CYG

PROTECTION

CATALOGUE

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Jun, 2022

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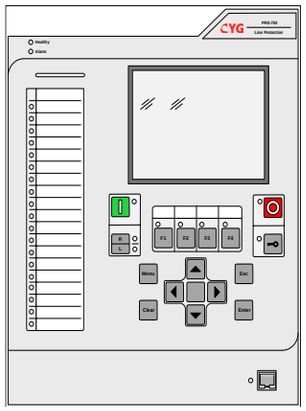
Contents

Relay Protection

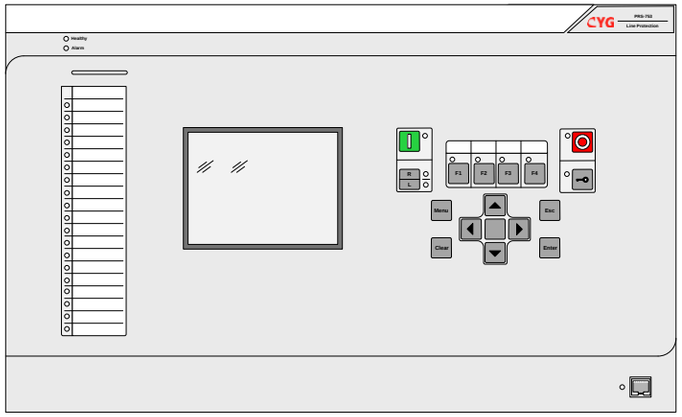
PRS-753

General Application

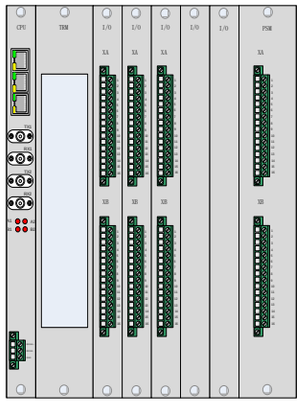
The PRS-753 is a numerical line differential and distance protection intended for protecting and monitoring various line arrangement of various voltage level, ranging from 1000kV to 110kV. PRS-753 can detect and clear all types of internal phase-to-phase and phase-to-earth faults locating within the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



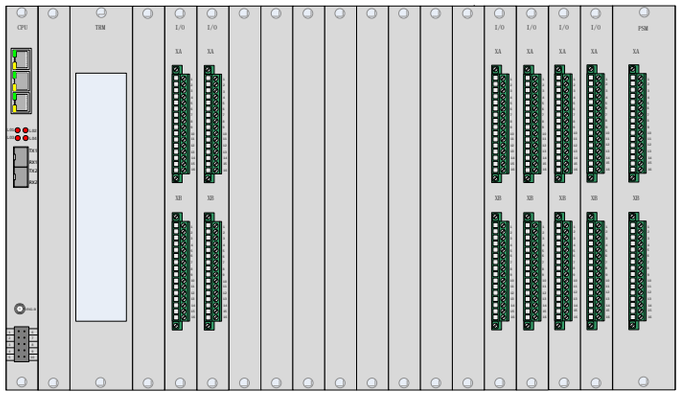
❖ Front Panel



❖ Front Panel



❖ Rear Panel

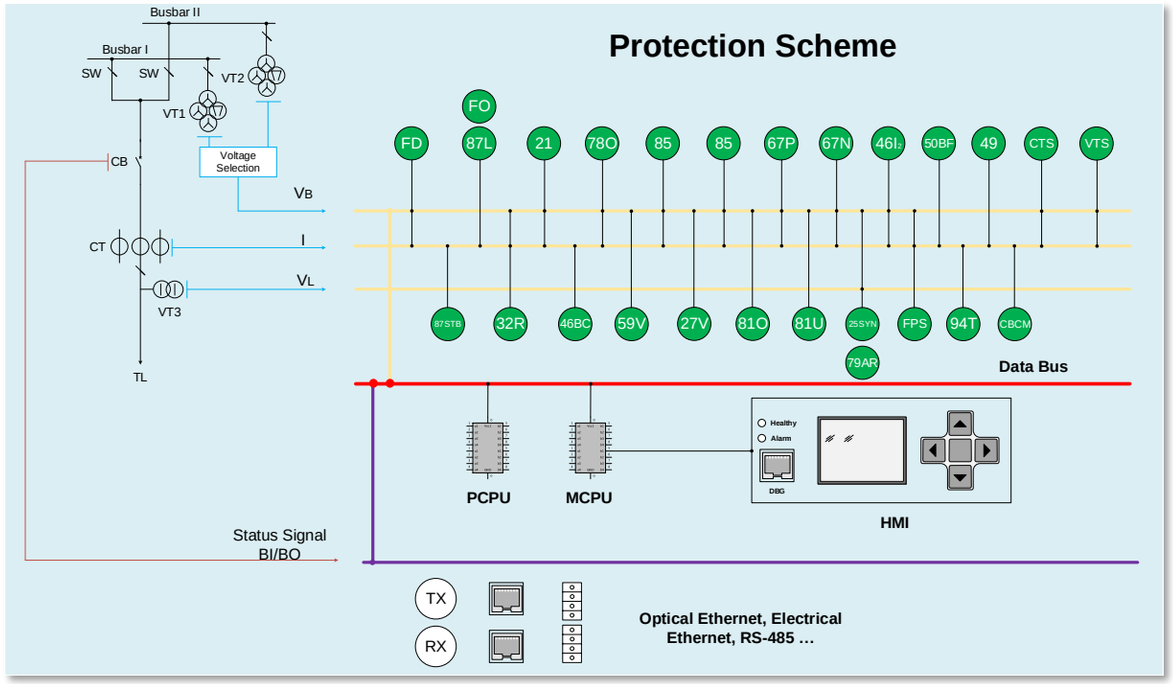


❖ Rear Panel

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 16-key keypad and 21 LED indicators
Communication	Ethernet network, RS-485 serial ports. Communication protocol optional: IEC61850, IEC60870-5-103, DNP3.0 or ModBus.
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.

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	φ<	78	78O
Scheme communication logic for distance protection	-	CL	85
Scheme communication logic for directional earth fault protection	-	CLN	85
Three Phase Directional Overcurrent Protection	3I> ->	67P	67P
Directional Earth Fault Overcurrent Protection	Io>->	67N	67N
Directional Negative-sequence Overcurrent Protection	I2>	46	46I2
Breaker Failure Protection	3I>/I0>BF	50BF	50BF
Thermal Overload Protection	3Ith>	49	49
Stub Differential Protection	3I>STUB	50STB	87STB
Reverse Power Protection	P>	32R	32R
Broken Conductor Protection	-	46BC	46BC
Three Phase Overvoltage Protection	3U>	59	59V
Residual Overvoltage protection	2(U0>)	59N	59N
Three Phase Undervoltage Protection	3U<	27	27V
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

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater

Residual Current Element

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater

Overvoltage Current Element

Setting range	Un~2Unn (V)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater

Line Differential Protection

Current setting accuracy	≤ 2.5% Setting or 0.01In, whichever is greater
Time delay accuracy	≤ 5ms
Typical operating time	≤ 25ms, half size with normal trip module ≤ 20ms, whole size with fast trip module

Distance Protection

Setting range	(0.00~4Unn)/In (ohm)
Accuracy	≤ 2.5% Setting or 0.1Ω/In, whichever is greater
Resetting ratio	97%
Time delay	0.00~10.00 (s)
Accuracy	≤ 1% Setting+30ms, half size with normal trip module ≤ 1% Setting+20ms, whole size with fast trip module

Protection Specifications

Three Phase Directional Overcurrent Protection

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Resetting ratio	97%
Time delay	0.00~20.00 (s)
Accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 2 times current setting)
Accuracy (inverse-time characteristic)	≤ 2.5% of operating time or 30ms, whichever is greater (for current between 1.2 and 20 multiples of pickup)

Directional Earth Fault Protection

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Resetting ratio	97%
Time delay	0.00~20.00 (s)
Accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 2 times current setting)
Accuracy (inverse-time characteristic)	≤ 2.5% of operating time or 30ms, whichever is greater (for current between 1.2 and 20 multiples of pickup)

Directional Negative-sequence Overcurrent Protection

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Resetting ratio	97%
Time delay	0.00~20.00 (s)
Accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 2 times current setting)
Accuracy (inverse-time characteristic)	≤ 2.5% of operating time or 30ms, whichever is greater (for current between 1.2 and 20 multiples of pickup)

Breaker Failure Protection

Pick-up time	≤ 20ms
Drop-off time	≤ 20ms
Setting range of phase current	0.05In~30.00In (A)

Protection Specifications

Setting range of zero-sequence current	0.05In~30.00In (A)
Setting range of negative-sequence current	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Time delay (first)	0.00~10.00 (s)
Time delay (second)	0.00~10.00 (s)

Thermal Overload Protection

Base current setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Line thermal time constant	0.100~100.000 (min)
Thermal overload coefficient for trip	1.000~3.000
Thermal overload coefficient for alarm	1.000~3.000
Resetting ratio	97%
Drop-off time	<30ms
Time accuracy	≤ 2.5% of operating time or 30ms, whichever is greater (for current between 1.2 and 20 multiples of pickup)

Stub Differential Protection

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Resetting ratio	97%
Time delay	0.00~10.00 (s)
Accuracy	≤ 1% Setting+30ms (at 2 times current setting)

Pole Discordance Protection

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Resetting ratio	97%
Time delay	0.00~10.00 (s)
Accuracy	≤ 1% Setting+30ms (at 2 times current setting)

Protection Specifications

Reverse Power Protection

Setting range	0.1~900.00 (W)
Accuracy	≤ 2.5% Setting or 0.5W, whichever is greater
Resetting ratio	97%
Time delay	0.10~600.00 (s)
Accuracy	≤ 1% Setting+30ms

Broken Conductor Protection

Setting range (I2/I1)	0.2~1
Accuracy	≤ 2.5% Setting
Resetting ratio	97%
Time delay	0.00~600.00 (s)
Accuracy	≤ 1% Setting+30ms

