

# PHASE FAILURE RELAYS



These relays are suitable for monitoring incoming 3- phase supply from Mains (Electricity distribution line). Being independent of load, they can be used for any HP/KW rating of load.

## MODELS

**VSP D1, VSP D2, VPG D1, USP D1**  
**P1 PFS1, P1 PFS2, P2 PFS1**  
**S2 VMR1, S2 VMR2, S2 VMR3, S2 VMR6, S2 VMR8**  
**D1 HLS1, HLV D2, ALV D2, VMR D2, VST D1,**  
**D1 VMR1, D2 VMR1, D2 VMR2,**  
**S1 VMR7, F3 VSR4**



## FEATURES

- Fixed/adjustable unbalance settings
- Fixed/adjustable under-voltage/over-voltage settings
- Fixed/adjustable trip delays
- Built-in or external power supply
- Resetting Auto / Manual / Remote
- Output contacts: 1 CO or 2 CO
- Choice of enclosures (DIN-Rail, Flush, Plug-in)
- Models with Micro-Controller based design
- 2 Line Alpha-Numeric LCD display (For F3 VSR4 model)
- Serial Communication (RS 232) Port (for F3 VSR4 model)
- Use of SMD Technology
- User-friendly LED indications





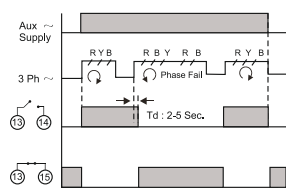
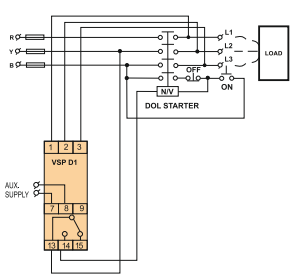
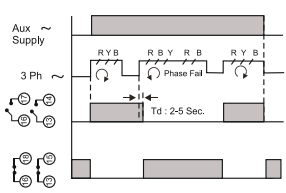
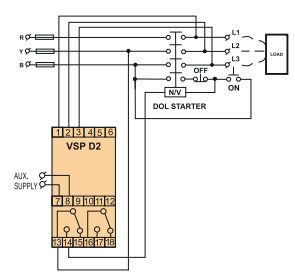
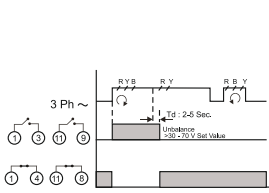
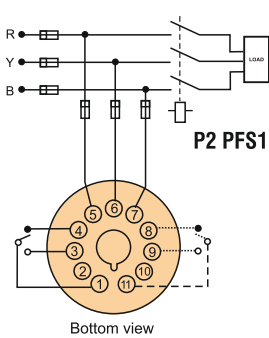
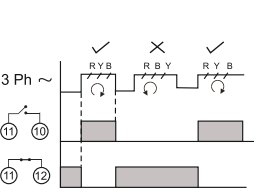
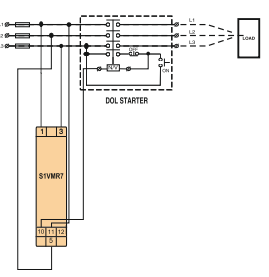
## PROTECTIONS / FUNCTIONS

- Phase Failure (Phase Loss / Single Phasing),
- Phase sequence reversal,
- Voltage Unbalance,
- Under Voltage,
- Over Voltage
- Dry Run

### Ordering Instructions





- Product Family Name
- Model Name
- System Supply Voltage & Frequency
- Aux. Supply / Control supply voltage

