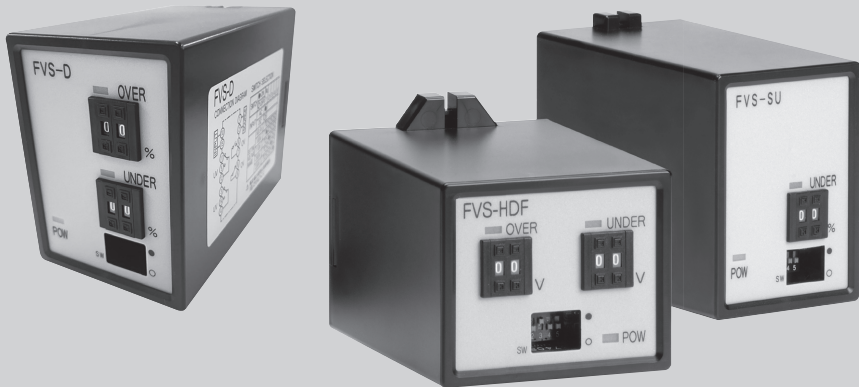




VOLTAGE RELAY

FVS TYPE

Easy setting, long life voltage relay
Easy to use new models are available



FEATURES

Easy setting by digital switches

Setting reference voltage can be easily set by DIP switches.

Setting voltage value can be set by digital switch of direct voltage and percent value and it prevents malfunction.

Long life design

Long life is achieved by a design not using aluminum electrolytic capacitors.

Wide variety of control power

Standard 100 / 110V type and multi power 100 - 220V AC / DC type are available for control power.

Conformed to B-402 standards

FVS has high noise withstand, voltage fluctuation and insulation performance.

LED lamp for operation monitor

Control power presence and operating condition can be easily checked by LED lamps.

Variety-rich product development

New FVS-SS type can monitor high voltage over 200V and minute voltage less than 300mV.

The newly added FVS-SDG type performs two main operations of overvoltage detection and undervoltage detection in a single unit with 8-pin type. It allows space saving.

HOW TO ORDER

FVS - SS ☐ - 100/220

Basic type Shape code Circuit code Control power voltage

Shape code	Circuit code	Control power voltage	Monitoring voltage range	OV monitor	UV monitor	Setting style	Pin number	Remark	Page
SS	A	100 / 220	5 to 99V (Setting voltage range : 100V) 100 to 199V (Setting voltage range : 200V) 200 to 249V (Setting voltage range : 250V)	1c		V	8 pin	Standard	D25 to D26
	B		0.5 to 9.9V (Setting voltage range : 10V) 10.0 to 19.9V (Setting voltage range : 20V) 20.0 to 29.9V (Setting voltage range : 30V)	1c					
	C		5 to 99mV (Setting voltage range : 100mV) 100 to 199mV (Setting voltage range : 200mV) 200 to 299mV (Setting voltage range : 300mV)	1c					

HOW TO ORDER

FVS - ☐ ☐ ☐ - 100/220 - A

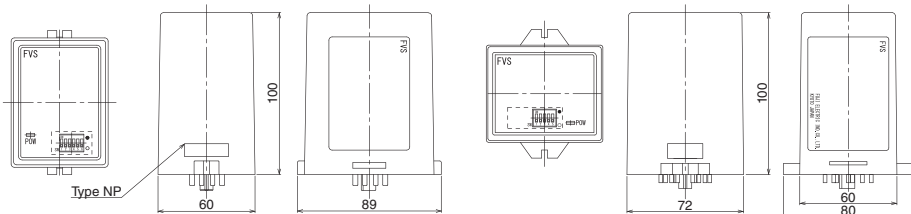
Basic type Shape code Circuit code Control power voltage Code

Shape code	Circuit code	Control power voltage	Monitoring voltage range	OV monitor	UV monitor	Setting style	Pin number	Remark	Page
S	DG	100 / 220	DC : 100 / 110 / 200 / 220V AC : 63.5 / 100 / 110 / 200 / 220V	1b	1b	%	8 pin	Standard	D27 to D28
	U		DC : 100 / 110 / 200 / 220V AC : 63.5 / 100 / 110 / 200 / 220V	—	1c			Sub standard	
	O		DC : 100 / 110 / 200 / 220V AC : 63.5 / 100 / 110 / 200 / 220V	1c	—			Sub standard	
	UB		DC : 12 / 24 / 48V AC : 12 / 24 / 48V	—	1c			Sub standard	
	OB		DC : 6 / 12 / 24 / 48V AC : 6 / 12 / 24 / 48V	1c	—			Sub standard	
Shape code	Circuit code	Control power voltage	Monitoring voltage range	OV monitor	UV monitor	Setting style	Pin number	Remark	Page
H	DF	100 / 220	0 to 99V, 100 to 199V	1a 1b	2c	V	14 pin	Standard	D29 to D30
	UF		0 to 99V, 100 to 199V	—	1a 1b 2c			Sub standard	
	WF		0 to 99V, 100 to 199V	—	SET1: 1a 1b SET2: 2c			Special	
	WE		0 to 99V, 100 to 199V	—	SET1: 1a 1b SET2: 2c			Sub standard	
Shape code	Circuit code	Control power voltage	Monitoring voltage range	OV monitor	UV monitor	Setting style	Pin number	Remark	Page
(none)	D	100 / 220	DC : 100 / 110 / 200 / 220V AC : 63.5 / 100 / 110 / 200 / 220V	1a 1b	2c	%	14 pin	Standard	D31 to D32
	DD		DC : 125 / 200 / 220V AC : 125 / 200 / 220V	1a 1b	2c			Sub standard	
	U		DC : 100 / 110 / 200 / 220V AC : 63.5 / 100 / 110 / 200 / 220V	—	1a 1b 2c			Special	
	UA		DC : 100 / 110 / 200 / 240V AC : 63.5 / 100 / 110 / 200 / 240V	—	1a 1b 2c			Sub standard	

