

Pressure Switches

Super Z



The time-proven results show proof of reliability.

A Total Supplier of Pressure Switches

Taihei Boeki Co., Ltd.



QEC25000 ISO 9001: 2015
Design and manufacturing of pressure switch





Progressive pressure switches meet every need.

Super Z family

Taihei Boeki has always moved through with the history of pressure switches of Japan. The type Z series brought out in 1980 has become a reliable brand boasting the sales result of more than 700,000 units as compact and high-performance pressure switches, which utilizes an original technology.

The Super Z series based on the basic design of the type Z pressure switches are higher-performance pressure switches to satisfy the users' needs that have become more diversified and sophisticated. The Super Z series having more than 250,000 actual sales results are blessed with high appreciation in such industries as power plants and plant facilities.

An affluent lineup of the Super Z family commencing with the Super Z series lining up pressure switches, differential pressure switches and vacuum switches, adds New Super Z series that features high proof pressure and extremely small differential (dead band), and explosion-proof type Super Z series. Thanks to the affluent varieties, the Super Z family assures the most optimal solution complying with various applications of customers.



Super Z Series

Bellows / Piston Types

High Performance Pressure Switches

Differential Pressure Switches



New Super Z Series

Diaphragm Actuated Extremely
Small Differential (Dead Band) •
High Proof Pressure Type

Pressure Switches

Differential Pressure Switches






Super Z TEX Series

Explosion-proof type <d2G4>

Pressure Switches


Super Z Series

Name of Products	Pressure Switches		Vacuum Switches
Model	SZ□□□B SZ□□□BS SZ□□□BW SZ□□□BSW	SZ□□□P SZ□□□PW SZ□□□PM	SZ-01BSV SZ-01BSVW
Appearance			
Pressure Range	0.003-11.5 MPa 0.03-115 kgf/cm ²	0.1-63.5 MPa 1-635 kgf/cm ² 1-50 MPa 10-500 kgf/cm ²	2.7 kPaVac-100 kPaVac 20-760 mmHgV
Pressure Medium	Air, Water, Oil, Gases, Steam	Oil Water, Oil, Steam	Vacuum
Actuator	Bellows	Piston	Bellows
Material of Pressure Sensing Element	Phosphor Bronze or SUS316L	SUS420F, SUS316	SUS316L
Micro Switch	SPDT (1a,1b)、DPDT (2a, 2b) In addition to a standard type, a micro-load type (for 24V DC) and a sealed type (environment-resistance) are available for the SPDT. SZ□□□PM is SPDT (1C) only available.		
Applicable Standards	CCC certified* ¹ UL & CSA approved* ²		
Remarks	* 1 Except with the pilot lamp * 2 Except the micro-load type, the sealed type and 1c of the SPDT, and the DPDT		

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Differential Pressure Switches		Vacuum-Differential Pressure Switches	Low-Pressure Switches
SZ□□□BD、SZ□□□BSD SZ□□□BDW、SZ□□□BSDW SZ1/10BDC、SZ1/10BSDC SZ1/10BDW、SZ1/10BSDW	SZ□□□PD SZ□□□PED SZ□□□PDW SZ□□□PEDW	SZ-01BSD SZ-01BSDW	SZ1/4D SZ1/4DW
			
0.0002-2.5 MPa 0.002-25 kgf/cm ²	0.2-20.5 MPa 2-205 kgf/cm ²	2.7kPaVac-100 kPaVac 20-760 mmHgV	3-25 kPa 0.03-0.25 kgf/cm ²
Air, Water, Oil, Gases, Steam	Oil	Vacuum	Air, Water, Oil, Gases, Steam
Bellows	Piston	Bellows	Diaphragm
Phosphor Bronze or SUS316L	SUS420F, SUS316	SUS316L	Nitrile Rubber
SPDT (1a,1b)、DPDT (2a, 2b) In addition to a standard type, a micro-load type (for 24V DC) and a sealed type (environment-resistance) are available for the SPDT.			
CCC certified* ¹ UL & CSA approved* ²		CCC certified approved* * Except the micro-load type	CCC Certified* ¹
* 1 Except with the pilot lamp			

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Reference Chart of The Super Z Family Products

Super Z Series

New Super Z Series

Name of Products	Low-Pressure Switches	Compound-Pressure Switches	Pressure Switches
Model	SZ□□□BF-X15 SZ□□□BSF-X15	SZ□□□BR*1 SZ□□□BRW*1 SZ1/10BRF-X15*2 SZ1/10BSRF-X15*2	SZ□□□D
Appearance			
Pressure Range	0.5-60 kPa 0.005-0.6 kgf/cm ²	80 kPaVac-900 kPa 600 mmHgV-9 kgf/cm ²	0.002-28 MPa 0.02-280 kgf/cm ²
Pressure Medium	Air, Water, Oil, Gases, Steam		Air, Water, Oil, Gases, Steam
Actuator	Bellows		Diaphragm
Material of Pressure Sensing Element	Phosphor Bronze or SUS316L	Phosphor Bronze or SUS316L (* 1 only Phosphor Bronze available)	SUS316L, SUS316
Micro Switch	SPDT (1c) only	SPDT (1a, 1b), DPDT (2a, 2b) SPDT type has standard type, micro-load type (for 24V DC), and sealed type (environment resistance) (* 2 SPDT (1c) only)	SPDT (1c) only
Applicable Standards	CCC Certified (Except with the pilot lamp)		CCC Certified
Remarks		* 2 Sensitivity (Dead band) is not adjustable.	Sensitivity (Dead band) is not adjustable.

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Super Z TEX Series

Differential Pressure Switches		Explosion-proof Pressure Switches	
SZ□□□DD SZ□□□DDEX	SZ1/4DD	TEX1-SZ□□□B TEX1-SZ□□□BS TEXW-SZ□□□BW TEXW-SZ□□□BSW	TEX1-SZ□□□P TEXW-SZ□□□PW
			
0.002-21 MPa 0.02-210 kgf/cm ²	0.0005-6.6 MPa 0.005-66 kgf/cm ²	0.005-11.5 MPa 0.05-115 kgf/cm ²	0.1-63.5 MPa 1-635 kgf/cm ²
Air, Water, Oil, Gases, Steam		Air, Water, Oil, Gases, Steam	Oil
Diaphragm		Bellows	Piston
Polyimide, SUS316		Phosphor Bronze or SUS316L	SUS420F
SPDT (1c) only		SPDT (1a,1b) DPDT (2a,2b) In addition to a standard type, a micro-load type (for 24V DC) and a sealed type (environment-resistance) are available for SPDT.	
CCC Certified (Except with the pilot lamp)		d2G4 (explosion-proof class) approved	
Sensitivity (Dead band) is not adjustable.			

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High Performance Pressure Switches

Super Z Series



The Super Z series is high-grade pressure switches that have been evolved from the Z type and has adopted high quality bellows / piston actuators. Thus, the Super Z series has superior performance and high reliability.

■ Highly Reliable Basic Structure

The micro switch, the range module and the differential module that are the heart of the Super Z utilize the time-proven technology of the Z type pressure switches. The high performance and highly reliable switch mechanism has been realized by the original structure that comprises these elements combined with a cantilever.

■ High Quality Bellows / Piston are adopted.

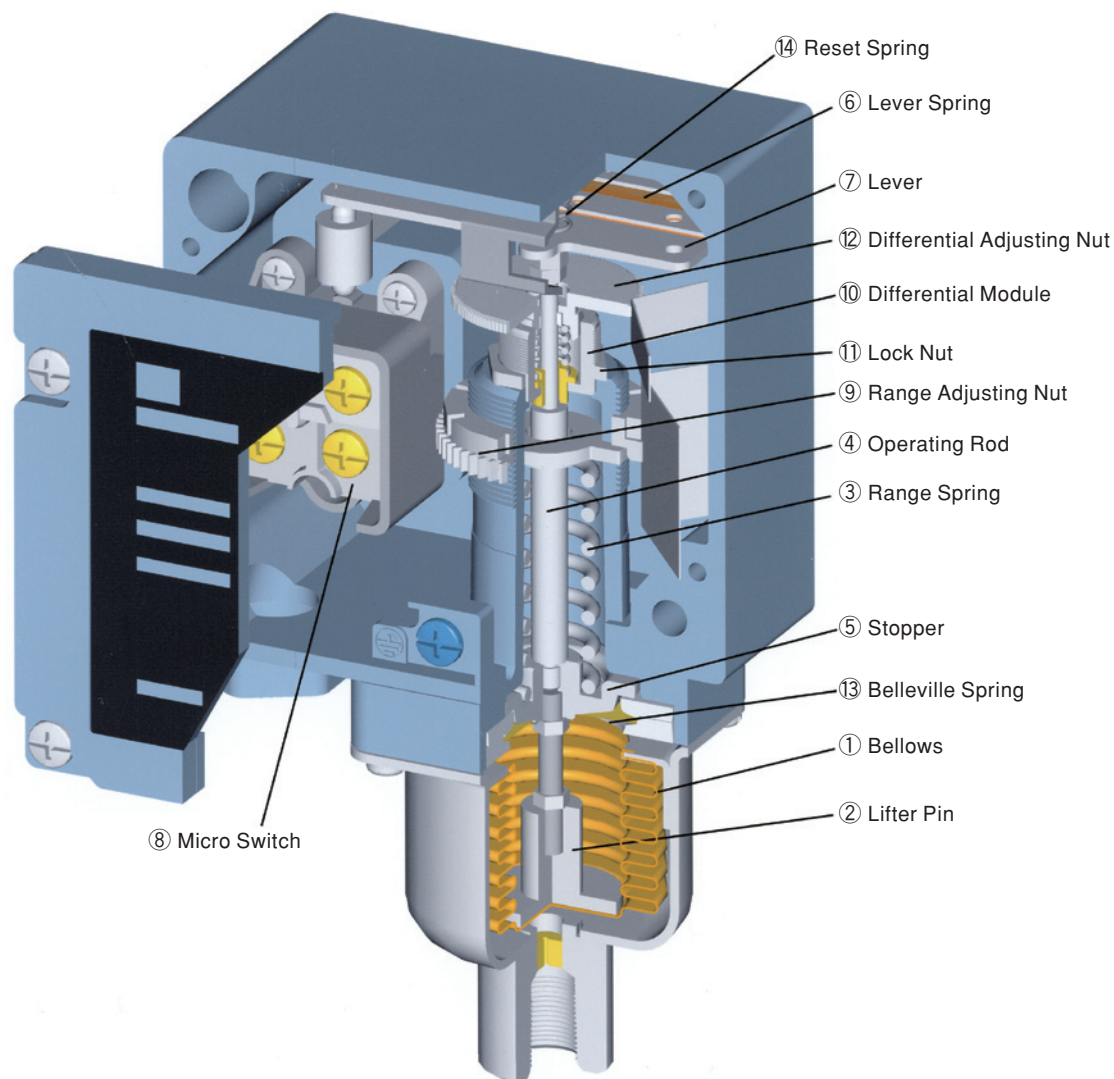
The bellows actuator utilizes original bellows, which we co-developed with a manufacturer specializes in manufacturing of bellows under strict evaluation test method. And, the piston actuator has adopted a sealed piston configuration sealed with an O-ring and a cup seal.

■ Abundant Variations

In addition to standard pressure switches, vacuum switches, compound-pressure switches and micro-pressure switches are line upped widely. The basic design enables to serialize vacuum switches and differential pressure switches.

And, the micro switches are selectable from a standard SPDT contact, a micro-load contact, a sealed contact and a DPDT contact for various kinds of applications.

Structural Drawing of the Super Z



Operating Mechanism of the Super Z Pressure Switch

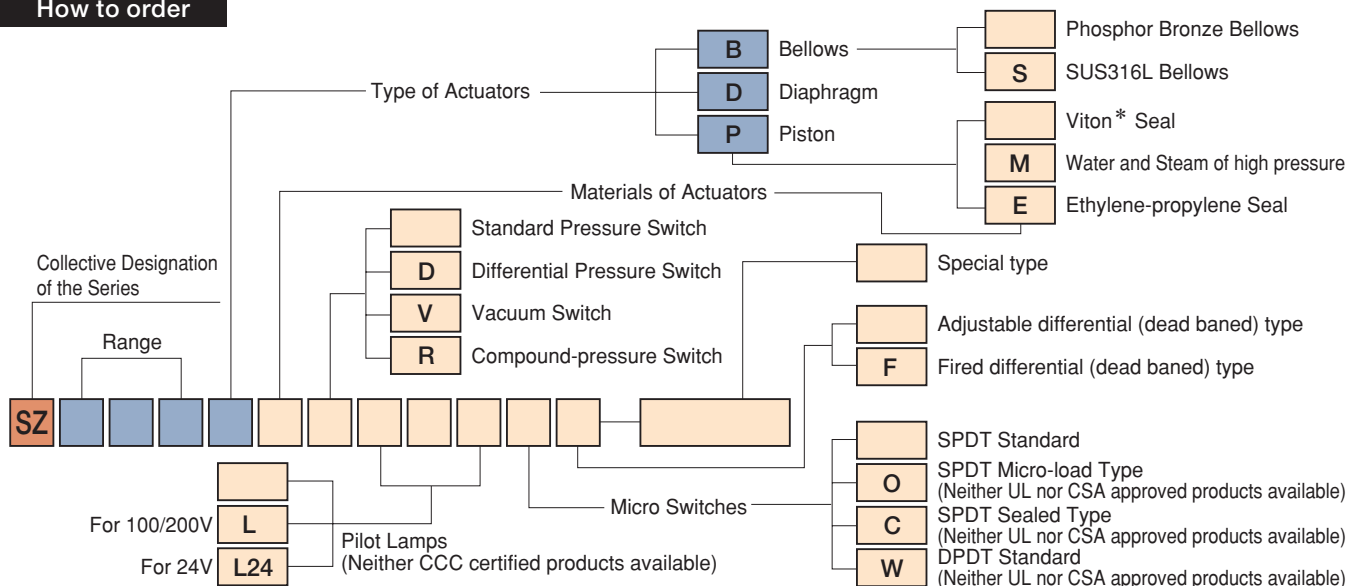
1. The pressure that is detected with the bellows ① is transformed into force, then it is transmitted to the switch mechanism through the lifter pin ②.
2. When the pressure reaches the preset pressure of the range spring ③, the bellows and the operating rod ④ start to stroke.
3. The stopper ⑤ that is connected to the operating rod defines the upper limit and the lower limit. Thus, this function always keeps steady the stroke of the bellows and the operating rod compensated.
4. The stroke of the operating rod is transmitted to the lever ⑦ connected to the lever spring ⑥, then it strokes the push button of the micro switch ⑧.
5. The operating pressure is adjustable and can be set with the range adjusting nut ⑨ that sets the preset pressure of the range spring.
6. The differential (dead band) is adjustable and can be set with the differential mechanism that stands between the operating rod and the lever. The differential mechanism has been preset to an appropriate position and locked with the lock nut ⑪. The dead band adjustment can be done by changing force of the differential spring with the differential adjusting nut ⑫. This adjustment will only change the setting of operating pressure on rising without affecting the setting of operating pressure on falling.
7. The Belleville spring ⑬ has been adopted as a guide of the operating rod. And it allows the Super Z to be set at low pressure.
8. The reset spring ⑭ gives reset force to the micro switch.

Specifications

Housing Material	: Die-cast Aluminum
Painting Color	: 7.5BG4/1.5
Gasket Material	: Nitrile Rubber, Viton*, Others
Enclosure Type	: IP65
Pressure Port Connection	: Rc1/4 (PT1/4)
Electrical Connection	: G1/2 (PF1/2)
Operating Ambient Temperature	: -20 to +80°C (No condensation or no freezing)
Allowable Operating Frequency	: 120 cycles / minute
Insulation Resistance	: Between discontinuous terminals, and between each terminal and non-charging metal Over 100MΩ (at 500V DC)
Withstand Voltage	: Between discontinuous terminals, 1000V AC, 50/60Hz, 1minute Between each terminal and non-charging metal, and ground 2200V AC, 50/60Hz, 1minute : Low-voltage and low current type (symbol: O) Between discontinuous terminals, 600V AC, 50/60Hz, 1 minute Between each terminal and non-charging metal, and ground 1500V AC, 50/60Hz, 1 minute : Micro-pressure Switch, Compound-pressure Switch Between the same polarity terminals: 600V AC, 50/60Hz, 1 minute Between each terminal and non-charging metal, and ground 2000V AC, 50/60Hz, 1minute
Terminal Screws of Micro Switches	: SPDT M4 DPDT M3.5
Grounding Terminal	: M4
Allowable Medium Temperature	: Phosphor Bronze Bellows : -40°C to +120°C Stainless Steel Bellows : -40°C to +250°C Piston Actuator : -20°C to +120°C Diaphragm Actuator : -40°C to +80°C
Material of the Pressure Sensing Element	: Standard Bellows Actuator Bellows Phosphor Bronze Housing Steel (Nickel Plated) : Stainless Bellows Bellows SUS316L Housing SUS316L : Standard Piston Actuator Piston SUS420F Cylinder SUS316 Seal Material Viton*, Teflon* : Special Type Piston Actuator Piston SUS420F Cylinder SUS316 Seal Material Ethylene-propylene, Teflon* : SZ350PM, SZ500PM Piston SUS420F Cylinder SUS316 Seal Material Viton* : Diaphragm Actuator (Micro-Pressure Switch) Diaphragm Nitrile Rubber Housing Brass (Nickel Plated) O-ring Nitrile Rubber
Pressure Port Orifice	: Bellows Actuator 1.5 φ Except for the following 3 models Differential Pressure Switch, Vacuum-differential Pressure Switch, Compound-pressure Switch Piston Actuator 1 φ Diaphragm Actuator None
Temperature Drift	: Bellows Actuator Pressure Switch -20°C to +60°C ±1.5% of max range +60°C to +80°C ±2% of max range
Repeatability	: Standard Pressure Switch ±0.5% of max range (SZ350PM and SZ500PM are ±1% of max range) Differential Pressure Switch ±1% of max range
Drift	: Bellows Actuator Pressure Switch ±2% of max range
Durability	: More than 10 million cycles (when the pressure is set at the middle of the range, and it is to be activated within -20% of the lower limit and +20% of the higher limit that are based on the pressure).

* Viton and Teflon are the registered trademarks of DuPont.

How to order



Note: A pilot lamp can not be installed to the DPDT micro switch (type symbol: W).
 * Viton is the registered trademark of Du Pont.

- UL, CSA Approved and CCC Certified Products
 - ① When UL (Underwriter Laboratories) and CSA (Canadian Standard Association) are needed, add appendix of - X99 to the end of model numbers.
 Example: An approved of SZ010BS SZ010BS-X99
 - ② When CCC (China Compulsory Certificate system) is needed, add appendix of - C to the end of model numbers.
 Example: An certified of SZ010BS SZ010BS-C
 - ③ The following marks are shown on the name plate of the UL or CSA approved and CCC certified products.
 UL . . . CSA . . . (=) CCC . . .
 - ④ Pilot lamps for UL approved products.
 - (1) Wiring shown as WIRING DIAGRAM 3, 4 can not be made (refer to page 57).
 - (2) Since the lamp assembly has not been approved as a kit, a change to a model equipped with the pilot lamp can not be made in the field.
 - ⑤ UL and CSA approved products are not available for the micro-load type (symbol = O), sealed type (symbol = C) and DPDT type micro switches.
 - ⑥ CCC certified products is not available for the with pilot lamps.

Applicable options

Standard Types	Symbols for Options							
	S	E	L	L24	O	C	W	F
SZ001B	○	—	○	○	○	○	○	○
SZ002B	○	—	○	○	○	○	○	○
SZ006B	○	—	○	○	○	○	○	○
SZ010B	○	—	○	○	○	○	○	○
SZ025B	○	—	○	○	○	○	○	○
SZ035B	○	—	○	○	○	○	○	○
SZ050B	○	—	○	○	○	○	○	○
SZ115B	○	—	○	○	○	○	○	○
SZ032P	—	○	○	○	○	○	○	○
SZ070P	—	○	○	○	○	○	○	○
SZ210P	—	○	○	○	○	○	○	○
SZ400P	—	○	○	○	○	○	○	○
SZ635P	—	○	○	○	○	○	○	○
SZ350PM	—	—	—	—	—	—	—	—
SZ500PM	—	—	—	—	—	—	—	—
SZ-01BSV	○	—	○	○	○	○	○	○
SZ002BD	○	—	○	○	○	○	○	○
SZ006BD	○	—	○	○	○	○	○	○
SZ010BD	○	—	○	○	○	○	○	○
SZ025BD	○	—	○	○	○	○	○	○
SZ1/10BDC	○	—	○	○	—	○	—	○
SZ1/10BDW	○	—	—	—	—	—	○	○
SZ070PD	—	○	○	○	○	○	○	○
SZ210PD	—	○	○	○	○	○	○	○
SZ-01BSD	○	—	○	○	○	○	○	○
SZ1/4D	—	—	○	○	○	○	○	○
SZ1/5BF-X15	○	—	—	—	—	—	—	○
SZ2/5BF-X15	○	—	—	—	—	—	—	○
SZ3/5BF-X15	○	—	—	—	—	—	—	○
SZ001BR	—	—	○	○	○	○	○	○
SZ005BR	—	—	○	○	○	○	○	○
SZ009BR	—	—	○	○	○	○	○	○
SZ1/10BRF-X15	○	—	—	—	—	—	—	○

Pressure Switches (Bellows Actuator)

SZ□□□B (SPDT) / SZ□□□BW (DPDT)



Features

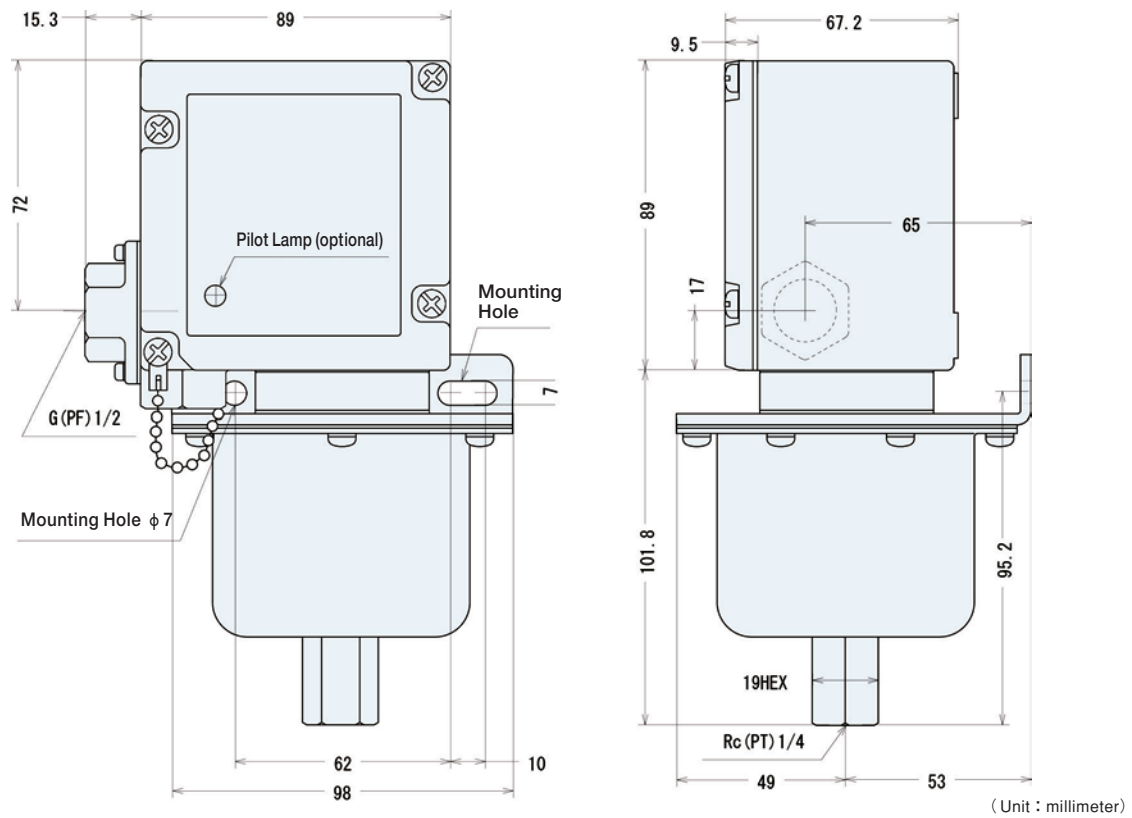
- A high quality phosphor bronze bellows is adopted as a pressure sensing element. It can be used for pressure medium such as air, oil and gases.
- When it is used for medium of causticity, water and steam, we recommend use SUS316L bellows actuator.
- The bellows actuated pressure switches are applicable to pressures from 0.003 to 11.5MPa ranges.
- The micro switch is selectable from a SPDT standard rating type, a micro-load type (for 24V DC), and a sealed type (environment resistance). In addition, a DPDT contact micro switch is also available. * Refer to page 56 for details.
- CCC, UL and CSA approved
(Please note that UL or CSA approved switches are not available for the devices equipped with a SPDT micro-load contact, a sealed contact and a DPDT contact. CCC certified switches is not available for the with pilot lamps.)

