

2011.05

# MAGNETIC SWITCH





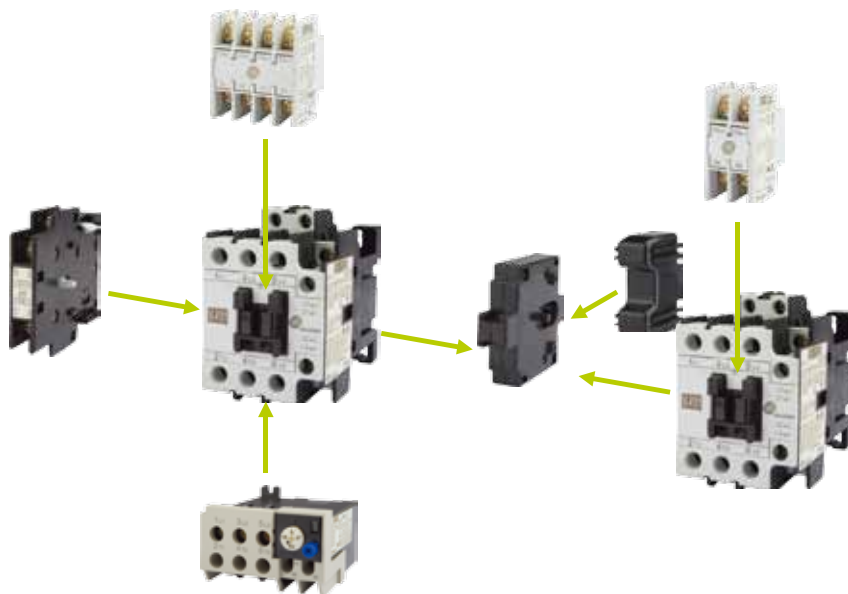
## Functionalities and characteristics of Magnetic Contactor

### • Configuration

Composite magnetic switch (abbreviated as MS) is comprised of a contactor for turning on and off current and a thermal overload relay for protecting the load.

### • Functions

- Switching the control system for electric power transmission and distribution.
- Operation of the start and stop of motors.
- Electric power control for all kinds of industrial machinery, machine tools and injection molding machines etc.
- Electric power control for air conditioners, thermostats, escalators and automatic doors etc.



### • Characteristics

- Products comply with multiple international standards.  
Compliant standards: JIS, JEM, IEC, EN, VDE  
Certified standards: UL, CSA, TUV
- Available for installing Auxiliary Contact Block (S-P11~S-P60T can be installed on the front or the side, S-P125T~S-P220T can be installed on the side).
- Auxiliary Contact Block designed for installing on the front and on the side can satisfy the spatial requirements of different operating environments.



Front mounted  
type AP-2P  
(1a1b,2a,2b)



Front mounted  
type AP-4P  
(2a2b,4a,3a1b)



Side mounted  
type APS-11  
(1a1b)

Charact-eristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

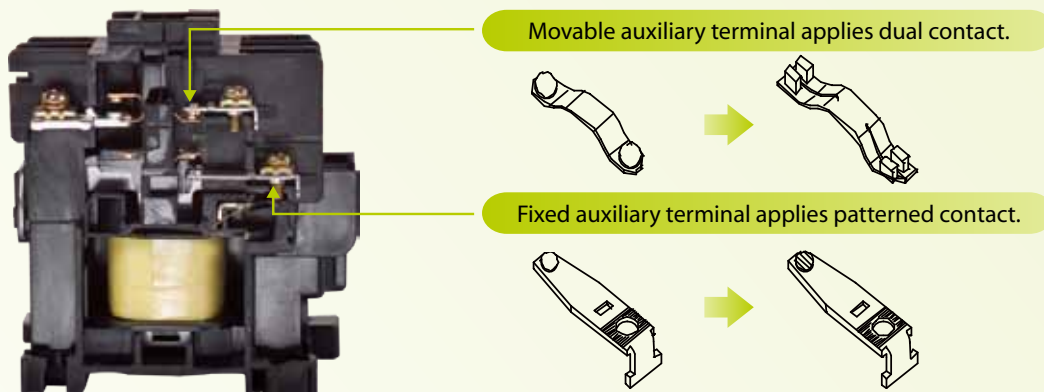
EYD

Series

Selec-tion

Others

d. Increase the reliability of auxiliary contacts (S-P60T and lower).



Notes:  
Apply the above auxiliary terminal design can increase the reliability of the contacts and minimize the contact resistance variation.

