DIGITAL
MOTOR PROTECTION
RELAY

DSP-A Series : AOM, AOL, AOM-RG, AOM-N

Samwha DSP Ltd.

Digital Motor Protection Relay

Digital Motor Protection Relay, VIP-Series ,P-Series, C-Series, A-Series of SAMWHA DSP are 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 unbalance(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 this can meet an applicable flexibility for designing and manufacturing for the low voltage panel in terms of various model with or without logic input.
Additionally we produce a lot of kind of special application relay such as shut down turn-over relay for motor restart action in instant power off, multi-purposed voltage relay, voltage phase relay and DC current relay,etc.

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 as applying for DC500V. 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

| Easy Handling

• to maximize convenient application

| Multi-complexed Function

• necessary for motor protection

| Digital 485 communication & data recorder
4~20mA Current Communication

• remote control & monitor over Networking

Digital Motor Protection Relay

DSP-AOL, AOL-RG : Panel Mounting Type / DSP-AOM, AOM-RG : Panel Flush Mounting Type

DSP-AOM, AOM-RG

DSP-AOL, AOL-RG

Terminal Type : AOM, AOL, AOM-RG, AOL-RG

Display meter type

L	Unified meter with converter
M	Seperated meter from converter

Over/Under Current Protection

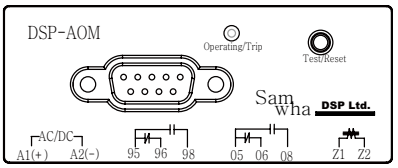
10 Type	0.5 ~ 10A	Available for external CT
70 Type	5 ~ 70A	

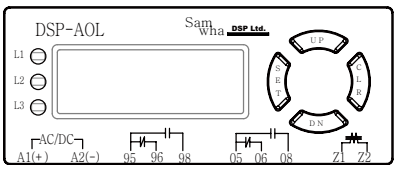
GF protection

AOM	* zero phase current is sensed through ZCT : 50mA ~ 2A * ZCT / 200mA : 1.5mA or 200m A : 100mV / recognized by order form
AOM-RG	zero phase current is sensed in internal residual circuit : 500mA ~ 10A

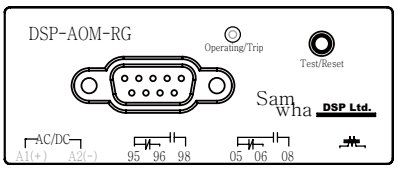
Input/Output

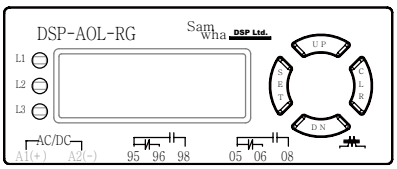
▶ External ZCT applied type/possible with external CT





▶ Residual type/not possible with external CT and external ZCT





* Trip Output Operation Pattern

Trip output : main/95-96(b)-98(a), aux/05-06(b) 08(a)

■ b is selected in "out" mode : factory default
* Control power is on / unchanged output state : 95-96(b)-98(a), aux/ 05-06(b)- 08(a
* TRIP operation state : 95-96(a)-98(b), 05-06(a)-08(b)

■ a is selected in "out" mode
* Control power is on / changed output state : 95-96(a)-98(b), 05-06(b)-08(a)
* TRIP operation state : 95-96(b)-98(a), 05-06(a)-08(b)

Digital Motor Protection Relay

DSP-AOL, AOL-RG : Panel Mounting Type / DSP-AOM, AOM-RG : Panel Flush Mounting Type

Protection

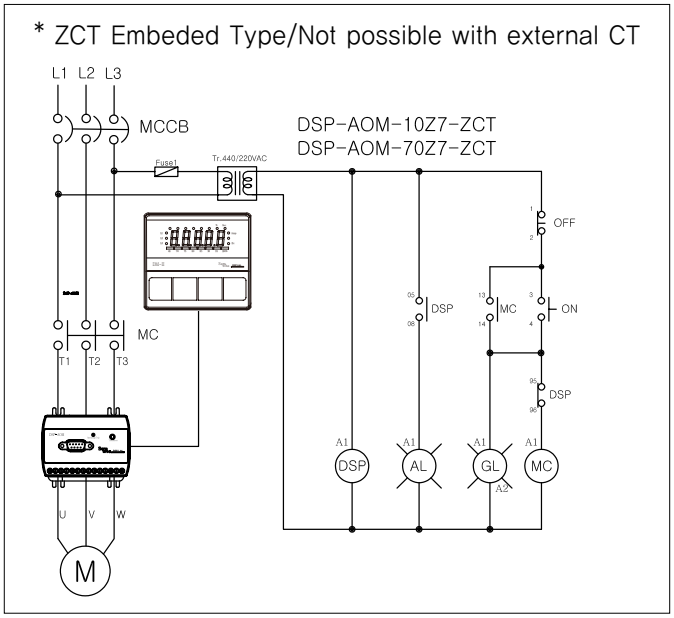
DIV	Description	Operation time
Over current(OC)	sensed in case the load current is greater than preset value	0.1 ~ 60 sec / adjustable, Definite T-I 5 ~ 30 Class, Definite T-I
Under current(UC)	sensed in case the load current is lower than preset value	1 ~ 30 sec / adjustable, Definite T-I
Phase loss(PLc)	sensed in case one of three phase is lost	1~5sec / Adjustable, Definite T-I
reverse phase(rPc)	sensed in case the order of incomming phase is changed like "RTS" from "RST"	0.5 sec
Locked rotor(LC)	sensed in case the starting current greater than 300% of "OC" preset value is occurred after dt is elapsed	dt + 0.1sec
Shock/Stall	sensed in case the 180 ~ 700% running current of preset "OC" value is occurred while a motor is working	0.5 ~ 3sec / Adjustable, Definite T-I
Current unbalance(ub)	[(max current-min current)/max current] * 100%	8sec
Ground fault(EC)	sensed in case the ground fault current greater than preset value is occurred	OFF , 1 ~ 30 sec / adjustable, Definite T-I