Type of Micro Switches	Models	Range MIN. : Minimum setting point of falling pressure. MAX. : Maximum setting point of rising pressure. MPa (kgf/cm ²) MIN. - MAX.	Differential (Dead Band) Add to the Range Value MPa (kgf/cm ²) MIN. - MAX.	Rated Pressure Maximum Pressure in Continuous Use MPa (kgf/cm ²)	Proof Pressure MPa (kgf/cm ²)
SPDT	SZ001B	0.003-0.1 (0.03-1)	0.003-0.02 (0.03-0.2)	0.1 (1)	0.15 (1.5)
	SZ002B	0.005-0.2 (0.05-2)	0.005-0.04 (0.05-0.4)	0.2 (2)	0.3 (3)
	SZ006B	0.005-0.6 (0.05-6)	0.02-0.1 (0.2-1)	0.6 (6)	0.9 (9)
	SZ010B	0.005-1 (0.05-10)	0.04-0.2 (0.4-2)	1 (10)	2 (20)
	SZ025B	0.03-2.5 (0.3-25)	0.1-0.5 (1-5)	2.5 (25)	4.2 (42)
	SZ035B	0.05-3.5 (0.5-35)	0.15-0.8 (1.5-8)	3.5 (35)	5.3 (53)
	SZ050B	0.1-5 (1-50)	0.35-0.9 (3.5-9)	5 (50)	14 (140)
	SZ115B	0.2-11.5 (2-115)	0.8-1.8 (8-18)	11.5 (115)	17.5 (175)
DPDT	SZ001BW	0.003-0.1 (0.03-1)	0.004-0.02 (0.04-0.2)	0.1 (1)	0.15 (1.5)
	SZ002BW	0.005-0.2 (0.05-2)	0.008-0.04 (0.08-0.4)	0.2 (2)	0.3 (3)
	SZ006BW	0.005-0.6 (0.05-6)	0.03-0.1 (0.3-1)	0.6 (6)	0.9 (9)
	SZ010BW	0.005-1 (0.05-10)	0.05-0.2 (0.5-2)	1 (10)	2 (20)
	SZ025BW	0.03-2.5 (0.3-25)	0.13-0.5 (1.3-5)	2.5 (25)	4.2 (42)
	SZ035BW	0.05-3.5 (0.5-35)	0.19-0.8 (1.9-8)	3.5 (35)	5.3 (53)
	SZ050BW	0.1-5 (1-50)	0.45-0.9 (4.5-9)	5 (50)	14 (140)
	SZ115BW	0.2-11.5 (2-115)	1-1.8 (10-18)	11.5 (115)	17.5 (175)

- Fixed differential (dead band) types are available for each model equipped with SPDT or DPDT micro switch.
- The differential (dead band) of the fixed differential (dead band) type is less than or equal to the minimum value of the adjustable differential (dead band) models.
- A SUS316L bellows is available for each model equipped with SPDT or DPDT micro switch.
- The set point must be within the range.

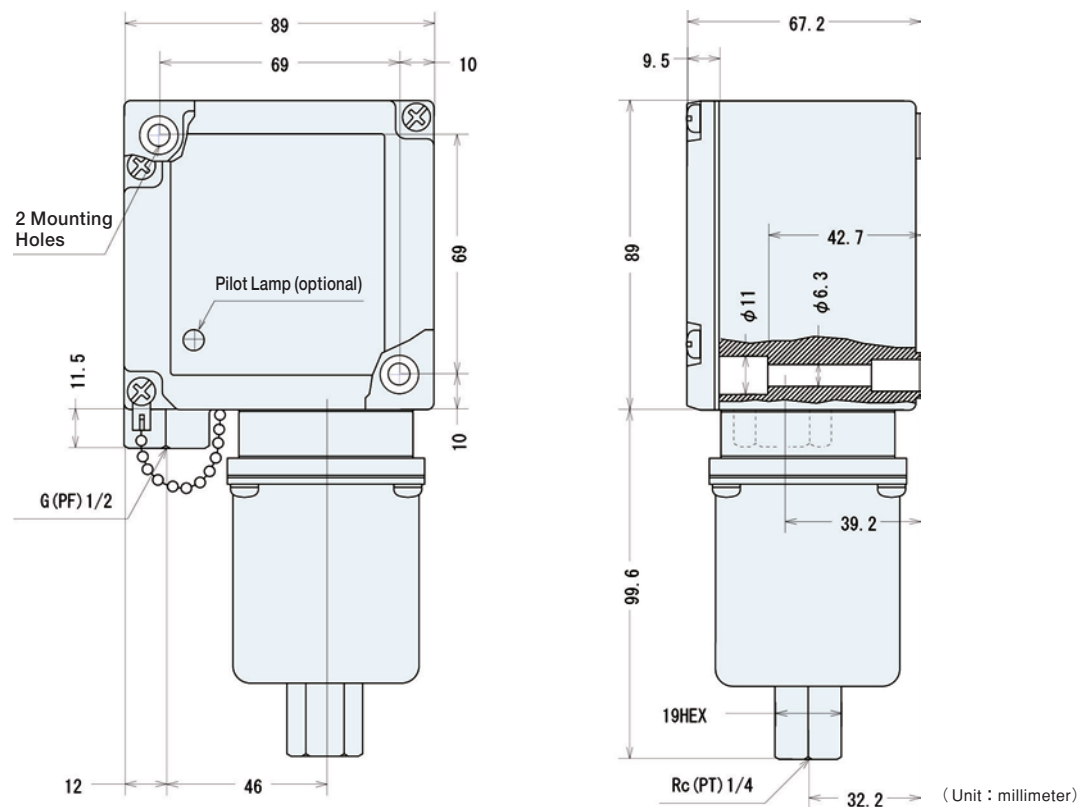
SZ001B/BS

Mass: approx. 1.38kg



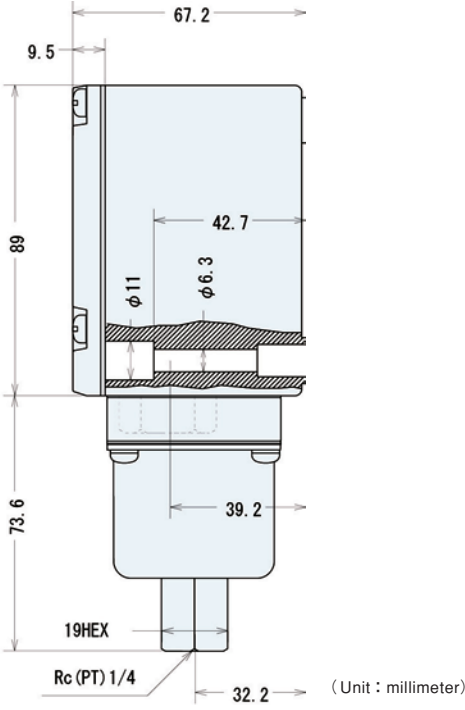
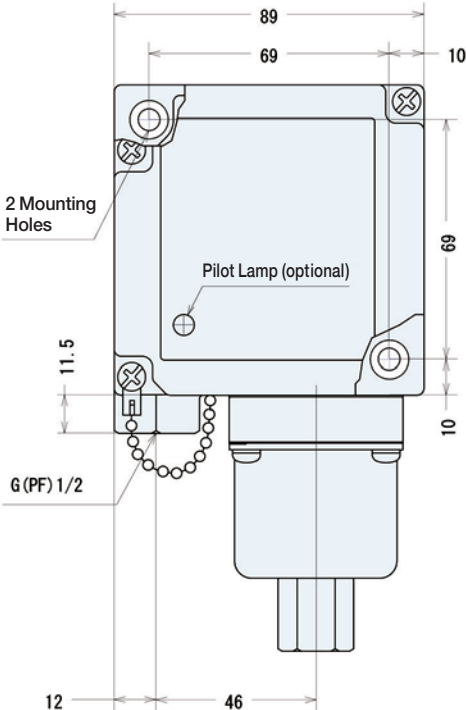
SZ002B/BS

Mass: approx. 1.08kg

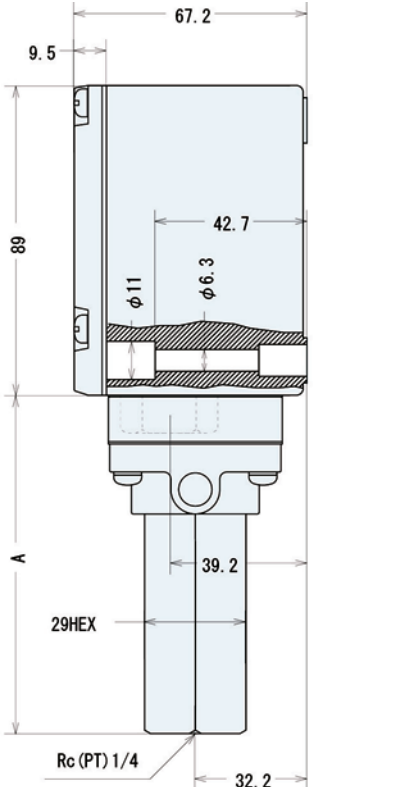
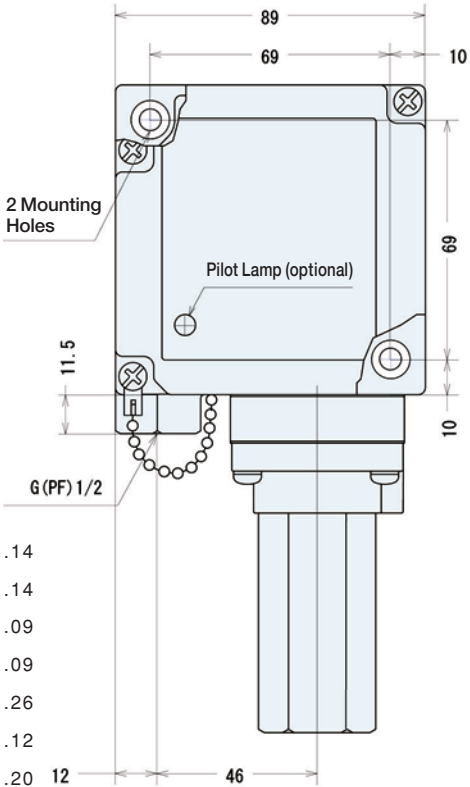


SZ006B / BS
SZ010B / BS

Mass : approx. 0.92kg



SZ025B / BS
SZ035B / BS
SZ050B / BS
SZ115B / BS



Type	A	Mass (kg)
SZ025B	95.4	Approx. 1.14
SZ035B	95.4	Approx. 1.14
SZ025BS	85.4	Approx. 1.09
SZ035BS	85.4	Approx. 1.09
SZ050B	125.4	Approx. 1.26
SZ050BS	104.4	Approx. 1.12
SZ115B	108	Approx. 1.20
SZ115BS	93	Approx. 1.16

Pressure Switches (Piston Actuator)

SZ□□□P、SZ□□□PM(SPDT) / SZ□□□PW(DPDT)



Features

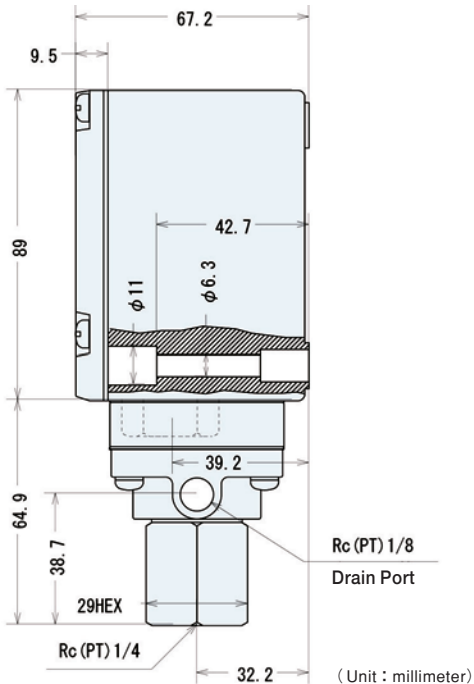
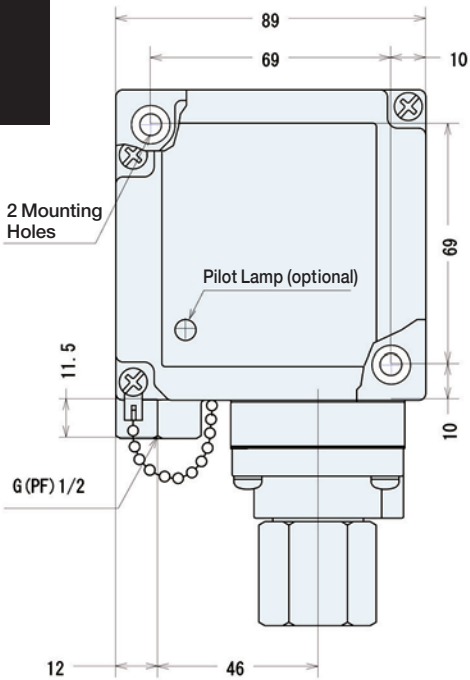
- Viton is adopted as a standard sealing material. That makes the piston actuated pressure switches can be used for not only oil but also for other medium that has lubricity to a certain degree (soluble oil). In addition, Ethylene Propylene Seal can be also selectable.
- We will prepare SZ□□□PM for which the medium besides the oil pressure can also use the high-pressure steam and water by the specific technology.
- The piston actuated pressure switches are applicable to pressure from 0.1 to 63.5 MPa ranges.
- The micro switch is selectable from a SPDT standard rating type, a micro-load type (for 24VDC), and sealed type (environment resistance). In addition, a DPDT contact micro switch is also available (SZ□□□PM is only C contact)
* Refer to page 56 for details.
- CCC, UL and CSA approved.
(Please note that UL or CSA approved switches are not available for the device equipped with a SPDT micro-load contact, a sealed contact, a DPDT contact and SZ□□□PM. CCC certified switches is not available for the with pilot lamps.)

Type of Micro Switches	Models	Range MIN. : Minimum setting point of falling pressure. MAX. : Maximum setting point of rising pressure. MPa (kgf/cm ²) MIN. - MAX.	Differential (Dead Band) * Add to the Range Value MPa (kgf/cm ²) MIN. - MAX.	Rated Pressure Maximum Pressure in Continuous use MPa (kgf/cm ²)	Proof Pressure MPa (kgf/cm ²)
SPDT	SZ032P	0.1-3.2 (1-32)	0.18-0.6 (1.8-6)	3.2 (32)	10 (100)
	SZ070P	0.2-7 (2-70)	0.28-1.3 (2.8-13)	7 (70)	35 (350)
	SZ210P	0.5-20.5 (5-205)	0.7-3.8 (7-38)	20.5 (205)	70 (700)
	SZ400P	1-40 (10-400)	1.5-7.5 (15-75)	40 (400)	70 (700)
	SZ635P	2-63.5 (20-635)	2.5-12 (25-120)	63.5 (635)	120 (1200)
DPDT	SZ032PW	0.1-3.2 (1-32)	0.22-0.6 (2.2-6)	3.2 (32)	10 (100)
	SZ070PW	0.2-7 (2-70)	0.34-1.3 (3.4-13)	7 (70)	35 (350)
	SZ210PW	0.5-20.5 (5-205)	0.85-3.8 (8.5-38)	20.5 (205)	70 (700)
	SZ400PW	1-40 (10-400)	1.8-7.5 (18-75)	40 (400)	70 (700)
	SZ635PW	2-63.5 (20-635)	3-12 (30-120)	63.5 (635)	120 (1200)
SPDT * (C contact only)	SZ350PM	1-35 (10-350)	1.5-2 (15-20)	40 (400)	70 (700)
	SZ500PM	2-50 (20-500)	2-2.5 (20-25)	63 (630)	100 (1000)

- Fixed differential (dead band) types are available for each model equipped with SPDT or DPDT micro switch.
- The differential (dead band) of the fixed differential (dead band) type is less than or equal to the minimum value of the adjustable differential (dead band) models.
- The minimum differential (dead band) indicates a value at approximately in-between of the range. Because of the sealed piston, the differential (dead band) tends to be rather smaller at lower pressure and rather wider at higher pressure than the represented value (* refer to the list on the next page).
- A PT 1/8 drain port is equipped on the side of the body so that the pressure switch is used with piping for drains beforehand, in an environment that will not allow even a small amount of seepage. The drain port must be opened to the atmospheric pressure.
- The set point must be within the range.
- * Only SPDT (C contact) is available. In addition, the differential (dead band) is not adjustable. It is fixed within the range of indicated value.

**SZ032P
SZ070P
SZ210P
SZ400P
SZ635P**

Mass : approx. 1.03kg

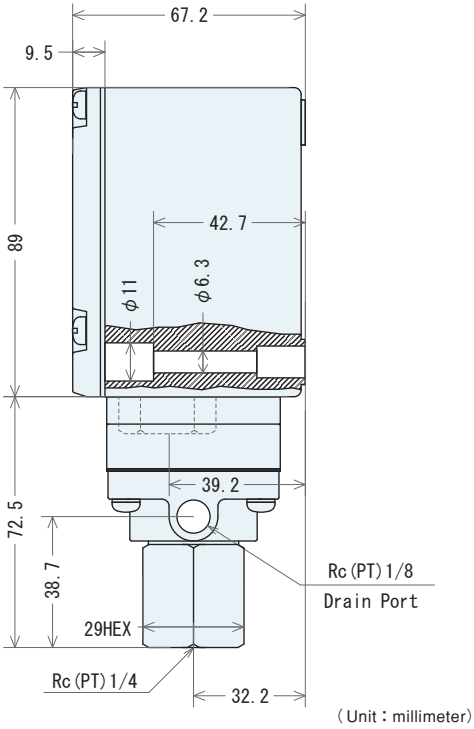
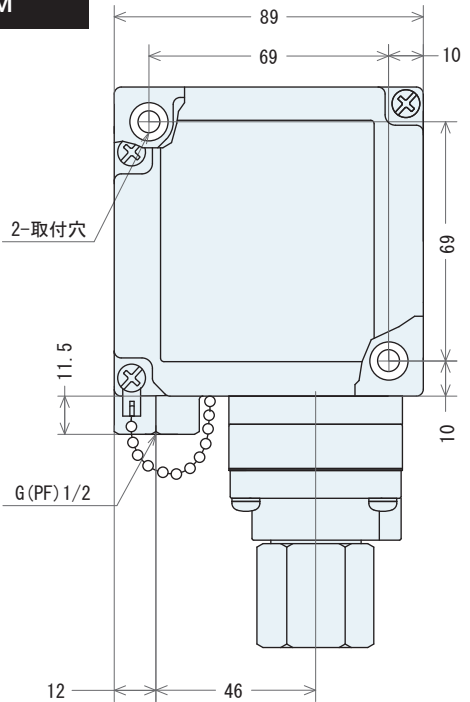


* An example of the minimum differential (dead band) is shown on the right as a guide.

