IMC-III

Intelligent Motor Controller

**IMC-III is for low voltage motor under 1000V,
and is integrated motor protection relay,
Indication lamp, Current transformer(CT).
IMC-III is intelligent motor controller which has
high micro-Processor Technique.**

Contents :

IMC-III includes Direct, Y-△, Forward/Reverse, Reactor, Inverter, S/V valve start, solution for complicated water treatment Sequence.

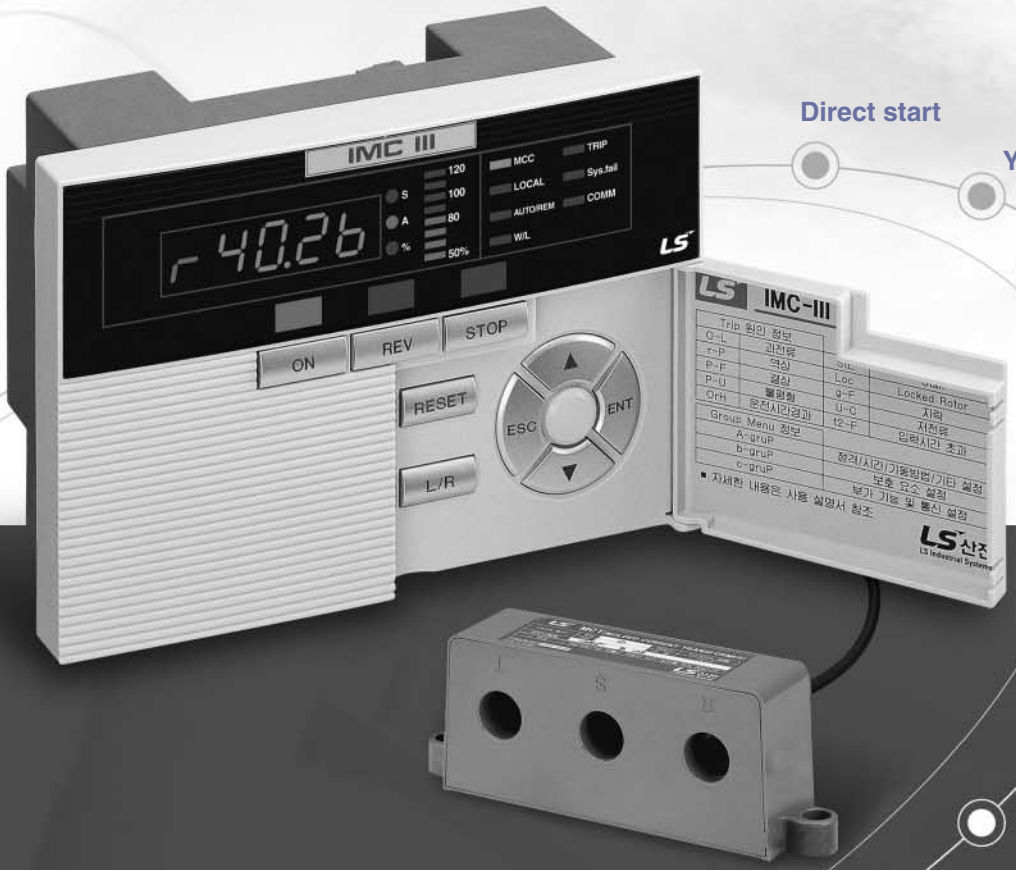
IMC-III also has various motor protection function, and is possible to communicate with PLC, Water level for auto operating, remote control and monitoring by RS-485, 4~20mA(only monitoring).

IMC-III

Digital motor protection control unit

Various motor start application within one model.

IMC-III includes Direct, Y-△, Forward/Reverse, Reactor, Inverter, S/V valve start, solution for complicated water treatment Sequence.



Direct start

Y-△ start

Reactor start

For/Rev start

Inverter start

S/V valve start

Overcurrent

Under current

Unbalance

Stall/Locked rotor

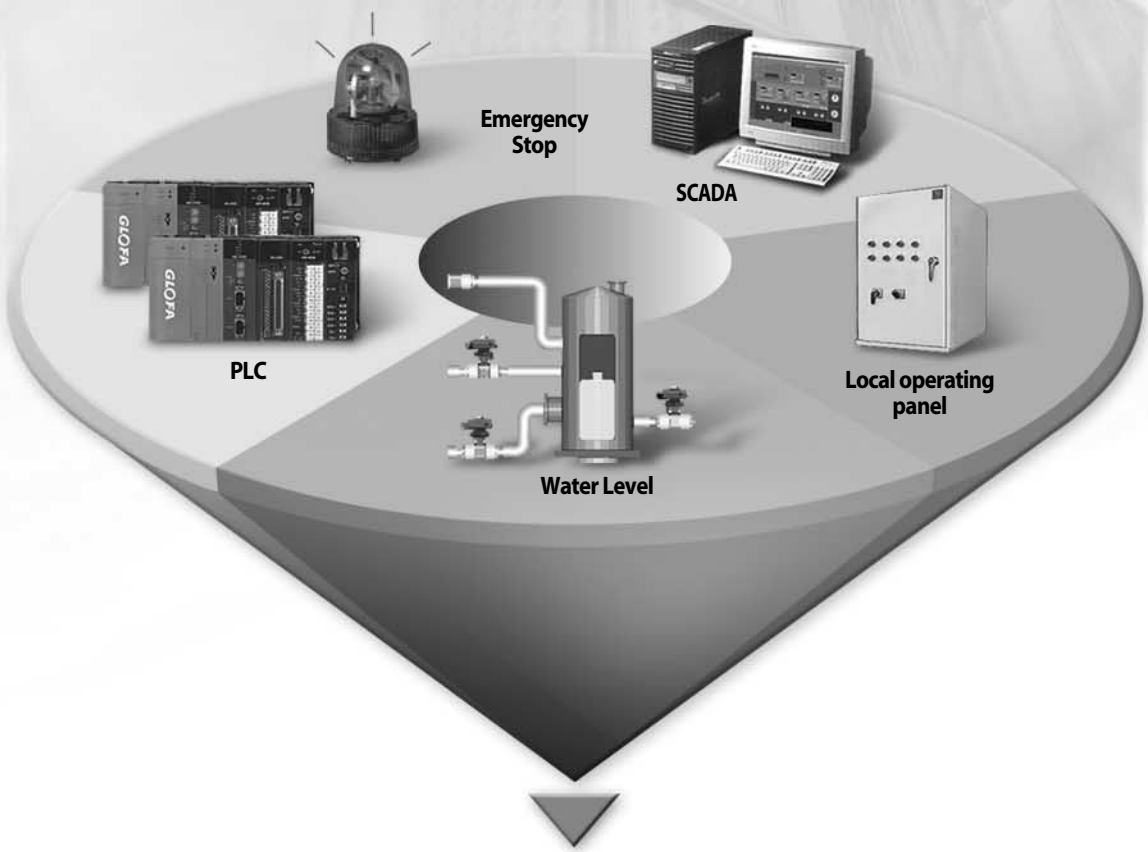
Phase loss

Phase reverse

Earth fault

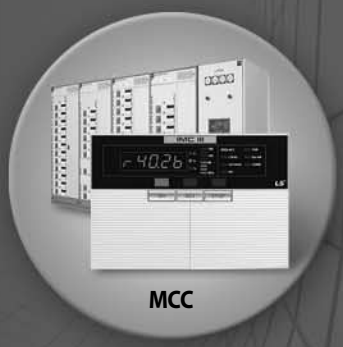
Various protection function

Safely protection for over current, Under current, Phase loss, Unbalance, (Stall, Lock) Earth fault, Alarm function.



Various remote control and monitoring

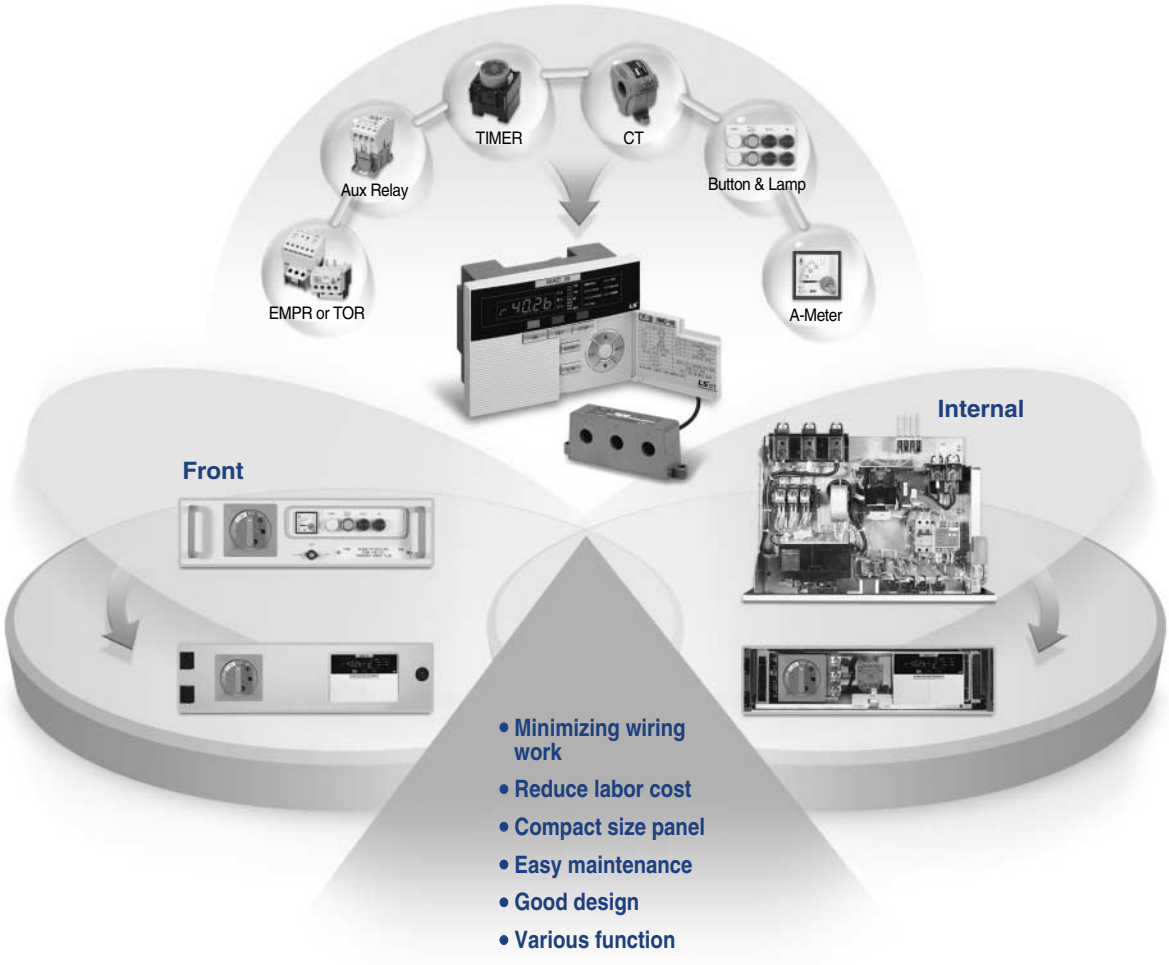
It is possible to operate at MCC and LOP by just simple sequence, also can be automatic operation up to water level by remote control and monitoring with PLC/DCS.