● Dimensional comparison table before and after miniaturization S-P300T、S-P400T

| Type                 |                       | External dimensions (mm) |     |       | Installation dimensions (mm) |               |
|----------------------|-----------------------|--------------------------|-----|-------|------------------------------|---------------|
|                      |                       | L                        | W   | H     | L                            | W             |
| Old type             | S-C300 / S-C401       | 230                      | 220 | 195   | 200                          | 200           |
|                      | MSO-C300 / MSO-C401   | 345                      | 220 | 195   | 200                          | 200           |
| New type             | S-P300T / S-P400T     | 246                      | 164 | 196.5 | 229                          | 60 or 130~145 |
|                      | MSO-P300T / MSO-P400T | 370                      | 164 | 196.5 | 229                          | 60 or 130~145 |
| Saving rate (volume) | S-P300T/S-C300        | 20%                      |     |       | -                            | -             |
|                      | S-P400T/S-C401        | 20%                      |     |       | -                            | -             |
|                      | MSO-P300T/MSO-C300    | 19%                      |     |       | -                            | -             |
|                      | MSO-P400T/MSO-C401    | 19%                      |     |       | -                            | -             |

● Descriptions of product characteristics S-P300、S-P400

| Category              | Product characteristics  |
|-----------------------|--|
| Usability             | <ul style="list-style-type: none"> <li>Energy saving: energy-saving design with low power consumption for operating coils and operating VA capacity.</li> <li>Operating coils apply common AC/DC power, AC or DC operation, DC holding, absolutely free of electromagnetic noise.</li> <li>Wide range of operating voltage 100-240V, 265-450V, 440-575V, ease of customer use.</li> </ul>  |
| International ization | <ul style="list-style-type: none"> <li>Compliant with IEC, CE, UL, TUV worldwide standards.</li> </ul>   |
| Safety                | <ul style="list-style-type: none"> <li>Spaced safety partition design: prevent short-circuit accidents caused by falling foreign objects.</li> <li>Safety trip mechanism design: when main contact melts down, auxiliary NC contact will break apart and open.</li> <li>Trip indication safety mechanism design: prevent external forces or human faulty activation which could lead to false function that bring about danger.</li> <li>Highly voltage drop withstand coil design (prevent the motor from starting at insufficient voltage [<math>&lt;65\%U_s</math> is not allowed to activate]).</li> </ul> |
| Others                | <ul style="list-style-type: none"> <li>Contact material does not contain cadmium, which complies with RoHs requirements</li> </ul>   |

## Characteristics descriptions of TH thermal overload relay

- **Automatic temperature compensation design**

Dual-alloy plate design can adjust and compensate automatically for ambient temperature changes, which increase the reliability of the product.

- **Single unit installation base can be added for independent use**

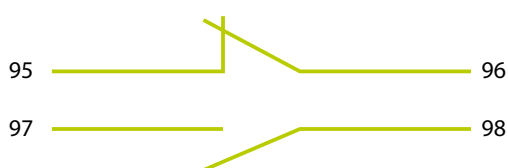
TH-P12, TH-P18 can be installed to single unit installation base, which can be used independently on the track or be fixed on the installation plate.

- **Safety protective cover design for high safety level**

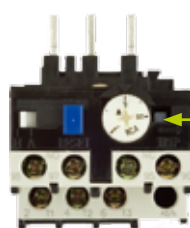
Protective cover can be added, is easy to install and complies with IEC degree of protection of IP 20.

- **Auxiliary terminal of thermal overload relay is 1a1b**

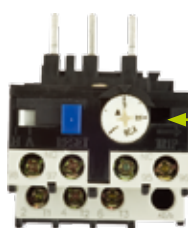
a auxiliary contact and b auxiliary contact are designed independently, which can be used for the control of two different power sources and are convenient for wiring.



- **Thermal overload relay reset/trip indicator is clear and easily seen**



(Reset state)  
White rod will appear in the indicator window.



(Trip) White rod shifted and unable to be seen directly.

- **Switching of thermal overload relay between manual/automatic reset is easy**

(customers can switch by themselves according to their needs)



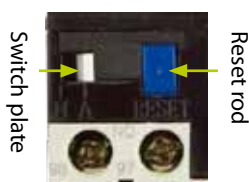
TH-P12

**Manual → Automatic reset switching method**

Press reset rod down and hold it; in the meantime, pull switch plate to the right to position “A” to lock reset rod and keep it in pressed down state, which then becomes the automatic reset state.