Three Phase Overvoltage Protection

Setting range	Un~2Unn (V)
Accuracy	≤ 2.5% Setting or 0.01Un, whichever is greater
Resetting ratio	97%
Time delay	0.00~30.00 (s)
Accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 1.2 times voltage setting)
Accuracy (inverse-time characteristic)	≤ 2.5% of operating time or 30ms, whichever is greater (for voltage between 1.2 and 2 multiples of pickup)

Three Phase Undervoltage Protection

Setting range	0~Unn (V)
Accuracy	≤ 2.5% Setting or 0.01Un, whichever is greater
Resetting ratio	97%
Time delay	0.00~30.00 (s)
Accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 0.8 times voltage setting)
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)

Protection Specifications

Overfrequency Protection

Setting range	50.00~65.00 (Hz)
Accuracy	≤ 0.02Hz
Time delay	0.05~20.00 (s)
Accuracy	≤1% Setting+30ms (at 1.2 times frequency setting)

Underfrequency Protection

Setting range	45.00~60.00 (Hz)
Accuracy	≤ 0.02Hz
Time delay	0.05~20.00 (s)
Accuracy	≤1% Setting+30ms (at 0.8 times frequency setting)

Auto-reclosing

Phase difference setting range	0~89 (Deg)
Accuracy	3.0Deg
Voltage difference setting range	0.02Un~0.8Un (V)
Accuracy	≤ 2.5% Setting or 0.01Un, whichever is greater
Frequency difference setting range	0.02~1.00 (Hz)
Accuracy	0.01Hz
Operating time of synchronism check	≤ 1% Setting+20ms
Operating time of energizing check	≤ 1% Setting+20ms
Operating time of auto-reclosing	≤ 1% Setting+20ms

Transient Overreach

Tolerance for all high-speed protection	≤ 2%

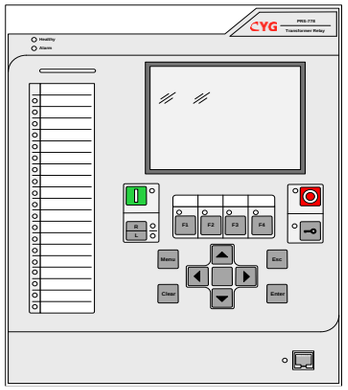
Fault Locator

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

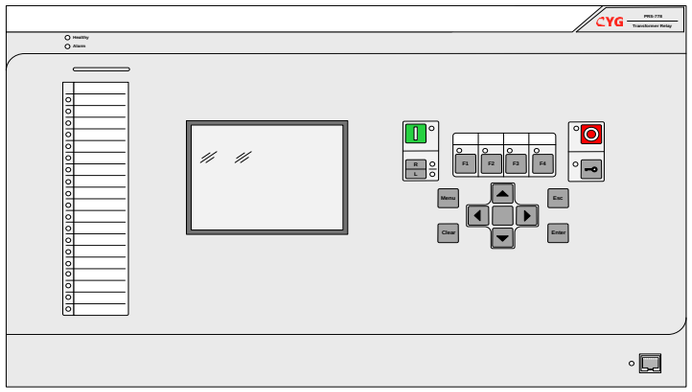
PRS-778

General Application

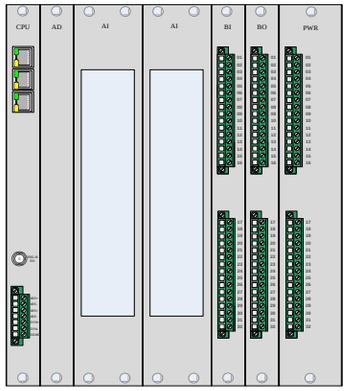
PRS-778 is a numerical distributed transformer protection intended for protecting and monitoring various transformer types of various voltage level, ranging from 1000kV to 110kV. PRS-778 provides fast and selective protection, monitoring and control for two and three-winding transformers, autotransformers, step-up transformers and generator-transformer block units, phase shifting transformers, special railway transformers and shunt reactors.



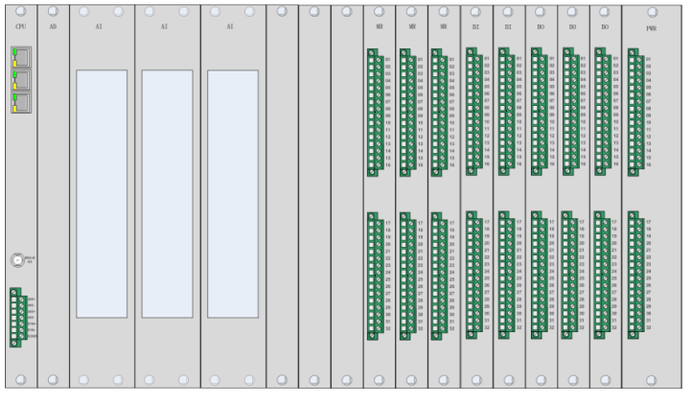
❖ Front Panel



❖ Front Panel



❖ Rear Panel

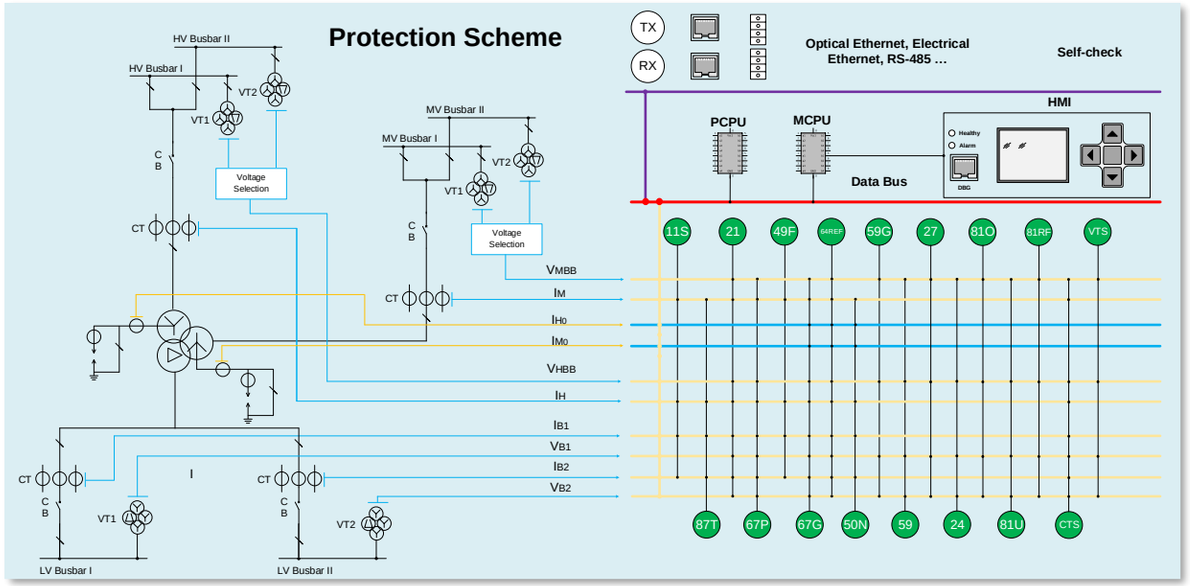


❖ Rear Panel

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 16-key keypad and 21 LED indicators
Communication	Ethernet network, RS-485 serial ports. Communication protocol optional: IEC61850, IEC60870-5-103, DNP3.0 or ModBus.
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.

Protection Functions



Protection Functions

Description	IEC 60617	ANSI	CYG Code
Transformer differential protection	3Id/I	87T	87T
Winding Differential Protection	3Id/I	87W	87W
Mho Impedance protection	Z<	21	21M
Quadrilateral Impedance protection,	Z<	21	21Q
Power swing detection	Zpsb	68	68PS
Four stage directional overcurrent protection	3I>	67P	67P
Three-phase thermal overload protection	-	49	49
Earth Fault protection	IN>	51G_67G	67N
Restricted Earth Fault protection	IdN/I	87NL	64REF
Non-directional Instantaneous earth fault protection	IN>>	50N	50N
Breaker Failure Protection	3I0> I>	50BF	50BF
Three stage residual overvoltage protection	3U0	59N	59N
Two stage three-phase overvoltage protection	3U>	59P	59P
Two stage three-phase undervoltage protection	3U<	27P	27P
Overexcitation protection	U/f	24	24
Overfrequency protection	f>	81O	81O
Underfrequency protection	f<	81U	81U
Rate-of-change frequency protection	Df/dt<>	81R	81R
Reactor differential protection	3Id/I	87R	87R
Reactor zero-sequence differential protection	IdN/I	87N	87N
Reactor interturn Protection	-	21IT	21IT

Supervision Functions

Description	IEC 60617	ANSI	CYG Code
Current circuit supervision	-	87	CTS
Fuse failure supervision	-	-	VTS

Protection Specifications

Biased Differential Protection

Tolerance of 2nd harmonic settings	0.01
Tolerance of 5th harmonic settings	0.02
Tolerance of operating current	≤2.5% of operating current or 0.02In., whichever is greater
Operating time (without blocking criteria)	50Hz: ≤ 30ms (Id>2 times current setting) 60Hz: ≤ 25ms (Id>2 times current setting)
Drop-off time	≤30ms

Instantaneous Differential Protection

Tolerance of current setting	≤2.5% of setting or 0.02In, whichever is greater
Operating time	50Hz: ≤ 20ms (Id>1.5 times current setting) 60Hz: ≤ 20ms (Id>1.5 times current setting)
Drop-off time	≤30ms