* a = NO contact, b = NC contact, c = Changeover contact

<8 pin - voltage setting type, % setting style 8pin / 14pin outline>

<14 pin - voltage setting type outline>





VOLTAGE RELAY

FVS TYPE

SPECIFICATIONS

8 pin-voltage setting type

Applicable standard : B402 (2016)

Specification		Type	FVS-SSA	FVS-SSB	FVS-SSC
Rating	Rated insulation voltage (Ui)		250V		
	Control power voltage		100 to 220V AC / DC (free input)		
	Fluctuation range of control power voltage (free input)		100 to 220V AC / DC (free input) 80V to 250V		
	Input voltage style		AC (50Hz / 60Hz), DC		
	Max. input voltage style		250V AC / DC		50V AC / DC
	Input impedance		Approx. 1MΩ		Approx. 100KΩ
	Output contact rating	Max. operational voltage	380V AC max., 125V DC max.		
		Rated current-carrying capacity (Ith)	5A		
Making and breaking capacity (reference)	Resistive load		1,250VA AC, 150W DC		
	Inductive load (cos φ=0.4, L/R=7ms)		500VA AC, 90W DC		
Specification / Performance	Setting reference voltage		100V, 200V, 250V	10V, 20V, 30V	100mV, 200mV, 300mV
	Setting voltage range		100V range : 5 to 99V 200V range : 100 to 199V 250V range : 200 to 249V	10V range : 0.5 to 9.9V 20V range : 10.0 to 19.9V 30V range : 20.0 to 29.9V	100mV range : 5 to 99mV 200mV range : 100 to 199mV 300mV range : 200 to 299mV
	Set / Reset time		1sec. max.(approx. 0.5sec. when relay is ON)		
	Error range		100V range : ±2V 200V range : ±4V 250V range : ±6V	10V range : ±0.2V 20V range : ±0.4V 30V range : ±0.6V	100mV range : ±2mV 200mV range : ±4mV 300mV range : ±6mV
	Reset dead band		±4 to 99V	±0.4 to 9.9V	±4 to 99mV
	Holding error		100V range : ± 4V 200V range : ± 8V 250V range : ±12V	10V range : ±0.4V 20V range : ±0.8V 30V range : ±1.2V	100mV range : ± 4mV 200mV range : ± 8mV 300mV range : ±12mV
	Temperature effect		±0.5V / 10°C max.	±0.05V / 10°C max.	±0.5mV / 10°C max.
	Operational indication color	Control power	Yellow		
		Output contact	Yellow		
	Insulated resistance	Between all circuit and ground	10MΩ or more (DC500V mega)		
		Between poles			
	Power-frequency withstand voltage	Between all circuit and ground	2,000V AC / 1min.		
		Between poles			
	Impulse withstand voltage (Uimp)	Between all circuit and ground	±7kV (each 3 time for monitor input, output contact, every control power terminal ⇄ mount rail)		
		Between poles①	±4.5kV (each 3 time for monitor input ⇄ output contact, monitor input ⇄ control power terminal)		
		Between poles②	±3kV (3 time for output contact ⇄ control power terminal)		
	Noise resistance	Electric wave noise	150MHz band, 400MHz band, 2GHz band		
		Static noise	Contact discharge : 8kV, Air discharge : 15kV		
	Vibration resistance		Frequency : 16.7Hz, Width : 0.4mm, 3 directions, 10min.		
	Shock resistance		294m/s ² , each 3 time for 6 directions		
	Power consumption (When operated by rated control power voltage, output relay is working)		Approx. 2W		
	Weight		Approx. 200g		
Normal service condition	Operating temperature		0°C to 40°C		
	Storing temperature		-20°C to 60°C		
	Relative humidity		30% to 90% (no condensation)		
	Altitude		2,000 m max.		