Trip cause indication

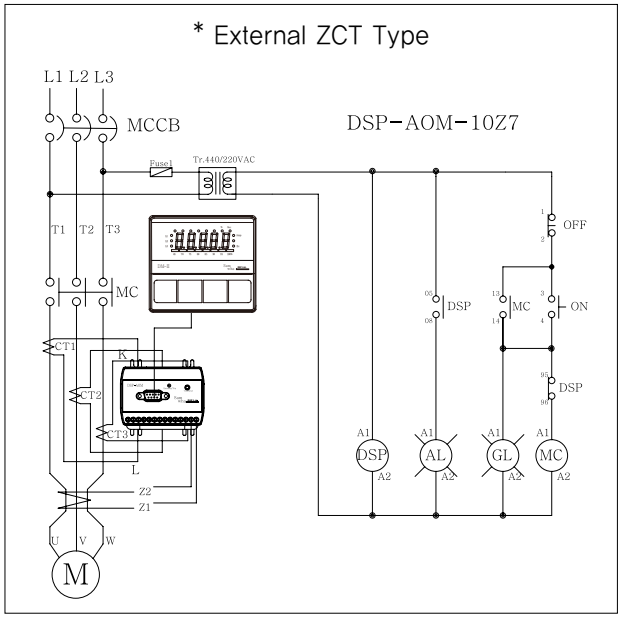
* If trip is happened, trip cause and current value of each phase are stored and able to indicate
* The information of 8 trip is stored and this is able to be checked in "trip" mode orderly
* the operator is possible to change preset value of each mode while motor is running normally only if "opset" is preset "on", but needs careful attention to do so.

Application sequence diagram

* ZCT Embeded Type/Not possible with external CT



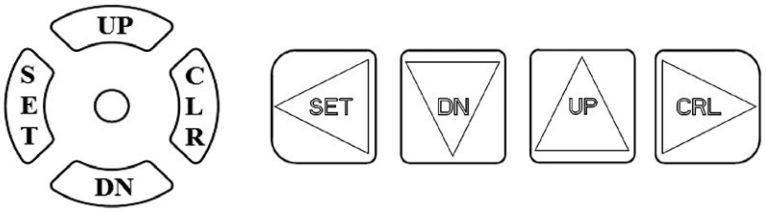
* External ZCT Type



Digital Motor Protection Relay

DSP-AOL, AOL-RG : Panel Mounting Type / DSP-AOM, AOM-RG : Panel Flush Mounting Type

Preset Key Operation



1. "SET" key	* Press "SET" Key to enter into setting mode, then "P0000"(factory default password) is shown * Move cursor from first digit to right end digit by pressing "CLR"key to input password, if default is used, otherwise make required digit by using "UP", "DN" key if password is user's number, finally 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. 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 selection a character or number by using UP / DN
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 one by one as pressing "UP"(forwardly), "DN"(reversely) * Press "CLR" ket once more to release fix state
To check and/or to change preset value of each mode during operation	▶To check preset value * possible to check value and mode as pressing "SET" key once during operation, * 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 ▶To change preset value * possible to change a preset value after entering into checking state if the preset value of "OPSET" mode belonged to "CAB" mode group is "ON"/ factory default value is "OFF" → Operator shall give intensive attention to do this job because the unwanted trip may be happened
Test/Reset:"CLR" Key	* to check if this relay is ready to work normally or not. * "tESt" is shown in case the operator presses test sw on the converter or "CLR" key for 3 sec or more, then release * main(95-96-98) & aux trip(05-06-08) output will be trip after counting down preset o-time * 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

Display Meter Indication Detail

① Phase(L1-L2-L3)
② Load factor / Bar Graph / ratio of actual current to preset "OC" value
③ Mode selection key
④ Ampere(A)
⑤ Ground fault current
⑥ %, sec