Mho Impedance Protection

Relay characteristic angle	1~89 (deg)
Impedance setting	0.05~200 (Ω)
Time setting	0.05~20 (s)
Tolerance of impedance setting	≤2.5%xSetting or 0.5Ω/In, whichever is greater
Resetting ratio	98%
Tolerance of time setting	≤1%xsetting + 40ms (at 1.5 times impedance setting)
Drop-off time	≤30ms
Current setting of fault detector for 68PS	0.04~150 (A)
Tolerance of current setting	≤2.5% of setting or 0.02In, whichever is greater
Minimum operate current	(10–30)% of In
Positive sequence impedance, Ph-E loop	(0.005–3000.000) Ω/phase
Positive sequence impedance angle, Ph-E loop	(10–90) degrees
Reverse reach, Ph-E loop (Magnitude)	(0.005–3000.000) Ω/phase
Dynamic overreach	<5% at 85 degrees measured with CVT’s and 0.5<SIR<30
Definite time delay Ph-Ph and Ph-E operation	(0.000-60.000) s

Protection Specifications

Quadrilateral characteristic impedance protection

Relay characteristic angle	1~89 (deg)
Impedance setting	0.05~200 (Ω)
Time setting	0.05~20 (s)
Tolerance of impedance setting	≤2.5%xSetting or 0.5Ω/In, whichever is greater
Resetting ratio	98%
Tolerance of time setting	≤1%xsetting + 40ms (at 1.5 times impedance setting)
Drop-off time	≤30ms
Current setting of fault detector for 68PS	0.04~150 (A)
Tolerance of current setting	≤2.5% of setting or 0.02In, whichever is greater
Minimum operate current, phase-to-phase and phase-to-earth	(10-1000)% of In
Positive sequence reactance	(0.10-3000.00) Ω/ phase
Positive sequence resistance	(0.01-1000.00) Ω/ phase
Zero sequence reactance	(0.10-9000.00) Ω/ phase
Zero sequence resistance	(0.01-3000.00) Ω/ phase
Fault resistance, phase-to-earth	(0.10-9000.00) Ω/loop
Fault resistance, phase-to-phase	(0.10-3000.00) Ω/loop

Out-of-step Protection

Relay characteristic angle	1~89 (deg)
Impedance setting	0.05~200 (Ω)
Time setting	0.05~20 (s)
Tolerance of impedance setting	≤2.5%xSetting or 0.5Ω/In, whichever is greater
Resetting ratio	98%
Tolerance of time setting	≤1%xsetting + 40ms (at 1.5 times impedance setting)
Current setting of fault detector for 68PS	0.04~150 (A)
Tolerance of current setting	≤2.5% of setting or 0.02In, whichever is greater
Rotor start angle	±5.0 degrees
Rotor trip angle	±5.0 degrees

Protection Specifications

Four stage directional overcurrent protection

Current setting	0.04In~20In (A)
Tolerance of current setting	≤2.5% of setting or 0.02In, whichever is greater
Resetting ratio	98%
Operating time	≤2.5% of operating time or 40ms, whichever is greater
Time delay setting	0.00~60 (s)
Time delay accuracy (definite-time characteristic)	≤1% of 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)

Three-phase thermal overload protection

Reference current setting	0.05 - 4.00In
Resetting ratio	98%
Tolerance of reference current setting	≤ 2.5% Setting or 0.01×In, whichever is greater
Short time constant setting	60 - 60000s
Long time constant setting	60 - 60000s
Pickup time	≤ 35ms
Dropout time	≤ 35ms
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)

Protection Specifications

Earth Fault Protection

Current setting	0.04In~20In (A)
Tolerance of current setting	≤2.5% of setting or 0.02In, whichever is greater
Resetting ratio	98%
Time delay setting	0.00~60 (s)
Time delay accuracy (definite-time characteristic)	≤1% of 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)

Restricted Earth Fault Protection

Tolerance of operating current	≤2.5% of operating current or 0.02In, whichever is greater
Resetting ratio	98%
Operating time	50Hz: ≤30ms (3I0d>2 times current setting) 60Hz: ≤25ms (3I0d>2 times current setting)
Time delay accuracy	≤25ms(at 4 times current setting)

Non-directional Instantaneous Earth Fault Protection

Current setting	0.04In~20In (A)
Tolerance of current setting	≤2.5% of setting or 0.02In, whichever is greater
Resetting ratio	98%
Operating time	≤40ms (at1.2 time current setting)

Three stage Residual Overvoltage Protection (DT)

Voltage setting	2~200 (V)
Tolerance of voltage setting	≤2.5% of setting or 0.1V, whichever is greater
Resetting ratio	98%
Operating time	50Hz: ≤35ms (at 1.2 times voltage setting) 60Hz: ≤30ms (at 1.2 times voltage setting)
Time delay setting	0.00~3600 (s)
Time delay accuracy (definite-time characteristic)	≤1% of setting +30ms (at 1.2 times voltage setting)

Protection Specifications

Three stage Residual Overvoltage Protection (IDMT)

Pickup voltage setting	2~200 (V)
Tolerance of voltage setting	≤2.5% of setting or 0.1V, whichever is greater
Resetting ratio	98%
Multiple of the maximum operating current to pickup setting	10~40
Time multiplier setting	0.05~3.2
Minimum delay setting	0.0~20 (s)
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)

Two Stage Three-phase Overvoltage Protection

Start value setting	0.05 - 1.60Un
Resetting ratio	98%
Tolerance of voltage setting	≤ 2.5% Setting or 0.01Un, whichever is greater
Operate delay time setting	0.040 - 300.000s
Pickup time	≤ 50ms
Dropout time	≤ 50ms
Tolerance of time setting	≤ 1% Setting + 30ms

Two Stage Three-phase Undervoltage Protection

Start value setting	0.05 - 1.60Un
Resetting ratio	102%
Tolerance of voltage setting	≤ 2.5% Setting or 0.01Un, whichever is greater
Tolerance of voltage setting	≤ 2.5% Setting or 0.10V, whichever is greater
Operate delay time setting	0.040 - 300.000s
Pickup time	≤ 50ms
Dropout time	≤ 50ms
Tolerance of time setting	≤ 1% Setting + 30ms

Protection Specifications

Overexcitation Protection

Multiple setting of definite time	1.0~1.6
Multiple setting of inverse time	1.0~1.7
Tolerance of Multiple setting	≤2.5% of setting or 0.01, whichever is greater
Resetting ratio	97%
Operating time	50Hz: ≤25 ms (at 2 times current setting)
	60Hz: ≤23 ms (at 2 times current setting)
Time delay setting	0.1~9999 (s)
Tolerance of time setting	≤1% of setting +30ms (at 2 times current setting)
Drop-off time	≤30ms

Overfrequency Protection

Frequency setting	50~65 (Hz)
Tolerance of frequency setting	≤ 0.02Hz
Time setting	0~100 (s)
Tolerance of time setting	≤1%Setting+30ms (at 1.2 times frequency setting)

Underfrequency Protection

Frequency setting	45~60 (Hz)
Tolerance of frequency setting	≤ 0.02Hz
Time setting	0~100 (s)
Tolerance of time setting	≤1%Setting+100ms (at 1.2 times frequency setting)

Rate-of-change Frequency Protection

Frequency setting	45~60 (Hz)
Tolerance of frequency setting	≤ 0.02Hz
Time setting	0~100 (s)
Tolerance of time setting	≤1%Setting+100ms (at 1.2 times frequency setting)

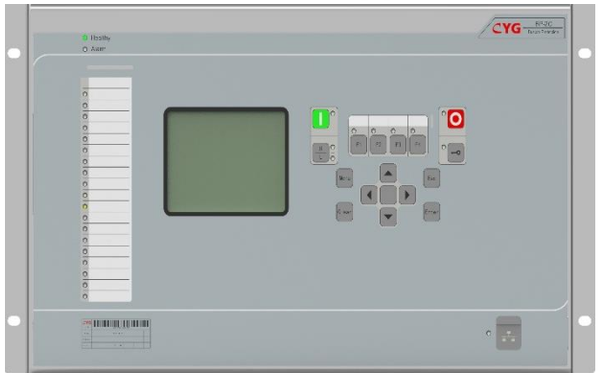
Protection Specifications

BP-2C

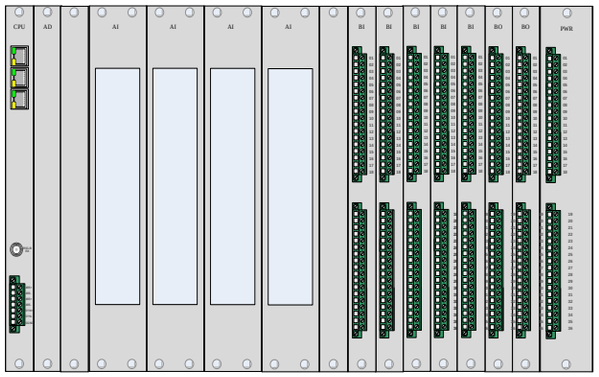
General Application

BP-2C is a numerical busbar differential protection intended for protecting and monitoring various busbar arrangement of various voltage level, ranging from 35kV to 1000kV. BP-2C is suitable for various busbar configurations, including single busbar, single busbar with bus-section breaker, double busbar, double busbar with bus-section breakers and bus-coupler breakers, and one-and-half circuit breaker.

