DAIKIN

High Pressure | High Flow Rate
Analog Command Input | High Accuracy

# SUPER UNIT

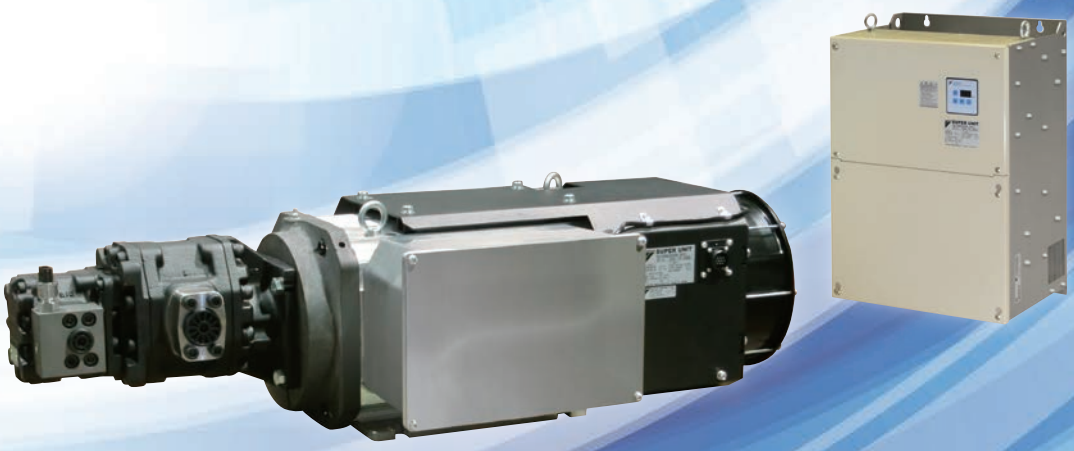
## HYBRID HYDRAULIC UNIT

**Exceeds standard of high efficiency motor regulation**

## New Model with High Pressure/High Flow Rate

(Equipped with 37 kW equivalent IPM motor)

- Maximum operating pressure: 28 MPa
- Maximum flow rate: 220, 260, 300 L/min



## Unique Offer from DAIKIN!!

### Unparalleled energy-saving and high-accuracy servo-based pump PQ control system

- An extensive lineup of pump control systems covering a wide range of applications including presses and industrial machinery -

INDEX

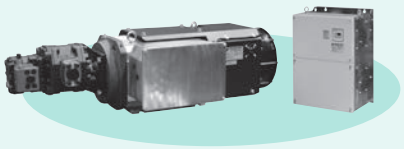



DAIKIN INDUSTRIES, LTD.
Oil Hydraulic Division
Oil Hydraulic Equipment

# SUPER UNIT
## Model List

Flow rate/pressure combinations other than those given in the model list below are also available. Please consult us when considering adoption.

## SUPER UNIT (Analog Command Input, High-accuracy Type) Pressure/Flow Rate Model List



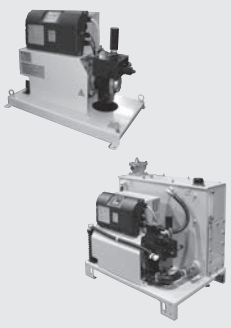
The encircled numbers indicate the nominal motor capacity [kW].

| Maximum discharge rate | 18 MPa | 21 MPa | 25 MPa | 28 MPa |
|---|---|---|---|---|
| 300 L/min | | SUT00D30021 200/400 V (37) | | SUT00D30028 200/400 V (37) |
| 260 L/min | | SUT00D26021 200/400 V (37) | | |
| 220 L/min | | | | SUT00D22028 200/400 V (37) |
| 200 L/min | SUT00S20018 400 V (22) | SUT00D20021 200/400 V (15) | SUT00D20025 200/400 V (22) | |
| 150 L/min | SUT00S15018 200/400 V (15) | SUT00D15021 200/400 V (15) | | |
| 130 L/min | SUT00S13018 400 V (15) | SUT00S13021 400 V (15) / SUT00D13021 200/400 V (15) | SUT00D13025 400 V (15) | |
| 80 L/min | SUT00S8018 200/400 V (11) | SUT00D8021 200/400 V (11) | SUT00D8025 400 V (11) | |
| 50 L/min | | SUT00S5021 200/400 V (11) | SUT00S5025 200/400 V (15) | |
| 30 L/min | SUT00S3018 200 V (7) | SUT00D3021 200 V (7) | | |

Note 1 All models allow selection of the input type as the analog command input type or 8-PQ digital command input type using a parameter. (Factory default is the analog command input type.)
Note 2 All models have a motor pump (tankless) and a controller (electrical components) that are of the separately installed type.
Note 3 When a discharge rate higher than 300 L/min is required, it can be achieved by combining multiple SUPER UNITs. Please consult us for detailed information.
Note 4 Consult DAIKIN if you use hydrous/synthetic oils such as water-glycol hydraulic oil or other non-petroleum oils.

## SUPER UNIT Pressure/Flow Rate Model List

| Maximum discharge rate | 7 MPa | 10 MPa | 16 MPa | 21 MPa |
|---|---|---|---|---|
| 110 L/min | SUT00S11007 200 V | | | SUT00D11021 200 V P-SUT20D11KW |
| 80 L/min | SUT00S8007 SUT10S8007 200 V | | | SUT00D8021 SUT10D8021 SUT16D8021 200 V |
| 60 L/min | SUT00S6007 SUT06S6007 200 V | | | SUT00D6021 SUT06D6021 SUT10D6021 200 V |
| 40 L/min | SUT00S4007 SUT03S4007 200 V | | SUT00D4016 SUT06D4016 200 V | |
| 30 L/min | | SUT00S3010 SUT03S3010 200 V | SUT00S3016 SUT06S3016 200 V | |
| 15 L/min | | | SUT00S1516 SUT03S1516 200 V | |



Note 1 All models are 16-PQ control type units. The communications type and analog command input type (single pump type only) can be selected as optional models.
Note 2 A motor pump type (tankless) and unit type (with tank) are available. Please refer to the separately provided SUPER UNIT catalog for details.

| Series | Nominal motor capacity [kW] (Equivalent) | Power supply voltage [V] | Flow rate selection | Maximum operating pressure [MPa] | Maximum flow rate [L/min] | Maximum flow rate [L/min] 30 50 80 100 130 150 180 200 250 300 | Model | PQ chart No. | Figure Page No. |
|---|---|---|---|---|---|---|---|---|---|
| Single pump type | 7 | AC 3-phase 200 V | — | 17.6 | 30 | | SUT00S3018-30-A | 1 | 22 |
| | 11 | | | 20.6 | 50 | | SUT00S5021-40-A | 2 | |
| | 11 | | | 17.6 | 80 | | SUT00S8018-40-A | 3 | |
| | 15 | | | 24.5 | 50 | | SUT00S5025-41-L-N0432 | 4 | 23 |
| | 15 | | | 17.6 | 150 | | SUT00S15018-40-A | 5 | 24 |
| | 11 | AC 3-phase 400 V | — | 20.6 | 50 | | SUT00S5021-40YA-N0265 | 6 | 22 |
| | 11 | | | 17.6 | 80 | | SUT00S8018-40YA | 7 | |
| | 15 | | | 17.6 | 130 | | SUT00S13018-40YA-N0218 | 8 | 24 |
| | 15 | | | 20.6 | 130 | | SUT00S13021-40YA-N0286 | 9 | |
| | 15 | | | 17.6 | 150 | | SUT00S15018-40YA | 10 | |
| | 22 | | | 17.6 | 200 | | SUT00S20018-40YL-N0340 | 11 | |
| Double pump type | 7 | AC 3-phase 200 V | Combination | 17.6 | 30 | | SUT00D3021-30-B-N0436 | 12 | 25 |
| | | | Independent | 20.6 | 18.3 | | | | |
| | 11 | | Combination | 17.6 | 80 | | SUT00D8021-40-B-N0323 | 13 | 26 |
| | | | Independent | 20.6 | 38.4 | | | | |
| | 15 | | Combination | 20.6 | 130 | | SUT00D13021-40-B-N0321 | 14 | |
| | | | Independent | 20.6 | 47.9 | | | | |
| | 15 | | Combination | 17.6 | 150 | | SUT00D15021-40-B-N0365 | 15 | |
| | | | Independent | 20.6 | 70.9 | | | | |
| | 15 | | Combination | 11.0 | 200 | | SUT00D20021-40-L | 16 | 27 |
| | | | Independent | 25.0 | 56 | | | | |
| | 22 | | Combination | 12.3 | 200 | | SUT00D20025-41-L | 17 | 28 |
| | | | Independent | 25.0 | 56 | | | | |
| | 37 | | Combination | 14.0 | 220 | | SUT00D22028-41-L | 18 | 29 |
| | | | Independent | 28.0 | 63.2 | | | | |
| | 37 | | Combination | 11.0 | 260 | | SUT00D26021-41-L | 19 | 30 |
| | | | Independent | 20.6 | 111 | | | | |
| | 37 | | Combination | 10.0 | 300 | | SUT00D30021-41-L | 20 | |
| | | | Independent | 20.6 | 111 | | | | |
| | 37 | | Combination | 9.0 | 300 | | SUT00D30028-41-L | 21 | 29 |
| | | | Independent | 28.0 | 56 | | | | |
| | 11 | AC 3-phase 400 V | Combination | 17.6 | 80 | | SUT00D8021-40YB-N0324 | 22 | 26 |
| | | | Independent | 20.6 | 38.4 | | | | |
| | 15 | | Combination | 20.6 | 130 | | SUT00D13021-40YB-N0322 | 23 | |
| | | | Independent | 20.6 | 47.9 | | | | |
| | 15 | | Combination | 17.5 | 150 | | SUT00D15021-40YB-N0358 | 24 | |
| | | | Independent | 20.6 | 70.9 | | | | |
| | 15 | | Combination | 11.5 | 200 | | SUT00D20021-40YL | 25 | 27 |
| | | | Independent | 25.0 | 56 | | | | |
| | 11 | | Combination | 15.0 | 80 | | SUT00D8025-40YL | 26 | |
| | | | Independent | 25.0 | 40 | | | | |
| | 15 | | Combination | 15.0 | 130 | | SUT00D13025-40YL | 27 | |
| | | | Independent | 25.0 | 37.3 | | | | |
| | 22 | | Combination | 16.5 | 200 | | SUT00D20025-40YL | 28 | 28 |
| | | | Independent | 25.0 | 56 | | | | |
| | 37 | | Combination | 14.0 | 220 | | SUT00D22028-41YL | 29 | 29 |
| | | | Independent | 28.0 | 63.2 | | | | |
| | 37 | | Combination | 11.0 | 260 | | SUT00D26021-41YL | 30 | 30 |
| | | | Independent | 20.6 | 111 | | | | |
| | 37 | | Combination | 10.0 | 300 | | SUT00D30021-41YL | 31 | |
| | | | Independent | 20.6 | 111 | | | | |
| | 37 | | Combination | 9.0 | 300 | | SUT00D30028-41YL | 32 | 29 |
| | | | Independent | 28.0 | 56 | | | | |

Note 1 The numbers in the PQ chart No. column in the above table correspond to the figure numbers in the “PQ characteristic chart” later in this catalog.
Note 2 Please refer to P34 “List of Electrical Components” for the electrical components that need to be arranged separately for each of the models indicated above.

| Series | Nominal motor capacity [kW] (Equivalent) | Power supply voltage [V] | Flow rate selection | Maximum operating pressure [MPa] | Maximum flow rate [L/min] | Maximum flow rate [L/min] 10 20 30 40 50 60 70 80 90 100 110 | Motor pump type (tankless) | Unit type (with tank) | Tank capacity [L] |
|---|---|---|---|---|---|---|---|---|---|
| Single pump type | 3.7 | AC 3-phase 200 V | — | 7.0 | 39.7 | | SUT00S4007-30 | SUT03S4007-30 | 30 |
| | 5.0 | | | 7.0 | 61.1 | | SUT00S6007-30 | SUT06S6007-30 | 60 |
| | 7.0 | | | 7.0 | 83.0 | | SUT00S8007-30 | SUT10S8007-30 | 100 |
| | 11.0 | | | 7.0 | 110 | | SUT00S11007-41 | — | — |
| | 3.7 | | | 10.0 | 25.6 | | SUT00S3010-30 | SUT03S3010-30 | 30 |
| | 3.7 | | | 16.0 | 15.2 | | SUT00S1516-30 | SUT03S1516-30 | 30 |
| | 5.0 | | | 16.0 | 25.6 | | SUT00S3016-30 | SUT06S3016-30 | 60 |
| Double pump type | 3.7 | AC 3-phase 200 V | Combination | 7.0 | 40.2 | | SUT00D4016-30 | SUT06D4016-30 | 60 |
| | | | Independent | 15.7 | 15.2 | | | | |
| | 5.0 | | Combination | 7.0 | 60.3 | | SUT00D6021-30 | SUT06D6021-30 | 60 |
| | | | Independent | 20.6 | 20.4 | | | SUT10D6021-30 | 100 |
| | 7.0 | | Combination | 7.0 | 81.7 | | SUT00D8021-30 | SUT10D8021-30 | 100 |
| | | | Independent | 20.6 | 27.4 | | | SUT16D8021-30 | 160 |
| | 11.0 | | Combination | 7.0 | 109.2 | | SUT00D11021-41 | P-SUT20D11KW-41 | 200 |
| | | | Independent | 20.6 | 39.7 | | | | |

Note 1 Please refer to the separately provided SUPER UNIT catalog for specifications and external appearances.

# Nomenclature

| SUT | 00 | S | 130 | 18 | – | 40 | Y | L | R | – | ※※※※ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a | b | c | d | e | | f | g | h | i | | j |

## a Model No.

- SUT : SUT series

## b Tank capacity

- 00 : Motor pump type (tankless)

## c Pump type

- S : Single pump type
- D : Double pump type

## d Pump discharge rate

- 30 : 30 L/min
- 50 : 50 L/min
- 80 : 80 L/min
- 130 : 130 L/min
- 150 : 150 L/min
- 200 : 200 L/min
- 220 : 220 L/min
- 260 : 260 L/min
- 300 : 300 L/min

## e Maximum operating pressure

- 18 : 17.6 MPa
- 21 : 20.6 MPa
- 25 : 25.0 MPa
- 28 : 28.0 MPa

## f Design No. (The design number is subject to change.)

## g Power supply voltage*1

- – : AC 200 V specifications
- Y : AC 400 V specifications

## h Functional option code

- A : Analog command input type, with discharge block with safety valve
- B : Analog command input type, with discharge block without safety valve
- L : Analog command input type, with discharge block without safety valve

## i Motor terminal box (viewed from pump side)

- No designation : Terminal box at the right side (standard)
- R : Terminal box at the left side
- U : Terminal box at the top *2

## j Non-standard code

- No designation: Standard
- “N” + non-standard number designated for each specification
- C Equipped with communications function
  Protocol: Daikin original protocol/Modbus-RTU
  Port: RS232C
- C**** Equipped with communications function
  Protocol: Daikin original protocol/Modbus-RTU
  Port: RS485

*1 200/400 V cited as power supply voltage specifications are nominal voltages.
Refer to the specification tables (pages 9 to 11) and separately provided model drawings for details on the operating range.
*2 The terminal box at the top of motor is only available with SUT00D30028, SUT00D22028, SUT00D30021 and SUT00D26021.

# Main Features and Functions

**High Voltage/High Flow Rate**

The analog command input/high-accuracy type SUPER UNITs **have operating ranges extended to include high pressure and high flow rate ranges**, enabling PQ control with even greater accuracy than conventional SUPER UNITs.

**Basic Hybrid Hydraulic unit video!**
URL https://www.hyd.daikin.com/mv/sut_hp_hfr

**High Accuracy**

**Achieving stable servo control in response to analog input voltages over a range from low pressure (1%)/flow rate (1%) to the maximum pressure/flow rate.**
The double pump type units enable low-pressure/high-flow-rate control in the combination flow mode, and high-pressure holding (continuous) control over a prolonged period in the individual flow mode.

**Energy Saving**

Superior energy-saving hydraulic systems suited to applications with industrial machinery such as presses and general industrial machines while offering **high performance, easy operation and reasonable prices.**

**Two Types of Operation Commands**

As an alternative to directly specifying command values for pressure and flow rate with analog voltage inputs, the operation conditions can be selected easily by **using 3-bit ON/OFF digital signals** that can **call eight different preset pressure/flow rate patterns.**
(8-PQ type: Selectable using a parameter)



# Features

## Energy Saving

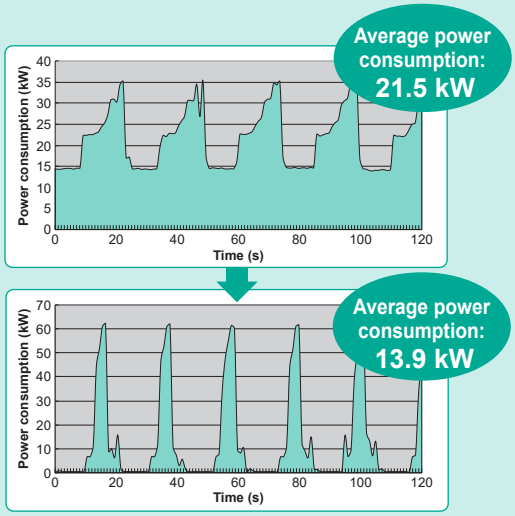
### Energy savings at least 60% greater than conventional fixed displacement pump systems

(The energy-saving effect varies depending on the operation conditions.)

- Significant reduction of running costs with a small investment. Contributes to improvement of production efficiency at a reasonable price.

| 600-t press machine | | |
|---|---|---|
| Pump model | Fixed-displacement pump → | SUT00D8025 |
| Average power consumption | 21.5 kW → | 13.9 kW |
| **Effect of reduced power consumption: $6,350 (¥635,000) / year** | | |

* Electricity rate: $0.16 (¥16) / kWh, Annual operating hours: 5,220 hours / year




### Oil cooler downsized by suppressing oil temperature rise

- Fewer oil changes by restricting hydraulic oil deterioration. Further, downsizing the hydraulic oil tank and oil cooler reduces the amount of hydraulic oil and cooling water used.

## High Accuracy with Simple Operation

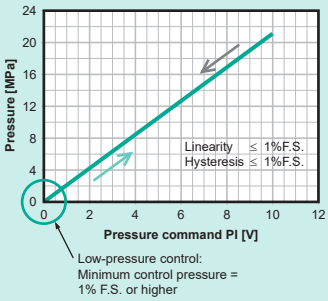
### High-accuracy servo control according to analog pressure (P) / flow rate (Q) voltage commands

- Easy to use, just like conventional proportional valves.
  The servo-controlled pump adjusts the pressure and flow rate in accordance with the load.
- Highly accurate control with respect to pressure/flow rate command values, with a linearity of 1% F.S. maximum and hysteresis of 1% F.S. maximum.

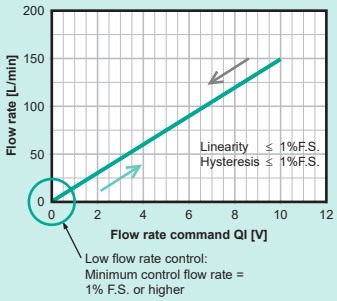
**Case study of high accuracy SUPER UNIT**
URL https://www.hyd.daikin.com/en/mv/sut_example_press

**Example with double pump type (SUT00D15021-40-B)**

**Pi-Po static characteristics**




**Qi-Qo static characteristics**



# Main Features and Functions

## Features

### Sustained High-pressure Holding Control

**Sustained high-pressure control with energy savings by selecting the pump flow rate**

- Double pump type units enable selection of combination or independent flow using a dedicated solenoid valve to achieve sustained high-pressure control, switching between a low pressure with high flow rate and a high pressure with low flow rate, as is often required for presses and other equipment.
- There is also a specification where the solenoid valve can be switched autonomously by the SUPER UNIT.

### Faster Shipping Adjustment

**Simple adjustment to start a trial run on the machine, meaning a shorter adjustment time**

- The SUPER UNIT can be easily adjusted without requiring special skills for setting/adjusting complicated parameters of servo systems. The unit runs stably even with the default settings so the machine can reach the trial run stage in a short time.

**Economical replacement of conventional hydraulic systems with servo-controlled pump systems**

- Conventional hydraulic systems with proportional valves can be economically replaced with energy-saving high-accuracy servo-controlled pump systems, where the pump discharge rates and pressures are servo-controlled, by using analog command input type SUPER UNITs.
- Even hydraulic systems that do not incorporate proportional valves can be replaced with energy-saving hydraulic systems that can achieve stable control with a simple pressure/flow rate adjustment.
- The command input method can be selected, by parameter setting, as the analog command input type (0 to 5 V or 0 to 10 V) or the 8-PQ pattern input type using 3-bit digital ON/OFF input signals. (Factory default is the analog command input type.)

### Improving the Working Environment

**Reduced noise during operation**

- Noise while holding a high pressure is reduced by lowering the rotational speed of the pump to the minimum level required to hold the pressure.
- Shockless control of pressures and flow rates can be achieved by ramping the command voltages during acceleration/deceleration of the pressure and flow rate. This gives smooth machine operation with less impact noise, helping to improve your working environment.

**Ambient air temperature rise reduced by restricting oil temperature rise**

- Temperature rise of the hydraulic oil raises the ambient temperature, which leads to a poor working environment. SUPER UNIT minimizes the rise in oil temperature, helping to improve your working environment.

### Exceeds Standard of High Efficiency Motor Regulation

**Equipped with DAIKIN's unique IPM motor**

- Exceeds standard of high efficiency motor regulations eliminates complicated formalities both in Japan and when exporting the machine.
- Since no induction motor is used, the maximum discharge rate of the pump does not fluctuate depending on the power supply frequency, making it unnecessary to adjust the machines' maximum speed for each shipping destination.

### American UL Standard Compliant

- In addition to European CE standards, the 37 kW 400 V motors and controllers comply with American UL standards. (SUT00D22028-30YL, SUT00D26021-30YL, SUT00D30021-30YL, SUT00D30028-30YL)

# Functions

## Communication Function

### Remote Setting of Operating Conditions

**Operating condition setting of the SUPER UNIT possible from a distance**

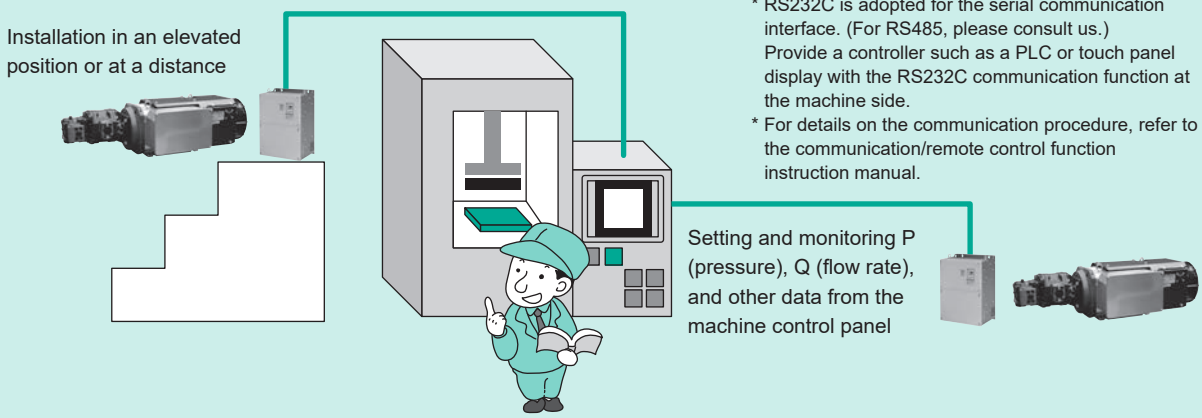
- Various settings such as response gain settings, as well as the pressure and flow rate, can be set remotely. This makes it possible to control the hydraulic pressure operating conditions in synchrony with the control of the machine.

### IoT-ready

**Managing the pressure and flow rate from a machine**

**IoT applications are explained in a video!**
URL https://www.hyd.daikin.com/en/mv/hybrid_iot

- The information that the SUPER UNIT outputs during machine operation, such as pressure and flow rate, can be displayed on the monitor at a machine.
- By continuously collecting data from the SUPER UNIT, it is possible to determine machining faults, diagnose machine failures, and utilize the data for predictive maintenance.




* RS232C is adopted for the serial communication interface. (For RS485, please consult us.)
Provide a controller such as a PLC or touch panel display with the RS232C communication function at the machine side.
* For details on the communication procedure, refer to the communication/remote control function instruction manual.

## Maintenance/Management Function Software

### Editing/Saving Parameter Settings

**Equipped with RS232C communications port as default, DAIKIN's maintenance/ waveform measurement software (Hybrid-Win) provided**

- The software tool Hybrid-Win, which can manage default parameter settings, read the alarm history, and save parameter data, allows easy maintenance and management of the SUPER UNIT simply by preparing a personal computer (Windows 7/8/10) and a communications cable (RS232C/USB conversion cable).

### Displaying and Recording Waveform Graphs during SUPER UNIT Operation

- During service work or adjustment for test runs, the pressure and flow rate commands at the SUPER UNIT and the result of pressure and flow rate control can be monitored and displayed in the form of graphs using Hybrid-Win software. The graphs and other information can also be saved in the PC. This speeds up adjustment of SUPER UNIT parameters and troubleshooting.

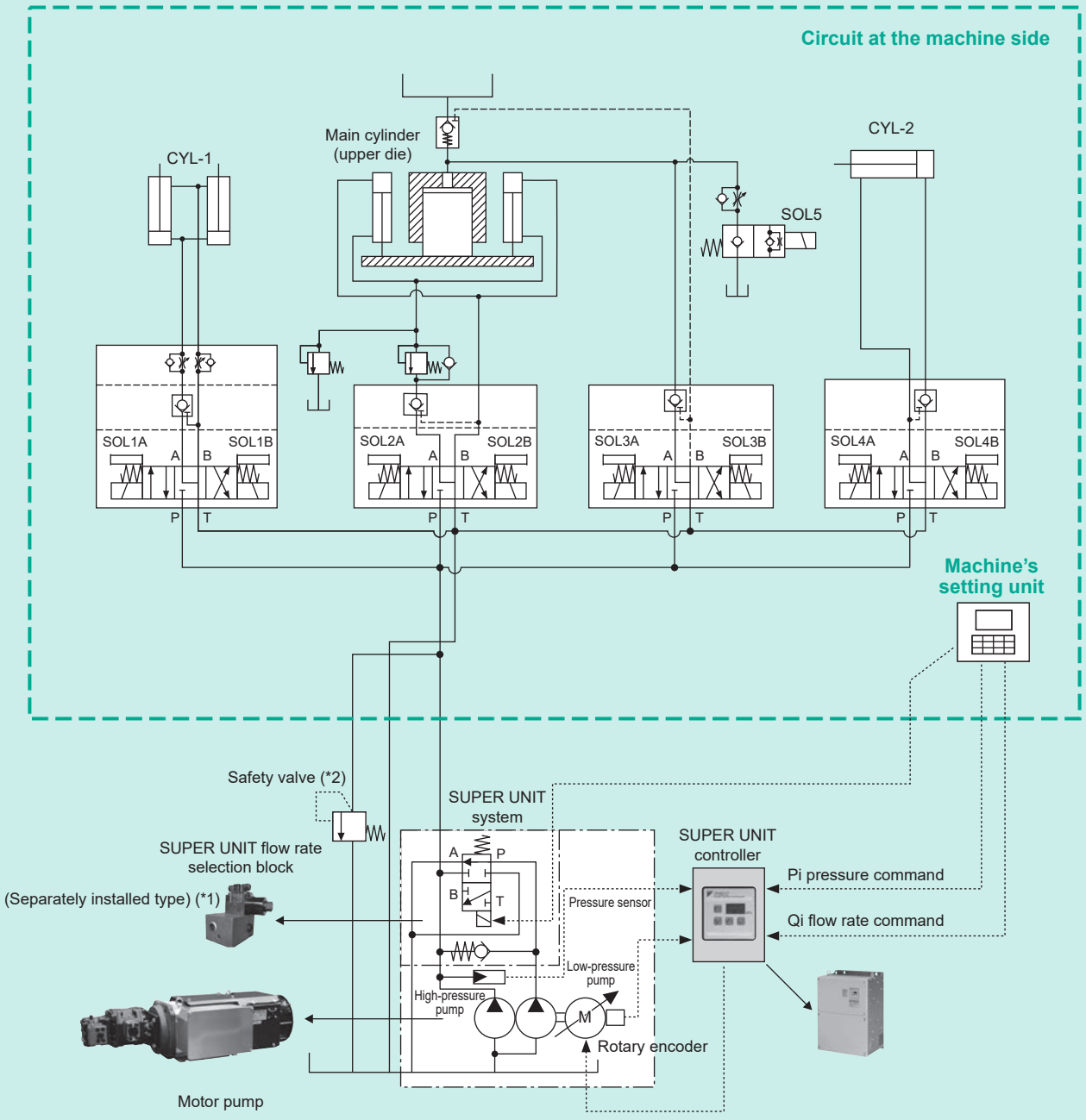
### Collecting Data for Predictive Maintenance (*1)

- Periodically collecting, monitoring and analyzing those data on the results of SUPER UNIT control using the RS232C communications port opens up the possibility of new approaches to maintenance and management such as predictive maintenance.

Note: A personal computer with Windows 7/8/10 operating system and an RS232C/USB conversion cable are necessary.
Communications cables (3-core soldered cables PM-CM02-15 for 1.5 m and PM-CM02-30 for 3 m) are available as options (to be ordered separately).
Note: Hybrid-Win is a software tool to provide functions for editing or saving parameters and measuring waveforms of a SUPER UNIT, and runs on a personal computer connected to the SUPER UNIT using a communications cable.
Hybrid–win and its instruction manual are available free of charge from the website (https://www.hyd.daikin.com) after registering as a member.
(*1) Please consult us for detailed information on predictive maintenance.

