

Derwent
Top 100
Global
Innovator
2020

Optimized LS System Drive Panel



LS ELECTRIC

LS Leads You to the Advanced Industry!

LS drives, widely used in a variety of applications such as cranes, elevators, steel manufacturing, automobiles, air conditioning and water treatment plants. LS Drives meet rigorous standards set by strict quality, marine, environment and many other international regulations; and thrives to expand its market share beyond Korea, by continuously adopting new technologies and hidden needs of our potential customers.

LS Drive Solution offers Optimized Energy Saving!

- Easy to use & easy to maintenance design
- Built-in AC reactor for harmonic reduction
- Built-in standard sequence meets all operating conditions
- Vector system, high capacity & energy saving



Energy saving



Human interface design



Built-in AC reactor

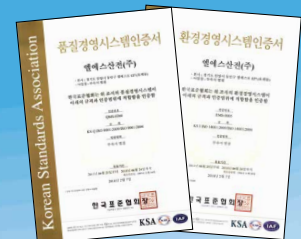


Built-in standard sequence



Vector control

Applications : Oil & gas, food & beverages, water & waste water, power generation, metal processing, chemicals, ship building & marine, rubber & plastics, cement, papers



ISO9001,14001

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HVAC Compact Solution

LS HVAC compact drive panel offers not only optimized compact design but also additional filter option based on customer needs.



* Option box (DC reactor, AC reactor, dv/dt filter, Y- Δ starting)

Panel Configuration

- Standard design (Built-in DOL bypass)
- Applicable customized design (Additional filter, Etc.)

Customer Optimized Solution

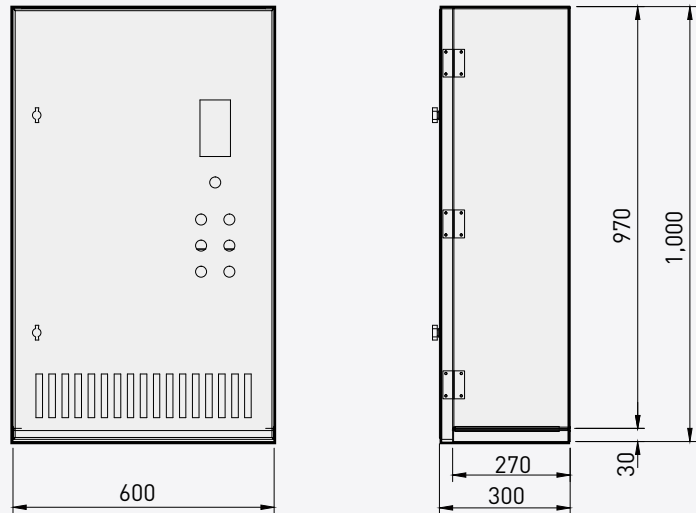
- Wall mountable design for building HVAC system
- Short lead time with standard design in local factory (Korea, Vietnam)

Applicable Drive & Option

- H100 series
- Built-in DOL (Y- Δ option)
- Applicable various operation mode (Remote/Panel)

Dimension

Standard (Built-in DOL* Bypass)

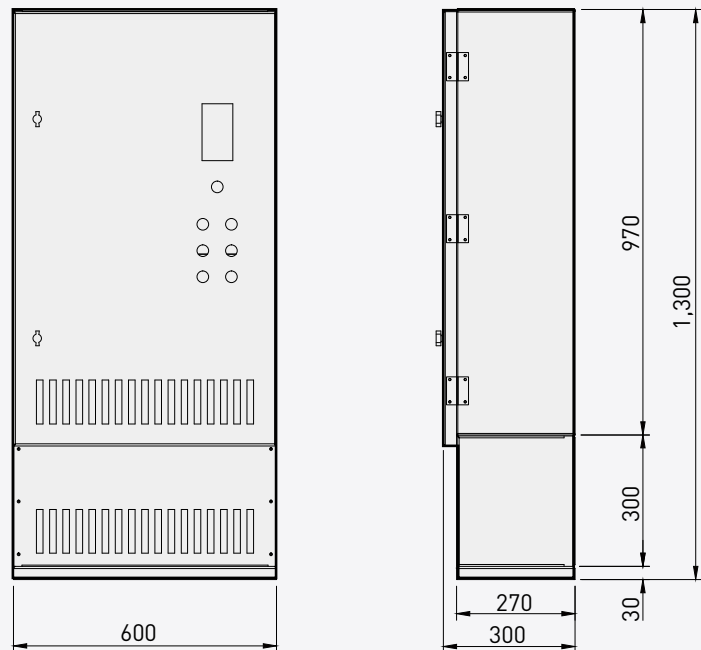


W/D/H[mm] : 600/300/1000 (~ less than 30kW)
W/D/H[mm] : 900/400/1150 (~ less than 90kW)