Preset Description

Mode	Function	Description	Factory
P0000	Password	P0000 is shown as pressing "SET" ,then press "CLR" 4 times to enter into preset mode	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 preset CT ratio	* 1 : current is sensed its own CT * ratio for external CT based on secondary rating 5A : 1~240 * 2t : 2 times wired through its own CT * 4t : 4 times wired through its own CT	1
OC	to preset a range to protect over current	10 type : 0.5~10A/adjustable, 70 type : 5~70A/adjustable	10:10A 70:50A
dt	to preset starting trip delay time	1.0 ~ 300 Sec / adjustable	5sec
OtC	to select time-current chracteristics for over current protection	dEF : definite T-I, Inv : inverse T-I	dEF
Ot	to preset operating trip delay time	Def : 1~60Sec/adjustable, Inv : 5~30 Class	5sec
Shoc	to protect mechanical shock during motor is working	* preset to "OC" is followed calculation / max 700% - 10 Type : 180%~[30/"OC"preset value] % - 70 Type : 180%~[210/"OC" preset value] %	OFF
st	to preset a time for shock protection	0.5 ~ 3sec / definite	-
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 AOM/AOL : 50mA~2A with exteranal ZCT / adjustable, AOM-RG / AOL-RG : 0.5A ~ 10A without ezternal ZCT, sensed internal residual circuit. OFF : disable	OFF
Edt	to preset starting trip delay time	1 ~ 25sec / adjustable	-
EOt	to preset operating trip delay time to protect ground fault	0.1 ~30sec / adjustable	-
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	1 ~ 30sec / adjustable	-
Ub	to preset current unbalance rate(%) among 3 phase	* formular : [(max-min) / max] * 100 [%] * range : 30% ~ 90% *minimum available current : 0.3A	OFF
AU-O	to preset a kind of AUX trip output	* OFF/AL/Ec/Uc/Ec-tb *OFF : same as main output	OFF
AL	to preset alarm level rate(%) to OC	* % range : 15% ~ 100% / adjustable ("AL" is preset in "Auo" mode) * "95"% point LED in bar graph and "AL" are flickering together	95
rESEt	to decide how to reset trip state	* hr : manual reset / Password input * Er : electrical reset / "Reset" key,"CLR" key, Control power-off * A-rE : auto reset	Er
Aut	to preset auto reset time	* 1 ~ 300sec / adjustable * If "hr" is preset in "rESEt" mode, this mode becomes disable	-
trIP	to show latest number of 8 trip cause	* trip information in the order : faulty phase and faulty value is showned alternatively as controlling "UP" or "DN" key * In order to enter setup state on the way of trip condition, press "DN" under pressing "UP" firstly and release "DN" firstly under pressing "UP", finally release "UP"	-

Technical Specification

Division			Description
Current setting range	10 Type		* 0.5A ~ 10A * 0.5 ~ 6A with external CT, inverse / 800%
	70 Type		* 5A ~ 70A * 5A ~ 40A, inverse/800%
	External CT		Refer Table
Ground protection	Zero Sequence Current		▶AOM,AOL Type * 50mA ~ 2A * Sensed through external ZCT or embeded ZCT * External CT type must be combined with external ZCT ▶AOM-RG,AOL-RG * 500mA ~ 10A * Sensed through internal residual circuit
Time setting	Starting delay time(dt)		OFF, 1 ~300 sec/def, "OFF" selection means inverse curve
	over current trip delay time(ot)		1 ~ 60 sec/def, 5~30class/inv : refer curve
	under current trip delay time(ut)		1 ~ 30 sec/def
	Shock/stall trip delay time(st)		0.5 ~ 3 sec/def
	Ground fault starting delay time(Edt)		OFF,1 ~ 25 sec/def
	Ground fault trip delay time(Eot)		0.5~ 30 sec/def
Allowable tollerance	Current		C〈=2A : 0.2A, C〉2A : +, -, 5%
	Time		t〈=2 sec : +, -, 0, 1sec, t〉2 sec : +, -, 5%
Control power			* 85VAC ~ 260VAC, 50/60Hz(90VDC~370VDC)
			* 24VAC/DC(optional)
Trip output Relay	Main		1c(1-spdt), 3A/Resistive
	Aux		1c(1-spdt), 3A/Resistive
	GR		1c(1-spdt), 3A/Resistive(Aux output must be set "GR" in "Au-o" mode)
Application environment	Temperature	Operation	-25℃ ~ +70℃
		Storage	-40℃ ~ +80℃
	Relative humidity		30 ~ 85%,non-condensing
Current tollerance against changeable frequency in inverter			Avg ±5% in 30Hz ~ 300Hz
Max Conductor Size			25sq
Screw Torque			Max 0.6 N.m
Insulation Resistence/IEC 60255-5			10Mohm or more/500VDC,circuit-case
High Voltage Withstand Test/ IEC-60255-5			* circuit-case : AC2000V, 60Hz, 1 min * contact-contact : AC1000V, 60Hz, 1min
Lightning 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-61000-4-3			Level 3, 10V/m
Electric Fast Transient Burst :IEC-61000-4-4			Power, Realy output : Level 4, 4KV
Surge Immunity test:IEC-61000-4-5			Relay output : 1.2X50uS,2KV (0°, 90°, 180°, 270°)
Conducted Disturbence Test:IEC-61000-4-6			10V,Level 3
Consuming power			4W/max

Digital Motor Protection Relay

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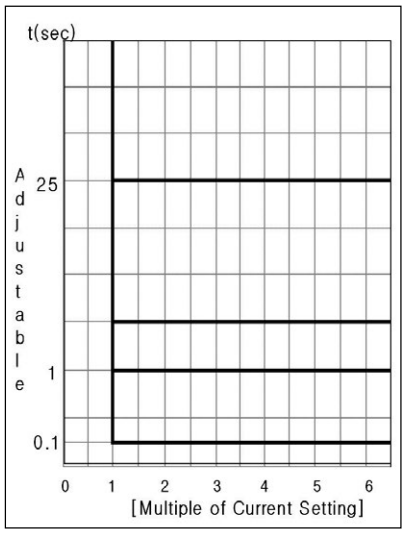
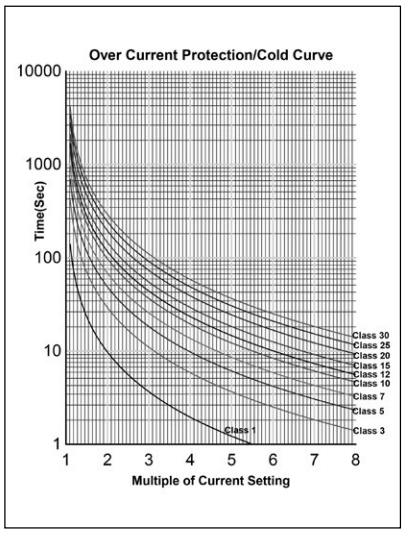
Definite