STANDARD PRODUCTS

8 pin-voltage setting type

FVS-SSA-100/220

OV, UV select type

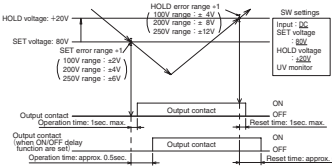


●Accessory

Socket	8PFA1	(Optional)
Voltage label	FVS V-NP-SSA	(Attached)

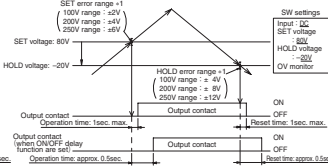
●Operation chart

Example1 : UV (Under Voltage) monitor SET voltage=80V DC, HOLD voltage +20V



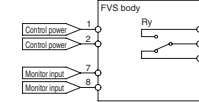
• The above chart shows a contact (NO contact) operation.

Example2 : OV (Over Voltage) monitor SET voltage=80V DC, HOLD voltage -20V



• The above chart shows a contact (NO contact) operation.

●Connection diagram



- *1 Error range of SET and HOLD shows the error towards absolute voltage values.
SET voltage 80V : 80V±2V
HOLD voltage +20V : 100V±4V
- *2 When SET voltage is less than 5V, the above error range is not applicable.
- *3 Please do not set SET voltage less than 8V for OV setting.

FVS-SSB-100/220

OV, UV select type

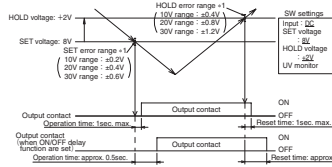


●Accessory

Socket	8PFA1	(Optional)
Voltage label	FVS V-NP-SSB	(Attached)

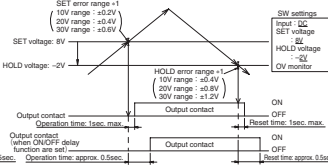
●Operation chart

Example1 : UV (Under Voltage) monitor SET voltage=8V DC, HOLD voltage +2V



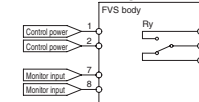
• The above chart shows a contact (NO contact) operation.

Example2 : OV (Over Voltage) monitor SET voltage=8V DC, HOLD voltage -2V



• The above chart shows a contact (NO contact) operation.

●Connection diagram



- *1 Error range of SET and HOLD shows the error towards absolute voltage values.
SET voltage 8V : 8V±0.2V
HOLD voltage +2V : 10V±0.4V
- *2 When SET voltage is less than 0.5V, the above error range is not applicable.
- *3 Please do not set SET voltage less than 0.8V for OV setting.

FVS-SSC-100/220

OV, UV select type

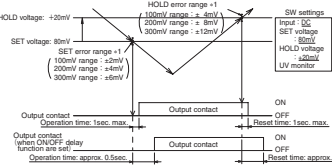


●Accessory

Socket	8PFA1	(Optional)
Voltage label	FVS V-NP-SSC	(Attached)

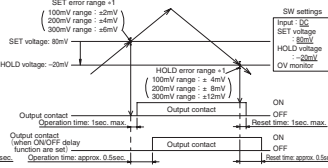
●Operation chart

Example1 : UV (Under Voltage) monitor SET voltage=80mV DC, HOLD voltage +20mV



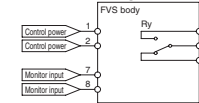
• The above chart shows a contact (NO contact) operation.

Example2 : OV (Over Voltage) monitor SET voltage=80mV DC, HOLD voltage -20mV



• The above chart shows a contact (NO contact) operation.

●Connection diagram



- *1 Error range of SET and HOLD shows the error towards absolute voltage values.
SET voltage 80mV : 80mV±2mV
HOLD voltage +20mV : 100mV±4mV
- *2 When SET voltage is less than 5mV, the above error range is not applicable.
- *3 Please do not set SET voltage less than 8mV for OV setting.



VOLTAGE RELAY

FVS TYPE

SPECIFICATIONS

8 pin-percent setting type

Applicable standard : B402 (2016)

