



# *TemPower ACB*

*Double Breaker*

# 1 Features



## Communication facility added to *TemPower2*

*TemPower2* is equipped with an optional communication interface unit that allows data exchange with a host PC via a Modbus open network. Data communicated includes measurements, fault log, maintenance information, ON/OFF status, settings, and control (ON/OFF/RESET) signals.

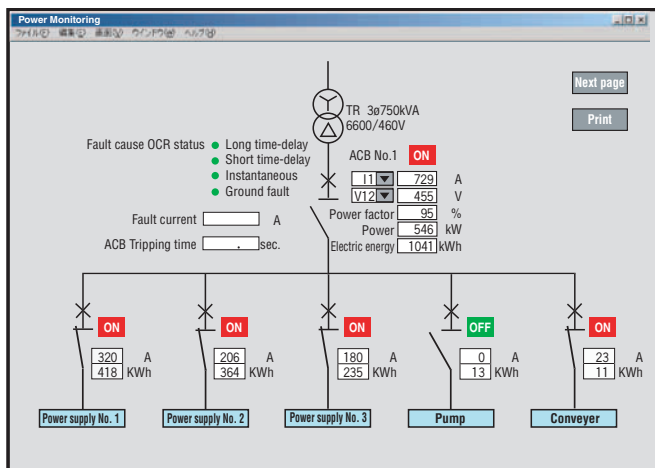
### ● Fault log

Cause	Whichever trip functions, LTD, STD, INST, or GF is activated is then transmitted.
Fault current	The fault current at which the breaker tripped open is transmitted.
Trip pickup time	The trip pickup time is transmitted.

### ● Maintenance information

Tripping circuit monitoring	The tripping coil is always monitored for disconnection. If the breaker is not open within approx. 300 ms of a trip signal delivered from the OCR, an alarm signal is generated.
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### On-screen PC monitor



### ● Data measurement

Phase current	Phase current $I_1, I_2, I_3, I_N, I_g$ and max current $I_{max}$ are measured and transmitted.
Line-to-line voltage	$V_{12}, V_{23}$ and $V_{31}$ are measured.
Active power	Three-phase power and the reverse power are measured.
Demand active power	Active power demand (over time) and historical max. power are recorded.
Accumulated power	Accumulated power is measured.
Power factor	Circuit power factor is measured.
Frequency	Frequency is measured.

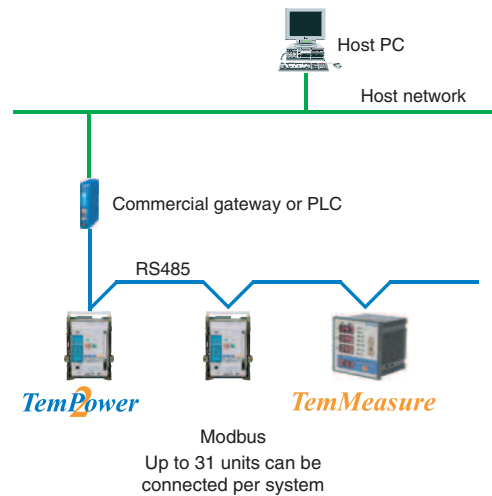
Note) Above is for type AGR-31 OCR.

Type AGR-21 and AGR-22 measure only phase current.

### ● Network interface I/O specifications

Item	Modbus
Transmission standard	RS-485
Transmission method	Two-wire half-duplex
Topology	Multi-drop bus
Transmission rate	19.2 kbps max
Transmission distance	1.2 km max (at 19.2 kbps)
Data format	Modbus-RTU or ASCII
Max number of nodes	1 – 31