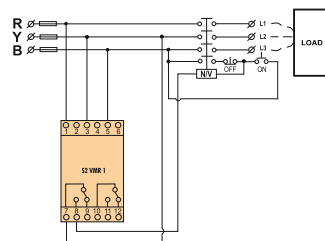
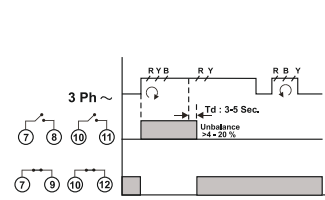
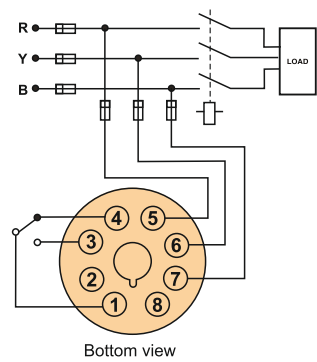
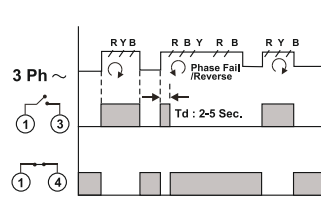
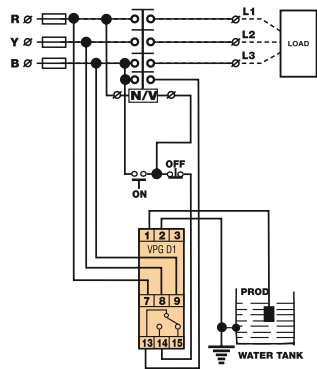
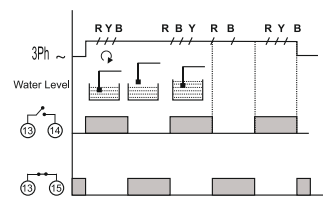
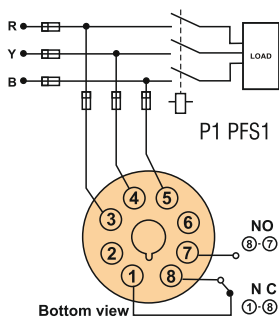
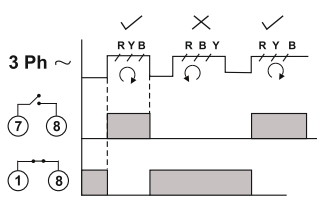
# 3 PHASE FAILURE RELAYS

	VSP D1 Phase Failure Relay	VSP D2 Phase Failure Relay	P2 PFS1 Phase Failure Relay	S1 VMR7 Phase Sequence Relay
				
	Phase Failure, Unbalance, Phase Sequence, Auto Reset, Fixed Unbalance Setting, 1 CO output Relay	Phase Failure, Unbalance, Phase Sequence, Auto/Manual/Remote Reset, Adjustable Unbalance setting, 2 CO output relay	Phase Failure, Unbalance, Phase Sequence, Auto Reset, Adjustable Unbalance Trip Settings, Adjustable Trip Delay, 2 CO output relay	Phase Sequence, Auto Reset, 1 CO output relay
<b>Supply Voltage</b> <small>Note: Mention specific voltage System (Fixed/wide range) in order</small>	100-120/220-240/380-440 V AC ±20% 50 / 60 Hz	100-120/220-240/380-440 V AC ±20% 50 / 60 Hz	110/ 220/ 380/ 415 VAC ± 10%, 50/ 60 Hz	380 – 440 VAC, ± 20%, 3PH-3 Wire
<b>Output Contacts</b>	1 CO	2 CO	2 CO	1 CO
<b>Trip Setting (Volts)</b>				
Phase Sequence	Yes	Yes	Yes	Yes
Phase Unbalance	40 V ±6 V (fixed)	30 V to 70 V ±6 V (adjustable)	30 V to 70 V ± 6 V (adjustable)	-
<b>Trip Time Delay</b>				
On Phase Failure/Unbalance	3.5 sec. ±1.5 sec.	3.5 sec. ±1.5 sec.	1 - 5 secs. (variable)	Instant
For level sensing	N.A.	N.A.	N.A.	N.A.
<b>Resetting Mode</b>	Auto	Auto / Manual / Remote	Auto	Auto Reset
<b>Weight</b>	320 gms.	400 gms.	250 gms.	90 gms. (Approx.)
<b>Dimensions (mm)</b>				
Overall (L x W x D)	76 x 30.5 x 117.5	76 x 56.5 x 117.5	80 x 35 x 95	90 x 18 x 60 (Approx.)
Mounting (L x W)	68 centre to centre / 35 mm rail Mounting	67 x 46 □ / 35 mm rail Mounting	11 Pin Plug- In	35 mm rail Mounting
<ul style="list-style-type: none"> <li>• Wherever not specified Contact Rating : 5A @ 230 V AC (resistive)</li> <li>• * Available on request.</li> </ul>	 	 	 	 

