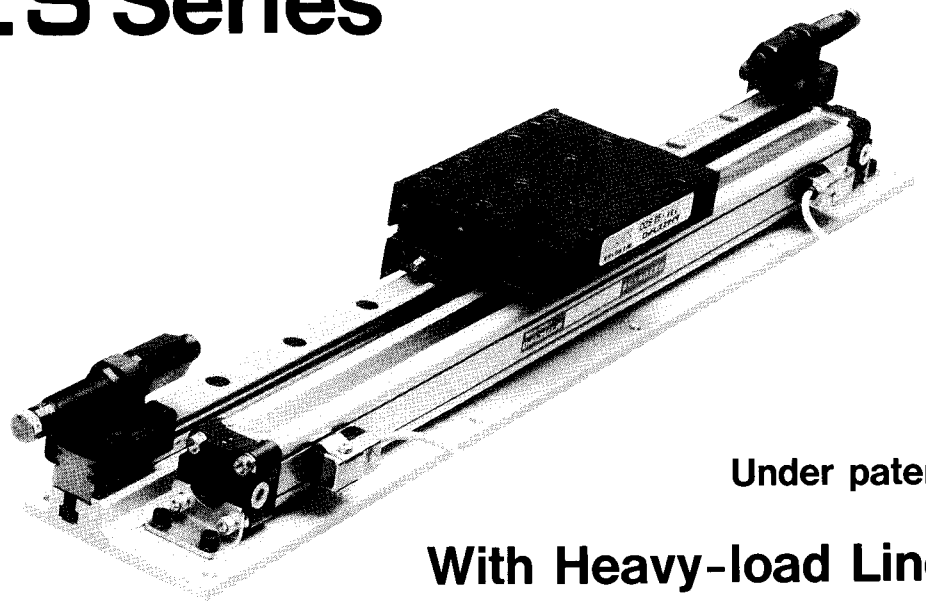
RODLESS SLIDER

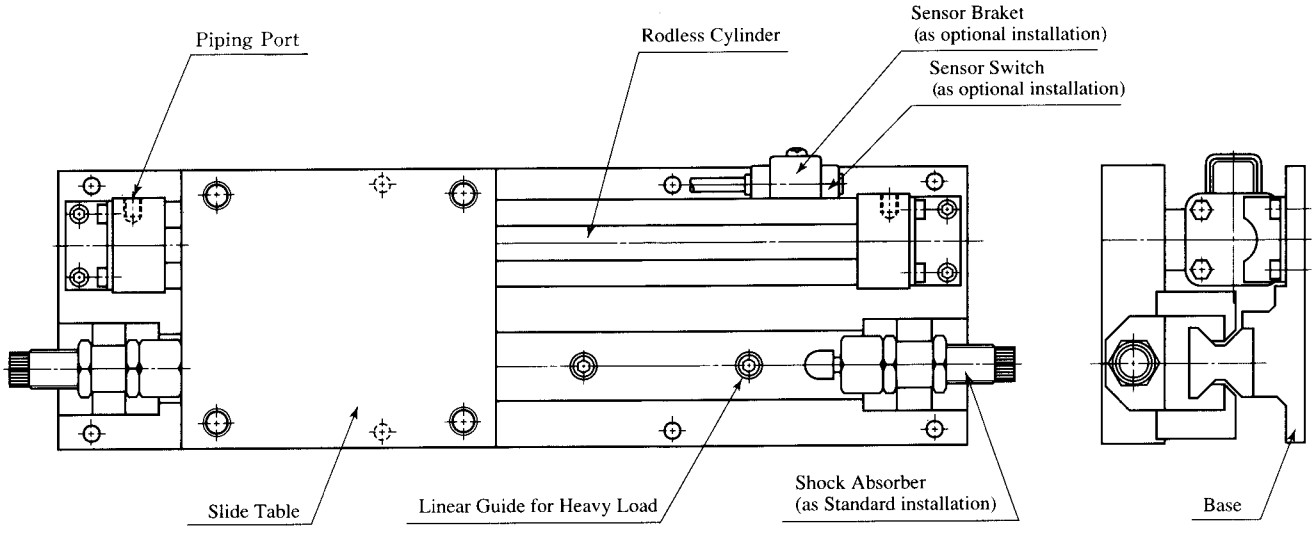
OZS Series



Under patent Application

With Heavy-load Linear Guide

Construction



Features

1) The series features integrated construction of both the rodless cylinder and the double sealed linear guide, allowing heavily loaded high-precision operation.
2) The standard type, equipped with hydraulic shock absorbers on both ends, allows it to stop a heavy object at high speed without impacts.
3) Because of the shock absorber's adjustable setting position, the stroke of the slide table can be determined freely.
4) Due to the sensor switch's free setting position in its optional installation, both end detection and midpoint transit verification can be easily done.
5) The series can be installed in any direction, this includes the vertical, horizontal and back-to-back mountings.

OZS — 16×500 — CS4KR — 2

OZAK Rodless Slider　Cylinder Diameter x Stroke

- **[Sensor Switch]**

Switch Type (See the following table.) ..... With Switches
No Marking ..... With No Switches

- **Number of Sensor Switches**

1: One switch installation
2: Two switch installation
3: Three switch installation

Sensor Switch Type

For OZS10 and OZS16

Sensor Switch Type / Lead Wire Length 1.5m	Working Voltage Range	Working Current Range	Contact Method	Operation Indicator Lamp
CS7GR	DC10~30V	200mA MAX.	Non-Contact Type	Installed
CS4KR	AC85~115V	5~25mA	Contact Type	Installed
	DC5~30V	5~40mA		

For OZS25 and OZS40

Sensor Switch Type / Lead Wire Length 3.0m	Working Voltage Range	Working Current Range	Contact Method	Operation Indicator Lamp
CS2BR	AC85~230V	2~200mA	Contact Type	Installed
CS3BR	DC5~30V	10~46mA	Contact Type	Installed
CS4BR	DC5~30V	5~25mA	Contact Type	Installed
CS5BR	DC3~30V	0.1~80mA	Contact Type	None

*The standard OZS10 and 16 are equipped with two CS4KRs each and the standard OZS25 and 40 are with two CS4BRs each.

