

COMPACT PRESSURE GAUGE

PG-75



FEATURES

- Compact, lightweight and multi-functional general-purpose pressure gauge.
- It is adopted welding integral structure with SUS304/316L at pressure receiving section.
- A pressure display function is substantial. (3 1/2digit, 7 segment LED, 2-color LED red / green change, Non-display mode)
- Two types of analog output , one is voltage output (1-5V),The other is current output (4-20mA) .
- The gage pressure is (0 ~ positive pressure), compound pressure range (negative pressure ~ positive pressure),to support maximum of 3.5 MPa.
- Comply with IP65, CE Marking and UL certification obtained.

INTERNAL STRUCTURE (9/16-18UNF)

| Part name |               | Material                       |
|-----------|---------------|--------------------------------|
| ①         | Fitting       | SUS304<br>Diaphragm<br>SUS316L |
| ②         | Sensor module |                                |
| ③         | Sensor holder | PBT<br>(UL-94-HB)              |
| ④         | Adapter       |                                |
| ⑤         | Housing       |                                |
| ⑥         | Panel sheet   | Polyester                      |
| ⑦         | Cable         | Vinyl chlorid resin (UL2844)   |

MODEL NUMBER DESIGNATION

PG-75-102R-NV R2 B

Series name

Rated pressure

Switch output interface

Analog output

Pressure port

Fitting (With M5 female screw)

102G : 0 ~ 100kPa    102R : -100 ~ 100kPa

103G : 0 ~ 1.0MPa    103R : -0.1 ~ 1.0MPa

353G : 0 ~ 3.5MPa    353R : -0.1 ~ 3.5MPa

N : N : NPN open collector

P : P : PNP open collector

V : V : Voltage output (1-5 V)

A : A : Current output (4-20mA)

