• DSP-COL/M, CTL/M, CCL/M, CSL/M

Digital Motor Protection Relay/Economic Class
VIP-COL, CTL, CCL, CSL : Panel Mounting Type
VIP-COM, CTM, CCM, CSM : Panel Flush Mounting Type

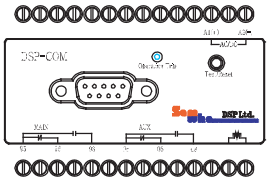
Technical Specification

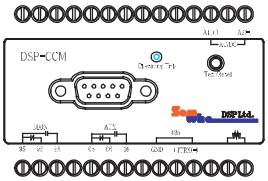
Division		Description
Current setirg range	10 Type	0.5A ~ 10A /0.5 ~ 6A with exterral CT
	70 Type	5A ~ 70A
	Exterral CT	Refer Table
Grcurd prclection	Zero Sequerce Currert	30mA~2A * Sensed throcgh exterral ZCT or embeded ZCT * Exterral CT type must be combired with exterral ZCT
Time setting	Starting deay time(dt)	OFF,1 ~300 sec/def, "OFF" selection mears irverse curve
	over current trip delay time(ot)	0.5~60 sec/def, 5~30class/ nv : refer curve
	under current trip delay time(ut)	0.5~30 sec/def
	Shock/stal trip delay time(st)	0.5~3 sec/def
	Grcund fault starting delay time(Edt)	OFF,0.5~25 sec/def
	Grcund fault trp delay time(Ect)	0.5~30 sec/def
Allowable tolerance	Current	C<=2A:0.2A,C>2A:+,- 5%
	Time	t<=2 sec:+,-,0.1sec, t>2 sec+,-5%
Control powcr		* 85VAC~260VAC, 50/60Hz(90VDC~370VDC) * 24VAC/DC(optional)
Trp cutput Relay	Main	1c(1-spdt), 3A/Rcsistive
	Aux	1c(1-spdt), 3A/Resistive
	GR	1c(1-spdt), 3A/Resistive(Aux cutput must be set "GR" in Au-o" mocde)
Applicatcn envircnment	Temperature	Cperatcn: -25°C ~ +70°C
		Storage: -40°C ~ +80°C
	Relative humidity	30 ~ 85%, ncr-condensirg
Current tollerance against chargeab e frequency in inverter		Avg ± 3% in 20Hz ~ 400Hz
Max Corductor Size		25sq
Insulatcn Resistence		10Mohm or more/500VDC, circuit-case
High Voltage Insulatcn Test		* crcuit-case : AC 2000V, 60Hz, 1 mn * corntac-conact : AC 1500V, 60Hz, 1 min
Logic Irput		90~220 VAC,DC
Screw Torque		Max 0.6 N.m
Frame : EC/EN 60695-2-12		650°C
Shock : EC,EN 60068-2-27		1/2 sine wave, 15g/11ms
Trp Output : IEC/EN60947-1		690V(Vrms : 2KV,1 min)
Electrostatc Discharge : IEC/EN 61000-4-2		Air : Level 3, 8KV, Contact : Level 3, 6KV
Rad ated Electromagretic Field Dis urbance : EC ,EN 61000-4-3		Level 3, 10V/m
Electric Fast Transiert Burst : EC/EN 6000-4-4		Power, relay cutput : Level 4, 4KV,cthers : Level 3, 2KV
Surge : EC,EN 61000-4-5		relay cutput : 1.2 X 50uS, 2KV (0°, 90°, 180°, 270°)
Immun ty to corducted disturbence : EC/EN6000-4-6		10V, Level 3
Voltage variation : EC-61000-4-11		3ms/0, 300 ms/70%
Egital Commur cat cn /CCM/CCL Type	Phys cal feature	2 wre RS 485
	Address	1 ~ 250
	Speed	9.6/19.2/38.4/57.6/76.8/115.2kbps
	wiring correctcn	Screw Terminal
	Terminatcn ress stence	Exterral resistance/200 Ohm
	Cable	Sheathed cab e, 2 Pair
Current Loop Communicatcn : 4 ~ 20mA		20mA or maximum valve in 3 phase current : CTM/CTL type
Corsuming power		6W / max

