New Leader !! Optimized Preventive Maintenance Solution!!

Digital Motor Protection Relay

DSP - 2SD

DSP - 3SD, 3SD-RG

Samwha DSP Ltd.
DIGITAL STANDARD PROTECTION

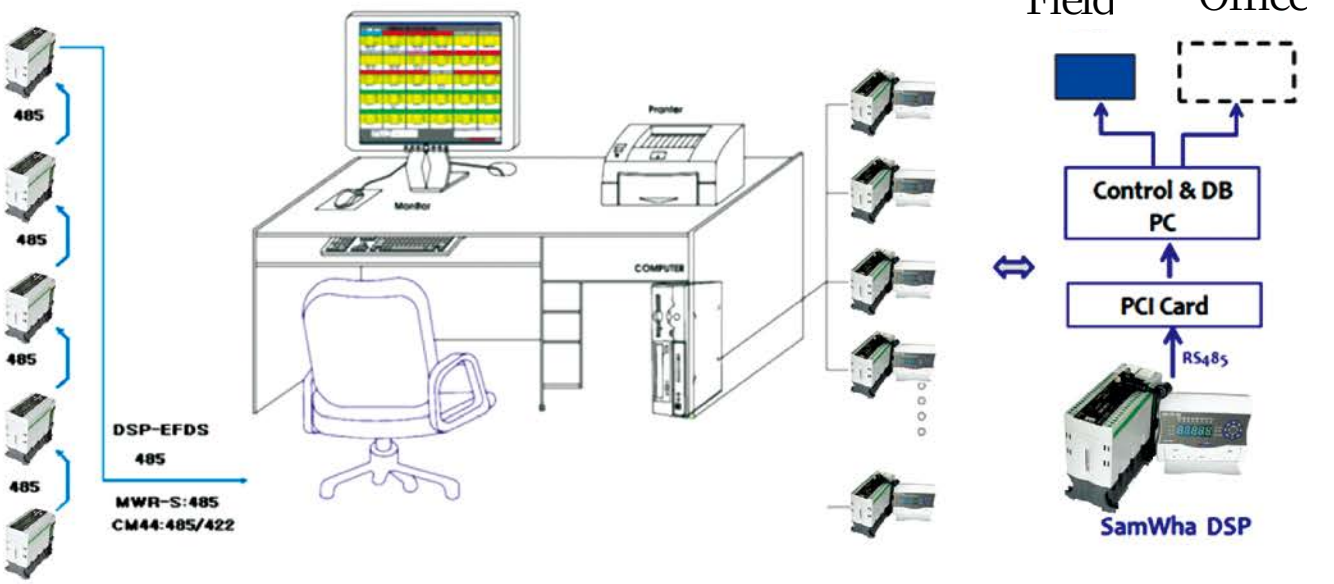
www.samwhadsp.com

Motor Preventive Maintenance Diagnostic System(DSP-EFDS)
: VIP-PM/RTM, "samdsp","samdspdb"

- ●Created data for motor protection : Voltage, Current/KW, Earth current, Isulation resistance, Temperature, Power factor, Unbalance
- ●Building data base(DB) up based on 485/Modbus network
- ●Analyzing and managing DB DATA in order to check the motor condition and to make alarm in case of unstable condition : able to preset alarm level for each factor
- ●Possible to analyze correct trip cause through stored data of trip instant in MWR-S(Motor working Recorder) connected with converter directly
- ●Office PC is able to do master job without installation for additional Server as master

Field Office

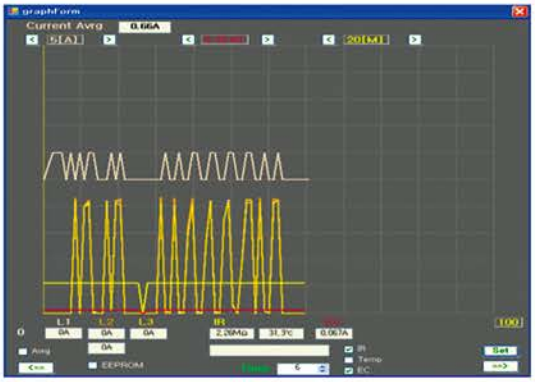
◎ System



–Window 10 or more –Office(Excel) –Net Frame 4.0 or more(open protocol)
–Desk PC(with PCI Card) "samdsp":monitoring & Analyzing" ＊"samdspdb":monitoring & data base"

Main window

Graph window



New Leader !! SamWha DSP!!

Digital Motor Protection Relay

Digital Motor Protection Relay,DSP VIP-Series , P-Series,C-Series,A-Series, is useful for low voltage motor protection. It is aimed to protect a motor against a trouble which is happened from over/under load[current],locked rotor, stall[shock], voltage (power type)/current unbalance, phase loss, reverse phase, short circuit, ground fault, over/under voltage(power type) in motor operation.

Also it is able to raise the efficiency for motor operation as being possible to realize a supervision, a protection and a control, furthermore each kind of series item takes it's own specialized function, respectively, in order to meet various customer need such as short circuit , alarm before trip,4~20mA output for load current, insulation resistance measureemnt, vibrated frequency detection through 4~20mA output from sensor, RS485 or Ethernet communication.

Especially Current-Resistance type can meet two kind of different job which is consisted of powerful motor protection during a motor running state and the insulation resistance measurement for a power line of the motor during a motor stop state. This would be more powerful to prevent an industrial disaster caused by a degraded power line of the motor used for the long term since first installation

Now we launch new item such as DSP-2SD/3SD which is based on 2CT or 3CT with basic essential protective function except GR fault matched with ZCT. However, we prepared 3SD-RG with GR fault protection through residual circuit for user who want to take specific function like GF. We will do not cease R&D to meet customer's need in any condition in today and in future.

Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 2CT Based
DSP-2SD:OC/PLc/Lc

Protection Range

10 Type	0.5 ~ 10A	Available for external CT
60 Type	5 ~ 60A	

	Definite T-I
10 Type	0.5~10A
60 Type	5 ~ 60A

Input/Output

DIV	Terminal	Description
Input	A1(+), A2(-)	100~240VAC, 50/60Hz
Output	1a-1b/95-96, 97-98	OC/PLc/Lc

Trip Output Operation Pattern

Main Trip output : main/95-96(b), 97-98(a)

b is selected in "out" mode : factory default
Control power is on/unchanged output state : 95-96(b), 97-98(a)
TRIP operation state : 95-96(a), 97-98(b)

a is selected in "out" mode
Control power is on/changed output state : 95-96(a), 97-98(b)
TRIP operation state : 95-96(b), 97-98(a)

Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 2CT Based DSP-2SD:OC/PLc/Lc

Protection

DIV	Description	Operation time
Over current(oc)	in case the load current greater than preset value is sensed	1~300 sec/adjustable
Phase loss(PLc)	In case one of three phase is a state of phase loss	1~5sec
Locked rotor(Lc)	In case the starting current greater than 200% of "OC" preset value is kept after dt is elapsed	0.1sec

Trip cause indication

□to show the number of 8 trip cause in the order

□press "UP" or "DN" in the "trip" mode state, then trip cause and value are shown alternatively

□press "CLR" or ""SET" to check next event or previous event

□self-test trip is also stored

Preset value check and/or change in running state

□to check: press "SET" key once during the operation

- preset value and mode are appeared alternatively
- next mode as pressing “CLR” Key or previous mode as pressing “SET” key

□to change : Firstly preset "ON" for “OPSET” mode(“CAB” mode group) is “ON”→ factory default value is “OFF”, then follow same manner for "checking" procedure

□Return to operating mode as pressing both “SET” and "CLR" key in the same time or waiting for 15sec

Self-Diagnostic

□"tESt" is appeared in case the operator press "CLR" key for 3 sec or more in motor stop state, then release pressed "CLR" key