Relay contact position shown in 'Power off' condition

# PHASE FAILURE RELAYS





<b>P1 PFS1</b> Phase Sequence Relay	<b>VPG D1</b> Phase Failure Relay + Lower Water Level Guard	<b>P1 PFS2</b> Phase Failure Relay	<b>S2 VMR1</b> Phase Failure Relay
 <p>Phase Sequence, Auto Reset, 1 CO output relay</p>	 <p>Single phasing, reverse phasing, unbalanced supply, Auto reset, 1 CO output contact Suitable for any HP/kW rating submersible pumps Low water level guard for dry running protection</p>	 <p>Phase Failure, Unbalance, Phase Sequence, Auto Reset, fixed unbalance setting, 1 CO output relay</p>	 <p>Microcontroller design, SMD Technology, Phase Failure, Unbalance, Phase Sequence Auto/Manual Reset, Adjustable Unbalance setting, 2 CO output relay</p>
110/ 220/ 380/ 415 VAC ± 10%, 50 / 60 Hz	415VAC ± 20%, 50 Hz ± 3%	110 / 240 / 380 / 415 V AC ±10%, 50 / 60 Hz	100-120 / 220-240 / 380-440V AC, -25+20%, 48-63 Hz
Built-in 1 CO	Built-in 1 CO	Built-in 1 CO	Built In 2 CO
Yes -	Yes 40 V ± 6 V (fixed)	Yes 40V ± 6V (fixed)	Yes 4 % TO 20 % (Variable) ± 5% of full scale.
Instant	3.5 Sec ± 1.5 Sec	3.5 sec. ±1.5 sec.	4 Sec ± 1 Sec / RP-Instant
N.A.	3.5 Sec ± 1.5 Sec	N.A.	N.A.
Auto Reset	Auto Reset	Auto	Auto/ Manual Reset (Selectable by Front Push Button)
90 gms.	300 gms.	175 gms.	100 gms (Approx.)
50 x 40 x 80	76 x 30.5 x 117.5	50 x40 x 80	90 X 35 X 60
8 Pin Plug - In	68 centre to centre / Panel Mounting & 35 mm rail Mounting	8 - Pin Plug-in	35 mm Rail Mounting



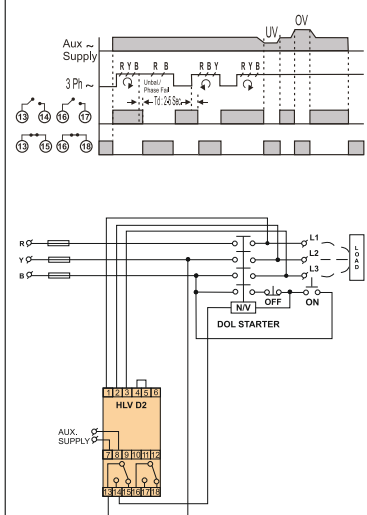
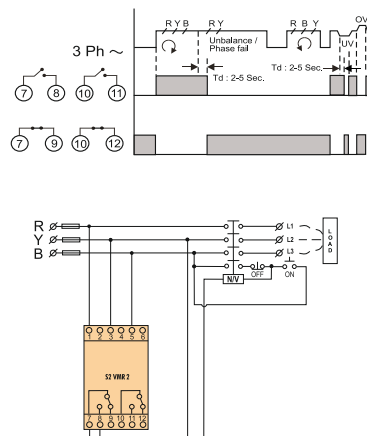
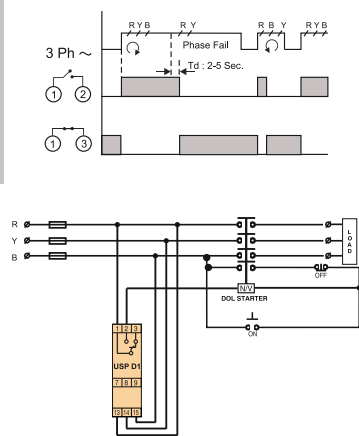
Relay contact position shown in 'Power off' condition

Note: S2 Series - RoHS Product available on request.  
CE marked VSP D1, VSP D2 available on request.