Note) Based on H100 series

* DOL : Direct on line

Additional Option Box

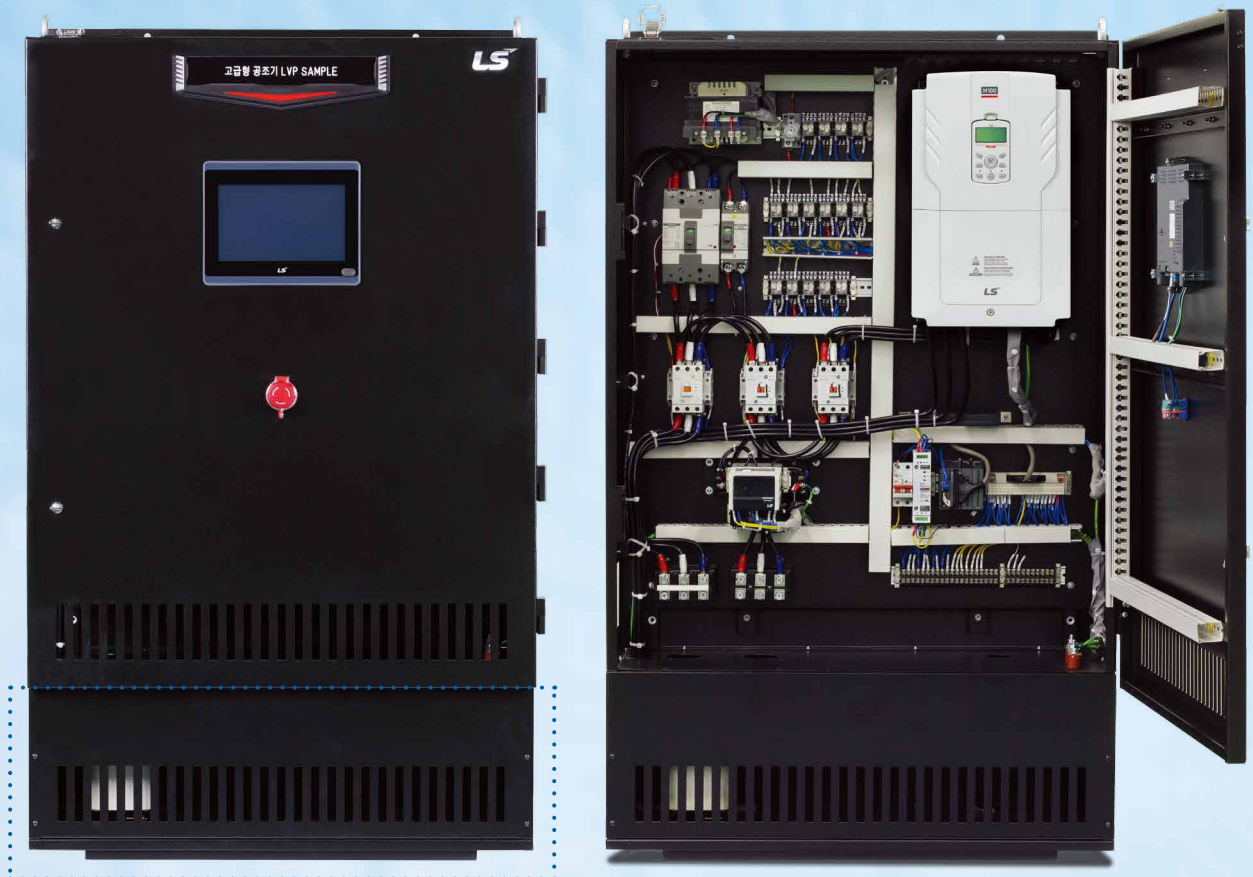


W/D/H[mm] : 600/300/1300 (Option BOX : 300mm)
W/D/H[mm] : 900/400/1500 (Option BOX : 300mm)

Note) Based on H100 series

HVAC Premium Solution

LS HVAC premium drive panel offers optimized customer solution with LS PLC/HMI in demand for control & monitoring.



* Option box (DC reactor, AC reactor, dv/dt filter, Y- Δ starting)

Panel Configuration

- Standard design (Built-in DOL bypass)
- Built-in LS HMI
- Built-in LS PLC for customizing

Customer Optimized Solution

- Wall mountable design for building HVAC system
- Customizing solution with PLC for various field condition
- Short lead time with standard design in local factory (Korea, Vietnam)

Applicable Drive & Option

- H100 series
- Built-in DOL (Y- Δ option)
- Various operation information on HMI

LS Optimized Solution

Built-in LS PLC (XBM)

- XBM main unit + XGT analog I/O module (Applicable additional module)
- PLC wiring with XTB-40J terminal

Specification

- Main unit I/O points : Input 16 / Output 14
- HVAC drive panel use 10 points input and 8 points output
 - Input : Additional 6 points possible
 - Output : Additional 6 points possible
 - 2 points for high-speed counter (Disable)



Built-in LS HMI (eXP60)

Specification

- 10.2" TFT LCD-applied wide type
- LED backlight adopted for enhanced contrast ratio and low-power
- Wide variety of communication interfaces
 - Serial : 2 channel RS232C/RS485, 1 channel RS422/485 combination
 - EtherNet : 1 channel 10/100Base-TX
- Large memory for drawing (64MB)
- RTC function (Maintained by battery)
- Convenient downloading/Uploading of drawings via USB port in the front
- IP65 enclosure
- Certificates : CE, UL, KC



HVAC Premium Solution

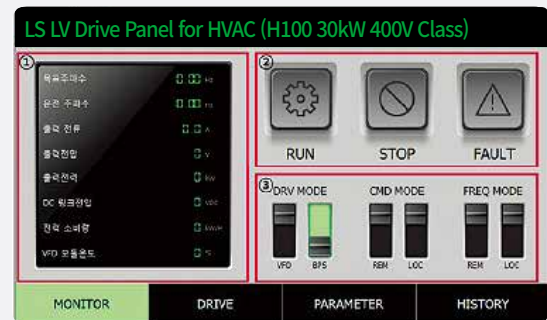
Customer Optimized Solution

HMI Configurations & Features

- Operation information & monitoring
- Operation control with HMI (Without keypad)
- Parameter check & setting
- History check