[Note]: For separate orders of the sensor switches, use the following identification numbering.

- In case of a set order for both the sensor switches and sensor brackets

CS4KR — 16
(Switch Type)　(Cylinder Diameter)

- In case of a separate order for the sensor switches

CS4KR
(Switch Type)

Standard Stroke List

Unit: mm

Type	Standard Stroke	Producible Stroke Range
OZS10	200, 250, 300, 350, 400, 500,	25~1,500
OZS16	200, 300, 400, 500, 600, 700, 800,	25~3,000
OZS25	200, 300, 400, 500, 600, 700, 800, 1,000, 1,200	25~3,500
OZS40	300, 400, 500, 600, 700, 800, 1,000, 1,200, 1,400	100~5,500

[Note]: For orders other than the standard strokes, specify the required stroke.

Specifications

Type	OZS10	OZS16	OZS25	OZS40
Cylinder Diameter (mm)	10	16	25	40
Working Fluid	Air			
Working Pressure (kgf/cm²) {KPa}	2~7	1.5~8 {150~800}		
Pressure Limit (kgf/cm²) {KPa}	12 {1200}			
Working Temperature Range (°C)	0 ~ 60			
Working Speed Range (mm/S)	100~500	100 ~ 1,000		
Lubrication	Required (See Note 1)			
Installation Direction	Unlimited			
Repeat Accuracy of End Edge Stoppage	± 0.04			
Maximum Loading Capability (kgf)	10	20	45	120

[Note 1]: When the piston speed is 500mm/s or less, lubrication is not required. The following oils are recommended for lubrication.

Recommended Oil: **Idemitsu Kohsan: duffney Rock Drill 38;**
Showa Shell Petroleum: Rock Drill Oil 32;
Mobile Petroleum: Almo 525;
Others: equivalents to the oil stated above

Piston Outputs

Choose a proper cylinder diameter, based on the required piston output obtained from the loaded conditions and the operating air pressure.
Choose the diameter of the cylinder to meet the required ratio [(loaded Ratio) = (Load)/(Calculated Value) which must be 70% or less. (50% or less in high speed operations)], based on the calculated values in the table.