Models	Minimum Differential (Dead Band) MPa (kgf/cm ²)
SZ032P (SPDT)	0.25 (2.5)
SZ070P (SPDT)	0.3 (3)
SZ210P (SPDT)	1.2 (12)
SZ400P (SPDT)	1.8 (18)
SZ635P (SPDT)	3 (30)

**SZ350PM
SZ500PM**

Mass : approx. 1.03kg



Vacuum Switches

SZ-01BSV / SZ-01BSVW



Features

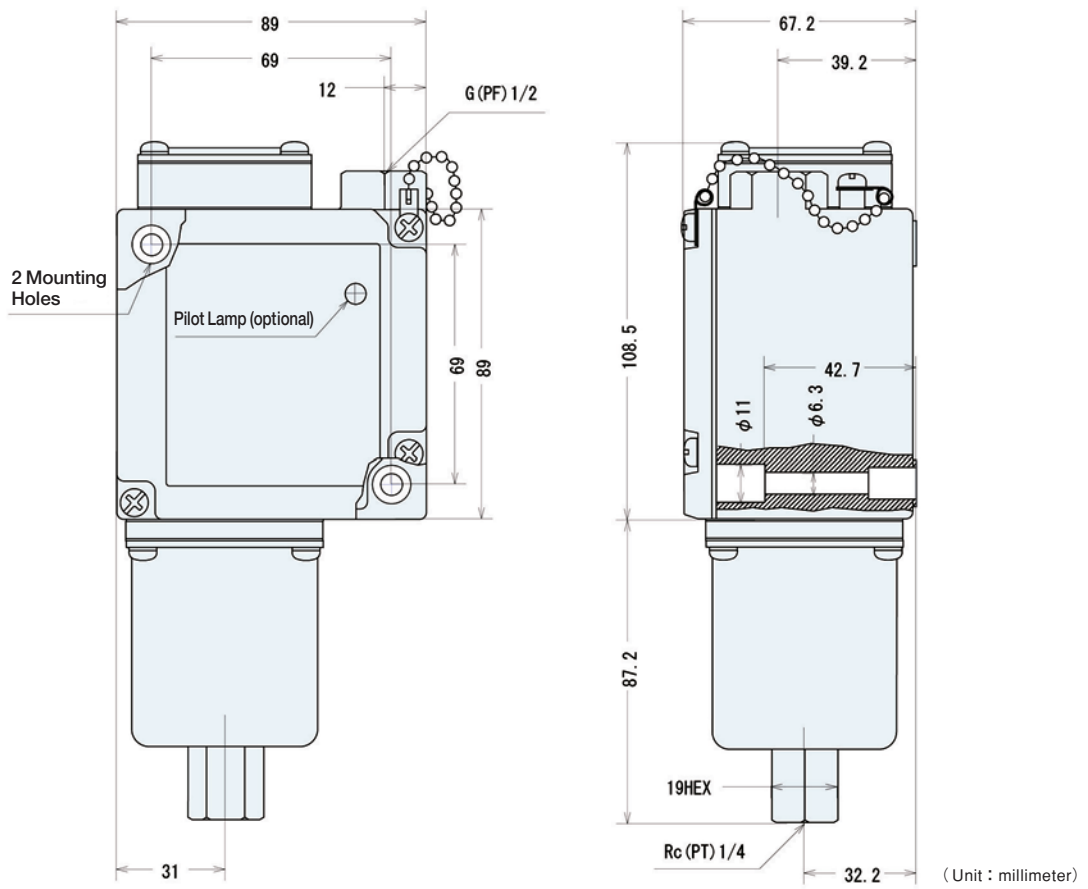
- Adopting a SUS316L bellows as a pressure sensing element realizes highly accurate response to vacuum.
- The vacuum switches are applicable to vacuum pressures range from 2.7kPaVac to 100 kPaVac. The proof pressure of the positive pressure side is 150kPa.
- The micro switch is selectable from a SPDT standard rating type, a micro-load type (for 24V DC), and a sealed type (environment resistance). In addition, a DPDT contact micro switch is also available. * Refer to page 56 for details.
- CCC, UL and CSA approved
(Please note that UL or CSA approved switches are not available for the devices equipped with a SPDT micro-load contact, a sealed contact and a DPDT contact. CCC certified switches is not available for the with pilot lamps.)

Type of Micro Switches	Models	Range MIN. : Minimum setting point of falling vacuum pressure. MAX. : Maximum setting point of rising vacuum pressure. kPaVac (mmHgV) MIN. - MAX.	Differential (Dead Band) The switch is activated on increasing vacuum pressure. kPaVac (mmHgV) MIN. - MAX.	Rated Pressure Maximum Pressure in Continuous Use kPaVac (mmHgV)	Proof Pressure (Positive Pressure) kPa (kgf/cm ²)
SPDT	SZ-01BSV	2.7-100 (20-760)	3.3-33 (25-250)	100 (760)	150 (1.5)
DPDT	SZ-01BSVW	2.7-100 (20-760)	3.3-33 (25-250)	100 (760)	150 (1.5)

- Fixed differential (dead band) models are available for each type equipped with SPDT or DPDT micro switch.
- The differential (dead band) of the fixed differential (dead band) type is less than or equal to the minimum value of the adjustable differential (dead band) models.
- Only stainless steel bellows is available.
- The set point must be within the range.

SZ-01BSV

Mass : approx. 1.08kg



Differential Pressure Switches (Bellows Actuator)

SZ□□□BD、SZ1/10BDC (SPDT) / SZ□□□BDW (DPDT)



Features

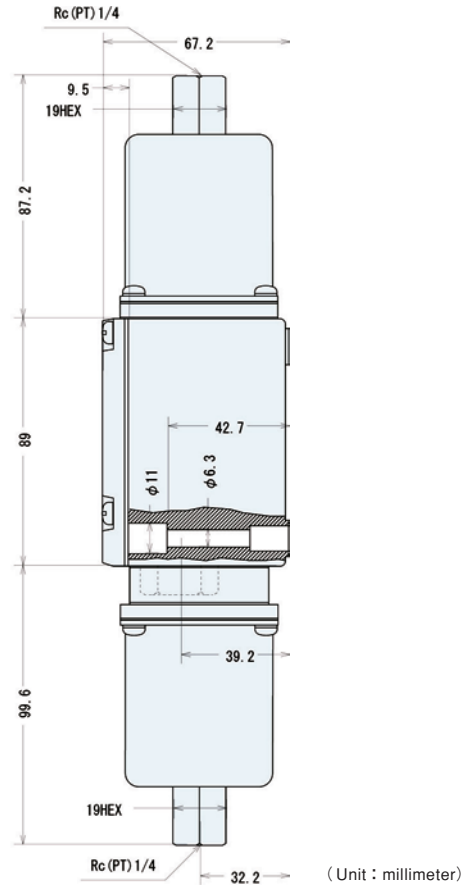
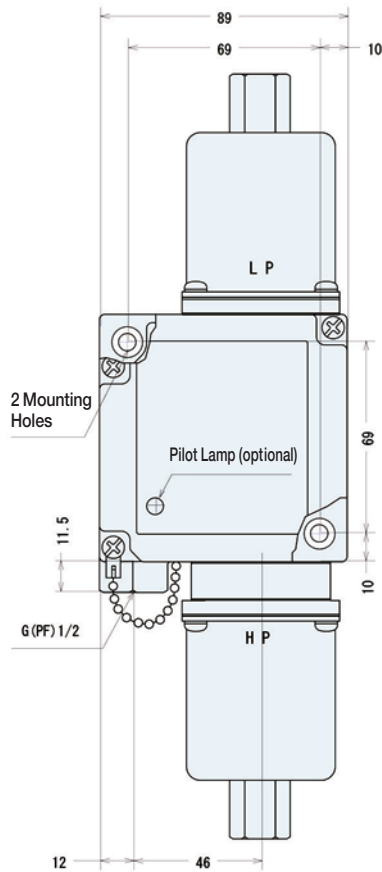
- The differential pressure switch detects pressure difference between two pressures. Not only the differential pressure but also the dead band of the switch can be set.
- A high quality phosphor bronze bellows is adopted as a pressure sensing element. It can be used for pressure medium such as air, oil and gases.
- When it is used for medium of causticity, water and steam, we recommend use SUS316L bellows actuator.
- The differential pressure switches are applicable to the range from 0.0002 to 2.5MPa.
- The micro switch is selectable from a SPDT standard rating type, a micro-load type (for 24V DC), and a sealed type (environment resistance). In addition, a DPDT contact micro switch is also available. * Refer to page 56 for details.
- CCC, UL and CSA approved (Please note that UL or CSA approved switches are not available for the devices equipped with a SPDT micro-load contact, a sealed contact and a DPDT contact. CCC certified switches is not available for the with pilot lamps.)

Type of Micro Switches	Models	Range MPa (kgf/cm ²) MIN. - MAX.	Sensitivity (Dead Band) The switch is activated on increasing pressure difference. MPa (kgf/cm ²) MIN. - MAX.	Range of Adjustable Difference The switch is reset on decreasing pressure difference. MPa (kgf/cm ²) MIN. - MAX.	Rated Pressure Maximum Pressure in Continuous Use MPa (kgf/cm ²)	Proof Pressure MPa (kgf/cm ²)
SPDT	SZ002BD	0.005-0.2 (0.05-2)	0.005-0.04 (0.05-0.4)	0-0.2 (0-2)	0.2 (2)	0.3 (3)
	SZ006BD	0.005-0.6 (0.05-6)	0.02-0.1 (0.2-1)	0-0.6 (0-6)	0.6 (6)	0.9 (9)
	SZ010BD	0.005-1 (0.05-10)	0.04-0.2 (0.4-2)	0-1 (0-10)	1 (10)	2 (20)
	SZ025BD	0.03-2.5 (0.3-25)	0.14-0.5 (1.4-5)	0-2.5 (0-25)	2.5 (25)	4.2 (42)
	SZ1/10BDC *	0.0002-0.05 (0.002-0.5)	0.0012-0.005 (0.012-0.05)	0-0.01 (0-0.1)	0.05 (0.5)	0.15 (1.5)
DPDT	SZ002BDW	0.005-0.2 (0.05-2)	0.005-0.04 (0.05-0.4)	0-0.2 (0-2)	0.2 (2)	0.3 (3)
	SZ006BDW	0.005-0.6 (0.05-6)	0.02-0.1 (0.2-1)	0-0.6 (0-6)	0.6 (6)	0.9 (9)
	SZ010BDW	0.005-1 (0.05-10)	0.04-0.2 (0.4-2)	0-1 (0-10)	1 (10)	2 (20)
	SZ025BDW	0.03-2.5 (0.3-25)	0.14-0.5 (1.4-5)	0-2.5 (0-25)	2.5 (25)	4.2 (42)
	SZ1/10BDW	0.0002-0.05 (0.002-0.5)	0.0016-0.005 (0.016-0.05)	0-0.01 (0-0.1)	0.05 (0.5)	0.15 (1.5)

- Fixed sensitivity (dead band) types are available for each model equipped with SPDT or DPDT micro switch.
- The sensitivity (dead band) of the fixed sensitivity (dead band) model is less than or equal to the minimum value of the adjustable sensitivity (dead band) models.
- A SUS316L bellows is selectable for each model equipped with SPDT or DPDT micro switch.
- UL or CSA approved devices are not available for SZ1/10BDC, SZ002BDW, SZ006BDW, SZ010BDW, SZ025BDW and SZ1/10BDW.
- The set point must be within the range.
- * Only a sealed type micro switch is available.

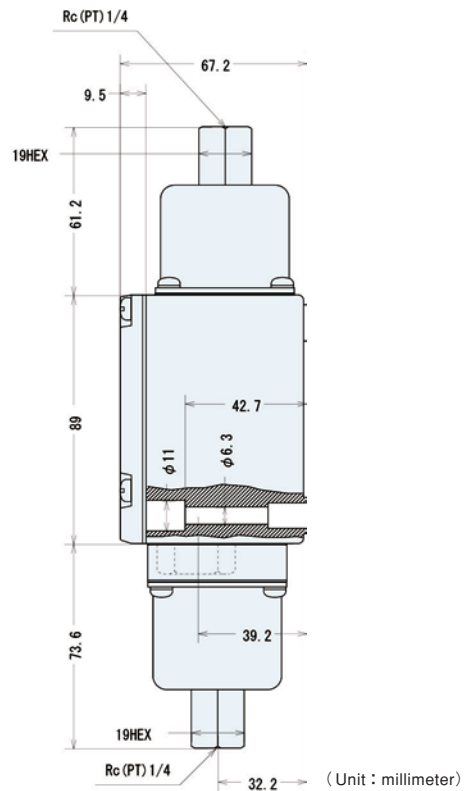
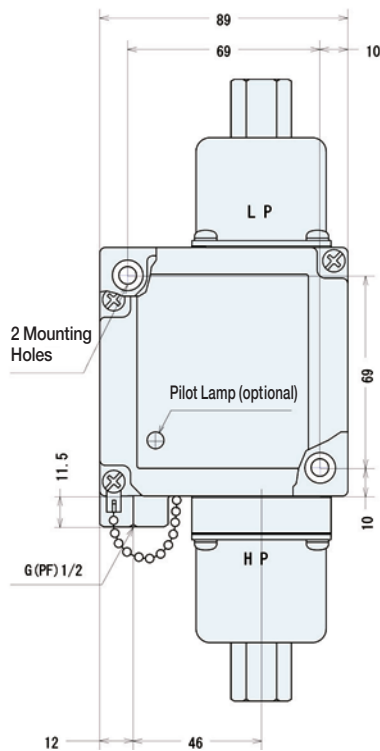
SZ002BD / BSD

Mass : approx. 1.45kg



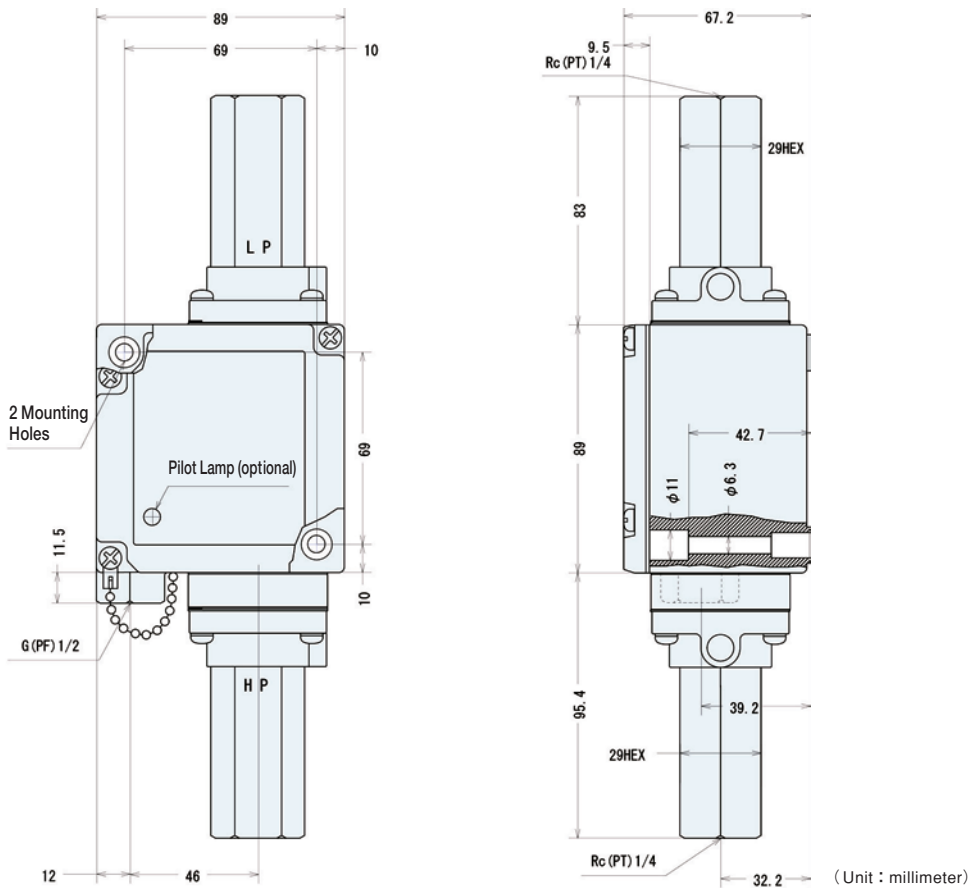
SZ006BD / BSD SZ010BD / BSD

Mass : approx. 1.12kg



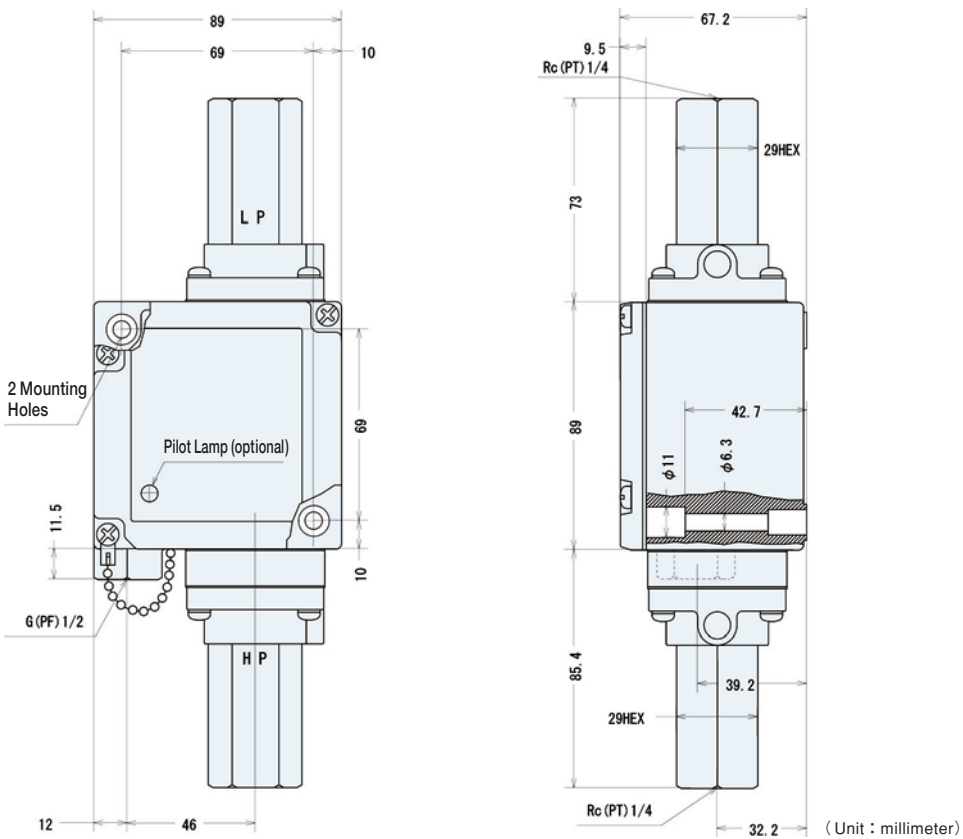
SZ025BD

Mass : approx. 1.55kg



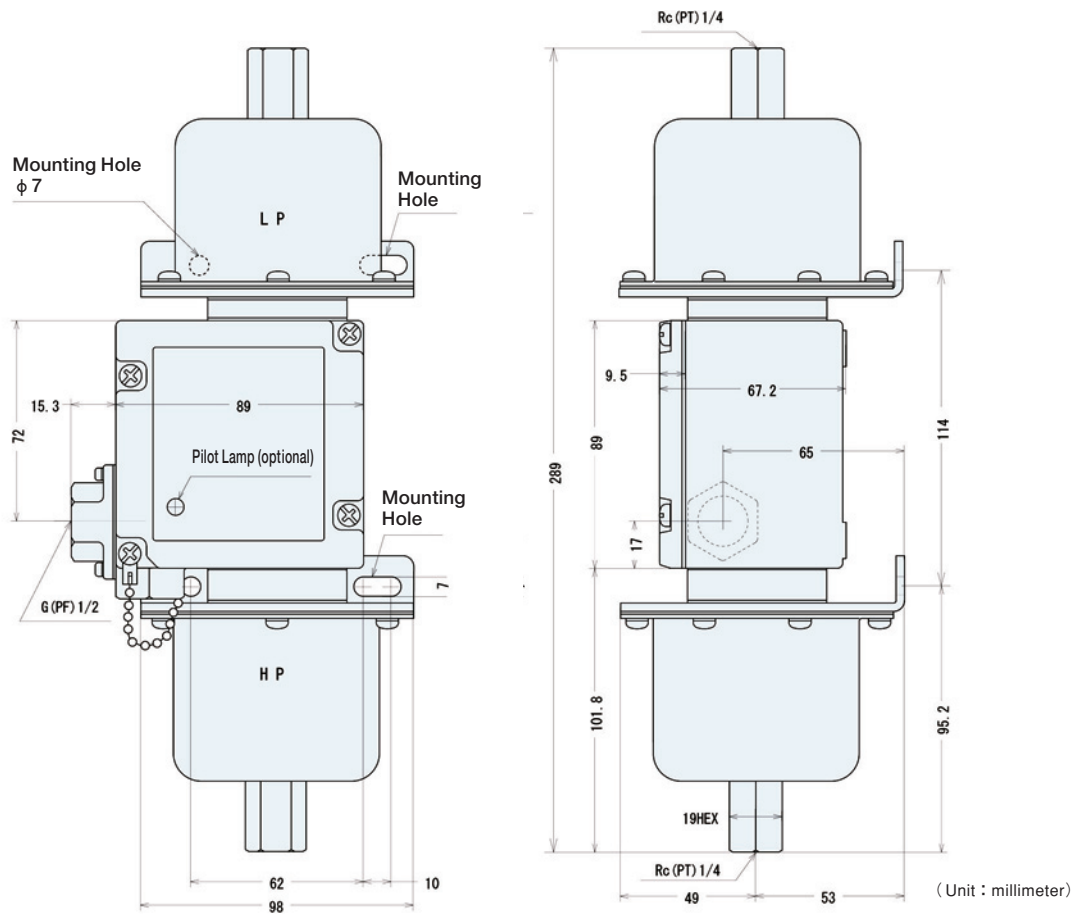
SZ025BSD

Mass : approx. 1.55kg



SZ1/10BDC / BSDC

Mass : approx. 2.15kg



Differential Pressure Switches (Piston Actuator)

SZ□□□PD (SPDT) / SZ□□□PDW (DPDT)



Features

- The differential pressure switch detects pressure difference between two pressures. Not only differential pressure but also dead band of the switch can be set.
- A piston made of SUS420F is adopted, which is suitable for oil pressure. An ethylene-propylene sealed piston can be selected.
- The differential pressure switches are applicable to the range from 0.2 to 20.5MPa.
- The micro switch is selectable from a SPDT standard rating type, a micro-load type (for 24V DC), and a sealed type (environment resistance). In addition, a DPDT contact micro switch is also available. * Refer to page 56 for details.
- CCC, UL and CSA approved (Please note that UL or CSA approved switches are not available for the devices equipped with a SPDT micro-load contact, a sealed contact and a DPDT contact. CCC certified switches is not available for the with pilot lamps.)