•DSP-COL/M, CTL/M, CCL/M, CSL/M

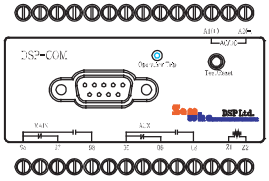
Input/Output : COL/M Type

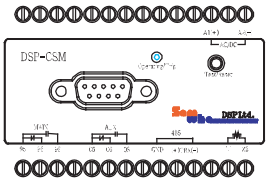
▶ External ZCT type/possible with external CT

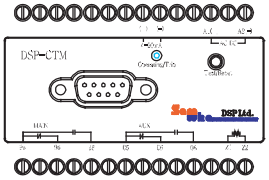




▶ Embeded ZCT type/not possible with external CT







Trip Output Operation Pattern

Trip output : main(95-96(b)-98(a), aux(C5-C6(b)-C8(a)

b is selected in "cut" mode : factory default

Control power sensor(uncharged output state : 95-96(b-98(a), aux(C5-C8(b- C8(a)

TRIP operation state : 95-96(a)-98(b), C5-C8(a-C8(b)

a is selected in "cut" mode

Control power sensor(changed output state : 95-96(a)-98(b), C5-C6(b-C8(a)

TRIP operation state : 95-96(b-98(a), C5-C8(a-C8(b)

Aux output → : AL(pre-alarm to OC preset value before trip

: Trip factor is selected in "AL-C" Mode

: Independent output contact from main trip output

: "Auto" mode : OFF, AL, UC, SHOCK, EC, IP

Model

- DSP-CCL,CCM : Typical basic type
- DSP-CTL,CTM : Typical Basic Type + 4~20mA
- DSP-CCL,CCM : Typical basic type + RS485
- DSP-CSL,CSM : Typical basic type + Short circuit protection

Trip cause indication

- Preset value check in running state,Such mode and preset value are shown alternatively as pressing SET button and next mode is shown as pressing CLR button
- If trip is happened, trip cause and current value of each phase are stored and able to indicate
- The information of 8 trip is stored and this is able to be checked in "trip" mode orderly

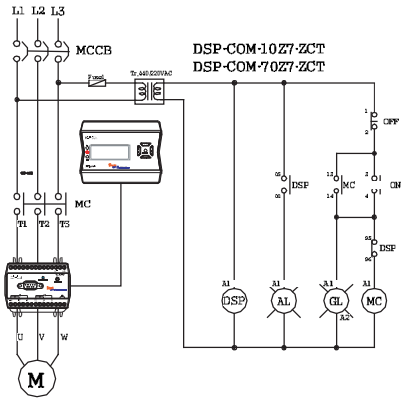
Protection

DIV	Description	Operation time	Remark
Over current(OC)	in case the load current greater than preset value is sensed	Definite time:0.1~60 sec/adjustable	C Type
Under current(UC)	in case the load current lower than preset value is sensed	Definite time:0.1~30 sec/adjustable	
Phase loss(PLc)	In case one of three phase is a state of phase loss	1sec	
reverse phase(rPc)	In case the order of incomming phase is changed like "RTS" from "RST"	0.5sec	
Locked rotor(LC)	In case the starting current greater than 300% of "OC" preset value is kept after dt is elapsed	0.1sec	
Shock/Stall	In case the 180~700% running current of preset "OC" valueis sensed	0.05sec	
Current unbalance(Ub)	[(max current-min current)/max current] *100%	1sec ~8sec,adjustable	
Ground fault(EC)	in case the ground fault current greater than preset value is sensed	Definite time:0.1~30 sec/adjustable	
short circuit(SSc)	in case short circuit is happend	in start/0.05 sec	CSL,CSM Type