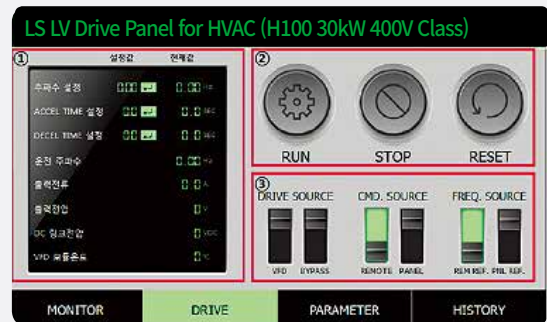
1. Monitoring

- Operation information
- Operation status
- Operation mode



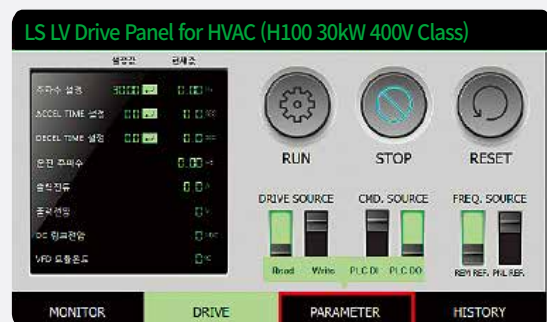
2. Operation Control

- Frequency, Acc./Dec. time setting
- Drive status control
- Mode selection



3. Parameter Setting

- Parameter read
- Parameter write
- PLC DI/DO status check



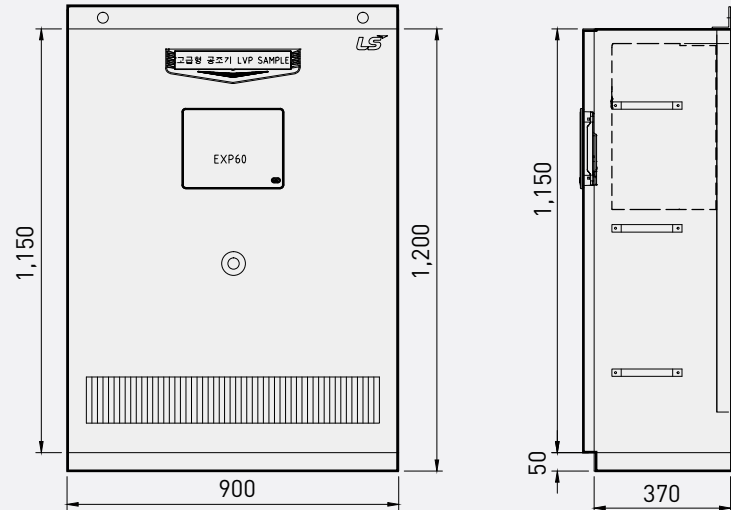
4. History Check

- Drive & event log (Run/Stop/Trip/Etc.)
 - Yellow shadow: Recovery record
 - White shadow: Current status
- USB back-up



Dimension

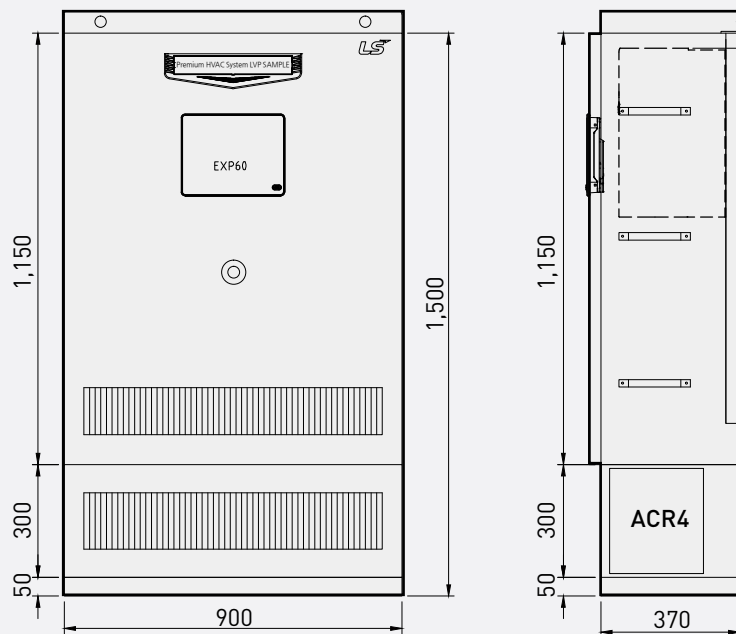
Standard



W/D/H [mm] : 600/300/1000 (~ less than 30kW)
W/D/H [mm] : 900/400/1150 (~less than 90kW)

Note) Based on H100 series

Additional Option Box



W/D/H [mm] : 600/300/1300 (Option BOX : 300mm)
W/D/H [mm] : 900/400/1500 (Option BOX : 300mm)

Note) Based on H100 series

Plant Solution

LS Plant drive panel offers optimized motor control and energy saving solution in various factories.



Panel Configuration

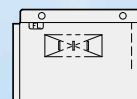
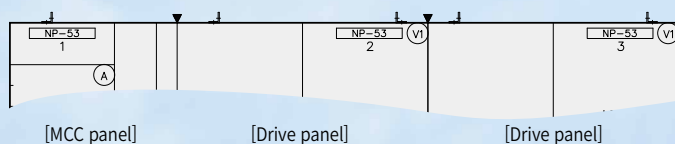
- Standard design (Built-in DOL bypass)
- LS PI applied on door control

Applicable Drive & Option

- iS7, H100 series
- Y- Δ / Reactor / Soft starter starting option

Customer Optimized Solution

- Customized design
 - dv/dt filter, sine wave filter, flame retardant cable (XHHW), Draw-out type panel, harmonic filter, Etc.
- MCC-drive package solution
 - Power busbar connection between MCC and drive panel



[MCC panel]

[Drive panel]