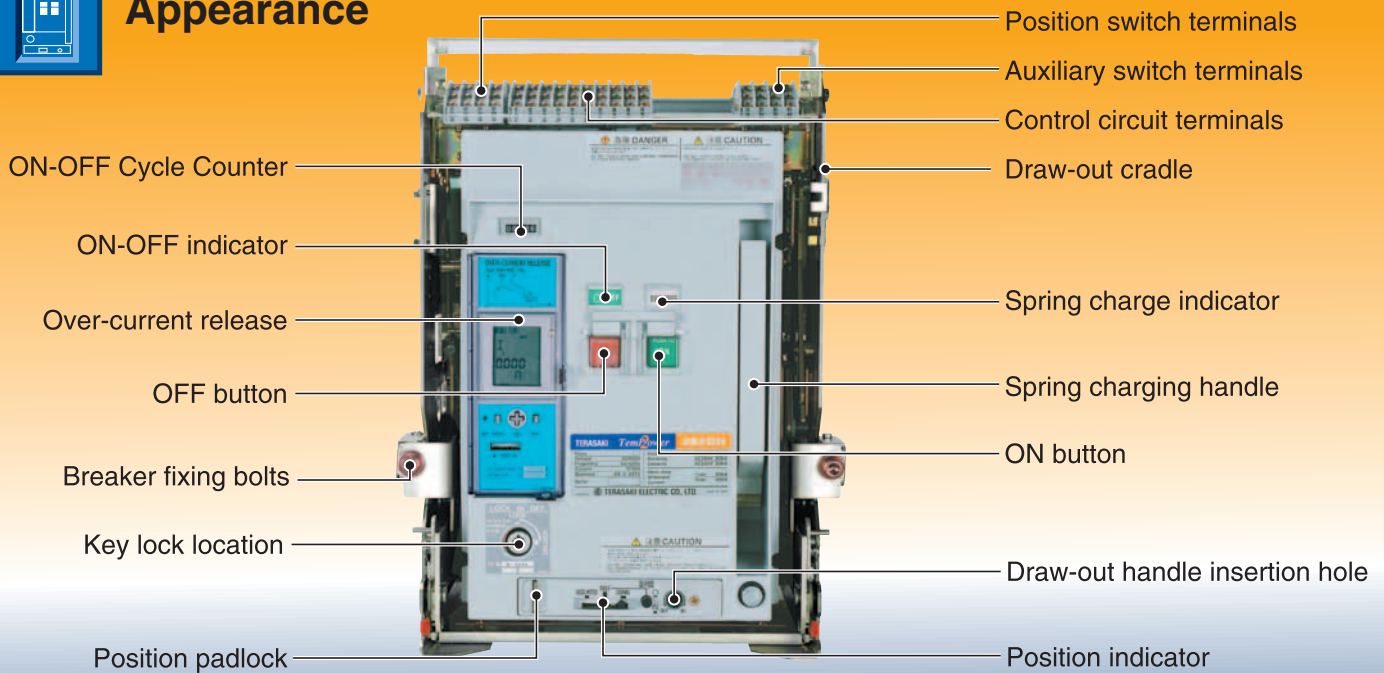
### Communication network



# 2 Appearance and Internal Construction