Main characteristic

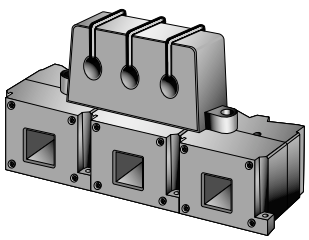
Easy and convenience installation

It can be checked fault analysis and operated motor by inserting the main unit into panel. It°Øs possible to set current/operating time/various function easily by simple button. And it can be also composed of compact MCC, minimized wiring work, so user can reduce labor cost.



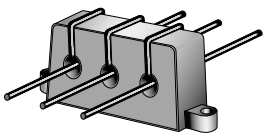
Wide current setting range : 0.125A~1000A within 1 model

It can be changed from 0.5~6A to 5~60A by slide S/W, the current can be changed to 0.125A up to MCT number of the time of penetrating current line.

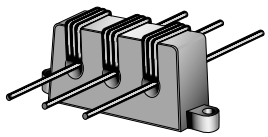


• External CT

* External CT : Note p22 (option)
* MCT : Molded current transformer(Enclosing with product)



• 2 times(0.25~3A)
• A group → 5.ctr 0.5 setting



• 4 times(0.125~1.5A)
• A group → 5.ctr 0.25 setting

The moment stopping of power supply compensation and Restart

■ **The moment stopping of power supply compensation**

- Line current reduces under 65% of rated voltage.
- When the moment stopping of power supply within 10S, IMC-III makes it restart same as before condition.

■ **Restart delayed time(0~300S)**

- When the line voltage recovers over 75% rated voltage, it can be restarted.
- when it restarted, IMC-III makes it sequence restart 0~300s for prohibition overload.
- Indication of Restart delayed time countdown.

■ **Operating condition and maintain operation mode**

- It can be maintained before the moment stopping power supply condition(Local, MCC, Auto, W/L, Remote)

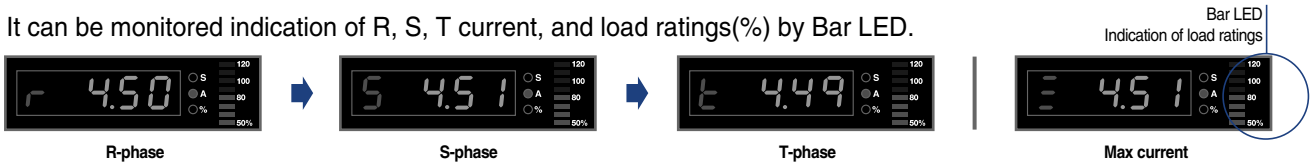
Ex) Incase of restarting delayed time 30S

Information

- It can be changed operation mode (ON, OFF) and count time during countdown
- Changed operation mode can be applied after finishing count.
- When the short stopping power supply generates under 100ms, IMC-III dose not detect, so the motor will maintain normal condition

Digital ampere-meter

It can be monitored indication of R, S, T current, and load ratings(%) by Bar LED.



Fault analysis and Recording

It can be indicated fault cause and fault current value by 7-segment and LED.
At the moment of instantaneous stopping of power supply, it can solve the problem. Because of the fault storage.

Self-supervision and contactor failure function

IMC-III can be checked self-supervision like a memory fault. When the motor starts/stops, that indicates Error.No and turn on Sys.Fail LED by supervising Input/output condition.

Total operation time setting and storage

It can be stored motor operation time up to 10 years. Continuous operation time can be stored and setting.

Information

When the user contact mode is normal mode, even if indicating "OrH Alarm, motor operates in normal condition

Communication function

It's possible to communicate with other system and organize various communication Network by MODBUS/RS-485. And it's also possible to communicate with system by Analog current signal(4~20mA). So that makes it possible to interchange by using TD(Transducer).

Intelligent Motor Controller

Ratings and function

Rating

Model				IMC-III
Operating time	**Characteristic**			Inv/Def time
Current range(A)				0.125~60A(Within 1 model)
Time setting (s)	**Inverse time**			1~60sec/1sec(Class)
	Definite time	**D-Time** *		1~200sec/1sec
		O-Time *		1~60sec/1sec
	Auto re-closing time			1~20min/1min, OFF
Control power	**Voltage**			AC 110V or AC 220V(±15%)
	Frequency			50/60Hz
	Power consumption			Under 6W
Output contact	**Capacity**			5A/250VAC impedance load
(9EA)	**Composition**	**Operating contact**	**3a**	Forward/Reverse, Y-△, Reactor, Inverter start
		Condition contact	**3a**	Local, Auto, W/L condition indication
		Timer contact	**2a**	ON delay, OFF delay
		Trip contact	**1a**	Fault output contact
Input contact	**Operating input**		**5a**	Local, Auto, Water, Level, Flow, switch operating inout
(9EA)	**MC condition input**		**1a**	Sequence condition monitoring(LED)
	External trip		**2a**	Emergency stop, Sequence
	ZCT	**Ratings**		200mA/0.1mA(ZCT)
		Specification		ø25, ø40, ø80
Indication	**7-Segment**			3-Phase current, Trip cause, Settings
	LED			Operating condition, Trip, System fail settings
Self-Diagnostic				System fail LED and err indication
Communication(Option)				Modbus/RS-485 or 4~20mA
Installation				Inside the panel
Separate cable				MCT cable 2m base(4m cable option)
Insulation voltage				AC 2kV(1.5kV) / 1 min
Impulse voltage				Over AC 5kV(3kV), 1.2x50㎲
Insulation resistance				Over DC500V 10MΩ
Power frequency magnetic field				100A/m, 50Hz
Burst disturbance				Common 2.5kV Differential 1.0kV
Fast transients disturbance				Input 2kV, Other Input 1kV
Electrostatic discharge				Air 8kV, Contact 6kV
RFI				30cm near electric wave by 5W transceiver(230MHz)
EMI				AC power : 0.15~0.50MHz, Standard : 79dB, Average : 66dB 0.50~30MHz, Standard : 73dB Average : 60dB
Operating temperature				-10 ~ 55℃
Storage temperature				-20 ~ 70℃
Relative humidity				93% @40℃ for 56days
Standard				IEC 60255, IEC 61000-4, IEC 60068-2, EN 50081-2
Weight				0.6kg(MCT 0.35kg)
Dimension	**Main unit**			148(W) × 100(H) × 74(D) mm
	MCT			151(W) × 55(H) × 33(D) mm

* D-Time(Delay time) : It is delay time for IMC-III start during motor start time
* O-time (Operating delay time) : When over current generates more then setting current, that makes it delayed until IMC-III operated.

Motor protection

		Operating condition	Time	Remark
Over current	Inverse	Over 110% setting current	1~60s/1s	600% standard operating time
	Definite time	Over 105% setting current	1~60s/1s	Delay time 1~200s
Phase fault		Over 70% current phase unbalance	Within 1.5s	
Phase unbalance		Current phase unbalance 30~50%	Within 5s	
Reverse phase		Reverse the current phase	Within 0.1s	Over 110% minimum ratings
Under current		Rating current 30~70%	Within 3s	
Holding	Stall	Rating current 150~300%	Within 5s	Detection after over current setting time
	Locked rotor	Rating current 200~700%	Within 0.5s	
Ground fault		The current rating 0.1~2.5A setting	0.05~1.0s	Ground fault delay operation
Pre-alarm		Over 120% setting value		Bar-LED blinking

Sequence function

			Contents	Remark
Operating type	Direct operation		Non-reversible direct operation	
	Y-△ operation	Y operation time	1~120s/1s	
		Y-△ switching time	0.05, 0.1, 0.2s	
	Forward / Reverse operating		Reversible direct operation	
	Reactor	Reactor time	1~120s/1s	
	Inverter	Inverter delayed time	ON 1sec/0.1sec	
Instantaneous under voltage compensation	Compensation time		OFF 1~10s /1s	
	Re-operation delay time		0~300s /1s	
	Under voltage detection		(Rating control voltage × 65%) ± 10%	
	Recovering voltage detection		(Rating control voltage × 75%) ± 10%	
User contact point mode	Normal		Normal mode	
	Time delay	ON delay	0~300s/1s	
		OFF delay		
	Flow switch	ON delay	0~300s/1s	Comparing Timer > ON delay timer
		OFF delay		
		Comparing timer		
Remote control	Local		LOP(Local Operation Panel)	
	MCC		Motor Control Center	
	Auto		PLC, DDC, DCS auto operation	
	W/L		Water Level	
	Remote		Modbus/RS-485 communication	

Communication function

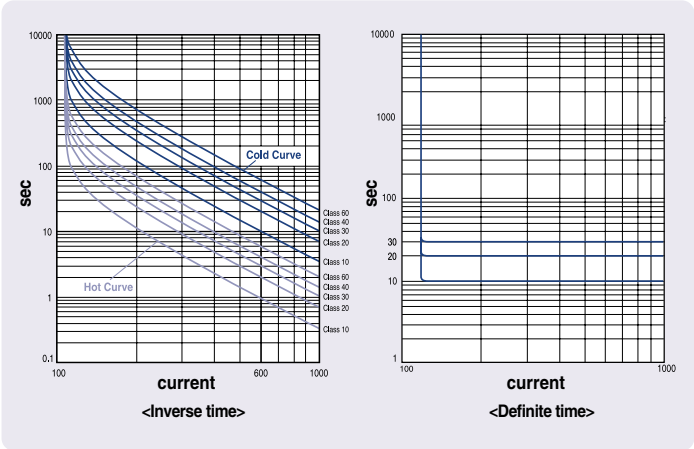
Type	Contents	Specification	Remark
Modbus / RS-485	Protocol	Modbus_RTU	
	Communication	RS-485	
	Operation	Differential	
	Baud rate	9600, 19200, 38400bps	
	Length	Max 1.2km	Different from local situation
	Cable	RS-485 Shielded twist 2-pair cable	
	Transmission	Half-duplex	
	Max in/Output voltage	-7V ~ +12V	

Protection function

Overload protection(49)

Overload protection function senses current which is flowing on the motor, and tracing the heat, and then protects. When the heat capacity approaches, it generates overload trip, and this heat capacity is calculated by characteristic curve and I²t. Class1 ~Class60 overload characteristic curve is determined by setting motor's rated current, considering motor operating time, setting operating time 1s~60s by according to 600% of setting current.