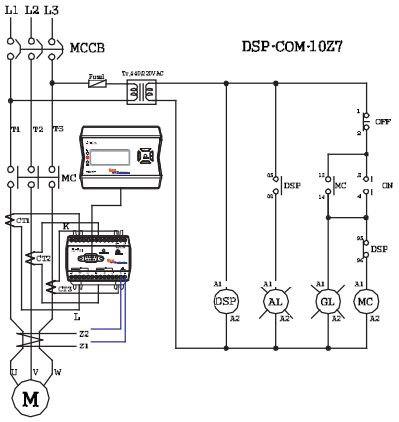
•DSP-COL/M, CTL/M, CCL/M, CSL/M

Application sequence diagram

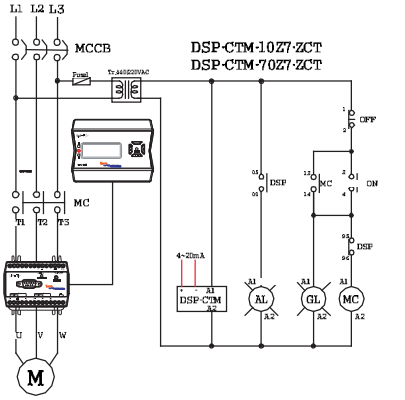
▶ Embeded ZCT type/not possible with external CT



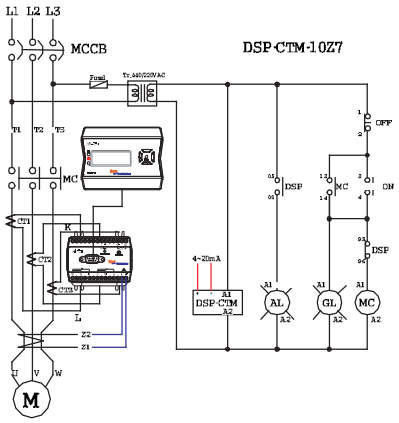
▶ External ZCT type



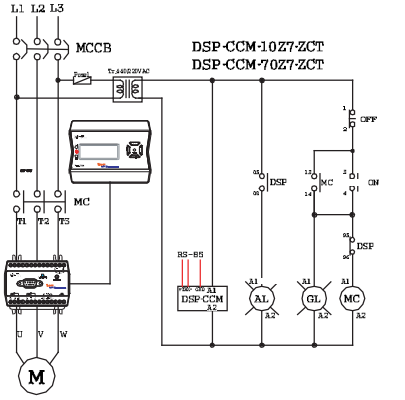
▶ Embeded ZCT type/not possible with external CT



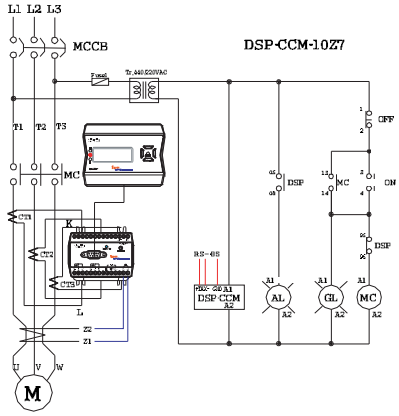
▶ External ZCT type



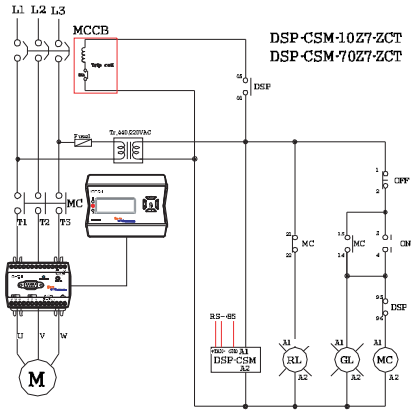
▶ Embeded ZCT type/not possible with external CT



