INSTRUCTION MANUAL

| ISOLATION AMPLIFIER (4 channels, input isolation) | MODEL **20VS1F** |

BEFORE USE ....

Thank you for choosing us. Before use, please check contents of the package you received as outlined below.
If you have any problems or questions with the product, please contact our sales office or representatives.

■ PACKAGE INCLUDES:
Amplifier ....(1)

■ MODEL NO.
Confirm that the model number described on the product is exactly what you ordered.

■ INSTRUCTION MANUAL
This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

POINTS OF CAUTION

■ POWER INPUT RATING & OPERATIONAL RANGE
• Power Supply
Operational voltage range: 15V DC ±10%
Power consumption: approx. 20mA DC (no load)
Install the filter for the power supply as indicated below.
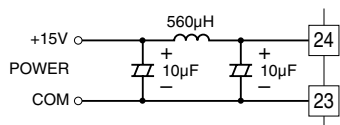
■ ENVIRONMENT
• Indoor use
• When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
• Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
• Environmental temperature must be within -20 to +70°C (-4 to 158°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

■ WIRING
• Do not install cables (power supply, input and output) close to noise sources (relay drive cable, high frequency line, etc.).
• Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

■ INSTALLING THE MODULE
When it is installed on the printed wiring board, land diameter ø1.5 and through-hole ø0.9 are recommended.

■ AND ....
• The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.
• With voltage output, do not leave the output terminals shortcircuited for a long time. The unit is designed to endure it without breakdown, however, it may shorten appropriate life duration.

CHECKING

1) Terminal wiring: Check that wiring is correctly connected according to the connection diagram.
2) Power input voltage: Check voltage across the pins.
3) Input: Check that the input signal is within 0 – 100% of the full-scale.
4) Output: Check that the load resistance meets the described specifications.
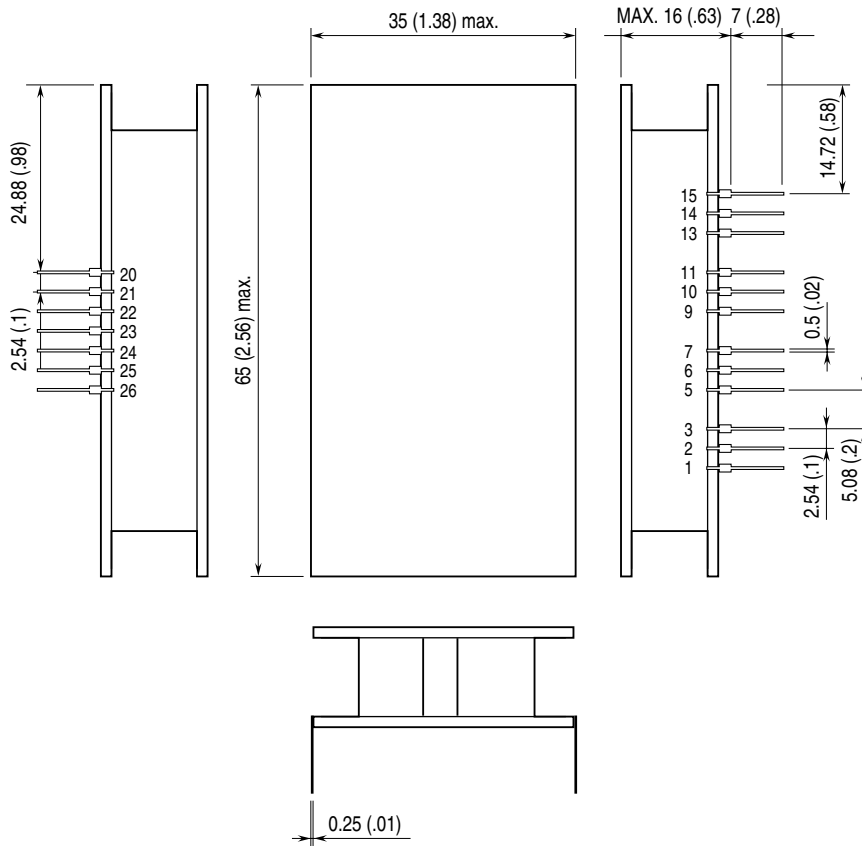
MAINTENANCE

Regular calibration procedure is explained below:

■ CALIBRATION
Warm up the unit for at least 10 minutes. Apply 0%, 25%, 50%, 75% and 100% input signal. Check that the output signal for the respective input signal remains within accuracy described in the data sheet.