❖ **Central Type**



❖ **Central Type Front Panel**

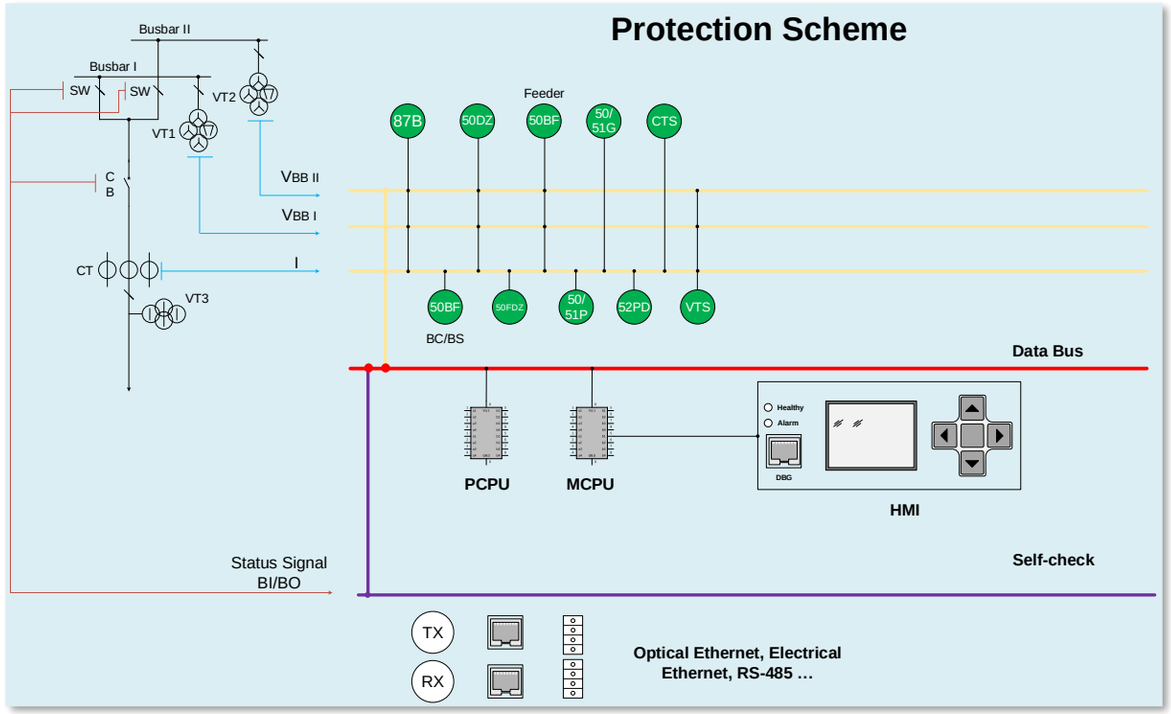


❖ **Central Type Rear Panel**

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 16-key keypad and 21 LED indicators
Communication	Ethernet network, RS-485 serial ports. Communication protocol optional: IEC61850, IEC60870-5-103, DNP3.0 or ModBus.
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.

Protection Functions



Protection Functions

Description	IEC 61850	IEC 60617	ANSI
Busbar differential protection	-	3Id/I	87B
Breaker failure protection	CC_RBRF	3I>BF	50BF
BC/BS Dead Zone Protection			50DZ
Feeder End-fault Protection			50FDZ
Feeder Breaker Failure Protection	CC_RBRF	3I>BF	50BF
Phase OverCurrent Protection	OC_PTOC	3I>	50/51P
Ground OverCurrent Protection	EF_PIOC	IN>>	50/51G
Pole Discordance Protection	CCPDSC	PD	52PD

Supervision Functions

Description	IEC 61850	IEC 60617	ANSI
Fuse failure supervision	SEQRFUF	FUSEF	60
Current circuit supervision	CCRDIF	MCS 3I	MCS 31

Protection Specifications

Busbar Differential Protection

Start value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.02In, whichever is greater
Undervoltage setting range	0~Un
Residual voltage setting range	0~Un
Negative-sequence voltage setting range	0~Un
Accuracy of voltage setting	≤ 2.5% Setting or 0.01Un, whichever is greater

Protection Specifications

BC/BS Breaker Failure Protection

Current value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

Feeder End-fault Protection

Current value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

Feeder Breaker Failure Protection

Phase current setting	0.05In - 20In
Residual current setting	0.05In - 20In
Negative-sequence current setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s

Protection Specifications

Undervoltage setting range	0~Un
Residual voltage setting range	0~Un
Negative-sequence voltage setting range	0~Un
Accuracy of voltage setting	≤ 2.5% Setting or 0.01Un, whichever is greater
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

Phase Overcurrent Protection

Start value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

Ground Overcurrent protection

Start value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

Protection Specifications

Pole Discordance Protection

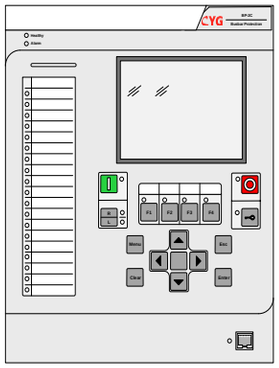
Start value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

BP-2CD

General Application

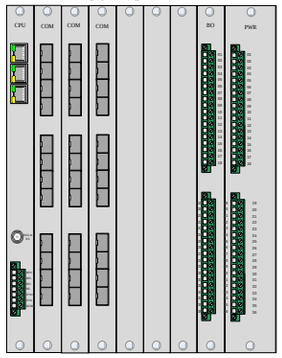
BP-2CD is a distributed busbar differential protection intended for protecting and monitoring various busbar arrangement of various voltage level, ranging from 35kV to 1000kV. BP-2CD is suitable for various busbar configurations, including single busbar, single busbar with bus-section breaker, double busbar, double busbar with bus-section breakers and bus-coupler breakers, and one-and-half circuit breaker.

❖ Distributed Type

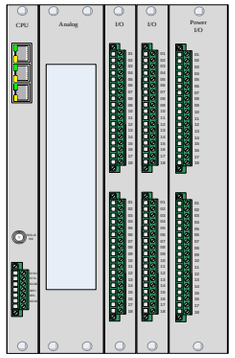


❖ Master Front Panel

❖ Slave Front Panel



❖ Master Rear Panel

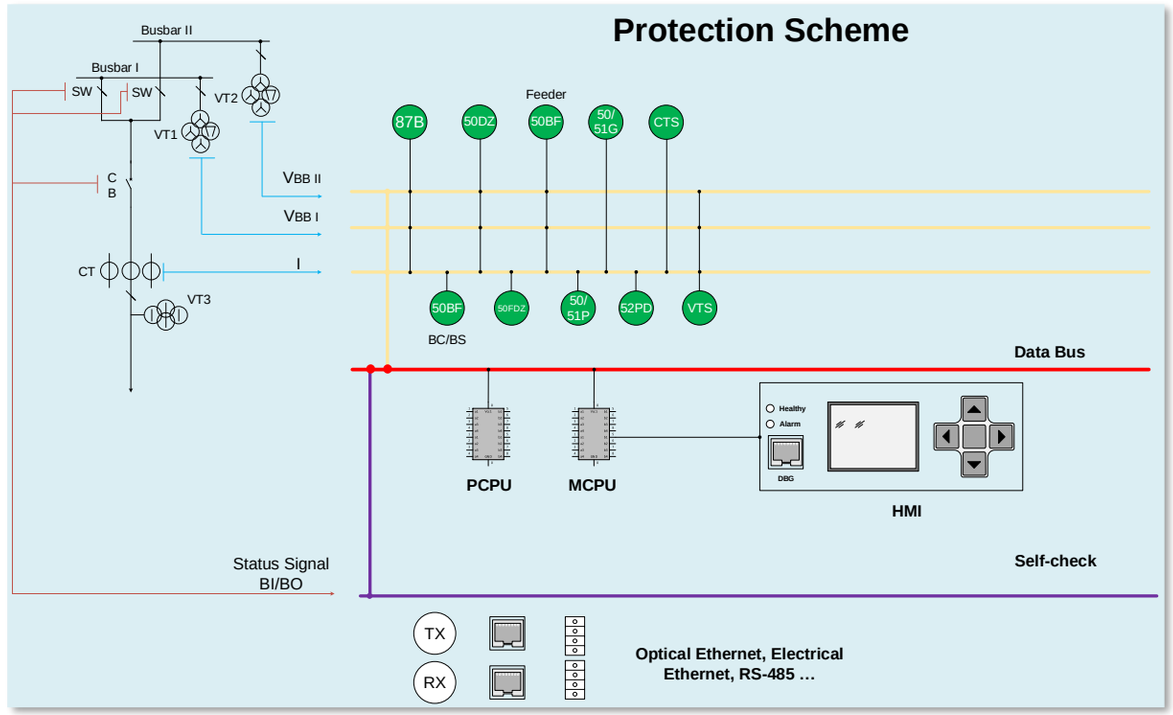


❖ Slave Rear Panel

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 16-key keypad and 21 LED indicators
Communication	Ethernet network, RS-485 serial ports. Communication protocol optional: IEC61850, IEC60870-5-103, DNP3.0 or ModBus.
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.

Protection Functions



Protection Functions

Description	IEC 61850	IEC 60617	ANSI
Busbar differential protection	-	3Id/I	87B
Breaker failure protection	CC_RBRF	3I>BF	50BF
BC/BS Dead Zone Protection			50DZ
Feeder End-fault Protection			50FDZ
Feeder Breaker Failure Protection	CC_RBRF	3I>BF	50BF
Phase OverCurrent Protection	OC_PTOC	3I>	50/51P
Ground OverCurrent Protection	EF_PIOC	IN>>	50/51G
Pole Discordance Protection	CCPDSC	PD	52PD

Supervision Functions

Description	IEC 61850	IEC 60617	ANSI
Fuse failure supervision	SEQRFUF	FUSEF	60
Current circuit supervision	CCRDIF	MCS 3I	MCS 31

Protection Specifications

Busbar Differential Protection

Start value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.02In, whichever is greater
Undervoltage setting range	0~Un
Residual voltage setting range	0~Un
Negative-sequence voltage setting range	0~Un
Accuracy of voltage setting	≤ 2.5% Setting or 0.01Un, whichever is greater

Protection Specifications

BC/BS Breaker Failure Protection

Current value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

Feeder End-fault Protection

Current value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

Feeder Breaker Failure Protection

Phase current setting	0.05In - 20In
Residual current setting	0.05In - 20In
Negative-sequence current setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s

Protection Specifications

Undervoltage setting range	0~Un
Residual voltage setting range	0~Un
Negative-sequence voltage setting range	0~Un
Accuracy of voltage setting	≤ 2.5% Setting or 0.01Un, whichever is greater
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

