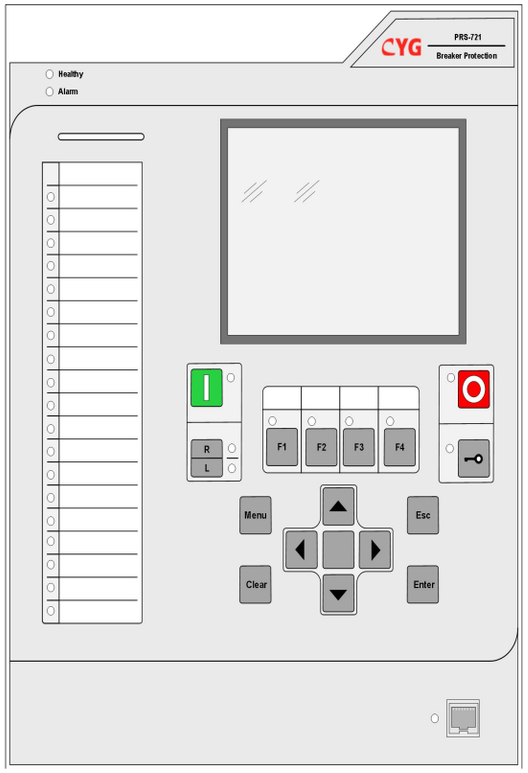
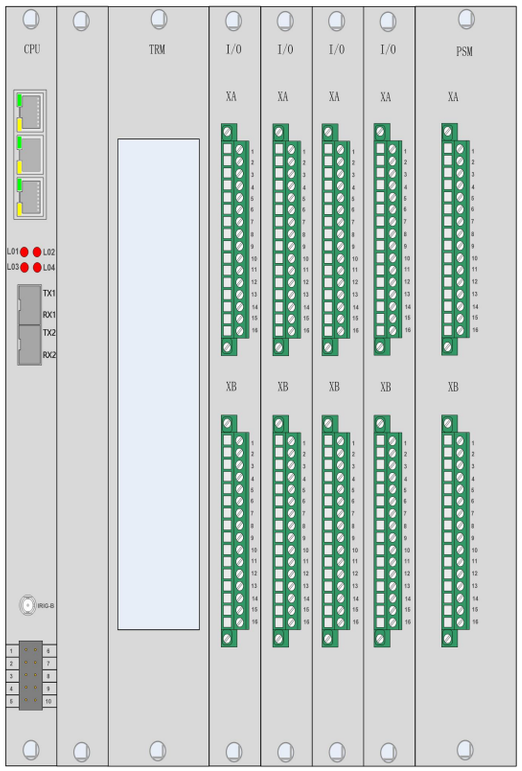
PRS-721

General Application

The PRS-721 is a digital breaker protection device and can be applied for all kinds of busbar arrangement of various voltage level ranging from 1000kV to 110kV. By default, breaker failure protection, voltage protection, overcurrent protection, stub protection, broken conductor check and automatic reclosing function is taken as the standard function of PRS-721.



