

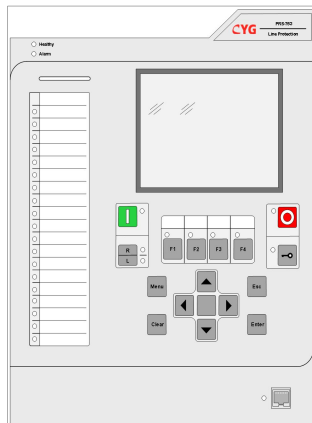


# PRRS-753

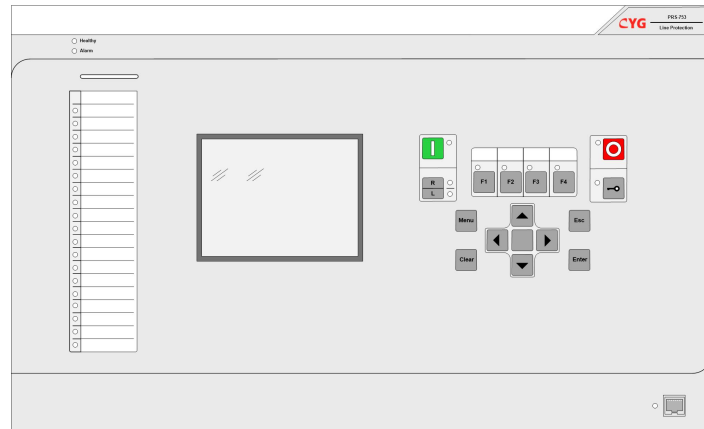


## General Application

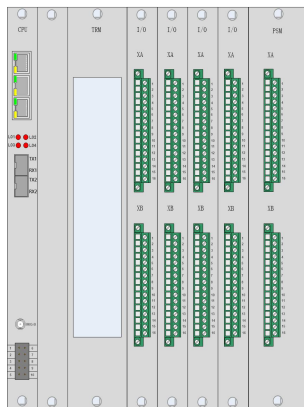
The PRRS-753 is a numerical line differential and distance protection intended for protecting and monitoring various line arrangement of various voltage level, ranging from 1000kV to 110kV. PRRS-753 can detect and clear all types of internal phase-to-phase and phase-to-earth faults locating within the line protection zone.