Phase Overcurrent Protection

Start value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

Ground Overcurrent protection

Start value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

Protection Specifications

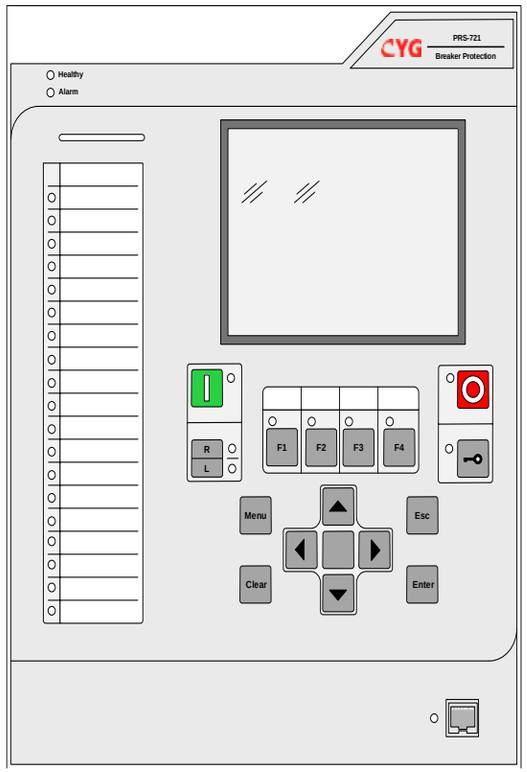
Pole Discordance Protection

Start value setting	0.05In - 20In
Pickup current	1.00×Setting
Dropout current	0.97×Setting
Tolerance of current setting	≤ 2.5% Setting or 0.01In, whichever is greater
Operate delay time setting	0.01s - 10s
Pickup time	≤ 35ms
Dropout time	≤ 35ms
Tolerance of time setting	≤ 1% Setting + 35ms

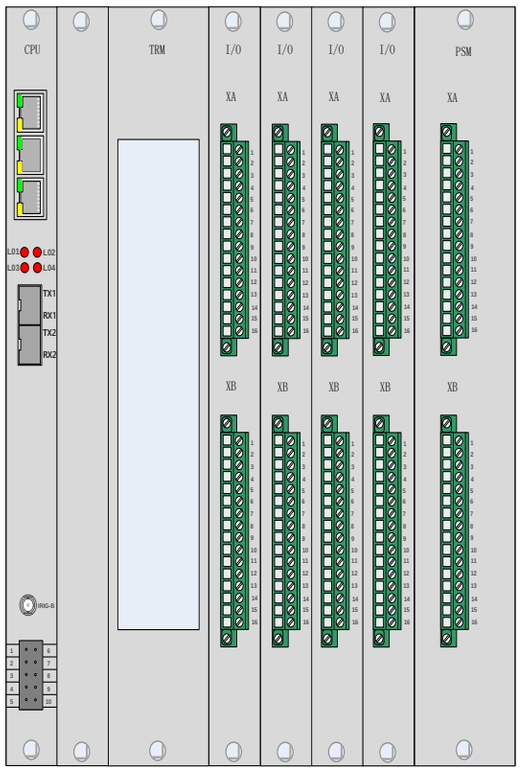
PRS-721

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**

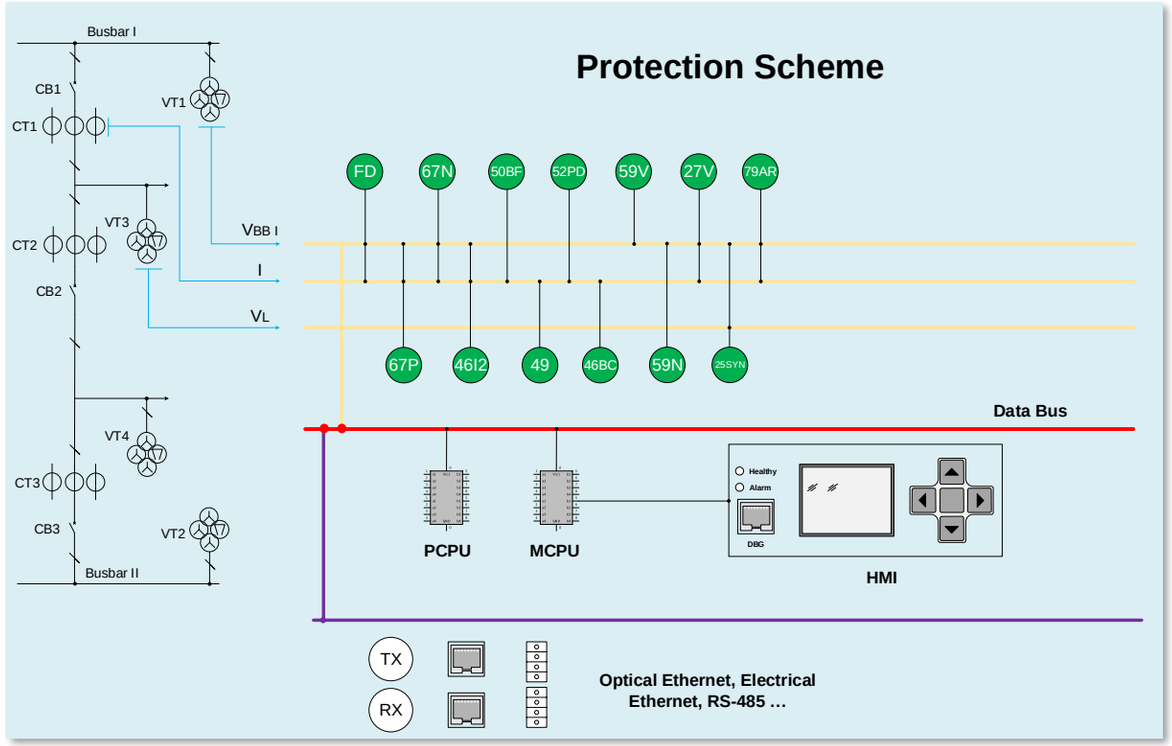


❖ **Rear Panel**

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 16-key keypad and 21 LED indicators
Communication	Ethernet network, RS-485 serial ports. Communication protocol optional: IEC61850, IEC60870-5-103, DNP3.0 or ModBus.
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.

Protection Functions



Protection Functions

Description	IEC 60617	ANSI	CYG Code
Three Phase Directional Overcurrent Protection	3I> ->	67P	67P
Directional Earth Fault Overcurrent Protection	Io>->	67N	67N
Directional Negative-sequence Overcurrent Protection	I2>	46	46I2
Breaker Failure Protection	3I>/I0>BF	50BF	50BF
Thermal Overload Protection	3Ith>	49	49
Pole Discordance Protection	PD	52PD	52PD
Broken Conductor Protection	-	46BC	46BC
Three Phase Overvoltage Protection	3U>	59	59V
Residual Overvoltage protection	2(U0>)	59N	59N
Three Phase Undervoltage Protection	3U<	27	27V
Synchrocheck	SYNC	25SYN	25SYN
Automatic Reclosure	O ->I	79	79AR
Circulating Current protection	-	-	87CCP
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

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater

Protection Specifications

Residual Current Element

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater

Overvoltage Current Element

Setting range	Un~2Unn (V)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater

Three Phase Directional Overcurrent Protection

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Resetting ratio	97%
Time delay	0.00~20.00 (s)
Accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 2 times current setting)
Accuracy (inverse-time characteristic)	≤ 2.5% of operating time or 30ms, whichever is greater (for current between 1.2 and 20 multiples of pickup)

Directional Earth Fault Protection

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Resetting ratio	97%
Time delay	0.00~20.00 (s)
Accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 2 times current setting)
Accuracy (inverse-time characteristic)	≤ 2.5% of operating time or 30ms, whichever is greater (for current between 1.2 and 20 multiples of pickup)

Directional Negative-sequence Overcurrent Protection

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Resetting ratio	97%

Time delay	0.00~20.00 (s)
Accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 2 times current setting)
Accuracy (inverse-time characteristic)	≤ 2.5% of operating time or 30ms, whichever is greater (for current between 1.2 and 20 multiples of pickup)

Breaker Failure Protection

Pick-up time	≤ 20ms
Drop-off time	≤ 20ms
Setting range of phase current	0.05In~30.00In (A)
Setting range of zero-sequence current	0.05In~30.00In (A)
Setting range of negative-sequence current	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Time delay (first)	0.00~10.00 (s)
Time delay (second)	0.00~10.00 (s)

Thermal Overload Protection

Base current setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Line thermal time constant	10~6000 (s)
Thermal overload coefficient for trip	0.10~4.00
Thermal overload coefficient for alarm	0.10~4.00
Resetting ratio	97%
Drop-off time	<30ms
Time accuracy	≤ 2.5% of operating time or 30ms, whichever is greater (for current between 1.2 and 20 multiples of pickup)

Broken Conductor Protection

Setting range	0.05In~30.00In (A)
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater

Resetting ratio	97%
Time delay	0.00~60.00 (s)
Accuracy	≤ 1% Setting+30ms (at 2 times current setting)

Broken Conductor Protection

Setting range (I2/I1)	0.2~1
Accuracy	≤ 2.5% Setting
Resetting ratio	97%
Time delay	0.00~600.00 (s)
Accuracy	≤ 1% Setting+30ms

Three Phase Overvoltage Protection

Setting range	Un~2Unn (V)
Accuracy	≤ 2.5% Setting or 0.01Un, whichever is greater
Resetting ratio	97%
Time delay	0.00~30.00 (s)
Accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 1.2 times voltage setting)
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

Setting range	0.01Un~2Unn (V)
Accuracy	≤ 2.5% Setting or 0.01Un, whichever is greater
Resetting ratio	97%
Time delay	0.00~30.00 (s)
Accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 1.2 times voltage setting)
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

Setting range	0~Unn (V)
Accuracy	≤ 2.5% Setting or 0.01Un, whichever is greater
Resetting ratio	97%
Time delay	0.00~30.00 (s)
Accuracy (definite-time characteristic)	≤ 1% Setting+30ms (at 0.8 times voltage setting)
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)

Auto-reclosing

Phase difference setting range	0~89 (Deg)
Accuracy	3.0Deg
Voltage difference setting range	0.02Un~0.8Un (V)
Accuracy	≤ 2.5% Setting or 0.01Un, whichever is greater
Frequency difference setting range	0.02~1.00 (Hz)
Accuracy	0.01Hz
Operating time of synchronism check	≤ 1% Setting+20ms
Operating time of energizing check	≤ 1% Setting+20ms
Operating time of auto-reclosing	≤ 1% Setting+20ms