TERMINAL CONNECTIONS

■ **EXTERNAL DIMENSIONS mm (inch)**

PIN ASSIGNMENT

|	
1	INVERTING INPUT 1
2	NON-INVERTING INPUT 1
3	COM 1
5	INVERTING INPUT 2
6	NON-INVERTING INPUT 2
7	COM 2
9	INVERTING INPUT 3
10	NON-INVERTING INPUT 3
11	COM 3
13	INVERTING INPUT 4
14	NON-INVERTING INPUT 4
15	COM 4
20	OUTPUT 4 (+)
21	OUTPUT 3 (+)
22	OUTPUT (−)
23	POWER SUPPLY (−)
24	POWER SUPPLY (+)
25	OUTPUT 2 (+)
26	OUTPUT 1 (+)

■ **TERMINAL ASSIGNMENTS**
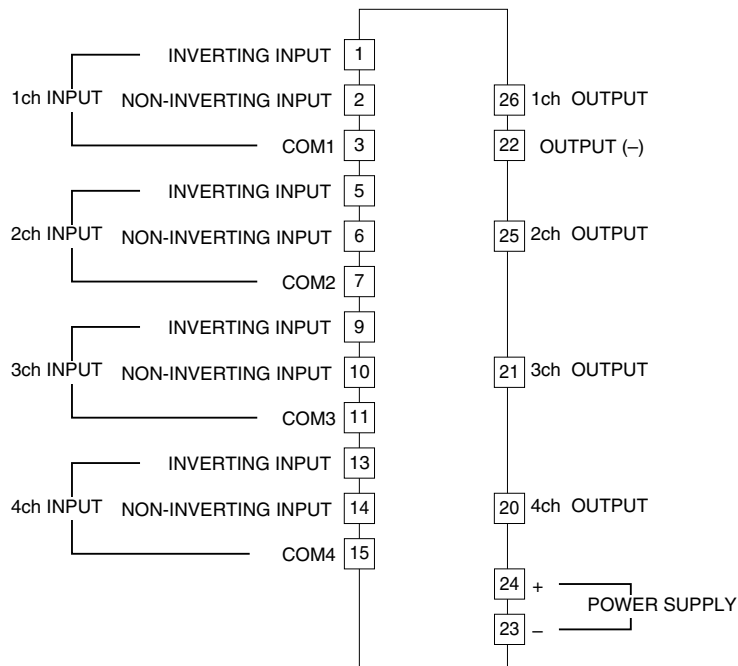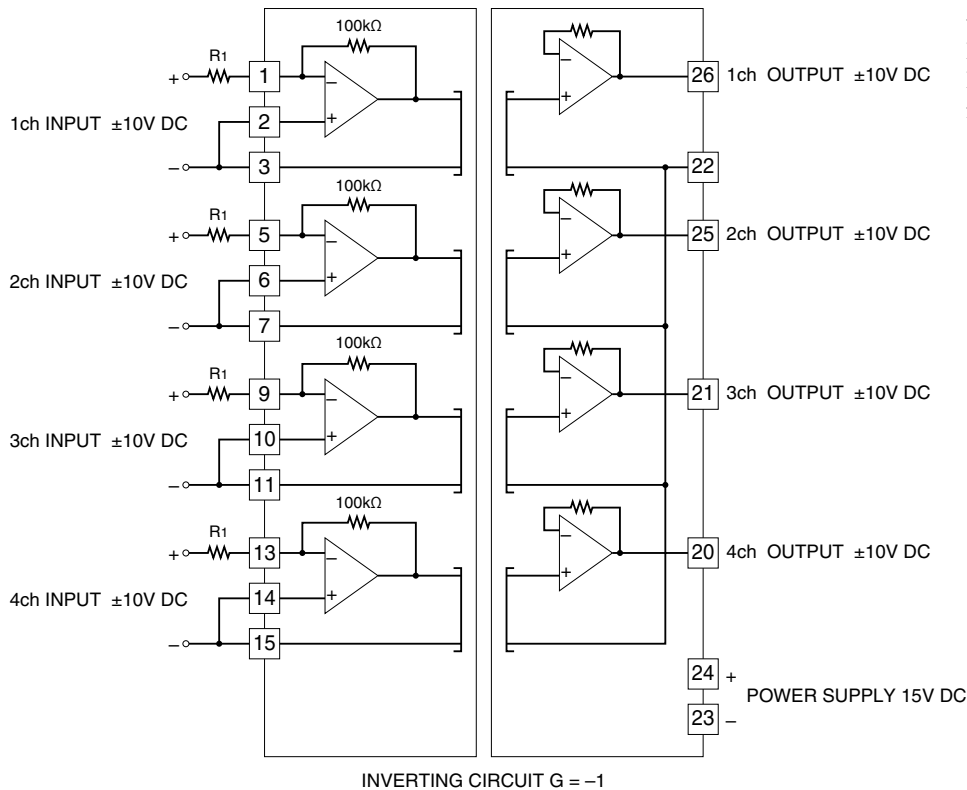
APPLICATION EXAMPLES

The resistance of R1 must be between 1 kΩ and 200 kΩ.