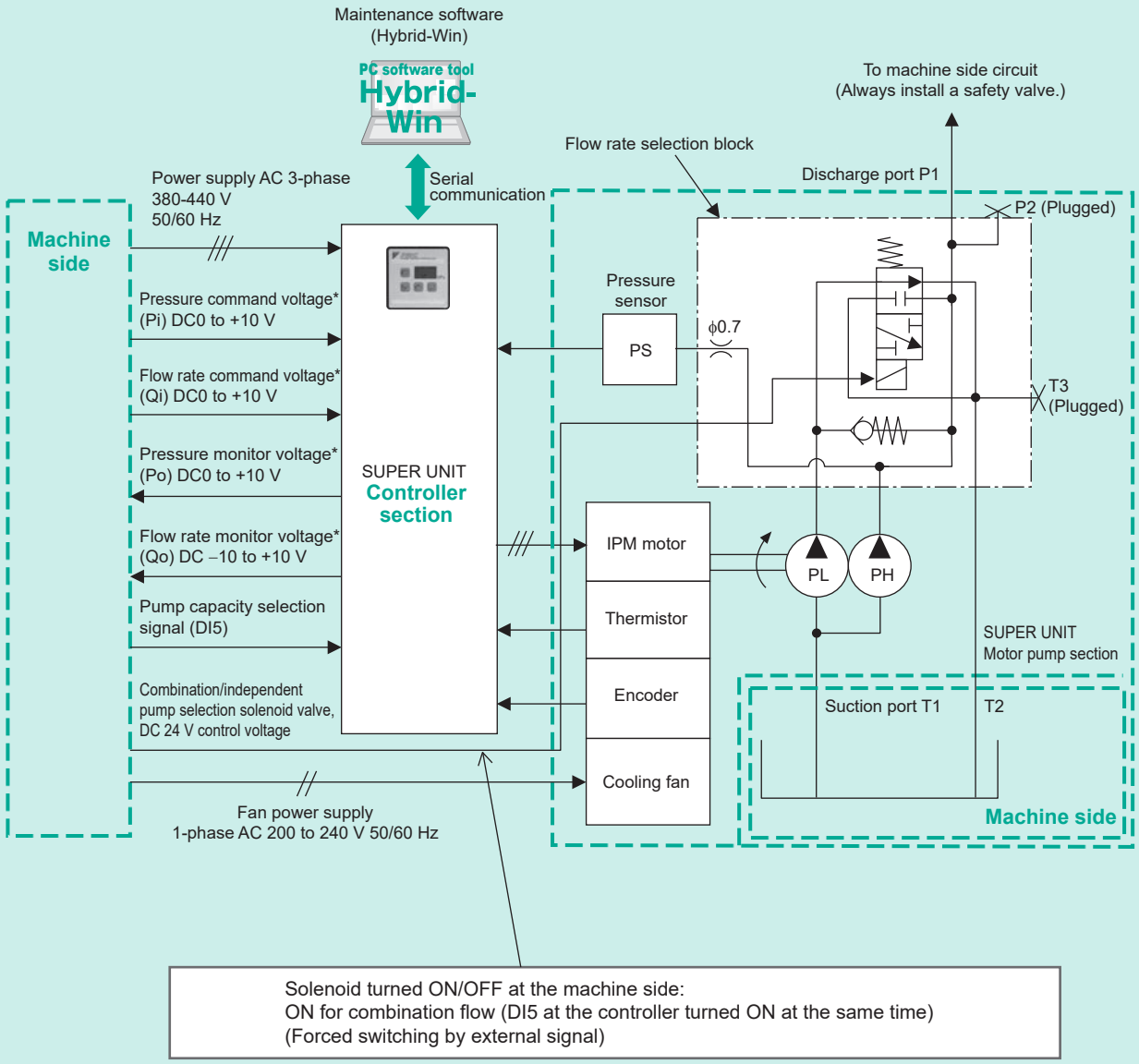
# Circuit Configuration Examples (Double pump specifications)

## Example Hydraulic Press Circuit




(*1) There are two types of flow rate selection circuit, the type built into the pump discharge block and the separately installed type.
(*2) A safety valve needs to be incorporated in hydraulic circuits at the pump discharge side for safety.

## System block diagram for SUT00D flow rate selection specifications (example)




(*) Assuming an analog input voltage of 0 to 10 V

# Specifications by Product (Single pump 200 V/400 V specifications) (*1)

| Item \ Model | | | 200 V specifications | | | | | 400 V specifications | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SUT00S | | | | | SUT00S | | | | | |
| | | | 3018-30-A | 5021-40-A | 8018-40-A | 5025-41-L-N0432 | 15018-40-A | 5021-40YA-N0265 | 8018-40YA | 13018-40YA-N0218 | 13021-40YA-N0286 | 15018-40YA | 20018-40YL-N0340 |
| Maximum operating pressure [MPa] | | | 17.6 | 20.6 | 17.6 | 24.5 | 17.6 | 20.6 | 17.6 | 17.6 | 20.6 | 17.6 | |
| Maximum flow rate [L/min] | | | 30 | 50 | 80 | 50 | 150 | 50 | 80 | 130 | | 150 | 200 |
| Operating pressure adjustment range [MPa] | | | 0.18 to 17.6 | 0.21 to 20.6 | 0.18 to 17.6 | 0.25 to 24.5 | 0.18 to 17.6 | 0.21 to 20.6 | 0.18 to 17.6 | | 0.21 to 20.6 | 0.18 to 17.6 | |
| Operating flow rate adjustment range [L/min] | | | 0.3 to 30 | 0.5 to 50 | 0.8 to 80 | 0.5 to 50 | 1.5 to 150 | 0.5 to 50 | 0.8 to 80 | 1.3 to 130 | | 1.5 to 150 | 2.0 to 200 |
| Pump | Pump type | | Single geared pump | | | | | | | | | | |
| | Pump capacity [cm$^3$] | | 9.13 | 20.7 | 31.2 | 27.4 | 52.7 | 20.7 | 31.2 | 44 | | 52.7 | 73 |
| Power supply | Controller input power (*2) | | 3-phase AC 200 to 220 V (50 Hz/60 Hz) | | | | | 3-phase AC 380 to 440 V (50 Hz/60 Hz) | | | | | |
| | | Permissible power supply voltage fluctuation range | –15% to +10% | | | | | –20% to +10% | | | | | |
| | | Required power supply capacity [kVA] | 11.3 | 23.2 | | 33.8 | | 20.1 | | 34.8 | | | 52 |
| | | Recommended breaker capacity [A] | 30 | 50 | | 75 | | 30 | | 40 | | | 50 |
| | Motor cooling fan power | | 1-phase AC 200 to 240 V (50 Hz/60 Hz) | | | | | | | | | | |
| Leak current [mA] (*3) | | | – | – | | 3 | 3.2 | 2.1 | | – | | | 2.8 |
| Mass | Motor pump [kg] | | 40 | 69 | 70 | 92 | 103 | 69 | 70 | 103 | 104 | 103 | 118 |
| | Controller [kg] | | 11 | | | | | 11 | | | | | 14 |
| Analog command input voltage DC [V] (*4) | | | 0 to +5 | | | | | 0 to +10 | | | | | |
| Non-standard specifications | Suction flange/block | | Incorporated | None | | Incorporated | None | Incorporated | None | Incorporated | | None | Incorporated |
| | Safety valve (*5) | | Incorporated | | | None | Incorporated | | | Incorporated | | | None |

(*1) To use this product, electrical components such as a regenerative resistor and DC reactor are required separately. For details, refer to Page 34 “List of Electrical Components”.
(*2) Even if the unit is used within the permissible power voltage fluctuation range, the PQ output characteristics may deteriorate if the power voltage fluctuates to the negative side. Also note that power voltage fluctuation to the positive side may cause alarms, due to overloading of regenerative operation, depending on the operation conditions. You are therefore recommended to use the unit in an environment with limited power voltage fluctuation as far as possible.
(*3) Representative values when using a noise filter recommended by DAIKIN. Protection against noise, in accordance with DAIKIN’s recommendations, may be required depending on the operating environment.
(*4) With 5 V analog command input voltage specifications, the voltage can be adjusted from 0 to 5 V using parameter VMAX. With 10 V specifications, the voltage can be adjusted from 0 to 10 V, so it can also be operated with 5 V inputs.
(*5) With models without a safety valve in the discharge block, incorporate a safety valve in the hydraulic circuit at the machine side. Use the unit with the safety valve set at the maximum operating pressure + 2 MPa.

# Specifications by Product (Double pump 200 V specifications) (*1)

| Item \ Model | | | 200 V specifications | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SUT00D | | | | | | | | | |
| | | | 3021-30-B-N0436 | 8021-40-B-N0323 | 13021-40-B-N0321 | 15021-40-B-N0365 | 20021-40-L | 20025-41-L | 22028-41-L | 26021-41-L | 30021-41-L | 30028-41-L |
| Maximum operating pressure | Combination [MPa] | | 17.6 | | 20.6 | 17.6 | 11.0 | 12.3 | 14.0 | 11.0 | 10.0 | 9.0 |
| | Independent [MPa] | | 20.6 | | | | 25.0 | | 28.0 | 20.6 | | 28.0 |
| Maximum flow rate | Combination [L/min] | | 30 | 80 | 130 | 150 | 200 | | 220 | 260 | 300 | |
| | Independent [L/min] | | 18.3 | 38.4 | 47.9 | 70.9 | 56.0 | | 63.2 | 111 | | 56.0 |
| Operating pressure adjustment range [MPa] | | | 0.21 to 20.6 | | | | 0.25 to 25 | | 0.3 to 28 | 0.21 to 20.6 | | 0.3 to 28 |
| Operating flow rate adjustment range [L/min] | | | 0.3 to 30 | 0.8 to 80 | 1.3 to 130 | 1.5 to 150 | 2.0 to 200 | | 2.2 to 280 | 2.6 to 260 | 3.0 to 300 | |
| Pump | Pump type | | Double geared pump | | | | | | | | | |
| | Pump capacity | Combination [cm³] | 9.1 | 31.2 | 44.0 | 52.7 | 74.1 | | 80.4 | 100.0 | 114.6 | 123.5 |
| | | Independent [cm³] | 5.6 | 15.0 | 16.2 | 24.9 | 20.8 | | 23.1 | 42.7 | | 23.1 |
| Power supply | Controller input power (*2) | | 3-phase AC 200 to 220 V (50 Hz/60 Hz) | | | | | | | | | |
| | Permissible power supply voltage fluctuation range | | –15% to +10% | | | | | | | | | |
| | Required power supply capacity [kVA] | | 11.3 | 23.2 | 33.8 | | | 60 | 80 | | | |
| | Recommended breaker capacity [A] | | 30 | 50 | 75 | | | 125 | 200 | | | |
| | Motor cooling fan power | | 1-phase AC 200 to 240 V (50 Hz/60 Hz) | | | | | | | | | |
| | Flow rate selection solenoid valve power | | DC 24 V ±10% (*3) | DC 24 V ±10% (*4) | | | – (*5) | | | | | |
| Leak current [mA] (*6) | | | – | – | 3.2 | | 3.9 | 13.6 | 9.6 | | | 7.7 |
| Mass | Motor pump [kg] | | 40 | 76 | 109 | | 99 | 125 | 168 | 178 | 180 | 174 |
| | Controller [kg] | | 10 | | | | | 13 | 40 | | | |
| Analog command input voltage DC [V] (*7) | | | 0 to +10 | | | | | | | | | |
| Non-standard specifications | Suction flange/block | | Incorporated | | | | | | | | | |
| | Safety valve (*8) | | None | | | | | | | | | |

(*1) To use this product, electrical components such as a regenerative resistor and DC reactor are required separately. For details, refer to Page 34 “List of Electrical Components”.
(*2) Even if the unit is used within the permissible power voltage fluctuation range, the PQ output characteristics may deteriorate if the power voltage fluctuates to the negative side. Also note that power voltage fluctuation to the positive side may cause alarms, due to overloading of regenerative operation, depending on the operation conditions. You are therefore recommended to use the unit in an environment with limited power voltage fluctuation as far as possible.
(*3) Solenoid valve model: KSOB-G02-9AP-40-N-H7 (minute signal current type solenoid valve, power supply voltage: DC 24 V ± 10%)
(*4) Solenoid valve model: KSO-G03-20BP-20-EN (power supply voltage: DC 24 V ± 10%)
(*5) Not equipped with a solenoid valve for flow rate selection (To be prepared by the customer, or the V-SUT series option needs to be ordered separately)
(*6) Representative values when using a noise filter recommended by DAIKIN. Protection against noise, in accordance with DAIKIN’s recommendations, may be required depending on the operating environment.
(*7) With 5 V analog command input voltage specifications, the voltage can be adjusted from 0 to 5 V using parameter VMAX. With 10 V specifications, the voltage can be adjusted from 0 to 10 V, so it can also be operated with 5 V inputs.
(*8) With models without a safety valve in the discharge block, incorporate a safety valve in the hydraulic circuit at the machine side. Use the unit with the safety valve set at the maximum operating pressure + 2 MPa.

# Specifications by Product (Double pump 400 V specifications) (*1)

| Item | | | Model | 8021-40YB-N0324 | 13021-40YB-N0322 | 15021-40YB-N0358 | 20021-40YL | 8025-40YL | 13025-40YL | 20025-40YL | 22028-41YL | 26021-41YL | 30021-41YL | 30028-41YL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 400 V specifications | | | | | | | | | | | | | | |
| | | | | SUT00D | | | | | | | | | | |
| Maximum operating pressure | Combination | [MPa] | | 17.6 | 20.6 | 17.6 | 11.0 | 15.0 | | 16.5 | 14.0 | 11.0 | 10.0 | 9.0 |
| | Independent | [MPa] | | 20.6 | | | 25.0 | | | | 28.0 | 20.6 | | 28.0 |
| Maximum flow rate | Combination | [L/min] | | 80 | 130 | 150 | 200 | 80 | 130 | 200 | 220 | 260 | 300 | |
| | Independent | [L/min] | | 38.4 | 47.9 | 70.9 | 56.0 | 40.0 | 37.3 | 56.0 | 63.2 | 110 | | 56.0 |
| Operating pressure adjustment range | | [MPa] | | 0.21 to 20.6 | | | 0.25 to 25 | | | | 0.3 to 28 | 0.21 to 20.6 | | 0.3 to 28 |
| Operating flow rate adjustment range | | [L/min] | | 0.8 to 80 | 1.3 to 130 | 1.5 to 150 | 2.0 to 200 | 0.8 to 80 | 1.3 to 130 | 2.0 to 200 | 2.2 to 220 | 2.6 to 260 | 3.0 to 300 | |
| Pump | Pump type | | | Double geared pump | | | | | | | | | | |
| | Pump capacity | Combination | [cm³] | 31.2 | 44.0 | 52.7 | 74.1 | 33.4 | 57.7 | 74.1 | 80.4 | 100.0 | 114.6 | 123.5 |
| | | Independent | [cm³] | 15.0 | 16.2 | 24.9 | 20.8 | 16.7 | 16.6 | 20.8 | 23.1 | 42.7 | | 23.1 |
| Power supply | Controller input power (*2) | | | 3-phase AC 380 to 440 V (50 Hz/60 Hz) | | | | | | | 3-phase AC 380 to 480 V (50 Hz/60 Hz) | | | |
| | Permissible power supply voltage fluctuation range | | | –20% to +10% | | | | | | | –15% to +10% | | | |
| | Required power supply capacity [kVA] | | | 20.1 | 34.8 | | | 20.1 | 34.8 | 52 | 80 | | | |
| | Recommended breaker capacity [A] | | | 30 | 40 | | | 30 | 40 | 50 | 100 | | | |
| | Motor cooling fan power | | | 1-phase AC 200 to 240 V (50 Hz/60 Hz) | | | | | | | | | | |
| | Flow rate selection solenoid valve power | | | DC 24 V ±10% (*3) | | | – (*4) | | | | | | | |
| Leak current [mA] | | | (*5) | 2.1 | 3.9 | | | 2.1 | 3.9 | 2.8 | 9.7 | 7.7 | | |
| Mass | Motor pump | | [kg] | 76 | 109 | | 99 | 65 | 98 | 119 | 168 | 178 | 180 | 174 |
| | Controller | | [kg] | 10 | | | | | | 14 | 40 | | | |
| Analog command input voltage DC [V] | | | (*6) | 0 to +10 | | | | | | | | | | |
| Non-standard specifications | Suction flange/block | | | Incorporated | | | | | | | | | | |
| | Safety valve | | (*7) | None | | | | | | | | | | |

(*1) To use this product, electrical components such as a regenerative resistor and DC reactor are required separately. For details, refer to Page 34 “List of Electrical Components”.
(*2) Even if the unit is used within the permissible power voltage fluctuation range, the PQ output characteristics may deteriorate if the power voltage fluctuates to the negative side. Also note that power voltage fluctuation to the positive side may cause alarms, due to overloading of regenerative operation, depending on the operation conditions. You are therefore recommended to use the unit in an environment with limited power voltage fluctuation as far as possible.
(*3) Solenoid valve model: KSO-G03-20BP-20-EN (power supply voltage: DC 24 V ±10%)
(*4) Not equipped with a solenoid valve for flow rate selection (To be prepared by the customer, or the V-SUT series option needs to be ordered separately)
(*5) Representative values when using a noise filter recommended by DAIKIN. Protection against noise, in accordance with DAIKIN’s recommendations, may be required depending on the operating environment.
(*6) With 5 V analog command input voltage specifications, the voltage can be adjusted from 0 to 5 V using parameter VMAX. With 10 V specifications, the voltage can be adjusted from 0 to 10 V, so it can also be operated with 5 V inputs.
(*7) With models without a safety valve in the discharge block, incorporate a safety valve in the hydraulic circuit at the machine side. Use the unit with the safety valve set at the maximum operating pressure + 2 MPa.

# Common Specifications (30 L/min to 300 L/min, single/double pump, 200 V/400 V specifications)

| Item | | | Specifications |
|---|---|---|---|
| Analog Input (*1) (2ch) | | | Command resolution: 0.1 [%] |
| | Pressure command Pi | | 5 V specifications: 0 to +5 V / 0 to PMAX<br>10 V specifications: 0 to +10 V / 0 to PMAX |
| | Flow rate command Qi | | 5 V specifications: 0 to +5 V / 0 to QMAX<br>10 V specifications: 0 to +10 V / 0 to QMAX |
| Analog output (*1) (2ch) | | | 5 V specifications: 0 to +5 V / 0 to PMAX<br>10 V specifications: 0 to +10 V / 0 to PMAX |
| | Pressure monitor Po | | 5 V specifications: −5 to +5 V / −QMAX to +QMAX<br>10 V specifications: −10 to +10 V / −QMAX to +QMAX |
| | Flow rate monitor Qo | | |
| Digital input signal (*2) (8ch) | | | Photo-coupler insulation, DC +24 V (27 V maximum), 5 mA/channel, shared plus/minus common |
| | DI1 | | Start/stop signal (control stop signal) |
| | DI3, DI4, DI6 | | PQ number selection signal for 8-PQ type (3-bit) |
| | DI5 | | Pump capacity selection input (for flow rate selection specifications) |
| | DI2, 7, 8 | | (Unassigned) |
| Digital output signal (*3) (7ch) | | | Photo coupler insulation, open collector, DC +24 V, 50 mA maximum, shared plus/minus common |
| | DO1 | | Ready to operate signal |
| | DO3 | | Pump capacity selection output (for autonomous flow rate selection specifications) |
| | DO4 | | Overload warning output (OFF: normal, ON: Warning) |
| | DO5 to 7 | | (Unassigned) |
| Contact output (alarm) (1ch) | | | Dry contact: DC 30 V, 1 channel, 500 mA maximum |
| Paint color | Motor pump | | No paint, only fan cover is in black |
| | Controller | | Ivory white (Munsell code 5Y7.5/1) |
| Oil used (*4) | Oil type | | General petroleum-based hydraulic oil / Wear-resistant hydraulic oil |
| | Oil temperature | | 0 to 60°C (Recommended operating temperature range: 15 to 50°C) |
| | Viscosity grade | | ISO VG32 to 68 |
| | Viscosity range | | 15 to 400 $mm^2/s$ |
| | Contamination | | Within NAS class 9 |
| Operating environment | Atmosphere | | Indoors (not to be directly exposed to sunlight) Not to be subject to corrosive gases, inflammable gases, oil mist or dust. |
| | Altitude | | 1000 m maximum |
| | Ambient humidity | | 85% RH maximum (no dew condensation) |
| | Ambient temperature | Motor pump | 0 to 40°C (no freezing) |
| | | Controller | 0 to 55°C (no freezing) |
| | Installation orientation | Motor pump | To be secured on the base for the hydraulic unit on the machine. To be installed in the horizontal orientation. |
| | | Controller | To be installed inside an electrical cabinet (IP54). To be installed in the vertical orientation (with the main power supply terminals at the bottom). |
| Vibration resistance | Nominal motor capacity: Equivalent to 7 kW/11 kW/ 15 kW/22 kW | Motor pump | 30.0 $m/s^2$ 33.3 Hz, 3 directions, X/Y: 2 Hr Z: 4 Hr |
| | | Controller | 21.6 $m/s^2$ 33.3 Hz, 3 directions, X/Y: 2 Hr Z: 4 Hr |
| | Equivalent to 37 kW | Motor pump | 30.0 $m/s^2$ 33.3 Hz, 3 directions, X/Y: 2 Hr Z: 4 Hr |
| | | Controller | 10 to 57 Hz, Amplitude 0.075 mm, 57 to 150 Hz, 9.8 $m/s^2$ |
| Protection grade | Controller | | IP00 |
| | Motor (*5) | | IP44 |
| Storage environment | Storage temperature | Motor pump | −20 to +70°C (no condensation) |
| | | Controller | −20 to +60°C (no condensation) |
| | Storage humidity | Motor pump | 85% RH maximum (no dew condensation) |
| | | Controller | |
| Startup time | | | 5 seconds maximum (at ambient temperature of 15°C) |
| Others | | | (a) Install a no-fuse breaker on the main power supply to protect electrical circuits from overcurrent, in the event of short circuits for example.<br>(b) Be sure to connect the ground terminals of the controller and motor pump.<br>(c) Frequently turning the controller's power supply ON/OFF will substantially shorten the controller's service life. It is advisable to start and stop the motor by turning the digital input (DI1) ON/OFF. |

(*1) There are two different voltage specifications: 5 V specifications and 10 V specifications. The PMAX and QMAX settings can be selected using parameters. The input and output voltage settings can be selected using parameter VMAX. (*2) When incorporating a semiconductor relay in the circuit, select a product with a leak current specification of 1 mA maximum. (*3) When incorporating a relay in the circuit as a load, take necessary measures against surge or select a surge-resistant product. (*4) Consult DAIKIN about the use of hydraulic oils other than petroleum-based oil (e.g. hydrous/synthetic) such as water-glycol hydraulic oil. (*5) The shaft through hole, encoder connector, motor cooling fan and terminal block are excluded.

# Performance Specification

| Item \ Model | | Common to all models |
|---|---|---|
| Flow rate characteristics | Linearity | F.S. 1[%] |
| | Hysteresis | F.S. 1[%] |
| | Maximum flow rate response time (*1) | 0.1 [s] |
| | Repeatability | F.S. 1[%] |
| Pressure characteristics | Linearity | F.S. 1[%] |
| | Hysteresis | F.S. 1[%] |
| | Maximum pressure response time (*2) | 0.1 [s] |
| | Repeatability | F.S. 1[%] |

Note: The data indicated in the table to the left are the typical performance, not guaranteed values.

(*1) Time required to reach 95% of the commanded value in response to a command to change the flow rate from 0 to the maximum with no load applied.

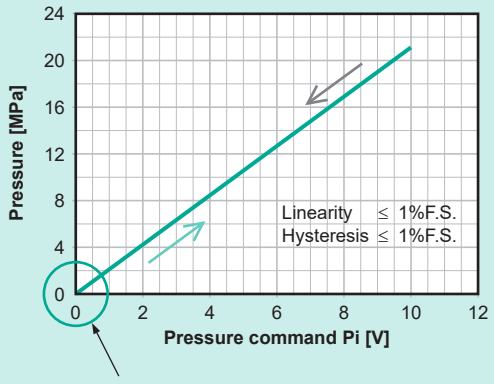
(*2) Time required to reach 95% of the commanded value in response to a command to change the pressure from 0 to the maximum. For double pump specifications, this is the pressure response time at confluence. The load volume conditions are the values with Daikin's inspection equipment. (Distance between SUT and inspection equipment: 2 m) Response time varies depending on the distance to the cylinder.

# Command Voltage - Control Pressure, Command Voltage - Control Flow Rate Characteristics

## Command Voltage - Control Pressure / Command Voltage - Control Flow Rate Characteristic Examples

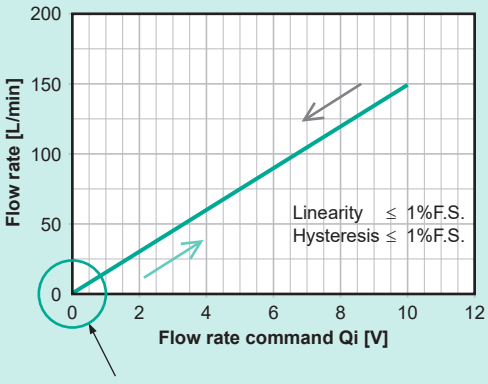
### Example with Double Pump Type (SUT00D15021-40-B)

**Pi-Po static characteristics**



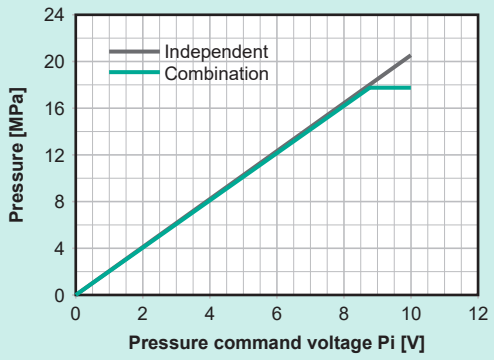

Low-pressure control:
Minimum control pressure = 1% F.S. or higher

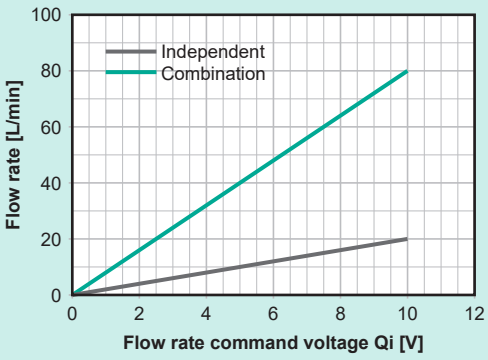
**Qi-Qo static characteristics**

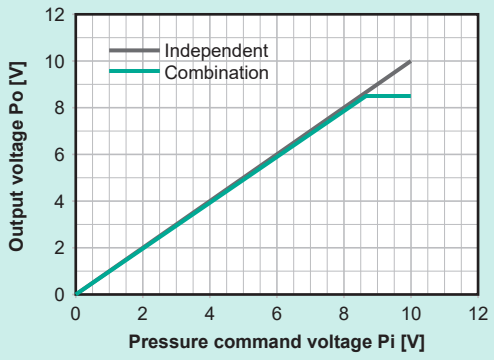


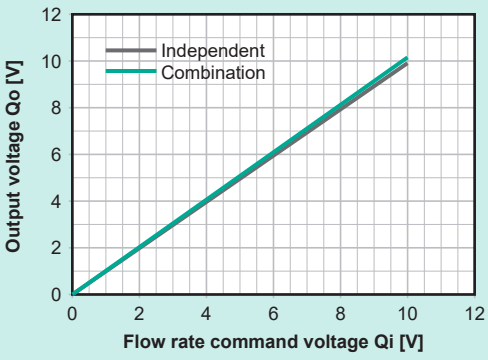

Low flow rate control:
Minimum control flow rate = 1% F.S. or higher

## Example Output Characteristics for Flow Rate Selection Specifications (SUT00D8021-40-B)




Note 1: Since the PQ characteristics vary depending on the model, refer to the appropriate PQ characteristic chart for the detailed output characteristics of each model.

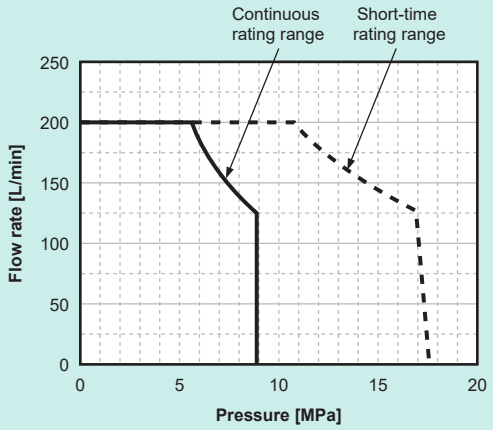
Note 2: When the combination flow is selected (DI5 = ON), the pressure does not rise above 17.6 MPa even if the pressure command voltage (Pi) is increased as shown in the graph above.

## Memo

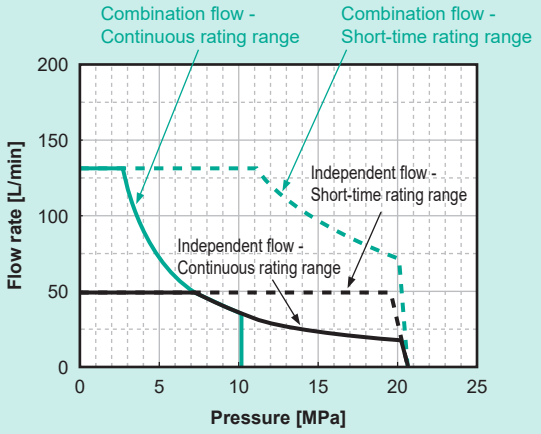
# About Continuous and Short-time Rating Range

**Analog command input/high-accuracy type SUPER UNITs can run continuously within the continuous rating range given in the pressure - flow rate characteristic charts (see P-Q charts on pages 16 to 21). In the short-time rating range, they can run for up to 20 seconds. (60 seconds for 400 V single pump specifications)**

**Example with Single Pump Type**
SUT00S20018-40YL-N0340




**Example with Double Pump Type**
SUT00D13021-40-B-N0321




**Continuous Rating** : Continuous operation is possible when the mean-square hydraulic power obtained based on the pressure and flow rate during operation of 1 cycle is lower than the hydraulic power for the continuous rating range in the figure above and also the mean square of the load pressure is within the maximum pressure for the continuous rating range.
(With the double pump type unit shown in the figure above with independent flow selected, continuous operation with the pressure held at 20.6 MPa is possible. However, for cycles that include pressure holding for 3 minutes or longer, a bleed off circuit equivalent to the capacity of a single pump running at 150 $min^{-1}$ must be provided at the pump discharge side to cool the pump.)

**Short-time Rating** : Operation possible for 20 seconds (or 60 seconds with 400 V single pump type)

## ■ Reference

### How to obtain the root-mean-square of hydraulic power and root-mean-square of load pressure (example for single pump type)

**When load pressure in each process within 1 cycle is $P_n$ (n = 1, 2, ...., n), flow rate is $Q_n$ (n = 1, 2, ...., n), and time is $t_n$ (n = 1, 2, ...., n)**

- Root-mean-square of hydraulic power = $SQRT(((P_1 \times Q_1/60)^2 \times t_1 + (P_2 \times Q_2/60)^2 \times t_2 + \ldots + (P_n \times Q_n/60)^2 \times t_n)/(t_1+t_2+\ldots+t_n))$
- Root-mean-square of load pressure = $SQRT((P_1^2 \times t_1 + P_2^2 \times t_2 + \ldots + P_n^2 \times t_n) / (t_1+t_2+\ldots+t_n))$
  (Note, however, that if the pump runs above the rated pump rotational speed of 1800 $min^{-1}$ to provide the control flow rate of $Q_n$, with the load pressure $P_n$, $P_n$ needs to be converted to the value when the pump is running at 1800 $min^{-1}$.)
  When the pump capacity of the SUPER UNIT is $q_n$ [$cm^3$], the pump rotational speed $N_n$ is $N_n = Q_n \times 10^3/q_n$.
  Therefore, converted pressure $P_n = P_n \times (N_n/1800)$

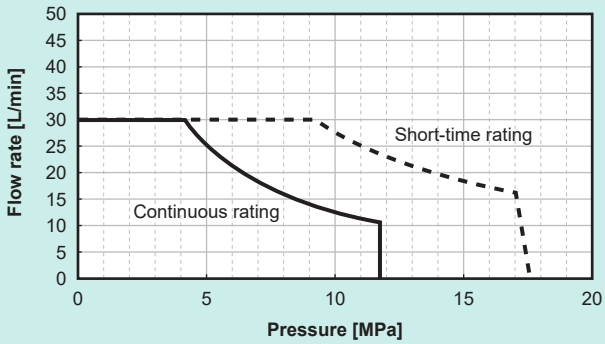
Note 1: The procedure for obtaining the mean hydraulic power and root-mean-square pressure with flow-rate-selection specifications (double pump type) is basically the same as above. Please consult us for detailed information.