Type of Micro Switches	Models	Range MPa (kgf/cm ²) MIN. - MAX.	Sensitivity (Dead Band) * The switch is activated on increasing pressure difference. MPa (kgf/cm ²) MIN. - MAX.	Range of Adjustable Difference The switch is reset on decreasing pressure difference. MPa (kgf/cm ²) MIN. - MAX.	Rated Pressure Maximum Pressure in Continuous Use MPa (kgf/cm ²)	Proof Pressure MPa (kgf/cm ²)
SPDT	SZ070PD	0.2-7 (2-70)	0.3-1.3 (3-13)	0-7 (0-70)	7 (70)	35 (350)
	SZ210PD	0.5-20.5 (5-205)	0.7-3.8 (7-38)	0-20.5 (0-205)	20.5 (205)	70 (700)
DPDT	SZ070PDW	0.2-7 (2-70)	0.3-1.3 (3-13)	0-7 (0-70)	7 (70)	35 (350)
	SZ210PDW	0.5-20.5 (5-205)	0.7-3.8 (7-38)	0-20.5 (0-205)	20.5 (205)	70 (700)

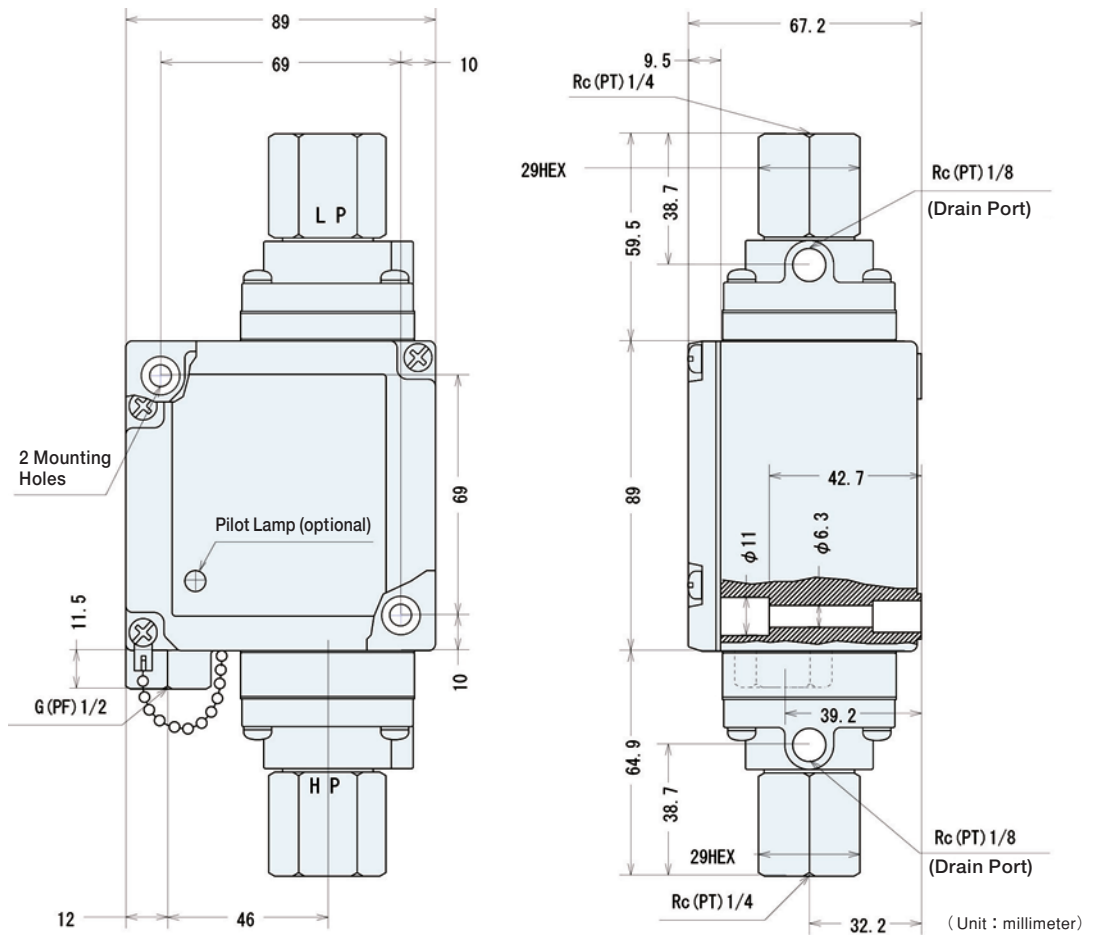
- Fixed sensitivity (dead band) types are available for each model equipped with SPDT or DPDT micro switch.
- The sensitivity (dead band) of the fixed sensitivity (dead band) type is less than or equal to the minimum value of the adjustable sensitivity (dead band) models.
- Two PT 1/8 drain ports are equipped on the both sides of the body so that the differential pressure switch is used with piping for drains beforehand, in an environment that will not allow even a small amount of seepage. The drain ports must be opened to the atmospheric pressure.
- The set point must be within the range.

* The minimum sensitivity (dead band) of these two switches that adopt the sealed piston method varies according to activation differential pressures as shown in the below list.

Models	Minimum Sensitivity (Dead Band) MPa (kgf/cm ²)		
	Low Range	Middle Range	High Range
SZ070PD	0.3 (3)	0.4 (4)	0.6 (6)
SZ210PD	0.6 (6)	0.9 (9)	1.2 (12)

SZ070PD / PED
SZ210PD / PED

Mass : approx. 1.40kg



Vacuum-Differential Pressure Switches

SZ-01BSD (SPDT) / SZ-01BSDW (DPDT)



Features

- The vacuum-differential pressure switch detects pressure difference between two pressures within vacuum range.
- A SUS316L bellows is adopted as a pressure sensing element.
- The vacuum-differential pressure switches are applicable to vacuum pressures range from 2.7kPaVac to 100kPaVac. The proof pressure of the positive pressure side is 150kPa.
- The micro switch is selectable from a SPDT standard rating type, a micro-load type (for 24V DC), and a sealed type (environment resistance). In addition, a DPDT contact micro switch is also available. * Refer to page 56 for details.
- CCC approved

Type of Micro Switches	Models	Range kPaVac (mmHgV)	Sensitivity (Dead Band) The switch is activated on increasing differential pressure. kPaVac (mmHgV)	Differential Pressure Range The switch is reset on decreasing differential pressure. kPaVac (mmHgV)	Rated Pressure Maximum Pressure in Continuous Use, kPaVac (mmHgV)	Proof Pressure (Positive Pressure) kPa (kgf/cm ²)
		MIN. - MAX.	MIN. - MAX.	MIN. - MAX.		
SPDT	SZ-01BSD	2.7-100 (20-760)	3.3-15 (25-112)	0-40 (0-300)	100 (760)	150 (1.5)
DPDT	SZ-01BSDW	2.7-100 (20-760)	3.3-15 (25-112)	0-40 (0-300)	100 (760)	150 (1.5)

- Fixed sensitivity (dead band) models are available for each type equipped with SPDT or DPDT micro switch.
- The sensitivity (dead band) of the fixed sensitivity (dead band) type is less than or equal to the minimum value of the adjustable sensitivity (dead band) models.
- Only stainless steel bellows is available.
- The set point must be within the range.

Low Pressure Switches (Diaphragm Actuator)

SZ1/4D (SPDT) / SZ1/4DW (DPDT)



Features

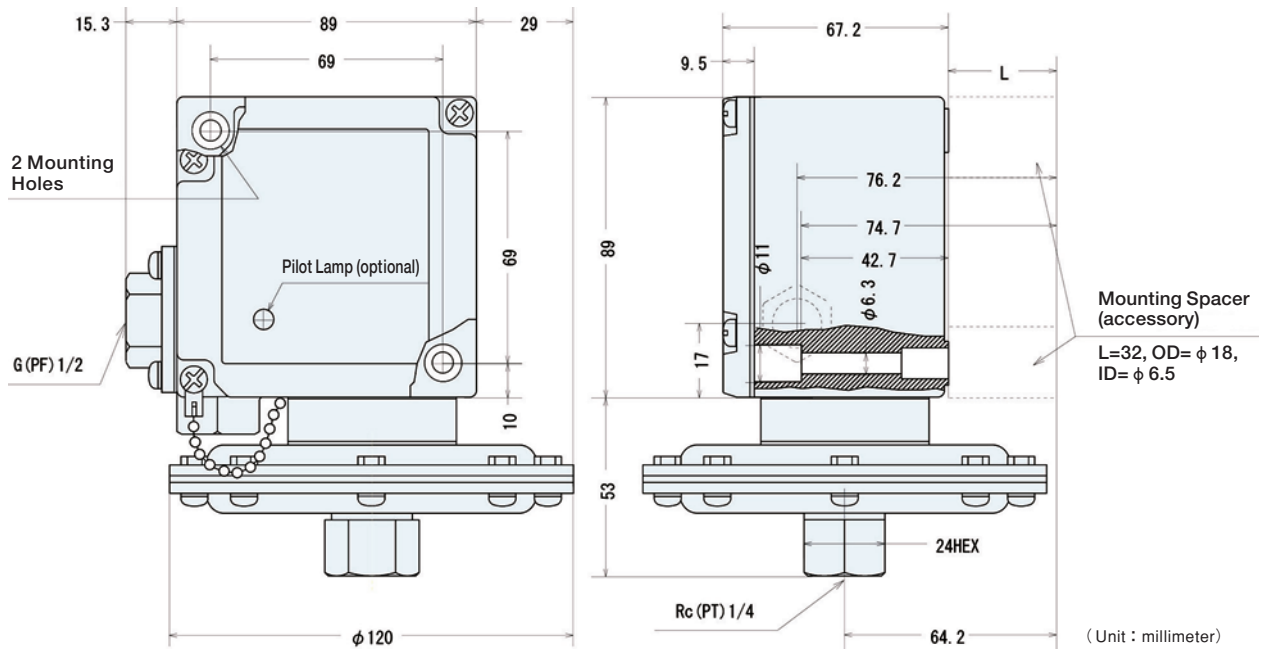
- The low pressure switches can be used within very low range of 3 to 25kPa.
- A nitrile rubber is adopted as a pressure sensing element.
- The low pressure switches can be used for various pressure medium such as air, water, oil, gases and steam.
- The micro switch is selectable from a SPDT standard rating type, a micro-load type (for 24V DC), and a sealed type (environment resistance). In addition, a DPDT contact micro switch is also available. * Refer to page 56 for details.
- CCC approved
(Please note that CCC certified switches is not available for the with pilot lamps).

Type of Micro Switches	Models	Range MIN. : Minimum setting point of falling pressure. MAX. : Maximum setting point of rising pressure. kPa (kgf/cm ²) MIN. - MAX.	Differential (Dead Band) Add to the Range Value kPa (kgf/cm ²) MIN. - MAX.	Rated Pressure Maximum Pressure in Continuous Use kPa (kgf/cm ²)	Proof Pressure kPa (kgf/cm ²)
SPDT	SZ1/4D	3-25 (0.03-0.25)	1.5-9 (0.015-0.09)	25 (0.25)	300 (3)
DPDT	SZ1/4DW	3-25 (0.03-0.25)	2-9 (0.02-0.09)	25 (0.25)	300 (3)

- Fixed differential (dead band) models are available for each type equipped with SPDT or DPDT micro switch.
- The differential (dead band) of the fixed differential (dead band) type is less than or equal to the minimum value of the adjustable differential (dead band) models.
- The set point must be within the range.

SZ1/4D

Mass : approx. 1.87kg



Low Pressure Switches (Bellows Actuator)

SZ□□□BF-X15 (SPDT)



Features

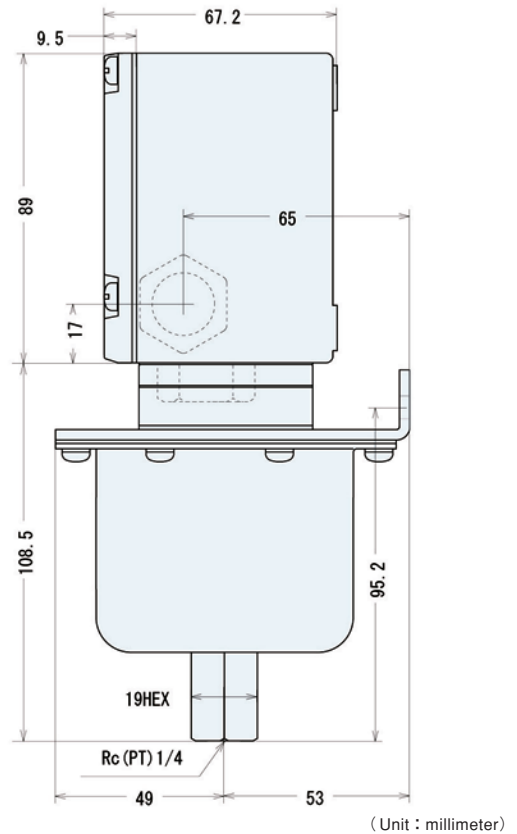
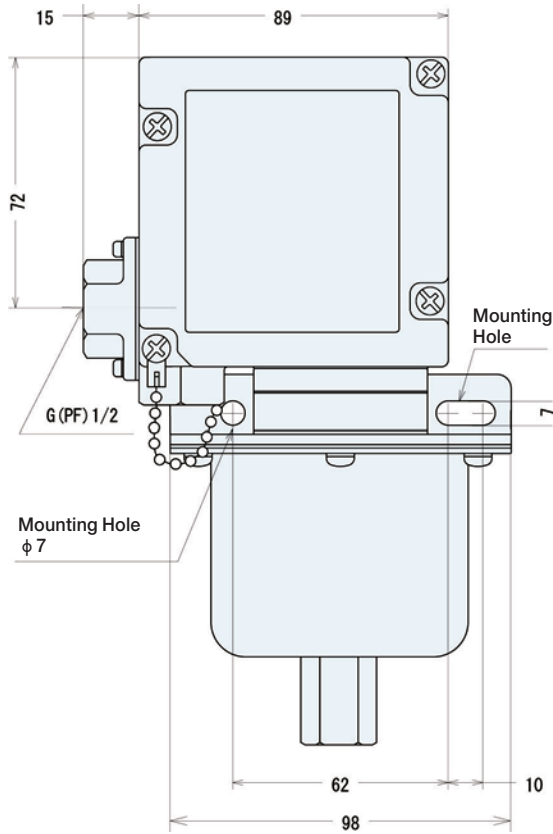
- The low pressure switches adapt to very small differential (dead band) within a very low pressure range.
- The high proof pressure of the switch assures you to use the switch with reassurance at any time.
- A high quality phosphor bellows is adopted as a pressure sensing element.
- The low pressure switches can be used for various pressure medium such as air, water, oil, gases and steam.
- The low pressure switches are applicable to the range from 0.5 to 60kPa.
- CCC approved

Type of Micro Switches	Models	Range MIN. : Minimum setting point of falling pressure. MAX. : Maximum setting point of rising pressure. kPa (kgf/cm ²) MIN. - MAX.	Differential (Dead Band) Add to the Range Value kPa (kgf/cm ²)	Rated Pressure Maximum Pressure in Continuous Use kPa (kgf/cm ²)	Proof Pressure kPa (kgf/cm ²)
SPDT (C contact only)	SZ1/5BF-X15	0.5-20 (0.005-0.2)	0.7 (0.007)	20 (0.2)	150 (1.5)
	SZ2/5BF-X15	1-40 (0.01-0.4)	1.2 (0.012)	40 (0.4)	300 (3)
	SZ3/5BF-X15	2-60 (0.02-0.6)	2.0 (0.02)	60 (0.6)	900 (9)

- The differential (dead band) is not adjustable. It is fixed less than of indicated value.
- Only SPDT (C contact) micro switch is available.
- An optional pilot lamp can not be equipped.
- A SUS316L bellows is also available.
- The set point must be within the range.

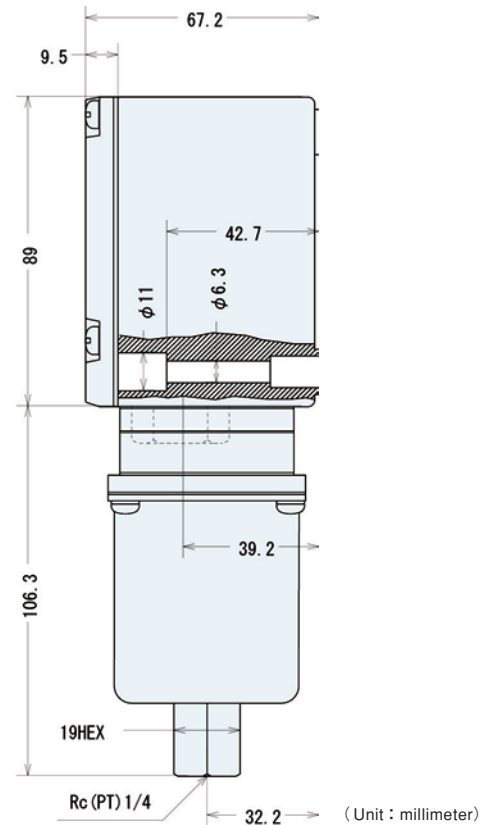
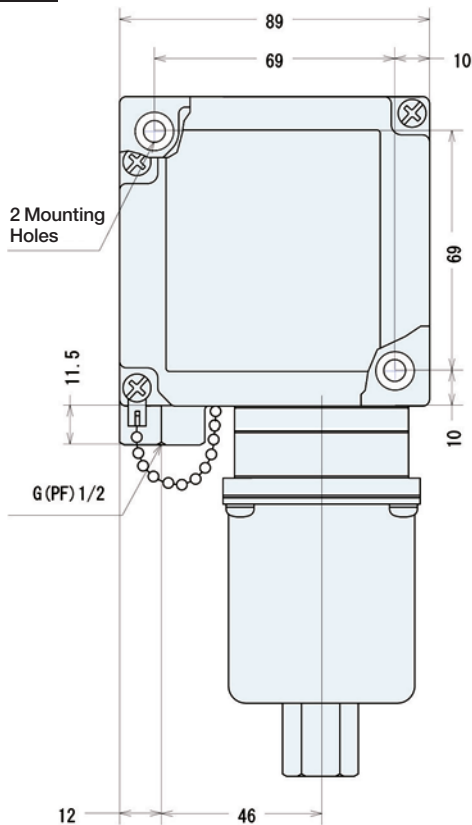
SZ1/5BF-X15
SZ1/5BSF-X15

Mass : approx. 1.50kg



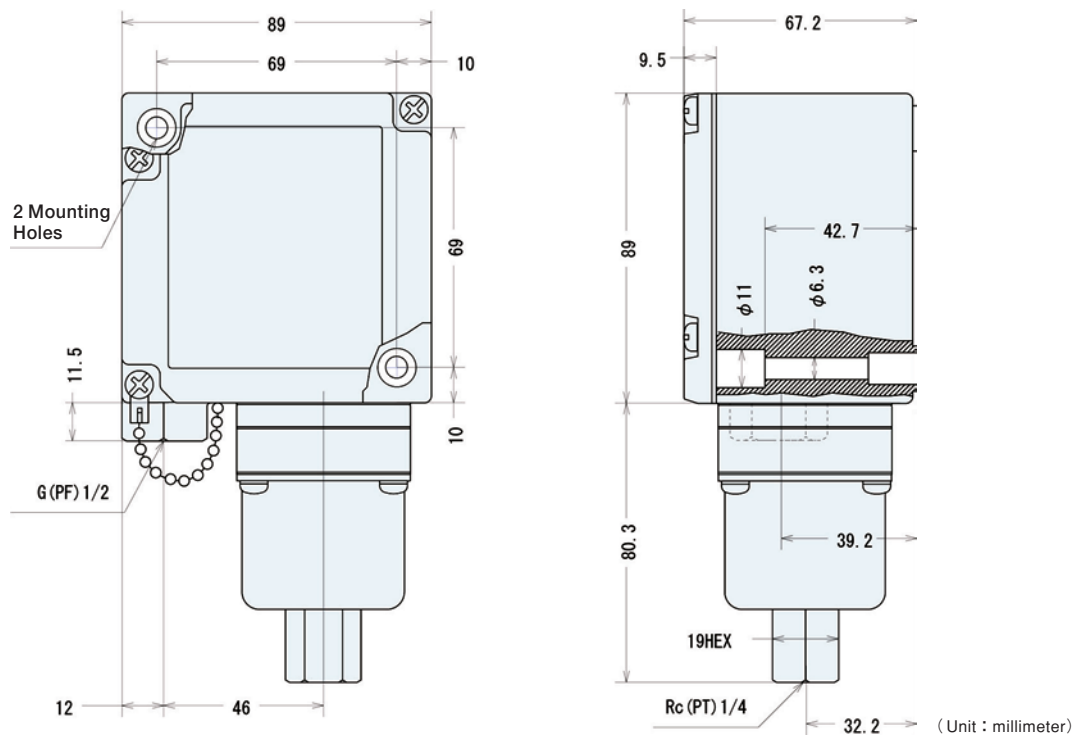
SZ2/5BF-X15
SZ2/5BSF-X15

Mass : approx. 1.10kg



SZ3/5BF-X15
SZ3/5BSF-X15

Mass : approx. 1.00kg



Compound-Pressure Switches

SZ□□□BR、SZ1/10BRF-X15 (SPDT) / SZ□□□BRW (DPDT)



Features

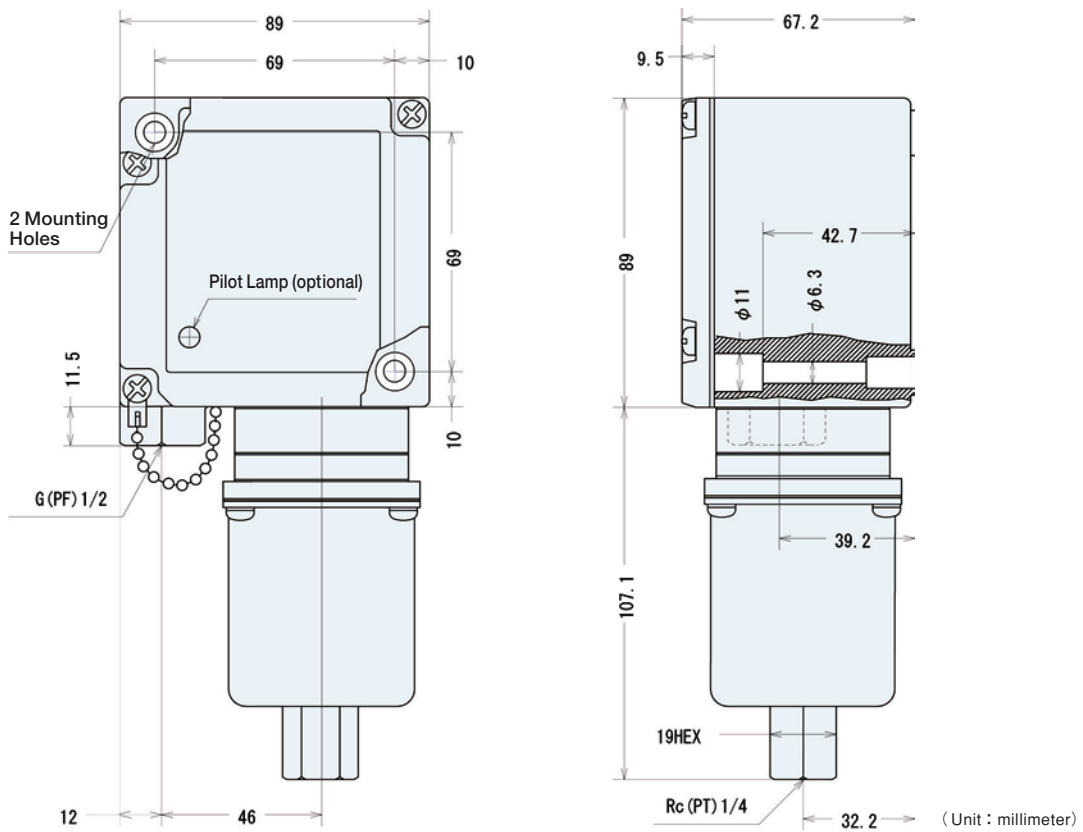
- The compound-pressure switches can be used from a vacuum range to a positive pressure range. They can be set within vacuum range only, from vacuum to positive pressure ranges, or positive pressure range only.
- The atmospheric pressure (gauge pressure = 0) can be also set.
- A high quality phosphor bellows is adopted as a pressure sensing element.
- The compound-pressure switches can be used for various pressure medium such as air, water, oil, gases and steam.
- CCC approved
(Please note that CCC certified switches is not available for the with pilot lamps).