R1 : R1/8

R2 : R1/4

Blank : Stem mount

B : Back mount

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## COMPACT PRESSURE GAUGE

### LIST OF MODEL NUMBERS

| Pressure port | Fitting | SW output | Analog output | Pressure range (Rated range analog output) |                    |                    |                    |                    |                    |
|---------------|---------|-----------|---------------|--------------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|               |         |           |               | (0 ~ 100kPa)                               | (-100 ~ 100kPa)    | (0 ~ 1.0MPa)       | (-0.1 ~ 1.0MPa)    | (0 ~ 3.5MPa)       | (-0.1 ~ 3.5MPa)    |
| Stem          | R1/8    | NPN       | 1 ~ 5V        | ⇒ PG-75-102G-NVR1                          | ⇒ PG-75-102R-NVR1  | ⇒ PG-75-103G-NVR1  | ⇒ PG-75-103R-NVR1  | ⇒ PG-75-353G-NVR1  | ⇒ PG-75-353R-NVR1  |
|               |         |           | 4 ~ 20mA      | ⇒ PG-75-102G-NAR1                          | ⇒ PG-75-102R-NAR1  | ⇒ PG-75-103G-NAR1  | ⇒ PG-75-103R-NAR1  | ⇒ PG-75-353G-NAR1  | ⇒ PG-75-353R-NAR1  |
|               |         | PNP       | 1 ~ 5V        | ⇒ PG-75-102G-PVR1                          | ⇒ PG-75-102R-PVR1  | ⇒ PG-75-103G-PVR1  | ⇒ PG-75-103R-PVR1  | ⇒ PG-75-353G-PVR1  | ⇒ PG-75-353R-PVR1  |
|               |         |           | 4 ~ 20mA      | ⇒ PG-75-102G-PAR1                          | ⇒ PG-75-102R-PAR1  | ⇒ PG-75-103G-PAR1  | ⇒ PG-75-103R-PAR1  | ⇒ PG-75-353G-PAR1  | ⇒ PG-75-353R-PAR1  |
|               | R1/4    | NPN       | 1 ~ 5V        | ⇒ PG-75-102G-NVR2                          | ⇒ PG-75-102R-NVR2  | ⇒ PG-75-103G-NVR2  | ⇒ PG-75-103R-NVR2  | ⇒ PG-75-353G-NVR2  | ⇒ PG-75-353R-NVR2  |
|               |         |           | 4 ~ 20mA      | ⇒ PG-75-102G-NAR2                          | ⇒ PG-75-102R-NAR2  | ⇒ PG-75-103G-NAR2  | ⇒ PG-75-103R-NAR2  | ⇒ PG-75-353G-NAR2  | ⇒ PG-75-353R-NAR2  |
|               |         | PNP       | 1 ~ 5V        | ⇒ PG-75-102G-PVR2                          | ⇒ PG-75-102R-PVR2  | ⇒ PG-75-103G-PVR2  | ⇒ PG-75-103R-PVR2  | ⇒ PG-75-353G-PVR2  | ⇒ PG-75-353R-PVR2  |
|               |         |           | 4 ~ 20mA      | ⇒ PG-75-102G-PAR2                          | ⇒ PG-75-102R-PAR2  | ⇒ PG-75-103G-PAR2  | ⇒ PG-75-103R-PAR2  | ⇒ PG-75-353G-PAR2  | ⇒ PG-75-353R-PAR2  |
| Back          | R1/8    | NPN       | 1 ~ 5V        | ⇒ PG-75-102G-NVR1B                         | ⇒ PG-75-102R-NVR1B | ⇒ PG-75-103G-NVR1B | ⇒ PG-75-103R-NVR1B | ⇒ PG-75-353G-NVR1B | ⇒ PG-75-353R-NVR1B |
|               |         |           | 4 ~ 20mA      | ⇒ PG-75-102G-NAR1B                         | ⇒ PG-75-102R-NAR1B | ⇒ PG-75-103G-NAR1B | ⇒ PG-75-103R-NAR1B | ⇒ PG-75-353G-NAR1B | ⇒ PG-75-353R-NAR1B |
|               |         | PNP       | 1 ~ 5V        | ⇒ PG-75-102G-PVR1B                         | ⇒ PG-75-102R-PVR1B | ⇒ PG-75-103G-PVR1B | ⇒ PG-75-103R-PVR1B | ⇒ PG-75-353G-PVR1B | ⇒ PG-75-353R-PVR1B |
|               |         |           | 4 ~ 20mA      | ⇒ PG-75-102G-PAR1B                         | ⇒ PG-75-102R-PAR1B | ⇒ PG-75-103G-PAR1B | ⇒ PG-75-103R-PAR1B | ⇒ PG-75-353G-PAR1B | ⇒ PG-75-353R-PAR1B |
|               | R1/4    | NPN       | 1 ~ 5V        | ⇒ PG-75-102G-NVR2B                         | ⇒ PG-75-102R-NVR2B | ⇒ PG-75-103G-NVR2B | ⇒ PG-75-103R-NVR2B | ⇒ PG-75-353G-NVR2B | ⇒ PG-75-353R-NVR2B |
|               |         |           | 4 ~ 20mA      | ⇒ PG-75-102G-NAR2B                         | ⇒ PG-75-102R-NAR2B | ⇒ PG-75-103G-NAR2B | ⇒ PG-75-103R-NAR2B | ⇒ PG-75-353G-NAR2B | ⇒ PG-75-353R-NAR2B |
|               |         | PNP       | 1 ~ 5V        | ⇒ PG-75-102G-PVR2B                         | ⇒ PG-75-102R-PVR2B | ⇒ PG-75-103G-PVR2B | ⇒ PG-75-103R-PVR2B | ⇒ PG-75-353G-PVR2B | ⇒ PG-75-353R-PVR2B |
|               |         |           | 4 ~ 20mA      | ⇒ PG-75-102G-PAR2B                         | ⇒ PG-75-102R-PAR2B | ⇒ PG-75-103G-PAR2B | ⇒ PG-75-103R-PAR2B | ⇒ PG-75-353G-PAR2B | ⇒ PG-75-353R-PAR2B |

The products marked ⇒ are manufactured upon receipt of order basis.

