

Read all instructions thoroughly

I N S T R U C T I O N

DIGITAL PRESSURE CONTROL "TYPE BFE"



I N T R O D U C T I O N

Failure to read and follow all instructions carefully before installing or operating this digital injury and or property damage. Save this instructions for future use.

CAUTION ON SAFETY



Be careful about following matters to prevent from getting an electric shock.

- Do not pour water on the Pressure Switch.
- Do not open a front cover during welding.
- Wire after making sure to be power OFF.
- Make sure to fasten lead wires on the terminal block on wiring.

MOUNTING METHOD

The pressure switch can be mounted in any direction. Use the screws of unit mounting screw holes (M4 X 0.7, deep 5) provided on the rear side of the unit when mounting the unit on a wall face or a panel.

- Do not drop.
- Before installing on the pipe, remove dust or foreign particle and make pipe inside clean.
- Do not paint.
- Don't open any portions other than the terminal cover.
- Make sure to use another spanner at the hexagonal portion of connector when connect it to the pipe.

MOUNTING CONDITIONS

Use the pressure switch under the following conditions, otherwise when malfunction or a performance drop may occur. Please contact us if the unit is used under a condition exceeding the following range.

- Make sure to use within allowable fluid temperature range.
- Warm up the unit for longer than 3 minutes before using it.
- Do not give static electricity to it because of electronic apparatus.
- Do not use it under condition of dewing.
- Install it less than 9.81m/s² (Vibration).
- This product is an electronic unit. Don't use this prssure switch in an environment subjected to an electromagnetic trouble.
- Available for fluid that does not give any damage to SUS, Solder & Brass of the element.

CONNECTION METHOD

Connect the cable to the terminal screws of the terminal board, referring to the connection diagram at the upper right.

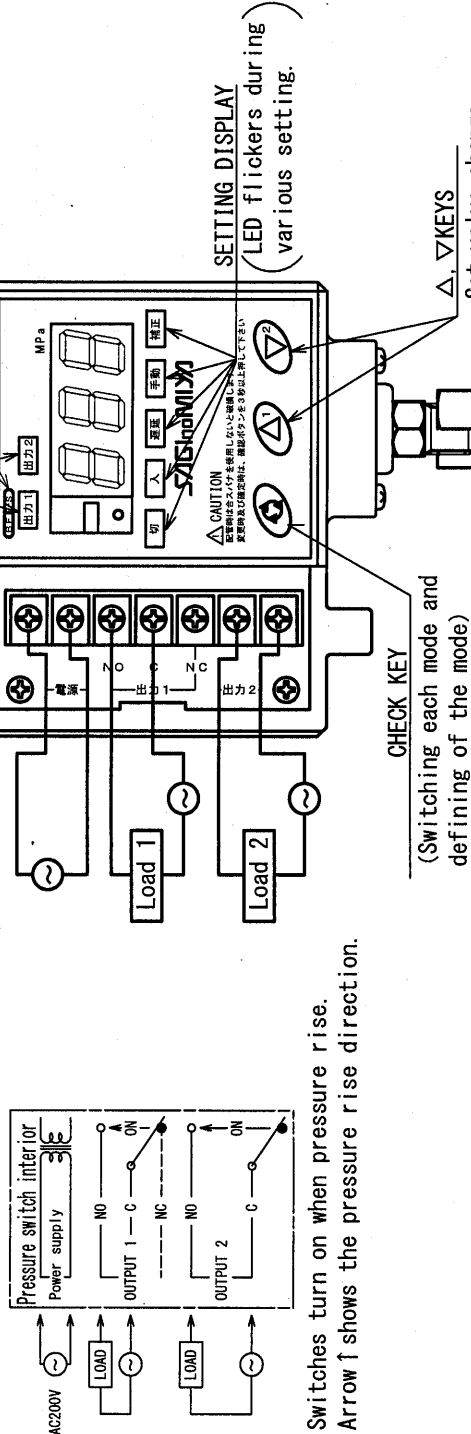
- Use an AC power supply free of voltage fluctuations and surge.
- Don't touch any terminals directly when one is electrified with static electricity.
- Don't apply any withstand voltage exceeding 1500V AC, otherwise the sensor may be broken.