Note 2: SQRT above represents square root operation ($\sqrt{\ }$). For the continuous rating hydraulic powers for each model, see the pressure - flow rate characteristic charts (P-Q characteristic charts) given in the instruction manual provided separately.

# Pressure – Flow Rate Characteristics (Representative characteristics, single pump specifications)

## 200 V Single Pump

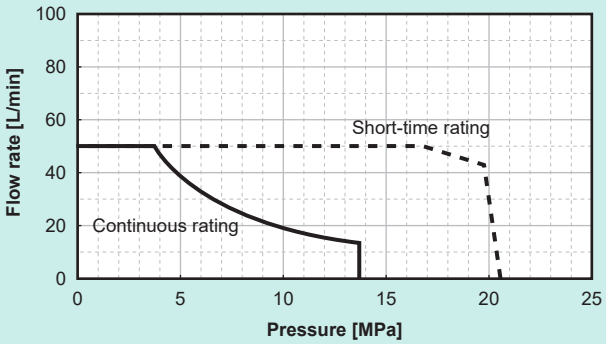
### PQ chart - 1




**SUT00S3018-30-A**

Maximum operating pressure = 17.6 [MPa]
Maximum flow rate = 30 [L/min]
Command voltage = 5 [V]

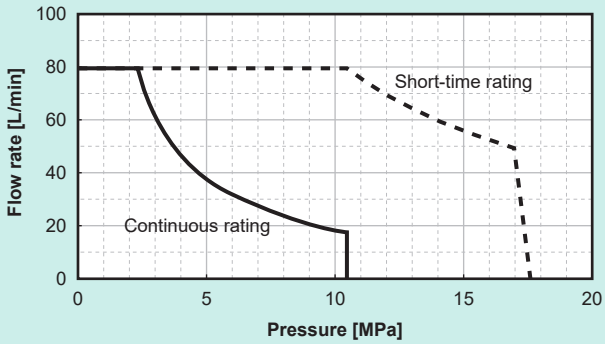
### PQ chart - 2




**SUT00S5021-40-A**

Maximum operating pressure = 20.6 [MPa]
Maximum flow rate = 50 [L/min]
Command voltage = 5 [V]

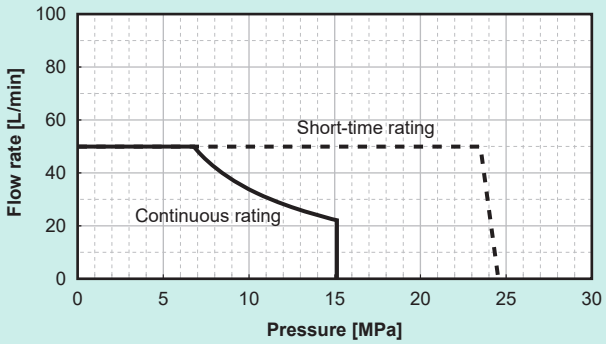
### PQ chart - 3




**SUT00S8018-40-A**

Maximum operating pressure = 17.6 [MPa]
Maximum flow rate = 80 [L/min]
Command voltage = 5 [V]

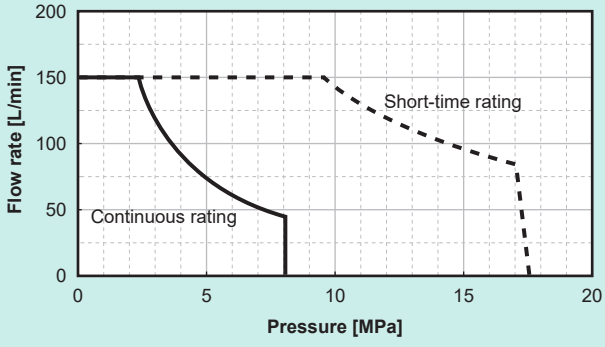
### PQ chart - 4




**SUT00S5025-41-L-N0432**

Maximum operating pressure = 24.5 [MPa]
Maximum flow rate = 50 [L/min]
Command voltage = 5 [V]

### PQ chart - 5



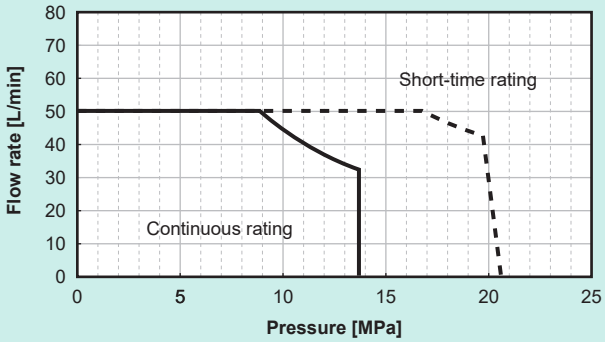

**SUT00S15018-40-A**

Maximum operating pressure = 17.6 [MPa]
Maximum flow rate = 150 [L/min]
Command voltage = 5 [V]

# Pressure – Flow Rate Characteristics (Representative characteristics, single pump specifications)

## 400 V Single Pump

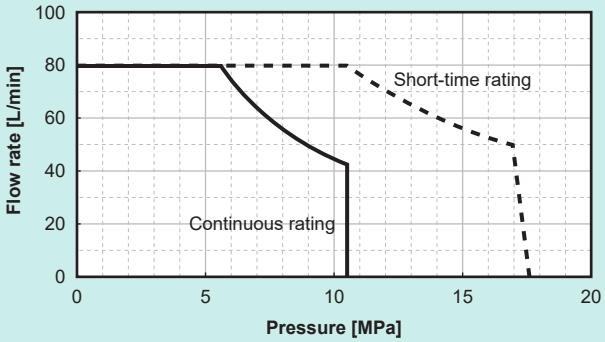
### PQ chart - 6




**SUT00S5021-40YA-N0265**

Maximum operating pressure = 20.6 [MPa]
Maximum flow rate = 50 [L/min]
Command voltage = 10 [V]

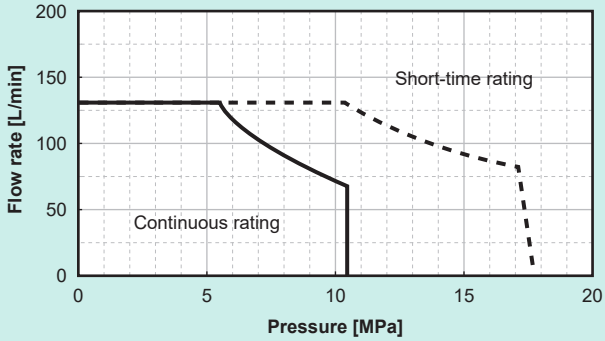
### PQ chart - 7




**SUT00S8018-40YA**

Maximum operating pressure = 17.6 [MPa]
Maximum flow rate = 80 [L/min]
Command voltage = 10 [V]

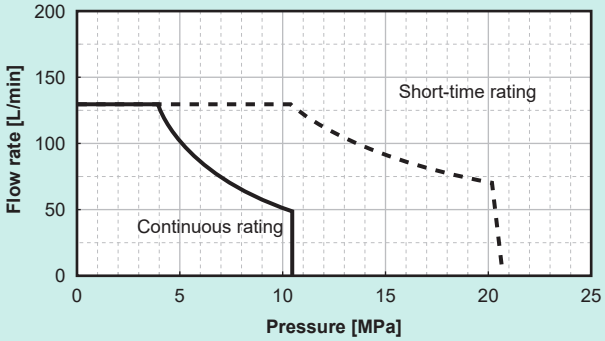
### PQ chart - 8




**SUT00S13018-40YA-N0218**

Maximum operating pressure = 17.6 [MPa]
Maximum flow rate = 130 [L/min]
Command voltage = 10 [V]

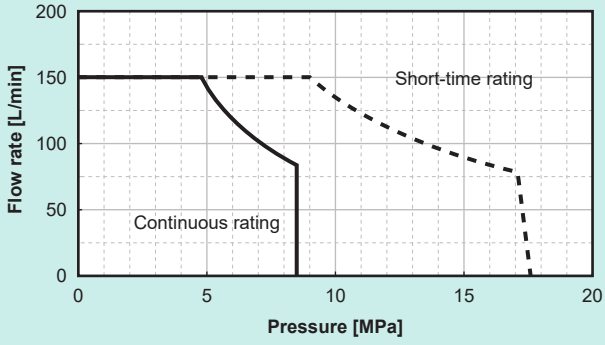
### PQ chart - 9




**SUT00S13021-40YA-N0286**

Maximum operating pressure = 20.6 [MPa]
Maximum flow rate = 130 [L/min]
Command voltage = 10 [V]

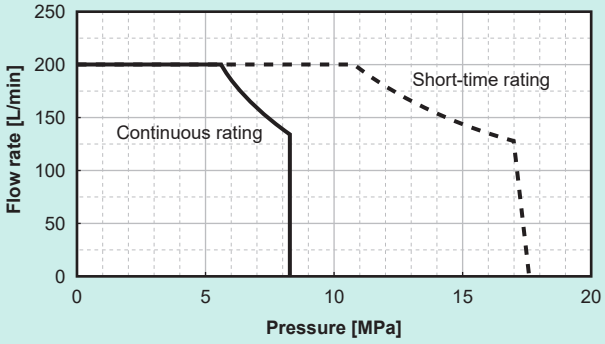
### PQ chart - 10




**SUT00S15018-40YA**

Maximum operating pressure = 17.6 [MPa]
Maximum flow rate = 150 [L/min]
Command voltage = 10 [V]

### PQ chart - 11



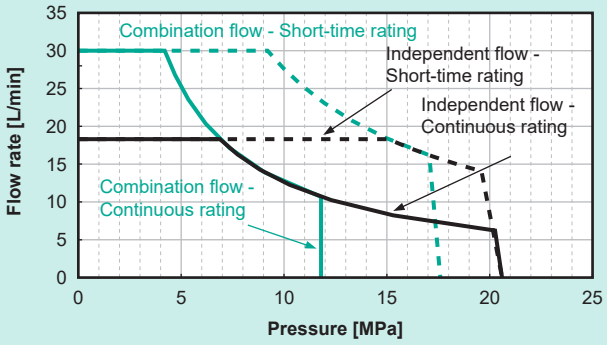

**SUT00S20018-40YL-N0340**

Maximum operating pressure = 17.6 [MPa]
Maximum flow rate = 200 [L/min]
Command voltage = 10 [V]

# Pressure – Flow Rate Characteristics (Representative characteristics, double pump specifications)

## 200 V Double Pump

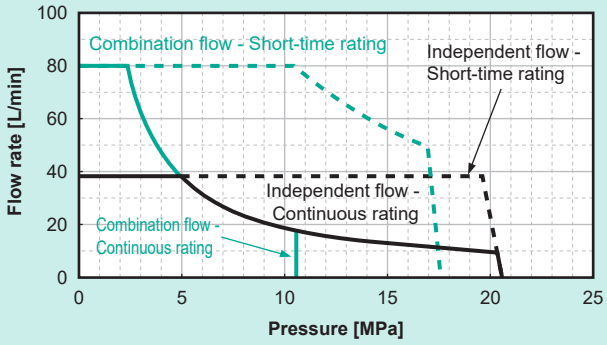
### PQ chart - 12




**SUT00D3021-30-B-N0436**

Maximum operating pressure = 17.6/20.6 [MPa]
Maximum flow rate = 30/18.3 [L/min]
Command voltage = 10 [V]

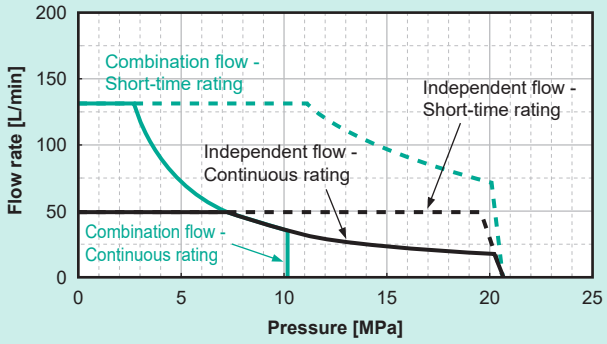
### PQ chart - 13




**SUT00D8021-40-B-N0323**

Maximum operating pressure = 17.6/20.6 [MPa]
Maximum flow rate = 80/38.4 [L/min]
Command voltage = 10 [V]

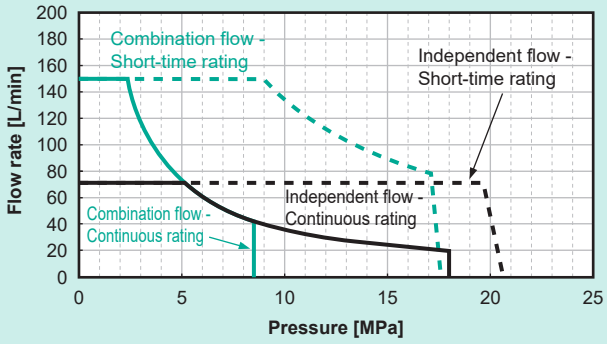
### PQ chart - 14




**SUT00D13021-40-B-N0321**

Maximum operating pressure = 20.6/20.6 [MPa]
Maximum flow rate = 130/47.9 [L/min]
Command voltage = 10 [V]

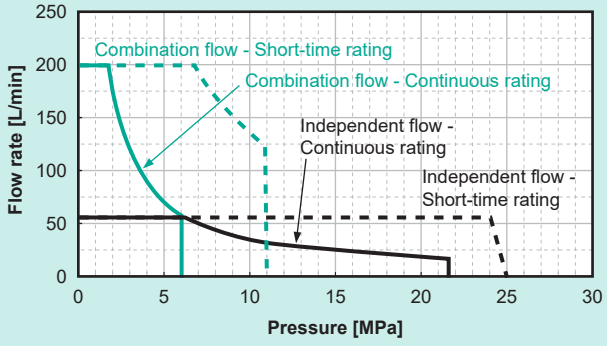
### PQ chart - 15




**SUT00D15021-40-B-N0365**

Maximum operating pressure = 17.6/20.6 [MPa]
Maximum flow rate = 150/70.9 [L/min]
Command voltage = 10 [V]

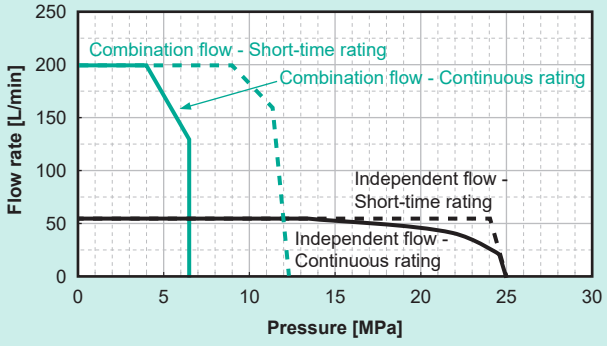
### PQ chart - 16




**SUT00D20021-40-L**

Maximum operating pressure = 11.0/25.0 [MPa]
Maximum flow rate = 200/56 [L/min]
Command voltage = 10 [V]

### PQ chart - 17



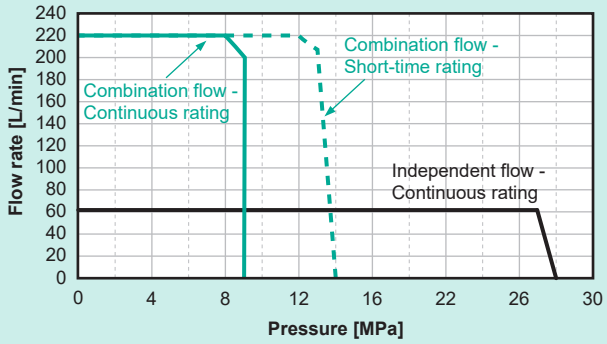

**SUT00D20025-41-L**

Maximum operating pressure = 12.3/25.0 [MPa]
Maximum flow rate = 200/56.0 [L/min]
Command voltage = 10 [V]

# Pressure – Flow Rate Characteristics (Representative characteristics, double pump specifications)

## 200 V Double Pump

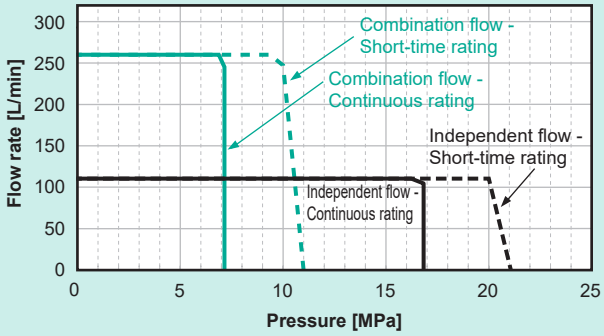
### PQ chart - 18




**SUT00D22028-41-L**

Maximum operating pressure = 14.0/28.0 [MPa]
Maximum flow rate = 220/63.2 [L/min]
Command voltage = 10 [V]

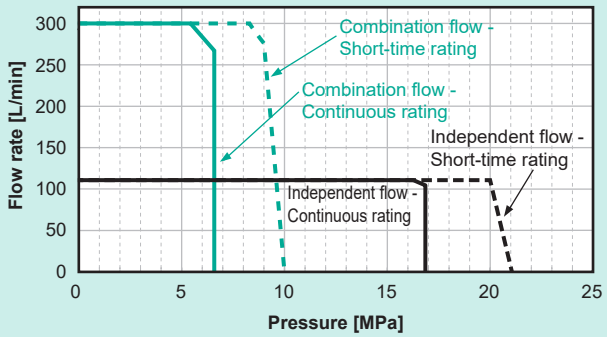
### PQ chart - 19




**SUT00D26021-41-L**

Maximum operating pressure = 11.0/20.6 [MPa]
Maximum flow rate = 260/111 [L/min]
Command voltage = 10 [V]

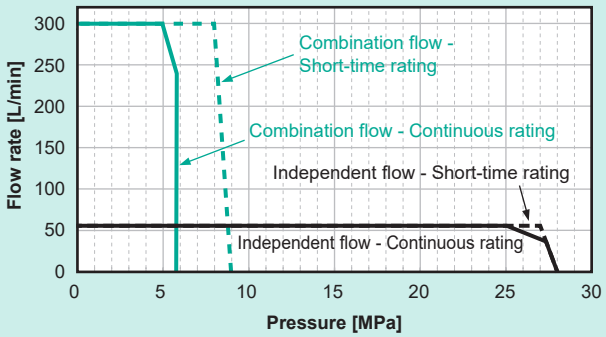
### PQ chart - 20




**SUT00D30021-41-L**

Maximum operating pressure = 10.0/20.6 [MPa]
Maximum flow rate = 300/111 [L/min]
Command voltage = 10 [V]

### PQ chart - 21

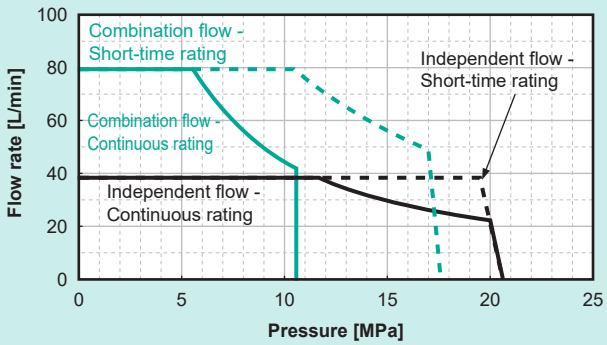



**SUT00D30028-41-L**

Maximum operating pressure = 9.0/28.0 [MPa]
Maximum flow rate = 300/56.0 [L/min]
Command voltage = 10 [V]

## 400 V Double Pump

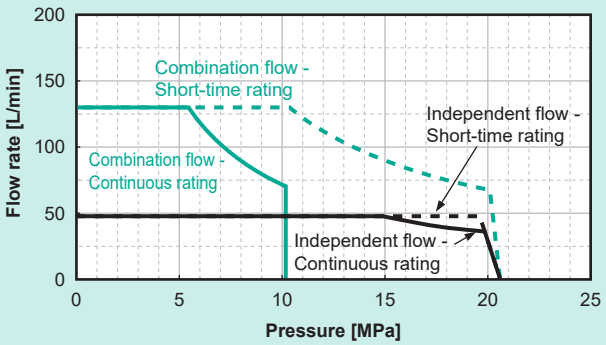
### PQ chart - 22




**SUT00D8021-40YB-N0324**

Maximum operating pressure = 17.6/20.6 [MPa]
Maximum flow rate = 80/38.4 [L/min]
Command voltage = 10 [V]

### PQ chart - 23

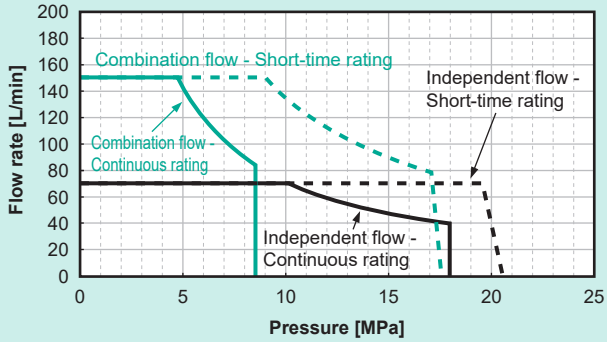



**SUT00D13021-40YB-N0322**

Maximum operating pressure = 20.6/20.6 [MPa]
Maximum flow rate = 130/47.9 [L/min]
Command voltage = 10 [V]

## 400 V Double Pump

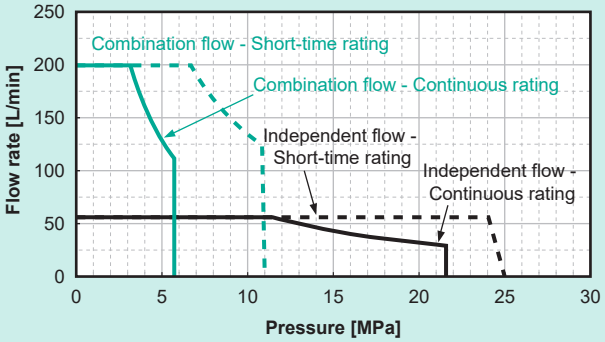
### PQ chart - 24




**SUT00D15021-40YB-N0358**

Maximum operating pressure = 17.6/20.6 [MPa]
Maximum flow rate = 150/70.9 [L/min]
Command voltage = 10 [V]

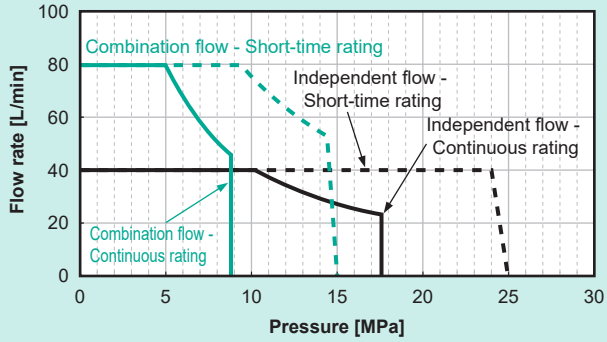
### PQ chart - 25




**SUT00D20021-40YL**

Maximum operating pressure = 11.0/25.0 [MPa]
Maximum flow rate = 200/56.0 [L/min]
Command voltage = 10 [V]

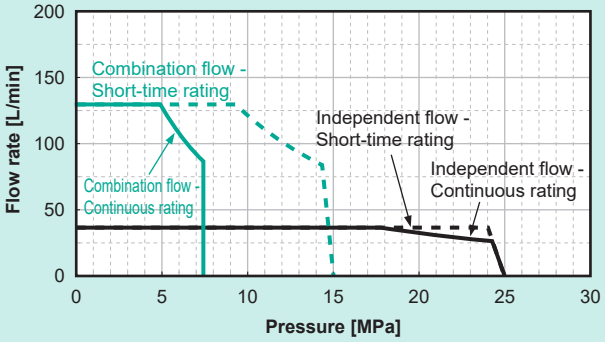
### PQ chart - 26




**SUT00D8025-40YL**

Maximum operating pressure = 15.0/25.0 [MPa]
Maximum flow rate = 80/40.0 [L/min]
Command voltage = 10 [V]

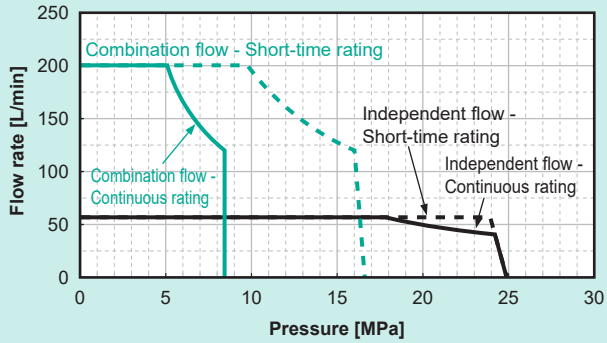
### PQ chart - 27




**SUT00D13025-40YL**

Maximum operating pressure = 15.0/25.0 [MPa]
Maximum flow rate = 130/37.3 [L/min]
Command voltage = 10 [V]

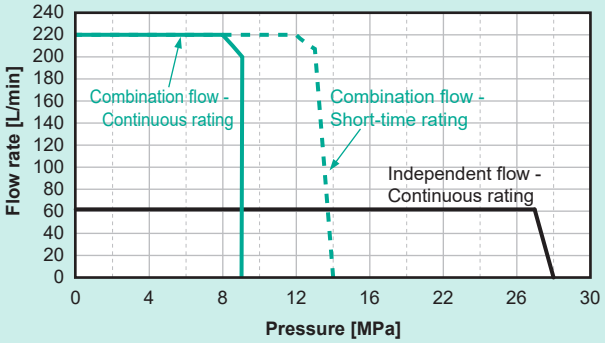
### PQ chart - 28




**SUT00D20025-40YL**

Maximum operating pressure = 16.5/25.0 [MPa]
Maximum flow rate = 200/56.0 [L/min]
Command voltage = 10 [V]

### PQ chart - 29



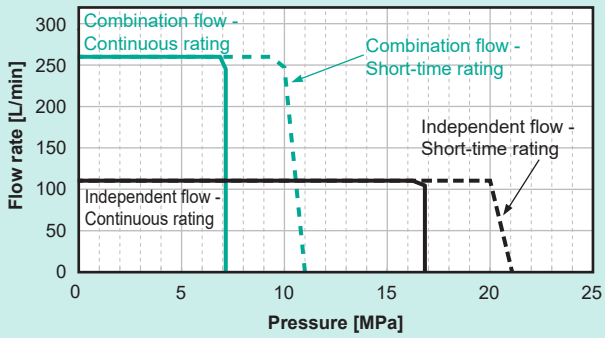

**SUT00D22028-41YL**

Maximum operating pressure = 14.0/28.0 [MPa]
Maximum flow rate = 220/63.2 [L/min]
Command voltage = 10 [V]

# Pressure – Flow Rate Characteristics (Representative characteristics, double pump specifications)

## 400 V Double Pump

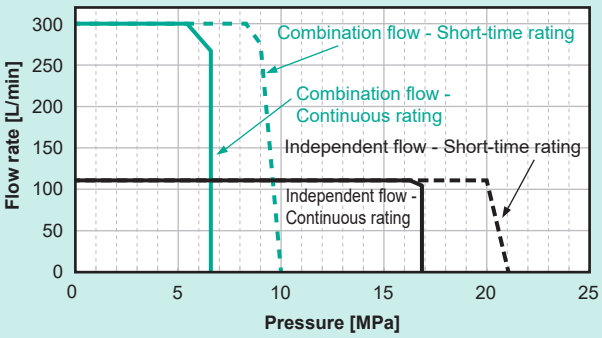
### PQ chart - 30




**SUT00D26021-41YL**

Maximum operating pressure = 11.0/20.6 [MPa]
Maximum flow rate = 260/110 [L/min]
Command voltage = 10 [V]

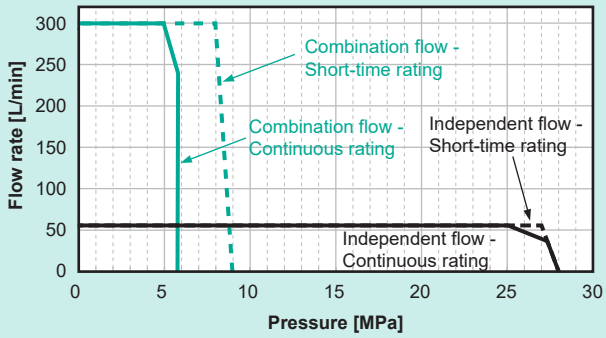
### PQ chart - 31




**SUT00D30021-41YL**

Maximum operating pressure = 10.0/20.6 [MPa]
Maximum flow rate = 300/110 [L/min]
Command voltage = 10 [V]

### PQ chart - 32



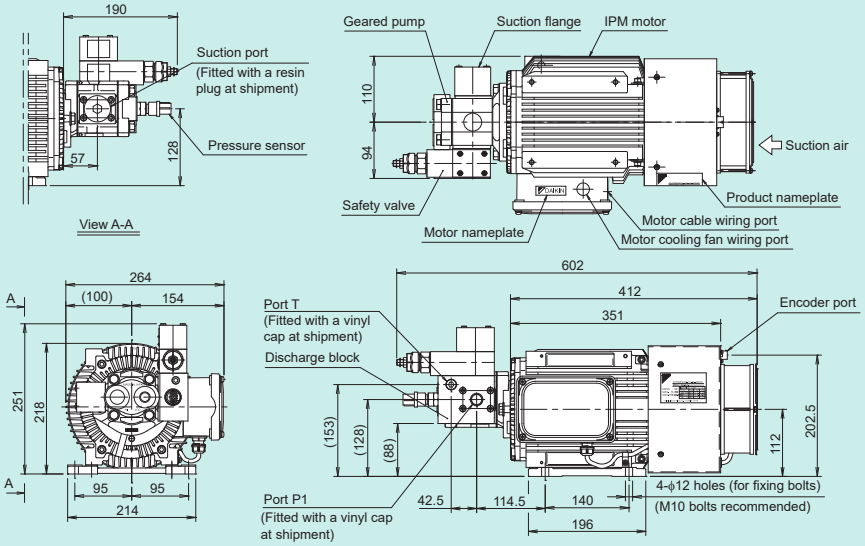

**SUT00D30028-41YL**

Maximum operating pressure = 9.0/28.0 [MPa]
Maximum flow rate = 300/56.0 [L/min]
Command voltage = 10 [V]

# External Dimension Diagrams (Motor pump 200 V/400 V single pump type)

## 200 V 30 L/min 17.6 MPa

### SUT00S3018-30-A

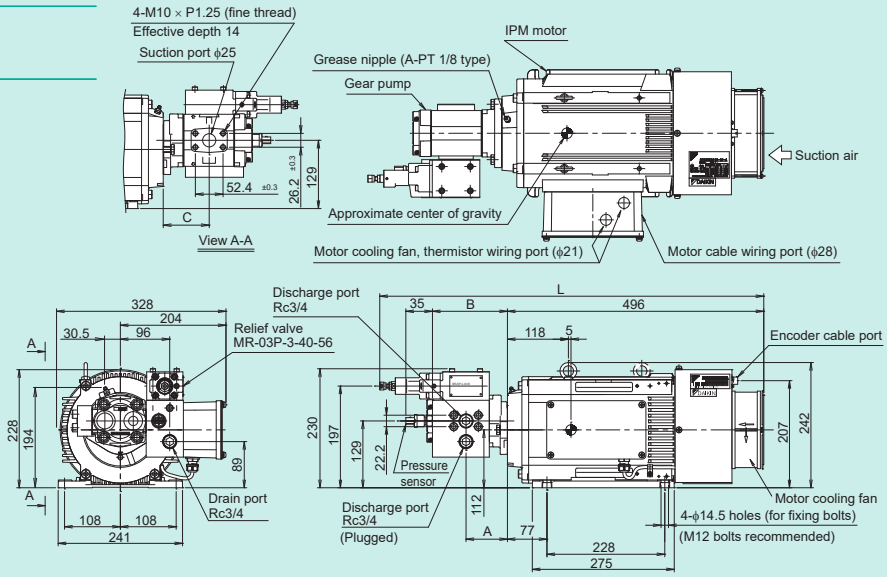



| Model code | Power supply specifications | Pump specifications | Suction port | Discharge port | Drain port | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|
| SUT00S3018-30-A | 200 V | Single | Rc1 | Rc1/2 | Rc3/8 | Front | Incorporated |

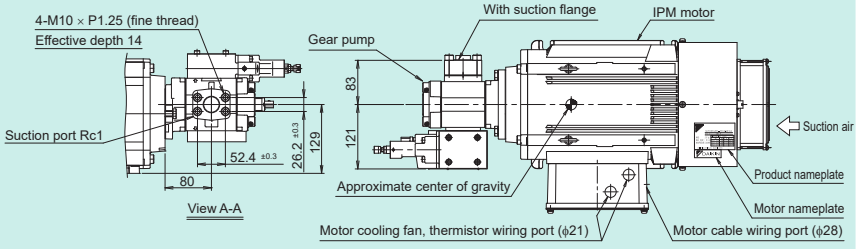
(*1) "Pressure sensor orientation" indicates the orientation of the pressure sensor viewed from the pump side.