### STANDARD SPECIFICATIONS

|                        | Model number          |               | PG-75                                                                              |            |            |                  |               |               |
|------------------------|-----------------------|---------------|------------------------------------------------------------------------------------|------------|------------|------------------|---------------|---------------|
|                        |                       |               | 102G                                                                               | 103G       | 353G       | 102R             | 103R          | 353R          |
| General specifications | Pressure reference    |               | Gauge                                                                              |            |            | Gauge (Compound) |               |               |
|                        | Rated pressure        | Pr(L) ~ Pr(H) | 0 ~ 100kPa                                                                         | 0 ~ 1.0MPa | 0 ~ 3.5MPa | -100 ~ 100kPa    | -0.1 ~ 1.0MPa | -0.1 ~ 3.5MPa |
|                        | Maximum pressure      | Pmax          | 200kPa                                                                             | 2MPa       | 5MPa       | 200kPa           | 2MPa          | 5MPa          |
|                        | Break-down pressure   | Pb            | 300kPa                                                                             | 3MPa       | 7MPa       | 300kPa           | 3MPa          | 7MPa          |
|                        | Full-scale            | FS            | 100KPa                                                                             | 1MPa       | 3.5MPa     | 200kPa           | 1.1MPa        | 3.6MPa        |
|                        | Pressure Medium       |               | Corrosive gases/Liquids compatible with SUS304 or SUS316                           |            |            |                  |               |               |
|                        | Sealed liquid         |               | Silicone oil                                                                       |            |            |                  |               |               |
|                        | Operating voltage     | Vopr          | 10.8 ~ 30VDC (Including ripple percentage)                                         |            |            |                  |               |               |
|                        | Consumption current   |               | 50mA maximum (Not included current analog output)                                  |            |            |                  |               |               |
|                        | Protection grade      |               | IP65 of IEC                                                                        |            |            |                  |               |               |
|                        | Operating temp.       |               | -10 ~ 50°C (Storage Temperature : -20 ~ 70°C )                                     |            |            |                  |               |               |
|                        | Operating humidity    |               | 35 ~ 85% RH                                                                        |            |            |                  |               |               |
|                        | Insulation resistance |               | 100MΩ minimum at DC500V between bundled leads and pressure port                    |            |            |                  |               |               |
|                        | Dielectric strength   |               | One minuts at AC500V between bundled leads and pressure port (1mA maximum leakage) |            |            |                  |               |               |
|                        | Fitting port types    |               | R1 (R1/8)、R2 (R1/4)                                                                |            |            |                  |               |               |
|                        | Fitting materials     |               | Diaphragm : SUS316L、Fitting : SUS304                                               |            |            |                  |               |               |
|                        | Net Weight            |               | Approx. 115±15g (incl. 2m cable)                                                   |            |            |                  |               |               |

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### STANDARD SPECIFICATIONS

|                  | Model number       | PG-75                                                                                             |      |      |      |      |      |
|------------------|--------------------|---------------------------------------------------------------------------------------------------|------|------|------|------|------|
|                  |                    | 102G                                                                                              | 103G | 353G | 102R | 103R | 353R |
| Switch output    | Number of outputs  | Two outputs (NPN/PNP)                                                                             |      |      |      |      |      |
|                  | Switching capacity | 30VDC / 100mA maximum                                                                             |      |      |      |      |      |
|                  | Residual voltage   | 1.2V maximum (NPN) / 2.2V maximum (PNP), Load current 100mA                                       |      |      |      |      |      |
|                  | Hysteresis         | 0 ~ Approx 0.3Pr(H),(Adjustable)                                                                  |      |      |      |      |      |
|                  | Repeatability      | ±0.3 % FS / Reference temp. 25°C                                                                  |      |      |      |      |      |
|                  | Accuracy           | ±2%FS (Integrated accuracy:Including errors of setting, linearity, hysteresis and thermal error.) |      |      |      |      |      |
|                  | Response           | Approx 5 ms (Digital filter settings : "F0")                                                      |      |      |      |      |      |
|                  | Protection         | Exists / Short circuit protection(Switch Overload current detection :Approx 150mA minimum)        |      |      |      |      |      |
|                  | State indication   | SW monitor LED(2 points) ,Lighted when the switch output is ON.(Pressure display inverted colors) |      |      |      |      |      |
|                  | Voltage output     |                                                                                                   |      |      |      |      |      |
| Analog output    | Vo                 | 1 ~ 5V / Pr(L) ~ Pr(H) , F.S. : 4V                                                                |      |      |      |      |      |
|                  | Accuracy           | ±2%F.S. (Integrated accuracy) /Measurement load resistance(1MΩmaximum)                            |      |      |      |      |      |
|                  | Resolution         | Approx 2.7mV (Approx 0.068% F.S.) (11bitDAC)                                                      |      |      |      |      |      |
|                  | Output resistance  | Approx 1kΩ(Internal impedance)                                                                    |      |      |      |      |      |
|                  | Response           | Approx 2ms maximum                                                                                |      |      |      |      |      |
|                  | Current output     |                                                                                                   |      |      |      |      |      |
|                  | Io                 | 4 ~ 20mA / Pr(L) ~ Pr(H), F.S. : 16mA                                                             |      |      |      |      |      |
|                  | Accuracy           | ±2%F.S. (Integrated accuracy) /Measurement load resistance(250Ωmaximum)                           |      |      |      |      |      |
|                  | Resolution         | Approx 0.011mA (Approx 0.068% F.S.) (11bitDAC)                                                    |      |      |      |      |      |
|                  | Output resistance  | Vopr ≤ 18VDC : 50 ~ 300Ω, Vopr > 18VDC : 50 ~ 500Ω                                                |      |      |      |      |      |
|                  | Response           | Approx 2ms maximum                                                                                |      |      |      |      |      |
| Pressure display | Display element    | 3 1/2 digits, 7 segment LED (Red/Green) Reverse display selectable in tandem with SW1.            |      |      |      |      |      |
|                  | Display cycle      | 5 times /sec (moving average)                                                                     |      |      |      |      |      |
|                  | Accuracy           | ±2% F.S.(Integrated accuracy)                                                                     |      |      |      |      |      |