Specification		Type	FVS-SDG	FVS-SU	FVS-SO	FVS-SUB	FVS-SOB	
Rating	Rated insulation voltage (Ui)		250V					
	Control power voltage		100 to 220V AC / DC (free input)					
	Fluctuation range of control power voltage	100 to 220V AC / DC (free input)	80V to 250V					
	Input voltage style		AC (50Hz / 60Hz), DC					
	Max. input voltage		250V					
	Input impedance		Approx. 1MΩ		Approx. 200KΩ			
	Output contact rating	Max. operational voltage	250V AC max., 125V DC max.					
		Rated current-carrying capacity (Ith)	5A					
Making and breaking capacity (reference)	Resistive load	1,250VA AC, 150W DC						
	Inductive load (cos φ =0.4, L/R=7ms)	500VA AC, 90W DC						
Specification / Performance	Setting reference voltage		DC : 100, 110, 200, 220V AC : 63.5, 100, 110, 200, 220V			12V, 24V, 48V		6V, 12V, 24V, 48V
	Setting voltage range		3% to 96%					
	Set / Reset time		1.5sec. max. (50% max. towards setting range)					
	Error range		±2% max. (towards setting reference voltage)					
	Reset dead band (Setting reference voltage %)		OVER : -6% UNDER : +6%	+6% max.	-6% max.	+6% max.	-6% max.	
	Temperature effect		±0.5% / 10°C max. (towards setting reference voltage)					
	Operational indication color	Control power	Yellow					
		Output contact	Yellow					
	Insulated resistance	Between all circuit and ground	10MΩ or more (500V DC mega)					
		Between poles						
	Power-frequency withstand voltage	Between all circuit and ground	2,000V AC / 1min.					
		Between poles						
	Impulse withstand voltage (Uimp)	Between all circuit and ground	±7kV (each 3 time for monitor input, output contact, every control power terminal ⇔ mount rail)					
		Between poles①	±4.5kV (each 3 time for monitor input ⇔ output contact, monitor input ⇔ control power terminal)					
		Between poles②	±3kV (3 time for output contact ⇔ control power terminal)					
	Noise resistance	Electric wave noise	150MHz band, 400MHz band, 900MHz band					
		Static noise	Contact discharge : 8kV, Air discharge : 15kV					
	Vibration resistance		Frequency : 16.7Hz, Width : 0.4mm, 3 directions, 10min.					
	Shock resistance		300m/s ² , each 3 time for 6 directions					
	Power consumption (When operated by rated control power voltage, output relay is working)		Approx. 1.5W					
	Weight		Approx. 200g		Approx. 220g		Approx. 200g	
	Normal service condition	Operating temperature		0°C to 40°C				
		Storing temperature		-20°C to 60°C				
Relative humidity		30% to 90% (no condensation)						
Altitude		2,000 m max.						

STANDARD PRODUCTS

8 pin-percent setting type

FVS-SU-100/220-A

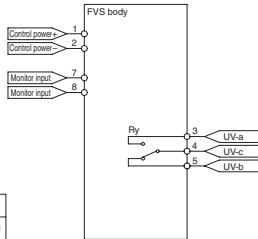
UV type



●Accessory

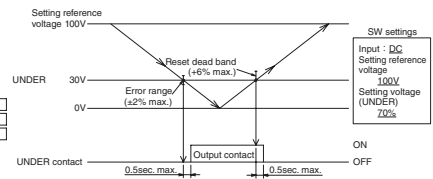
Socket	8PFA1	(Optional)
Voltage label	FVS V-NP	(Attached)

●Connection diagram



●Operation chart

Example : Operation voltage is UNDER=30V DC



* % of Error range and reset dead band are value towards setting reference voltage.
* The above chart shows a contact (NO contact) operation.

FVS-SO-100/220-A

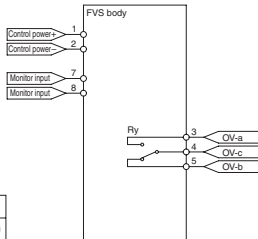
OV type



●Accessory

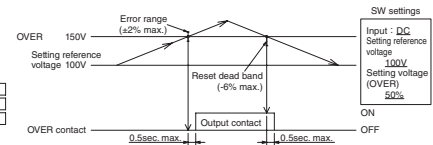
Socket	8PFA1	(Optional)
Voltage label	FVS V-NP	(Attached)

●Connection diagram



●Operation chart

Example : Operation voltage is OVER=150V DC



* % of Error range and reset dead band are value towards setting reference voltage.
* The above chart shows a contact (NO contact) operation.

FVS-SUB-100/220-A

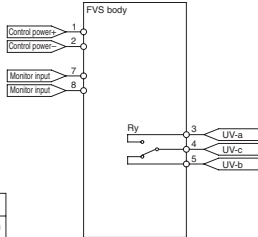
UV type



●Accessory

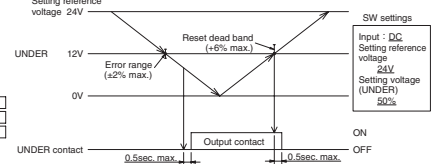
Socket	8PFA1	(Optional)
Voltage label	FVS V-NP B	(Attached)

●Connection diagram



●Operation chart

Example : Operation voltage is UNDER=12V DC



* % of Error range and reset dead band are value towards setting reference voltage.
* The above chart shows a contact (NO contact) operation.

FVS-SOB-100/220-A

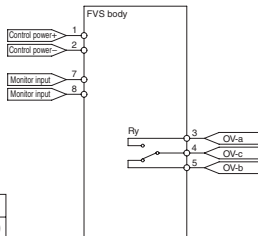
OV type



●Accessory

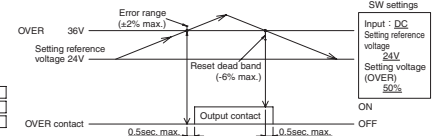
Socket	8PFA1	(Optional)
Voltage label	FVS V-NP B2	(Attached)

●Connection diagram



●Operation chart

Example : Operation voltage is OVER=36V DC



* % of Error range and reset dead band are value towards setting reference voltage.
* The above chart shows a contact (NO contact) operation.