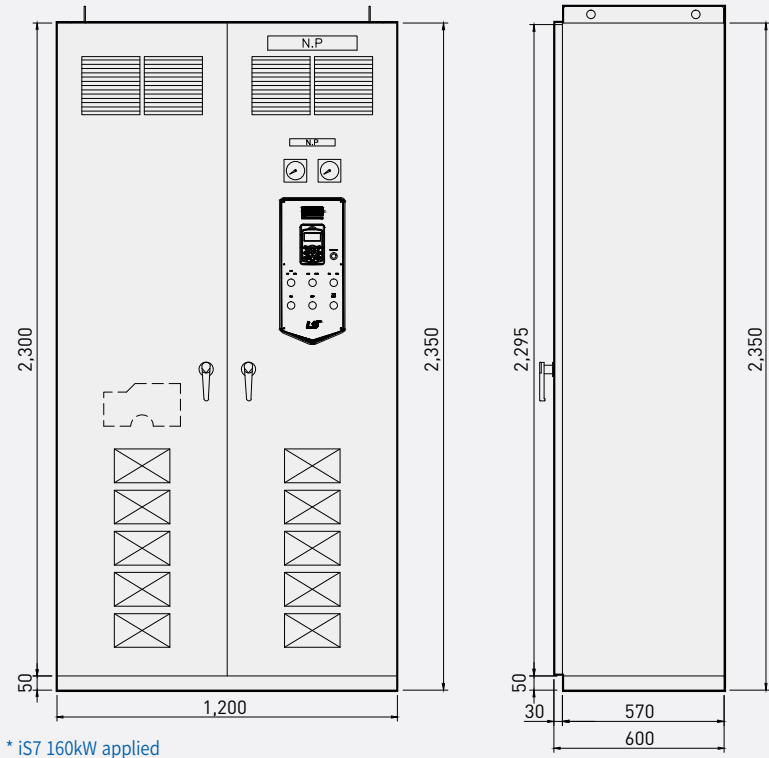
[Drive panel]

[Front inner view]

[Left inner view]

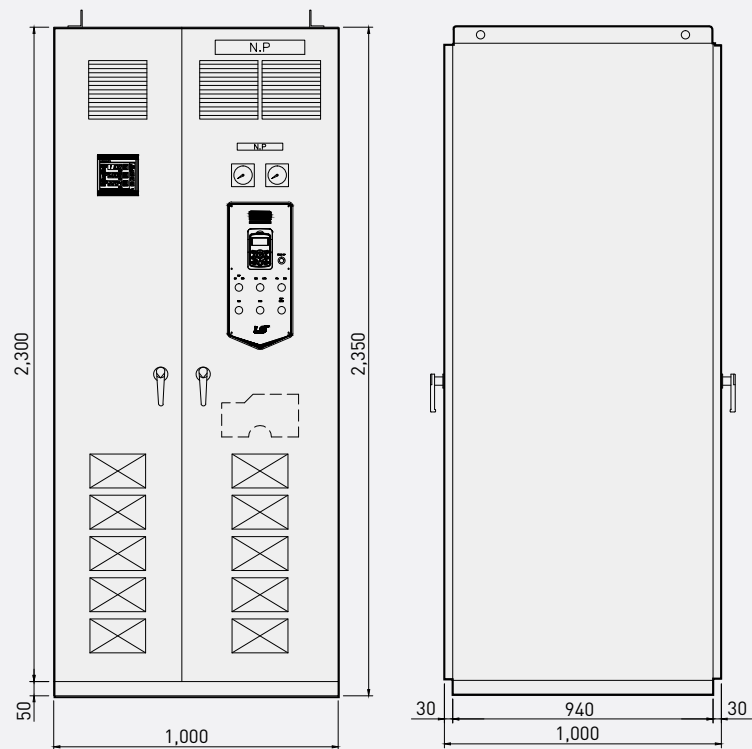
Dimension

Front Open Type

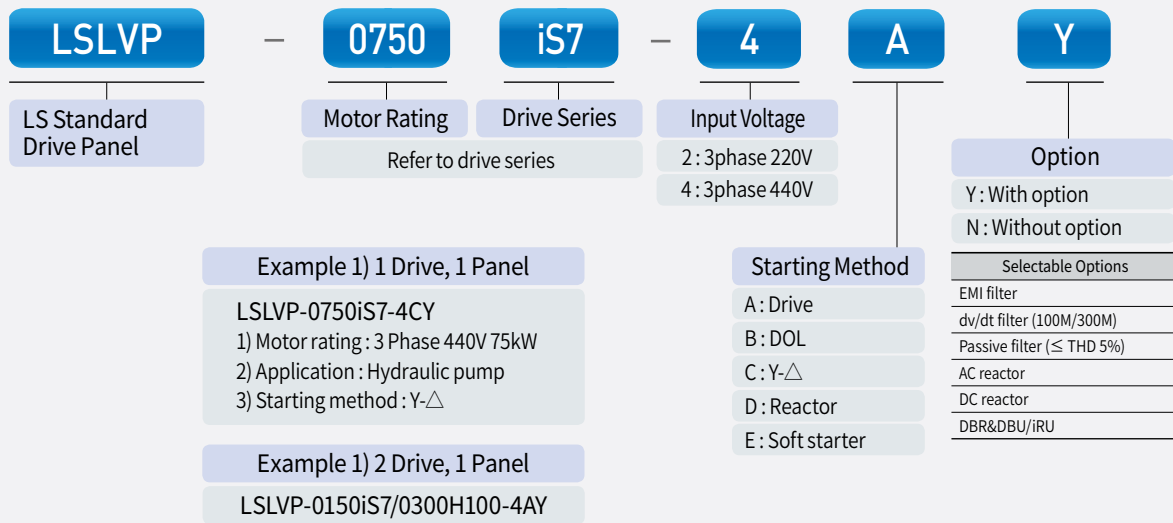


* iS7 160kW applied

Front/Rear Open Type



Model & Type



Drive Series (Units, 400V Class)