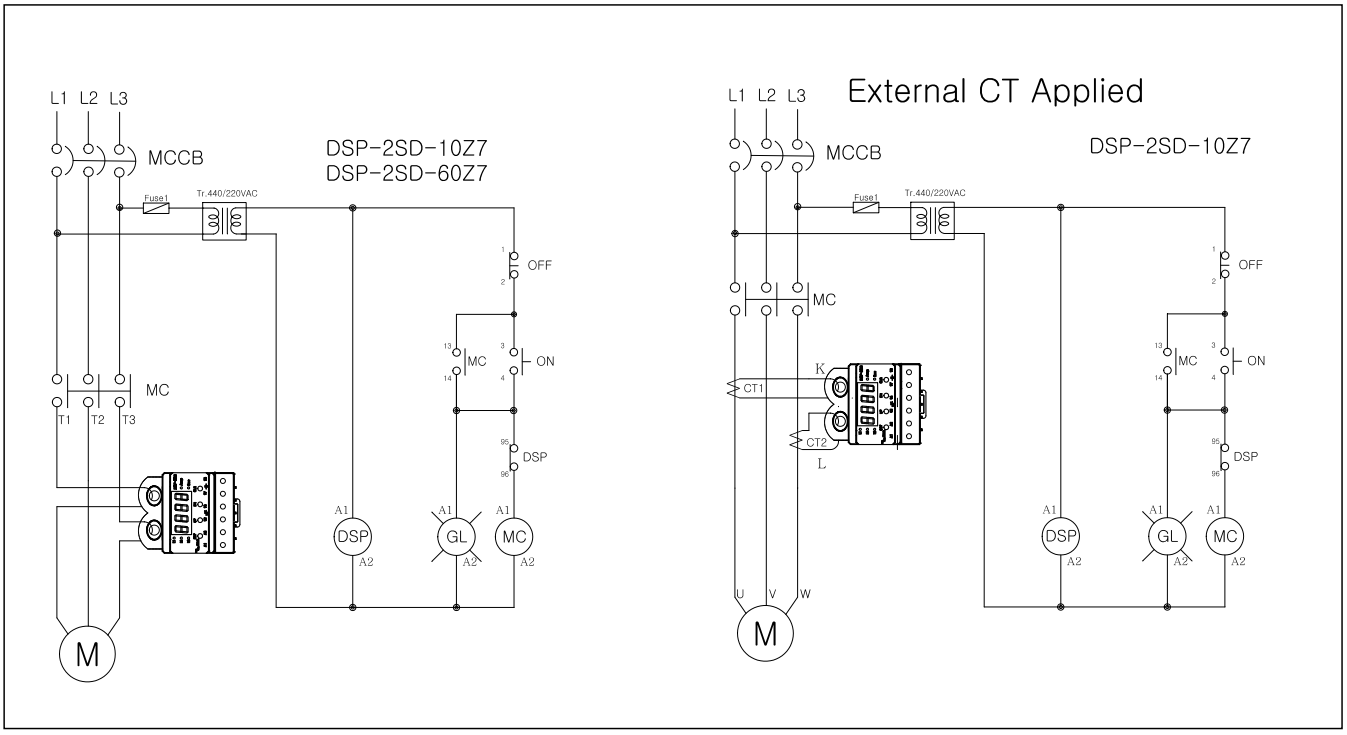
□main trip output(95-96,97-98) will be trip after counting down preset o-time

□press “CLR” key to reset

Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 2CT Based
DSP-2SD:OC/PLc/Lc

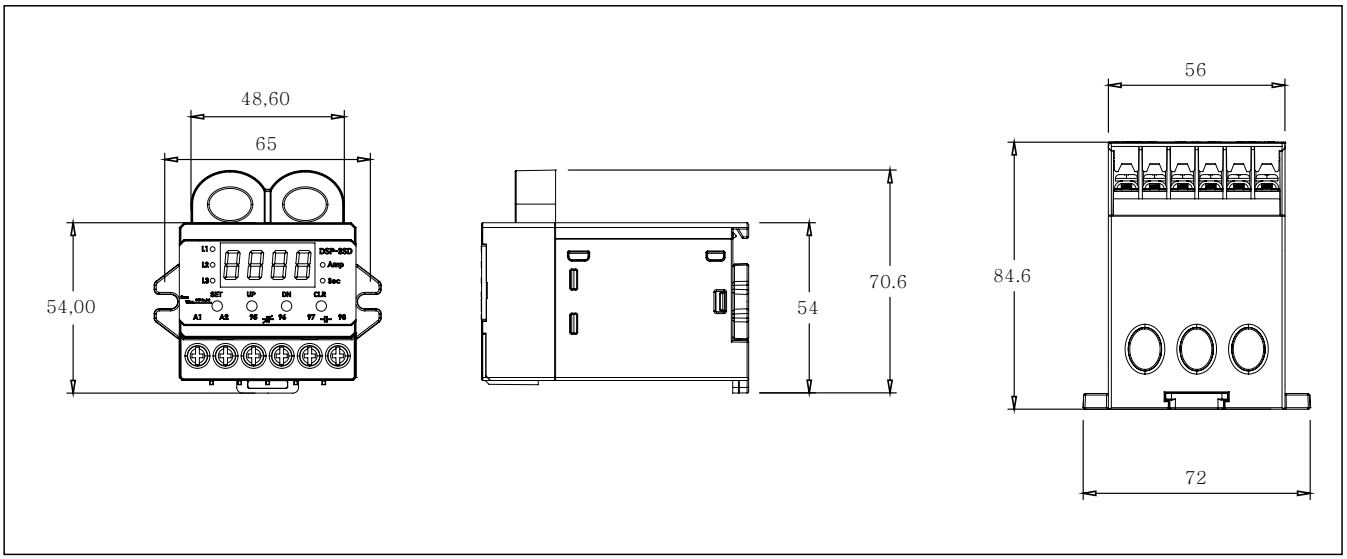
Application sequence diagram



*Note

It is required that external auxiliary power relay shall be matched with trip output of DSP in order to meet large capacity of contactor

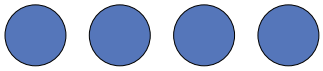
Dimension



Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 2CT Based DSP-2SD:OC/PLc/Lc

Preset Key Operation



SET DN UP CLR

1. "SET" key	* Press "SET" Key to enter into setting mode, then "P000"(factory default password) is shown * Move cursor from first digit to right end digit by pressing "CLR" key to input password, in the same time make required digit by using "UP", "DN" key if password is customized number, finally press once more in order to meet possible state for preset of each mode * If there is no input for 15sec or pressing both "SET" and "CLR" key, it can be entered into operating condition.
2. Changed feature of Setting Key	* After entering into posible state for preset , each key acts its job as follows : SET ---> backward direction, CLR ---> foward direction, UP. DN---> able to select number or character in preset mode. * The previous mode based on setting mode is come out as pressing "SET" key during doing a prest job
3. "SET" Key & "CLR" Key/to select MODE	* Possible to select Mode by using "SET" or "CLR" key
4. "UP" key & "DN" Key/ Adjust	* Possible to preset required value as selecting a character or a number by using UP/DOWN
5."SET" & "CLR" Key/ Store	* The storage for preset data is completed by pressing both SET and CLR key in the same time or after 15sec is elapsed
6."CLR" key	* While each factor is rotated during an operation, one of rotated factor is fixed by pressing "CLR" key * After fixing a operating factor, the operator is able to rotate manual one by one as pressing "UP"(forwardly), "DN"(reversely)

Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 2CT Based DSP-2SD:OC/PLc/Lc

Preset Description

Mode	Function	Description	Factory
P0000	Password	P000 is shown as pressing SET and need to press CLR 3 times to enter into mode to be preset	0000
PhAS	to select phase of power line	* 1P : Single phase * 3P : Three phase	3P
Ct	to select for direct through CT or external CT	* available for 10 type :based on CT ratio of external CT with 5A secondary rating * 1 ~ 120 1 : to sense a current through its own CT or external CT with 5/5 ratio	1
OC	to preset a range to protect over current	10 type : 0.5~10A/0.5~6A with external CT, 60 type : 5~60A	10 : 10, 60 : 60
dt	to preset starting trip delay time	OFF : dt is zero, 1 ~ 300sec/adjustable	5
Ot	to preset operating trip delay time	1 ~ 60sec/adjustable	5sec
LC	to protect Locked Rotor	* it is available for selecting ON [operation time:01sec after dt is elapsed] * conditoion for "ON" : start running current is kept on 200% after dt is elapsed	OFF
PLC	to protect phase loss by load current	ON : available/1~5sec, OFF : not available	OFF
rESt	to decide how to reset trip state	* Hr:manual reset/Password input * Er:electrical reset : "CLR" Key : Control power-off * A-rE : automatic reset by time of “AUt” mode only for over current trip	Er
AUt	to preset auto reset time	* time range : 0(instant), 0.1sec,1~300sec * If Hr is preset in " rESt" mode, this mode becomes disable	"- -"
OUt	to decide initial state of main trip relay	* to make initial state(a or b) of main trip output(95-96, 97-98) when control power is powered * a : normal energized type(95-96(a), 97-98(b) * b : normal deenergized type(95-96(b), 97-98(a)/not changed state	b
trIP	to show latest number of 8 trip cause	* to show the number of 8 trip cause in the order * press "UP" or "DN" in the "trip" mode state, then trip cause and value are shown alternatively * press "CLR" or ""SET" to check next event or previous event * self-test trip is also stored * In order to enter setup state on the way of trip condition check, press "DN" under pressing "UP" firstly and release "DN" firstly under pressing "UP", finally release "UP"	"- -"
Test	* to check if this relay is ready to work normally or not. *"tESt" is appeared in case the operators press "CLR" key for 3 sec or more, then release pressed "CLR" key * main trip output (95-96,97-98) will be trip after counting down preset o-time * press “CLR” key to reset		

Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 2CT Based DSP-2SD:OC/PLc/Lc

Technical Specification

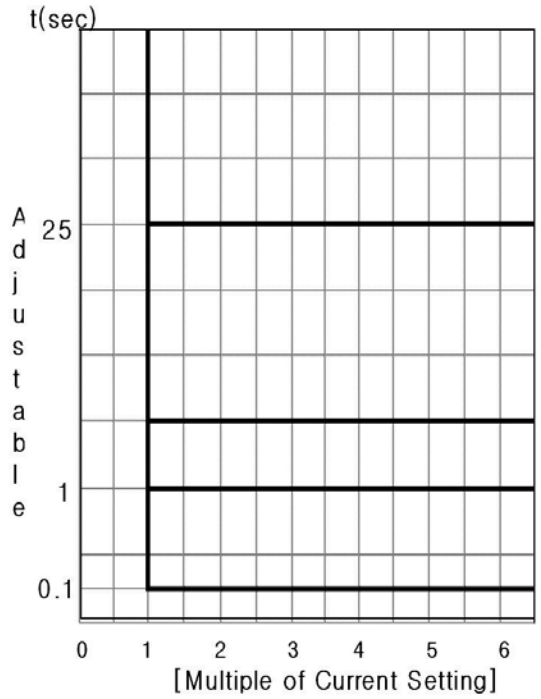
DIV		Description	
Current setting range	10 Type	0.5A ~ 10A : Definite T-I 0.5A ~ 6A with external CT	
	60 Type	5A ~ 60A : Definite T-I	
	External CT	1A ~ 600A	
Time setting	Starting delay time(dt)	OFF, 1 ~ 300 sec	
	over current trip delay time(ot)	1 ~ 60 sec	
	Phase loss trip delay time(PLc)	1 ~ 5 sec	
	Locked Rotor trip delay time(PLc)	dt + 0.1sec	
Allowable tollerance	Current	C <= 2A : 0.2A, C > 2A : +, - 5%	
	Time	t <= 2 sec : +, -, 0.1sec, t > 2 sec : +, - 5%	
Control power		* 100 VAC ~ 240 VAC, 50/60Hz(90VDC ~ 370VDC)	
		* 24 VAC / DC(optional)	
Trip output Relay	Main (95-96,97-98)	1a - 1b(1-SPDT), 250 VAC / 2A, 30 VDC / 1A, Resistive	
Application environment	Temperature	Operation	-25 ^{O} C ~ +70 ^{O}C
		Storage	-40 ^{O}C ~ +80 ^{O}C
	Relative humidity	30 ~ 85%, non-condensing	
Current tollerance against changeable frequency in inverter		Avg ±5% in 30Hz ~ 400Hz	
Max Conductor Size		25sq	
Screw Torque		Max 0.6 N.m	
Insulation Resistence / IEC-60255-5		100Mohm or more/500VDC, circuit-case	
High Voltage Withstand Test/ IEC-60255-5		* circuit-case : AC 2000V, 60Hz, 1 min * contact-contact : AC 1000V, 60Hz,1 min	
Lightening Impulse Voltage Withstand Test/ IEC-60255-5		* Circuit - Ground, Circuit - Circuit : 1.2/50uS, 5KV * Control Circuits : 1.2/50uS, 5KV	
1 MHz Burst Immunity Test:IEC 61000-4-18		2.5KV, Positive/Negative under 2sec	
Electrostatic Discharge:IEC-61000-4-2		Air : Level 3, 8KV, Contact : Level 3, 6KV	
Radiated Electromagnetic Field Disturbance : IEC /EN 61000-4-3		Level 3, 10V/m	
Electric Fast Transient Burst:IEC/EN 61000-4-4		Power, relay output : Level 4, 4KV	
Surge Immunity test:IEC-61000-4-5		Relay output : 1.2 X 50uS, 2KV (0 ^{O} , 90 ^{O} , 180 ^{O} , 270 ^{O})	
Conducted disturbence Test:IEC/EN61000-4-6		10V,Level 3	
Installation		DIN Rail, Screw fixed	
Consuming power		2W max	

Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 2CT Based
DSP-2SD:OC/PLc/Lc

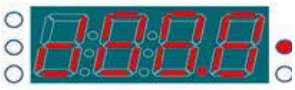
Time - Current Characteristics

Definite T-I



Operational Indication

- Indication during d-time for morto starting → " d & Current value" is indicated if "d-time" is executed for mortor starting, but "d" is flickering in every 1sec

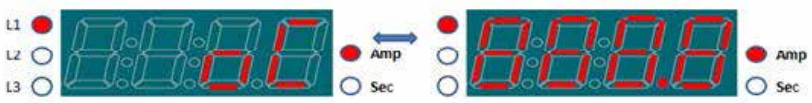


-Indication during preset operating time before trip in followed each case

* "OC" trip :o & Current value" is indicated if "o-time" is executed for over current protection , but "o" is flickering in every 1 sec

-Trip Indication

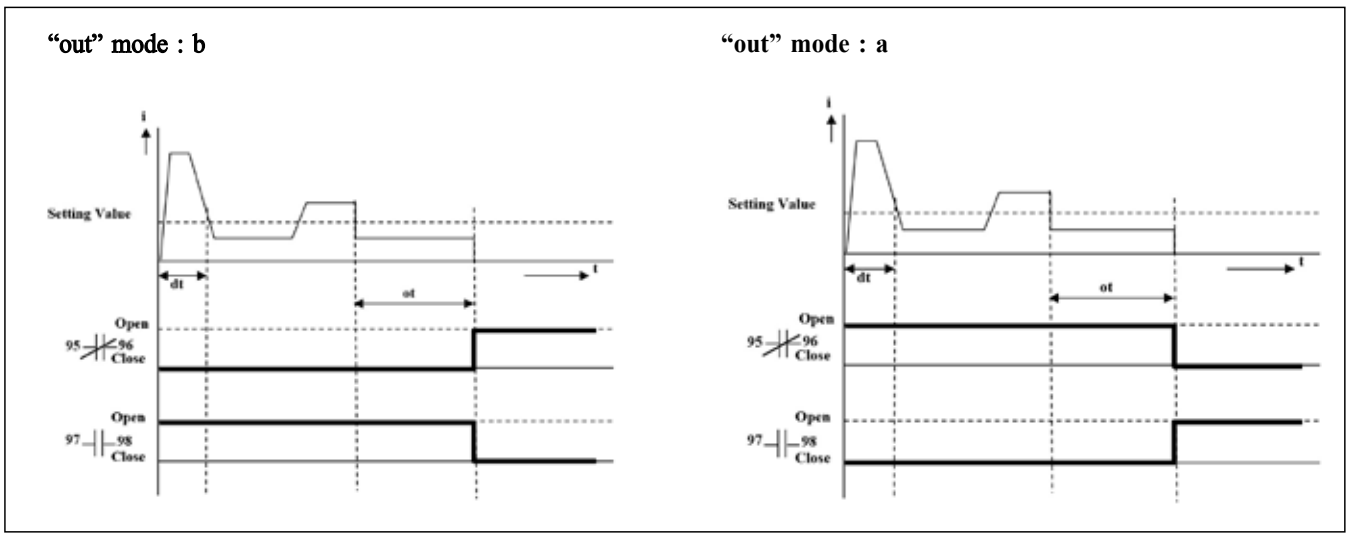
Indication after trip in every each case is that "trip cause" and "trip value" are shown alternatively



Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 2CT Based
DSP-2SD:OC/PLc/Lc

Time Based Trip Relay Output for over current protection



Order Form

Item	Reference Code	Description
DSP-2SD	DSP-2SD-10-B	Panel Mounting Type, 0.5 ~ 10A / 0.5A ~ 6A with external CT, 24 VDC, Optional Type
	DSP-2SD-10-Z7	Panel Mounting Type, 0.5 ~ 10A / 0.5A ~ 6A with external CT, 100 VAC ~ 240 VAC(120VDC-370VC), 50 / 60Hz
	DSP-2SD-60-B	Panel Mounting Type, 5~60 A, 24 VDC, Optional Type
	DSP-2SD-60-Z7	Panel Mounting Type, 5 ~ 60A, 100 VAC ~ 240 VAC(120 VDC - 370 VDC), 50 / 60Hz
2CT combined	Basic code + C12	With 100 / 5 CT
	Basic code + CC2	With 150 / 5 CT
	Basic code + C22	With 200 / 5 CT
	Basic code + C32	With 300 / 5 CT

Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 3CT based

DSP-3SD:OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub

DSP-3SD-RG : OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub/ Ec(Ground Fault Protection based on Residual Current)

Preset Key Operation

Protection Range

10 Type	0.5 ~ 10A	Available for external CT
60 Type	5 ~ 60A	

	Definite T-I	Inverse T-I
10 Type	0.5~10A	0.5A~6A/800% to “oc”
60 Type	5 ~ 60A	5A~15A/800% to “oc”

Input/Output

DIV	Terminal	Description
Input	A1(+), A2(-)	100~240VAC,50/60Hz
Output	1a-1b/95-96,97-98	OC/UC/RP/PLc/Lc/Shock/Ub/EC

Trip Output Operation Pattern

Main Trip output : main/95-96(b), 97-98(a)

b is selected in "out" mode : factory default

Control power is on/unchanged output state : 95-96(b),97-98(a)

TRIP operation state : 95-96(a), 97-98(b)

a is selected in "out" mode

Control power is on/changed output state : 95-96(a), 97-98(b)

TRIP operation state : 95-96(b), 97-98(a)

Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 3CT based

DSP-3SD:OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub

DSP-3SD-RG : OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub/ Ec(Ground Fault Protection based on Residual Current)

Protection

DIV	Description	Operation time
Over current(oc)	in case the load current greater than preset value is sensed	1~300 sec / adjustable
Under current(Uc)	in case the load current lower than preset value is sensed	1~60 sec / adjustable
Phase loss(PLc)	In case one of three phase is a state of phase loss	1~5sec
reverse phase(rPc)	In case the order of incomming phase is changed like "RTS" from "RST"	0.5 sec
Locked rotor(Lc)	In case the starting current greater than 200% of "OC" preset value is kept after dt is elapsed	0.1 sec
Shock/Stall	In case the 180~700% running current of preset "OC" value is sensed	1~3sec
Current unbalance(Ub)	[(max current-min current) / max current] * 100%	1 ~10 sec / adjustable
Ground fault(Ec)	in case the ground fault current greater than preset value is sensed : 3SD-RG Type	1 ~10 sec / adjustable

Trip cause indication

□to show the number of 8 trip cause in the order

□press "UP" or "DN" in the "trip" mode state, then trip cause and value are shown alternatively

□press "CLR" or ""SET" to check next event or previous event

□self-test trip is also stored

Preset value check and/or change in running state

□to check: press "SET" key once during the operation

- preset value and mode are appeared alternatively
- next mode as pressing “CLR” Key or previous mode as pressing “SET” key

□to change : Firstly preset "ON" for “OPSET” mode(“CAB” mode group) is “ON”→ factory default value is “OFF”, then follow same manner for "checking" procedure

□Return to operating mode as pressing both “SET” and "CLR" key in the same time or waiting for 15sec

Self-Diagnostic

□"tESt" is appeared in case the operator press "CLR" key for 3 sec or more in motor stop state, then release pressed "CLR" key

□main trip output(95-96,97-98) will be trip after counting down preset o-time

□press “CLR” key to reset

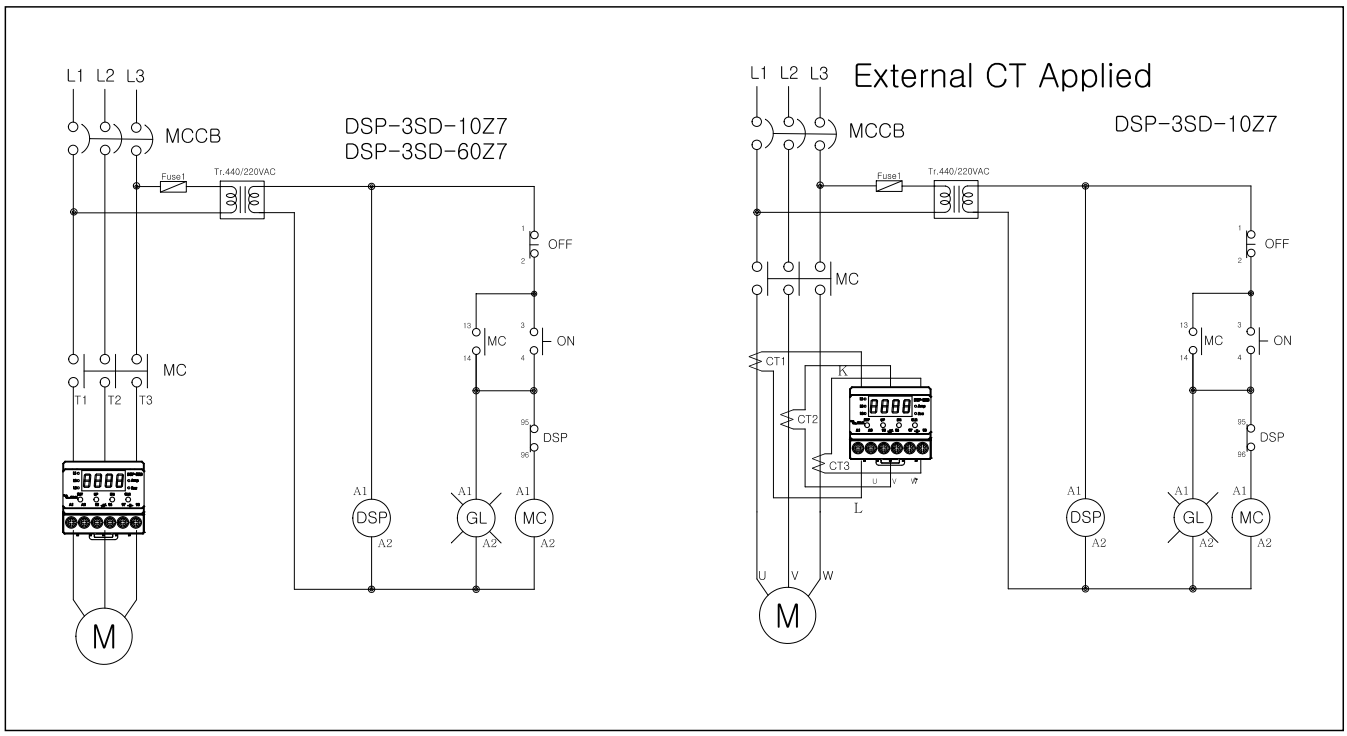
Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 3CT based

DSP-3SD:OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub

DSP-3SD-RG : OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub/ Ec(Ground Fault Protection based on Residual Current)

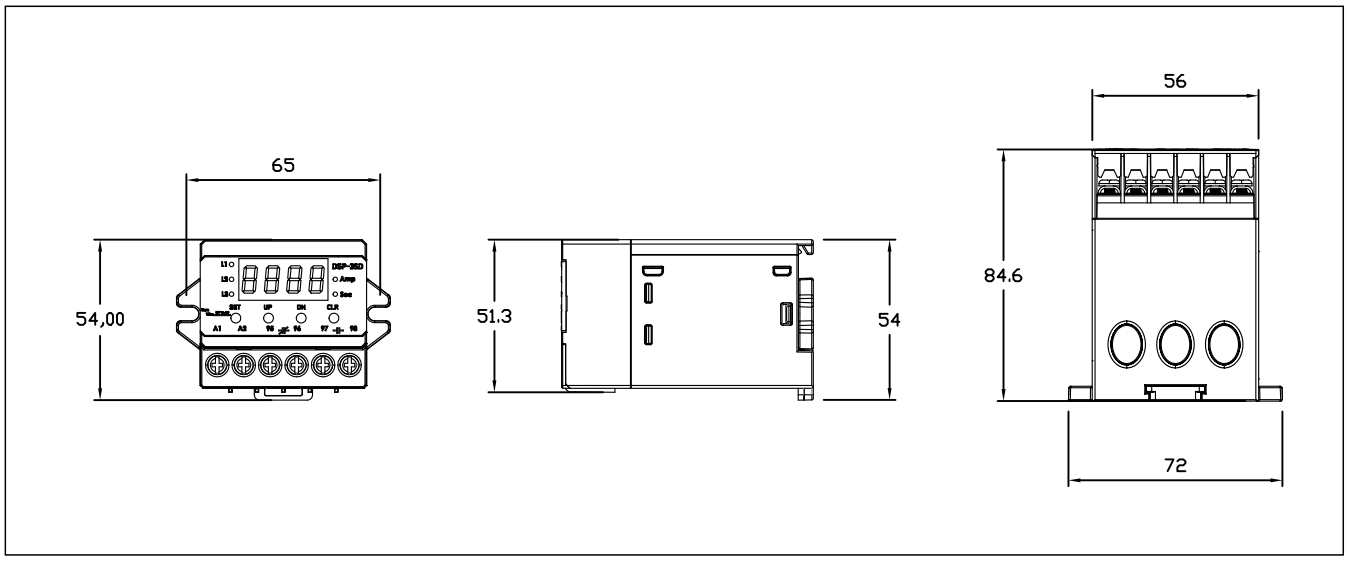
Application sequence diagram



*Note

It is required that external auxiliary power relay shall be matched with trip output of DSP in order to meet large capacity of contactor