Circulating Current protection

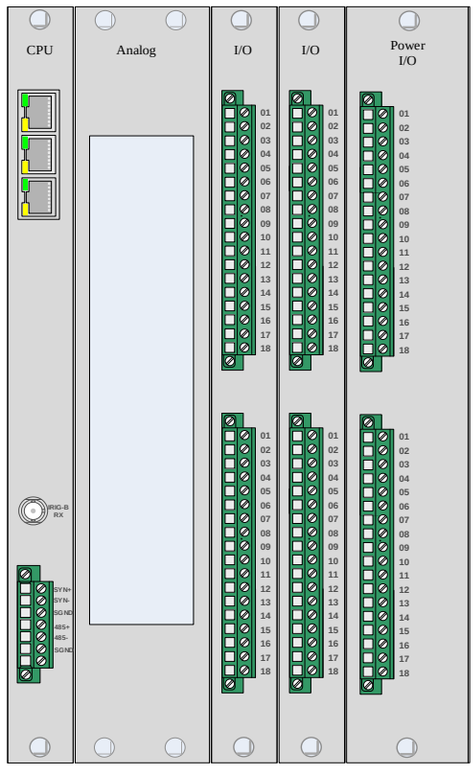
Accuracy	≤ 2.5% Setting or 0.02In, whichever is greater
Resetting ratio	97%
Time delay accuracy	≤ 1% Setting+30ms (at 2 times current setting)

PRS-7367

General Application

PRS-7367 provides a cost-effective protection &control solution for distribution system. The relay offers extensive protection, control, monitoring and measuring functions in one enclosed unit. The relay is suitable for the application in solidly grounded, impedance grounded, peterson coil grounded or ungrounded networks.

❖ **Front Panel**

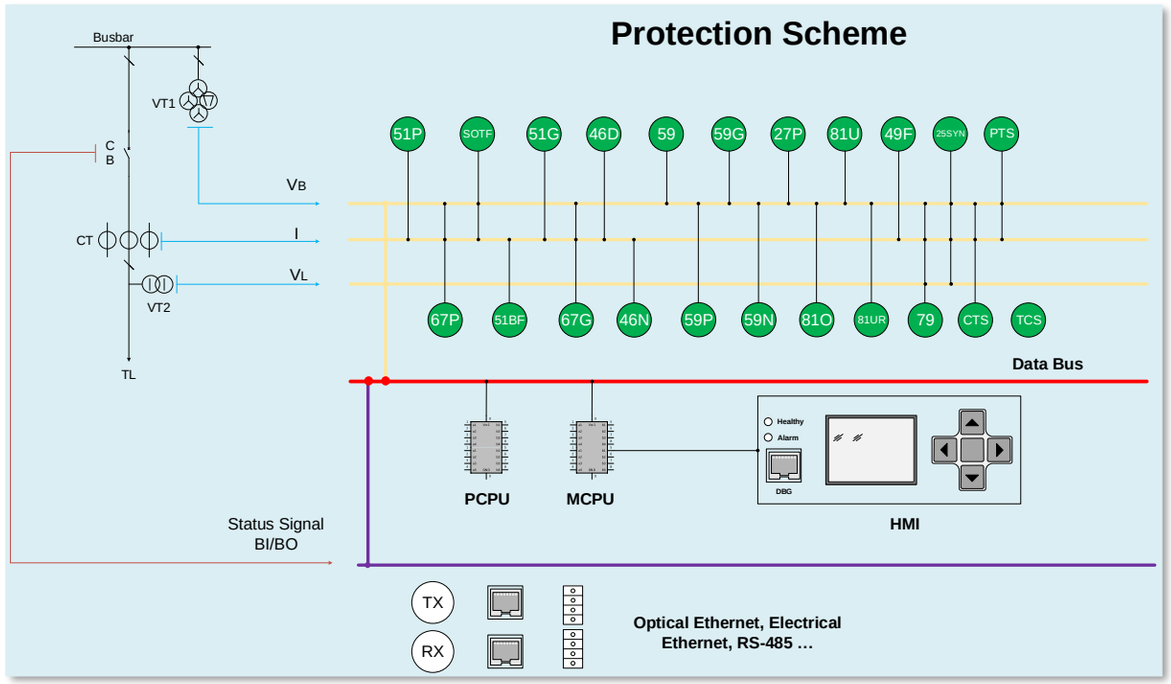


❖ **Rear Panel**

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 16-key keypad and 18 LED indicators
Communication	Ethernet network, RS-485 serial ports. Communication protocol optional: IEC61850, IEC60870-5-103, DNP3.0 or ModBus.
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.

Protection Functions



Protection Functions

Description	IEC 60617	ANSI	CYG Code
Non-directional overcurrent protection	3I>	51P	51P
Directional overcurrent protection	3I> ->	67P	67P
Switch onto fault	SOTF	SOTF	SOTF
Circuit breaker failure protection	3I>/I0>BF	50BF	50BF
Phase discontinuity protection	I2/I1>	46PD	46D
Non-directional earth-fault protection	Io>	51N	51G
Directional earth-fault protection	Io>->	67N	67G
Negative sequence current protection	I2>	46N	46N
Three-phase overvoltage protection	3U>	59	59
Positive sequence overvoltage protection	U1>	47	59P
Residual overvoltage protection	Uo>	59G	59G
Negative sequence overvoltage protection	U2>	47	59N
Positive sequence undervoltage protection	U1<	47	27P
Overfrequency protection	f>	81	81O
Underfrequency protection	f<	81	81URS
Underfrequency restore protection	-	-	81URE
Frequency gradient protection	Df/dt<>	81	81R
Three-phase thermal overload protection	3Ith>	49	49F
Auto-recloser	O ->I	79	79
Synchrocheck	SYNC	25	25SYN
Three phase under voltage protection of capacitor	3U<	27	CUB_27
Reverse power protection	P or Q>	32R/32O	32R
Fault locator	FLOC	21FL	21FL
Mechanical protection			MP
Backup power automatic switch	/	/	BPAS
Wattmetric sensitive earth fault	/	/	SEF

Supervision Functions

Description	IEC 60617	ANSI	CYG Code
Current circuit supervision	MCS 3I	MCS 3I	CTS
Fuse failure supervision	FUSEF	60	PTS
Trip circuit supervision	TCS	TCM	TCS

Protection Specifications

Overcurrent Protection

Operate current	±1.0% of the set value or ±0.005 × In
Blocking voltage	±1.0% of the set value or ±0.005 × Un
Reset time	<45ms
Reset ratio	Typically 98%
Tolerance of operating time at definite time mode	±1.0% of the set value or ±40 ms
Tolerance of operating time at inverse time mode	±5.0% of the theoretical value or ±40 ms, Maximum Start value = 2.5 × In, Start value multiples in range of 1.5...20.
DIR criteria	≤±2°

Residual Overcurrent Protection

Operate current	±1.0% of the set value or ±0.005 × In
Blocking voltage	±1.0% of the set value or ±0.005 × Un
Reset time	<40ms
Reset ratio	Typically 98%
Tolerance of operating time at definite time mode	±1.0% of the set value or ±40 ms
Tolerance of operating time at inverse time mode	±5.0% of the set value or ±40 ms, Maximum Start value = 2.5 × In, Start value multiples in range of 1.5 to 20.

Protection Specifications

Sequence Overcurrent Protection

Tolerance of operating current	±1.0% of the set value or ±0.005 × In
Reset time	<40ms
Reset ratio	Typically 98%
Tolerance of operating time at definite time mode	±1.0% of the set value or ±40 ms

Phase Discontinuity Protection

Tolerance of Ratio setting	±2% of the set value
Reset time	<40ms
Reset ratio	Typically 98%
Tolerance of operating time at definite time mode	±1.0% of the set value or ±40 ms

Over/Under Frequency Protection

Tolerance of operating frequency	± 0.01Hz, 30.00-70.00 at Fn=50; 40.00-80.00 at Fn=60
Tolerance of frequency gradient	± 0.1Hz/s at -10.00~10.00 Hz/s
Operate time, definite time function	±1.0% of the set value or ±60 ms
Reset time, definite time function	<190ms

Over/Under Voltage Protection

Tolerance of operating voltage	±1.0% of the set value or ±0.005 × Un
Tolerance of blocking voltage	±1.0% of the set value or ±0.005 × Un
Reset ratio	≤98% for Over, ≥102% for Under
Tolerance of operating time	±1.0% of the set value or ±40 ms

Protection Specifications

CBF Protection

Operate current	±1.0% of the set value or ±0.005 × In
Operate residual current	±1.0% of the set value or ±0.005 × In
Reset ratio	Typically 98%
Tolerance of operating time at definite time mode	±1.0% of the set value or ±40 ms

Thermal overload

Operate current	±1.0% of the set value or ±0.005 × In at 0.04…3In
$t = \tau \times \ln \frac{I^2 - \theta_t (k \cdot I_B)^2}{I^2 - \theta_{t+1} (k \cdot I_B)^2}$	IEC 60255-8, ±5% + 200ms

Auto-Reclose

Tolerance of operating time	±1.0% of the set value or ±40 ms

Current Unbalance Protection

Operate current	±1.5% of the set value or ±0.005 × In
Tolerance of operating time at definite time mode	±1.0% of the set value or ±40 ms
Tolerance of operating time at inverse time mode	±5.0% of the theoretical value or ±40 ms

Voltage Unbalance Protection

operating voltage	±1.0% of the set value or ±0.005 × Un
Tolerance of operating time	±1.0% of the set value or ±40 ms