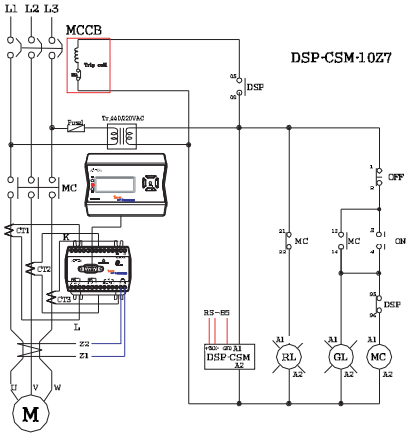
▶ External ZCT type



▶ Embeded ZCT type/not possible with external CT



▶ External ZCT type



•DSP-COL/M, CTL/M, CCL/M, CSL/M

Preset Key Operation

DV	Description
1."SET" key	* Press "SET" Key to enter into setting mode, then "FOCCO"(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, finaly press once more, then operator meets possible state for preset a number or character of mode. * If there is no input for 15sec or pressing both "SET" and "CLR"key, it can be entered into operating condition.
2.Charged feature of Setting Key	* After entering into posible state for preset, each key acts its job as follows : SET---> backward direction, CLR---> forward 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 preset 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 selection a character or 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
6."CLR" key	* While each factor is rotated, one of rotated factor is fixed by pressing "CLR" key * After fixing a operating factor, the operator is able to rotate manual ore by ore as pressing "UP"(forwardly), "DN"(reversely)
To check preset value of each mode during operaion	* possible to check value and mode as pressing "SET" key once during operator, * preset value and mode are appeared alternatively * possible to check next mode as pressing "CLR" Key * return to operating mode as pressing both "SET" and "CLR" key or waiting for 15sec without any touch * Not possible to charge existed preset value
Test/Reset: "CLR" Key	* to check if this relay is ready to work normally or not. * "TEST" is appeared in case the operator presses test sw on the converter or "CLR" key for 3 sec or more, then release pressed test sw or "CLR" key * main(95-96-98) & aux trip(C5-C6-C8) output will be trip after counting down preset o-time (definite T-I) * In case of display meter type, LED on the converter is flickering after a trip * After making trip, press "CLR" key for the reset action