Dimension



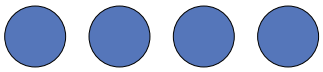
Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 3CT based

DSP-3SD:OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub

DSP-3SD-RG : OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub/ Ec(Ground Fault Protection based on Residual Current)

Preset Key Operation



SET DN UP CLR

1. "SET" key	* Press "SET" Key to enter into setting mode, then "P000"(factory default password) is shown * Move cursor from first digit to right end digit by pressing "CLR" key to input password, in the same time make required digit by using "UP", "DN" key if password is customized number, finally press once more in order to meet possible state for preset of each mode * If there is no input for 15sec or pressing both "SET" and "CLR" key, it can be enter ed into operating condition.
2. Changed feature of Setting Key	* After entering into posible state for preset , each key acts its job as follows : SET ---> backward direction, CLR ---> foward direction, UP. DN---> able to select number or character in preset mode. * The previous mode based on setting mode is come out as pressing "SET" key during doing a prest job
3. "SET" Key & "CLR" Key/to select MODE	* Possible to select Mode by using "SET" or "CLR" key
4. "UP" key & "DN" Key/ Adjust	* Possible to preset required value as selecting a character or a number by using UP/DOWN
5."SET" & "CLR" Key/ Store	* The storage for preset data is completed by pressing both SET and CLR key in the same time or after 15sec is elapsed
6."CLR" key	* While each factor is rotated during an operation, one of rotated factor is fixed by pressing "CLR" key * After fixing a operating factor, the operator is able to rotate manual one by one as pressing "UP"(forwardly), "DN"(reversely)

Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 3CT based

DSP-3SD:OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub

DSP-3SD-RG : OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub/ Ec(Ground Fault Protection based on Residual Current)

Preset Description

Mode	Function	Description	Factory
P0000	Password	P000 is shown as pressing SET and need CLR 3 times to enter into mode to be preset	0000
PhAS	to select phase of power line	* 1P:Single phase : “PLc”,”rPc”,”Uc” and “Ub” mode are disable naturally/ under current protection is executed based on higher value between L1 and L3 * 3P : Three phase	3P
Ct	to select for direct through CT or external CT	* available for 10 type : based on CT ratio of external CT with 5A secondary rating * 1:to sense a current through its own CT or external CT with 5/5 ratio * 2t:two times winding through CT hole,0.3~3A * 4t:four times winding through CT hole,0.2~2A	1
OC	to preset a range to protect over current	10 type : 0.5~10A / 0.5~6A with external CT, 60 type : 5~60A	10 : 10, 60 : 60
dt	to preset starting trip delay time	OFF : dt is zero, 1 ~ 300sec/adjustable	5
OtC	to select time-current chracteristics for over current protection	* deF(definite):trip based on preset value for “OC” and “ot” * inverse - dt=0 : trip based on cold curve - dt>0 : trip based on hot curve after dt is elapsed (actually dt+calculated time in inverse curve) - 10 type : 0.5 ~ 6A/800% - 60 type : 5A ~ 15A/800%	dEF
Ot	to preset operating trip delay time	1 ~ 60sec/adjustable	5sec
LC	to protect Locked Rotor	* it is available for selecting ON[operation time:01sec after dt is elapsed] * conditoion for "ON" : start running current is kept on 200% after dt is elapsed	OFF
ShoC	to protect mechanical shock during motor is working	* max 700% * 10Type : 180% ~ [40/"OC"preset value] % * 70Type : 180% ~ [120/"OC" preset value] %	OFF
St	to preset a time for shock protection	0.5 ~ 3 sec	"- -"
PLC	to protect phase loss by load current	ON: available/1~5sec, OFF : not available	OFF
rPC	to protect reverse phase by load current	ON: available, OFF : not available, within 0.5sec	OFF
EC	to preset a range of zero phase current to protect ground fault	* protection range : 0.5A~10A/adjustable,OFF:disable * sensed in residual circuit * not be matched with external CT * Available for 3SD-RG type only	OFF
Edt	to preset starting trip delay time	1 ~ 25sec/adjustable * Available for 3SD-RG type only	"- -"

Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 3CT based

DSP-3SD:OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub

DSP-3SD-RG : OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub/ Ec(Ground Fault Protection based on Residual Current)

Preset Description

Mode	Function	Description	Factory
EOt	to preset operating trip delay time to protect ground fault	1 ~30sec/adjustable * Available for 3SD-RG type only	"- -"
UC	to preset a range to protect under current	* preset range:0.6A ~ under "OC" preset value * In case preset "OC" value is under 0.7A, "UC" function is not available	OFF
Ut	to preset trip delay time to protect under current	1 ~ 30/adjustable	"- -"
Ub	to preset current unbalance rate(%) among 3 phase	* formular:[(max-min) /max]*100 [%] * range : 30% ~ 90% *minimum available current:0.3A	OFF
Ubt	to preset trip delay time for current unbalance	* oFF : this mode is disable naturally if “Ub” preset “oFF” * 1~10sec	OFF
rESt	to decide how to reset trip state	* Hr:manual reset/Password input * Er : electrical reset : "CLR" Key : Control power-off * A-rE : automatic reset by time of “AUt” mode only for over current trip	Er
AUt	to preset auto reset time	* time range : 0(instant), 0.1sec,1~300sec * If Hr is preset in " rESt" mode, this mode becomes disable	"- -"
OUt	to decide initial state of main trip relay	* to make initial state(a or b) of main trip output(95-96, 97-98) when control power is powered * a: normal energized type(95-96(a), 97-98(b) * b: normal deenergized type(95-96(b), 97-98(a)/not changed state	b
trIP	to show latest number of 8 trip cause	* to show the number of 8 trip cause in the order * press "UP" or "DN" in the "trip" mode state, then trip cause and value are shown alternatively * press "CLR" or ""SET" to check next event or previous event * self-test trip is also stored * In order to enter setup state on the way of trip condition check, press "CLR"	"- -"
Test	* to check if this relay is ready to work normally or not. *"tESt" is appeared in case the operators press "CLR" key for 3 sec or more, then release pressed "CLR" key * main trip output (95-96,97-98) will be trip after counting down preset o-time * press “CLR” key to reset		

Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 3CT based

DSP-3SD:OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub

DSP-3SD-RG : OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub/ Ec(Ground Fault Protection based on Residual Current)

Technical Specification

DIV		Description	
Current setting range	10 Type	0.5A ~ 10A : Definite T-I 0.5A ~ 6A : Inverse T-I / 800%, with external CT	
	60 Type	5A ~ 60A : Definite T-I 5A ~ 15A : Inverse T-I / 800%	
	External CT	1A ~ 600A	
Ground protection	Zero Sequence Current	* 0.5A ~ 10A * Sensed through residual circuit * Available for 3SD-RG type only	
Time setting	Starting delay time(dt)	OFF, 1 ~ 300 sec	
	over current trip delay time(ot)	1 ~ 60 sec/def, 5~ 30 class/inv	
	under current trip delay time(ut)	1 ~ 30 sec	
	Locked Rotor trip delay time(PLc)	dt + 0.1sec	
	Shock/stall trip delay time(st)	1 ~ 3 sec	
	Ground fault starting delay time(Edt)	OFF, 1 ~ 25 sec * Available for 3SD-RG type only	
	Ground fault trip delay time(Eot)	1 ~ 30 sec * Available for 3SD-RG type only	
	Phase loss trip delay time(PLc)	1 ~ 5sec	
Allowable tollerance	Current	C <= 2A : 0.2A, C > 2A : +, - 5%	
	Time	t <= 2 sec : +, -, 0.1 sec, t > 2 sec : +, - 5%	
Control power		* 100 VAC ~ 240 VAC, 50/60Hz(90VDC~370VDC)	
		* 24 VAC/DC(optional)	
Trip output Relay	Main (95-96,97-98)	1a - 1b(1-SPDT), 250 VAC/2A, 30 VDC/1A, Resistive	
Application environment	Temperature	Operation	-25 ^{O}C ~ +70 ^{O}C
		Storage	-40 ^{O}C ~ +80 ^{O}C
	Relative humidity	30 ~ 85%, non-condensing	
Current tollerance against changeable frequency in inverter		Avg ±5% in 30Hz ~ 400Hz	
Max Conductor Size		25sq	
Screw Torque		Max 0.6 N.m	
Insulation Resistence/IEC-60255-5		100Mohm or more/500VDC, circuit-case	
High VoltageWithstand Test/ IEC-60255-5		* circuit-case : AC 2000V, 60Hz, 1 min * contact-contact : AC 1000V, 60Hz, 1 min	