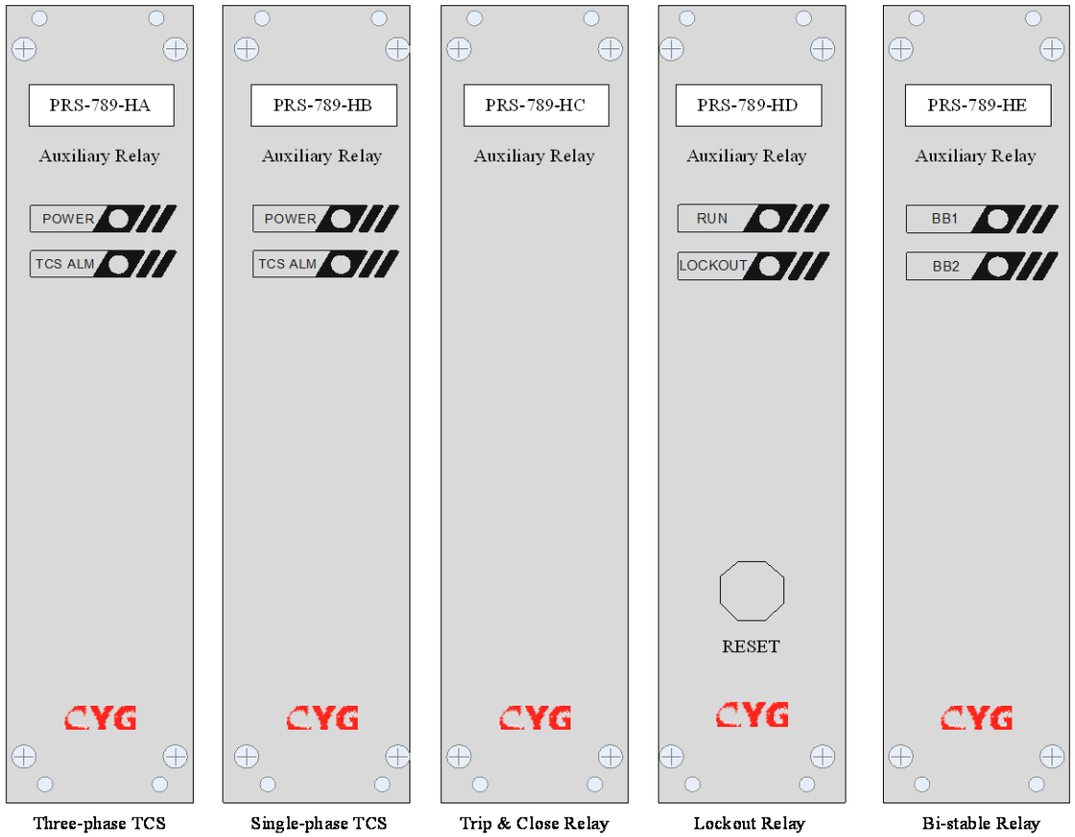
Fault Locator

Fault location accuracy	±2.5% of the line length or ±0.2km/0.13 mile

PRS-789

General Application

PRS-789 serial auxiliary relay mostly cooperates with main protection relay to achieve trip circuit supervision, from the positive supply to the negative supply whilst the circuit breaker is open or close status, and as well trip & close activation with self-adaption trip & close coil current, or lockout relay with bi-stable function.



Three-phase TCS　Single-phase TCS　Trip & Close Relay　Lockout Relay　Bi-stable Relay

❖ **Front Panel**

Feature

Item	Parameter
Performance	High levels of reliability and dependability
IP degree	Reliable operation over a wide temperature range
Power supply	Rated auxiliary voltage: 220V, 125V, 110V.

Type and Function

Type	Function	Application
PRS-789-HA	Trip circuit supervision, high-speed trip relay ,close relay	Mostly use for three-pole operation circuit breaker with one trip coil and one close coil
PRS-789-HB	Segregated Phase trip circuit supervision	Mostly use for Single-pole operation circuit breaker
PRS-789-HC	High-speed trip relay &close relay (3 elements) with self-latching function	Mostly use for Single-pole operation circuit breaker
PRS-789-HD	Lockout relay, repeat relay, high burden trip contact	Mostly use for lock-out close circuit after CB trip and initiating trip circuit
PRS-789-HE	Bi-stable relay, AC voltage switching relay	Mostly use for signal selection or switching control

Relay Specifications

PRS-789-HA Single Phase TCS Relay

Standard	IEC 60225-6：1988
Rated voltage	Un DC110V、125V、220V
TCS Pickup voltage	55% ~70%Un
TCS drop off delay	300ms
Output contacts	TCS：2NO/2NC，trip relay：1NO，close relay：1NO
self-adaptive current range for trip coil	1A~8A
TR pickup current	0.2A~0.5A

Relay Specifications

Trip operating time	<10ms
TR Drop off delay	<10ms
Maximum voltage for contact	380Vac, 250Vdc
Voltage withstand for normally open contact	1200Vac, 1min
Current carrying capacity for contact	8A
Overcurrent capacity for contact	50A@200ms, 20A@0.5s, 10A@3s
Breaking capacity for contact (L/R=40ms)	1.2A@48Vdc, 0.5A@110Vdc, 0.25A@220Vdc
Current of supervision circuit(mA)	close status: 9 mA, open status:8 mA
Dimension	40mm×173.5mm×231mm (W×H×D)
Installation method	flush mounted
Weighty	0.7kg
enclosure IP degree	IP40
Operating temperature	25°C~+55°C
Relative humidity	5%~95%, without condensation

PRS-789-HB Three Phase TCS Relay

Standard	IEC 60225-6：1988
Rated voltage	Un DC110V、125V、220V
Pickup voltage	55% ~70%Un
drop off delay	300ms
Output contacts	TCS:2NO/2NC
Maximum voltage for contact	380Vac, 250Vdc
Voltage withstand for normally open contact	1200Vac, 1min
Current carrying capacity for contact	8A
Over current capacity for contact	50A@200ms, 20A@0.5s, 10A@3s
Breaking capacity for contact (L/R=40ms)	1.2A@48Vdc, 0.5A@110Vdc, 0.25A@220Vdc
Current of supervision circuit(mA)	close status: 9 mA, open status:8 mA
Dimension	40mm×173.5mm×231mm (W×H×D)

Relay Specifications

Installation method	flush mounted
weighty	0.7kg
enclosure IP degree	IP40
Operating temperature	25°C~+55°C
Relative humidity	5%~95%, without condensation

PRS-789-HC Trip & Close Relay

Standard	IEC 60225-6：1988
Self-adaptive current range for trip & close coil	1A~8A
Rated voltage drop	<2V
Pickup current	0.2A~0.5A
Operating time	<10ms
Drop off delay	<10ms
Output contacts	3 phase, 1NO per phase
Maximum voltage for contact	380Vac, 250Vdc
Voltage withstand for normally open contact	1200Vac, 1min
Current carrying capacity for contact	8A
Over current capacity for contact	50A@200ms, 20A@0.5s, 10A@3s
Breaking capacity for contact (L/R=40ms)	1.2A@48Vdc, 0.5A@110Vdc, 0.25A@220Vdc
Dimension	40mm×173.5mm×231mm (W×H×D)
Installation method	flush mounted
weighty	0.7kg
Enclosure IP degree	IP40
Operating temperature	25°C~+55°C
Relative humidity	5%~95%, without condensation

Relay Specifications

PRS-789-HD Lockout Relay

Standard	IEC 60225-6：1988
Rated voltage	Un DC110V、125V、220V
Pickup voltage	55% ~70%Un
Pickup power	>25W: 220Vdc, >9W: 110Vdc, 125Vdc
Operating time	<10ms
Reset time	<15ms
Current of supervision relay coil	1.5mA
Output contacts	Ten groups of electrical reset relay (6 normally open contacts and 4 normally closed contact), one group of signal contact Eight groups of electrical reset relay (6 normally open contacts and 2 normally closed contacts), one group of signal contact
Maximum voltage for contact	380Vac, 250Vdc
Voltage withstand for normally open contact	1200Vac, 1min
Current carrying capacity for contact	8A
Over current capacity for contact	50A@200ms, 20A@0.5s, 10A@3s
Breaking capacity for contact (L/R=40ms)	1.2A@48Vdc, 0.5A@110Vdc, 0.25A@220Vdc
dimension	40mm×173.5mm×231mm (W×H×D)
Installation method	flush mounted
weighty	0.7kg
enclosure IP degree	IP40
Operating temperature	25°C~+55°C
Relative humidity	5%~95%, without condensation

Relay Specifications

PRS-789-HE General Bi-stable Relay

Standard	IEC 60225-6：1988
Rated voltage	Un DC110V、125V、220V
Pickup voltage	55% ~70%Un
Pickup power	>25W: 220Vdc, >9W: 110Vdc, 125Vdc
Operating time	<10ms
Reset time	<10ms
Output contacts	4 groups of switching contacts, one group of signal contact
Maximum voltage for contact	380Vac, 250Vdc
Voltage withstand for normally open contact	1200Vac, 1min
Current carrying capacity for contact	8A
Over current capacity for contact	50A@200ms, 20A@0.5s, 10A@3s
Breaking capacity for contact (L/R=40ms)	1.2A@48Vdc, 0.5A@110Vdc, 0.25A@220Vdc
dimension	40mm×173.5mm×231mm (W×H×D)
Installation method	flush mounted
weighty	0.7kg
enclosure IP degree	IP40
Operating temperature	25°C~+55°C
Relative humidity	5%~95%, without condensation

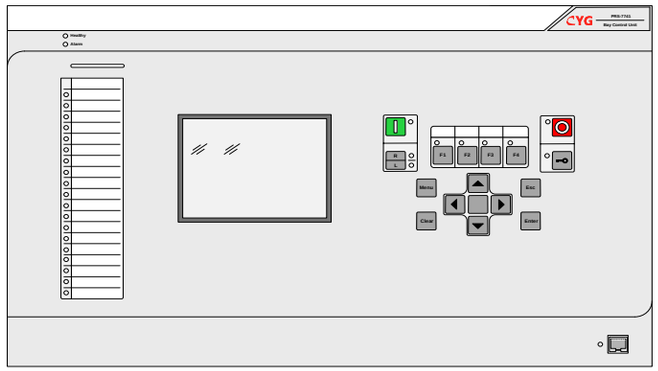
PRS-7741

General Application

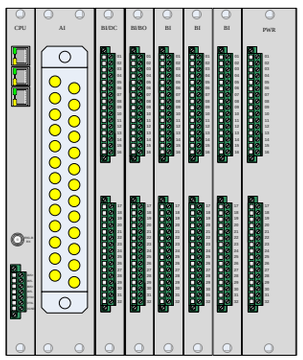
The PRS-7741 relay is a microprocessor based Bay Control Unit (abbreviated as BCU) which is used for bay level controlling and monitoring in power grid. It is suitable for application in Substation Automation System (abbreviated as SAS) with distributed control IEDs.

