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.

Conformed to B-402 standards

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

Long life design

Life time is designed for about 13 years with consideration of heat influence.

LED lamp for operation monitor

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

Wide variety of control power

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

New FVS-SS type

New FVS-SS type can monitor high voltage over 200V and minute voltage less than 300mV.
Over voltage and under voltage monitor functions are built-in one product and can be changed by DIP switches.
Setting value and resetting value can be set separately.

HOW TO ORDER

FVS - □ □□ - DC110

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	G3 to G4
	B	100 / 220	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	100 / 220	5 to 99mV 〈Setting voltage range : 100mV〉 100 to 199mV 〈Setting voltage range : 200mV〉 200 to 299mV 〈Setting voltage range : 300mV〉	1c					

Shape code	Circuit code	Control power voltage	Monitoring voltage range	OV monitor	UV monitor	Setting style	Pin number	Remark	Page
S	U	110 DC	DC：100 / 110 / 200 / 220V AC：63.5 / 100 / 110 / 200 / 220V	—	1c	%	8 pin	Standard	G5 to G6
		100 / 220						Sub standard	
	O	110 DC	DC：100 / 110 / 200 / 220V AC：63.5 / 100 / 110 / 200 / 220V	1c	—			Standard	
		100 / 220						Sub standard	
	UB	110 DC	DC：12 / 24 / 48V AC：12 / 24 / 48V	—	1c			Standard	
		100 / 220						Sub standard	
	OB	110 DC	DC：6 / 12 / 24 / 48V AC：6 / 12 / 24 / 48V	1c	—			Standard	
		100 / 220						Sub standard	

Shape code	Circuit code	Control power voltage	Monitoring voltage range	OV monitor	UV monitor	Setting style	Pin number	Remark	Page
H	DF	110 DC	0 to 99V、100 to 199V	1a 1b	2c	V	14 pin	Standard	G7 to G8
		100 / 220						Sub standard	
	UF	110 DC	0 to 99V、100 to 199V	—	1a 1b 2c			Standard	
		100 / 220						Sub standard	
	WF	110 DC	0 to 99V、100 to 199V	—	SET1: 1a 1b SET2: 2c			Special	
		100 / 220							
	WE	110 DC	0 to 99V、100 to 199V	—	SET1: 1a 1b SET2: 2c			Standard	
		100 / 220						Sub standard	

Shape code	Circuit code	Control power voltage	Monitoring voltage range	OV monitor	UV monitor	Setting style	Pin number	Remark	Page
(none)	D	110 DC	DC：100 / 110 / 200 / 220V AC：63.5 / 100 / 110 / 200 / 220V	1a 1b	2c	%	14 pin	Standard	G9 to G10
		100 / 220						Sub standard	
	U	110 DC	DC：100 / 110 / 200 / 220V AC：63.5 / 100 / 110 / 200 / 220V	—	1a 1b 2c			Standard	
		100 / 220						Sub standard	
	UA	110 DC	DC：100 / 110 / 200 / 240V AC：63.5 / 100 / 110 / 200 / 240V	—	1a 1b 2c			Special	
		100 / 220							
	W	110 DC	DC：100 / 110 / 200 / 220V AC：63.5 / 100 / 110 / 200 / 220V	—	UV1: 1a 1b UV2: 2c			Standard	
		100 / 220						Sub standard	
	DD	125 DC	DC：125 / 200 / 220V AC：125 / 200 / 220V	1a 1b	2c			Special	
		100 / 220							