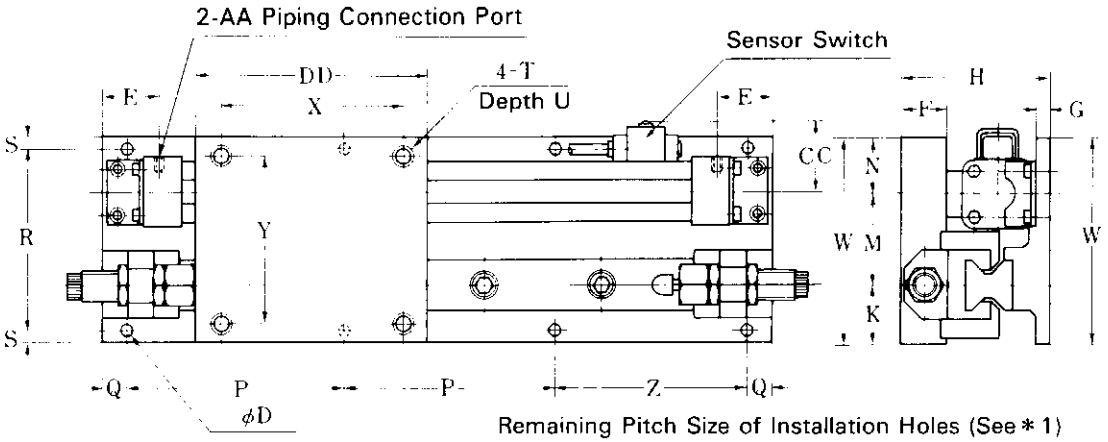
Unit: kgf

Type	Pressurized Area (cm²)	Air Pressure (kgf/cm²)						
		2	3	4	5	6	7	8
OZS10	0.75	1.5	2.3	3.1	3.9	4.7	5.4	—
OZS16	2.01	4	6	8	10	12	14	16
OZS25	4.90	9	14	19	24	29	34	39
OZS40	12.56	25	37	50	62	75	87	100

Main Body Weight

Type	Main Body Weight (kgf)
OZS10	1.059+0.0032 × (Stroke mm)
OZS16	2.224+0.0054 × (Stroke mm)
OZS25	5.655+0.0087 × (Stroke mm)
OZS40	15.921 + 0.0180 × (Stroke mm)

[Note 2]: The main body weight includes two shock absorbers and two switches.



