



Delta Servo Press - E Series Installation and Maintenance Instructions

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Delta Electronics Servo Press (External Electric Cylinder)
Installation and Maintenance Instructions

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1. Safety Information

1.1 Safety Information Before Use

Item	Description
<p style="text-align: center;">Power Supply</p>	<p>Please shut down power before removing the external power lines to the unit so that the unit is in a disconnected state when the servo press will be out of service for an extended period of time.</p>
	<p>Please follow the main power and voltage requirements.</p>
	<p>Do not let the servo press or power lines get exposed to water or oil.</p>
	<p>Make sure that the power line is properly plugged and fastened.</p>
<p style="text-align: center;">Machinery</p>	<p>For long-term use, please periodically check if the screws fixating the unit are loose and re-fasten loose ones.</p>
	<p>While in operation, warning signs may be put up in the surroundings to prevent against possible danger.</p>
	<p>Do not modify or alter the equipment yourself.</p>
	<p>Do not work in areas with direct exposure to sunlight.</p>
	<p>During transfer, setup, and operations, avoid collisions with the equipment.</p>
	<p>Please check if the screws are fastened for a jig fixture installed with the punch.</p>
	<p>Do not use the equipment in areas with dust and water vapor.</p>

1.2 Safety Information During Use

Item	Description
Equipment Surroundings and Operation	Please confirm there are if items interfering with punching and pressing in the surroundings of the equipment.
While the Equipment is Active	While the equipment is active, do not enter the scope of operation of the equipment.
	While the equipment is active, if there are any unusual sounds or burnt odors, stop the equipment right away and notify the Company (Delta Electronics) or the contract service provider.

1.3 Safety Information During Maintenance and Under Other Circumstances

Item	Description
Equipment Operation	Make sure that the main power is off during checks and while oil is being applied.
While the Equipment is Active	While the equipment is being checked, do not reach into the scope of operation of the equipment.

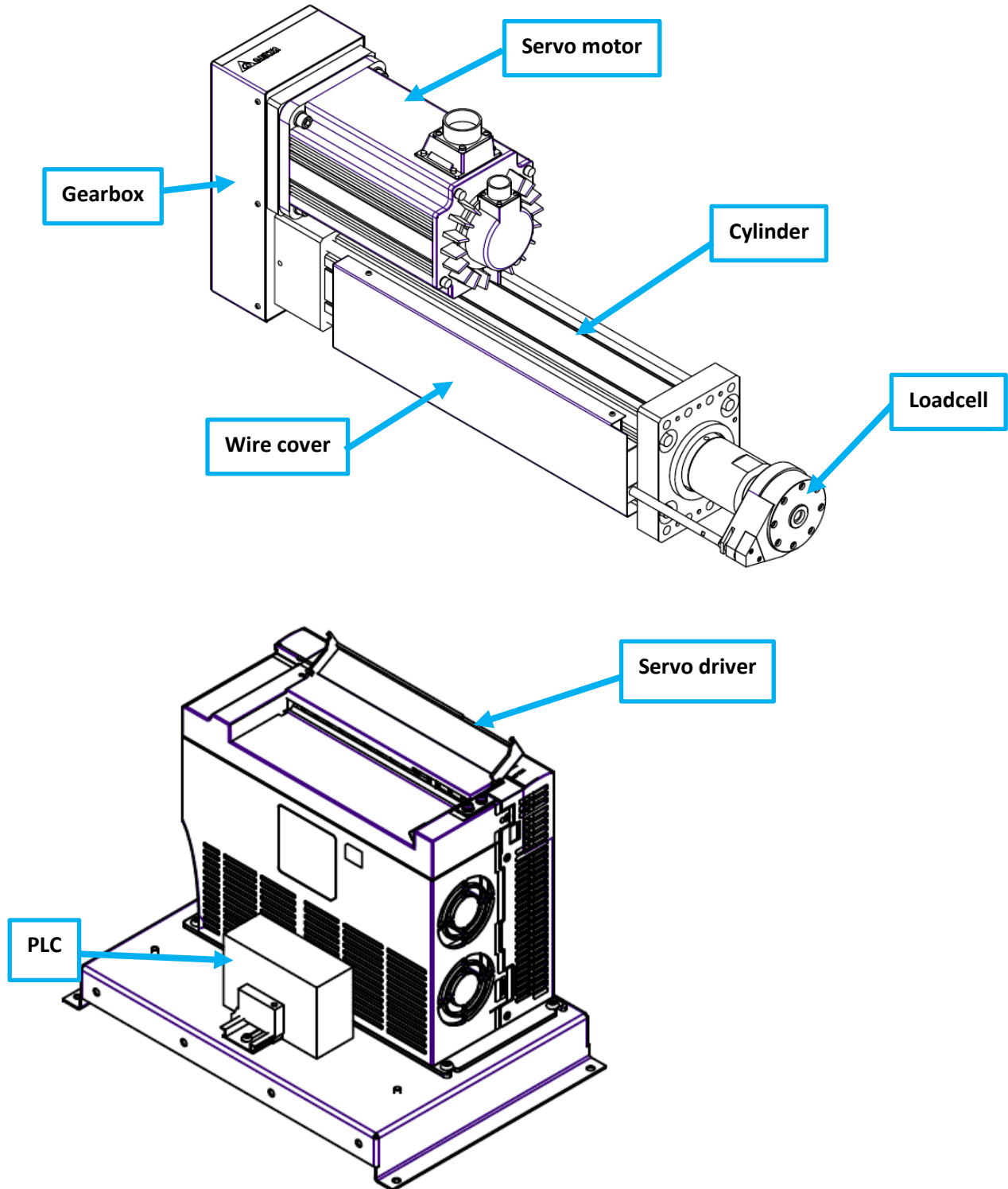
1.4 Powering System

Power Specifications	Model
AC single-phase three-wire 220V 50/60Hz, 10A	AM-ESP-E001-XXXX
	AM-ESP-E002-XXXX
	AM-ESP-E005-XXXX
AC three-phase four-wire 220V 50/60Hz, 30A	AM-ESP-E010-XXXX
	AM-ESP-E030-XXXX
	AM-ESP-E050-XXXX