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

VOLTAGE RELAY

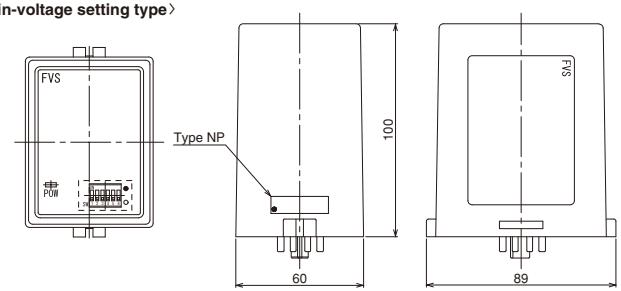
FVS TYPE

SPECIFICATIONS

8 pin-voltage setting type

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	100 to 220V AC / DC (free input)	80V to 250V		
	Input voltage style		AC (50Hz / 60Hz), DC		
	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
	Temperature effect		±0.5V / 10℃ max.	±0.05V / 10℃ max.	±0.5mV / 10℃ max.
	Operational indication color	Control power	Yellow		
		Output contact	Yellow		
	Insulated resistance	Between pole and ground	10MΩ or more (DC500V mega)		
		Between poles			
	Power-frequency withstand voltage	Between pole and ground	2,000V AC / 1min.		
		Between poles			
	Impulse withstand voltage (Uimp)	Between pole 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/s², 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		–10℃ to 55℃		
	Storing temperature		–20℃ to 60℃		
	Relative humidity		30% to 90%		
	Altitude		2,000 m max.		

〈Outlines of 8 pin-voltage setting type〉



STANDARD PRODUCTS

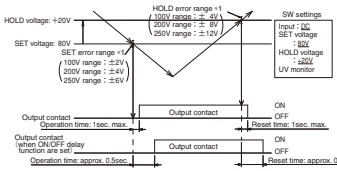
8 pin-voltage setting type

FVS-SSA-100/220

OV, UV select type

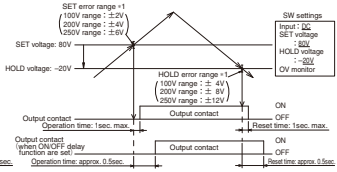
●Operation chart

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



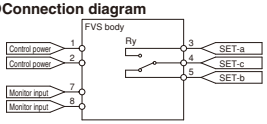
＊The above chart shows a contact (NO contact) operation.

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.

●Accessory

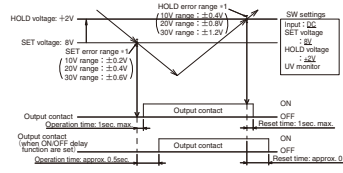
Socket	8PFA1	(Optional)
Voltage label	FVS V-NP-SSA	(Attached)

FVS-SSB-100/220

OV, UV select type

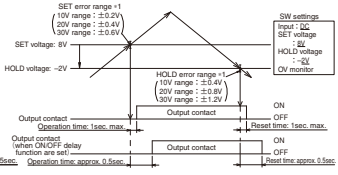
●Operation chart

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



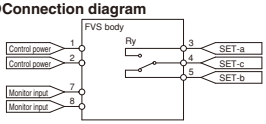
＊The above chart shows a contact (NO contact) operation.

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.

●Accessory

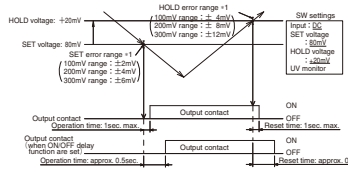
Socket	8PFA1	(Optional)
Voltage label	FVS V-NP-SSB	(Attached)

FVS-SSC-100/220

OV, UV select type

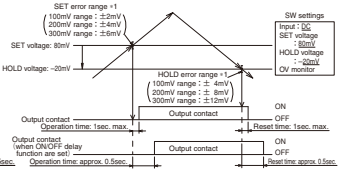
●Operation chart

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



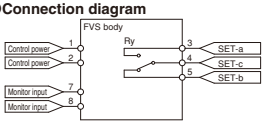
＊The above chart shows a contact (NO contact) operation.

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.