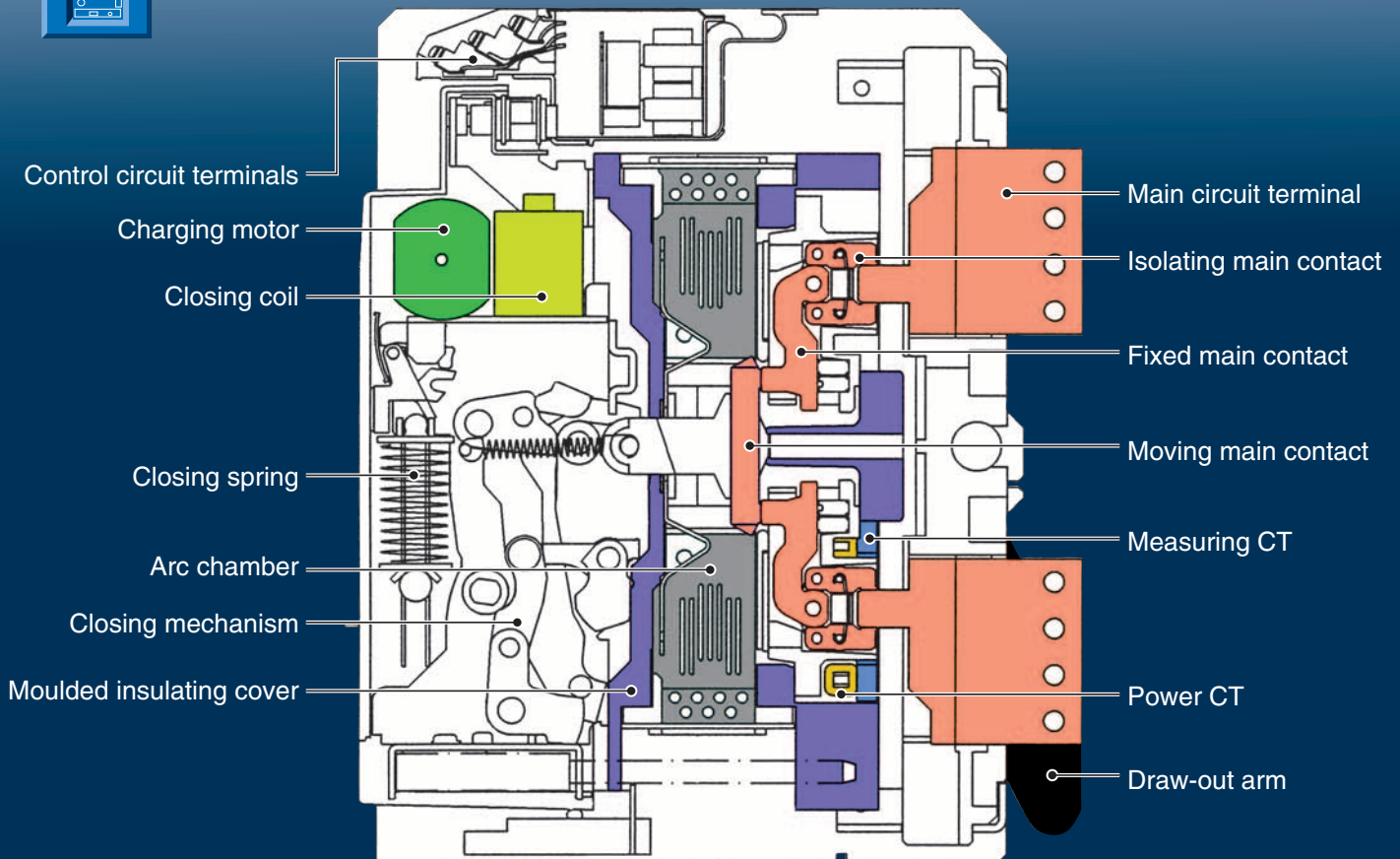
## Appearance



※Red ON button and GREEN OFF button are available on request.