When you choose the definite time characteristic, it starts over current after Delayed time and if over current keeps applying over Operation-time, it generates trip.

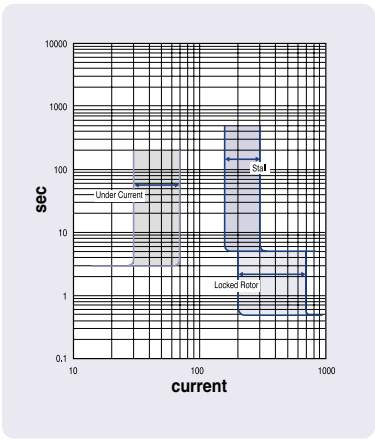


Stall/Locked rotor protection (48/51LR)

When the fault generates like locked rotor, the mechanical units like pump, fan can be damaged easily. IMC-III prohibits stall, locked rotor, start failure, over current and open the circuit when the current increases rapidly, load torque exceeds the motor torque. But IMC-III has delayed time, it can not be tripped by operating current.

Under current protection(37)

Protection of no-load condition by operating axis separation , maintenance of pump noload and in case of motor frigidus method, it can be used for protection of operating terminal overload. It's possible to set 30~70% of rated current, it operates within 3s.



Phase fail/Phase unbalance protection-47P

If the phase fail generates due to the motor internal fault or wiring problem. Motor cannot operate or keep operating,

In this case, high reverse phase current applied, so motor can be damaged. IMC-III will trip within 1.5s when the unbalance rate is over 70%. IMC-III will trip within 5s, when the unbalance rate is over 30~50%. However,

when you applied 1p motor, it can not be detected phase-fail and unbalance. User has to be off in this case.

Reverse phase protection

Reverse phase protection prohibits motor reverse rotation when the phase of current changed each other.

IMC-III will trip within 0.1s, when the phase changed each other by comparing 3phase difference.

IMC-III can detect the reverse phase over minimum 110%, of setting current, during motor operation.

When the 1p motor is applied, it can not be detected reverse phase. User has to be off in this case.

Ground fault protection-51G

This function protects fault circuit by detecting earth fault, ground fault. And this function also protects second fault (short circuit, electric shock) by detecting earth fault current. User has to set the current value, operating time differently by protection system. Ground fault sensing current can be set 100~2500mA, and ground fault operating time can be set 0.05s~1s. The separate ZCT (Zero phase current transformer) is used for detecting ground fault current. However, when the IMC-III start inverter operation, it can not be protected ground fault Protection. User has to be OFF.

Fault analysis, fault recording

User can check fault current value by UP/DOWN button and fault recording can be checked by [ESC + ENT].

Overload

Under current

Locked rotor

Stall

Phase fault

Phase unbalance

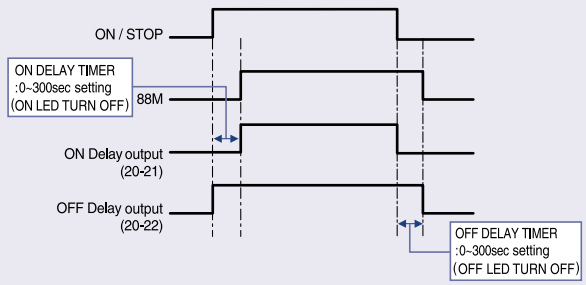
Reverse phase

Ground fault

In case of no F/S input within setting time

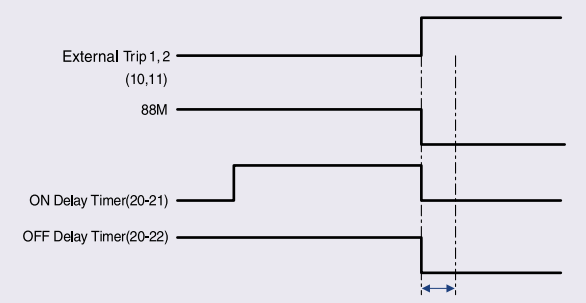
When it passed the operating setting time

Time delay(t-d) mode



1) After ON operation, it passed ON delay time, 88M will be ON and motor will operate.
2) After OFF operation, it passed OFF delay time, 88M will be OFF and motor will be stopped.

External trip input



* When the external trip generates it will be OFF simultaneously irrespective of ON/OFF Delay Timer

Self-diagnostic function

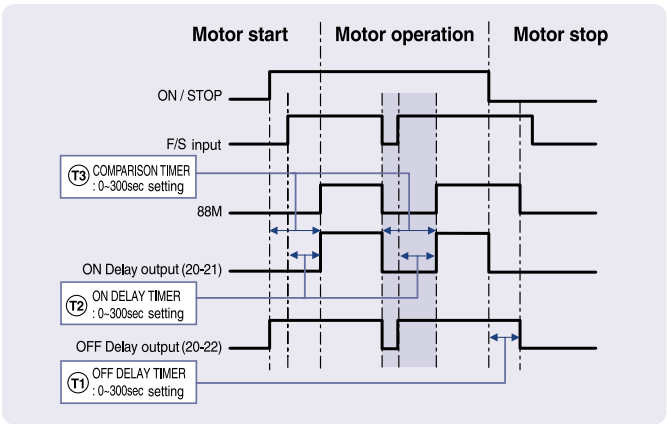
When MC condition input contact point is ON after output contact OFF operating.

When MC condition input contact point is OFF, after output contact point ON operating.

When the external input contact point "FOR", REV" is applied at once.

EEPROM Fault

Flow switch (F-S) mode



Motor start

1) If F/S (FlowSwitch) is applied within setting **comparison timer-ON Delay timer** after ON operation. After ON delay timer, motor will operate.
2) If F/S is not applied, ON will be canceled, “t2-F” will be indicated, will maintain OFF condition.

Motor operation

1) During motor operation, if F/S input is out of state, 88M will be OFF, Motor will stop.
2) At this time, the comparison timer will operate, and if F/S is reapplied within setting **comparison timer-ON Delay timer**, motor will be re-started in normal Condition
3) If F/S is not reapplied within **comparison timer-ON Delay timer**, “t2-F” will be indicated, motor keep stopping.
4) When user operates OFF, 88M will be OFF, after OFF delay time, motor will stopped.

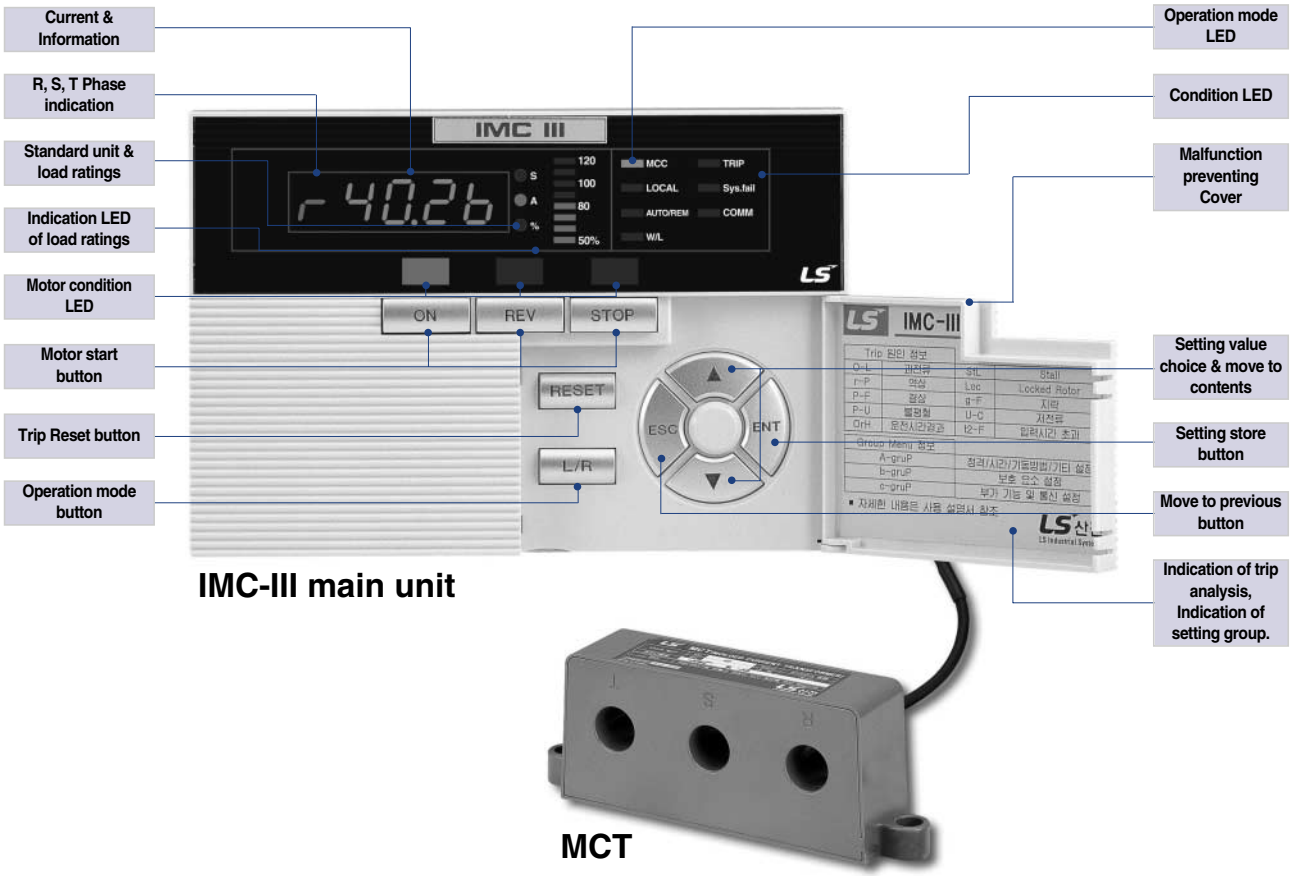
ex) When the T1 timer : 1s, T2 Timer : 10s, T3 Timer 5s set, F/S re-applied time after F/S OFF has to be within 10s-5s = 5s and ‘t2-F’ will not indicated, motor will be re-started in normal condition.