●Accessory

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

VOLTAGE RELAY

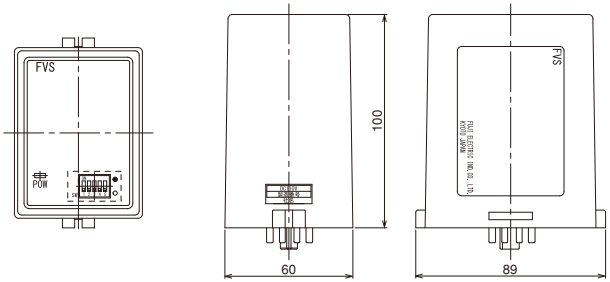
FVS TYPE

SPECIFICATIONS

8 pin-percent setting type

Specification \ Type			FVS-SU	FVS-SO	FVS-SUB	FVS-SOB
Rating	Rated insulation voltage (Ui)		250V			
	Control power voltage		100 / 110V DC			
			100 to 220V AC / DC (free input)			
	Fluctuation range of control power voltage	110 DC	–20% to +30%			
		100 to 220V AC / DC (free input)	80V to 255V			
	Input voltage style		AC (50Hz / 60Hz), DC			
	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		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		0.5sec. max. (50% max. towards setting range)			
	Error range		±2% max. (towards setting reference voltage)			
	Reset dead band (Setting reference voltage %)		+6% max.	–6% max.	+6% max.	–6% max.
	Temperature effect		±0.5% / 10℃ max. (towards setting reference voltage)			
	Operational indication color	Control power	Green			
		Output contact	Red			
	Insulated resistance	Between pole and ground	10MΩ or more (500V DC mega)			
		Between poles				
	Power-frequency withstand voltage	Between pole and ground	2,000V AC / 1min.			
		Between poles				
	Impulse withstand voltage (Uimp)	Between pole 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		294m/s², 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			
Normal service condition	Operating temperature		–10℃ to 55℃			
	Storing temperature		–20℃ to 60℃			
	Relative humidity		30% to 90%			
	Altitude		2,000 m max.			

〈**Outlines of 8 pin-percent setting type**〉



STANDARD PRODUCTS

8 pin-percent setting type

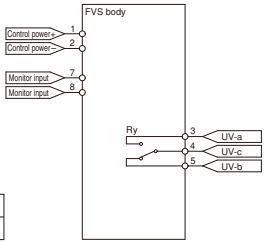
FVS-SU

UV type

●Accessory

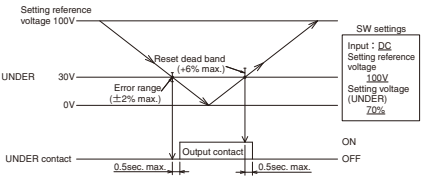
Socket	8PFA1	(Optional)
Voltage label	FVS V-NP	(Attached)

●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.

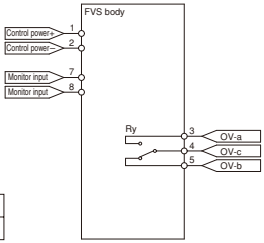
FVS-SO

OV type

●Accessory

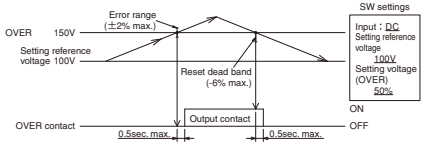
Socket	8PFA1	(Optional)
Voltage label	FVS V-NP	(Attached)

●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.

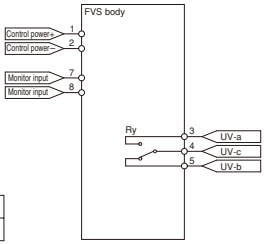
FVS-SUB

UV type

●Accessory

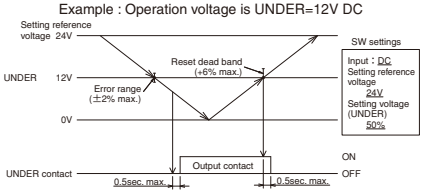
Socket	8PFA1	(Optional)
Voltage label	FVS V-NP B	(Attached)

●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.