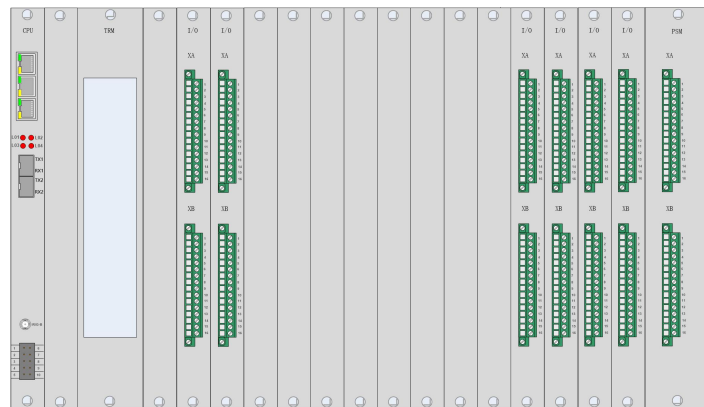
❖ Front Panel



❖ Front Panel



❖ Rear Panel

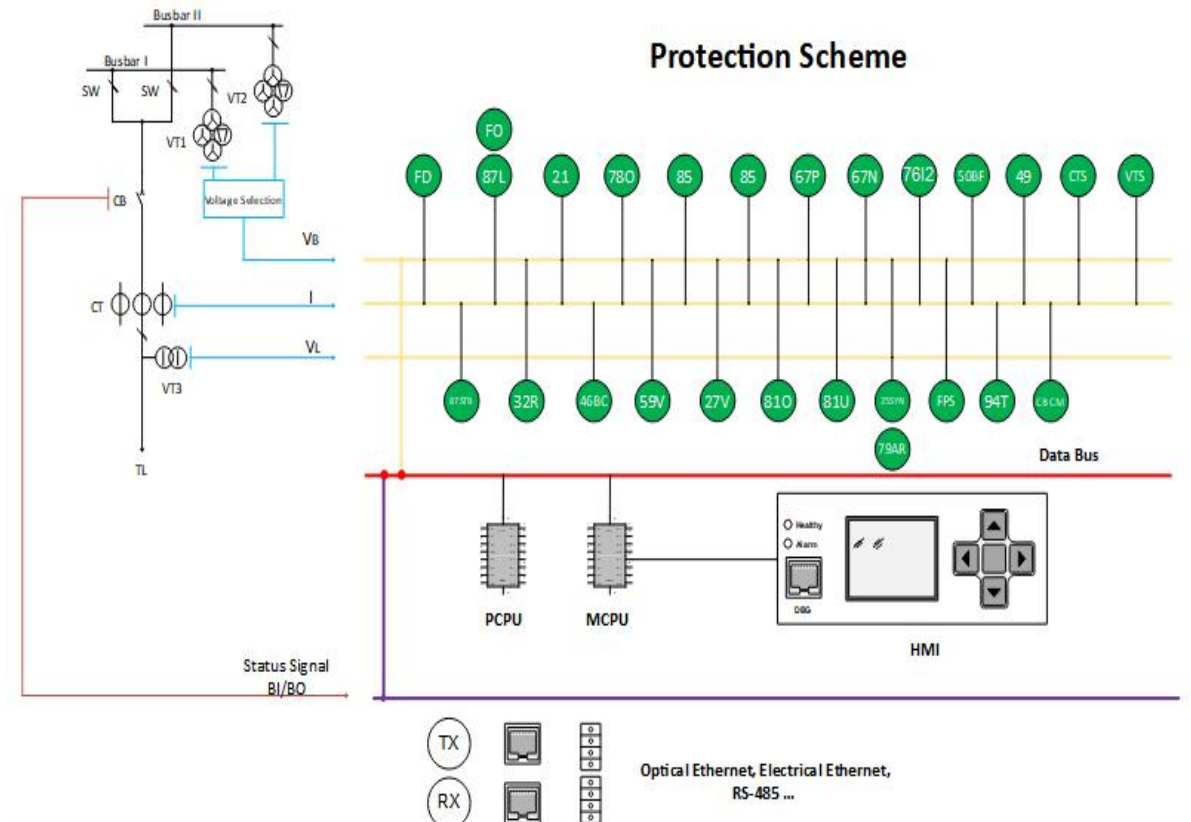


❖ Rear Panel

## Feature

Item	Parameter
Performance	32-bit high performance dual-core processor, internal high speed bus and intelligent I/O ports
Hardware	Modularized hardware design, flexibly configurable, easy extension
Interface	The human machine interface (HMI) with a small control module (a 320×240-dot LCD, a 9-key keypad and 31 LED indicators)
Communication	Ethernet network, RS-485 serial ports. Communication protocol optional: IEC61850, IEC60870-5-103, DNP3.0.
Time Synchronization	SNTP, IEEE 1588, pulse per second (PPS) and IRIG-B
Analog	Support the protocol IEC60044-8, IEC61850-9-2 and GOOSE, constantly measures and calculates voltage, current, power and frequency.
Recording	Fault and disturbance waves, operation reports, supervision, control operation records and time tagged sequence of event.
Monitor & Control	Optional: BI, BO, measurement and control