# PHASE FAILURE RELAYS

	USP D1 Phase Failure Relay	S2 VMR2 Phase Failure Relay	HLV D2 Phase Failure with UV / OV Relay
			
	Phase Failure, Unbalance, Phase Sequence, Auto Reset, Fixed Unbalance Setting, 1 CO output relay	Microcontroller design, SMD Technology, Phase Failure, Unbalance, Phase Sequence, under voltage, Over Voltage, Auto reset, Fixed Unbalance setting, Fixed UV/OV settings, 2 CO output relay	Phase Failure, Unbalance, Phase Sequence, under voltage, Over Voltage, Manual reset, Fixed Unbalance setting, Adjustable UV/OV settings, 2 CO output relay
<b>Supply Voltage</b>	415 VAC $\pm$ 20%, 50 Hz $\pm$ 3%	100-110-120 / 220-230-240 / 380-415-440V AC -25+20%, Selectable by Front Knob, 48-63 HZ	110 / 240 / 380 / 415 / 440 V AC $\pm$ 20%, 50 / 60 Hz
<small>Note: Mention specific voltage System (Fixed/wide range) in order</small>			
<b>Output Contacts</b>	Built In	Built In (from 3 Phase)	110 V (Fixed) or (220-230-240) or (380-415-440) VAC(selectable)
<b>Trip Setting (Volts)</b>	1 CO	2 CO	2 CO
<b>Phase Sequence</b>	Yes	Yes	Yes
<b>Phase Unbalance</b>	60 V $\pm$ 6 V (fixed)	10% (Fixed) $\pm$ 10%	40 V $\pm$ 6 V (fixed)
<b>Under Voltage</b>	For 380-440V AC For 220-240V AC For 100-120V AC		80% to 95% (adjustable)
<b>Over Voltage</b>	For 380-440V AC For 220-240V AC For 100-120V AC	$\pm$ 20% (Fixed)	105% to 120% (adjustable)
<b>Trip Time Delay</b>			
<b>On Phase Failure</b>	3.5 sec. $\pm$ 1.5 sec.	2 - 5 Sec. (Fixed) / RP-Instant	3.5 secs. $\pm$ 1.5 sec
<b>On UV/OV</b>			Less than 2 secs. for OV & 2 - 5 secs for UV
<b>Resetting Mode</b>	Auto Reset	Auto Reset	Manual / Remote
<b>Weight</b>	100 gms (Approx.)	100 gms (Approx.)	430 gms.
<b>Dimensions (mm)</b>			
<b>Overall (L x W x D)</b>	76 x 30.5 x 117.5	90 X 35 X 60	76 x 56.5 x 117.5
<b>Mounting (L x W)</b>	68 centre to centre / 35 mm rail Mounting	35 mm Rail Mounting	67 x 46 / 35 mm rail Mounting

- Wherever not specified Contact Rating : 5A @ 230 V AC (resistive)
- \* CE marked products available on request.






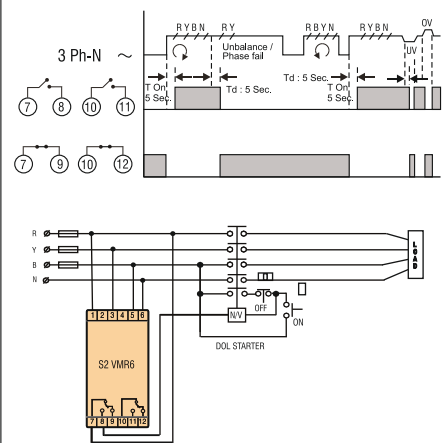
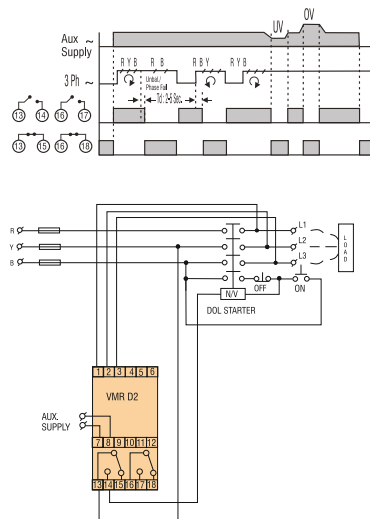
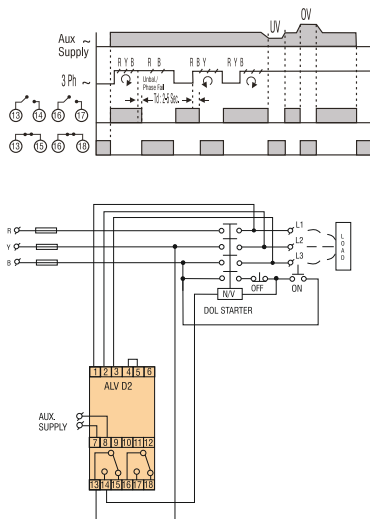
Relay contact position shown in 'Power off' condition

Note: S2 Series - RoHS Product available on request.  
CE marked HLV D2, ALV D2, VMR D2 available on request.