VOLTAGE RELAY

FVS TYPE

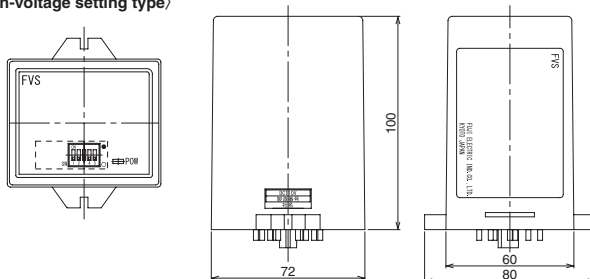
SPECIFICATIONS

14 pin-voltage setting type

Applicable standard : B402 (2016)

Specification		Type	FVS-HDF	FVS-HUF	FVS-HWF	FVS-HWE
Rating	Rated insulation voltage (Ui)		250V			
	Control power voltage		100 to 220V AC / DC (free input)			
	Fluctuation range of control power voltage	100 to 220V AC / DC (free input)	80V to 250V			
	Input voltage style		AC (50Hz / 60Hz), DC			
	Max. input voltage		250V			
	Input Impedance		Approx. 1MΩ			
	Output contact rating	Max. operational voltage	250V AC max., 125V DC max.			
		Rated current-carrying capacity (Ith)	5A			
Making and breaking capacity (reference)	Resistive load	1,250VA AC, 150W DC				
	Inductive load (cos φ=0.4, L/R=7ms)	500VA AC, 90W DC				
Specification / Performance	Setting reference voltage		03 to 99V (UV) 06 to 99V (OV) 100 to 196V (OV, UV)	03 to 99V, 100 to 196V		
	Setting voltage range		0 to 99V, 100 to 199V			
	Set / Reset time		1.5sec. max.			
	Error range		±2V max.			
	Reset dead band		±6V max.		+6V max.	
	Temperature effect		±0.5% / 10°C max.			
	Operational indication color	Control power	Yellow			
		Output contact	Yellow			
	Insulated resistance	Between all circuit and ground	10MΩ or more (500V DC mega)			
		Between poles				
	Power-frequency withstand voltage	Between all circuit and ground	2,000V AC / 1min.			
		Between poles				
	Impulse withstand voltage (Uimp)	Between all circuit and ground	±7kV (each 3 time for monitor input, output contact, every control power terminal ⇔ mount rail)			
		Between poles①	±4.5kV (each 3 time for monitor input ⇔ output contact, monitor input ⇔ control power terminal)			
		Between poles②	±3kV (3 time for output contact ⇔ control power terminal)			
	Noise resistance	Electric wave noise	150MHz band, 400MHz band, 900MHz band			
		Static noise	Contact discharge : 8kV, Air discharge : 15kV			
	Vibration resistance		Frequency : 16.7Hz, Width : 0.4mm, 3 directions, 10min.			
	Shock resistance		300m/s ² , each 3 time for 6 directions			
	Power consumption (When operated by rated control power voltage, output relay is working)		Approx. 2W			
	Weight		Approx. 220g			
Normal service condition	Operating temperature		0°C to 40°C			
	Storing temperature		-20°C to 60°C			
	Relative humidity		30% to 90%			
	Altitude		2,000 m max.			

〈Outlines of 14 pin-voltage setting type〉





VOLTAGE RELAY

FVS TYPE

SPECIFICATIONS

14 pin-percent setting type

Applicable standard : B402 (2016)

Specification		Type	FVS-D	FVS-DD	FVS-U	FVS-UA
Rating	Rated insulation voltage (Ui)		250V			
	Control power voltage		100 to 220V AC / DC (free input)			
	Fluctuation range of control power voltage	100 to 220V AC / DC (free input)	80V to 250V			
	Input voltage style		AC(50Hz / 60Hz), DC			
	Max. input voltage		250V			
	Input impedance		Approx. 1MΩ			
	Output contact rating	Max. operational voltage	250V AC max., 125V DC max.			
		Rated current-carrying capacity (Ith)	5A			
Making and breaking capacity (reference)	Resistive load	1,250VA AC, 150W DC				
	Inductive load (cos φ=0.4, L/R=7ms)	500VA AC, 90W DC				
Specification / Performance	Setting reference voltage		AC: 63.5, 100, 110, 200, 220V DC: 100, 110, 200, 220V	125V, 200V, 220V	AC: 63.5, 100, 110, 200, 220V DC: 100, 110, 200, 220V	AC: 63.5, 100, 110, 200, 240V DC: 100, 110, 200, 240V
	Setting voltage range		3% to 96%			
	Set / Reset time		1.5sec. max. (50% max. towards setting range)			
	Error range		±2% max. (towards setting reference voltage)			
	Reset dead band (Setting reference voltage %)		±6% max.			
	Temperature effect		±0.5% / 10°C max. (towards setting reference voltage)			
	Operational indication color	Control power	Yellow			
		Output contact	Yellow			
	Insulated resistance	Between all circuit and ground	10MΩ or more (500V DC mega)			
		Between poles				
	Power-frequency withstand voltage	Between all circuit and ground	2,000V AC / 1min.			
		Between poles				
	Impulse withstand voltage (Uimp)	Between all circuit and ground	±7kV (each 3 time for monitor input, output contact, every control power terminal ⇔ mount rail)			
		Between poles①	±4.5kV (each 3 time for monitor input ⇔ output contact, monitor input ⇔ control power terminal)			
		Between poles②	±3kV (3 time for output contact ⇔ control power terminal)			
	Noise resistance	Electric wave noise	150MHz band, 400MHz band, 900MHz band			
		Static noise	Contact discharge : 8kV, Air discharge : 15kV			
Vibration resistance		Frequency : 16.7Hz, Width : 0.4mm, 3 directions, 10min.				
Shock resistance		300m/s², each 3 time for 6 directions				
Power consumption (When operated by rated control power voltage, output relay is working)			Approx. 1.5W		Approx. 2W	
Weight		Approx. 220g				
Normal service condition	Operating temperature		0°C to 40°C			
	Storing temperature		-20°C to 60°C			
	Relative humidity		30% to 90%			
	Altitude		2,000 m max.			