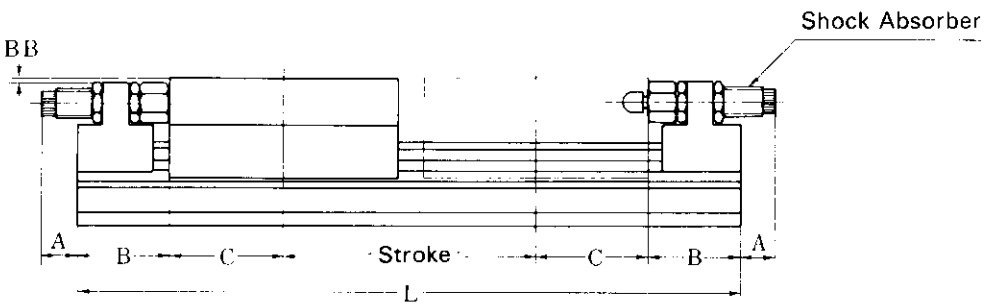


Table 177 : OZS Series Dimensions Table

Unit : mm

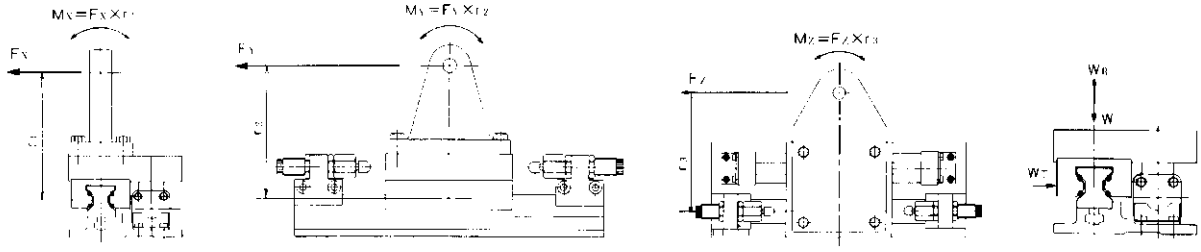
Type	A	B	C	D	E	F	G	H	K	L	M	N	P
OZS10	9	36	35	4.5	30	16	4	50	18.5	142+ Stroke	28	18.5	100
OZS16	31	43	45	5.5	28.5	20	5	60	22.5	176+ Stroke	35.5	22	100
OZS25	39	66	75	6.6	49.5	25	7	80	26.5	282+ Stroke	45	33.5	150
OZS40	36	75	100	9	40	28	10	115	37	350+ Stroke	74	54	150

Unit : mm

Type	Q	R	S	T	U	W	X	Y	AA	BB	CC	DD
OZS10	5	55	5	M5×0.8	14	65	42	54	M5×0.8	1	23	70
OZS16	5	70	5	M6×1	18	80	52	65	M5×0.8	1	34	90
OZS25	10	90	7.5	M8×1.25	20	105	90	90	PT⅛	1	38	150
OZS40	10	145	10	M10×1.5	28	165	120	140	PT¼	1	49	200

[Note 1] : The remaining pitch size of the installation holes, Z, can be obtained in Z = L − (2XQ + nXP). However the installation holes are not required if the value Z is 50mm or less for the OZS10 and OZS16, and 75mm or less for the OZS25 and OZS40.

Allowable Load · Moment



[Note] 1. The maximum load W is given when the center of gravity is located on the center line of the linear guide. When there is a deviation in the center of gravity, take the moment M_X into account.
2. Both r_1 and r_2 give the height of the table unit from the center.

- **Maximum Lateral Bending Moment** : $M_X = F_X \times r_1$ (kgf·m)
- **Maximum Bending Moment** : $M_Y = F_Y \times r_2$ (kgf·m)
- **Maximum Twisting Moment** : $M_Z = F_Z \times r_3$ (kgf·m)
- **Maximum Loading Capability** : W, W_T, W_R (kgf)

Type	Allowable Load · Moment					
	M_X	M_Y	M_Z	W	W_R	W_T
OZS10	0.3	0.5	0.5	10	10	10
OZS16	0.6	0.9	0.8	20	20	20
OZS25	1.5	2	2	45	45	45
OZS40	6	9	9	120	120	120

Precision

Items	OZS10	OZS16	OZS25	OZS40
Minimum Working Pressure kgf/cm²	1.5	1	1	1
Table Height Tolerance mm	± 0.3	± 0.3	± 0.3	± 0.4
Straightness of Table Motion mm	0.1/200	0.1/200	0.1/200	0.15/200
Relief of Table (Contact with Stop) mm	0.02	0.02	0.02	0.03

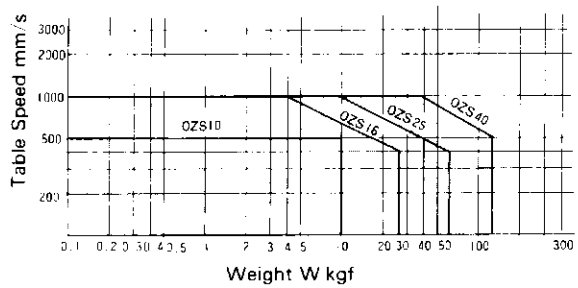
[Note] 3. The precision values shown in the above table are the maximum allowable values when the rodless slider is installed on the surface plate and wet air is used.