Note) Comparison timer has to be set more than ON Delay timer.

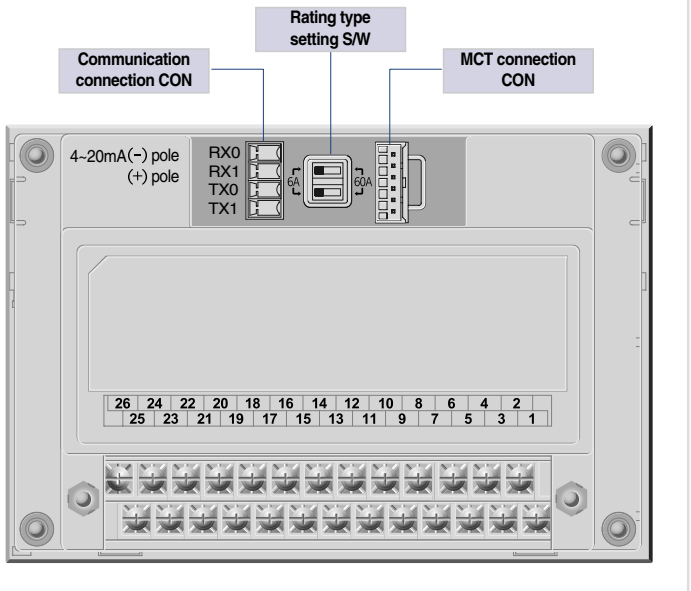
Intelligent Motor Controller

Operation and setting

Front view



Rear view



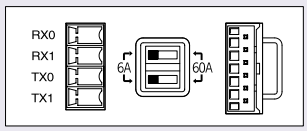
Setting method

1) The first stage will be indicated maximum current in znormal condition.
2) When the UP/DOWN button is pushed, A, B, C group is indicated.
3) When user push the ENT button after selecting group, it move to the detail setting contents.
4) After selecting contents by pushing UP/DOWN button, if user push the ENT button, the setting value will be stored.
5) When UP/DOWN button is pushed, the setting value will change, so that after selecting contents, if you push the ENT button , setting value will be stored.
6) After setting, if user push the ESC button, IMC-III will be returned normal operating condition.

Note) 1. Pls note that setting value can be changed during motor operation.
2. If user did not operate for 10S , Setting value and group setting contents will returned to current indication mode automatically.

Group	No.	Setting	Indication	Setting value	Default value	Remark
A. grp Basic setting	1	Characteristic (Over current protection)	A.1CHA	Inu/dEF	Inu	Inverse/Definite time selection
	2	Operating time (Over current protection)	A.2.0-t	1~60/1sec	60	In case of definite time, motor operating time
	3	Operating delayed time (Over current protection)	A.3.d-t	1~200/1sec	200	
	4	Setting of rated current	A.4.r-C	0.5~6/0.1(A), 5~60/1(A)	6 / 60	6/60A selection
	5	CT ratio	A.5.Ctr	0.25, 0.5, 1~200/1	1	Impossible to set in case of selection 60A
	6	Start type selection	A.6.dru	dir/y-d/F-r/Ind/Iut	dir	Direct, Y-Δ. Reactor, Inverter start
	7	Y operation time	A.7.d-t	1~120/1sec	5 (Inverter start :0)	Reactor start time Inverter start delayed time (0~1sec)
	8	Y-D switching time	A.8.ydt	0.05, 0.1, 0.2(sec)	0.2	
	9	Short time power off compensation time	A.9.S-t	OFF, 1~10/1sec	OFF	
	10	Re-start time	A.10.Sd	0~300/1sec	-	9. It can be indicated only in case of short time power stop compensation time
B. grp Protection function	1	Lock protection	b.1.Loc	OFF, 200~700/100(%)	OFF	
	2	Stall protection	b.2.StL	OFF, 150, 200, 300(%)	OFF	
	3	Phase-fault protection enabled	b.3.P-F	OFF/On	On	
	4	Unbalance protection	b.4.P-U	OFF, 30, 40, 50(%)	OFF	
	5	Reverse phase protection	b.5.r-P	OFF/On	OFF	Only during operation
	6	Under current protection	b.6.U-C	OFF, 30~70/5(%)	OFF	
	7	Ground fault protection	b.7.9-F	OFF/On	OFF	OFF setting in case of inverter start
	8	Ground fault operation current	b.8.9-C	0.1, 0.2, 0.5, 1.0, 1.5, 2.0, 2.5(A)	0.1	7. Indication by ground fault protection seleection
	9	Ground fault operation time	b.9.9-t	0.05, 0.1~1.0/0.1sec	0.05	
	10	Ground fault delay	b.10.9d	OFF/On	OFF	
C. grp Additional function	1	I/O state information	C.1.1-0	4-segment		Notify the manual
	2	Total operation time	C.2.trt	Total operation time checking	Time check, Setting disabled	Day → hour, min (Max.1year : 8760 hour)
	3	Operation time	C.3.r-t	Operation time checking	Time check, Setting disabled	Operation time →Day → Hour, min (Max 1year : 8760 hour)
	4	Operation time setting	C.4.Srt	OFF, 10~8760/10(H)	OFF	After reached setting operation time, indicating "OrH"
	5	Contactor check	C.5.CCh	OFF/On	On	MC condition input check (OFF→not indicated Err1,2)
	6	User contact point mode	C.6.n-F	nor/t-d/F-S	nor	Normal/Time delay/Flow switch
	7	ON Delay Timer	C.7.tOn	0~300sec/1sec	0	In case of t-d, F-S mode selection, it can be set
	8	OFF Delay Timer	C.8.tOF	0~300sec/1sec	0	
	9	Comparison timer	C.9.t-C	0~300sec/1sec	0	In case of F-S mode selection, it can be set
	10	Auto- returning	C.10.Ar	OFF, 1~20min/1min	OFF	
	11	Communication address	C.11.Ad	1~255	1	Only indication of communication model
	12	Communication Spped	C.12.bS	96, 192, 384	96	bps(×100)
	13	SWAP	C.13.SP	OFF/On	On	Floating data frame reverse (3, 4, 1, 2) selection

Rated current setting



Note) Don't change the switch during the operation.

1) IMC-III rated current can be selected 6A(0.5~6A), 60A(5~60A)
2) To select the rated current.
   ① Move to the slide switch to the rated current side in the rear side
   ② **User has to switch the IMC-III power OFF → ON**
   ③ Set the detail current by moving from A setting group to [4.r-C] group in the front side.
   - Setting by motor setting current
   - After finishing motor starting, set the 110~115% of real load current in the load operation condition.

Information

- **Load under 0.5A**
  - Set the CT ratio 0.5 or 0.25 in the [6.ctr]
  - MCT cable penetration increase from 2 times to 4 times
  - Rated current setting range : 0.25~3A(2 times), 0.125~1.5A (4 times)
- **Over 60A load**
  - Usage of external CT
  - CT ratio (1~200) : Maximum 1000A

Operating time setting

1) It can be set 1~60s in the A group in [2.O-t]
   ① In case of selecting inverse time in the [1.CHA]
   - Setting operation time is 600% standard of rated current
   ② In case of selecting the definite time
   - The standard is over 105% of rated current.
   - User has to set the operation delayed time 1~200s In the [3.d-t] considering motor operating time.

Special function key

Turn the heating capacity into clear and return by force

IMC-III inverse time protects overload fault by sensing the applied current on the motor, trace heating condition of motor. Motor has heating capacity until completed cold status even if . motor stopped. IMC-III accumulates heating capacity values similar with motor. In case of continuous re-start, or generating the trip, it can be tripped by acknowledgement Hot curve through the cumulated heating capacity,

Information

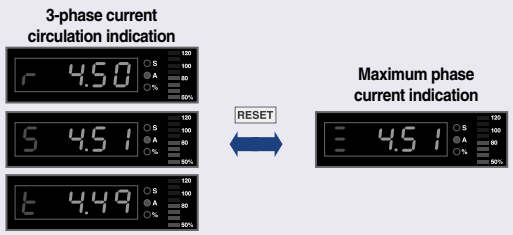
If user want to re-start even if damaged to motor, push the STOP + RESET button. in conclusion, cumulative heating capacity remove and can be reset.

Fault recording

IMC-III provides fault recording function even if power is OFF. If user push the ESC + ENT button, user can check the Fault analysis and fault current value. If user push the RESET button, fault analysis and fault recording will be deleted.
If there is no string data, it will be indicated “non” And then if user push the ESC + ENT button, it will come back to normal mode.

Transfer to current indication mode.

If user push the RESET button for 2 seconds, it will come back to current indication mode.



Note) If user push the RESET button for over 10s, IMC-III will come back first manufacturing status. At this time, user has to know that setting and storing value is deleted and comes back first manufacturing status.

Total operation time

Total operation time check : 2.tot → ENT → **day** → ▼ → **Hour minute**

ex) If total operation time is 50hours 50 minutes : 2.tot → ENT → 2 days → ▼ → 2.50(2 hours 50 minutes)

Operation time 3.r-t → ENT → **Total operation time** → ▼ → **converse day** → ▼ → **Extra hour, minutes**

ex) If operation time is 50 hours 50minutes : 3.r-t → ENT → 50 hours → ▼ → 2days → ▼ → 2.50 (2 hours 50 minutes)

Operation mode handling method

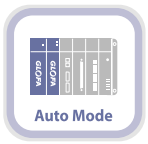
Operation priority : Local > MCC > Auto, W/L > Remote

Local operation panel mode

The local operation mode is the highest priority mode, When the emergency situation generates,
it can control motor in the local site. Only in case of closing switch to the local site, motor can be controlled.
At that time, Local LED of IMC-III is lighting on, can not be controlled in another modes.

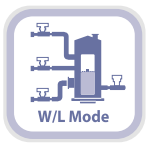
Motor control center mode

This mode is possible to operate in the IMC-III of MCC panel. If MCC LED is lighting up
by pushing the L/R button, it's possible to control motor in the IMC-III.
At this time, it can not be controlled by in AUTO.