## 200 V/400 V 50 L/min 20.6 MPa
## 200 V/400 V 80 L/min 17.6 MPa

### SUT00S5021-40-A
### SUT00S8018-40-A
### SUT00S5021-40YA-N0265
### SUT00S8018-40YA




## SUT00S5021-40YA-N0265 with suction flange




| Model code | Power supply specifications | Pump specifications | L | A | B | C | Suction port | Discharge port | Drain port | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SUT00S5021-40-A | 200 V | Single | 742 | 80 | 145 | 80 | ϕ25 | Rc3/4 | Rc3/4 | Front | None |
| SUT00S8018-40-A | 200 V | | 749 | 87 | 152 | 87 | ϕ25 | Rc3/4 | Rc3/4 | Front | None |
| SUT00S5021-40YA-N0265 | 400 V | | 742 | 80 | 145 | 80 | Rc1 | Rc3/4 | Rc3/4 | Front | Incorporated |
| SUT00S8018-40YA | 400 V | | 749 | 87 | 152 | 87 | ϕ25 | Rc3/4 | Rc3/4 | Front | None |

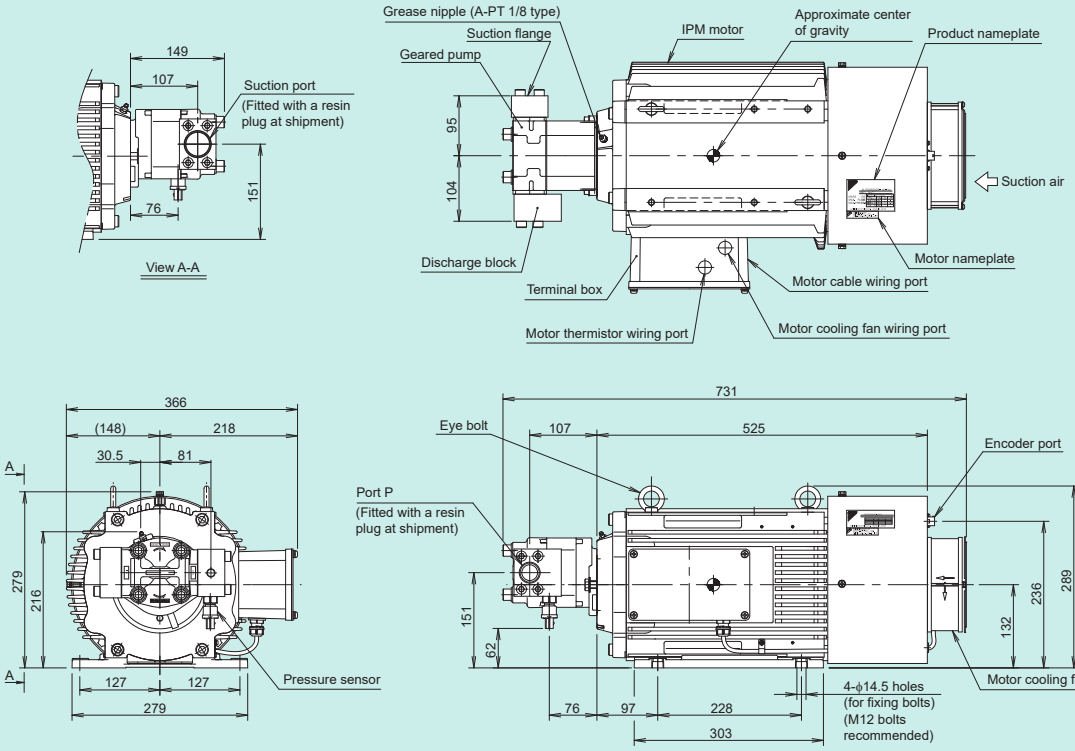
(*1) "Pressure sensor orientation" indicates the orientation of the pressure sensor viewed from the pump side.

* The motor pump needs to be secured horizontally on the machine or tank. Also, secure a clearance of at least 100 mm at the suction side of the motor cooling fan.
In addition, a clearance of at least 100 mm from the pump or solenoid valve is required at the exhaust side, with good ventilation assured by mounting a cover provided with ventilation holes or other means.

# External Dimension Diagrams (Motor pump 200 V/400 V single pump type)

## 200 V 50 L/min 24.5 MPa

### SUT00S5025-41-L-N0432

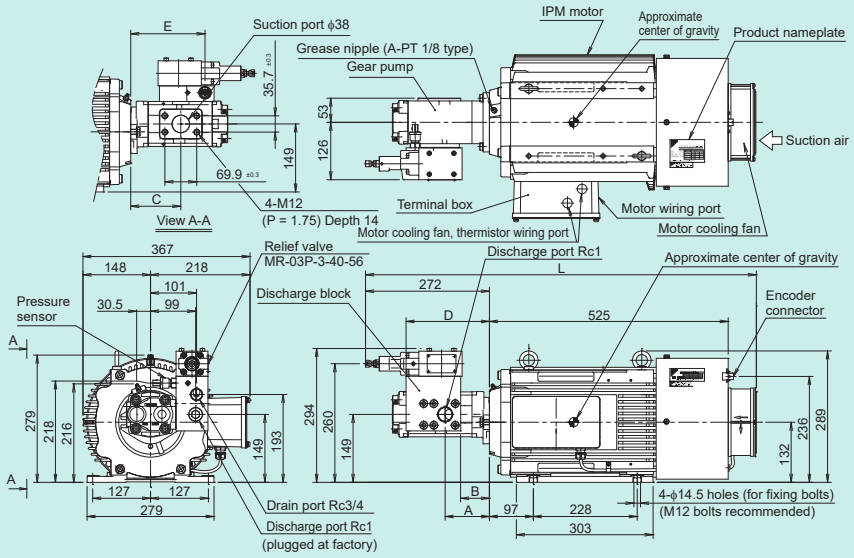



| Model code | Power supply specifications | Pump specifications | Suction port | Discharge port | Drain port | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|
| SUT00S5025-41-L-N0432 | 200 V | Single | Rc1-1/4 | Rc1 | - | Bottom | Incorporated |

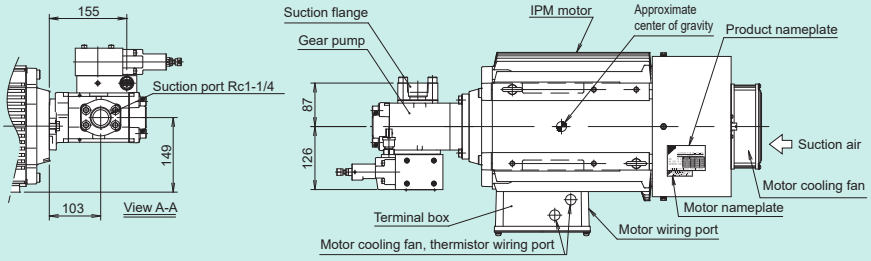
(*1) “Pressure sensor orientation” indicates the orientation of the pressure sensor viewed from the pump side.

## 200 V 150 L/min 17.6 MPa
## 400 V 130 L/min 17.6 MPa, 130 L/min 20.6 MPa, 150 L/min 17.6 MPa

**SUT00S15018-40-A**
**SUT00S13018-40YA-N0218**
**SUT00S13021-40YA-N0286**
**SUT00S15018-40YA**




### SUT00S13018-40YA-N0218 with suction flange

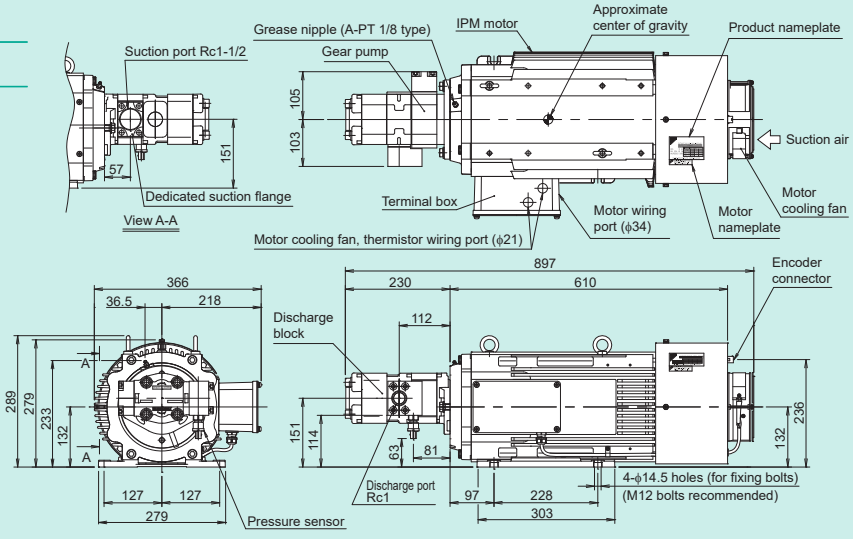



| Model code | Power supply specifications | Pump specifications | L | A | B | C | D | E | Suction port | Discharge port | Drain port | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUT00S15018-40-A | 200 V | Single | 854 | 97 | 63 | 110 | 183 | 163 | ϕ38 | Rc1 | Rc3/4 | (L) | None |
| SUT00S13018-40YA-N0218 | 400 V | | 850 | 90 | 55 | 103 | 175 | 155 | Rc1-1/4 | Rc1 | Rc3/4 | (L) | Incorporated |
| SUT00S13021-40YA-N0286 | 400 V | | 850 | 90 | 55 | 103 | 175 | 155 | Rc1-1/4 | Rc1 | Rc3/4 | (L) | Incorporated |
| SUT00S15018-40YA | 400 V | | 854 | 97 | 63 | 110 | 183 | 163 | ϕ38 | Rc1 | Rc3/4 | (L) | None |

(*1) "Pressure sensor orientation" indicates the orientation of the pressure sensor viewed from the pump side.

## 400 V 200 L/min 17.6 MPa

**SUT00S20018-40YL-N0340**




| Model code | Power supply specifications | Pump specifications | Suction port | Discharge port | Drain port | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|
| SUT00S20018-40YL-N0340 | 400 V | Single | Rc1-1/2 | Rc1 | – | Bottom | With dedicated part |

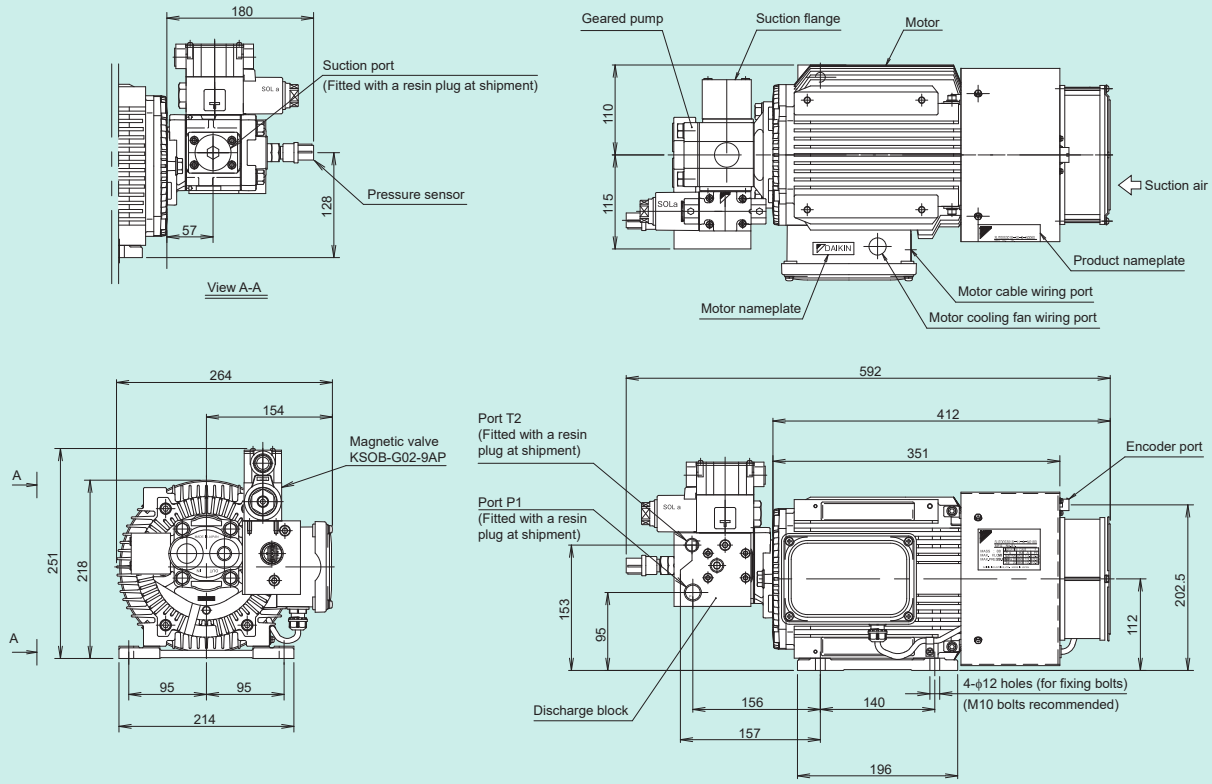
(*1) "Pressure sensor orientation" indicates the orientation of the pressure sensor viewed from the pump side.

* The motor pump needs to be secured horizontally on the machine or tank. Also, secure a clearance of at least 100 mm at the suction side of the motor cooling fan.
In addition, a clearance of at least 100 mm from the pump or solenoid valve is required at the exhaust side, with good ventilation assured by mounting a cover provided with ventilation holes or other means.

# External Dimension Diagrams (Motor pump 200 V/400 V double pump type)

## 200 V 30 L/min 20.6 MPa

### SUT00D3021-30-B-N0436

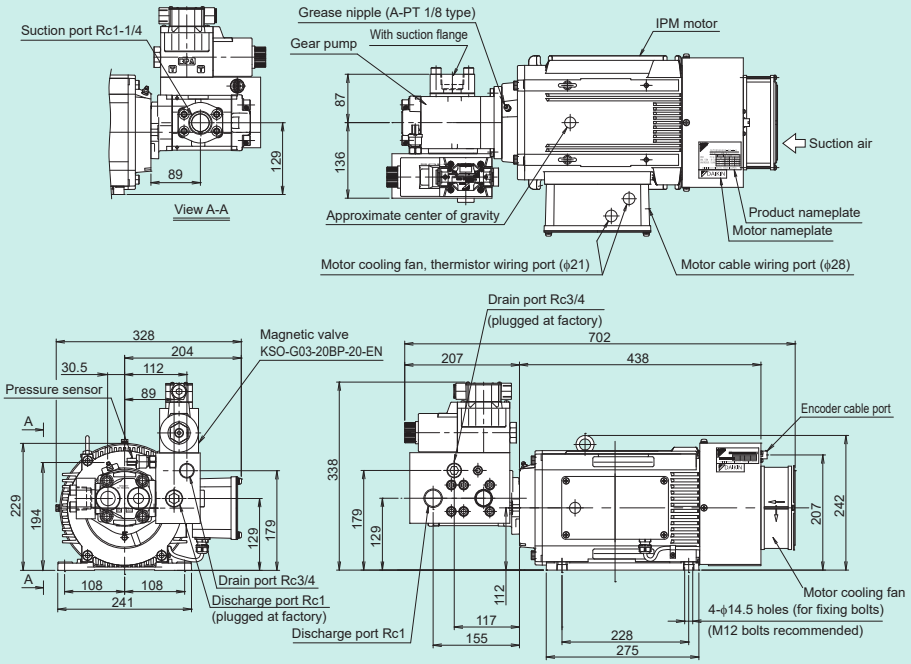



| Model code | Power supply specifications | Pump specifications | Suction port | Discharge port | Return port (T2) | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|
| SUT00D3021-30-B-N0436 | 200 V | Double | Rc1 | Rc1/2 | Rc3/8 | Front | Incorporated |

(*1) “Pressure sensor orientation” indicates the orientation of the pressure sensor viewed from the pump side.

## 200 V 80 L/min 20.6 MPa
## 400 V 80 L/min 17.6 MPa

**SUT00D8021-40-B-N0323**
**SUT00D8021-40YB-N0324**

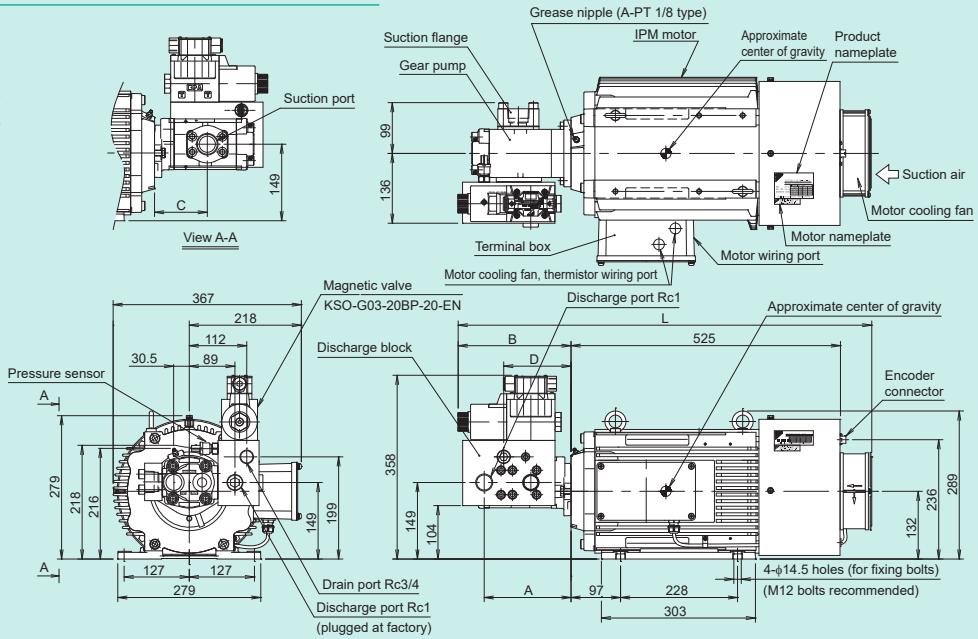



| Model code | Power supply specifications | Pump specifications | Suction port | Discharge port | Drain port | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|
| SUT00D8021-40-B-N0323 | 200 V | Double | Rc1-1/4 | Rc1 | Rc3/4 | (L) | Incorporated |
| SUT00D8021-40YB-N0324 | 400 V | | Rc1-1/4 | Rc1 | Rc3/4 | (L) | Incorporated |

(*1) “Pressure sensor orientation” indicates the orientation of the pressure sensor viewed from the pump side.

## 200 V 130 L/min 20.6 MPa, 150 L/min 20.6 MPa
## 400 V 130 L/min 20.6 MPa, 150 L/min 20.6 MPa

**SUT00D13021-40-B-N0321**
**SUT00D15021-40-B-N0365**
**SUT00D13021-40YB-N0322**
**SUT00D15021-40YB-N0358**




| Model code | Power supply specifications | Pump specifications | L | A | B | C | D | Suction port | Discharge port | Drain port | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUT00D13021-40-B-N0321 | 200 V | Double | 802 | 169 | 220 | 103 | 131 | Rc1-1/4 | Rc1 | Rc3/4 | (L) | Incorporated |
| SUT00D15021-40-B-N0365 | 200 V | | 811 | 177 | 228 | 110 | 139 | Rc1-1/2 | Rc1 | Rc3/4 | (L) | Incorporated |
| SUT00D13021-40YB-N0322 | 400 V | | 802 | 169 | 220 | 103 | 131 | Rc1-1/4 | Rc1 | Rc3/4 | (L) | Incorporated |
| SUT00D15021-40YB-N0358 | 400 V | | 811 | 177 | 228 | 110 | 139 | Rc1-1/2 | Rc1 | Rc3/4 | (L) | Incorporated |

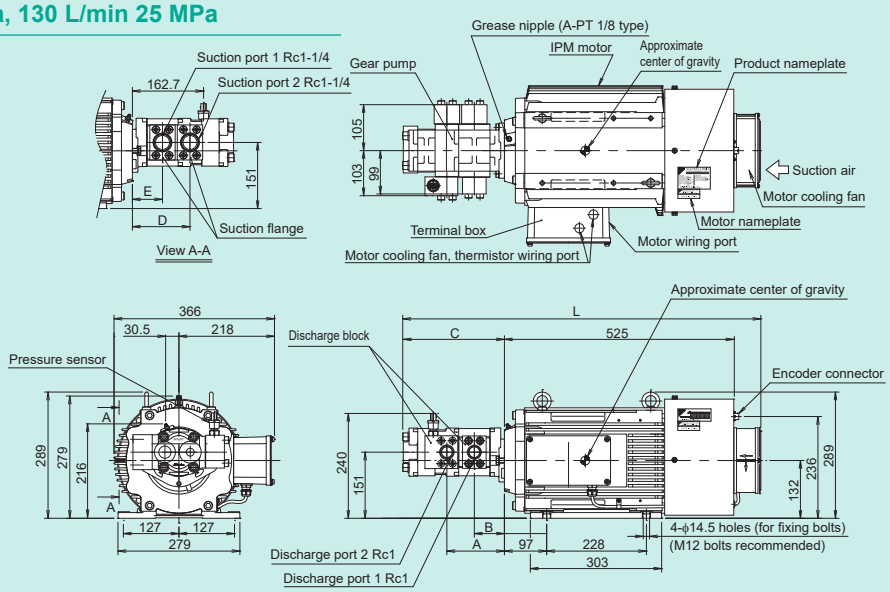
(*1) “Pressure sensor orientation” indicates the orientation of the pressure sensor viewed from the pump side.

* The motor pump needs to be secured horizontally on the machine or tank. Also, secure a clearance of at least 100 mm at the suction side of the motor cooling fan.
In addition, a clearance of at least 100 mm from the pump or solenoid valve is required at the exhaust side, with good ventilation assured by mounting a cover provided with ventilation holes or other means.

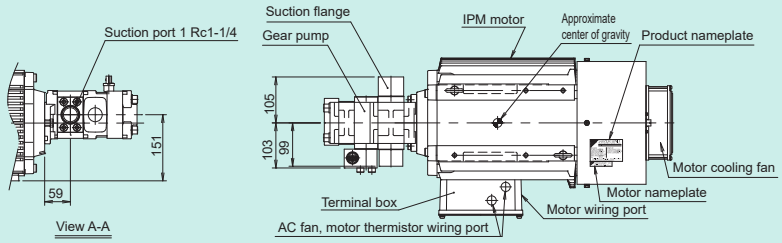
# External Dimension Diagrams (Motor pump 200 V/400 V double pump type)

## 200 V 200 L/min 20.6 MPa
## 400 V 200 L/min 20.6 MPa, 130 L/min 25 MPa

**SUT00D20021-40-L**
**SUT00D20021-40YL**
**SUT00D13025-40YL**




### SUT00D13025-40YL (pump section, suction flange on 1 port)

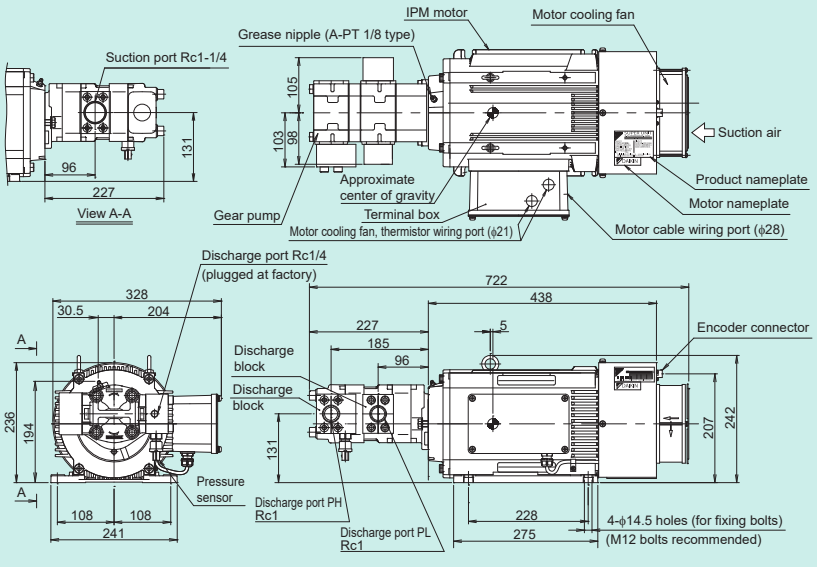



| Model code | Power supply specifications | Pump specifications | L | A | B | C | D | E | Suction port 1 | Suction port 2 | Discharge port | Drain port | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUT00D20021-40-L | 200 V | Double | 815 | 132 | 69 | 232 | 132 | 69 | Rc1-1/4 | Rc1-1/4 | Rc1 | Rc1 | Top | 2 pcs. provided |
| SUT00D20021-40YL | 400 V | | 819 | 131.6 | 68.6 | 232 | 131.6 | 68.6 | Rc1-1/4 | Rc1-1/4 | Rc1 | Rc1 | Top | 2 pcs. provided |
| SUT00D13025-40YL | 400 V | | 799 | 116 | 59 | 212 | – | 59 | Rc1-1/4 | – | Rc1 | Rc1 | Top | Incorporated |

(*1) “Pressure sensor orientation” indicates the orientation of the pressure sensor viewed from the pump side.

## 400 V 80 L/min 25 MPa

**SUT00D8025-40YL**

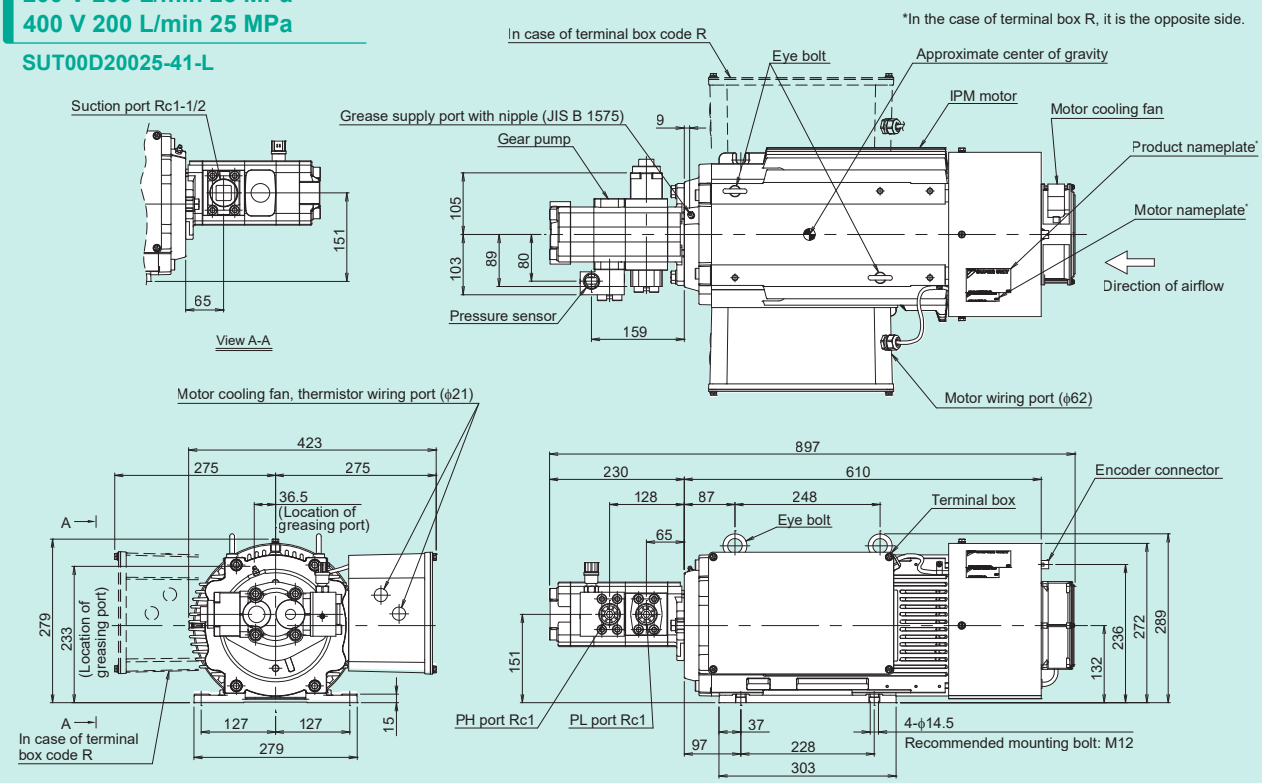



| Model code | Power supply specifications | Pump specifications | Suction port | Discharge port PL | Discharge port PH | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|
| SUT00D8025-40YL | 400 V | Double | Rc1-1/4 | Rc1 | Rc1 | Bottom | Incorporated |

(*1) “Pressure sensor orientation” indicates the orientation of the pressure sensor viewed from the pump side.