2. Comprehensive System Structure

2.1 Model & Electronic Control Panel

The following figure uses the AM-ESP-E050-41XX as an example:

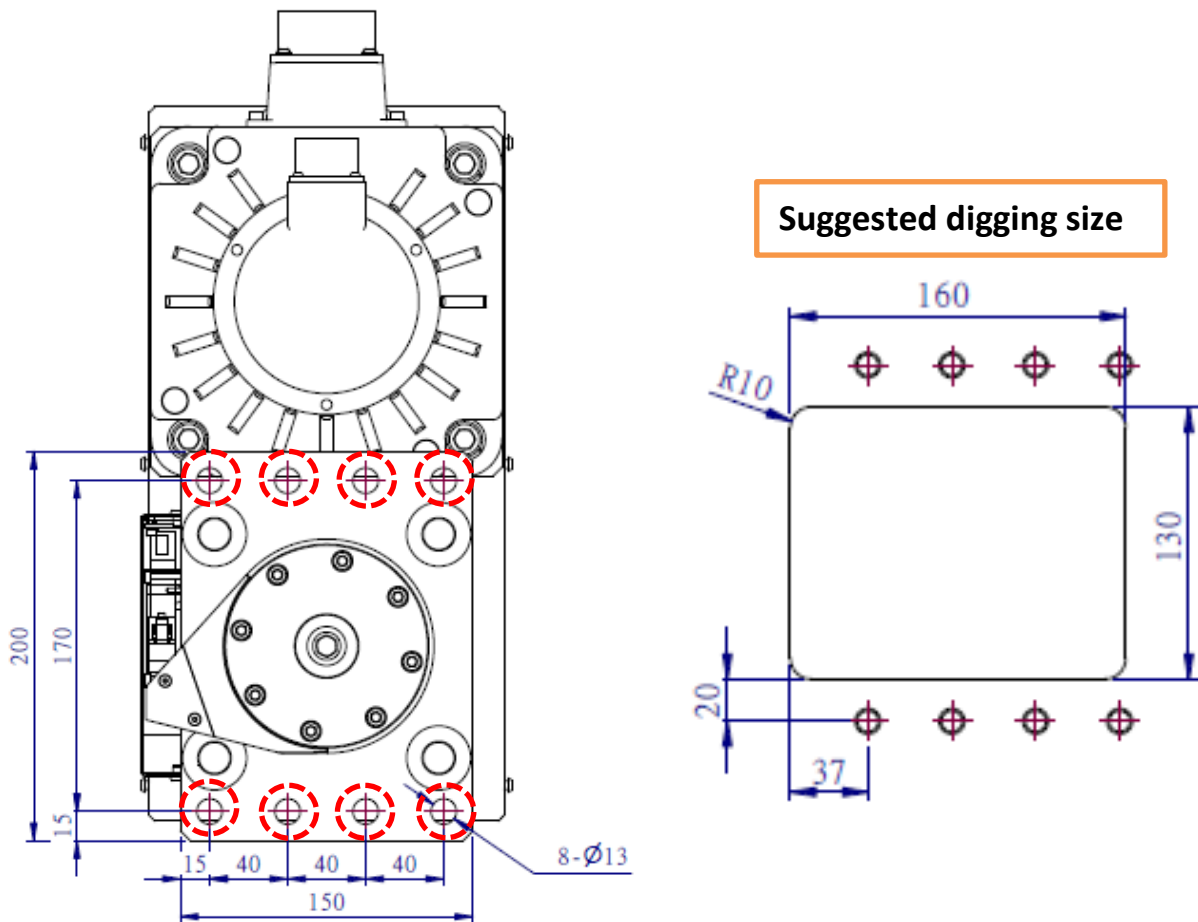


3. Installation Setup

3.1 Fixed Way

3.1.1 AM-ESP-E050-XXXX/AM-ESP-E030-XXXX models

The fixed servo press is installed with a flange. The fastening ports are shown in the figure below. Please use 8 general M12X1.75 hex screws (JIS strength is 12.9, length 60) and apply the tightening torque of 1160 kgf-cm.