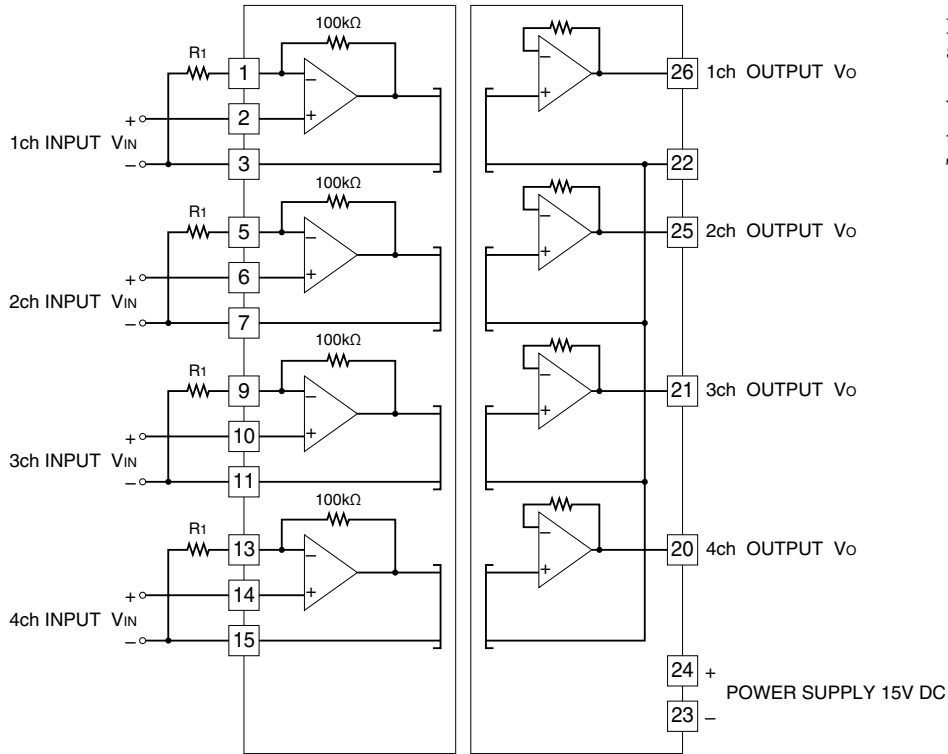■ **Non-inverting amplifier circuit: Basic example of G = 1**
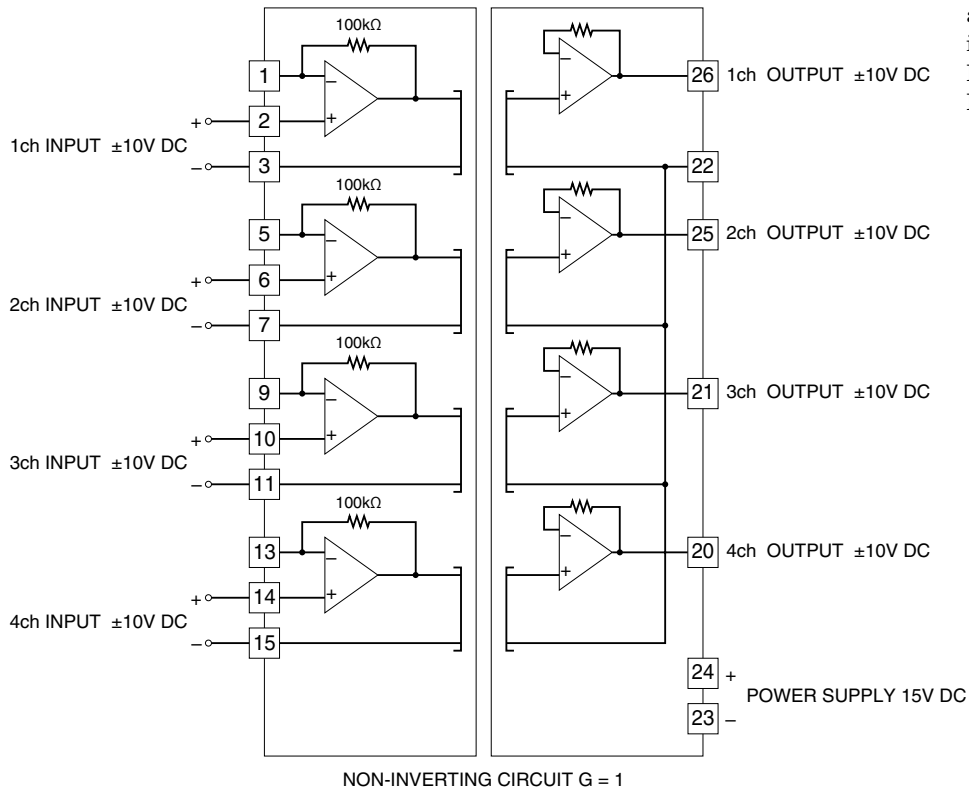
The output is proportional to the input. The gain is 1.
E.g. ±10V DC for ±10V DC input.