## 200 V 200 L/min 25 MPa
## 400 V 200 L/min 25 MPa

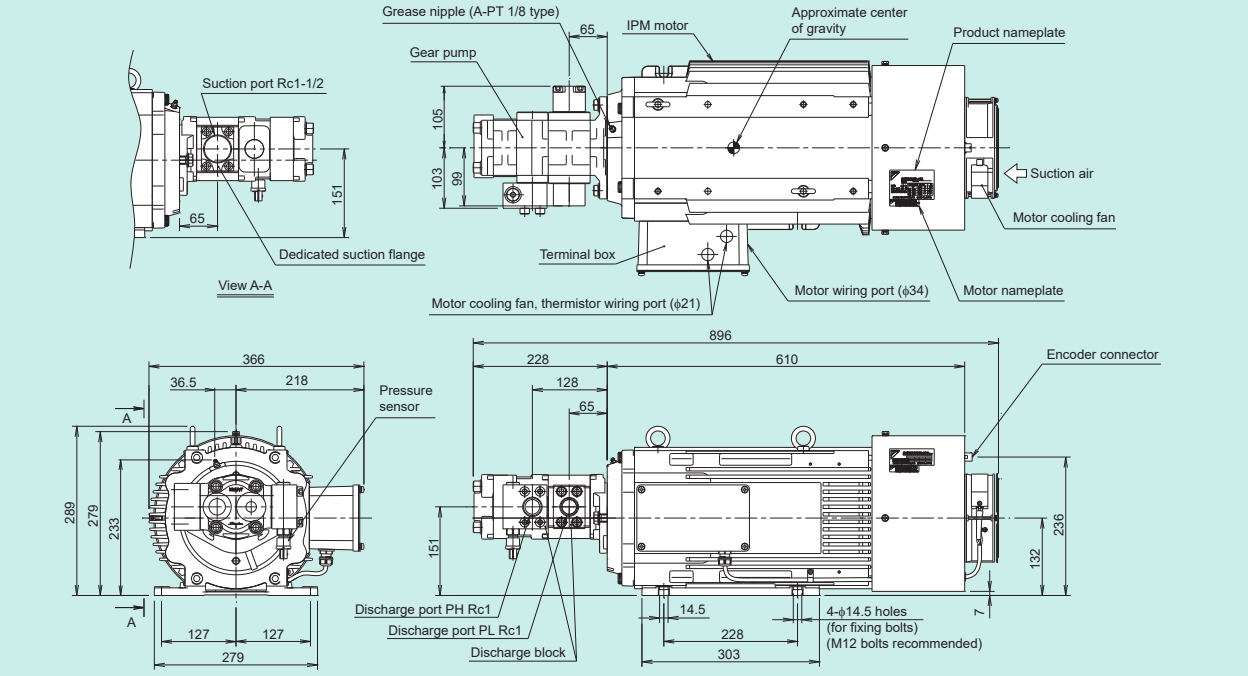
### SUT00D20025-41-L




| Model code | Power supply specifications | Pump specifications | Suction port | Discharge port PL | Discharge port PH | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|
| SUT00D20025-41-L | 200 V | Double | Rc1-1/2 | Rc1 | Rc1 | Top | With dedicated part |

(*1) "Pressure sensor orientation" indicates the orientation of the pressure sensor viewed from the pump side.

### SUT00D20025-40YL




| Model code | Power supply specifications | Pump specifications | Suction port | Discharge port PL | Discharge port PH | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|
| SUT00D20025-40YL | 400 V | Double | Rc1-1/2 | Rc1 | Rc1 | Bottom | With dedicated part |

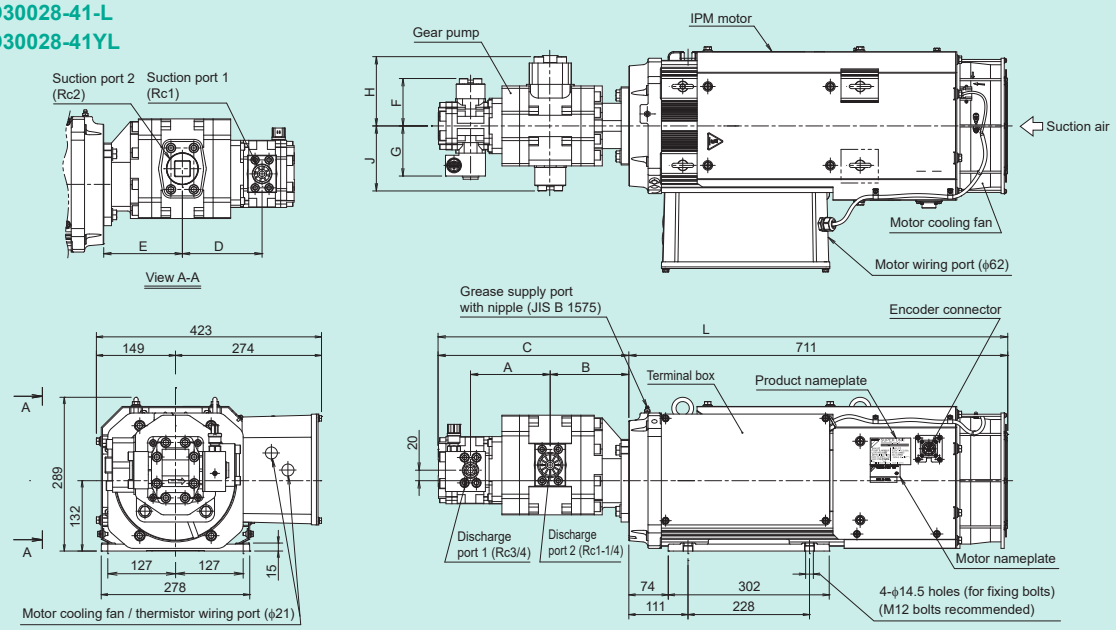
(*1) "Pressure sensor orientation" indicates the orientation of the pressure sensor viewed from the pump side.

* The motor pump needs to be secured horizontally on the machine or tank. Also, secure a clearance of at least 100 mm at the suction side of the motor cooling fan.
In addition, a clearance of at least 100 mm from the pump or solenoid valve is required at the exhaust side, with good ventilation assured by mounting a cover provided with ventilation holes or other means.

# External Dimension Diagrams (Motor pump 200 V/400 V double pump type)

## 200 V/400 V 220 L/min 28 MPa
## 200 V/400 V 300 L/min 28 MPa

**SUT00D22028-41-L**
**SUT00D22028-41YL**
**SUT00D30028-41-L**
**SUT00D30028-41YL**

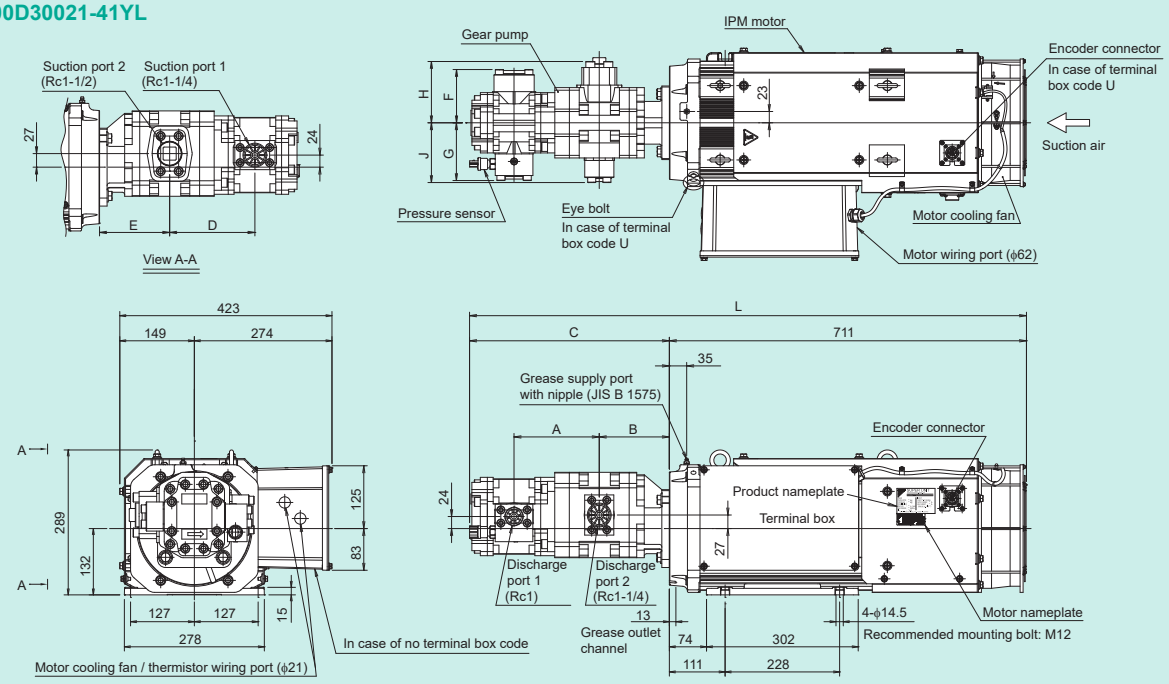



| Model code | Power supply specifications | Pump specifications | L | A | B | C | D | E | F | G | H | J | Suction port 1 | Suction port 2 | Discharge port 1 | Discharge port 2 | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUT00D22028-41-L | 200 V | Double | 1,044 | 140 | 133 | 333 | 140 | 133 | 89 | 94 | 122 | 119 | Rc1 | Rc1-1/2 | Rc3/4 | Rc1-1/4 | Top | Incorporated |
| SUT00D22028-41YL | 400 V | | 1,044 | 140 | 133 | 333 | 140 | 133 | 89 | 94 | 122 | 119 | Rc1 | Rc1-1/2 | Rc3/4 | Rc1-1/4 | Top | Incorporated |
| SUT00D30028-41-L | 200 V | | 1,069 | 150 | 148 | 358 | 150 | 148 | 89 | 94 | 130 | 122 | Rc1 | Rc2 | Rc3/4 | Rc1-1/4 | Top | Incorporated |
| SUT00D30028-41YL | 400 V | | 1,069 | 150 | 148 | 358 | 150 | 148 | 89 | 94 | 130 | 122 | Rc1 | Rc2 | Rc3/4 | Rc1-1/4 | Top | Incorporated |

(*1) “Pressure sensor orientation” indicates the orientation of the pressure sensor viewed from the pump side.

## 200 V/400 V 260 L/min 20.6 MPa
## 200 V/400 V 300 L/min 20.6 MPa

**SUT00D26021-41-L**
**SUT00D26021-41YL**
**SUT00D30021-41-L**
**SUT00D30021-41YL**




| Model code | Power supply specifications | Pump specifications | L | A | B | C | D | E | F | G | H | J | Suction port 1 | Suction port 2 | Discharge port 1 | Discharge port 2 | Pressure sensor orientation (*1) | Suction flange |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUT00D26021-41-L | 200 V | Double | 1,094 | 162 | 133 | 383 | 162 | 133 | 106 | 115 | 122 | 119 | Rc1-1/4 | Rc1-1/2 | Rc1 | Rc1-1/4 | Rear | Incorporated |
| SUT00D26021-41YL | 400 V | | 1,094 | 162 | 133 | 383 | 162 | 133 | 106 | 115 | 122 | 119 | Rc1-1/4 | Rc1-1/2 | Rc1 | Rc1-1/4 | Rear | Incorporated |
| SUT00D30021-41-L | 200 V | | 1,109 | 170 | 140 | 398 | 170 | 140 | 106 | 115 | 122 | 119 | Rc1-1/4 | Rc1-1/2 | Rc1 | Rc1-1/4 | Rear | Incorporated |
| SUT00D30021-41YL | 400 V | | 1,109 | 170 | 140 | 398 | 170 | 140 | 106 | 115 | 122 | 119 | Rc1-1/4 | Rc1-1/2 | Rc1 | Rc1-1/4 | Rear | Incorporated |

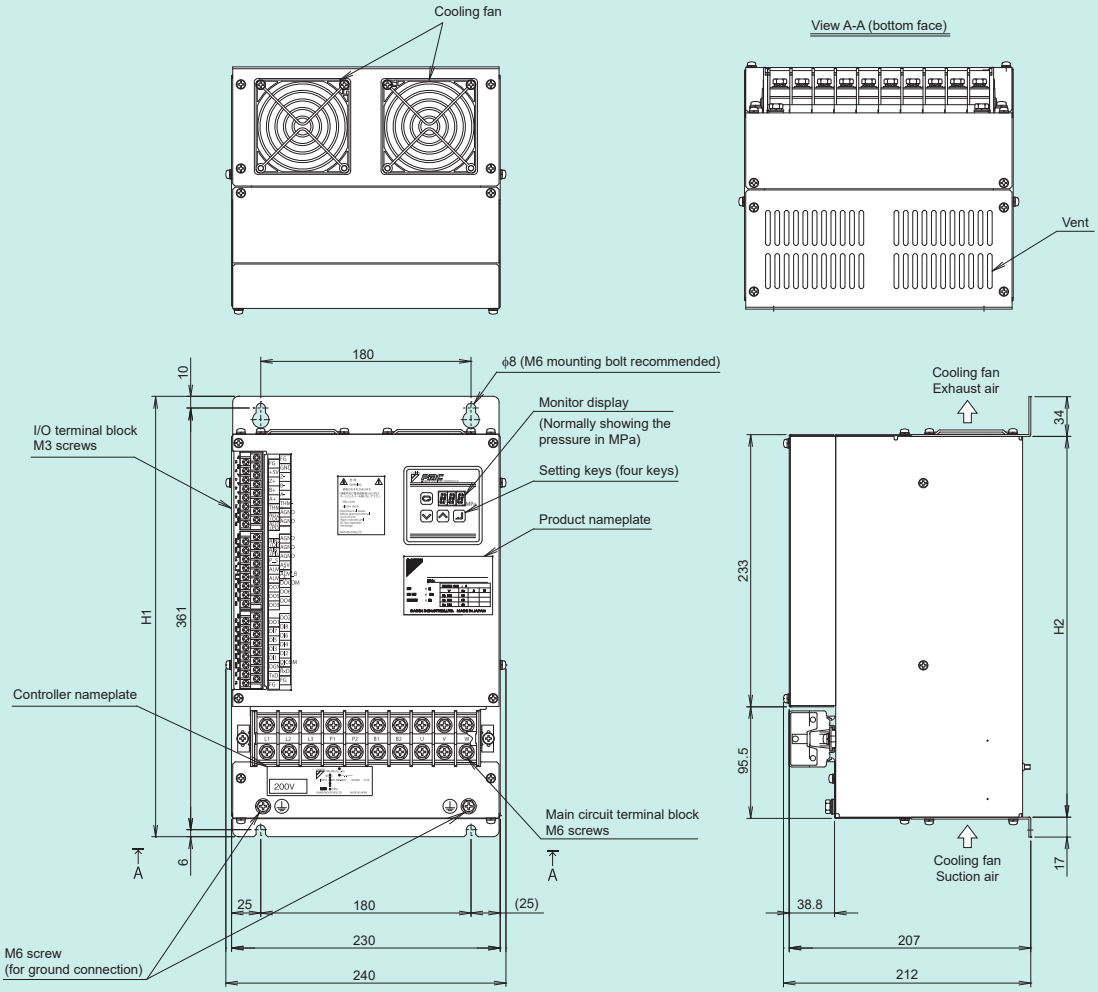
(*1) “Pressure sensor orientation” indicates the orientation of the pressure sensor viewed from the pump side.

* The motor pump needs to be secured horizontally on the machine or tank. Also, secure a clearance of at least 100 mm at the suction side of the motor cooling fan.
In addition, a clearance of at least 100 mm from the pump or solenoid valve is required at the exhaust side, with good ventilation assured by mounting a cover provided with ventilation holes or other means.

# External Dimension Diagrams (Controller 200 V/400 V single/double pump type)

**200 V 30 to 200 L/min 17.6 MPa, 20.6 MPa, 24.5 MPa (Single/double pump)**
**400 V 50 to 200 L/min 17.6 MPa, 20.6 MPa, 24.5 MPa (Single/double pump)**

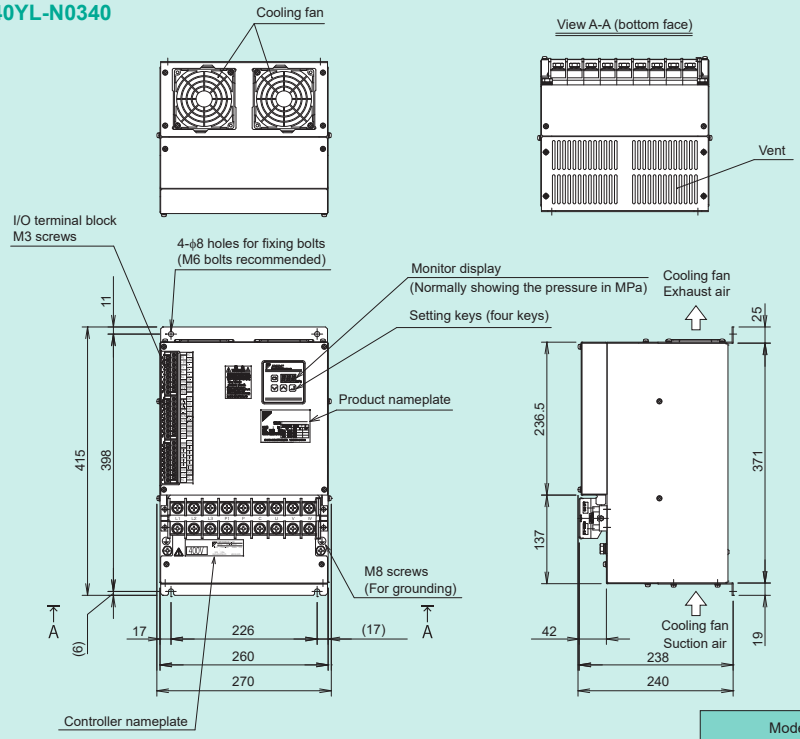
SUT00S3018-30-A
SUT00S5021-40-A
SUT00S8018-40-A
SUT00S5025-41-L-N0432
SUT00S15018-40-A
SUT00S5021-40YA-N0265
SUT00S8018-40YA
SUT00S13018-40YA-N0218
SUT00S13021-40YA-N0286
SUT00S15018-40YA
SUT00D3021-30-B-N0436
SUT00D8021-40-B-N0323
SUT00D13021-40-B-N0321
SUT00D15021-40-B-N0365
SUT00D20021-40-L
SUT00D8021-40YB-N0324
SUT00D13021-40YB-N0322
SUT00D15021-40YB-N0358
SUT00D20021-40YL




| Model code | Power supply specifications | Pump specifications | H1 | H2 |
|---|---|---|---|---|
| SUT00S3018-30-A | 200 V | Single | 377 | 326 |
| SUT00S5021-40-A | | | | |
| SUT00S8018-40-A | | | | |
| SUT00S5025-41-L-N0432 | | | 379 | 328 |
| SUT00S15018-40-A | | | | |
| SUT00S5021-40YA-N0265 | 400 V | | 377 | 361 |
| SUT00S8018-40YA | | | | |
| SUT00S13018-40YA-N0218 | | | | |
| SUT00S13021-40YA-N0286 | | | 379 | 328 |
| SUT00S15018-40YA | | | | |
| SUT00D3021-30-B-N0436 | 200 V | Double | 377 | 326 |
| SUT00D8021-40-B-N0323 | | | | |
| SUT00D13021-40-B-N0321 | | | 379 | 328 |
| SUT00D15021-40-B-N0365 | | | | |
| SUT00D20021-40-L | | | | |
| SUT00D8021-40YB-N0324 | 400 V | | 377 | 326 |
| SUT00D13021-40YB-N0322 | | | 379 | 328 |
| SUT00D15021-40YB-N0358 | | | | |
| SUT00D20021-40YL | | | | |

## 400 V 200 L/min 17.6 MPa (Single pump)

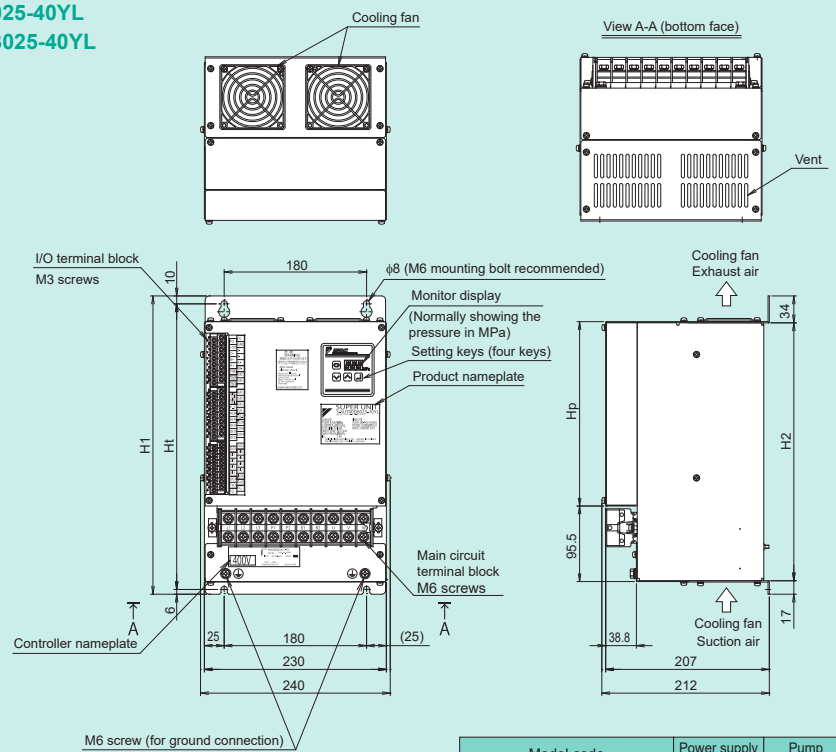
### SUT00S20018-40YL-N0340




| Model code | Power supply specifications | Pump specifications |
|---|---|---|
| SUT00S20018-40YL-N0340 | 400 V | Single |

## 400 V 80 L/min 25 MPa, 130 L/min 25 MPa (Double pump)

### SUT00D8025-40YL
### SUT00D13025-40YL



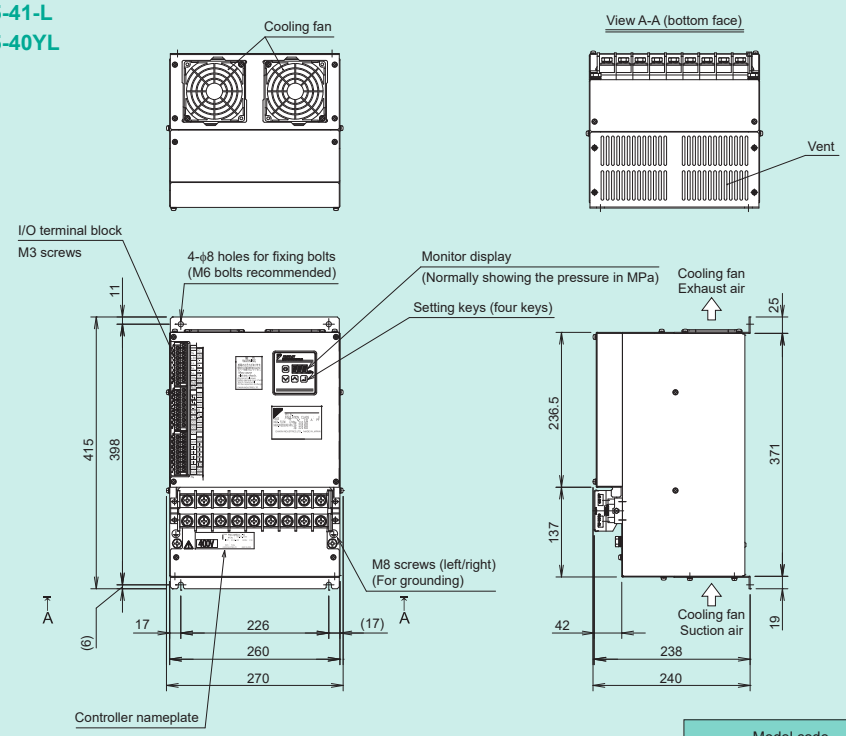

| Model code | Power supply specifications | Pump specifications | H1 | H2 | Ht | Hp |
|---|---|---|---|---|---|---|
| SUT00D8025-40YL | 400 V | Double | 377 | 326 | 361 | 233 |
| SUT00D13025-40YL | | | 379 | 328 | 363 | 235 |

* The controller needs to be mounted vertically on a wall inside the electrical cabinet, with a clearance of at least 100 mm secured above and below and a clearance of at least 30 mm for wiring and maintenance at the left and right.

# External Dimension Diagrams (Controller 200 V/400 V double pump type)

## 200 V/400 V, 200 L/min, 25 MPa (Double pump)

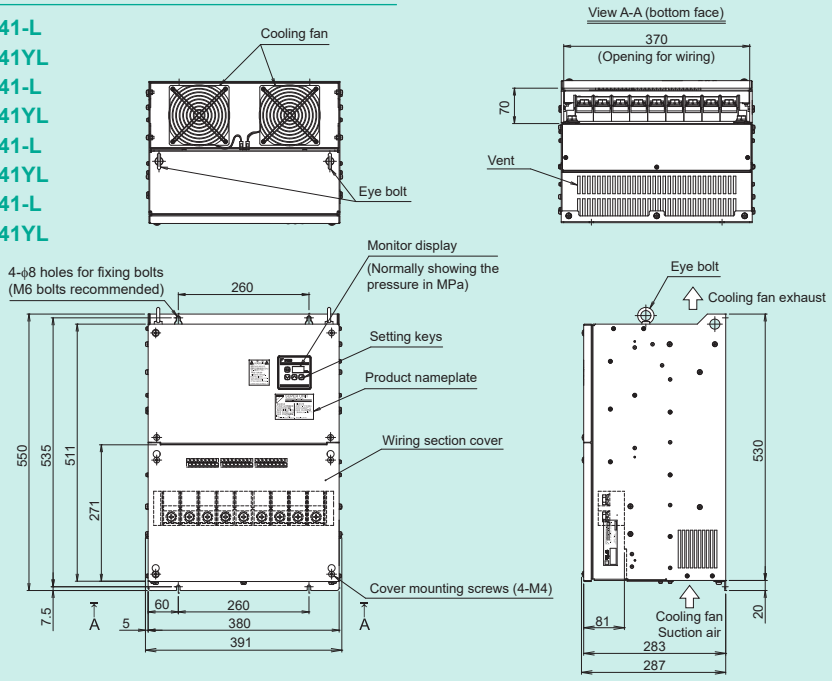
**SUT00D20025-41-L**
**SUT00D20025-40YL**




| Model code | Power supply specifications | Pump specifications |
|---|---|---|
| SUT00D20025-41-L | 200 V | Double |
| SUT00D20025-40YL | 400 V | |

## 200 V/400 V, 260 L/min, 21 MPa (Double pump)
## 200 V/400 V, 300 L/min, 21 MPa (Double pump)
## 200 V/400 V, 220 L/min, 28 MPa (Double pump)
## 200 V/400 V, 300 L/min, 28 MPa (Double pump)

**SUT00D26021-41-L**
**SUT00D26021-41YL**
**SUT00D30021-41-L**
**SUT00D30021-41YL**
**SUT00D22028-41-L**
**SUT00D22028-41YL**
**SUT00D30028-41-L**
**SUT00D30028-41YL**




| Model code | Power supply specifications | Pump specifications |
|---|---|---|
| SUT00D26021-41-L | 200 V | Double |
| SUT00D26021-41YL | 400 V | |
| SUT00D30021-41-L | 200 V | |
| SUT00D30021-41YL | 400 V | |

| Model code | Power supply specifications | Pump specifications |
|---|---|---|
| SUT00D22028-41-L | 200 V | Double |
| SUT00D22028-41YL | 400 V | |
| SUT00D30028-41-L | 200 V | |
| SUT00D30028-41YL | 400 V | |

* The controller needs to be mounted vertically on a wall inside the electrical cabinet, with a clearance of at least 100 mm secured above and below and a clearance of at least 30 mm for wiring and maintenance at the left and right.

# List of Electrical Components

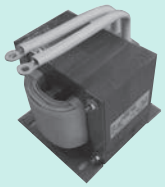
**This is a list of electrical components required for SUPER UNITs.**
The list shows the model code and quantity for each of the electrical components that are contained in each set model code, that need to be ordered separately, and that are contained in each SUT model code.