Rated Motor	Drive Series (Units)	
	H100 (Fan & pump)	iS7 (General purpose)
0.75kW	0008H100-4	0008 iS7-4
1.5kW	0015H100-4	0015 iS7-4
2.2kW	0022H100-4	0022 iS7-4
3.7kW	0037H100-4	0037 iS7-4
5.5kW	0055H100-4	0055 iS7-4
7.5kW	0075H100-4	0075 iS7-4
11kW	0110H100-4	0110 iS7-4
15kW	0150H100-4	0150 iS7-4
18.5kW	0185H100-4	0185 iS7-4
22kW	0220H100-4	0220 iS7-4
30kW	0300H100-4	0300 iS7-4
37kW	0370H100-4	0370 iS7-4
45kW	0450H100-4	0450 iS7-4
55kW	0550H100-4	0550 iS7-4
75kW	0750H100-4	0750 iS7-4
90kW	0900H100-4	0900 iS7-4
110kW	1100H100-4	1100 iS7-4
132kW	1320H100-4	1320 iS7-4
160kW	1600H100-4	1600 iS7-4
185kW	1850H100-4	1850 iS7-4
220kW	2200H100-4	2200 iS7-4
250/280kW	2500H100-4	2800 iS7-4
315kW	3150H100-4	3150 iS7-4
355/375kW	3550H100-4	3750 iS7-4
400/450kW	4000H100-4	
500kW	5000H100-4	

Note) H100 series rating is based on normal duty

Drive Unit Specifications

* Based on the standard specifications

Drive Unit	iS7	H100
Control Method	V/F, V/F PG, slip compensation, sensorless vector 1/2, vector control	V/F, slip compensation
Frequency Setting Resolution	Digital command: 0.01Hz Analog command: 0.06Hz (based on 60Hz)	Digital command: 0.01Hz Analog command: 0.06Hz (based on 60Hz)
Frequency Tolerance	Digital command: 0.01% of the Max. frequency Analog command: 0.1% of the Max. frequency	1% of the Max. frequency
V/F Pattern	Liner, squared overload reduction and user V/F	Liner, squared overload reduction and user V/F
Output Frequency	0~400Hz	0~400Hz
Overload Capacity	CT(HD): Rated current 150% 1min, 200% 0.5sec. VT(ND): Rated current 110% 1min	0.75~90kW: rated current 120%, 1min 110~500kW: rated current 110%, 1min
Torque Boost	Manual, automatic	Manual, automatic
Drive Mode	Keypad, terminal block or communication control	Keypad, terminal block or communication control
Frequency Setting	Analog: -10~10V, 0~10V, 0~20mA Digital: Keypad	Analog: -10~10V, 0~10V, 0~20mA Digital: Keypad and pulse train input
Control Function	PID control, up-down operation, 3-wire operation, DC brake, frequency limit, frequency jump, second function, slip compensation, reverse rotation prevention, auto restart, drive by-pass, auto tune flying start, energy buffering, power braking, flux braking, leakage current reduction, MMC, easy start	PID control, 3-wire control, frequency limitation, secondary functions, forward/reverse rotation prohibited, DC braking, commercial power switching, speed search, power braking, reduction of leakage, up-down control, DC braking flux braking, frequency pump, slip compensation, automatic restart, automatic tuning, energy buffering control, energy-saving control
Trip Function	Over voltage, low voltage, over current, over current detection, drive overheat, motor thermal protection, phase loss, protection, overload protection, communication error, frequency command loss, hardware failure, cooling fan failure, pre-PID, failure, no motor trip, external brake trip. Safety function, etc.	Over-current trip, Trip caused by external signals, ARM short-circuit current trip, Overheat trip, Pipe broken trip, Input open-phase trip Ground trip, Motor overheat trip, IO board connection trip, No Motor trip, Parameter Write trip, Emergency stop trip, Command loss trip, External memory error, CPU watchdog trip, Motor under-load trip, Overvoltage trip, Temperature sensor trip, Drive overheat, Option trip, Output open-phase trip, Drive overload trip, Fan trip, Low voltage trip during operation, Low voltage trip, Analog input error, Motor overload trip, Keypad command loss trip, Damper trip, Level Detect trip, All auxiliary motor failure trip, Pump clean failure (fault)
Alarm Function	Stall prevention, overload, diminished load, encoder error, fan failure, keypad command loss, speed command loss	Command loss trip alarm, overload alarm, under-load alarm, drive overload alarm, fan operation, alarm, damping resistance brake percentage alarm, capacitor life alarm, pump clean alarm, fire Mode alarm and LDT alarm
Certificates	CE, UL	CE, UL