STANDARD PRODUCTS

14 pin-percent setting type

FVS-D-100/220-A

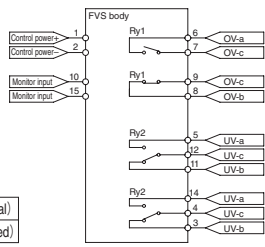
OV, UV type



●Accessory

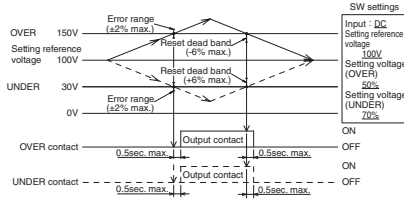
Socket	14PFA	(Optional)
Voltage label	FVS V-NP	(Attached)

●Connection diagram



●Operation chart

Example : Operation voltage are OVER=150V DC, UNDER=30V DC



* % of Error range and reset dead band are value towards setting reference voltage.
* The above chart shows a contact (NO contact) operation.

FVS-DD-100/220-A

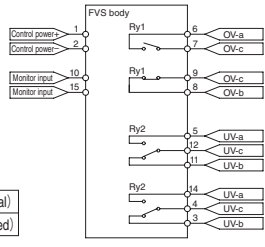
OV, UV type



●Accessory

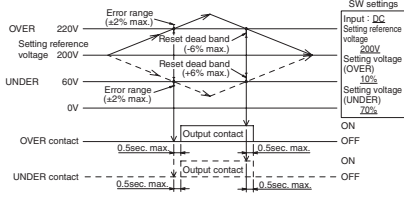
Socket	14PFA	(Optional)
Voltage label	FVS V-NP A	(Attached)

●Connection diagram



●Operation chart

Example : Operation voltage are OVER=220V DC, UNDER=60V DC



* % of Error range and reset dead band are value towards setting reference voltage.
* The above chart shows a contact (NO contact) operation.

FVS-U/FVS-UA-100/220-A

UV type

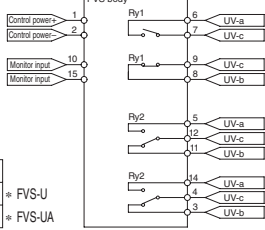


●Accessory

Socket	14PFA	(Optional)
Voltage label	FVS V-NP	(Attached) * FVS-U
	FVS V-NP A	(Attached) * FVS-UA

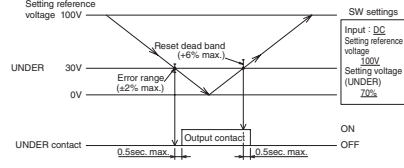
FVS-UA=Setting reference voltage 240V DC

●Connection diagram



●Operation chart

Example : Operation voltage is UNDER=30V DC



* % of Error range and reset dead band are value towards setting reference voltage.
* The above chart shows a contact (NO contact) operation.

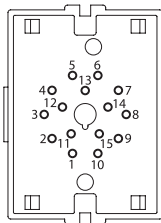


VOLTAGE RELAY

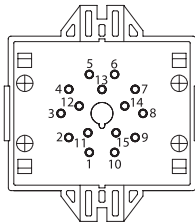
FVS TYPE

PIN ARRANGEMENT

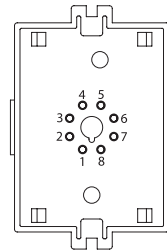
Vertical 14 pin type



Horizontal 14 pin type (H)



Vertical 8 pin type (S, SS)



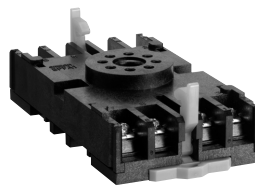
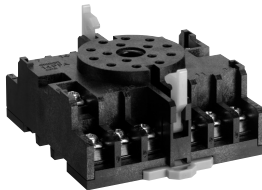
ACCESSORIES

Applicable sockets

(Order unit: 10)

■14PFA [Manufactured by OMRON Corporation]

■8PFA1 [Manufactured by OMRON Corporation]



* Vertical 14 pin type is applicable to PL15, too (Manufactured by OMRON Corporation).