Hydraulic Shock Absorbers Specifications

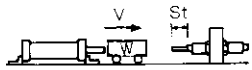
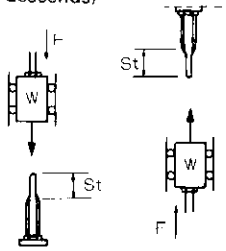
Type	OZS10	OZS16	OZS25	OZS40
Maximum Absorbed Energy (kgf·m)	0.25	0.3	0.8	3.0
Maximum Equivalent Load (kgf)	15	30	50	300
Maximum Collision Speed (m/s)	0.6	2	2	1
Maximum Working Cycle (cpm)	30	60	60	60
Stroke (mm)	8	10	12	16
Collision Energy per minute (J/min)	75	100	240	350
Adjusting Method for Shocks	Fixed Orifice:	Analogue Adjusting Type		
Working Temperature Range (C)	−5 ~70	−10~80		

Shock Absorber Performance Chart

The weight W(kgf) and speed, which can be handled by the ends of the hydraulic shock absorbers in horizontal travel, under 4kgf/cm² of the operational pressure, are given on the chart in the area below the graphs.



Selection Formulas

	When pushed horizontally by Cylinder	When pushed up and down by Cylinder
Collision Type		(When descends) (When ascends) 
Weight of Colliding Object (kgf)	W	W
Collision Speed (m/sec)	V	V
Kinetic Energy (kgf·m)	$E_K = 0.051 \cdot W \cdot V^2$	$E_K = 0.051 \cdot W \cdot V^2$
Thrust (kgf)	Cylinder Output $F = F_1 \quad \frac{\pi}{4} \cdot D^2 \cdot P$	$F = F_1 \cdot W$ (When descends) $F = F_1 \quad W$ (When ascends)
Thrust Energy (kgf·m)	$E_1 = F \cdot St$	$E_1 \quad F \cdot St$
Total Energy (kgf·m)	$E_T = E_K \cdot E_1$	$E_T = E_K \cdot E_1$
Equivalent Load (kgf)	$We = \frac{E_T}{0.051 \cdot V^2}$	$We = \frac{E_T}{0.051 \cdot V^2}$
Collision Energy per minute (J/min)	$Es = 9.8 \times E_T \times N$	$Es = 9.8 \times E_T \cdot N$

E_T (kgf·m) – Total energy;
E_K (kgf·m) – Kinetic energy;
F (kgf) – Thrust acting on shock absorber;
E_1 (kgf·m) – Energy by cylinder thrust;
F_1 (kgf) – Cylinder thrust;
W (kgf) – Weight of colliding object;
V (m/s) – Collision speed;
S_t (m) – Shock absorber stroke;
E_s (J/min) – Collision energy per minute (J/min);
N (cpm) – Working cycle;
D (cm) – Cylinder diameter;
P (kgf/cm²) – Air pressure

• Specifications of Sensor Switches

Type	Type of Contact	Specifications: Power Source, Working Voltage Range	Working Current Range	Operation Indicator Lamp	Sensor Switch Type
For OZS 10 & OZS 16	Non-contact Type	DC only	DC10~30V	200mA MAX.	Red-LED (lights when the switch ON)	CS 7GR
	Contact Type	both AC & DC	AC85~115V	5~25mA	Red-LED (lights when the switch ON)	CS 4KR
			DC 5~30V	5~40mA(Ta 25℃)		
For OZS 25 & OZS 40	Contact Type	AC only	AC85~230V	2~200mA	Neon Lamp (lights when the switch OFF)	CS 2BR
		DC only	DC 5~30V	10~46mA(Ta 0~60℃)	Red-LED (lights when the switch ON)	CS 3BR
				5~25mA(Ta 0~60℃)		CS 4BR
			DC 3~30V	0.1~80mA	None	CS 5BR

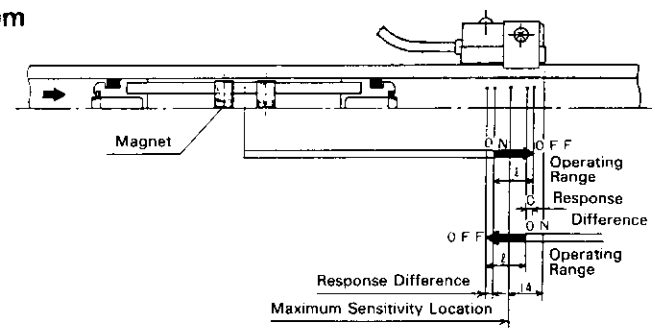
• Operating Ranges, Response Difference and Maximum Sensitivity Location of Sensor Switches

Operating Range:

This term means the range the piston travels after the sensor switch starts to function, (ON), then the piston moves further in the same direction until coming to a halt, (OFF). The maximum sensitivity location is given at the center of the operating range.