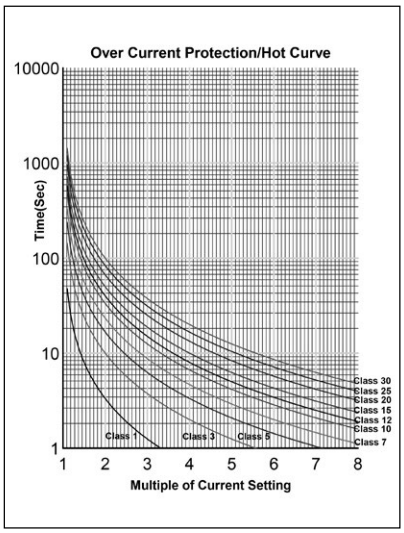
■ Over Current Protection



Inverse

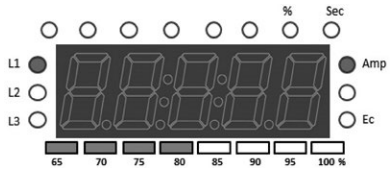
■ Over Current Protection





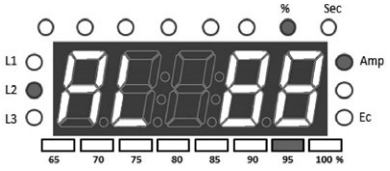
Operational Indication

■ Bar Graph



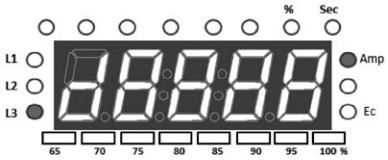
the % value with 5% point unit is shown based on the formular, [(actual current value/"OC" preset value)*100] while a motor is working

■ Alarm before trip



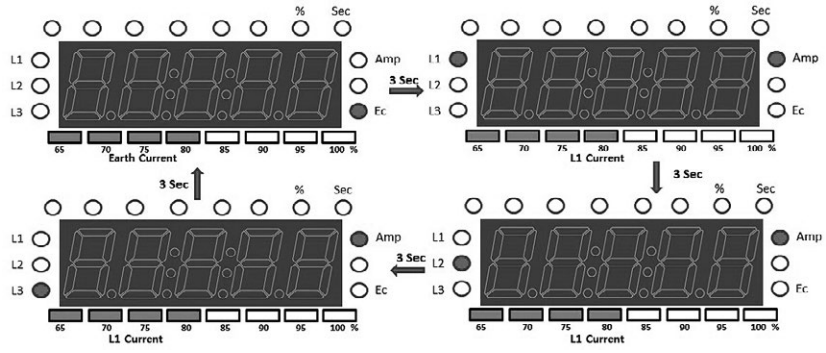
"95%" point LED and "AL" are flickering without turning on bar graph LED
if the preset alarmed level to "oc" is happened

■ Indication during d-time for mortor starting



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

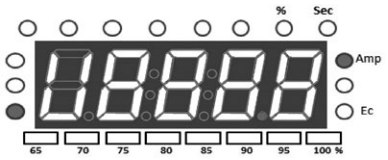
■ Rotated indication while motor is working
: Each phase current and GF current



■ Indication for "OC" trip

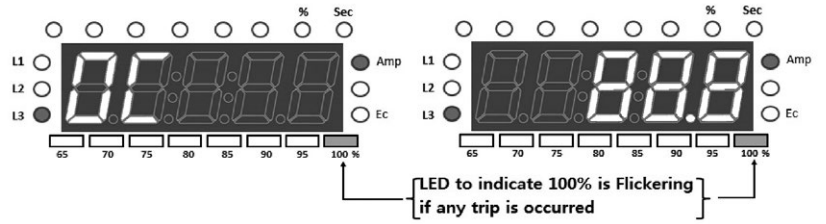
"o & Current value" is indicated if "o-time" is executed for over current protection, but "o" is flickering in every 1 sec

■ Indication for "UC" trip



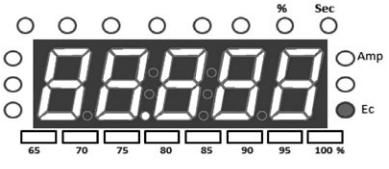
"U & Current value" is indicated if "o-time" is executed for over current protection, but "U" is flickering in every 1 sec

■ Indication after trip



trip cause" and "trip value" are shown alternatively as "100%" point LED in bar graph is flickering

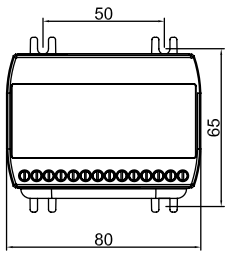
■ Indication for "Ec" trip

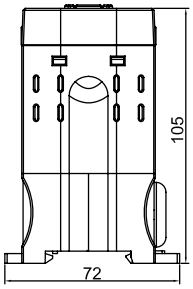


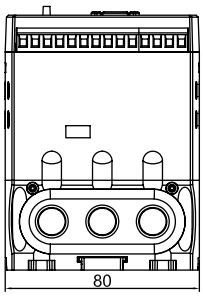
"E & Current value" is indicated if "o-time" is executed for over current protection, but "E" is flickering in every 1 sec