**Automatic → Manual reset switching method**

Pull switch plate to the left to position “H” to have reset rod recoiled back upward and finish.



TH-P20~TH-P600

**Manual → Automatic reset switching method**

Use cross screwdriver and align it with the cross hole on the top of reset rod, engage and drive the rod rotating it 90° counterclockwise to have the arrow on the top of reset rod pointing from “H” to “A” and keep reset rod in pressed down state.

**Automatic → Manual reset switching method**

Use cross screwdriver and align it with the cross hole on the top of reset rod, engage and drive the rod rotating it 90° clockwise to have the arrow on the top of reset rod pointing from “A” to “H” and the reset rod recoiled back to its original position.

Charact-eristics

SP

Series

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Selec-tion

Others

Ordering information



S-P21



S-2xP30T

|   |   |    |   |     |      |
|---|---|----|---|-----|------|
| S | - | 2x | P | 35T | 220V |
| 1 |   | 2  | 3 | 4   | 5    |

|          |                                |  |
|----------|--------------------------------|--|
| <b>1</b> | <b>Model</b>                   | S : AC Magnetic contactor  |
| <b>2</b> | <b>Non-reversing/reversing</b> | Blank   Non-reversing<br>2x   Reversing  |
| <b>3</b> | <b>Series</b>                  | P   P Series<br>C   C Series (Applicable to type 600)                            |
| <b>4</b> | <b>Type (rated capacity)</b>   | 11、12、15、16、21、25、30T、35T、40T、50T、60T、80T、100T、125T、150T、200T、220T、300T、400T、600 |
| <b>5</b> | <b>Control circuit voltage</b> | EX. 110V、220V、380V、440V (Refer to P34)   |



| Type  |  |                | Non-reversing            |          | S-P11     | S-P12           | S-P15    |       |
|---|--|----------------|--------------------------|----------|-----------|-----------------|----------|-------|
|   |  |                | Reversing                |          | S-2×P11   | S-2×P12         | S-2×P15  |       |
| Rated capacity  | CNS 2930<br>CNS 14816<br>JIS C8201<br>JEM 1038 | AC 3<br>(kW/A) | 1 Φ                      | 100~110V | 0.55/12   | 0.55/12         | 0.75/16  |       |
|   |  |                |                          | 200~220V | 1.1/12    | 1.1/12          | 1.5/16   |       |
|   |  |                | 3 Φ                      | 200~220V | 3/12      | 3/12            | 3.7/16   |       |
|   |  | 380~440V       |                          | 4/9      | 4/9       | 5.5/12          |          |       |
|   |  | 500~550V       |                          | 4/7      | 4/7       | 5.5/10          |          |       |
|   |  | AC1 (A)        |                          |          |           | 20              | 20       | 30    |
|   | Ith (A)  |                |                          |          | 20        | 20              | 30       |       |
|   | IEC 60947-4-1<br>EN 60947-4-1<br>DIN VDE 0660  | AC 3<br>(kW/A) | 3 Φ                      | 240V     | 3.5/13    | 3.5/13          | 4.5/18   |       |
|   |  |                |                          | 440V     | 5.5/12    | 5.5/12          | 7.5/16   |       |
|   |  |                |                          | 550V     | 5.5/9     | 5.5/9           | 7.5/13   |       |
|   |  | 660V           |                          |          |           | 5.5/7           | 5.5/7    | 7.5/9 |
|   |  | AC1 (A)        |                          |          |           | 20              | 20       | 30    |
|   | Ith (A)  |                |                          |          | 20        | 20              | 30       |       |
|   | UL 508<br>CSA-C22.2                            | FLA<br>(HP/A)  | 1 Φ                      | 110~120V | 0.5/9.8   | 0.5/9.8         | 1/16     |       |
|   |  |                |                          | 220~240V | 2/12      | 2/12            | 3/17     |       |