SPECIFICATIONS

TYPE	BFE-SA10B-***	2-RELAY TYPE (Displayed as "BFE-S" at the upper left of the display nameplate)	
	BFE-RA10B-***	ROTATION TYPE (Displayed as "BFE-R" at the upper left of the display nameplate)	
INDICATION METHOD	7-segment LED indication	ACCURACY	
PRESS. INDICATION RANGE	-0.095 to 0.995MPa	±0.010 MPa at 25°C, -0.095 to 0.600 MPa	
		±0.030MPa at -10 to 60°C, -0.095 to 0.995 MPa	
STEP	0.005MPa	PRESS. COMPENSATION (MANUAL)	±0.030MPa
" OFF" SET PRESS. RANGE	-0.095 to 0.985MPa	SUPPLY VOLTAGE	200VAC±10%
" ON" SET PRESS. RANGE	-0.085 to 0.995MPa	FLUID	Refrigerants(excluding ammonia), Water, Air
MINIMUM PRESS. DIFFERENTIAL	0.010MPa	AIRTIGHT PRESS.	3.85 MPa
		OUTPUT DELAY TIMER	0 to 200sec (Step=1sec)
OUTPUT 1	1c relay contact	PROTECTION	Open type
OUTPUT 2	1a relay contact	DIELECTRIC STRENGTH	1500VAC 1min, or 1800VAC 1sec
OUTPUT CONTACT RATING	125/250VAC, 1A (cos φ=1)	PRESS. CONNECTION	1/4 Male flare
AMBIENT TEMP. RANGE	-10 to 60°C	MOUNTING METHOD	Fixing by using screws (M4 X 0.7, deep 5) at 2 portions on the rear side.
STORAGE TEMP. RANGE	-20 to 70°C	TERMINAL BOARD	Connected on terminal board
CONTACT LIFE (RELAY)	100,000 times	SCREW SIZE	(+ bind M3.5 X 0.6 X 6)

NAME OF COMPONENT PARTS AND CONNECTION METHOD

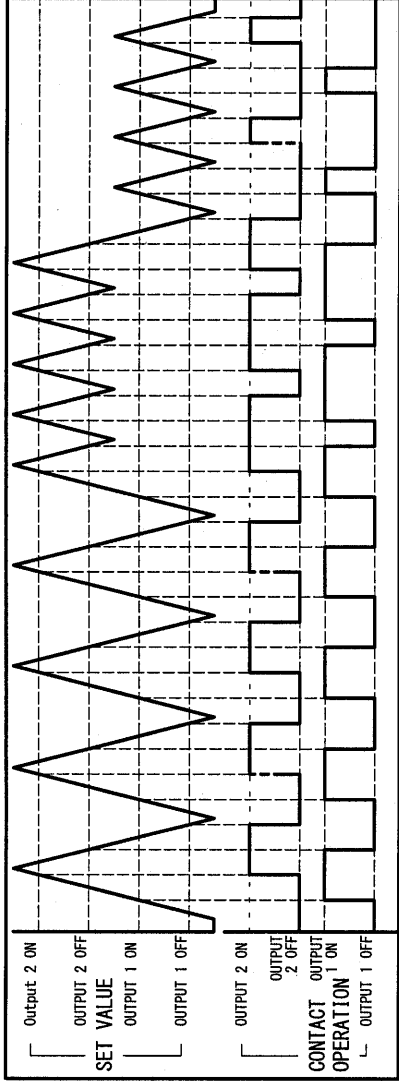
Connect method
(Connection of OUTPUT 1 and OUTPUT 2 assuming that the switches are turned on when pressure rises.)



Switches turn on when pressure rise.
Arrow ↑ shows the pressure rise direction.