Type of Micro Switches	Models	Range MIN. : Minimum setting point of falling pressure. MAX. : Maximum setting point of rising pressure. MIN. - MAX.	Differential (Dead Band) Add to the Range Value kPa (kgf/cm ²) MIN. - MAX.	Rated Pressure Maximum Pressure in Continuous Use	Proof Pressure kPa (kgf/cm ²)
SPDT	SZ001BR	80kPaVac-100kPa (600mmHgV-1kgf/cm ²)	9-40 (0.09-0.4)	100kPaVac-100kPa (760mmHgV-1kgf/cm ²)	300 (3)
	SZ005BR	73kPaVac-500kPa (550mmHgV-5kgf/cm ²)	20-100 (0.2-1)	100kPaVac-500kPa (760mmHgV-5kgf/cm ²)	900 (9)
	SZ009BR	67kPaVac-900kPa (500mmHgV-9kgf/cm ²)	40-200 (0.4-2)	100kPaVac-900kPa (760mmHgV-9kgf/cm ²)	2000 (20)
	SZ1/10BRF-X15 *	10kPaVac-10kPa (76mmHgV-0.1kgf/cm ²)	0.49 (0.0049)	10kPaVac-10kPa (76mmHgV-0.1kgf/cm ²)	150 (1.5)
DPDT	SZ001BRW	80kPaVac-100kPa (600mmHgV-1kgf/cm ²)	10-40 (0.1-0.4)	100kPaVac-100kPa (760mmHgV-1kgf/cm ²)	300 (3)
	SZ005BRW	73kPaVac-500kPa (550mmHgV-5kgf/cm ²)	30-100 (0.3-1)	100kPaVac-500kPa (760mmHgV-5kgf/cm ²)	900 (9)
	SZ009BRW	67kPaVac-900kPa (500mmHgV-9kgf/cm ²)	50-200 (0.5-2)	100kPaVac-900kPa (760mmHgV-9kgf/cm ²)	2000 (20)

- Fixed differential (dead band) types are available for each model equipped with SPDT or DPDT micro switch.
 - The differential (dead band) of the fixed differential (dead band) type is less than or equal to the minimum value of the adjustable differential (dead band) models.
 - A SUS316L bellows is available for SZ1/10BRF-X15 only.
 - The set point must be within the range.
- * Only SPDT (C contact) is available. An optional pilot lamp can not be equipped.

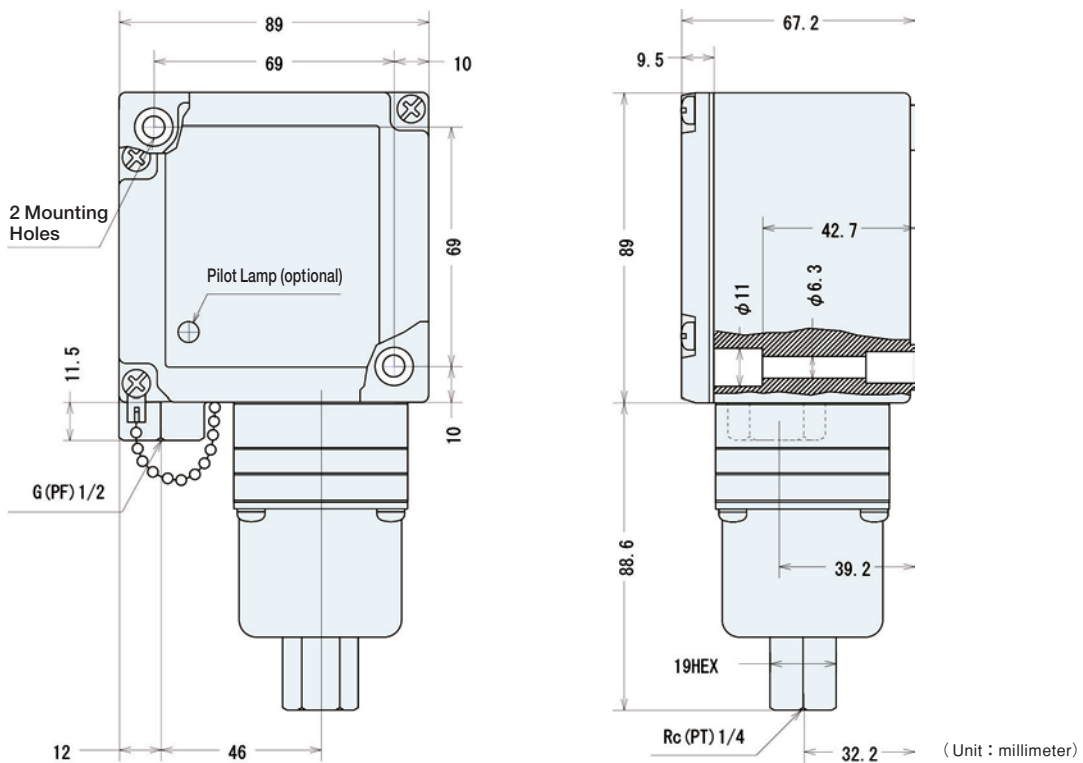
SZ001BR

Mass : approx. 1.33kg



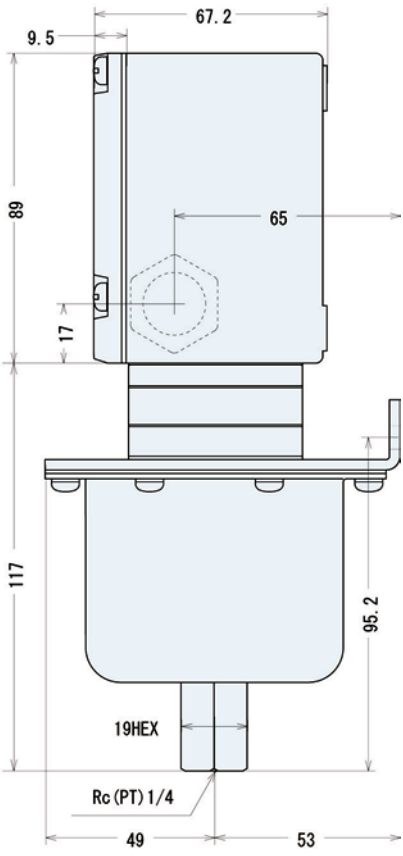
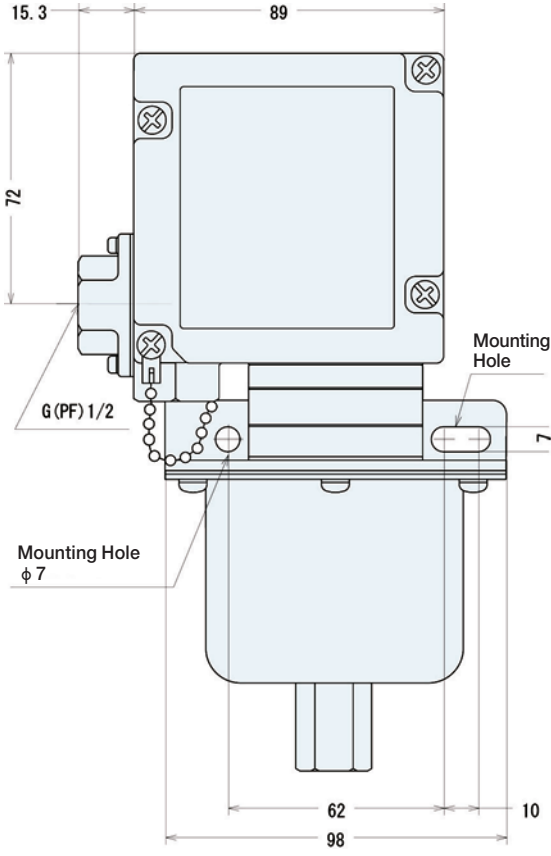
SZ005BR SZ009BR

Mass : approx. 1.13kg



SZ1/10BRF-X15

Mass : approx. 1.64kg



(Unit : millimeter)

Diaphragm Type Pressure Switches

New Super Z Series



The diaphragm type pressure switches inherit the mechanism of the Super Z, and adopt a high quality diaphragm actuator. This configuration realizes epochal pressure switches that have the high proof pressure and the extremely small differential (dead band) at the same time.

■ Highly reliable basic structure

The micro switch and the range module that are the heart of the New Super Z utilize the high-caliber and time-proven technology of the SZ type pressure switches. The high performance and highly reliable switch mechanism have been realized by the original structure.

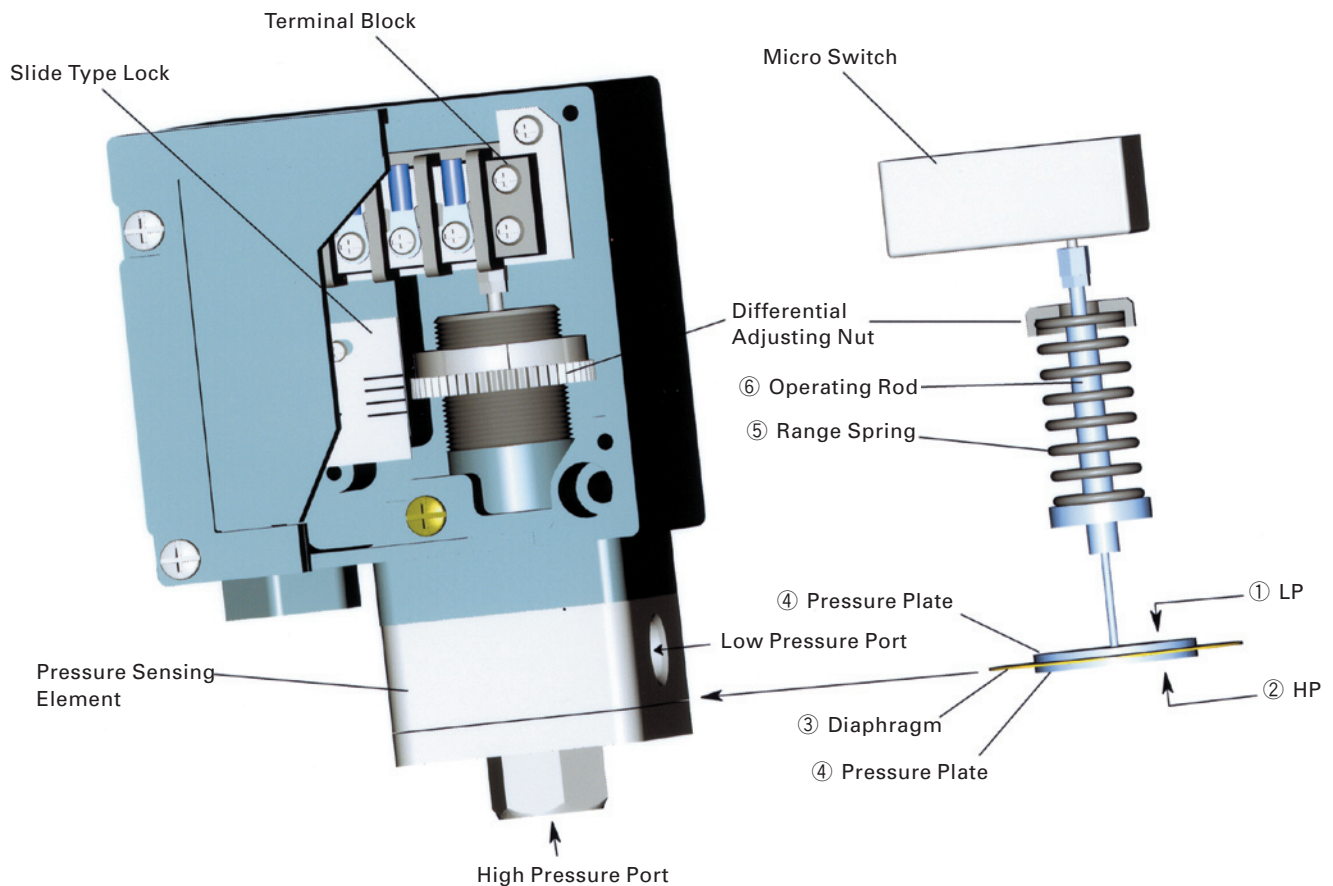
■ Pressure switches featuring high proof pressure and extremely small dead band.

A SUS316L stainless steel diaphragm has been adopted for the pressure switches. The switches feature high proof pressure and extremely small dead band. Thus the switches can be used for high pressure medium such as high pressure water or steam up to the maximum pressure of 28MPa.

■ The differential pressure switches have adopted a polyimide diaphragm.

The differential pressure switches have adopted a polyimide diaphragm. The differential pressure switches that have adopted the newly developed polyimide diaphragm enable to set extremely small differential pressure even though the system pressure is high. Further out, SZ1/4DD that is specialized for the extremely small differential pressure (0.0005 to 0.025MPa) is also line upped.

Structural Drawing of New SZ Differential Pressure Switch



Operating Mechanism of the New Super Z Series Differential Pressure Switches

The differential pressure ($H_p - L_p$) brought forth from the difference between the lower pressure and the higher pressure is applied to the diaphragm ③, then the force received by the pressure plate ④ is transmitted to the operating rod that is restrained by the range spring ⑤.

The differential pressure can be adjusted with the differential adjusting nut.

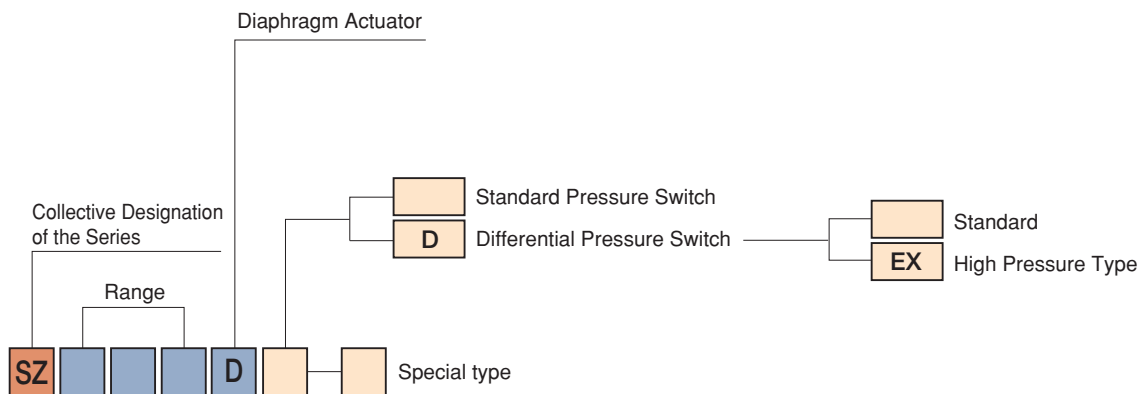
- The differential pressure switch should be used in the circumstance in which the line pressure of the high side is always higher than the pressure of the low side. ($H_p > L_p$)
- The dead band of all of this series differential pressure switches is fixed.
The dead band is smaller within the lower differential pressure range, and larger within the higher range.

Specifications

Housing Material	: Die-cast Aluminum
Painting Color	: 7.5BG4/1.5
Gasket Material	: Nitrile Rubber
Enclosure Type	: IP65
Pressure Port Connection	: Rc1/4 (PT1/4)
Electrical Connection	: G1/2 (PF1/2)
Operating Temperature	: -20 to +80°C (No condensation or no freezing)
Allowable Operating Frequency	: 120 cycles / minute
Insulation Resistance	: Between discontinuous terminals, and between each terminal and non-charging metal
	Over 100MΩ (at 500V DC)
Withstand Voltage	: Between discontinuous terminals, 2000V AC, 50/60Hz, 1minute
Allowable Medium Temperature	: SUS316 -20 to +200°C
	Polyimide -20 to +200°C
	(Subject to being within the range that does not affect the switch mechanism)
Micro Switch	: SPDT M4
Ground Terminal	: M4
Material of the Pressure Sensing Element	: Standard Pressure switch
	Diaphragm SUS316L
	Diaphragm Flange SUS316
	Pressure Plate SUS316 · Aluminum
	Pressure Port SUS316
	O-ring Viton*
	: Differential Pressure Switch
	Diaphragm Polyimide
	Diaphragm Flange SUS316
	Pressure Plate SUS316
	Pressure Port SUS316
	O-ring Viton*
Repeatability	: Pressure Switch ±1% of max range
	: Differential Switch ±1% of max differential

* Viton is the registered trademark of DuPont.

Ordering Information



When CCC certified is needed, add appendix of - C to the end of model numbers.
 Example: An certified of SZ1.7D · · · · · SZ01.7D-C

Pressure Switches (Diaphragm Actuator)

SZ□□□D



Features

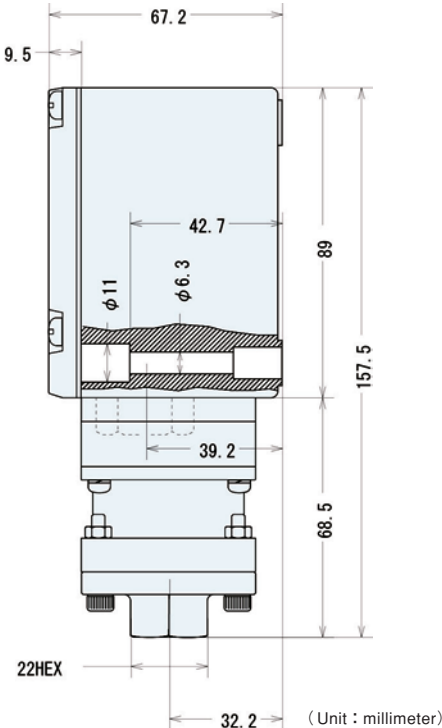
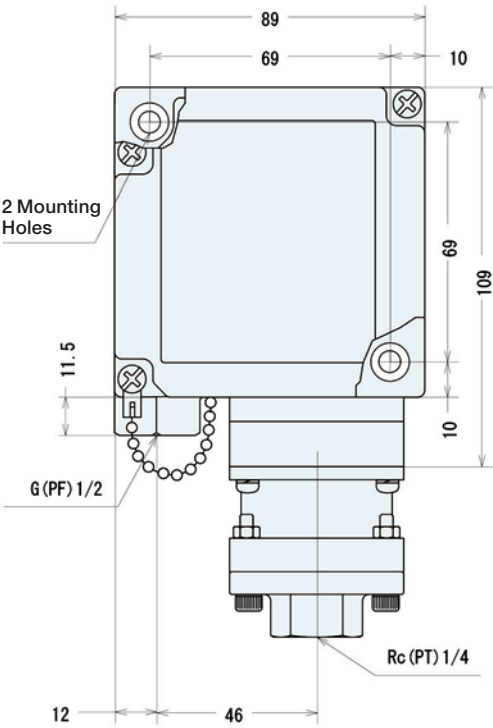
- The pressure switches adapt to high pressure and extremely low differential (dead band) at the same time.
- The switches adapt up to the maximum range of 28MPa.
- A SUS316L diaphragm is adopted as a pressure sensing element.
- The diaphragm actuated pressure switches can be used for various pressure medium such as air, water, oil, gases and steam.
- CCC approved

Type of Micro Switches	Models	Range MIN. : Minimum setting point of falling pressure. MAX. : Maximum setting point of rising pressure. MPa (kgf/cm ²) MIN. - MAX.	Differential (Dead Band) Add to the Range Value (Representative Value of the middle range.) MPa (kgf/cm ²)	Rated Pressure Maximum Pressure in Continuous Use MPa (kgf/cm ²)	Proof Pressure MPa (kgf/cm ²)
SPDT (C contact only)	SZ1.7D	0.002-0.17 (0.02-1.7)	0.003 (0.03)	2.3 (23)	3.5 (35)
	SZ005D	0.005-0.5 (0.05-5)	0.005 (0.05)	2.3 (23)	3.5 (35)
	SZ025D	0.02-2.5 (0.2-25)	0.025 (0.25)	7 (70)	12 (120)
	SZ035D	0.05-3.5 (0.5-35)	0.05 (0.5)	10 (100)	41 (410)
	SZ070D	0.1-7 (1-70)	0.12 (1.2)	12 (120)	41 (410)
	SZ120D	0.2-12 (2-120)	0.2 (2)	15 (150)	41 (410)
	SZ280D	0.2-28 (2-280)	0.7 (7)	35 (350)	42 (420)

- The differential (dead band) is not adjustable.
- The differential (dead band) indicates value at the middle of the pressure range. The differential (dead band) becomes smaller than the indicated value within the lower range, and larger within the higher range.
- The set point must be within the range.
- Only SPDT (C contact) is available.