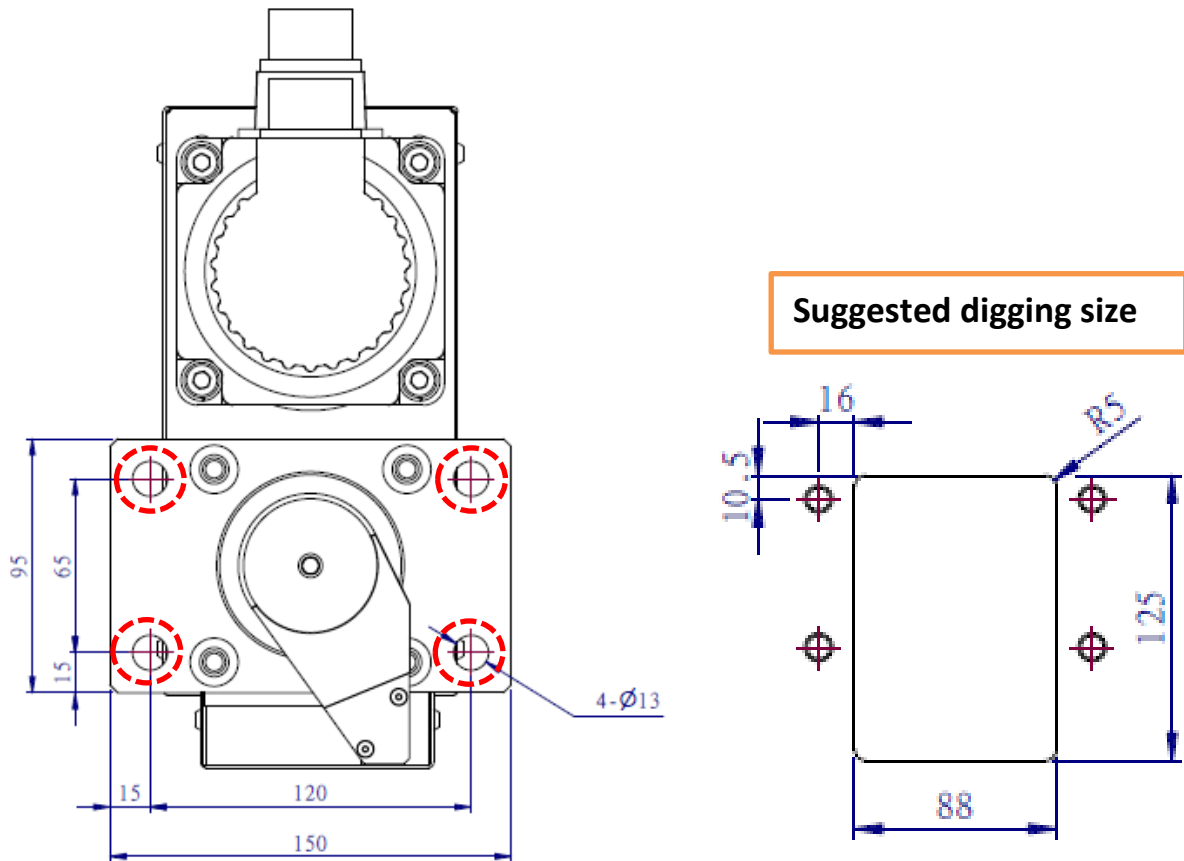


 : Locking and fastening site

Caution: Please note that the equipment has to be closely attached to the locking and fastening platform while fastening the servo press.

3.1.2 AM-ESP-E010-XXXX / AM-ESP-E005-XXXX models

The fixed servo press is installed with a flange. The fastening ports are shown in the figure below. Please use 4 general M12X1.75 hex screws (JIS strength 12.9, length 60) and apply the tightening torque of 1160 kgf-cm.

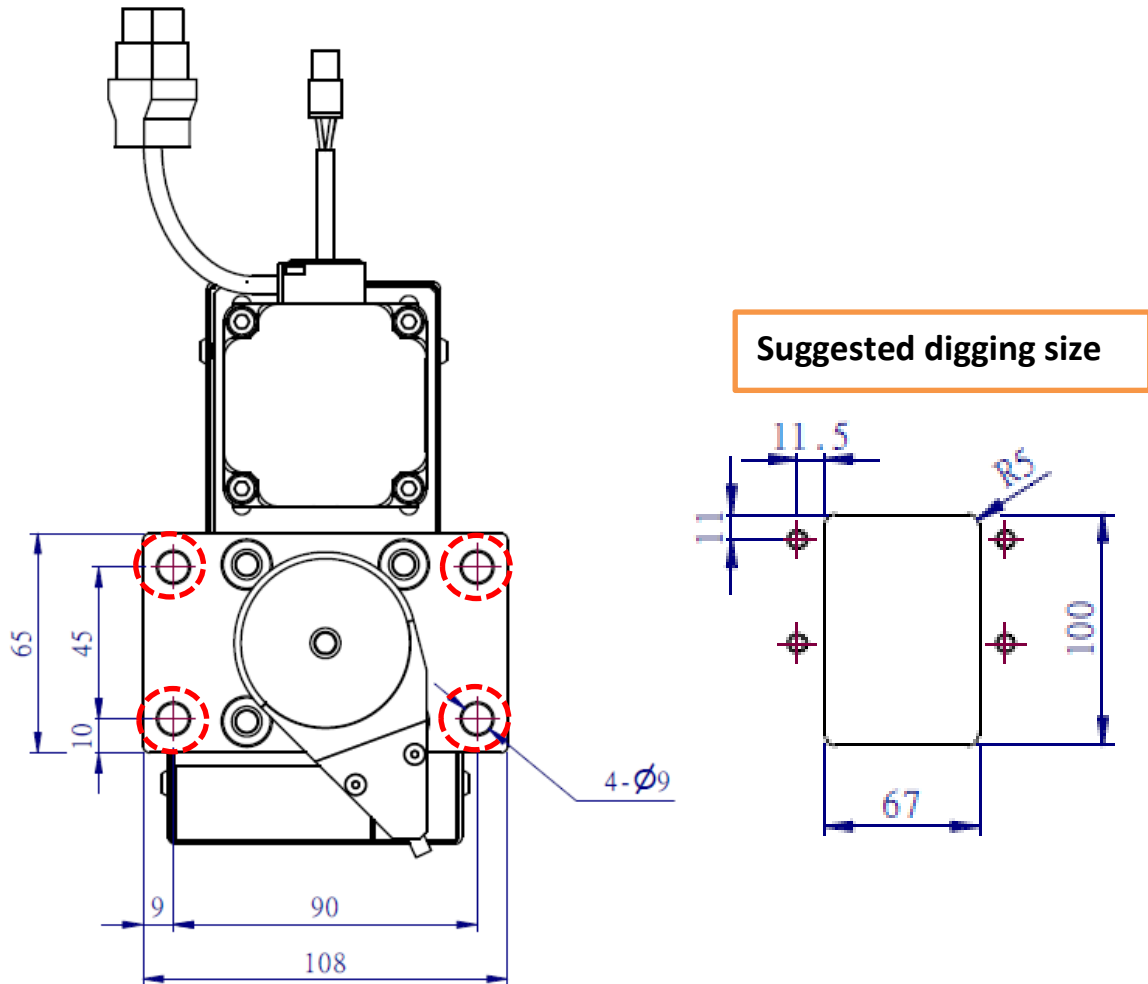


 : Locking and fastening site

Caution: Please note that the equipment has to be closely attached to the locking and fastening platform while fastening the servo press.