DISCRIPTION OF PRODUCT

- Since an absolute pressure type pressure sensor is used in the pressure receiver of this unit, this unit is affected by the atmospheric pressure. A change quantity(%FS) due to the atmospheric pressure is as shown below.
(Measured atmospheric pressure -1013) /10000/Rated pressure (MPa) ×100
- If the pressure exceeds the measuring pressure range, [H] or [LO] is displayed.
- This product cannot be set to OFF set press. ≥ ON set press.. For pressure setting, the following condition must be satisfied without fail.
 - ON set press. ≥ OFF set press. + 0.010 [MPa]
- If an attempt is made to set a pressure lower than the minimum press. differential, the set value fluctuates while keeping the minimum press. differential, automatically.
Example) Assume that the OFF pressure is changed to 0.105[MPa] when the ON pressure is set to 0.110[MPa], and the OFF pressure is set to 0.100[MPa] and the ON pressure becomes 0.115[MPa] automatically. (This also applies to a reverse case, correspondingly.)
- The unit returns to the normal mode if it is left as it is for 10 seconds in the check mode.
- The unit returns to the normal mode if it is left as it is for 10 seconds in the setting mode. (Setting is not changed.)
- If its manual function is used, the unit does not return to the normal mode even if it is left as it is for 10 seconds. Press CHECK key.
- The ROTATION FUNCTION is provided to change the set values of OUTPUT 1 and OUTPUT 2 from each other when either OUTPUT 1 or OUTPUT 2 or both outputs turn OFF as illustrated below.



In case pressure decrease than the ON pressure during working of Delay timer, timer is reset, and does not turn on.

VACUUM SIDE PRESSURE CONVERSION TABLE

MP a	mmHg	MP a	mmHg
0	0	-0.050	-368
-0.005	-37	-0.055	-405
-0.010	-74	-0.060	-441
-0.015	-110	-0.065	-478
-0.020	-147	-0.070	-515
-0.025	-184	-0.075	-552
-0.030	-221	-0.080	-588
-0.035	-257	-0.085	-625
-0.040	-294	-0.090	-662
-0.045	-331	-0.095	-699

PRESSURE UNIT CONVERSION TABLE

	MPa	mmH ₂ O	mmHg	kgf/cm ²	atm
1MPa	1	1.01972 × 10 ⁵	7.50062 × 10 ³	1.01972 × 10 ⁵	9.86923
1mmH ₂ O	9.80665 × 10 ⁻⁶	1	7.35559 × 10 ⁻²	1 × 10 ⁻⁴	9.67841 × 10 ⁻⁵
1mmHg	1.33322 × 10 ⁻⁴	1.35951 × 10	1	1.35951 × 10 ⁻³	1.31579 × 10 ⁻³
1kgf/cm ²	9.80665 × 10 ⁻²	1 × 10 ⁴	7.35559 × 10 ²	1	9.67841 × 10 ⁻¹
1atm	1.01325 × 10 ⁻¹	1.03323 × 10 ⁴	7.60000 × 10 ²	1.03323	1

DESCRIPTION OF MODES

BFE contains three modes shown in the right.

These modes are changed and checked by CHECK key and they are reset by Δ▽ keys.

OPERATION

The LEDs shown in the left table flicker in the CHECK mode and SETTING mode. The set value check and change methods are described below.

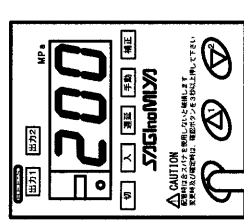
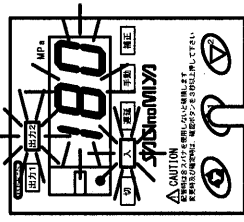
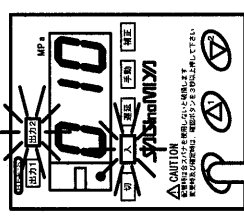
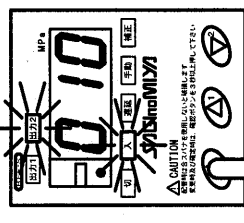
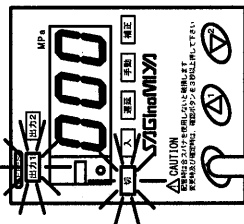
1. Set value check method (CHECK MODE)

- (1) By pressing CHECK key, the CHECK mode is selected. (By pressing CHECK key several times, the check items are switched in the sequence shown in the left table.)
- (2) The present set value is displayed.
- (3) The CHECK mode returns to normal display (NORMAL MODE) when it is left as it is for 10 seconds.