## Internal Construction



# 3 Ratings

Series	Standard	Standard	High fault	Standard	High fault	High fault	Standard	High fault
AMPERE RATING(A)	800	1250	1250	1600	1600	1600	2000	2000
<b>TYPE</b>	<b>AR208S</b>	<b>AR212S</b>	<b>AR212H</b>	<b>AR216S</b>	<b>AR216H</b>	<b>AR316H</b>	<b>AR220S</b>	<b>AR220H</b>
RATED CURRENT (max) [ $I_n$ ](A)	800	1250	1250	1600	1600	1600	2000	2000
① ②								
JIS⑫, IEC, EN, AS	800	1250	1250	1540	1600	1600	2000	2000
NEMA, ANSI	800	1250	1250	1600	1600	1600	2000	2000
Marine	800	1250	1250	1600	1600	1600	2000	2000
NEUTRAL POLE AMPERES FRAME (A)	800	1250	1250	1600	1600	1600	2000	2000
NUMBER OF POLES	3 4	3 4	3 4	3 4	3 4	3 4	3 4	3 4
RATED PRIMARY CURRENT OF OVER-CURRENT RELEASE [ $I_{CT}$ ](A)	200	400	200	400	1600	200	400	2000
400	800	400	800	400	800	400	800	2000
800	1000	800	1000	800	1000	800	1000	2000
• for general feeder circuit use		1250	1000	1250	1600	1250	1250	1600
			1250	1600		1600	2000	
RATED CURRENT OF OVER-CURRENT RELEASE (A)	$100 \leq I_n \leq 200$	$200 \leq I_n \leq 400$	$100 \leq I_n \leq 200$	$200 \leq I_n \leq 400$	$800 \leq I_n \leq 1600$	$100 \leq I_n \leq 200$	$200 \leq I_n \leq 400$	$1000 \leq I_n \leq 2000$
• for generator protection use	$200 < I_n \leq 400$	$400 < I_n \leq 800$	$200 < I_n \leq 400$	$400 < I_n \leq 800$		$200 < I_n \leq 400$	$400 < I_n \leq 800$	
$I_n$ is generator rated current.	$400 < I_n \leq 800$	$500 < I_n \leq 1000$	$400 < I_n \leq 800$	$500 < I_n \leq 1000$		$400 < I_n \leq 800$	$500 < I_n \leq 1000$	
		$630 < I_n \leq 1250$	$500 < I_n \leq 1000$	$630 < I_n \leq 1250$		$630 < I_n \leq 1250$	$630 < I_n \leq 1250$	
			$630 < I_n \leq 1250$	$800 < I_n \leq 1600$		$800 < I_n \leq 1600$	$800 < I_n \leq 1600$	
							$1000 < I_n \leq 2000$	
AC RATED INSULATION VOLTAGE [ $U_i$ ](V. 50/60Hz)	1000	1000	1000	1000	1000	1000	1000	1000
RATED OPERATIONAL VOLTAGE [ $U_o$ ](V. 50/60Hz)	690	690	690	690	690	690	690	690
AC RATED BREAKING CAP [kA sym rms]/MAKING CAP [kA peak]								
JIS⑫, IEC, EN, AS	AC 690V	50/105 ⑤	55/121	50/105 ⑤	55/121	85/187	50/105 ⑤	55/121
[ $I_{cs} = I_{cu}$ ]	440V	65/143 ⑥	80/176	65/143 ⑥	80/176	100/220	65/143 ⑥	80/176
NEMA	AC 635V	42/96.6	42/96.6	42/96.6	42/96.6	50/115	42/96.6	42/96.6
ANSI	508V	50/115	55/127	50/115	55/127	80/184	50/115	55/127
	254V	65/149.5	80/184	65/149.5	80/184	100/230	65/149.5	80/184
⑦ ⑧	DC 250V	40/40	40/40	40/40	40/40	40/40	40/40	40/40
NK ⑨	AC 690V	50/115	55/128	50/115	55/128	85/201	50/115	55/128
	450V	65/153 ⑥	80/186	65/153 ⑥	80/186	100/233	65/153 ⑥	80/186
LR, AB, ⑨	AC 690V	50/115	55/128	50/115	55/128	85/201	50/115	55/128
GL, BV	450V	65/153 ⑥	80/186	65/153 ⑥	80/186	100/233	65/153 ⑥	80/186
REVERSE CONNECTED	⑮	⑮	⑮	⑮	⑮	⑮	⑮	⑮
RATED IMPULSE WITHSTAND VOLTAGE [ $U_{imp}$ ](kV)	12	12	12	12	12	12	12	12
RATED SHORT TIME WITHSTAND	1s	65	80	65	80	100	65	80
CURRENT [ $I_{cw}$ ](kA rms)	3s	50	55	50	55	75	50	55
LATCHING CURRENT (kA)	65	65	65	65	65	85	65	65
TOTAL BREAKING TIME (s)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
CLOSING OPERATION TIME								
SPRING CHARGING TIME (s) max.	10	10	10	10	10	10	10	10
CLOSE TIME (s) max.	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
No. of operating cycles								
Mechanical life								
with maintenance	30000	30000	30000	30000	30000	25000	25000	30000
without maintenance	15000	15000	15000	15000	15000	12000	12000	15000
Electrical life								
without maintenance	AC460V 12000	12000	12000	12000	12000	10000	10000	12000
	AC690V 10000	10000	10000	10000	10000	7000	7000	10000
Draw-Out Body (kg)	⑪	45 51	45 51	46 52	46 52	46 52	56 68	46 52
Draw-Out Chassis (kg)	⑪	28 35	28 35	33 42	30 38	33 42	49 57	33 42
Total Draw-Out Weight (kg)	⑪	73 86	73 86	79 94	76 90	79 94	105 125	79 94
Fixed (kg)	⑪	53 59	53 59	54 60	54 60	54 60	80 92	54 60
OUTLINE DIMENSION (mm)								
FIXED TYPE								
		360 445	360 445	360 445	360 445	360 445	466 586	360 445
		460	460	460	460	460	460	460
		290	290	290	290	290	290	290
		75	75	75	75	75	75	75
DRAW-OUT TYPE ⑩								
		354 439	354 439	354 439	354 439	354 439	460 580	354 439
		460	460	460	460	460	460	460
		345	345	345	345	345	345	345
		40	40	40	40	40	40	40