# 3 PHASE FAILURE RELAYS





<b>ALV D2</b> Phase Failure with UV / OV Relay	<b>VMR D2</b> Phase Failure with UV / OV Relay	<b>S2 VMR6</b> Phase Failure with UV / OV Relay
 <p>Phase Failure, Unbalance, Phase Sequence, under voltage, Over Voltage, Auto Reset, Fixed Unbalance setting, Adjustable UV/OV settings, 2 CO output relay</p>	 <p>Phase Failure, Unbalance, Phase Sequence, under voltage, Over Voltage, Auto Reset, Fixed Unbalance setting, Adjustable UV/OV settings, 2 CO output relay</p>	 <p>Phase Failure, Unbalance, Phase Sequence, Under Voltage, Over Voltage, Auto Reset, Fixed Unbalance Settings, Adjustable UV/ OV Settings, Neutral Fail, 2 CO output relay</p>
110 / 240 / 380 / 415 / 440 V AC $\pm 20\%$ , 50 / 60 Hz 110 V (Fixed) or (220-230-240) or (380-415-440) VAC $\pm 20\%$ selectable 2 CO	110/220/230/240/380/415/440 V AC $\pm 20\%$ , 50/60 Hz 110/220/230/240/380/415/440 V AC $\pm 20\%$ , 50/60 Hz 2 CO	415 V AC $\pm 20\%$ (fixed) Built-In 2 CO
Yes 40 V $\pm 6$ V (fixed) 80% to 95% (adjustable)	Yes 94 V $\pm 6$ V (fixed) 80% to 95% (adjustable)	Yes 94 V $\pm 6$ V ph-ph (fixed) 75% to 95% of 415 VAC
105% to 120% (adjustable)	105% to 120% (adjustable)	105% to 125% of 415 VAC
3.5 secs. $\pm 1.5$ sec Less than 2 secs.	3.5 secs. $\pm 1.5$ sec Less than 2 secs.	5 sec. $\pm 1$ sec for UB/SP/UV/OV, Instant for RP, Less than 2 secs. for NF.
Auto Reset 400 gms.	Auto Reset 400 gms.	Auto Reset 110 gms.
76x 56.5 x 117.5 67 x 46 / 35 mm rail Mounting	76x 56.5 x 117.5 67 x 46 / 35 mm rail Mounting	90 x 35 x 60 35 mm rail mounting



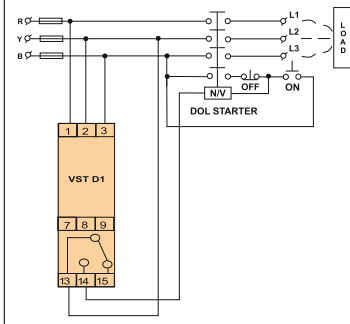
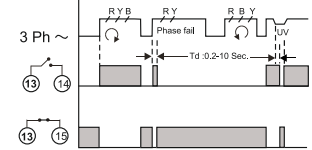
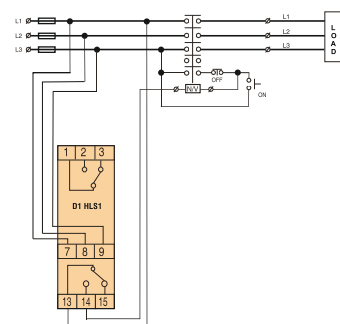
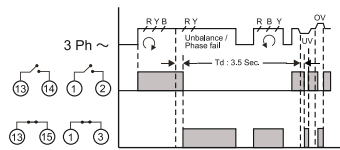
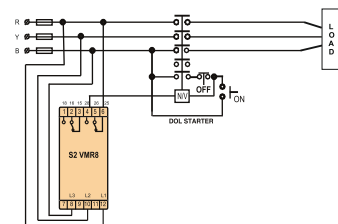
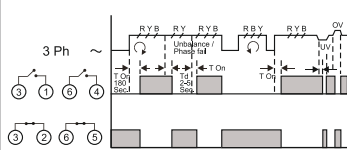
Relay contact position shown in 'Power off' condition