## Protection Functions



## Protection Functions

Description	IEC 60617	ANSI	CYG Code
Line Differential Protection	3dI>L	87	87L
Mho distance protection	Z<	21	21M
Quadrilateral distance protection,	Z<	21	21Q
Power Swing Blocking Releasing	ZPSBR	68	PSBR
Out-of-Step Protection	$\varphi$ <	78	78O
Scheme communication logic for distance protection	-	CL	85
Scheme communication logic for directional earth fault protection	-	CLN	85N
Three Phase Directional Overcurrent Protection	3I> ->	67P	67P(50/51P)
Directional Earth Fault Overcurrent Protection	I <sub>0</sub> >->	67N	67N(50/51N)
Directional Negative-sequence Overcurrent Protection	I <sub>2</sub> >	67	67I2
Breaker Failure Protection	3I>/I <sub>0</sub> >BF	50BF	50BF
Thermal Overload Protection	3I <sub>th</sub> >	49	49
Stub Differential Protection	3I>STUB	50STB	87STB
Pole Discordance Protection	PD	52PD	52PD
Reverse Power Protection	P>	32R	32R
Broken Conductor Protection	-	46BC	46BC
Three Phase Overvoltage Protection	3U>	59	59P
Residual Overvoltage protection	2(U <sub>0</sub> >)	59N	59N
Three Phase Undervoltage Protection	3U<	27	27P
Overfrequency Protection	f>	81O	81O
UnderFrequency Protection	f<	81U	81U
Synchrocheck	SYNC	25SYN	25SYN
Automatic Reclosure	O ->I	79	79AR
Faulty Phase Selection	-	21FL	21FL
Trip Logic	-	94	94T
Fault Detector	-	-	FD
Optical Fibre Communication	-	-	FO

## Supervision Functions

Description	IEC 60617	ANSI	CYG Code
Current circuit supervision	-	87	CTS
Fuse failure supervision	FUSEF	60	VTS
CB Position Supervision	CBCM	CBCM	CBCM

## Protection Specifications

### Superimposed Current Element

Accuracy	≤ 2.5% Setting or 0.02I <sub>n</sub> , whichever is greater
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### Residual Current Element

Accuracy	≤ 2.5% Setting or 0.02I <sub>n</sub> , whichever is greater
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### Line Differential Protection

Current setting accuracy	≤ 2.5% Setting or 0.02I <sub>n</sub> , whichever is greater
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Time delay accuracy	≤ 25ms (at 4 times current setting)
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### Distance Protection

Accuracy	≤ 2.5% Setting or 0.1Ω/I <sub>n</sub> , whichever is greater
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Time delay accuracy	≤ 1% Setting or 25ms
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Transient overreaching	≤ 5% (0.1<SIR<30) ≤ 10% (SIR≥30)
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Minimum operate current	Phase to ground: 120A*Prot_TA_Secondary/Prot_TA_Primary Phase to Phase: 300A*Prot_TA_Secondary/Prot_TA_Primary
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Maximum operate current	100A
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### Three Phase Directional Overcurrent Protection

Accuracy	≤ 2.5% Setting or 0.02I <sub>n</sub> , whichever is greater
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Resetting ratio	97%
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Time delay accuracy (definite-time characteristic)	≤ 1% Setting or 30ms (at 2 times current setting)
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Time delay accuracy (inverse-time characteristic)	≤ 2.5% of operating time or 30ms, whichever is greater (start value multiples in range of 1.2...20 when I > I <sub>n</sub> ) ≤ 5.0% of operating time or 40ms, whichever is greater (start value multiples in range of 2...20 when I ≤ I <sub>n</sub> )
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## Protection Specifications

### Directional Earth Fault Protection

Accuracy	$\leq 2.5\%$ Setting or $0.02I_n$ , whichever is greater
Resetting ratio	97%
Time delay accuracy (definite-time characteristic)	$\leq 1\%$ Setting or 30ms (at 2 times current setting)
Time delay accuracy (inverse-time characteristic)	$\leq 2.5\%$ of operating time or 30ms, whichever is greater (start value multiples in range of 1.2...20 when $I > I_n$ ) $\leq 5.0\%$ of operating time or 40ms, whichever is greater (start value multiples in range of 2...20 when $I \leq I_n$ )

### Directional Negative-sequence Overcurrent Protection

Accuracy	$\leq 2.5\%$ Setting or $0.02I_n$ , whichever is greater
Resetting ratio	97%
Time delay accuracy (definite-time characteristic)	$\leq 1\%$ Setting or 30ms (at 2 times current setting)
Time delay accuracy (inverse-time characteristic)	$\leq 2.5\%$ of operating time or 30ms, whichever is greater (start value multiples in range of 1.2...20 when $I > I_n$ ) $\leq 5.0\%$ of operating time or 40ms, whichever is greater (start value multiples in range of 2...20 when $I \leq I_n$ )

