Measurement Data Management

Convenient data collection tool and quality control software

Mini-Printer Equipped with Data Logging Function
SERIES 264 — Digimatic Mini-Processor DP-1VA LOGGER

In addition to the conventional (DP-1VR) printing and statistical calculation functions, data logger and USB output functions are added and enhanced!

- This is a palm-sized printer used to print measurement data from Digimatic gages or to perform statistical analysis.
- The versatile **DP-1VA LOGGER** printer not only prints measurement data, but performs a variety of statistical analyses, draws histograms and D-charts and also performs complex operations on Xbar-R control charts.
- The data logger function allows storage of up to 1,000 pieces of data in memory, and batch transfer of stored data to an Excel-format inspection certificate, etc., by connecting to a PC with a USB cable (optional).
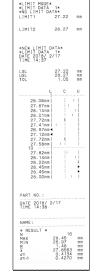

264-505 DP-1VA LOGGER

Measurement and storage at site → Transfer → Analysis by PC

Custom Excel sheet

Specifications

- • 264-505
- • Model: **DP-1VA LOGGER**
- • Data input: Digimatic input, RS-232C input (specific to Mitutoyo **KA** counter)
- • Data processing capacity:
  Mode 0: 100,000 pcs. of data
  Modes 1,2: 9,999 pcs. of data
  Mode 3: Sample size
  10×9,999 subgroups=99,990 pcs. of data
- • GO/±NG judgment (five sets can be defined)
- • Output: 1) USB output
  2) RS-232C data output at TTL levels
  3) GO/±NG judgment result output (+NG, GO, –NG)
- • Input timer: Input intervals
  0.25 s, 1 s, 5 s, 30 s, 1 min, 30 min, 60 min
- • Printing method: Thermal line printer
- • Printing speed: 0.8 s per line (6.5 mm/s) (using AC adapter)
- • Printing line: 10,000 lines of normal characters per roll
  7,000 lines of large characters per roll
- • Printing paper: High durability thermo-sensitive paper
  Width 58 mm × length 48 m
  Note: If it is to be used for official documents, or stored more than 5 years, it is recommended to make a more durable copy.
- • Power supply: 2 power methods
  1) AC adapter 100 to 240 V 50/60 Hz AC adapter (6 V, 2 A) as a standard accessory.
  2) 4 pcs. of LR6/AA size (alkaline or Ni-Mh)
  Note: Manganese dioxide batteries are not usable.
- • Battery life: About 10,000 lines* (if data is printed once every 5 seconds using 1,600 mA NiMH batteries at 20 ℃)
  * This is a typical value and is not guaranteed.
- • External dimensions: 94 (W) ×201 (D) ×75.2 (H) mm
- • Mass: 390 g (main unit)

Optional Accessories
1) USB cable (A-microB): **06AFZ050** (1 m)
2) RS-232C output cable: **09EAA084** (1 m, D-SUB 9 pin)
3) RS-232C counter cable: **09EAA094**
   Cable for **KA** counter (1 m, D-SUB 25-pin)
4) GO/±NG judgment cable: **965516**
   (2 m, 10 pin terminal/separate)
5) Foot switch: **937179T**

Consumable Items
Printing paper (10 rolls): **09EAA082**

Example of printout

MODE1
Various statistical calculations are executed using all input data. If the tolerance limits have been set, GO/±NG judgment and histogram creation are also enabled.

```
*LIMIT DATA  1*
LSL     19.11   mm
USL     21.00   mm
TOL      1.89   mm

    1   20.14   mm
    2   20.18   mm
    3   19.68   mm
    4   19.77   mm
    5   20.27   mm
    6   20.28   mm
    7   19.31   mm
    8   19.64   mm
    9   19.93   mm
   10   19.30   mm
   11   19.58   mm
▼
   29   18.49   mm
   30   20.82   mm

PART NO. :
DATE 2018/ 2/15
TIME 12: 8

NAME:

* RESULT *
N          30
MAX     21.06   mm
MIN     18.99   mm
R        2.07   mm
X̄      19.9550 mm
σn      0.4501  mm
σn-1    0.4578  mm

-NG        1
+NG        1
P        6.667  %
Cp       0.688
Cpk      0.615

* HISTOGRAM *
LSL     19.11   mm
USL     21.00   mm
TOL      1.89   mm

DIV        10

-NG  1 │
LSL  1 │
A      │
B      │
C    2 │
D    2 │
E    4 │
F    6 │
G    6 │
H    3 │
I    3 │
J    1 │
USL  1 │
+NG  1 │

□=    1
A   19.1100 mm ~
B   19.2990 mm ~
C   19.4880 mm ~
D   19.6770 mm ~
E   19.8660 mm ~
F   20.0550 mm ~
G   20.2440 mm ~
H   20.4330 mm ~
I   20.6220 mm ~
J   20.8110 mm ~
    21.0000 mm ~
```