- ①: Values in open air at 40°C (45°C for marine applications).
- ②: Values of AR208S, AR212S, AR216S for draw-out type with horizontal terminals, Values of the other ACBs for draw-out type with vertical terminals.
- ③: For 2 pole ACBs use outside poles of 3 pole ACB.
- ④: 4poles ACBs without Neutral phases protection can not apply IT earthing system.
- ⑤: Cannot apply IT earthing system, i.e., insulated from earth.
- ⑥: For 500V AC.
- ⑦: ARG OCRs can not be used for DC. Please contact TERASAKI for DC application.
- ⑧: A special version of the breaker is available to use above 250V DC. Contact Terasaki for details.

- ⑨: Applicable to only 3 pole ACBs.
- ⑩: For vertical terminals or horizontal terminals.
- ⑪: These weights are based on normal specifications with the OCR and standard accessories.
- ⑫: Comply with JIS C 8201-2-1 Ann.1 Ann.2
- ⑬: Values for ACBs with INST. 100/220kA for ACBs with MCR.
- ⑭: Can apply IT system with special specification. Contact TERASAKI for the detail.
- ⑮: Available as standard.
- ※: Contact TERASAKI for the ratings.
- Note:** When the INST trip function is set to NON, the MCR function should be enabled, otherwise, the rated breaking capacity is reduced to the rated latching current.