3.1.3 AM-ESP-E002-XXXX / AM-ESP-E001-XXXX models

The fixed servo press is installed with a flange. The fastening ports are shown in the figure below. Please use 4 general M8X1.25 hex screws (JIS strength 12.9, length 40) and apply the tightening torque of 334 kgf-cm.



 : Locking and fastening site

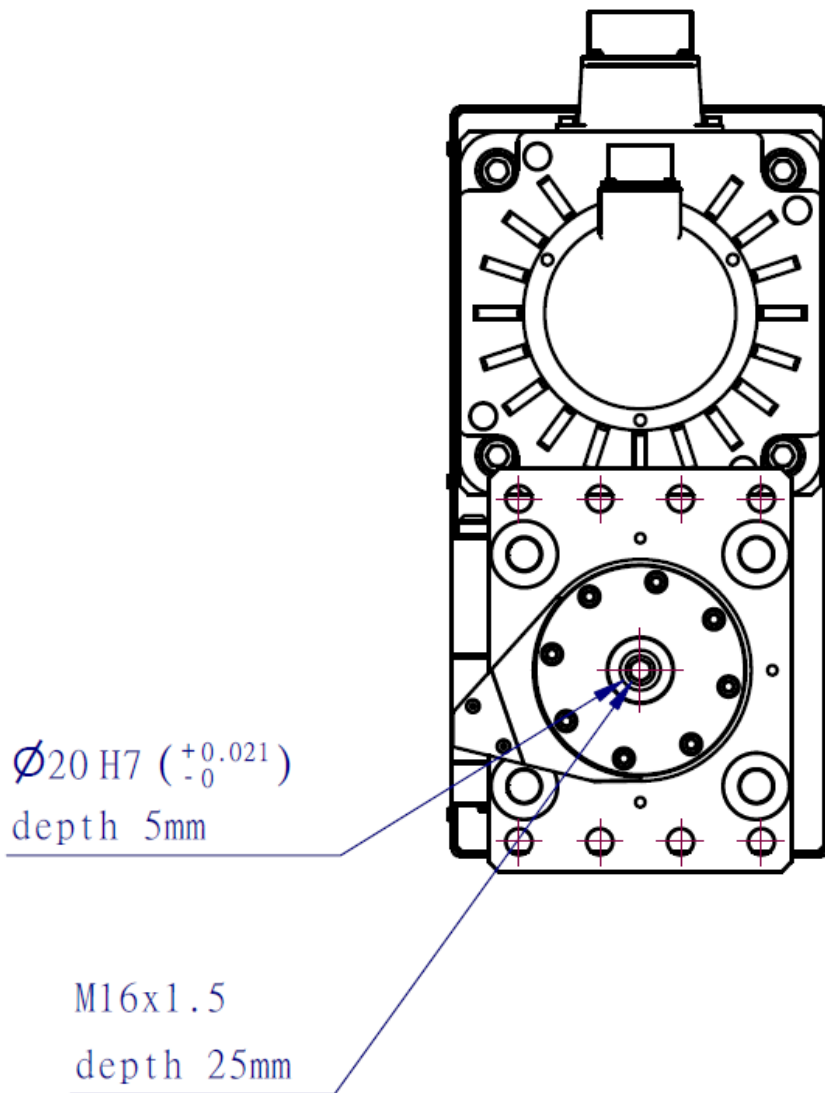
Caution: Please note that the equipment has to be closely attached to the locking and fastening platform while fastening the servo press.

3.2 Loading and Unloading Spindle Punch

Recommended punch jig design is provided in this section to facilitate realistic application by users.

3.2.1 AM-ESP-E050-XXXX / AM-ESP-E030-XXXX models

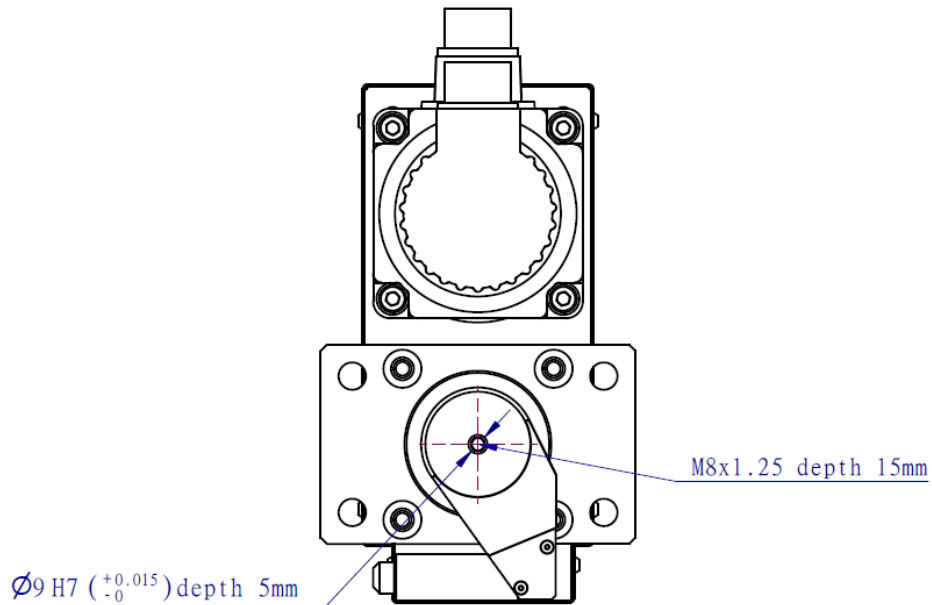
Please use M16x1.5 threads for the punch jig design.