Note: Product available on request - P2 PFV1, P2 SMV1

# 3 PHASE FAILURE RELAYS

	S2 VMR8 Phase Failure Relay	D1 HL S1 Phase Failure with UV / OV Relay	VST D1 Phase Failure with Under Voltage
			
	Phase Failure, Unbalance, Phase Sequence, Under Voltage, Over Voltage, Auto Reset, Fixed Unbalance Settings, Fixed UV/ OV Settings, 2 CO output relay	Phase Failure, Unbalance, Phase Sequence, under voltage, Over Voltage, Auto reset, Fixed Unbalance setting, Fixed UV/OV settings, 2 CO output relay	Phase Failure, Phase Sequence, under voltage, Auto Reset, Adjustable trip delay, Adjustable UV setting, 1 CO output relay Selectable range of supply voltage
<b>Supply Voltage</b> <small>Note: Mention specific voltage (Fixed/wide range) in order</small>	415 V AC $\pm$ 20%	100-110-120/220-230-240/380-415-440V AC +20,-25%, 48-63 Hz	240 / 415 / 575 V AC 3 Phase ( $\pm$ 15% selectable)
<b>System</b>	Built-In	Built-in Selectable by Front Knob	Built-in
<b>Auxiliary</b>			
<b>Output Contacts</b>	2 CO	2 CO	1 CO
<b>Trip Setting (Volts)</b>			
Phase Sequence	Yes	Yes	Yes
Phase Unbalance	40 V $\pm$ 4 V (10 % $\pm$ 10% of set value-fixed)	10% (Fixed)	N.A.
Under Voltage <small>For 380-440V AC For 220-240V AC For 100-120V AC</small>	85% of 415 V AC (fixed)	75% of system supply (Fixed)	80% of V set
Over Voltage <small>For 380-440V AC For 220-240V AC For 100-120V AC</small>	110 % of 415 V AC (fixed)	120% of system supply (Fixed)	N.A.
<b>Trip Time Delay</b>			
On Phase Sequence	Instant for RP/OV	Instant	0.2 - 10 secs.
On SP/UV/OV	3.5 $\pm$ 1.5 sec. fixed for UB/SP/UV	3.5 $\pm$ 1.5 sec. fixed for UB/SP, Less than 2 Sec. for UV/OV	0.2 - 10 secs. (same for UV & SP)
<b>Resetting Mode</b>	Auto Reset	Auto	Auto
<b>Weight</b>	150 gms.	200 gms.	300 gms.
<b>Dimensions (mm)</b>			
Overall (L x W x D)	110 x 35 x 60	76 x 30.5 x 117.5	76 x 30.5 x 117.5
Mounting (L x W)	Screw Mounting	68 centre to centre / 35 mm rail Mounting	68 centre to centre / 35 mm rail Mounting




• Wherever not specified  
Contact Rating :  
5A @ 230 V AC  
(resistive)

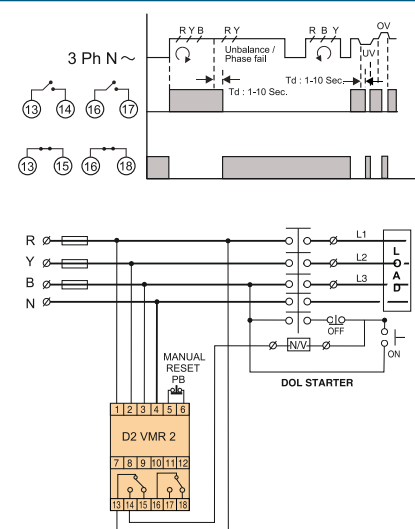
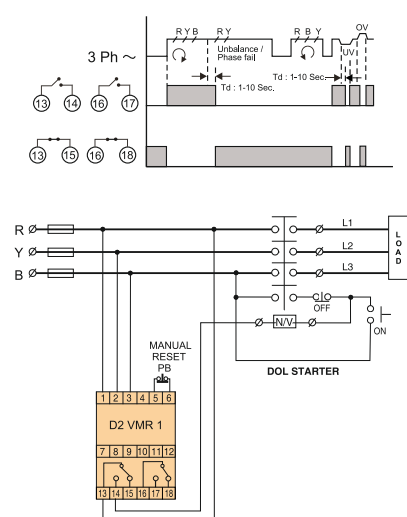
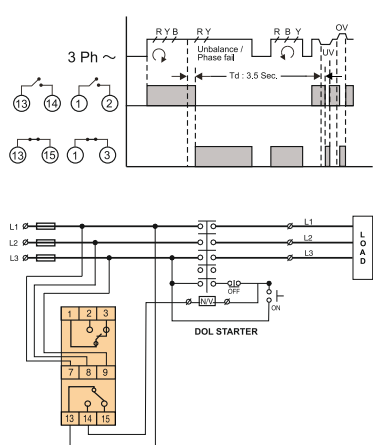