MODE2
In addition to the MODE1 function, measurements within the tolerance limits are printed out as a D chart*. This chart allows you to identify the trend of variations in measurement data.
* D chart stands for Displacement chart.

```
*LIMIT MODE*
*LIMIT DATA  1*
*NO LIMIT DATA*
LIMIT1   27.22   mm

LIMIT2   28.27   mm


*NEW LIMIT DATA*
*LIMIT DATA  1*
DATE 2018/ 2/17
TIME 14:37

LSL     27.22   mm
USL     28.27   mm
TOL      1.05   mm

          L    C    U
28.08mm│   │
27.87mm│   │
28.14mm│   │ │
28.01mm│   │ │
27.72mm│   │ │
27.41mm│ │ │
26.97mm◄│ │
27.12mm│   │ │
27.72mm│   │ │
27.58mm│   │ │
27.82mm│   │ │
28.14mm│   │ │
28.22mm│   │    ►
28.45mm│   │    ►
28.45mm│   │    ►
28.00mm│   │ │

PART NO. :

DATE 2018/ 2/17
TIME 14:38

NAME:

* RESULT *
N          16
MAX     28.45   mm
MIN     26.97   mm
R        1.48   mm
X̄      27.8563 mm
σn      0.4134  mm
σn-1    0.4270  mm
```

MODE3
Only input of data automatically enables calculation processing of complex control limit values as well as calculation for creating an Xbar-R control chart.

```
SUB GR. NO.   1
    1   25.93   mm
    2   26.77   mm
    3   28.82   mm
    4   25.70   mm
    5   27.41   mm
    6   23.84   mm
    7   26.57   mm

X̄      26.3486 mm
R        4.98   mm
PART NO. :
DATE 2018/ 2/17
TIME 14:40

NAME:

SUB GR. NO.   2
    1   27.77   mm
    2   27.13   mm
    3   27.98   mm
    4   27.64   mm
    5   27.90   mm
    6   26.86   mm
    7   28.85   mm

X̄      27.7329 mm
R        1.99   mm
PART NO. :
DATE 2018/ 2/17
TIME 14:40

NAME:

*CONTROL LIMIT*
DATE 2018/ 2/17
TIME 14:40
NO.OF SUB GR.   2
SAMPLE SIZE     7
X̄      27.0407 mm
X̄-UCL  28.5009 mm
X̄-LCL  25.5805 mm
R̄       3.4850 mm
R-UCL   6.7051 mm
R-LCL   0.2649 mm
```

Example of batch printing log data

In OUTLOG Setting 1
```
* OUT LOG START *
* LOG  =   10

DATE 2018/ 2/15

10:16:32      37.20 mm
10:16:44  ▲   38.64 mm
10:16:59      37.22 mm
10:17: 8      37.27 mm
10:17:56  ▼   36.96 mm
10:18:41      37.66 mm
10:19:16      37.70 mm
10:19:47  ▲   37.80 mm
10:20:17      37.29 mm
10:20:43      37.04 mm

* OUT LOG END *
```
This setting allows printout of measurement time, measurement value, and GO/±NG judgment result.

In OUTLOG Setting 2
```
* OUT LOG START *
* LOG  =   10

DATE 2018/ 2/15

    1  ▼   20.41   mm
    2      20.37   mm
    3      22.05   mm
    4  ▲   22.31   mm
    5      22.19   mm
    6      20.66   mm
    7  ▼   20.13   mm
    8      21.29   mm
    9      21.58   mm
   10      22.03   mm
```
This setting allows printout of data number, measurement value, and GO/±NG judgment result.

In OUTLOG Setting 3
```
* OUT LOG START *
* LOG  =   10

  1 2018/ 2/15 10:28:28
          21.00 mm

  2 2018/ 2/15 10:28:31
          20.10 mm

  3 2018/ 2/15 10:28:33
          19.80 mm

  4 2018/ 2/15 10:28:37
          19.03 mm
▼
  5 2018/ 2/15 10:29:29
          20.55 mm
```
This setting allows printout of data number, measurement date and time, and GO/±NG judgment result.

Statistical calculation data

MODE0
GO/±NG judgment

MODE1, 2
- N: Number of pieces of data
- MAX: Maximum value
- MIN: Minimum value
- R: Range
- $\bar{X}$: Mean value
- σn: Standard deviation of a population (N)
- $\sigma n-1$: Sample standard deviation (N-1)
- –NG: For the number of pieces of data smaller than the lower limit
- +NG: For the number of pieces of data larger than the upper limit
- P: Percentage of rejects
- Cp: Maximum process capability potential
- Cpk: Actual process capability achieved

MODE3
- N: Number of pieces of data
- MAX: Maximum value
- MIN: Minimum value
- n: Number of subgroups (up to 10)
- $\bar{X}$: Mean value in a subgroup
- R: Range of a subgroup
- $\bar{\bar{X}}$: Mean value
- $\bar{X}$-UCL: Upper control limit
- $\bar{X}$-LCL: Lower control limit
- $\bar{R}$: Center (R control)
- R-UCL: Upper control limit (R control)
- R-LCL: Lower control limit (R control)

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Refer to the **DP-1VA LOGGER** Brochure (**E12041**) for more details.