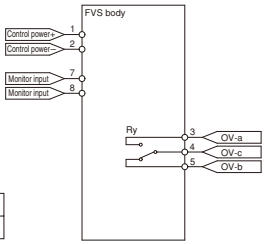
FVS-SOB

OV type

●Accessory

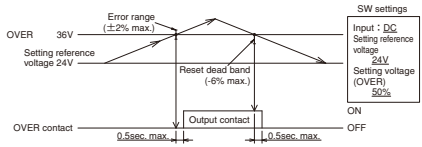
Socket	8PFA1	(Optional)
Voltage label	FVS V-NP B2	(Attached)

●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

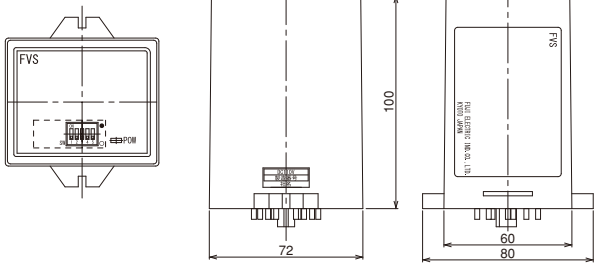
FVS TYPE

SPECIFICATIONS

14 pin-voltage setting type

Specification \ Type			FVS-HDF	FVS-HUF	FVS-HWF	FVS-HWE
Rating	Rated insulation voltage (Ui)		250V			
	Control power voltage		100 / 110V DC			
			100 to 220V AC / DC (free input)			
	Fluctuation range of control power voltage	110 DC	–20% to +30%			
		100 to 220V AC / DC (free input)	80V to 255V			
	Input voltage style		AC (50Hz / 60Hz), DC			
	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		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℃ max.			
	Operational indication color	Control power	Yellow		Green	
		Output contact	Yellow		Red	
	Insulated resistance	Between pole and ground	10MΩ or more (500V DC mega)			
		Between poles				
	Power-frequency withstand voltage	Between pole and ground	2,000V AC / 1min.			
		Between poles				
	Impulse withstand voltage (Uimp)	Between pole 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		294m/s², 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		–10℃ to 55℃			
	Storing temperature		–20℃ to 60℃			
	Relative humidity		30% to 90%			
	Altitude		2,000 m max.			

〈Outlines of 14 pin-voltage setting type〉



STANDARD PRODUCTS

14 pin-voltage setting type

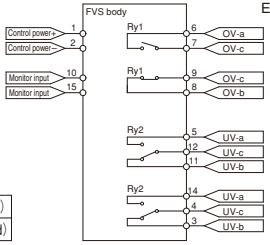
FVS-HDF

OV type, UV type

●Accessory

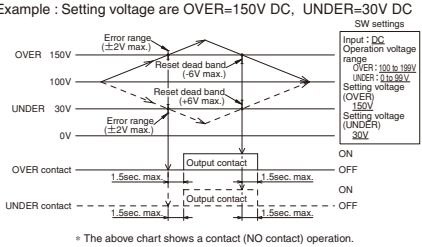
Socket	14PFA	(Optional)
Voltage label	FVS V-NP HDF1	(Attached)

●Connection diagram



●Operation chart

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



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

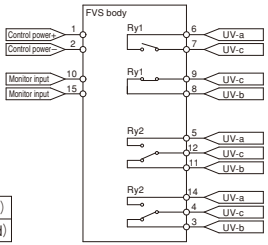
FVS-HUF

UV type

●Accessory

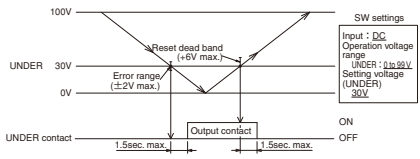
Socket	14PFA	(Optional)
Voltage label	FVS V-NP HUF1	(Attached)