Dimension

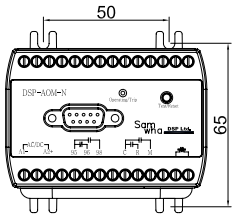
AOL Type

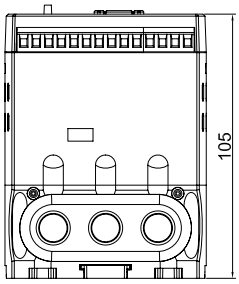


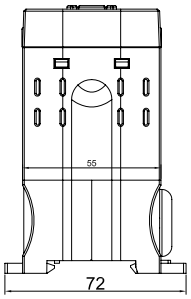




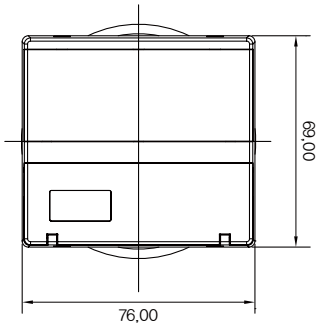
AOM Type

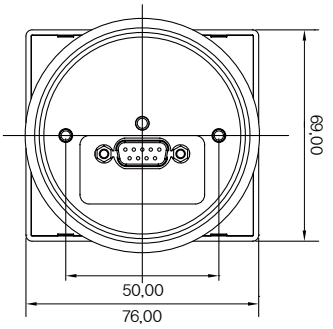






Display Meter





Reference code

■ DSP – AOM – 10 – Z – 7 – ZCT – A – T

① ② ③ ④ ⑤ ⑥ ⑦

DIV		Description	Remark
①	AOL, AOL-RG		Panel mounting Type
	AOM, AOM-RG	Display Meter	Panel Flush mounting Type
②	02	0.1A ~ 2A	Optional
	10	0.5A ~ 10A	0.5A~6A with external CT
	70	5A ~ 70A	
	C1	10A ~ 100A	Combined with external CT, 100/5
	Cc	15A ~ 150A	Combined with external CT, 150/5
	C2	20A ~ 200A	Combined with external CT, 200/5
	C3	30A ~ 300A	Combined with external CT, 300/5
	C4	40A ~ 400A	Combined with external CT, 400/5
③	B	24VAC/DC	Control Power
	Z	85VAC ~ 260VAC(90VDC ~ 370VDC)	
④	7	50/60Hz	Frequency/Control Power
⑤	ZCT	ZCT Embeded	Blank:standard to use external ZCT , ZCT: ZCT embeded
⑥	V	200mA : 100mV	
	A	200mA : 1.5mA	
⑦	T	Terminal Type	Teraminal is installed through CT hole

Digital Motor Protection Relay

DSP-AOM-N : Panel Flush Mounting Type & Display meter with RUN/STOP/RESET button

DSP-AOM-N

Over/Under Current Protection

10 Type	0.5 ~ 10A	Available for external CT
70 Type	5 ~ 70A	

GF protection

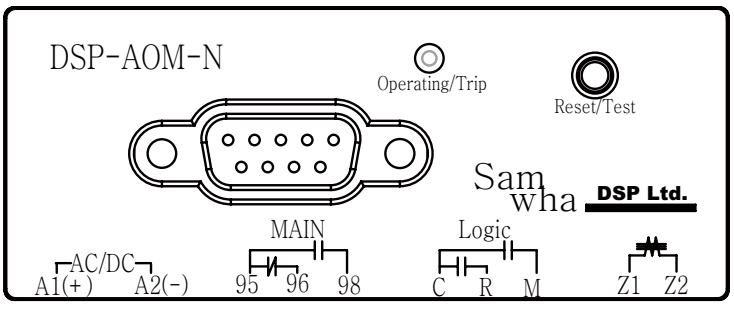
AOM-N	zero phase current is sensed through ZCT : 50mA ~ 2A
ZCT Rating	200mA : 1.5mA or 200mA : 100mV / recognized by order form

Motor Starting Operation

"CtroL" mode	"OFF " : "RUN" or "STOP" for a motor is executed right after pressing "RUN" key or "STOP" key
	"chEc" : "Start" is shown right after pressing "RUN" key to make run a motor,then a motor is actually run after pressing once again within 5 sec

Input/Output

▶ External ZCT applied type/possible with external CT



Digital Motor Protection Relay

DSP-AOM-N : Panel Flush Mounting Type & Display meter with RUN/STOP/RESET button

Protection

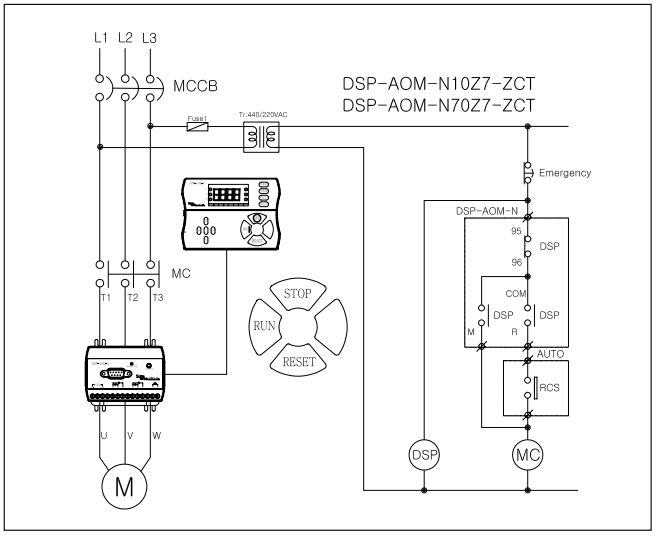
DIV	Description	Operation time
Over current(OC)	sensed in case the load current is greater than preset value	0.1~60 sec / adjustable, Definite T-I 5~30 Class, Definite T-I
Under current(UC)	sensed in case the load current is lower than preset value	1~30 sec / adjustable, Definite T-I
Phase loss(PLc)	sensed in case one of three phase is lost	1~5sec / Adjustable, Definite T-I
reverse phase(rPc)	sensed in case the order of incomming phase is changed like "RTS" from "RST"	0.5 sec
Locked rotor(LC)	sensed in case the starting current greater than 300% of "OC" preset value is occurred after dt is elapsed	dt + 0.1sec
Shock/Stall	sensed in case the 180~700% running current of preset "OC" value is occurred	0.5~3sec / Adjustable, Definite T-I
Current unbalance(ub)	[(max current-min current) / max current] * 100%	8sec
Ground fault(EC)	sensed in case the ground fault current greater than preset value is occurred	OFF, 1~30 sec / adjustable , Definite T-I