Response Difference:

This term indicates the distance the piston travels after the sensor switch starts functioning, (ON), and then moves in the reverse direction until it stops (OFF).



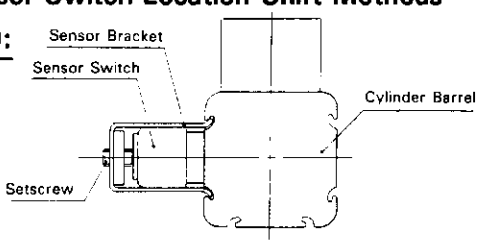
Maximum Sensitivity Location

Cylinder Diameter Type	OZS10		OZS16		OZS25	OZS40
Sensor Switch Type	CS4KR		CS7GR	CS4KR	CS BR	
Operating Range : ℓ	8~12		7~11	8~12	13~16	17~23
Response Difference : C	1.5		1.5		1.4	
Maximum Sensitivity Location (Note)		13	11	13	14	

[Note]: The values are measured from the opposite edge of the lead wire. (The value for CS4KR is measured from the main body of the switch excluding the indicator.)

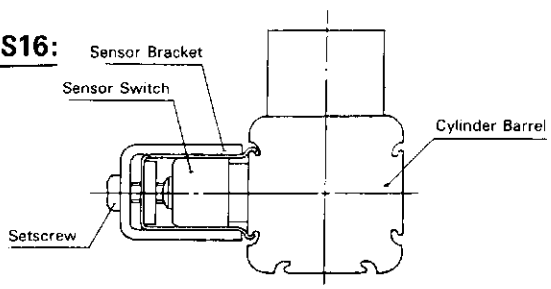
• Sensor Switch Location-Shift Methods

OZS10:



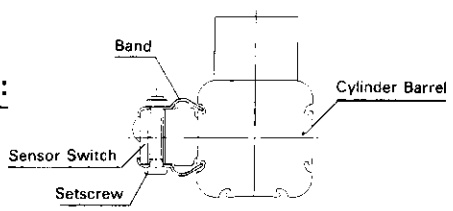
Slightly loosen the setscrews, and the sensor can be shifted freely along the cylinder barrel's channels. Both sensor bracket and sensor switch can be removed, when the setscrews have been loosened completely.

OZS16:



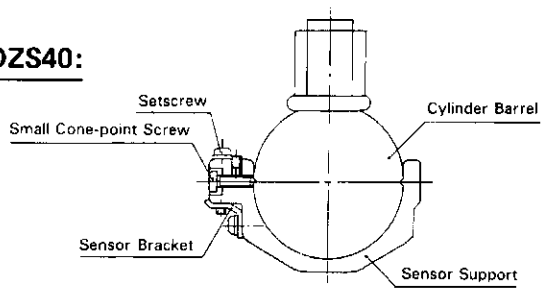
Slightly loosen the setscrews, and the sensor can be shifted freely along the cylinder barrel's channels. Both sensor bracket and sensor switch can be removed when the setscrews have been loosened completely.

OZS25:



Slightly loosen the setscrews, and the sensor switch can be shifted within 4mm of the fine adjustment range in the axial direction. Further loosen the setscrews, and the sensor can be shifted freely along the channels of the cylinder barrel. Both bands and sensor switch can be removed when the setscrews have been loosened completely.

OZS40:

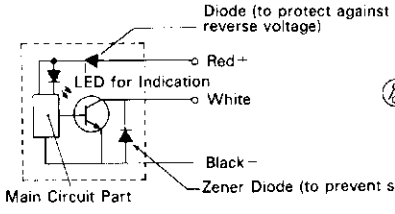


Slightly loosen the setscrews, and the sensor switch can be shifted within 4mm of the fine adjustment range in the axial directions. Remove the setscrews, and the sensor can be shifted 10mm in the axial direction along with the additional 4mm fine adjustment at the location. The support can be moved freely along the channels of the cylinder barrel when the small cone-point screw is loosened.