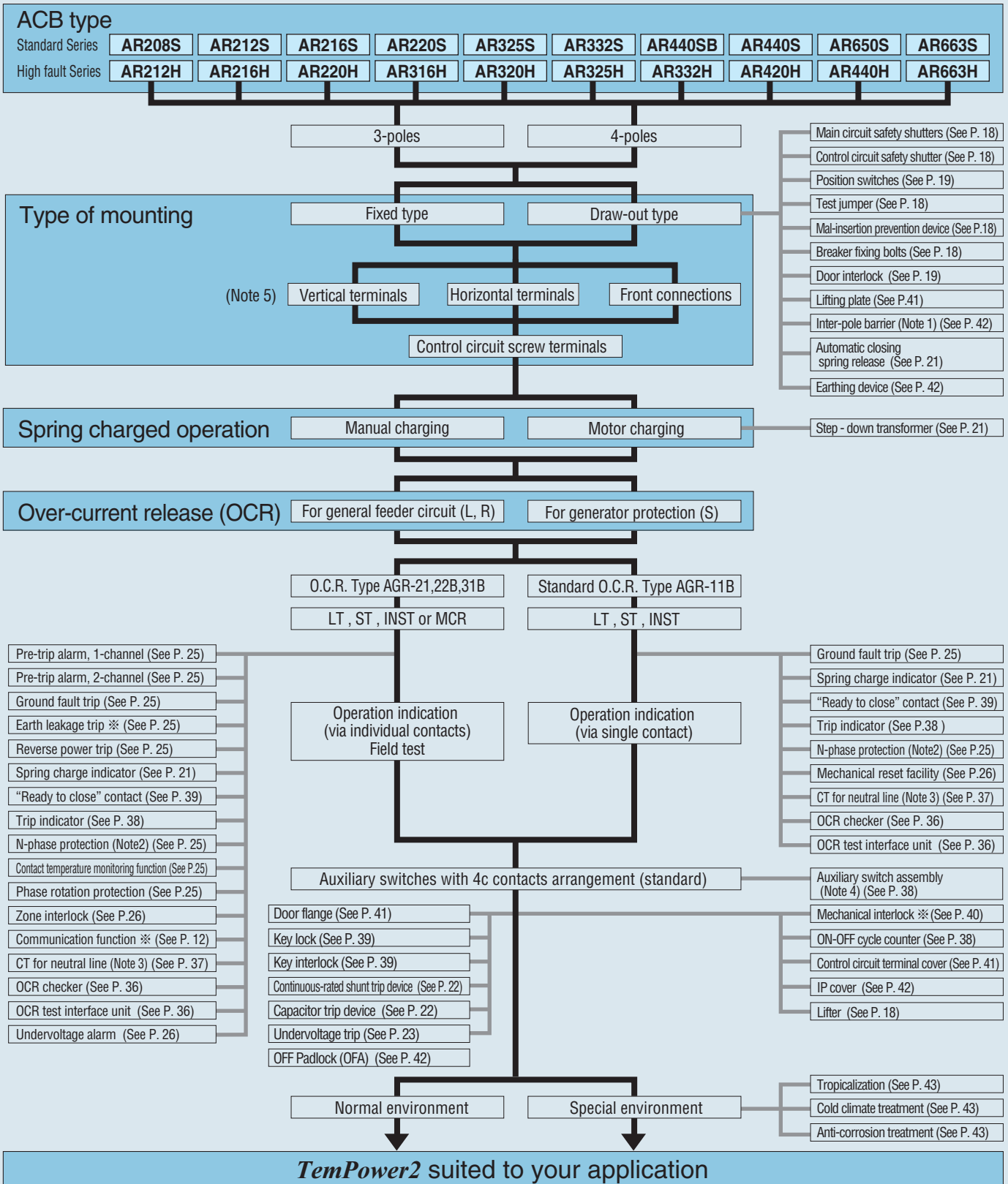
High fault 2000	High fault 2000	Standard 2500	High fault 2500	Standard 3200	High fault 3200	Standard 4000	Standard 4000	High fault 4000	Standard 5000	Standard 6300	High fault 6300
AR320H	AR420H	AR325S	AR325H	AR332S	AR332H	AR440SB	AR440S	AR440H	AR650S	AR663S	AR663H
2000	2000	2500	2500	3200	3200	4000	4000	4000	5000	6300	6300
2000	※	2500	2500	3200	3200	3310	3700	3700	4700	5680	5680
2000	2000	2500	2500	3200	3200	4000	4000	4000	5000	6300	6300
2000	2000	2500	2500	3200	3200	4000	4000	4000	5000	6300	6300
3   4	3	3   4	3   4	3   4	3   4	3   4	3   4	3	3   4	3   4	3   4
2000	800 2000	2500	2500	3200	3200	4000	4000	4000	5000	6300	5000 6300