Trip cause indication

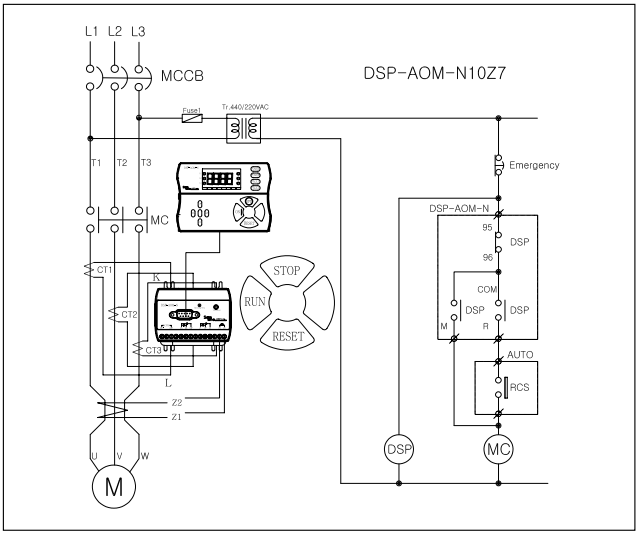
* If trip is happened, trip cause and current value of each phase are stored and able to indicate
* The information of 8 trip is stored and this is able to be checked in "trip" mode orderly
* the operator is possible to change preset value of each mode while motor is running normally only if "opset" is preset "on", but needs careful attention to do so.

Application sequence diagram

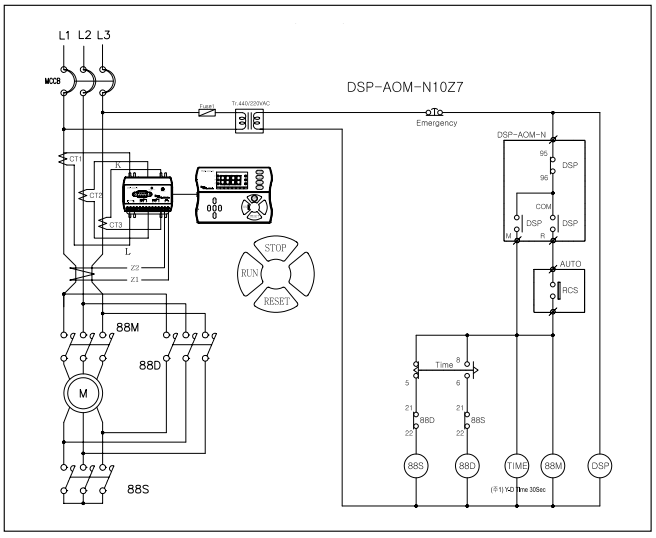
External ZCT Type/Standard



Embeded ZCT Type/Optional



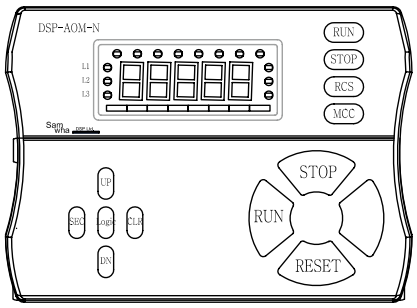
Y-D Operation/External ZCT



Digital Motor Protection Relay

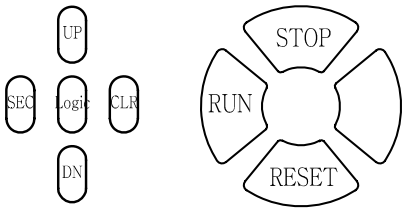
DSP-AOM-N : Panel Flush Mounting Type & Display meter with RUN/STOP/RESET button

Protection



Name	Description	Remarks
Display	* Seven Segment LED : 5 Digit	
Bar Graph	* [running current/"OC' preset value] * 100[%] * 65% ~ 100%	
RUN/STOP	* Motor run : LED tums on / RED * Motor stop : LED tums on / Green	
RCS	* Motor "run" is executed by external device(Sensor, ON / OFF SW), not RUN-STOP key in meter / LED turns on → Green	"RCS" is shown
MCC	* Motor "run" is executed by RUN-STOP key in meter / LED turns on → Green	"MCC" is shown
TRIP	* Reset is executed if trip is happened / LED turns on → Yellow	
A	* Load current[A]	
GR	* Earth current[A]	
LF	* Load factor=[running current/"OC' preset value]	
L1/L2/L3	* Each phase	

