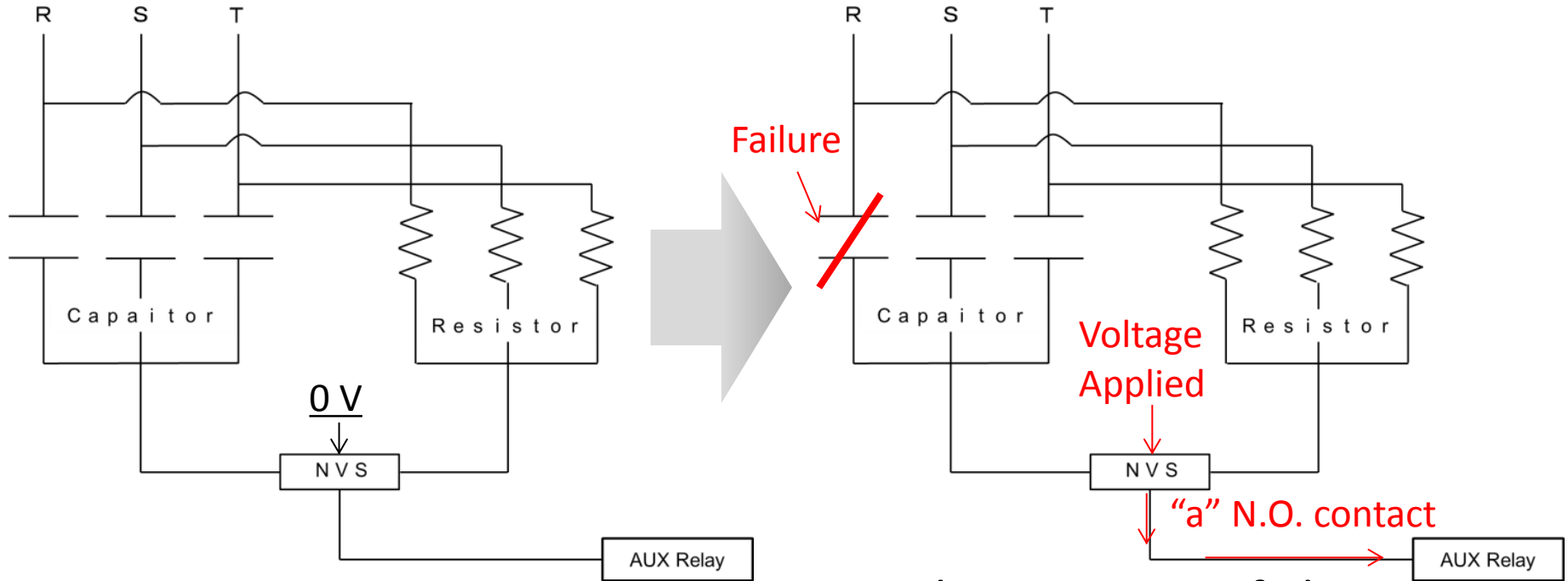


NVS (Neutral Voltage Sensor) Comparison



Preface - Explanation of NVS -

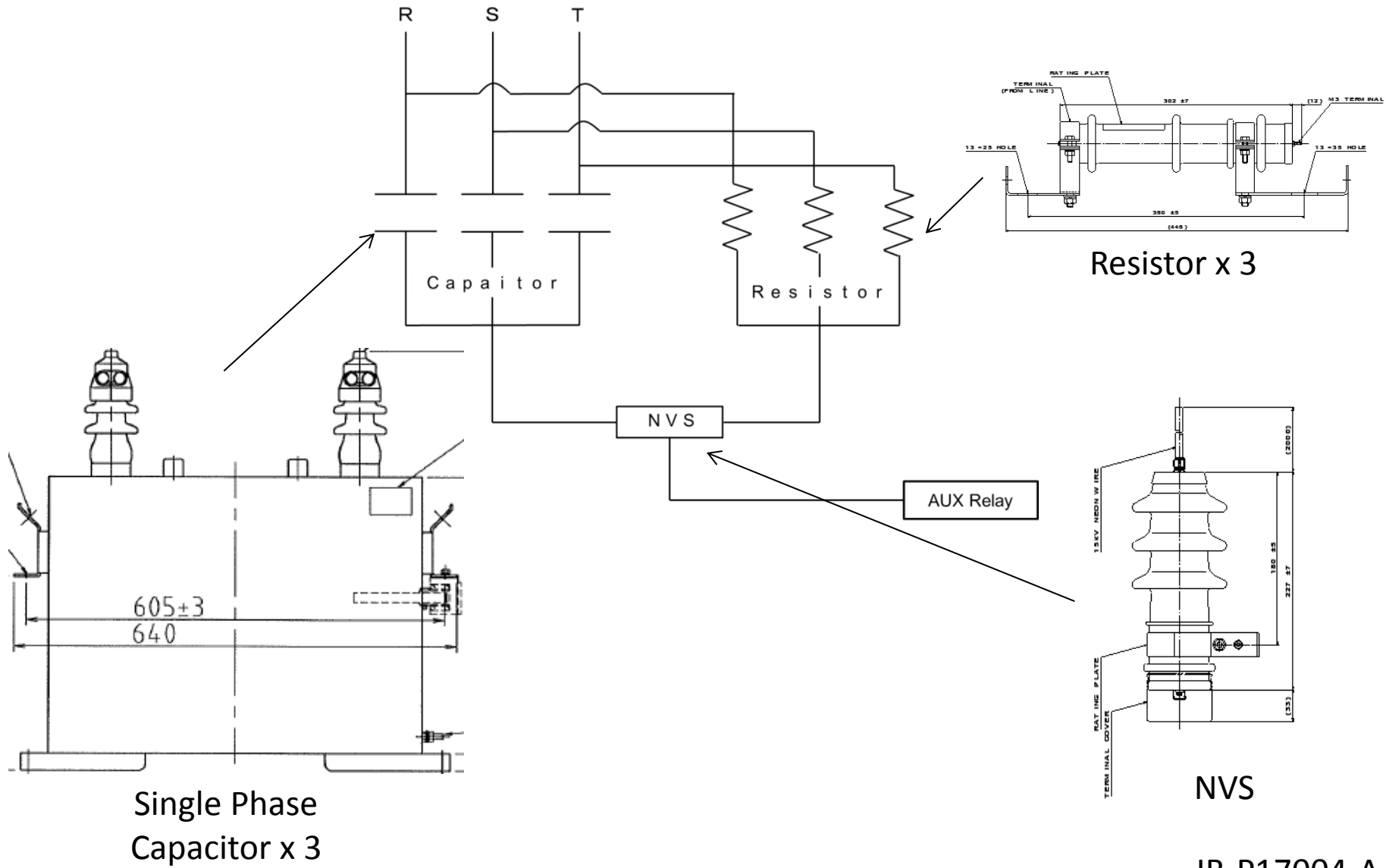


Normally 0V on the neutral

When capacitor failure
voltage applied on the neutral
NVS detect the voltage

NVS detects capacitor failure from the beginning stage
even from "only one element failure" inside capacitor

Preface - NVS system outline -



Comparison -Neutral Voltage Sensor-

Company	Shizuki	Korean
Ambient Temperature	-20 ~ 50°C	-20 ~ 40°C
Circuit Voltage	3300V/6600V +10/-10%	3300V/6600V
Rated Voltage	3790kV/7590V	
Insulation Strength	AC22/60kV (Class 6A)	
Frequency	50/60Hz	
Min. Operating Voltage	AC230V	AC250V
Contact Form	1a	
Contact Rating	AC/DC100V 0.1A	
Test Voltage	AC22kV for 1 min. Main circuit terminals to Joined terminals A-A' & Ground	
	AC2kV for 1 min. Joined terminals (A-A') to Ground	

Shizuki NVS has higher environmental withstand

Comparison -Resistors for NVS-

Company	Shizuki		Korean	
Conection	Single Star (SY)	Double Star (WY)	Single Star (SY)	Double Star (WY)
Circuit Voltage (Continuity/Phase)	3300/6600V±10%	3300/6600V±10%	3300/6600V	3300/6600V
Short Time Permissible V (1min./Phase)	4400/8800V	2200/4400V	3800/7600V	1900/3800V
Instantaneous Permissible V (0.1Sec./Phase)	5000/10000V	2500/5000V	No Infor.	No infor.
Resistance	6mΩ±1%	2mΩ±1%	6mΩ±3%	2mΩ±3%

Shizuki use more precise controlled resistors.