| 3 Φ   |  |                | 220~240V                 | 3/9.6    | 3/9.6     | 5/15.2          |          |       |
|   |  | 440~480V       | 7.5/11                   | 7.5/11   | 10/14     |                 |          |       |
|   |  | 550~600V       | 10/11                    | 10/11    | 10/11     |                 |          |       |
| AC1 (A)   |  |                |                          | 24       | 24        | 30              |          |       |
| Ith (A)   |  |                |                          | 24       | 24        | 30              |          |       |
| NEMA  |  |                |                          | 00       | 00        | 0               |          |       |
| Auxiliary contact   | Contact structure                              |                | Non-reversing            |          | 1a (1b)   | 1a1b (2a or 2b) | 1a (1b)  |       |
|   |  |                | Reversing                |          | 2×1b      | 2×1a1b          | 2×1b     |       |
|   | IEC 60947-5-1<br>EN 60947-5-1                  | AC12<br>(A)    |                          | 110V     | 6         | 6               | 6        |       |
|   |  |                |                          | 220V     | 5         | 5               | 5        |       |
|   |  |                |                          | 440V     | 3         | 3               | 3        |       |
| 550V  |  |                |                          | 3        | 3         | 3               |          |       |
| Ith (A)   |  |                |                          | 16       | 16        | 16              |          |       |
| Auxiliary contact class (UL)                                  |  |                |                          | A600     | A600,P600 | A600            |          |       |
| Functionality   | Mechanical life                                |                | (10 thousand times)      |          | 500       | 500             | 500      |       |
|   | Electrical life                                |                | AC3 (10 thousand times)  |          | 100       | 100             | 100      |       |
|   | On/Off frequency                               |                | (times/hour)             |          | 1200      | 1200            | 1200     |       |
| Ancillary device  | Auxiliary contact block                        | Front type     | 2P                       | 2a       | AP-20     | AP-20           | AP-20    |       |
|   |  |                |                          | 1a1b     | AP-11     | AP-11           | AP-11    |       |
|   |  |                |                          | 2b       | AP-02     | AP-02           | AP-02    |       |
|   |  | 4P             | 4a                       | AP-40    | AP-40     | AP-40           |          |       |
|   |  |                | 3a1b                     | AP-31    | AP-31     | AP-31           |          |       |
|   |  |                | 2a2b                     | AP-22    | AP-22     | AP-22           |          |       |
|   |  | Side type      |                          | 1a1b     | APS-11    | APS-11          | APS-11   |       |
|   | Applied thermal overload relay                 |                | Two-element              |          | TH-P12    | TH-P12          | TH-P12   |       |
|   |  |                | Three-element            |          | TH-P12E   | TH-P12E         | TH-P12E  |       |
|   |  |                | Phase failure protection |          | TH-P12PP  | TH-P12PP        | TH-P12PP |       |
| Coil Varistor (external type applicable to AC 240V and below) |  |                |                          | ☉        | ☉         | ☉               |          |       |
| Mechanical interlock  |  |                |                          | MPU-11   | MPU-21    | MPU-11          |          |       |