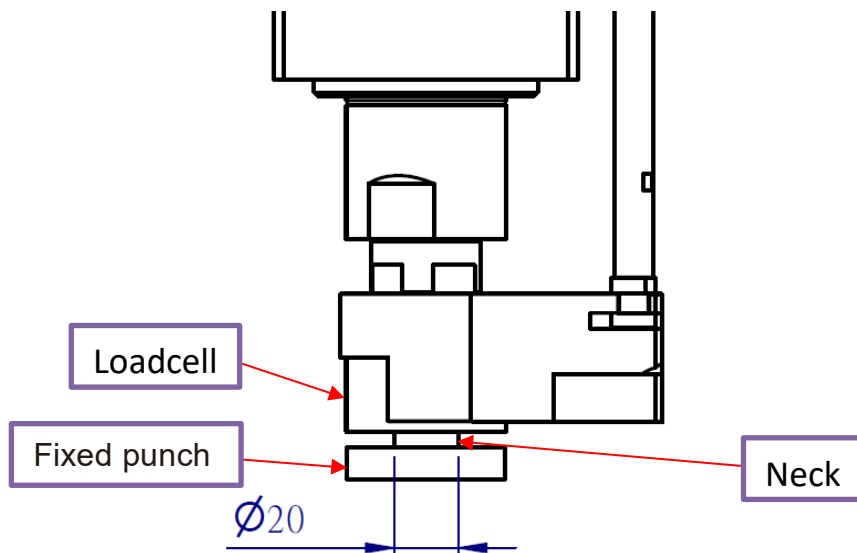
Caution: The top of the spindle punch is installed with the load cell. Do not assemble tools in a way that could result in deviations or impacts.

3.2.2 AM-ESP-E010-XXXX / AM-ESP-E005-XXXX models

Please use M8x1.25 threads for the punch jig design.



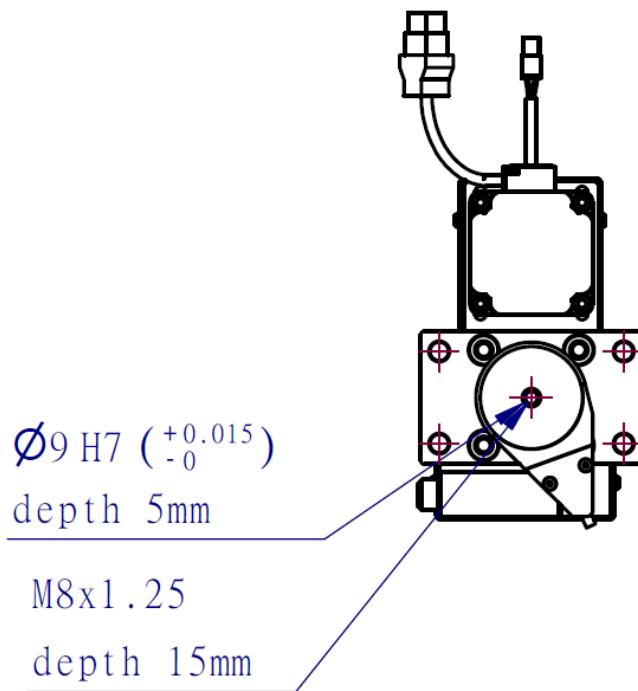
The design of the fixed punch should not be in contact with the entire surface of the front Loadcell. It is recommended to design a neck structure to avoid full-surface contact with the front Loadcell.



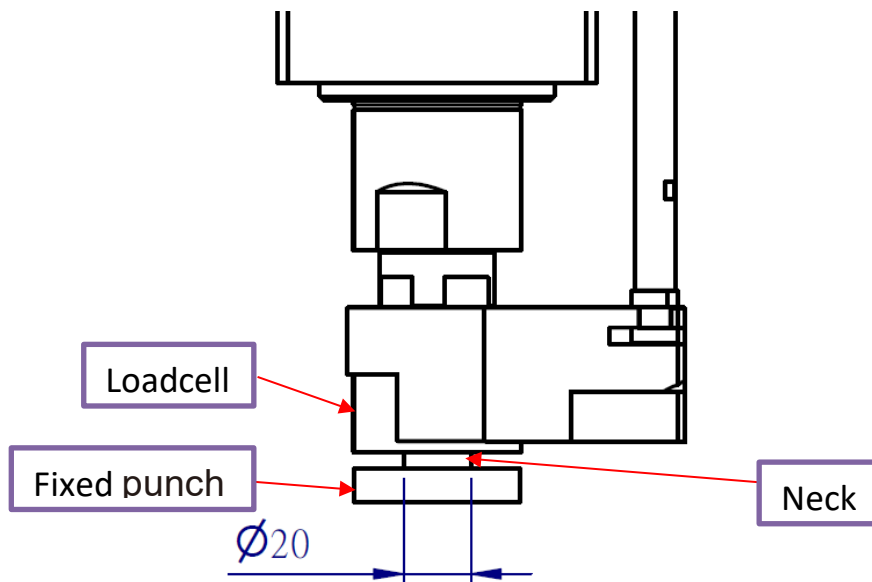
Caution: The top of the spindle punch is installed with the load cell. Do not assemble tools in a way that could result in deviations or impacts.

3.2.3 AM-ESP-E002-XXXX / AM-ESP-E001-XXXX models

Please use M8x1.25 threads for the punch jig design.



It is recommended to design a neck structure to avoid full-surface contact with the front Loadcell.



Caution: The top of the spindle punch is installed with the load cell. Do not assemble tools in a way that could result in deviations or impacts.