Digital Motor Protection Relay

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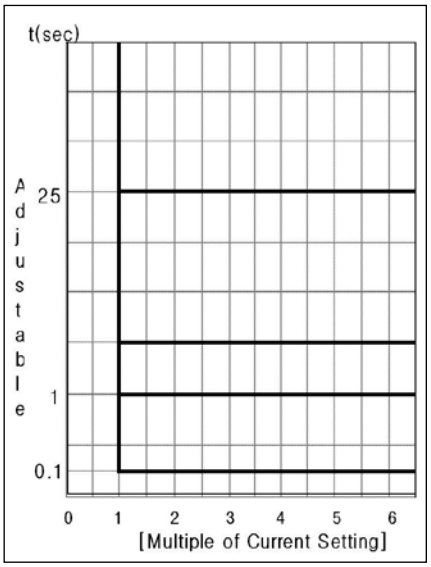
DSP-3SD-RG : OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub/ Ec(Ground Fault Protection based on Residual Current)

Technical Specification

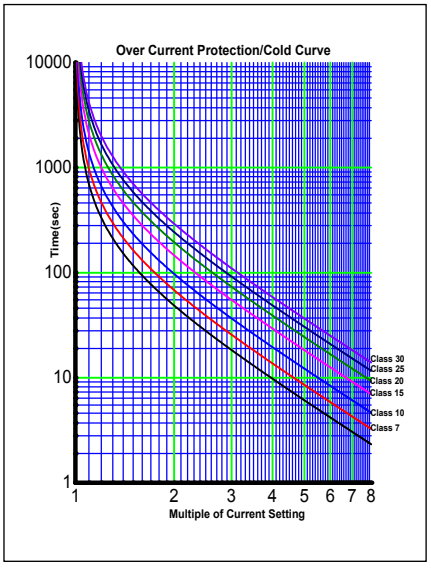
DIV	Description
Lightening Impulse Voltage Withstand Test / IEC-60255-5	*Circuit-Ground, Circuit-Circuit : 1.2/50uS, 5KV *Control Circuits : 1.2/50uS, 5KV
1 MHz Burst Immunity Test : IEC 61000-4-18	2.5KV, Positive/Negative under 2sec
Electrostatic Discharge:IEC-61000-4-2	Air : Level 3, 8KV,Contact : Level 3, 6KV
Radiated Electromagnetic Field Disturbance : IEC /EN 61000-4-3	Level 3, 10V/m
Electric Fast Transient Burst:IEC/EN 61000-4-4	Power, relay output : Level 4, 4KV
Surge Immunity test:IEC-61000-4-5	Relay output : 1.2 X 50uS, 2KV (0O, 90O, 180O , 270O)
Conducted disturbence Test:IEC/EN61000-4-6	10V, Level 3
Installation	DIN Rail, Screw fixed
Consuming power	2W max

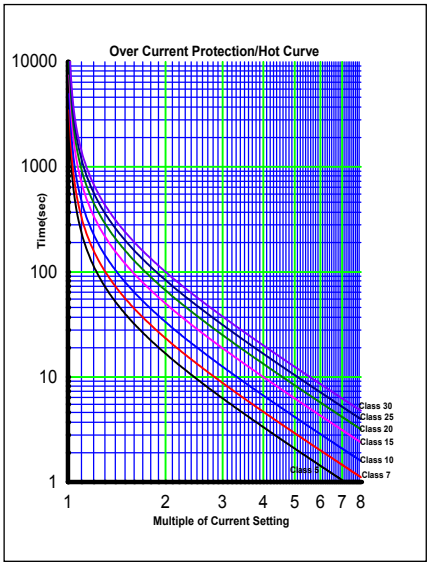
Time - Current Characteristics

Definite T-I



Inverse T-I





Digital Motor Protection Relay

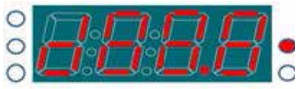
Panel Mounting Type/Unified Meter with Converter, 3CT based

DSP-3SD:OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub

DSP-3SD-RG : OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub/ Ec(Ground Fault Protection based on Residual Current)

Operational Indication

-Indication during d-time for mor tor s tar ting→
"d & Current value" is indicated if "d-time"is executed for mortor starting, but "d" is flickering in every 1sec

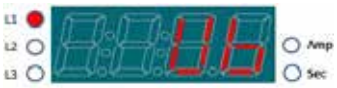


-Indication during preset operating time before trip in followed each case

* "OC" trip :o & Current value" is indicated if "o-time" is executed for over current protection , but "o" is flickering in every 1 sec

* "UC" trip : "uc" & Cur rent value" is indicated if "ut-time" is executed for under current protection , but "U" is flickering in every 1 sec

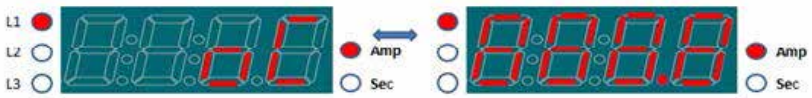
* "Ub" trip :"ub" is indicated if "ubt-time" is executed for current unbal ance protection , also "Ub" is flickering in every 1 sec



* " EC " trip : " E & Current value" is indicated alternatively if "o-time" is executed for ground fault current protection, but " E " is flickering in every 1 sec

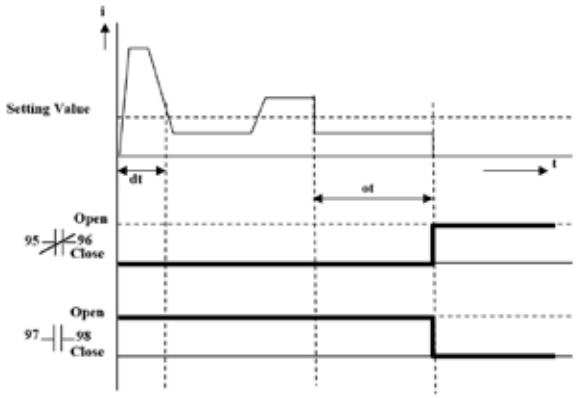
-Trip Indication

Indication after trip in every each case is that "trip cause" and "trip value" are shown alternatively

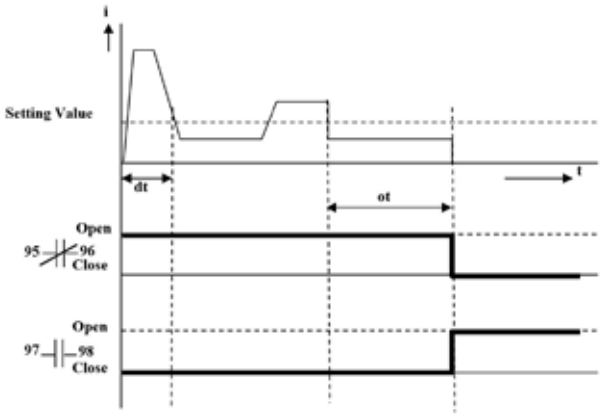


Time Based Trip Relay Output for over current protection

"out" mode : b



"out" mode : a



Digital Motor Protection Relay

Panel Mounting Type/Unified Meter with Converter, 3CT based

DSP-3SD:OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub

DSP-3SD-RG : OC/UC/RP/PLc/Lc/Shoc(Stall)/Ub/ Ec(Ground Fault Protection based on Residual Current)