### ENVIRONMENTAL CHARACTERISTICS

| Test item           | Test conditions (At 25 ± 5 °C)                                                     | Permissible change                                                                                              |
|---------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Vibration           | 10 ~ 500Hz 1.5mm maximum / 98.1m/s <sup>2</sup> , three directions, two hours each | Pressure indication, switch operating pressure and analog output (zero and span) : ± 2%F.S. maximum during test |
| Shock               | 490m/s <sup>2</sup> , three directions, three times each                           |                                                                                                                 |
| Pressure cycling    | 0~Rated pressure, 10 <sup>6</sup> cycles                                           |                                                                                                                 |
| Moisture resistance | 40 °C, 90~95 %RH, 240 hrs.                                                         |                                                                                                                 |

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### ENVIRONMENTAL CHARACTERISTICS

| Test item | Test conditions (At 25 ± 5 °C)                                                                                  | Permissible change                                                                               |
|-----------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| EMC       | EMI : EN55011: 2009, A1: 2010 Group 1, class B<br>EMS : EN61326-1 : 2006 Table 2<br>EN61326-2-3 : 2006 Annex BB | Pressure indication, switch operating pressure and analog output : ± 5 %F.S. maximum during test |

### MULTIPLIER FACTOR

The multiplier factor is selectable by changing the value of third digit on the display during the operation setting.

| Code/Multiplier Factor | Pressure Range / Display specification rated pressure |                |              |               |             |              |
|------------------------|-------------------------------------------------------|----------------|--------------|---------------|-------------|--------------|
|                        | 102G                                                  | 102R           | 103G         | 103R          | 353G        | 353R         |
| 1:×1 (kPa)             | 0.0 ~ 100.0                                           | -100.0 ~ 100.0 | 0 ~ 1000     | -100 ~ 1000   | —           | —            |
| 2:×0.0102              | .000 ~ 1.020                                          | -1.020 ~ 1.020 | 0.00 ~ 10.20 | -1.02 ~ 10.20 | 0.0 ~ 35.7  | -1.0 ~ 35.7  |
| 3:×10.2                | 0 ~ 1020                                              | -1020 ~ 1020   | —            | —             | —           | —            |
| 4:×7.501               | 0 ~ 750                                               | -750 ~ 750     | —            | —             | —           | —            |
| 5:×0.01                | .000 ~ 1.000                                          | -1.000 ~ 1.000 | 0.00 ~ 10.00 | -1.00 ~ 10.00 | 0.0 ~ 35.0  | -1.0 ~ 35.0  |
| 6:×10                  | 0 ~ 1000                                              | -1000 ~ 1000   | —            | —             | —           | —            |
| 7:×0.145               | 0.0 ~ 14.5                                            | -14.5 ~ 14.5   | 0.0 ~ 145.0  | -14.5 ~ 145.0 | 0 ~ 508     | -15 ~ 508    |
| 8:×0.001 (MPa)         | —                                                     | —              | .000 ~ 1.000 | -.100 ~ 1.000 | 0.00 ~ 3.50 | -0.10 ~ 3.50 |
| 9:×0.2953              | 0.0 ~ 29.5                                            | -29.5 ~ 29.5   | 0 ~ 295      | -30 ~ 295     | 0 ~ 1033    | -30 ~ 1033   |