Drive Panel Specifications

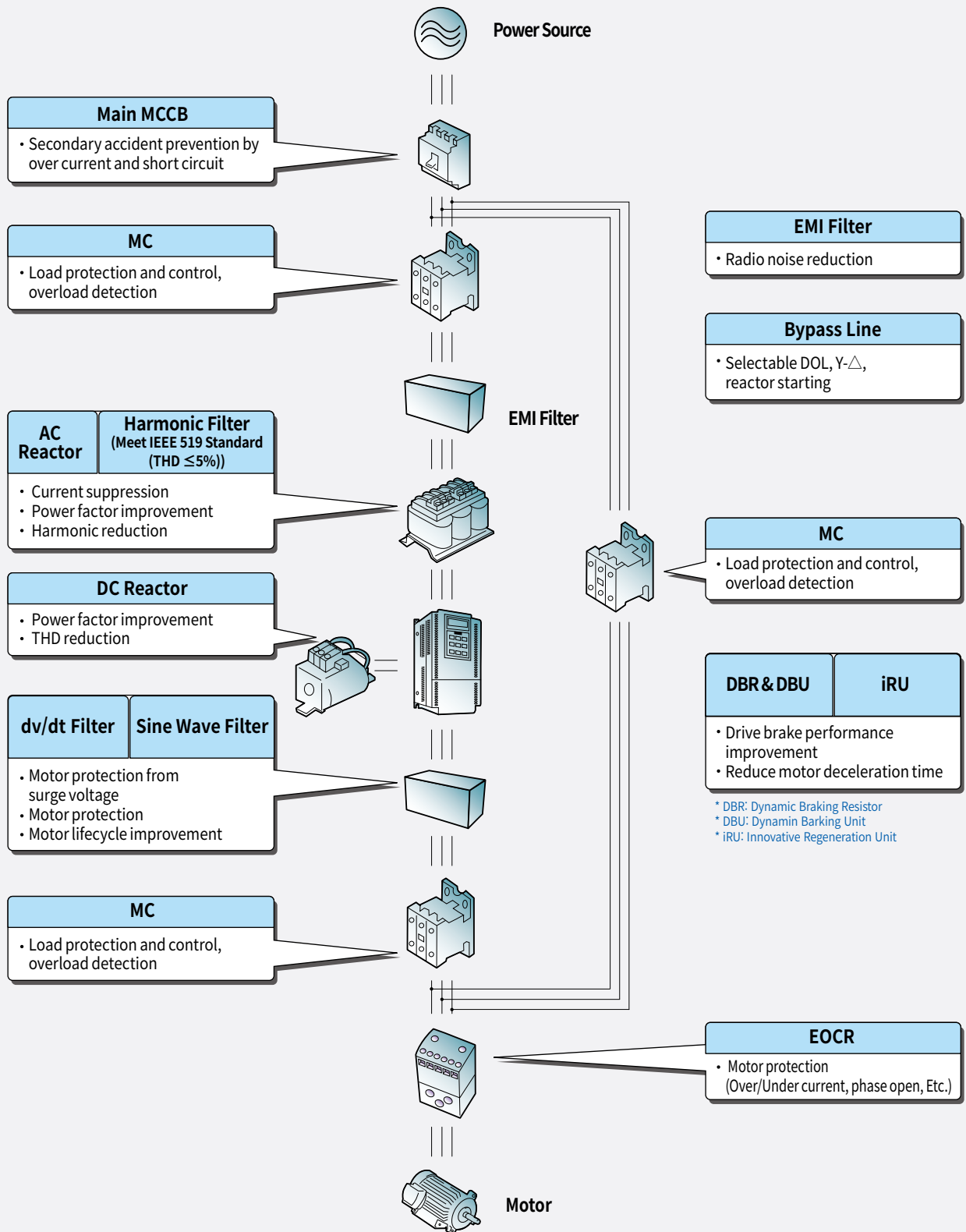
* Based on the standard specifications

Item	For Plant	For HVAC
Bypass Line	Standard : DOL Option: Y- Δ , reactor, soft starter	Standard : DOL Option: Y- Δ
Harmonic Filter	AC Reactor, DC reactor (Built-in iS7 up to 220kW) Option: Passive filter (\leq THD 5%)	AC reactor, DC reactor (Built-in H100 37~500kW)
Noise Filter	EMI filter built-in iS7 (up to 22kW)	EMI filter built-in H100
Output Filter	Under 500M: dv/dt filter Over 500M: Sine wave filter	- (Under 50M)
Shape	Standard: 1 drive / 1 panel Option: Others	Standard: 1 drive / 1 panel Option: others
Color	Customized	Customized
Structure	Indoor stand alone (Front/Rear open)	Indoor stand alone (Front open)
Thickness	Frame: 2.3t, Door: 2.3t (Option: 3.2t)	Frame: 2.3t, Door: 2.3t
Cable In/Out	Bottom/Bottom	Bottom/Bottom
Cooling Method	Forced air cooling	Natural cooling, forced air cooling
Operation Method	Panel, local, DCS	Panel, remote
Speed Reference	Manual, auto	Manual, auto
Starting Method	Drive, bypass	Drive, bypass
Panel Operation	Run, stop, reset	Run, stop, reset
Indicating Lamp	Run, stop, trip	Run, stop, trip
Enclosure	IP21, IP42(Option)	IP21

Note) Cable I/O, paint film, color and so forth may change upon customers' request.