Order Form

Item	Reference Code	Description
DSP-3SD	DSP-3SD-10-B	Panel Mounting Type, 0.5 ~ 10A / 0.5A ~ 6A with external CT, 24VDC, Optional Type
	DSP-3SD-10-Z7	Panel Mounting Type, 0.5 ~ 10A / 0.5A ~ 6A with external CT, 100VAC ~ 240 VAC(120 VDC - 370 VC), 50 / 60Hz
	DSP-3SD-60-B	Panel Mounting Type, 5~60 A , 24 VDC, Optional Type
	DSP-3SD-60-Z7	Panel Mounting Type, 5 ~ 60A, 100 VAC ~ 240 VAC(120 VDC - 370V DC), 50 / 60Hz
3CT combined	Basic code + C1	With 100 / 5 CT / 3 Core
	Basic code + CC	With 150 / 5 CT
	Basic code + C2	With 200 / 5 CT
	Basic code + C3	With 300 / 5 CT
	Basic code + C4	With 400 / 5 CT

DSP-2CT
External 2CT of One Body

Technical Specification

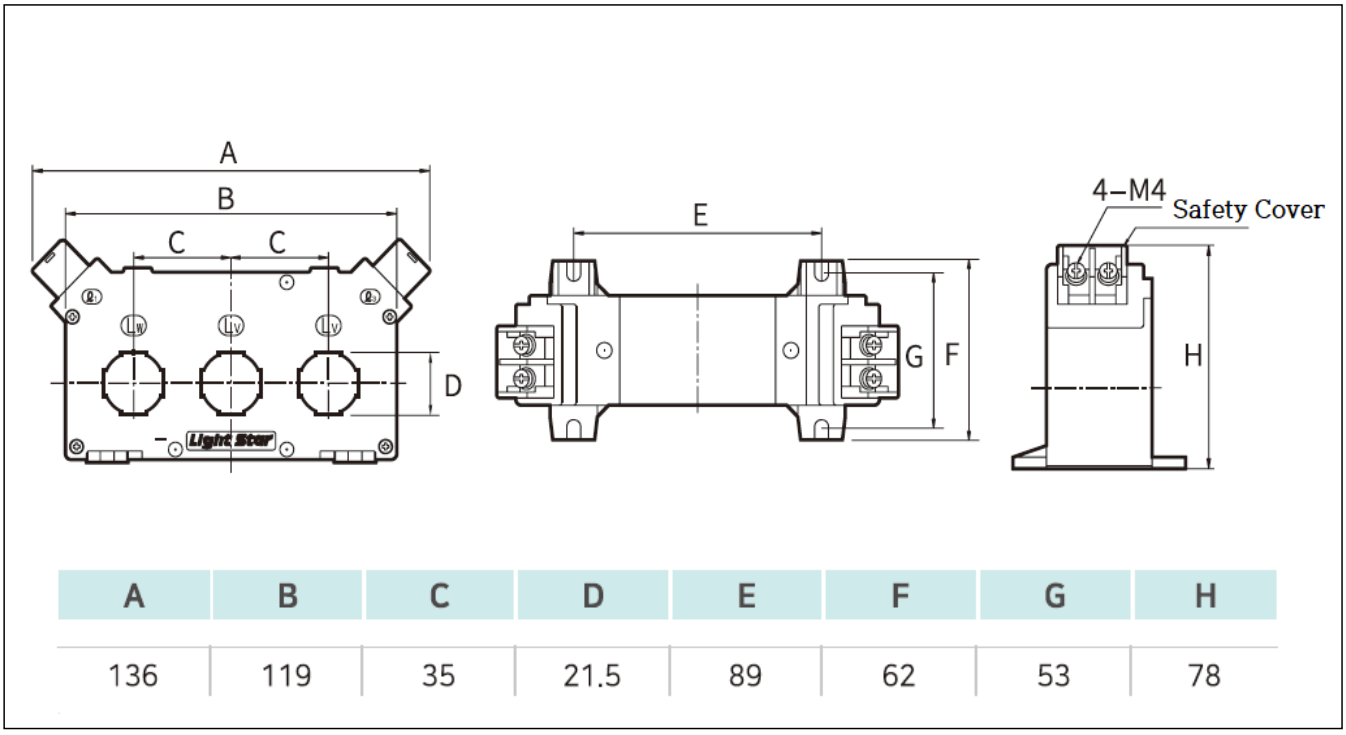
Division	Description		Remark
DSP-2CT	CT ratio	100:5	internal shape : octagonal
		150:5	
		200:5	
		300:5	
Class		1.0	
Burden		5VA	
Maximum system Voltage		1150V	
Dielectric Voltage		4KV/1min	
Usage Frequency		50/60Hz	
Thermal withstand current		16KA/1sec	
Maximum allowable cable length		2.5SQ/10M	
Installation		Panel Mounting	

※ Burden is based on metering class and the accuracy is lower than 1.5% under 1VA
※ Do not use this CT except DSP

DSP-2CT

External 2CT of One Body

Dimension



A	B	C	D	E	F	G	H
136	119	35	21.5	89	62	53	78

DSP-3CT
Current Transfomer

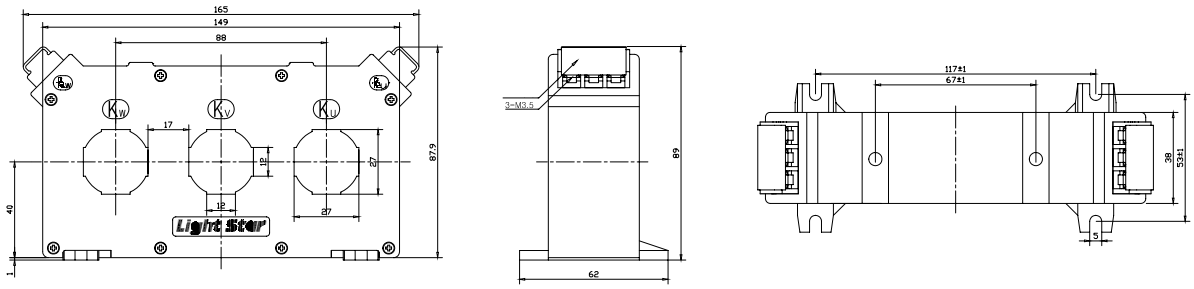
Specification

Model	DSP-3CT	
CT Ratio	100 : 5A	
	150 : 5A	
	200 : 5A	
	300 : 5A	
	400 : 5A	
Class	1.0, 3.0	
Burden(VA)	3VA	
Maximum Voltage	1150V	
Withstand Voltage	4kV / 1min	
Frequency	50 ~ 60Hz	
Accuracy	5P 5	
Cable Length(Max)	2.5SQ / 10M	
Installation	Screw Fix	

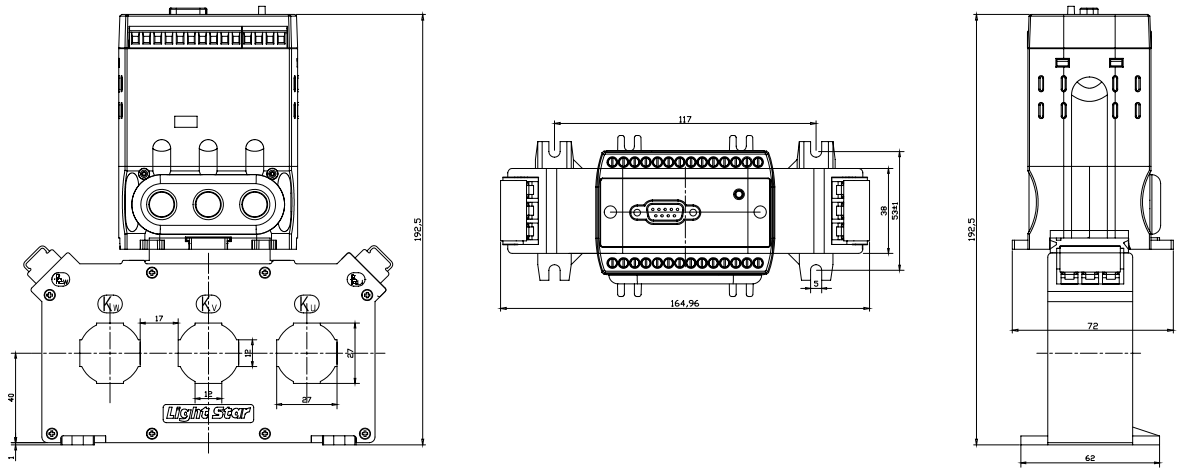
•These CT has to combine with DSP product only.