### Breaker Failure Protection

Accuracy	$\leq 2.5\%$ Setting or $0.02I_n$ , whichever is greater
Resetting ratio	97%
Time delay accuracy	$\leq 1\%$ Setting+20ms (at 2 times current setting)

### Thermal Overload Protection

Accuracy	$\leq 2.5\%$ Setting or $0.02I_n$ , whichever is greater
Resetting ratio	97%
Time delay accuracy	$\leq 2.5\%$ of operating time or 30ms, whichever is greater (start value multiples in range of 1.2...20 when $I > I_n$ ) $\leq 5.0\%$ of operating time or 40ms, whichever is greater (start value multiples in range of 2...20 when $I \leq I_n$ )

## Protection Specifications

### Stub Differential Protection

Accuracy	$\leq 2.5\%$ Setting or $0.02I_n$ , whichever is greater
Resetting ratio	97%
Time delay accuracy	$\leq 1\%$ Setting+30ms (at 2 times current setting)

### Pole Discordance Protection

Accuracy	$\leq 2.5\%$ Setting or $0.02I_n$ , whichever is greater
Resetting ratio	97%
Time delay accuracy	$\leq 1\%$ Setting+30ms (at 2 times current setting)

### Reverse Power Protection

Accuracy	$\leq 2.5\%$ Setting or $0.5W$ , whichever is greater
Resetting ratio	97%
Time delay accuracy	$\leq 1\%$ Setting+30ms

### Broken Conductor Protection

Accuracy	$\leq 2.5\%$ Setting
Resetting ratio	97%
Time delay accuracy	$\leq 1\%$ Setting+30ms

### Three Phase Overvoltage Protection

Accuracy	$\leq 2.5\%$ Setting or $0.01U_n$ , whichever is greater
Resetting ratio	98%
Time delay accuracy (definite-time characteristic)	$\leq 1\%$ Setting+30ms (at 1.2 times voltage setting)
Time delay accuracy (inverse-time characteristic)	$\leq 2.5\%$ of operating time or 30ms, whichever is greater (for voltage between 1.2 and 2 multiples of pickup)

### Residual Overvoltage Protection

Accuracy	$\leq 2.5\%$ Setting or $0.01U_n$ , whichever is greater
Resetting ratio	98%
Time delay accuracy (definite-time characteristic)	$\leq 1\%$ Setting+30ms (at 1.2 times voltage setting)
Time delay accuracy (inverse-time characteristic)	$\leq 2.5\%$ of operating time or 30ms, whichever is greater (for voltage between 1.2 and 2 multiples of pickup)

# Protection Specifications

## Three Phase Undervoltage Protection

Accuracy	$\leq 2.5\%$ Setting or $0.01U_n$ , whichever is greater
Resetting ratio	102%
Time delay accuracy (definite-time characteristic)	$\leq 1\%$ Setting+30ms (at 0.8 times voltage setting)
Time delay accuracy (inverse-time characteristic)	$\leq 2.5\%$ of operating time or 30ms, whichever is greater (for voltage between 0.5 and 0.8 multiples of pickup)

## Overfrequency Protection

Accuracy	$\leq 0.02\text{Hz}$
Time delay accuracy	$\leq 1\%$ Setting+30ms (at 1.2 times frequency setting)

## Underfrequency Protection

Accuracy	$\leq 0.02\text{Hz}$
Time delay accuracy	$\leq 1\%$ Setting+30ms (at 0.8 times frequency setting)

## Auto-reclosing

Phase accuracy	3.0Deg
Voltage accuracy	$\leq 2.5\%$ Setting or $0.01U_n$ , whichever is greater
Frequency accuracy	0.01Hz
Time delay accuracy	$\leq 1\%$ Setting+40ms

## Transient Overreach

Tolerance for all high-speed protection	$\leq 2\%$
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## Fault Locator

Accuracy for multi-phase faults with single end feed	3%
Tolerance will be higher in case of single-phase fault with high ground resistance.	