NON-INVERTING CIRCUIT G = 1

■ **Inverting amplifier circuit: Basic example of G = -1 (output inverted to the input) (R$_1$ = 100 kΩ)**

The output is inverted to the input. The gain is -1.
E.g. +10V DC for -10V DC input and -10V DC for +10V DC input.

INVERTING CIRCUIT G = −1

■ **Non inverting amplifier circuit: Example of G = 1 + 100 kΩ / R1**
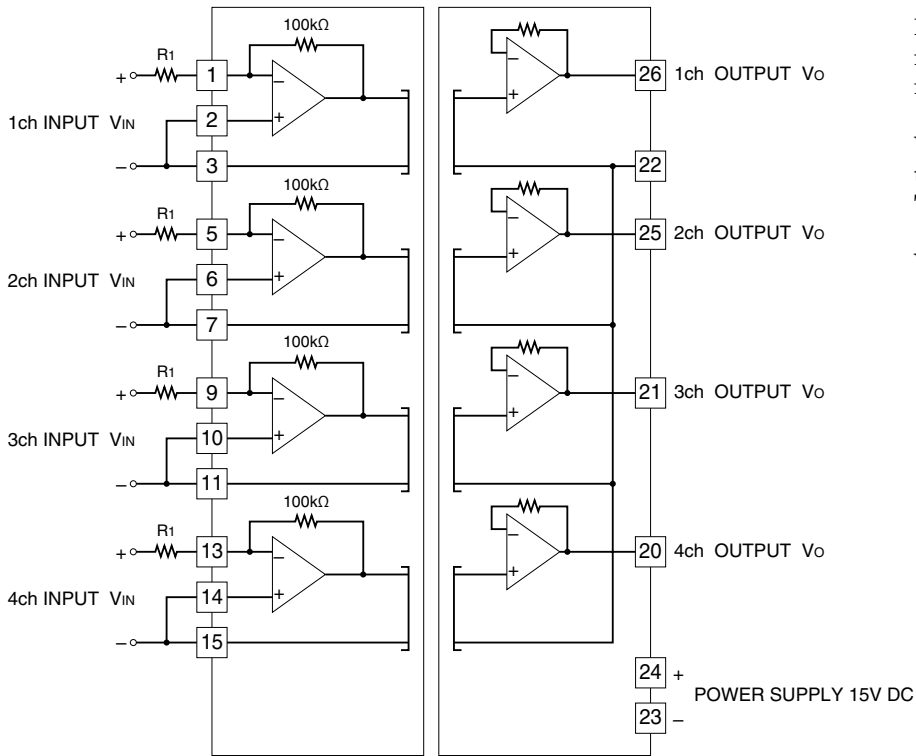

NON-INVERTING CIRCUIT G = 1 + 100 kΩ / R1

For a non-inverting amplification the output is as following.

$V_O = (1 + 100\text{k}\Omega/R) \times V_{IN}$

When $R_1 = 100\text{k}\Omega$, then the output is following. The gain is 2.

$V_O = 2 \times V_{IN}$

■ **Inverting amplifier circuit: Example of G = –100 kΩ / R1**

INVERTING CIRCUIT G = –100 kΩ / R1

For an inverting amplification the output is as following.

$V_O = -(100\text{ k}\Omega / R_1) \times V_{IN}$

When $R_1 = 50\text{k}\Omega$, then the output is following. The gain is -2.

$V_O = -(100\text{k}\Omega / 50\text{k}\Omega) \times V_{IN} = -2 \times V_{IN}$