2. Set value change method (SETTING MODE)

- (1) Select an item to be changed by pressing CHECK key.
- (2) After confirming the selected item, flicker the indicating value by pressing CHECK key for 3 seconds. The set value is changed and the SETTING mode returns to normal display. (If this mode is left as it is for 10 seconds, it returns to the NORMAL mode without setting change. Also, the manual function is reset to the NORMAL mode by pressing CHECK key.)

OPERATION METHOD 1 (Example: A change of "ON" pressure value of OUTPUT 2)



CHECK MODE
I. Press CHECK key once.
[OUTPUT 1] and [OFF] displays flicker and the CHECK mode is selected.

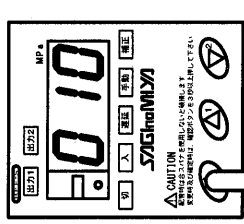
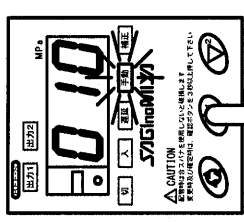
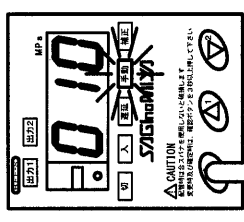
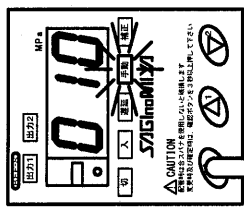
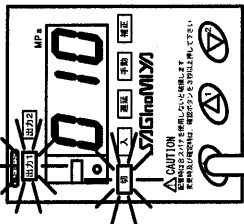
ITEM SELECTION
II. Continue pressing CHECK key until [OUTPUT 2] and [ON] lamp flicker.
(Press CHECK key 4 times.)

SETTING MODE
III. Continue pressing CHECK key for 3 seconds.
The indicating value flickers and the SETTING mode is selected.

NUMERICAL INPUT
IV. Change the set pressure by pressing Δ▽ keys.

MEMORY AND MODE SELECTION
V. Continue pressing CHECK key for 3 seconds.
The indicating value stops flickering and the NORMAL mode is selected.

OPERATION METHOD 2 (Example: Manual operation of OUTPUT 1 [FORCED OPERATION])



CHECK MODE
I. Press CHECK key once.
[OUTPUT 1] and [OFF] displays flicker and the CHECK mode is selected.

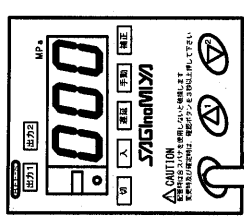
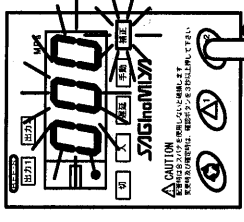
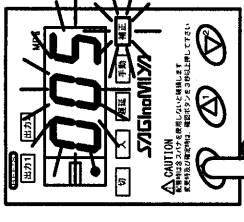
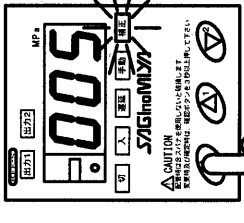
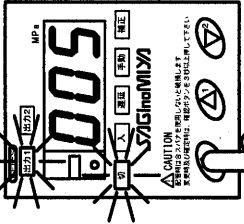
ITEM SELECTION
II. Continue pressing CHECK key until the manual lamp flickers.
(Press CHECK key 6 times furthermore.)

SETTING MODE
III. Continue pressing CHECK key for 3 seconds.
The indicating value flickers and the SETTING mode is selected.