❖ **Front Panel**

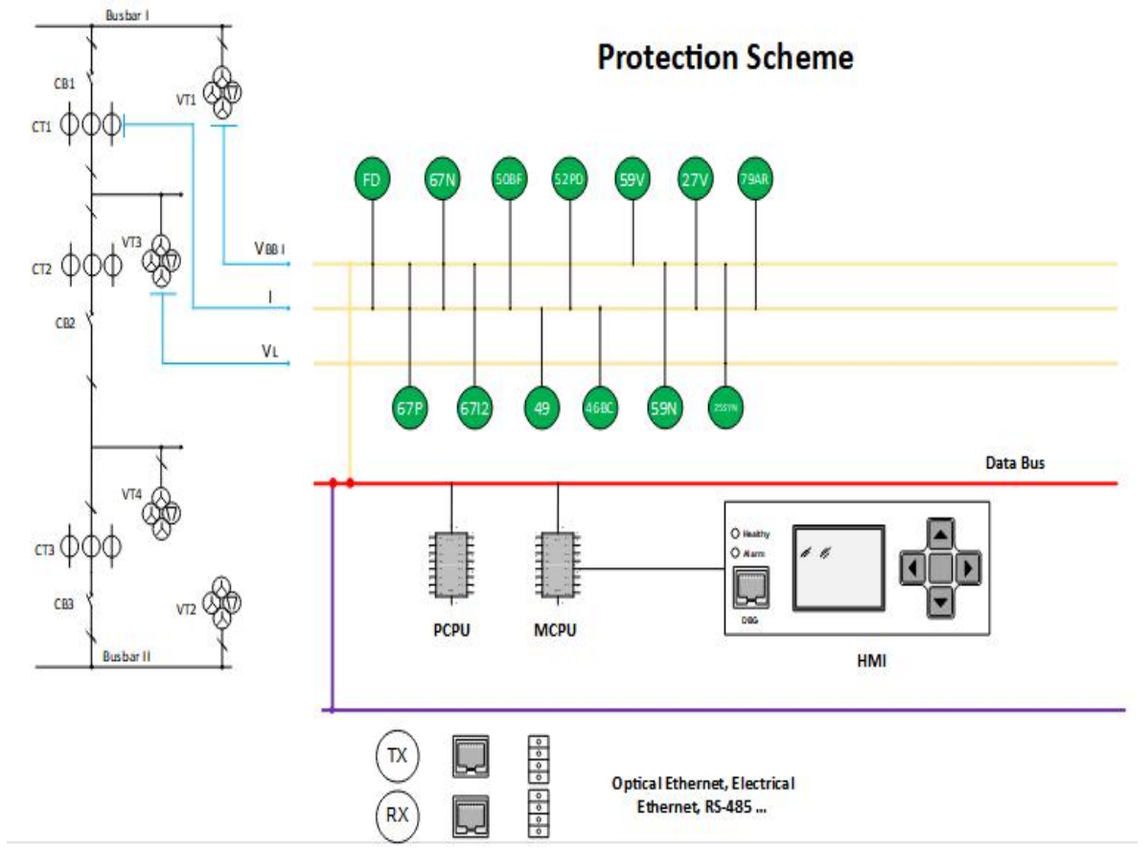


❖ **Rear Panel**

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
Three Phase Directional Overcurrent Protection	3I> ->	67P	67P(50/51P)
Directional Earth Fault Overcurrent Protection	Io>->	67N	67N(50/51N)
Directional Negative-sequence Overcurrent Protection	I2>	67	67I2
Breaker Failure Protection	3I>/I0>BF	50BF	50BF
Thermal Overload Protection	3Ith>	49	49
Stub Differential Protection	3I>STUB	50STB	87STB
Circulating Current protection	-	-	87CCP
Feeder Line End Fault Protection	3I> ->	51	51FLE
Pole Discordance Protection	PD	52PD	52PD
Broken Conductor Protection	-	46BC	46BC
Three Phase Overvoltage Protection	3U>	59	59P
Residual Overvoltage protection	2(U0>)	59N	59N
Three Phase Undervoltage Protection	3U<	27	27P
Synchrocheck	SYNC	25SYN	25SYN
Automatic Reclosure	O ->I	79	79AR
Fault Detector	-	-	FD

Supervision Functions

Description	IEC 61850	IEC 60617	ANSI
Current circuit supervision	-	87	CTS
Fuse failure supervision	FUSEF	60	VTS

Protection Specifications

Superimposed Current Element

Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater

Protection Specifications

Residual Current Element

Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater

Three Phase Directional Overcurrent Protection

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

Directional Earth Fault Protection

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

Directional Negative-sequence Overcurrent Protection

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

Protection Specifications

Breaker Failure Protection

Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Time delay accuracy	≤ 1% Setting+20ms (at 2 times current setting)
Drop-off time	≤ 20ms

Thermal Overload Protection

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

Stub Differential Protection

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

Circulating Current protection

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

Feeder Line End Fault Protection

Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Resetting ratio	97%
Time delay accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 2 times current setting)
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> In) ≤ 5.0% of operating time or 40ms, whichever is greater (start value multiples in range of 2…20 when I≤ In)

Protection Specifications

Pole Discordance Protection

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

Reverse Power Protection

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

Broken Conductor Protection

Accuracy	≤ 2.5% Setting
Resetting ratio	97%
Time delay accuracy	≤ 1% Setting+30ms

Three Phase Overvoltage Protection

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

Residual Overvoltage Protection

Accuracy	≤ 2.5% Setting or 0.01Un, whichever is greater
Resetting ratio	98%
Time delay accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 1.2 times voltage setting)
Time delay accuracy (inverse-time characteristic)	≤ 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	≤ 2.5% Setting or 0.01Un, whichever is greater
Resetting ratio	102%
Time delay accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 0.8 times voltage setting)
Time delay accuracy (inverse-time characteristic)	≤ 2.5% of operating time or 30ms, whichever is greater (for voltage between 0.5 and 0.8 multiples of pickup)

Overfrequency Protection

Accuracy	≤ 0.02Hz
Time delay accuracy	≤1% Setting+30ms (at 1.2 times frequency setting)

Underfrequency Protection

Accuracy	≤ 0.02Hz
Time delay accuracy	≤1% Setting+30ms (at 0.8 times frequency setting)

Auto-reclosing

Phase accuracy	3.0Deg
Voltage accuracy	≤ 2.5% Setting or 0.01Un, whichever is greater
Frequency accuracy	0.01Hz
Time delay accuracy	≤ 1% Setting+20ms