- The settings indicated by "-" on the table above are not selectable because of resolution.
- Either "1" (for 102A, 102V, 102G, and 102R) or "8" (for 103G, 103R, 353G and 353R) are set prior to delivery.
- Changes of the multiplier factor apply to display values. Also, note the changes reset switch setting value and hysteresis.

### SWITCH OUTPUT MODE

SW output is selectable by changing the value of first digit on the display.

<SW Operation Code>

| Output                             | SW1      |    |                                    |   | SW2      |    |                                    |   |
|------------------------------------|----------|----|------------------------------------|---|----------|----|------------------------------------|---|
|                                    | Separate |    | Window comparator                  |   | Separate |    | Window comparator                  |   |
| Mode                               | HI       | LO | A                                  | B | HI       | LO | A                                  | B |
| Operation                          |          |    |                                    |   |          |    |                                    |   |
| 1                                  | ○        |    |                                    |   | ○        |    |                                    |   |
| 2                                  | ○        |    |                                    |   |          | ○  |                                    |   |
| 3                                  |          | ○  |                                    |   | ○        |    |                                    |   |
| 4                                  |          | ○  |                                    |   |          | ○  |                                    |   |
| 5                                  |          |    | ○                                  |   |          |    | ○                                  |   |
| 6                                  |          |    | ○                                  |   |          |    | ○                                  |   |
| 7                                  |          |    |                                    | ○ |          |    |                                    | ○ |
| 8                                  |          |    |                                    | ○ |          |    |                                    | ○ |
| Pressure setting (Operating point) | Set 1    |    | (Minimum) Set 1<br>(Maximum) Set 3 |   | Set 2    |    | (Minimum) Set 1<br>(Maximum) Set 4 |   |

<Switch Operation Mode>

| Separate mode                                                                | Window comparator mode |
|------------------------------------------------------------------------------|------------------------|
| <p>(HI operation)</p>                                                        | <p>(A operation)</p>   |
| <p>(L operation)</p>                                                         | <p>(B operation)</p>   |
| <p><math>P1 \leq P2</math> or <math>P1 \geq P2</math></p>                    |                        |
| <p><math>P1 \leq P3-2H</math> and <math>P2 \leq P4-2H</math></p>             |                        |
| <p>H : Hysteresis,<br/>P1 = Set 1, P2 = Set 2<br/>P3 = Set 3, P4 = Set 4</p> |                        |

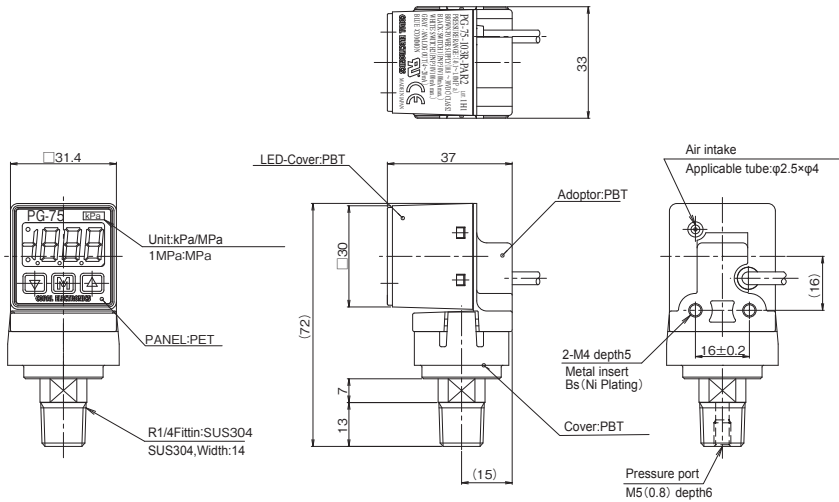
- In the Separate mode, SW 1 corresponds to Setting 1 and SW2 corresponds to Setting 2.
- In the Window Comparator Mode, SW 1 corresponds to the Setting 1 (lower limit) and Setting 3 (upper limit). Also, SW2 corresponds to the setting 2 (lower limit) and setting 4 (upper limit).
- The Hysteresis (H) setting is common to SW 1 and SW 2 operations.
- When SW operation is changed between the Separate Mode and Window Comparator Mode, SW pressure settings that are set separately will be reset.