FORCED OPERATION
IV. OUTPUT 1 is operated forcibly by pressing Δ key and OUTPUT 2 is operated forcibly by pressing ▽ key. By pressing Δ▽ keys several times, the relays are switched by the number of pressed times.
[The indicating value]

RESET AND MODE SELECTION
V. Press CHECK key.
The indicating value stops flickering, and the NORMAL mode is selected.
※ In case of MANUAL function, the present mode does not return to the NORMAL mode without pressing CHECK key.

PRESS. COMPENSATION OPERATION METHOD



CHECK MODE
I. Press CHECK key once.
[OUTPUT 1] and [OFF] displays flicker and the CHECK mode is selected.

ITEM SELECTION
II. Continue pressing CHECK key until the COMPENSATION lamp flickers.
(Press CHECK key 7 times furthermore.)

SETTING MODE
III. Continue pressing CHECK key for 3 seconds.
The indicating value flickers and the SETTING mode is selected.

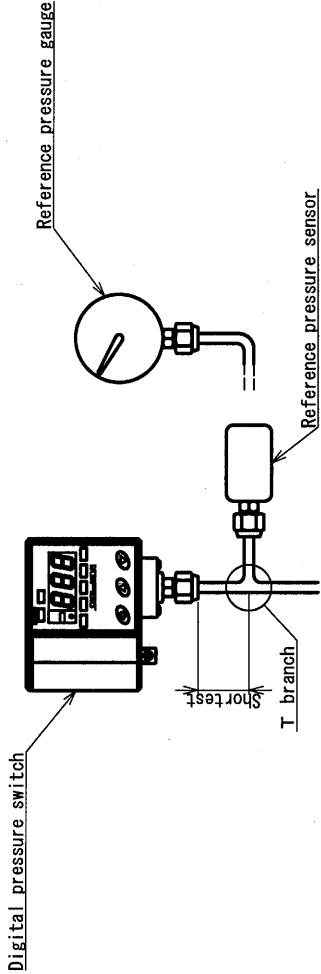
COMPENSATION
IV. Compensate the pressure value to 0 by pressing Δ, ▽ keys.
The indicating value remains flickering.

MEMORY AND MODE SELECT
V. Continue pressing CHECK key for 3 seconds.
The indicating value stops flickering, and the NORMAL mode is selected.

COMPENSATION METHOD

- Since an absolute pressure type pressure sensor is used in the pressure receiver of this unit, this unit is affected by the atmospheric pressure. If pressure is compensated under the atmospheric pressure condition, the set value changes correspondingly as the atmospheric pressure changes.
- For compensating this unit, apply an actual pressure.
- Compensate this unit at 25°C.
- Compensate this unit by using a reference pressure gauge having accuracy of better than 1% or a reference pressure sensor.
- Compensate this unit without any pressure loss at the product mounting position and reference pressure gauge (sensor) measuring position.

Example) An example of piping during compensation



OPERATION CHECK

Install and calibrate the product correctly and then check its operation to confirm correct function of the whole system when using.

LIMIT ON APPLICATION

The product is not designed nor manufactured for an use such equipment or system that is intended to be used under such circumstances that may affect human life. For application requiring extreme high reliability, please contact the Company first.

SCOPE OF WARRANTY

Unless otherwise agreed by the both parties, warranty period of the Product shall be one year after of delivery to Buyer. In case of failure attributable to the Company within such period, the Product shall be repaired or replaced without charge that any one of followings are out of the warranty.

- ① Improper handling or application by user
- ② Modification or repair by other than the Company
- ③ Any failure to be caused by acts of God, fire, storm or the like, war, riot or the like and other causes beyond the control of the parties concerned.

Warranty described in this paragraph means the warranty for the Product itself and does not include warranty for any consequential damage arising out of or occasioned by a defect or failure or the Product.

REMEDIAL MEASURES TO BE TAKEN IN THE OCCURRENCE OF A TROUBLE

If the unit does not operate normally, please contact us.

SAGINOMIYA
SEISAKUSHO, INC.

13-1, Ichibancho, Chiyoda-ku, Tokyo
102-0082 Japan
Tel: +81 3 5843 3338 Fax: +81 3 5843 3364
E-mail: inter@saginomiya.co.jp
URL: http://www.saginomiya.co.jp