Characteristics

SP

Series

MS

Series

Other

Series

Coil

TH

Series

EYD

Series

Selection

Others

MS | S-P Series



| Type  |  | Non-reversing  |                          | S-P16     | S-P21     | S-P21A   | S-P25    |          |
|---|--|----------------|--------------------------|-----------|-----------|----------|----------|----------|
|   |  | Reversing      |                          | S-2×P16   | S-2×P21   | S-2×P21A | S-2×P25  |          |
| Rated capacity  | CNS 2930<br>CNS 14816<br>JIS C8201<br>JEM 1038 | AC 3<br>(kW/A) | 1 Φ                      | 100~110V  | 0.75/16   | 1.1/24   | 1.1/24   | 1.3/26   |
|   |  |                |                          | 200~220V  | 1.5/16    | 2.2/24   | 2.2/24   | 2.6/26   |
|   |  | 3 Φ            | AC1 (A)                  | 200~220V  | 3.7/16    | 5.5/24   | 5.5/24   | 6.5/26   |
|   |  |                |                          | 380~440V  | 5.5/12    | 11/21    | 11/21    | 12/23    |
|   |  |                |                          | 500~550V  | 5.5/10    | 11/17    | 11/17    | 12/20    |
|   |  |                |                          | lth (A)   | 30        | 40       | 40       | 40       |
|   | IEC 60947-4-1<br>EN 60947-4-1<br>DIN VDE 0660  | AC 3<br>(kW/A) | 3 Φ                      | 240V      | 4.5/18    | 5.5/24   | 5.5/24   | 6.5/26   |
|   |  |                |                          | 440V      | 7.5/16    | 11/21    | 11/21    | 12/23    |
|   |  |                |                          | 550V      | 7.5/13    | 11/17    | 11/17    | 12/20    |
|   |  |                |                          | 660V      | 7.5/9     | 11/14    | 11/14    | 12/16    |
|   |  | AC1 (A)        |                          | 30        | 32        | 32       | 32       |          |
|   |  | lth (A)        |                          | 30        | 32        | 32       | 32       |          |
|   | UL 508<br>CSA-C22.2                            | FLA<br>(HP/A)  | 1 Φ                      | 110~120V  | 1/16      | 2/24     | 2/24     | 2/24     |
|   |  |                |                          | 220~240V  | 3/17      | 3/17     | 3/17     | 3/17     |
|   |  | 3 Φ            | AC1 (A)                  | 220~240V  | 5/15.2    | 7.5/22   | 7.5/22   | 10/28    |
| 440~480V  |  |                |                          | 10/14     | 15/21     | 15/21    | 15/21    |          |
| 550~600V  |  |                |                          | 10/11     | 15/17     | 15/17    | 15/17    |          |
| lth (A)   |  |                |                          | 30        | 35        | 35       | 40       |          |
| NEMA  |  | 0              | 1                        | 1         | 1         |          |          |          |
| Auxiliary contact   | Contact structure                              |                | Non-reversing            | 1a1b      | 1a1b      | 2a2b     | 1a1b     |          |
|   |  |                | Reversing                | 2×1a1b    | 2×1a1b    | 2×2a2b   | 2×1a1b   |          |
|   | IEC 60947-5-1<br>EN 60947-5-1                  | AC12<br>(A)    | 110V                     | 6         | 6         | 6        | 6        |          |
|   |  |                | 220V                     | 5         | 5         | 5        | 5        |          |
|   |  |                | 440V                     | 3         | 3         | 3        | 3        |          |
| 550V  |  |                | 3                        | 3         | 3         | 3        |          |          |
| lth (A)   |  | 16             | 16                       | 16        | 16        |          |          |          |
| Auxiliary contact class (UL)                                  |  | A600,P600      | A600,Q300                | A600,Q300 | A600,Q300 |          |          |          |
| Functionality   | Mechanical life (10 thousand times)            |                |                          | 500       | 500       | 500      | 500      |          |
|   | Electrical life AC3 (10 thousand times)        |                |                          | 100       | 100       | 100      | 100      |          |
|   | On/Off frequency (times/hour)                  |                |                          | 1200      | 1200      | 1200     | 1200     |          |
| Ancillary device  | Auxiliary contact block                        | Front type     | 2P                       | 2a        | AP-20     | AP-20    | AP-20    | AP-20    |
|   |  |                |                          | 1a1b      | AP-11     | AP-11    | AP-11    | AP-11    |
|   |  |                |                          | 2b        | AP-02     | AP-02    | AP-02    | AP-02    |
|   |  |                | 4P                       | 4a        | AP-40     | AP-40    | AP-40    | AP-40    |
|   |  |                |                          | 3a1b      | AP-31     | AP-31    | AP-31    | AP-31    |
|   |  |                |                          | 2a2b      | AP-22     | AP-22    | AP-22    | AP-22    |
|   | Side type                                      |                | 1a1b                     | APS-11    | APS-11    | APS-11   | APS-11   |          |
|   | Applied thermal overload relay                 |                | Two-element              |           | TH-P20    | TH-P20   | TH-P20   | TH-P20   |
|   |  |                | Three-element            |           | TH-P20E   | TH-P20E  | TH-P20E  | TH-P20E  |
|   |  |                | Phase failure protection |           | TH-P20PP  | TH-P20PP | TH-P20PP | TH-P20PP |
| Coil Varistor (external type applicable to AC 240V and below) |  |                |                          | ☉         | ☉         | ☉        | ☉        |          |
| Mechanical interlock  |  |                |                          | MPU-21    | MPU-21    | MPU-21   | MPU-21   |          |