PRS-7741 is designed for controlling and monitoring switchgears such as circuit breaker, dis-connector, and earthing switch. Additionally, it supports tap changer control for transformer and shunt reactor.

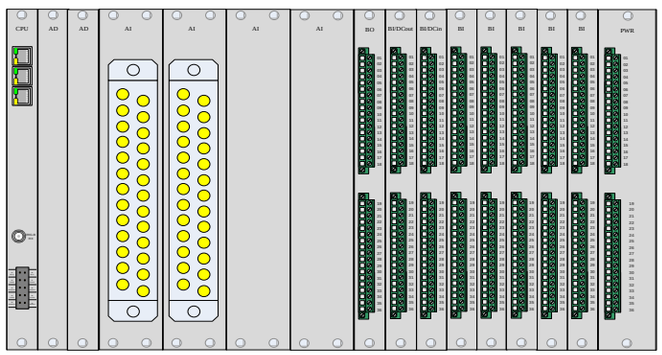
❖ **Front Panel**



❖ **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 16-key keypad and 21 LED indicators
Communication	Ethernet network, RS-485 serial ports. Communication protocol optional: IEC61850, IEC60870-5-103, DNP3.0 or ModBus.
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.

Functions

Item	Parameter
Measurement	Conventional CT/VT sampling method with AC AI module in using electrical cable (24 samples per cycle) Transducer input in DC for temperature, humidity, etc.
Configurable	Programmable binary input Programmable binary input Programmable software & hardware interlocking logic output Programmable LED indicators
Supervision	Fuse Failure supervision Current circuit supervision Self-diagnostic Device power supply supervision
Even Recorder	512 latest protection operation reports, 512 latest supervision records, 512 latest blocking records, 128 latest control operation records, 128 latest user operation records and 2000 latest SOE
Synchronization	Supporting PPS, IRIG-B, PPM and SNTP etc.

Specifications

Measurement Range and Accuracy

Metering Item	Range	Accuracy
Phase range	0° ~ 360°	≤ 0.5% or ±1°
Frequency	35.00Hz ~ 70.00Hz	≤ 0.01Hz
Current (three phase 3Ip)	0.2In<I<2In 0.1 Un<U<1.5Un	±0.2%In, I≤In; ±0.2%I, I>In
Voltage (Phase 3Up, Phase-to-Phase 3Upp)	0.2In<I<4In 0.1 Un<U<1.5Un	±1%Un, U≤Un; ±1%U, U>Un
P, Q, S,	0.2In<I<4In 0.1 Un<U<1.5Un	±1% for power (S, P and Q)
power factor cos		±0.02 for power factor

Auxiliary Power Supply

Reference	IEC 60255-1, IEC 60255-26
Rated voltage	24VDC~250VDC, 48V~250VAC
Variation	80% ~ 120%
Frequency	50/60Hz, ± 5Hz
Maximum interruption time in the auxiliary DC voltage without resetting the IED	0%Un,100ms； 40%Un,200ms； 70%Un,500ms At the Un=DC220V
Gradual shut down / Start up	Class C (60s shut down ramp, 5 min power off, 60s start up ramp)
Ripple in the DC auxiliary voltage	Class A (15% of rated @200Hz, 220VDC)
Maximum load of auxiliary voltage supple	≤30W (normal state), ≤45W (maximum state)
Reference	IEC 60255-1, IEC 60255-26
Rated voltage	24VDC~250VDC, 48V~250VAC

Binary input

Reference	IEC 60255-1, Clause:6.10.5
Binary input number	Up to 90
Rated voltage	24VDC~250VDC, 64VAC~250VAC
Pickup voltage	55% ~ 70% rated voltage

Specifications

“ON” value voltage	70% ~ 120% rated voltage
“OFF” value voltage	< 55% rated voltage
Maximum permitted voltage	120% rated voltage
Resolution of binary input signal	≤ 1ms
Resolution of SOE	≤ 1ms

Binary output

Reference	IEC 60255-1	
Item	Tripping output	Signal output
Binary output number	Up to 82	Up to 82
Output model	Potential-free contact	Potential-free contact
Max system voltage	380Vac, 250Vdc	380Vac, 250Vdc
Voltage across open contact	1000V RMS for 1min	1000V RMS for 1min
Continuous carry	8.0A @ 380Vac； 8.0A @ 250Vd	5.0A @ 380Vac； 5.0A @ 250Vdc
Short duration current	30A, 0.2s 10A, 1s	30A, 0.2s 10A, 1s
Breaking capacity	1.00A @ 48Vdc, L/R=40ms 0.30A @ 110Vdc, L/R=40ms 0.20A @ 220Vdc, L/R=40ms	0.60A @ 48Vdc, L/R=40ms 0.10A @ 110Vdc, L/R=40ms 0.05A @ 220Vdc, L/R=40ms
Pickup time	< 8ms	< 10ms
Dropout time	< 5ms	< 8ms

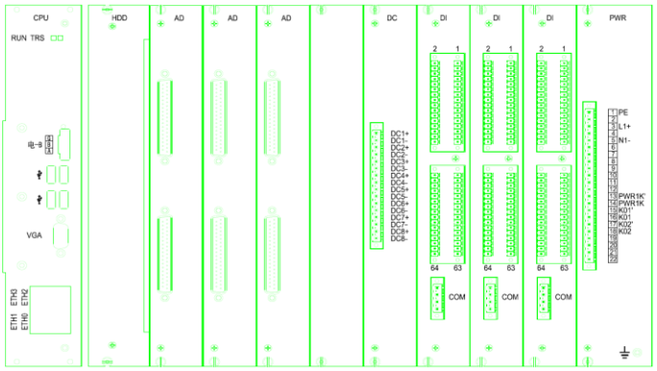
PRS-7973

General Application

The PRS-7973 digital fault recorder is mainly used for recording the dynamic fault processes of power system anomalies. It is mainly designed to capture and diagnose the changing process of relative electrical parameters of the power system.

PRS-7973 digital fault recorder integrates multiple functions into one unit, provide transient recording, continuous disturbance recording, phasor measurements, power quality monitoring and sequence of events recording.

❖ **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	VGA port and USB ports for the external human machine interface (HMI) , and 7 LED indicators
Communication	Ethernet network. Communication protocol optional: IEC61850.
Analog	Support the protocol IEC60044-8, IEC61850-9-2 and GOOSE, constantly measures and calculates voltage, current, and power.
Recording	Transient and disturbance recording, Power Quality Recording, Sequence of Events Recording.

Functions

Item	Parameter
Measurement	Conventional CT/VT sampling method (up to 96 analog inputs) with AC AI module in using electrical cable (256/512 samples per cycle) Transducer input in DC for temperature, humidity, etc.
Configurable	Programmable analog input Programmable binary input Programmable software function
Function	Transient and disturbance trigger Digital Channels trigger Power Quality Fault Locator Waveform analysis Self-diagnostic Device power supply supervision
Recorder	Have both transient trigger and continuous recording modes. The 1TB hard disks provides ample storage for all your data. which can store 3000 transient state fault files and 2500 stable state fault files.
Synchronization	Supporting PPS, IRIG-B, PPM and SNTP etc.

Specifications

Measurement Range and Accuracy

Metering Item	Range	Accuracy
Phase range	0° ~ 360°	≤ 0.5% or ±1°
Frequency	35.00Hz ~ 70.00Hz	≤ 0.01Hz
Current	0.2In<I<2In	±0.1%In, I≤In; ±0.1%I, I>In
Voltage	0.1 Un<U<1.5Un	±0.1%Un, U≤Un; ±0.1%U, U>Un
P, Q,	0.2In<I<4In 0.1 Un<U<1.5Un	±0.2% for Power quality

Auxiliary Power Supply

Reference	IEC 60255-1, IEC 60255-26
Rated voltage	88V~250VDC, 88V~250VAC
Variation	80% ~ 120%
Frequency	50/60Hz, ± 5Hz
Maximum interruption time in the auxiliary DC voltage without resetting the IED	0%Un,100ms； 40%Un,200ms； 70%Un,500ms At the Un=DC220V
Gradual shut down / Start up	Class C (60s shut down ramp, 5 min power off, 60s start up ramp)
Ripple in the DC auxiliary voltage	Class A (15% of rated @200Hz, 220VDC)
Maximum load of auxiliary voltage supple	≤40W (normal state), ≤50W (maximum state)
Reference	IEC 60255-1, IEC 60255-26

Binary input

Reference	IEC 60255-1, Clause:6.10.5
Binary input number	Up to 192
Rated voltage	110VDC/125VDC/220VDC
Pickup voltage	55% ~ 70% rated voltage

“ON” value voltage	70% ~ 120% rated voltage
“OFF” value voltage	< 55% rated voltage
Maximum permitted voltage	120% rated voltage
Resolution of binary input signal	≤ 1ms
Resolution of SOE	≤ 1ms

Binary output

Reference	IEC 60255-1
Output model	Potential-free contact
Max system voltage	380Vac, 250Vdc
Voltage across open contact	1000V RMS for 1min
Continuous carry	5.0A @ 380Vac； 5.0A @ 250Vdc
Short duration current	30A, 0.2s 10A, 1s
Breaking capacity	0.60A @ 48Vdc, L/R=40ms 0.10A @ 110Vdc, L/R=40ms 0.05A @ 220Vdc, L/R=40ms
Pickup time	< 10ms
Dropout time	< 8ms