(*1) The electrical components assigned a set ordering code indicate the nature of each of the electrical components included in the complete set of electrical components required for a SUPER UNIT. The numerical values in each column are the numbers of electrical components included. Please order separately from the SUPER UNIT.
(*2) The included accessories are the electrical components that are shipped with the SUPER UNIT.
(*3) These are the electrical components that are required for compliance with European CE standards. Please order them separately.
(*4) These are the electrical components that are required for compliance with American UL standards. Please order them separately.
(*5) When using VCT cable, we recommend adding one extra ring core of the same size and wiring one turn on each of the two ring cores. Refer to the electrical wiring diagram for each model for details.
(*6) The regenerative resistors (2 pcs.) of SUT00S5025-*-L-N0432 are 1 kW specifications. When using the unit for applications with high regenerative load factors, additional regenerative resistors will be required.

| | | SUPER UNIT model code | Electrical component ordering category/set ordering code (*1) | | PM-SDL03 | PM-SDL04 | PM-SDL05 | PM-SDL06 | PM-SDL07 | PM-SDL08 | PM-RB02 | PM-RB04 | PM-RB05 | PM-RB06 | PM-RB08 | PM-RB09 | PM-FUD01 | PM-FUD03 | PM-FUD04 | PM-FUD05 | PM-FUD06 | PM-FUD08 | PM-FUD09 | PM-FUD10 | PM-SPH05-001 | PM-SPH05-002 | PM-SPH05-003 | PM-SPH10 | PM-SEH05-P22-A09R | PM-SEH05-P22-A12R | PM-SEH10-P20-N10R | PM-SEH10-P22-A09R | PM-SNF01 | PM-SNF04 | PM-SNF06 | PM-SNF07 | PM-SNF10 | PM-SNF11 | PM-SNF13 | PM-SRC01 | PM-SRC02 | PM-SRC03 | PM-FC01 | PM-FC04 | PM-FC05 | PM-SPD01 | PM-SPD02 | PM-FU01 | PM-FU02 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | DC reactor | | | | | | Regenerative resistor | | | | | | Current fuse set for regenerative resistor | | | | | | | | Pressure sensor harness | | | | Encoder harness | | | | Noise filter | | | | | | | Ring core | | | Ferrite core | | | Surge protector | | Fuse for power supply | |
| Single pump specifications | 200 V | SUT00S3018-30-A | Model code for set order | PM-SOP15D | | | | 1 | | | | 2 | | | | | | 1 | | | | | | | | | 1 | | | | | 1 | | | | | | | | | | | | | | | | |
| | | SUT00S5021-40-A<br>SUT00S8018-40-A | Model code for set order | PM-SOP16D | | | | 1 | | | 3 | | | | | | | 1 | | | | | | | | 1 | | | | 1 | | | | 2 | | | | | | | | | | | | | | |
| | | SUT00S5025-41-L-N0432 (*6) | Included accessories (*2) | | 1 | | | | | | | 2 | | | | | | | 1 | | | | | | | 1 | | | | 1 | | | | | 2 | | | | | | | 1 | 1 | | | | | |
| | | SUT00S15018-40-A | Model code for set order | PM-SOP10D | 1 | | | | | | 6 | | | | | | | | 1 | | | | | | | 1 | | | | 1 | | | | | | | | | | | | (*5) | (*5) | | | | | |
| | | | Option (*3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | 1(2) | 1(2) | | | 1 | 1 | | | |
| | 400 V | SUT00S5021-40YA-N0265<br>SUT00S8018-40YA | Model code for set order | PM-SOP04D | | 1 | | | | | | | | 2 | | | | | | | 1 | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | |
| | | | Option (*3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | 3 | | | 1 | | | | | |
| | | SUT00S13018-40YA-N0218<br>SUT00S13021-40YA-N0286<br>SUT00S15018-40YA | Model code for set order | PM-SOP08D | | 1 | | | | | | | | 4 | | | | | | | | 1 | | | | 1 | | | | 1 | | | | | | | | | | | | (*5) | | | | | | |
| | | | Option (*3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | 1 | 2(4) | | | 3 | | | | |
| | | SUT00S20018-40YL-N0340 | Model code for set order | PM-SOP12D | | | 1 | | | | | | | 6 | | | | | | | | | 1 | | | | 1 | | | | 1 | | | | | | | | | | | | (*5) | | | | | | |
| | | | Option (*3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | 1(2) | | | | | | |
| Double pump specifications | 200 V | SUT00D3021-30-B-N0436 | Model code for set order | PM-SOP15D | | | | 1 | | | | 2 | | | | | | 1 | | | | | | | | | 1 | | | | | 1 | | | | | | | | | | | | | | | | |
| | | SUT00D8021-40-B-N0323 | Model code for set order | PM-SOP16D | | | | 1 | | | 3 | | | | | | | 1 | | | | | | | | 1 | | | | 1 | | | | 2 | | | | | | | | | | | | | | |
| | | SUT00D13021-40-B-N0321<br>SUT00D15021-40-B-N0365<br>SUT00D20021-40-L | Model code for set order | PM-SOP10D | 1 | | | | | | 6 | | | | | | | | 1 | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | |
| | | | Option (*3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | 1 | 1 | | | 1 | 1 | | | |
| | | SUT00D20025-41-L | Included accessories (*2) | | | | | | 1 | | | | 6 | | | | | | | 1 | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | |
| | | | Option (*3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | 1 | | | | | | |
| | | SUT00D30028-41-L<br>SUT00D22028-41-L<br>SUT00D26021-41-L<br>SUT00D30021-41-L | Included accessories (*2) | | | | | | 1 | | | | | | 2 | | | | | 1 | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | 1 | | 3 | |
| | | | Option (*3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | 1 | | | | | | |
| | 400 V | SUT00D8021-40YB-N0324<br>SUT00D8025-40YL | Model code for set order | PM-SOP04D | | 1 | | | | | | | | 2 | | | | | | | 1 | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | |
| | | | Option (*3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | 3 | | | 1 | | | | | |
| | | SUT00D13021-40YB-N0322<br>SUT00D15021-40YB-N0358<br>SUT00D20021-40YL<br>SUT00D13025-40YL | Model code for set order | PM-SOP08D | | 1 | | | | | | | | 4 | | | | | | | | 1 | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | |
| | | | Option (*3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | 1 | 2 | | | 3 | | | | |
| | | SUT00D20025-40YL | Model code for set order | PM-SOP12D | | | 1 | | | | | | | 6 | | | | | | | | | 1 | | | | 1 | | | | 1 | | | | | | | | | | | | (*5) | | | | | | |
| | | | Option (*3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | 1(2) | | | | | | |
| | | SUT00D30028-41YL<br>SUT00D22028-41YL<br>SUT00D26021-41YL<br>SUT00D30021-41YL | Included accessories (*2) | | | | | | | 1 | | | | | | 2 | | | | | | | 1 | | | | 1 | | | 1 | | | | | | | | | | | | | | | 1 | | 3 | |
| | | | Option (*3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | 2 | | | | | | |
| | | | Option (*4) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | 3 | | | | | | |

# External/Installation Dimension Diagrams for Electrical Components

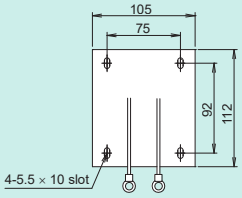
## DC reactor



PM-SDL03/PM-SDL04

PM-SDL05

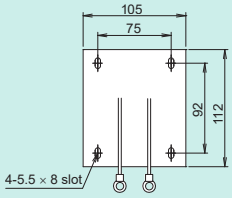
### PM-SDL03




M5 round terminals with insulating coating

Length of lead wire: 140 mm
Height: 91 mm

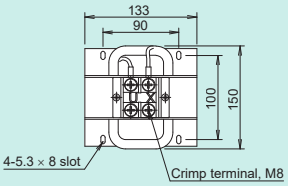
### PM-SDL04




M5 round terminals with insulating coating

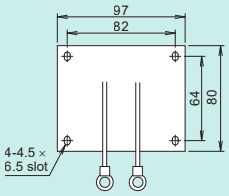
Length of lead wire: 140 mm
Height: 95 mm

### PM-SDL05




Height: 180 mm

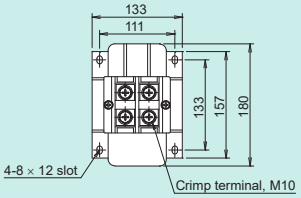
### PM-SDL06




M5 round terminals with insulating coating

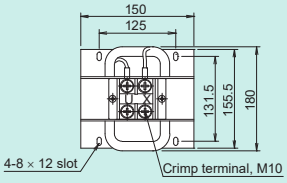
Length of lead wire: 500 mm
Height: 86 mm

### PM-SDL07




Height: 220 mm

### PM-SDL08



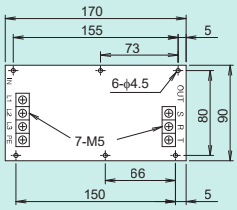

Height: 235 mm

## Noise filter

PM-SNF01

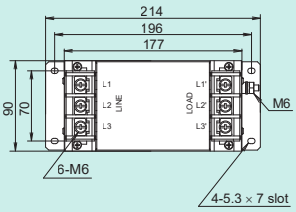
PM-SNF07

### PM-SNF01



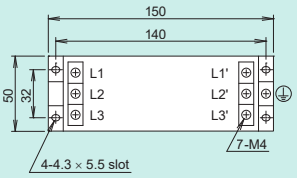

Height: 55 mm

### PM-SNF04



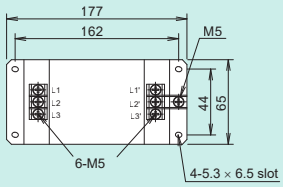

Height: 86 mm

### PM-SNF06



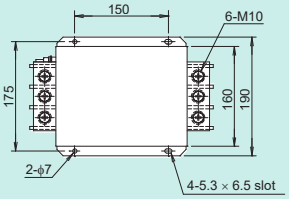

Height: 78 mm

### PM-SNF07



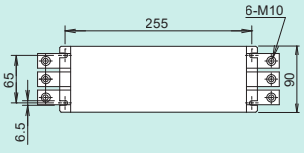

Height: 84 mm

### PM-SNF10



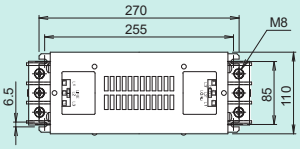

Height: 120 mm

### PM-SNF11




Height: 150 mm

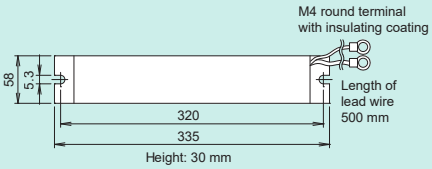
### PM-SNF13




Height: 140 mm

## Regenerative resistance

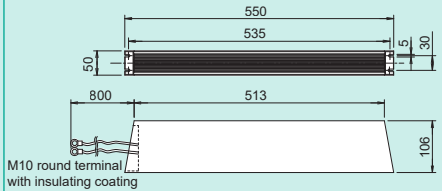
### PM-RB02 to 06




Height: 30 mm

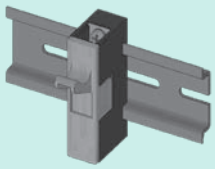
**PM-RB02: 30 Ω 500 W**
**PM-RB04: 10 Ω 500 W**
**PM-RB05: 20 Ω 500 W**
**PM-RB06: 68 Ω 500 W**

### PM-RB08 to 09

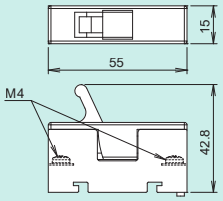



**PM-RB08: 6 Ω 2,000 W**
**PM-RB09: 15 Ω 2,000 W**

## Current fuse set for regenerative resistor

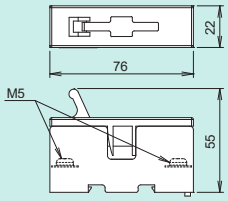


### PM-FUD01 to 04




DIN rail width: 35 mm

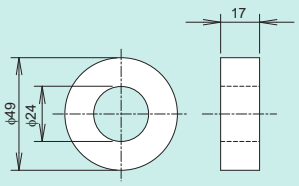
### PM-FUD05 to 10



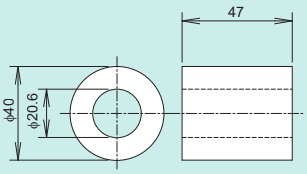

DIN rail width: 35 mm

## Ring core

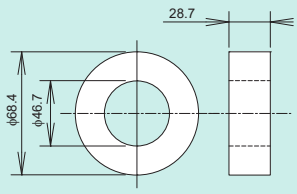
### PM-SRC01




### PM-SRC02



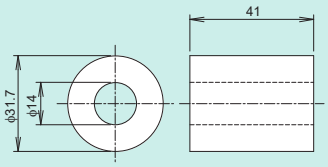

### PM-SRC03



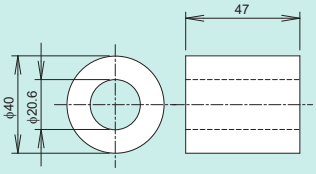

## Ferrite core

PM-FC01

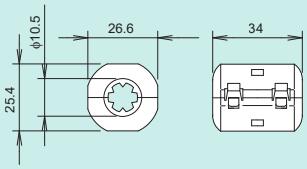
### PM-FC01




### PM-FC04




### PM-FC05




## Pressure sensor harness/encoder harness

### PM-SPH05/PM-SH10 Pressure sensor harness

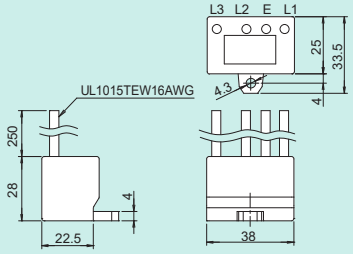
| Model code | Cable length | Remarks |
|---|---|---|
| PM-SPH05-001 | 5 m | With ferrite core 2T |
| PM-SPH05-002 | | With ring core 3T |
| PM-SPH05-003 | | Ring core |
| PM-SPH10 | 10 m | Ring core |

### PM-SEH05-P22-A09R/PM-SEH05-P22-A12R encoder harness

| Model code | Cable length | Remarks |
|---|---|---|
| PM-SEH05-P22-A09R | 5 m | 9-pin |
| PM-SEH05-P22-A12R | | 12-pin |
| PM-SEH10-P22-A09R | 10 m | 9-pin |
| PM-SEH10-P20-N10R | | 10-pin water-proof plug |

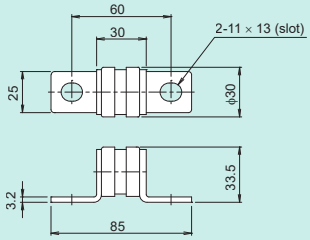
## Surge protector

### PM-SPD01/PM-SPD02

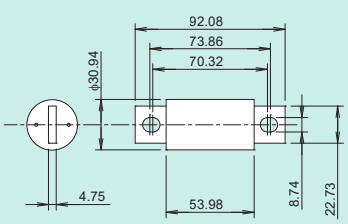



## Fuse for power supply

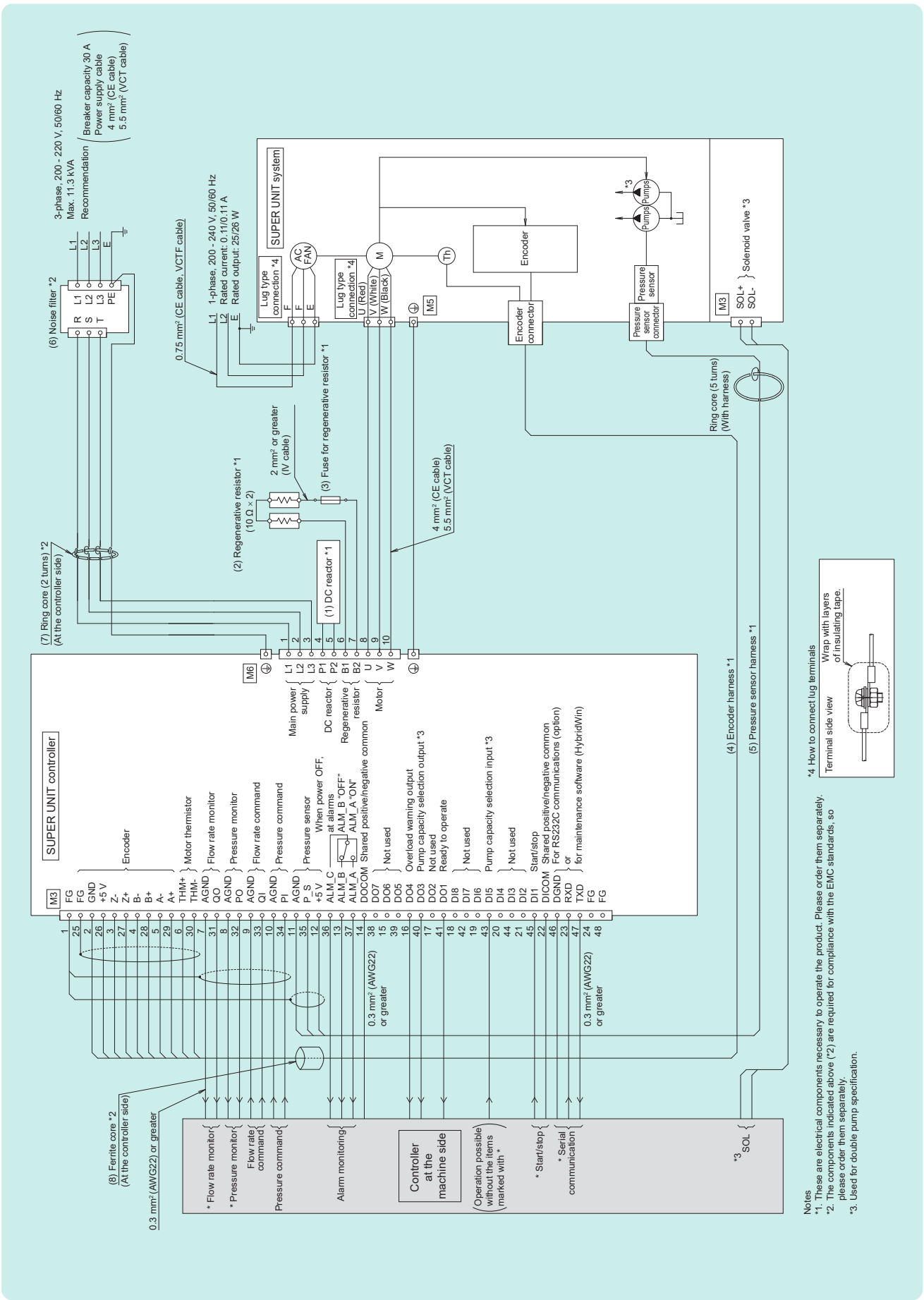
### PM-FU01



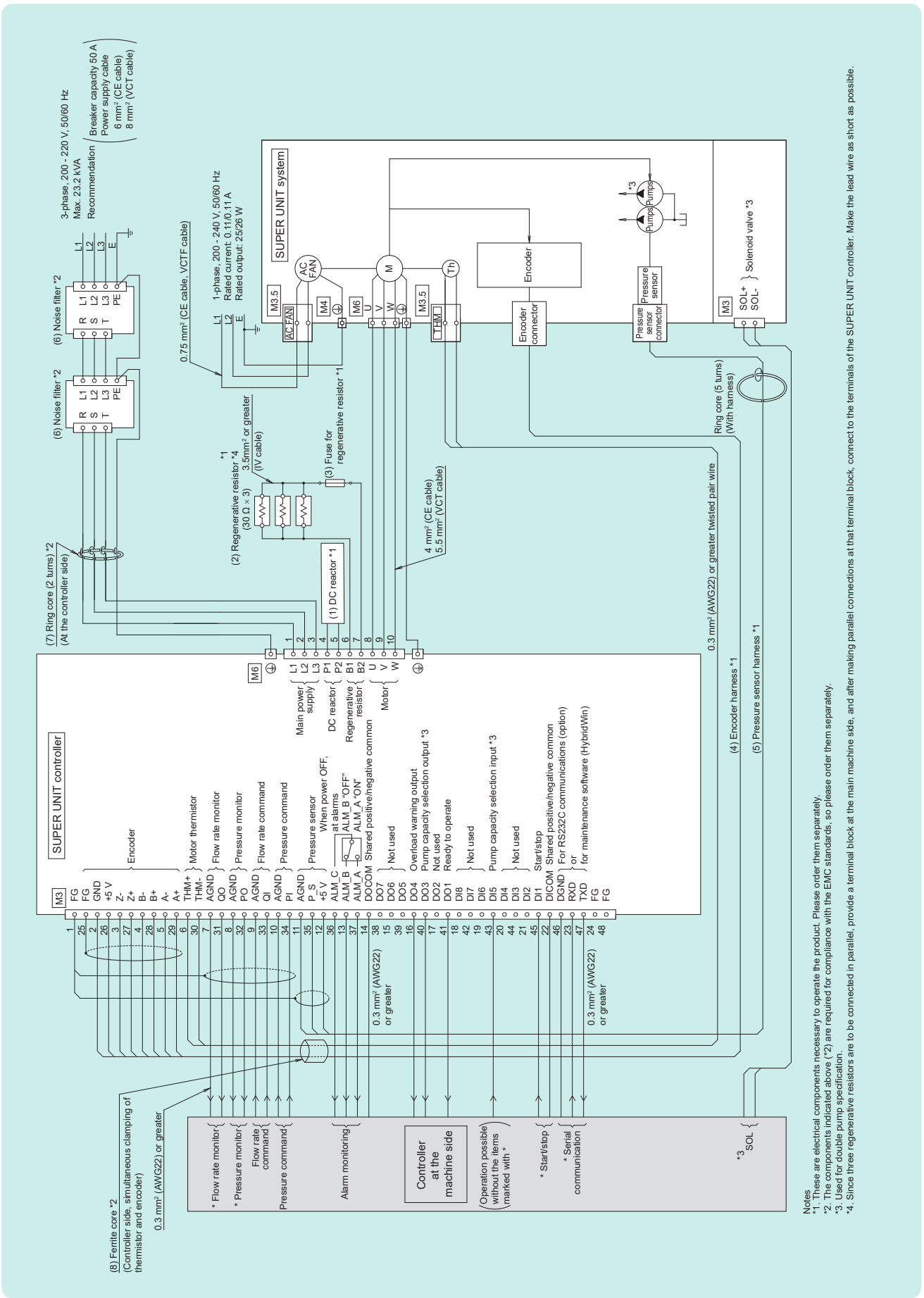

### PM-FU02



# Electric Wiring Diagram (7 kW 200 V SUT00S3018, SUT00D3021)

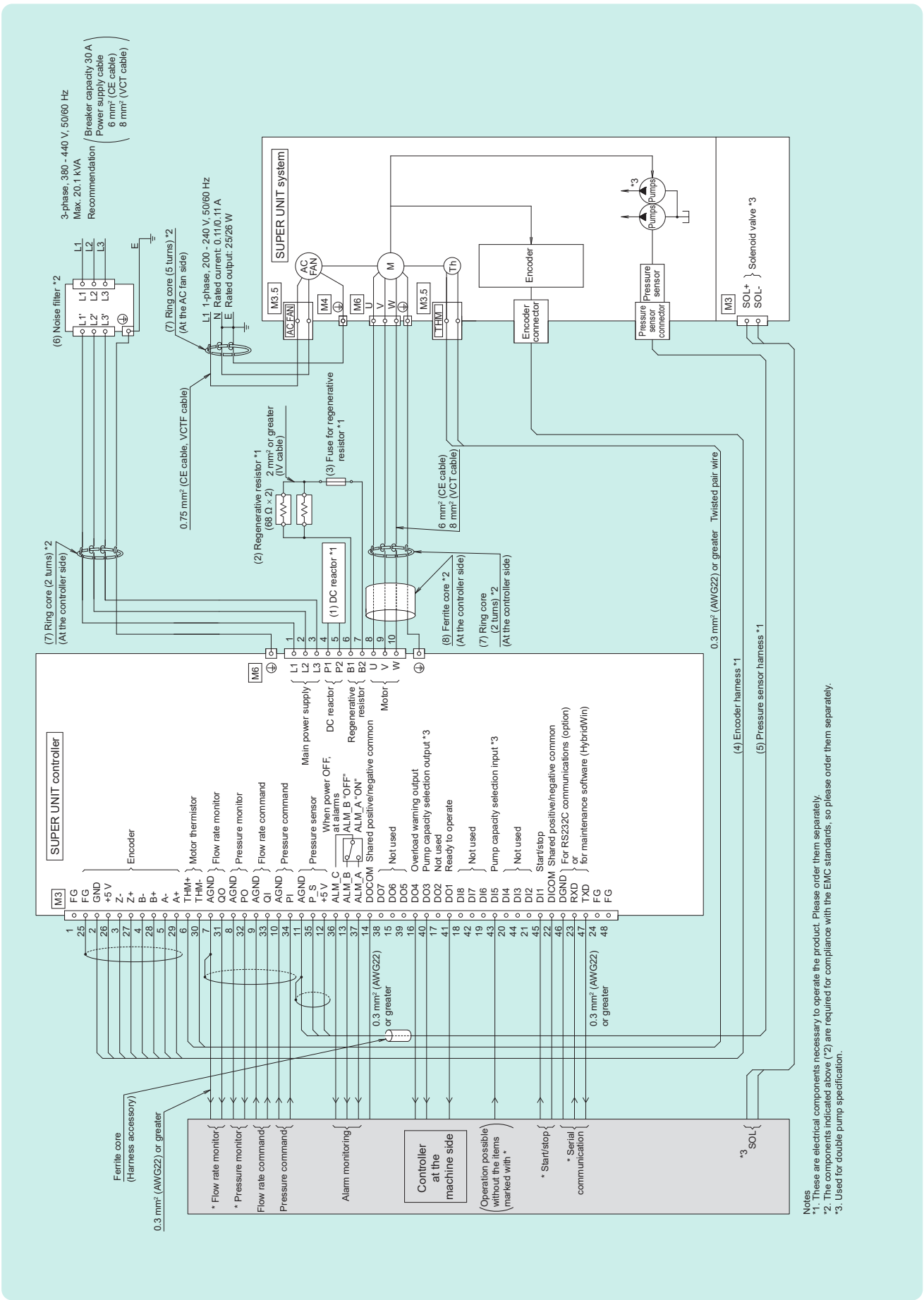


# Electric Wiring Diagram (11 kW 200 V SUT00S5021, SUT00S8018, SUT00D8021, SUT00D8025)



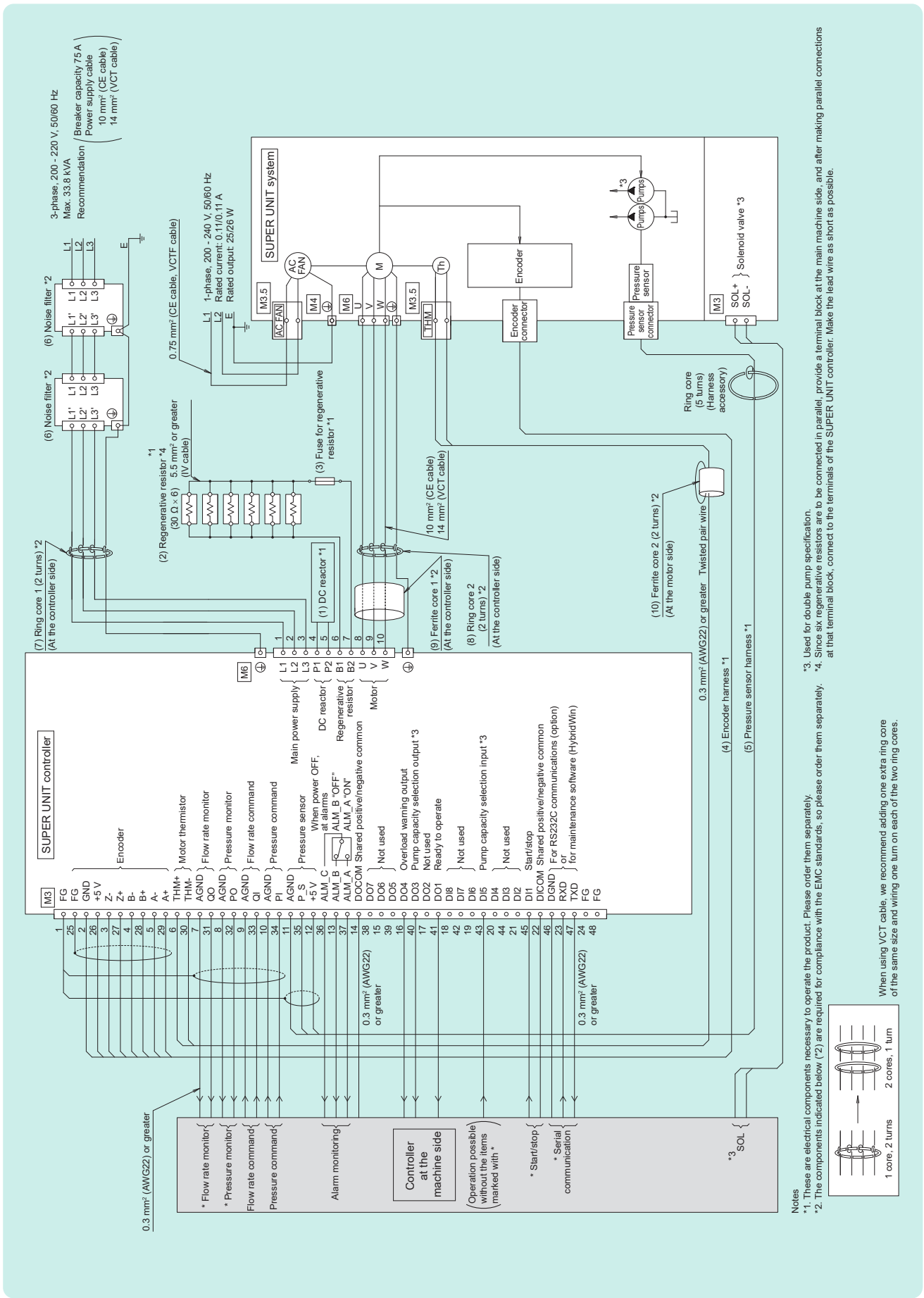

Notes
*1. These are electrical components necessary to operate the product. Please order them separately.
*2. The components indicated above (*2) are required for compliance with the EMC standards, so please order them separately.
*3. Used for double pump specification.
*4. Since three regenerative resistors are to be connected in parallel, provide a terminal block at the main machine side, and after making parallel connections at that terminal block, connect to the terminals of the SUPER UNIT controller. Make the lead wire as short as possible.

# Electric Wiring Diagram (11 kW 400 V SUT00S5021, SUT00S8018, SUT00D8021, SUT00D8025)

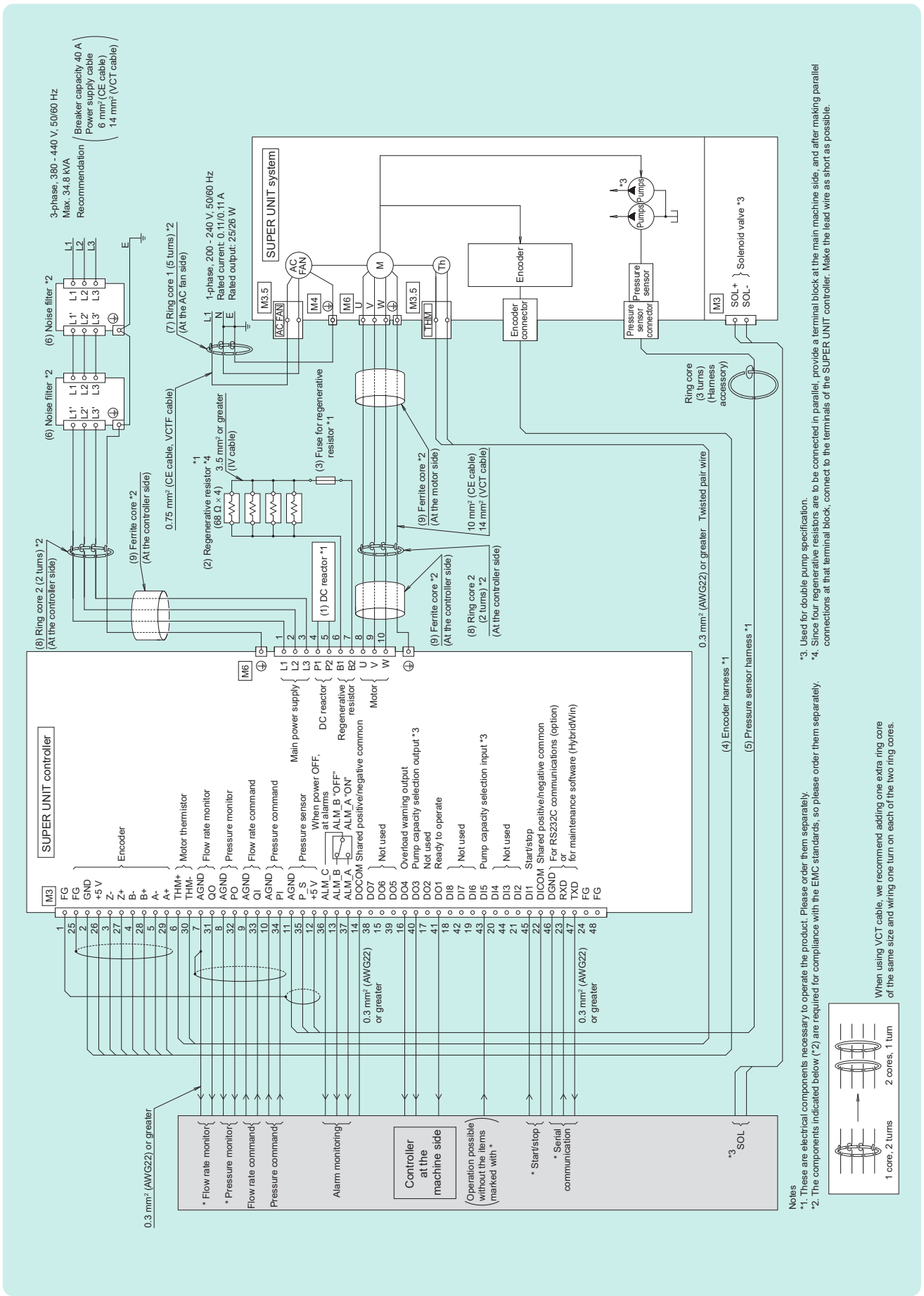



Notes
*1. These are electrical components necessary to operate the product. Please order them separately.
*2. The components indicated above (*2) are required for compliance with the EMC standards, so please order them separately.
*3. Used for double pump specification.