•DSP-COL/M, CTL/M, CCL/M, CSL/M

Preset Description

Mode	Function	Description	Factory
F0000	Password	F0000 is shown as pressing SET and reed CLR 4 times to enter into mode to be preset	0000
OUt	to decide initial state of main trip relay	*to make initial state (a or b) of main trip output(95-96-98) when control power is powered *a : normal energized type(95-96(a)-98(b) *b : normal deenergized type(95-96(b)-98(a)),not changed state	b
Ct	to select or direct through CT or external CT	5-2(2 times through CT hole), 5-4((4 times through CT hole), 5-1 ~ 5-240(the value of CT ratio, eg"5-20"→CT 100/5A)	5-1
CC	to preset a range to protect over current	10 type:0.5~10A/adjustable, 70 type:5~70A/adjustable	10
dt	to preset starting trip delay time	1.0 ~ 300Sec/adjustable	5sec
OtC	to select time-current characteristics for over current protection	dEF : definite, Inv : inverse	dEF
Ot	to preset operating trip delay time	0.2~60Sec/adjustable	5sec
LC	to protect Locked Rotor	it is available for selecting ON [operation time : 01sec after dt is elapsed], condition for 'ON' : start running current is kept on 300% after dt is elapsed	OFF
SS/OFF /ON	to define available term for short protection	*off : disable only for starting time (dt) *on : able from starting initially *only for CSL/M Type	ON
SSc/ct/ setting value	to define short protection % to 'CC"	*current range for short circuit protection *10 Type : 0.5~5A *70 Type : 2~10A *only for CSL/M Type	10 : 1300 70 : 2000
ShoC	to protect mechanical shock during motor is working	*preset to 'CC" : followed calculation max 700% -10Type : 180% ~ [50/'CC"preset value]% -70Type : 180% ~ [210/'CC"preset value]%	OFF
St	to preset a time for shock protection	0.5 ~ 3sec / definite	St--
PLC	to protect phase loss by load current	ON : available, OFF : not available	ON
rPC	to protect reverse phase by load current	ON : available, OFF : not available	OFF
EC	to preset a range of zero phase current to protect ground fault	protection range : 30mA~2A/adjustable, OFF : disable	2A
Edt	to preset starting trip delay time	1 ~ 25/adjustable	2sec
EOt	to preset operating trip delay time to protect ground fault	0.1 ~ 30/adjustable	0.1sec
UC	to preset a range to protect under current	possible preset range : minimum possible preset current ~ under "OC" preset value	OFF
Ut	to preset trip delay time to protect under current	0.2 ~ 30/adjustable	2sec
Ub	to preset current unbalance rate(%) among 3phase	*formular : [(max-min) /max] * 100 [%] *range : 30% ~ 90% *minimum available current : 0.3A	50%
AL-O	to preset a kind of AUX trip output	*OFF/Ec,Ect(CCL/M,CTL/M Type),Uc,Shock/AL/[Ec-ta,Ec-tb(CCL/M, CSL/M Type)]	AL
AL	to preset alarm level rate(%) to CC	*% range : 65% ~ 100%/adjustable ('AL" is preset in 'Auc" mode)	90
ALt	to preset a limit of accumulated working time necessary to give alarm.	0.1 hr~6553.5 hr in 0.1 hr step	6500
dC	to decide max current to charge into 20mA	to transfer maximum current of 3 phase current into 20mA, and 4mA means zero ampere output/CTM, CTL Type	5
rO.A	to indicate additional factor besides basic factor to indicate running operation value in a order	OFF : basic factor (L1,L2,L3,Ec), ON : basic factor + additional fdor (AWT/ accumulated working time, load factor)	OFF
rESEt	to decide how to reset trip state	hr : manual reset, AUt : auto reset(available for "OC" trip	hr
At	to preset auto reset time	0.1 ~ 300sec/adjustable	0.1
I-AUt	to preset total possible time available for executing desired times of auto reset	30 ~ 60min/adjustable	60
trIP	to show latest number of 8 trip cause	trip information in order : faulty phase and faulty value is appeared alternatively as controling "UP" or "DN" key	
Addr	to put self-address to communicate with pc	range of number : #1 ~ #250/CCM/L, CSM/L Type	1
bPS	to decide communication speed	2400, 9600, 19200, 38400bps/CCM/L, CSM/L Type	9600

•DSP-COL/M, CTL/M, CCL/M, CSL/M

Order Form

DSP-1(Type)-2(Rating current)-3(Control Power)-4(ZCT Embeded)-P(Optional)