Preset Key Operation



RUN-STOP-RESET	RUN	* Motor run : to make "C-M" be closed * "ctRol" mode - OFF : possible for motor to run right after pressing this key - chEc : "Start" is shown as prssing,then motor is possible to run as pressing this key once again within 5 sec
	STOP	* Motor stop : to make "C-M" be opened
	RESET	* Make a reset only after trip which is executed during the operation
MCC-RCS/ Toggle key	Logic	* MCC-RCS is selected as toggling this key with turning LED * MCC : RUN-STOP of motor is executed by "RUN" and "STOP" key in this meter * RCS : RUN-STOP of motor is executed by external switch * The trip of C-M or C-R each comes out with main trip together if trip is happened

1. "SET" key	* Press "SET" Key to enter into setting mode, then "P0000"(factory default password) is shown * Move cursor from first digit to right end digit by pressing "CLR"key to input password, if default is used, otherwise make required digit by using "UP","DN" key if password is user's number, finally 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. 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.
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/DN
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 one by one as pressing "UP"(forwardly), "DN"(reversely) * Press "CLR" ket once more to release fix state
To check and/or to change preset value of each mode during operation	▶To check preset value * possible to check value and mode as pressing "SET" key once during operation, * 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 ▶To change preset value * possible to change a preset value after entering into checking state if the preset value of "OPSET" mode belonged to "CAB" mode group is "ON"/factory default value is "OFF" → Operator shall give intensive attention to do this job because the unwanted trip may be happened
Test/Reset:"CLR" Key	* to check if this relay is ready to work normally or not. * "tESt" is shown in case the operator presses test sw on the converter or "CLR" key for 3 sec or more, then release * main(95-96-98) & aux trip(05-06-08) output will be trip after counting down preset o-time * 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

Preset Description

Mode	Function	Description	Factory
P0000	Password	P0000 is shown as pressing "SET", then press "CLR" 4 times to enter intopreset mode	0000
ctrol/oFF /chEc	to confirm for"RUN"operation	* OFF : "RUN" or "STOP" for a motor is executed right after pressing "RUN" key or "STOP" key * chEc : "Start" is shown right after pressing "RUN" key to make run a motor,then a motor is actually run after pressing once again within 5 sec * This mode becomes disable if RCS is selected by Logic key * This mode is not cooperated with "OPSET" Mode of "CAB" mode group	OFF
Ct	to preset CT ratio	* 1 : current is sensed its own CT * ratio for external CT based on secondary rating 5A : 1~240 * 2t : 2 times wired through its own CT * 4t : 4 times wired through its own CT	1
OC	to preset a range to protect over current	10 type : 0.5~10A/adjustable, 70 type : 5~70A/adjustable	10:10A 70:50A
dt	to preset starting trip delay time	1.0 ~ 300 Sec/adjustable	5sec
OtC	to select time-current chracteristics for over current protection	dEF : definite T-I, Inv : inverse T-I	dEF
Ot	to preset operating trip delay time	Def : 1~60Sec / adjustable, Inv : 5~30 Class	5sec
LC	to protect Locked Rotor	* it is available for selecting ON [operation time : 0.1sec after dt is elapsed] * conditoion for "ON" : start running current is kept on 300% after dt is elapsed	OFF
Shoc	to protect mechanical shock during motor is working	* preset to "OC" is followed calculation / max 700% - 10 Type : 180%~[30/"OC"preset value] % - 70 Type : 180%~[210/"OC" preset value] %	OFF
st	to preset a time for shock protection	0.5 ~ 3sec / definite	-
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 : 50mA~2A/adjustable, OFF : disable	OFF
Edt	to preset starting trip delay time	1 ~ 25sec / adjustable	-
EOt	to preset operating trip delay time to protect ground fault	0.1 ~30sec / adjustable	-
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	1 ~ 30sec / adjustable	-
Ub	to preset current unbalance rate(%) among 3 phase	* formular : [(max-min) /max]*100 [%] * range : 30% ~ 90% *minimum available current : 0.3A	OFF
rESEt	to decide how to reset trip state	* hr : manual reset / Password input * Er : electrical reset / "Reset" key,"CLR" key, Control power-off * A-rE : auto reset	Er
Aut	to preset auto reset time	* 1 ~ 300sec/adjustable * If "hr" is preset in "rESEt" mode, this mode becomes disable	-
trIP	to show latest number of 8 trip cause	* trip information in the order : faulty phase and faulty value is showned alternatively as controlling "UP" or "DN" key * In order to enter setup state on the way of trip condition, press "DN" under pressing "UP" firstly and release "DN" firstly under pressing "UP", finally release "UP"	-