# Electric Wiring Diagram (15 kW 200 V SUT00S13018, SUT00S15018, SUT00D13021, SUT00D15021)

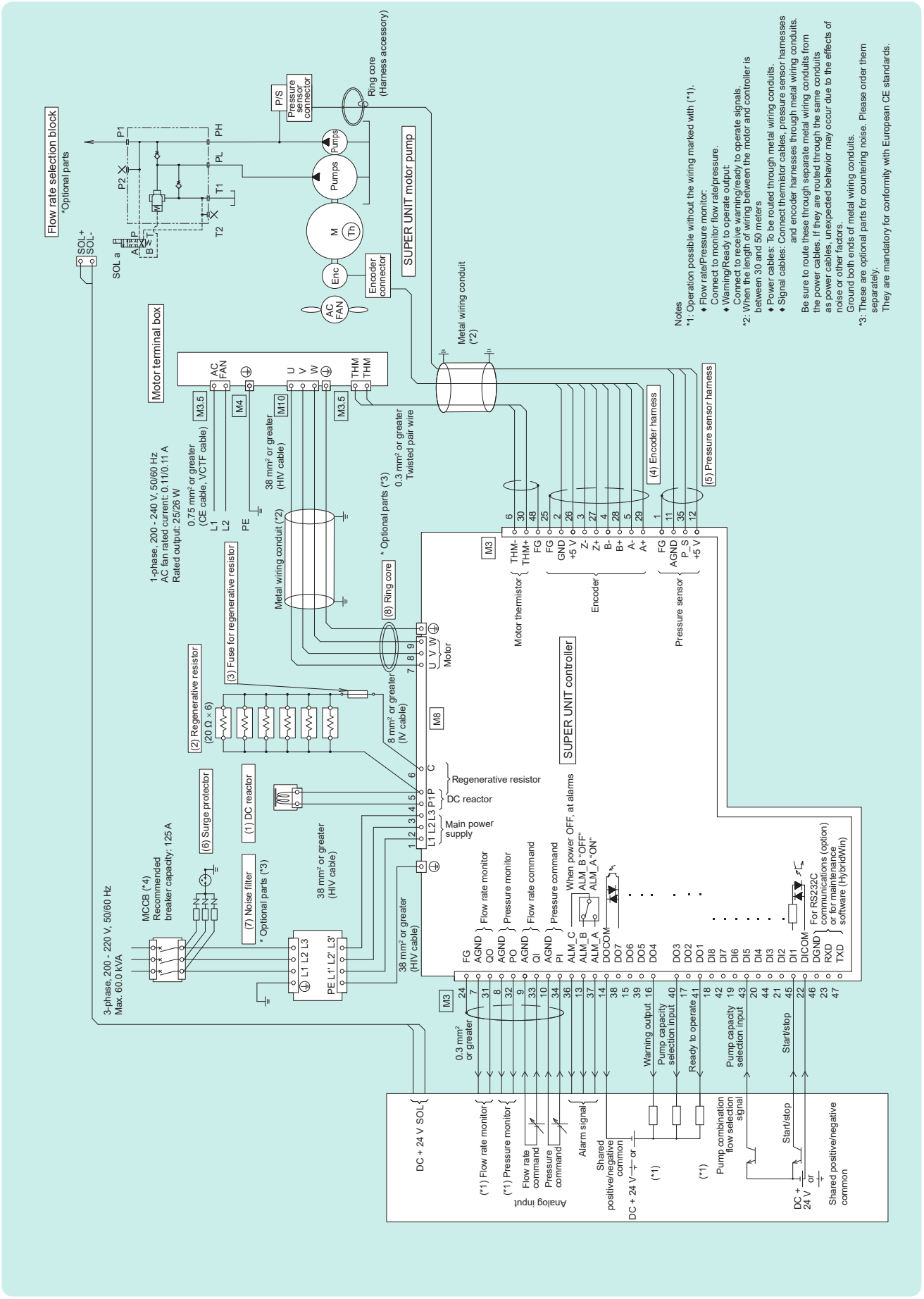


# Electric Wiring Diagram (15 kW 400 V SUT00S13018, SUT00S15018, SUT00D13021, SUT00D15021)




Notes
*1. These are electrical components necessary to operate the product. Please order them separately.
*2. The components indicated below (*2) are required for compliance with the EMC standards, so please order them separately.
*3. Used for double pump specification.
*4. Since four regenerative resistors are to be connected in parallel, provide a terminal block at the main machine side, and after making parallel connections at that terminal block, connect to the terminals of the SUPER UNIT controller. Make the lead wire as short as possible.

# Electric Wiring Diagram (22 kW 200 V SUT00D20025)



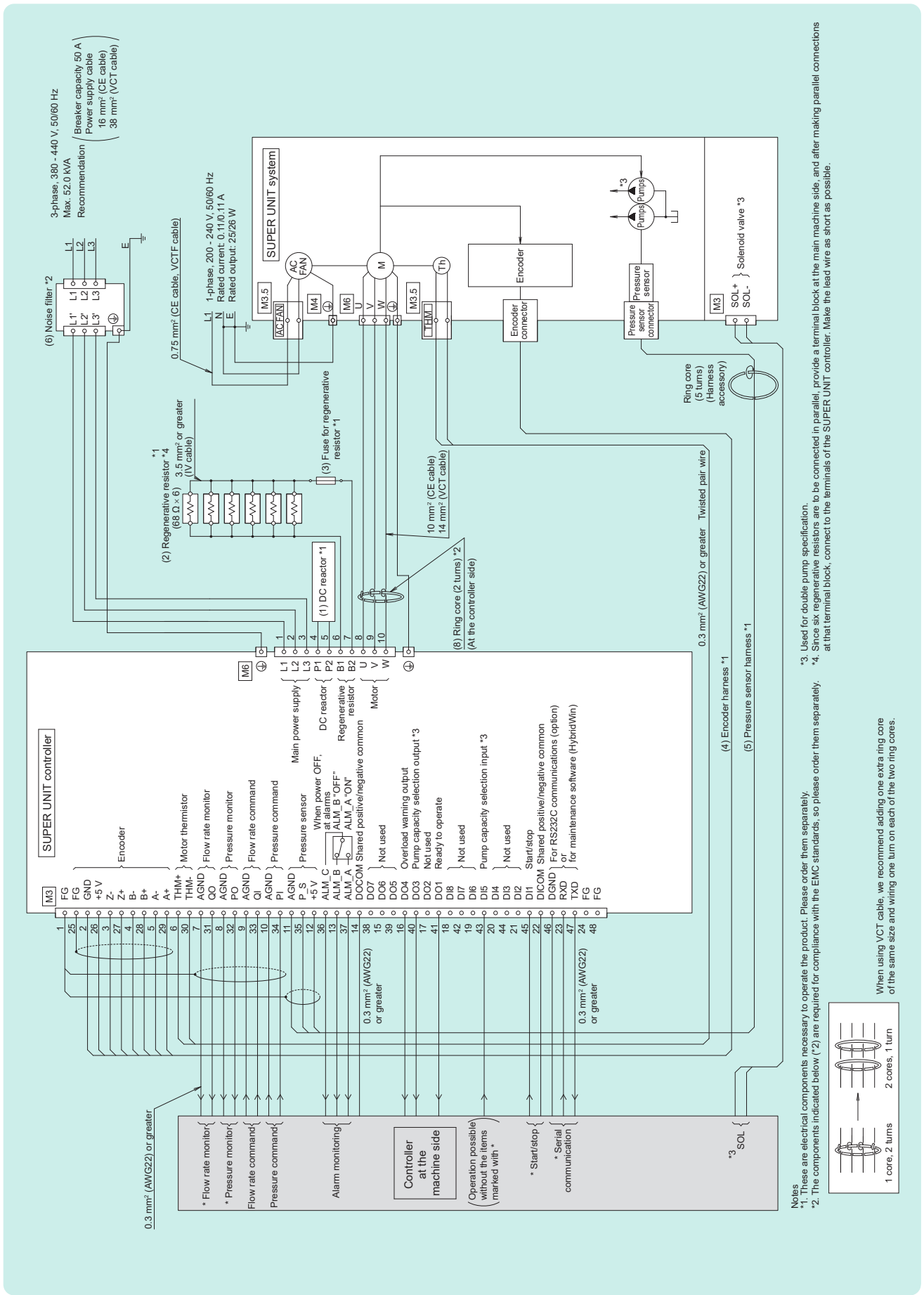

Notes
*1: Operation possible without the wiring marked with (*1).
- Flow rate/Pressure monitor:
  Connect to monitor flow rate/pressure.
- Warning/Ready to operate output
  Connect to receive warning/ready to operate signals.

*2: When the length of wiring between the motor and controller is between 30 and 50 meters
- Power cables: To be routed through metal wiring conduits.
- Signal cables: Connect thermistor cables, pressure sensor harnesses and encoder harnesses through metal wiring conduits.

Be sure to route these through separate metal wiring conduits from the power cables. If they are routed through the same conduits as power cables, unexpected behavior may occur due to the effects of noise or other factors.
Ground both ends of metal wiring conduits.

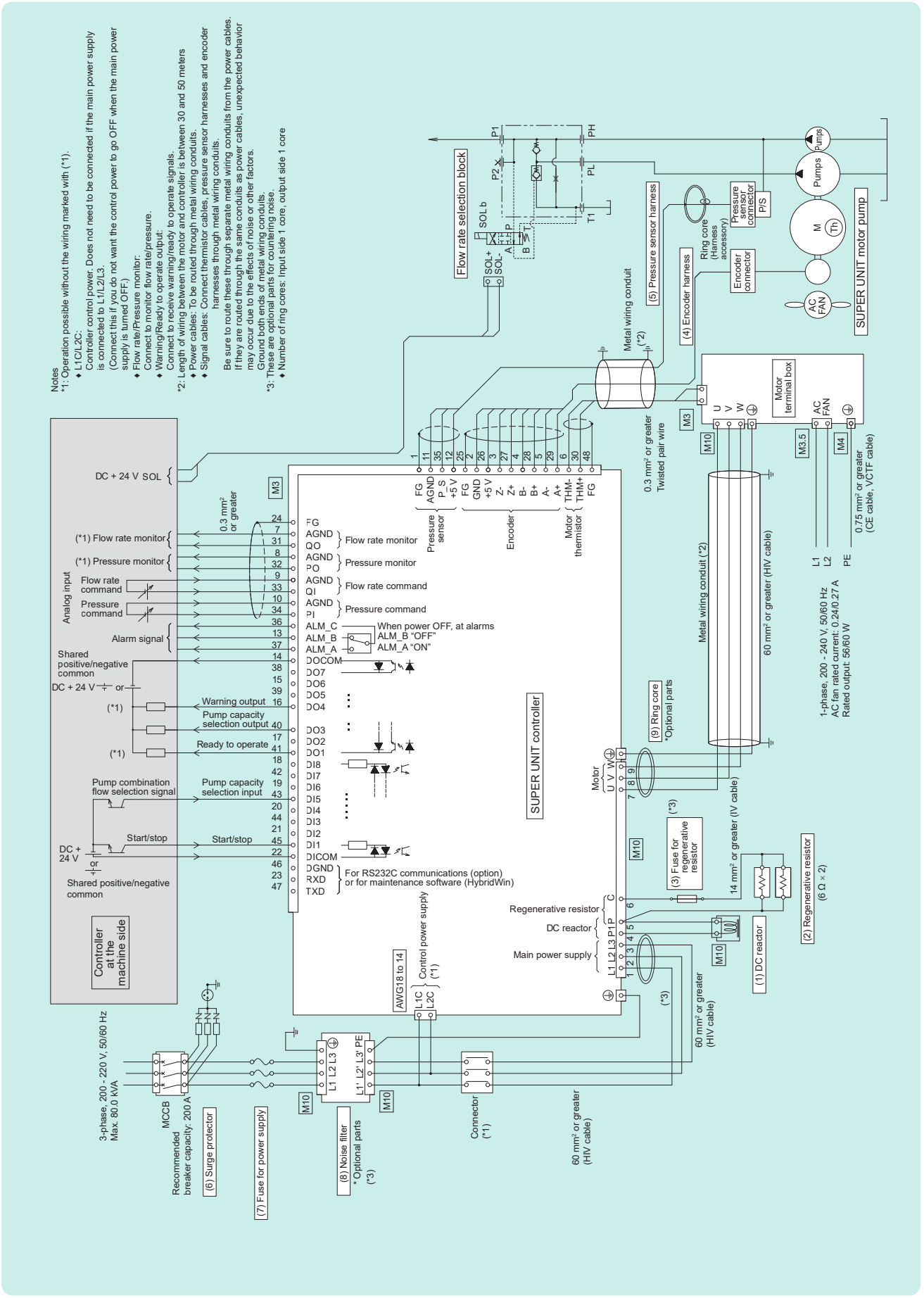
*3: These are optional parts for countering noise. Please order them separately.
They are mandatory for conformity with European CE standards.

# Electric Wiring Diagram (22 kW 400 V SUT00S20018, SUT00D20025)

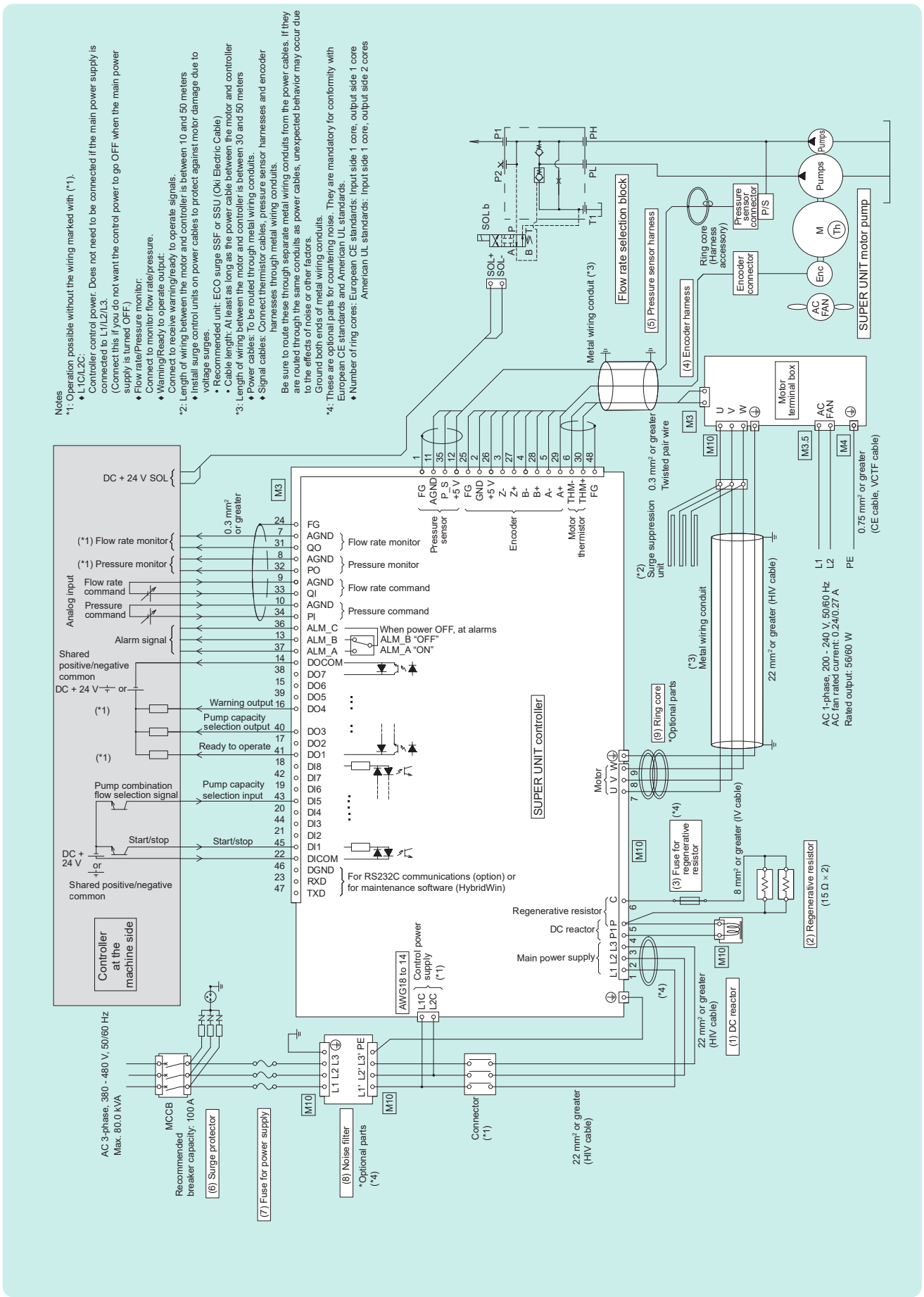



Notes
*1. These are electrical components necessary to operate the product. Please order them separately.
*2. The components indicated below (*2) are required for compliance with the EMC standards, so please order them separately.
*3. Used for double pump specification.
*4. Since six regenerative resistors are to be connected in parallel, provide a terminal block at the main machine side, and after making parallel connections at that terminal block, connect to the terminals of the SUPER UNIT controller. Make the lead wire as short as possible.

# Electric Wiring Diagram (37 kW 200 V SUT00D22028)

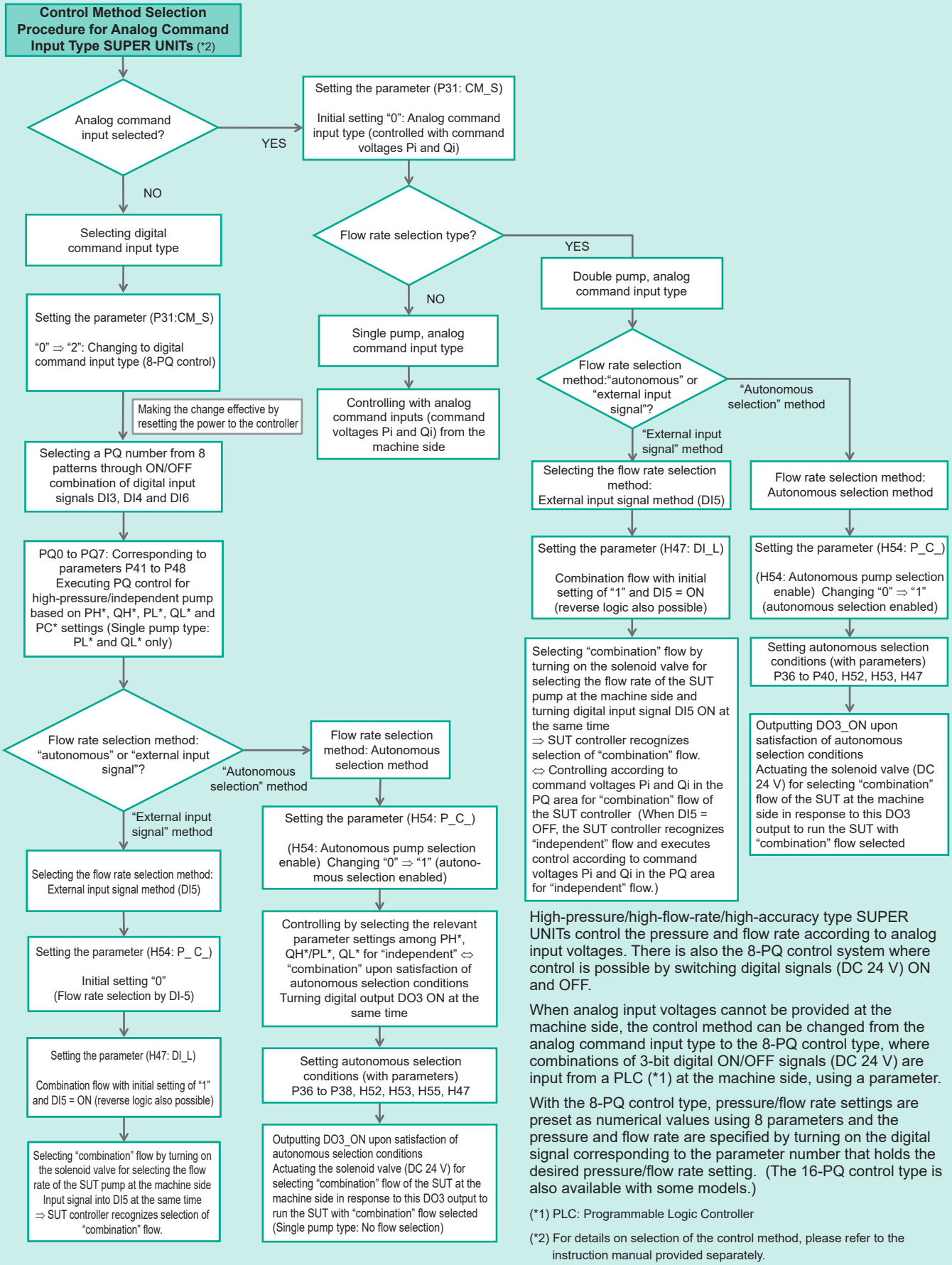


# Electric Wiring Diagram (37 kW 400 V SUT00D22028)



## Memo

# 8-PQ Control




High-pressure/high-flow-rate/high-accuracy type SUPER UNITs control the pressure and flow rate according to analog input voltages. There is also the 8-PQ control system where control is possible by switching digital signals (DC 24 V) ON and OFF.

When analog input voltages cannot be provided at the machine side, the control method can be changed from the analog command input type to the 8-PQ control type, where combinations of 3-bit digital ON/OFF signals (DC 24 V) are input from a PLC (*1) at the machine side, using a parameter.

With the 8-PQ control type, pressure/flow rate settings are preset as numerical values using 8 parameters and the pressure and flow rate are specified by turning on the digital signal corresponding to the parameter number that holds the desired pressure/flow rate setting. (The 16-PQ control type is also available with some models.)

(*1) PLC: Programmable Logic Controller

(*2) For details on selection of the control method, please refer to the instruction manual provided separately.

**The following table shows the settings and details of parameters given in the Control Method Selection Procedure. (For details, please refer to the instruction manuals for the analog command input type and for the 8-PQ control type.)**

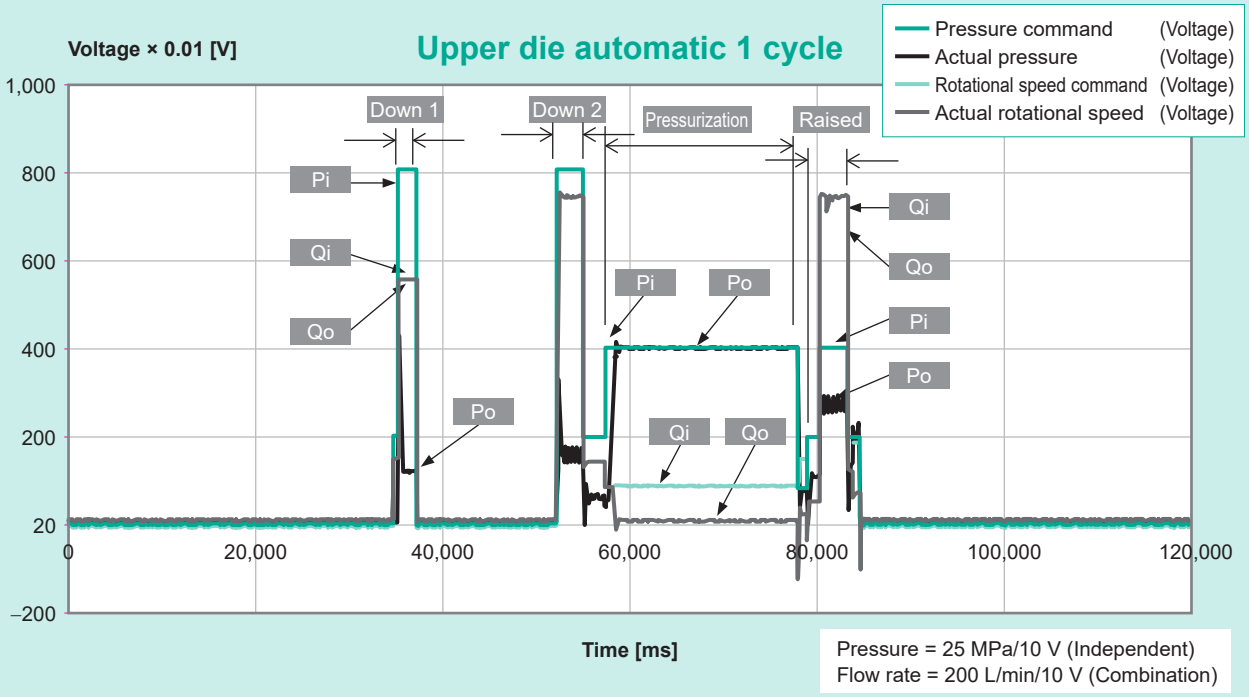
| | Parameter No. | Expression | Name | Initial value | Description |
|---|---|---|---|---|---|
| | P31 | CM_S | Command input target selection | 0 | Pressure/flow rate command input target selection<br>0: Analog input<br>1: Cannot be set (reserved by system)<br>2: Digital input (8-pattern PQ type (8-PQ)) |
| For setting the pressure/flow rate for each of eight PQ patterns | P41 | – | PQ selection 0 (PQ_0) | | - Double pump type (*1)<br>PH*: High-pressure (independent) side pressure setting<br>QH*: High-pressure (independent) side flow rate setting<br>PL*: Low-pressure (combination) side pressure setting<br>QL*: Low-pressure (combination) side flow rate setting<br>PC*: Pump selection condition<br>(enabled when using the autonomous selection function)<br><br>- Single pump type<br>PL*: Low-pressure (combination) side pressure setting<br>QL*: Low-pressure (combination) side flow rate setting |
| | P42 | – | PQ selection 1 (PQ_1) | | |
| | P43 | – | PQ selection 2 (PQ_2) | | |
| | P44 | – | PQ selection 3 (PQ_3) | | |
| | P45 | – | PQ selection 4 (PQ_4) | | |
| | P46 | – | PQ selection 5 (PQ_5) | | |
| | P47 | – | PQ selection 6 (PQ_6) | | |
| | P48 | – | PQ selection 7 (PQ_7) | | |
| For digital input | H47 | DI_L | Pump combination flow signal selection | 1 | Combination/independent selection logic for digital input signal DI5 ON/OFF setting<br>0: Combination when DI5 = OFF, independent when DI5 = ON<br>1: Combination when DI5 = ON, independent when DI5 = OFF |
| | H54 | P_C_ | Pump autonomous selection enable | 0 | Double pump autonomous selection enable/disable setting<br>0: Disabled (pump selection according to digital input DI5)<br>1: Enabled (autonomous selection according to selection conditions) |
| For autonomous selection setting (condition) | P36 | CS_P | Independent flow selection pressure offset | 1.0 | Pressure condition setting for autonomous combination ⇒ independent pump selection<br>Switching (to independent flow under the following conditions)<br>"PL*" + "CS_P" < Control pressure |
| | P37 | CS_N | Independent flow selection flow rate offset | 100 | Flow rate condition setting for autonomous combination ⇒ independent pump selection<br>Switching (to independent flow under the following conditions)<br>Control flow rate < "QH*" - Flow rate conversion of "CS_N" |
| | P38 | CD_P | Combination flow selection pressure offset | 1.0 | Pressure condition setting for autonomous independent ⇒ combination pump selection<br>Switching (to combination flow under the following conditions)<br>Control pressure < "PL*" - "CD_P" |
| | P39 | QH_ | Pump max. independent flow rate | | Set the maximum flow rate when the pump selection is independent.<br>This is the theoretical flow rate calculated from the motor speed.<br>The flow rate command value when the pump selection is independent is limited by this parameter.<br>If a value of 0 is set, switching the pump to the independent selection is disabled. |
| | P40 | PL_ | Pump max. combination flow pressure | | Set the maximum pressure when the pump selection is combination.<br>The pressure command value when the pump selection is combination is limited by this parameter.<br>If a value of 0 is set, switching the pump to the combination selection is disabled. |
| | H52 | CS_T | Independent flow hold time | 0.3 | Setting the time to maintain independent flow by disabling independent ⇒ combination pump selection, immediately after combination ⇒ independent pump selection |
| | H53 | CD_T | Combination flow hold time | 0.3 | Setting the time to maintain combination flow by disabling combination ⇒ independent pump selection, immediately after independent ⇒ combination pump selection |
| | H55 | SD_T | Pump combination flow hold time at startup | 0.1 | Time to maintain combination flow after starting the pumps from the stopped state or standby state |
| | H47 | DI_L | Pump combination flow signal selection | 1 | Pump capacity selection output logic in the autonomous selection method (switching the solenoid valve for selecting the flow rate at the machine side according to digital output DO3)<br>0: Combination when DO3 = OFF, independent when DO3 = ON<br>1: Combination when DO3 = ON, independent when DO3 = OFF |

Note 1: "*" in PH*, QH*, PL* and QL* in the above table represents a PQ number from "0" to "7".