Auto-PLC automatic operation mode.

This mode can provides automatic operation and remote control by PLC, DDC, DCS.
If auto / Rem LED lights up, motor is controlled by automatic operation.
It's possible to operate without converting mode in the IMC-III of MCC by operation priority.
And when the motor controls, operation mode convert to MCC.



W/L- Water level automatic operation mode

This mode is for automatic operation and remote control by water changes.
If W/L LED lights up by operating L/R button of IMC-III it can be controlled through the automatic operation.
It's possible to operate automatically through the PLC, DDC.
It's also possible to operate without converting mode in the IMC-III of MCC by operation priority.
And when the motor controls, operation mode convert to MCC.

Note) In case of using with Auto mode, the user has to compose of interlock circuit by using status output contact point.

Remote- communication operation mode

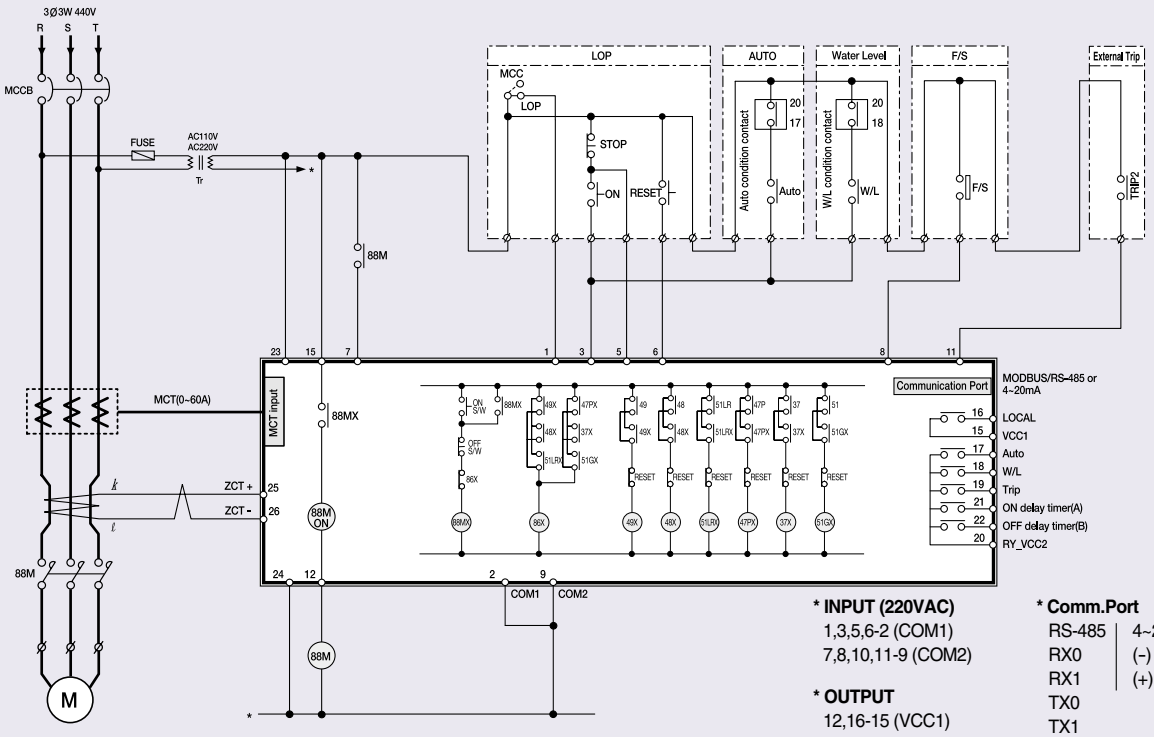
This mode is for remote monitoring control by Modbus, RS-485. If Auto/Remote LED lights up,
It's possible to communicate with Modbus/RS-485 and also check the 3phase value, fault value,
various data. **It's also possible to operate without converting mode in the IMC-III of MCC**
by operation priority. And when the motor controls, operation mode convert to MCC.

Note) 4~20mA output model can check only current Value through the Analog communication(4~20mA)

Intelligent Motor Controller

Wiring method

Direct start sequence



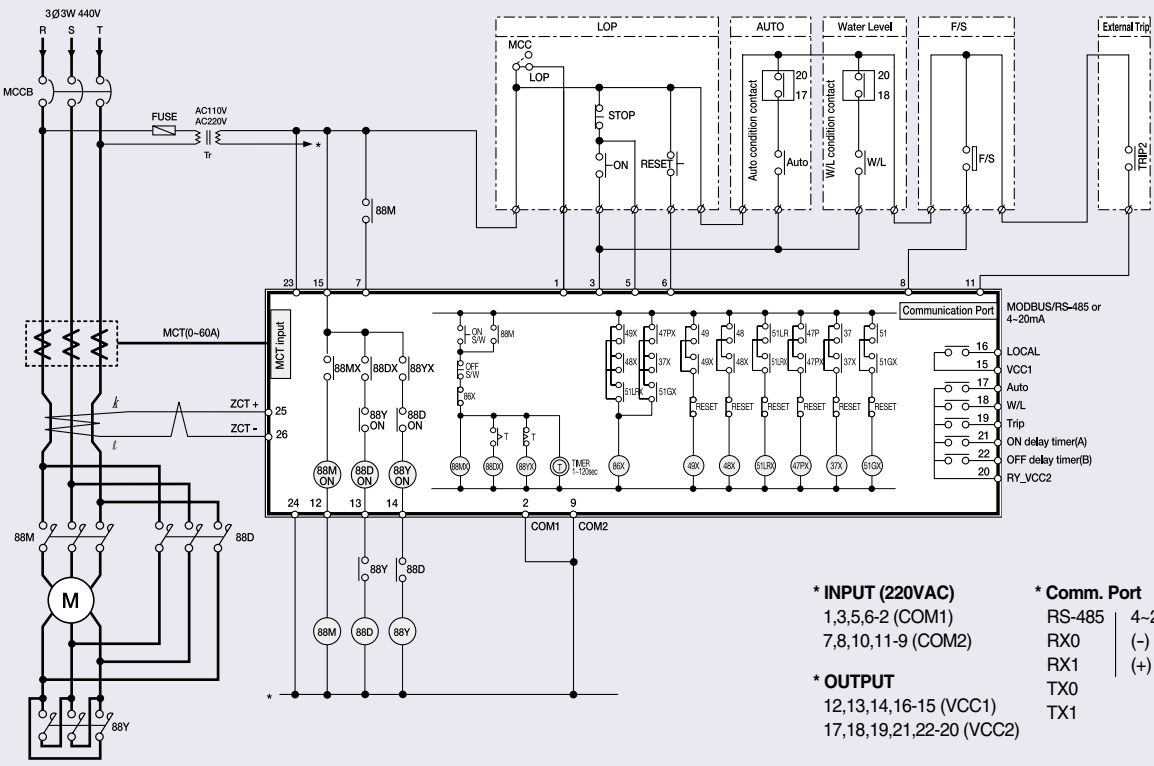
*** INPUT (220VAC)**
1,3,5,6-2 (COM1)
7,8,10,11-9 (COM2)

*** OUTPUT**
12,16-15 (VCC1)
17,18,19,21,22-20 (VCC2)

*** Comm.Port**

RS-485	4~20mA
RX0	(-)
RX1	(+)
TX0	
TX1	

Y-△ start



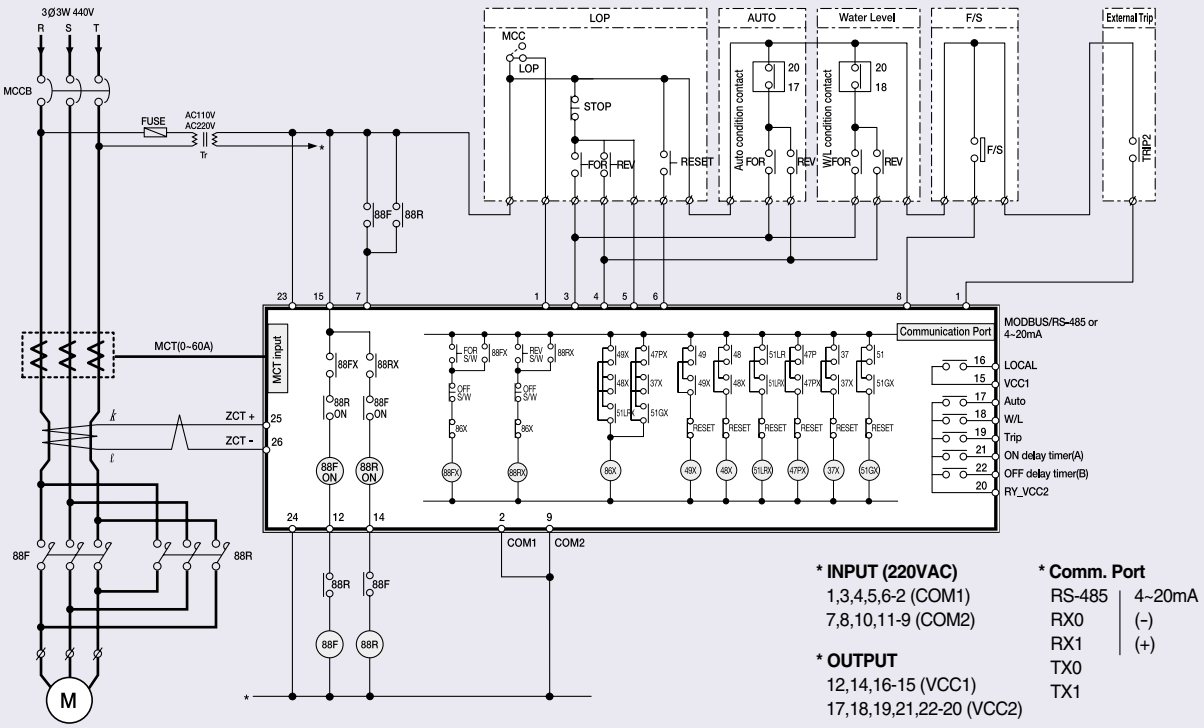
*** INPUT (220VAC)**
1,3,5,6-2 (COM1)
7,8,10,11-9 (COM2)