Voltage labels

(Order unit: 10)

■FVS V-NP- type

●Label list

Product type	Voltage label type
FVS-SSA	FVS V-NP-SSA
FVS-SSB	FVS V-NP-SSB
FVS-SSC	FVS V-NP-SSC
FVS-SDG	FVS V-NP
FVS-SU	FVS V-NP
FVS-SO	FVS V-NP
FVS-SUB	FVS V-NP B
FVS-SOB	FVS V-NP B2
FVS-HDF	FVS V-NP HDF1
FVS-HUF	FVS V-NP HUF1
FVS-HWF	FVS V-NP HWE1
FVS-HWE	FVS V-NP HWE1
FVS-D	FVS V-NP
FVS-DD	FVS V-NP A
FVS-U	FVS V-NP
FVS-UA	FVS V-NP A



DC	AC
SET1 0V~99V	SET1 0V~99V
SET2 0V~99V	SET2 0V~99V
DC	AC
SET1 0V~99V	SET1 0V~99V
SET2 100V~199V	SET2 100V~199V
DC	AC
SET1 100V~199V	SET1 100V~199V
SET2 0V~99V	SET2 0V~99V
DC	AC
SET1 100V~199V	SET1 100V~199V
SET2 100V~199V	SET2 100V~199V

ご注意
本ラベルは設定電圧時に使用致しますので
大切に保管してください。
左のNPは上向き表向きにご使用ください

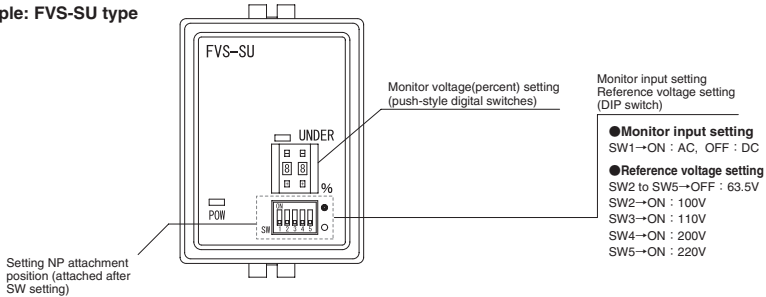
△ 設定電圧変更時にも、使用
致しますので保管下さい



INSTRUCTIONS

■ How to set monitor voltage (percent-setting type)

Example: FVS-SU type



1. Monitor input setting

- Select monitor input (AC or DC) by setting No.1 DIP switch.
- Set ON for AC and set OFF for DC.

2. Reference voltage setting

- Select reference voltage by setting DIP switch No.2, 3, 4 and 5.
- Set all DIP switches OFF for 63.5V, set only No.2 ON for 100V, set only No.3 for 110V, set only No.4 for 200V and set only No. 5 for 220V as reference voltage.
- Voltage range differ from each type. Refer to "DIP switch setting list" on the side of product bodies.

3. Monitor voltage setting

- Set the value for monitor voltage by setting digital switch.
- Monitor voltage is (reference voltage) – (reference voltage) × (setting voltage : percent).
Example: when reference voltage = 110V and setting value is 80 (%), monitor voltage is 22V.

4. Voltage label attachment

- Attach each NP for each setting.



Caution for setting

Prevent setting under the monitoring condition because it causes malfunction and output error.
(Setting instruction under monitoring condition is shown on page D37.)

■How to set monitor voltage (voltage-setting type)

Example: FVS-HDF type

Setting NP

監視入力	DC	監視入力	AC
OVER	0V~99V	OVER	0V~99V
UNDER	0V~99V	UNDER	0V~99V
予防びの付いた電圧範囲(100V)			
監視入力	DC	監視入力	AC
OVER	0V~99V	OVER	0V~99V
UNDER	100V~199V	UNDER	100V~199V
予防びの付いた電圧範囲(100V)			
監視入力	DC	監視入力	AC
OVER	100V~199V	OVER	100V~199V
UNDER	0V~99V	UNDER	0V~99V
予防びの付いた電圧範囲(100V)			
監視入力	DC	監視入力	AC
OVER	100V~199V	OVER	100V~199V
UNDER	100V~199V	UNDER	100V~199V
予防びの付いた電圧範囲(100V)			

この図は、本シリーズは設定変更時に使用するもので、本機に付属していません。
右のNPは、上掲表の例に之に使用してください。

Setting voltage NP
This NP is used when setting voltage range is 100 to 199V.
(included in setting NP)

Setting NP attachment position (attached after SW setting)

Monitor voltage setting (push-style digital switches)

Monitor input setting
Voltage range setting
(DIP switch)

- Monitor input setting
SW1→ON : AC, OFF : DC
- Voltage range setting
SW2(OVER) → OFF : 0 to 99V
ON : 100 to 199V
SW3(UNDER) → OFF : 0 to 99V
ON : 100 to 199V
SW4→non-use
SW5→non-use

1. Monitor input setting

- Select monitor input (AC or DC) by setting No.2 DIP switch.
- Set ON for AC and set OFF for DC.