# Example Control

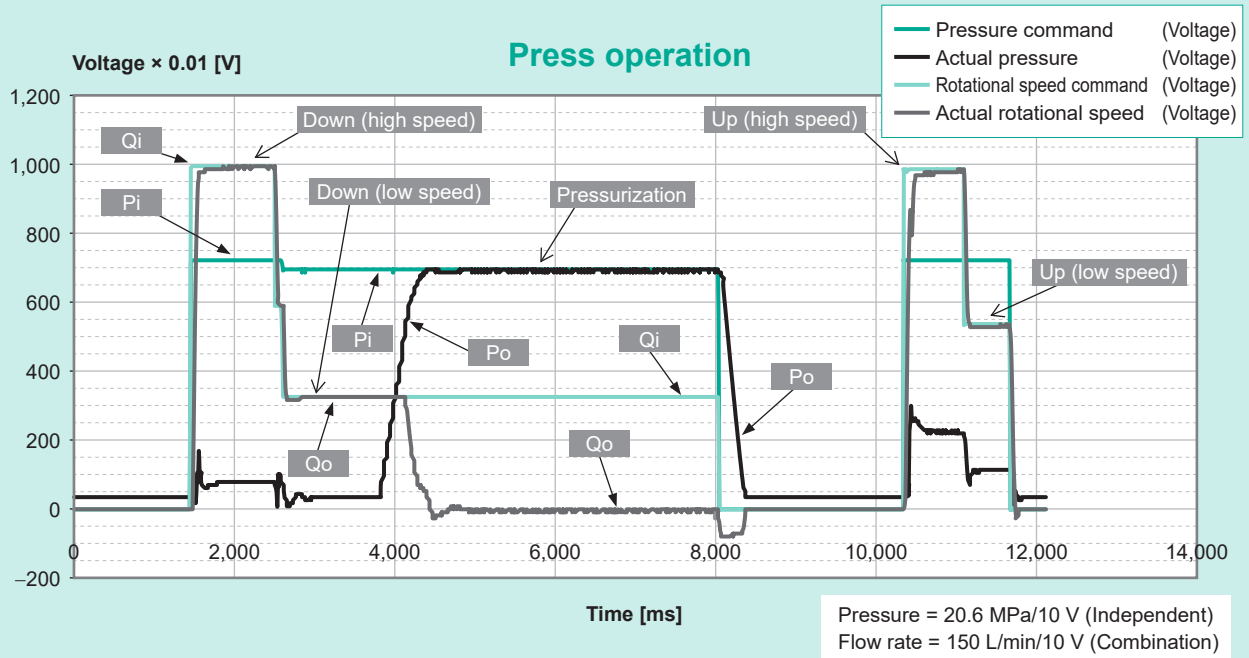
*** The following shows example waveforms while controlling the pressure and flow rate on press machine a SUPER UNIT incorporated.**

## Example with SUT00D20025-40YL




Pressure = 25 MPa/10 V (Independent)
Flow rate = 200 L/min/10 V (Combination)

## Example with SUT00D15021-40-B

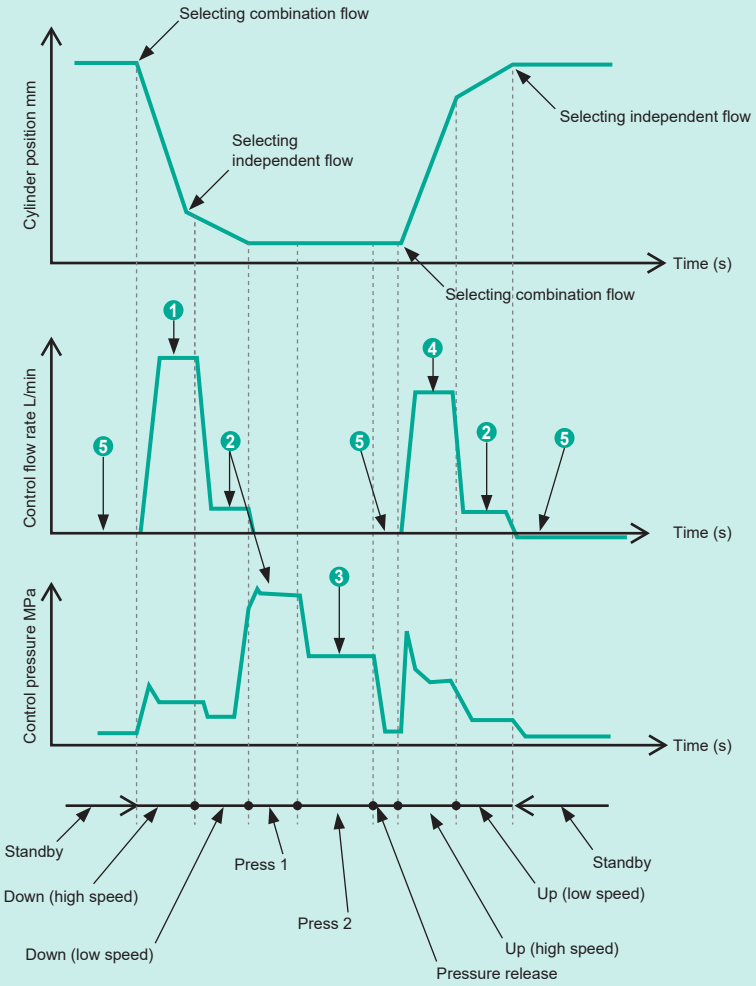


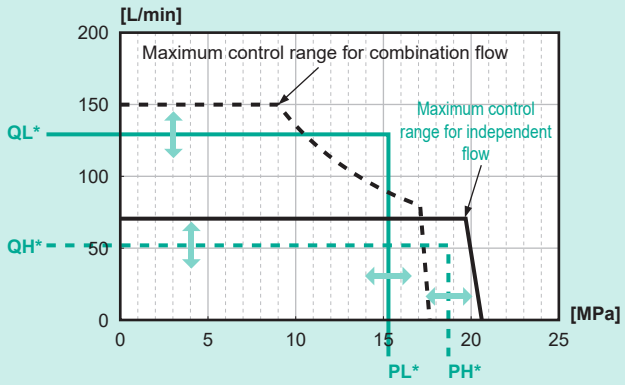

Pressure = 20.6 MPa/10 V (Independent)
Flow rate = 150 L/min/10 V (Combination)

# Example Timing Chart for Cylinder Operation and Signals on a Press Machine

## Example Press Operation (Down-Press-Up) in 8-PQ Control (SUT00D15021, 200 V Specifications)

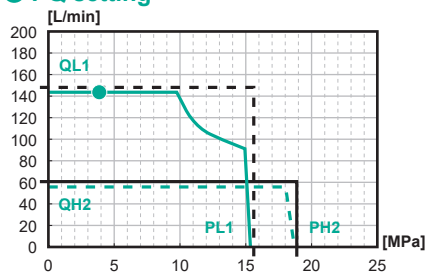
**The following shows an operation example using five setting patterns by setting the pressure and flow rate for each process for PQ numbers 0 to 4, corresponding to PQ setting charts ❶ to ❺.**
**(In this example, the selection of combination/independent flow is controlled from the machine using an external signal (DI5).)**



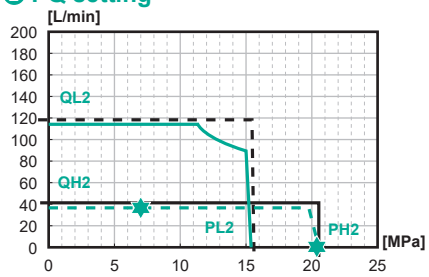




**8-PQ Setting Example with SUT00D15021-40-B**
Up to eight patterns of the flow rate for combination flow (QL*), pressure for combination flow (PL*), flow rate for independent flow (QH*) and pressure for independent flow (PH*) can be set using parameters. The PQ settings shown in the charts to the right are the example setting patterns applied to each of the operating ranges in the figures above.

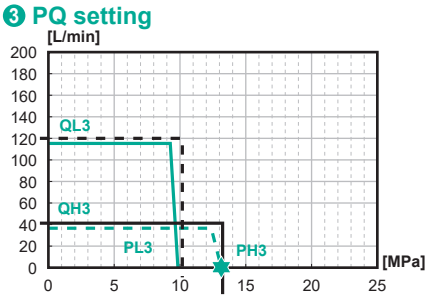
### ❶ PQ setting



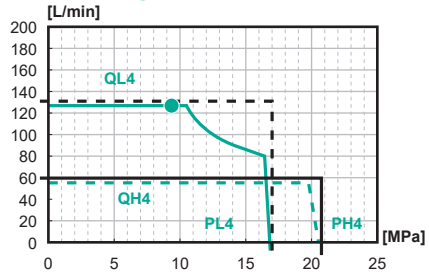

### ❷ PQ setting



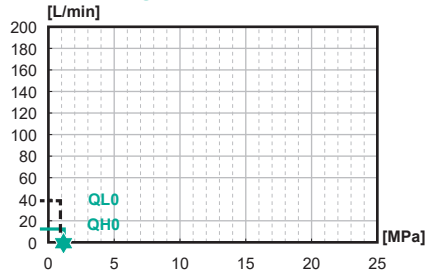

### ❸ PQ setting




### ❹ PQ setting




### ❺ PQ setting

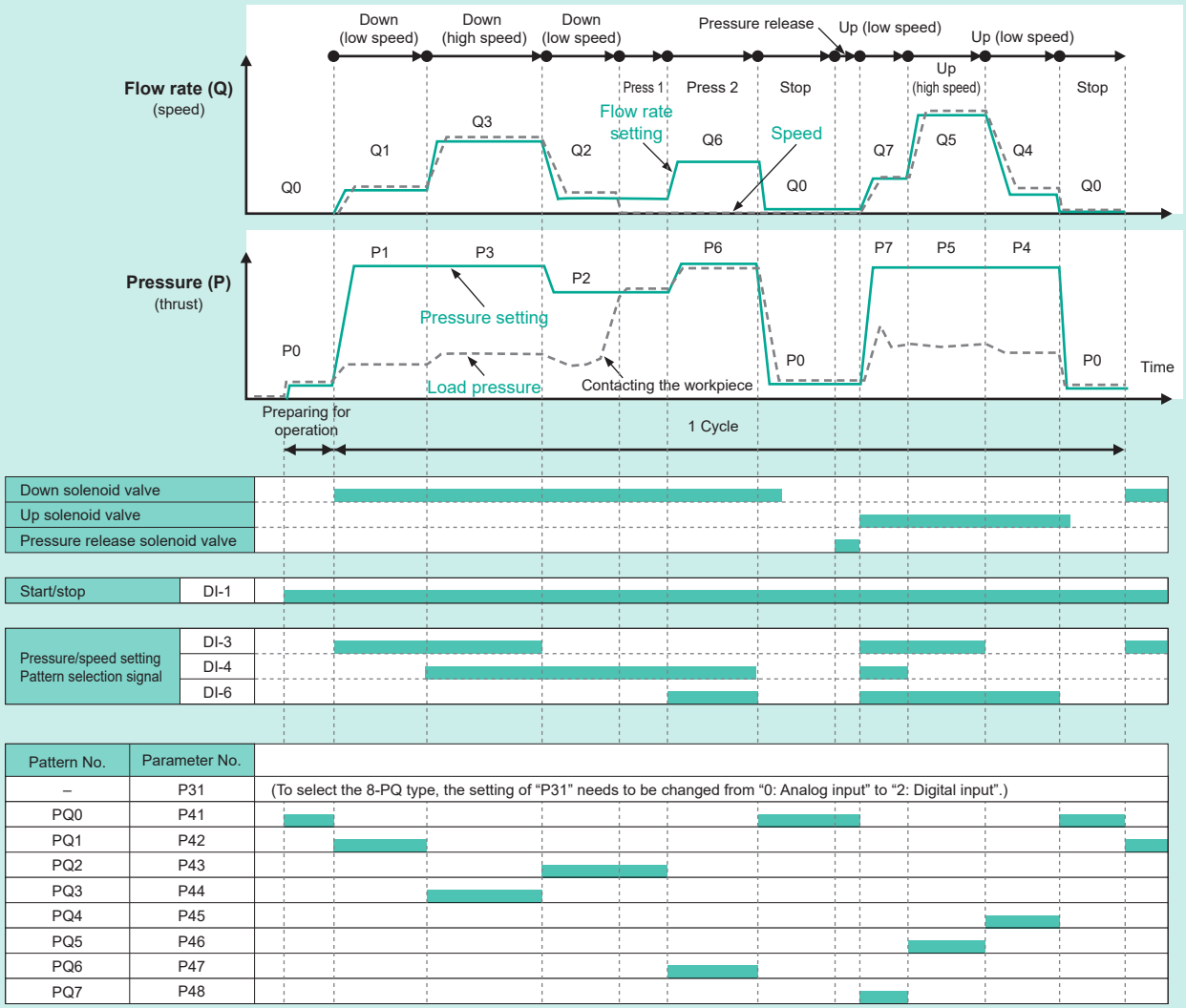



● indicates an example operating point when combination flow is selected.
★ indicates an example operating point when independent flow is selected.

# Example Timing Chart for Cylinder Operation and Signals on a Press Machine

## Example of 8-PQ Function: Example Timing Chart with SUT00S (Single Pump, 8-PQ Type)

### Example Timing in 8-PQ Control (Single Pump)




| Pattern No. | Parameter No. | |
|---|---|---|
| – | P31 | (To select the 8-PQ type, the setting of “P31” needs to be changed from “0: Analog input” to “2: Digital input”.) |
| PQ0 | P41 | |
| PQ1 | P42 | |
| PQ2 | P43 | |
| PQ3 | P44 | |
| PQ4 | P45 | |
| PQ5 | P46 | |
| PQ6 | P47 | |
| PQ7 | P48 | |

### Digital Selection Signals and PQ Numbers

| DI-3 | DI-4 | DI-6 | Pattern No. |
|---|---|---|---|
| off | off | off | PQ0 |
| on | off | off | PQ1 |
| off | on | off | PQ2 |
| on | on | off | PQ3 |
| off | off | on | PQ4 |
| on | off | on | PQ5 |
| off | on | on | PQ6 |
| on | on | on | PQ7 |

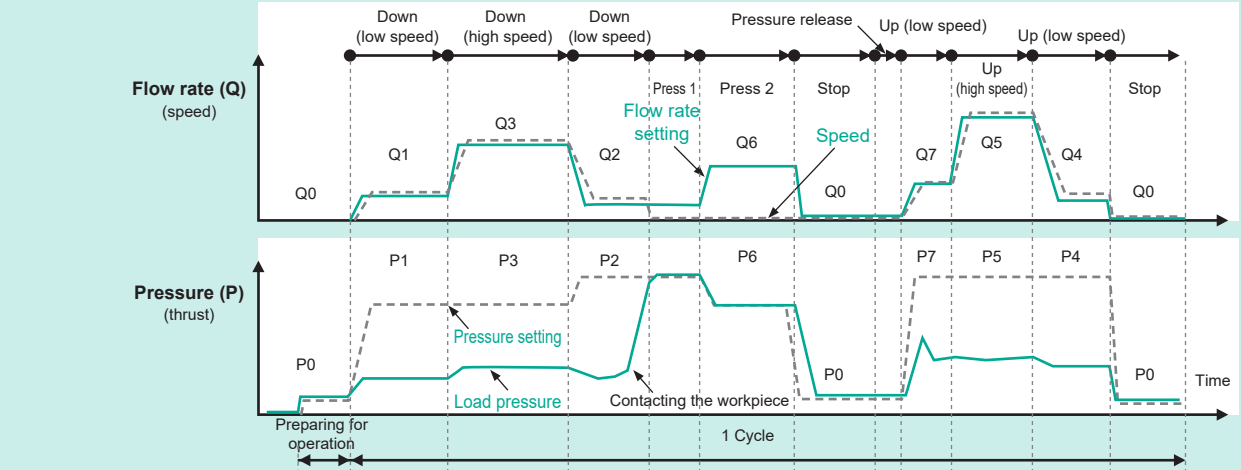
### PQ Numbers and Example Pressure/Flow Rate Settings

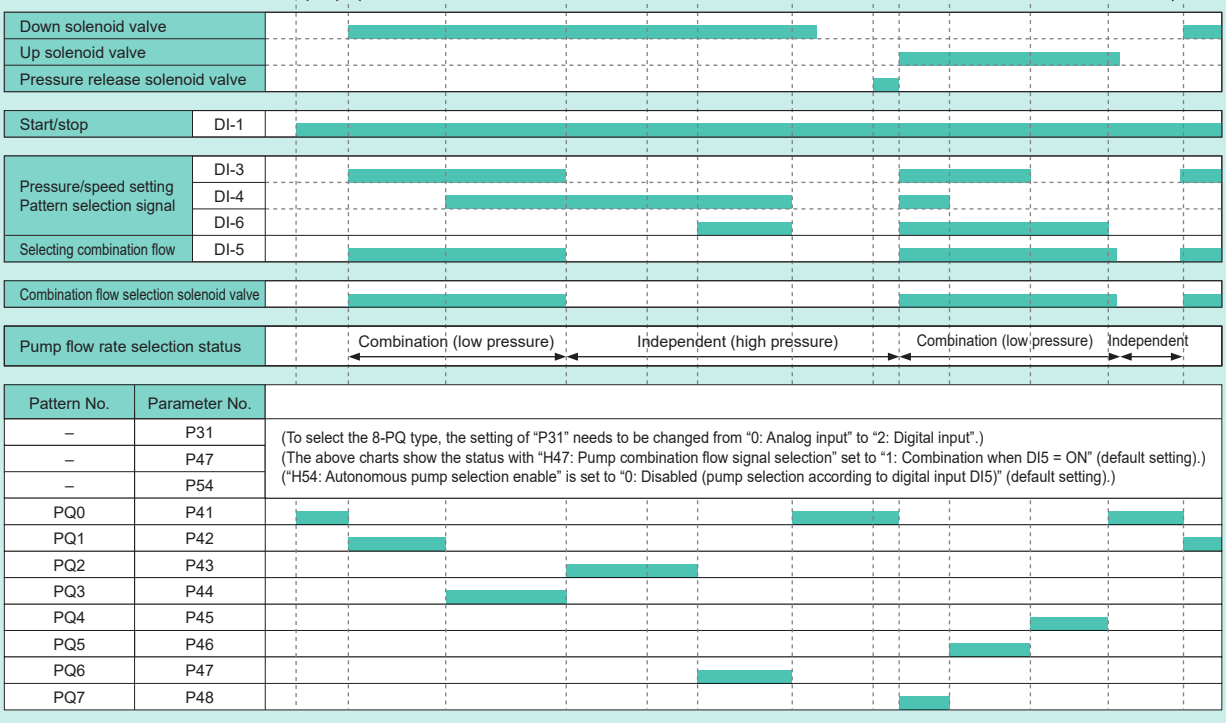
| | PL* [MPa] | QL* [L/min] |
|---|---|---|
| PQ0 | 0.5 | 0.0 |
| PQ1 | 16.0 | 10.0 |
| PQ2 | 12.0 | 8.0 |
| PQ3 | 16.0 | 70.0 |
| PQ4 | 16.0 | 6.0 |
| PQ5 | 16.0 | 80.0 |
| PQ6 | 17.6 | 50.0 |
| PQ7 | 16.0 | 10.0 |

Note: The analog input function is selected with parameter P31 (command input target selection) by default. (Parameter P31 (command input target selection) is set to “0: Analog input”.)
To use the 8PQ function, the setting of parameter P31 needs to be changed to “2: Digital input (8-PQ)”. (The setting change takes effect upon restarting the power.)
To achieve shockless control on a machine, the flow rate, pressure, response time and other settings need to be adjusted according to the machine.

# Example of 8-PQ Function: Example Timing Chart with SUT00D13021 (Double Pump, 8-PQ Type, Flow Rate Selection by External Signal)

## Example Timing with 8-PQ, Double Pump, External Signal (DI5) Selection Specifications




| Pattern No. | Parameter No. | |
|---|---|---|
| – | P31 | (To select the 8-PQ type, the setting of "P31" needs to be changed from "0: Analog input" to "2: Digital input".)<br>(The above charts show the status with "H47: Pump combination flow signal selection" set to "1: Combination when DI5 = ON" (default setting).)<br>("H54: Autonomous pump selection enable" is set to "0: Disabled (pump selection according to digital input DI5)" (default setting).) |
| – | P47 | |
| – | P54 | |
| PQ0 | P41 | |
| PQ1 | P42 | |
| PQ2 | P43 | |
| PQ3 | P44 | |
| PQ4 | P45 | |
| PQ5 | P46 | |
| PQ6 | P47 | |
| PQ7 | P48 | |

## Digital Selection Signals and PQ Numbers

| DI-3 | DI-4 | DI-6 | Pattern No. |
|---|---|---|---|
| off | off | off | PQ0 |
| on | off | off | PQ1 |
| off | on | off | PQ2 |
| on | on | off | PQ3 |
| off | off | on | PQ4 |
| on | off | on | PQ5 |
| off | on | on | PQ6 |
| on | on | on | PQ7 |

## PQ Numbers and Example Pressure/Flow Rate Settings

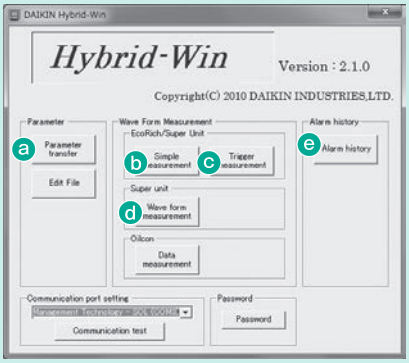
| | PH* [MPa] | QH* [L/min] | PL* [MPa] | QL* [L/min] | PC* |
|---|---|---|---|---|---|
| PQ0 | 1.0 | 5.0 | 1.0 | 10.0 | 1 |
| PQ1 | 20.6 | 30.0 | 12.0 | 50.0 | 1 |
| PQ2 | 20.6 | 30.0 | 18.0 | 30.0 | 1 |
| PQ3 | 20.7 | 30.0 | 12.0 | 130.0 | 1 |
| PQ4 | 20.6 | 30.0 | 14.0 | 30.0 | 1 |
| PQ5 | 20.6 | 30.0 | 18.0 | 130.0 | 1 |
| PQ6 | 17.0 | 40.0 | 17.6 | 40.0 | 1 |
| PQ7 | 20.6 | 30.0 | 18.0 | 50.0 | 1 |

Note: This example shows operation of SUT00D13021 (200 V specifications) with 8-PQ type and flow rate selection by external signal (DI5) selected.
Flow rate selection by the 8-PQ function can also be used in the autonomous selection mode. For details on the 8-PQ control, please refer to the instruction manual provided separately.
To achieve shockless control on a machine, the flow rate, pressure, response time and other settings need to be adjusted according to the machine.

# Maintenance/Management Tool (Hybrid-Win)

Hybrid-Win is a software tool that connects your personal computer running Windows 7/8/10 to a SUPER UNIT through communications (RS232C) to enable editing/saving of SUPER UNIT parameters and measurement of waveforms that result from the pressure/flow rate control.
Hybrid–win and its instruction manual are available from the website (https://www.hyd.daikin.com) after registering as a member.
A personal computer and an RS232C/USB conversion cable are necessary.

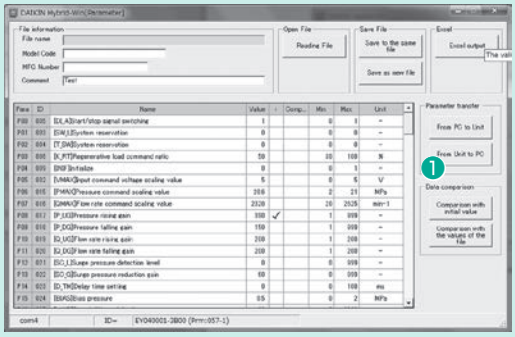
PC tool Hybrid-Win




## Startup Window of Hybrid-Win

Hybrid-Win can also be used for maintenance of other hybrid products from DAIKIN such as ECORICH products and oil cooling units.
The startup window has the [Parameter transfer], [Simple measurement], [Trigger measurement], [Wave form measurement] and [Alarm history] buttons as shown in the figure to the left to provide access to the major functions of Hybrid-Win. Some basic functions are covered here.
(Please refer to the instruction manual provided separately for details.)

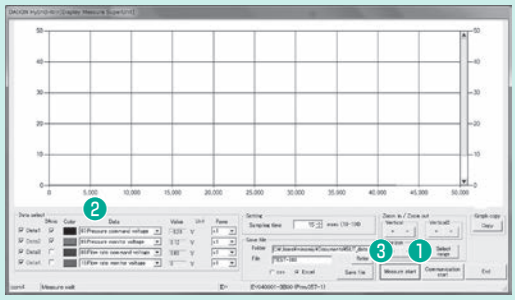
- ⓐ : [Parameter transfer]
- ⓑ : Waveform measurement: [Simple measurement]
- ⓒ : [Trigger measurement]
- ⓓ : Waveform measurement: [Wave form measurement]
- ⓔ : [Alarm history]



## ⓐ Loading Parameters from SUPER UNIT (Parameter Transfer)

Clicking the “From Unit to PC” button transfers parameter data from the Super Unit to the personal computer and displays the parameters on the Hybrid-Win window shown to the left.
The parameters can be edited and saved in this window.

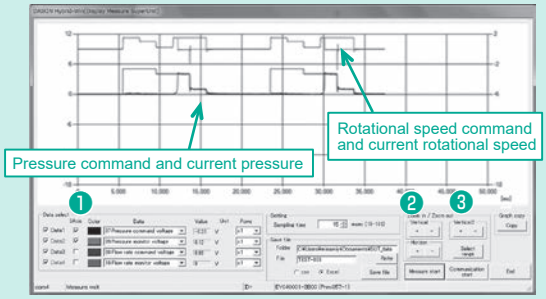
- ❶ : [From Unit to PC] button



## ⓓ Measuring Waveforms of SUPER UNIT

Click the [Communication start] button and select four data types to be displayed.
Clicking the [Measure start] button starts the measurement and the waveforms are displayed on the software screen as shown in the figure to the left over an extended period (90 seconds, when the sampling time is set to 15 ms for example) until the [measure stop] button is clicked. The waveform data can also be saved in the Excel graph format.

- ❶ : [Communication start] button
- ❷ : Selecting data to be displayed
- ❸ : [Measure start] button




## Zooming the Measured Waveforms In/Out

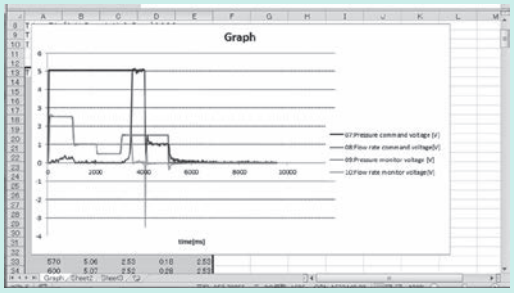
By checking “2Axis” for data types to be displayed, the chart can be zoomed along each of the vertical axes as shown in the figure to the left. The figure to the left shows the waveforms with the command pressure (voltage) and current pressure (voltage) assigned to the left axis, the command rotating speed (voltage) and current rotating speed (voltage) assigned to the right axis, and both axes zoomed using the “Vertical” and “Vertical 2” [+] buttons. It is also possible to zoom the chart along the horizontal axis (time).
This function can be used for monitoring waveforms on the screen while the SUPER UNIT is running and saving some significant waveforms as Excel data.

- ❶ : Selecting data type to be displayed as “2Axis”
- ❷ : “Vertical” zoom in/out buttons
- ❸ : “Vertical 2” zoom in/out buttons

## Window Displayed by Clicking ⓒ [Trigger measurement]

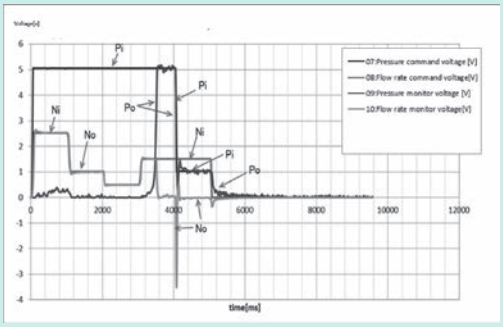
This window appears when the [Communication start] button is clicked after the [Trigger measurement] button in the start window to enable selection of the sampling time, four data types to be measured and trigger conditions.
When the trigger conditions are satisfied after clicking the [Measurement start] button, the measurement starts and the waveforms are displayed as an Excel graph upon completing the measurement. (When Excel is selected as the file saving format) When the sampling time is set to 20 ms for example, measurement is possible for 5.1 seconds. It is also possible to save the data in the CSV format.

❶ : [Communication start] button
❷ : Selecting "Measurement data"
❸ : "Trigger condition setting"
❹ : [Measurement start] button



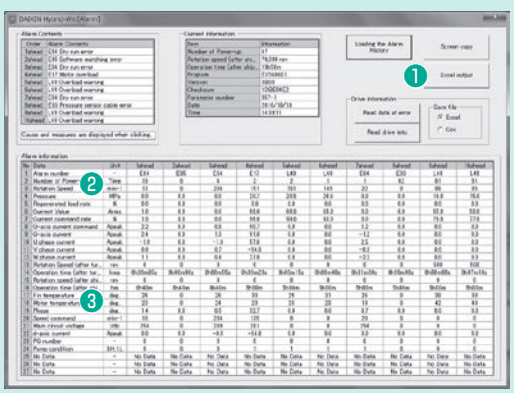

## Measurement Results when Excel File Selected as the Target with ⓑ [Simple measurement] or ⓒ [Trigger measurement]

When Excel file is selected as the file saving format with the [Simple measurement] or [Trigger measurement] function, Excel window as shown in the figure to the left automatically appears upon completing the measurement to show the measurement data in a graph.
The graph can be adjusted for better visibility by correcting/modifying its time axis and vertical axes using Excel, and saved as Excel data.




## Example of Measured Waveforms after being Edited in Excel

When Excel file is selected as the file saving format with the [Simple measurement] or [Trigger measurement] function, the waveforms are displayed in an Excel graph automatically upon completing the measurement. The figure to the left shows an example after editing the displayed waveforms for better visibility.



## Alarm Window Displayed by Clicking ⓔ [Alarm history]

The window displays details on the latest 10 alarms.
Information on the alarms including the alarm number and the total operating time at the occurrence of the alarm can be checked in the table as shown in the figure to the left. The data can also be saved as Excel data or in other formats.

❶ : [Excel output] button
❷ : Alarm number
❸ : Total operating time (after shipment)

High Pressure | High Flow Rate

Analog Command Input | High Accuracy

# SUPER UNIT

## HYBRID HYDRAULIC UNIT

## [Official] Introducing a Video Site

We have opened a site where you can watch videos on the latest models of the DAIKIN Oil Hydraulics Division, including Super Unit, EcoRich, and oil cooling units, all in one place.

Everything from the energy-saving technology supporting hybrid products to the features and functions of each model is explained in an easy-to-understand manner.

By registering the page in the favorites on your computer or cell phone, you can find the latest information at your fingertips any time.

URL https://www.hyd.daikin.com/mv

The site is also ready for smartphones and tablets!

Daikin Hydraulic Search


**DAIKIN INDUSTRIES, LTD.**

**Oil Hydraulic Equipment**

**Osaka Office**

YODOGAWA PLANT
1-1, Nishi-Hitotsuya, Settsu, Osaka 566-8585, Japan
Phone: 81-6-6349-4475
Fax.: 81-6-6349-7862
Home Page: **https://www.hyd.daikin.com**

**All World Machinery Supply, Inc.**

**A member of DAIKIN group**

6164 All World Way, Roscoe, IL 61073, U. S. A.
Phone: +1-815-943-9111
Fax.: +1-815-943-5370
Home Page: **https://www.allworldmachinery.com/**





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