Relay contact position shown in 'Power off' condition

Note: S2 Series - RoHS Product available on request.

# 3 PHASE FAILURE RELAYS

<b>D1 VMR1</b> Phase Failure with UV / OV Relay	<b>D2 VMR1</b> Phase Failure with UV / OV (3Ø-3W)	<b>D2 VMR2</b> Phase Failure with UV / OV (3Ø-4W)
 <p>Phase Failure, Unbalance, Phase sequence, Under &amp; Over voltage, Auto Reset, fixed unbalance setting, Adjustable UV/OV settings, fixed trip delay, 2 CO output relay</p>	 <p>Suitable for 3 Ph-3W system, Microcontroller design, Absolute values of UV/OV settings, Phase Failure, Unbalance, Phase Sequence, under voltage, Over Voltage, Auto/Manual reset, Adjustable settings for Unbalance, UV/OV and trip delays, 2 CO output relay</p>	 <p>Suitable for 3 Ph-4W system, Microcontroller design, Absolute values of UV/OV settings, Phase Failure, Unbalance, Phase Sequence, under voltage, Over Voltage Neutral Fail Auto/Manual reset, Adjustable settings for Unbalance, UV/OV and trip delays, 2 CO output relay</p>
100-120/220-240/380-440 VAC ±20%, 3Ph-3Wire, 48-63 Hz	100-120 / 220-240 / 380-440V AC -25%+20%, 48-63 Hz	100-120 / 220-240 / 380-440V AC -25%+20%, 48-63 Hz
Built-in	Built In (from 3 Phases)	Built In (from 3 Phases)
2 CO	2 CO	2 CO
Yes	Yes	Yes
10% (fixed)	4 % - 20 % [Variable]	4 % - 20 % [Variable]
285-425V AC [Variable] 165-225V AC [Variable] 75-115V AC [Variable]	285-425V AC [Variable] 165-225V AC [Variable] 75-115V AC [Variable]	165-245V AC [Variable] 95-135V AC [Variable] 45-65V AC [Variable]
400-520V AC [Variable] 230-290V AC [Variable] 105-140V AC [Variable]	400-520V AC [Variable] 230-290V AC [Variable] 105-145V AC [Variable]	230-310V AC [Variable] 130-170V AC [Variable] 60-80V AC [Variable]
Instant for RP	Instant	Instant
3.5 secs ± 1.5 sec.	1 To 10 Sec [Variable]	1 To 10 Sec [Variable]
Auto	Auto/ Manual Reset (External NC Push Buttons)	Auto/ External Manual Reset (External NC Push Buttons)
430 gms.	300 gms.	300 gms.
76 x 30.5 x 117.5	76 X 56.5 X 117.5	76 X 56.5 X 117.5
68 centre to centre / 35 mm rail Mounting	67 x 46 / 35 mm rail Mounting	67 x 46 / 35 mm rail Mounting



Relay contact position shown in 'Power off' condition

Note: Product available on request - P2 PFV1, P2 SMV1

# 3 PHASE FAILURE RELAYS

## S2 VMR3

Phase Failure with UV / OV Relay



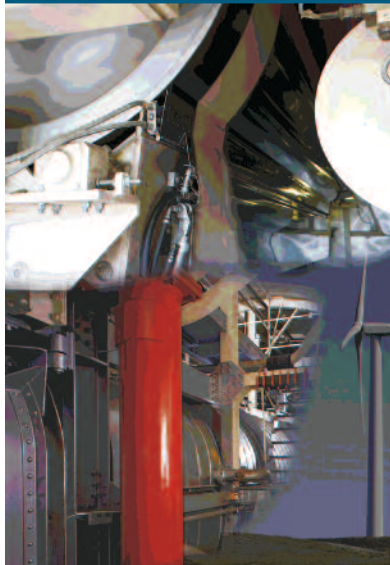
Microcontroller design,  
SMD Technology,  
Absolute values of UV/OV settings,  
Phase Failure, Unbalance, Phase  
Sequence, under voltage, Over Voltage  
Auto/Manual reset, Adjustable  
settings for Unbalance, UV/OV and trip  
delays,  
2 CO output relay