Option

Drive Panel Option & Peripheral Device



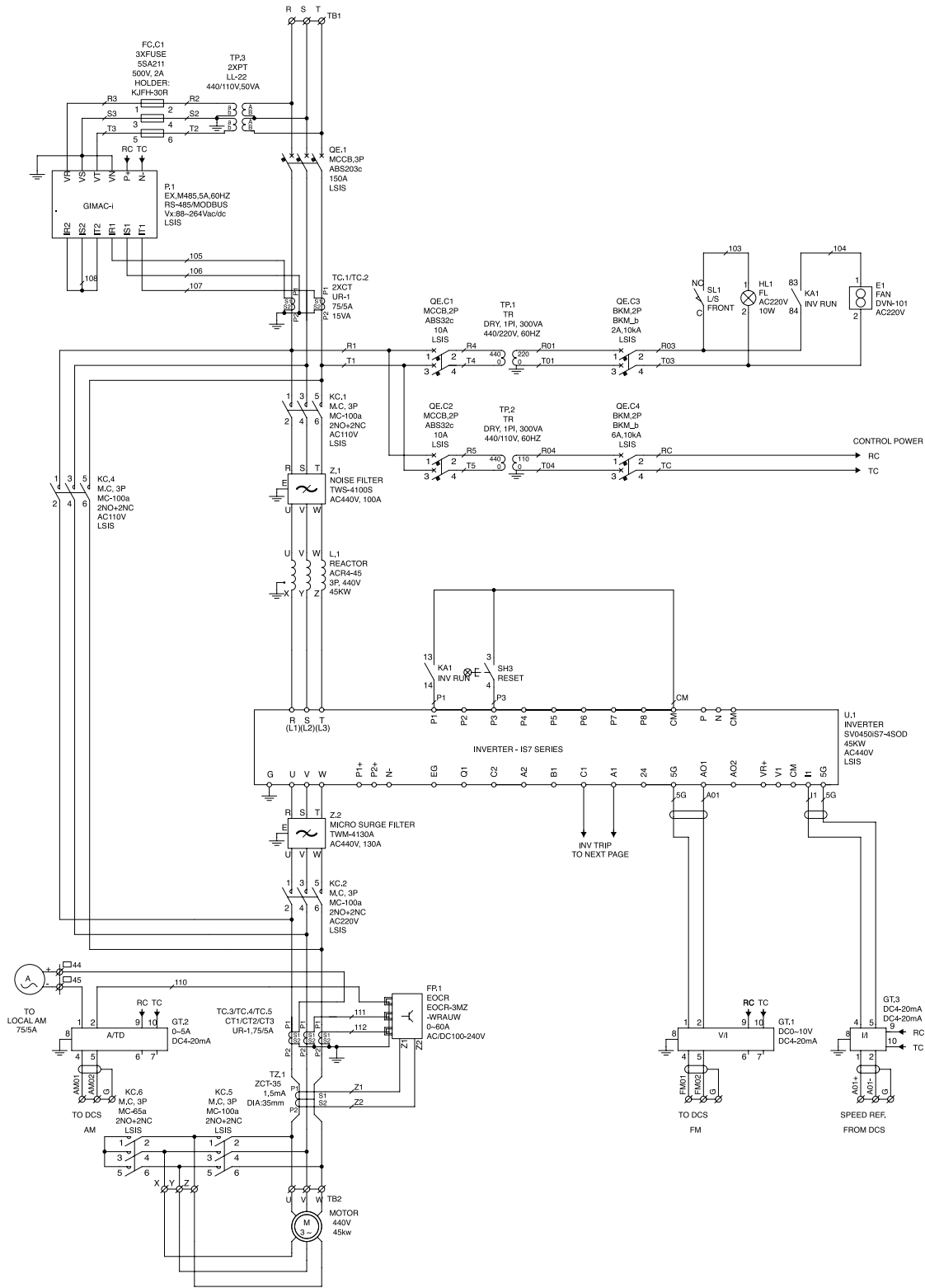
Power Loss Data

Category			Power Loss(W)	Input Filter				Output Filter			Power Loss (W)			Power Loss (Kcal/h)		
Rated Motor(KW)	KVA	Rated Current		Drive Unit(57)	EMI Filter	AC Reactor(ACR)	DC Reactor(DCR)	Passive Harmonic Filter (PHF)	dv/dt Filter(300M)	dv/dt Filter(500M)	Sine Wave Filter(SWF) (2,000M)	Drive+ACR +dv/dt	Drive+PHF +dv/dt	Drive+PHF+SWF	Drive+ACR +dv/dt	Drive+PHF +dv/dt
0.75	1.9	2.5A	41.3	-	-	-	50.0	21.0	53.0	65.0	62.3	144.3	156.3	53.5	124.0	134.4
1.5	3	4A	82.5	-	-	-	67.0	21.0	53.0	65.0	103.5	202.5	214.5	89.0	174.1	184.4
2.2	4.5	6A	116.6	-	6.6	-	67.0	21.0	53.0	80.0	137.6	236.6	263.6	118.3	203.4	226.7
3.7	6.1	8A	196.1	-	11.1	-	116.0	30.0	53.0	90.0	226.1	365.1	402.1	194.4	313.9	345.7
5.5	9.1	12A	286.0	-	16.5	-	132.0	56.0	53.0	115.0	342.0	471.0	533.0	294.1	405.0	458.3
7.5	12.2	16A	390.0	-	22.5	-	160.0	56.0	55.0	115.0	446.0	605.0	665.0	383.5	520.2	571.8
11	18.3	24A	550.0	-	33.0	-	237.0	72.0	55.0	150.0	622.0	842.0	937.0	534.8	724.0	805.7
15	22.9	30A	750.0	-	45.0	-	294.0	72.0	143.0	170.0	822.0	1,187.0	1,214.0	706.8	1,020.6	1,043.9
18.5	29.7	39A	888.0	-	55.5	-	351.0	94.0	182.0	170.0	982.0	1,421.0	1,409.0	844.4	1,221.8	1,211.5
22	34.3	45A	1,056.0	-	66.0	-	354.0	94.0	182.0	260.0	1,150.0	1,592.0	1,670.0	988.8	1,368.9	1,435.9
30	46	61A	1,380.0	25.9	90.0	-	459.0	119.0	189.0	280.0	1,499.0	2,028.0	2,119.0	1,288.9	1,743.8	1,822.0
37	57	75A	1,702.0	25.9	111.0	-	571.0	119.0	214.0	330.0	1,821.0	2,487.0	2,603.0	1,565.8	2,138.4	2,238.2
45	69	91A	2,070.0	17.1	135.0	-	589.0	182.0	254.0	500.0	2,252.0	2,913.0	3,159.0	1,936.4	2,504.7	2,716.3
55	84	110A	2,475.0	25.4	165.0	-	821.0	182.0	316.0	500.0	2,657.0	3,612.0	3,796.0	2,284.6	3,105.8	3,264.0
75	116	152A	3,750.0	12.9	225.0	-	1,028.0	220.0	449.0	680.0	3,970.0	5,227.0	5,458.0	3,413.6	4,494.4	4,693.0
90	139	183A	4,050.0	13.2	270.0	-	1,067.0	220.0	464.0	680.0	4,270.0	5,581.0	5,797.0	3,671.5	4,798.8	4,984.5
110	170	223A	4,400.0	20.6	330.0	-	1,143.0	250.0	508.0	880.0	4,650.0	6,051.0	6,423.0	3,998.3	5,202.9	5,522.8
132	201	264A	5,148.0	15.7	396.0	-	1,538.0	250.0	508.0	880.0	5,398.0	7,194.0	7,566.0	4,641.4	6,185.7	6,505.6
160	248	325A	6,240.0	18.4	480.0	-	1,411.0	324.0	604.0	1,100.0	6,564.0	8,255.0	8,751.0	5,644.0	7,098.0	7,524.5
185	286	370A	6,845.0	24.7	555.0	-	1,411.0	275.0	637.0	1,100.0	7,120.0	8,893.0	9,356.0	6,122.1	7,646.6	8,044.7
220	329	432A	8,140.0	24.7	660.0	-	1,775.0	275.0	471.0	1,350.0	8,415.0	10,386.0	11,265.0	7,235.6	8,930.4	9,686.2
280	416	547A	10,080.0	31.8	840.0	DCR4-280	-	253.0	437.0	2,000.0	10,333.0			8,884.8		
315	467	613A	11,340.0	50.5	945.0	DCR4-315	-	253.0	437.0	2,000.0	11,593.0			9,968.2		
375	557	731A	13,125.0	65.9	1,125.0	DCR4-375	-	253.0	486.0	2,800.0	13,378.0			11,503.0		