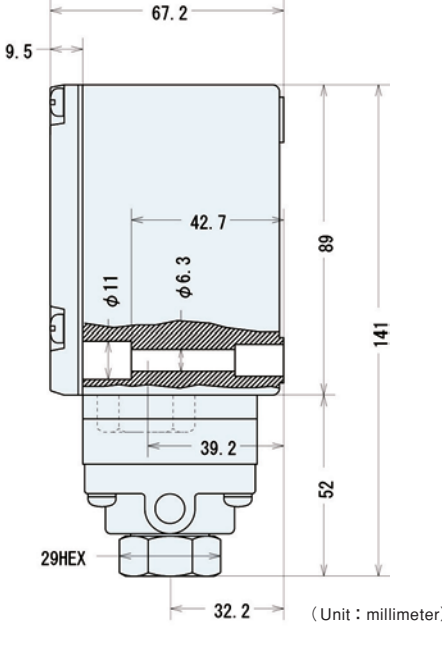
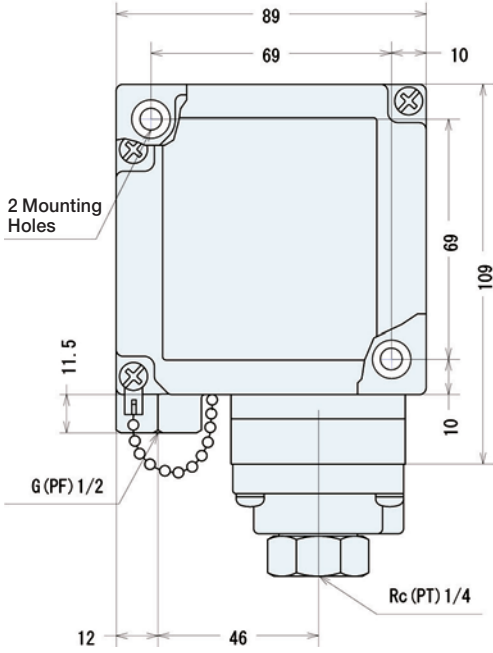
SZ1.7D
SZ005D
SZ025D

Mass : approx. 1.10kg



SZ035D
SZ070D
SZ120D
SZ280D

Mass : approx. 0.90kg



Differential Pressure Switches (Diaphragm Actuator)

SZ□□□DD / SZ□□□DDEX



Features

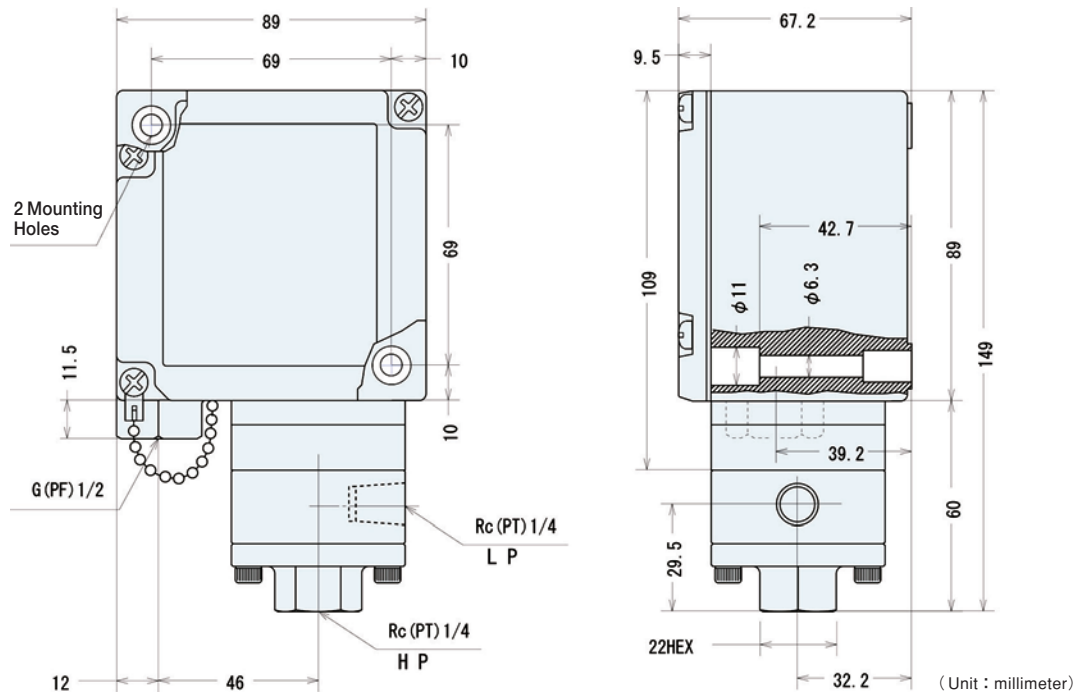
- The differential pressure switches adapt to high pressure and extremely small dead band at the same time.
- The switches adapt up to the maximum range of 21 MPa. The adjustable differential range is 0.002 to 3.5 MPa.
- A polyimide diaphragm is adopted as a pressure sensing element.
- To realize the high proof pressure and the small dead band at the same time, the stroke and the clearance have been made smaller. (It is recommended to use an approx. 20 μm filter for the both higher pressure side and lower pressure side.)
- The diaphragm actuated pressure switches can be used for various pressure medium such as air, water, oil, gases and steam.
- CCC approved

Type of Micro Switches	Models	Range MPa (kgf/cm ²) MIN. - MAX.	Sensitivity (Dead Band) The switch is activated on increasing pressure difference. MPa (kgf/cm ²)	Range of Adjustable Difference The switch is reset on decreasing pressure difference. MPa (kgf/cm ²) MIN. - MAX.	Rated Pressure Maximum Pressure in Continuous use MPa (kgf/cm ²)	Proof Pressure MPa (kgf/cm ²)
SPDT (C contact only)	SZ2.5DD	0.002-2 (0.02-20)	0.005 (0.05)	0.002-0.25 (0.02-2.5)	2 (20)	3.5 (35)
	SZ005DD	0.005-2 (0.05-20)	0.01 (0.1)	0.005-0.5 (0.05-5)	2 (20)	3.5 (35)
	SZ012DD	0.005-2 (0.05-20)	0.05 (0.5)	0.005-1.2 (0.05-12)	2 (20)	3.5 (35)
	SZ020DD	0.005-2 (0.05-20)	0.07 (0.7)	0.005-2 (0.05-20)	2 (20)	3.5 (35)
	SZ2.5DDEX	0.002-21 (0.02-210)	0.005 (0.05)	0.002-0.25 (0.02-2.5)	21 (210)	35 (350)
	SZ005DDEX	0.005-21 (0.05-210)	0.01 (0.1)	0.005-0.5 (0.05-5)	21 (210)	35 (350)
	SZ012DDEX	0.005-21 (0.05-210)	0.05 (0.5)	0.005-1.2 (0.05-12)	21 (210)	35 (350)
	SZ035DDEX	0.005-21 (0.05-210)	0.07 (0.7)	0.005-3.5 (0.05-35)	21 (210)	35 (350)

- The sensitivity (dead band) is not adjustable.
- The sensitivity (dead band) indicates value at the middle of the range of adjustable difference. The sensitivity (dead band) becomes smaller than the indicated value within the lower range of adjustable difference, and larger within the higher range of adjustable difference.
- The set point must be within the range of adjustable difference.
- Only SPDT (C contact) is available.

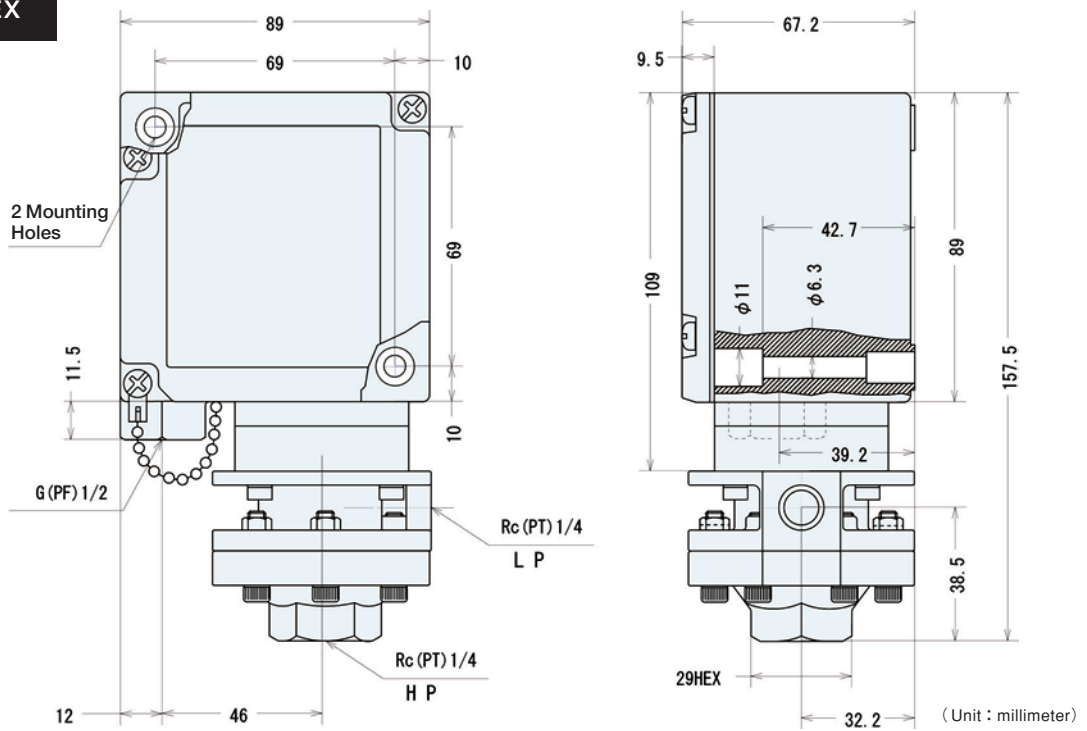
SZ2.5DD
SZ005DD
SZ012DD
SZ020DD

Mass : approx. 1.10kg



SZ2.5DDEX
SZ005DDEX
SZ012DDEX
SZ035DDEX

Mass : approx. 1.45kg



Differential Pressure Switches (Diaphragm Actuator)

SZ1/4DD



Features

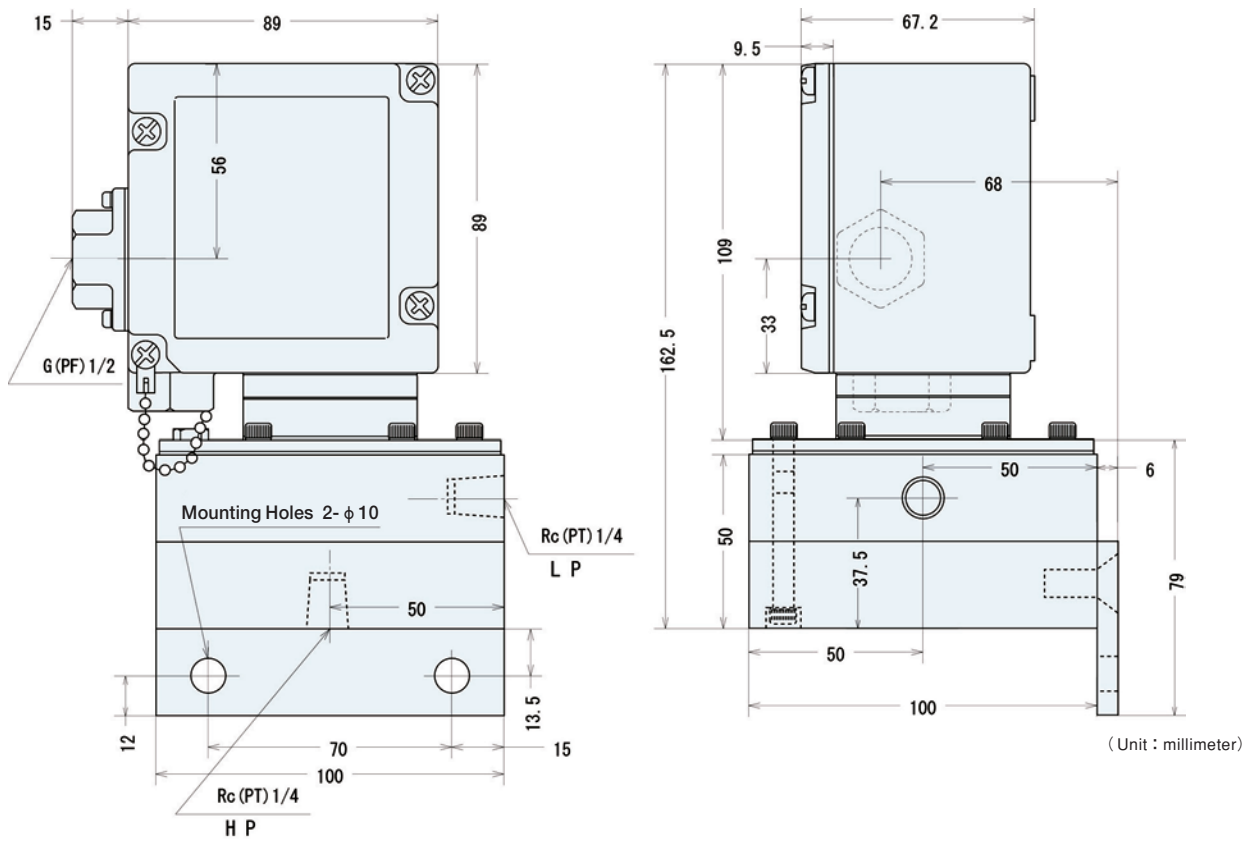
- This differential pressure switch especially specializes in extremely small differential pressure.
- The differential pressure switch adapts to the differential range of 0.0005 to 0.025 MPa.
- A polyimide diaphragm is adopted as a pressure sensing element.
- To realize the high proof pressure and the extremely small dead band at the same time, stroke and clearance have been made smaller. (It is recommended to use an approx. 20 μm filter for the both higher pressure side and lower side pressure side.)
- The diaphragm actuated pressure switches can be used for various pressure medium such as air, water, oil, gases and steam.
- CCC approved

Type of Micro Switches	Models	Range MPa (kgf/cm ²) MIN. - MAX.	Sensitivity (Dead Band) The switch is activated on increasing pressure difference. MPa (kgf/cm ²)	Range of Adjustable Difference The switch is reset on decreasing pressure difference. MPa (kgf/cm ²) MIN. - MAX.	Rated Pressure Maximum Pressure in Continuous use MPa (kgf/cm ²)	Proof Pressure MPa (kgf/cm ²)
SPDT (C contact only)	SZ1/4DD	0.0005-6.6 (0.005-66)	0.0005 (0.005)	0.0005-0.025 (0.005-0.25)	6.6 (66)	10 (100)

- The sensitivity (dead band) is not adjustable.
- The sensitivity (dead band) indicates value at the middle of the range of adjustable difference. The sensitivity (dead band) becomes smaller than the indicated value within the lower range of adjustable difference, and larger within the higher range of adjustable difference.
- The set point must be within the range of adjustable difference.
- Only SPDT (C contact) is available.

SZ1/4DD

Mass : approx. 5.00kg



Explosion-proof Pressure Switches

Super Z TEX Series



**The Super Z Pressure Switch is enclosed
in a rugged explosion-proof housing.
The Super Z TEX series are easier to use
explosion-proof pressure switches that
have enhanced reliability.**

The high rating contact of the switch enables direct on-off action of an electric circuit in the flammable gases atmosphere.

The Super Z TEX series are robust and highly reliable explosion-proof pressure switches that can be used at ease in the flammable gases environment. The high rating contact of the switch enables direct on-off action of an electric circuit with safety and sureness even in the flammable gases (ambient atmosphere).

The Super Z pressure switch is enclosed.

Further upgraded a conventional TEX type, the time-proven Super Z pressure switch is enclosed.

Explosion class: d2G4

The explosion class of the TEX type is 2, and its ignition point is G4. The switch can be used in the flammable gases (ambient atmosphere) described below.

● A reference chart of gases (ambient atmosphere) in which the TEX type can be used.

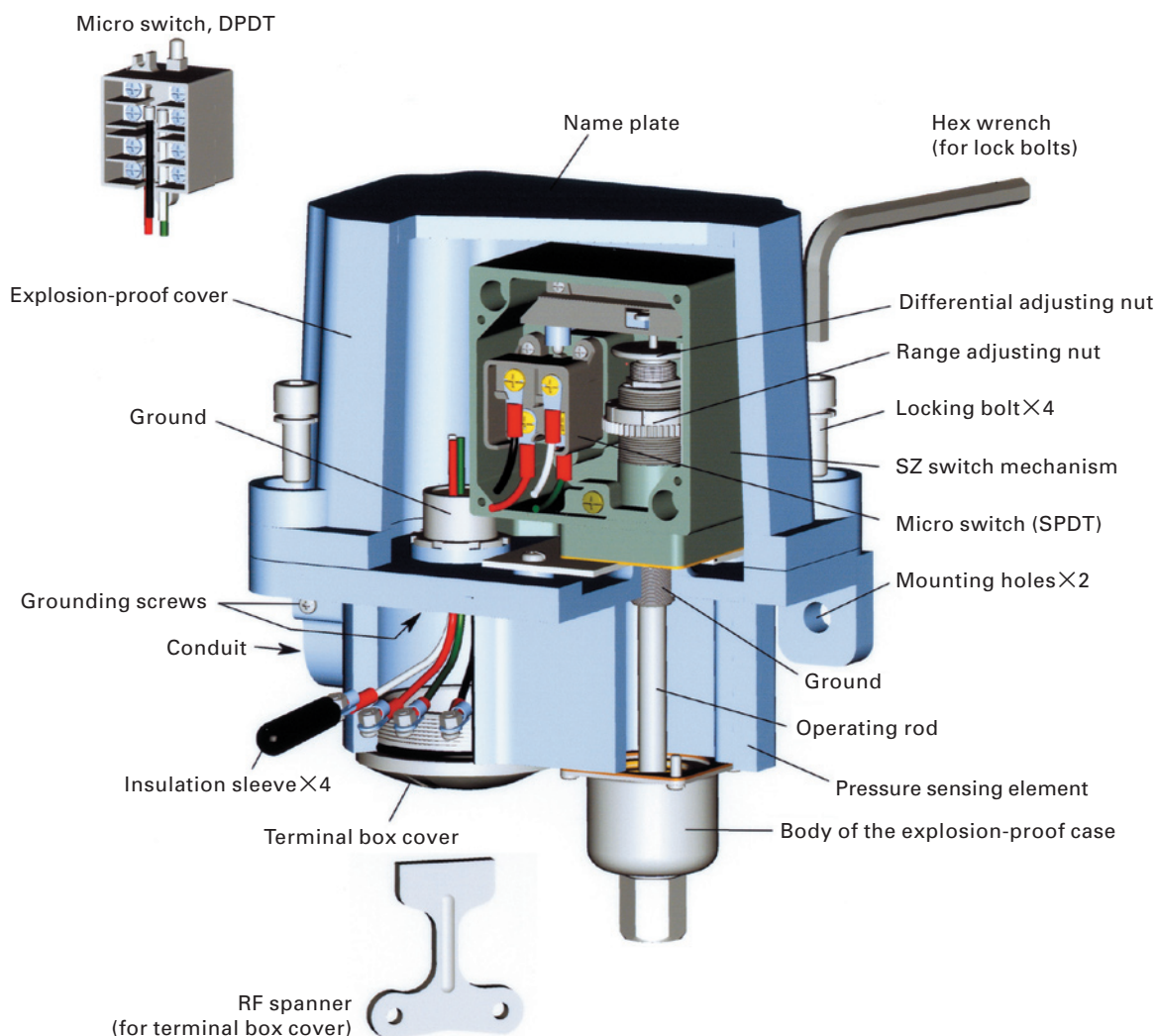
Ignition Point	G1	G2	G3	G4	G5
☆ 1	Acetone Ammonia Carbon monoxide Ethane Acetic acid Ethyl acetate Toluene Propane Benzene Methanol Methane	Ethanol Acetic acid Isoamyl 1-butanol Butane Acetic acid Anhydride	Gasoline Hexane	Acetaldehyde Ethyl ether	
2	Coal gas	Ethylene Ethylene oxide			
3	Hydrogen gas Hydrogen	Acetylene			Carbon disulfide

Classification of typical explosive fumes shows the region in which the switch can be used.

☆ Explosion Class

Structural Drawing of the TEX SZ

Connected with the ground and the operating rod, a Super Z series pressure switch is enclosed in an explosion-proof case.



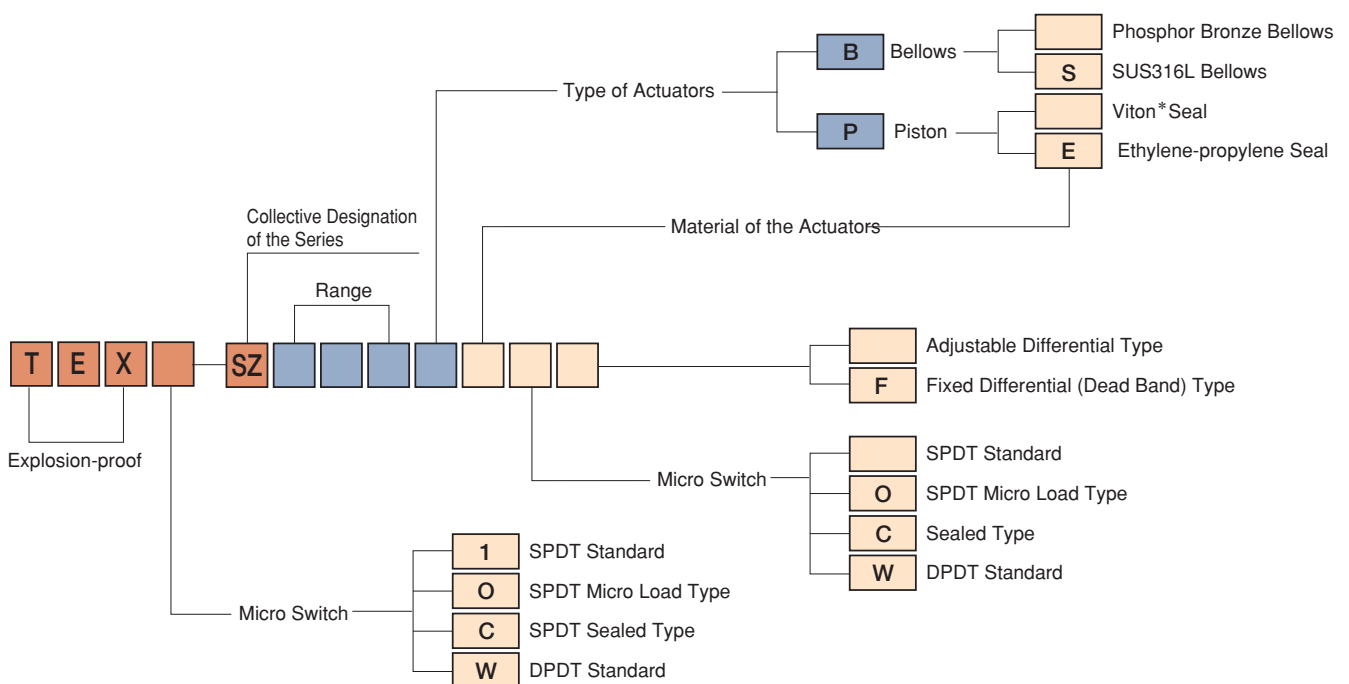
■ SPDT Standard Rating • Sealed Type Contact construction : SPDT (1a, 1b)	■ DPDT Standard Rating Contact construction : DPDT (2a or 2b)	
<p>Wiring connection diagram 1</p> <p>(Black • White) Open on rising pressure</p> <p>(Red • Green) Close on rising pressure</p>	<p>Wiring connection diagram 2</p> <p>(Black • White) Close on rising pressure</p> <p>(Red • Green) Close on rising pressure</p>	<p>Wiring connection diagram 3</p> <p>(Black • White) Open on rising pressure</p> <p>(Red • Green) Open on rising pressure</p>

Specifications

Housing Material	: FC20 (cast iron)
Painting Color	: 7.5BG6/1.5 (acrylic resin heat coating)
Explosion Class	: d2G4
Pressure Port Connection	: Rc1/4 (PT1/4)
Conduit	: G3/4 (PF3/4)
Operating Temperature	: -10 to +40°C (No condensation or no freezing)
Allowable Operating Frequency	: 100 cycles / minute
Insulation Resistance	: Between each terminal and non-charging metal Over 100MΩ (at 500V DC)
Withstand Voltage	: 1000V AC, 50/60Hz, 1 minute
	: Between each terminal and non-charging metal, and ground
Withstand Voltage	: 2200V AC, 50/60Hz, 1minute
	: Ground Terminal : M4
Allowable Medium Temperature	: Phosphor Bronze Bellows -40 to +125°C
	: Stainless Steel Bellows -40 to +250°C
	: Piston Actuator -20 to +120°C
Material of the Pressure Sensing Element	: Standard Bellows Actuator
Standard Bellows Actuator	: Bellows Phosphor Bronze
	: Housing Steel (Nickel Plated)
Stainless Steel Bellows	: Bellows SUS316L
	: Housing SUS316
Standard Piston Actuator	: Piston SUS420F
	: Cylinder SUS316
	: Seal Material Viton*, Teflon*
	: Special Type Piston Actuator
Special Type Piston Actuator	: Piston SUS420F
	: Cylinder SUS316
	: Seal Material Ethylene-propylene, Teflon*
Pressure Port Orifice	: Bellows Actuator φ 1.5
	: Piston Actuator φ 1

* Viton and Teflon are the registered trade marks of Du Pont.

