exit.
- Relay QUALIFICATION exit.
- Electrical decoupled entries by means of photocouplers.
- High luminosity led display 6 digits + negative sign.
- Water and abrasion-proof, polycarbonate keyboard with tactile   sensitivity.
- Electronical circuit, completely realized with CMOS Technology,   RISC Micro Controller Technology.
- Memory for machine constants and totalizator on EEPROM , thus   without buffer battery.
- Power/down supervisor circuit as warrant of a very high security   in data storage.
- Connections with external circuits with extractable terminals.
- Plastic self-extinguishing housing container "VO" in NORLY 43700   144X72X125 DIN standards.
- Drilling measures of the panel for embedding : 138x68.

IN COMPLIANCE WITH:

EN 50081-1 FOR NOISES RADIATION
EN 50082-2 FOR NOISES EXEMPTION
AS PROVIDED BY THE LAW ABOUT ELECTRO-MAGNETIC COMPATIBILITY.

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READING OF THE INSTRUCTION MANUAL

This manual describes the functioning and programming of PRG 910A. In some points we refer to the installed software or to the hardware configuration since this product is very flexible either in construction or in programming, so it has been possible to produce it in a lot of versions, which are different in order to permit the most suitable functioning of the machine on which it is assembled. So this instruction manual describes all the main functionings of the positioner but for functional details, please read the last page of the manual where we have shortly noted the modifications carried out on each single product.

RUNNING MODE

PRG 910A positioner can settle a powered axis in a manual and automatic mode. It also has a four digits work counter, that can be programmed while working in automatic mode, whose function is to count the number of executed repetitions by means of the closing of the contact connected to the cycle-increase entry, thus allowing the closing of the O.K. POSITION contact , till the programmed repetitions are reached. PRG 91OA has also a memory desk, where it's possible to write the necessary parameters, called "machine constants", for the correct running of the powered axis.

MACHINE CONSTANTS PROGRAMMING

In order to write the machine constants, act as follows:
Press button 0 for about 5 seconds, the dispaly of position will start flashing , then press button 1 to correct the position where the axis is placed or button 2 to write or change the following listed parameters. Anyway remember that during this operation, by pressing ENTER button it's possible to read the different parameters without changing them, whereas by pressing a numerical button from 0 up to 9, the display will automatically set on zero and it will be possible to insert the new value confirming it with ENTER button.
The number of the parameter you are reading or correcting appears on the display before the new value.
Press STOP button to exit this operation.
1 Axis-position, reading limits from -150000 up to 750000.
2 Taking-up slack value : if set on zero the taking-up slack value will not be carried out; if positive,
    the taking-up slack value is carried out in positive or increasing direction, if negative it's carried out
    in negative or decreasing direction.
3 Value of the change of speed: if set on zero the axis moves only at slow speed; in order to have a
    correct positioning, when using a two speeds system the value of the change of speed has to be
    higher than the value of inertia of the system in high speed.
4 Value of inertia in slow speed if the system has two speeds, in negative or decreasing direction or only
    readable, since PRG 910A adjusts it automatically according to the installed software.
5 Value of inertia in slow speed if the system has two speeds, in positive or increasing direction, or only
    readable, since PRG 910A adjusts it automatically according to the installed software.
6 Value of tolerance, where positioning is accepted.
7 Value of deviation.
8 Value od time, in tenths of a second, to pass from the moment when a deviation is controlled till
    the moment it's carried out.
9 Value of the minimum limit switch from -150000 up to 750000.
10 Value of the maximum limit switch , from - 150000 up to 750000.
11 Value of the multiplication constant of the encoder impulses X1 X2 X4
12 Value of the decimal multiplication constant of the encoder impulses from 0,000001 up to 1,999999. By
    setting 0 this parameter is excluded. The six numbers of this parameter are decimal and the negative
    sign has the function of 0,..... whereas the absence of the negative sign has the function of 1,.....
13 Value of preset, from -150000 up to 750000, where the position of the axis is immediately setted when
    operating the relative entry.
14 Decimal point position: by setting 0 = reading without decimal 1= one decimal 2= two decimals
    3= three decimals.

MANUAL MODE

Upon start-up PRG 910A is ready for manual mode. In this mode, the axis movement can be controlled by means of the four buttons: slow increase, fast increase, slow decrease, fast decrease. The limit switches for the minimum and maximum attainable values are operating even in manual mode, even if they are overcome by the values of inertia of the system in fast speed.

AUTOMATIC MODE

By pressing ENTER/AUTOMATIC in manual mode, the led on the relative button will light up and the display of position will show a flashing 000000. Introduce the desired value by means of the numerical buttons; it's possible to introduce only values included among the previously setted limits of the limit switches. By pressing START button, positioning will start. By pressing again ENTER instead of START, 9999 will appear on the display and that shows the number of repetitions to program.

Confirm or write the number of repetitions, max. 9999 and confirm with START, thus allowing the beginning of positioning. In this condition, the led on START button is lit up, to show that positioning is occurring.

If for every reason , positioning doesn't occur within the limits of the programmed tolerance, PRG 910A will try to carry it out again, max. for three times, and if also after the last attempt positioning has not been carried out correctly, O.K. POSITION relay will stay open and the led on START button will start flashing, thus indicating the anomaly. Press STOP button to exit this operation and check if the non-positioning was due to a wrong setting of the machine constants or to mechanical problems.