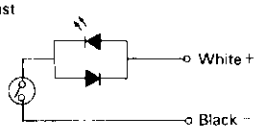
● Internal Circuits in Sensor Switches

Sensor Switches for OZS10 and OZS16

Non-contact Type

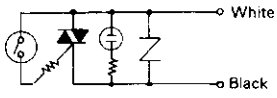


Contact Type

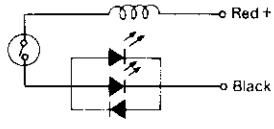


Sensor Switches for OZS25 and OZS40

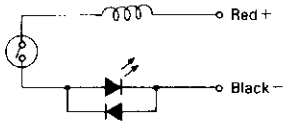
CS 2BR



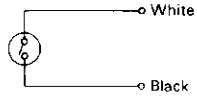
CS 3BR



CS 4BR



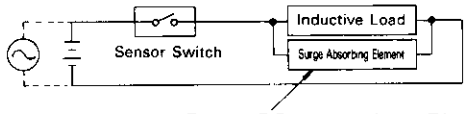
CS 5BR



● Protection for Contacts

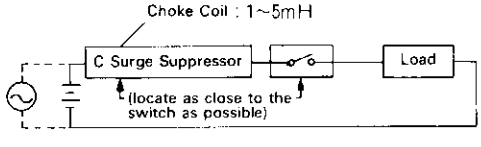
For stable use of the sensor switches, the following contact protection measures must be carried out.

● When connected with inductive loads such as an electromagnetic relay;



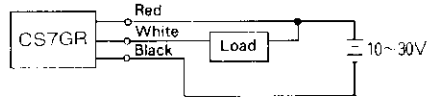
- For a DC connection: Diode, CR or equivalents
- For an AC connection: CR or equivalent
- Diode: For the direction of normal current flow, choose a diode with more than twice the rated current of the circuit, and for the reverse direction, choose a diode that has a resistance ten times higher than the resistance in the direction of normal current flow.

● When a capacitive surge occurs (with a lead wire of more than 10m)

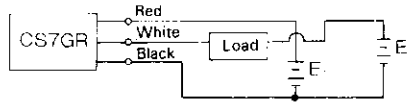


● Connection Methods for Non-contact Types

● When equipped with one power source

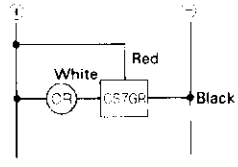


● When equipped with two power sources

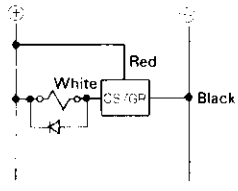


Both E1 and E2 are allowed in 10~30V.

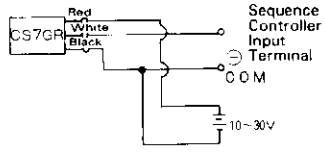
● When connected with relay



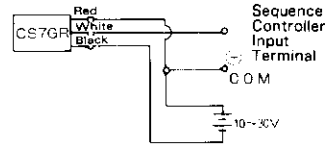
● When connected with an electromagnetic valve



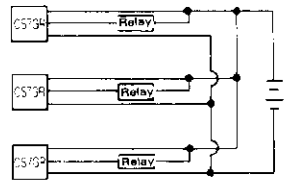
● Case with (−) COM terminal



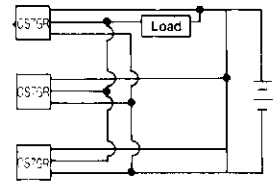
● Case with (+) COM terminal

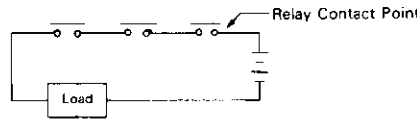


● AND (Series) Connection;



● OR (Parallel) Connection





Note.

1) Pay due attention to the color of the lead wires in the connection. Incorrect connections may cause the product's malfunction or breakdown.
2) Use the photocoupler input method in the product's direct use for TTL or C-MOS level ICs.
3) The one pulse output signal (0.5 ms), originating from the power supply, will be cause any adverse effects during operation.
4) The use of protective diodes to safeguard against surging is recommended for inductive loads.