*** OUTPUT**
12,13,14,16-15 (VCC1)
17,18,19,21,22-20 (VCC2)

*** Comm. Port**

RS-485	4~20mA
RX0	(-)
RX1	(+)
TX0	
TX1	

For/Rev start



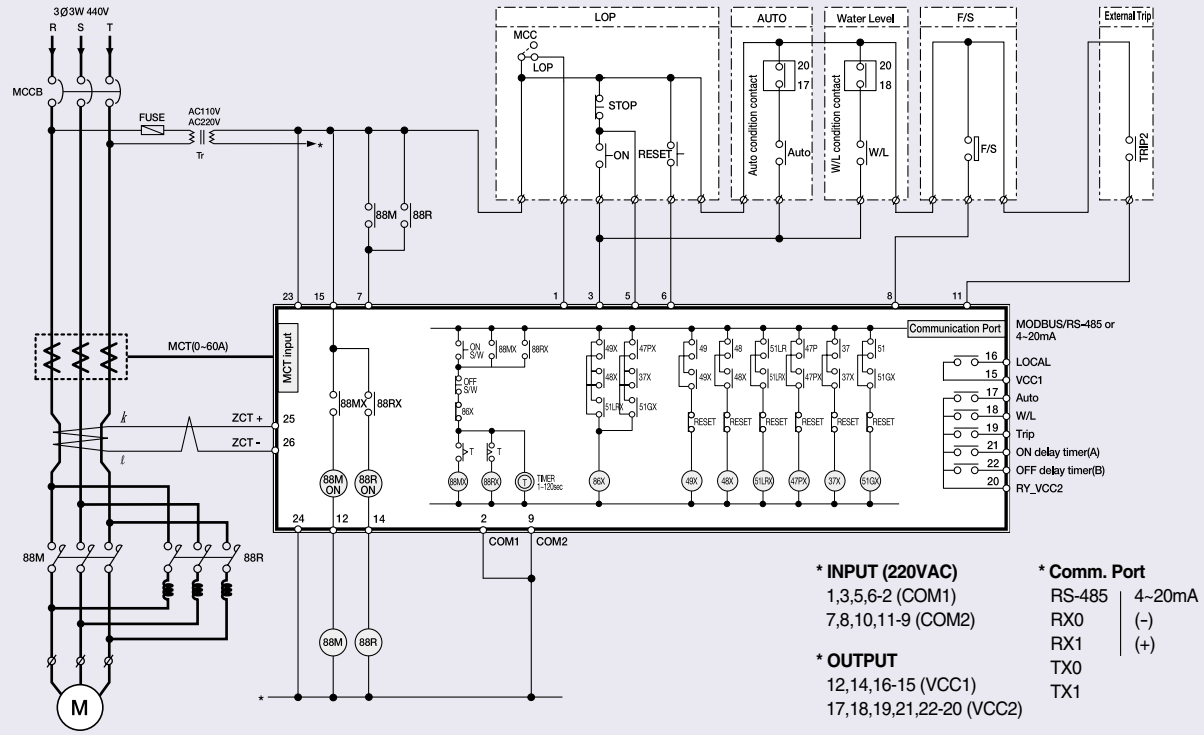
*** INPUT (220VAC)**
1,3,4,5,6-2 (COM1)
7,8,10,11-9 (COM2)