Digital Motor Protection Relay

DSP-AOM-N : Panel Flush Mounting Type & Display meter with RUN/STOP/RESET button

Technical Specification

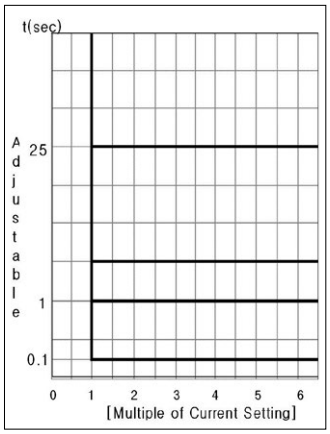
Division			Description
Current setting range	10 Type		* 0.5A ~ 10A * 0.5 ~ 6A with external CT, inverse / 800%
	70 Type		* 5A ~ 70A * 5A ~ 40A, inverse/800%
	External CT		Refer Table
Ground protection	Zero Sequence Current		50mA ~ 2A * Sensed through external ZCT or embeded ZCT(Optional)
Time setting	Starting delay time(dt)		OFF, 1 ~300 sec/def, "OFF" selection means inverse curve
	over current trip delay time(ot)		1~60 sec/def, 5~30class/inv:refer curve
	under current trip delay time(ut)		1~30 sec/def
	Shock/stall trip delay time(st)		0.5 ~ 3 sec/def
	Ground fault starting delay time(Edt)		OFF, 1 ~ 25 sec/def
	Ground fault trip delay time(Eot)		0.5~ 30 sec/def
Allowable tollerance	Current		C〈=2A:0.2A,C〉2A:+,- 5%
	Time		t〈=2 sec : +, -, 0.1sec, t〉2 sec : +, -, 5%
Control power			* 85VAC ~ 260VAC, 50 / 60Hz(90VDC~370VDC)
			* 24VAC/DC(optional)
Trip output Relay	Main :95-96-98		1c(1-spdt), 3A/Resistive, 30VDC/1A, Resistive
	Logic : C-R-M		1a(1-spst), 3A/Resistive, 30VDC/1A, Resistive
			1a(1-spst), 3A/Resistive, 30VDC/1A, Resistive
Application environment	Temperature	Operation	-25℃ ~ +70℃
		Storage	-40℃ ~ +80℃
	Relative humidity		30 ~ 85%, non-condensing
Current tollerance against changeable frequency in inverter			Avg ±5% in 30Hz ~ 300Hz
Max Conductor Size			25sq
Screw Torque			Max 0.6 N.m
Insulation Resistence/IEC 60255-5			10Mohm or more/500VDC, circuit-case
High Voltage Withstand Test/ IEC-60255-5			* circuit-case : AC2000V, 60Hz, 1 min * contact-contact : AC1000V, 60Hz, 1min
Lightning 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-61000-4-3			Level 3, 10V/m
Electric Fast Transient Burst :IEC-61000-4-4			Power, Realy output : Level 4, 4KV
Surge Immunity test:IEC-61000-4-5			Relay output : 1.2X50uS, 2KV (0°, 90°, 180°, 270°)
Conducted Disturbence Test:IEC-61000-4-6			10V, Level 3
Consuming power			4W/max

Digital Motor Protection Relay

DSP-AOM-N : Panel Flush Mounting Type & Display meter with RUN/STOP/RESET button

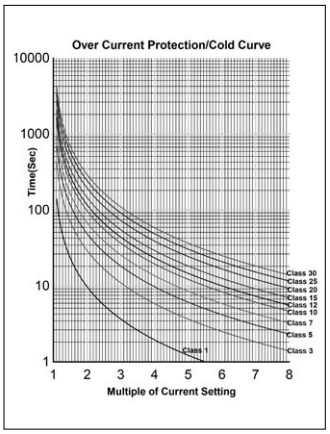
Definite

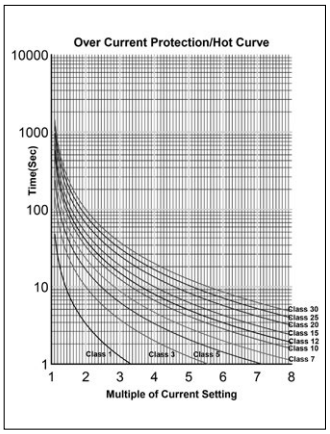
■ Over Current Protection



Inverse

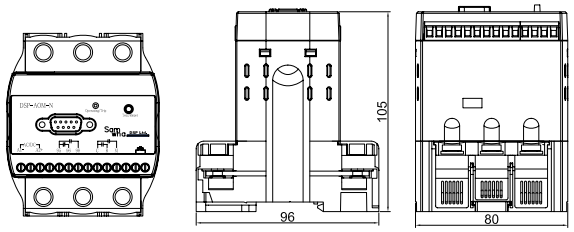
■ Over Current Protection



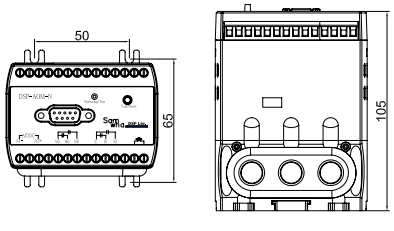


Dimension

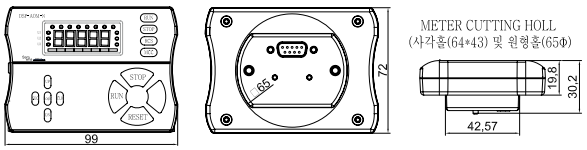
AOL Type



AOM Type



Display Meter



Reference code

■ **DSP – AOM – N10 – Z – 7 – ZCT – P**

① ② ③ ④ ⑤ ⑥ (Option)

DIV		Description	Remark
①	AOM	Display Meter	Panel Flush mounting Type New controller function meter
	N10	0.5A ~ 10A	0.5A ~ 6A with external CT
	N70	5A ~ 70A	
	NC1	10A ~ 100A	Combined with external CT, 100/5
	NCc	15A ~ 150A	Combined with external CT, 150/5
	NC2	20A ~ 200A	Combined with external CT, 200/5
	NC3	30A ~ 300A	Combined with external CT, 300/5
	NC4	40A ~ 400A	Combined with external CT, 400/5
③	B	24VAC/DC	Control Power
	Z	85VAC ~ 260VAC(90VDC ~ 370VDC)	
④	7	50/60Hz	Frequency/Control Power
⑤	ZCT	ZCT Embeded	Blank:standard to use external ZCT, ZCT : ZCT embeded
⑥	P	200mA : 100mV	ZCT rating

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