●Connection diagram



●Operation chart

Example : Operation voltage is UNDER=30V DC



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

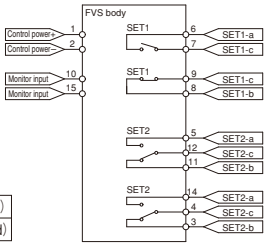
FVS-HWF

UV2 type

●Accessory

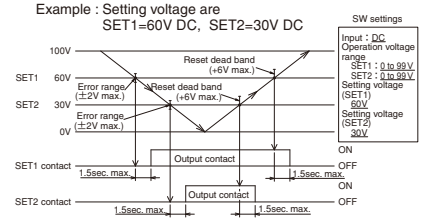
Socket	14PFA	(Optional)
Voltage label	FVS V-NP HWE1	(Attached)

●Connection diagram



●Operation chart

Example : Setting voltage are SET1=60V DC, SET2=30V DC



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

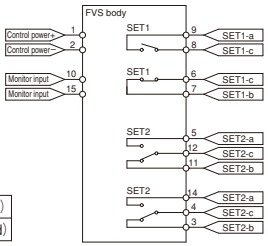
FVS-HWE

UV2 type

●Accessory

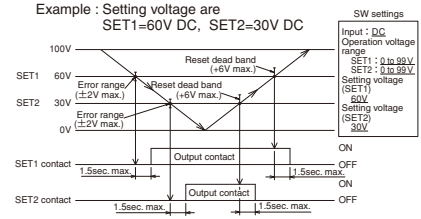
Socket	14PFA	(Optional)
Voltage label	FVS V-NP HWE1	(Attached)

●Connection diagram



●Operation chart

Example : Setting voltage are SET1=60V DC, SET2=30V DC



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

VOLTAGE RELAY

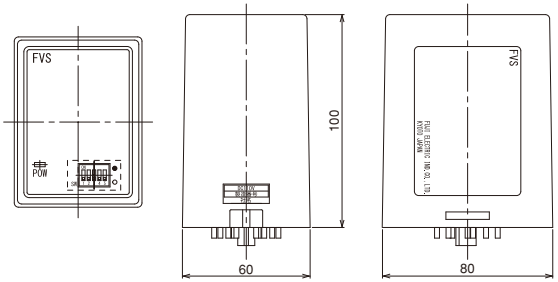
FVS TYPE

SPECIFICATIONS

14 pin-percent setting type

Specification \ Type			FVS-D	FVS-U	FVS-W	FVS-DD	FVS-UA
Rating	Rated insulation voltage (Ui)		250V				
	Control power voltage		100 / 110V DC			125V DC	100 / 110V DC
			100 to 220V AC / DC (free input)				
	Fluctuation range of control power voltage	110 DC	–20% to +30%			+15%	–20% to +30%
		100 to 220V AC / DC (free input)	80V to 255V				
	Input voltage style		AC (50Hz / 60Hz), DC				
	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 ($\cos\phi$=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:63.5,100,110,200,240V DC:100,110,200,240V
	Setting voltage range		3% to 96%				
	Set / Reset time		0.5sec. max. (50% max. towards setting range)				
	Error range		±2% max. (towards setting reference voltage)				
	Reset dead band (Setting reference voltage %)		±6% max.	+6% max.		±6% max.	+6% max.
	Temperature effect		±0.5% / 10℃ max. (towards setting reference voltage)				
	Operational indication color	Control power	Green				
		Output contact	Red				
	Insulated resistance	Between pole and ground	10MΩ or more (500V DC mega)				
		Between poles					
	Power-frequency withstand voltage	Between pole and ground	2,000V AC / 1min.				
		Between poles					
	Impulse withstand voltage (Uimp)	Between pole 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		294m/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		Approx. 1.5W	—
	Weight		Approx. 220g				
Normal service condition	Operating temperature		–10℃ to 55℃				
	Storing temperature		–20℃ to 60℃				
	Relative humidity		30% to 90%				
	Altitude		2,000 m max.				