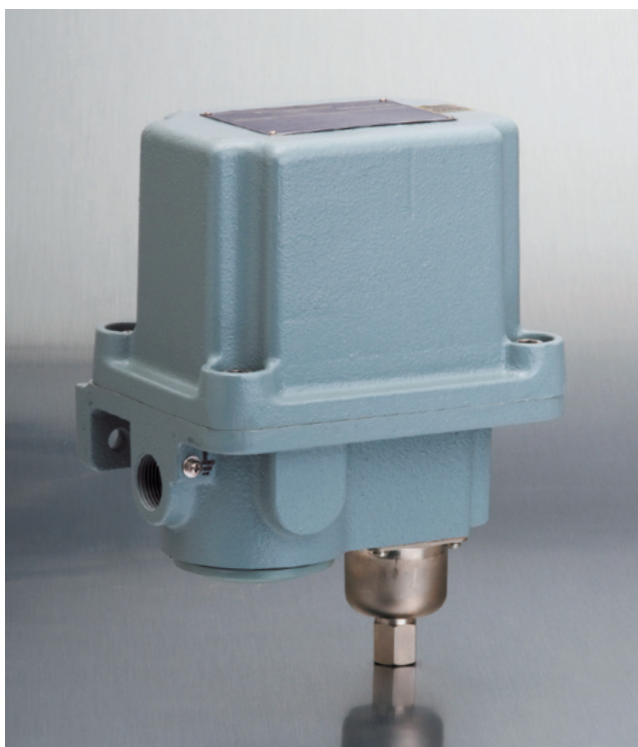
Ordering Information



* Viton is the registered trade mark of Du Pont.

Explosion-proof Pressure Switches (Bellows Actuator)

TEX1-SZ□□□B / TEXW-SZ□□□BW



Features

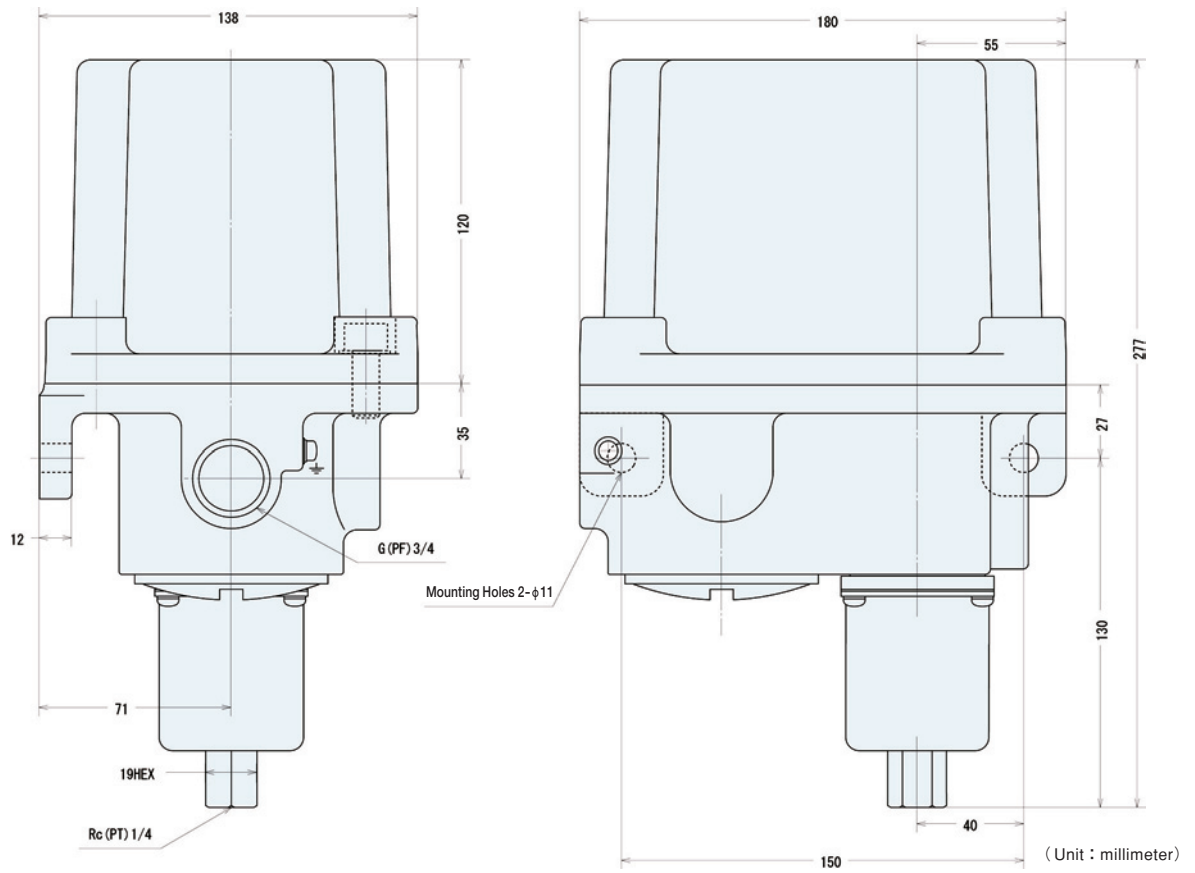
- An explosion-proof type pressure switches that enclose the Super Z.
- A high quality phosphor bronze bellows is adopted as a pressure sensing element. It can be used for pressure medium such as air, oil and gases.
- When it is used for medium of causticity, water and steam, we recommend use SUS316L bellows actuator.
- The pressure switches are applicable to pressures range from 0.005 to 11.5 MPa.
- The micro switch is selectable from a SPDT standard type, a micro-load type (for 24V DC), and a sealed type (environment resistance). In addition, a DPDT contact micro switch is also available. * Refer to page 56 for details.
- d2G4 (explosion-proof class) approved.

Type of Micro Switches	Models	Range MIN. : Minimum setting point of falling pressure. MAX. : Maximum setting point of rising pressure. MPa (kgf/cm ²) MIN. - MAX.	Differential (Dead Band) Add to the Range Value MPa (kgf/cm ²) MIN. - MAX.	Rated Pressure Maximum Pressure in Continuous Use MPa (kgf/cm ²)	Proof Pressure MPa (kgf/cm ²)
SPDT	TEX1-SZ002B	0.005-0.2 (0.05-2)	0.008-0.04 (0.08-0.4)	0.2 (2)	0.3 (3)
	TEX1-SZ006B	0.005-0.6 (0.05-6)	0.03-0.1 (0.3-1)	0.6 (6)	0.9 (9)
	TEX1-SZ010B	0.005-1 (0.05-10)	0.06-0.2 (0.6-2)	1 (10)	2 (20)
	TEX1-SZ025B	0.03-2.5 (0.3-25)	0.17-0.5 (1.7-5)	2.5 (25)	4.2 (42)
	TEX1-SZ050B	0.1-5 (1-50)	0.5-0.9 (5-9)	5 (50)	14 (140)
	TEX1-SZ115B	0.2-11.5 (2-115)	1.2-1.8 (12-18)	11.5 (115)	17.5 (175)
DPDT	TEXW-SZ002BW	0.005-0.2 (0.05-2)	0.012-0.04 (0.12-0.4)	0.2 (2)	0.3 (3)
	TEXW-SZ006BW	0.005-0.6 (0.05-6)	0.05-0.1 (0.5-1)	0.6 (6)	0.9 (9)
	TEXW-SZ010BW	0.005-1 (0.05-10)	0.08-0.2 (0.8-2)	1 (10)	2 (20)
	TEXW-SZ025BW	0.03-2.5 (0.3-25)	0.21-0.5 (2.1-5)	2.5 (25)	4.2 (42)
	TEXW-SZ050BW	0.1-5 (1-50)	0.65-0.9 (6.5-9)	5 (50)	14 (140)
	TEXW-SZ115BW	0.2-11.5 (2-115)	1.4-1.8 (14-18)	11.5 (115)	17.5 (175)

- Fixed differential (dead band) types are available for each model equipped with SPDT or DPDT micro switch.
- The differential (dead band) of the fixed differential (dead band) type is less than or equal to the minimum value of the adjustable differential (dead band) models.
- A SUS316L bellows is available for each model equipped with SPDT or DPDT micro switch.
- The set point must be within the range.

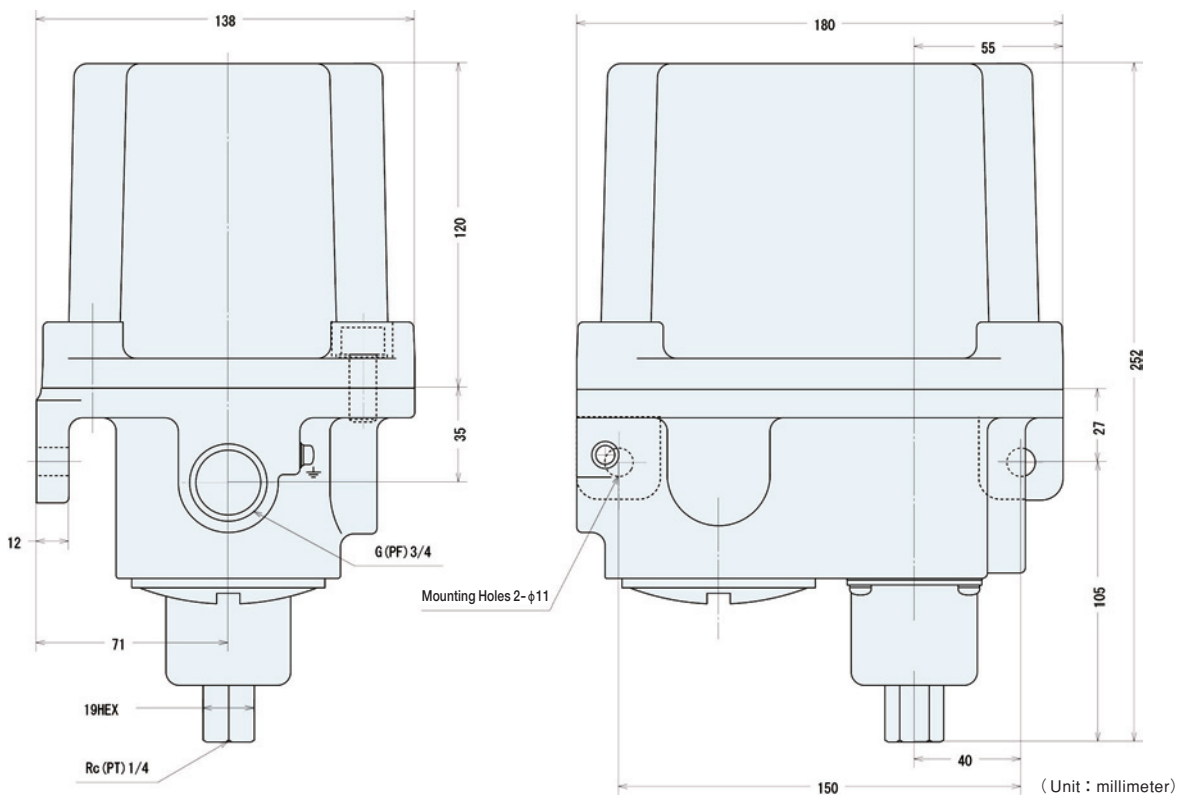
TEX1-SZ002B/BS

Mass : approx. 9.00kg



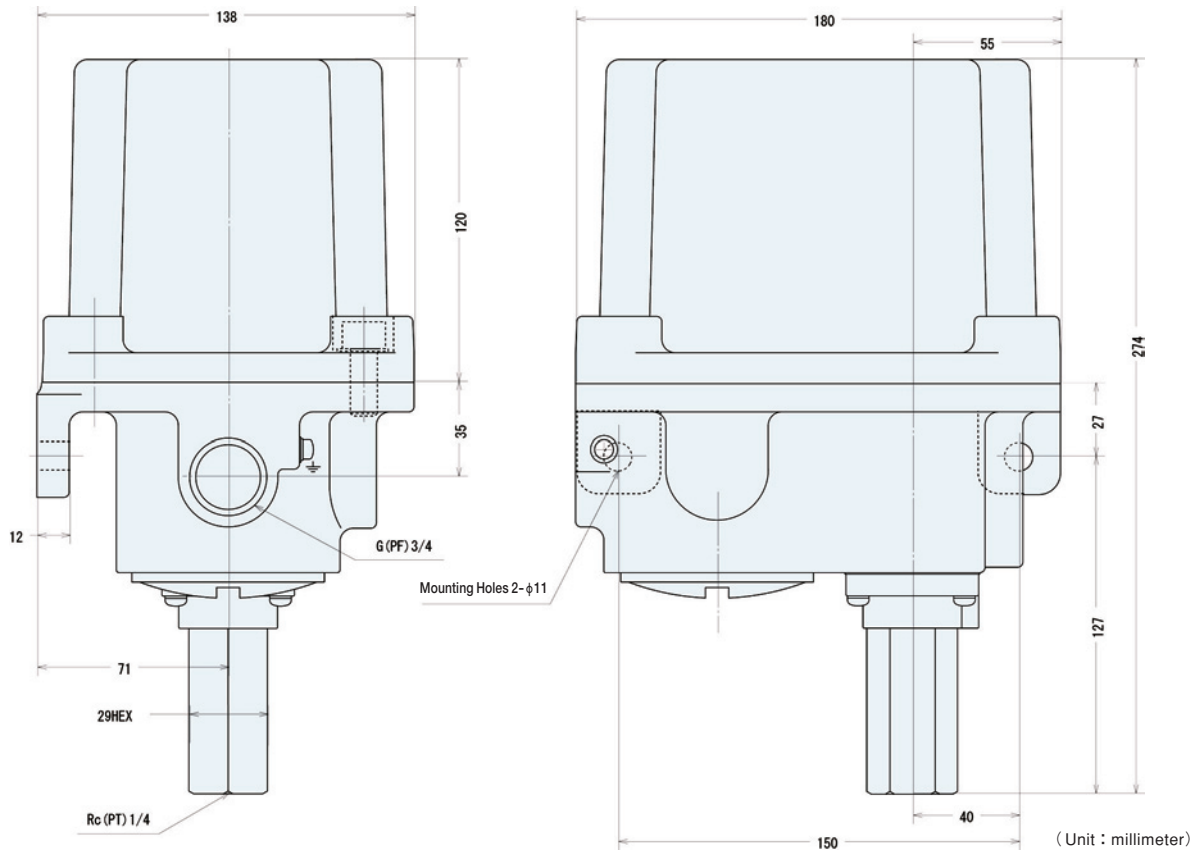
TEX1-SZ006B/BS TEX1-SZ010B/BS

Mass : approx. 9.00kg



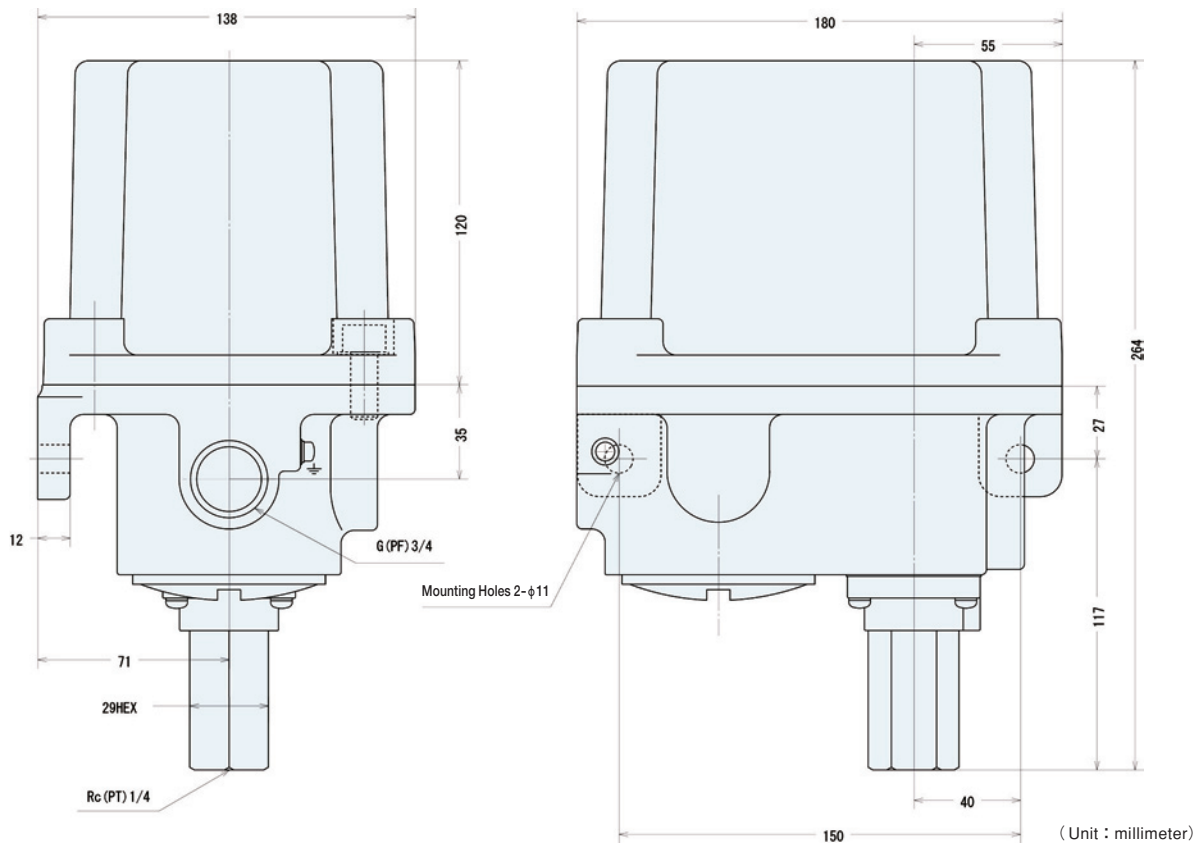
TEX1-SZ025B

Mass : approx. 9.00kg



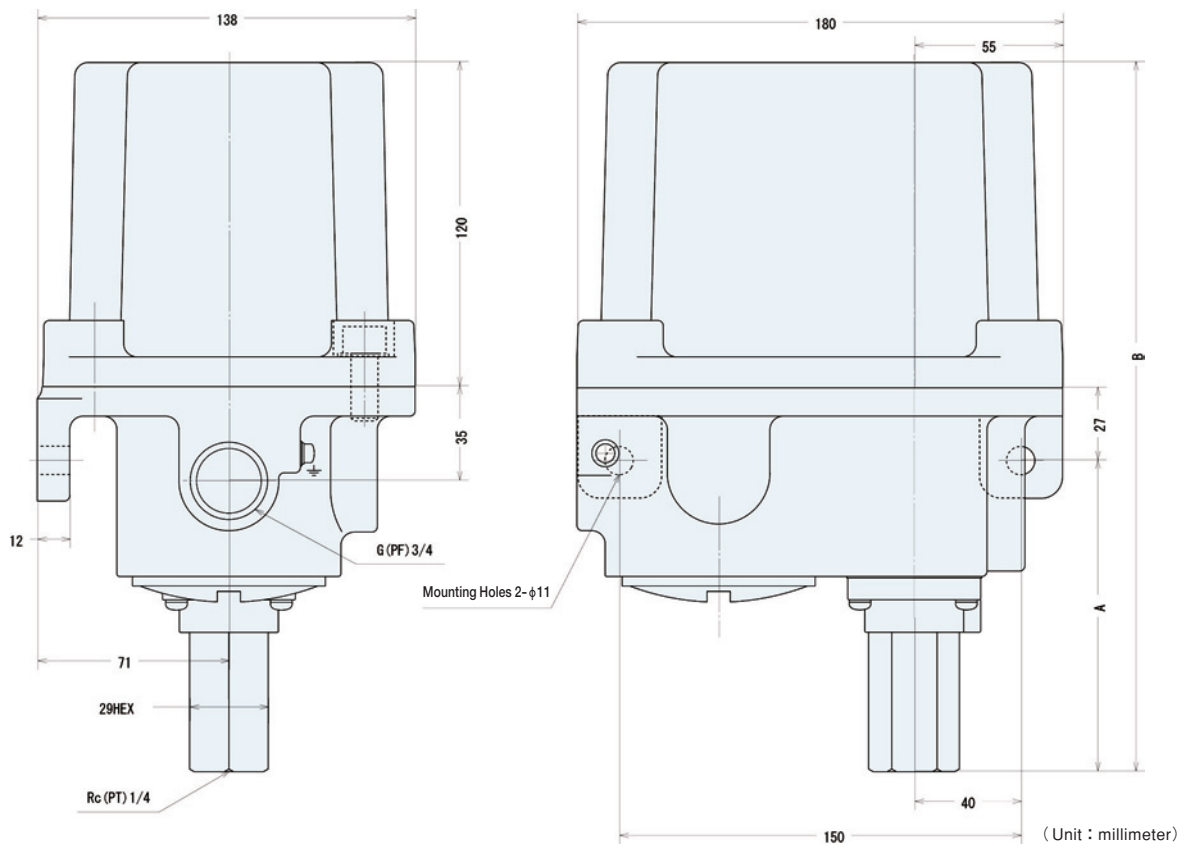
TEX1-SZ025BS

Mass : approx. 9.00kg



TEX1-SZ050B/BS
TEX1-SZ115B/BS

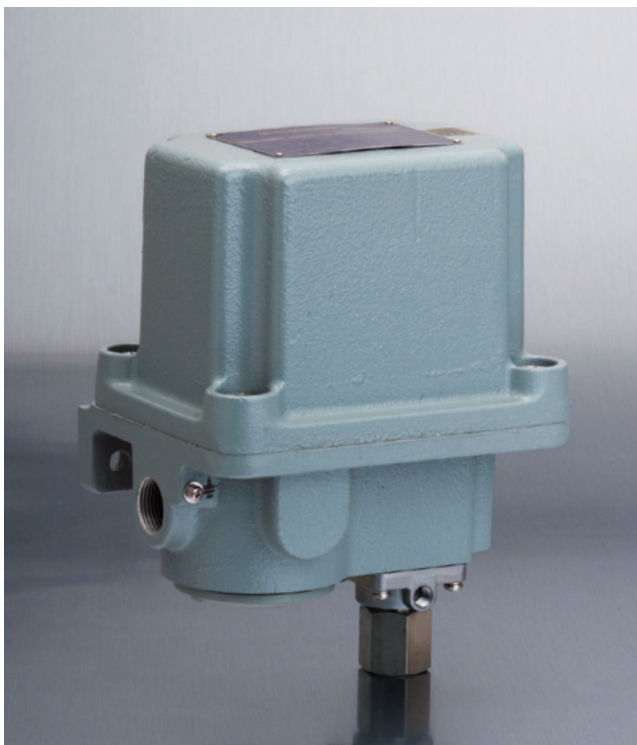
Mass : approx. 9.00kg



Type	A	B
SZ050B	157	304
SZ050BS	136	283
SZ115B	140	287
SZ115BS	124	271

Explosion-proof Pressure Switches (Piston Actuator)