3.2.4 Restrictions of Jig

Punch dimensions and recommended jig designs are provided in the preceding three sections. Extended descriptions and precautions are provided hereunder. See the table below:

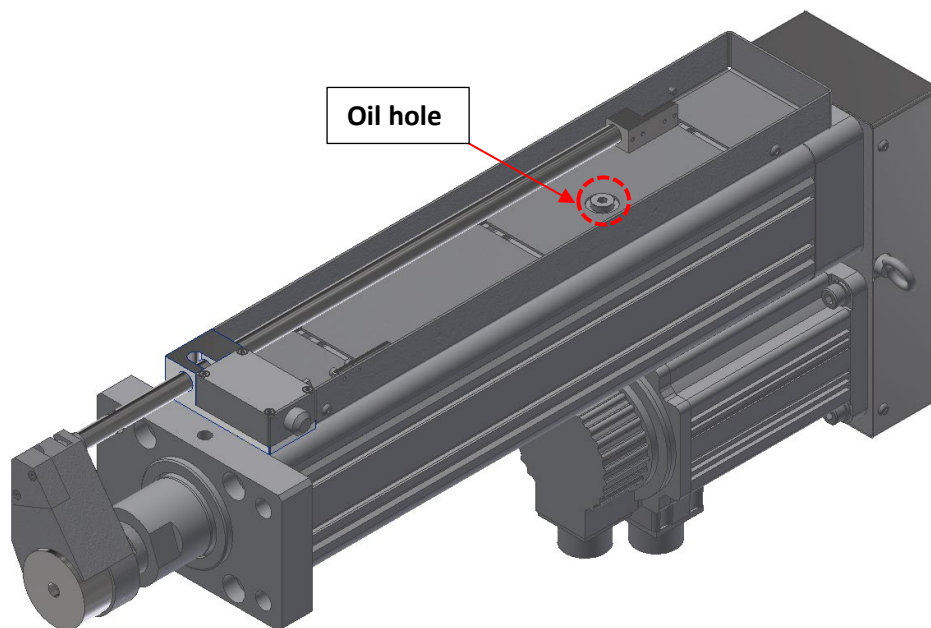
Item	Description
Jig weight (Payload)	For the weight limits, please follow those shown in the catalog [front-end load requirements of the spindle]. When the limits are exceeded, it will result in the spindle moving downwards due to gravity upon shutdown.
Center of the jig	The jig must be designed to overlap the core of the spindle. Otherwise, the partial load phenomenon will damage the loaded elements.

4. Equipment Care and Maintenance

4.1 Applying Oil to Equipment

High temperature lubricating grease has been applied to the servo electric cylinder at the factory. Please refer to the table below for the time intervals for regular lubrication of the bearings and ball screws.

Average rotation speed of ball screw (RPM)	Recommended time intervals for applying oil (Hr)
250	10,000
500	10,000
1,000	8,000
1,500	7,000
2,000	5,800
2,500	5,000
3,000	4,000



It is recommended to use Mobil SHC220 grease. The working temperature range of this grease is -40°C to 177°C

*Recommended oil injector: KCG-470H (Brand: Alba)

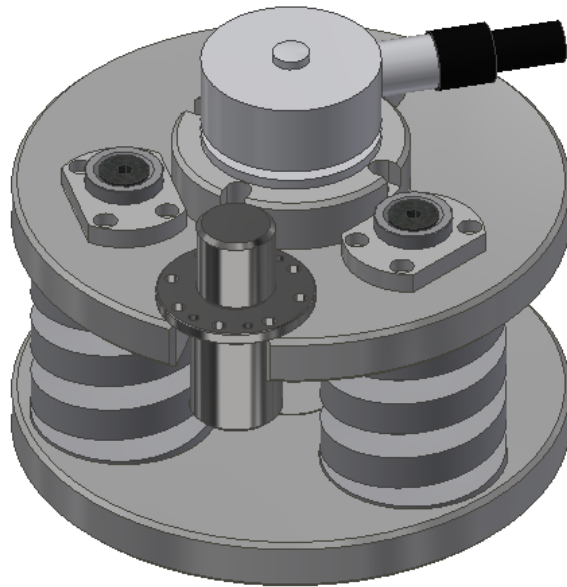
*Single injection volume: 40 ml

The injection steps are as follows:

- Step 1: Remove the outer cover of the cylinder block wire cover
- Step 2: Unscrew the plug of the oil hole on the cylinder body
- Step 3: Pull out the electric cylinder until you see the nozzle in the oil hole
- Step 4: Stop the motor and cut off the power
- Step 5: Inject grease into the nozzle
- Step 6: Screw on the plug
- Step 7: Put the outer cover of the cylinder block wire cover on
- Step 8: Turn on the power and allow the servo electric cylinder to fully cycle 2 to 3 times