〈Outlines of 14 pin-percent setting type〉



STANDARD PRODUCTS

14 pin-percent setting type

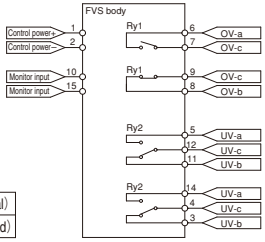
FVS-D

OV, UV type

●Accessory

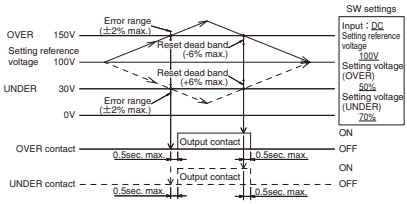
Socket	14PFA	(Optional)
Voltage label	FVS V-NP	(Attached)

●Connection diagram



●Operation chart

Example : Operation voltage are OVER=150 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-U/FVS-UA

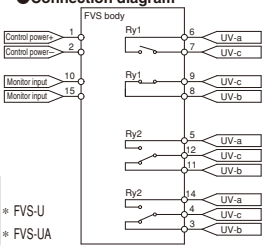
FVS-UA=Setting reference voltage 240V DC

UV type

●Accessory

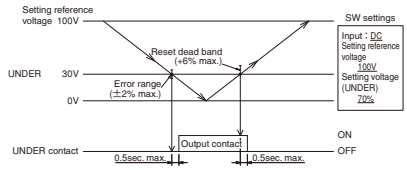
Socket	14PFA	(Optional)	
Voltage label	FVS V-NP	(Attached)	∗ FVS-U
	FVS V-NP A	(Attached)	∗ FVS-UA

●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.

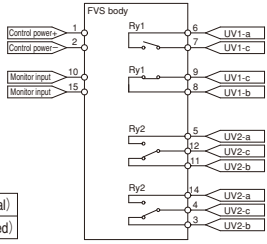
FVS-W

UV2 type

●Accessory

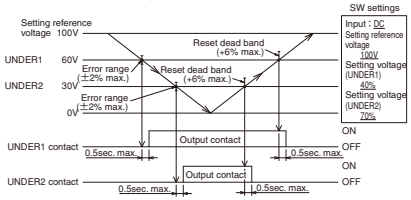
Socket	14PFA	(Optional)
Voltage label	FVS V-NP	(Attached)

●Connection diagram



●Operation chart

Example : Operation voltage are UNDER1=60V DC, UNDER2=30V DC



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

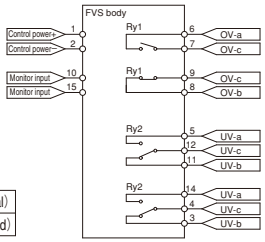
FVS-DD

OV, UV type

●Accessory

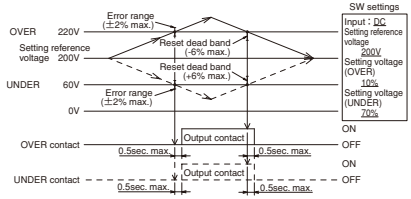
Socket	14PFA	(Optional)
Voltage label	FVS V-NP A	(Attached)

●Connection diagram



●Operation chart

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



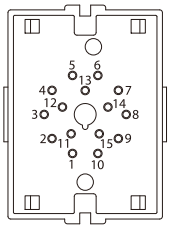
∗ % of Error range and reset dead band are value towards setting reference voltage.
∗ The above chart shows a contact (NO contact) operation.