At the end of positioning, by pressing again ENTER/AUTOMATIC button, it's possible to carry out a new positioning. By using STOP button, it's possible to stop positioning or the counting of steps in every moment. PRG 910A permits positionings even if the requested position is included among the value obtained from the present position more or less the value of inertia of the system. In this case, the positioner places on its own in the more suitable direction for positioning at the same distance as three times the value of inertia of the system from the present position or it makes a take-up slack and from that position it lets the axis place to the requested quota. When establishing the mechanical limits of the system you have to take into consideration that even if PRG 910A doesn't accept values of positioning higher than the limits programmed on the machine constants, it exceeds these limits of the taking-up slack value plus the value of the inertia system in high speed, in order to make a correct positioning, or it exceeds the above mentioned limits of three times the value of inertia in slow speed.

O.K. POSITION

O.K. POSITION is a contact which opens during movements and closes 0.5 seconds after the execution of positioning. It remains open if positioning has not had a positive result, in semiautomatic mode if the repetitions counter has reached the value previously setted ; in automatic mode at the end of each program in programming mode and when entering the machine constants.

MANUAL-SEMIAUTOMATIC/AUTOMATIC

This is a contact which opens its own contact when PRG 920 is in MANUAL and SEMIAUTOMATIC mode and closes it when positioner is in AUTOMATIC mode.

CYCLE INCREASE

When this input is closed all the programmed repetitions are counted. At each closing, the counter is increased of one unit.

EXTERNAL START

This input repeats the function of the button placed on the frontal.

EXTERNAL STOP

It repeats the function of the button placed on the frontal , with the only difference that each time this input is gated, the positioner returns on manual mode. This input must be connected to a contact normally closed.

GATING

GATING a contact which closes each time a movement starts and opens about 0,5 seconds after the end of the movement. Each axis may be equipped with this contact.

DEVIATION

DEVIATION is a function gated by the relative button; it is activated when the led is on and it makes the axis position increase according to the value programmed in the machine constants, when the relative input is closed. The increase occurs after the time, programmed in the machine constants, has passed. During this movement the O.K. POSITION is closed. The coming back to the previous position occurs when the

CYCLE-INCREASE input, which has priority on DEVIATION, closes; in fact it's possible to come back to the value even if the DEVIATION movement has not finished; during this movement of return O.K. POSITION is open. Each axis may be equipped with this input.

RESET

Each time this input is closed, the reset value, memorized on the machine constants, is stored on the counter and this value is the new position of the controlled axis. This happens only if the output of 0 of the encoder is not connected to the INPUT 0. Each axis may be equipped with this input.

0 ENCODER INPUT

Each time this input is gated from the encoder output, the value of reset memorized on the machine constants is stored on the counter and this is the new position of the controlled axis. This happens only if the contact on RESET input is closed. Each axis may be equipped with this input.

TOTALIZATOR

By pressing this button , the relative led will light up and the display will show a number which represents the absolute number of times the cycle-increase entry closed.The number can be visualized in units and in hundreds, according to the installed software. It's also possible to reset this counter, always according to the installed software, by pressing for about 5 seconds the relative button. Being written on EEPROM , the value of this counter is extremely reliable. Thus this function may be used to check exactly how many cycles have been carried out by the mechanical part connected to the cycle-increase contact.

MEMORANDUM OF THE MEMORIZED MACHINE CONSTANTS

N.	NAME OF THE CONSTANT	VALUE
2	TAKE UP-SLACK VALUE	
3	CHANGE OF SPEED	
4	INERTIA -	
5	INERTIA +	
6	TOLLERANCE	
7	DEVIATION	
8	DELAY IN DEVIATION	
9	MINIMAL MICRO-SWITCH	
10	MAX. MICRO-SWITCH	
11	ENCODER MULTIPLICATION	
12	DECIMAL ENCODER MULTIPLICATION	
13	PRESET	
14	POSITION OF THE DECIMAL	

TABLE GENERAL OPTIONS

AUTOMATIC INERTIA	
IT COMES TO THE PRESET VALUE AFTER EACH POSITIONING	
GATING OUTPUT	
EXTERNAL STOP INPUT	
EXTERNAL START INPUT	
PRESET INPUT	
0 ENCODER INPUT	
TOTALIZATOR WITH VISUALIZATION IN HUNDREDS	
RESETTABLE TOTALIZATOR	

EXTERNAL CONNECTIONS PRG 910A

O.K. POS = O.K. POSITION
ABBILT. MOV. = GATING
LENTO = SLOW
VELOCE = FAST
AVANTI (−) = DECREASE
INDIETRO (+) = INCREASE

OUTPUT

24V AC/DC 2A
24V AC/DC 2A
24V AC/DC 2A
24V AC/DC 2A
24V AC/DC 2A
24V AC/DC 2A

DATA   MAT.

ABILIT.MOV
ABILIT.MOV
OK.POS
OK.POS
COM. L/V
COM. A/I
LENTO
VELOCE
AVANTI
INDIETRO

24 V AC
24 V AC
NEGATIVO
+ 12V
INPUT A
INPUT B
INPUT 0
PRESET
PRESET

STOP
START
SCOST.
INC.C.
C. NC
C. NA

PRESET

FEEDING

ENCODER

STOP
START
DEVIATION
CYCLE INCREASE

INPUT