* 1RT = 3,320 Kcal/h, 1Kcal/h = 1.163w

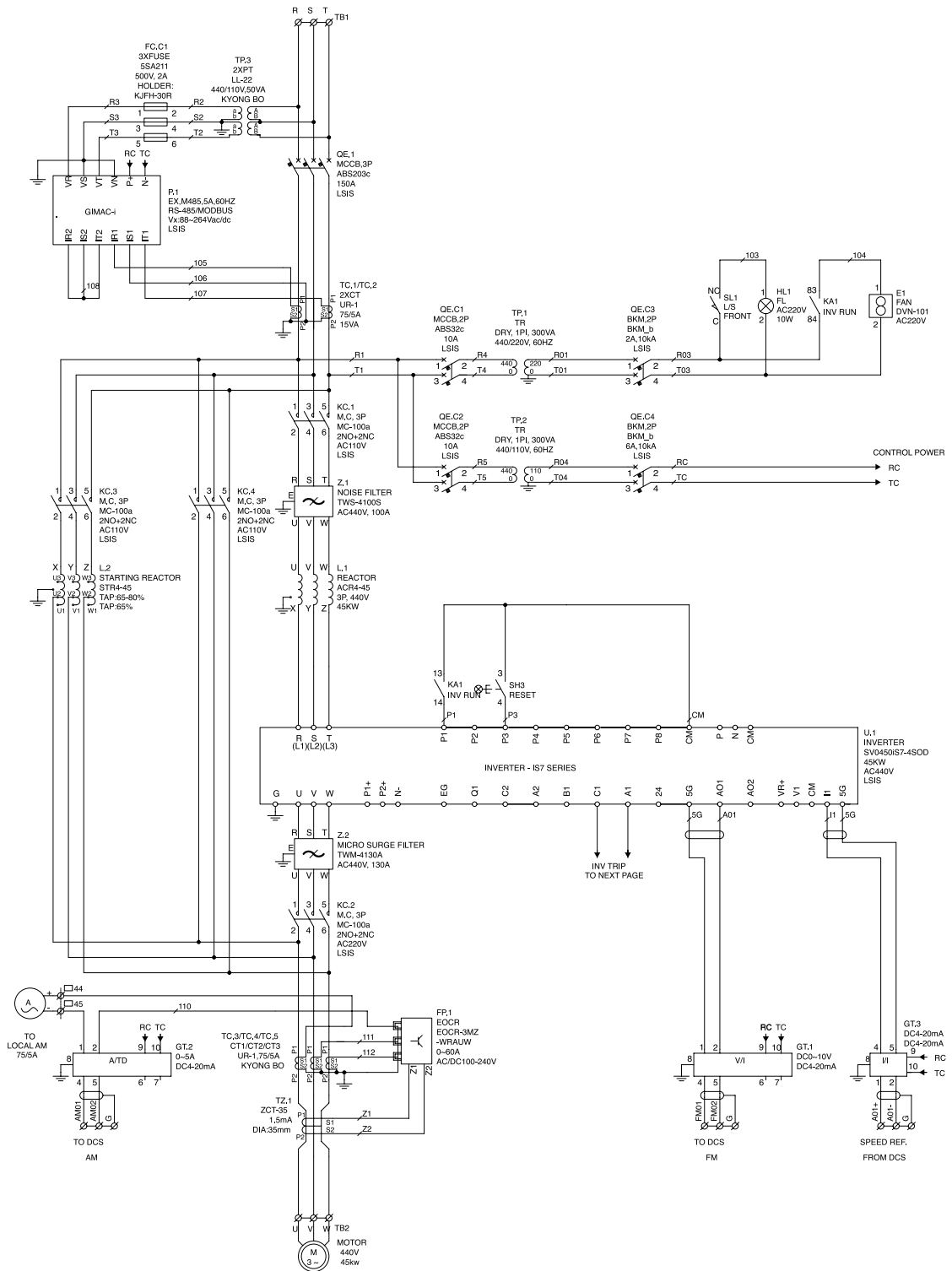
* The rating on table is LS standard panel, and the value may change depending on the panel configuration.

Y-△ Starting



Connection Diagram

Reactor Starting



A large, empty white rectangular area with rounded corners, intended for writing a memo. It is centered on the page and occupies most of the vertical space.



Safety Instructions

- For your safety, please read user's manual thoroughly before operating.
- Contact the nearest authorized service facility for examination, repair, or adjustment.
- Please contact qualified service technician when you need maintenance. Do not disassemble or repair by yourself!
- Any maintenance and inspection shall be performed by the personnel having expertise concerned.



- According to The WEEE Directive, please do not discard the device with your household waste.

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