VOLTAGE RELAY

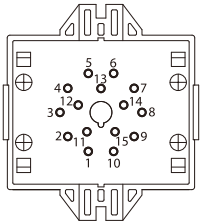
FVS TYPE

PIN ARRANGEMENT

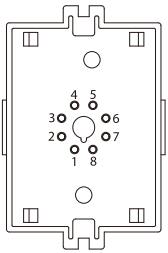
Vertical 14 pin type



Horizontal 14 pin type (H)



Vertical 8 pin type (S, SS)

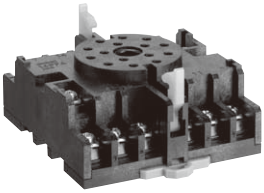


ACCESSORIES

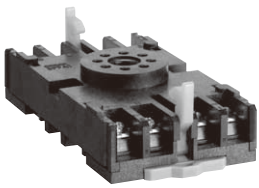
Applicable sockets

(Order unit: 10)

■14PFA [OMRON]



■8PFA1 [OMRON]



∗ Vertical 14 pin type is applicable to PL15, too (OMRON).

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-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-U	FVS V-NP
FVS-UA	FVS V-NP A
FVS-W	FVS V-NP
FVS-DD	FVS V-NP A

INSTRUCTIONS

■How to set monitor voltage (FVS-SS, voltage setting type)

Example: FVS-SSA type

Setting NP

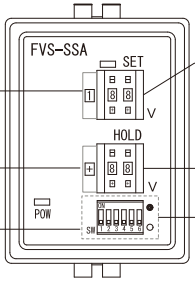
監視入力	DC	監視入力	AC
SET	5V～99V	SET	5V～99V
HOLD	4V～99V	HOLD	4V～99V
SETはデジタル設定器で設定下3桁を表示		SETはデジタル設定器で設定下3桁を表示	
監視入力	DC	監視入力	AC
SET	100V～199V	SET	100V～199V
HOLD	4V～99V	HOLD	4V～99V
SETはデジタル設定器で設定下3桁を表示		SETはデジタル設定器で設定下3桁を表示	
監視入力	DC	監視入力	AC
SET	200V～249V	SET	200V～249V
HOLD	4V～99V	HOLD	4V～99V
SETはデジタル設定器で設定下3桁を表示		SETはデジタル設定器で設定下3桁を表示	

ご注意）
本シールは設定変更時に使用後しますので大切に保管してください
左のNPは上記表示用にご使用ください

SET voltage NP
This NP is used when SET voltage range is 100V～ and 200V～.
(included in setting NP)

HOLD voltage NP
used for ± indication
(included in setting NP)

Setting NP
attachment position
(attached after SW setting)



SET voltage setting (push-style digital switches)

HOLD voltage setting (push-style digital switches)

Monitor input setting
SET voltage setting
(push-style digital switches)
Delay function setting

●Monitor input setting
SW1→ ON：UV (Under Voltage) monitor
OFF: OV (Over Voltage) monitor
SW2→ ON：AC
OFF: DC

●SET voltage setting

SET voltage range	5-99V	100-199V	200-249V
SW3	OFF	ON（OFF）	ON
SW4	OFF	OFF（ON）	ON

●Delay function setting
SW5→ ON：ON delay (normal operation time + approx. 0.5sec.)
OFF: no delay (normal operation time = 1sec. max.)
SW6→ ON：OFF delay (normal reset time + approx. 0.5sec.)
OFF: no delay (normal operation time = 1sec. max.)

1 . Monitor voltage style setting (UV or OV)

●Select monitor voltage style (UV or OV) by setting No.1 DIP switch.
●Set ON for UV monitor and set OFF for OV monitor.

2 . Monitor input setting

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

3 . Reference voltage range setting

●Select reference voltage range by setting NO.3 and 4 DIP switches.
●Set OFF both No.3 and 4 for range 5-99V, set ON No.3 and OFF No.4 for range 100-199V, set ON both No.3 and 4 for range 200-249V.
●Voltage range differ from each type. Refer to “DIP switch setting list” on the side of product bodies.

4 . Delay function setting

●Select delay functions for SET delay and HOLD delay by setting NO.5 and 6 DIP switches.
●Use delay function when operation time is delayed for 0.5sec.
●Set ON No.5 for setting SET delay function and set ON No.6 for setting HOLD delay function.