Item	Reference Code	Description
DSP-COL	DSP-COL-10Z7	Panel Mounting Type, 0.5A~10A, 85~260VAC, 50/60Hz(90~370VDC), able to use external CT & external ZCT
	DSP-COL-70Z7	Panel Mounting Type, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), able to use external ZCT
	DSP-COL-10Z7-ZCT	Panel Mounting Type, 0.5A~10A, 85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT
	DSP-COL-70Z7-ZCT	Panel Mounting Type, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT
DSP-CCL	DSP-CCL-10Z7	Panel Mounting Type, 0.5A~10A, 85~260VAC, 50/60Hz(90~370VDC), able to use external CT, abe to use external ZCT, RS485
	DSP-CCL-70Z7	Panel Mounting Type, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), able to use external CT, able to use external ZCT, RS485
	DSP-CCL-10Z7-ZCT	Panel Mounting Type, 0.5A~10A, 85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT, RS485
	DSP-CCL-70Z7-ZCT	Panel Mounting Type, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT, RS485
DSP-CTL	DSP-CTL-10Z7	Panel Mounting Type, 0.5A~10A, 85~260VAC, 50/60Hz(90~370VDC), able to use external CT, abe to use external ZCT, 4~20mA
	DSP-CTL-70Z7	Panel Mounting Type, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), able to use external CT, able to use external ZCT, 4~20mA
	DSP-CTL-10Z7-ZCT	Panel MountingType, 0.5A~10A, 85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT, 4~20mA
	DSP-CTL-70Z7-ZCT	Panel Mounting Type, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT, 4~20mA
DSP-COM	DSP-COM-10Z7	Panel Flush Mounting Type, 0.5A~10A, 85~260VAC, 50/60Hz(90~370VDC), able to use external CT, able to use external ZCT
	DSP-COM-70Z7	Panel Flush MountingType, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), ble to use external ZCT
	DSP-COM-10Z7-ZCT	Panel Flush MountingType, 0.5A~10A, 85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT
	DSP-COM-70Z7-ZCT	Panel Flush Mounting Type, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT
DSP-CCM	DSP-CCM-10Z7	Panel Flush Mounting Type, 0.5A~10A, 85~260VAC, 50/60Hz(90~370VDC), able to use external CT, abe to use external ZCT, RS485
	DSP-CCM-70Z7	Panel MountingType, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), able to use external CT, abe to use external ZCT, RS485
	DSP-CCM-10Z7-ZCT	Panel MountingType, 0.5A~10A,85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT, RS485
	DSP-CCM-70Z7-ZCT	Panel Mounting Type, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT, RS485
DSP-CTM	DSP-CTM-10Z7	Panel Mounting Type, 0.5A~10A, 85~260VAC, 50/60Hz(90~370VDC), able to use external CT, abe to use external ZCT, 4~20mA
	DSP-CTM-70Z7	Panel MountingType, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), able to use external ZCT, 4~20mA
	DSP-CTM-10Z7-ZCT	Panel MountingType, 0.5A~10A, 85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT, 4~20mA
	DSP-CTM-70Z7-ZCT	Panel Mounting Type, 5A~70A, 85~260VAC, 50/60Hz(90~370VDC), Embeded ZCT/inable to use external CT, 4~20mA
DSP-CSL	DSP-CSL-10Z7	Panel Mounting Type, unified meter type with converter, 0.5A~10A(0.5~5A for short circuit protection), 85~260VAC, 50/60Hz(90~370VDC), external CT, external ZCT
	DSP-CSL-10Z7-ZCT	Panel Mounting Type, unified meter type with converter, 0.2A~10A(0.5~5A for short circuit protection), 85~260VAC, 50/60Hz(90~370VDC), not available for external CT, embeded ZCT
	DSP-CSL-70Z7	Panel Mounting Type, unified meter type with converter, 5A~70A(2~15A for short circuit protection), 85~260VAC, 50/60Hz(90~370VDC), external ZCT
	DSP-CSL-70Z7-ZCT	Panel Mounting Type, unified meter type with converter, 5A~70A(2~15A for short circuit protection) 85~260VAC, 50/60Hz(90~370VDC), embeded ZCT
DSP-CSM	DSP-CSM-10Z7	Panel Flush Mounting Type, seperated meter type, 0.5A~10A(0.5~5A for short circuit protection), 85~260VAC , 50/60Hz(90~370VDC), not available for external CT, embeded ZCT
	DSP-CSM-10Z7-ZCT	Panel Flush Mounting Type, seperated meter type, 0.5A~10A(0.5~5A for short circuit protection), 85~260VAC, 50/60 Hz(90~370VDC), not available for external CT, embeded ZCT
	DSP-CSM-70Z7	Panel Flush Mounting Type, seperated meter type, 5A~70A(2~15A for short circuit protection), 85~260VAC, 50/60Hz(90~370VDC), embeded ZCT
	DSP-CSM-70Z7-ZCT	Panel Flush Mounting Type, seperated meter type, 5A~70A(2~15A for short circuit protection), 85~260VAC, 50/60 Hz (90~370VDC), embeded ZCT
Opional Order	DSP-VIFXXX-XXXXXXX-P	* Customised Software