$1000 \leq I_n \leq 2000$	$400 \leq I_n \leq 800$ $1000 \leq I_n \leq 2000$	$1250 \leq I_n \leq 2500$	$1250 \leq I_n \leq 2500$	$1600 \leq I_n \leq 3200$	$1600 \leq I_n \leq 3200$	$2000 \leq I_n \leq 4000$	$2000 \leq I_n \leq 4000$	$2000 \leq I_n \leq 4000$	$2500 \leq I_n \leq 5000$	$3150 \leq I_n \leq 6300$	$2500 \leq I_n \leq 5000$ $3150 \leq I_n \leq 6300$
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1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
690	690	690	690	690	690	690	690	690	690	690	690
85/187	75/165 ⑤	65/143 ⑤	85/187	65/143 ⑤	85/187	85/187	75/165 ⑤	75/165 ⑤	85/187 ⑭	85/187 ⑤	85/187 ⑤
100/220	120/264 ⑬	85/187 ⑥	100/220	85/187 ⑥	100/220	100/220	100/220	120/264 ⑬	120/264	120/264	135/297
50/115	65/149.5	50/115	50/115	50/115	50/115	50/115	65/149.5	65/149.5	65/149.5	65/149.5	65/149.5
80/184	75/172.5	65/149.5	80/184	65/149.5	80/184	80/184	75/172.5	75/172.5	80/184	80/184	80/184
100/230	120/276	85/195.5	100/230	85/195.5	100/230	100/230	100/230	120/276	100/230	100/230	100/230
40/40	40/40	40/40	40/40	40/40	40/40	40/40	40/40	40/40	40/40	40/40	40/40
85/201	75/179	65/153	85/201	65/153	85/201	—	75/179	75/179	85/201	85/201	85/201
100/233	120/287	85/201 ⑥	100/233	85/201 ⑥	100/233	—	100/245	120/287	120/287	120/287	138/322
85/201	75/179	65/153	85/201	65/153	85/201	85/198	75/179	75/179	85/201	85/201	85/201
100/233	120/287	85/201 ⑥	100/233	85/201 ⑥	100/233	100/233	100/245	120/287	120/287	120/287	138/322
⑮	⑮	⑮	⑮	⑮	⑮	⑮	⑮	⑮	⑮	⑮	⑮
12	12	12	12	12	12	12	12	12	12	12	12
100	100	85	100	85	100	100	100	100	120	120	135
75	85	65	75	65	75	75	85	85	85	85	85
85	100	85	85	85	85	85	100	100	120	120	120
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.05	0.05	0.05
10	10	10	10	10	10	10	10	10	10	10	10
0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
25000	15000	20000	20000	20000	20000	15000	15000	15000	10000	10000	10000
12000	8000	10000	10000	10000	10000	8000	8000	8000	5000	5000	5000
10000	3000	7000	7000	7000	7000	3000	3000	3000	1000	1000	1000
7000	2500	5000	5000	5000	5000	2500	2500	2500	500	500	500
56   68	71	56   68	56   68	56   68	56   68	58   71	71   92	71	125   160	140   180	140   180
49   57	76	49   57	49   57	49   57	49   57	68   87	68   84	76	75   100	80   105	80   105
105   125	147	105   125	105   125	105   125	105   125	126   158	139   176	147	200   260	220   285	220   285
80   92	—	80   92	80   92	80   92	80   92	—   —	—   —	—	—   —	—   —	—   —
466   586	—	466   586	466   586	466   586	466   586	—   —	—   —	—	—   —	—   —	—   —
460	—	460	460	460	460	—	—	—	—	—	—
290	—	290	290	290	290	—	—	—	—	—	—
75	—	75	75	75	75	—	—	—	—	—	—
460   580	631	460   580	460   580	460   580	460   580	460   580	631   801	631	799   1034	799   1034	799   1034
460	460	460	460	460	460	460	460	460	460	460	460
345	375	345	345	345	345	345	375	375	380	380	380
40	53	40	40	40	40	140	53	53	60	60	60

# 4 Specifications

TemPower2 series ACBs have an extensive range of accessories available, enabling the ACBs to be “custom built” to suit every application.



Note 1: Not applicable to ACBs equipped with front connections.

Note 2: Applicable to 4-pole ACBs.

Note 3: Required for ground fault protection for 3-poles ACB on 3-phase, 4-wire systems.

Note 4: Microload switch assembly with 3c arrangement available.

Note 5: Vertical terminal is standard and horizontal terminal is optional for High fault series. Front connection is not available for High fault series.

※: Contact Terasaki for details.

## 1 Types of Mounting

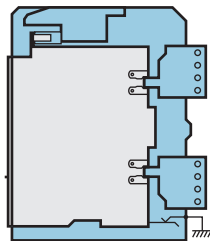
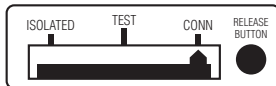
### Draw-out type

This type of ACB consists of a breaker body and a draw-out cradle. The breaker body can be moved within or removed from the draw-out cradle that is fixed in the switchboard.