TEX1-SZ□□□P / TEXW-SZ□□□PW



Features

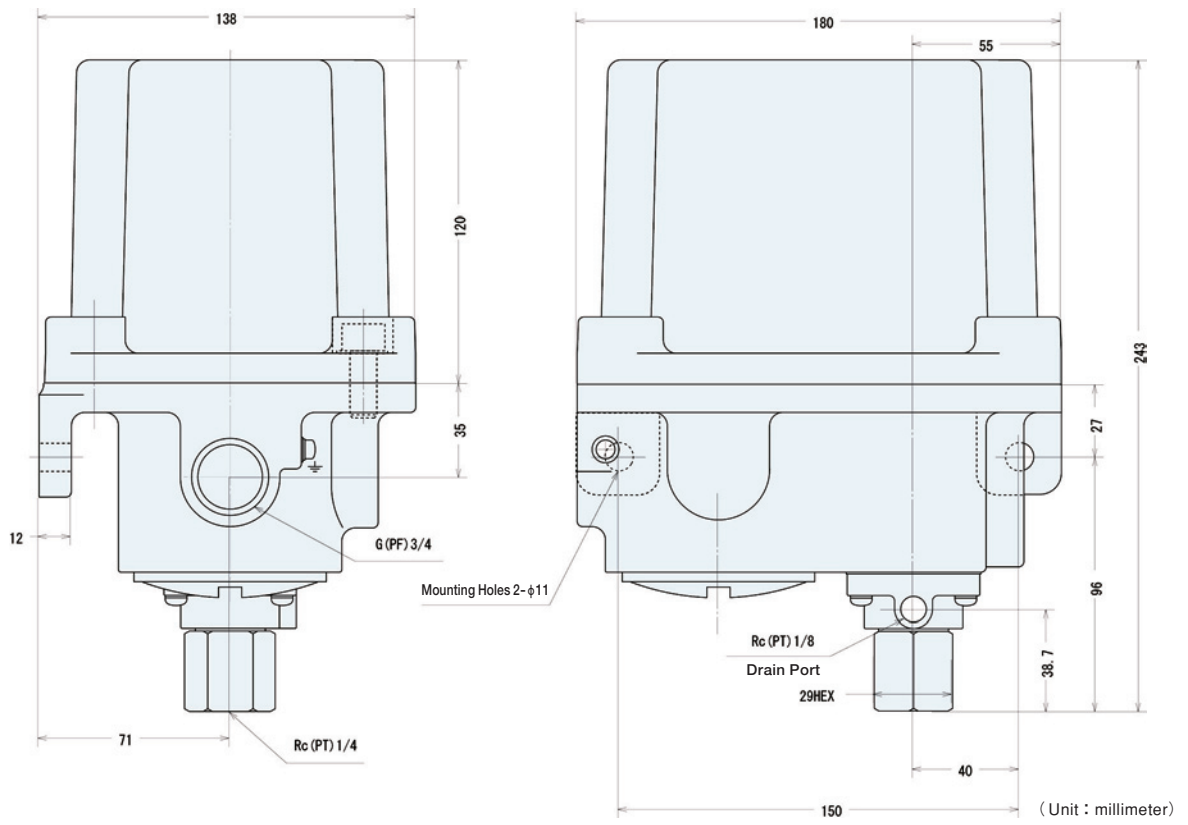
- An explosion-proof type pressure switches that enclose the Super Z.
- A piston made of SUS420F is adopted, which is suitable for oil pressure.
- Viton is adopted as a standard sealing material. That makes the piston actuated pressure switches can be used for not only oil but also for other medium that has lubricity to a certain degree (soluble oil). In addition, Ethylene Propylene Seal can be also selectable.
- The piston actuated pressure switches are applicable to pressures range from 0.1 to 63.5 MPa ranges.
- The micro switch is selectable from a SPDT standard type, a micro-load type (for 24V DC), and a sealed type (environment resistance). In addition, a DPDT contact micro switch is also available. * Refer to page 56 for details.
- d2G4 (explosion-proof class) approved.

Type of Micro Switches	Models	Range		Differential (Dead Band)		Rated Pressure		Proof Pressure	
		MIN. : Minimum setting point of falling pressure. MAX. : Maximum setting point of rising pressure. MPa (kgf/cm ²)		Add to the Range Value MPa (kgf/cm ²)		Maximum Pressure in Continuous Use MPa (kgf/cm ²)		MPa (kgf/cm ²)	
		MIN. - MAX.		MIN. - MAX.					
SPDT	TEX1-SZ032P	0.1-3.2	(1-32)	0.27-0.6	(2.7-6)	3.2	(32)	10	(100)
	TEX1-SZ070P	0.2-7	(2-70)	0.4-1.3	(4-13)	7	(70)	35	(350)
	TEX1-SZ210P	0.5-20.5	(5-205)	1.1-3.8	(11-38)	20.5	(205)	70	(700)
	TEX1-SZ400P	1-40	(10-400)	2.3-7.5	(23-75)	40	(400)	70	(700)
	TEX1-SZ635P	2-63.5	(20-635)	3.8-12	(38-120)	63.5	(635)	120	(1200)
DPDT	TEXW-SZ032PW	0.1-3.2	(1-32)	0.33-0.6	(3.3-6)	3.2	(32)	10	(100)
	TEXW-SZ070PW	0.2-7	(2-70)	0.5-1.3	(5-13)	7	(70)	35	(350)
	TEXW-SZ210PW	0.5-20.5	(5-205)	1.3-3.8	(13-38)	20.5	(205)	70	(700)
	TEXW-SZ400PW	1-40	(10-400)	2.7-7.5	(27-75)	40	(400)	70	(700)
	TEXW-SZ635PW	2-63.5	(20-635)	4.5-12	(45-120)	63.5	(635)	120	(1200)

- Fixed differential (dead band) types are available for each model equipped with SPDT or DPDT micro switch.
- The differential (dead band) of the fixed differential (dead band) type is less than or equal to the minimum value of the adjustable differential (dead band) models.
- The minimum differential (dead band) indicates a value at approximately in-between of the range. Because of the sealed piston, the differential (dead band) tends to be rather smaller at lower pressure and rather wider at higher pressure than the represented value (* refer to the list on the next page).
- A PT 1/8 drain port is equipped on the side of the body so that the pressure switch is used with piping for drains beforehand, in an environment that will not allow even a small amount of seepage. The drain port must be opened to the atmospheric pressure.
- The set point must be within the range.

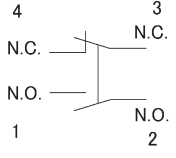
TEX1-SZ032P
 TEX1-SZ070P
 TEX1-SZ210P
 TEX1-SZ400P
 TEX1-SZ635P

Mass : approx. 9.00kg



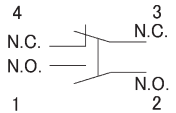
Electrical Rating of Micro Switches

SPDT Standard Type · Sealed Type

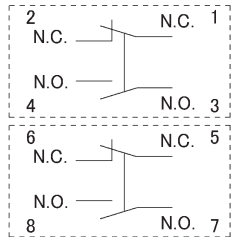
Contact Structure SPDT	Voltage (V)	Resistance Load (A)		Lamp Load (A)		Inductive Load (A)		Motor Load (A)	
		N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.
	AC 125	10	10	3	1.5	10	5	2.5	
	250	10	10	2	1	10	3	1.5	
	480	10	10	1.5	0.8	3	1.5	0.8	
	600	3	1	1	0.5	1.5	1	0.5	
	DC 8	10	6	3	10	6			
	14	10	6	3	10	6			
	30	6	4	3	6	4			
	125	0.8	0.2	0.2	0.8	0.2			
	250	0.4	0.1	0.1	0.4	0.1			

* The voltages for UL, CSA approved switches are 125V AC, 250V AC and 250V DC

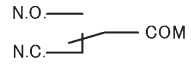
SPDT Micro Load Type

Contact Structure SPDT	Rating		Recommended Range of Load
	125V	AC0.1A	DC5-30V
	30V	DC0.1A	0.5-100mA


DPDT Standard Type

Contact Structure DPDT	Voltage (V)	Resistance Load (A)		Lamp Load (A)		Inductive Load (A)		Motor Load (A)	
		N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.
	AC 125	5	2	4	3				
	250	3	1	2	1.5				
	480	1.5	0.5	1	0.8				
	600	1	0.4	0.7	0.5				
	DC 8	—	—	—	—				
	14	5	2	4	3				
	30	3.4	1	2	1.5				
	125	0.4	0.1	0.4	0.1				
	250	0.2	0.05	0.2	0.05				

SPDT (C contact) : SZ

Contact Structure SPDT	Voltage (V)	Resistance Load (A)		Lamp Load (A)		Inductive Load (A)		Motor Load (A)	
		N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.
	AC 125	15	3	1.5	15	5	2.5		
	250	15	2.5	1.25	15	3	1.5		
	500	10	1.5	0.75	6	1.5	0.75		
	DC 8	15	3	1.5	15	5	2.5		
	14	15	3	1.5	10	5	2.5		
	30	2	2	1.4	1	1	1		
	125	0.4	0.4	0.4	0.03	0.03	0.03		
	250	0.2	0.2	0.2	0.02	0.02	0.02		

SPDT (C contact) : New SZ

Contact Structure SPDT	Voltage (V)	Resistance Load (A)		Lamp Load (A)		Inductive Load (A)		Motor Load (A)	
		N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.
	AC 125	10	3	1.5	10	5	2.5		
	250	10	2.5	1.25	10	3	1.5		
	DC 8	15	3	1.5	15	5	2.5		
	14	15	3	1.5	10	5	2.5		
	30	2	2	1.4	1	1	1		
	125	0.4	0.4	0.4	0.03	0.03	0.03		
	250	0.2	0.2	0.2	0.02	0.02	0.02		

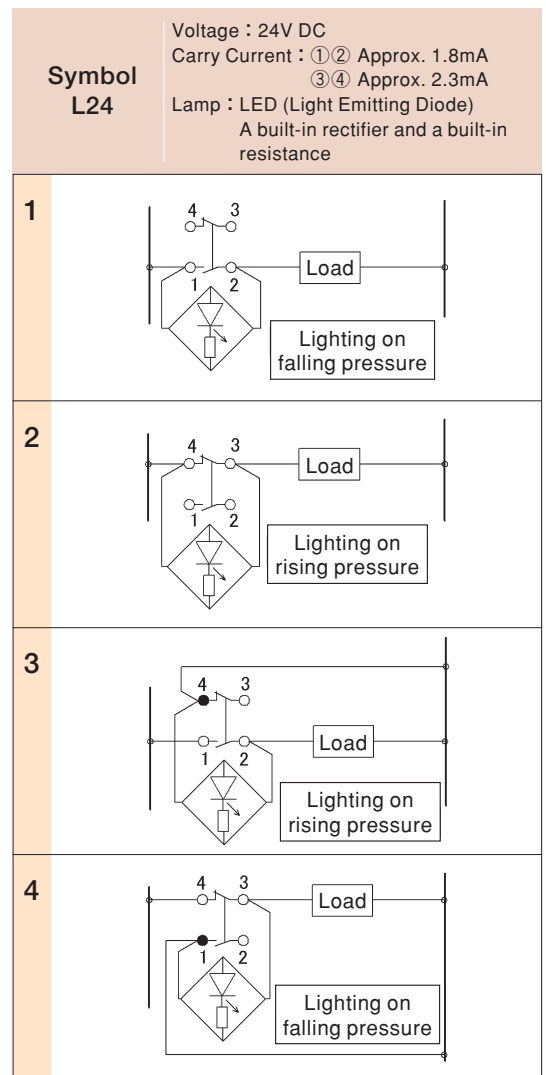
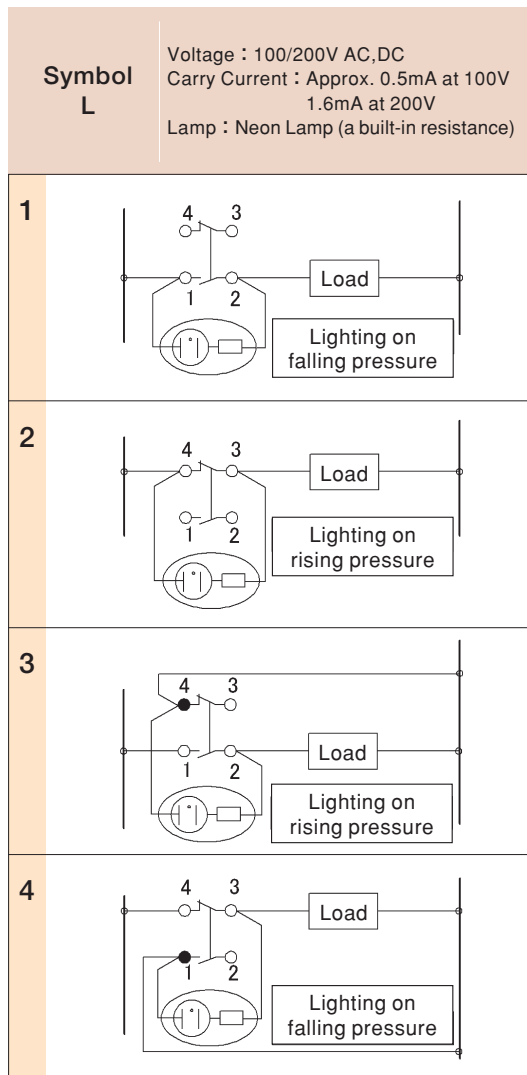
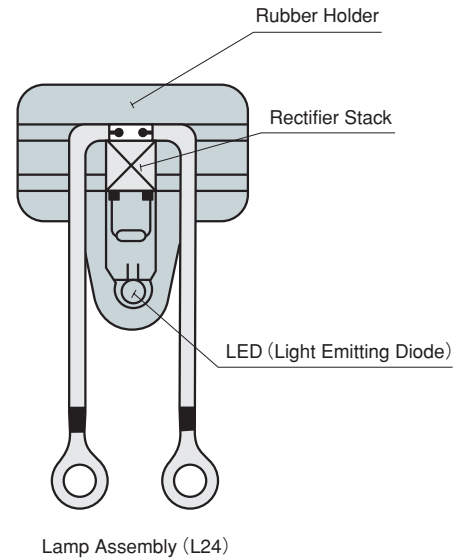
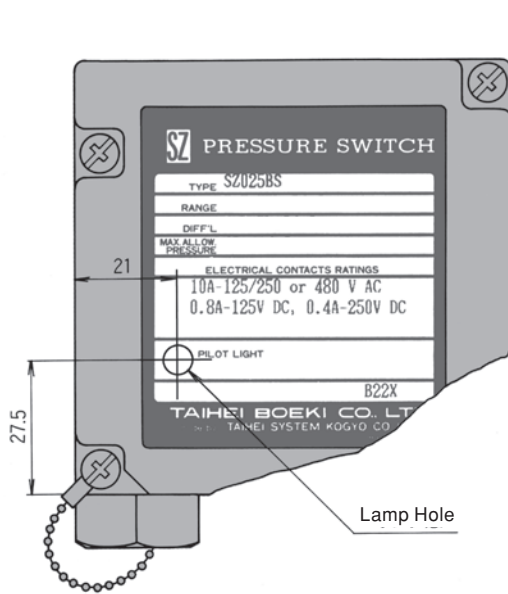
① The above tables show steady-state current.

② Inductive Load : Alternating current-phase factor 0.4 or more, Direct current-time constant below 7 milliseconds.

③ Lamp Load : Having decuple inrush current.

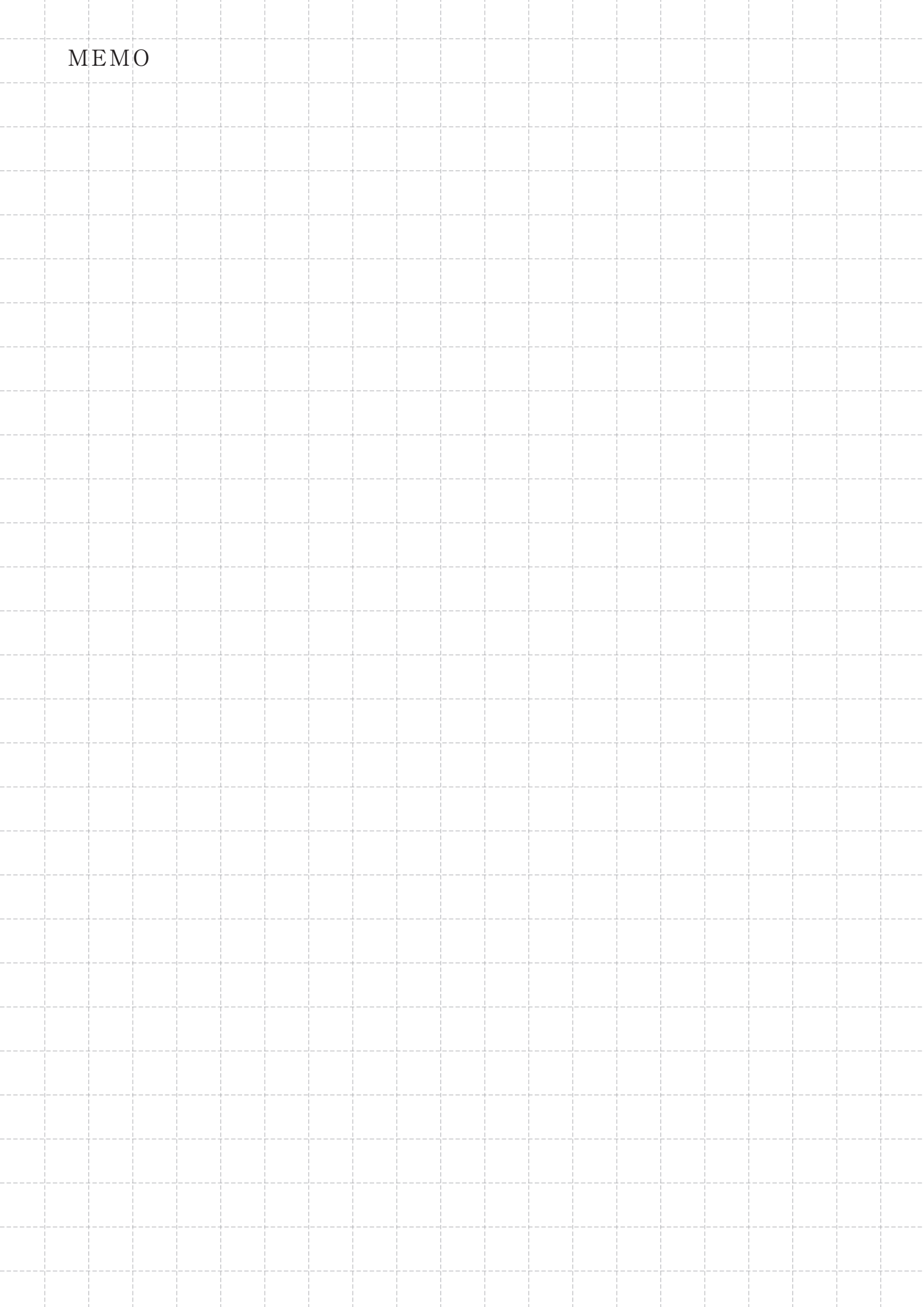
④ Motor Load : Having sextuple inrush current.

Pilot Lamps (Optional)

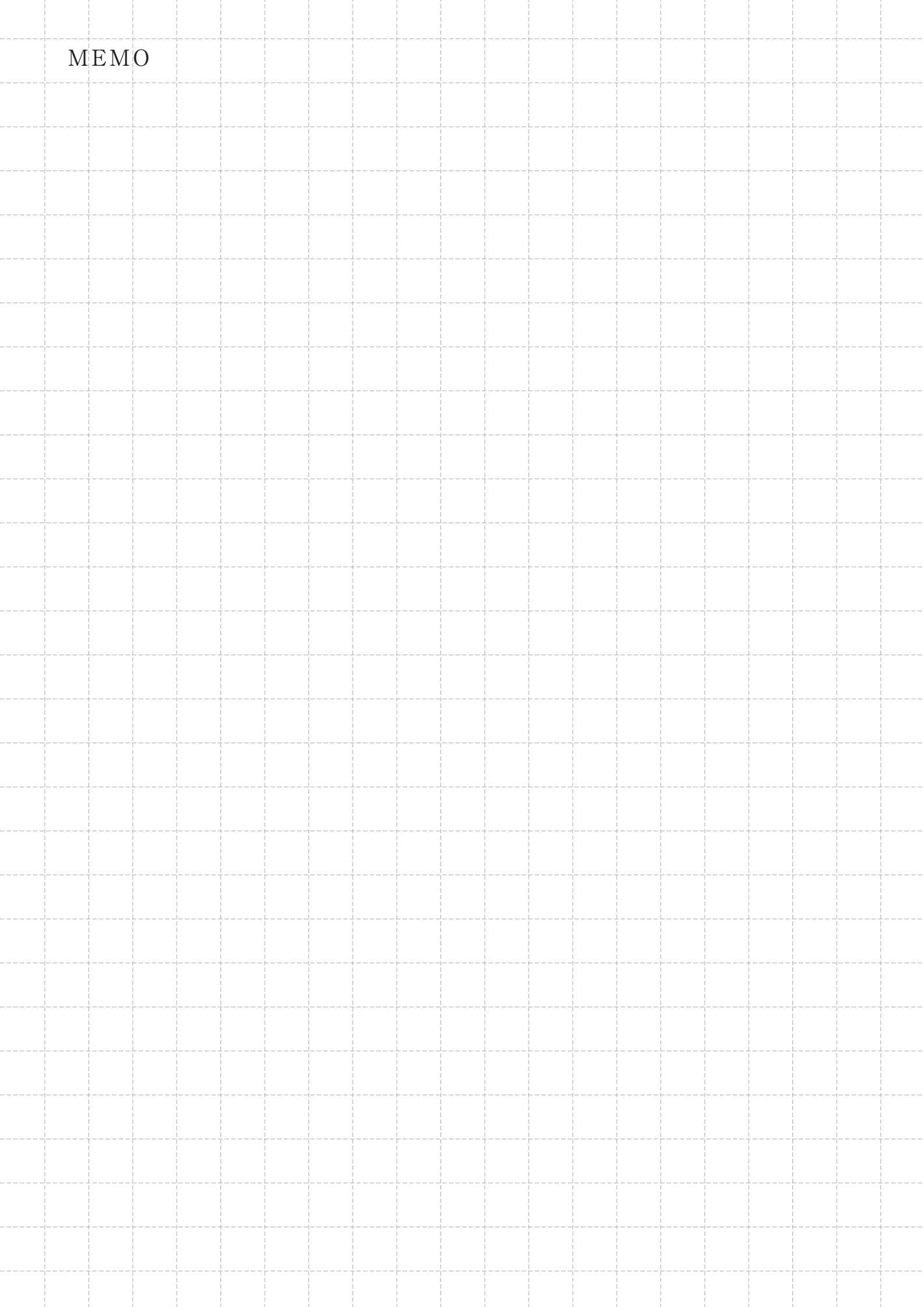


Note : Use a plastic terminal set that comes with the pilot lamp as a relay terminal at the ● point.

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