Dimension

3CT



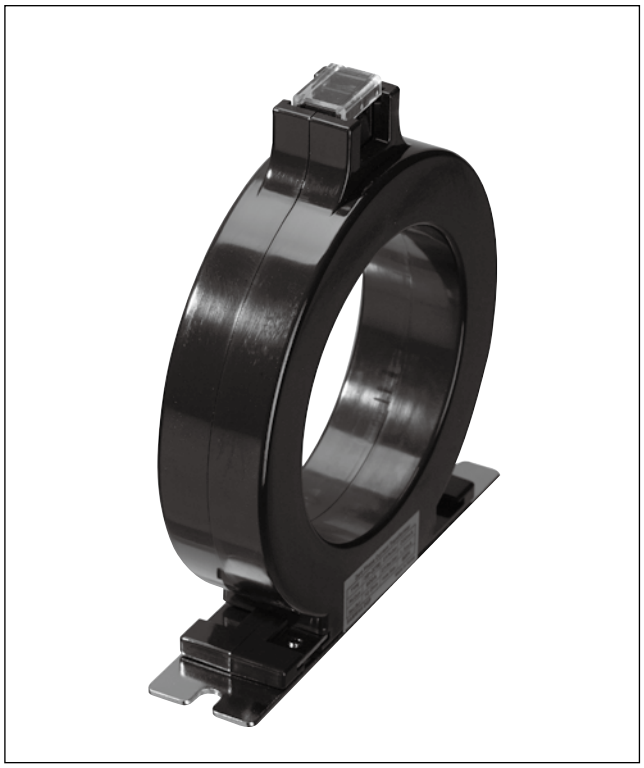
3CT with DSP



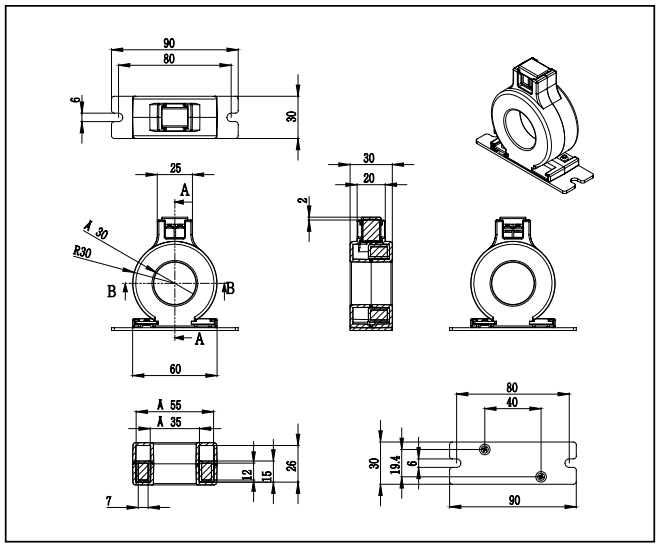
Order

Item	CT Ratio	Reference Code
3CT	100 : 5	DSP-3CT-100
	150 : 5	DSP-3CT-150
	200 : 5	DSP-3CT-200
	300 : 5	DSP-3CT-300
	400 : 5	DSP-3CT-400

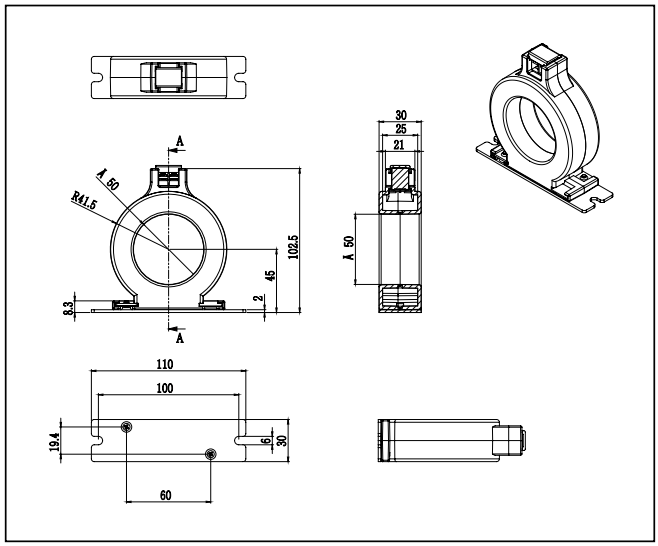
DSP-ZCT
Zero Phase Current Transformer



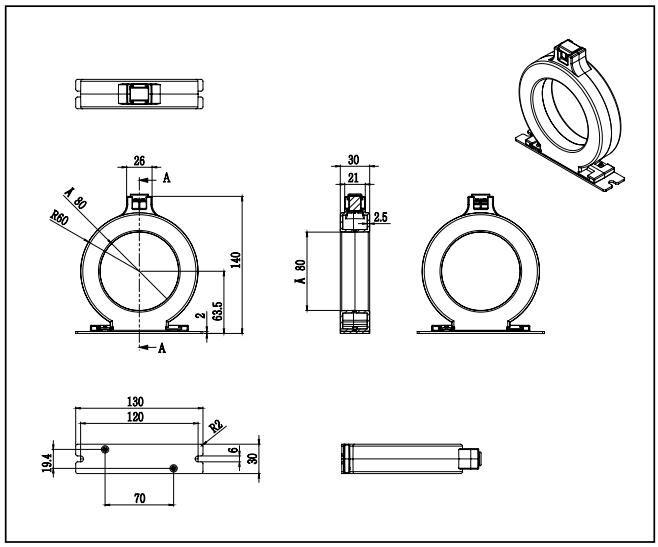
(30 ϕ ~80 ϕ)



30 ϕ



50 ϕ



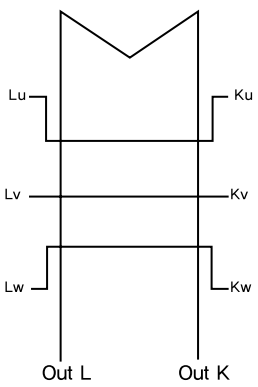
80 ϕ

Specification

Inner Diameter	30	50	80	120
Z.P.PrimaryCurrent	200mA			
Z.P.Secondary Current	1.5mA			
Primary Current	100	250	600	1000
Operating Temperature	-25℃ ~ +70℃			
Storage Temperature	-35℃ ~ +80℃			
High Potential Test	AC 2000V, 1min			
Insulation Resistance	DC 500V, 10MOhm			
Operating Frequency	50/60Hz			
Error Tolerance	10%			
Installation	Screw Fix			
Weight	170	215	345	700

Order Form

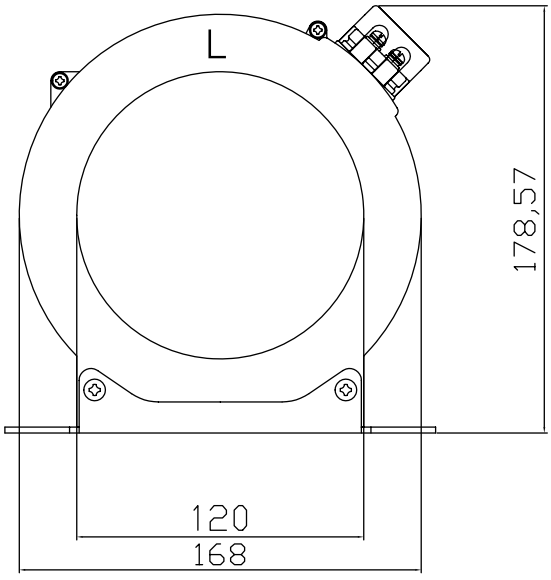
Item	Inner Diameter (mm)	Reference Code
ZCT	30	DSP-ZCT-30N
	50	DSP-ZCT-50N
	80	DSP-ZCT-80N
	120	DSP-ZCT-120N

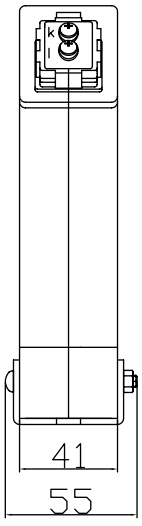


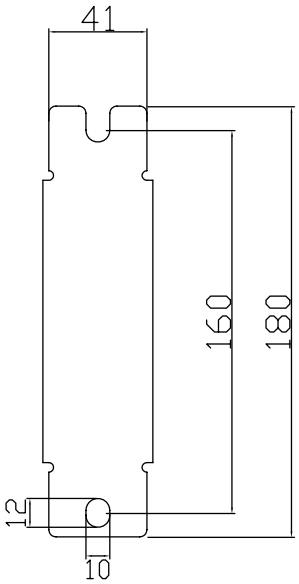
DSP-ZCT

Zero Phase Current Transformer

(120 ϕ)











"New Leader !!"

Optimized Preventive Maintenance Solution!!

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