*** OUTPUT**
12,14,16-15 (VCC1)
17,18,19,21,22-20 (VCC2)

*** Comm. Port**

RS-485	4~20mA
RX0	(-)
RX1	(+)
TX0	
TX1	

Reactor start



*** INPUT (220VAC)**
1,3,5,6-2 (COM1)
7,8,10,11-9 (COM2)

*** OUTPUT**
12,14,16-15 (VCC1)
17,18,19,21,22-20 (VCC2)

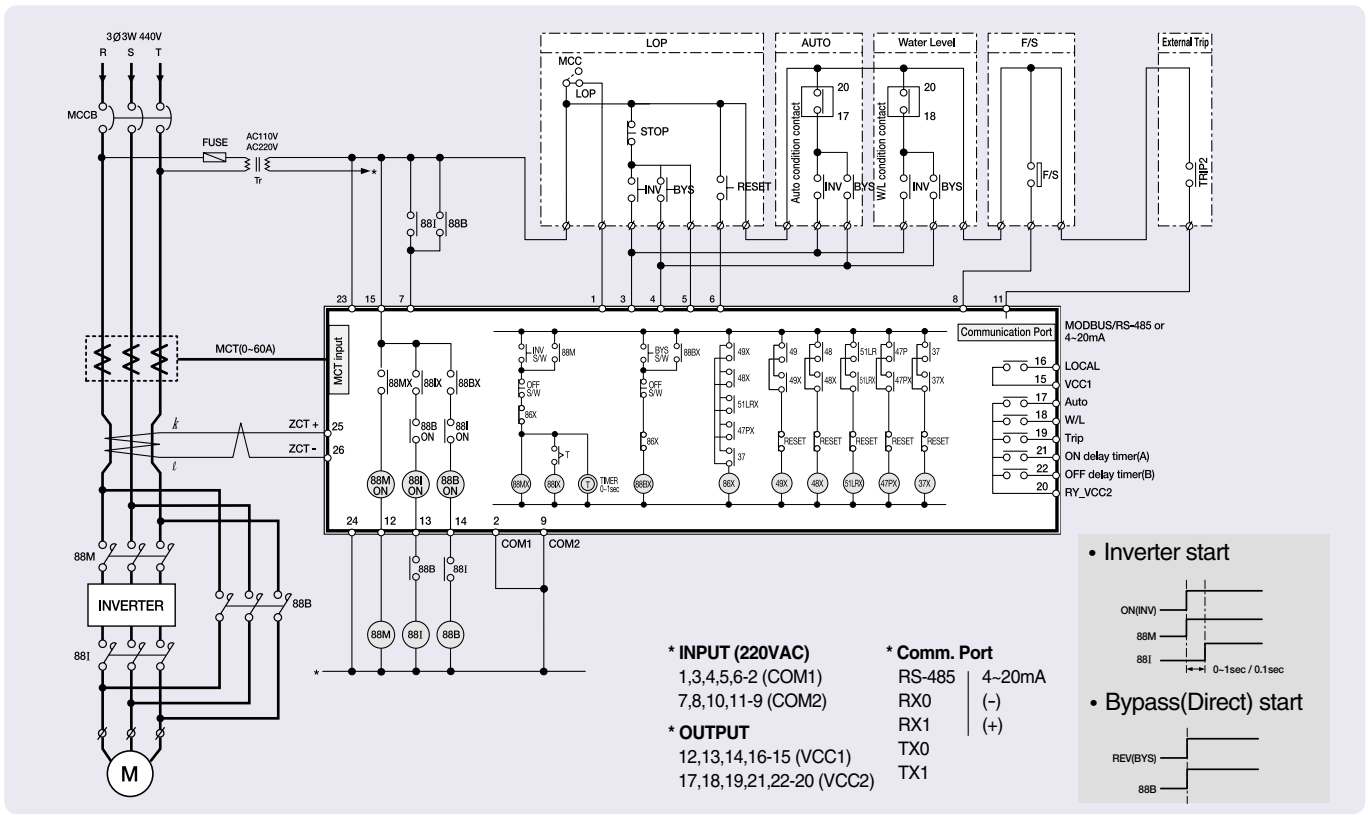
*** Comm. Port**

RS-485	4~20mA
RX0	(-)
RX1	(+)
TX0	
TX1	

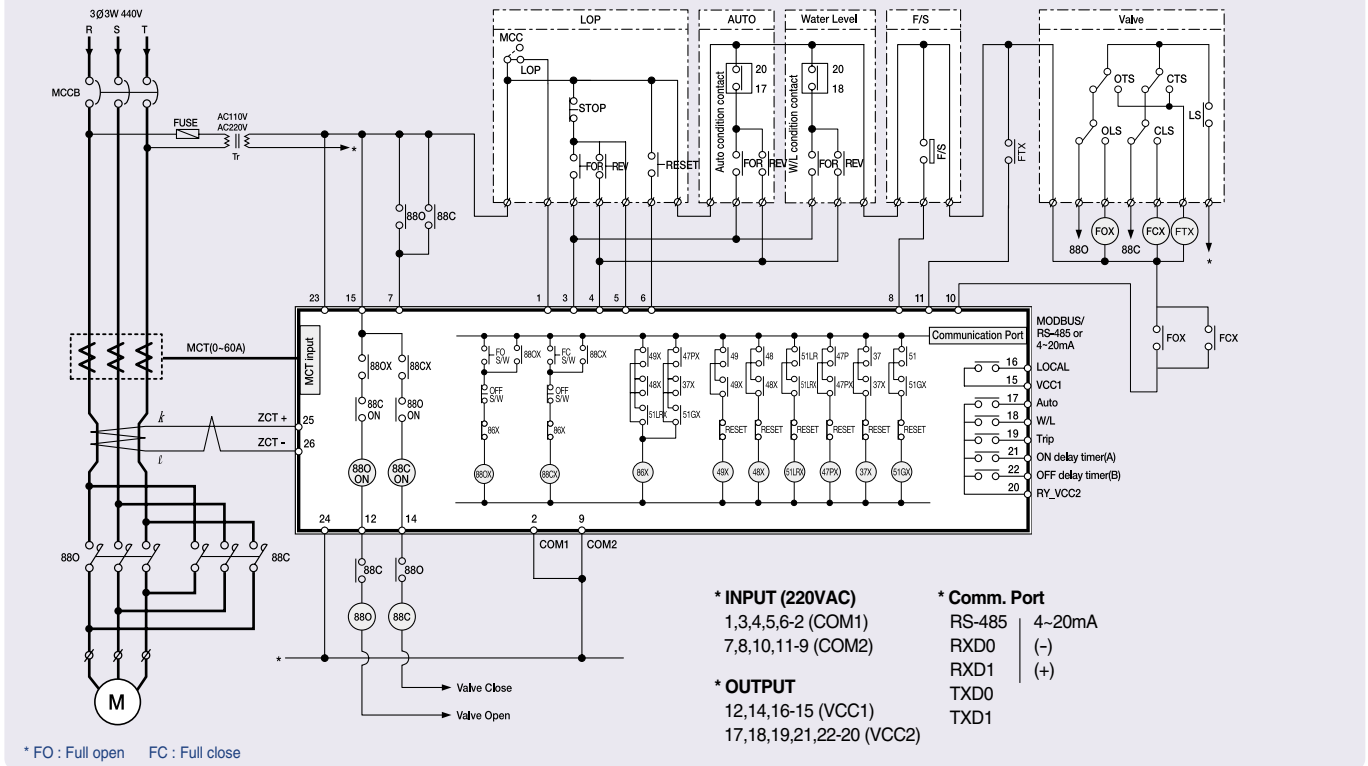
Intelligent Motor Controller

Wiring method

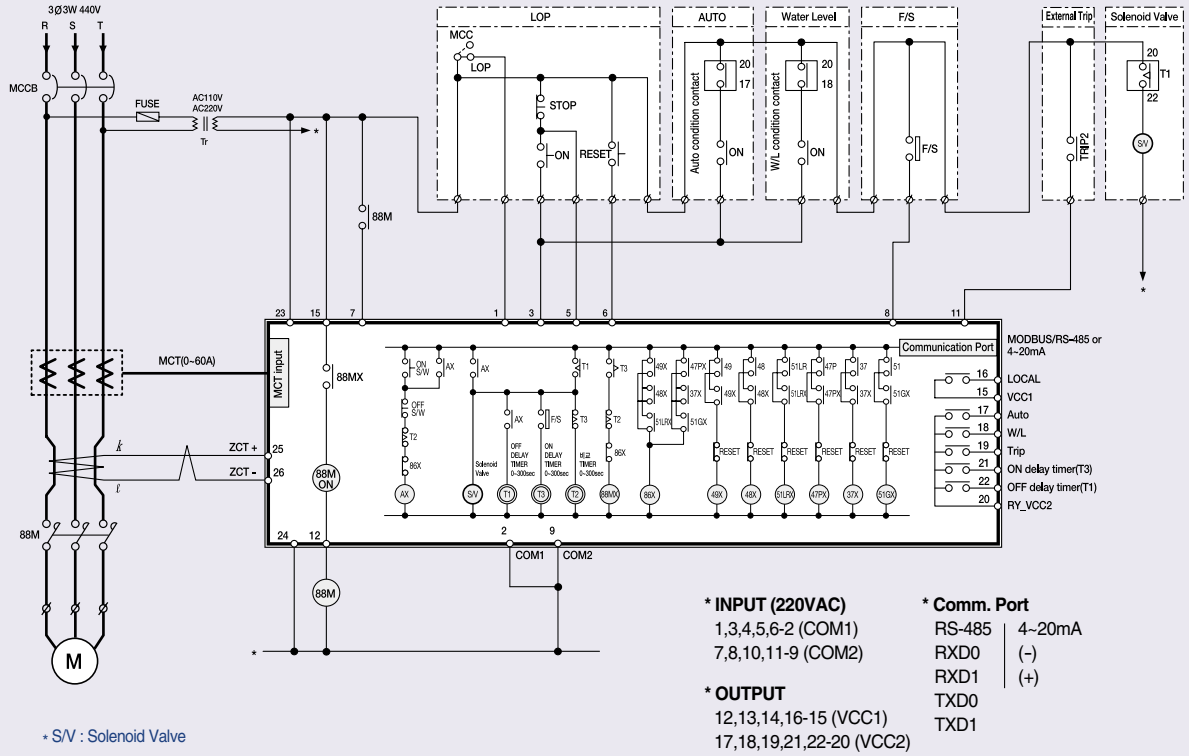
Inverter start



FO/FC start(Forward)



S/V valve start(Direct)



* S/V : Solenoid Valve

① If ON S/W applied, S/V(Solenoid Valve) becomes ON, OFF Delay Timer (T1) becomesON.
② If F/S (Flow Switch) applied within [T2-T3] time, ON Delay timer (T3) becomes ON.
③ If (T3) becomes ON, comparison timer (T2) becomes OFF after setting time. And then Motor will operate because 88MX becomes ON.
④ At this time, if F/S does not apply within setting [T2-T3], ON will be canceled and then "t2-F" will be indicated.
⑤ Comparison timer(T2) has to be set more than ON Delay Timer (T3), user has to consider time margin until F/S application.
⑥ If OFF s/w applied for motor stop, S/V and motor will be OFF delay same as (T1) time
⑦ If F/S input is removed during motor operation, 88MX will be OFF, motor will be stopped. At this time S/V will be OFF.

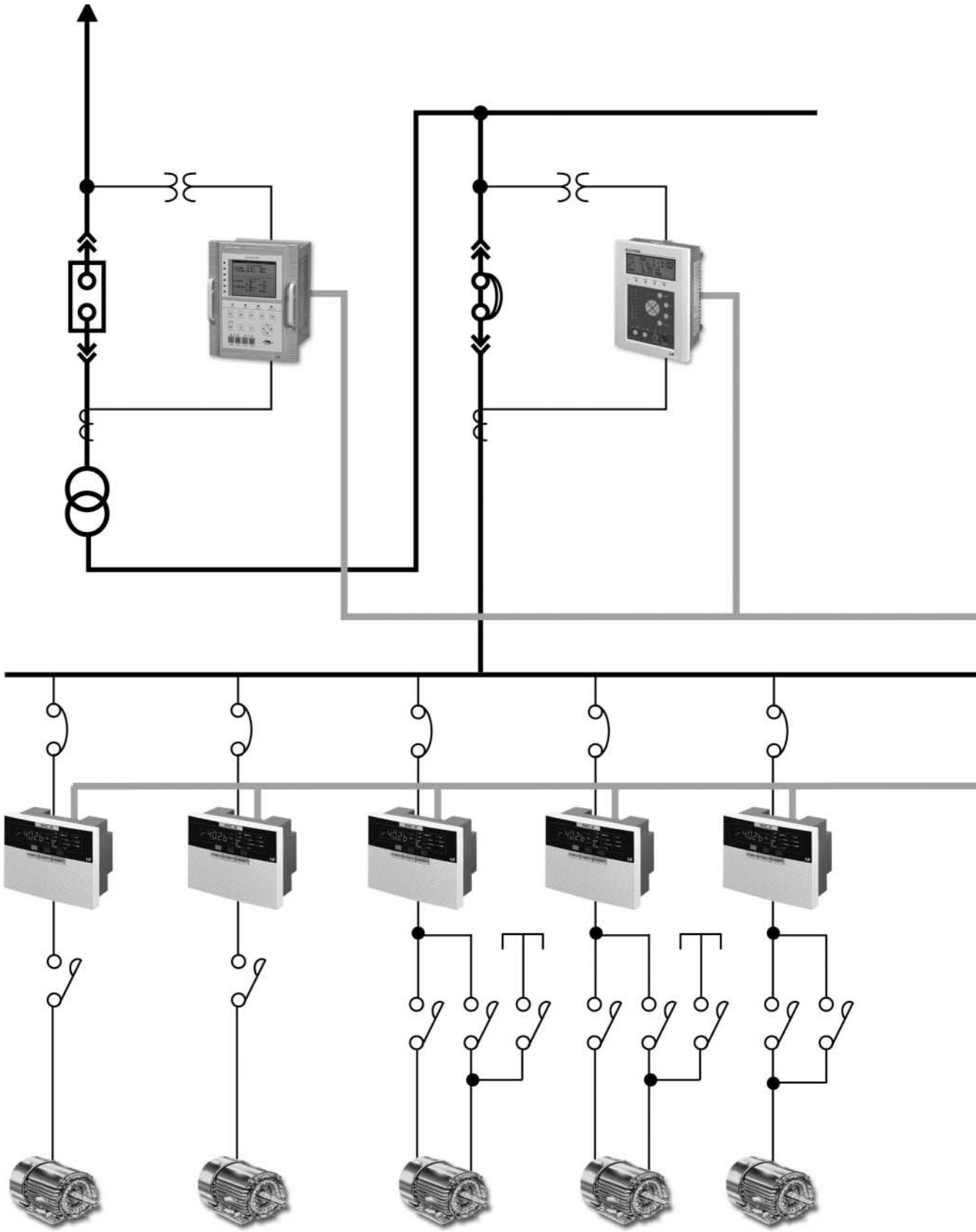
Terminal number

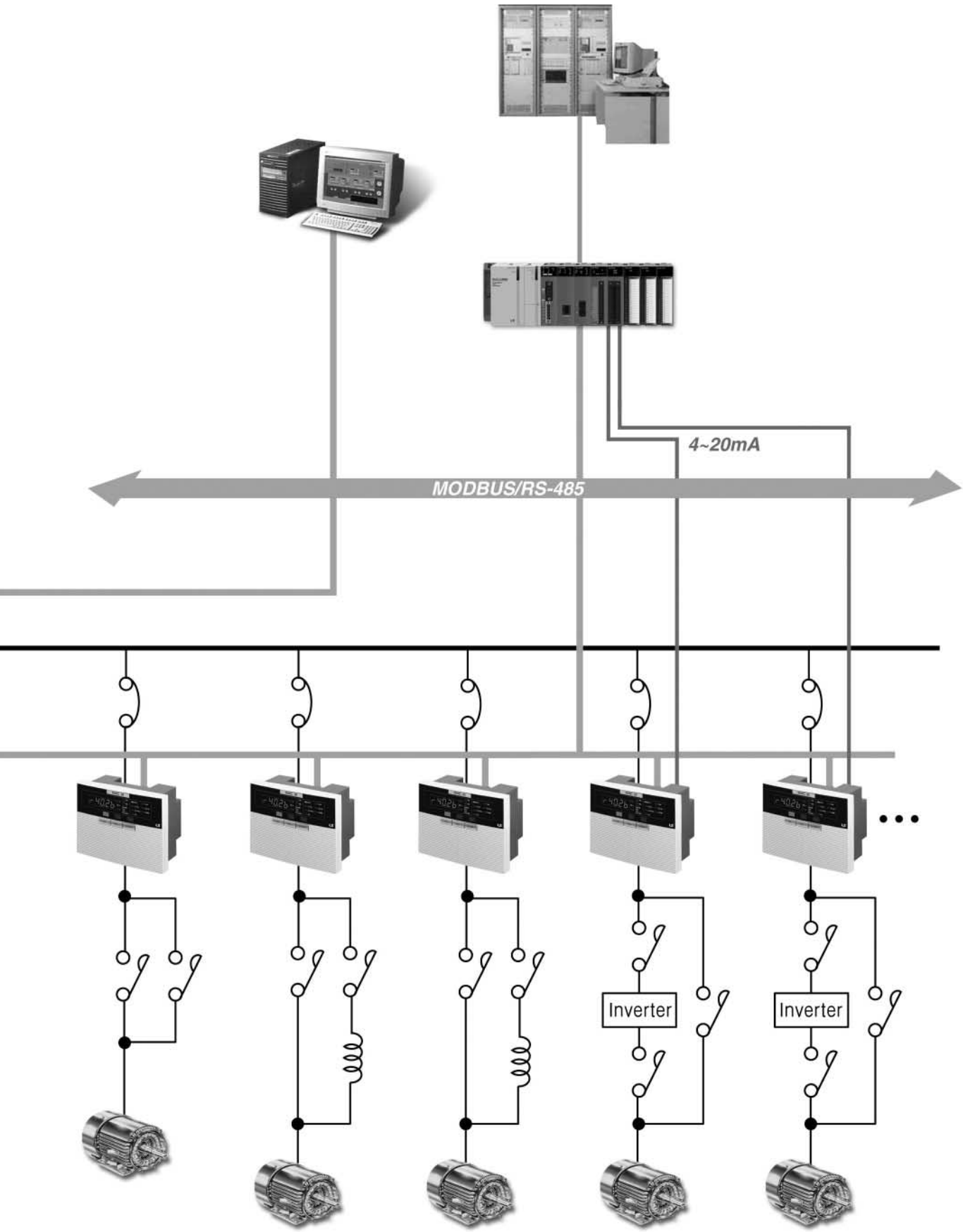
Terminal No	Explanation	Terminal No	Explanation
1	LOP selection input	14	Y-start/Reverse rotation/Reactor/Bypass contact point output
2	COM1(1, 3, 4, 5, 6)	15	VCC1(12, 13, 14, 16)
3	ON input	16	LOP condition output
4	Reverse rotation ON input(Bypass)	17	Auto condition output
5	Stop input	18	Water level condition output
6	Reset input	19	TRIP output(1a)
7	MC condition input	20 *	VCC2(17, 18, 19, 21, 22)
8	F-S mode input	21 *	ON delay timer output(t-d, F-S mode)
9	COM2(7, 8, 10, 11)	22	OFF delay timer output(t-d, F-S mode)
10	External trip1 input	23	Control power(AC110V or 220V)
11	External trip2 output	24	Control power(AC 110V or 220V)
12	ON output	25	ZCT input(k)
13	△start/Inverter contact output	26	ZCT input(ℓ)