Comparison – Operation Time & Voltage -

On the specifications

Shizuki			Korean		
Applied Voltage (Failure Voltage)	Contact		Applied Voltage (Failure Voltage)	Contact	
	Operating starting time	Holding Time (Closing)		Operating starting time	Holding Time (Closing)
AC220V	No Operation			No Operation	
AC230 ~ 300V	Initial Operation	100m Sec. or More	250+10/-10%	Initial Operation	100m Sec. or More
AC300 ~ 500V	6 ~ 18 Sec.		350V+10/-10%	9~15 Sec.	
AC500 ~ 800V	4 ~ 7 Sec.		650V+10/-10%	2~5 Sec.	
AC800 ~ 1600V	1 ~ 3 Sec.		950V+10/-10%	1~3 Sec.	
AC1600 ~ 2300V	0.5 ~ 2 Sec.				

No big differences between Shizuki & Korean

Comparison – Operation Time & Voltage -

Actual Test Result

Shizuki			Korean		
Applied Voltage (Failure Voltage)	Contact		Applied Voltage (Failure Voltage)	Contact	
	Operating starting time	Holding Time (Closing)		Operating starting time	Holding Time (Closing)
270V	No operating (3min.)		273V	No operating (3min)	
301V	44 sec.	103 msec	288V	34.8 sec.	58.5 msec
350V	17.7 sec.	103 msec	348V	10.4 sec.	76.9 msec
500V	7.3 sec.	109 msec			
650V	4.7 sec.	110 msec	655V	3 sec.	78.6 msec
800V	3.3 sec.	112 msec			
950V	3.3 sec.	112 msec	957V	1.9 sec.	68.2 msec
1600V	1.7 sec.	117 msec			
1900V	1.3 sec.	126 msec	1907V	1.4 sec.	75.4 msec
2300V	1.3 sec.	132 msec			

Some Korean NVS is out of specifications for contact holding time.
This might affect on relay operation to trip the breaker/contactator.