There are four breaker body positions: CONNECTED, TEST, ISOLATED, and WITHDRAWN. The switchboard panel door can be kept closed in the CONNECTED, TEST, and ISOLATED positions (“shut-in three positions”).

#### 1 CONNECTED position

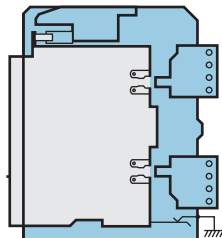
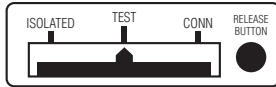
Position indicator



Both the main and control circuits are connected for normal service.

#### 2 TEST position

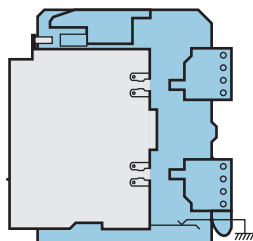
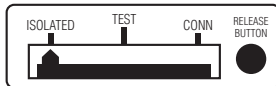
Position indicator



The main circuit is isolated and the control circuits are connected. This position permits operation tests without the need for opening the switchboard panel door.

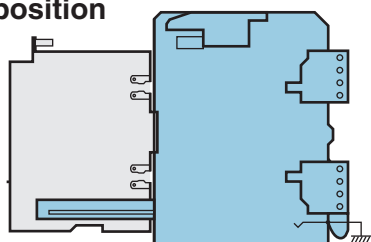
#### 3 ISOLATED position

Position indicator



Both the main and control circuits are isolated. The switchboard panel door does not need to be opened.

#### 4 WITHDRAWN position



The breaker body is fully withdrawn from the draw-out cradle.

### Fixed type

This type of ACB has no draw-out cradle and is designed to be directly mounted in the switchboard.

### Terminal arrangements

#### Main circuit terminals

Three(3) types of main circuit terminal arrangements are available: vertical terminals, horizontal terminals, and front connections. Different types of terminal arrangements can be specified for the line and load sides.

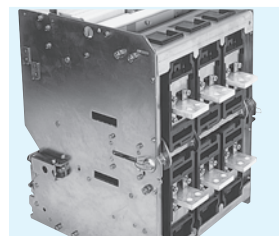
Note: The max. rated current [ $I_n$ ] may be reduced depending on the main circuit terminal arrangement. For more information see page 70.

Type	Vertical terminals	Horizontal terminals	Front connections
AR208S, AR212S, AR216S	○	⊙	○
AR220S, AR325S, AR332S	⊙	○	○
AR212H, AR216H, AR220H, AR316H, AR320H, AR325H, AR332H	⊙	●	—
AR440SB, AR440S, AR650S, AR663S, AR420H, AR440H, AR663H	⊙	—	—

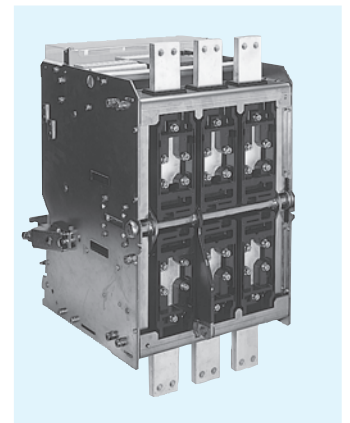
⊙: Standard. This configuration used unless otherwise specified.

○: Optional standard. Specify when ordering.

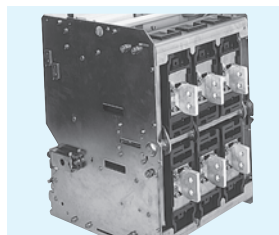
●: "yes" or "available". —: "no" or "not available".



▲Horizontal terminals



▲Front connections



▲Vertical terminals

#### Control circuit terminals

Control circuit terminals are front located to allow easy wiring/access.

- The terminal blocks (for auxiliary switches, position switches, and control circuits) are positioned on the top of the ACB front panel and can be accessed from the front for wiring.



▲Screw terminals

- M4 screw terminals are standard.