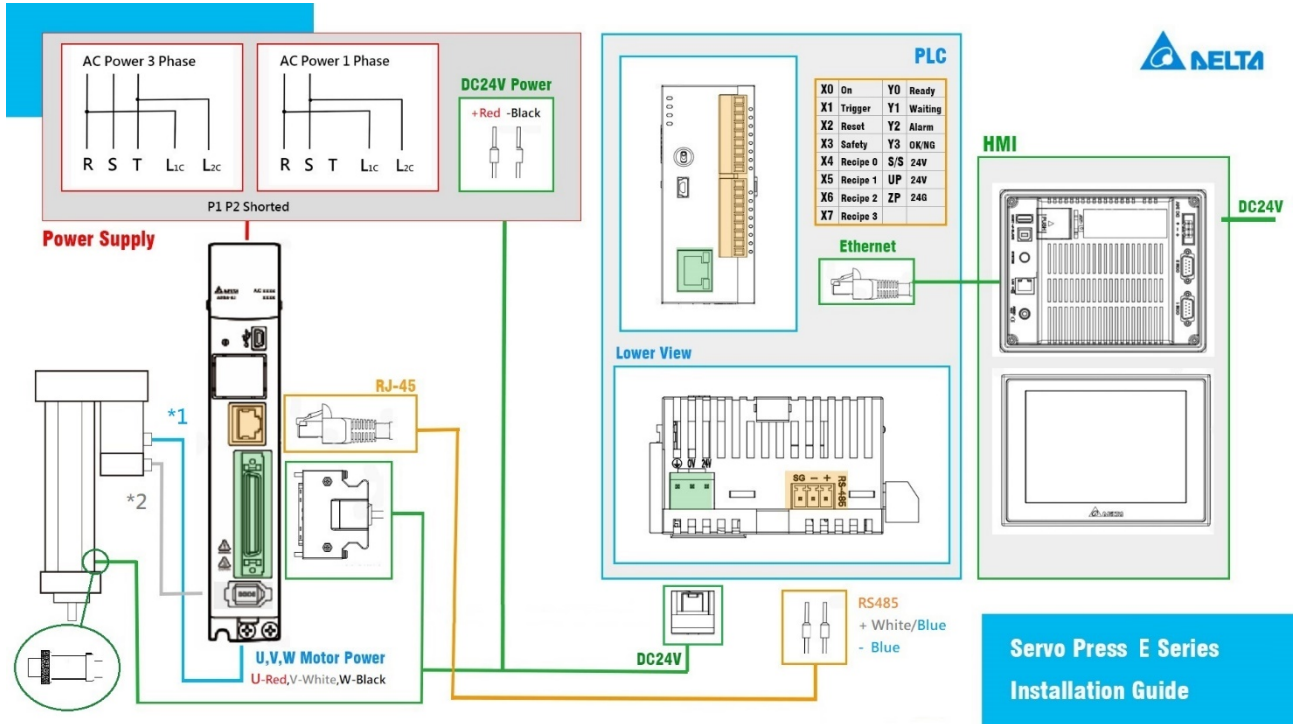
4.2 Load Cell Calibration

In order for the servo press to maintain precise quality, please perform load cell calibration if unusual force levels appear, or perform load cell calibration on a regular basis (after the warranty period expires). The load cell calibration tool is shown in the figure. Please follow the Operating Instructions while performing calibration and qualification or contact the Company (Delta Electronics) or contract service providers.

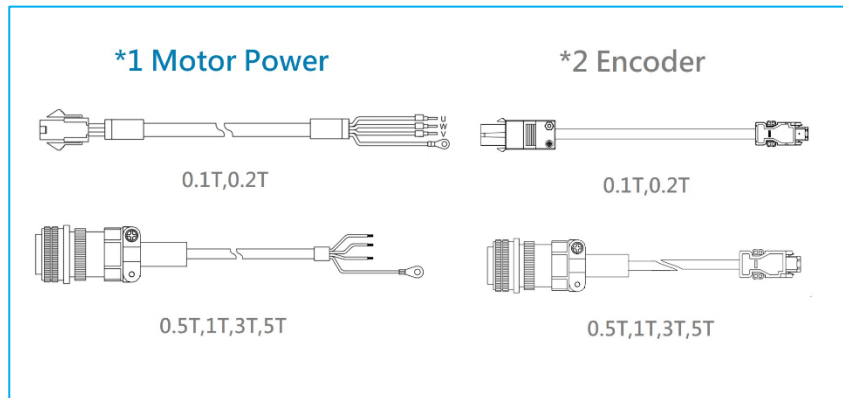


5. Wiring Instructions

5.1 Circuit Diagram

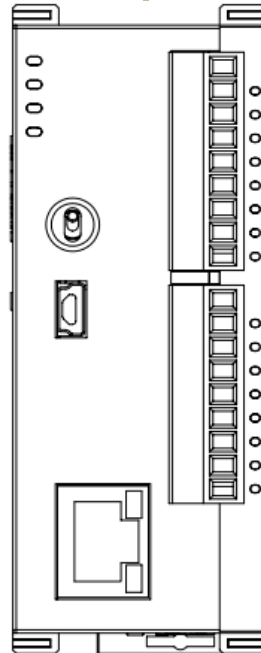


*During configurations, it is recommended that the signal line (green) and the motor power line (blue) be routed separately.



5.2 PLC External I/O Contact Details

IN		Power distribution reference
S/S	24V	24V
X0	On	Start button (hold type)
X1	Trigger	Two-hand switch (rising edge)
X2	Reset	Reset button (rising edge)
X3	Safety	Light Curtain (NC)
X4	Recipe 0	DIP Switches
X5	Recipe 1	
X6	Recipe 2	
X7	Recipe 3	