## F3 VSR4

Voltage Scanner [3 Ph - 3 W / 4 W]



3-Phase 3-Wire or 3-Phase 4-Wire voltage  
monitoring & display, Phase Failure,  
Unbalance, Phase Sequence, under voltage,  
Over Voltage,  
Auto / Manual Reset, Adjustable unbalance  
trip setting, Adjustable under/over voltage  
settings, adjustable trip delay, RS232  
communication port,  
2 CO output relay, True RMS Values



### Supply Voltage

Note: Mention specific voltage (Fixed/wide range) in order

### Output Contacts

### Trip Setting (Volts)

### Phase Sequence

### Phase Unbalance

Under Voltage For 380-440V AC  
For 220-240V AC  
For 100-120V AC

Over Voltage For 380-440V AC  
For 220-240V AC  
For 100-120V AC

### Trip Time Delay

### On Phase Sequence

### On SP/UV/OV

### Resetting Mode

### Weight

### Dimensions (mm)

### Overall (L x W x D)

### Mounting (L x W)

100-120 / 220-240 / 380-440V AC -25%+20%, 48-63 Hz

Built In (from 3 Phases)

2 CO

Yes

4 % - 20 % [Variable]

285-425V AC [Variable]  
165-225V AC [Variable]  
75-115V AC [Variable]

400-520V AC [Variable]  
230-290V AC [Variable]  
105-145V AC [Variable]

Instant

1 To 10 Sec [Variable]

Auto/ Manual Reset [Selectable]

110 gms (Approx.)

90 X 35 X 60

35 mm Rail Mounting

415 V AC + 20%,-30% (3 Ph-3 W or 3 Ph-4 W selectable)

90-270 V AC/DC, 50 Hz/ (60 Hz) ± 3%

2 CO & RS 232 (optional)

Yes

1 - 20 % (Adjustable)

1 - 80V below nominal voltage (for 3 Ph. 3 W)  
1 - 50V below nominal voltage (for 3 Ph. 4 W)

1 - 60V above nominal voltage (for 3 Ph. 3 W)  
1 - 25V above nominal voltage (for 3 Ph. 4 W)

RP - Instant

1 - 59 secs. or 1-5 mins Selectable

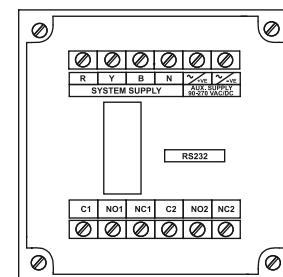
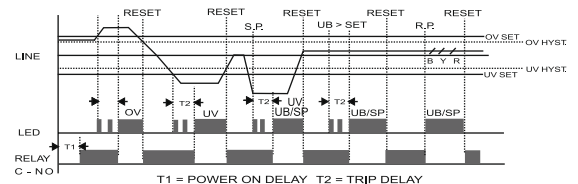
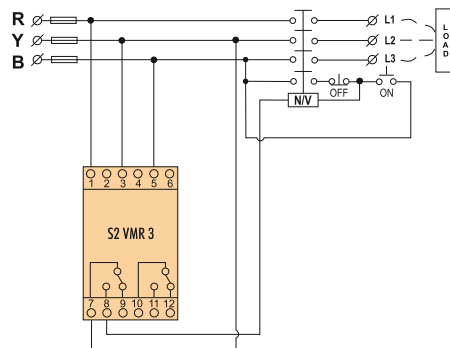
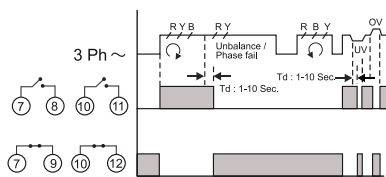
Auto/ Manual Reset [Selectable]

800 gms

96 x 96 x 130

92 x 92 mm

• Wherever not specified  
Contact Rating :  
5A @ 230 V AC  
(resistive)



Relay position shown in 'Power off' condition

Note: S2 Series - RoHS Product available on request.