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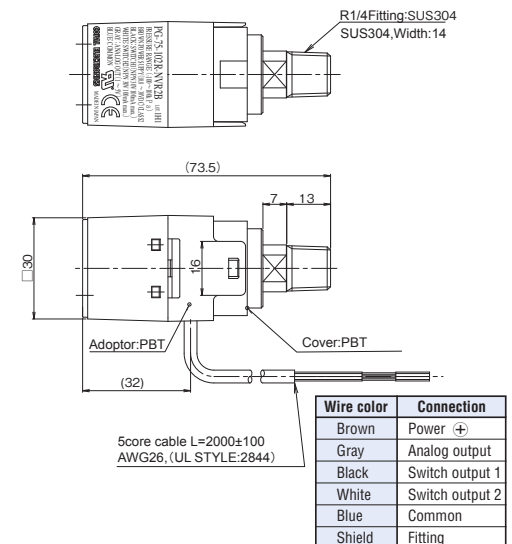
## COMPACT PRESSURE GAUGE

### EXTERNALS SPECIFICATION (unit:mm)

#### Vertical installation type

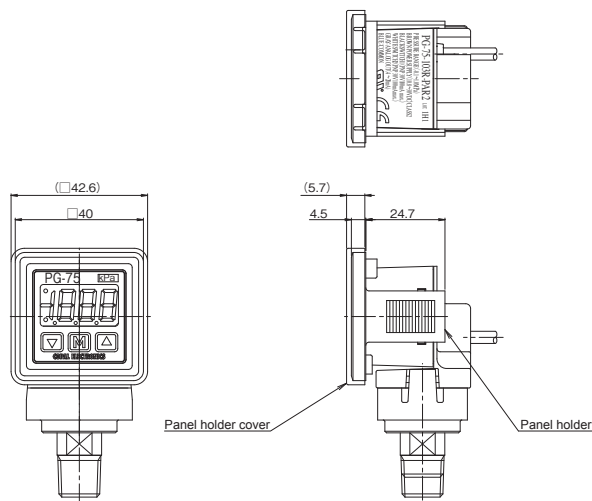


#### The horizontal installation type

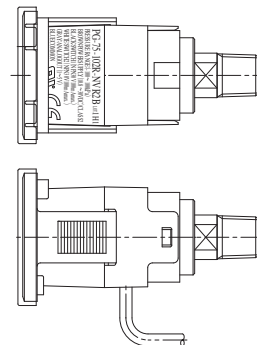


### MEANS OF ATTACHMENT (Option)

#### Vertical installation type



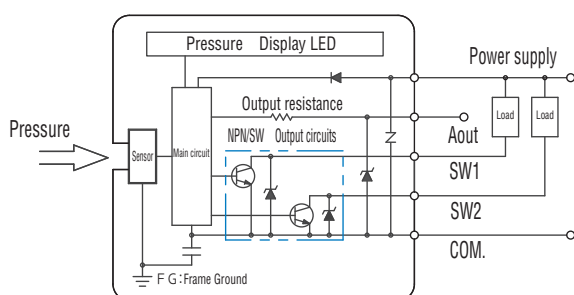
#### The horizontal installation type



※ Accessories (sold separately) are available for common use with PG-30, PG-35, PG-75 series. (P.173)

### INTERNAL ELECTRICAL SCHEMATICS

#### NV/NA:NPN



#### PV/PA:PNP