| S-P30T       | S-P35T       | S-P40T       | S-P50T    | S-P60T       | S-P80T       | S-P100T                                |
|--------------|--------------|--------------|-----------|--------------|--------------|--|
| S-2×P30T     | S-2×P35T     | S-2×P40T     | S-2×P50T  | S-2×60T      | S-2×P80T     | S-2×P100T                              |
| 1.5/30       | 1.8/35       | 2.2/44       | 3/58      | 3.7/68       | 4.5/80       | —                                      |
| 3/30         | 3.7/35       | 4/44         | 5.5/58    | 7.5/68       | 9/80         | —                                      |
| 7.5/30       | 9/35         | 11/44        | 15/58     | 19/68        | 22/80        | 25/105                                 |
| 15/27        | 15/27        | 22/40        | 30/52     | 37/65        | 40/75        | 55/100                                 |
| 15/22        | 15/22        | 22/32        | 30/41     | 37/52        | 45/60        | 55/85                                  |
| 50           | 50           | 65           | 80        | 100          | 100          | 135                                    |
| 50           | 50           | 65           | 80        | 100          | 100          | 135                                    |
| 7.5/30       | 9/35         | 11/44        | 15/58     | 19/65        | 22/80        | 30/105                                 |
| 15/27        | 15/27        | 22/40        | 30/52     | 37/65        | 40/75        | 60/105                                 |
| 15/22        | 15/22        | 22/32        | 30/41     | 37/52        | 45/60        | 60/85                                  |
| 15/18        | 15/18        | 22/26        | 30/34     | 37/43        | 45/50        | 60/70                                  |
| 50           | 50           | 50           | 80        | 90           | 100          | 135                                    |
| 50           | 50           | 50           | 80        | 90           | 100          | 135                                    |
| 2/24         | 2/24         | 3/34         | 5/56      | 5/56         | 7.5/80       | —                                      |
| 5/28         | 5/28         | 7.5/40       | 10/50     | 10/50        | 15/68        | —                                      |
| 10/28        | 10/28        | 15/42        | 20/54     | 20/54        | 25/68        | 30/80                                  |
| 20/27        | 20/27        | 20/27        | 30/40     | 40/52        | 50/65        | 60/77                                  |
| 30/32        | 30/32        | 30/32        | 40/41     | 50/52        | 60/62        | 60/62                                  |
| 50           | 50           | 50           | 80        | 90           | 90           | 100                                    |
| 50           | 50           | 50           | 80        | 90           | 90           | 100                                    |
| 2            | 2            | 2            | 2         | 2            | 3            | 3                                      |
| 2a2b         | 2a2b         | 2a2b         | 2a2b      | 2a2b         | 2a2b         | 2a2b                                   |
| 2×2a2b       | 2×2a2b       | 2×2a2b       | 2×2a2b    | 2×2a2b       | 2×2a2b       | 2×2a2b                                 |
| 6            | 6            | 6            | 6         | 6            | 6            | 6                                      |
| 5            | 5            | 5            | 5         | 5            | 5            | 5                                      |
| 3            | 3            | 3            | 3         | 3            | 3            | 3                                      |
| 3            | 3            | 3            | 3         | 3            | 3            | 3                                      |
| 16           | 16           | 16           | 16        | 16           | 16           | 16                                     |
| A600,Q300    | A600,Q300    | A600,Q300    | A600,Q300 | A600,Q300    | A600,Q300    | A600,Q300                              |
| 500          | 500          | 500          | 500       | 500          | 500          | 500                                    |
| 100          | 100          | 100          | 100       | 100          | 100          | 100                                    |
| 1200         | 1200         | 1200         | 1200      | 1200         | 1200         | 1200                                   |
| AP-20        | AP-20        | AP-20        | AP-20     | AP-20        | —            | —                                      |
| AP-11        | AP-11        | AP-11        | AP-11     | AP-11        | —            | —                                      |
| AP-02        | AP-02        | AP-02        | AP-02     | AP-02        | —            | —                                      |
| AP-40        | AP-40        | AP-40        | AP-40     | AP-40        | —            | —                                      |
| AP-31        | AP-31        | AP-31        | AP-31     | AP-31        | —            | —                                      |
| AP-22        | AP-22        | AP-22        | AP-22     | AP-22        | —            | —                                      |
| APS-11       | APS-11       | APS-11       | APS-11    | APS-11       | —            | —                                      |
| TH-P20(TA)   | TH-P20(TA)   | TH-P20(TA)   | TH-P60    | TH-P60(TA)   | TH-P60(TA)   | TH-P120(TA)                            |
| TH-P20E(TA)  | TH-P20E(TA)  | TH-P20E(TA)  | TH-P60E   | TH-P60E(TA)  | TH-P60E(TA)  | TH-P120E(TA)                           |
| TH-P20(TA)PP | TH-P20(TA)PP | TH-P20(TA)PP | TH-P60PP  | TH-P60(TA)PP | TH-P60(TA)PP | TH-P120(TA)PP                          |
| ☉            | ☉            | ☉            | ☉         | ☉            | SACW 240L    | SACW 240L                              |
| MPU-11       | MPU-11       | MPU-11       | MPU-11    | MPU-11       | MPU-50       | Assembled and adjusted by the factory. |

Charact-eristics

SP

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Selec-tion

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