2. Voltage range setting

- Select voltage range by setting DIP switch No.2 and 3.
- Set No.2 for OVER side voltage range and set No.3 for UNDER side voltage range.
- When each switch is OFF, voltage range is 0-99V. When each switch is ON, voltage range is 100-199V.
- Voltage range differ from each type. Refer to "DIP switch setting list" on the side of product bodies.

3. Monitor voltage setting

- Set the monitor voltage by setting digital switch.
- Voltage can be set every 1V.

4. Voltage label attachment

- Attach each NP for setting voltage and each setting.



Caution for setting

Prevent setting under the monitoring condition because it causes malfunction and output error.
(Setting instruction under monitoring condition is shown on page D37.)



VOLTAGE RELAY

FVS TYPE

TECHNICAL DATA

Polarity of FVS type

There is instruction for polarity as "pin No.1 is + (P) pole and No.2 is - (N) pole", some users check polarity while wiring. However rectifier circuit is built-in the circuit for control power (Diagram1) and polarity instruction is not necessary.

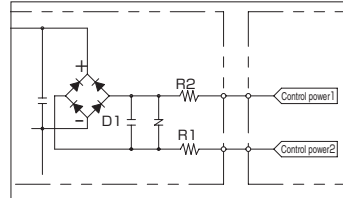


Diagram 1

Setting instruction under monitoring condition

Setting under monitoring condition is not recommended because it may cause malfunction and output error.

If you need to change under monitoring condition, please set by following the right chart.

- ① Set number "9" of the one's digit.
- ② Set ten's digit.
- ③ Set one's digit.

Noise resistance

Under each operating condition based on Power Standard B-402: Table 6,1-15 "Relay Test Conditions, Undervoltage Relay", It has been confirmed that irradiation of the specified radio noise does not interfere with the performance.

Test results

Control power voltage: 80V DC (rated x 80%) Monitoring input power supply: 88V

Test 1: Relay standby state (normal monitoring state)

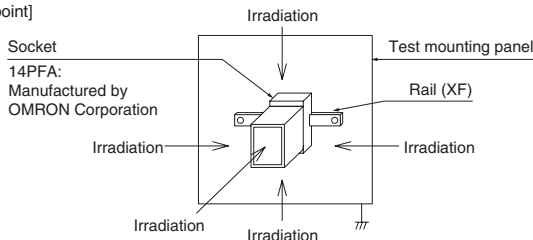
No.	Checklist	Output	Monitoring input voltage	Operating voltage setting	Before voltage application	Abnormalities (Malfunction and false output)	Judgment
1	150MHz	5W	88V AC	80V AC	Relay standby	NA	Good
2	400MHz	5W	88V AC	80V AC	Relay standby	NA	Good
3	900MHz	cellular phone	88V AC	80V AC	Relay standby	NA	Good

Control power voltage: 80V DC (rated x 80%) Monitoring input power supply: 72V

Test 2: Relay operating state (output operating state)

No.	Checklist	Output	Monitoring input voltage	Operating voltage setting	Before voltage application	Abnormalities (Malfunction and false output)	Judgment
1	150MHz	5W	72V AC	80V AC	Relay standby	NA	Good
2	400MHz	5W	72V AC	80V AC	Relay standby	NA	Good
3	900MHz	cellular phone	72V AC	80V AC	Relay standby	NA	Good

[Irradiation point]



Product life time

We conducted acceleration test (environment test for 5,000 hours) for forecasting product life time in field, and confirmed that problems of components deterioration and functional disorder do not happen.

We calculate 12.9 years for product's life time under 40°C environment. (But this life time differ from actual life time by usage environment changes.)

Frequency characteristic

We conducted operation test by the following frequency other than commercial frequency (50Hz / 60Hz) for monitor input voltage.

Tested frequency: 20 / 40 / 60 / 80 / 100 / 300 / 500 / 700Hz

1) Confirmation of malfunction for rated frequency

Confirm whether operation / reset voltage change and malfunction happens or not when monitor input frequency change between 47.5Hz to 63Hz.

Rated frequency: 50 / 60Hz, Voltage variation : $\pm 5\%$, Judge range: operation voltage = $\pm 2V$, reset voltage = -6V (OV), +6V (UV)

Frequency		Criterion range	Result	Malfunction	Judgement
Rated frequency	50 / 60Hz	Operation $\pm 2V$	○ (in Criterion range)	No malfunction	Good
Variation frequency ($\pm 5\%$)	-5% of 50Hz = 47.5Hz +5% of 60Hz = 63.0Hz	Reset OV : -6V UV : +6V			

2) Confirmation of malfunction for out range of rated frequency

Confirm whether operation / reset voltage change and malfunction happens or not when monitor input frequency change from 20Hz to 700Hz.

Frequency	Criterion range	Result	Malfunction	Judgement
Out range of rated frequency (20 to 700Hz)	Reference test	Gap happens from 100Hz between setting voltage and operation voltage	-	Reference

Use as normal excitation condition

Use as normal condition (non-normal excitation) and normal excitation condition are not different for continuous use time, and both of them can be used without problems.