5 . Monitor voltage setting

●Set monitor voltage for UV or OV by setting upper digital switches, and set HOLD voltage by setting lower digital switches.
●HOLD voltage is over value from monitor voltage of UV or under value from monitor voltage of OV.

6 . Voltage label attachment

●Attach each NP for SET voltage, HOLD voltage polarity and each setting.

⚠ Caution for setting
Prevent setting under the monitoring condition because it may cause malfunction and output error.
(Setting instruction under monitoring condition is shown on page G15.)

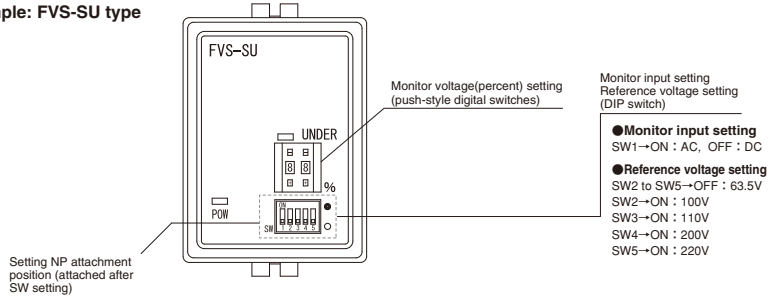
VOLTAGE RELAY

FVS TYPE

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.2 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 88V.

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 G15.)

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

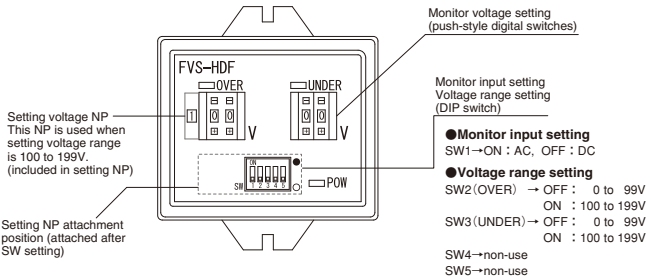
Example: FVS-HDF type

Setting NP

監視入力	DC	監視入力	AC
OVER	0V～99V	OVER	0V～99V
UNDER	0V～99V	UNDER	0V～99V
デジタルスイッチは設定電圧値の下2桁を表示		デジタルスイッチは設定電圧値の下2桁を表示	
監視入力	DC	監視入力	AC
OVER	0V～99V	OVER	0V～99V
UNDER	100V～199V	UNDER	100V～199V
デジタルスイッチは設定電圧値の下2桁を表示		デジタルスイッチは設定電圧値の下2桁を表示	
監視入力	DC	監視入力	AC
OVER	100V～199V	OVER	100V～199V
UNDER	0V～99V	UNDER	0V～99V
デジタルスイッチは設定電圧値の下2桁を表示		デジタルスイッチは設定電圧値の下2桁を表示	
監視入力	DC	監視入力	AC
OVER	100V～199V	OVER	100V～199V
UNDER	100V～199V	UNDER	100V～199V
デジタルスイッチは設定電圧値の下2桁を表示		デジタルスイッチは設定電圧値の下2桁を表示	

1 1 1 1 1

ご注意）
本シールは設定変更時に使用致しますので
大切に保管してください
左のNPは上記表示用にご使用ください



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 G15.)

VOLTAGE RELAY

FVS TYPE

TECHNICAL INFORMATION

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.

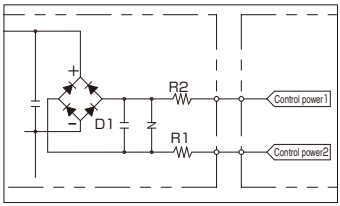


Diagram 1

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.

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：±5%, Judge range: operation voltage = ±2V, reset voltage = -6V (OV), +6V (UV)

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

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.