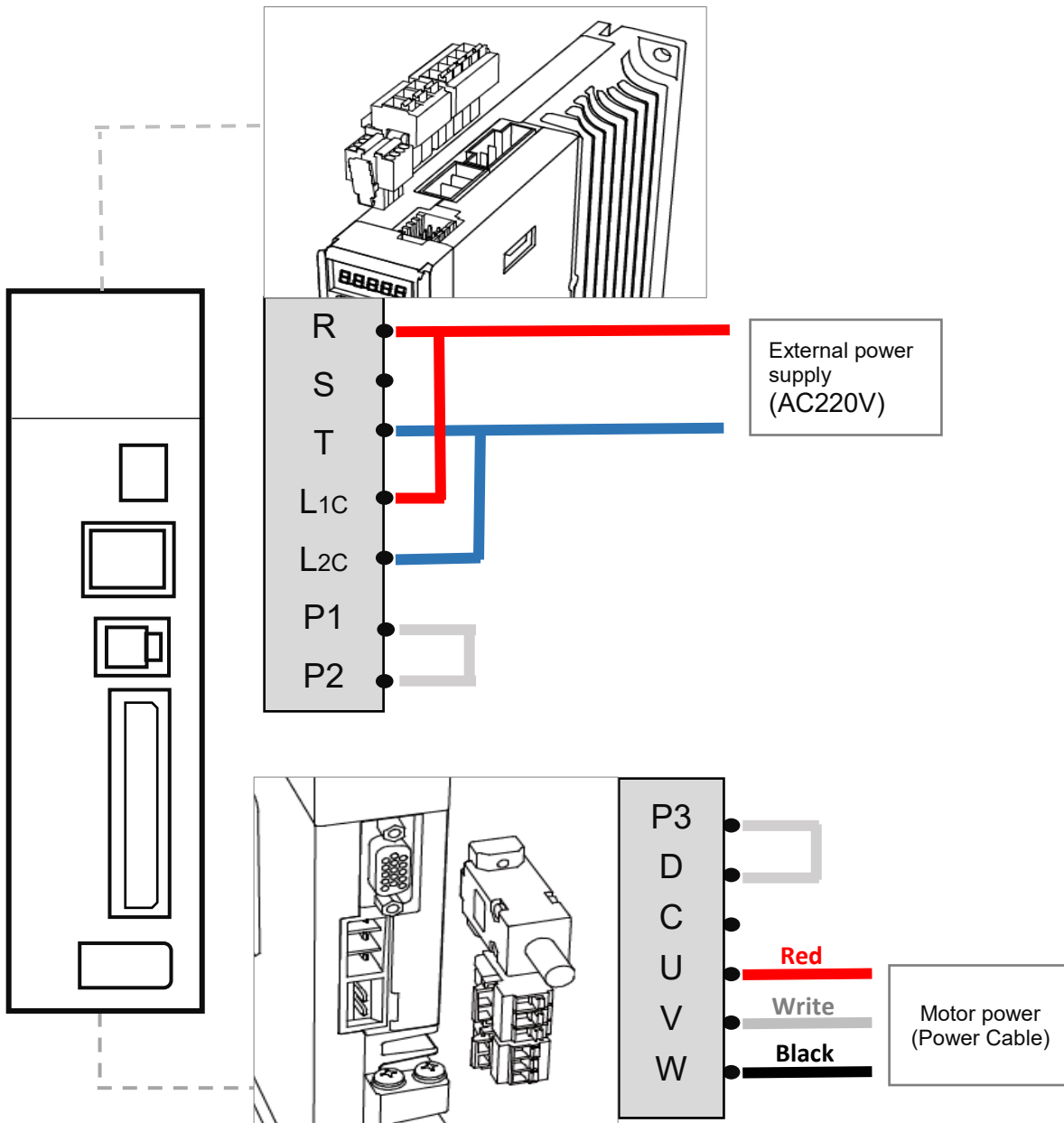


OUT		Power distribution reference
Y0	Ready	Indicator
Y1	Waiting	Indicator
Y2	Alarm	Indicator (red)
Y3	OK/NG	Indicator (green)
UP	24V	24V
ZP	24G	24G

5.3 Details of Drive Power Distribution

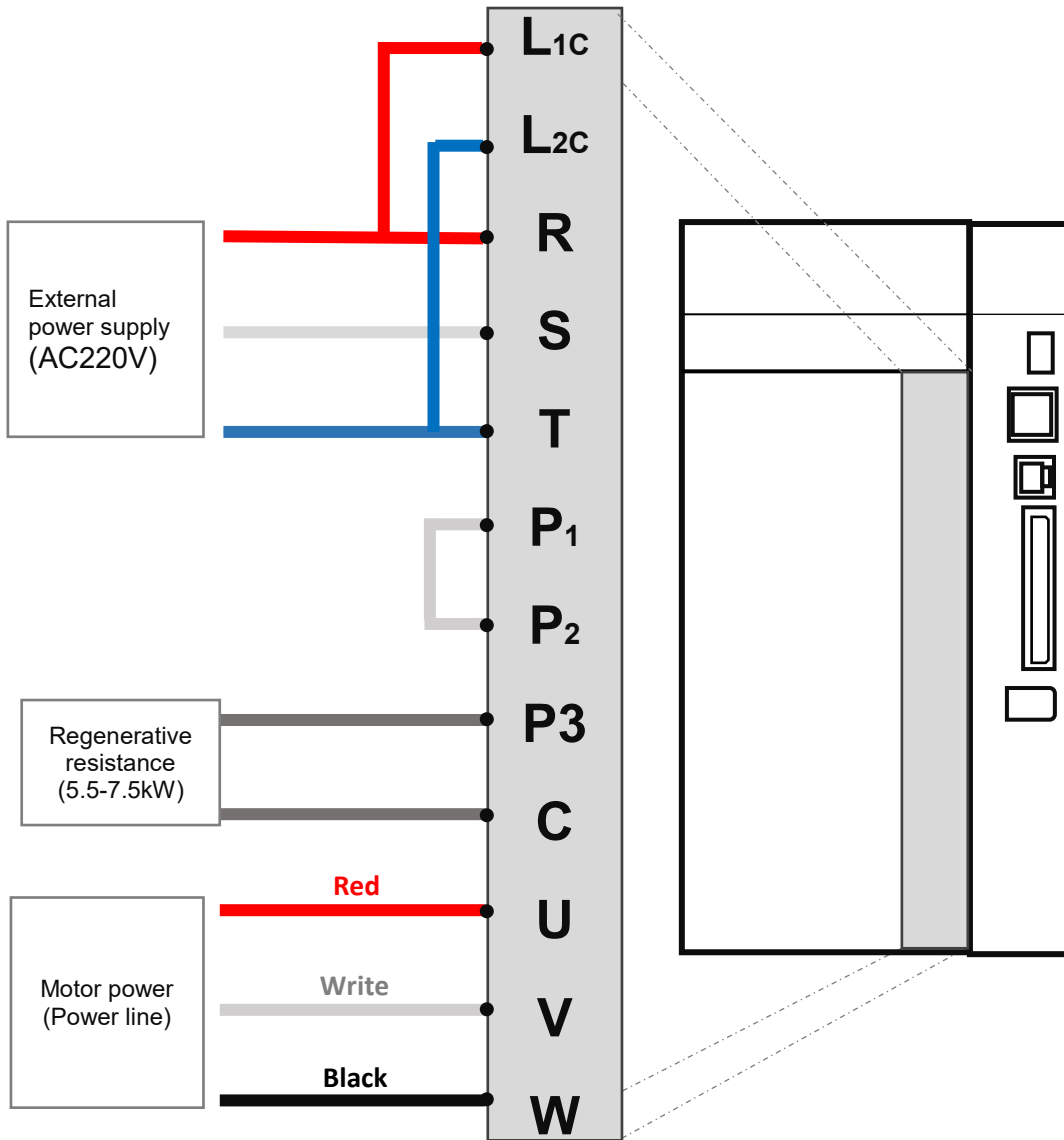
5.3.1 0.4 kW~1 kW

0.4 kW ~ 1 kW



5.3.2 2 kW~7.5 kW

2 kW ~ 7.5 kW





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