* Normal mode
  - 20-21 : Operation alarm("OrH") output
  - 20-22 : not in use

Intelligent Motor Controller

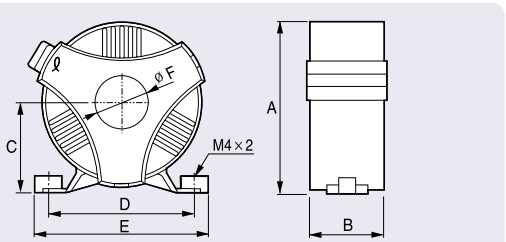
System configuration




4~20mA
MODBUS/RS-485
Inverter
Inverter

Accessories

ZCT(Zero-phase current transformer)



Contents	Inside diameter (mm)	Zero phase current transformer ratio	Weight (kg)
LZT-025(I)	25	200mA/0.1mA	0.5
LZT-040(I)	40		0.8
LZT-080(I)	80		0.4

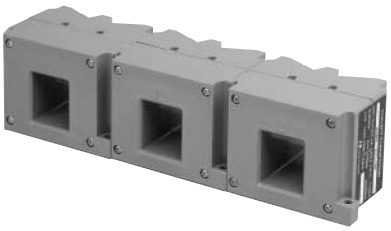
Dimension(mm)	A	B	C	D	E	ø F
LZT-025(I)	81	43	43.5	68	81	25
LZT-040(I)	101	43	53.5	88	101	40
LZT-080(I)	146	43	76	133	146	80

Note) This product is only for IMC, and user has to use this ZCT for protection ground fault.

SCT(3CT)

1CT

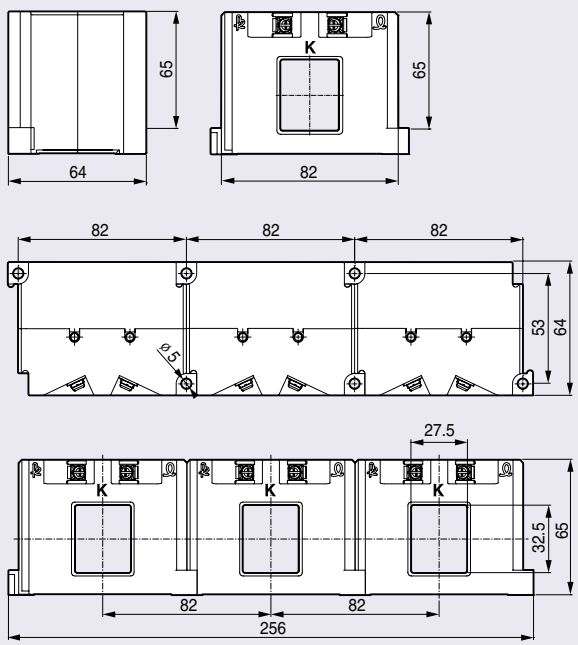
3CT(Combination of 1CT 3EA)



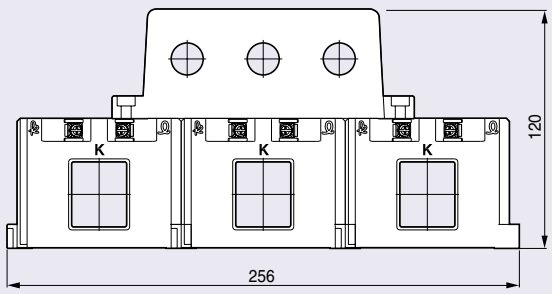
Ratings

Model		3CT
Current transformer ratio	SCT-100	100:5A
	SCT-150	150:5A
	SCT-200	200:5A
	SCT-300	300:5A
	SCT-400	400:5A
Class		1.0
Burden		5VA
Insulated voltage		AC 600V
Insulated internal pressure		2kV
Insulation resistance		10M Ω (DC 500V Megger)
Mounting		Panel

Dimension



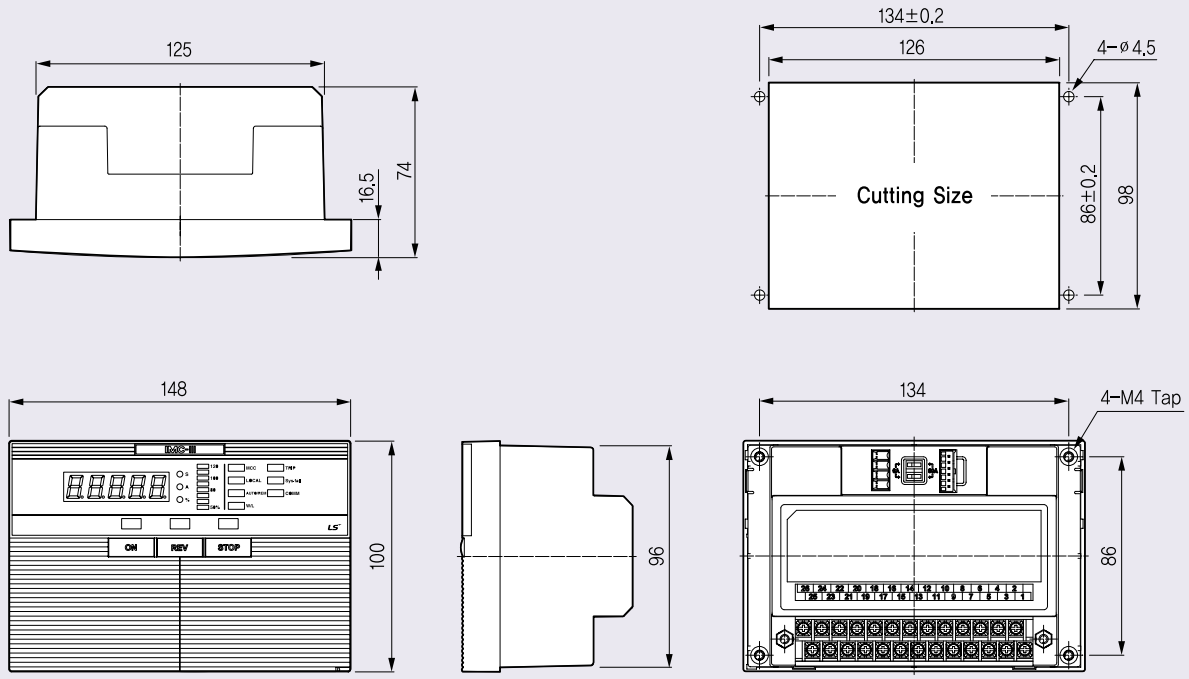
In case of MCT combination



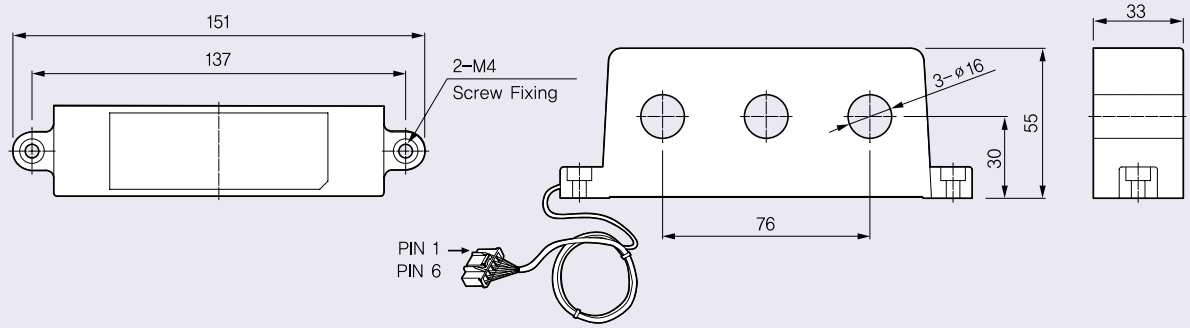
Note) 1. This product is only for EMPR, IMC, user must not use for other service
2. Pls order each 3EA with IMC-III, because this product is 1CT type.

Dimensions

IMC-III main unit



MCT



Ordering

IMC-III

NO

Item	
NO	Normal (No communication)
M485	Modbus/RS-485
A420	Analog 4~20mA

2M

MCT cable length	
2M	2m
4M	4m

AC 110V

Operation and control power
AC 110V
AC 220V

50/60Hz

Frequency
50/60Hz